# Do Income-Oriented Portfolios Reduce Safe Withdrawal Rates?

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Among studies of safe withdrawal rates (SWRs) researchers have followed a common path: constructing portfolios with the goal of optimizing total return. This strategy achieves the highest SWR, but retirees often prefer a more income-oriented portfolio. I will illustrate the tradeoff investors make – in terms of a lower SWR – as they increase allocations to income-producing securities. But increasing income also brings a key benefit: lower estimation risk.

Bill Bengen pioneered the concept of SWRs in the 1990s. It is the percentage that a retiree can withdraw annually, adjusted for inflation, from a portfolio over a fixed time frame with a given probability of success (i.e., not depleting one's assets). For this article, I used a 30-year time horizon and a 3% inflation rate to construct portfolios with a 90% probability of success.

Over the past two decades, a variety of methods have been brought to bear in determining SWRs. Early work assumed portfolios only held two asset classes, stocks and bonds, and used average historical returns and volatilities to determine the allocations that achieve the highest probability of success. Researchers soon showed that diversifying beyond a two-asset portfolio produces higher returns and SWRs.

A second limitation of the classical research into SWRs is too heavy an emphasis on the use of long-term historical U.S. market data. Future returns from equities are not likely to be as generous as those over the last century. For example, record low bond yields virtually guarantee that fixed-income returns will be lower than they have been in the past 30 years. I explored the implications of bond yields for SWRs in a recent article.

An important piece of the SWR puzzle that is unresolved is how to choose between total-return and income-focused portfolios. Financial planners routinely pursue a total-return strategy. But there is no reason why a total-return strategy should be superior to an income-focused strategy. Let's explore the costs and benefits of total-return and income-oriented strategies as they pertain to SWRs.

**The theory**

The key justification for focusing on total-return strategies is the seminal research by Modigliani and Miller in the 1950s that concluded that investors should be indifferent to whether their returns come

from price gains or dividends. This is referred to as the dividend irrelevance proposition. In theory, managers of a company can reinvest their earnings, buy back shares or pay some portion of their earnings to shareholders. Because markets are assumed to be totally efficient, there is no information content in the payment of dividends and investors have no reason to prefer dividends over the price appreciation that should ultimately result from a company reinvesting its earnings.

Recent research demonstrated that there is a missing piece in this paradigm. When investors consider purchasing an asset, they have to estimate expected future return. This estimate may be qualitative (e.g., stocks will return more than bonds) or explicit. Estimation risk measures the uncertainty in predicting risk and return.

Is estimation risk less for income-generating assets than for non-income assets? While this question cannot be answered conclusively, there is evidence that dividend-paying stocks have a more consistent earnings stream than non-dividend payers, which implies that their estimation risk should be lower. It is easier to estimate the future return for a stock with a 4% yield than for one with no dividend, if they both have the same expected total volatility. The dividend provides a baseline for estimating the total return.

Estimation risk for fixed-income assets is low because return is driven by the yield at purchase, as I discussed in my previous article. If estimation risk is lower for portfolios in which a substantial portion of the total return comes from income distributions, this could make income strategies especially attractive.

**Comparing income and total-return portfolios**

For this analysis, I used Quantext Portfolio Planner (QPP), a Monte Carlo-based portfolio analysis tool that I designed. QPP generates expected total return and risk estimates for portfolio holdings and for the portfolio as a whole. I provided examples of expected returns for a wide range of asset classes generated by QPP in my recent article. I used an optimizer to construct portfolios based on three criteria: the maximum expected return, the maximum portfolio yield and both. QPP does not explicitly account for the differences in estimation risk, but the tradeoff associated with optimizing on yield versus total return allows us to see the cost of choosing more income, which implies lower estimation risk.

I started with a portfolio from my last article that QPP projected would provide at least a 4% SWR. One of these portfolios (Portfolio 2, or P2) had a 4% SWR and a projected 7% annualized volatility, which was very close to the volatility of a portfolio allocated 50% to the S&P 500 and 50% to the aggregate bond index (AGG). For comparison, I constructed two portfolios that optimized income and expected total return, respectively, with the same 7% volatility. Using all the of the same model settings, the projected volatility for P2 using three years of data through July is 6.8%, and I have created income portfolios at this risk level.

To design these income-oriented portfolios, I selected a series of high-dividend exchange-traded funds (ETFs) as well as ETFs representing major asset classes that are typically included in core holdings. I limited the allocations to certain asset classes, based on my expectation of the degree of exposure that

would be acceptable to most investors.

I added one additional constraint. Each portfolio had to have a correlation to 10-year Treasury bond yields of at least 15%. A major risk in income portfolios is too much interest-rate sensitivity (a negative correlation to bond yields). The 15% threshold ensures acceptable portfolio allocations.

I ran three optimizations that maximized three separate criteria:

1. Expected total return
2. Portfolio yield
3. Expected return with portfolio yield ≥ 5%

The first case is a control to determine the maximum SWR that could be achieved using these asset classes in a traditional total-return approach, matching the methodology in my previous article. The second portfolio is the pure-income portfolio. The third portfolio is a hybrid of the previous two cases. The motivation for this third scenario is explained below.

***Optimal SWR portfolios***

| | | | Allocations | | |
|---|---|---|---|---|---|
| Asset Class | Ticker | Yield | Max Expected Return Portfolio | Max Yield Portfolio | Max Expected Return (Yield>=5%) |
| International Dividend Stocks | DWX | 6.9% | 4% | - | 1% |
| S&P500 | SPY | 2.0% | 15% | 19% | 27% |
| Small Cap Stocks | VB | 1.5% | 22% | - | 3% |
| Preferred Shares | PSK | 6.5% | - | 16% | 9% |
| Preferred Shares | PFF | 5.9% | - | 10% | 7% |
| Mortgage REITs | REM | 14.4% | 2% | 6% | 5% |
| Global Ex-U.S. Real Estate | DRW | 10.8% | - | 1% | 2% |
| High Yield Bonds | HYG | 6.6% | - | 16% | 10% |
| High Yield Munis | HYD | 5.3% | 7% | 12% | 11% |
| Long Corporate Bonds | LWC | 4.8% | 6% | - | 3% |
| Corporate Bonds | LQD | 4.0% | 5% | - | - |
| Build America Bonds | BAB | 5.1% | 12% | 12% | 11% |
| Insured Munis | PZA | 4.1% | 10% | - | 5% |
| Zero-Coupon Treasury Bonds | EDV | 3.6% | 6% | - | 3% |
| Short Treasury Bonds | SHY | 0.3% | 5% | 5% | - |
| MLPs | AMJ | 4.8% | 6% | 3% | 3% |
| | | | | | |
| Portfolio Yield | | | 3.6% | 5.4% | 5.0% |
| Portfolio Expected Return | | | 7.0% | 5.8% | 6.5% |
| Portfolio Expected Risk | | | 6.7% | 6.8% | 6.8% |
| SWR with 90% Probability of Lasting 30 Years | | | 4.15% | 3.55% | 3.90% |

The first portfolio has a SWR of 4.15%, comparable to the results in my previous article. The specific

allocations are somewhat different, which is not surprising. There is a range of possible portfolios on the efficient frontier of maximum return at a given risk level.

The yield of the portfolio maximized on total expected return is 3.6%. For investors favoring the total-return paradigm, this portfolio will be attractive. With a hypothetical $1 million portfolio, in the first year, $36,000 is provided by income and the remaining $5,500 comes from a sale of assets. In other words, the investor expects to sell 0.55% of his portfolio each year to bridge the gap between income distributions from the portfolio and the target withdrawal rate. This portfolio has the highest expected return of the three (7%), because it was optimized for expected total return. The problem is that the 7% expected return is made up of 3.6% in yield, which is directly observable from the portfolio, and an additional 3.4% that is based on assumptions about the equity-risk premium.

The second portfolio was optimized to produce the maximum yield with a projected volatility of 6.8% and a minimum correlation to changes in Treasury yields of 15%. It has a yield of 5.4% and an expected total return of 5.8%. The investor must withdraw all but 0.4% of the portfolio's expected total annual return (price appreciation plus all income distributions). The SWR is 3.55%, well below the 5.4% yield, because some portion of this 5.4% must be reinvested to keep pace with inflation.

By maximizing yield, the final portfolio has a lower expected total return (5.8%) than the previous one (7%), but it has less estimation risk. This portfolio had a yield of 5.4% over the past year, so we have a reasonable expectation that it will do so again. The uncertainty with regard to the expected return is much higher. Recent years' returns cannot be used to project next year's, for example.

The SWR is determined by the estimated total return and risk. To the extent that the yield is a larger fraction of total return, there is less estimation risk for the SWR. The question that investors and advisors must address is whether the higher apparent SWR for the portfolio optimized on total return is worth the estimation risk.

As a compromise between the two extremes of optimizing on total return and yield, I created the third portfolio with a minimum yield of 5%. This portfolio also has the same constraint on positive correlation to Treasury bond yield. It has a yield that is 0.4% less than the yield of the maximum-yield portfolio and a projected total return that is 0.5% less than the total-return portfolio. The projected SWR is 3.9%, a reasonable alternative between the two extremes.

**Accounting for estimation risk**

The difficulty in determining estimation risk is a consequence of the difficulty in forecasting the expected returns for various asset classes. In my last article, I showed that estimates generated by QPP were approximately equal to Ibbotson's projections. For fixed-income securities, estimation risk is low. If a preferred share index has a current 12-month yield of 5.9%, we have a reasonable expectation that the yield will be roughly the same next year. But, the fact that the S&P 500 has a trailing three-year average annual return of 17.7% or a trailing 12-month return of 19.4% does not tell us much about next year's return. Expected total returns for an index like the S&P 500 are based on either long-term historical records or fundamental measures such as price-to-earnings ratios. The estimation risk is substantial.

Optimizing for total return incurs additional estimation risk, so one should expect higher returns. This is confirmed by QPP's results. With the two income-oriented portfolios, one can be confident that the withdrawals can be made without having to sell into a declining market, if one should occur. This cannot be said for the maximum-expected-return portfolio.

Those who suggest that total-return investing is inherently superior to income investing are ignoring a potentially crucial source of uncertainty: estimation risk. If you believe that you can estimate a portfolio's expected price appreciation as accurately as you can project its future income, you should favor a total-return portfolio. If, on the other hand, you acknowledge that past income is more predictive of future income than past price returns are predictive of future price returns, you should be biased toward income-oriented portfolios.

My conclusions can be summarized as follows:

1. Total-return-oriented portfolios have higher expected return and higher estimation error than income-oriented portfolios.
2. The SWRs for total-return strategies are higher than for income strategies, but they are more likely to require revisions and adjustments due to changes in the projected equity risk premium.
3. Income-oriented strategies will provide lower SWRs but with a lower probability of downward adjustments to the withdrawal rate, because they are less likely to require substantial selling into a declining market (one of the worst scenarios for retirees).
4. Portfolios designed to optimize total return but with a threshold income level that must be satisfied (as in my third scenario above) are a compromise solution.

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