Topic 5.2 - Unions: Wage and Employment Determination

Professor H.J. Schuetze

Economics 471

Wage and Employment Determination

How do firms and unions interact in the setting of employment and wages?

- The view taken in the economic literature is that unions maximize an objective (utility) function subject to firm behaviour

Union Objectives:

What do unions want?

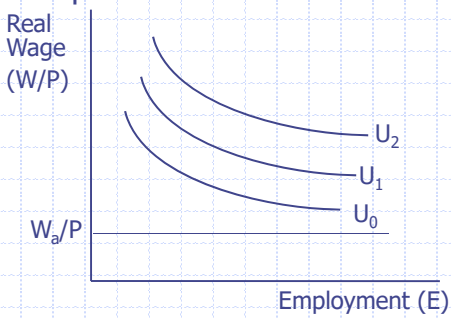
- "more" – Samuel Gompers, founder of the American Federation of Labor
-

Union Objectives

- Note that the union's objectives are not necessarily the same as those of the union members
-
-
- Nonetheless it is useful to think of the union acting as a single decision making unit in search of higher wages and employment

The Union's Indifference Curves

Thus, the union's indifference curves have the usual shape



Downward Sloping:
- High wage is necessary to compensate for low employment

Convex:
- With a high wage and low employment willing to give up a lot of wages to increase E
-

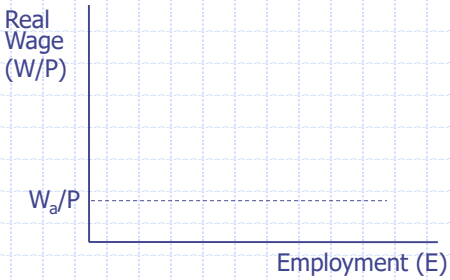
The worker's alternative wage also matters
-
-

Alternative Objective Functions

- Other union objective functions have also been suggested

1. Maximize the wage rate

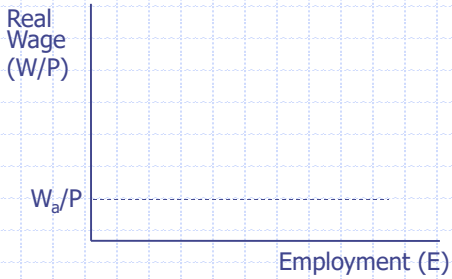
- Place all the weight on wages and none on employment



- Utility increases "vertically" only

Alternative Objective Functions

2. Maximize employment

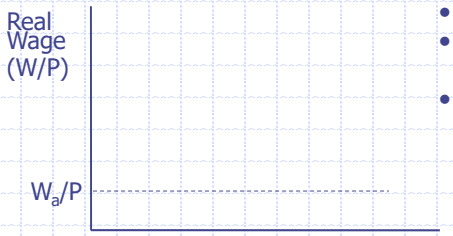


- Utility increases "horizontally"

- Recall that union membership matters to the union because it increases union dues

Alternative Objective Functions

3. Maximize the real wage bill (W/P•E)
   - The real wage bill is just total labour income
   - Here the union places weight on both wages and employment

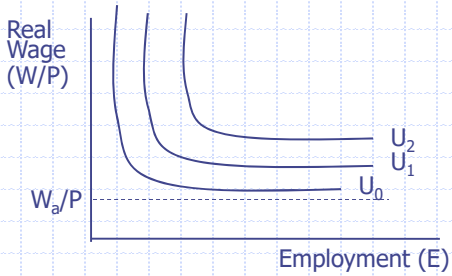


- W/P•E =constant
-
-

   - Only makes sense if the income is shared between employed and unemployed members
   -

Alternative Objective Functions

4. Maximize real economic rent $(W/P - W_a/P)\bullet E$
   - Similar to profit maximization for a monopolist
     -
   - The alternative wage represents the opportunity cost to each member



W/P•E = total revenue
$W_a/P\bullet E$ = total cost

- Indifference curves are rectangular hyperbolas
-

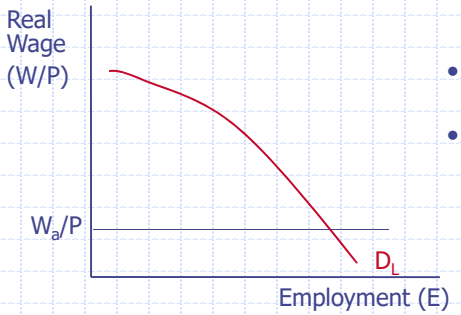
   -

Union Constraints

- The "choice" of wages and employment by the union is constrained by the firm's behaviour
- Assume that the firm is dealing with a profit-maximizing competitive firm
- Also assume (initially) that the determination of wages and employment is carried out in two stages
-
-
- The firm need only to look to its labour demand curve which specifies the profit maximizing employment level at each wage

Union Constraints

In a sense, the firm's labour demand curve can be viewed as a constraint on union behaviour

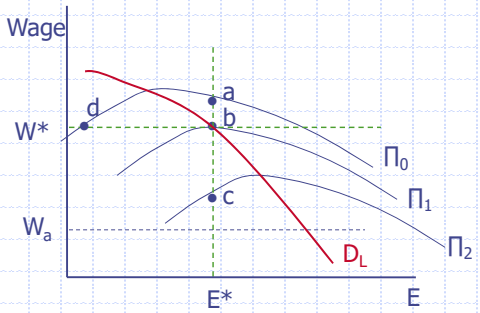


- If the firm can not be induced off of the demand curve
- Union utility maximization occurs at a point of tangency (a_0)

- a_0 represents one of the possible outcomes from collective bargaining in this model
-

The Firm's Preferred Outcome

- The firm prefers outcomes that yield higher profits
- Profits vary along the firm's labour demand curve

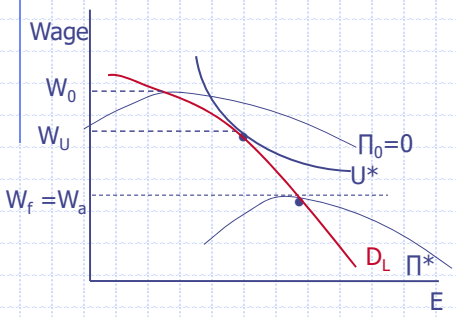


- To see this consider the firm's isoprofit curves
-
-

- Isoprofits lower on the demand curve are associated with higher profits (preferred by the firm)
-

Bargaining Range

- The range of wages along the demand curve over which bargaining can occur is constrained



1. The lowest possible wage the firm can negotiate is W_a
   -
2. The zero-profit isoprofit limits the wage the union can ask for
   -

- As drawn the zero profit constraint is not binding
  - The union prefers a wage less than W_0 (I_U) because of the negative employment effects of a higher wage
-

Some Implications

I. Elasticity of Demand:

- In the absence of the union the competitive wage is given by W_a
- Thus, if the union has any bargaining power wages will be higher and employment lower with the union
- Because of this the likelihood of a successful union drive and union utility increase when the labour demand curve is inelastic
  -
  -

Some Implications

- Not surprisingly, a number of union practices are aimed at making labour demand more inelastic

These include:

Reducing the number of substitutes for union labour

-
-

Reducing substitutes for union-made products

-
-
-

Some Implications

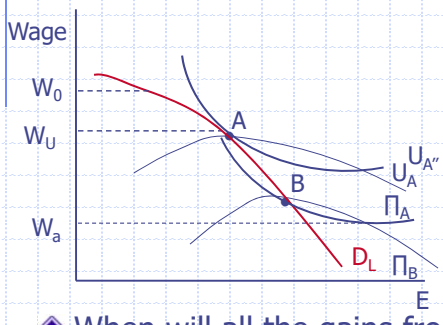
II Labour Market Efficiency:

- The outcome implied by the model is inefficient because unions reduce the total value of labour's contribution to national income
- If unions are able to raise wages (reduce employment) in union sectors employment increases in nonunion firms (if available etc.)
- The last worker hired by a nonunion firm would have greater productivity if she moved to the union sector
-

Efficient Contracts

- The fact that the previous equilibrium is inefficient suggests there might be a "better" contract off of the demand curve

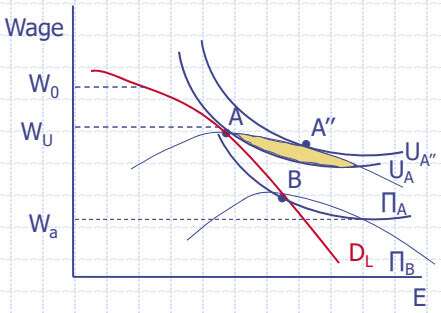
Point A: represents the "ideal" union outcome in previous model



Point B: Again there is a shaded region in which both parties benefit

- When will all the gains from trade be exhausted?
- No change can make one party better off without making the other party worse off

Efficient Contract (A")

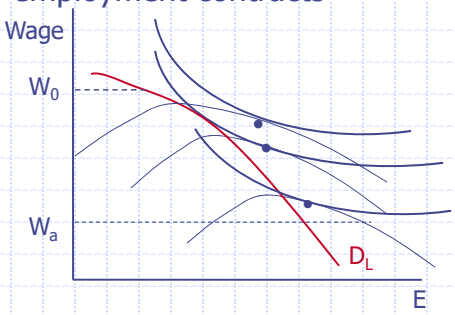


- At A" all of the gains from trade are exhausted
- This occurs at a point of tangency between the union's indifference curve and the firm's isoprofit curve

- A" is a "Pareto-efficient" contract
-
-

Contract Curve

- The locus of all of the relevant Pareto-efficient wage-employment contracts



- Contract Curve = C - C'
- The contract curve lies to the right of D_L
-
-

- Points up on C-C' are preferred by the union and those lower on C-C' are preferred by the firm
- Bargaining range is determined by zero economic profit and the workers' alternative wage

Implications

1. Featherbedding

- Outcomes on the contract curve contain higher levels of employment than the firm would choose on its own
- The firm is overstaffed

- The firm and the union will be forced to negotiate "make-work" or featherbedding practices to share tasks
-

Implications

2. Relationship between wages and employment

- The negative "ceteris paribus" relationship between wages and employment need not hold
-

3. "Efficiency"

- Although the term "efficient contract" is used for all contracts on the contract curve they may not be allocatively efficient
-
-

Obstacles to Reaching Efficient Contracts

- There are obvious incentives for firms and unions to reach an agreement on the contract curve
- These agreements may, however, be difficult to reach

Why?

1. Imperfect Information

- May not realize that there are gains to be made if there is not full information about willingness/ability to trade
-

Obstacles to Reaching Efficient Contracts

2. Difficult to enforce employment contracts

- The firm has an incentive to reduce employment at the negotiated wage (reach the demand curve)
-
-

Bargaining Theory

- The union models we have examined so far suggest that there is a range of possible outcomes
- Some of these outcomes are more preferred by the firm and some are better for the union

Bargaining Theory is used to:

1.
2.

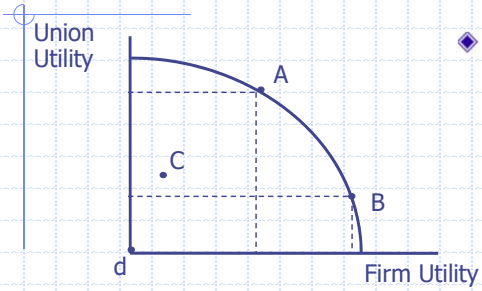
- The basic idea is that the union and firm will engage in strategic behaviour (like a card game or chess)
- Both parties conjecture about the potential actions of their collective bargaining partner

The Basic Bargaining Problem

There is a set of characteristics that is common to all bargaining situations

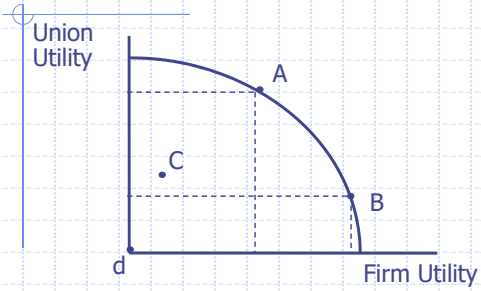
-
-
-
- For the bargaining problem of a collective agreement between a firm and a union the problem might be illustrated as follows:

Firm/Union Bargaining Problem



- d = disagreement or "threat point"
- The area bounded by the curve represents the set of feasible outcomes
  -
- Bounded by the firm's profits
- Points on the boundary are Pareto Efficient
- To see this consider point C (inside the boundary)

Firm/Union Bargaining Problem



- Conflict arises because the set of Pareto Efficient outcomes yield higher utility for one party at the cost of the other
- Point B is also Pareto Efficient but yields higher utility to the firm than A and lower utility to the union

Bargaining Problem Solutions

There are two classes of solutions:

1.
   - Give a set of properties that describe the outcome
2.
   - Model the process of bargaining along with giving predictions about the outcome
   - What follows are examples of each of these

The Nash Bargaining Solution:

- Follows from the work of John Nash
- Assumes perfect information about the possible payoffs and preferences
  - Not about what the other party will do

The Nash Bargaining Solution

- Outlines four axioms that a solution to the bargaining problem must obey

1. The outcome must be Pareto Efficient
   -

2. If the bargaining set is "symmetric" the solution must give equal utility increments to each party
   -

   - Bargaining power depends on possible outcomes
   - With symmetry both parties have the same amount of bargaining power

The Nash Bargaining Solution

3. The solution is not altered by a linear transformation of either party's utility function

- The units that utility is measured in should not matter
-

4. Independence of Irrelevant Alternatives

-
- The basic idea is as follows:
- Suppose you "play the game" with all possible outcomes and come to a solution

The Nash Bargaining Solution

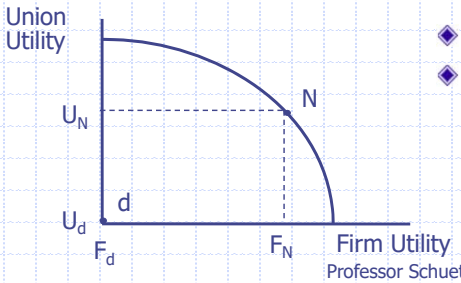
- If we remove some of the possible outcomes (other than the solution) we should get the exact same outcome

Example: Deciding on how to get to school

- Choose between: bus, car and bike
- Suppose you choose to ride your bike
- You find out that, in fact, the buses are not running
-
- It is a little more complex in a two person situation and it is an axiom that is often violated in experiments

Nash Equilibrium

- It turns out that these four axioms imply a unique solution to the bargaining problem
- The "Nash Equilibrium" is such that the product of the two parties' utility increment is maximized



- In terms of the graph
-

Rubinstein's Bargaining Theory

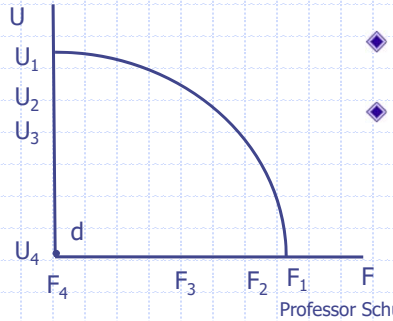
- Rubinstein models the bargaining process
- Clearly there are a number of different ways in which firm's and unions will interact
- The interaction will depend, in part, on the "rules" of the game

The rules in Rubinstein's game are as follows

- The bargainers take turns making offers
- The offer is either accepted or rejected
-
-

Assumptions

- Perfect information
- Each party cares only about the utility derived at the end of the process
- Each round in which an agreement is not reached is costly to both parties
  - Potential profits from bargaining (boundary) decrease

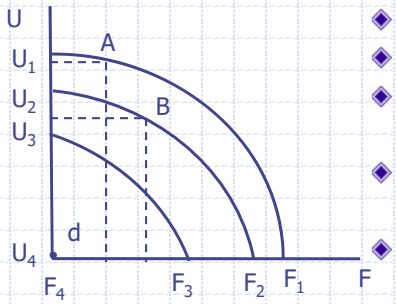


- First period bargaining boundary = $U_1 - F_1$
- Second period falls to $U_2 - F_2$

Assumptions

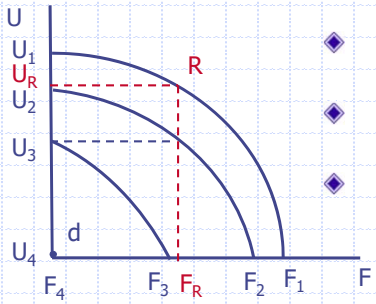
- Each party acts rationally and can expect the other party to do the same
  -

Example: The union starts the bargaining by offering A and only A in the following graph



- i.e. otherwise end up at d
- This is not a credible threat

Equilibrium – Union Makes First Offer



- The equilibrium will occur at R if the union moves first
- i.e. the union will offer and the firm will accept R
- To see this we must use backward induction

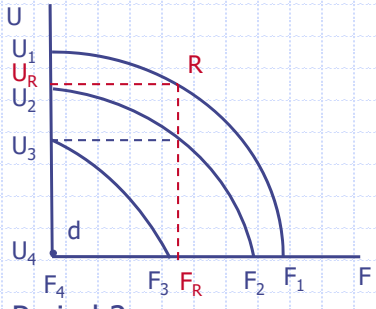
Period 2: the firm moves, period 3: the union moves, period 4: no decision to make

- The best the firm can do in period 4 is F_4

Period 3:

-

Equilibrium – Union Makes First Offer



Period 2:

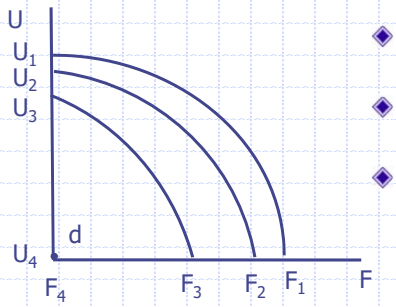
- The firm will offer (U_3,F_R)

Period 1: The same rational leads to the union offering and getting (U_R,F_R)

Delay Costs

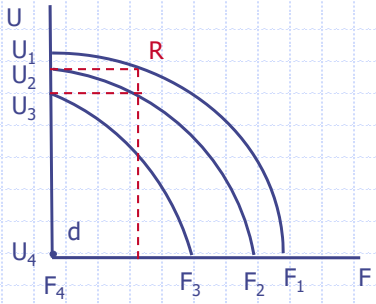
- Notice that delay costs are important in that the threat of these costs give the negotiators power
- In fact, what really gives a party power in negotiations is the relative delay costs

To see this consider the following diagram:



- The feasible set in period 1 is the same as before
- Delay costs to the firm are also the same
-

Delay Costs



- The relative delay costs for the firm have increased
- This decreases the bargaining power of the firm and increases that of the union

Some Final Words

- Clearly, Rubinstein's model is overly simplistic
  -
- Captures the importance of relative delay costs in determining the equilibrium outcome
- Might help to explain why strikes or lockouts are important in bargaining
  -
- Doesn't help to explain why strikes actually occur
-

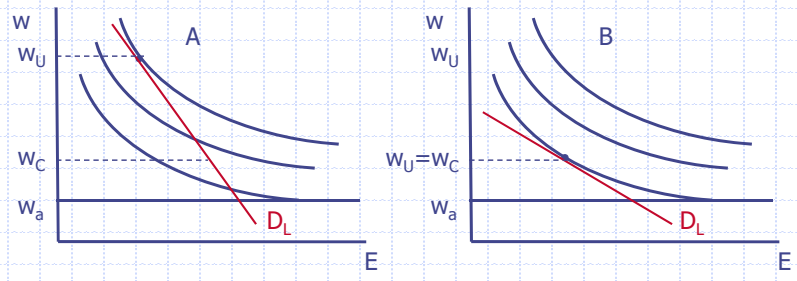
Some Final Words

- The strike is irrational
-
- The irrationality of strikes is known as the "Hicks Paradox"
- Most models that attempt to explain strikes assume that there is asymmetric information
  -
- In such circumstances strikes may make sense

More on Bargaining Power

- So far, we have thought of bargaining power as the ability of one party to raise (lower) wages
  -
- However, union bargaining power is also related to the elasticity of labour demand
- Here the notion of bargaining power is associated with the union's willingness to raise wages
-
- It is possible for a union to be powerful in one respect but not in the other

More on Bargaining Power



-
-
- Of course, unions can be powerful or weak according to both meanings as well