Social Security Spillovers:
How the Full Retirement Age affects Medicare and Mortality

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Abstract

In the early 1980s, changes to Social Security increased the Full Retirement Age (FRA) above 65 years for cohorts born after 1937. This increased the age at which seniors could claim their Social Security benefits without penalty, as well as increasing the penalties associated with claiming at earlier ages. Research has shown that increasing the FRA through to age 66 has delayed claiming and increased labor force participation of males older than 62, but little is known about its health-related effects. In this paper, we use exogenous variation in this policy change to identify the causal effect of extended employment policies on the Medicare claiming behavior and mortality of older men. We find that increases to the FRA delayed Medicare enrollment, likely because administrative links to the program's activation were delayed. Despite the delayed enrollment in Medicare, mortality also decreased at around age 65. This suggests a positive effect of continued labor force participation among those influenced to delay their retirement by changes to the FRA. We are in the process of adding more data and additional analysis to further understand how increasing the FRA has affected health insurance and health outcomes.

KEYWORDS: Social Security; Full Retirement Age; Retirement; Mortality; Medicare
JEL CLASSIFICATION: H51, H55, I11, I12, J14, J26.

Extended Abstract

The United States is undergoing dramatic demographic changes that affect the viability of Social Security, the primary income support program for retired Americans. While Social Security can be claimed from age 62, the "Full Retirement Age" (FRA, sometimes referred to as the "Normal Retirement Age") has provided a benchmark retirement age at which individuals receive 100% of the payments due to them based on their earnings history. Individuals claiming Social Security before the FRA receive reduced benefits, while seniors delaying claiming through to age 70 receive enhanced benefits.

The FRA – and its associated mix of penalties and incentives – has been the focus of Social Security reform aimed at delaying the claiming of Social Security benefits and increasing labor force participation among older Americans. The 1983 Social Security Act Amendments increased the Full Retirement Age (FRA) from 65 to 67 years. Its implementation based on birth cohorts, and only affected Americans aged 45 years and younger at the time it was passed.

The initial phase-in was in two-month increments per birth cohort. The 1938 birth cohort was the first one with an FRA greater than 65 years, and the 1943 birth cohort the first one with an FRA of 66 years. The 1954 birth cohort, the last cohort before further increases towards 67, just reached aged 70 this year. As a result, it is a good time to more fully understand the effects of the first half of this multi-decade policy change, in order to evaluate its effects and determine the likely changes coming with the further increases through to an FRA of 67 years.

Research has documented that the move of the FRA from 65 to 66 years has delayed Social Security claiming and increased labor force participation (Song & Manchester, 2008; Kopczuck & Song, 2008; Mastrobuoni, 2009; Behaghel & Blau, 2012), although recent research has shown that retirement has been "stickier" at the original FRA of 65 years than previously understood (Deshpande, Fadlon and Gray, 2024). Even when individuals do not delay Social Security claiming, such as those who file for benefits upon reaching age 62, a higher FRA lowers their Social Security benefits via larger penalties at a given age.

It is important to understand the broader implications of these changes to seniors' income and work activity. In this paper, we focus on two types of health-related outcomes. The first is health insurance. We particularly focus on the effects on Medicare, a federal health insurance program that covers the cost of hospitalization, medical care, and some related services for Social-

Security-eligible seniors from age 65. The second is mortality. These outcomes have potentially important impacts on both government finances and seniors' wellbeing.

Health insurance is closely linked to employment and retirement. The FRA increases may have affected health insurance arrangements through changes in the availability of employer-sponsored health insurance, and also because Social Security beneficiaries are automatically enrolled into Medicare once they are eligible at age 65. Consistent with these factors, we show that the FRA has delayed Medicare enrollment for some seniors from ages 65 to 66. We are in the process of using detailed data and a larger set of affected cohorts to assess the impact of these changes on employer-sponsored health insurance, healthcare usage and Medicare claiming.

It is also important to understand the impacts of the FRA on life expectancy. The FRA affects seniors' income, work activity and – as we document here – their health insurance. A small literature has documented how other Social Security policies affect mortality, with Social Security income associated with both increases and decreases in mortality. For example, Fitzpatrick and Moore (2018) find that Social Security claiming and retirement at the Social Security Early Eligibility Age of 62 is associated with an increase in mortality, which is consistent with Snyder and Evans (2006) finding that lower income from the Social Security "notch" decreased work activity and mortality. In contrast, however, Gelber, Moore, Pei and Strand (2023) find that more Social Security income to disabled workers younger than the FRA reduces their mortality. Moreover, what is different about our setting relative to this previous research is that the policy variation affects Medicare, which has been found to have distinct effects on mortality, such as extending the lives of hospitalized seniors (Card, Dobkin & Maestas, 2009).

We show that increasing the FRA has lowered the mortality rates of males aged around 65 years, with no meaningful impact on the mortality of females. We are currently in the process of expanding the number of cohorts in our analysis, which will allow us to understand the effects more precisely and examine the role of particular causes of death. We are also examining the broader health impacts of the changes in the FRA using the Health and Retirement Study (HRS).

Medicare and Health Insurance Analysis and Results

Background. If continued work leads to continued access to employer-sponsored health insurance, then a higher FRA could affect individuals' decision to apply for Medicare after age 65. Similarly,

the change in income or time-use stemming from the changes in employment with the increased FRA may decrease Medicare take-up.

Perhaps most importantly, there are direct interactions between Social Security and Medicate that may affect Medicare enrollment. One is that Medicare automatically enrolls almost everyone that begins collecting benefits from either Social Security or the Railroad Retirement Board before their 65th birthday.[1] Those who have not claimed Social Security benefits by their 65th birthday must sign up for Medicare on their own. Another is that Medicare premiums are commonly deducted from Social Security payments. By delaying the timing of Social Security benefit collection beyond age 65 for many people, the increase in FRA means that those people are no longer automatically enrolled in Medicare when they turn 65, and there are increased frictions involved in doing so.

Data. Our primary source of data is the Medicare Claims data collected by the Centers for Medicare and Medicaid Services as part of its administration of the Medicare system. Nearly all individuals eligible for Medicare enroll in Part A, the hospital insurance program, and Part B, the part of Medicare that covers physician and outpatient services. We use the Master Beneficiary Summary File, which captures all enrollment in both Parts A and B.

We define an individual in the administrative data as enrolled in Medicare if she is enrolled in either Part A or Part B at any point in a given calendar year. Age in the administrative data is measured as of the end of a given calendar year. We then combine the counts of the number of enrollees of a given age in a given calendar year with Census Bureau population estimates to create Medicare enrollment rates for each birth cohort at each age.[2]

We use Current Population Survey (CPS) data to establish the basic patterns in Social Security claiming and Medicare enrollment. We are also in the process of adding more birth cohorts, using finer measures of age, and analyzing additional data in order to understand the impact of the FRA on Medicare and other health insurance outcomes.

Graphical evidence. It is useful to start by examining patterns in the outcomes across treated and untreated cohorts in the raw data. We initially focus on males, as their trends in earnings and

[1] For more information on the process of Medicare enrollment, see https://www.medicare.gov/sign-up-change-plans/get-parts-a-and-b/when-how-to-sign-up-for-part-a-and-part-b.html

[2] We use Intercensal population estimates by sex and age for July of a given year. For example, we use the 1990 estimates of male population as of July 1998 and 1999 and the 2000 estimates of population in July 2000 to 2009.

employment at younger ages are more stable across cohorts than those of females. In Figure 1, we use the Current Population Survey data to present information on their employment, Social Security claiming, and Medicare participation across ages 55 to 70 years. We use two separate groups: those who face an FRA of 65 (1930-1937 birth cohorts) and those who face an FRA of 66 (1943-1949 birth cohorts). In each panel, the solid line traces the outcomes of the former group and the dashed line plots the outcomes of the latter group. We also use variation in the FRA for the 1938-1942 birth cohorts in subsequent analysis, although for the sake of simplicity we omit those birth cohorts from Figure 1.

Figure 1A shows that the employment rates of these two groups of men are almost identical before they reach age 62, at which point they are eligible for Social Security. Beyond that age, their employment rates diverge, with the cohorts that have an FRA of 66 more likely to be employed than cohorts with an FRA of 65. Figure 1B shows that the patterns of Social Security receipt for these two groups are extremely similar before they reach age 62.[3] At age 62, and at every age thereafter, the fraction of males receiving Social Security income is lower for the cohorts with an FRA of 66 than it is for the cohorts with an FRA of 65. These patterns are consistent with previous research on how these outcomes have been affected by FRA increases (e.g., Mastrobuoni, 2009; Behaghel & Blau, 2012; Deshpande, Fadlon and Gray, 2024).

In Figure 1C, the outcome is the fraction of males taking up Medicare. The pattern is broadly similar, except that the cohorts diverge at age 65 rather than age 62. This is because Medicare eligibility for most adults occurs at age 65, rather than 62. It provides suggestive evidence that the FRA has also reduced Medicare take-up among older males.

We also take a closer look at enrollment at ages 65 and 66 among the cohorts for which we have information on enrollment rates available in the administrative data. In Figure 2, we present the fraction of males in each cohort from 1935 to 1946 that newly enroll in Medicare at age 65 and at age 66. Recall that the FRA began increasing with the 1938 cohort and continued increasing until the 1943 cohort; for cohorts in 1943 in our sample it was 66 years. In Figure 2A, which shows enrollment rates at age 65, there is a noticeable dip in new Medicare enrollment that begins with the 1939 cohort. New enrollment rates average 83.5 percent for the cohorts born earlier than 1939.

[3] Note that the levels of Social Security take-up before age 62 are not equal to zero because the variable used measures receipt of Social Security income, which "includes payments to retired persons, to dependents of deceased insured workers, and to disabled workers (King et al)."

These rates decrease to around 81 percent for younger cohorts in our sample, a drop of 2.5 percentage points.

Figure 2B shows that, at the same time, enrollment rates at age 66 are increasing over the same cohorts. In cohorts born before 1939, about 1.5 percent of males wait until age 66 to enroll in Medicare. This doubles as the FRA rises to age 66, with approximately three percent of males among these younger cohorts waiting until age 66 before enrolling in Medicare. This is suggestive evidence that some men who faced an increased FRA delayed their Medicare enrollment.

Empirical approach and results. Next, we use exogenous variation in the strength of the policy based on birth cohorts to identify the effects of the Social Security policy on Medicare enrollment. We use difference-in-differences methods, estimating the following equation:

$$Y_{ca} = \theta_a + \delta_c + \sum_{j=64}^{70} \beta^j \, Policy_c + \varepsilon_{ca} \qquad (1)$$

This framework compares the enrollment rate, *Y*, for members of each birth cohort, *c*, at every age *a* between ages 55 and 70 years. Medicare enrollment changes as people age, so we include age fixed effects, θ_a, to control for any age-specific differences. We also include cohort fixed effects, δ_c, to control for cohort-specific differences in Medicare activity.

Our exogenous measure of treatment, *Policy*, captures how much the Social Security incentives changed for a particular cohort. In our main specification, we define it as an increasing measure from zero for the cohorts born in 1937 or earlier to a value of one for the cohorts born in 1943 or later. The values for the 1938 to 1942 cohorts are directly proportional to the fraction of a year that the full retirement age increased. For example, the full retirement age increased by two months for the 1938 cohort, so the variable will equal 1/6 for that cohort. Therefore, the β^j coefficients measure the effects at specific ages of the increase in the FRA from age 65 to 66, relative to our reference age of 64 years.

Figure 3 shows the coefficient estimates and 95 percent confidence intervals for each β^j when the dependent variable is the rate of new enrollment (Panel A) and the overall enrollment rate (Panel B). Given that Medicare eligibility is extremely limited prior to age 65, it is not surprising that, in both panels, there is no change in Medicare take-up prior to age 65. At age 65, new Medicare enrollment is 2.8 percentage points lower for cohorts with an FRA of 66 than cohorts with an FRA of 65. This is statistically different from zero at the one percent level. At age 66, new Medicare enrollment is an imprecise 1.1 percentage points higher for cohorts with an FRA

of 66 than cohorts with an FRA of 65. The subsequent age estimates are smaller than 0.2 percentage points and not statistically different from zero. It suggests that the FRA lowered enrolment at age 65, which is at least partially offset by enrolment at age 66.

The regression results for overall Medicare enrollment are shown in Figure 3B. They tell a similar story, although they suggest that Medicare enrollment fully recovers by age 69. These results, along with the raw data in the Current Population Survey, is motivating us to get a more complete picture of Medicare claiming and use, as well as a broader understanding of how the FRA has affected health insurance arrangements. Preliminary analysis of females' experience with the FRA suggests that the FRA increase has also delayed Medicare enrollment.

Next steps. We are beginning to work with newer Medicare administrative files, which will provide more comprehensive information and allow us to examine the impacts of changes to the FRA for a larger set of cohorts affected by the changes. We are also examining the Current Population Survey and the Health and Retirement Survey. Until recently, the sample sizes in the HRS were too small to precisely identify effects of the sizes seen in administrative data. Recent waves and additional cohorts have the potential increase statistical power enough to generate interesting insights. In addition to the difference-in-differences analysis presented here, we will also implement a regression discontinuity design based on the sharp changes in FRA levels based on birth dates, similar to the approach used by Deshpande, Fadlon and Gray (2024). This will allow us to be sure the estimated effects are not contaminated by broader changes in health across cohorts affected by the changes to the FRA.

Mortality and Health Analysis and Results

Background. As discussed above, understanding mortality and the broader health effects of the FRA is crucial. Economists have long been interested in the link between retirement and health. For example, research has shown that, particularly for individuals who are poor and liquidity constrained, retirement may be associated with lower consumption and fewer resources that can be used to invest in protecting and maintaining health (Hurst 2008; Hurd and Rohwedder, 2008; Scholz, Seshardi and Khitatrakun 2006); decreased physical and mental activity (Bosang, Adam and Perelaman 2012; Rohwedder and Willis, 2010); and changes in alcohol consumption and other health-related behaviors (e.g., Bacharach et al., 2004). As the literature has grown, there has been an increasing emphasis on using methods of causal inference to determine the relationship between

retirement and health, and a recognition that mortality provides an objective outcome that is important in itself.

Data. Our primary data source is restricted-used versions of the National Center for Health Statistics' Multiple Cause of Death (MCOD) files. The MCOD files are compiled from death certificates filed in each state and the District of Columbia. The restricted-use version of the data obtained for this project includes the exact dates of birth and death, which means we can precisely measure cohort and age of death. As before, we focus on males aged 55 to 70 who were born in cohorts from 1930 to 1949, although we are also expanding the number of cohorts used in our analysis going forward. We use population estimates for each cohort at each age to transform the number of deaths to a death rate.[4] The annual death rate for men ranges from about one percent at age 55 to nearly three percent at age 70.

In addition to age, cohort and gender information, the MCOD contain variables measuring educational attainment, race and marital status. This information will allow us to determine whether the effects of the FRA increase differ for people by various characteristics. The MCOD also include information on the cause of death based on the International Classification of Diseases. We will examine death from different types of causes.

Graphical evidence. As before, it is useful to start by examining patterns in mortality rates across treated and untreated cohorts in the raw data. In Figure 4, we present information on each of our main outcome of interest by age for the same two groups of male birth cohorts: those with an FRA of 65 (the 1930 to 1937 cohorts) and those with an FRA of 66 (the 1943 to 1949 cohorts). In each panel, the solid line traces the outcomes of the former group and the dashed line plots the outcomes of the latter group. In our estimation, we also make use of the FRA variation for the cohorts born between 1938 and 1942 but, for the sake of simplicity, we leave those cohorts out of Figure 4.

We can see that although the mortality rates of these two groups of older men are different in levels, the rates increase similarly as the groups age until the men hit age 62, at which point the mortality rates begin to diverge, with the more recent cohorts experiencing relatively lower mortality rates than the earlier cohorts at similar ages. This divergence is most pronounced at ages

[4] In the results presented, we use the CPS to estimate population counts by age and cohort. Results are similar using the National Cancer Institute's Surveillance, Epidemiology and End Results Program Population estimates data. Results available from the authors upon request.

64, 65 and 66; beyond these ages, the mortality rates begins to converge. These results are suggestive that the increase in the FRA from 65 to 66 decreased the mortality of older men, particularly those around age 65. We now turn to the results of estimating equation (1) to confirm these results.

Empirical approach and results. Next, we use exogenous variation in the strength of the policy based on birth cohorts to identify how the FRA affected mortality rates. We use an approach similar to equation (1), now using age- and cohort-specific mortality rates on the left-hand side. We change our reference period to age 61, which is the year before individuals can claim retirement benefits from Social Security. Age and cohort fixed effects are included, and *Policy* captures how much the Social Security incentives related to the FRA changed for a particular cohort. As before, the β^j coefficients measure the effects at specific ages of the increase in the FRA from age 65 to 66, now relative to our reference age of 64 years.

Figure 5 shows the coefficient estimates and 95 percent confidence intervals for each β^j when the dependent variable is the male mortality rate. The underlying assumption is that the age-mortality relationship is consistent across the 1930 to 1949 cohorts, other than changes caused by the FRA. To assess this assumption, we look for evidence that the increased full retirement age policy is uncorrelated with health trajectories prior to the Social Security Early Eligibility Age of 62. There is no evidence that the increase in the FRA from 65 to 66 had any effect on outcomes before age 62; the point estimates are close to zero and none are statistically significant.

In contrast, estimates after age 61 do indicate some changes in mortality rates related to the FRA. The estimates are negative at ages 64 and 65, with the latter estimate statistically significant from zero at the five percent level. The results imply that the FRA increase from age 65 to 66 lowered male mortality by around 10 percent at age 65. There are large negative point estimates at ages 69 and 70, although they are noisy and the confidence intervals do not rule out no impact of the FRA. Preliminary analysis of females' experience with the FRA suggests that the FRA had smaller effects on their mortality.

Next steps. We are using more recent MCOD data to update the analysis, which will allow us to examine the effects of the FRA for a larger set of cohorts and also get more precise results at older ages. We are also examining the Health and Retirement Survey to understand other health outcomes; the sample sizes in the latter data were previously too small, although recent waves and

additional cohorts have the potential to generate interesting insights. In addition to the analysis presented here, we will also implement a regression discontinuity design based on the sharp changes in FRA levels based on birth dates, similar to the approach used by Deshpande, Fadlon and Gray (2024).

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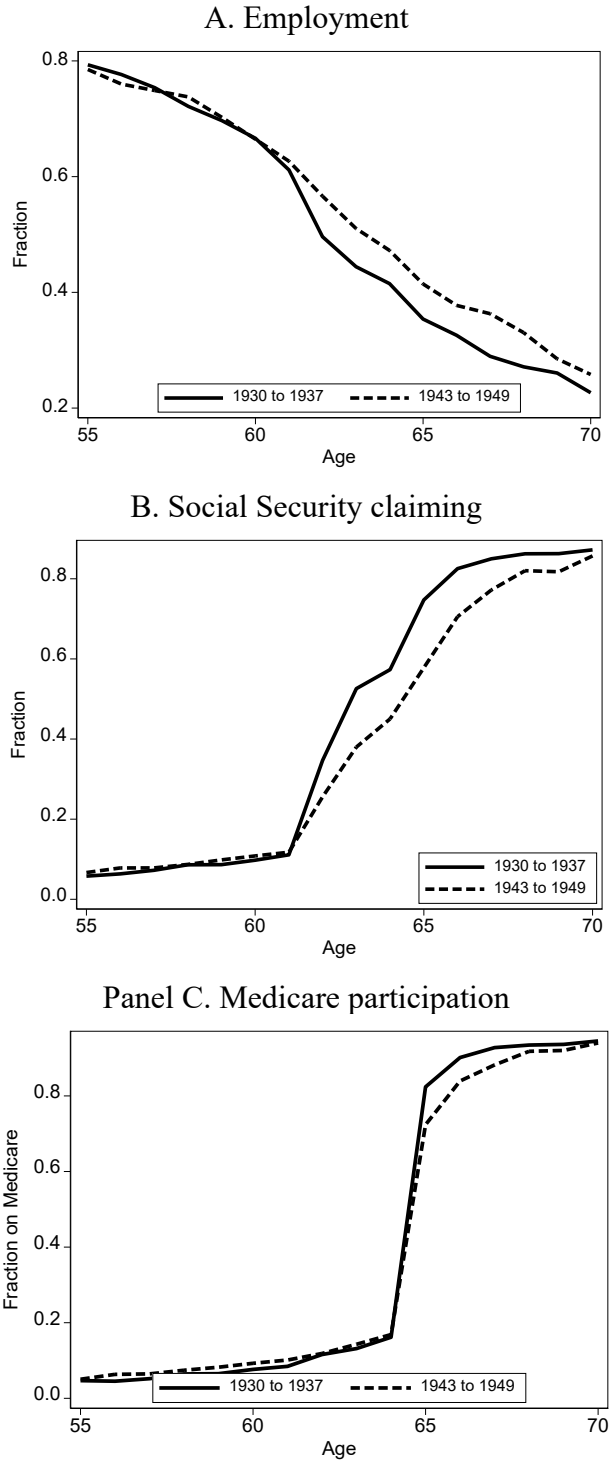
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Figure 1 Male employment rates, Social Security take-up and Medicare enrollment by age, Cohorts with an FRA of 65 versus 66 years



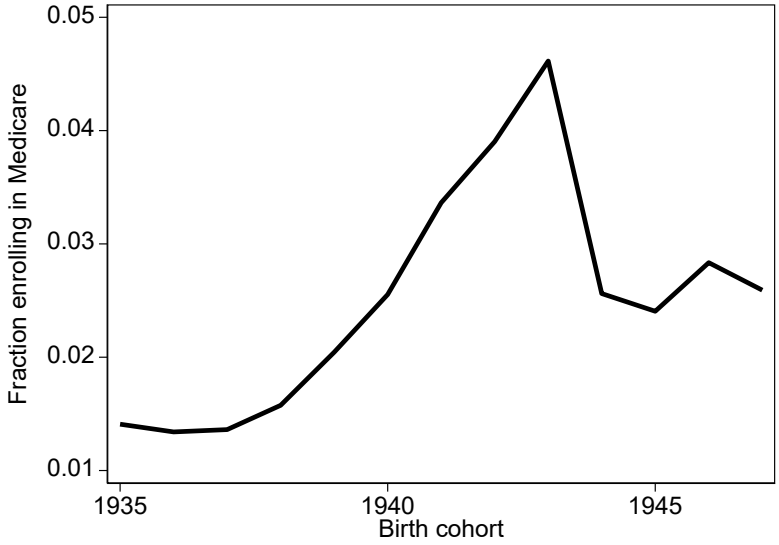
Note: Based on the authors' calculations using the CPS, 1985-2018.

Figure 2. Fraction of the male cohorts newly enrolled in Medicare at ages 65 and 66

A. New enrollment rates at age 65



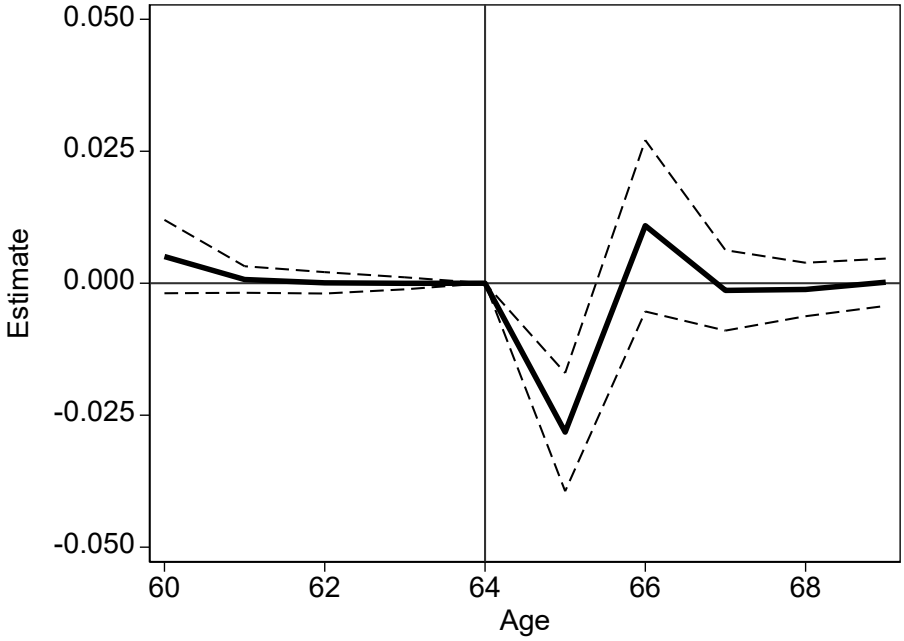
B. New enrollment rates at age 66



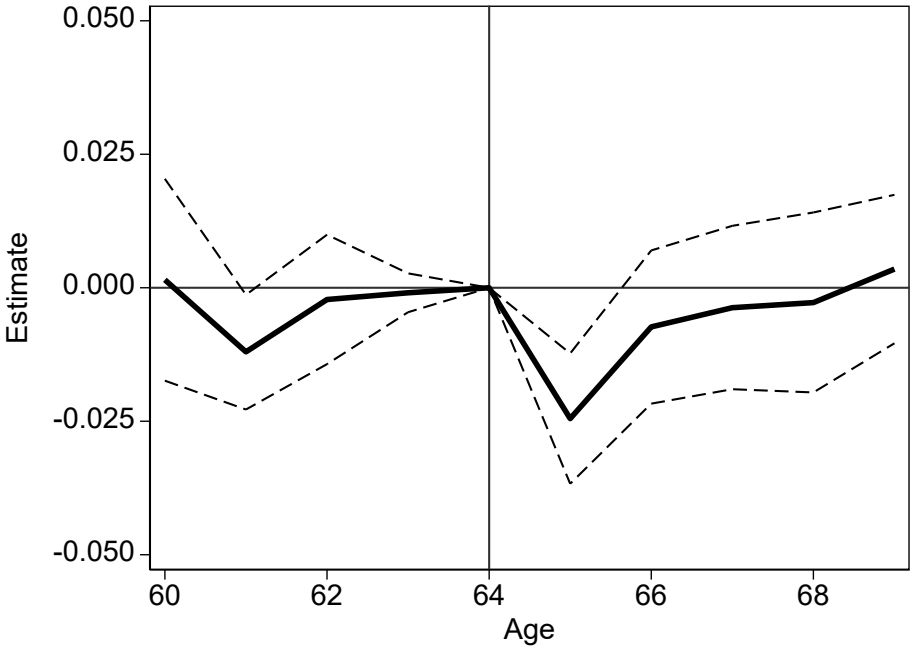
Note: Based on the authors' calculations using administrative data from the Centers for Medicare and Medicaid Services, 1999-2012.

Figure 3. Regression estimates of the effects of the Full Retirement Age increase on males' Medicare enrollment and participation

A. New Medicare enrollment

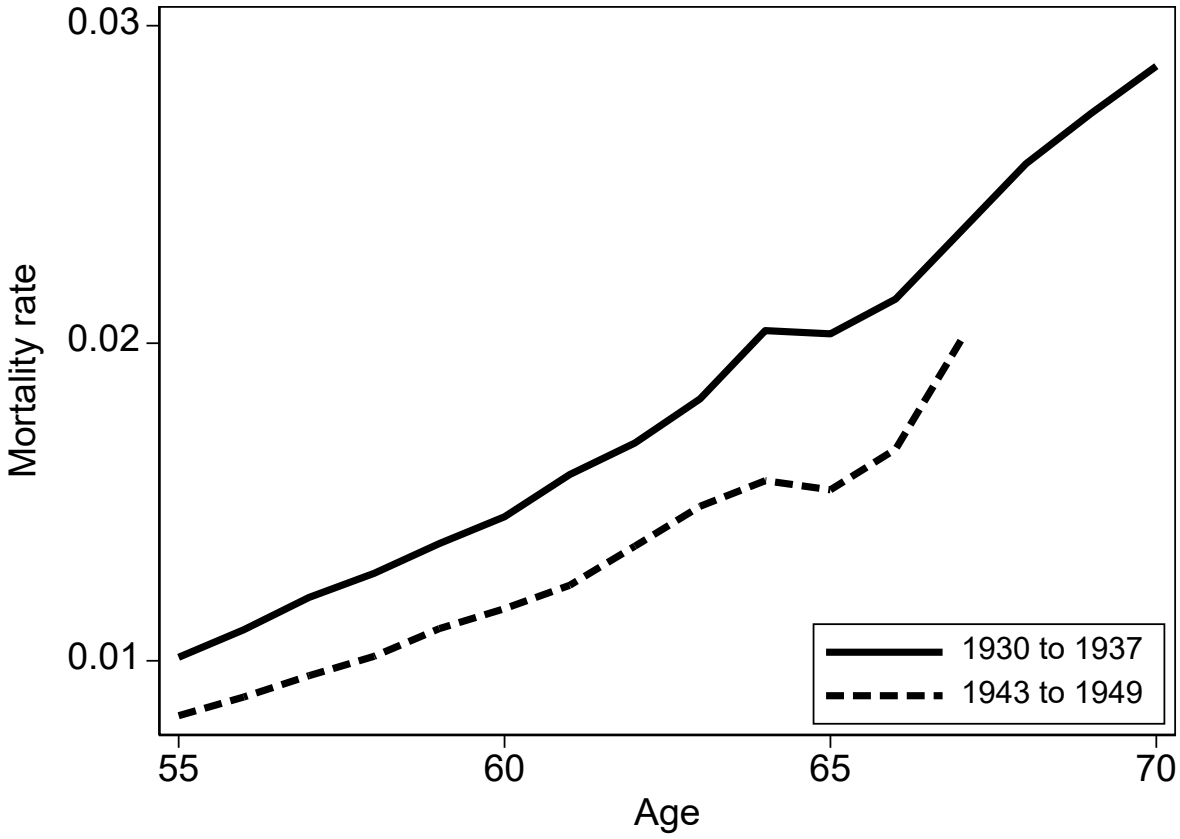


B. All Medicare enrollment



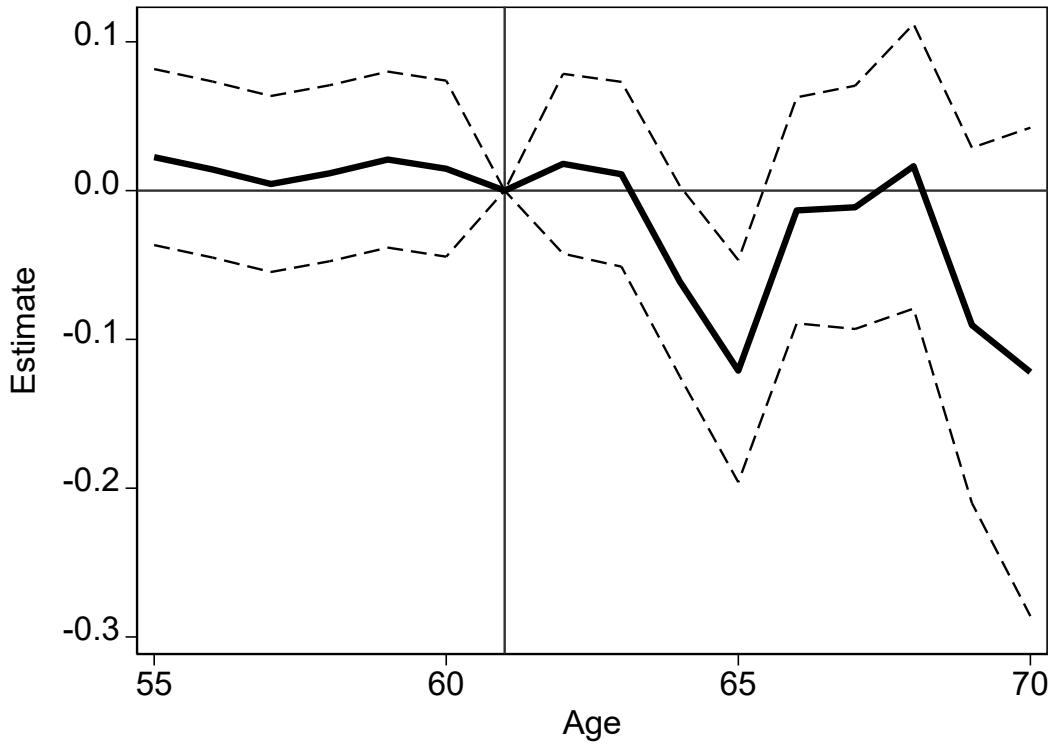
Notes: Based on authors' calculations using administrative data from the Centers for Medicare and Medicaid Services, 1999-2012. Figures present coefficients and confidence intervals from difference-in-difference estimation of the effect of the increase in the Social Security Full Retirement Age from 65 to 66 on Medicare enrollment by age.

Figure 4 Male mortality rates by age for cohorts with an FRA of 65 versus 66 years



Note: Based on the authors' calculations using the MCOD, 1985-2014.

Figure 5. Regression estimates of how Full Retirement Age increases affected male mortality



Note: Based on data from the MCOD, 1985-2014. Sample includes individuals ages 55 to 70 from the cohorts born between 1930 and 1949. The solid line plots difference-in-difference estimates of the age-specific effects of increasing the FRA from 65 to 66 on the outcome indicated. Specification includes age and year fixed effects and age-specific controls for changes to the Social Security earnings test. Standard errors are clustered at the cohort level. Dashed lines trace out the upper and lower 95 percent confidence intervals.