Two-tier labour markets in the Great Recession: France vs. Spain

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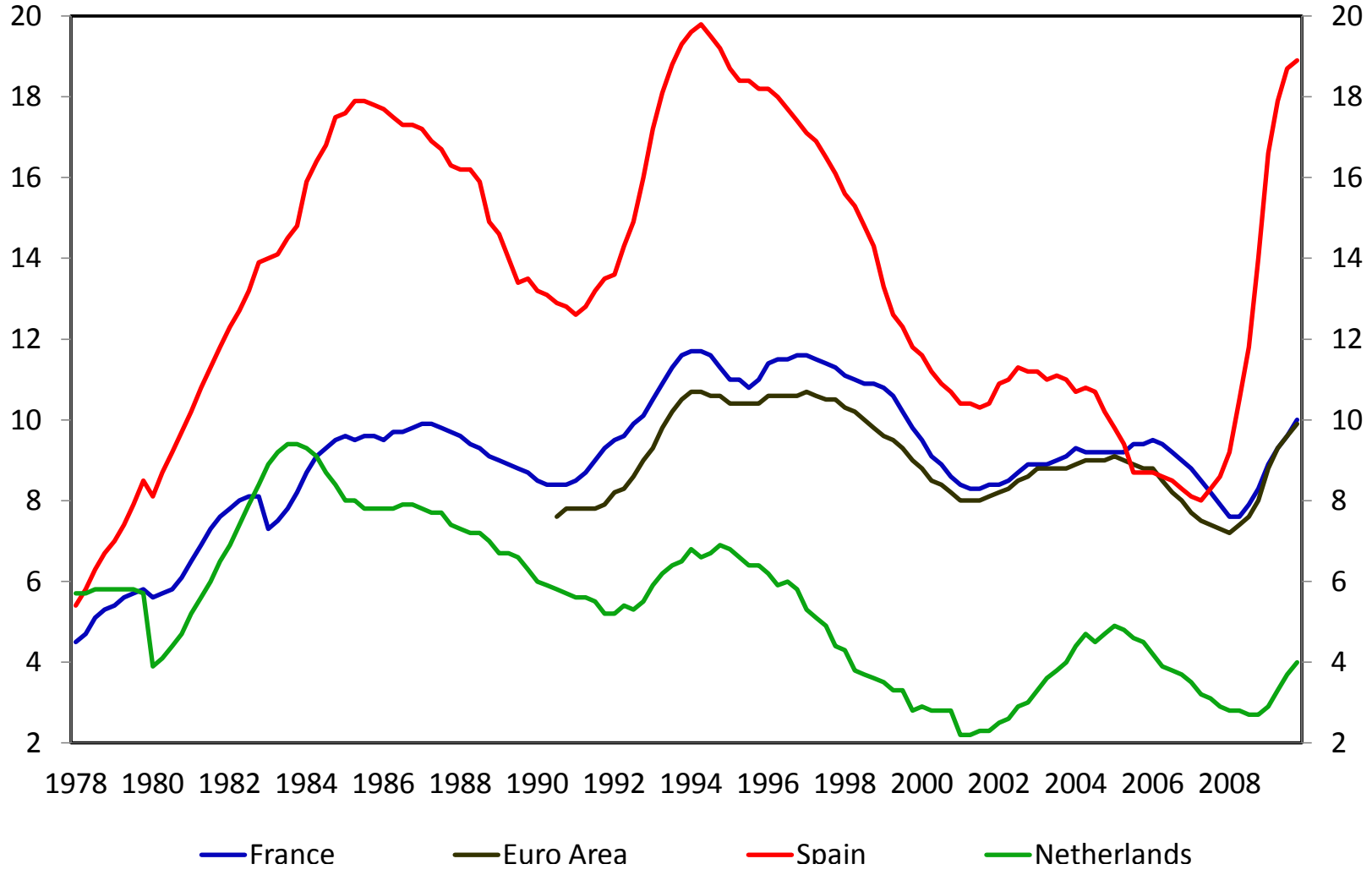
Increasing LM Flexibility: Boon or Bane ?
IAB, Nürnberg, march 18-19, 2011

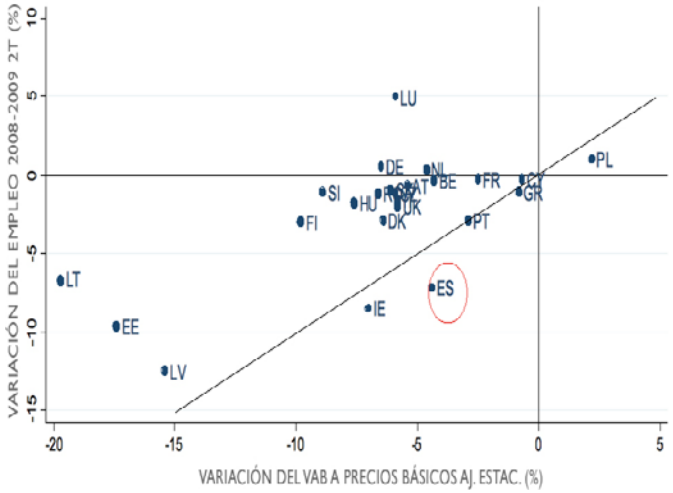
The wild ride of Spanish unemployment (3rd time in 3 decades)

OECD Harmonized unemployment rate

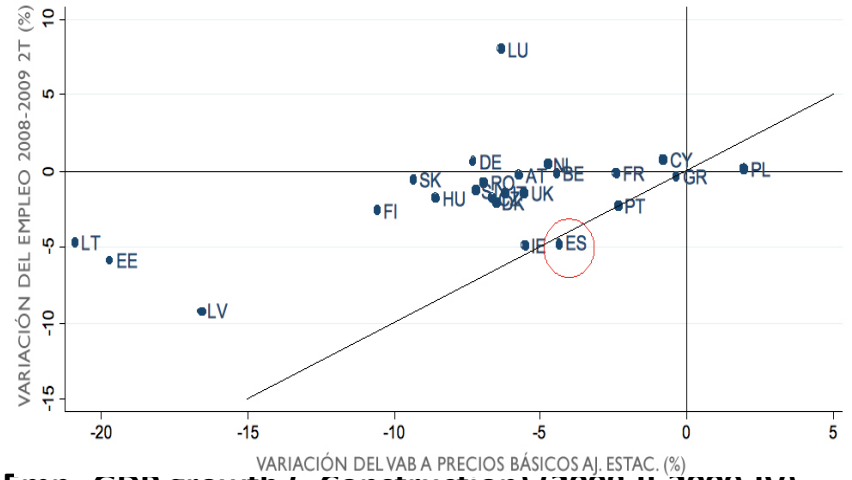


Why France vs. Spain ?

- Very different reaction of SP unemployment to the crisis relative to FR

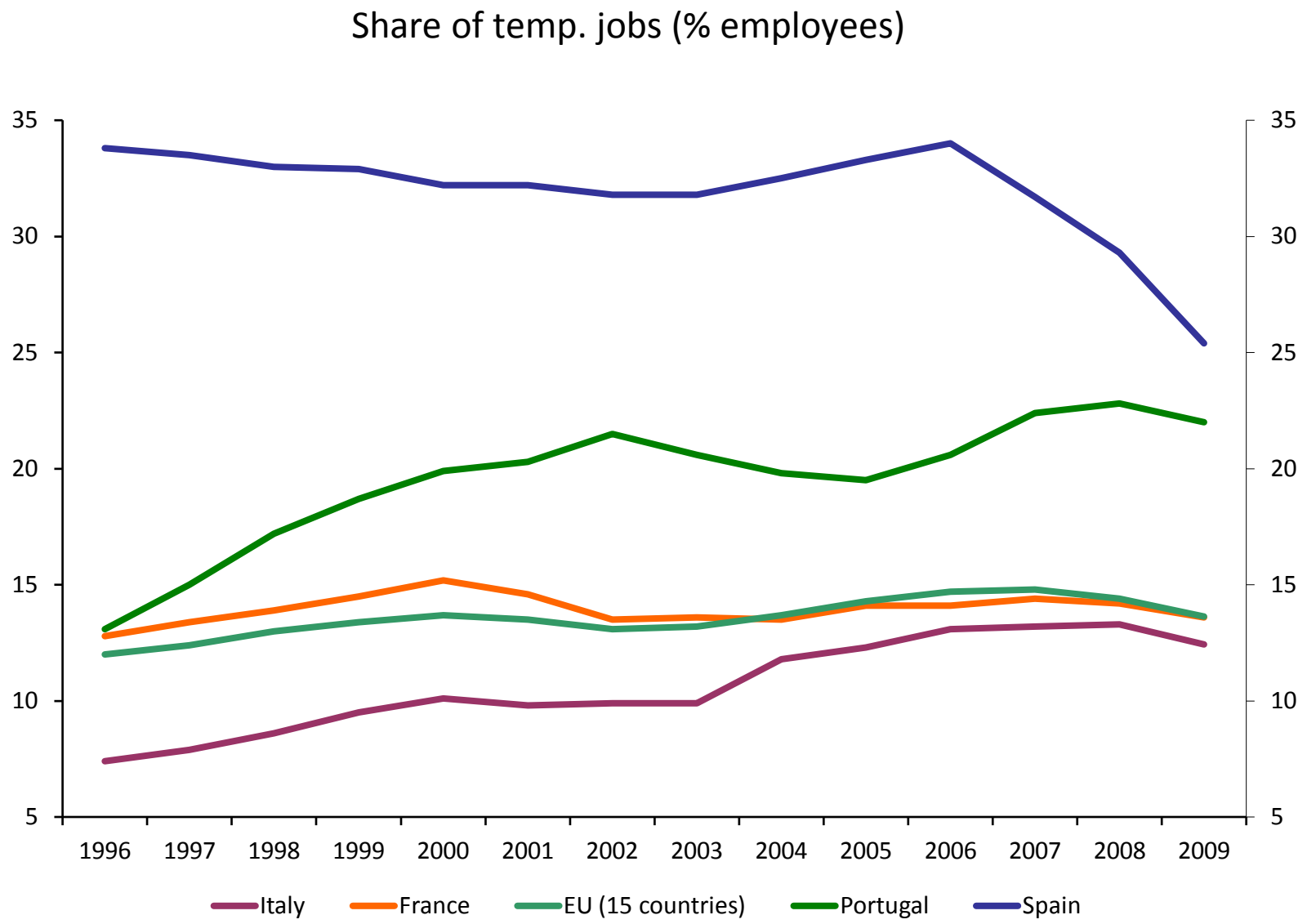


Emp.- GDP growth (2008-II-2009-IV)

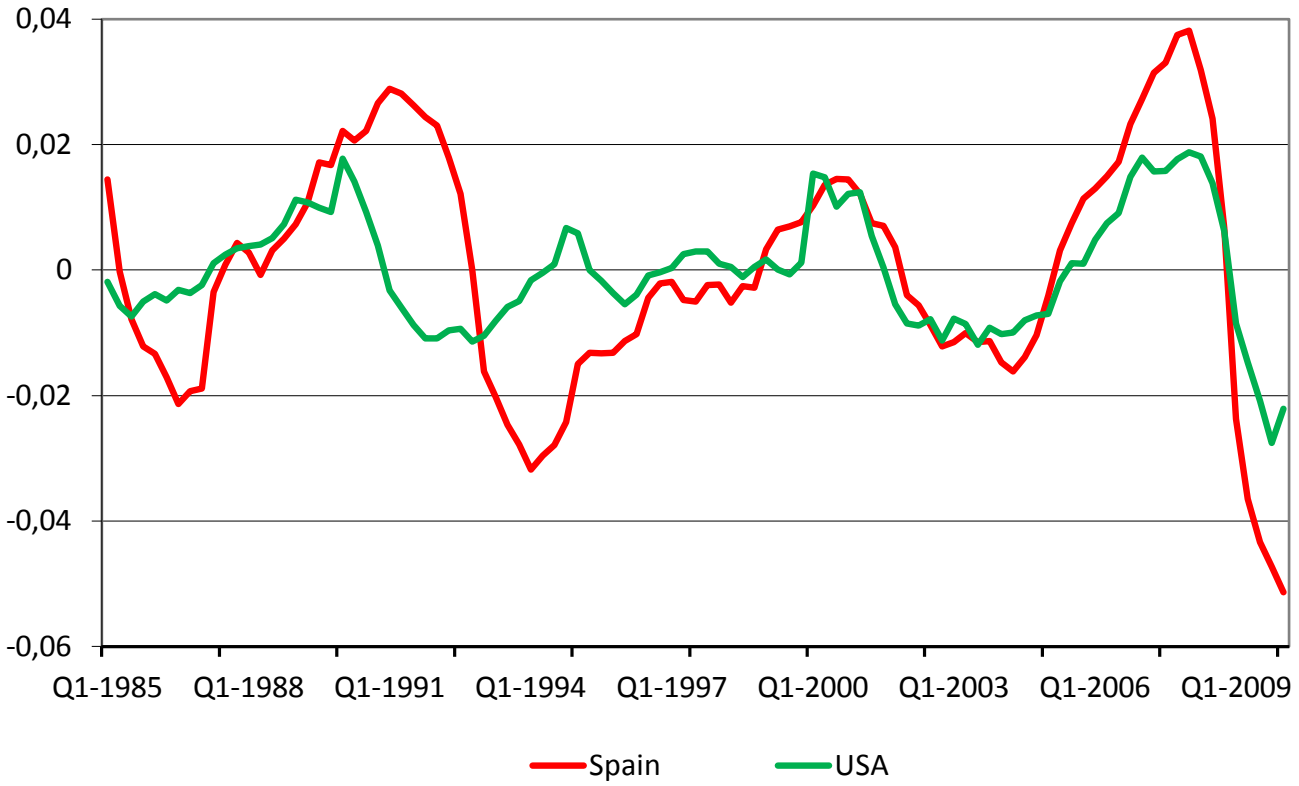


Emp.-GDP growth (- Construction) (2008-II-2009-IV)

- But similar labor market institutions: EPL, UB, CB (except **gap in firing costs + limitations on use of temp. contracts: EPL gap**)


Share of temp. jobs (% employees)
35
30
25
20
15
10
5
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Italy
France
EU (15 countries)
Portugal
Spain

Cyclical component of employment (H-P filtered series)



Outline

Research question : What is the role of temporary employment (EPL gap vs. other factors? (residential construction + financial crisis)

- Extend Mortensen-Pissarides (1994) model to a dual labour market with temporary and permanent jobs + other institutions (EPL, UB, CB)

- Focus on role of **EPL gap in red-tape costs between perms. & temps, and legal restrictions on use of temp contracts .**

  Shortcut: Other policies enter as calibrated parameters (share and duration of temporary contracts, matching efficiency, shock parameters)

- Calibrate the model to FR & SP before (2005-2007) and during (2008-2009) the Great Recession (GR). The simulate counterfactual scenario: *What if Spain had French EPL before the GR ? (and vice versa)*
- **Conclusion: This reform would have saved about 45% of its unemployment increase**

Table 1: Labor market evolutions in France and Spain

Levels (%)		1998:1	2007:4	2009:4
1. Unemployment	France	10.3	7.5	9.7
	Spain	15.2	8.7	18.9
2. Fixed-term employment[1]	France	13.8	14.3	13.1
	Spain	33.3	30.9	25.1
3. Hours of work[2]	France	40.7	37.7	37.4
	Spain	38.8	39.0	39.1
Annual growth rates (%)[3]			**1998:1-2007:4**	**2008:1-2009:4**
4. Gross Domestic Product	France		2.3	-1.1
	Spain		3.7	-2.2
5. Labor force	France		0.8	0.9
	Spain		3.3	1.3
6. Employment	France		1.1	-0.3
	Spain		4.2	-4.6
7. Private non-agricultural employees:				
(a) Total	France		1.5	-1.6
	Spain		5.6	-5.7
(b) Construction	France		2.4	-1.8
	Spain		8.1	-19.8
(c) Manufacturing	France		-0.7	-3.2
	Spain		2.0	-10.8
(d) Market services	France		2.2	-1.1
	Spain		6.8	-0.9
8. Real hourly earnings[4]	France		1.3	1.1
	Spain		0.3	2.5
9. Hiring on temporary contracts[5]	France		78.6	83.3
	Spain		90.5	89.6

LM institutions

- (EPL)

  Similar average EPL (OECD indicators) but much higher **EPL gap** in Spain than in France.

  Gap in **Red-tape** firing costs: 1.33 quarters of wages in FR, 2 in SP, but

  Restrictions on Temps: Much laxer in SP

  Advance notice: 1.33 quarters in FR, 0.23 quarters in SP

- (UB)

  Very similar (taking into account income taxes, entitlement duration rules, and assistance benefits)

- (CB)

  Similar (sectoral /regional) (Spain copied France in 1980s)

➢ (Mismatch: Much larger reallocation shock in SP)

- Why?: Construction N share (2007): France 6.9%, Spain **13.3**%

  Higher fall in real interest rate in SP at €Z access + Abundance of unskilled labor (dropouts, immigrants)+ Dual labor market (Saint-Paul, 1997, Bentolila-Dolado- Jimeno, 2009)→ Specialization in mature sectors intensive in temp workers: residential construction+ services

  Correl. Total and Construction ↓% Δ N across regions: 0.7

- Mismatch (2007:4 → 2009:4) **u range: 10.3 pp. →15.6 pp**.; **u std. dev.: 3 → 5**

  (France: u range 9.6 pp. → 11.3 pp.; u std. dev. 1.3 → 1.4)

- Geographical mobility is much lower in Spain

  Interregional migration rate: France 2.1%, Spain 0.2%

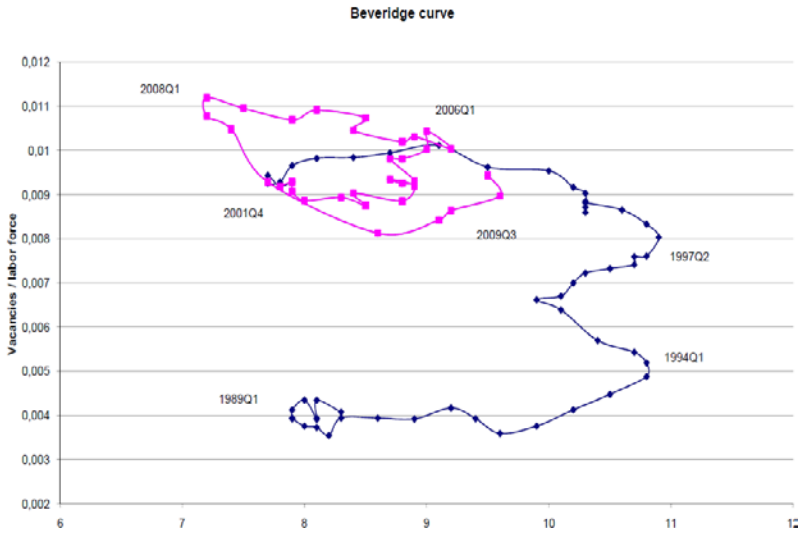
- Determinants of low mobility:

  - Housing regulations (Oswald, 1999; Rupert-Wasmer, 2009):

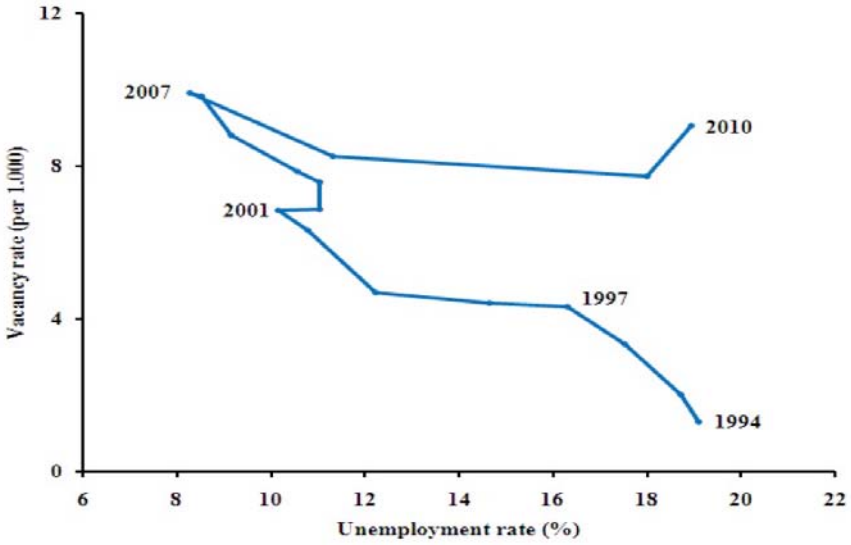
    Rental market, Spain 12%, France 40% +

  - EPL: Higher risk on Temp jobs (Antolín-Bover, 1997) & late home leaving (Bentolila-Ichino, 2008, Becker-Bentolila-Fernandes-Ichino, 2010.

Beveridge Curve France



Beveridge C urve Spain



Previous literature on temporary jobs in search models

- Blanchard and Landier (2002), Cahuc and Postel-Vinay (2002):
  - Endogenous job destruction w/ temporary and permanent jobs
  - Temporary jobs $\longrightarrow$ More job creation and destruction
  - Bentolila and Saint-Paul (1996), Boeri and Garibaldi (2007): transitional honeymoon (job creation followed by reductions in employment)
  - Sala, Silva, and Toledo (2009): calibrated on a representative European labor market; intermediate unemployment volatility
  - Costain, Jimeno, Thomas (2010): focus on the dynamics of unemployment with dual labor market

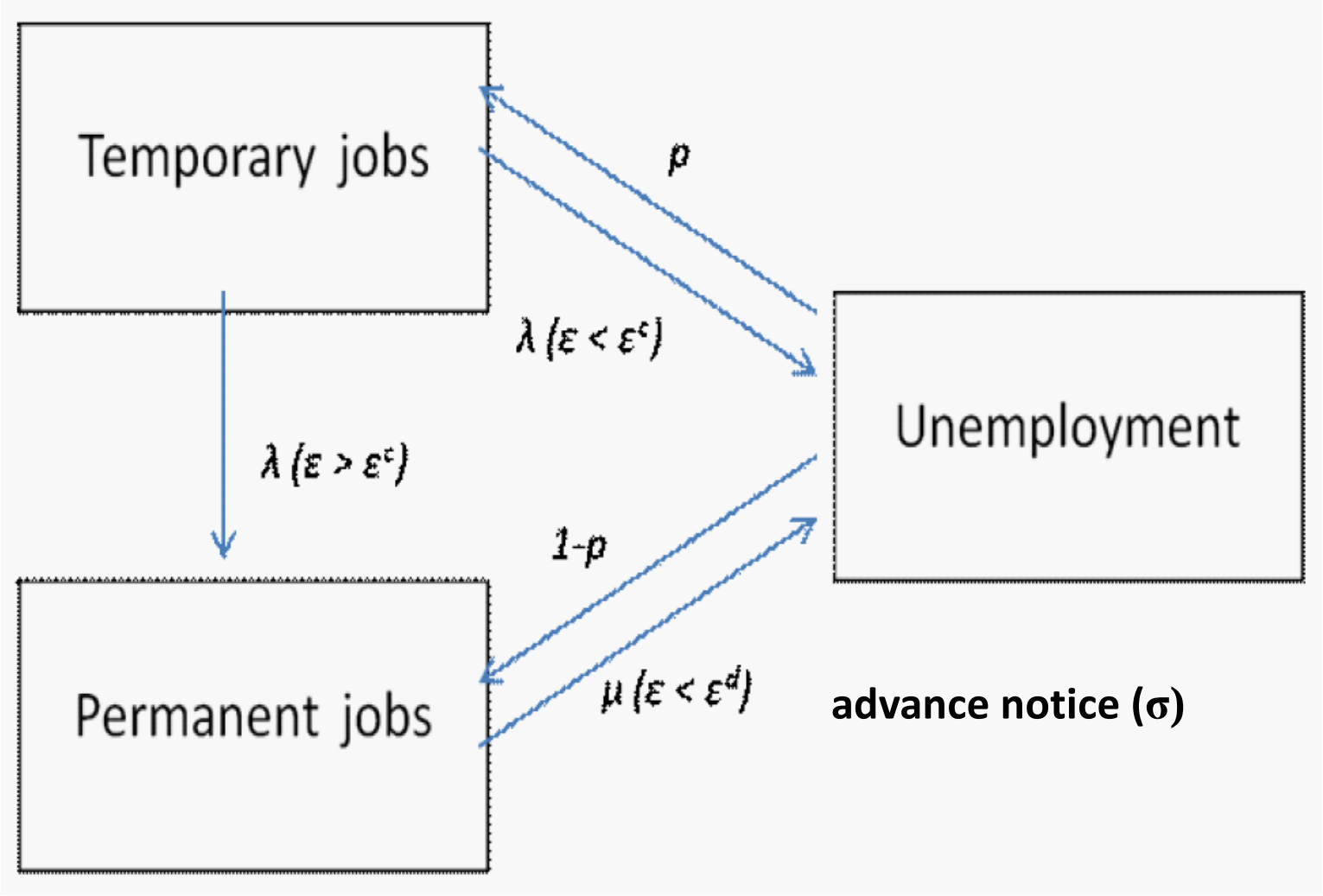
- Our approach:
  - Specific event: a negative aggregate shock in France and Spain
  - Account of actual features of labor contracts
    - temporary jobs cannot be destroyed before their date of termination
    - time is needed to destroy permanent jobs
    - wages are renegotiated by mutual agreement
  - Different types of wage setting: endogenous, endogenous with fixed benefits and firing cost
  - Difference-in-differences approach

Model setup

- Continuum of infinitely-lived risk-neutral workers and firms, discount rate $r > 0$
- Measure of workers $= 1$
- Matching function à la Pissarides (2000):
  - $m(u, v) = m_0 u^{\alpha} v^{1-\alpha}$
  - Matching rate for vacancies: $q(v/u) = q(\theta)$
  - Matching rate for unemployed: $\theta q(v/u) = \theta q(\theta)$
- Workers
  - Unemployed
  - Employed on temporary job
  - Employed on permanent job
  - Under advance notice

- Job matches with (idiosyncratic) productivity distribution: $F(\varepsilon) \subset [\underline{\varepsilon}, \bar{\varepsilon}]$.
- $\varepsilon \sim$ Poisson(μ).
- All new jobs start with $\varepsilon = \bar{\varepsilon}$
- When created, a job is
  - Temporary with probability p
  - Permanent with probability $1 - p$
- Temporary jobs end at rate λ
  - Either transformed into a permanent job (if their productivity ε if high enough)
  - or destroyed at zero cost
- Permanent jobs
  - under advance notice if ε is below an endogenous reservation productivity level
  - permanent jobs under advance notice are destroyed at rate σ

Model setup


Temporary jobs
Permanent jobs
Unemployment
p
λ (ε < ε^c)
λ (ε > ε^c)
1-p
μ (ε < ε^d)
advance notice (σ)

Asset Values

Firms

- V: Value to the firm of a vacant job,
- $J_t(\varepsilon)$: Value to the firm of a temporary job with productivity ε,
- $J_0(\varepsilon)$: Value to the firm of a new permanent job with productivity ε, not yet subject to firing costs,
- $J_p(\varepsilon)$: Value to the firm of a continuing permanent job with productivity ε, subject to both firing cost f and advance notice
- J_a : Value to the firm of a permanent job under advance notice,

Workers

- U: Value to the worker of unemployment,
- $W_t(\varepsilon)$: Value to the worker of a temporary job with productivity parameter ε,
- $W_0(\varepsilon)$: Value to the worker of a new permanent with productivity ε subject to firing costs f (recall that a new permanent job can previously be a temporary job),
- $W_p(\varepsilon)$: Value to the worker of a continuing permanent job with productivity parameter ε, subject to firing costs f.
- W_a : Value to the worker of a permanent job under advance notice.

Surpluses

$$S_t(\bar{\varepsilon}) = J_t(\bar{\varepsilon}) - V + W_t(\bar{\varepsilon}) - U$$

$$S_0(\varepsilon) = J_0(\varepsilon) - V + W_0(\varepsilon) - U$$

$$S_p(\varepsilon) = J_p(\varepsilon) - J_a + W_p(\varepsilon) - W$$

Bellman eqns. for firms

$$rV = -h + q(\theta)\left[p\left(J_t(\overline{\varepsilon}) - V\right) + (1-p)\left(J_0(\overline{\varepsilon}) - V\right)\right]$$

$$rJ_t(\varepsilon) = \varepsilon - w_t + \mu\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\left[J_t(x) - J_t(\varepsilon)\right]\mathrm{d}F(x) + \lambda\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\max\left[J_0(x) - J_t(\varepsilon), V - J_t(\varepsilon)\right]\mathrm{d}F(x)$$

$$rJ_0(\varepsilon) = \varepsilon - w_0(\varepsilon) + \mu\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\max\left[J_p(x) - J_0(\varepsilon), V - J_0(\varepsilon)\right]\mathrm{d}F(x)$$

$$rJ_p(\varepsilon) = \varepsilon - w_p(\varepsilon) + \mu\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\max\left[J_p(x) - J_p(\varepsilon), J_a - J_p(\varepsilon)\right]\mathrm{d}F(x)$$

$$rJ_a = \underline{\varepsilon} - \overline{\omega} - \sigma\left[f + J_a - V\right]$$

...and similarly for workers

$$rU = b + \theta q(\theta)\left[p(W_t(\overline{\varepsilon}) - U) + (1-p)(W_0(\overline{\varepsilon}) - U)\right]$$

$$rW_t(\varepsilon) = w_t + \mu\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\left[W_t(x) - W_t(\varepsilon)\right]\mathrm{d}F(x) + \lambda\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\max\left[W_0(x) - W_t(\varepsilon), U - W_t(\varepsilon)\right]\mathrm{d}F$$

$$rW_0(\varepsilon) = w_0(\varepsilon) + \mu\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\max\left[W_p(x) - W_0(\varepsilon), U - W_0(\varepsilon)\right]\mathrm{d}F(x)$$

$$rW_p(\varepsilon) = w_p(\varepsilon) + \mu\int_{\underline{\varepsilon}}^{\overline{\varepsilon}}\max\left[W_p(x) - W_p(\varepsilon), W_a - W_p(\varepsilon)\right]\mathrm{d}F(x)$$

$$rW_a = \overline{\omega} + \sigma\left[U - W_a\right]$$

Productivity thresholds for permanent jobs (PJD and PJD) and (overall) Job Creation equation (JC)

$$S_p(\varepsilon^d) = 0 = \varepsilon^d - \frac{r}{r+\sigma}(\underline{\varepsilon} - \sigma f) - \frac{\sigma}{r+\sigma}\left(b + \theta\frac{\beta h}{1-\beta}\right) + \mu\int_{\varepsilon^d}^{\overline{\varepsilon}} S_p(x)\mathrm{d}F(x) \qquad \text{(PJD)}$$

$$S_0(\varepsilon^c) = 0 = \varepsilon^c + \frac{\mu}{r+\sigma}(\underline{\varepsilon} - \sigma f) - \frac{r+\sigma+\mu}{r+\sigma}\left(b + \theta\frac{\beta h}{1-\beta}\right) + \mu\int_{\varepsilon^d}^{\overline{\varepsilon}} S_p(x)\mathrm{d}F(x) \quad \text{(PJC)}$$

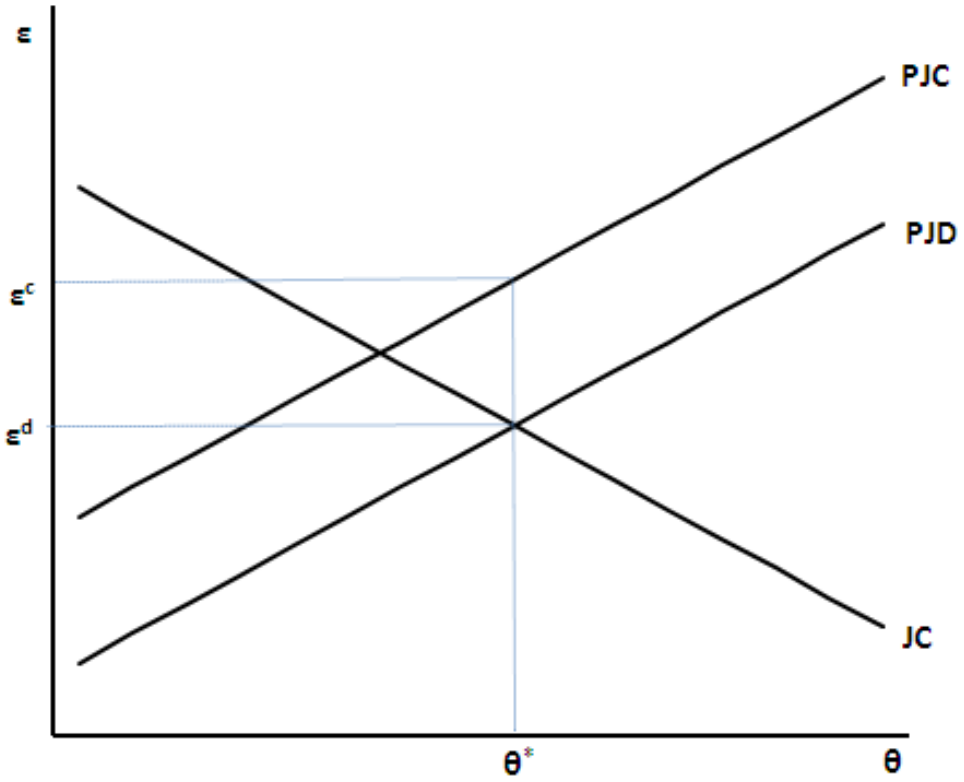
Hence, subtracting (PJD) from (PJC) yields:

$$\varepsilon^c = \varepsilon^d + \frac{r+\mu}{r+\sigma}\left(\sigma f + b + \theta\frac{\beta h}{1-\beta} - \underline{\varepsilon}\right)$$

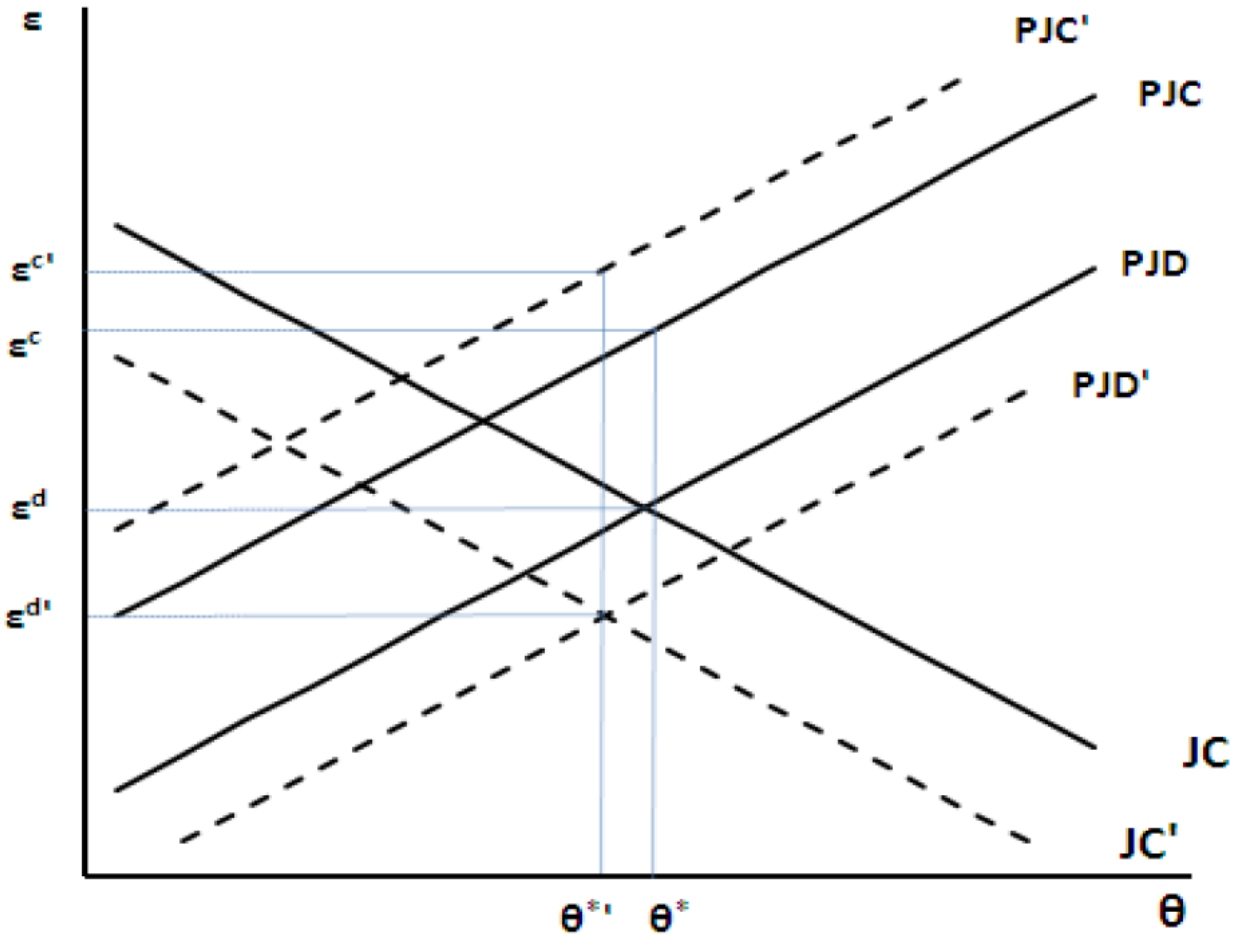
whereas

$$\frac{h}{1-\beta} = q(\theta)\left[\begin{array}{c} \frac{p}{(r+\mu+\lambda)}\left[\overline{\varepsilon} + \frac{\mu}{r+\lambda}\int_{\underline{\varepsilon}}^{\overline{\varepsilon}} x\mathrm{d}F(x)\right] + \frac{p}{r+\lambda}\left[\lambda\int_{\varepsilon^c}^{\overline{\varepsilon}} \frac{(x-\varepsilon^c)}{\mu+r}\mathrm{d}F(x) - b - \frac{\beta\theta h}{1-\beta}\right] \\ +(1-p)\frac{\overline{\varepsilon}-\varepsilon^c}{\mu+r} \end{array}\right] \qquad \text{(JC)}$$

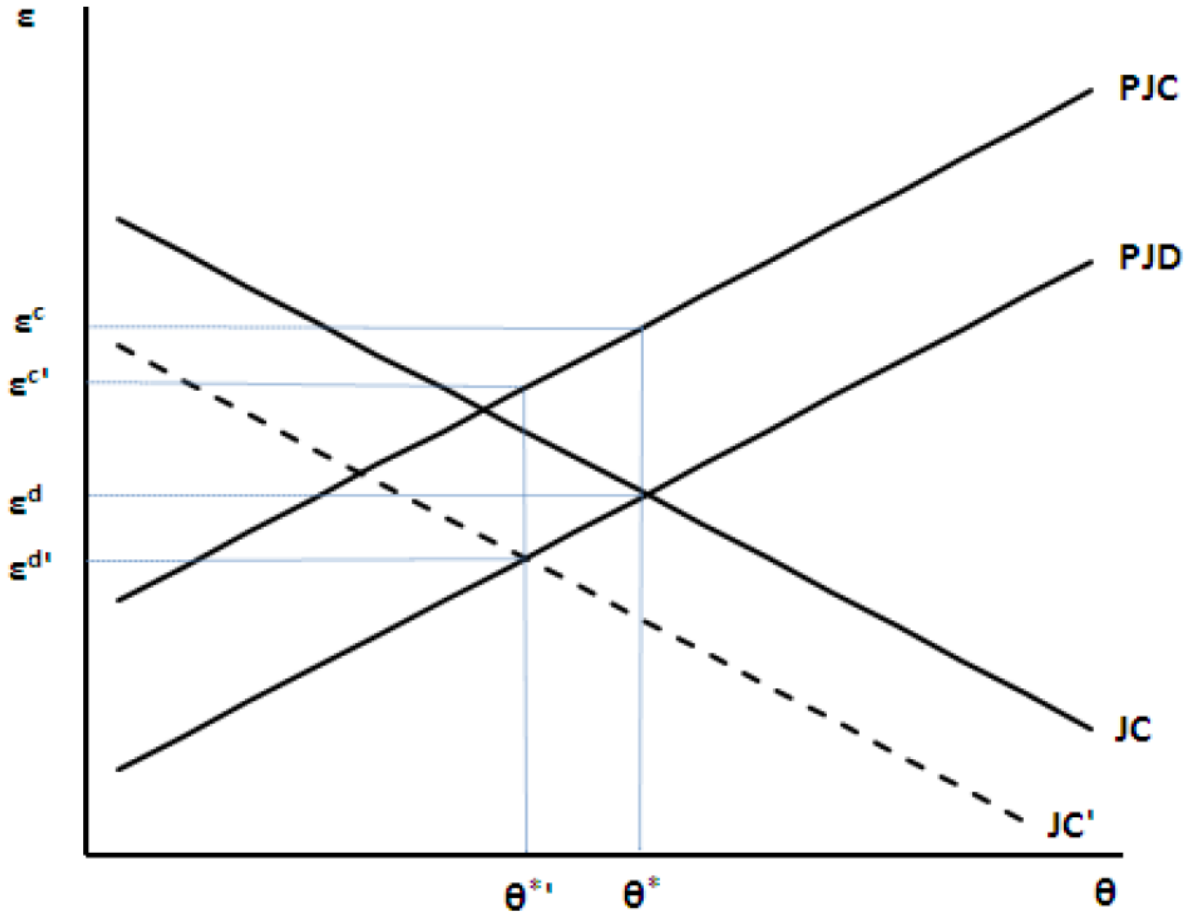
Labour market equilibrium



Effects of $\uparrow f$



Effects of ↓ *p*


ε
PJC
PJD
ε^c
$\varepsilon^{c'}$
ε^d
$\varepsilon^{d'}$
JC
JC'
$\theta^{*'}$
θ^*
θ

Summary

Comparative statics

- *Increase in firing cost f on permanent jobs:*
  - Firms become less strict in firing perm workers
  - More strict in transforming temp contracts into perm
  - Ambiguous effect on
    - Unemployment
    - Job destruction (less permanent, more temporary)
- *Reduction in the probability p of creating temporary jobs:*
  - Less job creation
  - Less job destruction
  - Ambiguous effect on unemployment

Proposition: What happens when *f* is too large ?

- But if $f \geq \overline{f}$, then higher f or higher p increase u-rate

$$u^* = \frac{\lambda\sigma\mu F(\varepsilon^d)}{\lambda\sigma\mu F(\varepsilon^d) + \theta q(\theta)[\sigma\mu p F(\varepsilon^d) + \lambda\left[1 - pF(\varepsilon^c)\right]\left[\sigma + \mu F(\varepsilon^d)\right]}$$

$\uparrow \varepsilon^d, \uparrow \varepsilon^c \Rightarrow \uparrow u^*$ &

$\uparrow f \Rightarrow (\varepsilon^c - \varepsilon^d) \Leftrightarrow F(\varepsilon^c) \gg F(\varepsilon^d) \Rightarrow F(\varepsilon^c)$ becomes the dominant term

Wages

$$w_t = \beta\overline{\varepsilon} + (1-\beta)rU$$

$$w_0(\varepsilon) = \beta\left(\varepsilon + \frac{r+\mu+\sigma}{r+\sigma}\theta h - \frac{\sigma}{r+\sigma}\mu f\right) + \frac{\mu}{r+\sigma}(\beta\underline{\varepsilon} - \overline{\omega}) + \frac{r+\mu+\sigma}{r+\sigma}(1-\beta)b$$

$$w_p(\varepsilon) = \beta\left(\varepsilon + \frac{\sigma}{r+\sigma}\theta h + \frac{\sigma}{r+\sigma}rf\right) - \frac{r}{r+\sigma}(\beta\underline{\varepsilon} - \overline{\omega}) + \frac{\sigma}{r+\sigma}(1-\beta)b$$

It can be easily checked that $w_0(\varepsilon) < w_p(\varepsilon)$ and $w_0(\varepsilon) < w_t$. Notice that, when $\sigma \uparrow \infty$, $w_p(\varepsilon) = w_t + \beta[rf - (\overline{\varepsilon} - \varepsilon)]$, so that the wage of permanent workers is not necessarily larger than the wage of temporary workers because the latter always start at the highest productivity level. Nonetheless, the larger is f the more likely it is that $w_p(\varepsilon) > w_t$. Similar qualitative results hold when σ is finite.

Flows

$$
\begin{aligned}
\dot{N}_t &= pu\theta q(\theta) - \lambda N_t \\
\dot{N}_p &= (1-p)u\theta q(\theta) + \lambda N_t[1 - F(\varepsilon^c)] - \mu N_p F(\varepsilon^d) \\
\dot{N}_a &= \mu N_p F(\varepsilon^d) - \sigma N_a \\
\dot{u} &= \lambda F(\varepsilon^c) N_t + \sigma N_a - u\theta q(\theta)
\end{aligned}
$$

…and in steady state

$$
\begin{aligned}
N_t^* &= \frac{1}{\lambda} pu^* \theta q(\theta) \\
N_p^* &= \theta u^* q(\theta) \frac{1 - pF(\varepsilon^c)}{\mu F(\varepsilon^d)} \\
N_a^* &= \frac{u^* \theta q(\theta)}{\sigma} [1 - pF(\varepsilon^c)] \\
N_a^* + N_p^* &= \frac{u^* \theta q(\theta)}{\mu F(\varepsilon^d)} [1 - pF(\varepsilon^c)] \frac{\sigma + \mu F(\varepsilon^d)}{\sigma} \\
u^* &= 1 - N_p^* - N_a^* - N_t^*
\end{aligned}
$$

→ Average wage : *f* &*b* $\overline{\omega}$

$$
\overline{\omega} = \frac{N_t w_t + \frac{N_{0t}}{1-F(\varepsilon^c)} \int_{\varepsilon^c}^{\overline{\varepsilon}} w_0(x) \mathrm{d}F(x) + N_0 w_0(\overline{\varepsilon}) + \frac{(N_p - N_{0t} - N_0)}{1-F(\varepsilon^d)} \int_{\varepsilon^d}^{\overline{\varepsilon}} w_p(x) \mathrm{d}F(x)}{1 - u - N_a}
$$

Calibration

a) Calibrated parameters:

- Cobb-Douglas matching function. Hosios: $\alpha = \beta = 0.5$

b) Parameters estimated by indirect inference: Table 2

- Cost of vacant jobs (h), matching function scale parameter (m_0), productivity shocks arrival rate (λ)

Targets: (i) Job destruction rate of perm. jobs, (ii) Temp. rate & (iii) U-rate, assuming $\varepsilon \sim U[0,1]$

c) Alternative wage setting models:

- *Endogenous wage*: determined in equilibrium
- *Endogenous wage with Fixed f and b*: firing cost f and unemployment benefit b linked to average wage in expansion (realistically indexed on previous wages, not on current wages)

Table 2: Calibrated and estimated parameters[1]

		France	Spain
Standard parameters:			
Interest rate	r	0.01	0.01
Matching function elasticity	α	0.50	0.50
Worker bargaining power	β	0.50	0.50
Institutional parameters:			
Unemployment benefit replacemente rate	b	0.55	0.58
Severance pay for permanent employees	f	1.33	2.00
Dual labor market flow rates:			
Probability of hiring into a temporary job	p	0.85	0.91
Probability of temporary contract ending	λ	0.88	0.88
Parameters estimated by indirect inference:			
Cost of keeping jobs vacant	h	0.50	0.25
Matching efficiency level in expansion	m_0	1.50	2.50
Matching efficiency level in recession	m_0	1.50	1.50
Incidence rate of productivity shocks	μ	0.04	0.09
Lower bound of productivity shock	$\underline{\varepsilon}$	0.00	0.00
Shocks multiplicative shift factor in recession	γ	0.90	0.87
Advance notice rate	σ	0.75	4.30

[1] Reference period: 2005:1-2007:4.

Simulation results (Expansion & Recession)

I. **Expansion** (good match for FR and SP)

II. **Recession** (aggregate/ reallocation shocks):

(i) Model 1 : $\varepsilon \sim U[0,1] \rightarrow U[0, \gamma]$, $\gamma<1$: FR: $\gamma=0.90$, SP: $\gamma=0.77$

Good match for FR but failure in SP (temp. rate).

(ii) Model 2: (SP) $\gamma=0.87$ & $\downarrow m_0$: $2.5 \rightarrow 1.5$

Good match for SP when reallocation shock is allowed for.

- Difference-in-differences approach:
  - u in recession $-$ u in expansion in Spain
    minus
  - u in recession $-$ u in expansion in Spain with French policy parameters (f, p)
- Changes in unemployment
  - steady states Table 4
  - transitional dynamics Figure 2

Table 3: Simulation results

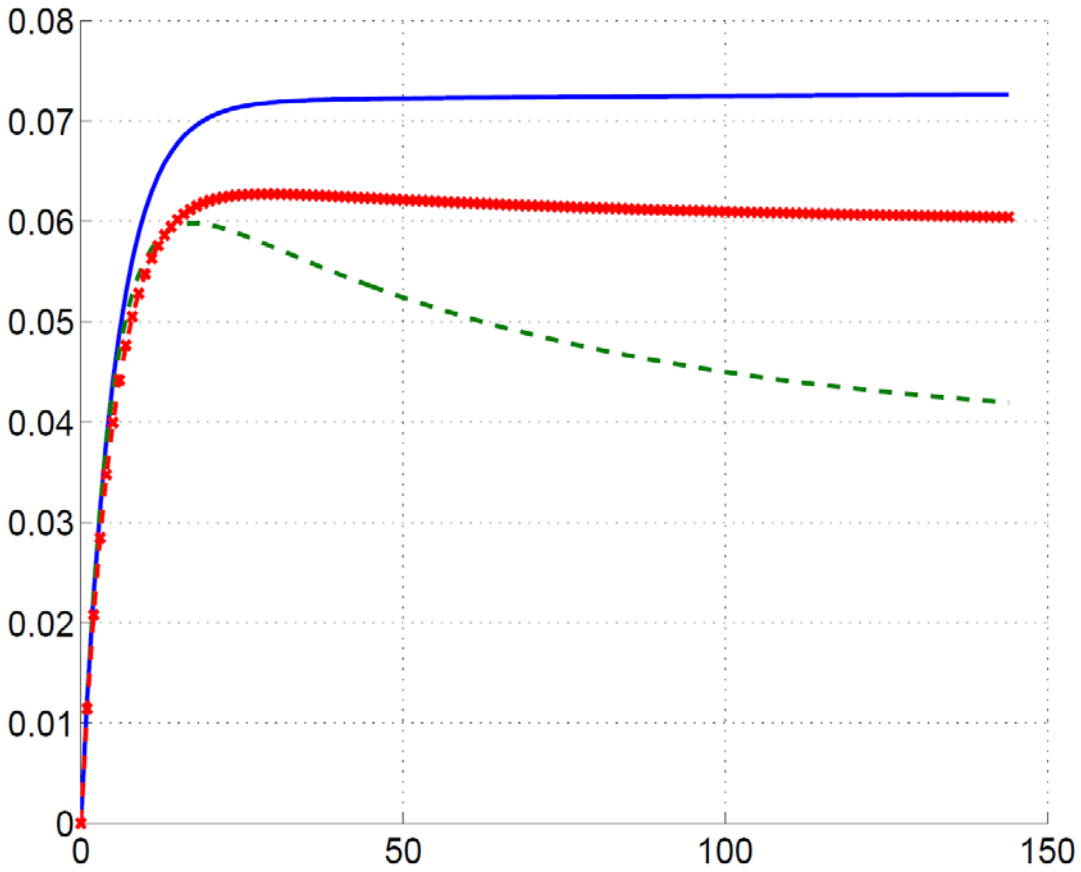
	Unemployment rate	Perm. jobs destruction rate	Temporary employment rate
France - Expansion			
Data	0.0850	0.0150	0.1260
Model	0.0854	0.0305	0.1137
France - Recession			
Data	0.0980	0.0130	0.1250
Model	0.0973	0.0304	0.1145
Spain - Expansion			
Data	0.1030	0.0470	0.3330
Model	0.1022	0.0655	0.3300
Spain - Recession			
Data	0.1770	0.0400	0.2700
Model 1	0.1736	0.0641	0.3793
Model 2	0.1765	0.0611	0.2796

Table 4: Differential increase in unemployment in Spain induced by the recession explained by differences with France in the alternative simulation (percentage points)

	Δu_{SP}	$\Delta u_{SP}(FR)$	$\Delta u_{SP} - \Delta u_{SP}(FR)$
A. Spain with French EPL: f and p			
* Fixed f and b model	7.43	4.05	3.38
* Endogenous wage model	7.27	5.85	1.42
B. Spain with French EPL: f			
* Fixed f and b model	7.43	6.13	1.30
* Endogenous wage model	7.27	7.28	-0.01
	Δu_{FR}	$\Delta u_{FR}(SP)$	$\Delta u_{FR} - \Delta u_{FR}(SP)$
C. France with Spanish EPL: f and p			
* Fixed f and b model	1.19	3.08	-1.90
* Endogenous wage model	1.28	2.58	-1.30

Note: Δu_{SP} denotes the change in unemployment explained by the model simulated for the Spanish economy and $\Delta u_{SP}(FR)$ the change in unemployment explained by the model simulated for the Spanish economy with the indicated set of parameter values corresponding to the simulated French economy. The mirror definitions apply to Δu_{FR} and $\Delta u_{FR}(SP)$.

Transitional dynamics (deviations in pp. from average SP u-rate in good state, 10.30%)



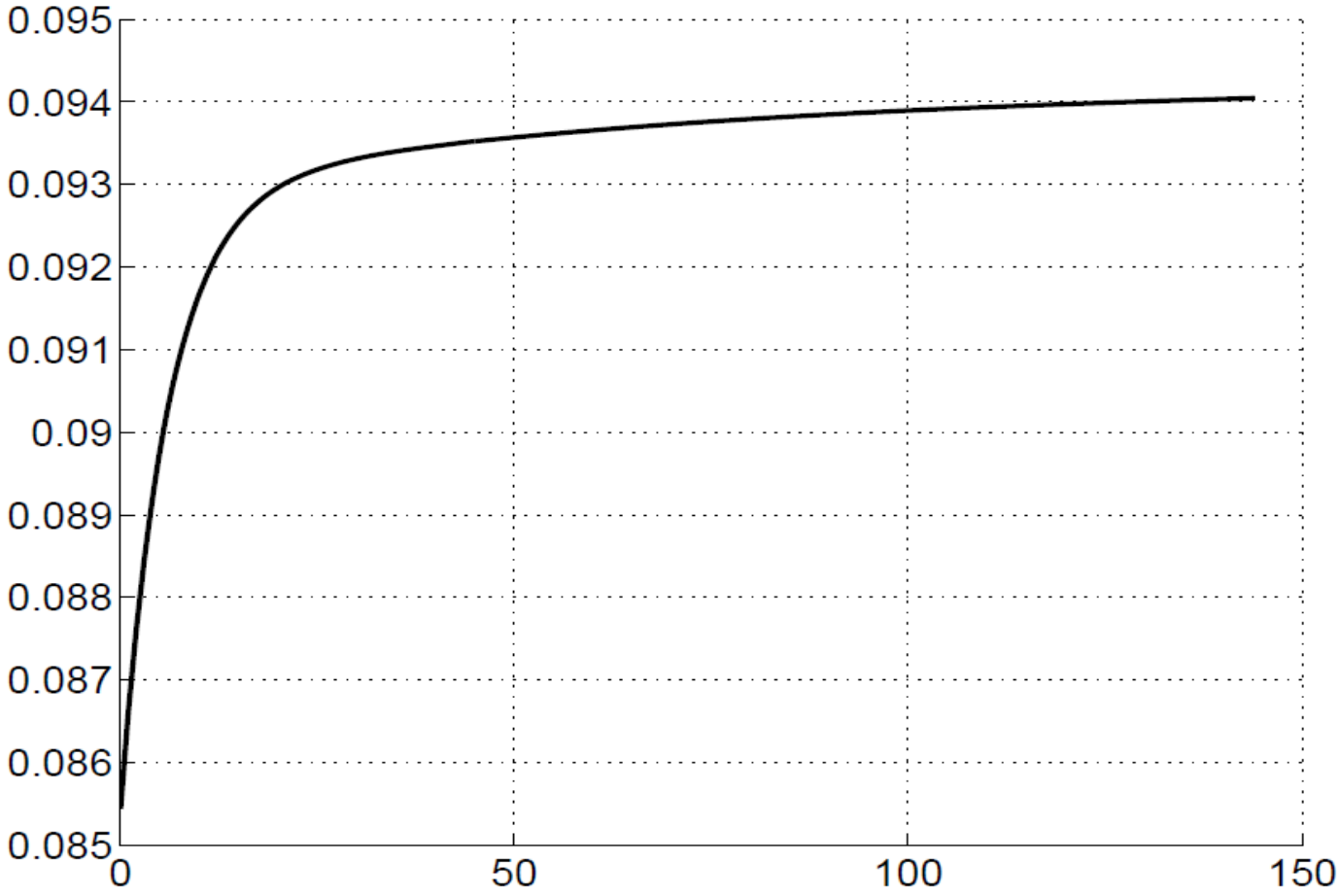


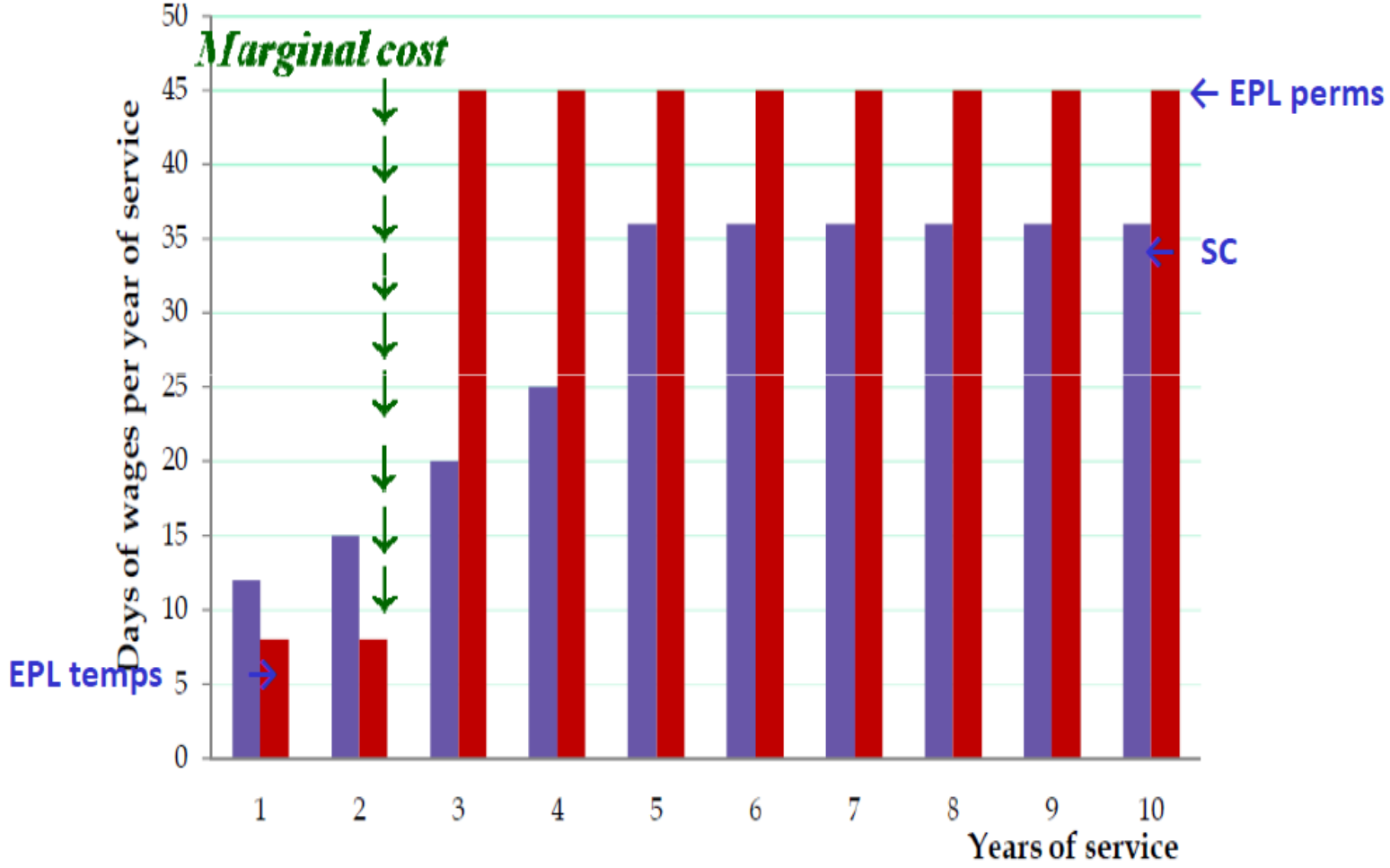
Figure 6: Simulated change in unemployment rate in France (period in weeks)

Conclusions

- We find that
  - About 45% of increase in unemployment rate avoided had Spain had French institutions
  - One-third of it due to firing costs
- Recent initiatives in Europe highlighting the negative effects of the permanent-temporary divide and proposing a single labor contract:
  - France: Blanchard-Tirole (2003) and Cahuc-Kramarz (2004)
  - Italy: Boeri-Garibaldi (2008) and Ichino (2009)
  - Spain: Proposal by 100 academic economists (Andrés *et al.*, 2008)

The results in this paper provide some support for the single contract

Paramount importance of a "Single Contract" (SC)



Thank you
for your attention!