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WAGE TARGETS AND TRADE UNION UTILITY

ABSTRACT

The starting point of this paper is the idea of a target or aspiration wage which has not previously been formally applied to union behaviour. The paper argues that the union utility function changes when a target or aspiration wage is reached. In order to capture this, the paper constructs a two-part union utility function. After deriving the union indifference curves, the paper analyses the significance of such union utility under a monopoly union framework. The discussion is extended to a situation of 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 that significant employment effects are observed during a boom period.

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I. INTRODUCTION

In the last few years there has been an increased awareness that union behaviour is quite complex and diverse. In particular, a number of theorists have begun to realize that a single, well behaved union utility function might be inadequate to describe union behaviour in its entirety. Thus the standard formulations of union utility which implicitly assume that the union utility function remains the same over the whole range of variables, are started to be questioned. Some signs

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of this can be seen in recent papers regarding the insiders-outsiders story. 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). The appropriate form of the union utility function used is a two part function.

A similar formulation can also be introduced with respect to the wage rate, especially when we accept the role of the aspiration or target wage. In particular, it can be maintained that the union utility function changes when a certain level or aspiration wage has been achieved. The idea of the aspiration wage (also fair or target wage) is quite old in the literature and has been used in a number of contexts (see for instance Duesenberry,1949; Scitovsky, 1976; Frank, 1984, 1997). More recently authors like Oswald (1979, 1986), Gylfason and Lindbeck (1986) Summers (1988) Akerlof and Yellen (1990) and Clark and Oswald (1996) have used it more in connection to labour economics. In a Keynesian framework, it is also plausible to connect the target 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.

This paper starts by accepting the importance of the target or aspiration wage 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. TARGETS 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, Akerlof (1969) Atherton (1973), Corden (1981), Mulvey (1978), Oswald (1985) and Rees (1977)).

However, there have been some theoretical studies which cast

doubt on the idea of continuous substitutability between employment and wages or among union objectives in general. Ross' work was one of the first to express reservations about the wage-employment trade-off relationship. Ross's approach is more complex and connects union behaviour with considerations such as the proportion of labour costs to total costs, the degree of competition in the industry and the level of unionization of the industry (Ross, 1950). Furthermore, Ross argues that unions are not so much concerned with the maximum possible wage increase, as with relative as opposed to absolute wages. This idea can also be connected to Keynes's point that relativities matter, and also to subsequent literature (Ross, 1948; and Akerlof and Yellen, 1990). Ross's idea that unions attempt to enforce the common rule of «equal pay for equal work» has also found support among other theorists (for a discussion see King, 1990). In the same spirit, Cartter also questions the established trade-off relationship between employment and wages. He states:

«it would seem most likely, once a union is already enjoying a particular wage-employment combination, that it would take a considerable increase in wages to compensate for a reduction in employment, and it would take a considerable increase in employment to compensate for a wage reduction» (Cartter, 1959).

The reason for the limited substitutability according to Cartter is mainly the internal political structures and pressures of the union (Cartter, 1959; Atherton, 1973). In the same framework, some modern theorists have also questioned the standard approach mainly because they view unionism as simultaneously individualistic and collectivistic (e.g. Mayhew and Turnbull, 1989). Similarly, Reder doubts the established view that unions maximize in the sense of consumer or the theory of the firm. Instead, he is inclined towards the satisficing model (Reder,1952,1960 and Turnbull,1988). A connection can be made here with Simon's (1982) concept of bounded rationality which is more appropriate when choice (in this case union choice) takes place in a complex environment characterized by pressures.

The above ideas can be interpreted as suggesting that union behaviour cannot be adequately described by the assumption of a single union utility function implying a continuous marginal rate of substitution over the whole range of employment and wages. The work of Carruth and Oswald (1987) and Jones and McKenna(1989) 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. 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 a target wage rate as the critical point.

The concept of the target wage can be found in other social sciences (see Homans,1961) 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. 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 the average wage settlement in the industry or to the previous year wage rate (Keynes, 1973, pp.13-14). In a similar conceptual framework, 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 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 inderdependent 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 inderdependence in US manufacturing. Furthermore, wage changes in Sweedish 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).

Another justification of the target wage rate can be found at the individual level. As was mentioned in the introduction, many theo-

rists have employed it in various frameworks (e.g wage levels comparison among individuals has been used by Summers (1988) in his relative wage-based efficiency wage theory). Furthermore, there is experimental evidence from psychology which supports the idea (see Valenzi and Andrews, 1971). A link can also be made here with empirical findings in the job satisfaction literature which operates in the individual worker's level. The empirical indications imply that the wage rate is the most important variable in job satisfaction when its level is below the workers' target level (see Locke, 1976, Oswald, 1992, Drakopoulos and Theodossiou, 1997).

Thus, if we accept the relevance of wage inderdependence, 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:

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

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, Hieser 1970, Johnston 1972, Oswald, 1986, Summers 1988, Akerlof and Yellen, 1990, Frank, 1997) When the union achieves that wage level (w*) then it turns its attention to the secondary objective which is employment. For simplicity, we assume that union members are identical and that we have an interior solution which implies that membership

is always higher than employment. Since we are not concerned with uncertainty, we adopt a simple form of the standard utilitarian utility function, given as:

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

Where w is the wage rate, N is employment, b is the unemployment benefit and q is a constant and $O \leq q \leq 1$. The second part of the utility function implies that when the wage exceeds the target or the aspired level then it becomes a secondary objective but it still provides positive utility to the union. The slope of the indifference curve is:

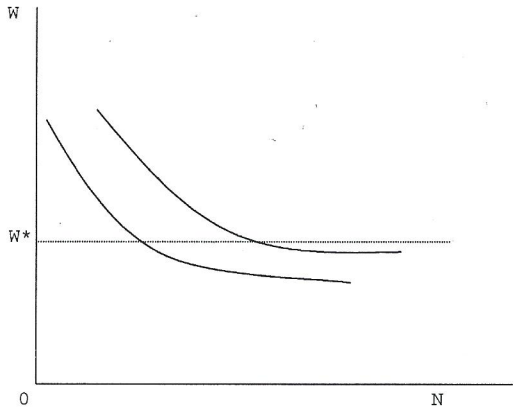
$$\frac{dw}{dN} = \begin{cases} -\dfrac{(w-b)}{N} < 0 & \text{for} \quad w < w^* \quad (3) \\ -\dfrac{q(w-w^*)+(w^*-b)}{qN} < 0 & \text{for} \quad w > w^* \quad (4) \end{cases}$$

It is not hard to see that the union indifference curve will be kinked and negatively sloped. Only when q=1 the two slopes will be equal and thus there will be no kink. After checking for convexity, we can also see that in the region close to w* we have:

$$\frac{dw}{dN} \lim\ w > w^* - \ > \frac{dw}{dN} \lim\ w > w^* +$$

Therefore the resulting indifference curve will have a kink at w*.

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. ANALYSIS IN A MONOPOLY UNION FRAMEWORK

We assume first, that we operate in the context of a Monopoly Union model (McDonald and Solow 1981; Oswald 1982; Mayhew and Turnbull 1989). 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

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

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:

$$\begin{aligned} &\underset{w}{\text{Max}}\ U = N(w-b) \\ &\text{s.t.} \\ &N = g(w/p) \end{aligned} \tag{7}$$

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

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

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

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

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·

$$f(N) = N^{a}/_{a}, \quad \text{where } a < 1$$
$$\text{this implies that: } g(w/p) = (w/p)^{1/(a-1)} \qquad (10)$$

By using (10) 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:

$$\frac{dw}{dp}_{w < w^*} = \frac{w}{p} > 0 \qquad (11)$$

An interesting observation here is that the result implies real wage rigidity. Combining the above with relation (6), we can see that $dN/dp=0$ for constant elasticity labour demand. Thus, as long as the wage level is below the target level, a positive shock will always result in wage increase. In other words, there is real wage rigidity result.

For the second part of the utility function ($w > w^*$) we follow the same procedure. As before, the union sets the wage subject to labour demand.

$$\underset{w}{\text{Max}}\ U = q(w - w^*)N + N(w^* - b)$$
$$\text{s.t.}$$
$$N = g(w/p)$$

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

$$\frac{q(w - w^*) + (w^* - b)}{p} = \frac{-g(w/p)}{g'(w/p)} \qquad (12)$$

Having in mind the above, the comparative static result for $w > w^*$ is

$$\frac{dw}{dp} = \frac{\frac{w}{p^2} g''(w/p)[(w^* - b) + q(w - w^*)] + \frac{w}{p} g'(w/p) - qg'(w/p)}{\frac{1}{p^2} g''(w/p)[(w^* - b) + q(w - w^*)] + 2qg'(w/p)} \quad (13)$$

For linear labour demand the above is unambiguously positive. It is ambiguous for non-linear labour demand. Using (as before) a constant elasticity production function, the sign is unumbiguously positive:

$$\frac{dw}{dp}_{w > w^*} = \frac{(w^* - qw^* + awq)w}{pw^*[(2-a)(1-q)]} > 0 \quad (14)$$

Still, however, the effect on employment is ambiguous (see equation 6). It is also interesting to see what happens when w tends to w* in a constant elasticity framework. The sign of (dw/dp)w->w* depends on the value of q. For instance when q > 1/2 then:

$$\frac{dw}{dp}_{w > w^*} < 0 \quad \text{this implies} \quad \frac{dN}{dp}_{w > w^*} > 0$$

The findings up to now indicate some assymetry 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 also to be affected when the wage is higher than the target wage. With all the above in mind, it is possible to get possible wage paths. Let us start with the simple case of linear labour demand. Since both (9) and (13) are positive for linear labour demand, we can compare them in terms of magnitude. It is clear that:

$$\frac{dw}{dp}_{w > w^*} < \frac{dw}{dp}_{w < w^*} \quad (15)$$

This implies that the effect on wages is stronger when the wage rate is below the target level. In a sense this means that the union cares more about the wage when the wage is lower than the expected or target wage rate. The positive sign of relation (13) again means that the wage is still important but not as important when it is relatively high. This can also be seen from the wage path. In the case of linear labour demand and assuming that both (9) and (13) are 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. In particular the slope of the wage path will

be relatively steep for $w < w^*$, and relatively flat for $w > w^*$. It is also possible that there will be a vertical segment which is due to the fact that in the region of around w^* we need a strong shock in order to get an increase in employment.

FIGURE 2.
a possible wage path for linear labour demand

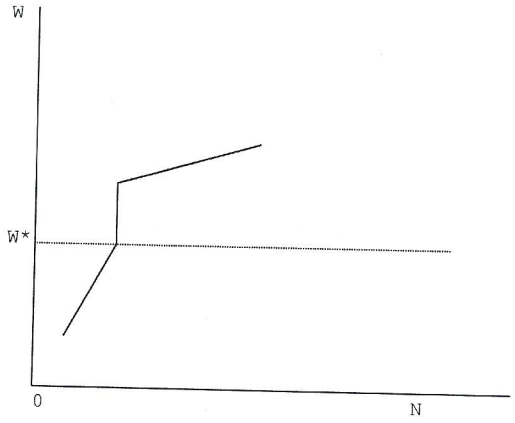
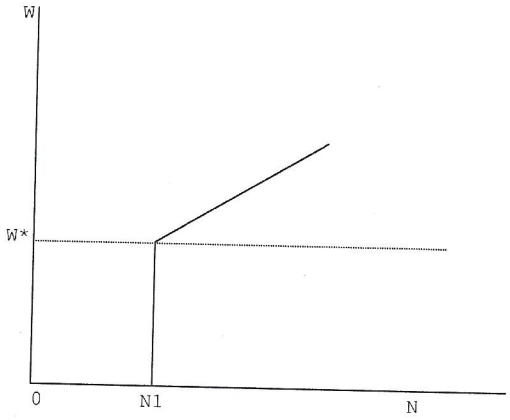


FIGURE 3.
a possible wage path for constant elasticity labour demand



A kinked wage preference path can also appear in the case of constant elasticity labour demand. Relation (11) implies a vertical wage path up to w^*. For $w > w^*$ we assume that the expression

dw/dp is never sufficiently positive as to reduce employment when there is a positive shock.

The kinked wage preference path can be compared with the standard approach and also with the Cartter and Marshall model (Cartter, 1959 and 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 target wage, 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 target level.

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 maximizes 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:

$$\underset{w,N}{\text{Max}}\ U = N(w-b)$$

$$\text{s.t}$$

$$pf(N) - wN \geq \pi$$

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

$$pf'(N) - b = 0 \qquad (16)$$

The slope of the contract curve can be found by differentiation of the above and it will be equal to infinity. This implies that the contract curve is a straight line at some level of N_1. This can also be connected with our result in the monopoly union case when

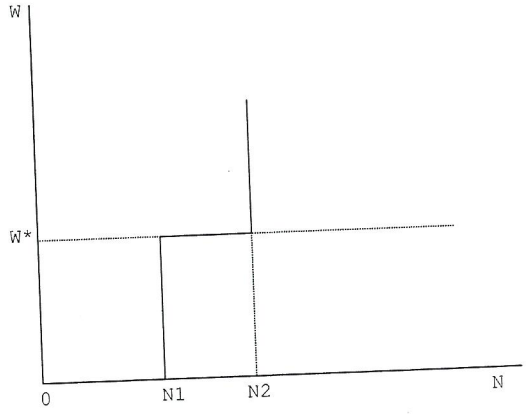
dw/dp=w/p for w < w*. Total revenue is maximized at the same point of a constant elasticity labour demand.

In the case where w > w*, the contract curve will be:

$$qpf'(N) - b = 0 \qquad (17)$$

The slope of the above will be again equal to infinity and this implies that the contract curve is a straight line at some N_2 with $N_2 > N_1$. As the figure shows:

FIGURE 4.



The horizontal segment is also part of the contract curve since it represents corner solutions. Comparing equations (16) and (17), it is clear that q is a shift parameter. When w* is achieved the union shifts its attention to employment: more members will increase its power. Union membership becomes attractive because the union is able to offer new members a satisfactory or fair wage level.

V. CONCLUSION

The starting point of this paper was the idea that union utility is not the same over the whole range of wages. This was combined with the concept of aspiration or target wage rate, a concept which has a long presence in economics but it has not received enough attention in connection to union utility. In particular, the idea of a target or appropriate 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. In order to capture this behaviour, a two part union utility function was used. The paper demonstrated the shape of the resulting union indifference curves.

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. However, it is reasonable to assume that the wage is likely to be high only during the boom period of the business cycle. This might be seen as an additional explanation why employment increases are observed during a boom period. In general, the paper attempted to show that the two part utility function which incorporates the idea of targets has interesting implications for the economic theory of the trade unions.

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