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

by Jae Song and Joyce Manchester

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Summary

This article examines changes in the age at which people claim Social Security retirement benefits in response to two recent changes in the Social Security rules: the removal of the retirement earnings test at ages 65 to 69 in 2000 and the gradual increase in the full retirement age (FRA) for those born in 1938 or later. Data come from the 1 percent sample of Social Security administrative data for 1997–2005. Descriptive and regression analyses show that the largest effect of the change in the earnings test rule in 2000 occurs at age 65. At that age, the proportion of people who claim retirement benefits increases by about 4 percentage points among men and 2 percentage points among women. 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

Recently, two major changes in Social Security rules became effective: the removal of the retirement earnings test for persons who are at the full retirement age (FRA) through age 69 in 2000 or later and a gradual increase in the FRA for those who reach age 62 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 entitlement age at which people claim Social Security retirement benefits and the work behavior of older Americans.

The effectiveness of the 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 the change in the earnings test in 2000 is that claiming benefits at the FRA has become more attractive for those who previously claimed benefits later than the FRA. Accelerated benefit claims at the FRA with continued post-FRA employment reduce benefit amounts by forfeiting 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 affect the benefit claiming ages of those who are younger than the FRA as well.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.

Effects of raising the FRA would seem to be more straightforward at first glance. 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 Social Security administrative data, this article 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 claiming benefits close to the early retirement age. Results here will help shed light on responses by future workers as the FRA continues to rise to age 67 and, more generally, on responses to changes in retirement incentives.

Previous studies have examined effects of the earnings test removal in 2000, but none of them has investigated simultaneously the effects of the gradual increase in the FRA on earnings and old-age benefit entitlement.³ This study investigates effects of both program rule changes. We take advantage of the fact that while the change in the earnings test in 2000 affects those who are at 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 the calendar year and different birth years, we first identify three different 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.
- Those affected by both rule changes.

We then examine changes in the distribution of ages at which people claim benefits and benefit entitlement status across time and across birth cohorts. Also

investigated are changes in the percentage of persons who are entitled to benefits among those who are fully insured both before and after 2000, by holding age constant. We define a person who is entitled to benefits as one who has filed a claim for a specific type of benefit and has received an award for that benefit. Once an award is made, the person usually receives an immediate payment.

The remainder of this article

- 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,
- presents regression results on the impact of the rule changes on the age at benefit entitlement, and
- concludes with the key findings.

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 to the earnings test occurred 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). Persons receiving old-age benefits who have not reached the FRA remain subject to the earnings test. Social Security benefits of those 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. Benefits are reduced \$1 for every \$3 earned beyond the modified threshold, which was \$30,720 in 2003.⁴ Thus, the earnings test removal in 2000 not only eliminated the test for those who had attained ages 65–69 (more precisely, 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

In an effort to improve the solvency of the system, the 1983 Amendments to the Social Security Act gradually raised the full retirement age beginning with those 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 2-month intervals beginning with persons born in 1938 until it

reaches age 67 for those born in 1960 or later.⁶ Persons born in 1938 have an FRA of 65 years and 2 months, those born in 1939 at 65 and 4 months, those born in 1940 at 65 and 6 months, and so forth (see Social Security Administration 2005, 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 age 62. For those who become entitled to benefits before the FRA, monthly benefits are reduced from the full benefit amount at the rate of 5/9 of 1 percent per month for the first 36 months before the FRA and 5/12 of 1 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 (Chart 1).⁷

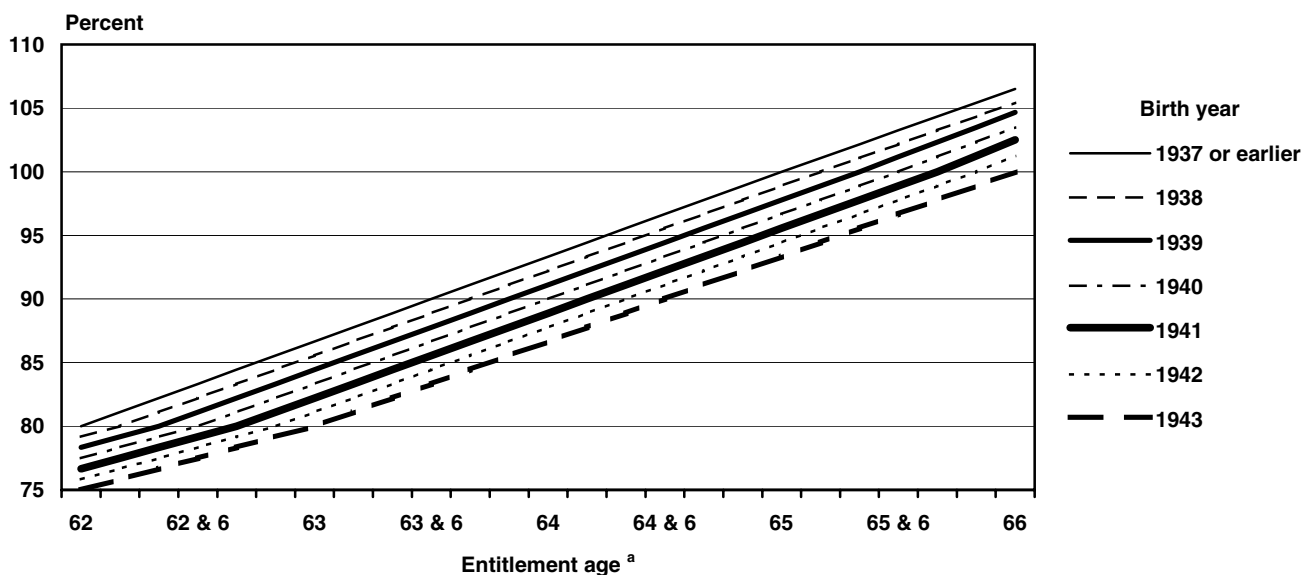
Both rule changes could affect Social Security finances as well as individuals' retirement wealth. Consider the responses of persons claiming benefits at ages below the FRA, at the FRA, and above the FRA. First, those who claim benefits at given ages earlier than the FRA would experience additional declines in benefits due to 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. To the extent that 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 Social Security trust fund finances. Finally, accelerated benefit claiming among 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' labor supply responses and benefit-claiming decisions. While 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 (DRC) 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 DRC

Chart 1.
Benefit amounts as a percentage of the primary insurance amount, by birth year and entitlement age



SOURCE: Social Security Administration (2005), Table 2.A17.1.

a. Entitlement age is measured in 2-month increments; the notation "62.5" = 62 years and 6 months.

is 1/2 of 1 percent for each incremental month, or 6 percent per year. The marginal (yearly) percentage increase in the DRC 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.⁸ The increase in DRC 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 FRA changes and the DRC changes could dilute the pure effect of raising the retirement age. Identifying the separate effects of these changes, however, is left for future research.

The focus of this article is on the effects of the Social Security rule changes, 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 2001–2002, with the unemployment rate reaching 6.0 percent in 2003. This recession may have resulted in older persons encountering difficulty holding on to existing jobs or finding new jobs. As a result, delays in claiming retirement benefits shown here may be understated to some degree.

Data and Analytical Strategy

The data used in this study come from a number of 1 percent extracts of Social Security Administration data, including the Continuous Work History Sample (CWHS) 2004, Master Beneficiary Record (MBR), and 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. Further, 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** is an analytical master file for the 1 percent sample of Social Security numbers ever issued and is the base data set used for this article. The file is derived from several administrative master files, including the MBR 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 (Social Security-covered annual earnings from 1951 to the present and total annual wages from 1978 to the present), OASDI benefit entitlement status, and death information (if any). The CWHS has both an active and an inactive file. The active file includes workers who ever reported earnings from any employment. Before 1978, the CWHS tracked only earnings covered by Social Security. However, starting in 1978, the CWHS was extended to include uncovered earnings. The inactive sample includes those who never worked in covered or uncovered employment. By combining both the active and inactive files, we can analyze the earnings and OASDI program participation of our 1 percent sample of the U.S. population with valid Social Security numbers.

The semiannual **Master Beneficiary Record** 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.⁹ Information on date of death permits us to eliminate those in the sample who died. Thus, our sample includes only those who are alive at the end of each reference year.

Investigating how changes in the rules affect age at entitlement requires a data source with precise information on age, birth month and year, and month and year of entitlement. The elimination of the retirement earnings test affects those from age 65 (or 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 2-month intervals, the year in which a person becomes affected by the elimination of the retirement earnings test not only depends on the year in which they were born but also on the month in which they were born. For example, someone born in November through 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 FRA increase.

Whereas the earnings test removal in 2000 was a relatively abrupt change in a Social Security program parameter, the gradual increase in the FRA was anticipated for many years following the enactment of the 1983 amendments. The earliest birth cohort affected by the 1983 amendments reached their FRA in 2003–2004. Thus, a forward-looking individual would have adjusted his or her labor supply over the last 20 years in order to compensate for the expected benefit reduction due to the increase in the FRA. Unlike ongoing labor supply decisions, benefit claiming can occur 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 amendment on the age at which benefits are claimed. It is worth noting, 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. Thus, our analysis relies primarily on comparing benefit entitlement probabilities and entitlement hazards over the period before and after the rule changes became effective, holding age constant. Entitlement hazard refers to the probability that those who have not yet claimed benefits will do so during the specified period.

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

- **The first treatment group is affected only by the 2000 earnings test rule change.** 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 change in the earnings test in 2000.** 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 prior to attainment of the FRA, is affected only by the increase in the FRA.** For example, for the

year 2000, the 1938 cohort would not be directly affected by the earnings test change because they were too young in that year.¹⁰

Descriptive Analysis

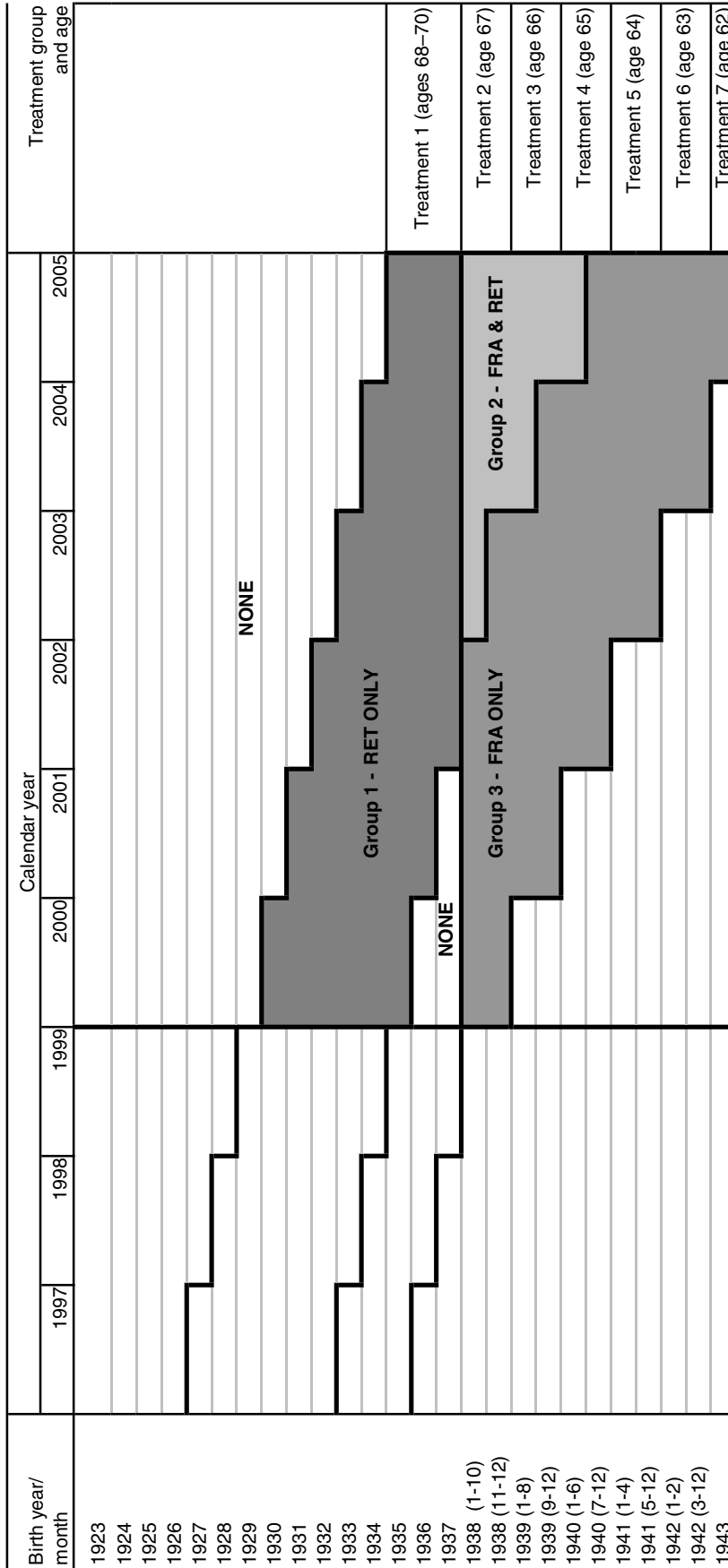
An Overview of the 1 Percent Sample

For 1997–2005, year-end counts of OASI beneficiaries and persons who are fully insured (as of age 60) give us 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.¹¹ Only 292 of the 10,374 auxiliary beneficiaries in that age group in 2000 are male. While the number of women auxiliary beneficiaries tends to drop significantly over the study period, the number of men auxiliary beneficiaries 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, we note that the reduction factors for the spouse and survivor portion of benefits are different than for primary benefits and that the FRA increase for survivor benefits has a different schedule than that for primary or spouse benefits (Social Security Administration 2005, Tables 2.A21–2.A22).

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

Among those 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 removal of the earnings test in 2000 and raising the FRA are evident here. The percentage of male primary beneficiaries drops

Chart 2.
Effect of rule changes on treatment groups, by birth year and calendar year



SOURCE: Social Security Administration (2005, 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 2000 earnings test rule change. 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 change in the earnings test in 2000. 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 prior to attainment of the FRA, is affected only by the increase in the FRA. For example, for the year 2000, the 1938 cohort would not be directly affected by the earnings test change because they were too young in that year.

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

Table 1.
OASI benefit entitlement status for those aged 62–70, 1997–2005

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

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

OASI = Old-Age and Survivors Insurance.

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). It is notable 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 removal, the percentage of primary men beneficiaries rises nearly 3 percentage points to 97 percent. Female primary beneficiaries also increase 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 household Social Security benefits. Primary-worker beneficiaries are the largest group among Old-Age and Survivors Insurance (OASI) beneficiaries; they constituted approximately 75 percent of total OASI beneficiaries in 2002 (Social Security Administration 2004). Only persons aged 62 or older can claim benefits as primary beneficiaries, so we do not include persons 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 persons who were ever beneficiaries under the Social Security Disability Insurance program and Old-Age beneficiaries who converted from the Disability Insurance program.

Percentage of Primary Beneficiaries in Each Treatment Group

Our empirical strategy is to trace both the number and the percentage of primary beneficiaries among the fully insured population from 1997–2005, by holding age constant. Data on the population that is fully insured as of age 60 can be found in Table 2 and Chart 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 earnings test change in 2000, benefit claiming among those 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 2004 and 2005. For those who are younger than age 65, the percentage entitled decreases slightly over the period 2003–2005, 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 more than likely understate the effect on persons 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 those who are “newly” entitled in a given year, among those who are fully insured but not previously entitled (Table 3 and Chart 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, whereas 41.8 percent of men aged 69 became entitled in 2000. Further, 32.3 percent of men aged 66 who were not yet entitled became entitled in 1999, whereas 65.9 percent of men aged 66 became entitled in 2000. For men and women aged 65, the entitlement hazards decline noticeably starting from 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. Results here also show that men are more responsive to the rule changes than 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. 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.

Table 2.
Number and percentage of primary beneficiaries at the end of each year, by sex and birth year

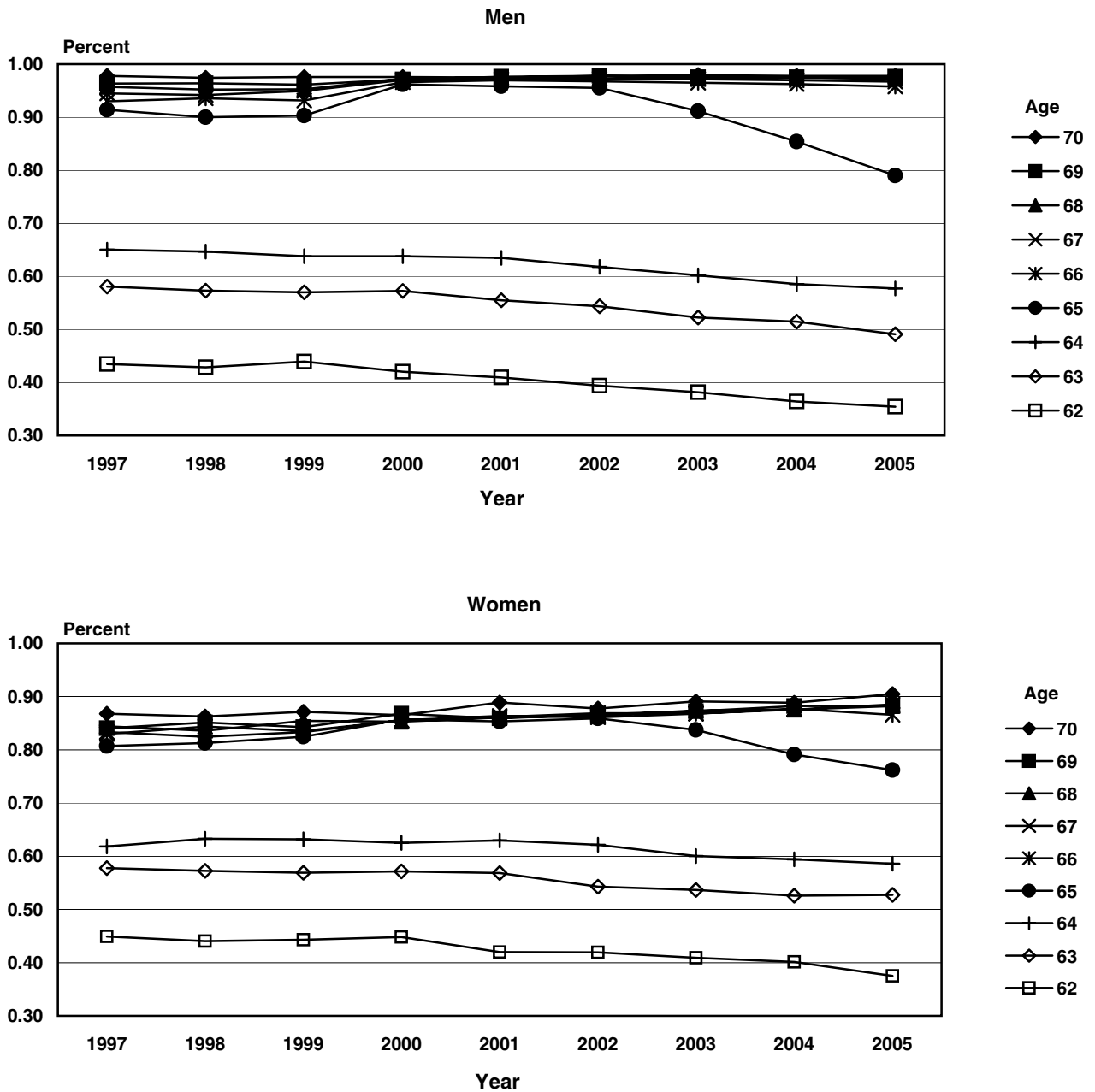
Birth year	1997		1998		1999		2000		2001		2002		2003		2004		2005			
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women		
1927	6,928	5,193																		
1928	6,909	5,184	6,782	5,239																
1929	6,884	5,290	6,764	5,260	6,686	5,311														
1930	7,104	5,495	7,000	5,468	6,924	5,427	6,838	5,489												
1931	6,838	5,427	6,754	5,427	6,694	5,431	6,682	5,416	6,528	5,467										
1932	6,709	5,307	6,773	5,362	6,777	5,372	6,806	5,413	6,695	5,365	6,537	5,390								
1933	4,826	3,969	6,587	5,172	6,728	5,259	6,877	5,350	6,766	5,327	6,657	5,293	6,527	5,371						
1934	4,433	3,874	4,869	4,211	6,712	5,444	7,051	5,582	6,963	5,563	6,846	5,515	6,720	5,489	6,591	5,503				
1935	3,519	3,045	4,581	3,857	5,041	4,221	7,485	5,683	7,451	5,669	7,345	5,645	7,235	5,623	7,115	5,617	7,036	5,705		
1936			3,483	3,070	4,581	3,934	5,065	4,293	7,496	5,823	7,448	5,822	7,365	5,807	7,256	5,718	7,196	5,800		
1937					3,568	3,220	4,598	4,127	5,037	4,516	7,488	6,106	7,456	6,123	7,385	6,113	7,321	6,127		
1938							3,594	3,455	4,708	4,349	5,184	4,723	7,565	6,322	7,892	6,565	7,866	6,596		
1939									3,534	3,185	4,642	4,104	5,087	4,510	7,137	5,902	7,932	6,428		
1940											3,557	3,387	4,664	4,312	5,164	4,746	6,916	6,052		
1941													3,553	3,496	4,739	4,474	5,273	4,968		
1942															3,916	3,954	5,254	5,177		
1943																	4,012	3,794		
1927	0.9778	0.8680																		
1928	0.9636	0.8405	0.9740	0.8628																
1929	0.9574	0.8444	0.9637	0.8514	0.9758	0.8715														
1930	0.9446	0.8297	0.9520	0.8360	0.9613	0.8427	0.9756	0.8652												
1931	0.9301	0.8334	0.9417	0.8438	0.9526	0.8545	0.9712	0.8679	0.9746	0.8891										
1932	0.9138	0.8071	0.9354	0.8244	0.9493	0.8355	0.9727	0.8527	0.9762	0.8592	0.9777	0.8774								
1933	0.6503	0.6181	0.8999	0.8128	0.9313	0.8336	0.9702	0.8550	0.9745	0.8606	0.9777	0.8670	0.9794	0.8909						
1934	0.5805	0.5775	0.6464	0.6326	0.9032	0.8246	0.9659	0.8556	0.9714	0.8615	0.9734	0.8644	0.9752	0.8724	0.9777	0.8883				
1935	0.4346	0.4490	0.5727	0.5728	0.6377	0.6317	0.9616	0.8570	0.9698	0.8635	0.9721	0.8689	0.9738	0.8742	0.9753	0.8822	0.9778	0.9050		
1936			0.4284	0.4406	0.5697	0.5690	0.6381	0.6248	0.9583	0.8536	0.9674	0.8614	0.9718	0.8684	0.9741	0.8757	0.9761	0.8829		
1937					0.4392	0.4429	0.5724	0.5716	0.6347	0.6297	0.9553	0.8592	0.9648	0.8678	0.9698	0.8754	0.9721	0.8825		
1938							0.4202	0.4484	0.5546	0.5686	0.6178	0.6214	0.9114	0.8376	0.9624	0.8771	0.9669	0.8853		
1939									0.4094	0.4199	0.5433	0.5429	0.6017	0.6005	0.8539	0.7909	0.9575	0.8657		
1940											0.3938	0.4195	0.5222	0.5368	0.5851	0.5944	0.7899	0.7620		
1941													0.3816	0.4089	0.5148	0.5258	0.5770	0.5861		
1942																	0.4910	0.5272		
1943																	0.3640	0.4013	0.3542	0.3749

Percentage

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.

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

Chart 3.
Entitlement probability: Percentage entitled as primary beneficiaries, 1997–2005, by sex and age



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.

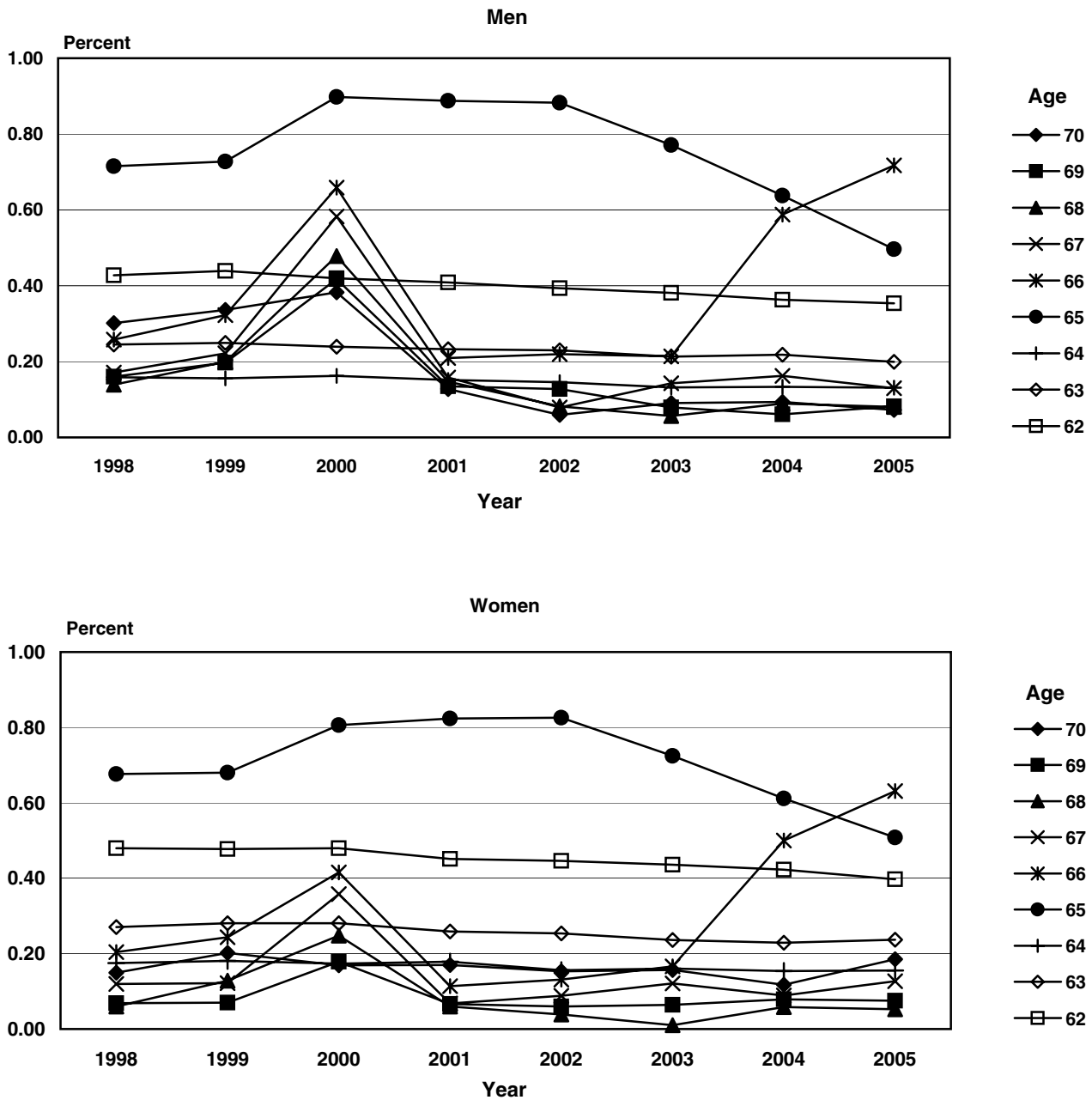
NOTE: Data represent primary beneficiaries who were fully insured at age 60.

Table 3.
Number and percentage of persons who become entitled in each year, 1998–2005, by birth year and sex

Birth year	1998		1999		2000		2001		2002		2003		2004		2005	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	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				
1935	1,097	813	523	381	2,515	1,345	58	28	17	19	11	2				
1936	3,456	3,008	1,138	863	550	370	2,491	1,416	68	30	34	24	15	12	12	32
1937			3,546	3,152	1,073	912	511	401	2,509	1,478	69	39	41	17	17	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
Percentage fully insured but not entitled at the beginning of each year																
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										
1931	0.1711	0.1199	0.1990	0.1280	0.4177	0.1783	0.1278	0.1696								
1932	0.2577	0.2041	0.2217	0.1217	0.4783	0.2477	0.1348	0.0664	0.0596	0.1532	0.0909	0.1570	0.0932	0.1176	0.0723	0.1850
1933	0.7152	0.6760	0.3226	0.2432	0.5823	0.3580	0.1472	0.0594	0.1273	0.0595	0.0791	0.0639	0.0608	0.0785	0.0820	0.0750
1934	0.1591	0.1747	0.7273	0.6798	0.6585	0.4151	0.1581	0.0680	0.0821	0.0388	0.0564	0.0103	0.0891	0.0585	0.0806	0.0523
1935	0.2450	0.2705	0.1561	0.1807	0.8976	0.8059	0.2094	0.1134	0.0787	0.0880	0.0564	0.1660	0.1621	0.0890	0.1297	0.1266
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	0.0806	0.0523
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	0.1297	0.1266
1938					0.4196	0.4795	0.2326	0.2589	0.1457	0.1563	0.7712	0.7243	0.5877	0.5000	0.7174	0.6311
1939							0.4086	0.4509	0.2298	0.2536	0.1318	0.1603	0.6378	0.6114	0.7174	0.6311
1940									0.3932	0.4462	0.2133	0.2359	0.1332	0.1535	0.4963	0.5080
1941											0.3813	0.4358	0.2180	0.2290	0.1311	0.1554
1942													0.3631	0.4224	0.1996	0.2370
1943															0.3536	0.3976

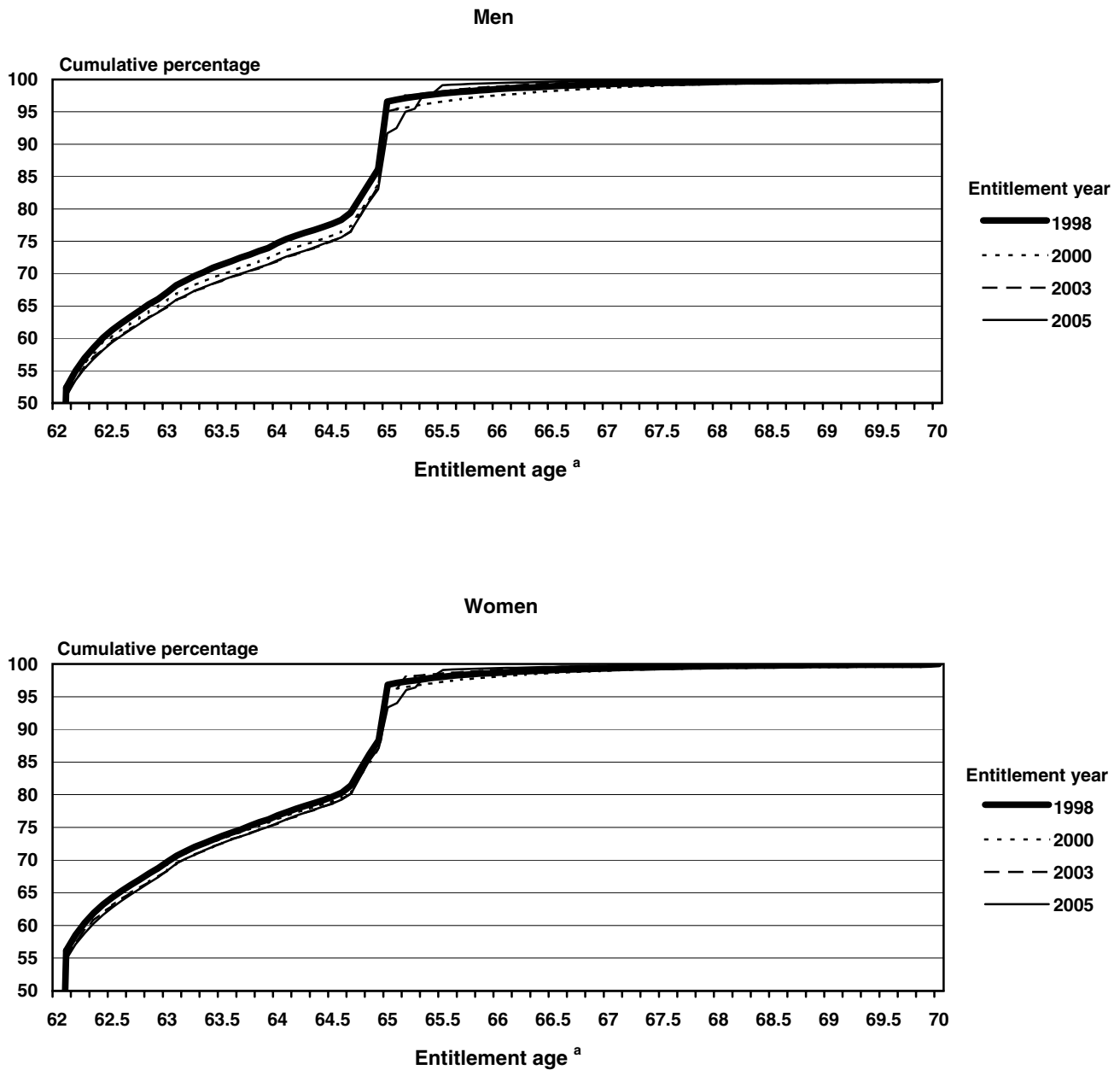
SOURCE: Authors' tabulations using active and inactive files of the Continuous Work History Sample, 2004; 1 percent Master Beneficiary Record extract based on Claim Account Number, and 1 percent Master Beneficiary Record extract based on Beneficiary Own Account Number for December 1999–2005 and June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

Chart 4.
Entitlement hazard: Percentage newly entitled, 1998–2005, by sex and age



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.

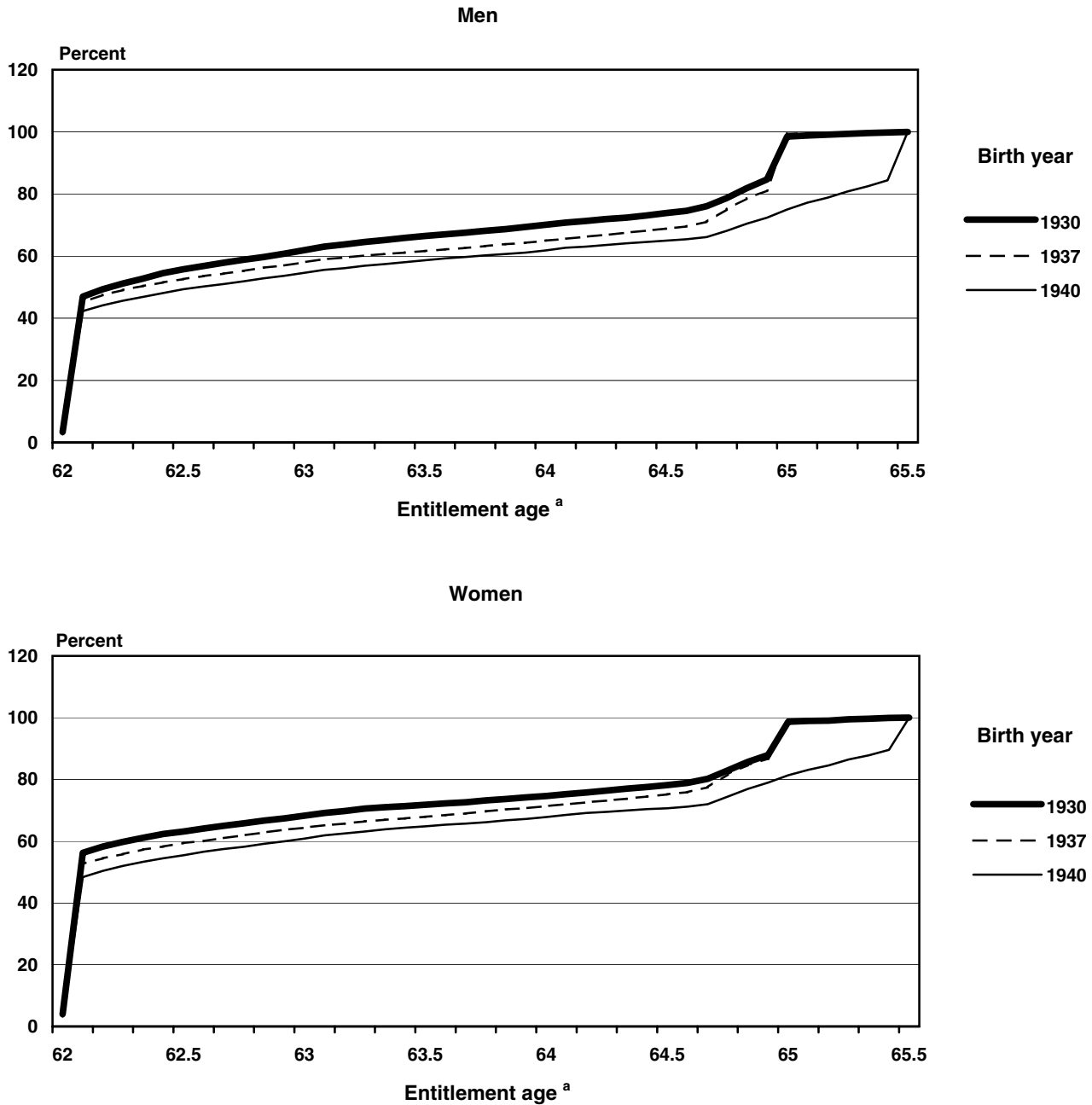
Chart 5.
Cumulative percentage distribution of entitlement age, by sex and entitlement year



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 1999–2005 and June 2006.

a. Entitlement age is measured in 2-month increments; the notation "62.5" = 62 years and 6 months.

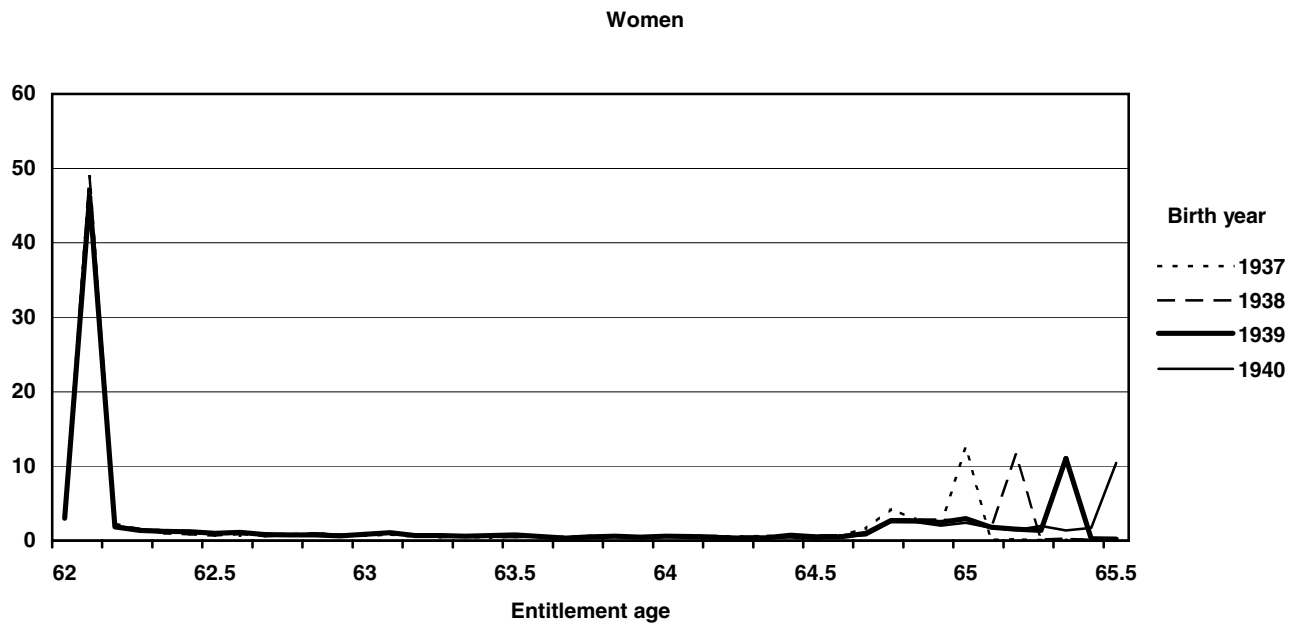
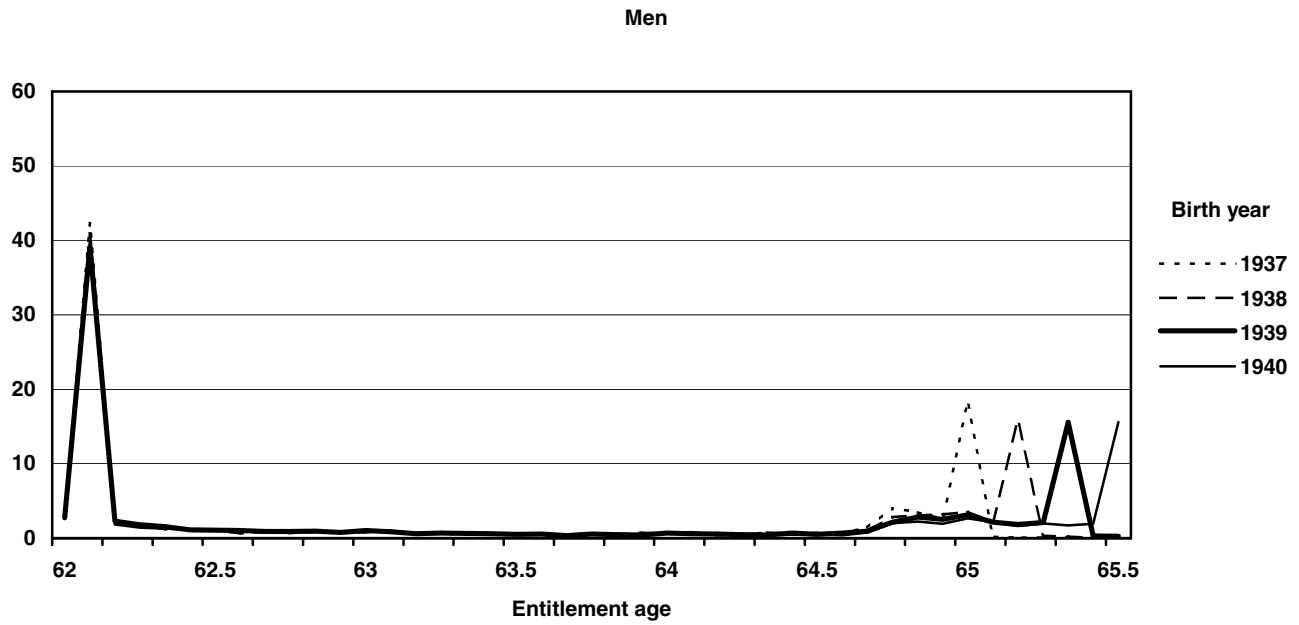
Chart 6.
Percentage distribution of fully insured men and women, by entitlement age, sex, and birth year



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 1999–2005 and June 2006.

a. Entitlement age is measured in 2-month increments; the notation "62.5" = 62 years and 6 months.

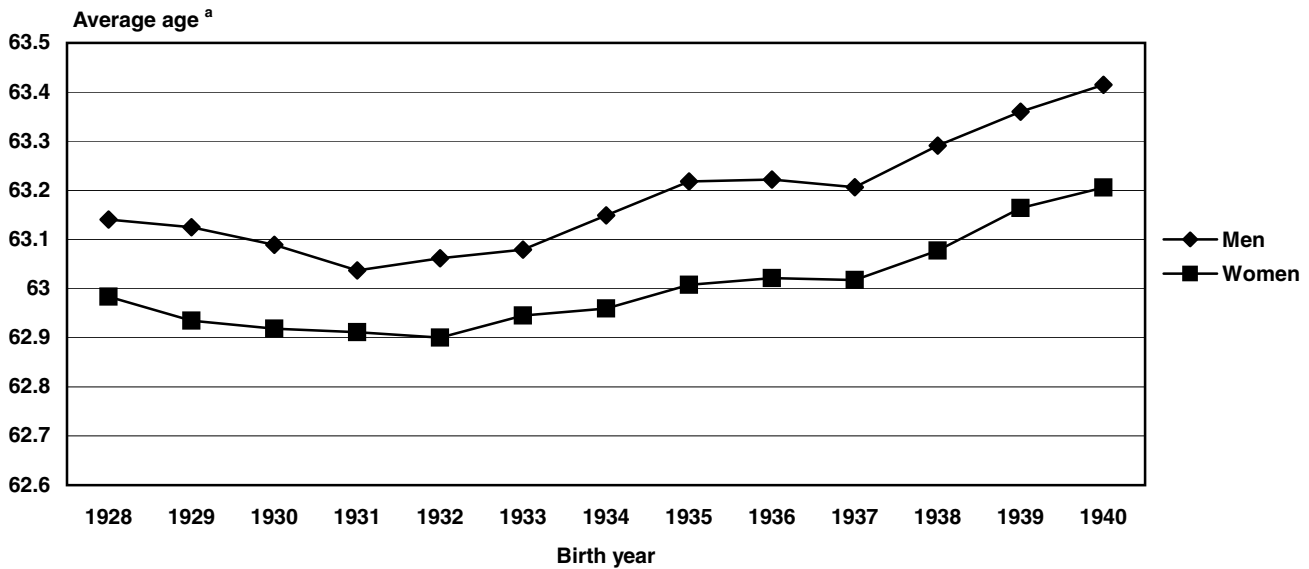
Chart 7.
Entitlement age distribution, by sex and birth year



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 1999–2005 and June 2006.

a. Entitlement age is measured in 2-month increments; the notation "62.5" = 62 years and 6 months.

Chart 8.
Average age at entitlement, by sex and birth year



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

a. Average age at entitlement shown in years and months and measured in 1-month increments.

Cumulative distributions by year of entitlement in Chart 5 show the percentage of fully insured people who have claimed benefits as of a specific age in each year 1997–2005. Here we choose the age range from 62 to 70 because the percentage of those who become entitled by age 70 tends to be stable before and after the rule changes (Table 2). Several interesting aspects are evident. First, the distribution of males shifts more than that of females, suggesting again that males are more responsive to the rule changes than females. Second, in the years following the earnings test removal, 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 somewhat affects the benefit entitlement age for those who are younger than the FRA. Third, gradual downward shifts in the curves in the segment for those at entitlement age 65 or older appear to be a result of the gradual increase in the FRA for those who are born in 1938 or later. Fourth, the curves of 2000 through 2005, particularly for those at the segment younger than the entitlement age 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.

Sorting out the economic effects of the benefit reductions from the signaling or institutional role of the FRA is a difficult task, but Chart 6 may offer some clues. The chart shows the proportion of men and women among the cohorts born in 1930, 1937, and 1940 who become entitled to retirement benefits at 2-month intervals between ages 62 and 65 and 6 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 59 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 1940 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 alone affect people who retire before age 65, so the drop in the percentage who claim before age 65 largely reflects that benefit reduction.

As shown in Chart 7, more dramatic changes are evident in the entitlement age 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 2 months per year

for the 1938, 1939, and 1940 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 6 months, the relevant FRA for the 1940 cohort. People who previously would have claimed benefits at age 65 but waited until their new, higher FRA were probably responding to a combination of the benefit reduction and the signaling aspect of the Social Security retirement age. It is also possible that the “full” retirement age in integrated private pension plans influenced the age at claiming Social Security benefits. Further investigation will help identify those two effects more clearly.

The changing distribution of entitlement ages also affects the average age at entitlement, a simple summary measure that may be useful to both researchers and policymakers. Chart 8 shows the average entitlement age for men and women by birth year, 1928–1940. For comparison purposes, we calculate the average only for those who have become entitled at ages 62 through 65 and 6 months. The average entitlement age for both men and women increased as the FRA rose, starting with those born in 1938 or later. Also suggested is that for every 2-month increase in the FRA, the average entitlement age has increased by approximately 0.65 to 1 month for men and 0.5 to 1 month for women. Increases in the average age at entitlement for those born in 1935 or later were probably caused by the influx of benefit claiming at the FRA following the removal of the earnings test.

Regression Analysis of Benefit Entitlement Status at Specific Ages

In this study, the range of age groups affected by the law changes differs over the study period. For example, those affected only by the earnings test removal 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. Persons reaching age 65 and 6 months through age 67 in 2005 are affected by both the earnings test removal 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.

Instead, we estimate the effect of 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 entitled year (2000, 2001, 2002, 2003, 2004, and 2005); and X is a vector of the individual’s characteristics, such as race and sex. Effects of the earnings test removal 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 7 subgroups according to their ages (Chart 2). We then estimate the effect of the rule changes in the 7 separate regressions, using the age 71–72 group as the control group. For example, the first regression includes those 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 previously seen in Table 2 and Chart 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 not the cumulative probability of entitlement at ages 71 and 72.¹²

In Table 4, we report estimates of 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.

Both the direction and the magnitude of the estimated effects accord with our expectations. For men aged 68 to 70, we estimate that benefit entitlement in 2000–2005 rises approximately 1 percentage point as a result of the earnings test removal in 2000. The effects

Table 4.
Marginal effects on benefit entitlement, by age and sex

Year	Policy effect	Men		Women	
		Marginal effect	Standard error	Marginal effect	Standard error
Age 68–70					
2000	RET	0.0112	0.0019	0.0063	0.0032
2001	RET	0.0137	0.0020	0.0117	0.0035
2002	RET	0.0138	0.0021	0.0083	0.0035
2003	RET	0.0112	0.0022	0.0106	0.0032
2004	RET	0.0093	0.0022	0.0097	0.0032
2005	RET	0.0066	0.0023	0.0120	0.0031
Age 67					
2000	RET	0.0275	0.0027	0.0109	0.0035
2001	RET	0.0290	0.0027	0.0147	0.0037
2002	RET	0.0280	0.0028	0.0161	0.0038
2003	RET	0.0259	0.0029	0.0115	0.0040
2004	RET	0.0211	0.0031	0.0132	0.0038
2005	RET & FRA (2 months)	0.0148	0.0033	0.0165	0.0035
Age 66					
2000	RET	0.0320	0.0024	0.0144	0.0034
2001	RET	0.0358	0.0023	0.0191	0.0034
2002	RET	0.0322	0.0025	0.0145	0.0037
2003	RET	0.0268	0.0028	0.0143	0.0039
2004	RET & FRA (2 months)	0.0221	0.0030	0.0175	0.0038
2005	RET & FRA (4 months)	0.0145	0.0033	0.0070	0.0039
Age 65					
2000	RET	0.0460	0.0022	0.0239	0.0032
2001	RET	0.0436	0.0023	0.0216	0.0034
2002	RET	0.0391	0.0025	0.0218	0.0034
2003	RET & FRA (2 months)	-0.0032	0.0040	0.0045	0.0041
2004	RET & FRA (4 months)	-0.0593	0.0055	-0.0291	0.0053
2005	RET & FRA (6 months)	-0.1251	0.0069	-0.0544	0.0059

(Continued)

are a bit larger for those who are aged 66, but they are still less than 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 FRA rule change offsets the effect from the earnings test rule change. For those age 65 in 2000–2002, the change in the earnings test rule increases benefit entitlement by slightly more than 3 percentage points for men and by slightly more than 2 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 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 Chart 2). Yet estimated effects are all negative and quite large for persons aged 62–64 in other years. A 4-month increase in the FRA results in declines 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 6-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 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 relatively small but incremental responses at ages 63 and 64.

Table 4.
Continued

Year	Policy effect	Men		Women	
		Marginal effect	Standard error	Marginal effect	Standard error
Age 64					
2000	None	-0.0039	0.0043	-0.0023	0.0043
2001	None	-0.0060	0.0045	0.0001	0.0044
2002	FRA (2 months)	-0.0207	0.0048	-0.0089	0.0046
2003	FRA (4 months)	-0.0372	0.0052	-0.0265	0.0050
2004	FRA (6 months)	-0.0524	0.0055	-0.0346	0.0054
2005	FRA (8 months)	-0.0636	0.0058	-0.0458	0.0057
Age 63					
2000	None	-0.0017	0.0045	-0.0017	0.0044
2001	FRA (2 months)	-0.0120	0.0049	-0.0033	0.0046
2002	FRA (4 months)	-0.0239	0.0051	-0.0222	0.0051
2003	FRA (6 months)	-0.0443	0.0055	-0.0328	0.0053
2004	FRA (8 months)	-0.0540	0.0057	-0.0449	0.0055
2005	FRA (10 months)	-0.0771	0.0060	-0.0503	0.0057
Age 62					
2000	FRA (2 months)	-0.0098	0.0051	0.0016	0.0048
2001	FRA (4 months)	-0.0168	0.0055	-0.0149	0.0054
2002	FRA (6 months)	-0.0334	0.0058	-0.0209	0.0055
2003	FRA (8 months)	-0.0502	0.0061	-0.0360	0.0058
2004	FRA (10 months)	-0.0697	0.0063	-0.0466	0.0058
2005	FRA (12 months)	-0.0850	0.0065	-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 those who are fully insured at age 60.

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

Following the gradual increase in the FRA, policy-makers have asked whether people who are younger than the FRA would change their behavior. 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. As seen in Chart 4, among those who have reached the FRA a dramatic increase in the entitlement hazard occurs right after the earnings test rule change. The estimated marginal effects in 2000 for those aged 66 or older range from 18 (ages 68–70) to 29 (age 65) percentage points for men and 10 (ages 68–70) to 22 (age 65) percentage points 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 the earnings test removal in 2000 are reflected in estimates of the entitlement hazard for those aged 65 in 2000–2002. Estimated marginal effects in 2000–2002 are approximately 26 percent to 29 percent for men and 21 percent to 24 percent for women. Starting in 2003, that age group is affected not only by the earnings test removal but also by the gradual increase in the FRA. The estimated marginal effect at age 65 is small and statistically insignificant in 2003 but negative and statistically significant in

Table 5.
Marginal effects on benefit entitlement hazard, by age and sex

Year	Policy effect	Men		Women	
		Marginal effect	Standard error	Marginal effect	Standard error
Age 68–70					
2000	RET	0.1791	0.0393	0.0985	0.0301
2001	RET	-0.0262	0.0146	-0.0008	0.0160
2002	RET	-0.0409	0.0126	0.0000	0.0171
2003	RET	-0.0592	0.0082	-0.0235	0.0120
2004	RET	-0.0627	0.0072	-0.0262	0.0112
2005	RET	-0.0622	0.0075	-0.0137	0.0140
Age 67					
2000	RET	0.2987	0.0506	0.1893	0.0448
2001	RET	-0.0082	0.0173	-0.0203	0.0113
2002	RET	-0.0366	0.0114	-0.0055	0.0160
2003	RET	-0.0229	0.0138	-0.0021	0.0163
2004	RET	-0.0253	0.0128	-0.0235	0.0104
2005	RET & FRA (2 months)	-0.0339	0.0108	-0.0055	0.0148
Age 66					
2000	RET	0.3715	0.0524	0.1708	0.0446
2001	RET	-0.0357	0.0282	-0.0486	0.0152
2002	RET	-0.0159	0.0318	-0.0326	0.0195
2003	RET	-0.0494	0.0254	-0.0328	0.0186
2004	RET & FRA (2 months)	0.1897	0.0450	0.1428	0.0400
2005	RET & FRA (4 months)	0.3254	0.0478	0.2605	0.0465
Age 65					
2000	RET	0.2871	0.0331	0.2248	0.0474
2001	RET	0.2455	0.0346	0.2112	0.0453
2002	RET	0.2577	0.0354	0.2381	0.0464
2003	RET & FRA (2 months)	0.0560	0.0453	0.0460	0.0482
2004	RET & FRA (4 months)	-0.1415	0.0464	-0.1178	0.0441
2005	RET & FRA (6 months)	-0.2676	0.0446	-0.1981	0.0413

(Continued)

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/year 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/year 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.

Concluding Remarks

This article investigates benefit-claiming behavior among fully insured males and females following the removal of the retirement earnings test in 2000 and the gradual increase in the full retirement age for persons who turn age 65 starting in 2003. Although results presented in this article are based on fairly rudimentary before-and-after analysis and reduced form difference-in-difference analysis, we find that significant responses occur in the age at entitlement around the

Table 5.
Continued

Year	Policy effect	Men		Women	
		Marginal effect	Standard error	Marginal effect	Standard error
Age 64					
2000	None	0.0421	0.0292	0.0339	0.0293
2001	None	0.0086	0.0240	0.0144	0.0254
2002	FRA (2 months)	0.0169	0.0260	0.0095	0.0260
2003	FRA (4 months)	-0.0242	0.0205	-0.0168	0.0221
2004	FRA (6 months)	-0.0412	0.0183	-0.0406	0.0190
2005	FRA (8 months)	-0.0359	0.0194	-0.0323	0.0205
Age 63					
2000	None	0.0431	0.0366	0.0559	0.0386
2001	FRA (2 months)	0.0058	0.0315	0.0046	0.0325
2002	FRA (4 months)	0.0211	0.0344	0.0181	0.0352
2003	FRA (6 months)	-0.0337	0.0287	-0.0377	0.0294
2004	FRA (8 months)	-0.0558	0.0262	-0.0690	0.0261
2005	FRA (10 months)	-0.0607	0.0267	-0.0531	0.0284
Age 62					
2000	FRA (2 months)	0.0522	0.0468	0.0692	0.0481
2001	FRA (4 months)	0.0020	0.0425	0.0009	0.0439
2002	FRA (6 months)	0.0116	0.0451	0.0214	0.0468
2003	FRA (8 months)	-0.0545	0.0409	-0.0462	0.0431
2004	FRA (10 months)	-0.1087	0.0377	-0.0986	0.0405
2005	FRA (12 months)	-0.1033	0.0389	-0.1066	0.0411

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 Number¹ 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 those who are fully insured at age 60.

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

time that those rule changes come into effect. Several key findings stand out.

- First, the largest effect of the earnings test rule change in 2000 occurs at age 65. At that age, the rate of benefit entitlement increases by more than 5 percentage points among men and 3 percentage points among women.
- Second, the removal of the earnings test significantly increases the benefit entitlement hazard by more than 20 percent for those turning the FRA.
- Finally, 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 their early retirement age.

Notes

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

² A number of studies have analyzed how incentives generated by Social Security program rules have affected labor supply and earnings by exploring the earnings test rule changes. Friedberg 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 (2002) examined the elimination of a similar earnings test in Canada and the United Kingdom. Song and Manchester (2007) examined the 2000 earnings test change using Social Security administrative data. See Krueger and Meyer (2002) for reviews of and references to other related studies.

³ Examples of past studies on the removal of the earnings test in 2000 include Song (2006), Song and Manchester (2007), Haider and Loughran (2006), and Tran (2004). Duggan, Singleton, and Song (2005) studied the effects of the gradual increase in the FRA using the 1 percent Social Security administrative data, 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 Amendments. The budgetary impact of the earnings test removal in 2000 has been examined in Mastrobuoni (2006a).

⁴ See Social Security Administration (2005, Table 2.A29) for a brief history of changes in the retirement earnings test.

⁵ Note that the more moderate version of the test applied in the year a person turned age 65 even before the 2000 legislation. However, the 2000 legislation completely eliminated the test beginning with the month in which a person turns age 65 (or FRA).

⁶ The FRA remains at 66 for those who were born from 1942 to 1954; it then gradually increases by 2 months per year starting with those who were born in 1955 until it reaches 67.

⁷ For example, a person born in 1937 (or earlier) who claims benefits at age 62 receives 80 percent of the PIA, but a person born in 1943 who claims benefits at age 62 receives 75 percent of the PIA (see Chart 1). Thus, the increase in the FRA can be seen as reductions in benefit amounts (given all else constant) that depend on the year of birth.

⁸ See Social Security Administration (2005, Table 2.A20) for historical DRC values.

⁹ For further discussion of SSA administrative files, see Panis and others (2000).

¹⁰ We note, however, they may be indirectly affected (for example, if the repeal of the earnings test at the FRA affected their benefit-claiming decisions before the FRA).

¹¹ Throughout the rest of this article, we define age to be reference year minus year of birth. Persons who are fully insured have enough quarters of coverage to be eligible for old-age benefits as primary beneficiaries.

¹² We have tried 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.

References

- Baker, Michael, and Dwayne Benjamin. 1999. How do retirement tests affect the labour supply of older men? *Journal of Public Economics* 71(1): 27–52.
- Disney, Richard, and Sarah Tanner. 2002. The labour supply effect of the abolition of the earnings rule for older workers in the United Kingdom. *Economic Journal* 112(478): c136–c152.
- Duggan, Mark, Perry Singleton, and Jae G. Song. 2007. Aching to retire? The rise in the full retirement age and its impact on the Social Security disability rolls. *Journal of Public Economics* 91(7–8): 1327–1350.
- Friedberg, Leora. 2000. The labor supply effects of the Social Security earnings test. *Review of Economics and Statistics* 82(1): 48–63.
- Gruber, J., and P. Orszag. 2003. Does the earnings test affect labor supply and benefit receipt? *National Tax Journal* 56: 755–773.
- Haider, S.J., and D.S. Loughran, 2006. Do the elderly respond to taxes on earnings? Evidence from the Social Security retirement earnings test. Working Paper. Available at <http://www.msu.edu/~haider/Research/haiderloughran-july06.pdf>.
- Krueger, A.B., and B.D. Meyer. 2002. Labor supply effects of social insurance. In *Handbook of public economics*, vol. 4., ed. A. Auerbach and M. Feldstein, 1–34. Amsterdam: North-Holland.
- Mastrobuoni, Giovanni. 2006a. The Social Security earnings test removal: Money saved or money spent by the trust fund? Collegio Carlo Alberto Working Paper No. 25. Available at <http://www.carloalberto.org/files/no.25.pdf>.
- . 2006b. Labor supply effects of the recent Social Security benefit cuts: Empirical estimates using cohort discontinuities. Collegio Carlo Alberto Working Paper No. 33. Available at <http://www.carloalberto.org/files/no.33.pdf>.
- Packard, Michael D. 1990. The earnings test and the short-run work response to its elimination. *Social Security Bulletin* 53(9): 2–16.
- Panis, Constantijn, Ronald Euler, Cynthia Grant, Melissa Bradley, Christine E. Peterson, Randall Hirscher, and Paul Stinberg. 2000. *SSA Program Data User's Manual*, Baltimore, MD: Social Security Administration.
- Social Security Administration. 2005. *Annual Statistical Supplement to the Social Security Bulletin, 2004*. Washington, DC: Office of Policy.

- . 2004. *Annual Statistical Supplement to the Social Security Bulletin, 2003*. Washington, DC: Office of Policy.
- Song, Jae G. 2006. Evaluating the initial impact of the elimination of the retirement earnings test. *Social Security Bulletin* 65(1): 1–15.
- Song, Jae G., and Joyce Manchester. 2007. New evidence on earnings and benefit claims following changes in the retirement earnings test in 2000. *Journal of Public Economics* 91(3–4): 669–700.
- Tran, Bac V. 2004. The impact of the repeal of the retirement earnings test on the labor supply of older workers. Unpublished manuscript, College Park, MD: Department of Economics, University of Maryland. Available at <http://www.glue.umd.edu/~btran/paper.pdf>.
- Vroman, Wayne. 1985. Some economic effects of the Social Security retirement earnings test. In *Research in labor economics*, ed. Ronald Ehrenberg, 31–89. Greenwich, CT: JAI Press.