

WHAT'S A SUSTAINABLE PORTFOLIO WITHDRAWAL RATE?

- There is no single answer to the question, “How much income can my retirement portfolio provide?”, but history might provide some context for setting reasonable targets for most retirees and investors.
- When we analyze a wide range of rolling 30-periods back to 1926, including very negative market environments, we find that a 4% withdrawal rate (generally accepted as a decent “rule of thumb” in financial planning) runs a very low risk of depleting a retiree’s portfolio assets, except in periods of unusually high inflation.
- Investors should be wary of ignoring a second major component of their retirement sustainability – inflation, or the growth of their cost of living.
- High inflation has a major impact on the sustainability of a retirement portfolio, in some cases equal to or greater than the impact of the initial withdrawal rate.
- Investors facing retirement would also be well served to look beyond a purely income-based approach to providing cash flow in retirement, and build a diversified portfolio designed to generate a “total return,” including both capital growth and income, to keep pace with spending and inflation.

Introduction

In contemplating retirement, perhaps the most important question investors wrestle with is how much money they can afford to draw from their retirement nest egg. What withdrawal rate is sustainable, without knowing how long that spending may need to be maintained? No retiree wants to exhaust his savings while he is still alive, and many aspire to leave a legacy to their children, grandchildren, or to worthy causes. Financial planners call this *longevity risk*, and as life expectancies rise, it’s a growing problem for many individuals and families as they chart their financial futures. In this paper, we will discuss withdrawal rates, along with the related issue of how portfolios may be designed to generate annual income – differentiating between the investor’s need for cash flow and the yield an investment generates.

An appropriate (that is, reasonably sustainable) withdrawal rate will obviously differ based on a number of variables – someone who is 65 years old may plan for a retirement of 30 years or more, and need to be more conservative in her spending than a retiree who is already in her 80s. In addition to disparities in the personal needs of specific individuals, in discussing the withdrawals a portfolio can maintain we must also account for the vagaries of the markets – no years, or decades, are identical. While a “bull” market with multiple years of high returns might allow for a high level of spending with little risk of depleting a portfolio, we believe that a more conservative approach, which accounts for the inherent risk of retiring into a down market, is far more reasonable. While determining a single “correct” withdrawal rate is not possible without being able to predict the future, in this paper we will apply historical data and a range of possible scenarios to a simulated “balanced” portfolio to try to determine what an investor might use as a starting point.

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Comparing Withdrawal Sustainability Across Time Periods and Withdrawal Rates

To examine a hypothetical investor’s experience under different withdrawal rate scenarios, we will use a portfolio with a 50/50 mix of riskier equity investments and less volatile cash and fixed income – 50% of the portfolio invested in domestic stocks (as represented by the S&P 500 Index), 40% in a blend of long-term and short-term US bonds, and 10% in cash. A US-only portfolio was used for this analysis to provide market returns for the longest possible time frame and the inclusion of a wide range of market conditions over roughly 90 years back to 1926.

Although in some “real life” cases, an actual investor may have flexibility regarding the timing or sources of his retirement cash flow, we will further assume that this portfolio is an investor’s sole source of income.

Our baseline study used the following methodology:

- The investor retires with a \$1,000,000 portfolio and expects the portfolio to fund living expenses for 30 years (i.e., from age 65 to age 95).
- The investor withdraws a percentage of the initial portfolio (in this case \$1,000,000) every year. With a 4% withdrawal rate, for example, in the first year, \$40,000 is taken out. These monthly withdrawals are adjusted at the start of every following year based upon an assumed rate of inflation – that is, an initial 4% withdrawal growing at a simulated 4% inflation rate would see the second year of income total \$41,600, the third year total \$43,264, and so on.
- We analyzed every 30-year period from 1926 to 2017, rolling forward in 12-month intervals and beginning from each calendar year start, for a total of 63 historical market environments.
- Taxes are not considered in our analysis. However, the lack of tax costs in this paper may be thought of in one of a few ways. First, the withdrawals from the simulated portfolio may be assumed to be “net” withdrawals – i.e., if retirees take \$40,000 from their investments, they pay both their taxes and living expenses from that amount. Secondly, for many actual retirees, sources of non-portfolio income (such as Social Security or pensions, which are not considered in this analysis) often serve to at least partially balance out the additional costs of taxes. In either case, a more detailed and personalized retirement plan for a specific investor should certainly account for taxes.

Exhibit 1: Total Withdrawals from \$1mm Portfolio Over 30 Years

Initial Withdrawal Rate	Assumed Inflation Rate		
	3%	4%	5%
3%	-\$1,427,262	-\$1,682,548	-\$1,993,165
4%	-\$1,903,017	-\$2,243,398	-\$2,657,554
5%	-\$2,378,771	-\$2,804,247	-\$3,321,942

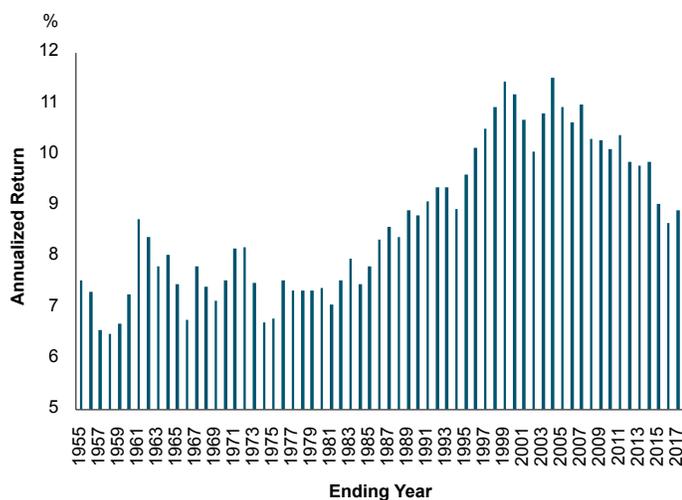
Source: Gerstein Fisher Research

Both withdrawal rate and inflation rate are extremely important in these scenarios – even a 1% annual increase in the cost of living across 30 years of retirement results in hundreds of thousands of dollars in increased income needed from the portfolio (see Exhibit 1). Every retirement is different, and few investors’ expenses actually increase in a steady or predictable manner – often being influenced by unpredictable medical or family expenses. However, tracking and understanding the change in one’s cost of living through a retirement that can span many years is very important to a portfolio’s ability to sustain itself.

As indicated above, the specific market environment that a retiree experiences has a major impact on her portfolio’s growth – and few people are fortunate enough to have perfect control over the timing of when their retirement begins and they will start to tap their portfolio to provide some or all of their income. Historically, the 30-year annualized returns of the 50/50 portfolio we are simulating have varied widely – between just over 6% annualized to nearly double that rate of return (see Exhibit 2). While the average annualized return for the 30-year periods we examined was between 8% and 9%, the variance in actual returns for any *specific* period is why it is so important for retirees not to assume they will have an “average” market experience.

In Exhibit 3, we can see the vast difference a starting year can make, comparing the portfolio values over time of a portfolio where we assume a 4% withdrawal rate and 3% annual inflation but begin in three very different periods. In the worst case, retirement begins in 1929, on the eve of the Great Depression; in 1961, retirement begins in an “average” period with moderate market returns; and in 1975, we have a 30-year period of exceptionally good returns overall, fueled by falling interest rates and by missing the 2008-2009 Global Financial Crisis. In the 1929 case, the portfolio essentially exhausts itself over the course of retirement, while in the 1975 case the portfolio concludes retirement with a huge amount of growth over the initial \$1 million, ending with over \$16 million. The 1929 starting year occurs near the beginning of the

Exhibit 2: 30-Year Annualized Returns Comparison – Rolling Periods by 12-Month Increments
50% S&P 500/40% US Bonds/10% Cash Portfolio



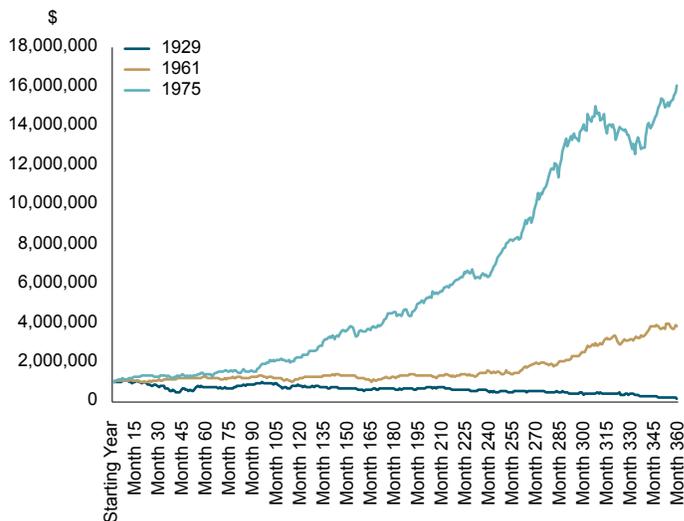
Sources: Standard & Poor’s, Morningstar, Gerstein Fisher Research

Great Depression, when even with a modest withdrawal and inflation rate, the portfolio fails to “break even” over the course of a 30-year retirement. However, this “worst case” scenario is only one market period – we will now turn our attention to the full historical range of our analysis.

When we expand to every 30-year period between 1926 and 2017, we can then look at how, at least historically, a variety of withdrawal and inflation rates would have fared (see Exhibit 4). Broadly, 3% withdrawal rates (equivalent to roughly \$30,000 of income per \$1 million of a portfolio) are sustainable, even with high inflation assumptions – only 5% or so of years in our sample failed with a 3% withdrawal rate and a 7% inflation rate. A withdrawal rate of 4% (often cited as a benchmark in financial planning for sustainable withdrawals) is indeed generally successful, unless inflation exceeds 5% annually – above historical averages but not unprecedented. **Withdrawal rates of 5% or higher are fundamentally risky**, based on these scenarios – even with modest 4% inflation (roughly in line with historical averages), in one out of five periods the portfolio was unable to sustain its spending.

At low-to-moderate levels of inflation, our finding that a 4% rate was (in all but the lowest-returning market periods) a sustainable withdrawal rate is consistent with academic research on the topic of withdrawal rates, including that of Bengen (1994) and what is commonly called the “trinity study” of Cooley, Hubbard, and Walz (1998), each of which also arrived at a sustainable 4% rate for an investor

Exhibit 3: Portfolio Values Over Time
Select Periods



Sources: Standard & Poor’s, Morningstar, Gerstein Fisher Research

Exhibit 4: Ratio of Failed Scenarios Across Withdrawal and Inflation Rates

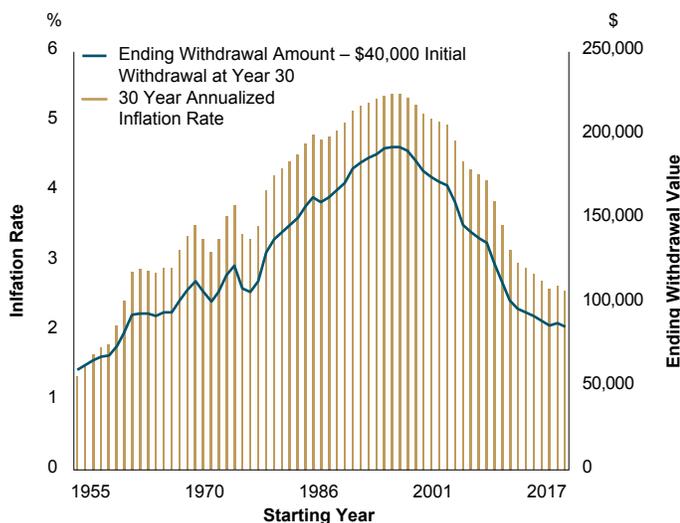
Withdrawal Rate	Inflation Rate				
	3%	4%	5%	6%	7%
3%	0%	0%	0%	2%	5%
4%	0%	3%	6%	22%	44%
5%	6%	19%	40%	62%	76%
6%	33%	52%	71%	78%	83%
7%	60%	75%	79%	84%	92%

Sources: Standard & Poor’s, Morningstar, Gerstein Fisher Research

with a “moderate” allocation. That said, there is no magic number that is right for everyone. Depending on factors like portfolio size, lifestyle and spending requirements, age, and health considerations, a specific retiree may be well-advised to consider a targeted withdrawal rates of 3%, 5%, or even 6%, and which may – depending on a wide range of variables – still represent a reasonable probability of not exhausting assets during the specified time horizons.

It is also important to note that these results are based on a somewhat simplified, US-only portfolio simulation. In reality, investors have the option to construct portfolios which may include a wide range of tilts to quantitative factors, global securities, and alternative asset classes. For a few of our research papers on the topic of improving the

Exhibit 5: Comparison of 30-Year Rolling Inflation Rates And Portfolio Withdrawals



Sources: Bureau of Labor Statistics, Gerstein Fisher Research

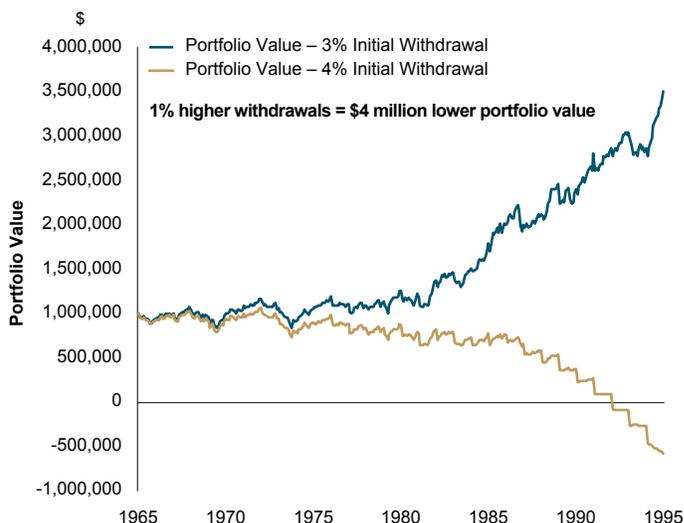
risk-adjusted return of a long-term portfolio through these forms of diversification, please see: [“Beyond Smart Beta: What is Global Multi-Factor Investing and How Does It Work?”](#), [“Commodities and a Diversified Portfolio”](#), and [“The Rewards of Multi-Asset Class Investing”](#).

Considering High Inflation and Annuity-Style Withdrawal Sustainability

We discussed above the importance of inflation in the sustainability of a given level of desired income from a portfolio – how much an investor withdraws in year 1 is relevant, but how much they are spending by the 15th, or 24th year of their retirement is equally critical to their success. Inflation (as measured by the Consumer Price Index or CPI) has fluctuated heavily over the last 90 years – from just over 1% annualized (indicating a rise in cost of living of about 50% over 30 years) to over 5% annualized (a rate at which the cost of living would be *five times* greater after 30 years). See Exhibit 5 for a breakdown of how 30-year inflation rates have changed over time.

To examine what a “worst case scenario” regarding inflation might look like, we examine one of the highest inflation periods in modern US history – a retirement starting in 1966 and ending in 1995, which experienced multiple years of double-digit inflation in the mid- to late-1970s. Even a 4% initial withdrawal rate isn’t sustainable given the rapid increase in inflation (the portfolio is expected to meet an annual withdrawal of nearly \$200,000 by the end of the 30-year period), exhausting the portfolio in roughly 25 years.

Exhibit 6: High-Inflation Period Portfolio Sustainability Comparison



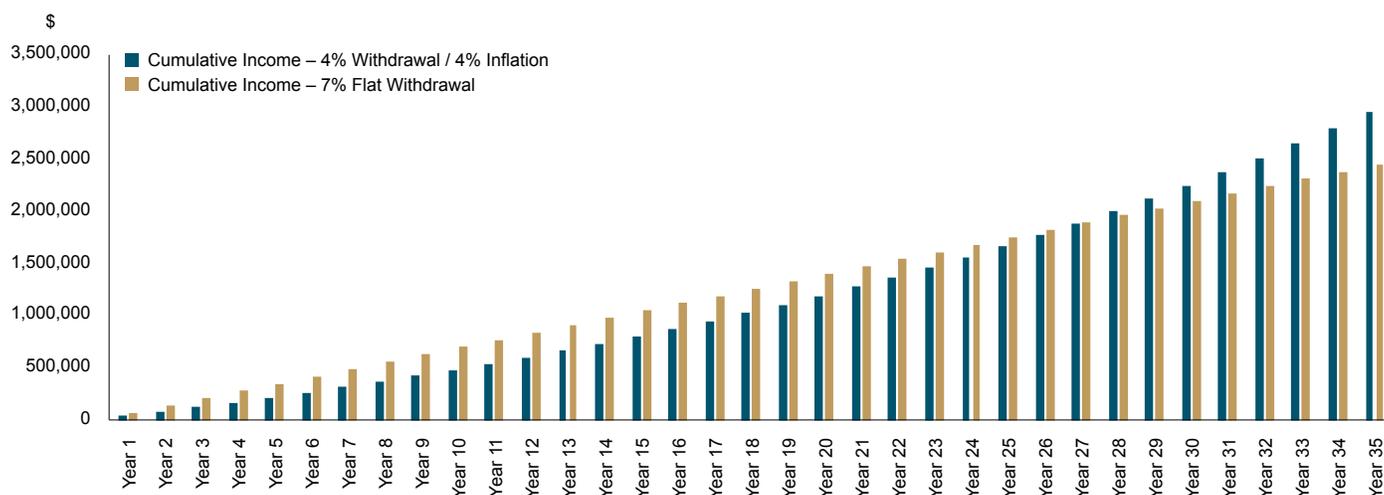
Sources: Standard & Poor’s, Morningstar, Gerstein Fisher Research

A 3% initial rate of withdrawal, however, is sustainable for the full period, and even allows for some significant portfolio growth over time (see Exhibit 6).

Let us also consider the mirror image of a high-inflation income scenario – a higher initial withdrawal rate which remains constant over time (e.g., taking a \$70,000 withdrawal from a \$1 million portfolio in year 1, then taking \$70,000 every year following). This manner of income generation is broadly referred to as an annuity-style of income, and has both pros and cons relative to the model discussed above. For investors who have a very stable cost of living, or who may have a shorter time frame over which to draw income, annuitizing their portfolio may provide the benefit of increasing their cash flow, as the inflationary risk is lessened for them. Over a sufficiently long time period, or if a retiree’s income need increases faster than expected, a fixed level of income taken from a portfolio may fail to “keep up” with the compounding growth of his cost of living (see Exhibit 7).

Generally, most retirees face significant uncertainty regarding both their life expectancy and the possible future changes to their income needs and cost of living. Therefore, a fixed withdrawal would need to be significantly higher than the 4% withdrawal rate growing with inflation which was described earlier in this paper to justify the long-term impact of fixing their cash flow to a set amount. In short, an annuity-style withdrawal rate may provide some short-term benefit but entails the significant long-term risk of a retiree losing relative spending power over time.

Exhibit 7: Cumulative Income Comparison



Source: Gerstein Fisher Research

Benefits of a Total Return Approach Over a Focus on Interest and Dividends

So how might an investor seek to actually generate a 4% annual withdrawal to supplement her income in retirement? Many investors are inclined to take the approach of “reaching for yield” in income-focused investment instruments – for example, high-yield bonds, high dividend-yielding stocks, and preferred stocks. But this practice has risks, including high correlations to other forms of both market and quantitative “factor” risks. For more on the interplay between dividend yield and other forms of value investing, please see our paper [“Dividend Investing: A Value Tilt in Disguise?”](#).

For instance, during the market crash of 2007–2009, the prices of REITs and preferred stocks (80% of which are financial companies) collapsed along with those of common stocks. Higher-dividend-yield stocks may also be inclined to cut an above-average dividend in a difficult environment, causing investors to not only lose out on that income but putting additional downward pressure on the share price of the stock. In our view, reaching for yield equates to reaching for risk – and not the kind that reliably rewards investors in the form of return. Additionally, a pure income strategy may leave a portfolio vulnerable to inflation, which is one of the greatest risks to investors over decades of retirement.

In contrast with bonds, equities have historically done a good job of keeping pace with inflation. For instance, from January 1, 1926 to December 31, 2017 the S&P 500 Index returned 10.16% annualized, long-term US government bonds returned 5.54% annualized, and US CPI rose by 2.89% annualized over the same period. Put another way, equities offered a roughly 7% “real return” – that is, return over inflation – while bonds offered a 2.5% real return. An investor who reduces his exposure to equities in favor of bonds is, in effect, making a trade: reducing stock market risk and potentially increasing his current income (bond yields tend to be higher than stock yields) in exchange for a higher risk to future income due to lower returns which may not keep pace with inflation. Indeed, a decision to move entirely into bonds significantly decreases a portfolio’s ability to sustain a desired level of spending over the long run. For more of our research on the impact high and unexpected inflation may have on various asset classes, please see our paper [“Asset Classes and Inflation: A Complicated History”](#).

Rather than attempting to alter portfolios by overweighting bonds, increasing bond duration, or overweighting income-oriented stocks and other assets, investors would, in our opinion, be better served by employing a total return approach, which allows for spending both from portfolio cash flows as well as from the potential increase in the portfolio value due to capital appreciation.

Using this strategy, income generated by the portfolio's investments is generally the first source tapped to meet spending needs, supplemented as needed by liquidating holdings (sometimes called "tapping principal") to make up the shortfall. In highly positive years, equities should meaningfully outperform a portfolio's withdrawals, and trimming a portfolio's capital gains can supplement the income taken from interest and dividends without reducing the long-term value of the portfolio. Additionally, these targeted sales of equities following significant gains can be done in conjunction with periodic portfolio rebalancing and risk management across multiple asset classes. An investor's fixed income allocation may also serve to help avoid the sale of more volatile equities in "bear" markets, when stocks have negative returns, and as stocks are potentially sold on good equity market years, bonds may be trimmed in bad years. In situations (a high interest rate environment perhaps) when the total portfolio cash flow is equal to or more than the annual spending requirement, a flexible total return approach would need to sell little or no assets, and could be thought of as equivalent to an income-oriented approach.

Conclusion

Determining the appropriate withdrawal rate from a portfolio to cover a retiree's living expenses (the amount needed in addition to what he or she receives in pension, Social Security, or other benefit payments) is an important but challenging exercise. Our research points to 4% as being a reasonable starting point for a withdrawal rate that can be sustained for the long term. Investors should also consider age, health, and other individual-specific issues in determining whether their own withdrawal rates should in fact be lower than this, or possibly higher. While investors may be tempted, particularly in the current low-interest rate environment, to reach for yield in high-dividend-yielding stocks or high-yield bonds, this approach entails excessive risk for most investors. When it comes to structuring a portfolio for retirement, we believe that a diversified portfolio and a total return approach to generating cash flow in retirement is a sounder alternative to an income-only approach.

Finally, while there is no single "correct" or risk-free approach to taking income from an investor's portfolio in retirement, or in predicting what any individual retirement may look like, there are some general guidelines which may help retirees navigate this phase of life. Planning conservatively, managing withdrawals in the context of the portfolio which needs to sustain them, and tracking the inflationary pressure of the growth of expenses/spending are key. It is our hope that the data and analysis above serves as a useful starting point for understanding these core variables and how they might impact the retirement planning process.

References

Bengen, William P. 1994. "Determining Withdrawal Rates Using Historical Data." *Journal of Financial Planning*, Vol. 7, No. 4 (October): 171–180.

Cooley, Philip L., Carl M. Hubbard, and Daniel T. Walz. 1998. "Retirement Savings: Choosing a Withdrawal Rate That Is Sustainable." *American Association of Individual Investors Journal*, Vol. 20, No. 2 (February): 16–21.

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