Impact of Early Retirement Incentives on Labor Market Participation: Evidence from the Parametric Change in the Czech Republic

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Econometrics
Conclusion

Demografical projection
Literature review

Motivation

- ▶ The Czech Republic–example of aging society.
- ▶ Many countries try to avoid early retirement option.
- ▶ High participation rate of older workers: one way to go around.
- ▶ The Czech Republic in 2001: decrease in early retirement benefits.
- ▶ Was it successful?

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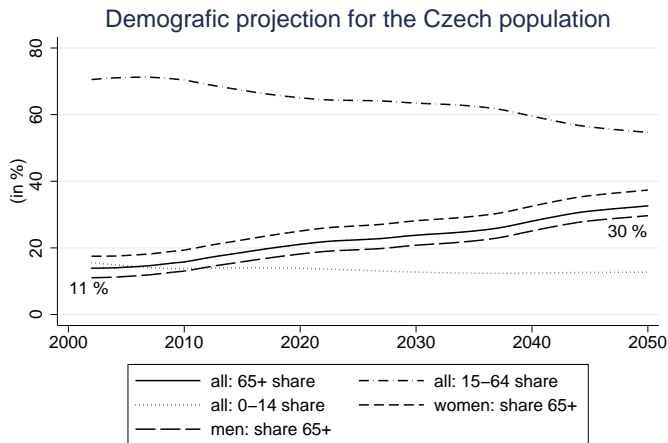- ▶ Was it successful?

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Demographic projection of the Czech population

Demografic projection for the Czech population

Source: Czech Statistical Office (2003)

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Literature review

► Empirical literature provide mixed results.

► Gruber and Wise (2002) and Borsch-Supan (2000) show positive relationship between incentives and labor force participation

► Brinch, Hernaes and Strom (2001) show negative relationship

► no clear evidence e.g. Baker and Benjamin (1999) or Moffitt (1987)

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Newly granted pensions
Changes in early retirement benefits

Institutional setting

▶ The Czech retirement scheme is standard pay-as-you-go
(PAYG) system with high degree of redistribution.

▶ Statutory retirement age has been prolonging by two months
per year since 1996=>problems for estimation.

▶ Several option how to enter early retirement: permanently cut
benefits, temporarily cut benefits, disability retirement.

▶ "Punishment" for the permanently cut early retirement was
changed in June 2001.

▶ "Punishment" increased from 0.6 or 0.3 % to 0.9 % per each
90 days remaining to statutory retirement age.

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Table: Newly granted pensions (in CZK)

	1999	2000	2001	2002	2003	2004	2005
(1) all pensions	5,991	6,106	6,399	7,055	7,224	7,760	8,391
(2) at retirement age	6,222	6,485	6,823	7,226	7,512	7,968	8,693
(3) after retirement age	7,272	7,485	7,916	8,621	9,157	9,410	10,306
(4) early ret. - temp. cut	5,370	5,513	5,838	5,917	6,224	6,404	6,836
(5) early ret. - perm. cut	**5,593**	**5,659**	**5,844**	**5,667**	**5,996**	**6,261**	**6,984**
(5)/(2) (in %)	90	87	86	78	80	79	80

Source: MLSA (2006), own computation of averages

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Changes in early retirement benefits

Table: Changes in early retirement benefits due to the policy change

	Years before eligible age T	Absolute decrease	Relative descrease	Change in terms of net wage (in pp)
70% of avg. wage	T-3	191	-3	-2.4
	T-2	133	-2	-1.6
	T-1	131	-2	-1.1
Avg. wage	T-3	218	-3	-1.9
	T-2	149	-2	-1.3
	T-1	152	-2	-1.3
150% of avg. wage	T-3	237	-3	-1.3
	T-2	162	-2	-0.9
	T-1	166	-2	-0.9

Source: Own computation based on the official formula published in MLSA (2002).

Note: Benefits are computed for 46 years of service. The net wage is CZK 11,324 in 2001. Three income groups were chosen arbitrarily. 70 % of the average wage reflects approximately the group of workers with the median wage and 150 % of the average wage represents managers and high-paid workers in the Czech economy.

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Data description

- ▶ Czech Labor Force Survey from 1998-2005.
- ▶ Rotating panel data (individual is observed only 4-5 quarters in row).
- ▶ Subsample of males.
- ▶ Age window: 6 to 0 years until the eligibility age.
- ▶ 50 152 observations for 11 843 individuals
- ▶ Basic characteristics: labor market status (endogenous variable), education, marital status, number of household members, district.
- ▶ Limitations: we observe only few changes in labor market status for individual i
    - ▶ We treat our data as repeated cross-section.
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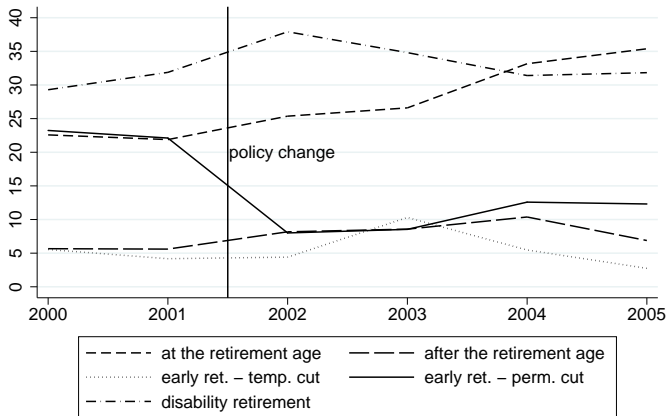**Summary statistics**
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Table: Descriptive statistics

variable	control group		treatment group	
	Mean	Std. Dev.	Mean	Std. Dev.
inactivity status	*0.17*	0.38	*0.42*	0.49
elementary educ.	0.09	0.29	0.12	0.32
apprenticeship	0.54	0.50	0.50	0.50
high school educ.	0.24	0.43	0.25	0.43
lower tertiary educ.	0.01	0.10	0.01	0.09
upper tertiary educ.	0.11	0.32	0.12	0.32
unmarried	0.04	0.21	0.04	0.20
married	0.84	0.37	0.84	0.37
widowed	0.04	0.20	0.05	0.22
divorced	0.07	0.26	0.07	0.26
before the policy change	0.22	0.42	0.25	0.43
1-1.5 year after the policy change	0.24	0.43	0.26	0.44
1.5 - 3 years after the policy change	0.28	0.45	0.26	0.44
3 - 4.5 years after the policy change	0.26	0.44	0.23	0.42
number of household members	2.60	1.07	2.41	0.97
age	56.90	0.94	59.72	0.78

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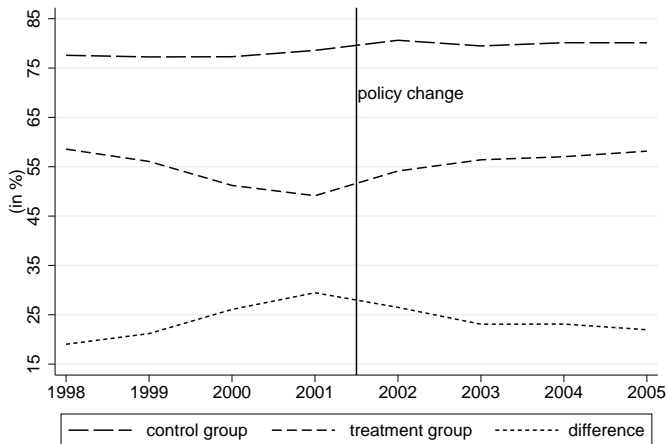Summary statistics
Graphical overview

Newly granted pensions (men - in % of total)

Source: Czech Social Security Administration, own calculation
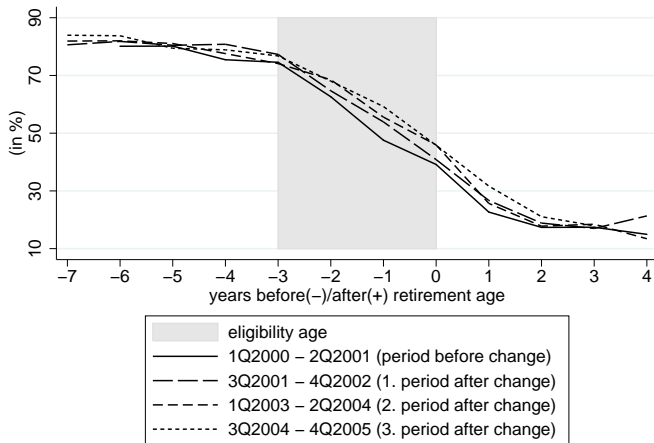Note: The short time span before the actual policy change is given by the limitation of official statistics.
     The remainder to 100% are e.g. widower's and orphan's pensions.

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Participation rate in 1998-2005

Source: Labor Force Survey, own calculation

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Participation rate across cohorts

Source: Labor Force Survey, own calculation

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Hazard rate

Source: Labor Force Survey, own calculation

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Econometric methodology

- ▶ Difference-in-differences (Baker and Benjamin, 1999).
- ▶ Treatment group
  - ▸ eligible for early retirement program
  - ▸ less than 3 years before statutory retirement age
- ▶ Control group
  - ▸ more than 3 years before statutory retirement age
  - ▸ 1.5 year long=>robustness check
- ▶ Periods: one before, three after the policy step
- ▶ Problems:
  - ▸ the system was not stable before the policy change
  - ▸ expectations

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Econometric specification

▶ Basic econometric se up:

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y_{it} = {} & \alpha_i + \beta_1 OLD_{it} + \beta_2 AFTER1_{it} + \beta_3 AFTER2_{it} \\
& + \beta_4 AFTER3_{it} + \beta_5 (OLD_{it} \cdot AFTER1_{it}) + \beta_6 (OLD_{it} \cdot \\
& AFTER2_{it}) + \beta_7 (OLD_{it} \cdot AFTER3_{it}) + \beta_8 X_{it} + \epsilon_{it},
\end{aligned}
$$

▶ LHS: 0 if individual i is inactive at time t, 1 if an individual is active

▶ It is estimated using probit model.

▶ Interaction terms should identify the policy effect.

▶ We used different periods for robustness checks and controlling for expectations.

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Table: Estimated coefficients from the probit model in three different specifications

Model	(1)	(2)	(3)
OLD*AFTER1	-0.0159	-0.0108	-0.0096
	(0.0180)	(0.0182)	(0.0182)
OLD*AFTER2	-0.0509***	-0.0340*	-0.0318*
	(0.0179)	(0.0184)	(0.0184)
OLD*AFTER3	-0.0457**	-0.0354*	-0.0317
	(0.0187)	(0.0189)	(0.0191)
Personal characteristics		X	X
District dummies			X
N	50,152	50,152	50,152
Pseudo R-squared	0.07	0.10	0.14

Note: Coefficients are recalculated into the probability measure (min 0, max 1). Standard errors are in parentheses.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

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Table: Estimated coefficients from the probit model in three different specifications without the first half of 2001

Model	(1)	(2)	(3)
OLD*AFTER1	-0.0004	0.0034	0.0031
	(0.0209)	(0.0211)	(.02104)
OLD*AFTER2	-0.0361*	-0.0201	-0.0197
	(0.0196)	(0.0201)	(0.0201)
OLD*AFTER3	-0.0308	-0.0214	-0.0193
	(0.0204)	(0.0206)	(0.0207)
Personal characteristics		X	X
District dummies			X
N	46,127	46,127	46,127
Pseudo R-squared	0.06	0.11	0.13

Note: Coefficients are recalculated into the probability measure (min 0, max 1). Standard errors are in parentheses.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

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Table: Marginal effects probit

Variables	Active	Employed	Unemployed
OLD1*after2	0.072***	0.045	0.038**
	(0.023)	(0.027)	(0.020)
OLD1*after3	0.053**	0.040	0.013
	(0.024)	(0.027)	(0.015)
OLD2*after2	0.079***	0.062**	0.034*
	(0.025)	(0.029)	(0.025)
OLD2*after3	0.081***	0.078**	0.008
	(0.026)	(0.029)	(0.018)
OLD3*after2	0.069**	0.051	0.042
	(0.027)	(0.031)	(0.035)
OLD3*after3	0.041	0.031	0.034
	(0.031)	(0.033)	(0.035)

Note: Coefficients are recalculated into the probability measure (min 0, max 1).

Standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Conclusion and Further Research

▶ 3 % decrease in early retirement benefits boosted labor supply
  by approximately same size

▶ These findings are in line with high elasticity of labor market
  participation of older males across Europe (Börsch-Supan,
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