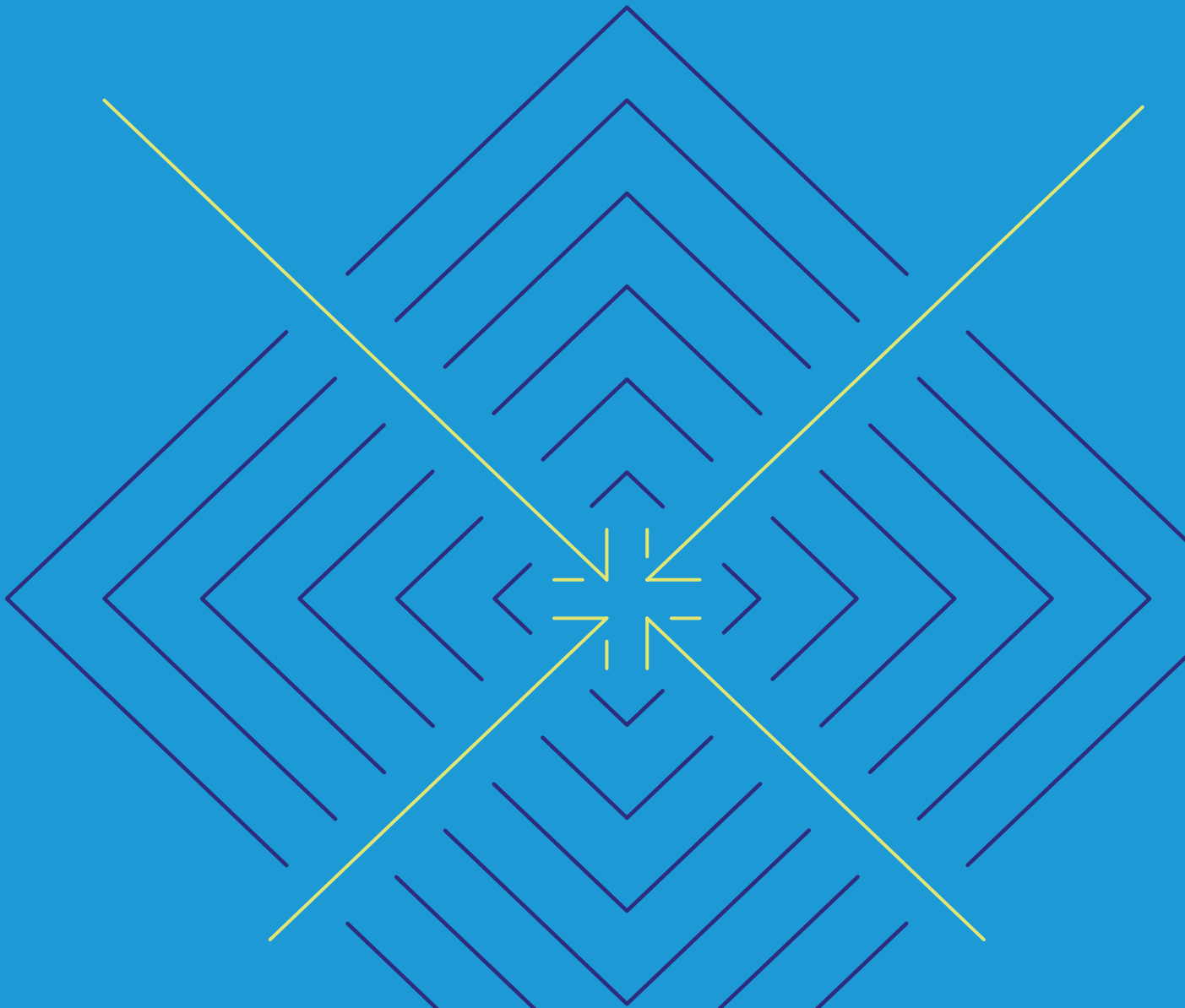




BERNSTEIN

2019

BEYOND THE FRONTIER



Amid a wave of investment product innovation over the last several decades, one critical element to investment success has been left behind—asset allocation models. Almost as though suspended in time, they are the same today as they were more than a half a century ago. But the investment world has changed with the prominent adoption of alternative investment, and age-old conventions when constructing asset allocation advice is a mistake, for one simple reason—they fail to capture the unique features of alternative investments, and in particular, illiquidity. This is important because investors are struggling with how to achieve returns similar to historical levels in the face of low interest rates, elevated volatility levels, or high equity valuations. Alternative investments have carved out a niche of consistent, high returns. Even when considering the potential lock-ups, investors are still increasing their allocations. For the most part, asset allocation to alternative investments is driven by rules of thumb, rather than a precise approach. We think there's a better way.

Illiquidity Looms Large for Alternatives

Illiquid alternative investments are not easily or quickly traded; there is no public market to match a buyer and a seller, or if there is a market, the shares are infrequently transacted. Illiquid investments possess different risks than traditional public assets. Unfortunately, these risks are often misunderstood, causing investors to sub-optimally allocate to illiquid investments, if at all.

YESTERDAY'S ASSET ALLOCATION

Asset allocation is generally modeled based on an efficient frontier. The concept of the efficient frontier, the basis of modern portfolio theory, was first introduced by Nobel Laureate Harry Markowitz in 1952. Markowitz posited that portfolios along the efficient frontier offer the highest expected return for their assumed risk; those that fall off are either too risky or too low returning.

The Cold War, Elvis, ...and a 60/40 Portfolio

Since the 1950s, the efficient frontier signaled that the 60/40 portfolio—60% stocks and 40% bonds—was the optimal portfolio for most investors. Nearly 70 years later, this allocation still dominates portfolio construction, despite the fact that the investment landscape has changed dramatically, with the rise of alternative investments in recent decades.

In our view, the allocation models that championed 60/40 portfolios are missing key inputs. They focus solely on the tradeoff between risk and return, where risk is defined as the volatility of returns, measured by standard deviation. That's fine when it's only stocks and bonds. But when other asset classes with different characteristics are available, how can one assess what is optimal?

What's the Alternative?

Alternative investments are typically defined as anything that's not a stock or a bond. But that definition is quite broad and overly simplistic!

Alternatives run the gamut—from tangible, real assets like commodities and real estate, farmland or timber, to private market investments like private equity or debt, and leveraged public market assets, such as hedge funds. While the number of investment options has grown, investor understanding of them has not kept pace.

Traditional asset allocation models are incapable of capturing the unique features of alternative assets. We describe these characteristics as DLRR—return drivers, leverage, return relationships, and risk (**Display 1**): Each alternative asset class has

DISPLAY 1: IDIOSYNCRASIES OF ALTERNATIVE ASSETS

D

Unique **D**ivers
of return

L

Varying levels
of **L**everage

R

Diverse **R**eturn
relationships

R

Distinct levels
of **R**isk

Source: Bernstein

drivers of return that differ from traditional bonds and equities, and from other alternatives. For example, sources of return on private credit are the interest payments on floating rate loans, which are very different from returns on private equity that come from the recapitalization or sale of a company—and both are different from the drivers of return for public market bonds or stocks. Those unique drivers give rise to return patterns that are dissimilar to patterns of other asset classes, creating a **diverse return relationship** or correlation with other assets. Many also tend to use **leverage**, although the amount differs depending on the asset. Leverage is one of several **distinct risks** that alternatives take on.

Unfortunately, these idiosyncrasies are not well understood, so many allocate to alternatives solely based on the belief that they provide a diversification benefit to traditional investments. This belief is generally true, but sometimes an investment labeled as alternative can merely be a version of a traditional investment— for example an equity investment that takes on leverage. In this case, the so-called alternative not only fails to provide diversification, but may instead increase concentration risk. This concentration is made even worse when assets are highly correlated—when the returns of assets have a strong relationship to one another so that in up markets, they rise together, and when markets are falling, they magnify losses. Conversely, when assets with weak relationships—low or negative correlations—are combined, they mute returns in up markets, but help offset losses when markets decline. Unfortunately, determining the relationship between returns is not always straightforward.

Are They Really Unrelated?

The true level of return correlation between alternatives and public market securities may not be readily apparent. While measuring correlation is straightforward in markets that are transparent and where daily price information is available, measuring return relationships is more difficult for investments that lack transparency and liquidity. If an investment is only valued once a month, it will tend to exhibit a low correlation to liquid, public markets. But is that correlation due to unique drivers of return between the asset classes, or the fact that the investment is illiquid and infrequently valued?

Consider two investments—a long/short energy hedge fund and an energy private equity fund. Both invest in energy companies, but in different vehicles with markedly dissimilar liquidity profiles. The hedge fund invests in publicly-traded energy securities, but in a structure that makes it slightly less liquid than a traditional mutual fund. In contrast, the underlying energy companies owned by the private equity fund do not trade publicly. Even though both investments are valued monthly, it is easy to ascertain the value of the hedge fund's underlying securities at any point in time. But, only upon a transaction—a sale, merger, or initial public offering—is the true value of the private fund's assets realized. Yet, both investments are often assigned the same degree of low correlation to traditional

DIVERSIFICATION ON MANY FRONTS

True alternatives offer several types of diversification. The first is **return diversification**. Investors in traditional assets view this as the primary method of diversification. For example, when a portfolio with only US equities adds international stocks, a different return stream is accessed. But US and international stocks, though diversifying, have a high degree of correlation since they are both public equities. *Adding alternatives where the underlying source of return has low correlation to public equities can improve diversification.*

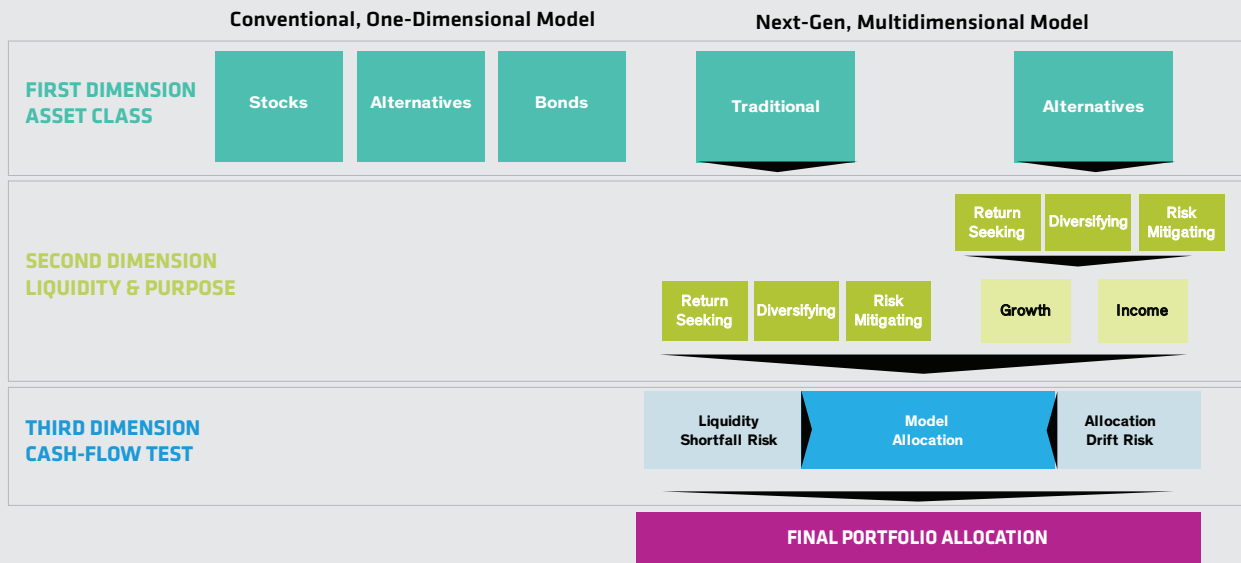
The second is **liquidity profile diversification**. Compared to a portfolio of public securities, which can be traded throughout the day, alternatives provide very limited liquidity. For example, investment dollars in private market alternatives are used to build businesses over time, and are therefore only appropriate for investors with long time horizons who can wait for those returns to be realized. In return, investors demand extra compensation for having their investment dollars tied up for lengthy periods of time. *Owning investments with differing liquidity profiles is a diversifier to investors.*

The third is to provide **investor diversification**. Alternative funds have specific mandates, which often attract *like-minded investors*. Publicly-listed stocks and bonds funds typically do not—no one knows if the holder of a share of stock is long-term holder or a short-term trader. This can lead to untimely exits and entrances to a fund, potentially harming performance. The impact of this mismatch is most pronounced in volatile markets.

The fourth is **vintage diversification**. Many types of alternatives—like private equity, private lending, venture capital, and real estate funds—invest over multi-years. The year the fund makes its first investment marks the vintage year. Each vintage is subject to certain market conditions that are likely different from another vintage. In other words, *spreading investment dollars over different vintages provides a built-in level of diversification*. In public markets, an investor can only attain vintage diversification by dollar cost averaging or buying on market dips. To be successful, an investor must have discipline to buy when a security dips, which can be difficult.

The final is **cycle diversification**. In alternatives like private equity, real estate and private credit, investor contributions to fund new investments are negatively correlated to bad markets. This is unlike in public equities, where investors are 'perma-invested'. In private markets, when markets get rocky, the funds typically cease new investments. So, it's likely that *allocating to these alternatives will achieve more optimal initial timing on investments as funds avoid both the top and bottom of the cycle*. This also fosters a 'dry powder effect'. While it's hard for private funds to buy the dips – because deals take a long time to analyze and close and it's hard and risky to react quickly to a correction – they typically buy in when other investors are fearful and pulling back. In other words, where public market investors fear bad markets, private market investors look forward to them, and the attractive entry points they bring.

DISPLAY 2: A NEW ALLOCATION PARADIGM



For illustrative purposes only.
Source: Bernstein

stocks and bonds simply due to their structure without consideration of the underlying assets. In reality, the hedge fund will likely exhibit a higher correlation to public equities.

TOMORROW'S ASSET ALLOCATION

The next-generation model needs to consider the unique attributes of alternative assets—DLRR (refer to Display, page 1). While not overlooking the parameters inherent in traditional models, it needs to integrate liquidity, investor purpose, and cashflow requirements in a multi-dimensional, layered analysis. (Display 2). Liquidity refers to the level of liquid assets—cash or assets that can be easily converted to cash—needed to meet normal daily use. Investor preferences such as capital appreciation, stability, or income define purpose, while modeling for cash use ensures that the assets adequately meet client goals, whether those goals are to have a specific amount to transfer to heirs, or a plan to spend down the wealth to zero. These considerations formed the basis for Bernstein's Alternatives Impact Analysis model.

AIA is Born

Bernstein's Alternatives Impact Analysis (AIA) model is a multi-asset analytics platform that is flexible, broad, and transparent. Its layered analysis is designed to assist investors in making long-term allocation decisions across all possible investment choices. (Display 3)

The inspiration for AIA was to create a platform that integrates the distinct characteristics of alternatives—DLRR—in allocation decisions and to equate all assets—traditional and alternative—so that a portfolio can be analyzed holistically rather than in disparate parts.

AIA accomplishes these goals in two ways. The first is by dimensioning liquidity, purpose, and cash use into the model to address DLRR. Secondly, AIA models the drivers of returns for alternatives and their linkages to stocks and bonds to ensure the entire portfolio is aligned with the investor's needs and goals.

In addition, AIA considers the impact of taxes on investor objectives. Instead of allocation rules applied without consideration of potential taxation on portfolio income and gains, AIA provides guidance on asset location beyond just the allocation. Our modeling treats an asset allocation recommendation for a taxable account differently than a non-taxable account and guides investors about where a specific portfolio should be housed—a tax-exempt account versus taxable family trust, for example.

These multi-layers improve outcomes of asset allocation by:

- marrying traditional assets with alternative investment allocation
- avoiding mismatch in cash use and asset allocation
- allocating to cash-flow oriented investments where appropriate, but not at the cost of overall growth
- explicitly understanding the liquidity characteristics of the portfolio
- understanding and planning for unlikely, but exceptionally bad outcomes to avoid portfolio "shock"

DISPLAY 3: AIA'S MULTI-STEP PROCESS

These five steps form the backbone of Bernstein's Alternatives Impact Analysis model

INVESTOR EXPECTATIONS

1

The investor's goals—long-term wealth planning and short-term liquidity needs—frame return expectations and risk tolerance.



INVESTOR TOLERANCE

2

Calculates possible outcomes over a period of one year to 20 years, using a series of portfolios with different asset allocations to test scenarios.



RETURN TESTING

3

Considers the relationships within and among the capital markets—using AB research and our proprietary systems, and historical data. It also looks at the unpredictability of markets to create a range of possible market returns, and allows for randomness that may change the distribution.



RISK ANALYSIS

4

Forecasts risks among public securities, using a third-party system. Risk are aggregated to determine the portfolio's overall risk.



OUTCOME VERIFICATION

5

Tests the output to determine tail returns—those outcomes that fall within the top and lowest 5% of the range—to understand the most extreme possible outcomes.




For illustrative purposes only.


Risks to Cashflow


AIA's ability to account for usage of cash is a key differentiator. When an investor spends from their portfolio, they normally pull assets from the liquid portion, while the illiquid component remains untouched. But not all illiquid investments have the same level of liquidity and liquidity risk. We address this by first categorizing alternative investments as either growth (zero liquidity until sale of an investment asset) or income (varying liquidity based on underlying asset class). This allows us to more accurately calibrate cash needs with the portfolio's underlying investments.


DISPLAY 4: CAUSES OF A LIQUIDITY SHORTFALL


WITHIN INVESTOR CONTROL

 Unplanned capital expenditures


 Cash use exceeds budget


 Ambitious family gifts or wealth transfer planning


 Higher portfolio taxes

 High unhedged variable debt as interest rates increase

OUTSIDE INVESTOR CONTROL

 Higher than expected inflation

 Capital market returns are lower than expected

 Slow return of capital from long-dated investments

Next, we account for two additional risks—liquidity shortfall and allocation drift risks. Liquidity Shortfall Risk (LSR) refers to the likelihood of running out of accessible money at some point over the next ten years. LSR is especially worrisome when portfolios are heavily weighted in illiquid assets (**Display 4**). If an investor spends from a portfolio, we avoid allocations that have even a small probability of running out of cash.

Allocation drift risk is harder to avoid, and a risk that we accept within reason. This risk is the degree to which asset weights drift over time due to disparate patterns of return. Drift will likely occur in any portfolio with illiquid investments; as the illiquid investment changes in value, it will make up an increasing or decreasing percentage of the overall portfolio. Recalibrating drift is difficult, because illiquid investments, when their weights rise, cannot be sold to rebalance into liquid investments.

Additionally, high usage of cash from the liquid portion of a portfolio may exacerbate drift. Establishing acceptable bands of drift is an essential component of alternative asset allocation. The model tests numerous scenarios to capture a range of outcomes for liquid and illiquid investments and makes judgments on an acceptable drift range based on an investor's goals and preferences. Scenarios are eliminated from consideration if the estimated drift is too significant.

Machine Override

The last step in the process is perhaps the most important. While AIA considers 10,000 simulated scenarios, modeling the highest probability outcomes to the least likely outlier scenarios, we believe fiduciary controls and other manual adjustments are needed to correct for quantitative biases.

An example of such a modification is a fiduciary limitation on the maximum amount of alternative investments an investor should own. Because many alternative investments offer attractive risk-adjusted returns and low correlation to the broader market, an unconstrained model could conceivably recommend a 100% allocation to alternatives.

In fact, before the completion of modeling additional risks, we looked at an aggressive investor with 0% spending. This investor, by definition, has zero liquidity shortfall risk, and the model, knowing nothing of the real world, allocated this investor to 100% alternative investments. When we introduced other risks, including tail risks (**see discussion under “AIA’s Unique Advantages”**) the model reduced the maximum alternative asset allocation recommendation, but despite that lower proposed amount, it was still too high from a fiduciary standpoint. Our fiduciary controls adjust for unrealistic allocations by establishing a ceiling limitation.

AIA’s Unique Advantages

AIA solves for many of the problems that plague traditional asset allocation.

AIA creates return projections for alternative strategies by separating alpha—return attributed to manager skill—from beta—return attributed to the movement of the overall market. Investors should look for managers that have strong skill in security selection, rather than ones that rely solely on rising markets to deliver performance. Our model captures those differences for both traditional and alternative strategy managers.

AIA also corrects for the biases that corrupt correlation. As we discussed earlier, traditional allocation models use the relationship between the returns of various asset classes as a determination of diversification. But this simple measure of association fails with illiquid alternatives, as they often feature long lock-ups and are valued infrequently. This distinction means an illiquid investment will appear to demonstrate low levels of volatility and low correlations to public markets, a characteristic we believe is misleading.

While the asset class may show a weak relationship, it may be true that the only diversifying element is the strategy’s illiquidity. The infrequent valuation must be disaggregated from the actual behavior of the underlying assets. Otherwise, the results are skewed to overstate the lack of correlation. We were able to correct for these biases by recovering the true economic risks of illiquid investments from their infrequent and often smoothed valuations.

Take private equity for example. AIA computes the sensitivity of a private equity investment to both current and lagged public equity

market returns. This analysis effectively ‘unsmooths’ the reported valuation of private equity, and these ‘unsmoothed’ returns are used in AIA’s asset allocation modeling.

Additionally, our model creates tail risk events for our strategies. We define tail risk events as the worst 1% of outcomes. There is only a minimal likelihood of such an occurrence coming to pass, but the inclusion of tail risk is necessary to ensure an accurate perspective of total risk.

Tail risk matters when investing in illiquid strategies because illiquidity can magnify the conditions that create difficult equity markets. Why? Owners of rarely-traded instruments become forced sellers at a time when prices are falling. In other words, to maintain liquidity at a time when their entire portfolio—both the liquid portion that is likely invested in traditional stocks and bonds and the illiquid portion held in alternative assets—is falling, investors may need to sell their illiquid assets at deep discounts. Understanding the pricing pressures that exist in illiquid markets was critical in constructing a model depicting potential downside experiences.

Are Alternatives Right for You?

We’ve just walked you through the necessity of a new allocation model when investing in alternative and traditional assets. But you may be taking a step back and wondering if alternative investments are right for you at all and if so, how much?

Part of the thesis behind why many institutions—pension funds, endowment and foundations—are investing in alternatives today is that they expect lower and more volatile returns from stocks over the next decade than the prior one, which is a problem because they need to achieve a return that meets or exceeds their liabilities. That’s getting increasingly hard to do with portfolios that only invest in traditional stocks and bonds. Additionally, these institutions cannot afford to experience large drawdowns on their portfolios; they need to have some consistency of returns to help them budget and forecast accurately. Individuals are facing the same environment. Alternatives can help.

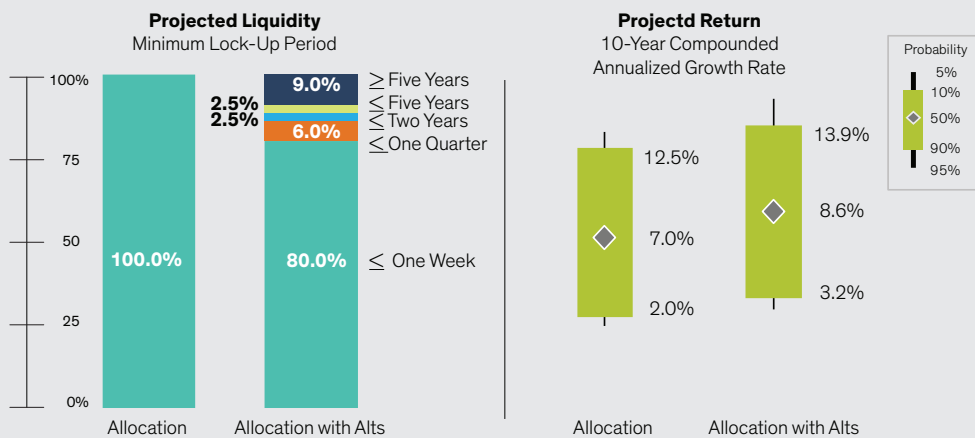
The diversification benefits of alternatives—especially return diversification—smooth the returns of a portfolio that invests in traditional assets. At the same time, returns on alternative have historically been higher than those of traditional equities. But since alternatives are less liquid, most investors can only hold a portion of their assets in them. That’s why an allocation typically complements the traditional portfolio allocation. Now that you’ve contemplated whether alternatives are right for you, then next question is: How much makes sense? The answer: It depends.

Every investor has priorities and objectives that create a return expectation profile and a risk tolerance. To achieve their goals, the model considers total asset level, tax rate, client objectives, annual cash needs, and investment objective to determine return seeking, diversifying and risk mitigating targets. These inputs are fed into AIA to model the optimal allocation, which is reviewed and adjusted by the team to arrive at a final allocation (**Display 5**).

The bottom line is that alternatives are appropriate for investors looking to achieve strong returns and mitigate short-term market fluctuations, but because of the illiquid nature, any allocation should be made after consideration of the risks, and importantly, as part of a broader allocation to reach the investor's long-term goals.

DISPLAY 5: SAMPLE ALTERNATIVES SUMMARY REPORT

	Median Return	Long Term Volatility	Probability of 20% Loss	Tail Risk	Income
Allocation	7.0%	13.8%	28%	(24)%	2.7%
Allocation with Alts	8.6	10.4	22	(26)	2.7



For Illustrative Purposes.
SOURCE: AIA model.

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