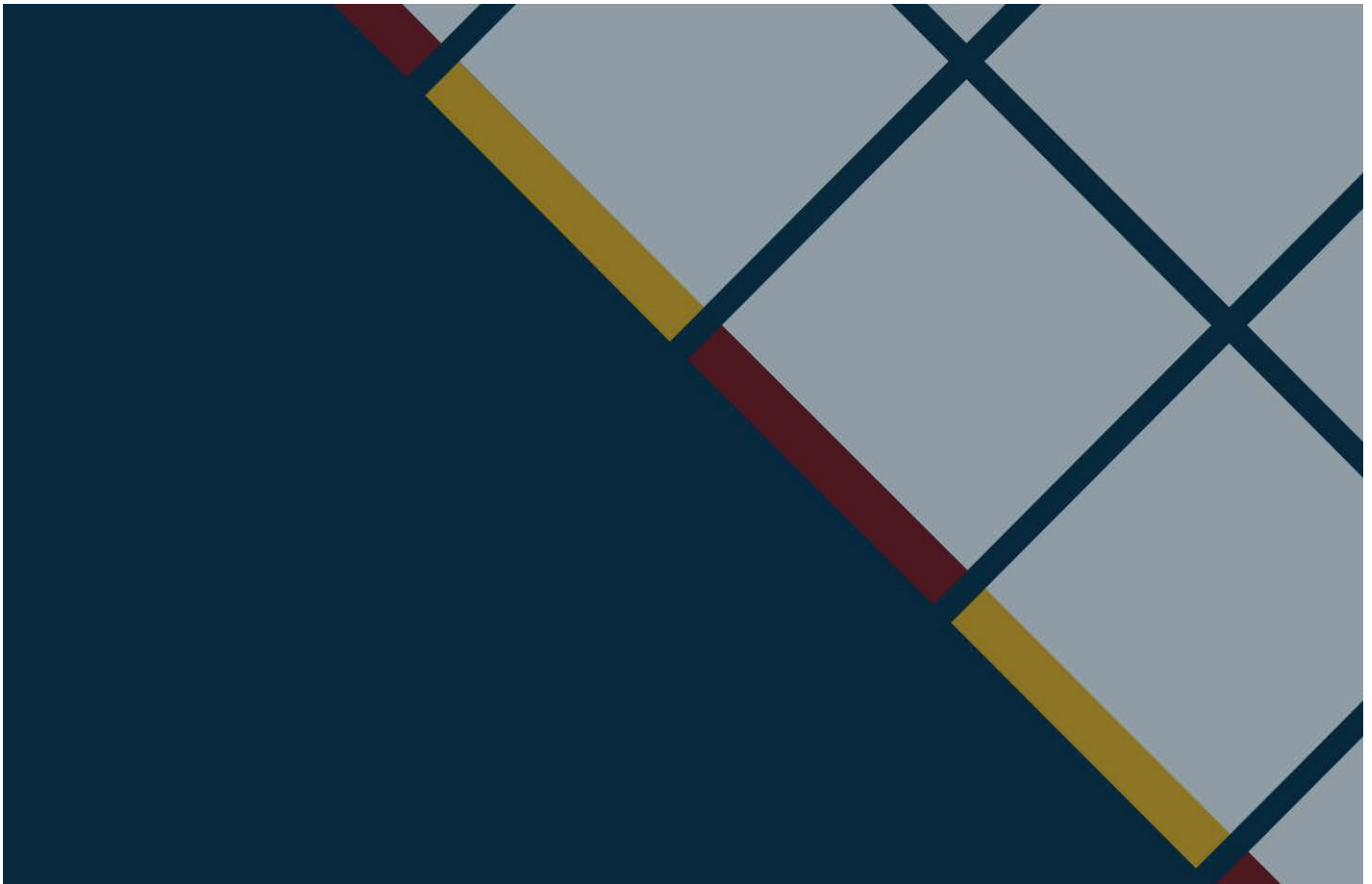




Active Risk in Asset Allocation



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Introduction

Most investors are familiar with the notion of passive risk, or the risk and return characteristics of diversified asset classes. Strategic asset allocation models have long been used to construct portfolios of traditional asset classes. They are now being extended to include alternative asset classes such as private equity, real estate, managed futures and hedge funds.

Classic asset allocation involves allocating capital to asset classes in a way that maximizes return for a specified level of risk. It is often formulated as a mean-variance optimization problem requiring the following inputs:

- › *Return forecasts for each asset class (e.g., domestic equity, fixed income, international equity).*
- › *Estimates of standard deviations for each asset class.*
- › *Estimates of covariance among all asset classes.*

The solution to the allocation problem is an efficient frontier, showing combinations of asset classes that provide the greatest return for a given level of risk (i.e., standard deviation). Portfolio choice depends on required return and risk tolerance. Plan sponsors or individuals then choose investment managers within each asset class to implement the allocations.

While useful, such models only address allocating to traditional investments such as stocks, bonds and cash. They provide little or no guidance in the realm of alternative investments on choosing active managers, leaving investors to make this critical decision in an ad-hoc fashion.

We believe that active managers may serve as an important component of portfolio construction. Active managers generate returns based both on passive risk and active risk, which refers to the risk and return generated by a manager's unique decisions (e.g., decisions to overweight a company exposure or to time markets). Active risk is a powerful addition to portfolios for at least three reasons:

■ Diversification

Since active risk relates to the unique decisions of a manager, it is generally uncorrelated with passive risk. Therefore, it serves as a diversifier in portfolios.

■ Larger Opportunity Set

Since passive risk comes from exposure to passive asset classes, investors have a limited number of passive risk sources from which to choose. In contrast, each active manager provides a unique source of active risk. Thousands of managers imply thousands of often uncorrelated active return sources.

■ Risk Adjusted Returns

Some active managers perform far better than passive asset classes on a risk-adjusted basis. To the extent that investors can identify these managers, they can significantly improve their portfolios' performance.

Historically, investors have separated the approach to asset allocation into two steps. In step one, investors use the well-developed asset allocation models to choose a strategic allocation, that is, the combination of asset classes that generates the highest return for a given passive risk level. In step two, investors try to improve upon this strategic allocation by choosing active managers within each asset class. The hope is that the active manager will be able to match the returns of her asset class and more. Usually, active managers are funded out of their corresponding asset classes and are chosen independently. Although expedient, this approach has several drawbacks.

■ Weight Constraint

First, allocations to managers within a given asset class are constrained by the weight of that asset class within the overall strategic portfolio. For example, consider a strategic allocation consisting of 60% fixed income, 30% domestic equity, and 10% international equity. Traditionally, an investor with this allocation would only have been able to allocate 10% of his portfolio to active international equity managers, even if these managers have a greater ability to add value through active management than domestic equity and fixed income managers.

■ **Manager Mix**

Second, choosing managers independently does not necessarily provide a portfolio consistent with the investor's preferences. The attractiveness of any given manager depends on the other managers in the portfolio; choosing managers independently will lead to a sub-optimal set of allocations.

Investors therefore need to extend the familiar asset allocation models to include active managers and optimize their portfolios around both passive and active risk. The prize for doing so may be large, particularly within the alternative investments arena. Dispersion among alternative managers is much greater than that among their traditional counterparts; as a result, incorporating alternative managers into portfolios can significantly boost overall performance, but only if done so in a responsible fashion. We now introduce active risk and highlight the challenges investors face when incorporating active risk into their portfolios.

Defining Active Risk

The risks of broad, well-diversified asset classes are known as passive risks because their characteristics can be replicated via formulaic investment strategies that do not require manager discretion. For example, investors can gain access to the S&P 500 index by investing in each stock within the S&P 500 in proportion to its market capitalization. In addition to being easily replicable, sources of passive risk share several common features:

■ **Low Cost**

Investors can typically access passive sources of risk cheaply, either through passive index funds or ETFs, or mutual funds. Here we point out that "passive-like" exposure to alternative asset classes (i.e., meaningful diversification among a set of managers through a fund of funds) usually entails significantly higher fees as compared to passive exposure to traditional asset classes. However, an alternative fund of funds may still reduce an investor's costs by reducing the need for due diligence.

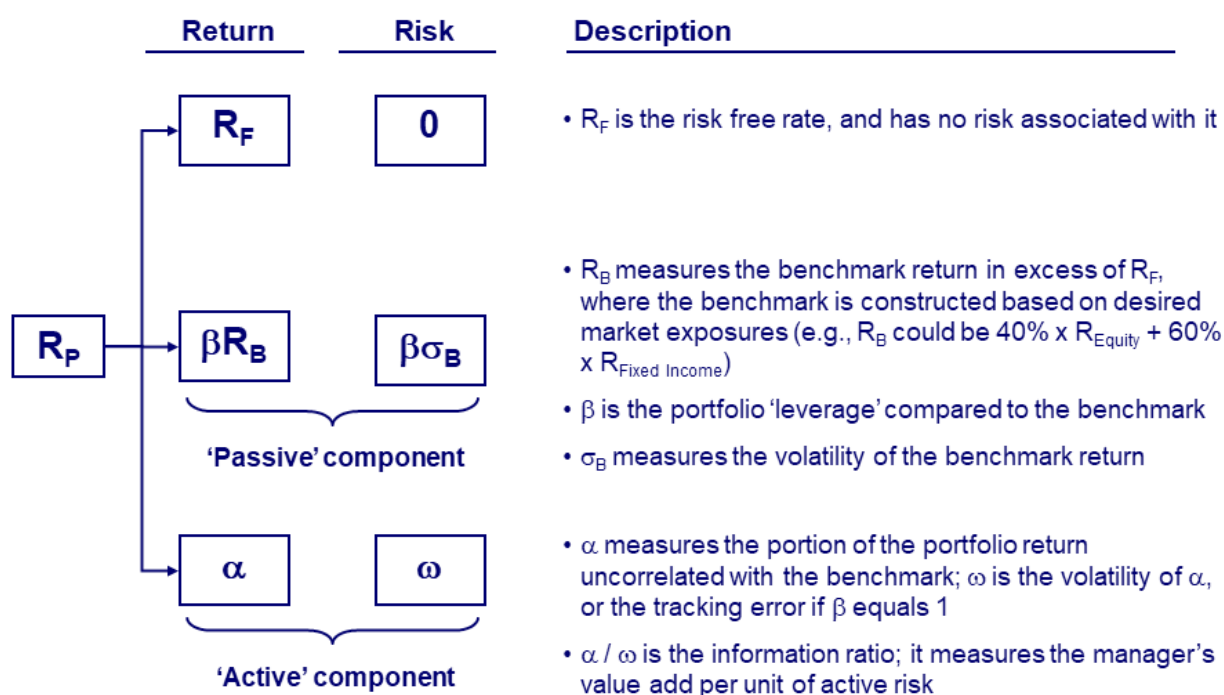
■ Exposure to Systematic Factors

Passive sources of risk are often correlated with macroeconomic factors. For example, fixed income returns are closely tied to interest rates and credit spreads. Since these risks are often related to similar sets of factors, they cannot be completely diversified.

■ Stability

Investors typically have a high degree of confidence in their ability to characterize passive risks, as well as the compensation for bearing them. Since passive risk cannot be completely diversified, investors earn a premium for bearing passive risk even when markets are in equilibrium. In other words, the long-term Sharpe ratios of passive risk sources (i.e., excess return over cash divided by risk), are predictable.

Figure 1. Differences Between Active and Passive Risk



Active risk, however, is fundamentally different from passive risk. It is generated through the unique decisions of managers, typically related to market timing or security selection. Since these decisions are often independent, active risk can be diversified more than passive risk. Furthermore, investors pay a premium to access active risk. Whereas an ETF may charge an investor a 10-basis point management fee, a long short equity fund might charge investors a 100-basis point management fee in addition to an incentive fee. Finally, active return and risk are much more difficult to characterize. Active return is a zero-sum game; for every investor who outperforms a passive asset class, there must

be another investor (or set of investors) that underperforms. Investors rely on a manager's skill to generate positive active returns, which can diminish or be competed away over time. Therefore, investors have less confidence in their ability to predict active risks and returns.

Decomposing Manager Returns

Investors can decompose a manager's risks (and therefore returns) into passive and active components, which are referred to as beta and alpha. Beta measures the manager's exposure to a given asset class. A manager beta of 0.5 to the S&P 500 implies that on average, the manager will earn 0.5% for each 1% increase in the S&P 500. Managers can have exposures to multiple passive asset classes, and these can be positive or negative. For example, a convertible arbitrage manager typically has a positive beta to High Yield and a negative beta to Equity. On average, this manager will make money when High Yield performs well, and lose money when Equity performs well.

Alpha measures the portion of a manager's return that is unrelated to returns of passive asset classes. For example, assume that a large cap equity manager has a beta of 1 to the S&P 500, and zero exposure to all other passive asset classes. If her average monthly return is 100 bps, and the average monthly return of the S&P 500 is 90 bps, the manager's average alpha is 10 bps. Her active risk corresponds to the volatility of this alpha. Since most investors can gain cheap exposure to passive asset classes, managers are typically evaluated based on their ability to efficiently generate alpha. The most common measure of manager skill is the information ratio, which measures the active return per unit of active risk. A high information ratio indicates that a manager can add active return without taking on much risk.

We see many advantages to separating Active and Passive risks.

- › *Risk budgeting – Forces investors to explicitly consider (i) Total risk they are willing to accept; and (ii) Make choices on the optimal mix of active and passive risk.*
- › *Confidence levels – Enables investors to assign different confidence levels to active and passive return forecasts. This is important since estimates of active risk (alpha) are far less stable than estimates of passive risk.*
- › *Transparency and Accountability – Enables investors to evaluate fund managers based on their ability to generate active returns. It helps them identify the cost of active management when the cost of passive management is usually insignificant.*

Challenges with Incorporating Active Risk

Return Estimation

As described earlier, active risk and return are much harder to forecast than passive risk and return. This lack of confidence creates additional uncertainty in the forecasts of future returns. Conceptually, investors can decouple this additional uncertainty into two components: sampling error and specification error. Sampling error arises when we don't have enough data. For example, very few investors would have much confidence in a manager with a one-year track record; there is no way to tell whether these returns are due to skill or just luck. Specification error refers to uncertainty about the actual return generating process. Even if a skilled manager was able to generate a 5% active return historically, he may not be able to do so going forward due to increased competition. Investors need a systematic way of addressing these issues before incorporating active risk into their portfolios.

Estimation of alpha can be difficult due to: (i) Short time periods for estimation; (ii) Lack of data transparency; (iii) Cyclical nature of alpha for given investment strategy; (iv) Drift in strategies of investment managers; and (v) Inherent instability of alpha.

Implementation Choices

Once investors have addressed the issues around estimating returns, they still need to decide how to incorporate active risk into their portfolios. They face two primary choices:

■ Amount of Active Risk

Investors need to determine how much active risk to assume, relative to the passive risk in their portfolios. In general, this is a function of the investor's risk tolerance. Investors who are more comfortable with overall risk should also be comfortable with a greater proportion of active risk.

■ Funding of Active Risk

Investors must also determine how to fund the active risk. If an investor holds a portfolio consisting of 60% equity and 40% fixed income, he has several choices for how to fund allocations to active managers. Examples include:

- › *Fund allocations entirely out of equity*
- › *Fund allocations proportionally out of equity and fixed income*
- › *Borrow money and use that to fund allocations*

These examples are far from exhaustive but illustrate the range of options that an investor faces.

Conclusion

Most investors are interested in active risk, as it can potentially improve absolute portfolio returns, and lower risk through diversification. However, active risk behaves very differently than passive risk; as a result, many investors add active managers to their portfolios on an ad-hoc basis. In this paper we have attempted to define active risk and highlight the challenges investors face when adding so. In subsequent papers, we will present our framework to help investors overcome these challenges, and thus improve portfolio performance.