

# Excess Early Retirement? Evidence from the Norwegian 2011 Pension Reform

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# Social security and retirement

- Common observation: Spikes in retirement hazards at the Early Retirement Age (ERA)

Possible explanations:

1. Lower net returns to work past the ERA
  - Due to earnings testing and non-neutral deferral mechanisms
2. Availability of pension benefits affecting retirement
  - Inconsistent with “standard model” with no liquidity constraints
  - Due to liquidity constraints, self-control problems, focal point norms?

# Social security and retirement

- Common observation: Spikes in retirement hazards at the Early Retirement Age (ERA)

Possible explanations:

1. Lower net returns to work past the ERA
  2. Availability of pension benefits affecting retirement
- A comprehensive pension reform in Norway allows us to quantify the effects of
    1. increased net returns to work past the ERA
    2. a reduction in the ERA

# Research questions

- 1 What are the effects of increased work incentives past the ERA on older workers' labor market behavior?
  - AFP workers: ERA = 62  
Removed implicit tax on continued work
- 2 What is the labor supply effect of providing flexible pensions from age 62?
  - nonAFP workers: ERA = 67 → ERA = 62
- 3 Can the spike in retirement at the ERA be reconciled with incentives in the pension system?
  - Calculate elasticities consistent with observed bunching in retirement age

## Main findings (so far)

- 1 Removing earnings testing and implicit tax on work past ERA has large positive effects on employment and earnings
- 2 Allowing workers to start drawing on their pension wealth from an earlier age has no effects on employment
  - Myopia/liquidity constraints not particularly important for spikes in retirement at minimum pensionable age
- 3 Elasticities consistent with observed bunching and changes in work incentives around the ERA are small
  - Behavioral responses to the Norwegian pension system in line with standard economic theory

# Literature and institutions

# Literature

- Effects of benefit availability on retirement age
  - Baker and Benjamin (1999); Vestad (2013); Staubli and Zweimüller (2014)
- Effects of benefit levels on retirement age/labor supply
  - Mastrobuoni (2009); Manoli and Weber (2014)
- Earnings test and net returns to work
  - Friedberg (2000); Song and Manchester (2007); Brown (2013); Brinch et al. (2014); Gelber et al. (2014)
- Early retirement and program substitution (UI, DI, sick leave)
  - Duggan et al. (2007); Karlström et al. (2008); Staubli (2011); Inderbitzin et al. (2015)

# The Norwegian pension system (pre-reform)

- NIS (National Insurance Scheme):
  - A PAYGO system with universal coverage
  - Minimum pension + earnings related pension
  - Benefits available from age 67
- AFP (supplementary contractual pension scheme):
  - Covers about 50% of private sector workers
  - Available between age 62 and 67
  - No actuarial adjustments; earnings testing
- Disability pension system:
  - Take-up rate  $\approx 40\%$  at age 66



# The 2011 pension reform

- Main features of new system:

- ① Claiming of public pensions can take place between ages 62 and 75
- ② Actuarially neutral benefit deferrals/deductions
- ③ No earnings testing

⇒ “Flexible retirement”: New pension rules disentangle age of exit from the labor force (“exit age”) from age of claiming benefits (“claiming age”)

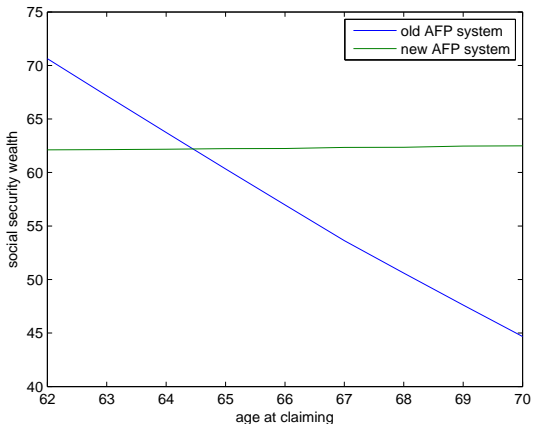
# AFP covered workers vs non-covered workers

Two groups of private sector workers affected in distinctively different ways:

- 1 AFP affiliated workers: Earnings testing and implicit tax on continued work past ERA removed
- 2 Non-affiliated workers: Access to public pensions up to five years earlier than before

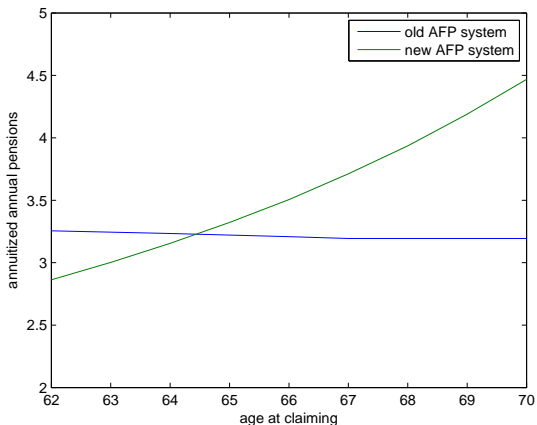
This presentation: Start with AFP workers, then AFP vs nonAFP

# Incentives: Total pension wealth by claiming age



**Figure:** Total pension wealth by claiming age. Decreasing in old system (no adjustments), constant in new system (actuarial adjustments).

# Incentives: Pension level by claiming age



**Figure:** Annuitized annual pensions by claiming age. Constant in old system (no adjustments), increasing with claiming age in new system (actuarial adjustments). [▶ Fig](#)

# Empirical analysis: AFP workers

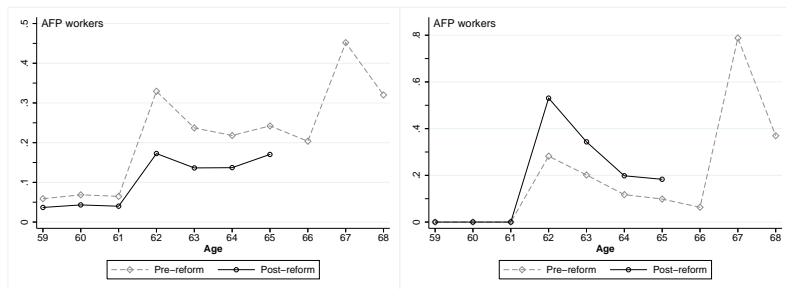
# Data

- Norwegian register data (various sources)
- Main sample:
  - Employed in private sector firm at age 58
  - Cohorts 1945-1955
  - Observed 2007-2014
- Outcomes: Employment, earnings, pensions, DI/UI benefits

# Descriptives: AFP workers, pre- and post-reform

Variable	Ages 62-65		Ages 59-61	
	Post	Pre	Post	Pre
Male	0.71	0.72	0.70	0.72
Married	0.70	0.73	0.68	0.72
Higher education	0.19	0.18	0.21	0.19
Earnings (in BA)	7.00	6.79	6.95	6.92
Experience	23.3	23.3	23.2	23.3
At least 1 yr without pension points	0.15	0.16	0.15	0.16
Months with sick leave benefits	0.83	0.88	0.79	0.84
Sick leave at age 58	0.21	0.22	0.20	0.21
Employed in small firm	0.03	0.05	0.03	0.04
Employed in manufacturing	0.35	0.39	0.31	0.37
Eastern Norway	0.40	0.43	0.39	0.41
<i>N. of individuals</i>	37,222	38,314	56,095	57,186
<i>N. of observations</i>	93,406	94,755	111,618	114,685

# Spikes: Labor market exits and pension claims



**Figure:** Labor market exit hazards (left panel) and pension claiming hazards (right panel), extended sample.

- Left: Significant reduction in exit hazards
  - Right: Significant increase in claiming hazards
- ⇒ Pension receipt + continued work more common

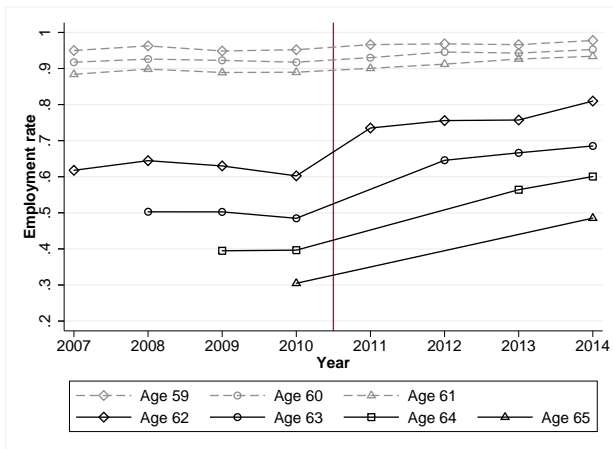


# Empirical specification: Difference-in-differences

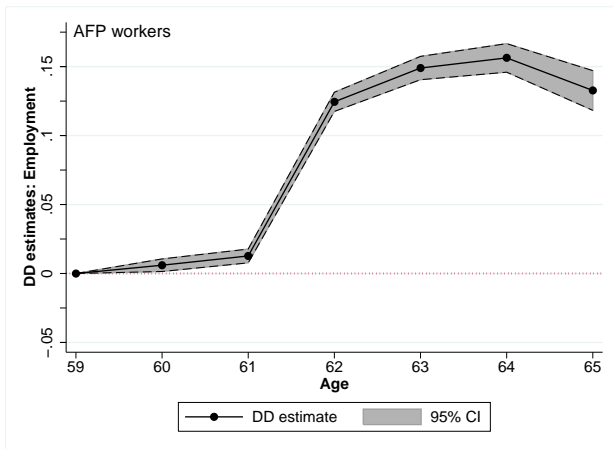
$$Y_{at} = \alpha + \lambda_t + \gamma_a + \sum_{a=60}^{65} \beta_a (\text{Post}_t \times \gamma_a) + \eta X + \varepsilon_{at},$$

- $\lambda_t$ : year fixed effects
- $\gamma_a$ : age fixed effects
- $\text{Post}_t$ : indicator for post-reform observations
- $\beta_a$ : the difference between post- and pre-reform outcomes at age  $a \in [60, 65]$ , minus the post-pre difference at age 59.

# Trends in employment rates, AFP workers

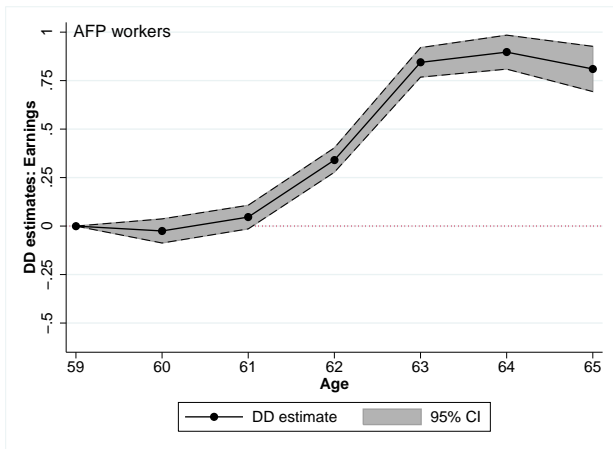


# Employment effects by age



DD coefficients relative to employment pre-reform (age):  
20% (62), 30% (63), 39% (64), 43% (65).

# Effects on earnings by age



DD coefficients relative to mean earnings pre-reform (age):  
6% (62), 22% (63), 30% (64), 36% (65).

# The impacts of pension reform on AFP workers

Effects of introducing actuarial neutrality and abolishing earnings testing:

- Substantial increase in employment (13 pp / 43% at age 65)
- Substantial increase in earnings (0.81 BA / 36% at age 65)
- Substantial increase in early claiming [▶ Tab](#)
- Still excess retirement at ERA

# nonAFP workers

# nonAFP workers

- Pre-reform: could not claim pensions prior to age 67
  - Post-reform: access to “flexible retirement” from age 62
- ⇒ A pure liquidity effect
- Expect no impact on labor market behavior, absent liquidity constraints and myopia

▶ Fig

# Pension claiming hazards (extended sample)

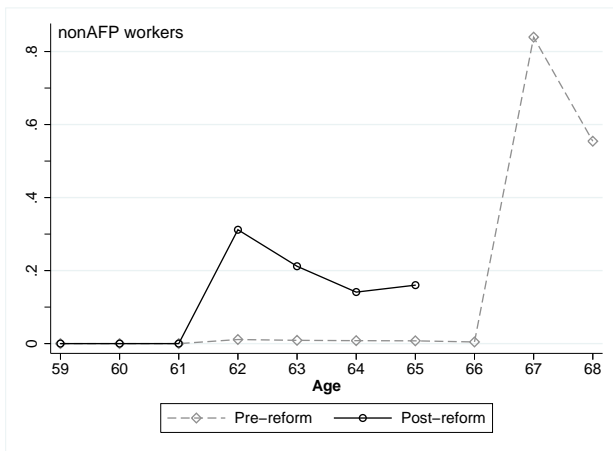
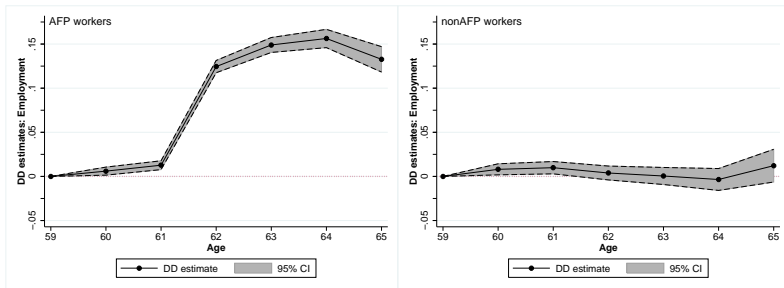


Figure: Pension claiming hazards, extended sample.

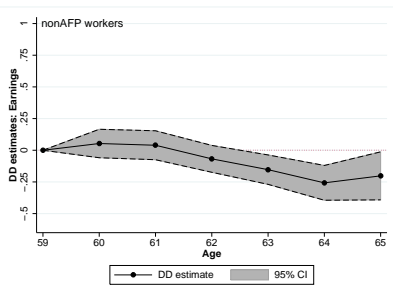
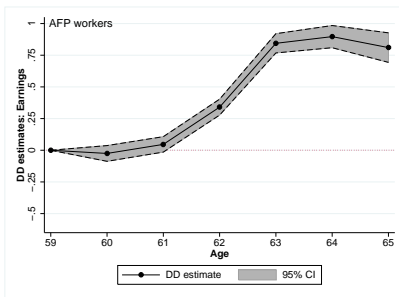


# Employment effects by age: AFP vs nonAFP workers

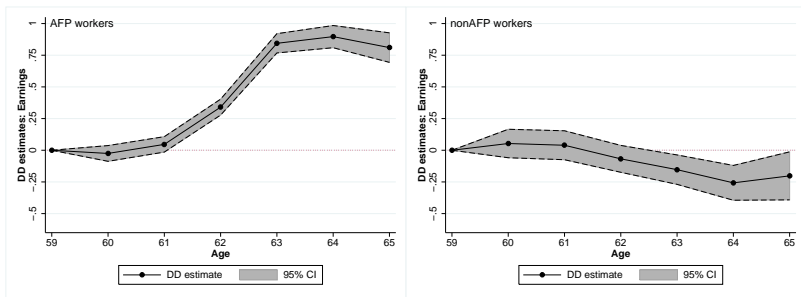


- nonAFP: No effects on employment rates (extensive margin)

# Effects on annual earnings by age: AFP vs nonAFP



# Effects on annual earnings by age: AFP vs nonAFP



DD coefficients relative to mean earnings pre-reform (age):

	(62)	(63)	(64)	(65)
AFP	6%	22%	30%	36%
nonAFP	-1%	-3%	-5%	-5%

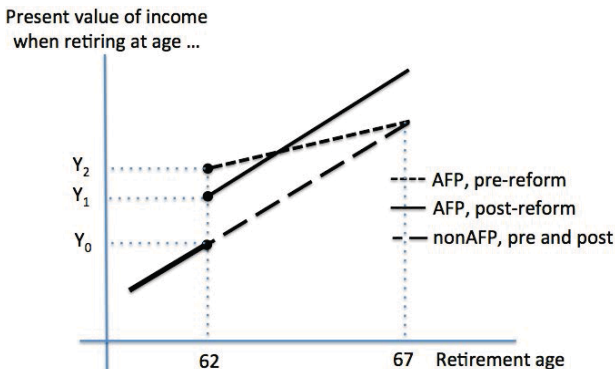
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# Excess retirement

# Excess retirement at the ERA

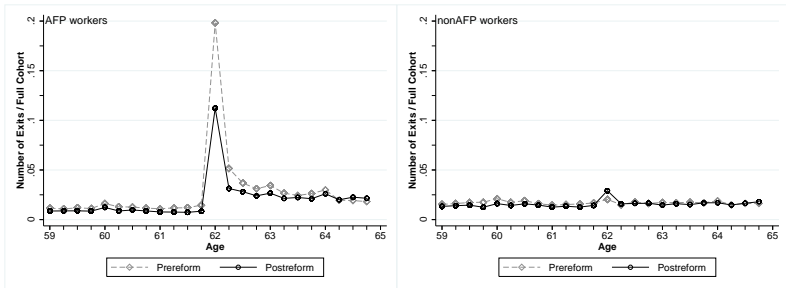
- Def. excess retirement: A mass point in the distribution of retirement ages (i.e.  $P(\text{retire at age } a) > 0$ )
- Should not occur when
  - (1) preferences for leisure are smoothly distributed
  - (2) individuals are rational
  - (3) there are no binding liquidity constraints
  - (4) the budget constraint is linear
- Spikes in retirement hazards are observed even in neutral systems (e.g. U.S.)
  - Possible explanations: liquidity constraints, self-control problems, norms
- Our aim: Investigate whether Norwegian spike can be explained by economic incentives

# The lifetime budget constraint



- nonAFP: no change in slope/level around ERA
- AFP pre-reform: upward notch and flatter slope after ERA
- AFP post-reform: upward notch but same slope after ERA

# Distribution of exit age: AFP vs nonAFP workers



**AFP:** Spike is reduced, but still excess retirement at ERA

**nonAFP:** Distribution  $\approx$  uniform; not affected by reform

# Retirement spikes and economic incentives

- Start out with post-reform spike; absent frictions, all bunching from below

Procedure:

- 1 Estimate excess mass at the ERA
- 2 Quantify work incentives from pension formulas
- 3 Calculate elasticities consistent with observed bunching and pension incentives
  - Static lifetime labor supply model
  - Quasi-linear preferences



# 1a. Counterfactual retirement age distribution

- Assumptions:

- no income effects
- smooth distribution of preferences for leisure
- no frictions

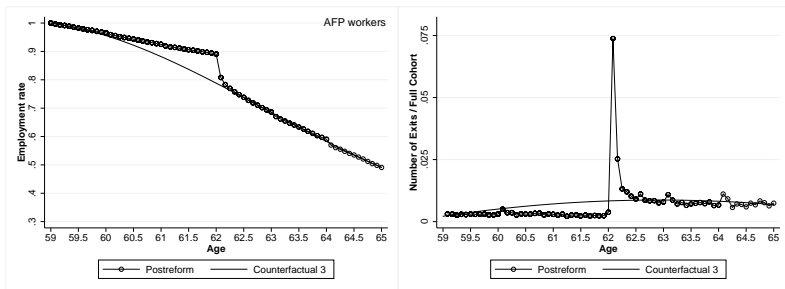
⇒ Labor supply behavior of post-reform workers *past age 62* unaffected by pension system

- Estimate counterfactual age profile of employment rate  $\hat{e}_t$  based on  $t > 62$

- Predicted frequency of retirement at age  $t$ :

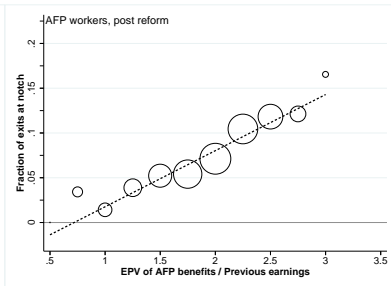
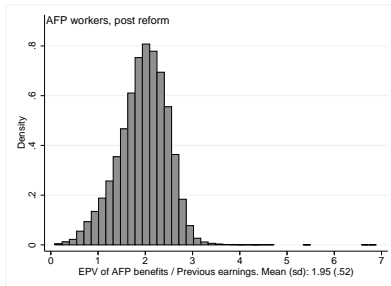
$$\widehat{f}[R(t)] = \hat{e}_{t-1} - \hat{e}_t$$

# 1b. Estimate excess mass



Counterfactual based on post-reform AFP workers past age 62y3m  
Bunching at the notch: 10.6 months

## 2. Relative notch and the size of the spike



- Left: Value of AFP affiliation  $\approx$  2 yearly earnings
- Right: Stronger incentives for bunching  $\Rightarrow$  more bunching

## 3a. Estimating elasticities from notches

- Apply formula based on Kleven and Waseem (QJE2013)

Simple story:

- When notch is present, all those who would otherwise retire between 61 and 62 will retire at age 62
- Marginal buncher:  $u(R = 61) = u(R = 62)$

$$\Rightarrow \frac{b + w\Delta R}{wR} = \frac{1}{1 + 1/e} \left[ \left( \frac{R^*}{R} \right)^{1+1/e} - 1 \right]$$

## 3b. Lifetime labor supply elasticity of substitution

Group	$\frac{\Delta SSW}{w}$	$B$	$\varepsilon_0$ (since 58)	$\varepsilon_1$ (lifetime)
<b>All</b> (n=18,489)	1.94	10.63	0.0815	0.0114
<b>Small notch</b> (n=6,156)	1.37	5.62	0.0356	0.0056
<b>Medium notch</b> (n=6,158)	1.98	9.85	0.0710	0.0100
<b>Large notch</b> (n=6,175)	2.47	16.41	0.1483	0.0184

- $\varepsilon_1 = 0.01$ : 1% increase in the net-of-tax rate  $\Rightarrow$  0.01% increase in lifetime labor supply
- $\Rightarrow$  Individual retirement decisions are very insensitive to financial incentives

# Bunching and pre-reform incentives

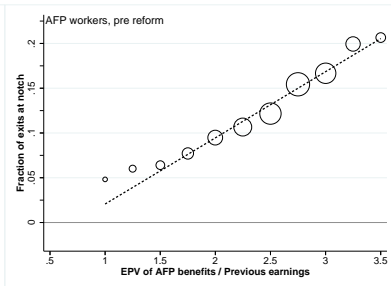
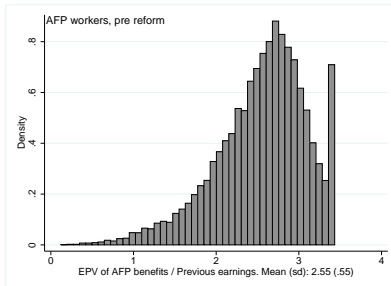
- Pre-reform system generates bunching from below ( $BB$ ) and above ( $BA$ ):
  - Below: Postpone retirement to collect AFP benefits
  - Above: Advance retirement because of implicit tax past ERA

Procedure for estimating elasticity:

- 1 Estimate excess mass at the ERA  $\Rightarrow$  total bunching ( $B$ )
- 2 Quantify work incentives from pension formulas; notch and kink
- 3 Combine notch and kink formulas, and solve for  $e$ :

$$B = BB(e) + BA(e)$$

# Relative notch and the size of the spike, pre reform



- Left: Value of AFP affiliation  $\approx$  2.5 yearly earnings
- Right: Stronger incentives for bunching  $\Rightarrow$  more bunching

# Lifetime labor supply elasticity, pre-reform data

<b>Group</b>	$\frac{\Delta SSW}{w}$	$B$	$(BB + BA)$	$\varepsilon_1$ (lifetime)
<b>All</b> (n=28,601)	2.55	20.8	(16.2 + 4.6)	0.019
<b>Small notch</b> (n=9,568)	1.93	13.9	(12.0 + 1.8)	0.014
<b>Medium notch</b> (n=9,516)	2.61	20.9	(16.3 + 4.7)	0.019
<b>Large notch</b> (n=9,517)	3.10	27.6	(20.4 + 7.3)	0.024



# Conclusion

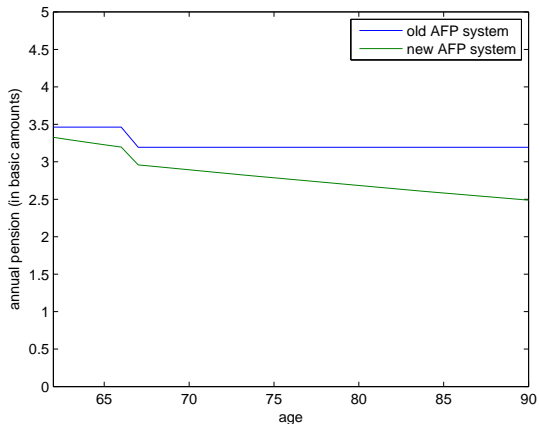
# Conclusion

- AFP workers: Increase in return to work past ERA
  - Strong impacts on earnings and employment at ages 62-65
  - Still excess retirement at age 62, but
  - Elasticities consistent with observed bunching and changes in work incentives around the ERA are small
- nonAFP workers: Earlier access to own pension wealth
  - No impact on employment at ages 62-65
  - Moderate intensive margin responses
- Both groups:
  - Substantial increase in early claiming
  - Small/no impacts on DI and UI take-up



<http://olavestad.com/>

## Incentives: Pension level when claiming at age 62



**Figure:** Pension level when claiming at age 62. Difference in social security wealth for early claimers is mainly due to different indexation.

## Incentives: Pension level when claiming at age 67

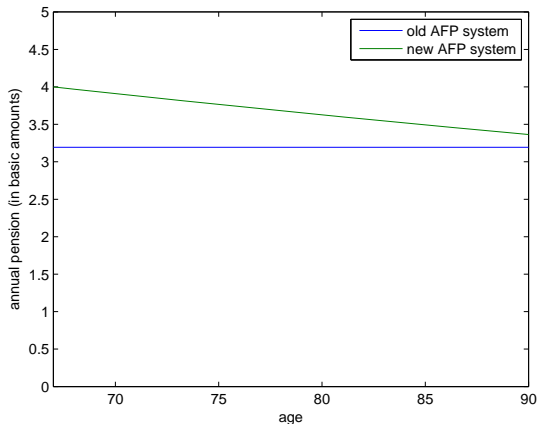


Figure: Pension level when claiming at age 67. Initial difference due to actuarial adjustments, convergence due to different indexation. [◀ Back](#)

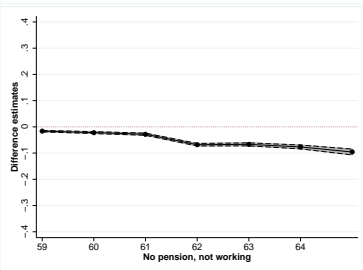
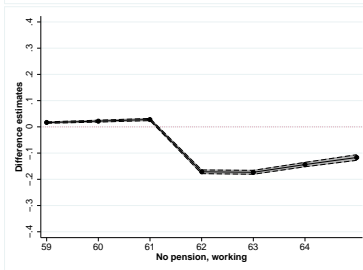
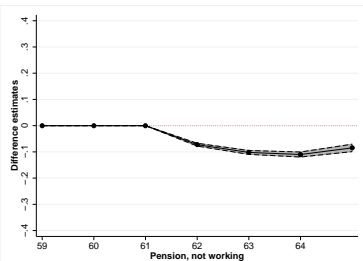
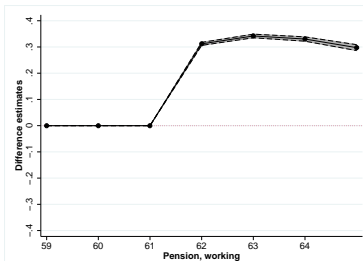
# Employment and pension claiming, pre- and post-reform

	Pension		No pension	
	Working (1)	Not working (2)	Working (3)	Not working (4)
Difference estimate	0.324*** (0.002)	-0.085*** (0.002)	-0.166*** (0.002)	-0.073*** (0.002)
Controls included	Yes	Yes	Yes	Yes
Mean pre-reform	0.093	0.306	0.416	0.185
<i>N. of individuals</i>	75,536	75,536	75,536	75,536
<i>N. of observations</i>	188,161	188,161	188,161	188,161

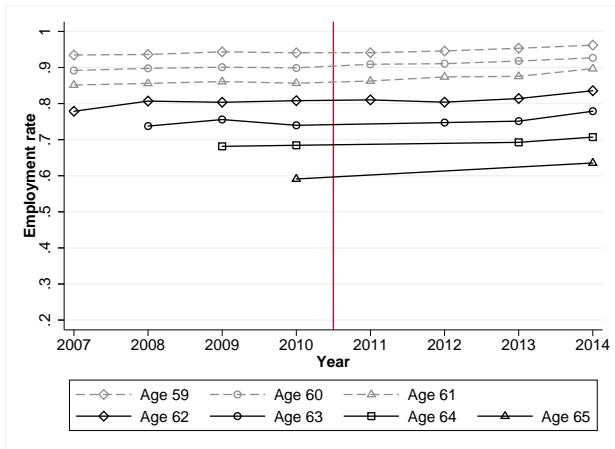
The sample includes AFP workers of age 62-65. The pre-reform (post-reform) group includes the cohorts 1945-1948 (1949-1952). We include observations of pre-reform (post-reform) workers until 2010 (2014).

Heteroskedasticity robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

# Employment and pension claiming by age



# Trends in employment rates, nonAFP workers





# Employment and pension claiming by age

