



Flaws in Vanguard's Withdrawal Strategy: Income versus Total-Return Portfolios

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Vanguard advertises that its mission is to simplify investors' retirement decisions. In a recently published [study](#), however, it oversimplified the critical choices investors and their advisors face in constructing a portfolio for the withdrawal phase of retirement.

The study in question, written by Colleen M. Jaconetti, examined the relative merits of income and total-return strategies. By her definition, an investor who uses an income approach relies only on the returns his or her principal generates; a total-return approach draws down principal as well. Drawing on extensive historical data, Vanguard found that total-return strategies are superior for investors in the withdrawal phase. Vanguard summarized its findings succinctly:

In conclusion, the total-return approach to spending is identical to the income approach for investors whose portfolios generate enough cash flow to meet their spending needs. For those investors who need more cash flow than their portfolios yield, the total-return approach is the preferred method. Compared with the income-only approach, the total-return approach is likelier to increase the longevity of the portfolio...

Not so fast. This study glosses over a number of issues, some of which have a substantial bearing on its results. In this article, I'll explore the issue of income versus total-return strategies in a manner consistent the Vanguard study, but I find that a total-return strategy does not enjoy an advantage over an income-oriented approach.

Two approaches

The Vanguard study uses historical data going back to 1926 and looks at the range of possible outcomes for a 25-year retirement that starts at each year in that time period. Success in a retirement strategy is measured by longevity risk – the probability that the portfolio will be depleted prior to the expiration of the 25-year horizon.

In a slightly odd twist, for retirements starting in the last 25 years, Jaconetti reverted to data from 1926 to provide a continuous data series. For example, the retirement path starting in 2007 was modeled using returns from the 1920s and 1930s. Regardless, the approach chosen by Vanguard makes sense for the most part.

The only major possible objection to Vanguard's overarching methodology is that the average returns on stocks for the period from 1926-2007 were higher than we expect in a future characterized by PIMCO's "new normal" of low economic growth and muted returns.



John West of Research Affiliates has [recently presented](#) the case that expected returns on stocks will be well below their long-term average. Vanguard's data nevertheless shows average nominal returns for stocks of approximately 10% per year and nearly 6% for bonds (see their Figure 1).

An additional limitation that comes with using purely historical data is that there is no way to model income-generating asset classes such as high-yield bonds because there is insufficient long-term data on these asset classes.

In my approach to the same question Vanguard tackled, I used Monte Carlo simulation (the **Quantext Portfolio Planner**). The benefit of using a Monte Carlo simulation instead of historical data is that I can explicitly set the expected return for stocks (the equity risk premium). As a baseline setting, I assume that equities (the S&P500) will return approximately 8% nominally and that inflation will be 3% per year, which is its average over the past century. Another benefit of Monte Carlo simulation? I can project risk and return for any asset class, and I can also account for the levels of correlation between asset classes observed in modern times. This approach allows me to examine the role of income-generating asset classes such as corporate bonds.

Does increasing yield reduce longevity risk?

One of the key arguments in the Vanguard study is that allocating a portfolio to provide higher yield reduces the probability that the portfolio will be able to provide income for an extended retirement. Jaconetti's reasoning, based on historical data, is straightforward. She starts with the assumption that there are only two asset classes available to an investor: stocks and bonds, the former having higher expected returns and lower yields than the latter. The only way to increase yield from the portfolio is to increase its allocation to bonds, which reduces the average total return of the portfolio. Reducing the total return leads to higher longevity risk, Jaconetti concludes.

Her conclusion would be correct if the only two asset classes available were a stock index and a bond index, but that is not the case. A number of higher-yielding investment options are available, as I provide below.

Income versus total return

I constructed two model portfolios to correct for the limitations of the Vanguard study. To begin, let's look at a portfolio that is more diversified than the generic mix of the S&P500 and a bond index.



Model Portfolio 1

Asset Class	Ticker	Percentage of Funds
S&P500	IVV	10%
Small Cap Stocks	IWM	10%
NASDAQ	QQQQ	10%
Emerging Markets	EEM	10%
Developed International	EFA	10%
Commodities	DJP	10%
Short Gov't Bonds	SHY	10%
Intermediate Gov't Bonds	IEF	10%
Long Gov't Bonds	TLT	10%
Investment Grade Corp. Bonds	LQD	10%

This portfolio has 40% in bonds, 50% in equities, and 10% in commodities. The commodities provide diversification and inflation protection. The equity exposure is spread between international and domestic equities. Our model Portfolio 1 has a yield of only 1.7%, but its expected return is 7.8%. The portfolio has expected volatility of 11.5%. The expected return and expected volatility are generated by the Monte Carlo simulation, using all baseline settings. The model generates expected returns for each asset class and expected volatilities, then it calculates expected return and volatility for the total portfolio, accounting for correlations between asset classes

How well would this portfolio serve in providing long-term income for a retiree? Let's define our generic investor, Pat, to be 65-years old and retiring this year. How much income can Pat draw? Using the Monte Carlo analysis, Pat can draw of 4.3% of the value of the portfolio at retirement, increase that amount 3% per year for inflation, and have a longevity risk of 15% — the chance of running out of money by age 90. If Pat retires with a \$1 million portfolio, he could draw \$43,000 the first year and then scale this amount up by 3% per year. This result is consistent with the Vanguard study and with other published studies of safe withdrawal rates.

Jaconetti found that a portfolio with 40% to 60% allocated to equities (which she defined as 'moderate') can support a withdrawal rate of 5.25% per year with a 15% longevity risk. In her historical data, however, stocks have an average annual return of about 10% – considerably higher than my baseline assumption of 8.3% per year. If we could expect the S&P500 to deliver 10% per year, it would be a great deal easier to fund a safe retirement, but [research](#) on the fundamental drivers of equity returns do not support such a high expected future return.

Now let's examine an alternative portfolio with considerably higher yield:



Model Portfolio 2

Asset Class	Ticker	Percentage of Funds
U.S. Preferred Stock Index	PFF	13%
Global Telecom Stocks	IXP	12%
Global Utility Stocks	JXI	13%
Pharmaceutical Stocks	PPH	12%
Intermediate Gov't Bonds	IEF	10%
Long Gov't Bonds	TLT	10%
Investment Grade Corp. Bonds	LQD	10%
High Yield Bonds	HYG	20%

For Portfolio 2, I focused on creating a portfolio with a high yield, with an expected total return and with risk comparable to Portfolio 1. I also sought a portfolio that has the same probability of being able to fund the 4.3% draw rate over 25 years. Portfolio 2 has a 5.5% yield, expected total return of 7.5% and expected volatility of 11%. This portfolio has the same 15% longevity risk as Portfolio 1, but it is made up of very different asset classes. More of the total return comes from income generation than price appreciation, but the total longevity risk of both portfolios is the same.

My Monte Carlo results suggest that there is no difference between dividends and price appreciation in terms of longevity risk – neither is innately superior as a way to generate risk-adjusted returns. This makes intuitive sense. Markets would have to be grossly inefficient over even the longest terms if capital appreciation was somehow inherently superior to dividends.

The results from Portfolio 2 show that an income-focused portfolio can have longevity risk equal to or even lower than a total-return oriented portfolio. While Portfolio 2 generates high income, however, the portfolio does not guarantee that the investor can live off of the income alone – there is still a 15% probability of depleting Portfolio 2 by age 90.

The examples shown here are illustrative rather than comprehensive. There are many plausible variations on total-return portfolios and income portfolios. The main conclusion to draw, however, is that we can construct income-oriented portfolios with no more longevity risk than a total-return portfolio when we consider high-yield equity and bond asset classes.

Behavioral effects

Less understood are certain market anomalies that favor income-oriented asset classes in ways that are not fully captured by the Monte Carlo simulations or by the long-term historical data. These are market inefficiencies that can be explained on the basis of behavioral finance.



Low-beta equities

High-yield equities tend to have low betas. Fama and French's groundbreaking [research](#) that found that small-cap stocks and value stocks tend to outperform also found that low-beta stocks tend to outperform:

...passively managed stock portfolios produce abnormal returns if their investment strategies involve tilts toward CAPM problems. ... For example, funds that concentrate on low-beta stocks, small stocks, or value stocks will tend to produce positive abnormal returns...even when the fund managers have no special talent for picking winners.

Low-beta stocks tend not to be 'glamour stocks' and substantial research beyond just Fama's and French's, suggests that glamour stocks underperform. The low-beta effect is partly captured by my Monte Carlo simulations, because this model does not assume that low-beta stocks are inherently low return (as implied by CAPM).

Manager Incentives

Management at companies that focus on maintaining and raising dividends have different incentives than managers at firms that have little or no dividend and focus on stock price appreciation. Managers who receive a large portion of their compensation in stock options have an incentive to reduce dividends, because dividend payments reduce the expected value of those options.

[Research](#) by Kevin Murphy at USC analyzed the enormous change in executive compensation through the 1990s and found that stock options had become the largest single component of executive compensation by the end of that decade. In a more recent summary [study](#), Michael Jensen and Murphy discussed this trend and explored its implications. They found that the average CEO received 24% of his or her compensation in the form of stock options in 1992, but by 2000 that fraction had risen to approximately 50% of total compensation.

Jensen and Murphy hypothesized that a vicious cycle emerges when companies become overvalued, one that creates agency problems between managers and shareholders:

It becomes ever more clear to the managers of [overvalued] organizations that it is difficult to generate the performance necessary to support the sky-high stock price. And knowing that the market will hammer the stock price if it becomes clear the expected performance will not be realized, managers begin to take actions that will at least appear to generate the required performance. They use the firm's overvalued equity as currency to make acquisitions to satisfy growth expectations. They use access to cheap capital to engage in excessive internal spending in risky Greenfield investments. They make increasingly aggressive accounting and operating decisions that shift future revenues to the present



and current expenses to the future. Eventually when these fail to resolve the issues, managers, under incredible pressure, turn to further manipulation and even fraud.

None of these actions truly improve performance. In fact, when they are taken purely to give the impression of value-creating growth, they destroy part or all of the firm's core value.

... Equity-based compensation through options, restricted, unrestricted or phantom stock holdings by executives, could not solve the problem either. In fact, in the presence of significantly overvalued equity, such equity-based incentives are like throwing gasoline on a fire – they make the problem worse, not better.

An additional agency issue discussed in this study is that managers have incentives to massage earnings numbers so as to maximize the probability of meeting or exceeding analysts' projections. Stock prices tend to enjoy a significant jump when a company meets or beats expectations, which results in another incentive problem:

The earnings game managers are involved in with analysts creates kinked pay performance relations and therefore creates incentives for managers to manipulate earnings to meet or beat the analyst's forecast, to manipulate analysts' forecasts, and to take actions to meet those forecasts even when those actions destroy long run value.

Not surprisingly, this study also documents that the effects on stock prices of earnings relative to expectations are much larger for growth firms than for value firms (which tend to be the dividend-payers). The price of a growth stock is principally determined by expected future earnings, while the price of a value stock is more dependent on maintaining and growing dividends. The ability of management to manipulate the financials of a firm is much lower when a large portion of return is in the form of consistent dividend payments.

In light of these behavioral effects on managers and investors, dividend-paying value stocks have distinct advantages over growth stocks. These advantages are not evident in long-term historical data, largely because of the recent, enormous shift in compensation schemes referenced above and the other factors cited above that determine how companies and their managers are rewarded or punished by analysts and by the market as a whole.

Conclusion

On the basis of Monte Carlo Simulation, I find that income-oriented portfolios can be just as attractive as total-return focused portfolios. In contrast to Vanguard's conclusion, I found no reason to assume that an income-oriented portfolio will increase longevity risk. Income-oriented portfolios, however, do not necessarily reduce longevity risk.



These results make sense intuitively. Total return is made up of the two components: price appreciation and yield. There is no innate mathematical reason to believe that dividends are inherently better as a source of return than price appreciation.

There is, however, an important additional consideration. Research shows that value-oriented companies operate differently than companies that pay low or no dividends. Some companies have long track records of maintaining and raising dividends (such as [S&P's list of Dividend Aristocrats](#)). The managers of these companies have different incentives than those whose companies pay only small dividends or none at all and aim for price appreciation as their primary means to serve investors. A high fraction of expected future returns for glamour stocks comes from projected growth, and managers at these firms have incentives to act in ways that do not benefit long-term investors.

Companies that have incentives to maintain and grow dividends are a better match to the needs of investors whose primary goal is to generate a consistent and steady income stream. The behavioral component of this problem — matching the incentives of company managers to the needs of specific types of investors — makes income-oriented portfolios worthy of consideration.

To express this another way, the trends in relationships among management, analysts, and investors make high-quality, low-beta, dividend-paying stocks more attractive than growth-oriented stocks. As such, an income-focused portfolio that emphasizes less glamorous equity sectors and corporate bonds provides a compelling choice.

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