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特集　スタグフレーションへのネオ・マルクス学派的接近

The Analytics of Neo-Marxian Crisis Theory*

—— An Illustrative Model ——

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The literature on Marxian crisis theory identifies a capitalist crisis as a generalized set of economic and political difficulties that call into question the reproduction of a capitalist socioeconomic system. The Marxian emphasis on capital accumulation as the driving force of a capitalist system suggests that the origins of a capitalist crisis are to be found in the factors that slowdown or arrest the process of accumulation. A capitalist economic boom is characterized by a prolonged period of successful accumulation that ensures the smooth reproduction of a capitalist society over time; by contrast, a capitalist economic crisis is characterized by a prolonged period of arrested accumulation in which difficulties spread from the economic to the political and social spheres of the society.

Within the broadly defined Marxian tradition there have been many efforts to explain concrete historical periods of capitalist boom and crisis in terms of various aspects of Marxian economic theory. In particular, the modern historical period since the end of World War II has been analyzed by many Marxists in terms of an initial postwar boom (or "golden age") of rapid accumulation from the late 1940s to the late 1960s or early 1970s, followed by a subsequent economic crisis of slow accumulation and continuing economic difficulties on a world scale.

In this paper I will address myself to one branch of Marxian crisis theory that has frequently been applied by contemporary political economists —— especially in the United Kingdom and the United States —— to analyze the most recent capitalist economic crisis. I will label this the "neo-Marxian" approach, because it departs from the traditional Marxian value-theoretic framework to focus on the interaction of conventionally defined macroeconomic variables in a context of class conflict and the exercise of power by conflicting classes. Among the studies of capitalist economic crisis that reflect such a neo-Marxian approach are the works of Glyn and Sutcliffe (1972), Rowthorn

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(1976, 1977), Armstrong, Glyn and Harrison (1984), Weisskopf (1979), Bowles and Gintis (1982) and Bowles, Gordon and Weisskopf (1983, 1986, 1988). While differing in many particulars, these studies share a common focus on the importance of distributive conflict, power and profitability in the functioning of a capitalist economy ; and they locate the source of capitalist economic crisis in forces that depress the average rate of profit.

My objective here is not to review or to extend the analyses of capitalist economic crisis carried out by these authors, but instead to formalize the analytical framework that appears to underlie their overall theoretical approach. I will develop a deliberately over-simplified model of a capitalist economy, with a view to highlighting the essential features of the neo-Marxian approach and the nature of its assumptions. It is my hope that this analytical exercise will contribute both to theoretical clarity about the neo-Marxian approach and to subsequent efforts to apply it empirically to analyze concrete developments in the history of the capitalist economies.

1. A Simple Model of a Closed Capitalist Economy

A central feature of the neo-Marxian approach to capitalist accumulation and crisis is its focus on the rate of profit as a critical variable for analysis. I will therefore begin by constructing a model of a capitalist economy in which the determinants of the average economy-wide rate of profit can be illuminated. I assume a closed economy, producing a single homogeneous good that can be used for consumption or investment.[1] Aggregate income Y is divided into wages W and profits (or surplus) S:

[1] $Y=W+S$.

Aggregate output Q is related to aggregate income Y via the general price level p:

[2] $Q=Y/p$.

Output is produced by inputs of "effective" labor hours H^e and "effective" capital services K^e, with average productivities q_h and q_k:

[3] $Q=q_h*H^e$

[4] $Q=q_k*K^e$;

H^e and K^e are in turn related to actual labor hours H and utilized real capital stock K as follows:

[5] $H^e=i_h*H$

[6] $K^e=i_k*d_k*K$,

where i_h and i_k are measures of the *intensity* of use of actual labor hours and actual capital service inputs, respectively, and d_k is a measure of the duration of capital stock use (the ratio of actual capital services to utilized capital stock). Denoting the available supply of labor hours as H^s and the available real capital stock as K^s, I define *utilization* coefficients as follows:

[7] $u_h=H/H^s$

[8] $u_k=K/K^s$.

From equations [3]-[8] it follows that output Q can be expressed as:

[9] $Q=q_h*i_h*u_h*H^s=q_k*i_k*d_k*u_k*K^s$.

The (hourly) real wage rate b is defined as follows:

[10] $b=w/p=(W/H)/p=B/H$,

where w is the nominal wage rate and B is the real volume of wages. The shares of wages s_w and profits/surplus s_s in income can then be expressed as follows:

[11] $s_w=W/Y=B/Q=b/(q_hi_h)$

[12] $s_s=S/Y=R/Q=1-b/(q_hi_h)$.

where R is the real volume of profits/surplus. Finally, the rate of profit is defined as the ratio of the volume of profits to the value of capital stock:

[13] $r=S/(pK^s)=R/K^s=(R/Q)*(Q/K^s)$
$=s_s*(q_ki_kd_ku_k)=s_s*u_k*z$,

where s_s is the profit share, u_k is the rate of utilization of capital stock, and z is the product $(q_ki_kd_k)$, which can be characterized as the adjusted average productivity of capital stock.

1) In future work I intend to extend this model to take into account the effects of international trade and foreign competition.

To focus on the essential features of the neo-Marxian analysis, I will now make a series of simplifying assumption.[2] First, I assume that the intensities of use of labor and capital services are equal (and represented by a single measure of work intensity i):

[14] $i_h=i_k=i$;

this is reasonable in that more intensive worker effort is likely to entail more intensive use of machines, and units can be chosen so as to measure intensities on the same scale. Second, I assume that the duration of capital use is constant and equal to unity:

[15] $d_k=1$;

the constancy assumption is substantive, but the choice of units is trivial. Third, I assume that the rates of utilization of the available labor hour supply and the available capital stock are equal (and represented by a single measure of capacity utilization u):

[16] $u_h=u_k=u$;

as in the case of intensities of use, rates of utilization of labor and capital inputs will surely be highly correlated, and units can be chosen so as to measure utilization rates on the same scale. With these simplification the rate of profit can now be expressed as:

[13′] $r=s_g*u*z=(1-b/q_hi)*u*(q_ki)$.

2. The Determination of Target Wage and Profit Shares

The neo-Marxian analysis of the determination of the rate of profit focuses on conflict between workers and capitalists and on the exercise of power by the two classes to attain their desired economic objectives. To develop the analysis I need to specify those objectives and the sources of power that each class brings to bear on the struggle to attain its objectives. Following Rowthorn (1977), Carlin and Soskice (1985) and Weisskopf (1987), I model the objectives of workers and capitalists in terms of target wage and profit shares. In the spirit of Bowles, Gordon and Weisskopf (1983, 1986, 1988), I locate the basic source of worker power in the structure of socioeconomic institutions governing capital-labor relations: the more favorable is the institutional structure to workers, the higher will be the (nominal) wage rate that is achieved by the working class in its bargaining with capitalists. In the spirit of Cowling (1982), I locate the basic source of capitalist power in the structure of product markets; the higher the "degree of monopoly" enjoyed by capitalists, the higher will be the mark-up that capitalists can apply to unit costs in setting output prices.

I assume for simplicity that the general nominal wage rate w is set periodically in rounds of wage bargaining, and that output prices (and hence the general price level) are set periodically in rounds of price setting. Consider first the perspective of workers at the time of a wage-bargaining round. At each such time they face a given price level p and an exogenous average productivity of (effective) labor q_h.[3] Workers have an interest in raising their real wage b and in lowering their intensity of work i; they use whatever power they can muster to achieve these objectives. To model their effort I write:

[17] $b^L=fbl(\Pi_L)$

[18] $i^L=i=fi(-\Pi_L)$,

where the prefix f is used to represent a function, the superscript L indicates a target of workers (not necessarily realized), Π_L denotes the power workers bring to bear in pressing for their objectives, and a minus sign in front of an independent variable in a functional expression signifies a negative partial derivative. The real wage targetted by workers is not necessa-

2) The reader can trace the consequences of relaxing these assumption to see that they do not affect the qualitative nature of the conclusions drawn below.

3) To simplify the exposition I assume that prices are expected to remain at their current level p; I could incorporate expectations about price changes (based on past price behavior) into the model, but this would merely complicate the analysis without altering its essential features.

rily realized, for actual b depends both on the nominal wage rate (which is negotiated) and the general price level (which may not remain at p, depending on firms' output price decisions in a subsequent price-setting round). On the other hand, the intensity of work desired by workers will be realized because it is assumed to depend directly on working class power Π_L. The level of Π_L depends upon workers' collective organizational strength as well as all aspects of the economic environment which affect their bargaining strength vis-a-vis capitalists (we will consider some of these environmental factors further below).

Utilizing equation [17] to model workers' target real wage, one can express the nominal wage rate negotiated by workers during the wage-bargaining round as:

[19] $w=p*b^L=p*fbl(\Pi_L)$.

For the analysis of profit rate determination it will be desirable to formulate an expression for workers' target wage share. This can be done by substituting equations [18] and [19] into equation [11]:

[20] $s_W{}^L=b^L/q_h i$
$=fbl(\Pi_L)/[q_h fi(-\Pi_L)]$
$=fswl(\Pi_L,-q_h)$.

Equation [20] implies that a rise in q_h will lead to an equiproportionate fall in $s_w{}^L$, which reflects my assumption that workers target the real wage rather than the wage share itself. If workers targetted the wage share rather than the real wage, then $-q_h$ would have to be removed from equation [20]. But as long as workers pay some attention to the real wage and are not exclusively concerned with the wage share, then it remains appropriate to include $-q_h$ as an independent argument in the $fswl$ function.

Consider now the perspective of capitalist firms at the time when they set their output prices and thus determine the general price level p. At each such time they face a given average nominal wage rate w, a given intensity of work i, and an exogenous average productivity of effective labor input q_h. Following the Kaleckian model of oligopoly pricing in the context of excess capacity and constant unit costs. I assume that firms will set prices by marking up unit variable costs c:

[21] $p=k^K*c=k^K*(W/Q)=k^K*(w/q_h i)$,

where k^K is the desired mark-up and each variable in equation [21] represents a value averaged across all firms in all industries in the economy. Cowling (1982) has shown that the desired mark-up in each industry is (1) a negative function of the industry price-elasticity of demand, (2) a positive function of an index of firm concentration in the industry and (3) a positive function of the degree of collusion among the firms in the industry. The average desired mark-up in the economy as a whole can then be expressed as:

[22] $k^K=fkk(\Pi_K)$,

where Π_K is a measure of overall capitalist market power based on the economy-wide average of the product-market structural characteristics identified by Cowling.

For the analysis of profit rate determination I need to formulate an expression for capitalists' target profit share. Note first (from equations [11] and [21]) that a given mark-up k implies a corresponding wage share of income:

[23] $s_w=b/q_h i=w/pq_h i=1/k$.

Thus one can express the wage share targetted by capitalists as:

[24] $s_W{}^K=1/k^K=1/fkk(\Pi_K)$,

for this is the wage share resulting from their desired (average) mark-up based on their market power. The corresponding share of profits targetted by capitalists can then be expressed as:

[25] $s_s{}^K=1-s_W{}^K=1-1/fkk(\Pi_K)$
$=fssk(\Pi_K)$;

$s_s{}^K$ reflects the Kaleckian (average) "degree of monopoly" of firms in this simple capitalist economy.

3. The Determination of the Actual Profit Share

I have now derived a wage share targetted by workers and a profit share targetted by capitalists. Corresponding to the workers' target wage share is a target profit share, which can be expressed as follows:

$$[26] \quad s_s{}^L = 1 - s_W{}^L = 1 - fswl(\Pi_L, -q_h) = fssl(-\Pi_L, q_h).$$

There is clearly no necessary reason to expect that $s_s{}^L$ will be equal to the target profit share of capitalists given by equation [25] above, since there are no *a priori* restrictions on the levels of power Π_L and Π_K.

To analyze more fully the determination of the actual level of the profit share, in the context of conflicting target shares, I need to focus attention now on the relationship between the capacity utilization rate u and the power variables Π_L and Π_K. According to the Marxian theory of capitalist cyclical fluctuations, workers' bargaining power rises with the depletion of the reserve army of labor and falls with its replenishment. This suggests that I should recognize a functional dependence of Π_L on u:

$$[27] \quad \Pi_L = fpl(\Pi_{*L}, u),$$

where u can be interpreted as the rate of utilization of either the capital stock or the labor force,[4] and Π_{*L} reflects the "underlying" power of workers —— i. e. the structural element of working class power that is independent of the size of the reserve army and is grounded in longer-term characteristics of the capital-labor bargaining environment —— as distinct from workers' "effective" power Π_L.

Now one should recognize that the mark-up power of firms may also vary positively with u, insofar as high overall rates of capacity utilization impose quantity constraints on competing firms and thereby limit their ability to gain market shares at the expense of firms who raise output prices. Thus, *ceteris paribus*, the average economy-wide mark-up is likely to rise as u approaches its upper limit. This effect can be modelled by writing:

$$[28] \quad \Pi_K = fpk(\Pi_{*K}, u),$$

where Π_{*K} reflects the "underlying" power of capitalists —— i. e., the structural element of capitalist class power that is independent of the utilization rate and is grounded in longer-term product market structural characteristics —— as distinct from capitalists' "effective" power Π_K. It seems reasonable to presume that this mark-up effect of u is weaker than the Marxian worker-bargaining-power effect, if only because it only becomes a factor at very high rates of u.

Substituting equations [27] and [28] into equations [26] and [25], I arrive at more fully specified equations for the two target profit shares:

$$[29] \quad s_s{}^L = fssla(-\Pi_{*L}, q_h, -u)$$

$$[30] \quad s_s{}^K = fsska(\Pi_{*K}, u).$$

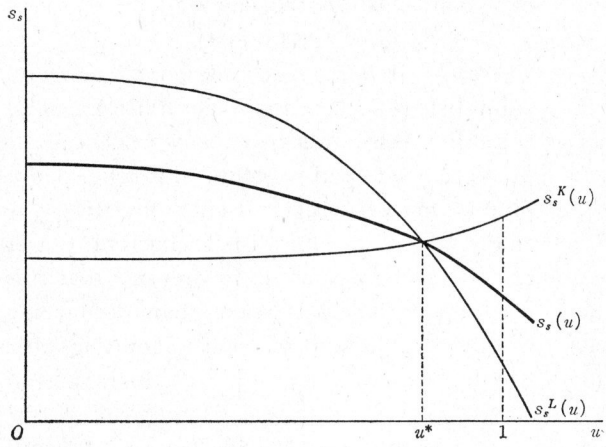
The functional relationships between the target profit shares and the utilization rate are shown in Figure 1. The curves for $s_s{}^L(u)$ and $s_s{}^K(u)$ are drawn so as to reflect the reasonable assumption that the u-effect on each target share becomes strongest as u approaches 1, and that the u-effect is considerably weaker on the share targetted by capitalists than on the share targetted by workers. Thus the $s_s{}^L(u)$ curve slopes downward, and the $s_s{}^K(u)$ curve slopes (less sharply) upward. Note that there is a single level of u —— denoted by $u*$ —— at which the two curves intersect.[5]

Given the conflict between the two target shares (everywhere but at $u=u*$), how will the actual level of the profit share be determined? One can begin to answer this question under the assumption that the rate of capacity utilization, as well as the levels of underlying worker and capitalist power, are specified exogenously. Consider now the timing of the wage-bargaining

4) Recall my simplifying assumption (reflected in equation [16]) that $u_H = u_K = u$.

5) Strictly speaking, there need not be any intersection point within the range $0<u<1$; but I will make the reasonable assumption that such a point does exist.

Figure 1 Profit Shares as Functions of the Utilization Rate



s_s=actual profit share
s_s^K=capitalists' target profit share
s_s^L=workers' target profit share
u=utilization rate

and price-setting rounds in which workers and capitalists exercise their power to negotiate nominal wages and set output prices. If firms can respond instantaneously to each wage-bargaining round by setting output prices according to their target profit share, then the latter will always be realized. On the other hand, if workers can renegotiate their nominal wage rate instantaneously following each price-setting round (or, equivalently, if they can index their nominal wage rate fully to price changes and thus in effect bargain for a target real wage rate), then it is the workers' target profit share that will always be realized.

In actual practice, it would be unrealistic to suggest that either side can completely dominate the wage-and-price-setting process, it is much more reasonable to suggest that the actually realized profit share will (on average, over time) fall somewhere between the workers' and the capitalists' target shares. This can be modelled formally by assuming that each wage-bargaining round follows a price-setting round with a time lag of t_w, and each price-setting round follows a wage-bargaining round with a time lag of t_p.[6] The realized profit share can then be expressed as:

$$[31]\quad s_s=(t_p/t)*s_s^L+(t_W/t)*s_s^K$$
$$=(t_p/t)*fssla(-\Pi*_L, q_h, -u)$$
$$+(t_W/t)*fsska(\Pi*_K, u),$$

where t is defined as (t_p+t_W). An $s_s(u)$ curve corresponding to equation [31] is also shown in Figure 1; it is simply a weighted average of the $s_s^L(u)$ and $s_s^K(u)$ curves. To simplify things I will assume that the weights are equal ($(t_p=t_W)$, in which case the $s_s(u)$ curve always slopes downward (as in Figure 1) and equation [31] can be rewritten as follows:

$$[32]\quad s_s=fss(\Pi*_K, -\Pi*_L, q_h, -u).$$

The s_s function in equation [32] and Figure 1 determines the actually realized profit share at any given rate of capacity utilization (and at exogenously given levels of average effective labor input productivity and underlying working class and capitalist class power). Consider now the consequences of the given rate of capacity utilization for wage and price dynamics. In each wage-bargaining round workers negotiate a nominal wage rate given by:

$$[33]\quad w=p_{-t_W}*b^L=p_{-t_W}*q_h*i*s_W{}^L,$$

where the subscript following p indicates the time lag after the price level is set (in the previous price-setting round). In each price-setting round capitalists set output prices at an average level given by:

$$[34]\quad p=k^K*c_{-t_p}$$
$$=[w_{-t_p}/(q_h*i)]*[1/s_W{}^K],$$

where the subscript following c and w indicates the time lag after the wage rate is set (in the previous wage-bargaining round). Substituting equation [33] into equation [34], one can express the price level as a function of its level in the previous price-setting round:

$$[35]\quad p=p_{-t}*[s_W{}^L/s_W{}^K]$$
$$=p_{-t}*[(1-s_s^L)/(1-s_s^K)].$$

6) Such a device can also be used to capture the effect of relaxing our assumption of simultaneous economy-wide wage bargaining and simultaneous economy-wide price setting.

The percentage rate of inflation (from one price-setting round to the next) is then given by:

$$[36] \quad f=\log[p/p_{-t}] = \log[(1-s_s{}^L)/(1-s_s{}^K)] = \log[s_W{}^L/(1-s_s{}^K)].$$

Equation [36] indicates that there will be no inflation when the two target profit shares are equal; there will be inflation/deflation when $s_s{}^K$ is greater/lesser than $s_s{}^L$. Alternatively, one can say that the condition for no inflation is that the workers' target wage share and the capitalists' target profit share add up precisely to unity (no conflict over the distribution of income); there will be inflation/deflation when the respective target shares are greater/lesser than unity.[7]

It is clear from Figure 1 that the capacity utilization rate $u*$ is the only one at which the two target profit shares are equalized and therefore the only one at which price (and nominal wage) stability can be attained. Any $u>u*$ generates inflationary pressures and any $u<u*$ generates deflationary pressures. One can therefore identify $u*$ as the non-inflationary rate of capacity utilization, akin to the NAIRU(non-inflation-accelerating rate of unemployment) of the mainstream macroeconomic literature.[8] Note that, $u*$ is grounded not in any neoclassical notion of labor market clearing but rather in the neo-Marxian logic of the exercise of power by contending classes; thus the unemployment associated with $u*$ is not "natural" in the sense of voluntary, but instead the involuntary consequence of the structure of power in the economy.

To solve for $u*$ analytically, I first substitute the target profit share equations [29] and [30] into the inflation equation [36] to get:

$$[37] \quad f=\log[1-fssla(-\Pi*_L, q_h, -u)] - \log[(1-fsska(\Pi*_K, u)] = ff(\Pi*_K, \Pi*_L, -q_h, u).$$

This equation confirms that increases in underlying capitalist class power and/or working class power, as well as increases in the rate of capacity utilization (which increase the effective power of both classes), tend to increase the rate of inflation: on the other hand, increases in average effective labor input productivity have a dampening effect on inflation. The non-inflationary utilization rate $u*$ is then determined as the level of u at which $f=0$; in terms of equation [37], $u*$ must satisfy:

$$[38] \quad 0=ff(\Pi*_K, \Pi*_L, -q_h, u*).$$

It is clear from the signs of the variables in the ff function that $u*$ itself can be expressed in functional form as:

$$[39] \quad u*=fus(-\Pi*_K, -\Pi*_L, q_h);$$

in other words, $u*$ is a negative function of each of the two class power variables and a positive function of average effective labor input productivity.

The profit share corresponding to $u*$ can be determined by substituting $u=u*$ into the fss function of equation [32]:

$$[40] \quad s*_s=fss(\Pi*_K, -\Pi*_L, q_h, -u*);$$

it is the same as the values of $s_s{}^L$ and $s_s{}^K$ obtained by substituting $u*$ into the $fssla$ and $fsska$ functions of equations [29] and [30]. This profit share $s*_s$ is literally the "price-equilibrium" profit share; it is a function of the exogenously given variables $\Pi*_K$, $\Pi*_L$ and q_h (which affect $s*_s$ both directly in equation [40] and indirectly via the determination of $u*$ by equation [39]).

At any given time the actual profit share s_s will depend (via equation [32]) on the current rate of capacity utilization u, which is in turn a function of aggregate demand conditions. A

7) This result is identical to that of Rowthorn (1977), who uses the term "aspiration gap" to characterize the extent to which the sum of the target shares exceed unity and finds inflationary pressure to be a function of the size of the aspiration gap. Rowthorn actually takes account of (fixed) shares claimed by the government and the rest-of-the-world as well as the targetted shares of workers and capitalists.

8) Were I to model price expectation formation along conventional lines, $u*$ would become a non-inflation-accelerating rather than a non-inflationary rate of capacity utilization.

relatively expansionary government macropolicy could sustain $u>u*$ for a period of time, at the cost of inflation: a contractionary macropolicy could bring u down below $u*$ and set in motion deflationary pressures. However, there will generally be a tendency for u to return toward $u*$ bacause of pressures on government policy-makers to maintain price stability (pressures which are likely to be all the stronger in an open economy in which price competitiveness is an important factor in maintaining balance of payments equilibrium). $s*_s$ may therefore be labelled the "sustainable" profit share (dependent upon the levels of the three exogenous variables in equations [39] and [40]), on the grounds that continual inflation or deflation is unsustainable.

4. The Determination of the Profit Rate

To express the average economy-wide profit rate r in terms of the underlying variables distinguished in the previous section, I need to substitute expressions for the profit share s_s (from equation [32]) and for work intensity i (using equations [18] and [27]) into equation [13′] to get:

$$[41]\quad r=s_s*u*z=s_s*u*(q_k i)$$
$$=fss(\Pi*_K, -\Pi*_L, q_h, -u)$$
$$*u*q_k*fi(-\Pi*_L, -u).$$

Note that underlying working class power $\Pi*_L$ has an adverse effect on the profit rate both via its effect on the profit share s_s and via its effect on the average intensity of work i. The rate of capacity utilization u has a favorable direct effect on the profit rate (as one of the primary components of r in equation [13′]), but it has two adverse indirect effects —— via the profit share and the work intensity functions.

Equation [41] indicates that the partial derivatives of r with respect to $\Pi*_K$, q_h and q_k are unambiguously positive, and the partial derivative of r with respect to $\Pi*_L$ is unambiguously negative. In the case of u, however, the sign is ambiguous: the direct positive effect of the rate of capacity utilization on the profit rate is countered by its two indirect negative effects. The relationship between the profit rate and the utilization rate can be illuminated with the help of a diagram in which r is graphed as a function of u. Figure 2 shows the profit rate curve $r(u)$ first rising and then falling as u rises, as is implied by differentiation of r with respect to u in equation [41]:

$$[42]\quad dr/du=+(s_s*q_k*i)$$
$$-(u*q_K*i*fss_4)$$
$$-(s_s*u*q_k*fi_2),$$

where the subscript i on a function represents the partial derivative with respect to the ith independent variable. At low levels of u, the negative second and third terms are relatively insignificant: as u rises (and both s_s and i fall), the latter two terms gain in significance relative to the first term and ultimately change the sign of dr/du from positive to negative. Whether this will happen before u reaches its maximum of 1 depends on the precise specification of the fss and fi functions. Since the presence of such a "high-employment profit squeeze" is an essential element of neo-Marxian crisis theory, I have drawn Figure 2 in such a way that dr/du does indeed turn negative well below $u=1$.

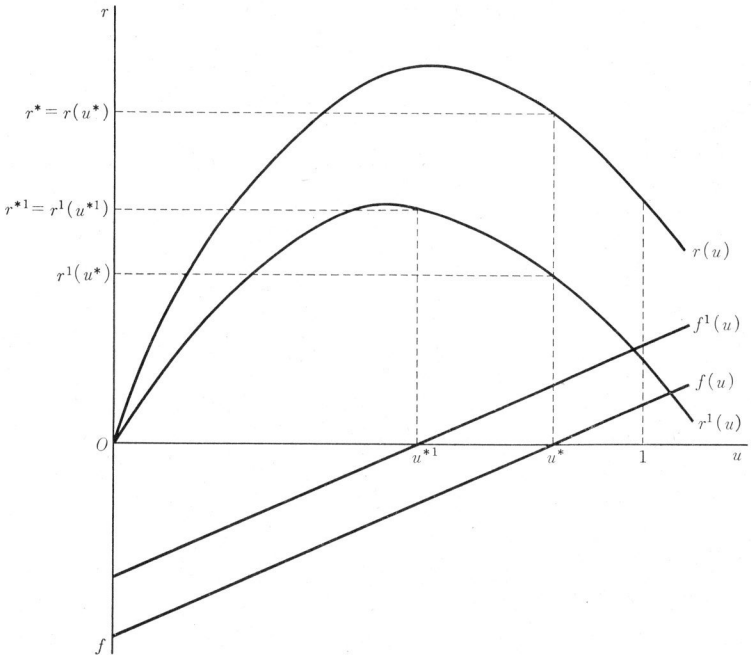
Combining terms in equation [41], one can derive a reduced-form expression for the profit rate as follows:

$$[43]\quad r=fr(\Pi*_K, -\Pi*_L, q_h, q_k, +/-u).$$

With the fr function we have represented the profit rate in our simple economy as a function of four exogenous variables —— $\Pi*_K$, $\Pi*_L$, q_h and q_k —— and the rate of capacity utilization u. The first two of the exogenous variables reflect the underlying structure of power in the economy, and the third and fourth reflect the state of its technology. I will characterize the complete set of these four exogenous variables as the "profit structure" of the economy.

In the previous section I defined a "sustainable profit share" $s*_s$ that is completely determined by variables representing elements of the profit structure of the economy. One can define in the same way a "sustainable profit

Figure 2 Profitability and Inflation as Functions of the Utilization Rate



r=profit rate
f=inflation rate
u=utilization rate

rate" by substituting the non-inflationary capacity utilization rate $u*$ into equation [43] to get:

$$[44] \quad r* = fr(\Pi*_K, -\Pi*_L, q_h, q_k, u*) = frs(\Omega),$$

where Ω denotes the economy's profit structure. $r*$ is completely determined by the four exogenous variables comprising the economy's profit structure, all of which effect $r*$ directly via the first expression in equation [44], and three of which also affect $r*$ indirectly via the determination of $u*$ by equation [39]. In Figure 2 I show $r*$ as the point on the $r(u)$ curve at which $u=u*$; note that there is no reason why $r*$ should be the same as the maximum level of r reached by $r(u)$.

Changes in the profit structure of the economy will affect the position of the $r(u)$ curve in Figure 2. From equation [43] one can see that the $r(u)$ curve will shift upward with an increase in $\Pi*_K$, q_h or q_k and with a decrease in $\Pi*_L$. From the perspective of capitalists interest in increasing profitability, any such change appears to represent an improvement in the profit structure of the economy; a higher $r(u)$ curve means a higher rate of profit at any given rate of utilization, and a higher maximum rate of profit.

However, it may well be more meaningful to use the sustainable profit rate $r*$ as a measure of the extent to which the economy's profit structure is conducive to capitalist profitability, since —— as I have noted in the previous section —— there will always be pressures on u to move toward $u*$. One must then bear in mind that a change in any of the profit structure variables (other than q_k) will not only affect the position of the $r(u)$ curve, but it will also affect the non-inflationary utilization rate $u*$. Therefore, its ultimate effect on $r*$ will be the consequence both of a shift in the location of the $r(u)$ curve —— its direct effect —— and a movement along the $r(u)$ curve from the previous to the new $u*$ —— its indirect effect (via the change in u).

Consider, for example, an increase in the underlying power of labor $\Pi*_L$. This will shift the profit rate curve $r(u)$ down to $r^1(u)$, as shown in Figure 2, having the direct effect of reducing the profit rate from $r*=r(u*)$ to $r^1(u*)$. But it will also lower the $s_s{}^L(u)$ curve in Figure 1, leading to a new point of intersection with the $s_s{}^K(u)$ curve at a lower level of u; thus the new $u*^1$ will be lower than the old $u*$. This change can be depicted in Figure 2 by plotting there the two inflation curves $f(u)$ and $f^1(u)$ obtained by inserting the relevant values

of the exogenous profit structural variables into the ff function of equation [37]. $u*$ and $u*^1$ are then indicated by the points at which the corresponding inflation curve cross the x-axis ($f=0$).

From Figure 2 one can see that the fall in $u*$ will have the indirect effect of raising the profit rate from the level of r at the old $u*$ —— $r^1(u*)$ —— to the new and higher $r*^1=r^1(u*^1)$, since the economy is operating on the downward-sloping portion of the $r^1(u)$ curve. The end result is that $r*^1$ is still lower than the original $r*$; but it is clear that a rise in $\Pi*_L$ could conceivably result in an increase in $r*$ for certain specifications of the relevant functions.

A similar potential ambiguity arises from changes in the profit structural variables $\Pi*_K$ and q_h, because a change in either of these variables affects both the position of the $r(u)$ curve (via equation [43]) and the position of the $f(u)$ curve (via equation [37]), which in turn determines the level of $u*$. On the other hand, a change in q_k affects only the height of the $r(u)$ curve; so its total effect on the sustainable profit rate is the same as its direct effect.

5. Profitability and Accumulation in the Long Run

In section 3 I explored the implications of a positive relationship between the rate of capacity utilization u and the effective power of labor Π_L as well as the effective power of capital Π_K. The functional dependence of Π_L on u was grounded in the Marxian analysis of the effect of fluctuations in the size of the reserve army of labor on the bargaining power of workers in a short-run cyclical context. The same Marxian line of reasoning points as well to a longer-term relationship between the demand for labor and working class bargaining power. More concretely, Marxian theories of "over-accumulation" (as in Armstrong, Glyn and Harrison (1984), chapter 11) suggest that rapid accumulation and employment growth over a long period —— e. g., a decade or two —— tend to strengthen the working class. Even though capitalists may seek to avoid long-run depletion of the reserve army via more aggressive recruitment of labor from new sources and via investment in labor-saving technology, these measures themselves entail costs that can be represented as a consequence of the increased bargaining strength of workers.

It follows that a model of neo-Marxian crisis theory needs to take into account a functional dependence of Π_L on the long-run past rate of growth of employment as well as on the current rate of labor utilization. Thus the earlier equation [27] should be modified as follows:

[45] $\Pi_L=fpla(\Pi**_L, u, gE)$,

where E denotes employment, the prefix g is an operator representing the rate of growth over a long-run period —— e. g., a decade or two —— up to the present time, and the two stars attached to Π_L reflect a conception of "underlying" power from which the influence of both u and gE have been removed. The variable $\Pi**_L$ reflects the deep-seated structural foundations of working class power that are grounded in institutional characteristics of the capital-labor bargaining environment independent of the effects of the long-run past rate of employment growth as well as the current size of the reserve army.

Recall that I denote by u both the rate of utilization of the labor supply ($u_H=H/H^S$) and the rate of utilization of the capital stock ($u_K=K/K^S$), under the simplifying assumption that u_H is not only highly correlated with u_K but identical to it. In the case of long-run past rates of growth (as opposed to current rates of utilization), it is no longer permissible to assume that the demand for labor grows at the same rate as the demand for capital inputs, because over time there is every reason to expect the capital/labor ratio to change. Thus one must recognize the following relationship between the rate of growth of (utilized) capital stock K and the rate of growth of employment E:

[46] $gK=gE+gKE$,

where KE denotes the average ratio of capital stock to labor utilized in production. To simplify the exposition I will ignore the (relatively secondary) long-term effects of variation in u so as to identify gK with the rate of growth of total capital stock; and I will assume (reasonably) that over time employment moves in the same direction as capital stock, so that any change in K is accounted for in part by a corresponding (but lesser proportionate) change in E and in part by a corresponding (but lesser proportionate) change in KE; thus:

[47] $gE=fge(gK)$

[48] $gKE=fgke(gK)$.

Rewriting gK as k_{-T}, where k denotes the long-run rate of capital accumulation and the subscript $-T$ reflects the lag between the current year and the center of the period over which the accumulation rate is measured, I can rewrite equation [45] as:

[49] $\Pi_L=fplb(\Pi^{**}_L, u, k_{-T})$.

which expresses the effective power of labor directly in terms of the long-run past rate of accumulation.

Since I allowed for the possibility of a positive effect of the current rate of utilization u on the effective power of capital Π_K as well as the effective power of labor Π_L, I should consider also the possibility that the long-run past accumulation rate might affect Π_K as well as Π_L. One could argue that rapid past rates of accumulation (like high current rates of utilization) tend to strengthen the mark-up power of capital because it is easier for firms to raise prices in a buoyant market than in a stagnant market. On the other hand, it seems likely that rapid accumulation will facilitate entry by new firms and thus reduce the average degree of monopoly enjoyed by all firms. It is impossible to determine on the basis of *a priori* reasoning which of these effects will dominate, and therefore I will simplify things by assuming that they offset one another so that we can ignore any k_{-T} effect on Π_K.

However, one must recognize that equation [48] implies a functional relationship between the long-run past rate of accumulation and the average productivity of effective labor input q_h. Thus far I have treated q_h as an exogenous parameter; but it is clear that over time an increase in the ratio of utilized capital stock to employment ($KE=K/E$) will tend to increase the ratio of real output to employment ($QE=Q/E$) and thus also the ratio of real output to effective labor input ($q_h=Q/H^e$).[9] Thus q_h will be a positive function of the long-run past rate of accumulation, so:

[50] $q_h=fql(q^*_h, K_{-T})$,

where q^*_h represents that part of q_h which is determined by technological forces independent of the past rate of accumulation. Note that no similar functional expression is warranted for q_k, since there is no *a priori* reason to believe that capital accumulation will have either a positive or negative effect on the ratio of output Q to effective capital service input $K^e(=i^*K)$. More rapid accumulation will tend to mean more rapid growth in both Q and K (hence also K^e), and its effect on the ratio $q_k=Q/K^e$ is indeterminate.

Recognition of the role of the long-run past rate of accumulation k_{-T} in neo-Marxian theory requires that I extend the model of profitability determination in the previous section by using equation [49] instead of equation [27] for Π_L and by utilizing equation [50] for q_h. This leads first to a new expression for the profit share s_s, with which to replace the old equation [32]:

[51] $s_s=fssa(\Pi^*_K, -\Pi^{**}_L, q^*_h, -u, -k_{-T})$.

There is actually some ambiguity about the sign of k_{-T} in the *fssa* function; in entering a negative sign I am assuming (consistently with the overall neo-Marxian approach) that the

9) Strictly speaking, H^e need not move with E since H^e measures effective labor hour input (H^*i) and E measures actual employment: but this discrepancy is secondary and can be ignored in the present context.

negative effect of k_{-T} on s_s, which operates via Π_L, will dominate the positive effect of k_{-T} on s_s, which operates via q_h.[10] Recognizing that k_{-T} also exerts a negative influence on the profit rate via the effect of Π_L on work intensity i, the old profit rate equation [41] can then be replaced by:

$$[52] \quad r = fssa(\Pi_{*K}, -\Pi_{**L}, q_{h*}, -u, -k_{-T}) * u * q_{K*} \; fia(-\Pi_{**L}, -u, -k_{-T}).$$

Equation [52] shows that the partial derivative of r with respect to k_{-T} is unambiguously negative (under the assumption made in deriving equation [51]); so the reduced-form equation for the rate of profit (corresponding to the old equation [43]) becomes:

$$[53] \quad r = fra(\Pi_{*K}, -\Pi_{**L}, q_{*h}, q_k, +/-u, -k_{-T}).$$

In this equation the exogenous variables are the same as before, except that the variable reflecting the power of labor (Π_{**L}) and the average productivity of effective labor input (q_{*h}) are now "purged" of their functional dependence on k_{-T}. The long-run past accumulation rate k_{-T} now joins the current capacity utilization rate u as an endogenous variable in the profit rate function, but —— unlike the case with u —— there is no ambiguity about the sign of the effect of k_{-T} on r.

Once again one can define a "sustainable profit rate" $r*$ as the level of r attained in equation [53] when the rate of capacity utilization is equal to its non-inflationary level $u*$; in parallel with equation [44], this yields:

$$[54] \quad r* = fra(\Pi_{*K}, -\Pi_{**L}, q_{h*}, q_k, u*, -k_{-T}) = frsa(\Omega, -k_{-T}),$$

where Ω encompasses the slightly revised set of four exogenous variables (Π_{*K}, Π_{**L}, q_{*h} and qk) which now comprise the profit structure of the economy.[11] Corresponding to equation [54] one can draw a curve in $r*/k$ space showing the sustainable rate of profit as a function of the (long-run past) rate of accumulation, for any given profit structure Ω. Such a "long-run profitability curve" appears in Figure 3; the curve has a negative slope because higher rates of accumulation imply lower rates of profit.

How, then, will rates of profit and accumulation be determined in the long run? To answer this question one must invoke a second essential element of the neo-Marxian analysis of capitalist accumulation and crisis —— the idea that capitalist investment is driven by profitability. More precisely, I model the hypothesis that the current rate of capital accumulation is a positive function of expected profitability, and that expected profitability is a positive function of the average sustainable rate of profit during a period of time —— e.g., five to ten years —— prior to the current year:

$$[55] \quad k = fk(\Phi, r*_{-T'}),$$

where Φ reflects what I will label the "investment climate" of the economy and the subscript $-T'$ reflects the lag between the current year and the center of the period over which the sustainable rate of profit is averaged.[12] Φ represents all those exogenous forces affecting the incentive to invest which are independent of $r*_{-T'}$; since investment decisions are presumably motivated by the prospect of future profits, one can think of Φ as reflecting expectations about future profitability relative to past profitability.

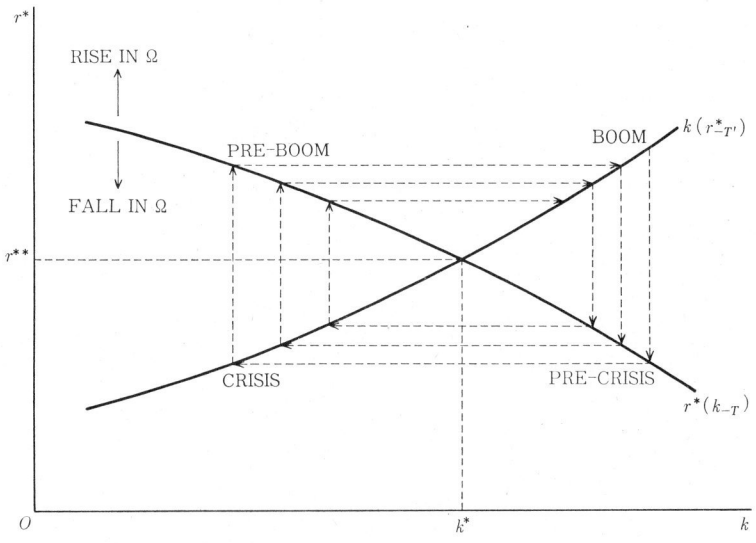
The "long-run accumulation curve" cor-

10) The positive effect of k_{-T} on s_s via q_h will be diminished to the extent that workers target the wage share rather than the real wage.

11) Note that $u*$ is now dependent upon k_{-T} as well as the four exogenous variables represented by Ω——since k_{-T} affects Π_L and q_h, and both of these variables help to determine the rate of inflation and hence also $u*$ in equation [37] and [39].

12) The magnitude of the average lag T' will depend upon the period of time over which profit expectations are formed, which can reasonably be assumed to be somewhat shorter than that of the average lag T with which accumulation affects the effective power of labor. Strictly speaking, the lag in the effect of $r*$ on k should include also the period between the time investment decisions are made and the time the corresponding new capital stock is actually added.

Figure 3 Long-Run Profitability and Accumulation Curves



$r*$=sustainable profit rate
k=accumulation rate
u=utilization rate
Ω=profit structure

responding to equation [55] is shown along with the long-run profitability curve in Figure 3: the accumulation curve slopes upward because of the positive effect of (sustainable) profitability on accumulation. Whereas a more favorable profit structure Ω will shift the long-run profitability curve upward, an improvement in the investment climate Φ will shift the accumulation curve to the right.[13]

The intersection of the long-run profitability and accumulation curves at $\langle r**, k* \rangle$ in Figure 3 defines a long-run stationary equilibrium. The nature of the equilibrium, however, is very different than that of the non-inflationary rate of utilization $u*$ in Figure 2. In the present case there are two endogenous variables ($r*$ and k), each of which is a lagged function of the other. Thus there will be a dynamic cobweb pattern of adjustment from any initial position other than the stationary equilibrium point; depending on the slopes of the two curves in the relevant neighborhood, the adjustment path could be either damped or explosive. One such (damped) adjustment path is shown in Figure 3, on the assumption that the economy begins on the accumulation curve at a point of relatively high $r*$ and relatively high k.

It is easy to see that the system represented by equations [54] and [55] will respond to any departure from equilibrium by generating long-run cycles around the stationary equilibrium point; depending on the slopes of the two curves, the amplitude of the cycles will increase, stay constant, or decrease. In the absence of shifts in the curves themselves, there will be a cyclical progression through four phases as depicted in Figure 3. A "boom" phase of high $r*$ and high k eventually gives way to a "pre-crisis" phase of low $r*$ and high k as the (sustainable) profit rate falls due to the high long-run past rate of accumulation; the "pre-crisis" phase in turn yields a "crisis" phase of low $r*$ and low k as the accumulation rate responds to the lower past (sustainable) profit rate; there follows a "pre-boom" phase of high $r*$ and low k as the (sustainable) profit rate rises in response to the lower past accumulation rate; and this leads to a new boom phase as the accumulation rate follows the (sustainable) profit rate upward again.[14]

The actual time path of the sustainable

13) It might appear at first that the long-run profitability and accumulation curves are interdependent, insofar as a higher rate of accumulation implies a higher level of investment demand and this in turn implies a higher rate of capacity utilization u and higher rate of profit r. But note that the two curves in Figure 3 are defined in terms of the *sustainable* profit rate $r*$, not the actual profit rate r; so $r*$ is independent of u and it is legitimate to treat the long-run profitability and accumulation curves as independent of one another.

profit rate and the accumulation rate in an economy characterized by equations [54] and [55] would be affected both by the long-run cyclical dynamics outlined above and by shifts in the underlying curves themselves. A rise in the long-run profitability curve (arising from an improvement in the profit structure Ω of the economy) would shift the stationary equilibrium point upward and to the right, leading to observations of higher profit rates as well as higher accumulation rates. On the other hand, a rightward shift in the long-run accumulation curve (arising from an improvement in the investment climate Φ of the economy) would shift the stationary equilibrium point downward and to the right, leading to observations of lower profit rates along with higher accumulation rates.

6. Alternative Neo-Marxian Approaches to Crisis Analysis

Following the literature on Marxian crisis theory, I have defined an economic crisis as a prolonged period in which accumulation rates are low or even negative. The model of long-run profitability and accumulation developed in the previous section suggests several possible sources of economic crisis. First, independently of any long-cycle dynamics, one would observe reduced rates of accumulation over an extended period of time if either the profit structure Ω or the investment climate Φ deteriorated significantly. Second, even in an environment of relatively stable Ω and Φ, economic crises could arise periodically out of the dynamic interaction of profitability and accumulation if the lags between the two were long enough to generate a long-run cycle in response to an initial position of disequilibrium.

14) Since one would expect T (the lag of $r*$ behind k) to be somewhat greater than T' (the lag of k behind $r*$), one would expect the boom and the crisis periods to be longer than the pre-boom and pre-crisis periods; a full cycle of 4 phases would be completed in $2T+2T'$ years, which is of the order of 2–4 decades according to my rough estimates.

Consider first the possibility of significant adverse shifts in (A) the profit structure Ω or (B) the investment climate Ω. In case (A) there would be a new stationary long-run equilibrium in which profit rates as well as accumulation rates were reduced; while in case (B) there would be a new equilibrium characterized by reduced accumulation rates in the context of increased profit rates.[15] The latter case is alien to the neo-Marxian conception of economic crisis; it reflects an essentially Keynesian perspective in which accumulation is determined primarily by exogenous "animal spirits" that govern the investment climate, and in which reduced accumulation is not attributable to depressed profitability.

On the other hand, a downward shift in the profit structure Ω would generate the combination of depressed profitability and reduced accumulation that is associated with the neo-Marxian perspective. As shown in section 5, such a shift could result from changes in any one of the four exogenous variables that comprise Ω —— i.e., a rise in the underlying power of labor Π^{**}_{L}, a fall in the underlying power of capital Π^{*}_{K}, a fall in the underlying average productivity of effective labor input q^{*}_{h} or a fall in the average productivity of effective capital service input q_k. But the last two of these variables reflect technological aspects of the profit structure, which —— like the "animal spirits" associated with Φ —— are outside of the arena of class conflict and the exercise of power. Thus a neo-Marxian theorist would not expect a fall in profitability to be attributable primarily to declines in q^{*}_{h} or q_k. Instead, the logic of the neo-Marxian analysis points to changes in the other two variables —— Π^{**}_{L} and Π^{*}_{K} —— as the principal potential sources of an economic crisis associated with declining Ω.

15) Of course, any combination of adverse shifts of Ω and Φ could also generate a decline in accumulation rates; the direction of movement of profit rates would depend on whether Ω or Φ fell furthest, and on the slopes of the profitability and accumulation curves.

This latter approach has in fact been adopted by the "social structure of accumulation" (SSA) school of neo-Marxian crisis theory associated with the work of Bowles, Gordon and Weisskopf (1983, 1986, 1988). These authors work with a more complex analysis of class structure and institutionally-based power in the post-World-War-II United States than is reflected in the simple model of this paper. However, the essential logic of their analysis is that the postwar SSA provided the institutional foundation for a low level of $\Pi^{**}{}_L$ and a high level of $\Pi^{*}{}_K$ —— and thus a high level of Ω —— which underpinned high rates of profit and accumulation from the late 1940s through the mid-1960s ; and that in the 1960s contradictions in the postwar SSA gave rise to various "challenges to capitalist control" that raised $\Pi^{**}{}_L$ and reduced $\Pi^{*}{}_K$ and thus led to a fall in Ω, which consequently reduced rates of profit and accumulation during the following two decades.[16] Although this brand of neo-Marxian crisis theory has been applied only to the U. S. economy, similar arguments could be developed to explain the postwar macrohistory of the rest of the advanced capitalist world.

An alternative neo-Marxian explanation of economic crisis is based on the long-run interaction of (sustainable) profitability and accumulation with a relatively stable underlying profit structure and investment climate. As we have seen, an initial disturbance from the stationary equilibrium position $\langle r^{**}, k^{*}\rangle$ determined by fixed long-run profitability and accumulation curves would lead to a long-run cyclical pattern of boom and crisis. If the initial position were far enough from the stationary equilibrium, and if the lags in the profitability and accumulation functions were long enough, such a cycle could imply long periods of rapid accumulation followed by long periods of depressed accumulation. In this event we would expect profit rates to have fallen in the period prior to the period of slowest accumulation and profit rates to begin rising while accumulation rates remained depressed.

This latter scenario is associated with the neo-Marxian theory of "over-accumulation" and the notion of a long-run "high-employment profit squeeze," in which a long period of rapid accumulation and high employment is followed by a squeeze on profitability and a subsequent decline in accumulation. Such an approach has been applied to the advanced capitalist economies in the post-World-War-II period by the "over-accumulation" school of neo-Marxian crisis theory associated with the work of Glyn and Sutcliffe (1972) and Armstrong, Glyn and Harrison (1984). Unlike the scenario based on a long-run deterioration in the profit structure, this one implies that there is an endogenous basis for recovery from the economic crisis : the slow accumulation and high unemployment associated with the crisis will eventually "unsqueeze" profitability, and higher profitability will ultimately raise the rate of accumulation itself.

The failure of such a recovery to manifest itself in the advanced capitalist world after at least a decade and a half of "under-accumulation" suggests that more has been going on in the modern capitalist economies than can be accounted for by the over-accumulation approach alone. But it is perfectly possible to combine elements of both schools of neo-Marxian crisis theory to explain the latest crisis of profitability and accumulation. The SSA approach suggests that the continuation of the recent economic crisis in the advanced capitalist economies is attributable to an underlying profit structure Ω that remains weak after

16) Bowles, Gordon and Weisskopf initially (1983, 1986) distinguished three "classes" —— the domestic working class, foreign buyers and sellers, and the domestic citizenry —— whose underlying power vis-a-vis the U. S. capitalist class (akin to $\Pi^{**}{}_L$) was limited during the postwar U. S. boom period and rose to precipitate the subsequent crisis. In later work (1988) they introduced a fourth dimension of internal capitalist class power (akin to the variable $\Pi^{*}{}_K$), whose diminution over the course of the postwar period contributed to the erosion of the postwar SSA.

having deteriorated from a relatively strong position in the first few decades after World War II. From this perspective, the generation of a new long-run boom would require that Ω be raised by the construction of a new and robust social structure of accumulation on a world capitalist scale —— a political and institutional task that appears far from being realized at the present time.

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