1. Unemployment

April 1, 2007
The effects of state-mandated employment protection

- Basic facts.
- Two dimensions: Transfers versus costs (waste); uncertainty.
- Effects on labor costs and wages. When does bargaining take place? Can the firm commit? Bonding.
- Effects on job creation, destruction, and unemployment.
- Evidence. micro/macro.
- Open issues. Pol economy of EP. Optimal EP.

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1. Basic facts

- Constructing measures of employment protection. Objective, subjective. Dimensions: Permanent contracts, temporary contracts. OECD Employment Outlook Figure 3.9

- One index fits all?

- No clear cross-country relation between EP and unemployment.

- Clearer relation between EP, u flows and duration. (Blanchard Portugal Figure 4)

- No clear relation EP job flows.

- Relation participation rates and employment protection: causal? (Mediterranean countries).
Figure 3.9. Overall summary index of EPL strictness and its three main components, 2003
(http://www.oecd.org/document/59/0,3343,en_2649_34731_36944315_1_1_1_1,00.html)
Flow into unemployment versus EP rank

Figure by MIT OCW.

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Employment protection index

Average duration

Unemployment duration versus EP rank

Figure by MIT OCW.

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2. Introducing employment protection in the DMP model

- Same assumptions as before. $y$ from cdf $G(y)$, and Poisson parameter $\lambda$.

- Two types of state-imposed costs. Severance payments, $T$. Pure firing costs, $F$ (administrative/legal steps, waste).

- Assume labor contracts now include the wage $w(y)$ and—clear why later—, potential payment of workers to firms contingent on separation, $X$.

- Effects of $T$ and $F$ on wages and the threshold. thus on job creation, destruction, and unemployment?
The value equations:

\[ rV = -c + q(\theta)(J(\bar{y}) - V) \]

\[ rJ(y) = (y - w(y)) + \lambda[G(y^*)(V - F - T + X) + \int_{y^*}^{1} J(y')dG(y') - J(y)] \]

\[ rU = b + \theta q(\theta)(E(\bar{y}) - U) \]

\[ rE(y) = w(y) + \lambda[G(y^*)(U + T - X) + \int_{y^*}^{1} E(y')dG(y') - E(y)] \]
3. Wage bargaining

If firm and worker do not agree, does the firm have to pay the severance payments, and the firing costs?

- If not: Can think of ex-ante wage setting, with commitment by the worker not to renegotiate.

- If yes: Then can think of ex-post wage setting.

- Maybe, ex-ante first time around, then ex-post when renegotiate after a shock. (Pissarides version).

If ex-ante, with symmetric Nash:

\[ (J(y) - V) = (E(y) - U) \]

If ex-post:

\[ J(y) - (V - T - F) = E(y) - (U + T) \]
Deriving the wage under ex-ante bargaining

As before:

\[ V = 0 \Rightarrow J(\bar{y}) = c/q(\theta) \]

\[ rU = b + \theta q(\theta)(E(\bar{y}) - U) = b + c\theta \]

\[ (r + \lambda)(J(y) - E(y)) = (y - 2w(y)) \]
\[ + \lambda[G(y^*)(V - T - F + X) - (U + T - X)] \]
\[ + \int_{y_*}^{1} (J(y') - E(y'))dG(y') \]

Use \((J(y) - E(y)) = (V - U) = -U\) to get:

\[ (r + \lambda)(-U) = (y - 2w(y)) + \lambda G(y^*)(-U - F - 2T + 2X) + \lambda (1 - G(y^*))(-U) \]
Simplify and use \( rU \) from above to get:

\[
w(y) = \frac{1}{2}(y + b + c\theta) + \lambda G(y^*)(X - T - \frac{F}{2})
\]

Many ways of achieving it: different combinations of \( w(y) \) and \( X \).

- If \( X = 0 \), wage lower by \(-\lambda G(y^*)(T + F/2)\).
- Or if \( X = T + F/2 \), pay the same wage as before: \( w(y) = (1/2)(y + b + c\theta) \). In case of separations, workers pay back severance and half of firing costs.
4. Job creation with ex-ante wage bargaining.

Assume (for convenience, as the division between \( w(y) \) and \( X \) does not matter for job creation), \( w(y) = (1/2)(y + b + c\theta) \), and \( X = T + F/2 \).

\[
J(\bar{y}) = c/q(\theta)
\]
\[
(r + \lambda)(J(\bar{y}) - J(y^*)) = \frac{1}{2}(\bar{y} - y^*)
\]
\[
J(y^*) + T + F - X = J(y^*) + F/2 = 0
\]

This implies

\[
\frac{c}{q(\theta)} = \frac{1}{2(r + \lambda)}(\bar{y} - y^*) - F/2
\]

Interpretation (remember \( \beta = 1/2 \)). Sharp distinction between transfers (legally imposed severance payments) and other costs.
5. Job destruction with ex-ante bargaining

Assume first that the worker and the firm take the privately efficient decision. Separate if surplus of match is equal to zero. So \( y^* \) given by:

\[
S(y^*) = J(y^*) + F + E(y^*) - U
\]

From the value equations for \( J(y) \) and \( E(y) \), adding and subtracting \( \lambda(1 - G(y^*)) (J(y^*) - E(y^*)) \) on the right:

\[
r(J(y) + E(y)) = y + \lambda G(y^*)(U - F) + \lambda \int_{y^*}^{1} (J(y') + E(y') - J(y^*) - E(y^*)) dG(y')
\]

\[
+ \lambda(1 - G(y^*)) (J(y^*) + E(y^*)) - \lambda(J(y) + E(y))
\]

Apply to \( y = y^* \), and use the Nash bargaining equation, to get:

\[
y^* = ru - rF - \frac{\lambda}{r + \lambda} \int_{y^*}^{1} (y' - y) dG(y')
\]
From above, \( rU = b + c\theta \), so the threshold \( y^* \) is given by:

\[
y^* = b + c\theta - \frac{\lambda}{r + \lambda} \int_{y^*}^{1} (y' - y^*)dG(y') - rF
\]

- Interpretation. Effect of \( F, T \).
- What if the firm takes the decision unilaterally? If it does, then \( y^* \) is given by:

\[
J(y^*) = -F - T + X
\]

From Nash bargaining, \( E(y^*) - U = J(y^*) \), so

\[
S(y^*) = -2F - 2T + 2X + F
\]

For \( S(y^*) = 0 \), it must be that \( X = T + F/2 \)
- Do we observe such transfers? What if not?
Verify that $J(y^*) = -F - T + X = -F/2$ gives the same threshold:

$$rJ(y^*) = \frac{1}{2}(y^* - b - c\theta) + \lambda[-G(y^*)F$$
$$+ \frac{1}{2}(r + \lambda) \int_{y^*}^{1} (y' - y^*)dG(y') + (1 - G(y^*))J(y^*) - J(y^*)]$$

where we added and subtracted $(1 - G(y^*))J(y^*)$. Simplifying gives the same expression for $y^*$ as above.
6. Equilibrium

- Job creation.

\[
\frac{c}{q(\theta)} = \frac{1}{2(r + \lambda)}(\bar{y} - y^*) - \frac{F}{2}
\]

- Job destruction

\[
y^* = b + c\theta - \frac{\lambda}{r + \lambda} \int_{y^*}^{1} (y' - y^*) dG(y') - rF
\]

- Effect of an increase in \(F\)? Shifts JC down, JD to the left. \(y^*\) decreases: lower reallocation. \(\theta\) ambiguous; unemployment duration may increase or decrease.
Effects of an increase in F on job creation and job destruction

theta

ystar

Job creation

Job destruction

A

A'

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Renegotiations, inefficient separations. Open issues

Renegotiation. After hiring, workers may want to renegotiate. In this case, if breakdown, firm has to pay $T + F$, workers receive $F$, so, under Nash bargaining:

$$J(y) - (V - T - F) = E(y) - (U + T) \Rightarrow E(y) - U = J(y) + 2T + F$$

Different formalizations:

- Renegotiation right after hiring. so ex-post from start (notes at the end of the slides. a number of ambiguities)

- Ex-ante at hiring, ex-post when new productivity draw and renegotiation (Mortensen-Pissarides). Leads to insider/outsider wages. Actually easier analytically.

- Special case with no matching frictions (for example my notes on unemployment, book part of web site).
• Implications. In general, both $T$ and $F$ increase wages, and lead to lower JC and thus lower equilibrium $\theta$. Longer unemployment duration.

Efficient separations?

• Efficient separations, and Coasian bargains. We do not see $X$ being paid. (Bonding does not do it per se.) Then, both $T$ and $F$ likely to decrease $y^*$. Two issues conceptually separate (but related). can have ex-ante or ex-post wage setting, and efficient/inefficient separations.
• If ex-ante wage setting \( E(y^*) - U = J(y^*) \), \( X = 0 \), and separation left to the firm, and \( J(y^*) = -F - T \), then

\[
E(y^*) - U - T = -F - T + T = -F - 2T
\]

• So will workers quit before? Even if no severance payments, \( E(y^*) - U = -F - T < 0 \)

Quits versus layoffs. Does the distinction make sense? What does it capture?

• Efficient versus inefficient separations?

• Even if separations are efficient, origin of the shock \((b \text{ or } y?)\)

• Asymmetric information \((b \text{ and } y \text{ private information})\). (Hall and Lazear). Some inefficient layoffs/quits.
Some micro-evidence

- EP and flows across countries. Hard/impossible to convincingly control for other variables.

- Differences in EP across sectors/types of firms within a country. (Typically large or small firms) Better but still hard to control for sectoral differences.

Looking across sectors and countries. (US sectors as no EP benchmarks. not quite true: Experience rating)

Haltiwanger-Scarpetta-Schweiger. World Bank WPS 4070, 2006

- Changes in EP across time affecting sectors/types of firms differently.

Differences across US states in the adoption of employment-at-will exceptions. Autor-Kerr-Kugler 2006 (look at flows, and productivity)

Kugler-Jimeno-Hernanz on Spanish labor market reforms, 2005

Kugler-Pica on Italian labor market reforms, 2006.
Kugler and Pica on Italy

The 1990 reform:

- In case of layoffs, can take employers to court, and argue dismissal is unfair. If unfair, payments range between 5 and 14 months.

- Until 1990, firms under 15 workers exempt for these rules. In 1990, now subject to rules, with payments from 2.5 to 6 months.

The data set


  Information for each worker about characteristics, current employment status, firm identifier.

  For firms, location, sector, number of employees, number of employees, date of incorporation and termination.
Regressions
For workers, 2 regressions (linear or probit): Separations and accessions.

\[ m_{ijt} = D_t + D_k + D_r + X_{ijt}\beta + \delta_1 D + \delta_2 (D \ast Post_t) + \epsilon_{ijt} \]

where \( i \) is worker, \( j \) is firm, \( t \) is time, \( m_{ijt} \) is a dummy, 1 if move (separation, or accession), \( D_t, D_k, D_r \) are time, sectoral, and regional dummies. \( D \) is 1 if worker employed in small firm, 0 otherwise. \( Post_t \) is 1 post-1990.

For firms: volatility of employment.

\[ \|\Delta L_{jt}\| = D_t + D_k + D_r + Z_{jt}\beta + \delta_1 D + \delta_2 (D \ast Post_t) + \epsilon_{ijt} \]

And probability of entry and exit:

\[ e_{jt} = D_t + D_k + D_r + W_{jt}\beta + \delta_1 D + \delta_2 (D \ast Post_t) + \epsilon_{ijt} \]

where \( e_{jt} \) is a dummy equal to 1, if entry—or if exit.
Figure 1: Yearly Accession Probabilities by Firm Size.
Figure 2: Yearly Separation Probabilities Conditional on Firm Size.
Table 3. Effects of the 1990 Reform on Accessions and Separations.
Table 4. Effects of the 1990 Reform on the Change in Firm-level Employment.
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Table 5. Effects of the 1990 Reform on Firms' Entry and Exit.

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Two issues. I. Political economy of employment protection. Notes

- Protect insiders at the expense of new entrants. Median voter is the insider, by a large margin.

- Introduction of fixed-term contracts at the margin. Example of France. Can be perverse (Blanchard-Landier):
  Larger protection for insiders, so higher wages.
  Higher threshold productivity to keep outsiders, so more turnover, less training.

- Emergence of a dual market. For the young, sequence of bad (no training) jobs and unemployment, for the old, good (permanent contract) jobs.
Is reform politically feasible? (Saint-Paul, in particular NBER Macroeconomics, 1993)

- Median voter: insider. So introduce fixed-term contracts for new workers. Both types of workers may be for it: Insiders still protected. If become unemployed, easier to get a job.

- Time consistency problem. Proportion of workers with permanent contracts decreases over time. At some $t^*$, median voter becomes a fixed-term contract worker.

  May vote to eliminate permanent contracts

  Anticipation of this change leads permanent contract workers to be less willing to accept reform at $t = 0$.

- Can reform be implemented? If $t^*$ high enough. If reform is slow enough. If conversion clauses are tough enough. (Not the end. Renegotiation at $t < t^*$?)

- Example of Spain. Example of France.
II. Optimal employment protection? Notes.

- Taken up in Chapter 9 of Pissarides. But under linear preferences, and lump sum taxation. Best then is $b = 0$, and $T = F = 0$.

- If workers are risk averse, role for unemployment insurance.

- Could be provided by (risk neutral) firms, but monitoring of status and search effort may be difficult.

- Maybe more efficiently provided by the state. Status, and to some extent, monitoring.

- Then, need to have firms internalize this cost. Firms should pay an amount equal, in expectation or in realization, to the unemployment benefits paid to the worker. Layoff tax.

- US solution: Experience rating: Paying of unemployment contributions proportional to costs of unemployment benefits, up to some ceiling.
• Complications. Moral hazard in search, so limits on unemployment insurance. Then, justified to distort separation decision. Higher employment protection. Layoff tax.

• Complications. Ex-post wage setting. Firm may not be able to get a lower wage in exchange for insurance. Then, lower layoff tax.

• A first pass: Blanchard-Tirole. But much remains to be done. Integration with moral hazard-search-saving models (Werning, Hopenhayn-Nicolini)

• Relevant reference: Alvarez-Veracierto.
Taking stock.

- Does it affect growth? Combining with the evidence on productivity growth and reallocation (Foster et al 2002, for retail trade in the US: 90% of productivity growth due to reallocation): probably. But no direct evidence yet.
- Some EP is desirable. How much? In what form? Layoff tax, or more administrative protection?
- How to go from current institutions to better ones. At the center of the current French elections...
Wage setting with ex-post wage bargaining

Assume $X = 0$ (cannot commit to payments from workers in case of layoff). Then same steps. Start with equation for $J(y) - E(y)$, and use Nash bargaining relation to get:

$$(r + \lambda)(V - U - F - 2T) = y - 2w(y) + \lambda [G(y^*)(V - U - F - 2T)] + (1 - G(y^*))(V - U - F - 2T)$$

Derive the equation for $rU$ and replace:

$$-b - c\theta - \theta q(\theta)(2T + F) = (y - 2w(y))$$
Rewrite as:

\[ w(y) = \frac{1}{2}(y + b + c\theta) + (r + \theta q(\theta))(T + \frac{F}{2}) \]

Interpretation. Why is there now an effect of \( T \)?
Job creation under ex-post wage bargaining

Same steps as before:

\[
J(\bar{y}) = \frac{c}{q(\theta)}
\]

\[
(r + \lambda)(J(\bar{y}) - J(y^*)) = \frac{1}{2}(\bar{y} - y^*)
\]

\[
J(y^*) + T + F = 0
\]

This implies

\[
\frac{c}{q(\theta)} = \frac{1}{2(r + \lambda)}(\bar{y} - y^*) - F - T
\]

Both severance payments and firing costs decrease the profitability of new jobs.
Job destruction under ex-post wage bargaining

Again, take the same approach as before. Assume that separations are privately efficient.

\[ S(y^*) = J(y^*) + F + E(y^*) - U = 0 \]

Following the same steps as before gives:

\[ y^* = rU - rF - \frac{\lambda}{r + \lambda} \int_{y^*}^{1} (y' - y) dG(y') \]

This is the same expression as before (no surprise as separations are privately efficient). \( rU \) however is given by:

\[ rU = b + \theta q(\theta)(E(\bar{y} - U) = b + c\theta + \theta q(\theta)(2T + F) \]

Replacing gives:

\[ y^* = b + c\theta + -rF - \frac{\lambda}{r + \lambda} \int_{y^*}^{1} (y' - y) dG(y') + \theta q(\theta)(2T + F) \]
In Pissarides (Chapter 9), given the two-wage structure, \( rU \) is still given by

\[
rU = b + c\theta
\]

This simplifies things a lot, for the wage equation, for job destruction, and eliminates some ambiguities (which may however be relevant: Higher wages, higher threshold, higher destruction).
Two effects of $F$: directly, through $rF$, decreases separations. indirectly, through the increase in $rU$, which increases separations.

Under efficient separations, the effect of $T$ is only to increase $rU$ and thus to increase separations.

What if the firm chooses unilaterally to layoff the worker? It will choose $y^*$ so

$$J(y^*) = -F - T$$

This implies:

$$S(y^*) = J(y^*) + F + E(y^*) - U = 2(J(y^*) + F + T) = 0$$

So the separation decision can be left to the firm; the firm will layoff the worker when the surplus from the match is equal to zero.
Job creation, job destruction, and equilibrium

- Job creation

\[
\frac{c}{q(\theta)} = \frac{1}{2(r + \lambda)}(\bar{y} - y^*) - F - T
\]

- Job destruction

\[
y^* = b + c\theta + -rF - \frac{\lambda}{r + \lambda} \int_{y^*}^{1} (y' - y)dG(y') + \theta q(\theta)(2T + F)
\]

- The effects of an increase in \( F, T \). The sources of ambiguity.