

Optimizing the initiation of Social Security benefits

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Abstract

This research examines the decision couples and individuals face when determining the age at which to begin receiving their Social Security benefits. By comparing a personal required rate of return to the internal rate of return between various retirement ages and various life expectancies, a couple or an individual can better decide when to initiate receipt of Social Security benefits. Early initiation of benefits is the correct course of action for individuals with lower life expectancies. However, delayed initiation of benefits may often be the correct course of action for a single person with a long life expectancy or for a married male who is the higher income-earning spouse. © 2006 Academy of Financial Services. All rights reserved.

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1. Introduction

As the “baby boomer” generation nears retirement age, each boomer must decide when is the right time to start drawing Social Security benefits. This study examines how mortality considerations and other factors influence the determination of the optimum financial time to initiate drawing these benefits. Obviously many things can influence retirement and the decision to start drawing benefits, such as personal health, work environment, and various family issues. However, these issues are case-by-case considerations separate from the general rule of how to maximize the financial value of Social Security benefits.

This research focuses only on the retirement cash flows associated with the old age and survivors’ insurance program within Social Security. Social Security provides for a host of other benefits such as disability insurance, death benefits, non-spousal survivor benefits, and

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Table 1 Year of birth vs. full retirement age

Year of birth	Full retirement age
1937 (or earlier)	65
1938	65 + 2 months
1939	65 + 4 months
1940	65 + 6 months
1941	65 + 8 months
1942	65 + 10 months
1943–1954	66
1955	66 + 2 months
1956	66 + 4 months
1957	66 + 6 months
1958	66 + 8 months
1959	66 + 10 months
1960 (or later)	67

others. The other benefits increase the attractiveness of the Social Security program to workers, but incorporating these other benefits is outside the scope of this research.

Current law provides for “full retirement age” somewhere from age 65 to 67, depending on one’s date of birth. For many baby boomers full retirement age is around 66 years of age (see Table 1). Full retirement age benefits are primarily a function of payments into the program while working during the years before initiating the receipt of benefits. By starting to receive Social Security benefits at an age other than the full retirement age, individuals will permanently increase or decrease the monthly benefits they are entitled to receive.

Table 2 reports examples of the level of reduced and augmented Social Security benefits relative to the year of birth and age at date of initiation of benefits. For example, an individual who was born in the 1943 through 1954 period and who starts drawing Social Security benefits at age 62, would receive 75% of his or her full retirement benefits (i.e., that person would receive a 25% permanent reduction in the level of his or her benefits). However, by waiting until age 70 this individual would receive 132% of full retirement age benefits. There is no increase in the level of benefits past the age of 70.

Table 2 Age at initiation of benefits vs. benefit level (benefits in percentage)

Actual initiation age	If date of birth is 1937	If date of birth is 1943–54	If date of birth is 1960
62	80	75	70
63	86.7	80	75
64	93.3	86.7	80
65	100	93.3	86.7
66	106.5	100	93.3
67	113	108	100
68	119.5	116	108
69	126	124	116
70	132.5	132	124

2. Literature review

Because of issues encompassing the financial viability of the Social Security trust fund, much uncertainty surrounds the issue of Social Security benefits. However, it is generally advised in the literature (Reichenstein, 1998; Tacchino & Saltzman, 2001) that individuals should make their financial plans on the assumption that Social Security will be present and solvent when they retire.

Most studies that have been done on when to initiate the receipt of benefits use a form of time value of money analysis. In one of the earlier studies Detweiler (1999) treats cash flows one creates by taking Social Security at age 62 (to age 65) as negative cash flows; cash flows from starting Social Security at age 65 and later are treated as positive cash flows. He then uses selected discount rates and calculates the time of death where the net present value of the total cash flows goes to zero. He refers to this age as a “breakeven.” If a person dies at this age, the present value of the Social Security income stream is the same if that person retires at 62 or at 65. He estimates the probability of dying at or before this age and then plots these probabilities against the discount rates used for individuals of selected ages.

Rattiner (1993) offers a good overall explanation of the various benefits and provisions associated with Social Security, and includes a brief discussion of the arguments surrounding early versus late retirement. He asserts that the early start of benefits is appropriate for persons with short life expectancies or high personal required rates of return.

Rose and Larimore (2001) focus on early retirement for an individual, using a present value analysis. They conclude that early retirement at age 62 is always the best choice for men, but is not the best choice for those women who are pre-baby boomers and thus have a full retirement age benefit starting at age 65) or who expect to have longer life expectancies. However, because of the delayed full retirement date, female baby boomers and those who follow the boomers will be better off with starting benefits at age 62.

Other research studies addressing the initiation of the receipt of Social Security benefits use a present value methodology with an assumed discount rate. Perhaps inspired by Reichenstein (1998) who argues that Social Security benefits should be viewed as a “bond,” Fraser, Jennings and King (2000) suggest that Social Security is the same as a generic inflation-indexed fixed income security. Thus they use a “market-based” discount rate of 3.95% that is associated with the return on Treasury Inflation Protection Securities (TIPS) taken from the financial markets at the time their study is conducted.

Cook, Jennings and Reichenstein (2002) advance investigation into the optimal age at which to begin receipt of Social Security benefits by looking at females as a separate class from males and incorporating the impact that longer female life expectancies have on maximizing the present value of those benefits. They assume a three-percentage discount rate. Once these authors calculate the age at which the individual receives the maximum present value of expected retirement benefits, the percentage of this maximum that one would receive at other retirement ages is presented. They argue that it really makes no difference as to whether one takes early or delayed benefits, as the benefit schedules are set up actuarially to balance out.

Muksian (2004) explores the early retirement issue, but does so through a carefully crafted discussion of the highly intricate method used by Social Security to calculate one’s benefit

amount. He shows how continuing to work beyond age 62 almost certainly increases the full retirement benefit for each year of continued employment.

Muksian is very critical of the analysis of Rose and Larimore (2001), and argues that they understate the benefits to be received by delaying the start of benefits. He maintains that in the absence of any subjective reasons to take early retirement benefits, an individual is financially better off taking benefits at age 66. This is true (1) because incomes during the period of time between ages 62 and 66 tend to be large and can contribute to an increase in Social Security benefits and (2) because the level of benefits (see Table 2) increases.

Updegrave (2004) presents an interesting perspective, asserting that taking Social Security benefits early at age 62 should allow one to pull less from their retirement savings. This allows those savings to continue to grow. He contends that this growth actually compensates for the early receipt of reduced Social Security benefits and makes the early receipt of these benefits more attractive “unless you come from a long line of centarians.” Ultimately, he argues, the issue on when to begin receipt of Social Security benefits depends on one’s estimate of personal life expectancy.

Spitzer (2006) also uses the future value approach that Updegrave followed, but introduces variable rates of return utilizing a bootstrap methodology. Focusing on the baby boomer generation born in 1943 through 1954, he concludes that the delay of benefits “is not generally advisable.” This finding is particularly true for males.

3. Issues in the analysis

The decision as to when to start drawing benefits seems to be as straightforward as deciding which alternative provides the greatest present value of lifetime benefits. However, there are at least five factors that influence this decision. They are:

1. the appropriate discount rate to be used for a present value analysis;
2. the personal life expectancy for the individual;
3. the earned income offset that can reduce some (or all) of one’s Social Security benefits if one continues to work while drawing benefits before full retirement age;
4. the income taxation of benefits because of the presence of other income; and
5. the issue of spousal survivorship.

The first two factors relate to the parameters used in the formula to compute the present value of the Social Security payments. The last three of these are not directly related to the present value calculation, but rather they are other factors that influence the overall benefit a person would receive from the Social Security Administration. We do acknowledge that any of these variables can assume a position of predominance in individual cases.

3.1. Discount rate

A number of issues surround the choice of the discount rate. First, there can be legitimate debate between researchers as to the appropriate variable or index to use as a discount rate, as is evidenced by Fraser et al. (2000) using the 3.95% TIPS rate, Rose and Larimore (2001)

using four percentage, and Cook et al. (2002) using a three percentage rate. In fact there may not be a single answer to this issue, as it is possible that different individuals could have different required rates of return. By determining the internal rate of return between the various ages at which benefits may be started and taking life expectancies into account, an individual can compare her own personal discount rate to the internal rate of return measurements of the various alternatives and make the decision that is correct for that individual. Second, even when using a common variable like the TIPS rate, the discount rate is likely to change over time as other economic variables (such as the inflation rate) change. The TIPS rate today is not what it was two years ago or even one year ago. Therefore, the decision as to the optimal time to initiate Social Security benefits made when the (TIPS) rate is low can be very different from the decision made when the same rate is high.

It is important to note that choosing a different discount rate may change the results of one's analysis. For example assume a person born in 1943 through 1954 period was thinking about retiring, and anticipates living to the median life expectancy of age 81. Retiring early at age 62 he would receive a benefit equal to 75% of his full retirement age benefit, which we assume (for this example) is \$750 per month. However, retiring at age 66 he would receive his full retirement age benefit, and we assume this amount is \$1,000 per month. For this simple example we will assume a one-percentage discount rate. The present value approach would compare the present value of \$750 per month payments for the 19 years of life expectancy at age 62, to the present value of \$1,000 per month payments for the 15 years of remaining life expectancy at age 66 (based on expectancy at age 62 when the decision is made). Discounting both cash flows back to age 62, the present value of the \$750 monthly payments started at age 62, is \$155,678. The present value (at age 62) of the \$1,000 monthly payments is \$160,536. Based only on this elementary analysis, the individual should choose to retire at age 66. However, if the discount rate had been the 3.95% used by Fraser et al. (2000), this analysis would have indicated that the individual should retire at age 62.

3.2. Life expectancy

Some studies use a median life expectancy for analyzing planning decisions. The problem with median life expectancy is that half of the population will live beyond that point (Milevsky, Kwok & Robinson, 1997). Not knowing for certain how long our individual lives will be may likely influence many people to plan for living longer than the median to reduce the possible burden on their family members for providing for their welfare.

Table 3 presents various life expectancies for white males and females as reported in "United States Life Tables, 2002" from the U.S. Department of Health and Human Services. For comparison purposes Bell, Wade and Gross (1992) provided similar data from a decade earlier. For example, a female who is 62 years old has a 90% probability of living (or a 10% probability of not living) eight more years, an 80% probability of living 13 years, a 50% probability of living 22 years, a 20% probability of living 30 years and a 10% probability of living 34 years.

Although the "United States Life Tables" provide data on median life expectancy, it is crucial to consider also an individual's family history and lifestyle. A family history with a high incidence of cancer, high blood pressure, high levels of cholesterol, or other adverse

Table 3 Age vs. life expectancies for white males and females (in years—rounded to nearest year)

Sex	Age	Lowest 10%	Lowest 20%	Median	Highest 20%	Highest 10%
Men	62	6	10	19	27	31
Men	63	6	10	18	26	30
Men	64	5	9	17	25	29
Men	65	5	9	17	24	28
Men	66	4	8	16	24	27
Men	67	4	8	15	23	26
Men	68	4	7	15	22	25
Men	69	4	7	14	21	24
Men	70	3	6	13	20	23
Women	62	8	13	22	30	34
Women	63	8	13	21	29	33
Women	64	7	12	20	28	32
Women	65	7	11	20	27	31
Women	66	6	11	19	27	30
Women	67	6	10	18	26	29
Women	68	6	9	17	25	28
Women	69	5	9	16	24	27
Women	70	5	8	16	23	26

medical condition would exert a strong negative influence on the numbers from the tables for median life expectancy. Additionally, life styles that include tobacco use, high levels of alcohol consumption, poor diets, and little or no exercise would exert their own strong negative influence.

Since life expectancy is such a key variable that influences the decision as to when to initiate Social Security benefits, a comprehensive physical and health assessment should be considered of paramount importance when one approaches age 62. A less precise estimate of life expectancy is available on line. The Boston University School of Medicine provides a Website that allows individuals to obtain an estimate of their life expectancy by using the Living to 100 Life Expectancy Calculator (Perls, 2005).

3.3. The offset

It is possible to continue working while drawing Social Security benefits, and some persons do not really 'retire' when they start drawing benefits. For individuals who continue to work and who are drawing benefits before the full retirement age, the level of earned income may reduce the amount of Social Security benefits the retiree receives.

In the years before an individual reaches the full retirement age, one dollar in benefits will be deducted for each two dollars the individual earns above a base amount. For 2006 this base amount is set at \$12,480. For an individual below full retirement age who would otherwise be receiving Social Security benefits, those benefits would decrease to zero once that individual's earned income reaches an income level of \$37,440.

The level of benefits becomes fixed once they are initiated (except for a possible annual increase to compensate for inflation). Therefore, an individual who continues working after initiating receipt of Social Security benefits, but before full retirement age disadvantages

himself or herself in two ways; the level of benefits become fixed and the individual's earnings may result in some of those benefits having to be paid back because of the earned income offset. A person who expects to continue working past age 62 should consider delaying the initiation of Social Security benefits.

3.4. Income taxation

Income taxation of Social Security benefits may also be an issue in certain cases. Provisional income is defined as half the Social Security benefits plus all non-Social Security income. For a married couple filing jointly, 50% of Social Security benefits become taxable once their provisional income reaches \$32,000 annually. The percentage of benefits taxed rises as provisional income rises, with 85% of Social Security benefits becoming taxable once provisional income equals or exceeds \$44,000 annually. It should be noted that this taxation of benefits is income based, and is independent of current age or the age at which the drawing of benefits is initiated.

3.5. Surviving spouse

A surviving spouse has the right to draw the benefits equal to that of the deceased spouse or the benefits that belong to the survivor (assuming no governmental pension offset provisions apply). In the case where there is an expectation that the spouse with the higher benefits will die first, this can be an overriding consideration as to when to initiate receipt of Social Security benefits.

Assume a man with higher benefits than his spouse, and he is older than the spouse. Given his older age and shorter life expectancy as a male, his younger spouse could survive him for many years. His choice of when to start receiving benefits will determine the survivor benefits she will have as an annuity for the rest of her life. To maximize her survivor benefits, he may have to wait until 70 to start drawing Social Security.

We will also initially ignore the survivorship issue, but will include it in a second example.

4. Methodology

An internal rate of return analysis is used to ascertain the interest rate that sets the present values of the retirement alternatives described above to be equal. Use of the internal rate of return gives us a broader rule than specifying a single discount rate. Once the internal rate of return is calculated, it can be compared to a personal discount rate (i.e., personal required rate of return) for current conditions. By comparing that internal rate of return (which is a function of life expectancy and benefit level) to a personal discount rate, an individual can make a more informed decision as to the age at which it is most appropriate to start drawing Social Security benefits.

Previous studies select discount rates that individual researchers believe serve all persons, while this current research uses the internal rate of return. This rate is analogous to a growth rate or rate of return the retiree obtains by delaying retirement. If the internal rate of return

between two or more alternatives is relatively low, then there is less of an advantage to delaying retirement. If the internal rate of return between two or more alternatives is relatively high, then there may be more of an advantage to delaying retirement.

To focus on the issue of how life expectancies and benefit levels impact the decision as to when to start drawing benefits, we will assume that the individual (and later the family) has no (or very low) income in addition to Social Security benefits. This eliminates the confounding variables of an earned income offset and taxation on Social Security benefits for this study, and is consistent with the approach of Spitzer (2006) and others. However, it should be noted that if a person starts to draw benefits and continues to work before the month of their full retirement age, the combination of the earned income offset and the taxation of benefits would almost certainly make the early drawing of benefits even less attractive than is reported in this paper.

As observed by Muksian (2004) it is difficult at age 62 to predict exactly what one's full retirement benefit amount will be at ages 66 or 70. Planners can only offer approximations because of the fact that individuals who work past age 62 are probably raising their average working salary each year and marginally boosting their Social Security benefits. Because benefits are based in part on a moving average of earned income for the preceding 35 years, the full benefit amount calculated at age 62 based on past earnings, is almost certainly lower than the full benefit amount calculated at 66 (or later) based on a somewhat different 35 year period. This would provide a small additional financial reason for delaying the initiation of the receipt of Social Security benefits. For a given individual it is virtually impossible for us to forecast the rate at which that person's benefits will be rising. For that reason in this study we make the conservative assumption that the growth rate from age 62 to age 66 in the full retirement age benefit is zero. The full retirement benefit calculated at age 66 and the retirement benefits calculated at ages 62 and 70 (then to be multiplied by 75% and 132%, respectively) are based on the same income stream (i.e., it is assumed that income earned after age 62 does not influence the level of Social Security benefits at ages 66 or 70). Given that most persons see rising income as they progress in their working years, this conservative assumption marginally favors early retirement in this analysis.

5. Empirical analysis

Assume a male born in 1943 that has no dependents, and at age 62 is considering at what date to start drawing Social Security benefits. Given a median life expectancy of 19 years to age 81, he faces a decision (1) to start drawing benefits at age 62 and receive a reduced benefit of 75% of his full retirement age benefit for a period of 19 years (i.e., 228 monthly payments); (2) to delay to age 66 and receive his full retirement age benefit for a period of 15 years (i.e., 180 monthly payments); or (3) to delay the drawing of benefits until age 70 and receive a benefit of 132% of the full retirement age benefit for a period of 11 years (i.e., 132 monthly payments). All calculations must be based on life expectancy at age 62, since that is the point at which the decision is being made.

Comparing age 62 to age 66¹, the internal rate of return can be solved for by use of the following equation.

Table 4 Internal rates of return of alternative ages for initiating benefits (in percentage)

Age	Lowest 10%	Lowest 20%	Median expectancy	Highest 20%	Highest 10%
Men					
62 vs. 66	0.0	0.0	2.4	5.9	5.9
62 vs. 70	0.0	0.0	0.5	4.6	5.4
66 vs. 70	0.0	0.0	0.0	3.8	4.9
Women					
62 vs. 66	0.0	0.0	3.9	5.8	6.2
62 vs. 70	0.0	0.0	2.6	5.2	5.8
66 vs. 70	0.0	0.0	1.3	4.7	5.4

$$.75 \sum (1/(1 + irr/12))^i = (1/(1 + irr/12))^{48} * \sigma (1/(1 + irr/12))^j$$

$$i = 1 \text{ to } 228 \text{ and } j = 1 \text{ to } 180$$

In the example immediately above, the left-hand side of the calculation represents the present value of initiating receipt of benefits at age 62. The first term on the right-hand side of the calculation discounts the present value of benefits for the 66-year-old male back to age 62 so that comparisons can be done at the same point in time (namely, age 62). The second term on the right-hand side of the calculation represents the present value of the benefits (at age 66) to a male with a median life expectancy who retires at age 66, and is expected to live 15 more years until age 81. The internal rate of return is that interest rate that makes the present value of the left-hand side of the equation equal the present value of the right-hand side.

The equation above was solved via iteration using a spreadsheet and the median life expectancies from Table 3. Initially, an internal rate of return of one percentage was tried on each side of the equation above. The magnitude of the left-hand side was then compared to the magnitude of the right-hand side to determine if they were equal. Then integer rates of two to seven percentage were tried. The values for the right-hand side of the equation above would decrease at a greater rate than the values of the left-hand side. Once the integer interest rate was found that brought the values of the two sides of the above equation close to one another, the integer interest rates were broken down into tenths and the process was continued to determine the precise interest rate that would make the values of each side of the above equation equal.

Table 4 presents the internal rates of return obtained by using the equations given above and in the Notes, and brings to light some interesting facts. First, notice that for both males and females in the lowest 10% and 20% of life expectancies there is no financial incentive to delaying the initiation of receipt of Social Security benefits past age 62. The internal rate of return is zero, indicating no value in waiting. Second, for males and females with median or above median life expectancies, notice that the highest rates of return are always associated with delaying retirement from age 62 to age 66. Lower rates of return are associated with delaying retirement to age 70, whether from age 62 or from age 66.

A single male born in 1943 and with a median life expectancy of 19 years, the example referenced above, would decide to retire at age 70 if his personal required rate of return was less than 0.5%, retire at age 66 if his personal required rate of return was equal to or greater

than 0.5% but no greater than 2.4% and retire at age 62 if his personal required rate of return was greater than 2.4%. Note the low rates of return associated with postponing retirement to age 66 or age 70 for a male with a median or lower life expectancy. Note also the much higher rates of return for males and females with long life expectancies.

A married couple presents a more complicated case than the relatively straightforward example of the single person just given above. Assume Bob is a 53-year-old White male and Betty, his spouse, is a 46-year-old White female. Using the “United States Life Tables, 2002” from the U.S. Department of Health and Human Services the median male life expectancy for Bob is 26.8 years. Therefore, he is expected to live to age 78.8 years of age. Betty’s life expectancy is 36.9 years, and she is expected to live to 81.9 years of age. Using these estimates means that when Bob dies at age 78.8, Betty will be only 71.8 years old and will be expected to live another 10.1 years. We will assume that they both earned credits in the Social Security system. However, because of different work history and lower wages, the dollar value of Betty’s full benefit is equal to only 60% of what Bob will be entitled to receive.

The task is to compute the internal rate of return between the various benefit alternatives that Bob and Betty face. His full retirement age is 66 since he was born in 1953, and her full retirement age is 67 because she was born in 1960. Because Betty is expected to outlive Bob, she will begin to receive his monthly Social Security benefit at his death because his monthly benefit is larger than hers is. In addition, his decision as to when to initiate receiving his Social Security benefits will influence the amount of the Social Security benefits she receives following his death. To limit the number of alternatives, we will consider Bob retiring at 62, his full retirement age of 66, or age 70. We assume Betty can retire at age 62, 67, or 70.

Bob can receive benefits equal to 75% of the full retirement age benefit amount at age 62, 100% of the full retirement age benefit amount at age 66, or 132% of the full retirement age benefit amount if he waits until age 70 to initiate receipt of his Social Security benefits. Betty will be eligible at ages 62, 67 and 70, for 70%, 100%, and 124% of her full retirement age benefit, respectively.

Although the number of permutations and combinations of options as to when to initiate receipt of benefits increases dramatically from that of the single individual examined above, they are still finite in number. Because there are three different ages at which both Bob and Betty can retire, there are $3 \times 3 = 9$ distinct outcomes. The goal is to make pair-wise comparisons of these nine outcomes: there are ${}_9C_2 = 36$ such pair-wise comparisons. The matrix in Table 5 presents the 36 comparisons facing Bob and Betty.

Discussing individually how each of the 36 comparisons in Table 5 is developed would be a needlessly lengthy exercise for the reader. Discussion of the construction of one comparison (e.g., A vs. D) should demonstrate to the reader how to replicate the entire procedure for decision-making. For example, changing the assumption as to the couple’s current ages or relationship between their ages or by changing the fraction of one spouse’s full retirement benefits that the other spouse is expected to receive at retirement can change the outcome of the analysis. However, the process is mathematical and should be easy to replicate under a vast array of individual circumstances.

Alternative A is the situation in which both Bob and Betty decide to begin initiation of Social Security benefits at age 62. For him this decision will mean he will receive monthly

Table 5 Husband/wife age combinations for initiating Social Security benefits

Bob/Betty		Bob/Betty		Bob/Betty		Bob/Betty	
62/62 = A		62/67 = B		62/70 = C			
66/62 = D		66/67 = E		66/70 = F			
70/62 = G		70/67 = H		70/70 = I			
Alternatives							
AB	AC	AD	AE	AF	AG	AH	AI
	BC	BD	BE	BF	BG	BH	BI
		CD	CE	CF	CG	CH	CI
			DE	DF	DG	DH	DI
				EF	EG	EH	EI
					FG	FH	FI
						GH	GI
							HI

Internal rate of return between alternatives A, D, and G.

$G < 3.8\%$; $3.8\% \leq D \leq 5.2\%$; $5.2\% < A$.

Social Security benefits that are equal to 75% of his full retirement amount. Her decision will mean that she will receive monthly Social Security benefits that are equal to 70% of her full retirement amount (which we have previously assumed was 60% of her spouse’s full retirement amount). Therefore, Betty will receive a monthly benefit equal to 42% of Bob’s full retirement benefit when she retires at age 62 (i.e., $0.7 \times 0.6 = 0.42$).

Bob begins receiving benefits at age 62 and for a seven-year (84-month) period he receives his benefits before Betty’s benefits beginning. When he is 69, she starts drawing her benefits and together they draw a benefit that is equal to 117% of Bob’s full retirement benefit (i.e., Bob’s 75% plus Betty’s 42%). They expect to draw these benefits 9.8 years (i.e., Bob’s remaining life expectancy). Then, following Bob’s death, Betty draws her spousal benefits (which is 75% of his full retirement benefit) until she passes away at the age of 81.9 years. All of these benefits are discounted back to the date Bob turns age 62 with various annual interest rates of between one and seven percentage.

Alternative A is compared to alternative D in which Bob begins receiving Social Security benefits at age 66 and Betty begins receiving them at age 62. In this situation Bob’s Social Security benefits are his full retirement age benefits. Thus, Bob will receive a relative benefit of 100% on a monthly basis for a period of three years and then they will together receive a relative benefit of 142% for 9.8 years before he dies. Then Betty will receive Bob’s monthly benefit of 100% until she passes away at the age of 81.9. Again, all of these benefits are discounted back to age 62 for Bob at various annual interest rates of between one and seven percentage.

The analysis shows that at an interest rate of 5.2%, the present values of alternatives A and D are equal. Thus, 5.2% represents the internal rate of return that makes the present value of the benefit stream associated with alternative A equal to the present value of the benefit stream associated with alternative D. Alternatively, one could say that the couple is achieving a 5.2% rate of return by delaying Bob’s retirement to age 66. Therefore, if the couple’s required rate of return is 5.2% they would be indifferent between alternatives A and D. If

they have a higher rate of return, they would select alternative A. However, a lower rate would indicate a preference for alternative D.

Even though there were 36 comparisons indicated in Table 5, the results we obtain based on the assumptions used in this example indicate three alternatives dominate the other 33. These dominant alternatives are A, D, and G. In other words, there is no internal rate of return that would make B or C preferred to A; E or F preferred to D; or H or I preferred to G. Therefore, for Bob and Betty, their choices come down to three comparisons: A versus D, A versus G, and D versus G. Thus, the decision facing Bob is whether to begin drawing benefits at age 62, 66, or 70. Betty should begin drawing benefits at age 62. The present values of the combined Social Security benefits to Bob and Betty associated with having Betty begin drawing benefits at ages 67 or 70 are always less than if she begins drawing benefits at age 62.

The lower part of Table 5 presents succinctly the results of this study. If Bob and Betty's required rate of return is less than 3.8%, Bob should retire at age 70 and Betty at age 62. If their required rate of return is between 3.8 and 5.2% inclusive, Bob should retire at age 66 and Betty at age 62. In addition, if their required rate of return is greater than 5.2%, they should both retire at age 62.

It should also be noted that the taxation of benefits because of the presence of other income does not affect the results just presented unless (1) the receipt of Social Security benefits results in movement into a higher tax bracket, (2) the receipt of Required Minimum Distributions that begin with the retiree reaching 70.5 years of age results in movement into a higher tax bracket, or (3) receipt of benefits and/or Required Minimum Distributions triggers the alternative minimum tax. Analysis of these two cases quickly become significantly more complex and will be treated in future research.

6. Conclusions

In choosing when to start drawing benefits, one is faced with the trade-off that each year one delays the initiation of benefits will both permanently increase the monthly (annual) benefit but will also shorten the amount of time that one will draw benefits. By comparing the internal rate of return associated with the various choices, an individual or married couple can determine if there is a financial advantage to delaying receipt of Social Security benefits to the full retirement age. This research also shows that the financial advantage to delaying receipt of Social Security benefits is related (in a positive manner) to life expectancy. This advantage grows as the length of the individual's life expectancy grows.

Clearly individuals may have personal issues that make retirement at one age preferable to retirement at another age. A truly bad work environment and/or ill health could cause a person to quit work and start drawing benefits early, regardless of whether that maximizes or reduces lifetime benefits. (A pleasant and interesting work environment may have the opposite result.) However, this study has focused on the financial issues of when to initiate Social Security benefits to maximize the present value of those benefits.

This research suggests that a comprehensive health assessment at or close to age 62 and a review of family health history should be considered very important factors for deciding

when to begin receipt of Social Security benefits. People in good health would be better off delaying receipt of benefits, whereas people in failing health have no reason to delay the receipt of Social Security benefits.

Notes

1. Comparing age 62 to age 70, the internal rate of return would be determined by solving the following equation:

$$.75 \sum (1/(1 + irr/12))^i = (1/(1 + irr/12))^{96} * 1.32 \sigma (1/(1 + irr/12))^j$$

$$i = 1 \text{ to } 228 \text{ and } j = 1 \text{ to } 132$$

Comparing age 66 to 70, the internal rate of return would be determined by solving the following equation:

$$\sum (1/(1 + irr/12))^i = (1/(1 + irr/12))^{48} * 1.32 \sigma (1/(1 + irr/12))^j$$

$$i = 1 \text{ to } 180 \text{ and } j = 1 \text{ to } 132$$

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