The Evolution of Modern Portfolio Theory for the Institutional Investor

Most endowments and foundations use the policy portfolio as a guiding anchor for setting their investment strategy. The policy portfolio represents the synthesis of a strategic asset allocation anchored by the risk profile and return objectives of the institution, as well as a tactical overlay reflecting their best thinking of current market conditions and future returns.

Such an approach owes its origin to the work of Harry Markowitz¹ and others in the 1950s, now commonly referred to as Modern Portfolio Theory. Markowitz’s work demonstrated the risk-adjusted benefits of portfolio diversification in an unambiguous manner. Today, the implementation of his technique of combining different sources of returns to reduce the overall risk of the portfolio is simply known as asset allocation.

The early pioneers of Endowment Investing², notably David Swensen and Jack Meyer, correctly foresaw that certain investment structures and securities could provide different risk-return characteristics than those provided by standard asset classes. The addition of absolute return structures, illiquid private equity, venture capital and timber was a logical evolution of Markowitz’s insight on portfolio diversification. The policy portfolio can thus be viewed as asset allocation on steroids, albeit with additional insight and non-trivial implementation hurdles (see Exhibit 1).

Exhibit 1: The Policy Portfolio is Asset Allocation on Steroids

“The policy portfolio can thus be viewed as asset allocation on steroids, albeit with additional insight and non-trivial implementation hurdles.”

Ashvin B. Chhabra  
Chief Investment Officer, Merrill Lynch Wealth Management  
Head of Investment Management & Guidance
The early adopters of Endowment Investing were also able to successfully deliver excess return (alpha) through astute manager and security selection. However, there is a clear tradeoff between maximizing return and diversifying the overall portfolio.

Concentrating one’s chips on a few managers that have the promise to maximize alpha may be the theoretically pure choice, but not without significant downside. Boston University’s ill-fated investment in Seragen in the 1980s serves as an important reminder of the dangers of over-confidence and concentration. Therefore, most endowments diversify prudently, thus inevitably reducing both idiosyncratic risk and expected excess return.

The Problems of Trend Chasing and Herd Behavior

Nevertheless, the notion of delivering superior or even out-sized returns for one’s institution through a differentiated investment strategy is a powerful one. In a recent paper, Goetzmann demonstrates the hypnotic effect this philosophy has had on Endowment Investing – leading to trend-chasing and herd behavior. In particular, he found that endowments with below-median allocations to alternative investments increased their allocations to hedge funds in an effort to catch up with their “school’s nearest competitors”. He argues that “the dynamic patterns that we see in asset allocations in university endowments are consistent with an arms race model of universities.”

A fair question to ask is whether this kind of trend-chasing and herd behavior led to the exacerbation of the problems experienced by endowments and foundations in 2008.

The purpose of this article is to stress that the source of those problems is much deeper than one might imagine and has its roots in how we understand Modern Portfolio Theory in the context of institutional investing. Given the continued economic uncertainty and fragility of financial markets, I hope that the formalism discussed below can be helpful in setting an appropriate investment strategy for institutions.

The Greater Objective -- Meeting Goals

To begin, one must note that maximizing returns through any particular investment strategy is merely part of a greater objective of meeting a series of (often conflicting!) goals for the institution. The most immediate and essential of these goals is to provide cash flows, as much and when needed, for an individual or institution to function effectively. Thus both the Markowitz framework (asset allocation) and the Endowment Model (policy portfolio) need to be understood within a larger framework of institutional needs.

An Important Step: Bond Immunization

An important step in connecting the diversified market portfolio with the particular needs of the investing institution was taken by James Tobin a few years after Markowitz wrote his famous paper. Tobin pointed out that corporations had well-defined liabilities that needed to be met with certainty. This certainty was at odds with the uncertainties of even a well-diversified market portfolio. Tobin’s solution involved creating a bond portfolio that matched the near-term liabilities. This technique is now known as bond immunization. Through duration matching, the coupons of the bond portfolio match the firm’s short to medium term liabilities and protect those liabilities from market fluctuations.

Two Distinct Approaches: Risky and Riskless Portfolios

In the broader context this step led to a framework that combined two distinct approaches—asset-liability management (the riskless portfolio) and the standard diversified market (risky)
portfolio. Of course, the two distinct portfolios can be visually represented by a single pie-chart, but the distinction is of critical importance.

Why is the distinction so important?

Detailed historical studies of global financial markets\(^5\)\(^6\) show quite clearly that they are susceptible to instabilities of all magnitudes. Markets, as Mandelbrot\(^7\) emphasized, are not just mildly random but wildly random.

In return distributions these instabilities are evident as fat tails. However, the fat tails do not do justice to these instabilities as such events do not occur randomly. Rather, these instabilities are highly correlated and come in clusters. In extreme cases, some financial markets simply go out of existence for extended periods of time.

The riskless portfolio concept thus deserves serious consideration. The generalization of bond immunization is immunization against all the kinds of risks that an institution can face (whenever possible or affordable).

The Challenge of Idiosyncratic Risk and Return

A second point worthy of further discussion is the impact of idiosyncratic risk and return. CIOs spend a great deal of effort selecting managers that provide the promise of significant alpha to the portfolio while at the same time judiciously combining them to create a diversified portfolio. However, the role (and impact) of alpha in the Endowment Model has been fundamentally misunderstood by the slew of new adopters.

Let us consider what impact alpha, within the context of a diversified portfolio, can have on an institution.

First, let us examine the increase in alpha that can be added by superior performance, relative to an already sophisticated peer group (see Exhibit 2).

Given this data\(^8\), we can ask the following question: What impact can this superior performance have on the size of the total endowment over time?

To answer this question, it is instructive to examine the size distribution of the list of endowments covered by NACUBO in its annual survey (see Exhibit 3).

Let us now assume that an institution of median size (50th percentile) would like to grow its endowment aggressively. Assume further that, by investing aggressively in illiquid and alternative strategies (within the diversified framework), it is able to systematically deliver top quartile performance. At the same time consider an endowment in the 75th percentile in terms of size that is sluggish in its strategy and only manages bottom quartile performance. Let them do this year after year.

Neglecting any additional risks arising from this out-performing strategy adopted by the smaller endowment, let us compute how many years it takes before the median sized endowment breaks into the top quartile in terms of size.

The smaller institution will catch up (even under these very favorable assumptions) in about 65 years. The time frame is similar for an institution in the 75th percentile chasing one already in the 90th percentile.
In retrospect the answer is obvious. The distribution of endowment sizes is not normal but instead has a very long tail. Consistent out-performance is hard to come by and it is hard to move the needle unless one takes a lot of idiosyncratic risk and veers off the beaten path. This observation is consistent with what is seen when studying endowments, foundations or the net-worth of individual investors.

Endowments may have a long-term view of their institution, but the day-to-day reality of the investment process has a much shorter time frame. Studies have shown that after three years of under-performance CIOs exit a manager or strategy. In summary, an aggressive investment strategy stuck within a diversified framework is not the ticket to wealth mobility, or to breaking out of one's peer group. This is true for both individual investors and for institutions. However, the desire to provide top quartile performance within an already sophisticated peer group can lead to some pretty skewed strategies – leading many to disregard the Hippocratic admonition of first doing no harm.

A Third Portfolio Bucket

In order to better analyze the overall portfolio, it turns out to be important and useful to separate investments that have exceedingly high return expectations into a third portfolio bucket, as they come with a risk-return profile different from that of a diversified market portfolio.

The three portfolios together create a framework for understanding the entire portfolio in terms of objectives, risk and return within the context of fat tails and black swans (see Exhibit 4).

**Exhibit 4: The Wealth Allocation Framework for Institutional Investors**

<table>
<thead>
<tr>
<th>Bucket 1: Safety Portfolio</th>
<th>Bucket 2: Policy Portfolio</th>
<th>Bucket 3: Aspirational Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Safety Portfolio:</strong> A risk mitigation portfolio that may include Asset Liability Management and other protective strategies including tail-risk hedging.</td>
<td><strong>A Policy Portfolio:</strong> A diversified market portfolio where the source of return is driven by various market betas with an overlay of some alpha. This includes hedge funds and private equity.</td>
<td><strong>An Aspirational Portfolio:</strong> This portfolio consists of a collection of investments that may have a disproportionately positive impact on the institution, usually accompanied by much higher risk. These investments may be concentrated around areas where the institution has or can build a sustainable advantage such as building a top-notch medical facility, sports team or fund-raising operation.</td>
</tr>
</tbody>
</table>

**The Critical Role of Risk Allocation**

The critical piece in this three-portfolio framework is the concept of Risk Allocation. Risk Allocation is a fundamentally more important concept than asset allocation. In fact asset allocation is simply a special case of Risk Allocation. The policy portfolio is a piece, albeit an important one, within the overall framework. The optimal Risk Allocation involves balancing allocations among the three (inter-related) risk buckets and must be set in the context of meeting the goals and objectives of the institution.

Failure to understand Risk Allocation can lead to structural imbalances in the investment portfolio, as evidenced by the liquidity crisis in endowment portfolios during the 2008 crash. The following example may be illustrative:
In the quest to increase returns, many endowments embarked on an aggressive program to capture the illiquidity premium through investments in private equity. In 2008, the policy portfolio of several institutions indicated that illiquid securities ranged from a third to a half of their holdings. Furthermore, these institutions had PE commitments approximating about 10% a year over the next three years. These commitments were either to be balanced by expected distributions or were part of an overall strategy to increase exposure to alternative investments. While this situation may look like a sensible diversified investment strategy in terms of the policy portfolio, it is instructive to look at it in the context of the Wealth Allocation Framework (see Exhibit 5).

Exhibit 5: Evolution of the Policy portfolio?

The Wealth Allocation Framework for Institutional Investors
The Wealth Allocation Framework forces the portfolio to separate out the risk-mitigation assets from market assets and aspirational assets. One then adds the liabilities associated with contributions to the operating budget and commitments to private equity capital calls. Since private equity commitments are firm commitments, they force one to debit the safety portfolio/bucket (rather than the market portfolio) by the same amount. This is not true for other non-recourse leverage that may be tied to a particular investment. Hence the critical distinction between recourse and non-recourse leverage is evident in this framework.
Most institutions were highly under-allocated to bonds and cash (Harvard’s 2008 cash allocation was -5%). This led to an overall net negative safety portfolio for many institutions. The equity and equity-like market portfolio had an approximately 50% allocation to illiquid assets. When the total value of the market portfolio decreased by 30% to 40% (a major instability or market crash) illiquid investments as a percentage of the total balance sheet went up sharply. This was accentuated by the fact that the dollar amount of the PE commitments did not go down at all. This de-correlation between the size of the PE commitments and that of the PE portfolio itself is evident in the Wealth Allocation Framework (see Exhibit 6).

Exhibit 6: A Risk Balance Sheet Approach

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Portfolio</td>
<td>3 Year Spending (-15%)</td>
</tr>
<tr>
<td>Policy Portfolio</td>
<td>3 Year PE Commitment (-30%)</td>
</tr>
<tr>
<td>Aspirational Portfolio</td>
<td>Seed &amp; Co-Investments</td>
</tr>
<tr>
<td></td>
<td>Patents</td>
</tr>
<tr>
<td></td>
<td>Sizable Donor Gifts</td>
</tr>
</tbody>
</table>

The emergent picture clearly indicates that such a risk allocation cannot withstand a major market downturn without severe stress.

Additional Comments

Exposure to Beta

There is a choice of how much exposure to equity markets one may want in the market portfolio. The total exposure can also be quantified as a single number, beta (sensitivity to the equity market), in order to incorporate other sources of return (such as credit spreads) that may be correlated to equity markets. It is somewhat surprising to see that many institutions with widely varying risk profiles and dependencies on their endowments all seem to have similar betas ranging from 0.6 to 0.75. This situation may have its origin in the common historical starting point for most endowments and foundations, the conventional 60/40 stock and bond portfolio. For an understanding of what happens to these high-beta portfolios that contain a large percentage of alternative assets in extreme market conditions, the concept of stress beta introduced by Leibowitz,12 is important and especially useful.

Risk Parity

Risk Parity is a special case of risk allocation. However, one may ask, “parity with respect to what?” In some cases it may be useful to think about a target volatility to compare different sources of return while building a portfolio. In the broader context, however, it may be more useful for an institution to develop the right risk sensitivities or allocation with regard to a series of possible economic and market scenarios that the portfolio or institution may be exposed to.
In the end the institution's investment strategy is simply part of a much broader effort to control the risk of not achieving institutional goals under a variety of possible market scenarios. The Wealth Allocation Framework clarifies the role of an investment strategy within the broader context of essential and aspirational goals and stable and unstable economic scenarios.

The Role of True Alpha
True alpha comes from idiosyncratic investing—tactical asset allocation, security selection and so on. However, for it to make a difference in the aggregate to the institution, this strategy must be accomplished on a large scale i.e. on a scale comparable to the institution's wealth. This is neither desirable nor feasible for most endowments and is accomplished only occasionally. Successful examples are few and far between and in most cases, it means charting one's own course and having the backing of the institution to stay the course for many decades.

As a rule, idiosyncratic return from superior investment and manager selection will only contribute a small percentage to the total wealth of an institution. Therefore, the risks taken to achieve these excess returns should be small in the aggregate. Not every investment portfolio can execute well on the Aspirational Portfolio. Instead, an institution may try to fill this bucket through other activities such as raising large donor gifts or identifying intellectual property that may yield potentially lucrative patents. Other examples may be developing a top-notch medical facility or a top-tier sports team. The overall portfolio construction should focus on achieving institutional goals. In the institutional sense, this demands a closer connection between the investment strategy and other activities of the institution.

Acknowledgements
I would like to thank Nevenka Vrdoljak and Ravindra Koneru for assistance with the figures and calculations for this paper. An earlier version of this paper was published in the NMS Exchange newsletter in November 2012.
Sources, References and Further Reading

5. Carmen M. Reinhart & Kenneth S. Rogoff, This Time Is Different: Eight Centuries of Financial Folly, Published by Princeton University Press (2011)
8. Nacubo-Commonfund Study 2013 (see www.nacubo.org)