ONLINE APPENDIX

Closing routes to retirement for women: how do they respond?

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A Pension types

Depending on the length of the insurance record and other qualifying conditions, the age at which pension benefits can be claimed lies between 60 and 65.5 for the cohorts under study (1951–1952). In addition to the regular pension, which requires 5 years of contributions there are four early retirement programs with different qualifying conditions:

1. Pension for women
2. Invalidity pension
3. Pension after unemployment or old-age part-time work
4. Pension for the long-term insured

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The first two of these programs allow retirement starting from 60 years of age, the *pension for women* and the pension for people with severe disability status (*invalidity pension*). The NRA, the age at which full benefits can be claimed, is different between these programs. The NRA of the pension for women and for the invalidity pension are 65 and 63, respectively. Early retirement is associated with actuarial deductions of 0.3 percent per month before the NRA. That is, retiring through the pension for women at age 60 is associated with permanent pension deductions of 18 percent. Deductions amount to only 10.8 percent for people of the same age who are eligible for invalidity pensions. The other two early retirement programs allow retirement starting from age 63 for the cohorts studied in this analysis. The pension for the long-term insured enables individuals with particularly long insurance records of at least 35 years to retire early.

People who are not able to work due to severe health conditions can retire before the age of 60 through the disability pension program. Table A1 summarizes the different programs. Note that there are two different types of pensions due to health problems: the *disability pension* (*Erwerbsminderungsrente*) and the *invalidity pension* (*Rente wegen Schwerbehinderung*). The *disability pension* is comparable to disability benefits in the US. Eligibility for full benefits (partial benefits) requires that an individual is unable to work more than 3 hours (6 hours) a day for at least six months. It is the only pension that is available before the age of 60. In contrast, the *invalidity pension* is an old-age pension available from age 60 for people with a severe disability status under German law. The severe disability status requires a degree of disability of 50 percent or more and does not require work incapacity. The ERA of this pension has been increased since 2012.

Table A1: Pathways to pensions

Pension type	Early (ERA)	Normal (NRA)	Contribution Period	Notes
Regular	-	65 ⇒ 67	5	Retirement age has been increased to 67 since 2012; fully phased-in with cohort 1964
Women	60	65	15 (10 after age 40)	Abolished for cohorts born after 1951
Invalidity	60 ⇒ 62	63 ⇒ 65	35	Starting with cohort 1952 ERA and NRA increase by two years; fully phased-in with cohort 1964
Long-term insured	63 ⇒ 65	65⇒67	35	ERA increases to 65, NRA increases to 67; fully phased-in with cohort 1964
	-	63 ⇒ 65	45	Special scheme for people with particularly long insurance records
Unemployed/old-age part-time	63	65	15 (8 in last 10 years)	Abolished for cohorts born after 1951
Disability pension	no threshold	63 ⇒ 65	5 (3 in last 5 years)	Maximum deductions amount to 10.8 percent; since 2012 the NRA increases to 65; fully phased in with cohort 1964

B Sample characteristics

Table B1: Comparison of women who retire early (< 63) and late (≥ 63)

	Retire early (< 63)		Retire late (≥ 63)			
	Mean	**SD**	**Mean**	**SD**	**Diff**	**t-value**
Average annual pension points	0.63	0.26	0.67	0.29	0.04	**-2.98**
Total sum of pension points	31.59	11.89	35.50	14.71	3.91	**-6.00**
Low income	0.31	0.46	0.27	0.45	-0.04	1.77
High income	0.35	0.48	0.42	0.49	0.07	**-2.75**
Poor health (sick spell age 50-55)	0.25	0.43	0.20	0.40	-0.05	**2.16**
Has at least one child	0.86	0.35	0.88	0.32	0.02	-1.25
Number of children	1.69	1.07	1.74	1.12	0.05	-0.95
Sum contribution months after 40	209.76	36.16	215.37	37.20	5.61	**-3.07**
Eligible for early retirement with 63	0.93	0.25	0.91	0.28	-0.02	1.41
Contribution period in years	36.75	6.52	39.04	7.73	2.29	**-6.53**
Employed at 60^{th} birthday	0.43	0.50	0.74	0.44	0.31	**-13.08**
Unemployed at 60^{th} birthday	0.12	0.33	0.06	0.24	-0.06	**4.04**
Disability pension at 60^{th} birthday	0.10	0.30	0.07	0.26	-0.02	1.70
N	645		1050		1695	

Notes: Including all women born in 1951 who fulfill the eligibility criteria for the early pension for women. Analytic weights assumed. High and low income corresponds to the highest and lowest third of the average earnings points distribution. *Source:* VSKT 2016, own calculations.

Table B2: Cohort characteristics

Sample	**1949**		**1950**		**1951**		**1952**		**1953**		**1954**	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**
Average annual pension points	0.67	(0.28)	0.65	(0.28)	0.65	(0.28)	0.67	(0.29)	0.67	(0.29)	0.69	(0.30)
Total sum of pension points	34.03	(13.88)	33.50	(13.82)	33.99	(13.81)	35.29	(14.32)	34.79	(13.26)	35.37	(13.68)
Poor health (sick spell 50-55)	0.21	(0.41)	0.22	(0.42)	0.22	(0.41)	0.20	(0.40)	0.21	(0.41)	0.21	(0.41)
Has at least one child	0.86	(0.35)	0.87	(0.34)	0.87	(0.33)	0.85	(0.36)	0.84	(0.37)	0.82	(0.38)
Number of children	1.64	(1.06)	1.67	(1.11)	1.72	(1.10)	1.66	(1.14)	1.64	(1.10)	1.63	(1.12)
Sum contribution months 40+	214.16	(35.63)	213.22	(36.06)	213.20	(36.89)	214.48	(35.46)	216.15	(35.07)	214.85	(35.06)
Years worked at age 60	31.25	(8.47)	30.85	(8.86)	30.94	(8.51)	31.23	(8.62)	31.11	(8.44)	31.17	(8.41)
Eligible for retirement with 63	0.91	(0.28)	0.90	(0.30)	0.92	(0.27)	0.93	(0.26)	0.92	(0.27)	0.91	(0.28)
Contribution period in years	38.02	(7.55)	38.12	(7.85)	38.15	(7.37)	39.19	(7.52)	38.97	(7.48)	38.30	(7.28)
Employed at 60^{th} birthday	0.62	(0.49)	0.64	(0.48)	0.62	(0.48)	0.66	(0.48)	0.70	(0.46)	0.68	(0.47)
Unemployed at 60^{th} birthday	0.18	(0.38)	0.12	(0.32)	0.09	(0.28)	0.09	(0.29)	0.07	(0.26)	0.08	(0.27)
Disability at 60^{th} birthday	0.06	(0.23)	0.06	(0.24)	0.08	(0.27)	0.08	(0.27)	0.09	(0.28)	0.10	(0.30)
N	1403		1528		1695		1782		1855		1979	

All women	**1949**		**1950**		**1951**		**1952**		**1953**		**1954**	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**
Average annual pension points	0.53	(0.32)	0.53	(0.32)	0.54	(0.32)	0.55	(0.32)	0.55	(0.32)	0.57	(0.34)
Total sum of pension points	22.66	(16.78)	23.08	(16.65)	23.57	(16.82)	25.12	(17.45)	24.92	(16.73)	25.26	(17.18)
Poor health (sick spell 50-55)	0.12	(0.33)	0.13	(0.34)	0.13	(0.33)	0.12	(0.33)	0.13	(0.33)	0.13	(0.34)
Has at least one child	0.80	(0.40)	0.80	(0.40)	0.81	(0.40)	0.78	(0.41)	0.77	(0.42)	0.75	(0.43)
Number of children	1.63	(1.20)	1.65	(1.28)	1.66	(1.23)	1.60	(1.23)	1.59	(1.24)	1.54	(1.21)
Sum contribution months 40+	124.38	(101.56)	129.02	(100.41)	130.78	(99.68)	136.20	(98.88)	137.30	(99.40)	137.38	(98.83)
Years worked at age 60	20.81	(13.73)	21.17	(13.70)	21.52	(13.53)	22.43	(13.50)	22.37	(13.29)	22.68	(13.24)
Eligible for retirement with 63	0.53	(0.50)	0.54	(0.50)	0.56	(0.50)	0.58	(0.49)	0.59	(0.49)	0.59	(0.49)
Contribution period in years	25.94	(15.33)	26.54	(15.45)	26.93	(15.17)	28.18	(15.52)	28.11	(15.31)	27.76	(15.09)
Employed at 60^{th} birthday	0.34	(0.47)	0.36	(0.48)	0.36	(0.48)	0.39	(0.49)	0.42	(0.49)	0.41	(0.49)
Unemployed at 60^{th} birthday	0.13	(0.33)	0.09	(0.29)	0.07	(0.26)	0.08	(0.26)	0.06	(0.24)	0.07	(0.25)
Disability at 60^{th} birthday	0.05	(0.22)	0.06	(0.23)	0.07	(0.26)	0.08	(0.28)	0.09	(0.29)	0.09	(0.29)
N	3156		3231		3466		3557		3767		3943	

Notes: Exclusing women who claim miners' or invalidity pensions. Characteristics are measured at the 60^{th} birthday. Analytic weights assumed.
Source: VSKT 2016, own calculations.

C Results for 58-59 and 63 year-old women

Table C1: Linear regression results, age 58-59

	Employment	Unemployment	Disability	Residual
D_i	0.020	0.001	-0.004	-0.020
	(0.0351)	(0.0144)	(0.0196)	(0.0180)
$(1 - D_i) * mob_i$	0.002	0.000	0.000	-0.000
	(0.0037)	(0.0012)	(0.0016)	(0.0021)
$D_i * mob_i$	-0.000	-0.003**	0.000	0.001
	(0.0032)	(0.0013)	(0.0018)	(0.0017)
High income	0.182***	-0.072***	-0.041***	-0.038***
	(0.0170)	(0.0105)	(0.0095)	(0.0113)
Low income	-0.145***	0.062***	-0.000	0.031**
	(0.0180)	(0.0138)	(0.0148)	(0.0122)
Children	0.045**	-0.030**	-0.021	-0.018
	(0.0164)	(0.0113)	(0.0188)	(0.0150)
West	0.043**	-0.087***	0.020*	0.023**
	(0.0178)	(0.0101)	(0.0102)	(0.0109)
Constant	0.541***	0.211***	0.102***	0.126***
	(0.0375)	(0.0208)	(0.0300)	(0.0232)
N	3477	3477	3477	3477
R^2	0.078	0.045	0.006	0.010
Pre-treatment mean	0.634	0.105	0.074	0.126

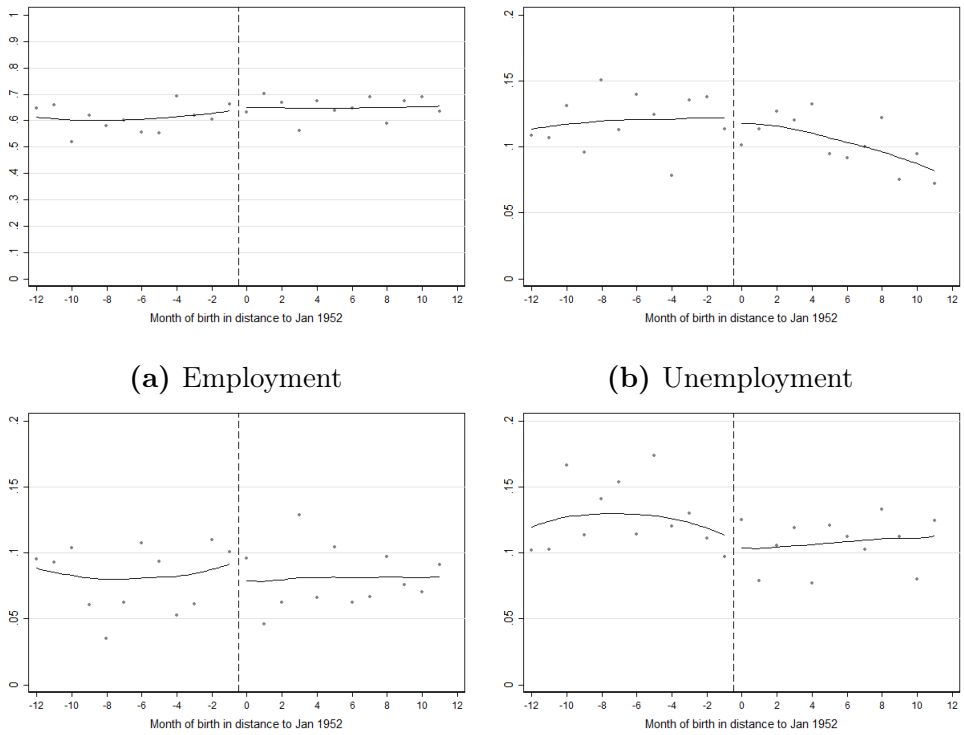
Notes: *** p<0.01, ** p<0.05, * p<0.1 . Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Table C2: Local linear regression results, age 58-59

Bandwidth	Employment	Unemployment	Disability	Residual
12 months	-0.000	-0.003	-0.018	-0.002
	(0.0321)	(0.0138)	(0.0201)	(0.0153)
N (effective)	36,792	36,792	36,792	36,792
6 months	0.006	-0.021	-0.042*	0.026
	(0.0426)	(0.0185)	(0.0238)	(0.0171)
N (effective)	16,968	16,968	16,968	16,968
N (person-months)	245,808	245,808	245,808	245,808

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Local linear regressions are based on triangular kernel functions with a bandwidth of 12 and 6 months. Note that we include cohorts 1949-1954 in this analysis (10,242 individuals).
Source: VSKT 2016, own calculations.

Figure C1: Local linear regression plots, age 58-59



(a) Employment **(b)** Unemployment

(c) Disability pension **(d)** Residual

Notes: Scatter plots display mean outcome values using monthly bins. Local linear regression plots are based on triangular kernel functions with a bandwidth of 12 months.
Source: VSKT 2016, own calculations.

Table C3: Subgroup analysis - linear regression results, age 58-59

	Employment	Unemployment	Disability	Residual	N
Baseline	0.020	0.001	-0.004	-0.020	3477
	(0.0351)	(0.0144)	(0.0196)	(0.0180)	
West Germany	0.007	-0.007	0.007	-0.016	2485
	(0.0449)	(0.0151)	(0.0250)	(0.0203)	
East Germany	0.050	0.031	-0.031	-0.035	992
	(0.0478)	(0.0310)	(0.0360)	(0.0249)	
Low income	0.067	-0.010	0.012	-0.053*	1777
	(0.0404)	(0.0221)	(0.0358)	(0.0276)	
High income	-0.027	0.013	-0.019	0.014	1700
	(0.0456)	(0.0116)	(0.0374)	(0.0279)	
Poor health	0.037	-0.028	0.037	-0.068*	796
	(0.0670)	(0.0339)	(0.0629)	(0.0331)	
Children	0.037	-0.002	0.012	-0.037*	3011
	(0.0359)	(0.0156)	(0.0206)	(0.0210)	
No children	-0.060	0.016	-0.111	0.078**	466
	(0.0552)	(0.0286)	(0.0688)	(0.0371)	

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable (month of birth) on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Table C4: Linear regression results, age 63

	Employment	Unemployment	Disability	Residual	Pension
D_i	0.041	0.026*	0.002	0.022*	-0.095***
	(0.0306)	(0.0127)	(0.0238)	(0.0121)	(0.0296)
$(1 - D_i) * mob_i$	0.002	-0.001	0.002	0.001	-0.002
	(0.0036)	(0.0013)	(0.0019)	(0.0013)	(0.0032)
$D_i * mob_i$	-0.004	-0.002*	-0.000	0.000	0.005*
	(0.0038)	(0.0011)	(0.0023)	(0.0014)	(0.0026)
High income	0.090***	-0.017**	-0.046***	-0.034***	0.017
	(0.0231)	(0.0060)	(0.0126)	(0.0076)	(0.0198)
Low income	-0.042**	0.035***	0.022	0.009	-0.051**
	(0.0189)	(0.0086)	(0.0161)	(0.0107)	(0.0222))
Children	0.022	-0.006	-0.028	-0.038***	0.030
	(0.0196)	(0.0073)	(0.0174)	(0.0105)	(0.0203)
West	0.134***	0.005	0.025**	0.041***	-0.213***
	(0.0185)	(0.0056)	(0.0104)	(0.0076)	(0.0181)
Constant	0.137***	0.033**	0.141***	0.059***	0.653***
	(0.0363)	(0.0119)	(0.0304)	(0.0154)	(0.0385)
N	3477	3477	3477	3477	3477
R^2	0.034	0.012	0.010	0.020	0.049
Pre-treatment mean	0.263	0.041	0.084	0.037	0.545

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

D Robustness and validity of the empirical strategy

We identified several potential threats to our identification strategy. These are discontinuities in covariates, and the turn of the year effect, and bias due to sample selection. While Section 5 describes our empirical strategy and Section 7 discusses limitations, we address all possible identification threats in greater detail in this online appendix, and check whether our results are robust to several alternative specifications of the empirical model.

D.1 Discontinuities in covariates

A main concern for every analysis based on cohort discontinuities is that something other than the policy change of interest is affecting the relevant cohorts. This may lead to

discontinuities in covariates that may in turn affect the outcome variables of interest. One way to account for this concern is to check for discontinuities in covariates that should not be affected by the reform. The analysis of outcomes for 58 and 59 year-old women can be interpreted as a test for covariate-discontinuities. However, although these age groups are not directly affected by the reform, they may have adapted their employment behavior in anticipation of the ERA increase. Consequently, it is difficult to find covariates that are truly unaffected by the reform. Nevertheless, we estimate a simple linear RDD model for several covariates, measured at age 60, and do not find significant discontinuities between cohorts for covariates that should not be affected by the reform.

Table D1: Test for discontinuities in covariates

	Sample (eligible women)			All women		
	RDD-Coef	RDD-SE	Mean	RDD-Coef	RDD-SE	Mean
Eligible early pension for women				-0.022	(0.019)	0.57
Average monthly pension points	-0.005	(0.018)	0.66	-0.028**	(0.010)	0.54
Sum of pension points	0.045	(0.762)	34.7	-0.068	(0.450)	24.4
Poor health status	0.014	(0.019)	0.21	0.007	(0.009)	0.13
Has children	-0.001	(0.026)	0.86	-0.004	(0.021)	0.79
Total contribution period in years	0.690*	(0.358)	38.7	0.126	(0.433)	27.6
Contribution months after age 40	-0.645	(2.226)	214.6	-1.539	(3.199)	134.0
Eligible for retirement with 63	-0.016	(0.017)	0.92	0.001	(0.022)	0.57
Total years worked up to age 60	-0.058	(0.451)	31.1	-0.523	(0.419)	22.0

Notes: Covariates are measured at age 60. All regressions include calendar month fixed effects, income group dummies, and linear trends of the running variable (month of birth) on both sides of the policy cutoff. Standard errors (in parentheses) are clustered by month of birth. Analytic weigths assumed for means.
Source: VSKT 2016, own calculations.

D.2 Difference-in-discontinuities approach

We refer to differences between women born at the end of a year in comparison to women who were born at the beginning of a year as *turn of the year effect*. In particular, there may be discontinuities in labor market outcomes for women born between December and January that are unrelated to the ERA increase. In order to address this concern, we performed a difference-in-discontinuities analysis using the discontinuity between cohorts born in 1950 and 1951 as counterfactual with a hypothetical policy-cutoff in the running

variable at the turn of the year. The difference-in-discontinuities estimation is implemented by interacting the regression equation with an indicator function T_i, equal to one for the real sample around the actual reform cutoff-date, and zero otherwise. The results for 60-62 and 58-59 year-old women are displayed in Table D2 and Table D3. Reassuringly, the results are similar to those of the baseline specification presented in Section VI.B. The coefficients of the interaction term $T_i * D_i$ do not differ significantly from the corresponding coefficients in Tables 1 and C1. We conclude that discontinuities between cohorts can be attributed to the ERA increase and therefore select a standard RD framework as our baseline specification.

Table D2: Difference-in-discontinuities results, age 60-62

	Employment	Unemployment	Disability	Residual
$T_i * D_i$	0.181***	0.040**	0.005	0.070***
	(0.0327)	(0.0159)	(0.0257)	(0.0122)
$T_i * (1 - D_i) * mob_i$	-0.002	0.001	-0.004***	0.002
	(0.0020)	(0.0009)	(0.0013)	(0.0010)
$T_i * D_i * mob_i$	-0.004	0.000	-0.001	0.000
	(0.0057)	(0.0023)	(0.0034)	(0.0018)
D_i	-0.036	0.006	0.003	-0.014
	(0.0271)	(0.0106)	(0.0142)	(0.0111)
$(1 - D_i) * mob_i$	0.004	-0.001	0.003**	-0.000
	(0.0025)	(0.0012)	(0.0015)	(0.0012)
$D_i * mob_i$	0.003	-0.001	0.001	0.001
	(0.0039)	(0.0014)	(0.0017)	(0.0009)
High income	0.151***	-0.046***	-0.037***	-0.020***
	(0.0119)	(0.0066)	(0.0073)	(0.0053)
Low income	-0.115***	0.037***	0.008	0.022**
	(0.0119)	(0.0071)	(0.0088)	(0.0082)
Children	0.050***	-0.015*	-0.032**	-0.022**
	(0.0154)	(0.0088)	(0.0128)	(0.0093)
West	0.083***	-0.046***	0.024***	0.032***
	(0.0094)	(0.0082)	(0.0079)	(0.0073)
Constant	0.331***	0.117***	0.119***	0.059***
	(0.0245)	(0.0149)	(0.0166)	(0.0128)
N	5005	5005	5005	5005
R^2	0.070	0.025	0.008	0.020

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable (month of birth) on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Table D3: Differences-in-discontinuities results, age 58-59

	Employment	Unemployment	Disability	Residual
$T_i * D_i$	0.054	0.003	-0.002	-0.027
	(0.0397)	(0.0104)	(0.0211)	(0.0208)
$T_i * (1 - D_i) * mob_i$	0.001	0.002**	-0.003**	0.001
	(0.0020)	(0.0009)	(0.0011)	(0.0012)
$T_i * D_i * mob_i$	-0.002	-0.003	-0.000	0.001
	(0.0060)	(0.0020)	(0.0027)	(0.0031)
D_i	-0.033	-0.009	0.008	0.005
	(0.0309)	(0.0120)	(0.0126)	(0.0178)
$(1 - D_i) * mob_i$	0.002	-0.001	0.002*	-0.001
	(0.0021)	(0.0014)	(0.0011)	(0.0011)
$D_i * mob_i$	0.002	0.000	0.000	-0.000
	(0.0037)	(0.0012)	(0.0016)	(0.0021)
High income	0.189***	-0.076***	-0.030***	-0.046***
	(0.0124)	(0.0086)	(0.0071)	(0.0084)
Low income	-0.138***	0.060***	0.002	0.032***
	(0.0120)	(0.0098)	(0.0095)	(0.0094)
Children	0.041***	-0.032***	-0.029**	-0.014
	(0.0124)	(0.0077)	(0.0134)	(0.0088)
West	0.052***	-0.094***	0.016*	0.028***
	(0.0103)	(0.0080)	(0.0080)	(0.0071)
Constant	0.531***	0.228***	0.096***	0.125***
	(0.0297)	(0.0157)	(0.0172)	(0.0147)
N	5005	5005	5005	5005
R^2	0.078	0.046	0.006	0.012

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable (month of birth) on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

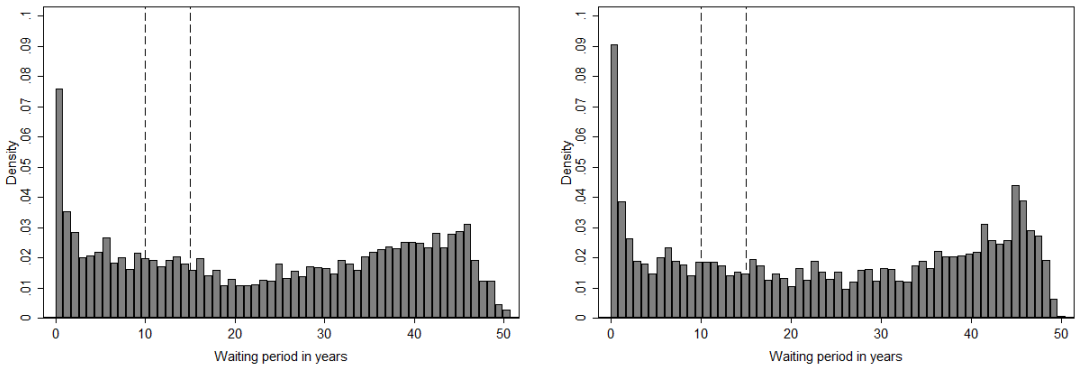
D.3 Sample selection

A major concern arises due to the selection of the sample by the eligibility criteria of the pension for women. Specifically, women born in 1951 may select into the sample by prolonging their pension contribution period in order to be eligible for early retirement. In contrast, women born in 1952 do not have the same incentives to fulfill the eligibility criteria. The eligibility criteria for claiming a pension for women are: (i) at least 15 years of pension insurance contributions; and (ii) at least 10 years of pension insurance contributions after the age of 40.

Consequently, we expect bunching in the density distribution after 15 contribution years for the 1951 cohort, but not for the 1952 cohort. However, when the reform was intro-

duced in 1999, women born in 1951 and 1952 were already 47-48 years old. At that age, most women have already collected at least 5 contribution years. Therefore, cohorts have different incentives primarily with respect to the second eligibility criterion of a contribution period of at least 10 years after age 40. We show in Figure D1 and Figure D2 that there is no bunching: neither after 15 years, nor after 121 contribution months for the 1951 cohort, when compared to the 1952 cohort. Seibold (2017) also looks at bunching in pension contribution years and finds only little bunching at the relevant cutoffs for women. Furthermore, we test for a discontinuity (1) in the fraction of women fulfilling the eligibility criteria for early retirement, (2) the number of contribution months after age 40, (3) eligibility for the old-age pension for the long term insured, and (4) the sum of years worked up to age 60 (see Table D1). We find that there is no significant discontinuity at the cohort-cutoff. The corresponding local linear and local polynomial regression plots for the fraction of women fulfilling the eligibility criteria are displayed in Figure D3.

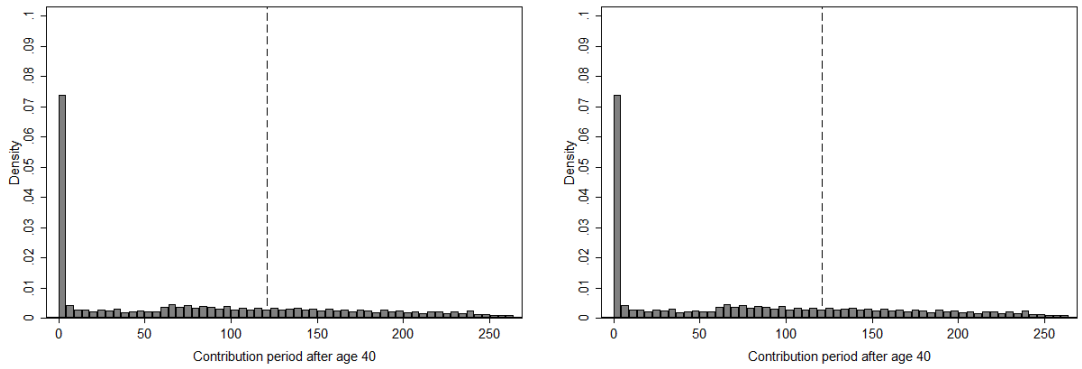
Figure D1: Distribution of contribution years by cohort



(a) 1951 Cohort **(b)** 1952 Cohort

Notes: Eligibility requires 15 years of contributions.
Source: VSKT 2016, own calculations.

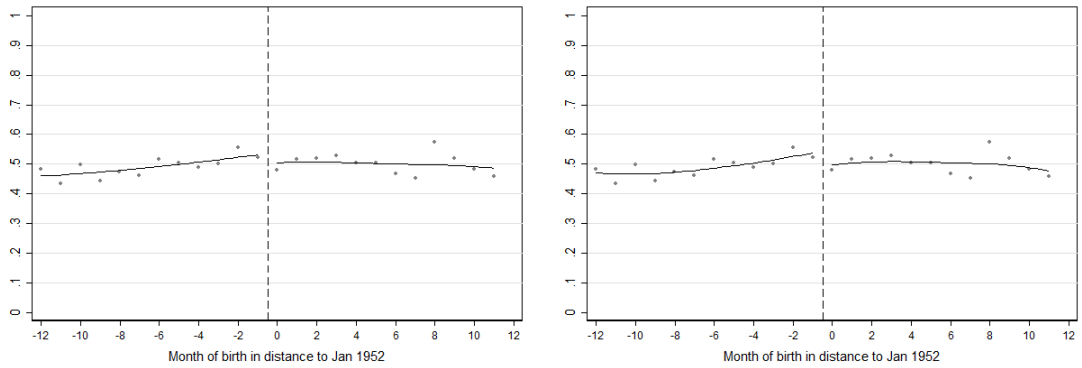
Figure D2: Distribution of contribution months after age 40 by cohort



(a) 1951 Cohort **(b)** 1952 Cohort

Notes: Eligibility requires 121 contribution months after age 40.
Source: VSKT 2016, own calculations.

Figure D3: Testing for discontinuity in fulfillment of eligibility criteria



(a) Local linear regression **(b)** Local quadratic regression

Notes: Scatter plots display mean outcome values using monthly bins. Local linear regression plots are based on triangular kernel functions with a bandwidth of 12 months.
Source: VSKT 2016, own calculations.

We also performed a formal density test to evaluate whether there is any bunching of the treatment assignment variable (date of birth) around the cutoff-date. A standard RD manipulation test using third-order local polynomial density estimation shows that there is no significant evidence for bunching. We obtain similar results using triangular kernels, both with a bandwidth of ± 12 months and an automatically chosen optimal bandwidth of -18 and $+14$ months. We conclude that bias due to sample selection is negligible.

D.4 RDD results for all women

Table D4: Linear regression for all women, age 60-62

	Employment	Unemployment	Disability	Residual	Pension
D_i	0.079***	0.032***	0.020	0.020	-0.160***
	(0.0170)	(0.0068)	(0.0177)	(0.0196)	(0.0118)
$(1 - D_i) * mob_i$	0.001	-0.000	0.001	-0.002	-0.000
	(0.0018)	(0.0008)	(0.0009)	(0.0018)	(0.0017)
$D_i * mob_i$	-0.002	-0.001*	-0.002	0.003*	0.000
	(0.0017)	(0.0006)	(0.0020)	(0.0019)	(0.0002)
High income	0.178***	-0.024***	-0.014	-0.101***	0.008
	(0.0133)	(0.0056)	(0.0097)	(0.0115)	(0.0079)
Low income	-0.155***	0.054***	-0.037***	0.157***	-0.046***
	(0.0132)	(0.0095)	(0.0098)	(0.0172)	(0.0115)
Children	0.094***	0.027***	0.020**	-0.248***	0.029***
	(0.0087)	(0.0072)	(0.0092)	(0.0135)	(0.0101)
West	-0.126***	-0.051***	-0.028***	0.246***	-0.089***
	(0.0175)	(0.0100)	(0.0091)	(0.0136)	(0.0175)
Constant	0.265***	0.073***	0.116***	0.332***	0.229***
	(0.0256)	(0.0125)	(0.0176)	(0.0245)	(0.0186)
N	7023	7023	7023	7023	7023
R^2	0.130	0.024	0.007	0.159	0.110
Pre-treatment mean	0.258	0.057	0.073	0.345	0.193

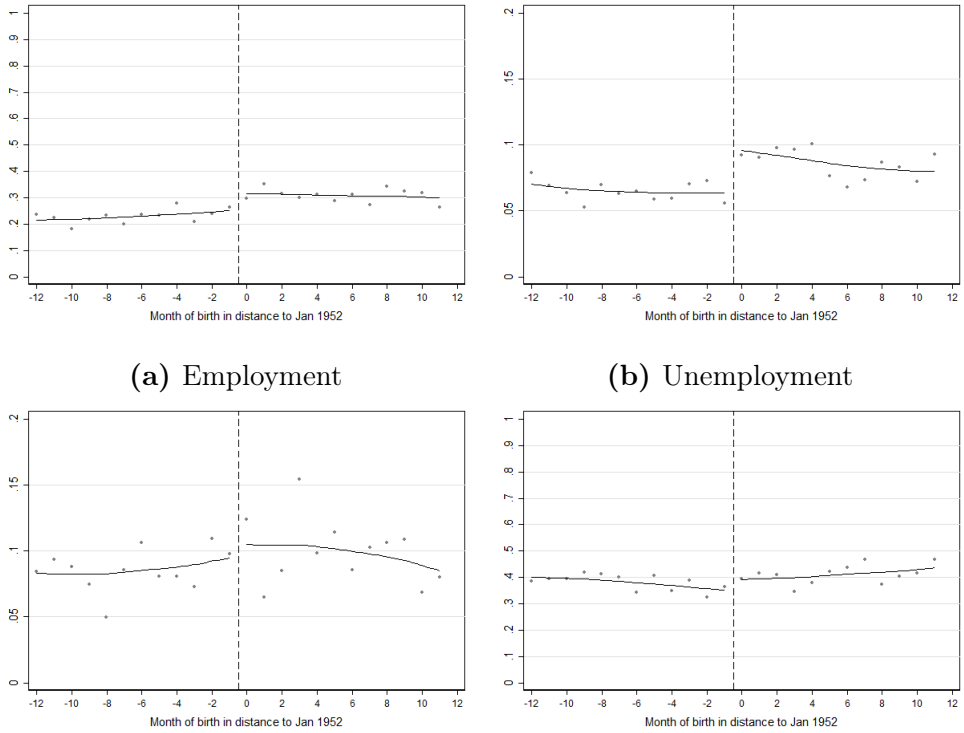
Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable (month of birth) on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Table D5: Local linear regression results for all women, age 60-62

Bandwidth	Employment	Unemployment	Disability	Residual	Pension
12 months	0.058***	0.032***	0.007	0.049**	-0.162***
	(0.0196)	(0.0065)	(0.0190)	(0.0198)	(0.0143)
N (effective)	112,716	112,716	112,716	112,716	112,716
6 months	0.062**	0.031***	-0.009	0.061**	-0.158***
	(0.0263)	(0.0090)	(0.0238)	(0.0250)	(0.0208)
N (effective)	49,572	49,572	49,572	49,572	49,572
N (person-months)	739,252	739,252	739,252	739,252	739,252

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Local linear regressions are based on triangular kernel functions with a bandwidth of 12 and 6 months. Note that we include cohorts 1949-1954 in this analysis (20,120 individuals).
Source: VSKT 2016, own calculations.

Figure D4: Local linear regression plots, all women, age 60-62



(a) Employment **(b)** Unemployment

(c) Disability pension **(d)** Residual

Notes: Scatter plots display mean outcome values using monthly bins. Local linear regression plots are based on triangular kernel functions with a bandwidth of 12 months.
Source: VSKT 2016, own calculations.

Table D6: Linear regression results for all women, age 58-59

	Employment	Unemployment	Disability	Residual
D_i	0.018	0.010	0.021	-0.043**
	(0.0183)	(0.0119)	(0.0141)	(0.0175)
$(1 - D_i) * mob_i$	0.001	0.000	0.000	-0.002
	(0.0024)	(0.0013)	(0.0008)	(0.0017)
$D_i * mob_i$	-0.001	-0.003***	-0.002	0.004**
	(0.0015)	(0.0006)	(0.0016)	(0.0013)
High income	0.211***	-0.040***	-0.008	-0.104***
	(0.0150)	(0.0070)	(0.0097)	(0.0141)
Low income	-0.194***	0.051***	-0.029***	0.162***
	(0.0146)	(0.0098)	(0.0102)	(0.0169)
Children	0.104***	0.031***	0.013	-0.237***
	(0.0105)	(0.0067)	(0.0093)	(0.0108)
West	-0.191***	-0.076***	-0.025**	0.241***
	(0.0165)	(0.0102)	(0.0091)	(0.0127)
Constant	0.402***	0.128***	0.093***	0.378***
	(0.0252)	(0.0170)	(0.0169)	(0.0229)
N	7023	7023	7023	7023
R^2	0.168	0.031	0.006	0.153
Pre-treatment mean	0.365	0.086	0.065	0.400

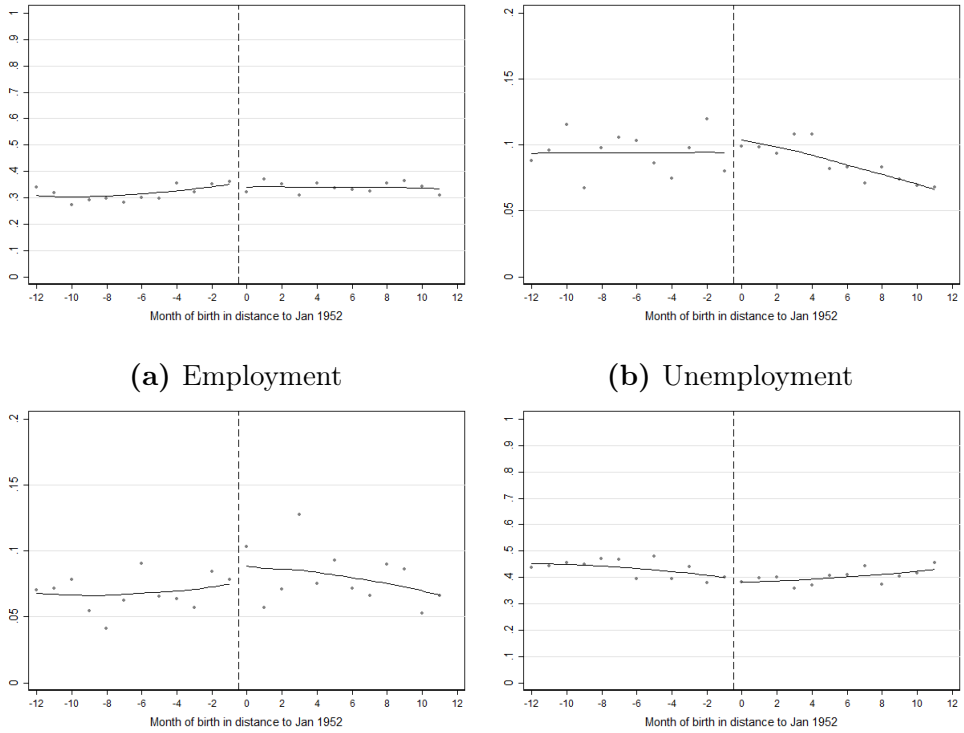
Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All linear regressions include calendar month fixed effects, income group dummies, and linear trends in the running variable (month of birth) on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Table D7: Local linear regression results for all women, age 58-59

Bandwidth	Employment	Unemployment	Disability	Residual
12 months	-0.025	0.010	0.011	-0.008
	(0.0159)	(0.0132)	(0.0148)	(0.0155)
N (effective)	75,144	75,144	75,144	75,144
6 months	-0.031	0.002	-0.001	0.012
	(0.0193)	(0.0207)	(0.0178)	(0.0202)
N (effective)	33,048	33,048	33,048	33,048
N (person-months)	506,880	506,880	506,880	506,880

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Local linear regressions are based on triangular kernel functions with a bandwidth of 12 and 6 months. Note that we include cohorts 1949-1954 in this analysis (20,120 individuals).
Source: VSKT 2016, own calculations.

Figure D5: Local linear regression plots, all women, age 58-59

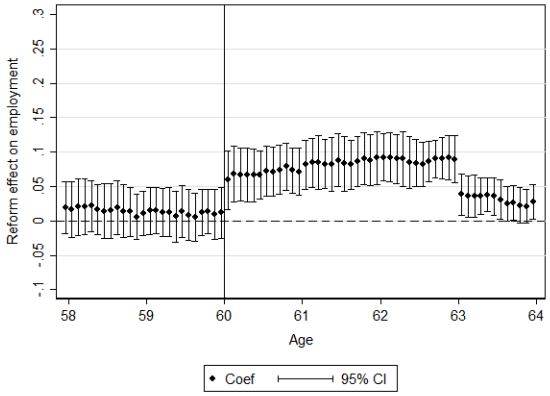


(a) Employment **(b)** Unemployment

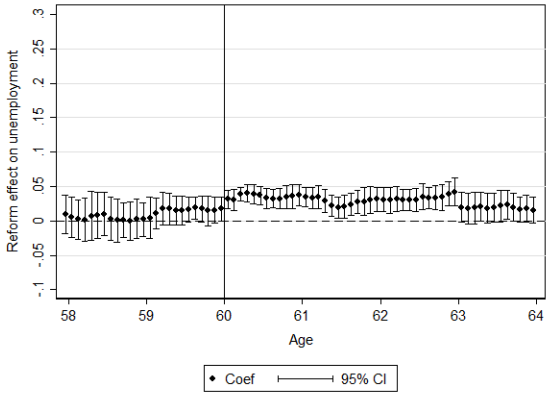
(c) Disability pension **(d)** Residual

Notes: Scatter plots display mean outcome values using monthly bins. Local linear regression plots are based on triangular kernel functions with a bandwidth of 12 months.
Source: VSKT 2016, own calculations.

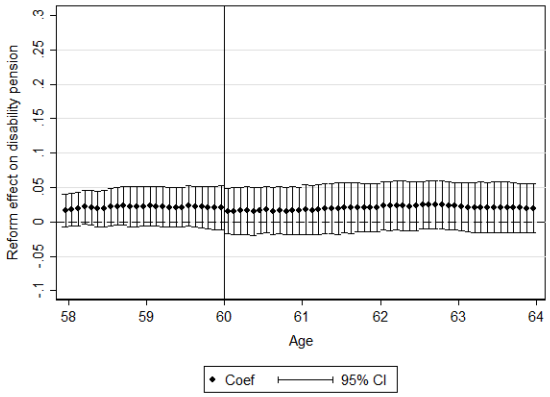
Figure D6: Coefficients of ERA increase by age in months, all women



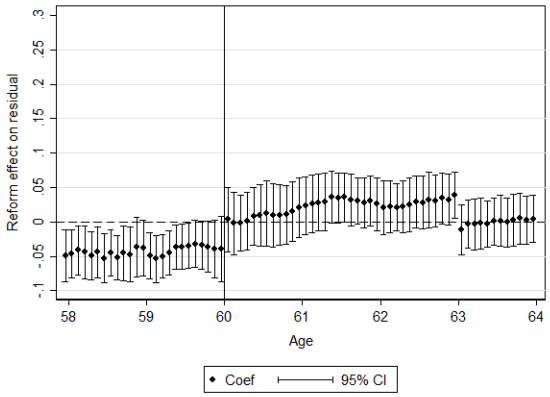
(a) Employment



(b) Unemployment



(c) Disability pension



(d) Residual

Notes: The coefficients of the treatment dummy interacted with the age profile are estimated using a linear regression model including age fixed effects, linear trends in month of birth and the interaction with age in months, calendar month fixed effects, income groups, and a dummy for West Germany. Confidence intervals of clustered standard errors are displayed using error bars.
Source: VSKT 2016, own calculations

D.5 RDD results without trends and covariates

Table D8: Regression without trends, age 60-62

	Employment	Unemployment	Disability	Residual
D_i	0.143***	0.042***	0.004	0.071***
	(0.0173)	(0.0071)	(0.0112)	(0.0079)
Low income	-0.118***	0.045***	0.009	0.014
	(0.0195)	(0.0125)	(0.0152)	(0.0125)
High income	0.157***	-0.053***	-0.047***	-0.027***
	(0.0161)	(0.0089)	(0.0114)	(0.0088)
Children	0.063***	-0.023	-0.027	-0.035**
	(0.0202)	(0.0144)	(0.0173)	(0.0143)
West	0.072***	-0.068***	0.024**	0.028**
	(0.0163)	(0.0123)	(0.0099)	(0.0105)
Constant	0.315***	0.140***	0.127***	0.070***
	(0.0332)	(0.0206)	(0.0233)	(0.0167)
N	3477	3477	3477	3477
R^2	0.075	0.035	0.008	0.022

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered by month of birth, in parentheses.
Source: VSKT 2016, own calculations.

Table D9: Regression without covariates, age 60-62

	Employment	Unemployment	Disability	Residual
D_i	0.140***	0.049***	-0.007	0.062***
	(0.0369)	(0.0129)	(0.0245)	(0.0128)
$(1 - D_i) * mob_i$	0.003	-0.001	0.001	0.000
	(0.0042)	(0.0011)	(0.0018)	(0.0009)
$D_i * mob_i$	-0.002	-0.001	0.001	0.001
	(0.0029)	(0.0013)	(0.0023)	(0.0018)
Constant	0.453***	0.063***	0.115***	0.056***
	(0.0313)	(0.0083)	(0.0154)	(0.0088)
N	3477	3477	3477	3477
R^2	0.022	0.005	0.000	0.016

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. All regressions include linear trends in the running variable (month of birth) on both sides of the policy cutoff. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

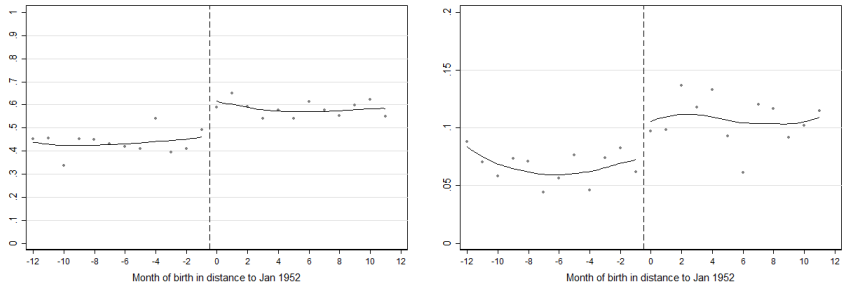
D.6 RDD results with quadratic trends

Table D10: Regression with quadratic trends, age 60-62

	Employment	Unemployment	Disability	Residual	Pension
D_i	0.140***	0.024	-0.043	0.066***	-0.239***
	(0.0421)	(0.0173)	(0.0323)	(0.0164)	(0.0205)
$(1-D_i)*mob_i$	0.008	0.010**	0.013	0.001	-0.020**
	(0.0110)	(0.0043)	(0.0080)	(0.0052)	(0.0074)
$(1-D_i)*mob_i^2$	0.000	0.001**	0.001	0.000	-0.001**
	(0.0008)	(0.0003)	(0.0006)	(0.0004)	(0.0005)
D_i*mob_i	-0.012	0.000	0.006	-0.002	0.002**
	(0.0088)	(0.0060)	(0.0090)	(0.0065)	(0.0011)
$D_i*mob_i^2$	0.001	-0.000	-0.000	0.000	-0.000
	(0.0009)	(0.0005)	(0.0007)	(0.0007)	(0.0001)
High income	0.157***	-0.052***	-0.047***	-0.028***	-0.004
	(0.0160)	(0.0089)	(0.0114)	(0.0087)	(0.0088)
Low income	-0.118***	0.046***	0.009	0.014	0.001
	(0.0195)	(0.0124)	(0.0151)	(0.0125)	(0.0148)
Children	0.064***	-0.022	-0.026	-0.035**	0.001
	(0.0200)	(0.0144)	(0.0169)	(0.0142)	(0.0093)
West	0.073***	-0.069***	0.023**	0.028**	-0.054***
	(0.0164)	(0.0124)	(0.0100)	(0.0106)	(0.0132)
Constant	0.345***	0.158***	0.160***	0.073***	0.283***
	(0.0483)	(0.0250)	(0.0331)	(0.0237)	(0.0248)
N	3477	3477	3477	3477	3477
R^2	0.075	0.036	0.008	0.022	0.170

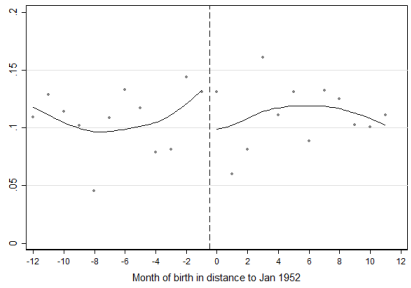
Notes: *** p<0.01, ** p<0.05, * p<0.1. All regressions include calendar month fixed effects. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Figure D7: Local polynomial regression plots, age 60-62

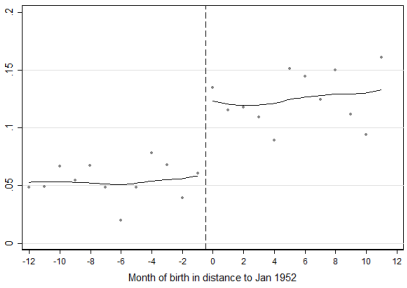


(a) Employment

(b) Unemployment



(c) Disability pension



(d) Residual

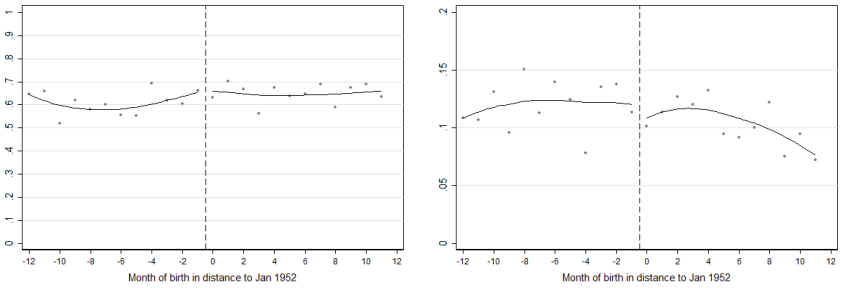
Notes: Local polynomial regressions of 2nd degree, with triangular kernel and a bandwidth of 12 months.
Source: VSKT 2016, own calculations.

Table D11: Regression with quadratic trends, age 58-59

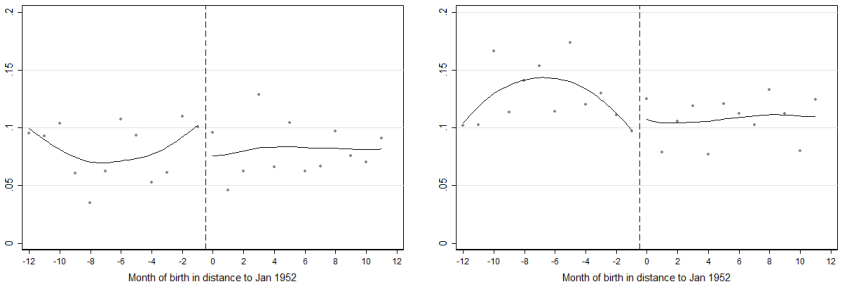
	Employment	Unemployment	Disability	Residual
D_i	-0.030	-0.012	-0.035	0.027
	(0.0324)	(0.0165)	(0.0229)	(0.0176)
$(1-D_i)*mob_i$	0.028***	0.000	0.013*	-0.019***
	(0.0078)	(0.0053)	(0.0067)	(0.0057)
$(1-D_i)*mob_i^2$	0.002***	-0.000	0.001*	-0.001***
	(0.0006)	(0.0004)	(0.0005)	(0.0005)
D_i*mob_i	-0.005	0.005	0.001	-0.001
	(0.0092)	(0.0042)	(0.0066)	(0.0061)
$D_i*mob_i^2$	0.000	-0.001*	-0.000	0.000
	(0.0009)	(0.0004)	(0.0006)	(0.0005)
High income	0.183***	-0.072***	-0.040***	-0.038***
	(0.0169)	(0.0106)	(0.0095)	(0.0113)
Low income	-0.144***	0.062***	0.000	0.030**
	(0.0179)	(0.0139)	(0.0147)	(0.0124)
Children	0.046**	-0.030**	-0.021	-0.019
	(0.0167)	(0.0114)	(0.0187)	(0.0150)
West	0.043**	-0.087***	0.019*	0.024**
	(0.0178)	(0.0101)	(0.0103)	(0.0109)
Constant	0.598***	0.211***	0.131***	0.083***
	(0.0358)	(0.0213)	(0.0318)	(0.0215)
N	3477	3477	3477	3477
R^2	0.079	0.045	0.007	0.011

Notes: *** p<0.01, ** p<0.05, * p<0.1. All regressions include calendar month fixed effects. Standard errors are clustered by month of birth.
Source: VSKT 2016, own calculations.

Figure D8: Local polynomial regression plots, age 58-59



(a) Employment **(b)** Unemployment



(c) Disability pension **(d)** Residual

Notes: Local polynomial regressions of 2nd degree, with triangular kernel and a bandwidth of 12 months.
Source: VSKT 2016, own calculations.