Sooner rather than later? The causal effect of partial retirement on the timing of retirement

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Work in progress

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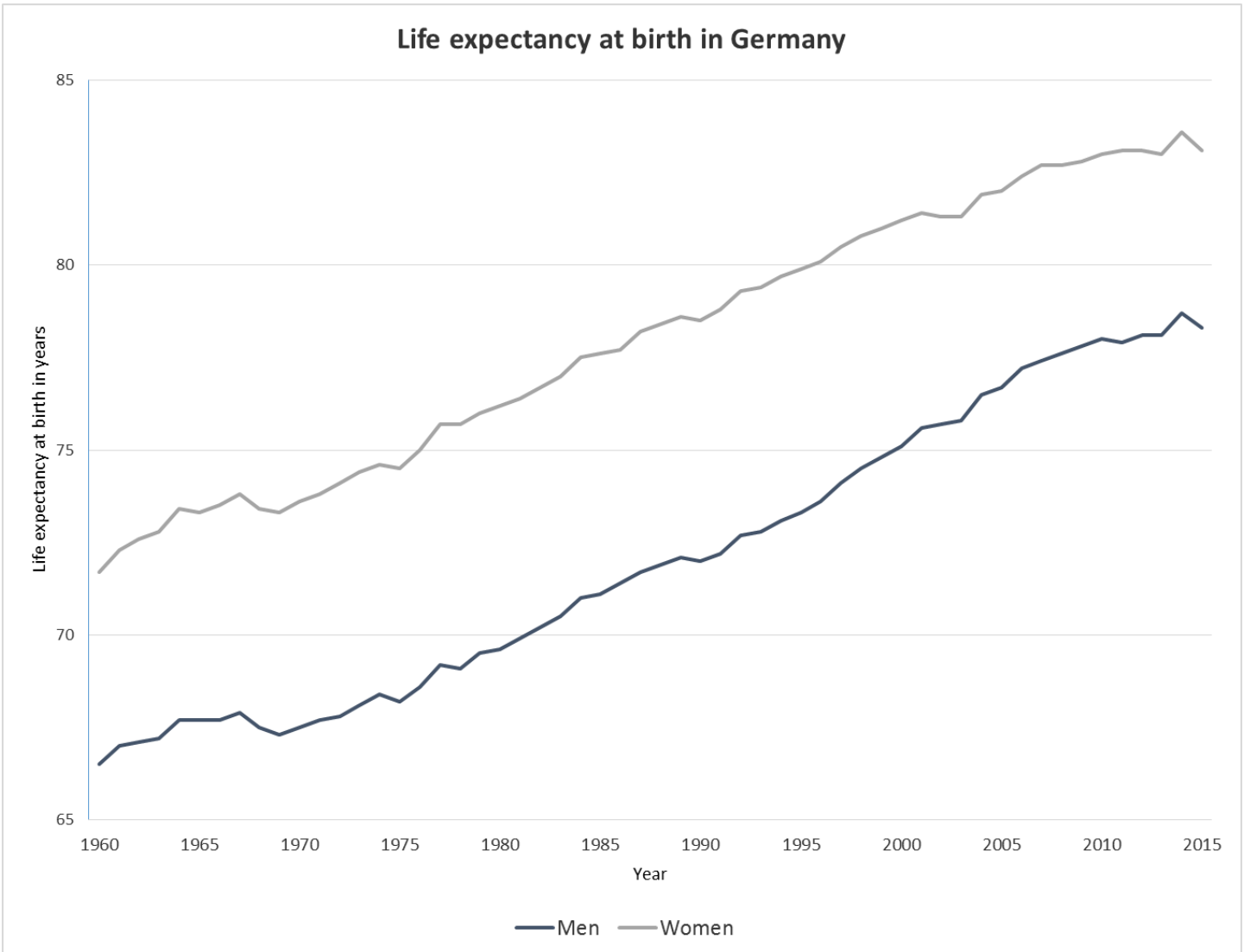
Germans are living longer



Source: Eurostat (2017).

Why this is something to be concerned about

- Increasing life expectancy is combined with a lower fertility
- Higher ratio of working-age population (15 to 64 year olds) to dependent population (aged 65+)
  $\rightarrow$ from 4:1 in 2000 to 2.5:1 in 2030
- Financial pressure on German pay-as-you-go pension system (transfers from today's workers to today's retirees)

Older workers' labour market participation

- Increasing relevance of older workers' labour market participation
- Postponement of retirement resp. encouragement of older workers' employment content of various labor market reforms
  - Reduction of unemployment benefits, deductions for early retirement, increase of full retirement age
    $\rightarrow$ large literature shows effectiveness
  - Partial retirement
    $\rightarrow$ effects are highly controversial

Partial retirement (PR)

- Options (on firm level) to work part-time before entering old age retirement
- Supporters: Increase of older workers' employment that would have otherwise withdrawn from work life via unemployment and/or early retirement
- Critics: Reduction of older workers' working time that would otherwise have worked full-time

This paper

What Causal effect of partial retirement options on the timing of retirement

How Exploiting the introduction of partial retirement options in Germany in 1996

International literature

Conflicting evidence about the effects of partial retirement:

- Sundén (1994) and Wadensjö (2006) - net increase in labor supply of older workers in Sweden
- Graf et al. (2011) - crowding out of full-time employment in Austrian labor market
- Machado & Portela (2014) - voluntary reduction in hours of work are associated with earlier retirement of Portuguese workers

German literature

Inconclusive effects of partial retirement:

- Wanger (2009) - workers in PR leave labor market 2 years earlier than non-PR workers
- Huber et al. (2016) - no effect on timing of retirement, but reduced unemployment before retirement
- Berg et al. (2015) - increase in men's employment duration of 1.8 years

Contribution

1. Offering further insights into causal effects of partial retirement
2. Looking at a broader sample of establishments
3. Using a more appropriate control group
4. Analyzing heterogeneity with respect to PR model, men vs. women, East vs. West Germany, and small firms vs. large companies

PR in Germany

- Options introduced through the *Altersteilzeitgesetz (AtG)* in 1996
- Intention: Extending of older workers' employment life by offering gradual transition from working life as an alternative to unemployment and/or abrupt (early) retirement
- Workers
  - aged 55 and older,
  - who worked at least 1,080 days in the last 5 years in employment with social security contributions,
  - and reduced work hours by 50 %
- were paid a minimum supplement of 20 % of prior earnings (add. to 50 %) and 40 % of pension contribution under full-time work Details

PR in Germany

- AtG sets compensation and pension contribution floors
- Voluntarily agreement on details in individual, firm, or collective agreements between workers and firms
- Choice to reduce work hours by 50 % for the whole PR period (part-time model) or work 100 % in first half of PR period and 0 % in second half (block model)
- Workers can enter retirement due to unemployment/PR after PR period earlier than regular old age retirement $\rightarrow$ retirement age differs by birth cohort Details

Hypotheses

Hypothesis 1

Partial retirement leads to a postponement of retirement

Hypothesis 2

Partial retirement leads to a reduction of unemployment as a bridge to retirement

Hypothesis 3

Effect on retirement higher for women $\rightarrow$ no incentives to use PR as an early retirement option

Hypothesis 4

Effect on retirement higher for part-time model $\rightarrow$ allowing real gradual transition from working life

Data

- Linked-Employer-Employee-Data
- Establishment Panel surveying German establishments and covering broad firm level information
- Linked to employment biographies of firms' employees which contain information about personal characteristics, employment, unemployment benefit receipt and more on a day-to-day basis

Sample

- Firms surveyed in the Establishment Panel from 1999 to 2001
- Individuals worked in firms for at least 1 day between 1.1.1996 - 31.12.2002
- Employment biographies available for period 1990-2006
  - Men and women
  - East and West Germans
  - Years from 1996 to 2004
  - 59 to 64 year olds (birth cohorts 1932-1945)

Identification strategy

Difference-in-Differences design

- Identification of effect by exploiting introduction of PR in firms between 1997 and 1999
- Comparison of changes in employment of workers employed in firm introducing PR in 1998 or 1999 and workers employed in firms not introducing PR
- Sample restricted to all firms not offering PR in 1997 $\rightarrow$ Information is taken from employment biographies of workers
- Treatment is based on availability of PR in 1999 $\rightarrow$ Information is taken from Establishment Survey in 1999

Groups and periods

Treatment group

59-64 years old workers employed in firm introducing PR between 1997 and 1999

Control group

59-64 years old workers employed in firm not introducing PR between 1997 and 1999

Pre-treatment period

1996-1997

Post-treatment period

1999-2004

Main estimation equation

$$E[Y_{i,t}|treat, post, age, X] = \alpha\, treat_{i,t} \cdot age_{i,t} + \beta\, post_{i,t} \cdot age_{i,t} + \tau\,(post_{i,t} \cdot treat_{i,t} \cdot age_{i,t}) + \theta X_{i,t}$$

$Y_{i,t}$	Outcome for individual i in year t
treat	Indicator for belonging to treatment group
post	Indicator for post-treatment outcome
age	Vector of indicators for age
X	Controls for socio-demographic characteristics, firm characteristics, retirement, and calendar year.
τ	Treatment effect of availability of PR in firm

Outcome variables

1. $E[Y_{i,t}|age = z] = Pr(retire_{i,t} = 1|age = z)$
   Probability of worker i in year t to leave employment in retirement within the next year $t + 1$ given her age is $z = 59, ..., 64$.
2. $E[Y_{i,t}|age = z] = Pr(unempl\_ret_{i,t} = 1|age = z)$
   Probability of worker i in year t to leave employment into unemployment prior to retirement given her age is $z = 59, ..., 64$.

Spell data is converted to a panel of person-year observations
Both outcomes are defined as absorbing states and observations are censored thereafter

Treatment effects on retirement and unemployment prior to ret. by age

	retire	unempl_ret
post · treat ·		
age59	0.0532***	0.0154**
age60	0.0260***	−0.0346***
age61	0.0438***	−0.0276***
age62	0.0376**	0.0102
age63	−0.0083	0.0191
age64	−0.0338	0.0476
Controls	Yes	Yes
N	197,918	154,275
Mean	0.2623	0.0537

Note: OLS coefficients. Robust SE. * p < 0.1, ** p < 0.05, *** p < 0.01.

Treatment effects on retirement for 59 year olds

Dep. variable: retire	(I)	(II)	(III)	(IV)
post · treat · age59	0.0532***		−0.2423***	
post · block · age59		0.1294***		0.0258**
post · part-time · age59		−0.0664***		−0.0632**
post · block & part · age59		0.0076***		−0.0374***
post · treat · age59 · men			0.4938***	
post · block · age59 · men				0.1511***
post · part-time · age59 · men				−0.0198
post · block & part · age59 · men				0.0774**
Controls	Yes	Yes	Yes	Yes
N	197,918	197,918	197,918	197,918
Mean for age59	0.2344	0.2344	0.2344	0.2344

→ Positive treatm. effects driven by availability of block model and by men

→ Lower prob. for retirement for women and individuals in firms with part-time model (for men and women) compared to control group

→ similar results for 60 year olds

Treatment effects on retirement for 61 year olds

Dep. variable: retire	(I)	(II)	(III)	(IV)
post · treat · age61	0.0438^{***}		-0.1605^{***}	
post · block · age61		0.0595^{***}		-0.0218^{**}
post · part-time · age61		0.0603^{**}		0.0252
post · block & part · age61		0.0313^{***}		0.0161
post · treat · age61 · men			0.2493^{***}	
post · block · age61 · men				0.1045^{***}
post · part-time · age61 · men				0.0283
post · block & part · age61 · men				0.0484^{***}
Controls	Yes	Yes	Yes	Yes
N	197,918	197,918	197,918	197,918
Mean for age61	0.1851	0.1851	0.1851	0.1851

→ Positive treatment effects for men indep.; neg. effects for women

→ No differences with respect to PR models for pooled sample and for men

→ For women neg. effects for block model

More

Treatment effects on unemployment prior to ret. for 62 year olds

Dep. variable: unempl_ret	(I)	(II)	(III)	(IV)
post · treat · age62	0.0102		0.1231***	
post · block · age62		−0.0056		0.0313
post · part-time · age62		0.0859***		0.1224***
post · block & part · age62		0.0143		0.0497**
post · treat · age62 · men			−0.1304***	
post · block · age62 · men				−0.0398***
post · part-time · age62 · men				−0.0372
post · block & part · age62 · men				−0.0369***
Controls	Yes	Yes	Yes	Yes
N	154,275	154,275	154,275	154,275
Mean for age62	0.0564	0.0564	0.0564	0.0564

→ Sign. positive treatment effect for women, very small neg. effect for men

→ For women (sign.) positive treatment effect for all PR models; for men neg. treatment effects only for block model, pos. effects for part-time and block & part-time model

More

Threats to identification strategy

- Assumption of parallel trends for control and treatment group in absence of PR introduction Graphs
- Workers self-select into firms with partial retirement $\Rightarrow$ Workers have to be employed by the sampled firm in 1999 with at least 3 years
- Simultaneous pension reforms $\Rightarrow$ Controls for individual (early) retirement age
- Indirect coding of empl. exit into retirement as last spell in the data $\Rightarrow$ Omitting periods 2005 and 2006

Threats to identification strategy

- Differences in arrangements for older workers between control and treatment firms $\Rightarrow$ Robustness check with firms bound to collective agreements using information about collective agreements
- Differences in intertemporal variation of treatment and control group on key expl. variables $\Rightarrow$ Test significance of differences in means
- Robustness due to estimator and clustering of SE $\Rightarrow$ Estimations with different estimators and cluster levels

Thank you for your attention!

References I

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Appendix

Broader sample of establishments

- Huber et al. (2016) base identification of the effect on introduction of PR in firms between 2000 and 2002
- Exclude firms that had agreements prior to 2000 which is a substantial number of firms resp. workers
- Until 2000, already over 300 collective agreements affecting over 12 million workers were reached. (Brussig et al. 2009)
- Also excluded firms without collective wage agreements and specific sectors because of their matching approach and common support issues

Return

More appropriate control group

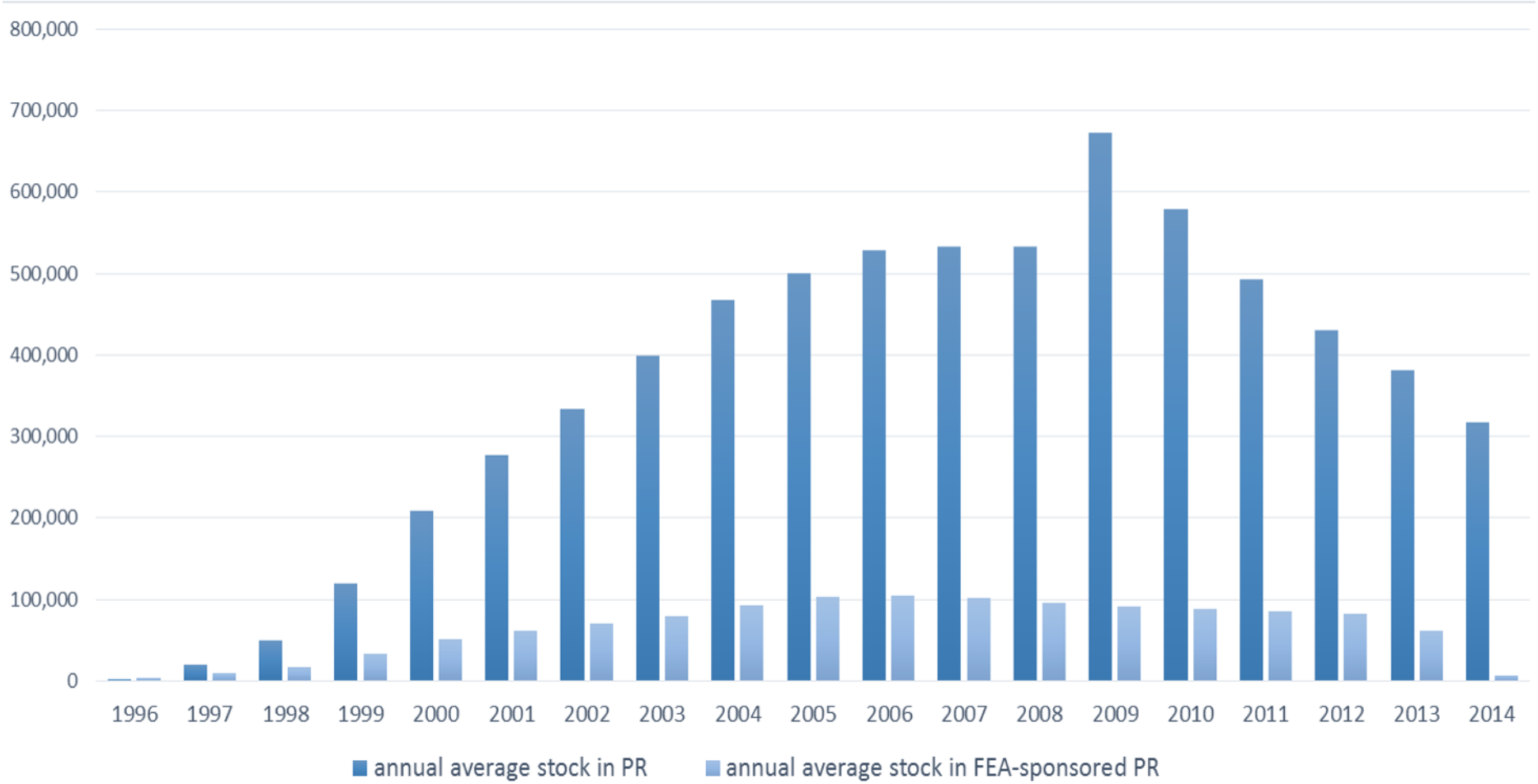
- Berg et al. (2015) use also DiD framework, but use 50-54 year-olds as control group for retirement decision
- 50-54 year-olds do not have access to any retirement pathway (except for disability pension benefit), so the outcome variable will not change between pre- and post-treatment period
- Therefore, it is not possible to difference out time trends affecting the outcome variable

Return

PR in Germany

- Wage and pension contribution settlements were paid by the German Federal Employment Agency (FEA) if employer replaced partial retirees' hours by hiring an unemployed worker or trainee
- Supplements from the Federal Employment Agency expired by end of 2009, but law remains valid and PR can still be offered

Take-up of PR in Germany



Source: German Pension Insurance Fund (2016), Federal Employment Agency (2015).

Return

Retirement age in Germany

Birth Cohort	Retirement due to unempl./PR		Retirement for women		Regular old age retirement	
	Full Age	Early Age	Full Age	Early Age	Full Age	Early Age
1932	60 (1992)	n.a.	60 (1992)	n.a.	65 (1997)	n.a.
1933	60 (1993)	n.a.	60 (1993)	n.a.	65 (1998)	n.a.
1934	60 (1994)	n.a.	60 (1994)	n.a.	65 (1999)	n.a.
1935	60 (1995)	n.a.	60 (1995)	n.a.	65 (2000)	n.a.
1936	60 (1996)	n.a.	60 (1996)	n.a.	65 (2001)	n.a.
1937	rising to 61 (1998)	60 (1997)	60 (1997)	n.a.	65 (2002)	n.a.
1938	rising to 62 (2000)	60 (1998)	60 (1998)	n.a.	65 (2003)	n.a.
1939	rising to 63 (2002)	60 (1999)	60 (1999)	n.a.	65 (2004)	n.a.
1940	rising to 64 (2004)	60 (2000)	rising to 61 (2001)	60 (2000)	65 (2005)	n.a.
1941	rising to 65 (2006)	60 (2001)	rising to 62 (2003)	60 (2001)	65 (2006)	n.a.
1942	65 (2007)	60 (2002)	rising to 63 (2005)	60 (2002)	65 (2007)	n.a.
1943	65 (2008)	60 (2003)	rising to 64 (2007)	60 (2003)	65 (2008)	n.a.
1944	65 (2009)	60 (2004)	rising to 65 (2009)	60 (2004)	65 (2009)	n.a.
1945	65 (2010)	60 (2005)	65 (2010)	60 (2005)	65 (2010)	n.a.

Return

Treatment effects on retirement for 62 year olds

Dep. variable: retire	(I)	(II)	(III)	(IV)
post · treat · age62	0.0376**		0.2274***	
post · block · age62		0.0257**		0.0169
post · part-time · age62		0.1157**		0.1288*
post · block & part · age62		0.0381***		0.0770***
post · treat · age62 · men			−0.2247***	
post · block · age62 · men				0.0110
post · part-time · age62 · men				−0.0147
post · block & part · age62 · men				−0.0488**
Controls	Yes	Yes	Yes	Yes
N	197,918	197,918	197,918	197,918
Mean for age62	0.4149	0.4149	0.4149	0.4149

→ Positive treatment effects for women; very low pos. effects for men

→ For all PR models (significant) positive treatment effects for pooled sample, women, and men

→ For 63 and 64 year olds: sign. positive for women and sign. negative effects for men; no clear patterns for PR models

◂ Return

Treatment effects on unemployment prior to ret. for 59 year olds

Dep. variable: unempl_ret	(I)	(II)	(III)	(IV)
post · treat · age59	0.0154**		0.0740***	
post · block · age59		0.0086		0.0003
post · part-time · age59		0.0306		0.0296
post · block & part · age59		0.0196***		0.0248***
post · treat · age59 · men			−0.0716***	
post · block · age59 · men				0.0116**
post · part-time · age59 · men				0.0075
post · block & part · age59 · men				−0.0038
Controls	Yes	Yes	Yes	Yes
N	154,275	154,275	154,275	154,275
Mean	0.0560	0.0560	0.0560	0.0560

→ No differences with respect to PR models; for all PR models (significant) positive treatment effects for pooled sample, women, and men

→ Positive treatment effects for women; sign. lower pos. effect for men

Treatment effects on unemployment prior to ret. for 60 year olds

Dep. variable: unempl_ret	(I)	(II)	(III)	(IV)
post · treat · age60	-0.0346^{**}		0.0907^{***}	
post · block · age60		-0.0354^{***}		-0.0354^{***}
post · part-time · age60		-0.0086		0.0057
post · block & part · age60		-0.0360^{***}		-0.0217^{**}
post · treat · age60 · men			-0.1453^{***}	
post · block · age60 · men				0.0011
post · part-time · age60 · men				-0.0142
post · block & part · age60 · men				-0.0149^{**}
Controls	Yes	Yes	Yes	Yes
N	154,275	154,275	154,275	154,275
Mean	0.0539	0.0539	0.0539	0.0539

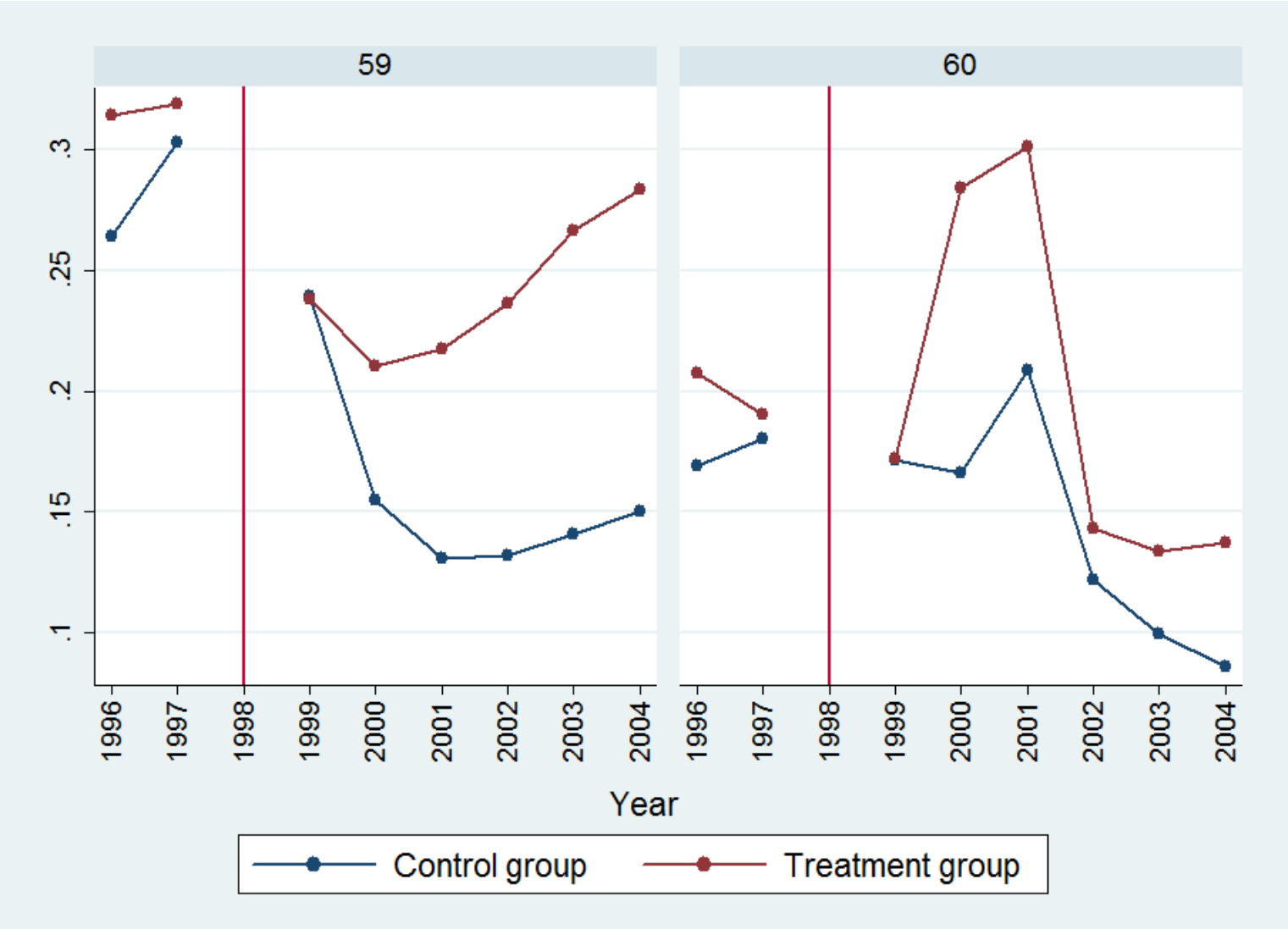
→ For all PR models (sign.) negative treatment effects for pooled sample

→ Sign. negative treatment effects for men for all PR models, pos. effects for women, but just for part-time model

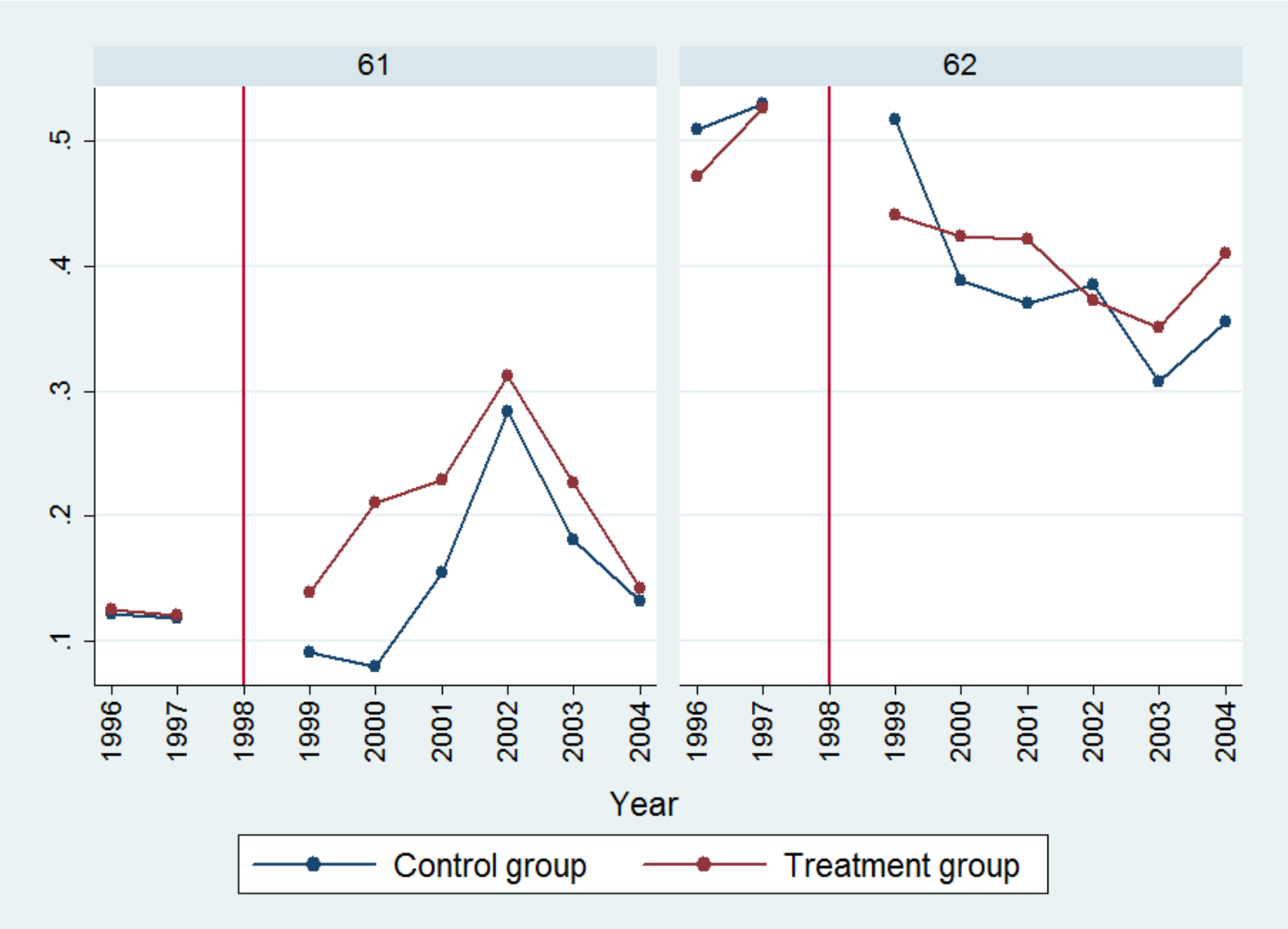
→ For 61 year olds similar results

◂ Return

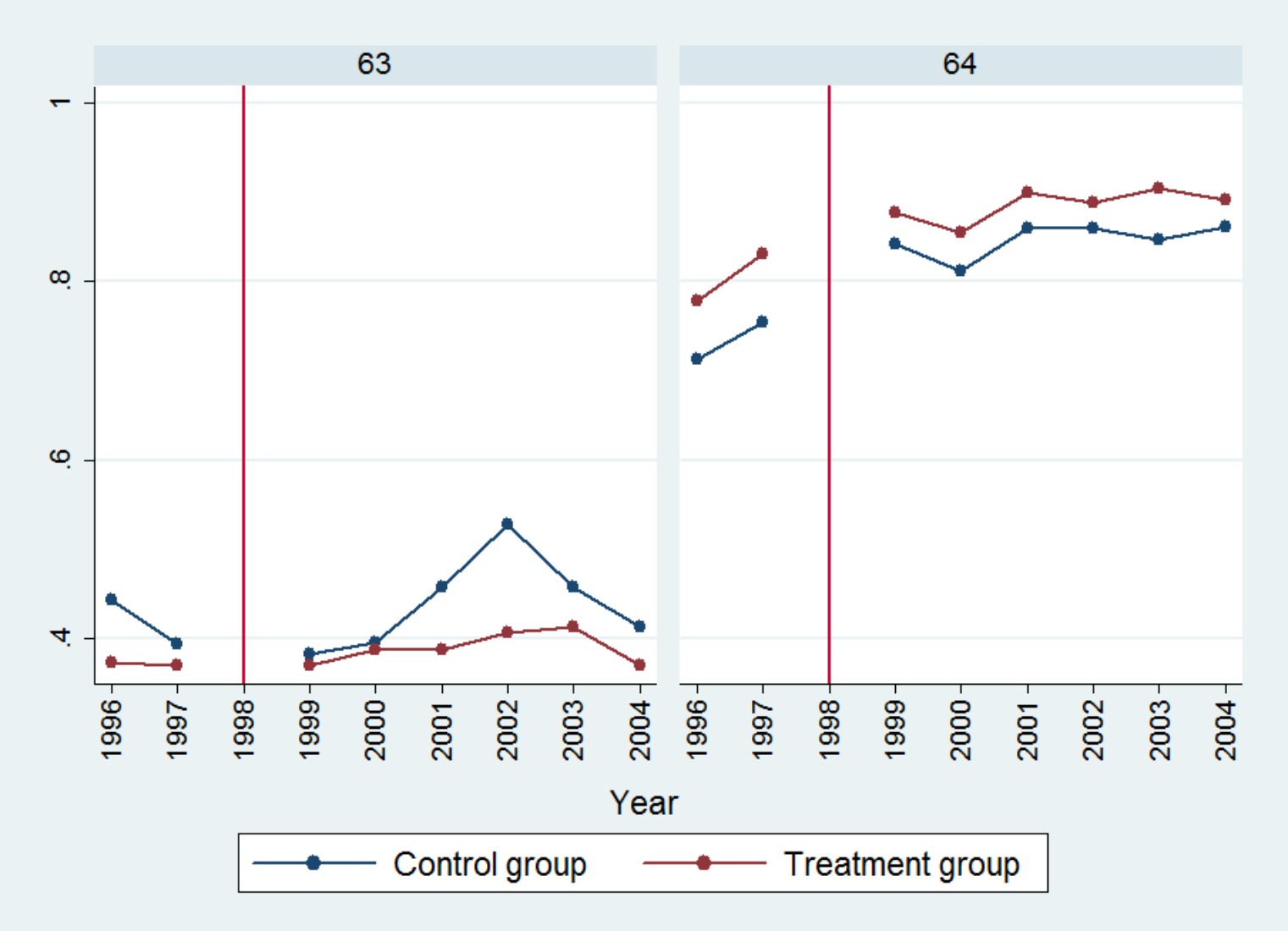
Time trend of retirement by treat and age



Time trend of retirement by treat and age



Time trend of retirement by treat and age



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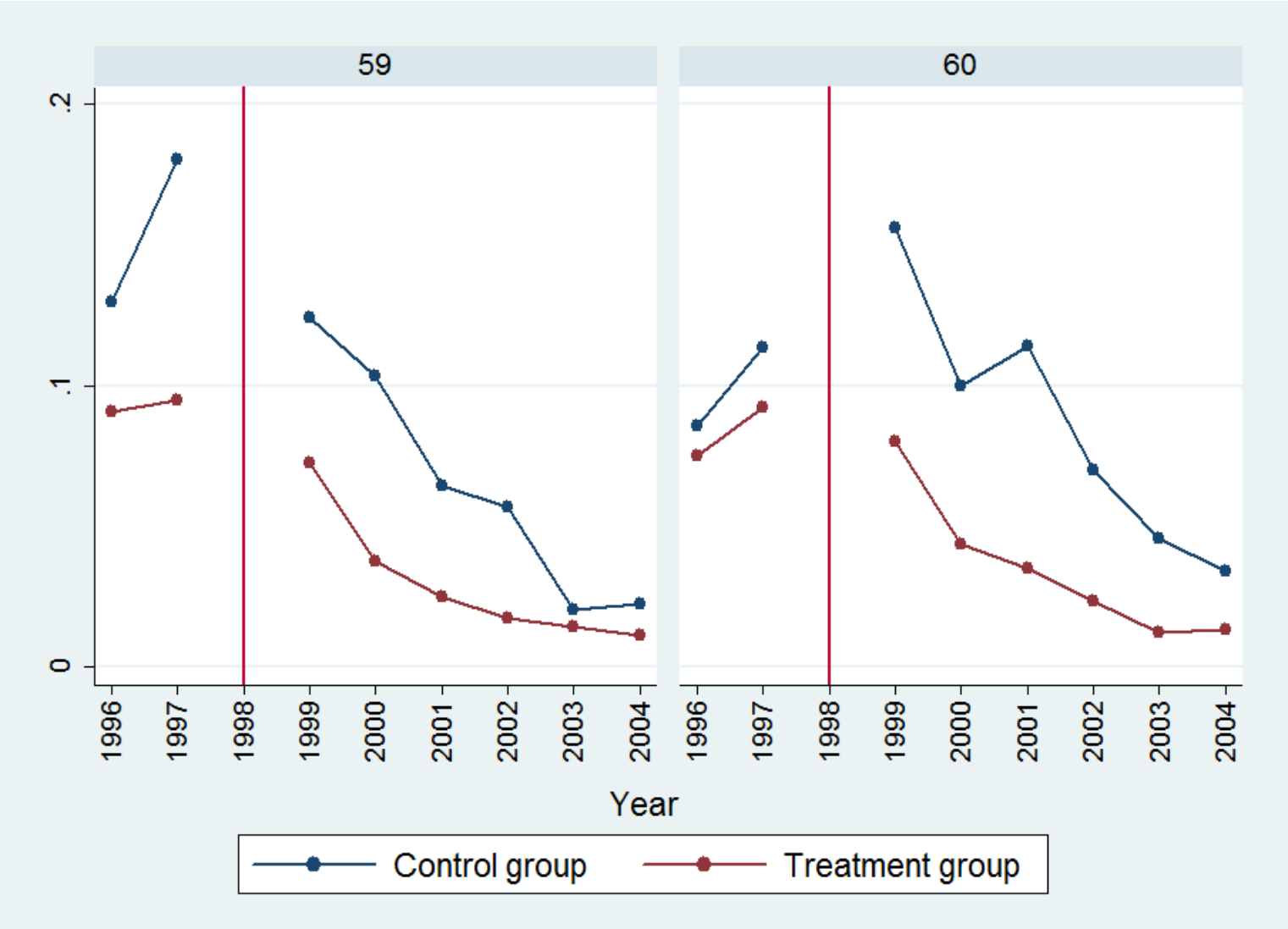
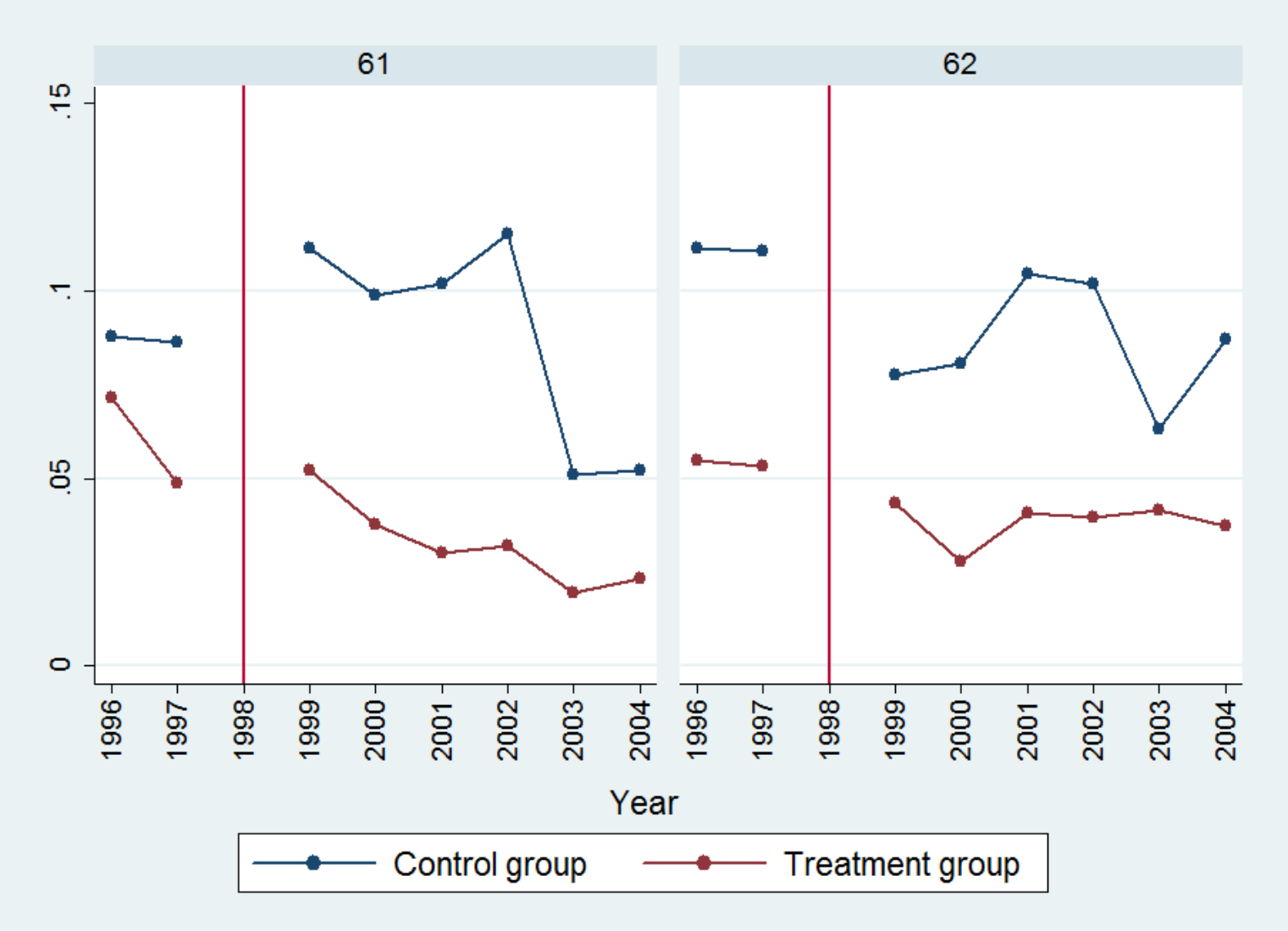
Time trend of unempl. prior to ret. by treat and age



Time trend of unempl. prior to ret. by treat and age



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