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Gradual Retirement, Financial Incentives, and Labour Supply of Older Workers: Evidence from a Stated Preference Analysis

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Aim and motivation

Policy context (I)

- Population ageing and declining fertility $\longrightarrow$ steady decrease in the ratio of contributing workers to inactive retirees who draw from these schemes.

- Most industrialized countries are implementing major pension reforms (decreases in the generosity of pension benefits and increases in the eligibility age for early and statutory retirement)

- In addition, in several countries gradual retirement schemes have been introduced

Policy context (II)

- Gradual retirement schemes can have major benefits both at the micro and the macro level

- Micro level:
  - Improve life time utility as they avoid an abrupt pension shock following an abrupt transition, and extend the choice set of older workers (Reday-Mulvey and Delsen 1996; Reday-Mulvey 2000).
  - Reduce the burden of work enabling workers to keep working beyond an age at which they would otherwise have fully retired (Kantarci and Van Soest 2008).

- Macro level
  - Gradual retirement may restrain early withdrawal

- But…
  - May also lead to a reduction in total labour supply when workers engage in early part-time retirement, while they otherwise would have chosen to continue to work on a full-time basis.

What is this paper about? (I)

- ## Research question:
  - To what extent does the introduction of gradual retirement opportunities actually stimulates workers to continue working, and to what extent it can be expected to increase total labour supply?

- ## This paper:
  - stated preference approach to study the impact of a gradual retirement scheme on the expected retirement age and total labour supply of Dutch public sector workers.
  - investigates whether the effects differ with the financial incentives provided by the pension system,
  - explores the heterogeneity in the impact of the introduction of gradual retirement opportunities on retirement preferences with different personal and job characteristics.

What is this paper about? (II)

- Main findings:
  - Replacement of full-time retirement schemes with a gradual retirement scheme stimulates workers to retire, on average, one year later.

  - Total labour supply significantly decreases by 3.4 months when workers have the gradual retirement option

  - The impact is heterogeneous across groups of workers. Workers with non-routine job tasks are inclined to retire later (and increase their overall labour supply) in gradual retirement schemes

  - The positive impact of financial incentives to postpone retirement on workers' retirement expectations does not differ between gradual and full retirement options.

  - A ranking analysis of workers' preference for the different scenarios shows that gradual retirement is not a preferred option among workers

Our contribution

1. Investigating the causal effect of the introduction of gradual retirement opportunities on total labour supply

2. This paper builds on and differs from two related studies of Van Soest et al. (2007) and Kantarci and Van Soest (2013):
   1. focus on net impact on total labour supply.
   2. the base scheme in our stated preference experiment is similar to the actual pension scheme of public sector workers in the Netherlands
   3. More detailed choices

3. Additional heterogeneity analyses

Data and approach (I)

- The public sector's pension fund provided us with 13,151 randomly selected email addresses of Dutch public sector employees born between 1946 and 1975.

- In the first week of April 2015, we sent an e-mail to these employees containing the link to a web-based survey (the *ROA Public Sector Survey 2015*)

- 3,611 individuals who completed the survey (age < 64 and did not answered a shortened version)

Stated preferences experiment(I)

- Our stated preferences experiment:

- Employees were assigned to six vignettes presenting pension scheme scenarios including
  - **different financial incentives** and
  - **containing a set of retirement ages and related replacement rates** (in percentage of their current net income)

- For each scenario, respondents were asked which retirement age and associated replacement rate they prefer

- After the experiment, respondents were asked to rank their choices on (part-time or full-time) retirement ages and replacement rates in the various scenarios
  - from the most preferred (coded 6) to the least preferred one (coded 1)

Stated preferences experiment (II)

- We designed in total ten different pension schemes scenarios with different retirement ages and replacement rate combinations.

- Each respondent had to respond to two baseline scenarios: full-time and gradual

- The other eight scenarios differ from one another in terms of the incentives for continued employment provided by the retirement scheme
  - 2 full-time scenario's with increase in accrual rate with 2.5% and 5%
  - 2 full-time scenario's with drop in pension wealth with 5% and 10%
  - 2 gradual scenario's with increase in accrual rate with 2.5% and 5%
  - 2 gradual scenario's with drop in pension wealth with 5% and 10%

- In the gradual scenarios, individuals work 50% of their time and are retired for the other 50%.

Stated preferences experiment (IV)

Retirement age[*]	1	2	3	4	5
	Baseline	Price of leisure incentive		Pension wealth incentive	
Regular retirement	accruals: 5%; replacement rate: 90% at 68	accruals 7.5%; replacement rate: 90% at 68	accruals 10%; replacement rate: 90% at 68	accruals 5%; replacement rate: 85% at 68	accruals 5%; replacement rate: 80% at 68
62	60	45	30	55	50
63	65	52.5	40	60	55
64	70	60	50	65	60
65	75	67.5	60	70	65
66	80	75	70	75	70
67	85	82.5	80	80	75
68	90	90	90	85	80
69	95	97.5	100	90	85
70	100	105	110	95	90

Stated preferences experiment (V)

Gradual retirement		Baseline accruals: 5%; replacement rate: 90% at 68	Price of leisure incentive accruals 7.5%; replacement rate: 90% at 68	accruals 10%; replacement rate: 90% at 68	Pension wealth incentive accruals 5%; replacement rate: 85% at 68	accruals 5%; replacement rate: 80% at 68
	62-63	62.5	48.75	35	57.2	52.5
	62-64	65	52.5	40	60	55
	63-64	67.5	56.25	45	62.5	57.5
	63-65	70	60	50	65	60
	62-67	72.5	63.75	55	67.5	62.5
	64-65	72.5	63.75	55	67.5	62.5
	63-67	75	67.5	60	70	65
	64-66	75	67.5	60	70	65
	66-67	77.5	71.25	65	72.5	67.5
	65-66	77.5	71.25	65	72.5	67.5
	62-70	80	75	70	75	70
	65-67	80	75	70	75	70
	63-70	82.5	78.75	75	77.5	72.5
	66-67	82.5	78.75	75	77.5	72.5
	65-69	85	82.5	80	80	75
	66-68	85	82.5	80	80	75
	66-69	87.5	86.25	85	82.5	77.5
	67-68	87.5	86.25	85	82.5	77.5
	66-70	90	90	90	85	80
	67-70	92.5	93.75	95	87.5	82.5
	68-70	95	97.5	100	90	85
	69-70	97.5	101.25	105	92.5	87.5

Empirical approach

- OLS models to regress the age of retirement on characteristics of the retirement scenarios (with clustered s.e.)

- Gradual retirement dummy: value 1 if the retirement scenario includes gradual retirement and 0 otherwise

- Price of leisure incentive: continuous variable taking value 0 for the actuarially-fair 5% accruals, 1 for 7.5% accruals, and 2 for 10% accruals

- Pension income incentive: continuous variable taking value 0 for 90% replacement rate at age 68, 1 for 85%, and the value 2 for 80%

- FT-equivalent retirement age is calculated to be 6 months for each additional year of gradual retirement

Results

"THAT'S MISTER THORNDYKE. HE'S RETIRING NEXT MONTH, SO THEY'RE PHASING HIM OUT."

Basic result from vignette (I)

Scenario	1	2	3	4	5
	Baseline	Price of leisure incentive		Pension wealth incentive	
Regular retirement	accruals: 5%; replacement rate: 90% at 68	accruals 7.5%; replacement rate: 90% at 68	accruals 10%; replacement rate: 90% at 68	accruals 5%; replacement rate: 85% at 68	accruals 5%; replacement rate: 80% at 68
Retirement age	64.97	65.84	66.05	65.40	65.99
	(1.80)	(1.56)	(1.36)	(1.72)	(1.77)
Full-time-equivalent age of retirement	64.97	65.84	66.05	65.40	65.99
	(1.80)	(1.56)	(1.36)	(1.72)	(1.77)
Scenario	6	7	8	9	10
	Baseline	Price of leisure incentive		Pension wealth incentive	
Gradual retirement	accruals: 5%; replacement rate: 90% at 68	accruals 7.5%; replacement rate: 90% at 68	accruals 10%; replacement rate: 90% at 68	accruals 5%; replacement rate: 85% at 68	accruals 5%; replacement rate: 80% at 68
Retirement age	65.95	66.65	67.18	66.34	66.88
	(1.83)	(1.76)	(1.73)	(1.75)	(1.92)
Full-time-equivalent age of retirement	64.77	65.36	65.79	65.10	65.59
	(1.47)	(1.38)	(1.27)	(1.44)	(1.56)

Basic result from vignette (II)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
		Retirement Age			Full-time-equivalent age of retirement	
Gradual retirement	0.977***	0.976***	0.964***	-0.287***	-0.288***	-0.224***
	(0.024)	(0.024)	(0.029)	(0.017)	(0.017)	(0.023)
Price of leisure incentive		0.601***	0.591***		0.545***	0.585***
		(0.017)	(0.017)		(0.013)	(0.016)
Gradual retirement* Price of leisure incentive			0.021			-0.079***
			(0.026)			(0.017)
Pension income incentive		0.464***	0.462***		0.444***	0.467***
		(0.015)	(0.015)		(0.012)	(0.015)
Gradual retirement*Pension income incentive			0.004			-0.047***
			(0.024)			(0.017)
Constant	65.695***	65.094***	65.101***	65.692***	65.147***	65.115***
	(0.097)	(0.101)	(0.101)	(0.092)	(0.095)	(0.096)
Observations	10,560	10,560	10,560	10,560	10,560	10,560
R-squared	0.072	0.128	0.128	0.016	0.079	0.080

Ranking analysis (I)

Retirement Scenario	Average ranking	Percentage most preferred scenario
Scenario 1	5.13	57.4
Scenario 2	3.83	5.0
Scenario 3	2.85	2.2
Scenario 4	3.80	2.4
Scenario 5	2.54	0.9
Scenario 6	4.39	26.2
Scenario 7	3.06	2.6
Scenario 8	1.95	1.0
Scenario 9	3.06	1.3
Scenario 10	1.85	1.1

Ranking analysis (II)

	(1)	(2)	(3)
VARIABLES			
Gradual retirement	-0.764***	-0.764***	-0.732***
	(0.044)	(0.043)	(0.054)
Price of leisure incentive		-1.189***	-1.150***
		(0.024)	(0.031)
Gradual retirement* Price of leisure incentive			-0.077**
			(0.037)
Pension income incentive		-1.273***	-1.280***
		(0.021)	(0.028)
Gradual retirement*Pension income incentive			0.015
			(0.038)
Constant	3.881***	5.112***	5.096***
	(0.022)	(0.028)	(0.033)
Observations	8,897	8,897	8,897
R-squared	0.050	0.397	0.397

Heterogeneity analysis (I)

VARIABLES	(1) Retirement age	(2) Fulltime equivalent of retirement age	(3) Ranking of scenarios
Gradual retirement	1.005**	-0.233	-1.852**
Male	0.099	0.098	0.057
Male * gradual retirement	0.049	0.084*	-0.113
Age	-0.010	-0.010	0.004
Age * gradual retirement	-0.002	0.002	-0.007
High education level (intermediate level = ref)	**-0.299***	**-0.298***	**-0.004**
High education level * gradual retirement	**-0.149**	**-0.028**	**0.005**
Low education level	0.107	0.106	0.164
Low education level * gradual retirement	-0.054	0.011	-0.329
Wage	**-0.014**	**-0.014**	**-0.121***
Wage * gradual retirement	**0.035**	**-0.023**	**0.244***
Married	**-0.310**	**-0.308**	**-0.061**
Married * gradual retirement	**0.178***	**0.091**	**0.116**
Partner with own income	-0.307*	-0.308*	0.042
Partner with own income * gradual retirement	-0.015	0.080	-0.077
Partner works	0.073	0.071	-0.060
Partner works * gradual retirement	-0.027	-0.044	0.119
Number of Sick days	-0.003**	-0.003**	0.000
Number of Sick days * gradual retirement	0.001	0.001	-0.000
Life expectancy	**0.007***	**0.007***	**0.003**
Life expectancy * gradual retirement	**-0.002**	**-0.002**	**-0.005**
Constant	66.413***	66.406***	4.427***
Observations	10,008	10,008	8,477

Heterogeneity analysis (II)

VARIABLES	(1) Retirement age	(2) Fulltime equivalent of retirement age	(3) Ranking of scenarios
Gradual retirement	0.774***	-0.440***	-0.657***
	(0.081)	(0.063)	(0.147)
Routine tasks	0.006	0.006	0.012
	(0.015)	(0.015)	(0.009)
Routine tasks * gradual retirement	0.011	0.008	-0.025
	(0.010)	(0.008)	(0.018)
Non-Routine tasks	**-0.030***	**-0.030***	**-0.005**
	(0.016)	**(0.016)**	**(0.009)**
Non-Routine tasks * gradual retirement	**0.026****	**0.018****	**0.010**
	(0.011)	(0.009)	(0.018)
Constant	65.637***	65.637***	3.829***
	(0.121)	(0.121)	(0.074)
Observations	10,476	10,476	8,849
R-squared	0.068	0.010	0.051

Conclusion and discussion

- The introduction of gradual retirement schemes stimulates workers to retire approximately one year later.

- Total labour supply, however, significantly decreases in gradual retirement systems, as the positive effect of postponing retirement on labour supply is cancelled out by the reduction of working hours before full retirement.

- The impact of financial incentives on workers' retirement expectations is similar across gradual and full retirement options.

- Gradual retirement is not a preferred option among workers as the large majority still prefers full retirement. This holds particularly for workers with lower wages or high life expectancy.

- Policy implication: changing current retirement schemes into gradual retirement schemes will not contribute to a further increase in the labour supply of older generations!

Retirement age (baseline scenarios)
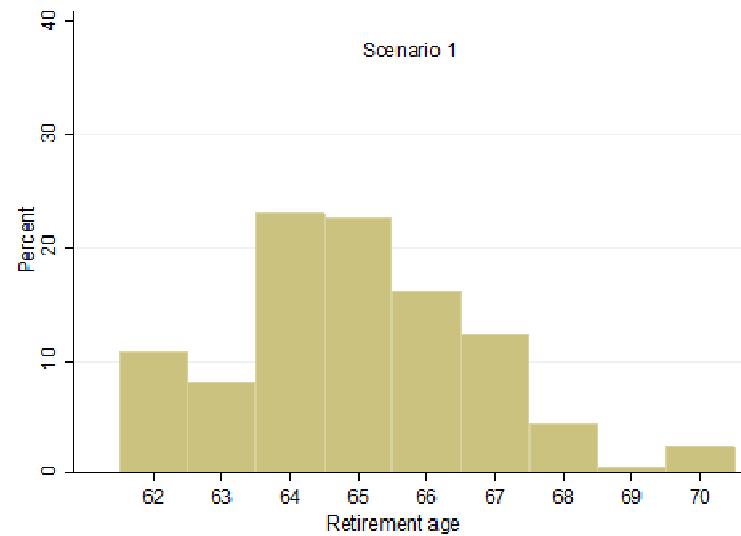

Regular
retirement
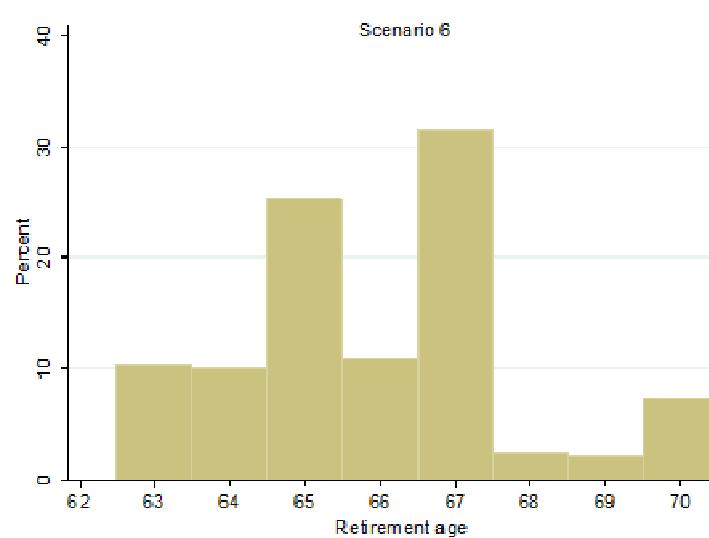
Gradual
retirement

Retirement age (price of leisure incentive)
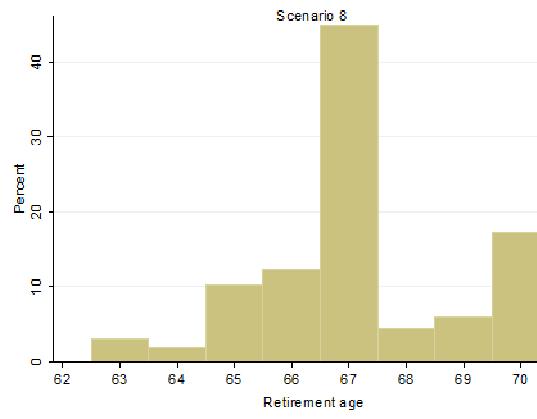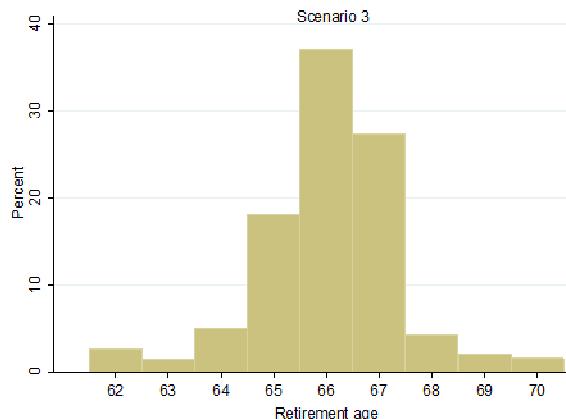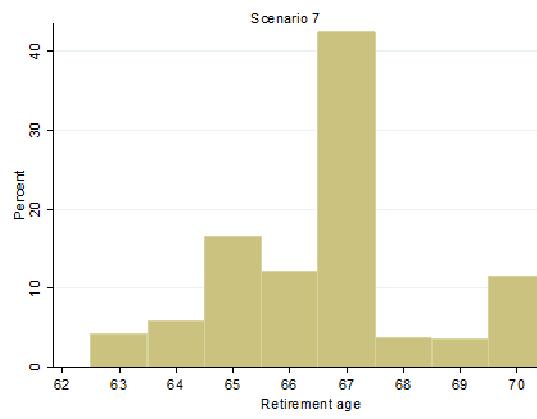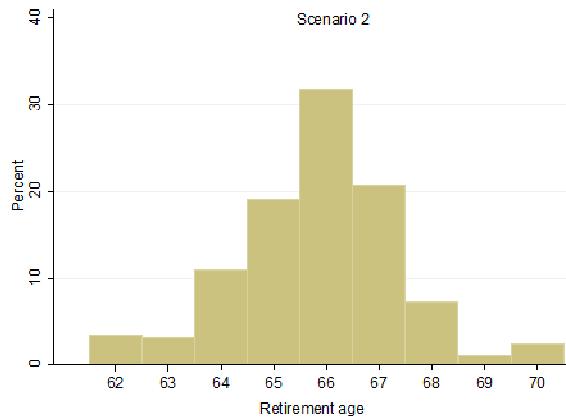
Regular retirement

Gradual retirement

Retirement age (pension income incentive)
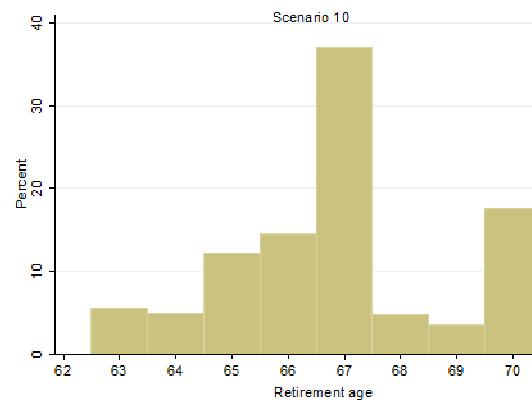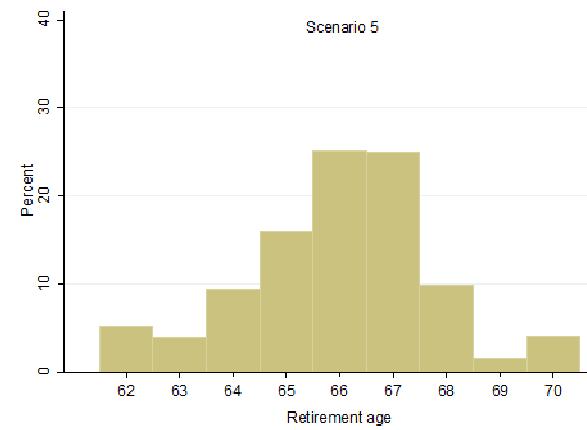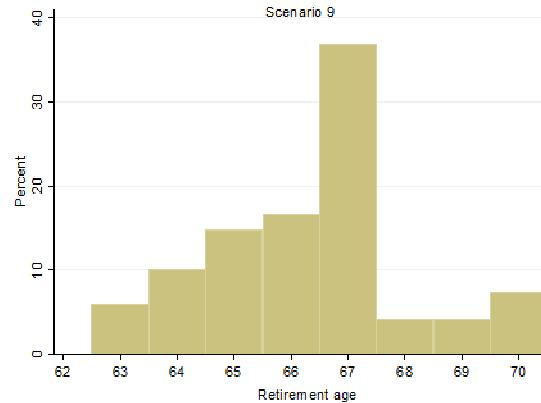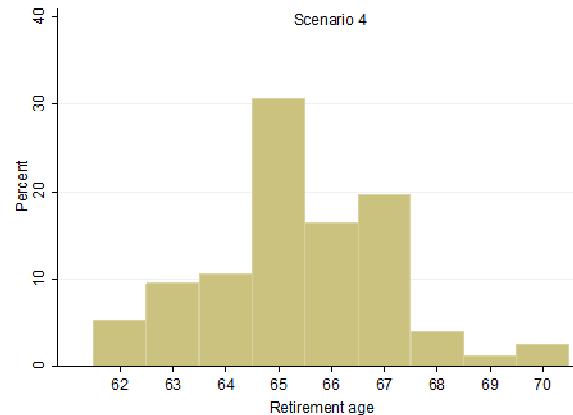
Regular retirement

Gradual retirement

Figure 2a: Differences in marginal effects of a multinomial logit on early, middle and late retirement: shocks in accrual rates and gradual retirement (marginal effects relative to the full-time base scenario)
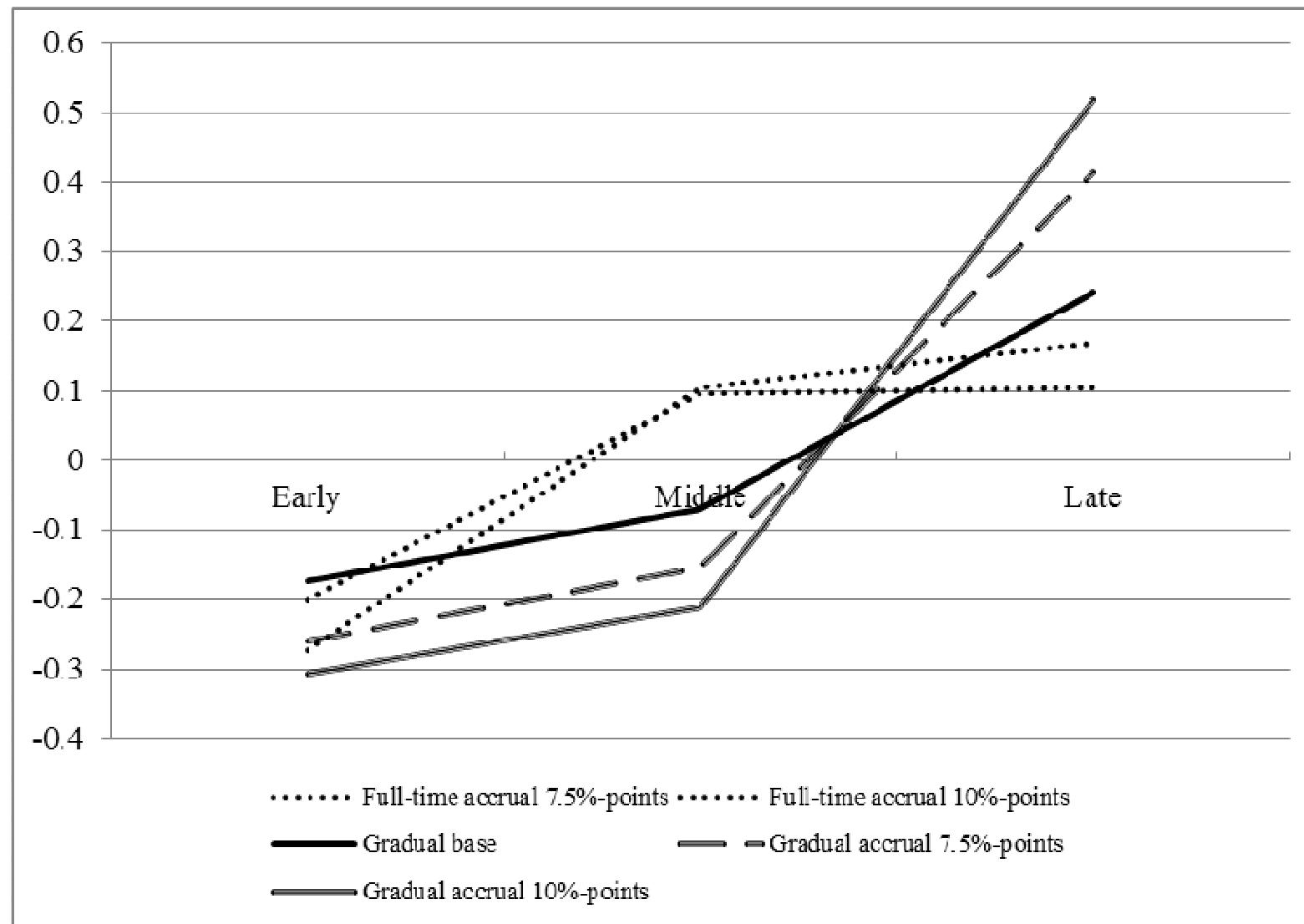
Figure 2a: Differences in marginal effects of a multinomial logit on early, middle and late retirement: income shocks and gradual retirement (marginal effects relative to the full-time base scenario)
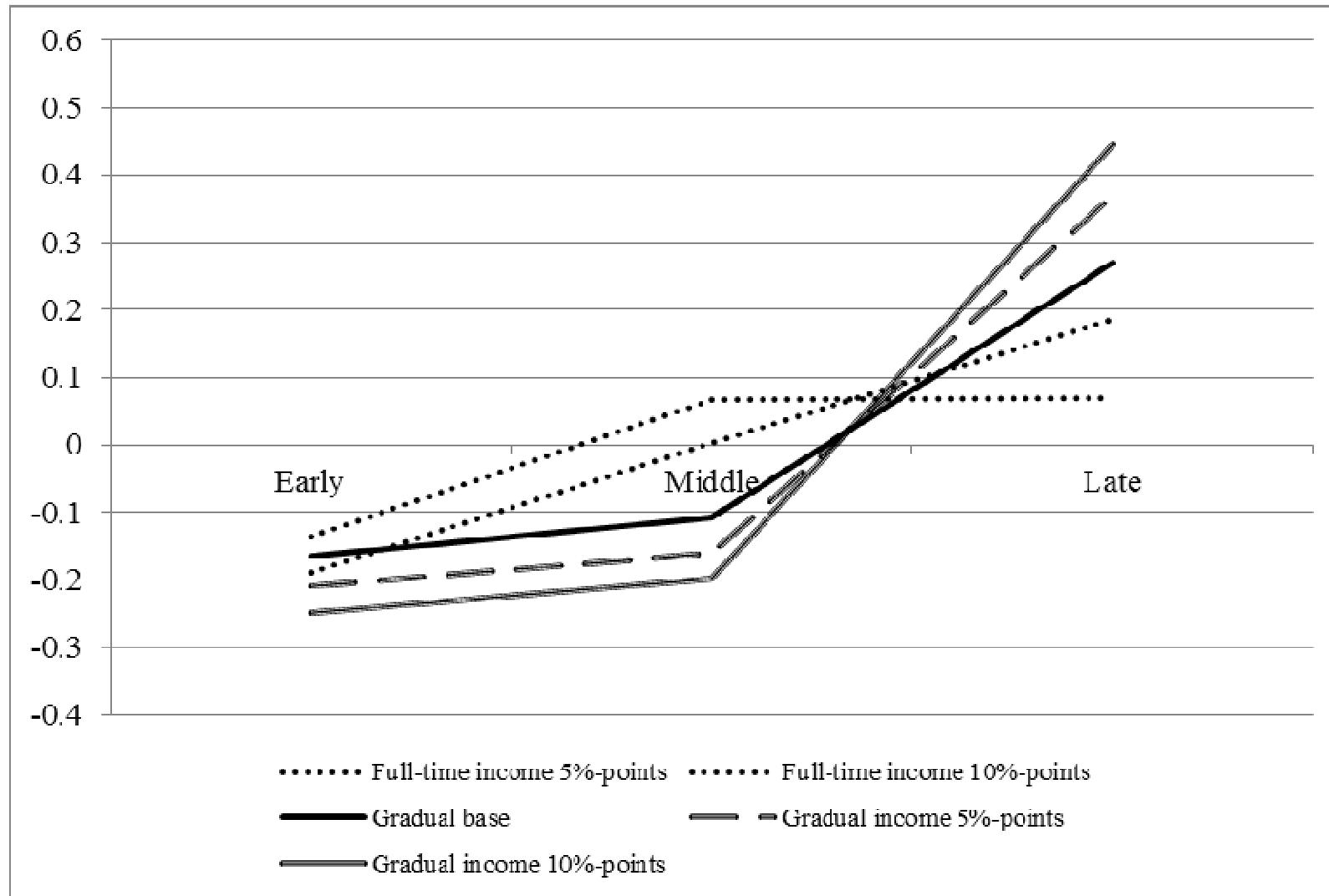
Descriptives

Characteristic	Average	Standard deviation
Age	56.12	5.70
Gender (1 if male)	0.62	0.48
Married	0.82	0.39
High-educated	0.72	0.44
Low-educated	0.04	0.20
Log monthly wage	7.73	0.54
Partner with income	0.71	0.45
Partner with work	.57	0.50
Number of sick days	1.11	1.27
Life expectancy (probability to reach age 80)	0.83	0.18
Cognitive tasks (on a scale from 0-10)	4.62	2.49
Repetitive tasks (on a scale from 0-10)	6.16	2.52

Background characteristics by retirement scenario

Characteristic	Percentage										F-value
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	
Age	56.1	56.3	56.0	56.2	56.2	56.1	56.0	56.3	56.0	55.9	0.34
Gender (1 if male)	0.62	0.61	0.61	0.63	0.63	0.62	0.60	0.62	0.63	0.62	0.47
Married	0.72	0.71	0.71	0.74	0.73	0.72	0.71	0.71	0.73	0.73	0.37
Highly educated	0.01	0.06	0.04	0.03	0.0.4	0.04	0.05	0.04	0.04	0.04	0.68
Low-educated	7.74	7.74	7.73	7.74	7.75	7.74	7.73	7.73	7.74	7.74	0.37
Log monthly wage	0.81	0.81	0.80	0.83	0.83	0.82	0.80	0.81	0.82	0.82	0.09
Partner with income	0.71	0.70	0.69	0.71	0.72	0.71	0.70	0.69	0.71	0.72	0.70
Partner with work	0.57	0.57	0.56	0.57	0.58	0.57	0.57	0.57	0.57	0.58	0.48
Sick days	1.11	1.13	1.110	1.13	1.12	1.11	1.08	1.15	1.08	1.07	0.18
Life expectancy (probability to reach age 80)	83.3	83.1	83.3	83.3	83.2	83.3	83.3	83.2	83.4	83.4	0.36
Cognitive tasks	4.61	4.59	4.61	4.61	4.62	4.62	4.62	4.58	4.65	4.66	0.03
Repetitive tasks	6.17	6.20	6.13	6.21	6.21	6.17	6.12	6.20	6.14	6.13	0.08

Basic model including fixed effects

VARIABLES	(1) Retirement age	(2) Fulltime equivalent of retirement age
Gradual retirement	0.964***	-0.224***
	(0.029)	(0.023)
Price of leisure incentive	0.591***	0.585***
	(0.017)	(0.016)
Gradual retirement* Price of leisure incentive	0.021	-0.079***
	(0.026)	(0.017)
Pension income incentive	0.462***	0.467***
	(0.015)	(0.015)
Gradual retirement*Pension income incentive	0.004	-0.047***
	(0.024)	(0.017)
Constant	65.001***	65.000***
	(0.019)	(0.017)
Individual fixed effects	Yes	Yes
Observations	10,560	10,560
R-squared	0.375	0.330
Number of individuals	1,760	1,760

Introduction text

We would like to know more about your retirement preferences. In the following six questions, we therefore confront you with different retirement schemes. Thereby, you always have to assume that you presently work full-time.

Some of these schemes only enable you to retire full-time, while other schemes enable you to first retire part-time for several years before you retire full-time (you always retire for half and have to continue work for half in these schemes until you fully stop working). It always holds that the earlier you retire, the lower your pension will be.

In each question, we present a table in which for each possible retirement age is shown how much pension you will receive from that age. The income is net (free disposable after taxes and benefits) and is expressed as a percentage of your current net wage. Your state old age pension (AOW) and the income from part-time work (in case of part-time retirement) are already included in the calculation. In the schemes in which you first retire part-time, you would receive this income during the period in which you are part-time retired and during the period thereafter.