S.A. Drakopoulos*

TRADE UNION STATUS, EMPLOYMENT EFFECTS AND WAGE RIGIDITY

ABSTRACT

The starting point of this paper is the idea that wage settlements are interdependent. This implies that when a «status» wage is reached the union shifts its entire attention to employment. In order to capture this, the paper constructs a two-part union utility function which changes when the status wage is reached. The paper analyses the significance of such union utility under a monopoly union framework and also under efficient bargains. A general result of the discussion is that large positive shocks are needed to increase employment and this might be seen as an additional explanation of procyclical employment effects. Furthermore, it is shown that there is downward wage rigidity during a high employment period.

JEL CLASSIFICATION: J51, E24

I. INTRODUCTION

The idea that wage settlements are interdependent especially in the unionised sector has been recurring in the union and industrial relations literature. In particular, there are empirical indications that

* University of Athens.

wage settlements in a key sector of the economy determine settlements in other sectors. Moreover, the concept has been used in a number of theoretical frameworks (see for instance Duesenberry,1949; Scitovsky, 1976; Frank, 1984). More recently authors like Oswald (1979, 1986), Gylfason and Lindbeck (1986) Summers (1988), Akerlof and Yellen (1990), Clark and Oswald (1996), Drakopoulos and Theodossiou (1997) have used it more in connection to labour economics. In a Keynesian framework, it is also plausible to connect the status wage with the previous wage level, and/or the rest of the industry's wage settlements. However, the idea of the aspiration wage resulting into two part union utility function has not been given much attention, with the exception of Oswald (1986) who set the initial ideas.

The paper constructs a two part union utility which changes when the status wage is reached. The two part union utility has been used before especially in an insiders-outsiders context. In particular, the union is viewed as putting different weight on employment when all insiders have been employed (Carruth and Oswald, 1987; Jones and McKenna, 1989; Drakopoulos and Skatun, 1997).

This paper starts by accepting the importance of the interdependence of wage settlements and provides an example of a two-part union utility function which changes when the union reaches a target wage rate. After deriving the union indifference curve, the paper analyses the significance of such union utility under a monopoly union framework. The discussion is extended to a situation of efficient bargains.

II. WAGE SETTLEMENTS STATUS AND UNION UTILITY

The standard specification of a union utility function is a function which is defined over wages and employment, $U = U(w,N)$, and which has all the characteristics of well behaved utility function originating from consumer theory. The well behaved union utility function (usually of a utilitarian form) gives convex union indifference curves with continuous marginal rate of substitution over the whole range of w and N. (See for instance, Corden (1981), Oswald (1985), Rees (1977) and Booth (1995).

In the recent years however, a number of theorists have come to realise that a continuous union utility function implying a continuous

marginal rate of substitution over the whole range of employment and wages, might not be appropriate for describing some aspects of union behaviour. The work of Carruth and Oswald (1987), Jones and McKenna (1989) and Drakopoulos (1996) which develops the idea of non-continuous marginal rate of substitution is an indication that more Labour theorists begin to reconsider the assumption of a single union utility function. For instance, Carruth and Oswald and Jones and McKenna employ a two-part union utility function in an insiders-outsiders framework, in which membership is the critical point for the union. One can however, think of the status wage as the critical point.

The concept of the target wage can be found in other social sciences (e.g Homans, 1961; Valenzi and Andrews, 1971) and as was seen in the introduction, it can also be found in economics. There are a number of reasons which can justify its importance in union utility (see Clark and Oswald, 1996). Apart from the papers mentioned which have used the idea, one can find possible justifications which relate to union leadership. The first possible justification can be found in Keynes's views: unions base their wage claims partly on the wages received by other groups of workers. Thus the target wage can be linked to the average wage settlement in the industry or to the previous year wage rate (Keynes, 1973, pp.13-14). Similarly, Gylfason and Lindbeck (1984) employ the idea that unions wage decisions are interdependent, in the sense that a union aspires to an appropriate wage by taking into account the rest of the industry's wage or the average national wage.

One can connect the previous justification with the work of Ashenfelter and Johnson (1969) and Swint and Nelson (1978, 1980) which argues that union leadership is interested in providing «some acceptable level of members benefits first». The target wage is an obvious candidate of these benefits, since the preservation of previous wage rate levels can be seen as a primary concern.

Furthermore, empirical evidence seems to support the idea of interdependent wage decisions. For instance, «key groups» industries in US manufacturing determine to a large extent wage changes in «non-key Groups» industries (Eckstein and Wilson, 1962). Similarly, Flanagan (1976) found indications of wage settlements interdependence in US manufacturing. Furthermore, wage changes in Swedish non-manufacturing sector were found to be influenced by changes

in the manufacturing sector (Jakobsson and Lindbeck, 1971). More recent empirical evidence indicates that the concept of fair wage (connected to national or industry's level) is very important in union negotiations in the US (Jacoby and Mitchell, 1990).

Thus, if we accept the relevance of wage interdependence, it might be more appropriate to have a two-part function which captures the idea the union changes emphasis when a certain level of wages is reached. The two part utility function has recently been employed in trade union analysis (Carruth and Oswald, 1987; Jones and McKenna, 1989). The foundations of a two-part union utility function in terms of preference theory, are close to a broad hierarchical system of choice in which the union orders objectives in terms of urgency or importance. In our case, the most important objective is to achieve a target wage. The utility index of the primary objective is higher than the utility index of the secondary one (see, e.g. Day and Robinson, 1973; Earl, 1983 and for a review Drakopoulos, 1992; 1994). Generally, the two part union utility function defined over two objectives, wages (w) and employment (N) is:

$$U(w,w^*,N) = \{U_1(w,N), U_2(w,w^*,N)\}$$

where $U(w,w^*,N) = U_1$ for $w \leq w^*$
and $\quad U(w,w^*,N) = U_2$ for $w > w^*$

Having in mind the above, let us give an example of a very simple situation where the union members have two objectives, w and N, and where the wage level is the primary target up to a given level w^*. As was mentioned, the setting of w^* can be related to the previous wage rate or to a perception of the «appropriate» wage. (For a further discussion on this issue see Dunlop 1944, Oswald, 1986, Summers 1988 and Akerlof and Yellen, 1990). When the union achieves that wage level (w^*) then it turns its attention to the secondary objective which is employment. We adopt the standard utilitarian utility function, given as:

$$U = \begin{cases} Nh(w) + (M-N)h(b) & \text{for} \quad w < w^* \quad (1) \\ Nh(w^*) + (M-N)h(b) & \text{for} \quad w > w^* \quad (2) \end{cases}$$

Where w is the wage rate, N is employment, M is membership and b is the unemployment benefit (union members are assumed to

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be identical). The second part of the utility function implies that when the wage exceeds the status wage then it has no importance for the union. The slope of the indifference curve is:

$$\frac{h(w)-h(b)}{Nh'(w)} < O \quad \text{for} \quad w < w^* \tag{3}$$

$$\frac{dw}{dN} = \infty \quad \text{for} \quad w > w^* \tag{4}$$
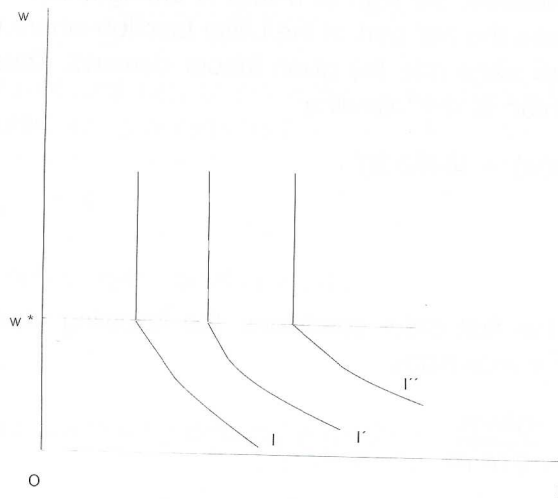
Thus the union indifference map is the following:

FIGURE 1

It is interesting to note the difference of the above kinked indifference curves with the ones derived by other authors such as Carruth and Oswald (1987). The kink of the union indifference curves lies on the employment equals membership point, while in our case the kink lies on the target wage level.

III. A MONOPOLY UNION

We assume first, that we operate in the context of a Monopoly Union model (McDonald and Solow, 1981). This model implies that firm sets employment (N) in the sense that it chooses the N which maximises a profit function given as:

$$\pi = pf(N) - wN \tag{5}$$

where π is profit and p is product price and f(N) is a strictly concave production function. Thus the firm's labour demand is $N=g(w/p)$ with $g'(w/p)<0$ and $g''(w/p)=0$ for linear labour demand. The effect on employment by an increase in product price is given by

$$\frac{dN}{dp} = \frac{g'(w/p)}{p}[dw/dp - w/p] \tag{6}$$

This means that if dw/dp is negative then (6) is positive. Furthermore, it will be positive if the expression in the bracket is negative (if dw/dp is positive, the sign of dN/dp is ambiguous).

We now take the first part of the utility function where $w<w^*$. The union sets the wage rate (w) given labour demand. Thus the problem of the union is the following:

$$\text{Max}_{w} \ U = Nh(w) + (M-N)h(b)$$

s.t. $\tag{7}$

$$N = g(w/p)$$

Applying the first order conditions, the following equation is the condition for a maximum:

$$\frac{h(w)-h(b)}{p} = \frac{-g(w/p)}{g'(w/p)} \tag{8}$$

The comparative static result for $w^*>w$ is

$$\frac{dw}{dp} = \frac{\dfrac{w}{p^2}g''(w/p)[h(w)-h(b)] + h'(w)[\dfrac{w}{p}g'(w/p)-g(w/p)]}{\dfrac{1}{p^2}g''(w/p)[h(w)-h(b)] + 2g'(w/p)h'(w) + pg(w/p)h''(w)} \tag{9}$$

The sign of (9) is unambiguously positive for linear labour demand. However, it is ambiguous for non-linear labour demand since $g''(w/p)>0$. We can gain some additional insight if we look at a constant elasticity form of production function·

$$f(N) = N^{a/a}, \text{ where } a<1$$

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$$g(w/p) = (w/p)^{1/(\alpha-1)} \tag{10}$$

We can also use the fairly standard assumption of a constant elasticity worker's utility function:

$$h(w) = w^{\delta/\delta} \text{ where } \delta<1 \tag{11}$$

By using (10) and (11) we can see that relation (9) is unambiguously positive. In particular, with constant elasticity labour demand and by assuming for simplicity that b tends to zero, equation (9) becomes:

$$\frac{dw}{dp} \bigg|_{w<w^*} = \frac{1/\alpha-1 + \delta}{p[(\delta-1)(2+(\alpha-1)\delta)]} > 0 \tag{12}$$

For the second part of the utility function ($w>w^*$) we follow the same procedure. It is clear that:

$$\frac{dw}{dp} \bigg|_{w>w^*} = 0$$

This implies from equation (6) that

$$\frac{dw}{dp} \bigg|_{w>w^*} > 0$$

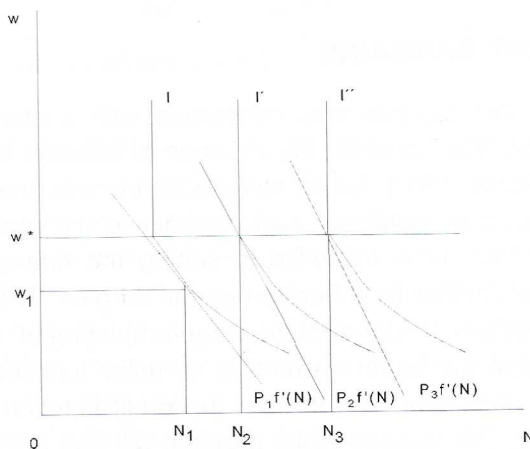We can see this by drawing a graph:

FIGURE 2

The findings up to now indicate some asymmetry in the response to shocks depending on whether the wage is lower or higher than the target wage. In particular, when the wage is less than the target level, a positive shock will only affect the wage. In contrast, employment seems to be affected only when the wage is higher than the target wage.

This can also be seen from the wage path. In the case of linear labour demand and assuming that (9) is never sufficiently positive for employment to fall when there is an increase in product demand, relation (6) implies that the wage path will exhibit a kink. A kinked wage preference path can also appear in the case of constant elasticity labour demand (see relation 11).

The kinked wage preference path can be compared with the standard approach and also with the Cartter and Marshall model (Cartter and Marshall, 1967). Moreover, it can be seen as a justification to possible empirical findings which might suggest a kinked wage preference path. A possible general macroeconomic implication here is that since employment increases occur after the status wage is achieved, a strong shock is needed for employment effects. This is likely to happen during a boom period when the wage is likely to exceed the status level. The other interesting effect is that at high employment levels, a negative shock will only affect employment. This is due to downward wage rigidity. However, when the negative shock is very strong, both employment and wages will fall.

IV. EFFICIENT BARGAINS

Until now, our analysis was concerned with a monopoly union model. We can also consider the situation of efficient bargains (McDonald and Solow, 1981). Under this model, there is one union which negotiates with one employer, and contrary to the monopoly model, the union has some influence in setting the employment level. The two parts together fix a Pareto optimal bargain. The outcome of the bargain results in an efficient wage-employment combination. This implies that the union maximises its utility function, subject to a given profit constraint. The form of the profit function is the same as equation (5). The solution of the problem will give a contract curve. Thus in our case, for $w < w^*$, the problem of the union is:

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$$\text{Max } U = Nh(w) + (M-N)h(b)$$
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s.t
$$pf(N) - wN \geq \pi$$

The solution of this problem gives us the contract curve for $w < w^*$ which is:

$$h'(w)[pf'(N) - w] + h(w) - h(b) = 0 \qquad (13)$$

The slope of the contract curve can be found by differentiation of the above.

$$\frac{dw}{dN}\bigg|_{w<w^*} = \frac{-pf''(N)h'(w)}{h''(w)[pf'(N) - w]} > 0 \qquad (14)$$

This implies that the contract curve has a positive slope up to w^*. It is also possible to see that the standard result concerning optimal wage and unemployment benefit still holds:

$$\frac{\partial w}{\partial b} = \frac{h'(b)}{h''(w)[pf'(N) - w]} > 0 \qquad (15)$$

If unemployment benefit or the outside opportunity increases then efficient bargains imply a higher wage at any level of employment. In the case where $w > w^*$, the contract curve is:

$$h(w^*) - h(b) - w = 0 \qquad (16)$$

The slope of the above will be:

$$\frac{dw}{dN}\bigg|_{w>w^*} = 0 \qquad (17)$$

Figure 3 shows the contract curve.

When the wage is lower than b_1 there is no bargain (the flat part of the curve). Above b_1 the contract curve has a positive slope up to w^* where the slope becomes equal to zero. This implies that there are substantial employment increases when the wage rate is equal to the status wage rate. Similarly to the monopoly case, there is wage rigidity above w^*. The graph also shows the effect of an increase in unemployment benefit to b_2.
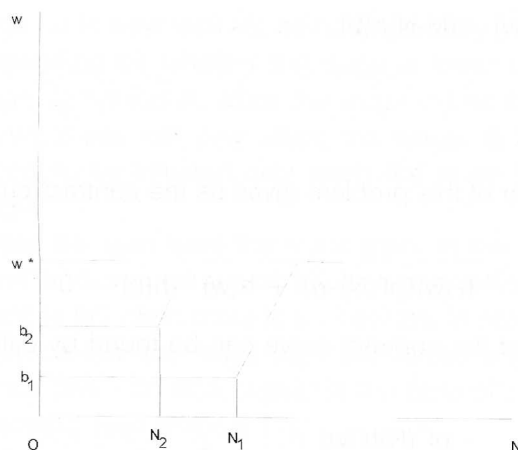
FIGURE 3

V. CONCLUSION

The starting point of this paper was that wage settlements are interdepend and that gives rise to the concept of union status wage rate. In particular, the idea of a status or target wage was used to justify the assertion that union utility changes form, when a certain level w^* is reached. After this level -considered by the union as the «proper» wage rate-, there is a shift towards enlarging the union membership. As in the insiders-outsiders literature, a two-part union utility function was used in order to capture this behaviour.

The second part of the paper considered the effect of such formulation for the wage path and contract curve. In particular, in the case of a monopoly union, it was shown that the slope of the wage path changes and this has interesting implications for a macroeconomic point of view. The main idea was that large positive shocks are needed to increase employment. In the case of efficient bargains, it was demonstrated that the contract curve indicates that employment increases substantially when the target wage has been achieved. In both models, employment is likely to increase only when the wage level is sufficiently high, and this is usually the case during a boom. This might be seen as an additional explanation of procyclical employment increases. Furthermore, for high employment levels, wages are shown to be sticky downwards.

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