

Employees' Retirement System of Rhode Island

May 27, 2026

Asset-Liability Study: Part 4
Updated Model Output

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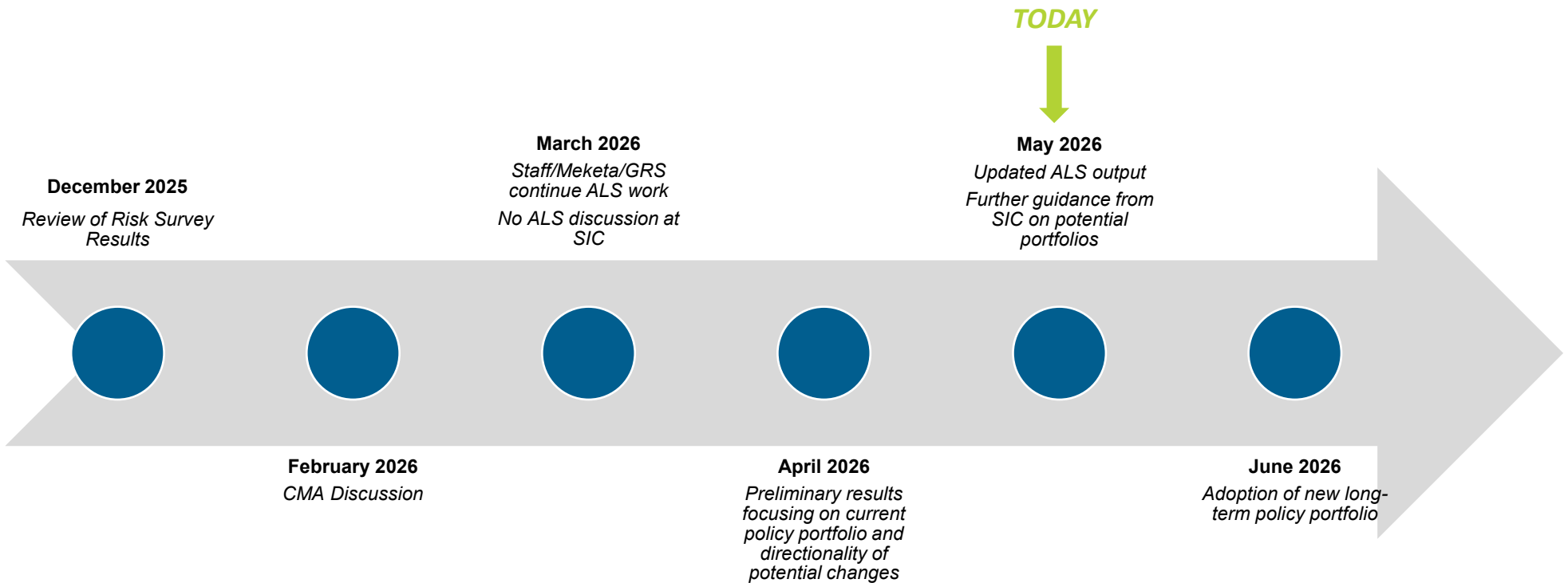
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4. Conclusion/Next Steps

Introduction

Goals of Today

1. Review Asset-Liability Study (“ALS”) timeline.
2. Present updated asset-liability modeling results, including liquidity analysis.
3. Receive feedback/guidance for final modeling stage.

Asset-Liability Study Timeline



→ Meketa and Staff expect to conclude the Asset-Liability Study in June 2026.

April 2026 SIC Meeting - Review

- The April meeting focused on the current policy portfolio and asset-only optimizations.
 - The intent was two-fold:
 1. Gain comfort with the asset-liability metrics to be used during the study.
 2. Receive feedback on directionality of potential asset allocation changes.

- Main areas of feedback:
 1. Increase the minimum for Global Equity from 30% to 40%.
 2. Examine a full suite of liquidity metrics inclusive of benefit payments and private market requirements.
 3. SIC was amenable to the potential removal of sub-components within the *Income* class.
 4. Desire to potentially decrease the *Crisis Protection Class* at the margin.

- **The updated asset-liability output in this presentation reflects the April SIC feedback.**

Important Notes

- There are two primary goals of an asset-liability study:
 1. Gain an improved/updated understanding of how the financial condition of ERSRI may vary over time.
 2. Modify the asset allocation to improve the probabilities of ERSRI success over time.

- **From an asset allocation perspective, the ERSRI portfolio is already in an attractive position.**
 - Any changes will either be marginal and/or reflect new SIC perspectives.
 - Some of these perspectives may seek to account for known challenges in the modeling process (e.g., low correlation assumption between Public Equity and US Treasuries).
 - Throughout all modeled scenarios, overall ERSRI liquidity is not a major risk.

- From Meketa’s perspective, the end result of this asset-liability study will be a refinement of the portfolio and an improved understanding of the overall financial condition of ERSRI.

Updated Asset-only Output

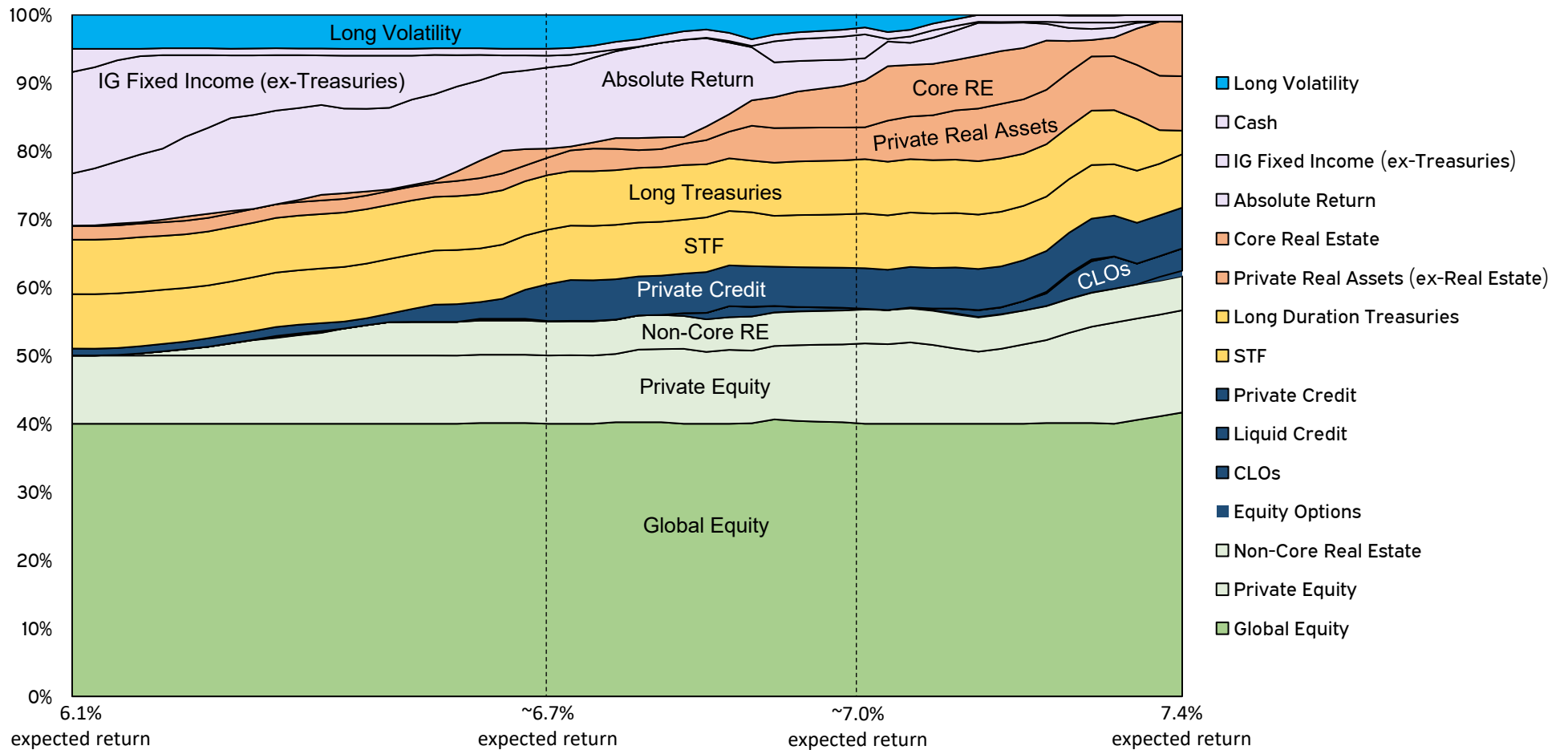
Updated Constraints (mins and maxes)

Strategic Classes	Components	Asset Class	Min (%)	Max (%)	Min V2 (%)	Max V2 (%)
Growth	Public Growth	Global Equity	30.0	60.0	40.0	---
	Private Growth	Private Equity	10.0	20.0	---	15.0
		Non-Core Real Estate	0.0	6.0	---	5.0
Income	Income	Equity Options	0.0	5.0	---	---
		CLOs	0.0	6.0	---	---
		Liquid Credit	0.0	15.0	---	---
		Private Credit	1.0	6.0	---	---
Stability	Crisis Protection Class	Systematic Trend Following	0.0	12.5	---	8.0
		Long Duration Treasuries	0.0	12.5	---	8.0
		Long Volatility	0.0	5.0	---	---
	Inflation Protection	Private Real Assets (ex-Real Estate)	2.0	8.0	---	---
		Core Real Estate	0.0	8.0	---	---
	Volatility Protection	Absolute Return	0.0	15.0	---	---
		IG Fixed Income (ex-Treasuries)	0.0	15.0	---	---
Strategic Cash		1.0	4.0	---	---	

Updated Efficient Frontier - Allocations

→ The graphic below depicts how “optimal” allocations change in the simulation as risk/return increase.

SBO - Efficient Frontier - Allocations



General Takeaways from Asset-Only Optimizations

- **With updated constraints, the same general takeaways (as April) hold true.**
- Near the actuarial rate, the asset-only optimization seeks to:
 - Reduce Global Equity to ~40% (model minimum)
 - Maintain Private Equity at similar allocation level
 - Increase Non-Core Real Estate and Private Real Assets (ex-Real Estate)
 - Materially reduce “Income” class and focus on Private Credit
 - Increase Systematic Trend Following and Long Duration
 - Long Volatility (new strategy) is introduced at a small allocation
 - Reduce Core Real Estate
 - Maintain Absolute Return and Investment Grade Fixed Income (ex-Treasuries) at similar allocations.
 - Additional note: CLOs, Liquid Credit, Core Real Estate, and Absolute Return have various degrees of interchangeability.

- Meketa and Staff have explored “near-optimal” portfolios that seek to reflect the optimization output, SIC feedback, opportunities for simplification, and qualitative views on tailwinds/headwinds for classes.
 - Pursuing a portfolio near at a 7.0% expected return may be incongruent with SIC preferences.
- These portfolio options are reflected as A-E on subsequent pages.

Preliminary Asset Allocation Options

Strategic Classes	Components	Asset Class	Policy (%)	3/31 Actual (%)*	A (Similar Risk)	B (More GE, Same Illiquid)	C (More GE, 6.9% Expected Return)	D (More Liquid, Same Return)	E (7.0% Expected Return)
Growth	Public Growth	Global Equity	40.0	37.3	40.0	45.0	43.0	45.0	40.0
	Private Growth	Private Equity	12.5	15.7	12.5	12.0	12.5	12.5	15.0
		Non-Core Real Estate	2.5	2.5	3.0	3.0	5.0	3.0	5.0
Income	Income	Equity Options	2.0	1.8	---	---	---	---	---
		CLOs	2.0	1.8	---	---	---	---	---
		Liquid Credit	5.0	4.5	5.0	6.5	5.0	6.0	2.0
		Private Credit	3.0	3.1	5.0	5.0	5.0	4.0	5.0
Stability	Crisis Protection Class	Systematic Trend Following	5.0	4.8	6.0	5.0	4.0	4.0	5.0
		Long Duration Treasuries	5.0	4.8	4.0	3.0	3.0	3.0	4.0
		Long Volatility	---	---	2.0	2.0	2.0	2.0	2.0
	Inflation Protection	Private Real Assets (ex-RE)	4.0	4.3	5.0	4.0	6.5	5.0	7.0
		Core Real Estate	4.0	3.0	3.0	2.0	1.0	---	2.0
	Volatility Protection	Absolute Return	6.5	6.5	6.5	5.0	6.0	7.5	6.0
		IG Fixed Income (ex-Treasuries)	6.5	6.4	7.0	6.5	6.0	7.0	5.0
		Strategic Cash	2.0	2.8	1.0	1.0	1.0	1.0	2.0

*Other assets = 0.8%

Preliminary Asset Allocation Options

Strategic Classes	Components	Policy (%)	3/31 Actual (%)*	A (Similar Risk)	B (More GE, Same Illiquid)	C (More GE, 6.9% Expected Return)	D (More Liquid, Same Return)	E (7.0% Expected Return)
Growth	Public Growth	40.0	37.3	40.0	45.0	43.0	45.0	40.0
	Private Growth	15.0	18.2	15.5	15.0	17.5	15.5	20.0
Income	Income	12.0	11.2	10.0	11.5	10.0	10.0	7.0
Stability	Crisis Protection Class	10.0	9.6	12.0	10.0	9.0	9.0	11.0
	Inflation Protection	8.0	7.3	8.0	6.0	7.5	5.0	9.0
	Volatility Protection	15.0	15.6	14.5	12.5	13.0	15.5	13.0
Expected Return		6.7	---	6.7	6.7	6.9	6.7	7.0
Volatility		12.4	---	12.3	12.9	13.1	12.9	13.1
Expected Max Drawdown		44.0	---	42.8	45.7	46.1	45.8	45.5
Illiquids		26.0	28.6	28.5	26.0	30.0	24.5	34.0

*Other assets = 0.8%

Preliminary Asset Allocation Options

Asset Class	Policy (%)	3/31 Actual (%)*	A (Similar Risk)	B (More GE, Same Illiquid)	C (More GE, 6.9% Expected Return)	D (More Liquid, Same Return)	E (7.0% Expected Return)
Global Equity	40.0	37.3	40.0	45.0	43.0	45.0	40.0
Private Equity	12.5	15.7	12.5	12.0	12.5	12.5	15.0
Non-Core Real Estate	2.5	2.5	3.0	3.0	5.0	3.0	5.0
Equity Options	2.0	1.8	---	---	---	---	---
CLOs	2.0	1.8	---	---	---	---	---
Liquid Credit	5.0	4.5	5.0	6.5	5.0	6.0	2.0
Private Credit	3.0	3.1	5.0	5.0	5.0	4.0	5.0
Systematic Trend Following	5.0	4.8	6.0	5.0	4.0	4.0	5.0
Long Duration Treasuries	5.0	4.8	4.0	3.0	3.0	3.0	4.0
Long Volatility	---	---	2.0	2.0	2.0	2.0	2.0
Private Real Assets (ex-RE)	4.0	4.3	5.0	4.0	6.5	5.0	7.0
Core Real Estate	4.0	3.0	3.0	2.0	1.0	---	2.0
Absolute Return	6.5	6.5	6.5	5.0	6.0	7.5	6.0
IG Fixed Income (ex-Treasuries)	6.5	6.4	7.0	6.5	6.0	7.0	5.0
Strategic Cash	2.0	2.8	1.0	1.0	1.0	1.0	2.0
Expected Return	6.7	---	6.7	6.7	6.9	6.7	7.0
Volatility	12.4	---	12.3	12.9	13.1	12.9	13.1
Expected Max Drawdown	44.0	---	42.8	45.7	46.1	45.8	45.5
Illiquids	26.0	28.6	28.5	26.0	30.0	24.5	34.0

*Other assets = 0.8%

Impacts on Funded Status Projections

- Options A-E all have expected returns of 6.7%-7.0% and expected volatilities of 12.3%-13.1%
- Given the similarities of these metrics with those of the current policy portfolio, there are no meaningful differences between the projected funded status metrics over the next ~10 years.
- **The focus of the SIC should be on the mosaic of funded status projections, return/risk, liquidity considerations, and overall preferences.**
- **Integrated asset-liability metrics are presented in the subsequent section.**

Updated Asset-Liability Results

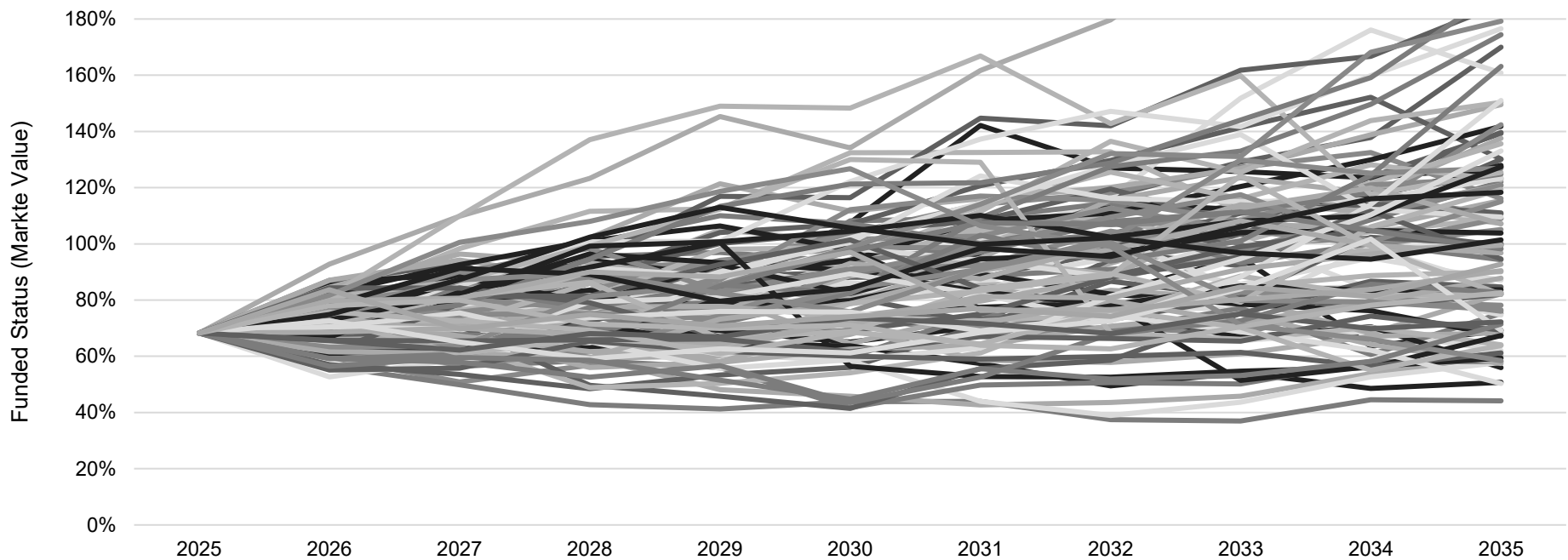
Asset-Liability Modeling – Key Parameters

- The model is focused on the largest sleeve of the Rhode Island system, the ERS (State Employees and Teachers).
 - Asset Rebalancing: annual
 - Liabilities and Normal Cost: The liabilities, normal cost and expected benefit payments used in this study were provided by GRS as of June 30, 2025. Only the State Employees and Teachers are accounted for in this study.
 - Plan Provisions and Additional Assumptions: Additional details regarding provisions and assumptions are documented in the June 30, 2025 actuarial valuation report issued by GRS.
 - Private Market Capital Calls/Distributions: Meketa integrated the portfolio's current private markets portfolios, and the model incorporates Meketa's standard pacing models for achieving the various targets allocations to private markets classes throughout time (inclusive of variable distributions/contributions during periods of stress).

- At the April meeting, the SIC confirmed that no additional plans (e.g., MERS) need to be included.

- Upon completion of the asset-liability study, an asset allocation review for OPEB will be conducted.

Funded Status Simulations

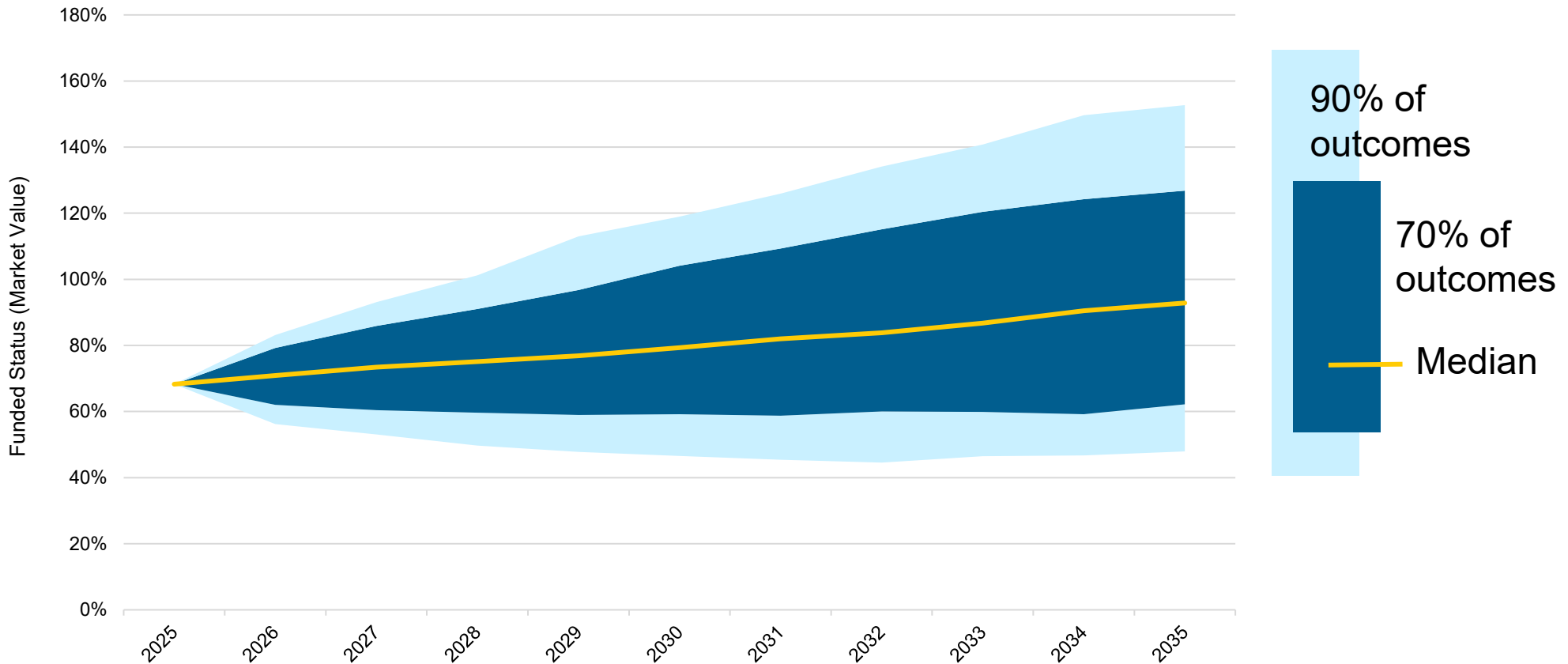


→ Funded Status (assets divided by liabilities) is simulated in a variety of market environments.

→ Analysis reflects the current:

- Asset allocation
- Projected benefit payments
- Funding policy (statutory)
- Plan provisions
- Actuarial assumptions
- Meketa 2026 Capital Market Assumptions

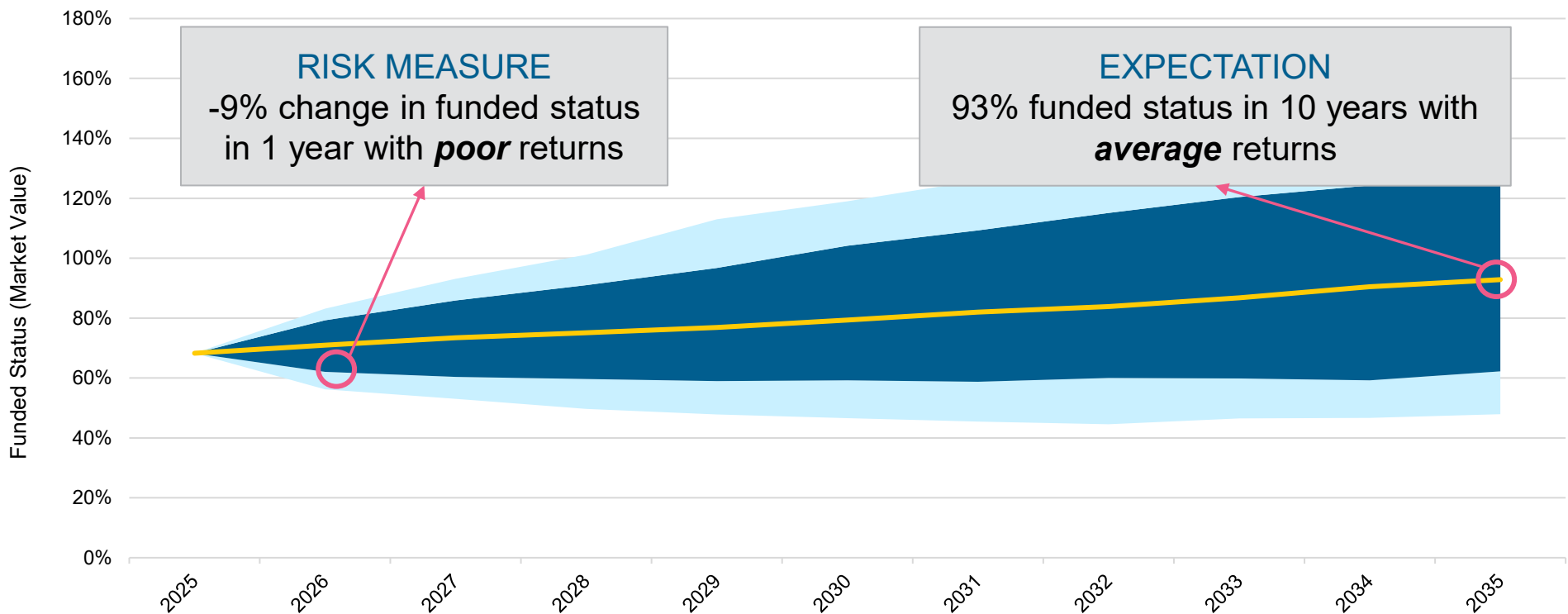
Funded Status Simulations



- Simulations are summarized into percentiles, providing a quantitative analysis of enterprise risk, given the current asset allocation.
- As an example, the median (50th Percentile) Funded Status in 2035 is 93% => there is a 50% probability the Funded Status will be greater than 93% and 50% probability it will be less than 93%.

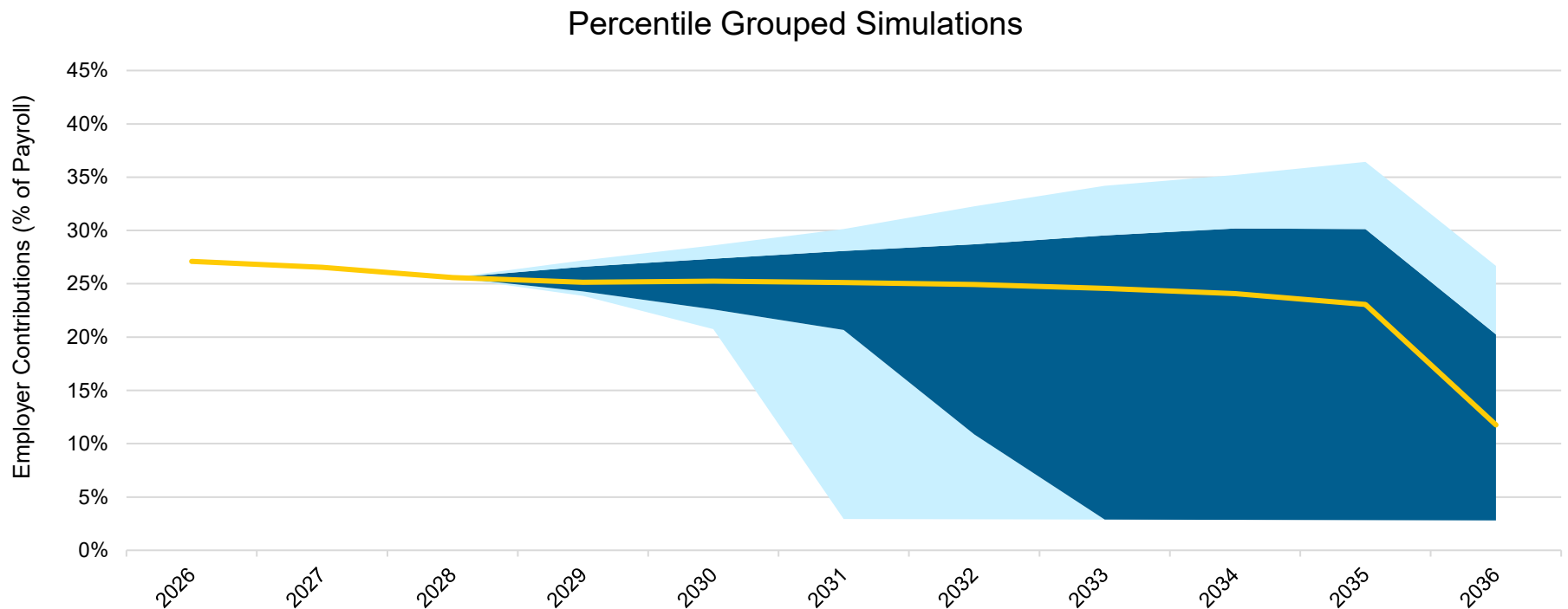
Expectation/Risk Measure Framework - Tradeoffs

- Key observations are determined during objective setting discussion and analyzed in a “Expectation/Risk Measure” framework.
 - **Expectation** – Outcome where all the underlying assumptions prove to be accurate over the long-term (Example: 50th percentile over a 10-year time horizon).
 - **Risk Measure** – Outcome with a lower probability (Ex: 85th percentile) and detrimental impact, especially when that outcome occurs in the short-term (Ex: 1-year time horizon).



Contribution Levels

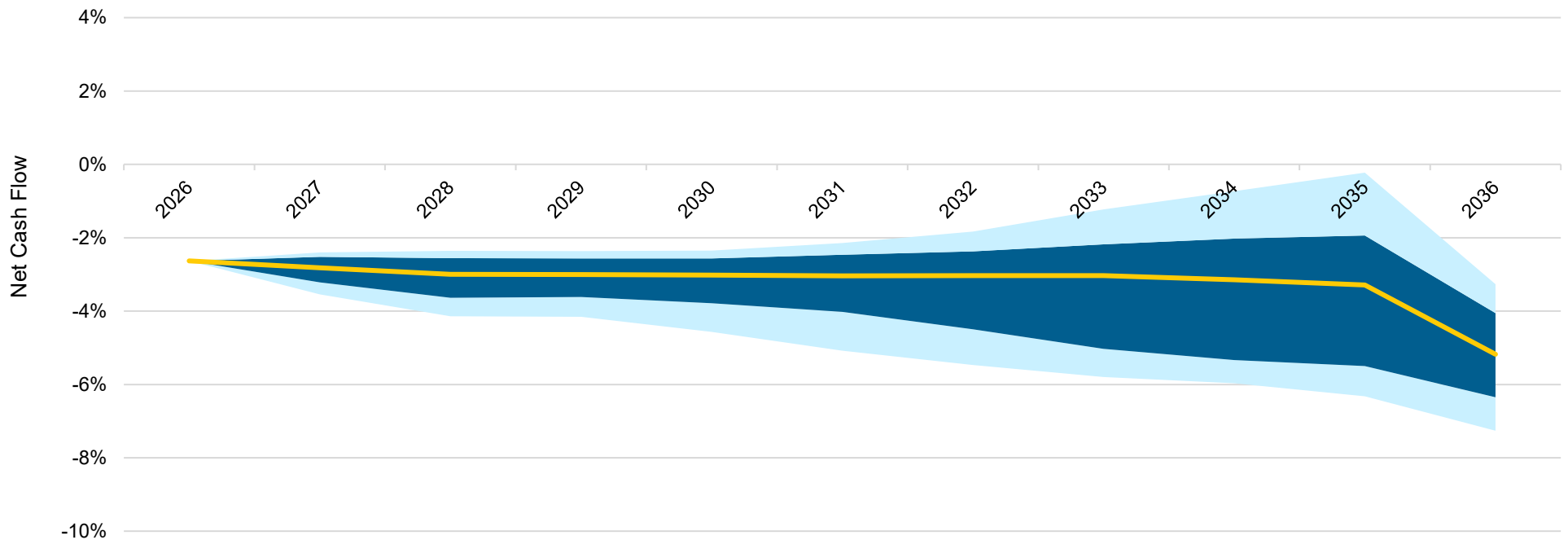
- Contribution levels for upcoming few years are known due to the System’s method for recognizing gains/losses.
- Employer contributions as a percent of payroll anticipated to experience a drop-off in 2036 once historical losses are fully amortized.



Net Cash Flows

- Net cash flow is defined as contributions less benefit payments and expenses, expressed as a percentage of market value of assets. This metric reflects the share of assets expected to be liquidated each year to meet cash needs.
- Net cash flow is anticipated to be between **-2% to -4% over the next 5-6 years**, after which outcomes widen depending on future market experience.

Percentile Grouped Simulations



Additional Metrics – Current Policy Portfolio

Metric	Related Risk Survey Results	Current Policy Portfolio
Probability of falling below 55% funded ratio	“Minimum funded ratio willing to accept in market crisis scenario” ≈ 55%	17.6% probability of falling below 55% in next five years.
Funded Status Volatility <i>Defined as difference between median market value funded status in one year and one standard deviation funded status in one year</i>	Related SIC Objectives: <ul style="list-style-type: none"> - Maintain consistent progress towards improving funded status 	8.9%
Probability of a 2% absolute increase in employer contribution rate	Related SIC Objectives: <ul style="list-style-type: none"> - Continue making progress on funded status - Net-cash flows are an important consideration - Limit need for plan sponsor contribution increases (lower SIC priority) 	36.1% probability of a 2% absolute rise in employer contribution rate over 2026-2035.
Probability of >30% employer contribution rate	Related SIC Objectives: <ul style="list-style-type: none"> - Limit need for plan sponsor contribution increases (lower SIC priority) 	19.7% probability of employer contribution rising above 30% from 2026-2035.
Contribution Rate Volatility <i>Defined as the difference between median contribution rate in 2035 and one standard deviation contribution rate in 2035</i>	Related SIC Objectives: <ul style="list-style-type: none"> - Limit need for plan sponsor contribution increases (lower SIC priority) 	7.0%

Additional Metrics – Current Policy Portfolio and Options A-E

Metric	Current Policy Portfolio	A	B	C	D	E
Probability of falling below 55% funded ratio	17.6%	17.5%	19.3%	19.2%	19.2%	19.2%
Funded Status Volatility	8.9%	8.7%	9.1%	9.2%	9.2%	9.3%
Probability of a 2% absolute increase in employer contribution rate	36.1%	35.9%	37.9%	38.0%	37.7%	37.7%
Probability of >30% employer contribution rate	19.7%	19.3%	20.3%	20.3%	20.7%	19.5%
Contribution Rate Volatility	7.0%	7.1%	7.5%	7.5%	7.5%	7.6%
Funded Ratio & Contributions						
10-yr Median Funded Ratio	93.0%	93.1%	92.6%	94.0%	92.2%	95.6%
10-yr Median Contributions	\$5.894 B	\$5.900 B	\$5.893 B	\$5.861 B	\$5.901 B	\$5.794 B
10-yr 85 th Percentile Contributions	\$6.631 B	\$6.619 B	\$6.653 B	\$6.630 B	\$6.655 B	\$6.622 B

Liquidity

- Meketa recommends a unique perspective on the liquidity of assets that is focused on their role, correlation/volatility, and accessibility. This segments each asset class into tiers.
- Updated asset-liability modeling incorporates RI-specific pacing considerations.

Tier 1	<ul style="list-style-type: none"> - Assets with either low-to-moderate volatility or a negative equity beta. - Must be accessible within days-to-weeks. - Ex: cash, short-to-intermediate Treasuries, long volatility strategies, etc.
Tier 2	<ul style="list-style-type: none"> - Assets that are expected to be uncorrelated to public equity but exhibit one or more of the following characteristics: <ul style="list-style-type: none"> - High volatility (i.e., 10% or more annual standard deviation). - Liquidity that isn't accessible for one month or more. - Ex: systematic trend following, liquidity restricted commingled funds, etc.
Tier 3	<ul style="list-style-type: none"> - Assets that are liquid (days-to-weeks) but with high correlations to public equity. - Ex: public equity, public credit, public real assets, etc.
Tier 4	<ul style="list-style-type: none"> - Illiquid assets/private markets. - Ex: private equity, private credit, private real assets, etc.

ERSRI Classes – Liquidity Tiers

→ The tiers form a natural contingency plan for how liquidity is expected to be accessed during challenging market environments.

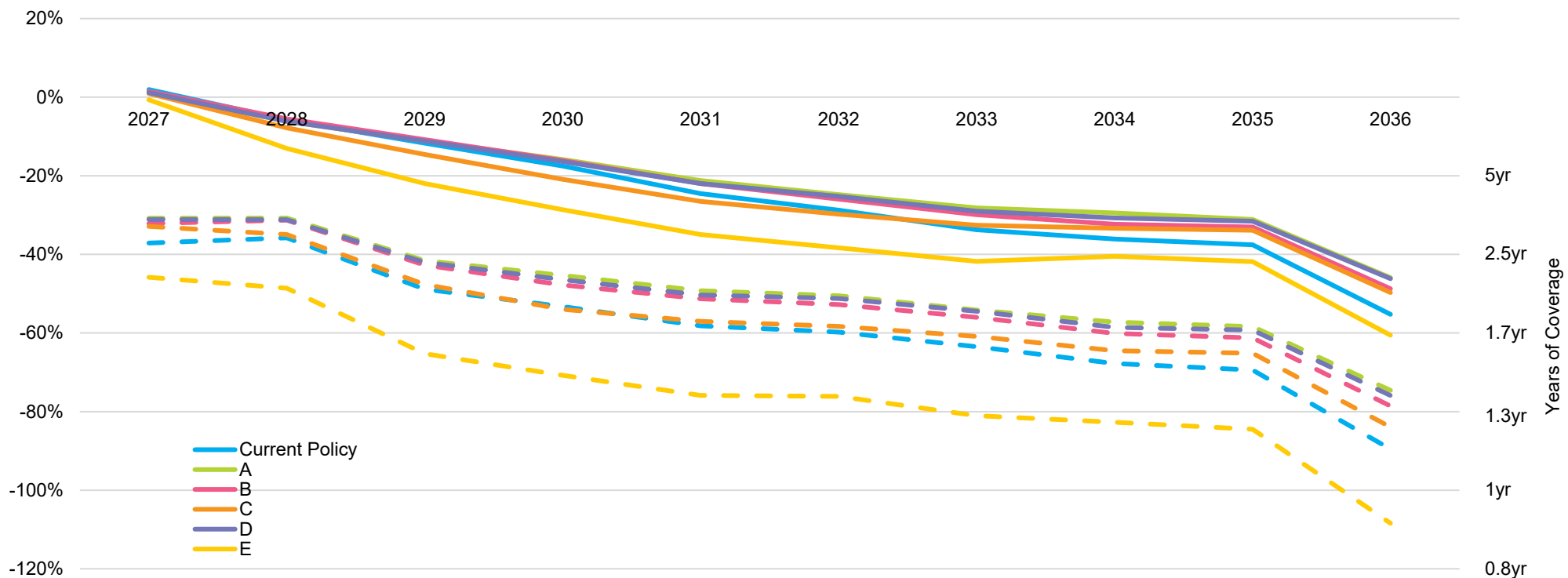
Asset Class	Liquidity Tier
Global Equity	3
Private Equity	4
Non-Core Real Estate	4
Equity Options	3
CLOs	4
Liquid Credit	3
Private Credit	4
Systematic Trend Following	2
Long Duration Treasuries	2
Long Volatility	1
Private Real Assets (ex-RE)	4
Core Real Estate	4
Absolute Return	2
IG Fixed Income (ex-Treasuries)	1
Strategic Cash	1

- Total required cash flows (i.e., net benefit payments and net projected capital calls) can be divided by respective assets in each liquidity tiers.
- The ratios can be interpreted as the number of years of “annual liquidity requirements” available in each tier.
 - 5% = 20 years
 - 20% = 5 years
 - 33% = 3 years
 - 50% = 2 years

Tier 1 Asset Liquidity

→ Net cash flows, including private markets, divided by Tier I assets. Solid lines are median, dotted lines are 85th percentile.

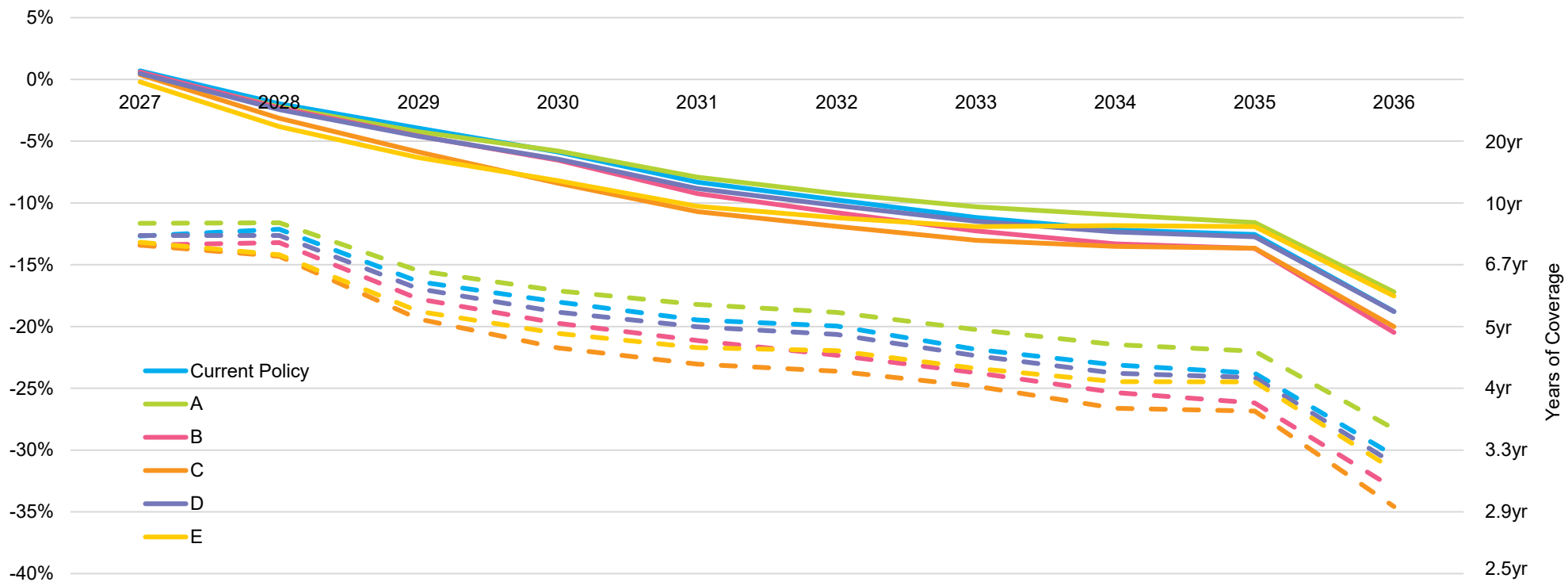
Cash Flow / Tier I



Tier 1-2 Asset Liquidity

→ Net cash flows, including private markets, divided by Tier I and Tier II assets. Solid lines are median, dotted lines are 85th percentile.

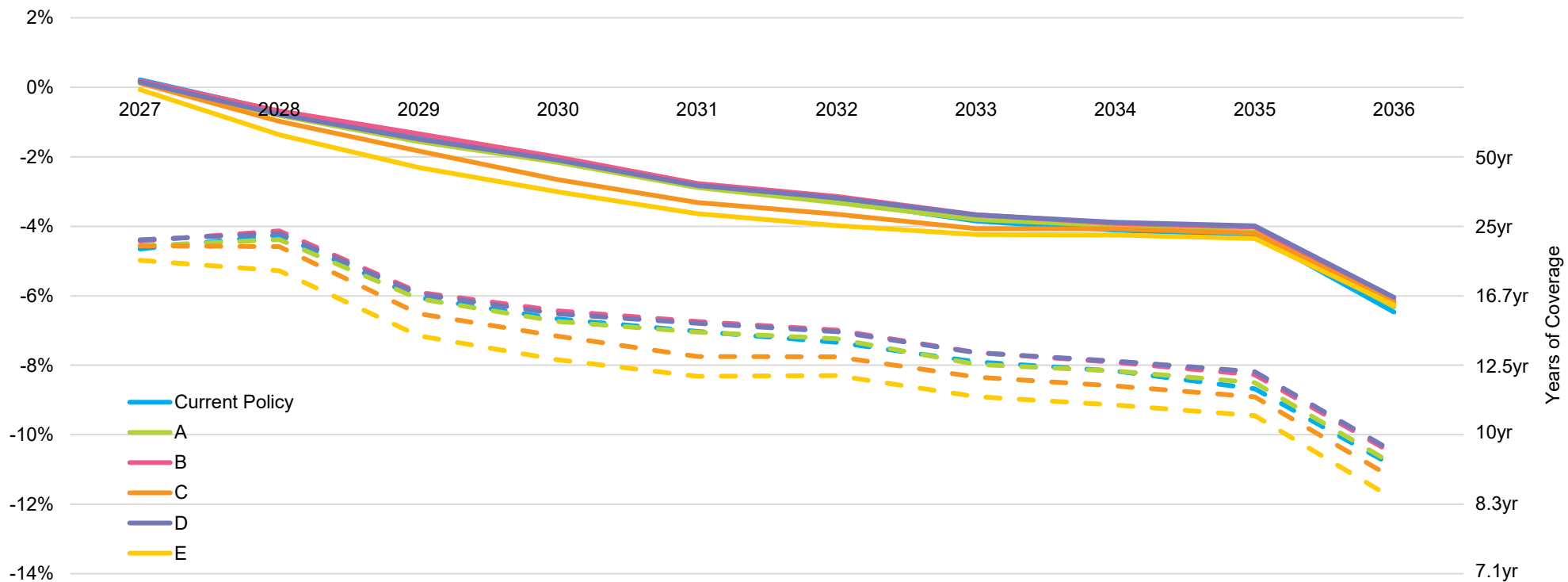
Cash Flow / (Tier I + Tier II)



Tier 1-3 Asset Liquidity

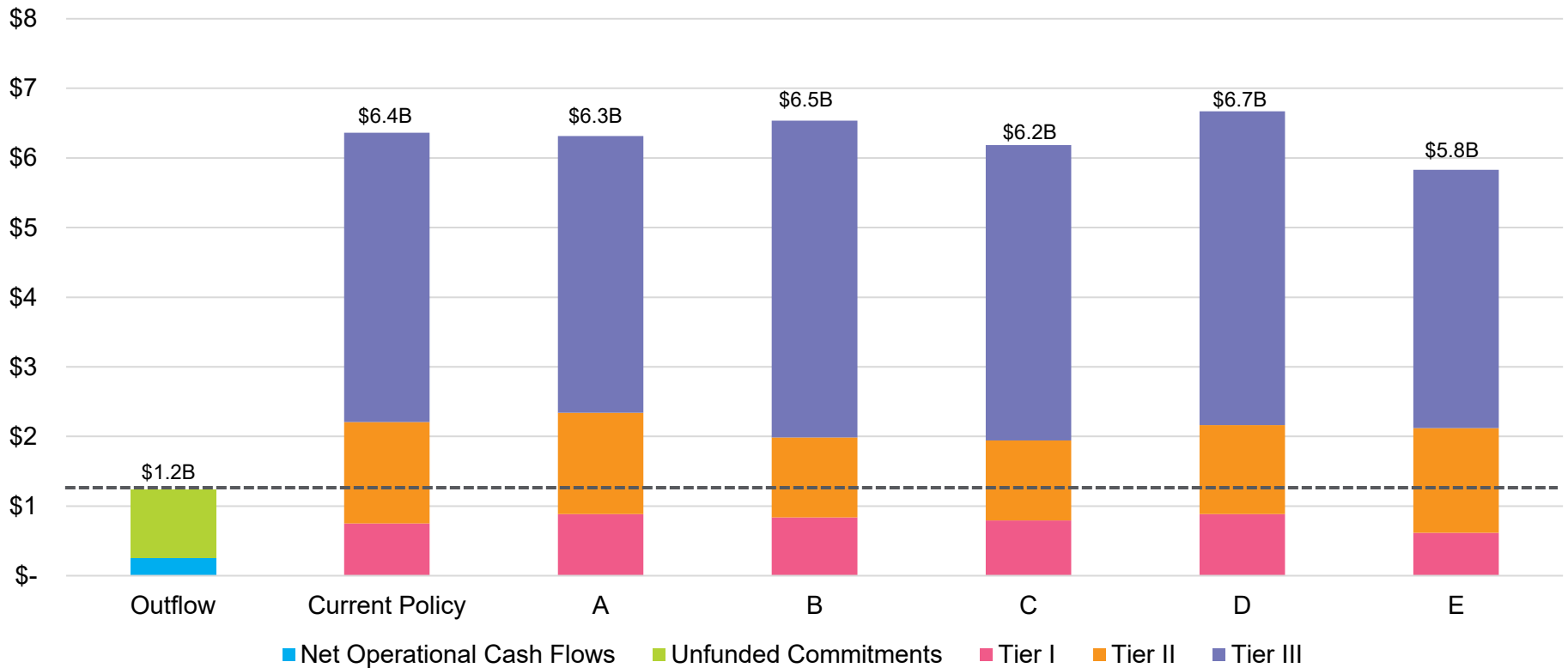
→ Net cash flows, including private markets, divided by Tier I, Tier II and Tier III assets. Solid lines are median, dotted lines are 85th percentile.

Cash Flow / (Tier I + Tier II + Tier III)



Liquidity Stress Test (\$B)

→ Outflow consists of expected net cash flows (benefit payments & expenses minus contributions) for FY 2027 and all committed but uncalled capital* for private equity, credit, real assets and non-core real estate



* As of 3/31/2026

Conclusion/Next Steps

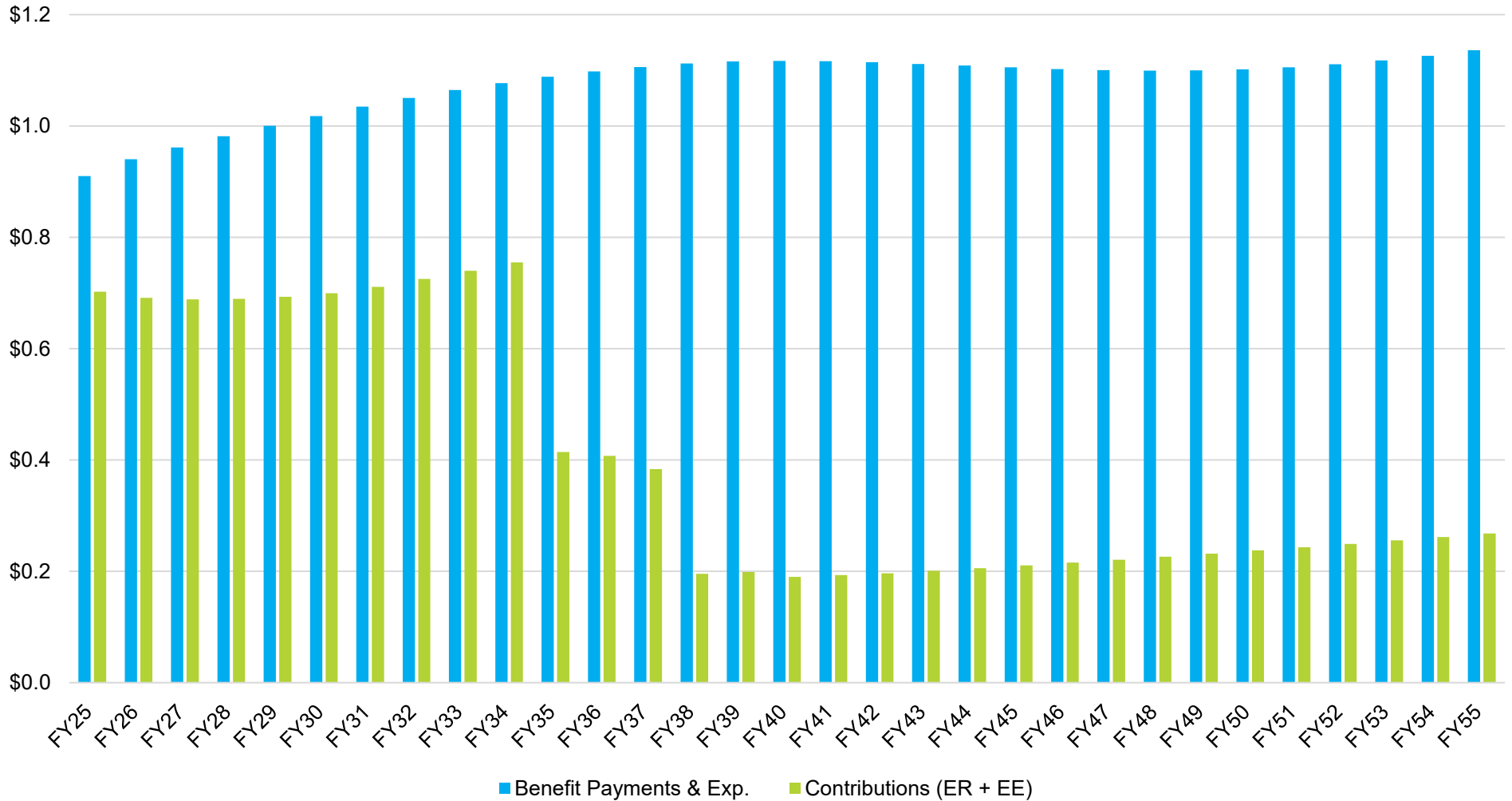
Conclusion/Next Steps

- This presentation builds off the April SIC discussion, taking the received feedback and incorporating it into updated modeling output.
- A multitude of lenses/metrics have been provided, which are expected to inform the decision-making process as the asset-liability study progresses.
- **From an asset allocation perspective, the ERSRI portfolio is already in an attractive position.**
 - Any changes will either be marginal and/or reflect new SIC perspectives.
 - Some of these perspectives may seek to account for known challenges in the modeling process (e.g., low correlation assumption between Public Equity and US Treasuries).
 - Throughout all modeled scenarios, overall ERSRI liquidity is not a major risk.
- **Based on direction/guidance from the SIC, Meketa and Staff will return in June with refined portfolio allocation options for final selection.**

Appendix

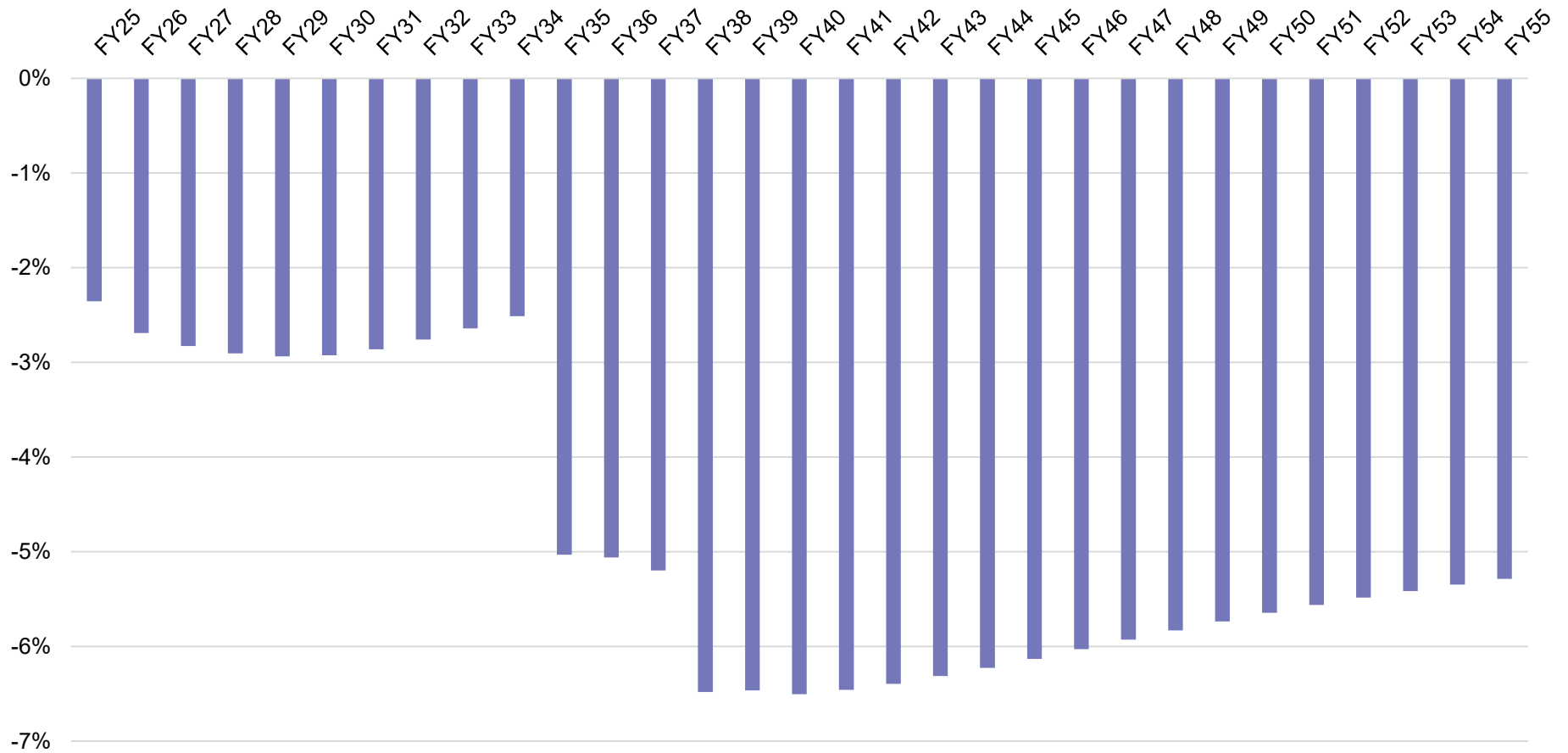
As presented in April

Cash Flows – Annual Dollar Amounts (\$B)



As presented in April

Net Cash Flow – % of Market Value of Assets



A/L Process

3 key high-level steps to the A/L process:

1.

Develop an understanding of how the financial condition of ERSRI might vary based on outcomes of the investment portfolio.

2.

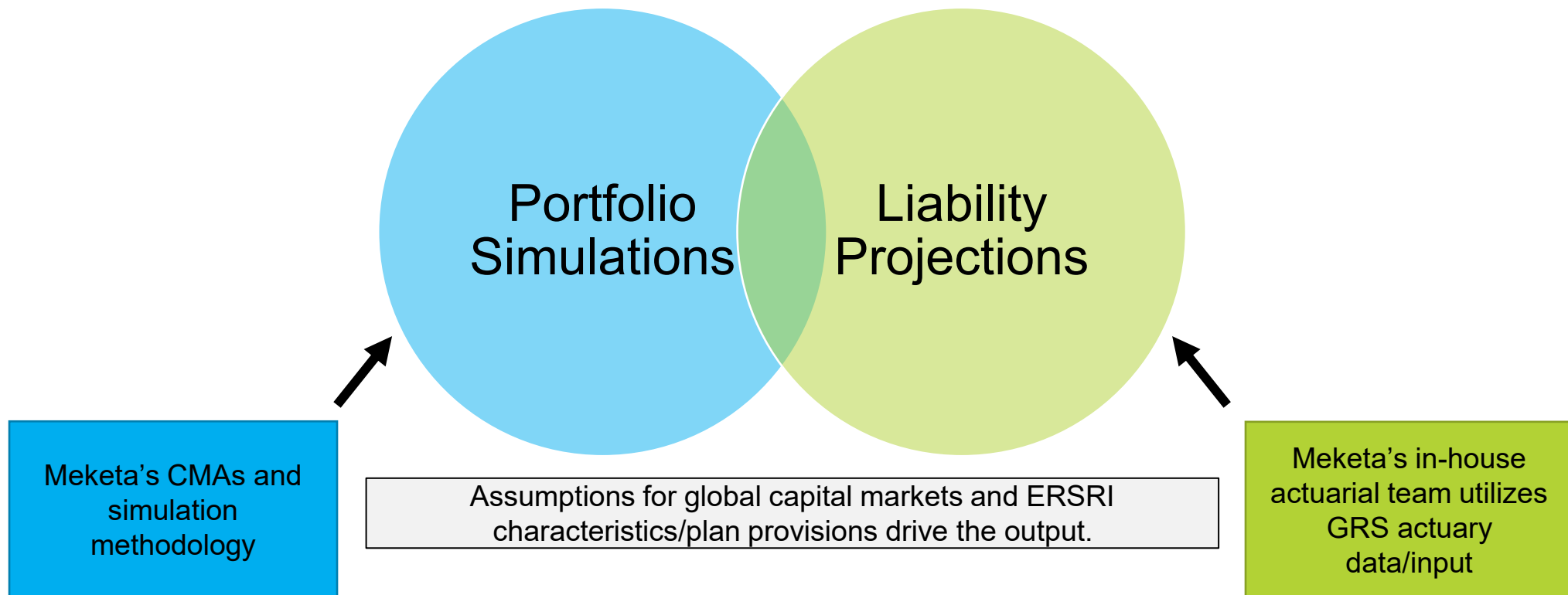
Set a consensus definition and view of the risk(s) ERSRI should bear.

3.

Once a view/tolerance for risk has been established, select an appropriate long-term investment strategy (i.e., a policy portfolio / strategic allocation).

Approach to Asset-Liability Studies

→ Asset-liability studies are the intersection of asset and liability projections.



Approach to Asset-Liability Studies

- The actuarial value of assets (AVA) and actuarial accrued liability (AAL) change from one year to the next in a formulaic fashion.
 - Note: actuarial losses/gains are important considerations that are generally related to experience vs. assumptions.

Asset-liability studies examine a wide range of modeled returns and corresponding impacts.

Example: Change in AVA and AAL

AVA at Beginning of Year

+ Contributions

+ Actual return (accounting for any smoothing)

- Benefits paid

- Expenses

= AVA at End of Year

AAL at Beginning of Year

+ Service cost (benefits accrued during year)

+ Interest cost

+/- Actuarial losses/gains during the year

- Benefits paid

= AAL at End of year

ERSRI Asset Class and Meketa’s Modeling Approach

Strategic Classes	Components	Asset Class	Notes
Growth	Public Growth	Global Equity	Modeled as ACWI. Can be regional if desired.
	Private Growth	Private Equity	---
		Non-Core Real Estate	50% Value Add / 50% Opportunistic RE
Income	Income	Equity Options	---
		CLOs	---
		Liquid Credit	Modeled as High Yield Bonds
		Private Credit	---
Stability	Crisis Protection Class	Systematic Trend Following	---
		Long Duration Treasuries	---
	Inflation Protection	Private Real Assets (ex-Real Estate)	Modeled as 50% Core / 50% Non-Core Private Infrastructure
		Core Real Estate	---
	Volatility Protection	Absolute Return	Modeled as RMS Diversifiers
		Investment Grade Fixed Income (ex-Treasuries)	Modeled as 50% IG Corporate / 50% MBS
		Strategic Cash	---

--- indicates one-for-one match between asset class and Meketa’s CMAs

ERSRI Asset Class and Respective Expected Returns

Strategic Classes	Components	Asset Class	2025 ER	2026 ER
Growth	Public Growth	Global Equity	6.7	6.3 ↓
	Private Growth	Private Equity	9.8	9.0 ↓
		Non-Core Real Estate	9.1	9.4 ↑
Income	Income	Equity Options	5.6	5.5 ↓
		CLOs	6.9	5.8 ↓
		Liquid Credit	6.3	5.4 ↓
		Private Credit	8.7	7.8 ↓
Stability	Crisis Protection Class	Systematic Trend Following	3.5	3.6 ↑
		Long Duration Treasuries	5.0	4.5 ↓
	Inflation Protection	Private Real Assets (ex-Real Estate)	7.2	7.5 ↑
		Core Real Estate	5.5	5.8 ↑
	Volatility Protection	Absolute Return	4.7	4.5 ↓
		Investment Grade Fixed Income (ex-Treasuries)	5.4	4.6 ↓
		Strategic Cash	2.8	2.8

ERSRI Asset Class and Respective Expected Volatilities

Strategic Classes	Components	Asset Class	2025 Volatility	2026 Volatility
Growth	Public Growth	Global Equity	17.0	17.0
	Private Growth	Private Equity	25.0	26.0 ↑
		Non-Core Real Estate	22.4	22.4
Income	Income	Equity Options	13.0	13.0
		CLOs	13.0	13.0
		Liquid Credit	11.0	11.0
		Private Credit	15.0	15.0
Stability	Crisis Protection Class	Systematic Trend Following	18.0	18.0
		Long Duration Treasuries	12.0	12.0
	Inflation Protection	Private Real Assets (ex-Real Estate)	18.0	19.0 ↑
		Core Real Estate	12.0	12.0
	Volatility Protection	Absolute Return	4.0	5.0 ↑
		Investment Grade Fixed Income (ex-Treasuries)	5.2	5.2
		Strategic Cash	1.0	1.0

Approach to Modeling Long Volatility

→ Meketa has two options for modeling Long Volatility:

Mean-Variance	Simulation-based
<ul style="list-style-type: none"> • 0.5% expected return and 9.0% volatility • -0.5 correlation to Global Equity • Pros <ul style="list-style-type: none"> ○ Simple, easy to understand • Cons <ul style="list-style-type: none"> ○ Assumes normal distribution ○ Cannot recognize non-linearity and convexity 	<ul style="list-style-type: none"> • Conditional payoff based on Global Equity simulated returns: <ul style="list-style-type: none"> ○ Global Equity >0%: -4% return (negative carry) ○ Global Equity < 0%: -0.25x of GE ○ Global Equity < -10%: -0.5x of GE ○ Global Equity < -20%: -1.0x of GE ○ Global Equity < -30%: -1.15x of GE ○ Global Equity < -40%: -1.2x of GE ○ Global Equity < -50%: -1.25x of GE • Pros <ul style="list-style-type: none"> ○ More accurately reflects actual payoff structure ○ Calibrated based on a universe of actual performance histories with conservative adjustments • Cons <ul style="list-style-type: none"> ○ No explicit expected return or volatility assumption (through simulation process, ER and Vol approximate mean-variance assumptions)

→ **The simulation-based approach is being used for the 2026 Asset-Liability Study**

2026 Peer Comparison Sample

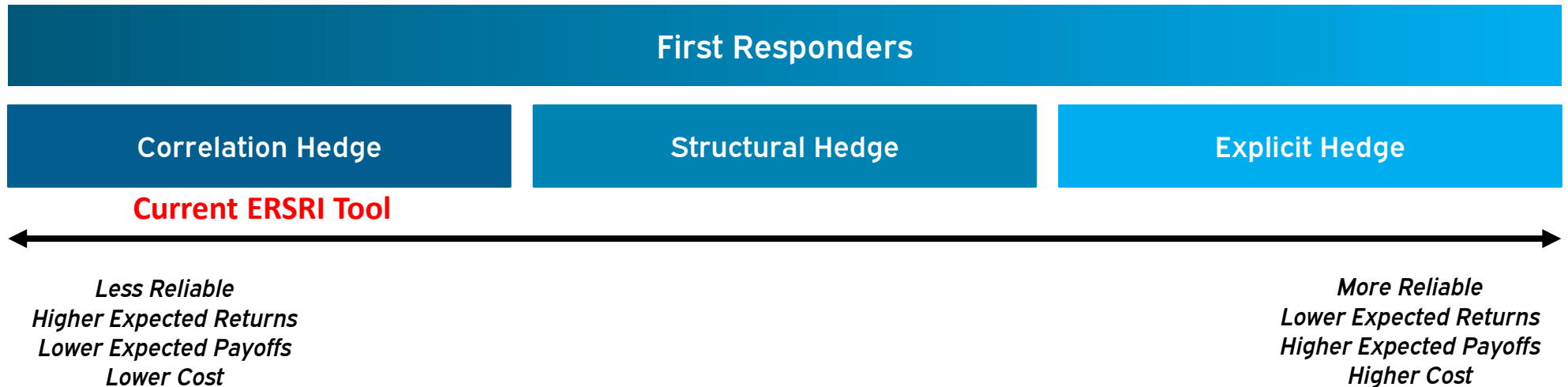
- The table below highlights 10-year expected returns from a sample of investment consultants & asset managers.
- Data was sourced from publicly available documents/websites on 2/15/25.
 - Peer data are all 2026 CMAs but represented a mix of 11/30 and 12/31 end dates for inputs.

Asset Class	Meketa	Verus	Wilshire	Callan	Vanguard	BlackRock	Northern Trust	Average (ex Meketa)
US Equity	6.3%	5.5%	4.5%	7.4%	4.9%	5.2%	6.8%	5.7%
Developed Non-US Equity	6.2%	6.8%	5.5%	7.3%	5.9%	7.1%	6.8%	6.6%
Emerging Markets Equity	6.2%	6.7%	5.7%	7.5%	4.2%	5.9%	6.9%	6.1%
Investment Grade Bonds	4.2%	4.7%	4.9%	4.8%	4.6%	4.1%	5.0%	4.7%
High Yield Bonds	5.4%	5.7%	6.1%	5.9%	4.8%	5.7%	5.5%	5.6%
Private Equity	9.0%	9.0%	6.1%	8.5%	---	12.9%	10.2%	9.3%
Private Real Estate*	7.2%	8.5%	6.9%	---	---	---	7.9%	7.8%
Core Private Real Estate	5.8%	7.2%	6.0%	6.3%	---	5.8%	---	6.3%

*Private Real Estate represents the firm's stated, single line item assumption or an assumed blend of 50% Core / 25% Value Add / 25% Opportunistic.

The First Responders “Tool Kit”

- First responders are meant to be the first line of defense in an equity event.
- Strategies should produce meaningful gains in the initial stages of a market shock.
- There are three main types of hedging all of which can be found within the First Responders component of RMS:
 1. Correlation hedge: a bet that one asset will produce good returns when another produces bad returns.
 2. Structural hedge: an investment in a security that has a close inverse relationship with another.
 3. Explicit hedge: analogous to an insurance contract (e.g., an ongoing payment in exchange for a payoff if an event X occurs).
- Strategies vary primarily by certainty, payoff magnitude, expected return, and cost.





First Responders Strategy Summaries

Correlation Hedge

Strategies:
→ Long US Treasuries

Performance Drivers:
→ Investors often seek high quality assets when markets decline

Most Effective When...
→ Flight-to-safety 

Least Effective When...
→ Rising rates 

Implementation Example
→ Buying 20+ year US Treasuries


Strategy Benefits
→ Well known
→ Low cost
→ Historically reliable


Things to consider...
→ Relies on the behavior of others
→ Negative real yields
→ Changing correlations?

Structural Hedge

Strategies:
→ Long Volatility

Performance Drivers:
→ Volatility increases as equity price changes accelerate

Most Effective When...
→ Increasing volatility 

Least Effective When...
→ Stable / low volatility 

Implementation Example
→ Buying CBOE VIX options


Strategy Benefits:
→ High certainty
→ High event payoffs
→ Flexible implementation


Things to consider...
→ Low expected returns
→ Complexity
→ Ability to hold

Explicit Hedge

Strategies:
→ Tail risk hedging

Performance Drivers:
→ Continual insurance payment for a guaranteed payoff

Most Effective When...
→ Sharp drawdowns 

Least Effective When...
→ Stable, bull markets 

Implementation Example
→ Buying equity put options

Strategy Benefits:
→ Guaranteed payoff
→ Targets specific levels
→ Highest payoff

Things to consider...
→ Explicit ongoing cost
→ Most difficult to hold
→ Counterparty risk

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