A Framework for Risk Analysis of Alternative Assets

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What is the proper way of measuring risk characteristics of alternative assets? This note attempts to answer this questions through a simple and yet useful framework.

When asset allocators are asked why they invest in alternative assets, the first response is not typically that they have the highest expected returns or the lowest risks. Those are typical risk-return characteristics of traditional asset classes. While every investment is expected to provide some rate of return, investors also look at other characteristics of alternative investments in order to determine whether an allocation to this asset class is justified.

In the framework presented here, we look at two broad categories of risks – standalone risk and factor exposure risk – to provide a simple framework for characterizing alternative assets along quantitative risk measures. The framework presented here provides focuses on relative measures of risk. That is, given the universe of investments under considerations, the framework ranks the investments in two dimensions: standalone risk and factor exposure risk.

Standalone risk. This characteristic of an alternative investment focuses on the risk of the asset regardless of whether it is held as part of a diversified portfolio or it constitutes the bulk of an investor's portfolio. Even if an alternative asset is held as part of a diversified portfolio, the standalone risk is still relevant. Everything else being the same, the investor would prefer an investment that has lower volatility, lower tail risk, lower historical maximum drawdown, and so on.

Factor exposure risk. This characteristic of an alternative investment focuses on the risk of the asset in a portfolio context. Many investors allocate to this asset class because it is expected to reduce or at least not contribute to the total risk of their portfolios. Furthermore, asset allocators who wish to exercise some degree of tactical asset allocation would want to know how these assets are expected to perform during "risk-on" and "risk-off" regimes.

The framework developed here can be the first step in a decision-making process. There is substantial academic and industry research behind it but is simple and intuitive enough to be used by both institutional and individual investors.

Methodology

The methodology implemented here aggregates various measures of risks along two dimensions: standalone risk and factor exposure risk. All the risk measures are first normalized to account for differences in unit of measurement. For example, while standard deviation is measured using the same unit of measurement as rates of returns, kurtosis is measured in terms of the fourth power of the rates

of return. The process of normalizing the risk measures accounts for the relative size of the risk measure within the universe of assets or funds that are being considered. For example, if eventually the standalone risk of a fund is presented to be 10, then this indicates that the asset has the highest standalone risk among all the assets being considered. On the other hand, if the factor exposure risk of the asset is stated to be 8, then this indicates that the asset has a factor exposure risk that is 20% smaller than the fund with the highest factor exposure risk.

Measuring Standalone Risk

As the name implies, this characteristic of an investment focuses on its risks regardless of whether it is held inside or outside of a diversified portfolio. The following measures of risk are used to construct a single measure of standalone risk:

- Annual standard deviation is used to measure the volatility of historical returns
- Two different measures of maximum drawdown are used to measure the ability of the manager to control downside risk
- Skewness is used to construct a measure of tail risk of historical returns
- Kurtosis is used to construct a measure of extreme returns

Once these measures are calculated, they are normalized and then aggregated to create our measure of standalone risk.

Measuring Factor Exposure Risk

This measure focuses on the exposure of a strategy to major sources of risk in the economy and financial markets. We use the following measures of factor exposures to construct our aggregate measure:

- Exposure to equity risk is used to measure the sensitivity of the fund's returns to changes in equity markets
- Exposure to credit risk is used to measure the sensitivity of the fund's returns to changes in credit markets
- Exposure to VIX is used to measure the sensitivity of the fund's returns to changes in VIX, which is often used to gauge the degree of stress in financial markets

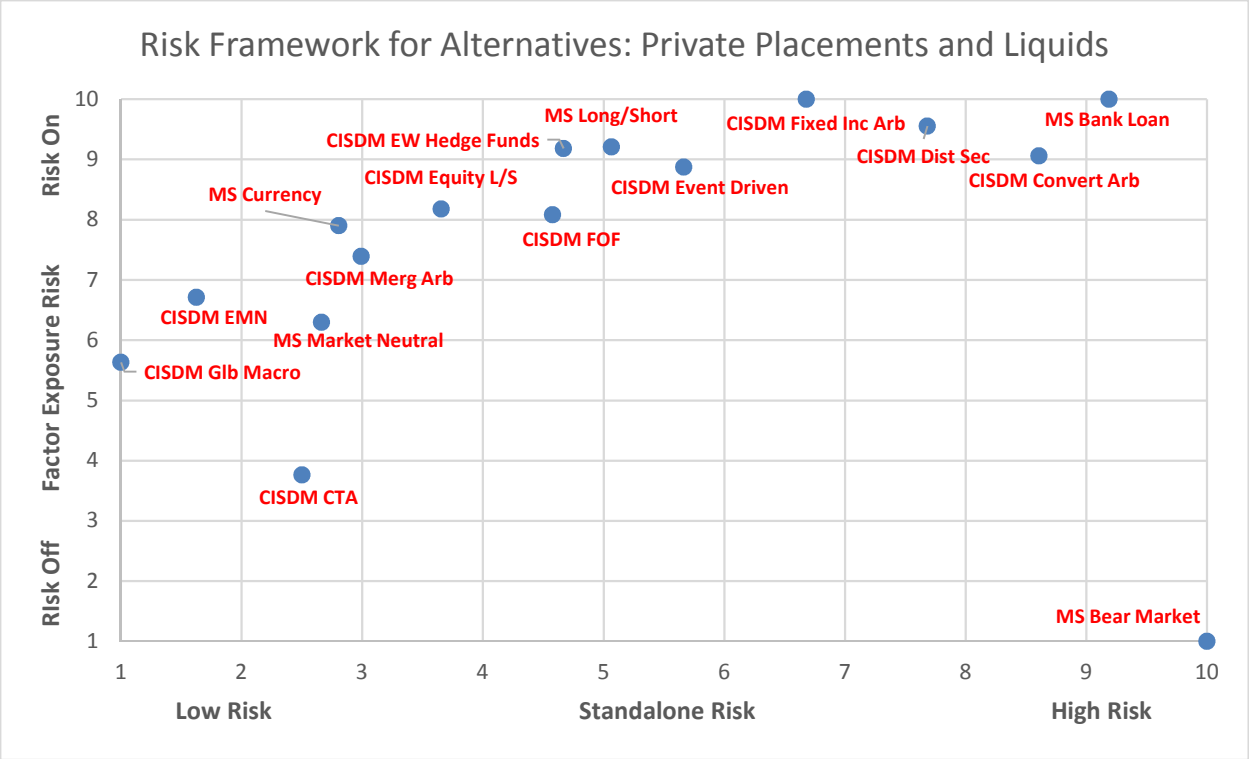
Similar to the standalone measure of risk, we normalize the above exposures to create a single measure representing factor exposure risk.

Examples

To illustrate our approach, we apply the above framework to CISDM Hedge Fund Indices and Morningstar Liquid Alternative Indices. Both are peer group benchmarks in the sense that they are calculated using equally weighted returns of managers who follow specific strategies. The results appear in Exhibit 1.

Let's start with Morningstar's Bear Market Benchmark, which represents an interesting case. As expected, this index has the lowest factor exposure risk. That is, funds that follow this strategy are the ultimate diversifiers. On the other hand, this fund has the highest standalone risk. Alternatively, the CISDM Global Macro Index has the lowest standalone risk and has about 40% lower factor exposure risk than the riskiest strategy – Morningstar's Bank Loan Benchmark. Overall, we can see that while there is a great deal of

variation in terms of standalone risk among these indices, most of the strategies' factor exposure risks are with 80% of the riskiest strategy. CTA, Global Macro, Equity Market Neutral, and Merger Arbitrage strategies are the only indices that have factor exposure risks that are less than 80% of the riskiest strategy. Finally, we can see that compared to private placement funds, which are represented by CISDM indices, liquid alternatives represented by the Morningstar benchmarks have relatively high factor exposure risks. In other words, these funds are not as effective diversifiers as the private placement funds.



Source: CISDM, Morningstar and authors' calculations

Qualitative Due Diligence

The quantitative framework just discussed measures the standalone risk and the factor exposure risk of a variety of hedge fund and liquid alternative indices. While this framework measures the risk of each category or strategy of a fund, the quantitative risk measure of an index does not rank how a specific fund would experience risk and return over the course of a full market cycle. That is, the indices are an average of the performance of a large number of funds, and the experience of any one fund within an index may be more positive or more negative than the performance of the index as a whole.

In order to understand the risks of a specific fund, investors should perform both operational due diligence and investment due diligence.

Investment Due Diligence

Before allocating assets to a specific investment vehicle, investors should make sure that they understand the investment strategy and develop a belief that the portfolio management team has the skills required

to manage the fund successfully. While entire books have been written on the due diligence process, a few questions are included here to get the process started.

- What investment strategies has this portfolio management team run in the past? Were those strategies successful? Were those strategies closely related to the investment strategy of the fund currently being considered?
- What is the investment strategy of the fund? Is the strategy substantially similar to one tracked by a CISDM hedge fund index where the risk and return of the index can be appropriately used to understand the characteristics of the fund?
- Does the portfolio management team have the right skills, experience, and incentives to be a cohesive, long-term team that can generate respectable or excess investment performance?
- What are the management fees, incentive fees, and total costs that investors will pay for this fund? How do these fees compare to similar investment products or the expected returns of the fund?

Operational Due Diligence

No matter how strong the investment team, investors also need to examine the operations of a firm before investing in a fund.

- Does the fund management firm have a culture of risk management that is respected by traders and portfolio managers and electronically enforced by the trading systems?
- Does the fund understand the regulatory environment and legal issues and have controls in place for the product to comply with all applicable regulations?
- Does the fund have an appropriately structured team, with separation of duties and the skill to manage compliance, performance measurement and valuation, operations, clearing, and trading? Are procedures in place to ensure the safe custody of client assets?
- Do both the investor and the manager understand how positions will be valued? If the investments are not liquid and exchange traded, are the positions priced using an internal model or an external valuation service?

In summary, the risk of any investment product must be analyzed through both quantitative and qualitative risk measures. Before making any investment, investors should have a strong understanding of the risk and return characteristics of the investment product. While many alternative investments have lower standard deviation risk than a long-only equity index, the complexity of these products requires a heightened level of understanding and due diligence.