

How Long Should An Individual At Full Retirement Age Delay Receiving Social Security Benefits?

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ABSTRACT

An important topic for many individuals approaching 66 in 2011 is whether to start social security benefits at full retirement age (FRA) or to delay the benefits in order to gain greater payouts in the future. In 2009, the bonus for delaying the start of benefits rose to about 8% per year. By delaying benefits for four years (to age 70), it is possible to increase benefits by 38 to 55 percent per month for the remainder of the retiree's life. In addition to the higher monthly benefits from delaying start of benefits, there are also substantial benefits for high income retirees in relocating to lower tax states. Also, given that the remaining age to death for most retirees at FRA is clearly finite, one would expect to see some value in discounting future earnings.

Our paper evaluates accumulated benefits over a 25 year time horizon to assess retirement decisions post FRA. We consider three examples of accumulated benefits: (1) constant dollar accumulated benefits without discount or taxes; (2) alternative rates of discount of the future stream of earnings without income taxes; and (3) discounted after tax benefits. Each scenario is evaluated to assess whether delaying social security benefits past FRA is a profitable idea. Based upon our analysis, any discount rate in excess of 5% of the available after-tax returns provides no breakeven age within expected life ages. That is, at high discount rates, it is always better to start benefits at FRA or with only short delay once FRA is reached, if the individual wishes to maximize accumulated benefits over the expected life.

At discount rates of less than 3%, the accumulated benefits may be increased within the expected life span by delaying the start of benefits. If no discount rate is applied, accumulated benefits are maximized by delayed start since all breakeven ages occur within life expectancy. In addition, we find that the negative impact of taxes on accumulated benefits can be as large as a discount rate of 3% on accumulated benefits. For high income retirees, a strategy of (1) relocating to lower tax states and (2) delaying the start of benefits can provide substantial increases to accumulated benefits. Finally, we note that the retirement decision is not entirely financial, but that many factors including family, spouse, work climate, health, expected life span, and fear of running out of money lead individuals into making decisions that may not optimize the present value of future benefits.

BACKGROUND

The social security insurance program is one of the most popular and widely used government programs. Social security provides more than 50 percent of total income for almost two-thirds of beneficiaries over 65. For one-third of the beneficiaries, social security accounts for 90 percent of total income. For twenty one percent of the beneficiaries, social security provides 100% of total income (Fisher, 2007; SSA, 2004). That is, for the least fortunate one-fifth, social security is their only source of income (Diamond and Orszag, 2004).

On reaching 62 years of age, qualified individuals can begin receiving social security benefits. However, benefits at 62 years of age are reduced to 75% of the beneficiary's Primary Insurance Amount (PIA). The PIA is calculated by (1) determining the Average Indexed Monthly Earnings (AIME) and then by (2) applying the PIA formula. To calculate AIME, the individual's taxable income from the highest earning 35 years of work is multiplied by an index number for each given year. The index number adjusts taxable income for inflation over a retiree's life time horizon of up to 35 years.

Once AIME is determined, PIA is calculated from a progressive formula, which weights the lower income amounts in the AIME heavier, thereby favoring low income wage earners. In 2009, The PIA formula took 90% of the first \$744 of AIME, 32% of the next \$3739 of AIME, and then 15% of AIME in excess of \$4483. Examples of AIME and PIA calculations are shown on the social security website.

As noted above, retirees at 62 years of age receive 75% of PIA. To gain 100% of PIA, the retiree must be at Full Retirement Age (FRA). For individuals born during the years 1945-1954, the FRA is 66 years of age. That is, to gain 100% of PIA, individuals born in those years must wait until 66 years of age to begin benefit payments.

In addition to the lower proportion of PIA received by beneficiaries not yet at FRA, there is also an annual earnings limit (\$14,160 in 2009). If an individual's earnings exceed \$14,160, \$1 of benefits is withheld for every \$2 earned above \$14,160. The earnings limit can be severe. If an individual's annual benefit is \$12,000 per year, the individual will lose all social security benefits by earning \$38,160: $(\$38,160 - \$14,160 = \$24,000; \$24,000 \times .5 = \$12,000)$.

Furthermore, by beginning benefits too early, the retiree forgoes the potential increases in AIME and PIA, which would occur as past lower wages at the beginning of the work history are replaced by current higher wages in the more skilled later years. Clearly, individuals who wish to take social security benefits before FRA are significantly reducing monthly benefits relative to only four years hence.

In fact, some analysts (Muksian,2011)believe that delaying benefits until FRA is virtually mandated because of (1) the substantial increase in percent of benefits paid (75% at age 62 to 100% at age 66); (2) the additional contributions from continuing to work; and (3) the taxation of social security benefits received prior to FRA. Taking benefits before FRA is recommended only for individuals in distress because of illness or disability, job loss (with little prospect for future employment), or overwhelming family demands (caregiving to relatives).

THE QUESTION FOR RETIREES

Given that the correct decision for almost all individuals is to wait until FRA is reached before starting benefits, the dilemma of when to start receiving benefits is shifted to the period after FRA and before age 70, when beginning receipt of benefits is required. The decision post FRA is difficult because of our inability to accurately estimate individual longevity and long-term health, and because of the rather dramatic increase in benefits awarded for delay. Delayed benefits receive a double compounding from (1) cost-of-living adjustments (COLA) and (2) from the 2/3% per month increase (usually reported as 8% per annum)in benefits awarded for delaying receipt of benefits. For example, a 3% annual COLA increase plus an 8% delay adjustment yields a 54% increase in benefits over a four year period $[(1.03^{**4}) \times (1.0066667^{**48}) = 1.548]$.

Furthermore, the structure of social security benefits themselves contributes to the difficulty of the decision. Theoretical economic models of the social security system, designed primarily for policy makers (Crawford and Lilien, 1981) note that because of uncertain lifetimes, social security tends to create an "income" and "substitution" effect. The income effect tends to encourage early retirement, because workers see a continuation of income without working, and the substitution effect tends to delay retirement because the benefits of social security can only be fully realized by working longer.

Given that most individuals will make a post FRA decision, Muksian (2011) and Fahlund (2011) use the accumulation of actual benefits and the accumulation of post-tax invested benefits at various rates of return to assess break even ages. The breakeven age occurs when the accumulated benefits from delayed start equal the accumulated benefits from starting at FRA. For invested benefits, the greater the after-tax rate of return, the greater

the break even age. Above 9% per annum, the breakeven age is 90 or greater which indicates that an immediate start of benefits at FRA is optimal. For simple benefit accumulation (not adjusted for taxes or investment return), the break even age usually occurs in the late 70’s or early 80’s, depending upon how long the start of benefits is delayed.

We should note here that the official social security web site (www.socialsecurity.gov.) also uses accumulation without adjustment for taxes or rate of return. In general, if a post-tax investment return of 5% can be achieved (Fahlund, 2011), the retiree is better off taking their social security benefits at FRA. However, the retirement decision is also complicated by non-financial factors which can influence the decision to delay benefits, such as the preferences of a spouse or the climate at work (Henkens and Solinge, 2002).

Given the complexity of the retirement decision and the number of factors involved, the emphasis of this paper is to provide accessible information to individuals facing retirement decisions. The paper presents analysis of accumulated benefits for scenarios of (1) constant dollar accumulated benefits without future discount or taxes; (2) constant dollar accumulated benefits with alternative rates of future discount without income taxes; and (3) constant dollar after tax accumulated benefits with alternative rates of future discount.

ANALYSIS AND TABLES

In the following tables, the analysis is summarized for various alternative rates of inflation, Cost-of-Living Adjustment (COLA), discount rates to present value, and low and high income tax rates. The tables are presented in terms of index numbers, where 1.0 is the annual PIA at FRA. Since the level of benefits can be different for each beneficiary, we employ an index to avoid the problem of choosing enough monthly dollar amounts to represent a wide range of individual beneficiaries. Prospective users of this analysis can simply take their PIA and multiple it by the numbers in each cell to get their numerical amount.

Table 1: Cumulative Constant Unit Benefits By Age By Starting Year
Assumptions: Inflation Rate = COLA = 0; Discount Rate = 0

Year	Age	FRA Age 66	Delay 1 Year Age 67	Delay 2 Years Age 68	Delay 3 Years Age 69	Delay 4 Years Age 70
2011	66	1.0000	0.0000	0.0000	0.0000	0.0000
2012	67	2.0000	1.0830	0.0000	0.0000	0.0000
2013	68	3.0000	2.1660	1.1729	0.0000	0.0000
2014	69	4.0000	3.2490	2.3458	1.2702	0.0000
2015	70	5.0000	4.3320	3.5187	2.5405	1.3757
2016	71	6.0000	5.4150	4.6916	3.8107	2.7513
2017	72	7.0000	6.4980	5.8644	5.0810	4.1270
2018	73	8.0000	7.5810	7.0373	6.3512	5.5027
2019	74	9.0000	8.6640	8.2102	7.6214	6.8783
2020	75	10.0000	9.7470	9.3831	8.8917	8.2540
2021	76	11.0000	10.8300	10.5560	10.1619	9.6297
2022	77	12.0000	11.9130	11.7289	11.4321	11.0053
2023	78	13.0000	12.9960	12.9018	12.7024	12.3810
2024	79	14.0000	14.0790	14.0747	13.9726	13.7567
2025	80	15.0000	15.1620	15.2476	15.2429	15.1324
2026	81	16.0000	16.2450	16.4204	16.5131	16.5080
2027	82	17.0000	17.3280	17.5933	17.7833	17.8837
2028	83	18.0000	18.4110	18.7662	19.0536	19.2594
2029	84	19.0000	19.4940	19.9391	20.3238	20.6350
2030	85	20.0000	20.5770	21.1120	21.5941	22.0107
2031	86	21.0000	21.6600	22.2849	22.8643	23.3864
2032	87	22.0000	22.7430	23.4578	24.1345	24.7620
2033	88	23.0000	23.8260	24.6307	25.4048	26.1377
2034	90	24.0000	24.9090	25.8036	26.6750	27.5134
2035	91	25.0000	25.9920	26.9764	27.9452	28.8890

Turning to Table 1, note that Table 1 has zero inflation, no COLA, no income taxes, and no discount rate. The table shows the accumulated amount of benefits by age over a twenty-five year period. The FRA column assumes that benefits begin at 66 years of age. The column with heading of DELAY 1 YEAR assumes benefits begin at 67 years of age. Similarly, DELAY 2 YEARS starts at 68 years of age, DELAY 3 YEARS at 69, and DELAY 4 YEARS at 70. The cells with heavy borders note the breakeven ages for delaying benefits. The breakeven age is when accumulated benefits for a later starting age equal or exceed an earlier starting age.

For example, the breakeven age for starting at 67 years of age versus 66 occurs at 79 years of age when accumulated benefits for DELAY 1 YEAR equals 14.0790, which is greater than 14.0000 for 66 years of age (FRA) start. The breakeven age for DELAY 2 YEARS occurs at 80 years of age, when accumulated benefits of 15.2476 exceed those of DELAY 1 YEAR (15.1620). In Table 1, each additional year of delay, beginning at 79 years of age, adds a year to breakeven age until the accumulated benefits of DELAY 4 (17.8837) exceed those of DELAY 3 (17.7833).

The results in Table 1 indicate that breakeven ages for delaying benefits all occur within the 84 years expected life span of a male reaching 66 years of age. The accumulated benefits for delaying the start of social security pays off in the sense of gaining greater lifetime income. With a discount rate of zero, benefits in the future are of the same value as benefits today. The results shown in Table 1 suggest that retirees would optimize future income by delaying the start of social security benefits. The results in Table 1 are similar to those reported by Muskian (2011), Furlung (2011), and are similar to the results shown on the social security website.

COLA and Inflation

After benefits begin, beneficiaries are protected against inflation by Cost-of-Living Adjustments (COLA). The inflation adjustment is based upon the CPI-W, the Consumer Price Index for Urban and Clerical Workers. The COLA formula computes the annual percent difference between the average of CPI-W in the third quarter of the latest year with the third quarter average of CPI-W from the most recent year with a change in COLA. For example, when calculating the 2010 COLA, the third quarter average is compared to the 2008 third quarter average because no change in COLA occurred in 2009. No change in COLA occurs when the COLA formula computes a decrease in COLA; when calculating benefits for such a year, no decrease in benefits is applied.

For the years where COLA increase, the calculated percent increase is rounded to the nearest tenth and becomes the COLA applied on January 1, in the succeeding year. While there is some discussion on the composition and biases within the CPI-W compared to actual expenditures by beneficiaries (Hobijn and Lagakos, 2003; Duggan and Gillingham, 1999) the fundamental purpose of COLA is to maintain benefits at the same constant dollar amount.

Therefore, the results in Table 1 are the same for different rates for inflation and COLA, because the benefit amount is multiplied and divided by the same coefficient. For example, a 3% inflation rate assumed over the remaining life of the beneficiary would lead to a 3% adjustment in COLA and the benefits in real dollar amounts would be the same as shown in Table 1. Given that the goal of COLA is to maintain purchasing power of beneficiaries, for the purposes of this paper, we can use Table 1 as our base calculation in constant dollars for retiree benefits for the forecast period.

Discount to Present Value and Benefits Adjusted for Taxes

As analysis from Table 1 has shown, beneficiaries can expect to receive greater accumulated payments by age 82 even after delaying benefits for up to four years. The unit incomes shown in Table 1 can be viewed as units of constant dollars since they are adjusted for inflation through COLA. However, the accumulated earnings are not adjusted for time preference: That is, beneficiaries, because of finite and uncertain life times, may have greater preferences for current benefits relative to future benefits. Table 2 introduces discounting of future benefits by a factor of 1.03, or a 3% discount rate. At a 3% discount rate, benefits in 23.5 years have only half of the value of current period benefits ($1.03^{23.5}=2.003$). In other words, current retirees at FRA (66 years of age) would value benefits at 89.5 years of age at only half the amount if those benefits were received today.

Table 2: Cumulative Constant Unit Benefits By Age By Starting Year
Assumptions: Inflation Rate = COLA; Discount Rate = 3%

Year	Age	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years
2012	66	1.0000	0.0000	0.0000	0.0000	0.0000
2013	67	1.9709	1.0515	0.0000	0.0000	0.0000
2014	68	2.9135	2.0723	1.1056	0.0000	0.0000
2015	69	3.8286	3.0634	2.1789	1.1624	0.0000
2016	70	4.7171	4.0256	3.2210	2.2910	1.2223
2017	71	5.5797	4.9598	4.2328	3.3868	2.4089
2018	72	6.4172	5.8668	5.2150	4.4506	3.5610
2019	73	7.2303	6.7474	6.1687	5.4834	4.6796
2020	74	8.0197	7.6023	7.0946	6.4861	5.7655
2021	75	8.7861	8.4324	7.9935	7.4597	6.8199
2022	76	9.5302	9.2382	8.8663	8.4048	7.8435
2023	77	10.2526	10.0206	9.7136	9.3225	8.8373
2024	78	10.9540	10.7802	10.5362	10.2134	9.8022
2025	79	11.6350	11.5177	11.3349	11.0784	10.7389
2026	80	12.2961	12.2336	12.1103	11.9181	11.6484
2027	81	12.9379	12.9288	12.8631	12.7335	12.5314
2028	82	13.5611	13.6037	13.5940	13.5250	13.3887
2029	83	14.1661	14.2589	14.3037	14.2935	14.2210
2030	84	14.7535	14.8951	14.9926	15.0397	15.0290
2031	85	15.3238	15.5127	15.6615	15.7641	15.8136
2032	86	15.8775	16.1123	16.3109	16.4674	16.5752
2033	87	16.4150	16.6945	16.9414	17.1502	17.3147
2034	88	16.9369	17.2597	17.5535	17.8131	18.0327
2035	90	17.4436	17.8084	18.1478	18.4567	18.7297
	91	17.9355	18.3412	18.7248	19.0816	19.4065

Looking at Table 2, which shows inflation adjusted constant units with a 1.03 percent discount rate, the breakeven years are 82 to 85 with 1 to 4 years of delay respectively. The preference for current benefits over future benefits delays breakeven by three years (compared to Table 1) to 85 years of age for the choice of delay of four years. The 85th year is one year beyond the expected life span of men who survive to 66 years of age. If the individual choosing the 4 year delay option is in good health with high expectations of reaching or exceeding 85 years of age, the delay of four years is still an optimizing choice. From Table 2 we can conclude that even modest rates of discounting extend the break even age for each year of delay by three years compared to Table 1. However, even with a 3% discount rate, all of the break even ages, except delay 4, occur within the expected life span of 84 years for males reaching 66 years of age today.

What occurs if we increase the discount rate to 5 percent? At a 5% discount rate, the value of benefits declines by 50% in 14.21 years ($1.05^{14.21} = 2.0003$). In other words, a retiree starting benefits at 66 values benefits received at 80 at about half of current value. Looking at Table 3, the break even ages for delay 1 year to delay 4 years span from 85 years of age to 88 years of age. Clearly, this suggests that retirees with high strong preference for current earnings should not delay receiving benefits. All of the breakeven ages exceed expected life span including start at FRA. That is, at 5 percent discount rates, the optimum starting point for social security benefits could be before FRA since any starting year of 66 to 70 years of age yields a breakeven age beyond life expectancy.

Table 3: Cumulative Constant Unit Benefits By Age By Starting Year
Assumptions: Inflation Rate = COLA; Discount Rate = 5%

Year	Age	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years
2012	66	1.0000	0.0000	0.0000	0.0000	0.0000
2013	67	1.9524	1.0314	0.0000	0.0000	0.0000
2014	68	2.8594	2.0137	1.0638	0.0000	0.0000
2015	69	3.7232	2.9493	2.0770	1.0973	0.0000
2016	70	4.5460	3.8403	3.0420	2.1423	1.1318
2017	71	5.3295	4.6888	3.9610	3.1376	2.2096
2018	72	6.0757	5.4970	4.8362	4.0854	3.2362
2019	73	6.7864	6.2666	5.6697	4.9882	4.2138
2020	74	7.4632	6.9997	6.4636	5.8479	5.1450
2021	75	8.1078	7.6978	7.2196	6.6667	6.0317
2022	76	8.7217	8.3626	7.9397	7.4466	6.8763
2023	77	9.3064	8.9958	8.6255	8.1892	7.6806
2024	78	9.8633	9.5989	9.2786	8.8965	8.4466
2025	79	10.3936	10.1732	9.9006	9.5702	9.1762
2026	80	10.8986	10.7202	10.4930	10.2117	9.8710
2027	81	11.3797	11.2412	11.0571	10.8227	10.5327
2028	82	11.8378	11.7373	11.5945	11.4047	11.1629
2029	83	12.2741	12.2098	12.1062	11.9589	11.7631
2030	84	12.6896	12.6598	12.5935	12.4867	12.3347
2031	85	13.0853	13.0884	13.0577	12.9893	12.8791
2032	86	13.4622	13.4966	13.4998	13.4681	13.3976
2033	87	13.8212	13.8853	13.9208	13.9240	13.8914
2034	88	14.1630	14.2555	14.3217	14.3583	14.3616
2035	90	14.4886	14.6081	14.7036	14.7718	14.8095
	91	14.7986	14.9439	15.0672	15.1657	15.2361

The Impact of Income Taxes on Social Security Benefits Verses Delayed Start of Benefits

From the above, it is clear that a modest discount rate of 3 percent still encourages delay of benefits for three to four years. However, what about the impacts of income tax on retirement decisions? Many high income retirees reside in high tax states. Is it worthwhile to consider moving at retirement to a new home in a lower tax state?

Before we address the question of taxation effects verses benefit start decision, a short summary of how social security benefits are taxed is in order. First of all, it should be noted that benefits are federal income tax free for the majority of beneficiaries and partially tax free for all beneficiaries. However, the share of benefits taxed can reach up to 85% for high income beneficiaries. The portion of social security benefits which are taxed depends upon specific thresholds. For example, a single person filing income taxes has thresholds of \$25,000 and \$32,000. Whereas, married couples filing a joint return have thresholds of \$32,000 and \$44,000. Fifty percent of any excess over the first threshold plus 35 percent of any excess over the second threshold are included in adjusted gross income. For instance, someone with an adjusted gross income of \$67,000 would have 85 percent of his or her \$20,000 social security benefit taxed. By the way, income from tax exempt bonds is included in the calculation to determine what portion of social security benefits is taxable.

Estimates of benefits received after income taxes are shown in Table 4 and Table 5. Each table shows constant units of social security benefits subject to 15 percent and 20 percent average tax rates with no discount rates. Fifteen and twenty percent tax rates were selected because there are many married high income retirees who exceed \$68,000 per year AGI (federal 25% marginal tax bracket) and whose average tax rate is likely to be in the 15% and 20% range. In addition, many retirees live in high tax states, which can add another 5 to 10 percent in marginal tax rates (the top California state income tax rate in 2010 was 9.55% beginning at \$93,532 of taxable income for married couples).

Table 4: Cumulative Constant Unit Benefits By Age By Starting Year
 Assumptions: Inflation Rate = COLA; Discount Rate = 0%; Average Tax Rate = 15%

Year	Age	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years
2011	66	0.8725	0.0000	0.0000	0.0000	0.0000
2012	67	1.7450	0.9449	0.0000	0.0000	0.0000
2013	68	2.6175	1.8898	1.0233	0.0000	0.0000
2014	69	3.4900	2.8348	2.0467	1.1083	0.0000
2015	70	4.3625	3.7797	3.0700	2.2166	1.2003
2016	71	5.2350	4.7246	4.0934	3.3248	2.4005
2017	72	6.1075	5.6695	5.1167	4.4331	3.6008
2018	73	6.9800	6.6144	6.1401	5.5414	4.8011
2019	74	7.8525	7.5593	7.1634	6.6497	6.0014
2020	75	8.7250	8.5043	8.1868	7.7580	7.2016
2021	76	9.5975	9.4492	9.2101	8.8663	8.4019
2022	77	10.4700	10.3941	10.2335	9.9745	9.6022
2023	78	11.3425	11.3390	11.2568	11.0828	10.8024
2024	79	12.2150	12.2839	12.2801	12.1911	12.0027
2025	80	13.0875	13.2288	13.3035	13.2994	13.2030
2026	81	13.9600	14.1738	14.3268	14.4077	14.4032
2027	82	14.8325	15.1187	15.3502	15.5160	15.6035
2028	83	15.7050	16.0636	16.3735	16.6242	16.8038
2029	84	16.5775	17.0085	17.3969	17.7325	18.0041
2030	85	17.4500	17.9534	18.4202	18.8408	19.2043
2031	86	18.3225	18.8983	19.4436	19.9491	20.4046
2032	87	19.1950	19.8433	20.4669	21.0574	21.6049
2033	88	20.0675	20.7882	21.4903	22.1657	22.8051
2034	89	20.9400	21.7331	22.5136	23.2739	24.0054
2035	90	21.8125	22.6780	23.5369	24.3822	25.2057

Table 5: Cumulative Constant Unit Benefits By Age By Starting Year
 Assumptions: Inflation Rate = COLA; Discount Rate = 0%; Average Tax Rate = 20%

Year	Age	FRA	Delay 1 Year	Delay 2 Yearss	Delay 3 Years	Delay 4 Years
2011	66	0.8300	0.0000	0.0000	0.0000	0.0000
2012	67	1.6600	0.8989	0.0000	0.0000	0.0000
2013	68	2.4900	1.7978	0.9735	0.0000	0.0000
2014	69	3.3200	2.6967	1.9470	1.0543	0.0000
2015	70	4.1500	3.5956	2.9205	2.1086	1.1418
2016	71	4.9800	4.4944	3.8940	3.1629	2.2836
2017	72	5.8100	5.3933	4.8675	4.2172	3.4254
2018	73	6.6400	6.2922	5.8410	5.2715	4.5672
2019	74	7.4700	7.1911	6.8145	6.3258	5.7090
2020	75	8.3000	8.0900	7.7880	7.3801	6.8508
2021	76	9.1300	8.9889	8.7615	8.4344	7.9926
2022	77	9.9600	9.8878	9.7350	9.4887	9.1344
2023	78	10.7900	10.7867	10.7085	10.5430	10.2762
2024	79	11.6200	11.6856	11.6820	11.5973	11.4180
2025	80	12.4500	12.5845	12.6555	12.6516	12.5599
2026	81	13.2800	13.4833	13.6290	13.7059	13.7017
2027	82	14.1100	14.3822	14.6025	14.7602	14.8435
2028	83	14.9400	15.2811	15.5760	15.8145	15.9853
2029	84	15.7700	16.1800	16.5495	16.8688	17.1271
2030	85	16.6000	17.0789	17.5230	17.9231	18.2689
2031	86	17.4300	17.9778	18.4965	18.9774	19.4107
2032	87	18.2600	18.8767	19.4700	20.0317	20.5525
2033	88	19.0900	19.7756	20.4435	21.0860	21.6943
2034	89	19.9200	20.6745	21.4170	22.1403	22.8361
2035	90	20.7500	21.5734	22.3904	23.1946	23.9779

There are two aspects to Tables 4 and 5 that are noteworthy. First, the breakeven age is not affected by tax rates. The breakeven ages with 15% or 20% tax rates are ages 79 through 82 for delay of 1 year through 4 years respectively. However, the second noteworthy item is the impact of taxation on accumulation of benefits. By 79 years of age, the no tax accumulation with start at FRA is 14.0 units. The accumulation at 79 years of age with a 15% tax rate is 12.215 units. The accumulation at 79 years of age with a 20% tax rate is 11.62. While the reduction in benefits caused by taxes is not surprising, the relative size of the loss of income from an additional 5% in taxation (0.595 units= 12.215-11.62) exceeds the maximum benefits gained by delaying start for four years with no tax effect.

For example, in Table 1, the accumulation of unit benefits at 79 years given the choice of delay 4 years has a unit value of 13.7567 compared to the 14.00 units accumulated given the choice of start at FRA. In other words, the decision to delay benefits four years is still a deficit of .2433 units at 79 years of age, while the loss of income from an addition 5% in income tax is 0.595 units. Assuming a life span of 79 years, the choice of whether to leave or stay in a state with high levels of income tax is more significant for accumulation of benefits than the decision to delay the start of benefits. Also, a delay of benefits by 1 year provides a positive return to 14.07 units. But the 0.07 gain is less than the gain of .595 which arises from moving to a low tax state. Note that the total gain of accumulated benefits between FRA at 20% tax rate and accumulated benefits at Delay 1 Year at 15% is 0.6439 units (=12.2839-11.62). These results are summarized in Table 6 below:

Table 6: Accumulated Benefits in Units by Percent Income Tax, by Age of Beneficiary, and by Start Year

Age of Beneficiary	No Income Tax (Table 1)		Accumulated Benefits in Units With Taxes: (Table 4—15% and Table 5—20%)					Delta: FRA – Delay Year 1	
	FRA	Delay 1 Year	Percent Income Tax	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years		Delay 4 Years
79	14.00	14.07	15	12.2150	12.2839	12.2801	12.1911	12.0027	0.0689
79	14.00	14.07	20	11.6200	11.6856	11.6820	11.5973	11.4180	0.0656
			Delta	0.5950	0.5983	0.5981	0.5938	0.5847	

Looking at Table 6 above, which shows the results for 79 years of age, the impact of taxes is shown to cause a greater reduction in benefits than the gain in benefits from delaying start by four years. For example, note that the accumulated benefits between 15% and 20% tax rates are between 0.5983 (delay 1 year) to .5938 (Delay 3 years) while the gain from one year delay is only 0.0689 at 15% and 0.0656 at 20% tax rate. Even a 4 year delay provides 0.2123 (=12.2150-12.0027) at 15% or 0.2020 (=11.620-11.418) at 20% compared to starting benefits at FRA. The impact of reducing income taxes 5% is nearly three times as beneficial as the gains achieved by delaying start of benefits by 4 years.

Similar results are shown in Table 7 below, which compares tax consequences to the delay start decision at 82 years of age. By 82 years of age, the no tax accumulation of benefit with start at FRA is 17.00 and the accumulated benefit at 82 years with a delay of 4 years is 17.8837, for a difference with no taxes of 0.8837. Given a delay of 4 years, the accumulation of benefits at 82 years of age with a 15% tax rate is 15.6035 units. The accumulation at 82 years of age with a 20% tax rate is 14.8435. Again, the tax caused reduction in benefits is not surprising, but the relative size of the loss of income from the additional 5% taxation (0.760 units = 15.6035-14.8435) is only 0.1237 units less than the maximum benefit (0.8837) gained by delaying start for four years with no tax effect. The after tax gain from delaying start by 4 years is 0.7710 at 15% and 0.7335 at 20%. Clearly, the reduction from taxes is about the same as the gain from delaying start by 4 years.

In other words, the decision to delay benefits four years provides a net benefit of 0.8837 units at age of 82 years (with no tax), while the loss of income from an addition 5% in income tax is 0.760 units. With a life span of 82 years, the choice of whether to leave or stay in a state with high levels of income tax is nearly as significant for accumulation of benefits as the decision to delay the start of benefits. Finally, note that the total gain in benefits from using both strategies is 1.4935 units (=15.6035-14.11). In other words, a combination of (1) delaying start of benefits and (2) relocating to a lower tax state can add about one and one half years of accumulated benefits by 82 years of age.

Table 7: Accumulated Benefits in Units by 82 Years of Age, by Percent Income Tax, and by Start Year

Age of Beneficiary	No Income Tax (Table 1)		Accumulated Benefits in Units With Taxes: (Table 4—15% and Table 5—20%)					Delta: FRA-Delay 4 Years	
	FRA	Delay 4 Years	Percent Income Tax	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years		Delay 4 Years
82	17.00	17.8837	15	14.8325	15.1187	15.3502	15.5160	15.6035	0.7710
82	17.00	17.8837	20	14.1100	14.3822	14.6025	14.7602	14.8435	0.7335
			Delta	0.7225	0.7365	0.7477	0.7558	0.7600	

One can conclude from the above analysis that the best financial strategy for retirees who are likely to reach life expectancy (84 years for men who are 66 today), is to delay receipt of social security benefits for four years and move to a lower tax state before the benefits commence.

Discounting to Present Value

Table 8: Cumulative Constant Unit Benefits By Age By Starting Year
 Assumptions: Inflation Rate = COLA; Discount Rate = 3%; Average Tax Rate = 15%

Year	Age	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years
2011	66	0.8725	0.0000	0.0000	0.0000	0.0000
2012	67	1.7196	0.9174	0.0000	0.0000	0.0000
2013	68	2.5420	1.8081	0.9646	0.0000	0.0000
2014	69	3.3405	2.6728	1.9011	1.0142	0.0000
2015	70	4.1157	3.5124	2.8103	1.9989	1.0664
2016	71	4.8683	4.3274	3.6931	2.9549	2.1018
2017	72	5.5990	5.1188	4.5501	3.8831	3.1070
2018	73	6.3084	5.8871	5.3822	4.7843	4.0829
2019	74	6.9972	6.6330	6.1900	5.6591	5.0304
2020	75	7.6659	7.3572	6.9743	6.5085	5.9503
2021	76	8.3151	8.0603	7.7358	7.3332	6.8435
2022	77	8.9454	8.7430	8.4751	8.1339	7.7106
2023	78	9.5574	9.4057	9.1928	8.9112	8.5524
2024	79	10.1515	10.0492	9.8897	9.6659	9.3697
2025	80	10.7283	10.6739	10.5662	10.3986	10.1632
2026	81	11.2883	11.2804	11.2231	11.1099	10.9337
2027	82	11.8321	11.8692	11.8608	11.8006	11.6816
2028	83	12.3599	12.4409	12.4799	12.4711	12.4078
2029	84	12.8724	12.9959	13.0811	13.1221	13.1128
2030	85	13.3700	13.5348	13.6647	13.7542	13.7973
2031	86	13.8531	14.0580	14.2313	14.3678	14.4619
2032	87	14.3221	14.5659	14.7814	14.9635	15.1071
2033	88	14.7775	15.0591	15.3154	15.5419	15.7335
2034	89	15.2195	15.5379	15.8340	16.1035	16.3417
2035	90	15.6488	16.0027	16.3374	16.6487	16.9321

The next part of the analysis is to evaluate the impact of preferring current benefits over future benefits. Given a 3% discount rate, does it still make financial sense to delay benefits and move to a lower tax state? Tables 8 and 9 show accumulated benefits at a 3% discount rate for 15% and 20% income tax rates. As noted earlier, a 3% discount rate raises breakeven ages to 82 (Delay 1 Year) and 85 (Delay 4 Years). Also, as mentioned earlier, 85 years of age exceeds the 84 year life expectancy of a man reaching 66 years of age in 2011. Therefore, Tables 10 and 11 below will use 82 and 84 years of age for comparison of delay of start of benefits with relocation to a low tax state. However, it was decided to add Table 12 in order to show the breakeven year of 85 years of age for a delay of benefits by 4 years, although such a delay is a gain only for fortunate healthy long lived men.

Table 9: Cumulative Constant Unit Benefits By Age By Starting Year
Assumptions: Inflation Rate = COLA; Discount Rate = 3%; Average Tax Rate = 20%

Year	Age	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years
2011	66	0.8300	0.0000	0.0000	0.0000	0.0000
2012	67	1.6358	0.8727	0.0000	0.0000	0.0000
2013	68	2.4182	1.7200	0.9176	0.0000	0.0000
2014	69	3.1777	2.5426	1.8085	0.9648	0.0000
2015	70	3.9152	3.3413	2.6734	1.9016	1.0145
2016	71	4.6312	4.1167	3.5132	2.8110	1.9994
2017	72	5.3263	4.8695	4.3285	3.6940	2.9557
2018	73	6.0011	5.6003	5.1200	4.5512	3.8840
2019	74	6.6563	6.3099	5.8885	5.3835	4.7854
2020	75	7.2925	6.9989	6.6346	6.1915	5.6605
2021	76	7.9101	7.6677	7.3590	6.9760	6.5101
2022	77	8.5097	8.3171	8.0623	7.7377	7.3350
2023	78	9.0918	8.9476	8.7451	8.4771	8.1358
2024	79	9.6570	9.5597	9.4080	9.1950	8.9133
2025	80	10.2057	10.1539	10.0516	9.8921	9.6682
2026	81	10.7385	10.7309	10.6764	10.5688	10.4011
2027	82	11.2557	11.2910	11.2831	11.2258	11.1126
2028	83	11.7579	11.8349	11.8720	11.8636	11.8034
2029	84	12.2454	12.3629	12.4439	12.4829	12.4741
2030	85	12.7188	12.8755	12.9990	13.0842	13.1253
2031	86	13.1783	13.3732	13.5380	13.6679	13.7574
2032	87	13.6245	13.8564	14.0613	14.2347	14.3712
2033	88	14.0576	14.3255	14.5694	14.7849	14.9671
2034	89	14.4782	14.7810	15.0627	15.3191	15.5457
2035	90	14.8865	15.2232	15.5416	15.8377	16.1074

Table 10: Accumulated Benefits in Units by Age 82, by Percent Income Tax, and by Start Year with 3% Discount Rate

Age of Beneficiary	No Income Tax With 3% Discount Rate (Table 2)			Accumulated Benefits in Units With Taxes and 3% Discount: (Table 8—15% and Table 9—20%)						Delta: FRA-Delay 1 Year
	FRA	Delay 1 Year	Delay 4 Years	Percent Income Tax	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years	
82	13.5611	13.6037	13.3887	15	11.8321	11.8692	11.8608	11.8006	11.6816	0.0371
82	13.5611	13.6037	13.3887	20	11.2557	11.2910	11.2831	11.2258	11.1126	0.0353
				Difference	0.5764	0.5782	0.5777	0.5748	0.7490	

Table 10 above summarizes the results for accumulated benefits by age 82 given an income tax and a 3% discount rate. Because discounting pushes the breakeven year to older ages, an 82 year old beneficiary receives additional gain by postponing start of benefits for one year only. The “Delta” in the far right column describes the benefit to the beneficiary of postponing benefits one year. Note that the maximum of 0.0371(=11.8692-11.8321)units, which occurs at the 15% tax rate, is significantly below the difference in accumulated benefits (listed in the bottom row) between low tax (15%) and high tax (20%) states. At the breakeven year for Delay 1 year, the accumulated difference in benefits between low and high tax rates is 0.5782 units, which is substantially higher than 0.0371 units, the gain from a one year in start of benefits. To summarize, in the case where an individual, who expects to live to 82 years of age, has higher preference (3% discount rate) for current benefits verses benefits in the future, the decision to delay benefits is not as rewarding as the decision to relocate to lower tax states. Note that the total benefit received by the retiree by delaying benefits one year and by relocating to a lower tax state is 0.6135 units (=11.8692-11.2557). Can we expect similar conclusions given discounting of future benefits if the individual expects to live to 84 or 85 years of age? The following tables present results for 84 and 85 years of age.

Table 11: Accumulated Benefits in Units by Age 84, by Percent Income Tax, by Start Year with 3% Discount Rate

Age of Beneficiary	No Income Tax With 3% Discount Rate (Table 2)			Accumulated Benefits in Units With Taxes and 3% Discount: (Table 8—15% and Table 9—20%)						Delta: FRA-Delay 3 Years
	FRA	Delay 1 Year	Delay 4 Years	Percent Income Tax	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years	
84	14.7535	14.8951	15.0290	15	12.8724	12.9959	13.0811	13.1221	13.1128	0.2497
84	14.7535	14.8951	15.0290	20	12.2454	12.3629	12.4439	12.4829	12.4241	0.2357
				Delta	0.6270	0.6330	0.6372	0.6392	0.6887	

Table 11 above summarizes the results for accumulated benefits by age 84 given an income tax and a 3% discount rate. An 84 year old beneficiary can receive additional gain by postponing start of benefits for up to three years. Compared to a one year or two years delay, a delay for three years provides the largest increase in monthly benefits. The “Delta” in the far right column describes the benefit to the beneficiary of postponing benefits for three years. Note that the maximum of 0.2497(=13.1121-12.8724) units, which occurs at the 15% tax rate, is not as large as the difference in accumulated benefits (listed in the bottom row) between low tax (15%) and high tax (20%) states.

At the breakeven year for Delay 3 Years, the accumulated difference in benefits between low and high tax rates is 0.6392 units, which is larger than 0.2497 units, the gain from a three year delay in start of benefits. To summarize, in the case where an individual, who expects to live to 84 years of age, and who has higher preference (3% discount rate) for current benefits verses benefits in the future, the decision to delay benefits is not as rewarding as the decision to relocate to lower tax states. However, by delaying three years and by moving to a lower tax state, the retiree gains a total of 0.8767 units (=13.1221-12.2454).

Table 12: Accumulated Benefits in Units by Percent Income Tax, by Age of Beneficiary, and by Start Year with 3% Discount Rate

Age of Beneficiary	No Income Tax With 3% Discount Rate (Table 2)			Accumulated Benefits in Units With Taxes and 3% Discount: (Table 8—15% and Table 9—20%)						Delta: FRA-Delay 4 Years
	FRA	Delay 1 Year	Delay 4 Years	Percent Income Tax	FRA	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years	
85	15.3238	15.5127	15.8136	15	13.3700	13.5348	13.6647	13.7542	13.7973	0.4273
85	15.3238	15.5127	15.8136	20	12.7188	12.8755	12.9990	13.0842	13.1253	0.4065
				Delta	0.6512	0.6593	0.6657	0.6700	0.6720	

Table 12 above summarizes the results for accumulated benefits by age 85 given an income tax and a 3% discount rate. An 85 year old beneficiary can receive additional gain by postponing start of benefits for up to four years. Compared to a delay of fewer years, a delay for four years provides the largest increase in monthly benefits permitted by social security. The “Delta” in the far right column describes the benefit to the beneficiary of postponing benefits for four years. Note that the maximum of 0.4273 (=13.7973-13.3700) units, which occurs at the 15% tax rate, is not as large as the difference in accumulated benefits (listed in the bottom row) between low tax (15%) and high tax (20%) states.

At the breakeven year for Delay 4 Years, the accumulated difference in benefits between low and high tax rates is 0.6720 units, which is larger than 0.4273 units, the gain from a four year delay in start of benefits. To summarize, in the case where an individual, who expects to live to 85 years of age, and who has higher preference (3% discount rate) for current benefits verses benefits in the future, the decision to delay benefits is not as rewarding as the decision to relocate to lower tax states. Furthermore, comparison of the accumulated benefits for FRA at 20% tax rate relative to the accumulated benefits for Delay 4 Years at 15% tax rate indicates a total gain of 1.0785

units (= 13.7973-12.7188). That is, over a full year of benefits can be gained by using both strategies: (1) delay benefits for 4 years and (2) relocate to a lower tax state.

Income Effects on Taxation and Benefits

In every scenario presented above, the social security beneficiary gains higher levels of accumulated benefits by delaying start of benefits and by relocating to a lower tax state. The analysis presented in this paper has used non denominated units of benefits. By this approach, prospective retirees can simply multiply their scheduled benefits by the number of units and get a dollar amount for each scenario presented in the paper.

As shown in the tables in the preceding paper, the financial benefits from delay of start of benefits and from relocating can be substantial in terms of unit benefits. However, if we begin to use dollar denominated benefits and typical levels of benefits, are the strategies worth the sacrifice to the beneficiaries?

At the present time, the average benefit for retired couples is \$1876 per month, or \$22,512 per year. Given this level of average benefit, does it make sense for the average couple to avail themselves of the strategies of delaying social security benefits and moving to lower tax states?

From Table 1, delaying benefits for four years can add 0.8837 units to accumulated benefits by age 82. In dollar values, the average couple gains \$19,894 by delaying benefits 4 years. Their annual benefit would increase 38% ($1.00667^{48} = 1.3759$) to \$30,969. If social security is 100% of their income, they will pay no federal taxes on their \$30,969 annual social security benefits since they are below the \$32,000 threshold. In California, their tax bracket would be 2.25% (\$14,248 to \$33,780). Depending upon their deductions and other factors in their California return, they would probably pay less than \$500. At these income levels, there is much less tax incentive to relocate to a lower tax state. Could they wait four years before starting social security? It would depend upon a number of factors such as savings, personal health, availability of work, and social net work considerations.

What about individuals who are making the maximum benefit of \$2,323 per month, or \$27,876 per year? Given the threshold level of \$25,000 per year for individuals, a beneficiary making \$27,876 per year might find that about 50% of \$2,876 (= \$27,896-\$25,000) could be taxed. The federal tax rate would likely be 10% with a resultant income tax of about \$288. If the individual has no significant other income, there is little incentive to relocate. The decision to delay benefits would depend on a number of factors as noted earlier.

The individuals and couples who might benefit from the strategies described in this paper would most likely be high income couples or individuals. For example, a retiree from a California public employer with a guaranteed pension of \$80,000 per year and who is eligible for \$2,300 per month (\$27,600 per year) in social security benefits at FRA, would likely benefit from delaying the start in benefits and from moving to a lower tax state. At these income levels, 85% of all social security benefits are subject to federal income tax and some benefits could be subject to the maximum rate of California income tax. By delaying start of benefits for 4 years (and assuming a 3% COLA), the \$2,300 per month benefit increases to about \$3,561 per month or about \$42,734 per year. Clearly, the former public employee would have eventually an adjusted gross income in excess of \$100,000 and face marginal tax rate levels of about 34% in California (=25% Federal and 9.55% State). A quick relocation to Nevada, which has no income tax, could conservatively save the individual about \$6,000 or \$7,000 per year. Just think, the state of California will indirectly provide high income retirees a bonus of about \$6,000 or \$7,000 per year to move out of state.

SUMMARY

The results of the previous analysis and tables are summarized in Table 13 below. Note that the breakeven ages change by year of delay of start because of discount rate, not tax rates. The different average rates of income tax (0%, 15%, and 20%) do not alter the breakeven age. The breakeven age is not effected since tax rates are assumed to remain the same throughout the remaining life of the beneficiary. The assumption of constant rates makes the calculations much simpler and seems reasonable given that most beneficiaries are not at income levels targeted for increased taxation in the current tax and deficit debates.

Table 13: Summary of Breakeven Age by Start Year, Discount Rate and Tax Rate

	Delay 1 Year	Delay 2 Years	Delay 3 Years	Delay 4 Years	Discount Rate	Tax Rate
Breakeven Ages by Years of Delay in Start of Benefits	79	80	81	82	0%	No Income Tax, 15% and 20%
	82	83	84	85	3%	No Income Tax, 15% and 20%
	85	86	87	88	5%	No Income Tax

At discount rates less than of 3% or less, the accumulated benefits may be increased by delay of start for up to 3 years since breakeven age occurs within the expected life span, favoring the choice to delay start of social security benefits. At a 3% discount rate, a delay of 4 years results in a breakeven age of 85 years--one year beyond the expected lifespan of a man turning 66 in 2011. If no discount rate is applied, accumulated benefits are maximized by delayed start since all breakeven ages occur within life expectancy.

However, as noted earlier, maximizing present value may not be the most important consideration in the retirement decision. Many retirees choose to delay benefits even though the choice to delay has a lower present value of accumulated benefits. Many retirees express great fear of inflation and a recent Allianz poll (2010) found that 61% of individuals would rather die than run out of money. Delaying the start of social security benefits until 70 can significantly increase monthly benefits, particularly if the individual continues to work. The monthly increase could be viewed as a “hedge” to reduce the impact of expected inflation. Consequently, while our financial analysis with discounting suggests taking benefits at FRA or with only a short delay, a strong preference to have adequate flow of funds in an uncertain future seems to “trump” a higher present value today. Such preferences indicate that some retirees do not have “high” discount rates for future earnings, but evaluate benefits in terms of current cash flow where higher is greatly preferred over lower.

Finally, as shown in Tables 10 through 12, the negative impact of taxes on accumulated benefits can be as large as a low discount rate of 3% on accumulated benefits. For high income retirees, a strategy of (1) relocating to lower tax states and (2) delaying the start of benefits can provide substantial increases to accumulated benefits.

In summary, there are substantial incentives to delay the start of social security benefits and to relocate to lower tax states. The incentives tend to apply most to high income individuals and couples, who face high marginal tax rates and are likely to have substantial portions of their social security benefits subject to federal tax. The incentives are not as attractive to lower income individuals for whom social security benefits are not taxed and who are less likely to have the resources to delay the start of social security.

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