

Risk Mitigating Strategies (RMS) Framework

WHITEPAPER

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Introduction

Wall Street jargon runs rampant throughout the investment services world and a single term can have meaningful differences depending on an investor’s perspective and inherent biases. As an organization rooted in a long history of consulting, we make our best attempt to reduce and simplify Wall Street jargon. We seek to use terminology that may have a higher probability of resonating with the marketplace to educate investors on complex topics.

The intention of this educational whitepaper is to use language clearer than, for example, “hedge funds”, which tends to be a nebulous term. Investing in “hedge funds” is akin to playing “sports”. Well, which sports are we referring to? Basketball, Football, Skiing, Field Hockey, Lacrosse, Racing? Sports like Racing have many sub-categories such as NASCAR, Indy, Motocross, Rally, etc. Thus, we will make our best effort to identify the sports that may help investors conceptualize building an effective and efficient all-around athlete to complement the other players of the strategic asset allocation team.

Championship teams tend to have both a talented offense and defense. Many strategic asset allocations have a well-built offensive roster, which tends to move with changes in economic growth risk. Economic growth risk, which may also be referred to as equity risk, shows up in almost all investment strategies from public and private equity to real estate and high yield bonds. Many times, the amount of risk an investor’s portfolio may have relative to economic growth risk may be masked by label diversification. Figure 1 is illustrative of the potential masking caused by label diversification in a strategic asset allocation relative to viewing such allocation through a risk lens where the portfolio likely has a high dependence on economic growth.

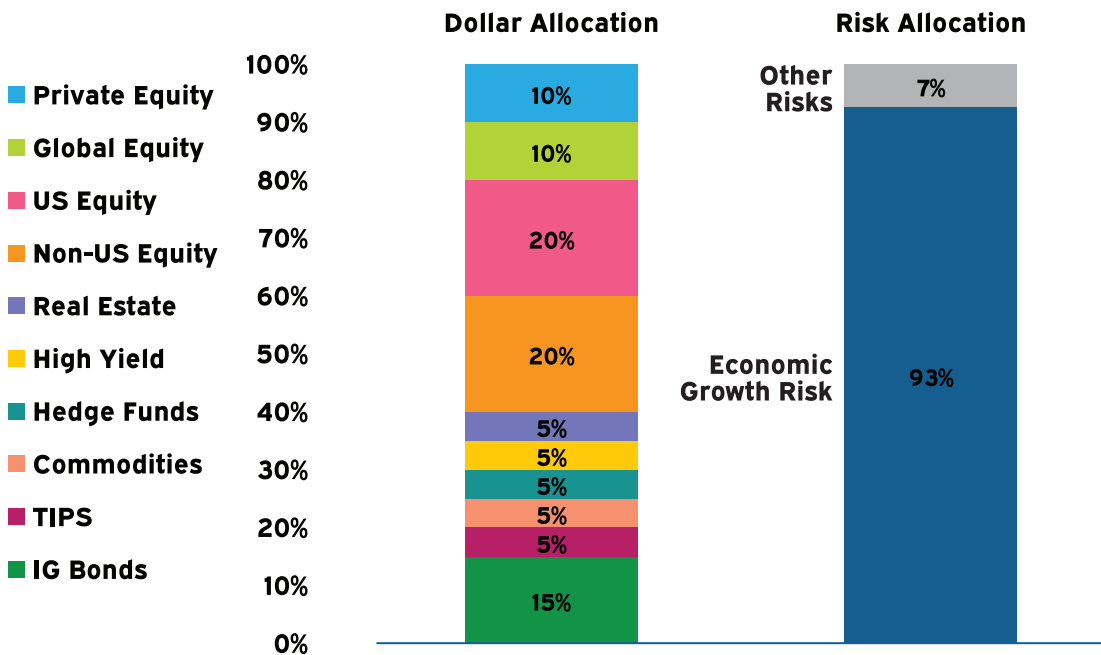


FIGURE 1
Example Portfolio Dollar Allocation versus Risk Allocation

Source: Meketa. Hypothetical asset allocation. Allocation associated with Growth Risk include Private Equity, Global Equity, US Equity, Non-US Equity, Real Estate, and High Yield. Utilizes Meketa’s 2022 20-year mean variance optimization expected correlations and risks. Risk Contribution for each asset class is calculated as the sum of the asset class correlation with each other asset class multiplied by each respective asset class standard deviation multiplied by the asset class dollar allocations.

The illustrative strategic asset allocation may not be as balanced as hoped due to a lack of diversification. To continue the sports analogy, this may reduce the chances of the portfolio consistently competing at the highest level. That is not to say the portfolio is prevented from being a championship team, but it is overly reliant on offense or on offensive players with a lack of defense. As such, investors may seek defensive tools that could be utilized to raise the probability of constructing a team or portfolio that consistently competes at a championship level.

Like the previously mentioned strategic asset allocation issue where label diversification may mask the underlying risk concentration, hedge fund programs often follow a similar pattern. Some hedge fund programs are playing zone defense, as some do not actually hedge, at least not enough from the perspective of the historical embedded beta¹ and drawdowns exhibited by industry standard benchmarks. By these measures, as shown in Figures 2 and 3, many hedge fund programs may be a low equity beta implementation of risks an investor already has elsewhere in their strategic asset allocation.

¹ Embedded beta refers to consistent drivers of returns due to exposure to traditional risk factors (e.g., equities). For example, long / short equity strategies are often consistently long equities (albeit at different levels), which often results in them producing negative returns at the same time as broad equities (e.g., the S&P 500, MSCI ACWI). Beta = the correlation between the HFRI FWC and Global Equity multiplied by the HFRI FWC standard deviation divided by the Global Equity standard deviation.

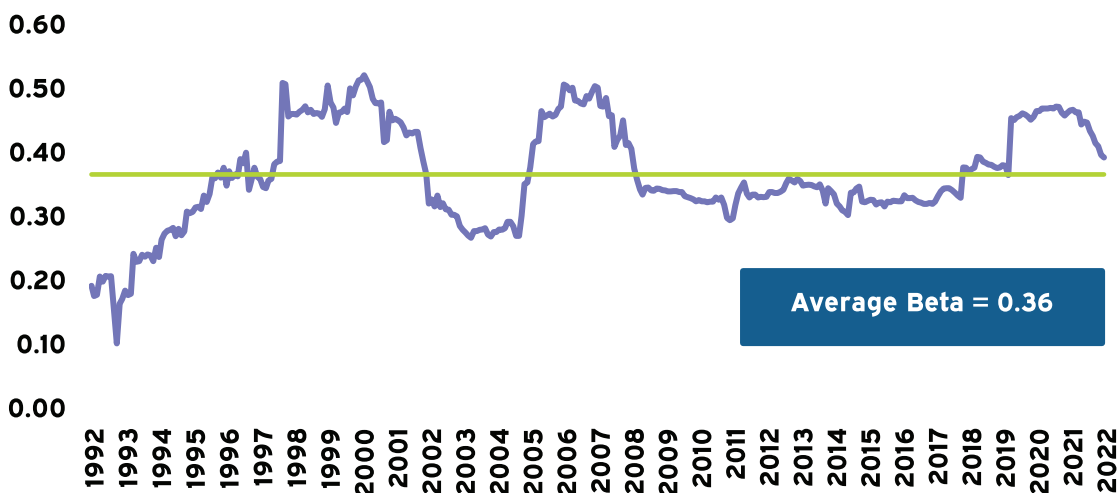


FIGURE 2
Rolling 36-month Beta of HFRI FWC to Global Equity: Jan-90 to Dec-22

Source: MSCI, FactSet, HFRI. Global Equity is modeled as MSCI ACWI.

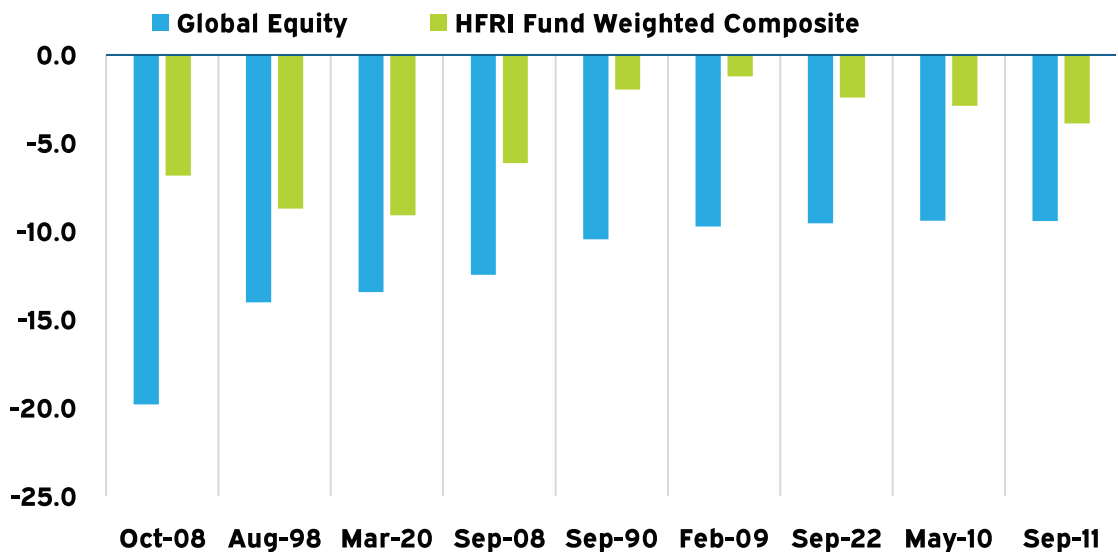


FIGURE 3
Returns During Worst 10 Months of Global Equity: Jan-90 to Dec-22

Source: MSCI, FactSet, HFRI. Global Equity is modeled as MSCI ACWI.

Introduction to Risk Mitigating Strategies (RMS)

Previously, we said the category “hedge funds” is nebulous. The category naming conventions often fall short of setting appropriate expectations for investors. Many investors have recognized this naming pitfall and have begun to use organizational frameworks which better reflect their desired or expected outcome. This often is focused on selecting strategies which may provide defensive properties or frameworks used to complement an investors equity risk exposure. For example, institutional investors have used different naming conventions such as Risk Mitigating Strategies (RMS), Crisis Risk Offset (CRO), Risk Mitigation Class, Crisis Protection Class, and Diversifying Strategies, among others. In addition, some investment managers have launched investment products around similar defensive frameworks.

In this paper we use the name Risk Mitigating Strategies (RMS) as a common investment framework or organizational structure that can be used to consider allocations to investment strategies that are expected to provide exposures which are complementary to equity risk. An RMS framework may seek to provide positive long-term returns while producing negative to modestly positive correlations to traditional sources of risk (interest rates, credit spreads, equities, etc.) on average. More specifically, some risk mitigating strategies seek to produce gains during turbulent markets, such as equity drawdowns, with some having negative, and others positive, conditional correlations during these times.

Risk Mitigating Strategies (RMS) framework

A key tenant of any strategic allocation is the framework used to achieve investor objectives. For RMS it can be helpful to use a functional framework of three groups: first responders, second responders, and diversifiers. These groups can be seen as levers with which to customize an RMS framework to seek a specific outcome. As markets and objectives change over time, this may afford investors additional flexibility to adapt as new tools or opportunities become available.

Further, in creating allocations meant to protect against equity market drawdowns, there are key trade-offs to consider that are aided by a functional framework. What the future holds, or at least how and when it will occur, is unknowable. It is nearly impossible to predict when the next equity drawdown will occur, and which assets or strategies will move in the same or opposite direction as equities at that time. To improve its effectiveness, an RMS framework seeks to identify strategies that provide protection against both high velocity drawdowns (e.g., Q1 2020) and extended drawdowns (e.g., Tech bubble, Global Financial Crisis, 2022). Various strategies can be used within each functional group that often vary by reliability, cost, expected return, and convexity.²

As noted, within an RMS framework it may be helpful to organize investment strategies into three functional groups, shown in Figure 4, each with its own key objectives: first responders, second responders, and diversifiers.

² Convexity in this context refers to the benefits the RMS framework exhibits relative to equity markets and relative to their own observed volatility. A positively convex profile tends to produce positive returns at an accelerating rate as equity markets fall.

First responders, as implied by the name, are meant to include strategies which are intended to be the first line of protection in a material equity drawdown and often utilize long duration US Treasuries, long volatility, and tail risk.

Second responders are meant to include strategies that may capitalize on protracted bear markets. This most commonly includes trend following strategies (i.e., CTAs and managed futures). The dynamic nature of trend following strategies often allows them to also produce gains in extended bull markets.

The third group, diversifiers, can house the most wide-ranging strategies by number and type. The main goal of a diversifier is to provide returns that are uncorrelated to the first and second responders, and to the rest of the investor’s portfolio. While the first and second responders may be the most important groups for the purposes of protecting against market drawdowns, diversifiers play a key role in helping to bolster returns during bull and flat equity markets when the performance of the other two groups may be lackluster. We further expand on each of the three functional groups in the next section.

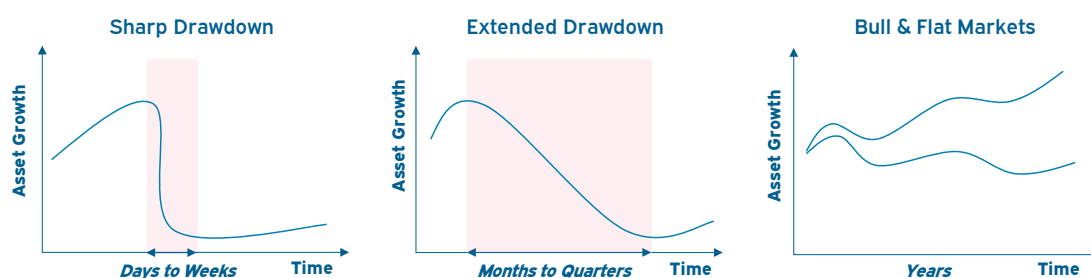


FIGURE 4
First Responders,
Second Responders, and
Diversifiers

Source: Meketa Investment Group, 2023.

First Responders	Second Responders	Diversifiers
<p>Primary Role: First line of protection in an equity drawdown</p> <p>Strategy Examples: Long Volatility, Long Duration US Treasuries, Tail Risk Strategies</p>	<p>Primary Role: Second line of protection in an equity drawdown</p> <p>Strategy Examples: Trend Following, CTAs, Managed Futures</p>	<p>Primary Role: Provide uncorrelated returns to stabilize 1st and 2nd responders</p> <p>Strategy Examples: Global Macro, Alternative Risk Premia, Multi-Strategy, Equity Market Neutral, Relative Value, Insurance Linked, etc.</p>

First responders overview

Strategies utilized as first responders are expected to be the first line of defense and produce meaningful gains in the initial stages of an equity drawdown or market shock. There are three main types of hedging strategies that are often considered when constructing a first responder portfolio: correlation hedges, structural hedges, and explicit hedges.

There are key distinctions between each type of hedge and underlying strategy, which primarily come down to cost, coverage (i.e., reliability), capital efficiency, and convexity (i.e., return profile).³ Many investors have historically relied on long-term US Treasuries as a correlation hedge to serve as a first responder. Given the basis risk⁴ of long-term US Treasuries, investors may consider allocating to other strategies more directly linked to negative equity market events (e.g., long volatility or tail risk) in addition to, or even in lieu of, long-term Treasuries. A high-level summary of these first responder strategies is provided in Figure 5 below, followed by more detailed summaries.

³ Cost refers to the management fees charged for a strategy as well as costs such as paying to be long an option. Coverage refers to the probability of payoff in equity drawdowns. Capital efficiency refers to the amount of dollars that need to be invested to gain a desired exposure. Convexity refers to the difference in returns expected relative to equities during drawdown periods. There may be additional considerations depending on an investor's constraints and desired outcomes.







Correlation Hedge	Structural Hedge	Explicit Hedge
<p>Strategies: Long US Treasuries</p> <p>Performance Drivers: Investors often seek high quality assets when markets decline</p> <p>Most Effective When... Flight-to-safety </p> <p>Least Effective When... Rising rates </p> <p>Implementation Example Buying 20+ year US Treasuries</p> <p>Strategy Benefits → Well known → Low cost → Historically reliable</p> <p>Things to consider... → Relies on the behavior of others → Negative real yields → Changing correlations?</p>	<p>Strategies: Long Volatility</p> <p>Performance Drivers: Volatility increases as equity price changes accelerate</p> <p>Most Effective When... Increasing volatility </p> <p>Least Effective When... Stable / low volatility </p> <p>Implementation Example Buying CBOE VIX options</p> <p>Strategy Benefits: → High certainty → High event payoffs → Flexible implementation</p> <p>Things to consider... → Low expected returns → Complexity → Ability to hold</p>	<p>Strategies: Tail risk hedging</p> <p>Performance Drivers: Continual insurance payment for a guaranteed payoff</p> <p>Most Effective When... Sharp drawdowns </p> <p>Least Effective When... Stable, bull markets </p> <p>Implementation Example Buying equity put options</p> <p>Strategy Benefits: → Guaranteed payoff → Targets specific levels → Highest payoff</p> <p>Things to consider... → Explicit ongoing cost → Most difficult to hold → Counterparty risk</p>

FIGURE 5
Explicit, Structural, and Correlation Hedges

Source: Meketa Investment Group, 2023.

The trade-offs and performance drivers highlighted previously result in different forward-looking and historical performance expectations across market environments. As illustrated in Figure 6, long volatility strategies produced positive results in all noted drawdowns, driven by rising volatility, while long duration Treasuries and tail risk strategies did not. Long duration Treasuries have struggled in rising rate and inflationary periods, while tail risk strategies may require a certain depth of drawdown to produce a benefit.

⁴ Basis risk refers to the risk that occurs from an imperfect hedge. Here, long-term US Treasuries are a correlation hedge relying on the behavior of others. As the future behavior of others is uncertain, this introduces the possibility that it could fail to produce strong positive returns during an equity market drawdown.

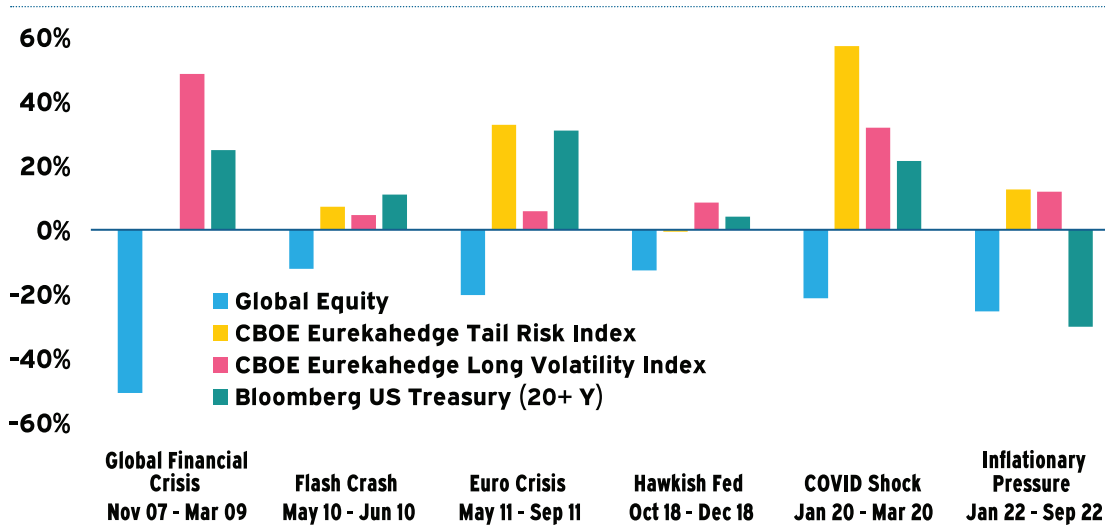


FIGURE 6
Return During Global Equity Drawdowns of at Least 10%

Sources: Meketa, FactSet. For the period January 2005 to December 2022. The CBOE Tail Risk index was inceptioned in January of 2008 and thus not included in the Nov 07 - Mar 09 comparison. From January 2008 to March of 2009, the CBOE Tail Risk Index produced a return of 12.5% versus an MSCI ACWI return of -48%. A description of the benchmarks can be found in the Appendix. Global Equity is modeled as MSCI ACWI.

Explicit hedges

Tail risk strategies may offer an explicit hedge which may be considered as a first responder. An explicit hedge describes a highly certain payoff when an event of a specific magnitude occurs. This may be viewed similarly to buying car insurance, where someone pays a consistent premium to an insurance company in exchange for a guaranteed payoff should a specific event occur (e.g., car crash). Tail risk strategies typically utilize derivatives, which often allow for substantial payoffs during market crises due to their inherent leverage. The most basic implementation consists of buying equity put options, which involves paying a consistent premium to have the option to sell equities at a pre-specified price in the future.

These strategies may target a specific equity drawdown level and specific amount of the portfolio to protect. For example, a strategy might be implemented to prevent losses of more than 20% in an equity drawdown. This effectively sets a maximum loss level for the portfolio should an event of higher magnitude materialize. The key drawback of tail risk strategies is that (ignoring interim profit harvesting) 100% of the premium spent will be lost if an equity drawdown of that magnitude does not occur. Due to the ongoing cost of holding the option, this type of strategy has a negative long-term expected return. However, tail risk strategies are often the most reliable way to hedge a portfolio and, aside from counterparty risk, are essentially guaranteed to pay off if the event of concern occurs.

Structural hedges

Long volatility strategies may be used as a first responder and offer a structural hedge against an equity drawdown. A structural hedge describes a strategy that profits from changes in a security that are closely related to or based upon movements in markets (e.g., equities). This may be the second most direct form of equity drawdown mitigation, benefiting from structural attributes. Long volatility strategies purchase derivative securities linked to equity, interest rate, credit, currency, and/or commodity volatility. The strategy profits as market volatility rises or is higher than anticipated. Equity market corrections or drawdowns tend to be accompanied by sharp increases in volatility, so strategies that are long (i.e., buy) equity volatility will most likely profit.

Long volatility strategies may have a higher expected return than tail risk strategies, but are still likely to experience negative returns during less volatile periods. During market drawdowns they might generate a return of 50% to 150% of the corresponding equity drawdown (e.g., S&P 500 return of -40% results in an expected long volatility return of 20% to 60%). As shown in Figure 7, long volatility has produced a convexity⁵ profile between those of long US Treasuries and tail risk. Long volatility strategies can suffer from basis risk if they have a small or no allocation to equity volatility products (e.g., VIX futures). On the other hand, allowing exposure to volatility outside of equities, may provide positive benefits when other assets experience dislocations.

⁵ Convexity in this context refers to a progressively higher (non-linear) increase in positive returns for first responders as more negative MSCI ACWI returns are observed.

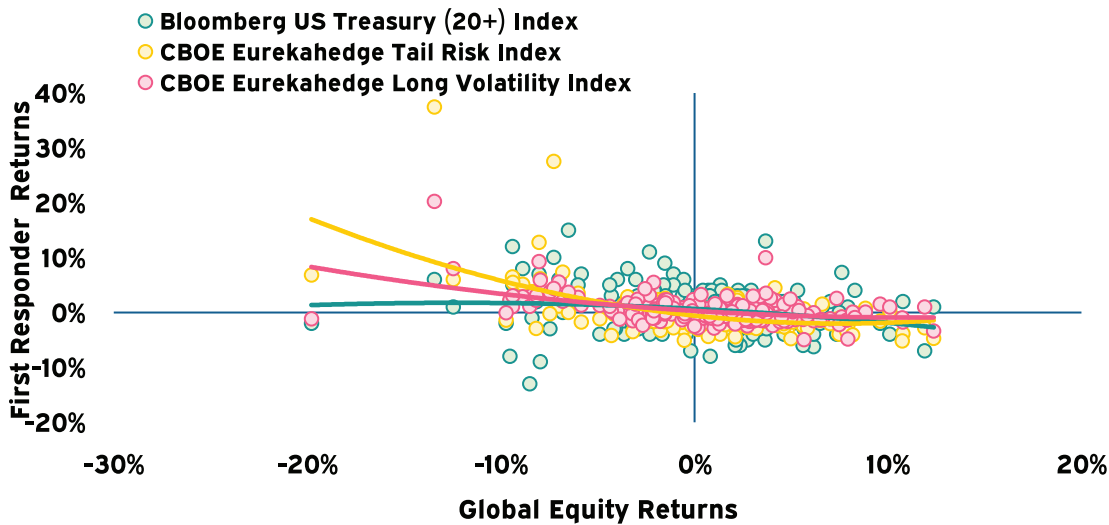


FIGURE 7
First Responder Monthly Returns vs. Global Equity

Sources: Meketa, FactSet. For the period 2008 to December 2022. Global Equity is modeled as MSCI ACWI. The depicted trend lines are second-degree polynomial functions.

Correlation hedges

Long duration US Treasuries may offer a correlation hedge against equity drawdowns. A correlation hedge describes a strategy that has historically had a negative correlation to an asset (e.g., equities) due to the behavior of other market participants. Treasuries may represent a common first responder strategy due in part to their low cost, simplicity, and ease of implementation. As is implied by the name, this strategy makes investments in long-term (20+ year) US Treasury bonds. Treasuries might be the least complex, lowest fee, and most liquid strategy of an RMS framework. Exposure to Treasuries elsewhere in an investor’s asset allocation should be accounted for before considering its use as a first responder. This strategy also may offer the highest long-term expected return versus other first responders due to Treasuries’ inherent yield, although this gap can change along with the level of interest rates and inflation.

Given the perceived risk-free characteristics of all US government-issued debt, Treasuries have historically behaved as a “safe haven” asset during times of crisis. Historically, equity market declines have generally coincided with declines in interest rates and holding longer duration bonds (versus shorter duration) magnifies their defensive impact. As a correlation hedge, however, their behavior during an equity drawdown may be reliant on the actions of other investors and government institutions. If a rising rate environment accompanies an equity drawdown or period of crisis, Treasuries could face material losses or reduced effectiveness as a hedge to equities.⁶

⁶ The correlation between equities and bonds has historically been variable and exhibited some sensitivity to the rate of inflation. Since the year 2000, equity losses have been dampened by bond returns while inflation has been relatively benign; however, a potentially shifting macro environment (e.g., one of higher inflation) may pose a challenge to the hedging properties of bonds during equity drawdowns.

Second responders overview

Strategies utilized as second responders are expected to serve as the second line of defense by producing meaningful gains during extended equity drawdowns or market shocks. These are most often trend following strategies which are commonly implemented by commodity trading advisors (CTAs). These strategies use systematic processes to invest based on the direction (or trend) of equities, interest rates, currencies, and commodities through futures contracts. As the name suggests, trend following strategies seek to capture directional trends or momentum in markets, understood as the tendency of assets that have performed well (or poorly) recently to continue to perform well (or poorly) in the future.

Investors might expect trend following strategies to capture trending behavior in markets, but struggle during market inflection periods, as well as during trendless but volatile environments (i.e., “sideways markets”). These strategies have historically provided a complementary return profile to equities, as evidenced by the SG Trend Index⁷ shown in Figures 8, 9, and 10.

⁷ The SG Trend Index represents a composite of the 10 largest trend following strategies open to new investment with sufficient liquidity as defined by Société Générale (SG). For complete methodology see link in the appendix.

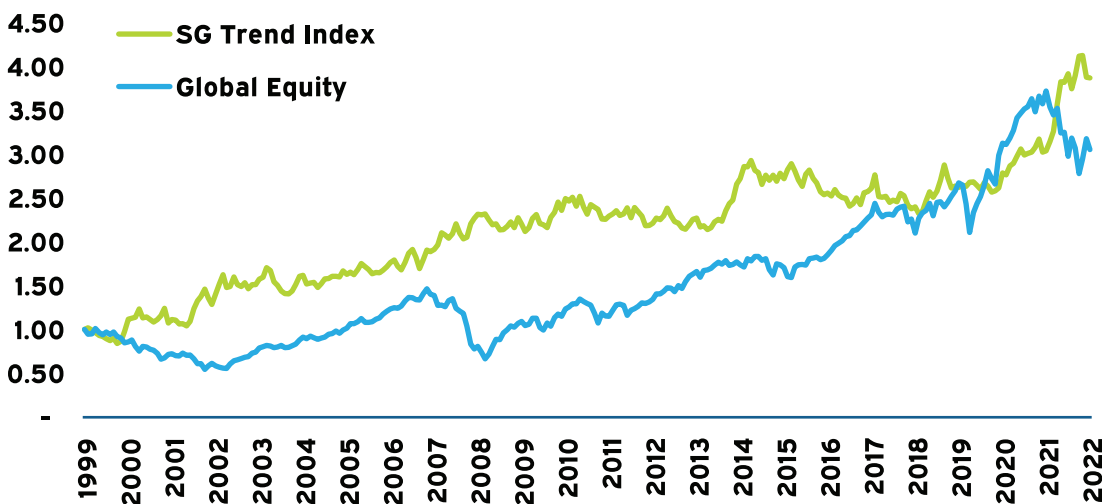


FIGURE 8
Growth of \$1 for Global Equities and Trend Following Strategies

Sources: Meketa, FactSet, Societe Generale. For the period from 2000 to December 2022. Global Equity is modeled as MSCI ACWI.

The average time horizon of trend following models provides a trade-off between reactivity to inflection points and excessive trading. While medium- to long-term trend following strategies can be slower to capture market inflections, the fact that they remain invested longer in trends generally leads to higher risk-adjusted returns. Short-term models, by contrast, will be quicker to react to market inflections, but with a higher risk of entering and exiting trends too soon, which can create excessive trading costs and/or hurt performance.

Over the long term, trend following strategies have no structural bias for long or short positions; they are designed to equally capture both upward and downward price trends regardless of asset type. This means they may generate positive returns during downward trending markets by “shorting” equities and by buying appreciating assets benefiting from flight to quality attributes. This results in a variable correlation profile as shown in Figure 9, which is low, on average, relative to equities and other assets. However, low correlations are not always expected.

For example, if equity markets are trending upward, trend followers will likely be net buyers of equities, leading to higher correlations with equities. Conversely, if equities are trending down, trend followers will likely be net sellers, leading to negative correlations to equities. This risk-taking profile and process of trend followers may produce an attractive profile (i.e., convex shape⁸) with potentially significant gains in large up and down equity markets. As shown in Figure 10, as time frames for evaluation are extended, this profile becomes more pronounced, or convex, aligning well with the objectives of second responders in an RMS framework.

⁸ The convex shape is often referred to as a "smile" because the strongest returns for trend followers occur in the largest negative and positive periods for equities, which are often the product of sustained trends within markets.

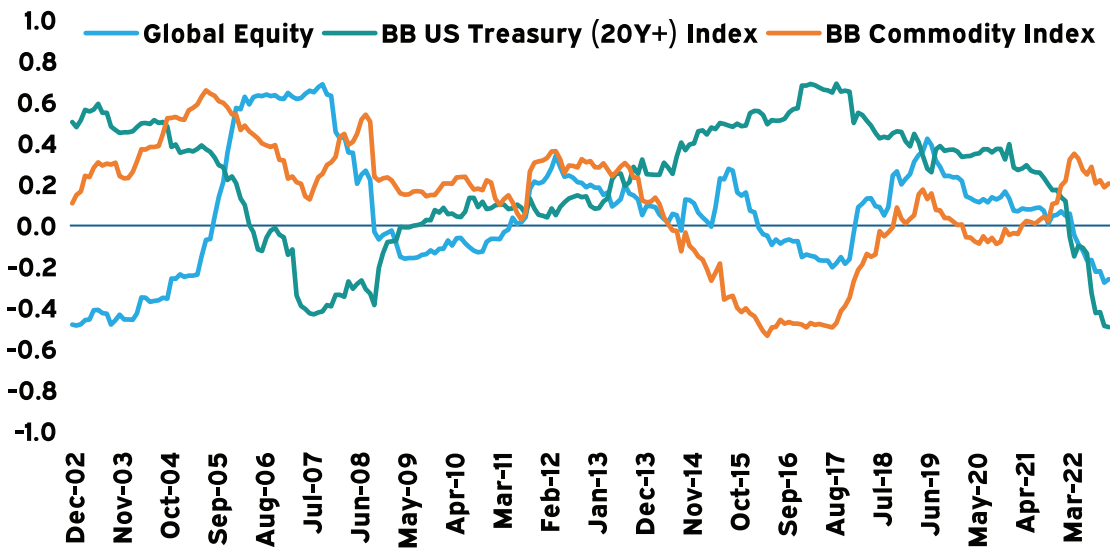


FIGURE 9
Rolling 3-year Correlation to SG Trend Index

Sources: Meketa, FactSet, Societe Generale. For the period from 2000 to December 2022. Global Equity is modeled as MSCI ACWI.

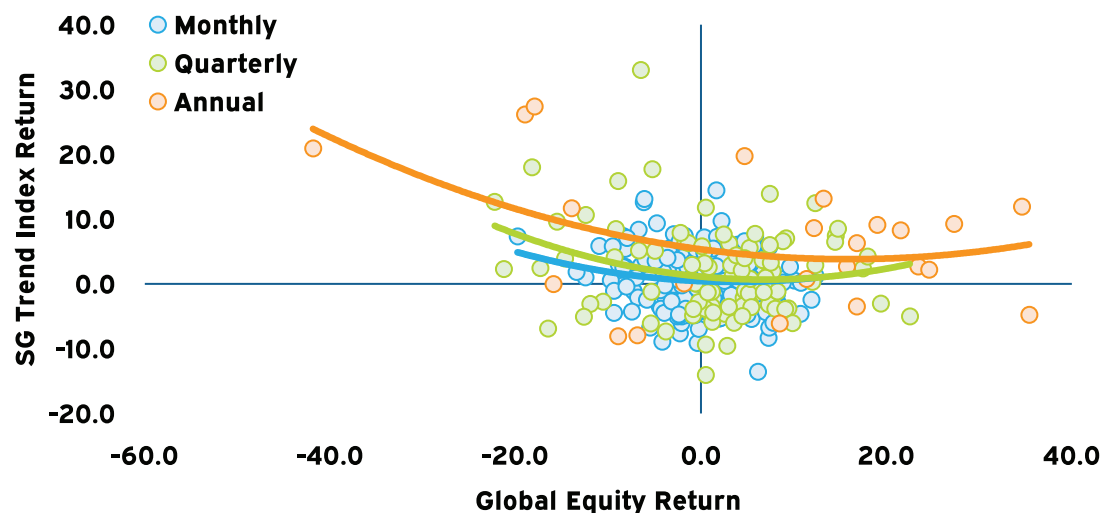


FIGURE 10
Convexity by Time Horizon

Sources: Meketa, FactSet, Societe Generale. For the period from 2000 to December 2022. Global Equity is modeled as MSCI ACWI. The depicted trend lines are second-degree polynomial functions.

Diversifiers overview

The diversifiers group can contain a wide range of investment strategies. These strategies can include some of the traditional hedge fund categories such as Global Macro, Equity Market Neutral, Relative Value, and Event Driven. Other strategies such as insurance-linked securities, alternative risk premia, and multi-strategy platforms, which combine a breadth of strategies, may also be considered. A high-level summary of some of these categories is shown in Figure 11.

Diversifiers	Global Macro	Alternative Risk Premia	Insurance Linked Strategies
	<p>Summary Attempts to profit by predicting market moves or finding inefficiencies through systematic and/or discretionary analysis</p> <p>Common Implementation: Liquid global futures/ forwards contracts across equities, bonds, currencies, and commodities</p>	<p>Summary Harvests non-traditional risk premiums in a market neutral fashion (Value, Carry, Momentum)</p> <p>Common Implementation: → Liquid global futures/ forwards contracts across equities, bonds, currencies, and commodities → Single name equities</p>	<p>Summary Harvests a risk premium linked to property damage insurance contracts related to natural catastrophes</p> <p>Common Implementation: Modestly illiquid reinsurance contracts</p>
	Arbitrage Strategies	Equity Market Neutral	Multi-strategy
	<p>Summary Attempts to profit from market inefficiencies related to idiosyncratic events or relative value opportunities</p> <p>Common Implementation: → Liquid global futures / forwards contracts across equities, bonds, currencies, and commodities → Single name equities</p>	<p>Summary Uses a systematic approach to profit from pricing anomalies related to mean reversion or technical analysis</p> <p>Common Implementation: → Single name equities</p>	<p>Summary A diversified portfolio of multiple investment strategies or portfolio managers</p> <p>Common Implementation: → Liquid global futures / forwards contracts across equities, bonds, currencies, and commodities → Single name equities</p>

FIGURE 11
Example Categories

Source: Meketa Investment Group, 2023.

We defer an in-depth discussion of these strategies as their attributes may or may not be a fit for a risk mitigating framework, depending on an investor’s objectives and constraints. Importantly, the list of strategies is not meant to be exhaustive. Setting aside labels and categorizations of hedge funds is important when identifying diversifying strategies because some hedge fund categories may be associated with high levels of embedded beta. Diversifiers often, in isolation or in aggregate, seek to meet several of the objectives outlined below:

- Provide higher expected risk-adjusted returns than first and second responders
- Are largely uncorrelated to first and second responders
- Generate uncorrelated returns from alpha and/or exposure to non-traditional risk premia

Evaluating strategies which may fit as diversifiers often includes considering approach, geography, breadth, and implementation. Investment managers may employ systematic or discretionary approaches and seek to generate excess returns through idiosyncratic risk exposures, predicting market moves or exploiting other market inefficiencies. Focusing on a subset of strategies meant to be uncorrelated with major market risks may result in a beta expectation that is lower than industry benchmarks⁹ and closer to zero (+/- 0.2) beta to equities objective over the long term.

⁹ As noted in Figure 2, the average beta of the HFRI Fund Weighted Composite over 36-month rolling time frames from January of 1990 to December of 2022 has been 0.36.

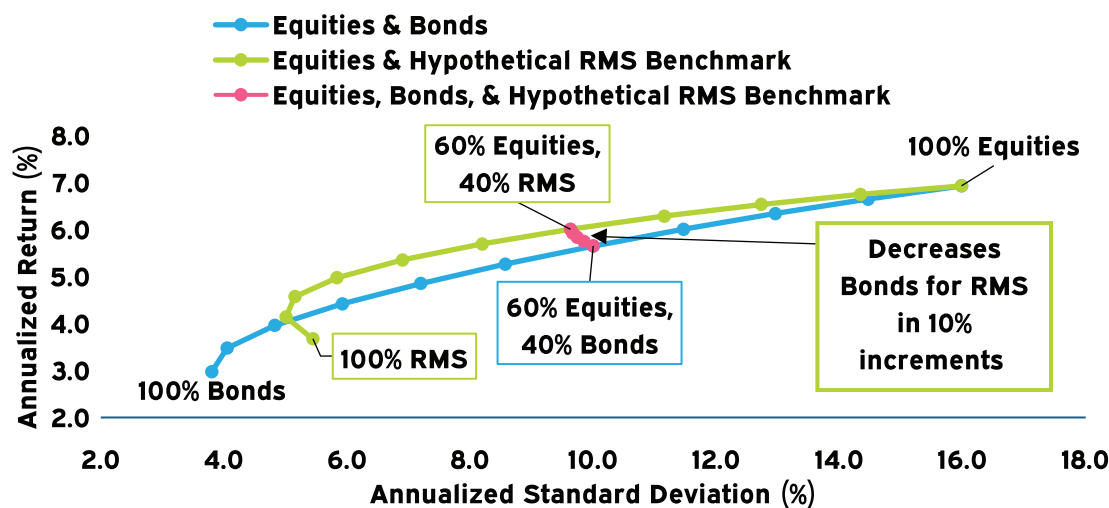
Using a Risk Mitigating Strategies (RMS) framework in strategic asset allocation

In this section, we utilize a hypothetical composite of indices to provide an example of the performance of an ensemble of risk mitigating strategies. While an RMS framework would be customized to specific investor objectives and constraints, these equal weighted benchmarks provide a good starting point to illustrate some of the performance tendencies of using a risk mitigating strategies framework. The performance below is an equally weighted blend of first responders (CBOE Eureka hedge Tail Risk Index, CBOE Eureka hedge Long Volatility Index, Bloomberg US Treasury 20+ Years), second responders (SG Trend Index), and diversifiers (HFRI Macro, HFRI Relative Value, HFRI Equity Market Neutral, HFRI Event Driven).¹⁰

Taking a holistic approach when using an RMS framework can be helpful as no single group of an RMS functional framework, or a single strategy within a group, is likely to effectively fulfill all objectives. The goals of an RMS framework may be the following:

- Generate a positive long-term expected return
- Produce modest to meaningful positive returns during equity drawdowns
- Be sufficiently liquid to allow for timely rebalancing
- Be scalable and capital efficient to have impact in a strategic asset allocation
- Provide modestly negative to modestly positive correlations to traditional risk factors on average

We anticipate that these attributes could prove beneficial to expected investor outcomes by bending the efficient frontier up and to the left as shown in Figure 12. Including risk mitigating strategies with other common assets (e.g., equities and bonds) may help investors achieve an improved risk-return trade-off. While the efficient frontier illustrates a historical benefit to using a hypothetical RMS framework, forward-looking expectations using basic optimization techniques such as mean variance optimization (MVO) may also indicate a benefit. However, even MVO may understate the potential benefits of RMS, as MVO does not consider the non-normal distribution of asset returns we observe in practice. Thus, it is important to evaluate both historical and forward-looking simulations that consider non-normal distributions.



¹⁰ This is not an investible portfolio and is meant to be broadly and hypothetically representative example of a collection of risk mitigating strategies. Indices are widely used industry benchmarks. Please see the Appendix for additional detail on the construction and underlying benchmarks.

FIGURE 12
Historical Hypothetical Portfolio Return & Risk: 2005 through December 2022

Sources: Meketa, Factset, Societe Generale. Bonds refer to the Bloomberg US Aggregate index, and Equities refers to the MSCI ACWI. Composition of RMS, as the RMS Benchmark, can be found in the Appendix. In an effort to use readily available benchmark data, we have focused on the period of January 2005 to December of 2022 as a common period across most of the indices used. Analysis of other less readily available datasets results in similar takeaways and forward-looking expectations across the three types of hedges mentioned. Hypothetical portfolios change in 10% increments and assume annual rebalancing.

Many investor portfolios with long-term horizons, hence heavily invested in growth assets, might benefit from establishing an RMS framework. The ideal size of an allocation depends on several factors and will be dependent on the objectives, constraints and needs of the investor.

One factor to consider is the expected return of implementing an RMS framework and its conditional performance during drawdowns. As with most investments, these two factors trade off with each other, meaning allocations with higher expected returns may tend to have lower probabilities of positive performance during turbulent times.

Moreover, the characteristics of an RMS framework influences the structure of the rest of a strategic asset allocation. Notably, RMS allocations with high expected conditional performance during drawdowns may allow investors to increase equity or growth risk exposures, thereby implementing a “barbell” approach to risk allocations. This is primarily driven by the offsetting or positive returns expected during material equity drawdowns, as shown in Figure 14. This can be compared with Figure 13 which details the trailing 1-, 5-, 10-, and 15-years annualized performance for the period ending December 31, 2022. This is the most recent period end, and any analysis may be subject to endpoint bias.¹¹

Risk mitigating strategies may have the potential to produce higher returns than bonds and a broad representation of “hedge funds” in equity drawdowns. While bonds have historically served as a ballast for investor portfolios, using an RMS framework may partially or fully allow investors to hold more equity exposure. The ability to rebalance from appreciated assets into depreciated assets may allow investors to compound returns at a higher rate over time.

¹¹ Statistically, endpoint bias refers to the inclusion or exclusion of data that significantly influence results. Practically speaking, endpoint bias refers to investors’ tendency to place undue significance on results for measurement periods ending in the present. If the recent past witnessed unusually high or low returns, then long term results can change considerably.

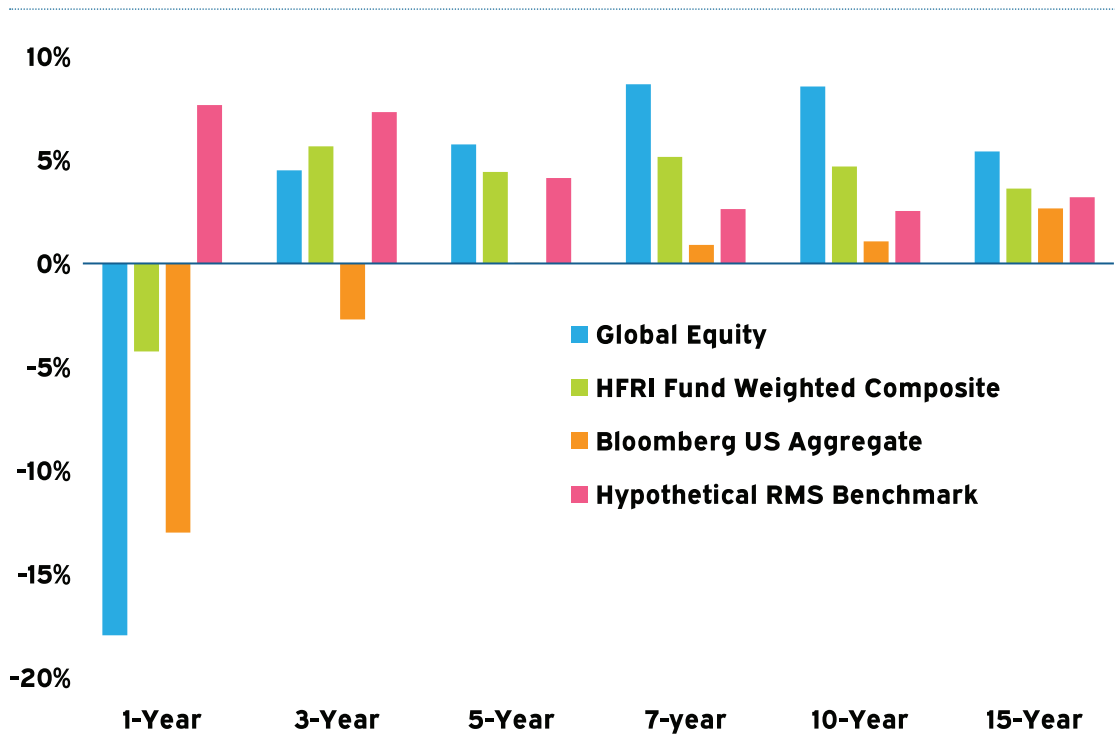


FIGURE 13
Trailing Annualized Returns as of December 31, 2022

Sources: Meketa, FactSet. For the period from 2005 to December 2022. Global Equities is modeled as the MSCI ACWI. Composition of RMS, as the RMS Benchmark, can be found in the Appendix.

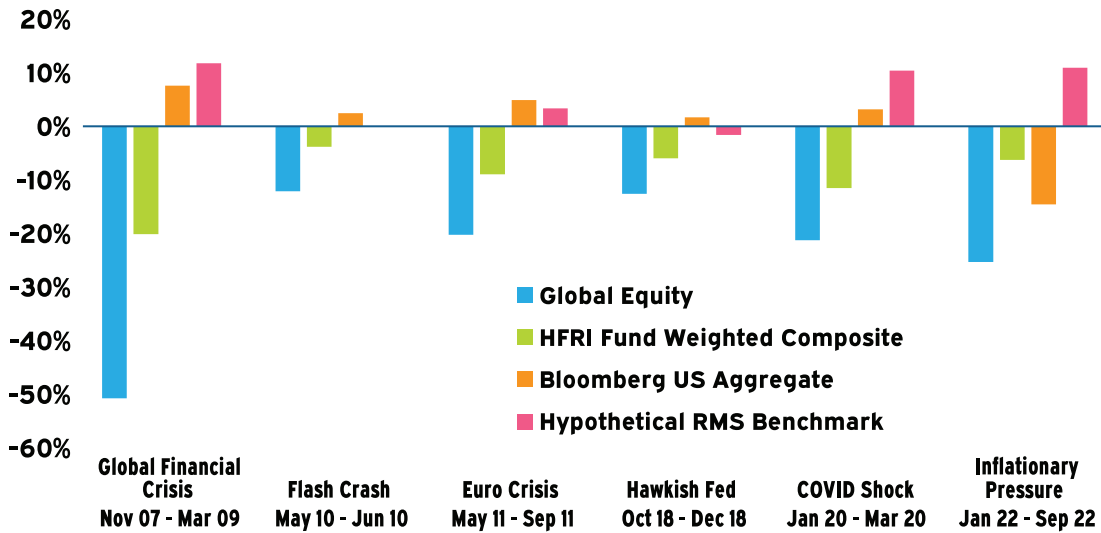


FIGURE 14
Return During Global Equity Drawdowns of at Least 10%

Sources: Meketa, FactSet. For the period from 2005 to December 2022. Global Equities is modeled as the MSCI ACWI. Composition of RMS, as the RMS Benchmark, can be found in the Appendix.

Conversely, risk mitigating strategies with higher expected returns, but lower defensive capabilities may warrant a larger size in the portfolio but may not allow for adding growth asset risk in the rest of the portfolio. For example, an RMS framework allocation with a higher weighting to first responders may have lower expected returns but higher conditional positive expected returns during drawdowns. This structure could support a lower allocation to an RMS framework, because with higher convexity, a smaller allocation is likely needed to provide the desired defensive capabilities. On the other hand, approaches with higher allocations to diversifiers may have higher expected returns but lower conditional expected performance during market crises.

In addition, related to the concept of convexity, the expected returns of risk mitigating strategies tend to increase with greater equity-related stress (e.g., equity declines of 10-20% or more), yet their effectiveness may be less certain during smaller equity "corrections" (e.g., equity declines of 10% or less).

This can be observed in the historical scatter plot shown in Figure 15 which compares the returns of risk mitigating strategies to equities. Many of the best months for the example hypothetical RMS portfolio occurred in the worst periods experienced by equities, while many of the worst months tend to occur during periods of flat or muted equity returns.

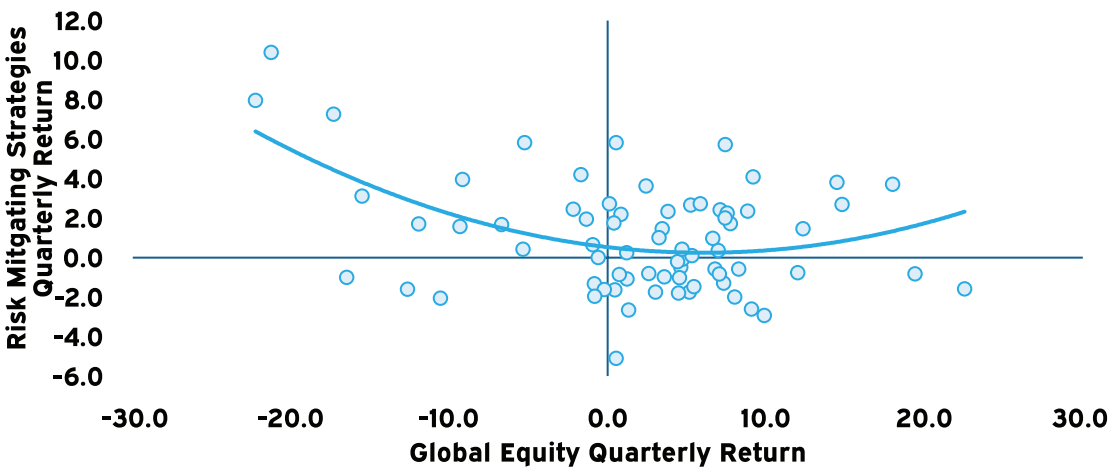


FIGURE 15
Hypothetical RMS Benchmark versus Global Equity

Sources: Meketa, FactSet, Societe Generale. For the period from 2005 to December 2022. Global Equity is modeled as MSCI ACWI. Composition of RMS, as the RMS Benchmark, can be found in the Appendix. The depicted trend lines are second-degree polynomial functions.

Further refinement of an RMS framework may consider the type of event that an investor seeks to protect against. For example, a higher allocation to first responder strategies may be more protective during quick and deep drawdowns but less effective during longer, extended drawdowns. A higher allocation to second responder strategies may be more protective during longer, extended drawdowns, but at the expense of being more exposed to the potential of negative returns during quick market reversals. A higher allocation to diversifiers may be more attractive during shallow, mean-reverting markets but may be exposed to downside risks during high velocity market drawdowns.

Given the dynamism of an RMS framework, it is important to emphasize there are multiple ways to implement an allocation across investors' strategic asset allocations, and there are many factors and perspectives to weigh when doing so.

Options, as noted in Figure 16, could include using an RMS framework to complement active investing across equities and/or fixed income, multi-asset exposures, or targeting the potential complementary nature of an RMS approach with a Liability Driven Investing¹² (LDI) portfolio. Again, the allocations across first responder, second responder, and diversifier strategies are built to meet the specific needs of each investor and address the risks most important to the investor. In addition, while there is a spectrum of manager selection risk across the groups, there may be opportunities to add value through portfolio construction, manager selection, vehicle structure, capital efficiency, and negotiation of terms.

¹² LDI refers to an investment strategy that involves more explicitly matching assets with projected liabilities, often by matching the duration of liabilities with that of yield generating assets (e.g., bonds).

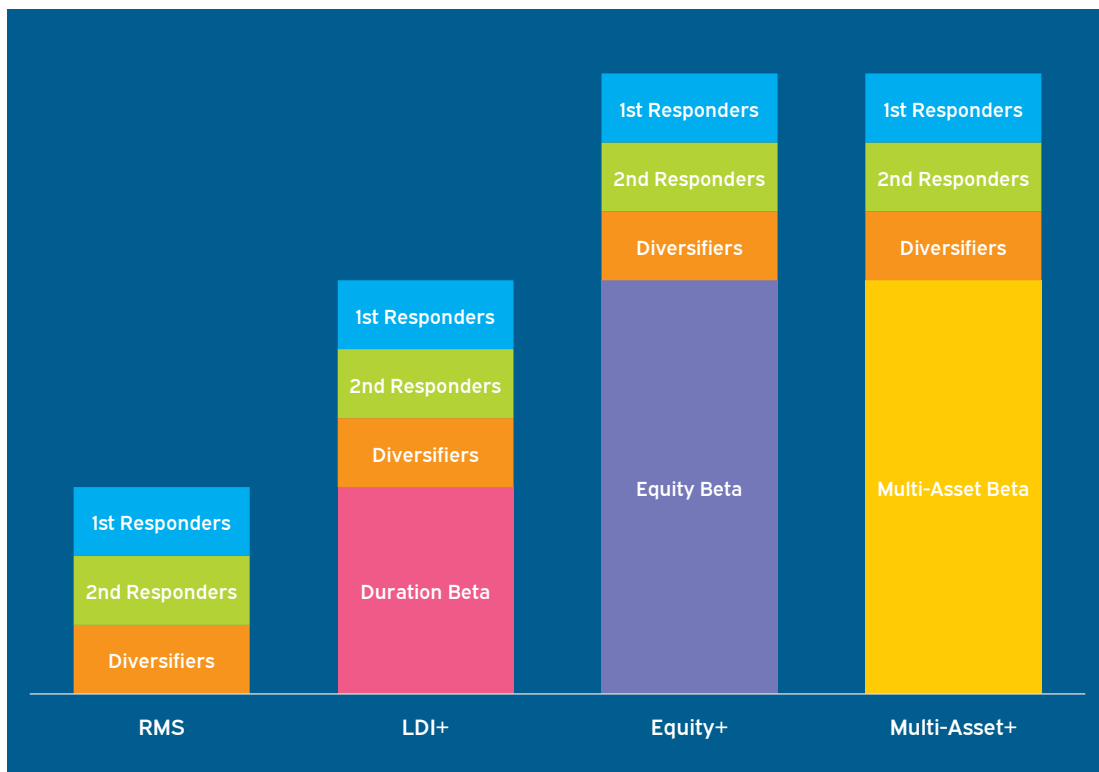


FIGURE 16
Potential Ways to Incorporate Risk Mitigating Strategies

Source: Meketa Investment Group, 2023.

Summary and conclusions

Investors have a daunting task in that they typically need to achieve high expected returns to support their objectives (e.g., assumed rates of return, spending rates, benefit payments, etc.) while at the same time controlling for different risks. Recent and historical events in both equity and bond markets have demonstrated that during times of stress most assets tend to move in unison. This reduces, and sometimes even eliminates some of the diversification benefits and risk reducing characteristics of traditional strategic asset allocations, thus leaving portfolios exposed to potentially very large losses.

An RMS framework provides building blocks to design a defensively oriented portion of an investor's strategic asset allocation that seeks diversification of risks, rather than diversification of labels, especially during times of severe equity downturns. In a broader sense, utilizing an RMS framework is a hedge against uncertainty, which could manifest itself across geopolitical risk, economic risk, and financial market risk. This framework may be constructed to complement growth-oriented assets such as equities, which will remain the main driver of expected returns in many portfolios. As such, RMS may serve as a long-term strategic allocation rather than a tactical hedging strategy.

An RMS framework may allow investors to consider allocating across three functional groups: first responders, second responders, and diversifiers. Structuring each group to achieve functional outcomes rather than investing in a more non-descript category such as "hedge funds" may produce more effective and balanced solutions. In addition, this may allow for increased flexibility to adapt as markets evolve. As each functional group has its merits and limitations, a balanced approach would likely improve the probability of investors achieving their desired outcomes. An RMS framework seeks to organize investor allocations in a way that might increase the likelihood of achieving their objectives. In general, these objectives include low correlations to equities, positive expected returns, and most importantly, positive expected performance during times of market crisis or material equity drawdowns. Strategic asset allocations often rely heavily on strategies that are focused on producing offense through exposure to economic growth (e.g., public equity, private equity, public credit, private credit, real assets, etc.) and incorporating an RMS framework may be a way to add strategies which seek to provide complementary defensive attributes.

Appendix: Hypothetical RMS benchmark composition

The hypothetical risk mitigating strategies (RMS) benchmark is equally weighted, rebalanced at the beginning of each calendar year. The hypothetical benchmark deducts a 0.50% fee annualized on a monthly basis. The following benchmarks are used:

First responders (1/3rd weight)

First responders are an equally weighted composite, rebalanced at the beginning of each calendar year, across the following across the following three benchmarks:

- CBOE Eurekahedge Tail Risk Index
 - From 2005 to 2007 the Index is proxied as the CBOE Eurekahedge Long Volatility Index as inception of the CBOE Eurekahedge Tail Risk Index begins in January of 2008.
- CBOE Eurekahedge Long Volatility Index
- Bloomberg US Treasury 20+ Years

Second responders (1/3rd weight)

Second responders are proxied by the SG Trend Index

Diversifiers (1/3rd weight)

- 25% HFRI Relative Value
- 25% HFRI Equity Market Neutral
- 25% HFRI Macro
- 25% HFRI Event Driven

Additional details:

Benchmarks and financial indices are shown for illustrative purposes only and are provided for the purpose of representing a categories of investment types as a point of reference only. Such benchmarks and financial indices are unmanaged, assume reinvestment of income, do not reflect the impact of any trading commissions and costs, management and incentive fees, and have limitations when used for comparison or other purposes because they, among other reasons, may have a different trading strategy, volatility, credit, or other material characteristics (such as limitations on the number and types of securities or instruments). No representation is made that any benchmark or index is an appropriate measure of comparison.

- CBOE Eurekahedge Tail Risk Index is an equally weighted index of 13 funds. It is designed to be representative of hedge fund managers that seek capital appreciation during periods of extreme equity market stress.
- CBOE Eurekahedge Long Volatility Index is an equally weighted index of 14 funds. It is designed to be representative of hedge fund managers that take net long views on implied volatility with a goal of positive absolute returns.
- Bloomberg US Treasury 20+ Years Index measures the performance of US dollar-denominated, fixed-rate debt issues by the US Treasury with maturities of greater than 20-years. The index does not include STRIPS and is a sub-set of Bloomberg US Treasury Index.
- SG Trend Index is an equal-weighted index of 10 of the largest (by assets under management) trend following managers that meet the criteria specified by Société Generale.
- HFRI Relative Value (Total) Index represents a collection of investment managers who implement investment strategies which seek to profit from valuation discrepancies between multiple securities. Managers may employ fundamental and quantitative techniques and invest broadly across equity, fixed income, derivative, or other security types.

- HFRI EH: Equity Market Neutral Index represents a collection of investment managers who implement investment strategies which utilize quantitative techniques to predict and profit from future price movement and relationships between securities. This can include both Factor-based and Statistical Arbitrage/Trading strategies. Strategies typically maintain net equity market exposure no greater than 10% long or short.
- HFRI Macro (Total) Index represents a collection of investment managers who implement investment strategies which seek to profit from using quantitative or qualitative models that seek profit from predicting the movement of equity, fixed income, hard currency, and commodity markets. Managers may employ both discretionary and systematic analysis, combinations of top down and bottom-up theses, quantitative and fundamental approaches, and long and short-term holding periods.
- HFRI Event Driven (Total) Index represents a collection of investment managers who implement investment strategies which seek to profit by maintaining positions in companies currently or prospectively involved in corporate transactions such as mergers, restructurings, financial distress, tender offers, shareholder buybacks, debt exchanges, security issuance, or other capital structure adjustments.

Notes on potential biases of benchmarks that aggregate manager returns:

- For HFRI Indices; if a fund in an index liquidates or closes, that fund's performance will be included in the HFRI up to the fund's last reported performance update. Additional index methodology details can be found at <https://www.hfri.com/hfri-index-methodology>.
- For CBOE Indices; the returns of dead funds have been included in the indices to better capture the performance of each underlying strategy as well as to mitigate survivorship bias. Historical returns for funds that liquidate are maintained and reflected in the index values up to and including their last reporting month. Since the rationale behind the suite of indices is relative benchmarking (rather than making them investible), funds that are closed for further capital inflows are also included in an index. For new funds that are added in, their performance numbers will only be included on a prospective basis and subject to a key index rule that returns prior to 3 months shall be locked in. This is to avoid for a backfilling bias as well as to ensure that index values prior to the most recent 3 months do not undergo changes over time. Additional index methodology details can be found at <http://www.eurekahedge.com/Indices/CBOE-Eurekahedge-Volatility-Indexes-Methodology>
- For SG Trend Index; the 10 managers are selected each year with equal allocation on January 1st. The index is reconstituted annually but not rebalanced during the year or backfilled. The 10 managers are meant to be representative of the largest trend following CTAs in the managed futures space, exhibiting a significant correlation to trend following peers and the SG Trend Indicator. Strategies are also required to be open to new investment and to report returns on a daily basis, net of fees. Historically, strategies have come in and out of the index as they have met or failed to meet the criteria of Societe Generale. However, many of the managers or strategies which have been removed or added to the index have live track records that extend beyond exclusion to present or before inclusion in the index. Additional index methodology details can be found at https://wholesale.banking.societegenerale.com/fileadmin/indices_feeds/SG_Trend_Index_Methodology.pdf.

Important information

Analysis in this paper is based on hypothetical modeling. Model, simulated, or pro-forma performance results (referenced as the RMS Benchmark) are unaudited and do not reflect actual results. Model performance results are for illustrative purposes only and are not necessarily indicative of performance that would have been achieved if an investment utilized the RMS framework during the relevant periods, nor are these historical simulations necessarily indicative of future performance of the example RMS framework. Inherent limitations of such hypothetical returns are as follows without limitation: 1) model results are generally prepared with the benefit of hindsight; 2) model results do not represent the impact that material economic and market factors might have on an investment adviser's decision-making process if the adviser were actually managing client assets; 3) there are numerous factors related to the markets in general, many of which cannot be fully accounted for in the preparation of hypothetical performance results and all of which may adversely affect actual investment results. Investing involves the risk of loss, including the potential loss of principal, and there can be no assurance the adviser will be able to achieve profitable or results comparable to those expressed herein.

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