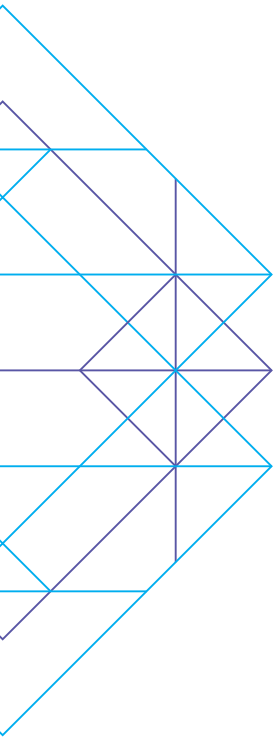
Alternative Thinking 2024 Issue 3

Broad Strategic Asset Allocation

Sizing Allocations to Liquid and Illiquid Alternatives Alongside Traditional Assets



Executive Summary

Traditional strategic asset allocation (SAA) involves determining allocations to stocks, bonds and cash that are appropriate to an investor's risk appetite and investment horizon. Where do alternatives fit into this framework? How should their risk and return characteristics be estimated, and how can realistic constraints be modeled? Which alternatives deliver the biggest incremental benefit, and what is an appropriate strategic allocation?

This paper presents one justifiable set of inputs and finds that alternatives earn themselves a sizable strategic allocation. Investors are encouraged to compare these results with their own assumptions, constraints and allocations as they look to build a resilient portfolio for long-term investment success.

PSG
Portfolio Solutions Group

Contents

About the Portfolio Solutions Group

The Portfolio Solutions Group provides thought leadership to the broader investment community and custom analyses to help AQR clients achieve better portfolio outcomes.

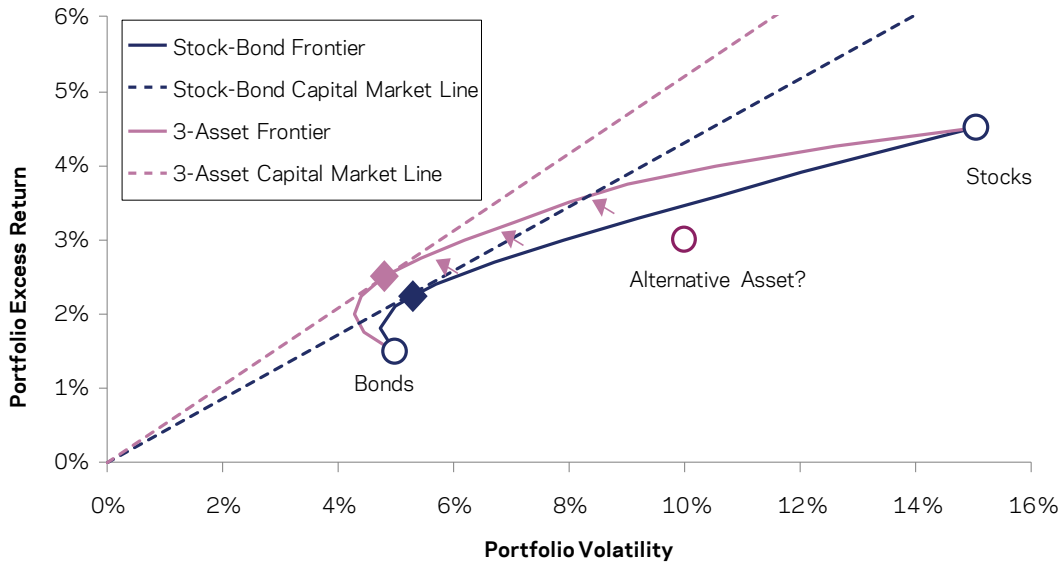
AQR credits Thomas Maloney for his work on this paper. The lead author thanks Alfie Brixton, Jordan Brooks, Nathan Chong, Pete Hecht, Antti Ilmanen, Nick McQuinn, Dan Villalon and Dan Whitehouse for assistance and helpful comments.

The Case for SAA and for Alternatives

So – you have capital to invest, thousands of possible investments and a blank sheet of paper. Where do you begin? Probably, you begin by recognizing that the investments fall into categories with common properties, common drivers and common risks. You might decide to invest entirely within the category you know best. You might move your capital from one category to another, based on some tactical view. But probably some combination of humility and risk aversion will lead you to divide your capital across categories—more in the risky categories if you want big returns, and more in the safer categories if you want to reduce the risk of severe losses. This is strategic asset allocation in a nutshell.

Back in the 1950s, modern portfolio theory introduced the staggering insight that all investors should hold the same mix of assets regardless of their risk tolerance—assuming they all want to maximize return per unit of risk, and they have access to a risk-free asset. This is the so-called tangency or mean-variance optimal (MVO) portfolio, which—for stock/bond investors—is the blue diamond in **Exhibit 1**. Then they should hold or borrow the risk-free asset according to their risk appetite (move along the dotted blue line).

Exhibit 1: Strategic Aim of a Diversifying Allocation: Expanding the Efficient Frontier



Source: AQR. Assumes 0.3 Sharpe ratios for all three assets, with zero correlations. Volatilities are 15% for stocks, 5% for bonds and 10% for alternatives. For illustrative purposes.

So much for the textbook. Even if investors acted on this advice (which they don't, except for a few purists), they would disagree on expected returns and risks, and choose different tangency portfolios. In practice, most can't or won't borrow at the risk-free rate, so they choose an (unlevered) asset mix that suits their risk tolerance or achieves their return target.[1] In our chart, that means they settle on the solid blue line rather than the

1 For a classic discussion on this topic, see Campbell and Viceira (2002) and references therein. See also AQR *Alternative Thinking* Q2 2015.

theoretically superior dashed one. But modern portfolio theory still offers two important and practicable insights: (1) diversify by risk, not dollars, and (2) tilt towards higher return-per-unit-of-risk assets, *and* assets less correlated to others in your portfolio. But this paper focuses on a third crucial insight: real-world allocation decisions are largely driven by beliefs and constraints.

Traditional SAA has tended to involve determining allocations to stocks, bonds and cash that are appropriate to an investor's risk appetite and investment horizon. Access to a lowly-correlated **alternative investment** may make it possible to earn a higher return at a given level of risk, or take less risk to earn a given level of return—in other words, it expands the efficient frontier (solid pink line in **Exhibit 1**). The beneficial impact of this third risky asset class will depend partly on its own risk-adjusted return and its correlation to the other two assets.[2] In macroeconomic terms, an alternatives allocation can improve portfolio resilience by boosting performance in environments where both stocks and bonds underperform (notably, inflationary episodes like 2022)—as long as it doesn't just deliver the same underlying risks in a different guise.

But expected returns and risks of alternative investments (both liquid and illiquid) tend to be even more uncertain than they are for stocks and bonds. This uncertainty is an additional source of variance or risk, and is one rational reason why investors tend to make smaller allocations than would be implied by naïve optimization. Other reasons include aversion to complexity, unconventionality, high fees and/or illiquidity. This article sets out an intuitive framework for guiding broad SAA decisions across both traditional and alternative asset classes. Constraints or other anchors will be of first-order importance.

Establishing Objectives and Constraints

To implement any SAA framework, an investor must first specify *either* a primary return objective (to be achieved with minimum risk) *or* a primary risk constraint (within which to maximize expected return).

- A **return objective** may be expressed as total nominal, or excess of inflation, cash or another benchmark. These differences can have major implications when there is a substantial change in the interest rate or inflation outlook (for example, with cash rates rising from zero to 4-5% in the last few years, total return targets became much easier to achieve, while excess-of-cash return targets probably became more challenging).

- A **risk constraint** may be absolute or determined by some SAA benchmark, and is typically expressed in volatility or value-at-risk units. It may be defined with reference to a specific market scenario such as a severe equity bear market, as this is where various operational risks are most likely to materialize. Some investors use risk mitigation or tail protection strategies in an attempt to boost risk-taking during

2 The benefit will be larger if stocks and bonds become more correlated to each other—as they have in the 2020s. For a more detailed discussion of the drivers of the stock-bond correlation and the implications for SAA, see Brixton et al. (2023).

'good times,' while meeting this 'bad times' constraint.[3]

Mean-variance investors with no other constraints are rare. Real-world constraints on SAA may be explicit (such as regulatory requirements or mandate limitations) or they may be implicit. In our experience, the most insightful SAA analyses are those with thoughtfully constructed constraints or anchors that define a reasonable territory within which the investor is able to address their specific portfolio problem. Some approaches achieve this by anchoring the portfolio to some 'neutral' benchmark.[4] But modeling constraints directly—and exploring their implications—can be a very insightful process, and this is the approach we take here. Consider which of the following four constraints apply to your portfolio:

- **Leverage:** Recall that modern portfolio theory assumes investors can 'monetize' diversification via leverage. If direct leverage is forbidden or constrained, then delegated or embedded leverage—whether in high-beta stocks, long duration bonds, or liquid or illiquid alternatives—is likely to be more valuable.

- **Liquidity:** Allocations to illiquid assets will be limited by the need to accommodate cash flow needs and/or rebalance allocations without costly 'fire-sale' events. One simple proxy for liquidity needs is a requirement to rebalance following a plausible adverse combination of market event and cash flow need—for example, a rapid 30% fall in equity markets coinciding with a 10% outflow, assuming no illiquid assets can be bought or sold.[5] Liquidity crises are serious but rare, which may have tempted some investors to stretch liquidity constraints and undervalue liquid diversifiers.

- **Peer / conventionality / benchmark risk:** It is apt that peer risk rhymes with career risk. As Keynes said, it is often better for reputation to fail conventionally. We can model this implicit constraint using expected tracking error (i.e., active risk) versus a relevant conventional benchmark or peer average portfolio. Or, if we have historical returns at our disposal, we can ask by how much the investor would be willing to underperform the peer benchmark over a given period (say, 12 months) and constrain that rolling relative return. This can be an effective way to determine viable allocations to the most diversifying (and unconventional) strategies.

- **Fees and complexity:** Even though our assumptions will be net of fees, some investors are explicitly fee-constrained; others are understandably fee-averse, as fees are certain whereas expected net returns are not. Many are averse to complex strategies that require costly due diligence, or are challenging to fit into existing portfolio management structures or to explain to stakeholders. We can model these constraints by assuming a 'typical fee' parameter for each building block (see appendix)—which also tends to correlate with complexity—and constraining this at the building block or portfolio level.

3 Aversion to large losses can be modeled by constraining performance of the SAA during historical tail events. The calendar years 2008 and 2022 provide convenient examples of disinflationary and inflationary bear markets, respectively. In this paper we focus on forward-looking analysis.

4 For example, the Black-Litterman model and its many derivatives (see Black and Litterman, 1991).

5 More sophisticated frameworks for matching illiquidity allocations to cash flow needs are described elsewhere, for example in Vaiciulis and Greaves (2023).

Building Blocks

When aggregating investments into asset class building blocks, we are looking for common properties. Some investments may have very similar economic exposures but different enough implementations that they fall into separate asset class categories (such as public and private equity investments in the same region or sector). Others may have very different economic properties but enough ontological similarity that they are grouped together (such as oil, coffee and gold futures).

Exhibit 2 lists 10 convenient SAA building blocks, each representing a set of assets with broadly similar risk exposures and similar trading instruments. Each can be divided further, by region, credit quality, sector or strategy type, but in this article we maintain the broadest possible view. We separate alternatives into two fundamentally distinct categories:

- **Illiquid alternatives** are investments via private markets in equity, real estate or credit. These provide access to a broader opportunity set than is available in listed public markets, and are commonly believed to offer fertile ground for alpha generation, an illiquidity premium and a way to avoid mark-to-market volatility. The downsides are illiquidity, opacity of risks and high fees.

- **Liquid alternatives** are investments with potential to deliver returns lowly correlated to stock and bond markets, using liquid assets. This includes alternative asset classes such as commodities,[6] as well as long/short active strategies that use financial tools to hedge market exposures and amplify diversifying sources of risk and return (typically employed by hedge funds). One deliberate and notable choice in our framework is to separate these long/short liquid alternatives into two strategic allocation building blocks:

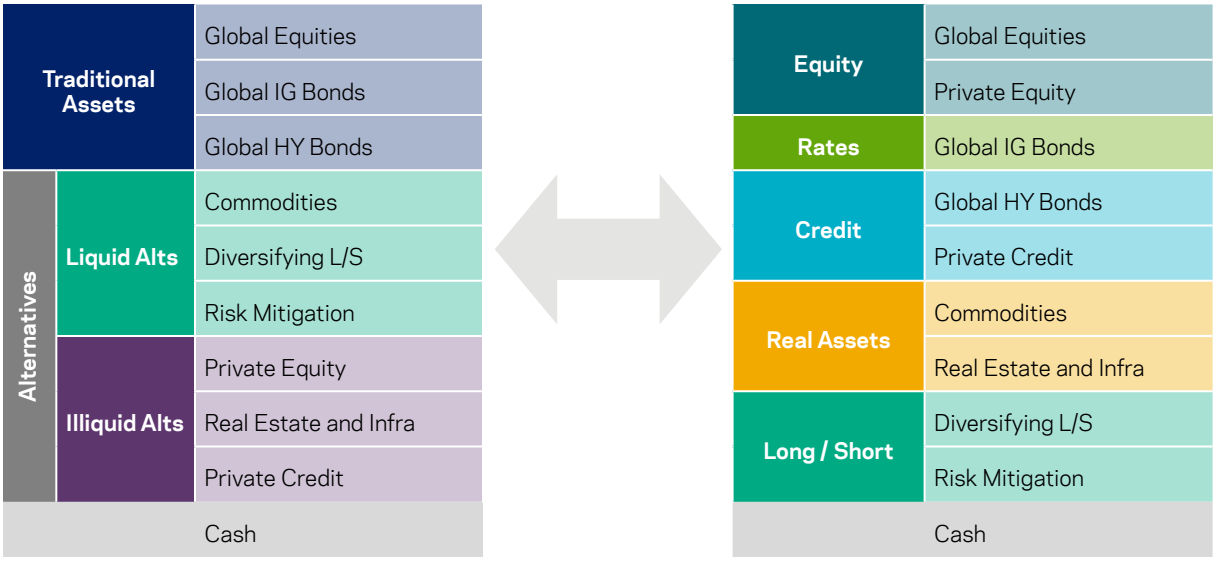
  - **Diversifying long/short strategies** such as equity market neutral, alternative risk premia and other multi-strategy allocations, which have a broad role in helping to expand the efficient frontier and reduce equity risk concentration.

  - **Risk mitigating strategies** which have a more specific role in helping investors meet constraints or preferences relating to large losses. We will use trend following (a.k.a. managed futures) to represent this building block, as it has historically delivered both tail hedging capabilities and positive long-term returns (see AQR *Alternative Thinking* 2023 Issue 2). Of course, some multi-strategy hedge funds span both building blocks.

The building blocks can be grouped in the conventional categories of traditional and alternative assets (left table), or according to their underlying risk exposures (right table). The same investor may find both groupings are useful—for example, they may wish to set a limit on their total allocation to illiquid assets, but also on their aggregate (public and private) equity exposure. Our analysis will initially use the conventional categories, before we turn to common underlying risks in section 6.

6 Commodities have low long-term correlations to stocks and bonds thanks to their very different macroeconomic exposures. For analysis and discussion see Ooi et al. (2022).

Exhibit 2: Same 10 Building Blocks, Different Groupings



Source: AQR. Note IG bonds typically include some credit risk, and HY bonds include some rates risk.

What is the risk-free asset? Over a short horizon, a Treasury Bill issued by the relevant low-default-risk sovereign is unambiguously the risk-free asset. Over longer horizons, T-Bills are exposed to the risk that real or nominal interest rates fall, the present value of future needs rises and the investor cannot meet that increase. A bond—nominal or inflation-linked—held to maturity locks in current short-rate expectations for the life of the bond (which can be duration-matched to liabilities), but is exposed to an opportunity cost if yields rise. This 'risk' loomed large when bond yields were at historical lows.

In this article our risk-free return is the *expected* return on a strategy of rolling short-maturity T-bills throughout the investment horizon. This expected return estimate is partly dependent on the current yield of a Treasury bond, which embeds market expectations of changes in the short rate, but we also take account of current cash rates and survey data.

Return, Risk and Correlation Assumptions

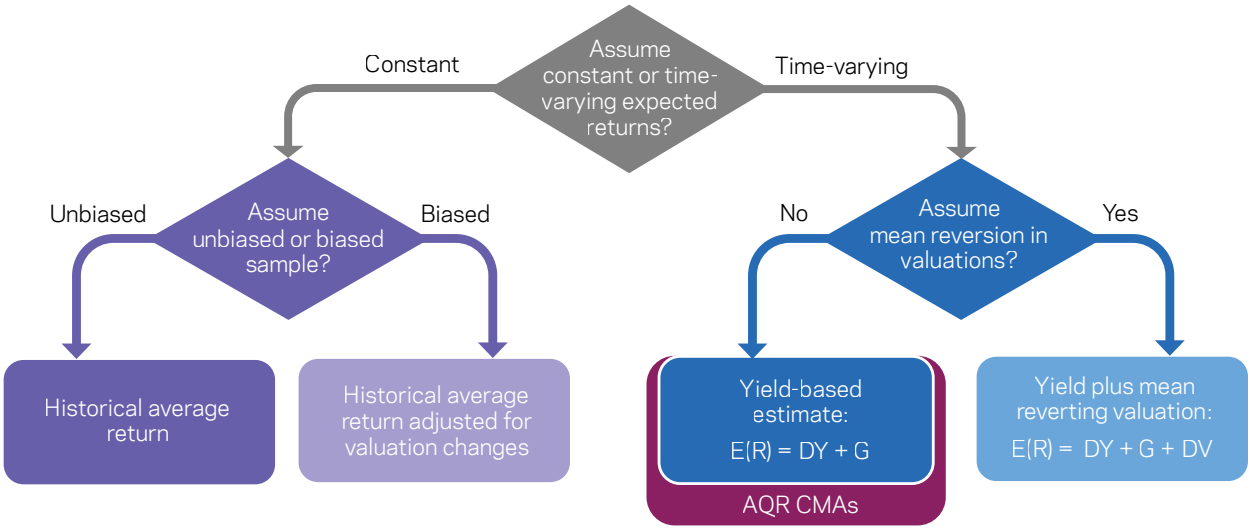
Expected Risks and Correlations

Volatilities and correlations vary over time, but they tend to be more persistent than returns. We therefore use historical inputs based on proxy indices, using a long sample period but giving more weight to the last 15 years or so. For illiquid assets, volatilities and correlations are likely to understate economic risks due to the lack of mark-to-market. Here we use public proxies, estimates of industry-wide leverage and some judgement to generate reasonable industry-wide estimates of the magnitude and correlation of underlying risks in private markets (but individual allocations may vary widely). These are the risks that will tend to materialize during prolonged episodes of market stress. Our proxy indices and correlation assumptions are stated in the appendix.

Expected Returns

How do investors put a number on something so wildly uncertain as the rate of return they should expect from a given asset class over their investment horizon? In the 1900s, capital market assumptions (CMAs) were usually based on historical averages. In the 2000s, academics and practitioners increasingly proposed that expected returns vary over time and are best estimated from current yields. **Exhibit 3** illustrates the key choices when developing a set of CMAs. The most important choice is whether to assume constant or time-varying expected returns, and thus whether to rely on historical average returns or current market yields, which matter most over **intermediate 5- to 10-year horizons**.[7] Each branch then requires a second choice—whether to adjust for (past or expected future) valuation changes. There are, of course, many other more granular decisions. AQR's yield-based framework is set out in our annual CMA report.

Exhibit 3: Key Decisions Underlying a CMA Framework



Source: AQR.

7 For further discussion, see AQR *Alternative Thinking* 2024 Issue 1.

Our latest yield-based estimates (as of mid- 2024) are shown in the blue column in **Exhibit 4**, expressed as total nominal USD[8] compound returns. We also show the resulting Sharpe ratios implied by our volatility and cash assumptions (blue arrows). Where current yields imply compressed risk premia, expected Sharpe ratios will be lower than normal.

The impact of starting yields is diluted over multi-decade horizons. This leaves long-horizon investors with some combination of historical average returns and economic theory. When assessing **long-horizon** expected returns, we start from the useful anchor that several major asset classes have delivered very long-run Sharpe ratios near 0.3, after adjusting for valuation changes. Our long-term Sharpe ratio assumptions are shown in the purple column. We take 0.3 as our long-run estimate for global equities, global IG bonds and global credit, and then adjust sub-sectors and regions for breadth such that they aggregate back to 0.3, based on long-term correlations.

Exhibit 4: Working with Long-Term and Yield-Based Assumptions

		Long-Term			Yield-Based		
		Total GM Return	Sharpe Ratio	Volatility	Total GM Return	Sharpe Ratio	Equity Correl.
Traditional Assets	Global Equities	6.9%	0.30	15%	6.5%	0.24	1.00
	Global IG Bonds	4.6%	0.30	4%	4.7%	0.20	0.16
	Global HY Bonds	6.0%	0.30	10%	5.5%	0.20	0.67
Alternatives – Liquid Alts	Commodities	6.1%	0.24	16%	6.6%	0.24	0.28
	Diversifying L/S	6.1%	0.36	8%	6.6%	0.36	0.39
	Risk Mitigation	5.4%	0.24	10%	5.9%	0.24	0.08
Alternatives – Illiquid Alts	Private Equity	7.5%	0.30	20%	5.0%	0.15	0.82
	Real Estate and Infra	6.0%	0.30	10%	5.0%	0.15	0.74
	Private Credit	6.0%	0.30	10%	5.5%	0.20	0.57
	U.S. Cash	3.5%			4.0%		

Source: Bloomberg, Consensus Economics and AQR. For details see main text and references therein. Returns and Sharpe ratios are net of fees. GM is geometric mean. For illiquid alternatives, volatility is an estimate of economic risk. For liquid alternatives, we don't have yield-based returns and instead use long-term Sharpe ratios to generate returns for both scenarios. See appendix for full correlation matrix and proxy indices.

For commodities we assign a slightly lower Sharpe ratio of 0.24, consistent with long-term historical evidence.[9] For long/short strategies, we assume net-of-fee Sharpe ratios substantially lower than has been realized by corresponding hedge fund indices, to account for their well-known selection and reporting biases. Consistent with other building blocks, we assume no manager selection skill or alpha, but rather that these strategies (in aggregate) harvest well-documented alternative risk premia and behavioral biases. Diversifying long/short is assigned a higher Sharpe ratio than trend following thanks to its greater

8 For any international allocation, investors must choose how to address the accompanying currency risk. Unhedged currency risk will impact both expected return and risk. A currency hedge gives access to the local excess-of-cash return plus the investor's own risk-free rate (minus basis and transaction costs). To avoid making this analysis specific to one currency domicile, we assume all investments are hedged. The main results don't depend on this choice.

9 See Levine et al. (2018) and corresponding data in the AQR data library.

breadth, but also slightly higher correlations to traditional assets (see last column in **Exhibit 4**).

Finally, for illiquid alternatives, we assume that each private asset class delivers a similar long term Sharpe ratio as the major public asset classes. In other words, we assume that illiquidity premia and any industry-average alpha are offset by higher fees and investor preferences for the 'return smoothing' provided by these asset classes. Investor enthusiasm for illiquid assets over the past decade implies many have more optimistic assumptions than we do. But even with no net-of-fee illiquidity premium or alpha, private assets will still be additive in many optimization scenarios, thanks to their embedded leverage and modest diversification.

Our long-term expected returns are derived from these Sharpe ratio assumptions (purple arrows), in a reverse of the process employed for yield-based estimates. So, which set of assumptions are more relevant for SAA analysis? It depends. One justifiable approach is to use both – to try to build a portfolio that has a reasonable chance of meeting investment objectives under both the conditional (yield-based) and the unconditional (long-term) scenario. In the next section we initially focus on long-term assumptions for simplicity, then compare and combine results from the two sets.

Guided Optimization Examples

Once you have a thoughtful set of constraints and a thoughtful set of assumptions, the mean variance optimization itself is trivial to run. But experienced investors know that even with sensible inputs, MVO allocations can behave counterintuitively. Because it takes all inputs as certain and exact, an optimizer often fixates on some investments and discards others entirely, with the results depending on one or two seemingly unimportant parameters. One way to mitigate this instability is to introduce a neutral anchor portfolio, as in the Black-Litterman approach. Another is to explore the impact of adjusting assumptions and constraints, and combine several portfolios to create a more robust solution.

Let's start with constraints. **Exhibit 5** shows allocations that achieve the maximum expected compound net-of-fee return for a given risk target, based on our long-term return, risk and correlation assumptions, with several other intuitive constraints applied. In Panel A, we gradually relax conventionality and fee/complexity constraints at the same volatility target, equivalent to a 60/40 stock/bond portfolio. The optimizer spends its tracking error (TE) and fee budgets on a combination of liquid alternatives (green) and private equity (maroon), as well as a small allocation to public credit. Since direct leverage is forbidden in this case, bonds are incrementally replaced with more

capital-efficient diversifiers to raise the portfolio expected return.

In Panel B, we adjust the portfolio risk target while again assuming no leverage is allowed. The lower-risk portfolio favors a risk-balanced blend of equities, bonds, liquid and illiquid alternatives, whereas the higher risk portfolio is forced to tilt towards public and private equity, sacrificing diversification. Notably, liquid alternatives are favored at all risk levels, thanks to their low equity correlations and embedded leverage. The third column in Panel A and the second column in Panel B are the same, as their constraints coincide.

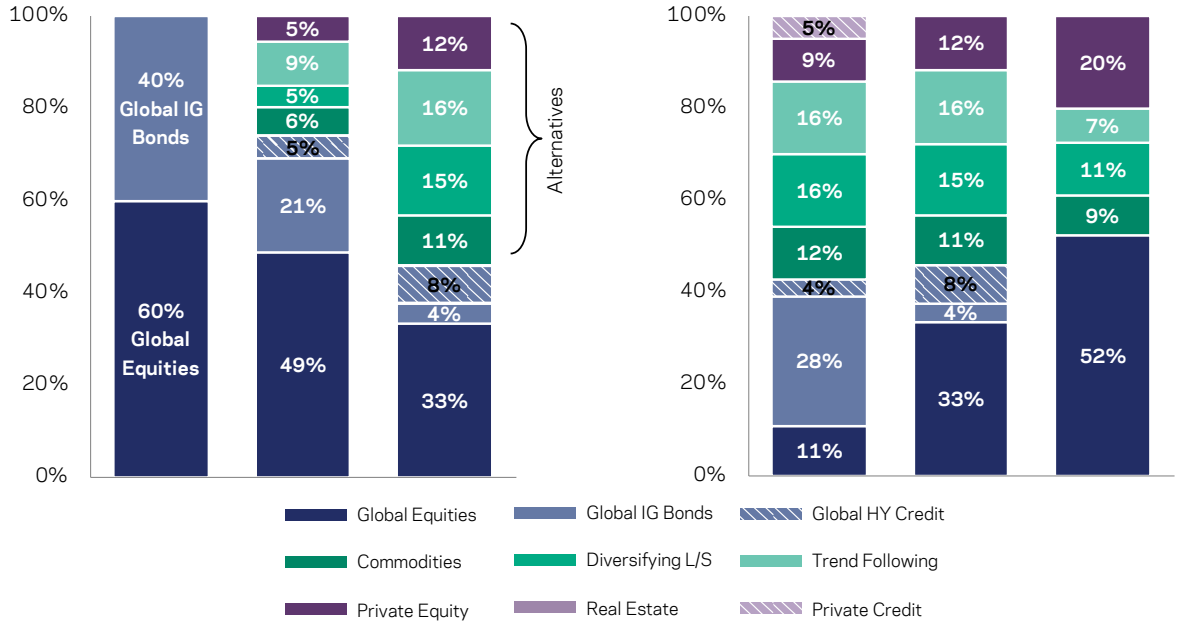
Exhibit 5: Impact on Optimal SAA of Adjusting Different Constraints

A. Conventionality and Costs

	Allow more unconventionality		
	60/40	**2% TE**	**4% TE**
Total GM Ret	6.2%	6.6%	6.8%
Volatility	9.4%	9.4%	9.4%
Sharpe Ratio	0.34	0.37	0.40
Equity Beta	0.62	0.61	0.57
TE vs. Bmk	0.0%	2.0%	4.0%
Avg. Fee	0.1%	0.4%	0.8%
Alts Allocation	0%	26%	54%

B. Risk Appetite

	Increase risk appetite		
	6.4% Vol	**9.4% Vol**	**12.4% Vol**
Total GM Ret	6.2%	6.8%	7.1%
Volatility	6.4%	9.4%	12.4%
Sharpe Ratio	0.46	0.40	0.36
Equity Beta	0.33	0.57	0.80
TE vs. Bmk	4.0%	4.0%	4.0%
Avg. Fee	0.8%	0.8%	0.8%
Alts Allocation	57%	54%	48%



Source: Bloomberg, Consensus Economics and AQR. Expected returns and Sharpe ratios are net of fees. Leverage is not allowed, and other constrained parameters are indicated by pink shading in the tables. In panel B, the benchmark is a risk-matched combination of 60/40 and cash.

In **Exhibit 6** we shift our focus to two other constraints. Panel A sets a varying constraint on illiquid assets (liquid alternatives are excluded here as we explore the trade-off between public and corresponding private assets, and TE and cost constraints are relaxed). The optimizer favors illiquid assets for their embedded leverage and mild diversification, but the expected return and risk benefits are modest. Panel B permits varying amounts of direct leverage to achieve a volatility target equivalent to 60/40 (TE and fee constraints are also gradually relaxed). When direct leverage is permitted, the optimizer reduces allocations to embedded leverage in private equity and long/short strategies, and increases bond exposure for additional diversification.[10] According to our assumptions, access to leverage and liquid diversifiers has a more substantial impact on expected returns than access to illiquid assets. Different assumptions would yield different results.

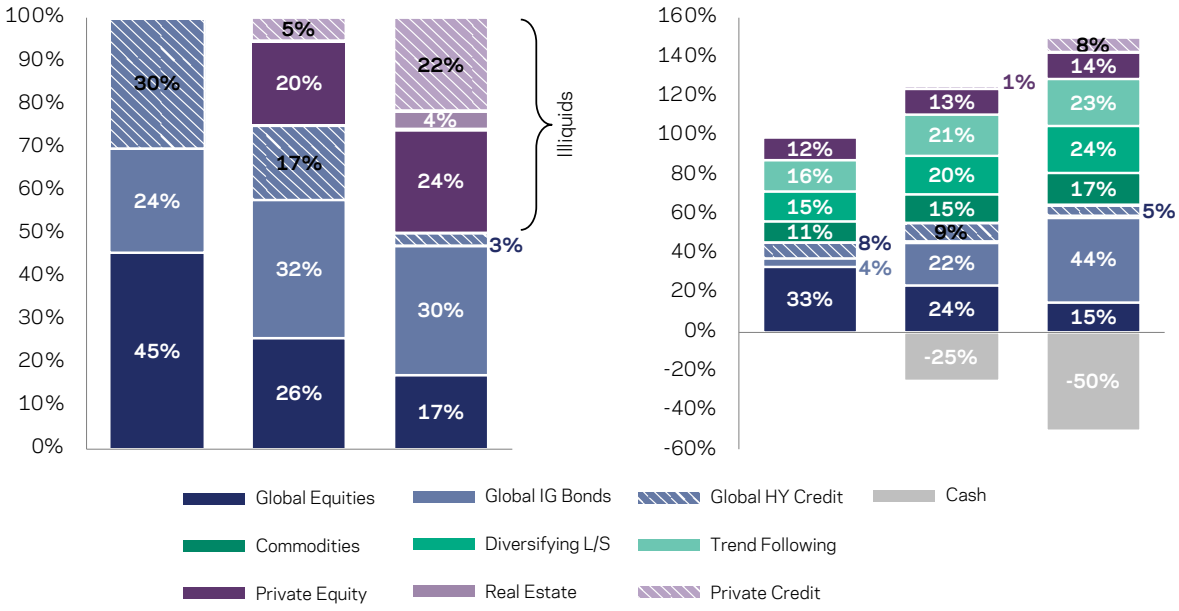
Exhibit 6: Impact on Optimal SAA of Adjusting Different Constraints

A. Liquidity (no liquid alts)

	Allow more illiquidity → 0% Illiq	25% Illiq	50% Illiq
Total GM Ret	6.3%	6.5%	6.5%
Volatility	9.4%	9.4%	9.4%
Sharpe Ratio	0.35	0.36	0.37
Equity Beta	0.60	0.58	0.56
TE vs. Bmk	2.2%	3.1%	4.0%
Avg. Fee	0.1%	0.5%	0.8%
Alts Allocation	0%	25%	50%

B. Leverage

	Allow more leverage → 0% Levg	25% Levg	50% Levg
Total GM Ret	6.8%	7.1%	7.4%
Volatility	9.4%	9.4%	9.4%
Sharpe Ratio	0.40	0.43	0.46
Equity Beta	0.57	0.53	0.48
TE vs. Bmk	4.0%	5.0%	6.0%
Avg. Fee	0.8%	1.0%	1.2%
Alts Allocation	55%	70%	86%



Source: Bloomberg, Consensus Economics and AQR. Expected returns and Sharpe ratios are net of fees. Pink shading in table indicates a constrained parameter. Panel A also constrains the total illiquid allocation (see column headings) and excludes leverage and liquid alternatives. Panel B allows leverage up to the constraint in the column headings.

10 If the leverage constraint is removed entirely, the optimizer applies about 120% leverage to achieve maximum diversification at a 60/40 risk level. One alternative to direct SAA leverage that can deliver a similar benefit is to allocate to a risk parity strategy that uses managed leverage to provide risk-balanced exposures across equities, bonds and inflation-sensitive assets.

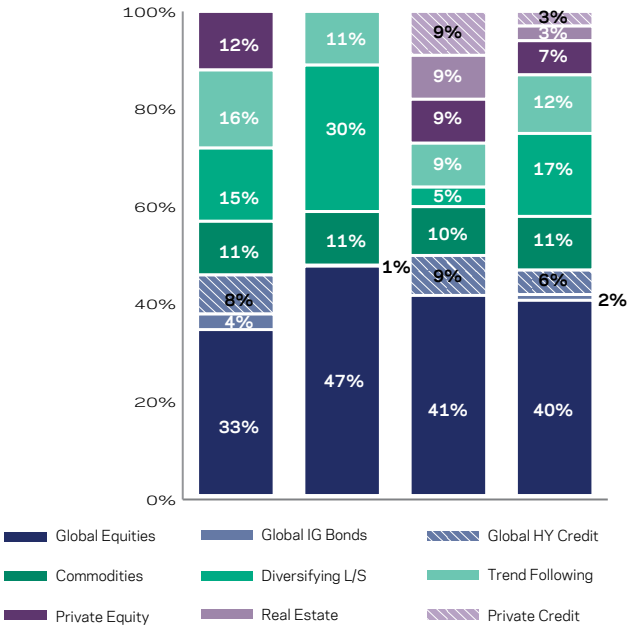
Exhibits 5 and **6** help to illustrate the impact of constraints on real world SAA portfolios. Now we turn to the role of capital market assumptions. How sensitive are optimal allocations to changes in return or correlation assumptions?

Exhibit 7 shows the optimal SAA at a 60/40 risk level with 4% TE using three different sets of assumptions, then takes the average. The first column is based on the same long-term assumptions we used for the previous charts. The second column uses the yield-based return assumptions from **Exhibit 4**. As of mid-2024, the equity premium is compressed, yield curves are inverted, credit spreads are tight, and private asset valuations haven't repriced in response to higher discount rates and borrowing costs—which implies lower excess returns and lower Sharpe ratios for all these asset classes. Long/short liquid alternatives appear relatively attractive in this high-cash-rate environment because they are structured to offer 'cash-plus' returns.[11] The optimizer selects a combination of public equity (still one of the highest returning assets) and liquid alternatives. Note that this portfolio has a higher expected compound return than any building block, thanks to the magic of diversification. The third column assigns equal Sharpe ratios to all building blocks, and sets all correlations to the pairwise average. By including this in our average, we effectively dilute or shrink the impact of all our building block-specific assumptions.

The fourth column is the simple average of the other three portfolios. This 'robust' optimal portfolio is mainly a combination of equities and liquid alternatives, with small allocations to bonds, credit and all three illiquid asset classes. This may be close to the optimal SAA for an investor with this particular set of constraints (same volatility as 60/40, with 4% TE and no direct leverage), who places equal weight on our two CMA scenarios and adds an extra dose of humility.

Exhibit 7: Impact of Different Assumptions

	Long-Term	Yield-Based	Equal SRs & Correls	Average
Total GM Ret	6.8%	6.8%	6.4%	6.7%
Volatility	9.4%	9.4%	9.7%	9.5%
Sharpe Ratio	0.40	0.35	0.30	0.35
Equity Beta	0.57	0.57	0.58	0.57
TE vs. Bmk	4.0%	4.0%	4.0%	4.0%
Avg. Fee	0.8%	0.8%	0.6%	0.8%
Alts Allocation	54%	52%	50%	52%



Source: Bloomberg, Consensus Economics and AQR. Expected returns and Sharpe ratios are net of fees. Pink shading in table indicates a constrained parameter. 4th column is simple average of other 3 columns.

One insightful way to 'sanity-check' an existing SAA is to perform a reverse optimization—to calculate the set of assumptions that would make your current portfolio mean-variance optimal, and then compare to your actual assumptions. An example is given in the appendix.

11 For more analysis and discussion on asset allocation in an environment of higher rates and compressed premia, see Maloney (2024).

Factor Perspectives on SAA

We have already noted that several asset classes share underlying risk exposures, so merely spreading allocations across asset class building blocks does not guarantee true diversification. Factor analysis is often used to uncover common risks in stock portfolios, and the same concept can be applied to SAA. The equity market factor is of primary importance in both contexts, but while a stock portfolio analysis might add value, size and quality factors, an SAA analysis needs to take a higher-level view, and consider factors such as real rates, inflation, credit and currency risk.

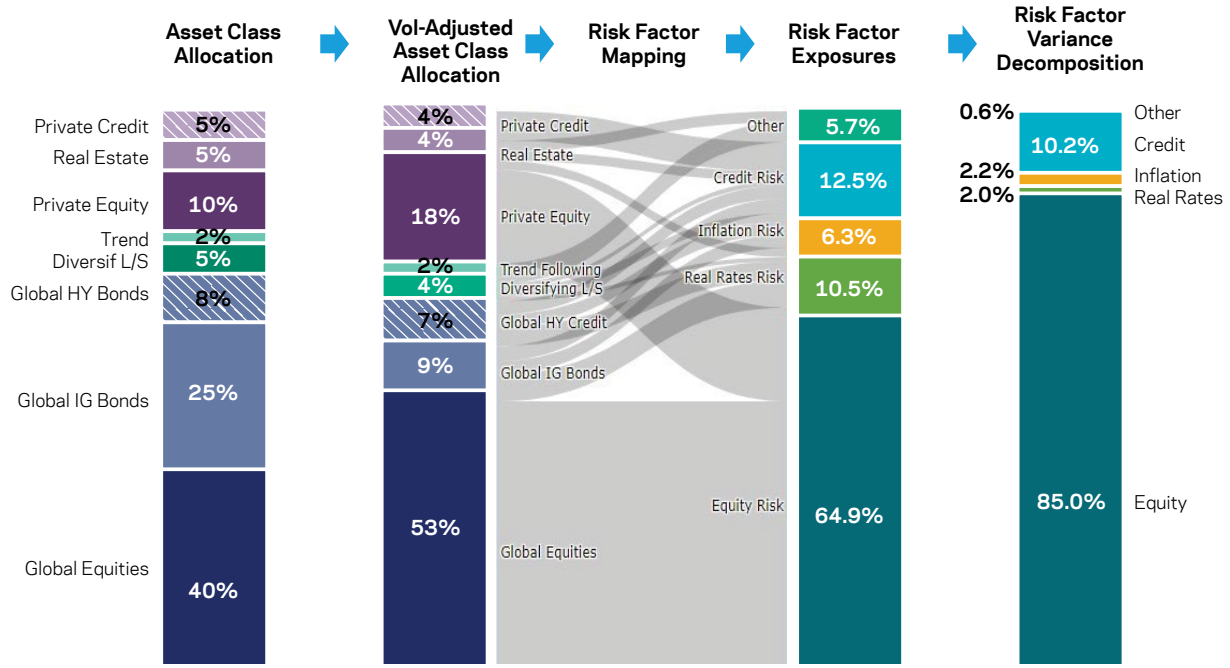
A factor approach to SAA is useful for measuring and communicating the common risks across public market and corresponding private market allocations. It also allows estimation of the impact on the portfolio of shocks to specific factors. There are several possible methods and design choices. For example, some frameworks attempt to identify orthogonal or non-overlapping factors, but these mathematical constructions can be difficult to interpret, especially as factor relationships vary through time. We prefer to use economically intuitive factors even if there are some overlaps (for example, equity and credit market factors are clearly correlated); then we can explicitly model the relationships between those factors.

In **Exhibit 8** we start from a typical institutional asset class allocation on the left. The first step is to translate capital allocations to risk allocations by adjusting for volatilities (second column). Then we can map these asset class risk exposures to underlying factor exposures (third column).[12] These standalone exposures are proportional to the impact of an equally probable shock to each factor separately.

The final optional step is to calculate how much each standalone factor exposure contributes to portfolio risk (fourth column). For this seemingly diversified portfolio with just 40% of capital allocated to public equities, a whopping 95% of portfolio risk is driven by correlated equity and credit risk factors. For this factor allocation to be optimal, 95% of expected return would have to come from these factors too. This is unlikely to be consistent with return assumptions, implying that greater diversification is desirable.

12 Mathematically, this is done by assigning to each asset class a set of factor betas that imply a chosen factor risk allocation and the correct aggregate volatility (accounting for factor correlations). These betas can then be summed across factors to produce aggregate portfolio factor exposures. The chart is a visual approximation of this process. See appendix for factor mapping assumptions.

Exhibit 8: Example of Mapping Asset Class Allocations to Underlying Risk Factors



Source: AQR. For illustrative purposes only. Analysis is based on assumptions shown in appendix.

Concluding Thoughts and Next Steps

Constraints and beliefs drive real-world asset allocation, especially where alternatives are involved. In this paper we've demonstrated how defining an intuitive set of constraints can help investors to build an SAA process that is both rigorous and practicable. One plausible set of objectives, assumptions and (fairly tight) constraints led us to a portfolio of around 40% equities, 40% liquid alternatives, 10% fixed income and 10% illiquid assets. This is very different from most investor portfolios, and it's worth asking why. Do those investors have different assumptions or beliefs, do they face different constraints, or is it a combination of both? Could some of those constraints be challenged, with the aim of improving long-term investment performance? If our readers ask themselves these questions, then the paper has achieved its purpose.

How often should the SAA be revisited?
Each investment outcome is the sum of expected and unexpected returns—returns that were forecast and returns that were not. Unfortunately, the unexpected returns tend to dominate even at long horizons. Investors must focus on what they can control: maintaining a SAA that gives a reasonable chance to meet objectives, based on a reasonable central scenario. If this central scenario changes—say, because of a big shift in yield-based expected returns—it may be time to revisit the SAA.

This can be done without conflating strategic and tactical considerations. The SAA is based on a neutral scenario as priced by markets. Tactical tilts relate to active views, i.e., views on where market pricing is wrong. Note that there may be a tendency for the SAA to be reviewed more often than it should be, due to agency and career pressures and personnel changes. But with thoughtful implementation it can provide a foundation for patient long-term investing.

Next steps: Professional investors will want to generate additional returns by taking active risk. They should decide on an active risk budget (by how much are they prepared to underperform their SAA?), and then allocate this across security selection (directly or via manager selection) and tactical asset allocation. This process of active risk budgeting was discussed in a previous edition (2020 Q3).

References and Further Reading

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Appendix

Proxy Indices for Volatilities and Correlations

Asset Class	Proxy Indices (January 1990 – June 2024)
Global Equities	MSCI World Hedged USD Index
Global IG Bonds	Bloomberg Global Aggregate Bond Hedged Index
Global HY Bonds	1999-2024 Bloomberg Global High Yield Hedged Index; 1990-1998 Bloomberg US High Yield Index
Commodities	Bloomberg Commodities Index
Diversifying L/S	50% HFRI Equity Hedge: Equity Market Neutral Index, 50% HFRI Macro Total Index (both scaled to 10% volatility)
Trend Following	2000-2024 SG Trend Index; 1990-1999 HFRI Macro Systematic Diversified (both scaled to 10% volatility)
Private Equity	50% Russell 2000 x 1.2, 50% Cambridge U.S. Private Equity Index
Real Estate	50% FTSE NAREIT Global Developed REITs Index, 50% NCREIF Index
Private Credit	2004-2024 33% Credit Suisse Distressed Index, 33% Cliffwater Direct Lending Index, 33% HFRI Credit Index; 1994-2004 Credit Suisse Distressed Index; 1990-1993 Bloomberg US High Yield Excess Index
Cash	3-Month U.S. T-Bills

Correlations and Typical Fees for SAA Optimization Analysis

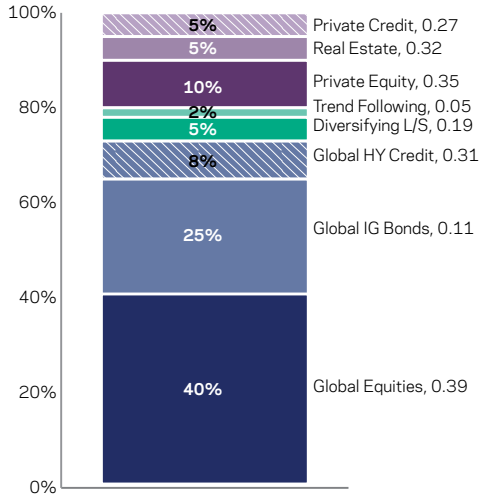
Correlations	Global Equities	Glob. IG Bonds	Glob.HY Credit	Commod-ities	Diversify-ing L/S	Trend	Private Equity	Real Estate	Typical Fee
Global Equities	1.00								0.10%
Global IG Bonds	0.16	1.00							0.10%
Global HY Credit	0.67	0.31	1.00						0.20%
Commodities	0.28	-0.06	0.34	1.00					0.40%
Diversifying L/S	0.39	0.18	0.32	0.34	1.00				2.00%
Trend Following	0.08	0.12	-0.02	0.11	0.54	1.00			1.00%
Private Equity	0.82	0.11	0.66	0.29	0.41	0.07	1.00		2.00%
Real Estate	0.74	0.30	0.63	0.35	0.34	0.11	0.68	1.00	1.00%
Private Credit	0.57	0.12	0.72	0.26	0.46	0.14	0.60	0.46	1.00%

Reverse Optimization Example

In **Exhibit A1** we start from a typical institutional SAA with the same volatility as global 60/40, input our volatility and correlation assumptions, and then calculate the building-block Sharpe ratios (SRs) that would make this the optimal portfolio at this risk level. These are listed in the labels to the right of the chart.

This portfolio would be optimal *if* public and private equity had the highest expected SRs, and those for liquid alternatives were much lower (near zero for trend). Note that here we assume there is no leverage constraint, so bonds would need a low SR for this unlevered portfolio to be optimal.

Exhibit A1: Implied Sharpe Ratios for an Existing SAA to be Optimal



Source: AQR. Assumes portfolio Sharpe ratio of 0.4.

Assumptions for SAA Factor Analysis

The risk decompositions below are based on historical proxies with some discretionary judgment. Commodities' exposure to the inflation factor is opposite signed to bonds', indicated with parentheses. Currency factor correlations here assume a USD-domiciled investor.

Factor Risk Decomposition by Asset Class

	Equities	Real Rates	Inflation	Credit	Currencies	Other
Global Equities H	100%	0%	0%	0%	0%	0%
Global IG Bonds	0%	65%	30%	5%	0%	0%
Global HY Credit	0%	15%	5%	80%	0%	0%
Commodities	10%	0%	(40%)	0%	30%	20%
Diversifying L/S	11%	6%	8%	9%	0%	66%
Trend Following	0%	0%	0%	0%	0%	100%
Private Equity	100%	0%	0%	0%	0%	0%
Real Estate	60%	10%	0%	10%	0%	20%
Private Credit	0%	0%	0%	100%	0%	0%

Risk Factor Correlations

	Equities	Real Rates	Inflation	Credit	Currencies	Other
Equities	1.0					
Real Rates	0.0	1.0				
Inflation	0.2	0.0	1.0			
Credit	0.5	0.0	0.0	1.0		
Currencies	0.1	0.0	0.0	0.1	1.0	
Other	0.0	0.0	0.0	0.0	0.0	1.0

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The **Cambridge Associates U.S. Private Equity Index** is based on data compiled from approx. 2,000 funds, including fully liquidated partnerships.

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The **FTSE EPRA Nareit Developed Index** is designed to track the performance of listed real estate companies and REITS worldwide.

The **Credit Suisse Event Driven Distressed Index** is a subset of the Credit Suisse Hedge Fund Index that measures the aggregate performance of event driven funds that focus on distressed situations.

The **HFRI Credit Index** is a composite index of strategies trading primarily in credit markets.

The **Cliffwater Direct Lending Index** is an asset-weighted index of directly originated middle market loans that was created to help investors better understand direct lending characteristics and benchmark manager performance.

The **Bloomberg US High Yield Credit Excess Index** measures USD-denominated, high yield, fixed-rate corporate bond market returns in excess of duration-matched U.S. Treasuries.

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