Effect of Delayed Retirement Credit on Social Security Claiming and Employment

Mark Duggan
Stanford University

Irena Dushi
Social Security Administration

Sookyo Jeong
Stanford University

Gina Li
Stanford University

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Introduction

Social Security is the largest social insurance program in the U.S.

- Began in 1935 during the Great Depression
- Provides monthly income to insured workers and their families
- As of December 2018:
  - Total cost of OASDI: $1.000 trillion
  - 46.8 million retired workers and dependents received benefits with average monthly benefits of $1414.37

Long term program solvency

- OASDI costs will exceed income beginning in 2020
- OASI reserves to be depleted by 2034
- Program insolvency driven by two major sources:
  1. Retirement rate of baby-boomers exceeds increase in number of covered workers
  2. Increased life expectancy

Social Security Program Details

Program Eligibility

- Paid payroll tax for at least 40 quarters (10 years)
- Age 62 (Early Retirement Age) or older

Benefits Formula

1. Calculate the AIME (Average Indexed Monthly Earnings) - Average of 35 years of highest indexed earnings
2. Derive the PIA (Primary Insurance Amount) from AIME
3. Adjust for Claiming Age
   - 3.1 Early claiming actuarial reduction
   - 3.2 Delayed Retirement Credit (DRC)

Changes Affecting Claiming Incentives

Historical Changes (DRC and FRA)

1. 1977 Amendment: DRC increases to 3% between 65 and 72
2. 1983 Amendment: FRA and DRC changes by birth cohort

Earnings Test

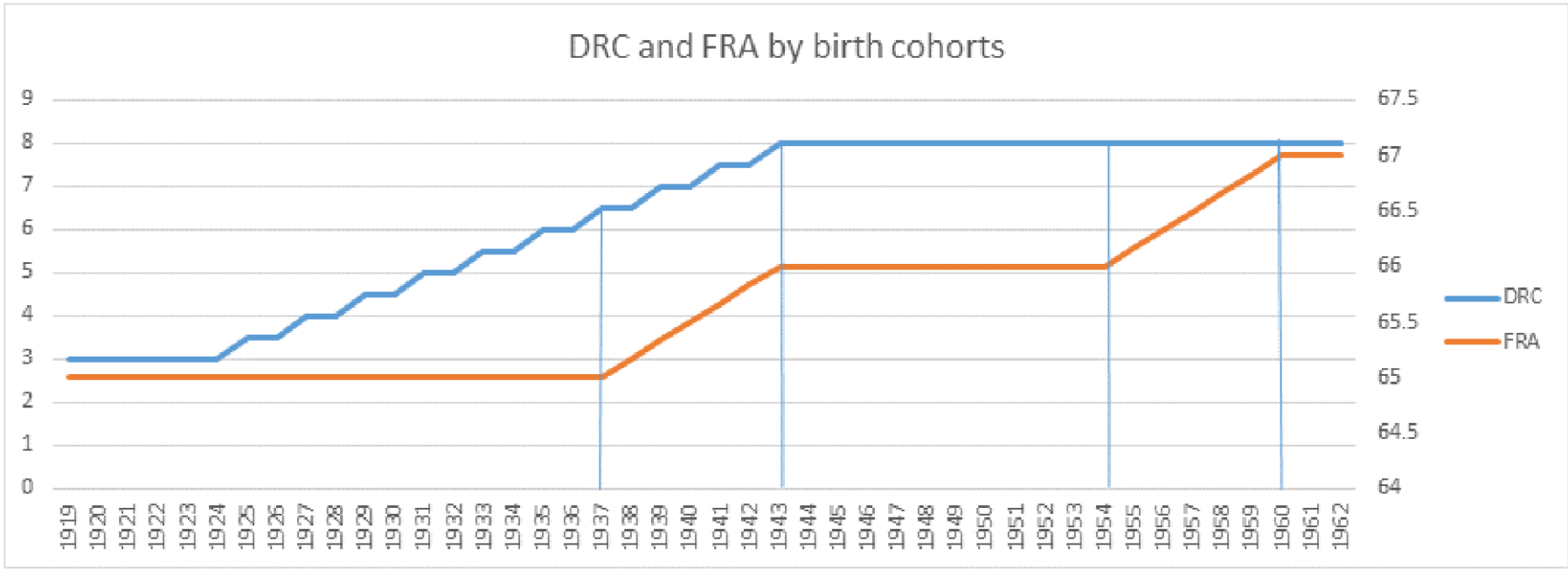
1. 1983: Elimination of earnings test for 71-72
2. 1990: Lowered benefits reduction rate to 33% from 50% for 65+ (enacted in 1983)
3. 2000: Elimination of earnings test for 65+

Rise in Life Expectancy

Probability of Death within Year

Birth Year	65	66	67	68	69
1924	2.4%	2.6%	2.8%	3.0%	3.2%
1937	1.9%	2.0%	2.1%	2.2%	2.4%

DRC and FRA


DRC and FRA by birth cohorts
9
8
7
6
5
4
3
2
1
0
67.5
67
66.5
66
65.5
65
64.5
64
1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962
DRC
FRA

Rate Schedule

Birth Year	FRA	DRC (%)	Age 62 (%)	Age 65 (%)	Age 70 (%)
1919-24	65	3	80	100	115
1925-26	65	3.5	80	100	117.5
1927-28	65	4	80	100	120
1929-30	65	4.5	80	100	122.5
1931-32	65	5	80	100	125
1933-34	65	5.5	80	100	127.5
1935-36	65	6	80	100	130
1937	65	6.5	80	100	132.5
1938	65, 2 mo.	6.5	79.2	98.9	131.4
1939	65, 4 mo.	7	78.3	97.8	132.7
1940	65, 6 mo.	7	77.5	96.7	131.5
1941	65, 8 mo.	7.5	76.7	95.6	132.5
1942	65, 10 mo.	7.5	75.8	94.4	131.25
1943-54	66	8	75	93.3	132

Research Question

How have increases in the delayed retirement credit affected the Social Security claiming decisions of retired workers?

- Do people respond to these later claiming incentives?
  - Heterogeneity in response: Are those with the longest life expectancies or highest PIAs the ones claiming later?
- What implications do DRC rates have on employment and earnings?
  - Previous research have largely focused on changes in the FRA and the earnings test

$\Longrightarrow$ Social security expenditure and program solvency

Literature Review

Delaying SS is documented to be beneficial to most individuals.

- Coile et al. 2001; Shoven and Slavov 2012, 2013; Heiland and Yin 2014; Sun and Webb 2009; Meyer and Reichenstein 2010; Munnell and Soto 2005; Sass, Sun, and Webb 2007, 2013; Mahaney and Carlson 2007; Meyer and Reicherstein 2010

Features of SS, such as FRA and DRC, have implications for elderly employment.

- Pingle 2006; Song and Manchester 2007; Purcell 2016; Mastrobuoni 2006; Krueger and Meyer 2002

Constraints that Prevent Delaying Claims

- Liquidity: Goda et al. 2015; Engelhardt, Gruber and Kumar 2018
- Mortality: Goda et al. 2017; Hurd, Smith, and Zissimopoulos 2004; Glickman and Hermes 2015; Beauchamp and Wagner 2012; Waldron 2002
- Social Norms: Behagel and Blau 2012; Coe, Kahn and Rutledge 2013
- Knowledge about SS: Liebman and Luttmer 2014, 2015; Mastrobuoni 2009; Delavande and Rohwedder 2011; Rohwedder and Soest 2006; Maurer et al. 2016

Simulation Details

When to Claim?

- Some may aim to maximize expected present value of benefits stream
- For a single individual deciding to claim in month m since age 62 with birth year b, EPV from claiming:

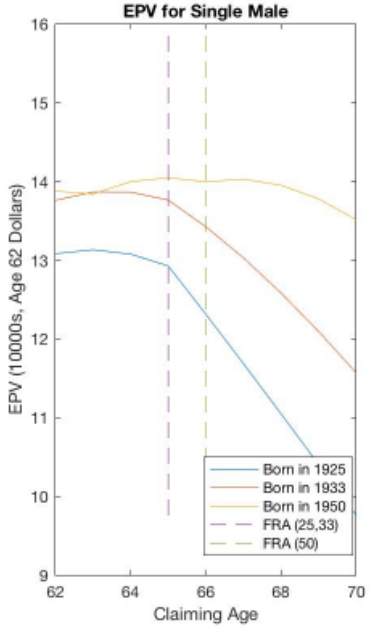
$$EPV_{m,b}^{mon} = (PIA \cdot \delta_{m,b}) \sum_{t=m}^{A} \left[\left(\prod_{j=-1}^{t-1} l_{j,b} \right) (1 + r_{mon})^{-t} \right]$$

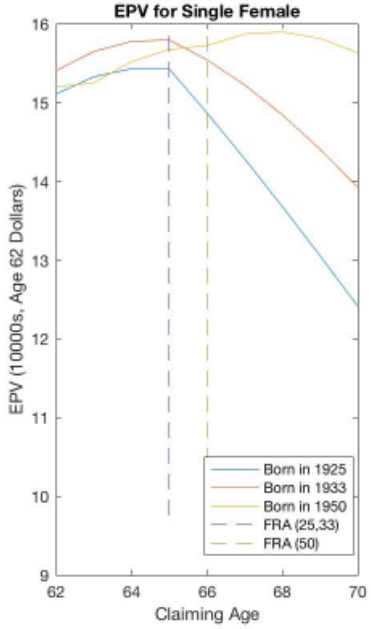
- where δ is the adjustment rate, A is the maximum age, l is the monthly survival probability, and r is the real discount rate

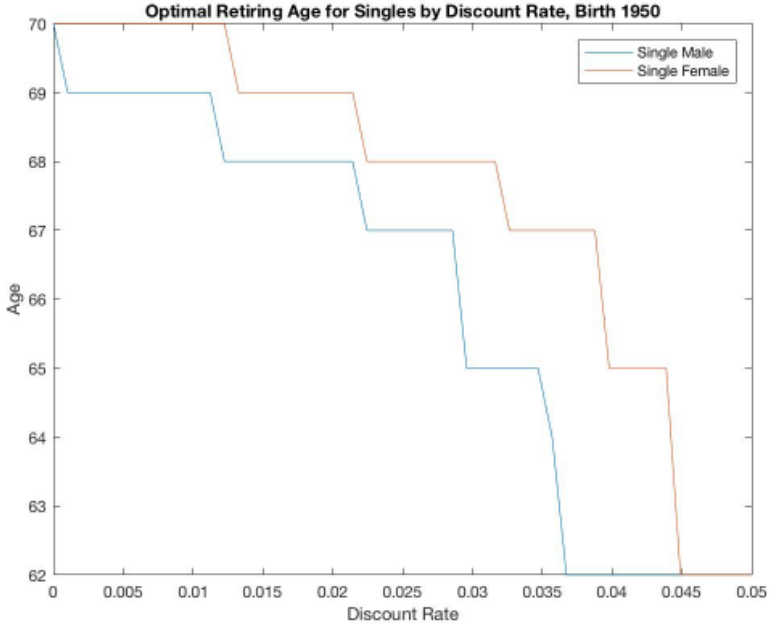
Optimal Claiming Simulations

- Utilizes historical and projected death probabilities from 2018 Trustees Report: Contains probability of death within one year
  - Allow probabilities to vary by birth year, age, and sex.

Simulation Predictions







Note: For both graphs, assumes $1000 PIA; left graph also takes a 3% real discount rate. Mortality profiles from 2018 Trustees Report.

Data (For Today)

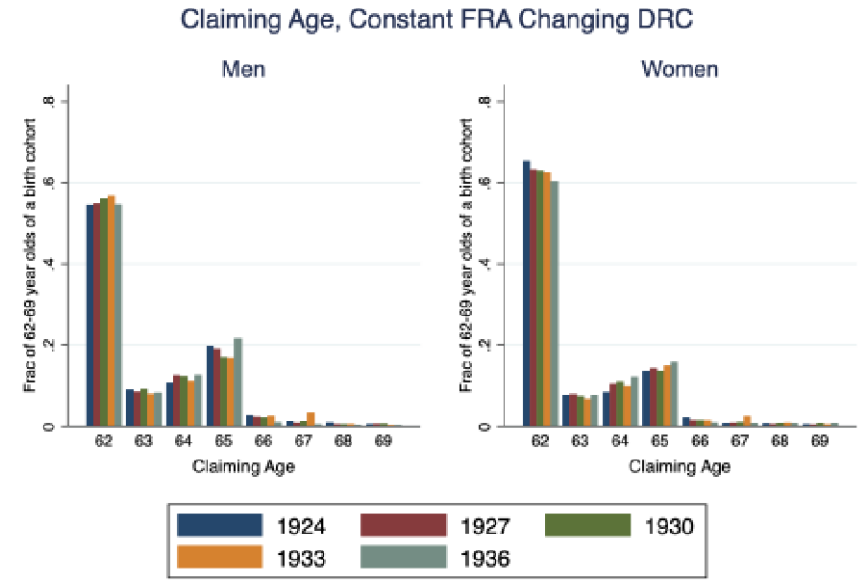
Annual Statistical Supplement (1983-2017)

- Incorporated historical Table 6A.4: 'Number and average monthly benefit for retired and disabled workers, by age and sex'
- Results by birth cohort: birth year = claim year - age
  - Caveat: Age is bucketed starting at 70, so we know only number of claims by birth year for ages 62-69

CPS Annual Social and Economic Supplement (1980-2015)

- Used Social Security recipiency as outcome (OASI + SSDI)
- Results by birth cohort
  - Caveat: Public data only reports respondent's age as of the survey week; all self reported
  - Solution: Weights observations by probability of the age being correct, assuming uniform distribution of birth months (Mastrobuoni, 2006)
- Government transfer programs are generally under-reported in CPS (Meyers, 2015)

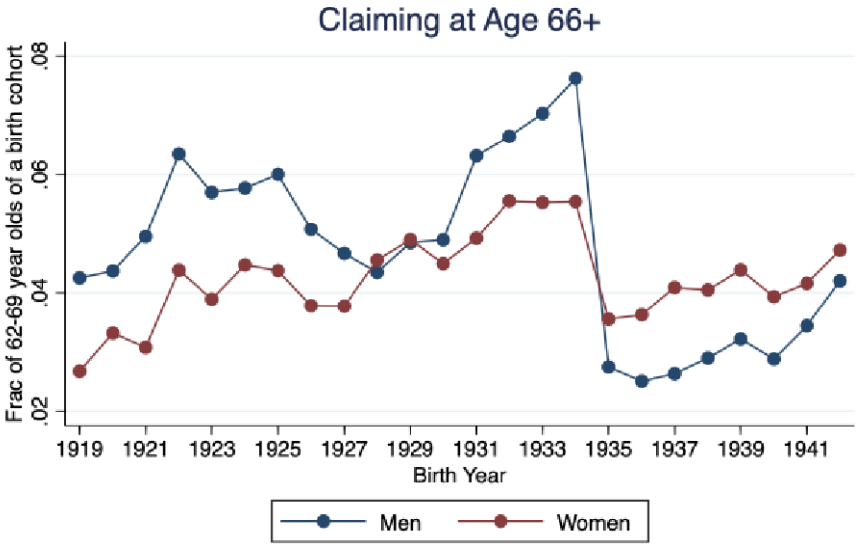
Claiming Patterns



Source: Annual Statistical Supplement 1985-2017, Table 6A4
All birth cohorts had FRA of 65, and DRC increases from 3% to 6%.

- Vast majority claim on or before FRA
- Age 62 is most popular claiming age, though claiming after 62 became more popular for women
- Despite DRC increasing from 3% to 6.5%, there is not a major shift to claiming later

Fraction Claiming Later

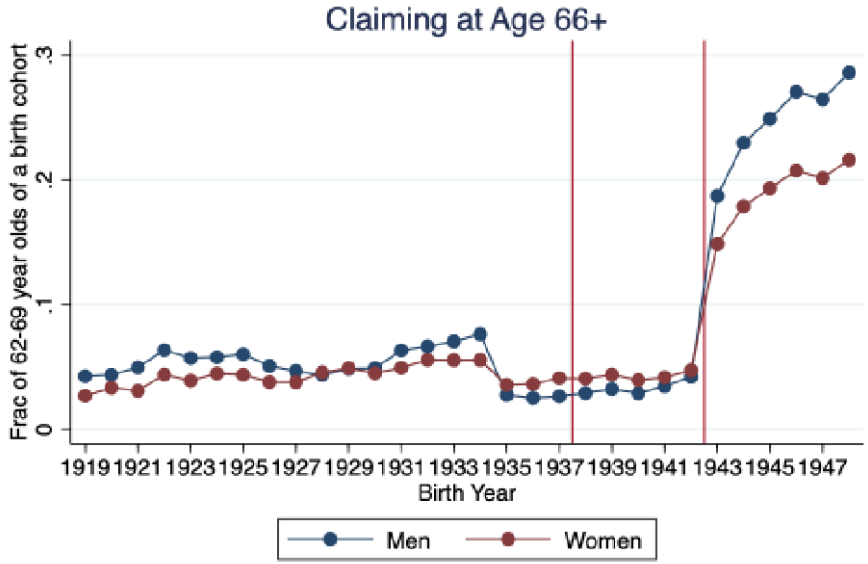


Source: Annual Statistical Supplement
FRA is 65 for 1919-1937, and increases by 2 month increments 1938-1942
DRC is 3% through 1924, and is 7.5% by 1942.

- 1919-1934: general trend upwards
- Cliff in 1935: introduction of 2000 earnings test
  - Women less affected by earnings test removal for 65+
- 1935: another upward trend, consistent with rising DRC

Fraction Claiming Later

- FRA increased starting in 1938, and became age 66 beginning in 1943
- After 1943, DRC stays constant at 8%, despite rise in claiming later for 66+ and 67+
  - Lag in policy change; introduction of early claiming at age 62
  - Age 62 claiming began with 1899 birth cohort for men
  - 1961: 7.2% men claimed at 62; 1962: 11.9%; 1963: 14.2%; 1970: 18.4%



Source: Annual Statistical Supplement
Lines separate FRAs of 65, between 65 and 66, and 66. DRC increases from 3% to 8%.

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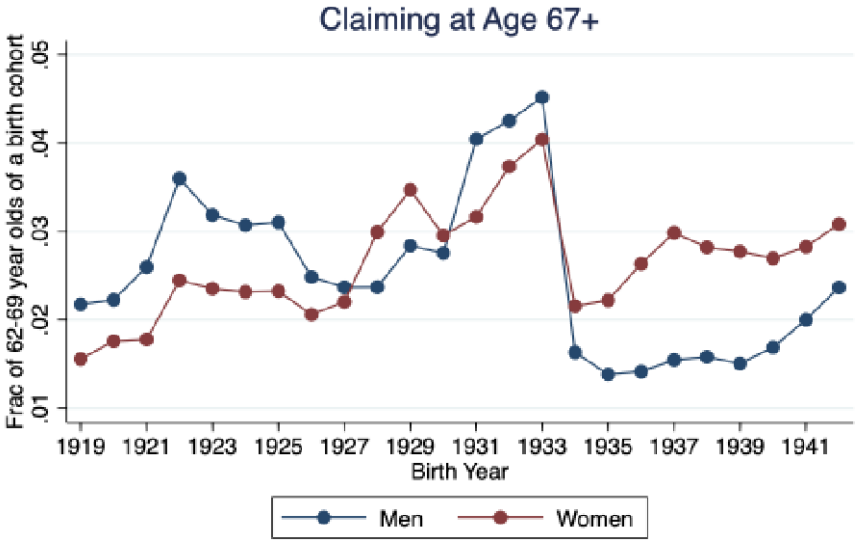

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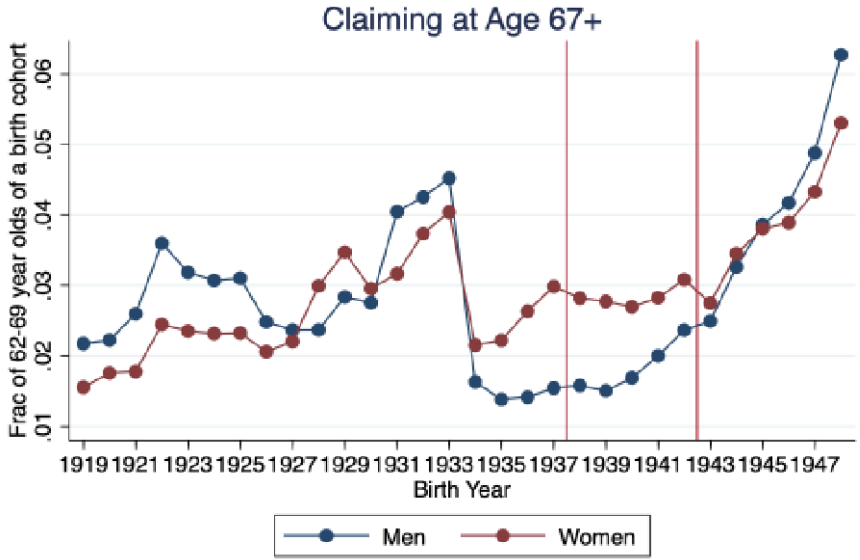
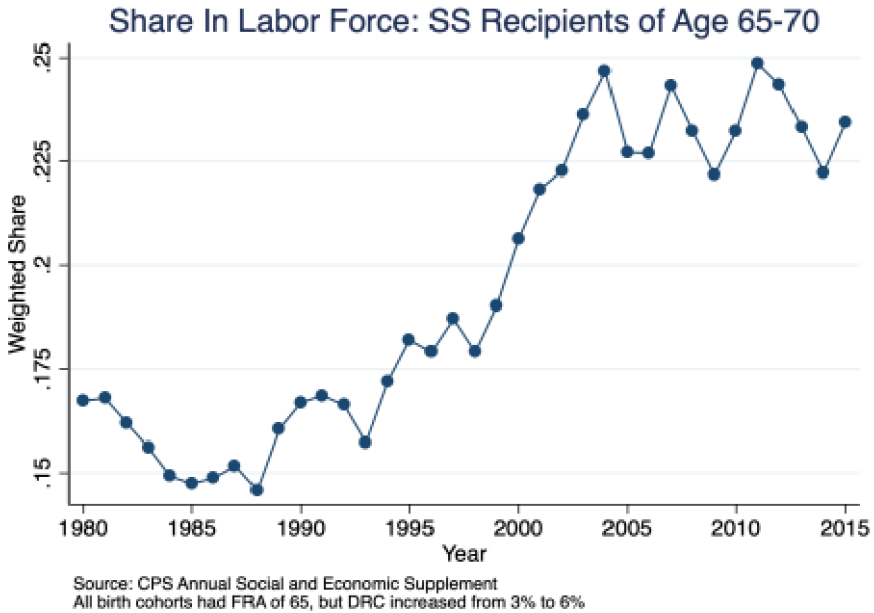


Source: Annual Statistical Supplement
Lines separate FRAs of 65, between 65 and 66, and 66. DRC increases from 3% to 8%.

DRC and Labor Force Participation

How does DRC affect LM Choices?

- Claiming age affects retirement decisions
- Benefits reduced from earnings test are recovered through benefit enhancement at DRC rate for 65+ workers



Regression Setup

Using the CPS, OLS Regression

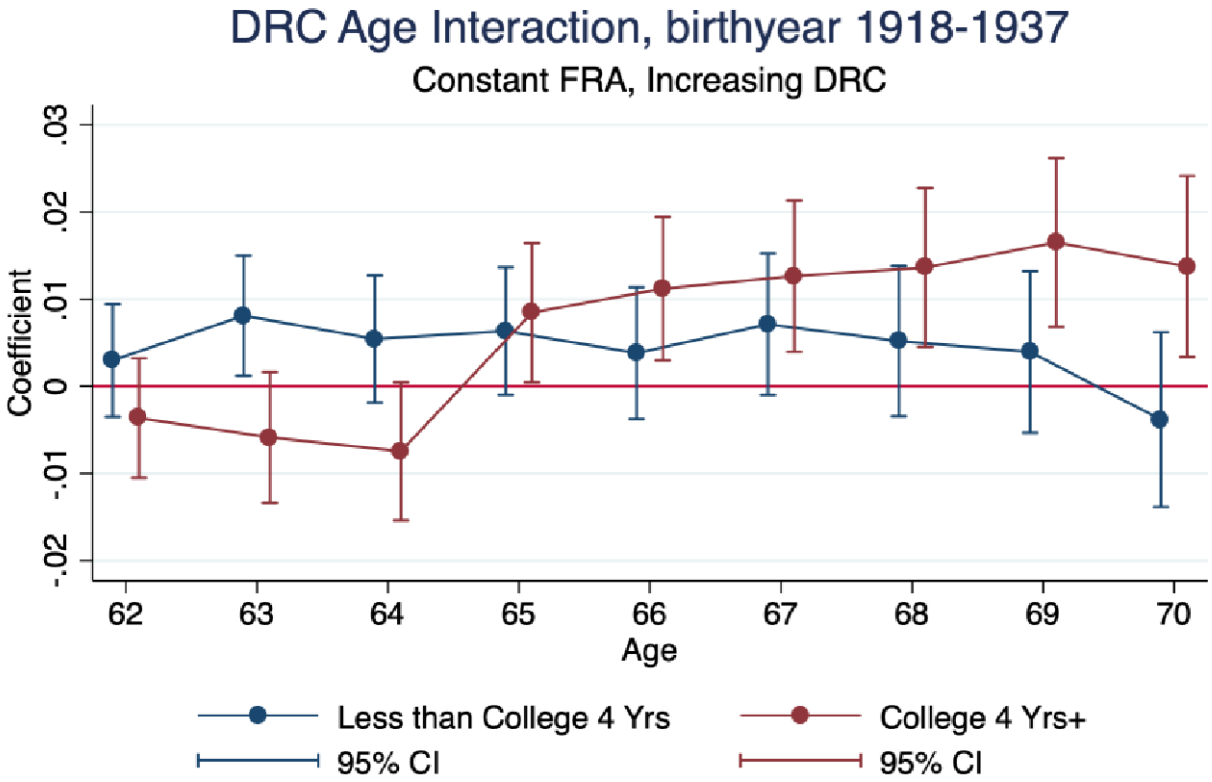
$$SS\_Receipt_{iaby} = \alpha_y + \gamma_a + \sum_{a=62}^{70} \mathbb{1}_a \cdot DRC(b) + \sum_{a=62}^{70} \mathbb{1}_a \cdot DRC(b) \cdot Type_{iaby} + X_{iaby}\theta + \epsilon_{iaby}$$

- individual i born in birth cohort b
- age a in March during CPS interview year y
- Type: variable of types, such as gender, educational attainment, and in labor force.
- X: a matrix of controls, including controls for gender and race
- SS_Receipt: an indicator of self reported social security recipiency

Calculating Applicable DRC

- Assume uniform dist. of birth months, and weight by probability. (Mastrobuoni, 2006)
  $\Rightarrow$ Expected DRC Regression: $\mathbb{E}[DRC(b)] = DRC(0.7 \cdot (y - a - 1) + 0.3 \cdot (y - a))$
- Missclassify birth year with probability 0.3
  $\Rightarrow$ Naive Regression: $DRC(b) = DRC(y - a - 1)$

Effect of DRC on SS Recipiency by Educational Attainment



Source: CPS Annual Social and Economic Supplement
All birth cohorts had FRA of 65, but DRC increased from 3% to 6.5%

Conclusion

Summary of Preliminary Findings

- Overall, despite DRC increasing from 3% to 6.5%, there was not a dramatic shift to claiming later
- Evidence of shift to claiming beyond FRA
- Increase in LFP by 65+ coincides with increases in DRC
- DRC associated with increased SS claiming at FRA+ ages ($\approx$ 1 pp increase in DRC increases SS recipiency by 1 pp for 66+ ages), more profound effect for men, more educated, and those already in the labor force

Shortcomings

- Birth year is imputed
- Exact claiming age is unknown
- Unknown work and earnings histories
- CPS measurement error: Respondents might under-report SS recipiency

Future Work

1% Extracts of SSA Data on Earnings and Benefits (up through 2016)

- Continuous Work History Sample (CWHS):
  - Active file: with covered earnings
  - Inactive file: no earnings or covered earnings
- Master Beneficiary Record (MBR): applications and entitlement dates, benefits
- NUMIDENT: Dates of birth, death, place of birth, race, sex
- Master Earnings File (MEF): longitudinal earnings

Analysis

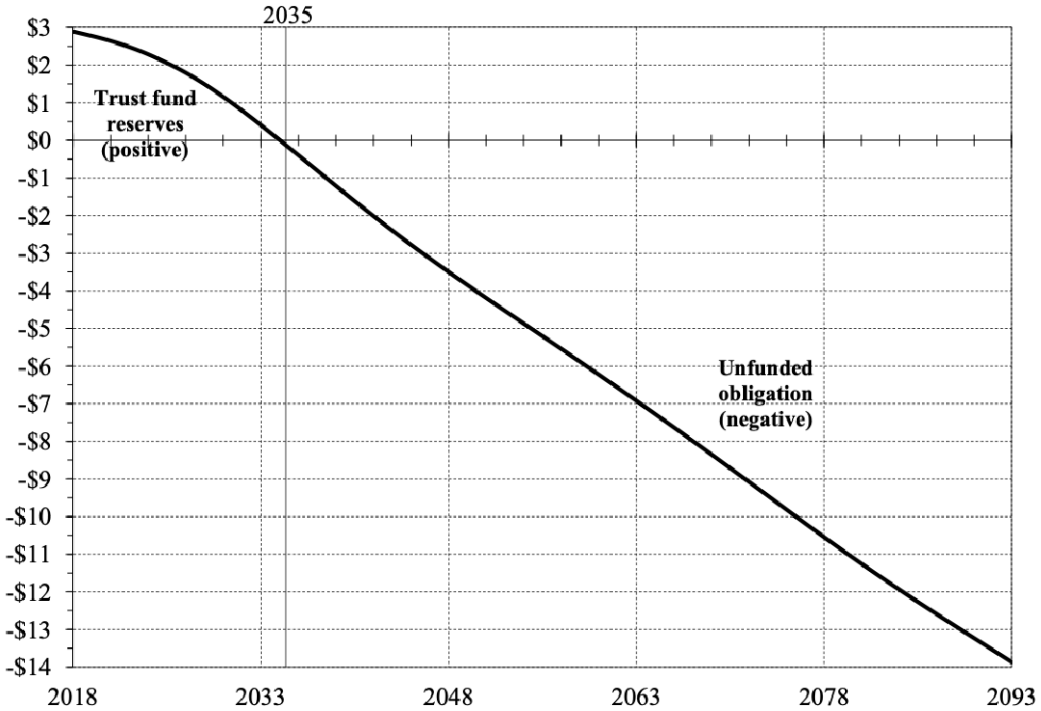
- Adverse Selection in Social Security claiming?
  - Claiming by age and PIA
  - Is response to DRC stronger for those with higher PIA or longest life expectancies?
- Regression analysis
  - Exact birth year and claiming age
  - Controls for earnings test and FRA changes, exclude those under disability insurance
  - Outcome variables: timing of claiming, labor market decisions

Appendix

OASDI Solvency

Figure II.D5.—Cumulative Scheduled OASDI Income Less Cost, From Program Inception Through Years 2018-2093

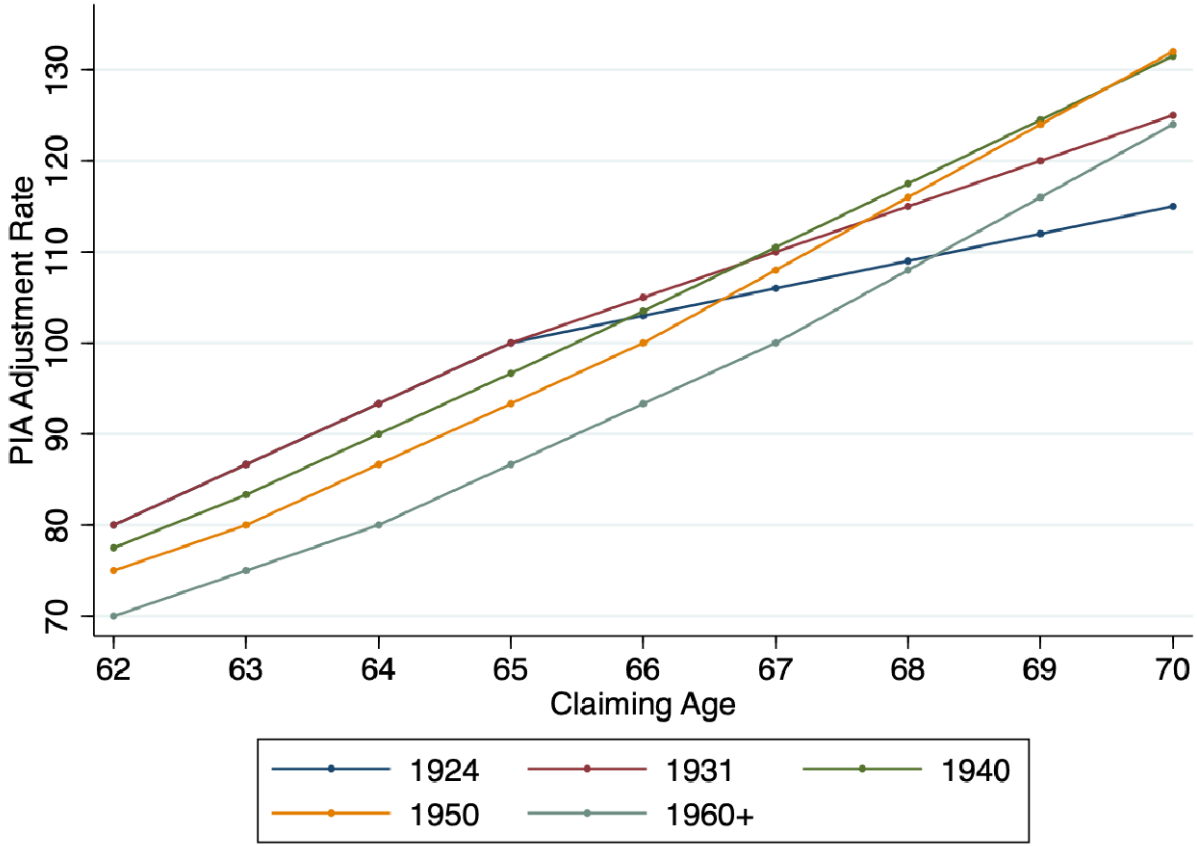
[Present value as of January 1, 2019, in trillions, under Intermediate Assumptions]



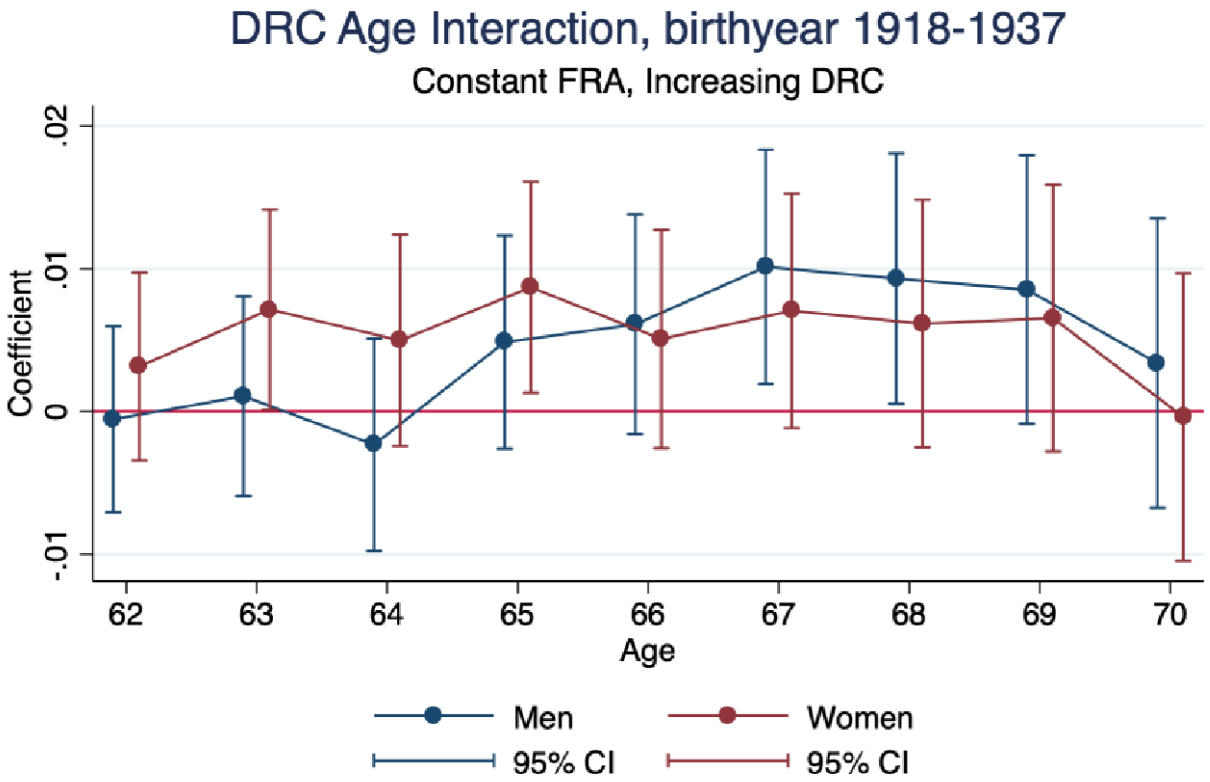
Rate Schedule

Birth Year	DRC	Age 62	Age 63	Age 64	Age 65	Age 66	Age 67	Age 68	Age 69	Age 70
1919-1924	3	80	86.7	93.3	100	103	106	109	112	115
1925	3.5	80	86.7	93.3	100	103.5	107	110.5	114	117.5
1926	3.5	80	86.7	93.3	100	103.5	107	110.5	114	117.5
1927	4	80	86.7	93.3	100	104	108	112	116	120
1928	4	80	86.7	93.3	100	104	108	112	116	120
1929	4.5	80	86.7	93.3	100	104.5	109	113.5	118	122.5
1930	4.5	80	86.7	93.3	100	104.5	109	113.5	118	122.5
1931	5	80	86.7	93.3	100	105	110	115	120	125
1932	5	80	86.7	93.3	100	105	110	115	120	125
1933	5.5	80	86.7	93.3	100	105.5	111	116.5	122	127.5
1934	5.5	80	86.7	93.3	100	105.5	111	116.5	122	127.5
1935	6	80	86.7	93.3	100	106	112	118	124	130
1936	6	80	86.7	93.3	100	106	112	118	124	130
1937	6.5	80	86.7	93.3	100	106.5	113	119.5	126	132.5
1938	6.5	79.2	85.6	92.2	98.9	105.4	111.9	118.4	124.9	131.4
1939	7	78.3	84.4	91.1	97.8	104.7	111.7	118.7	125.7	132.7
1940	7	77.5	83.3	90	96.7	103.5	110.5	117.5	124.5	131.5
1941	7.5	76.7	82.2	88.9	95.6	102.5	110	117.5	125	132.5
1942	7.5	75.8	81.1	87.8	94.4	101.25	108.75	116.25	123.75	131.25
1943-1954	8	75	80	86.7	93.3	100	108	116	124	132
1955	8	74.2	79.2	85.6	92.2	98.9	106.7	114.7	122.7	130.7
1956	8	73.3	78.3	84.4	91.1	97.8	105.3	113.3	121.3	129.3
1957	8	72.5	77.5	83.3	90	96.7	104	112	120	128
1958	8	71.7	76.7	82.2	88.9	95.6	102.7	110.7	118.7	126.7
1959	8	70.8	75.8	81.1	87.8	94.4	101.3	109.	117.3	125.3
1960+	8	70	75	80	86.7	93.3	100	108	116	124

Actuarial Adjustment of PIA by Age

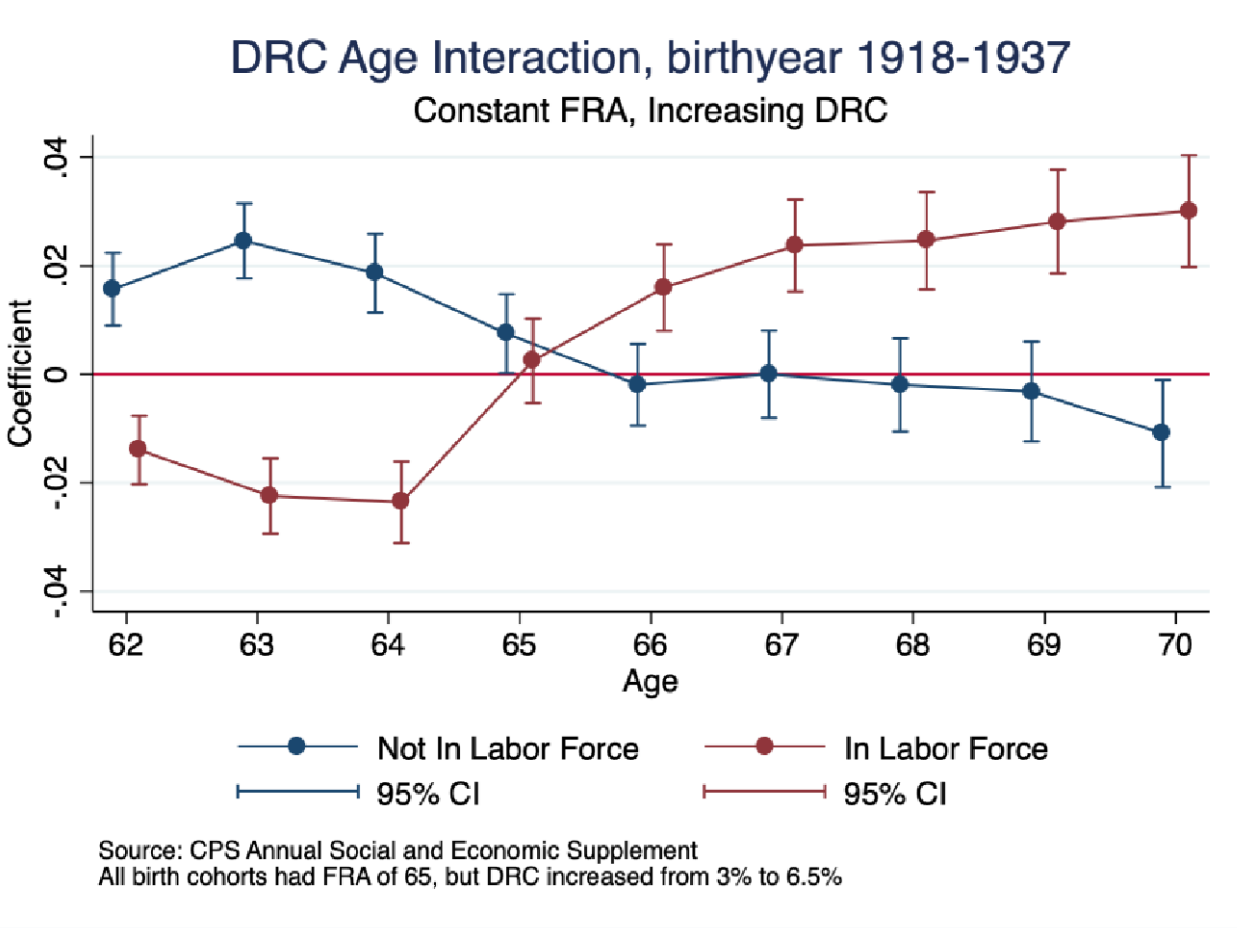


Effect of DRC on SS Recipiency by Gender



Source: CPS Annual Social and Economic Supplement
All birth cohorts had FRA of 65, but DRC increased from 3% to 6.5%

Effect of DRC on SS Recipiency by Labor Force Participation Status



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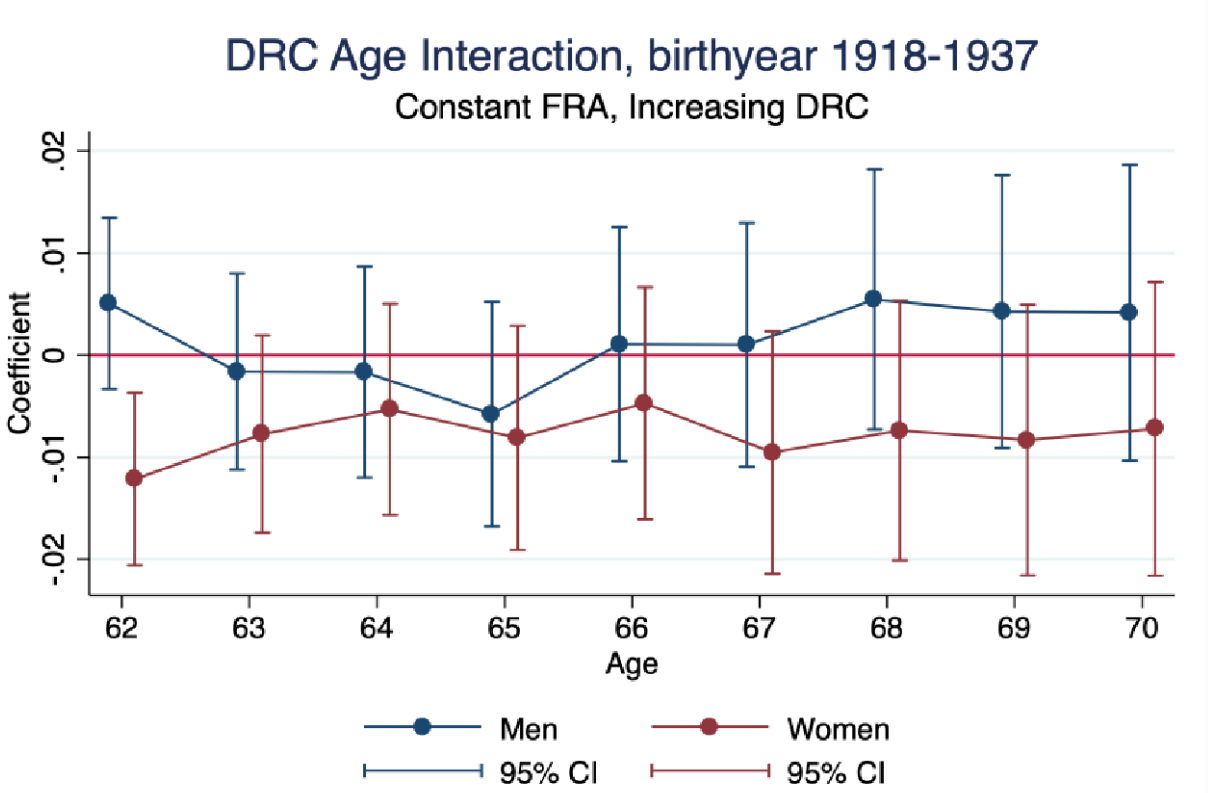
Naive Regression Results



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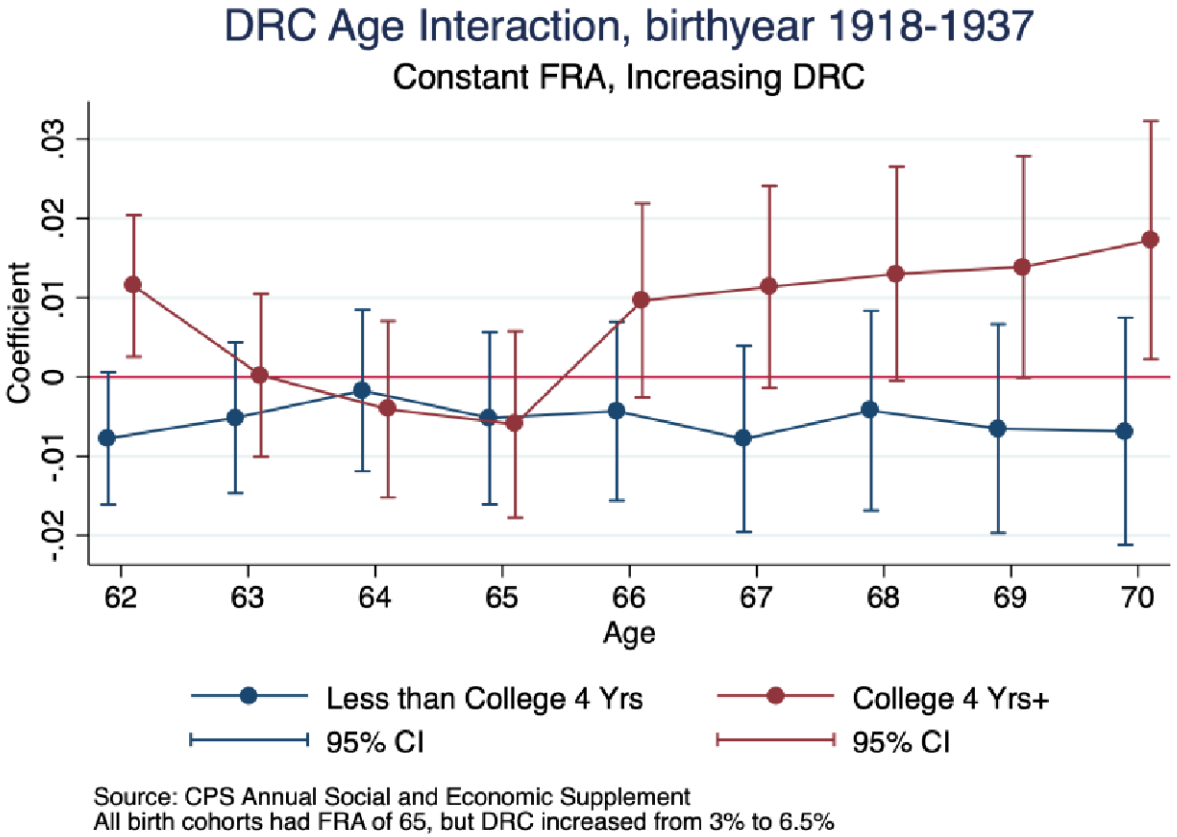

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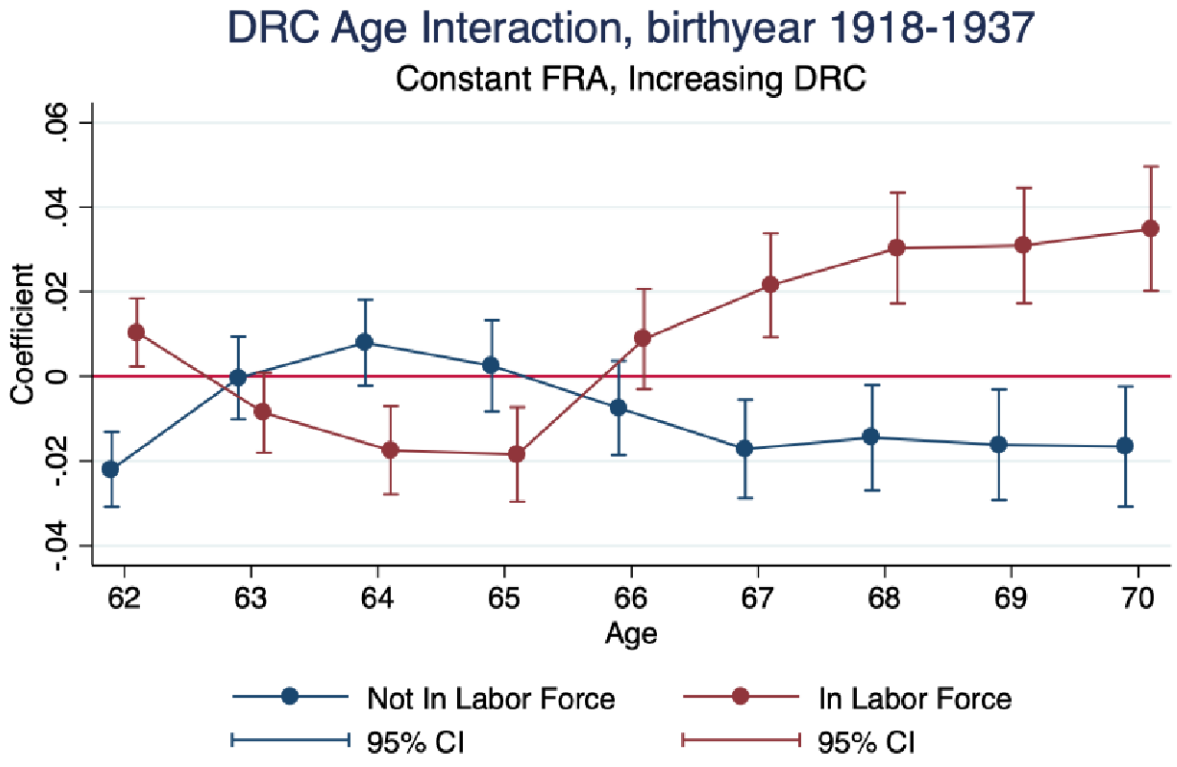

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