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COMPETING WAGE CLAIMS, COST INFLATION, AND CAPACITY UTILIZATION

by
Thorvaldur Gylfason
and
Assar Lindbeck

Seminar Papers are preliminary material circulated to stimulate discussion and critical comment.

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Institute for International Economic Studies
S-106 91 Stockholm
Sweden
COMPETING WAGE CLAIMS, COST INFLATION,
AND CAPACITY UTILIZATION*

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Thorvaldur Gylfason and Assar Lindbeck
Institute for International Economic Studies, University of Stockholm

Abstract

This paper develops a theory of competing wage claims and cost inflation, and attempts to integrate this theory into the core of modern macroeconomic analysis. Specifically, the paper proposes an explanation for wage rigidity and wage interdependence based on an application of duopoly theory to labor unions, and incorporates this microeconomic theory of labor union behavior into a macroeconomic general equilibrium model with goods, money, and bonds as well as two kinds of labor. Special emphasis is placed on the interplay between demand and cost factors in the inflation process and on the implications of wage competition among labor unions for the relationship between inflation and unemployment in the short and long run.

* This paper is a revised version of Sections I, III, and V of our earlier IIES Seminar Paper No. 133, "Cost Inflation and Macro-economic Theory" (December 1979). Sections II and IV of that paper are scheduled to appear, with minor changes, in KYKLOS (Fasc. 3, September 1982), with the title "The Political Economy of Cost Inflation", and will be issued as IIES Reprint No. 192. We are indebted to John Cuddington, Hans Genberg, Douglas Purvis, and Robert Solow as well as to several colleagues at the Institute for International Economic Studies for helpful comments on earlier drafts of this paper. We are solely responsible for remaining errors and other shortcomings.
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COMPETING WAGE CLAIMS, COST INFLATION, AND CAPACITY UTILIZATION

I. Introduction

Albeit firmly imbedded in popular folklore, the concept of cost inflation is not universally accepted among economists.

The rise of cost inflation theories in the 1950s and their subsequent fall into disrepute (or at least out of favor) among academic economists in the 1960s and 1970s are reflected in three important surveys of inflation theory written in the last two decades. Bronfenbrenner and Holzman (1963) present in their survey an eclectic view of demand and supply (or cost) theories of inflation. Their survey shows, however, that it was not generally understood at that time how the aggregate demand and supply framework, which served as a basis for the distinction between demand and cost inflation, could be reconciled with the standard IS-LM framework, Keynesian theories of the labor market, and the Phillips curve. Thus, they end their survey by predicting the emergence of "... simpler and more usable syntheses of the three or four main streams of thought we have noted in this survey - demand inflation, supply or cost inflation, interactions with sociological economics, and interactions with the burgeoning theory of economic growth and development" (p. 100).
The survey of Harry Johnson (1967, Ch. III) also mirrors the failure of the profession at the time to see how the above-mentioned elements of inflation theory hang together; instead, Johnson treats them as competing hypotheses. He describes the issue of "cost-push" versus "demand-pull" as "largely a spurious one" (p. 128), and criticizes dynamic models of wage and price inflation originating from the struggle over income shares for assuming "what is essentially arbitrary behavior" as well as on the grounds that "the relationships of the models are assumed to be independent of the monetary environment" (p. 120).

In the most recent of the three surveys, Laidler and Parkin (1975) abandon altogether the aggregate demand and supply framework around which Bronfenbrenner and Holzman organized their survey article as they "find the cost-push/demand-pull distinction analytically unhelpful" (p. 742). Like Johnson before them, Laidler and Parkin interpret demand and cost (or supply) theories of inflation as competing rather than complementary hypotheses, and "reject the sociological and other push hypotheses" (p. 764). However, they concede that "[i]n the present state of the debate an eclectic position... appeals to many, with excess demand and inflationary expectations being combined with sociological and political factors into a multi-cause explanation of inflation" (p. 781).

Against this background it is the purpose of this paper to attempt the kind of eclectic synthesis of demand and supply (or cost) theories of inflation (as well as, perhaps, depending on what is meant by the term, "sociological" theories) which Bronfenbrenner and Holzman predicted would be undertaken and Laidler and Parkin describe as "appeal[ing] to many". More specifically, the aim of
our analysis is to develop a theory of competing wage claims and
cost inflation and integrate it into the core of macroeconomic
theory by bringing together in one whole (i) standard IS-LM
analysis of aggregate demand; (ii) Keynesian theory of employ-
ment and aggregate supply; (iii) an explanation for wage rigidity
and wage interdependence based on an application of oligopoly
type to labor unions; and (iv) Phillips curves for wage forma-
tion in interdependent labor markets, extended to allow not only
for inflation expectations but also competing wage claims.

In the dynamic model of inflation and economic activity
which we construct from these ingredients, both demand and cost
variables have an important part to play. By virtue of tying
wage competition to a microeconomic theory of labor unions, and
being based on a fairly general macroeconomic theory of in-
fation and economic activity, our analysis is meant to avoid
some of the above-mentioned pitfalls in earlier models of cost
inflation stressed, for instance, by Johnson (1967, Ch. III).

For the purpose of highlighting competing wage claims without
introducing unnecessary complexity, two kinds of labor are in-
cluded in the analysis to follow (e.g., skilled vs. unskilled;
white vs. blue collar; private vs. public sector). While "desired
real wages", defined in Section II, are taken to be rigid in the
short run and interdependent in the two sectors for reasons to
be explained in Section III, we set forth the hypothesis in
Section IV that, over time, the rate of change of desired real
wages in each labor market responds not only to changes in capacity
utilization but also to expectations about wage developments in the
other labor market. Thus, in each labor market the original
Phillips curve relationship between nominal wage inflation and unemployment is adjusted not only for expectations of future inflation but also for nominal wage increases expected to be granted in the other labor market. Attempts by labor unions to protect or enhance the absolute or relative purchasing power of their members' wages are thus an independent source of wage inflation and, hence, of price inflation and unemployment in the model.

The idea that labor unions base their wage claims partly on the wages received by other groups of workers may be traced back at least to Keynes (1936, p. 14). This paper may be viewed as an attempt to rationalize this idea and integrate it into a general macroeconomic framework. The model developed in this paper differs from most formal models of cost inflation to date in that these have emphasized competing claims of labor and capital on national income, while we emphasize competing wage claims by different groups of labor. Furthermore, by virtue of being a general equilibrium model with goods, money, bonds, and two kinds of labor, the model presented below is considerably more general and richer in its implications than previous models of cost inflation such as, for example, the simple income determination models of Reder (1948) and Holzman (1950) and the wage and price determination models of Duesenberry (1950), Turvey (1951), Pitchford (1957, 1963, 1977), Turnovsky and Pitchford (1978), and Turnovsky (1979).

The structure of the paper is as follows. In Section II we set the stage by presenting a simple static model of income and price determination with two separate markets for labor. In Section III we proceed to develop a duopolistic theory of competing wage claims, thus explaining wage stickiness and interdependence and laying the basis for the dynamic
analysis of wage formation to follow. In Section IV we introduce Phillips curves relating wage inflation to capacity utilization, and convert the static model into a dynamic one of price inflation and economic activity. Within this framework we analyse the effects of changes in demand as well as cost variables and mechanisms on output and the inflation rate in the short run. The long-run properties of the model are investigated in Section V. Section VI contains concluding remarks.
II. Analytical Background

To set the stage for the dynamic analysis of inflation and economic activity to follow, it is convenient to begin with a simple static model of the determination of income, employment, the interest rate, and the price level in a closed economy.\(^1\) The model is standard except, as mentioned before, it contains two separate markets for labor. The equations of the model are:

1. \( Y = E(Y, r, P^e) + G \) \hspace{2cm} [goods market]
2. \( M/P = L(Y, r, P^e) \) \hspace{2cm} [money market]
3. \( Y = F(N^1, N^2) \) \hspace{2cm} [production function]
4. \( W^1/P = \bar{w}^1 \cdot (P^e)^{1/\lambda}/P = F_1(N^1, N^2) \) \hspace{2cm} [labor market 1]
5. \( W^2/P = \bar{w}^2 \cdot (P^e)^{1/\mu}/P = F_2(N^1, N^2) \) \hspace{2cm} [labor market 2]

**NOTATION**

Endogenous variables:

- \( Y \) - real income
- \( r \) - nominal interest rate
- \( P \) - price level
- \( N^1 \) - employment in labor market 1
- \( N^2 \) - employment in labor market 2
- \( W^1 \) - nominal wage in labor market 1
- \( W^2 \) - nominal wage in labor market 2

---

\(^1\) It has been our ambition to strip the formal analysis of complications such as wealth effects, stock-flow considerations, and openness to trade and capital flows for the purpose of emphasizing our main contribution: a study of competing wage claims and cost inflation in the context of the core of macroeconomic theory. However, some modifications that would follow from a more complex formulation of the model will be indicated at various points; in particular, some open-economy considerations are introduced at the end of the paper.
Exogenous variables:

\[ M \] - money supply
\[ G \] - \( r \) government expenditure
\[ P^e \] - expected price level
\[ \bar{w}^1 \] - desired real wage in labor market 1 \( \equiv W^1/(P^e)^\lambda \)
\[ \bar{w}^2 \] - desired real wage in labor market 2 \( \equiv W^2/(P^e)^\mu \)

Functions:

\[ E \] - real private expenditure
\[ L \] - real demand for money
\[ F \] - aggregate production function

Operators:

\[ f' \] - derivative of function \( f \) with respect to its only argument
\[ f_i \] - derivative of function \( f \) with respect to its \( i \)th argument
\[ \dot{X} \] - first time derivative of \( X \) \( (\dot{X} \equiv dX/dt) \)
\[ \ddot{X} \] - proportional rate of change of \( X \) \( (\ddot{X} \equiv X/X) \)

Eqs. (1) and (2) are standard except that the expected rate of inflation \( \bar{P}^e \) is assumed to influence private expenditures (through the real rate of interest, given the nominal rate) as well as the demand for money \((0 < E_1 < 1, E_2 < 0, E_3 > 0; L_1 > 0, L_2 < 0, L_3 < 0)\). Eq. (3) expresses real income as a function of employment of two different kinds of labor \((F_1, F_2 > 0; F_{11}, F_{22} < 0;)\)
the capital stock is assumed to be fixed and implicit in the production function. Eqs. (4) and (5) state that the real wage in each labor market equals the marginal product of labor in that market.

For the moment both $\hat{P}^e$ (the expected rate of inflation) and $P^e$ (the level of prices expected at the beginning of the period, when wage contracts are negotiated, to prevail over the period) are assumed to be exogenously determined. Desired real wages in the two markets, $w^1$ and $w^2$, are defined as $w^1/(p^e)^\lambda$ and $w^2/(p^e)^\mu$, respectively, where $\lambda$ and $\mu$ reflect the extent to which workers are concerned with real vs. nominal wages, and are assumed to lie between 0 and 1. If $\lambda$ and $\mu = 1$, workers are interested only in expected real wages proper, while, with $\lambda$ or $\mu < 1$, they are to some extent concerned about, or contractually committed to, nominal wages. It needs to be emphasized that the assumption of some degree of nominal wage rigidity with $\lambda$ or $\mu < 1$ need not entail money illusion if wage contracts are negotiated less frequently than price expectations are revised (as, for example, in Fischer, 1977, and Taylor, 1980) or if labor unions in each industry care not only about their own real wage but about real wages in other industries as well (see Keynes, 1936, p. 14; Tobin, 1947; and Patinkin, 1979). We return to the latter argument in the next section. It is also worth noting that as long as utility-maximizing labor unions hold desired real wages above market clearing rates as shown in the next

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1) The last restriction within the parentheses reflects the assumption of nonincreasing returns to scale, which is a necessary condition for profit maximization under perfect competition. Without this assumption (and the assumption that $\psi_{12} - \psi_{21} = 0$), implying that $N^1$ and $N^2$ are technical complements or neutral), the sign of the Jacobian of the model, underlying the comparative-statics results shown in Table 1, would be ambiguous.
section, there is excess supply of labor and hence involuntary unemployment. It is therefore unnecessary to specify labor supply functions in the two labor markets in the model.

For convenience, the model may be reduced to the following pair of quasi-reduced-form equations:

\begin{align}
(6) \quad Y &= Y^d(M/P, G, \hat{P}^e) \quad \text{[aggregate demand]} \\
(7) \quad Y &= Y^s(P/(P^e)^\lambda, P/(P^e)^\mu, \check{\omega}^1, \check{\omega}^2) \quad \text{[aggregate supply]}
\end{align}

where $Y^d_1, Y^d_2, Y^d_3, Y^s_1, Y^s_2 > 0$ and $Y^s_3, Y^s_4 < 0$. Eq. (6) is derived from eqs. (1)-(2) as usual, while eq. (7) is based on eqs. (3)-(5).

Eq. (7) shows that, with either some degree of nominal wage rigidity (i.e., $\lambda$ or $\mu < 1$) or with less than full and immediate adjustment of expected prices to actual prices (i.e., $\partial P^e/\partial P < 1$), aggregate supply and the price level are positively related as shown by the S schedule in Figure 1, because an increase in the price level lowers actual real wages, and thus stimulates output and employment in the short run. The S schedule thus remains upward sloping as long as $\lambda$ or $\mu < 1$, even though price expectations are assumed "rational" with perfect foresight (i.e., $P^e = P$), but becomes vertical in the long run if expectations are formed rationally and $\lambda$ and $\mu = 1$ (see Section V). Aggregate demand, on the other hand, is negatively related to the price level as usual as shown by the D schedule in Figure 1.

As is standard in models of this kind, monetary and fiscal
FIGURE 1
DETERMINATION OF INCOME AND THE PRICE LEVEL IN THE SHORT RUN

\[ S(p_e, w^{-1}, w^{-2}) \]
\[ D(M, G, \Lambda^{e}) \]

TABLE 1
EFFECTS OF CHANGES IN EXOGENOUS VARIABLES ON INCOME, EMPLOYMENT, THE INTEREST RATE, AND THE PRICE LEVEL IN THE SHORT RUN

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>G</th>
<th>\Lambda^e</th>
<th>P</th>
<th>\bar{w}^{-1}</th>
<th>\bar{w}^{-2}</th>
</tr>
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<tbody>
<tr>
<td>Y</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>N^1</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>?</td>
</tr>
<tr>
<td>N^2</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>?</td>
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<td>r</td>
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<td>+</td>
<td>?</td>
<td>+</td>
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<tr>
<td>p</td>
<td>+</td>
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policies\textsuperscript{1} can be used to stimulate output and employment in the short run, but only at the cost of an increase in the price level; in Figure 1, this may be described by an outward shift of the D schedule. An increase in \( \bar{w}^1 \) or \( \bar{w}^2 \) or both, on the other hand, raises costs and reduces production so that total employment falls and the price level rises; in Figure 1, this may be illustrated by an upward shift in the S schedule.\textsuperscript{2} Table 1 summarizes the short-run comparative-statics properties of the model.\textsuperscript{3}

\begin{itemize}
\item \textsuperscript{1} Monetary policy is assumed to be engineered through open-market operations, and government expenditures are assumed to be financed by bond issue.
\item \textsuperscript{2} A similar dichotomy underlies Malinvaud's (1977) distinction between "Keynesian" unemployment (due to insufficient aggregate demand) and "classical" unemployment (due to excessive real wages). See also Gylfason and Lindbeck (1982).
\item \textsuperscript{3} Note that the effect of a change in the desired real wage in each sector on employment in the other is ambiguous. An increase in, say, \( \bar{w}^1 \) raises P but, by reducing \( N^1 \), lowers the marginal product of \( N^2 \), i.e., \( F^2 \), if \( N^1 \) and \( N^2 \) are technical complements in production. Thus the net effect on the value of the marginal product of \( N^2 \), i.e., \( P F^2 \), may be positive or negative. This makes the effect on \( N^2 \) of a change in \( \bar{w}^1 \) ambiguous. Similarly, the effect on \( N^1 \) of a change in \( \bar{w}^2 \) is ambiguous. If \( N^1 \) and \( N^2 \) are technical substitutes in production, however, these cross effects are unambiguously positive. Note also that by reducing the demand for money and stimulating expenditures an increase in \( P^e \) shifts both the LM schedule and the IS schedule in \((Y,r)\)-space to the right, rendering the net effect on \( r \) ambiguous.
\end{itemize}
III. A Duopolistic Approach to Labor Union Behavior

One important question is left unanswered by the static model presented in the preceding section. Why are desired real wages rigid? To put the same question differently, why does "involuntary" unemployment persist?

In this section we suggest an explanation for this controversial phenomenon by an application, originally due to Oswald (1979), of oligopoly theory to the analysis of employment and wages in an economy with a fully unionized labor force. For simplicity, we continue to assume two separate markets for labor. Labor unions are assumed to behave rationally and seek to maximize the utility of their membership (or of the leadership), represented by a well-behaved utility function which includes as arguments (i) the expected real wage of members of the union, defined as $\bar{w}_i = \bar{w}_i^i / P^e$ where $i = 1, 2$; (ii) the expected (or perceived) level of employment of union members; and (iii) the expected real wage of members of the other union, defined as $\bar{w}_j = \bar{w}_j^j / P^e$ where $j \neq i$ and $\bar{w}_j^j$ is the nominal wage that union $i$ expects to be negotiated by union $j$. Thus, unlike Oswald (1979), we assume that each union does not foresee the outcome of the wage settlement being negotiated simultaneously by the other union, nor does it foresee the price level that will prevail over the contract period and hence not either the corresponding actual real wage. Each union must therefore rely on expected values of these variables.

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1) In view of the large extent of unionization in most modern industrial countries, the assumption that all workers belong to labor unions may be regarded as a reasonable first approximation for these countries, with the obvious exception of the United States where only about one-fifth of the work force is presently unionized. Alternatively, we might have assumed that labor unions are concerned about the level of employment of nonorganized as well as of organized labor.
Accordingly, union 1 maximizes

\[(8) \quad U^1 = U^1 (w^1, N^1, \tilde{w}^2)\]

where \(U^1_1, U^1_2 > 0, U^1_3 < 0, U^1_{11}, U^1_{22} < 0, U^1_{12}, U^1_{13} > 0,\) and \(U^1_{23} = 0\)

(see Oswald, 1979), subject to a (perceived) labor demand constraint:

\[(9) \quad N^1 = N^1 (w^1, \tilde{w}^2)\]

where \(N^1_1 < 0\) and the sign of \(N^1_2\) is ambiguous. The labor demand equation (9) is derived from marginal productivity conditions analogous to eqs. (4) and (5), with the change that when the labor contract is entered into at the beginning of the period the union is assumed to expect firms to employ labor to the point where marginal productivity equals expected real wages as defined above (i.e., nominal wages deflated by \(p^e\)) so that \(w^1 = F_1(N^1_1, N^2)\) and \(w^2 = F_2(N^1_1, N^2)\); at the beginning of the contract period the actual price level over the period, and hence the corresponding actual real wage is as yet unknown. The sign of \(N^1_2\) is positive or negative depending on whether \(N^1_1\) and \(N^2_1\) are gross substitutes or complements in production (in the Slutsky-Hicks sense). Hence, while the second term in eq. (9) reflects a "spillover effect" on labor demand, the third argument in the utility function in eq. (8) reflects an "envy effect".

The solution to the union's maximization problem is illustrated in Figure 2.

Assuming that union 1 takes \(\tilde{w}^2\) as given, the first-order condition for maximum utility may be expressed as
FIGURE 2

MAXIMIZATION OF LABOR UNION UTILITY SUBJECT TO LABOR DEMAND CONSTRAINT
\begin{align*}
(10) \quad \frac{dU^1}{dw^1} = U^1_1 + N^1_2 U^1_2 = 0
\end{align*}

Logarithmic linearization of eq. (10), using eqs. (8) and (9), gives the following "reaction function" for union 1:

\begin{align*}
(11) \quad \ln(w^1) = a\ln(\tilde{\omega}^2) + \alpha \quad \text{[reaction function 1]}
\end{align*}

The loglinear form is assumed for convenience: $\alpha$ is a constant. The reaction coefficient $a$ may be expressed as

\begin{align*}
(12) \quad a = \frac{-[U^1_{13} + N_2^1 (U^1_{12} + N^1_2 U^1_{22})]}{[U^1_{11} + 2N^1_1 U^1_{12} + (N^1_1)^2 U^1_{22}] - -}
\end{align*}

Thus, $a$ is composed of two effects: an "envy effect" through $U^1_{13}$ and a "spillover effect" through $N^1_2 (U^1_{12} + N^1_2 U^1_{22})$, both in the numerator of eq. (12). While the envy effect is unambiguously positive (as $U^1_{13} > 0$ by assumption), the spillover effect is positive only if $N^1$ and $N^2$ are gross substitutes (i.e., $N^1_2 > 0$), so that $a$ is unambiguously positive in this case. If instead they were gross complements, the spillover effect would become negative and the sign of $a$, ambiguous, depending on the relative strength of the envy effect and the spillover effect.

Using the definitions of $w^1$ and $\tilde{\omega}^2$, we can rewrite eq. (11) as

\begin{align*}
(11') \quad \ln(w^1) = a\ln(\tilde{\omega}^2) + (1-a)\ln(P^e) + \alpha
\end{align*}

This formulation of the wage reaction function shows clearly why rational behavior does not compel union 1 to require full compensation for expected inflation unless it assumes union 2 to be fully compensated, and thus formalizes Keynes' (1936, p. 14).
original rationale for nominal wage stickiness (see p. 8). Rewriting eq. (11') as

\[ (11'') \quad \ln(\bar{w}^1) = a \ln(\bar{w}^2) + a \]

shows how the desired real wage of union 1, \( \bar{w}^1 \equiv \bar{w}^1 / (p^e)^\lambda \), with \( \lambda = 1 - a \), is determined by union 1's expectations about the nominal wage negotiated by union 2. Hence, with \( \bar{w}^2 \) given, \( \bar{w}^1 \) can be treated as an exogenous variable in the short run as in Section II.

In an exactly analogous manner, union 2 behaves according to a loglinear reaction function:

\[ (13) \quad \ln (w^2) = b \ln(\bar{w}^1) + \beta \quad [\text{reaction function 2}] \]

i.e.,

\[ (13') \quad \ln(\bar{w}^2) = b \ln(\bar{w}^1) + (1-b) \ln(p^e) + \beta \]

where the reaction coefficient \( b \) has exactly the same properties as \( a \) above and \( \beta \) is a constant.

For purposes of the short-run analysis presented in the next section we assume that each union must determine its wage demands without knowledge of the wage claims made simultaneously by the other union. Accordingly, we treat \( \bar{w}^1 \) and \( \bar{w}^2 \) as exogenous variables in the short run, but assume that they catch up with reality over time so that, in the long run, \( \bar{w}^1 = w^1 \) and \( \bar{w}^2 = w^2 \), and hence \( \bar{w}^1 = w^1 \) and \( \bar{w}^2 = w^2 \). With wage expectations thus realized, the intersection of the two reaction functions (11) and (13) in \((w^1, w^2)\)-space represents a long-run "Cournot equilibrium" in the wage formation process.
as is shown in Figure 3. The conditions for the stability of this process (i.e., \( ab < 1 \)) entail the relative slopes shown in the diagram. The Cournot solution implies the following pair of nominal wage equations for the long run, based on a simultaneous solution of eqs. (11) and (13) or, equivalently, eqs. (11') and (13'):

\[
\begin{align*}
(14) & \quad \ln(w^1) = A + \ln(p^e) \\
(15) & \quad \ln(w^2) = B + \ln(p^e)
\end{align*}
\]

where \( A = (\alpha + \beta a)/(1 - ab) \) and \( B = (\beta + \beta a)/(1 - ab) \). Thus, with a unitary coefficient on \( \ln(p^e) \) in these equations, nominal wages adjust fully to expected inflation in the long run, notwithstanding the short-run stickiness of nominal wages implied by eqs. (11') and (13').

The duopolistic approach taken above provides an explanation for two intriguing phenomena that have caused much confusion and controversy over the years. First, it explains why real wage rates - or in the present exposition, desired real wage rates - are rigid and thus do not necessarily adjust instantly so as to equilibrate demand and supply in labor markets. Thus, unemployment is created whenever the labor supply schedule, reflecting the preferences and individual market behavior of the rank and file of the union, intersects the labor demand

---

1) This analysis can easily be extended so as to obtain the "Stackelberg solution" in which one union assumes the position of a "wage leader" and the other union, that of a "wage follower". But if both unions desire to be leaders, a "Stackelberg disequilibrium" is encountered, the result of which is economic warfare. Other extensions are also possible but will not be pursued in this paper (see Gylfason and Lindbeck, 1982a).
FIGURE 3

Competing wage claims: the Cournot solution

\[ \ln(w) = a \ln(w^2) + \alpha \]

\[ \ln(w) = b \ln(w^1) + \beta \]
schedule below and to the right of the equilibrium tangency point shown in Figure 2.1 Strictly speaking, however, such unemployment can be said to be "involuntary" only if it is argued that the preferences and the individual market behavior of the rank and file membership of the union differ from those of the leadership.2

Second, the duopolistic approach explains why, with rational labor unions, wage claims tend to be interdependent once the equilibrium of the system is disturbed by, for example, a change in government policy. The next section is devoted to further analysis of this mechanism and to its integration into a dynamic extension of the general static model presented in Section II.

IV. Wage Formation, Capacity Utilization, and Cost Inflation

While the static model presented in Section II focused on the determination of output and the price level (cf. Figure 1), we now shift the focus of attention to inflation, capacity utilization, and the evolution of wage demands over time. This requires converting the static model into a dynamic one by first differentiating the reduced-form solution of the static model with respect to time and then endogenizing the rate of change of wages by introducing Phillips curves. To facilitate the conversion, we assume in this section that price expectations adjust instantly to changes in actual prices so that $\pi^e = \pi$ throughout. Although not essential for our purposes, this "rational expectations" (or rather "perfect

1) The same result could, of course, be obtained by application of monopoly theory to the analysis of an integrated nation-wide labor market dominated by a single labor union (see McDonald and Solow, 1981, and Calmfors, 1982), or by using a more general oligopoly theory to analyze labor market behavior in an economy with three or more unions (see Gylfason and Lindbeck, 1982a).

2) This observation corresponds to Corden's (1981, p. 314) distinction between "union-voluntary" and "private-involuntary" unemployment.
foresight") assumption simplifies the analysis to follow considerably. The introduction of gradual adjustment of expectations would not result in any qualitative changes in the short-run response of output and inflation to changes in economic policy or other disturbances, although stagflationary tendencies would be accentuated. On the other hand, gradual adjustment of expectations would increase the scope for incomes policy by driving a wedge between actual and expected inflation.

Assuming instantaneous adjustment of price expectations, we can express the reduced-form solution of eqs. (1)-(5) for the rate of change of output $\hat{Y}$ and the rate of inflation $\hat{P}$ as follows:

\begin{align*}
(16) \quad \hat{Y} &= f(\hat{M}, \hat{G}, \hat{\omega}^1, \hat{\omega}^2) \\
(17) \quad \hat{P} &= g(\hat{M}, \hat{G}, \hat{\omega}^1, \hat{\omega}^2)
\end{align*}

with $f_1, f_2 > 0$; $f_3, f_4 < 0$; and $g_1, g_2, g_3, g_4 > 0$ as shown by the first and last rows of Table 1.

**Wage formation**

Although desired real wages may be viewed as predetermined in the short run as was shown in the preceding section, we assume that they respond to market forces over time. Specifically, we assume that the rate of change of the nominal wage in each labor market is positively related not only to the rate of change of the expected nominal wage in the other labor market and to the expected rate of inflation (cf. eqs. (11') and (13')) but also to the overall rate of capacity utilization in the economy as follows:

---

1) Note that the expected rate of inflation is defined here as the rate of change of the expected price level: $\hat{P}^e = \hat{p}^e / P^e$, and equals $\hat{P}$ here by assumption. If expectations are assumed to adjust through the standard mechanism $\hat{p}^e = \theta (\hat{P} - \hat{P}^e)$ with $\theta > 0$, the rational expectations assumption ensures that the second derivative $\hat{p}^e$ equals zero throughout, thus eliminating that variable from the analysis.
\[ \hat{W}^1 = a\hat{v}^2 + \lambda p^e + h(Y-Y^*) + h_o \]  
[short-run Phillips curve 1]

\[ \hat{W}^2 = b\hat{v}^1 + \mu p^e + k(Y-Y^*) + k_o \]  
[short-run Phillips curve 2]

Here \( \lambda = 1-a; \mu = 1-b; h', k', h_o, k_o > 0; \) \( h(0) = k(0) = 0; \) and \( Y^* \) is the full-employment level of output (corresponding to the desired supply of labor at prevailing wages). These equations describe the evolution of the wage reaction functions through time, and are derived simply by differentiating the reaction functions (11') and (13') with respect to time and by postulating that the "autonomous" components of wage increases are increasing functions of capacity utilization (i.e., \( \dot{a} = h(Y-Y^*) + h_o \) and \( \dot{k} = k(Y-Y^*) + k_o \); the positive shift parameters \( h_o \) and \( k_o \) reflect exogenous wage push impulses).

Eqs. (18) and (19) imply that \( \hat{W}^1 \) and \( \hat{W}^2 \) do not adjust fully to changes in \( p^e \) in the short run as long as \( a, b > 0 \) and \( \hat{W}^1 \) and \( \hat{W}^2 \) are fixed.

In the long run, however, wage expectations are realized (i.e., \( \hat{W}^1 = \hat{W}^1 \) and \( \hat{W}^2 = \hat{W}^2 \)), so that eqs. (18) and (19) can be solved simultaneously so as to give the following long-run Phillips curve equations with unitary coefficients on \( p^e \):

\[ \hat{W}^1 = H_o + H(Y-Y^*) + p^e \]  
[long-run Phillips curve 1]

\[ \hat{W}^2 = K_o + K(Y-Y^*) + p^e \]  
[long-run Phillips curve 2]

Here \( H_o = (h_o + ak_o)/(1 - ab) > 0, H' = (h' + ak')/(1 - ab) > 0, \) \( K_o = (k_o + bh_o)/(1 - ab) > 0, \) and \( K' = (k'+bh')/(1 - ab) > 0. \) The partial derivatives of \( H_o, H', K_o \) and \( K' \) with respect to \( a \) and \( b \) are all positive.

According to the short-run Phillips curve equations (18) and (19), wage claims in each labor market are influenced not only by capacity utilization (or unemployment) and by expected inflation, but also
by wage increases expected in the other labor market. The restrictions on the adjustment coefficients (i.e., $a, b \geq 0$ and hence $\lambda, \mu \leq 1$) imply that workers in each market claim wage increases over and above those dictated by the employment situation both to protect, partially or fully as the case may be, the purchasing power of their wages in terms of goods and services ($\lambda, \mu \leq 1$) and to protect or enhance the purchasing power of their wages relative to the wage increases expected on the other labor market ($a, b \geq 0$). The main difference between these two types of "cost inflation" mechanisms is that the first type reflects attempts by workers to influence their real economic position, while the second type reflects their attempts to protect their relative position. \footnote{Whether the first type of cost inflation, i.e., attempts to protect real wages against inflation, should be called "cost inflation" is perhaps a matter of taste. See Lindbeck (1980, Ch. 3) and Gylfason and Lindbeck (1982).}

The Phillips curve equations above have the property that the more compensation workers in each labor market get for wage increases granted in the other labor market, the less direct compensation they get for expected inflation. This property ensures that workers are not overcompensated for inflation. Thus, the equations have the desired homogeneity property that if in the long run $\hat{\lambda}^1 = \hat{\lambda}^2 = \hat{\lambda}^1 = \hat{\lambda}^2 = \hat{\lambda}^1 = \hat{\lambda}^2 = \hat{\lambda}^1 = \hat{\lambda}^2$ (hence abstracting from productivity changes), the Phillips curves become vertical in the long run regardless of the values of $a$ and $b$ and hence of $\lambda$ and $\mu$ (see Section V). The long-run stability of the wage formation process per se requires, however, that $ab < 1$, for if one group of labor insists on a larger increase in relative wages than the other group is willing to accept, an explosion of wage increases will result. For this reason, we assume throughout that $ab < 1$. \footnote{Whether the first type of cost inflation, i.e., attempts to protect real wages against inflation, should be called "cost inflation" is perhaps a matter of taste. See Lindbeck (1980, Ch. 3) and Gylfason and Lindbeck (1982).}
Output and inflation

Having introduced wage adjustment into the model, we are now in position to integrate the wage equations into the reduced-form solutions for the rates of change of output and prices in the short run. This can be done most easily by first noting that

\[(22) \quad \tilde{\omega}^1 = \tilde{\omega}^1 - \lambda \tilde{p}^e = \tilde{a} \tilde{w}^2 + h(Y - Y^*) + h_o\]
\[(23) \quad \tilde{\omega}^2 = \tilde{w}^2 - \mu \tilde{p}^e = \tilde{b} \tilde{w}^1 + k(Y - Y^*) + k_o\]

and then substituting from eqs. (22) and (23) into (16) and (17) to get

\[(24) \quad \hat{Y} = \phi(M, \hat{G}, Y - Y^*, b\tilde{w}^1 + k_o, a\tilde{w}^2 + h_o) \quad [\phi \text{ schedule}]\]
\[(25) \quad \hat{P} = m(M, \hat{G}, Y - Y^*, b\tilde{w}^1 + k_o, a\tilde{w}^2 + h_o) \quad [m \text{ schedule}]\]

where \(\phi_1 \equiv f_1 > 0; \phi_2 \equiv f_2 > 0; \phi_3 \equiv f_3 h' + f_4 k' < 0; \phi_4 \equiv f_4 < 0; \phi_5 \equiv f_3 < 0; m_1 \equiv g_1 > 0; m_2 \equiv g_2 > 0; m_3 \equiv g_3 h' + g_4 k' > 0; m_4 \equiv g_4 > 0; m_5 \equiv g_3 > 0.\) The reason why \(\phi_3\) is negative is that an increase in output stimulates the rate of change of wages and thus reduces the rate of growth of output. Hence, the dynamic adjustment path of output described by eq. (24) is stable. The equilibrium level of output may therefore be obtained from eq. (24) by setting \(\hat{Y} = 0:\)

\[(26) \quad Y = l(M, \hat{G}, Y^*, b\tilde{w}^1 + k_o, a\tilde{w}^2 + h_o) \quad [l \text{ schedule}]\]

where \(l_1 \equiv -\phi_1/\phi_3 > 0, l_2 \equiv -\phi_2/\phi_3 > 0, l_3 = 1, l_4 \equiv -\phi_4/\phi_3 < 0,\) and \(l_5 \equiv -\phi_5/\phi_3 < 0.\)
These relationships determine the equilibrium level of output and rate of inflation in the short run as is shown by the intersection of the $\ell$ schedule and the $m$ schedule in Figure 4. Since eq. (26) is a reduced-form equation for $Y$, expressing output as a function solely of exogenous variables, the $\ell$ schedule is vertical at that level of $Y$ at which the $\phi$ schedule intersects with the horizontal axis in the phase diagram expressing the relation between $\hat{Y}$ and $Y$ in the lower panel of the figure. Eq. (25), on the other hand, is a semi-reduced-form equation, and the $m$ schedule slopes up because an increase in output increases wage inflation through the Phillips curves and hence price inflation through eq. (17), reflecting a "demand pull" effect of output on wages combined with a "cost push" effect of wages on prices. Given the values of the exogenous variables in the model ($\Delta, c$, and $Ya$ as well as $b\tilde{m} + k_o$ and $a\tilde{\omega} + h_o$), the system is in equilibrium where the $\ell$ and $m$ schedules intersect at point $A$ in Figure 4, in the sense that once the system has settled at that point, there is no automatic tendency for it to move away from it. It is worth noting that, with $\hat{Y}$ adjusting along the $\phi$ schedule and $\hat{P}$ along the $m$ schedule (until $\hat{Y} = 0$), our model is consistent with a variety of empirical results concerning the relative flexibility of inflation and output (or unemployment).

Let us now study the consequences of economic policy and wage rivalry for inflation and economic activity. Monetary and fiscal expansion have qualitatively similar effects on inflation and output. Both shift the $\phi$ and $\ell$ schedules to the right (by the same distance) and the $m$ schedule to the left so that the system moves to an equilibrium point such as $B$, somewhere in the shaded area in the figure, at which both the level of output and the inflation rate are higher.
FIGURE 4

DETERMINATION OF INCOME AND THE INFLATION RATE IN THE SHORT RUN
than before. Thus, with respect to changes in \( \hat{M} \) and \( \hat{c} \), there is a clear trade-off between inflation and unemployment in the short run.

Figure 4 may also be used to analyze the effects of competing wage claims on output, inflation, and the efficacy of monetary and fiscal policy. By shifting the short-run Phillips curves (18) and (19) to the left in \( (\tilde{W}, Y-Y^*) \) - space for given positive \( \tilde{W}_1 \) and \( \tilde{W}_2 \), increases in the reaction coefficients a and b shift both the m schedule and the l schedule to the left, hence also shifting the locus of points such as A and B in Figure 4 to the left. It follows that an increase in a or b or both causes the trade-off between inflation and unemployment with respect to monetary and fiscal policy to deteriorate. In other words, the more intensely labor unions compete with one another for wage increases, the more costly in terms of increased inflation it is for the government to attempt to reduce unemployment to a given rate through monetary and fiscal expansion.

If, as may in fact be reasonable to assume, a and b are greater at high than at low rates of capacity utilization, the trade-off between inflation and unemployment with respect to monetary and fiscal policy would deteriorate during business upswings, making the locus of equilibrium points such as A and B in Figure 4 convex in a similar way as traditional Phillips curves.

In this model the government is unable to reduce unemployment and inflation simultaneously by monetary and fiscal measures alone. If the economy happens to be in short-run equilibrium at point A in Figure 4, the government is unable to move it to, say, point C where full employment prevails (by assumption) and prices are stable \( \hat{P} = 0 \) unless it manages to reduce the competition for wage increases.
This might perhaps be accomplished through incomes policy; in the context of Figure 4, a successful incomes policy would be reflected by a rightward shift of both the \( \ell \) schedule and the \( m \) schedule.

Alternatively, the full-employment point \( C \) might perhaps be reached by way of aggregate demand management as follows. Assuming that the aggressiveness of labor unions recedes as unemployment increases and the rate of inflation falls, implying that the "envy" components of the reaction coefficients \( a \) and \( b \) fall when \( Y \) and \( \hat{P} \) fall, a reduction of \( \hat{M} \) and \( \hat{G} \) would, by moving the economy southwest from point \( A \) in the figure, result (after a while) in lower \( a \) and \( b \). As a result, the \( \ell \) and \( m \) schedules would then drift to the right and, as a result, \( \hat{P} \) would fall and \( Y \) would rise. Thus, if the monetary and fiscal authorities were willing to accept a temporary increase in unemployment in order to return the economy ultimately to full employment, a path such as the one shown by the broken curve in the figure might be generated through aggregate demand management. One of the most controversial empirical issues in macroeconomics is, of course, how large and extended such a temporary slowdown of the economy would have to be, and by how much unemployment subsequently could be reduced without inducing a new round of inflation.
V. Some Long-Run Considerations

Although we have discussed the long-run properties of various equations of the model in previous sections, the comparative-statics analysis has been kept deliberately short-term in character thus far, as is perhaps most relevant from a political point of view. In order to make the model as a whole applicable to the analysis of inflation and income determination in the longer run, it is necessary to respecify the static labor market equations (4) and (5) of Section II to reflect the assumption that each union's expectations about wage increases granted to the other union are correct in the long run, and thus to ensure conformity with the long-run wage equations (14) and (15) of Section III. According to the latter pair of equations, expected real wages proper, \( w^1 = \frac{w}{p} \) and \( w^2 = \frac{w}{p} \), rather than "desired" real wages, \( \tilde{w}^1 = \frac{w}{(p^e)^\lambda} \) and \( \tilde{w}^2 = \frac{w}{(p^e)^\mu} \), are rigid in the long run. Accordingly, eqs. (4) and (5) must be replaced by

\[
(4') \quad \frac{w^1}{p} = \frac{w^1}{p} = F_1(N^1, N^2)
\]

\[
(5') \quad \frac{w^2}{p} = \frac{w^2}{p} = F_2(N^1, N^2)
\]

Therefore, assuming \( p^e = p \) as before, the S schedule in Figure 1 becomes vertical in the long run. 1) Thus, while the inflation rate depends on the same variables as before (except \( \tilde{w}^1 \) and \( \tilde{w}^2 \) must be replaced by \( \tilde{w}^1 \) and \( \tilde{w}^2 \), monetary and fiscal policies have no effect on

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1) To keep the analysis simple, we continue to ignore the effects of capital formation and other changes in wealth on spending and aggregate supply.
output and unemployment in this case. Consequently, eqs. (16) and (17) must be replaced by

$$\hat{\dot{Y}} = f(\hat{\ddot{w}}^1, \hat{\ddot{w}}^2),$$ (16')

$$\hat{P} = g(\hat{\ddot{w}}, \hat{\ddot{w}}, \hat{\ddot{w}}^1, \hat{\ddot{w}}^2),$$ (17')

where $\hat{\ddot{w}}^1 = \ddot{w}^1 - \ddot{p}^e$, $\hat{\ddot{w}}^2 = \ddot{w}^2 - \ddot{p}^e$, $\hat{\ddot{w}}_1 < 0$, $\hat{\ddot{w}}_2 < 0$, and $g_1 > 0, g_2 > 0, g_3 > 0, g_4 > 0$ as before.

Substitution from the long-run Phillips curve equations (20) and (21) into (16') and (17') as before gives:

$$\hat{\dot{Y}} = \phi(Y - Y^*, H_o, K_o)$$ (24')

$$\hat{P} = m(M, G, Y - Y^*, H_o, K_o)$$ (25')

where $\phi_1 = f_1 H' + f_2 K' < 0$, $\phi_2 = f_1 < 0$, $\phi_3 = f_2 < 0$, $m_1 = g_1 > 0$, $m_2 = g_2 > 0$, $m_3 = g_3 H' + g_4 K' > 0$, $m_4 = g_3 > 0$, and $m_5 = g_4 > 0$.

Solving eq. (24') for the long-run equilibrium level of $Y$ by setting $\hat{\dot{Y}} = 0$ gives:

$$Y = \ell(Y^*, H_o, K_o)$$ (26')

where $\ell_1 = 1$, $\ell_2 = -\phi_2/\phi_1 < 0$, and $\ell_3 = -\phi_3/\phi_1 < 0$.

Figure 5 shows how the intersection of the $\ell$ schedule (eq. (26')) and the $m$ schedule (eq. (25')) determines output and the inflation rate in the long run as defined here. Comparison of the above expression for $m_3$ with the corresponding expression following eq. (25) shows that the $m$ schedule is steeper in the long run than in the short run.
(The broken horizontal line will be explained later.)

Expansionary monetary and fiscal policies shift the m schedule to the left as before so that the rate of inflation increases, but the l schedule does not move and output (and unemployment) hence remains unchanged. There is thus no trade-off between inflation and unemployment with respect to monetary and fiscal policy in the long run, in contrast to the short-run analysis with rational expectations. On the other hand, wage rivalry as reflected by the a and b coefficients in eqs. (20) and (21) is among the factors on the supply side of the economy that determine the relationship between Y and Y* and hence the locus of the l schedule and the m schedule (through $H_0^o$ and $K_0^o$) and also, as before, the slope of the m schedule (through $H'$ and $K'$ in the above expression for $m_3$).

Thus, changes in the intensity of wage competition can drive a wedge between the long-run equilibrium level of output and the full-employment level of output. As the Phillips curves in eqs. (20) and (21) are shifted to the left (through $H_0^o$ and $K_0^o$) and steepened (through $H'$ and $K'$) by increased wage competition, both the l schedule and the m schedule in Figure 5 shift to the left (and the latter becomes steeper) so that output falls further below the full-employment level. However, the effect on the equilibrium inflation rate is ambiguous because the direct inflationary cost push effects are (after a while) counteracted by the indirect deflationary effects of increased induced slack. Intuitively, while cost inflation is accentuated by keener wage rivalry, inflation related to the level of capacity utilization ("demand inflation") tends to slow down because of the increased slack.
FIGURE 5

INCOME AND THE INFLATION RATE IN THE LONG RUN
To recapitulate, we have argued that labor union behavior (and possibly also structural changes in labor markets not modelled here) can change the long-run equilibrium level of output, even though the rigidity of real wage rates and rational expectations render the government unable to influence output and unemployment in the long run through monetary and fiscal policy. Although real wages may be rigid with respect to monetary and fiscal policy in the long run, they may still be susceptible to exogenous cost push impulses or endogenous spirals of competing wage claims. For these reasons the long-run unemployment rate may differ from the "natural" rate (corresponding to $Y^*$) that would prevail in the absence of such influences.

If it were within the government's power to slow down the competition for wage increases by reducing the competing claims coefficients $a$ and $b$, unemployment and inflation could in principle be reduced simultaneously in the long-run model, real wage rigidity and rational expectations notwithstanding. By lowering $a$ and $b$, the government could thus induce a shift of the $\ell$ schedule to the right until it intersects the horizontal axis in Figure 5 at full employment, $Y^*$, and shift the $m$ schedule at the same time to the right through monetary or fiscal policies so that it passes through the intersection with the $\ell$ schedule at $Y^*$. This is, indeed, the idea behind incomes policy and other types of labor market policies designed to increase aggregate supply without increasing inflation.

One further result of interest may be derived from the long-run version of the model: there is no one-to-one relation between the rate of inflation and the rate of expansion of the money stock even
in the long run. A given rate of inflation can be achieved by different combinations of rates of change of M and G, with different implications for the rate of change of the allocation of resources between the private and the public sector.\(^1\) However, if G is constant in the long run, M and P would have to expand in the same proportion due to the zero-degree homogeneity property of the money demand function.

Finally, it should be noted that an application of our model to an open economy would require the inclusion of the real exchange rate, \(\varepsilon P^*/P\), where \(\varepsilon\) is the nominal exchange rate and \(P^*\) the price level abroad, as an additional determinant of aggregate demand in the model. While this would not affect the short-run comparative statics properties of the model, the "opening" of the model, in this limited way, would have important consequences for the long-run analysis. Specifically, under a fixed exchange rate, a divergence between foreign and domestic inflation rates would imply a continuous change in the current account of the balance of payments and hence also in domestic output and employment; this effect would be accentuated if wealth effects via the current account were included. Thus, a fixed real exchange rate would have to be imposed as a long-run equilibrium condition. Long-run equilibrium would then require that domestic monetary and fiscal policy be pursued in such a

\(^1\) The monetary implications of government spending have been ignored throughout the analysis on the assumption that the budget deficit (= PG in the absence of taxation) is bond-financed, G includes interest payments, and wealth effects are negligible. If government spending is financed by monetary expansion, the government budget constraint may be written as \(M = PG\) or, equivalently, \(M/M - M = G(H/P)\). From this it may be seen that in long-run equilibrium, with \(M\) fixed, \(M\) may grow faster or slower than \(P\) or at the same rate, depending on whether \(G\) is increasing, decreasing, or constant.
way that the $m$ schedule passes through the point where the horizontal $\hat{P} = \hat{c} + \hat{P}^*$ line in Figure 5 intersects the vertical $l$ schedule, to prevent foreign demand for domestic output, and domestic demand for foreign output, from changing — with repercussions for domestic output and employment. This point of intersection constitutes a unique long-run equilibrium position for both $Y$ and $\hat{P}$ in an open economy — for given $\hat{c}$ and $\hat{P}^*$ and given intensity of wage competition as reflected here by $a$ and $b$. 
VI. In Conclusion

The purpose of this paper has been to develop a theory of cost inflation through competing wage claims, and to integrate it into the core of macroeconomic theory. Specifically, we have proposed an explanation for wage rigidity and wage interdependence based on an application of duopoly theory to labor unions, and incorporated this microeconomic theory of labor union behavior into a macroeconomic general equilibrium model with goods, money, and bonds as well as two kinds of labor. In the course of the analysis we have placed special emphasis on the interplay between demand and cost variables and mechanisms in the inflation process, highlighting how inflation and unemployment rates can move either in the same direction or in opposite directions depending on what kind of exogenous shock or endogenous transmission mechanism is at work. We have also stressed the implications of wage competition among labor unions for the relationship between inflation and capacity utilization in the short and long run.

By and large, the available empirical evidence seems to support the hypothesis about interdependent wage decisions. Eckstein and Wilson (1962) found that while wage changes in "key-group" industries in U.S manufacturing were determined primarily by labor and product market variables, wage changes in "non-key-group" industries could be explained mainly by wage changes in the "key group". Similarly, in a study of the Swedish labor market, Jacobsson and Lindbeck (1971) found that while wage changes in industries with flexible wages (manufacturing and construction) were influenced by the labor market situation, wage changes in other sectors were affected by present and past wage increases in manufacturing. Mehra (1976) concluded
that wage changes in the competitive, low-wage sector of U.S. manu-
ufacturing could be explained mainly in terms of exogenous labor and
product market forces (unemployment and price inflation); in the
noncompetitive, high-wage sector, however, wage changes were highly
correlated. Finally, Flanagan (1976) found evidence of interdependence
of wage settlements in the union sector in U.S. manufacturing, but
not in the nonunion sector.¹ Further theoretical and empirical research
is needed to shed further light on the behavior of labor market organi-
zations and on the wage formation process in general, not least wage
inertia and interdependence as well as the macroeconomic implications
of these phenomena which have been the central focus of this paper and
which have apparently contributed to both inflation and unemployment
in the world economy in recent years.

¹ A more detailed discussion of empirical studies in this area
is provided by Mitchell (1980, Ch. 5).
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