RiskFirst

A new approach to setting endowment and foundation investment strategy

How to incorporate objective risk measures into the determination of portfolio strategies

Executive summary

The current success paradigm for endowments and foundations (E&F) is largely one based on delivery of relatively better performance than comparable institutions. Where an E&F portfolio lies within published performance league tables becomes the sine qua non of determining success or failure. The result is an observable clustering around a typical asset allocation, akin to that described as the Yale Model.

Yet is this portfolio strategy appropriate across all E&F? Where does "risk" factor into the success paradigm, and how to we determine "risk"?

In this paper we propose a methodology for the incorporation of objective risk measures into the determination of E&F portfolio strategies. Through leveraging advances in technology and risk modeling, we can incorporate the unique characteristics of an E&F into the asset allocation paradigm. Thus, in addition to considerations of performance, the risk to delivery on the sponsoring organization's unique objectives can be properly considered.

1. Are all endowments and foundations the same?

For most educational endowments, the equivalent of annual bonus day comes with the publishing of the annual NACUBO-CommonFund Study of Endowments, which lists the performance of nearly 1000 participant schools. There is a frantic rush to find out where a portfolio sits in the league table versus "comparable" schools, or even Yale, considered the gold standard when it comes to long-term performance. For non-educational organizations, similar studies are produced by organizations such as the Council on Foundations.

Given this success paradigm, and the natural desire to avoid failure, it would seem that a starting point for constructing an endowment portfolio would be the median endowment asset allocation, given that differing from this opens significant risk to underperformance in a league table. Interestingly, the asset allocation of most endowments included in such studies does not actually vary much , – indicating pressure to stick to a typical asset allocation.

In isolation from the sponsoring organization, such an approach to portfolio construction may seem perfectly reasonable. But should portfolio strategy be the same for a school where 2% of its income is financed by the endowment versus one where it is 50%? Should it be the same for a school with an endowment of US$1m per student versus one with US$50,000 per student? Or a charity flush with donations versus one living entirely off an endowment?

Clearly, portfolio risk should reflect these factors. This is not happening – indicated by the tight distribution of asset allocation.

In the same way that performance can be benchmarked, wouldn't it be powerful if risk could be too? Taken together, this could provide a far more meaningful insight into explaining past performance, as well as aiding the design of the most optimal portfolio geared to an E&F's unique characteristics, goals and objectives. Yet there appears to be a dearth of statistics available on E&F risk.

At RiskFirst we decided to take a look at the population of endowments we have modeled over the last few years to see if we could develop any conclusions which might help move the portfolio strategy decision beyond simply one of trying to beat Yale.

2. The value of a forward-looking approach

Analysis of past risk and returns is a critical component of risk management. However, it is by nature backward-looking, and deterministic (i.e. only one scenario is provided). Today's technology allows powerful future projections to be made through running thousands of Monte Carlo simulations across highly complex investment paradigms on demand.

Necessary to this is an economic and capital market outlook. Rather than use one person or firm's forecast, we prefer to use an economic scenario generator. It should be emphasized that this approach is not one of predicting the future; rather it focuses on providing thousands of individual investment performance outcomes across a probability distribution (stochastic). This enables judgements to be made around the likelihood of various outcomes and further consideration of extreme, perhaps previously unidentified, outcomes (stress-testing).

Projecting returns on a population of E&Fs

By utilizing each portfolio's unique holdings, we were able to make ten-year stochastic projections for our population of E&F (see Figure 1) with a starting date of September 30th 2018. For each endowment's projection one output was the median return. The ten-year median return on the lowest performing portfolio is 5.13% (technically "ex-ante" statistics, i.e. forward-looking). The highest is 7.56% giving a range from top to bottom of 2.43%. This is a relatively narrow range, which is not surprising given similar asset allocations.

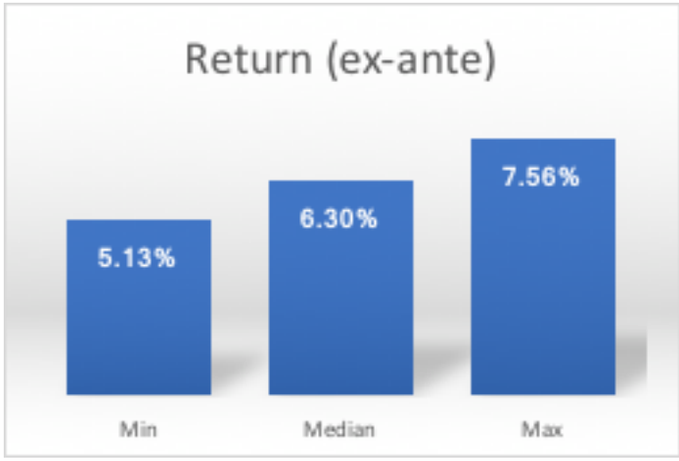

Figure 1: Ten-year stochastic projections for returns of E&F population

What is the risk of achieving those returns?

We chose one year Value-at-Risk (VaR) as a measure of portfolio risk because it better represents the size of extreme outcomes rather than standard deviation. When looking at risk rather than returns, the VaR95 exhibits a very wide range of outcomes from a low of 9.82% to a high of 27.36% (see Figure 2).

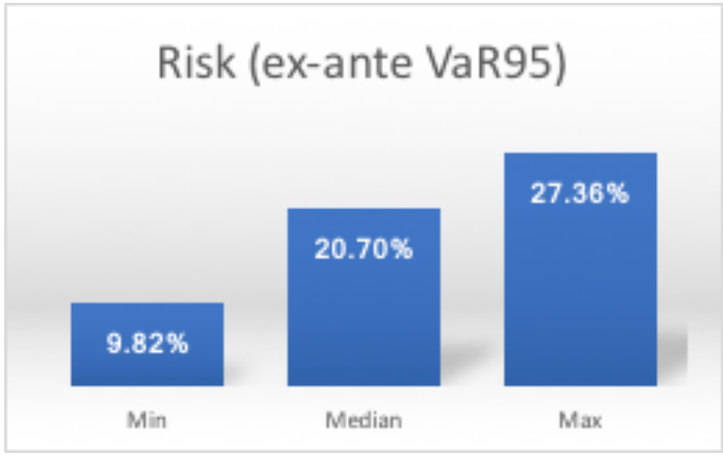

Figure 2: VaR95 of E&F population

This indicates a significant difference in the risk of the endowment portfolios in the study (a range of 17.54%), as compared to the more tightly clustered return projections (a range of 2.43%). You could infer from this that perhaps certain endowments are taking far more risk than they realize to achieve marginally improved returns.

Can traditional risk-adjusted analysis help us in defining the optimal portfolio?

A traditional approach to assessing the efficiency of portfolio construction is to compare risk and return. Often this would involve comparing expected return and ex ante volatility of returns; in this case we have used VaR95 as the risk measure. We selected three endowment portfolios for further analysis to compare to the model of the population (the straight line shown on the chart in Figure 3); endowments A, B and C.

Figure 3: Return vs Risk

Traditionally, if these returns were actually achieved, kudos in the published performance reports would go to Endowment A with an annual return of 7.56%. Endowment B represents the second best-performer with a return of 6.83% and Endowment C exhibits a very poor comparable return of 5.13%. However, Endowment C is arguably more optimal than Endowment B on a risk-adjusted basis. Both A and C appear to be relatively efficient relative to the population.

The only conclusion we might make based on this is that Endowment B's portfolio is sub-optimal given that it appears possible to generate the same return for a reduction in risk of around 2.5%. But what is the relative conclusion between A and C? If the goal is simply to maximize return then Endowment A clearly beats C by a wide margin. However, if the pledge to stakeholders is to consider risk in the management of the portfolio (which is what most endowments state) then how do we know which portfolio is more desirable since both compare well to the population?

The fact is that this type of analysis tells us little about which portfolio is optimal for an endowment or foundation. Depending on the organization, we could assume that some would be more suited to A, others to C and no doubt many in-between.

3. A new approach: Linking portfolio optimization to E&F objectives

What if we borrowed the concept of asset-liability management from other institutional investors such a pension funds? Not in an abstract manner – defined by volatilities, VaR or Sharpe ratios – but rather asking the question as to what is the sponsoring organization's objectives, and are there "risky" outcomes to be avoided.

Let us consider the endowment goal of preserving inter-generational equity, and maintaining or enhancing the real value of spending for future generations (which is considered "mission delivery").

For E&F, this means considering the size and volatility of spending as a factor in portfolio construction. We call this VaREx, the VaR of expenditure. If poor portfolio performance means that mission delivery is curtailed through reductions in scholarships, cancellation of new laboratories, reductions in housing homeless families etc., this should perhaps be something to minimize the likelihood of.

This may all sound very subjective, bringing to mind theoretical dissertations on enterprise risk management. But to make this real, let us define a quantitative objective.

Definition and evaluation of a quantitative objective

Let us assume that the organization believes that it can withstand a 20% reduction in spending over time before serious cuts would need to be made to mission delivery and administrative services (which we shall refer to as the "trigger point"). For a wealthy school, the trigger point might be a reduction of 50% or higher, and for a charitable organization with no significant fund-raising this might be 5%. The point is to define a measurable outcome related to the risk tolerance and objectives of the particular non-profit organization.

A suitable risk-management tool can provide this critical link by analyzing the impact that portfolio strategy has on the ability to deliver on mission objectives. Some of the key facets of this tool should be a credible economic and capital market forecasting module as well as the ability to parameterize E&F spending formulae.

Utilizing an E&F-specific risk management tool, we can create a stochastic projection of nominal and real spending for each of the three endowments, A, B and C shown in Figure 3 earlier. An example of a stochastic projection of nominal spending is provided in Figure 4 .

Figure 4: Sample stochastic projection of nominal spending for an endowment

Stochastic projections enable us to quantify the probability of hitting the trigger point of a 20% reduction in nominal spending in a specific year as compared to the current year's spending (see Figure 5).

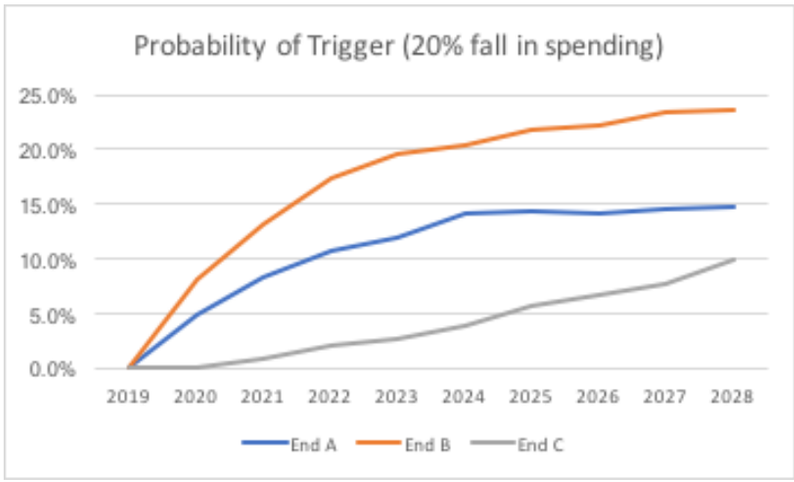

Figure 5: Probability of hitting the trigger point for three endowments

Endowment A and B have somewhat similar risks, but the higher expected long-term return of Endowment A and marginally lower risk contributes to a lower probability of hitting the trigger. Endowment C's significantly lower risk reduces the probability of the trigger despite it also having the lowest return of all three endowments. If minimizing the trigger probability was the main objective of an endowment, then the portfolio of Endowment C could be the most appropriate. For example, endowment C's portfolio strategy could be optimal for a community foundation entirely reliant on the endowment for its income, and one where a meaningful reduction in spending could have a very detrimental impact on the community it supports.

Assessing upside objectives

Most E&F are also focused on maintaining, or indeed increasing, mission effectiveness over time. Using the same modeling tools, we can easily examine the probability of meeting this objective. Let us consider maximizing the probability that the endowment can increase its spending in real terms (after taking into account inflation) by 5%, from current spending, in any given year (see Figure 6).

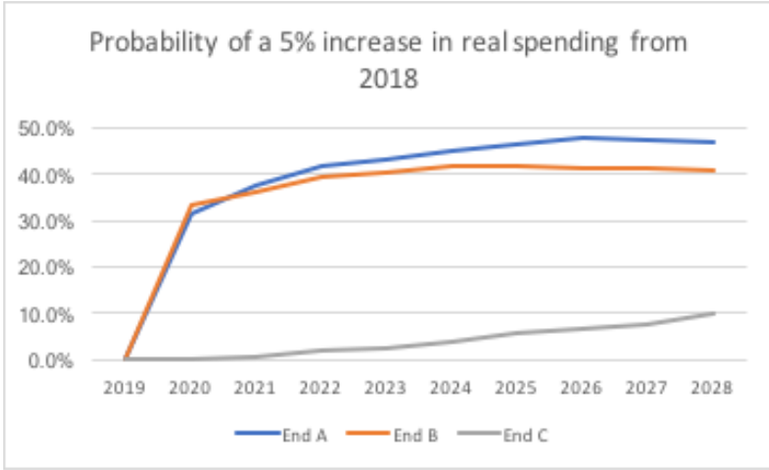

Figure 6: Probability of a 5% increase in real spending for three endowments

If increasing mission effectiveness over time is a major objective for the endowment, then Endowment A and B deliver the goods with a 40% chance of delivering on this objective by 2022. Yet the downside risk of Endowment B, as shown in Figure 5, would lead us this to conclude that Endowment A was far superior. Interestingly for two endowments with similar one year risk and return profiles, our analysis shows that when put in this new context, the risk profiles differ and Endowment B has a significantly higher risk of hitting the downside trigger.

Endowment C has only a small (under 10%) chance of meeting the objective by 2028 – although as we saw above it has a significantly lower probability of suffering a trigger event.

We have only shown analysis for two definable objectives above. But this type of approach can be repeated many times for many different definable objectives allowing the creation of a framework to define risk. Within this framework, E&Fs can analyze outcomes objectively and enter a more informed discussion with their stakeholders about what portfolio strategy is most appropriate.

4. Conclusion

Advances in technology allow E&Fs to define a framework for risk which reflects the objectives and risk tolerances of the E&F's sponsoring organization. The example discussed in this paper involves interactively running many stochastic scenarios to help determine portfolio strategy.

For CIOs and consultants, leveraging today's technology through appropriate risk software tools empowers the optimization of performance within quantifiable risk parameters. For CFOs used to traditional financial modeling packages which overly simplify endowment income volatility, having significantly more understanding and control over how investment volatility impacts their organization's budgets significantly enhances governance.

At the end of the day, the durability of the organization's mission relies on endowment spending. Understanding and managing that spending variability is where the rubber meets the road.

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