Alternative Alphas and Asset Allocation

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It has been many years since the idea of alternative investments as a mainstream method of investing began to gain a foothold in the investment management community, but applying a traditional framework of asset allocation to alternative investments has revealed some challenges in seamlessly connecting alternative investments to traditional investments. Fundamentally, a traditional framework rests on the assumption that asset classes are its basic building blocks, and that in the long run each asset class has a repeatable pattern of risks and returns, as well as a correlation to other asset classes. However, this assumption contradicts many alternative investment strategies such as those for hedge funds. Moreover, one realizes that within the domain of traditional investments there have been challenges in dealing with extended diversification beyond domestic stocks and bonds.

This paper argues that by focusing on exposure to risk factors that are return drivers, one can intersect the artificial boundary between traditional investments and alternative investments. In addition, by analyzing various investment products and strategies from the perspective of the "complexity of risk management," this paper maintains that each of these diverse products is a part of a continuum connecting market betas, alternative betas and alphas. Finally, this paper proposes an alternative approach to traditional asset allocation, combining three components of return sources: equity systematic risk, orthogonal risk factors, and various types of alphas. Importantly, the alternative approach is better suited to address "outcome oriented investments," the realization of which is the ultimate purpose of determining and implementing an asset allocation.

Extended Diversification

For the framework of traditional asset allocation to be effective, each asset class should be defined in a systematic manner based on statistical analyses. Specifically, the asset class factor model presents an important basis for classification. When properly implemented, the asset class factor model should entail: (1) mutually exclusive asset classes, (2) exhaustive coverage of securities, and (3) asset classes each having returns that "differ."[1] Insofar as the financial securities are limited to the universe of US stocks and bonds, these requirements may be fulfilled to a reasonable degree.[2] Nonetheless, once the investment universe is extended beyond the two traditional domestic asset classes, these requirements become difficult to fulfill, even for non-exotic asset classes such as international equities.

Take the example of the MSCI EAFE index. EAFE is the index of equity markets in developed countries in Europe, Australasia and the Far East. The index is considered to be a complement to the US equity index, and has been extensively utilized for institutional asset allocation and as a mutual fund benchmark. It may well be preposterous to assume that these geographically diverse markets constitute a coherent group in a way determined by the asset class factor model. For this assertion to be valid, the equity securities within EAFE countries must move together with each other more than they do so with securities outside of EAFE countries. An analysis of actual correlations indicates otherwise.

Exhibit 1 shows various correlation relationships involving: (1) EAFE countries in the Eurozone, (2) non-EAFE countries in the Eurozone, (3) non-Eurozone EAFE countries in Europe and the Middle East, (4) EAFE countries in Asia and Oceania, and (5) the United States. For each of the first four groups, the following are calculated: (A) in-group average correlations, (B) average correlations to other EAFE countries, and (C) average correlations to the US.

It is clear from the table that for each EAFE subgroup, as well as for non-EAFE Eurozone countries, the correlations to the US are higher than those of any other relationships. For instance, one would expect the group 1 countries to have a high in-group correlation (0.73) as they share a common currency and they are included in the EAFE index as European representatives (along with developed countries in group 3). This appears to be the case as each of the other 3 groups has a correlation which is lower than 0.73. Even so, note that group 1's in-group correlation is lower than its correlation to the U.S. (0.77), signifying the possibility that correlations among equities in group 1 countries are in part due to the secondary effects of each country's having a high correlation to US equities. In addition, the average correlation within the EAFE countries (group 1, group 2 and group 4 combined) is 0.70, whereas the average correlation between the US and EAFE countries is 0.76. Hence, one cannot readily determine if the EAFE countries' equity securities constitute a separate asset class from the one which includes US equities. This situation at minimum violates the first condition for a proper asset class classification: mutually exclusive asset classes.

Importantly, the EAFE index also omits the group 2 countries that are in the Eurozone. These are OECD countries and are regarded as having developed economies. To the degree that EAFE is typically used as a proxy for the equities of non-US developed economies, this represents a significant omission and deviates from the second requirement of the asset class factor model: exhaustive coverage of securities. Whereas for a capitalization-based allocation such an omission may be justifiable on the grounds that the group 2 countries account for a small portion of the entire capitalization of developed economy equities, it is problematic when one is dealing with an equal-weighted allocation for developed economies as each country contributes equally regardless of its market capitalization (For further discussion of global investing, see Appendix).

Beyond the international equities mentioned above, the definition of asset class becomes even more blurred for non-traditional investment strategies. For example, commodities are often touted for their ability to deliver diversification benefits due to their low correlations to equities. In fact, the correlation between S&P 500 total returns and GSCI total returns for the 30 year period from June 1989 to May 2018 was 0.18.[3] Nevertheless, investment returns in commodity futures[4] are highly varied, partly due to the fact that some commodities are characterized by normal

	A. In-Group Correlations	B. Average Correlations to Other EAFE Countries	C. Average Correlation to the US
1. Eurozone and EAFE Countries	0.73	0.71	0.77
2. Eurozone and non-EAFE Countries	0.51	N/A	0.59
3. Other EAFE Countries in Europe and Middle East	0.69	0.70	0.77
4. EAFE Countries in Asia and Oceania	0.61	0.62	0.71
5. EAFE Countries	0.70	N/A	0.76

Exhibit 1: Correlations among EAFE Groups and the US
Source: OECD, author's calculation based on each country's equity price index (monthly data in local currency)

backwardation and other commodities by contango. To make matters more complicated, commodities such as natural gas go back and forth between the states of normal backwardation and contango. Thus, it is difficult to say that the risk-return characteristics of various commodities can be grouped together. Each commodity market tends to have its own unique demand-supply mechanism and the factors that drive commodity prices are as varied as local weather and the global trend on consumer luxury goods. The asset allocation framework that deems commodities to be a single asset class often results in disappointment, as the recent underperformance of commodity indices such as GSCI testifies.[5] In order to derive benefits from commodity investing, one needs to identify a group of commodities whose risk-return characteristics are in concert with one's investment objectives.

To cite another example, hedge funds are a collection of diverse investment strategies that exploit market mispricing and arbitrage opportunities, sometimes adjusting beta exposures dynamically. With a mild sense of bewilderment, it is often pointed out that there are as many hedge fund strategies as there are hedge funds.[6] As is the case with commodities, it is misleading to assume that these funds constitute a single asset class. Due to each fund having its own unique investment universe, a broad-based hedge fund index tends to generate "average" returns that do not apply to any type of strategy. Consequently, the performance of such indices tends to deviate substantially from the true risk-return characteristics of a particular hedge fund. However, in order to determine an allocation to hedge funds as a group, the traditional asset allocation approach often treats these funds as members of a homogeneous asset class for expediency's sake. This is likely to result in a distorted allocation, and bring unintended and often disappointing performance results. To make a successful investment in alternative products including hedge funds, one must pay attention to specific risks involved in an individual fund or strategy, as these risks are often sources of alphas.

Asset Class Parameters vs. Factors

In addition to the problem of ill-defined boundary conditions for asset classes, parameter uncertainty is a serious problem associated with optimization for traditional asset allocation. In particular, while the expected return of each asset class is extremely difficult to forecast with some degree of accuracy, this parameter tends to play the most important role in determining allocation weights.[7] Unfortunately, a small change in expected returns can result in a very different asset mix. Moreover, there appears to be a certain cognitive dissonance: in calculating optimal portfolios, a value for the expected return for any asset is rarely made negative. Yet, in real life, negative returns for some asset classes are prevalent and can persist. In this sense, a naïvely applied traditional allocation framework may become unreliable, based unwittingly on "hoped-for" returns rather than truly "expected" returns.

The other parameters, such as correlations, are also known to be non-stationary. To illustrate, as indicated in Exhibit 2, the correlation between US stocks and bonds has reversed its sign several times since 1937. Specifically, the trailing 10 year correlations between the S&P 500 and 10-year Treasury bonds based on annual returns were positive until 1950, after which they turned negative and stayed negative for 21 years. In 1972, the correlations moved back into the positive territory and stayed positive until 2004. During this period, the correlations reached and stayed over 0.7 for several years. However, after 2004, the correlations have become strongly negative and since 2008 they have been near or over -0.8, recording a -0.86 in 2009. In light of the fact that the absolute value of trailing correlations changed by 1.6 out of a maximum 2.0 in just 15 years from a +0.74 in 1994 to a -0.86 in 2009, it is difficult to believe that the correlation between the two key asset classes remains stable for allocation purposes. Needless to say, US equities and fixed income are the core allocations for a typical institutional portfolio, and if a correlation has a positive or negative sign plays a critical role in an optimization process. Thus, even this core allocation is not standing on solid ground, to put it mildly.

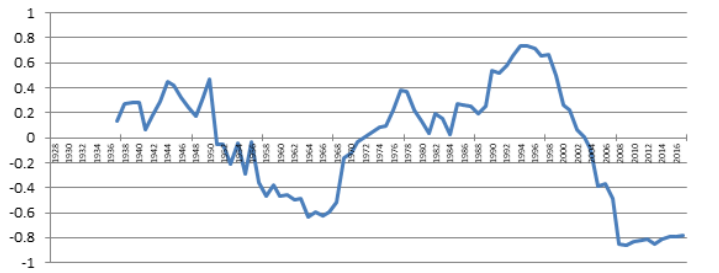

Exhibit 2: Trailing 10 Year Correlations Between Stocks and Bonds
Source: New York University Stern School of Business, Calculation by Author

Another problem with traditional asset allocation lies in its implicit reliance on the single factor model. A traditional asset allocation framework deals with benchmarks with the assumption that most parts of the portfolio returns are determined by beta exposure to systematic risk inherent in each asset class. Alphas, if any, which can be extracted from an asset class are deemed to account for a small portion of return variations. In reality, many asset classes have return drivers beyond systematic risk. In the case of equity, size and value factors, in addition to market risk, constitute the well-known Fama-French factors. Traditional asset allocation has addressed the issue of additional factors by defining different "styles." There is also "credit risk" to be contended with in the case of fixed income securities. Moreover, as the asset classes extend beyond domestic equities and fixed income securities, the correspondence between systematic risk and asset class becomes even more uncertain.

Factor investments are free from artificial demarcation of asset classes based on a tradition or expediency. The drawbacks of traditional asset allocation can be in part remedied by a factor-based allocation where exposures to return generating factors are targeted irrespective of asset class classification. Here, there are at least two important advantages. First, instead of postulating that the non-systematic risks should be diversified away so that each asset class can be effectively represented by a relevant index, a factor-based allocation literally deals with factors directly. In principle, any asset class can be explained by a combination of factors. To illustrate, a commodity can be explained by factors such as roll yield and momentum. Second, while there is a general expectation regarding the size of factor returns, typically no attempt is made to estimate "expected return" of each factor. This eliminates a large and substantive part of uncertainly in

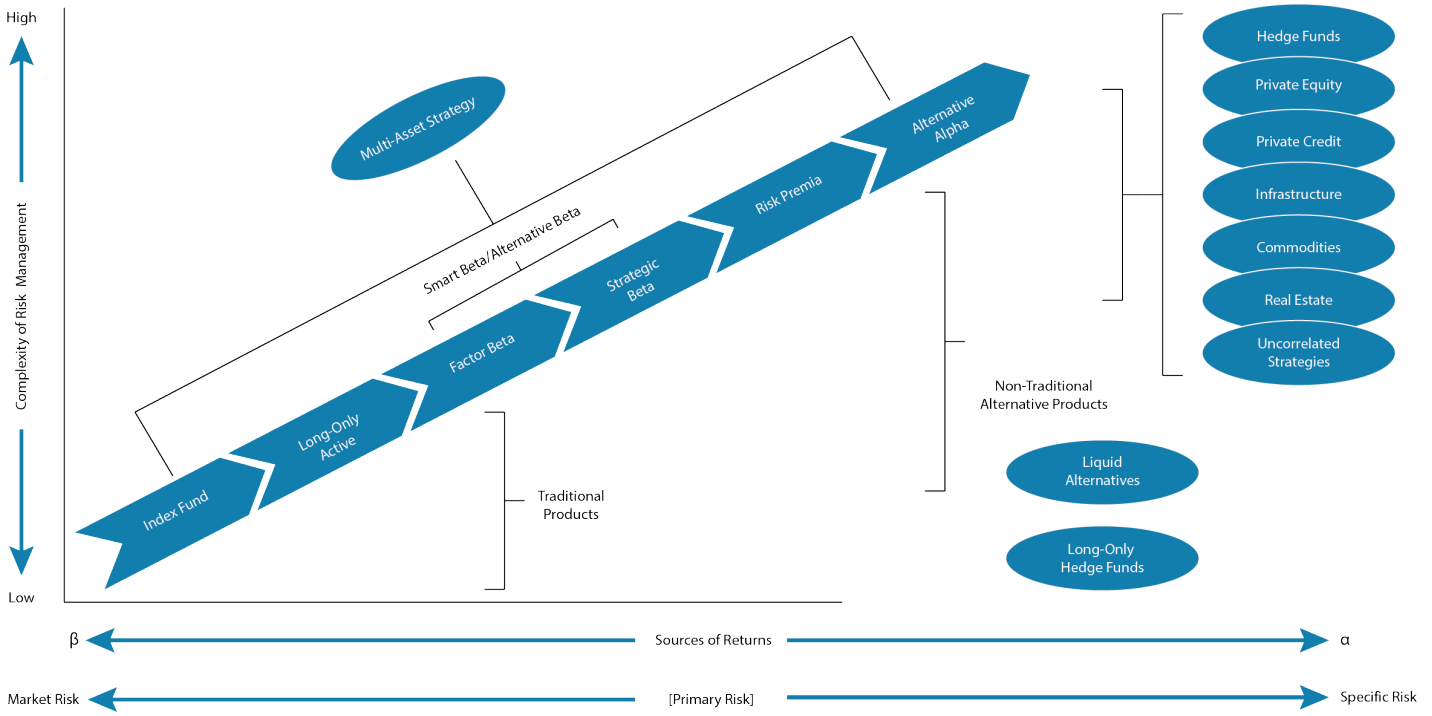

Exhibit 3: Expanding Roles of Alternatives

determining allocation. Factors should be chosen based on their long-term expectation of positive returns along with their risk characteristics.[8]

Complexity of Risk Management

Risk management is not merely a means of risk mitigation, but a means of value creation. Perhaps, no other activities demonstrate better the verity of this axiom than those of investment management. The idea of portfolio management is based on the notion that the risk of a portfolio is lower than the sum of the risks of all securities in the portfolio. In addition, the very expression "risk premium" indicates that taking risk generally accompanies returns. Delivering alphas requires pursuing some types of risks while controlling other types of risks. It is no exaggeration to say that investment management firms are primarily in the business of investment risk management.

While a certain set of risk management techniques are well-adopted in traditional investment management, alternative investments enjoy an even greater flexibility in undertaking a variety of risk management activities. An important implication of this fact is that in order to make maximum use of the flexibility, managers need to become adept at a whole range of techniques and procedures in risk management. To illustrate, alternative managers can select an investment universe, choose between long and short exposures, and take advantage of derivatives or dynamic strategies to alter risk-return payoff patterns. With the understanding that alternative alphas are generated through various skills and that risk management is an integral part of an investment manager's critical skills, one can see why alternative investment has expanded its role substantially in recent years.

Exhibit 3 illuminates the progression from index funds to alternative products (from beta, through alternative beta, risk premia, and to alternative alpha) in terms of the complexity of risk management. At the same time, the figure also shows alternative investments' expanding sphere. When the sources of returns are static exposure to market betas, the primary risk lies in market risk. On the other hand, when the sources of returns are alternative alphas, the primary risk is found in specific risks. As the sources of returns moves away from straight beta, the complexity of risk management rises. Generally speaking, alpha generating activities accompany very high degrees of complexity in risk management. The concept of "alternative alphas" will be discussed in the next section.

When managing index funds, the complexity of risk management is expected to be low. While formulating and implementing a procedure to replicate an index may require substantial knowledge of risk management, day-to-day management of index funds can be straightforward. The fee levels of straight index funds tend to be lowest among investment products, and these funds and their ETF equivalents have comprised a growing the share of professionally managed investment products.[9]

As the next stage of progression, long-only active mandates attempt to add some alphas, and in the process these mandates need to take some active risk. A performance metric such as an information ratio is used to control added return over a relevant benchmark. Though long-only active management currently enjoys the largest amount of assets under management, its relative share in the investment management industry has been declining steadily.[10] In the process of managing long-only active mandates, many adapted the academic finding that size and value factors also explain the variability of equity returns. A momentum factor was also added. In the institutional investment management community, it had become a common practice to tilt portfolio risk exposure toward these factors. The long-only active mandates require a higher degree of risk management and accordingly charge higher fees than index funds. Index funds and straight long-only mandates, with or without factor tilts, constitute "traditional investment products."

Later, the practice of having exposure to these factors re-emerged with the use of factor betas, and subsequently the set of factors was expanded. These factors have come to be known as smart betas or alternative betas, and they are based on economic factors such as growth or inflation or market factors such as size or value.[11] Factor investing can be viewed as a quantitative equivalent of active investments. While there appears to be no clear consensus on the difference between smart betas and alternative betas, some argue that the former applies to long-only indices and the latter refers to risk factors that are typically employed in hedge fund strategies and pursued through long and short exposures.[12] It is noteworthy that factor betas, as applied to long-only mandates, do not take short positions, and thus have exposure to market risk. By contrast, most alternative betas are constructed so that they are uncorrelated or have low correlations to market risk. In addition, alternative betas include strategic betas whose justification lies in deployment of strategies with potentially resilient performance but without necessarily having well-understood risk premium. The risk parity for equity portfolios[13] is an example of strategic beta.[14]

Exhibit 3 makes a distinction between alternative betas and risk premium investing. This distinction is important since, in risk premium investing, factors are chosen so that they are orthogonal (uncorrelated) to each other. By contrast, in alternative beta investing too many factors may be juxtaposed and some factors are correlated to each other, even if these factors may be uncorrelated to market risk, causing a multi-collinearity problem in modelling. As a result, an issue with factor stability may arise.[15] Exhibit 4 shows an example of orthogonal risk premia latent in different asset types. The set of risk premia can avoid factor instability when properly designed and implemented.

It is interesting that the risk premium "momentum" appears in all of equity, fixed income, currency and commodity strategies. For equity strategies, as is the case for factor beta, both "size" and "value" are important, and "emerging" can be added as an orthogonal source of risk premium.[16] For fixed income strategies, "credit" is the additional source of risk premium, and for currency, "carry" plays an important role. Finally, for commodities, "relative value" and "roll yield" complete the list in this example.[17] These risk premia should be calibrated so that they are minimally correlated to each other and the market risk.

Alternative Alphas

Alternative investment managers can extract alphas in many different ways. Notable methods by which these managers can add value beyond static exposure to the market and other factors are listed in Exhibit 5. For simplicity, let us label these values as "alternative alphas" as they are based on alternative investment managers' skills in bringing about excess returns by executing various strategies.

First, there are many risk factors that are either explicit or implicit in various active strategies. Some strategies are quantitatively driven whereas other strategies are based on fundamental analyses. Regardless of how investment managers select factors relating to traditional betas and/or alternative betas, these managers attempt to deliver performance in line with a particular investment goal. By exercising effective control over risk factors, investment managers can bring about risk premia from each factor. The controls can be either (1) directly value adding through exposure to the factors that accompany risk premia or (2) pursued indirectly through risk mitigation of factors that detract from value adding.

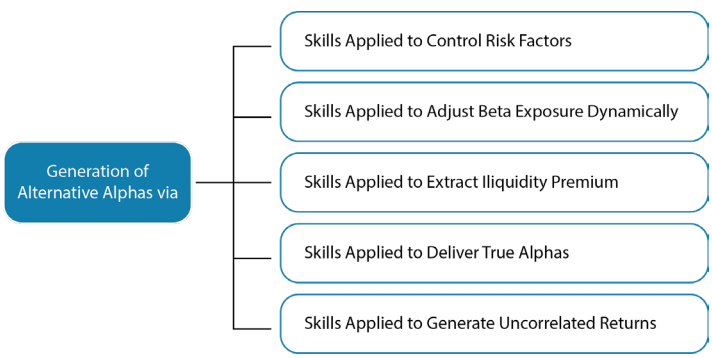

Exhibit 5: Sources of Alternative Alphas (Derived Via the Application of Certain Skills by Investment Managers)

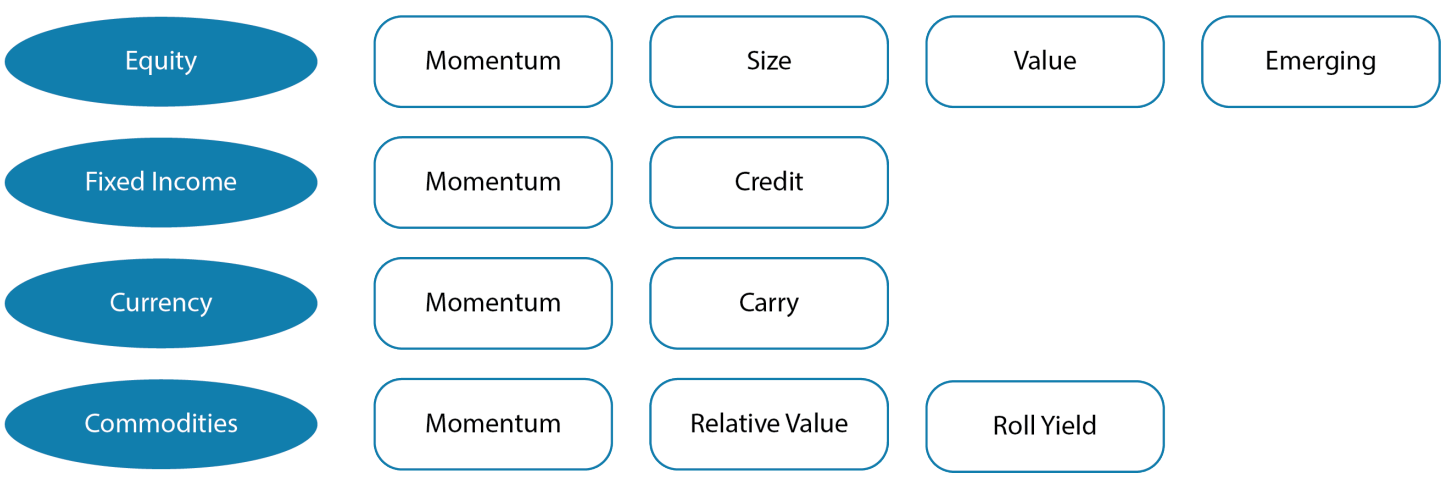

Exhibit 4: An Example of Risk Premia*

Note: *The same figure appeared in Masao Matusda and Andrew Weisman, "Risk Management Implications of Risk Premium Investing," Risk Intelligence, Global Association of Risk Professionals (August 2017), GARP.org

Some of these strategies may be heuristically or purely empirically derived. For instance, it has been shown that an equal-weighted portfolio often outperforms a capitalization-weighted portfolio. In this case, equal-weighting is a "strategic beta," but, by itself, may not be a driver of risk premium. Actual outperformance may come from a higher than capitalization-based weight being given to a particular group of stocks due to equal weighting. For instance, equal weighting naturally gives a weight higher than their capitalization to small stocks, which have a known size effect. Among different alternative strategies, hedge funds are likely to be best able to exercise control over risk factors, as hedge funds mostly deal with liquid securities.

	High Volatility Months	Low Volatility Months	Entire Period
Range of VIX Values	23.84-59.89	9.51-13.84	9.51-59.89
Average VIX Value	30.90	12.21	19.89
Average Annualized Return	2.3%	5.9%	4.8%

Exhibit 6: Volatility and the Return of Following Month (January 2000 through December 2017)
Soure: CBOE and Dow Jones

Second, from a longitudinal perspective, higher volatility does not translate into higher returns. Exhibit 6 summarizes the relationship between the month-end value of VIX and the return of the S&P 500 for the following month. The high expected volatility months are defined to be those months in which the VIX value was in the top quartile, and the low expected volatility months are those in which the VIX value was in the bottom quartile. The range of VIX value and the average value of VIX, as well as the average annualized return corresponding to each period are shown in the table. During the high volatility months, the average return was 2.3%, whereas during the low volatility months, the average return was 5.9%. It is clear from the table that the market characterized by a high value of VIX at the end of the month tends to lead to the lower than average return (4.8% for the entire period) in the subsequent month.

Investment managers can take advantage of this relationship between expected volatility and subsequent returns. For instance, using the same set of data, if the leverage ratio was adjusted by dividing the current value of VIX by its average value,[18] the cumulative return of the strategy would have been 134.98% during the period while the S&P 500 returned only 81.97%. It is interesting to see that though the average leverage ratio was 1.11, the leverage ranged from 0.32 to 2.04. In this hypothetical strategy, one's ability to dynamically adjust beta exposure clearly contributed to the improvement in risk-return ratios. This type of alpha based on a manager's skill to adjust beta exposure dynamically is sometimes called "allocation alpha."[19] This is one area where alternative investments including hedge funds have a clear advantage over traditional benchmark-constrained mandates.

Third, many types of alternative investments lack liquidity, and this illiquidity can be turned into alphas. For instance, private equity funds invest in private companies whose securities are not traded on the stock exchanges and their security prices tend to be discounted. However, by taking these companies public, private equity funds can extract illiquidity premium. Generating alphas requires the investment acumen of general partners (GPs), along with the willingness of limited partners (LPs) to meet capital calls and commit investment for a number of years. In particular, GPs need to conduct a thorough due diligence on potential companies to invest, to negotiate prices and capital structure, to oversee the management of companies, and to implement an exit via public offering or a sale to another entity, in order to extract value from investments. It is a highly active process, and a manager's skills in all of these stages affect outcomes.

Other private investment opportunities, such as infrastructure, real estate, and private credit face similar challenges and rewards. To illustrate, investments in infrastructure come with a variety of types of assets in which a manager can specialize. There are projects in: contract power generation, airports, and telecommunications, to name just a few. While many infrastructure projects share the benefits of limited competition and relatively inelastic demand, investing in each type of asset requires specialized knowledge to manage the risks of infrastructure projects. Investment managers are expected to deliver cash yield while pursuing substantial capital gains. Likewise, investments in private credit require a specialized knowledge of senior debt, subordinated capital, distressed credit or specialty finance, each of which has its own distinct risk-return profile. In addition, for real estate investment, it goes without saying that managing the idiosyncratic risk of each property is the most important element in delivering alphas.

Fourth, some alternative investment managers appear to genuinely possess the capability to select securities that can lead to alpha generation. While rare, value added through this type of capability is called "true alphas." For a number of decades, excess returns over market betas were treated as alphas. These days, however, it has come to be accepted that beta exposures, including alternative betas, account for most excess returns. Along with efforts to control risk factors, to adjust beta exposure dynamically and to extract illiquidity premium, a select group of highly skilled managers can deliver true alphas. With the advent of big data, progress in artificial intelligence and other technological advancements, some managers have been pursuing an edge in identifying investment targets.

Conceptually, true alphas are often associated with the security selection capability of managers, and are considered to apply to long-only mandates as well as to hedge fund strategies. In addition, true alphas can also apply to other alternative investments such as private equity funds. After all, before making investments, a GP needs to select private companies to be included in the fund's portfolio. Managers of other types of private investment strategies may be able to deliver true alphas. It needs to be noted, however, that to the degree that alpha generation involves managing specific or the idiosyncratic risks of portfolio companies or invested assets, it may be difficult to isolate true alphas from other sources of alternative alphas.

Finally, certain types of specialty finance can deliver truly uncorrelated returns. For instance, litigation finance and life settlement have return sources that are by nature independent from the risk premia that financial securities carry. To wit, in the case of litigation finance, "court decisions and awards are rarely dependent on the performance of financial assets,"[20] and in the case of life settlements, mortality-related risks are affected by many factors such as advances in medicine, but are certainly uncorrelated to financial markets. Importantly, these investments are unlikely to suffer from the tightening of correlations at the time of market crises or a liquidity crunch. For this reason, these investments can generate returns even at times when other types of investments, including some alternatives, fail to deliver diversification benefits.

Both litigation finance and life settlement are considered to be part of private credit opportunities and investors can expect relatively stable and periodic returns. These investments tend to rely on the law of large numbers. In other words, by increasing a number of litigation cases or insurance contracts, each fund can stabilize the relative frequency and magnitude of adverse outcomes occurring as the probability distribution starts resembling a normal curve. For each fund, creating a group that approximates a normal distribution takes skill on the part of managers, and managing periodic cash payouts also requires correctly anticipating future cash flows. Like other private investment opportunities, manager skills are an important source of returns.

Alternative Asset Allocation

A study conducted by a well-known pension consultant points out that a "60-40" stock and bond portfolio (36% US equity, 24% non-US global equity and 40% US fixed income) has over 90% equity risk concentration.[21] Even when some alternative strategies are added (30% US equity, 20% non-US global equity, 25% US fixed income, 10% hedge funds, 10% real estate, and 5% high yield), there is still 79% equity risk exposure.[22] It is no wonder diversification often fails with traditional asset allocation.[23] This fact unequivocally indicates that an alternative approach to asset allocation is necessary, as an asset-class-based allocation is unlikely to deliver sufficient diversification benefits at a time of turmoil in equity markets.

An alternative approach can take advantage of the factor investing discussed earlier, while addressing some shortcomings of this method of investing.[24] The alternative approach also provides a means to incorporate the traditional assets and alternative investment strategies in a common analytical framework. Unlike the traditional approach, it is not necessary to resort to the expediency of treating various hedge fund strategies as belonging to a single asset class for optimization. The same applies to other alternative strategies. Exhibit 7 highlights the correspondence between the sources of returns and the complexity of risk management, as did Exhibit 3. The figure also demonstrates a potential framework for "Alternative Asset Allocation." The framework has three main components. The first component, exposure to the equity systematic risk, can be easily implemented through investment in an index fund or ETF. Unlike traditional allocation, it is not necessary to decide the weight given to equity risk based on expected returns or forecasted covariance with other asset classes. Instead, the weight is determined relative to the risk premium of other factors.

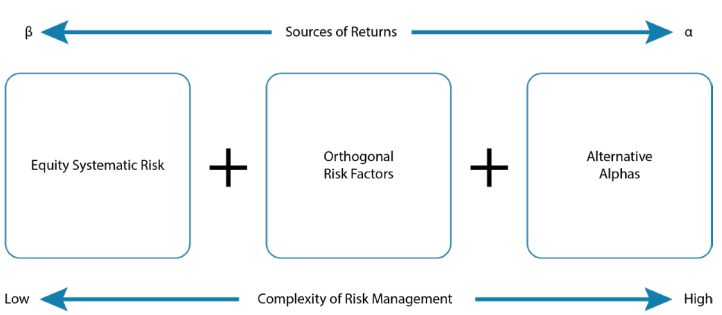

Exhibit 7: Alternative Asset Allocation Framework

The second component consists of orthogonal risk factors. These factors should be chosen so that they are uncorrelated to each other, as well as to the market or systematic risk. The advantage of orthogonality lies in the fact that being independent from other factors a given factor can be linearly combined with other factors including the systematic risk of equity. There are an array of factors, but some factors may only have transitory effectiveness and may be dependent on the states of economies or markets. It is advisable to choose factors that have been well-researched and for which the reasons for their ability to bring premia are well-understood. Risk premia investing fulfills this requirement well.

The third set of components is alternative alphas. As was described in the previous section, there are five sources of such alphas. These alphas can be pursued through investments in hedge funds, private equity, private credit, infrastructure, commodities, real assets including real estate, as well as specialty financing whose returns are anticipated to be uncorrelated, as shown in Exhibit 3. Some of these investment strategies are liquidity constrained, but managers are capable of turning illiquidity into alphas. Another source of alphas can be extracted through the first component of this framework. More specifically, there is abundant empirical evidence that through allocation alpha one can improve the risk-return profile of such risk based on forecasted volatility.

The ultimate purpose of asset allocation is to deliver the outcomes that investors seek. Being focused on a weight distribution among different asset classes, it is difficult for a traditional asset allocation framework to create direct linkages between asset classes and investment outcomes. The desired outcomes may include any one or more of the following: (1) inflation protection and real return, (2) volatility and risk management, (3) equity risk diversification and market neutrality, (4) alpha opportunities from expanded sources of returns. In addition, in the traditional framework, return parameters are limited to a mean (expected return) and risk (standard deviation), and cash flow timing is not taken into account directly.

By contrast, the alternative framework suggested in this paper can easily adapt to each outcome. To illustrate, some alternative alpha opportunities listed in Exhibit 3, such as those associated with commodity and real estate, can deliver the first outcome ((1) above). The second outcome ((2) above) can be realized through a combination of equity systematic risk and alternative alphas adjusted dynamically to beta exposure. The third outcome ((3) above) can be pursued through orthogonal risk factors used in combination with another source of alternative alphas derived

from the generation of uncorrelated returns." Finally, the fourth outcome ((4) above) can be brought about by the exercise of a variety of skills (reference: Exhibit 5) by alternative investment managers in generating alternative alphas.

Before concluding, it is worth mentioning that investing in the third component of alternative asset allocation (Exhibit 7) entails having additional exposure to market risk beyond the exposure taken as part of the first component (Exhibit 7). It is possible to estimate various beta exposures inherent in these alternative strategies including private equity. Once the estimated beta exposures are aggregated, an adjustment can be made to the first component so that the entire portfolio can target the intended level of overall beta exposure. The first component requires periodic adjustment of beta exposure, and thus the estimates of beta for the third components also need to be updated so that the beta exposure of the entire portfolio is at the right level for any given time.

Conclusion

In light of the fact that the traditional asset allocation framework tends to result in a lack of effective diversification, particularly when extended asset classes and alternative investments are involved, a different approach to allocation is necessary. This paper has argued that by analyzing various investment opportunities from the perspective of the complexity of risk management, one can develop a framework that can seamlessly integrate alternative investments with traditional investments. It is no longer a question of whether alternatives are becoming a mainstream method of investing. Rather, alternatives should be considered as the main contributor to returns beyond having exposure to equity market risk.

The allocation framework suggested in this paper consists of three components: (1) equity systematic risk, (2) risk factors that are orthogonal to each other; and (3) alternative alphas. Note that while this framework does not directly address non-equity asset classes as traditionally defined, the risk factors in the second component cover the risk premia latent in these asset classes. In addition, five sources of alternative alphas were discussed. Significantly, this framework puts "alphas" back in portfolio management when alphas' boundaries seem to be increasingly narrowing in the investment management industry. The alternative asset allocation framework proposed herein is also better suited to the structuring of an investment portfolio that accords with the specific investment outcome pursued.

Appendix

In the field of international equity investing, the issue of whether the integration hypothesis or the segmentation hypothesis explains better the behaviors of the world's equity markets has been discussed for a number of decades. The integration hypothesis argues that the world's equity markets behave essentially as one, and country-specific factors are diversified away. The variability in country returns is due to the differences in each country's beta to the world market risk or a set of global risk factors.[25] On the other hand, the segmentation hypothesis argues that the effects of country specific factors are persistent and explain a substantial portion of variability of each country's equity returns.[26]

Depending on the sample period, both hypotheses seem to have proven their validity with supporting empirical evidence. This indicates that the degree of integration may change through time. The observed degree of integration also varies between developed markets and emerging markets. Sometimes the global equity markets essentially act as one, and at other times, the markets exhibit a degree of segmentation. One can argue that as a result of the regime changes, the degree of influence that global factors and local factors exert is time-varying.[27]

The instability of a singular global equity market structure addresses the heart of the problem of a traditional asset allocation framework. If global equity markets were completely integrated, the variability of returns of any equity securities in the world should be measured in terms of beta to the world equity market factor. The one factor model implicit in the framework would be effective, and for ultimate diversification investors should hold a fund that replicates the performance of an integrated and single global equity market. The reality is that global equity markets are always fragmented to some degree and equity securities need to be examined for exposure for both global and local factors.

Endnotes

1. Sharpe (1992).
2. Some voice concern regarding the use of "the amount of bond outstanding" as a proxy for bond capitalization. When the outstanding amount for each issue is used as a weight, those issuers with higher amounts of debt receive higher allocations. The higher amounts of debt in turn can affect the credit risk of the issuers.
3. GSCI was originally known as Goldman Sachs Commodity Index. Now it is referred as "S&P GSCI."
4 Typically commodity investments are pursued through commodity futures.
5 Commodity indices vary substantially. For instance, S&P GSCI have nearly 60% of the weight given to energy commodities, while Bloomberg Commodity Index limits exposure to the energy sector to around 1/3.
6. According to the Hedge Fund Association, there were approximately 10,000 active hedge funds as of August 2017. See https://www.hedgefundassoc.org/about_hedge_funds/
7. To be sure, there is a method to address this challenge, such as the Black-Litterman model. However, reliance on the accuracy of parameter estimates remains unchanged.
8 Under a certain set of assumptions, an asset class-based allocation and a factor-based allocation deliver very similar performances. See Idzorek and Kowara (2013). While this means that neither allocation method may be theoretically superior to the other, it also implies that the latter can be effectively used if it can handle both traditional investments and alternative investments in a theoretically consistent manner.
9. Recently, Fidelity Investments has started charging zero management fees for some of its core index products. See https://www.cnbc.com/2018/08/01/fidelity-one-ups-vanguard-first-company-to-offer-no-fee-index-fund.html.

10. For instance, in October 2017, actively managed mutual funds accounted for about 18% of the equity market. In 2007 the share was 24%. https://www.marketwatch.com/story/passive-investments-are-hot-but-remain-a-small-slice-of-the-stock-market-2017-10-16.

11. J.P. Morgan Asset Management, "Factor Risk Management: A Generalized Methodology for Multi-Asset Class Portfolios," 2011.

12. J.P. Morgan Asset Management makes this distinction. See, J.P.Morgan Asset Management (2015).

13. The idea of risk parity is employed in both asset allocation and equity portfolio construction. For the former, for instance, the risks of investing in equity and the risks of investing in bonds are made equal, typically resulting in much higher allocations to bonds. For equity portfolio construction, risks can be made equal for individual stocks, groups of stocks or risk factors. See, for instance, https://www.etf.com/publications/journalofindexes/joi-articles/21890-risk-parity-strategies-for-equity-portfolio-management.html?nopaging=1

14. The expression "strategic beta" is often used interchangeably with the expression "smart beta." Morningstar Associates classifies strategic beta into (1) return-oriented, (2) risk-oriented, and (3) other.

    See, for instance, Schwab Center for Financial Research. In this paper, when the expression "strategic beta" is used, it refers to the risk-oriented types of smart beta.

15. J.P. Morgan Asset Management (2011).

16. For instance, the "emerging" is extracted as the return differential between emerging and developed markets, and hence is expected to have low correlation to US equity.

17. In terms of product offering, some alternative strategies are able to provide frequent liquidity. These products often pursue strategies that take advantage of factor investing in order to generate hedge fund-like returns. There are also products that make use of publicly traded securities to assimilate the returns of private equity strategies. Together, they are known as "liquid alternatives." In addition, hedge fund managers can apply their advanced risk management skills to long-only investments, and these are often referred to as "long-only hedge funds." See, for instance, Institutional Investors (2007). Such hedge fund managers may also take advantage of true alphas if applicable. Both liquid alternatives and long-only hedge funds are generally considered to be "non-traditional alternative products." Finally, there are "multi-asset strategies." Today's multi-asset strategies are generally quantitatively-oriented and often involve factor- or risk-premium-type investments, like those discussed earlier. What is more, the multi-asset strategies can be combined with alternative alphas from a set of private investment opportunities. To the degree that multi-asset strategies are operated over multiple asset classes and multiple factors, the right strategy can serve as a de facto asset allocation methodology.

18. The long term average VIX and the in-sample average for the period are similar.

19. Andrew M. Lo also uses this expression. See Lo (2008).

20. The Hedge Fund Journal (2018).

21. Callan Institute (2018). This study reports 99.85% equity risk exposure. Other studies also show over 90% equity risk exposure. See, for instance, Karl Merthaler and Helen Zhang, "Public Pension Funds: Asset Allocation Strategies," JP Morgan Investment Analytics and Consulting, June 2010.

22. Callan Institute (2018).

23. The problem is compounded by the fact that left tail correlations to US equity are very high for many traditional assets. Page and Paneriello demonstrate that developed market stocks, emerging market stocks, corporate bonds, and high yield bonds all have higher than 0.5 correlations to US equity in the left first percentile distribution, as well as the 5th percentile distribution. See Page and Paneiriello (2018).

24. Factor-based allocation is not omnipotent and has several obvious shortcomings. First, risk factors are not exhaustive and one may be missing relevant factors. In the same vein, while there are a sufficient number of factors, there is no assurance that the chosen factors are the correct and only factors that matter. Second, some risk factors may not be independent from each other and may compete for the same sources of returns. Many risk factors have exposure to other risk factors. Without a proper theoretical underpinning for each factor, two or more inter-related factors may be included unsuspectingly. As a result, the returns from these factors may converge at an unexpected time, and may also introduce biases and other issues in a statistical modeling process. Third, some factors are based on a heuristic idea. For instance, a minimum volatility strategy or "min vol" can be formed by a simple and ad hoc rule such as volatility rankings. Sometimes heuristic factors indeed may be effective, and may belong to the category of alternative alphas. Finally and critically, unlike traditional asset classes, factors often lack intuitive appeal as they are generally not directly observable.

25. For a classic study, see, for instance, Ferson and Harvey (1993).

26. For an application of International Capital Asset Pricing Model (ICAPM), see El Hedi (2009).

27. For an empirical analysis of the changes in the degree of market integration, see Bekaert and Harvey (1995).

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