Catastrophic Job Destruction

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DISCLAIMER: The views expressed are our own, and not necessarily the ones of the Bank of Portugal.

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Introduction

"Portugal is in serious trouble. Productivity growth is anemic. Growth is very low. The budget deficit is large. The current account deficit is very largeIn the absence of policy changes, the most likely scenario is one of competitive disinflation, a period of sustained high unemployment until competitiveness has been reestablished."(Portuguese Economic Journal, Olivier Blanchard, 2007).

Introduction

"...from 1995 to 2001 the large decrease in nominal interest rate (panel 1) fueled an expansion in private expenditure (panel 2) financed by debt (panel 3). The increase in demand pushed nominal labor compensation to run 6 percent per annum, a rate well above productivity, and GDP inflation to increase to 4 percent per annum. The result was a large and rapid loss in competitiveness vis--vis the eurozone partners (panel 4)." (Francesco Franco, 2013)
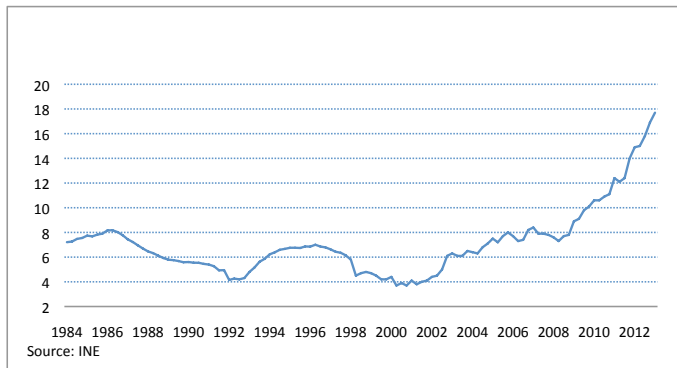
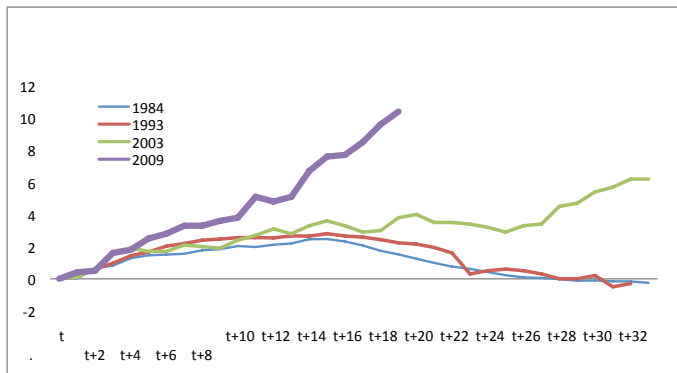# Introduction

Figure : **Portuguese macroeconomic imbalances**

Source: Eurostat 2012, REER GDP constructed using Eurostat weights
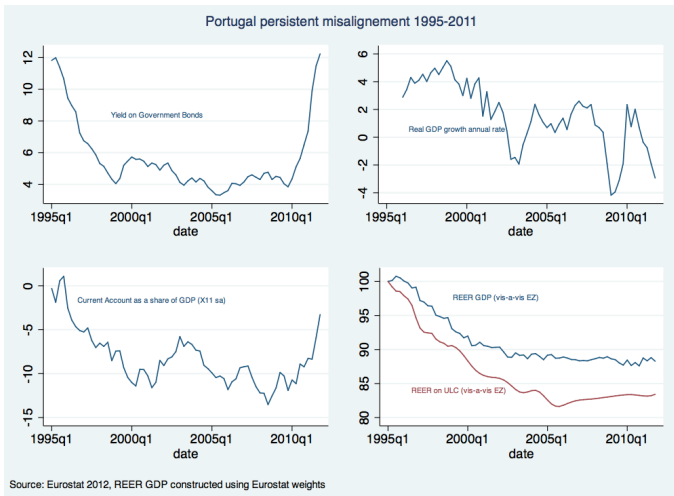
A period of sustained unemployment

Figure : **The evolution of the unemployment rate - Portugal 1984– 2012**
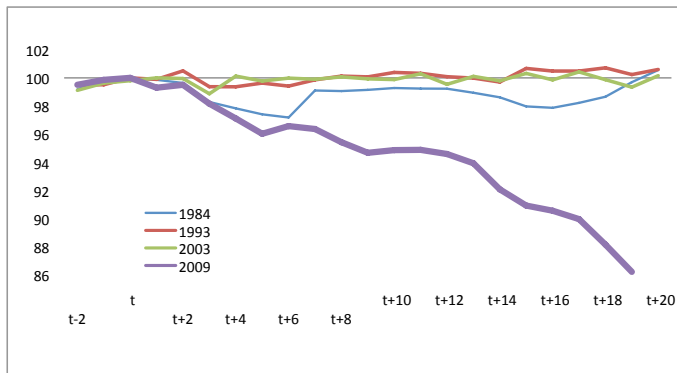

Source: INE

without parallel with other recessions

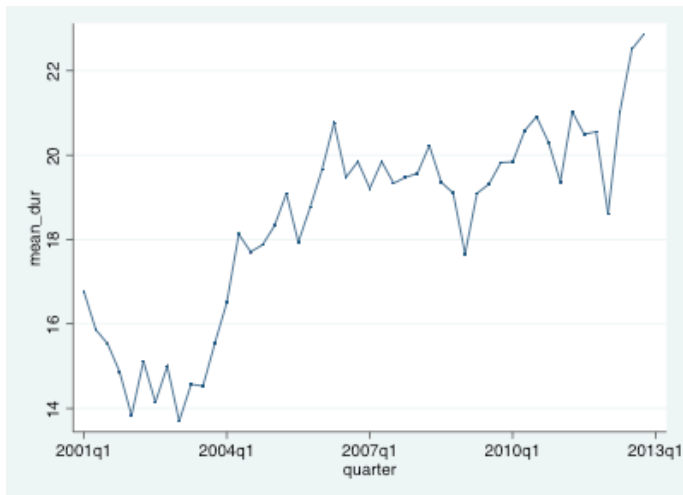Figure : **Unemployment rate recovery across recessions Portugal**

and a severe employment decline

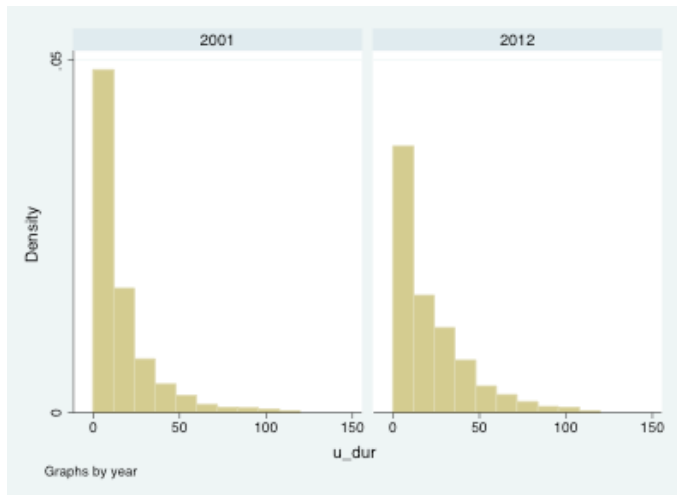Figure : **Employment rate recovery across recessions Portugal**

Long-term unemployment sharply increased

Figure : **Mean elapsed unemployment duration**

Elapsed unemployment duration

Figure : **Elapsed unemployment duration**

Graphs by year

Unemployment Duration

- Hazard function:

$$h(t) = ph_1(t) + (1 - p)h_2(t)$$

$$h(t) = p\lambda_1 + (1 - p)\lambda_2$$

- Likelihhod function:

$$L(\lambda_1, \lambda_2, p|t) = \prod_{i=1}^{n} p[e^{-\lambda_1 t_i}\lambda_1] + (1 - p)[e^{-\lambda_2 t_i}\lambda_2]$$

Unemployment duration changes

Table : The distribution of unemployment duration

	2001-2002	2011-20012
short-term λ_1	0.158	0.167
	(0.009)	(0.013)
long-term λ_2	0.045	0.044
	(0.001)	(0.001)
fraction of long-term	0.253	0.696
mean duration (months)	10.415	17.549
N	7045	21260

Source: Employment survey, INE.

Method

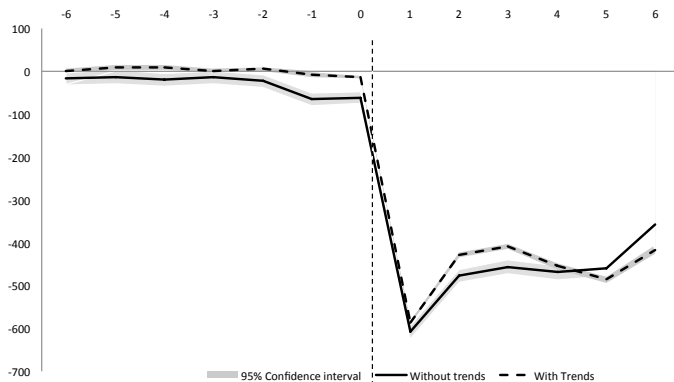- Jacobson, Lalonde, and Sullivan (1993)

$$logw_{it} = \alpha_i + \gamma_t + \beta X_{it} + \sum_{k \geq -6}^{6} D_{it}^k \xi_k + \epsilon_{it}$$

- Jacobson, Lalonde, and Sullivan (1993) with worker-specific random trends:

$$logw_{it} = \alpha_i + \omega_i t + \gamma_t + \beta X_{it} + \sum_{k \geq -6}^{6} D_{it}^k \xi_k + \epsilon_{it}$$

The Sources of the wage losses of the displaced workers (Raposo, Portugal and Carneiro, 2012)

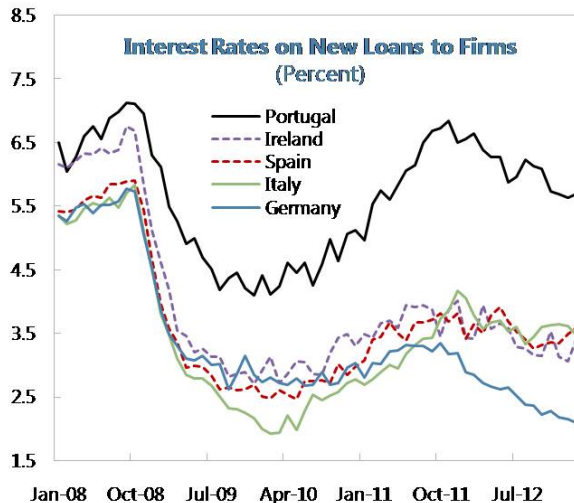Figure : **Monthly earnings loss of displaced workers**

Summary

- Unemployment rates tripled
- Employment declined dramatically
- Unemployment duration lengthen significantly from already high values
- The share of long-term unemployed reached almost 70 percent
- Earning losses of displaced workers are severe and persistent
- Catastrophic destruction of specific human capital of low-skilled workers

Navigation

- Macroeconomic imbalances
- Evidence on job destruction and other labor market outcomes
- Micro evidence on job destruction amplifying mechanisms:
    - The credit channel
    - The wage rigidity channel
    - The labor market segmentation channel
- Other channels (not addressed)
    - Negative aggregate demand shocks (role of fiscal multipliers)
    - Combination of job security with generous unemployment benefits (Ljungqvist and Sargent)
    - Hysteresis (Blanchard and Summers)

interest rate fragmentation

Interest Rates on New Loans to Firms
(Percent)

Portugal
Ireland
Spain
Italy
Germany

Jan-08   Oct-08   Jul-09   Apr-10   Jan-11   Oct-11   Jul-12

Source: European Central Bank.
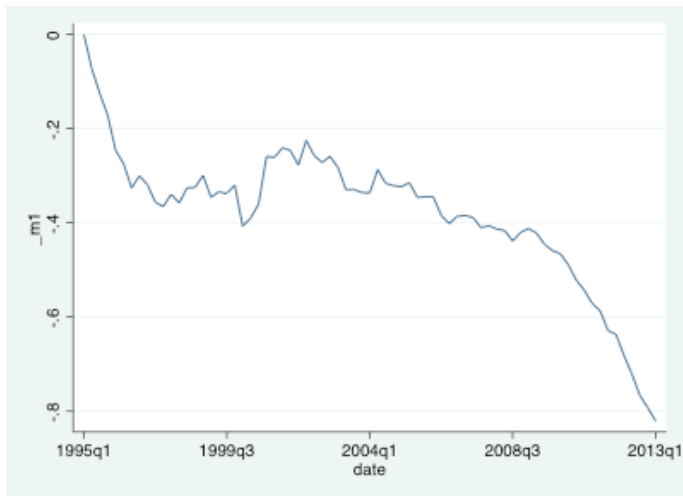
Empirical strategy

Time trends in the standing debts:

$$log \; Debt_{fbt} = \alpha_{fb} + \gamma_t + \epsilon_{fbt}$$

- $Debt_{fbt}$ denotes the amount of debt of firm f to bank b in quarter t;
- α_{fb} is a firm-bank match specific fixed effect;
- γ_t is a quarter fixed effect;
- ϵ_{fbt} is an idiosyncratic error term.

Credit crunch

Figure : **Time trend in firms debt levels**

Failure function

Failure regression (Probit regression model):

$$Prob(Exit_{ft+1} = 1) = \Phi(\alpha_0 + \alpha_1 log\ Sales_{ft} + \alpha_2 log\ TFP_f + log\ Debt_{ft}$$

$$+\alpha_3 log\ Wages_{ft} + \alpha_4 log\ Workers_{ft} + \delta_t + \xi_t r_{ft} + \epsilon_{ft})$$

- $Exit_f = 1$ means that firm f exited at year $t + 1$;
- *Sales* is the value of shipments;
- *TFP* is an estimate of total factor productivity;
- Debt is the amount of outstanding debt;
- Wages is the wage bill divided by the number of workers;
- Workers corresponds to the size of the workforce;
- r is a measure of the the firm-specific interest rate;
- ϵ_{ft} is an idiosyncratic error term.

Firm deaths

Table : The determinants of firm closure (probit regression)

	Coefficient	Standard error
log sales	-0.174	0.018
tfp	-0.232	0.016
log debt	0.105	0.009
log wage	0.051	0.030
log L	0.144	0.009
firm interest rate 2006	0.998	0.115
firm interest rate 2007	0.849	0.108
firm interest rate 2008	0.962	0.099
firm interest rate 2009	1.064	0.106
firm interest rate 2010	1.185	0.130

Source: Informacao Empresarial Simplificad (N=79 988).

Labor demand

Dynamic labor demand (fixed-effects model):

$$lnL_{ft} = \alpha_f + \rho lnL_{ft-1} + \alpha_1 log\ Sales_{ft} + \alpha_2 log\ Wages_{ft}$$

$$+\delta_t + \xi_t r_{ft} + \epsilon_{ft}$$

- L_{ft} corresponds to the number of workers at firm f in year t;
- α_f is the firm fixed effect.

Labor demand

Table : Dynamic Labor Demand(fixed effects estimation)

	Coefficient	Standard error
$\log L_{t-1}$	0.240	0.006
log sales	0.352	0.007
log wage	-0.427	0.016
firm interest rate 2006	-0.019	0.014
firm interest rate 2007	-0.028	0.013
firm interest rate 2008	-0.028	0.011
firm interest rate 2009	-0.039	0.017
firm interest rate 2010	-0.118	0.025
firm interest rate 2011	-0.106	0.025

Source: Informacao Empresarial Simplificada (N=106 332).

Summary

- Worrying interest rate fragmentation
- Suggestive evidence of credit crunch impacting on firm's the ability to borrow
- Financially distressed firms:
  - Shut-down (1 percentage point, around 20 percent of total closures)
  - Contract employment (1 to 3 percent of total employment)

The wage setting system in Portugal

Wage bargaining system in Portugal prevailing over the sample period:

- Mandatory minimum wage

- Collective bargaining takes place at a sectoral level, but mandatory extensions are commonplace

- Around 30 000 job-title wage floors are settled each year
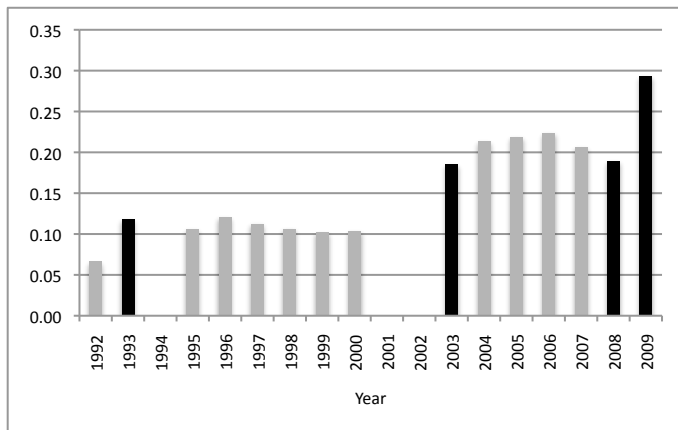- Despite very low unionization rates (less than 10 percent)

Nominal wage rigidity
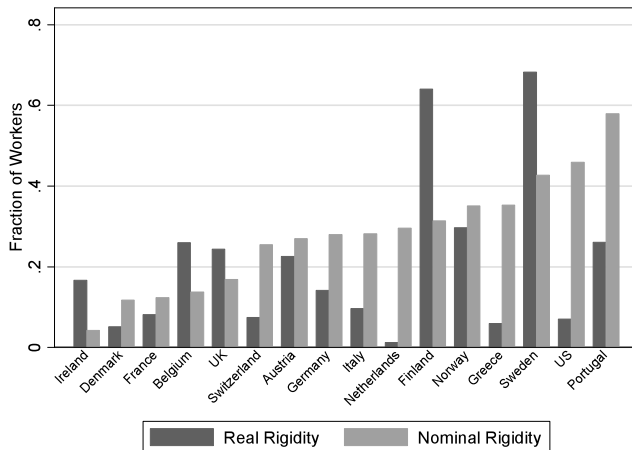
Trends on the incidence of minimum wages (1992-2009)

Figure : **Incidence of minimum wages (1992-2009)**
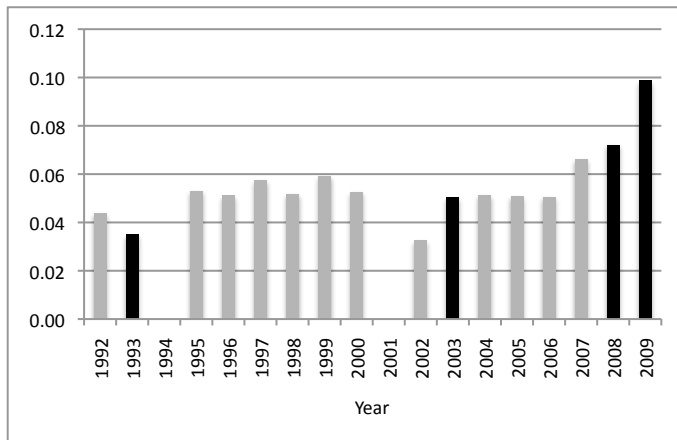
Incidence of nominal wage freezes on surviving matches, 1992-2009

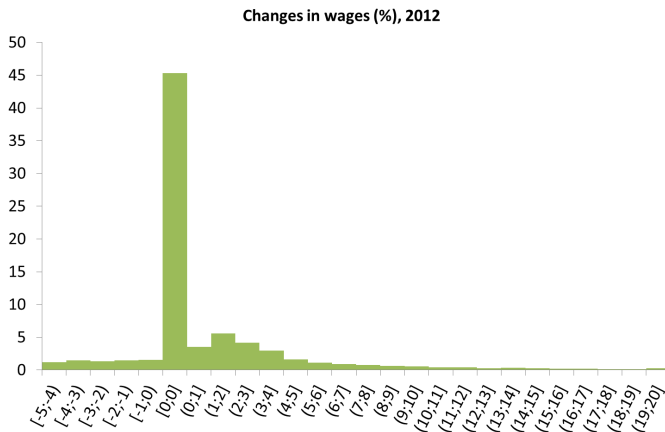Figure : **Incidence of nominal wage freezes on surviving matches, 1992-2009**

Wage change distribution, stayers, 2010-2012

Changes in wages (%), 2010

Wage change distribution, stayers, 2010-2012

Changes in wages (%), 2011

Wage change distribution, stayers, 2010-2012

Changes in wages (%), 2012

The cyclicality of real wages, Carneiro, Guimarães, and Portugal, AEJ Macro (2012)

$$y_{ijft} = \lambda_i + \theta_f + \gamma_j + \xi cycle_t + \beta X_{ift} + \epsilon_{ijft} \tag{1}$$

- y_{ijft} represents the logarithm of the hourly wage for each individual i, in job j, working for firm f in year t.
- X_{ift} are observed time-varying characteristics of individual i and firm j in year t.
  - Workers time-varying characteristics (age, age squared, seniority, and seniority squared)
  - Firms time-varying characteristics (log of size)
- λ_i is a worker fixed effect
- θ_f is a firm fixed effect
- γ_j is a job-title fixed effect
- ϵ_{ijft} is an idiosyncratic error term

wage cyclicality

Table : Unemployment rates and wage cyclicality (N=30 906 573)

|	1986-2000	2001-2007
stayers	-2.460	0.002
new-hires	-3.455	-0.341

Source: Quadros de Pessoal.

Insider-outsider wages (Guimarães, Martins and Portugal, 2013)

$$y_{ifjt} = \theta_f + \gamma_f wage_{fjt}^{insider} + \alpha_f wage_{jt}^{outsider} + \phi_f wage_t^{minimum} + \epsilon_{ifjt} \quad (2)$$

- y_{ift} represents the logarithm of the monthly wage of a newly-hired worker i, at firm f, at job-title j, in year t.
- $wage^{insider}$ is the firm's ruling wage for workers with the same job-title
- $wage^{outsider}$ is the bargained wage for workers with the same job-title
- $wage minimum$ is the mandatory minimum wage
- θ_f is a firm fixed effect
- γ_f, α_f, ϕ_f are firm-specific regression coefficients.
- ϵ_{ifjt} is an idiosyncratic error term

The wage rigidity channel

Figure : **The determinants of entry wages**

Insider Outsider Wages

kernel = epanechnikov, bandwidth = 0,0165
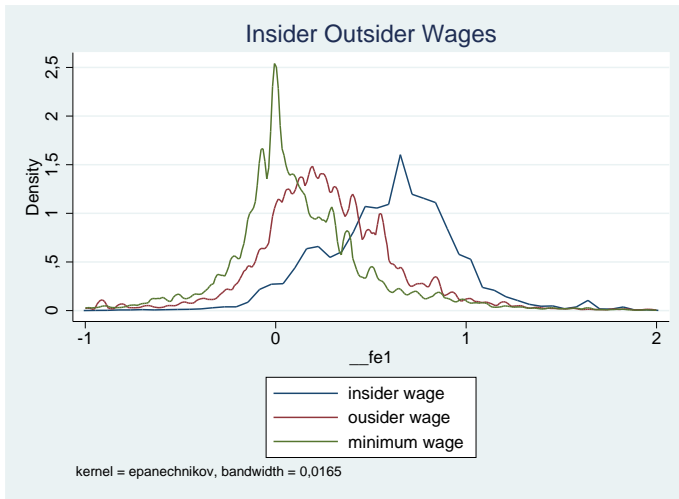
Empirical strategy: the role of bargained wages

wage rididity and worker flows:

$$hiring\ rate_{ft} = \xi\hat{\alpha}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

$$separation\ rate_{ft} = \xi\hat{\alpha}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

$$net\ job\ creation_{ft} = \xi\hat{\alpha}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

$$failure\ rate_{ft} = \xi\hat{\alpha}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

where X includes industry and regional dummies, the age of the firm, and its size.

Empirical strategy: the role of minimum wages

wage rididity and worker flows:

$$hiring\ rate_{ft} = \xi\hat{\phi}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

$$separation\ rate_{ft} = \xi\hat{\phi}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

$$net\ job\ creation_{ft} = \xi\hat{\phi}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

$$failure\ rate_{ft} = \xi\hat{\phi}_f + \delta_t + \beta X_{ft} + \epsilon_{ft}$$

where X includes industry and regional dummies, the age of the firm, and its size.

Wage rigidity and labor market flows

Table : Bargained wages and labor market flows

	hiring rate	separation rate	net job creation	failure rate
Bargained weight	-0.034	-0.006	-0.028	0.010
	(0.016)	(0.013)	(0.014)	(0.005)

Table : Minimum wages and labor market flows

	hiring rate	separation rate	net job creation	failure rate
MW weight	0.062	0.087	-0.025	0.023
	(0.017)	(0.018)	(0.016)	(0.006)

Source: Martins, Guimaraes, and Portugal (2013)

Summary

- Downward nominal wage rigidity is severe
- The wage setting system accentuates DNWR
    - through extension mechanisms
    - leading to nearly 30 000 wage floors
- Minimum wage hikes were triggered before the crisis
- Wage freezes generalized to unprecedented levels
- Real wage cyclicality faded
- Suggestive evidence that external wage restriction led to job destruction
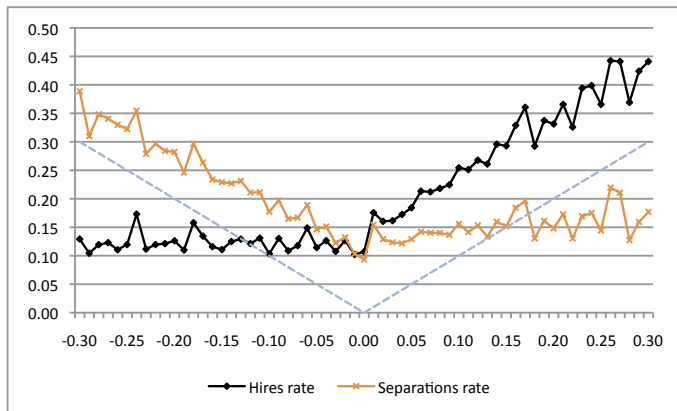
Job Creation and Job Destruction (1992-2009)
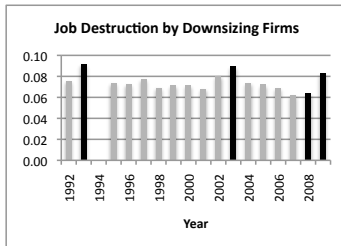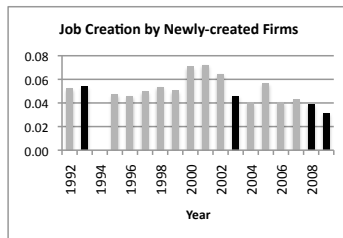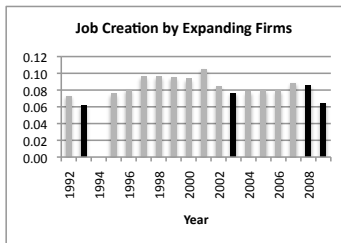
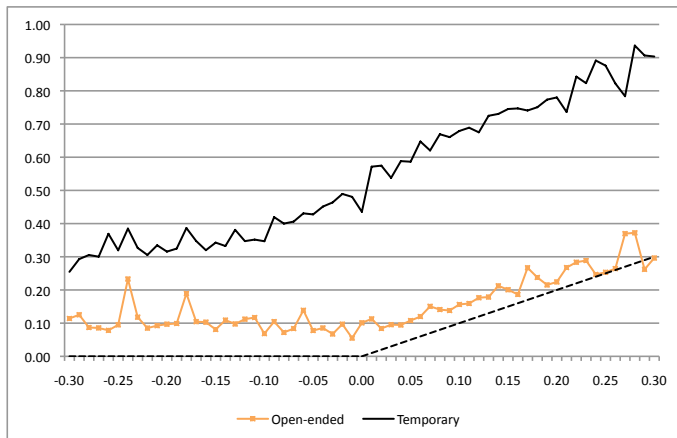# Share of temporary employment in total employment
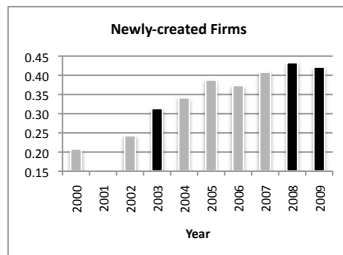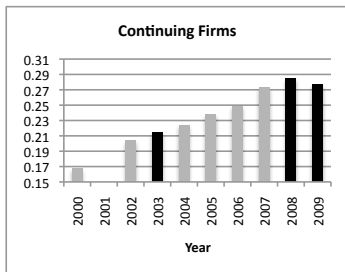
Labor market segmentation channel

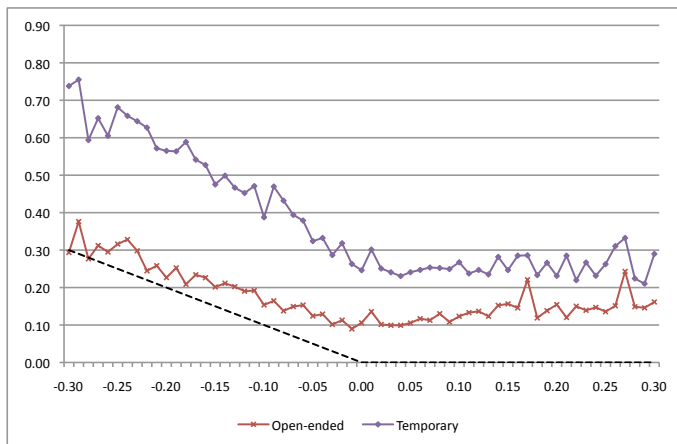Figure : **The relationship of hires and separations to net employment variation**

Hires rate   Separations rate

Labor market segmentation channel

Figure : **The relationship of hires to net employment variation, by contract type**

The labor market segmentation channel

Figure : **The relationship of separations to net employment variation, by contract type**

Summary

- High differences between firing costs between open-ended and fixed-term contracts
  - increased the number of temporary workers
  - leading to excessive worker churning
- Suggestive evidence that fixed-term contracts speeded up job destruction by facilitating job separations in recessions

Conclusions

- Job destruction
    - flows into unemployment
    - long-term unemployment
    - human capital destruction

    Three mechanisms seemed to play a role:
    - credit channel
    - wage rigidity channel
    - labor market segmentation channel

- What can be done?
    - fiscal devaluation (missed)
    - reduce labor costs through social security taxes (at least for low-wage workers)
    - reduce labor market segmentation through single contracts for new hires
    - credit constraints?