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Pichler, Eva

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Eva Pichler
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Abstract

The paper investigates the nexus between the structure of union wage bargaining and workers' preferences for status, which is measured by relative wages. For two types of workers it is shown that due to externalities on the other group's status wages of both types of workers will be lower if an encompassing union negotiates for the whole workforce than if different groups of workers are unionized separately. Moreover, unemployment will be reduced by the central union relative to separate negotiations even if unions are not concerned with employment effects of wage negotiations at all.

I. Introduction

The link between efficiency wages and union wage bargaining has already been established in the literature: Hoel (1989) shows that the presence of unions aggravates the unemployment caused by efficiency wage considerations. If bargaining takes place at a local level, it unambiguously gives a higher negotiated wage than the wage set by firms in the absence of unions. Under central bargaining this will happen if the firms' labor demand elasticity is sufficiently large. These results are obtained upon the assumption that the union utility function only depends of wages, i.e. $V = V(w)$.

This paper investigates the economic impact of union bargaining if workers are not only concerned for wages but also care for relative wages and status, as stressed by Hicks (1975), Akerlof and Yellen (1988) and Frank (1984). If unions take into account these preferences in the bargaining process, the outcome for wages and employment will depend on whether an encompassing union represents all workers within the firm or if a single union negotiates for only a part of the workforce. For simplicity it will be assumed that there are only two groups of workers that can be unionized separately. In general, unions will adopt wage policies designed to raise wages above the level unilaterally set by the firm in any case. However, if a union is representing the firm's whole workforce, wages will be more moderate and employment will be higher for both groups of workers than with separate negotiations. This occurs since a central union within the firm takes into consideration the
negative externality of higher wages of one group of workers on the other workers' status resp. relative wages. If the externality of paying high wages is sufficiently strong, the central union might even reduce the level of wages below standard efficiency wages minimizing the firm's cost of efficient labor. In this case Hoel's result would be reversed, so that wages would fall due to union activities relative to the level set by firms unilaterally. Thus employment would be higher with than without union negotiations.

The insight that central union bargaining will lead to lower unemployment rates than separate union bargaining is not a new one: e.g. Hoel (1989) has shown that employment will be higher with central union bargaining. This occurs since the central union takes care of employment-effects when raising wages. Although this paper derives a similar conclusion it is based on a different argument: even if the central union does not take account of unemployment it will increase employment by mitigating the effort-competition between workers, resulting in a reductions of wages for both groups.

The paper proceeds as follows: section II presents the behavior of the firm. Section III analyzes the union's objective, section IV is concerned with both central and separate union bargaining.

II. The firm

If it is prohibitively costly for firms to monitor workers' labor input directly, it can nevertheless influence it indirectly if effort can be enhanced by higher wages, yielding an efficiency-wage context. Thus, the wage rate is either unilaterally set by firms or alternatively it is negotiated in a bargain between firms and the union (in the latter case the firm is left free to select employment subsequently), leaving the choice of effort to workers in both cases.

Output is produced by two kinds of "efficient labor": \( Y = Y(e, L_1, e, L_2) \) with \( Y_1<0, Y_{11}<0, Y_2<0, Y_{22}<0 \). It is sold at a competitive market at a price \( p=1 \). The firm maximizes its profits \( P \):
In the absence of unions, the firm will select wages and employment by calculating the following first-order conditions:

(6) \[ P'(w_1) : Y^1 L_1 \cdot \frac{de_1}{dw_1} + Y^2 L_2 \cdot \frac{de_2}{dw_1} - L_1 = 0 \]

(7) \[ P'(w_2) : Y^2 L_2 \cdot \frac{de_2}{dw_2} + Y^1 L_1 \cdot \frac{de_1}{dw_2} - L_2 = 0 \]

(8) \[ P'(L_1) : Y^1 e_1 - w_1 = 0 \]

(9) \[ P'(L_2) : Y^2 e_2 - w_2 = 0 \]

with \( Y^i = \frac{dY}{de_i L_i} \), \( i = 1, 2 \). According to (6) and (7) the firm choose wages so that the marginal product of an increase of wages in terms of efficiency units of both workers is equal to marginal costs. Workers being concerned for status, the reaction of effort with respect to the other worker's wage will be negative. Employment will be adjusted according to (8) and (9), so that each worker gets a wage per effort equal to his marginal product. Second-order conditions will insure that \( d^2 P/(dw_i)^2 < 0 \) and \( d^2 P/(dL_i)^2 < 0 \), \( i = 1, 2 \), at the optimal solution.

III. The Objective Function of the Union

A modified version of the Stone-Geary utility function can be used in order to incorporate workers' preferences for status into the union's utility function. For each group of workers within establishments that can be unionized separately it has the form

(10) \[ V_i = L_i^{\theta_i} \cdot [U_i(w_i, \Omega_i)]^{\phi_i}, \quad i = 1, 2, \]

where \( L_i \) stands for employment and \( U_i(\cdot) \) is the union's utility from the pay-variables wages \( w_i \) and status resp. relative wages \( \Omega_i \) with \( \Omega_i = w_i/w_j \), \( i, j = 1, 2, i \neq j \). The relative value of \( \theta \) and \( \phi \) is an indicator of the relative weight of employment and pay-

\[ ^2 \text{In an efficiency-wage context effort could be included as an additional argument in (10). Yet it can be shown that results could not be affected as long as workers are left free to choose effort by themselves. Thus workers' utility would be strictly increasing in both wages and status as suggested by (10).} \]
variables in the union's objectives. For simplicity the absolute minimum level of wages and employment levels that the union can tolerate have been set equal to zero. If a union is negotiating for only one group of workers within the firm its objective function is given by (10). The union representing the whole workforce of the firm is supposed to maximize the sum of the separate unions' objectives:

\[
V = V_1 + V_2.
\]

IV. Union wage Bargaining

Encompassing Union

If a right-to-manage model is assumed to hold, the union can bargain over the wage and the firm retains the right to determine employment subsequently. In the bargaining process, the firm wants its profits \( P \) to be as large as possible, whereas the encompassing union wishes (11) to get as large as possible. If the generalized Nash bargaining solution is used as solution concept, the weighted average of the gains to the union and to the firm \( G \) will be maximized:

\[
G = \psi \cdot P^{1-\psi}
\]

\( \psi \) reflects the relative bargaining strength of the union. For the sake of simplicity it has been supposed that both \( V \) and \( P \) will be zero in case no settlement between the parties can be found (i.e. if a strike occurs). If the union is representing the whole workforce, the first-order condition for \( w_1 \) (a similar relationship holds for \( w_2 \)) is given by:

\[
\frac{\psi}{V} \left[ \Theta L_1 \Psi U_1(w_1) + \phi L_1 \Psi U_1'(w_1) + \Theta L_2 \Psi U_2(w_1) + \phi L_2 \Psi U_2'(w_1) \right] + \frac{1-\psi}{P} \cdot P'(w_1) = 0
\]
Separate Unions

If different groups of workers are organized separately, (10) is maximized for i=1,2. We assume that both kinds of labor are essential in production, so that the firm's threat point is not shifted in the separate negotiations as it cannot make positive profits by continuing production with the other group of workers (see Horn and Wolinsky 1988). In this case

$$G_i = V_i^g \cdot P^{1-g}, \quad i = 1,2$$

is going to be maximized. First-order conditions for negotiations with union 1 yield:

$$\frac{\beta}{V_1} \cdot [\theta L_1^e \cdot U_1' (w_1) + \phi L_1^e \cdot U_1' (w_1)] + \frac{(1-\beta)}{P} \cdot P'(w_1) = 0$$

Comparison

Since $P' (w_1)$ is negative at the firm's optimum, the wage negotiated will be increased by union bargaining if the first term of the r.h.s. of (13) resp. (15) is positive.

At first it is advantageous to look at a special case of these solutions. If the union's objective is maximization of only pay-variables, $\theta_1 = \theta_2 = 0$ and $\phi_1 = \phi_2 = 1$, first-order conditions are reduced to:

$$\frac{\beta}{V} \cdot [U_1' (w_1) + U_2' (w_1)] + \frac{(1-\beta)}{P} \cdot P' (w_1) = 0$$

for the encompassing union resp.

$$\frac{\beta}{V_1} \cdot U_1' (w_1) + \frac{(1-\beta)}{P} \cdot P' (w_1) = 0$$

for separate wage bargaining. We immediately recognize that wages will unambiguously be lower and employment will be higher if an encompassing union is representing all workers of the firm than in case of separate wage bargaining. This result is obtained since the central union takes into account the negative
spillover from an increase in $w_1$ on $n_2$: $U_2'(w_1) = - \left[ \frac{dU_2}{dn_2} \right]' \frac{w_2}{w'_1}$ being strictly negative, the first term in brackets on the l.h.s. in smaller in (16) than in (17), yielding the above result.

If the externality on the other workers' status is sufficiently strong, it is even possible that $U_1'(w_1) > - U_2'(w_1)$. In this case the central union would reduce wages below the level which would unilaterally be chosen by firms. Thus unemployment would be mitigated by union bargaining in this case even if the union is only concerned with the pay-variables income and status and does not care for employment at all. It is to be noted that result cannot be derived in case of separate negotiations but only if the preferences of all workers are taken account of simultaneously in the bargaining process, so that the externality can be internalized.

Weaker results are obtained in the general case where $\theta_1, \theta_2 > 0$ holds. By comparing (13) and (15) it is easy to show that under these circumstances a central union will still negotiate for lower wages than separate unions if:

\[
(18) \quad \frac{dU_1/U_1}{dw_1/w_1} > \frac{dU_2/U_2}{dw_1/w_1},
\]

or if the elasticity of union utility with respect to the own wage is larger than the elasticity of the other union's utility with respect to the own wage. In general it can be assumed that condition (18) will be met.
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