Should You Retire at Age 62 or at 65?

Craig M. Newmark,[1] North Carolina State University
Michael Walden,[2] North Carolina State University

Retiring at age 62 allow pensions and Social Security payments earlier, with three more years of leisure time. Waiting to retire at age 65 will probably give the retiree larger pension and Social Security payments plus the earnings from three more years of work. We present a methodology for analyzing this decision. We present the cost of retiring at age 62 in terms of foregone income per hour of leisure gained between age 62 and age 65.
KEY WORDS: *present value, retirement planning*

The Problem

If you retire at age 62, you will start receiving your pension and Social Security benefits earlier and you will have more leisure time than if you retire at age 65. But if you wait, your monthly pension checks may be larger and your monthly Social Security checks will almost surely be. In addition, you will earn three more years of salary. Which choice is better? Do you prefer more leisure time and monthly checks that start earlier but are smaller in amount, or do you prefer less leisure time, more earnings, and monthly checks that start later but are larger?

Retirement is a big change in a person's life and experts tell us that each individual should consider the psychological aspects of retirement carefully. Economics can not provide you with any useful advice concerning these psychological aspects. But economics can provide you with a useful framework for comparing the *financial* consequences of the two choices.

Perhaps surprisingly, this decision has not been widely examined in the literature. Several authors have examined aggregate determinants and impacts of retirement decisions. For example, Burtless and Moffitt (1985) have estimated the impact of Social Security on aggregate labor supply; Fields and Mitchell (1984) calculated the effects of earnings, Social Security, and pension benefits on retirement age; Smith and Stanley (1981) studied the costs and benefits of raising the Social Security retirement age; and Gendell and Siegel (1992), Haywood, Grady, and McLaughlin (1988), and Moen (1988) have analyzed trends in the age of retirement.

Only Clements (1995) has looked at a similar issue from an individual perspective. However, Clements assumes that the individual retires early, at age 62, and the decision is whether to delay receiving Social Security to age 65. This is different than our decision. Our decision is when to retire, at age 62 or age 65?

How to Compare: Present Value Analysis

To understand how economists analyze problems like the retirement-age problem, consider a simpler problem. Suppose you had the happy task of choosing between receiving $5,000 today or receiving ten guaranteed payments of $1,000 each, with the first payment arriving exactly one year from today, the second arriving two years from today, and so on, with the tenth payment arriving ten years from today. You *could* make your choice simply by adding up the ten $1,000 payments and concluding that $10,000 is larger than $5,000. But this could well be a bad choice for three reasons. The first reason is inflation: we have come to expect that the purchasing power of a dollar falls over time and that a dollar in the future is therefore worth less than a dollar today. A second reason is uncertainty, reflected in the observation, "A bird in the hand is worth two in the bush." We prefer a dollar today rather than in the future because we are uncertain whether the future receipt really will arrive or because, even if we

[1]*Craig M. Newmark, Associate Professor, Department of Economics, North Carolina State University, Box 8109, Raleigh, NC 27695.*

[2]*Michael Walden, Professor, Department of Agricultural and Resource Economics, North Carolina State University, Box 8109, Raleigh, NC 27695. Phone: (919) 515-4671. Fax: (919) 515-1794. Email: michael_walden@ncsu.edu.*

knew it would, we are uncertain whether we will still be able to enjoy it.

But even in a world with no inflation and no uncertainty, comparing the ten $1,000 future payments with the $5,000 you could receive today could still be a mistake. This third reason is that money you have today can be invested and can earn interest while money you do not have yet can not. This means that directly comparing expenditures or receipts of money occurring at different points in time is as potentially misleading as directly comparing Japanese yen or Canadian dollars to American dollars. Just as you would not choose to receive 10,000 Japanese yen or 10,000 Canadian dollars rather 5,000 American dollars without checking the exchange rate between the currencies, you should not choose between future dollars and current dollars without knowing the exchange rate between them.

The "exchange rate" you should use between future dollars and current dollars is related to the interest rate you get on your investments. Once you compute this exchange rate, the correct procedure is to convert all future dollar amounts into their equivalent value in current dollars. (Just as you would convert an amount denominated in a foreign currency into an equivalent amount in dollars.) Once you have converted all future dollars into present dollars, making a choice between different sets of cash flows is both easy and economically sound.

To see how you should compute the exchange rate between present dollars and future dollars, consider the first of the ten $1,000 payments in the sequence described above. If you had $1,000 today, you could invest it over the coming year. Suppose you earned an annual rate of interest equal to R%. Suppose further that interest were paid only once a year, at the end of the year.[a] Then $1,000 today would equal $1,000 times (1 + R/100) one year from today. If you rearrange the equation, you find that $1,000 one year from today equals $1,000 divided by (1 + R/100) today. Since this divisor will be greater than one for any positive rate of interest, you are reducing, or *discounting*, the future $1,000 in order to put it in present dollar terms. For example, if the annual interest rate were 7.5%, $1,000 one year from today would be worth 1000/1.075 or $933.23 today.

The amount of $1,000 earned today would equal $1,000 times $(1 + R/100)^2$; so the $1,000 payment at the end of two years would be worth $1000/(1.075)^2$ or $865.33 today. The general formula is now evident. The amount $1,000 received at the end of T years is worth $\$1,000/(1 + R/100)^T$ in present dollars.

So to properly compare the set of ten $1,000 payments with $5,000 today, you should discount each of the ten payments to present value terms and *then* add them up. With an annual interest rate of 7.5% (and with annual payment of interest), the ten payments have a total present value of $6,804.08. We conclude that at 7.5% interest the ten payments are better. But the ten payments are substantially less than twice as good that is what the simple addition of the payments indicates.

Having worked through this example with us you may have several questions at this point. What about inflation? The purchasing power of the $1,000 payments in the example will be eroded by inflation. Why didn't we adjust the payments to reflect this? What about taxes? Since most forms of income are subject to the tender mercies of tax collectors - local, state, and federal - shouldn't we take out taxes before comparing financial alternatives? Lastly, what about uncertainty? Even if the interest rate were zero and the inflation rate were zero, as noted above most people would prefer a dollar today to a dollar in the future because of uncertainty about the future. How should we handle this in the analysis?

Inflation is easy to deal with. Because inflation affects equally the value of dollars received in the future and the value of dollars *invested* today, it cancels out when future amounts are discounted. A simple example illustrates this point. Suppose the inflation rate is 0, you are earning 10% per year in a bank account, and you have to choose between getting $1,000 today and $1,100 one year from today. You reason that $1,000 invested in your bank account today will grow to $1,100 one year from today. The two options therefore are of equal value to you. Now suppose the inflation rate is X% per year. The $1,100 you could receive one year from today is not worth $1,100 today in buying power. But that applies equally well to the $1,000 invested in the bank. The $1,100 you would have in the bank at the end of one year is not worth $1,100 today in buying power to the same degree that the first $1,100 is not.

For any rate of inflation you would still be indifferent between the two choices (ignoring any effects of taxes or uncertainty). As long as both the cash receipts and the interest rate you are using are not adjusted for inflation, you do not need to worry about inflation in present value analysis.[b]

Taxes can be more difficult to handle. Consider our example of choosing between $1,000 today and $1,100 one year from today. Suppose both amounts are taxed when received, as is interest earned on bank accounts. Suppose the interest rate is once again 10% per year. And let's let your average tax rate on all income equal 10%. If you choose the $1000 today, taxes will reduce it to $900. You will get $90 interest one year from today of which you'll keep $81, giving you a total at the end of a year of $981. If you choose to receive $1,100 one year from today, you'll pay $110 in taxes, leaving you with $990. So, two options that were equally attractive before are now not.

But we note that the difference between the two choices, $9, or about 1%, is small. Even for much more complicated choices we might not change our conclusions if we ignore taxes rather than consider them. For the remainder of this paper we will make just this assumption, that taxes affect the results little enough that we can draw valid conclusions if we use pretax income rather than post-tax income. We stress, though, that our lack of consideration of taxes is not a weakness inherent in present value analysis. If you knew or could estimate roughly what your average tax rate will be, both for years you are working and years you are retired, you could apply present value analysis as we have discussed to the after-tax amounts.

The problem with that is only that the shortcut procedure we offer you later in this paper would not work.[c]

As for most people's preference for "a bird in the hand rather than two in the bush", this, too, is difficult to reflect precisely in the analysis. One way for you to indicate a high personal preference for current dollars rather than future dollars is to use an interest rate for discounting even higher than the rate you earn on your investments. A higher interest rate will lower the present value of money you receive in the future relative to money you receive in the present.

Garbage In, Garbage Out

To make the correct choice of retirement age from a financial standpoint, you need to apply the correct procedure - present value analysis - to accurate numbers on how much money you will receive in each of the two cases. Unfortunately, it is impossible to know the exact values of most of the needed numbers. In this section we will discuss which numbers we expect that you can get fairly reliably and which numbers you will have to estimate. We also indicate how you can address the uncertainty about the numbers.

By contacting your employers you can get a reasonably accurate estimate of your monthly pension benefits, either if you retire at 62 or if you retire at 65. Take note if you are eligible to receive a one-time, lump-sum payment for retiring early. Many large companies now make such buyout plans available. If you are eligible, we assume that you know it and that you know what the amount of the lump sum is. We also assume that you know what your monthly Social Security benefit would be under current law, again both for retirement at 62 and for retirement at 65. (The Social Security Administration has a simple form that you can use to request a statement of your projected benefits.) Currently, the government reduces monthly benefits by 5/9 of a percentage point for each month before age 65 that you retire. If you retire at 62, therefore, your monthly check will equal 80% of the monthly benefit you would get retiring at 65. Finally, we assume that if you decide to work to age 65 you can predict what your average monthly salary will be from ages 62 to 65.

Now for the difficult numbers. First is the number of years you will live after age 62. This number is both unpleasant to think about and very uncertain. So we will simply let you incorporate whatever number, or range of numbers, that you like.

Next is the average rate of return you expect to earn on your investments while you are retired. Since this is also uncertain, we will again simply let you determine the number, or range of numbers, that you feel is appropriate.[d] We will also give you some guidance as to what an appropriate range of rates would be.

One problem remains. While we assume that you can get a good estimate of your Social Security benefits

under current law, how sure can you be that the law will be remain the same throughout your retirement? The answer is, you can't. Given the recent history of Social Security as well as current discussion in Washington, we think it is reasonable to assume that the law will change. And we think it is likely that the government will reduce benefits at some point. So we suggest that you use your currently projected Social Security benefits in the analysis but that you treat current projections as an optimistic view of what you will actually receive.[e]

Performing the Analysis

We now compare the financial merits of retiring at age 62 versus retiring at age 65. We can do it in 20 easy steps.

Let's first compute the present value of your retirement benefits if you retire at 62.

1. State what your monthly pension benefit would be if you retired at 62.

2. Now look at Table 1. This table shows the total present value of receiving $1 per month, each month, for any number of years up to fifty and for selected interest rates between 0% and 12% per year.[f] The present value is the single amount of money today, which if invested at the given interest rate, would produce $1 each month for the given number of months. Table 1 shows the number of years in the first column on the left and shows the interest rates in the top row. Scanning down the column for 0% interest, we see that the values are equal simply to the sum of the number of dollars received. But for any interest rate greater than zero, the values in the table are less than the sum of the dollars received. This is as we'd expect given our discussion of why future dollars are worth less than present dollars.

   Now pick two numbers: the number of years beyond your sixty-second birthday you expect to live and the average annual rate of interest you expect to earn on your investments while retired.

   We offer no advice on how to estimate what the number of years should be. We can, however, offer some perspective on picking an appropriate interest rate. The interest rate you should expect to earn depends fundamentally on how much risk you are willing to take. A person who keeps his cash under the mattress always knows where his money is and how much he has, but he earns no interest. Toward the other end of the risk spectrum would be someone who invests 100% of his retirement money in common stocks. Over long periods the stock market has yielded a much higher average rate of return than mattresses, but investments in the stock market are subject to breathtaking declines in value in short periods. Specifically, economists have estimated that the average annual nominal rate of return to owning common stock over the period 1871 to 1988 was 8.7%; over the period 1926 to 1988, 10.0% (Gottshalk & Donnelly, 1989; Wilson & Jones, 1987; Walden, 1992, pp. 462-463). But in the worst five year periods from 1926 to 1988, stocks yielded a return of -17.4% (Gibson, 1990, p. 87).

   An appropriate range for your interest rate would have zero at the lower end and 9 or 10% at the upper end. (We include interest rates up to 12% to allow for your being either smart enough or risk-loving enough to outperform the stock market.) Clearly, investments such as checking and savings accounts or bonds would yield a return somewhere in between, probably in the lower half of the range, as they are much less risky than stocks. Depending on how risky your investments are, choose an interest rate appropriate for you. If you have time, you should perform the analysis with two or three different rates to see how much your analysis depends on what interest rate you assume.[g] After picking the number of years and the interest rate, find the row with that number of years and the column with that interest rate. Record the number in the table at that row and column.

3. Multiply your answers from number 1 and number 2 together.

4. State what your monthly Social Security benefit would be if you retired at 62.

5. You need to look up another number in Table 1. Use the number of years that you used for step 2. But you should choose a different interest rate. You will use the interest rate you select here to

discount your Social Security benefits whereas you used the rate you selected in step 2 to discount your pension benefits. Your monthly pension check is fixed in amount, but your Social Security checks increase in amount, by law, at a rate equal to the rate of inflation. Economists refer to such inflation-adjusted amounts as being in "real" dollars. (Before adjusting for inflation we refer to the amounts as being in "nominal" dollars.) Whenever you apply present value analysis to amounts measured in real dollars, you should use a similarly inflation-adjusted, "real" interest rate. The real interest rate is equal to the interest rate unadjusted for inflation (the "nominal" rate of interest) minus the rate of inflation minus the product of the nominal rate of interest and the rate of inflation. The last term tends to be very small and is therefore usually ignored. This tells us that to find the real interest rate we need to subtract the rate of inflation from the nominal interest rate. But what will the future rate of inflation be? What will it be over the many long years of your retirement?

We don't pretend to know. But we can still offer some help in picking a real interest rate. The real rate of return to holding U.S. common stocks over long periods of time has been remarkably stable. Wilson and Jones (1987) reported that over the period 1871 to 1988, the real rate of return to stocks was 6.8%. Over the period 1926 to 1988, the real rate of return was 6.9%. We would thus estimate the real interest rate for someone who is 100% invested in stocks at about 7%. Money put in a mattress and even checking accounts realize a negative real rate of interest. Savings accounts and short-term CDs have recently been earning about 1 to 2% in real terms; longer-term CDs and bonds have recently been around 3%, in some cases near 4%. We estimate, therefore, that for most people a real interest rate of about 2 or 3% would be appropriate.

Find the value in the table for the number of years you used in step 2 and for the real interest rate just discussed.

6. Multiply your answers from step 4 and step 5 together.

7. If you are eligible for a lump-sum payment for retiring early, state this amount.

8. Now add the your answers to numbers 3, 6, and 7. This sum is the present-dollar value, at the time of your sixty-second birthday, of all your retirement receipts if you retire at 62.

9. Now we compute the present value of your retirement benefits if you retire at 65 plus the present value of your earnings from ages 62 to 65. Start by stating what your monthly pension benefit would be if you retired at 65.

10. Pick two numbers: the number of years beyond your sixty-fifth birthday you expect to live and the average annual rate of interest you expect to earn on your investments while retired. (This is what you did in step 2 except here you use the years after your sixty-*fifth* birthday not your sixty-second.) Find the row in Table 1 with that number of years and the column with that interest rate. Record the number in the table for that row and column.

11. Multiply your answers from step 9 and step 10 together.

12. State what your monthly Social Security benefit would be if you retired at 65.

13. Look up the value in Table 1 corresponding to the number of years you used in step 10 and the real interest rate you used in step 5.

14. Multiply your answers from step 12 and step 13 together.

15. Add your answers to steps 11 and 14. This sum is the present-dollar value of all your retirement benefits if you retire at 65. The "present" in the present-dollars here, however, is the day of your sixty-fifth birthday. To meaningfully compare these age-65 dollars to the number you obtained in 8, you have to discount again. Look in Table 2 for the entry corresponding to the interest rate that you used in step 10. Multiply that value by the answer you have just obtained at the beginning of this step. You now have a value measured in age-62 dollars, the same as the answer in step 8.

Table 1
Present Value of $1 Received Each Month for N Years At Selected Interest Rates

	Annual Interest Rate											
N years	0	1	2	3	4	5	6	7	8	9	10	12
10	120.00	114.15	108.68	103.56	98.77	94.28	90.07	86.13	82.42	78.94	75.67	69.70
15	180.00	167.09	155.40	144.81	135.19	126.46	118.50	111.26	104.64	98.59	93.06	83.32
16	192.00	177.36	164.19	152.34	141.64	131.98	123.24	115.31	108.12	101.57	95.61	85.20
17	204.00	187.53	172.82	159.65	147.84	137.24	127.70	119.10	111.33	104.30	97.92	86.86
18	216.00	197.60	181.27	166.74	153.80	142.24	131.90	122.62	114.29	106.79	100.02	88.34
19	228.00	207.57	189.55	173.63	159.52	147.00	135.85	125.91	117.03	109.06	101.91	89.66
20	240.00	217.44	197.67	180.31	165.02	151.53	139.58	128.98	119.55	111.15	103.62	90.82
21	252.00	227.21	205.63	186.80	170.31	155.83	143.09	131.84	121.89	113.05	105.18	91.85
22	264.00	236.89	213.44	193.09	175.38	159.93	146.40	134.51	124.04	114.79	106.58	92.77
23	276.00	246.47	221.08	199.20	180.26	163.83	149.51	137.00	126.03	116.38	107.85	93.58
24	288.00	255.95	228.58	205.12	184.95	167.53	152.44	139.32	127.87	117.83	109.01	94.31
25	300.00	265.34	235.93	210.88	189.45	171.06	155.21	141.49	129.56	119.16	110.05	94.95
30	360.00	310.91	270.55	237.19	209.46	186.28	166.79	150.31	136.28	124.28	113.95	97.22

Table 2
Factors to Multiply Age-65 Dollars to Convert Them to Age-62 Dollars at Selected Interest Rates

Interest Rate	Factor	Interest Rate	Factor
0.00%	1.000000	6.25%	0.829433
0.25%	0.992529	6.50%	0.823268
0.50%	0.985115	6.75%	0.817150
0.75%	0.977758	7.00%	0.811079
1.00%	0.970458	7.25%	0.805054
1.25%	0.963213	7.50%	0.799076
1.50%	0.956024	7.75%	0.793142
1.75%	0.948891	8.00%	0.787255
2.00%	0.941812	8.25%	0.781412
2.25%	0.934787	8.50%	0.775613
2.50%	0.927816	8.75%	0.769859
2.75%	0.920898	9.00%	0.764149
3.00%	0.914034	9.25%	0.758482
3.25%	0.907222	9.50%	0.752859
3.50%	0.900462	9.75%	0.747278
3.75%	0.893754	10.00%	0.741740
4.00%	0.887097	10.25%	0.736244
4.25%	0.880492	10.50%	0.730789
4.50%	0.873937	10.75%	0.725377
4.75%	0.867432	11.00%	0.720005
5.00%	0.860976	11.25%	0.714675
5.25%	0.854570	11.50%	0.709385
5.50%	0.848213	11.75%	0.704135
5.75%	0.841905	12.00%	0.698925
6.00%	0.835645	12.25%	0.693755

16. State what your average monthly salary would be if you worked the three years from your sixty-second birthday to your sixty-fifth birthday.[h]

17. Look in Table 1 at the row for three years and the column for the interest rate you expect to earn on your investments while working full time. Record this number.

18. Multiply your answers from step 16 and step 17 together. This is the present value of your salary from ages 62 to 65 where "present" is your sixty-second birthday.

19. Add your answers to questions 15 and 18 together.

20. You should now compare your answers to questions 8 and 19. The answer to 8 is the present value in age-62 dollars of retiring early, while the answer to 19 is the present value in age-62 dollars of retiring at age 65. If the answer to 8 is larger than the answer to 19, the better choice, economically, is clear: retire early. You'd have both more wealth and more leisure time. If the answer to 19 is larger, the better choice is not quite so clear. Retiring early would give you more leisure time but leave you poorer. What we recommend in this case is to divide the additional wealth obtained by working until 65 - the difference between the answer to 19 from the answer to 8 - by the number of hours you'd have to work from age 62 to age 65.

This is your implicit hourly wage rate in age-62 dollars. If this amount is high enough that working seems worthwhile then retire at 65. If this amount is lower than what you would want to continue working then retire at 62.

Examples

Let's take a look at some examples of our approach.

Consider a person who will earn an average of $120,000 per year between ages 62 and 65. If he retires at 65, he expects a pension of $54,000 per year and Social Security of $14,000 per year. If he retires at 62, he expects a pension of $42,000 per year and Social Security of $11,200 per year. He has chosen a nominal interest rate of 9% and a real interest rate of 3%, and he expects to live to 95. Finally, he works 2,000 hours per year.

Here are the answers to the twenty questions for this individual.

1. A pension of $42,000 per year if he retires early equals $3,500 per month.

2. Living to 95 would be an additional 33 years after he turns 62. We enter Table 1 in the row headed **33** and go to the column headed **9.00**. The number there is 126.42.

3. Multiplying the answers to 1 and 2 yields $442,470.

4. $11,200 per year in Social Security equals $933.33 per month.

5. Entering Table 1 in the row headed **33** and the column headed 3.00 - remember we use an inflation-adjusted, "real" rate of interest to discount Social Security - we find $251.19.

6. Multiplying the answers to 4 and 5 yields $234,444.

7. Since our individual has no lump-sum incentive for early retirement, the answer for this step is just 0.

8. Adding the answers to 3, 6, and 7 we obtain $676,914. This is the present value, at age 62, of the individual's pension and Social Security benefits if he retires early.

9. A pension of $54,000 per year if he retires at age 65 equals $4,500 per month.

10. Living to 95 would be an additional 30 years after he turns 65. The Table 1 entry in the row for **30** and the column for **9.00** is 124.28.

11. The answers to 9 and 10 multiplied equals $559,260.

12. $14,000 per year in Social Security equals $1,166.67 per month.

13. The Table 1 entry in the row for **30** and the column for **3**% is 237.19.

14. The answers to 12 and 13 multiplied equals $276,722.

15. The answers to 11 and 14 added together equals $835,982. This is the present value, at age 65, of the individual's pension and Social Security benefits if he retires at the normal age. To put this number in the same units as the answer to step 8, we have to convert it to a present value as of age 62. To do this we discount $835,982 by multiplying it by 0.764149, the value corresponding to an interest rate of 9.00% in Table 2 . This operation yields $638,815. This number is in age-62 dollars and we can compare it to the answer from step 8. But before doing that, we want to take account of the individual's salary from age 62 to age 65.

16. An annual salary of $120,000 equals $10,000 per month.

17. The entry in Table 1 for **3** years and **9.00%** is 31.45.

18. The answers to 16 and 17 multiplied together equals $314,500.

19. The answers to 15 and 18 added together is $953,315.

20. Our conclusion is that on this person's sixty-second birthday, the present value of his pension benefits and Social Security if he retires early equals $676,914, while the present value of his benefits, Social Security, and salary equals $953,315. The individual will be $276,401 wealthier in age-62 dollars if he retires at age 65. But this person will have to work 6,000 hours to obtain this larger amount! This means that his implicit wage would be $46.07 per hour. Our advice, at long last, is simple. If the individual feels on his sixty-second birthday that it is worth working for three more years for $46.07 an hour, he should retire at 65. But if he feels his leisure time is more valuable than that, he should retire at 62.

To close, we'll look at two applications of present value analysis to situations that are a bit simpler.

A letter to *Money* magazine (May, 1992) asked the following. "I am leaving the Air Force soon and have to choose between two voluntary separation packages: a lump-sum $31,000 or an annual $6,200 for 28 years. Which choice is best for retirement in about 25 years? Because of cutbacks, thousands of G.I.s face similar decisions."

We'll assume that the military employee expects to live to collect all his promised payments if he chooses the deferred-payment option. We'll also assume, since our Table 1 is constructed using monthly values, that the $6,200 per year is made in 12 monthly payments of $516.67.

All we need do is enter the table in the row for **28** years and the column for the G.I. is interest rate. We don't know what interest rate he wants to use, so we'll look at two extreme values, **0** and **12**. At an interest rate of 0% the table value is 336. The present value of the deferred-payment option would therefore be $516.67 times 336, or $173,600. Clearly, the G.I. would be better off if he took the deferred payments rather than the lump sum. What if he wants to use an interest rate of 12%? In this case the value is 96.47 and the present value of the deferred-payment option would be $49,843. Once again, we would recommend that he take the deferred payments.[i]

For a final example, let's suppose that having paid Social Security taxes for these many years you want to know how to get the largest amount from your Social Security benefits. Will retiring early or retiring at 65 give you the largest present value of benefits? The question is interesting because under current law if you retire at 62 your monthly benefit will equal only 80% of your monthly benefit if you retire at 65.

First, look up the Table 1 value for some number of years past your sixty-second birthday and an interest rate of your choice. Remember that since Social Security benefits are indexed to the inflation rate you should use a real (inflation-adjusted) interest rate. For many people a rate in the range of 1% to 3% will probably be appropriate. You interpret this value as the present value in age-62 dollars of one dollar per month of the Social Security benefits you'll receive if you retire at 62.

Next, look up the Table 1 value for a number of years exactly three less than you just chose and for the same interest rate. Multiply this value by 1.25. The result is the present value in age-65 dollars of your monthly Social Security benefit if you retire at age 65. (You multiply by 1.25 because you would get monthly payments that are 20% greater than those from retiring at 62.) You should now discount this amount down to age-62 dollars. You do that by multiplying by the appropriate value in Table 2. Now you have both the early retirement benefits and the normal retirement benefits expressed in age-62 dollars. Whichever number is larger is the better choice financially.

For a given interest rate the longer you expect to be collecting Social Security benefits, the more likely it is that the present value of your benefits will be larger if you retire at 65. How many years past age 62 does it take for the two choices to be equal in present value? Consider three reasonable real interest rates: 1%, 2%, and 3%. The breakeven number of years past your sixty-second birthday in these three cases are sixteen, seventeen, and a bit less than nineteen. It is interesting that according to recent U. S. government information, the life expectancy of a white male on his sixty-second birthday is 17.3 years (U. S. Bureau of the Census, 1995, Table No. 116). It thus appears that for a sixty-two year old white male who lives the average life span for his age group and who earns about an average rate

of return on his investments, early retirement and normal retirement yield roughly the same present value of Social Security benefits. (One suspects that the Social Security Administration deliberately designed the payment scheme to achieve this result.)

Conclusion

The noted statistician George Box advised, "Models are to be used but not to be believed." We would echo his advice as it applies to present value analysis. The method is correct and is one whose principles all economists agree upon. But to implement the analysis we made several assumptions. We have tried in this note to be very clear about what those assumptions are. We fully acknowledge that the conclusion of the analysis could be in error if the assumptions are not satisfied. Nonetheless, we think present value analysis offers the best means of thinking about decisions involving cash receipts and outlays at different points of time. It therefore offers the best means of thinking about the financial aspects of the decision about whether to retire at 62 or at 65.

Endnotes

a. *We assume that interest is paid only at the end of the year to keep the arithmetic simple. We can certainly relax this assumption. For the retirement decision, we will assume interest is paid monthly. The basic principle used in present value analysis holds no matter how often interest is paid.*

b. *If, on the other hand, future cash amounts were adjusted upward at a rate equal to the inflation rate, then our present value analysis must be modified a bit. We'll discuss this more below when we talk about Social Security payments that are, at least under present law, indexed to the inflation rate.*

c. *But if you want the greater accuracy of considering taxes, contact your CPA first for help in computing the needed average tax rates.*

d. *The rate of return that you earn will probably vary year to year. It would be appropriate to incorporate these fluctuations into the analysis if they were known. Since they are not, we have little choice but to assume that the rate stays constant.*

e. *You could also assume that your Social Security benefits will decrease by some specific percentage, say 10% or 20% , and redo the analysis substituting these lower values for your currently projected benefits.*

f. *The table uses two assumptions. We assume that you start receiving your monthly pension and Social Security checks one month after your sixty-second birthday. We also assume that you receive interest on your investments monthly. The second assumption seems to be a reasonable choice given that different people will receive interest in different ways. For instance, someone whose investments were mostly bank accounts might get interest daily. On the other hand, stocks which pay dividends tend to pay interest quarterly and bonds often pay interest only yearly. Changing the period in which interest is paid from monthly to some other reasonable period such as daily, weekly, quarterly, or yearly would not affect the results of the analysis materially. (The table was prepared using Microsoft Excel's PV function.)*

g. *We assume that your pension benefits do not rise with inflation that occurs during your retirement. Indeed, almost no private pension provides for inflation adjustments (Schulz, 1988, p. 234). If, however, you do have a private pension which rises with inflation during retirement, then you should discount these pension benefits in the way you will discount Social Security benefits (steps 4, 5, and 6).*

h. *In questions 1 through 8 you computed the present value of your pension and Social Security benefits if you retired at age 62. We assumed in those questions that if you retire you will not work at all thereafter. Suppose, instead that after you retire you are thinking of working part time subsequently. If so, for this question you should record the average difference between your full-time and part-time monthly salaries.*

i. *The interest rate at which the two options are equal in present value is about twenty percent.*

References

Burtless, G. & Moffitt, R. (1985). The joint choice of retirement age and post retirement hours of work. *Journal of Labor Economics, 3*, 209-236.

Clements, J. (1995, April 18). Delaying social security benefits may not be as smart as you think. *The Wall Street Journal*, p. C1.

Fields, G. & Mitchell, O. (1984). Economic determinants of the optimal retirement age: An empirical investigation. *Journal of Human Resources, 19*, 245-262.

Gendell, J. & Siegel, J. (1992). Trends in retirement age by sex, 1950-2005. *Monthly Labor Review, 115*, 22-29.

Gibson, R. C. (1990). *Asset allocation: balancing financial risk*. Homewood, IL: Business One-Irwin.

Gottshalk, E. C., Jr. & Donnelly, B. (1989, Oct. 17). Despite market swings, stocks make sense. *The Wall Street Journal*.

Hayward, M., Grady, W. & McLaughlin, S. (1988, August). Changes in the retirement process among older men in the United States: 1972-81. *Demography*, 371-386.

Moen, J. (1988, July-August). Past and current trends in retirement: American men from 1860 to 1980. *Economic Review of the Federal Reserve Bank of Atlanta*, 16-27.

Money Magazine (1992, May). Letter to the editor, *21*(5), 54.

Schultz, J. (1988). *The economics of aging*. Dover, MA: Auburn House Publishing Co.

Smith, S. & Stanley, K. (1981). Social security retirement age: Alternatives and cost comparisons. *Journal of Risk and Insurance, 48*, 694-699.

U.S. Bureau of the Census. (1994). Statistical Abstract of the United States.

Walden, M. L. (1992). *Economics and consumer decisions*. Englewood Cliffs, NJ: Prentice-Hall.

Wilson, J. W. & Jones, C. P. (1987). A comparison of annual common stock returns: 1871-1925 with 1926-1985. *Journal of Business, 60*, 239-258.