THE UTILITY OF VALUE:
THE "NEW SOLUTION," UNEQUAL EXCHANGE, AND CRISIS

James N. Devine

I. INTRODUCTION

Even after more than a century, the debate on Marx's "law of value" seems Rasputin-like, unkillable. This is primarily because Marx's uses for the law are so often forgotten. Far too often, the law is dubbed a "labor theory of value" and thus confused with (or reduced to) David Ricardo's labor theory of prices.[1] As such, it has been rejected by many—and indeed should be. Steedman (1977) presents the reductio ad absurdum of this approach: Ricardian labor-values, he argues, are ambiguous and unnecessary to the calculation of prices. To Elster (1985, p. 131), Ricardian "labor value fails because there is no use to which the concept can be put." Instead, they argue, prices of production can be calculated more straightforwardly from Sraffian technical coefficients of production, assuming equalized profit rates.

The goal of this paper is not to highlight the mathematical and theoretical flaws in Steedman's approach, but to take up Elster's challenge, to argue that

Research in Political Economy, Volume 12, pages 21–39.

ISBN: 0-89232-990-4

value analysis is *useful*, an important tool for understanding the capitalist world and a basis for developing hypotheses and predictions. The law of value does more than give intellectuals something to debate. This paper applies the so-called "New Solution" to Marx's transformation problem of Duménil (1980), Foley (1982), Lipietz (1982, 1985), and Ehrbar and Glick (1986) to examine the issues of transfer of value, unequal exchange, crises, and inflation. Here understanding is stressed more than hypothesis–generation and prediction.

To clear the decks and to avoid yet another paper on "what Marx (really) said," seven controversial principles are assumed to be true:[2]

1. Unlike Ricardo's labor theory, Marx's law of value is not chiefly a price theory.[3] A commodity has simultaneously a value and a value–form (i.e., price). The main purpose of the former is not the mathematical derivation of the latter. Rather, the key question concerns the relationship between values and prices.
2. Values form an alternative accounting framework to prices: a commodity has a value, the amount of socially necessary abstract labor time needed to reproduce it, by definition.[4]
3. In the first two volumes of *Capital*, Marx (1967a, 1967b) assumed that values = prices so as to reveal the totality of capitalism. This broke through the fetishism of commodities to show the social production of surplus–value hidden by markets and prices, and to explore questions of capitalist accumulation.[5]
4. But Marx was quite conscious of value/price deviation in the real world: early on, he mentions commodities such as virgin land or conscience with no value but having a price (1967a, p. 102). Indeed, the equation of prices with values contradicts the nature of capitalism as a social system except under unlikely conditions (e.g., zero exploitation).
5. The value/price deviation reflects the contrast between socialized production and class relations (seen in values) and individual appropriation of income (through prices).
6. The "problem" of the "transformation" concerns the macrosocietal link between values and prices, that is, Marx's propositions that total value = total price, that total surplus–value = total profit, and that the value profit rate = the price profit rate.[6]
7. The current literature overemphasizes prices of production and equilibrium in general. Value/production–price relations should be seen as a special case of value/market–price relations. That is, we should not be restricted to fathoming equilibrium utopias such as those of the Sraffians.[7]

Based on these propositions, section II argues that the New Solution solves the problem of the macrosocial relationship between values and market prices. The special case of prices of production is not considered, nor are matrix models of

the economy. The discussion interprets the existing literature and sets up the mathematical framework for the rest of the paper.

Section III examines the distribution of surplus–value, including the meaning the transfer of value between capitalists and other groups. This phenomenon is part of the contrast between socialized production and individual appropriation: workers create and *contribute* value and surplus–value to the capitalist system. But prices determine the *claims* that various social groups have on value and surplus–value. This issues are studied in greater detail in section IV, which focuses on types and meaning of "unequal exchange."

The mathematics incorporates the roles of fixed capital and unproductive labor. Thus, this paper is applying value analysis to understand a relatively realistic picture, indicating the flexibility of the New Solution. Nonetheless, many real-world issues are not probed, for example, household labor, heterogeneous labor (Devine 1989), and the role of the state.

The last section examines dynamic implications of the static analysis: commodity fetishism stabilizes the capitalist social system but is intertwined with the contradiction between socialized production and individual appropriation. The latter has implications for theories of crisis and inflation. Because we can use value to analyze capitalism as a totality, it is an appropriate part of macroeconomic theory (a "macrofoundation").

This paper uses three distinctions not often emphasized in the value literature, not even that of the New Solution: *ex ante* versus *ex post* value, contributions to versus claims on value, and synchronic versus diachronic causation. Also, the focus is on individual values and prices rather that sectoral values and prices.[8] These emphases are important to a dynamic–disequilibrium view of capitalism emphasizing individual appropriation. It is also true to Marx, I feel. But their justification here is only their use in understanding our world, not their trueness to Marx.

II. VALUE/PRICE UNITY: THE NEW SOLUTION

Rather than emphasizing Sraffian matrix algebra, the new solution rethinks price/value relations (see Duméil 1980; Foley 1982; Lipietz 1982, 1985; Ehrbar and Glick 1986).[9] In most cases, the *ex ante* calculation of price/value ratios becomes an empirical question, while individual price/value deviations are as important as their similarities. The price/value link appears on the macrosocietal level, as in point (6) above. The macro link between values and prices is interpreted as saying that the money price of the mass of new commodities in a commodity–producing society (total "net revenue") expresses the total social living labor. Then the issue is how this value comes to be realized in the money prices of particular commodities. Price/value relations become relatively trivial, so we can move on to applications.

Start with the two accounting frameworks that coexist under capitalism. For each commodity i, values are defined as:

$$A_i = C_i + V_i + S_i = C_i + VA_i \tag{1}$$

where C, V, and S are conventionally defined and VA = value added or living labor ($S+V$). All are measured in socially–necessary abstract labor time per unit commodity. In a dynamic world, two types of values exist. First, there are notional or ex ante values, reflecting the amount of abstract labor socially necessary to produce a good in the absence of realization problems. These have been stressed in much of the literature, especially in matrix models, where costs determined values. They constrain the second type of value, ex post or realized values: if the market "cannot stomach" as much as labor produced, some of that labor turns out to be wasteful (socially unnecessary) ex post and does not form part of value (Marx 1967a, p. 107). In Sections II–IV, the latter values are central: the macrosocietal identities below are between realized values and prices. The notional/realized contrast reappears in Section V.

On the other hand, prices are:

$$P_i = c_i + wc_i + pr_i = c_i + nr_i \tag{2}$$

where: pr = profits;
c = constant capital costs;
wc = wage costs; and
nr = net revenue ($wc+pr$), all in money terms (pesos) per unit.

Below, capital letters indicate value categories and lower-case letters signify prices.

The New Solution revamps the total value/total price relation. First, Marx's assertion that total price = total value is modified because it involves double-counting.[10] Instead, the link between total VA and total net revenue is examined. Second, money need not be gold (as in some solutions to the transformation problem). That assumption is unsuited to our age of credit money (cf. Lipietz 1985, chap. 6). Instead, money is the social expression of value, a claim on part of the total abstract labor done. The value of money (Vm) is defined as the ratio of aggregate living labor (Y) to the total net revenue (y). In symbols,

$$\Sigma VA_i \equiv Vm\ \Sigma nr_i \text{ or } Y \equiv Vm\ y \tag{3}$$

where Vm is measured in hours of labor per peso.[11] At any time, Vm is given, so that there is a clear link between total new value and total net revenue.

The net revenue for any commodity i multiplied by Vm is its owner's claim on aggregate living labor realized in selling the commodity. Individual appropriation of living labor typically differs from the living labor actually required to produce the commodity. If this claim exceeds the VA needed to produce the commodity, the seller gains value in exchange. But on the societal level, as Marx argued,

value is neither created nor destroyed in exchange: value is "transferred" between sectors. So Equation (3) is a macrosocietal conservation principle showing that the sum of all value transfers in exchange is zero.[12]

In selling labor–power, as with other commodities, the claim on aggregate living labor is labor–power's price (the money wage) times Vm. That is, the value claim of the average wage is:

$$VCw \equiv Vm\ w \equiv Vm\ (\Sigma wc)/N \tag{4}$$

where w = the average price of an hour of labor–power and N is the total hours of labor–power sold.[13]

The third and probably most controversial assumption of the New Solution is that variable capital is measured in terms of the claim on VA by the wage:

$$\Sigma V = VCw\ N \tag{5}$$

That is, the capitalists' costs in value terms are measured by workers' actual *claim on value* rather than the value of labor–power (Vlp, the socially-determined subsistence level).[14] The assumption that $\Sigma V = Vlp\ N$ might be valid if workers were produced means of production (i.e., chattel slaves) or were paid in kind. But labor–power is unique among commodities in that its supply does not follow profit–maximization. Moreover, as Keynes emphasized, workers bargain not over real wages or the value of real wages, but over money wages. Whether they can pass higher consumer prices onto capitalists by raising money wages (and attain $VCw = Vlp$) depends on the class struggle and conditions of accumulation. In sum, $\Sigma V = VCw\ N = Vlp\ N$, might be a long-run equilibrium condition (see Section V), but we do not want to restrict our analysis to that case.[15]

Equations (3) through (5) imply that the claim of the entire working class on (and the share of variable capital in) total living labor equals their share in total net revenue ($VCw\ N/Y = \Sigma V/Y = w\ N/y$). Because the ratio of total living labor done (Y) to the total number of hours of labor–power sold (N) is the average intensity of labor (e),

$$VCw = w\ N\ e/y \tag{6}$$

If $e = 1$, as Foley (1982) assumes, then the value claim of the wage = the workers' share of total net revenue (see Marx 1967a, pp. 409–410 on the intensity of labor).[16]

Now the link between total surplus–value and total profits can be derived. (It is not merely assumed!) Subtracting Equation (5) from (3),

$$\Sigma S = Vm\ \Sigma pr \tag{7}$$

This is Marx's second macroeconomic conservation principle.

Further, from Equations (7) and (5), the rate of surplus–value equals the aggregate profit-to-wage ratio:

$$S' \equiv \Sigma S/\Sigma V = \Sigma pr/\Sigma wc \tag{8}$$

The formula for the profit rate as a function of S′ is derived in the next section, in a more realistic model.

At this point, one question is inevitable, since Equations (3) and (7) seem tautological. Should we read them with value categories determining prices, or vice-versa? In fact, the equations should be read *both ways*. The effect of values on prices reflects the role *at any time* of the social totality in limiting and determining microeconomic decisions and results: to Marx, the productive and exploitative relations between classes in the capitalist mode of production are more than the sum of individual relations and have a certain regularity and solidity that constrains and shapes individual actions at any time.[17] Total value thus limits total revenue and total surplus–value limits total profits in the battle over distribution (see below). However, as seen Section V, individual actions within this mode of production end up helping to determine the system's laws of motion, so that decisions based on prices affect values through accumulation. In sum, values constrain prices synchronically (in the cross-section) but behavior based on prices affects values diachronically (in the time-series).[18] Consider synchronics and distribution first.

III. DISTRIBUTION: CONTRIBUTIONS VERSUS CLAIMS

Now examine the distribution of value and surplus–value in a model of capitalism incorporating nonequalized rates of surplus–value and of profit, unproductive labor and capital, and fixed capital. Before the model is developed, however, the fundamentals of distribution theory must be probed.

To Marx, before profits could be distributed, surplus–value had to be created at the societal level. The rate of surplus–value summarizes societal class relations, as seen by its determinants, which are also those of the aggregate profit/wage ratio:

$$\begin{aligned} S' &= Y/\Sigma V - 1 \\ &= e/VCw - 1 = e/Vm\ w - 1 \end{aligned} \tag{9}$$

So the rate of surplus–value depends on labor intensity (e) and the value claim of the wage. VCw depends on workers' ability to raise wages as the value of money falls due to either inflation or rising productivity, while e depends on conflict and technology in the work process. These factors in turn reflect the organizational strength of the two main classes on the societal level and the dynamics of accumulation. But at any time, class relations and S' are given and constrain the distributive struggle to be a "zero–sum game."

Because capitalists appropriate neither surplus–value nor profits collectively

as a class, price–value deviations are typical.[19] That is, individual profit appropriation contrasts with socialized production of surplus–value. Profits are divided among capitalists by prices, by market competition: the value in one sector may be sold for a higher price than an equal value produced in another. Exchange backed by special advantages—barriers to entry, control of a cheap source of raw materials, a state of the art production technique, or political clout—may increase an individual capitalist's profits, allowing the receipt of an above-average profit rate. But special advantages do not create profits on the societal level. Class tension skulks behind the more harmonious market: because the mass of surplus–value produced is given by the general state of class relations (measured by the intensity of labor and the *VCw*) and the number of worker–hours employed, the high–profit capitalists are gaining at the expense of the low–profit capitalists.[20]

Sometimes it is said that surplus–value is "transferred" from one group of capitalists to another, from "competitive" capitalists to "monopoly" capitalists, from those with a low organic composition to those with a high organic composition, and so forth. But there is no *physical transfer* of labor between sectors: rather, one group gets a greater money profit (while another gets profits less) than their surplus–value extraction (when stated in the same units).[21] That is, money *claims* on surplus-value differ from *contributions*.

Because of value transfer, it is possible for some to garner profits without directly exploiting labor or creating value. That is, capital that does not directly aid productive workers and thus induces no surplus–value production ("unproductive capital") may still be profitable. For example, landowners and bankers get a share of total profits because they control assets that, though lacking value, are typically both scarce and necessary to capitalist production, land and loanable money–capital. These incomes (ground–rent and interest) are deductions from the aggregate surplus–value. The total surplus–value is thus split between profits of enterprise (industrial and merchant's profits), land–rent, and interest. Some also goes to the state, as taxes.

A similar rule applies to unproductive labor, which neither produces nor helps produce surplus–value on the societal level.[22] The employment of some unproductive labor gives capitalists a claim on the share of surplus–value. That is, hiring unproductive workers (for example, advertising staff) can be profitable without being socially productive.

The complexities of price/value relations can be understood with a simple model. Start with values, first restating constant capital as a sum of circulating constant capital (CC) and the value of fixed capital transferred to the product:

$$C_i = CC_i + KP_i/t_i \tag{10}$$

where KP is productive fixed capital, means of production that increase the efficacy of productive labor (labor that produces surplus-value), and t is the

turnover time of KP.[23] Second, in a disequilibrium world, surplus–value for a product i is:

$$S_i = S'V_i + D_i \tag{11}$$

where D_i is the deviation, due to barriers to the mobility of labor–power and capital, of this commodity's surplus–value from that determined by the average rate of surplus-value ($S'V_i$). By definition, $\Sigma D = 0$ for capitalism as a whole. Thus, from Equations (1), (10), and (11),

$$A_i = (1 + S')V_i + CC_i + KP_i/t_i + D_i \tag{12}$$

is the value of a unit of i.

Next, in price terms, capitalists receive a profit on money tied up in fixed capital plus profits due to special advantages:

$$pr_i = r\,k_i + d_i \tag{13}$$

where: r is the average rate of profit on fixed capital;
k is fixed capital per unit; and
d is profit (or loss) per unit due to special (dis)advantages.[24]

By definition, $\Sigma d = 0$ for the system as a whole. Unlike in the value equations, fixed capital includes both productive capital (kp) and unproductive capital (ku).[25] Unproductive capital, for example, land and money capital, are assets that do not increase the efficacy of productive labor but do allow capitalists to claim a share of surplus–value.[26]

Next, introduce the distinction between socially productive and unproductive wage costs per unit:

$$wc_i = v_i + u_i \tag{14}$$

where v is productive workers' wages and u is unproductive workers' wages, a nuance that capitalists of course ignore. (Up to this point, we assumed $wc = v$.) Finally, capitalists add the profit to costs[27] to get the price:

$$\downarrow \quad P_i = r\,k_i + cc_i + v_i + u_i + d_i \tag{15}$$

where cc is circulating capital costs. Taxes are ignored here.

Following the most common view to treat unproductive wages as a deduction from surplus–value,[28] equation (7) becomes:

$$Vm\ \Sigma(pr + u) = \Sigma S \tag{7'}$$

Substituting Equations (11) and (13) into (7'), the average profit rate on fixed capital ($\Sigma pr/\Sigma k$) equals:

$$r = (S'\Sigma V/Vm - \Sigma u)/\Sigma k \tag{16}$$

where d and D cancel out on the aggregate level. Alternatively,

$$r = [S'/Q - (Vm\ \Sigma u/\Sigma KP)](\Sigma KP/Vm\ \Sigma k) \qquad (17)$$

where Q equals $\Sigma KP/\Sigma V$, one measure of the value composition of capital. S'/Q is the value rate of profit (R).

Equation (17) suggests that Marx's assertion that the price rate of profit = the value rate of profit does not apply unless $\Sigma KP/\Sigma k = 1$ and $\Sigma u = 0$.[29] Although the price profit rate might be *defined* to make this equality true, to do so would distort the meaning of that rate. This profit rate, in most views, is a variable relevant to capitalist decision making: how else could it move toward equality among sectors or affect accumulation? Indeed, Marx did not introduce the profit rate concept until volume III when discussing prices and "the ordinary consciousness of the agents of production" [1967c, p. 25]. So instead of equating the two profit rates, reducing r to R, treat the connection between the rate of surplus–value and the price rate of profit (Equation 16) as the crucial value/price connection. Alternatively, use Equation (17) to relate r and R, noting that phenomena of competition (including the roles of unproductive capital and labor) prevent these relationships from being simple.

For a commodity j, the price equation can now be restated as:

$$\dot{P}_j = [(S'\Sigma V)/Vm - \Sigma u](k_j/\Sigma k) + cc_j + wc_j + d_j \qquad (18)$$

The profit received depends on the owner's share in total capital ($k_j/\Sigma k$) and total surplus–value net of total unproductive wages, plus special advantages (d_j). Further, the price of j depends on not only micro variables (cc_j, wc_j, d_j, and k_j) but on macro variables ($S'\Sigma V/Vm$, Σu, and Σk), summarized by r. The r is partly determined by the rate of surplus–value and the value profit rate R, which depend on society–wide class relations. In sum, Equation (18) shows the importance of the societal macrofoundations to microeconomics.

IV. AN APPLICATION: UNEQUAL EXCHANGE

"Unequal exchange" has either a broad or a narrow meaning, referring either to any case where $VA_i \neq Vm\ nr_i$ or to a paradigm of center/periphery relations, as introduced by Emmanuel (1972). To make matters more concrete, examine the latter. However, the following could apply to any two sectors: that is, assumptions of center/periphery differences are not essential.

Let the center be sector 1 and the periphery sector 2. Per-unit values are:

$$A_1 = (1 + S')V_1 + KP_1/t_1 + CC_1 - D/x_1 \qquad (19a)$$

$$A_2 = (1 + S')V_2 + KP_2/t_2 + CC_2 + D/x_2 \qquad (19b)$$

where D/x_2 is per-unit exploitation in the periphery that goes beyond the international average represented by S'; x_i is the amount of output. Assume that pe-

ripheral workers are "super-exploited":[30] surplus–value exceeds the average in the periphery ($D > 0$). So total surplus–value in each sector is:

$$TS_i = x_i S_i = x_i S' V_i + (-1)^i D$$
$$= S' TV_i + (-1)^i D \qquad (20)$$

where $TV_i = x_i V_i$.

In this section, $i = 1$ or 2.

Next consider prices:

$$P_1 = r\, k_1 + wc_1 + cc_1 + d/x_1 \qquad (21a)$$

$$P_2 = r\, k_2 + wc_2 + cc_2 - d/x_2 \qquad (21b)$$

where d/x_i = per-unit profits above $r\, k_i$.

Thus each sector's total profits are

$$tpr_i = x_i pr_i = r\, tk_i - (-1)^i d \qquad (22)$$

where $tk_i = x_i k_i$ = total fixed capital in sector i. Assume that the center has monopoly power or some other special advantage in trade, so that it receives above-average profits: $d > 0$. As above, a sector's profits differ from its claim on aggregate surplus–value. The latter is

$$tcl_i = r\, tk_i - (-1)^i d + tu_i \qquad (23)$$

where $tu_i = x_i u_i$, total unproductive wage costs.

From (7′), the conservation equation sets world surplus–value equal to world claims:

$$\Sigma TS/Vm = \Sigma tpr + \Sigma tu \qquad (24)$$

Given formulae (20) and (23), and rearranging terms, this gives the average rate of profit on a world scale:

$$r = (S'/q\, Vm) - z \qquad (25)$$

where: both D and d cancel out on the world level;
$q = \Sigma tk/\Sigma TV$, a measure of world average "capital intensity," in units of pesos per hour of socially–necessary abstract labor time; and
$z = \Sigma tu/\Sigma tk$, a measure of the relative importance of unproductive wages in the world, a pure number.

Transfer of surplus–value to the center (TR_1) is the difference between claims on value (tcl_1, translated into value terms) and value actually produced (TS_1):

$$TR_1 = Vm(r\, tk_1 + tu_1 + d) - (S'\, TV_1 - D) \qquad (26)$$

To see this transfer in price terms, simply divide through by Vm. Either way, the transfer to the center plus that to the periphery equals zero.

Combining Equations (25) and (26),

$$TR_1 = Vm\ d + S'\ (q_1/q - 1)\ TV_1 + D + (z_1 - z)\ Vm\ tk_1 \qquad (27)$$

where $q_1 = tk_1/TV_1$ and $z_1 = tu_1/tk_1$.

This is the basic equation of unequal exchange, and represents a step beyond previous efforts at a unified schema for understanding unequal exchange. For example, Shaikh (1980, p. 49) provides a 2x2 chart combining the effects of two types of value transfer (cases (1) and (2) below). Equation (27) is more exact and adds Emmanuel's unequal exchange and a form of value transfer not previously noted. Consider the equation's four parts separately.

1. To deJanvry and Kramer (1979), the first term ($Vm\ d$) represents "unequal trade" due to the monopoly power of the center in the trade of goods and services (due to tariffs, etc.) It also reflects other advantages (land and technological rents).[31] Mandel (1975) emphasizes the latter type of unequal exchange.

2. The second term ($S'\ (q_1/q - 1)\ V_1$) says that there is surplus–value transfer if the center's q is higher than the world average. This is "transformation problem" transfer, due to differences in "capital intensity." Note that capital intensity is measured in a different way than in most of the literature. This tk/TV is the ratio of the ability to claim surplus–value to their contributions to the world pool. On the one hand, surplus–value is *produced* by variable capital. On the other hand, it is ownership of fixed capital (in price terms) that allows capitalists to *claim* profit: capitalists will not invest in fixed capital unless they receive profit in proportion.

This transfer will not occur if $S' = 0$. This is close to impossible under capitalism, occurring only during severe crises, but does take place with simple commodity production. In that case, total world surplus–value and profits would both equal zero. Profits could be made only if other sectors have losses, under a system of plunder, unequal trade, and Emmanuel's unequal exchange. On the other hand, the transfer to the center is high if the mass of "normal" surplus–value produced in the center ($S'V_1$) is high: the larger the use of variable capital in the center, the larger the value transfer, ceteris paribus.

3. The third term (D) denotes Emmanuel's unequal exchange, transfer of surplus–value to the center due to superexploitation in the periphery. Shaikh (1980, p. 52) suggests that the effect of differential wages is only to exaggerate the other transfers. However, Equation (27) shows this to be untrue in general: D can be positive even if terms (1) and (2) are zero.

Nonetheless, the conditions for the existence of this unequal exchange cannot be taken for granted. DeJanvry and Kramer (1979) doubt its existence if capital moves to take advantage of low wages, raising wages and lowering D in the periphery.[32] It might be argued that since equilibria are always being disrupted by capitalist accumulation, unequal exchange of this sort can exist. However,

that view does not imply any direction to the flow of surplus–value. A vicious–circle theory of underdevelopment is needed to explain why disequilibrium leads to superexploitation of only peripheral workers.

4. Finally, there is a new type of unequal exchange not noted before: if the center uses unproductive labor more than the world average ($z_1 > z$), then value will be transferred to the center. There is also transfer to the sector using the most unproductive capital, represented as part of transfer type (2), since *tk* includes both *kp* and *ku*. As noted in Section III, though unproductive labor and capital do not produce surplus–value, their use is profitable. The sector not emphasizing unproductive labor and capital pays for these profits.

To end this section, *so what* if value is transferred? One part of the world is doing more work than it is getting in terms of net revenue (both as a percentage of the world total). For systemic reasons, there is inequality of monetary rewards relative to the socially necessary abstract labor done.

The competition over the distribution of value described in Sections III and IV affects individual perceptions and actions, which in turn affect the system's laws of motion. Turn to these issues next.

V. DYNAMICS: FETISHISM, CRISIS, AND INFLATION

To sum up the above, the law of value shows that individual producers under capitalism are socialized, that is, interdependent, rather than isolated as in the neoclassical vision. We are all in the same boat. This interdependence is shown by conservation principles (3) and (7′).

Interdependence does not imply harmony. The "boat" is rife with rivalry among the officers and potential mutiny of the crew. Moreover, people often do not see the existence and nature of the boat itself. Dropping the now heavily barnacled analogy, individuals appropriate income, often not knowing, and unable to act on, their interdependence. Workers, capitalists, and economists suffer from commodity fetishism or the illusions arising from competition (Marx 1967c, part 7).

Because prices are out of sync with values, the link between surplus–value and individual profits is obscured, as are class relations. As described above, an individual capitalist's profits appear to arise from her investments (*k*), efforts, risk taking, and special advantages (*d*)—and not because she shares in society–wide exploitation. It cannot be stressed too often that this illusion arises not because of "false consciousness" but because of an individual's partial view of the system from the inside. Indeed, from a purely individual view, it is not an illusion! Further, even if an individual can see values or surplus–value, she typically cannot act on the basis of them.

This mystification helps legitimate the system, making force less needed to protect capitalist property and surplus–value extraction. Individual workers and unions often lack a vision of the "big picture": for example, craft unions often push for better wages and conditions for an elite of skilled workers, totally disregarding class interests. And seeing "their" capitalist's profits as crucial to the provision of jobs, many times workers ally with employers to fight for special privileges (e.g., tariff protection).

However, the stabilizing benefits to the capitalists are not free: the individualized nature of capitalist property and the resultant anarchy of production are also the major bases of economic crises. Here we touch briefly on capitalism's laws of motion.

Part of the story comes from labor's side: if their claim on value (VCw) is less than subsistence (Vlp), then it is pushed by necessity to struggle for higher wages. If, on the other hand, $VCw > Vlp$, the "moral and historical" element of subsistence (and with it Vlp) tends to rise as established luxuries become new needs. Over the longer term, the two should be similar, if workers' struggles are successful. One might write of a long–term equilibrium, where $VCw = Vlp$.

But at any time, Vlp is merely a center of gravity for fluctuations of VCw. Further, until the working class is class conscious and highly organized, labor is more acted upon by capitalist accumulation than it is an independent actor.[33] So consider accumulation, taking the VCw as mostly determined by accumulation, ignoring historically–specific factors such as labor's organizational strength.

Capitalists augment their capitals using their profits plus borrowed funds, which are based on the surplus–value produced by society. But they make these decisions on the basis of individual profitability: it is prices and money incomes, not values, that determine behavior. Rather than seeking to produce the most private or aggregate surplus–value, an industrial or commercial capitalist maximizes the following, subject to various microeconomic constraints:[34]

$$\begin{aligned} \pi_j &= ([r - r_f])k_j + d_j)\, x_j \\ &= (p_j - cc_j - wc_j - r_f\, k_j)\, x_j \end{aligned} \tag{28}$$

where r_f is the interest rate on borrowed capital.[35]

Note that this refers to behavior ex ante rather than pricing ex post (as in previous equations). When value analysis moves to diachronics, the contrast between ex post and ex ante (realized and notional) values must be highlighted: decisions are made ex ante but results are seen ex post. Most importantly, ex ante net value (Y') need not equal ex ante net revenue ($Vm\ y'$). Labor done under capitalism is not directly social; it only proves itself to be socially necessary in the market test.

Maximizing a formula such as (28), capitalists strive to own anything that allows them to claim a high money profit, that is, large investments (k) and special advantages (d). On the former, if $r > r_f$, capitalists vie for large capitals even though it is not a large capital *but the exploitation of labor* on the societal

level that produces profits. Capitalists thus accumulate independent of the social conditions, ignoring the effects on r. The competitive struggle induces capitalists to overaccumulate, in fear of falling behind.

These effects can be seen by restating Equation (17):

$$r = [S'/Q - (Vm\ \Sigma u/\Sigma KP)](\Sigma KP/Vm\ \Sigma k) \qquad (17)$$

One type of overaccumulation involves the purchase of means of production even though on the social level they do not create surplus-value: profits cannot be created by machines, only by the exploitation of workers.[36] In Marx's law of the tendency for the profit rate to fall, this causes a rise of the composition of capital (measured by Q). Ceteris paribus, this depresses r.[37]

Another type of squeeze on profit rates consists of hiring too many workers (by capitalist standards): though individual capitalists minimize wage costs, aggregate accumulation may hurt S' and thus r. This is because they accumulate assuming that as individuals they have no effect on these aggregate variables. Excess growth dries up the reserve pool of the unemployed, raises wages, undermines the intensity of labor, and squeezes the profit rate. This type of crisis is part of the story of the late 1960s for the United States (Devine 1987).

Third, capitalists invest in unproductive activities such as speculation simply because these are individually profitable. These raise ku_j and thus k_j without boosting productive capital (KP) or ΣS, depressing the last term of Equation (17), and ceteris paribus, the rate of profit. Competition also pushes individual capitalists to pay unproductive wages (u) because of the private benefits, even if it raises $\Sigma u/\Sigma KP$ and hurts the profit rate.[38]

In sum, the fact that individual capitalists can claim more than they contribute to social surplus-value means that they can drive themselves into a collective crisis: this crisis dramatically shows the hidden interdependence of individual appropriation. Further, crises threaten to delegitimize the system by revealing the totality of the system and undermining the fetishism of commodities.

In general, if the profit rate falls relative to the interest rate (fixed by prior loan agreements), accumulation slows. This breaks the social conditions needed to maintain adequate demand (seen in Marx's reproduction schemes) so that a realization crisis results: notional claims on value ($Vm\ y'$) < notional value (Y'), so that realized value falls.[39]

Turning to inflation, Marx himself did not develop a theory beyond noting that inflation can result from the discovery of new gold supplies. Because the current monetary system is not based on gold, that is hardly relevant. But rudiments of an inflation theory can be outlined.

With the value of money and the average wage (w) given, the VCw is determined. With the intensity of work (e) also given, the competition among capitalists to attain profits represents a fight over a fixed pool of surplus-value. This struggle intensifies if overaccumulation has driven the profit rate downward.

One way to mitigate this fight can be a fall in the value of money. If notional

claims on value exceeds notional net value ($Vm\ y' > Y'$) and value production Y cannot rise (due to capacity constraints), Vm must fall so that realized value claims $Vm\ y$ equals value production Y. Because the value of money is measured in labor hours per peso, Vm can fall if there is a fall in either labor–hours per unit output (an increase in productivity) or output per peso (inflation). Suppose that productivity increases at the same rate as money wages (or slower). Then only inflation can temper capitalist rivalry: each capitalist tries to end cost pressure on her profit rate by hiking prices, even though these increases do not solve the basic problem of a depressed profit rate. So each attempts to raise prices again; a continuous process of inflation results as long as the profit rate is depressed. This is possible if the supplies of credit increase sufficiently.[40]

In conclusion, the above analyses of distribution, unequal exchange, crises, and inflation are incomplete and abstract. No concrete or testable hypotheses have been developed, but the basis for doing so has been built. The analyses do indicate the fruitfulness of the New Solution approach in a dynamic–disequilibrium context to help our understanding of the workings of capitalism.

ACKNOWLEDGMENTS

Thanks to Paul Zarembka, John Miller, Alain Lipietz, Mark Glick, David Gleicher, Steve Cullenberg, and members of the Greater Los Angeles Political Economy Seminar for their comments on an earlier draft. Of course, all crimes of passion and premeditation are mine alone.

NOTES

1. Marx never used the phrase "labor theory of value," except to refer to other economists' views, especially those of Ricardo.

2. These points are argued in a longer manuscript available from me. Not all are accepted by proponents of the New Solution.

3. See Himmelweit and Mohun (1978); Wolff, Callari, and Roberts (1984); and Ehrbar and Glick (1986–1987) on the different interpretations of value of Marx and Ricardo.

4. For joint production (e.g., wool and mutton being produced by the same sheep), commodities are merged into a composite commodity (wool + mutton). On this issue, Farjoun (1984) shows that the cases of joint production that shed doubt on the definition of value are unrealistic. Swanson (1986) argues against the joint product interpretation of fixed capital.

5. This arises from his philosophy of historical materialism, in which historical actions of people in society take precedence and from his commitment to the class interests of the workers.

6. Freeman (1984, pp. 250–251) argues that the function of Marx's "two equalities" (total price = total value and total profit = total surplus-value) is not part of a solution "for calculating prices which are already known anyway, but . . . an analytic instrument for going *behind* these prices and finding out how they distribute the results of production to the capitalists" (emphasis in original).

7. Mandel and Freeman (1984) argue ably against the equilibrium interpretation of value theory, especially that of the Sraffians.

8. The distinction between the individual and social value of a commodity is ignored, treating each product as if it were sold in a separate market from all others. This is one response to the prevalence of monopolistic competition and the common arbitrariness of the division of the economy into sectors or industries.

9. Lipietz (1982) and Ehrbar and Glick (1986) present matrix analyses in this tradition.

10. Marx knew of this problem, seeing the need for "some rectifications" to ensure that "Looking upon society as a whole, the profit contained in, say, the price of flax cannot appear twice—not both as a portion of the linen price and as the profit of the flax" (1967c, p. 160).

11. Because all summations below are for all commodities under capitalism, the index is dropped below.

12. However, that does not say that value can never be destroyed: if no exchange occurs (a realization crisis) or productivity increases, the notional value of existing commodities is not realized.

13. Some New Solution authors refer to the VCw as the "value of labor-power." This confusing terminology is avoided because equation (5) is more crucial to the New Solution than definition (4) and because of the importance of the clash between claims on value and production of value.

14. Wolff et al. (1984) present another solution to the transformation problem in which the values of the *means of production* rather than labor-power are identified with price categories. The New Solution assumption is preferred because of its emphasis on class conflict (in the determination of the money wage), the likelihood that $Vlp \neq VCw$ and its usefulness for understanding capitalism, as seen below. Also, the Wolff et al. solution has a strange result: they assume that the sum of the prices of means of production = the sum of their values (1984, Appendix, Equation 3). This implies that if a machine is sold below value, value must be transferred to another seller in the sector producing means of production. Why cannot the value-transfer be from, say, the consumer goods sector?

15. See Rowthorn (1980) for a complete discussion of the complexities of Marx's theory of wages.

16. I argue elsewhere (Devine 1989) that this assumption fits Marx's view. For expositional purposes, however, it is not made.

17. The role of determination "at any time" in Marx can be seen by the recurrence in *Capital* of phrases such as "in a given country, at a given period" something is "practically known." See, for example (1967a, p. 171).

18. This view is akin to Lipietz's warp-woof duality (1985, pp. 30, 37ff). The exception to the synchronic determination of prices by values is the money wage, which is determined simultaneously as the value claimed by the wage (VCw). This seems reasonable if the wage is "prevalidated," that is, if wages are paid whether or not the product is sold and whether or not the value produced is realized.

19. This conclusion is implicit in the transformation literature.

20. Total surplus-value = $S'\Sigma V$. Since $\Sigma V = VCw\,N$, ΣS equals $S'VCw\,N$. So ΣS equals $(e - VCw)N$.

21. Himmelweit and Mohun (1978, p. 83) criticize the notion of surplus-value redistribution, seeing "no real-world state which exists prior to such redistribution. . . . competition distributes aggregate surplus-value . . . but there is no *re*distribution. The process of redistribution is . . . [merely] a conceptual one which is symbolic of the theoretical transition required between concepts of a different order" (emphasis in original). In my view, there is no redistribution of value, but rather differences in *the pricing of values*. It is money that is distributed, not labor. Nor is it merely a matter of theory: both values and prices coexist at any time under capitalism.

22. Only *purely* unproductive labor is discussed here. But this allows understanding of the role of more complex cases in society, such as "indirectly productive labor" (which reduces waste, allows greater exploitation, etc.). See Miller (1984) for a useful summary of the literature on unproductive labor.

23. For a more complete treatment of fixed capital, see Swanson (1986).

24. Because of its limited mobility, the use of fixed capital ensures that profit rates will typically not be equalized between sectors.

25. Of course, capitalists ignore this distinction. The impact of the contrast between productive and unproductive fixed capital is examined further in Section V.

26. If the capital is entirely money–capital or land, then the "profit" is called interest or rent. This suggests a simple perspective on rent theory: ku_i is the capitalized value of future money rents, the asset price of land. The capitalist earns income $r\,ku_i$ simply for being an owner of land (akin to Marx's absolute rent, but not the same). In addition, there is differential rent d_i. Note that the existence of either sort of rent cannot be shown or explained on the price level. This presupposes value analysis of rent, one of Marx's tasks in volume III.

27. Adam Smith's "adding on" theory of prices applies on the micro level of individual appearances, but not on the macro level of values. Also, the ability of capitalists to "add on" depends on market conditions ex post.

28. Unproductive wages have instead been treated as part of constant capital (Mage 1963) or of variable capital (by those rejecting the productive–unproductive distinction). In all cases, conservation equations similar to (3) and (7) will be met. In the case of (7′), equations (3) and (5) become:

$$\Sigma VA \equiv Vm\,(\Sigma pr + \Sigma v + \Sigma u) \tag{3′}$$

$$\Sigma V = Vm\,\Sigma v \tag{5′}$$

On the latter, variable capital is measured by the value claim of productive wages, while the average wage (w) is defined for only productive workers.

29. For $\Sigma KP/\Sigma k = 1$, not only will there have to be no unproductive capital, but the price of kp must proportional to the value of KP.

30. This can occur if the periphery has relatively high work intensity, long workday, or low value claimed by the wage.

31. This type of unequal exchange is larger if the value of money is high. But this is trivial, because it is only a matter of translating different accounting frameworks into each other.

32. Shaikh's (1980, p. 42) more concrete model suggests that the net transfer to the center is ambiguous. This refers to the sum of all of the terms of Equation (27) (except 4) and depends on the assumptions of his model. See also Huston and Paus (1987) for a largely empirical critique of unequal exchange.

33. This generalizes Marx's view that the average wage is an endogenous, not exogenous, variable (1967a, p. 620).

34. These include the demand curve for the firm's output, supply curves of inputs, technical relations among the inputs, and the limits on which types of k are seen as profitable.

35. The application of the interest rate to the entire fixed capital follows from the logic of opportunity cost: the capitalist could have lent out the money equivalent of k_j at the interest rate instead of tying it up as fixed capital.

36. Gaining profits by buying machines below value does not solve the social problem because it is at other capitalists' expense.

37. See Marx (1967c, part 3); Shaikh (1978) and Laibman (1982) present two recent interpretations of this "law." The controversy surrounding this theory exceeds the scope of this paper.

38. As Tarbuck (1983, p. 82) notes, ". . . at certain times the general and the particular conditions of capital accumulation come into violent contradiction and . . . the problem of productive and unproductive labor is one of the key elements in this clash."

39. A more complete picture of this story and those below would involve a model of reproduction schemes involving money, such as in Foley (1986, ch. 5). Note that equality of $Vm\,y'$ and Y' might be enforced by rising Vm. This involves deflation or decreasing labor productivity (the reverse of the inflation case below). Both are disastrous.

40. As Lipietz (1985, ch. 6) makes clear, sustained inflation is impossible without the replacement of gold money by credit money.

REFERENCES

DeJanvry, A. and F. Kramer. 1979. "The Limits of Unequal Exchange." *Review of Radical Political Economics* 11(4)3–15.

Devine, J. N. 1987. "Cyclical Over-Accumulation and Crisis: Theory and Evidence." *Eastern Economic Journal* 13(2):271–280.

_____. 1989. "What is 'Simple Labor'? A Re-Examination of the Value-Creating Capacity of Skilled Labor."*Capital and Class* 39:113–131.

Duménil, G. 1980. *De la Valeur aux Prix de Production*. Paris: Economica.

Ehrbar, H. and M. Glick. 1986. *The Transformation Problem: An Obituary*. Paper presented at the Allied Social Science Associations convention, University of Utah.

_____. 1986–1987. "The Labor Theory of Value and Its Critics." *Science and Society* 50(4):464–478.

Elster, J. 1985. *Making Sense of Marx*, Cambridge: Cambridge University Press.

Emmanuel, A. 1972. *Unequal Exchange: A Study of the Imperialism of Free Trade*. New York: Monthly Review Press.

Farjoun, E. 1984. "The Production of Commodities by Means of What?" In *Ricardo, Marx, Sraffa*, edited by E. Mandel and A. Freeman. London: Verso.

Foley, D. 1982. "The Value of Money, the Value of Labor Power and the Marxian Transformation Problem." *Review of Radical Political Economics* 14(2):37–47.

_____. 1986. *Understanding Capital: Marx's Economic Theory*. Cambridge, MA: Harvard University Press.

Freeman, A. 1984. "The Logic of the Transformation Problem." In *Ricardo, Marx, Sraffa*, edited by E. Mandel and A. Freeman. London: Verso.

Himmelweit, S. and S. Mohun. 1978. "The Anomalies of Capital." *Capital and Class* 6:67–105.

Huston, D. and E. Paus. 1987. "The Theory of Unequal Exchange: an Indictment." *Review of Radical Political Economics* 19(1):90–97.

Laibman, D. 1982. "Technical Change, the Real Wage, and the Rate of Exploitation: the Falling Rate of Profit Reconsidered." *Review of Radical Political Economics* 14(2):95–105.

Lipietz, A. 1982. "The 'So-Called Transformation Problem' Revisited." *Journal of Economic Theory* 26(February):59–88.

_____. 1985. *The Enchanted World: Inflation, Credit, and the World Crisis*. London: Verso.

Mage, S. 1963. *The Law of the Falling Tendency of the Rate of Profit: Its Place in the Marxian Theoretical System and Relevance to the United States*. Unpublished Ph.D. dissertation, Columbia University.

Mandel, E. 1975. *Late Capitalism*. London: Verso.

Mandel, E. and A. Freeman, eds. 1984. *Ricardo, Marx, Sraffa*. London: Verso.

Marx, K. 1967a. *Capital: A Critique of Political Economy*, vol. 1. New York: International Publishers.

_____. 1967b. *Capital: A Critique of Political Economy*, vol. 2. New York: International Publishers.

_____. 1967c. *Capital: A Critique of Political Economy*, vol. 3. New York: International Publishers.

Miller, R. 1984. "A Comment on Productive and Unproductive Labour." *Studies in Political Economy* 14(Summer):141–153.

Rowthorn, B. 1980. "Marx's Theory of Wages." In *Capitalism Conflict, and Inflation*, by B. Rowthorn. London: Lawrence & Wishart.

Shaikh, A. 1978. "Political Economy and Capitalism: Notes on Dobb's Theory of Crisis," *Cambridge Journal of Economics* 2:233–251.

_____. 1980. "Foreign Trade and the Law of Value: Part II." *Science and Society*, 44(1):27–57.

Steedman, I. 1977. *Marx after Sraffa*. London: Verso.

Swanson, P. 1986. "The Labor Theory of Value and Fixed Capital." *Review of Radical Political Economics* 18(3):44–64.

Tarbuck, K. J. 1983. "Marx: Productive and Unproductive Labor." *Studies in Political Economy* 12 (Fall) 81–102.

Wolff, R. D., A. Callari, and B. Roberts. 1984. "A Marxian Alternative to the Traditional 'Transformation Problem.'" *Review of Radical Political Economics* 16(2,3):115–135.