Recent Changes in the Gains from Delaying Social Security[*]

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Abstract

Social Security retirement benefits can be claimed at any age between 62 and 70, with delayed claiming resulting in larger monthly payments. In Shoven and Slavov (2013), we show that claiming later increases the present value of lifetime benefits for most individuals. However, this has not always been the case. During the late 1990s and early 2000s, a number of policy changes increased the gains from delay, particularly for couples. In addition, mortality improved and real interest rates fell substantially over this period, further increasing the attractiveness of delay. We perform simulations to examine the role of these factors in changing the gains from delay. We find that the gains from delay increased substantially after 2000, with changes in the interest rate playing the largest role in driving the increase. Using data from the Health and Retirement study, we show that individuals who turned 62 after 2000 are indeed more likely to delay than those who turned 62 before 2000. However, even in the younger cohort, most individuals still claim benefits soon after turning 62. Moreover, we find no evidence of a relationship between the probability of delay and the individual characteristics (e.g., gender, race, or health status) that affect the gains from delay.

1. Introduction

Social Security retirement benefits can be claimed at any age between 62 and 70, with delayed claiming resulting in larger monthly payments. These larger payments represent an actuarial adjustment to account for the fact that an individual who claims later is likely to receive benefits for a shorter period. In our earlier work (Shoven and Slavov 2013), we investigated the actuarial fairness of this adjustment in light of recent low real interest rates combined with improved mortality. We concluded that delaying Social Security is actuarially advantageous for most individuals. Delay is particularly beneficial for the primary earner in a couple; however, even singles with mortality rates that are substantially above average can benefit from delay at near-zero real interest rates like those that have prevailed for much of 2013. We also demonstrated that the gains from delay have increased substantially – particularly for couples – since the early 1960s, when delays first became available.

Besides falling interest rates, a number of benefit rule changes in the 1990s and early 2000s have contributed to attractiveness of delaying Social Security. For example, prior to 2000, a non-earning spouse in a married couple could not claim a spousal benefit until the primary earner had claimed his or her worker benefit. Thus, delaying the primary earner's benefit forced the non-working spouse to delay as well. Since 2000, however, married individuals have been able to claim spousal benefits when their spouse reaches full retirement age or claims benefits, whichever is sooner. In addition, the delayed retirement credit – the adjustment for delaying Social Security beyond full retirement age (which was 65 for those turning 62 in 1992, and has risen to 66 for those turning 62 today) – has become substantially more generous.

In this paper, we extend our earlier work by investigating the impact of these recent rule changes on the gains from delay for a variety of stylized couples. We attempt to isolate the

effects of these rule changes from the effects of the interest rate and mortality changes that have also occurred over the past two decades. We find that the rule changes by themselves have increased the gains from delay – measured as the percent increase in the net present value of benefits from optimal delayed claiming relative to claiming at 62 – by about 1-2 percentage points for singles, 5-6 percentage points for two-earner couples, and 2-4 percentage points for one-earner couples. Most of this increase is attributable to the rise in the delayed retirement credit. Interest rate and mortality changes further increase the gains from delay for younger cohorts relative to older ones. The combination of rule changes, mortality changes, and interest rate changes have substantially increased the gains from delay for cohorts born in 1938 and later (i.e., for individuals turning 62 in 2000 and later), with interest rates playing the largest role.

In addition, our earlier conclusions about the gains from delay for two-earner couples relied on a somewhat unusual claiming strategy: one spouse claims spousal benefits starting at full retirement age (66 for our simulated couples), while allowing his or her own worker benefit to grow through delay. For example, we demonstrated that a present-value maximizing claiming strategy might involve the primary earner claiming a spousal benefit starting at age 66, then switching to his or her own benefit at age 70, while the secondary earner claims a worker benefit at age 62. Thus, the primary earner can effectively get paid during the delay period. The availability of this strategy is likely unintentional, arising from a system designed with one-earner couples in mind. It is also not well known and rarely used. Thus, we investigate how the gains from delay are altered if this strategy is made unavailable. We find that the gains from delay – again measured as the percent increase in net present value from optimal delay relative to claiming at 62 – fall by about 4-5 percentage points for two earner couples if this strategy is eliminated. However, they are still substantial.

Finally, we utilize data from the Health and Retirement Study to investigate whether individuals turning 62 in 2000 and later are indeed more likely to delay Social Security. To cleanly separate the decision to claim from the decision to stop working, we restrict attention to individuals who stopped work before age 62. Within this sample, we find that cohorts turning 62 in 2000 and later are indeed more likely to delay. However, the vast majority of individuals, even in the younger cohorts, still claim at age 62. Moreover, we find no evidence of a relationship between the probability of delay and the individual characteristics (e.g., gender, race, or health status) that affect the gains from delay.

This paper is organized as follows. Section 2 places this paper in the context of the prior research on Social Security claiming. The methodology behind our simulations is detailed in Section 3, and the results are presented in Section 4. Section 5 presents our empirical analysis. Finally, Section 6 concludes.

2. Prior Research

A number of prior studies have established that a large subset of individuals stand to gain from delaying Social Security (Meyer and Reichenstein 2010; Munnell and Soto 2005; Sass, Sun, and Webb 2007, 2013; Coile et al. 2002; Mahaney and Carlson 2007). The main finding is that the gains from delay are particularly large for primary earners in married couples because when a primary earner delays Social Security, it boosts the survivor benefit that the secondary earner would receive in the event of widowhood. Delaying Social Security may also have tax advantages (Mahaney and Carlson 2007), and the utility gain from delay may exceed the expected monetary gain due to the insurance value of the Social Security annuity (Sun and Webb 2009). Our own earlier work (Shoven and Slavov 2013) revisits this issue in the context of

historically low interest rates, demonstrating that delay increases the present value of benefits for most people. This finding applies not only to primary earners, but also to singles, even those with mortality that is much greater than average. In addition, the gains from delay have increased dramatically since the early 1960s, when delay first became available, as a result of interest rate changes, and mortality improvements, and (for couples) law changes.[1]

Empirical studies have shown that, while there is some evidence that those who benefit from delay are more likely to do so (Coile et al. 2002; Munnell and Soto 2005; Beauchamp and Wagner 2012), the vast majority of people claim as early as possible, even when it appears to be clearly suboptimal (Sass, Sun, and Webb 2007, 2013; Hurd, Smith, and Zissimopoulos 2004). Among those who stop working before age 62, there is not much of a relationship between claiming age and the factors that influence the gains from delay (Hurd, Smith, and Zissimopoulos 2004). Field experiments suggest that while providing factual information about the gains from delay does not appear to alter claiming decisions (Liebman and Luttmer 2011), self-reported claiming intentions are sensitive to the way in which the claiming decision is framed (Brown, Kapteyn, and Mitchell 2011).

Our current work investigates the extent to which the gains from delay have changed since the 1990s. In doing so, we reconcile the results of studies that focus primarily on cohorts born in the 1930s and early 1940s (e.g., Coile et al. 2002; Sass, Sun, and Webb 2007, 2013) and find more modest gains from delay with those of studies that focus on younger cohorts (e.g., Meyer and Reicherstein 2010; Munnell and Soto 2005; Shoven and Slavov 2013) and find substantial gains from delay. Together, these studies suggest that delay is more advantageous for cohorts approaching age 62 today compared to those approaching 62 in the 1990s and early

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[1] Jivan (2004) and Munnell and Sass (2012) shows that, for singles, the effect of interest rate changes and mortality improvements have roughly offset each other in the past. Thus, most of the gains for singles have been recent, as a result of near-zero interest rates.

2000s. We provide a detailed analysis of the factors underlying this shift, decomposing the change in the gains from delay into the components attributable to benefit rule changes on the one hand, and to economic (interest rate) and demographic (mortality) changes on the other.

In addition, some prior studies of claiming (Munnell, Golub-Sass, and Karamcheva 2009; Shoven and Slavov 2013) take into account a somewhat unusual claiming strategy for two-earner couples. They assume that one spouse (typically the primary earner) claims a spousal benefit starting at full retirement age, allowing his or her own worker benefit to grow through delay until age 70. The other spouse simply claims his or her own worker benefit. Effectively, one member of a two-earner couple can use this strategy to receive a Social Security payment during the delay period. As spousal benefits were originally designed with one-earner couples in mind, it is unlikely that policy makers intended for this claiming strategy to be available to two-earner couples. Moreover, this strategy is not well known and rarely used. As a result, other studies of the gains from delay (e.g., Sass, Sun, and Webb 2013) do not take this strategy into account. We shed light on the importance of this assumption by providing a detailed analysis of the effect that this strategy has on the gains from delay for two earner couples. Our calculation is complementary to that of Munnell, Golub-Sass, and Karamcheva (2009), who compute optimal claiming strategies both with and without the two-earner couple spousal benefit option, and estimate that the availability of the option could cost Social Security $9.5 billion per year. Our analysis extends their work by showing how this strategy has affected the gains from delay for two-earner couples over the past two decades.

Finally, we provide empirical evidence on whether the increases in the gains from delay over the past two decades are associated with changes in actual claiming decisions.[2] This

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[2] An earlier version of Shoven and Slavov (2013), available upon request, presents summary statistics showing that cohorts born in 1943 and later (who received the maximum possible delayed retirement credit of 8 percent), and

analysis contributes to our understanding of whether individuals respond to the incentives in the Social Security benefit formula.

3. Methodology

Before describing our methodology, it is useful to review the Social Security benefit formula. Retired worker benefits are based on an individual's average indexed monthly earnings (AIME), which is defined as the average of the highest 35 years of an individual's earnings, indexed for economy-wide wage growth. A progressive formula is then applied to the AIME, resulting in the worker's primary insurance amount (PIA), which is the monthly benefit the worker can receive if he or she claims at full retirement age. The PIA is calculated in the year the worker turns 62 and is indexed for inflation in subsequent years. Workers may claim benefits as early as age 62, but claiming before full retirement age results in an actuarial reduction. For individuals with a full retirement age of 65, claiming benefits at age 62 results in a monthly benefit of 80 percent of PIA. For individuals with a full retirement age of 66, claiming benefits at 62 results in a monthly benefit of 75 percent of PIA. Workers may alternatively claim benefits as late as age 70, receiving a delayed retirement credit for each month of delay beyond full retirement age. The delayed retirement credit varies depending on the worker's year of birth. In particular, it has become substantially more generous for younger cohorts, with workers born in 1930 receiving 4.5 percent of PIA per year of delay and workers born in 1943 and later receiving 8 percent of PIA per year of delay.[3]

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cohorts turning 62 in 2000 or later (who are eligible for file and suspend), are somewhat more likely to delay than earlier cohorts. Our empirical work here provides an extension of those simple summary statistics. We improve on the earlier analysis by obtaining permission to use the restricted Health and Retirement Study (HRS) earnings data to determine which individuals are eligible for benefits. We also examine the impact of birth year on claiming within a regression framework that controls for other observable characteristics.

[3] For additional information, see http://www.ssa.gov/oact/ProgData/ar_drc.html.

In addition to worker benefits, a married person can receive a spousal benefit equal to half of his or her spouse's PIA, if claimed at full retirement age. The spousal benefit is reduced for claims made before full retirement age, but there is no delayed retirement credit. An individual who claims both a spousal and a worker benefit is paid the higher of the two. A spousal benefit cannot be claimed unless the worker on whose record the benefit is based has claimed worker benefits. For example, consider a couple in which the wife is two years younger than the husband. Assume both have a full retirement age of 66. If the husband waits until age 70 to claim his worker benefit, the wife would not be able to claim a spousal benefit until age 68 even though the spousal benefit ceases to grow through delay when the wife turns 66. However, since 2000, a provision known as "file and suspend," allows a worker to file for his or her own benefit at full retirement age (or later) and then suspend the benefit. In our example, the husband could file for his worker benefit at age 66 and then suspend his benefit until age 70. The husband's benefit continues to grow through delay, but the wife can now claim a spousal benefit at age 64. Clearly, the introduction of "file and suspend" has made it less costly for a married person to delay his or her own benefit, as doing so no longer forces the spouse to delay the spousal benefit as well.

A widow can also receive a benefit based on his or her deceased spouse's record. The widow benefit is equal to either 82.5 percent of the deceased spouse's PIA or the deceased spouse's actual benefit, whichever is greater. Because the widow benefit is linked to the deceased spouse's actual benefit (including any reduction for early claiming or delayed retirement credits), the widow benefit rises when the deceased spouse delays claiming. The widow benefit is reduced if it is claimed before the widow's full retirement age (which is not always the same as the retirement age for worker and spousal benefits), but there are no credits

for delaying widow benefits beyond full retirement age.[4] As with the spousal benefit, an individual who claims both a worker and a widow benefit receives the higher of the two amounts.

To proceed with our analysis, we compute the expected net present value (NPV) of benefits from a large number of Social Security claiming strategies for various stylized households.[5] We consider single male and female households, with birth years ranging from 1930-1951 at 3-year intervals. We also consider both one-earner and two earner couples in which the primary earner (assumed to be the husband) has a birth year ranging from 1930-1951 at 3-year intervals. The secondary earner (or nonearner, for one-earner couples) is alternatively assumed to be either two years or seven years younger than the primary earner. In the two-earner couple households, the secondary earner's PIA is assumed to be 75 percent of the primary earner's PIA. Because all monthly benefit amounts are calculated as a percent of PIA, all net present values in our analysis can be expressed as a multiple of the primary earner's PIA. In other words, the actual levels of the stylized workers' PIAs do not affect the optimal claiming strategies or the percent gain from delay.

In calculating NPVs, we need to choose an appropriate discount rate. Because Social Security is an inflation-indexed obligation of the U.S. government, the most appropriate discount rate would be the interest rate on Treasury Inflation Protected Securities (TIPS), which are also an inflation-indexed obligation of the U.S. government. Interest rate data are available for TIPS

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[4] The reduction formula for the widow benefit is complex. A widow who claims at age 60 receives 71.5 percent of the deceased spouse's PIA plus any delayed retirement credits. If the deceased spouse claimed his or her own worker benefit at full retirement age or later (or died before claiming), the widow benefit is increased linearly until it reaches 100 percent of the deceased spouse's PIA plus delayed retirement credits at the widow's full retirement age. If the deceased spouse claimed his or her own worker benefit before full retirement age, the increases in the widow benefit proceed in the same linear fashion but stop once the benefit reaches 82.5 percent of the deceased spouse's PIA or the deceased spouse's actual benefit, whichever is higher. For additional details on these provisions, see Weaver (2002). For details on the full retirement age and actuarial reduction for widow benefits, see http://www.ssa.gov/survivorplan/survivorchartred.htm.
[5] Our methodology is similar to that described in Shoven and Slavov (2013).

of varying terms, including 5, 7, 10, 20, and 30 years. For an individual, the appropriate time horizon for discounting a stream of Social Security benefits is roughly 20 years. Therefore, whenever possible, we use the average annual yield on 20-year TIPS in our analysis. For 2013, we use the average TIPS yield in the first half of the year. Prior to mid-2004, 20-year TIPS were not available. Thus, for 2004 and earlier, we use the difference between the average annual yield on (nominal) 20-year Treasury bonds and the annual percent change in the consumer price index for all urban consumers.[6]

Table 1 summarizes the details of each of our stylized households. The first column of the table is the year of birth for the single person or primary earner. For this individual, the second and third columns provide, respectively, the full retirement age and the delayed retirement credit (as a percentage of PIA) that is earned for each year of delay beyond full retirement age. The next three columns provide the same information for the secondary earner (or nonearner) in the couple households. The next column indicates whether "file and suspend" was available when the primary earner in the household turned 62. Finally, the last column indicates the prevailing safe real interest rate when the primary earner turned 62.

A claiming strategy for a single person consists of an age at which to claim benefits. For one-earner couples, a claiming strategy includes an age for the primary earner to claim worker benefits, and an age for the secondary earner to claim spousal benefits. For two-earner couples, a claiming strategy includes an age for each spouse to claim worker benefits. In addition, as discussed above, we allow the possibility of an unusual claiming strategy: one member of the couple can claim a spousal benefit before claiming the worker benefit. This strategy is available as long as both worker and spousal benefits are delayed to full retirement age or later. If the

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[6] All data used in calculating interest rates come from from Federal Reserve Economic Data (FRED), available at http://research.stlouisfed.org/fred2/. Since nominal 20-year Treasury bonds were not available between 1987 and 1992, we average the rates on nominal 10-year and 30-year Treasury bonds to construct the interest rate for 1992.

spousal benefit is claimed before full retirement age, Social Security's rules require that the worker benefit be claimed at the same time. Although delays may occur in increments of one month, in order to reduce the number of strategies to consider, we assume all claims are made on birthdays.[7] We also do not consider strategic claiming for widow benefits: a widow is assumed to claim the widow benefit immediately upon the death of the spouse.[8]

For each claiming strategy, and for every possible age at death (or, for couples, combination of ages at death), we compute the NPV of the household's stream of benefits using the applicable real interest rate. We then compute the expected NPV for the claiming strategy across all possible ages at death. The probability distribution over ages at death is based on the Social Security Administration's latest cohort mortality tables, which are used for the intermediate projections in the 2013 Trustees Report. All deaths are assumed to occur halfway through the year. For couples, the deaths of the husband and wife are assumed to be independent events.

For each stylized household, we first compute the optimal claiming strategies and the gains from delay under the actual interest rate and mortality faced by that household. For couples, we perform this calculation both with and without "file and suspend." (Note that the availability of "file and suspend" is not based on birth cohort; it is available to anyone starting in 2000.) Then, we re-compute the optimal claiming strategies for each household holding mortality and interest rates constant. In particular, we assume a real interest rate of 2.9 percent (the long-term real interest rate assumed by the Social Security Trustees) and mortality equal to that faced

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[7] In addition, we ignore a number of other unusual claiming strategies. For example, we do not allow an individual to claim a benefit, suspend the benefit a few months or years later, then resume the benefit. We only allow "file and suspend" in the case of one spouse filing for his or her benefit and then immediately suspending it, in order to allow the other spouse to collect the spousal benefit. See Kotlikoff (2012) for further discussion of unusual claiming strategies.

[8] For NPV-maximizing widow benefit claiming strategies, see Shuart, Weaver, and Whitman (2010).

by the 1951 (for primary earners and singles), 1953 (for secondary earners who are two years younger), and 1958 (for secondary earners who are seven years younger) birth cohorts. In each case, for two-earner couples, we determine the optimal claiming strategies and gains from delay both with and without the spousal benefit option. These alternative calculations allow us to evaluate the relative effects of rule changes versus interest rate and mortality changes. We can also isolate the effect of "file and suspend" compared to the other rule changes (increases in the full retirement age and the delayed retirement credit). In addition, we can quantify the effect of the spousal benefit claiming strategy for two-earner couples.

4. Results

Table 2 show the NPV-maximizing claiming ages for single males and females, as well as the percent increase in NPV from claiming optimally versus claiming at age 62. Men born before 1939 receive no benefit from delay, and the gains for women born in this period are small. Starting with the 1939 birth cohort, however, the gains from delay begin to increase for both men and women. Men born in 1951 (who turn 62 in 2013) maximize NPV by claiming at 69, and receive a gain of 12.6 percent from following that strategy. Similarly, women born in 1951 maximizing NPV at 70 and receive a gain from delay of 17.8 percent.

There are multiple factors underlying the changes in the gains from delay shown in Table 2, including mortality improvements, a decline in real interest rates, and benefit rule changes. To isolate the effect of benefit rule changes, Table 3 presents the gains from delay for single men and women using the mortality rates of the 1951 birth cohort, and a real interest rate of 2.9 percent. The increase in the gains from delay is more modest in Table 3. For male cohorts born in 1942 and earlier, and for female cohorts born in 1939 and earlier, delay beyond full retirement

age reduces NPV. Thus, the changes in the gains from delay for these cohorts result solely from changes in the full retirement age. For later cohorts, the increase in the delayed retirement credit plays a role. The three most recent cohorts all face a delayed retirement credit of 8 percent and receive gains from delay ranging from 1.7 percent (for males) to 4.9 percent (for females). Despite the more modest gains from delay shown in Table 3, we emphasize that the gains from delay are not trivial for these recent birth cohorts, particularly for women.

In Table 4, we turn to two-earner couples, presenting the NPV-maximizing claiming strategies and associated gains from delay. Again, the gains from delay have risen dramatically, from a modest 1-2 percent for the 1930 primary earner birth cohort to more than 20 percent today. The results in Table 4 assume the availability of "file and suspend," but removing this option barely alters them. In particular, "file and suspend" matters only for the couple with birth years of 1951 and 1953. This couple relies on the husband filing and suspending his benefit at age 68, allowing the wife to claim a spousal benefit when she is 66. Both members of the couple then delay their own benefit to age 70. Without the "file and suspend" option, the couple's NPV is maximized when the secondary earner claims at 64, allowing the primary earner to claim a spousal benefit from ages 66 through 69. Under this second-best option, the gains are only 0.3 percentage points lower.

Just as for singles, much of the increase in the gains from delay for couples comes from improvements in mortality and declines in the real interest rate. To isolate the effect of rule changes, Table 5 shows the NPV-maximizing strategies for the two-earner couples assuming a real interest rate of 2.9 percent and the mortality profile of the 1951/1953 birth cohorts (for the top panel) and the 1951/1958 birth cohorts (for the bottom panel). The gains from delay have still increased substantially for two-earner couples, although the increase is not as dramatic as

that shown in Table 4. Removing the availability of "file and suspend" makes no difference to the results in Table 5.

Tables 4 and 5 also suggest that, generally speaking, the couple with the two-year age difference gets larger gains than the couple with the seven-year age difference. This result runs counter to conventional wisdom, which suggests that the gains from delay increase with the age difference between the primary and secondary earners (see, e.g., Coile et al. 2002). The intuition behind the conventional wisdom is straightforward. When the primary earner delays his benefit, he effectively purchases a second-to-die annuity. That is, he sacrifices his benefits today in exchange for higher future benefits not only over his own lifetime but also over the lifetime of the secondary earner if she is widowed.[9] The value of this second-to-die annuity increases as the age difference between the primary and secondary earners increases, as this age difference increases the length of time to the second death (the expected payout period for the annuity). The counterintuitive result in Table 4 comes from the availability of the spousal benefit claiming option. When there is a seven-year age difference between the spouses, the primary earner cannot claim the spousal benefit until he is 69 (and the secondary earner is 62), giving him only one year of spousal benefits before switching to his own benefit. With a two-year age difference, however, the primary earner can claim the spousal benefit age 66, giving him four years of spousal benefits before switching to his own benefit.

In Tables 6 and 7, we present results for two-earner couples without allowing the spousal benefit claiming option. In Table 6, we use the actual interest rate and mortality faced by the stylized couples; in Table 7, we hold the real interest rate constant at 2.9 percent and use the mortality profile of the 1951/1953 cohorts (top panel) or the 1951/1958 cohorts (bottom panel).

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[9] In contrast, when the secondary delays, however, she effectively purchases a first-to-die annuity. When she dies, her benefits cease as her spouse continues to receive benefits on his own record. When her spouse dies, her benefits cease because she switches to the widow benefit.

As the above discussion suggests, without the spousal benefit claiming option, a larger age difference does indeed result in a greater gain from delay. In addition, as one might expect, the spousal benefit option becomes increasingly valuable as various factors such as the delayed retirement credit and mortality improvements make it more attractive to delay the primary earner's benefit.

In Tables 8 and 9, we turn to one-earner couples. Table 8 shows that, under the actual interest rate and mortality conditions facing the stylized couples, the gains from delay have increased quite substantially for one-earner couples. Table 9 shows that with the interest rate held constant at 2.9 percent, and assuming the mortality rates of the 1951/1953 cohorts (top panel) or the 1951/1958 cohorts (bottom panel), the increase in the gains from delay are less dramatic. Both Tables 8 and 9 assume the existence of "file and suspend." The only benefit rule changes whose effects are reflected in Table 9 include the increase in the delayed retirement credit and the increase in the full retirement age. To determine the effect of "file and suspend," we recomputed the NPV-maximizing strategies for one-earner couples without this option in Tables 10 (using actual interest rates and mortality) and Table 11 (holding the interest rate and mortality constant). Comparing Tables 8 and 10 (both of which use the actual interest rate and mortality), we see that "file and suspend" makes a modest difference to the gains from delay for more recent cohorts. For earlier cohorts, delaying the primary earner's benefit beyond full retirement age is not optimal; thus, the unavailability of "file and suspend" does not constrain the secondary earner's claiming choices. But for more recent cohorts, other factors – including mortality improvements, interest rate changes, and rule changes – make delaying beyond full retirement age attractive. Thus, "file and suspend" provides a boost in the gains from delay by removing a constraint on the secondary earner's claiming age.

For example, for the couple born in 1951 and 1953, the NPV-maximizing strategy involves the wife claiming a spousal benefit at age 66, while the husband delays to age 70 (Table 8). Without "file and suspend," however, the wife would not be able to claim a spousal benefit until she is 68 and her husband is 70. If the wife wishes to claim a spousal benefit at 66 (her full retirement age), the husband would have to claim his own benefit at 67, forgoing some of the gains from delay. The NPV-maximizing claiming strategy without "file and suspend" represents a compromise: the husband claims his own benefit at age 69, allowing the wife to claim her spousal benefit at 67. This constraint reduces the gains from delay by around 3 percentage points. The availability of "file and suspend" is less important for couples with a large age difference: for these couples, the wife is so much younger that, even without file and suspend, the husband can delay substantially without constraining the wife's claiming decision. Comparing Tables 9 and 11, we find similar results with a constant interest rate and mortality. However, here, file and suspend makes a smaller difference to the gains from delay because delaying the primary earner's benefit beyond full retirement age is less attractive to begin with.

5. Empirical Analysis

Our simulations suggest that the gains from delay increased considerably for individuals turning 62 around 2000. That is, cohorts born in 1938 and later experienced large gains from delay compared to earlier cohorts. To test whether these cohorts are indeed more likely to delay, we utilize data from the Health and Retirement Study (HRS), a panel survey that is intended to be representative of older Americans. We use data from all waves (1992-2010, at 2-year intervals) of the HRS. Most of the variables used in our analysis come from the RAND version

of the HRS. However, we also obtained permission to merge in the restricted HRS datasets containing respondents' Social Security earnings and benefit records.

For each HRS respondent, we define the "age-62 wave" as follows. If the respondent was under 62 in wave t, and 62 or older in wave $t+1$, then wave t is defined as the respondent's age-62 wave. If the respondent was under 62 in wave t, but not interviewed in wave $t+1$ and turned 62 within two years of the wave t interview, then wave t is also defined as the respondent's age-62 wave. In other words, the age-62 wave is the wave immediately before the wave in which the respondent turned 62. We collect information on the characteristics of each individual in their age 62 wave, including marital status, labor force status, financial wealth (which we convert to 2010 dollars using the CPI-U-RS), self-reported health status, education, and race. We exclude individuals who are not observed in their age-62 wave, individuals who report that they have previously applied for disability or Supplemental Security Income (SSI), and individuals who report that they claimed Social Security before age 62. In order to minimize issues arising from the joint determination of claiming and retirement, we include only individuals who were not working in their age-62 wave.[10] We also include only individuals who are eligible for retired worker benefits (determined based on the number of quarters of coverage in the earnings records), and individuals who do not report a marital status of widowed in their age-62 wave or earlier.

We construct two dependent variables. The first dependent variable is an indicator for whether the individual delayed benefits to age 65 or later. The second is the number of months after age 62 that an individual claimed.[11] To avoid issues of truncation, we exclude individuals

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[10] It is, of course, possible that such an individual may return to work after their age-62 wave.

[11] Our dependent variables are based on self-reported claims, available in the RAND version of the HRS. An alternative measure of claiming would come from the restricted Social Security claiming records. However, a number of individuals who report that they have claimed benefits do not appear to have Social Security claiming

who had not yet turned 65 in the last wave in which they are observed. In addition, we set the number of months delay since age 62 to 36 for all individuals who claimed at 65 or later, or were not observed to have claimed within the sample period.

Table 12 shows summary statistics for all the variables used in our analysis. On average, individuals in our sample delay for almost 7 months beyond age 62, but only 9 percent delay to age 65 or later. Years of birth range from 1930 to 1945. Table 13 shows that, in the full sample, more than 80 percent claimed within a year of turning 62. However, among those who were born in 1938 or later, only 75.3 percent claimed within a year of turning 62. There does not appear to be much of a relationship between claiming delays and wealth, even though, in theory, wealth can facilitate delay. In fact, individuals whose household wealth lies in the top half of the wealth distribution are more likely to claim early than those whose wealth lies in the bottom half.

Table 14 presents results from our regressions. Column (1) reports the marginal effects from a probit model in which the dependent variable is equal to 1 if the individual delayed Social Security to age 65 or later. Column (2) reports the coefficients from a Tobit model in which the dependent variable is the number of months' delay since age 62. In this model, the dependent variable is left-censored at zero months and right-censored at 36 months. In both regressions, standard errors are clustered by household. Similar to Hurd, Smith, and Zissimopolous (2004), among this group of individuals who stopped work before age 62, we find very little relationship between claiming age and the factors that influence the gains from delay. Because of the large gains to delaying the primary earner's benefit, one might expect married males to be more likely to delay; however, this is not the case. Because mortality varies across race, one might expect to

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records. We suspect the self-reported claiming information is more reliable than the administrative Social Security information.

see difference in claiming behavior across races; however, this is again not the case. Counter to expectation, those with greater wealth are less likely to delay.

On the other hand, college education does appear to be associated with longer delays, possibly because of longer life expectancy or improved financial literacy. The probability of delaying to age 65 or later is 7.3 percentage points higher among those with some college than among those with no college. In addition, individuals with some college delay benefits for an additional 3.8 months compared to those with no college. Finally, as predicted, individuals who were born before 1938 have a probability of delay that is 6.2 percentage points lower than those who were born in 1938 and later. The older cohort's average delay period is 3.7 months shorter compared to the younger cohort.

6. Conclusion

We have shown that the gains from delaying Social Security have improved dramatically, particularly for couples, since the 1990s. Most of the increase in the gains from delay come from historically low interest rates and improved mortality. However, law changes since the 1990s have also contributed. In particular, the benefit formula has been changed so that delays beyond full retirement age are particularly attractive. Also, since 2000, one-earner couples have benefited from a provision known as "file and suspend," which allows the non-earner to claim a spousal benefit even if the primary earner delays his own worker benefit.

Throughout our analysis, we have focused on the percent gains from delay relative to claiming at age 62. This measure of the gains from delay does not depend on the individual or primary earner's PIA. However, it is worth noting the substantial increase in the dollar gains from delay as well. For any of our stylized couples, the gains from delay are less than $5,000 if

we assume that the primary earner's PIA is $1,400[12] and that he was born in 1930. In contrast, if the primary earner was born in 1951, a one-earner couple could gain more than $85,000, and a two-earner couple could gain more than $100,000 through optimal claiming relative to claiming at 62. For singles born in 1930 with a PIA of $1,400, the gains from delay are less than $1,000 for women and nonexistent for men. In contrast, for singles born in 1951, the gains from delay are more than $30,000 for men and more than $50,000 for women.[13]

Consistent with these findings, our empirical analysis suggests that individuals born in 1938 and later – who face more generous terms for delaying Social Security – are more likely to delay claiming. However, even among this younger group, the vast majority do not appear to delay optimally. In addition, we find little relationship between delay and the other factors that influence the gains from delay (such as primary earner status and mortality).

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[12] According to the Social Security Administration's 2012 Annual Statistical Supplement, this is roughly the average PIA for retired workers in December 2011. For more detailed information, see the tables at http://www.ssa.gov/policy/docs/statcomps/supplement/2012/5b.html.
[13] These calculations all assume the actual interest rates and mortality rates that the cohorts faced. In addition, the 1930 primary earner birth cohort is assumed not to have access to "file and suspend," while the 1951 primary earner birth cohort is.

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Table 1: Stylized Households and Benefit Rules

Case 1: Two-Year Age Difference

Primary/Single Year of Birth	Primary/Single FRA	Primary/Single DRC	Secondary Year of Birth	Secondary FRA	Secondary DRC	File and Suspend?	Interest Rate
1930	65	4.5%	1932	65	5.0%	no	4.3%
1933	65	5.5%	1935	65	6.0%	no	4.2%
1936	65	6.0%	1938	65.17	6.5%	no	4.2%
1939	65.33	7.0%	1941	65.67	7.5%	yes	2.8%
1942	65.83	7.5%	1944	66	8.0%	yes	2.4%
1945	66	8.0%	1947	66	8.0%	yes	2.4%
1948	66	8.0%	1950	66	8.0%	yes	1.7%
1951	66	8.0%	1953	66	8.0%	yes	0.3%

Case 2: Seven-Year Age Difference

Primary/Single Year of Birth	Primary/Single FRA	Primary/Single DRC	Secondary Year of Birth	Secondary FRA	Secondary DRC	File and Suspend?	Interest Rate
1930	65	4.5%	1937	65	6.5%	no	4.3%
1933	65	5.5%	1940	65.5	7.0%	no	4.2%
1936	65	6.0%	1943	66	8.0%	no	4.2%
1939	65.33	7.0%	1946	66	8.0%	yes	2.8%
1942	65.83	7.5%	1949	66	8.0%	yes	2.4%
1945	66	8.0%	1952	66	8.0%	yes	2.4%
1948	66	8.0%	1955	66.17	8.0%	yes	1.7%
1951	66	8.0%	1958	66.67	8.0%	yes	0.3%

Notes: FRA = full retirement age; DRC = delayed retirement credit

Table 2: NPV-Maximizing Strategies for Singles
(Actual Interest Rate and Mortality)

Male		
Year of Birth	*Claiming Age*	*Gains From Delay*
1930	62	0.0%
1933	62	0.0%
1936	63	0.0%
1939	64	1.2%
1942	65	2.0%
1945	67	2.8%
1948	68	5.7%
1951	69	12.6%
Female		
Year of Birth	*Claiming Age*	*Gains From Delay*
1930	63	0.5%
1933	63	0.7%
1936	63	0.8%
1939	66	3.2%
1942	67	5.2%
1945	68	6.5%
1948	69	9.8%
1951	70	17.8%

Table 3: NPV-Maximizing Strategies for Singles (Constant Interest Rate and Mortality)

Male		
Year of Birth	*Claiming Age*	*Gains From Delay*
1930	64	2.1%
1933	64	2.1%
1936	64	2.1%
1939	65	1.9%
1942	65	1.7%
1945	67	1.7%
1948	67	1.7%
1951	67	1.7%
Female		
Year of Birth	*Claiming Age*	*Gains From Delay*
1930	65	3.8%
1933	65	3.8%
1936	65	3.8%
1939	66	3.9%
1942	67	4.2%
1945	68	4.9%
1948	68	4.9%
1951	68	4.9%

Table 4: NPV-Maximizing Strategies for Two-Earner Couples (Actual Interest Rate and Mortality)

Case 1: Two-Year Age Difference						
Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Who Claims Spousal?	Spousal Claiming Age	Gains From Delay
1930	1932	66	62	primary	65	1.2%
1933	1935	68	62	primary	65	3.0%
1936	1938	69	62	primary	65	4.1%
1939	1941	70	62	primary	66	9.4%
1942	1944	70	62	primary	66	12.2%
1945	1947	70	62	primary	66	13.6%
1948	1950	70	62	primary	66	15.9%
1951	1953	70	70	secondary	66	21.5%
Case 2: Seven-Year Age Difference						
Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Who Claims Spousal?	Spousal Claiming Date	Gains From Delay
1930	1937	62	70	secondary	65	1.7%
1933	1940	65	62	-	-	1.1%
1936	1943	62	70	secondary	66	1.8%
1939	1946	70	62	primary	69	6.8%
1942	1949	70	62	primary	69	9.9%
1945	1952	70	62	primary	69	11.5%
1948	1955	70	62	primary	69	14.3%
1951	1958	70	70	secondary	67	20.8%

Table 5: NPV-Maximizing Strategies for Two-Earner Couples (Constant Interest Rate and Mortality)

			Case 1: Two-Year Age Difference			
Primary Year of Birth	*Secondary Year of Birth*	*Primary Claiming Age*	*Secondary Claiming Age*	*Who Claims Spousal?*	*Spousal Claiming Age*	*Gains From Delay*
1930	1932	68	62	primary	65	5.2%
1933	1935	70	62	primary	65	7.5%
1936	1938	70	62	primary	65	8.8%
1939	1941	70	62	primary	66	10.1%
1942	1944	70	62	primary	66	11.2%
1945	1947	70	62	primary	66	12.2%
1948	1950	70	62	primary	66	12.2%
1951	1953	70	62	primary	66	12.2%

			Case 2: Seven-Year Age Difference			
Primary Year of Birth	*Secondary Year of Birth*	*Primary Claiming Age*	*Secondary Claiming Age*	*Who Claims Spousal?*	*Spousal Claiming Date*	*Gains From Delay*
1930	1937	65	70	secondary	65	4.8%
1933	1940	66	62	-	-	4.3%
1936	1943	67	70	secondary	66	5.2%
1939	1946	70	62	primary	69	7.6%
1942	1949	70	62	primary	69	8.7%
1945	1952	70	62	primary	69	9.9%
1948	1955	70	62	primary	69	9.9%
1951	1958	70	62	primary	69	9.9%

Table 6: NPV-Maximizing Strategies for Two-Earner Couples (Actual Interest Rate and Mortality, No Spousal Benefit)

Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Gains From Delay
Case 1: Two-Year Age Difference				
1930	1932	65	62	1.1%
1933	1935	65	62	1.5%
1936	1938	65	62	1.7%
1939	1941	68	62	5.0%
1942	1944	70	62	7.2%
1945	1947	70	62	8.5%
1948	1950	70	62	11.1%
1951	1953	70	67	17.1%
Case 2: Seven-Year Age Difference				
1930	1937	64	62	0.8%
1933	1940	65	62	1.1%
1936	1943	65	62	1.3%
1939	1946	69	62	5.7%
1942	1949	70	62	8.7%
1945	1952	70	62	10.2%
1948	1955	70	62	13.2%
1951	1958	70	62	19.1%

Table 7: NPV-Maximizing Strategies for Two-Earner Couples (Constant Interest Rate and Mortality, No Spousal Benefit)

Case 1: Two-Year Age Difference				
Primary Year of Birth	*Secondary Year of Birth*	*Primary Claiming Age*	*Secondary Claiming Age*	*Gains From Delay*
1930	1932	65	62	4.0%
1933	1935	65	62	4.0%
1936	1938	66	62	4.2%
1939	1941	68	62	5.5%
1942	1944	69	62	6.1%
1945	1947	70	62	7.0%
1948	1950	70	62	7.0%
1951	1953	70	62	7.0%
Case 2: Seven-Year Age Difference				
Primary Year of Birth	*Secondary Year of Birth*	*Primary Claiming Age*	*Secondary Claiming Age*	*Gains From Delay*
1930	1937	65	62	4.2%
1933	1940	66	62	4.3%
1936	1943	67	62	4.8%
1939	1946	69	62	6.5%
1942	1949	70	62	7.5%
1945	1952	70	62	8.6%
1948	1955	70	62	8.6%
1951	1958	70	62	8.6%

Table 8: NPV-Maximizing Strategies for One-Earner Couples (Actual Interest Rate and Mortality, File and Suspend)

Case 1: Two-Year Age Difference				
Primary Year of Birth	*Secondary Year of Birth*	*Primary Claiming Age*	*Secondary Claiming Age*	*Gains From Delay*
1930	1932	64	63	1.2%
1933	1935	65	63	1.7%
1936	1938	65	63	1.8%
1939	1941	68	65	5.3%
1942	1944	69	65	7.8%
1945	1947	70	65	9.4%
1948	1950	70	66	12.8%
1951	1953	70	66	19.8%
Case 2: Seven-Year Age Difference				
Primary Year of Birth	*Secondary Year of Birth*	*Primary Claiming Age*	*Secondary Claiming Age*	*Gains From Delay*
1930	1937	64	62	0.8%
1933	1940	64	62	1.2%
1936	1943	65	62	1.3%
1939	1946	69	62	5.8%
1942	1949	70	62	8.9%
1945	1952	70	62	10.7%
1948	1955	70	65	14.0%
1951	1958	70	66	21.0%

Table 9: NPV-Maximizing Strategies for One-Earner Couples (Constant Interest Rate and Mortality, File and Suspend)

		Case 1: Two-Year Age Difference		
Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Gains From Delay
1930	1932	65	65	5.2%
1933	1935	65	65	5.2%
1936	1938	66	65	5.3%
1939	1941	68	65	6.3%
1942	1944	69	65	6.8%
1945	1947	70	65	7.7%
1948	1950	70	65	7.7%
1951	1953	70	65	7.7%
		Case 2: Seven-Year Age Difference		
Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Gains From Delay
1930	1937	65	64	4.7%
1933	1940	66	64	4.6%
1936	1943	67	62	5.0%
1939	1946	69	62	6.8%
1942	1949	70	62	7.7%
1945	1952	70	62	8.9%
1948	1955	70	62	8.9%
1951	1958	70	62	8.9%

Table 10: NPV-Maximizing Strategies for One-Earner Couples (Actual Interest Rate and Mortality, No File and Suspend)

Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Gains From Delay
Case 1: Two-Year Age Difference				
1930	1932	64	63	1.2%
1933	1935	65	63	1.7%
1936	1938	65	63	1.8%
1939	1941	67	65	5.2%
1942	1944	68	66	7.4%
1945	1947	68	66	8.3%
1948	1950	68	66	11.0%
1951	1953	69	67	16.7%
Case 2: Seven-Year Age Difference				
1930	1937	64	62	0.8%
1933	1940	64	62	1.2%
1936	1943	65	62	1.3%
1939	1946	69	62	5.8%
1942	1949	70	64	8.8%
1945	1952	70	64	10.6%
1948	1955	70	65	14.0%
1951	1958	70	66	21.0%

Table 11: NPV-Maximizing Strategies for One-Earner Couples (Constant Interest Rate and Mortality, No File and Suspend)

Case 1: Two-Year Age Difference				
Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Gains From Delay
1930	1932	65	65	5.2%
1933	1935	65	65	5.2%
1936	1938	66	65	5.3%
1939	1941	67	65	6.1%
1942	1944	68	66	6.5%
1945	1947	68	66	7.0%
1948	1950	68	66	7.0%
1951	1953	68	66	7.0%
Case 2: Seven-Year Age Difference				
Primary Year of Birth	Secondary Year of Birth	Primary Claiming Age	Secondary Claiming Age	Gains From Delay
1930	1937	65	64	4.7%
1933	1940	66	64	4.6%
1936	1943	67	62	5.0%
1939	1946	69	62	6.8%
1942	1949	69	62	7.5%
1945	1952	70	64	8.8%
1948	1955	70	64	8.7%
1951	1958	70	63	8.6%

Table 12: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.
Months Delay Since 62	6.95	11.14	0	36
Delay to 65	0.09	0.29	0	1
Year of Birth	1937	4.11	1930	1945
Financial Wealth (2010 dollars)	187503	403510	-104975	5065719
Fair/Poor Health Status	0.11	0.31	0	1
Some College	0.45	0.50	0	1
Nonwhite	0.12	0.32	0	1
Married Male	0.34	0.47	0	1
Married Female	0.53	0.50	0	1
Single Male	0.06	0.25	0	1
Single Female	0.06	0.24	0	1
Year of Birth < 1938	0.55	0.50	0	1

Notes: All summary statistics based on 1,095 individual-level observations.

Table 13: Distribution of Claiming Ages

	0-12 Months Delay	13-24 Months Delay	>24 Months Delay
Full Sample	80.5%	7.9%	11.7%
Year of Birth < 1938	84.8%	6.9%	8.4%
Year of Birth ≥1938	75.3%	9.0%	15.7%
Wealth in Top Half	83.4%	5.7%	11.0%
Wealth in Bottom Half	77.6%	10.0%	12.4%

Notes: Based on 1,095 individual-level observations.

Table 14: Factors Influencing Delayed Claiming

Variable	(1) Probability of Delay to 65	(2) Months Delay Since 62
Year of Birth < 1938	-0.0622***	-3.672***
	(0.0183)	(0.884)
Some College	0.0727***	3.844***
	(0.0187)	(0.897)
Wealth - Top Half	-0.0336*	-2.314***
	(0.0180)	(0.868)
Fair/Poor Health Status	0.00579	1.601
	(0.0298)	(1.360)
Nonwhite	0.0268	1.413
	(0.0306)	(1.395)
Married Female	0.0117	0.988
	(0.0188)	(0.901)
Single Male	-0.0359	-1.731
	(0.0310)	(1.575)
Single Female	-0.0171	0.193
	(0.0328)	(1.686)
Observations	1,095	1,095

Standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Notes: In column (1), dependent variable is the probability of delaying to 65 or later. In column (2) dependent variable is the number of months' delay since age 62. For column (1), coefficients reported are marginal effects. Standard errors clustered by household.