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Endowment Spending in Volatile Markets: *What Should Fiduciaries Do?*

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In the late 1960's, McGeorge Bundy, former President of the Ford Foundation, persuaded colleges and universities to increase the equity allocation of their endowments, based on the rationale that universities, unlike individuals have long-term time horizons, and over long periods of time stocks provide superior returns to bonds.

Unlike human beings, universities supposedly have an infinite life, and are better able to withstand the kind of volatility in the financial markets that have characterized the last two years. They do not face a tradeoff between potentially large long-term returns and short-term volatility.

However, universities, like individuals, have to spend their money. They don't really have 100 years to simply let their endowments grow. The steady income from their endowments contributes to making grants, paying salaries, and expanding operations. Harvard University - with over 25% of its endowment allocated to illiquid assets such as private equity, timber, and real estate - saw a 30% drop in the value its endowment, from $36.8 billion to $25.8 billion. Staff and athletic programs are being cut, and in the Boston neighborhood of Allston sits an unfinished science center. Similarly, Yale University is freezing salaries, leaving positions unfulfilled and postponing construction. For institutions, as for individuals, short-term volatility matters.

What can the fiduciary of an endowment do to reduce the probability of depleting their assets and maintain the steady income that they rely on to run the university?

Non-profit institutions must make two major decisions concerning their endowment: what is their spending rule, and what is their investment strategy? Should they use a 5% spending rule based on a three-year moving average with an asset allocation of 50% in equities and 50% in bonds? These two decisions should be made at the same time, since they will determine the longevity of the assets and the volatility in the spending of those assets. However, they rarely are.

To demonstrate the relation between spending rules and investment strategy, and to illustrate why a university might rationally choose a diversified portfolio of stocks and bonds over 100% stocks (even if the stock

portfolio earns a higher return during that period), we ran 10,000 simulations using stock market data during two fifty-year historical periods (1926 to 1975 and 1958 to 2007). In each period, we ran simulations using a variety of spending rules and asset allocations. For example, in some cases, we assume the investor spends 3% of their endowment each year and is invested 100% in equities. In other simulations, the investor spends 6% of their endowment and invests in a diversified portfolio of 50% bonds and 50% equities.

For each of the fifty year periods, we make sure not to use any year more than once. In this way, we use many different sequences of returns, but for each simulation the annual compounded return is the same.
Therefore, in each period, stocks outperformed bonds and, as a consequence, the buy-and-hold investor would have been better off holding an all-stock portfolio rather than a portfolio diversified over bonds and stocks. However, in each of these simulations, we assume that the investor is not simply a buy-and-hold investor, and is going to be spending a portion of their money. This changes the situation dramatically.

What our simulations demonstrate is that in both 50-year periods, assuming random sample of the data and a spending rate of 5%, a portfolio diversified over bonds and stocks provides a greater probability of success after 50 years than an all-equity portfolio.

The stewards of endowments have to decide on their asset allocation and their spending rule. In addition, they have to decide between steady returns and high returns. They can have one but not the other. If they want *steady* returns, they can't invest 100% in equities. And if they want *high* returns, they are increasing the probability of failure. In short, there is a direct trade-off between extremely good results and the probability of failure.

However, our simulations suggest that if the investor uses a moving average rule they will greatly reduce the probability of running out of money, even with 100% stocks. Does this mean that an endowment can can have the high returns without running out of money? Yes, but this still comes with a cost: the greater variability in spending. For example, in one out of every ten years, an institution would have to reduce its spending from its endowment by 12.4% or more in one year and by 27% or more over three years. If the allocation is changed to 50% bonds, the same institution would only have to reduce spending by 7% in one year and 16% over three years.

However, this volatility cost can be reduced by using a longer averaging period. So, instead of using an average of the prior three year market values of the endowment, the institution would use an average of five years. In doing this, we find that an institution can increase its allocation to equities with potentially better long-run returns with no increase in the short-term volatility in spending levels.

Getting back to our original question: how can an institution reduce the probability of depleting their assets and maintain the steady income that they rely on to run the institution? In short, they can spend less, diversify over stocks and bonds, and – assuming they use some version of the moving average rule – extend the time-frame from three years to five years. This will limit their spending during good times and give them flexibility to cut spending during the bad times.

Our key finding is that an institution that is reluctant to reduce spending when the value of its endowment falls should determine its spending rule and investment strategy simultaneously. Such an institution may rationally choose a portfolio with a lower long-run return over one with a greater long-run return. Portfolios with smaller short-term volatility reduce the probability of having to ever reduce steady spending.