THE IMPACT OF DIFFERENT AGES AND RACE ON THE SOCIAL SECURITY EARLY RETIREMENT DECISION FOR MARRIED COUPLES

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ABSTRACT

The purpose of this study is to examine the impact of age differences on the social security early and delayed retirement decision for married couples. This paper extends the analysis of Docking et. al. (2013) to couples of different ages. This analysis is done for married couples by race. More specifically, we analyze the 9 married couple combinations for the following races: Whites (W), Hispanics (H) and Blacks (B). The nine husband/wife combinations are: WW, BB, HH, WB, BW, WH, HW, BH and HB. We develop an Excel model to compute the breakeven IRR for each of the 9 race combinations. Following Blanchett (2013), three claiming scenarios are considered: receiving benefits early (e.g., at age 62 versus 66); the maximum realistic delay period (e.g., at age 62 versus 70) and delaying benefits past full retirement age (e.g., age 66 versus 70). Within these 3 claiming scenarios we examine couples by race combination who retire at the same age with age differences of 0, 4, 7 and 10 years. We assume the non-working wife (female) is younger than the working husband (male). The breakeven IRR's can be interpreted as follows: If a couple's opportunity cost of capital (which can be considered a hurdle rate) is greater than (less than) the computed breakeven IRR, the couple should retire at the earlier (later) age. For the age 62 versus 66 comparisons the BE IRR's uniformly decrease as the age difference increases. Since, as noted above, these IRR's are hurdle rates, this implies that greater age difference couples should retire earlier since the hurdle rate is less to overcome than at a smaller age difference. These results should be interpreted with caution however since an inflection point occurs at the age 62 versus 67 comparison (not shown in our tables) and continues onto the age 62 versus 70 comparison where the IRR's uniformly increase with age differences. We attribute this inflection point to the interaction of an increasing time gap between the early and delayed retirement with a constant set of age differentials. This age 62 versus 70 comparison implies that greater age differences involve a greater hurdle and the smaller the age difference the greater the incentive to retire earlier since the hurdle rate is lower. The results for the age 66 versus 70 comparison are similar to the age 62 to 70 comparison with the breakeven IRR's increasing with age differences although the numbers themselves are quite small by comparison and would seem to suggest early retirement at all age differences given the low hurdle rates to overcome. We also examine breakeven IRR's for couples by race combination who retire at different ages and who have a positive age difference. More specifically, we examine the impact of age differences on an early male/female retirement of 66 and 62 respectively versus a late male/female retirement of 70 and 66 respectively. In all 9 race combinations the breakeven IRR's decline as the age differences

increase. This suggests that the greater the age difference the greater the incentive to retire early as the hurdle rate is lower to overcome.

INTRODUCTION

The purpose of this study is to examine the impact of age differences on the social security early and delayed retirement decision for married couples. This paper extends the analysis of Docking, Fortin and Michelson (2013) to couples of different ages. This analysis is done for married couples by race. More specifically, we analyze the 9 married couple combinations for the following races: Whites (W), Hispanics (H) and Blacks (B). The nine husband/wife combinations are: WW, BB, HH, WB, BW, WH, HW, BH and HB. We develop an Excel model to compute the breakeven IRR for each of the 9 race combinations. Following Blanchett (2013), three claiming scenarios are considered: receiving benefits early (e.g., at age 62 versus 66), the maximum realistic delay period (e.g., at age 62 versus 70), and delaying benefits past full retirement age (e.g., age 66 versus 70). Within these 3 claiming scenarios we examine couples by race combination who retire at the same age with age differences of 0, 4, 7 and 10 years. We assume the working husband (male) is older than the non-working wife (female). We also examine a scenario where the couples retire at different ages with positive age differentials of 4, 7 and 10 years.

Individuals born between 1946 and 1954 can retire with full social security benefits at their full retirement age (FRA) of 66. The FRA gradually rises until it reaches 67 for people born in 1960 or later. However, individuals have the option to retire earlier or later than their FRA. The earliest one can retire is age 62, and the latest is age 70. Early retirement is attractive for many reasons: social security benefits (SSB) and rules can change, health concerns, and increased demand for leisure. However, SSB are permanently reduced by an actuarial reduction factor (5/9 of 1% for the first 36 months and 5/12 of 1% per month thereafter for early retirement). Delayed retirement is attractive because SSB are increased by a delayed retirement credit (DRC) of 8% for each year of delay after FRA up to age 70.

The results of previous research into the social security early and delayed retirement decision for married couples have been mixed. This paper extends the analysis of these prior studies to examine the role that race and age differences between spouses have on their retirement decisions. We will create a spreadsheet to model various retirement scenarios that will be beneficial for individual investors and their advisors.

LITERATURE REVIEW

There has been an extensive number of studies on the early versus delayed social security retirement decision for married couples although none have explicitly addressed the age difference issue across race categories as this study does. For a review of prior literature, see Docking, Fortin and Michelson (2012, 2013).

Only a few studies have looked at the age difference between the spouses in determining the optimal retirement age. Coile, Diamond, Gruber and Jousten (2002) find that if the husband is older than the wife, then he should delay retirement to age 65; but if the wife is 5 years older than her husband, he should retire early at age 62. Munnell and Soto (2007) show that as the age difference between the spouses (husband minus wife) increase, the wife should claim earlier (age 62) and the husband should claim later (age 69). Sun and Webb (2009) show that if the wife is 3 or more years older than her husband, he should retire at 69 and she at 66. Tucker (2009) says both should retire at age 62 no matter the age difference. McCormack and Perdue (2006) assume the husband is 7 years older than his wife and the husband has the higher earnings. They conclude that both should retire at age 62.

Docking, Fortin and Michelson (2013) look at the impact of race on the retirement decision for married couples of the same age. They compute a breakeven (BE) internal rate of return (IRR) for each of nine race combinations from age 62 through age 70. The greater the BE IRR, the more optimal for a couple to retire later. Results are fairly uniformly consistent across the nine race combinations: BE IRRs for a given base age are, in general, monotonically decreasing compared with older ages. The highest BE IRRs are for couples with a Hispanic husband, and the lowest BE IRRs are for couples with a White husband. This paper will expand on the Docking et. al. (2013) study and explore the effect of race and age difference on the retirement decision of married couples.

HOW SOCIAL SECURITY WORKS

A detailed description of how social security works can be found in Docking, Fortin and Michelson (2012, 2013). Briefly, individuals aged 62 or older who had earned income that was subject to the Social Security payroll tax for at least 10 years (40 quarters) since 1951 are eligible for retirement benefits.

No matter what your FRA is, you may start receiving benefits as early as age 62. However, if you start your benefits early, they will be reduced a fraction of a percent for each month before your FRA. This reduction is permanent. A worker with a FRA of 66 who claims early at age 62 receives 75% of their FRA benefit amount; a worker with a FRA of 67 who claims at age 62 receives only 70% of their FRA benefit amount.

A worker may choose to defer receipt of SSB past his FRA. In this case a delayed retirement credit (DRC) will be added to the FRA benefit. A worker with a FRA of 66 who delays claiming until age 70 receives 132% of their FRA benefit amount; a worker with a FRA of 67 who claims at age 70 receives only 124% of their FRA benefit amount.

Workers who claim early retirement benefits, but continue to work, may have their SSB reduced. This is referred to as the Earnings Test (ET). However, since 2000, there has been no ET above the FRA.[1] That is, SSB are not reduced if the worker is of FRA and continues to work.

A spouse has dual entitlements to SSBs. A spouse is entitled to the larger of 100% of benefits at FRA based on his or her earnings record or up to 50% of the spouse's benefits at FRA.

$$SSB_{spouse1} = \text{Max}\ \{SSB_{own};\ .5(SSB_{spouse2})\}$$

[1] http://www.socialsecurity.gov/pubs/10003.html

Once one begins SSBs based on his or her own work record they cannot later switch to SSBs based on the spouse's record. Also, one cannot begin SSB based on the spouse's record and then later switch to SSBs based on his or her own work record. However, there is an exception: a wife (husband) can retire and begin collecting her (his) own SSBs while her (his) husband (wife) still works and delays benefits. Upon her (his) husband's (wife's) retirement, she (he) can switch over to 50% of his (her) benefits, if spousal benefits are greater than her (his) own benefits. Spouse's benefits do not include any accrued delayed retirement credits.

For example, assume Richard and Jane, are both 62 with a FRA of 66. Currently, Richard's SSB at FRA are $2,000 per month and Jane's SSB at FRA are $1,000. Jane retires at 62 and receives 75% of 1,000 or $750 per month. Richard continues to work until age 66. His SSB at FRA are still $2,000 per month and he retires at FRA. Assuming no COLA for Jane's SSB, she can now switch over to spousal benefits of 50% x $2,000 = $1,000 per month.

MODEL

Similar to McCormack and Perdue (2006), we avoid the problem of an uncertain discount rate (DR) by computing the internal rate of return (IRR) equating two retirement options. For married couples of the same age, the IRR can be solved for by using the following equation:

$$\%\text{Benefit\_1} \times \sum_{1}^{i}\left(\frac{1}{1+\frac{\text{IRR}}{12}}\right)^{i} + \%\text{Benefit\_2} \times \sum_{1}^{j}\left(\frac{1}{1+\frac{\text{IRR}}{12}}\right)^{j}$$

$$= \%\text{Benefit\_3} \times \sum_{1}^{m}\left(\frac{1}{1+\frac{\text{IRR}}{12}}\right)^{m} \times \left(\frac{1}{1+\frac{\text{IRR}}{12}}\right)^{N3-N1}$$

$$+ \%\text{Benefit\_4} \times \sum_{1}^{n}\left(\frac{1}{1+\frac{\text{IRR}}{12}}\right)^{n} \times \left(\frac{1}{1+\frac{\text{IRR}}{12}}\right)^{N4-N2}$$

where:

Benefit_X = percent of SSB received based on retirement age
i = 1 to months to life expectancy for retirement Age 1 male (N1)
j = 1 to months to life expectancy for retirement Age 1 female (N2)
m = 1 to months to life expectancy for retirement Age 2 male (N3)
n = 1 to months to life expectancy for retirement Age 2 female (N4)
N3 – N1 and *N4 – N2* = difference in months between retirement Age 1 and retirement Age 2, where retirement Age 2 is greater than retirement Age 1.

The two terms on the left-hand side of the equation,

$$\%\text{Benefit\_1} \times \sum_{1}^{i} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{i} \quad \text{and} \quad \%\text{Benefit\_2} \times \sum_{1}^{j} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{j},$$

represent the present value of initiating receipt of benefits at retirement age 1. The two terms on the right-hand side of the equation,

$$\%\text{Benefit\_3} \times \sum_{1}^{m} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{m} \quad \text{and} \quad \%\text{Benefit\_4} \times \sum_{1}^{n} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{n},$$

represent the present value of initiating receipt of benefits at retirement age 2; the two second terms on the right-hand side,

$$\left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{N3-N1} \quad \text{and} \quad \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{N4-N2},$$

discount the present value of benefits at retirement age 2 back to retirement age 1 so that the IRR can be computed at the same point in time. For example, if the first retirement age is 62 and the second retirement age is 66, the IRR computation for the age 66 term must be discounted back to the same point in time as the age 62 term.

It should be noted that this model is appropriate only for same aged couples retiring at the same age. When the couples are different ages but still retire at the same age, an additional discount factor $\left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{D}$ is required to discount all expected cash flows back to the initial start of benefits. The model now becomes:

$$\%\text{Benefit\_1} \times \sum_{1}^{i} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{i} + \%\text{Benefit\_2} \times \sum_{1}^{j} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{j} \times \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{D}$$

$$= \%\text{Benefit\_3} \times \sum_{1}^{m} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{m} \times \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{N3-N1}$$

$$+ \%\text{Benefit\_4} \times \sum_{1}^{n} \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{n} \times \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{N4-N2} \times \left(\frac{1}{1 + \frac{\text{IRR}}{12}} \right)^{D}$$

where:

D = the age difference in months between the spouses ($Age_{husband} - Age_{wife}$) and $Age_{husband} > Age_{wife}$.

In addition, if the couples are different ages and retire at different ages, additional discounting complications are introduced. The model now becomes:

$$\%\text{Benefit\_1} \times \sum_{1}^{i} \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{i} + \%\text{Benefit\_2} \times \sum_{1}^{j} \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{j} \times \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{D-(N1-N2)}$$

$$= \%\text{Benefit\_3} \times \sum_{1}^{m} \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{m} \times \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{N3-N1}$$

$$+ \%\text{Benefit\_4} \times \sum_{1}^{n} \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{n} \times \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{N4-N2} \times \left(\frac{1}{1+\frac{\text{IRR}}{12}} \right)^{D-(N3-N4)}$$

4.1. Assumptions in the Model

The following assumptions are made:

1) SSB are received monthly.
2) The retirement decision is made annually because life expectancy tables only provide annual data.
3) The 2006 United States Life Tables and the 2010 National Center for Health Statistics provide life expectancies.[2]

[2] National Vital Statistics Report, June 28, 2010, Volume 58, Number 21; United States Life Tables, 2006 provides life expectancies for black and white males and females. Arias E., United States life tables by Hispanic origin. National Center for Health Statistics. Vital Health Stat 2(152). 2010 provides life expectancies for Hispanic males and females.

Table 1: Average life expectancy given current age

Age	White Males Avg # years remaining	Black Males Avg # years remaining	Hispanic Males Avg # years remaining
62	19.32	16.90	21.26
63	18.57	16.29	20.48
64	17.83	15.69	19.71
65	17.10	15.10	18.96
66	16.38	14.51	18.21
67	15.67	13.93	17.48
68	14.97	13.36	16.77
69	14.28	12.80	16.07
70	13.60	12.25	15.38
Age	**White Females Avg # years remaining**	**Black Females Avg # years remaining**	**Hispanic Females Avg # years remaining**
62	22.18	20.72	24.24
63	21.37	19.99	23.39
64	20.56	19.27	22.55
65	19.76	18.57	21.72
66	18.97	17.87	20.90
67	18.18	17.17	20.10
68	17.41	16.48	19.30
69	16.64	15.80	18.51
70	15.89	15.14	17.74

Source: National Vital Statistics Report, June 28, 2010, Volume 58, Number 21; United States Life Tables, 2006; and Arias E. United States life tables by Hispanic origin. National Center for Health Statistics. Vital Health Stat 2(152). 2010.

Life expectancy is adjusted for when a worker retires. For example, a white male who retires at age 62 is expected to live approximately 19 more years to age 81; whereas if he waits and retires at age 66 he is expected to live approximately 16 more years to age 82. We look at life expectancies based on gender and race.

4) We assume excess earnings are $0 and that early retirement SSB are not further reduced by the earnings test.
5) If a retiree has substantial income (earned and unearned) in addition to his SSB, up to 85% of his annual benefits may be subject to Federal income tax. In our analysis we assume other income is below the minimum such that 0% of SSB are taxed. However, by using the IRR method to find the optimal retirement age, taxation of SSB really becomes irrelevant, since (1-tax rate of SSB) shows up on both the left- and right-hand sides of our equation, effectively cancelling out one another.
6) Since 1983, the SSA provides for an automatic increase in SSB if there is an increase in the CPI-W from third quarter last year to third quarter of the current year. Spitzer (2006) finds that only longevity and expected rates of return are determining factors as the optimal time to retire and that inflation and taxes play no significant role. As a consequence, we assume COLA is zero.
7) We assume the husband (male) is older than the wife (female). We look at age differences (Age_{male} – Age_{female}) of 0, 4, 7, and 10. This assumption will be relaxed in future studies, allowing the wife to be older than the husband.
8) We assume a one-earner family. The husband is the working spouse, and the wife is the non-working spouse. Thus, a wife receives one-half of her husband's full retirement benefit unless the wife begins collecting benefits before her FRA. If the wife begins collecting benefits before her FRA, the amount of the wife's benefit is reduced by a percentage base on the number of months before she reaches FRA. For example, based on the FRA of 66, if the wife begins collecting benefits:
   At age 65, the benefit amount would be about 45.8 percent of the retired worker's (husband's) full benefit;
   At age 64, it would be about 41.7 percent;
   At age 63, 37.5 percent; and
   At age 62, 35 percent.
   This assumption will be relaxed in future research to allow the wife to be the working spouse, and allow a two-earner family.
9) We also assume the couple has no dependents, and that neither party receives a government pension. Furthermore, the couple may be forced into a higher federal or state tax bracket due to other income; this, too, is irrelevant in our analysis and is ignored.

AN EXAMPLE

Let us look at Michael, a black male born in 1952, who is trying to decide if he should retire early at age 62 or wait until his FRA of 66. Michael is married to Angela, a black female born in 1952, who has no SSB of her own. According to Table 1, Michael's life expectancy at age 62 is an additional 16.90 years (202.8 months) to age 78.9; while his life expectancy at age 66 is an additional 14.51 years (174.12 months) to age 80.51. Angela's life expectancy at age 62 is an additional 20.72 years (248.64 months) to age 82.72; while her life expectancy at age 66 is an additional 17.87 years (214.44months) to age 83.87. Based on current Social Security requirements, Michael will receive 100% of his SSB at age 66, but only 75% of his FRA benefits at age 62. Angela is able to claim up to 50% of Michael's SSB if she is at FRA, but only 35% at age 62.

Using Excel and Solver we can find the IRR that will equate both sides of the following equation:

$$75\% \times \sum_{1}^{202.8}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{i} + 35\% \times \sum_{1}^{248.64}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{j}$$

$$= 100\% \times \sum_{1}^{174.12}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{m} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(66-62)\times 12}$$

$$+ 50\% \times \sum_{1}^{214.44}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{n} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(66-62)\times 12}$$

The IRR that equates both sides is equal to 5.53%. If the couple's opportunity costs are less (greater) than 5.53%, then they should retire at the later (earlier) age.

Assume Michael's SSB at FRA of 66 is $1,600 per month and his early retirement benefit is 75% or $1,200 per month at age 62. Based on Michael's FRA benefit of $1,600 per month, Angela's SSB will be 35% of $1,600 or $560 per month at age 62. At age 66 Michael will receive $1,600 per month and Angela will receive 50% of $1,600 or $800 per month. If the current market interest rate is 5%, then the present value (PV) of the left-hand side of the equation (retire early at age 62) is $164,070 (Michael) plus $86,603 (Angela) for a total of $250,673. The PV of the right-hand side of the equation (delay retirement to age 66) is $162,038 (Michael) and $92,787 (Angela) for a total of $254,825. This results in a difference of $4,152, implying that that Michael and Angela should wait until age 66 to retire. If Michael and Angela believe they could invest their monthly SSB at 5.53% or greater over the next four years, then they should retire early, at age 62; if not, they should delay retirement until age 66. Of course, this assumes they do not need any of their SSB on which to live - a highly unlikely assumption.

In this example, with no differences in age and retiring at the same age, the breakeven IRR is 5.53% (5.5291% from Table 2 rounded to 2 decimal places). However, if the wife is 4 years younger there is an additional 4 years of discounting required (48 months) for the wife spousal benefits at both age 62 and 66. This is reflected in the following formula:

$$75\% \times \sum_{1}^{202.8}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{i} + 35\% \times \sum_{1}^{248.64}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{j} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(4\times 12)}$$

$$= 100\% \times \sum_{1}^{174.12}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{m} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(66-62)\times 12}$$

$$+ 50\% \times \sum_{1}^{214.44}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{n} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(66-62)\times 12} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(4\times 12)}$$

Note that the age 62 spousal benefits are now discounted 48 months (instead of none previously) and the age 66 spousal benefits are now discounted 96 months instead of 48 months. Using Excel and goal seek we find the breakeven IRR is 5.4042% which is reflected in Table 2 with a 4 year age difference.

To illustrate an example from Table 3 again consider the same couple above with a 4 year age difference but with the H/W early retirement ages of 66/62 and delayed retirement ages of 70/66. The formula to solve this example would be:

$$100\% \times \sum_{1}^{174.12}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{i} + 35\% \times \sum_{1}^{248.64}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{j} \times \left[\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{[4-(66-62)]\times 12}\right]$$

$$= 132\% \times \sum_{1}^{147}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{m} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(70-66)\times 12}$$

$$+ 50\% \times \sum_{1}^{214.44}\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{n} \times \left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{(66-62)\times 12} \times \left[\left(\frac{1}{1+\frac{\mathrm{IRR}}{12}}\right)^{[4-(70-66)]\times 12}\right]$$

Using goal seek to solve for the breakeven IRR yields 4.7984% (see Table 3).

RESULTS

Table 1 provides the average life expectancies for both males and females for the three race categories (White, Black and Hispanic) that the Breakeven (BE) Internal Rates of Return (IRR) in Tables 2 and 3 are based on. The results presented in Tables 2 and 3 are based on applying the previously described Excel model for a representative baby boom birth year of 1948 for both the husband and wife initially and progressively later years for the non-working female spouse.

Table 2 provides the BE IRR's for the 9 race combinations where W = White, B = Black and H = Hispanic. The 9 husband/wife combinations are: WW, BB, HH, WB, BW, WH, HW, BH, HB. Following Blanchett (2013), three claiming scenarios are considered: receiving benefits early (e.g., at age 62 versus 66); the maximum realistic delay period (e.g., at age 62 versus 70) and delaying benefits past full retirement age (e.g., age 66 versus 70). Within these 3 claiming scenarios we examine couples by race combination who retire at the same age with age differences of 0, 4, 7 and 10 years with the non-working spouse younger than the assumed working husband. These assumptions are, admittedly, arbitrary but useful from our perspective to examine the impact of increasing age differences on the breakeven IRR's.

Table 2 Breakeven IRRs for a Sample of Married Retirement Ages With Increasing Age Differences

Age Difference	Male Retirement Age1	Female Retirement Age1	Male Retirement Age2	Female Retirement Age2	WB Breakeven IRR	BW Breakeven IRR	WH Breakeven IRR
0	62	62	66	66	5.4566%	5.5371%	5.6061%
4	62	62	66	66	5.3301%	5.4115%	5.4601%
7	62	62	66	66	5.2168%	5.2977%	5.3317%
10	62	62	66	66	5.0862%	5.1661%	5.1851%
0	62	62	70	70	2.9863%	3.0080%	2.9830%
4	62	62	70	70	3.0656%	3.1025%	3.0615%
7	62	62	70	70	3.1848%	3.2385%	3.1864%
10	62	62	70	70	3.4207%	3.5005%	3.4391%
0	66	66	70	70	0.3148%	0.1922%	-0.0123%
4	66	66	70	70	0.3446%	0.2137%	-0.0137%
7	66	66	70	70	0.5873%	0.4828%	0.2525%
10	66	66	70	70	1.2727%	1.2629%	1.0592%

Table 2 Breakeven IRRs for a Sample of Married Retirement Ages With Increasing Age Differences

Age Difference	Male Retirement Age1	Female Retirement Age1	Male Retirement Age2	Female Retirement Age2	HW Breakeven IRR	BH Breakeven IRR	HB Breakeven IRR
0	62	62	66	66	5.6842%	5.6786%	5.6773%
4	62	62	66	66	5.5730%	5.5342%	5.5667%
7	62	62	66	66	5.4717%	5.4065%	5.4666%
10	62	62	66	66	5.3554%	5.2606%	5.3520%
0	62	62	70	70	3.3166%	3.0957%	3.3998%
4	62	62	70	70	3.4230%	3.1836%	3.5000%
7	62	62	70	70	3.5607%	3.3166%	3.6294%
10	62	62	70	70	3.8089%	3.5789%	3.8630%
0	66	66	70	70	0.7710%	0.1275%	0.9983%
4	66	66	70	70	0.8504%	0.1429%	1.0912%
7	66	66	70	70	1.1270%	0.4297%	1.3586%
10	66	66	70	70	1.8220%	1.2686%	2.0017%

Keep in mind that the BE IRR’s can be viewed as “hurdle rates” where if a couple’s expected return or opportunity cost of capital is greater than (less than) the computed BE IRR over the given time horizon, the couple should retire at the earlier (later) age. This analysis also assumes that the couple does not need the social security benefits to live on and can invest the benefits in the capital markets if the decision is made to retire early.

Our results are surprisingly similar across the 9 race combinations, but are different for the 3 age group comparisons. For the age 62 versus 66 comparisons the BE IRR’s uniformly decrease as the age difference increases. Since, as noted above, these IRR’s are hurdle rates, this implies that greater age difference couples should retire earlier since the hurdle rate is less to overcome than at a smaller age difference. These results should be interpreted with caution however since an inflection points occurs at the age 62 versus 67 comparison (not shown) and continues onto the age 62 versus 70 comparison where the IRR’s uniformly increase with age differences. We attribute this inflection point to the interaction of an increasing time gap between the early and delayed retirement with a constant set of age differentials. This age 62 versus 70 comparison implies that greater age differences involve a greater hurdle and the smaller the age difference the greater the incentive to retire earlier since the hurdle rate is lower. The results for the age 66 versus 70 comparison are similar to the age 62 to 70 comparison with the breakeven IRR’s increasing with age differences although the numbers themselves are quite small by comparison and would seem to suggest early retirement at all age differences given the low hurdle rates to overcome.

It is also interesting and useful to compare the results across race categories at key comparison ages. From Table 2, the high and low breakeven Internal Rates of Return for the following retirement age comparisons are evident:

Retirement Age Comparison	High Breakeven IRR	Low Breakeven IRR
62/62 versus 66/66		
Age Difference		
0	HH	WB
4	HH	WB
7	HH	WB
10	HH	WB
62/62 versus 70/70		
Age Difference		
0	HB	WW
4	HB	WW
7	HB	WW
10	HH	WW
66/66 versus 70/70		
Age Difference		
0	HB	WH
4	HB	WH
7	HB	WH
10	HB	WW

Recall that W = White, B = Black and H = Hispanic and the husband is listed first and the wife second. So, for example, WB refers to a white husband married to a black spouse. Note that a higher (lower) Breakeven IRR would imply retiring later (earlier) since the hurdle rate opportunity cost is more difficult (less difficult) to overcome. The high breakeven IRR column is dominated by HB (7 occurrences) and HH (5 occurrences). The low breakeven IRR column has 5 WW lows, 4 WB lows and 3 WH lows. The most obvious patterns here are the fact that the High Breakeven IRR group consistently has a Hispanic husband and Low Breakeven IRR group consistently has a white husband. For a given retirement age comparison/age difference the results can be interpreted as follows: the high (low) breakeven group would prefer to retire later (earlier) since the hurdle rate is more difficult (less difficult) to overcome.

In Table 3 we examine breakeven IRR's for couples by race combination who retire at different ages (Table 2 assumed the same retirement age for the couples) and who have a positive age difference. There is a Not Applicable (NA) in the table for an age difference of 0 since spousal benefits cannot be claimed by the female until the male retires. Table 3 examines the impact of age differences on an early male/female retirement of 66 and 62 respectively versus a late male/female retirement of 70 and 66 respectively. In all 9 race combinations the breakeven IRR's decline as the age differences increase. This suggests that the greater the age difference the greater the incentive to retire early as the hurdle rate is lower to overcome. It is also interesting to examine the high and low breakeven IRR's for this comparison for each age difference by race category:

Retirement Age Comparison 66/62 versus 70/66 Age Difference	High Breakeven IRR	Low Breakeven IRR
4	HH	WB
7	HH	WB
10	HH	WB

Interestingly, in all cases the HH (WB) race combination has the highest (lowest) breakeven IRR's. This suggests a later (earlier) retirement for the HH (WB) race combinations when comparing for a given age difference since the hurdle rate is higher (lower) respectively for the 2 combinations.

Table 3 Breakeven IRRs for a Sample of Married Retirement Ages With Different Retirement Ages and Increasing Age Differences

Age Difference	Male Retirement Age1	Female Retirement Age1	Male Retirement Age2	Female Retirement Age2	WW Breakeven IRR	BB Breakeven IRR	HH Breakeven IRR
0	66	62	70	66	NA	NA	NA
4	66	62	70	66	4.5980%	4.7984%	5.0782%
7	66	62	70	66	4.4554%	4.6613%	4.9375%
10	66	62	70	66	4.2894%	4.5026%	4.7772%

Table 3 Breakeven IRRs for a Sample of Married Retirement Ages With Different Retirement Ages and Increasing Age Differences

Age Difference	Male Retirement Age1	Female Retirement Age1	Male Retirement Age2	Female Retirement Age2	WB Breakeven IRR	BW Breakeven IRR	WH Breakeven IRR
0	66	62	70	66	NA	NA	NA
4	66	62	70	66	4.5863%	4.8090%	4.7454%
7	66	62	70	66	4.4453%	4.6704%	4.5878%
10	66	62	70	66	4.2816%	4.5096%	4.4063%

Table 3 Breakeven IRRs for a Sample of Married Retirement Ages With Different Retirement Ages and Increasing Age Differences

Age Difference	Male Retirement Age1	Female Retirement Age1	Male Retirement Age2	Female Retirement Age2	HW Breakeven IRR	BH Breakeven IRR	HB Breakeven IRR
0	66	62	70	66	NA	NA	NA
4	66	62	70	66	4.9467%	4.9523%	4.9375%
7	66	62	70	66	4.8207%	4.7987%	4.8129%
10	66	62	70	66	4.6756%	4.6224%	4.6698%

APPLICATIONS/IMPLICATIONS

The practical applications/implications of our results primarily depend on the couple's opportunity cost of capital and available other resources. If the couple's portfolio expected return or opportunity cost of capital is greater than (less than) the computed breakeven IRR, this would suggest that this couple retire at the earlier (later) date in the comparative analysis. These results should be useful for couples of different ages facing the Social Security early versus delayed retirement decision and financial planners. Using the analytics described in this paper, couples and/or their financial planners could first compute their breakeven Internal Rates of Return at various comparison ages and then compare this breakeven IRR to their expected portfolio return over the comparison period. If their expected portfolio return was greater than (less than) their breakeven IRR then they should consider retiring at the earlier (later) age.

CONCLUSIONS

The primary substantive conclusions from this study depends on the age comparisons that are being made. For different aged couples who retire at the same chronological age, the age 62 versus 66 comparisons show BE IRR's uniformly decrease as the age difference increases. Since these IRR's are hurdle rates, this implies that greater age difference couples should retire earlier since the hurdle rate is less to overcome than at a smaller age difference. These results reverse for the age 62 versus 70 comparison and age 66 versus 70 comparisons where the IRR's uniformly increase with age differences across all race combinations. This implies that greater age differences involve a greater hurdle and the smaller the age difference the greater the incentive to retire earlier since the hurdle rate is lower. For couples who have an early male/female retirement of 66 and 62 respectively versus a late male/female retirement of 70 and 66 respectively the breakeven IRR's consistently decline as the age differences increase across all race combinations. This suggests that the greater the age difference the greater the incentive to retire early as the hurdle rate is lower to overcome.

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APPENDIX A

Abbreviation	Meaning
COLA	Cost of Living Adjustment
DR	Discount Rate
DRC	Delayed Retirement Credit
ERA	Early Retirement Age
ET	Earnings Test
FRA	Full Retirement Age (receive full 100% of benefits)
IRR	Internal Rate of Return
PV	Present Value
SSA	Social Security Administration
SSB	Social Security Benefit