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Pfau, Wade Donald

National Graduate Institute for Policy Studies (GRIPS)

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Getting on Track for a Sustainable Retirement: A Reality Check on Savings and Work

by

Wade D. Pfau

Associate Professor

National Graduate Institute for Policy Studies (GRIPS)

7-22-1 Roppongi, Minato-ku, Tokyo 106-8677 Japan

Email: wpfau@grips.ac.jp

phone: 81-3-6439-6225

Abstract

The aim of traditional retirement planning is to set a wealth accumulation target for your retirement date so that your desired expenditures can be obtained using a “safe” withdrawal rate. But it is quite difficult to know if you are making progress toward this target. Volatility over short periods of time strongly limits the usefulness of using your current wealth accumulation at ten or even five years before retirement to predict your final retirement wealth. Fortunately, it is not necessary to focus on a retirement wealth accumulation target. The accumulation and retirement phases should not be treated separately in this way. This paper outlines a framework for considering if someone in mid-career is on track for a sustainable retirement. It investigates what combinations of savings rates and years of continued work would have allowed someone to have always accumulated enough by retirement to afford one’s desired retirement expenditures in all of the rolling periods from the historical data. A strategy is “safe” if it worked in the worst-case offered thus far by history. I consider a 55 year old as a case study to show what savings rate will be needed to retire 10 years later, or how much longer one should work with a variety of other savings rates. Results are shown for a wide variety of situations. These findings can potentially serve as a reality check about the sustainability of one’s retirement plans.

JEL Codes: C15, D14, G11, G17, N21, N22

Keywords: retirement planning, lifetime perspective, safe savings rate, safe retirement age, wealth accumulation targets, retirement spending goals, safe withdrawal rates

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Introduction

As you (or a client) progresses through your career, how do you know if you are making proper progress toward enjoying your desired retirement? For traditional retirement planning, you would track your progress toward a wealth accumulation target for your retirement date. That target would have been determined by first calculating how much you would like to withdraw from your savings after accounting for Social Security benefits and other income sources. You would also study the safe withdrawal rate literature to decide on a withdrawal rate you feel comfortable using. It is then a matter of saving enough so that the withdrawal amount to obtain your desired expenditures represents your determined safe withdrawal rate. Tracking your progress in this framework then involves determining whether your current wealth accumulation is sufficient to get you to your intended target at retirement.

Pfau (2011b) argues that due to mean reversion (the lowest sustainable withdrawal rates tend to follow strong bull markets just prior to retirement, while bear markets in the final pre-retirement years tend to allow for higher withdrawal rates), this framework may not be the best way to plan for retirement. Individuals whose careers end after a long bear market will be less likely to meet the traditional wealth accumulation target linked to the safe withdrawal rate, but unless the economy really experiences a crisis much deeper than anything to date, a higher withdrawal rate can be supported and those individuals will not have needed so much wealth to be able to withdraw their desired expenditures anyway. Likewise, it is only reasonable that those who worked at a time that provided the easiest path for reaching a wealth accumulation target (a retiree in 2000) should expect something closer to the harshest post-retirement conditions. The traditional wealth accumulation target for the 2000 retiree may not be enough. Instead of wealth targets, as Pfau (2011b) explains, someone saving at her “safe” savings rate will likely be able to finance her intended expenditures regardless of her actual retirement date circumstances. This study extends the case further, by arguing that even if you really want to achieve a particular

wealth accumulation target, knowing whether you are on track to accomplish this even 5 or 10 years before retirement is really a somewhat futile task (unless you happen to have already saved enough to immunize your portfolio with fixed income assets). It is rather difficult to track your progress toward a wealth target that may not provide you with a good idea about your retirement sustainability anyway.

The safe withdrawal rate literature tends to look at the retirement period without considering the preceding accumulation period. They really should be considered together. This means, do not aim for a wealth accumulation target at retirement, but rather aim to accumulate enough wealth to actually finance your desired retirement expenditures. Because of mean reversion (a terrible decade for financial markets just before retirement will most likely not also be followed immediately by another terrible decade after retirement), these seemingly similar concepts can actually be quite different. With this alternative, the way to know if you are on track for a sustainable retirement is to consider hypothetical individuals with the same current situation and retirement plans as you, but who reached your age at different points in history. See how these individuals fared over rolling periods from the historical data. Determine what else must be done (what savings rate is needed over how many more years of work) so that all the hypothetical individuals from history facing your same circumstances could retire successfully. This gives you an idea of whether you are on track based on history's worst-case scenario. To be sure, a more adventurous individual does not need to plan for success in the worst-case scenario, while a more risk averse individual may like to plan for an even worse worst-case scenario. Indeed, there is an important caveat that these "safe" strategies I will discuss are what would have worked in the worst-case scenario from the past. Future retirees may set new records for the worst retirement conditions, and this must always be kept in mind.

This paper provides a framework for mid-career individuals to develop a progress report about their retirement plans by showing which savings rate they may still need to use and how

much longer they may still need to work. These findings will serve as a reality check for some, if the results show that expecting to retire before 80 or 90 years old will be difficult without a drastic change in plans. Others may find that they are already comfortably on the way to retirement with lower wealth accumulations than they might have thought possible.

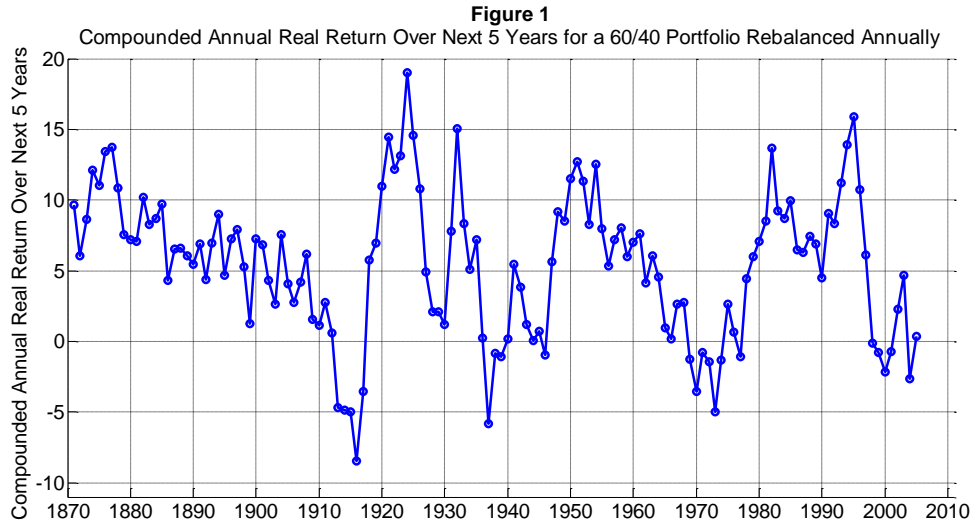
Unnecessarily Charting Progress to a Wealth Accumulation Target in a Sea of Volatility

A very real problem plaguing the traditional retirement planning process, which may not be well recognized, is that it is very difficult to know whether or not you are on track to meeting your retirement expenditure goals or even meeting a wealth accumulation target. Due to the logic of compounding returns, most of a portfolio's growth will occur just before retirement. Kitces (2010) dissects the logic of compounded returns very well, writing:

If there's one thing that has remained certain in this decade of difficulty, it's the gold standard advice for retirement planning: save a healthy amount of your income, start young, invest steadily, and you'll be able to retire when you want to and enjoy the standard of living you hoped and dreamed for. Yet the reality is that this model of retirement planning advice excellence is actually far more speculative than we have ever acknowledged, and might be better summed up as: 'Save for decades, build a base, and then in the last few years, quickly double up your wealth with investment growth and retire happily.' We'd never say that to our clients... yet in truth, that's exactly what we have been recommending all along!

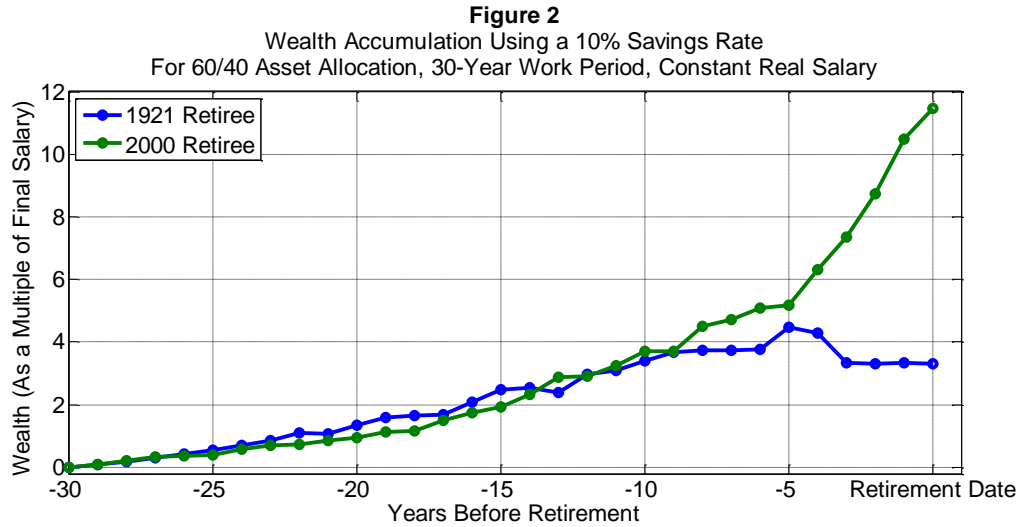
A portfolio earning a fixed 7 percent return, for instance, should double about once every 10 years. With this doubling, our nest eggs really are rather dependent on what happens in financial markets during our final working years. Shiller (2005) earlier touched upon a related idea, having noted a concern with target date funds (which reduce stock allocations as people get older). These funds maintain high stock allocations when people are young and have little saved, and low stock allocations when people are close to retirement and (hopefully) have a much larger portfolio. Basu and Drew (2009) identify this phenomenon as the "portfolio size effect," and argue for this reason that target date funds reduce stock allocations at precisely the wrong time. Most of the portfolio growth will occur late in a worker's career when larger portfolio balances will provide for more capital gains in absolute terms. Lowering stock allocations at this time

causes workers to tragically miss their main opportunity for building wealth through capital gains. Pfau (2011a) examines the same evidence as Basu and Drew (2009), but concludes instead that workers with modest risk aversion may still prefer reduced stock allocations as they approach retirement in order to better avoid the extremely low wealth accumulations that occasionally result from higher stock allocations.



With these considerations, the notion of a progress report toward meeting a wealth accumulation target seems to be based too much on an assumption of constant portfolio returns. This might not be such a bad assumption to get an idea about saving when one is 30 or 40 years from retirement, but it is still always going to be the case that because one is presumably contributing funds throughout her career, the order of returns matters. As well, bad returns early in one's career allow time to save more and recover, but a bad sequence near the end can be a much bigger problem. The specific returns earned in the final few years before retirement play a disproportionate role in determining the final accumulated wealth. But the variation in real returns for a 60/40 portfolio over a period of even 5 years can be very dramatic, hampering efforts for such planning. Figure 1 shows the compounded annual real return over the subsequent 5 years for a 60/40 portfolio over various rolling periods from the historical data. Though the average

compounded annual real return was 5.26 percent, the variation of returns over 5 year intervals is still quite dramatic, ranging from as low as -8.5 percent to as high as 19 percent. Real returns are negative in 21 of the 135 rolling 5 year periods. Given how wildly divergent events can be even in just the final 5 years, how can we know if we are on track for meeting our retirement goals?



My aim is to answer this question, but first suppose you are aiming for a wealth accumulation target at retirement. Just considering how much wealth you have already accumulated is not going to provide an adequate answer for how much you will have at the end. Pfau (2011d) begins with an illustration of this conundrum for two hypothetical individuals who lived and worked at different times in U.S. history. These two individuals each earned a constant real salary over 30 years, and they each contributed 10 percent of their salary at the end of each year to an annually rebalanced savings portfolio divided between 60 percent stocks and 40 percent fixed income. One individual retired in 1921 and the other in 2000. Figure 2 recreates the paths of their wealth accumulations over their respective 30 years of work. The 1921 and 2000 retirees are chosen for having accumulated the least and the most wealth of anyone after a 30-year work period. In comparing these two individuals, the problem with knowing whether one is on track for meeting a wealth accumulation target at a planned retirement date is that either one of them could have hardly had a clue about their upcoming record-breaking statuses even just 5

years before their respective retirements. It was only in the final 5 years that events either went very well or very poorly for these individuals.

Figure 3
Tracking Progress Toward a Wealth Accumulation Target [As a Multiple of Final Salary]
Comparing Real Wealth at Retirement to Real Wealth in Prior Years
For 60/40 Asset Allocation, 30-Year Work Period, 10% Savings Rate, Constant Real Salary

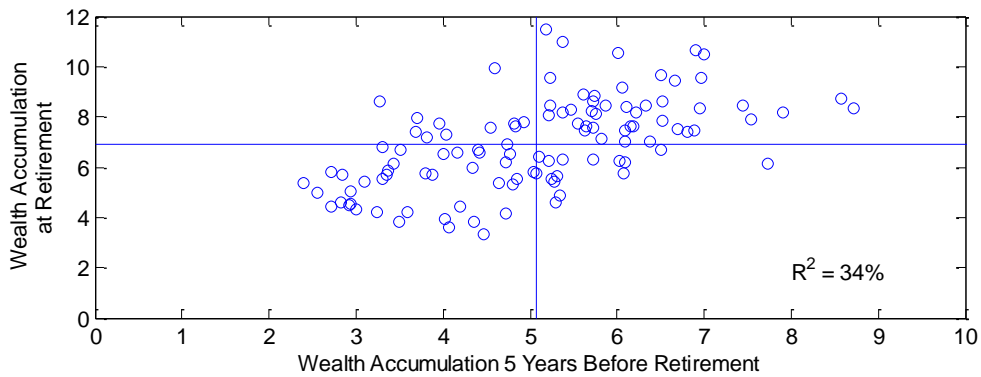
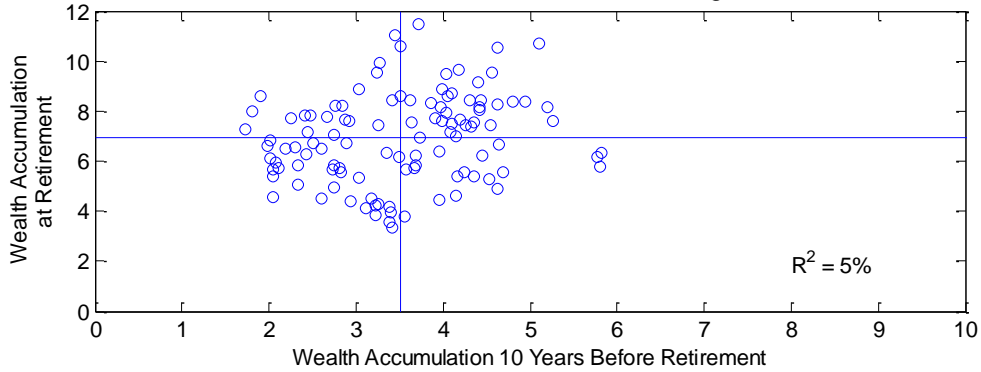


Figure 3 reveals that this lack of predictability is quite general and not an anomaly due to the extreme situation for these two retirees. This figure shows the accumulations for all the hypothetical individuals sharing these characteristics from rolling 30-year periods, comparing what these individuals had accumulated 10 and 5 years prior to retirement with their retirement date accumulation. These numbers are expressed in real terms as multiples of the constant real salary. The blue lines identify the averages. What is important to note in Figure 3 is that a progress report from 10 years before retirement would provide almost no information about the

final wealth accumulation. Only 5 percent of the variation in the final wealth accumulation could be explained by the wealth accumulation 10 years earlier. The remaining 95 percent is explained only by subsequent market events. The largest and smallest wealth accumulations at retirement (the 2000 and 1921 retirees) both hover close to the average wealth accumulation at 10 years prior to retirement. At the same time, those who had accumulated the most at 10 years before retirement actually ended up with slightly less than the average amount at the retirement date, while those who had accumulated the least with 10 years remaining actually ended up with above average wealth accumulations at retirement. At 5 years before retirement, such a progress report is a little more helpful and now a positive relationship between the two accumulations can be better seen. However, it is still the case that the wealth accumulated 5 years before retirement explains only 34 percent of the variation in the final accumulation.

Table 1
Usefulness of a Progress Report For Various Asset Allocations
Percentage of Final Wealth Accumulation at Retirement
Explained by Wealth Accumulation in Prior Years

		Stock Allocation (%)					
		0%	20%	40%	60%	80%	100%
Years Before Retirement	1	97	94	88	81	80	82
	2	91	87	75	63	60	63
	3	84	81	67	54	50	53
	4	78	72	57	43	39	43
	5	72	65	48	34	31	34
	6	66	57	40	28	25	29
	7	61	49	32	21	20	24
	8	53	39	23	13	13	16
	9	48	33	16	8	8	10
	10	43	27	12	5	4	6

Table 1 extends the information from Figure 3 to show the degree of predictability for retirement date wealth provided by varied asset allocations and at various points before retirement. The predictability does improve as retirement approaches. The lower volatility of short-term fixed

income also does allow for more predictive power, which suggests reducing one's stock allocation as a way to lock in a target as it comes into sight (doing this, though, may jeopardize your retirement spending plans). As can generally be seen, progress reports of this nature do not help much in predicting your final wealth. Average long-term returns cannot be applied to short periods, as there is still too much volatility. Not to worry though, as it is actually not so important to meet such a target in the first place. There is another way to think about whether you are on track for a sustainable retirement.

Methodological Framework

I use a historical simulations approach, considering the perspective of mid-career individuals planning for events over the remainder of their life, charting a course which starts from each year in the historical period. I develop a baseline to facilitate discussion, but these assumptions can mostly all be modified to allow for any variety of real world situations. My baseline assumptions include that these individuals wish to make plans for possible survival up to age 100, and tentatively plan to retire at age 65. They earn a constant real salary for each year of employment and contribute their new savings to their portfolio at the end of each working year. In order to track progress toward retirement, I calculate the minimum savings rates that would have been required starting from each year in the historical period in order to accumulate sufficient wealth by age 65 to successfully withdraw one's desired expenditures over the subsequent 35 years. The highest of these minimum necessary savings rates (the worst-case scenario from the historical record thus far) represents the "safe" savings rate for the remainder of one's career. I also consider that people may find their "safe" savings rate to be too high and may instead wish to use a lower savings rate while working longer than originally planned. I calculate how many years one would need to continue working while using a lower savings rate in order to have saved enough funds to finance retirement expenditures over the remainder of the time up to age 100. The term "safe" retirement age could be used in this context.

In the baseline, savings are deposited into an investment portfolio which is allocated 60 percent into large-capitalization stocks (Standard and Poor Composite Stock Price Index) and 40 percent into short-term fixed income assets (annual yield from 6-month commercial paper rates). The data for annual financial asset returns between 1871 and 2009 are from Robert Shiller's website (<http://www.econ.yale.edu/~shiller/data.htm>). Rebalancing occurs annually and the asset allocation remains fixed at all ages. Withdrawals are made at the beginning of each year during retirement. Withdrawal amounts are defined as a replacement rate from final pre-retirement salary. The withdrawal rate this represents is not important in the framework, nor is the actual wealth accumulation when retirement begins. I assume that the baseline individual wishes to replace 50 percent of her final salary with withdrawals from her accumulated wealth. This 50 percent is more than it may initially sound, as it is only the part from retirement savings. Social Security benefits and any other income sources would be added on top of this. As well, after retiring, one no longer has to save for retirement or contribute to Social Security, which increases the replacement rate with respect to what could have been spent before retirement. Withdrawal amounts are adjusted for inflation in subsequent years. There are no taxes or portfolio administrative and planning fees. A particular retirement strategy is successful if withdrawals can be sustained to at least age 100 without the account balance falling below zero.

To provide an example about the historical simulations, consider the situation for someone turning 55 at the start of the year. This person still has 45 years before reaching age 100. Rolling periods beginning between 1871 and 1965 can be considered, which result in 95 hypothetical individuals reaching 100 years old at the start of 1916 through 2010.

Getting 55 Year Olds on Track for a Sustainable Retirement

To illustrate what must still be done before one can reasonably expect a successful retirement, consider someone aged 55 who has accumulated wealth equal to 4 times her salary and who expects her salary to remain constant in real terms for the remainder of her career.

Because of space constraints, this discussion will focus only on 55-year olds. Readers can find tables for individuals aged 35, 45, 50, and 60 as well in Pfau (2011c). The 55 year old plans to maintain a 60/40 asset allocation for the remainder of her life. She also estimates her potential retirement income from Social Security and other pension sources, subtracts these from her desired total retirement spending, and determines that she would like to plan for replacing 50 percent of her pre-retirement salary from her savings. She does not know how long she might live, and she decides that she wants to accumulate enough before retiring to last her at least through age 100. She first has in mind that she will retire in 10 years at age 65, and she wonders what savings rate she will need to use over the next 10 years in order to have saved enough to make possible her planned subsequent 35 years of retirement expenditures.

Figure 4 considers this savings rate for the 95 rolling 45-year periods starting between 1871 and 1965. If she was fortunate to have reached age 55 at times such as the 1870s, the years around 1920, and the late 1940s, then her current 4 salary-multiples of wealth would have proved enough such that she could retire in 10 years without saving any new funds. This does not necessarily mean she could retire at 55, because she may still need the extra 10 years of compounding before retirement, and besides retiring today would require 45 years of withdrawals instead of 35 years. Nonetheless, it is possible, though not likely, that she has already contributed enough to her savings and can rely only on subsequent capital gains. For the most part, though, she should consider that she still has a taxing road ahead to reach a “safe” retirement. Just to have a 50 percent chance for retirement success, she will need to use a savings rate of 18.9 percent over the remaining 10 years. Her “safe” savings rate, which is the highest minimum savings rate from history that would have resulted in sustainability, is 52 percent of her salary for the next 10 years. If she wishes to avoid retiring until she can be fairly confident about her situation, but she is unable to save at such a high rate, then she must face the reality that her goal of retiring in 10 years may not be realistic.

Figure 4
 Minimum Necessary Savings Rates to Make Retiring in 10 Years Sustainable
 For 60/40 Asset Allocation, Current Wealth of 4x Salary, 35-Year Retirement Period, 50% Replacement Rate

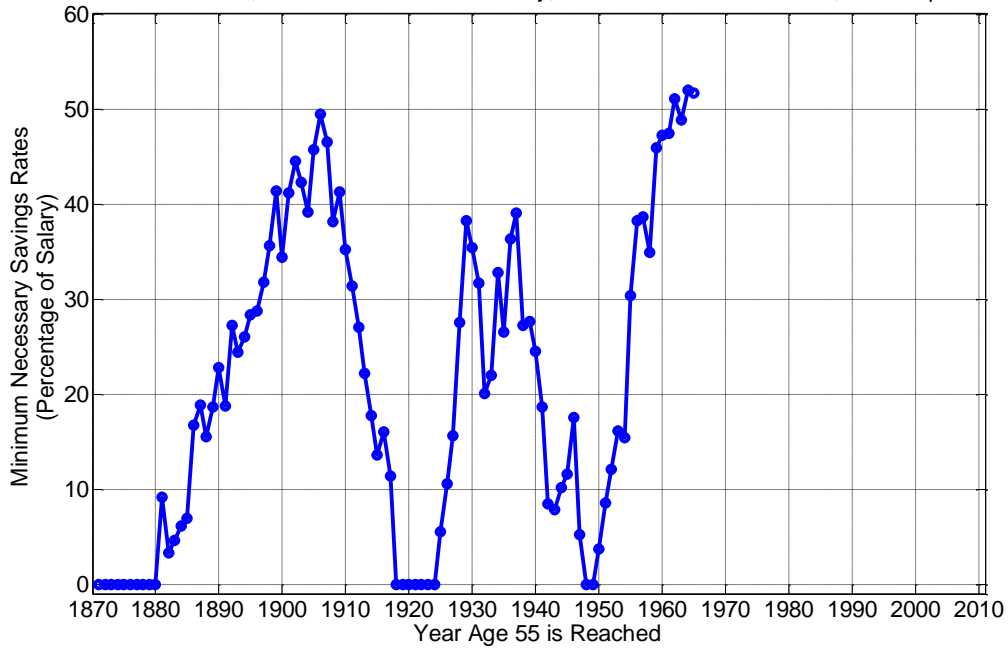
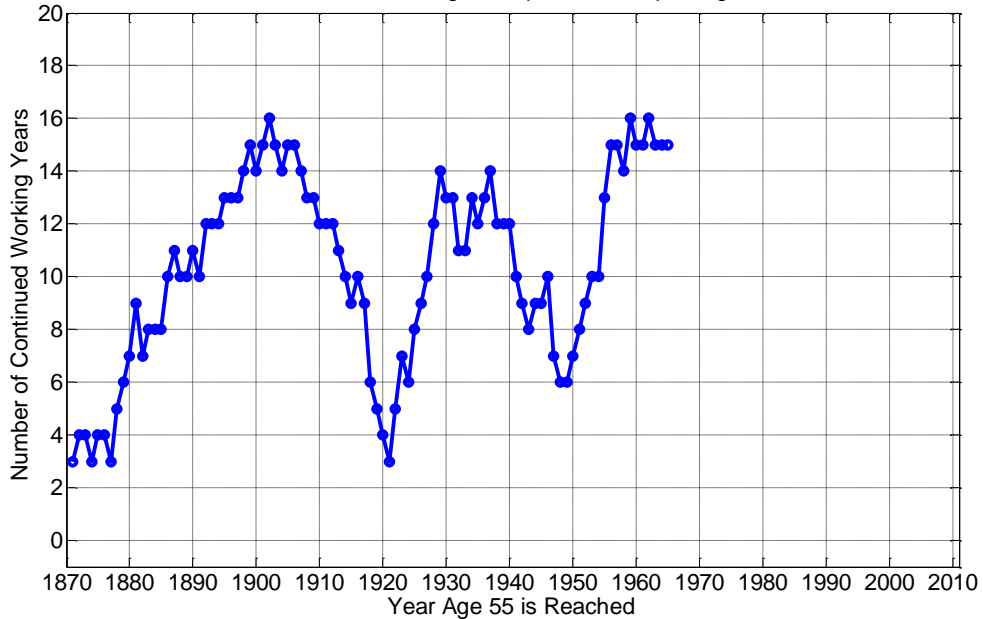


Figure 5
 Minimum Number of Years of Required Continuing Work
 For 60/40 Asset Allocation, 15% Savings Rate, Current Wealth of 4x Salary, 50% Replacement Rate
 55-Year Old Planning for Expenditures up to Age 100



Next, if she thinks that a 15 percent savings rate is all she can bear, she wonders how many more years she will still need to work before having accumulated enough to support her

desired expenditures for the remaining time up to age 100. Figure 5 provides an answer. In 4 of the rolling historical periods, retirement would become feasible in as soon as 3 years, when she turns 58. The median case, which would allow for a sustainable retirement in half of the situations, is 11 years of continued work, allowing for retirement at age 66. To be “safe,” she should consider working until age 71. These solutions (save 52 percent per year for 10 years, or save 15 percent per year for 16 years) provide two of many possible combinations which would have created a “safe” retirement plan in the worst-case scenario from history. Accumulating only 4 multiples of salary by age 55 leads to recommendations that may seem rather harsh, but this should serve as a reality check on what still needs to be done.

Table 2 expands what is shown in Figure 5 to provide the “safe” retirement age for someone aged 55 who is planning for retirement expenditures up to age 100 for a variety of other circumstances with regard to current wealth accumulations, savings rates, stock allocations, and replacement rates. Each part of the table varies one variable against wealth already accumulated at age 55. The first aspect of the table to note is that the current wealth accumulation plays an important role in pushing one toward a sustainable retirement at a younger age. In some cases, the 55 year old is already set to retire. For a 60 percent stock allocation and a 50 percent replacement rate, the first part of the table shows how the “safe” retirement age is impacted by wealth accumulations at 55 and savings rates. For someone without any savings, retirement can still be possible at some point, though even with a 30 percent savings rate, retirement cannot safely begin for 21 years until age 76. In general, the table shows that saving more after age 55 does assist in getting someone closer to a sustainable retirement more quickly. The second part of the table shows that increasing the stock allocation generally helps, but that stocks are also risky and that the differences in retirement ages between 50 percent and 100 percent stock allocations are small. Not letting the stock allocation fall too low is advisable based on this table, as a 55-year old is still planning to maintain their asset allocation choice for another 45 years. A 60/40 asset

allocation is quite competitive. Finally, the last part of the table shows that each incremental increase in the replacement rate has an important impact, and that budgeting to allow for a lower replacement rate in retirement can provide a very viable option to help individuals lower their “safe” retirement age. For instance, by lowering her replacement rate from 50 percent to 30 percent, the baseline individual considered earlier could reduce her retirement age from 71 to 65.

Table 2
The "Safe" Retirement Age Based on Current Wealth Accumulation
For 55 Year Olds Planning for Retirement Expenditures Through Age 100

A) For Various Savings Rates (Assumed 60% Stock Allocation and 50% Replacement Rate)

		Savings Rate Used for Rest of Working Years						
		0	5%	10%	15%	20%	25%	30%
Current Wealth Accumulation (x Salary)	0	100	92	86	82	79	77	76
	2	86	80	77	75	74	72	71
	4	76	74	72	71	69	69	68
	6	70	69	68	67	66	66	65
	8	66	65	65	64	63	63	62
	10	62	61	61	60	60	60	60
	12	59	58	58	58	58	58	57
	14	55	55	55	55	55	55	55

B) For Various Stock Allocations (Assumed 15% Savings Rate and 50% Replacement Rate)

		Stock Allocation						
		0	20%	40%	50%	60%	80%	100%
Current Wealth Accumulation (x Salary)	0	90	86	84	83	82	82	81
	2	87	82	77	76	75	75	74
	4	85	78	73	71	71	70	70
	6	82	75	70	68	67	67	67
	8	81	72	67	65	64	64	65
	10	79	70	64	62	60	61	61
	12	77	68	62	60	58	57	58
	14	75	65	59	57	55	55	55

C) For Various Replacement Rates (Assumed 15% Savings Rate and 60% Stock Allocation)

		Replacement Rates						
		30%	40%	50%	60%	70%	80%	100%
Current Wealth Accumulation (x Salary)	0	77	80	82	84	86	87	89
	2	70	73	75	77	79	81	83
	4	65	68	71	73	75	76	79
	6	60	64	67	69	71	73	76
	8	56	60	64	66	68	70	73
	10	55	57	60	64	66	68	70
	12	55	55	58	61	64	65	68
	14	55	55	55	58	61	63	67

Conclusions

This study outlines a framework for determining if one is on track for a sustainable retirement. The reason this is important, is both because traditional wealth accumulation targets do not provide the most effective framework for retirement planning, and because even if they did, financial market volatility makes it very hard to judge whether we are on track to meeting such targets. As an alternative for judging the fitness of our retirement plans, I extend the framework of Pfau (2011b), which simply integrates the pre-retirement and post-retirement periods to determine which actions should be taken prior to retirement in order to have accumulated enough to afford one's desired retirement expenditures. The answers derive from what would have proved safe in rolling periods of the historical data. The framework was demonstrated for someone aged 55, mixing various facets of a retirement plan to provide "safe" savings rate and retirement age guidelines.

This investigation does not incorporate all the necessary details about judging the feasibility of a retirement plan. First, a lot of thought must go into choosing a replacement rate: how the retirement age interacts with Social Security, Medicare, and other pensions, whether retirement spending should adjust with inflation, and how to account for unexpected expenditures. In subsequent research, annuities must also be incorporated to present a more complete picture about retirement possibilities, as well as the possibility that individuals may leave to leave bequests. Another concern is administrative fees and whether individuals will use an investment strategy that matches the returns on the indices used as part of this research. Retirees who can outperform these indices, perhaps by diversifying into other assets which could not be incorporated due to the lack of sufficient historical data, may more easily find safety. But it is more likely that many retirees will not choose investments that are able to match these index returns, at least after fees are deducted, and will find that the numbers here underestimate what will be needed. Further, many investors will not keep the same asset allocation over their lifetime,

and will wish to use lifecycle asset allocation strategies which reduce the asset allocation based on age. Table 2 may show some unrealistic retirement ages for people who would be unable to maintain their jobs for so long. However, such impractical retirement ages should really just serve as a wake-up call about the unrealistic nature of one's current plans. Hopefully, this framework can help contribute to strengthening the retirement planning process.

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