

Upward Nominal Wage Rigidity

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De Nederlandsche Bank

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A dysfunctional labor market

Poorly designed labor market institutions, faced by severe economic shocks, can lead to a disaster

- Strong employment protection
- Generous unemployment protection
- Extreme nominal wage rigidity

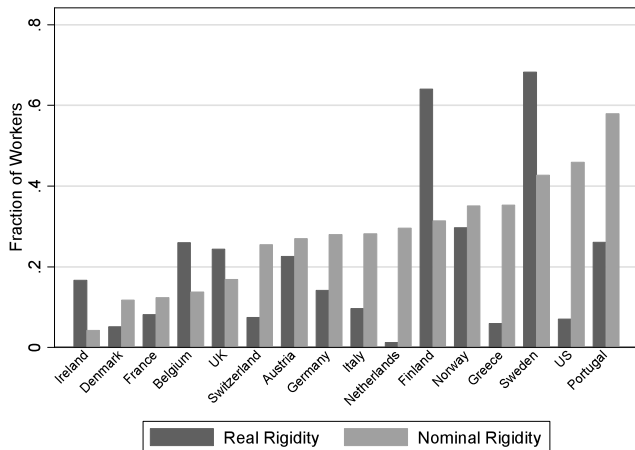
Generated

- A sclerotic labor market
- A chronic productivity problem in the economy
- A segmented labor market
- A catastrophic destruction of jobs

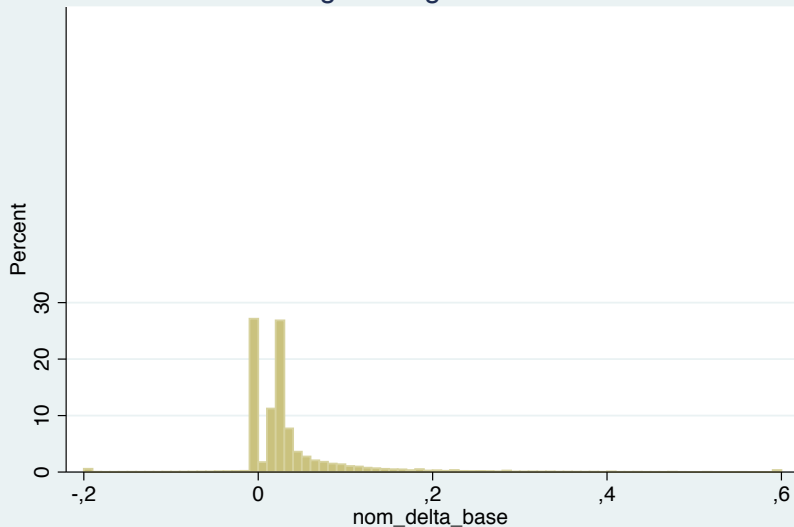
The architecture of the wage setting system

- There is a mandatory minimum wage
- Nominal wage cuts are forbidden since the 1950s
- Unions have monopoly over collective wage negotiations
- Despite very low unionization rates (less than 10 percent in the private sector)
- Wage negotiations between trade unions and employers associations define wage floors by "occupation categories" (around 30 000 job-titles)
- The wage agreement, by law, solely binds unionized workers and the firms that are members of the employer association
- But there are no mechanisms that oblige unions and employers associations to disclose their constituency
- The legal conundrum is circumvented via the use of extension clauses (often to the whole industry) by the Ministry of Employment
- That may last forever
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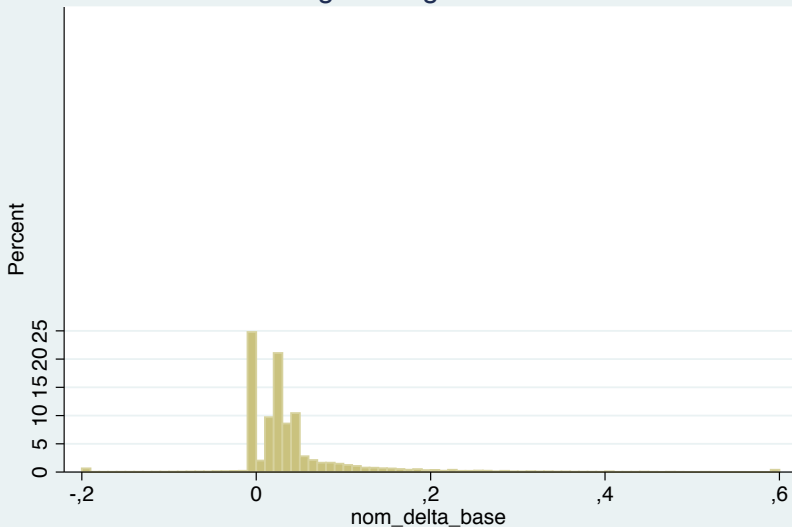
Downward nominal wage rigidity. International comparison.



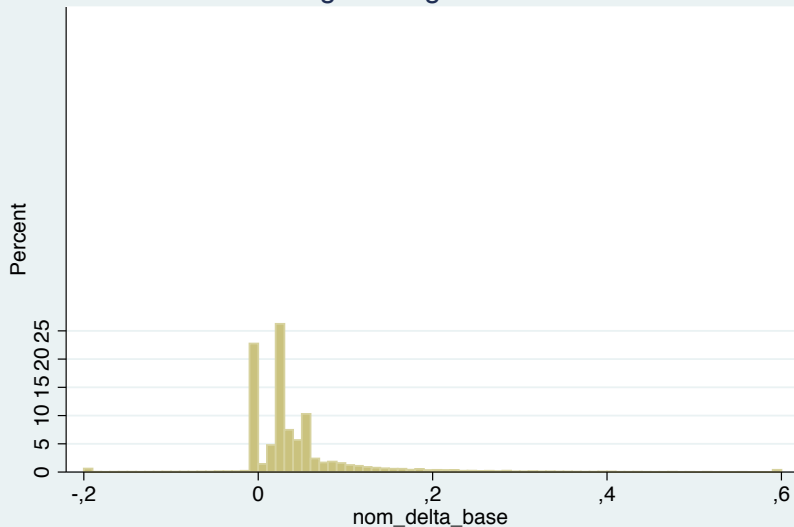
nominal wage change distribution: 2006



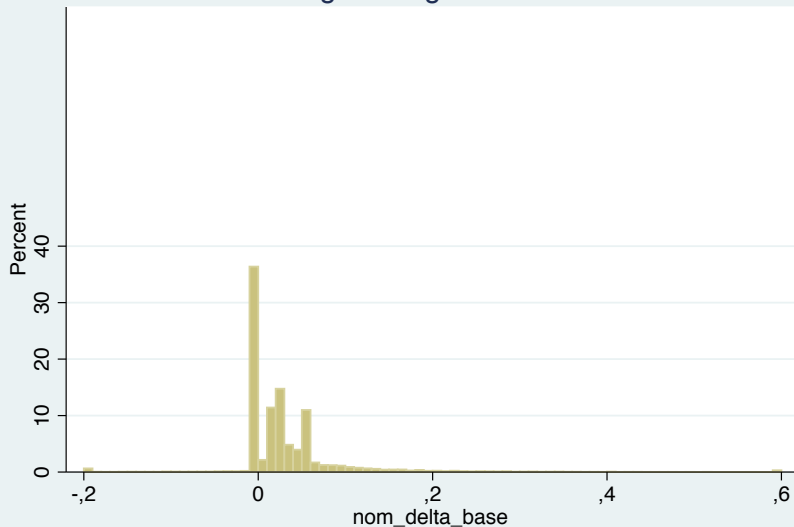
nominal wage change distribution: 2007



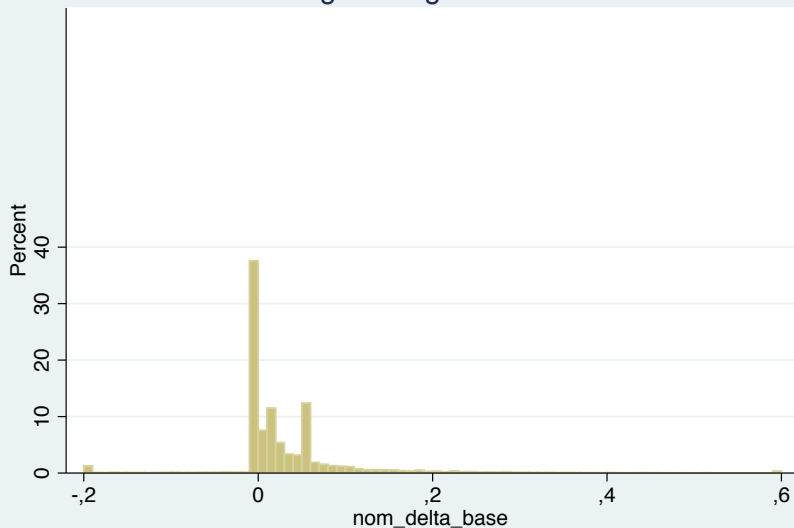
nominal wage change distribution: 2008



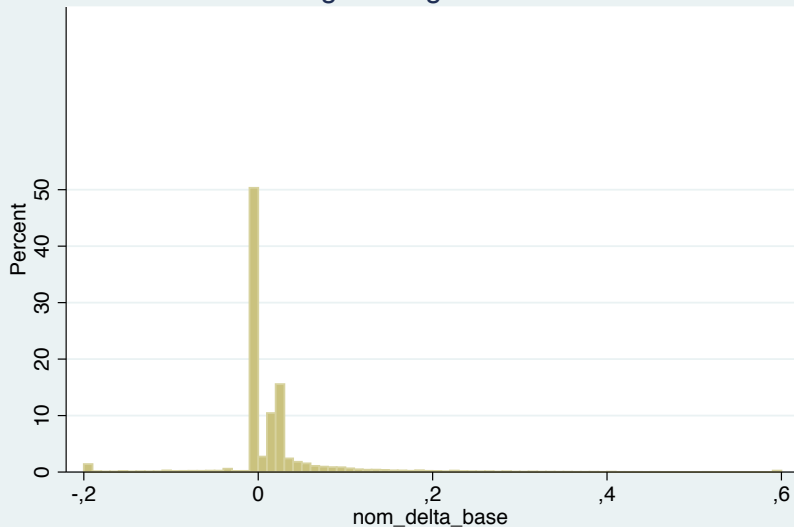
nominal wage change distribution: 2009



nominal wage change distribution: 2010

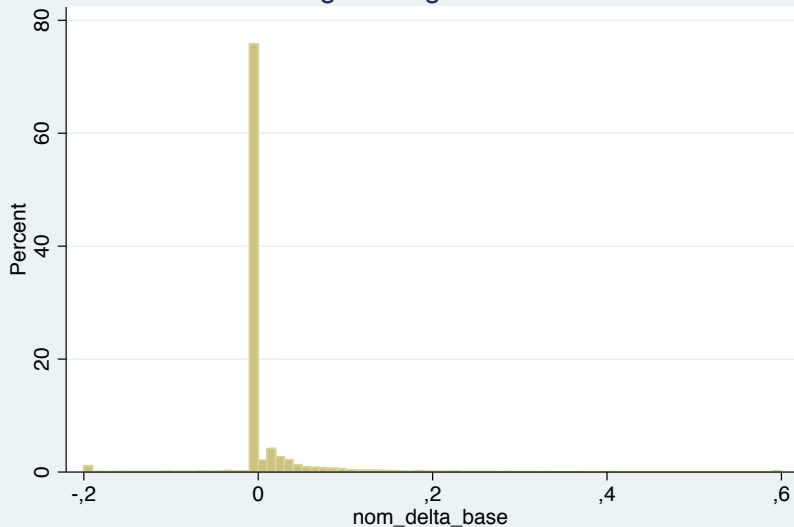


nominal wage change distribution: 2011



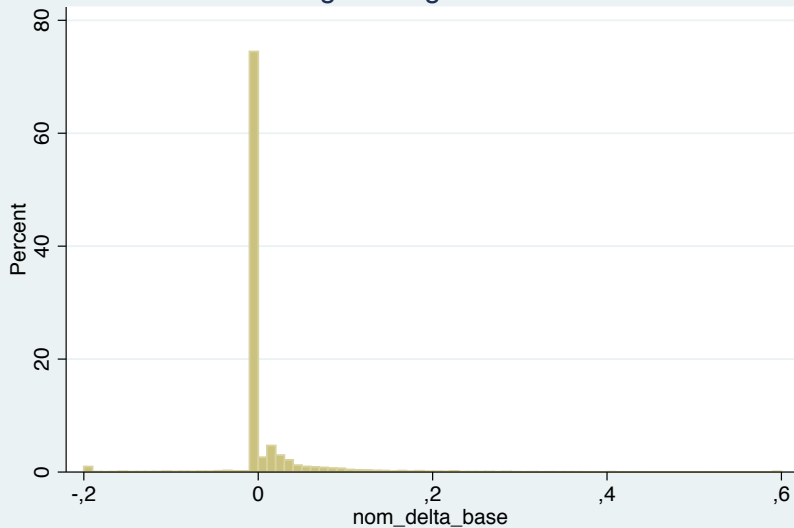
DNWR

nominal wage change distribution: 2012



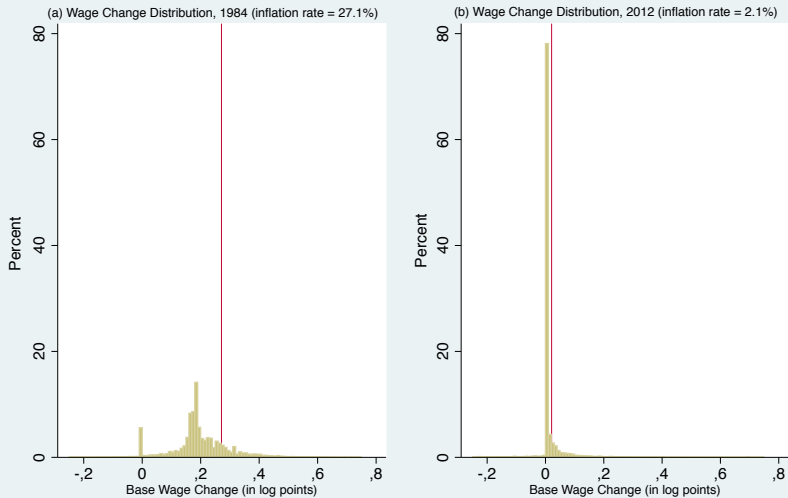
DNWR

nominal wage change distribution: 2013



Wage rigidity (same scale)

Downward Nominal Wage Rigidity in High and Low Inflation Regimes



Source: Quadros de Pessoal 1984, Relatório Único 2012.

Navigation

- Motivation
- Related literature
- Measuring upward wage nominal rigidity
 - The matched employer-employee- contract-job title longitudinal dataset
 - Estimation issues
 - Empirical results
 - Robustness checks
- Measuring the weight of internal and external wages
 - The matching the wages of new hires with wages of stayers in the same firm
 - How to estimate slippery slopes
 - Empirical results
 - Endogeneity issues
- Concluding remarks

Related Literature

- Collective wage agreements, extensions, and labor market outcomes
 - Cataln and Villanueva (2012)
 - Martins (2014)
 - Gal, Hijzen, and Wolf (2012)
- Minimum wages and worker flows
 - Abowd, Kramarz, Margolis, and Philipon (2000)
 - Portugal and Cardoso (2006)
 - Dube, Lester, and Reich (2013)
 - Carneiro, Portugal, and Varejo (2014)
- The cyclicality of the wages of new hires
 - Gertler and Trigari (2009)
 - Pissarides (2009)
 - Bills, Chang, and Kim (2014)
 - Carneiro, Guimares, and Portugal (2012)
 - Martins, Thomas, and Solon (2012)

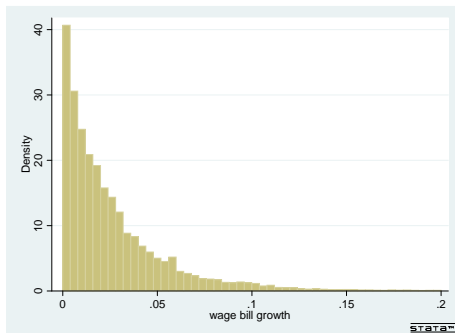
Quadros de Pessoal 1986-2009

- Covers wage earners in the private sector of the economy
- Unique firm, worker, collective agreement, and job title identifiers
- Information on base wages, total wages, hours, etc.
- Restricted to full-time wage earners covered by collective agreements (firm contracts are excluded)
- Around 800 000 firm/year and 13 million worker/year observations

Measuring upward nominal wage rigidity

- How to obtain a measure of the implied wage bill growth?
 - Step 1: Calculate the bargained wage
 - For each contract/job title/year combination estimate the mode of the base wage (as in Cardoso and Portugal, 2005)
 - Step 2: Assume that, in the following year, the workforce of the firm stays with the same workers and the same job titles
 - Step 3: Obtain, for each worker, the necessary wage change to comply with the bargained wage of the following year
 - Step 4: At the firm level, aggregate the implied wage changes and obtain the implied wage bill increase

Implied wage bill growth



Estimating equation

$$\Delta l_{ft} = \alpha_0 + \xi \Delta wb_{ft} + \alpha_1 \Delta \log \text{ base wage}_{ft-1} \\ + \alpha_2 \Delta ms_{ft-1} + \alpha_3 \text{ firm age}_{ft} + \delta_t + \epsilon_{ft}$$

- Δl_{ft} stands for net job creation (Δ), hiring rate (Δ^+), and separation rate (Δ^-)
- Δwb is the wage bill increase implied by the new contract
- Δms is the change in the market share of the firm (5 digit SIC)

Dependent variables

	Net job creation	Hiring rate	Separation rate
implied wage bill growth	-0.2096 (0.1003)	0.0193 (0.0783)	0.2289 (0.0657)
firm age	-0.0143 (0.0015)	-0.0373 (0.0012)	-0.0230 (0.0015)
Δ market share	0.0097 (0.0269)	-0.0020 (0.0190)	-0.0117 (0.0262)
Δ base wages	0.0004 (0.0056)	-0.0279 (0.0050)	-0.0283 (0.0064)
number of firms/workers	833,216/13,062,035		
yearly dummies	YES		

Dependent variables

	Net job creation	Hiring rate	Separation rate
implied wage bill growth	-0.3269 (0.0493)	0.0122 (0.0336)	0.3390 (0.0417)
firm age	-0.0182 (0.0015)	-0.0311 (0.0011)	-0.0129 (0.0012)
Δ market share	0.0179 (0.0266)	-0.0122 (0.0164)	-0.0300 (0.0219)
Δ base wages	-0.0004 (0.0052)	-0.0146 (0.0034)	-0.0143 (0.0052)
number of firms/workers	833,216/13,062,035		
collective wage agreements \times year(s) dummies	YES		

Dependent variable: failure

	Probit estimates	Marginal effects
implied wage bill growth	4.3844 (0.0808)	0.6317 (0.0117)
firm age	-0.0961 (0.0023)	-0.0139 (0.0003)
Δ market share	-0.1197 (0.0675)	-0.0172 (0.0097)
Δ base wages	-0.1103 (0.0132)	-0.0159 (0.0019)
Δ firm size	-0.2327 (0.0046)	-0.0335 (0.0007)
number of firms/workers		971,720/13,291,806
yearly dummies		YES

Robustness checks

- Exclude firms with workers collecting wages below the bargained wage
- Exclude firms paying wages above the bargained wage
- Exclude firms paying wages 5 percent or more above the bargained wage
- Exclude minimum wage earners
- Exclude firms that did not comply with the new wage schedule

Measuring the internal and external wage

- Step 1: For each contract/job title/year combination estimate the mode of the base wage (as before) - call it external wage
- Step 2: For each new hire obtain the base wages of all worker in the same firm with the same job title
- Step 3: Compute the mode of distribution of those wage and call it internal wage

Slippery slopes estimation

$$\log wage_{ift} = \theta_f + \beta_f \log internal\ wage_{ift} + \gamma_f \log external\ wage_{ift} \\ + \delta_t + \epsilon_{ift}$$

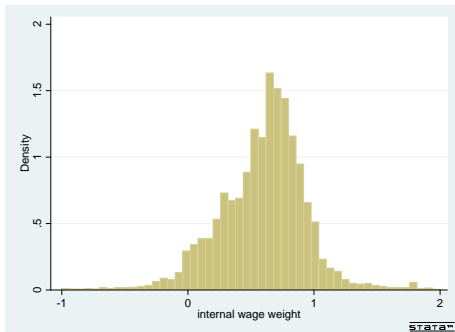
- the dependent variable is the wage of the new hire
- the coefficients on the internal and external wages are firm specific
- the OLS solution is obtained in two steps

Slippery slopes estimation

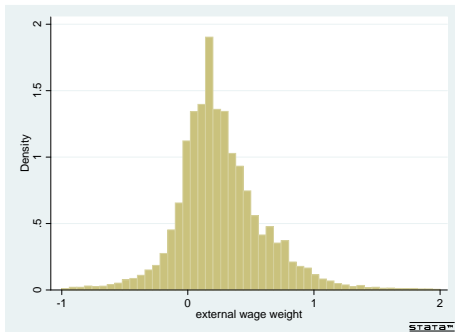
How to obtain the OLS solution?

- Making use of the Frisch-Waugh-Lovell theorem
- Step 1: Run firm level regression of the dependent variable and other explanatory variables (the time dummies) on the external and internal wages and obtain the residuals
- Step 2: Run a regression of the filtered dependent variable on the filtered time dummies, and obtain the coefficients of the time dummies
- Step 3: Now obtain the residuals from the previous estimation (the dependent variable purged from the effects of time dummies)
- Step 4: Run a firm level regression of the previous residual on the internal and external wages to obtain the firm fixed effect and the firm specific regression coefficient
- In summary, use the Stata command `regintfe`, provided by Paulo Guimares

Weight of internal wage



Weight of external wage



Estimating equation

$$\Delta l_{ft} = \alpha_0 + \xi \hat{\beta}_f + \alpha_1 \Delta \log \text{ base wage}_{ft-1} \\ + \alpha_2 \Delta ms_{ft-1} + \alpha_3 \text{ firm age}_{ft} + \delta_t + \epsilon_{ft}$$

- Δl_{ft} stands for net job creation (Δ), hiring rate (Δ^+), and separation rate (Δ^-)
- $\hat{\beta}_f$ is the estimate of the weight of the external wage

Results

OLS estimates

	Dependent variable		
	Hiring rate	Separation rate	Net job creation
$\hat{\beta}_f$	-0.0663 (0.0072)	-0.0360 (0.0074)	-0.0303 (0.0063)
firm age	-0.0879 (0.0025)	-0.0436 (0.0023)	-0.0443 (0.0017)
Δ market share	0.0309 (0.0227)	-0.0223 (0.0221)	0.0532 (0.0251)
Δ base wages	-0.1456 (0.0259)	-0.0584 (0.0231)	-0.0871 (0.0152)
number of firms		182,879	

Results

Dependent variable: failure

Probit estimates Marginal effects

$\hat{\beta}_f$	0.3261 (0.0029)	0.0122 (0.0001)
firm age	-0.0823 (0.0008)	-0.0031 (0.0000)
Δ market share	0.1078 (0.0102)	0.0040 (0.0004)
Δ base wages	-0.3273 (0.0057)	-0.0123 (0.0021)
Δ firm size	-0.3983 (0.0015)	-0.0149 (0.0001)

number of firms 182,879

yearly dummies YES

Results

IV estimates

	Dependent variable		
	Hiring rate	Separation rate	Net job creation
instrumented $\hat{\beta}_f$	-0.1674 (0.0077)	-0.0367 (0.0097)	-0.1307 (0.0094)
firm age	-0.0866 (0.0005)	-0.0412 (0.0006)	-0.0454 (0.0007)
Δ market share	0.0155 (0.0105)	-0.0322 (0.0120)	0.0477 (0.0135)
Δ base wages	-0.0305 (0.0042)	-0.0200 (0.0045)	-0.0106 (0.0048)
number of firms	182,879		

Results

Dependent variable: failure

Probit estimates Marginal effects

instrumented $\hat{\beta}_f$	1.4910 (0.1187)	0.1028 (0.0082)
firm age	-0.0944 (0.0076)	-0.0065 (0.0005)
Δ market share	-0.1695 (0.1448)	-0.0117 (0.0100)
Δ base wages	-0.1930 (0.0475)	-0.0133 (0.0033)
Δ firm size	-0.2241 (0.0214)	-0.0154 (0.0015)
number of firms	182,879	
yearly dummies	YES	

Robustness checks

- Allow for minimum wages to influence the wages of the newly hired
- Impose weights to sum one
- Include proxies for market power in the slippery slope regression
- Include measures of monopsony power in the slippery slope regression

what did we learn

- On the role of upward nominal wage rigidity
 - UNWR can hide to a large extent DNWR
 - 30 000 minimum wages affect labor demand in the same way of a mandatory minimum wage
 - Labor demand elasticities are identified arguably via an exogenous wage variation.
 - The main job destruction channel operates through job separations and firm closures
- On the formation of wages of new hires
 - Wages of new hires depend to large extent on the internal wages of the firm
 - But there is strong heterogeneity of firms' wage policies
 - Firm wage policies that are more driven by external wages (seem to) generate significantly lower hiring rates
 - In particular, when we attempt to short-cut the endogeneity of wage policies

what can be done

- Inflation would help... a lot.
- Reform of the wage setting system
 - Limiting extension clauses
 - Anchored on the representativeness of the social partners
 - Introducing opting-out clauses (or, even better, opting-in)
 - Move towards a decentralized wage bargaining system, where work councils play the leading role
 - Trying to learn from the praised German experience on collective (Dustmann et al., 2014)
 - But the Portuguese system of industrial relations is, unlike the German one, firmly rooted in legislation and overwhelmingly governed by the political process.

Labor market reforms were implemented

- Q policies
 - Dismissal clauses were facilitated.
 - Number of days worked increased.
 - Work schedules were made more flexible (bank of hours).
 - Administrative costs of individual dismissals were reduced.
- P policies
 - Minimum wages were frozen.
 - Overtime payments were cut.
 - Severance payments were reduced.
 - Extensions of collective agreements were limited.
 - (Generosity of unemployment benefits was reduced.)

Others may be needed to be considered

- To end the monopoly of wage bargaining by trade unions.
- Allow collective bargaining contracts to expire (or expire sooner)
- Introduce representation mechanisms that reveal the actual constituency of unions and employer associations.
- Find ways that guarantee independent financing of trade unions and employer associations.

Where are we now?

- Wage negotiations are essentially blocked.
 - It stopped "upward wage rigidity".
 - But not downward wage rigidity.
 - Current status quo is not sustainable in the long-run
- Unit labor costs decreased
 - Largely due to wage cuts in civil servants.
 - And through wage adjustments of new-hires.
- Catastrophic job destruction appears to be contained.
- Employment increased and unemployment decreased since the second quarter of 2013.

Are the labor market reforms working? Which ones?

- Most of the reforms took a long time to be implemented.
- Typically, accrued rights were protected.
 - Which means that it will take a long time to observe the full impact of the reforms.
- So. It is very hard to tell.
- It is probably too soon to evaluate the effects.
- Many policies were placed at the same time.
 - Raising serious identification problems.
- And our knowledge about the consequences of labor policies is rather limited.

Policy Analysis with Incredible Certitude

- "The scientific community rewards those that produce strong novel findings. The public, impatient for solutions to its pressing concerns, rewards those who offer simple analysis leading to unequivocal policy recommendations. These incentives make it tempting to maintain assumptions far stronger than they can persuasively defend, in order to draw strong conclusions."
in "Policy Analysis with Incredible Certitude," Charles Mansky, 2007, pp 3.