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Have People Delayed Claiming Retirement Benefits? Responses to Changes in Social Security Rules

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Summary

Two changes have been made recently to rules governing the Social Security program: the retirement earnings test was eliminated in 2000 for people aged 65–69, and the full retirement age (FRA) for people born in 1938 or later was scheduled to gradually increase in two-month increments until reaching age 67. This paper examines changes in the age at which people claim Social Security retirement benefits in response to those changes. Data come from a 1 percent sample of administrative data from the Social Security Administration for 1997 to 2007.

Descriptive and regression analyses show that the largest effect of eliminating the earnings test in 2000 occurs at age 65. At that age, the proportion of people who claim retirement benefits increases by 4.6 percentage points among men and 2.4 percentage points among women. In addition, eliminating the earnings test significantly increases—by more than 20 percent—the benefit entitlement hazard for those turning the FRA (that is, the percentage of people who are newly entitled in a given year among those who are fully insured but were not previously entitled). Moreover, the response to the gradual increase in the FRA occurs not only among those who are close to the FRA but also among those who are close to the early retirement age.

Introduction

Two major changes in Social Security rules recently became effective:

- The retirement earnings test was removed in 2000 for persons who have attained the full retirement age (FRA) through age 69 in 2000 or later, and
- The full retirement age was set to gradually increase for those who have reached age 62 (the early retirement age) in 2000 or later.

The FRA is the age at which 100 percent of retirement benefits is payable. Each rule change is expected to affect the age at which people claim Social Security retirement benefits (that is, their entitlement age) and the work behavior of older Americans.

The effectiveness of those changes largely depends on how people adjust their age at entitlement. Eliminating the retirement earnings test is meant to encourage older people to work so that their earnings can supplement their Social Security benefits, but how the change affects the age at which older people claim Social Security benefits is less clear. One of the unwanted consequences of eliminating the earnings test is that claiming benefits at the FRA has become more attractive for those who previously claimed benefits later than the FRA. People who claim benefits at the FRA rather than at a later age forfeit the expected long-term increase that otherwise accrues under the program's delayed retirement credit. At the same time, some analysts argue that eliminating the earnings test for those who have reached the FRA through age 69 could also affect the age at which those who are younger than the FRA claim benefits.¹ If that is true, one of the desired consequences is that those who have not attained the FRA are more likely to continue to work and not claim benefits until they reach the FRA.

¹ See Vroman (1985), Packard (1990), and Gruber and Orszag (2003).

Effects of raising the FRA would seem to be more straightforward at first blush. The aim of increasing the FRA is to improve the solvency of the Social Security system by providing stronger disincentives for claiming benefits early. What is not clear is how people actually respond to those disincentives. To understand the effect of the rule changes on Social Security finances and individuals' retirement wealth, we need to examine how people adjust the age at which they claim benefits in response to the rule changes.

Using a 1 percent sample of administrative data from the Social Security Administration, this paper documents and analyzes responses in the entitlement age for old-age benefits following the recent changes in Social Security rules.² Because the administrative data allow us to determine the exact age at entitlement for all Social Security beneficiaries, we can accurately document responses in benefit entitlement age before and after the rule changes. By doing so, we expect to learn whether people have responded to changes in Social Security rules by modifying the age at which they claim benefits, how responsive they have been, and whether the response is concentrated only around the FRA. One of the most interesting questions surrounding the gradual increase in the FRA is whether it can affect the behavior of those who claim benefits close to the early retirement age. Results of this analysis will help shed light on responses by future workers as the FRA

² A number of studies have analyzed how incentives generated by Social Security program rules have affected labor supply and earnings by exploring changes in the earnings test. Friedberg (2000) investigated three changes in earnings test rules in 1978, 1983, and 1990. Results reported in Gruber and Orszag (2003) for 1973–1998 and in Haider and Loughran (2006) for 1975–2003 are identified by all changes, including gradual increases in the test threshold in each year. Baker and Benjamin (1999) and Disney and Tanner (2000) examined the elimination of a similar earnings test in Canada and the United Kingdom. Song (2003/2004) and Song and Manchester (2007) examined the 2000 change in the earnings test using Social Security administrative data. See Krueger and Meyer (2002) for reviews of and references to other related studies.

continues to rise to age 67 and, more generally, on responses to changes in retirement incentives.

Previous studies have examined the effects of removing the earnings test in 2000, but none of them have investigated simultaneously the effects of the gradual increase in the FRA on earnings and entitlement to old-age benefits.³ This study investigates the effects of both changes in program rules. We take advantage of the fact that although the change in the earnings test in 2000 affects those who have attained the FRA through age 69 in 2000 or later, the gradual rise in the FRA affects those who reach age 62 in 2000 or later. Since the rule changes are specific to a calendar year and different birth years, we first identify three groups affected by the changes:

- Those affected by the gradual increase in the FRA,
- Those affected by the removal of the earnings test in 2000, and
- Those affected by both rule changes.

We then examine changes in the distribution of ages at which people claim benefits and changes in benefit entitlement status across time and across birth cohorts. Holding age constant, we also investigate changes in the percentage of people who are entitled to benefits among those who are fully insured both before and after 2000. A person who is entitled to benefits has filed a claim for and been awarded a specific type of benefit. Once an award is made, the person usually receives an immediate payment.

³ Duggan, Singleton, and Song (2007) studied the effects of the gradual increase in the FRA using a 1 percent sample of administrative data from the Social Security Administration, but that study focused on the effect on the rolls of the Social Security Disability Insurance program. Mastrobuoni (2006b) examines the labor supply effects of the 1983 Social Security reforms. The budgetary impact of eliminating the earnings test in 2000 has been examined in Mastrobuoni (2006a).

The remainder of this paper

- reviews recent changes in the earnings test and FRA and discusses theoretical predictions of how people will respond to those changes,
- discusses the data and our empirical strategy,
- presents descriptive results, and
- presents regression results on the impact of the rule change on the age at benefit entitlement.

Recent Changes in the Retirement Earnings Test and the Full Retirement Age

Under the retirement earnings test, Social Security benefits are reduced or withheld if earnings exceed specified threshold amounts. On April 7, 2000, major changes were made to the earnings test when President Clinton signed into law the Senior Citizens' Freedom to Work Act of 2000. That law eliminated the earnings test in and after the month in which a person attains the FRA (which was then age 65). People receiving old-age benefits who have not reached the FRA remain subject to the earnings test. The Social Security benefits of people who do not reach the FRA in the test year are reduced by \$1 for every \$2 earned beyond the earnings test threshold, which was \$11,520 in 2003. Those who reach the FRA during the year are subject to a more moderate test; their benefits are reduced \$1 for every \$3 earned beyond the modified threshold, which was

\$30,720 in 2003.⁴ Thus, removing the earnings test in 2000 not only eliminated the test for those who had attained ages 65 to 69 (more precisely, the FRA to 69), but it also considerably relaxed the test for those turning the FRA (see Song and Manchester [2007] for a more detailed description of the rule change).⁵

To improve the solvency of the Social Security system, the 1983 Amendments to the Social Security Act gradually raised the full retirement age beginning with people born in 1938 who reach the early retirement age (age 62) in 2000. The FRA is age 65 for those born in 1937 or earlier, but it gradually increases by two-month intervals beginning with people born in 1938 until it reaches age 67 for those born in 1960 or later.⁵ The FRA is 65 years and 2 months for people born in 1938, 65 and 4 months for those born in 1939, 65 and 6 months for those born in 1940, and so forth (see Social Security Administration 2007, Table 2.A17.1). Although the FRA is increasing, the age at which a person can start receiving reduced Social Security retirement benefits remains at 62. For those who become entitled to benefits before the FRA, monthly benefits are reduced from the full benefit amount at the rate of five-ninths of one percent per month for the first 36 months before the FRA and five-twelfths of one percent for any additional months. As a result, the gradual increase in the FRA causes a gradual increase in the permanent benefit reduction for early benefit claimants at any given age (Figure 1).⁶

⁴ See Social Security Administration (2007), Table 2.A29, for a brief history of changes in the retirement earnings test.

⁵The FRA remains at 66 for those who were born from 1942 to 1954. It gradually increases by two months per year starting with those who were born in 1955, until it reaches 67.

⁶ For example, a person born in 1937 (or earlier) who claims benefits at age 62 receives 80 percent of the primary insurance amount (PIA), but a person born in 1943 who claims benefits at age 62 receives 75 percent of the PIA (see Figure 1). Thus, the increase in the FRA can be seen as a reduction in benefit amounts (holding all else constant) that depends on the year of birth.

Both rule changes could affect Social Security finances as well as individuals' retirement wealth. Consider the responses of people claiming benefits at ages below the FRA, at the FRA, and above the FRA. First, those who claim benefits at ages earlier than the FRA would experience additional declines in benefits because of the increased FRA. Second, as pointed out in Gruber and Orszag (2003) and Song and Manchester (2007), workers may delay claiming benefits until they reach the increased FRA in order to receive their full benefits and avoid the earnings test. If they work longer before claiming benefits, they will also pay Social Security taxes longer. On the cost side, even if lifetime benefits for those who delay claiming benefits are not affected on average, the mortality experience of those who delay claiming could affect the finances of the Social Security trust fund if healthier people chose that option. Finally, accelerated benefit claiming among healthier workers who have reached the FRA and no longer face the earnings test could result in more years of benefit payments with lower levels of annual benefits. Benefits could be lower because those workers would miss out on the delayed retirement credit, which is discussed in more detail later.

The overall effect of the rule changes on Social Security finances depends on the combination of workers' decisions about how much to work and about when to claim benefits. Although choices regarding work participation and work hours affect Social Security revenues, responses in the age at benefit entitlement affect Social Security expenditures as well as individuals' retirement wealth.

An individual can earn a delayed retirement credit for each month benefits are not paid, beginning with the month in which he or she reaches the FRA and ending with the month before reaching age 70. For those who turned age 65 in 2000–2001, the credit is one-half of one percent for each incremental month, or 6 percent per year. The marginal (yearly) percentage increase in the delayed retirement credit for birth cohorts included in the study is 0.5 percent for every other birth cohort until it reaches 8.0 percent for cohorts born in 1943 or later.⁷ The increase in the credit does not affect benefit amounts as significantly as the two rule changes, but it might be considered to be a third change in the study period. Interaction between the changes in the FRA and in the delayed retirement credit could dilute the pure effect of raising the retirement age. Identifying the separate effects of those changes, however, is left for future research.

The focus of this paper is on the effects of the changes in the rules governing the Social Security program, but swings in economic activity, ongoing trends in labor force participation among older workers, and other factors can also influence the age at which people claim retirement benefits. For example, the economy was in recession during the 2001–2002 period, with the unemployment rate reaching 6.0 percent in 2003. That recession may have made it difficult for older people to hold on to existing jobs or find new jobs. As a result, the delays in claiming retirement benefits shown here may be understated to some degree.

⁷ See Social Security Administration (2007), Table 2.A20, for historical values of the delayed retirement credit.

Data and Analytical Strategy

The data used in this study come from a number of 1 percent extracts of administrative data from the Social Security Administration, including the Continuous Work History Sample 2004, the Master Beneficiary Record, and the Numident master file of Social Security numbers. Those administrative data extracts contain the exact month and year of entitlement for Old-Age, Survivors, and Disability Insurance (OASDI) benefits, the type of benefits (primary or auxiliary), and date of birth. Therefore, the age and month at benefit entitlement—the most important variable in this study—can be precisely derived. Furthermore, 1 percent extracts can be easily matched across different files using identification numbers. The 1 percent samples are selected by a “stratified cluster design” based on certain serial digits of the Social Security number. They are generally considered to be random samples and contain a large number of observations that represent the general population.

The **Continuous Work History Sample** (CWHS) is an analytical master file for the 1 percent sample of all Social Security numbers ever issued and is the base data set used in this analysis. The file is derived from several administrative master files, including the Master Beneficiary Record and the Master Earnings File, to support research and statistical analysis of the Social Security programs. The CWHS contains information on each individual’s demographic characteristics, longitudinal earnings (annual earnings from 1951 to 1977 covered by Social Security and total annual earnings from 1978 to the present), status of entitlement to OASDI benefits, and information related to death (if any).

The CWHS has both an active and an inactive file. The active file includes workers who have ever reported earnings from employment. Before 1978, the CWHS tracked only earnings covered by Social Security. Starting in 1978, however, the CWHS was extended to include earnings not covered by Social Security. The inactive sample includes people who never worked. By combining the active and inactive files, we can analyze the earnings of our 1 percent sample of the U.S. population with valid Social Security numbers and their participation in the OASDI program.

The semiannual **Master Beneficiary Record** (MBR) extract contains data related to the administration of the OASDI program, such as application and entitlement dates, benefit amounts, payment status, type of benefits, and demographic information. An MBR record is established whenever an individual application for benefits is processed. The MBR has one record for each primary beneficiary (the worker on whose earnings the benefit entitlement exists). However, each MBR record can contain more than one beneficiary.

Lastly, we merged our base data set with a 1 percent extract of the **Numident** file. The Numident is a master file of assigned Social Security numbers that contains birth and death dates, place of birth, race, and sex.⁸ Information on date of death permits us to eliminate people in the sample who died. Thus, our sample includes only those who are alive at the end of each reference year.

⁸ For further discussion of the Social Security Administration's administrative files, see Panis and others (2000).

Investigating how changes in the rules affect age at entitlement requires a data source with precise information on age, month and year of birth, and month and year of entitlement. The elimination of the retirement earnings test affects people from age 65 (or the FRA) to age 69. In a given year, anyone older than age 69 or younger than the full retirement age will not be affected directly by the elimination of the retirement earnings test. However, because the FRA gradually increases by two-month intervals, the year in which a person becomes affected by the test's elimination depends not only on the year in which they were born but also on the month in which they were born. For example, someone born in November or December 1939 would reach the FRA not in 2004 but in 2005. Yet someone born in January through October 1939 would reach the FRA in 2004. Only the year of birth, however, determines who is affected by the increase in the FRA.

Although removing the earnings test in 2000 was a relatively abrupt change in a parameter of the Social Security program, the gradual increase in the FRA was anticipated for many years following the enactment of the 1983 amendments. The earliest birth cohort affected by those amendments reached their FRA in 2003 or 2004. Thus, a forward-looking individual would have adjusted his or her labor supply over the last 20 years to compensate for the expected benefit reduction due to the increase in the FRA. Unlike ongoing decisions about labor supply, workers can claim benefits only after reaching the early retirement age. Thus, the standard before-and-after or difference-in-difference approach is valid in evaluating the effect of the 1983 amendments on the age at which benefits are claimed. Note, however, that larger compensating adjustments in labor supply result in smaller estimated effects on the age at benefit entitlement.

The fact that the "treatment" in this study depends on both time and age suggests a quasi-experimental study using a standard design. This analysis therefore relies primarily on comparing the probability of benefit entitlement and entitlement hazards over the period before and after the rule changes became effective, holding age constant. Entitlement hazard refers to the probability that people who have not yet claimed benefits will do so during the specified period.

Three distinct treatment groups emerge from the rule changes (Figure 2).

- The first treatment group is affected only by the 2000 change in the earnings test. It comprises people who were born in 1930–1935, 1931–1936, 1932–1937, 1933–1937, 1934–1937, and 1935–1937, respectively, for 2000, 2001, 2002, 2003, 2004, and 2005.
- The second treatment group is affected by both the 2000 change in the earnings test and the increase in the FRA. It comprises people who were born in January through October 1938, January 1938 through August 1939, and January 1938 through June 1940, respectively, for 2003, 2004, and 2005.
- The third treatment group, which consists of people who were born in 1938 or later for years before attaining the FRA, is affected only by the increase in the FRA. In 2000, for example, the 1938 cohort would not be directly affected by the change in the earnings test because they were too young in that year.⁹

⁹ We note, however, that they may be indirectly affected (for example, if the repeal of the earnings test at the FRA affected their decisions about claiming benefits before the FRA).

Descriptive Analysis

An Overview of the 1 Percent Sample

For 1997 through 2006, year-end counts of Old-Age and Survivors Insurance (OASI) beneficiaries and persons who are fully insured (as of age 60) provide a good overview of the 1 percent data (Table 1). In our 1 percent sample, 24,524 men and 21,797 women aged 62–64 in 2000 are fully insured.¹⁰ Only 292 of the 10,374 auxiliary beneficiaries in that age group in 2000 are male. Although the number of women who are auxiliary beneficiaries tends to drop significantly over the study period, the number of men in that category appears to remain relatively stable. Primary beneficiaries include individuals who claim benefits as dual beneficiaries—those receiving both a primary benefit and a partial spouse or survivor benefit. Although primary beneficiaries include dual beneficiaries, the reduction factors for the spouse and survivor portion of benefits are different from those for primary benefits, and the FRA increase for survivor benefits has a different schedule from that for primary or spouse benefits (Social Security Administration 2007, Tables 2.A21 and 2.A22).

The percentage of people who are fully insured and become primary beneficiaries before age 65 remains relatively constant until 1999 and then gradually decreases over the rest of the study period. Because those born in 1938 reach age 62 in 2000, the gradual decrease in the percentage of primary beneficiaries probably stems in large part from a delay in benefit claiming among those born in 1938 or later. Declines in the percentage of primary beneficiaries beginning in 2003 seem plausible because 2003 is the first year in

¹⁰ Throughout the rest of this paper, we define age to be reference year minus year of birth. People who are fully insured have enough quarters of coverage to be eligible for old-age benefits as primary beneficiaries.

which those aged 65 face the higher FRA. A part of the gradual decline, known as the spillover effect associated with the removal of the earnings test, may be attributed to individuals aged 62–64 who continue to work and delay claiming benefits until they reach age 65 following the test’s removal. Of course, that effect is unlikely to be as large as the direct effect of the rising FRA.

Among people aged 65–70, the percentage of primary beneficiaries increases over the 2000–2002 period and then gradually declines over the rest of the study period. Responses to removing the earnings test in 2000 and raising the FRA are evident here. The percentage of male primary beneficiaries drops from 96 percent to 95 percent between 2003 and 2004, followed by a decline from 95 percent to 93.6 percent between 2004 and 2005. The percentage of female primary beneficiaries also drops during both time intervals, but fairly insignificantly (less than 1 percentage point). One notable finding is that the drops for both men and women come at the same time that the increase in the FRA begins to affect them directly. Smaller declines for women may reflect lower responses among auxiliary beneficiaries, such as spouses and widows.

Eliminating the retirement earnings test also appears to affect the share of fully insured individuals who have claimed benefits as primary beneficiaries (Table 1). Among men aged 65–70, 94.5 percent of the fully insured are primary beneficiaries in 1999. In 2000, immediately after the earnings test was removed, that percentage rises nearly 3 percentage points, to 97 percent. The share of female primary beneficiaries also increases more than 1 percentage point, to 86 percent.

The rest of our analysis focuses exclusively on primary beneficiaries because their benefit-claiming behavior has the biggest effect on households' Social Security benefits. Primary worker beneficiaries are the largest group among OASI beneficiaries; they constituted approximately 75 percent of all OASI beneficiaries in 2002 (Social Security Administration 2007). Only people aged 62 or older can claim benefits as primary beneficiaries, so we do not include those younger than age 62 in the analysis. In addition, we limit our sample to individuals who have accumulated enough quarters of coverage to be fully insured between the year they turn age 21 and the year they reach age 60. Our analytical samples also exclude people who were ever beneficiaries under the Social Security Disability Insurance program and OASI beneficiaries who converted from the Disability Insurance program.

Percentage of Primary Beneficiaries in Each Treatment Group

Our empirical strategy is to trace the number and the percentage of primary beneficiaries among the fully insured population from 1997 to 2006, holding age constant. Data on the population that is fully insured as of age 60 can be found in Table 2 and Figure 3.

Entitlement Probability. For both men and women, the percentage aged 65–69 who are entitled as primary beneficiaries increases between 1999 and 2000. Over the same period, the percentage aged 62 decreases slightly. Such results show that after the change in the earnings test in 2000, benefit claiming among people who had already attained the FRA accelerated at the same time that it slowed down a bit among those younger than the

FRA. The slowdown is particularly apparent among those turning age 62. In 2003, when the first birth cohort that faces an increased FRA begins to reach their FRA (age 65 and 2 months), the overall percentage entitled begins to decrease, particularly among those aged 65. The decline continues in 2005 and 2006. For those who are younger than age 65, the percentage entitled decreases slightly over the 2003–2006 period, suggesting that a small fraction of those younger than the FRA responded to the FRA rule change as well.

Responses to the rule changes discussed above probably understate the effect on people who can choose whether to become entitled to benefits. The reason for the understatement is that the number of people who have not yet claimed benefits in each age/year group is fairly small. Nearly 90 percent of fully insured people become entitled by age 65 (Table 2).

Entitlement Hazard. We next focus on the percentage of people who are newly entitled in a given year, among those who are fully insured but not previously entitled (Table 3 and Figure 4). That measure is known as the entitlement hazard. For example, 19.7 percent of men aged 69 who were not yet entitled became entitled in 1999, compared with 41.8 percent in 2000. Furthermore, 32.3 percent of men aged 66 who were not yet entitled became entitled in 1999, compared with 65.9 percent in 2000. For men and women aged 65, the entitlement hazards decline noticeably starting in 2003, when the first birth cohorts are affected by the FRA increase. The entitlement hazards for those aged 66 increase nearly 40 percentage points for both men and women in 2004 when

those born in November or December 1938 reach their FRA. Those results also show that men are more responsive to the rule changes than are women.

Entitlement Age Distribution by Entitlement Year and Birth Year

We next present the distribution of benefit entitlement ages by entitlement year and birth cohort (Figures 5, 6, and 7). Comparing the distribution across different entitlement years and different birth cohorts provides data on the changes in claiming behavior as both rule changes become effective.

Cumulative distributions by year of entitlement in Figure 5 show the percentage of fully insured people who have claimed benefits as of a specific age in each year from 1997 to 2006. The analysis focuses on people aged 62–70 because the percentage of those who become entitled by age 70 tends to be stable before and after the rule changes. Several interesting aspects are evident. First, the distribution of men shifts more than that of women, suggesting that men are more responsive to the rule changes than are women. Second, in the years after the earnings test was removed, the curves shift downward for ages 62–65. They jump up at age 65 and then exhibit a stair-step incline as the FRA rises, indicating that the removal of the earnings test has a slight effect on the age at which those who are younger than the FRA become entitled. Third, gradual downward shifts in the curves in the segment for people at entitlement age 65 or older appear to be a result of the gradual increase in the FRA for those born in 1938 or later. Fourth, the curves of 2000 through 2006, particularly for those at the segment younger than the entitlement age

of 65, are tightly packed, perhaps reflecting both the additional benefit reduction as the FRA increases and the absence of an earnings test starting at the FRA.

Next we present a cumulative distribution of benefit entitlement ages for men and women for birth cohorts 1930, 1937, 1939, and 1941 (Figure 6). In this case, we include entitlement ages ranging from age 62 to age 65 and 8 months because the last birth cohort considered here (1941) reaches age 65 and 8 months—the FRA for that cohort—by the end of August 2007. Because our most recent MBR extract was pulled in December 2007, we are able to observe those who become entitled at ages up to 65 and 8 months for all birth cohorts considered in Figure 6. Persons born in 1934 or earlier who claimed benefits before reaching age 65 did so before the removal of the earnings test in 2000. Thus, the distribution of entitlement ages of the 1930 birth cohort should be relatively unaffected by both rule changes. For the 1937 birth cohort, benefit claiming at ages 63 or older takes place after the elimination of the earnings test. The curve of the 1930 birth cohort clearly lies above the curve of the 1937 birth cohort. For all cohorts, nearly 95 percent of primary beneficiaries claim benefits by the FRA. Further, the elimination of the earnings test appears to accelerate benefit claims at age 65. Thus, the vertical distance at age 65 between the curves of the 1930 and 1937 birth cohorts probably arises from accelerated benefit claims at age 65, which was the FRA for those birth cohorts. Although approximately 98 percent of men born in 1930 become entitled by age 65, nearly 99 percent of those born in 1937 become entitled by age 65, probably because of the effect of the removal of the earnings test in 2000. Similar effects are observable among women, but the magnitude appears to be a bit smaller.

The effects of the increase in the FRA are reflected in the horizontal dispersion in the vertical segments of the cumulative distribution curves for ages 65 and 65 and 8 months. It is well known that two peaks occur in the entitlement age distribution: one at the early retirement age (62) and the other at the FRA. Results here show that the peak at the FRA moves as the FRA increases. Furthermore, results show that the portion of the curve for those aged 62–64 keeps moving downward for more recent birth cohorts. One of the most important questions for policymakers is who is responding to the increase in the FRA. Are those observed responses largely due to changes in claiming behavior among those who would become entitled around the FRA or across different ages? The answer is unclear from the graphical results alone.

Sorting out the economic effects of the benefit reductions from the signaling or institutional role of the FRA is a difficult task, but the information in Figure 7 may offer some clues. That figure shows the proportion of men and women among the cohorts born in 1937 through 1941 who become entitled to retirement benefits at two-month intervals between ages 62 and 65 and 8 months. The 1937 birth cohort was not affected by the change in the full retirement age. About 42 percent of men in that cohort and 49 percent of women claimed benefits at age 62, the early retirement age. That percentage dropped slightly following the increase in the FRA, to about 40 percent of men and 45 percent of women in the 1941 cohort. The percentage of people who claim benefits after age 62 and a few months before the FRA stays relatively stable at about 1 percent at each age.

Benefit reductions affect only people who retire before age 65 and therefore are primarily responsible for the drop in the percentage who claim benefits before age 65.

More dramatic changes are evident in the upper end of the distribution. In the 1937 cohort, about 18 percent of men and 12 percent of women claimed benefits at age 65, the FRA for that cohort. As the FRA moved out by two months per year for the 1938, 1939, 1940, and 1941 cohorts, the spike at the FRA moved out as well. About 16 percent of men and 10 percent of women became entitled to benefits at 65 and 8 months, the relevant FRA for the 1941 cohort. People who previously would have claimed benefits at age 65 but waited until their new, higher FRA are most likely responding to a combination of the benefit reduction and the signaling aspect of the Social Security retirement age. Another possibility is that the “full” retirement age in integrated private pension plans influences the age at which people claim Social Security benefits. Further investigation will help identify those two effects more clearly.

Regression Analysis of Benefit Entitlement Status at Specific Ages

In this study, the range of age groups affected by the changes in law differs over the study period. For example, people affected only by the removal of the earnings test in 2000 reach ages 65–70 in 2000, but the group affected only by the earnings test removal in 2005 reaches ages 68–70 in 2005. People reaching age 65 and 6 months through age 67 in 2005 are affected by both the removal of the earnings test and the gradual increase in the FRA. Further, those affected by the gradual increase in the FRA in 2000 turn age 62

in 2000, but the affected group in 2002 reaches ages 62–64 in that year. Therefore, estimating a single regression equation based on stacked (repeated) cross-sectional data cannot clearly identify the effects of the rule changes.

A better approach is to estimate the effect of the rule changes on the probability of benefit entitlement at specific ages using a probit regression method. The dependent variable is binary: 1 if the person is entitled to old-age benefits in the reference year, and 0 if the person is not entitled to benefits in that year. The regression equation takes a standard difference-in-difference form:

$$y_{it}^j = a + g\Delta_t + h\Delta^j + \beta\Delta_t^j + c'X_i + e_{it}^j,$$

where y is the dependent variable that equals 1 when the person is entitled in year t and 0 when the person is not entitled in year t ; Δ s are dummy variables indicating the type of rule change affecting different age groups in different years; index j takes the value 0 or j , where j indicates the j th treatment group and 0 indicates the control group; time index t equals year of entitlement; and X is a vector of the individual's characteristics, such as race and sex.

Effects of the removal of the earnings test and the increase in the FRA are identified by the β s that are the coefficients on the year- and age-specific treatment dummies. Because the probability of benefit entitlement monotonically increases as age rises, one cannot estimate all β s with one regression. Thus, we further subdivide the affected group into seven subgroups according to age (Figure 2). We then estimate the effect of the rule changes in the seven separate regressions using the age 71–72 group as the control group.

For example, the first regression includes people who reach ages 68–70 in each reference year as treatment group 1 and those who reach ages 71–72 as the control group.

Similarly, the seventh regression includes those who reach age 62 as the treatment group and those who reach ages 71–72 as the control group.

Persons aged 71–72 appear to be an excellent control group for the analysis. As shown in Table 2 and Figure 3, observed (cumulative) benefit entitlement rates at ages 70 or older are largely independent of the two rule changes. The rule changes affect the shape of the age distribution at entitlement between ages 62 and the FRA (or age 70) but probably do not affect the cumulative probability of entitlement at ages 71 and 72.¹¹

In Table 4, we report estimates of the full effects on entitlement and the marginal effects on the probability of entitlement of year- and age-specific treatment dummies for men and women separately. Including year- and age-specific treatment dummies rather than only age-specific treatment dummies allows us to investigate the dynamics of benefit claiming at specific ages over the 2000–2005 period. The first two columns show the coefficient estimates and clustered robust standard errors on age interacted with year (the rule change dummies) for men. The third and fourth columns report the marginal effect evaluated at the mean of the independent variable and standard errors for men. In the last four columns, we report estimated effects and marginal effects for women.

¹¹ We have tested two alternative control groups: those who are not fully insured and auxiliary beneficiaries. Those results tend to overestimate effects for older age groups and underestimate effects for younger age groups.

Both the direction and the magnitude of the estimated effects accord with our expectations. For men aged 68–70, we estimate that benefit entitlement in 2000–2005 rises approximately 1 percentage point as a result of eliminating the earnings test in 2000. The effects are a bit larger for those aged 66, about 3 percentage points for men and less than 2 percentage points for women. In 2005, estimated effects are smaller for men and women aged 66 and 67, suggesting that the change in the FRA offsets the effect from the change in the earnings test. For those aged 65 in 2000–2002, the change in the earnings test increases benefit entitlement by 4.6 percentage points for men and by 2.4 percentage points for women. The FRA becomes the dominant rule change in 2004 and 2005, however, as the estimated marginal effect for those aged 65 turns negative and becomes as large as 12.5 percentage points for men and 5.4 percentage points for women in 2005.

Estimated policy effects for persons aged 64 in 2000–2001 and those aged 63 in 2000 are small and, for the most part, statistically insignificant. Such results are plausible because those age groups are not affected directly by the two rule changes (see Figure 2). Yet estimated effects are all negative and quite large for persons aged 62–64 in other years. A four-month increase in the FRA results in a decline in benefit entitlement rates for men of 1.7, 2.4, and 3.7 percentage points at ages 62, 63, and 64, respectively. For women the declines are 1.5, 2.2, and 2.7 percentage points at ages 62, 63, and 64, respectively. Following the six-month increase in the FRA, rates for men decline by 3.3, 4.4, and 5.2 percentage points at ages 62, 63, and 64, respectively, and by 2.1, 3.3, and 3.5 percentage points for women at those same ages. Those estimates suggest that a relatively large

response occurs at age 62 and that relatively small but incremental responses occur at ages 63 and 64.

Policymakers have asked whether people who are younger than the FRA would change their behavior following the gradual increase in the FRA. Our results show that the largest response occurs among those who are at the early retirement age of 62. Additional small but statistically significant responses are detected at ages 63 and 64 as well.

Estimates reported in Table 5 show how the two rule changes have affected the benefit entitlement hazard. Among those who have reached the FRA, a dramatic increase in the entitlement hazard occurs right after the change in the earnings test, as shown in Figure 4. The estimated marginal effects in 2000 for those aged 66 or older range from 18 percentage points (ages 68–70) to 29 percentage points (age 65) for men and 10 percentage points (ages 68–70) to 25 percentage points (age 65) for women. In the succeeding years the marginal effects are small and insignificant except for those at age 65. As expected, the entitlement hazard also increases significantly for those aged 66, rising 19 and 33 percentage points for men in 2004 and 2005, respectively, and 14 and 26 percentage points for women. Persons born in November–December 1938 reach the FRA (65 years and 2 months) in 2004, and those born in September–December 1939 reach the FRA (65 and 4 months) in 2005.

Effects of removing the earnings test in 2000 are reflected in estimates of the entitlement hazard for those aged 65 in 2000–2002. Estimated marginal effects in those years for men

and women are approximately 26 percent to 29 percent and 21 percent to 24 percent, respectively. Starting in 2003, that age group is affected not only by the removal of the earnings test but also by the gradual increase in the FRA. The estimated marginal effect at age 65 is small and statistically insignificant in 2003 but is negative and statistically significant in both 2004 and 2005, indicating that the effects of the gradual increase in the FRA dominate in those years. Estimated marginal effects in 2000–2003 are relatively small for those younger than age 65. However, the marginal effects for those aged 62–64 in 2004 and 2005 are negative, relatively large, and statistically significant.

We can easily derive elasticity estimates of interest from the estimates reported in Table 4. If all else remains constant, we know the percentage change in benefit amounts for all age groups affected by the gradual increase in the FRA. We can calculate the elasticity of benefit entitlement probability with respect to benefit amounts using our estimates on percentage changes in benefit entitlement probability by age group. The derived elasticity at age 64 ranges from 1.3 to 1.7 for men and from 0.7 to 1.1 for women. At age 62 it ranges from 0.8 to 1.3 for men and 0.7 to 1.2 for women. The larger elasticity at age 64 than at age 62 is plausible because the estimated effects at age 64 cumulate the effects at ages 62, 63, and 64.

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Table 1.
Status of Entitlement to Old-Age and Survivors Insurance Benefits for People Aged 62-70 in 1997-2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Ages 62-64										
Men										
Fully Insured Primary Beneficiaries	23,154	23,661	24,069	24,524	25,058	25,968	26,699	28,788	31,166	33,050
Number	12,778	12,933	13,190	13,257	13,279	13,383	13,304	13,819	14,539	14,595
Percentage of fully insured	0.5519	0.5466	0.5480	0.5406	0.5299	0.5154	0.4983	0.4800	0.4665	0.4416
Auxiliary Beneficiaries										
Number	321	292	300	292	294	291	306	328	370	328
Percentage of primary beneficiaries	0.0251	0.0226	0.0227	0.0220	0.0221	0.0217	0.0230	0.0237	0.0254	0.0099
Women										
Fully Insured Primary Beneficiaries	19,910	20,358	20,867	21,797	22,406	23,235	24,094	26,345	28,416	29,954
Number	10,888	11,138	11,375	11,875	12,051	12,215	12,319	13,174	13,940	14,223
Percentage of fully insured	0.5469	0.5471	0.5451	0.5448	0.5378	0.5257	0.5113	0.5001	0.4906	0.4748
Auxiliary Beneficiaries										
Number	10,239	10,193	10,194	10,082	9,881	9,369	9,072	9,044	8,987	5,910
Percentage of primary beneficiaries	0.9404	0.9152	0.8962	0.8490	0.8199	0.7670	0.7364	0.6865	0.6447	0.1973
Year of Birth Sample	1933-1935	1934-1936	1935-1937	1936-1938	1937-1939	1938-1940	1939-1941	1940-1942	1941-1943	1942-1944
Ages 65-70										
Men										
Fully Insured Primary Beneficiaries	43,660	43,068	42,876	43,058	43,172	43,621	44,592	45,658	47,274	49,194
Number	41,372	40,660	40,521	41,739	41,899	42,321	42,868	43,376	44,267	45,500
Percentage of fully insured	0.9476	0.9441	0.9451	0.9694	0.9705	0.9702	0.9613	0.9500	0.9364	0.9249
Auxiliary Beneficiaries										
Number	891	881	874	862	860	852	846	841	868	955
Percentage of primary beneficiaries	0.0215	0.0217	0.0216	0.0207	0.0205	0.0201	0.0197	0.0194	0.0196	0.0194
Women										
Fully Insured Primary Beneficiaries	38,126	38,090	38,231	38,344	38,427	38,991	40,044	41,113	42,634	44,801
Number	31,896	31,928	32,244	32,933	33,214	33,771	34,735	35,499	36,709	38,333
Percentage of fully insured	0.8366	0.8382	0.8434	0.8589	0.8643	0.8661	0.8674	0.8634	0.8610	0.8556
Auxiliary Beneficiaries										
Number	28,606	28,517	28,365	28,289	27,730	27,466	27,069	26,530	26,091	23,871
Percentage of primary beneficiaries	0.8969	0.8932	0.8797	0.8590	0.8349	0.8133	0.7793	0.7473	0.7108	0.5328
Year of Birth Sample	1927-1932	1928-1933	1929-1934	1930-1935	1931-1936	1932-1937	1933-1938	1934-1939	1935-1940	1942-1944

SOURCE: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999-2007.

NOTE: Dual beneficiaries are counted in both primary and auxiliary beneficiary categories.

Table 3.
Number and Percentage of People Who Become Entitled in Each Year, by Birth Year and Sex

Birth Year	1998		1999		2000		2001		2002		2003		2004		2005		2006		
	Men	Women	Men	Women															
1928	75	47																	
1929	47	20	81	54															
1930	56	23	67	25	103	54													
1931	83	47	79	43	132	51	23	39											
1932	158	99	100	46	165	81	24	16	9	34									
1933	1,806	1,083	230	107	276	116	29	12	21	11	13	27							
1934	498	357	1,894	1,108	459	181	37	17	16	9	14	14	15	24					
1935	1,097	813	523	381	2,515	1,345	58	28	17	19	11	2	11	15	12				
1936	3,456	3,008	1,138	863	550	370	2,491	1,416	68	30	34	39	41	10	15	12			
1937			3,546	3,152	1,073	912	511	401	2,509	1,478	69	41	17	9	9				
1938					3,566	3,377	1,137	899	541	390	2,430	1,487	419	239	38	30			
1939							3,507	3,105	1,155	910	507	418	2,111	1,309	853	479			
1940									3,536	3,308	1,151	931	559	450	1,795	1,233			
1941											3,530	3,436	1,232	978	577	498			
1942													3,882	3,862	1,347	1,213			
1943															3,982	3,732			
1944																			

Birth Year	1998		1999		2000		2001		2002		2003		2004		2005		2006		
	Men	Women																	
1928	0.3012	0.1492																	
1929	0.1604	0.0683	0.3361	0.2022															
1930	0.1393	0.0599	0.1971	0.0702	0.3829	0.1688	0.1278	0.1696											
1931	0.1711	0.1199	0.1990	0.1280	0.4177	0.1783	0.1348	0.0664	0.0596	0.1532	0.0791	0.0639	0.0932	0.1176					
1932	0.2577	0.2041	0.2217	0.1217	0.4783	0.2477	0.1472	0.0594	0.1273	0.0595	0.0791	0.0103	0.0608	0.0785					
1933	0.7152	0.6760	0.3226	0.2432	0.5823	0.3580	0.1472	0.0594	0.1273	0.0595	0.0909	0.1570	0.0932	0.1176					
1934	0.1591	0.1747	0.7273	0.6798	0.6585	0.4151	0.1581	0.0680	0.0821	0.0388	0.0791	0.0639	0.0608	0.0785					
1935	0.2450	0.2705	0.1561	0.1807	0.8976	0.8059	0.2094	0.1134	0.0787	0.0880	0.0564	0.0103	0.0608	0.0785					
1936	0.4277	0.4794	0.2491	0.2808	0.1623	0.1732	0.8874	0.8237	0.2194	0.1310	0.1429	0.1212	0.0891	0.0585					
1937			0.4389	0.4775	0.2395	0.2807	0.1513	0.1782	0.8825	0.8257	0.2136	0.1660	0.1621	0.0890					
1938					0.4196	0.4795	0.4086	0.4509	0.2298	0.1457	0.1563	0.7243	0.5877	0.5000					
1939									0.3932	0.4462	0.2133	0.2359	0.1332	0.1535					
1940											0.3813	0.4358	0.2180	0.2290					
1941													0.3631	0.4224					
1942															0.1996	0.2370			
1943																	0.1842	0.2252	
1944																			

SOURCE: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999-2007.

Table 4.
Marginal Effects on Benefit Entitlement, by Age and Sex

Year	Policy Effect	Men				Women			
		Estimate	Std. E.	Marg. Eff.	Std. E.	Estimate	Std. E.	Marg. Eff.	Std. E.
Ages 68-70									
2000	RET	0.1279	0.0238	0.0112	0.0019	0.0388	0.0202	0.0063	0.0032
2001	RET	0.1611	0.0272	0.0137	0.0020	0.0737	0.0227	0.0117	0.0035
2002	RET	0.1618	0.0279	0.0138	0.0021	0.0513	0.0221	0.0083	0.0035
2003	RET	0.1283	0.0273	0.0112	0.0022	0.0661	0.0210	0.0106	0.0032
2004	RET	0.1044	0.0268	0.0093	0.0022	0.0602	0.0204	0.0097	0.0032
2005	RET	0.0720	0.0267	0.0066	0.0023	0.0759	0.0205	0.0120	0.0031
Age 67									
2000	RET	0.2856	0.0355	0.0275	0.0027	0.0760	0.0258	0.0109	0.0035
2001	RET	0.3056	0.0368	0.0290	0.0027	0.1044	0.0281	0.0147	0.0037
2002	RET	0.2924	0.0369	0.0280	0.0028	0.1153	0.0296	0.0161	0.0038
2003	RET	0.2640	0.0369	0.0259	0.0029	0.0804	0.0295	0.0115	0.0040
2004	RET	0.2062	0.0358	0.0211	0.0031	0.0930	0.0283	0.0132	0.0038
2005	RET&FRA (2 mos)	0.1372	0.0340	0.0148	0.0033	0.1179	0.0267	0.0165	0.0035
Age 66									
2000	RET	0.3343	0.0336	0.0320	0.0024	0.1012	0.0255	0.0144	0.0034
2001	RET	0.3895	0.0347	0.0358	0.0023	0.1375	0.0266	0.0191	0.0034
2002	RET	0.3366	0.0346	0.0322	0.0025	0.1017	0.0276	0.0145	0.0037
2003	RET	0.2659	0.0345	0.0268	0.0028	0.1006	0.0290	0.0143	0.0039
2004	RET&FRA (2 mos)	0.2106	0.0334	0.0221	0.0030	0.1249	0.0290	0.0175	0.0038
2005	RET&FRA (4 mos)	0.1295	0.0321	0.0145	0.0033	0.0474	0.0275	0.0070	0.0039
Age 65									
2000	RET	0.4579	0.0315	0.0460	0.0022	0.1680	0.0253	0.0239	0.0032
2001	RET	0.4238	0.0316	0.0436	0.0023	0.1502	0.0259	0.0216	0.0034
2002	RET	0.3636	0.0312	0.0391	0.0025	0.1514	0.0259	0.0218	0.0034
2003	RET&FRA (2 mos)	-0.0225	0.0277	-0.0032	0.0040	0.0290	0.0266	0.0045	0.0041
2004	RET&FRA (4 mos)	-0.3416	0.0264	-0.0593	0.0055	-0.1653	0.0273	-0.0291	0.0053
2005	RET&FRA (6 mos)	-0.6142	0.0253	-0.1251	0.0069	-0.2872	0.0268	-0.0544	0.0059
Age 64									
2000	None	-0.0197	0.0212	-0.0039	0.0043	-0.0120	0.0221	-0.0023	0.0043
2001	None	-0.0298	0.0222	-0.0060	0.0045	-0.0003	0.0229	0.0001	0.0044
2002	FRA (2 mos)	-0.0996	0.0220	-0.0207	0.0048	-0.0452	0.0228	-0.0089	0.0046
2003	FRA (4 mos)	-0.1718	0.0221	-0.0372	0.0052	-0.1285	0.0229	-0.0265	0.0050
2004	FRA (6 mos)	-0.2346	0.0222	-0.0524	0.0055	-0.1646	0.0235	-0.0346	0.0054
2005	FRA (8 mos)	-0.2787	0.0222	-0.0636	0.0058	-0.2126	0.0240	-0.0458	0.0057
Age 63									
2000	None	-0.0081	0.0208	-0.0017	0.0045	-0.0083	0.0216	-0.0017	0.0044
2001	FRA (2 mos)	-0.0550	0.0217	-0.0120	0.0049	-0.0161	0.0224	-0.0033	0.0046
2002	FRA (4 mos)	-0.1069	0.0217	-0.0239	0.0051	-0.1032	0.0225	-0.0222	0.0051
2003	FRA (6 mos)	-0.1900	0.0217	-0.0443	0.0055	-0.1490	0.0224	-0.0328	0.0053
2004	FRA (8 mos)	-0.2277	0.0217	-0.0540	0.0057	-0.1989	0.0223	-0.0449	0.0055
2005	FRA (10 mos)	-0.3127	0.0213	-0.0771	0.0060	-0.2206	0.0225	-0.0503	0.0057
Age 62									
2000	FRA (2 mos)	-0.0405	0.0205	-0.0098	0.0051	0.0071	0.0212	0.0016	0.0048
2001	FRA (4 mos)	-0.0680	0.0216	-0.0168	0.0055	-0.0640	0.0224	-0.0149	0.0054
2002	FRA (6 mos)	-0.1318	0.0215	-0.0334	0.0058	-0.0886	0.0222	-0.0209	0.0055
2003	FRA (8 mos)	-0.1929	0.0216	-0.0502	0.0061	-0.1481	0.0221	-0.0360	0.0058
2004	FRA (10 mos)	-0.2604	0.0212	-0.0697	0.0063	-0.1885	0.0217	-0.0466	0.0058
2005	FRA (12 mos)	-0.3113	0.0211	-0.0850	0.0065	-0.2816	0.0217	-0.0726	0.0063

SOURCE: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2005 and June 2006.

Notes: The dependent variable is binary: 1 if entitled by the end of each year; 0 if not entitled by the end of each year. The sample includes people who are fully insured at age 60.

RET = retirement earnings test; FRA = full retirement age.

Table 5.
Marginal Effects on Benefit Entitlement Hazard, by Age and Sex

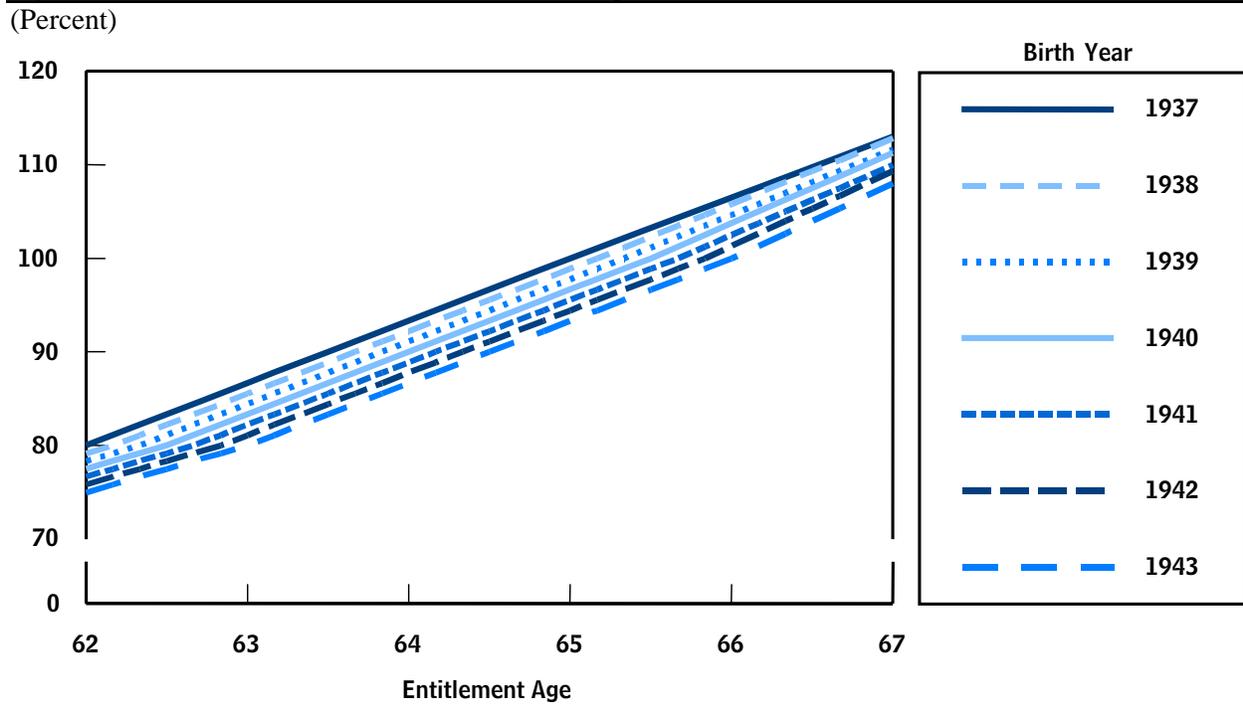
Year	Policy Effects	Men				Women			
		Estimate	Std. E.	Marg. Eff.	Std. E.	Estimate	Std. E.	Marg. Eff.	Std. E.
Ages 68-70									
2000	RET	0.8126	0.1316	0.1791	0.0393	0.5814	0.1353	0.0985	0.0301
2001	RET	-0.2100	0.1358	-0.0262	0.0146	-0.0066	0.1369	-0.0008	0.0160
2002	RET	-0.3638	0.1470	-0.0409	0.0126	0.0003	0.1445	0.0000	0.0171
2003	RET	-0.6274	0.1457	-0.0592	0.0082	-0.2349	0.1439	-0.0235	0.0120
2004	RET	-0.6911	0.1415	-0.0627	0.0072	-0.2687	0.1416	-0.0262	0.0112
2005	RET	-0.6796	0.1434	-0.0622	0.0075	-0.1271	0.1431	-0.0137	0.0140
Age 67									
2000	RET	1.2326	0.1424	0.2987	0.0506	0.9865	0.1519	0.1893	0.0448
2001	RET	-0.0710	0.1580	-0.0082	0.0173	-0.2544	0.1759	-0.0203	0.0113
2002	RET	-0.4073	0.1796	-0.0366	0.0114	-0.0584	0.1794	-0.0055	0.0160
2003	RET	-0.2214	0.1598	-0.0229	0.0138	-0.0218	0.1731	-0.0021	0.0163
2004	RET	-0.2504	0.1548	-0.0253	0.0128	-0.3078	0.1808	-0.0235	0.0104
2005	RET&FRA (2 mos)	-0.3630	0.1558	-0.0339	0.0108	-0.0585	0.1661	-0.0055	0.0148
Age 66									
2000	RET	1.1299	0.1358	0.3715	0.0524	0.7182	0.1428	0.1708	0.0446
2001	RET	-0.1698	0.1469	-0.0357	0.0282	-0.3858	0.1612	-0.0486	0.0152
2002	RET	-0.0717	0.1489	-0.0159	0.0318	-0.2343	0.1655	-0.0326	0.0195
2003	RET	-0.2441	0.1441	-0.0494	0.0254	-0.2356	0.1578	-0.0328	0.0186
2004	RET&FRA (2 mos)	0.6452	0.1276	0.1897	0.0450	0.6273	0.1354	0.1428	0.0400
2005	RET&FRA (4 mos)	1.0344	0.1272	0.3254	0.0478	1.0070	0.1331	0.2605	0.0465
Age 65									
2000	RET	0.8605	0.1276	0.2871	0.0331	0.5750	0.1282	0.2248	0.0474
2001	RET	0.7082	0.1200	0.2455	0.0346	0.5385	0.1210	0.2112	0.0453
2002	RET	0.7508	0.1261	0.2577	0.0354	0.6111	0.1268	0.2381	0.0464
2003	RET&FRA (2 mos)	0.1458	0.1198	0.0560	0.0453	0.1157	0.1209	0.0460	0.0482
2004	RET&FRA (4 mos)	-0.3575	0.1171	-0.1415	0.0464	-0.3054	0.1186	-0.1178	0.0441
2005	RET&FRA (6 mos)	-0.6846	0.1200	-0.2676	0.0446	-0.5290	0.1207	-0.1981	0.0413
Age 64									
2000	None	0.1962	0.1248	0.0421	0.0292	0.1577	0.1269	0.0339	0.0293
2001	None	0.0431	0.1175	0.0086	0.0240	0.0699	0.1194	0.0144	0.0254
2002	FRA (2 mos)	0.0831	0.1233	0.0169	0.0260	0.0465	0.1251	0.0095	0.0260
2003	FRA (4 mos)	-0.1315	0.1191	-0.0242	0.0205	-0.0879	0.1207	-0.0168	0.0221
2004	FRA (6 mos)	-0.2348	0.1170	-0.0412	0.0183	-0.2264	0.1186	-0.0406	0.0190
2005	FRA (8 mos)	-0.2009	0.1195	-0.0359	0.0194	-0.1753	0.1207	-0.0323	0.0205
Age 63									
2000	None	0.1523	0.1233	0.0431	0.0366	0.1906	0.1241	0.0559	0.0386
2001	FRA (2 mos)	0.0214	0.1156	0.0058	0.0315	0.0168	0.1166	0.0046	0.0325
2002	FRA (4 mos)	0.0764	0.1216	0.0211	0.0344	0.0643	0.1225	0.0181	0.0352
2003	FRA (6 mos)	-0.1314	0.1173	-0.0337	0.0287	-0.1438	0.1182	-0.0377	0.0294
2004	FRA (8 mos)	-0.2250	0.1154	-0.0558	0.0262	-0.2759	0.1162	-0.0690	0.0261
2005	FRA (10 mos)	-0.2451	0.1177	-0.0607	0.0267	-0.2062	0.1183	-0.0531	0.0284
Age 62									
2000	FRA (2 mos)	0.1383	0.1220	0.0522	0.0468	0.1778	0.1223	0.0692	0.0481
2001	FRA (4 mos)	0.0053	0.1144	0.0020	0.0425	0.0024	0.1147	0.0009	0.0439
2002	FRA (6 mos)	0.0311	0.1206	0.0116	0.0451	0.0556	0.1208	0.0214	0.0468
2003	FRA (8 mos)	-0.1507	0.1161	-0.0545	0.0409	-0.1224	0.1163	-0.0462	0.0431
2004	FRA (10 mos)	-0.3091	0.1141	-0.1087	0.0377	-0.2669	0.1143	-0.0986	0.0405
2005	FRA (12 mos)	-0.2925	0.1166	-0.1033	0.0389	-0.2893	0.1168	-0.1066	0.0411

SOURCE: Authors' calculations using active and inactive files of the Continuous Work History Sample, 2004; and 1 percent Master Beneficiary Record extract for December 1999-2005 and June 2006.

NOTES: The dependent variable is binary: 1, if entitled during each year; 0, if not entitled but fully insured at age 60. Samples include those who have not become entitled by the beginning of the reference year.

RET = retirement earnings test; FRA = full retirement age.

Figure 1.
**Benefit Amount as a Percentage of the Primary Insurance Amount,
 by Birth Year and Entitlement Age**



Source: Social Security Administration (2007), Table 2.A17.1.

Figure 2.
Effect of Rule Changes on Treatment Groups, by Birth Year and Calendar Year

Birth Year (Month)	Calendar Year									Treatment Group
	1997	1998	1999	2000	2001	2002	2003	2004	2005	
1923										
1924										
1925										
1926										
1927										
1928										
1929							NONE			
1930										
1931										
1932										
1933										
1934						RET ONLY				
1935										
1936										Treatment 1 (Ages 68–70)
1937				NONE						
1938 (1–10)										
1938 (11–12)										Treatment 2 (Age 67)
1939 (1–8)								FRA & RET		Treatment 3 (Age 66)
1939 (9–12)										Treatment 4 (Age 65)
1940 (1–6)										Treatment 5 (Age 64)
1940 (7–12)										Treatment 6 (Age 63)
1941 (1–4)										Treatment 7 (Age 62)
1941 (5–12)										
1942 (1–2)										
1942 (3–12)										
1943										

Source: Social Security Administration (2007), Tables 2.A17.1 and 2.A29.

Notes: Birth year is defined in years and months for cohorts born in 1938–1942. Persons born during this period are shown in two separate groups, depending on the calendar year in which they reach the FRA. For example, those born in January–October 1938 reach the FRA in 2003, but those born in November–December 1938 reach the FRA in 2004.

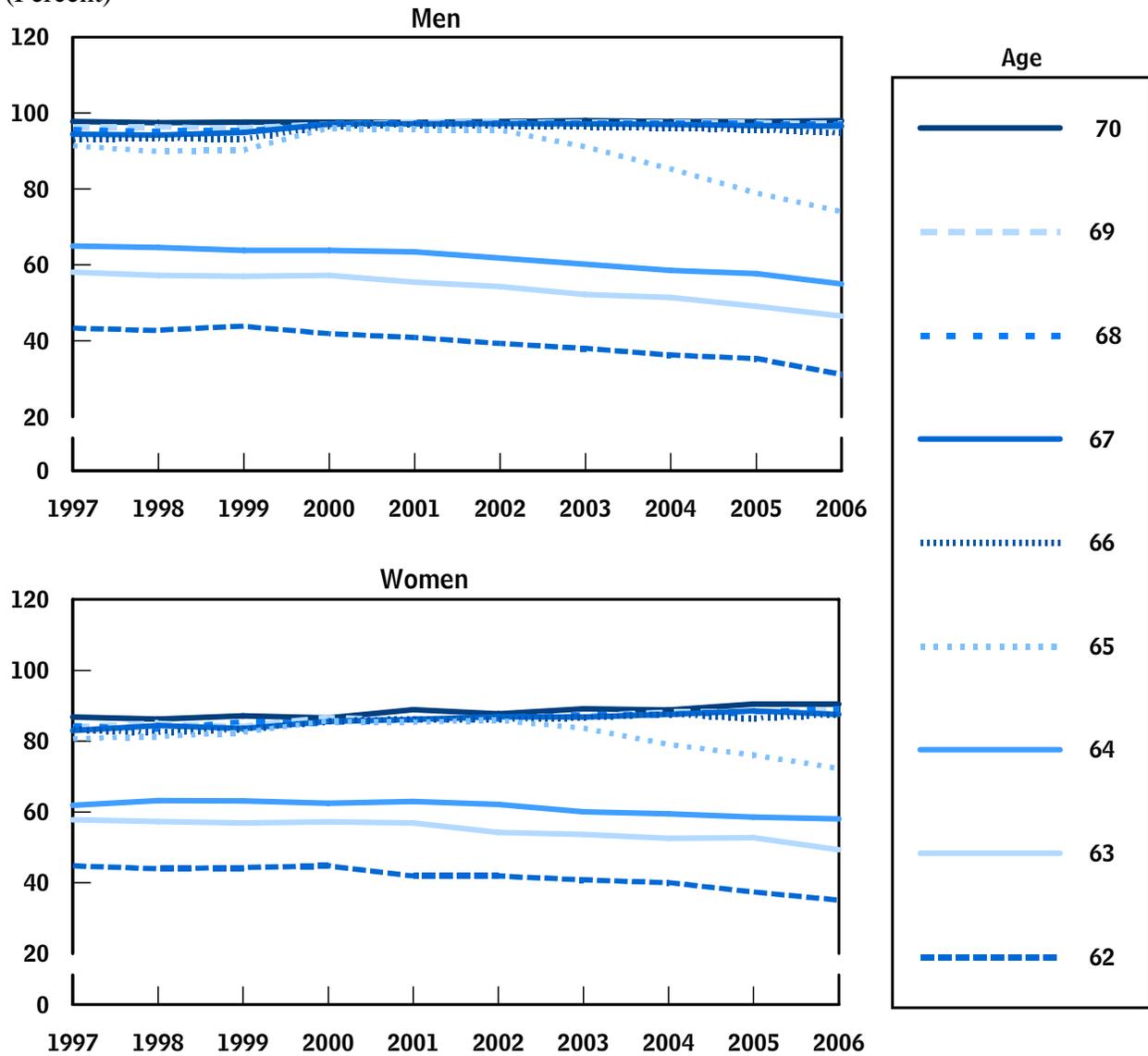
The first treatment group is affected only by the elimination of the earnings test in 2000. That group consists of those who were born in 1930–1935, 1931–1936, 1932–1937, 1933–1937, 1934–1937, 1935–1937, respectively, for 2000, 2001, 2002, 2003, 2004, and 2005. The second treatment group is affected by both the increase in the FRA and the elimination of the earnings test. It consists of those who were born in January 1938 through October 1938, January 1938 through August 1939, and January 1938 through June 1940, respectively, for 2003, 2004, and 2005. The third treatment group, which consists of those born in 1938 or later for years before attaining the FRA, is affected only by the increase in the FRA. For example, for 2000, the 1938 cohort would not be directly affected by the change in the earnings test because they were too young in that year.

RET = retirement earnings test; FRA = full retirement age.

Figure 3.

Entitlement Probability: Percentage Entitled as Primary Beneficiaries, Calendar Years 1997–2006, by Age and Sex

(Percent)



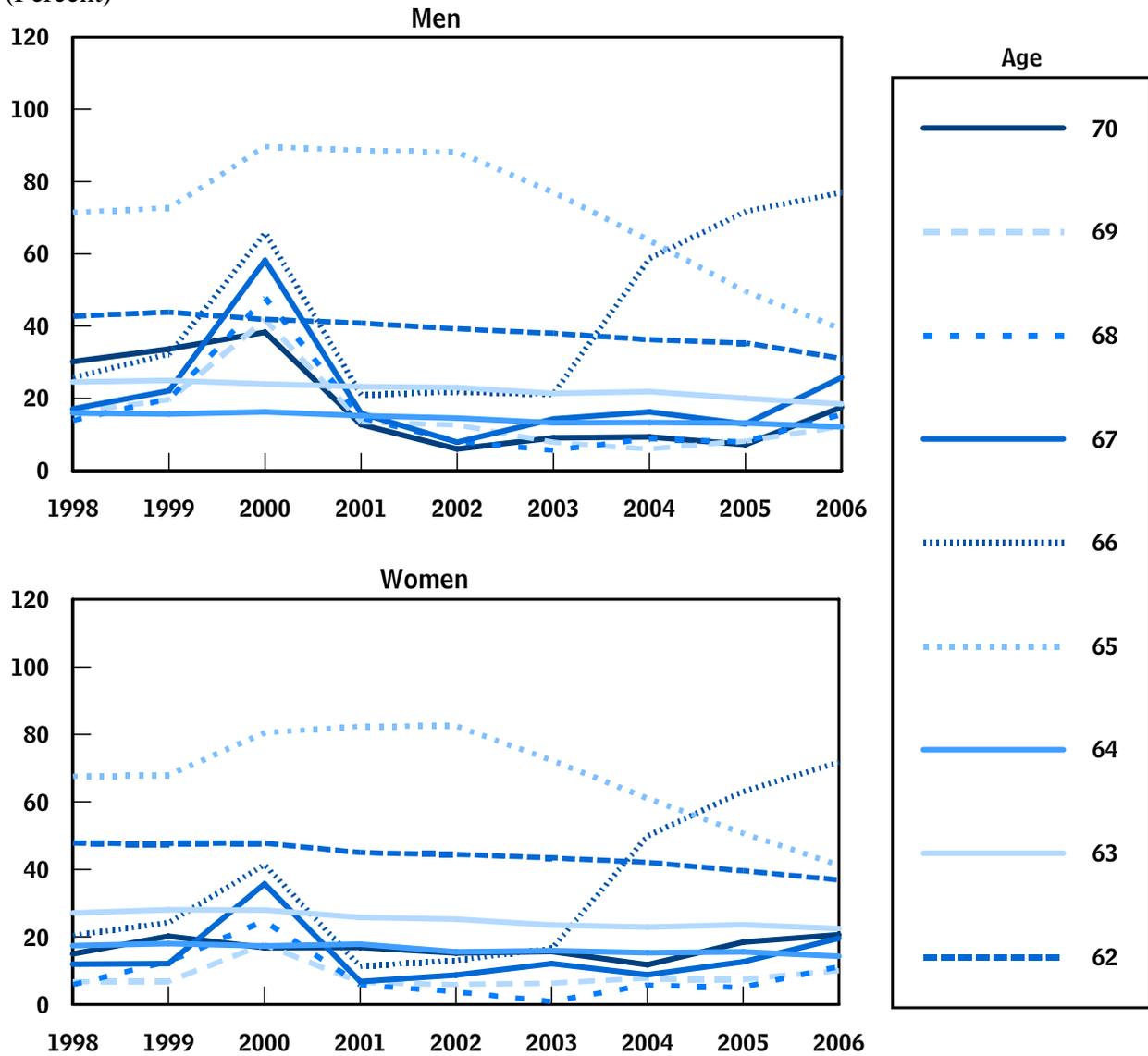
Source: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2007.

Note: Data represent primary beneficiaries who were fully insured at age 60.

Figure 4.

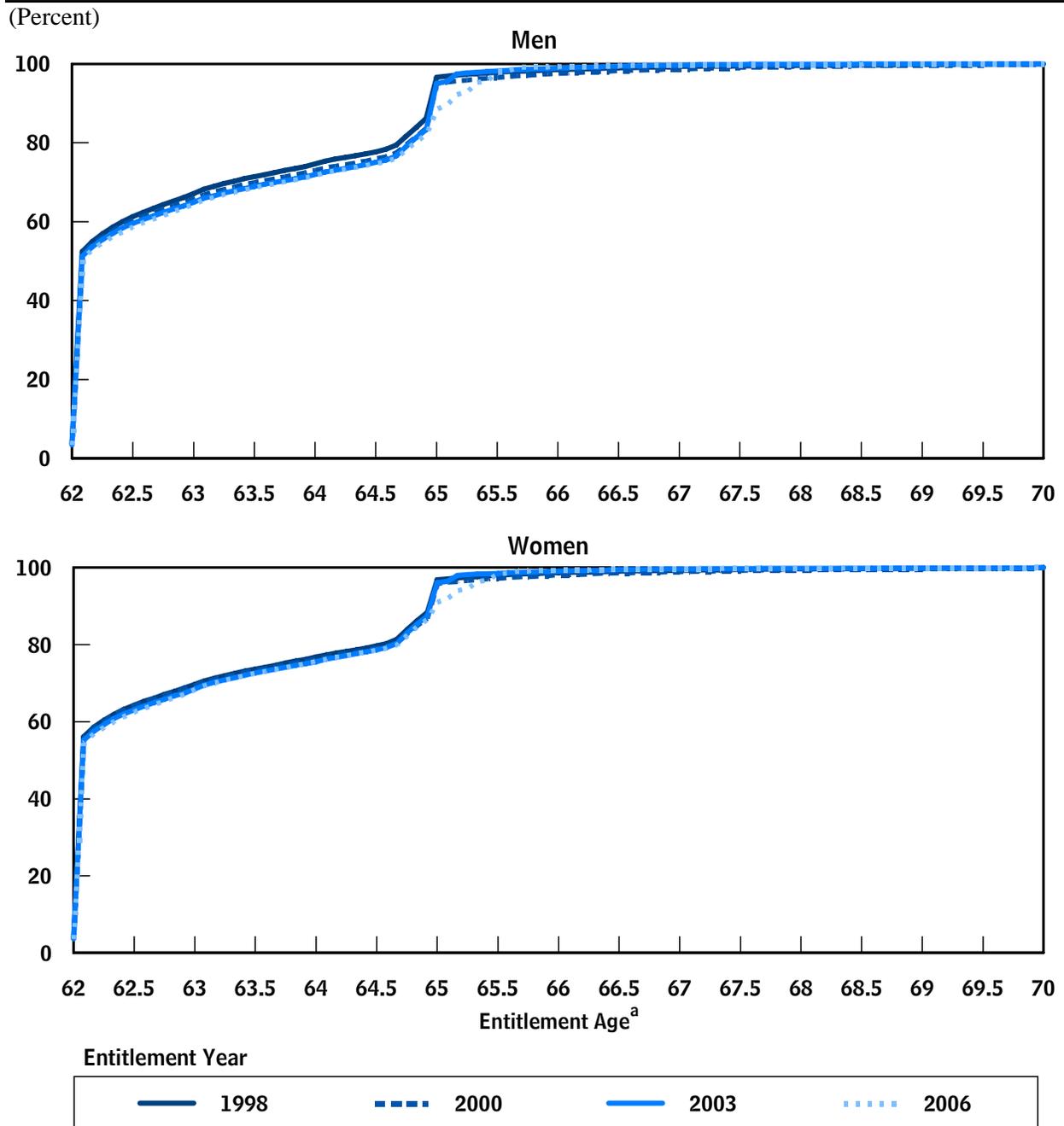
Entitlement Hazard: Percentage Newly Entitled, Calendar Years 1998–2006, by Age and Sex

(Percent)



Source: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2007.

Figure 5.
Cumulative Percentage Distribution, by Entitlement Age and Entitlement Year

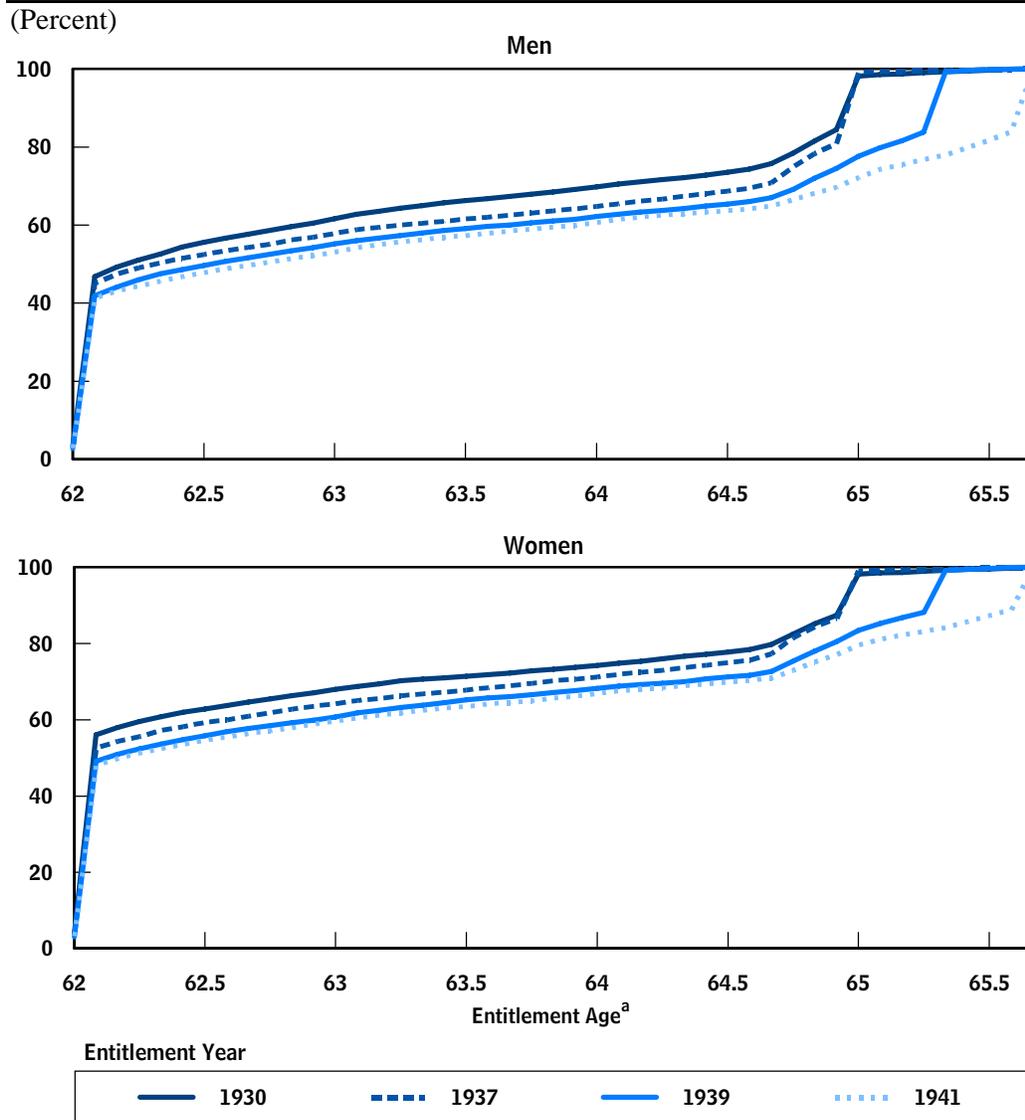


Source: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2007.

Note: The cumulative percentages are measured among those who become entitled by age 70.

a. Entitlement age is measured in two-month increments; the notation "62.5" = 62 years and 6 months.

Figure 6.
Cumulative Percentage Distribution, by Entitlement Age and Birth Year

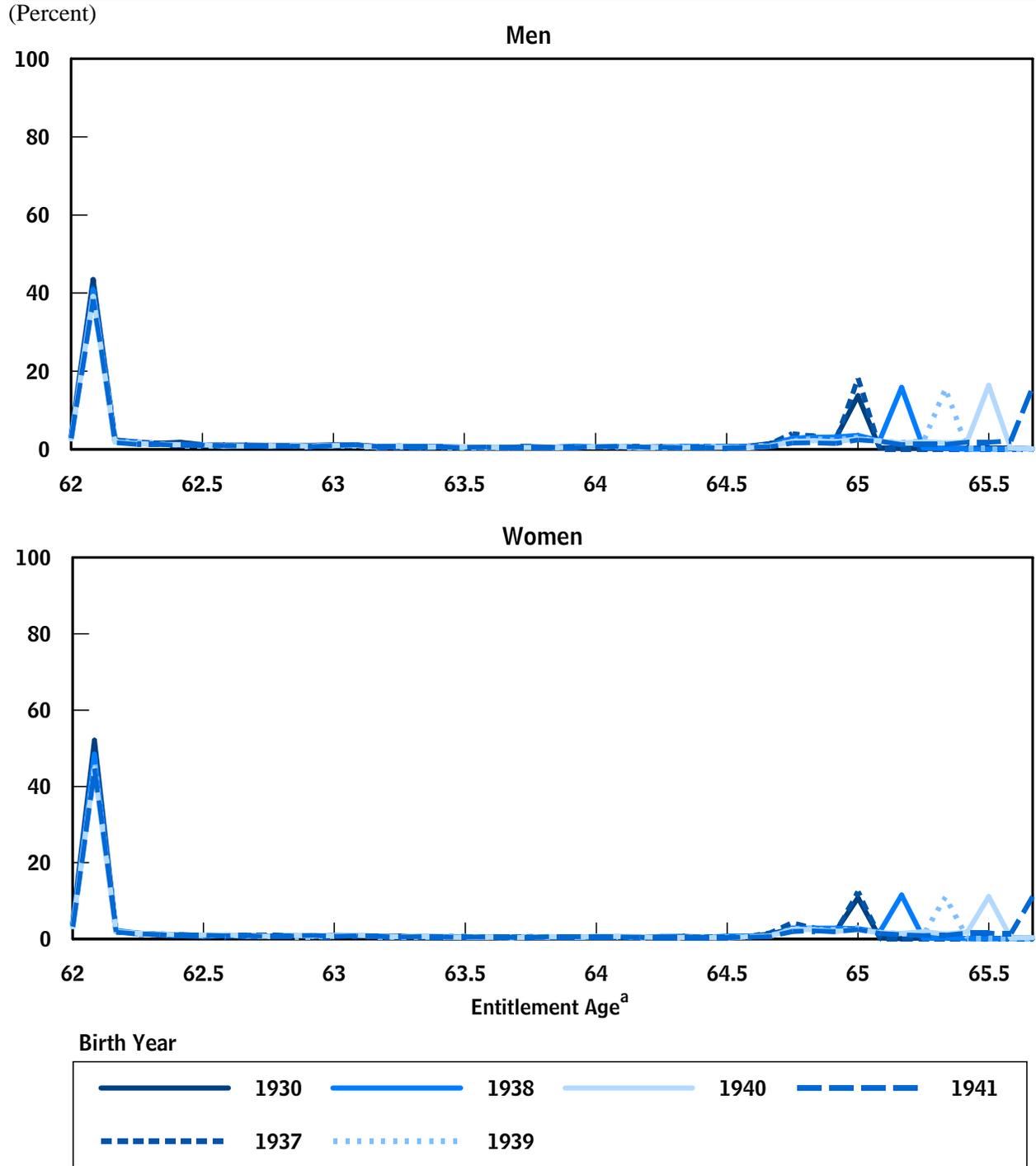


Source: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2007.

Note: The cumulative percentages are measured among those who become entitled by age 65 and 8 months.

a. Entitlement age is measured in two-month increments; the notation "62.5" = 62 years and 6 months.

Figure 7.
Percentage Distribution, by Entitlement Age and Birth Year



Source: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number; and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2007.

a. Entitlement age is measured in two-month increments; the notation "62.5" = 62 years and 6 months.