

# The Economics of Imperfect Labor Markets

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## **Chapter 3. Unions and Collective Bargaining**

# Unions: What are we Talking About?

- Unions typically bargain over all aspects of an employment contract: wages, working hours, overtime pay, fringe benefits, employment security, and health and safety standards.
- Voluntary membership organizations: workers will only join a union if it is profitable to do so.
- First unions in the UK (18<sup>th</sup> Century) as craft organizations providing mutual insurance to their members; later, in the 19<sup>th</sup> century, industrial unions representing workers in semiskilled positions; since the beginning of the 20<sup>th</sup> century national organizations with political role.
- Involved in collective bargaining with employers.

# Union density (% of all workers)

	1960	1980	2000	2006	2010
Denmark	57	79	74	69	69
France	20	18	8	8	8
Germany	35	35	25	21	19
Italy	25	50	35	33	35
Netherlands	42	35	23	20	19
Spain	–	–	17	15	16
UK	40	51	30	28	33
US	31	22	13	12	13

Austria: appr. 0.46 for 2001

# Union membership in four OECD countries

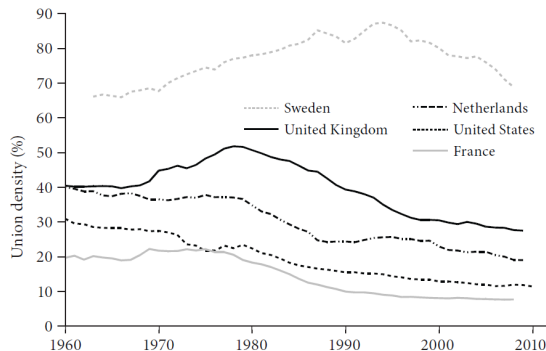


FIGURE 3.1 Union membership in five countries, 1960–2010

Source: Visser (2011).

Note: For details see table 3.1.

# Unions – presence and influence

- Union density (only active members?)
- Coverage of collective bargaining
- Dichotomy between unions' influence and presence: “excess coverage”
- Centralization of bargaining (formal level)
- Coordination of unions (informal level – implicit)
- Wage share
- Strikes

## Measures of union power – (often) 2010

	Coverage	Union density	Excess coverage	Level of bargaining	Coordination
Austria	99	28	71	2	4
Denmark	80	69	11	2	3
France	90	8	82	2	2
Germany	62	19	43	3	4
Italy	80	35	45	2	4
Netherlands	82	19	63	2	4
Spain	85	16	69	3	4
United Kingdom	33	28	5	1	1
United States	13	11	2	1	1

**Coverage**= Employees covered by wage bargaining agreements (%)

**Union Density**= Union members in the active, dependent and employed labor force (%).

**Level of Bargaining** = the dominant level(s) at which wage bargaining takes place:

5 = National or central level – 1 = local or company bargaining.

**Coordination of wage bargaining:**

5 = Economy-wide bargaining – 1 = fragmented bargaining, mostly at company level.

# Coordination and Union Density

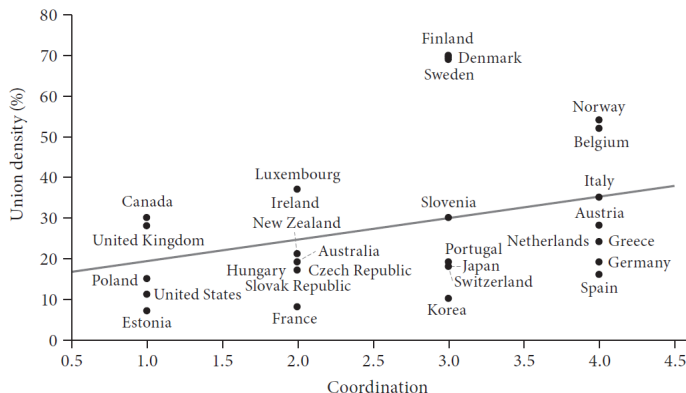


FIGURE 3.2 Coordination and union density, 2010

Source: Visser (2011).

Note: See definitions of coordination and union density in table 3.1.

# Strike activity – 2000-2004

	Strike rate	Average duration	Incidence of workers involved	Intensity of work stoppages
Denmark	39.4	1.3	27.9	37.6
France	101.0	-	-	5.9
Germany	3.5	1.4	4.0	-
Italy	140.3	1.0	157.4	4.9
Netherlands	10.7	2.5	5.5	0.2
Spain	234.2	2.7	138.5	5.3
UK	28.7	2.7	13.4	0.6
US	46.8	24.5	1.4	0.0

- Strike rate = number of work days lost per 1000 workers.
- Average duration = average work days lost per worker involved.
- Incidence = number of salaried workers involved in strikes or affected by lock-outs of workplaces per 1000 workers.
- Intensity = number of work stoppages per 100,000 workers.
- Austria: strike rate  $\sim$  2 days/1000 workers



# Union membership & free-rider problem

- Membership decision: Cost-benefit analysis.
- Join if costs of membership (fees, time) are smaller than benefits (wages, security).
- Under excess coverage, free-rider problem: why should workers pay union dues if they are covered in any event?
- How unions solve their free rider problem:
  - Externalities – reputation for “good societal values”.
  - Provision of exclusive services to members: on-the-job training, retirement and tax counseling.
- Austria: Problem: Chamber of labor (Arbeiterkammer) offers similar services.

# Union bargaining

- Most theories of union behavior take membership as given and concentrate on collective bargaining.
- The latter is modeled in three different ways:
  - Monopoly unions
  - Right-to-manage
  - Efficient bargaining

## Right-to-manage model

- Union and firms bargain over any surplus.
- Nash-bargaining: max of product of surplus of workers and firms weighted by respective bargaining strengths ( $\beta$  and  $(1 - \beta)$ ).  
Gains as surplus over fall back option (no-agreement outcome).
- For the firm, the fall-back option is zero.
- For the union member it is the reservation wage,  $w^r$ .
- The bargain concerns only the wage
- Employment = on the demand curve

## Bargaining over Wages (Right to Manage) (I)

The right-to-manage agreement obtains the wage level that maximizes the Nash product

$$[L^d(w) (w - w^r)]^\beta [R(w) - wL^d(w)]^{(1-\beta)}, \quad (1)$$

where  $\beta$  is the bargaining power of unions.

F.O.C. leads to:

$$\frac{w - w^r}{w} = \frac{\beta}{\frac{\beta}{\eta} + (1 - \beta)\varepsilon_w^\pi}, \quad (2)$$

where  $\eta$  and  $\varepsilon_w^\pi = \left| \frac{\partial \pi}{\partial w} \frac{w}{\pi} \right|$  are, respectively, the inverse wage elasticity of labor demand and the elasticity of profits with respect to wages.

## Bargaining over Wages (Right to Manage) (II)

$$\frac{w - w^r}{w} = \frac{\beta}{\frac{\beta}{\eta} + (1 - \beta)\varepsilon_w^{\pi}}, \quad (2)$$

When  $\beta$  tends to zero, the markup goes to zero, indicating that workers are paid their reservation wage, as in the competitive (and the pure monopsony) equilibrium. As  $\beta$  tends to unity (the union has all bargaining power), the markup is simply given by the inverse of the elasticity of labor demand. Then, the wage set by the unions is the monopoly union wage (denoted by the superscript  $u$ ) and the wage mark-up is equal to

$$\frac{w^u - w^r}{w^u} = \eta \quad (3)$$

The more elastic the labor demand, the lower the markup obtained by the union.

# “Right to manage” outcomes

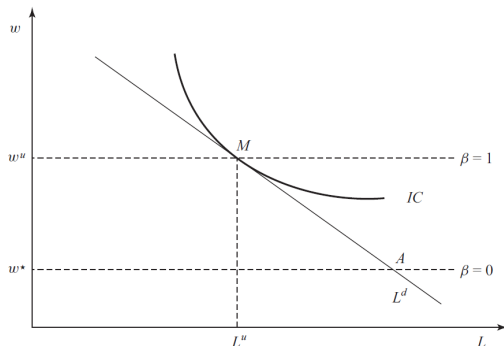


FIGURE 3.3 Right-to-manage outcomes and the bargaining power of unions

$L^d$  labor demand  
 $IC$ ...Indifference  
 curve of union  
 $\beta$ ...bargaining  
 power of union

# Monopoly union model

- Special case of right-to-manage: all bargaining power on workers
- The unique union is the sole “seller” of labor
- Union sets wages unilaterally maximizing the expected utility of a representative worker (median member) subject to the labor demand of the firm.
- The firm reads off the employment level corresponding to  $w$ .
- No bargaining takes place. Decision applies to all workers (“closed shop”).
- Utility function of the union:  
$$R = n u(w) + (m-n) u(b)$$

$m$ ...members,  $n$ ...employed,  $w$ ...real wage,  $b$ ...alternative wage

## Efficient bargaining: over wage **and** employment

- Firms: highest iso-profit curves
  - Iso profit curve: combination of wage and employment giving the same profit
  - Iso profit curve: reaches max crossing labor demand
- Unions: highest utility curve
- Bargaining only over wage generates non-efficient outcome
- Bargaining over wage **and** employment: efficient outcome
- Result: Off the labor demand curve
- Why is there so little efficient bargaining?



# Efficient bargaining: Labor demand & isoprofits

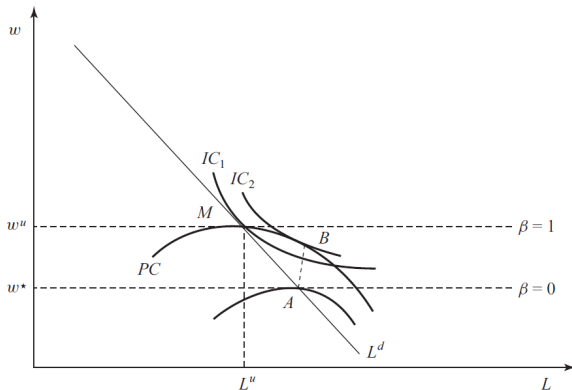


FIGURE 3.4 Efficient bargaining outcomes

► Efficient bargaining: Isoprofit curves & Union utility curves

# Why do workers join a union?

- Decision to join a union: depends on policies of unions.
- Generally sponsor egalitarian wage policies: high-skilled workers no incentive to join unions.
- High wage demands: low-skilled workers are crowded out of their jobs.
- More successful in recruiting among medium-skilled workers.
- Under excess coverage, free-rider problem: why should workers pay union dues if they are covered in any event?

# The Hold-up problem

When capital has already been invested, bargaining over rents can divert returns to investment to workers causing under-investment. Unless workers can commit to accept wages agreed before the investment is carried out.

- Unionized firms invest less than non-unionized firms.
- Problem also of truce after an agreement is reached.
- Problem of unions: low investment leads to de-unionisation (Hirsh, 2004).

# Strikes

- A strike may occur if employers and unions do not reach an agreement
- Strikes are costly, they shrink the surplus over which bargaining occurs
- When perfect information it is **irrational** to strike
- “Hicks paradox”: both parties would be better off without a strike
- Strike due to imperfect information about firms’ financial situation

► Hicks Paradox

# Effects of unions on wages

- “Union wage gap”: estimated via regressions of wage equations of the type

$$\ln(w_i) = \alpha + \beta_m M_i + X'_i \gamma$$

where

- $M_i$  is a dummy variable denoting membership of a trade union (= 1 when individual is member, 0 otherwise)
- $X$  is a vector of personal characteristics affecting wages (e.g. age, education, tenure).
- Denoting by  $w^u$  and  $w^n$  mean wages of union and non-union members, estimated union wage gap is  $\beta_m$

$$\frac{w^u - w^n}{w^n} \approx \ln(w^u) - \ln(w^n) = \beta_m$$

# Results

- Union wage gap ( $\beta_m$ ) between 3 and 19% in the UK, 12 to 20% in the US.
- In countries with excess coverage, it is meaningless (no counterfactual).
- Problems also in countries with no excess coverage:
  - endogeneity: self-selection into unions in industries with high surplus
  - spillovers: bargaining position of non-union members may improve

► Effects of de-unionization on US wage distribution

# Research on Unemployment and bargaining level

- Macro empirical literature estimating employment and unemployment equations
- It suggests that the level at which bargaining takes place is important
- The macro performance of an economy with high or low degree of *bargaining centralization* is, ceteris paribus, superior to that of an economy with intermediate (e.g., industry level) degree of co-ordination
- No centralization: firm-level bargaining takes firm profit situation into account
- Full centralization: negative externalities are internalized (union cares about unemployment)
- More recently: trend towards decentralization

## Policy Issue: Do Unions Increase Efficiency?

- “Exit–voice”: union give workers an option of **voicing** problems, instead of **exiting** the firm when they are unhappy.
- Unions may resist technological progress
- Countervailing power against monopsonists - may increase efficiency
- Wage compression may increase incentive for on-the-job training
- Unions may bargain over job security
- Rent extraction – unions stronger in industries with no product market competition.

► Do unions reduce workplace accidents?



## Coverage, union density and excess coverage in different industries in the United States (2011)

TABLE 3.3 Coverage, union density and excess coverage in different industries in the United States, 2011

Industry	Coverage (%)	Union density (%)	Employment share (%)
Utilities	28.7	27.5	1.0
Manufacturing	11.3	10.6	10.9
Construction	16.1	15.2	5.3
Transportation	30.5	28.8	4.3
Wholesale and retail trade	5.4	4.8	14.5
Education	37.0	33.3	10.1
Health care and social assistance	10.7	9.5	14.0
Public administration	36.3	32.7	5.4
Other industries	3.9	3.3	34.5
Total	13.0	11.8	100.0

*Source:* Dataset constructed by Barry Hirsch and David Macpherson; see Hirsch and Macpherson (2003).

*Note:* Employment = wage and salary employment; union density = percentage of employed workers who are union members; covered = percentage of employed workers who are covered by a collective bargaining agreement.

# Why do unions exist?

- Because they are popular among some socioeconomic group.
- The fast aging of the median union member in some countries suggests that unions may be caught in a vicious circle of aging membership and reduced attractiveness among the young and active population. New firms start often without unions.
- The share of retirees among union members is increasing everywhere. This means that unions increasingly favor older people in intergenerational conflicts, for example, in the design of public pensions.
- No unions in new firms, precarious jobs, etc.

# Review Questions

- 1 What are the pros and cons of the various measures of the strength of labor unions provided by the literature?
- 2 Why are unions stronger in industries where there is less competition in product markets?
- 3 Why is a right-to-manage bargaining system inefficient?
- 4 Why do unions pursue egalitarian wage policies?
- 5 Why is efficient bargaining seldomly seen?

## Exercise (I)

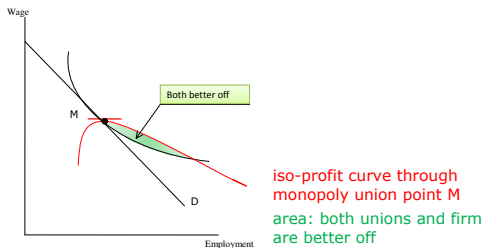
Wages in Kumbekistan are set via national agreements, in spite of large within country disparities in economic and labor market performance. In Eastern Kumbekistan labor demand is given by:  $L_E^d = 1,000,000 - 20w$  where  $w$  is the annual wage, while in Western Kumbekistan is given by  $L_W^d = 800,000 - 20w$ . Labor supply is the same in each region and there is no interregional mobility of the workforce  $L^s = 700,000 + 10w$ . Suppose that collective bargaining, involving mainly Eastern workers and employers, impose the wage that clears the market in Eastern Kumbekistan.

## Exercise (II)

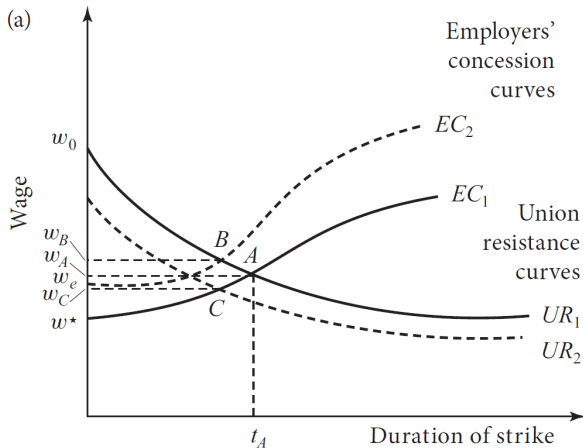
- (a) What would be the employment and unemployment level in the two regions?
- (b) Suppose that there is a labor supply shock, e.g., brought about by migration to the richest region, and hence labor supply in the East is now  $L_E^s = 790,000 + 10w$  and national wage contracts are revised accordingly. What happens to employment and unemployment levels in the two regions?
- (c) Finally suppose that wage setting is decentralized and workers and firms in the West are allowed to set wages clearing the regional labor market. What would be in such case the wage differential between the two regions? And how large should be the flow of workers from the Western to the Eastern regions to bring this wage differential to zero?

# ADDITIONAL MATERIAL:

# Efficient bargaining: Isoprofit curves & Union utility curves

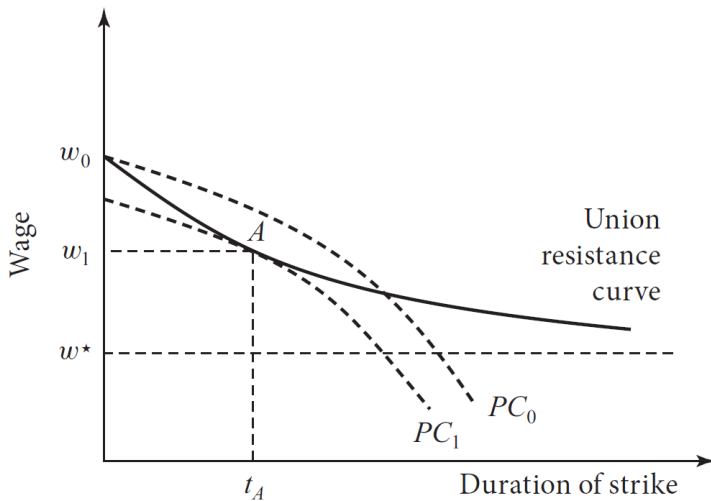


# Hicks Paradox

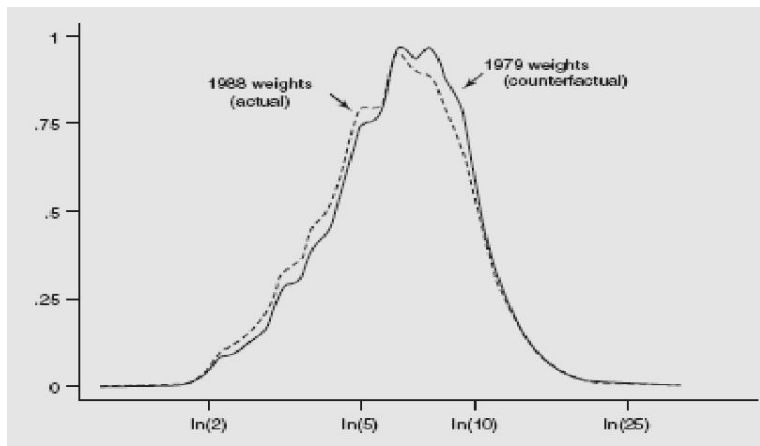




# Duration of a strike firm maximizing profit



# Effects of de-unionization on US wage distribution

[◀ Results](#)

# Evidence on Rent-Sharing

Study by Card et al. on Italian data. Longitudinal data on wages and firms financial conditions.

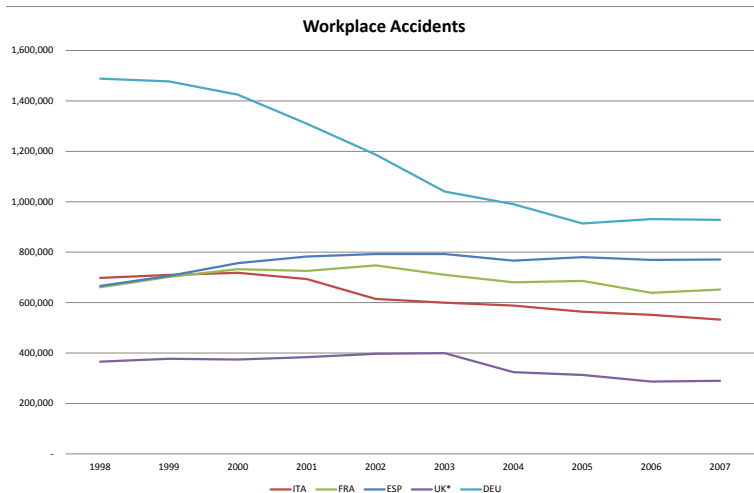
- Problem of endogeneity of profitability: more profitable firms hire best workers. Also efficiency wage effects.
- Identifying assumption: industry demand shocks affect industry level profitability without effects on local labor supply.
- Findings: more profitable employers pay higher wages. Elasticity of wages to quasi-rents in IV: 3-4
- Not much evidence of holdup problem: rent sharing deducts the full cost of capital.
- Consistent with dynamic model in which workers pay upfront portion of rents they will obtain from irreversible investment in the future.

# Do unions reduce workplace accidents?

- (A. S. Litwin, 2000) UK (no excess coverage): unions reduce workplace accidents. Endogeneity issue not dealt with.
- (Bacow, 1980) High heterogeneity in unions behaviour: some unions are more aggressive than others in pursuing health and safety objectives.

◀ Policy Issue: Do Unions Increase Efficiency?

# Unions and Workplace Safety



Policy Issue: Do Unions Increase Efficiency?

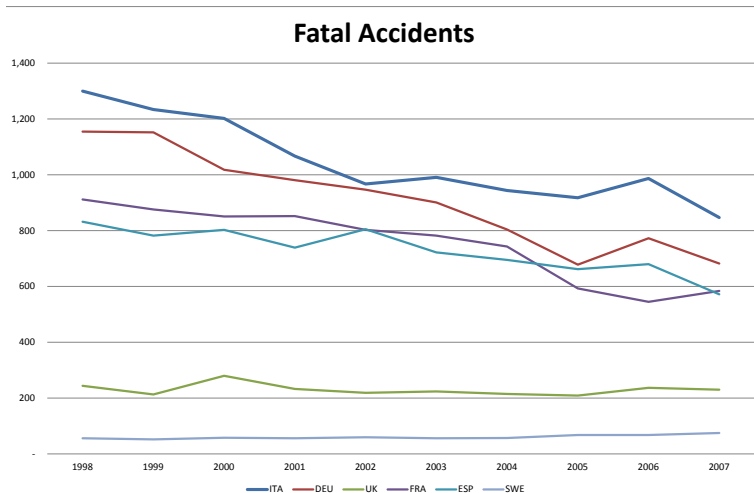
# Moral hazard problems

However...

- (J. Boone and J. C. van Ours, 2002) Number of reported workplace accidents is cyclical: low when unemployment is high, as reporting an accident increases worker's probability of being fired. Fluctuations in reported accidents **may not** reflect changes in workplace safety.
- Possible solution: look at **fatal accidents**

◀ Policy Issue: Do Unions Increase Efficiency?

# Fatal accidents



◀ Policy Issue: Do Unions Increase Efficiency?

# Unions and Product Market Competition in Europe

