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Prices, Employment, and Profit

Hyman P. Minsky Ph.D.

Pierro Ferri

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HYMAN P. MINSKY and PIERO FERRI

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Simultaneous inflation and unemployment, which has led to the coinage of terms like stagflation and slumpflation,[1] appears to be a nontransitory characteristic of advanced capitalist economies. This combination together with unimpressive growth in these economies since the mid-1960s is the result of both the behavior of labor and output markets and the system of government interventions that have aimed either to achieve a closer approximation to full employment or to prevent financial market incoherence. Thus stagflation has roots in both the structure and performance of markets and the behavior of macro-processes.

To understand the path of prices (P) and employment (N), we need to explain: (1) the dynamics of wage (W) and P behavior that reflect institutional characteristics; (2) how aggregate relations determine the set of possible P and N combinations; and (3) how these two determinants are reconciled to yield evolving reality.

The institutional assumptions

Today's institutional framework is characterized by: (a) firms and labor organizations which possess market power; (b) big government, whose monetary and fiscal measures constrain the "downward potential" of aggregate profits and influence the realized P-N outcomes; (c) a financial system which intermittently seems to verge on crisis; and (d) central bank interventions which prevent any system-wide financial

[1] A detailed description and interpretation of the various situations are to be found in Weintraub (1978, p. 76).

disaster from fully developing.

Thus market power is exercised within aggregate conditions which set limits to possible realized conditions. Neither market power nor aggregate explanations of the realized *P-N* combinations suffice. We need a framework that integrates the two.

Market power of firms leads to administered prices able to assure managers of an easy life and persuade financers that profit margins will not collapse when excess capacity (unemployment) prevails. This assurance facilitates the financing of expensive capital assets. Thus a modern capitalist economy has a debt structure that requires continuous validation by profit flows and a banking/financial structure which must function smoothly if investment is to take place. We will forego technical analysis of the banking and financing system in this paper; we merely assume that the managers of administered prices and the negotiators of wages *know* that both the Treasury and the Central Bank will intervene to prevent a "free fall" of the financial system.

Negotiated wages ensue from trade union power, which we take to be an organizational imperative in a democratic society. Negotiated and contractual wages also tend to make costs comparable among the "independent" firms that share market power. Labor's market power may have its genesis in the political power of workers, rather than in the economic power of unions.[2]

Big government mainly operates by way of transfer payments, defense spending, and taxes. Big government ordinarily implies a need for high taxes. Both the spending and taxing schedules are related to GNP so that the government will be moving towards deficit or surplus depending on whether the economy is in an upswing or downswing.

As mentioned earlier we postulate that a Central Bank exists and that it will jump in to prevent full-fledged chaos from developing.[3] We assume that the *W* and *P* processes take place in an environment in which it is known that the Central Bank will accommodate the financial needs of governments and will assure that a deep debt-deflation will not occur.[4]

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[2]The experience of 1982-83 shows that in the United States the market power of labor can be attenuated by unemployment, profit squeezes, and a hostile government. It is therefore an open question as to whether stagflation has been replaced by a "permanent" repression of employment in the United States. We believe that the success against inflation of 1982-83 is transitory unless the trade union fundamentals have been broken.

[3]For a discussion of these aspects, see Minsky (1982).

[4]Our argument does not lead to the monetarist conclusion that money income or

Big government, along with activist Central banks, has modified the nature of business cycles. A full-fledged debt-deflation and a deep and long depression are less likely, for when income drops a huge deficit well-nigh automatically occurs. The deficit sustains business profits which, in turn, enable business to fulfill its debt obligations. As a result, the value of business capital and the means to redeem debt commitments are maintained. Hence investment activity is at a higher plateau during modern recessions than otherwise.

Because deficits sustain—and even increase—profits during recessions, the markup per unit of output does not fall in recession. The exercise—real or potential—of trade union strength and the constraint upon the fall in output that follows from the government deficit limit the money wage fall that takes place during recessions. The very relations which moderate the income decline tend to at least attenuate any tendency for P's to fall during periods of high unemployment. The N, P, and Q characteristics of the business cycle have thus been transformed by post-World-War-II institutional adaptations.

The analytical framework

There are two aspects to the P and W formation in our economy: (1) a combination of bargaining that sets money wages and the exercise of market power which leads to the markup on unit labor costs; (2) the aggregate relations that yield the total obtainable markup on wage costs. The aggregate relations thus determine the P and Q combinations that can prevail. Both aspects yield markups, but each reflects different determinants of the flux of the economy.

Bargaining and market power

The determination of prices and wages by bargaining and market power may be represented by two interacting equations over time:

$$(1) \qquad P_c(t) = \gamma \frac{W_c(t)}{A_c(t)} + \alpha P_c{}^\circ(t)$$

$$(2) \qquad W(t) = g(X(t), P_c(t)) + \beta P_c{}^\circ(t)$$

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prices are determined by the money supply and velocity, but that Central Bank interventions that prevent debt-deflations are part of the environment within which investment takes place. On the money, wages, and markup nexus, see Weintraub (1981a).

where $P_c(t)$ and $W(t)$ represent price and wage levels and $A(t)$ traces average productivity, while $P_c^{\circ}(t)$ reflects price expectations and $X(t)$ stands for a vector of real variables (for instance, expected productivity gains, taxation . . .).[5]

The price equation reflects the market power of firms. The γ markup factor ($\gamma > 1$) reflects market power, history, and cash payment requirements imposed by the liability structure of firms.

As far as the wage equation is concerned, we live in a world in which trade unions exist and money wages are largely the result of bargaining and negotiations. Any explanation of wages must take this into account.[6] Unemployment (U) affects the wage boosts but, so long as catastrophic and prolonged unemployment has been averted, the effect of today's unemployment rate on wage bargains has been subdued. This implies that today's U rate can be omitted from equation (2) as an explicit variable,[7] although *chronic* high U's can erode the market power of unions and thus affect the W, P reaction. The price variable in the wage equation captures the explicit or implicit, full or partial, indexing of wages.

Substituting (2) into (1) we obtain (under particular specifications)[8]

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[5]Because the wage level is affected by the price level, the "P's" of this analysis are the prices of consumer goods. It will be evident in the argument about the aggregate determinants of prices and wages that the aggregate argument most immediately relates to the prices and wages of consumer goods. It is easy to assume that the wage level in consumer and investment goods is in a fixed relation one to the other and that prices of investment goods are markups on labor costs. Thus equations (1) and (2) might refer to both consumer and investment goods prices.

[6]For discussion see Weintraub (1978), in particular, his Chapter 5: "Money Wages: Phenomena in Search of a Theory."

[7]This coincides with what the New Cambridge School, based on the target real wage hypothesis, has done. See Cripps and Godley (1976).

[8]For instance, with extrapolative expectations:

$$P^{\circ}(t) = P(t - 1) + \theta(P(t - 1) - P(t - 2))$$

and if wages vary according to the following formula, then:

$$W(t) = \lambda P(t - 1)$$

and if output per man is given, then by substituting into equation (1), it follows that:

$$P(t) = \left(\frac{\gamma\lambda}{A} + \alpha + \alpha\theta\right)P(t - 1) - \alpha\theta\, P(t - 2).$$

It is worth stressing that this is just an example. The model can be specified in other forms.

a second order equation:

(3) $P_c(t) - (E + F) P_c(t - 1) + F P_c(t - 2) = 0$

which resembles the reduced form of the accelerator-multiplier trade cycle models.[9] The general solution to such an equation is given by:

(4) $P_c(t) = B_1 \mu_1{}^t + B_2 \mu_2{}^t$

where the roots μ_1 and μ_2 depend upon the parameters E and F, while B_1 and B_2 are determined by initial conditions. If the parameters are constant, the same holds for the roots μ_1 and μ_2. If the roots take on values greater than one, the model will tend to explode. The linear second order form to which we reduced the iterative wage-price determination process is a "gross simplification" of the interactions in the economy. It is unable to generate the complex paths that nonlinear systems do, but it can generate paths equally unacceptable as a stand-in for economic outcomes. The explosive result is as unacceptable as the incoherent or turbulent paths that nonlinear iterative processes generate.[10]

Acceptable, nonexplosive results can be obtained if meaningful constraints on the variables are introduced. For time series that tend to explode (or collapse), these constraints become ceilings and floors. If the ceilings and floors reflect economic processes, then the economic model can be characterized as "nonlinear." Analytically the positing of ceilings and floors is a technique for converting complex nonlinear processes into piecewise linear systems.[11]

Macroeconomic price determinants

The markup in equation (1) includes a factor allowing for price anticipations, for firms do not always succeed in attaining their price, quantity, and profit objectives. There are macro-constraints which limit

[9]For a discussion of these models see Samuelson (1939), Hicks (1949), and Minsky (1959).

[10]For an analysis of nonlinear systems, see Day (1982).

[11]Ceilings and floors break the iterative process by "not allowing" the results of the process in time t to occur and be fed into the determination of the variable in time $t + 1$, etc. . . . The characteristics of the time path generated by a model with an explosive process that is constrained depend on how the rate of growth of the ceiling (constraint) compares to the minor root (μ_2). For a mathematical proof, see Minsky (1959).

firms' price power; these determine whether in the aggregate the profit objectives of firms can be validated.

Gross capital income, or profits (R), is the difference between total revenue and labor costs. For the consumption sector this is equal to:

$$(5) \qquad R_c = P_c Q_c - W_c N_c$$

From Kalecki[12] we have

$$(6) \qquad R_c = W_I N_I + Df + C_R - S_w$$

where N_I and W_I refer to investment goods, C_R equals consumption out of profits, and S_w equals saving out of wages, while Df equals government deficit.[13]

Combining (5) and (6), one obtains:

$$(7) \qquad P_c Q_c = W_c N_c + W_I N_I + Df + C_R - S_w$$

Rearranging, we find that this becomes:

$$(8) \qquad P_c = \frac{W_c}{A_c}\left(1 + \frac{W_I N_I + Df + C_R - S_w}{W_c N_c}\right)$$

For convenience, we can write (8) as:

$$(9) \qquad P_c = \frac{W_c}{A_c}(1 + MK_c)$$

where MK_c = average markup in the C-goods. Equations (8) and (9) reveal that the P_c can be viewed as a markup on unit labor costs.[14] This macroeconomic relation has to be integrated with the market processes that determine price and wages.

[12]See Kalecki (1971).

[13]The definition of the deficit implied by this formula is (slightly) different from the one used by national accounts. On the spending side, acquisition of pre-existing assets and spending to refinance businesses needs to be excluded. On the revenue side there is a need to exclude revenues that reflect "transfer of wealth" such as death duties, fines, and capital levies.

[14]On Weintraub's assumption (1981a), according to which

$$P_c Q_c = \alpha WN$$

(8) becomes:

$$P_c = \alpha(W/A_c)N/N_c$$

For a "generalization of the generalized" α concept, see Ferri (1983).

The path of prices and employment:
the economics of stagnation

We therefore have two sets of relations which are involved in determining the paths of P and N. These reflect different aspects of the mechanisms of a modern economy. One reflects the market power of firms and the bargaining that sets wages. The second reflects: (1) the course of I; (2) the fiscal posture of G; and (3) the distribution of income in concert with the consumption propensities of the "classes" of income recipients. Both sets of relations reinforce the proposition that P_c is a markup on unit labor costs, but in one case it reflects market power and in the second it is a by-product of the structure of aggregate demand.

The actual P_c-path depends upon the interaction of the relations. Thus we require a reconciliation process. From (7) we can write:

$$(10) \qquad \left(P_c \frac{Q_c}{N_c} - W_c \right) N_c = W_I N_I + Df + C_R - S_w$$

Profit per unit of labor in C-production (the expression within the parentheses) times the number employed (this equals R_c) equals the sum of wages in investment production, the government deficit, and the saving and spending proclivities out of W and R incomes.

The course of aggregate R_c through time parallels the various R-components.[15] For purposes of this argument, the right-hand terms are determined *outside* the system. The path of profits, as determined by aggregate relations, is thus amenable to influence by monetary policy, although the effects may be remote. Thus, in the following exercises the behavior of the aggregate R_c is taken as given and R_c becomes a rectangular hyperbola in profit per unit of labor and employment.

Given that:

$$(11) \qquad P(t)_c \frac{Q_c(t)}{N_G(t)} \equiv P_c(t) A_c(t)$$

is the revenue per unit of employment and that $Q(t)/N(t) = A(t)$, then

[15]In a small government capitalism, the course of R_c depends upon N, W, and non-C production. Obviously, investment depends upon realized gross profits, but not in a simple way for the liability structure, financing conditions, and the market prices of existing capital assets are *determinants* of investment. See Minsky (1975).
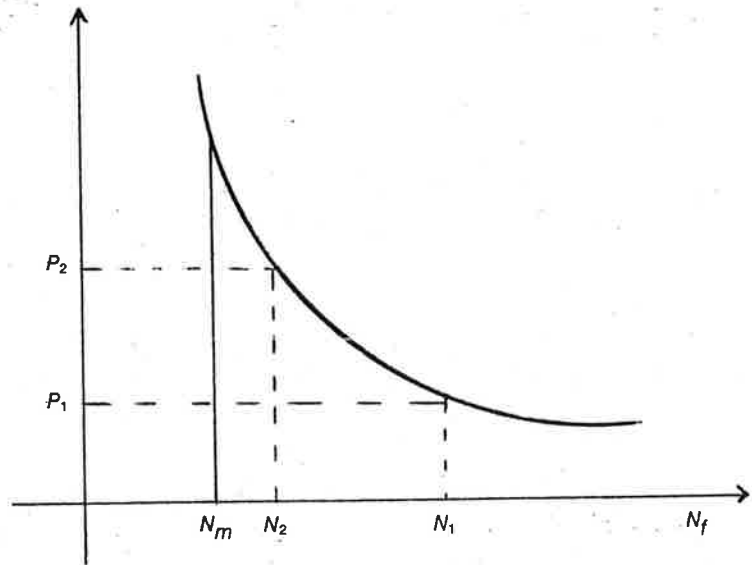
Figure 1

The stagflation profile, fixed total profits.

profit per unit of C-employment is equal to:

(12)
$$\frac{R_c(t)}{N_c(t)} = r_c(t) = A_c(t)P_c(t) - W_c(t)$$

By substituting (1) and (2) into (12), we obtain, for a given A, the solution equations:

(13)
$$r_c(t) = B_1'\mu_1'^t + B_2'\mu_2'^t$$

This portrays the *time profile* of profit in C-production *per employee* as determined by market processes. Inasmuch as profit per unit of employment is the price minus the wages per unit of employment P_c will conform to equation (13).

Let us assume that the macroeconomic relations are set so that aggregate $R_c = \bar{R}_c = r_c N_c$ (see the solid curve in Figure 1). Let us also suppose that the profit per employee as shown in equation (13) increases ($\mu > 1$ and t increases).

Beginning at point N_f, where an approximation to full employment exists, if profit per employee surges, then P_c will increase relative to W_c—see eq. (12)—and N will slump. Points ($N_1 P_1$ and $N_2 P_2$) in Figure 1
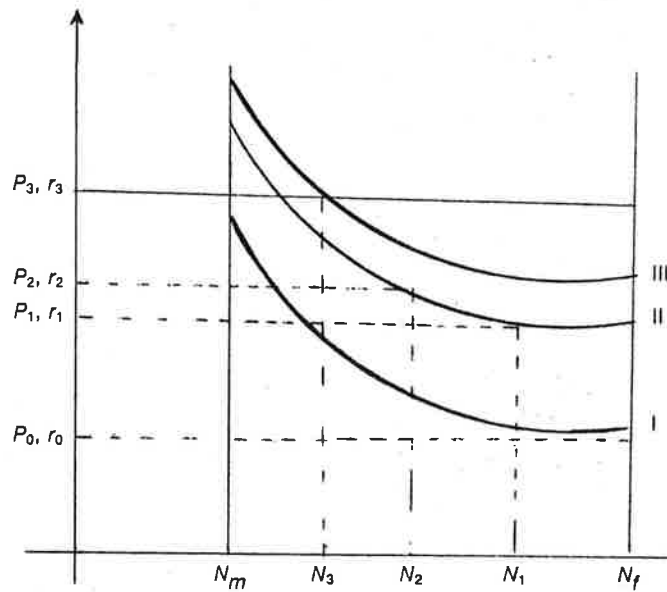
Figure 2

A changing total profit constraint

represent the P and N progression typical of stagflation: P's can zoom even as N tumbles.

The drop in N may hit an "unemployment barrier" (N_m) at which either government fiscal intervention or a breakdown in the price-wage process takes place. Here the realized money wage w and P_c reactions no longer conform to equation (2). At N_m, new initial conditions are imposed for the further evolution of P and N.

In Figure 2 the aggregate profit constraint of equation (10) is increasing (see lines I, II, III in the figure), even as unit R is guided by a process summarized in (13).[16]

In the example, starting from N_f and r_0, the (R/N) outraces the constraint shifts, so that r_1 (and hence P_1) is compatible with the N_1, r_2 is associated with N_2, and r_3 with N_3. On the path $N_f r_0$, $N_1 r_1$, $N_2 r_2$, and $N_3 r_3$ total profits and profits per unit of employment increase even as employment decreases.

At r_3 an effective maximum inflation barrier is posited where the limitations of the financial system and conventional anti-inflationary

[16]As P_c and W_c increase, W_I also increases. Total investment equals $W_I N_I + R_I$ and $W_I N_I$ is a determinant of R_c. Therefore it is "logical" to assume that the total profits available for the producers of C-goods will increase as wages and prices increase; an outward moving R_c curve is entailed by rising W's.

monetary and fiscal measures take hold. These drive private investment downward, even as the government deficit escalates. A sharp rise in U and the new aggregate constraint on the P-N combinations imply that new initial conditions are imposed on the price equation (equation 13) so that, for a time, ΔW and ΔP increases are moderated. At such time an expansion of aggregate attainable profits will mainly lead to a rise in employment.

Conclusions

This has been an exercise in integrating a market process explanation of price movements, with the constraints upon prices and employment that reflect the aggregate characteristics of the economy.

In our model U does *not* check inflation, but is the *result* of inflation when the total profits constraint is specified. Policy to constrain aggregate profits will not usually decrease inflation. In our model monetary policies that might increase investment or fiscal policy, which would enlarge the deficit, would *not* increase the accelerating rise in P during a "free fall" period in which the rise in P conforms to the market process dynamics of equation (13). Higher N's would be associated with unchanging rising P's if the aggregate profit constraint is sufficiently relaxed.

The "explosive" accelerator-multiplier relation is a representation of the migration of the economy towards an incoherent state: "floors" and "ceilings" prevent the migration to "incoherence" from occurring. In general, any system as complex as an economy will of its internal functioning drive towards incoherent situations. Floors and ceilings, imposed by institutional structures, "automatic" stabilizers, customary usages, and policy maneuvers will override the endogenous thrust to "incoherence" by substituting the value of a constraint for the run-away "free market" values.

A major implication of this type of analysis is that appropriate institutional arrangements and policy interventions are necessary to prevent a market economy from periodically degenerating into incoherence.

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