FINANCIAL
SERVICES
REVIEW

Financial Services Review 26 (2017) 87–111

The impact of age differences and race on the social security early retirement decision for married couples: An extension with gender role reversals

Diane Scott Docking[a,*], Rich Fortin[b], Stuart Michelson[c]

[a]*Northern Illinois University, Department of Finance, DeKalb, IL 60115, USA*
[b]*New Mexico State University, MSC 3 FIN, Box 30001, Las Cruces, NM 88003, USA*
[c]*Stetson University, School of Business – Unit 8398, 421 N. Woodland Boulevard, DeLand, FL 32723, USA*

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 article extends the analysis of Docking, Fortin, and Michelson's 2015 study that assumed the working spouse (male) was older than the non-working spouse (female). In this current study we reverse the spouse and spouse employment role and ages. We now assume a working spouse (female) who is older than her non-working spouse (male). We analyze the nine married couple combinations for the following races: Whites (W), Hispanics (H), and Blacks (B). We develop an Excel model to compute the breakeven internal rate of return (BE IRR) for each of nine race combinations. Three claiming scenarios are considered: receiving benefits early (e.g., at age 62 vs. 66), the maximum realistic delay period (e.g., at age 62 vs. 70), and delaying benefits past full retirement age (e.g., age 66 vs. 70). Within these three claiming scenarios we examine couples by race combination who retire at the same age and at different ages, and with age differences of 0, 4, 7, and 10 years. We compare the results of the two studies. The primary substantive conclusions from this study depends on the age comparisons that are being made. For couples who retire at the same age or at different ages, the greater the age difference the greater the incentive to retire early as the hurdle rate is lower to overcome. This is true irrespective who is older and the breadwinner (earning spouse). Women almost always have higher BE IRRs than men. The implication is that in marriages where the spouse is the breadwinner and the older partner, it is more difficult for the couple to retire early, as compared to marriages where the spouse is the breadwinner and the older partner. Irrespective of who is the breadwinner, Hispanics have higher hurdle rates, whereas Whites have lower hurdle rates. For a given retirement age comparison or age difference the results can be interpreted as follows: the high (low) breakeven group would prefer to

* Corresponding author. Tel.: +1-815-753-6396; fax: +1-815-753-0504.
E-mail address: ddocking@niu.edu (D.S. Docking)

retire later (earlier) because the hurdle rate is more difficult (less difficult) to overcome. Thus, Hispanics have a more difficult time retiring early, whereas Whites have a less difficult time retiring early.

Keywords: Social security; Retirement; Financial planning; Retirement age

1. 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 article extends the analysis of Docking, Fortin, and Michelson (2015), where we assumed the working spouse (male) is older than the non-working spouse (female).

In this current study, we reverse the spouse and spouse employment role and ages. We now assume the working spouse (female) is older than the non-working spouse (male). This extended analysis is done for married couples by race. More specifically, we analyze the nine married couple combinations for the following races: Whites (W), Hispanics (H), and Blacks (B). The nine spouse (male, M)/spouse (female, F) combinations are: WM_WF, BM_BF, HM_HF, WM_BF, BM_WF, WM_HF, HM_WF, BM_HF, and HM_BF. We develop an Excel model to compute the breakeven IRR for each of the nine race combinations. Following Blanchett (2013), three claiming scenarios are considered: receiving benefits early (e.g., at age 62 vs. 66), the maximum realistic delay period (e.g., at age 62 vs. 70), and delaying benefits past full retirement age (e.g., age 66 vs. 70). Within these three claiming scenarios we examine couples by race combination who retire at the same age and with age differences of 0, 4, 7, and 10 years. We also look at a specific scenario where the spouses retire at different ages and the impact of age differences on their retirement decision. We then compare these results with the results of the Docking, Fortin, and Michelson 2015 study.

2. 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. Results have been mixed. Coile, Diamond, Gruber, and Jousten (2002) find that if the spouse is older than the spouse, then he should delay retirement to age 65; but if the spouse is five years older than her spouse, he should retire early at age 62. Munnell and Soto (2007) show that as the age difference between the spouses (spouse minus spouse) increase, the spouse should claim earlier (age 62) and the spouse should claim later (age 69). Sun and Webb (2009) show that if the spouse is three or more years older than her spouse, 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 spouse is seven years older than his spouse and the spouse has the higher earnings. They conclude that both should retire at age 62. Blanchett (2013), examined three claiming scenarios for married couples: 62 versus 66, 62 versus 70, and 66 versus 70. They find that most retirees would be best served by delaying social security benefits (SSBs) until at least full retirement age (FRA) or later.

Docking, Fortin, and Michelson (2013) look at the impact of race on the retirement decision for married couples of the same age who retire at the same time. They compute a breakeven (BE) internal rate of return (IRR) for each of nine race combinations from age 62 through age 70. If a couple's opportunity cost of capital (that can be considered a hurdle rate) is greater than (less than) the computed BE IRR, the couple should retire at the earlier (later) age., that is, the greater (lower) the BE IRR, the more optimal for a couple to retire later (earlier). 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 spouse, and the lowest BE IRRs are for couples with a White spouse. They conclude that, from a given base age, it is generally more optimal to retire now with a longer time horizon since the hurdle rate is lower and later with a short time horizon because the hurdle rate is higher.

Docking, Fortin, and Michelson (2015) look at the impact of race and age difference on the retirement decision of married couples retiring at the same age and at different ages. In this study they assume the spouse is older than the spouse and is the only earner or breadwinner in the family. Assuming couples retire at the same age, for the retirement ages 62 versus 66, the BE IRRs uniformly decrease as the age difference increases. This implies that the greater the age difference between couples, the earlier the couples should retire. BE IRRs range from a low of 5.0862% for the WM_BF combination with a 10-year age difference, to a high of 5.8151% for the HM_HF combination with a zero year age difference. For the retirement ages 62 versus 70, the BE IRRs uniformly increase as the age difference increases. This implies that the greater the age difference between couples, the later the couples should retire. However, the BE IRRs are much lower in this retirement decision, ranging from a low of 2.8949% for the WM_WF combination with a zero year age difference, to a high of 3.8750% for the HM_HF with a 10-year age difference. Results for the 66 versus 70 retirement age decision are similar to the 62 versus 70 decision; however, the BE IRRs are even lower. BE IRRs range from a low of −0.123% for the WM_HF combination with a zero year age difference, to a high of 2.0017% for the HM_BF with a 10-year age difference. Overall, the highest BE IRRs have an older Hispanic male as the breadwinner; whereas the lowest BE IRRs have an older White male as the breadwinner. This would suggest early retirement at all age differences and all race-gender combinations, given the lower hurdle rates (BE IRRs) to overcome.

Assuming couples retire at different ages, Docking, Fortin, and Michelson (2015) examined a specific scenario of 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 nine race combinations the BE IRRs 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.

3. 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.

Individuals born between 1946 and 1954 can retire with full SSBs at their 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: SSBs and rules can change, health concerns, and increased demand for leisure. However, SSBs 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). For example, 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.

Delayed retirement is attractive because SSBs are increased by a delayed retirement credit (DRC) of 8% for each year of delay after FRA up to age 70. In this case a delayed retirement credit (DRC) will be added to the FRA benefit. For example, 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 SSBs reduced. This is referred to as the Earnings Test (ET). However, since 2000, there has been no ET above the FRA.[1] That is, SSBs 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 own earnings record or up to 50% of the spouse's benefits at FRA.

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

For example, a spouse receives one-half of her spouse's full retirement benefit unless the spouse begins collecting benefits before her FRA. If the spouse begins collecting benefits before her FRA, the amount of the spouse's benefit is reduced by a percentage base on the number of months before she reaches FRA.[2] For example, based on the FRA of 66, if the spouse begins collecting benefits:

At age 65, the benefit amount would be about 45.8% of the retired worker's (spouse's) full benefit;
At age 64, it would be about 41.7%;
At age 63, 37.5%; and
At age 62, 35%.

If the spouse's FRA is greater than 66, spousal benefits are further reduced for early retirement.

For example, assume Dean is 66 and Dorothy is 62, both with a FRA of 66. Dean retires at 66 with SSB at FRA of $2,000 per month. Dorothy retires early at 62 and receives 35% of $2,000 or $700 per month in spousal SSBs. If Dorothy waits and retires at her FRA of 66 she receives 50% of $2,000 or $1,000 in spousal SSBs.

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 SSBs 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 spouse (spouse) can retire and begin collecting her (his) own SSBs while her (his) spouse (spouse) still works and delays benefits. Upon her (his) spouse's (spouse'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 SSBs at FRA are $2,000 per month and Jane's SSBs 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 SSBs at FRA are still $2,000 per month and he retires at FRA. Assuming no COLA for Jane's SSBs, she can now switch over to spousal benefits of 50% × $2,000 = $1,000 per month.

4. 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. Following Docking, Fortin, and Michelson (2015), 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 of Spouse_1 (N1)
j = 1 to months to life expectancy for retirement Age 1 of Spouse_2 (N2)
m = 1 to months to life expectancy for retirement Age 2 of Spouse_1 (N3)
n = 1 to months to life expectancy for retirement Age 2 of Spouse_2 (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,

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

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

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

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

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

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_{Spouse_1} – Age_{Spouse_2}) and $Age_{Spouse\_1} > Age_{Spouse\_2}$.

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

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

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

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

In our 2015 study, we assumed Spouse_1 was the male/spouse and Spouse_2 was the female/spouse and Spouse_1 male was older than Spouse 2_female.

4.1. Assumptions in the model

Like our 2015 study, 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.[3]

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.

Table 1 Average life expectancy given current age

Age	All males		White males		Black males		Hispanic males	
	Avg # years remaining	Expected age to die	Avg # years remaining	Expected age to die	Avg # years remaining	Expected age to die	Avg # years remaining	Expected age to die
62	19.19	81.19	19.32	81.32	16.90	78.90	21.26	83.26
63	18.46	81.46	18.57	81.57	16.29	79.29	20.48	83.48
64	17.73	81.73	17.83	81.83	15.69	79.69	19.71	83.71
65	17.01	82.01	17.10	82.10	15.10	80.10	18.96	83.96
66	16.30	82.30	16.38	82.38	14.51	80.51	18.21	84.21
67	15.60	82.60	15.67	82.67	13.93	80.93	17.48	84.48
68	14.90	82.90	14.97	82.97	13.36	81.36	16.77	84.77
69	14.22	83.22	14.28	83.28	12.80	81.80	16.07	85.07
70	13.55	83.55	13.60	83.60	12.25	82.25	15.38	85.38
Age	All females		White females		Black females		Hispanic females	
	Avg # years remaining	Expected age to die	Avg # years remaining	Expected age to die	Avg # years remaining	Expected age to die	Avg # years remaining	Expected age to die
62	22.11	84.11	22.18	84.18	20.72	82.72	24.24	86.24
63	21.30	84.30	21.37	84.37	19.99	82.99	23.39	86.39
64	20.50	84.50	20.56	84.56	19.27	83.27	22.55	86.55
65	19.71	84.71	19.76	84.76	18.57	83.57	21.72	86.72
66	18.93	84.93	18.97	84.97	17.87	83.87	20.90	86.90
67	18.15	85.15	18.18	85.18	17.17	84.17	20.10	87.10
68	17.38	85.38	17.41	85.41	16.48	84.48	19.30	87.30
69	16.62	85.62	16.64	85.64	15.80	84.80	18.51	87.51
70	15.87	85.87	15.89	85.89	15.14	85.14	17.74	87.74

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

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 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 because of other income; this, too, is irrelevant in our analysis and is ignored.

In this study we make two different assumptions from out 2015 study:

8. We assume Spouse_1 is the spouse (female) and Spouse_2 is the spouse (male). The spouse (female) is older than the spouse (male). We look at age differences (Age_{female} – Age_{male}) of 0, 4, 7, and 10.

9. We assume a one-earner family. The spouse is the working Spouse_1, and the spouse is the non-working Spouse_2.

5. Examples

5.1. Spouse earner, spouse and spouse same age, spouse and spouse retire at same time

Michael, a Black male born in 1948, is married to Angela, a Black female born in 1948. They are trying to decide if they should retire early at age 62 or wait until FRA of 66. Michael is the sole breadwinner of the family. Angela has no SSBs 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; whereas her life expectancy at age 66 is an additional 17.87 years (214.44 months) 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 we can find the IRR that will equate both sides of the following equation:

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

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

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

The IRR that equates both sides is equal to 5.5291% (see Table 2A) or approximately 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 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.

5.2. *Spouse earner, spouse age > spouse age, spouse and spouse retire at same time*

Now, assume Angela was born in 1952 and is four years younger than Michael. There is an additional four years of discounting required (48 months) for the spouse's spousal benefits at both age 62 and 66. This is reflected in the following formula:

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

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

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

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 we find the BE IRR is 5.4042% (approximately 5.40%) that is reflected in Table 2A with a four year age difference. If the couple's opportunity costs are less (greater) than 5.40%, then they should retire at the later (earlier) age.

Again, if we assume Michael's SSB at FRA of 66 is \$1,600 per month and if the current market interest rate is 5%, then the PV of the left-hand side of the equation (retire early at age 62) is \$164,070 (Michael) plus \$70,933 (Angela) for a total of \$235,003. The PV of the right-hand side of the equation (delay retirement to age 66) is \$162,038 (Michael) and \$75,999 (Angela) for a total of \$238,037. This results in a difference of \$3,034, implying that Michael and Angela should wait until age 66 to retire. If Michael and Angela believe they could invest their monthly SSB at 5.40% or greater over the next four years, then they should retire early, at age 62; if not, they should delay retirement until age 66. Again, this assumes they do not need any of their SSB on which to live.

Now, assume Angela was born in 1958 and is 10 years younger than Michael. There is an additional 10 years of discounting required (120 months) for the spouse spousal benefits at both age 62 and 66. 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 47.2% of Michael's SSB at age 66, but only 33.3% at age 62.[4]

This is reflected in the following formula:

$$75\% \times \sum_{1}^{202.8}\left(\frac{1}{1+\frac{IRR}{12}}\right)^{i} + 33.3\% \times \sum_{1}^{248.64}\left(\frac{1}{1+\frac{IRR}{12}}\right)^{j} \times \left(\frac{1}{1+\frac{IRR}{12}}\right)^{(10\times 12)}$$

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

$$+ 47.2\% \times \sum_{1}^{214.44}\left(\frac{1}{1+\frac{IRR}{12}}\right)^{n} \times \left(\frac{1}{1+\frac{IRR}{12}}\right)^{(66-62)\times 12} \times \left(\frac{1}{1+\frac{IRR}{12}}\right)^{(10\times 12)}$$

Note that the age 62 spousal benefits are now discounted 120 months and the age 66 spousal benefits are now discounted 168 months. Using Excel we find the BE IRR is 5.1618% that is reflected in Table 2A with a 10 year age difference.

5.3. Spouse earner, spouse age > spouse age, spouse and spouse retire at different times

To illustrate an example from Table 3A again consider the same couple above with a four 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:

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

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

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

Using Excel to solve for the BE IRR yields 4.7984% or approximately 4.80% (see Table 3A).

6. Results

6.1. Retiring at same age

The results presented in Tables 2A are from Docking, Fortin, and Michelson (2015) and are based on applying the previously described Excel models for a representative baby boom birth year of 1948 for both the spouse and spouse initially and progressively later years for the non-working *female* spouse. The tables provide the BE IRRs for the nine race/gender combinations where W = White, B = Black, H = Hispanic, M = male, and F = female. The nine race/gender combinations are: WM_WF, BM_BF, HM_HF, WM_BF, BM_WF, WM_HF, HM_WF, BM_HF, and HM_BF. Three claiming scenarios are considered: receiving benefits early (e.g., at age 62 vs. 66); the maximum realistic delay period (e.g., at age 62 vs. 70) and delaying benefits past FRA (e.g., age 66 vs. 70). Within these three 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 working spouse.

6.1.1. Results of role switching

Table 2B shows BE IRRs when the spouse is the earner and is older than the spouse.

The results presented in Tables 2B are based on applying the previously described Excel models for a representative baby boom birth year of 1948 for both the spouse and spouse initially and progressively later years for the non-working *male* spouse.

Keep in mind that the BE IRRs 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 SSBs to live on and can invest the benefits in the capital markets if the decision is made to retire early.

Results are similar to when we assume the spouse was the earner and was older than the spouse. Assuming couples retire at the same age, for the retirement ages 62 versus 66, the BE IRRs uniformly decrease as the age difference increases. This implies that the greater the age difference between couples, the earlier the couples should retire. BE IRRs range from a low of 5.26% for the BM_WF combination with a 10-year age difference, to a high of 5.87% for the HM_HF combination with a zero year age difference. For the retirement ages 62 versus 70, the BE IRRs uniformly increase as the age difference increases. This implies that the greater the age difference between couples, the later the couples should retire. However, the BE IRRs are much lower in this retirement decision, ranging from a low of 3.25% for the WM_WF combination with a zero year age difference, to a high of 4.20% for the BM_HF with a 10-year age difference. Results for the 66 versus 70 retirement age decision are similar to the 62 versus 70 decision, however the BE IRRs are even lower. BE IRRs range from a low of 0.82% for the HM_WF combination with a zero year age difference, to a high of 2.66% for the BM_HF with a 10-year age difference. Overall the highest BE IRRs have an older Hispanic female as the breadwinner; whereas the lowest BE IRRs have an older White female as the breadwinner. This would suggest early retirement

Table 2A
Breakeven IRRs for a sample of married retirement ages with increasing age differences with male as breadwinner and male older (male born 1948; female born 1948, 1952, 1955, 1958)

Age difference	Male retirement age 1	Female retirement age 1	Male retirement age 2	Female retirement age 2	WM_WF breakeven IRR	BM_BF breakeven IRR	HM_HF breakeven IRR	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	62	62	66	66	5.4648%	5.5291%	5.8151%	5.4566%	5.5371%	5.6061%	5.6842%	5.6786%	5.6773%
4	62	62	66	66	5.3377%	5.4042%	5.6854%	5.3301%	5.4115%	5.4601%	5.5730%	5.5342%	5.5667%
7	62	62	66	66	5.2230%	5.2916%	5.5706%	5.2168%	5.2977%	5.3317%	5.4717%	5.4065%	5.4666%
10	62	62	66	66	5.0907%	5.1618%	5.4403%	5.0862%	5.1661%	5.1851%	5.3554%	5.2606%	5.3520%
0	62	62	70	70	2.8949%	3.1006%	3.3919%	2.9863%	3.0080%	2.9830%	3.3166%	3.0957%	3.3998%
4	62	62	70	70	2.9799%	3.1892%	3.4917%	3.0656%	3.1025%	3.0615%	3.4230%	3.1836%	3.5000%
7	62	62	70	70	3.1074%	3.3166%	3.6263%	3.1848%	3.2385%	3.1864%	3.5607%	3.3166%	3.6294%
10	62	62	70	70	3.3549%	3.5621%	3.8750%	3.4207%	3.5005%	3.4391%	3.8089%	3.5789%	3.8630%
0	66	66	70	70	0.0497%	0.4623%	0.7119%	0.3148%	0.1922%	−0.0123%	0.7710%	0.1275%	0.9983%
4	66	66	70	70	0.0550%	0.5083%	0.7865%	0.3446%	0.2137%	−0.0137%	0.8504%	0.1420%	1.0912%
7	66	66	70	70	0.3027%	0.7709%	1.0786%	0.5873%	0.4828%	0.2525%	1.1270%	0.4297%	1.3586%
10	66	66	70	70	1.0509%	1.4849%	1.8212%	1.2727%	1.2629%	1.0592%	1.8220%	1.2686%	2.0017%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.

Table 2B

Breakeven IRRs for a sample of married retirement ages with increasing age differences with female as breadwinner and female older (female born 1948; male born 1948, 1952, 1955, 1958)

Age difference	Male retirement age 1	Female retirement age 1	Male retirement age 2	Female retirement age 2	WM_WF breakeven IRR	BM_BF breakeven IRR	HM_HF breakeven IRR	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	62	62	66	66	5.53%	5.55%	5.87%	5.57%	5.51%	5.74%	5.68%	5.72%	5.72%
4	62	62	66	66	5.45%	5.47%	5.78%	5.49%	5.43%	5.67%	5.57%	5.65%	5.62%
7	62	62	66	66	5.37%	5.40%	5.70%	5.41%	5.35%	5.60%	5.48%	5.58%	5.52%
10	62	62	66	66	5.27%	5.31%	5.60%	5.32%	5.26%	5.51%	5.37%	5.51%	5.41%
0	62	62	70	70	3.25%	3.47%	3.68%	3.34%	3.38%	3.61%	3.33%	3.74%	3.42%
4	62	62	70	70	3.36%	3.58%	3.80%	3.45%	3.48%	3.74%	3.43%	3.86%	3.52%
7	62	62	70	70	3.49%	3.70%	3.94%	3.59%	3.60%	3.88%	3.56%	3.99%	3.66%
10	62	62	70	70	3.73%	3.92%	4.18%	3.83%	3.82%	4.12%	3.80%	4.20%	3.90%
0	66	66	70	70	0.86%	1.36%	1.39%	1.01%	1.21%	1.43%	0.82%	1.75%	0.97%
4	66	66	70	70	0.94%	1.47%	1.52%	1.11%	1.31%	1.56%	0.89%	1.89%	1.06%
7	66	66	70	70	1.19%	1.72%	1.80%	1.37%	1.54%	1.83%	1.15%	2.14%	1.33%
10	66	66	70	70	1.80%	2.26%	2.42%	1.99%	2.08%	2.42%	1.81%	2.66%	2.00%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.

at all age differences and all race-gender combinations, given the lower hurdle rates (BE IRRs) to overcome.

From Table 2C and 2D we can see that in all but seven scenarios, the BE IRRs are greater when the working spouse is female. Women almost always have higher BE IRRs.

When deciding to retire early or later, the higher the hurdle rate, the more difficult it is to retire early. The implication is that in marriages where the spouse is the breadwinner and is the older partner, it is more difficult for the couple to retire early, as compared to marriages where the spouse is the breadwinner and is the older partner.

It is also interesting and useful to compare the results across race categories at key comparison ages. From Tables 2A and 2B the high and low BE IRRs for the following retirement age comparisons are evident.

Retirement age comparison	Male as breadwinner and older		Female as breadwinner and older	
	High breakeven IRR	Low breakeven IRR	High breakeven IRR	Low breakeven IRR
62/62 vs. 66/66				
Age difference				
0	HM_HF	WM_BF	HM_HF	BM_WF
4	HM_HF	WM_BF	HM_HF	BM_WF
7	HM_HF	WM_BF	HM_HF	BM_WF
10	HM_HF	WM_BF	HM_HF	BM_WF
62/62 vs. 70/70				
Age difference				
0	HM_BF	WM_WF	BM_HF	WM_WF
4	HM_BF	WM_WF	BM_HF	WM_WF
7	HM_BF	WM_WF	BM_HF	WM_WF
10	HM_HF	WM_WF	BM_HF	WM_WF
66/66 vs. 70/70				
Age difference				
0	HM_BF	WM_HF	BM_HF	HM_WF
4	HM_BF	WM_HF	BM_HF	HM_WF
7	HM_BF	WM_HF	BM_HF	HM_WF
10	HM_BF	WM_WF	BM_HF	WM_WF

Remember that a higher (lower) BE IRR would imply retiring later (earlier) because the hurdle rate opportunity cost is more difficult (less difficult) to overcome. When the male is the breadwinner and older, the high BE IRR column is dominated by HM_BF (seven occurrences) and HM_HF (five occurrences). The low BE IRR column has 5 WM_WF lows, 4 WM_BF lows and 3 WM_HF lows. The most obvious patterns here are that the high BE IRR group consistently has a Hispanic spouse and low BE IRR group consistently has a White spouse.

When the female is the breadwinner and older, the high BE IRR column is dominated by BM_HF (eight occurrences) and HM_HF (four occurrences). The low BE IRR column has 5 WM_WF lows, 4 BM_WF lows and 3 HM_WF lows. The most obvious patterns here are that the high BE IRR group consistently has a Hispanic spouse and low BE IRR group consistently has a White spouse.

Thus, irrespective of who is the breadwinner, Hispanics have higher hurdle rates; while Whites have lower hurdle rates. For a given retirement age comparison or age difference the

Table 2C
Percentage difference in breakeven IRRs for a sample of married retirement ages with increasing age differences

Age difference	Male retirement age 1	Female retirement age 1	Male retirement age 2	Female retirement age 2	WM_WF breakeven IRR[a]	BM_BF breakeven IRR	HM_HF breakeven IRR	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	62	62	66	66	1.26%	0.45%	1.00%	2.13%	−0.42%	2.33%	−0.08%	0.73%	0.73%
4	62	62	66	66	2.09%	1.28%	1.70%	3.01%	0.37%	3.77%	0.03%	2.12%	0.87%
7	62	62	66	66	2.79%	1.99%	2.27%	3.72%	1.06%	4.96%	0.12%	3.29%	0.98%
10	62	62	66	66	3.60%	2.83%	2.93%	4.56%	1.89%	6.36%	0.23%	4.67%	1.10%
0	62	62	70	70	12.20%	12.06%	8.56%	11.77%	12.52%	21.08%	0.38%	20.82%	0.52%
4	62	62	70	70	12.63%	12.23%	8.86%	12.61%	12.28%	22.09%	0.21%	21.12%	0.70%
7	62	62	70	70	12.33%	11.70%	8.67%	12.76%	11.31%	21.79%	0.02%	20.18%	0.85%
10	62	62	70	70	11.12%	10.08%	7.79%	12.03%	9.06%	19.69%	−0.25%	17.31%	1.00%
0	66	66	70	70	1629.47%	194.45%	94.92%	221.74%	529.66%	11748.89%	5.80%	1271.88%	−3.08%
4	66	66	70	70	1609.78%	189.82%	92.71%	222.03%	511.98%	11514.12%	4.99%	1229.72%	−2.79%
7	66	66	70	70	292.53%	122.85%	66.88%	133.24%	219.35%	625.71%	2.43%	397.94%	−1.78%
10	66	66	70	70	71.30%	52.46%	32.71%	56.26%	64.78%	128.09%	−0.71%	109.54%	−0.33%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.

[a]Percentage difference calculated as absolute value of (female breadwinner IRR - male breadwinner IRR) divided by male breadwinner IRR or (Table 2B IRR - Table 2A IRR)/ABS(Table 2A IRR).

Table 2D
Percent difference in breakeven IRRs for a sample of married retirement ages with increasing age differences

Age difference	Male retirement age 1	Female retirement age 1	Male retirement age 2	Female retirement age 2	WM_WF breakeven IRR[a]	BM_BF breakeven IRR	HM_HF breakeven IRR	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	62	62	66	66	0.07%	0.03%	0.06%	0.12%	−0.02%	0.13%	0.00%	0.04%	0.04%
4	62	62	66	66	0.11%	0.07%	0.10%	0.16%	0.02%	0.21%	0.00%	0.12%	0.05%
7	62	62	66	66	0.15%	0.11%	0.13%	0.19%	0.06%	0.26%	0.01%	0.18%	0.05%
10	62	62	66	66	0.18%	0.15%	0.16%	0.23%	0.10%	0.33%	0.01%	0.25%	0.06%
0	62	62	70	70	0.35%	0.37%	0.29%	0.35%	0.38%	0.63%	0.01%	0.64%	0.02%
4	62	62	70	70	0.38%	0.39%	0.31%	0.39%	0.38%	0.68%	0.01%	0.67%	0.02%
7	62	62	70	70	0.38%	0.39%	0.31%	0.41%	0.37%	0.69%	0.00%	0.67%	0.03%
10	62	62	70	70	0.37%	0.36%	0.30%	0.41%	0.32%	0.68%	−0.01%	0.62%	0.04%
0	66	66	70	70	0.81%	0.90%	0.68%	0.70%	1.02%	1.45%	0.04%	1.62%	−0.03%
4	66	66	70	70	0.89%	0.96%	0.73%	0.77%	1.09%	1.58%	0.04%	1.75%	−0.03%
7	66	66	70	70	0.89%	0.95%	0.72%	0.78%	1.06%	1.58%	0.03%	1.71%	−0.02%
10	66	66	70	70	0.75%	0.78%	0.60%	0.72%	0.82%	1.36%	−0.01%	1.39%	−0.01%

W = White, B = Black, H = Hispanic, M = male, F = female.
[a]Percent Difference calculated as (Female breadwinner IRR - Male breadwinner IRR) or (Table 2B IRR - Table 2A IRR).

results can be interpreted as follows: the high (low) breakeven group would prefer to retire later (earlier) because the hurdle rate is more difficult (less difficult) to overcome. Thus, Hispanics have a more difficult time retiring early and Whites have a less difficult time retiring early.

6.2. Retiring at different ages

The results presented in Table 3A are from Docking, Fortin, and Michelson (2015) and are based on applying the previously described Excel models for a representative baby boom birth year of 1948 for both the spouse and spouse initially and progressively later years for the non-working *female* spouse. The spouses are assumed to retire at different ages. A specific scenario of 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, is examined.

There is a Not Applicable (NA) in the table for an age difference of 0 because spousal benefits cannot be claimed by the female until the male retires. In all nine race combinations the BE IRRs 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.

6.2.1. Results of role switching

Table 3B shows BE IRRS when the spouse is the earner and is older than the spouse. Results are similar to when we assume the spouse was the earner and was older than the spouse. Again, the BE IRRs uniformly decrease as the age difference increases. This implies that the greater the age difference between couples, the earlier the couples should retire.

From Table 3C and 3D we can see that in all but seven scenarios, the BE IRRs are greater when the working spouse is female. Again, women almost always have higher BE IRRs.

The implication is that in marriages where the spouse is the breadwinner and is the older partner, it is more difficult for the couple to retire early, as compared with marriages where the spouse is the breadwinner and is older partner.

It is also interesting to examine the high and low BE IRRs for this comparison for each age difference by race category. From Tables 3A and 3B the high and low BE IRRs for the following retirement age comparisons are evident.

Retirement age comparison	Male as breadwinner and older		Female as breadwinner and older	
	High breakeven IRR	Low breakeven IRR	High breakeven IRR	Low breakeven IRR
66/62 vs. 70/66				
Age difference				
0	NA	NA	NA	NA
4	HM_HF	WM_BF	HM_HF	BM_WF
7	HM_HF	WM_BF	HM_HF	BM_WF
10	HM_HF	WM_BF	HM_HF	BM_WF

Remember that a higher (lower) BE IRR would imply retiring later (earlier) because the hurdle rate opportunity cost is more difficult (less difficult) to overcome. The high BE IRR

Table 3A

Breakeven IRRs for a sample of married retirement ages with different retirement ages and increasing age differences. Male as breadwinner and male older (male born 1948; female born 1948, 1952, 1955, 1958)

Age difference	Male retirement age 1	Female retirement age 1	Male retirement age 2	Female retirement age 2	WM_WF breakeven IRR	BM_BF breakeven IRR	HM_HF breakeven IRR	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	66	62	70	66	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	66	62	70	66	4.60%	4.80%	5.08%	4.59%	4.81%	4.75%	4.95%	4.95%	4.94%
7	66	62	70	66	4.46%	4.66%	4.94%	4.45%	4.67%	4.59%	4.82%	4.80%	4.81%
10	66	62	70	66	4.29%	4.50%	4.78%	4.28%	4.51%	4.41%	4.68%	4.62%	4.67%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.

NA = not applicable because if husband(male) and wife(female) are same age, wife cannot retire and draw spousal benefits before her husband retires.

Table 3B

Breakeven IRRs for a sample of married retirement ages with different retirement ages and increasing age differences. Female as breadwinner and female older (female born 1948; male born 1948, 1952, 1955, 1958)

Age difference	Female retirement age 1	Male retirement age 1	Female retirement age 2	Male retirement age 2	WM_WF breakeven IRR	BM_BF breakeven IRR	HM_HF breakeven IRR	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	66	62	70	66	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	66	62	70	66	4.67%	4.78%	5.12%	4.81%	4.64%	4.99%	4.82%	4.96%	4.95%
7	66	62	70	66	4.56%	4.68%	5.01%	4.70%	4.54%	4.89%	4.69%	4.87%	4.83%
10	66	62	70	66	4.43%	4.56%	4.88%	4.58%	4.41%	4.78%	4.55%	4.76%	4.69%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.

NA = Not applicable because if husband(male) and wife(female) are same age, husband cannot retire and draw spousal benefits before his wife retires.

Table 3C
Percentage difference in breakeven IRRs for a sample of married retirement ages with different retirement ages and increasing age differences

Age difference	Female/male retirement age 1	Male/female retirement age 1	Female/male retirement age 2	Male/female retirement age 2	WM_WF breakeven IRR[a]	BM_BF breakeven IRR	HM_HF breakeven IR R	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	66	62	70	66	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	66	62	70	66	1.55%	−0.38%	0.85%	4.80%	−3.48%	5.06%	−2.57%	0.21%	0.30%
7	66	62	70	66	2.35%	0.38%	1.46%	5.76%	−2.88%	6.59%	−2.64%	1.51%	0.37%
10	66	62	70	66	3.33%	1.30%	2.19%	6.93%	−2.14%	8.47%	−2.72%	3.08%	0.44%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.

[a]Percentage difference calculated as (Female breadwinner IRR - male breadwinner IRR) divided by male breadwinner IRR or (Table 3B IRR - Table 3A IRR)/Table 3A IRR). Race and gender held constant.

Table 3D
Percent difference in breakeven IRRs for a sample of married retirement ages with different retirement ages and increasing age differences

Age difference	Female/male retirement age 1	Male/female retirement age 1	Female/male retirement age 2	Male/female retirement age 2	WM_WF breakeven IRR[a]	BM_BF breakeven IRR	HM_HF breakeven IR R	WM_BF breakeven IRR	BM_WF breakeven IRR	WM_HF breakeven IRR	HM_WF breakeven IRR	BM_HF breakeven IRR	HM_BF breakeven IRR
0	66	62	70	66	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	66	62	70	66	0.07%	−0.02%	0.04%	0.22%	−0.17%	0.24%	−0.13%	0.01%	0.01%
7	66	62	70	66	0.10%	0.02%	0.07%	0.26%	−0.13%	0.30%	−0.13%	0.07%	0.02%
10	66	62	70	66	0.14%	0.06%	0.10%	0.30%	−0.10%	0.37%	−0.13%	0.14%	0.02%

Notes: IRR = internal rate of return; W = White; B = Black; H = Hispanic; M = male; F = female.
[a]Percent difference calculated as (female breadwinner IRR - male breadwinner IRR) or (Table 3B IRR - Table 3A IRR). Race and gender held constant.

column is dominated by HM_HF, no matter which spouse is older or which spouse is the breadwinner.

When the male is older and the breadwinner, the low BE IRR is dominated by WM_BF. When the female is older and the breadwinner, the low BE IRR is dominated by BM_WF. The most obvious pattern here that the low BE IRR group has an older White breadwinner and a younger Black non-earning spouse.

Irrespective of who is the breadwinner, Hispanics have higher hurdle rates; whereas Whites have lower hurdle rates. For a given retirement age comparison or age difference the results can be interpreted as follows: the high (low) breakeven group would prefer to retire later (earlier) because the hurdle rate is more difficult (less difficult) to overcome. Thus, Hispanics have a more difficult time retiring early and Whites have a less difficult time retiring early.

7. Applications and 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 BE 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 BE IRR to their expected portfolio return over the comparison period. If their expected portfolio return was greater than (less than) their BE IRR then they should consider retiring at the earlier (later) age.

8. Conclusions

The primary substantive conclusions from this study depends on the age comparisons that are being made. For different aged couples, irrespective who is older and the breadwinner, couples who retire at the same chronological age, the age 62 versus 66 comparisons show BE IRRs uniformly decrease as the age difference increases. Because these BE IRRs are hurdle rates, this implies that greater age difference couples should retire earlier because 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 IRRs 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 because 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 BE IRRs 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.

For couples who retire at different ages, the greater the age difference the greater the incentive to retire early as the hurdle rate is lower to overcome. This is true irrespective who is older and the breadwinner.

Women almost always have higher BE IRRs. The implication is that in marriages where the spouse is the breadwinner and is the older partner, it is more difficult for the couple to retire early, as compared with marriages where the spouse is the breadwinner and is older partner. Irrespective of who is the breadwinner, Hispanics have higher hurdle rates; whereas Whites have lower hurdle rates. For a given retirement age comparison or age difference the results can be interpreted as follows: the high (low) breakeven group would prefer to retire later (earlier) because the hurdle rate is more difficult (less difficult) to overcome. Thus, Hispanics have a more difficult time retiring early and Whites have a less difficult time retiring early.

Notes

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

2 The percentage reduction for spousal benefits is 25/36 of 1% per month for the first 36 months and 5/12 of 1% for each additional month.

3 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. E. Arias, 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 (Arias, 2010).

4 Because Angela is born in 1958, her FRA is 66 and 8 months. Thus her spousal benefits are reduced by an extra 8 months.

References

Arias, E. (2010). *United States life tables by Hispanic origin*. National Center for Health Statistics. Vital Health Stat 2(152).

Blanchett, D. (2012). When to claim social security benefits. *Journal of Personal Finance, 11,* 36–87.

Coile, C., Diamond, P., Gruber, J., & Jousten, A. (2002). Delays in claiming social security benefits. *Journal of Public Economics, 84,* 357–385.

Docking, D. S., Fortin, R., & Michelson, S. (2012). The influence of gender and race on the social security early retirement decision for single individuals. *Journal of Economics and Economic Education Research, 13,* 87–104.

Docking, D. S., Fortin, R., & Michelson, S. (2013). The influence of race on the social security early retirement decision for married couples. *Financial Services Review, 22,* 133–150.

Docking, D. S., Fortin, R., & Michelson, S. (2015). The impact of different ages and race on the social security early retirement decision for married couples. *Journal of Economics and Economic Education Research, 16,* 72–88.

McCormack, J. P., & Perdue, G. (2006). Optimizing the initiation of social security benefits. *Financial Services Review, 15,* 335–348.

Munnell, A. H., & Soto, M. (2007). When should women claim social security benefits? *Journal of Financial Planning, 20,* 58–65.

National Vital Statistics Report. (2010). *United States Life Tables, 2006; Volume 58, Number 21*. June 28, 2010.

Social Security Administration. (2017). National Vital Statistics Report (available at http://www.socialsecurity-.gov/pubs/10003.html).

Spitzer, J. J. (2006). Delaying social security payments: A bootstrap. *Financial Services Review, 15,* 233–245.

Sun, W., & Webb, A. (2009). How much do households really lose by claiming social security at age 62? *Center for Retirement Research at Boston College, CRR WP 2009–11,* March, 1–28.

Tucker, M. (2009). Optimal retirement age under normal and negative market conditions considering social security and private savings. *Journal of Financial Planning, July,* 42–49.