

Executive Team:

Dominic D. Brown, CPA, CFE
Chief Executive Officer

Daryn Miller, CFA
Chief Investment Officer

Jennifer Zahry, JD
Chief Legal Officer

Matthew Henry, CFE
Chief Operations Officer



Board of Retirement:

Phil Franey, Chair
David Couch, Vice-Chair
Jordan Kaufman
Juan Gonzalez
Joseph D. Hughes
John Sanders
Rick Kratt
Tyler Whitezell
Dustin Contreras, Alternate
Chase Nunneley, Alternate
Robb Seibly, Alternate
3rd Member (Vacant)

April 19, 2024

Members, Board of Retirement
Employee Bargaining Units
Requesting News Media
Other Interested Parties

Subject: Meeting of the Kern County Employees' Retirement Association Investment Committee

Ladies and Gentlemen:

A meeting of the Kern County Employees' Retirement Association Investment Committee will be held on Friday, April 26, 2024 at 10:30 a.m. in the KCERA Boardroom, 11125 River Run Boulevard, Bakersfield, California, 93311.

How to Participate: Listen to or View the Board Meeting

To listen to the live audio of the Board meeting, please dial one of the following numbers (for best audio a landline is recommended) and enter ID# 874 4725 8022

- (669) 900-9128; U.S. Toll-free: (888) 788-0099 or (877) 853-5247

To access live audio and video of the Board meeting, please use the following:

- <https://us02web.zoom.us/j/87447258022?pwd=YkhGdnhEeGVXWHdncUpxbFA4QVFEdz09>
- Passcode: 999971

Items of business will be limited to the matters shown on the attached agenda. If you have any questions or require additional service, please contact KCERA at (661) 381-7700 or send an email to administration@kcera.org.

Sincerely,

Dominic D. Brown
Chief Executive Officer

Attachments

AGENDA:

All agenda item supporting documentation is available for public review on KCERA's website at www.kcera.org following the posting of the agenda. Any supporting documentation that relates to an agenda item for an open session of any regular meeting that is distributed after the agenda is posted and prior to the meeting will also be available for review at the same location.

**AMERICANS WITH DISABILITIES ACT
(Government Code §54953.2)**

Disabled individuals who need special assistance to listen to and/or participate in the meeting of the Board of Retirement may request assistance by calling (661) 381-7700 or sending an email to administration@kcera.org. Every effort will be made to reasonably accommodate individuals with disabilities by making meeting materials and access available in alternative formats. Requests for assistance should be made at least two (2) days in advance of a meeting whenever possible.

CALL TO ORDER

ROLL CALL (IN PERSON)

AB 2449 REMOTE APPEARANCE(S)

Items 1 and/or 2 withdrawn from agenda if no trustee(s) request to appear remotely:

1. JUST CAUSE CIRCUMSTANCE(S):
 - a) The following Trustee(s) have notified the Committee of a "Just Cause" to attend this meeting via teleconference. (See Government Code § 54953).
 - NONE
 - b) Call for Trustee(s) who wish to notify the Committee of a "Just Cause" to attend this meeting via teleconference. (See Government Code § 54953) – RECEIVE/HEAR REQUEST(S); NO COMMITTEE ACTION REQUIRED
2. EMERGENCY CIRCUMSTANCE(S):
 - a) The following Trustee(s) have requested the Committee approve their attendance of this meeting via teleconference due to an "Emergency Circumstance." (See Government Code § 54953).
 - NONE
 - b) Call for Trustee(s) requesting the Committee approve their attendance of this meeting via teleconference due to an "Emergency Circumstance". (See Government Code § 54953) – TAKE ACTION ON REQUEST(S) FOR REMOTE APPEARANCE DUE TO EMERGENCY CIRCUMSTANCE

3. [Discussion and appropriate action on the annual asset allocation review presented](#) by Scott Whalen, CFA, Verus, and Chief Investment Officer Daryn Miller, CFA, – RECOMMEND THE BOARD OF RETIREMENT APPROVE ASSET ALLOCATION

PUBLIC COMMENTS

4. The public is provided the opportunity to comment on agenda items at the time those agenda items are discussed by the Committee. This portion of the meeting is reserved for persons to address the Committee on any matter not on this agenda but under the jurisdiction of the Committee. Committee members may respond briefly to statements made or questions posed. They may ask a question for clarification and, through the Chair, make a referral to staff for factual information or request staff to report back to the Committee at a later meeting. Speakers are limited to two minutes. Please state your name for the record prior to making a presentation.

REFERRALS TO STAFF, ANNOUNCEMENTS OR REPORTS

5. On their own initiative, Committee members may make a brief announcement, refer matters to staff, subject to KCERA's rules and procedures, or make a brief report on their own activities.
6. Adjournment





**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



APRIL 2024

Strategic Asset Allocation Review

Kern County Employees' Retirement Association

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SAN FRANCISCO 415.362.3484

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***Past performance is no guarantee of future results.** This document is provided for informational purposes only and is directed to institutional clients and eligible institutional counterparties only and is not intended for retail investors. Nothing herein constitutes investment, legal, accounting or tax advice, or a recommendation to buy, sell or hold a security or pursue a particular investment vehicle or any trading strategy. This document may include or imply estimates, outlooks, projections and other “forward-looking statements.” No assurance can be given that future results described or implied by any forward looking information will be achieved. Investing entails risks, including possible loss of principal. Additional information about Verus Advisory, Inc. is available on the SEC’s website at www.adviserinfo.sec.gov. Verus – also known as Verus Advisory™.*

Executive summary

- Verus reviewed KCERA’s strategic asset allocation (“SAA”) applying updated 2024 Capital Market Assumptions (“CMAs”)
- 2024 CMAs were broadly higher than the previous year (with a few notable exceptions), largely resulting from higher interest rates
- Mean-variance modeling shows a modest improvement in portfolio efficiency with lower leverage and a correspondingly lower alpha pool

Capital market assumptions

Methodology

CORE INPUTS

- We use a fundamental building block approach based on several inputs, including historical data and academic research to create asset class return forecasts.
- For most asset classes, we use the long-term historical volatility after adjusting for autocorrelation.
- Correlations between asset classes are calculated based on the last 10 years. For illiquid assets, such as private equity and private real estate, we use BarraOne correlation estimates.

Asset	Return Methodology	Volatility Methodology*
Inflation	25% weight to the University of Michigan Survey 5-10 year ahead inflation expectation and the Survey of Professional Forecasters (Fed Survey), and the remaining 50% to the market's expectation for inflation as observed through the 10-year TIPS breakeven rate	-
Cash	1/3 * current federal funds rate + 1/3 * U.S. 10-year Treasury yield + 1/3 * Federal Reserve long-term interest rate target	Long-term volatility
Bonds	Nominal bonds: current yield; Real bonds: real yield + inflation forecast	Long-term volatility
International Bonds	Current yield	Long-term volatility
Credit	Current option-adjusted spread + U.S. 10-year Treasury – effective default rate	Long-term volatility
International Credit	Current option-adjusted spread + foreign 10-year Treasury – effective default rate	Long-term volatility
Private Credit	Levered gross return (SOFR + spread + original issuance discounts) – management fees – carried interest	Estimated volatility
Equity	Current yield + real earnings growth (historical average) + inflation on earnings (inflation forecast) + expected P/E change	Long-term volatility
Intl Developed Equity	Current yield + real earnings growth (historical average) + inflation on earnings (intl. inflation forecast) + expected P/E change	Long-term volatility
Private Equity**	US large cap domestic equity forecast * 1.85 beta adjustment	1.2 * Long-term volatility of U.S. small cap
Commodities	Collateral return (cash) + spot return (inflation forecast) + roll return (assumed to be zero)	Long-term volatility
Hedge Funds	Return coming from traditional betas + 15-year historical idiosyncratic return	Long-term volatility
Core Real Estate	Cap rate + real income growth – capex + inflation forecast	65% of REIT volatility
REITs	Core real estate	Long-term volatility
Value-Add Real Estate	Core real estate + 2%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Opportunistic Real Estate	Core real estate + 3%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Infrastructure	Current yield + real income growth + inflation on earnings (inflation forecast)	Long-term volatility
Risk Parity	Modeled as the 10-year return expectations of a <i>representative selection of Risk Parity strategies</i>	Target volatility

*Long-term historical volatility data is adjusted for autocorrelation (see Appendix)

**Private Equity is modeled assuming an 8.0% floor for expected return, and a 3% return premium ceiling over U.S. Large Cap Equity. These adjustments are in place to recognize that higher interest rates (cost of leverage) act as a drag on expected Private Equity returns but that this drag has had limits historically, and to recognize that future Private Equity total universe performance is likely to be more anchored to public equity performance than in past times, given a more competitive market environment

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Equities								
U.S. Large	S&P 500	5.9%	7.0%	15.5%	0.12	0.19	0.72	0.75
U.S. Small	Russell 2000	6.2%	8.2%	21.4%	0.10	0.19	0.28	0.37
International Developed	MSCI EAFE	8.1%	9.5%	17.6%	0.23	0.31	0.18	0.25
International Small	MSCI EAFE Small Cap	8.8%	10.9%	21.7%	0.22	0.31	0.20	0.27
Emerging Markets	MSCI EM	8.8%	11.4%	24.6%	0.19	0.30	0.06	0.14
Global Equity	MSCI ACWI	6.9%	8.2%	16.7%	0.17	0.25	0.44	0.50
Global Equity ex USA	MSCI ACWI ex USA	8.5%	10.2%	19.5%	0.23	0.31	0.15	0.22
Private Equity	CA Private Equity	8.0%	10.9%	25.6%	0.15	0.27	-	-
Private Equity Direct	CA Private Equity	9.0%	11.8%	25.6%	0.19	0.30	-	-
Private Equity (FoF)	CA Private Equity	7.0%	9.9%	25.6%	0.11	0.23	-	-
Fixed Income								
Cash	30 Day T-Bills	4.1%	4.1%	1.1%	-	-	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5-10	4.7%	4.8%	5.5%	0.11	0.13	0.13	0.15
Non-U.S. Inflation Linked Bonds	Bbg World Govt. Inflation Linked Bond ex U.S.	3.9%	4.2%	7.4%	(0.03)	0.01	(0.15)	(0.11)
U.S. Treasury	Bloomberg Treasury 7-10 Year	4.6%	4.8%	7.1%	0.07	0.10	(0.05)	(0.02)
Long U.S. Treasury	Bloomberg Treasury 20+ Year	4.7%	5.5%	13.2%	0.05	0.11	0.00	0.25
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	2.7%	3.2%	9.9%	(0.14)	(0.09)	(0.40)	(0.36)
Global Aggregate	Bloomberg Global Aggregate	4.1%	4.3%	6.6%	0.00	0.03	(0.27)	(0.24)
Core Fixed Income	Bloomberg U.S. Aggregate Bond	4.9%	5.0%	4.8%	0.17	0.19	0.00	0.02
Core Plus Fixed Income	Bloomberg U.S. Universal	5.2%	5.3%	4.5%	0.24	0.27	0.07	0.09
Investment Grade Corp. Credit	Bloomberg U.S. Corporate Investment Grade	5.7%	6.0%	8.4%	0.19	0.23	0.17	0.20
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1-3 Year	4.7%	4.8%	3.6%	0.17	0.19	(0.07)	(0.07)
Short-Term Credit	Bloomberg Credit 1-3 Year	5.1%	5.2%	3.6%	0.28	0.31	0.23	0.24
Long-Term Credit	Bloomberg Long U.S. Credit	5.7%	6.3%	10.9%	0.15	0.20	0.15	0.20
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	6.6%	7.2%	11.0%	0.23	0.28	0.42	0.44
Bank Loans	Morningstar LSTA Leveraged Loan	8.0%	8.4%	9.0%	0.43	0.48	0.58	0.59
Global Credit	Bloomberg Global Credit	5.1%	5.4%	7.7%	0.13	0.17	0.01	0.04
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	8.7%	9.2%	10.6%	0.43	0.48	0.15	0.20
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	6.5%	7.2%	12.2%	0.20	0.25	(0.17)	(0.12)
Private Credit	Morningstar LSTA Leveraged Loan	9.2%	9.8%	11.9%	0.43	0.48	-	-
Private Credit (Direct Lending - Unlevered)	Morningstar LSTA Leveraged Loan	8.0%	8.4%	9.0%	0.43	0.48	-	-
Private Credit (Direct Lending - Levered)	Morningstar LSTA Leveraged Loan	9.5%	10.2%	12.6%	0.43	0.48	-	-
Private Credit (Credit Opportunities)	Morningstar LSTA Leveraged Loan	9.6%	10.3%	12.8%	0.43	0.48	-	-
Private Credit (Junior Capital / Mezzanine)	Morningstar LSTA Leveraged Loan	9.0%	9.6%	11.4%	0.43	0.48	-	-
Private Credit (Distressed)	Morningstar LSTA Leveraged Loan	9.1%	12.7%	29.1%	0.17	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)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Other								
Commodities	Bloomberg Commodity	6.6%	7.8%	16.1%	0.16	0.23	(0.13)	(0.06)
Hedge Funds	HFRI Fund Weighted Composite	4.3%	4.6%	7.5%	0.03	0.07	0.48	0.49
Hedge Fund of Funds	HFRI Fund of Funds Composite	3.3%	3.6%	7.5%	(0.11)	(0.07)	-	-
Hedge Funds (Equity Style)	Custom HFRI Benchmark Mix*	7.2%	8.1%	14.1%	0.22	0.28	-	-
Hedge Funds (Credit Style)	Custom HFRI Benchmark Mix*	7.3%	7.7%	9.4%	0.34	0.38	-	-
Hedge Funds (Asymmetric Style)	Custom HFRI Benchmark Mix*	5.4%	5.6%	6.4%	0.20	0.23	-	-
Real Estate Debt	Bloomberg CMBS IG	7.4%	7.7%	7.5%	0.44	0.48	0.14	0.15
Core Real Estate	NCREIF Property	6.8%	7.5%	12.5%	0.22	0.27	-	-
Value-Add Real Estate	NCREIF Property + 200bps	8.8%	9.9%	15.4%	0.31	0.38	-	-
Opportunistic Real Estate	NCREIF Property + 300bps	9.8%	11.7%	21.1%	0.27	0.36	-	-
REITs	Wilshire REIT	6.8%	8.5%	19.2%	0.14	0.23	0.35	0.42
Global Infrastructure	S&P Global Infrastructure	8.4%	9.7%	16.9%	0.25	0.33	0.20	0.28
Risk Parity**	S&P Risk Parity 10% Vol Index	7.2%	7.8%	10.0%	0.31	0.37	-	-
Currency Beta	MSCI Currency Factor Index	2.3%	2.4%	3.4%	(0.52)	(0.49)	(0.06)	0.21
Inflation		2.5%	-	-	-	-	-	-

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.

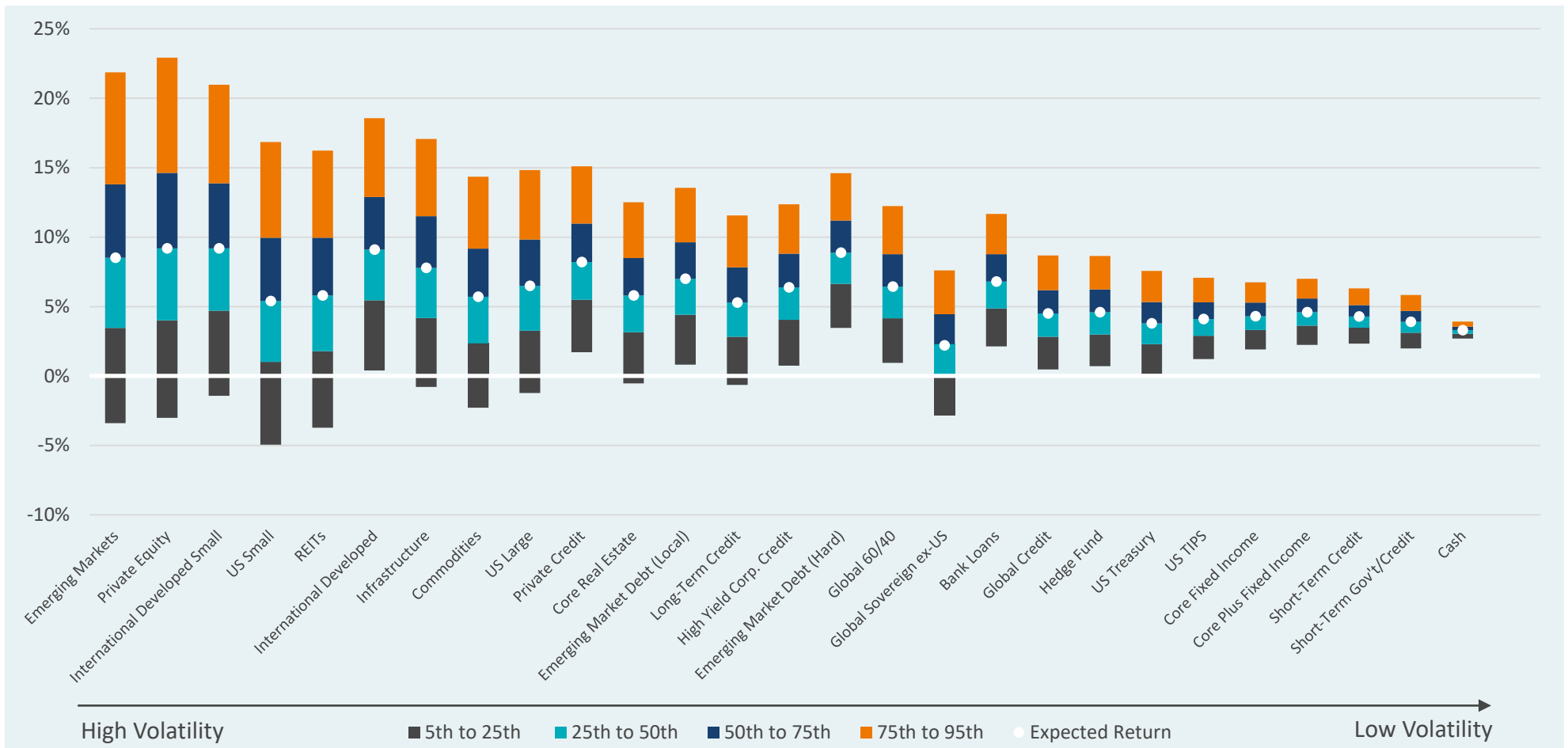
Correlation assumptions

	Cash	US Large	US Small	Intl Large	Intl Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex-US	US Core	Core Plus	Short-Term Gov't/Credit	Short-Term Credit	Long-Term Credit	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commodities	Hedge Funds	Real Estate	REITs	Infrastructure	Currency Beta	Risk Parity	
Cash	1.0																												
US Large	-0.1	1.0																											
US Small	-0.2	0.9	1.0																										
Intl Large	-0.1	0.9	0.8	1.0																									
Intl Small	-0.1	0.9	0.8	1.0	1.0																								
EM	-0.1	0.7	0.6	0.8	0.8	1.0																							
Global Equity	-0.1	1.0	0.9	0.9	0.9	0.8	1.0																						
PE	-0.2	0.7	0.7	0.6	0.6	0.6	0.7	1.0																					
US TIPS	-0.1	0.4	0.3	0.4	0.4	0.4	0.5	0.2	1.0																				
US Treasury	0.0	0.1	-0.1	0.0	0.0	0.1	0.1	-0.1	0.7	1.0																			
Global Sovereign ex-US	0.1	0.3	0.2	0.4	0.4	0.5	0.4	0.1	0.7	0.6	1.0																		
US Core	0.0	0.3	0.2	0.3	0.3	0.4	0.3	0.0	0.8	0.9	0.7	1.0																	
Core Plus	0.0	0.4	0.3	0.4	0.4	0.5	0.4	0.1	0.8	0.8	0.8	1.0	1.0																
Short-Term Gov't/Credit	0.2	0.2	0.0	0.2	0.2	0.3	0.2	0.0	0.7	0.8	0.6	0.8	0.8	1.0															
Short-Term Credit	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.2	0.6	0.5	0.7	0.7	0.8	0.7	1.0														
Long-Term Credit	0.0	0.5	0.4	0.5	0.5	0.5	0.6	0.2	0.8	0.7	0.7	0.9	0.9	0.6	0.8	1.0													
US HY	-0.1	0.8	0.8	0.8	0.8	0.7	0.8	0.5	0.6	0.1	0.5	0.4	0.6	0.3	0.6	0.7	1.0												
Bank Loans	-0.1	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.3	-0.2	0.2	0.1	0.3	0.0	0.5	0.4	0.8	1.0											
Global Credit	0.0	0.7	0.5	0.7	0.7	0.7	0.7	0.3	0.7	0.5	0.8	0.8	0.9	0.6	0.8	0.9	0.8	0.6	1.0										
EMD USD	-0.1	0.7	0.6	0.7	0.7	0.7	0.7	0.4	0.6	0.3	0.6	0.6	0.7	0.4	0.6	0.8	0.8	0.7	0.9	1.0									
EMD Local	0.0	0.5	0.4	0.7	0.6	0.8	0.7	0.4	0.4	0.2	0.6	0.4	0.5	0.4	0.5	0.6	0.7	0.5	0.8	0.8	1.0								
Commodities	-0.1	0.4	0.4	0.5	0.5	0.5	0.5	0.3	0.2	-0.2	0.2	0.0	0.1	0.0	0.2	0.1	0.5	0.5	0.3	0.4	0.4	1.0							
Hedge Funds	-0.1	0.8	0.9	0.8	0.9	0.8	0.9	0.6	0.3	-0.2	0.3	0.2	0.3	0.0	0.4	0.5	0.8	0.8	0.6	0.7	0.6	0.6	1.0						
Real Estate	-0.3	0.6	0.6	0.5	0.5	0.5	0.6	0.4	0.2	0.0	-0.1	0.1	0.2	0.0	-0.2	0.2	0.4	0.4	0.3	0.4	0.4	0.2	0.5	1.0					
REITs	-0.2	0.7	0.7	0.6	0.6	0.5	0.7	0.5	0.6	0.3	0.3	0.5	0.5	0.2	0.3	0.6	0.7	0.5	0.6	0.6	0.5	0.3	0.6	0.7	1.0				
Infrastructure	-0.2	0.8	0.7	0.8	0.8	0.7	0.8	0.6	0.5	0.1	0.5	0.4	0.5	0.2	0.5	0.6	0.8	0.7	0.7	0.8	0.7	0.6	0.8	0.6	0.7	1.0			
Currency Beta	-0.1	0.0	0.0	-0.2	-0.2	-0.2	-0.1	0.1	-0.2	-0.1	-0.3	-0.2	-0.2	-0.1	-0.3	-0.2	-0.1	-0.1	-0.3	-0.2	-0.2	-0.2	-0.1	0.1	0.0	-0.1	1.0		
Risk Parity	0.0	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.4	0.4	0.0	0.5	0.5	0.7	0.3	0.7	0.7	0.7	0.5	0.7	0.6	0.5	0.5	0.4	0.0	0.7	-0.2	1.0	

Note: as of 9/30/23 - Correlation assumptions are based on the last ten years. Private Equity and Real Estate correlations are especially difficult to model – we have therefore used BarraOne correlation data to strengthen these correlation estimates.

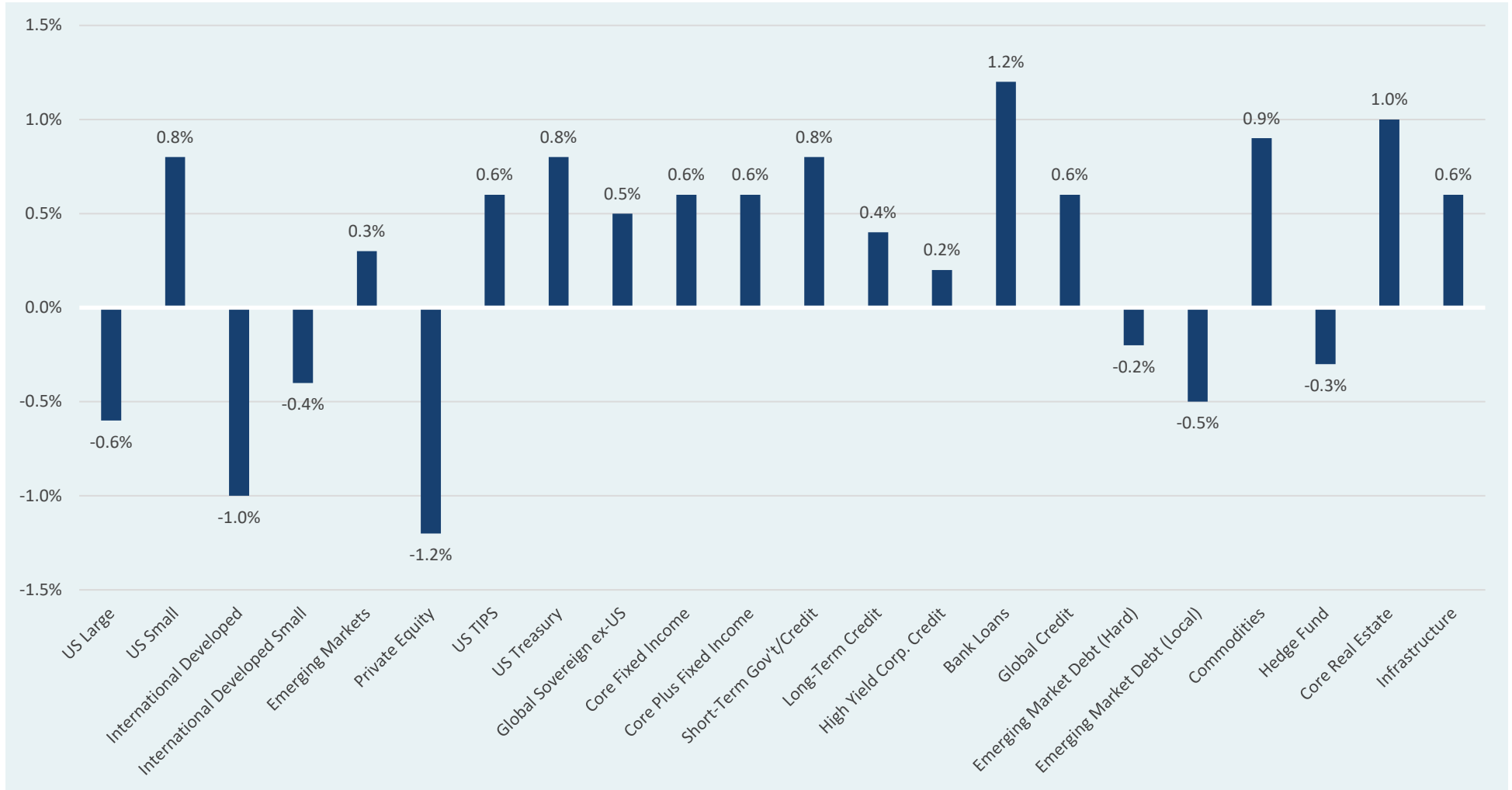
Range of likely 10-year outcomes

10-YEAR RETURN 90% CONFIDENCE INTERVAL



Source: Verus, MPI

2024 vs. 2023 return forecast



Source: Verus, as of 9/30/23

Strategic asset allocation

Mean variance analysis

	Current Dec 2023	Policy Sep 2023	Lower Leverage and Alpha Pool	Verus 2024 CMA's (10 Yr)			Return (g)	Return (a)	Standard Deviation	Sharpe Ratio (a)
				80-20	70-30	60-40				
Global Equity	32.5	33.0	33.0	80.0	70.0	60.0	6.9	8.2	16.7	0.17
Total Equity	33	33	33	80	70	60				
CORE	15	15	15	20	30	40				
Core Fixed Income	9.3	4.0	4.0	0.0	0.0	0.0	4.9	5.0	4.8	0.19
Core Plus Fixed Income	5.4	0.0	0.0	20.0	30.0	40.0	5.2	5.3	4.5	0.24
US Treasury	0.0	3.0	3.0	0.0	0.0	0.0	4.6	4.8	7.1	0.10
US Long Treasury	0.0	4.0	4.0	0.0	0.0	0.0	4.7	5.5	13.2	0.11
Short-Term Credit	0.0	4.0	4.0	0.0	0.0	0.0	5.1	5.2	3.6	0.31
CREDIT	8	10	10	0	0	0				
High Yield Corp. Credit	3.1	0.0	0.0	0.0	0.0	0.0	6.6	7.2	11.0	0.28
Bank Loans	0.0	2.5	2.5	0.0	0.0	0.0	8.0	8.4	9.0	0.48
Emerging Market Debt (Hard)	1.8	2.5	2.5	0.0	0.0	0.0	8.7	9.2	10.6	0.48
Emerging Market Debt (Local)	1.8	0.0	0.0	0.0	0.0	0.0	6.5	7.2	12.2	0.25
Securitized Credit	1.6	5.0	5.0	0.0	0.0	0.0	7.3	7.8	10.0	0.37
Total Fixed Income	23	25	25	20	30	40				
Commodities	3.7	4.0	4.0	0.0	0.0	0.0	6.6	7.8	16.1	0.23
Core Real Estate	4.8	5.0	5.0	0.0	0.0	0.0	6.8	7.5	12.5	0.27
Value Add Real Estate	2.9	5.0	5.0	0.0	0.0	0.0	8.8	9.9	15.4	0.38
Midstream	5.5	5.0	5.0	0.0	0.0	0.0	6.1	10.1	24.5	0.24
Total Real Assets	17	19	19	0	0	0				
Hedge Fund	10.1	10.0	10.0	0.0	0.0	0.0	4.3	4.6	7.5	0.07
Alpha Pool	4.0	8.0	4.0	0.0	0.0	0.0				
Private Equity	4.1	5.0	5.0	0.0	0.0	0.0	8.0	10.9	25.6	0.27
Private Credit ¹	5.5	8.0	8.0	0.0	0.0	0.0				
Opportunistic ²	2.6	0.0	0.0	0.0	0.0	0.0				
Total Non-Public Investments	26	31	27	0	0	0				
Short-Term Gov't/Credit	7.5	0.0	0.0	0.0	0.0	0.0	4.7	4.8	3.6	0.19
Cash	-6.1	-8.0	-4.0	0.0	0.0	0.0	4.1	4.1	1.1	--
Cash & Cash Equivalents	1.4	-8.0	-4.0	0.0	0.0	0.0				
Total Allocation	100	100	100	100	100	100				

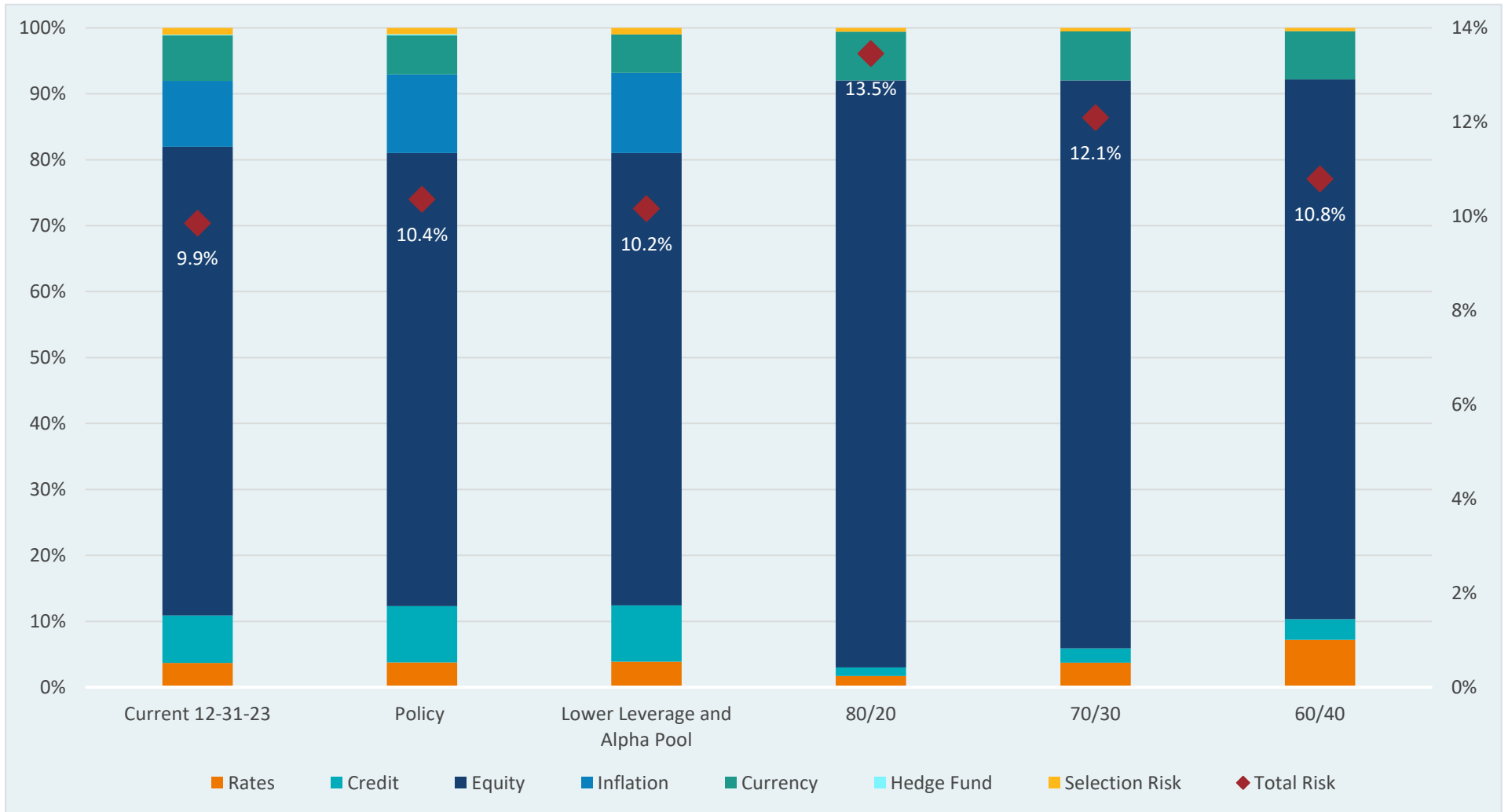
Mean Variance Analysis						
Forecast 10 Year Return	7.1	7.4	7.4	6.7	6.6	6.5
Standard Deviation	11.3	11.8	11.5	14.0	12.6	11.1
Return/Std. Deviation	0.6	0.6	0.6	0.5	0.5	0.6
1st percentile ret. 1 year	-16.0	-16.6	-16.1	-21.1	-18.7	-16.3
Sharpe Ratio	0.31	0.32	0.33	0.25	0.25	0.26

Source: Verus/MPI; Current Portfolio as of 12/31/23

¹ The Private Credit allocation is modeled using a mix of Direct Lending, Credit Opps., and Distressed Credit CMAs.

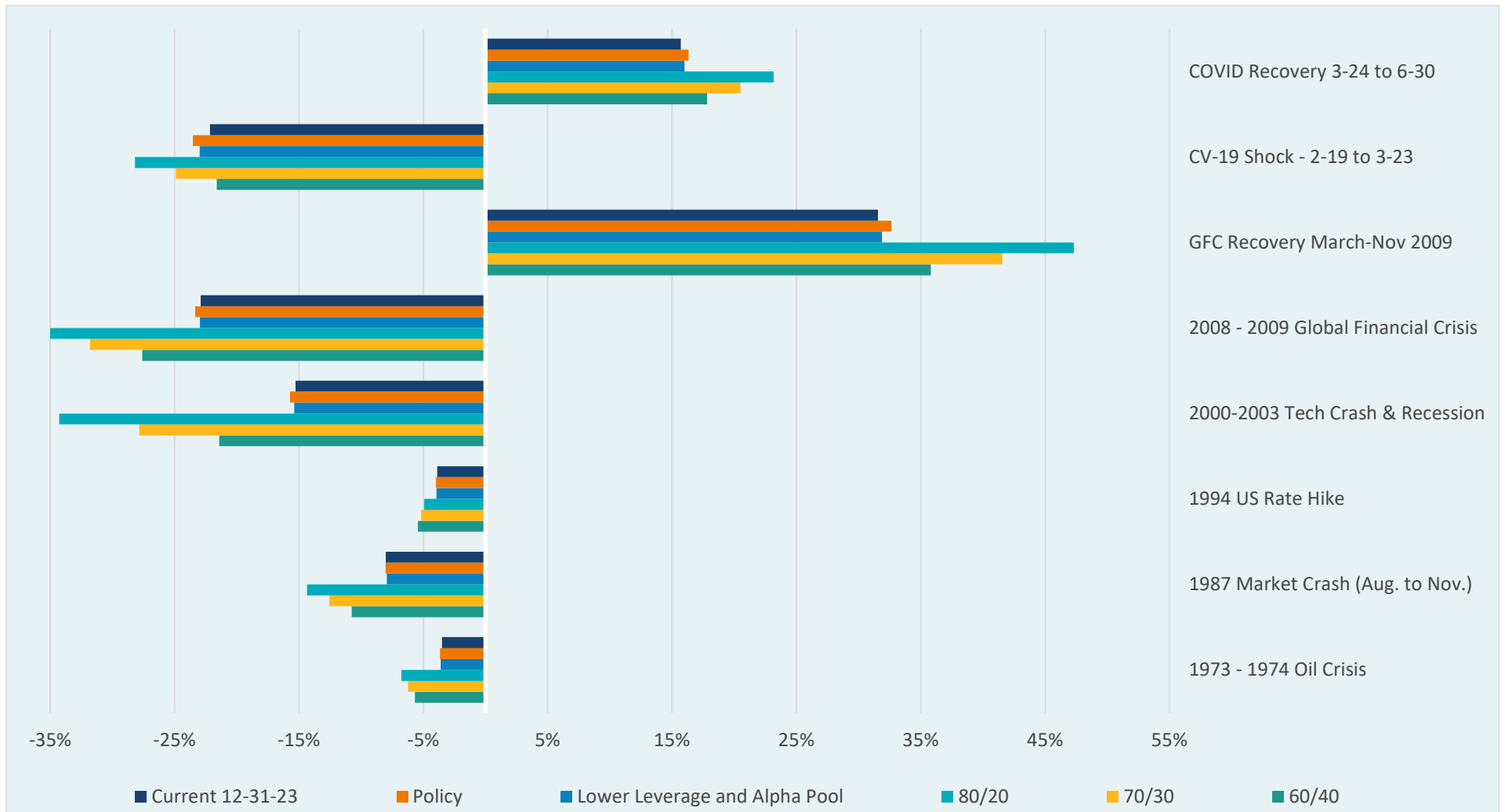
² The Opportunistic allocation is modeled in the Current Portfolio mix using a mix of Private Credit and Global Equity CMAs to align with estimated portfolio betas.

Risk decomposition



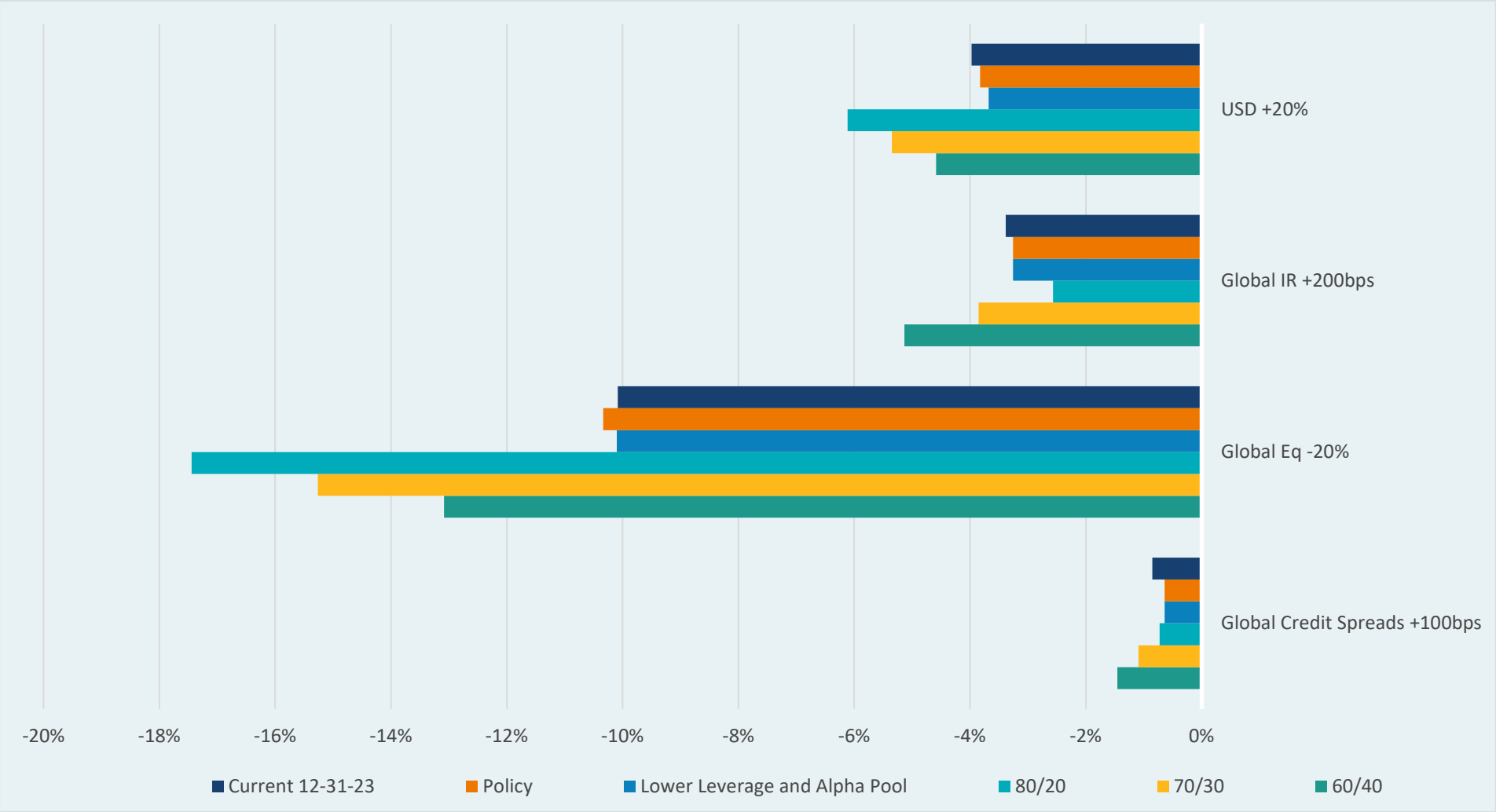
Source: Barra
Policy as of September 2023

Scenario analysis



Source: Barra
Policy as of September 2023

Stress tests



Source: Barra
 Policy as of September 2023

Observations / recommendations

Recommended SAA targets and allowable ranges

Asset Class	Target	Range
Public Equity	33%	23% – 45%
Domestic		12% – 28%
International Developed		5% – 18%
Emerging Market		0% – 9%
Fixed Income	25%	15% – 35%
Core	15%	10% – 25%
Credit	10%	5% – 10%
Commodities	4%	0% – 8%
Hedge Funds	10%	5% – 15%
Alpha Pool	4%	2% – 6%
Midstream	5%	0% – 10%
Core Real Estate	5%	2% – 8%
Opportunistic	0%	0% – 10%
Private Markets	18%	0 – 33%
Private Equity	5%	0% – 10%
Private Credit	8%	0% – 13%
Private Real Estate	5%	0% – 10%
Cash	-4%	-6% – 2%

Verus and KCERA Investment Staff recommend adjusting the Plan's SAA to reduce leverage and the Alpha Pool by four percentage points each, along with a corresponding adjustment to the allowable allocation ranges.