Trade Unions and Wage Inflation

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IT was a traumatic discovery for many economists interested in the problem of inflation that the Phillips Curve quite suddenly appeared . to lose its predictive capacity after 1966. Many clung on to the hope that what we were observing was simply a once-and-for-all parameter shift, connected with structural change in the labour market, and that a new trade-off relation would emerge when a suitable number of observations became available. Others, however, have sought different explanations. In particular, a certain amount of attention has been directed towards the apparent surge of aggression on the part of the trade union movements in various countries in the late 1960s which has been sustained in some, particularly the UK. This in turn has led to a good deal of research, mainly of an empirical kind, into the role of trade unions in the wage determination process, and, in particular, into the nature and extent of the inflationary impact of trade unions. Much of this recent work has simply involved the use of various instruments of trade union activity as regressors in otherwise conventional wage equations and has omitted to set these into any specific theoretical context. The purpose of this paper is to review briefly some aspects of the theory of trade union influence in wage determination, to consider the empirical results of some studies in this field and to consider what conclusions may be drawn from them. Hence, this paper is partly a survey of the literature on both the theory and evidence on the inflationary impact of trade union influence, but also attempts to set the empirical work into the context of established theory.

evaluating their relative merits on theoretical grounds alone since economic theory has little conclusive to say about the impact of trade unionism on the process of wage determination. The need is, therefore, for empirical evidence to assist in choosing between the competing hypotheses and a brief summary of the available evidence is given in section II.

The Nature of Trade Union Market Power and the Choice of Indicators

Two of our hypotheses suggest that trade unions may be able to bias the market adjustment process in such a way as to secure a more rapid rate of wage increase than would result if trade unions were absent from the market for at least some levels of excess demand (cases (*b*) and (*c*)). For this to be the case we must attribute to trade unions the ability to exercise "market power", which may be defined simply as a power deriving from organisational action to fix prices at a level in excess of what could be obtained in the absence of such organisational action. But what factors determine the existence and degree of union market power? Clearly, from the definition of market power given above, it must be that it is *collective,* rather than *individual,* wage fixing processes which introduce a bias into the market adjustment process. The advantages which the collective unit may possess over the individual in wage fixing may include:

(*a*) the ability to articulate wage demands with a greater degree of skill, aggressiveness and with more perfect market knowledge;

(*b*) the ability to threaten or undertake collective industrial actions against an employer (as against the individual's quit threat);

(*c*) the political and institutional, as well as economic, motivations which shape trade union wage policy (as against the predominantly economic motivation of the individual).

Similar categories of possible advantages of collective bargaining have been discussed by Holt [2], Levinson [3] and others, so that we need only briefly elaborate on them here.

The Collective Bargaining Advantage: Information and Expertise

Point (*a*) refers to the capacity of a trade union to gather and marshal information relevant to a wage demand and to have access to greater skill in utilising this information in the bargaining process than would be available to the individual. This advantage simply derives from the fact that trade unions have greater resources and more specialised bargaining expertise than does the individual.

It is of interest to consider how trade unions might, because of their superior access to, and use of, information, influence the relative importance of market

variables in the wage determination process as against the influence on these of individuals. Thus we might reasonably expect that trade unions will have access to more accurate and up-to-date information on the profitability of companies, the changes in productivity which are taking place and the behaviour of consumer prices than will the individual. Further, the trade union is, in consequence of its particular expertise in wage bargaining, better able than the individual to identify opportune circumstances for advancing wage claims and to phrase these claims in terms of persuasive economic argument. For example, trade unions are probably more conscious of real wage adjustments than are individuals and this will lead them to take greater account of price changes (past, present and, perhaps, expected) than will individuals. It is also likely that trade unions know a good deal more about company profitability and productivity developments than do individuals and are, therefore, better able to evaluate the strength of employer resistance to wage claims at any point in time. For the individual, knowledge of market circumstances relevant to his ability to improve his wages is likely to be confined to immediate and impressionistic information which will probably be difficult to use effectively in support of a wage round. Hence it is possible that the statistical significance which has been attributed to variables such as productivity, profitability and price changes in varying degrees and at different points in time may be partly explicable in terms of variations in the strength and emphasis of trade union activity over time. There is some evidence which would support this hypothesis, and this will be discussed in section II.

In contrast to the view outlined above there are some who have argued that the collective bargaining advantage is actually negative at some or all levels of excess demand for labour. This argument holds that when wages are being drawn up by market forces the intervention of the trade union, because it must prepare a case for a wage increase and present it through formal procedures, will be involved in time consuming processes which will prevent it from securing a rate of wage increase as rapid as the market alone would yield. The Friedman version of this hypothesis (case (d)) argues that such an effect will occur at all levels of excess demand while the Meidner and Rehn hypothesis (see [4]) restricts the union "damping" effect to high levels of excess demand only (case (c)). It is rather difficult to find a satisfactory theoretical justification for the damping hypothesis. While it is probably true that trade union negotiated wage rates react more slowly to market forces than non–union wage rates in excess demand situations (because collective bargaining is a periodic and time–consuming process) this simply produces a lagged union wage reaction function. Such a lag in the union response to market forces will not produce a biased reaction function, however. Consider the case of a single labour market in which the relation $\dot{w}_{mt} = ax_t$ holds when the labour force is not unionised. Suppose now that a trade union organises the labour force and indulges in the time-consuming process of collective bargaining such that in each time period the rate of wage increase is a reaction to some past level of excess demand, x_{t-1}. The wage equation for the market is now $\dot{w}_{ut} = ax_{t-1}$ and the difference between the market and union rates of wage

increase is $\dot{w}_{mt} - \dot{w}_{ut} = a(x_t - x_{t-1})$ which will be consistently positive only when excess demand is a monotonically increasing function of time, a highly unlikely situation. The case for the full or restricted damping hypothesis must, therefore, rest on grounds other than a trade union-induced lag in the wage adjustment process.

The Collective Bargaining Advantage: Strikes versus Quits

Point (b) implies that the coercive effects on employers of a threatened or actual strike are greater than those of the threatened or actual quit of an individual. Holt [2] has expressed this aspect of the collective bargaining advantage as equal to $\max(S - pQ, O)$ where S is the ratio of the cost of a strike to the company and the union respectively, Q is the ratio of the cost of a quit to the company and the individual respectively, and p is a constant which reflects any difference between the propensity of the union to strike and the individual to quit. Holt argues that the collective bargaining advantage will be greatest at high levels of unemployment and will decline as unemployment falls. The basic argument in support of this contention is that the quit cost ratio rises relatively faster than the strike cost ratio as the labour market tightens. Holt's hypothesis suggests that the union/non-union wage differential will be *negatively* correlated with strike activity, since the collective bargaining advantage will be large, and the strike cost ratio unfavourable to the union when unemployment is high; and *vice versa* when unemployment is low. We would, therefore, expect unions to engage in strike activity to a greater extent in times of low unemployment than in times of high unemployment; and there is some evidence to support this conclusion (see [5] and [6]). While there is some empirical evidence to support some of Holt's propositions, the overall hypothesis is, as Holt admits, somewhat speculative, in particular with regard to the relation between the collective bargaining advantage and the level of unemployment.

In contrast to Holt's hypothesis a number of authors have chosen to stress the importance of trade union rank and file militancy in determining the level of strike activity at different levels of unemployment. (See for example [7], [8] and [9]). These argue that the level of strike activity will be *positively* correlated with the union/non-union differential. The logic of this argument is simply that trade unions will tend actually to use the strike weapon most frequently when the strike cost ratio is high (i.e., when unemployment is low) and that this will be effective in increasing the union/non-union wage differential.

In many respects these two, apparently contradictory, views are analytically similar. The main points of difference between them appear to be the relative influence attached to the collective bargaining advantage, $\max(S - pQ, O)$, and the strike cost ratio on the union/non-union differential and the effect of strike activity on that ratio. Holt's position is, at least superficially, less plausible since he is forced to the paradoxical conclusion that " . . . it may be true that when there are the greatest number of strikes, unions are having their smallest effect on wages—the strikes in considerable part are gestures of complaint." [2]. It is,

of course, possible to conduct tests which can assist in choosing between these two hypotheses, and we shall consider these in section II.

One point of importance in any discussion of the impact of union activity on the union/non-union wage differential is that trade union activity may very well influence the growth of non-union, as well as union, wage rates. For example, it seems likely that employers of non-union labour who wish to prevent the unionisation of their labour force will be inclined to ensure that their employees' wages rise at a rate sufficient to prevent the development of a union/non-union wage differential large enough to create a demand for unionisation. Also it is probably the case that when third parties (arbitrators, etc.) are involved in determining non-union wage rates they will be influenced by the development of union wage rates. Hence, we cannot measure the impact of union activity in the labour market in terms of the union/non-union wage differential without reservation.

The Collective Bargaining Advantage: Political Variables

In his classic study, Ross advanced the hypothesis that the primary determinants of trade union wage policy were political rather than economic [10]. While not everyone would agree entirely with Ross's proposition, there are few who would deny that trade unions respond to political pressures which are more or less independent of the economic environment in formulating and pursuing their wage policies. The kind of political pressures which might influence the behaviour of the trade union derive essentially from its institutional characteristics. Thus the survival of a trade union may depend on its ability to match the economic performance of its rivals; the survival of its leadership may depend on negotiating agreements which are primarily designed to contain factionalism within the union membership; and there may be a positive desire on the part of union leaders to pursue a wage policy which will extend the power of the union or enhance the power of the leadership within the union. Examples of how all of these factors have played a significant role in determining the outcome of wage negotiations are given in [3] and [10]. The importance of taking account of the political aspect of trade union power is to emphasise the distinction between the wage policy of the collective as against individual bargaining unit. Individuals may be expected to bargain on a "rational" economic basis; trade unions, in so far as they also respond to political pressures, may be found to behave quite irrationally in economic terms. The effects of politically induced "irrationality" into union behaviour will often involve negotiating agreements which yield lower gain/cost ratios than could have been achieved if political considerations had not intruded, but will, nevertheless, tend to drive up wage rates more rapidly than would be the case if political pressures had been absent. (The classic example of this situation is one where the union incurs massive costs, through strike action, etc., in order to secure a very small increase in its members' wage rates. The small increase in wages may, however, be politically imperative in terms of comparison with the achievements of other unions.)

Some Other Aspects of Bargaining Power

In addition to the sources of trade union bargaining power outlined above, mention must be made of certain specific factors which are also relevant in this regard.

(a) *Concentration Ratio:* some authors (e.g., [26], [31], [32]) have stressed the importance of the *degree of monopoly* or concentration ratio in the product market as a determinant of trade union power to drive up wage rates. Holt phrases this argument in terms of the ease by which firms may pass on increases in labour costs to consumers in the form of higher prices [2]. In general a high concentration ratio will be associated with a low price elasticity of demand and *vice versa*.

We might, therefore, expect industries with low concentration ratios to be characterised by weak unionism, low profits and low rates of wage increase and those with high concentration ratios to be characterised by strong unionism, high profits and a rapid rate of wage increases.

(b) *The Transfer Mechanism and Wage Leadership:* the existence of wage transfer mechanism has been recognised since Ross talked of "orbits of coercive comparison" [10] and Dunlop of "wage contours" [11]. Essentially a wage transfer mechanism is created by a tendency for trade unions to pursue wage policies designed to maintain or establish relationships (horizontal and vertical) between the wages of workers in different employments. The transfer mechanism has been variously described as "pattern bargaining", "a demonstration effect", "a comparison effect", "comparability effects" and so on, and appears to be a feature, in varying degrees, of the collective bargaining system of most countries. The concept of the transfer mechanism is essentially within the category of political aspects of trade union activity; but we are considering it separately since it underpins a distinct hypothesis of trade union impact on wage changes, that of wage leadership. The wage leadership hypothesis concerns the influence of a "key bargain" on the wage rates of all of the employment sectors embraced by the transfer mechanism. Basically the hypothesis postulates that some particular group of workers will strike a "key bargain" which will then be imitated by other groups of workers in order to re-establish the *status quo ante* in the relations between the wage rates of the groups involved. The process by which the terms of the key bargain are generalised, the transfer mechanism, is invariably connected either with trade union attachment to motions of horizontal and vertical equity in wage fixing, or with situations in which inter-union competition makes it imperative for each union to be seen to perform at least as well as its rivals. This is an essentially political process, leading to upward adjustments of a large number of wage rates in response to some key bargain which may or may not have been struck according to criteria common to the whole employment group embraced by the transfer

mechanism. An interesting question here is what determines the key bargain. It may very well be the case that the key bargain reflects the economic circumstances of the particular employment in which it was struck, for example a local excess demand for labour or a productivity agreement, while its generalisation into other sectors reflects only the institutional or political force of the transfer mechanism. We shall return to this question with tentative answers in section II. The hypothesis outlined here is one which we have examined ([12] and [13]), alternative versions of the same basic theme have been advanced by others ([14], [15], [16], [17], [18], [19], [20]).

Trade Unions, Wage Inflation and the Union Differential

So far we have discussed some of the factors which might be expected to create a positive union/non-union wage differential. For our purposes it is necessary to consider how that differential will behave over time. Consider the basic wage equation in an economy in which some workers are unionised and others are not:

$$W = (1-k)W_n + kW_u \tag{1}$$

where W, W_n and W_u are the average wage rate, average non-union wage rate and average union wage rate respectively and k is the proportion of the labour force earning union wages. Now let the union wage differential be λ so that:

$$W_u = W_n(1+\lambda), \quad \lambda > 0 \tag{2}$$

Substituting (2) into (1) gives:

$$W = W_n(1+k\lambda) \tag{3}$$

Differentiating (3) with respect to time gives:

$$\dot{W} = \dot{W}_n + \left[\frac{k}{1+k\lambda}\right]\frac{d\lambda}{dt}, \quad k > 0 \text{ and constant,} \tag{4}$$

Now let us return to the assumption that $\ddot{W}_n = aX$ which is a simple aggregation of the competitive (or non-unionised) market reaction function listed under case (a) at the beginning of this paper. (This simple aggregation technique is based on manipulation of the Laspeyres wage index and is set out in full by Hansen [4]). We may now rewrite (4) in the following form:

$$\ddot{W} = aX + \left[\frac{k}{1+k\lambda}\right]\frac{d\lambda}{dt} \tag{5}$$

Similarly if we assume that $\lambda > 0$ and constant and differentiate (3) with respect to time we obtain:

$$\dot{W} = aX + \left[\frac{\lambda}{1+\lambda k}\right]\frac{dk}{dt} \qquad (6)$$

We may derive certain simple conclusions from these relations about how the rate of wage inflation will respond to changes in the union/non-union wage differential and the proportion of the labour force unionised:

(a) when $\frac{d\lambda}{dt} > 0$ and k constant, or $\frac{dk}{dt} > 0$ and λ constant, then $\dot{W} > aX$ and will correspond to the aggregate version of case (b) in Figure 1;

(b) when λ and k are both constant then $W = aX$, which corresponds to the aggregate version of case (a) in Figure 1.

This simply means that there are two routes by which trade unions can introduce an inflationary bias into the adjustment process in the labour market: by increasing the union/non-union wage differential or by increasing the proportion of the labour force in receipt of the union wage. This much is obvious. We must now briefly consider how to interpret these conclusions in terms of the impact of trade union activity in the labour market.

The Union/Non-Union Differential

Equation (5) tells us that in order that the trade union may bias the market adjustment process in an inflationary manner the union/non-union wage differential must *increase* over time, i.e., $\frac{d\lambda}{dt} > 0$. It is clear that the effect of the collective bargaining advantage could be to progressively widen the union/non-union differential, as a consequence of the application of any aspect of that advantage, and thus bias the market adjustment function in an inflationary way. Direct evidence on the behaviour of the union/non-union differential is confused and contradictory. (See, for example, [21], [22], [23], [24], [25], [26], [27] and [28].) What does, however, tend to emerge from these studies, particularly that of Lewis [28], is that at different periods of time the union/non-union differential has varied considerably (from 0/5 per cent in the 1940s to 25/40 per cent in the early 1930s in the US [28]), and that it appears in a general way to vary inversely with the level of demand. In a very general way this would tend to support the type of hypothesis listed under (c) in Figure 1 and is consistent with Holt's hypothesis [2]. This leads us to the question of how to design appropriate empirical tests of the impact of the union on the rate of wage inflation. Essentially what is required to formulate a testable model of the impact of the union on the

process of inflation is some measure of trade union "pushfulness" or "militancy". As we have already noted, the collective bargaining advantage is comprised of several elements, only some of which are in any sense measurable. For this reason a variety of proxy indicators of trade union militancy have been employed in empirical work, the main ones being:

(a) the proportion of the labour force organised in unions; [29], [30]

(b) strike activity; [7], [8], [9]

(c) industry profitability; [31]

(d) concentration ratios; [32]

(e) subjective estimates of militancy; [33]

(f) the rate of change in the proportion unionised. [34]

Each of these indicators, with the exception of (c) and (d), purports to be proxies for trade union militancy. Indicators (c) and (d) are more of the nature of circumstances which facilitate the effective exercise of any given degree of militancy. Indicator (f) requires special consideration since it is ambiguous and is open to an interpretation already advanced in equation [6]. Let us then briefly review the empirical evidence on the impact of trade unions in the inflationary process.

II

Empirical Evidence on the Impact of Trade Unions in Wage Inflation

Percentage Unionisation

An intuitively attractive approach to estimating the effect of trade union activity on the rate of change of wages by means of a unionisation variable is to divide labour markets into "strongly" and "weakly" organised groups, estimate a Phillips curve for each group and compare the coefficients on the unemployment variables. An early study of this type for the USA by McCaffree [35] indicated support for hypothesis (c) in Figure 1, but subsequent studies for the US and Canada have obtained results which may be interpreted as support for hypothesis (b) [30], [29]. Pierson carried out a study of the US manufacturing sector in which she divided the sector into strongly- and weakly-organised industry groups [30]. She then estimated Phillips curves for each group and observed that the coefficient on the unemployment variable, U^{-1}, was larger for the strongly-organised group than for the weakly-organised group. This result indicates that the Phillips curve for the strongly-organised group is displaced above the curve for the weakly-organised group at all levels of unemployment (as curve (b) is displaced above curve (a) in Figure 2). A similar type of study has been carried out for Canada by Vanderkamp [29]. Vanderkamp uses a simultaneously estimated wage/price equation system, and obtained a larger coefficient on the strongly-organised

Phillips curve than on the weakly-organised Phillips curve. In addition Vander-
kamp was able to explain the rate of change of wages better in the strongly-
organised group than in the weakly-organised group ($R^2(SO) = 0.89$ and
$R^2(WO) = 0.52$). This type of cross-section study is probably the closest approxi-
mation practicable to the ideal test which would be to compare the location of
the micro-Phillips curves in markets which are alike in all respects save that some
are unionised and some are not. However, the Pierson and Vanderkamp studies
may be criticised on the grounds that they are assuming that the effects of union
activity can be distinguished by considering markets differentiated by relative
degrees of organisation (the usual threshold is 40 per cent unionisation); Levinson
[3] would argue that the compared sectors may be distinguished by characteristics
which predispose them to have both different wage change/unemployment
trade-off relations and different degrees of unionisation, such as different entry
characteristics. Moreover, their findings conflict with those of McCaffree [35]
(and with the impressionistic growth of unionism/shifting Phillips curve interpre-
tation which one might put on Lipsey's study [36]) which indicate support for
hypothesis (c) in Figure 1.

It is interesting to note that both the Pierson and Vanderkamp studies revealed
that when the rate of change of prices was included as a regressor in the cross-
section, studies, it entered the equation for the strongly-unionised sector with a
larger coefficient than in the equation for the weakly-unionised sector. This
finding lends some support to the notion, outlined in section I of this paper, that
trade unions can ensure a fuller and more rapid reflection of past changes in prices
in current wage changes than is possible in a non-unionised market. The capacity
to do this presumably reflects the superior information and expertise advantage
of the collective unit over the individual unit in collective bargaining.

Strikes

In section I of this paper it was noted that there is disagreement between
various authors on the relation between strikes and the behaviour of the union/
non-union differential. Holt [2] argues that the differential will fall as unemploy-
ment falls and that strikes will increase as unemployment falls, hence we would
expect an inverse relation between strikes and the union/non-union differential.
In contrast certain other authors [7], [8], [9] have argued that falling unemploy-
ment will be associated with an increasing differential and increasing strikes. These
relations lead one to expect a positive correlation between the differential and
strikes. There is insufficient evidence on the behaviour of the differential over the
cycle to discriminate between these two hypotheses, but it is certainly the case that
most empirical work employing a strike activity variable as a regressor in the wage
equation finds a significant positive correlation [7], [8], [9]. In the absence of any
theoretical or empirical refutation of the positive sign hypothesis, we may simply
note that the strike variable is a valid proxy for a component of the collective
bargaining advantage and has been found to enter the wage equation (for both US
and UK data) with a significant positive coefficient. Such findings have usually

emerged from multi-variable equations which include industry profit levels, the rate of change of prices and the unemployment rate as additional regressors. Definition of the strike activity variable can vary, but is normally framed in terms of strike *frequency* either in absolute terms or as a rate per union member. We may conclude by saying that the findings obtained in [7], [8] and [9] constitute evidence of a trade union influence on the rate of change of wages.

Industry Profits

A number of studies have indicated that the level (and changes in the level) of profits is a significant explanatory variable in the wage change equation [31]. The most common interpretations placed on the profit variable are that (a) it indicates the balance of bargaining power in the labour market [31], [40]; (b) that profits-push inflation has evoked a defensive wage response [41]; and (c) that profits and wages will rise together when there is excess demand in both goods and labour markets. It should be said at the outset that the studies which indicate an association between wage changes and a profit variable normally do not include a price change variable and the inclusion of such a variable generally reduces the significance of the profit variable [42]. Further, Lipsey and Steuer for the UK [43] and Bodkin for the US [44] have found only a weak association between wage changes and profit variables. It should, therefore, be borne in mind in any discussion of the role of a profit variable that its statistical credentials are by no means impeccable.

The bargaining power hypothesis depends on the notion that when profit levels are high trade unions will feel that a favourable opportunity exists to press for higher wages since these can be financed out of high profits with a minimum of employers' resistance. At the same time the opportunity cost (in terms of lost profits) to the employer of facing a strike is greatest when profits are high and his ability to buy off a dispute is, in any case, enhanced by high profits. Hence we might expect a large number of wage claims to be advanced by trade unions and successfully negotiated when profits are high and a small number to be advanced with less success when profits are low. A variant of this hypothesis, advanced by Kaldor [40], links profit rates with productivity growth and investment levels but retains the bargaining power approach where unions are "eager" to press claims when industry is prosperous and employers are "willing" and "able "to meet these. Neither approach seems particularly plausible, the former since profits are presumably an endogenous variable determined by demand factors, productivity, etc., all of which imply a proxy role for profits rather than an independent causal role. If, for example, profit levels were a proxy for excess demand in both goods and factor markets then the so-called bargaining power hypothesis could be relegated to an intermediate step in a process in which the unions and employers read the market signals correctly and act through the appropriate institutions accordingly. If, on the other hand, profits are closely linked to labour productivity then a different interpretation, such as that advanced by Kuh [45], might be appropriate.

Another possibility is that an independent profits push initiates a defensive wage push by labour. This notion, often deriving from opinions regarding the price fixing behaviour of the US steel industry, involves a price fixing process governed by a "profit target" which is periodically raised. Machlup finds little evidence that this has been a significant feature of US experience in the post-war period [46]. In view of the market power enjoyed by many firms in the US, if this phenomenon is not significant there it is unlikely that it is so anywhere else.

One is inclined to be suspicious of the role attributed to profit variables in the wage determination equation, partly because of their statistical ambiguity and partly because there is no convincing theoretical interpretation of the part which they might play in the wage/price change process. Kuh [45] has argued that profits are a proxy for productivity change and that the latter is the fundamental influence on the rate of change of the money wage level.

Studies which have employed, as regressors in the wage equation, the profit level together with some indicator of union activity and the concentration ratio have, for individual industries, proved to have a high degree of explanatory power and the profit variable was normally significant [26], [32] and [31]. However, since the explanatory power of each of these variables taken individually is low, it was generally assumed that it was ". . . the *combined* result of strong union power aided by, and functioning within, a profitable and concentrated product market environment that together explain the more favourable wage movements" [3]. Levinson, however, has shown that, by substituting a concept based on the entry characteristics of an industry for the more usual concentration ratio, the profit variable becomes relatively unimportant as an explanatory variable in the industry wage equation for the US [3]. We shall consider Levinson's work next but for the time being remain unconvinced that the bargaining power hypothesis is necessarily the proper interpretation to place on wage equations which incorporate a statistically significant profit variable.

Concentration Ratios

The concept of the concentration ratio of an industry relates primarily to the degree of monopoly in the product market. Certain studies have found the concentration ratio to be a significant explanatory variable in the industry wage equation when profits and unionisation are included as regressors [26], [31] and [32]. Almost all such studies have used US data. Other authors have disputed the relevance of the concentration ratio, notably Levinson [3], and have argued a rather more complex case for a relation between market structure and union power. Levinson's hypothesis is simple, emphasising *the entry characteristics* of an industry in place of the more general concept of the degree of monopoly. Thus he says ". . . to the extent that the structure of the industry facilitates the establishment of new firms outside the union's jurisdiction, the union's ability to maintain control over the labour force in the industry will be gradually eroded and with it, the union's ability to press aggressively for wage increases. Conversely, if the market structure of the industry makes such entry difficult, the union's jurisdictional control, *once*

established, is better protected and its power position maintained." [3]. He further argues that the correlation between wage increases and the concentration ratio simply reflects the fact that the entry characteristics of an industry will be associated with its concentration ratio. His statistical findings lend considerable support to this hypothesis. Whichever is the proper interpretation of the significance of the concentration ratio/ease of entry variable (and we prefer Levison's interpretation) it is clearly very plausible to conclude from the findings of the studies cited that trade unions do affect the rate of wage inflation according to the structure of the product market. Since, according to Levinson's hypothesis, imperfections in the product market are directly associated with the degree of trade union power in the labour market, we may say that the competitive labour market reaction function does not necessarily describe the adjustment process in markets which are imperfectly competitive in products. While the evidence suggests an upward bias of the reaction function, it does not help us to discriminate between cases (*b*) and (*c*) in figure 1, only to discount case (*d*) and to strictly limit the relevance of case (*a*).

Subjective Estimates of Trade Union Militancy

Since any attempt to measure trade union aggressiveness quantitatively is at best a process of rough approximation, certain authors have simply chosen to make subjective judgements as to the degree of trade union militancy which was evident in various periods of time [33]. Such a procedure is open to charges of being unscientific, arbitrary and self-fulfilling. However, there can be little doubt that judgements made about the aggressiveness of trade unions, which are necessarily impressionistic but founded on an appraisal of all the available evidence, might very well provide an approximate measure of militancy every bit as accurate as those based on partial and selective measures which claim greater objectivity. Thus Dicks-Mireaux and Dow constructed an index of trade union militancy consisting of five steps beginning with "marked restraint" and ending with "marked pushfulness" and found this variable to have been statistically significant in explaining the rate of change of wages in the UK during the years 1946–56 [33]. It is of interest in this context to note that it was necessary to employ a dummy variable to take account of trade union militancy in May, 1968, in France in a study of French wage inflation [37]. It is easy to take issue with the use of essentially impressionistic and subjective indicators of trade union militancy such as those cited above but, given the vast problems involved in obtaining any precise and objective measure of that elusive quality, there is every reason to regard them as seriously as any other measure and to accept the findings of [33] as further evidence of a trade union effect on the rate of wage inflation.

The Rate of Change of the Percentage Unionised

In a celebrated article in the *Review of Economic Studies* in 1964, and in some subsequent work, A. G. Hines produced rather spectacular evidence that the rate

of change of the percentage unionised was a highly significant explanatory variable in the wage equation for the UK over a long period but especially in the post-war period [34]. He hypothesises that this association reflects trade union pushfulness manifest in simultaneous trade union recruitment campaigns and wage demands. Hines' hypothesis is open to a number of criticisms, and we shall briefly review these here. First, it is evident from equation [6] that changes in the percentage of the labour force will be associated with the rate of wage inflation. What is not evident, and what Hines cannot demonstrate, is that changes in the percentage unionised are valid proxies for trade union pushfulness. Secondly, the postulated line of causality in the Hines model is ambiguous. Is it not a more plausible hypothesis than that advanced by Hines to suppose that when trade unions secure increases in wages, *for whatever reason,* that the union may attract an increase in its membership? Because the data is available only for annual periods it is not possible to refute this alternative hypothesis. Thirdly, because there have been such small changes in the percentage unionised it seems implausible that such minute variations in union membership as have occurred could adequately reflect changes in union pushfulness. This point has been made by Burrows and Hiṭiris [38] and Godfrey [9]. Fourthly, Thomas and Stoney [39] have pointed to some statistical anomalies in Hines' model. The model is shown to exhibit dynamic properties which suggest model mis-specification.[2]

The Transfer Mechanism and Wage Leadership

Trade unions can affect the rate of wage inflation by creating a "wage transfer mechanism" based on criteria of horizontal and vertical equity in the structure of relative wages. Such a mechanism implies the existence of "wage leaders" and "wage followers" in the labour force. Numerous efforts to substantiate this intuitively plausible hypothesis have been made [14], [15], [16], [17], [18], [19], [20], [12]. In general these studies have yielded findings which tend to support some type of wage leadership/transfer mechanism hypothesis in a wide variety of contexts. In particular, Seltzner [14] and Levinson [15] have produced convincing evidence of a wage leadership process in the US steel and automobile industries. Similarly Eckstein and Wilson [20] have found that, for a group of inter-related US heavy industries, including automobiles and steel, wage leadership and "wage rounds" could be clearly identified. In those studies, however, the key bargain was always taken as given and its determinants remained unknown. This, in itself, is not from our point of view, an important *lacuna* since it is the institutional and political phenomenon of the transfer mechanism which supplies the vehicle by which the trade union may influence the rate of wage change independent of the level of demand. However, it is of interest to consider what the determinants of the key bargain may be. A local excess demand situation, a productivity agreement, particular aggression on the part of some trade union or

2. Considered as a stochastic difference equation system Hines' model is dynamically explosive and this precludes the use of standard *t*-tests of correlation coefficients.

some such special circumstances are all possible candidates for the occasion of a key bargain. In a study which we have carried out, relating to the Republic of Ireland, it was found that the rate of unemployment amongst a group of skilled manual workers (the rate of unemployment amongst electricians being the proxy) together with a shift dummy (to take account of wage freeze effects) explained 87 per cent of the variation in the rate of change of average hourly earnings [12]. This finding lent considerable support to the hypothesis, that because excess demand persisted in certain occupational labour markets in Ireland, while excess supply characterised the aggregate labour market, the overall rate of wage inflation was related to the conditions prevailing in the tightest markets through a wage leadership/transfer mechanism effect. These findings were, of course, specific to the circumstances of Ireland and may, or may not, be relevant to the situation in other countries. It is, in fact, unlikely that a single group or a single cause is persistently involved in a wage leadership process in most European or North American countries. What appears to be more likely is that at various points of time circumstances will favour the negotiation of a key bargain in some employment sector, and this will be generalised to some, or all, other sectors by way of a transfer mechanism, but the leading sector will vary over time and the circumstances favouring the key bargain will differ in different cases. This is an area of some importance in understanding the internal mechanism by which trade unions influence the inflationary process and much work remains to be done in relation to the phenomenon of wage leadership.

III

Conclusions

   The empirical evidence we have briefly surveyed in this paper is a somewhat confusing mixture. The hypotheses tested, the variables employed in the tests and the levels of aggregation vary from study to study; yet each would claim to be a statistical investigation of the impact of trade union activity on the process of wage determination. What then can we conclude from this mixture of findings? First, we may reasonably draw from the evidence presented the broad conclusion that trade union activity does, in certain circumstances at least, introduce an inflationary bias into the labour market. This is a general finding which emerges in some measure from almost all the studies considered but one which does not deny the possibility that the impact of the union may be negligible or even negative under certain circumstances. For example, almost every study finds that when the level of labour demand is low (unemployment high) trade unions generally can ensure that wages continue to inflate (or at worst prevent wages from falling) and increase the union/non-union differential (see in particular Lewis, [28]). However, there is a genuine doubt as to the effective impact of the union when labour markets are tight and there is no way of distinguishing

between hypotheses (*b*) and (*c*) in figure 1 on the basis of the available evidence. All that we can say is that the evidence is broadly consistent with both hypotheses (*b*) and (*c*), and inconsistent with hypotheses (*a*) and (*d*). For what it is worth we are prepared to speculate that a fifth hypothesis, combining (*a*) and (*c*), is impressionistically the most plausible of all. The hypothesis would be described by a reaction function, *ef* in Figure 1, which continues beyond *f* along the path of function (*a*). That is, the trade union will induce an inflationary bias into the market reaction function at all levels of demand below ox_1 but when $x > x_1$ (i.e., when market induced inflation crosses some critical threshold rate) the union will simply rubber stamp the market outcome by rapid consolidation of wage drift. We have only the vaguest impressionistic evidence in support of this hypothesis (drawn largely from Lewis [28]) and the reader must, therefore, regard it as highly speculative.

In addition to the general conclusion noted above we may also say that the evidence suggests that the significance of the price change variable in the wage equation varies directly with the degree of unionisation, and that product market variables, such as entry characteristics and, perhaps, concentration ratios, affect the degree of influence of trade unions in the labour market. The existence of transfer mechanisms, and the impact of key bargains too, is evidently another aspect of the impact of the union on the process of wage inflation.

While these conclusions are significant they are of a highly general nature and as a result tell us little about the precise mechanics of the inflationary impact of trade unions. In particular we can know little, from the available evidence, of the nature and effects of what we might call a "pure militancy" aspect of trade union behaviour. The pure militancy effect might be defined as a subjective quality in trade union activity which, given the values of the objective power variables such as percentage unionisation, influences their impact on the process of wage determination. An extreme example of this effect is the extraordinary upsurge of trade union militancy in France in May, 1968. Less extreme examples might be found in UK experience in 1971/72 and in various continental countries in the late 1960s. What appears to have occurred in these instances was that some surge of aggression within the trade union movement developed and was not obviously related to any of the conventional criteria which we commonly suppose determine the power of trade unions. Only subjective measures of trade union militancy, such as that employed by Dicks-Mireaux and Dow [33], and possibly strike variables, get anywhere near taking account of this factor. This is an aspect of trade union behaviour that requires to be researched further since it has clear relevance for the policy maker. Further, since this unquantifiable element is barely taken account of in the empirical work cited, we may record a reservation as to the significance of the findings of these studies. One further reservation which must be made, in relation to those studies which compare wage inflation in strongly- and weakly-unionised sectors, is that the undoubted existence of spill-overs from the strongly- to the weakly-organised sector affect the findings and make it difficult to gauge accurately the true degree of trade union influence.

The Implications for Economic Policy

We have concluded that trade union activity evidently increases the rate of wage inflation under certain circumstances. From the point of view of economic policy this conclusion is relevant only in so far as the trade union generated inflation, that is, the wage inflation brought about by trade union activity over and above that which would have occurred in any case in response to other factors, is a significant component of the overall rate of wage inflation. If, for example, it could be demonstrated that over some period of time trade union activity was the sole cause of an intolerably high rate of wage inflation (i.e., when all other causal variables had zero values) then an anti-inflationary policy would clearly require to concern itself with trade union wage policy by means of wage restraint, wage freezes, prices and incomes policies, etc. However, for example, if it could be shown that the impact of trade union activity added a negligible amount to an otherwise intolerable rate of wage inflation, resulting say from a high level of excess demand, then clearly the policy maker will not be particularly concerned with trade union wage policy but instead with reducing the level of excess demand. These are the extremes: between them there is presumably a wide range of situations in which excess demand and trade union activity (and perhaps other causal variables) combine in various proportions to exert pressure on the wage level. The trouble is, from the point of view of the policy maker, that we simply do not have any way of knowing what particular mix of causal variables is at work at any time. In addition, the policy maker may well be faced with a set of control variables which are partly compensatory in effect. Thus, if hypothesis (c) in Figure 1 in any way describes the aggregate reality, the union-induced inflationary bias is inversely related to the level of excess demand. Hence reducing excess demand simply increases the induced inflationary bias; while curbing the impact of the union will be most easily achieved by increasing the level of excess demand. This may or may not constitute a genuine trade-off situation since it may be possible to operate on the trade union-induced bias through policy instruments which are neutral with respect to the level of excess demand, such as prices and incomes policy. If, however, hypothesis (b) was the correct one, the question of a trade-off would not arise.

We are left then with very general conclusions and, therefore, with only very general observations on the role of economic policy in this matter. In conclusion, however, it should be said that in an area of such potential importance to economic policy, it is unsatisfactory that we should know so little about the mechanics of the relation between trade union activity and wage inflation because the design of policy must be very imprecise as a result. The need, therefore, is for further research into this relation.

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