

Unemployment insurance and distance to retirement: a natural experiment in France

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What is done here

An empirical analysis of the influence of unemployment insurance on behaviors in the labour market for older workers

From a natural experiment first studied by Fremigacci (2010)

- 1 Analysis of the age pattern of unemployment insurance (UI) inflow of older workers

Identification of critical age thresholds...

- based on a before\after comparison...
- controlling for time fixed-effects

- 2 Estimation of the causal effect of a reduction of PBD...

- on the age (at UI admission) of older workers...
- *eligible* for UI

Outlines

An empirical analysis of the influence of unemployment insurance on behaviors in the labour market for older workers

- 1 Issue and literature
- 2 Institutional background
 - UI rules and the 2003's reform
 - Age-related incentives associated to labour market institutions
- 3 Data and descriptive analysis of UI inflow's age pattern
- 4 Econometric analysis of UI inflow's age pattern
- 5 Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Raising the employment rate of older workers (40% in 2010)

- Reducing entries in early retirement programs ✓
- Raising contribution length to the pension system and the legal retirement age ✓
 - The optimistic view
 - it will "do the job"...
 - it's all a matter of *distance to retirement!*
 - The pessimistic view
 - Unless the labor demand increases...
 - older workers' unemployment will rise
- The issue of older workers' UI: Hairault (2012)

Issue and literature

The policy issue - Quantitative age-dependent workforce management in France

In France, UI rules are more favorable to older workers (≥ 50 years old)...

- 1 Longer PBD
- 2 Possible exemption from active job search
- 3 Possible extension of UI benefits until retirement

Any temptation to use UI as a pathway to retirement?

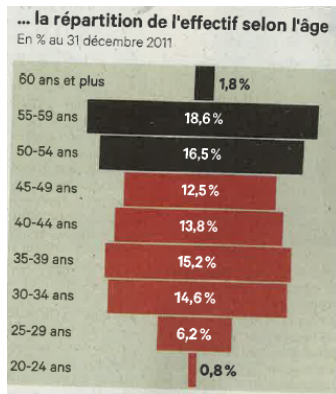


Figure: The example of Renault (source: Les Echos, January 28, 2013)

Issue and literature

The policy issue - Is UI used as a pathway to retirement?

Investigation of the relation between UI rules and the age of older workers at job termination date

- If UI is used as a bridge between employment and retirement
For a given retirement age...
 - the shorter the PBD...
 - the older the workers at job termination date
- Otherwise no influence of PBD

- Effects of UI on behaviors in the labor market: lots of papers!
Recent survey: Tatsiramos and van Ours (2012)
 - *Outflow effect*: impact of UI on unemployment duration
 - *Inflow effect*: impact of UI on flows into unemployment
 - *Eligibility effect*
 - *PBD effect*
 - Lalive, van Ours and Zweimüller (2011)
- The case of older workers: UI and retirement rules
Age-related incentives (PBD)
 - UI inflow's age pattern: Tuit and van Ours (2010)
 - Exit rate from employment: Winter-Ebmer (2003), Grogger and Wunsch (2012)
 - Early retirement programs interactions (UI/DI): Inderbitzin et al. (2013)

Theoretical arguments

- Within the perspective of the employer
 - Incentives to dismiss older workers eligible for extended benefits to limit the risk of legal appeal
 - Firms' reputation suffers less when high-tenured laid-off workers receive generous UI compensation
- Within the perspective of the worker
 - Incentives to quit and collect benefits (unlikely for France)
 - Lower effort as UI compensation improves → higher probability of being fired

- Replication within the context of the French labour market of Tuit and van Ours (2010)
- Interest:
 - Very generous UI system → stronger incentives
 - Dualistic labor market → insider/outsider story easy to check
 - Distinction between two effects:
 - Entitlement effect
 - Distance-to-retirement effect
 - Detailed interpretation according to wage, job termination motive, sociodemographic characteristics
- An original evaluation of the effect of the reform

Institutional background

UI rules and the 2003's reform

2001's agreement	Employment contracts ending between January 2001 and June 2002			
Entitlement class (age)	5 (<50)	6 (≥ 50)	7 (50-54)	8 (≥ 55)
Employment record	$\geq 14m/24$	$\geq 14m/24$ but <27m/36	$\geq 27m/36$	$\geq 27m/36$
PBD	30m	45m	45m	60m
July 2002's transitory rules	Employment contracts ending between July 2002 and December 2002			
Entitlement class (age)	5 (<50)	6' (≥ 50)		8' (≥ 55)
Employment record	$\geq 14m/24$	$\geq 14m/24$		$\geq 27m/36$
(Contrib. to pension syst.)				(≥ 100 quarters)
PBD	30m	45m		60m
2003's reform	Employment contracts ending between January 2003 and December 2005			
Entitlement class (age)		B	C (≥ 50)	D (≥ 57)
Employment record		$\geq 14m/24$	$\geq 27m/36$	$\geq 27m/36$
(Contrib. to pension syst.)				(≥ 100 quarters)
PBD		23m	36m	42m

Institutional background

Critical age thresholds - Constant over the period

- Pension system: 60.0
- UI rules
 - Exemption from job search obligation (DRE)
 - ≥ 160 quarters of contribution to the pension system: 55.0
 - < 160 quarters of contribution to the pension system: 57.5
 - Tax on older workers' job termination ("Contribution Delalande")
(Adding up to legal severance pay)

Institutional background

Critical age thresholds - Tax on older workers' job termination (1999-2006)

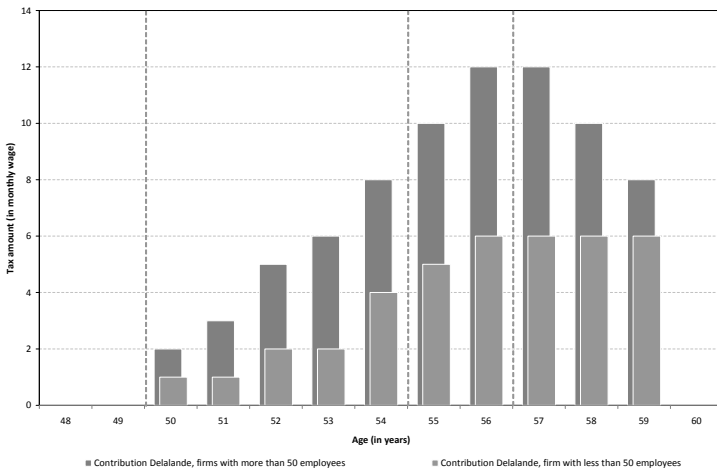


Figure: Age profile of the tax on older workers' layoff

Institutional background

Critical age thresholds - Changing over the period

- Critical in terms of entitlement
- Critical in terms of "distance to retirement" (59.5 before \ 60.0 after)
 - Intermediate ER
 - Before the reform: 55.75
 - After the reform: 58.08
 - Long ER
 - Before the reform: 55.00
 - After the reform: 57.00

Institutional background

Critical age thresholds - UI before\after, long ER

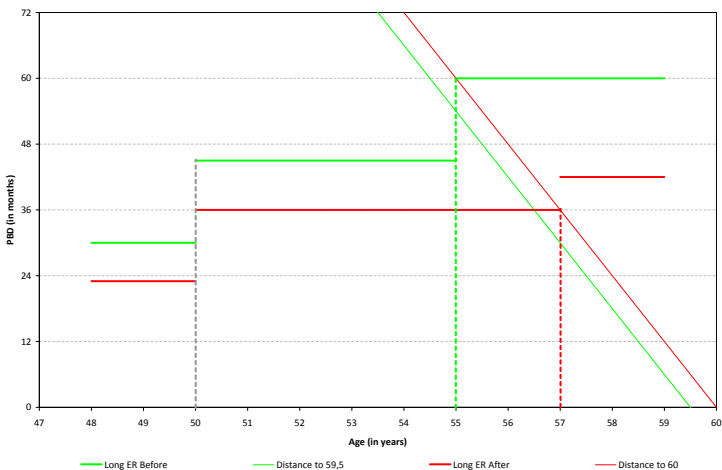


Figure: Long ER: $ER \geq 27m/36$

Institutional background

Critical age thresholds - UI before\after, intermediate ER

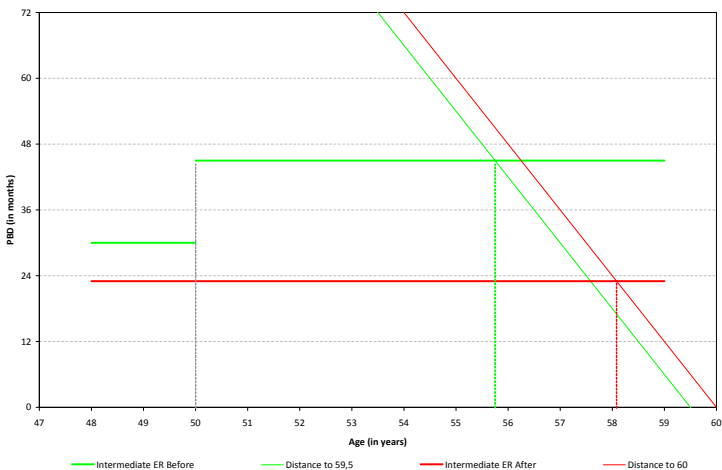


Figure: Intermediate ER : $14m/24 \leq ER < 27m/36$

Data and descriptive analysis of UI inflow's age pattern

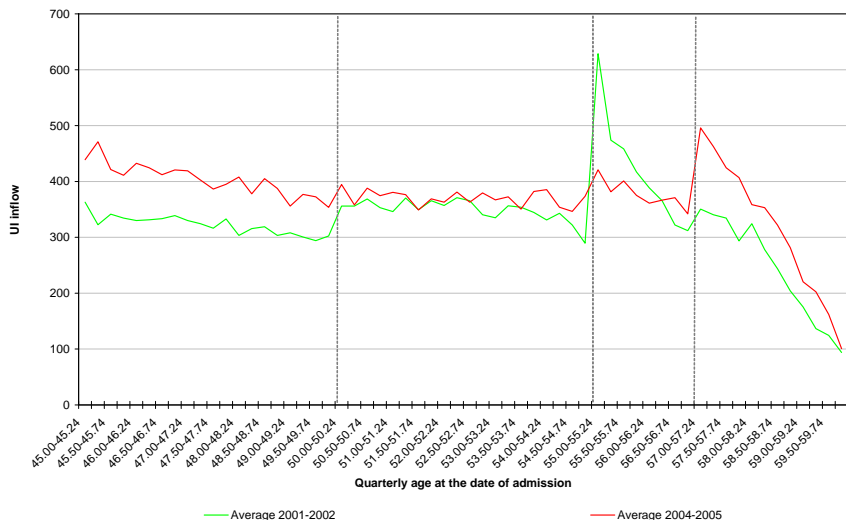
The baseline sample

- 1/10 (representative) sample...
 - of all *UI admissions*...
 - registered between Jan. 1, 2001 and Dec. 31, 2010
- Applied restrictions
 - ① Regular UI admissions (ARE hors annexes)...
 - ② registered between jan. 1, 2001 and dec. 31, 2005...
 - ③ with a fresh entitlement

Age at the date of UI admission	<i>N</i>
45.00 – 49.99	37,866
50.00 – 54.99	36,876
≥ 55.00	36,707
Total	111,449

Data and descriptive analysis of UI inflow's age pattern

The baseline evidence - Average annual UI inflow of workers, before\after 2003



Data and descriptive analysis of UI inflow's age pattern

Employment adjustment cycle

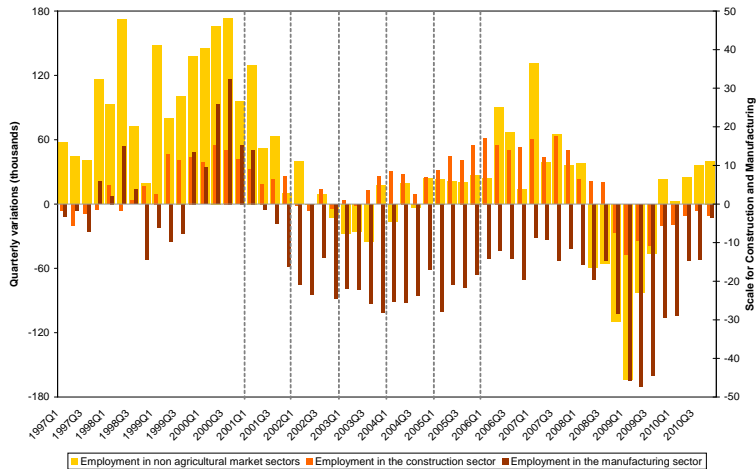


Figure: Quarterly variations of employment (source: Insee)

Econometric analysis of UI inflow's age pattern

The approach over the baseline sample

Tuit and van Ours (2010)

$t \setminus \tau$	45.00	...	52.00	...	59.75	
	45.24		52.24		59.99	
2001Q1	$y_{1,1}$		$y_{1,29}$		$y_{1,60}$	
\vdots		\ddots				
2002Q2	$y_{6,1}$		$y_{6,29}$		$y_{6,60}$	
\vdots				\ddots		
2005Q4	$y_{20,1}$		$y_{20,29}$		$y_{20,60}$	
						111,449

Econometric analysis of UI inflow's age pattern

The comprehensive analysis

- Specification

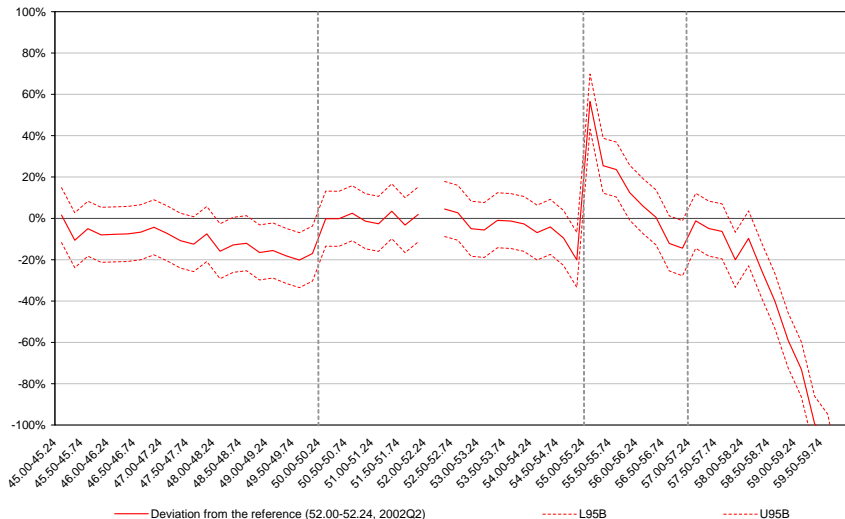
$$\log y_{t,\tau} = \log y_0 + \alpha_t + \beta_\tau + \delta_\tau \cdot (1 - b_t) + \varepsilon_{t,\tau}$$

The intercept $\log y_0$ corresponds to the reference: the 2002Q2 inflow of workers aged 52.00-52.24

- α_t captures quarter fixed-effects
 - β_τ captures age-class fixed-effects (independently from the 2003's reform)
 - δ_τ captures the before\after the 2003's reform difference for age class τ
- The model is estimated using OLS

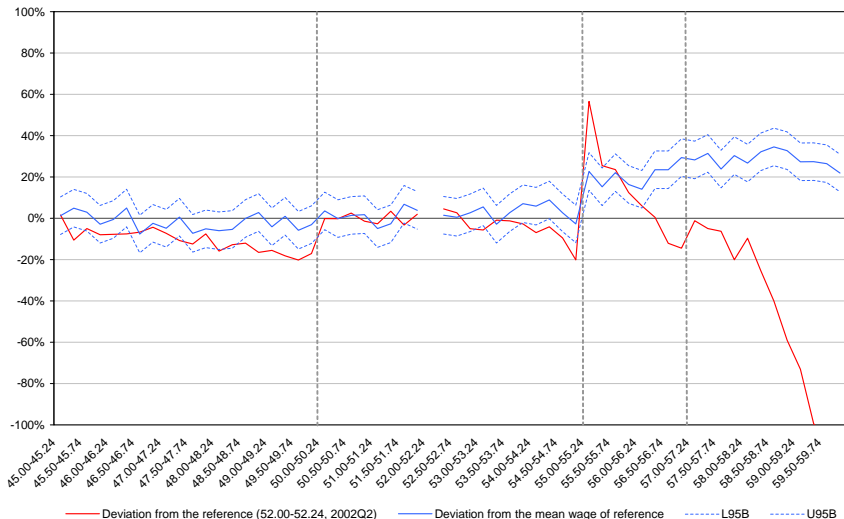
Econometric analysis of UI inflow's age pattern

The comprehensive analysis - Before the reform (betas), inflow



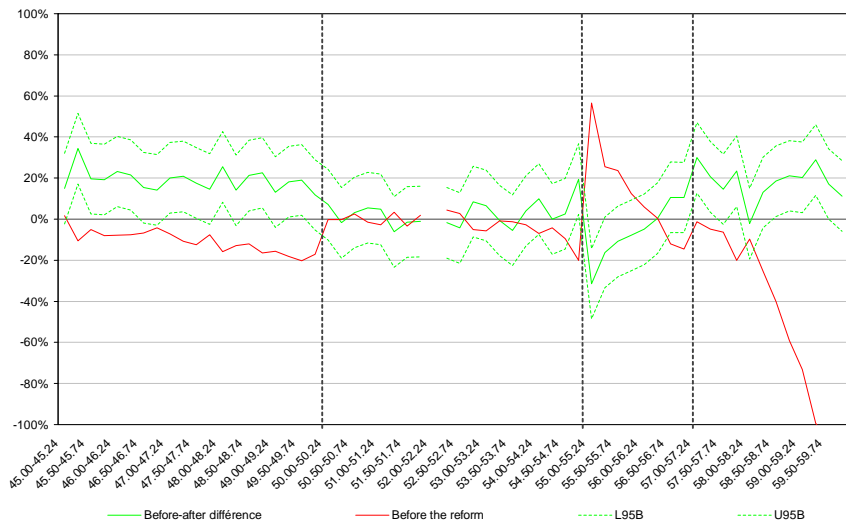
Econometric analysis of UI inflow's age pattern

The comprehensive analysis - Before the reform (betas), inflow + mean wage



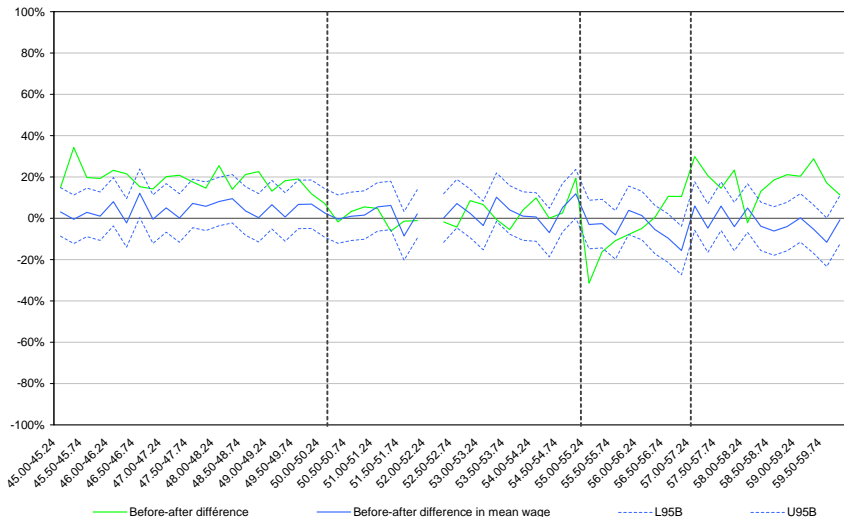
Econometric analysis of UI inflow's age pattern

The comprehensive analysis - Before\after difference (deltas and betas), inflow



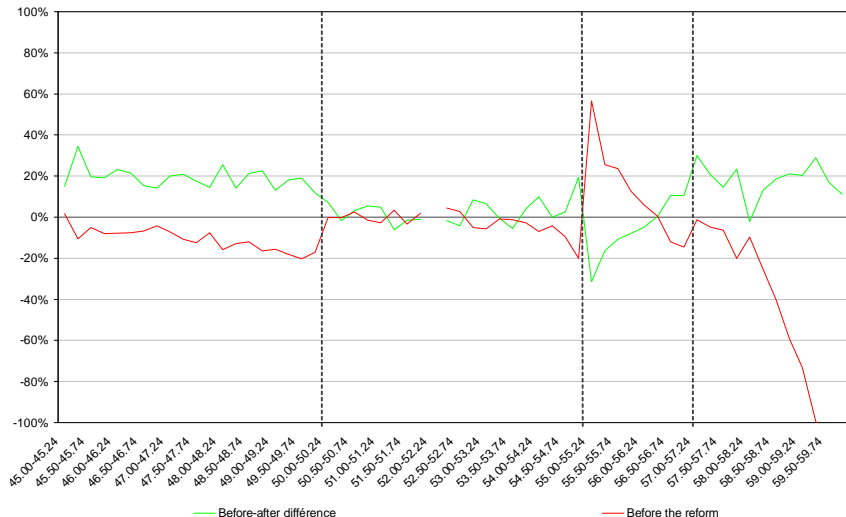
Econometric analysis of UI inflow's age pattern

The comprehensive analysis - Before\after difference (deltas), inflow + mean wage



Econometric analysis of UI inflow's age pattern

The comprehensive analysis - Conclusion



— Before-after difference

— Before the reform

Econometric analysis of UI inflow's age pattern

The targeted analysis

- Better suited to deal with missing values and to conduct the analysis over subsamples
- Specification (denoting $\log y_0$ the intercept)

$$\begin{aligned} \log y_{t,\tau} = & \log y_0 + \alpha_t + \gamma \cdot \tau \\ & + \sum_{age} \left(\begin{array}{l} (\zeta_{age}^b \cdot q_{<age} + \eta_{age}^b \cdot q_{\geq age}) b_t \\ + (\zeta_{age}^a \cdot q_{<age} + \eta_{age}^a \cdot q_{\geq age}) (1 - b_t) \end{array} \right) \\ & + \varepsilon_{t,\tau} \end{aligned}$$

- α_t captures quarter fixed-effects / γ captures an age-trend
- ζ_{age} tests whether a "hole" occurs just below age , (b) before and (a) after the reform
- η_{age} tests whether a "peak" occurs just above age , (b) before and (a) after the reform
- $age \in \{50; 55; 55.75; 57; 58\}$

		log y	
Reform break		January 2003	
Age thresholds		Before	After
50.00	$\hat{\zeta}$	-0.16*** (.06)	-0.09* (.05)
	$\hat{\eta}$	+0.02 (.06)	+0.04 (.05)
55.00	$\hat{\zeta}$	-0.12** (.06)	+0.03 (.05)
	$\hat{\eta}$	+0.65*** (.06)	+0.29*** (.05)
55.75	$\hat{\zeta}$	+0.33*** (.06)	+0.17*** (.05)
	$\hat{\eta}$	+0.22*** (.06)	+0.09** (.05)
57.00	$\hat{\zeta}$	-0.03 (.06)	+0.02 (.05)
	$\hat{\eta}$	+0.10* (.06)	+0.35*** (.05)
58.00	$\hat{\zeta}$	-0.07 (.06)	+0.11** (.05)
	$\hat{\eta}$	+0.03 (.06)	-0.04 (.05)
$\hat{\gamma}$		-0.0035*** (.0006)	
		N = 800	
		$R_{adj}^2 = .48$	
		log y = 4.50	
		$\widehat{\log y_0} = 4.58***$	

Econometric analysis of UI inflow's age pattern

The targeted analysis - Stratification

- Two lines of stratification are considered
 - ① Employment record (ER): incentives
 - ② Job termination motive: bargaining power
- Complementary analyses
 - Two correlated variables
 - Independent restrictions to the baseline sample
- Allow complementary lines of interpretation

Econometric analysis of UI inflow's age pattern

The targeted analysis - Stratification

	UI admissions registered...						Total
	Before		After		From		
	July 1, 2002				January 1, 2003 on		
Employment record (ER)	Interm.	Long	Interm.	Long	Interm.	Long	
Termination motive \	(6)	(7&8)	(6')	(8')	(E)	(C&D)	
End of a fixed-term contract	1,455	993	1,019	172	2,827	2,837	9,303
Economic redundancy	629	3,733	1,436	920	691	6,536	13,945
"PAP anticipé"	3	7	490	173	335	3,714	4,722
Other layoffs	1,077	7,931	2,699	2,050	2,035	16,659	32,451
Resignation	79	303	136	59	164	596	1,337
Other motive	547	1,195	673	454	667	1,393	4,929
Total	3,790	14,162	6,453	3,828	6,719	31,735	66,687

Age thresholds		Intermediate ER		Long ER	
		Before	After	Before	After
50.00	$\hat{\zeta}$				
	$\hat{\eta}$				
55.00	$\hat{\zeta}$	+ .19 (.13)	+ .05 (.09)	- .12* (.07)	+ .03 (.05)
	$\hat{\eta}$	+ .37*** (.13)	+ .06 (.09)	+ .80*** (.07)	+ .24*** (.05)
55.75	$\hat{\zeta}$	+ .11 (.13)	+ .24*** (.09)	+ .44*** (.07)	+ .12** (.05)
	$\hat{\eta}$	+ .14 (.13)	+ .07 (.09)	+ .28*** (.07)	+ .04 (.05)
57.00	$\hat{\zeta}$	- .02 (.13)	+ .18* (.09)	+ .08 (.08)	+ .00 (.05)
	$\hat{\eta}$	- .11 (.13)	+ .07 (.09)	+ .23*** (.08)	+ .42*** (.05)
58.00	$\hat{\zeta}$	- .20 (.13)	+ .24** (.10)	+ .01 (.08)	+ .11** (.05)
	$\hat{\eta}$	+ .13 (.13)	- .04 (.10)	+ .12 (.08)	- .04 (.05)
	$\hat{\gamma}$		- .044*** (.001)		.006*** (.001)
			N = 647		N = 648
			$R^2_{adj} = .68$		$R^2_{adj} = .59$
			$\widehat{\log y} = 2.57$		$\widehat{\log y} = 4.12$
			$\widehat{\log y_0} = 4.25***$		$\widehat{\log y_0} = 3.89***$

Econometric analysis of UI inflow's age pattern

The targeted analysis - Stratification, conclusions (1)

- Nothing consistent with PBD incentives is observable for *intermediate ER (outsiders)* at 55.75 nor at 58
No "distance-to-retirement" effect!
- Only for *long ER (insiders)*, do we observe the "hole-below\peak-above" pattern...
 - at 55 before the reform
 - at 57 after the reform
- Other incentives than just PBD seem at work at 55 and 57
 - Both groups (intermediate/long ER)
 - Both before and after the reform

Econometric analysis of UI inflow's age pattern

The targeted analysis - Stratification according to detailed job termination motive

Various job termination motives convey different information

- Economic redundancy (28.0%)
 - Termination due to insufficient profitability (declared)
 - Dismissed worker shall not be replaced to do the exact same job
 - Any choice on the timing?
- Other layoffs (48.5%): "*personal motive*" essentially
 - "Inability to hold the job" (no malpractice)
 - Most legal appeal concern this motive
- End of contract (14.0%)
 - The date of termination is determined at hiring
 - No legal risk associated to separation

Age thresholds	Eco. redundancy		Other layoffs		End of contract		
	Before	After	Before	After	Before	After	
50.00	$\hat{\zeta}$	-0.33*** (.10)	-0.16** (.08)	+0.03 (.08)	+0.00 (.07)	-0.31** (.13)	-0.24** (.11)
	$\hat{\eta}$	-0.13 (.10)	-0.05 (.08)	+0.15* (.08)	+0.19*** (.07)	+0.08 (.13)	-0.16 (.11)
55.00	$\hat{\zeta}$	-0.07 (.10)	+0.11 (.08)	-0.18** (.08)	-0.03 (.07)	-0.08 (.13)	+0.09 (.11)
	$\hat{\eta}$	+0.82*** (.10)	+0.51*** (.08)	+0.77*** (.08)	+0.21*** (.07)	+0.56*** (.13)	+0.12 (.11)
55.75	$\hat{\zeta}$	+0.31*** (.10)	+0.28*** (.08)	+0.43*** (.08)	+0.14** (.07)	+0.26* (.13)	+0.20* (.11)
	$\hat{\eta}$	+0.29*** (.10)	+0.08 (.08)	+0.29*** (.08)	+0.12* (.07)	+0.20 (.13)	+0.13 (.11)
57.00	$\hat{\zeta}$	-0.17* (.10)	-0.01 (.08)	+0.07 (.08)	-0.03 (.07)	-0.03 (.13)	+0.21* (.11)
	$\hat{\eta}$	+0.09 (.10)	+0.27*** (.08)	+0.22*** (.08)	+0.46*** (.07)	-0.09 (.13)	+0.28** (.11)
58.00	$\hat{\zeta}$	-0.06 (.10)	-0.10 (.08)	-0.00 (.08)	+0.22 (.07)	-0.19 (.13)	+0.15 (.11)
	$\hat{\eta}$	-0.10 (.10)	-0.22*** (.08)	+0.15* (.08)	+0.00 (.07)	+0.01 (.13)	+0.03 (.11)
	$\hat{\gamma}$	-0.0088*** (.0010)		+0.0123*** (.0008)		-0.0274*** (.0013)	
		N = 800		N = 800		N = 800	
		$R^2_{adj} = .55$		$R^2_{adj} = .50$		$R^2_{adj} = .45$	
		$\widehat{\log y} = 3.09$		$\widehat{\log y} = 3.63$		$\widehat{\log y} = 2.40$	
		$\widehat{\log y_0} = 3.43***$		$\widehat{\log y_0} = 3.15***$		$\widehat{\log y_0} = 3.05***$	

Econometric analysis of UI inflow's age pattern

The targeted analysis - Stratification, conclusions (2)

- The "other layoffs" motive: strong bargaining power!
 - "Hole-below\peak-above" pattern and its displacement after the reform, particularly clear
 - A bargained "early-retirement" motive?
- Economic redundancies less responsive to changes in UI rules (55 remains a critical threshold after the reform)
- Ends of contract come close to an outsider's profile
 - Responsive at 50
 - Responsive at 55 before the reform
 - Non-responsive elsewhere

Age	thresholds	Intermediate ER		Intermediate ER		Long ER		Long ER	
		Layoffs		Other motives		Layoffs		Other motives	
		Before	After	Before	After	Before	After	Before	After
55.00	ζ	-.08 (.19)	-.08 (.13)	+.29 (.18)	+.06 (.13)	-.10 (.08)	0.02 (0.06)	-.17 (.16)	.08 (.11)
	η	+.54*** (.19)	-.02 (.13)	+.17 (.18)	-.00 (.13)	+.83*** (.08)	+.23*** (0.06)	+.72*** (.16)	+.26** (.11)
55.75	ζ	+.09 (.19)	+.26* (.13)	+.12 (.18)	+.20 (.13)	+.45*** (.08)	+.12** (.06)	+.51*** (.16)	+.17 (.11)
	η	+.18 (.19)	+.09 (.13)	+.10 (.18)	-.03 (.13)	+.29*** (.08)	+.04 (.06)	+.34** (.16)	+.02 (.11)
57.00	ζ	-.28 (.19)	+.12 (.13)	+.11 (.18)	+.15 (.13)	+.12 (.08)	-.03 (.06)	-.08 (.16)	+.16 (.11)
	η	+.12 (.19)	+.05 (.13)	-.40* (.18)	-.07 (.13)	+.26*** (.08)	+.44*** (.06)	+.19 (.16)	+.35*** (.11)
58.00	ζ	-.20 (.21)	+.51*** (.14)	-.20 (.18)	-.10 (.13)	+.08 (.08)	+.12** (.06)	-.34*** (.16)	+.03 (.11)
	η	+.25 (.19)	+.04 (.14)	-.01 (.18)	-.08 (.14)	+.17** (.08)	-.04 (.06)	-.05 (.16)	-.13 (.11)
	γ	-.041*** (.002)		-.046*** (.002)		.008*** (.001)		-.008*** (.002)	
		N = 641		N = 642		N = 648		N = 647	
		$R^2_{\alpha,\beta} = .50$		$R^2_{\alpha,\beta} = .56$		$R^2_{\alpha,\beta} = .61$		$R^2_{\alpha,\beta} = .23$	
		$\overline{\log y} = 1.75$		$\overline{\log y} = 1.94$		$\overline{\log y} = 3.94$		$\overline{\log y} = 2.25$	
		$\widehat{\log y_0} = 3.57***$		$\widehat{\log y_0} = 3.47***$		$\widehat{\log y_0} = 3.62***$		$\widehat{\log y_0} = 2.51***$	

Econometric analysis of UI inflow's age pattern

The targeted analysis - Stratification, conclusions (3)

- The purest distinction is between...
 - Layoff and long ER: pure insiders
 - "All other motives" and intermediate ER: pure outsiders
- Behaviors are...
 - Non-responsive to UI rules as regards pure outsiders
 - Strongly responsive to UI rules as regards pure insiders (the majority among older workers)

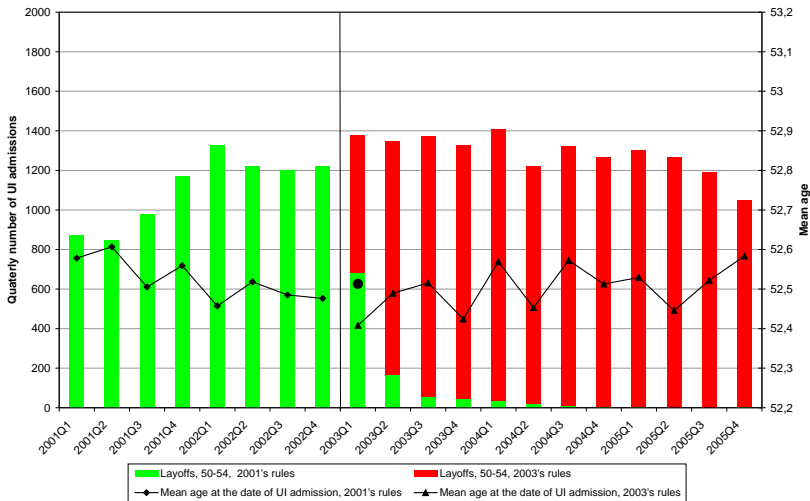
Estimating the effect of the reform on the age (at UI admission) of laid-off workers

The approach

- We distinguish between two groups of insiders:
 - ① Laid-off workers aged 50 to less than 55 at the date of UI admission: *far from retirement*
 - ② Laid-off workers aged 55 or more at the date of UI admission: *close to retirement*
- A pseudo difference-in-difference analysis
 - Both groups were impacted by the 2003's reform...
 - but only for the second have we identified changes in behaviors

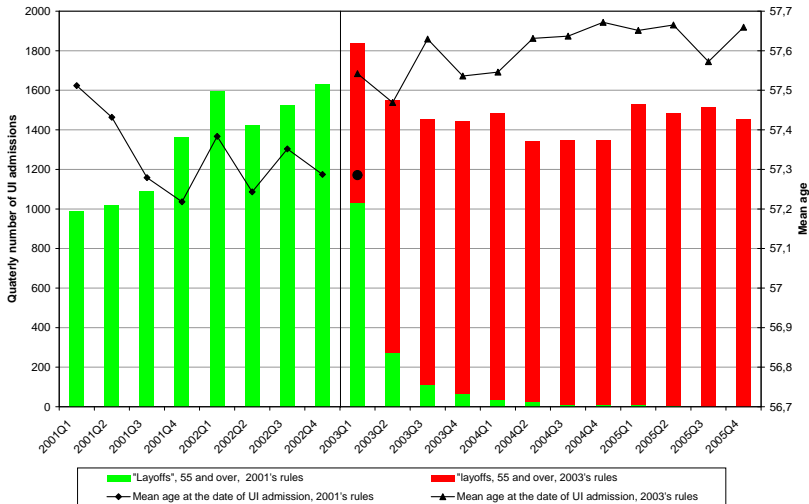
Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Descriptive analysis - Workers laid off far from retirement (aged 50 to less than 55)



Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Descriptive analysis - Workers laid off close to retirement (aged 55 and above)



Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Identifying a changing trend with a fuzzy regression discontinuity design

2SLS estimation

- Main first stage model

$$E [S_i | t_i] = \gamma + \gamma_0 \tilde{t}_i + \pi T_i + \gamma_1^* T_i \tilde{t}_i$$

- S_i : assignation (to new rules) dummy
- $\tilde{t}_i = t_i - t^*$, t^* : jan.. 1, 2003
- T_i : before\after (jan. 1, 2003) dummy
- $\gamma_1^* = \gamma_1 - \gamma_0$

- Second stage model

$$E [Y_i | t_i] = \alpha + \beta_0 \tilde{t}_i + \rho E [S_i | t_i] + \beta_1^* E [S_i \tilde{t}_i | t_i]$$

- β_0 captures the trend *before* the reform
- β_1^* captures the trend *after* the reform

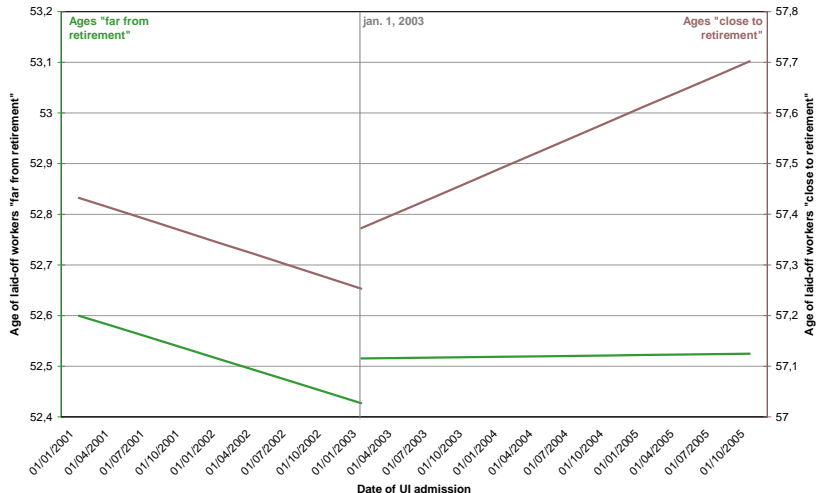
Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Identifying a changing trend with a fuzzy regression discontinuity design

Jan. 1, 2001 Dec. 31, 2005	Layoffs 50-55	Layoffs 55 and over
$\hat{\alpha}$	52.42*** (0.03)	57.25*** (0.03)
$\hat{\beta}_0$	-0.00024*** (0.00008)	-0.00025*** (0.00009)
$\hat{\rho}$	0.12** (0.05)	0.18*** (0.06)
$\hat{\beta}_1^*$	-0.00003 (0.00004)	+0.00026*** (0.00006)
N	23,479	27,639
R^2	0.0004	0.0056

Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Difference-in-difference analysis



Estimating the effect of the reform on the age (at UI admission) of laid-off workers

Difference-in-difference analysis

The model

$$Y_i = \alpha + \beta S_i + \gamma R_i + \delta S_i R_i + \varepsilon_i$$

- S_i : assignment dummy
- R_i : distance to retirement dummy
- The average effect is captured by δ

Jan. 1, 2001	Layoffs
Dec. 31, 2005	
$\hat{\alpha}$	52.53 ^{***}
(std-err)	(0.02)
$\hat{\beta}$	-0.03
(std-err)	(0.02)
$\hat{\gamma}$	4.75 ^{***}
(std-err)	(0.02)
Effect $\hat{\delta}$	0.35 ^{***}
(std-err)	(0.03)
R^2	0.69
N	51,118

- Labor management practices take UI rules into account
 - Dismissals of insiders close to retirement...
 - are postponed as a response to a reduced PBD
- Interpretation?
No effect as regards...
 - insiders far from retirement: a matter of distance to retirement
 - outsiders: avoiding legal challenges?
- What shall we do? A true "Filière unique"!