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COMPARISON WAGE IN TRADE UNION DECISION MAKING*

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The starting point of this paper is the idea that trade unions and individual workers pay attention to wage settlements in similar sectors of the economy. The foundations of the concept of comparison wage can be found in other social sciences and also in the literature of psychological economics. Despite the fact, however, that comparison – or reference – wage enters the decision making of the union (i.e. the union utility function), the concept has not received much attention in connection with union decision making. In this paper, a union utility function is employed incorporating the concept of comparison wage. The analysis is conducted in a bargaining framework and the results show the effects on the optimal wage of important variables like comparison wage, unemployment benefit, union power and of the weight that the union places on the comparison wage.

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1. INTRODUCTION

Social comparisons theories have a long history in social sciences and have provided numerous insights in many research fields. In economics, the concept of

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comparison income or wage belongs to this general theoretical framework. One of the first systematic uses of the idea of comparison (relative) wage with important analytic consequences can be found in Keynes (1973: 13–14). The next notable extension of the concept was the relative consumption hypothesis based on the notion of relative income in Duesenberry's (1949) book. Easterlin formulated the hypothesis that well-being depends on relative income, not absolute income (Easterlin 1974, 2001). Furthermore, the idea has been used by a number of behavioural economists in a variety of theoretical settings (for a review see Baxter 1993). In the last decades, its fruitfulness has been realised by an increasing number of economists and started to be widely used in the field of labour economics.

The idea that unions and workers compare wages with others has been expressed in a plethora of terms such as relative wage, fair wage, aspiration wage, comparison or target wage (see for instance, Oswald 1979, 1986; Layard 1980; Frank 1984; Gylfason – Lindbeck 1984, 1986; Summers 1988; Lommerud 1989; Akerlof – Yellen 1990; Chappell – Sampson 1990; Clark – Oswald 1996; Drakopoulos 1996; Drakopoulos – Theodossiou 1997; Arestis – Biefang-Frisancho Mariscal 1998; Charness – Grosskopf 2001 and Altman 2001). Empirical studies indicating that wage settlements in key sectors of the economy determine settlements in other sectors increased the analytical strength of the concept (e.g. Jacoby – Mitchell 1990). It has also been employed in formulations examining the relationship between income and happiness (e.g. Frey – Stutzer 2002; Drakopoulos forthcoming). Furthermore, the idea of comparison wage has been used extensively in other social sciences especially in the context of equity theory and motivation theory (Sweeny 1990; Levine 1993; Ambrose – Kulik 1999; Deci – Ryan 2000).

With this in mind, the paper utilises a union utility function that incorporates the idea that there is a comparison or reference wage which affects union utility. The comparison or reference wage can be linked to the previous wage level in a Keynesian framework and to the rest of the industry's wage settlements. The paper suggests that unions compare their wage with other wages in the sector and this implies that this reference wage enters the union utility function. Thus the paper starts with a discussion of the concept of comparison wage and its possible empirical manifestations in wage settlements. Part 3 presents a simple model of union behaviour incorporating the idea of wage comparisons. A discussion of the comparative static results follows in part 4. Finally, section 5 concludes.

2. WAGE SETTLEMENTS AND COMPARISON WAGE

Empirical evidence seems to support the idea of interdependent wage decisions among industries in the US and in many European countries (see for instance, de la Croix 1994; Urban – Palm – de la Croix 2000). More specifically, there are indications that for many years "key groups" industries in US manufacturing determine to a large extent wage changes in "non-key groups" industries (Eckstein – Wilson 1962; Flanagan 1976; Flanagan – Moene – Wallerstein 1993; McBride 2001). In Germany, wage settlements in one region and for a specific sector or industry act as indicators for others. For example, other sectors take the negotiated wage increases of the "leading" sector in the annual wage round as an important benchmark (Fitzenberger – Franz 1999). In Sweden, wage changes in the non-manufacturing sector were found to be influenced by changes in the manufacturing sector, while outside or reference wages were observed to be quite important for wage setting at the local level (Jakobsson – Lindbeck 1971; Holmlund – Skedinger 1990). There is also empirical support for relative wage considerations in Italy and Belgium (Galizzi – Lang 1998; de la Croix 1993). Further empirical evidence points to the idea that the notion of fair wage (connected to national or industry level) is very important in union negotiations in the US (Jacoby – Mitchell 1990; de la Croix 1994 and for specific empirical studies Gramm – Schnell 2001). On the individual worker level, Clark and Oswald (1996) found that workers care about comparison wage rates (see also Van de Stadt – Kapteyn – Van de Geer 1985; McBride 2001; Ferrer-i-Carbonell 2005). Furthermore, Hamermesh (1975) and Skott (2005) maintain that interdependence affects not only the decisions of workers but also those of firms.

The phenomenon of wage interdependence cannot easily be explained by the conventional approaches to union objectives. They usually ascribe it to union preferences and other factors without specifying how those preferences can be the source of such behaviour. However, the above findings combined with empirical results at the individual worker level, can easily be explained by employing the idea of comparison wages: unions and workers tend to care not only about their own wages but also about other unions wage settlements. This implies that the inclusion of exclusively own wages in the union objective function might be seriously incomplete. On the contrary, there are a number of theoretical reasons which may justify the importance of a comparison or reference wage in union utility (Clark – Oswald 1996; Frank 1997).

One possible justification can be found in Keynes' views. It is well known that in his "General Theory", Keynes paid a lot of attention to wage relativities as an integral part of his underemployment equilibrium analysis. He pointed out that the main reason why workers resist a cut in money wages is to maintain their relative

position in the wage structure and not so much to avoid a cut in their absolute income. Thus the reference wage can be linked to the average wage settlement in the industry or to the previous year wage rate (Keynes 1973: 13–14). The theme of wage relativity is thus very important in Keynes and the subsequent Keynesian inspired literature (see for instance, the papers in Rotheim 1998). In particular, some Keynesian oriented economists have employed it recently in wage setting and business cycle models (e.g. Arestis – Biefang-Frisancho Mariscal 1998; Danthime – Kurmann 2004). In the same spirit, Gylfason – 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. Analogous views can be found in the work of Frank (1984).

Another possible theoretical justification of the reference wage can be on the grounds of asymmetric response to over-pay and under-pay and to the level of pay that is seen as the "fair" amount. Evidence from experimental psychology seems to support the role of such response (e.g. Taylor 1982; Deci – Ryan 2000). A signalling interpretation might be an additional justification. In particular, the wage agreed by firm A might be a signal, containing information about market conditions affecting firm B (see for instance Chappell – Sampson 1990).

The theoretical justification concerning the importance of comparison wage can be extended to the individual worker level. The foundations of such an approach can be found in the behavioural and psychological economics literature. More specifically, a hierarchical structure of needs implies that the individual is motivated to meet unrealised needs step by step starting with the most important needs (for the basic argument see Maslow 1954 and for a review Drakopoulos 1994). However, in a dynamic setting the definition of basic or lower order needs alters in the sense that what was deemed a luxury a few years ago becomes a necessity today (Kaufman 1989; Berry 1994). Thus there will be unsatisfied needs and this is equivalent to the difference between reference income and actual income (see also Baxter 1993 and Altman 2001).

Furthermore, the importance of the idea of comparing rewards with others can be placed in the general framework of sociological, psychological and managerial perspectives which contain theories such as social comparison theory, reference group theory, relative deprivation theory, adaptation level theory, dissonance theory and equity theory (e.g. Festinger 1954; Adams 1963; Martin 1981; Greenberg 1990; Deci – Ryan 2000 and for surveys Kapteyn – Wansbeek 1982; Baxter 1988; Earl 1990). In the specific form of comparison wage, it can also be found in other social study fields (Homans 1961; Valenzi – Andrews 1971; Sweeny 1990; Kahnemann et al. 1997).

Given the above, a union utility function containing the concept of comparison wage may be constructed. In particular, comparison wage enters the utility function and provides negative utility. Thus the union's utility is based positively on union's wage but negatively on the reference wage.

3. THE MODEL

Having in mind the previous discussion, one can construct a union utility function which incorporates the idea of comparison wage (w^*). As mentioned above, the setting of w^* can be related to the previous income level or to a perception of the "appropriate" income. (For a further discussion on this issue see Oswald 1986; Summers 1988; Akerlof – Yellen 1990; Clark – Oswald 1996; Corneo – Jeanne 2001). In particular, comparison wage enters the utility function and provides negative utility. The negative utility that w^* gives can be linked to general formulations where deviation from a social norm causes a loss of utility (Bernheim 1994; Frank 1985; Lindbeck 1997; Clark – Oswald 1998; Cooper – Garcia-Penalosa – Funk 2001; Stutzer 2004). It can also be supported by empirical evidence which shows the negative impact on utility of a rise in comparison income (e.g. Solnick – Hemenway 1998; Blanchflower – Oswald 2004). Thus the union's utility is based positively on union's wage but negatively on comparison wage. For simplicity's sake, the union is assumed to have a utilitarian maximand Φ, defined as the sum of utilities of its employed and unemployed members:

$$\Phi = N(\alpha w - \beta w^*) + (M - N)b \tag{1}$$

where w is the wage rate, w^* stands for reference or comparison wage, N is the number of trade union members who are employed, M is the number of union members and b is unemployment benefit. It also holds that $\alpha > \beta$ and $M > \mathrm{N}$ (interior solution) and that $\alpha w > \beta w^*$.

The comparison wage can be conceived as a mark-up of the wage in other sectors or the industry wage. Thus

$$w^* = (1+ \mu)\, \ddot{y} \tag{2}$$

where $\ddot{y}$ is the industry wage and μ is the mark-up. Thus union utility becomes:

$$\Phi = N(\alpha w - \beta(1 + \mu)\, \ddot{y}) + (\mathrm{M} - \mathrm{N})\mathrm{b}. \tag{3}$$

The firm employs N workers to produce output $f(N)$ according to

$$Q = f(N), \text{ with } f'(N) > 0\ , f''(N) < 0. \tag{4}$$

The firm's profits are given as

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

where p denotes product price.

The wage rate is determined by negotiation between the firm and the union which has M members. Given the wage, employment is determined by the demand for labour, so that

$$f'(N) = w. \tag{6}$$

Therefore employment can be written as

$$N = g(w) \text{ with } g'(w) < 0. \tag{7}$$

4. BARGAINING AND COMPARATIVE STATICS

The firm and the union negotiate over wage w, according to a Nash bargain, following which employment $N = g(w)$ is determined according to relation (6): Without loss of generality, we can normalise both the firm's fallback profits and the union's fallback utility at zero. Thus the Nash bargain will maximise:

$$\Phi^s \Pi^{1-s} \tag{8}$$

where s is the union's bargaining power. If $s = 1$ then the model corresponds to the Monopoly Union model. If $0 < s < 1$ it corresponds to the "Right to manage" model. The Nash bargaining solution can be described as:

$$\underset{w}{\text{Max}}\ B = [N(\alpha w - \beta(1 + \mu)\, \ddot{y}) + (M - \mathrm{N})b]^s\ [pf(N) - wN]^{1-s}. \tag{9}$$

The aim now is to see how the bargained wage – and therefore, employment – alter in response to changes in the exogenous variable. The general first order condition is the following:

$$B_w = s\Phi_w/\Phi + (1 - s)\ \Pi_w/\Pi = 0. \tag{10}$$

We can write the following partial derivatives (also noting that $N = g(w)$):

$$\Phi_w = g'(w)[\alpha w - \beta(1+\mu)\,\ddot{y}] + g(w) - g'(w)b > 0 \tag{11}$$

$$\Phi_{wb} = -g'(w) > 0 \tag{12}$$

$$\Phi_b = M - g(w) > 0 \tag{13}$$

$$\Phi_{w\ddot{y}} = -g'(w)\,\beta(1+\mu) > 0 \tag{14}$$

$$\Phi_{\ddot{y}} = -g(w)\,\beta(1+\mu) < 0 \tag{15}$$

$$\Phi_{w\mu} = -g'(w)\,\beta\,\ddot{y} > 0 \tag{16}$$

$$\Phi_{\mu} = -g(w)\,\beta\,\ddot{y} < 0 \tag{17}$$

$$\Phi_{w\alpha} = g'(w)w + g(w) <> 0 \tag{18}$$

$$\Phi_{\alpha} = g(w)w > 0 \tag{19}$$

$$\Phi_{w\beta} = -g'(w)\,\ddot{y}\,(1+\mu) > 0 \tag{20}$$

$$\Phi_{\beta} = -g(w)\,\ddot{y}\,(1+\mu) < 0 \tag{21}$$

In order to proceed, we differentiate along relation (10) noting that $\Phi_w > 0$, and we obtain the following comparative statics:

$$\frac{\partial w}{\partial \theta} = \frac{-B_{w\theta}}{B_{ww}} \tag{22}$$

where θ is an exogenous variable. Furthermore, we assume that the second order conditions hold.

$$B_{ww} < 0 \tag{23}$$

Given (22) and (23) we have:

$$\operatorname{sign}(\partial w / \partial \theta) = \operatorname{sign}(B_{w\theta}).$$

Thus we obtain a simple expression for $B_{w\theta}$

$$B_{w\theta} = \frac{s(\Phi\Phi_{w\theta} - \Phi_w\Phi_\theta)}{\Phi^2} + \frac{(1-s)(\Pi\Pi_{w\theta} - \Pi_w\Pi_\theta)}{\Pi^2}.$$

Given all the above we can deduce the following propositions:

Proposition 1

An increase (decrease) in the industry (comparison) wage causes the union wage to increase (fall). Proof: Changes in $\ddot{y}$ affect only the union utility and not the firm's profits. From (22) and (24) and also from relations (11), (14), (15) we can see that:

$B_{w\ddot{y}} > 0$ and $\partial w / \partial \ddot{y} > 0$.

Proposition 2

An increase (decrease) in the unemployment benefit causes the union wage to increase (fall). Proof: Changes in b affect only the union utility function and not the firm's profits. From the first order condition, it is clear that the impact of a change in b has the same direction as a change in comparison income. Thus, from the previous proposition we can see that:

$B_{wb} > 0$ and $\partial w / \partial b > 0$.

Proposition 3

An increase (fall) in the mark-up causes union wage to increase (fall). Proof: the same as before, using relations (22) and (24) and from (11), (16), (17), it is clear that:

$B_{w\mu} > 0$ *and* $\partial w / \partial \mu > 0$.

Proposition 4

An increase (decrease) in union power causes wages to increase (fall). Proof: we know that:

$$B_{ws} = \frac{\Phi_w}{\Phi} - \frac{\Pi_w}{\Pi}.$$

From relation (11) and the fact that $\Pi_w = -N$ we have:

$B_{ws} > 0$ and $\partial w / \partial s > 0$.

Proposition 5

An increase (fall) to the weight that the union places on the comparison wage causes union wage to increase (decrease). Proof: from (22) and (24) and also from (11), (20) and (21) we can see that $B_{ws} > 0$ and $\partial w / \partial s > 0$.

5. CONCLUDING COMMENTS

The starting point of this paper was the idea that there is a comparison or reference wage which enters the union utility function. As we could see above, the justification of the presence of a comparison wage in unions' considerations is well-based on social comparisons theories and findings from economic psychology. This implies that standard union behaviour models which do not take into account wage comparisons might be inadequate and limiting. The paper then discussed the effects of the presence of a comparison wage in a bargaining setting where the firm and the union negotiate over the wage in a partial equilibrium framework. The results showed that the union wage exhibits a positive relationship with the comparison wage, unemployment benefit, the mark-up over the industry wage, union power and the weight that the union places on the comparison wage. The results concerning unemployment benefit and union power are not surprising given the general literature on union behaviour (see for instance Pencavel 1991; Booth – Chatterji 1995; Hart – Moutos 1995).

However, given the model used in this paper, the rest of the results indicate the way key variables are affected by the presence of the comparison wage in a union bargaining setting. For instance, if the union pays a lot of attention to other wage settlements in the industry then this will influence its own bargained wage and thus the level of employment. In particular, the concern that the union exhibits over other wage settlements in similar sectors has a positive effect on its own wage but a negative effect on the level of employment. Furthermore, the empirical findings of the existence of wage interdependence among industries in many countries might be better explained if the idea of comparison wage is taken into consideration. Finally, one possible benefit of this paper is that it might attract more attention to the wider effects of the idea of comparison wage, especially in a general equilibrium setting where the industry wage is also endogenous.

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