Nonparametric Evidence on the Effects of Financial Incentives on Retirement Decisions

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June 2013

Introduction

- How do individuals adjust labor supply in response to wage variation? Answer important in many fields: macro, public finance, labor
  - Design of equilibrium models of the labor market
  - Normative tax policy analysis
  - Modeling labor supply
  - Dispute over magnitude of elasticities between micro and macro studies
- Recent literature has highlighted the importance of distinguishing between the intensive and extensive margin (Heckman 1993, Saez 2002, Chetty et al. 2012)
- We focus on retirement decision in response to anticipated benefits
- Contribution: quasi-experimental estimates of extensive margin labor supply elasticities

Introduction

- How do individuals adjust retirement entry to anticipated benefits?
  - Relevant for design of pension systems, reforms, explaining retirement patters based on financial incentives
  - Complicated to disentangle incentives from various policies at retirement
- Research design based on a simple and salient incentive structure 'independent' from public pension system
- Exploit discontinuities in financial incentives along a dimension other than age
- Reduced form concept of extensive margin intertemporal substitution elasticities
- Noparametric estimation method based on bunching estimators (Saez 2009, Chetty et. al 2012, Kleven and Waseem 2013)

Research Design

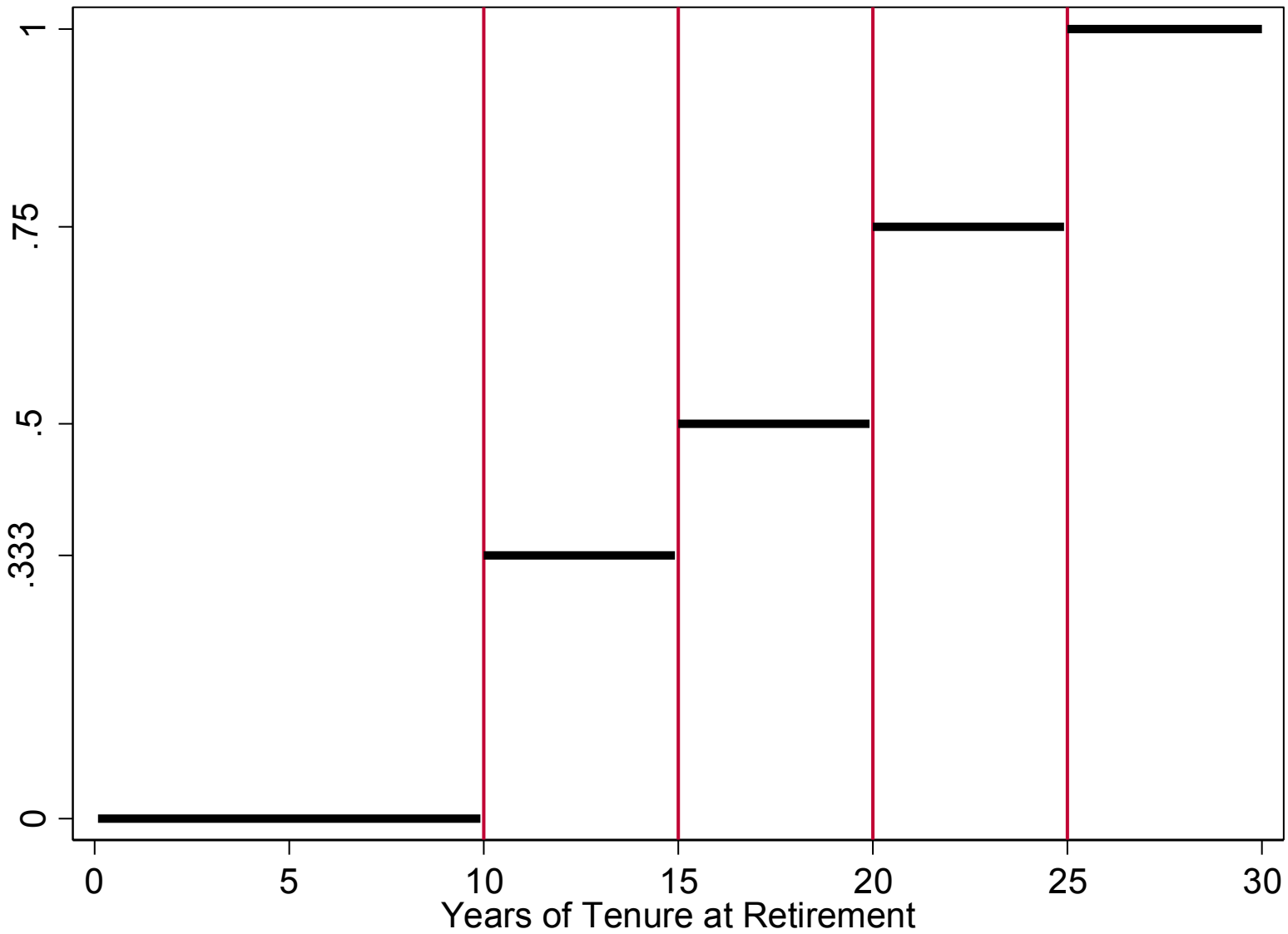
- Retirement rule in Austria: individuals who complete 10 years of tenure by retirement qualify for lump-sum payment from employer
  - Simple and salient rule
  - Benefits are fully anticipated but small relative to lifetime wealth
  - Focus on delay in retirement entry decisions
- Examine retirement behavior around the thresholds
  - Present graphical evidence on responses in retirement entry
  - Examine heterogeneity across population groups
- Examine magnitude of financial incentive
  - Contrast legislative incentive with estimated incentives from the data
- Elasticity relates retirement responses to financial incentives

Institutional Background I

Employer-provided retirement benefits within the severance pay system

- amount based on tenure at retirement
- mandated, lump-sum payments at retirement
- payments based on salary, not income / total compensation
- funds set aside by employers based on size of work force
- retirement is only voluntary separation that leads to payments
- severance payment is taxed at a constant, low rate of 6%

Severance Payments as Fraction of Annual Salary

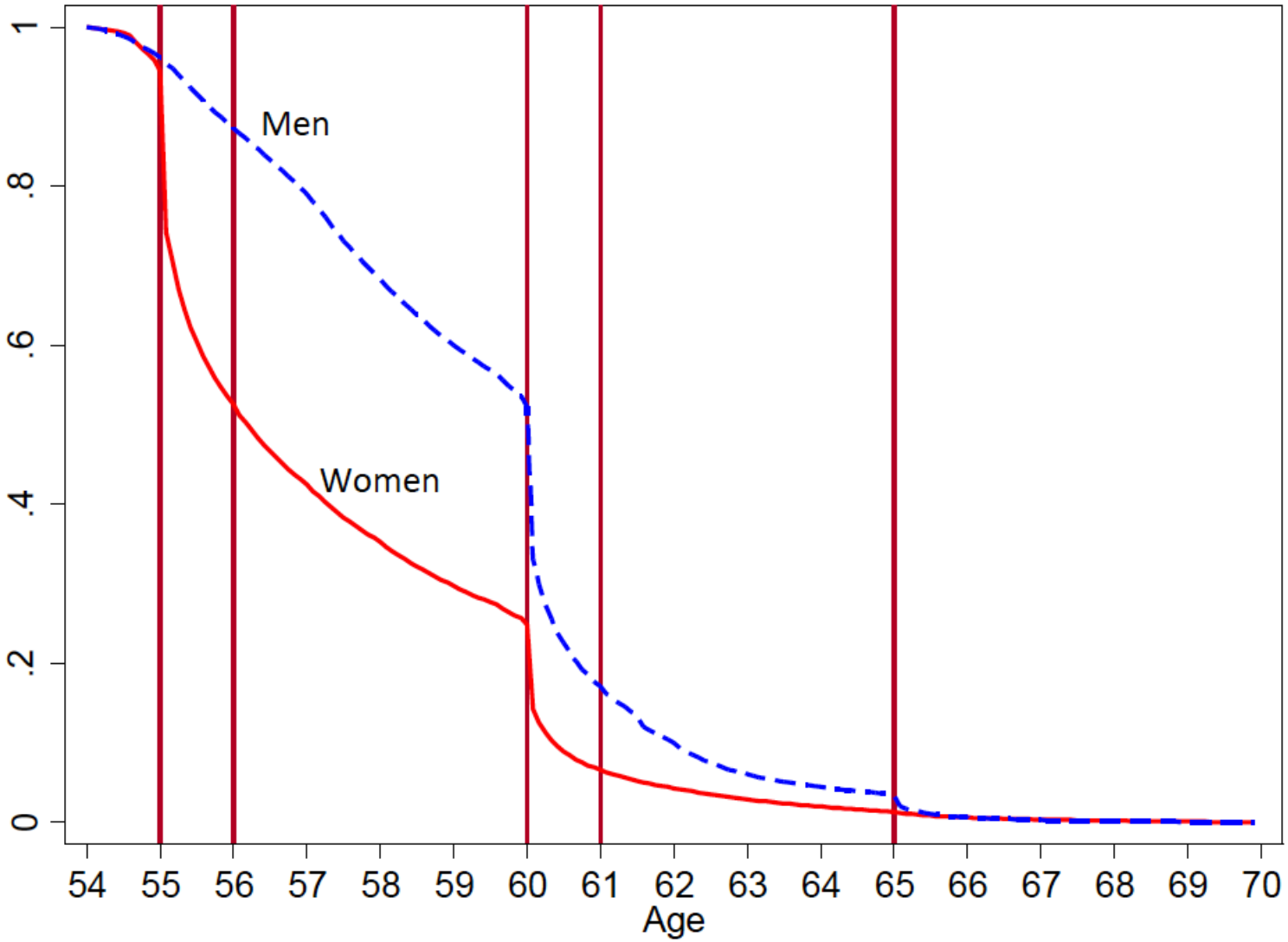


Institutional Background II

Government-provided pensions:

- Normal (statutory) retirement ages: 65 (men) & 60 (women)
- Early retirement ages: 60 (men) & 55 (women)
- Ages 55-59: retirement through disability pensions
- Replacement rates $\approx 75\%$
- Even with bonuses for retirement at older ages, system is still actuarially unfair for most individuals

Exits from the Labor Force into Retirement



Data

- Austrian Social Security Database 1972 - 2006
  - matched employer-employee census of private sector
  - complete earnings and employment histories
  - some demographic information on workers and firms
- Income Tax Records 1994 - 2005
  - employer reports to tax office at the end of the year
  - annual salary plus withholdings of social security contributions and income taxes
  - separate category for severance payments
- Sample restrictions:
  - non-construction workers
  - individuals still working at age 54
  - retiring within 6 months of last job
  - with uncensored job-tenure at retirement
  - retirements 1997-2005 matched to tax records
- Sample: 89,426 individual retirements with 6-28 years of tenure

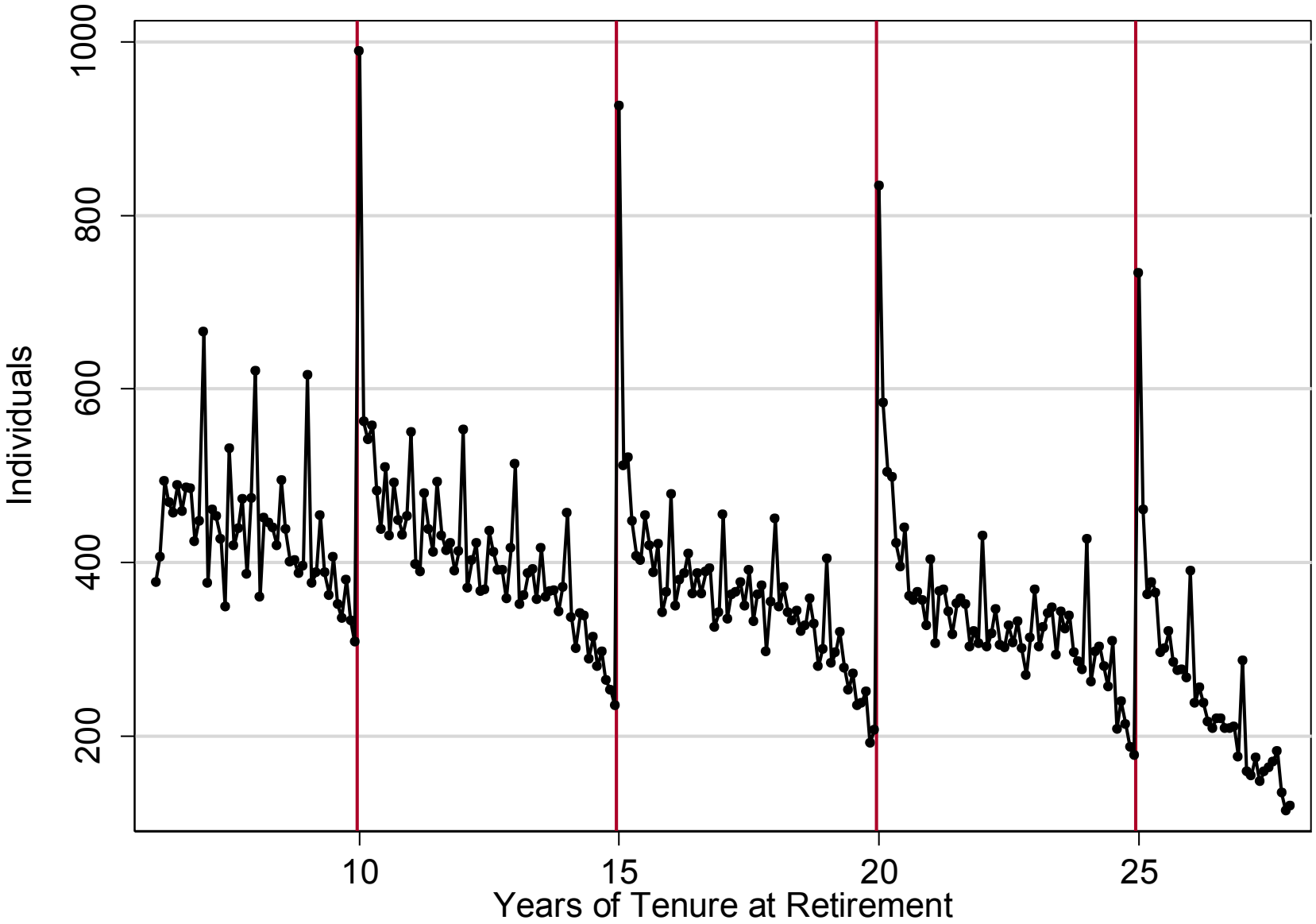
Summary Statistics

# Individuals	89,426	
	Mean	Std.dev
Female	0.51	
Retirement Age	59.1	2.59
Tenure	15.66	6.10
Annual Earnings	29,327	12,949
Severance Pay	18,510	21,661
Implicit Tax Rate	0.81	0.21
Years of Employment	34.3	8.67
Years of Sick Leave	0.17	0.33
Fractions:		
Disability Pension	0.21	
Early Retirement	0.57	
Old Age Pensions	0.22	

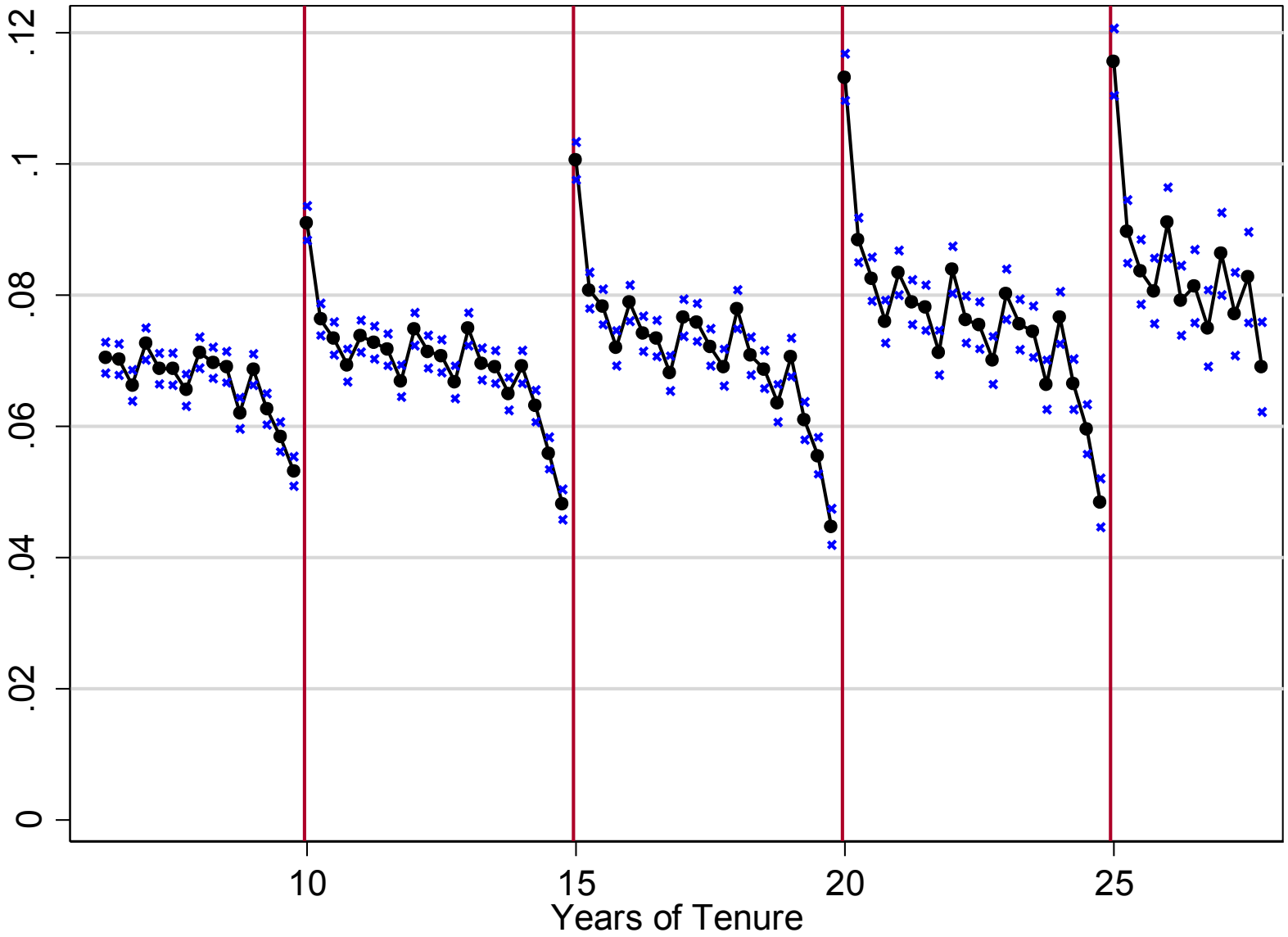
Outline

- Empirical evidence on retirements
- Empirical evidence on severance payments
- Reduced form elasticity concept
- Estimation strategy
- Estimation results
- Discussion: interpretation and policy relevance

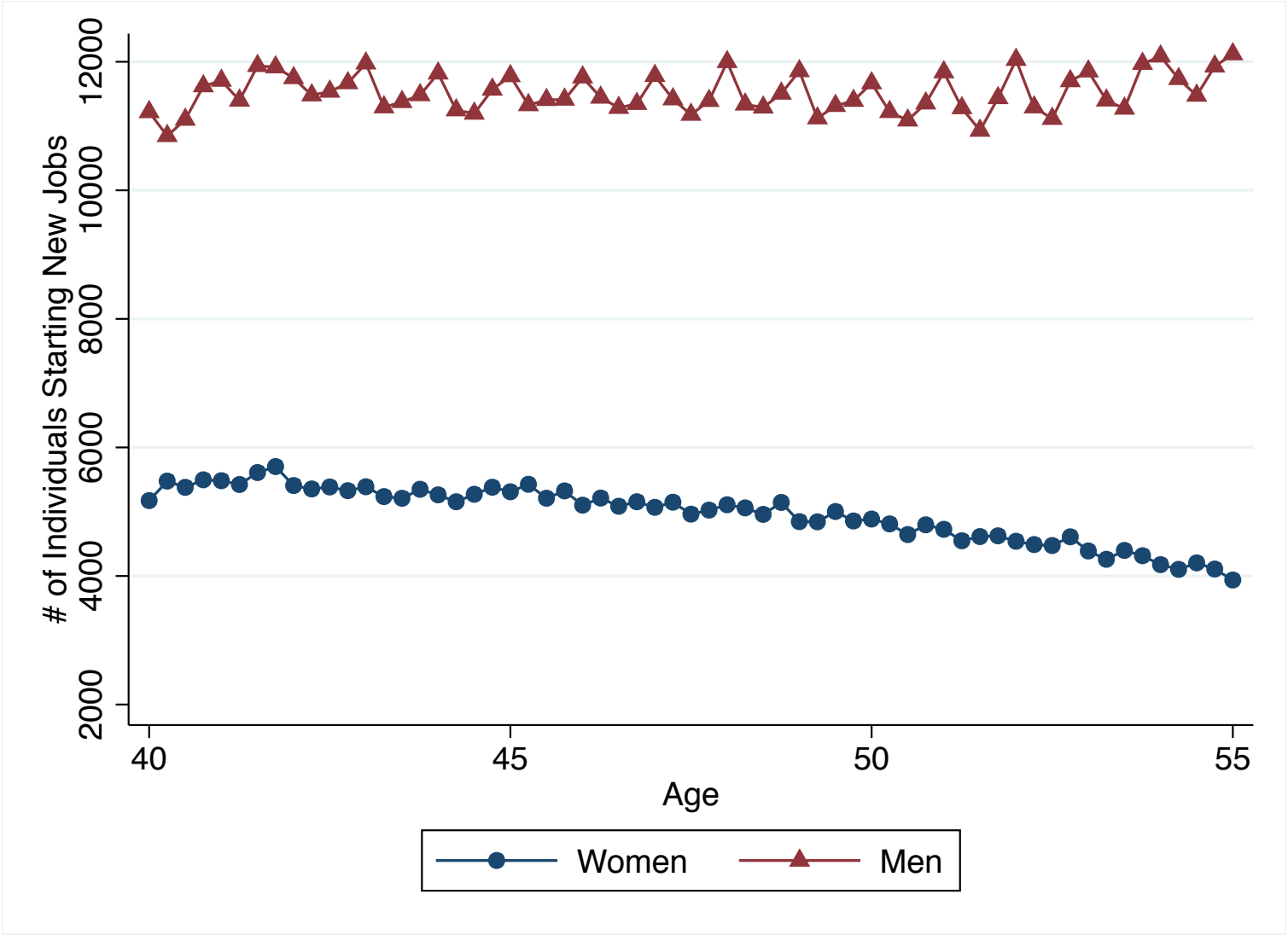
Distribution of Tenure on Retirement



Adjusting for Coviariates

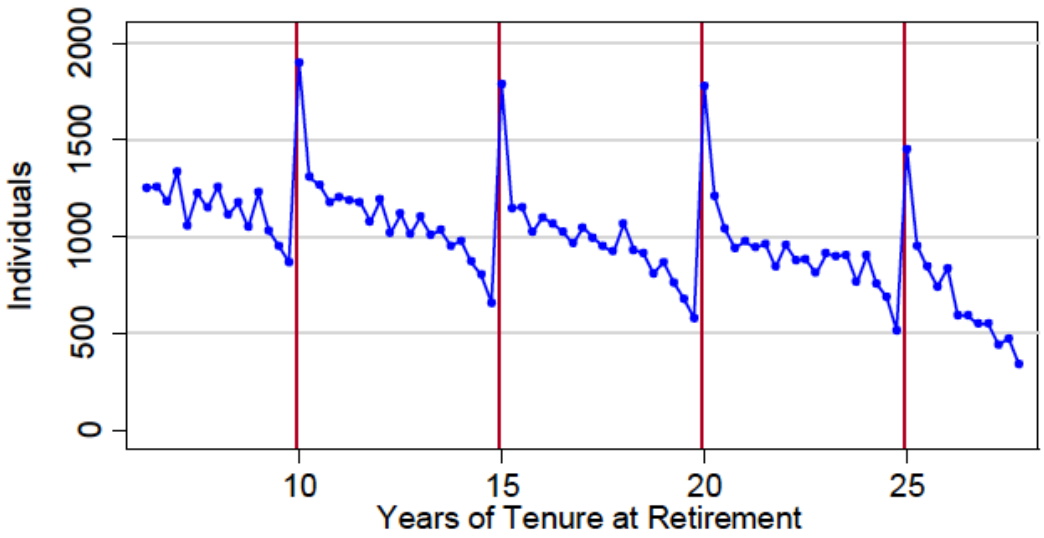


Distribution of Job Starts by Age

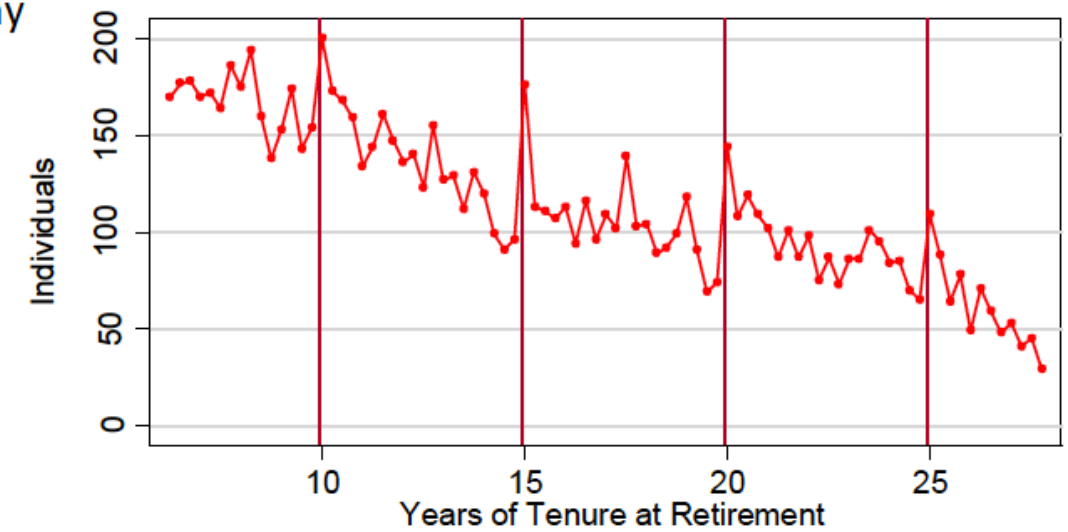


Hetergogeneity by Health Status

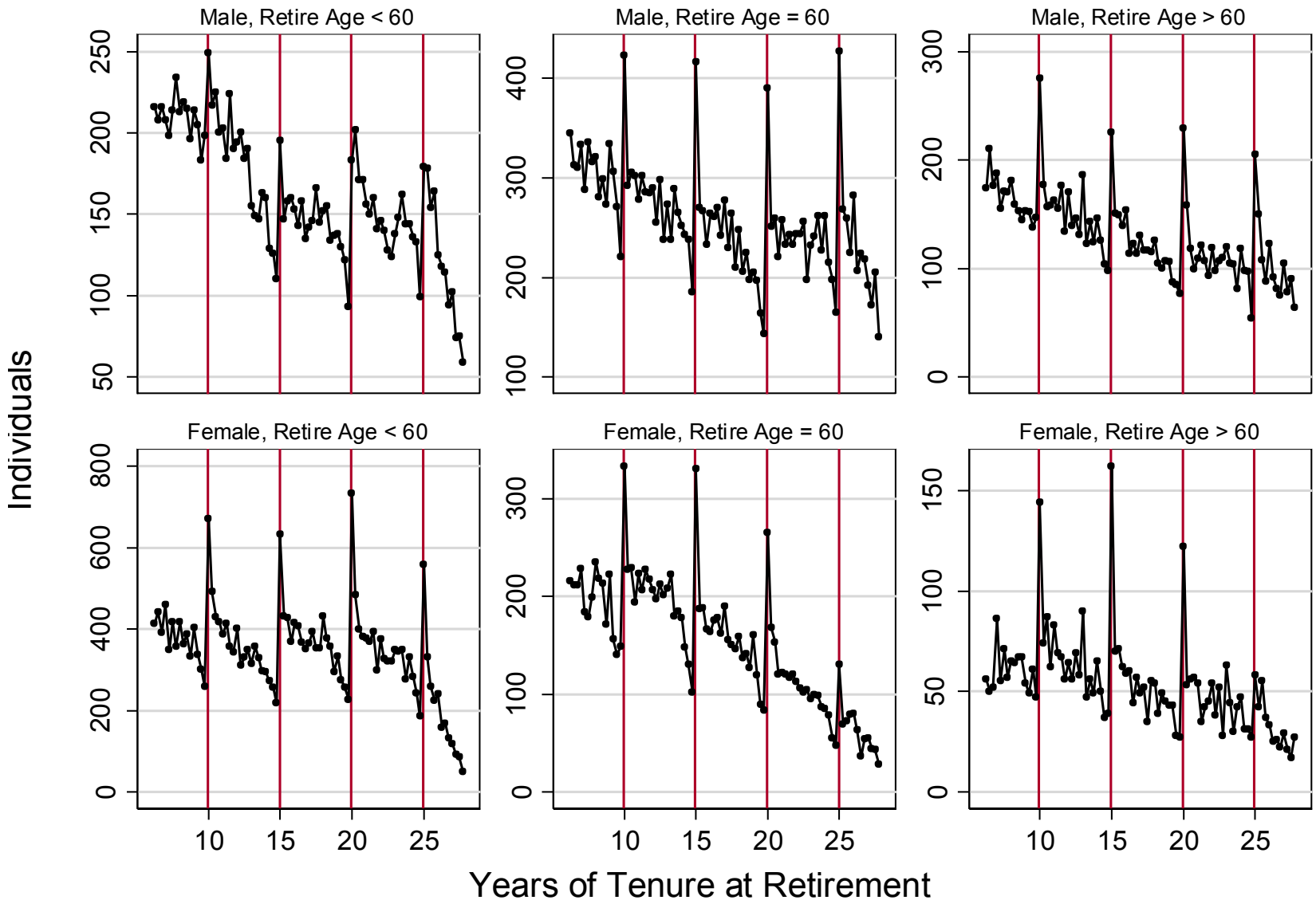
Healthy



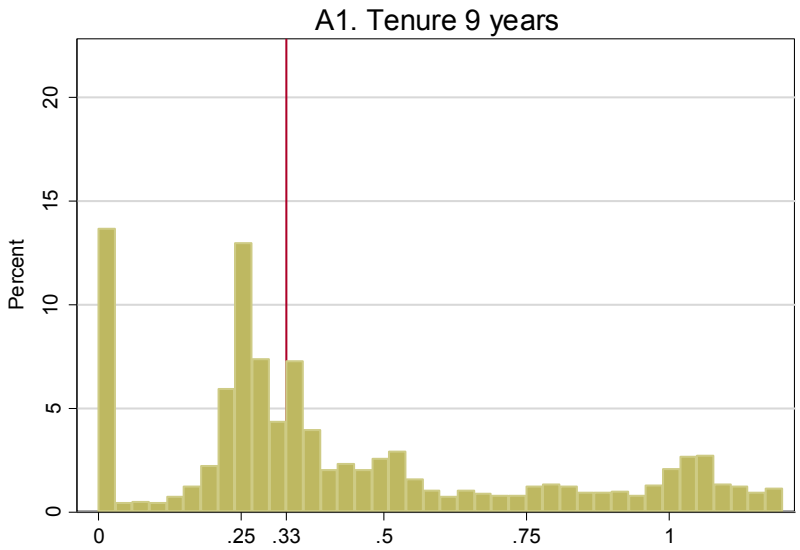
Unhealthy

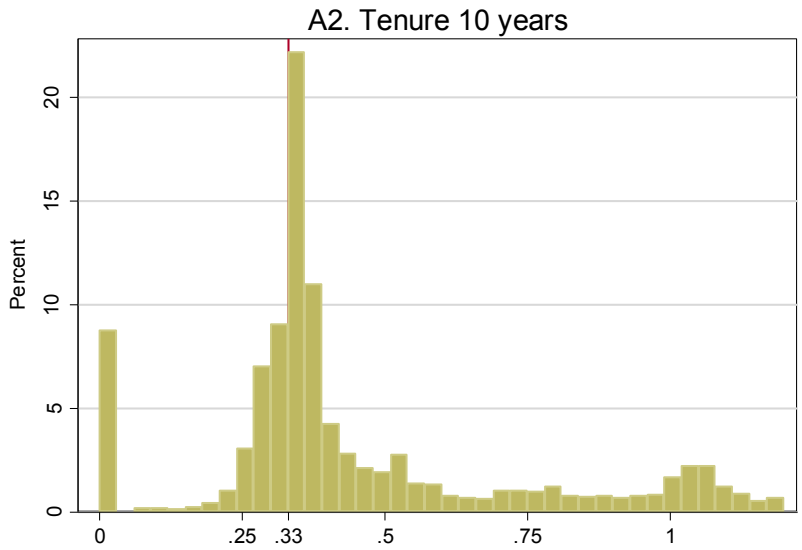


Hetergogeneity by Age and Gender

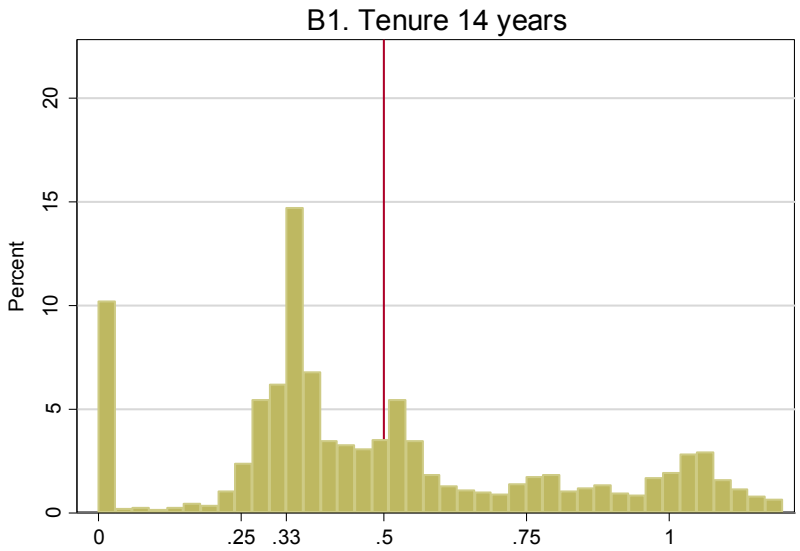


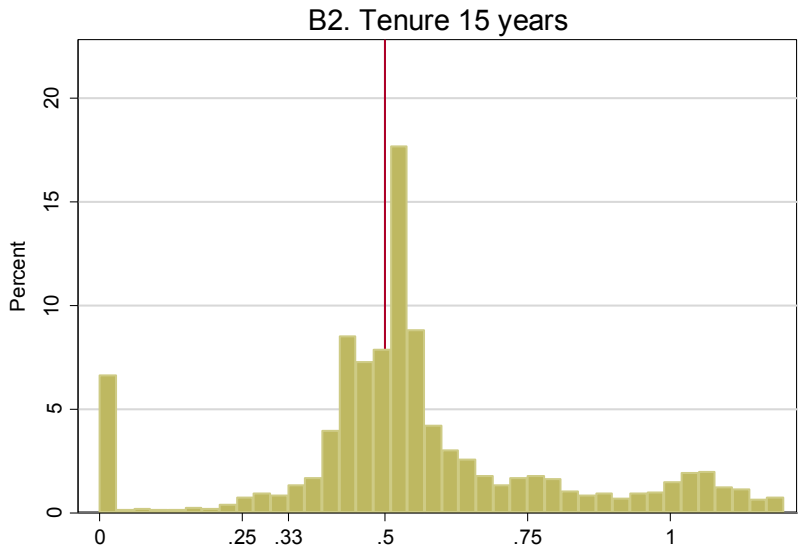
Distribution of Severance Payments, 10 Year Threshold



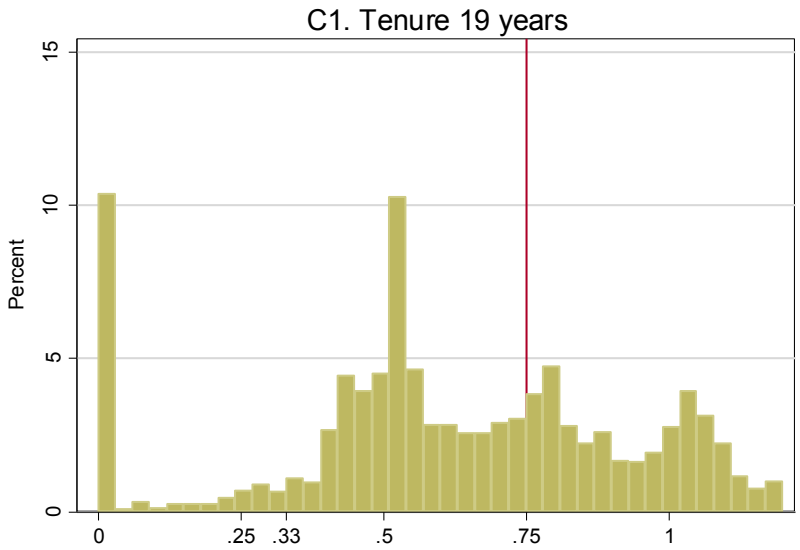


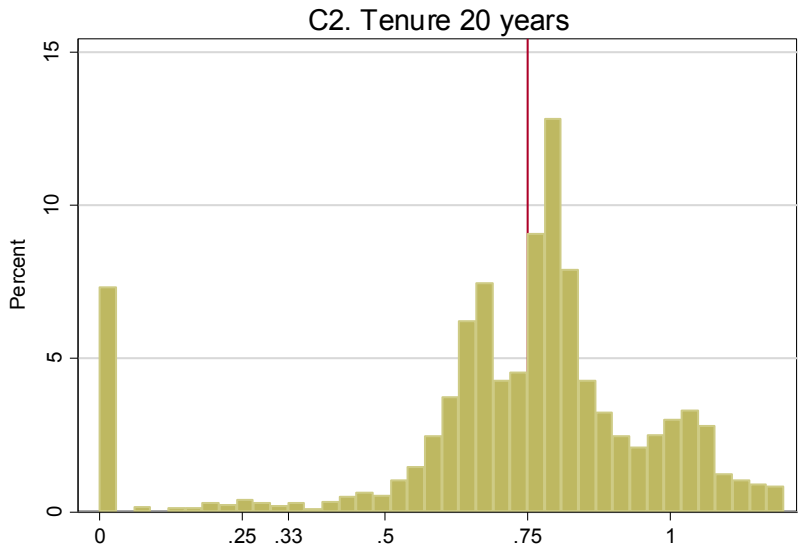
Distribution of Severance Payments, 15 Year Threshold



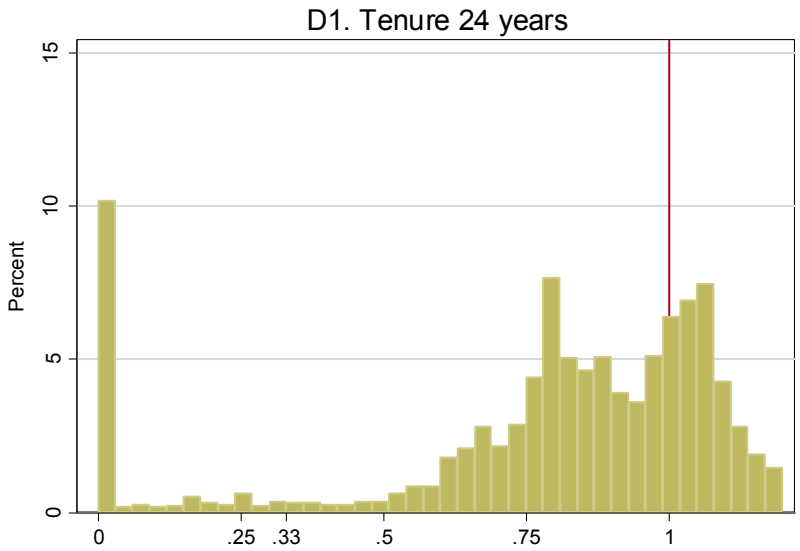


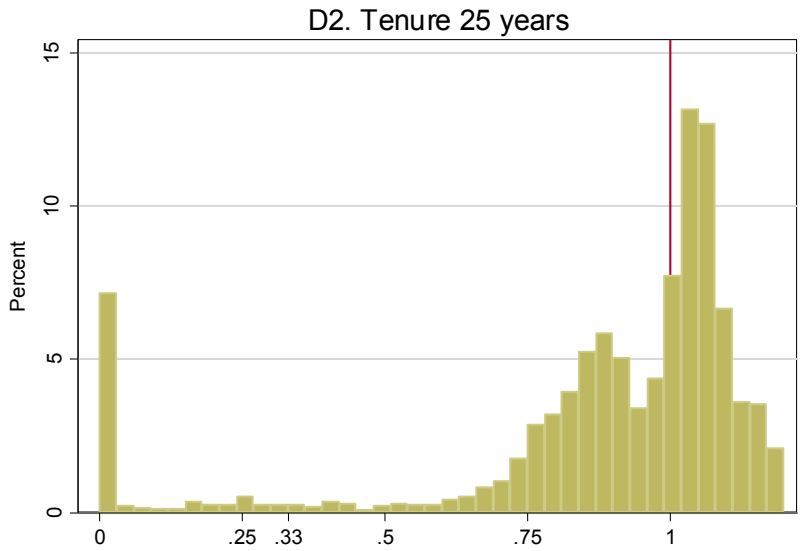
Distribution of Severance Payments, 20 Year Threshold



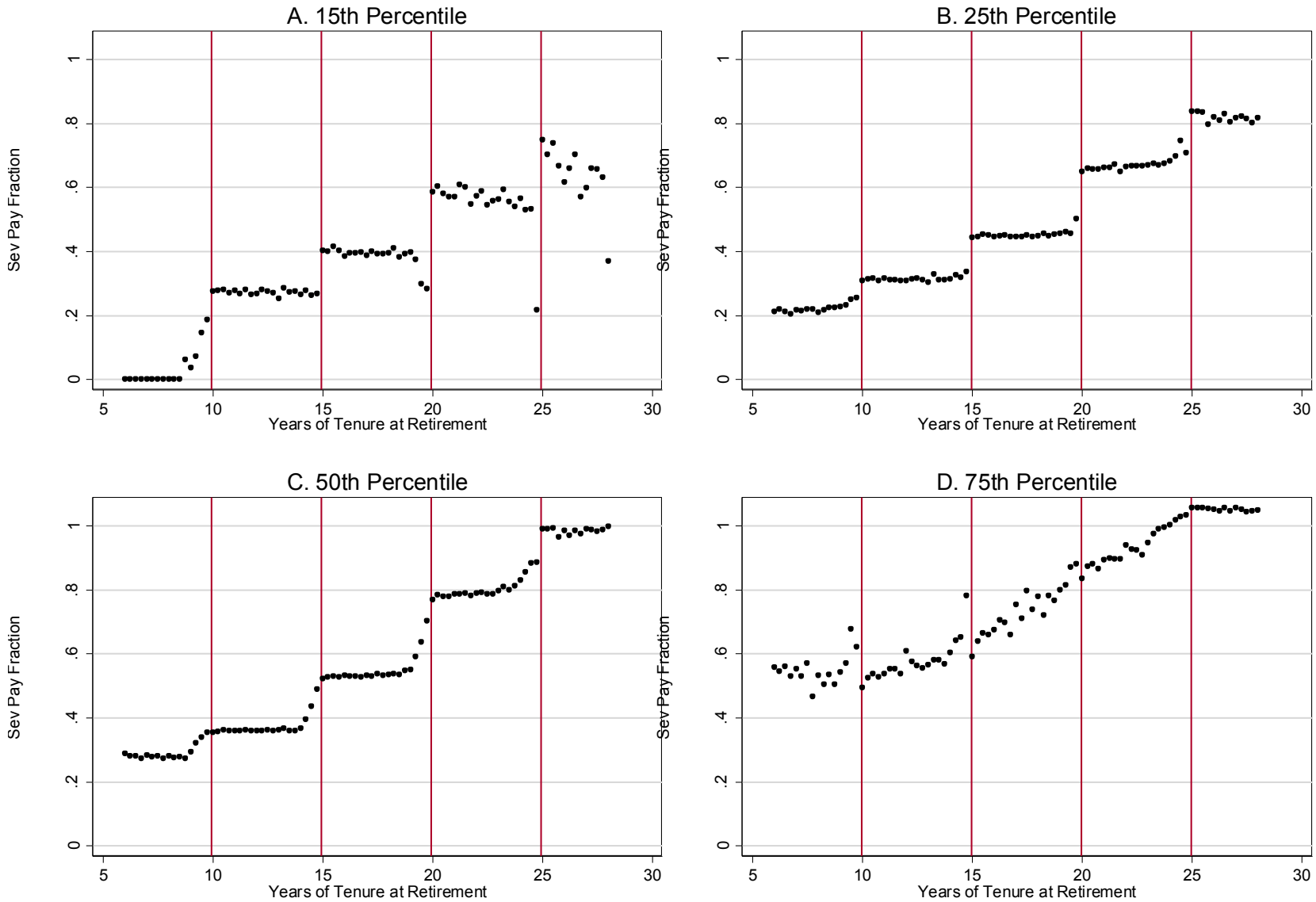


Distribution of Severance Payments, 25 Year Threshold

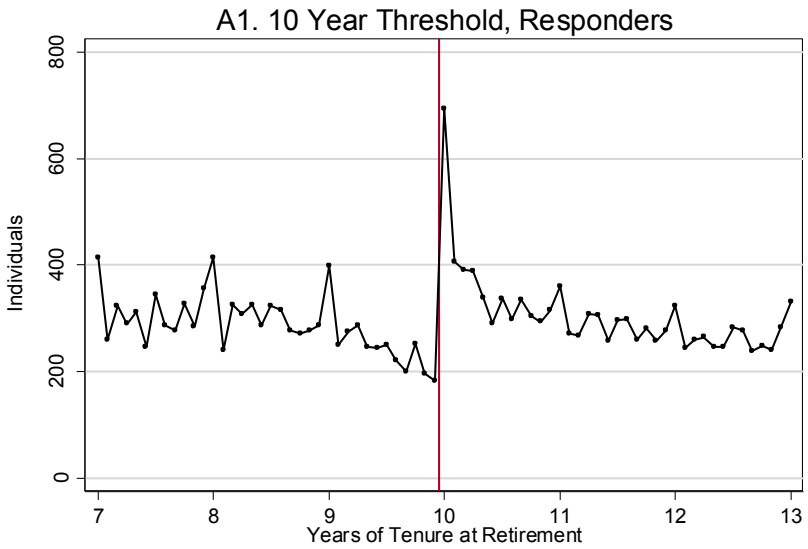


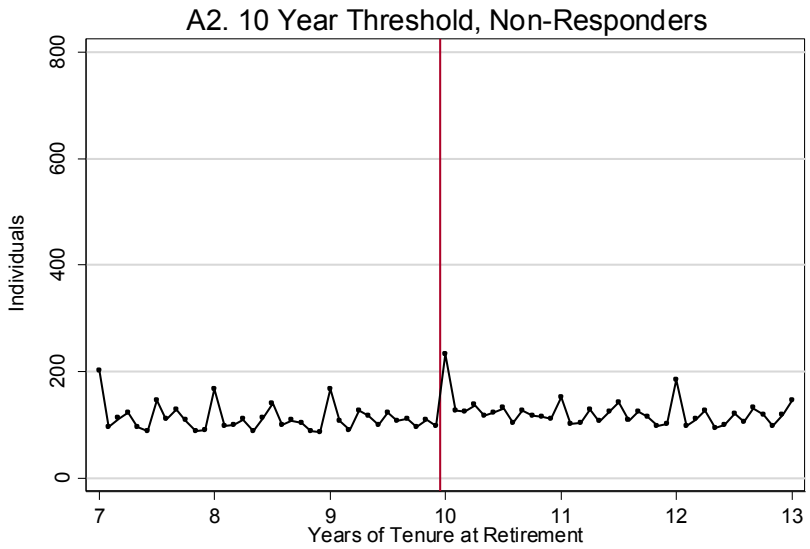


Distribution of Severance Payments

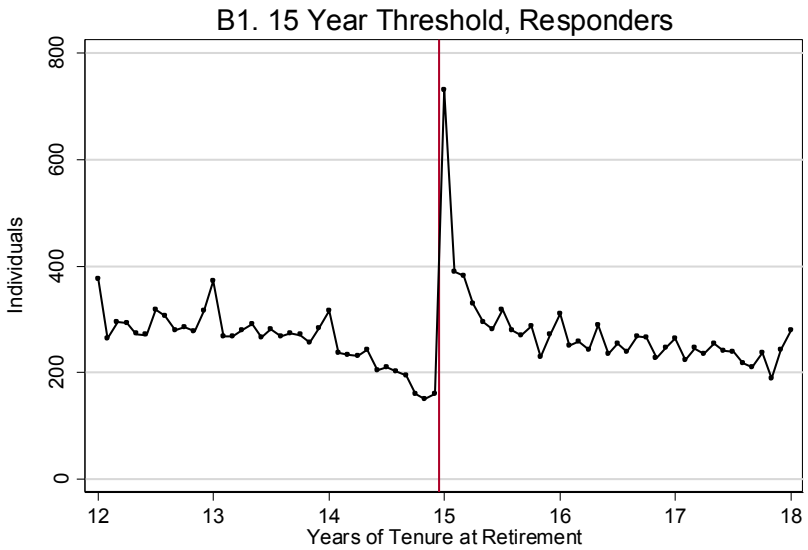


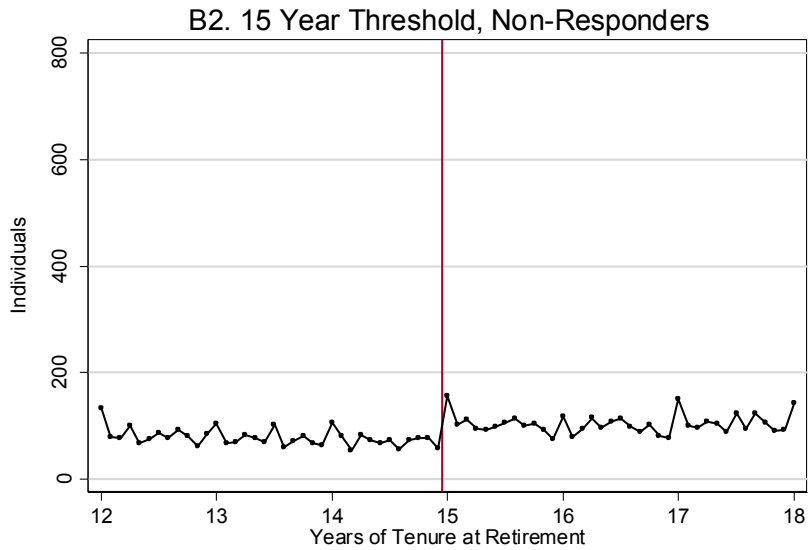
Definition of Responder Sample, 10 Year Threshold



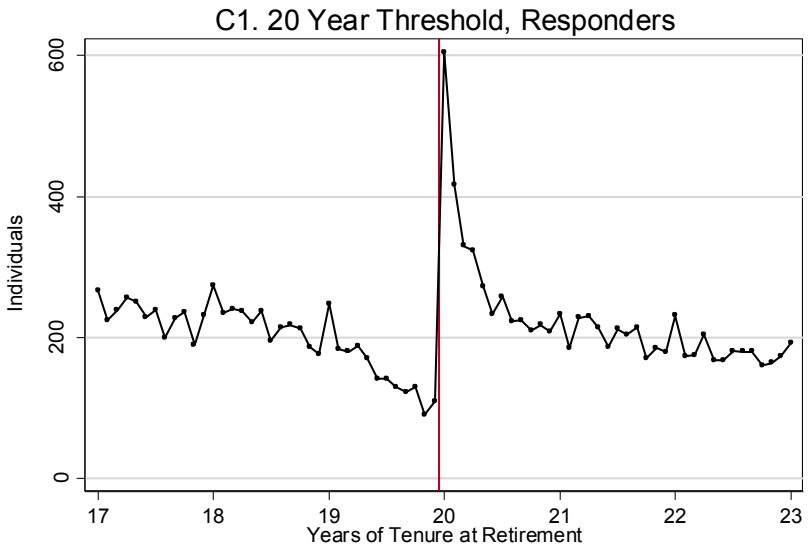


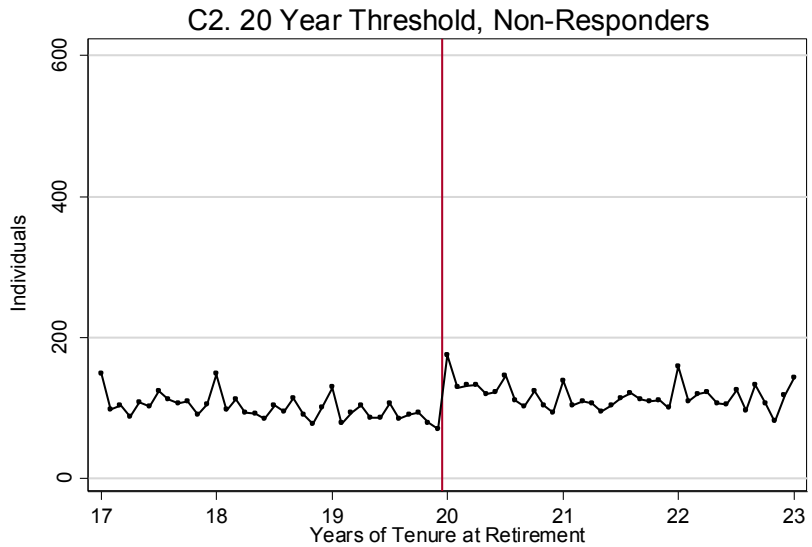
Definition of Responder Sample, 15 Year Threshold



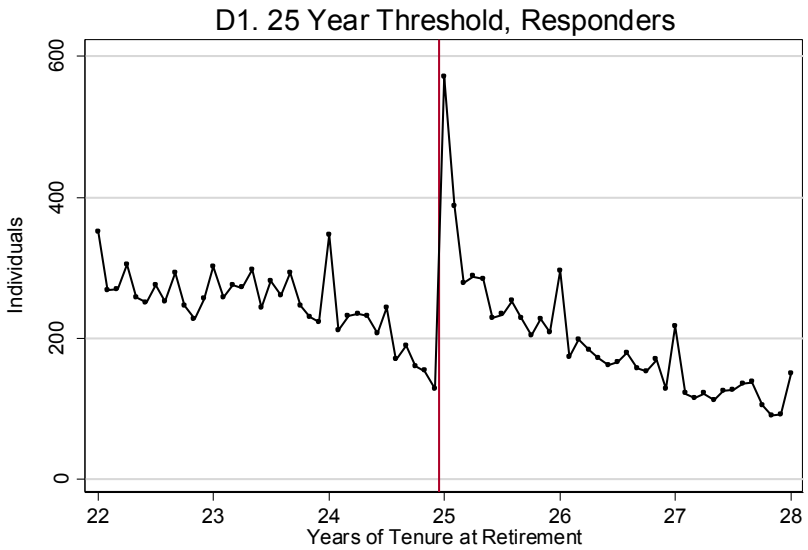


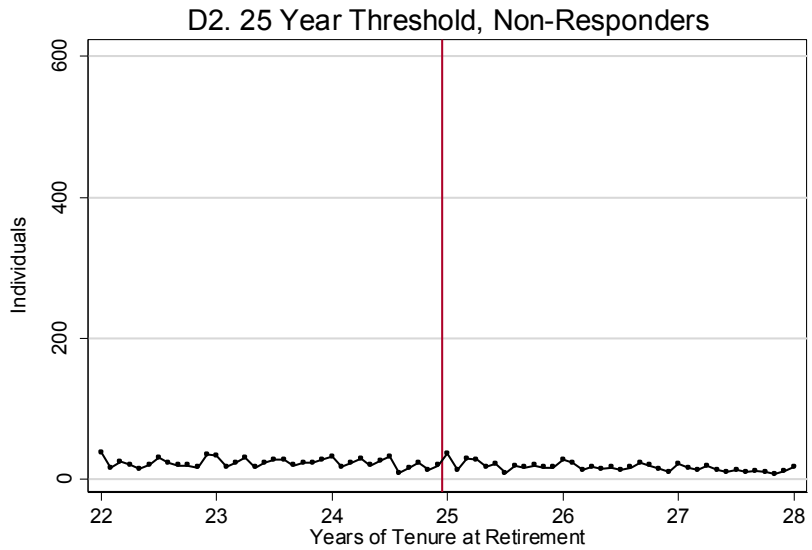
Definition of Responder Sample, 20 Year Threshold



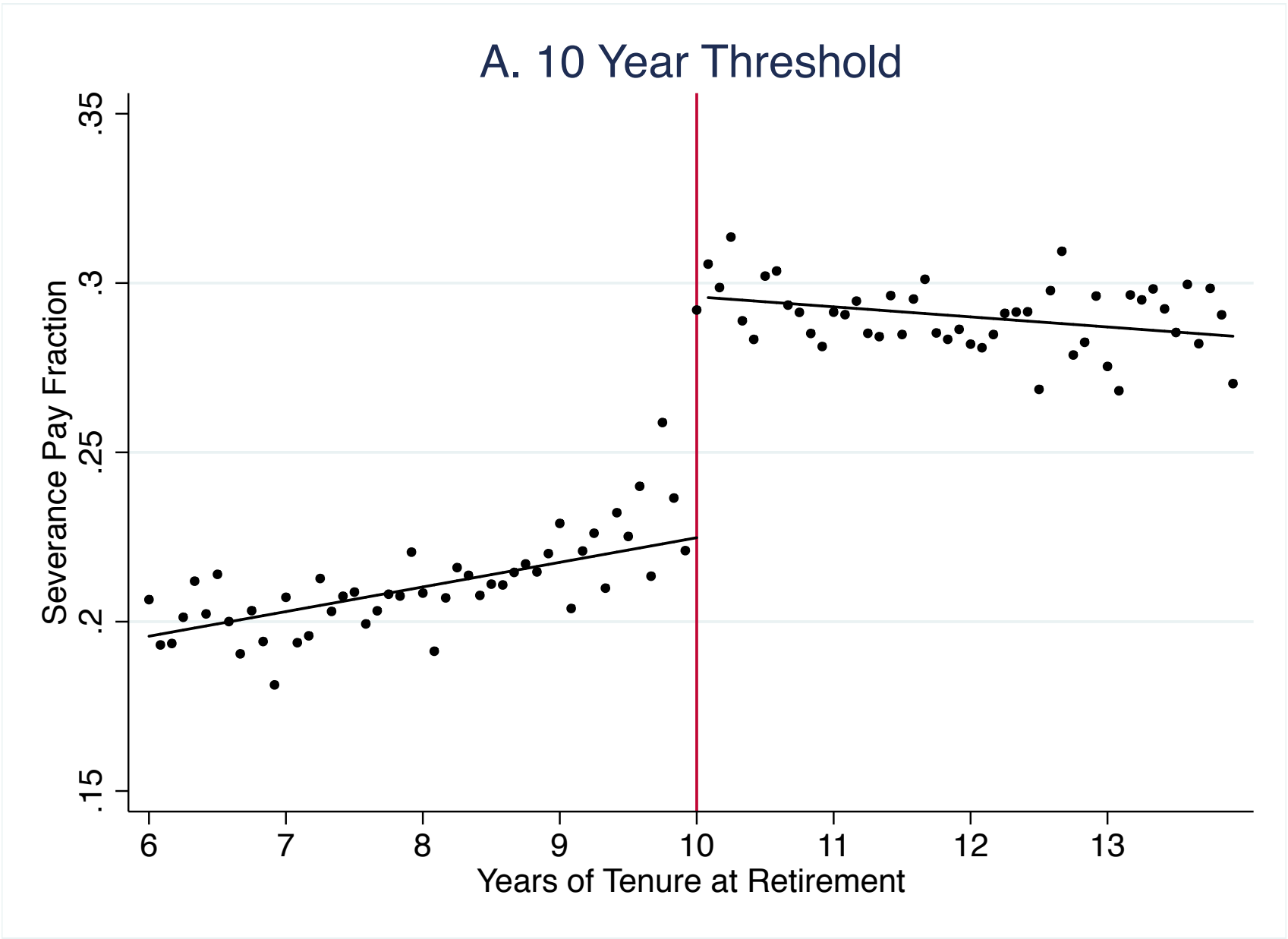


Definition of Responder Sample, 25 Year Threshold





Mean Severance Payments, Responder Sample



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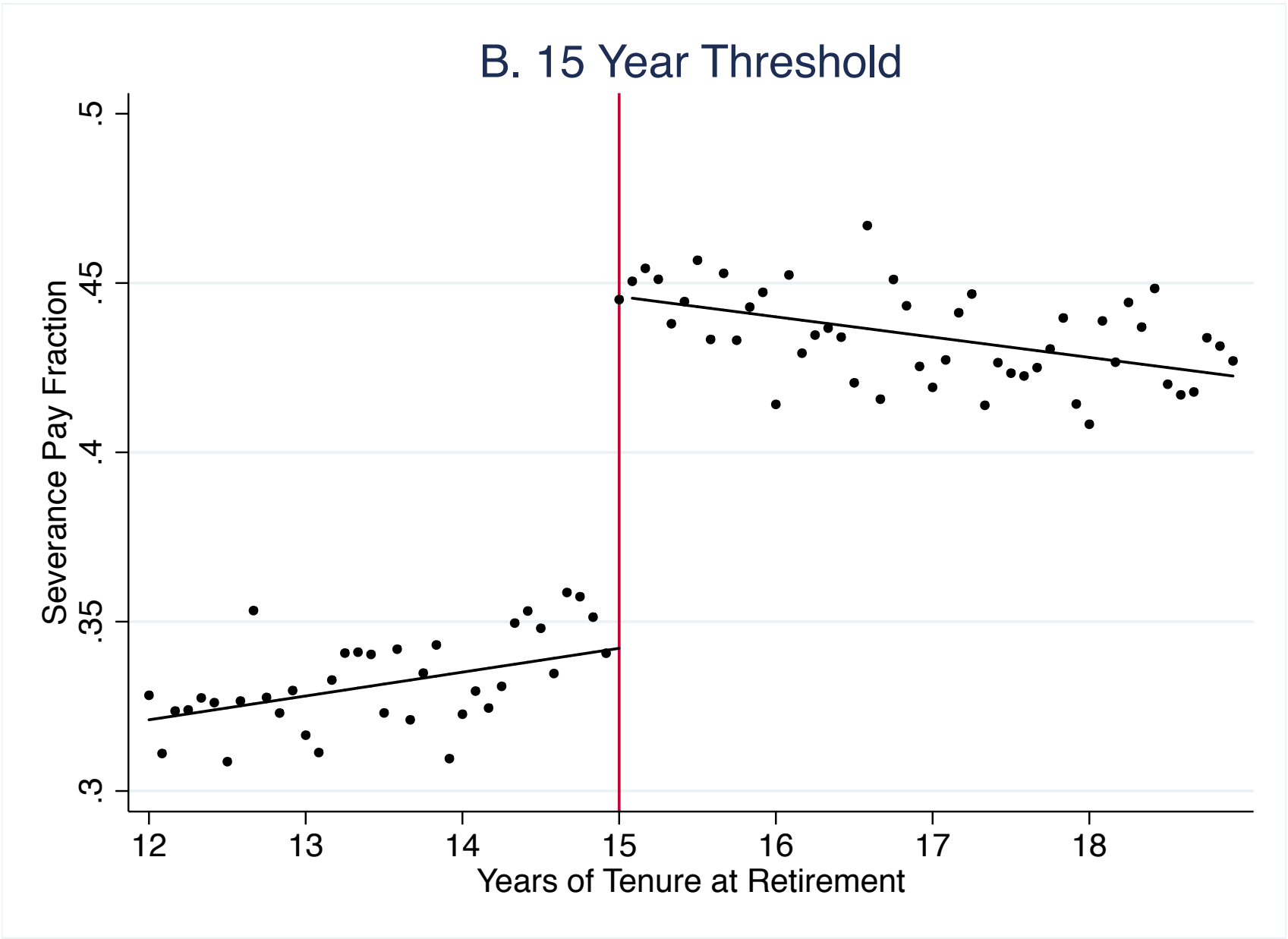

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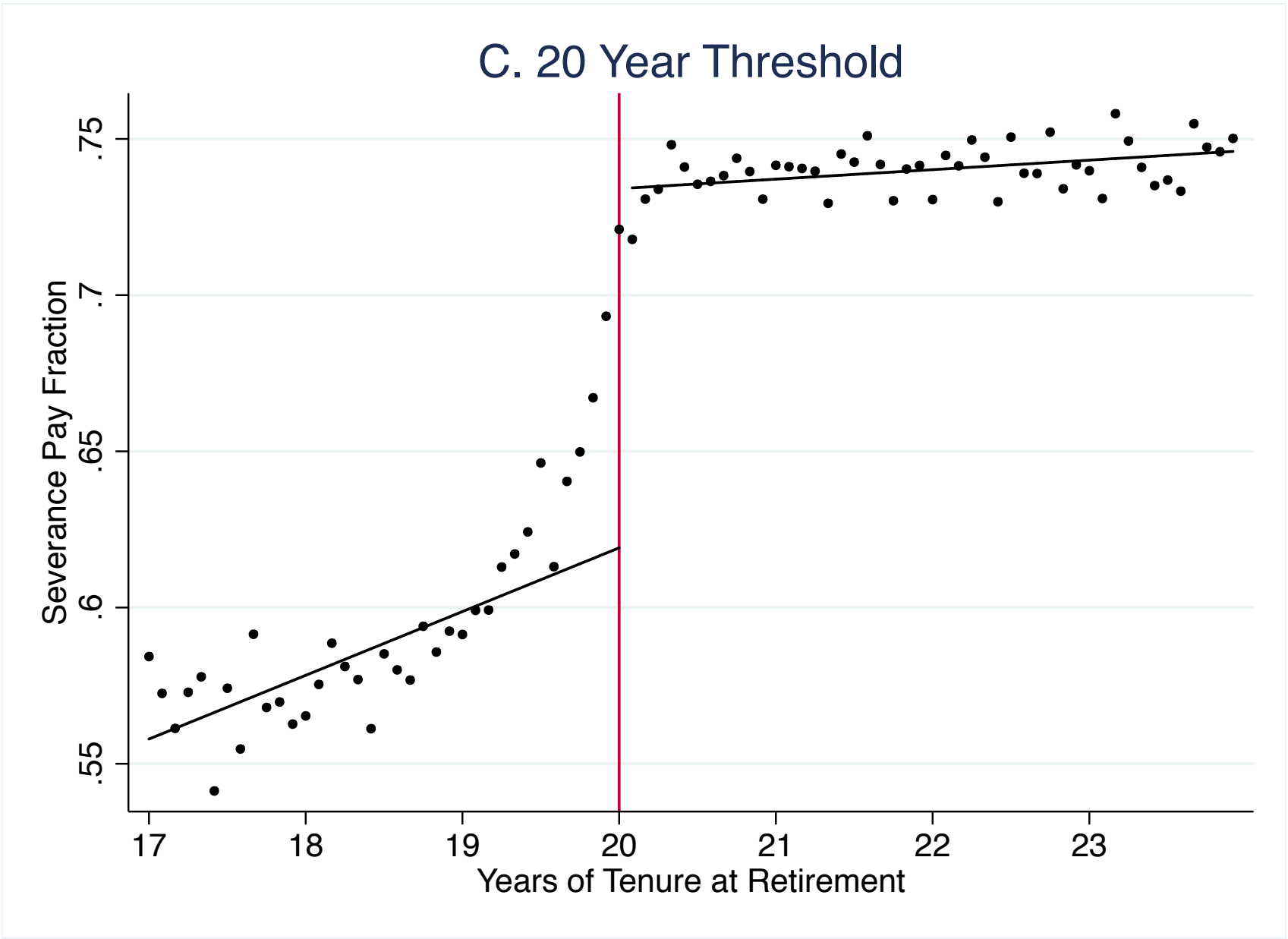
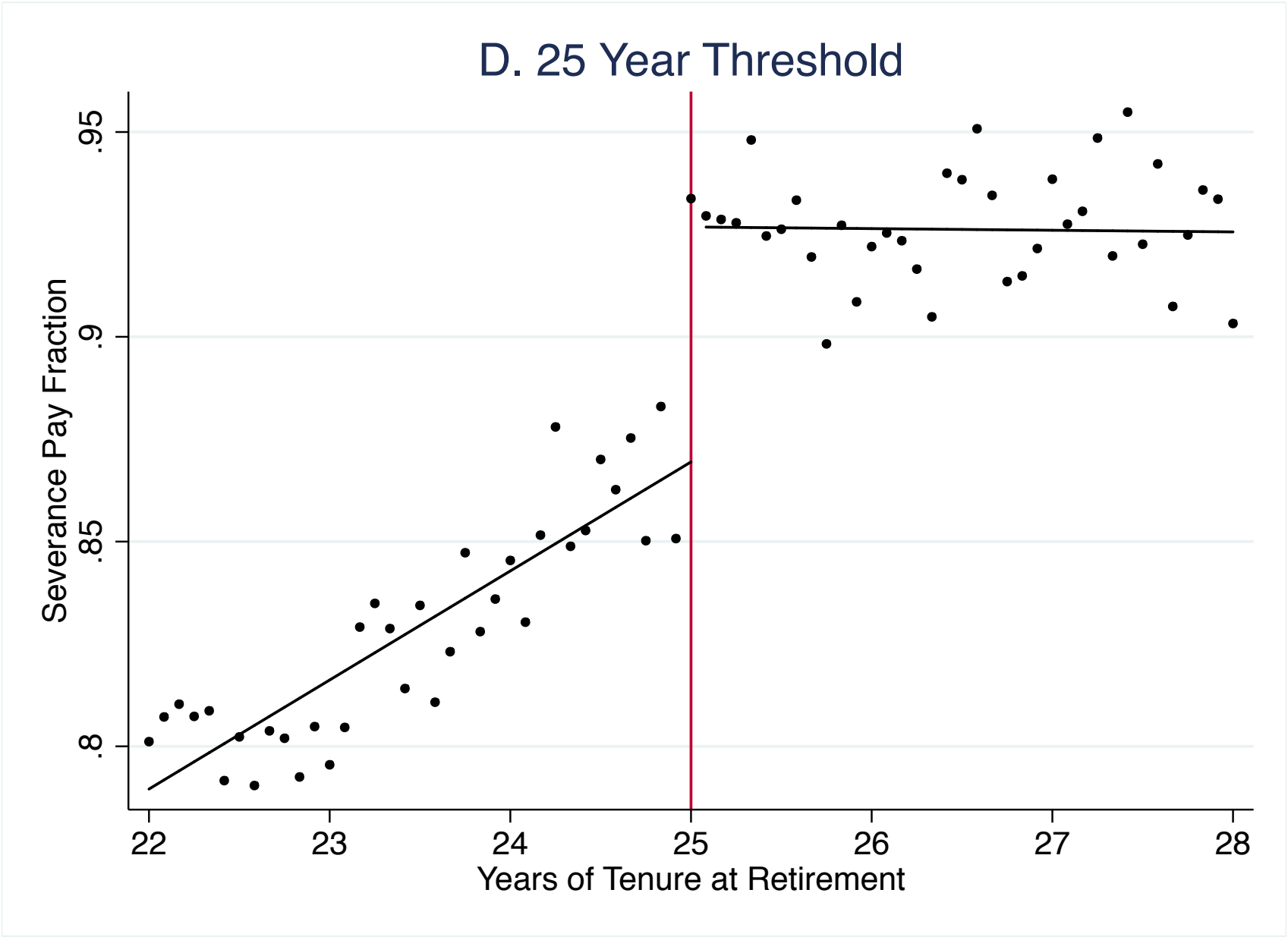


Mean Severance Payments, Responder Sample



Participation Elasticity

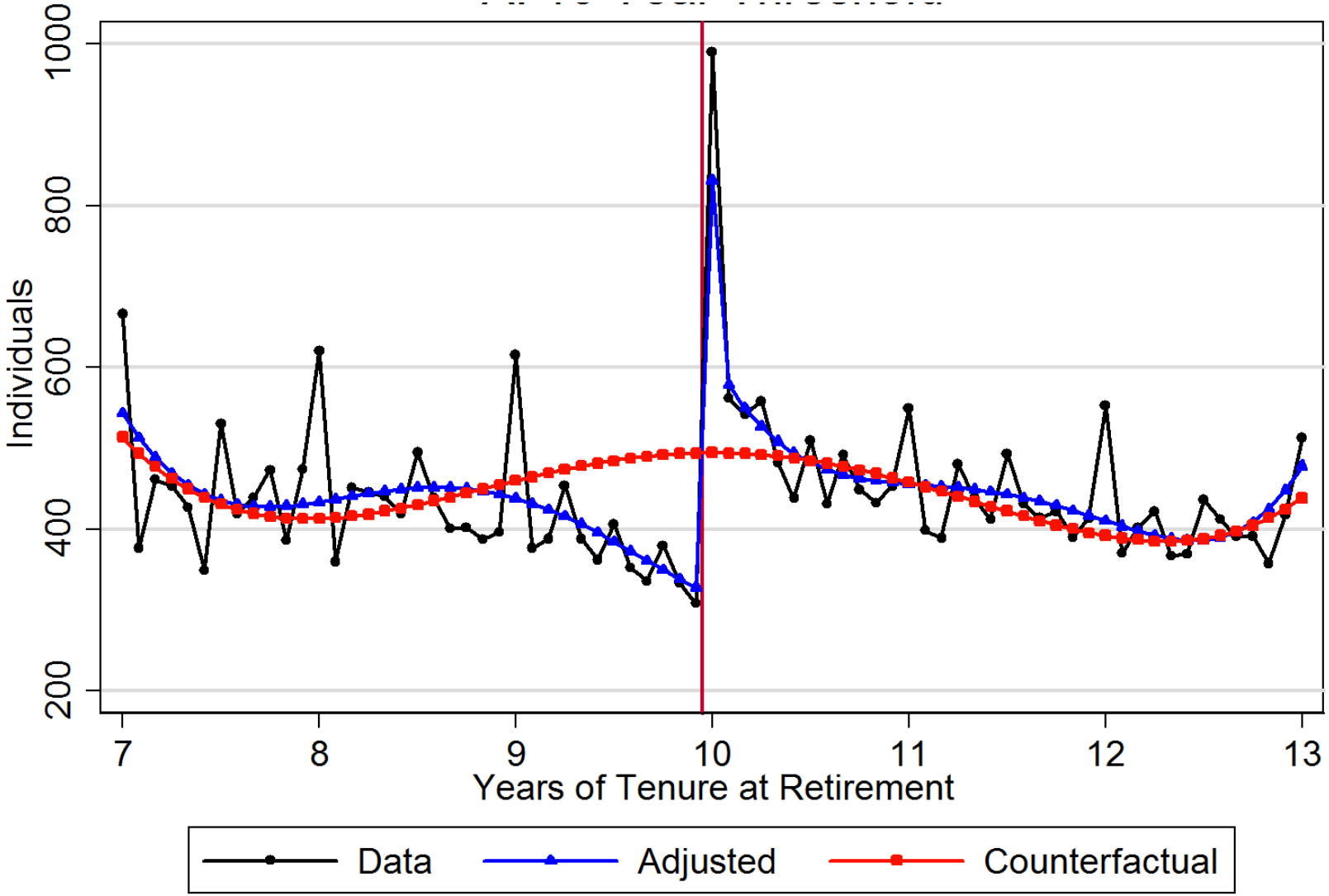
Relate retirement responses to financial incentives

$$\varepsilon = \frac{\Delta p/p}{-\Delta(1-\tau)/(1-\tau)}$$

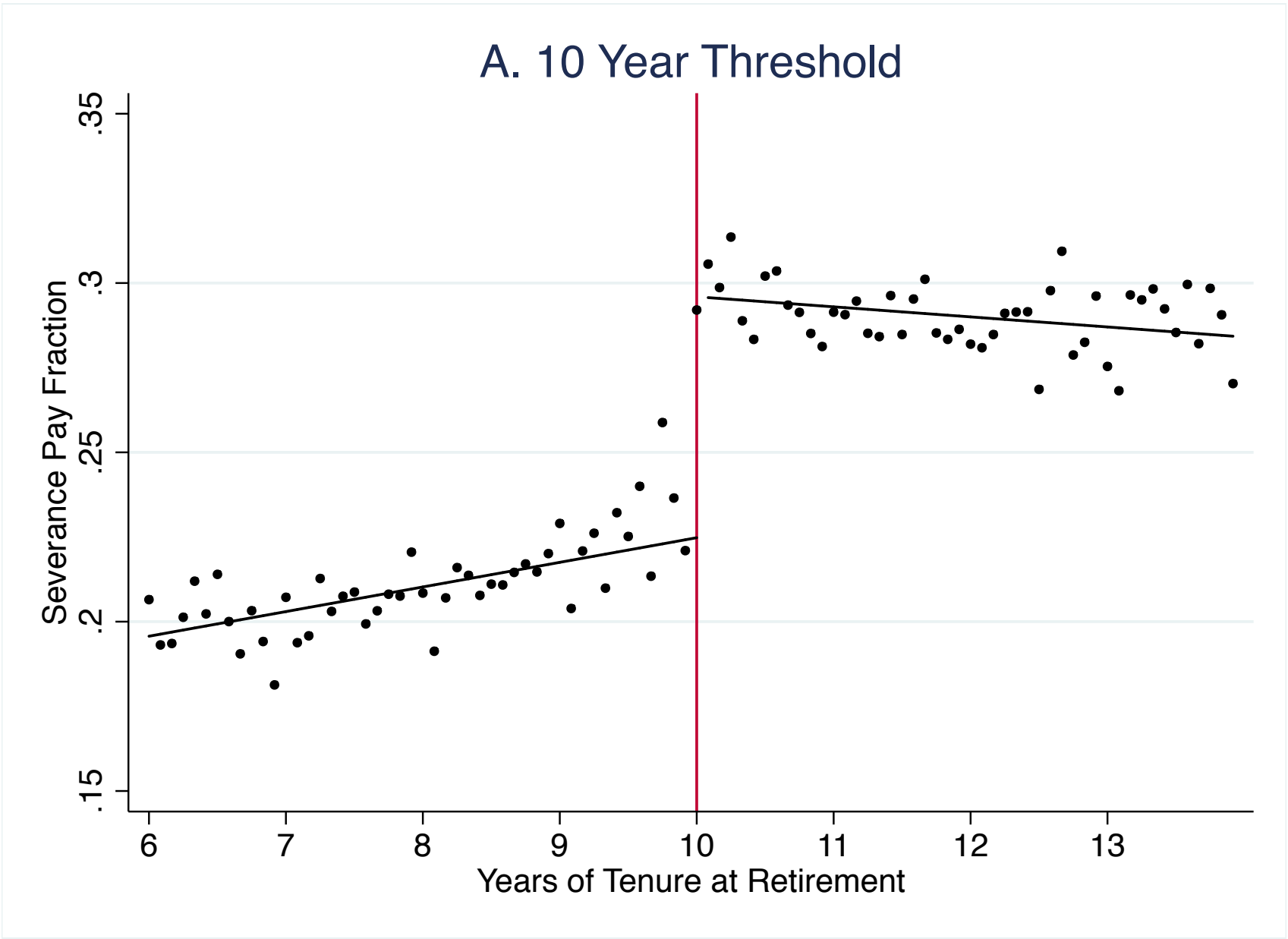
- Retirement response: relative increase in retirements at the tenure thresholds $\Delta p/p$
- Financial incentive: increase in the implicit tax rate

$$\Delta(1-\tau)/(1-\tau) = \frac{SP * (1 - t^{sev})}{y * (1-\tau)}$$

Estimating Changes in Retirement



Estimating Changes in Severance Pay



Participation Elasticities

Threshold	10 Year N=21,729	15 Year N=19,724	20 Year N=15,588	25 Year N=18,461	Average
Change in Retirement Probabilities					
	0.1414	0.2424	0.3777	0.2123	0.2434
	(0.0233)	(0.0277)	(0.0350)	(0.0251)	(0.0157)
Change in Sev Pay Fraction					
	0.0620	0.1056	0.1202	0.0514	0.0848
	(0.0046)	(0.0058)	(0.0049)	(0.0070)	(0.0028)
Change in Net-of-Tax Rate					
	0.2916	0.4963	0.5651	0.2415	0.3986
	(0.0215)	(0.0275)	(0.0229)	(0.0331)	(0.0131)
Elasticity					
	0.4848	0.4883	0.6684	0.8790	0.6301
	(0.0892)	(0.0622)	(0.0683)	(0.1668)	(0.0559)

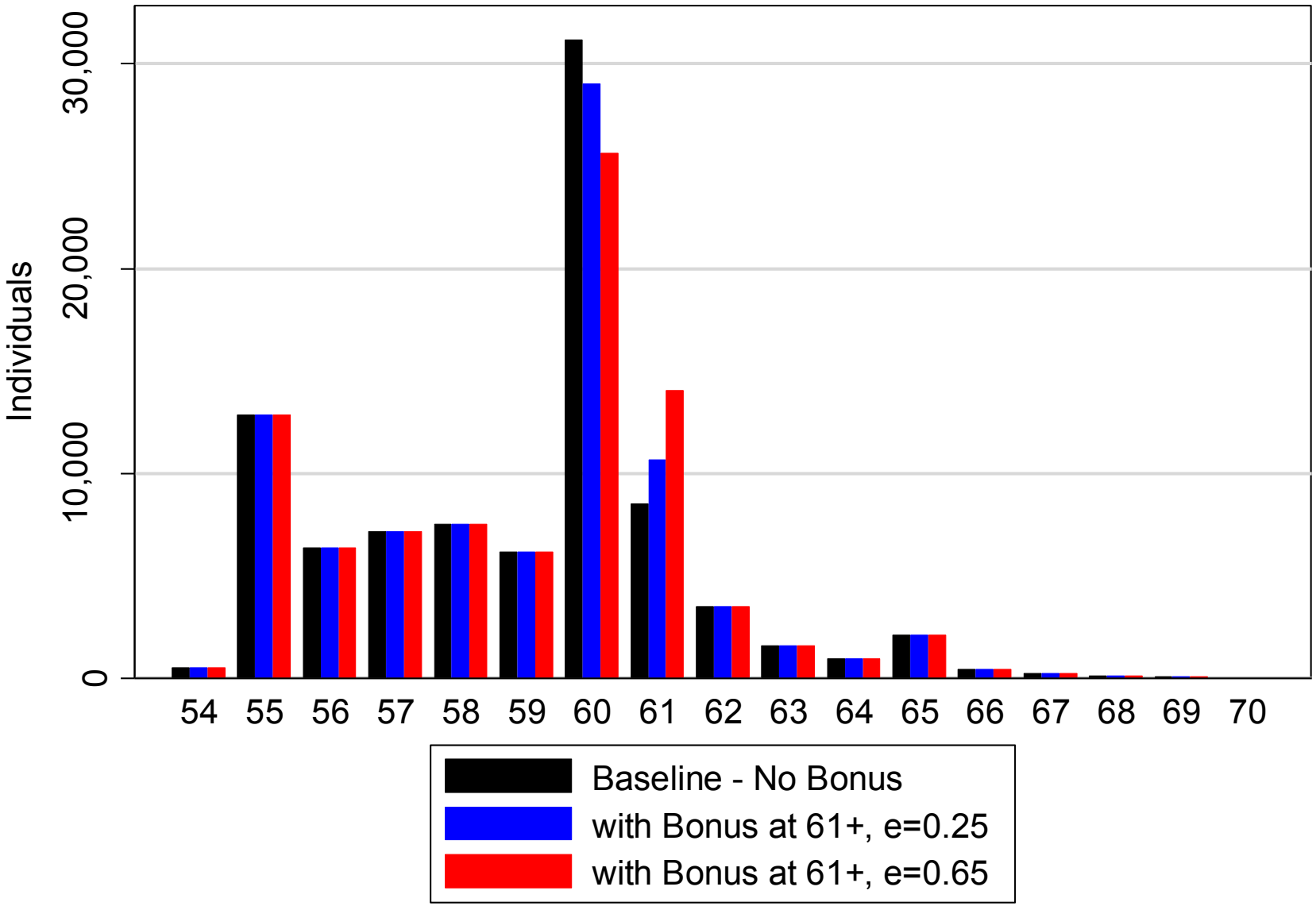
Participation Elasticities by Gender

Threshold	10 Year	15 Year	20 Year	25 Year	Average
Men					
Change in Retirement Probabilities					
	0.0975	0.1616	0.3889	0.1926	0.2102
	(0.0364)	(0.0397)	(0.0560)	(0.0322)	(0.0227)
Elasticity					
	0.3881	0.3815	0.7904	0.8455	0.6014
	(0.1613)	(0.1024)	(0.1298)	(0.2475)	(0.0877)
Women					
Change in Retirement Probabilities					
	0.1729	0.2999	0.3713	0.2375	0.2704
	(0.0288)	(0.0375)	(0.0421)	(0.0415)	(0.0203)
Elasticity					
	0.5380	0.5502	0.5990	0.9106	0.6495
	(0.1051)	(0.0762)	(0.0737)	(0.2691)	(0.0795)

Discussion

- Reduced from elasticity not derived as a structural model parameter
- Independent from parametric assumptions and specific model context
- Robust to scaling assumptions that arise in a static model framework a la Saez (2010)
- Elasticity can be used for calibration in standard macro model , i.e. Rogerson and Wallenius (2009)
- But: under more general model assumptions extensive margin intertemporal labor supply elasticity is an ambiguous concept (Attanasio, 2012)
- Policy experiment
  - Government provides lump-sum bonus for retiring at age 61 or later
  - Implies increase in average implicit tax rate from 0.8 to 1.00
  - Increase in fraction retiring at age 61 by $\hat{e} * dln(1 - \tau)$

Labor Supply Responses to Retirement Bonus at Age 61



Conclusion

How much are individuals adjusting retirement decisions in response to anticipated benefits?

- Exploit policy discontinuities in severance pay at retirement in Austria
- Clear evidence of retirement responses: Pattern of spikes and dips in retirements by tenure
- Analyse relevance of financial incentives in the data
- Reduced form elasticity concept relating retirement responses to financial incentives
- Results:
- Moderate elasticity of about 0.6, roughly three times larger than estimates based on legislative incentives
- Little evidence of heterogeneity across population of workers later in life-cycle
- Limited response to financial incentives in retirement decisions