Collective Bargaining

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Outline

Introduction



- Theory
- Orthodox theory of Collective Bargaining ["CB"]
- CB in the presence of search-matching frictions
- The degree of centralization
- Asymmetric Information
- 3 Empirical evidence
- Further Reading
- 5 References

Introduction

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Outline of the introduction

- Historical perspective
- Nowadays
 - What do unions do" in Continental Europe?
 - What are the effects of unions?
- Some facts
- Union goals

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Historical perspective

"Labor problems and unionization"

Richard T. Ely (1886) The Labor Movement in America

And Beatrice and Sidney Webb (1897) Industrial Democracy (U.K.)

are the first analyses of "labor movements" and unions.

These books and the followers were characterized by

- An interdisciplinary approach (→ Industrial Relations after WWII);
- An inductive approach (a lot of case studies);
- An historical and comparative approach;
- Preoccupation with social reforms.

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Historical perspective

Already at the end of the 19th/ beginning of the 20th century, a division between

 \rightarrow The "labor specialists" (on the whole strong advocates of unionism)

 \rightarrow And the "economic theorists" (stressing the monopoly aspects of unions).

Though among the latter:

"Marshall, Pigou, Taussig and other leading theorists were troubled by the 'peculiarities' of the labor market – the fact that the worker sells himself with his services, that his immediate financial need may place him at a disadvantage in negotiating with employers, that he is influenced by non-pecuniary motives, that he has limited knowledge of alternative opportunities, and that there are objective barriers to free movement of labor" (Reynolds, 1951)

Nowadays

Unions are widespread in Continental Europe and are an extremely complex "institution".

Questions arise such as:

- What do unions do" in Continental Europe?
- What are the effects of unions?

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"What do unions do" in Continental Europe?

Works councils vs unions

Works Council

"Most Western European countries mandate elected works council in enterprises above some size and give the councils rights to information and consultation about labor and personnel decisions^a. Germany gives councils co-determination over some decisions as well. In contrast to plant-level unions, councils cannot call strikes nor negotiate wages, though they invariably use their power to improve the position of workers within the firm." (Freeman and Lazear, 1995, p. 29)

^aE.g. regarding working conditions and organization or layoff decisions

Addison, Teixeira and Zwick (2010), Kriechel, Muehlemann, Pfeifer and Schuette (2014) and Addison and Teixeira (2019) study explicitly the effects of *works councils*.

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"What do unions do" in Continental Europe?

As most of the economic literature does, the rest of these slides focuses on the impacts of "union-firm bargaining"

- without typically being very precise about the institutional setting and
- with a strong emphasis on wage formation.

Note that

- Explicit bargaining over employment is rather unusual.
- Explicit bargaining over working conditions (e.g. working time) is however much more frequent (but largely ignored in these slides).
- Unions also bargain over
 - Grievance and arbitration procedures to settle a dispute (see e.g. p. 424-426 of Cahuc, Carcillo and Zylberberg, 2014);
 - The rules governing promotions and discipline (Not covered by the book);
 - The rules governing discharges (firing rules like seniority rules or last-in first-out - LIFO - rule); Not covered by the book;
 - Severance payments (the book emphasizes this).

"What do unions do" in Continental Europe?

In addition, in some countries :

 \rightarrow Unions and employers jointly manage the social security system,¹

 \rightarrow They take part to management of many institutions that control the functioning of (part of) the economy :

 \Rightarrow "Corporatism", a rather vague notion that refers to strong coordination between employers, unions and the government. Reference: Teulings and Hartog (1998)

Many differences within Europe. See e.g.

http://www.worker-participation.eu/

National-Industrial-Relations/Countries

¹See Boeri, Brugiavini and Calmfors (2001). An example is the so-called "Ghent system" in which unemployment insurance schemes are run by trade unions and partially subsidized by the State (e.g. Finland, Sweden, Denmark and Belgium).

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What are the effects of unions?

The common wisdom

"Trade unions maintain and improve workers' terms and conditions (...) Trade unions reduce wage inequality" (Bryson, 2014, p.1)

"...unions raise unemployment and reduce labor input (i.e. hours/population). These effects are, however, offset if unions and employers can coordinate their wage bargaining activities" (Nickell and Layard, 1999 p. 3055).

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What are the effects of unions?

A VERY difficult question!

- Because the nature of unions and the institutional settings in which they operate are heterogeneous and such differences matter.
- The counterfactual "what would happen in the absence of unions" is a tricky choice in theoretical analyses and a nightmare in empirical studies:
 - Theory: What is the relevant assumption about the functioning of the labor markets if unions did not exist? Is it pure competition?
 - Empirical analyses:
 - If unionized and non-unionized sectors (firms) coexist, unions affect non unionized sectors (firms) by the threat of unionism and indirect general equilibrium effects (see e.g. Rosen, 1969; Taschereau-Dumouchel, 2020);
 - In (almost) fully unionized economies instead, finding data about the counterfactual is utterly difficult.

Some facts

Indicators of "union power"

- Union density = the proportion of wage-earners who are unionized
- (CB) coverage = the proportion of wage-earners who are covered by collective agreements

Heterogeneity:

- Southern of Europe: Low density and high coverage. E.g., France (FRA): Union density \approx 10%; Coverage \approx 90%
- Nordic countries (and Belgium): density higher than in the previous group and coverage > density;
- U.S.: Union density \approx Coverage \approx 15%

Next graphs show some clear tendencies.

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Some facts: Coverage



Figure: Coverage. Source: OECD (2017)

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Some facts: Union density



Figure: Union density. Source: OECD (2017)

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Some facts

Indicators of "union power"

In Continental Europe, the amount of heterogeneity is substantial !

- (Recognized) unions are often by law *the* "institution" that has the right to negotiate wages (See Cahuc, Carcillo and Zylberberg, 2014, henceforth *CCZ*, p. 411-2, 461);
- The same pay between unionized and non-unionized workers is often the (enforceable?) rule;
- Under certain conditions, a mandatory extension of collective agreements to all workers and firms of the sector can be frequent (Hayter and Visser, 2018). In some countries, under certain conditions, firms have the opportunity of opting out of a collective agreement.

The bargaining level

See OECD (2017) (Chap. 4)

In principle, CB can take place at different levels:

- The firm or the establishment;
- The sector;
- The region;
- On a national scale;
- For some issues an international scale (EU, ILO).

In practice, there is often an overlap between negotiations occurring at several levels, with or without (much) explicit or implicit coordination.

Furthermore, in some countries the government intervenes in the bargaining process setting legal minimum wages, fixing wage growth norms, freezing wage levels during a period of time, and the like.

Union goals

Do unions maximize an objective function?

This is an old debate.

• Dunlop (1944) answered yes:

"... Logical models of trade unions are as indispensable to analytical economics as the theory of the conditions under which an enterprise maximizes profits" (p.32) On this basis, several objective functions for the union have been

advocated. For example, the wage bill.

 Ross (1948) answered no: "Of all participants in economic life, the trade union is probably least suited to purely economic analysis" (p.7)

... "The central objective of the union must be defined as institutional survival and growth." (p. 18)

"The union leadership (...) must reconcile conflicting interests among union members." (Pencavel, 1991, p. 56)

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Union goals

Do unions maximize an objective function?

Currently, there are 3 views:

- The dominant one assumes that unions maximize an objective function. Developed by CCZ and in the next slides.
- The most important alternative assumes:
 (i) Union members have heterogeneous preference over, say, the wage and
 (ii) Perfectly democratic union with heterogeneous members (choice through a vote).
- Union leadership has discretionary power and possible conflicts of objectives with the members.

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Union goals under view 1

- A union has a number N of *homogeneous* "members" (N = "the current size of the union". *Various interpretations*: Formal members, employed members, the whole labor force...).
- Each of the *N* members supply one unit of labor. The net real wage paid is denoted *w*.
- *L* of its members are employed.

So, loosely speaking, a standard objective function of a union writes:

$$\mathcal{V} = \mathcal{V}\left(\underset{\oplus}{\mathbf{w}}, \underset{\oplus}{\mathbf{L}}, \mathbf{N}\right) \tag{1}$$

Generalization to heterogeneous workers, endogenous working time, job amenities = possible.

Notice the *instrumental perspective*: unions care about (w, L, N).

⇒ "Fair treatment/workers dignity" not distinct from (w, L, N)? Unions have no "political objectives"?

Theoretical Analyses of Collective Bargaining

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Key Choice

The assumptions made about the functioning of the labor market affect the impacts of collective bargaining [CB]:

- Standard assumption: The labor market would be perfectly competitive in the absence of CB. Then, often, unionization can only push wages upwards and/or profits and employment downwards.
 - = "Orthodox theory of CB"
- Alternative assumptions:
 - Search and matching frictions.
 - Falch and Strom (2007) assume a (non-discriminating) monopsony (in partial equilibrium) in the absence of unions.
 - More generally, in the absence of unions, firms could have some monopsony power.
 - Asymmetric information.

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Brief introduction to Bargaining Theory

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Bargaining theory under complete information

References: Rubinstein (1982); Chapter 16 of Osborne (2004); CCZ p. 415-422.

Relatively standard: The *Axiomatic Approach* of Nash (see e.g. CCZ p. 415-416). Note: Kalai and Smorodinsky (1975) offer an alternative.

Less well-known: The *Strategic approach*: Main assumptions:

- Infinite horizon.
- Two impatient players who have to share a time-invariant "pie".
- Two rational players informed about each other's preferences.
- On even dates, player 1 proposes a partition which player 2 accepts or refuses. On odd dates, player 2 has the initiative.
- Subgame perfect equilibria. Both players with discount factor < 1 agree on a partition of the "pie" at the outset of the game.

Bargaining theory in a nutshell

Let r_U and r_{Π} be the discount rate resp. of the union and the firm owner \Rightarrow the "bargaining power of the union" is defined as

$$\gamma = \frac{r_{\Pi}}{r_U + r_{\Pi}}$$

If $r_U \rightarrow 0$, then $\gamma \rightarrow 1$. As r_U/r_{Π} increases, $\gamma \rightarrow 0$. Impatience reduces the bargaining power and conversely.

Let

- $\Pi = \Pi(w)$ be the profit function.
- Π is a "reservation level of profit" (e.g. the firm fires all the workers and recruit other ones or the firm shuts down and relocate in another region). Π = firm's "outside option". Similarly, w is the worker's "outside option".

• (10) • (10)

Bargaining theory in a nutshell

 Denote V₀ and Π₀ are the respective levels of the objective functions reached *during the negotiation* in case of an interruption (a strike or other action like work-to-rule, go-slow). Called "inside options".

Under certain conditions, the solution to the Rubinstein bargaining game converges to the following generalized Nash solution:

$$\max_{w} \left(\mathcal{V} - \mathcal{V}_{0} \right)^{\gamma} \left(\Pi - \Pi_{0} \right)^{1 - \gamma}$$

s.to
$$w \geq \overline{w}$$
 and $\Pi \geq \overline{\Pi}$

 $(\mathcal{V}, \Pi_0, \overline{w} \text{ and } \Pi \text{ being taken as given}).$

(2)

The Labor Market Would be Perfectly Competitive In the Absence of Unions

An analysis building upon Cahuc, Carcillo and Zylberberg (2014)

A specific union goal

Main assumptions in the book of CCZ = Cahuc, Carcillo and Zylberberg (2014)

In a static setting,

- The union cares *only* for an *exogenous* number *N* of (typically) *homogeneous* "members".
- All union "members" have the same exogenous reservation wage w called the "outside option".
- Hence, the labor supply of union members is flat for any $w \ge \overline{w}$ and becomes vertical when L = N.

Assuming (above) that the union is endowed with a given objective function $\mathcal{V}(w, L, N)$ is not in accordance with *Methodological Individualism*. The next slide avoids this shortcoming.

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A specific union goal

This union's objective function $\mathcal{V}(w, L, N)$ is the expected utility of a member.

Assuming an *equal treatment* of all "members" if employment falls short of the size of the union (i.e. if L < N): (CCZ p. 427)

$$\mathcal{V} = \ell \cdot \mathbf{v}(\mathbf{w}) + (1 - \ell) \cdot \mathbf{v}(\overline{\mathbf{w}}), \text{ where } \ell = \min(1, L/N)$$
 (3)

where v(w) designates the level of utility. The latter is increasing and concave (risk aversion). At the individual level, the *uncertainty* comes from the risk of being laid-off if L < N.

Indifference curves of the union or iso-utility of the union:

 $\mathcal{V} = \text{constant}$

They have the following shape:

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Theory

Indifference curves of the union



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Assumptions about $\mathcal{V} - \mathcal{V}_0$

Let w_0 be the net income of a worker during a strike (without resorting to outside opportunities). Remembering the union's objective (3),

$$\mathcal{V} - \mathcal{V}_0 = \begin{cases} (L/N)[v(w) - v(\overline{w})] + [v(\overline{w}) - v(w_0)] & \text{if } L < N \\ v(w) - v(w_0) & \text{if } L \ge N \end{cases}$$
(4)

To simplify expressions, CCZ, as many authors, assume that $w_0 = \overline{w}$.

Is it a sensible assumption? Few data on strike payments!

 \Rightarrow Difficult question.

Keeping $w_0 \neq \overline{w}$ would complicate formulas without gaining much insight.

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Assumptions about $\Pi - \Pi_0$

Consider a single-input firm² with a *deterministic* revenue function

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R(L) with R' > 0, R'' < 0.
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The (real) profit function is then simply a function of the endogenous pair (w, L):

$$\Pi(w,L)=R(L)-w\cdot L$$

CCZ assume $\Pi_0 = 0$ (no production and no fixed cost). So, implicitly, no replacement workers³.

²Union models where firms have more than one input are considered e.g. by Manning (1994), Booth (1995) p. 61-63, CCZ p. 445, Van der Linden (2002). ³Krueger and Mas (2004) argue that Firestone's decision to hire replacement workers during a strike led to a serious loss in product quality. Mas (2008) provides evidence that Π_0 could be < 0 if there is a labor dispute.

A static right-to-manage model in PARTIAL equilibrium: one firm-one union setting

Main assumptions:

- 1. Perfect information about union's preferences, the profit function, the "outside options",...
- 2. The firm has to bargain with the (unique recognized) union:
 - This can be imposed by law (as in many countries of Western Continental Europe).
 - In the anglo-saxon countries, this setting is called "closed shops" or "union shops", whereby a new employee has to join the local union within a certain period of time after hiring (OECD, Employment outlook, 2004). Less and less observed...
 - In the U.S., "if a majority of workers vote in favor of the union, the law required the management to bargain in 'good faith' with the recognized union" (DiNardo and Lee, 2004, p. 1385).

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Main assumptions

Continued

 The "right-to-manage" ["RtoM"] means: "The union and the firm bargain over w knowing that, conditional on w, the firm chooses the level of employment L that maximizes profits" (The timing matters: L is chosen after w!).

Theory

$$\max_{L} \Pi(w,L) \equiv R(L) - wL$$

From the F.O.C. of this problem, $\forall w, L$ is necessarily found along the *labor demand curve* $L^{d}(w)$:

F.O.C.
$$R'(L) - w = 0 \Rightarrow L^d(w) = R'^{-1}(w).$$

- 4. At $w = \overline{w}$, the profit level is positive (\exists an unexplained rent to be shared!).
- 5. Bargaining over the *real* wage... Unusual? See an exercise about bargaining over the *nominal* wage.

Iso-profit function

The shape of an iso-profit curve $\Pi(w, L) = \text{constant}$ in a (L, w) space is obtained by totally differentiating this equality:

Theory

$$(R'(L) - w) \cdot dL - L \cdot dw = 0$$
 or

$$\frac{dw}{dL} = \frac{R'(L) - w}{L} \tag{5}$$

whose sign is the one of R'(L) - w.

Hence, the iso-profit function is flat along the labor demand curve, upward-sloping on its left, downward-sloping on its right.

Iso-profit curves



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The bargaining problem

We assume $L \le N$. The case where L > N is allowed is treated by CCZ. At a given *union's bargaining power* $0 \le \gamma \le 1$, the maximization

$$\max_{w} \left(\mathcal{V} - \mathcal{V}_{0} \right)^{\gamma} \left(\Pi - \Pi_{0} \right)^{1 - \gamma}$$
s.to $w \ge \overline{w}$ and $L^{d} \le N$

(6)

becomes under (3) and the assumption $w_0 = \overline{w}$:

$$\max_{w} \left[L^{d}(w) / N \right]^{\gamma} \left[v(w) - v(\overline{w}) \right]^{\gamma} \left[\Pi(w) \right]^{1-\gamma}$$
(7)
s. to $L^{d} \leq N, w \geq \overline{w}$

where $\Pi(w)$ the profit function if $L = L^d(w)$, i.e. $\Pi(w) \equiv \Pi(w, L^d(w)) = R(L^d(w)) - w \cdot L^d(w)$. CCZ search for an interior solution to (7). It is easy to take account of the "outside option" constraint $\Pi \ge \overline{\Pi}$.

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Consider an interior solution to Problem (7). The F.O.C. is an implicit equation in w (see CCZ for the proof) :

Theory

$$\frac{\nu(w) - \nu(\overline{w})}{w\nu'(w)} = \mu \equiv \frac{\gamma}{\gamma \eta_w^L(w) + (1 - \gamma)\eta_w^\Pi(w)}$$
(8)

where $\eta_w^L(w) = -(w/L^d(w))(dL^d(w)/dw) > 0$ and $\eta_w^\Pi(w) = -(w/\Pi(w))(d\Pi(w)/dw) = wL^d(w)/(R(L^d(w)) - wL^d(w)) > 0$

- Shocks to $R(\cdot)$ affect w if η_w^L or η_w^Π vary. Real rigidity is not general.
- If $\gamma > 0$, then $w > \overline{w}$, $\Rightarrow \mu$ is a *mark-up*. $\frac{\partial \mu}{\partial \gamma} > 0$
- The higher η_w^L or η_w^Π , the lower μ . Intuition?
- Sufficient conditions: $\mu < 1, \frac{\partial \eta_{w}^{\mu}(w)}{\partial w} \ge 0, \frac{\partial \eta_{w}^{\Pi}(w)}{\partial w} \ge 0.$
- The "Monopoly Union" is the particular case $\gamma = 1$.

RToM case

Graphical summary



2

Approximation and wage rigidity

<u>Taylor expansion of order 1</u> of v(w) implies $\frac{v(w)-v(\overline{w})}{wv'(w)} \approx 1 - \frac{\overline{w}}{\overline{w}}$. So,

$$w pprox rac{\overline{w}}{1-\mu} > \overline{w} \quad ext{if } \gamma > 0$$

Particular case leading to totally rigid real wages:

Let $v(w) = \frac{w^{\sigma}}{\sigma}, \sigma \le 1, \sigma \ne 0$. Relative risk aversion $\equiv \frac{-w \cdot v''(w)}{v'(w)} = 1 - \sigma \ge 0$ (constant)

So,

$$\frac{v(w) - v(\overline{w})}{wv'(w)} = \frac{1}{\sigma} \left[1 - \left(\frac{\overline{w}}{w} \right)^{\sigma} \right]$$

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Particular case with real wage rigidity

Assuming also an iso-elastic revenue function $R(L) = A \cdot L^{\alpha}, A > 0, \alpha \in]0, 1[$

$$\Rightarrow \eta_w^L = 1/(1-\alpha)$$
 and $\eta_w^\Pi = \alpha/(1-\alpha)$, independent of A and w!

$$\Rightarrow \mu = \frac{\gamma(1-\alpha)}{\gamma+\alpha(1-\gamma)}, \text{ hence } \mu \in]0,1[\text{ if } \gamma > 0]$$

Then, Equation (8) becomes (check!):

$$w = \frac{\overline{w}}{\left[1 - \sigma \cdot \mu\right]^{1/\sigma}}, \text{ with } \frac{\partial w}{\partial \overline{w}} > 0, \ \frac{\partial w}{\partial \mu} > 0$$
(9)

and real wages are fully rigid (i.e. not affected by multiplicative shocks on *A*).

(日)

The Efficiency cost of Unions

Booth (1995) p. 60-01 and graph on next slide

Imagine an economy made of two firms using homogeneous (and mobile) labor only. Their revenue function is R(L) as above. Let *total* labor supply be exogenously fixed at 2 *N*.

Initially, in the absence of unions, it is assumed that the market clearing wage, w_c , prevails: $L_{1c} + L_{2c} = 2 N$.

Suppose now that a trade union is formed in firm 1 *only* with bargaining power $\gamma_1 > 0$. If some workers of firm 1 become redundant their outside option is $\overline{w} = w_c$. The RtoM wage $w_1 > \overline{w}$ and $L_1 < L_{1c}$. This is in a nutshell the above partial equilibrium story.

Redundant workers supply labor to firm 2 in which the wage clearing the labor market (w_2 on the graph) would now be below w_c .

The introduction of the union in firm 1 leads to an efficiency loss and to wage inequality. Aggregate labor income may increase or decrease.

The Efficiency cost of Unions



Figure: Final consequences of Firm 1 becoming unionized. Source: Booth (1995) p. 60-01.

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Extensions and Alternatives

Still assuming that the labor market would be perfectly competitive in the absence of unions,

• The RtoM solution is not Pareto Efficient in the sense that another allocation (*w*, *L*) could rise the objective of the union without deteriorating profits or the other way around.

 \Rightarrow Several alternatives exist (still in partial equilibrium) yielding efficient allocations (see CCZ p. 435-8).

• The above partial-equilibrium analyses have been put in a general equilibrium framework (with imperfect competition on the goods market) by e.g. Blanchard and Giavazzi (2003).

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A Labor Market Characterized by Search & Matching Frictions

Analysis Building Upon Krusell and Rudanko (2016) (Not in CCZ)

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Main assumptions

• A fully unionized economy (i.e. coverage = 100%).

Theory

- A labor market with random matching (CRS).
- Fully rational centralized union taking the implications of wage demands on labor demand.
- A single input : Homogeneous labor. A unique produced good. CRS in production: Each employee produces *y* units.
- In most of the slides, equal treatment of all workers (same wage w_t and same probability of job loss for all).
- A continuum of measure 1 of workers (supplying 1 unit of labor) and a continuum of measure 1 of identical capitalists. Both are risk neutral and discount the future with a discount factor β < 1.
- Jobless people produce z < y units of the good (e.g. home production).
- No disutility of labor.

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Timing of decisions

Discrete time framework. Infinite horizon. In each period $t \ge 0$,

Theory

- An initial level of employees L_t.
- A monopoly union sets the current wage w_t.
- Solution Capitalists open vacancies at unit cost h (their number is v_t).
- The matching process takes place.
- Production takes place.
- Workers and firms separate at an exogenous rate q.
- Period t ends.

Here the wage is chosen before the opening of vacancies (very different from an individual ex-post Nash bargaining)!

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- The matching process is fully standard. If 1 L people are jobless, let tightness $\theta \equiv v/(1 L)$, the probability of filling a vacancy is $m(\theta) \in [0, 1[, m' < 0 \text{ and an unemployed meets a vacancy with probability <math>p(\theta) \equiv \theta m(\theta) \in [0, 1[, p' > 0.$
- The law of motion of employment is

$$L_{t+1} = (1 - q) (L_t + p(\theta_t)(1 - L_t))$$

Free entry *in each period* leads to the "vacancy-supply" (or *labor demand*) relating the current level of tightness θ_t to the whole stream of wages {w_{t+s}}_{s=0}[∞]:

$$h = m(heta_t) \sum_{s=0}^{+\infty} \beta^s (1-q)^s (y-w_{t+s}) \quad \forall t \ge 0$$

This equality implicitly assumes that all matches are formed, i.e. all wages are below y and above z (hence, no quits). For vacancy creation to be optimal, one needs that the above sum be > h.

The objective of the union \mathcal{V} (generalization of what Krusell and Rudanko, 2016, assume) expressed in t = 0 =

Theory

The weighted welfare (= income) of all workers (since full coverage):

$$\mathcal{V} \equiv \sum_{t=0}^{\infty} \left[\alpha L_t w_t^i + \alpha^{\boldsymbol{u}} (\boldsymbol{p}(\theta_t)(1 - L_t) w_t^{\boldsymbol{\theta}} + (1 - \boldsymbol{p}(\theta_t))(1 - L_t) \boldsymbol{z}) \right] \quad (10)$$

where,

- α (resp., α^u) is the weight given to those employed (resp. unemployed) at the start of the period.
- *wⁱ* (resp, *w^e*) is the wage of the "insiders" [superscript *i*] (resp, the "entrants" [superscript *e*]). Under equal treatment,

$$w^i = w^e = w.$$

This is later called the *egalitarian union* case.

A Labor Market Characterized by Search & Matching Frictions

A Static Framework

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A one-period Model

Under equal treatment $w^i = w^e = w$

We get rid of the time index. E.g., the free-entry condition writes $h = m(\theta)(y - w)$ with $y > w \ge z$.

There is an exogenous initial level L < 1 of employed workers.

We will consider various settings:

- The choice of a social planner (caring about efficiency only).
- **2** A Monopoly Union caring only about unemployed workers $(\alpha = 0, \alpha^u = 1)$.
- S A Monopoly Union caring equally about employed and unemployed people ($\alpha = \alpha^u = 1$) + what happens if the union is no more egalitarian?

The Efficient Allocation

The objective of the social planner is the social output:

$$\omega \equiv (L + p(\theta)(1 - L)) y + (1 - p(\theta))(1 - L)z - h\theta(1 - L)$$
(11)

The planner maximizes ω with respect to θ given L.

The first-order condition is:

$$p'(\theta)(y-z) = h$$
(12)

This condition pinpoints the efficient level of tightness, say θ^{eff} . It is independent of *L*.

In a decentralized economy, which level of the wage would lead to an efficient allocation? See next slide.

The Efficient Allocation

The wage level

The planner does not care over wages. However, knowing θ^{eff} , one can compute the corresponding wage (along the labor demand curve):

$$w^{eff} = y - \frac{h}{m(\theta^{eff})} < y.$$

It can be checked that (12) guarantees that $w^{eff} \ge z$.

In addition since

$$p'(\theta) = m(\theta) + \theta m'(\theta) = m(\theta)[1 - \eta]$$

where

$$\eta \equiv -rac{ heta m'(heta)}{m(heta)} \quad ext{with} \quad 0 < \eta < 1,$$

Then, (12) and the labor demand curve imply that

$$w^{\text{eff}} = \eta \cdot y + (1 - \eta) Z.$$

A Monopoly Union Caring Only about the Unemployed Case not covered by Krusell and Rudanko (2016)

Consider a centralized monopoly union that *only* cares about the well-being of those who are unemployed at the start of the period.

The monopoly union is free to choose the wage knowing that tightness will be fixed by the labor demand curve.

The union's problem writes:

$$\max_{w,\theta} \quad \mathcal{V} = p(\theta)(1-L)w + (1-p(\theta))(1-L)z$$

subject to $h = m(\theta)(y-w) \Leftrightarrow w = y - \frac{h}{m(\theta)}$,

under the assumption that $w \ge z$.

A Monopoly Union Caring Only about the Unemployed

Theory

Or, by substituting the constraint,

$$\max_{\theta} \quad p(\theta)(1-L)\left(y-\frac{h}{m(\theta)}\right) + (1-p(\theta))(1-L)z$$

$$\Leftrightarrow \max_{\theta} \quad p(\theta)(1-L)y + (1-p(\theta))(1-L)z - h\theta(1-L) = \omega - Ly$$

So, a union endowed with this objective function does not maximize social output.

However, as L y is a constant, the chosen level of tightness is θ^{eff} . With this objective function, the replacement of individual bargaining by collective bargain leads to efficiency!

This result is due to Pissarides (1986). See also CCZ p. 605-6.

An Egalitarian Monopoly Union

The allocation is no more efficient if the union has a more "standard" objective.

Consider a monopoly union caring equally about all workers:

$$\max_{\substack{w,\theta}} \quad \mathcal{V} = L w + p(\theta)(1 - L)w + (1 - p(\theta))(1 - L)z \quad (14)$$

subject to $w = y - \frac{h}{m(\theta)}$

FOC:

$$p'(\theta)(y-z) = h - \frac{L}{1-L} \frac{h m'(\theta)}{m(\theta)^2} > h \quad \text{if } L > 0$$

whose solution $\theta^M < \theta^{eff}$ (as illustrated on the next slide). Hence w > z.

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Illustration of the efficient and monopoly union solution

Theory



Figure: Efficient and Monopoly Union Allocation

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Abandoning Equal Treatment

Lindbeck and Snower (1988) introduced the idea that wages are set by "insiders" (= incumbent workers) who do not care about those outside the firm (the "outsiders"). This idea was influential (CCZ p. 443-5). If in our context the monopoly union abandons the equal treatment of the employed at the start of the period (the "insiders") and of the newcomers in the fim ("entrants"), the union's problem becomes:

$$\max_{w^{i},w^{e},\theta} \quad \mathcal{V} = L \, w^{i} + p(\theta)(1-L)w^{e} + (1-p(\theta))(1-L)z$$

subject to $w^{e} = y - \frac{h}{m(\theta)}, \ w^{i} \le y$

The first-order conditions are:

$$w^{i} = y$$
 $p'(\theta)(y - z) = h \Rightarrow \theta = \theta^{eff}!$ (15)

We are back to efficiency but identical workers are paid differently ("tenure premium" or, actually, discrimination).

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A Labor Market Characterized by Search & Matching Frictions

A Dynamic Framework

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Inter-temporal setting

Summary of Krusell and Rudanko (2016)

In an infinite horizon setting, Krusell and Rudanko (2016) consider first the case where the (monopoly) *egalitarian union fully commits to future wages*.

Theory

That is: At t = 0, the union chooses a sequence of wages $\{w_t\}_{t=0}^{\infty}$ subject to the labor demand curve (free entry) and the law of motion in each period (see slide 48). Then,

The monopoly union "attains an efficient level of unemployment in the long run. In the short run, however, unemployment is inefficiently high because the union uses its market power to raise current wages above the efficient level to extract rents from firms with preexisting matches. Specifically, labor market tightness is shown to be inefficiently low in the initial period but efficient from then on." (p.36)

 \Rightarrow A time inconsistency issue arises.

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Summary of Krusell and Rudanko (2016)

"What would happen if the [monopoly] union did not have commitment to future wages? What effects would it have on the labor market? The paper answers this question by analyzing differentiable Markov perfect equilibria. In a calibrated model,⁴ the presence of the [monopoly] union raises wages by 11%, consequently raising unemployment from 5% to 16%, and reducing output by 12%, relative to efficient outcomes." (p.36)

In my opinion, the impact of the wage increase on the unemployment rate looks however too large to be reasonable.

Miscellaneous Theoretical Contributions

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At which level should CB take place?

• Collective bargaining [CB] can be organized at various levels: The firm/establishment, the sector,...

This has lead to a literature about the right degree of centralization of bargaining, suggesting that the intermediate case is the worst one.

"Large and all-encompassing trade unions naturally recognize their market power and take into account both the inflationary and unemployment effects of wage increases. Conversely, unions operating at the individual firm or plant level have very limited market power. In intermediate cases, unions can exert some market power but are led to ignore the macroeconomic implications of their actions." Calmfors and Driffill (1988)

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As the bargaining becomes more centralized, a range of *externalities* can be internalized. For example:

- A wage increase in a given firm or sector affects the output prices and hence the consumer price of everybody.
- If rises in wages create employment losses, the induced additional costs (unemployment benefits, public support to find another job,...) are a cost for the whole society.
- If workers represented by unions compare their wage gains/levels to those of workers in other firms or sector, there is an envy effect which leads to inefficient wage increases when the wage is bargained over at the decentralized level (see e.g. de la Croix, 1994).

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So, the internalization of externalities argument should lead to *centralized* bargaining.

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However, as the CB level moves up

- It becomes very difficult to collect the right information about the preferences and the specific economic situation at the local level
 - \Rightarrow At the central (often, country) level an observed tendency
 - To decide over wage changes across the board (not necessarily suited at the firm level) or
 - To negotiate only specific questions at the centralized level (e.g. over nationwide minimum wages).
- The question of the right set-up of bargaining institutions
 - Has been studied during the nineties (see e.g. Calmfors, 1993, and Teulings and Hartog, 1998)
 - And is still studied (see e.g. Jimeno and Thomas, 2013 or Cai, Gautier, Teulings and Watanabe, 2014, in the search and matching framework). Their conclusion: the intermediate level of bargaining is typically the worst case. But see Briskar (2021).

Asymmetric information

Up to know, information is

- Either perfect or "complete" (when pure competition prevails in the absence of unions)
- Or incomplete but symmetric (in the presence of search-matching frictions).
- At the stage of the wage bargain, information has been assumed to be perfect.

The threat of a disagreement is important but an agreement is found *instantaneously*. Why would the player wait in the presence of discounting, and lose production and earnings in case of a strike?

An implication of this is that strikes are nonsense. However, strikes are part of reality...

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Why are there strikes?

1. Asymmetric information

Asymmetric information with standard preferences (see Kennan, 1986, and Kennan and Wilson, 1993, for surveys):

Example:

Firm's profit function unobserved by the union.

The forgone profit during a strike is higher the larger the firm's gain if production takes place.

The willingness of a firm to endure a strike serves as a *signal* of lower profits and this allows a lower wage agreement to be reached.

Corollary: Under asymmetric information, bargaining over wages can take time and resources. Then, CB can be preferred to individual bargaining to the extent that it reduces negotiation costs.

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Why are there strikes?

2. Other ways of making sense of strikes

- Workers' irrational behavior or bounded rationality leading to miscalculations (Hicks, 1963).
- Ooing beyond the "instrumental perspective":

"Revolt takes many forms. Sometimes it stems from desperation; there is nothing to lose. Sometimes it stems from a dying moment, when the tide of history is drowning the losers, when just standing up is an act of defiance. The miners' strike in Britain in 1984 was like that. It was resistance against loss of a way of labouring that had turned adversity into a community of shared identity." (Standing, 2016).

See also Akerlof and Kranton (2010).

Many other mechanisms have been proposed. See the survey of Chun, Schaller and Skaperdas (2020).

Workers' Voice

Under asymmetric information,

- Workers have a hard time getting information about the economic situation of their firm;
- Workers' turnover can be costly. Employers ignore which worker is dissatisfied and intends to quit. Individual workers are unlikely to reveal their dissatisfaction and their preferences.

In response to that

- A union (or a Works council) may monitor the firm's performance and provide this information in a cheap way.
- More generally information about labor contracts and workplace characteristics is a kind of public good. The revelation of preferences for public goods is a well-known problem. A union can help dealing with this.
- Workers prefer to appoint a representative to express their preferences and dissatisfactions. And firms can value this because of turnover costs. See Hirschman (1970).

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Empirical Evidence about Collective Bargaining

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Main message of empirical research:

Let "bargaining status" mean

- Unionized vs non-unionized worker (US, UK,...),
- Firms or workers covered by collective agreements or not (Western Europe),
- Centralized vs decentralized bargaining, or ...

Main message of CCZ:

- Hard to find clear-cut conclusions about the effects of "bargaining status".
- Only few papers produce convincing evidence about the causal effect of unionization. Examples below.

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Why?

- Selectivity: Confound "bargaining status" with relevant
 - unobserved worker characteristics;
 - unobserved firm-level characteristics;

E.g.: If unions \Rightarrow wage compression, less productive workers might unionize. Note that employers might also be induced to pick the best workers even more than usual.

The "bargaining status" is an endogenous variable.
E.g.: Being or not a union member is related to the wage hikes⁵ a union may obtain.

⁵More generally, the advantages provided by the union to its members. **ESL (UCLouvain)** 72/105
Convincing Empirical Evidence With an emphasis on wage effects

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Impact on wages

Common wisdom (Anglo-Saxon countries): Unionized workers earn higher wages than similar non-unionized ones (e.g. Bryson, 2014).

However, there is no consensus. According to Frandsen (2021), "Studies using large worker-level datasets have consistently found large union wage premia (...). Studies using establishment-level data, however, have typically found small-to-nil effects."

Yet, is this evidence causal?

It is very hard to believe that the a change in "bargaining status" is purely random. E.g: A random move of a worker from the nonunion sector to the union sector = doubtful.

Very few papers have been able

- To find a quasi-random allocation of the "bargaining status" in the real world;
- Or convincing instruments.

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Impact on wages: Common wisdom challenged With establishment data

DiNardo and Lee (2004) were the first who exploited the specificity of US rules concerning union recognition:

- At the initiative of a group of employees (helped by a labor union), employees' signatures expressing a desire for union representation are collected and submitted to the National Labor Relations Board (NLRB).
- Under certain conditions, the NLRB holds a *secret-ballot* election at the work site.
- A simple majority (50% plus one vote) is required to recognize the union in a *given* firm.
- Then the union becomes "the exclusive bargaining agent for the unit, and the employer is obligated to negotiate 'in good faith' with that union." (p.1389; see this page for more details)

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Regression-Discontinuity Designs (RDD)

Formal treatment

Let

- *y* = the outcome of interest in each firm (e.g. the average wage);
- D = 1 if the union is recognized (otherwise D = 0);
- \mathbb{V} = the pro-union vote share in the election: "assignment var.";
- X = observable predetermined characteristics determining V and y;
- ε and u are unobservable determinants;
- $\beta =$ the parameter of interest.

$$y = \mathbf{X}\gamma + D\beta + \varepsilon$$
(16)

$$D = \begin{cases} 1 & \text{if } \mathbb{V} > 1/2 \text{ (cutoff value)} \\ 0 & \text{otherwise} \end{cases}$$
(17)

$$\mathbb{V} = \mathbf{X}\delta + u$$
(18)

Identifying assumptions

OLS essentially computes

$$\mathbb{E}\left[\textit{y} \mid \textit{\textbf{X}}=\textit{\textbf{x}}, \mathbb{V} > 0.5
ight] - \mathbb{E}\left[\textit{y} \mid \textit{\textbf{X}}=\textit{\textbf{x}}, \mathbb{V} \leq 0.5
ight]$$

which is biased if ε and u are correlated so that

$$\mathbb{E}\left[arepsilon \mid \mathbb{V} > 0.5
ight] - \mathbb{E}\left[arepsilon \mid \mathbb{V} \leq 0.5
ight]
eq 0$$

Identifying assumptions for RDD:

- There is some ex ante uncertainty in the vote share (*u*).
- **②** The density of *u* (and hence of \mathbb{V}) conditional on **X** and ε is continuous (at the threshold $\mathbb{V} = 0.5$)

Then (by Bayes rule), the density of $(\mathbf{X}, \varepsilon)$ conditional on \mathbb{V} is continuous at $\mathbb{V} = 0.5$.

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Consequently, it can be shown that

$$\lim_{\Delta \to 0^+} \left[\mathbb{E} \left(y | \mathbb{V} = 0.5 + \Delta \right) - \mathbb{E} \left(y | \mathbb{V} = 0.5 - \Delta \right) \right] = \beta$$
(19)

Internal validity: If the relation between **X** and the vote share is discontinuous (around $\mathbb{V} = 0.5$), the assumptions are not valid.

Two ways of presenting RDD evidence:

- Graphical plots of E (y|V) and E (X|V) as a function of vote share categories ("bins");
- 2 Approximating $\mathbb{E}(y|\mathbb{V})$ and $\mathbb{E}(\mathbf{X}|\mathbb{V})$ by flexible polynomials with an intercept shift at $\mathbb{V} = 0.5$ and estimating the parameters.

Here, only the first approach is considered and I only look at $\mathbb{E}(y|\mathbb{V})$.

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Evidence in the manufacturing industry

Unit of observation = a manufacturing establishment. Period of observation: 1984-2001.

First, DiNardo and Lee (2004) report evidence that barely winning an election has a lasting impact on legal recognition of the union:

- Almost no recognition (neither immediately, nor in the coming years) when $\mathbb{V}\leq 0.5;$
- Almost always a (rapid) recognition when $\mathbb{V} > 0.5$. (MORE).

Second, they provide evidence on the impact of recognition on wages:

- Solid circles = the means of the hourly wage by union vote share category for establishment-year observations in the years that follow the election;
- Open circles = the same but before the year of the election ("placebo test");
- Solid triangles = the means of post-election wage deviated from the establishment-specific mean during years before the election.



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Recognition, Subsequent Certification or Decertification, by Union Vote Share.

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In the paper

- There are many robustness checks.
- Some other outcomes are also considered (example below).

Interpretation:Small effects that cannot be of

- Small effects that cannot be detected by their research design; However, applying the same methodology in the context of nursing homes Sojouner, Frandsen, Town, Grabowski and Chen (2015) conclude that "unionization appears to raise wages for a given worker." (abstract);
- The effect of union recognition is truly non significantly different from zero. The authors argue that this is the right interpretation.

Open issues

- Here, the measured effect is identified at the 50% threshold.
- What if the union is recognized with a much higher share of votes ("stronger unions")?

Conclusions of DiNardo and Lee (2004) challenged...

...By Frandsen (2021) who has access to matched employer-employee data.

"Close union elections exhibit substantial nonrandom selection or manipulation. Estimates accounting for this selection show that unionization substantially <u>decreases</u> payroll, employment, average worker earnings, and establishment survival. Payroll and earnings decreases are driven by composition changes, with older and higher paid workers leaving unionizing establishments and younger workers joining or staying. Worker-level effects on earnings are small (...)."

More precisely: "Little impact on average earnings for workers who stayed".

Beyond the critique of the identification strategy of DiNardo and Lee (2004), Frandsen (2021) puts emphasis on compositional changes in firms induced by unionization.

Causal evidence in Europe?

1) Barth, Bryson and Dale-Olsen (2020)

European institutions and rules are so different form those in the US! Even harder to define a convincing counterfactual. Yet, Barth, Bryson and Dale-Olsen (2020) provide an instrumental approach.

Their paper is about Norway where

- 78 % of all employees work in plants with local collective bargaining. Centralized and sectoral bargaining are also influential.
- Half of all private employees are members of a union.
- A union member pays a membership fee. In 2012, the *average* fee *F* amounted to \approx \$890/year. Union membership is subsidised in Norway as a <u>deduction</u> on taxable income. Let *S* denote the amount of the subsidy = 28% of the <u>deductible amount</u>. The subsidy ratio is defined as *S*/(*F S*).

Empirical evidence



Figure: The Subsidy Ratio among Union Members in different parts of the Wage Distribution (Barth, Bryson and Dale-Olsen, 2020)

Note: Changes occurred because the deductible amount varied.

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Instrument

"No explicit pronouncements are made as to why the tax subsidy [i.e., the deductible amount] changes, but it is linked to changes in political power in Norway." (p. 1907) \leftrightarrow left-wing or right-wing majority.

"A 10 percentage point increase in the subsidy ratio yields a 1.08 percentage point increase in the probability of union membership. Additional controls for demography, income and unobserved worker and job heterogeneity increase the size of the subsidy effect even further." (p. 1912)

The government subsidy is not the main reason why workers unionize. So whose decision is affected? According to the paper:

- Employees at smaller and medium-sized firms;
- Also among employees who are younger, male, immigrants and more highly paid.

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The method

- Firm-level outcomes (productivity and wages) are regressed on among other things the firm- and time-specific union density D_{it}, with index *i* designating the firm and t ∈ {2001, ..., 2012}.
- The changes in the tax treatment of fees are exogenous to the firm and induces exogenous variation in union density.
- However,
 - The membership fee is worker-specific ⇒ A firm average could be affected by compositional changes ⇒ The average union membership fee is the one of the first year ⇒ The instrument is

$$\frac{S_t}{F_{i,2001}-S_t}.$$

• Their tax data contain annual union status and fees. However, there is no fee for non-members. They create about 7,000 workers cells (sector x occupation), compute the average union fee for each cell and associate this average to each worker.

Impact on firms' average wages

- Using data on all employed workers in Norway during the period 2001-2012, they first regress the individual log hourly wage on year dummies (10), worker vigintile age dummies (19), worker fixed effects.
- For each year, the dependent variable is the firm average of the residuals from the regressions in step 1.
- This dependent variable is finally regressed on union density and a number of controls, using OLS, a fixed-effect estimator and IV.
- Main message with IV: "a 1 percentage point increase in density increases wages by about 1.0 - 1.5%, depending on the model specification. (...) the instrument for union density in most specifications passes the standard tests for a weak instrument."

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Causal evidence in Europe?

2) Jäger, Schoefer and Heining (2021)

- German "codetermination" (or shared governance):
 - German supervisory board "responsible for the selection,(...), compensation structuring, and dismissal of the executive board" (p. 675) & is involved in fundamental decisions;
 - p. 678 : Since the 1950's, in stock corporations (only!) workers elect at least one-third of the seats of the supervisory board in firms with more than 500 employees.
 - In August 1994, this rule was "abruptly abolished (...) for newly incorporated stock corporations while preserving it in existing ones." (p. 678)
- Using firm-establishment-worker data (incl. financial and production data), they implement difference-in-differences and RDD approaches to conclude: "Worker representation on company boards does not appear to affect wage setting in detectable ways, such as by raising bargaining power". (p. 720)

Empirical Evidence on Miscellaneous outcome variables

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Effects on (un)employment

Direct estimations

♦ Direct estimations of a link

"Legislation influencing union power" \rightarrow employment" (e.g. Thatcher's reforms in the 1980s in the UK) lead to mixed results.

♦ Using a Regression Discontinuity Design (in the US),

- DiNardo and Lee (2004) conclude that union recognition has insignificant effects on employment.
- Sojouner, Frandsen, Town, Grabowski and Chen (2015) find significant negative effects on staffing levels⁶ in nursing homes.
- Frandsen (2021), quoted above, find substantial decreases in employment and establishment survival.

⁶The mean number of nursing hours per resident day.

Effects on (un)employment

Country panel analyses

- Sassanini and Duval (2009) (hereafter BD2009):
 - consider a panel of 20 OECD countries over the period 1982 -2003
 - study the relationship between the unemployment rate and a range of OECD harmonized indicators capturing in particular "labor market institutions".
 - Difficulty: How to address the potential endogeneity of those indicators? Is this approach able to identify causal effects?
 - Here I focus only on the basic specification and results. In the paper, they deal with interactions between "institutions" and so on.

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BD2009

Basic static specification:

$$U_{it} = \sum_{j} \beta_{j} \cdot X_{it}^{j} + \chi \cdot OG_{it} + \alpha_{i} + \lambda_{t} + \varepsilon_{it}, \quad i = 1, ..., 20, \quad t = 1982, ..., 2003$$
(20)

where

- *U_{it}* = standardized unemployment rate in % among the population aged 15-64;
- X_{it}^{j} = labor market indicator *j* in country *i* and year *t*;
- OG_{it} = The "output gap", i.e. the relative gap between observed GDP and potential GDP;⁷
- α_i country fixed-effect, λ_t time fixed-effect and ε_{it} the error term.

⁷Potential gross domestic product (GDP) is defined in the OECD's Economic Outlook publication as the level of output that an economy can produce at a constant inflation rate." (Source:

http://stats.oecd.org/glossary/detail.asp?ID=2094). => (=>) (

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Source: Bassanini and Duval (2006) and BD2009

On the labor market:

- "Replacement rate" = "average unemployment benefit replacement rate across two income situations (100% and 67% of APW (Average Production Worker) earnings), three family situations (single, with dependent spouse, with spouse in work) and three different unemployment durations (1st year, 2nd and 3rd years, and 4th and 5th years of unemployment)."
- The "*tax wedge*" expresses the sum of personal income tax and all social security contributions as a percentage of total labor cost for a single-earner couple with two children earning 100% of APW earnings.
- "Union density": Trade union density corresponds to the ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners (OECD)

Institutions X_{it}^{j} Sources: Bassanini and Duval (2006) and BD2009

On the labor market (C'ted):

- "EPL": OECD summary indicator of the stringency of Employment Protection Legislation.
- The "High corporatism" dummy variable takes value 1 when bargaining is centralised or co-ordinated and zero otherwise (OECD)

On the goods markets:

"PMR": "OECD summary indicator of regulatory impediments to product market competition in seven non-manufacturing industries.""

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	DEU-FIN-SWE 91-	without OG	with country	but substituting
	92,		specific OG	net for gross
	common OG,			replacement
	including fixed			rates
	effects, estimated by			
	OLS)			
Replacement rate	0.12	0.13	0.09	0.05
	[6.28]***	[5.78]***	[4.58]***	[3.73]***
Tax wedge	0.28	0.33	0.26	0.23
	[9.75]***	[9.20]***	[7.94]***	[7.45]***
Union density	-0.03	0.01	-0.01	-0.05
	[1.57]	[0.22]	[0.59]	[2.45]**
EPL	-0.31	-0.38	0.02	-0.81
	[0.98]	[0.95]	[0.05]	[2.50]**
PMR	0.60	0.69	0.59	0.51
	[2.98]***	[2.65]***	[2.74]***	[2.42]**
High corporatism	-1.42	-2.00	-1.42	-0.92
	[3.57]***	[4.22]***	[3.79]***	[2.35]**
Output gap	-0.48			-0.50
	[14.00]***			[13.06]***
Country effects	yes	yes	yes	yes
Country effects*OG	no	no	yes	no
Time dummies	yes	yes	yes	yes
Observations	434	434	434	367
R-squared	0.98	0.97	0.98	0.98

Table 1. Institutional determinants of unemployment (annual data 1982-2003)

Absolute value of robust t statistics in brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%. n.a.: not applicable. OG: output gap.

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Messages (significant effects):

- Positive correlation between the gross (net) replacement ratio and the unemployment rate;⁸
- Idem for the tax wedge;
- More competition on the goods market (i.e. lower PMR) is associated with lower unemployment;
- Corporatism" is negatively correlated with the unemployment rate;⁹

The effect of union density (as a proxy for union power) is often not significant! Either hard to find a detrimental effect of unions on the <u>unemployment rate or density</u> is a poor proxy of union power...

⁸"in Bassanini and Duval (2006) ... the positive impact of unemployment benefits on unemployment diminishes and can even collapse in countries that offset their detrimental effects through extensive active labor market policies." (BD2009)

⁹"Yet, this effect is identified by only four within sample shifts in the type of bargaining system, and therefore it should be seen as somewhat more tentative."(Bassanini and Duval, 2006, p.12)

Robust conclusions? The 1998-2008 period.

Unemployment rate at t	OLS	IV
$\ln(ret100)_{t-1}$	-6.617**	-22.069***
UBRR _{t-1}	0.055**	0.125***
UnionDensity _{t-1}	0.089	0.005
wcoord _{t-1}	-0.502**	-0.536***
EPL_{t-1}	1.084***	1.384***
outputgapt	-0.440***	-0.510***
inflchange _t	-0.113	-0.195*
irate _t	-0.359***	-0.582**
Openness _t	0.049***	0.053***
R^2	0.90	0.88
Hansen <i>J</i> test		0.3579
Anderson Rubin F test		0.0269

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More recent work based on country panel data

Despite its limitations, the above type of methodology is still widely used, in particular by international institutions.

Examples:

- OECD (2018), chapter 3, and supplementary material at https://www.oecd-ilibrary.org/employment/ oecd-employment-outlook-2018/ supplementary-material-for-chapter-3_empl_ outlook-2018-13-en A range of outcomes are considered (Employment rate,
 - Unemployment rate, Youth unemployment rate, ...).
- Miyamoto and Suphaphiphat (2020) focus on the determinants of long-term unemployment in Europe.

Other effects of CB

Effects of unions on productivity

Inspired by Hirschman (1970), Freeman and Medoff (1984) claim that unions can help enhance firm productivity by reducing turnover rates and by promoting changes in working methods/production techniques. Causal evidence can arguably be found in the recent literature:

- Positive effect confirmed by RDD Evidence in US nursing homes by Sojouner, Frandsen, Town, Grabowski and Chen (2015).
- In Norway, using IV, Barth *et al* (2020) conclude: "The results imply that an increase in union density of 1 percentage point raises firm productivity by 1.7 - 1.8%. The inclusion of heterogeneous labour (high and low skilled) (...) makes little difference."
- Jäger, Schoefer and Heining (2021): Value-added per worker in German firms with "codetermination" is everything else 2 to 8% higher.

Effects on profits

Again hard to find causal effects.

Using (US) NLRB elections, Lee and Mas (2012) look at the effect of "union victory" on the time-average of the gap between the stock market value of the firm and its predicted value.

- A difference-in-differences type approach covering heterogeneous vote shares for unions reveals an average decline in market value of about 10% following a union election victory.
- The magnitude of this effect appears to be very heterogeneous.
- Applying a RDD approach as in DiNardo and Lee (2004), Lee and Mas (2012) conclude that the impact is close to zero.

Remember however Frandsen (2021), who questions the approach of DiNardo and Lee (2004).

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Effects on investment (the *hold-up problem*; CCZ p. 445-8) Theory: there should be under-investment in unionized firms if \rightarrow investment is irreversible and

 \rightarrow the union cannot make a credible commitment not to renegotiate wages once the equipment has been installed.

Identifying this effect is difficult for the same reasons as above.

• A number of papers conclude that unionization has a negative effect on firms' investment (see CCZ, p. 465).

- This conclusion has however been challenged by
 - Card, Devicienti and Maida (2013) who use matched employer-employee data for an Italian region and developing an IV strategy
 - Jäger, Schoefer and Heining (2021) in Germany.

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Other effects of CB

CB and Wage Dispersion

"Collective bargaining also tends to affect wage dispersion, with greater dispersion in systems with no collective bargaining or where firms set wages independently. By contrast, wage dispersion is on average smallest among workers who are covered by sector-level bargaining. The lower dispersion in wages associated with sector-level bargaining in part reflects lower returns to education, seniority and potential experience for workers covered by collective agreements." (OECD, 2018, p. 75)

Health and Safety

Using a RDD approach *à la* DiNardo and Lee (2004), Sojouner and Yang (2021) show that union certification affects the enforcement of workplace-safety law in the US.

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Wages and unemployment

Which relationship?

A distinction should be made between:

- The Phillips Curve (Phillips, 1958), which is a relationship between wage *growth* and unemployment; studied with *aggregate* time-series methods.
- The Wage Curve (Blanchflower and Oswald, 1994), which is a (logarithmic) relationship between the *individual* wage *level* and unemployment *in the local area*.

An unemployment elasticity of approximately - 0.1 is found in many countries all over the world.

For a critical analysis of the Wage Curve, see Card (1995)).

Whether the empirical Phillips-Curve Relation and the Wage-Curve Relation can be reconciled is discussed by e.g. Blanchard and Katz (1999).

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Further Reading

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