

Unions in a Frictional Labor Market

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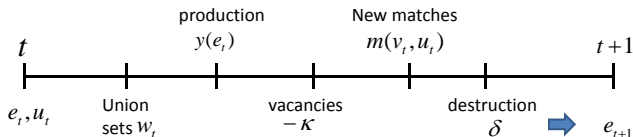
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Introduction

- **Objective:** analyze how **trade unions** affect labor markets.
- Neat **theoretical model:** search and matching frictions + union's monopoly power.
 - Key: union internalizes its effects on job creation (big player).
- ① **Theoretical findings:**
 - Commitment: efficient wages and vacancy creation for $t > 0$, but $w_0 > w^*$ and $u_0 > u^*$.
 - **Time inconsistency:** union wants to $\uparrow w$ ex-post.
 - Under discretion: **unemployment is inefficiently large** because wages are too high.
- ② **Quantitative findings:**
 - Endogenous real wage stickiness \Rightarrow **amplification** on vacancy creation and unemployment.

Standard S&M model (Pissarides '86)

- Timing



- Evolution: $e_{t+1} = (1 - \delta)e_t + m(v_t, u_t)$.
- Employment is given at $t \Rightarrow$ firms vacancies depend on expected **future wages**

$$-\kappa = q(v_t/u_t) \sum_{s=1}^{\infty} \beta^s (1 - \delta)^s (z - w_{t+s})$$

- What should unions do?

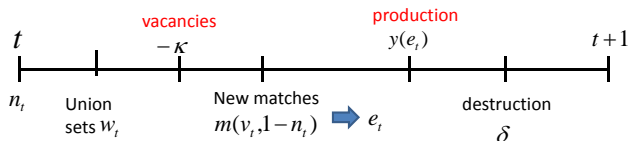
$$\max_{\{w_t\}} \sum_{t=0}^{\infty} \beta^t [e_t w_t + u_t b]$$

Understanding time inconsistency

- ① Under **commitment**, set $w_0 = z$ and w_t efficiently thereafter.
 - No distortions of hiking w_0 : initial stock e_0 given!
...analogous to the Ramsey model of taxation.
 - ② Under **discretion**, set $w = z$ every period.
 - Currently matched firms posted their vacancies yesterday
⇒ union does not internalize effects of high wages on past vacancies.
 - Is this a MPE? YES! If I expect tomorrow's union to set $w = z$, I do not want to deviate.
 - ...but then firms do not post new vacancies.
 - Jobs get destroyed at rate δ , and in the long run $u = 100\%!!$
- ⇒ Extreme form of time inconsistency. Only **current employers** are in the bargaining table.

This paper

- Timing



- Employment: $e_t = n_t + m(v_t, 1 - n_t)$.
- Matches are given at t but employment is not \Rightarrow vacancies also depend on **current wages**

$$-\kappa = q(v_t/1 - n_t) \sum_{s=0}^{\infty} \beta^s (1 - \delta)^s (z - w_{t+s})$$

- Here, **current and prospecting employers** are in the bargaining table.
- Wage setting affects the pool of employed/unemployed!

Time inconsistency?

- Time inconsistency is still present
 - Already matched firms can't fire (n_t given)
 - ⇒ unions have incentives to $\uparrow w$ and extract surplus from them.
- ...but is less severe
 - Unmatched firms can adjust vacancies
 - ⇒ unions have incentives to $\downarrow w$ and \uparrow matches.
- There exists a **trade-off**: increasing welfare of employed agents, lowers welfare of unemployed and searching guys.
- Without commitment this results in too **high wages** $w > w^*$, too **few vacancies** $v < v^*$, and **too much unemployment** $u > u^*$.

Can Unions do Better?

- **Key friction:** contracts are too rigid
 - w_t is restricted to be the same for existing workers n_t and newly hired $m(v_t, 1 - n_t) = \mu(\theta_t)(1 - n_t)$.
- Unions could offer **contingent contracts**, where the pay scale is based on employment status.
- One-period example: w^H and w^L

$$\max w^H n + w^L \mu(\theta)(1 - n) + (1 - \mu(\theta))(1 - n)b$$

$$\text{s.t. } \kappa = q(\theta)[z - w^L] \text{ and } w^H \leq z$$

- Re-arranging

$$\max [n + \mu(\theta)(1 - n)]z + (1 - \mu(\theta))(1 - n)b - \theta\kappa(1 - n)$$

same as the planner!

Seniority Wage Profile (Kuhn 1988)

- Union is a monopolist of labor: can price-discriminate!
- ⇒ set a nonuniform pricing policy where wages vary with seniority

$$w_t = \begin{cases} w_t^L, & \text{new hire (tenure=0);} \\ w_t^H, & \text{employed (tenure>0).} \end{cases}$$

- Firms' free entry is now

$$-\kappa = q(\theta_t) \left\{ (z - w_t^L) + \sum_{s=1}^{\infty} \beta^s (1 - \delta)^s (z - w_t^H) \right\}$$

- Unions' objective

$$\max \sum_{t=0}^{\infty} \beta^t w_t^H n_t + w_t^L \mu(\theta_t)(1 - n_t) + (1 - \mu(\theta_t))(1 - n_t)b$$

- ⇒ set $w_t^H = z$ and $w_t^L = z - \kappa/q(\theta_t)$.

Optimality

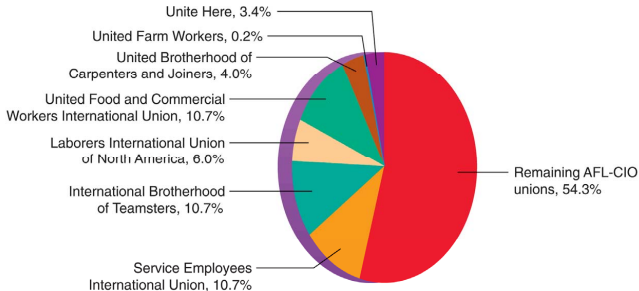
- Under **commitment**: we can show that this contract attains efficiency from $t = 0$. The union solves

$$\max \sum_{t=0}^{\infty} \beta^t [n_t + \mu(\theta_t)(1 - n_t)]z + (1 - \mu(\theta_t))(1 - n_t)b - \theta_t(1 - n_t)\kappa$$

- This is exactly the planner's objective.
- Moreover, there is **no time inconsistency** under this contract.
- Workers and unemployed would agree on it (both better off).
- What if firms could lay off workers?
 - Bargain seniority-dependent layoffs: fire the recently hired first (LIFO).

Do seniority contracts make sense?

- NBA salary cap on a player's maximum salary increases with tenure. Rookies are exempted (scale determined by draft position and fixed by the union).
- Collective bargaining agreements between AFL-CIO and employers exhibit wage profiles that increase with seniority



COLLECTIVE BARGAINING AGREEMENT
 BETWEEN
 COMMUNICATIONS WORKERS OF AMERICA, AFL-CIO
 AND
 JOHNSON CONTROLS, INC.



FACILITY ENGINEER

| | |
|--|---------|
| Maximum Wage Rate... | \$30.73 |
| Effective February 7, 2008 - 3% wage increase = | 31.65 |
| Effective February 7, 2009 - 3.25% wage increase = | 32.68 |
| Effective February 7, 2010 - 3.25% wage increase = | 33.74 |
| Effective February 7, 2011 - 3.50% wage increase = | 34.92 |

Three Year Progression

| | | 2/7/2007 | 2/7/2008 | 2/7/2009 | 2/7/2010 | 2/7/2011 | |
|---------------------|----------|----------|----------|----------|----------|----------|-------|
| Start | | 72% | 22.12 | 22.78 | 23.52 | 24.28 | 25.13 |
| 6 Months of Service | | 76% | 23.35 | 24.05 | 24.83 | 25.64 | 26.54 |
| 12 " " " | | 80% | 24.57 | 25.31 | 26.13 | 26.98 | 27.92 |
| 18 " " " | | 85% | 26.12 | 26.90 | 27.77 | 28.67 | 29.67 |
| 24 " " " | | 89% | 27.35 | 28.17 | 29.09 | 30.04 | 31.09 |
| 30 " " " | | 95% | 29.19 | 30.07 | 31.05 | 32.06 | 33.18 |
| 36 " " " | Job Rate | 30.73 | 31.65 | 32.68 | 33.74 | 34.92 | |

Note: Progression applies to new employees and employees promoted from Facility Mechanic/Facility

Empirical literature

- 1 Workers' wages increase with **employer tenure**
 - Altonji and Williams (2005), Topel (1991), Kambourov and Manovskii (2008).
 - Not clear whether this is due to experience, firm-specific human capital, or efficiency wage theory.
- 2 Workers' wages increase with **seniority** (a workers' tenure relative to her colleagues)
 - Negypal (2007) fore France: match-specific learning by doing (or unions) in the first six months.
 - Abraham and Farber (1988) for US: higher returns to seniority in the union that in the non-union sector.
 - Buhai, Portela, Teulings and van Vuuren (2011) for Portugal and Denmark. Evidence of LIFO.

But then, why don't they do better??

- The contract I showed is fully flexible and attains full efficiency.
 - Unions can write wages as a function of : seniority *and* the state of the economy (or their idiosyncratic shocks).
- But they choose not to. Typically,
 - 1 the wage schedule set by unions is fixed:

$$w^L = (1 - s)w^H$$

where $s \cong 10\%$ a year

- 2 and **independent of z** .
- These restrictions reintroduce time inconsistency and amplification.
 - Why do they write such contracts? Political economy among members of the union, imperfect information about z ...

Suggestions

- Analyze union vs non-union sectors further:
 - Wages are higher for unionized workers.



- What about volatility of wages and employment?
- Could changes in unionization rates explain the recent behavior of workers' income volatility (temporary component) or inequality?

Other comments

- Connection to Menzio-Mohen (2010):
 - Firms posts a wage profile but cannot commit to replacing senior workers with new hires.
 - Wage setting affects the flow of employment, which depends on the stock of workers.
 - Worker replacement \Rightarrow commitment problem \Rightarrow downward rigidities under TFP shocks.
 - Similar amplification results.