

## Costs of Negotiations and the Structure of Bargaining – A Note<sup>1</sup>

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According to Horn and Wolinsky's model on the patterns of unionization, the workers' and the firm's interests with respect to the scope of unionization are always opposed to each other. Of course, transaction costs of bargaining can establish a region in which an encompassing union is more profitable for both parties. This note demonstrates that due to externalities of negotiations the range of this possibility is much larger than the difference of expected transaction costs.

### I. Introduction

Wage bargaining under unionization is observed to be performed under a variety of patterns of unionization. Economic explanations of the scope of the union have primarily been dealing with legal-institutional constraints on the one hand, and with strategic reasons on the other hand. An important contribution putting down the pattern of unionization to technological characteristics of production has been presented by *Horn/Wolinsky* 1988. They show that if workers are close substitutes in production, then the equilibrium form of unionization is an encompassing union, whereas if workers are complements, two separate unions will emerge. The intuition behind this result is that a union representing all workers within a firm negotiates for the whole product of labor, whereas a union representing only a part of workers negotiates for the group's marginal product. If workers are substitutes in production, the average product exceeds the marginal product of labor and workers do better by joining a single union. If, however, the marginal product exceeds the average product of labor, two separate unions can push through higher wages for workers.

According to Horn and Wolinsky's view, the interests of workers and employers with respect to the structure of unionization are always opposed to each other: if an encompassing union is favorable for one party, separate unionization will be preferred by the other one.

Obviously it is easy to imagine that transaction costs of negotiations could affect this result. As costs of negotiations neither are to be treated as being

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<sup>1</sup> I would like to thank Herbert Walther for helpful discussion. Of course I am responsible for all remaining errors.

part of the “pie” to be shared nor as part of the disagreement point but simply as lump-sum expenditures involved in the process of negotiations, each party has to bear them by itself if it decides to enter into negotiations at all. Now, if an encompassing union is formed, negotiations take place only once (and not twice as with two separate unions). Consequently, both workers and the firm can economize on bargaining costs. They will agree on the optimal structure of unionization when transaction costs are substantial and when the difference between the marginal product and the average product of labor is not too pronounced.

This paper shows that the region in which firms and workers will agree on the scope of unionization might be much larger than expected by simply comparing the agents' costs of negotiations in the two regimes of unionization. Accordingly, if costs of bargaining are substantial, we should often expect the formation of an encompassing union even if workers are complements in production.

Bargaining costs can be thought of as consisting of two main components: First, direct costs of bargaining cover opportunity costs of time foregone by negotiating as well as direct costs of bargaining inclusive the disutility of the process of negotiations itself. If bargaining happens to take place within a short period, the second component of costs will be more important. It refers to the costs of gathering information about the pie and other party's possibilities if no settlement can be found. Hicks has explicitly stressed the importance of costs of negotiations in his “Theory of Wages” (Hicks 1966, 144 ff.) by pointing out that parties first have to become informed about the other party's possibilities of making concessions.

Costs of getting information prior to meeting at the negotiation table are explicitly to be distinguished from learning the relevant information during the process of bargaining. This latter aspect has extensively been analyzed by the literature on signalling, which is arguing that an agent can identify himself as a “strong” party by proposing offers and counteroffers which he could not afford to make if he were in a weak position. (Fudenberg/Tirole 1983, Sobel/Takahashi 1983).

The paper proceeds as follows: Section II considers wage formation with an encompassing union, in section III two separate unions are assumed to exist. A comparison is made in section IV. Finally, a summary and some concluding remarks are given in section V.

## II. Encompassing union wage bargaining

In what follows the most simple version of *Horn/Wolinsky's* 1988 model of the bargaining process is used. Neglecting the parties' costs of negotiations, they assume that output is  $x$  if one worker is employed and  $x + y$  if two

homogeneous workers produce at the same time. The disagreement point of both the workers and the firm in case of no production is set equal to zero for simplicity. If workers join together in an encompassing union to bargain for wages, they will get half of the surplus, i.e.  $2w = (x + y)/2$ . This result is derived as a perfect equilibrium in *Rubinstein's* 1982 noncooperative bargaining model of alternating offers and counteroffers if wage bargaining is supposed to take place within a short period of time, so that the parties' discount factor  $\delta$  ( $\delta < 1$ ) approaches one. Thus if workers agree on sharing the wage sum negotiated equally, each one gets  $w = 1/4(x + y)$ . If, on the other hand, workers decide to bargain separately, Horn and Wolinsky show that each of them will get a wage equal to  $y/2$ , i.e.  $w_A = w_B = y/2$ . Therefore, when  $y < x$  (implying that workers are substitutes in production as the marginal product of labor is less than the average product of labor), workers get higher wages by uniting. If  $y > x$ , so that workers are complementary in production, wages are higher in case of separate negotiations. Thus, if workers are substitutes, the firm would be better off with separate bargaining structures, whereas workers decide to join an encompassing union. For complementary workers, the reverse holds. In any case, the interest of the workers and the firm are always opposed to each other.

Now we assume that each time bargaining takes place, the firm and the union have to make lump-sum expenses  $c^F$  and  $c^L$ , respectively. In general, the bargaining costs of both parties will depend on the size of the union. However, for simplicity we assume  $c^F$  and  $c^L$  to be given exogeneously independently of the structure of unionization, reflecting the basic insight that the technology of bargaining will exhibit increasing economies of scale. The main reason for decreasing average costs of bargaining per worker is due to typical free-rider problems: even if the relevant information has already been acquired by one of the separate unions or by the firm, this party would have no incentive to tell it truthfully to the party still uninformed. It would rather bias information available in order to increase its own share of the pie.

As  $c^F$  and  $c^L$  are sunk costs arising independently of the outcome of bargaining, they can neither be treated to be part of the pie nor to be part of the disagreement point. Therefore, each party has to bear it by itself. With an encompassing union wages net of transaction costs are given by

$$(1) \quad w^e = 1/4 \{x + y\} - c^L/2,$$

because  $c^L$  is shared by workers. Net profits are found to be

$$(2) \quad \pi^e = 1/2 \{x + y\} - c^F$$

as the firm has to bargain only once.

### III. Separate union wage bargaining

If workers bargain for wages separately, the firm has the authority to stop cooperation with one of them if no agreement can be found and to continue production with the other one (See *Sutton* 1986, 715). Therefore, the firm's disagreement point is shifted upwards. If again the time period for negotiations is assumed to be small,  $\delta \rightarrow 1$  so that the discount factor can be neglected. In this case worker A's wage is approximately given by  $w_A = \frac{1}{2} \{x + y - w_B - (x - x/2)\}$ , where  $(x + y - w_B)$  is the firm's profit if both A and B are at work.  $(x - x/2)$  refers to the firm's disagreement point as it can credibly threaten to fire worker A and carry on working with B at  $w_B = x/2$ , B's share of the product that he can bargain for if he is the only one to be employed. Workers being identical, each one of them faces the risk of being fired when entering into negotiations with his employer. As a consequence,  $w_A = w_B$  must hold in equilibrium. Taking account of transaction costs of negotiations, wages with separate unions are given by

$$(3) \quad w^s = (x + 2y)/6 - c^L.$$

Since the firm has to bargain twice in this case, net profit is

$$(4) \quad \pi^s = (2x + y)/3 - 2c^F.$$

### IV. Comparison

If transaction costs are negligible, Horn and Wolinsky's main result can be derived straightforward, according to which workers will join an encompassing union if they are substitutes in production, i.e.  $y < x$  holds. For  $y > x$ , two separate unions will be formed. The firm's interest is exactly opposed to that of workers: If  $y < x$  profits are higher if workers are organized in separate unions. For  $y > x$  the employer always prefers bargaining with an encompassing union.

Taking transaction costs into consideration, workers will form an encompassing union if  $w^e > w^s$  or if

$$(5) \quad y < x + 6c^L.$$

The firm, on the other hand, would be better off facing an encompassing union if  $\pi^e > \pi^s$ , implying

$$(6) \quad y > x - 6c^F.$$

Although the difference in transaction costs only amounts to  $c^L/2$  for each individual worker and to  $c^F$  for the firm, the weight of transaction costs in

conditions (5) and (6) is given by the factor 6 and is therefore much more pronounced. Multiplication of bargaining costs arises as the difference of wages in the two regimes of unionization are only a small part of the whole product of labor, whereas bargaining costs are a lump-sum expenditure to be made at each negotiation separately. In other words, the workers' marginal contribution of bargaining by forming separate unions is only a small percentage of the wage received with an encompassing union (if  $y > x$  is satisfied), yet marginal costs of bargaining separately are given by  $c^L/2$ . A similar reasoning holds for the profits of the firm. The shaded area of fig. 1 shows the region where both parties prefer to have an encompassing union for the whole workforce of the firm.

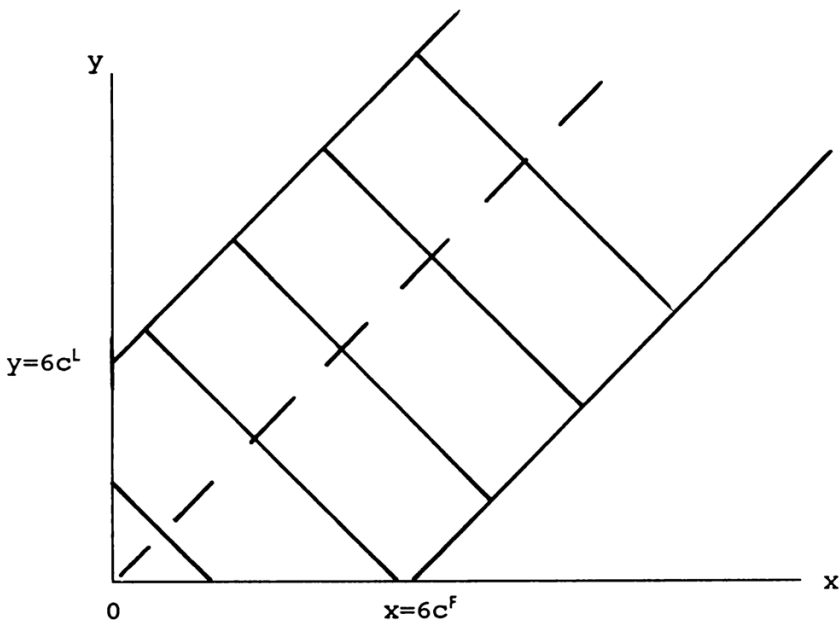


Figure 1

One might argue, that the region for  $y: x < y < x - 6c^F$  is of no relevance in this context since it is workers and not the firm who decide on the structure of unionization. Nevertheless, the existence of this region could affect the firm's incentive to make strategic moves in order to prevent workers from joining together in an encompassing union. However, this possibility has not been dealt with in this paper.

## V. Summary and Conclusions

This paper shows that costs of negotiations that are treated as lump-sum expenditures in the process of bargaining, so that each party has to bear them by itself, strongly influence the structure of union wage bargaining: Due to externalities, even small costs of negotiations might lead to a wide range of parameters where the workers and the firm agree to have an encompassing union. Thus, contrary to *Horn/Wolinsky's* 1986 results we find that the parties' interest will be much less conflicting if costs of negotiations are present.

It is a common observation that "corporatist" countries, where labor bargaining is centralized (i.e. Austria or the Scandinavian Countries) tend to have lower average rates of unemployment than other nations where bargaining is decentralized (e.g. England).

Several explanations have been put forward to these findings. Recent contributions are e.g. *Hoel* 1989, who argues that wages will be lower in a centralized setting as the encompassing union internalizes externalities on unemployment when demanding higher wages, or *Udden-Jondal* 1991, who shows that in the presence of interdependent utility functions the central union might bargain for lower wages because it is taking account of "envy"-spill-overs which are not internalized by separate negotiations.

This note provides an additional argument why central unions might be advantageous for economic performance: If the pattern of unionization is rather stable due to externalities that are linked to the costs of negotiations, moderate or even larger shifts in technology will not affect the structure of bargaining. Thus the parties can expect to cooperate with each other for a substantial period of time, making short-run concessions more easy and giving support to cooperative behavior.

### Summary

According to Horn and Wolinsky's model on the patterns of unionization the workers' and the firm's interests with respect to the scope of unionization are always opposed to each other. Of course, transaction costs of bargaining can establish a region in which an encompassing union is more profitable for both parties. This note demonstrates that due to externalities of negotiations the range of this possibility is much larger than the difference of expected transaction costs.

### Zusammenfassung

Horn und Wolinsky zeigten in ihrem Modell zur Erklärung der Struktur von Gewerkschaftsverhandlungen, daß komplementäre Arbeiter separate Gewerkschaften bilden, während substitutive Arbeiter eine einheitliche Gewerkschaftsorganisa-

tion wählen. In jedem Fall jedoch sind die Interessen der Arbeiter und der Firma diametral entgegengesetzt. Diese Arbeit zeigt, daß aufgrund von Externalitäten die Einführung von relativ geringen Verhandlungskosten das Entstehen eines relativ weiten Bereiches erklärt, in welchem die Interessen von Arbeitnehmern und Arbeitgebern bezüglich der Struktur der Verhandlungen gleichgerichtet und nicht entgegengesetzt sind.

### Literature

- Fudenberg, D./Tirole, J.* (1983), Sequential Bargaining with incomplete information. *Review of Economic Studies* 50, 221 - 247.
- Hoel, M.* (1989), Efficiency Wages and Local Versus Central Wage Bargaining. *Economic Letters* 30, 175 - 9.
- Horn, H./Wolinsky, A.* (1988), Worker Substitutability and Patterns of Unionization. *The Economic Journal* 98, 484 - 97.
- Osborne, M. J./Rubinstein, A.* (1990), *Bargaining and Markets*, Academic Press. San Diego. California.
- Rubinstein, A.* (1988), Perfect equilibrium in a bargaining model. *Econometrica* 50, 97 - 110.
- Sobel, J./Takahashi, I.* (1983), A Multi-Stage Model of Bargaining. *Review of Economic Studies* 50, 411 - 26.
- Sutton, J.* (1986), Non-cooperative Bargaining Theory: An Introduction. *Review of Economic Studies* 80, 709 - 724.
- Udden-Jondal, E.* (1991), Wage Formation in a Unionized Economy with Two Groups of Workers. Seminar Paper No. 435. University of Stockholm.