1. Introduction and Scope of the Article

Early in the Fifties, there appeared a number of articles on inflation that expressed a strong dissatisfaction with (pure) "economic" explanations of inflation. According to these critics, the most severe defect in economic explanations was, in quite general terms, that they did not take into account the existence and the effect of "powerful" groups or "power" relations in a society. This new view has come to be called the "institutional approach" to inflation (see J. Åkerman, 1960, and W. Fautz, 1978, for a critique). One of these "powers" that is particularly mentioned again and again is that of trade unions. It is alleged that unions have the "power" to set wages autonomously, i.e. independently of market conditions.

This view has received much attention in recent theoretical and empirical work (see the surveys and critiques by M. Parkin, 1975, and W. Fautz and K. Brunner, 1977). One of the major criticism against this work is especially put forward by monetarists who criticise, cost push theorists for ignoring the role of money in the inflationary process (see the survey by D. Laidler and M. Parkin, 1975). In response to this criticism, some proponents of wage-push introduced the concept of "monetary accommodation" (see e.g. R. Gordon, 1975 and 1977b) which is a new variant of the old "full employment guarantee" argument (see e.g. W. Reder, 1949, and J. Hicks, 1955). Other issues in the debate were discussed around the "Phillips curve" especially with reference to such features as short-run and long-run "trade-offs" and (vertical) "shifts" of the curve. Attention was thereby directed towards the role of the formation of price expectations.

The following model to be presented tries to incorporate the various theoretical concepts just mentioned, namely the Phillips-curve, price expectations, and monetary accommodation into a simple dynamic model of wage-push. Among the highly heterogeneous set of views on wage-push, our formulation comes...
closest to the conception of J. Hicks and R. J. Gordon. To render the model consistent with some readily observable facts had specific consequences for the formulation of price expectations which will therefore be dealt with in more detail. This will be done in section 2 along with the presentation of our basic wage-setting equation. In section 3, we briefly discuss how firms are viewed to react with their prices to this wage-setting behaviour of the labour supply. Section 4 formulates analytically the concepts of "monetary accommodation" and "full employment guarantee". In section 5 through 7, we discuss the model's short-run and long-run equilibrium properties, perform some comparative-static and dynamic exercises, the latter in the form of some simulations. Conclusions are presented in section 8. The model is designed for a "closed" economy.

2. An Aggregate Wage-Setting Equation

In an institutionalist context, aggregate wage formation may best be viewed as a "bargaining" process in which workers and employees as one group put down claims for higher wages, and employers accept whatever claims are forthcoming. One extreme view maintains that wage claims are completely independent of demand conditions and thus "purely autonomous" (see e.g. P. Wiles, 1973, and A. Jones, 1973). Many writers on wage-push, however, do not subscribe to this extreme view but consider both 'economic' and 'non-economic' factors in combination as determinants of wage-claims. The weights given to these two groups of factors in pertinent explanations may change over time, but most protagonists of "wage-push" would hold to the view of J. Hicks (e.g. 1974, p. 71) that "non-economic" factors or "social pressure" for rising wages have become dominant in the last decade or so which is enough justification for them to speak of a "new" kind of inflation.

We will follow-up this second moderate view of autonomous wage-policy. One starting point is the well-known price-expectation augmented Phillips-curve

\[ w = q + \pi - bu \quad b > 0. \]

(1)

All small letters except \( u \) denote percentage rates of change. According to (1), the rate of change in nominal wages \( w \) is determined by the rate of growth of average labour productivity \( q \), the rate of (total) expected price inflation \( \pi \)

\[ 2 \text{ This assumption may be justified by the fact that by and large proponents of the wage-push hypothesis of inflation have presented their views or analyses as if a country's inflation is primarily if not exclusively determined by national developments. Sometimes, import prices are considered as a means of transmission of external impulses but, with the exception of a few episodes, the emphasis has been placed on national trade unionism or social militancy. For an attempt to extend the analysis to an international transmission mechanism see the study by D. Laidler (1976).} \]
and an excess demand variable \( u \), here defined as the deviation of the actual rate of unemployment \( U \) from the full employment rate \( U^* \) (i.e., \( u = U - U^* \)).

Now, some proponents of wage-push simply add another variable (e.g. \( z \)) to equation (1) as representing the push element in wage formation (see e.g. R. J. Gordon, 1975), yielding

\[
w = \pi - bu + z \quad b > 0
\] (2)

(omitting the productivity variable for simplicity). But this formulation has a long-run property which render it unsatisfactory (see the pertinent critique by K. Brunner, 1975): In the long-run or — synonymously — in Hicks' "inflationary equilibrium" where \( p = \pi = w \), formulation (2) implies that \( U = U^* + z/b \), i.e., any positive cost-push continuously yields a rate of unemployment that is above its long-run rate. But the latter is some average of past values of the former which implies that cost-push, by itself alone (1), raises systematically the long-run or natural rate of unemployment and lowers systematically the growth path of real output. Furthermore, this property of (2) implies conversely that a decreasing cost push does foster real growth. Thus, given that wage-earners are interested in high real incomes, a negative cost push that lowers the growth of nominal wages would be in their interest\(^3\). The more nominal wages would be falling, the higher would be long-run real growth.

This long-run property is certainly not in accordance with the notion of the protagonists of the wage-push theory of inflation of which we want to present a model. Therefore, we like to reformulate the wage equation (2) in such a way that this undesirable long-run property does not hold any longer. This can be achieved by a different specification of the way price expectations are formed. Total price expectations \( \pi = E(p) \) may be thought of as a sum of two components: one referring to the push factor \( z \), the other comprising the influence of all other factors affecting the rate of price change. If we denote the latter component by \( \bar{p} \), this notion can accordingly be written as:

\[
\pi = E(p) = E(z) + E(\bar{p}).
\] (3a)

Let us recall that in our institutionalist model price expectations are formed by the wage setters (with trade unions usually playing a decisive role). Thus, for any period of time, \( z \) is a known magnitude for the wage-pushers, and thus \( E(z) = z \). Setting \( E(\bar{p}) \equiv \bar{\pi} \) analogously to \( E(p) \equiv \pi \), (3a) becomes

\[
\pi = z + \bar{\pi}.
\] (3b)

\(^3\) It should be noted that \( p = \pi = w \) and \( q = 0 \) implies a constant macro-economic income distribution.
With (3b) into (1) yields the following basic wage setting equation for our model (again omitting the productivity variable):

\[ w = \pi - bu + z. \]  

(4)

We will show below that this formulation yields the desired long-run properties when complemented with a correspondingly formulated hypothesis about price expectation formation.

### 3. The Behaviour of Firms

How do firms react to increased wage claims according to the proponents of autonomous wage-policy? Pertinent notions may be found e.g. in A. Hines (1971), R. Harrod (1972), and J. Hicks (1974). As mentioned briefly, labour demand is viewed as accepting fully the price of labour set by the supply side. According to Hicks, for example, employers “must” raise wages “for the sake of good industrial and employment relations”, to avoid feelings of “unfairness”. According to Harrod (p. 42), this passive attitude of firms is part of a “new, increased climate of general permissiveness” throughout the economy:

“We are dealing with a sort of activism on the part of the people, who want something for themselves – the labour unions if you like but also the corporations saying, ‘we’ll just make our customers pay’. All of this has been made possible of course by a certain permissiveness. Instead of employers presenting a stern front and saying ‘we can’t possibly give you the wage increase you want’, they have been permissive. And the consumers have been permissive too; they just take the prices asked for in the shops and don’t argue about them as they would have in the old days.” (Emph. W. F.)

A common assumption in the pertinent literature which corresponds to the notion of “we’ll just make our customers pay” in the preceding quote is that output prices are set by firms with a mark-up on unit labor cost (see e.g. J. Hicks, 1974, 1975a; R. J. Gordon, 1975). We write accordingly for the rate of aggregate price inflation \( p \):

\[ p = w - q. \]  

(5)

With (4) in (5) yields the following general price equation (again after omitting the productivity variable \( q \)):

\[ p = \pi - bu + z. \]  

(6)

So far, our representation has been very general. Now, for our dynamic analysis, we need time specifications for the various variables. For our wage equation, we thereby take into account the proposition (not only, but quite strongly, held by the institutionalists) that wages do respond “sluggishly” with respect to demand conditions due to “institutional” factors like wage-contracts or “market power” referred to above. We will assume a time-lag of one period and reformulate the
wage equation accordingly:

\[ w = \pi + z - bu_{-1}. \] (7)

Variables with no time-subscript refer to the current period. The pertinent price equation becomes then:

\[ p = \pi + z - bu_{-1}. \] (8)

For the question how expectations are formed, we consider only the part \( \pi \) and not the autonomous or exogenous component \( z \) for reasons mentioned above. If we use the adaptive expectation formation model, the corresponding dynamic relation is accordingly:

\[ \pi = \nu \pi_{-1} + (1 - \nu) \pi_{-1}. \quad 0 < \nu < 1 \] (9)

4. Monetary Accommodation and Full Employment Guarantee

Another major concept in the more developed hypotheses of cost-push is 'monetary accommodation'. Let us write the equation of exchange \( MV = PY \) in growth rates in the following way:

\[ y = m - p + v, \] (10a)

where the new variables \( m \) and \( v \) refer to the growth rates of money and income velocity of money, respectively. (10a) may be transformed into the following "adjusted form" by subtracting the long-term rate of real growth \( y^* \) from each side:

\[ x - v = m - p. \] (10b)

\( x \) is defined as the deviation of the actual rate of real growth from its long-run rate \( (x = y - y^*) \), and \( m \) is the adjusted rate of money growth: \( m = m - y^* \). Now, given \( m \), a sustained rise in \( p \) above \( m \) must, according to (10b), either lower the actual rate of real growth and therefore \( x \) or/and increase velocity. Most, if - by now - not all, cost-push theorists admit that changes in velocity are only modest and cannot explain marked accelerations or decelerations in inflation.

\footnote{An alternative formulation for adherents of the 'downward rigidity' argument of nominal wages (see Hicks, 1974, p. 70, and Jones, p. 23) is:

\[ w = \pi + z - bu_{-1} \]

\( b > 0 \) if \( u_{-1} < 0 \)

\( b = 0 \) if \( u_{-1} > 0. \)

In what follows, however, we will use the general form (7). For an empirical study of the 'downward rigidity' argument of nominal wages and prices see W. Fautz (1980b).}
Thus, an integral part of the cost-push and therefore wage-push theories is the (acceptance of the) assumption that – beyond the short-run – velocity does not behave in an accommodating fashion (see e.g. Hicks, 1976, and Gordon, 1977a and 1977b). In hypotheses about the causes of inflation (i.e. of a sustained rise in some level), equation (10b) may therefore be reduced to

\[ x = m - p. \]  

(11)

But this position implies that the full thrust of a sustained inflation at a rate above \( m \) will be on \( x \) (i.e. on the growth of real output and thereby on employment). Thus, workers and trade union leaders (or whoever is alleged to push wages due to increased ‘feelings of fairness’ and other alleged motives) are also responsible for increasing unemployment and recessions. This would have a delayed decelerating effect on the rate of wage inflation according to (7) and therefore on price inflation according to (8) (but not if the extreme sticky wage behavior is assumed mentioned in a footnote above). In the more moderate view of (7) and (8), it is alleged that the adjustment of wages and prices to changing market conditions has become very slow, especially downward. In other words, they assign a low value to our coefficient \( b \). Thus, “nowadays”, it would take too a deep and long recession or depression in order to yield any considerable success at the “inflation front”. But this is not possible, it is said, in modern democracies because governments will not be able to stay in power for long if they produce or allow long recessions and high unemployment. Here enters the argument of full (or high) employment guarantee (see e.g. M. Reder, 1949; G. L. Bach, 1973; R. J. Gordon, 1975, 1977a; J. Hicks, 1955, 1974, p. 69, 1975a; A Jones, p. 23). It says that governments cannot, and did not in the post war period, tolerate longer periods of high unemployment. They have and will continue to increase the money supply\(^5\) and thus accommodate or finance cost-push. Monetary policy is thus assumed to react passively to changes in employment and economic activity; it is conducted on a “labor standard” (Hicks, 1955) or, more generally speaking, politicians become endogenous (see A. Lindbeck, 1976).

One possible form (among many others) of a monetary reaction function which reflects the pertinent notion of some writers might be written as follows:

\[ m - m^0 = au_{-1} \quad a > 0 \]  

(12a)

or, equivalently,

\[ m - m^0 = au_{-1}, \]  

(12b)

---

\(^5\) Pure expansive fiscal policy, i.e. increased deficit spending financed entirely by issuing debt to the private sector, is not considered as appropriate remedy. It is seen as causing one-time-only changes in velocity (see e.g. R. J. Gordon, 1977a, p. 128).
where $m^0 = m^0 - \gamma^*$. Formulations (12a) and (12b) introduce the notion of a desired, long-run monetary growth rate $m^0$. The actual monetary growth rate is seen to be raised above this desired rate whenever there occurs "undesired" unemployment ($u > 0$) in the preceding period (and vice versa for boom periods). The reaction coefficient "a" is a measure of the sensitivity of governments (central banks) to deviations from full employment.

The above monetary reaction function has, however, an implication that is certainly not in the spirit of the proponents of wage-push: the long-run equilibrium rate of inflation is independent of wage-push even if the latter is permanent\(^6\). These implications suggest to distinguish between pure stabilization policy as expressed by (12a) and (12b), and accommodation policy. Accommodation policy must apparently mean that the desired monetary growth rate itself reacts to wage-push.

For a formulation of the monetary accommodation and full employment argument with implications acceptable to wage-push proponents, we divide the desired monetary growth rate $m^0$ into two components: into an autonomous rate $m^a$ and an "endogenous" rate $m^e$. We write accordingly:

$$m^0 = m^a + m^e$$

or, adjusted for $y^*$,

$$m^0 = m^a + m^e.$$  \hspace{1cm} (13b)

In the absence of wage-push, the central bank (and government) would pursue a policy aimed at the target rate $m^a$. But with "autonomous" powerful groups (price setters), central bankers and government officials are no longer the only monetary authorities. Through the full employment objective, the wage-pushers and price setters form a "tripartite monopoly" with the government sector (see esp. R. W. Reder, 1949, and G. L. Bach, 1973). We express this notion in our model by making $m^e$ a function of the push factor: $m^e = f(z)$. From the great number of specific formulations for this relation, we choose the following accommodative reaction function:

$$m^e = z_{-1}.$$  \hspace{1cm} (14)

If we maintain the assumption that monetary policy also reacts to deviations from full employment as expressed by the stabilization function (12b), the rate of change in the total money supply for the current period is

$$m = m^a + z_{-1} + au_{-1}.$$  \hspace{1cm} (15)

\(^6\) The reader may have noticed that – when combined with the assumption of a non-accommodating velocity ($v = 0$) and with $y^*$ exogenously given – any given desired monetary growth rate implies a desired long-run rate of price inflation ($p^*$).
With (15) into (11) yields:

\[ p = m^a + z_{-1} + au_{-1} - x. \]  

(16)

The last step in the presentation of the structural equations tries to link \( x = y - y^* \), i.e. a difference between growth rates, with \( u = U - U^* \), i.e. a difference between levels. As is known, this link cannot be derived analytically in a straightforward manner. It was A. Okun (1962) who constructed a pertinent ad hoc-relationship which turned out to be pretty stable. It has come to be called “Okun's Law” (see e.g. B. Friedman and M. Wachter, 1974, and R. Dornbusch, 1975) and may be expressed as follows:

\[ U - U_{-1} = -cx, \quad c > 0 \]  

(17)

(17) states that a real growth rate above normal \( (x > 0) \) will reduce the rate of unemployment in the current period below that of the previous period by a fraction \( c \). With a constant natural rate of unemployment \( U^* \), (17) can be transformed to

\[ u - u_{-1} = -cx \]  

(18a)

respectively

\[ \sigma(u - u_{-1}) = -x, \quad \sigma = \frac{1}{c} > 0. \]  

(18b)

(18b) in (16) yields our “monetary-cum-wage-push” equation (MM):

\[ p = m^a + z_{-1} + \sigma u + (a - \sigma)u_{-1}. \]  

(19)

We now discuss the short-run and long-run equilibrium properties of the above system, perform some comparative static exercises and derive the stability conditions. In the final section, we go into its dynamics by commenting on some simulations, and discuss some aspects related to the Phillips curve concept.

5. Short-Run Equilibrium and Comparative Static Exercises

We repeat here the basic equations of the system

\[ p = \pi + z - bu_{-1} \]  

(8)

\[ p = m^a + z_{-1} + \sigma u + (a - \sigma)u_{-1} \]  

(19)

\[ \pi = \nu \pi_{-1} + (1 - \nu)\pi_{-1} \]  

(9)

7 For the United States, \( c \) was found to be about one third.
and add the definition underlying our formulation of price expectations:

\[ \hat{p} = p - z. \]  

(20)

The endogenous variables are \( p, \hat{p}, \bar{\pi} \) and \( u; m^a \) is a policy and \( z \) our wage-push parameter. At any given point in time, the past is given. Thus equation (8) determines exclusively the short-term equilibrium rate of inflation \( p^0 \) for the current period:

\[ p^0 = \bar{\pi} + z - b u_{-1}. \]  

(21)

With (19) and (8) we get the pertinent short-term equilibrium deviation rate \( u^0 \):

\[ u^0 = -\frac{1}{\sigma} [m^a - (z - z_{-1}) - \bar{\pi} + (a + b - \sigma) u_{-1}]. \]  

(22)

Graphically, these values are determined by the intersection of the price-line (PP-line) corresponding to (8) and the MM-line corresponding to (19), given the values of the parameters and of the predetermined variables. This is shown by the following figure.

Figure 1
First second round effects of wage-push
In figure 1, the initial positions (denoted with the subscript 0) of the price line – which here is identical with the abscissa – and the “monetary-and-wage push line” (MM) are drawn in such a way as to intersect at the origin 0 where U is at its natural rate. Thus, \( u_0 = 0 \) and \( p_0 = 0 \). Let us now consider what happens if an autonomous wage-push occurs. The increase in \( z \) from \( z_0 \) to \( z_1 \) will shift the (horizontal) price line from \( P_0 P_0 \) to \( P_1 P_1 \). This leads to a rise in the price level by \( p_1 \) percent \( (= z_1) \) and simultaneously to an increase in unemployment by \( u_1 \) percentage points. Given that the wage-push of \( z_{-1} \) is permanent, will a situation like \( p_1/u_1 \) prevail for long? Our model clearly suggests that this will not be the case. In a second period, monetary policy will accommodate wage-push by adjusting the desired monetary growth rate and by reacting to the recession or increased unemployment caused by wage-push in the first period. This will shift the MM line to the left, say, to \( M_2 M_2 \). The PP line will have shifted downwards due to the sensitivity of wages and therefore prices to economic conditions in the period 1. The result of these second round effects are thus a lower rate of price change \( (p_2) \) and a reduction of unemployment (indicated by \( -u_2 \)), possibly leading to a state of “over-employment”. It should be noted that the effects of wage-push and monetary policy on (un)employment depend crucially on \( \sigma \) (i.e. on the coefficient of “Okun’s Law”) which is the slope of the MM line. – In the third period, price expectations start playing a role. Their effects are entangled with those effects just mentioned. What will be the long-run equilibrium values of \( p \) and \( u \)? Will the adjustment process converge to these values or will it diverge? These questions are dealt with in the next section.

6. Properties of Long-Run Equilibrium

The equations system (8), (9), (19) and (20) can be reduced to the following set of linear second-order difference equations:

\[
\begin{bmatrix}
-\sigma & 1 \\
0 & 1
\end{bmatrix}
\begin{bmatrix}
u \\
\pi
\end{bmatrix}
\begin{bmatrix}
\sigma - a - b & 0 \\
0 & -1
\end{bmatrix}
\begin{bmatrix}
u_{-1} \\
\pi_{-1}
\end{bmatrix}
\begin{bmatrix}
0 & 0 \\
v_{-1} & 0
\end{bmatrix}
\begin{bmatrix}
u_{-2} \\
\pi_{-2}
\end{bmatrix}
= 
\begin{bmatrix}
m^* - (z - z_{-1}) \\
0
\end{bmatrix}
\tag{23}
\]

If we try the solutions

\[ u = u_{-1} = u_{-2} = u^* \]

\[ \pi = \pi_{-1} = \pi_{-2} = \pi^* , \]

the above system gives us the following long-run values for \( u \) and \( \pi \):

\[ u^* = 0 \]
\[ \pi^* = m^* - (z - z_{-1}) . \]
The first result is consistent with our initial definition of $u$ and with the full employment guarantee-diea. With respect to $\bar{\pi}^*$, we may first recall that the expected rate of inflation $\pi$ is equal to $z + \bar{\pi}$. The pertinent long-run rate $\pi^*$ is accordingly $z + \bar{\pi}^*$. In the case of a permanent and constant wage-push, $z = z_{-1} = z^*$ and $\bar{\pi}^*$ becomes equal to $m^a$. Consequently,

$$\pi^* = m^a + z^*$$  \hspace{1cm} (25)

which is equal to the desired total money growth rate $m^0$ according to equations (13) and (14). Applying the same considerations to the price equation (8) yields

$$p^* = \pi^*$$  \hspace{1cm} (26)

i.e. the actual rate of inflation is equal to the expected rate. Thus, in this model, wage-push does co-determine the long-run rate of inflation, but the latter is at the same time equal to the (long-run or desired) rate of adjusted monetary growth. A further long-run implication of this wage-push-plus-monetary accommodation model that is in full agreement with a pure monetary model of inflation (see e.g. R. Dornbusch, 1975, and J. Black, 1975) is that there exists no long-run trade-off between growth (employment) and inflation. But wage-push does have the effects of pushing the short-run Phillips curve upward and increasing the average and long-run rate of inflation above that rate that would prevail in the absence of wage-push.

7. The Dynamics of the Model

7.1 Stability Analysis

The long-run equilibrium is reached only if certain stability conditions are met. To derive these conditions we take the homogeneous part of system (23) which yields the following characteristic equation:

$$\sigma k^2 + (a + b)k + (\sigma - a - b(1 - v)) = 0.$$  \hspace{1cm} (27)

For the system to be dynamically stable, it is necessary and sufficient that both roots $(k_1, k_2)$ lie between $-1$ and $+1$. An evaluation of these roots yields the following stability condition:

$$a < \sigma - b(1 - 0.5v).$$  \hspace{1cm} (28)

Given the adjustment coefficient of expectations $v$, the "Okun’s Law" coefficient $\sigma$, and the reaction coefficient of wages and prices to demand conditions $b$, conditions (28) forms a constraint on the behaviour of monetary authorities in response to changes in economic conditions (caused by wage-push or other factors).
7.2 Simulations

To obtain a better insight into the dynamics of the model, we performed some simulations with varying assumptions about the behaviour of the autonomous component of wage-policy \((z)\) over time. The other policy variable, that is the autonomous part of the money supply \((m^a)\), was held constant throughout at a rate of zero. In the absence of wage-push, the latter assumption would imply price stability in the average over a cycle and in the long-run. The following variants of the time paths for \(z_t\) were tried:

*Simulation variants: Values of \(z_t\) \((m^a = 0)\)*

<table>
<thead>
<tr>
<th>Period (t)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Variant</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>etc.</td>
</tr>
<tr>
<td>2. Variant</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>etc.</td>
</tr>
<tr>
<td>3. Variant</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>etc.</td>
</tr>
<tr>
<td>4. Variant</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

The first variant consists of a wage-push in period one that is maintained permanently. The rate of price inflation approaches the long-run equilibrium rate of 10 percent which is equal to the desired rate of total monetary growth, and unemployment and the real growth rate settle down to their given long-run rates. These implications are thus in accordance with the derived implications (24a) and (25) above and with the monetary constraint (11). The third variant of a continuously rising wage-push leads to a continuously rising rate of inflation, with unemployment fluctuating around its full employment rate. Variants 2 and 4 show both a cyclical behaviour of autonomous wage policy, with a constant average from cycle to cycle. We constructed two kinds of pertinent modified Phillips-curves, one in the \(p_t/u_t\) plane and the other in the \(p_t/x_t\) plane. It turned out that in the latter case both variants showed clear and regular *clockwise* Phillips-loops. This contrasts with the direction into which such loops move according to a (pure) monetary model of inflation similarly simple in structure and, specifically, with the same kind of expectation formation assumption as our autonomous wage-policy model (compare e.g. the model by R. Dornbusch, 1975). For variant 2, these loops are centered around one point that is determined by the long-run equilibrium rates of inflation and real growth implied by the model, while in variant 4 these loops are continuously shifted upwards, with the rate of real output growth fluctuating around its long-run rate. These characteristics of variant 4 are shown in figure 2 for the \(p_t/x_t\) plane.

Another aspect concerns the timing of the movements of the rates of change in wages respectively prices compared with that of total monetary growth. In all
Figure 2.
Modified Phillips-curve for a cyclical and increasing wage-push with monetary accommodation (Simulation variant 4 for 20 periods)\(^8\).

Symbols: \( p_t = \) rate of price inflation
\( x_t = \) difference between actual and normal rates of real output growth

\(^8\) The simulation was run with the following parameter values: \( a = b = 0.33, \sigma = 4, \nu = 0.5 \). The initial situation is a long-run equilibrium with \( x = \pi = p = 0 \).
variants, changes in the rates of price and wage inflation do lead changes in the monetary growth rate. This is another implication which is not expected according to a (pure) monetary model of inflation similarly simple in structure. This would suggest to apply a Sims 'causality test' for discriminating between the two kinds of explanations (see A. Sims, 1972), although we should keep in mind that statistical tests of this kind cannot test for "causality" in the strict sense (see e.g. A. Zellner, 1978).

8. Conclusions

In discussions about the causes of inflations, monetarist or monetary economists criticize protagonists of cost-push explanations for not (properly) taking into account the monetary constraint. We tried to formulate an autonomous wage-policy hypothesis that incorporates this critique. The resulting model exhibits long-run properties that are consistent with major monetarist propositions. Specifically, (1) the long-run rate of inflation is determined by monetary growth adjusted for real output growth and (2) there is no long-run trade-off between real growth (unemployment) and inflation. Another feature of the model is that this kind of autonomous price inflation model does leave the politicians or monetary authorities in the center of the analysis and of a pertinent 'political economy of inflation'. This view or this emphasis is thus quite different from that found in many institutionalist or psychosociological hypotheses of inflation in which attention is focussed on some 'powerful' social groups outside the government sector. In some studies, e.g. on income struggle hypotheses of inflation, these groups remain even totally anonymous.

References


Summary

A Simple Dynamic Model of Autonomous Wage Policy, Price Expectations, and Monetary Accommodation

In discussions about cost-push inflation, one major critique is that the monetary consequences of cost-push are not properly taken into account. The paper takes up this criticism in formulating a simple dynamic model of autonomous wage-policy with monetary policy accommodating the wage-push. The resulting solutions of the wage-push model exhibit long-run properties that are consistent with major monetarist propositions. Specifically, the long-run rate of inflation is determined by monetary growth adjusted for real output growth and there exists no long-run trade-off between real growth (or unemployment) and inflation.

Zusammenfassung

Ein einfaches dynamisches Modell autonome Lohnpolitik, mit Preiserwartungen und geldpolitischer Akkommodation


Résumé

Un modèle simple et dynamique d'une politique salariale autonome avec des anticipations de prix et d'accompmodation monétaire

Lors des discussions portant sur l'inflation «cost-push», on se heurte souvent à la critique selon laquelle on ne tient pas suffisamment compte des conséquences de la hausse des coûts sur le plan monétaire. Cet article répond à cette critique en formulant un modèle dynamique simple comprenant une politique de salaire autonome (revendications salariales) présentée comme étant à l'origine de l'inflation, et une politique monétaire passive s'adaptant à cette pression salariale. Les solutions résultant de ce modèle présentent des propriétés en harmonie avec les principales thèses monétaristes. Le taux d'inflation à long terme est déterminé par le taux d'expansion ajusté en fonction du taux de croissance réel et il n'existe pas de «trade-off» à long terme entre la croissance réelle (ou le chômage) et l'inflation.