

2021 경제학공동학술대회

# 국민연금 소득심사제도와 고령층 노동공급

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# Motivation

- Population aging
  - Increasing life expectancy (“working longer” inevitable to finance retirement)
  - Low fertility rate (fiscal burden on later generations under PAYG)
- Design policies to enhance labor incentive of the older people
  - Pension provisions matter
- **Pension provisions** affecting retirement decision
  - Normal Retirement Age (NRA)
  - Actuarial adjustment in benefits
  - **Earnings test**

# Earnings test

- 국민연금 소득심사
  - 소득활동에 따른 노령연금(제63조의2): 연금수급자 소득 활동 시 감액
  - 후생연금 在職老齡年金(1965~)
  - 재직자 노령연금(1973~)
- 소득 활동
  - 근로소득자 또는 사업자(사업자등록)
  - 월평균소득이 가입자 평균소득월액(A값) 초과
- 2015년 개혁으로 소득심사 완화
  - 고령층 근로유인 강화

# What we do

- Evaluate the labor supply responses
  - Following the 2015 reform of the earnings test of the National Pension
- Regression discontinuity design
  - **Sharp discontinuity** in treatment status over date of birth
    - Cutoff date of birth: 29<sup>th</sup> July 1954
    - **Pensioners have no control** over the date of birth
- The Korean Labor Force Survey – May Elderly Supplement
  - Access to **confidential** month of birth

# Literature on the OASDI

- Early studies
  - Small or insignificant effects (Blinder, Gordon, Wise 1980; Burtless & Moffitt 1985)
- Recent studies
  - Bunching (Friedberg 2000 Survey data; Haider & Loughran 2010 Admin data)
  - DD (Song & Manchester 2007; Gelber et al. JHR)
  - Using nonlinear budget sets (Gelber et al. AER & AEJAE)

# Literature on Non-US pensions

- Non-US public pensions
  - Canada (Baker & Benjamin 1999)
  - UK (Disney & Smith 2002)
  - Norway (Brinch et al. 2016)
- Our contributions
  - First to use RDD
  - Tax vs. Saving
  - Intensive vs. Extensive margins

# Preview of the findings

- Overall
  - **↑3.4h** per week among pensioners age 61-65
- By pension benefits
  - (bottom 75%) **↑6.5h**
  - (upper 50%) **↑12.4h**
  - (top 25%) **↑8.8h**
- By education
  - (college or more) **↑21.0h**
- By sex
  - (female) greater increase

# The 2015 reform of the earnings test

- Major changes
  - **Much less stringent**
  - Progressive structure
  - Penalize based on earnings, not age
- Post-reform rules
  - Effective for those **entitled on and after July 29, 2015**
- Notations
  - $y_i$  = monthly earnings for pensioner  $i$
  - $A = \bar{y}_j$  = average of monthly earnings of the workers  $j$
  - Excess monthly earnings (EME) =  $y_i - A$



# Pre-reform rules

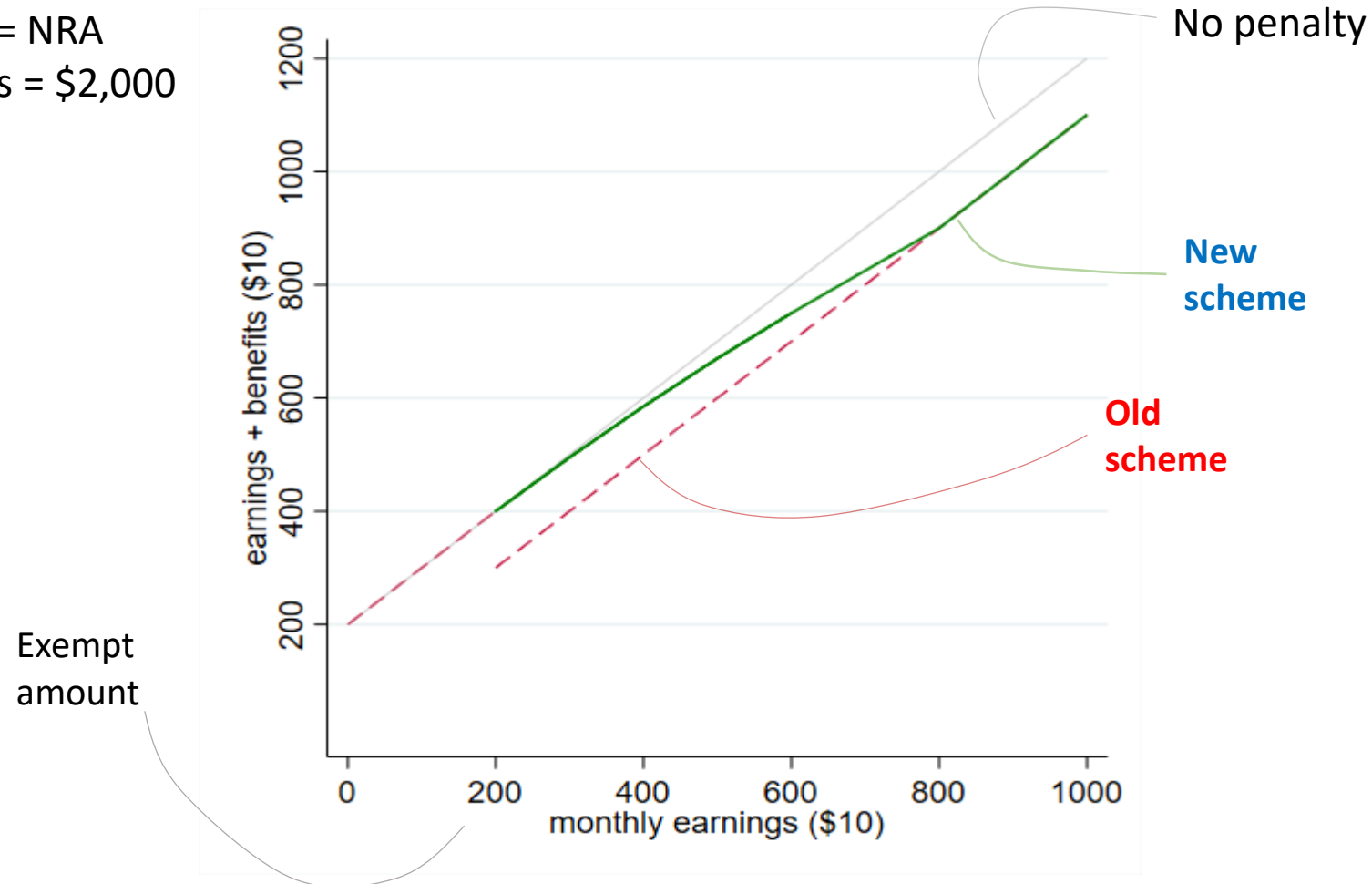
- Benefit reduction kicks in if  $EME > 0$
- Benefit reduction based on the **age of pensioner**
  - **50%** reduction in benefits at **NRA**
  - **40%** reduction in benefits at **NRA+1**
  - ...
  - **10%** reduction in benefits at **NRA+4**
- Max penalty=50% of benefits

# Post-reform rules

- Benefit reduction kicks in if
  - $EME > 0$
  - $age \in [NRA, NRA+4]$
- Benefit reduction based on **EME**
  - **Exempt amount = A**
  - **5%** of EME 첫 100만원
  - **10%** of 그 다음 100만원
  - ...
  - **25%** of 400만원 넘는 EME
- Max penalty=50% of benefits

# Income & earnings under the earnings test

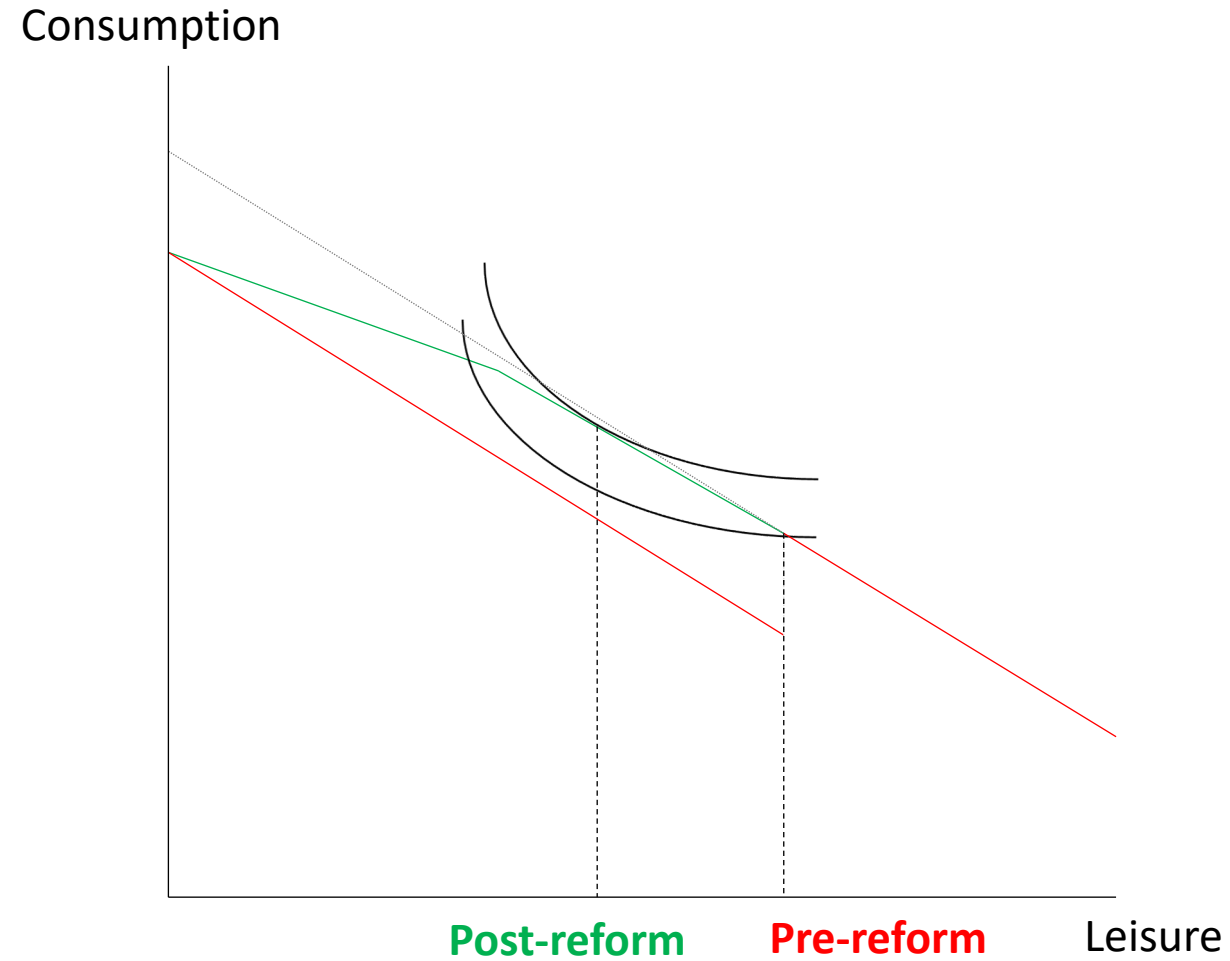
Pensioner's age = NRA  
Monthly benefits = \$2,000



# Theoretical prediction I

- Under the pre-reform earnings test,
  - Pensioners **bunch** below the exempt amount
  - These pensioners will **increase** L-supply following the reform

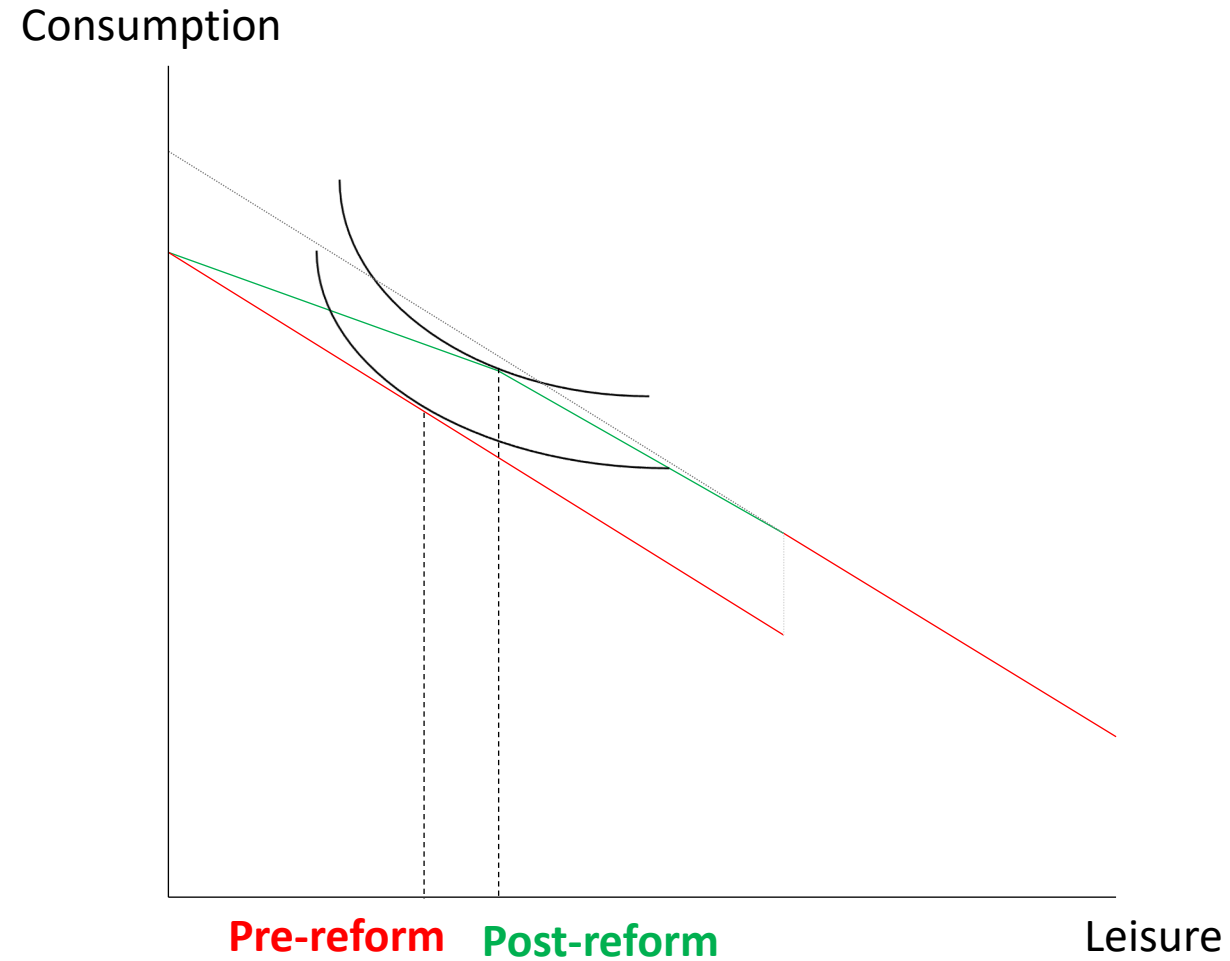
# Labor supply may increase



# Theoretical prediction II

- Those who would be subject to the penalty under the pre-reform earnings test will **decrease** L-supply under the post-reform earnings test
  - Income and substitutions effects having the same sign
- In sum, the aggregate response is ambiguous
  - An **empirical issue**

# Labor supply may decrease



# Empirical strategy

- Reform affected those entitled after July 29, 2015
  - NPA =61 for the 1954 birth cohort
  - Treated group: those born on and after July 29, 1954
  - Control group: Those born just before July 29, 1954
- Pooled cross-sectional comparison

		2016 May	2017 May	2018 May	2019 May
Treatment status	Date of birth				
Control	Jan 1954 ~ Jul 1954	61/62	62/63	63/64	64/65
Treated	Aug 1954 ~ Dec 1954	61	62	63	64



# Model

- Model

$$Hours_{i,t} = \alpha + \delta Treated_i + \gamma MOB_i + \theta \mathbf{X}_i + \lambda_t + e_{i,t}$$

- Controls

- Month of birth ( $MOB_i$ )
- Age dummies, sex, marital status, educational level, city, farm ( $\mathbf{X}_i$ )
- Calendar year effects ( $\lambda_t$ )

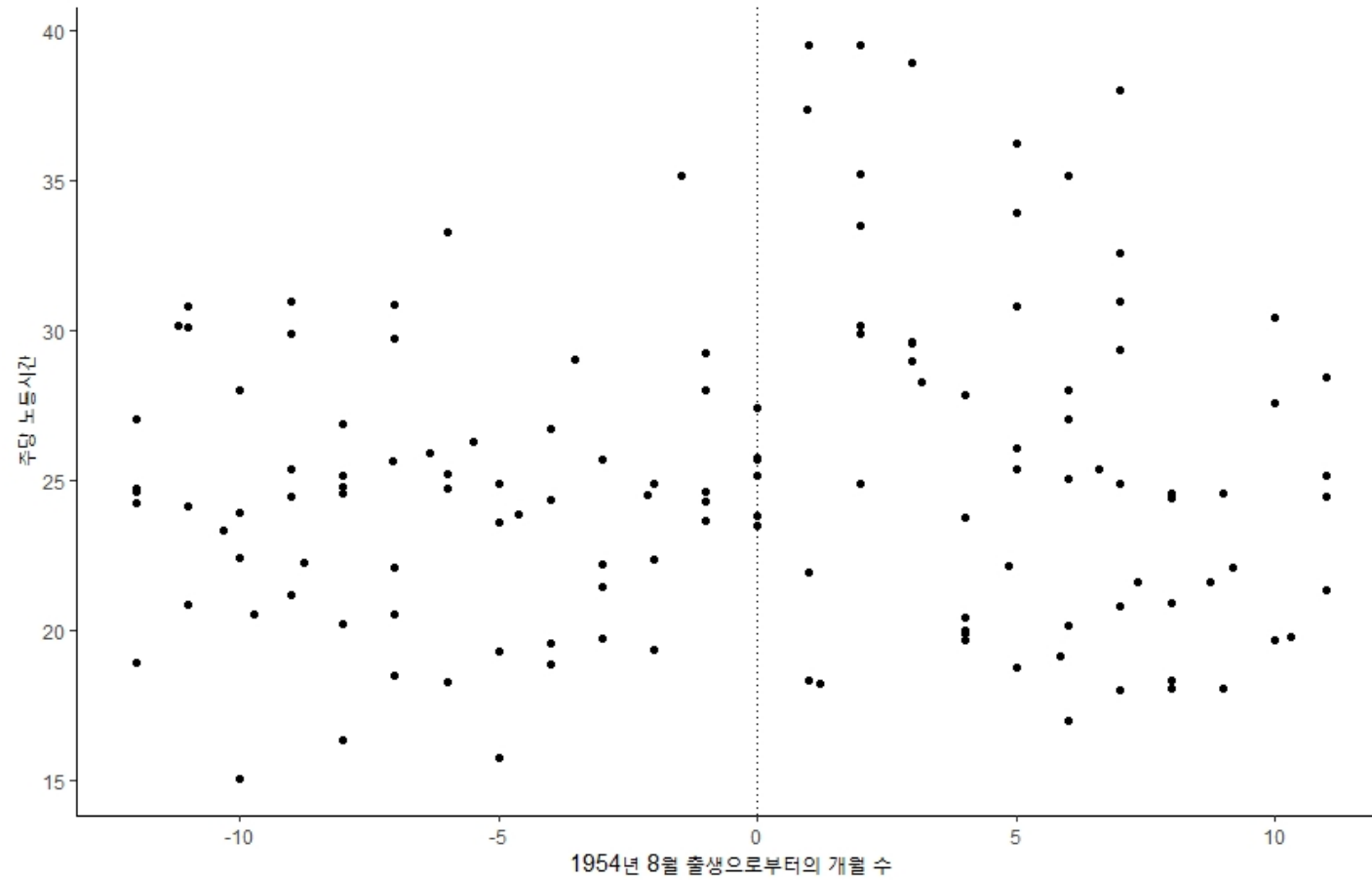
# Sample

- Source
  - 경제활동인구조사 5월 고령층부가조사, 2016-19
  - **Confidential data on month of birth**
  - Actual date of birth ≠ official date of birth
- Elderly employees in nonfarm private sector
  - Nonfarm employees in private-sector & self-employed
  - Aged 61-65
    - Subject to earnings test
    - Ineligible for the Basic Pension

# Sample restriction

Sample	Exclusion criteria	N
1954 Birth cohort, 2016-19		3,996
	No pension (2,297)	1,699
	Never worked (26)	1,673
	Public admin. & Military service (44)	1,629
	Education service (21)	1,601
Pensioner sample		1,081

# Hours worked by month of birth



# Modeling choices

- Sample periods
  - Baseline: 2016-19
  - Alternative: 2018-19
- Estimation window
  - Baseline: 1954 birth cohort
  - Balanced window: Mar to Dec, 1954
- Variance estimation
  - Cluster robust variance (CRV) estimator (Lee & Card 2008)
  - Eicker-Huber-White (EHW) estimator
- Hours & month of birth
  - Baseline: Common linear
  - Alternative: Separate linear

# Results:

## By benefits

Dependent var.	Hours worked			
Sample	Full	Benefits top 75%	Benefits upper 50%	Benefits Top 25%
	(1)	(2)	(3)	(4)
<b>Panel A. EHW</b>				
treated	3.38 (2.35)	6.53** (2.64)	12.37*** (3.24)	8.08* (4.74)
N	1,601	1,211	796	398
R-squared	0.14	0.15	0.17	0.12
<b>Panel B. CRV</b>				
treated	3.38 (2.92)	6.53*** (1.62)	12.37*** (3.04)	8.08 (5.76)
N	1,601	1,211	796	398
R-squared	0.14	0.15	0.17	0.12
<b>Panel C. EHW &amp; Window = 5m</b>				
treated	2.55 (2.65)	7.09** (2.97)	14.51*** (3.65)	13.55** (5.33)
N	1,315	1,009	661	332
R-squared	0.13	0.15	0.19	0.15
<b>Panel D. EHW &amp; Year &gt;= 2018</b>				
treated	0.12 (3.01)	2.97 (3.46)	8.53** (4.18)	5.43 (6.35)
N	946	714	465	224
R-squared	0.13	0.15	0.18	0.10
<b>Panel E. EHW &amp; Separate</b>				
treated	-0.04 (7.53)	10.36 (8.53)	21.65** (10.63)	29.97* (15.34)
N	1,601	1,211	796	398
R-squared	0.14	0.15	0.17	0.13

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Results:

## By education

Dependent var.	Hours worked			
Sample	Full	Less than high school	High school grad	College or more
	(1)	(2)	(3)	(4)
<b>Panel A. EHW</b>				
treated	3.38	-0.64	0.25	20.97***
	(2.35)	(3.27)	(4.31)	(5.34)
N	1,601	761	539	301
R-squared	0.14	0.16	0.16	0.21
<b>Panel B. CRV</b>				
treated	3.38	-0.64	0.25	20.97***
	(2.92)	(4.49)	(3.83)	(5.21)
N	1,601	761	539	301
R-squared	0.14	0.16	0.16	0.21
<b>Panel C. EHW &amp; Bandwidth = 5m</b>				
treated	2.55	-4.47	0.42	25.25***
	(2.65)	(3.67)	(4.94)	(5.69)
N	1,315	631	438	246
R-squared	0.13	0.16	0.15	0.21
<b>Panel D. EHW &amp; Year &gt;= 2018</b>				
treated	0.12	-3.05	-2.86	11.99*
	(3.01)	(4.09)	(5.80)	(6.96)
N	946	461	306	179
R-squared	0.13	0.15	0.12	0.22
<b>Panel E. EHW &amp; Separate</b>				
treated	-0.04	-15.92	-4.06	44.11***
	(7.53)	(10.90)	(13.28)	(15.88)
N	1,601	761	539	301
R-squared	0.14	0.16	0.16	0.22

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Summary

- Overall
  - 주당 3시간 더 근로
- By amount of pension
  - (연금액 상위 75%) 주당 6시간 더 근로
  - (연금액 상위 50%) 주당 12시간 더 근로
  - (연금액 상위 25%) 주당 8시간 더 근로
  - 여성에서 더 강한 효과
- By education
  - (대졸 이상) 주당 21시간 더 근로
  - 여성에서 더 강한 효과



# Policy implications

- The case for **complete removal**
  - Pensioners' labor supply is sensitive to penalty for work on pension
    - Labor disincentive still present after the 2015 reform
    - The number of older people is sharply increasing
    - The share of pensioners is increasing also
  - Arguably a Pareto improvement
    - Very small cost savings
  - Equity?
    - Strong redistribution already embedded in the benefit formula
    - Does not help to reduce poverty
    - Has to be achieved globally, not locally