

LONGEVITY: DOES 4% WITHSTAND THE TEST OF TIME?



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A primary concern for investors nearing retirement is if they will outlive their savings. Not only do they have to plan for the ever-changing investment environment, but people are living longer today than ever before, with current life expectancies reaching 79 years, according to the World Bank. Living longer is great news to most, however, it poses a risk—outliving your money.



Historically, financial practitioners have been able to earmark a 4% annual portfolio withdrawal rate for their clients, while having fairly high confidence that their savings will not dry up. History shows that the income and growth generated from a portfolio consisting of bonds and equities typically covers the 4% annual withdrawal. One can see why a 4% withdrawal rate was standard. Since 1980, the S&P 500 index has produced a real rate of return of 8%, while the 10-year Treasury bond has provided investors a real rate of return of 3%.

Times have changed, America is getting **older**, major innovation has **slowed**, and interest rates are **lower than historical averages**.

The changing demographics and investment environment make it more difficult to assume that the same portfolio of equities and 10-year Treasury bonds can match the historical real returns that we have experienced since 1980. Which begs the question, can investment portfolios in the current low interest rate environment provide enough income and appreciation to offset a 4% rate of withdrawal over longer time periods. Below we find out.

Time Period	3-Mo. T-Bill Yield
Long Term Average (1/1/1934 - 03/01/2019)	3.48
20 Years Prior to Credit Crisis (1/1989 - 12/2008)	4.29
10 Years Prior to Credit Crisis (1/1999 - 12/2008)	3.23
Past 20 Years (4/22/1999 - 4/22/2019)	1.78
Past 10 Years (4/22/2009 - 4/22/2019)	0.45
Current (As of April 22, 2019)	2.44

Table 1 - Source: MacroBond, Long Term Average (St. Louis Fed)

Interest rates, both short and long, are a primary consideration when forecasting future asset class and portfolio returns. When forecasting future investment returns, one must determine the risk-free rate, which is typically represented by the 3-month Treasury bill (T-bill). The 3-month T-bill is very sensitive to monetary policy, hence the historically low yields since the end of the credit crisis (Table 1). Interest rates have increased

recently, but the Federal Reserve has signaled that rates will remain unchanged in 2019, with one hike likely in 2020 and one in 2021. The low short-term interest rates will keep forecasted investment returns suppressed. Additionally, long term interest rates are also lower, which has placed pressure on financial advisors, as they cannot anchor a portfolio with a safe 3% real rate of return from a 10-year Treasury bond moving forward.

With that backdrop, we can move forward with forecasting future asset class returns. Since interest rates look to remain low through 2021, I will use a risk-free rate of 2.50% to forecast future asset class returns.

We must factor in **inflation**, which also remains **below** historical averages.

For this case study I have assumed a 2% rate of inflation. Using the Black-Litterman forecasting model and the above risk-free rate and inflation assumptions, we can calculate the forecasted returns for the primary asset classes (Table 2).

Asset Class	Index	Forecast Return	60/40 Allocation %
U.S. Equities	Russell 3000	6.56%	31.58
Global Developed Equities (Ex-U.S.)	S&P Developed Ex-U.S. BMI	7.66%	21.89
Emerging Markets Equities	S&P Emerging BMI	8.96%	6.377
U.S. Fixed Income	Bloomberg Barclays U.S. Aggregate	0.81%	8.929
World Fixed Income (Ex-U.S.)	FTSE non-USD WorldBIG	2.52%	31.22

Table 2 - Source: Informa Financial Intelligence's Zephyr Platform, Black-Litterman forecasting model

Using the above forecasted returns and the historical standard deviations and correlations for each asset class, we can build an efficient frontier to determine our optimized portfolio of 60% equities and 40% fixed income (60/40) (Figure 1, page 6). The corresponding asset allocation for the optimized 60/40 portfolio is listed in Table 2, which has an implied return of 5.18% and a standard deviation of 10.26%

A portfolio with an initial value of **\$500,000** has a **58% chance** of maintaining the initial value after **30 years**.



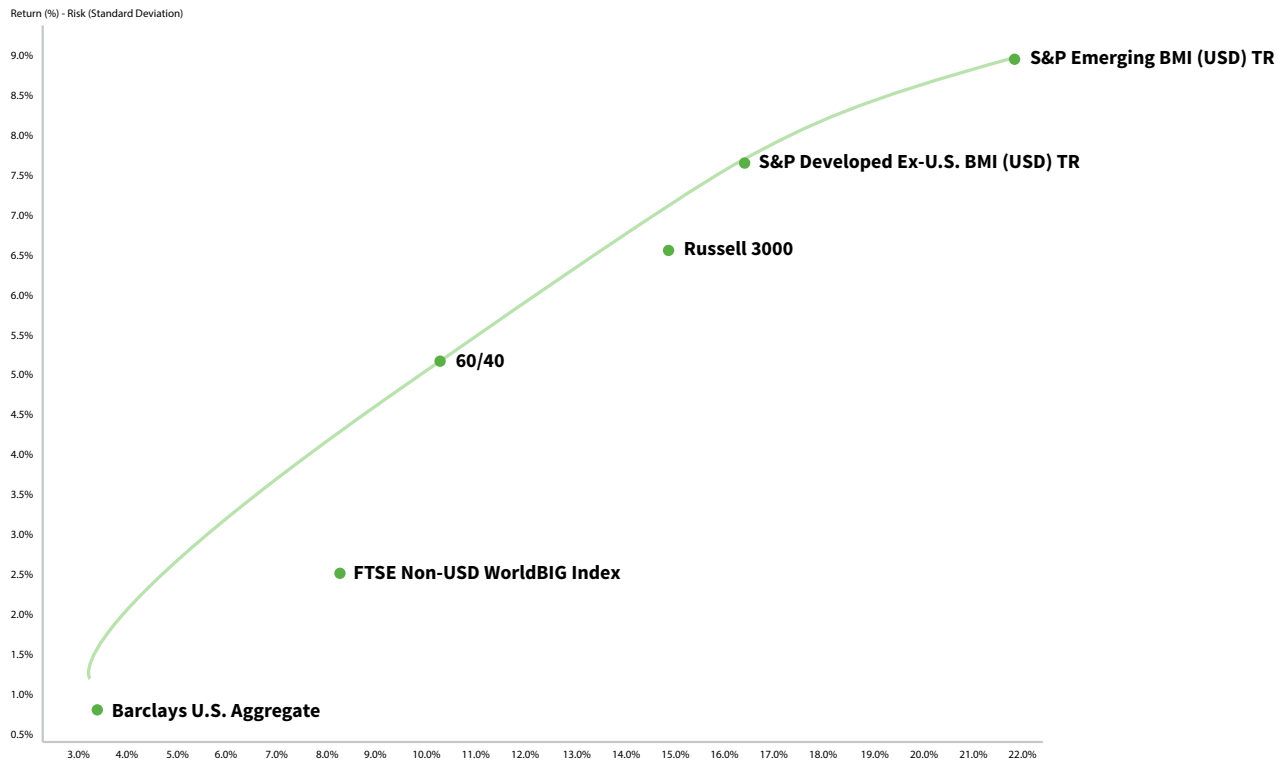
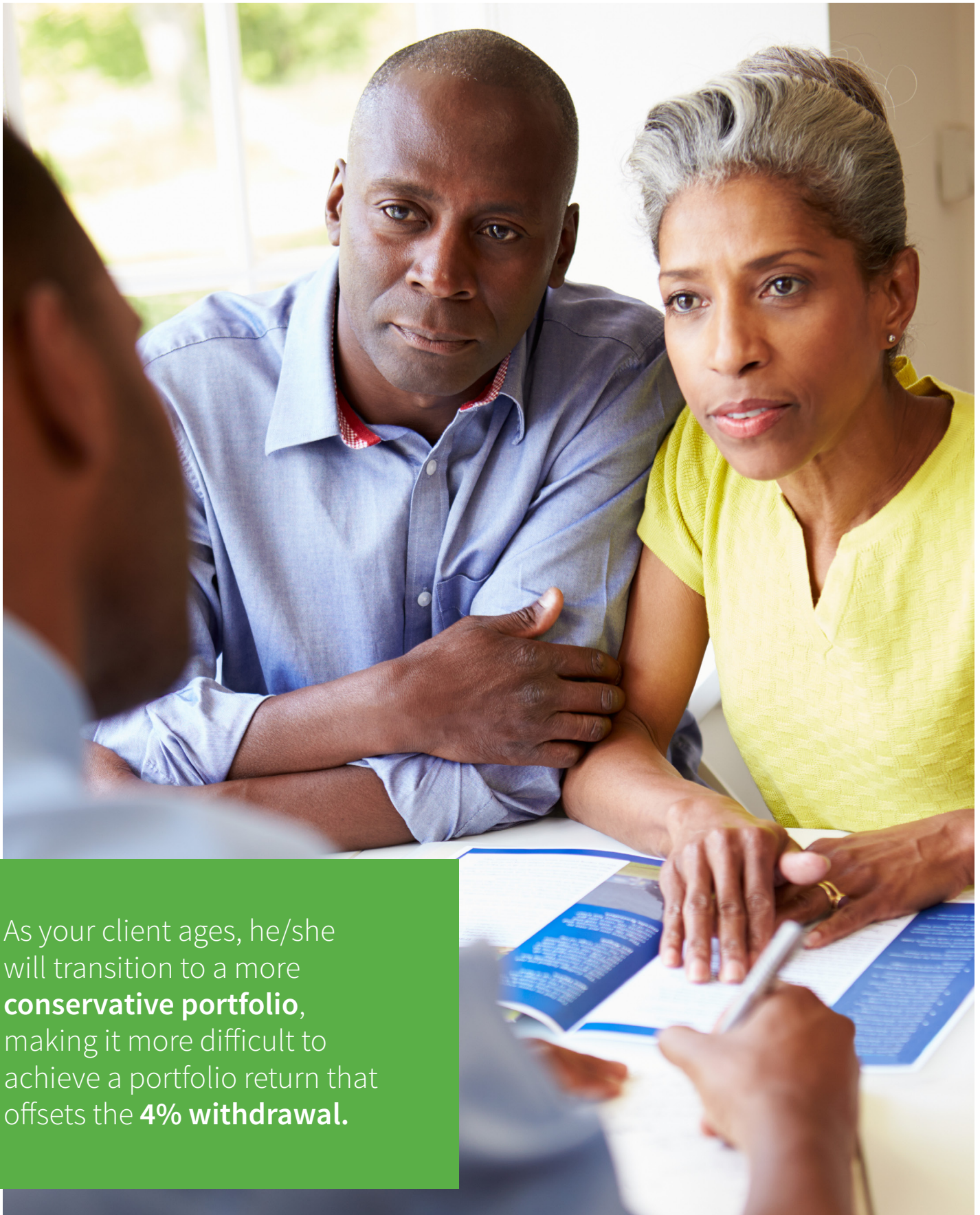


Figure 1 - Source: Informa Financial Intelligence's Zephyr Platform

With the above stated return distribution in hand (return 5.18%, standard deviation 10.26%), we can run a Monte Carlo simulation to determine if this traditional 60/40 portfolio can withstand 4% annual withdrawals over an extended time period. As you can see in Figure 2 on page 8, a portfolio with an initial value of \$500,000 has a 58% chance of maintaining the initial value after 30 years. In fact, the odds increase to above 63% at year 50.

There is a **0% chance** that the portfolio will go broke after 50 years while withdrawing **4% per year**.

Additionally, if you increase the rate of withdrawal to 5%, the probability of maintaining the \$500,000 drops to 38% at year 30, while still having a 0% chance of going broke.



As your client ages, he/she will transition to a more **conservative portfolio**, making it more difficult to achieve a portfolio return that offsets the **4% withdrawal**.

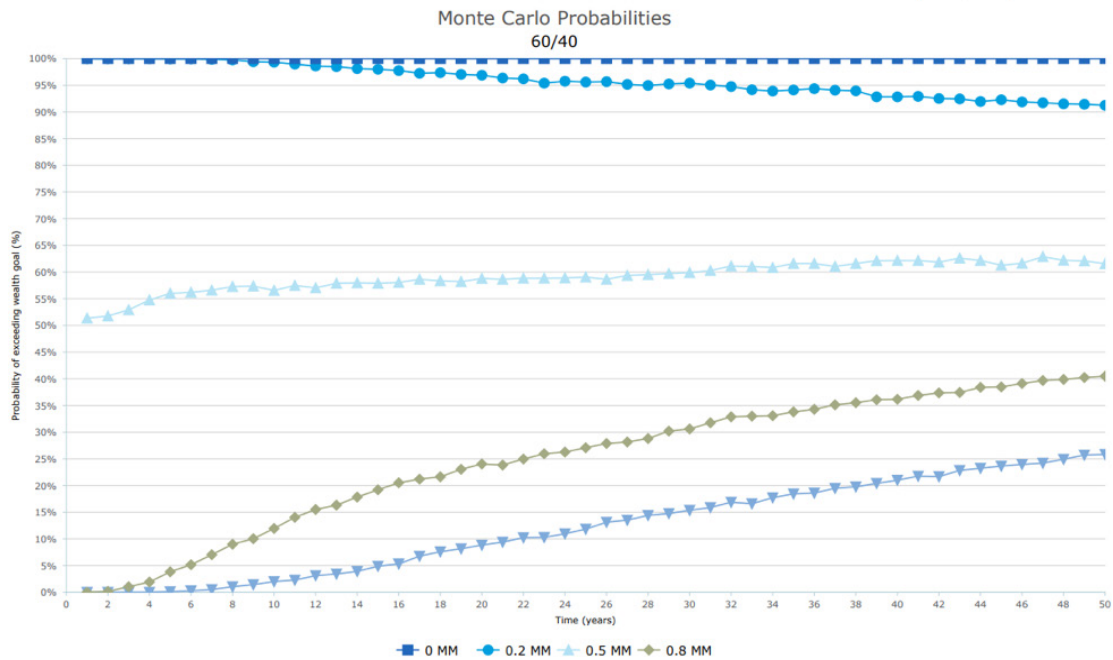


Figure 2 - Source: Informa Financial Intelligence's Zephyr Platform

Additionally, when reviewing the range of simulated outcomes (Figure 3 on page 9), 90% of the simulations finish year 30 with a portfolio value of at least \$288,000, while at year 50, 90% of the simulations finish with a portfolio value of at least \$270,000. When focusing on the outcomes that are most likely to happen – outcomes that fall between the 25th and 75th percentiles – the portfolio values range from \$400,078 to \$835,087 at year 30, and \$403,513 to \$1,006,299 at year 50.

This provides additional evidence that the basic 60/40 portfolio can withstand a **4% rate of withdrawal** over a long time period.

In fact, your clients can sleep well at night knowing that the likelihood of outliving their savings is small, while having a very good chance that their portfolio will appreciate over time.

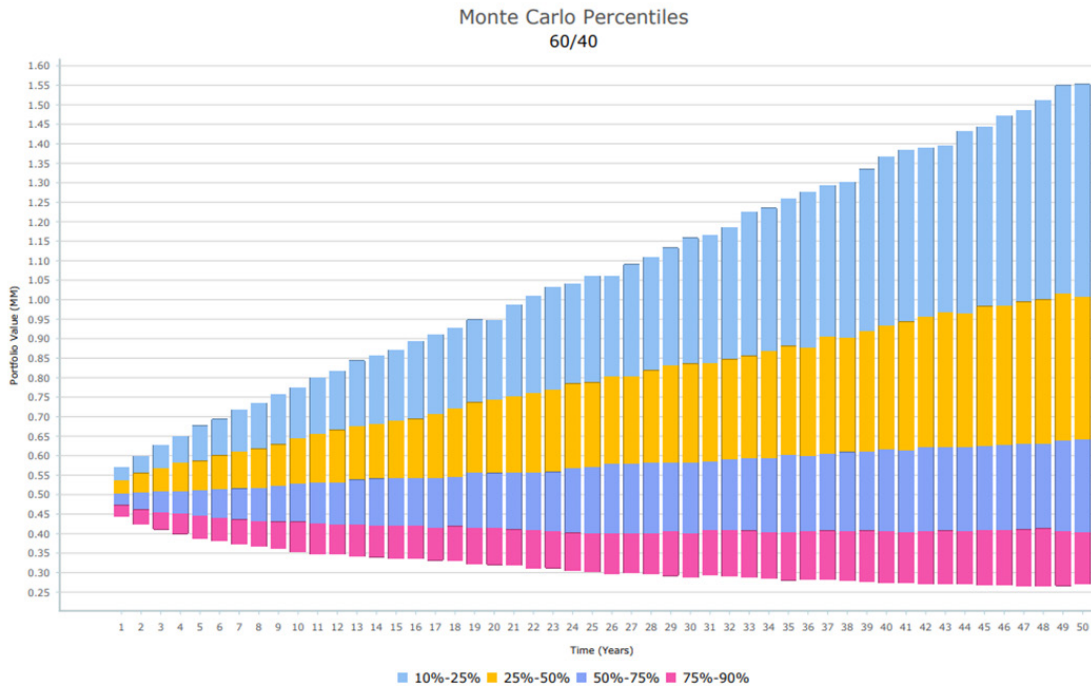


Figure 3 - Source: Informa Financial Intelligence's Zephyr Platform

It is important to note, that as your client ages, he/she will transition to a more conservative portfolio, making it more difficult to achieve a portfolio return that offsets the 4% withdrawal due to the low interest rate environment, forcing the client to include more risky assets. For example, using the same inputs as above, but changing the allocation to 40% equities and 60% fixed income results in a forecasted portfolio return of 3.60% and a standard deviation of 6.81. This portfolio provides a 100% chance of having at least \$10,000 after 30 years, however, the odds of maintaining the \$500,000 after 30 years drop to 24%.



Financial advisors may be able to build more optimized portfolios by including alternatives such as REITs, hedge funds, private equity and/or commodities, however, the illiquidity risks may not be suitable for clients who need enhanced liquidity when entering their spending stage.

Despite lower short- and long-term interest rates for the foreseeable future and increasing longevity, investment portfolios that are created using Mean Variance Optimization still have the staying power to offset a 4% withdrawal rate. However, it is important to note that as the portfolio's risk exposure decreases, the probability of maintaining your client's initial portfolio value decreases significantly due to the low interest rate environment.

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