Staggered Contracts and Unemployment during Recessions

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All views and opinions are our own.

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Introduction

- **Does Downward Nominal Wage Rigidity (DNWR) amplify the real effects of aggregate shocks?**
  - Adjustments in wages vs employment when demand falls.
  - Behavior of wages and incidence and duration of unemployment during recessions.
  - The role of policy (e.g. short time work).

- Two main forms of DNWR:
  - Low incidence of nominal wage cuts:
    - Bewley (1999), Dickens et al. (2006), Elsby (2009), Elsby et al. (2016, 2019).
  - **Staggered labor contracts** (collective agreements):
    - Card (1990), Tenreyro (2007, 2010), Gertler and Trigari (2009, 2020), Carlsson et al. (2018), Faia and Pezone (2023), Martins (2021).

What do we do?

- Study the probability of non-employment after large aggregate shocks distinguishing bw workers whose wages in collective contracts could/could not adjust.
  - The wage growth agreed in **already settled** agreements is **fixed**.
  - Agreements **negotiated at the time of the shock** can, in theory, **adjust**.
- Analyze the case of Spain
  - Three major recessions in the last 30 years.
  - 75% of workers covered by collective contracts, through automatic extension.
  - Sector-province level of bargaining leads to **variation in settlements within industries and provinces**.

The test

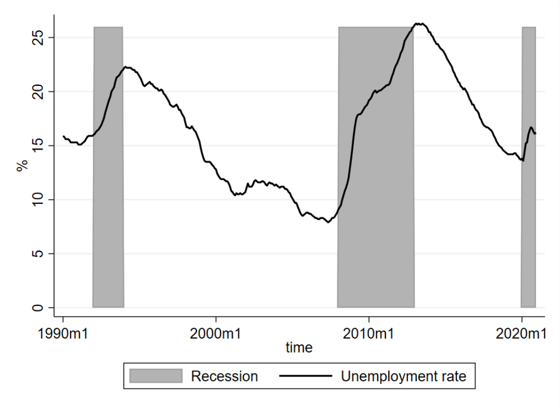
- Q(1) Are job losses more common among workers covered by collective contracts **signed before** an adverse shock than among those whose contracts were signed afterwards?
- Q(2) How **persistent** are job losses in different recessions?
- Q(3) Is the effect heterogeneous among workers whose wages were **close or far their corresponding min wage floor**?
- Q(4) What is the role of **inflation** and **institutions**?
- Large aggregate shocks that all parties observe.
  - **1993 Recession**
  - **2009 Recession**
  - **COVID-19 pandemic (first year)**

The Nature of the Macro Shocks

1. **1993 Recession** (December 1992)
   - Internal sources
   - Collective contracts of short duration
   - High inflation
2. **2009 Recession** (September 15th 2008)
   - External sources coupled with heavily leveraged private sector
   - Collective contracts of long duration
   - Low inflation
3. **First year of COVID-19 pandemic** (March 11th 2020)
   - External sources
   - Very abrupt
   - Low inflation
   - Unprecented policy response (e.g. short time work)

The Macro "Shocks"-extensive margin

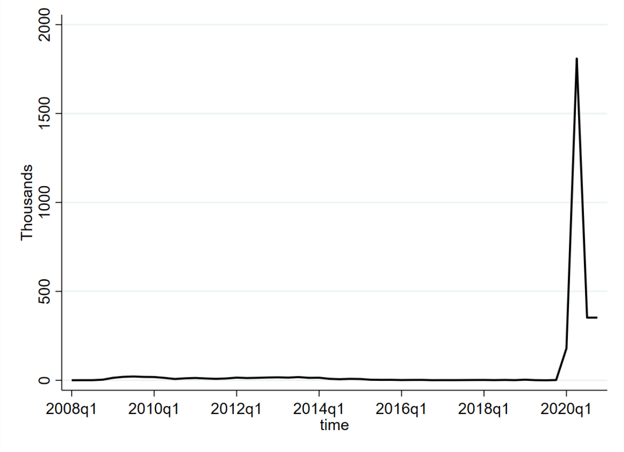
Monthly Unemployment rate, 1990m1-2020m12



Source: INE, Labour Force Survey (EPA).

The Macro "Shocks"-intensive margin

Yearly Number of Workers in Short Time Work, 2008q1-2020q4



Source: INE, Labour Force Survey (EPA).

Institutions

- Agreements between unions and representatives of employer federations regulate working conditions and set minimum wage floors (above national minW)
  - Extension to all firms and workers (as in AT, FR, IT, NL, PT, South Africa).
  - Regardless of degree of unionization or worker's seniority.
  - 75% of workers covered, 50% by province-industry agreements (our focus).
- Hard for a particular firm to opt out, agreement needed.
  - Labor reform in 2012 attempted to facilitate the process.
- Two different views regarding the effect of collective contracts on wages
  - **Explicit contract**: All wages move with collective contracts (widely used in macro, elements like escalation clauses reinforce it).
  - **Spot market**: Collective contracts fix minimum wages, do not move the whole wage distribution.

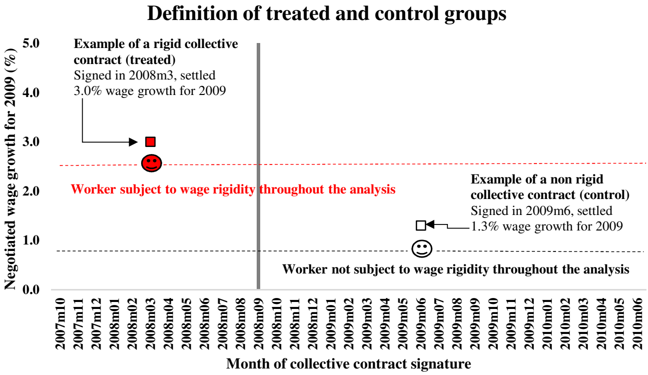
Identification strategy

- Most collective contract renewals take place shortly after the expiration of the collective contracts
- $\Longrightarrow$ Use the **signature date** to define the treated and control group.

- **Treated group:** Workers covered by contracts signed **before the onset of recessions** that could not adjust to the unfavorable macroeconomic conditions.
- **Control group:** Workers covered by contracts signed **after the deterioration of the macroeconomic conditions** that could potentially mitigate nominal wage growth during a recessionary period.

Identification strategy

Staggered collective contracts $\neq$ staggered DiD
This paper: time invariant treatment



Alternative identification strategy (robustness)

- Possible concern on the endogeneity of the signature date
- $\Longrightarrow$ Use the **expiration date** as an alternative identification strategy.
- $\Longrightarrow$ Take into account a small fraction ($<$15%) of collective contracts that had expired but did not get renewed.
- Consider non linearities by collective contract duration.

Date of signature and wage growth in collective contracts

Estimate the following regression:

$$\Delta NW_{sp} = \alpha_0 + \sum_{l=-5}^{+6} \alpha_{1l} Q_l SIGNED_{sp} + ind_s + prov_p + \epsilon_{sp}$$

- ΔNW_{sp} is the negotiated wage growth set in industry s and province p for 1993 (1993 Recession) or 2009 (2009 Recession)
- l=0 is 1993q1 (1993 Recession) or 2008q4 (Fall of Lehman Brothers).

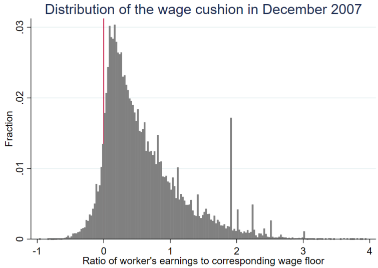
The impact of wage rigidity on the probability of non-employment (ITT)

Estimate the following LPM:

$$Y_{ispt} = \alpha_{0t} + \sum_{\substack{t=-a \\ a \neq -1}}^{t=+b} \alpha_{1t} SIGNEDpre_{sp} \times 1(year = t) + ind_{st} + prov_{pt} + \epsilon_{ispt}$$

- Yearly event study with a lags and b leads.
- $SIGNEDpre_{sp}$ =1 if wage (growth) is **"rigid"** (sector-province collective contract **signed pre-recession**).
- $Y_{ispt} = 1$ if worker i, who was employed at the onset of the 1993 or 2009 recession in industry s and province p is **non-employed** (works less than 6 months) in year t.
- ind_{st} and $prov_{pt}$ are sector-year and province-year fixed effects.
- Cluster s.e. at the collective contract level.

Analysis by distance from the minima



- Use unique data on minW floors by province, occupation and 3-digit sector to define workers whose wages were 0-10, 10-20, 20-40, >40% above their corresponding minW floor

Distance from minW	0-10%	10-20%	20-40%	>40%
Proportion of workers	0.092	0.117	0.189	0.525

Analysis by distance from the minima

- Difference-in-differences framework
  - Workers whose collective contracts were signed before or after the onset of a recession
  - Workers whose wages were close or far from the minW floors (reference category: $>$40%)

The impact of wage rigidity on actual wages and the prob(non-employment) by distance from the minima-DiD

$$Y_{ispt} = \delta_{0t} + \sum_{\substack{t=-a \\ a\neq -1}}^{t=+b} \sum_{k=k_1}^{k=k_3} \delta_{1t}(SIGNEDpre)_{sp} \times 1(W_{isp}^{pre} < k\bar{W}_{isp}) \times 1(year = t)$$

$$+ \sum_{\substack{t=-a \\ a\neq -1}}^{t=+b} \sum_{k=k_1}^{k=k_3} \delta_{2t} 1(W_{isp}^{pre} < k\bar{W}_{isp}) \times 1(year = t) + ind_{st} + prov_{pt} + \epsilon_{ispt}$$

- Y_{ispt}: job stayers' actual wage growth or prob(nonemp).
- k denotes distance to the minW: 0-10, 10-20, 20-40% above minW.
  - Interaction of "distance" and "signature" measures whether actual wages and Prob(nonemp) ↑ more close to the wage floor.
  - Wage floor is province-industry-skill specific.

Data

1 **Register of Collective Contracts: 1992-2020**

- Exact signature date, industry-province and % wage growth
- Negotiated wage floors for a subsample of industries (for around 38% of all workers covered by collective agreements).

2a **Continuous Sample of Working Histories (MCVL)**

- Random 4% draw of Social Security registers in 1991-2012.
- Monthly info on industry, province, skill, (non)employment and base wages.

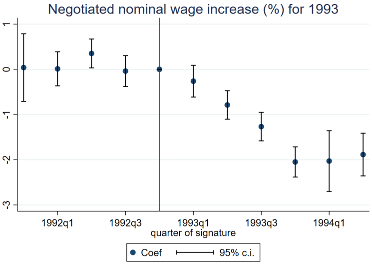
2b **Spanish Labour Force Survey (EPA) 2019q1-2020q4**

- [-] Monthly info on industry, province, skill, (un)employment, participation, short time work
- [-] Repeated cross section but info on most recent sector and province of employment.

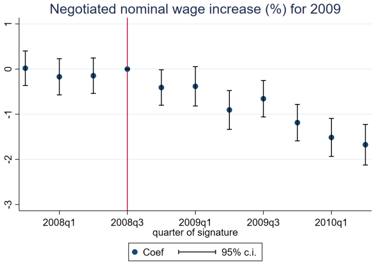
Sample selection

- Employees covered by a sector-province collective contract signed pre- or post-recession.
  - Aged 18 to 57 with regular labor contract.
  - At least **one year of tenure** in the firm as of 1992m12 (1993 recession) or 2008m12 (2009 recession).

Date of signature and wage growth in collective contracts



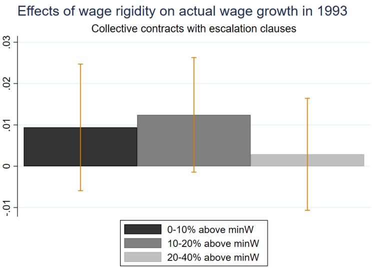
(a) 1993 Recession



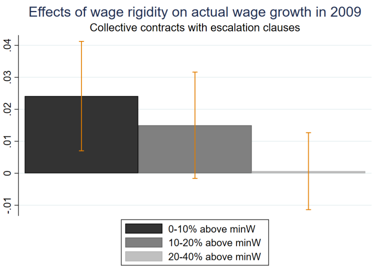
(b) 2009 Recession

- Negotiated nominal wage growth **adjusted downwards** in collective contracts that were **signed after** the onset of recessions.
- 1-2 pp lower negotiated nominal wage growth.
  - (Inflation rate 1993=4.5%, inflation rate 2009∼0%).

Actual wage rigidity by distance from the minima



(a) 1993 Recession



(b) 2009 Recession

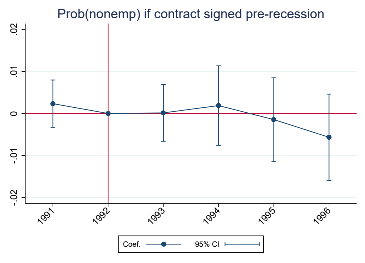
(a) Most collective contracts had escallation clauses+period of high inflation.

$\rightarrow$ Wage rigidity among **all** workers ("explicit contracts").

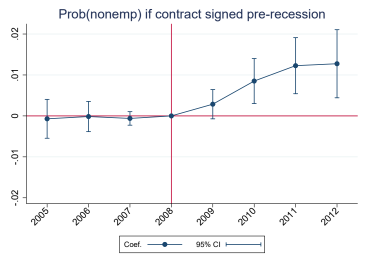
(b) Wage rigidity mainly among workers **close** to the minW.

$\rightarrow$ Higher wage growth by around 2% among job stayers with earnings close to the min in contracts signed before LB.

The impact of wage rigidity on the probability of non-employment



(a) 1993 Recession



(b) 2009 Recession

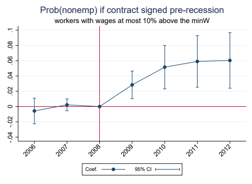
- **No job losses after 93** (high inflation)
  - Inflation "greases the wheels" of the labor market (Card and Hyslop, 1997).
- **Persistent unemployment after 2009** (low inflation)
  - In line with employment hysteresis in the US after the Great Recession (Yagan, 2019).

Heterogeneity by workers' distance from the minima

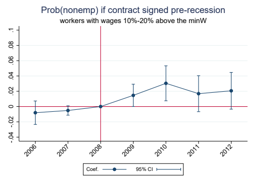
- **Distance from the minimum wage floors:** Available data for a subsample of workers for both recessions.
- We expect smaller margins of wage adjustment among workers close to the minima.
- BUT escalation clauses+macro environment may play a role.

The impact of wage rigidity on the probability of non-employment by distance from the minima

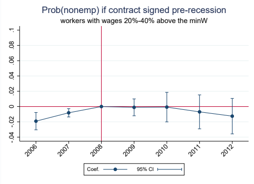
2009 Recession



(a) 0-10% above the min



(b) 10-20% above the min



(c) 20-40% above the min

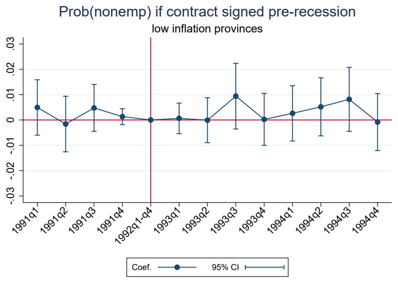
- **Larger** employment losses among workers whose wages were **closer** to the collective contract minima.

Underlying mechanism 1993: inflation greasing the wheels of the labor market

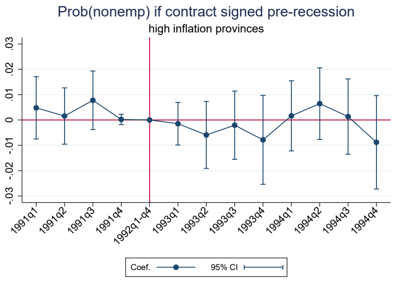
- **High inflation** $\Longrightarrow$ real $<$ nominal wage rigidity
- Classify provinces as high/low inflation if provincial inflation rate in 1993 above/below the national inflation rate (2.7-4.0% vs 4.1-5.5%).

The impact of wage rigidity on the probability of non-employment in low and high inflation provinces in 1993

1993 Recession



(a) Low inflation provinces in 1993

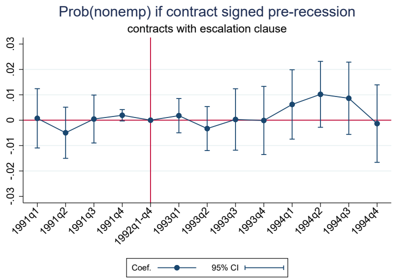


(b) High inflation provinces in 1993

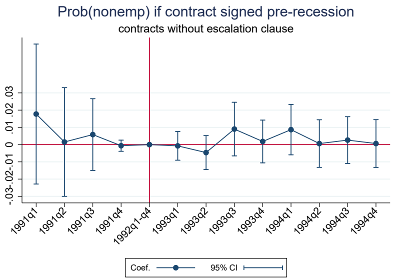
- Some (if any) employment losses only in **low** inflation provinces.

The impact of wage rigidity on the probability of non-employment by presence of escalation clauses

1993 Recession



(a) Escalation clauses



(b) No escalation clauses

- Some (if any) employment losses only among workers covered by **escalation clauses**.

Underlying mechanism 2009: duration of col. contracts

- **Duration:** collective contracts valid in 2008 could expire within a shorter or longer period after the onset of recession $\Longrightarrow$ higher increase in labor cost among the latter.
  - Assume duration in contracts signed prior to the onset of recessions is exogenous (not a good assumption for contracts signed afterwards)

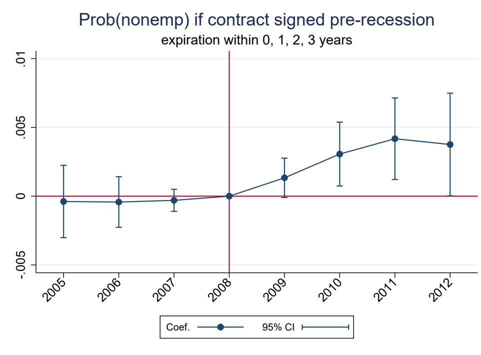
- Average duration of collective contracts signed before the 1993 recession: **1.3 years**
- Average duration of collective contracts signed before the fall of Lehman brothers: **3.8 years**

Underlying mechanism 2009: duration of col. contracts

- Ordinal categorical treatment
  - **0** if contract expired by 2009m1 (wage rigidity **lasted little**)
  - **1** if contract expired in 2009m2-2010m1
  - **2** if contract expired in 2010m2-2011m1
  - **3** if contract expired in 2011m2-2012m1 (**prolonged** wage rigidity)

The impact of wage rigidity on employment status by collective contract duration

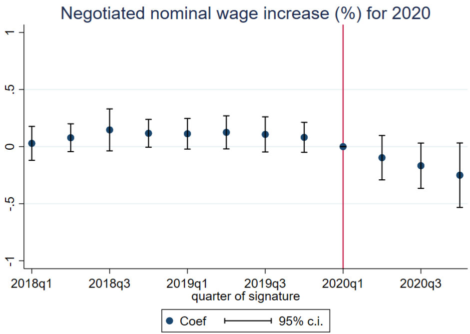
2009 Recession



- Prob(nonemp) ↑ more among workers covered by **longer**, pre-recession collective contracts.

Date of signature and wage growth in collective contracts

COVID-19



- Negotiated nominal wage growth adjusted downwards in collective contracts signed after the onset of the pandemic.
  - (Inflation rate 2020=∼0%).
- $\Longrightarrow$ 0.2 pp lower average wage growth.

The impact of wage rigidity on employment (ITT)

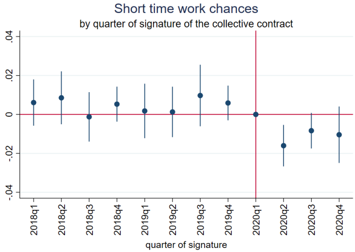
Estimate the following LPM on repeated cross sections:

$$Y_{ispt} = \alpha_{0t} + \alpha_{1t} \sum_{l=-9}^{+3} Q_l SIGNED_{sp} + \gamma X_{it} + ind_s + prov_p * q_t + \epsilon_{ispt}$$

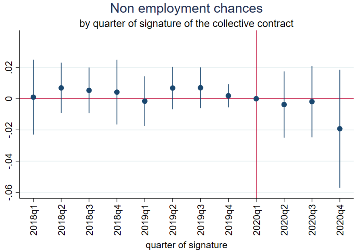
- Y_{ispt} takes value 1 if worker i, who is/was employed in industry s and province p
  - i) is in short time work in quarter t (intensive margin)
  - ii) is nonemployed in quarter t (extensive margin)
- X_{it}=age, gender, occupation, immigrant background, critical infrastructure sector during the pandemic.

The impact of wage rigidity on employment status, intensive vs extensive margin

COVID-19



(a) Short time work



(b) Non-employment

- Labor demand adjustment mainly through **hours**.
- Caveat: few collective contracts got signed in 2020.
  - Distribution by sector similar to 2019 for Q3 and Q4 but not for Q2.

Conclusions

- New evidence on the extent and the real consequences of wage rigidity.
- Document a **trade-off** between **wage growth** and **nonemployment** due to contract staggering.
- Interplay between wage rigidity, macroeconomic environment and labor market institutions:
  - **1993 Recession:** No employment losses as nominal wage rigidity $\neq>$ real wage rigidity (high inflation).
  - **2009 Recession: Persistent** nonemployment, concentrated among workers **close** to the wage floors (low inflation+long contracts).
    - **Extensive** margin (1993 and 2009 Recessions)
    - **Intensive** margin (First year of COVID-19 Recession).

- Contract staggering during **low-inflation** recessionary periods $\Rightarrow$ **amplifier of employment fluctuations** (consistent with macro models).

Table 1a. Descriptive statistics: Sample means (standard deviations)-1993 recession

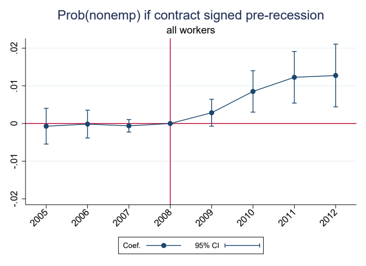
Characteristic	All	Contract signed pre 1992m12	Contract signed post 1992m12	Diff. net of prov., sec. FE
	(1)	(2)	(3)	(4)
		Sectoral distribution		
Agriculture, manufacturing & utilities (%)	18.5	18.9	18.2	-
Construction (%)	21.6	22.4	21.0	-
Trade, Food & Accomodation (%)	32.5	40.1	27.8	-
Transportation (%)	6.2	6.6	5.9	-
Finance and real estate (%)	0.20	0.0	0.27	-
Services to businesses, health & educ. (%)	20.0	11.6	25.2	-
		Collective contract characteristics		
Multi-year (%)	59.5	98.2	35.3	59.1***
Collective contract duration (in years)	1.43	1.53	1.37	0.17***
	(0.61)	(0.62)	(0.59)	(0.06)
Escalation clause (%)	62.0	64.6	60.5	6.96
Negotiated wage growth for 1993 (%)	5.20	6.35	4.49	1.79***
	(2.23)	(1.25)	(2.40)	(0.25)
		Worker characteristics		
Age (in years)	37.4	37.4	37.4	-0.14
	(11.0)	(11.0)	(11.0)	(0.16)
Female (%)	29.2	26.6	30.9	-2.08***
College, managers (%)	15.2	14.2	15.8	-0.19
White collar workers (%)	30.6	29.0	31.6	0.04
Blue collar workers(%)	54.2	56.8	52.6	0.14
Fixed-term contract (%)	n.a.	n.a.	n.a.	n.a.
N	73,183	28,154	45,029	73,183

Table 1b. Descriptive statistics: Sample means (standard deviations)-2009 recession

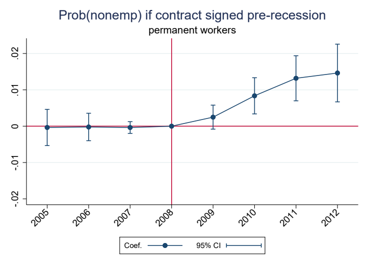
Characteristic	All	Contract signed pre 2008m9	Contract signed post 2008m9	Diff. net of prov., sec. FE
	(1)	(2)	(3)	(4)
		Sectoral distribution		
Agriculture, manufacturing & utilities (%)	12.6	14.7	11.6	-
Construction (%)	23.0	38.1	10.9	-
Trade, Food & Accomodation (%)	32.7	30.3	34.8	-
Transportation (%)	4.6	4.6	4.7	-
Finance and real estate (%)	0.18	0.3	0.0	-
Services to businesses, health & educ. (%)	26.3	11.4	37.9	-
		Collective contract characteristics		
Multi-year (%)	88.2	100	75.1	23.1***
Collective contract duration (in years)	3.29	3.74	2.95	0.95***
	(1.22)	(1.02)	(1.26)	(0.20)
Escalation clause (%)	64.3	82.2	44.2	20.3***
Negotiated wage growth for 2009 (%)	2.09	3.09	1.31	1.29***
	(1.51)	(0.97)	(1.39)	(0.19)
Negotiated wage growth for 2009-2010 (%)	3.88	4.67	3.27	0.99***
	(1.85)	(1.74)	(1.70)	(0.23)
		Worker characteristics		
Age (in years)	37.3	37.3	37.2	-0.11
	(10.7)	(10.7)	(10.4)	(0.11)
Female (%)	41.3	33.7	47.4	-1.47*
College, managers (%)	14.8	11.7	17.2	0.10
White collar workers (%)	35.0	28.5	40.1	-1.32**
Blue collar workers(%)	50.1	59.6	42.6	1.21
Fixed-term contract (%)	14.0	16.7	12.2	0.84
N	99,735	43,641	56,094	99,735

The impact of wage rigidity on the probability of non-employment by type of labor contract

2009 Recession



(a) All workers

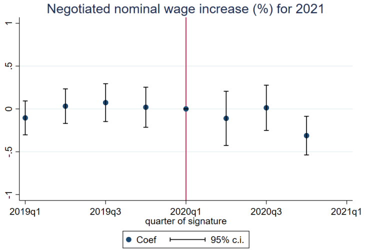


(b) Excluding temporary workers

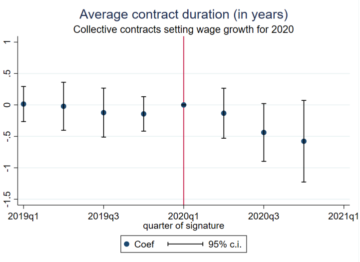
- ↑ **Prob(non employment) not driven by temporary workers**.
- Permanent workers may be less willing i) to search for a job (liquidity due to severance payment) ii) to accept jobs at lower wages (reference dependence-Koenig et al., 2017).

The impact of wage rigidity on employment status, perception of duration and uncertainty

COVID-19



(a) Negotiated wage growth for 2021



(b) Contract duration

- Shock initially perceived as **transitory** but with **uncertainty** $\Longrightarrow$ Negotiated wage growth for 2021 did not adjust downwards in contracts signed in 2020q2 and 2020q3 but parties on average refused to sign long contracts already in 2020q3.