Practice Management

Retirement Planning by Targeting Safe Withdrawal Rates

by David M. Zolt, CFP®, EA, ASA, MAAA

Financial advisers frequently find themselves in situations where traditional safe withdrawal rates do not apply. For example, what is a safe withdrawal rate for an 80-year-old client? What about for a client with Social Security or defined benefit pension entitlement that has not yet commenced? This article provides withdrawal rates for a variety of scenarios from which advisers can select based on the desired probability of success. And a new retirement income planning technique is presented that uses these withdrawal rates, eliminating the need to perform complex Monte Carlo simulations for each client.

3 Ways to Think about Safe Withdrawal Rates

Traditional safe withdrawal rates. Two decades have passed since the original safe withdrawal rate studies appeared (most notably, Bill Bengen's seminal article, "Determining Withdrawal Rates Using Historical Data," published in the October 1994 issue of this *Journal*). During the first decade, studies assumed portfolio withdrawals would increase each year in lockstep with inflation, regardless of portfolio performance. I refer to this approach as traditional safe withdrawal rates (TSWRs).

Using historical data from 1926 to 2013 and running Monte Carlo simulations of 100,000 iterations each with normal distributions[1], showed that the probability of success over 30 years of an initial withdrawal rate of 4 percent with future increases equal to inflation thereafter is 95 percent. Increasing the initial withdrawal rate to 5 percent reduces the success probability to 82 percent. An initial withdrawal rate of 6 percent has a success probability of 61 percent. Success is defined as making it to the end of the retirement duration with at least one dollar in the portfolio.

The Target Percentage Adjustment. During the most recent decade, researchers challenged the notion of withdrawal amounts that automatically track inflation regardless of portfolio performance. For example, my January 2013 *Journal* article, "Achieving a Higher Safe Withdrawal Rate with the Target Percentage Adjustment," demonstrated that initial withdrawal rates 50 percent higher than traditional safe withdrawal rates can be achieved with the same probability of success by using a dynamic withdrawal strategy called the

Target Percentage Adjustment (TPA).

The TPA approach establishes a target withdrawal rate for each year of retirement, and each year, portfolio performance is measured by comparing the actual withdrawal rate to the target. If the actual withdrawal rate exceeds the target percentage, the target percentage test is failed and no increase in the withdrawal amount is taken in that year—it remains the same as the prior year. If the actual withdrawal rate is less than the target percentage, the target percentage test is passed, and the withdrawal amount for that year is equal to the prior year withdrawal amount increased by inflation.

The probability of success over 30 years of an initial withdrawal rate of 6 percent using TPA is 94 percent. Increasing the initial withdrawal rate to 7 percent reduces the success probability to 82 percent. An initial withdrawal rate of 8 percent has a success probability of 61 percent. These probabilities of success are significantly more favorable than TSWRs; however, these higher initial withdrawal rates come with the risk of loss of future purchasing power by virtue of potential skipped inflation increases.

Table 3:	Case Study 2: When Can I Retire?						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Investment portfolio	$650,000	$704,450	$762,167	$823,347	$888,198	$956,940	$1,029,806
Annual savings	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	
Portfolio return (6%)	$39,450	$42,717	$46,180	$49,851	$53,742	$57,866	
Joe's age	62	63	64	65	66	67	68
Jane's age	62	63	64	65	66	67	68
Retirement income							
Joe's Social Security	$21,600	$23,040	$24,960	$26,880	$28,800	$31,104	$33,408
Jane's Social Security	$10,800	$11,520	$12,480	$13,440	$14,400	$15,552	$16,704
Total (A)	$32,400	$34,560	$37,440	$40,320	$43,200	$46,656	$50,112
Living expenses including taxes (B)	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000
Amount needed from portfolio (B – A)	$47,600	$45,440	$42,560	$39,680	$36,800	$33,344	$29,888
Percent of portfolio	7.3% poor	6.5% poor	5.6% borderline	4.8% very good	4.1% excellent	3.5% superb	2.9% superb

Case Study 1: Already Retired

Hank and Donna are each 63 years old and retired. Hank's Social Security is $2,000 a month, and Donna's is $1,000 a month. Hank receives a defined benefit pension of $1,000 a month (all benefits are currently in pay status). Their portfolio is $650,000, and their annual living expenses including income taxes are $85,000.

They receive a total annual defined benefit retirement income of $48,000 (12 multiplied by the sum of $2,000 + $1,000 + $1,000). Therefore, $37,000 ($85,000 – $48,000) of their annual living expenses must be withdrawn from their portfolio. This amount represents an annual withdrawal of 5.7 percent of their portfolio per year ($37,000 ÷ $650,000).

Whether 5.7 percent is considered a safe withdrawal rate depends upon whether or not the clients intend to increase their portfolio withdrawals each year in the future to keep up with inflation. If they do, then the TSWRs lookup in Table 2 indicates that the probability of their portfolio surviving for 30 years is poor. However, if they are willing to skip inflation increases in years when their withdrawal amount fails the target percentage test, then the TPA lookup in Table 2 indicates the chances of their portfolio surviving 30 years are superb. If they intend to follow the TPA 3 percent approach, their prospects are very good.

Case Study 2: When Can I Retire?

Joe, 62, is married to Jane, also 62. Joe is employed and the couple want to know when Joe can retire with confidence that they will not outlive their $650,000 portfolio. Annual living expenses including income taxes in retirement are expected to be $80,000. They both plan on starting Social Security when Joe retires. They expect to increase their portfolio withdrawals by inflation each year in the future.

Table 3 shows seven alternative scenarios of Joe retiring this year or each of the next six years. The calculation methodology for each column in Table 2 is the same for Case Study 1. The six-year portfolio projection shown in the first three lines is a simple roll forward calculation assuming annual retirement savings of $15,000 and a 6 percent portfolio return.

The bottom two rows of Table 3 indicate Joe's retirement date prospects. Note that their living expenses are not assumed to increase during the projection period, but this modification can easily be made as you will see in the next case study.

To improve the probability of not outliving their portfolio, the usual planning options apply to Joe and Jane (as well as Hank and Donna in Case Study 1), including lowering their living expenses and/or income taxes and adjusting their portfolio.

Case Study 3: Pivot Age

Bill is age 60 and employed. Mary is age 58. Bill's Social Security benefit payable at age 62 is $2,000 a month. Mary's Social Security benefit payable at age 62 is $1,000 a month. Bill and Mary would like to start Social Security benefits as soon as possible after Bill's retirement. Bill has a defined benefit pension of $1,000 a month beginning at age 65 with no early commencement option. They currently save $15,000 per year for retirement and expect to increase that amount by 2 percent per year in the future. Their portfolio is $650,000, and annual living expenses including income taxes in retirement are expected to be $80,000, which they assume will increase by 2 percent per year. They expect to increase their portfolio withdrawals by inflation each year in the future. Bill and Mary want to know when they can retire safely.

What makes their situation different from the first two case studies is that all of their defined benefit retirement income does not commence until five years from now when Bill's pension begins. Although we can calculate their withdrawal rate prior to the commencement of their defined benefit retirement income, we cannot use this metric to compare to the various tables presented in this article to determine their probability of success. We need to project their portfolio to the first date on which

Table 4:	Case Study 3: Pivot Age (Retire in 2018)					
	2014	**2015**	**2016**	**2017**	**2018**	**2019**
Investment portfolio	$650,000	$704,450	$762,476	$824,299	$890,152	$893,888
Annual savings (2%)	$15,000	$15,300	$15,606	$15,918		
Annual withdrawals					($46,862)	
Portfolio return (6%)	$39,450	$42,726	$46,217	$49,935	$50,597	
Bill's age	60	61	62	63	64	65
Mary's age	58	59	60	61	62	63
Retirement Income						
Bill's Social Security	-	-			$27,733	$27,733
Mary's Social Security	-	-	-	-	$12,000	$12,000
Bill's pension	-	-	-	-	-	$12,000
Total (A)	-	-			$39,733	$51,733
Living expenses including taxes (B)	$80,000	$81,600	$83,232	$84,897	$86,595	$88,326
Amount needed from portfolio (B – A)	$80,000	$81,600	$83,232	$84,897	$46,862	$36,593
Percent of portfolio						4.1% excellent

all of their defined benefit retirement income can or will commence in order to use the withdrawal rates presented here. I call this age their pivot age.

A five-year projection of Bill and Mary's portfolio, assuming Bill retires today, indicates an 8.6 percent withdrawal rate at their pivot ages in 2019. This projection assumes that for each of the next five years, the couple will withdraw from their portfolio their living expenses less Social Security. An 8.6 percent withdrawal rate is not sustainable; Bill and Mary need to look at retiring at a later date (see the online appendix at www.FPAJournal.org for tables illustrating this scenario).

However, as shown in Table 4, if Bill works until age 64 and the couple continues to save toward retirement, they can retire safely in 2018. In 2019, their portfolio at their pivot ages (65 for Bill and 63 for Mary) is expected to be $893,888. After receiving $51,733 in defined benefit retirement income, they will need to withdraw $36,593 per year to pay the remaining portion of their projected $88,326 annual living expenses. This withdrawal amount is projected to be 4.1 percent of their portfolio, which is excellent.

If Bill and Mary's portfolio today is $350,000 instead of $650,000, using

the same projection methodology, we anticipate that if Bill retires at age 64, the couple's portfolio withdrawal rate will be 7.4 percent at their pivot ages. Because this withdrawal rate is not likely to sustain their portfolio for a 30-year retirement, we need to evaluate the feasibility of retiring later. By illustrating five scenarios of retirement at the beginning of years 2019, 2020, 2021, 2022, and 2023, (see the online appendix) the projection indicates that Bill and Mary will probably not be able to safely retire until 2021.

Conclusion

By using lookup tables of safe withdrawal rates, the need to perform complex and cumbersome Monte Carlo simulations is eliminated. I recommend the analysis presented in this article be updated annually and in the event of significant life changes, including retirement or death of a spouse.

I have been using lookup tables for two years, and client response has been very favorable. This simple technique results in a one-page tabular display that clients can easily understand. Better client understanding results in better client buy in, which in turn results in better client compliance to the retirement plan, more client empowerment,

and more overall satisfaction with the financial planning process.

Clients are no longer overwhelmed and baffled by pages and pages of statistical data. They look at one-page; they get it; they accept it; and we move on to discuss other topics knowing that their most pressing concern has been addressed. ∎

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Endnotes

1. The model portfolio assumes 40 percent large-cap stocks, 10 percent small-cap stocks, and 50 percent intermediate-term government bonds with annual rebalancing. The allocation between large-cap and small-cap was selected to simulate the total U.S. stock market. Historical 1926 to 2013 data were taken from the *Ibbotson® SBBI® Classic Yearbook*. Monte Carlo simulations of 100,000 iterations each with normal distributions were performed using @RISK, an Excel add-in. Note that all withdrawal rate tables in the article are based on a 50/50 stock/bond allocation. Additional withdrawal rate tables based on five different asset allocations can be found at www.RetireSoft.com/WithdrawalRates.

Retirement Planning by Targeting Safe Withdrawal Rates
Online Appendix

Tables A1, A2, and A3 show the probability of success for initial withdrawal rates from 3 to 10 percent in half-percent increments over retirement durations of 10 to 40 years in five-year increments for the three methods discussed in the article (traditional safe withdrawal rates, the Target Percentage Adjustment, and the Target Percentage with 3% Maximum Adjustment).

Tables A1, A2, and A3 are based on a model portfolio of 40 percent large-cap stocks, 10 percent small-cap stocks, and 50 percent intermediate-term government bonds with annual rebalancing. The allocation between large-cap and small-cap was selected to simulate the total U.S. stock market. Historical 1926 to 2013 data were taken from the *Ibbotson® SBBI® Classic Yearbook*. Monte Carlo simulations of 100,000 iterations each with normal distributions were performed using @RISK, an Excel add-in.

Withdrawal rates based on other portfolio allocations are available at
www.RetireSoft.com/WithdrawalRates.

Table A1
Traditional Safe Withdrawal Rates

Initial Withdrawal Rate	Probability of Success Retirement Duration (Years)						
	10	15	20	25	30	35	40
3.0%	100%	100%	100%	100%	99%	99%	98%
3.5%	100%	100%	100%	99%	98%	96%	95%
4.0%	100%	100%	100%	98%	95%	92%	89%
4.5%	100%	100%	99%	95%	90%	85%	80%
5.0%	100%	100%	96%	89%	82%	75%	70%
5.5%	100%	99%	93%	82%	72%	64%	58%
6.0%	100%	98%	87%	73%	61%	52%	46%
6.5%	100%	95%	79%	62%	49%	41%	35%
7.0%	100%	91%	69%	51%	38%	31%	26%
7.5%	100%	85%	59%	40%	29%	22%	18%
8.0%	99%	78%	48%	30%	20%	15%	12%
8.5%	98%	69%	37%	22%	14%	10%	8%
9.0%	97%	59%	28%	15%	9%	6%	5%
9.5%	94%	48%	20%	10%	6%	4%	3%
10.0%	90%	39%	14%	6%	4%	2%	2%

95% or better	80% to 84%
90% to 94%	50% to 69%
85% to 89%	49% or less

Table A2
Target Percentage Adjustment

Initial Withdrawal Rate	Probability of Success Retirement Duration (Years)						
	10	15	20	25	30	35	40
3.0%	100%	100%	100%	100%	100%	100%	100%
3.5%	100%	100%	100%	100%	100%	100%	100%
4.0%	100%	100%	100%	100%	100%	100%	100%
4.5%	100%	100%	100%	100%	100%	99%	99%
5.0%	100%	100%	100%	99%	99%	98%	97%
5.5%	100%	100%	100%	99%	97%	95%	93%
6.0%	100%	100%	99%	97%	94%	91%	87%
6.5%	100%	100%	98%	94%	89%	84%	78%
7.0%	100%	99%	95%	89%	82%	75%	68%
7.5%	100%	98%	91%	82%	72%	64%	56%
8.0%	100%	97%	85%	72%	61%	51%	42%
8.5%	100%	94%	78%	62%	49%	39%	31%
9.0%	100%	89%	69%	51%	37%	28%	20%
9.5%	99%	83%	58%	40%	27%	19%	13%
10.0%	98%	76%	48%	30%	19%	13%	9%

- 95% or better
- 90% to 94%
- 85% to 89%
- 80% to 84%
- 50% to 69%
- 49% or less

Table A3
Target Percentage With 3% Maximum Adjustment

Initial Withdrawal Rate	Probability of Success Retirement Duration (Years)						
	10	15	20	25	30	35	40
3.0%	100%	100%	100%	100%	100%	100%	100%
3.5%	100%	100%	100%	100%	100%	99%	99%
4.0%	100%	100%	100%	100%	99%	98%	97%
4.5%	100%	100%	100%	99%	98%	96%	94%
5.0%	100%	100%	99%	98%	95%	92%	88%
5.5%	100%	100%	98%	95%	90%	85%	80%
6.0%	100%	100%	96%	90%	83%	76%	69%
6.5%	100%	99%	93%	83%	73%	65%	57%
7.0%	100%	97%	87%	74%	62%	53%	45%
7.5%	100%	95%	80%	64%	51%	41%	34%
8.0%	100%	91%	70%	52%	39%	30%	23%
8.5%	100%	85%	60%	41%	29%	21%	16%
9.0%	99%	78%	49%	31%	20%	13%	10%
9.5%	98%	69%	39%	22%	13%	9%	6%
10.0%	96%	60%	29%	15%	8%	5%	3%

- 95% or better
- 90% to 94%
- 85% to 89%
- 80% to 84%
- 50% to 69%
- 49% or less

Table A4 shows a five-year projection of Bill and Mary's portfolio to their pivot ages (65 for Bill, and 63 for Mary) in 2019 assuming Bill retires today. The portfolio projection in the upper portion of Table A4 assumes that, for each of the next five years, the couple will withdraw from their portfolio their living expenses less their Social Security. At the end of the five-year projection (the last column in Table A4), their portfolio is expected to be $467,170. After receiving $48,000 in defined benefit retirement income, they will need to withdraw $40,326 per year to pay the remaining portion of their projected $88,326 annual living expenses. This withdrawal amount is projected to be 8.6 percent of their $467,170 portfolio. Since this withdrawal rate is not sustainable, Bill and Mary need to look at retiring at a later date. Table 4 in the article shows Bill retiring in 2018 at age 64.

Table A4
Case Study 3 – Pivot Age (Retire in 2014)

		2014	2015	2016	2017	2018	2019
Investment Portfolio		650,000	604,200	553,956	524,407	491,321	467,170
Annual Savings							
Annual Withdrawals		(80,000)	(81,600)	(59,232)	(60,897)	(50,595)	
Portfolio Return	6%	34,200	31,356	29,683	27,811	26,444	
Age Bill		60	61	62	63	64	65
Mary		58	59	60	61	62	63
Retirement Income							
Bill's Social Security		-	-	24,000	24,000	24,000	24,000
Mary's Social Security		-	-	-	-	12,000	12,000
Bill's Pension		-	-	-	-	-	12,000
Total Retirement Income (A)		-	-	24,000	24,000	36,000	48,000
Living Expenses Including Taxes (B)	2%	80,000	81,600	83,232	84,897	86,595	88,326
Amount Needed from Portfolio (B - A)		80,000	81,600	59,232	60,897	50,595	40,326
Percent of Portfolio							**8.6%**
							Poor

Assuming instead that Bill and Mary's portfolio today is $350,000, Table A5 illustrates five scenarios of retirement in years 2019, 2020, 2021, 2022, and 2023. The projection indicates that they will probably not be able to safely retire until 2021.

Note that if retirement occurs before the pivot age (Tables 4 and A4), only one scenario can be displayed on a page. However, multiple scenarios can be displayed on a single page for retirement scenarios on and after the pivot age (Tables 3 and A5).

Table A5
Case Study 3 – Pivot Age (Retire in 2019, 2020, 2021, 2022, or 2023)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Investment Portfolio		350,000	386,450	425,396	466,994	511,409	558,817	609,404	663,368	720,917	782,274
Annual Savings	2%	15,000	15,300	15,606	15,918	16,236	16,561	16,892	17,230	17,575	17,926
Annual Withdrawals											
Portfolio Return	6%	21,450	23,646	25,992	28,497	31,172	34,026	37,071	40,319	43,782	47,474
Age Bill		60	61	62	63	64	65	66	67	68	69
Mary		58	59	60	61	62	63	64	65	66	67
Retirement Income											
Bill's Social Security		-	-	-	-	-	29,867	32,000	34,560	37,120	39,680
Mary's Social Security		-	-	-	-	-	12,800	13,867	14,933	16,000	17,280
Bill's Pension		-	-	-	-	-	12,000	12,000	12,000	12,000	12,000
Total Retirement Income (A)		-	-	-	-	-	54,667	57,867	61,493	65,120	68,960
Living Expenses Including Taxes (B)	2%	80,000	81,600	83,232	84,897	86,595	88,326	90,093	91,895	93,733	95,607
Amount Needed from Portfolio (B - A)		80,000	81,600	83,232	84,897	86,595	33,660	32,226	30,402	28,613	26,647
Percent of Portfolio							**6.0%**	**5.3%**	**4.6%**	**4.0%**	**3.4%**
							Poor	**Poor**	**Very Good**	**Superb**	**Superb**