An Industrial Interpretation of Inflationary Unemployment

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An apparent problem in some nations today is that prices of goods rise while unemployment persists or rises. Several economists have observed such positive correlation (*Friedman,* 1977; *Mullineaux,* 1980). Worse yet, during successive post-war recessions in the U.S.A., the maximum rates of inflation and unemployment have risen. From empirical (*Phillips'* curve) to ad hoc (political cycle) hypotheses, alternative explanations for the deepening malaise between prices and unemployment only indirectly addresses the two markets in which prices and employment are determined. A hypothesis which addresses the commodity market and the labor market directly and simultaneously should offer plausible reasoning for "inflationary recession."

The hypothesis is that cyclical change in industrial concentration ratios may impart anomalous patterns to price and unemployment behavior by fostering long-term growth in monopolistic competition. Specifically, as concentration within industries accedes during recession, surviving firms may lay permanent claim to a transitorily enlarged market share by undertaking long-run advertising.[1] As aggregate demand subsequently recovers, emerging firms may compete from a stronger position against potential new entries. The relatively greater price stability and output (and employment) instability of monopolistic competition occurs. While short-term or cyclical data to test the hypothesis are unavailable, even long-term data which exist are incongruous with the hypothesis.

I. Introduction

As industrial concentration rises, we should expect a positive correlation between price levels in commodity markets as a proxy for inflation and levels

[1] Long-run advertising best supports buyer loyalety to a particular "brand". Short-run advertising best responds to price and non-price "competition" which is non-enduring. Thus, advertising by a monopolistic competitor is usually long-run in the sense of claiming a permanent market share. In a non-competitive sense, firms with small minimum efficient scales of output may forestall additional competition by "producing" additional "brands" to enlarge a product line. This or increased advertising could raise the lower bound on costs.

of unemployment as a proxy for the rate of unemployment in labor markets. It has been suggested that concentration will increase if the lower bound of cost is approached (*Reid,* 1979). Minimum cost conditions are likely to occur when business activity recedes or when demand-increasing costs rise.[2] When recession ushers in more concentration via increased business failures or mergers to forestall failure, both factors are present. If demand-increasing costs for advertising by fewer firms supplants or exceeds reductions in variable output costs, the lower bound of cost will be approached even more rapidly. It has been observed frequently that increased advertising cost is consistent with lessened price competition (*Hicks,* 1964; *Lipsey,* 1971; *Robinson,* 1964; and *Tobin,* 1964).

If recurring trade cycles spawn changes in concentration ratios, surviving firms which insure their dominance through advertising may create an asymmetric bias toward monopolistic competition. With fewer competitive alternatives, consumers will be more receptive or vulnerable to advertising to differentiate an increasingly narrower range of substitutes. Since monopolistic competition does not foster alliances readily opposed to its existence, it rarely diminishes and thus evinces encroaching impediments to full price flexibility and full employment of resources. The presence of increased concentration serves as harbinger that price competition is suppressed (*Adelman,* 1978).

II. The Model

A device for assessing effects of inflation and unemployment concurrently is the short term *Keynes-Hicks-Hansen-Smith* comparative statics paradigm (*Smith,* 1956; *Coddington,* 1979). We shall illustrate two outcomes from a cyclical-to-permanent gain in industrial concentration. Figure 1 reveals that each component of the device is dependent on the other. Part (A) presents commodity and money markets (equilibria and disequilibria). Although this does not explicitly contain the bond market, an excess demand for bonds may be implied for excess supplies of money and/or goods. Part (B) presents the input-output relation between a fixed capital capacity and variable labor

[2] This will be true again. If demand falls, some sellers will not sell their output quickly at the price at which others are selling, unless market (information) costs are zero. If such costs are significant, sellers will sell less at a higher price to those buyers who prefer not to look for lower prices. See *Alchian* (1970). *Hicks* (1946) has also noted: "A rise in demand for the product may raise its price, or lower it; for all that we know is that the price must exceed the marginal cost by a percentage – not a fixed percentage. The effect is doubly indeterminate; the percentage may vary, and marginal cost may rise or may fall with an increase in output."

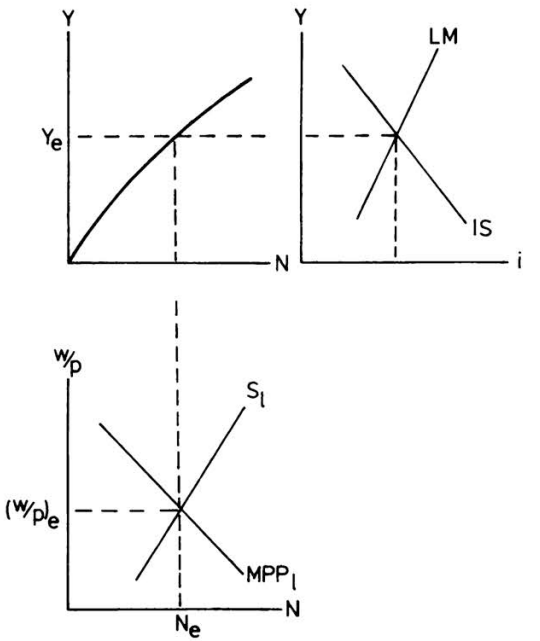

Figure 1

inputs. While capital stock is fixed, net and gross investment may be positive; that is, if net investment is interest-elastic, induced investment causes only employment effects during the gestation period. The aggregate production function thereby reflects diminishing returns. Part (C) presents the labor market. The demand for labor at alternative real wage rates is limited by the marginal physical product of labor (MPP_P). This schedule is derived from the supply of output which, technically, is the production function in Part (B). The supply of labor schedule is relatively less elastic than the demand for labor schedule. This is a result of firms, which demand labor, being more acutely aware of changes in the real wage than are households, which supply labor. Firms are more disposed to utilize the cost-benefit information in the real wage than households would be. Households are more likely to alter their participation in the labor market on the basis of a change in the money wage rate alone or a change in the price level alone (*Allsbrook*, 1973).

Optimal conditions exist at Y_e where employment is full (N_e) at a stable real wage $(W_P/P_x)_e$ and the excess demand for money is equal to zero (i_e).

Since the demand for labor is derived from the demand for output, it must be true that labor demand is affected, in some measure, by the extent of

competition present in producing industries. If less than pure competition prevails, a representative firm would seek to produce something less than its competitive output solution and attain a price somewhat higher than its marginal cost. Under imperfect competition, any firm's restriction of output may be effective if its product is perceived as different. Although long-term studies have not revealed an unbroken march of increased concentration, we shall suggest that varying intensities of cyclical inflation and unemployment and uneven policy responses may account for the greater evidence of increased concentration over the long-term. During representative cycles, therefore, we posit that concentration rises (competition decreases) in buyers' markets during recession, and concentration falls (competition increases) in sellers' markets during recovery. We further posit the rise in concentration to not be offset by the fall in concentration over the cycle. The trend rate of growth in monopolistic competition would thus be positive. During contration, the buyer's market would be shaded by output and employment declining more rapidly than prices; during expansion, the sellers' market would be depicted by output and employment increasing as rapidly as prices.

In the realm of monopolistic competition, the goal of increasing market share is aided during declines in aggregate demand. As competition lessens, product differentiation and brand loyalty promoted by long-term (noncyclical) advertising reinforces the policy of price stability. During contraction, the imperfect competitor must choose between selling less output for the same or a lower price. Ironically, the contraction may achieve for monopolistic competitors that which they are unable to attain during expansion, which is a gain in market share and a restriction of output. Advertising may then underwrite the cyclical gains monopolistic competitors make during the contraction phase. (*Kaldor* and *Silverman,* 1948).

Just as monopolistic competitors restrict output to prevent price reductions, so would labor demand be restricted by this type of firm. To the extent that output is restricted below the firm's potential real output, an industry or an economy of such firms would raise unemployment. The gap between actual and potential real output may be demonstrated within the *IS-LM-N* paradigm.

For an economy which is fully competitive in all industries, the demand for labor is equivalent to the marginal revenue product of labor. In Part (C) of Figure 2, the demand for labor is scheduled against the real wage rate (W/P_x). Under competition, the real wage (W/P_x) is equivalent to the ratio of the money wage to marginal revenue (W/MR_x). This follows from the equivalence of price and marginal revenue under competition. With less than full competition, however, a less than perfectly elastic demand curve is faced

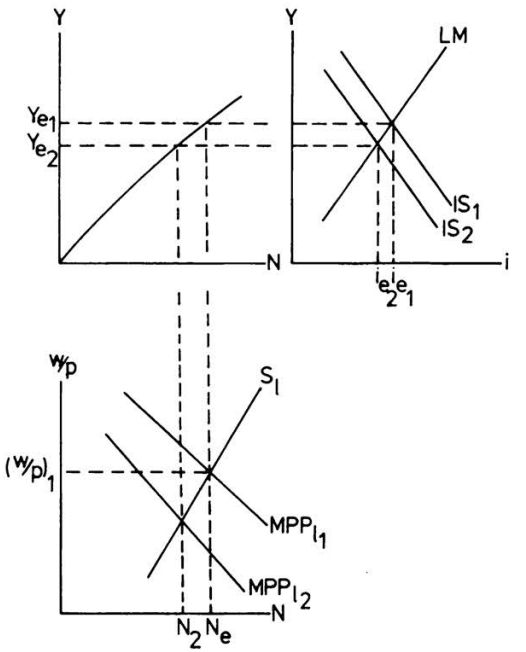

Figure 2

by individual firms. The difference between price (P_x) and marginal revenue (MR_x) is such that as price rises or falls, marginal revenue will always be lower $(P > MR)_x$. We shall illustrate this difference in Figure 3.

Since an economy with industries of firms which are not fully competitive will restrict output, the effect will be to lower the equilibrium level of employment below the level of perfectly competitive output.[3] This is seen both by the limit on the IS curve and subsequent marginal physical product of labor curve (MPP), as well as in the distinction between the marginal revenue product of labor curve (MRP) and the value of the marginal product of labor curve (VMP).

When real output is restricted, less is produced so less can be purchased. The imperfectly competitive IS_2 curve will therefore lie below a perfectly competitive IS_1 curve. As IS subsides, a given money stock will sustain the price level but lower interest rates. If the real wage rate does not fall below

[3] The difference between the summation of marginal product curves and the marginal product curve for the economy is treated by *Friedman*. The marginal product curve for the economy "(tends) to be more elastic than the sum of the marginal product curves for the firm..." See *Friedman* (1975), p. 186.

$(W/P)_1$ the derived shift in the MPP will create underemployment disequilibrium in the labor market $(N_e - N_2)$.

Because output is restricted below potential, the "excess demand" causes price to be higher than would prevail under competition. Price exceeds marginal revenue, and the marginal revenue product of labor is less than the value of the marginal product of labor. This follows from the internal equilibrium condition for a firm in its hiring: that it hire on its marginal productivity curve, where $W/P_x = MPP$. Since the $MRP = MR_x \times MPP$, and since the $VMP = P_x \times MPP$, it follows that the VMP will exceed the MRP at any restricted level of output and employment. The ratio of (W/MR_x) will exceed the ratio of (W/P_x) as price exceeds marginal revenue. This leads us to observe that, for a given MPP curve, employment will be less when $MR_x < P_x$. Firms will hire on the basis of MRP, although the VMP to firms may be greater.

Parts (A) and (B) of Figure 3 present two ways of drawing the same conclusion. In Part (A), the money wage is plotted against employment. The divergence between P_x and MR_x creates a gap between the VMP and the MRP at a given money wage, W_1. Unemployment exists when $N_e > N_2$. In Part (B), the money wage adjusted by the alternatives of price and marginal revenue are plotted against employment. The gap between P_x and MR_x is shown by $(W/MR_x)_1 > (W/P_x)_1$. Since the equilibrium hiring condition for the imperfectly competitive firm is where $W = MRP$, we have employment set at N_2 where $(W/MR_x)_1 = MPP$. This exists even in the absence of a contraction in the IS curve.

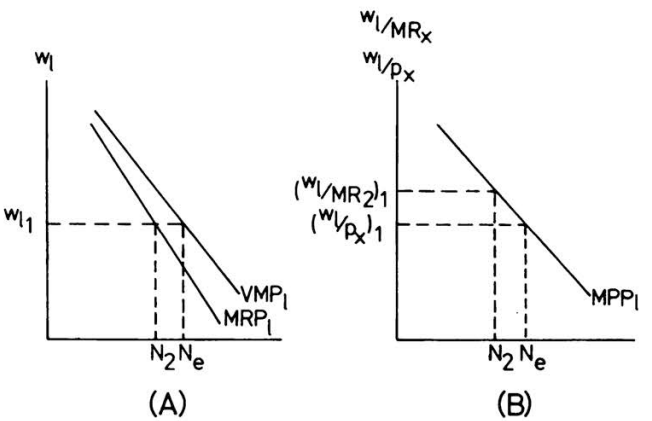

Figure 3

Further, we can liken the outcome of asymmetric change in concentration over an output cycle to a ratchet effect between aggregate demand and aggregate supply. Figure 4 shows that reductions in aggregate demand do not intersect a long-run aggregate supply curve. Instead, recession spawns a short-run aggregate supply curve which lies above its long-run counterpart. This recessionary equilibrium of supply and demand in product markets causes prices to be relatively higher and real output relatively lower than if prices were more flexible than output during recession. Essentially, the short-run ratchet reflects a lower elasticity to price changes and a higher elasticity to output changes. It is often posited that during recession firms "choose" to sell their output at higher prices rather than lower prices. To the extent that this is true, it may be explained by the prevalence of non-price over price competition within buyers' markets. Apparently firms do not believe price-elasticity of demand for their products to be sufficiently great to overcome the income-elasticity of demand responsible for fewer sales. This reasoning is not at odds with the stable price policies of monopolistic competitors during "normal" (expansionary) times. The real cost to society of increased concentration is for prices to fall less and output to fall more when vested market shares increase. In Figure 4, as D_1 falls to D_2, prices will fall less (to P_2 rather than P_1) and output will fall more (to Q_2 rather than Q_1). "*FN*" represents full employment.

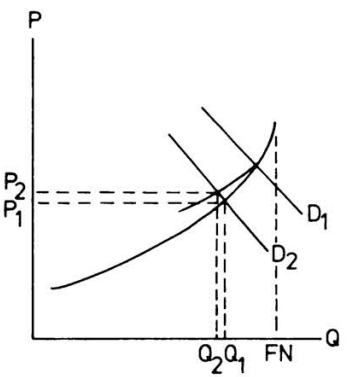

Figure 4

III. Conclusions

Under such conditions, the restriction of output to sell at prices above competitive marginal cost leads to a reduced demand for labor. And as recessions unfold, a trend toward lessened price competition through

cyclically increased concentration will exacerbate the rates of inflation and unemployment coupled at the cyclical trough. Price acceleration is not likely to proceed from advancing stages of imperfect competition, but it would seem that cyclically-driven shifts toward imperfect competition should eschew the use of conventional monetary, fiscal, or incomes policies during inflationary recession. The onset of price acceleration, as well as the cause of early cyclical inflation, is another matter entirely. Possibly the most gratifying insight provided by the analysis is in explaining the trend rate of inflation during successive troughs; the least satisfying inference, which should not be drawn, is in explaining the existence of cyclical inflation.

References

Adelman, Morris A.: "Change in Industrial Concentration," in *Mansfield,* E. (ed.), Monopoly Power and Economic Performance, W. W. Norton, New York, 1978. – *Alchian,* Armen A.: "Information on Costs, Pricing, and Resource Unemployment," in *Phelps,* E. (ed.), Microeconomic Foundations of Employment and Inflation Theory, W. W. Norton, New York, 1970. – *Allsbrook,* Ogden O.: "Keynes's Involuntary Unemployment Equilibrium: An Alternative View," South African Journal of Economics, March 1973, 41, pp. 60 - 66. – *Coddington,* Alan: "Hick's Contribution to Keynesian Economics," Journal of Economic Literature, September 1979, 17, pp. 970 - 88. – *Dean,* James W.: "The Inflation Process: Where Conventional Theory Falters," American Economic Review: Papers and Proceedings, May 1981, 71, pp. 362 - 67. – *Friedman,* Milton: Price Theory: A Provisional Text, Revised Edition, Aldine, Chicago, 1975. – *Friedman,* Milton: "Nobel Lecture: Inflation and Unemployment," Journal of Political Economy, June 1977, 85, pp. 451 - 72. – *Hicks,* John R.: Value and Capital, Clarendon Press, Oxford, 1946. – *Kaldor,* Nicholas and *Silverman,* R.: A Statistical Analysis of Advertising Expenditures and of the Revenues of the Press, Cambridge University Press. – *Lipsey,* Richard, G.: An Introduction to Positive Economics, Weidenfeld and Nicolson, London, 1971. – *Mullineaux,* Donald J.: "Inflation Expectations and Money Growth in the U.S.," American Economic Review, March 1980, 70, pp. 149 - 61. – *Reid,* Gavin C.: "An Analysis of the Firm," Scottish Journal of Political Economy, February 1979, 26, pp. 15 - 32. – *Robinson,* Joan: "'Imperfect Competition' Revisited," in *Robinson,* Collected Economic Papers, Volume Two, Blackwell, Oxford, 1964. – *Robinson,* Joan: "'Imperfect Competition' Today," in *Robinson,* Collected Economic Papers, Volume Two, Blackwell, Oxford, 1964. – *Smith,* Warren L.: "Graphical Exposition of the Complete Keynesian System," The Southern Economic Journal, October 1956, 23, pp. 115 - 25. – *Tobin,* James: "Inflation and Unemployment," in *Tobin* (ed.), Essays in Economics, Volume Two, American Elsevier, New York, 1964.

Zusammenfassung

Eine industrielle Interpretation von Arbeitslosigkeit bei Inflation

Dieser Aufsatz entwickelt die Hypothese, daß wiederholte Konjunkturzyklen immer stärkere Phasen von gleichzeitiger Inflation und Rezession erzeugen können. Als Modell wird das *Keynes-Hicks-Hansen-Smith*-Paradigma verwendet. Wenn man darin ein Preis- und Produktionsverhalten der Unternehmen berücksichtigt, das mit fortschreitenden Konjunkturzyklen zunehmend monopolistisch mit Werbung konkurriert, dann lassen sich eine verstärkte Produktionseinschränkung und anschließend immer höhere Preisniveaus in den folgenden Rezessionen begründen. Es gibt jetzt Evidenz dafür, daß diese Hypothese tragfähig ist. Nach einer empiririschen Untersuchung gewannen die Unternehmen, die eine Rezession überlebten, im Durchschnitt etwa ein halbes Prozent Marktanteil hinzu, aber sogar mehr als ein Prozent, wenn sie ihre Werbungskosten um 28 % oder mehr erhöhten.

Summary

An Industrial Interpretation of Inflationary Unemployment

This paper advances the hypothesis that recurring business cycles may spawn increasingly severe phases of concurrent inflation and recession. The model employed is the *Keynes-Hicks-Hansen-Smith* paradigm. By including the pricing and output behavior of firms which become gradually more monopolistically competitive as business cycles unfold, a case is made for increasingly severe output restriction, via advertising, and subsequently increasingly higher price levels during successive recessions. Evidence now exists that this hypothesis is tenable. In one study, the average surviving firm during recession gained approximately half a percent of market share compared to more than double that for a surviving firm which increased advertising costs by 28 % or more.

Résumé

Une interprétation industrielle du chômage en temps d'inflation

Cet article développe l'hypothèse que des cycles conjoncturels peuvent produire des phases de plus en plus fortes d'inflation et parallèlement de récession. Le paradigme *Keynes-Hicks-Hansen-Smith* est utilisé comme modèle. On peut expliquer une restriction croissante de la production et ensuite un niveau toujours en hausse des prix dans les récessions suivantes à partir de ce modèle si on y tient compte d'un comportement de prix et de production des entreprises qui, au plus les cycles conjoncturels sont avancés, fait concurrence de plus en plus monopoliquement à la publicité. Il est maintenant évident que cette hypothèse peut être soutenue. Selon une recherche empirique, les entreprises qui ont survécu une récession gagnèrent en moyenne environ un demi pourcent de part de marché. Elles gagnèrent même plus d'un pourcent lorsqu'elles augmentèrent leurs coûts de publicité de 28 % ou plus.