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Labor Bargaining: A Classroom Game for Chapter 12

Currently, an employer is paying members of a labor union $46,000 per year, but the union has told its members it thinks $68,000 would be a fairer amount. Every $1,000 increase in salary costs the employer $30 million per year, and benefits the workers in aggregate by $25 million (the missing $5 million going to taxes, which are heavier for the workers).

If the workers go on strike, it will cost the players $25 million per week in foregone earnings, and it will cost the employer $60 million in lost profits. Interest rates are low enough that they can be ignored in this game.

The rules for bargaining are as follows. The union makes the first offer, on May 1 (time 0), and the employer accepts or rejects. If the employer accepts the offer, there is no strike. If the employer rejects it, there is a strike for the next week, but the employer then can make a counteroffer on May 8 (time 1). If it is accepted by the union, the strike has lasted one week. If it is rejected, the union has one week in which to put together its counteroffer for May 15 (time 2).

The workers' morale and bank accounts will run out after 7 weeks of a strike, at time 7. If no other agreement has been reached, the union must then accept an offer as low as $46,000. It will not accept an offer any lower, because the workers angrily refuse to ratify a lower offer.

Students will be put into groups of three that represent either the employer or the union. Employer groups and union groups will then pair up to simultaneously play the game. A group's objective is to maximize its payoff. The instructor will set up place on the blackboard for each group to record its weekly offers. If a group cannot agree on what offer to make and does not write it up on the board in time, then it forfeits its chance to make an offer that week. Each offer must be in thousands of dollars of annual salary– no offers such as $52,932 are allowed.

Instructor's Notes

You may either write this on a blackboard or use an overhead slide.

The payoffs can be normalized with various starting points– which will confuse the students. That is a good confusion, and you can talk about that. I will normalize by taking the payoff with no strike and an accepted offer of \$46,000 – the status quo– to have a payoff of zero. Let the units be thousands of dollars in wages and millions of dollars in payoff.

$$\pi_{employer} = -30(wage - 46) - 60(weeks\ of\ strike)$$

$$\pi_{union} = 25(wage - 46) - 25(weeks\ of\ strike)$$

It would be equally correct mathematically to normalize by taking the payoff with a three-week strike and an accepted offer of \$60,000 to have a payoff of zero. The payoffs would then be:

$$\pi_{employer} = -30(wage-60)-60(weeks\ of\ strike-3) = 1980-30(wage)-60(weeks\ of\ strike)$$

$$\pi_{union} = 25(wage-60)-25(weeks\ of\ strike-3) = 1575+25(wage)-25(weeks\ of\ strike)$$

The optimal strategies would be exactly the same, since the second set of payoff functions differs from the first only in the value of the constants.

To find the perfect equilibrium, work back from the end.

At Time 7, the employer would offer a salary of \$46,000 and it would be accepted.

At Time 6, looking ahead to Time 7, the union would offer a salary of \$48,000. The employer would be willing to accept this, because if he rejects it he gains \$2,000 in salary concession, which is worth \$60 million to him, but that is the same as the cost of one more week of a strike.

At Time 5, looking ahead to Time 6, the employer would offer a salary of \$47,000. The union would accept this, because the benefit of rejecting it is a \$1,000 in salary concession, which is worth \$25 million to it, the same as the cost of one more week of a strike.

At Time 4, looking ahead to Time 5, the union would offer a salary of \$49,000. The employer would be willing to accept this, because if he rejects it he gains \$2,000 in salary concession, which is worth \$60 million to him, but that is the same as the cost of one more week of a strike.

At Time 3, looking ahead to Time 4, the employer would offer a salary of \$48,000. The union would accept this, because the benefit of rejecting it is a \$1,000 in salary concession, which is worth \$25 million to it, the same as the cost of one more week of a strike.

At Time 2, looking ahead to Time 3, the union would offer a salary of \$50,000. The employer would be willing to accept this, because if he rejects it he gains \$2,000 in salary concession, which is worth \$60 million to him, but that is the same as the cost of one more week of a strike.

At Time 1, looking ahead to Time 2, the employer would offer a salary of $49,000. The union would accept this, because the benefit of rejecting it is a $1,000 in salary concession, which is worth $25 million to it, the same as the cost of one more week of a strike.

At Time 0, looking ahead to Time 1, the union would offer a salary of $51,000. The employer would be willing to accept this, because if he rejects it he gains $2,000 in salary concession, which is worth $60 million to him, but that is the same as the cost of one week of a strike.

You should ask the students what would happen to the outcome if the workers' maximum strike length were 15 weeks or longer instead of 7 weeks.

What if the employer was only able to hold out 8 weeks, and would then have to accept any offer? (nothing– all that matter is that the employe can hold out the longest)

What are the workers' bargaining strengths? –a lower strike cost per week

What are the employer's bargaining strengths? – being able to hold out longer, and a greater benefit from wage concessions.

This game is adapted from Vijay Krishna, "The 1987 NFL Strike (B): Negotiating Exercise," Harvard Case No. 9-1890094 (1 April 1994).

Scoresheet for "Labor Bargaining: A Classroom Game for Chapter 12"

Weeks of Strike	Offeror	Pair 1	Pair 2	Pair 3	Pair 4
0	Union				
1	Employer				
2	Union				
3	Employer				
4	Union				
5	Employer				
6	Union				
7	Employer				

A diagram is handy for understanding this.