Social Security: When Should You Start Benefits and How to Minimize Longevity Risk?

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Executive Summary

- This study examines strategies for singles and couples who are deciding when to begin Social Security benefits.
- Two factors should affect individuals' decisions about when to begin Social Security benefits. First, which starting date for singles or starting dates for couples maximize the present value of benefits? Second, which date or dates minimize longevity risk?
- For single taxpayers with average life expectancies who will not be subject to an earnings test, present value of benefits is approximately the same no matter when benefits begin. Therefore, based on present value criterion, singles with short life expectancies should begin benefits early and those with longer life expectancies should delay. To minimize longevity risk, benefits should begin at 70.
- The decisions for couples revolve around spousal and survivor's benefits. For an average couple, present value is usually maximized when the lower-earning spouse begins benefits as soon as possible (as long as those benefits would not be lost due to the earnings test), while the higher-earning spouse delays benefits until age 70. Longevity risk is minimized when the higher-earning spouse delays benefits until 70.
- Finally, this study discusses the do-over option, whereby someone can repay prior benefits and start benefits anew. Singles can start benefits at age 62 regardless of their health and reassess their health at age 70. Couples can also benefit from the do-over, but there is a risk of the higher-earning partner starting benefits earlier with the plan to invest the Social Security benefits, keep the interest, and repay them at a later date. There are tax consequences associated with this option, which should be evaluated against the benefits.

This study examines strategies for singles and couples who are deciding when to begin Social Security benefits. A client may decide to retire from work at age 65, but that does not mean he or she should also begin Social Security benefits at that time. The decision to retire and the decision to begin benefits are separate decisions. It is important to consider carefully when to begin benefits because it will affect the level of benefits for the rest of the client's, and possibly the client's spouse's, life.

This study is based on promises and rules of the current Social Security system. Jennings and Reichenstein (2002) described those promises as of 2002. Since then, there have been a few tweaks to the promises, such as the do-over option. No one knows how future legislation may change benefits. Based on our intuition and recent proposals, benefits likely will change little for current retirees and those soon to retire. Consequently, this study may best serve individuals in this target audience. Nevertheless, it is important to note this limitation. Finally, this study does not discuss every exception or nuance in the Social Security program. As with any large government program, exceptions exist. For additional details, see the Social Security Administration Web site at www.socialsecurity.gov.

There are four major sections to this study. The first explains key terms related

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Table 1: Social Security Eligibility: Ages for Full Retirement Benefits, and Reductions and Credits for Early and Delayed Benefits

Year of Birth*	Year Individual Turns 62	Full Retirement Age (FRA)	Per Month Reduction If Benefits Begin Prior to Full Retirement Age	Age 62 Benefits as % of FRA Benefits	Per Year Delayed Retirement Credits	Age 70 Benefits as % of FRA Benefits
1936 or prior	1998 or prior	65	5/9%	80%	6%	130%
1937	1999	65	5/9%	80%	6 1/2%	132 1/2%
1938	2000	65 and 2 months	5/9% for 36 mos.+5/12%/mo.**	79 1/6%	6 1/2%	131 5/12%
1939	2001	65 and 4 months	5/9% for 36 mos.+5/12%/mo.**	78 1/3%	7%	132 2/3%
1940	2002	65 and 6 months	5/9% for 36 mos.+5/12%/mo.**	77 1/2%	7%	131 1/2%
1941	2003	65 and 8 months	5/9% for 36 mos.+5/12%/mo.**	76 2/3%	7 1/2%	132 1/2%
1942	2004	65 and 10 months	5/9% for 36 mos. +5/12%/mo.**	75 5/6%	7 1/2%	131 1/4%
1943–1954	2005–2016	66	5/9% for 36 mos. +5/12%/mo.**	75%	8%	132%
1955	2017	66 and 2 months	5/9% for 36 mos.+5/12%/mo.**	74 1/6%	8%	130 2/3%
1956	2018	66 and 4 months	5/9% for 36 mos.+5/12%/mo.**	73 1/3%	8%	129 1/3%
1957	2019	66 and 6 months	5/9%for 36 mos.+5/12%/mo.**	72 1/2%	8%	128%
1958	2020	66 and 8 months	5/9% for 36 mos.+5/12%/mo.**	71 2/3%	8%	126 2/3%
1959	2021	66 and 10 months	5/9% for 36 mos.+5/12%/mo.**	70 5/6%	8%	125 1/3%
1960 or later	2022 or later	67	5/9% for 36 mos.+5/12%/mo.**	70%	8%	124%

*Social Security considers people born on January 1 to have been born in the prior year.

**The montly reduction is 5/9% for the first 36 months prior to Full Retirement Age, and 5/12% for every month after the first 36 months.

Source: Jennings and Reichenstein (2001). "Estimating the Value of Social Security Retirement Benefits." Journal of Wealth Management (Winter): 14-29.

to Social Security. The second examines strategies for singles who are deciding when to begin Social Security benefits, while the third examines these strategies for couples. The third section explains the rules that govern spousal benefits and survivors' benefits. The final section presents a summary.

Background

This section explains key terms related to Social Security. Table 1 presents the full retirement age (FRA) for individuals by birth year. FRA is 66 for people born between 1943 and 1954, and rises to 67 for people born in 1960 or later. The primary insurance amount (PIA) is the amount of monthly benefits that an individual will receive based on his or her earnings record if he or she begins Social Security benefits at FRA. Table 1 presents the adjustments to PIA for someone who begins receiving benefits before and after FRA.

For example, if Tom was born between 1943 and 1954, then his FRA is 66. If he begins Social Security benefits at his FRA then he will receive monthly benefits equal to his PIA. He may begin benefits as early as 62 or delay benefits until as late as 70. If he begins benefits before attaining FRA, his benefits will be lowered by five-ninths of a percent per month for up to 36 months plus five-twelfths of a percent per month for the next 12 months. So, if he begins benefits at age 62, his monthly benefit would be 75 percent of his PIA. If he delays the start of benefits until after attaining FRA, his monthly benefits will be increased by five-ninths of a percent per month (8 percent per year) for up to 48 months. So, if he delays the start of benefits until age 70, his monthly benefit would be 132 percent of his PIA. All payments are in today's (that is, inflation-adjusted or constant) dollars.

When Should Singles Start Social Security Benefits?

This section examines the issue of when singles should begin Social Security benefits. Two criteria are used to make this decision. First, which starting date will maximize the present value of projected benefits? Second, which starting date will minimize longevity risk, that is, the risk of running out of money in someone's lifetime? Most prior research only considers the first criterion. However, maximizing the present value is not the only criterion that retirees might consider. Some are more concerned about longevity risk.

Let's first consider how the choice of starting date affects the present value of Social Security benefits. For singles who live to average life expectancies and whose benefits will not be affected by the earnings test, the present value of benefits is approximately equal no matter when benefits begin.

The earnings test applies to individuals who begin receiving payments before reaching FRA. In the years before someone reaches his or her FRA, Social Security benefits are reduced by $1 for every $2 of earned income above $14,160 (in 2010). In the year someone reaches his or her FRA,

Table 2: Single's Monthly Payoffs from Social Security

Age	Years	Strategy A	Strategy B	Strategy C
62	1	$1,500		
63	2	$1,500		
64	3	$1,500		
65	4	$1,500		
66	5	$1,500	$2,000	
67	6	$1,500	$2,000	
68	7	$1,500	$2,000	
69	8	$1,500	$2,000	
70	9	$1,500	$2,000	$2,640
71	10	$1,500	$2,000	$2,640
…		…	…	…
83	22	$1,500	$2,000	$2,640
PV, dies at 84		$308,044	$319,094	$311,311
PV Relative, dies at 84		96.5%	100%	97.6%
PV Relative, dies at 75		100%	87.8%	61.3%
PV Relative, dies at 95		83.5%	92.7%	100%

The discount rate is 0.2% per month or 2.43% per year. Because Social Security payments are indexed to inflation, the payments are constant in real terms. Therefore, the appropriate discount rate is the real yield on long-term inflation-linked Treasury bonds, which was about 2.43% in June 2009.
Using Excel, present value of benefits if begun at age 62 is PV(0.2%, 22x12, $1,500, ,1). If benefits begin at 70, the present value is PV(0.2%, 14x12, $2,640, ,1)/1.002^{96}. These are annuities due.

benefits are reduced by $1 for every $3 of earned income above $37,680 (in 2010). After reaching FRA, individuals can receive full benefits with no limit on earnings. Obviously, it does not pay to begin benefits before reaching FRA if those benefits would be lost because of the earnings test.

Table 2 Example. Table 2 illustrates that, for singles who live to average life expectancies and whose benefits would not be affected by the earnings test, the present values of benefits through life expectancy are approximately equal, no matter when benefits begin. It shows the present values of benefits for a single individual whose FRA is 66 and whose PIA is $2,000 per month, assuming the earnings test does not apply.[1] At age 62, the average male is expected to live about 20 years, while the average female is expected to live about 23 years.[2] Table 2 shows the present values of benefits for someone starting benefits at ages of 62, 66, and 70, assuming this single individual lives 22 years. As explained in Table 1, the monthly benefits level in today's dollars is $1,500 if benefits begin at age 62, $2,000 if benefits begin at 66, and $2,640 if benefits begin at age 70. Assuming a real discount rate of 0.2 percent per month, which was the long-term real yield on long-dated Treasury Inflation Protection Securities at the time of this writing, the present value of benefits is $308,044 if you start them at age 62, $319,094 if started at age 66, and $311,311 if started at age 70.[3] The present value relative row (PV Relative, dies at 84) presents these results in relative terms. The 100 percent present value relative at age 66 indicates that the highest present value occurs when benefits begin at this age. The present value relative of 96.5 percent at age 62 indicates that this present value is 3.5 percent lower than the present value if begun at age 66. The present value relative is 97.6 percent at age 70. In short, assuming average life expectancy and no reduction in benefits resulting from the earnings test, the present values are approximately the same no matter when benefits begin. Altogether, the government did a good job of setting actuarially fair penalties for beginning benefits before FRA and credits for delaying benefits beyond FRA.[4]

This implies that the average male should have a slightly larger present value of expected benefits if he begins benefits before FRA, while the average female has slightly larger present value if she begins benefits after FRA. In data not shown, if we assume a 20-year life expectancy at age 62 for a male and a 23-year life expectancy for a female, a male can maximize the present value of benefits by beginning benefits at age 65, while the female maximizes the present value of benefits by beginning benefits at 68. However, we join Munnell, Golub-Sass, and Karamcheva (2009); Richardson (2008); Sass, Sun, and Webb (2008); and TIAA-CREF (2002) in emphasizing that the benefits are approximately the same no matter when benefits begin, assuming average life expectancy and no reduction in benefits resulting from the earnings test.

The last two rows of Table 2 show the present value relative amounts assuming this single has a relatively short life expectancy (dies at 75) and a relatively long life expectancy (dies at 95). The results are what we would expect in that if the single has a short life expectancy then the present value is much larger if benefits are begun at 62 (assuming the earnings test does not apply). If the single has a long life expectancy, the present value is much larger if benefits are begun at 70. Clearly, life expectancy is a major factor affecting the present value of benefits.

Next, let's consider the objective of minimizing longevity risk. To minimize longevity risk we need to maximize the monthly payments at age 70 and beyond. This is done by delaying the beginning of benefits until age 70. Monthly payments in today's dollars at age 70 and beyond will be $1,500 if benefits began at age 62, $2,000 if begun at age 66, and $2,640 if begun at 70.

Figure 1 Illustration. Figure 1 illustrates this concept. It shows the beginning-of-year values of a single 62-year-old's financial portfolio if he begins Social Security

benefit at 62, 64, 66, 68, and 70. He begins retirement at the beginning of 2009 with $700,000 in a 401(k), assets earn 5 percent per year, and he spends $41,700 after taxes in real terms each year. We assume his PIA is $1,500. Therefore, if he begins benefits at 62 then he will receive $1,125 per month, at 64 he will receive $1,300, at 66 he will receive $1,500, at 68 he will receive $1,740, and at 70 he will receive $1,980 per month, with all amounts expressed in today's dollars. If he begins Social Security benefits at 62, he will withdraw less from his financial portfolio in the early years to attain his spending goal. Thus, his financial portfolio will be larger in these early years than if he begins benefits at a later date. About 2029, the values of the portfolio are similar no matter when benefits begin. This demonstrates that, if he lives to average life expectancy and benefit levels are not affected by the earnings test, the present value of Social Security benefits are approximately the same no matter when he begins benefits. If he lives much shorter than 20 years then his benefactors will inherit more if he begins benefits at 62. But if he lives much longer than 20 years then his benefactors will inherit the most if he begins benefits at 70.

From Figure 1, if he begins benefits at 62 then the portfolio will last 30 full years; the $41,700 annual after-tax real spending amount was selected because this is the level of spending (rounded to the lowest $100 increment) that allows the portfolio to just last 30 years.[5] By delaying the start of Social Security benefits until 64, 66, 68, or 70, he can extend the portfolio's longevity by, respectively, 1+, 2+, 4+, or 6+ years, where 1+ indicates that the portfolio provides full funding for one more year plus part of a second. Thus, beginning benefits at 70 instead of 62 extends the portfolio's longevity by more than six years.

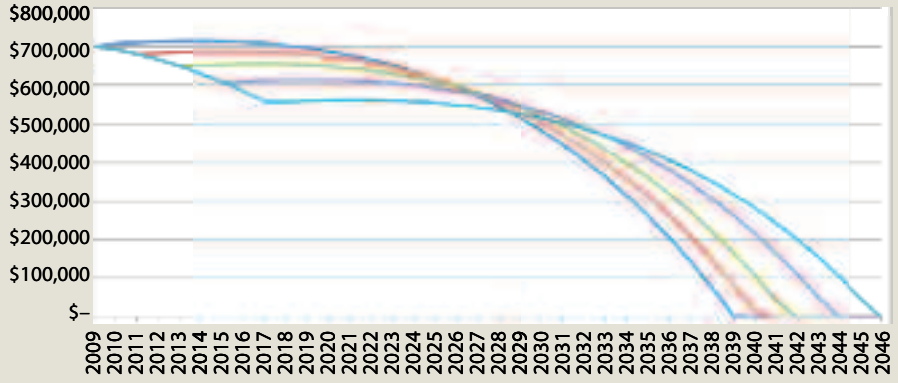
There are two reasons the portfolio's longevity increases when benefits are delayed. First, as mentioned earlier, the reductions in benefits for beginning Social Security before FRA or delaying benefits until after FRA are approximately actuarially fair for someone with average life expectancy. Therefore, as shown in Table 1, if you live a long time, it pays to delay the beginning of benefits. The second reason is taxes. If Social Security benefits begin at 70, less of this individual's Social Security will be taxed than if benefits begin at 62. If benefits begin at 70, there will be relatively small annual withdrawals from the 401(k) in that and later years to attain the spending goal. This reduces the taxable portion of Social Security benefits. In contrast, if Social Security benefits begin at 62, there will be much larger withdrawals from the 401(k) to attain the spending goal and more Social Security benefits will be taxable. Stated differently, 401(k) withdrawals are always taxable but, by delaying the start of Social Security benefits until 70, less of these benefits would be taxed. By delaying until 70, 401(k) withdrawals would be lower and these withdrawals determine how much of Social Security benefits are taxed.

For the given PIA, the additional longevity from delaying the start of benefits varies with the level of financial wealth. Continuing with the prior example, if he has $500,000 in the 401(k) and started Social Security benefits at 62, he can spend $34,200 in real terms each year and the portfolio will last 30 years. The additional longevity from delaying the beginning of benefits until 70 is 19+ years. If he has $1 million in the 401(k) and started Social Security benefits at 62, he can spend $52,900 in real terms each year and the portfolio will last 30 years. The additional longevity from delaying the beginning of benefits until 70 is more than three years. Conceptually, at a lower level of wealth, Social Security represents a larger portion of his combined retirement resources, that is, 401(k) plus Social Security. Therefore, attaining the larger level of Social Security benefits by delaying its start has a larger effect on his portfolio's longevity.

For retirees who are concerned about longevity risk, delaying the beginning of benefits is a lot like buying home insurance. Someone buys home insurance to protect against an unbearable risk. If nothing happens to the house, he will have lost his annual premium, but that is better than the cost of not insuring the home and having it burn down. Buying home insurance is not considered a bad decision before the fact, even if nothing happens to the house after the fact.

By delaying the start of Social Security, he receives a higher monthly income for

Figure 1: Household Assets



This example assumes the asset(s) earn 5% per year with inflation at 3% per year. He begins retirement on his 62nd birthday at the beginning of 2009. This example comes from a model developed at Retiree, Inc. This example assumes each year's taxes are based on current tax brackets, standard deduction amounts, personal exemption amounts, and deduction amount for being 65 or over all adjusted each year with inflation. It uses the three IRS formulas to calculate the taxation portion of Social Security benefits. See www.retireeinc.com for more information.

the rest of his life, which protects him from the risk of having too little money in his lifetime. If he dies early, the present value of his benefits will be lower than if he started benefits at an earlier age, but that is considered better than the cost of starting benefits sooner and running out of money in his lifetime. "Buying" longevity insurance should not be considered a bad decision before the fact, even if he happens to die early. (Besides, the do-over option, which is discussed later, reduces the risk of starting benefits late and dying early.) From an investment perspective, since the Social Security benefits by starting age are approximately actuarially fair, there is a positive expected return from delaying the start of benefits for someone with average life expectancy. In this respect, buying longevity insurance by delaying the Social Security starting date is more attractive than buying longevity insurance through a payout annuity.[6]

In summary, assuming average life expectancy and that the earnings test will not apply, the present value of benefits is about the same no matter what age benefits begin. Therefore, in terms of maximizing the present value of benefits, singles with short life expectancies who will not lose benefits to the earnings test should begin benefits early, perhaps as soon as 62. Singles with long life expectancies can maximize the present value of benefits by deferring their start, perhaps until age 70. The second criterion—to minimize longevity risk—is accomplished by delaying the start of benefits until age 70. The optimal starting date for a given single individual depends upon his or her health and whether he or she will be affected by the earnings test. It also depends on how strongly he or she weighs the two criteria. Individuals who are primarily concerned about longevity risk may want to delay the start of benefits until age 70.

Sun and Webb (2009) is the only other study to consider singles who are concerned with both criteria: maximize the present value of projected benefits and minimize longevity risk. Based on assumptions including a specific utility function and a constant relative risk aversion level of five, they conclude that a single female with average life expectancy should begin benefits at age 70, while a single male with average life expectancy should have a slight preference to begin benefits at age 69 followed closely by age 70. The conclusions from their study and this study are similar. To understand one factor affecting the slight difference in conclusions, recognize that the adjustment for delaying benefits from age 69 to 70 is actuarially too small. To understand why, consider someone who delays the beginning of benefits from age 69 to 70. By delaying from 69 to 70, monthly benefits increase from $2,480 to $2,640 or by 6.5 percent. In percentage terms, this is a smaller increase than the increase from delaying from 62 to 63, or for any other one-year delay. Separately, by delaying the beginning of benefits from 69 to 70, the investment horizon in Table 2 decreases from 15 to 14 years or by 6.7 percent, which is the largest percentage reduction in investment horizon from delaying the start of benefits by one year. Therefore, depending on how strongly the retiree weighs maximize present value and minimize longevity risk criteria, the optimal starting date for the male could be age 69 or 70.

Do-Over Option. Life seldom offers a do-over option, but the Social Security Administration does with respect to choice of when to begin Social Security benefits. A single individual could begin benefits at age 62 (or as soon as he would not lose all benefits due to earnings test) and conservatively invest the proceeds in, say, bank CDs. Then, when he turns 70, he could repay the benefits, keep the interest, and start benefits anew at his age-70 benefits level.

To a degree, this do-over option allows a single to have the best of both worlds. He starts benefits at age 62 regardless of his health (as long as all benefits would not be lost as a result of the earnings test). If he dies before attaining age 70, it would have been the right decision to begin benefits at 62. At 70, he reassesses his health. If he has a short life expectancy then he refrains from repaying benefits. If his life expectancy is average or better, he can repay prior benefits and begin benefits anew, which will minimize his longevity risk.

There are tax consequences associated with this option. Each taxpayer must consider whether the benefits are worth these consequences. Suppose a single began Social Security benefits in July 2002 at age 62 and repaid all benefits in July 2010 at age 70. Repayments of benefits received in 2010 are treated as if never received. However, taxes may have been paid on benefits received in 2002 through 2009. If repayments for these years exceed $3,000, which they almost surely would, then they would be treated as either (1) miscellaneous itemized deductions not subject to the 2 percent floor or (2) a §1341 credit. Back-of-the-envelope calculations suggest that the §1341 credit would usually save the most in taxes.[7] This credit requires that 2002–2009 tax returns be recalculated as if he did not receive Social Security benefits in any of those years. He could claim a tax credit in 2010 on the difference between 2002–2009 taxes that were paid and those that would have been paid if he did not receive Social Security benefits. However, he would not have to file amended returns for those years.[8]

This leads to the final conclusion for single individuals assuming the Social Security Administration does not eliminate this do-over option and he considers the investment returns worth the tax consequences. He should start benefits as soon as all benefits would not be lost due to the earnings test. At 70, if he then has at least average life expectancy, he could repay prior benefits and start benefits anew. This do-over option removes the risk that, at age 62, he would plan to defer benefits until age 70, but then die before age 70, or attain 70 but in poor health.

When Should Couples Start Social Security Benefits?

This section discusses factors that should influence when each partner in a marriage begins receiving benefits. One factor is the applicability of the earnings test. Another is each partner's life expectancy. However, because of the rules governing spouse's and survivor's benefits, the joint life expectancy of the couple—that is, the time until both partners have died—is a critical factor. Since strategies for couples who are deciding when to begin benefits revolve around spouse's and survivor's benefits, we first discuss the rules relating to and the calculation of these benefits. Later, we present the associated strategies.

Spouse's Benefits. We discuss spouse's benefits from the wife's perspective, but the benefits are parallel for the husband. A spouse has dual entitlements to Social Security benefits. She is entitled to the larger of 100 percent of benefits at FRA based on her earnings record or up to 50 percent of her spouse's FRA benefits based on his earnings record. When someone applies for benefits before attaining FRA, the Social Security Administration calculates her benefits based on her own earnings record and the spouse's record, and it pays the larger amount. However, if she applies for benefits after attaining FRA, she can begin benefits based on the spouse's record and later switch to benefits based on her own record.

Consider the couple, Sally, age 63, and Jack, age 66. Both have an FRA of 66. Based on her record, Sally has a PIA of $1,500. Based on his record, Jack has a PIA of $2,000. Now consider Sally's Social Security benefit possibilities. Based on her record, she could begin benefits today at $1,200 a month; because she is 36 months short of reaching FRA, she receives 80 percent of $1,500, as explained in Table 1. Alternatively, Sally may receive spouse's benefits based on Jack's earnings record if this amount is larger than benefits based on her own record. The rules for spouse's benefits are more complex. If she had attained FRA, Sally would be entitled to 50 percent of his PIA or $1,000. Spouse's benefits are reduced by 25/36 percent for each of the first 36 months that benefits are begun before reaching FRA and by five-twelfths of a percent for each additional month. Because she is 36 months shy of FRA, she could receive spouse's benefits of 75 percent of $1,000 or $750 a month. In this example, Sally would choose to receive benefits based on her own earnings record because this amount, $1,200, is larger than her spouse's benefits, $750.

Let's change the example. Suppose her spousal benefits were higher. Because Jack has reached FRA, she can receive spousal benefits. If Jack has not begun benefits, he should file for benefits and immediately suspend them. Swedroe (2009) notes that this can be done in the remarks section of the application. Jack may continue to delay the start of his Social Security benefits. Because Jack has filed for benefits and has attained FRA, Sally is eligible for spousal benefits based on his earnings record. Once Sally attains FRA, she is eligible for spousal benefits whether or not Jack has filed for benefits.

Suppose Jack begins benefits based on his earnings record at age 69, three years after reaching FRA. His benefits would reflect the 24 percent delayed retirement credit, but Sally's spousal benefits would not.

Survivor's Benefits. We discuss survivor's benefits as if the husband dies, but benefits are parallel if the wife dies. If the husband dies, the following individuals could receive survivor's benefits based on his earnings record: widow, divorced widow, unmarried minor or disabled children, and dependent parents. This study focuses on benefits to widows and divorced widows.

The widow has dual entitlements under Social Security. She is entitled to benefits based on her earnings record or survivor's benefits based on her deceased husband's earnings record. She can receive full survivor's benefits when she attains FRA or reduced benefits as early as age 60. A disabled widow can begin benefits as early as age 50. The same rules apply for divorced widows who were married to the deceased husband at least 10 years and did not remarry before age 60. For more information, see "Survivors Benefits" at www.ssa.gov/pubs/10084.html and "What Every Woman Should Know" at www.socialsecurity.gov/pubs/10127.html.

The widow receives a percentage of the deceased husband's actual benefits level, where the actual benefits level would exceed his PIA if he delayed the beginning of benefits until after FRA. If she is FRA or older, she receives 100 percent of his retirement benefits. If she is younger than FRA, she receives between 71.5 percent and 100 percent of these benefits. Regardless of the age at which the widow reaches FRA, she receives 71.5 percent of her deceased husband's unreduced retirement benefit if she begins survivor's benefits at age 60 and 100 percent if she waits until FRA. Thus, if her FRA is 66, the 28.5 percent maximum reduction is spread over 72 months, [(66 – 60)×12], and the monthly reduction factor is 57/144 percent, [28.5 percent/72 months].

For example, assume Jerry and Jan are both 60 with FRAs of 66. Jerry dies when his PIA is $2,000 per month. If Jan begins survivor's benefits at age 60, she is entitled to $1,430 per month. If she waits until FRA to begin survivor's benefits, she will receive $2,000.

There are two key differences between survivor's benefits and spouse's benefits. First, survivor's benefits reflect delayed retirement credits, while spouse's benefits do not. Second, a widow can begin benefits based on her own earnings record and later switch to survivor's benefits, or begin survivor's benefits and later switch to benefits based on his or her own record. In contrast, before attaining FRA, such switching strategies are not allowed between spouse's benefits and benefits based on her own record.

Table 3 Example. This example explains why it usually pays for the lower earner of a couple with average life expectancies to begin payments early—usually at 62—and for the higher earner to delay payments—usually until 70. Consider Matt and

Table 3: Couple's Monthly Payoffs from Social Security

Strategy/ Column	Year	Strategy A	Strategy B	Column C	Column D	Column E
Ages Female and Male begin SS		Female 62, Male 62	Female 62, Male 66/70	Diff B – A	Wash	Gravy
62	1	$2850	$1350	–$1500	–$1500	
63	2	2850	1350	–1500	–1500	
64	3	2850	1350	–1500	–1500	
65	4	2850	1350	–1500	–1500	
66	5	2850	2250	–600	-1500	900
67	6	2850	2250	–600	–1500	900
68	7	2850	2250	–600	–1500	900
69	8	2850	2250	–600	–1500	900
70	9	2850	3990	1140	1140	
71	10	2850	3990	1140	1140	
72	11	2850	3990	1140	1140	
73	12	2850	3990	1140	1140	
74	13	2850	3990	1140	1140	
75	14	2850	3990	1140	1140	
76	15	2850	3990	1140	1140	
77	16	2850	3990	1140	1140	
78	17	1500	2640	1140	1140	
79	18	1500	2640	1140	1140	
80	19	1500	2640	1140	1140	
81	20	1500	2640	1140	1140	
82	21	1500	2640	1140	1140	
83	22	1500	2640	1140	1140	
84	23	1500	2640	1140		1140
85	24	1500	2640	1140		1140
86	25	1500	2640	1140		1140
87	26	1500	2640	1140		1140
88	27	1500	2640	1140		1140
89	28	1500	2640	1140		1140
PV at 62		$582,952	$668,839	$85,887	$3,267	$82,621

All payments are expressed as payments per month in today's dollars.
The discount rate is 0.2% per month or 2.43% per year. Because Social Security payments are indexed to inflation, the payments are constant in real terms. Therefore, the appropriate discount rate is the real yield in long-term inflation-linked Treasury bonds, which was about 2.43% in June 2009.

Frances, a 62-year-old couple, each with average life expectancy. Although Matt has a life expectancy of about 20 years and Frances has a life expectancy of about 23 years, their joint life expectancy is about 28 years.[9] That is, there is about a 50 percent chance that at least one member of the couple will be alive at age 90. Furthermore, individually, each partner has more than a 50 percent chance of living to 78, but there is about a 50 percent chance that at least one spouse will die by 78. Consequently, we will assume that one spouse (Matt) dies on his 78th birthday and the other spouse (Frances) lives until her 90th birthday. Matt's PIA is $2,000 and Frances's PIA is $1,800.

Table 3 presents this average couple's Social Security benefits based on two strategies. In Strategy A, they both begin benefits today, on their 62nd birthday. They receive a combined $2,850 a month in today's dollars, $1,500 or 75 percent of $2,000 for Matt, and $1,350 or 75 percent of $1,800 for Frances. This level of real payments continues until the first spouse dies, no matter who it is. Matt dies 16 years hence, on his 78th birthday. Beginning in Year 17, Frances receives survivor's benefits of $1,500 per month for the remainder of her life. She dies and payments cease on her 90th birthday, at the end of Year 28.

In Strategy B, Frances begins benefits at age 62 based on her earnings record, while Matt begins spousal benefits when he turns FRA of 66, and switches to benefits based on his earnings record when he turns 70. From ages 62 through 65, they receive $1,350 in real benefits from Frances's earnings record. At age 66, Matt files for spousal benefits, which are $900 a month, that is, half of Frances's PIA. Their combined benefit is $2,250 a month. When he turns 70, he switches to benefits based on his earnings record of $2,640 a month. Their combined benefit is $3,990 a month, which continues through Matt's death. After Matt's death, Frances receives a $2,640 monthly survivor's benefits (Matt's benefits level) and this payment continues until her death.

At age 66, Matt was eligible to receive monthly benefits of $2,000 based on his own record. But it will pay to take the reduced spousal benefits of $900 a month until he turns 70 so they can receive $2,640, which includes the delayed retirement credits, instead of $2,000 for the rest of their joint lives—20 years for this average couple.

Column C shows the payments from Strategy B less payments from Strategy A. Columns D and E separate this difference into components. Column D is the difference in payments from Matt delaying the start of benefits from age 62 to 70 and assuming he lives 23 years, until age 84. That is, Column D corresponds to the tradeoff for a single with average life expectancy who starts benefits at age 70 instead of 62. As discussed earlier, this tradeoff is approximately a wash, meaning the net present value of $1,500 a month cash outflow for 8 years followed by $1,140 a month inflow for 14 years is approximately zero.

We call Column E the gravy, because this is the approximate gain from following Strategy B instead of Strategy A for this average couple. Strategy B provides two extra payment streams. The first is the higher earner's (Matt's) spousal benefit that begins when he turns 66 and continues through age 69. Following Munnell, Golub-Sass, and Karamcheva (2009), we call this the "claim-now-and-more-later" advantage. The size of this advantage increases with the size of the lower-earner's PIA. The second stream is the $1,140 monthly payment from age 84 through death of the second spouse. The payment amount is the difference between the higher earner's benefits based on his earnings if begun at ages 70 compared to 62, that is, $2,640–$1,500. The length of this payment stream reflects the additional years between the joint life expectancy of this 62-year-old couple compared to a single's life expectancy. In this example, the additional payments last from age 84 through 89. We call this the joint-lives advantage.

Let's consider this joint-lives advantage. It will usually be especially large when the wife is much younger than the husband. If Frances was 52 when Matt was 62, the difference between their joint life expectancy and Matt's life expectancy would probably be especially long. By delaying the start of benefits on Matt's record until age 70, his much younger wife can expect to enjoy the larger survivor's benefits for many more years.

An extreme example will illustrate that it is the couple's joint life expectancy that should affect the higher earner's decision to delay the start of benefits to collect the delayed retirement credits. Suppose Matt is 69, has terminal cancer, and will die in one year. But Frances comes from long-lived ancestors and expects to live to 90. Without switching to Matt's benefits base on his earnings record at 69, this couple would lose monthly benefits of $1,580 for one year,[10] but get an extra $160 benefit per month for 20 years thereafter. Even in this extreme case, the couple would maximize the present value of benefits by delaying Matt switching to benefits based on his own record until his death or his 70th birthday.

It may not be clear why the lower earner, Frances, should usually begin benefits early. Suppose she delayed benefits based on her record until she turned 66. This strategy would cost the couple $1,350 a month for four years and it would increase their benefits by $450 a month at age 66, [$1,800 - $1,350], but only until the death of the first spouse. Because the death of the first spouse is usually sooner than either spouse's life expectancy, this is usually a poor tradeoff.[11]

Therefore, because of the claim-now-and-more-later and joint-lives advantages, the average couple maximizes the present value of benefits when the lower-earning spouse begins benefits as soon as possible and the higher earner begins spousal benefits at FRA and switches to benefits based on his own record at age 70.

Next, let's consider the objective of minimizing longevity risk. To minimize this risk, we need to maximize the surviving spouse's payment. This is done when the higher earner delays the beginning of benefits until age 70. In Table 3, the surviving spouse receives $2,640 a month with Strategy B, but only $1,500 a month with Strategy A.

In short, the maximization of present value criterion suggests that the lower earner in an average couple begin benefits as soon as possible and the higher earner begin spousal benefits at FRA and switche to benefits based on his of her record at age 70.

Let's compare this conclusion to the conclusions from two of the best of prior studies. Munnell and Soto (2005) reach a similar conclusion. They conclude that if the lower earner's PIA is at least 40 percent of the higher earner's, the present value of benefits is maximized when the lower earner begins benefits at 62 and the higher earner begins at 69. Moreover, they emphasize the same arguments for the lower earner beginning early and the higher earner beginning late. The only difference between conclusions is whether the higher earner should begin benefits at age 69 or 70. However, their study only considered the maximization of present value criterion. We believe that if they also considered the minimization of longevity

Table 4: Survivor Mike's Monthly Payoffs from Social Security

Strategy/ Column	Year	Strategy A	Strategy B	Column C Diff B – A	Column D Wash	Column E Gravy
66	1	$2000	$1800	–$200	–$2000	$1800
67	2	2000	1800	–200	–2000	1800
68	3	2000	1800	–200	–2000	1800
69	4	2000	1800	–200	–2000	1800
70	5	2000	2640	640	640	
71	6	2000	2640	640	640	
72	7	2000	2640	640	640	
73	8	2000	2640	640	640	
74	9	2000	2640	640	640	
75	10	2000	2640	640	640	
76	11	2000	2640	640	640	
77	12	2000	2640	640	640	
78	13	2000	2640	640	640	
79	14	2000	2640	640	640	
80	15	2000	2640	640	640	
81	16	2000	2640	640	640	
82	17	2000	2640	640	640	
83	18	2000	2640	640	640	
PV at 66		$351,211	$425,114	$73,903	-$8,566	$82,469

All payments are expressed as payments per month in today's dollars.
The discount rate is 0.2% per month or 2.43% per year. Because Social Security payments are indexed to inflation, the payments are constant in real terms. Therefore, the appropriate discount rate is the real yield in long-term inflation-linked Treasury bonds, which was about 2.43% in June 2009.

risk, they would have reached a conclusion similar to ours.

As we mentioned earlier, Sun and Webb (2009) consider couples who are concerned with both objectives: maximizing the present value of projected benefits and minimizing longevity risk. Based on assumptions including a specific utility function, a constant relative risk aversion level of five, and the lower earner having a PIA at 50 percent of the higher earner's PIA, they conclude that the higher earner should delay the start of benefits based on his record until age 70, while the lower earner should be virtually indifferent between starting benefits at any age from age 62 through 67. Their analysis disregarded the higher earner's opportunity to exercise the claim-now-and-more-later option. This option would further strengthen the higher earner's incentive to delay the start of benefits until age 70.

Table 4 Example. Recall that you may switch from survivor's benefits to your own benefits or vice versa. This example shows that it often pays to switch from survivor's benefits to your own benefits. Felicia and Mike were 66 when Felicia died. Neither had begun Social Security benefits. Mike has the choice today of claiming his PIA of $2,000 or her PIA of $1,800. It sounds like he should claim his $2,000 a month benefit, but Table 4 shows this is the wrong decision unless he has a short life expectancy. In Strategy A, he begins benefits based on his record and collects $2,000 a month. Based on an average life expectancy of 18 years, the present value of benefits is $351,211. In Strategy B, he begins survivor's benefits of $1,800 a month based on Felicia's earnings record and, when he turns 70, switching to his benefits of $2,640 a month. He forgoes $200 a month in benefits in today's dollars for four years, but receives an additional $640 a month for the rest of his life. The present value is $73,903 higher at $425,114. Column C shows the differences by year between these two strategies. Columns D and F separate these differences into two parts. Column D shows the tradeoff between starting benefits at ages 66 and 70 for a single with average life expectancy. In present value terms, this is approximately a wash. Column E shows the gravy, the additional benefits from claiming survivor's benefits from age 66 through 69 and then switching to benefits based on his record. Column E represents the approximate increase in present value from following Strategy B.

Table 5 Example. The key to the prior example is that benefits based on your own record continue to increase if you are taking the survivor's benefits. If that benefit based on your record at age 70 will be higher than your survivor's benefit, it often pays to take the survivor's benefits and then switch to benefits based on your own

Table 5: Hugh and Mary's Payoffs from Social Security

Her Age	Year	Strategy A	Strategy B	Strategy C	Difference B – A	Difference C – B
Today			–$24,000	–$24,000		
66	1	$3200	$3000	1600	-$200	-1400
67	2	3200	3000	1600	-200	-1400
68	3	3200	3000	1600	-200	-1400
69	4	3200	3000	3640	-200	640
70	5	3200	3584	4224	384	640
71	6	3200	3584	4224	384	640
72	7	3200	3584	4224	384	640
73	8	3200	3584	4224	384	640
74	9	3200	3584	4224	384	640
75	10	3200	3584	4224	384	640
76	11	3200	3584	4224	384	640
77	12	2000	2000	2640	0	640
78	13	2000	2000	2640	0	640
79	14	2000	2000	2640	0	640
80	15	2000	2000	2640	0	640
81	16	2000	2000	2640	0	640
82	17	2000	2000	2640	0	640
83	18	2000	2000	2640	0	640
84	19	2000	2000	2640	0	640
85	20	2000	2000	2640	0	640
86	21	2000	2000	2640	0	640
87	22	2000	2000	2640	0	640
88	23	2000	2000	2640	0	640
89	24	2000	2000	2640	0	640
PV at 66		$550,098	$570,160	$607,329	$20,062	$37,169

All payments are expressed as payments per month in today's dollars.
The discount rate is 0.2% per month or 2.43% per year. Because Social Security payments are indexed to inflation, the payments are constant in real terms. Therefore, the appropriate discount rate is the real yield in long-term inflation-linked Treasury bonds, which was about 2.43% in June 2009.

record at 70. This same idea applies to taking spousal benefits early and then switching to your own benefits at age 70 with one exception. You may only begin spousal benefits and later switch to your benefits if you have attained FRA.

Consider Hugh, age 67, who began benefits at $2,000 a month when he reached FRA of 66. Mary, his wife, just reached her FRA of 66 and has a PIA of $1,200. They have probably missed their optimal strategy, which would have been for Mary to begin benefits at age 62 and for Hugh to start spousal benefits when he reaches FRA and then switch to benefits based on his earnings record at age 70 as discussed in a similar example in Table 3. However, now that Hugh has begun payments, they should take the best of remaining strategies. Table 5 presents a few of those strategies.

In Strategy A, Mary begins benefits today based on her earnings record, so they receive $3,200 a month in benefits based on today's dollars. This benefits level continues until the first dies, which is assumed to be when Hugh turns 78 and Mary turns 77. Mary receives $2,000 a month in survivor's benefits thereafter until her death at 90.

In Strategy B, Mary begins spousal benefits at $1,000 a month (half of Hugh's PIA) until she turns 70, at which time she switches to benefits based on her earnings record of $1,584, [$1,200(1.32)]. The Difference B-A column shows the differences in payments between Strategies B and A. In Strategy B, Mary forgoes $200 a month for four years but increases her payments by $384 thereafter until the death of the first to die, [$384 = $1,584 - $1,200, where $1,584 = (1.32)$1,200]. This has a positive present value.

Do-Over Option. Now, let's consider their do-over option. As we shall see, in this example this option provides the best strategy (assuming the present value advantage exceeds the costs of the tax con-

sequences). Continuing with the prior example, Hugh could repay prior benefits, begin spousal benefits today, and switch to benefits based on his earnings record at age 70, while Mary could begin spousal benefits today and switch to benefits based on her own earnings record when she turns 70. The Strategy C column presents the cash flows associated with this strategy. First, Hugh would have to repay his approximately $24,000 in prior benefits today. Hugh and Mary would each begin spousal benefits today at $600 and $1,000, respectively. When Hugh turns 70 and Mary turns 69, Hugh switches to benefits based on his earnings record of $2,640 [$2,000(1.32)], for combined benefits of $3,640. When Mary turns 70, she begins benefits based on her record of $1,584 for combined benefits of $4,224. After Hugh's death, Mary receives spousal benefits of $2,640 a month for the rest of her life. Assuming Hugh dies when he turns 78 and Mary lives until 90, the present value of this do-over strategy exceeds the present values of strategies A and B. Furthermore, the do-over option maximizes the level of benefits for the surviving spouse, so it should be especially attractive to this couple if they are concerned about longevity risk.

However, the option to do-over does not mean that someone should always count on this strategy. For example, consider Bill and Betty, a married couple. Bill was born in 1943, and began benefits when he reached his FRA in 2009. He plans to invest his Social Security payments until he turns 70 and then repay prior benefits, keep the interest, and start benefits anew. This will entitle he and Betty to the 32 percent larger monthly payment until the death of the last to die. But suppose Bill dies suddenly before his 70th birthday. Then this strategy would have gone awry. Betty would not be able to repay his prior payments and receive the larger payment for the rest of her life. This demonstrates a risk of the higher-earning partner starting benefits earlier with the plan to invest the Social Security benefits, keep the interest, and repay them at a later date. To repeat, there are also tax consequences associated with the do-over option.

Summary

This study examines factors that should affect individuals' decisions about when to begin Social Security benefits. There are two objective criteria for selecting the starting date for singles or starting dates for couples. First, which starting date or dates maximizes the present value of benefits through life expectancy(ies)? Second, which starting date or dates will minimize longevity risk—the risk of outliving your resources?

For single taxpayers with average life expectancies who will not be subject to the earnings test, the present value of benefits is approximately the same no matter when benefits begin. Therefore, based on the present value criterion, singles with short life expectancies should begin benefits early, possibly as early as 62, while singles with long life expectancies should begin benefits late, possibly as late as 70. The second criterion, to minimize longevity risk, encourages singles to maximize delayed retirement credits by beginning benefits at age 70.

The decisions for couples revolve around spousal and survivor's benefits. For a couple with average life expectancy, the present value is usually maximized when the lower-earning spouse begins benefits as soon as possible (as long as those benefits would not be lost because of the earnings test), while the higher-earning spouse delays benefits until age 70. Longevity risk is minimized when the higher-earning spouse delays benefits until age 70. Separately, there are often times when it pays for someone to begin spousal or survivor's benefits and then switch to benefits based on his or her own earnings record at age 70. If the higher earner delays the start of benefits based on his earnings record until age 70, it results in the highest level of benefits at this age and beyond, a higher level that will continue until the death of the second to die.

Finally, this paper discusses the do-over option, whereby someone can repay prior benefits and start anew. Therefore, someone who began benefits at an earlier age but now wishes he or she had not done so can redo the decision. However, this individual should consider the tax consequences of the repayments. If the benefits of the do-over option exceed its tax consequences then a single individual should start benefits as soon as all benefits would not be lost through the earnings test and invest the benefits. At 70, if she then has at least average life expectancy, she could repay prior benefits and start benefits anew. This do-over option reduces the risk that, at age 62, she would plan to defer benefits until age 70, but then die before attaining age 70 or attain 70 but in poor health. This study also considered this do-over option for a couple.

Endnotes

1. The annual *Your Social Security Statement*, which individuals receive several weeks before their birthday, provides an estimate of their PIA. For details of the calculation of PIA, see Jennings and Reichenstein (2002).
2. See Society of Actuaries, www.soa.org/research. See Tables 4–5 and 4–6, the male and female RP-2000 Rates for "Combined Healthy."
3. In this study, we calculate the present value of benefits through life expectancy, but the same conclusion prevails if you calculate the present value of expected cash flows. For the 62-year-old, the present value of benefits through life expectancy is the present value of $1,500 per month until age 84. The second present value calculates the present value of expected cash flows each year, where each year's expectation is the product of probability of being alive that year and cash flow if alive. Jennings and Reichenstein (2001) may

have been the first study to distinguish between the two present values. We use the present value of benefits through life expectancy in this study because it is more intuitive and more easily demonstrates the key concepts. In addition, it better accomodates shorter- or longer-than-average life expectancies.

4. There are break-even calculators to help individuals select a Social Security starting date. The government sets penalties for starting benefits early and credits for delaying benefits such that the break-even period, assuming a 3 percent real rate, is approximately equal if the individual lives to an average life expectancy. That is, break-even analysis is essentially the same as maximizing the present value of expected benefits. Both ignore the goal of minimizing longevity risk. The penalties for starting benefits early and credits for delaying benefits are also approximately actuarially fair at the 2.43 percent annual real rate (0.2 percent per month) used in this study.
5. The 30-year horizon is adopted from the withdrawal rate studies literature. These studies frequently ask how much real annual spending a portfolio can provide if it must last 30 years. Although the 30-year horizon is longer than the average individual's life expectancy, it is used to provide reasonable assurance that the portfolio will last his or her lifetime.
6. There are three factors favoring "buying" longevity insurance by delaying the start of Social Security benefits instead of through the purchase of a payout annuity. First, Social Security Administration sets penalties for starting benefits early and credits for delaying benefits approximately actuarially fair for someone with average life expectancy. In contrast, insurance firms assume the average buyer of a payout annuity has a longer-than-average life expectancy. Second, Milevsky and Young (2007) note that all insurance firms set payments on payout annuities to reflect aggregate mortality risk, that is, the risk that the population as a whole will live longer than expected. Third, the insurance firm's credit risk is larger than that of the U.S. government's. These factors favor buying longevity insurance by delaying the start of Social Security payments instead of through the purchase of a payout annuity. On the other hand, the government could change Social Security benefits, meaning the promises of the current system are not contractual guarantees. In contrast, annuity payments promised by insurance firms are contractual guarantees.
7. If he pays back $15,000 per year for 7.5 years, the repayment would be about $112,500. This large itemized deduction would likely reduce his 2010 taxable income to unusually low levels, perhaps to zero. This suggests that the tax savings from the itemized deductions at this low tax bracket would be smaller than the taxes paid on Social Security benefits received in 2002 through 2009. Thus, the tax credit will often save more in taxes.
8. We thank Brenda Schafer of H&R Block for providing this information.
9. Probabilities are based on actuarial tables mentioned in the second footnote.
10. If Matt switched to benefits based on his earnings record at 69, they would get $3,830—his $2,480 and her $1,350. By waiting to switch, they will get $2,250, as shown in Table 3, a $1,580 difference.
11. If a couple was confident that both partners would live to at least their life expectancies, the lower earner might wish to delay benefits beyond age 62.

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