



Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 22

MEETING DATE: August 21, 2024

SUBJECT: Education: Strategic Asset Allocation

SUBMITTED FOR: Consent Deliberation and Action Receive and File

RECOMMENDATION

Receive and file education presentation from Ian Toner, Verus Chief Investment Officer, on Strategic Asset Allocation.

PURPOSE

This item supports the 2024 Annual Investment Plan to provide investment education to Board members.

DISCUSSION

At the August Board meeting, Mr. Toner will lead a discussion with the Board on asset allocation.

The timing of this presentation is relevant given that SCERS is initiating an ALM study during the fourth quarter of 2024. The presentation will provide educational background, concepts, and considerations related to the ALM process and designing a strategic asset allocation.

ATTACHMENTS

- Board Order
- "Thinking About Asset Allocation" presentation

Prepared by:

/s/

Steve Davis
Chief Investment Officer

Reviewed by:

/s/

Eric Stern
Chief Executive Officer



Retirement Board Order

Sacramento County Employees' Retirement System

Before the Board of Retirement
August 21, 2024

AGENDA ITEM:

Education: Strategic Asset Allocation

THE BOARD OF RETIREMENT hereby accepts the recommendation of staff to receive and file education presentation from Ian Toner, Verus Chief Investment Officer, on Strategic Asset Allocation.

I HEREBY CERTIFY that the above order was passed and adopted on August 21, 2024 by the following vote of the Board of Retirement, to wit:

AYES:

NOES:

ABSENT:

ABSTAIN:

ALTERNATES:

(Present but not voting)

Board President

Eric Stern
Chief Executive Officer and
Board Secretary



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



AUGUST 2024

Thinking About Asset Allocation

Ian Toner CFA, Chief Investment Officer

Investing is about choices



The correct answer when it comes to donuts is **ALL OF THEM**

This does not work quite so well when investing

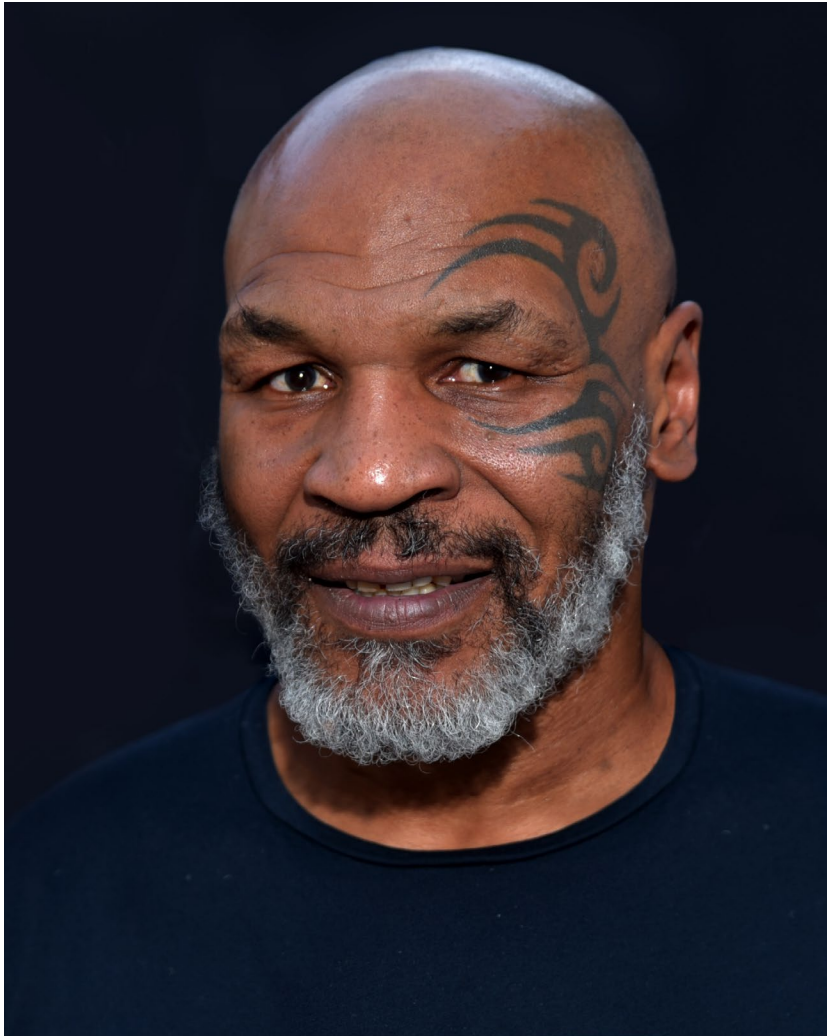
Let's have FUN!!!



Let's go for a walk in the mountains they said...

It'll be fun they said...

Mike Tyson - investment guru



Everyone has a
plan until
they're
punched in
the face

By Toglenn - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=79795126>

You need...

- A plan
- That will deliver what you need
- That you can stick to
- Whatever happens
- Because lots is going to happen

Investment philosophy

Verus investment philosophy

1. Return objectives, tolerance for risk, and the strategic mission of the enterprise should drive strategic asset allocation.

2. Risk-free rates and risk premia drive most market returns, and are themselves influenced by market and economic fundamentals.

3. Investment skill exists, and the deployment of active management where inefficiencies can be exploited is essential to achieving investment success in both public and private markets.

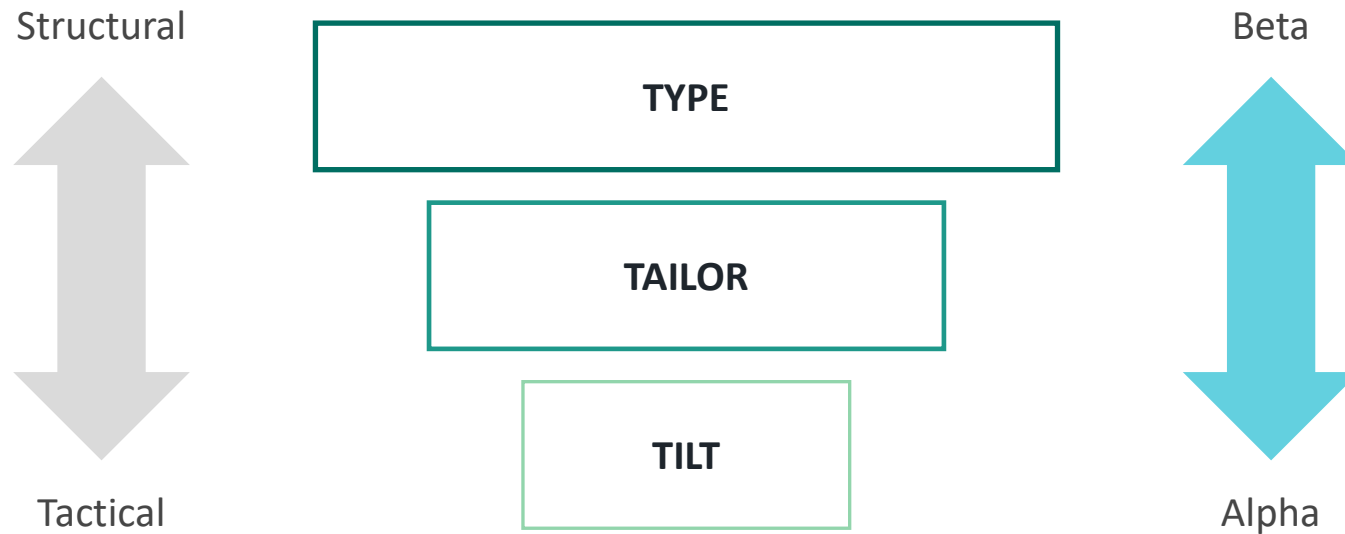
4. Fees and costs must be managed and minimized where appropriate.

5. Good results can best be achieved by managing uncertainty using varied risk management tools, complemented by discipline, skepticism and humility.

6. A portfolio should be as simple as possible for the goals it is designed to achieve. Investment complexity requires strong governance and appropriate investment oversight.

What conversation are we having?

Which conversation are we having?



Type



Source: Wikipedia

Are you on the market?

Or do you already own?

Tailor



How about that
kitchen renovation?

Source: Wikipedia

Tilt



I really like this color...

Source: Wikipedia

What does risk mean to us?

Which overall risks should you accept?

Accept greater volatility

Be truly different from peers

Add portfolio leverage, which can change risk profile

Accept lower risk, but also weaker performance

Take on illiquidity risk, which may lead to forced selling

Tilt into assets with higher expected return, but forecasts may be wrong

Make portfolio "bets" which might fail to pay off

Rely on active managers who may fail to produce alpha

Over-diversify which might reduce return

Source: Bridgewater, Verus

Which is higher risk?



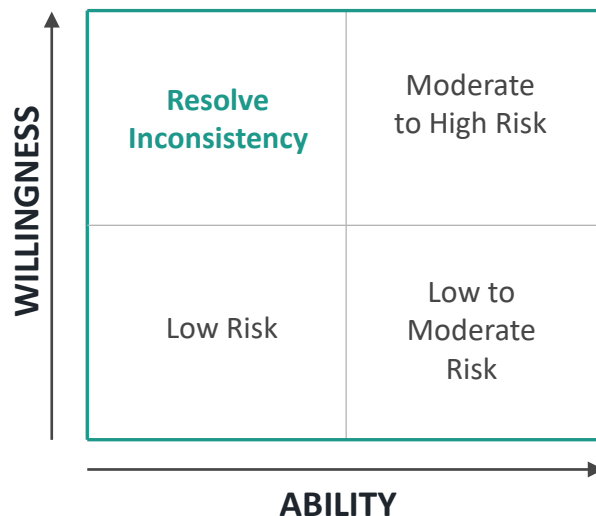
. Image from https://commons.wikimedia.org/wiki/File:A_Lion.jpg (CC BY-SA 3.0)

What do you need?

We begin with the most important consideration: what the investor needs. Those needs can be described along three main dimensions:

- 1) Return objective
- 2) Risk tolerance
- 3) Strategic mission

The first two of these work together. Risk is the currency with which we buy returns—and it is important that clear and collectively understood statements exist regarding the level of risk the investor can bear and the return they require.



The ability and willingness to take risk can be framed with enterprise-specific metrics:

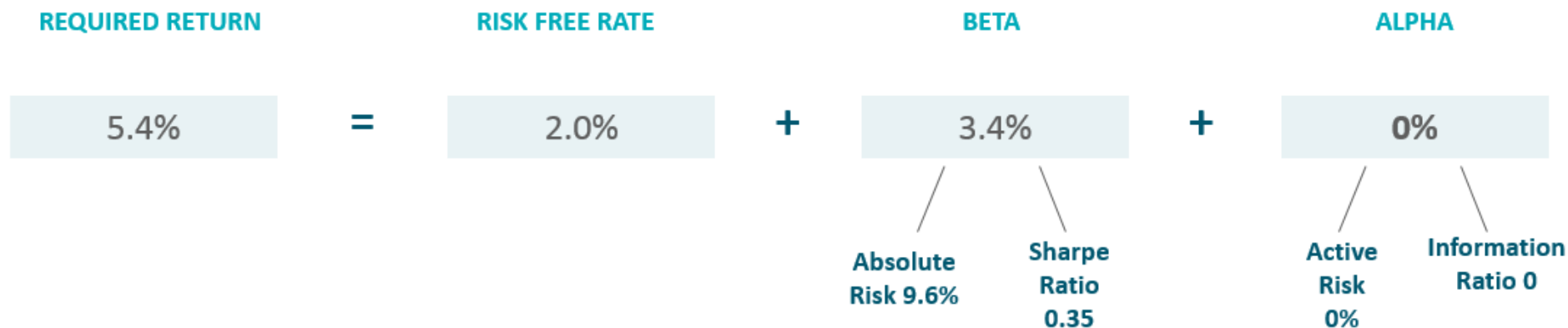
- *Mission & vision*
- *Liabilities & contributions*
- *Spending policy*
- *Credit covenants / worthiness*
- *Capital planning*

The “Investment Golden Rule”

In one sense, the underlying drivers of most portfolios are fairly simple. Risk-free rates are the foundation of most investment returns, with core risk premia providing some relatively predictable additional return over those risk-free rates, at least over a full cycle.

Focusing on getting these core underlying portfolio drivers right should be the primary job of investors: the other parts of the portfolio management process are additive, but secondary.

60/40 portfolio



Sharpe, William. “Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk.” *Journal of Finance*, Vol. 19, issue 3, 1964, pp 425-442



So let's buy some asset
classes!

10-year return & risk assumptions

| Asset Class | Index Proxy | Ten Year Return Forecast | | Standard Deviation Forecast | Sharpe Ratio Forecast (g) | Sharpe Ratio Forecast (a) |
|---|--|--------------------------|------------|-----------------------------|---------------------------|---------------------------|
| | | Geometric | Arithmetic | | | |
| Equities | | | | | | |
| U.S. Large | S&P 500 | 5.3% | 6.4% | 15.5% | 0.08 | 0.15 |
| U.S. Small | Russell 2000 | 6.4% | 8.4% | 21.4% | 0.11 | 0.21 |
| International Developed | MSCI EAFE | 7.4% | 8.8% | 17.6% | 0.19 | 0.27 |
| International Small | MSCI EAFE Small Cap | 8.5% | 10.6% | 21.7% | 0.21 | 0.30 |
| Emerging Markets | MSCI EM | 7.8% | 10.4% | 24.6% | 0.15 | 0.26 |
| Global Equity | MSCI ACWI | 6.3% | 7.6% | 16.7% | 0.14 | 0.22 |
| Global Equity ex USA | MSCI ACWI ex USA | 7.7% | 9.4% | 19.5% | 0.19 | 0.28 |
| Private Equity* | CA Private Equity | 8.0% | 10.9% | 25.6% | 0.16 | 0.27 |
| Private Equity Direct | CA Private Equity | 9.0% | 11.8% | 25.6% | 0.20 | 0.30 |
| Private Equity (FoF) | CA Private Equity | 7.0% | 9.9% | 25.6% | 0.12 | 0.23 |
| Fixed Income | | | | | | |
| Cash | 30 Day T-Bills | 4.0% | 4.0% | 1.1% | - | - |
| U.S. TIPS | Bloomberg U.S. TIPS 5-10 | 4.3% | 4.4% | 5.5% | 0.05 | 0.07 |
| Non-U.S. Inflation Linked Bonds | Bloomberg World Government Inflation Linked Bond ex U.S. | 3.3% | 3.6% | 7.4% | (0.09) | (0.05) |
| U.S. Treasury | Bloomberg Treasury 7-10 Year | 4.2% | 4.4% | 7.1% | 0.03 | 0.06 |
| Long U.S. Treasury | Bloomberg Treasury 20+ Year | 4.3% | 5.1% | 13.2% | 0.02 | 0.08 |
| Global Sovereign ex U.S. | Bloomberg Global Treasury ex U.S. | 2.3% | 2.8% | 9.9% | (0.17) | (0.12) |
| Global Aggregate | Bloomberg Global Aggregate | 3.6% | 3.8% | 6.6% | (0.06) | (0.03) |
| Core Fixed Income | Bloomberg U.S. Aggregate Bond | 4.6% | 4.7% | 4.8% | 0.13 | 0.15 |
| Core Plus Fixed Income | Bloomberg U.S. Universal | 4.7% | 4.8% | 4.5% | 0.16 | 0.18 |
| Investment Grade Corp. Credit | Bloomberg U.S. Corporate Investment Grade | 5.0% | 5.3% | 8.4% | 0.12 | 0.15 |
| Short-Term Gov't/Credit | Bloomberg U.S. Gov't/Credit 1-3 Year | 4.3% | 4.4% | 3.6% | 0.08 | 0.11 |
| Short-Term Credit | Bloomberg Credit 1-3 Year | 4.6% | 4.7% | 3.6% | 0.17 | 0.19 |
| Long-Term Credit | Bloomberg Long U.S. Credit | 5.1% | 5.7% | 10.9% | 0.10 | 0.16 |
| High Yield Corp. Credit | Bloomberg U.S. Corporate High Yield | 6.0% | 6.6% | 11.0% | 0.18 | 0.24 |
| Bank Loans | Morningstar LSTA Leveraged Loan | 7.7% | 8.1% | 9.0% | 0.41 | 0.46 |
| Global Credit | Bloomberg Global Credit | 4.7% | 5.0% | 7.7% | 0.09 | 0.13 |
| Emerging Markets Debt (Hard) | JPM EMBI Global Diversified | 7.9% | 8.4% | 10.6% | 0.37 | 0.42 |
| Emerging Markets Debt (Local) | JPM GBI-EM Global Diversified | 6.0% | 6.7% | 12.2% | 0.16 | 0.22 |
| Private Credit | Morningstar LSTA Leveraged Loan Index | 9.0% | 9.6% | 11.9% | 0.42 | 0.47 |
| Private Credit (Direct Lending - Unlevered) | Morningstar LSTA Leveraged Loan Index | 7.8% | 8.2% | 9.0% | 0.42 | 0.47 |
| Private Credit (Direct Lending - Levered) | Morningstar LSTA Leveraged Loan Index | 9.3% | 10.0% | 12.6% | 0.42 | 0.48 |
| Private Credit (Credit Opportunities) | Morningstar LSTA Leveraged Loan Index | 9.5% | 10.2% | 12.8% | 0.43 | 0.48 |
| Private Credit (Junior Capital / Mezzanine) | Morningstar LSTA Leveraged Loan Index | 9.0% | 9.6% | 11.4% | 0.44 | 0.49 |
| Private Credit (Distressed) | Morningstar LSTA Leveraged Loan Index | 9.1% | 12.7% | 29.1% | 0.18 | 0.30 |

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

10-year return & risk assumptions

| Asset Class | Index Proxy | Ten Year Return Forecast | | Standard Deviation Forecast | Sharpe Ratio Forecast (g) | Sharpe Ratio Forecast (a) |
|--------------------------------|-------------------------------|--------------------------|------------|-----------------------------|---------------------------|---------------------------|
| | | Geometric | Arithmetic | | | |
| Other | | | | | | |
| Commodities | Bloomberg Commodity | 6.4% | 7.6% | 16.1% | 0.15 | 0.22 |
| Hedge Funds | HFRI Fund Weighted Composite | 4.1% | 4.4% | 7.5% | 0.01 | 0.05 |
| Hedge Fund of Funds | HFRI Fund of Funds Composite | 3.1% | 3.4% | 7.5% | (0.12) | (0.08) |
| Hedge Funds (Equity Style) | Custom HFRI Benchmark Mix* | 6.7% | 7.6% | 14.1% | 0.19 | 0.26 |
| Hedge Funds (Credit Style) | Custom HFRI Benchmark Mix* | 7.0% | 7.4% | 9.4% | 0.32 | 0.36 |
| Hedge Funds (Asymmetric Style) | Custom HFRI Benchmark Mix* | 5.0% | 5.2% | 6.4% | 0.16 | 0.19 |
| Real Estate Debt | Bloomberg CMBS IG | 7.4% | 7.7% | 7.5% | 0.45 | 0.49 |
| Core Real Estate | NCREIF Property | 7.2% | 7.9% | 12.5% | 0.26 | 0.31 |
| Value-Add Real Estate | NCREIF Property + 200bps | 9.2% | 10.3% | 15.4% | 0.34 | 0.41 |
| Opportunistic Real Estate | NCREIF Property + 300bps | 10.2% | 12.1% | 21.1% | 0.29 | 0.38 |
| REITs | Wilshire REIT | 7.2% | 8.9% | 19.2% | 0.17 | 0.26 |
| Global Infrastructure | S&P Global Infrastructure | 8.3% | 9.6% | 16.9% | 0.25 | 0.33 |
| Risk Parity** | S&P Risk Parity 10% Vol Index | 6.6% | 7.2% | 10.0% | 0.26 | 0.32 |
| Currency Beta | MSCI Currency Factor Index | 2.1% | 2.2% | 3.4% | (0.55) | (0.52) |
| Inflation | | 2.4% | - | - | - | - |

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

*To represent hedge fund styles, we use a combination of HFRI benchmarks: Equity Style = 33% HFRI Fundamental Growth, 33% HFRI Fundamental Value, 33% HFRI Activist. Credit Style = 20% HFRI Distressed/Restructuring, 20% HFRI Credit Arbitrage, 20% HFRI Fixed Income-Corporate, 20% HFRI Fixed Income-Convertible Arbitrage, 20% HFRI Fixed Income-Asset Backed. Asymmetric Style = 50% HFRI Relative Value, 50% HFRI Macro

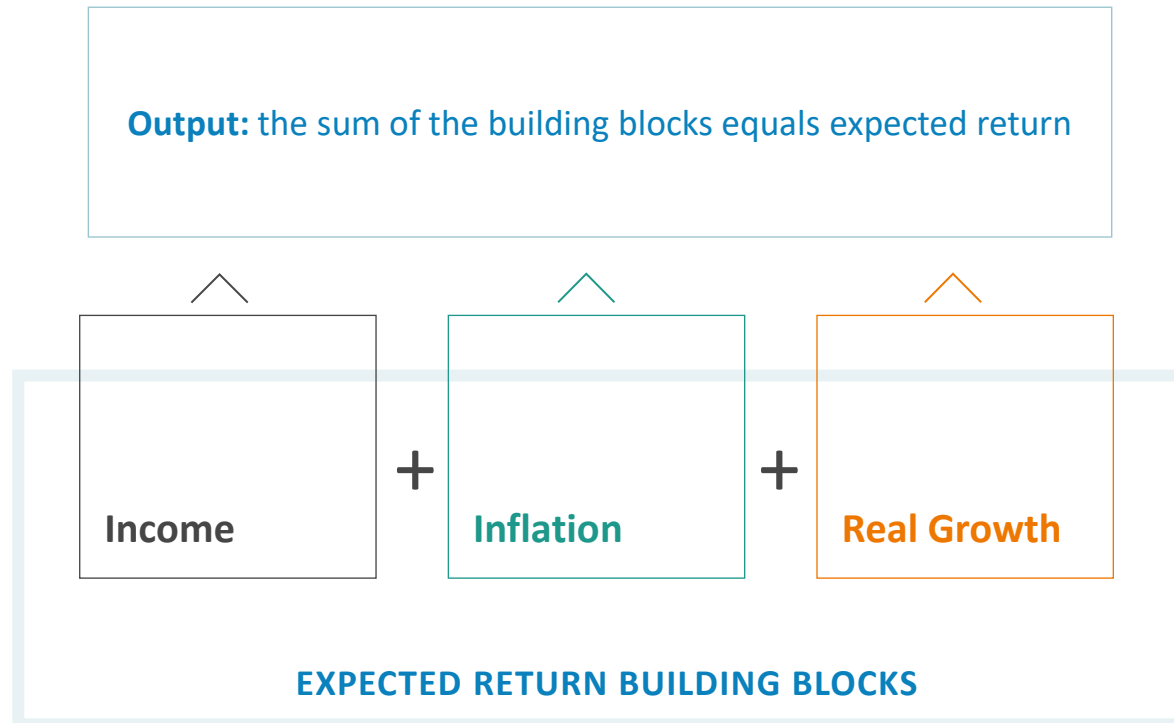
**The Risk Parity forecast shown here assumes a 10% target volatility strategy. We recommend customizing this forecast to the target volatility specifications of the risk parity strategy that an investor wishes to model. Please speak with your Verus consultant for customization needs.

Anyone feel like this?



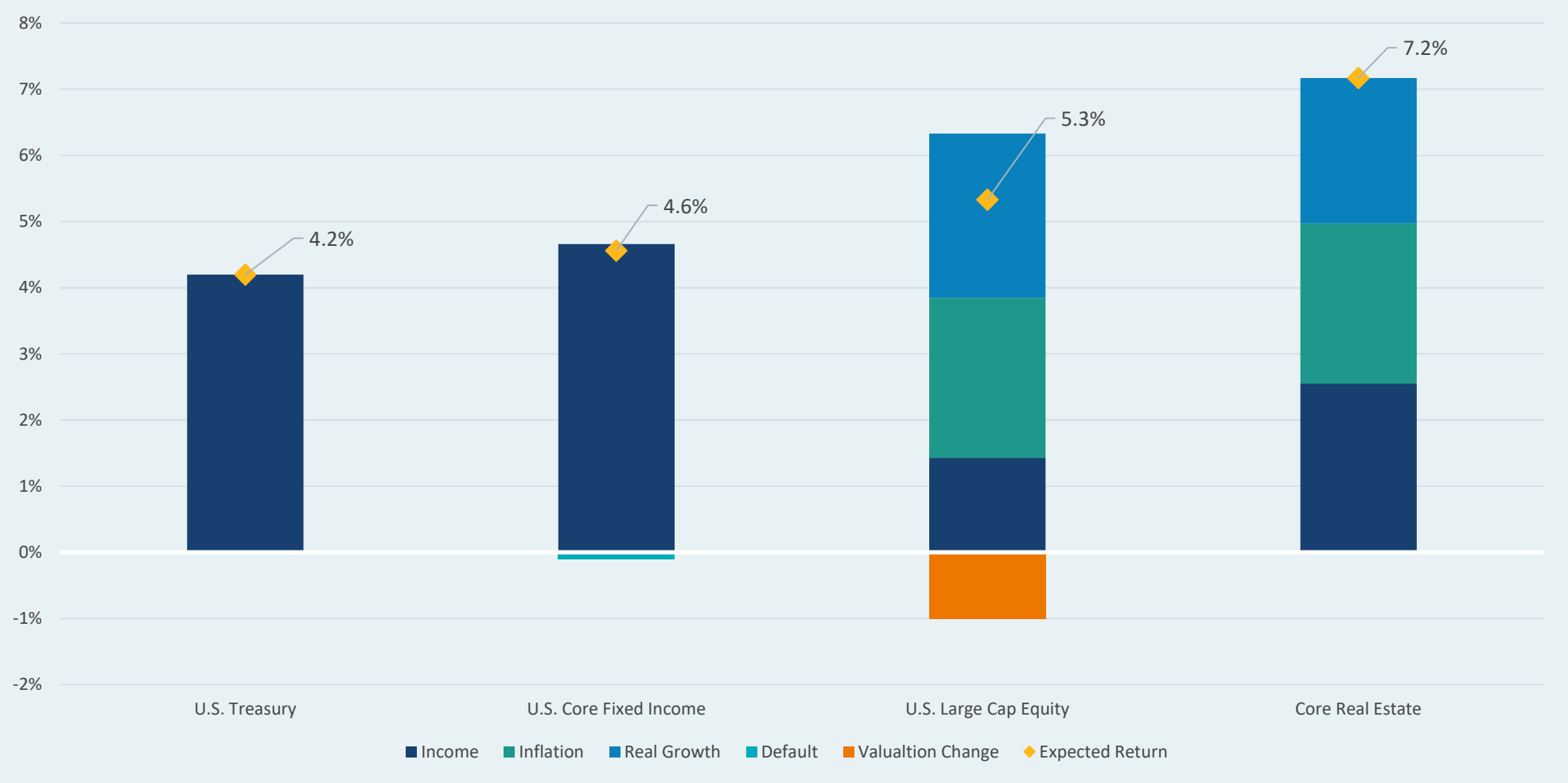
I DO NOT
KNOW
WHICH TO
CHOOSE AND
MY HEAD
HURTS SO
BAD AND I
WANT TO GO
HOME

Building block methodology



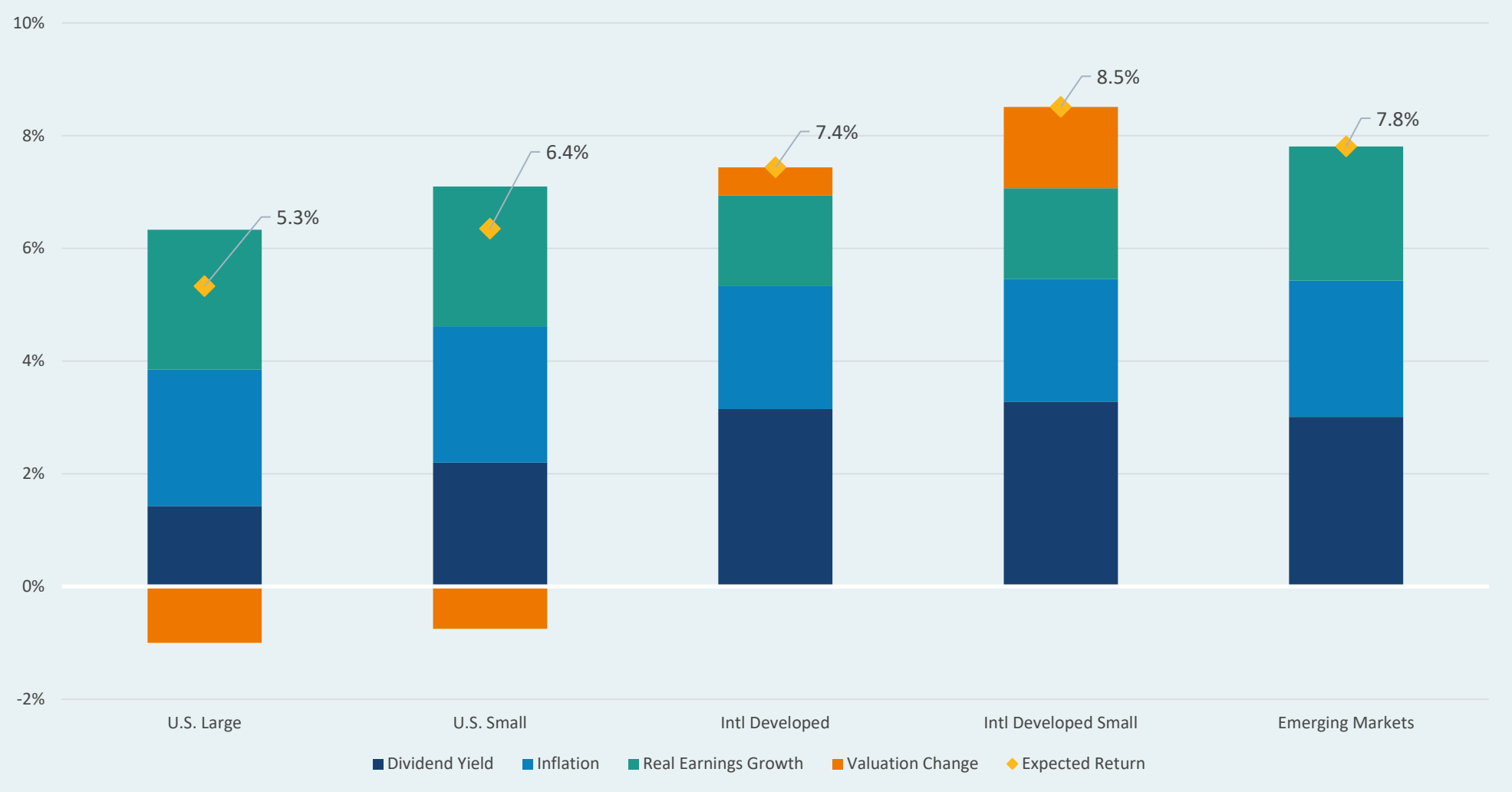
For illustrative purposes only

Expected return methodology



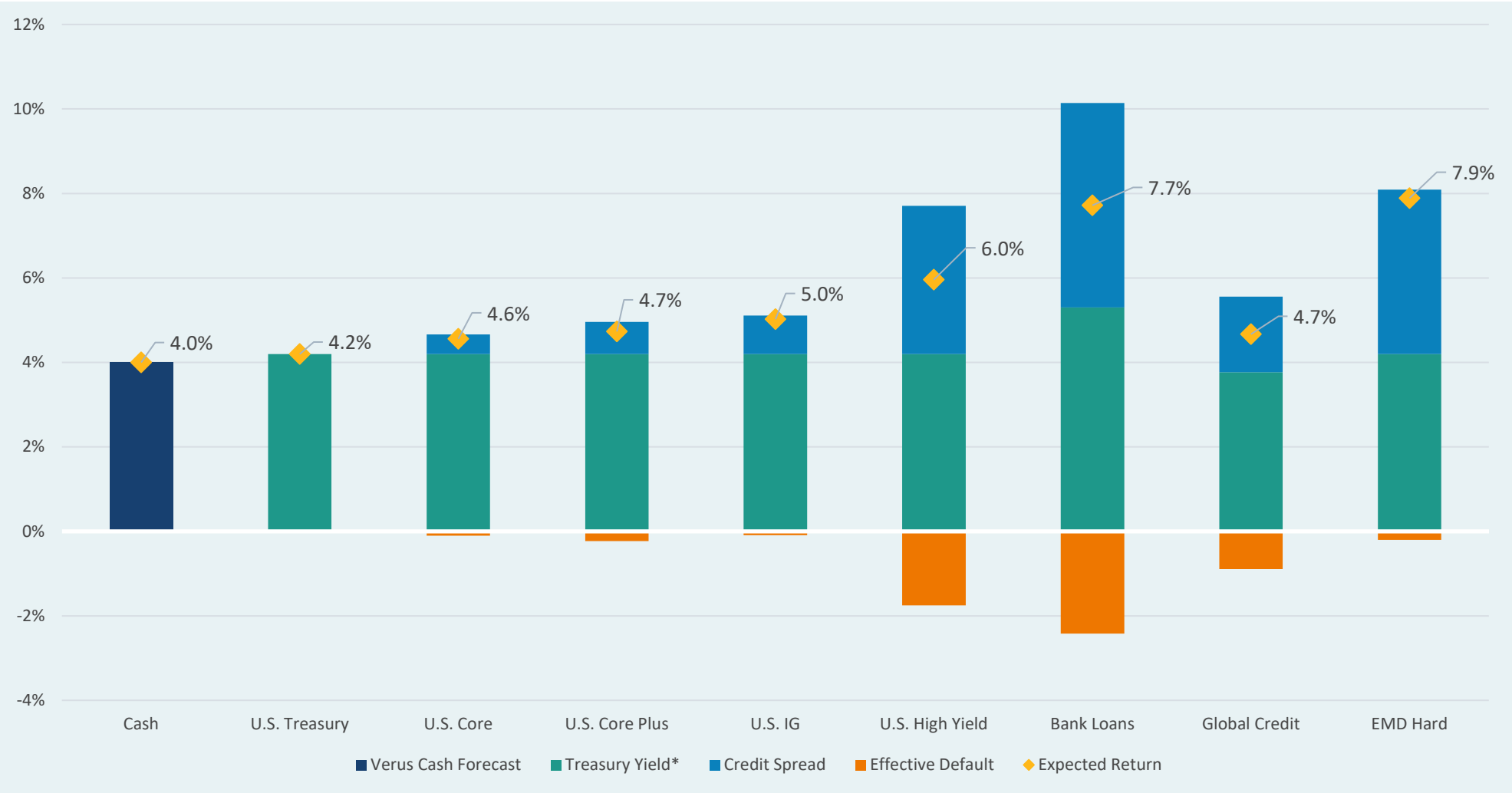
Source: Verus

Equity return forecasts



Source: Verus

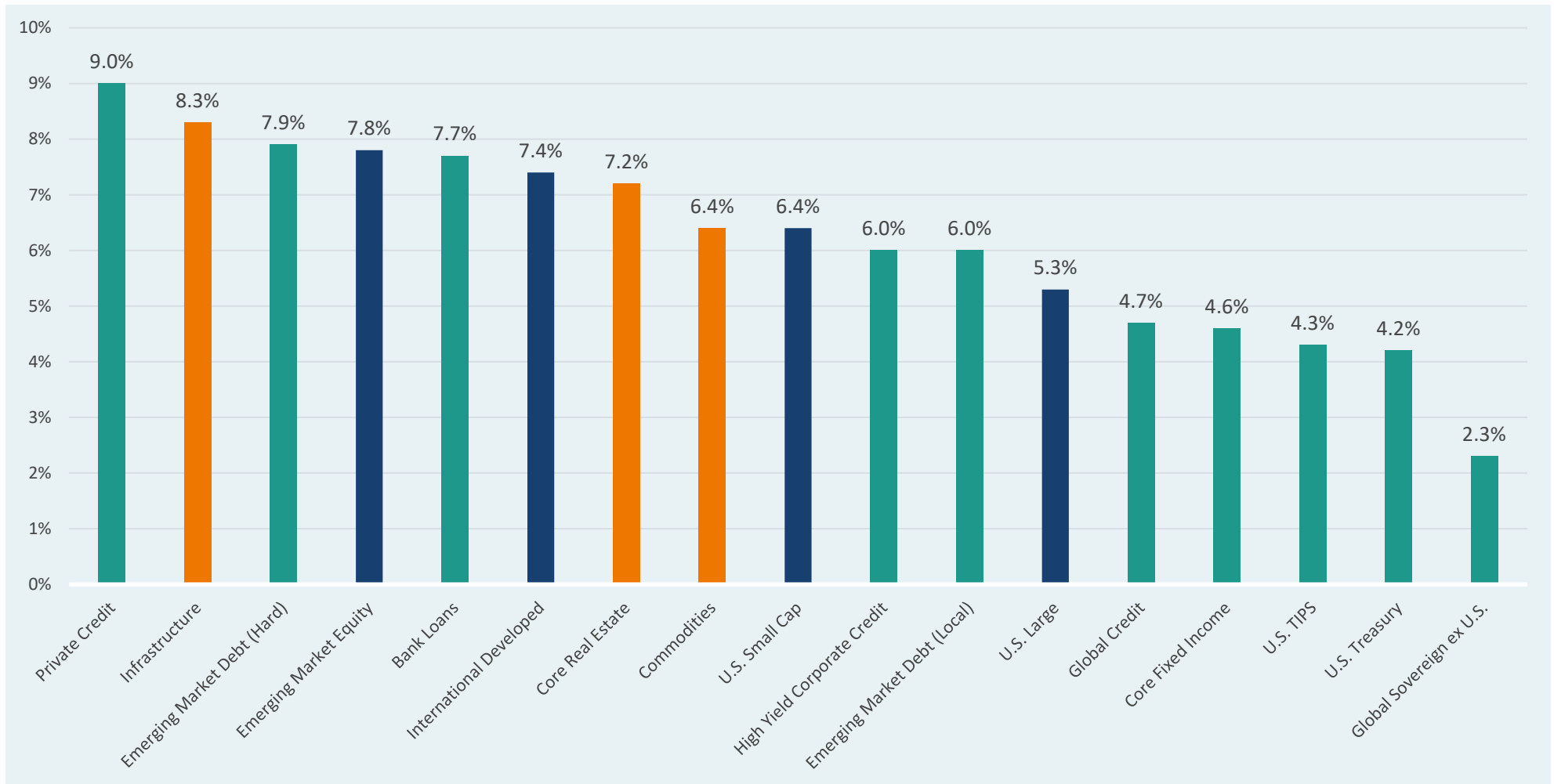
Fixed income return forecasts



Source: Verus

*Bank loans uses 3-month USD Libor instead of the Treasury yield

10-year expected returns

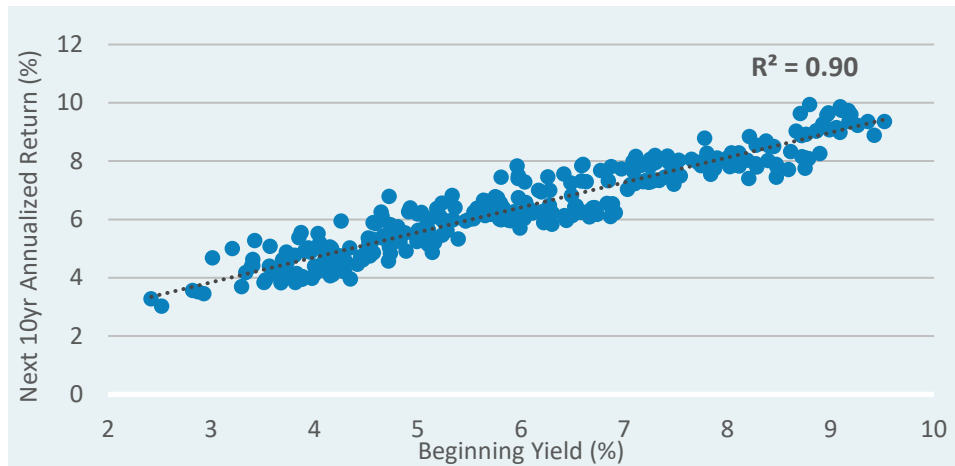


Source: Verus

Asset returns vary over time

We also believe that, over the long term, there are observable and often predictable forces that drive market returns.

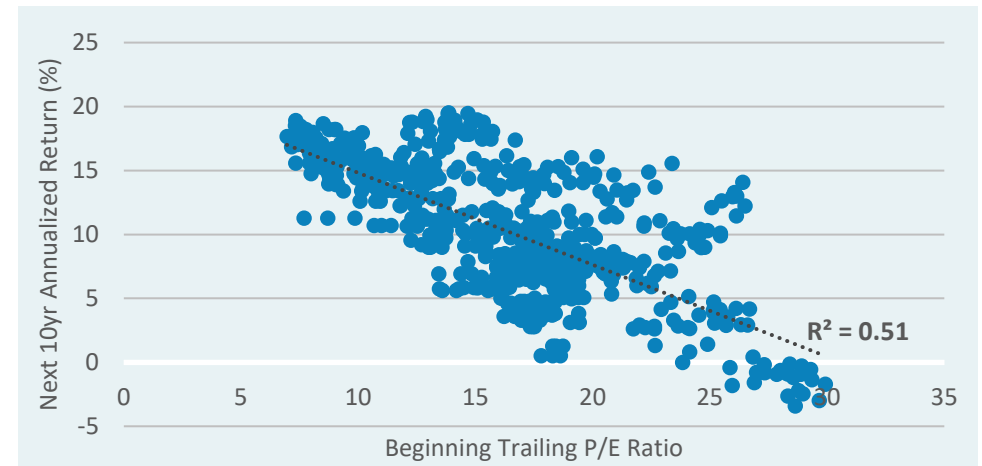
U.S. 10-YEAR TREASURY



Source: FRED, Verus

The coefficient of determination, or R^2 , illustrates the proportion of variability of the dependent variable that is described by the independent variable

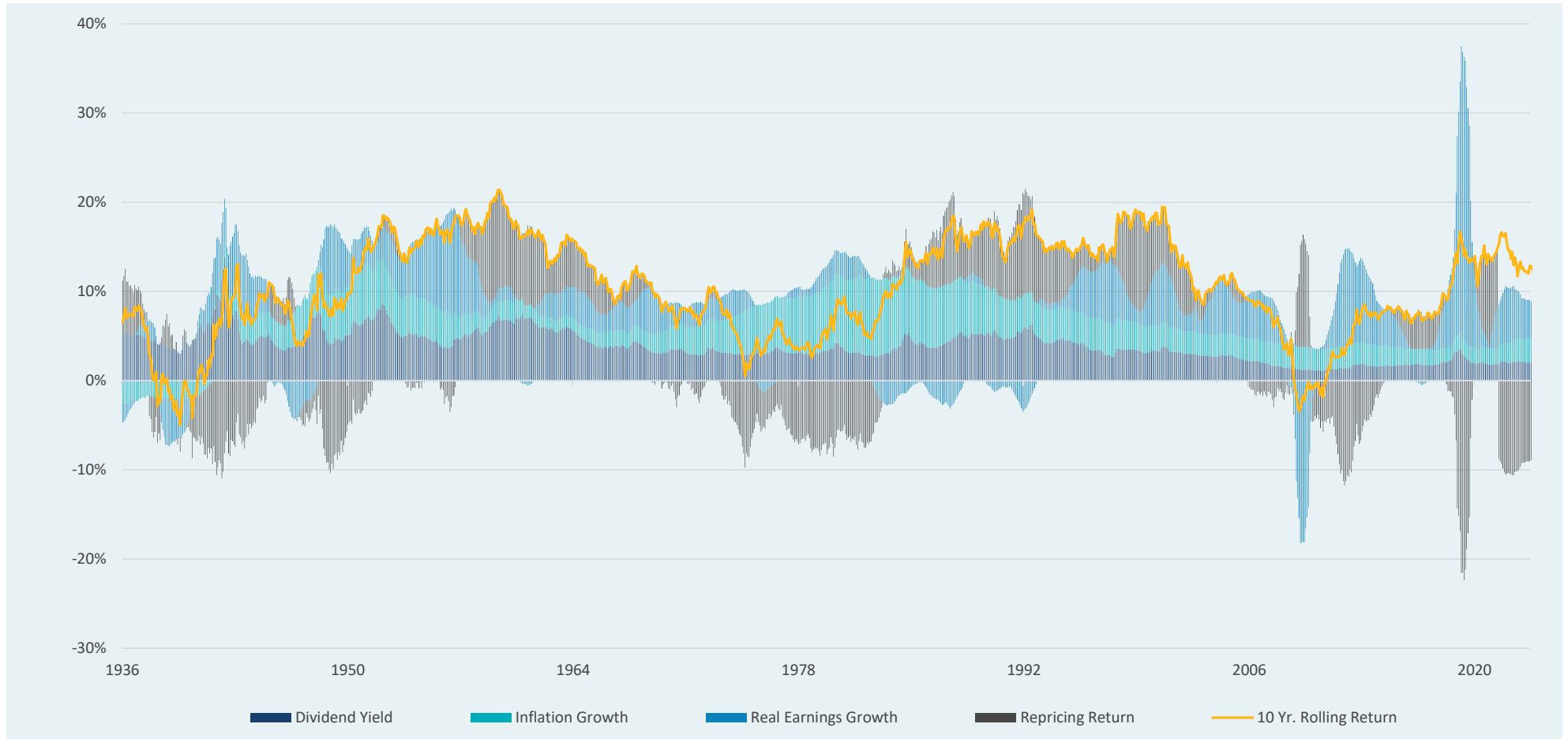
S&P 500



Source: Standard & Poor's, Verus

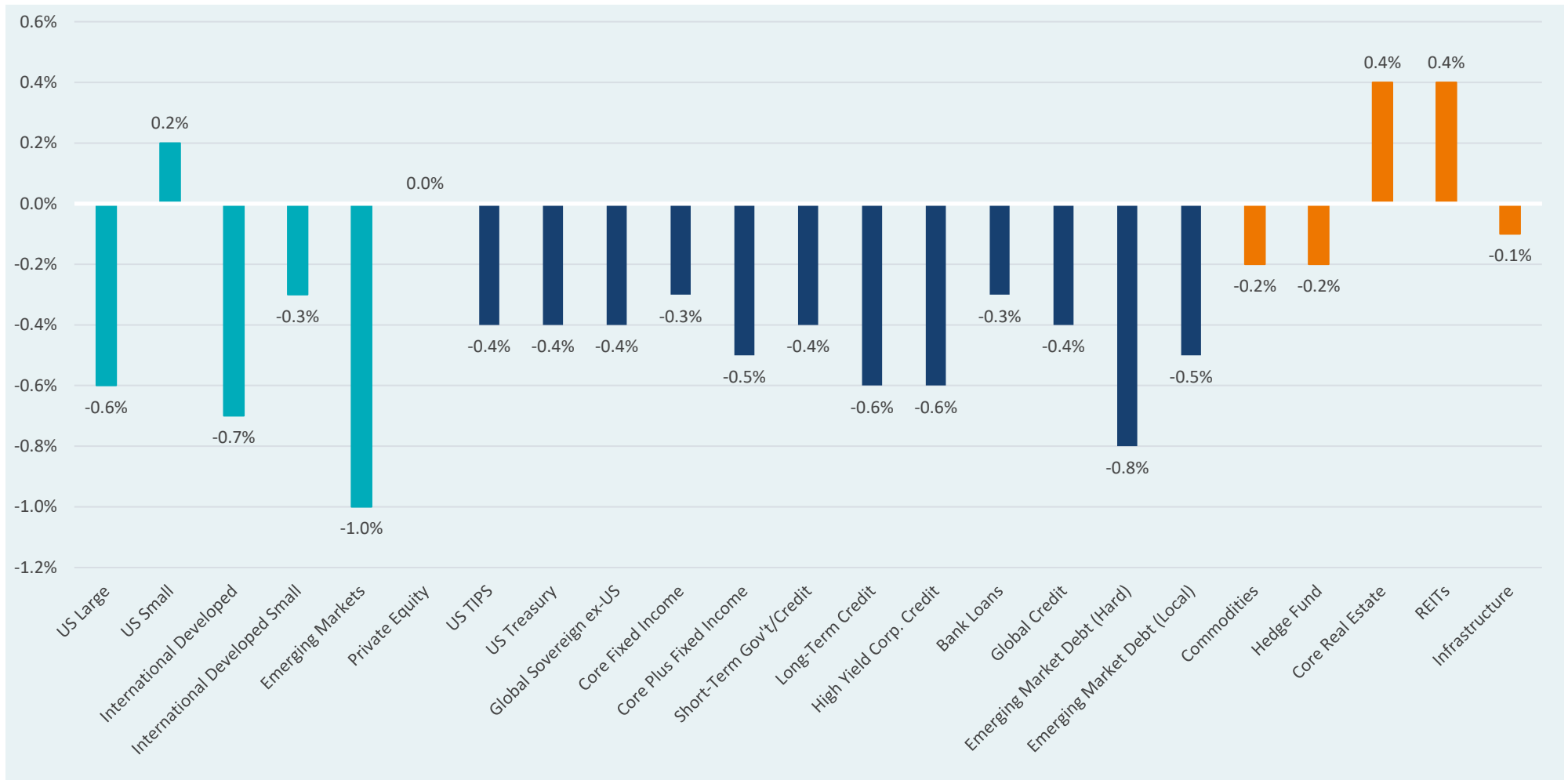
Equity

Trailing 10-year return decomposition

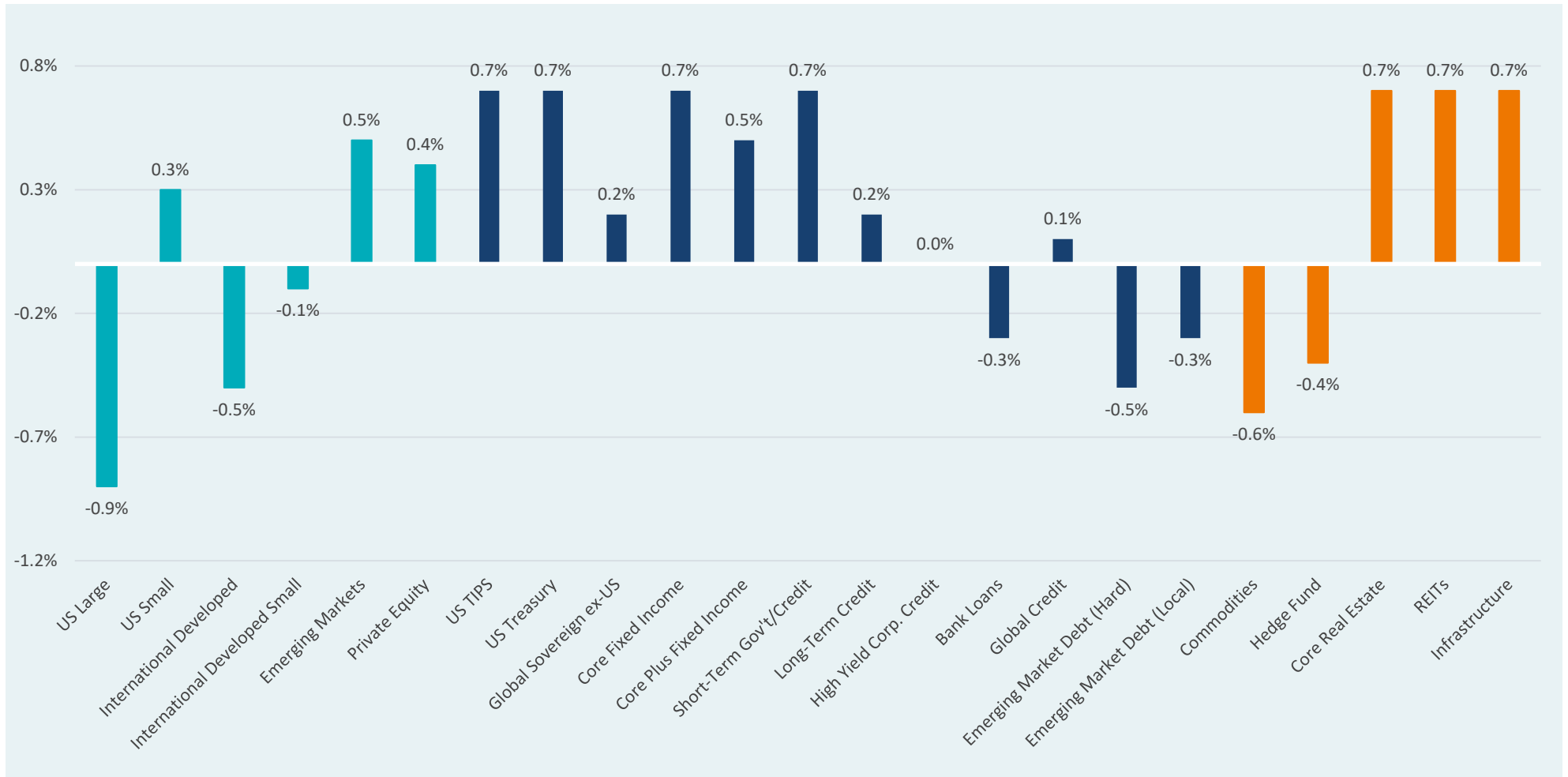


Source: Robert Shiller data, as of 9/30/23

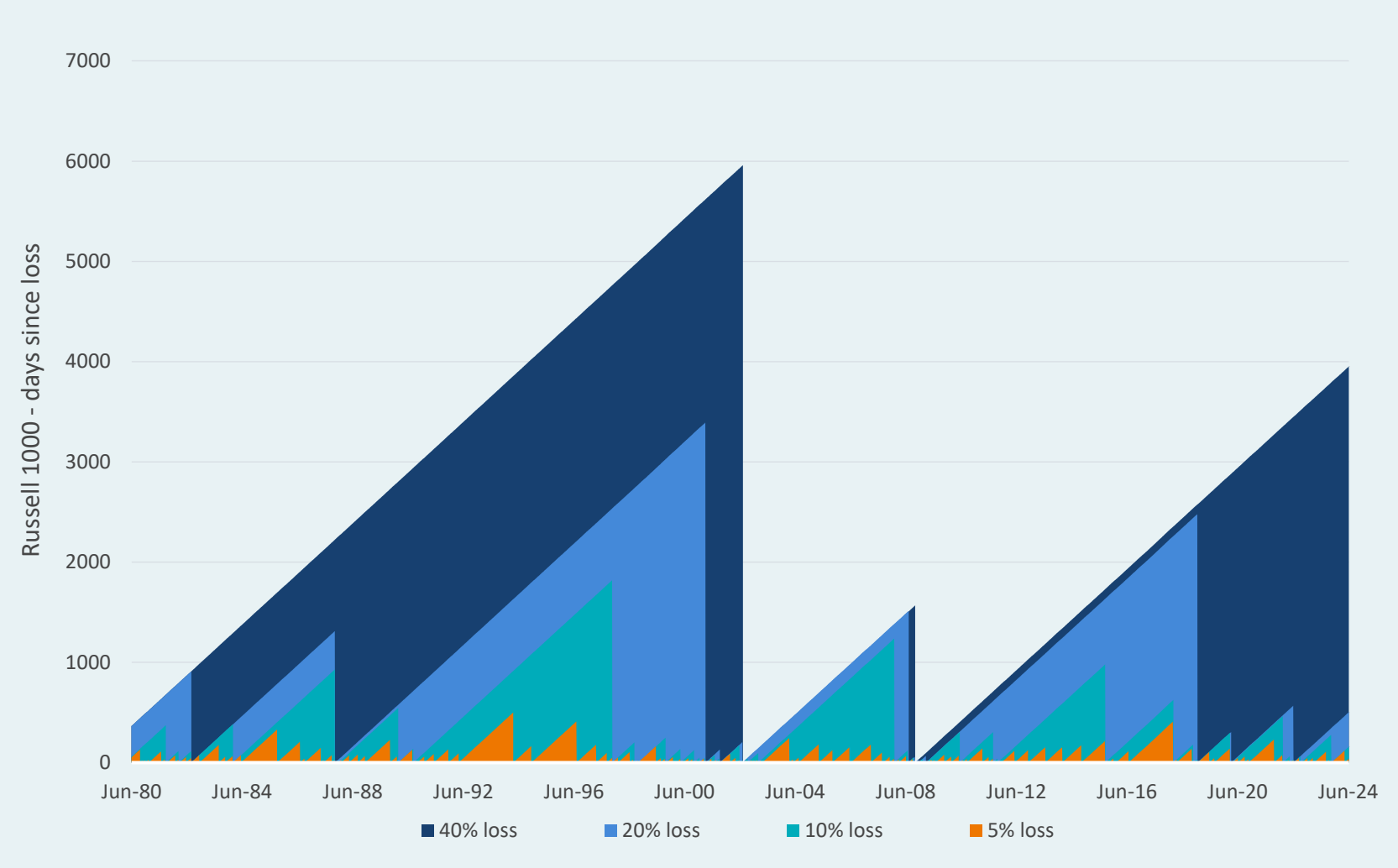
2024 mid-year vs. 2024 return forecast



2024 mid-year vs. 2023 mid-year return forecast



Expect the unexpected

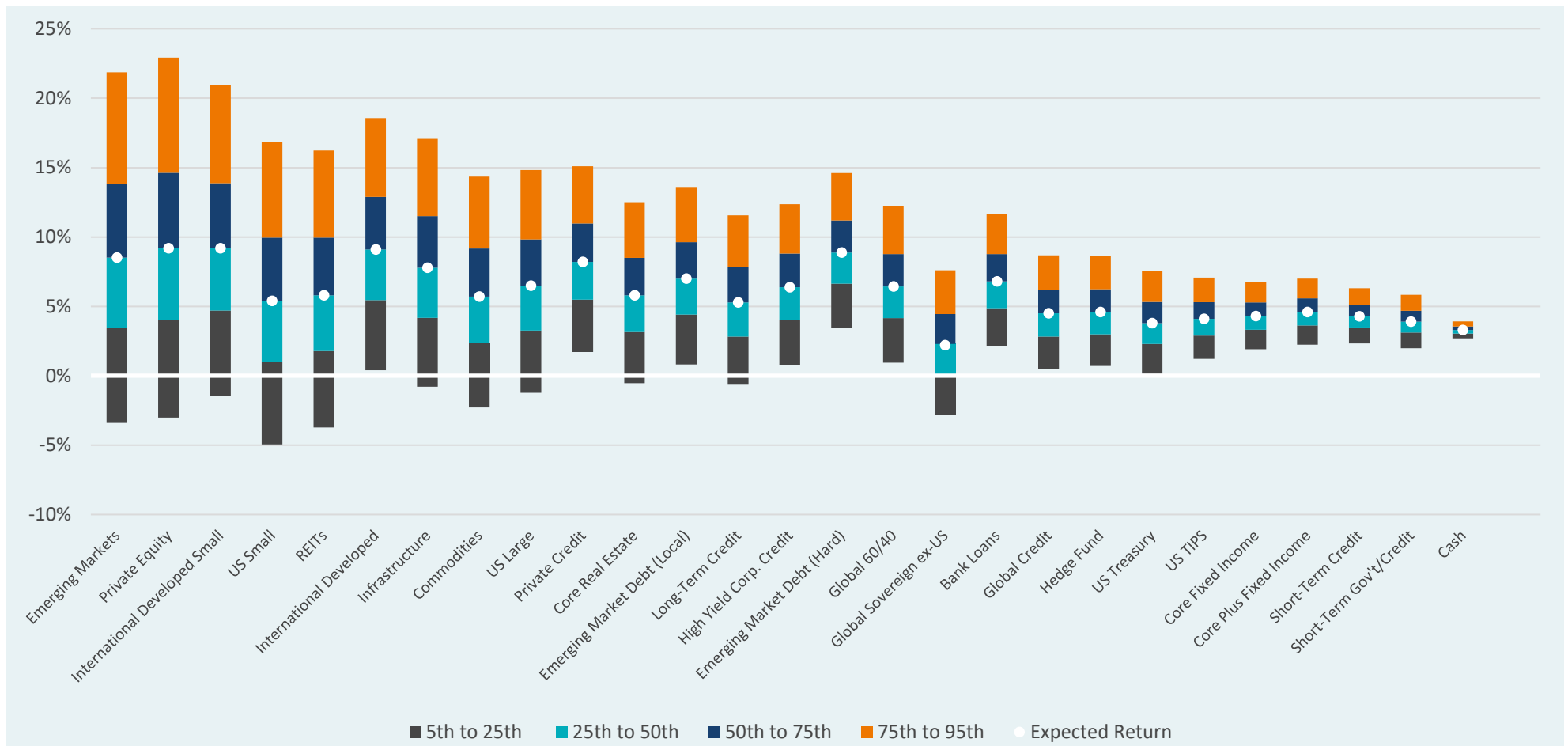


Source: FTSE Russell, Verus as of 6/14/24

Probabilities not certainty

Range of likely 10-year outcomes

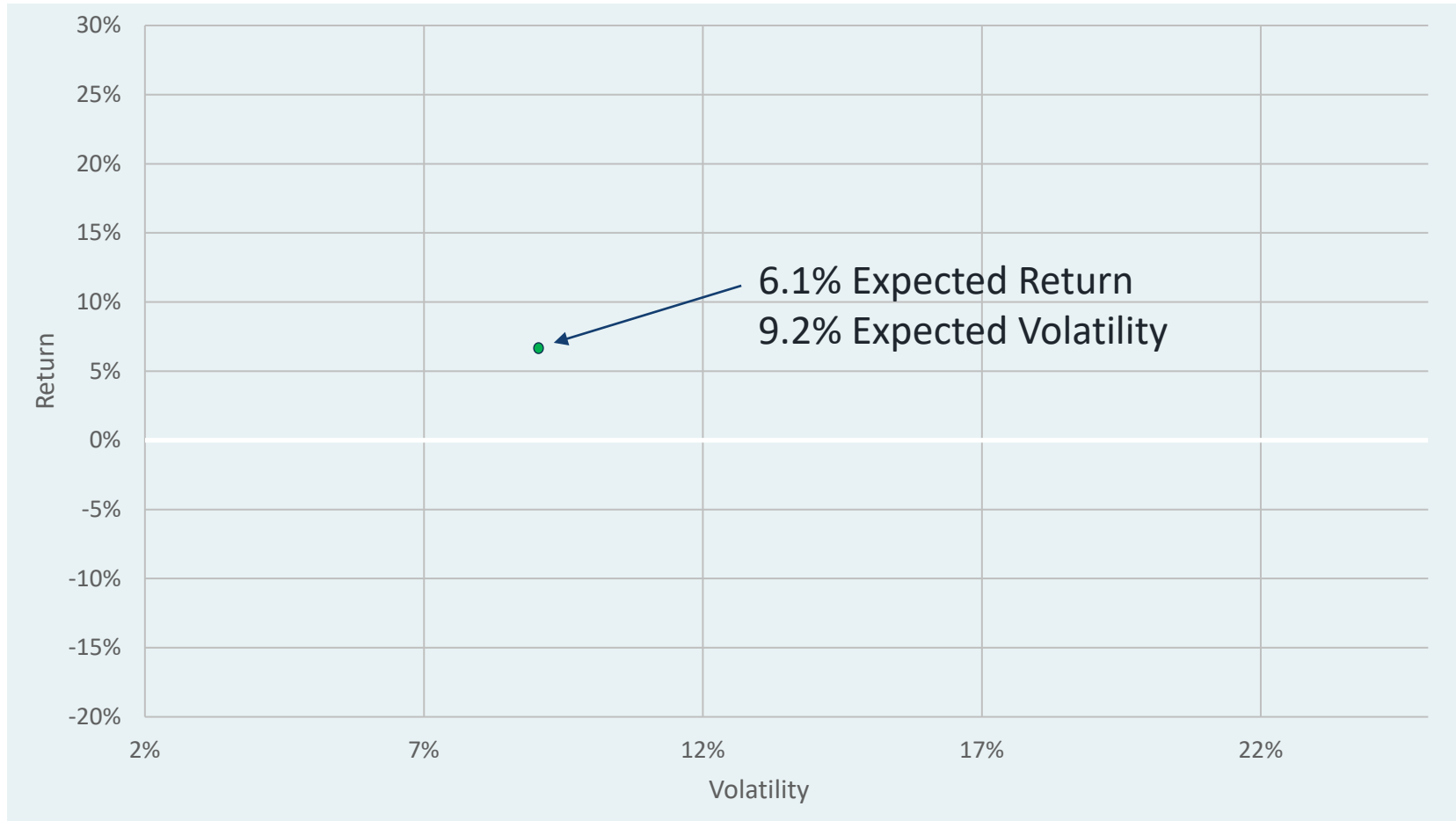
10-YEAR RETURN 90% CONFIDENCE INTERVAL



Source: Verus, MPI

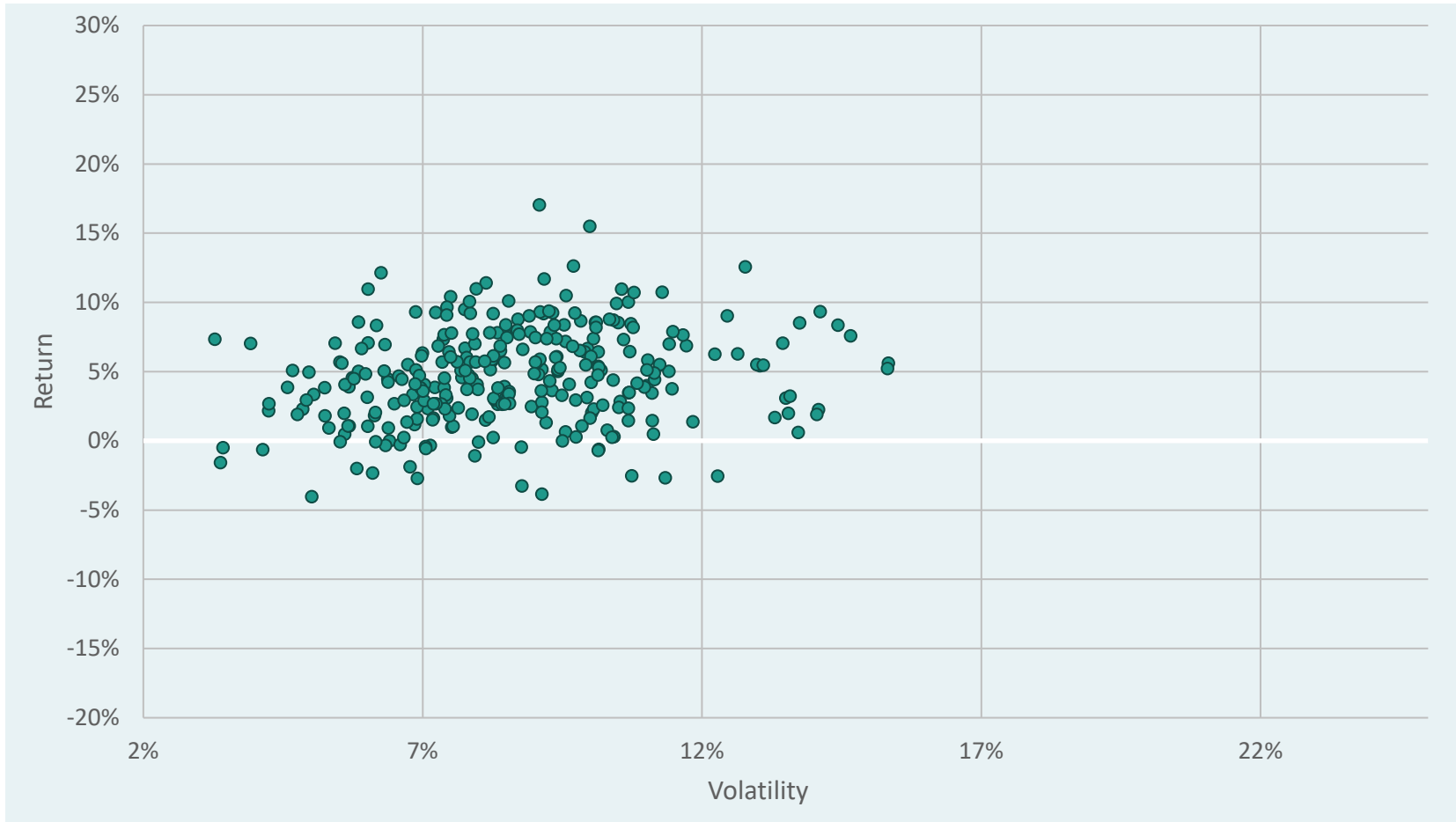
'Probabilistic' thinking

This is a conveniently simple way of thinking about the world



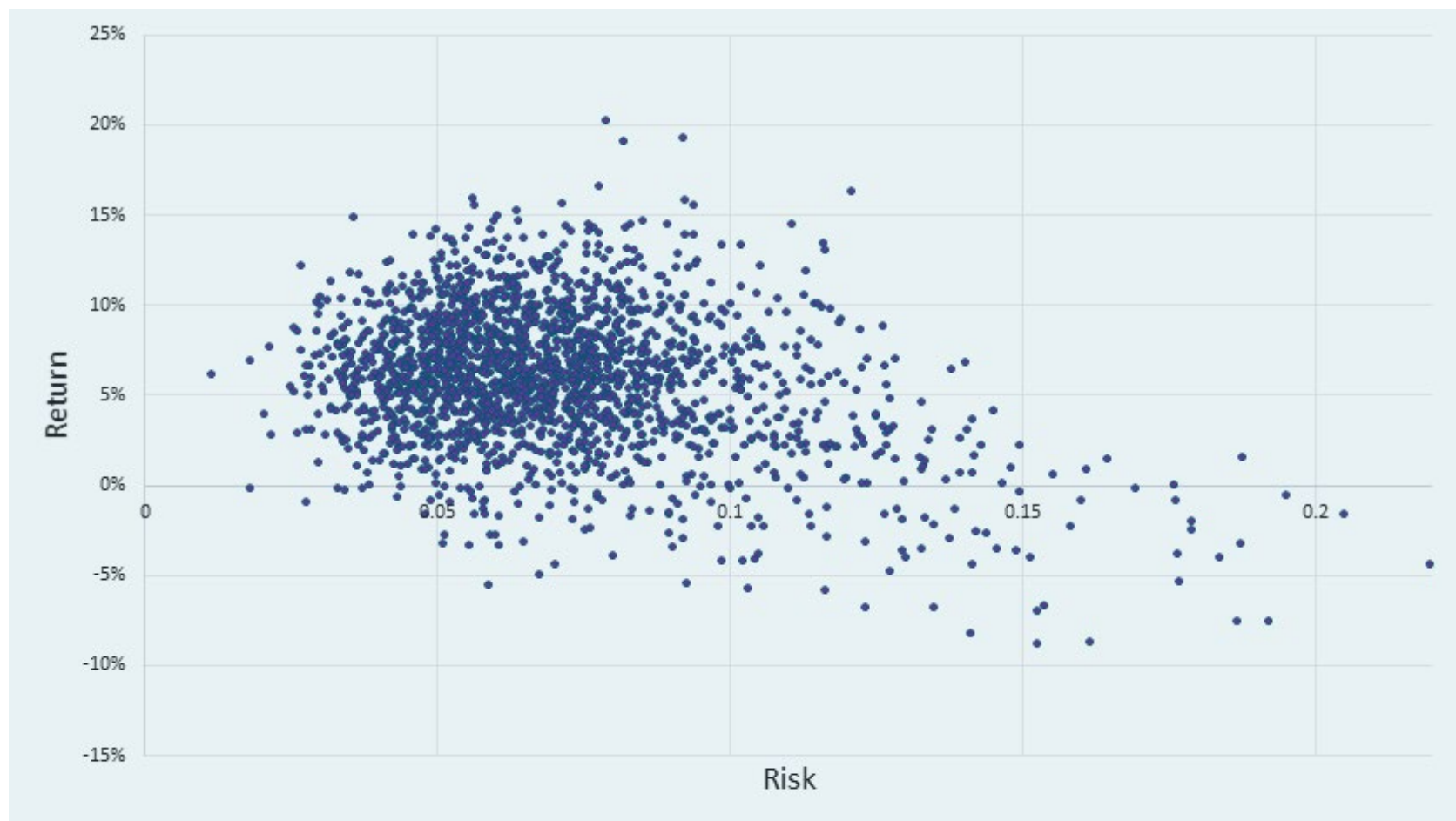
'Probabilistic' thinking

But in reality, this is what we should expect



Simple

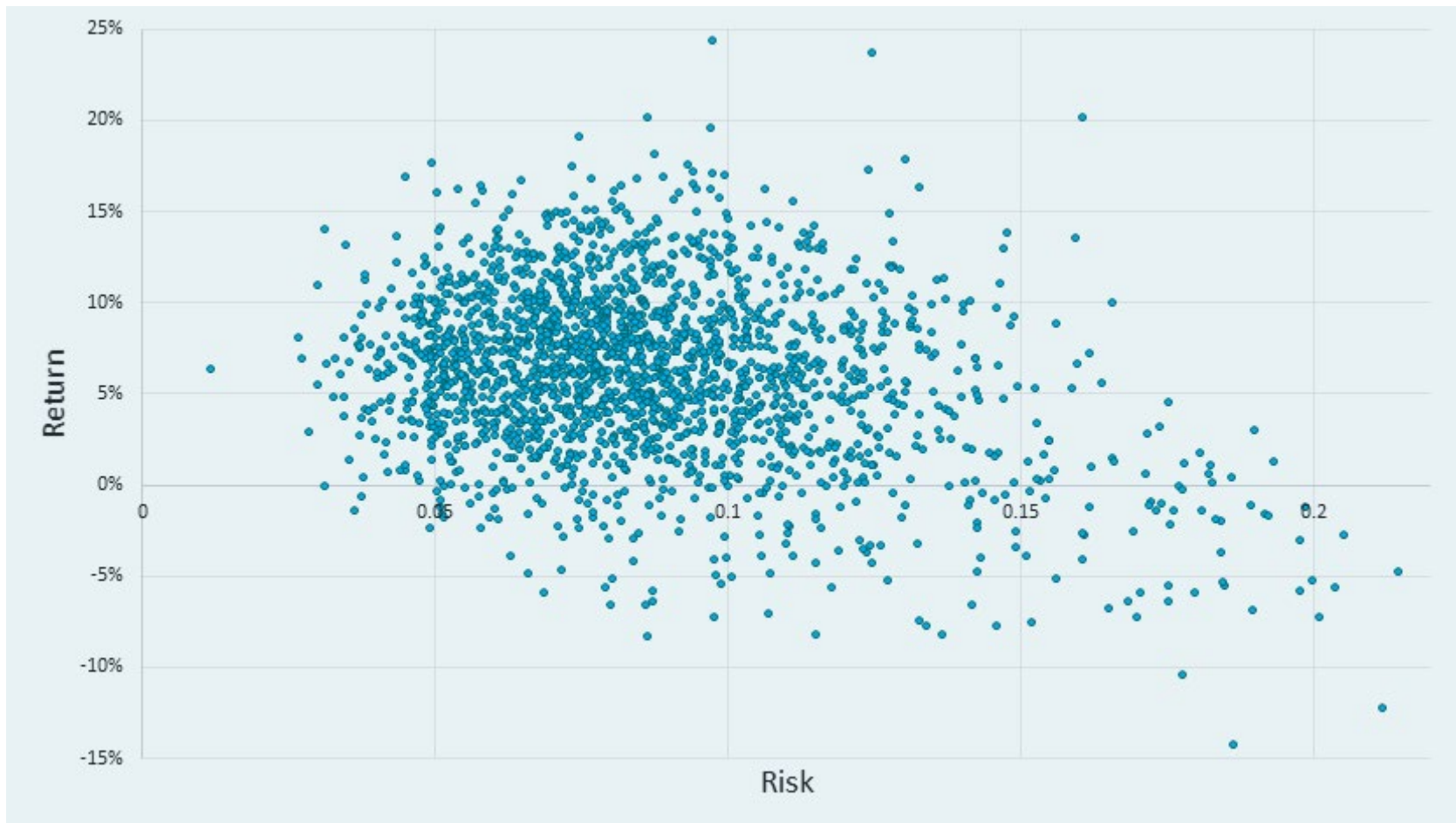
60/40 – GLOBAL EQUITY/US CORE BONDS



Source: MPI, Verus

More complex

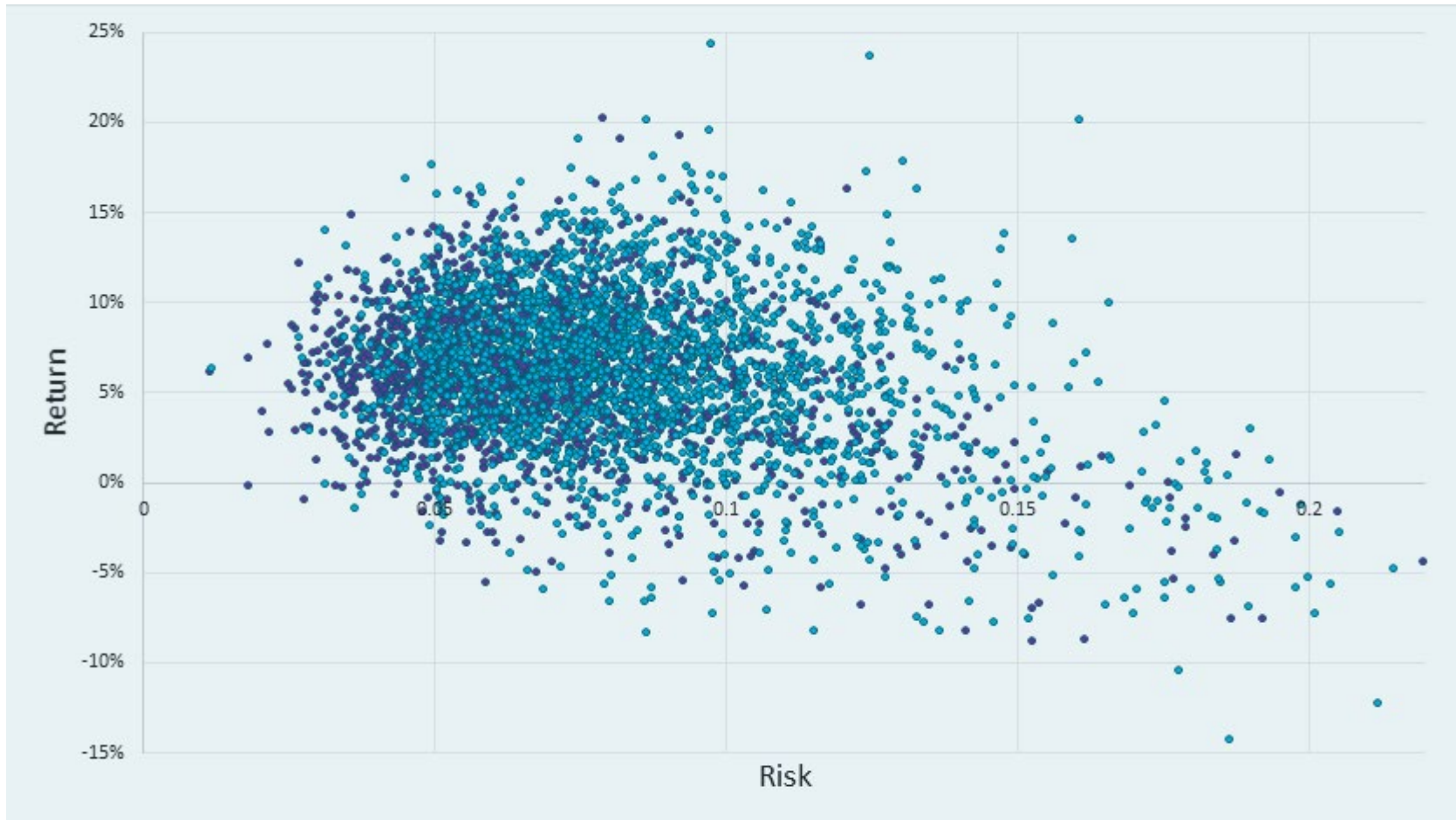
60/20/10/7/3 – GLOBAL EQUITY/US CORE BONDS/HF/REAL ESTATE/COMMODITIES



Source: MPI, Verus

And consider frictional costs

60/40 & 60/20/10/7/3

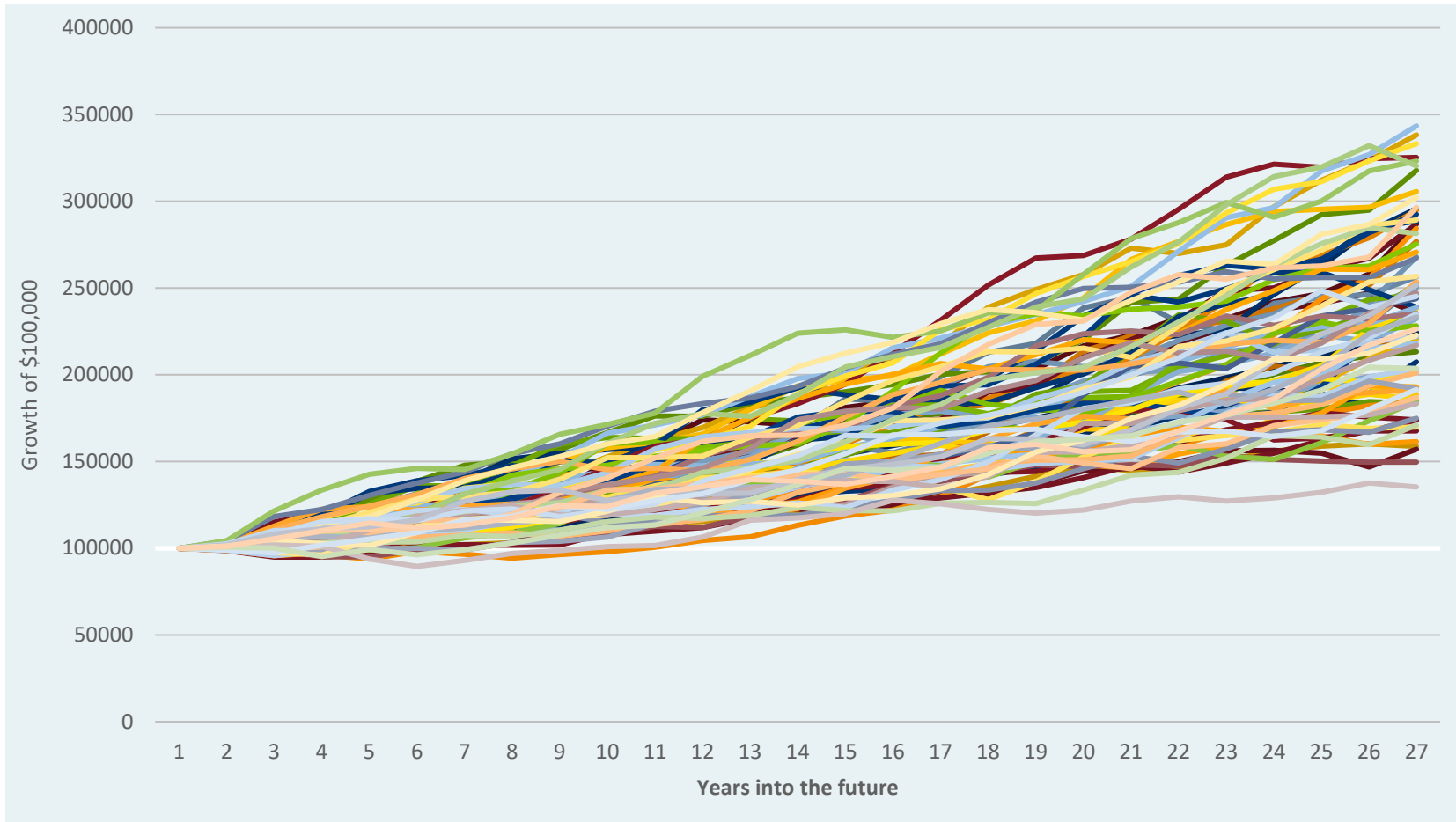


Added complexity may appear to produce a better return point estimate, but risks and costs should also be considered

Source: MPI, Verus

Randomness vs. range of forecasts

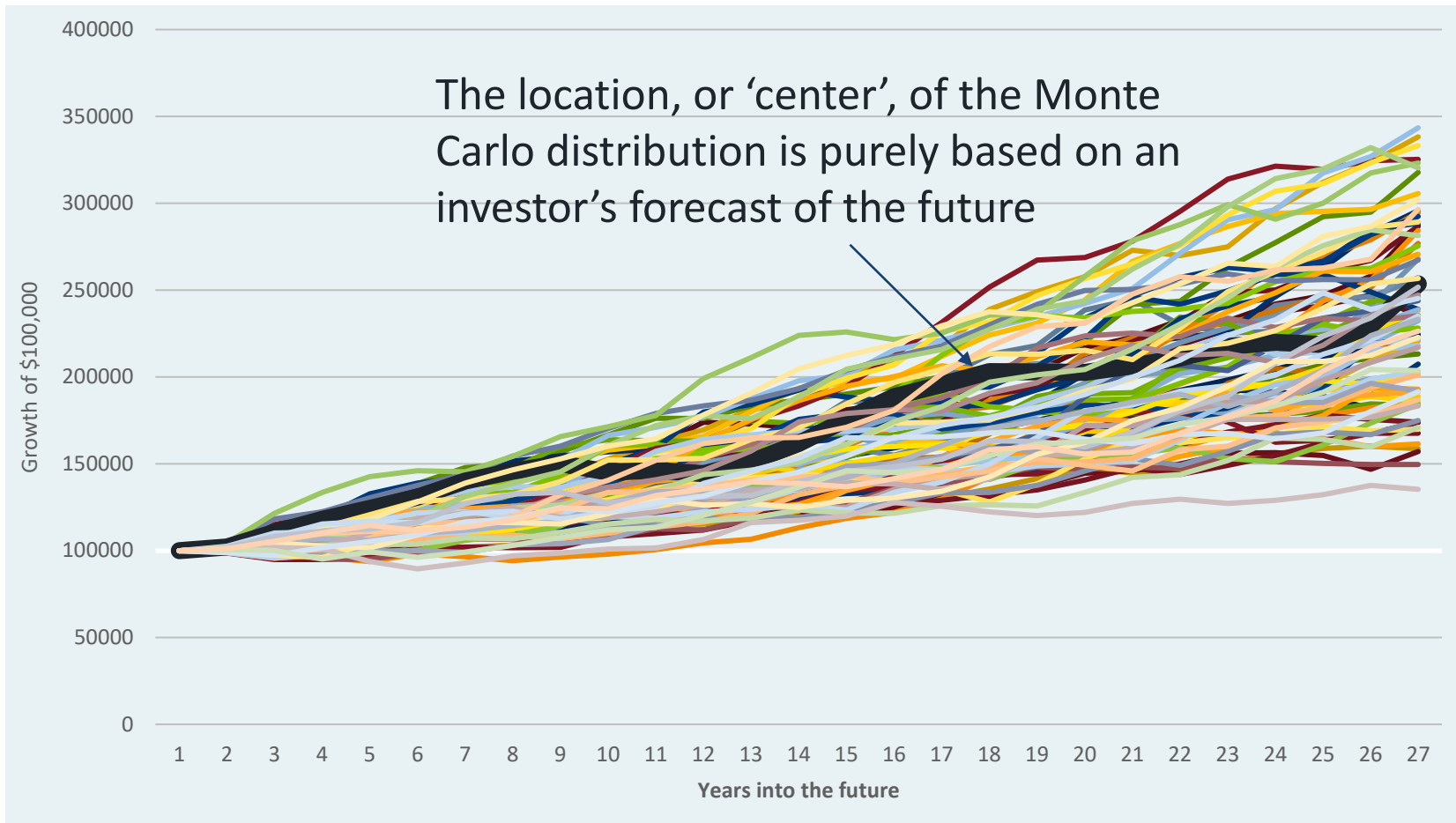
Monte Carlo analysis – *is this a tool to gage randomness?*



Randomness vs. range of forecasts

Monte Carlo analysis – *is this a tool to gage randomness?*

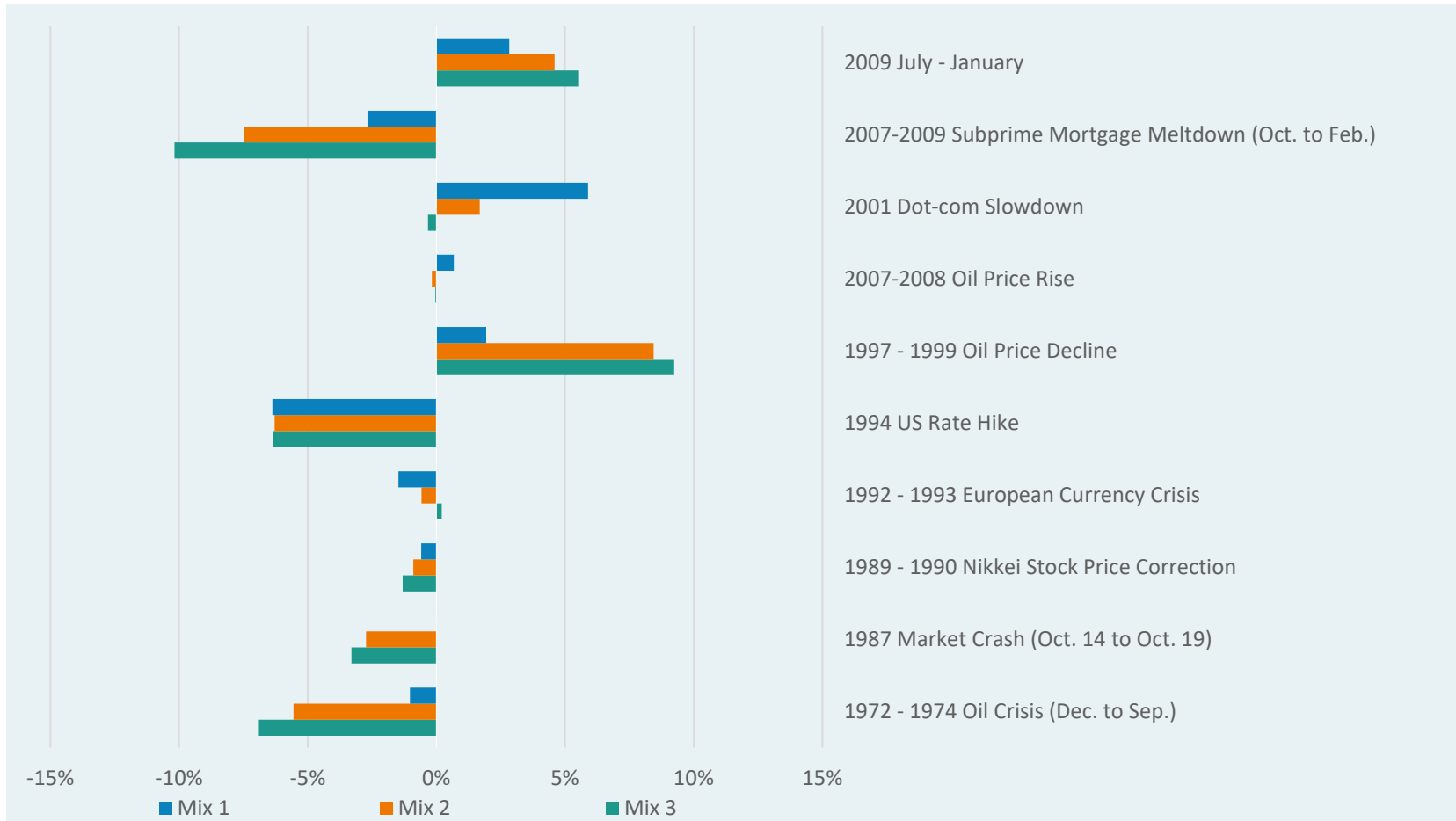
No. Monte Carlo analysis is 100% based on an investor's forecast



How can we think about the unexpected?

Historical scenario analysis provides another lens to portfolio design

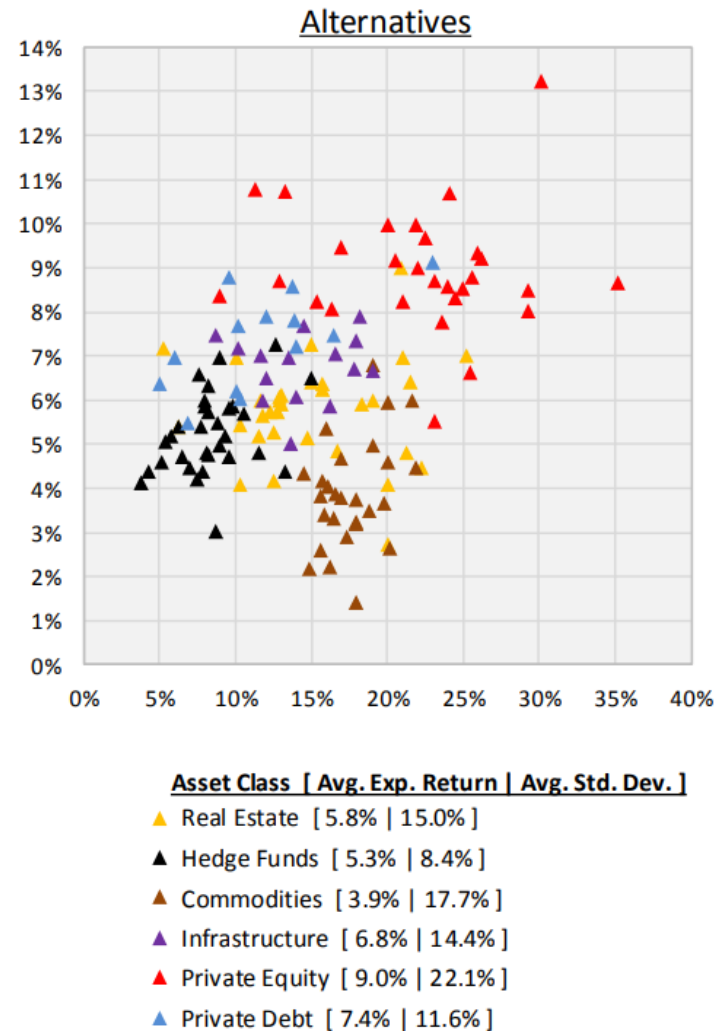
TAIL RISK – SCENARIO ANALYSIS



This analysis is based on how the risk factors inherent in the current index holdings reacted in those environments

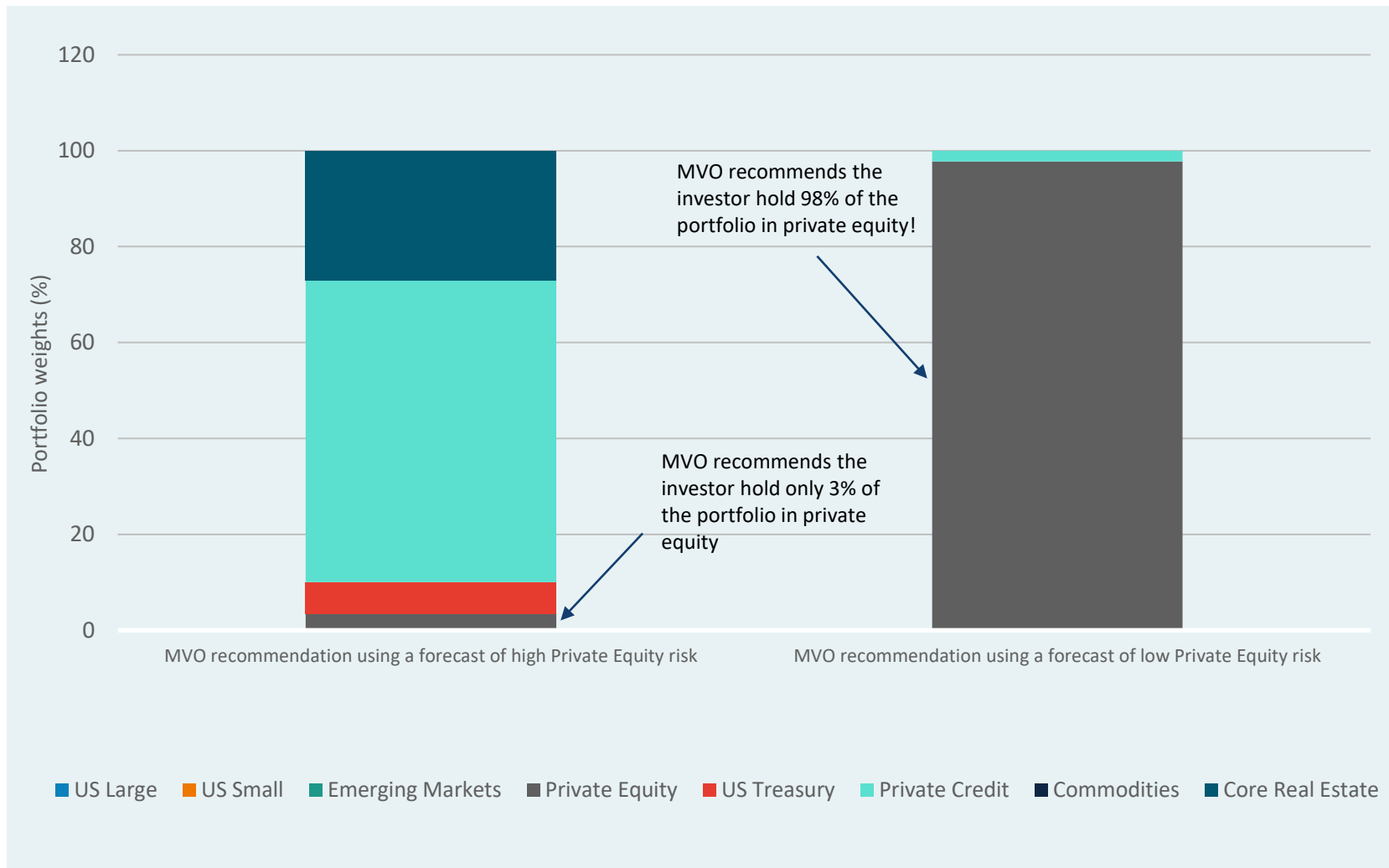
MVO is entirely dependent on forecasts

- Here we show the wide range of investment consultant forecasts for private equity return and risk.
- If each of the consultants that created these forecasts were to use MVO for asset allocation, they might reach wildly different conclusions regarding the “optimal” amount of private equity to hold.
- How much of an impact could the forecasted risk of a single asset class have on the MVO exercise? **On the next slide we show the impact on the total portfolio of these different forecasts for private equity volatility.**



Source: Horizon Actuarial Services, 2019 - https://www.horizonactuarial.com/uploads/3/0/4/9/30499196/horizon_cma_survey_2019_v0819.pdf

MVO is entirely dependent on forecasts



These are two iterations of the same MVO exercise

The only difference is that the two investors assumed different volatility levels of private equity

This single assumption, for a single asset class, results in entirely different portfolios

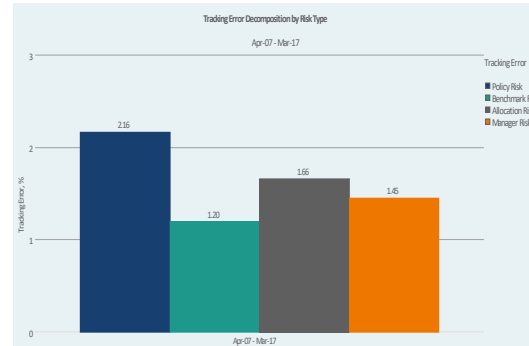
Analysis uses all Verus 2020 CMAs, but uses a higher private equity risk forecast for the left-hand bar chart, and a lower private equity risk forecast for the right-hand bar chart. Each portfolio shown is 9% volatility.

Multiple different approaches

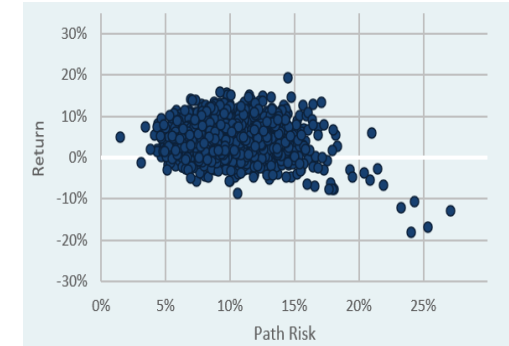
Verus Scenario Analysis

| | Policy | Mix 1 | Mix 2 | Mix 3 |
|-----------------------------------|--------------|--------------|--------------|--------------|
| Verus Scenario Analysis | | | | |
| 10 Year Return Forecast | | | | |
| Stagflation | 5.3 | 5.2 | 5.5 | 5.2 |
| Weak | 1.8 | 1.8 | 1.9 | 1.9 |
| Base CMA | 6.0 | 5.8 | 5.9 | 6.0 |
| Strong | 10.6 | 10.6 | 10.3 | 10.0 |
| Range of Scenario Forecast | 8.8 | 8.8 | 8.3 | 8.1 |
| Shock (1 year) | -24.4 | -24.7 | -22.7 | -22.3 |

Plan Tracking Error Tool



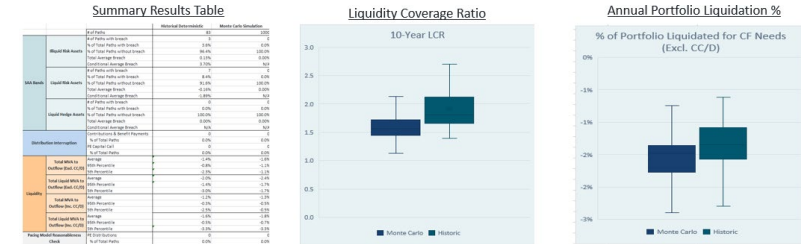
Monte Carlo Analysis



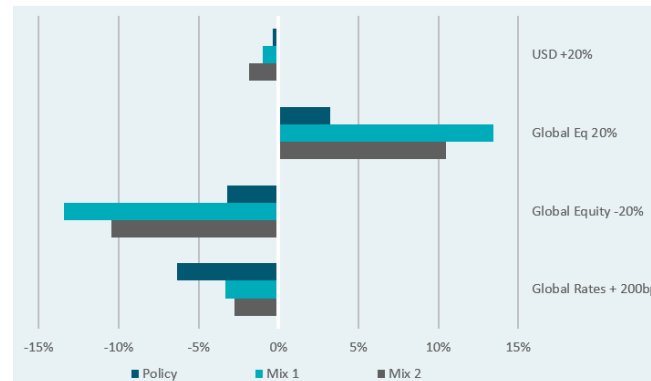
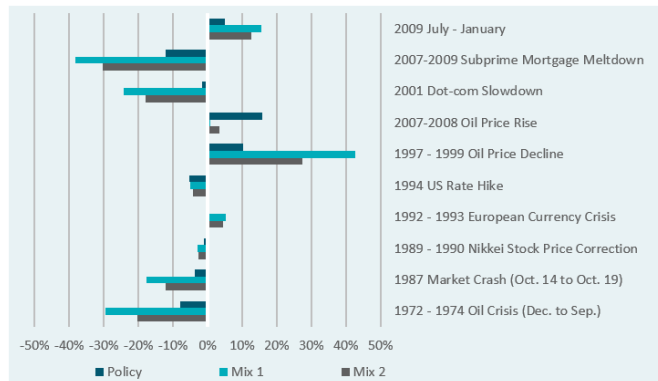
Active Manager Return Forecasting Tool



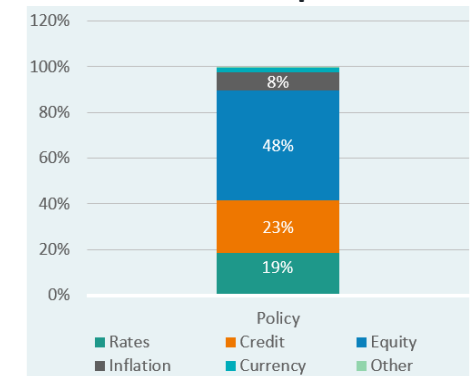
Liquidity Coverage & Spending Analysis Tool



Barra Tail Risk & Stress Tests



Barra Risk Decomposition



Mean variance analysis

| | Policy | Current | Diversified Allocation | Alternative Allocation | 80/20 | 70/30 | 60/40 | 2020 CMA's (10 Yr) | | |
|-------------------------------------|------------|------------|------------------------|------------------------|------------|------------|------------|--------------------|--------------------|------------------|
| | | | | | | | | Return (g) | Standard Deviation | Sharpe Ratio (a) |
| US Large | 23.0 | 24.9 | 20.0 | 20.0 | 0.0 | 0.0 | 0.0 | 5.5 | 15.4 | 0.31 |
| US Small | 6.0 | 5.8 | 5.0 | 5.0 | 0.0 | 0.0 | 0.0 | 5.7 | 21.1 | 0.28 |
| Total Domestic Equity | 29 | 31 | 25 | 25 | 0 | 0 | 0 | | | |
| International Developed | 17.0 | 17.2 | 18.0 | 16.0 | 0.0 | 0.0 | 0.0 | 7.0 | 17.5 | 0.37 |
| Emerging Markets | 7.0 | 7.7 | 7.0 | 7.0 | 0.0 | 0.0 | 0.0 | 7.6 | 25.6 | 0.33 |
| Total Int'l Equity | 24 | 25 | 25 | 23 | 0 | 0 | 0 | | | |
| Global Equity | 0.0 | 0.0 | 0.0 | 0.0 | 80.0 | 70.0 | 60.0 | 6.4 | 16.8 | 0.34 |
| Total Equity | 53 | 56 | 50 | 48 | 80 | 70 | 60 | | | |
| Core Plus Fixed Income | 22.0 | 21.8 | 20.0 | 22.0 | 20.0 | 30.0 | 40.0 | 2.7 | 8.3 | 0.14 |
| Bank Loans | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.3 | 10.0 | 0.39 |
| US TIPS | 5.0 | 4.8 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 5.4 | 0.06 |
| Total Fixed Income | 27 | 27 | 30 | 22 | 20 | 30 | 40 | | | |
| Core Real Estate | 5.0 | 6.7 | 5.0 | 5.0 | 0.0 | 0.0 | 0.0 | 6.6 | 12.4 | 0.44 |
| Value Add Real Estate | 5.0 | 4.0 | 5.0 | 5.0 | 0.0 | 0.0 | 0.0 | 8.6 | 17.7 | 0.46 |
| Total Real Assets | 10 | 11 | 10 | 10 | 0 | 0 | 0 | | | |
| Private Equity | 5.0 | 3.8 | 5.0 | 10.0 | 0.0 | 0.0 | 0.0 | 8.5 | 25.3 | 0.37 |
| Private Credit | 5.0 | 3.0 | 5.0 | 10.0 | 0.0 | 0.0 | 0.0 | 7.0 | 10.0 | 0.56 |
| Total Non-Public Investments | 10 | 7 | 10 | 20 | 0 | 0 | 0 | | | |
| Cash | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 1.2 | - |
| Total Allocation | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | |

| | Policy | Current | Diversified Allocation | Alternative Allocation | 80/20 | 70/30 | 60/40 |
|--------------------------------|------------|------------|------------------------|------------------------|------------|------------|------------|
| Mean Variance Analysis | | | | | | | |
| Forecast 10 Year Return | 6.1 | 6.0 | 6.2 | 6.5 | 5.8 | 5.5 | 5.2 |
| Standard Deviation | 11.5 | 11.6 | 11.4 | 11.9 | 13.9 | 12.5 | 11.2 |
| Return/Std. Deviation | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 |
| 1st percentile ret. 1 year | -17.4 | -17.7 | -17.1 | -17.7 | -21.7 | -19.7 | -17.8 |
| Sharpe Ratio | 0.42 | 0.41 | 0.42 | 0.44 | 0.35 | 0.35 | 0.35 |

Source: Barra. Current mix as of 12/31/19

Liquidity Coverage Ratio (LCR)

Does the Plan need to sell illiquid assets to cover cash outflows in the next 5 years?

$$\text{Liquidity Coverage Ratio (LCR)} = \frac{\begin{aligned} & \text{Liquid Financial Assets (normal market condition)} \\ & \sum(\text{Distributions from Illiquid Assets}) \\ & \sum(\text{Gifts/Contributions}) \\ & \sum(\text{Investment Income}) \end{aligned}}{\begin{aligned} & \sum(\text{Spending Policy}) \\ & \sum(\text{Capital Calls for Illiquid Assets}) \\ & \sum(\text{Plan Expenses}) \end{aligned}}$$

| LCR Value | Implication |
|-----------|--|
| <1 | The plan will need to sell illiquid assets to cover cash flows |
| 1 | The plan has sufficient liquidity to cover all cash flows |
| >1 | The plan will not be required to sell illiquid assets to cover liquidity needs |

Liquidity coverage ratio sensitivities

Understanding what drives changes to the LCR using deterministic scenarios

LCR FOR GIVEN DRAWDOWN AND SUBSEQUENT RETURNS

| | | Annualized subsequent returns (5yrs) | | | | | |
|-----------------------|------|--------------------------------------|-------|-------|-------|-------|-------|
| | | 1.75% | 2.75% | 3.75% | 4.75% | 5.75% | 6.75% |
| Immediate drawdown | -50% | 1.68 | 1.72 | 1.76 | 1.79 | 1.84 | 1.88 |
| | -40% | 1.83 | 1.87 | 1.92 | 1.97 | 2.02 | 2.08 |
| | -30% | 1.98 | 2.04 | 2.10 | 2.16 | 2.23 | 2.30 |
| | -20% | 2.14 | 2.21 | 2.29 | 2.37 | 2.43 | 2.49 |
| | -10% | 2.32 | 2.39 | 2.45 | 2.52 | 2.59 | 2.66 |
| | 0% | 2.46 | 2.53 | 2.60 | 2.67 | 2.75 | 2.82 |

Stressed market conditions require consideration of the magnitude of the drawdown, subsequent returns, changes to capital calls & distributions among other dynamics.

LCR FOR GIVEN CHANGES TO PRIVATE MARKET CAPITAL CALLS AND DISTRIBUTION

| | | Capital call reduction | | | | | |
|---------------------------|-----|------------------------|------|------|------|------|------|
| | | 5% | 15% | 25% | 35% | 45% | 55% |
| Distribution Reduction | 95% | 2.04 | 2.10 | 2.16 | 2.23 | 2.31 | 2.38 |
| | 85% | 2.09 | 2.15 | 2.22 | 2.29 | 2.36 | 2.44 |
| | 75% | 2.14 | 2.20 | 2.27 | 2.34 | 2.42 | 2.50 |
| | 65% | 2.19 | 2.26 | 2.33 | 2.40 | 2.48 | 2.56 |
| | 55% | 2.24 | 2.31 | 2.38 | 2.46 | 2.54 | 2.62 |
| | 45% | 2.29 | 2.36 | 2.43 | 2.51 | 2.59 | 2.68 |

LCR < 1 implies the need to sell illiquids to meet cash flows.

Roughly right is better than exactly wrong



Multiple different approaches can help you understand roughly where the right answer sits

So What?

Key takeaways

1. This is hard and there are no certainties
2. Investing is about deciding – and deciding as a group
3. Math is the tool we use to describe the uncertain future – but it draws a rough picture rather than gives an exact answer
4. Multiple tools are better than one tool – understanding what could go wrong is more important than trying to predict what will go right with certainty
5. There are NEVER any stupid questions in the investment process. Nobody knows everything. If you are confused someone else in the room is likely confused too

Notices & disclosures

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