

THE 4% RULE: WITHDRAWAL RATES IN REVIEW

by Tom Dodd, CFA

Executive Director, Pavilion Advisory Group Inc.

With the demise of defined benefit plans and ascendancy of defined contribution plans, participants not only must make decisions regarding investment strategy, but also they must decide on a withdrawal strategy once they retire. This can be agonizing especially given evidence that most baby boomers have under-saved for retirement. Retirees will want to withdraw as much as possible in order to support their pre-retirement lifestyle. However, resources may fall short of maintaining this lifestyle. The danger is that retirees fail to develop a comprehensive withdrawal strategy, withdraw too much money early in retirement and then fall short of resources later in life. Increased life expectancies have exacerbated this risk.

There are many variables to consider when designing a comprehensive withdrawal strategy; among them are the following:

- Payout period—factoring mortality into the strategy;
- Fixed or variable periodic payments;
- Whether an annuity should be part of the withdrawal strategy;
- Asset allocation—fixed or adaptive;
- Asset diversification; and
- Inflation protection.

Much has been written on the subject of withdrawal rates although the earliest studies most frequently cited by practitioners date to 1994. William Bengen wrote an article published in the October 1994 edition of the *Journal of Financial Planning* (“*Determining Withdrawal Rates Using Historical Data*”) that at the time was groundbreaking. Bengen described a methodology for developing a

withdrawal rate that had a high probability of avoiding failure (running out of money). The parameters that Bengen used in the study helped define future research on the subject:

- Historical investment returns were used instead of long-term averages. This was a significant change from prior practice. Larry Bierwirth published an article earlier in 1994 (“*Investing for Retirement: Using the Past to Model the Future*”) highlighting the flaws of using long-term averages to model long-term investment returns.
- Multiple time periods were examined using a deterministic model incorporating actual investment returns starting in 1926.
- An initial withdrawal rate was determined and adjusted annually (both up and down) for inflation. Other than the inflation adjustment, no changes in the withdrawal rate were made.
- Five asset allocations were modeled using a blend of large cap equities and intermediate-term Treasuries. The asset allocation did not change over the withdrawal period.
- Four initial withdrawal rates were modeled: 3%, 4%, 5% and 6%.

In his analysis, Bengen pointed out what has since become known as “sequence risk”: returns in the early years of retirement play an outsized role in determining wealth in later years. He also highlighted the dangers of a mid-course change in withdrawal strategy. Bengen arrived at the following conclusions:

- An initial withdrawal rate of 4% would last at least

50 years in most of the scenarios with the shortest period before wealth depletion being 33 years. Four percent is the “sweet spot.” A 3% withdrawal rate was deemed too conservative whereas 5% and 6% rates experienced many periods when wealth depletion occurred quickly (less than 20 years).

- The optimum asset allocation was between 50% and 75% equity.

Bengen went on to publish two more papers elaborating on his initial work, with similar parameters and conclusions:

- He defined a safe withdrawal rate as “the highest initial withdrawal rate that guarantees 30 years of portfolio longevity for all retirement dates.”
- The equity allocation was reduced by one percent per year during the withdrawal period (the infancy of the “glidepath”).
- The initial safe withdrawal rate was determined to be 4.1%.
- When 30% U.S. small-cap stocks were included in the equity allocation, the safe withdrawal rate increased to 4.3%.

Bengen’s work became known as the “4% Rule” and quickly caught the attention of brokers and financial planners, who frequently cited Bengen’s paper as the basis for withdrawal strategy recommendations.

The next step in the evolution of withdrawal rates was the work of Jonathan Guyton who, in 2004, published “*Decision Rules and Portfolio Management for Retirees: Is the ‘Safe’ Initial Withdrawal Rate Too Safe?*”. Guyton modified Bengen’s definition of a safe initial withdrawal rate as the maximum initial withdrawal rate that does not violate three conditions:

- Never requires a reduction in withdrawals;
- Allows increases in withdrawals each year to protect against inflation; and
- Allows the first two conditions to stand for a

minimum of 40 years.

Unlike Bengen who tested 51 different multi-year periods, Guyton only looked at one period, from 1973 through 2003. Guyton considered this to be the perfect storm for testing withdrawal rates: (1) bear market at the onset of the retirement; (2) high inflation concurrent with the initial bear market; and (3) a second bear market toward the end of the 30-year period.

Guyton added further diversification to the equity portfolios, expanding to six different equity asset classes and investment styles. He modeled two asset allocations: 60% equities and 80% equities. The result was that the safe initial withdrawal rate that satisfied Guyton’s criteria was 4.4% for the 60% equity portfolio and 4.7% for the 80% portfolio.

Guyton then went on to develop several rules to curb the annual inflationary adjustment in cases where investment results were poor or inflation was high. These “curbs” resulted in a substantial increase in the safe initial withdrawal rate. For the 60% equity allocation, the rate went from 4.4% to as high as 5.8% and for the 80% allocation the rate went from 4.7% to 6.2%.

Two years after Guyton’s first paper, he and a colleague, William Klinger, teamed up and published “*Decision Rules and Maximum Initial Withdrawal Rates*.” This paper was enhanced by moving from a deterministic analysis to a stochastic approach. With it, the authors introduced two new metrics of success: (1) the probability of maintaining the initial withdrawal rate for at least 40 years; and (2) the percentage of purchasing power maintained during the withdrawal period.

They also modified the “curbs” by instituting a “capital preservation rule” and a “prosperity rule” that act as “guardrails” to prevent failure when markets are poor and to provide reward in robust markets.

The results of this approach showed that with a 65% equity allocation, an initial withdrawal rate of 5.3% could be sustained over a 40-year period with a 99% chance of success (5.6% with an 80% equity allocation). If the

retiree is willing to live with a 95% chance of success, the initial withdrawal rates increase to 5.5% with a 65% equity allocation and 6.2% with an 80% equity allocation. With these withdrawal rates, approximately 100% of the initial purchasing power was maintained over the withdrawal period.

Now enter William Sharpe and two colleagues (Jason Scott and John Watson) who in a 2008 paper (“The 4% Rule—At What Price”) debunk the 4% Rule and all of its siblings. They argue rather persuasively that “supporting a constant spending plan using a volatile investment policy is fundamentally flawed.” A retiree using a constant spending plan as a withdrawal strategy faces two risks: (1) the risk of failure should investments underperform; and (2) the risk of surpluses and overpayments should investments outperform. (Note that Sharpe and his colleagues did not mention another source of volatility, mortality.)

The paper identifies a means to eliminate the surplus and overpayment risk through a rather complex options strategy. The paper goes on to propose that retirement spending be developed from a series of utility functions based on the retiree’s spending preferences. However, the authors conclude that these investment and spending strategies are not ready for retail consumption. Much more work needs to be done.

On a side note, the authors looked at glidepath investment strategies and found that the failure rates were higher for glidepath strategies than constant-mix investment strategies. With a glidepath, poor early returns were locked in as the portfolio took risk off the table whereas constant-mix strategies allowed the portfolio to rebound when investment results turned positive.

The final article for discussion was published in the Financial Analysts Journal in Q4 2017 (“*Reducing Sequence Risk Using Trend Following and the CAPE Ratio*”). This article demonstrates the theoretical basis for sequence risk and develops investment strategies to soften its effect and, ultimately, enhance the withdrawal rate.

The leap forward in this paper is that it expands the concept of “adaptive” rules. Recall Guyton who developed rules or “guardrails” to adapt the withdrawal rates to changed circumstances. In this paper, instead of adapting the withdrawal rates, the authors propose to adapt the asset allocation. In other words, they have introduced a form of “market timing” into the withdrawal strategy. The adaptive rules are:

- Apply a trend-following filter to the equity allocation; and
- Use equity valuation measures, specifically the CAPE (cyclically adjusted price-to-earnings) ratio to inform the equity allocation.

The authors concluded that these two adaptive tools reduced sequence risk and enhanced withdrawal rates.

Conclusion

Since the publication of Bengen’s first article 23 years ago, the research has trended in one direction: initial withdrawal rates have increased. The 4% Rule is too conservative. However, is the desired result driving the research? In a world where retirees have not saved enough, is the research merely justifying what we want to hear? Higher withdrawal rates would bail out those under-savers.

Mortality risk, or more accurately, longevity risk largely has been ignored. All of the articles have used rather arbitrary fixed withdrawal periods, assuming that a 30- or 40-year withdrawal period will adequately cover longevity risk. However, there is no evidence, other than citing life expectancies, that this is the case. Clearly, more work needs to be done on longevity. One possibility is adding an annuity to the withdrawal strategy.

The research suggests that retirees should maintain high equity exposure during retirement. This flies in the face of current thinking that investors should reduce risk as they age. Should the use of target date solutions be re-examined?

Finally, the use of “adaptive” strategies, whether applied to withdrawal rates, the asset allocation or both, seems to improve outcomes. “Set it and forget it,” strategies are not supported by the research. However, adaptive strategies come with their own risks, i.e., having the courage to implement the strategies in the face of market trends to the contrary.

The 4% Rule has gone through several iterations since Bengen’s 1994 paper, although it is still widely used. The volume of research adds comfort that 4% should be a “safe” minimum withdrawal rate, but issues remain and more research needs to be completed.

Inquiries or comments concerning this article may be addressed to:



Thomas H. Dodd, CFA, CAIA, FSA

Executive Director,

Pavilion Advisory Group Inc.

tdodd@pavilioncorp.com

GENERAL DISCLOSURE: This material contains proprietary and confidential information of Pavilion Advisory Group Inc. (“Pavilion”) and is intended for the exclusive use of the parties to whom it is provided. The opinions contained within this document are those of Pavilion and is subject to change based on changes in the firm’s opinions and other factors such as changes in market or economic conditions. Pavilion has relied on the use of third-parties in the preparation of this material. While we believe our sources to be reliable, we cannot be liable for third-party errors or omissions. The information should not be construed as an offer to sell or the solicitation of an offer to buy any security and does not constitute investment advice.

The content herein is intended solely for the recipient and not for broader distribution. Investing involves risk, including the loss of principal invested. Past performance is no guarantee of future results. You should carefully review and consider the applicable prospectus or other offering documents prior to making any investment.

Pavilion Advisory Group is a registered trademark of Pavilion Financial Corporation used under license by Pavilion Advisory Group Ltd. in Canada and Pavilion Advisory Group Inc. in the United States. Pavilion Advisory Group Inc. is a U.S. based investment adviser registered with the U.S. Securities and Exchange Commission. Pavilion Advisory Group Ltd., our Canadian affiliate, is an investment advisor registered with the securities commissions of various Canadian provinces.

© 2017 Pavilion Financial Corporation. All rights reserved.