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# The effects of introducing a single open-ended contract in the Spanish Labor Market

J. Ignacio García-Pérez

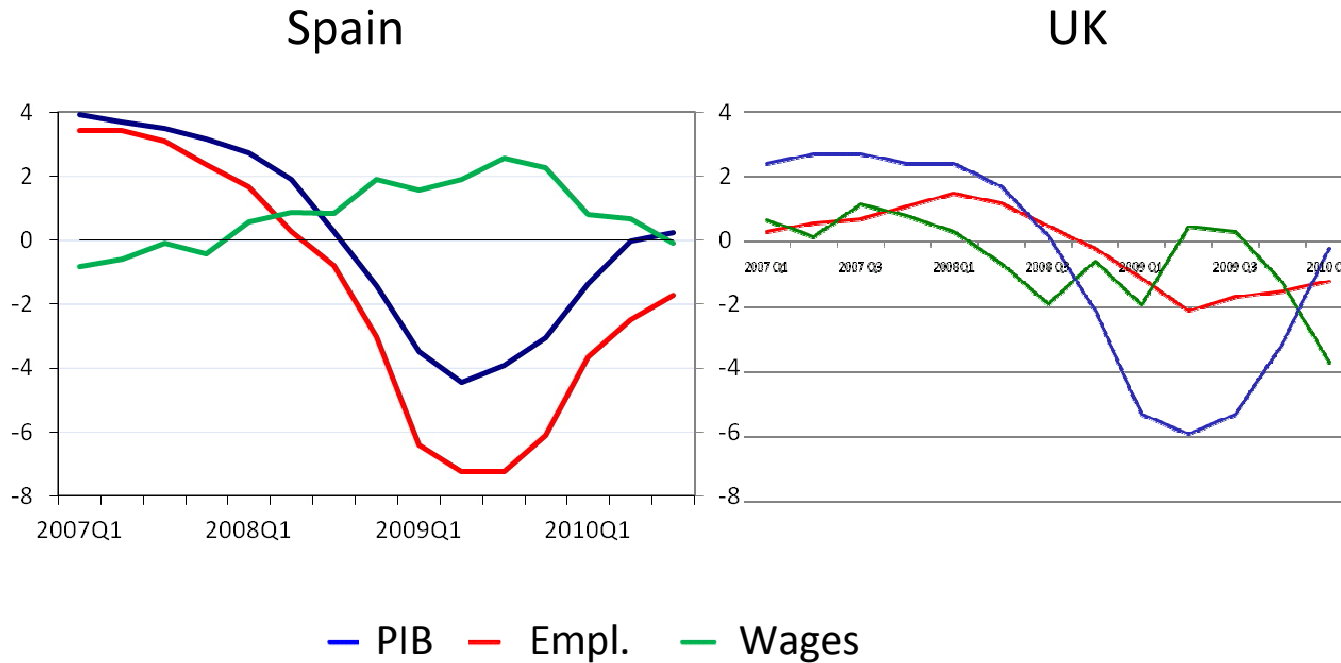
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- Labor market reforms in Europe often take the form of partial reforms at the margin.
- In some EU countries this process created dual labor markets with separate segments for temporary (TC) and permanent (PC) contracts.
  - In Spain, there exists a large gap in severance payments of PCs vs. TCs: 45 vs. 8 days of wages per year of seniority (p.y.o.s.).
- This makes that, during downturns, job destruction is much larger in Spain than in the rest of the EU...

## Adjusting employment instead of wages...



## Main Question of the paper

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What are the **effects** of introducing a **single open-ended contract** for new hires with severance payments growing with seniority as an alternative to the dual market prevailing in Spain?

We focus on

- Unemployment
- Job destruction
- Tenure distribution.

## Why is this question relevant?

### Features of the Spanish labor market and the need to eliminate the duality:

- Huge employment volatility: 77% of total job losses during the current crisis were due to TCs (34% in the EU).

	Share of Temporary Workers over Total employment (2008Q3)	Fixed-Term Job Losses as % of Total Job Losses during the crisis
EU	14.26%	34.19%
Greece	12.19%	11.92%
Spain	29.53%	76.94%
France	14.26%	12.81%
Italy	13.63%	54.30%

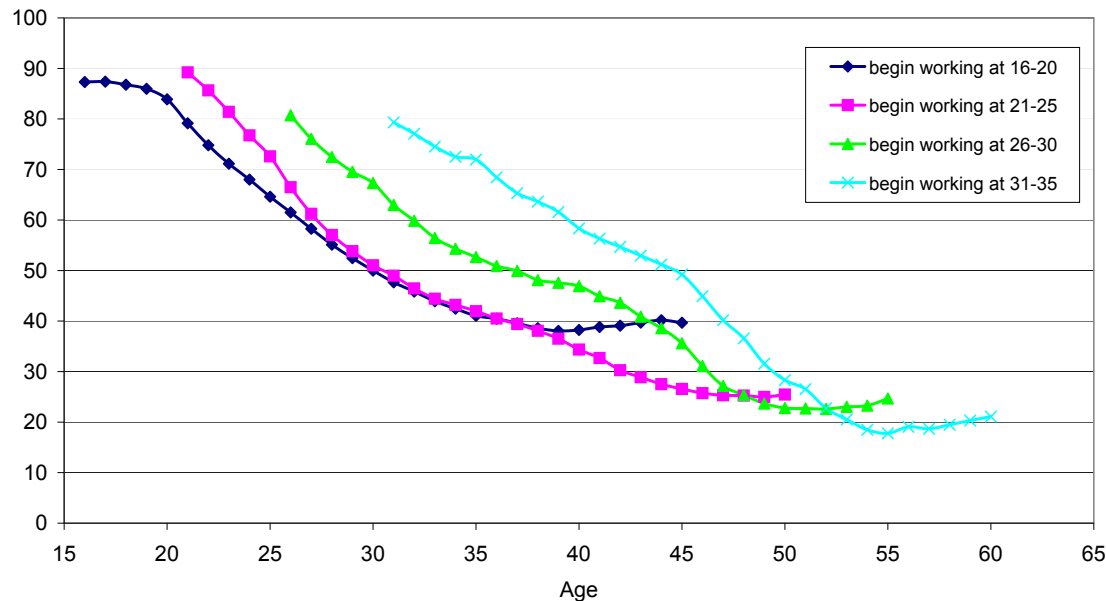
Source: Boeri (2010) based on Eurostat

# Why is this question relevant?

## Features of the Spanish labor market and the need to eliminate the duality:

- Huge employment volatility: 77% of total job losses during the current crisis were due to TCs (34% in the EU).
- Labor market segmentation is quite persistent: 40% of the workers who have a temporary job at age 20 still have one at the age of 40.

% with a temporary contract by entry age (MCVL-2009, 1990-2009)  
SPAIN



## Why is this question relevant?

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### Features of the Spanish labor market and the need to eliminate the duality:

- Huge employment volatility: 77% of total job losses during the current crisis were due to TCs (34% in the EU).
- Labor market segmentation is quite persistent: 40% of the workers who have a temporary job at age 20 still have one at the age of 40.
- Low productivity growth: no training, poor match quality and specialization in relatively low-productivity sectors.
- Bad implications for emancipation, birth rates, sustainability of the pension system.



## Policy options

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- **Subsidies to stimulate the creation of permanent jobs:** costly and inefficient: Garcia-Perez & Rebollo (2009).
- **Marginal reduction in the gap in EPL:** stricter limits on temporary contracts with very small compensating changes in permanent jobs.



# Policy options

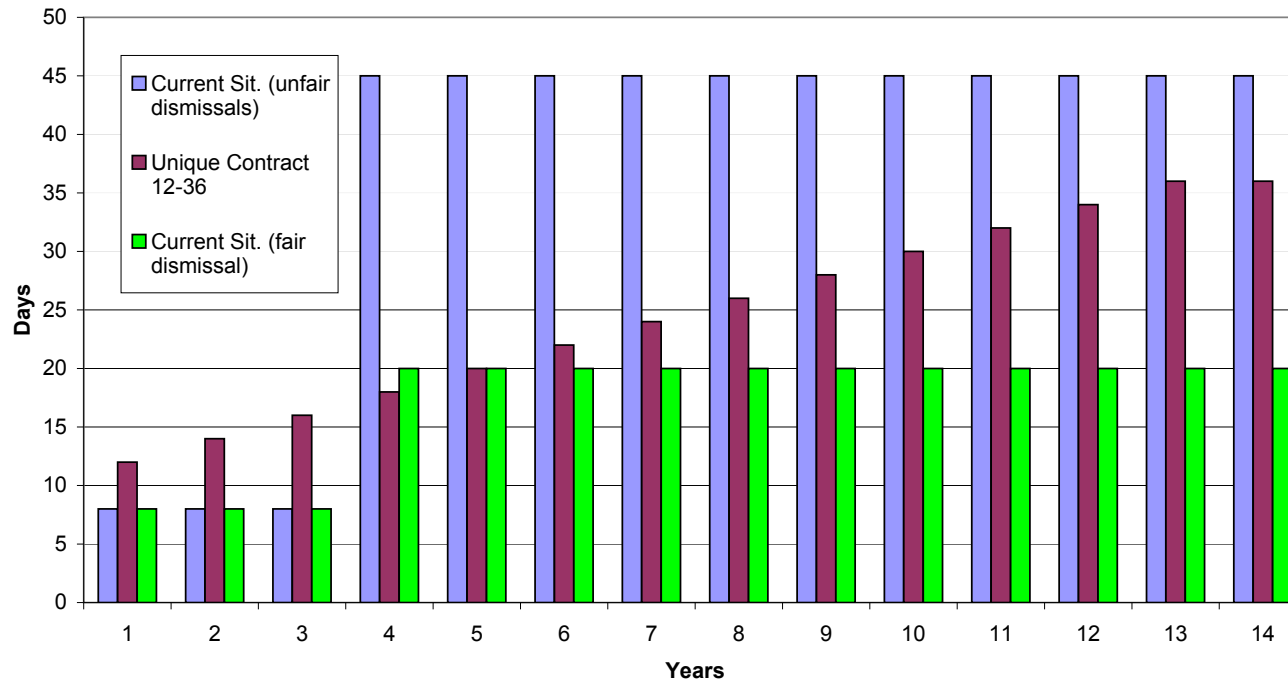
- **Subsidies to stimulate the creation of permanent jobs:** costly and inefficient: Garcia-Perez & Rebollo (2009).
- **Marginal reduction in the gap in EPL:** stricter limits on temporary contracts with very small compensating changes in permanent jobs.
- **Introduction of a single open-ended contract with gradually increasing levels of protection for all new hires:** *“Propuesta para la Reactivación Laboral en España”*.



## Example: “SC 12-36”:

“SC 12-36”: severance payments start being 12 days of wage and grows at a moderate rate (2-3 additional days p.y.o.s) until 36 days p.y.o.s

Severance Payments: number of days per year worked



# What kind of model do we need?

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A JC-JD model of the search and matching type.

## Standard ingredients:

- Heterogeneity (idiosyncratic shocks)
- Persistency (Markov processes)
- Frictions in the matching process
- Endogenous job destruction

## New ingredients:

- Dual labor market: two types of contracts (PCs and TCs) differing in maximum length and in firing costs
- Endogenous job conversion from TC's into PC's
- Firing costs modeled as transfer and being a function of wages and seniority
- Downward wage rigidity (minimum wage)
- Seniority as a state variable

## ● EPL Models:

- Effects on JC, JD, u: Mortenen & Pissarides (1994), Garibaldi and Violante (2002);
- Real business cycle: Hopenhayn & Rogerson (1993), Alvarez & Veracierto (2001);
- with TCs & PCs: Blanchard & Landier (2002), Cahuc & Postel-Vinay (2002).
- Efficiency wage: Saint-Paul (1996), Guell (1999).

## ● TC's Models:

- Effects on turnover, employment, productivity, wages: Wasmer (1999), Bentolila & Dolado (1994)
- Dynamic partial equilibrium demand: Bentolila & Saint-Paul (1992), Cabrales & Hopenhayn (1997).

## Closest papers

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- **Costain, Jimeno & Thomas (2010)**: to what extent the coexistence of permanent and temporary jobs account for the volatility of employment.

Difference: focus on business cycle properties.

- **Bentolila, Cahuc, Dolado & Le Barbanchon (2010)**: how much of the larger increase in unemployment in Spain versus France during the ongoing recession can be accounted for the difference in EPL between the two countries (45%).

Difference: exogenous temporary job destruction and red tape costs.

Our model differs:

- Firing costs are modeled as a **transfer** (not as a tax).
- **Minimum wage** constraints.
- Keep track of contracts and compute distributions of wages, JC and JD **by type of contract and tenure**, and distributions of employment loss by reason of separation.
- Detailed calibration exercise allow us to use the model to perform quantitative policy evaluations.

## Population

- Workers: employed or unemployed.
- Firms-Jobs: occupied or vacant.

## State Space

$S = \{\{0, 1\} \times \mathcal{E} \times D\}$ , where

$$\mathcal{E} = \{\epsilon_1, \dots, \epsilon_n\}$$

$$D = \{d_1, \dots, d_N\}$$

## Preferences

- Identical and linear in consumption.
- Work is offered inelastically.

## Production Technology

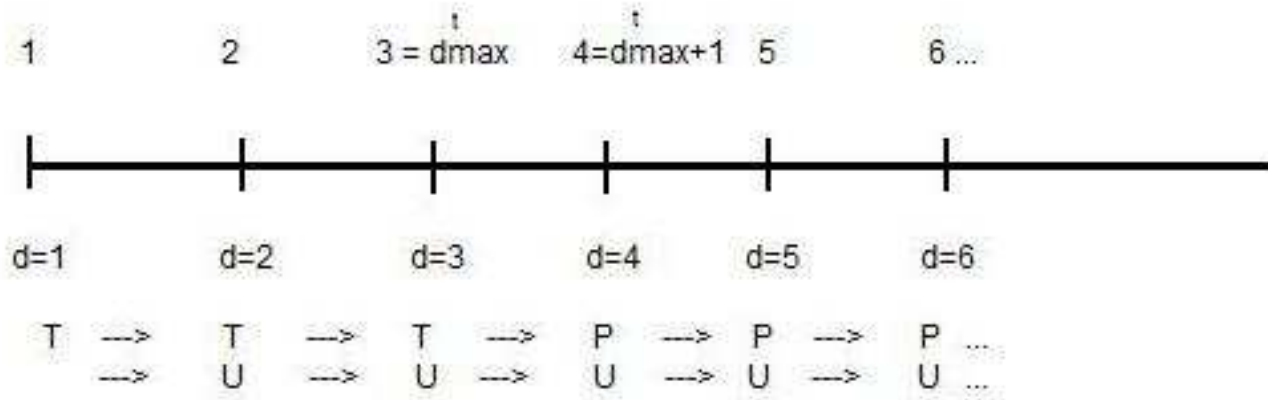
- Each firm produces one unit of product whose price is  $y(\epsilon_t)$  where
  - $\{\epsilon_t\}$  is Markov chain,  $\epsilon' \in \mathcal{E} = \{1, 2, \dots, n_\epsilon\}$ ,  $\Gamma(\epsilon'|\epsilon) = Pr\{\epsilon_{t+1}|\epsilon_t\}$
  - Entry level  $\epsilon_e$

## Matching Technology

- $c$ : cost of posting a vacancy.
- Every job is created as a temporary job.
- $m = m(u_t, v_t)$  matching function.
- Transition rates:
  - $q(\nu) = \frac{m(v, u)}{v} = m\left(1, \frac{u}{v}\right)$
  - $\alpha(\nu) = \frac{m(v, u)}{u} = m\left(\frac{v}{u}, 1\right)$
  - Job conversion at the end of the TC's maximum length.



# The model: timing



1. Firm's idiosyncratic shocks are revealed.
2. Firms and workers renegotiate wages.
3. Firm decides whether to continue producing or to terminate the match.
4. After that, production starts.
5. Finally, search decisions are made.



# The model: value functions

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Problem of a firm with an existing temporary job

$$J^t(\epsilon, d) = \max\{y(\epsilon) - w(\epsilon, d) + \beta \sum_{\epsilon'} \Gamma(\epsilon'|\epsilon) J^t(\epsilon', d'), \\ -f^t(\epsilon, d-1) - c + \beta(1 - q(\nu))J^0 + \beta q(\nu)J^t(\epsilon_e, 1)\}$$

$$g^t(\epsilon, d) = \begin{cases} 1 & \text{if the match continues} \\ 0 & \text{if the worker is fired} \end{cases}$$

# The model: value functions

Problem of a firm with an expired TC (prospective PC)

$$J^p(\epsilon, d_{max}^t + 1) = \max \left\{ y(\epsilon) - w(\epsilon, d_{max}^t + 1) + \beta \sum_{\epsilon'} \Gamma(\epsilon' | \epsilon) J^p(\epsilon', d'), \right. \\ \left. - f^t(\epsilon, d_{max}^t) - c + \beta(1 - q(\nu)) J^0 + \beta q(\nu) J^t(\epsilon_e, 1) \right\}$$

$$g^p(\epsilon, d_{max}^t + 1) = \begin{cases} 1 & \text{if the firm promotes the worker} \\ 0 & \text{if the worker is fired} \end{cases}$$

# The model: value functions

Problem of a firm with an existing permanent job

$$J^p(\epsilon, d) = \max \left\{ y(\epsilon) - w(\epsilon, d) + \beta \sum_{\epsilon'} \Gamma(\epsilon'|\epsilon) J^p(\epsilon', d'), \right. \\ \left. -f^p(\epsilon, d - 1) - c + \beta(1 - q(\nu))J^0 + \beta q(\nu)J^t(\epsilon_e, 1) \right\}$$

$$g^p(\epsilon, d) = \begin{cases} 1 & \text{if the match continues} \\ 0 & \text{if the worker is fired} \end{cases}$$

# The model: value functions

## Problem of a worker in a PC and a TC

$$\begin{aligned}
 V^p(\epsilon, d) &= \tilde{\Phi}(g^p = 1)[w(\epsilon, d) + \beta \sum_{\epsilon'} \Gamma(\epsilon'|\epsilon)V^p(\epsilon', d')] \\
 &+ \tilde{\Phi}(g^p = 0)[V^0 + f^p(\epsilon, d - 1)]
 \end{aligned}$$

$$\begin{aligned}
 V^t(\epsilon, d) &= \tilde{\Phi}(g^t = 1)[w(\epsilon, d) + \beta \sum_{\epsilon'} \Gamma(\epsilon'|\epsilon)V^t(\epsilon', d')] \\
 &+ \tilde{\Phi}(g^t = 0)[V^0 + f^t(\epsilon, d - 1)]
 \end{aligned}$$

## Problem of an unemployed worker

$$V^0 = b + \beta\alpha(\nu)V^t(\epsilon_e, 1) + \beta(1 - \alpha(\nu))V^0$$



# The model: wage determination

Bargaining surplus (e.g. in a permanent job)

$$S^p(\epsilon, d) = J^p(\epsilon, d) - (J^0 - f^p(\epsilon, d - 1)) + V^p(\epsilon, d) - (V^0 + f^p(\epsilon, d - 1))$$

Wages maximize:

$$[J^p - (J^0 - f^p(\epsilon, d - 1))]^{1-\theta} [V^p - (V^0 + f^p(\epsilon, d - 1))]^\theta$$

Hence, in equilibrium:

$$\begin{aligned} w^p(\epsilon, d) = & \max\{w_{min}, \theta y(\epsilon) + (1 - \theta)V^0 + f^p(\epsilon, d - 1) + \\ & \theta\beta \sum_{\epsilon'} \Gamma(\epsilon'|\epsilon) J^p(\epsilon', d) \\ & - \beta(1 - \theta) \sum_{\epsilon'} \Gamma(\epsilon'|\epsilon) V^p(\epsilon', d)\} \end{aligned}$$

# Equilibrium

A recursive equilibrium is a list of value functions  $J^p(\epsilon, d)$ ,  $J^t(\epsilon, d)$ ,  $V^p(\epsilon, d)$ ,  $V^t(\epsilon, d)$ ,  $J^0$ ,  $V^0$ , transition rates  $q(\nu)$ ,  $\alpha(\nu)$ , prices  $w(\epsilon, d)$  and decision rules  $g^p(\epsilon, d)$ ,  $g^t(\epsilon, d)$  such that

1. *Optimality*: Given functions  $q(\nu)$ ,  $\alpha(\nu)$  and  $w(\epsilon, d)$ , the value functions  $J^p(\epsilon, d)$ ,  $J^t(\epsilon, d)$ ,  $V^p(\epsilon, d)$  and  $V^t(\epsilon, d)$  satisfy the Bellman equations.
2. *Free entry*:  $J^0 = 0$ , implying  $c = \beta q(\nu) J^t(\epsilon_e, 1)$ .
3. *Wage bargaining*:

$$\begin{aligned} (1 - \theta)S^p(\epsilon, d) &= J^p(\epsilon, d) + f^p(\epsilon, d) \\ \theta S^p(\epsilon, d) &= V^p(\epsilon, d) - (V^0 + f^p(\epsilon, d)) \end{aligned}$$

In TCs similar conditions hold.

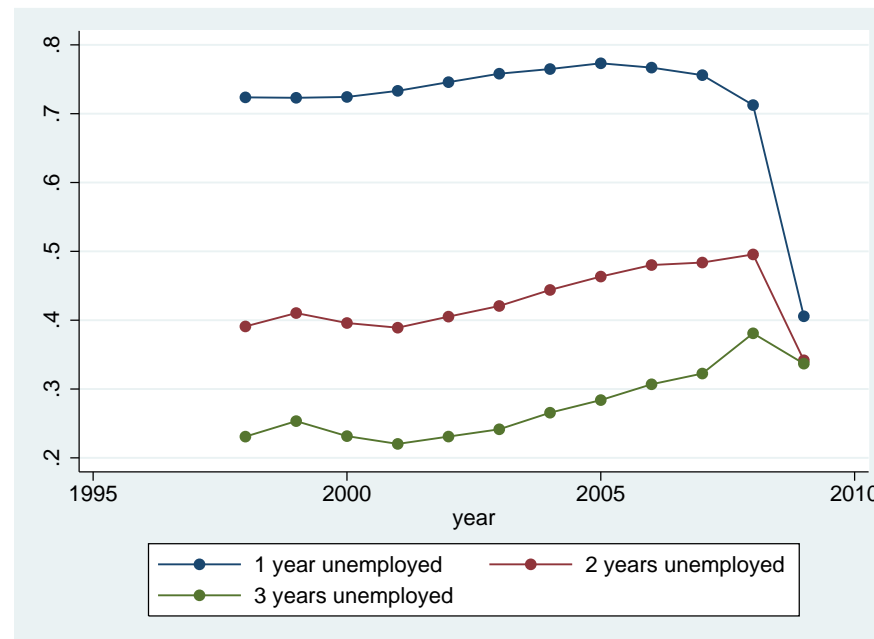
4. *Rational expectations*

# Calibration

**Data set:** “Muestra continua de vidas laborales” (MCVL): random draw from the Social Security archives.

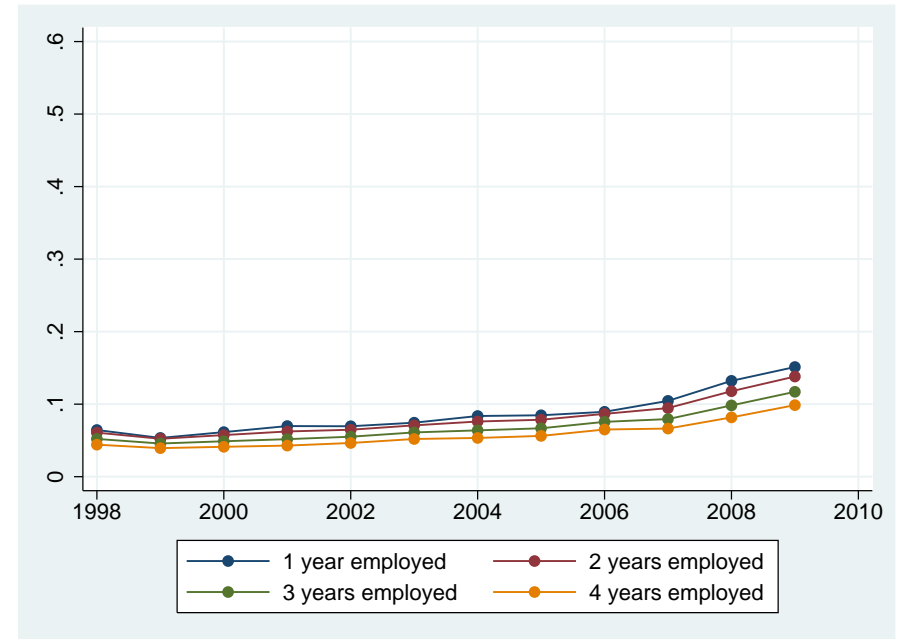
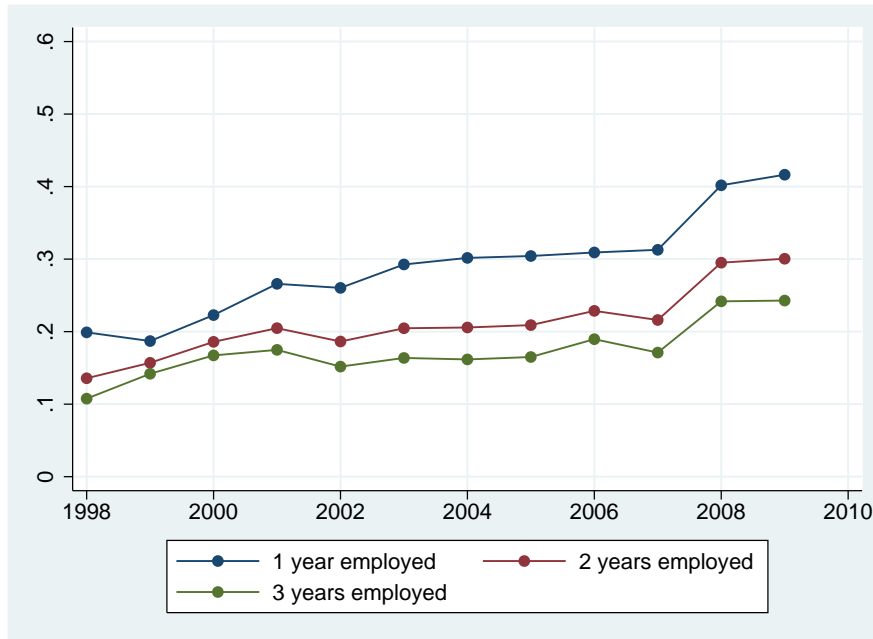
**Info on:** personal characteristics and all employment and unemployment spells throughout worker’s entire labour history.

**Figure 1:** Exit rate from unemployment to temporary employment, by unemployment duration



# Calibration

**Figure 2:** Exit rates from temporary (left) and permanent (right) employment to unemployment, by employment duration

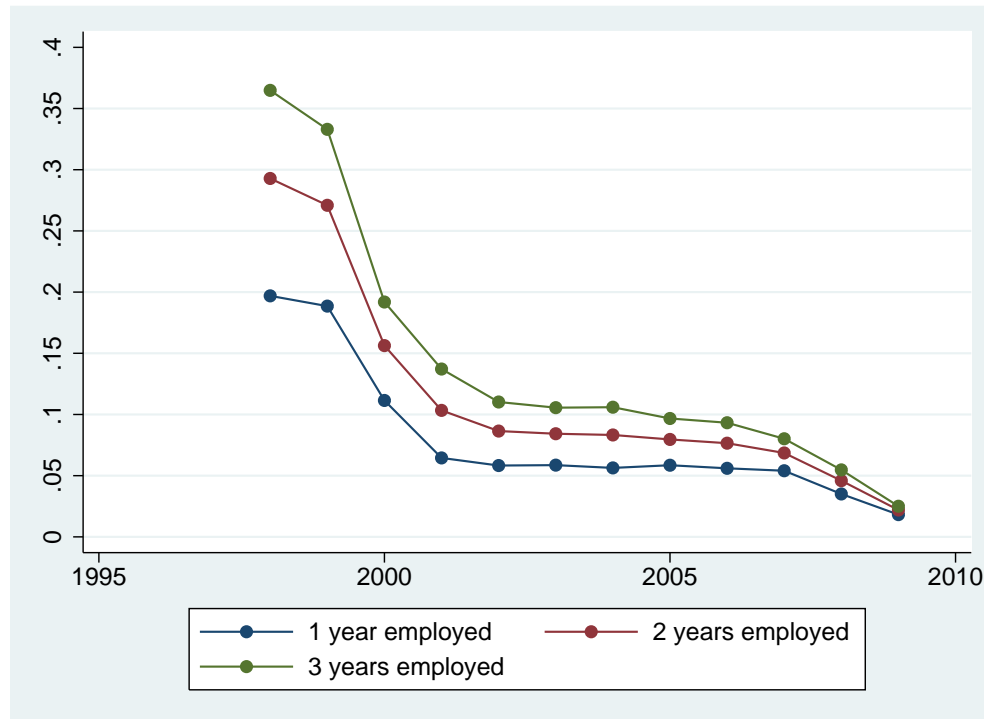


The exit from a temporary contract is much larger, at any employment duration



# Calibration

**Figure 3:** Transition from a temporary to a permanent contract, by employment duration



This transition is much lower than the exit to unemployment.

## Parameters to calibrate:

- $\beta$ ,  $\mu$ ,  $\sigma$  and  $\rho$ : empirical counterparts.
- $\eta$  and  $\theta$ : estimated empirical values.
- $y_{gap}$ ,  $c$ ,  $b$ ,  $w_{min}$  and  $A$ : simulated method of moments.

## Statistics to match:

- The permanent job destruction rate,  $JDp = 6.19\%$ .
- The temporary job destruction rate,  $JDt = 23.95\%$ .
- The ratio  $b/w_{min}$  is 35.11%.
- The wage share,  $w/y$ , is 70%.
- Unemployment duration,  $u_{dur}$ , is 10.38 months.

# Calibration

- *Preferences:*  $r = 3\%$  implies  $\beta = 0.97$ .
- *Idiosyncratic shocks:* Tauchen's procedure:  $\mu, \sigma, \rho$  of GDP implies  $\mathcal{E} = \{\epsilon_1, \dots, \epsilon_5\}$  and  $\Gamma(\epsilon' | \epsilon)$

$$\mu = 0.3, \sigma = 0.11, \rho = 0.75$$

- $y_{gap} = 0.17$
- *Unemployment benefits:*  $b = 0.1$ .
- *Minimum wage:*  $w_{min} = 0.3$
- *Matching technology:*

$$m = m(v, u) = A * v^\eta (u)^{1-\eta}$$
$$\eta = 0.51 \text{ and } A = 0.5$$

- *Hiring costs:*  $c = 0.05$
- *Bargaining power:*  $\theta = 0.3$

## Firing cost function for permanent workers

- Legal indemnities in fair dismissals (20 days of wages p.y.o.s. with a maximum of 12 monthly wages)
- Legal indemnities in unfair dismissals (45 days of wages p.y.o.s. with a maximum of 42 monthly wages)
- Procedural wages of around two monthly wages (except when applying the Law 45/2002: 67% of cases)
- 10% of all firing processes were judged and 73.2% of them were declared unfair.
- The rest of dismissals are: 4.3% collective dismissals, 18.7% agreed at UM (we assume all apply 45 days).

The firing cost function is  $f^p = 0.12 * w * d + 0.05 * w$  for permanent workers

and  $f^t = 0.02 * w * d$  in the case of temporary contracts.

# Calibration Results

Table 1: Statistics to match

Statistics	Simulated Model	Spanish Data
$JDp$	5.58	6.19
$JDt$	23.03	23.95
$b/w_{min}$	33.33	35.11
$w/y$	74.78	70.0
$u_{dur}$	10.64	10.38

# Calibration Results

Table 2: Statistics of interest

Statistics	Simulated Model	Spanish Data
$u$	14.54	11.0
$JD$	13.72	10.51
$Av.tenure \leq 6$	1.95	1.91
$Av.tenure \leq 10$	3.79	2.81

# Calibration Results

Table 4: The Effects of the Single Contract

Statistics	<i>Dual L.M.</i>	<i>S.C.</i>
$u$	14.54	11.42
$JD$	13.72	9.79
$JD_{d \leq 3}$	23.03	12.34
$JD_{d > 3}$	5.58	8.19
$Av.Tenure_{d \leq 6}$	1.95	2.06
$Av.Tenure_{d \leq 10}$	3.79	4.19

# Calibration Results

Table 4: The Effects of the Single Contract

Statistics	<i>Dual L.M.</i>	<i>S.C.</i>	%var	$\frac{\%var}{\%f}$
<i>u</i>	14.54	11.42	-21.46	+2.35
<i>JD</i>	13.72	9.79	-28.64	+3.14
<i>JD<sub>d≤3</sub></i>	23.03	12.34	-46.42	+5.08
<i>JD<sub>d&gt;3</sub></i>	5.58	8.19	+46.77	-5.12
<i>Av.Tenure<sub>d≤6</sub></i>	1.95	2.06	+5.64	-0.62
<i>Av.Tenure<sub>d≤10</sub></i>	3.79	4.19	+10.55	-1.16

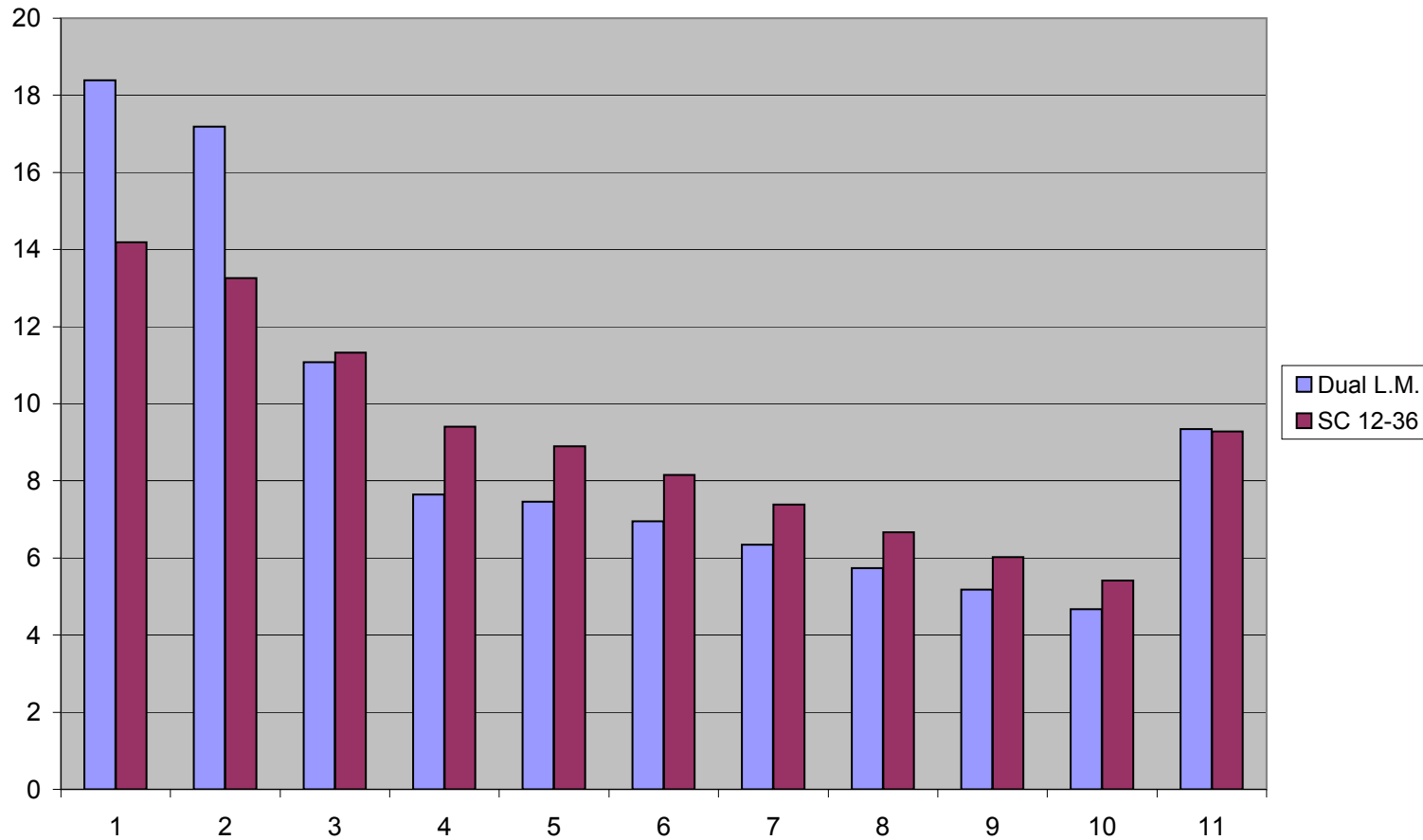
The SC will make average severance payments to reduce by 9%, in expected terms.

It also makes job creation to increase by 10,19% and unemployment duration to decrease by 9,25%.



# Calibration Results

Figure 4: Tenure distribution



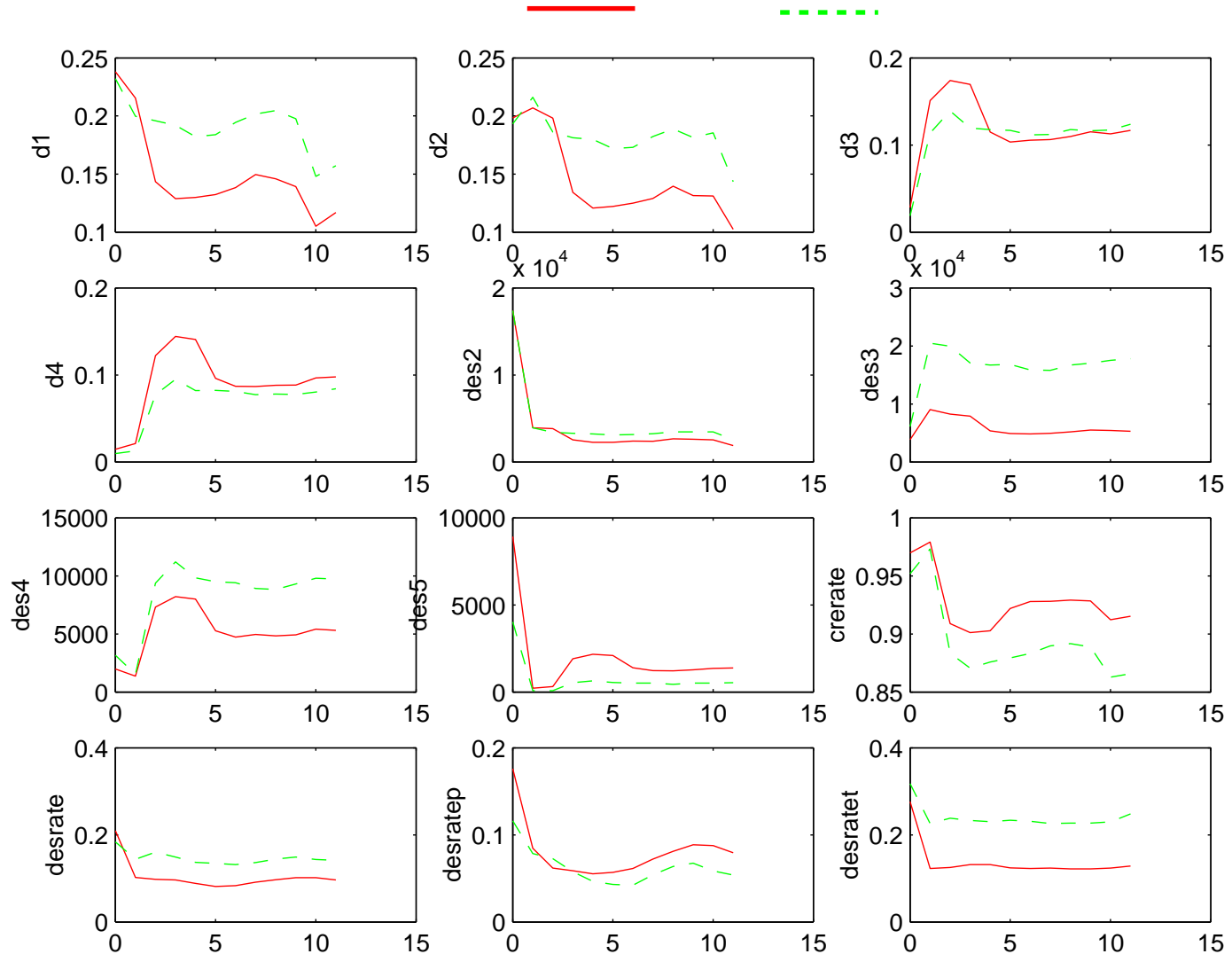
# The Transition

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- We will analyze the transition from the dual LM to the one with the SC by comparing the resulting LM careers for a subsample of workers under both scenarios and during 12 periods.
  - The policy rules that prevail during the transition for unemployed workers are the ones of the SC.
  - For those initially under a TC, job conversion will still take place but to the SC.
  - For those already in a PC, firms have to compare the value of continuing with the actual match to the one of firing the worker and hiring a new one under a SC.
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- The main results are as follows:

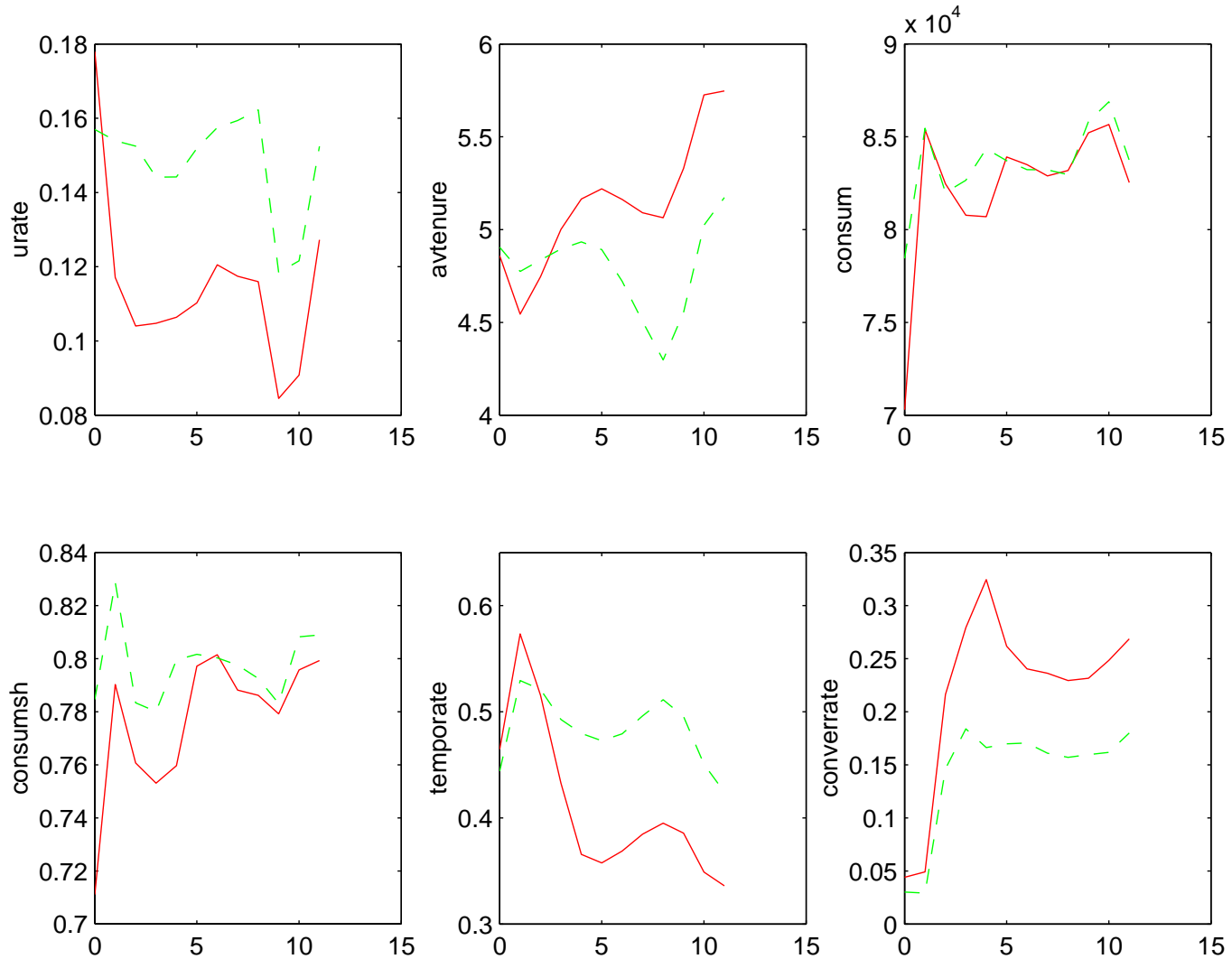
# The Transition

Figure 6: Transition vs. Status Quo



# The Transition

Figure 7: Transition vs. Status Quo



# The Transition

**Table 5: Winners and Losers**

TR vs. SQ	All	Permanent	Temporary	Unemployed
$s >, t >$	17.91%	17.51%	16.40%	21.12%
$s >, t =$	11.32%	12.66%	8.31%	11.84%
$s >, t <$	6.17%	6.28%	6.8%	5.02%
$s =, t >$	0.65%	0.03%	2.33%	0.03%
$s =, t =$	28.52%	32.05%	25.98%	22.31%
$s =, t <$	0.00%	0.00%	0.01%	0.00%
$s <, t >$	24.14%	22.85%	24.03%	27.90%
$s <, t =$	8.41%	6.03%	10.76%	11.70%
$s <, t <$	2.87%	2.60%	5.40%	0.09%

# The Transition

**Table 6: Winners and Losers**

In the Transition	All	Permanent	Temporary	Unemployed
Greater s	35.40%	36.45%	31.51%	37.98%
Same s	29.17%	32.08%	28.32%	22.34%
Lower s	35.42%	31.48%	40.19%	39.69%
Greater t	42.70%	40.39%	42.76%	49.05%
Same t	48.25%	50.74%	45.05%	45.85%
Lower t	9.04%	8.88%	12.21%	5.11%

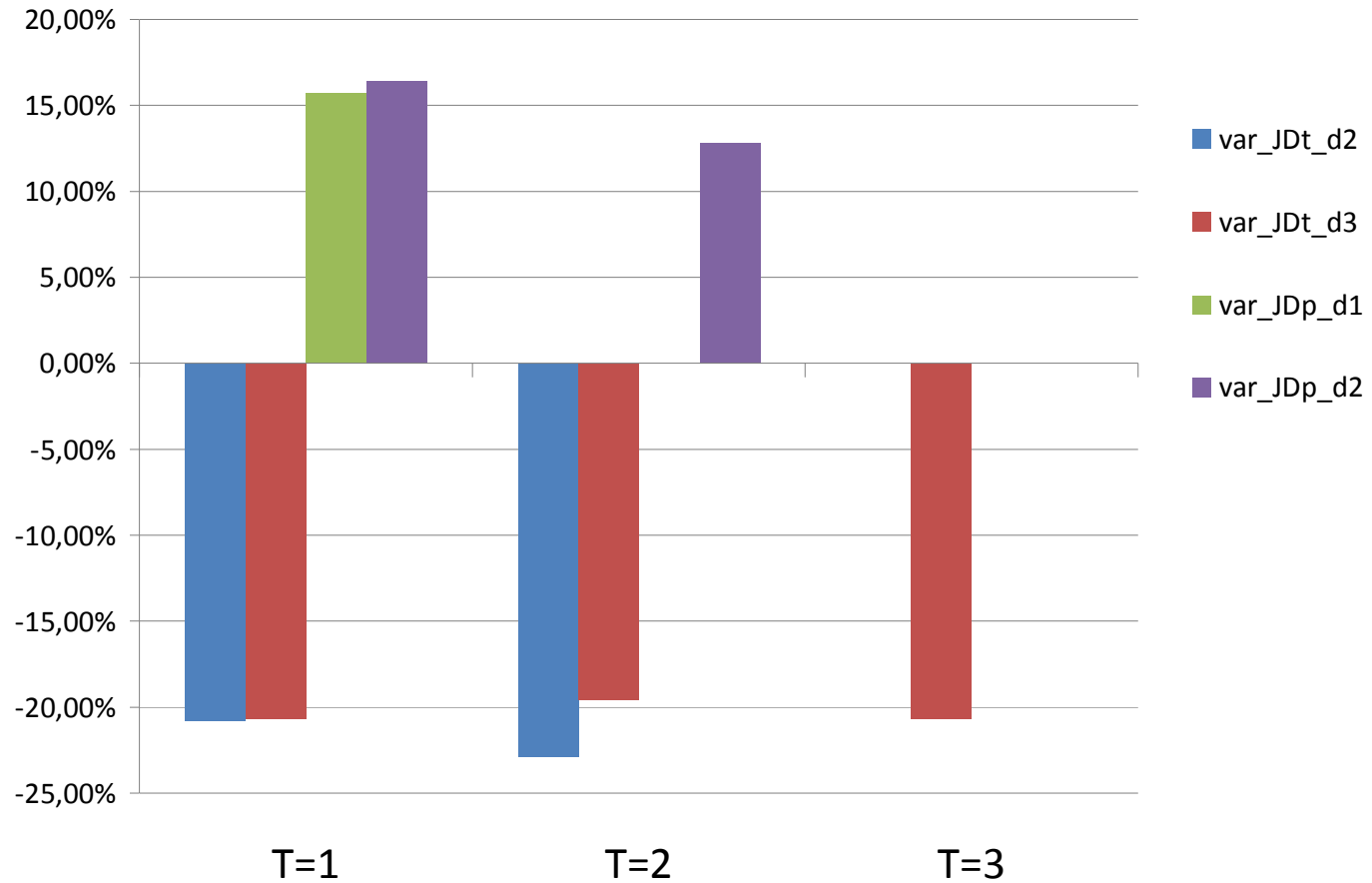
## The Transition

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- Firms have an incentive to substitute "*junior*" permanent workers with new ones under single contracts during the transition.
  - 34% of the separations of permanent workers in the first period and 25% in the second period are due to this substitution effect.
- But they also tend to reduce the separations of "*senior*" temporary workers during the first 3 periods in the transition.
  - There exists 29% less separations of temporary workers during these periods.

# The Transition

**Figure 8: Change in firing probabilities (transition)**





## Concluding Remarks

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- The Great Recession has once again demonstrated the poor performance of dual labor markets.
- Countries with dual labor markets should strive to extend job protection to a wider share of the population.
- The best option is the introduction of Single Open-ended Contracts for all new hirings.
- This policy provides more job security to the young and need not to harm the protection of the elderly.
- This policy fits well in the EU strategy of *flexicurity*.

## Concluding Remarks

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- The single open-ended contract:
  - Decreases unemployment and job destruction.
  - Smooths the probability of being fired as severance payments are smoothed: JD in contracts with tenure less than 3 years is **halved** although it increases by 46% for tenure larger than 3 years.
  - Reduces mean average severance payments by 9%, in expected terms (the expected cost for firms).
  - Smooths the tenure distribution: the number of workers with tenure less or equal than a year is **23% lower** and those with tenure higher than 3 years **increases by 15%**.
  - Changes **important for**: human capital accumulation, experience acquisition, emancipation, birth rates and the sustainability of the pension system.
  - The SC would be greatly beneficial for temporary workers and the unemployed with low expected costs on average for current permanent ones

## Concluding Remarks

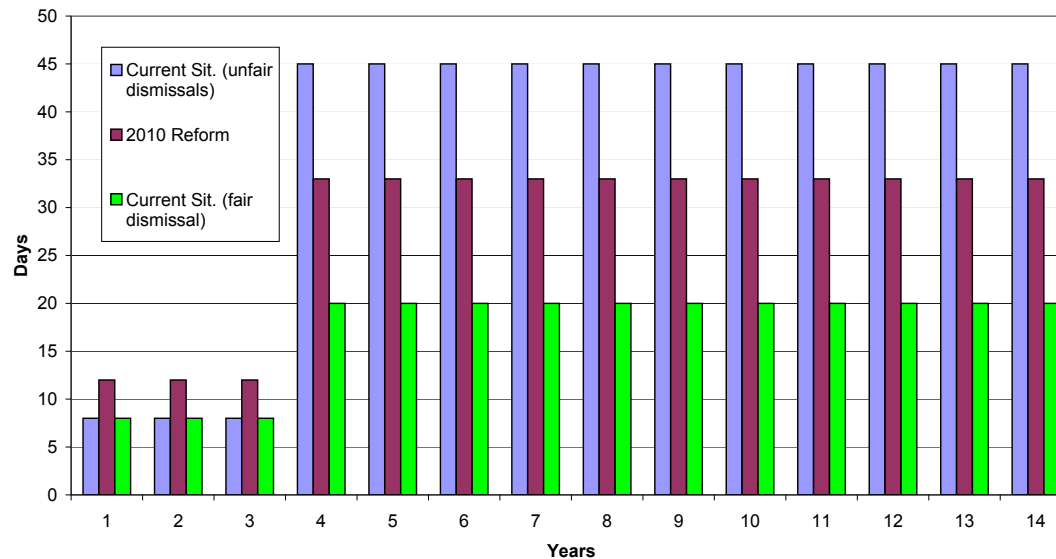
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- Was the last labor market reform a **lost opportunity** to reduce labor market segmentation?

# Concluding Remarks

- Was the last labor market reform a **lost opportunity** to reduce labor market segmentation?
- 2010 Reform: 12 days for TC's severance payments and extension of Promotion Contracts for almost all workers (33 days)

Severance Payments: number of days per year worked



# The 2010 Reform

Table 3: The Effects of the 2010 Reform

Statistics	<i>Dual L.M.</i>	<i>2010 Reform</i>	<i>S.C.</i>
<i>u</i>	14.54	13.10	11.42
<i>JD</i>	13.72	11.90	9.79
<i>JD<sub>d≤3</sub></i>	23.03	18.20	12.34
<i>JD<sub>d&gt;3</sub></i>	5.58	6.80	8.19
<i>Av.Tenure<sub>d≤6</sub></i>	1.95	2.00	2.06
<i>Av.Tenure<sub>d≤10</sub></i>	3.79	3.99	4.19