

Understanding Safe Withdrawal Rates

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The origins of the current body of knowledge on safe withdrawal rates date to the work of Bill Bengen and his seminal article in the *Journal of Financial Planning*.¹

Bengen began with a fairly straightforward premise, drawing on an article earlier that year by Larry Bierwirth²—that is, instead of using historical average rates of return, what if we analyzed the sustainability of retirement spending by looking at actual historical sequences of returns.

Average vs. Actual Returns

Most financial planners have seen some version of the long-term return charts produced by Ibbotson Associates, and other similar sources, indicating that the long-term returns of large-cap equities and intermediate-term bonds are approximately 10 percent and 5 percent, respectively (give or take about 0.5 percent depending on the source of the data, with an additional 2 percent or so of upside for small-cap equities). With long-term average inflation of about 3 percent, the effective historical real returns on large-cap equities and intermediate-term bonds are approximately 7 percent and 2 percent, respectively. In fact, these long-term historical return and inflation rates underlie the assumptions that most financial planners use in both portfolio design and retirement and insurance needs projections.

However, the reality is that even over periods as long as 30 years, the total real return of a balanced portfolio of stocks and bonds can vary significantly from the average. For instance, figure 1 shows the rolling 30-year real (inflation-adjusted) returns of a 60/40 stocks/bonds portfolio.

FIGURE 1: 30-YEAR ROLLING REAL RETURNS OF 60/40 PORTFOLIO



Even over periods as long as 30 years, the real returns of balanced portfolios have ranged from less than 3 percent to more than 8 percent, and in the past century they still have ranged widely from approximately 3.5 percent to 6.5 percent. Compounded over 30 years, a range of 3-percent annualized returns can add up to a significant amount of money.

Return Sequencing

As figure 1 shows, some “shortened” periods of time (of “only” 30 years) may have average returns that differ from the ultra-long-term average (i.e., clearly not every 30-year period in history has the same annualized compound rate of return as the entire past 100+ years). In addition, though, the order of returns in individual years also can have a significant impact on the success over the entire retirement time period.

For example, the historical period from 1969 to 1999 experienced average

annual compound inflation of 5.33 percent (based on headline CPI), stock growth of 13.39 percent (based on the S&P 500), and bond return of 8.62 percent (based on intermediate government bonds). If we use these average rates of return to project how much spending a client could safely engage in (assuming a starting account balance of \$1 million), we would find that the client could spend more than \$74,000 in the first year, then adjust that amount upward each year for inflation and still survive the entire time period. The success is due primarily to the fact that this time period experienced above-average returns (notwithstanding the higher average inflation) with an incredible bull market from 1982 to 1999 (see figure 2).

However, if a client really began retirement in 1969 with an initial withdrawal rate of 7.4 percent and experienced the actual sequence of stock, bond, and inflation results that



occurred historically, the results would be significantly different (see figure 3).

Even though the average rates of return should have allowed the portfolio to survive for 30 years, the actual sequence of returns was catastrophic, exhausting the portfolio in 12 years—even though the ultimate average annual growth rate of this 60/40 portfolio really was 11.48 percent for the entire time period.

Back to Bengen's Safe Withdrawal Rates

Thus, the Bengen article explored the sustainability of various spending/withdrawal strategies using actual sequences of returns for various asset classes and inflation throughout history instead of simply doing projections using average returns. On this basis, it quickly becomes clear that in some situations a favorable sequence of market returns and inflation allows for a relatively high spending rate (not to mention that some periods had higher overall returns). In other years, though, the cumulative return (or more significantly, the order of returns and inflation) was less favorable, and a lower spending rate was necessary to ensure retirement success.

The Bengen approach (followed by much of the subsequent researchers in this area as well), was to analyze safe spending strategies by assuming an initial withdrawal rate as a percentage of the starting portfolio to produce a certain dollar amount of spending in year 1, and then assuming that the specified year 1 dollar amount would be adjusted annually in subsequent years for inflation. On a nominal basis, this leads to a steadily rising dollar amount of spending as inflation increases are applied. On a real (inflation-adjusted) basis, this effectively assumes a flat, level real spending amount throughout the time period.

This approach provides two alternate, yet similar, ways to analyze safe spending. The first is to assume a certain initial withdrawal percentage and evaluate the number of years that

FIGURE 2: SUSTAINABLE SPENDING USING AVERAGE RETURNS (1969–1999)



FIGURE 3: SUSTAINABLE SPENDING USING ACTUAL RETURNS (1969–1999)



the spending amount can be sustained at various historical starting points (or how often the portfolio lasts for a minimum number of years, such as 30 years). For example, figure 4 shows how many years (up to a maximum of 30) that a sample initial withdrawal rate of 5 percent (e.g., \$50,000/year on a \$1-million starting portfolio, with spending adjusted annually for actual inflation) will last starting at various points throughout history using a balanced

60/40 stock/bond portfolio (rolling 30-year periods from 1871 to 1975).

History reveals only three time periods at which a 5-percent initial withdrawal rate was not sustainable: a) the aftermath of the crash of 1903 (although life expectancy was only 47 at the time) with the crash of 1916–1917 on the horizon (fails in five of the seven following years); b) leading up to the crash of 1929 and/or in the middle of the Great Depression (fails in two of the



following eight years); or c) leading up to the bear market and hostile inflation environment of the 1970s (fails in seven out of 10 years between 1963 and 1973).

A withdrawal rate of 5 percent is actually quite successful for the overwhelming majority of time periods. It is only in certain market- and retiree-adverse environments where the 30-year time horizon isn't achieved. However, in those situations, retirees can run out of money as early as only three-fourths of the way through the target time period. On this basis, if you wanted to figure out what a truly "safe" withdrawal rate would be, you'd have to keep re-creating figure 4 using lower and lower withdrawal rates, until you eventually found one where the withdrawals were sustained for each and every 30-year period.

An alternative way to view the preceding data is to determine what the maximum initial withdrawal rate (adjusted subsequently for inflation) *would have* been for each of the rolling 30-year time periods. Examining the data this way, again using a 60/40 stocks/bonds balanced portfolio, yields the results shown in figure 5.

Figure 5 reveals that in fact, over a 30-year time period, the sustainable initial withdrawal rate (subsequently adjusted for inflation) can vary quite significantly. For the long series of rolling 30-year periods shown, the median safe withdrawal rate was actually 6.2 percent. The highest safe withdrawal rate was a whopping 10.8 percent. However, the lowest safe withdrawal rate was only 4.4 percent using this data set.³

Thus, the basis for a safe withdrawal rate of approximately 4.5 percent (it appears to be about 4–4.5 percent, depending on exactly what data are used) is really quite simple—it is *the lowest initial withdrawal rate that would have survived any historical rolling 30-year period*. Essentially, it means that the "safe" withdrawal rate is the "worst" or lowest successful withdrawal

FIGURE 4: SUSTAINABLE YEARS OF WITHDRAWALS AT 5% INITIAL WITHDRAWAL RATE WITH 60% EQUITY PORTFOLIO

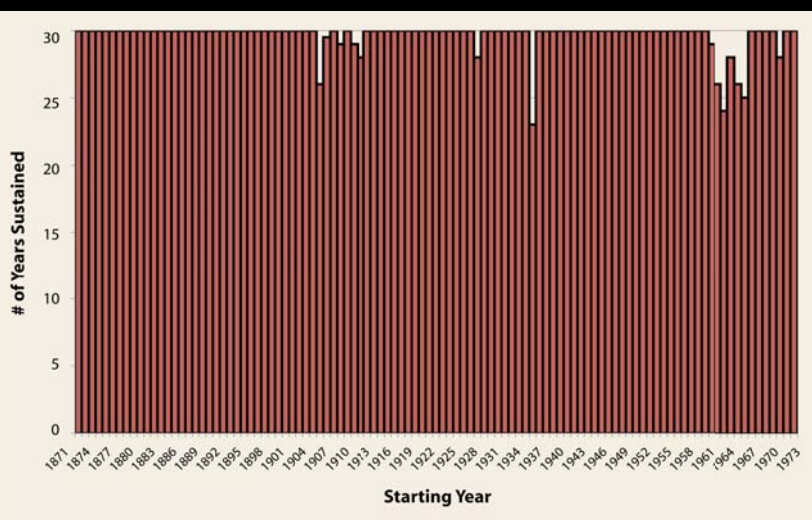
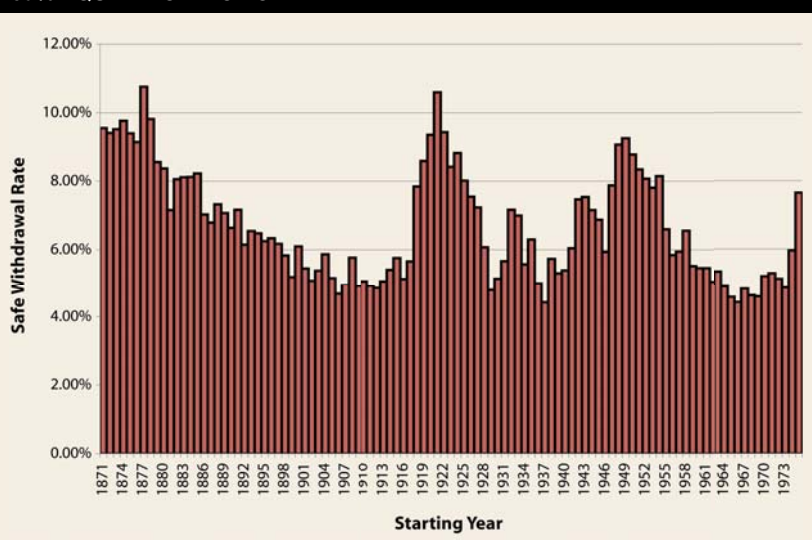


FIGURE 5: SAFE INITIAL WITHDRAWAL RATES BY STARTING YEAR WITH 60% EQUITY PORTFOLIO



rate that occurs at any point along the series of rolling 30-year periods.

The underlying assumption of the research is that if a withdrawal was low enough to have survived the least-favorable market scenario in history, it's probably a pretty "safe" spending amount that should be able to comfortably survive any future market scenarios. Of course, the future can always turn out to be different from any historical scenario we've ever seen—so even the 4-percent to 4.5-percent safe

withdrawal rate isn't bulletproof—but it certainly forms a reasonable basis for moving forward with a client spending recommendation. Ostensibly, if a market shock that occurred was worse than any loss scenario in history, including the Great Depression and the bear markets and inflation spike of the 1970s, we as planners could be cognizant of that reality and make additional adjustments along the way as necessary.

Another important observation from figure 5, beyond the fact that the



FIGURE 6: ANNUALIZED RATE RETURNS FOR THE FIRST 15 YEARS VS. THE SAFE WITHDRAWAL RATE



“ Suddenly, a strong relationship emerges. In fact, over the past 140+ years, the safe withdrawal rate for a 30-year retirement period has shown a whopping 0.91 correlation to the annualized real return of the portfolio over the first 15 years of the time period. ”

lowest/worst withdrawal rate of any scenario was approximately 4.4 percent, is that the safe withdrawal rate in any particular year doesn't appear to be entirely random. It is not as though the safe withdrawal rate is 5.7 percent one year, jumping to 10 percent the next, dropping to 4.8 percent the third year. Instead, the safe withdrawal rate appears to steadily increase (or decline). These trends last many years (even decades) at a time, before eventually shifting in the other direction. And these trends don't move entirely in isolation. Instead, perhaps not surprisingly, they appear to move in tandem with the long-term returns of the underlying stocks and bonds.

However, the returns in figure 1 do not necessarily correspond closely to the

rise and fall of safe withdrawal rates over the associated time period. A deeper look reveals that the mismatch sometimes occurs because it is actually the real returns over the *first 15 years* that have the most significant impact on long-term portfolio sustainability over the entire 30-year period. Figure 6 graphs the safe withdrawal rate over a 30-year period, as shown in figure 5, but this time against the annualized real return of the 60/40 portfolio for the first 15 years of the 30-year withdrawal period.

Suddenly, a strong relationship emerges. In fact, over the past 140+ years, the safe withdrawal rate for a 30-year retirement period has shown a whopping 0.91 correlation to the annualized real return of the portfolio over the first 15 years of the time period. The

data show that when the real returns are elevated for the first 15 years, significantly higher withdrawal rates are sustainable. On the other hand, when real returns are depressed for the first 15 years, the result is typically a lower safe initial withdrawal rate. In point of fact, in virtually every instance where the safe withdrawal rate was below 6 percent, it was associated with a time period where the annualized real return of the portfolio was 4 percent or less for the first 15 years.

The results above reveal that deviations of real returns above or below the historical averages—even, or especially, over 15-year periods—can have a significant impact on the sustainability of a 30-year period of retirement spending.

Implications in the Current Environment

The poor market returns of 2008 raise the specter of another weak safe withdrawal rate environment. And as discussed above, poor returns in the early years are most damaging to long-term retirement portfolios.

However, it is worth noting that even market declines as severe as the 1929 crash and the Great Depression that followed were able to survive with 4.5-percent withdrawal rates. Those who retired on the eve of the bear market of 1973–1974 were able to enjoy even higher safe withdrawal rates, in the 5-percent to 5.5-percent range, simply because the further into a long-term bear market that a client begins his/her retirement, the closer he/she is to the subsequent bull market that will ultimately arrive.

Consequently, planners should view today's environment to be a likely case in point, but probably not an exception, to the kinds of sustainable safe withdrawal rates that have been witnessed through history. However, the results may be worse for those who retired back at the start of the decade, which witnessed market valuations that exceeded even those of the late 1920s or

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late 1960s—two time periods in which the initial 15-year real returns were very far below average. Retirees who began in the year 2000 may find it necessary to take additional precautions that their retirements are still on track.

For the retiree in today's market, however, the "good" news is that the market is still well within its normal historical parameters for bear markets, suggesting that the historical safe withdrawal rate still should be pretty safe. It demonstrates the importance of starting withdrawals at levels "as low as" 4.5 percent of the initial account balance, even though average rates of return

(and even the median historical safe withdrawal rate) suggest that withdrawals over 6 percent might work. In point of fact, you might say that unexpected market returns like those that occurred over the past year are exactly why it is necessary to utilize a safe withdrawal rate approach in the first place. 

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Endnote

- 1 William P. Bengen, Determining Withdrawal Rates Using Historical Data, *Journal of Financial Planning* (October 1994): 14–24.
- 2 Larry Bierwirth, Investing for Retirement: Using the Past to Model the Future, *Journal of Financial Planning* 7, no. 1 (January 1994): 14–24.
- 3 Given slight discrepancies between the source data used for the analysis and the Bengen research, this should be viewed as yielding results substantively similar but not quite identical to the Bengen research.