Arbitration and the Incentive to Bargain (Appendix 13A)

27. Consider a situation where two parties (call them A and B) are negotiating about how to split a certain level of profit. The utility function for A and B are given by the equations

\[ U_A = \sqrt{S_A} \quad \text{and} \quad U_B = \sqrt{S_B}, \]

where \( S_A \) and \( S_B \) represent the share of total profits received by A and B. These shares must add to one. If the two sides cannot agree on how to split the profits, the decision will be made by an arbitrator.

27a. How much utility would A derive if the arbitrator awarded him half of the profits with certainty?

27b. How much utility would A derive from receiving one-fourth of the profits? What about three-fourths?

27c. If the probability of A receiving a one-fourth share was 50%, and the probability of receiving a three-fourths share was also 50%, what is the average level of utility person A could expect? How does this average level of utility compare with the average level derived from receiving a 50% share with certainty? What does this say about A’s attitudes toward risk?

27d. What is the minimum share A could receive with certainty that would yield the same average level of utility that is expected from arbitration?

27e. Assuming person A receives this minimum share, what is the maximum share B could receive?

27f. What is the minimum share B could receive with certainty that would be acceptable? What does that imply about the maximum share A could receive?

27g. What is the contract zone over which the two sides can bargain?

27h. Suppose that uncertainty about the arbitrator’s decision decreases. Half of the time she is expected to award A a share of one-third, while the rest of the time she is expected to award A a two-thirds share. What happens to the size of the contract zone? Is a negotiated settlement more or less likely? State any assumption you make.

Applications

Comparing Private and Public Sector Unions

28. One of the unique characteristics of public sector labor markets is that the percentage of employees that are members of a bargaining organization increased throughout much of the 1960s and 1970s and has been roughly steady ever since. In contrast, the percentage of union members in the private sector has been steadily declining. At the same time, numerous studies also suggest that public sector unions have had less of an effect on their members’ wages than private sector unions. If public sector unions have had less success raising wages, why have they been more successful attracting and retaining members?
“Monopoly Unions” or “Efficient Contracts”?

29. Figure 13-2 shows the demand curve ($D$) for union members. Suppose the preferences of union members concerning wage and employment combinations can be represented by the indifference curves labeled $U$ where higher subscripts represent higher levels of utility. The curves labeled $I$ represent employer isoprofit curves. Higher subscripts are associated with higher profit levels.

![Figure 13-2](image)

29a. Suppose the union is successful in raising the wage of its members from $15 to $30. The monopoly union model predicts that as a result of this, employment will fall from 7 to 4 (from point $a$ to point $b$). Why is point $b$ not an efficient contract?

29b. The set of points along the line $cd$ represent the set of efficient contracts in this diagram. What characteristic does each point in this set share? Are each of the outcomes fair to the union and to the firm?

29c. Unlike the monopoly union model, the efficient contract model requires that the union and employer bargain over both wage and employment levels. However, according to data cited in the text, in 1980 only 11% of major private sector bargaining agreements had explicit provisions guaranteeing employment levels. Does this mean that the collective bargaining process rarely leads to efficient contract agreements?

Models of Strike Activity

30. One of the most widely discussed strikes of the 1990s was the United Auto Workers strike against Caterpillar Inc., a maker of heavy construction and farm equipment. The strike began on November 4, 1991, with the union pushing for a contract similar to that signed earlier with Deere & Co., Caterpillar’s main domestic competitor. The company estimated that such a settlement would eventually raise wage and benefit costs 26% over three years. It countered with an offer of a 17% wage and benefit increase. After a five-and-a-half-month strike, members returned to work when the firm threatened to begin hiring permanent replacement workers. The firm imposed the terms of its last contract offer.

30a. Despite incurring the costs of a strike, union members were not able to secure a wage settlement above management’s original offer. Keeping in mind the problems of asymmetric information and the distinction between union leaders and the rank-and-file members, explain how such an outcome could have come about.
30b. Caterpillar’s argument throughout the strike was that a settlement in excess of management’s offer would make the company noncompetitive with rivals in Japan and Europe. Assuming this is true, was there any other bargaining approach the union could have taken that would have helped to make the firm more competitive and at the same time increased its members’ wages?

Effects of Unions on Output and Productivity

31. Consider an economy with a union and non-union sector. Suppose for simplicity that the relationship between employment, total output, and the marginal product of labor is the same in each sector. The relationship for each sector is shown in Table 13-1.

Table 13-1

<table>
<thead>
<tr>
<th>Employment</th>
<th>Total Output</th>
<th>Marginal Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>95</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>10</td>
<td>275</td>
<td>5</td>
</tr>
</tbody>
</table>

31a. Suppose that the real wage in each sector is originally 25. What would be the quantity of labor demanded in each sector? Assuming the demand can be satisfied, how much total output would be produced?

31b. Now suppose the wage is increased in the union sector to 35. Find the employment level and total output in the union sector.

31c. Assuming the workers unemployed by the union wage spill over to the non-union sector, find the wage and total output in the non-union sector.

31d. Contrast the total output in the economy before and after the union wage increase. Is the new allocation of labor in the economy optimal?

31e. Suppose that instead of spilling over to the non-union sector, unemployed workers in the union sector waited for future openings in that sector. Contrast the total output in the economy before and after the union wage increase.

31f. The effect unions have on total output through the reallocation of labor can theoretically be offset if unions enhance worker productivity by functioning as a collective voice in the workplace. Why is it necessary for workers to speak with a collective voice in order to bring about change in the workplace? Why can’t individual workers communicate with management directly?