The Role of Asset Allocation in Portfolio Management

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“Tis the part of a wise man to keep himself today for tomorrow, and not venture all his eggs in one basket.” - Miguel de Cervantes, Don Quixote de la Mancha, 1605.

“Behold, the fool saith, ‘Put not all thine eggs in the one basket’ - which is but a manner of saying, ‘Scatter your money and attention;’ but the wise man saith ‘Put all your eggs in the one basket and - WATCH that basket.’” - Mark Twain, Pudd'nhead Wilson, 1894.

Cervantes and Twain were both great writers, but Cervantes would have made a better investor. In fact, diversification has been a key component of asset allocation for some time. A prominent magazine in 1926 recommended that a portfolio contain 25% sound bonds, 25% sound preferreds, 25% sound common stocks, and 25% speculative securities. This may not be an entirely appropriate portfolio today, but the importance of asset allocation remains.

Any security-specific selection decision is preceded, either implicitly or explicitly, by an asset allocation decision. Asset allocation is therefore the most fundamental of investment decisions. Recent research has estimated that the asset allocation decision accounts for 91.5 percent of the variation between returns on different portfolios. With this result, it is not surprising that asset allocation has found its way into the financial spotlight. But the spotlight has not always been focused properly. Until recently, asset allocation was a pedestrian affair. Many institutional investors were advised to allocate 60 percent of their assets to stocks and 40 percent to fixed-income. Individual investors would be advised to allocate anywhere from 100 percent stocks to 100 percent bonds depending on such factors as age, income, dependents, etc. The basis of analysis on which this recommendation was determined could most charitably be described as ad hoc.

Today, asset allocation is a far more rigorous enterprise involving the use of tools that have transformed the process. What follows is a brief survey of these tools.

Section 1: Mean-Variance Optimization

Mean-variance optimization (MVO) refers to a mathematical process that calculates the security or asset class weights that provide a portfolio with the maximum expected return for a given level of risk; or, conversely, the minimum risk for a given expected return. The inputs needed to conduct MVO are security expected returns, expected standard deviations, and expected cross-security correlations. For his work in developing this process, Harry Markowitz was awarded a share of the 1990 Nobel Prize in Economics.[3]

When first developed, mean-variance optimization was applied (if at all) only to portfolios of individual stocks. Today, this technique is applied with increasing frequency on an asset class level. This trend is appropriate for two reasons. First, the inputs required by the Markowitz model are more difficult to estimate for individual securities than they are for asset classes. Second, the range of asset classes available to investors is now much larger, especially given the increased willingness of U.S. investors to consider global investing.

Institutional investors are not the only ones to benefit from this development. Retail brokerage houses have traditionally only provided stock selection advice to their individual clients. However, with increasing frequency they are suggesting a greater degree of passive security selection, and instead are providing asset allocation recommendations to their investors. This is accomplished by using optimization to create allocations that provide their individual accounts with greater expected return, less risk, or both. In addition, sophisticated techniques derived from utility theory and behavioral economics can be employed to develop questionnaires that more accurately gauge an individual's risk preferences.

Optimization has also found a home with pension funds who consider not just the assets themselves when choosing investment mixes, but the fund liabilities and the interaction between the two. The resulting allocations maximize the expected fund surplus (assets minus liabilities) for a given level of risk.

The consequence of mean-variance optimization is a set of asset class weights that can be used as a long-term guide for investing. This is often described as the portfolio's strategic asset allocation plan. The portfolio weights should be updated occasionally to reflect changes in estimates of the long-term parameters or different needs of the portfolio. However, these changes will likely result in small revisions in the portfolio composition.

Section 2: Dynamic Asset Allocation

Dynamic asset allocation refers to strategies that continually adjust a portfolio's allocation in response to changing market conditions. The most popular use of these strategies is portfolio insurance. Broadly speaking, portfolio insurance is any strategy that attempts to remove the downside risk faced by a portfolio. A popular means of implementing portfolio insurance is to engage in a series of transactions that give the portfolio the return distribution of a call option.

Option replication is based upon the work of Fischer Black and Myron Scholes who showed that under certain assumptions the payoff of an option can be duplicated through a continuously-revised combination of the underlying asset and a risk-free bond.[4] Hayne Leland and Mark Rubenstein extended this insight by showing that a dynamic strategy that increased (decreased) the stock allocation of a portfolio in rising (falling) markets and reinvested the remaining portion in cash would replicate the payoffs to a call option on an index of stocks.[5]

Through the mid-1980s, the popularity of portfolio insurance programs soared. It has been alleged that the procyclical nature of these strategies contributed to greater market volatility, particularly during the stock market crash of October 19, 1987. Moreover, portfolio insurance proved to be unsuccessful in totally eliminating losses on the day of the crash. Consequently, the use and viability of portfolio insurance is controversial. Nevertheless, portfolio insurance continues to play a significant role in the world of asset allocation today.

Section 3: Tactical Asset Allocation

Tactical asset allocation (also known as market timing or active asset allocation) is the process of diverging from the strategic asset allocation when an investor's short-term forecasts deviate from the long-term forecasts used to formulate the strategic allocation. If the investor can make accurate short-term forecasts, tactical asset allocation has the potential to enhance returns. In practice, tactical asset allocation (TAA) models tend to recommend contrarian trades, that is, they recommend purchasing (selling) an asset as its current market value drops (rises).[6] When viewed in this light, TAA becomes the mirror image of portfolio insurance. In other words, tactical asset allocators are the investors providing portfolio insurance.[7]

One consequence of TAA is that by overweighting certain assets during certain times and underweighting others, the portfolio is riskier because of its reduced diversification. Therefore, the strategy would need to generate above-market returns as compensation for this added risk. Whether or not tactical asset allocators have achieved this is a matter of continuing study. It is certain, however, that because the potential returns from successful TAA would be large, researchers will continue their investigations, and investors will continue to listen to their findings.

Section 4: The future of asset allocation

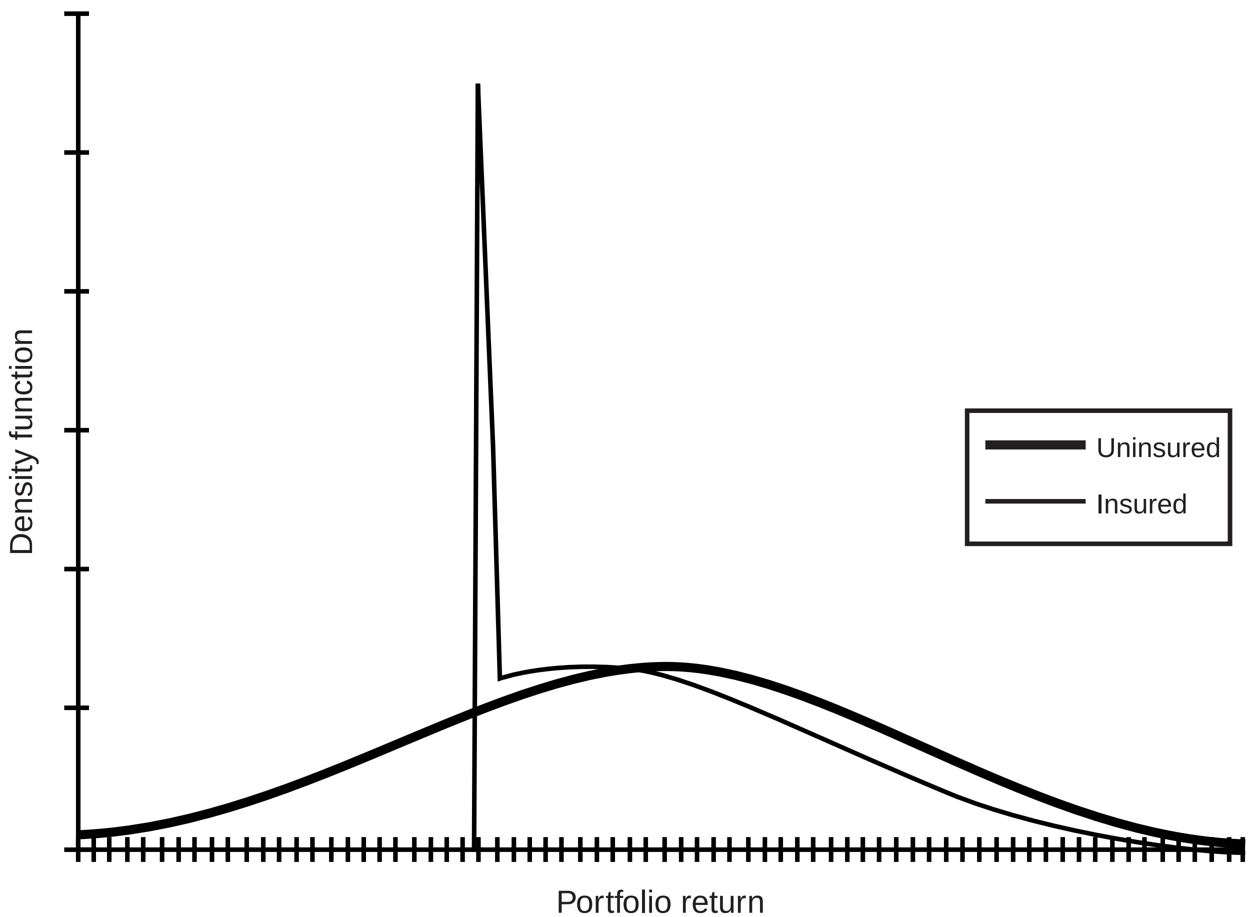
Most forecasters fall into two camps. Forecasters in the first camp are eager to predict that the future will closely mirror the recent past. Their archetypes are those damnable generals who are always preparing to fight the last war. Forecasters in the second camp rely heavily upon the adage that the only constant is change itself. Graduates of this school of thought usually don't know what to expect, but are quite sure it will be nothing like anything we've seen before. These caricatures are a bit harsh, but they do illustrate the problem of forecasting.

We view the future of asset allocation through lenses borrowed from both camps. That is, certain aspects of asset allocation today will continue to be recognizable for many years, while others will be historical curiosities. To be more precise, the goals and importance of asset allocation will not change, but the mechanisms by which investors seek to achieve those goals will be new.

The goal of the asset allocation decision, was, is, and will be to select a combination of assets that will generate a return sufficiently high and safe so as to offset some future liability. It is also safe to say that asset allocation decisions will have a continuing large role in explaining portfolio returns.

The mechanisms of implementing the asset allocation decision will be quite different. We see significant progress in at least three areas.

FIGURE I.1 Return Distribution for Uninsured and Insured Portfolios



1. The neatly drawn return distributions (e.g., Figure 1) in the marketing brochures of portfolio insurers have understandable appeal. Unfortunately, the diagrams assume certain market conditions that are not always present. For example, portfolio insurance programs work best when prices do not "jump" and markets have sufficient liquidity.[8] These conditions were not present during the October 1987 crash. In the future, we will see insurance programs that will be more adequately prepared to deal with certain types of market failure.

2. Optimization will continue to play a role in asset allocation, but whether or not it is the mean-variance optimization practiced today is another question. Using variance as a proxy for risk

troubles many investors. Today numerous researchers are investigating alternative measures of risk (e.g., minimizing the probability of a return below a certain level). Perhaps in the future a practical model will be developed that incorporates more intuitive measures of risk. In addition, mean-variance optimization is a one period model. We expect researchers to develop more robust models that allow investors to enter time-dependent estimates of expected return, risk, and correlation for their assets and then optimize accordingly.

Finally, many of the securities investors will use to implement asset allocation decisions in the future do not exist today and will have to be invented.

The asset allocation recommendation from 1926 mentioned previously was probably the product of the collective intuition of a writer and some of his acquaintances in the financial community. The process of determining this allocation would probably not be described today as rigorous. Today we approach the asset allocation problem more formally and many advances have been made. Nevertheless, asset allocation remains more art than science and will probably remain so as long as the models used are but approximations of a reality that is in constant flux.

There continues to be a need for investors and researchers to scrutinize the assumptions underlying today's models and evaluate whether the model is a sufficient reflection of reality. Undoubtedly, most of today's approaches will be found wanting in the future and new advances will be made. Whatever the future holds, it is sure to be interesting, so enjoy the ride.

Section 5: Endnotes

1. The Magazine of Wall Street, 1926.

2. Gary P. Brinson, Brian D. Singer, and Gilbert L. Beebower, “Determinants of portfolio performance II: An update,” Financial Analysts Journal, May/June 1991.

3. The original works that set out the principles of mean-variance optimization are: Harry M. Markowitz, “Portfolio selection,” Journal of Finance, March 1952; and Portfolio Selection: Efficient Diversification of Investments, New York: John Wiley & Sons, 1959.

4. Fischer Black and Myron Scholes, “The pricing of options and corporate liabilities,” Journal of Political Economy, May/June 1973.

5. Mark Rubenstein and Hayne E. Leland, “Replicating options with positions in stocks and cash,” Financial Analysts Journal, July/August 1981.

6. This argument is more fully developed in William F. Sharpe, “Asset allocation,” in John L. Maginn and Donald L. Tuttle eds., Managing Investment Portfolios: A Dynamic Process, second edition, Charlottesville, VA: Association for Investment Management and Research, 1990.

7. See William F. Sharpe and André F. Perold, “Dynamic strategies for asset allocation,” Financial Analysts Journal, January/February 1988.

8. A price jump is when, for example, a stock trades at $100 per share and then $90 per share, with no opportunity for an investor to transact at an intermediate price. The jump is problematic for dynamic asset allocation because it becomes impossible for the portfolio insurer to gradually sell the stock as it drops from $100 and $90. Liquidity is also necessary because the portfolio insurer, like all traders, requires a counterparty. If the market is illiquid, the series of transactions necessary to replicate the option cannot be undertaken.