

10/20 & 10/21/2026 SWIB Board of Trustees Workshop

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Adjourn	

Name of Meeting: Regular Meeting of the Board of Trustees
Date/Time: Tuesday, October 20, 2026 1:00 pm
Room: Great Room
Address: Lake Lawn Resort, 2400 East Geneva Street, Delavan, WI 53115

OPEN SESSION
Workshop Welcome & Kickoff
2027 Asset Allocation Preview
LMBI Overview
SIF Overview
Operational Risk Management
CLOSED SESSION*
EXECUTIVE CLOSED SESSION
RECONVENE IN OPEN SESSION
Announcement of Matters Taken Up in Closed Session

Motion to Recess

* The motion to go into closed session at this meeting is made pursuant to: (i) Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies and/or for any comments or discussion on prior closed session minutes that discuss the same; (ii) Section 19.85(1)(e) of the Wisconsin Statutes to consider confidential information and deliberate specified public business relating to ongoing negotiations with competitive bargaining concerns, and/or for any comments or discussion on prior closed session minutes that discuss the same; and (iii) Section 19.85(1)(c) of the Wisconsin Statutes to discuss performance evaluation data of specific SWIB employees, including SWIB's executive director/chief investment officer and SWIB's board of trustees, and/or for any comments or discussion on prior closed session minutes that discuss the same. The Board may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the Board will subsequently reconvene in open session to cover remaining agenda items.

Name of Meeting: Regular Meeting of the Board of Trustees
Date/Time: Wednesday, October 21, 2026 9:00 am
Room: Great Room
Address: Lake Lawn Resort, 2400 East Geneva Street, Delavan, WI 53115

OPEN SESSION
Workshop Welcome
The Return of Industrial Policy
Asset / Liability Modeling
CLOSED SESSION*
EXECUTIVE CLOSED SESSION
RECONVENE IN OPEN SESSION
Announcement of Matters Taken Up in Closed Session

Motion to Adjourn

* The motion to go into closed session at this meeting is made pursuant to: (i) Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies and/or for any comments or discussion on prior closed session minutes that discuss the same; (ii) Section 19.85(1)(e) of the Wisconsin Statutes to consider confidential information and deliberate specified public business relating to ongoing negotiations with competitive bargaining concerns, and/or for any comments or discussion on prior closed session minutes that discuss the same; and (iii) Section 19.85(1)(c) of the Wisconsin Statutes to discuss performance evaluation data of specific SWIB employees, including SWIB's executive director/chief investment officer and SWIB's board of trustees, and/or for any comments or discussion on prior closed session minutes that discuss the same. The Board may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the Board will subsequently reconvene in open session to cover remaining agenda items.

ASSET ALLOCATION REVIEW

BOARD OF TRUSTEES WORKSHOP
OCTOBER 2026

OCTOBER 2026

Joseph Nankof, Partner

Todd Mattina, Head Economist and ARA, CIO

AGENDA

- Summary
- Review of Current Asset Allocation
- Background & Assumptions
- Preview of Recommendations and Supporting Analysis
- Scenario Analysis
- Liquidity Risk Update
- Variable Trust Fund
- Appendix



SUMMARY

KEY INSIGHTS

- **Material shifts in financial markets**

- U.S. equities are richly valued, highly concentrated, and potentially overextended
- Credit spreads remain below historical averages, offering limited upside
- Treasury and TIPS yields have risen to almost 20-year highs

- **Themes of asset allocation analysis**

- Evaluate portfolio leverage ratios, private investment pacing plan, liquidity coverage and the strategic allocation across fixed income

- **Preliminary recommendations**

- The CTF Preliminary Recommendation is a decrease of 2% in Public Equity, increase in TIPS by 1%, and increase in Public Fixed Income by 1%
- The Preliminary Recommendation involves splitting the increase to Public Fixed Income evenly across Treasuries and Investment Grade Credit.
- The reallocation reduces CTF investment volatility without a material sacrifice in strategic returns and broadly maintains fixed income duration and high-quality liquid assets.
- No change is recommended in the VTF policy allocation.

CURRENT POLICY AND RECOMMENDATION

Decision	Current Policy Targets	Preliminary Recommended Targets
Public Markets Allocation	36% Equity/27% Fixed Income/19% TIPS	34% Equity/28% Fixed Income/20% TIPS
Private Markets Allocation	20% Private Equity & Debt / 8% Real Estate	No Change
Leverage Level	-10%	No Change
Public Equity Structure	Global Market Capitalization (China Half Weight)	No Change
Public Fixed Income Structure	60% Investment Grade / 40% Below Investment Grade and Emerging Markets Debt	Add 0.5% Treasuries and 0.5% IG Credit
Active Risk Limit	120 bps +/- 60 bps	No Change



*Current Actual Weight for Private Equity/Debt

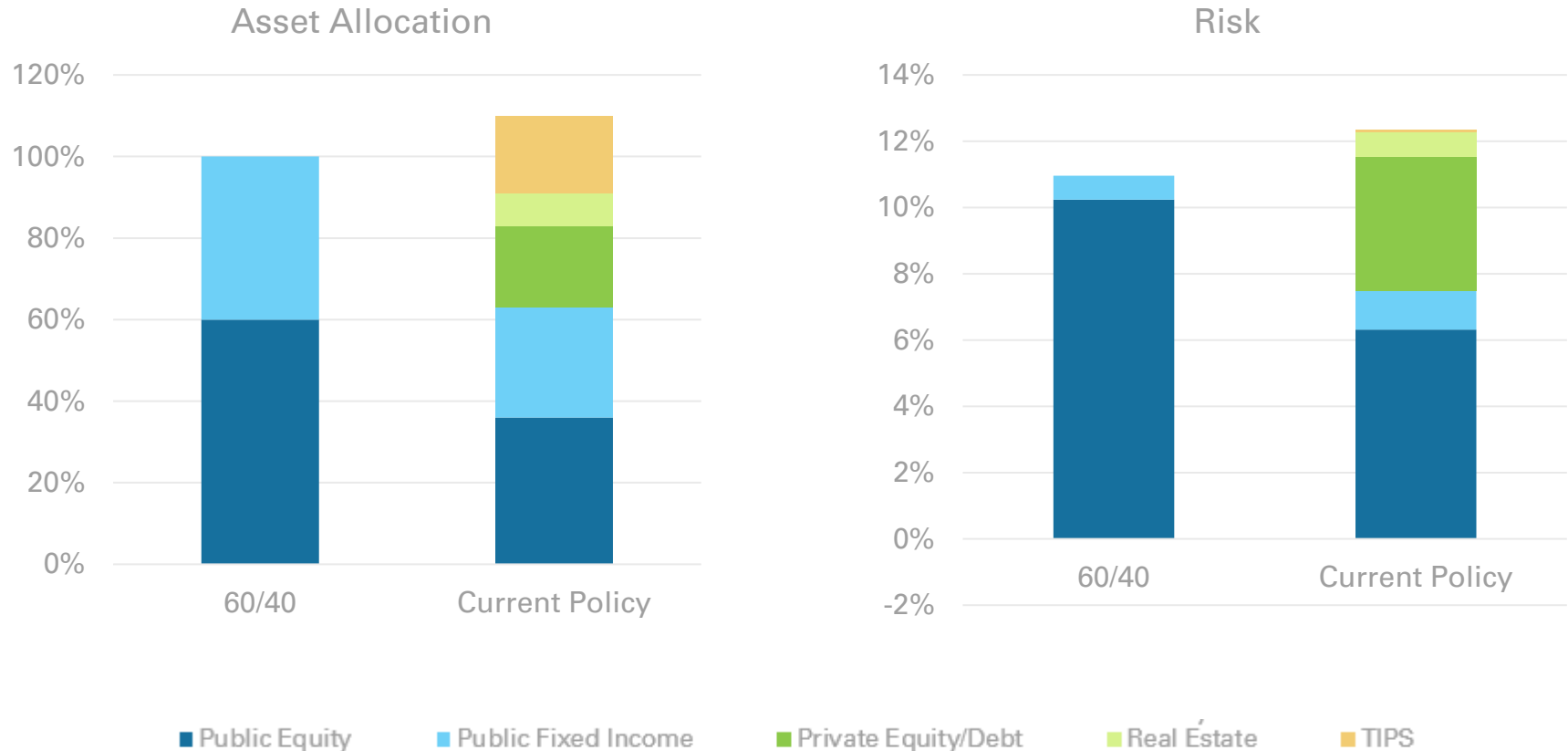


REVIEW OF CURRENT ASSET ALLOCATION



CURRENT POLICY: HIGH LEVEL ALLOCATION

Through a number of strategic decisions, the Current Policy Portfolio has a more diversified risk profile than the 60/40 Reference* portfolio.

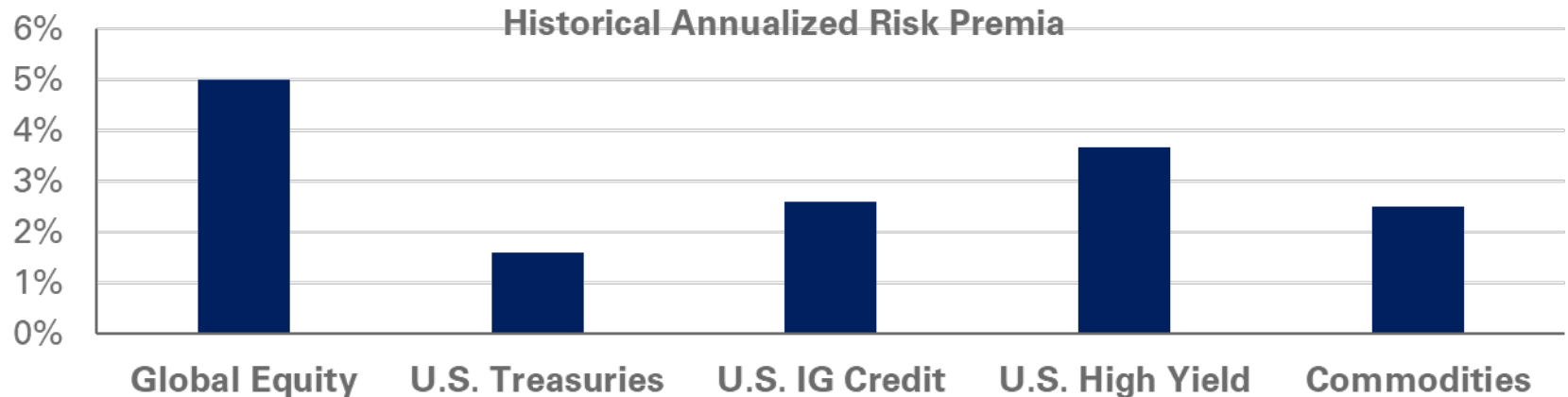


*60/40 Reference portfolio is 60% MSCI World/40% Bloomberg Gov/Credit

PUBLIC MARKET EQUITY OVERVIEW

STRATEGIC VIEWS

- **Public market equities serve as the primary return-generating asset, with the objective of delivering long-term portfolio wealth gains**
 - Equity generally exhibits the highest volatility among public market assets, but long-term return potential warrants a large exposure in most portfolios
- **Sizing public equity exposure is a strategic exercise and should reflect investor return objectives, risk-tolerance, and liquidity needs**
 - Active management, current opportunities, and asset allocation tilts enhance long-term returns as potential opportunities and market dynamics evolve

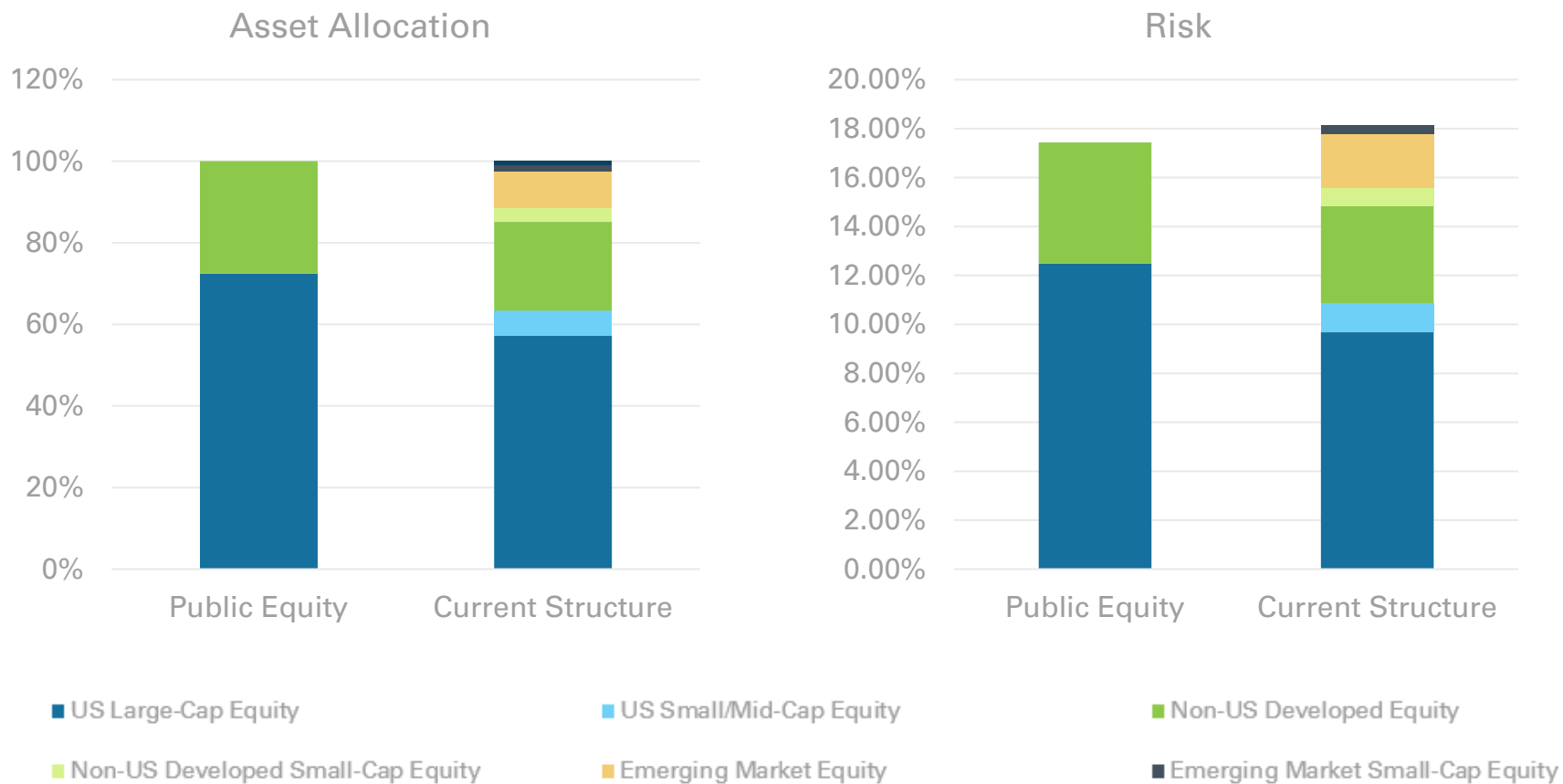


Notes: Risk premia calculated from 1/31/1970 and reflects market returns less cash returns. Global Equity reflects the MSCI World Index through 1/31/1988 and the MSCI ACWI Index thereafter.

Sources: MSCI, S&P, Bloomberg, FactSet

CURRENT POLICY: EQUITY STRUCTURE

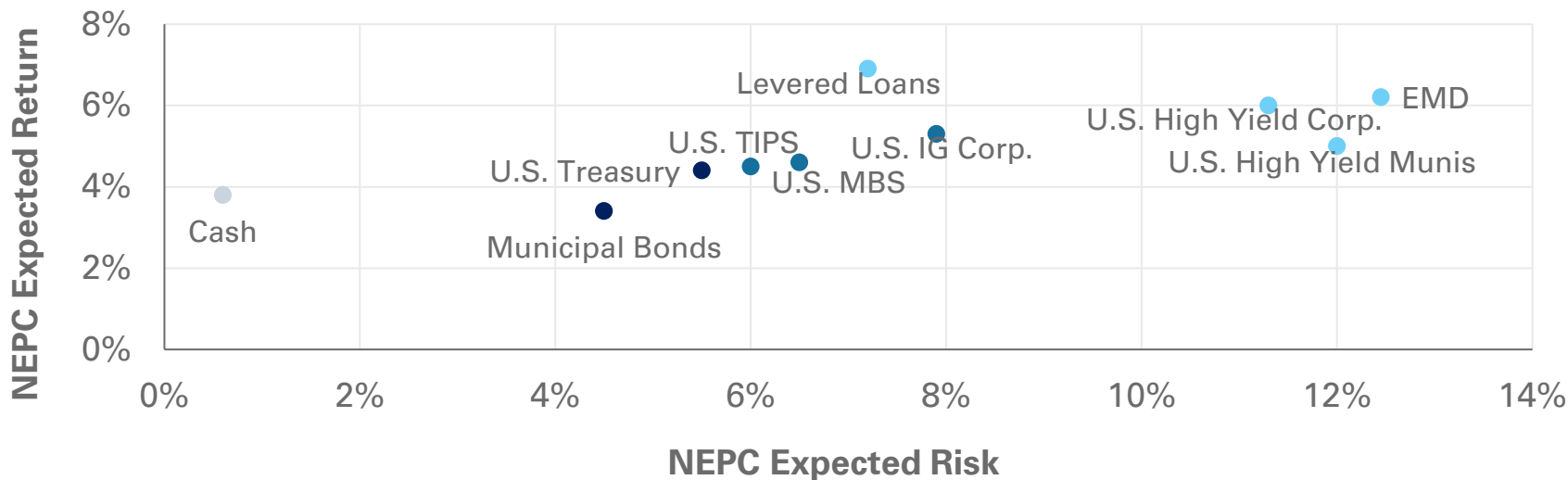
The current equity portfolio structure is generally aligned with the global market capitalization portfolio. One relative minor exception is the current structure China half-weight.



SAFE-HAVEN FIXED INCOME

NEPC STRATEGIC VIEWS

- **For many investors, strategic policy targets to fixed income are applied with a broad brush and hold conflicting investment objectives**
 - The goal of safety and return are in conflict and the need for liquidity and downside protection can be overlooked when reaching for yield
- **We recommend investors create distinct strategic asset allocation targets for safe-haven fixed income and high-quality fixed income**
 - Separate targets for high-quality and safe-haven fixed income align the objective and benchmark with each mandate and clarify their portfolio role



Source: NEPC 09/30/2025 Asset Class Assumptions

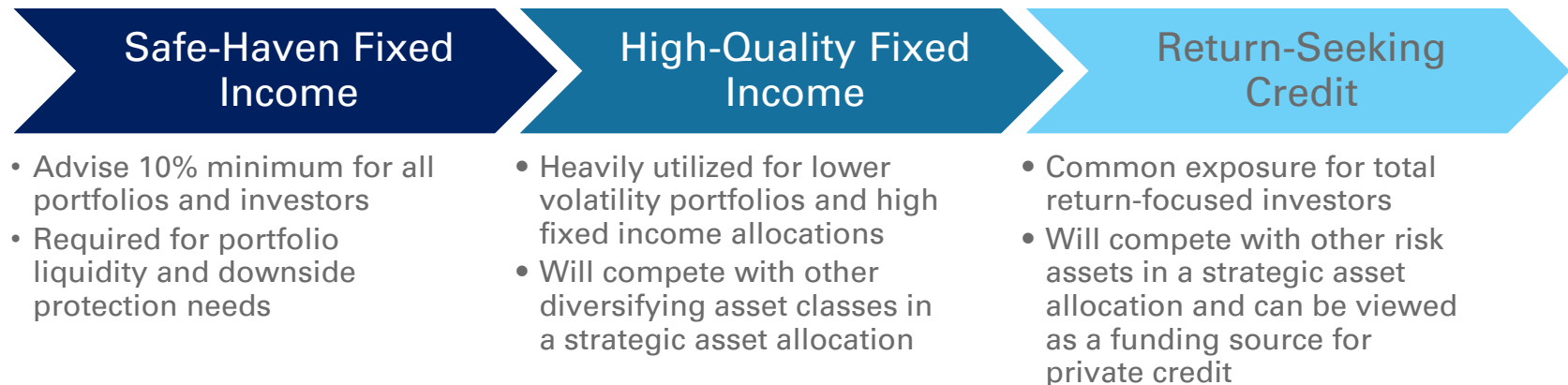


FIXED INCOME

STRATEGIC VIEWS

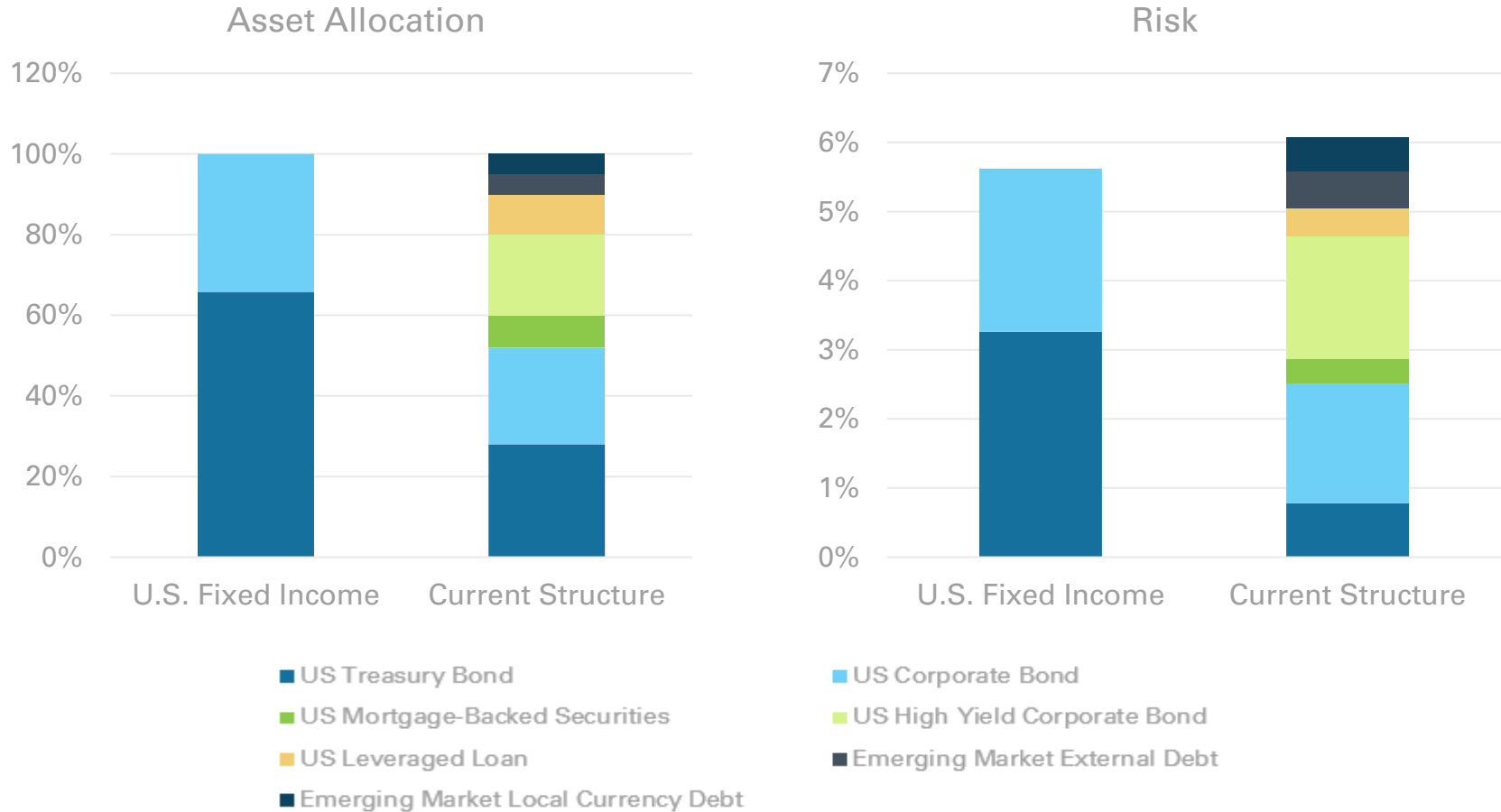
- **Strategic targets to TIPS, high-quality fixed income and return-seeking credit**
 - As a diversifying exposure, we recommend the use of high-quality fixed income
 - We believe the strategic blend of TIPS and Investment Grade Fixed Income is an effective complement to return-seeking credit and other portfolio exposures
 - TIPS and Treasuries also provide an important source of liquidity
 - Ultimately, target allocations to sectors will be a function of strategic views, risk management and bottom-up views on market opportunity and alpha potential

Fixed Income Allocation Spectrum



CURRENT POLICY: FIXED INCOME STRUCTURE

By setting target weights to Investment Grade and Return-Seeking Credit sectors, the Current Fixed Income structure risk is similar in magnitude but much more diversified than the U.S. Investment Grade market



PRIVATE INVESTMENTS

STRATEGIC VIEWS

Skilled Manager Selection is Critical to Achieve Return Potential

IRR Dispersion: Top vs. Bottom Quartile by Vintage Year

State Street Private Capital Index | Buyout | Percentage points

Top and Bottom Quartile IRR by Vintage Year



Private investments offer attractive expected returns for long-term investors

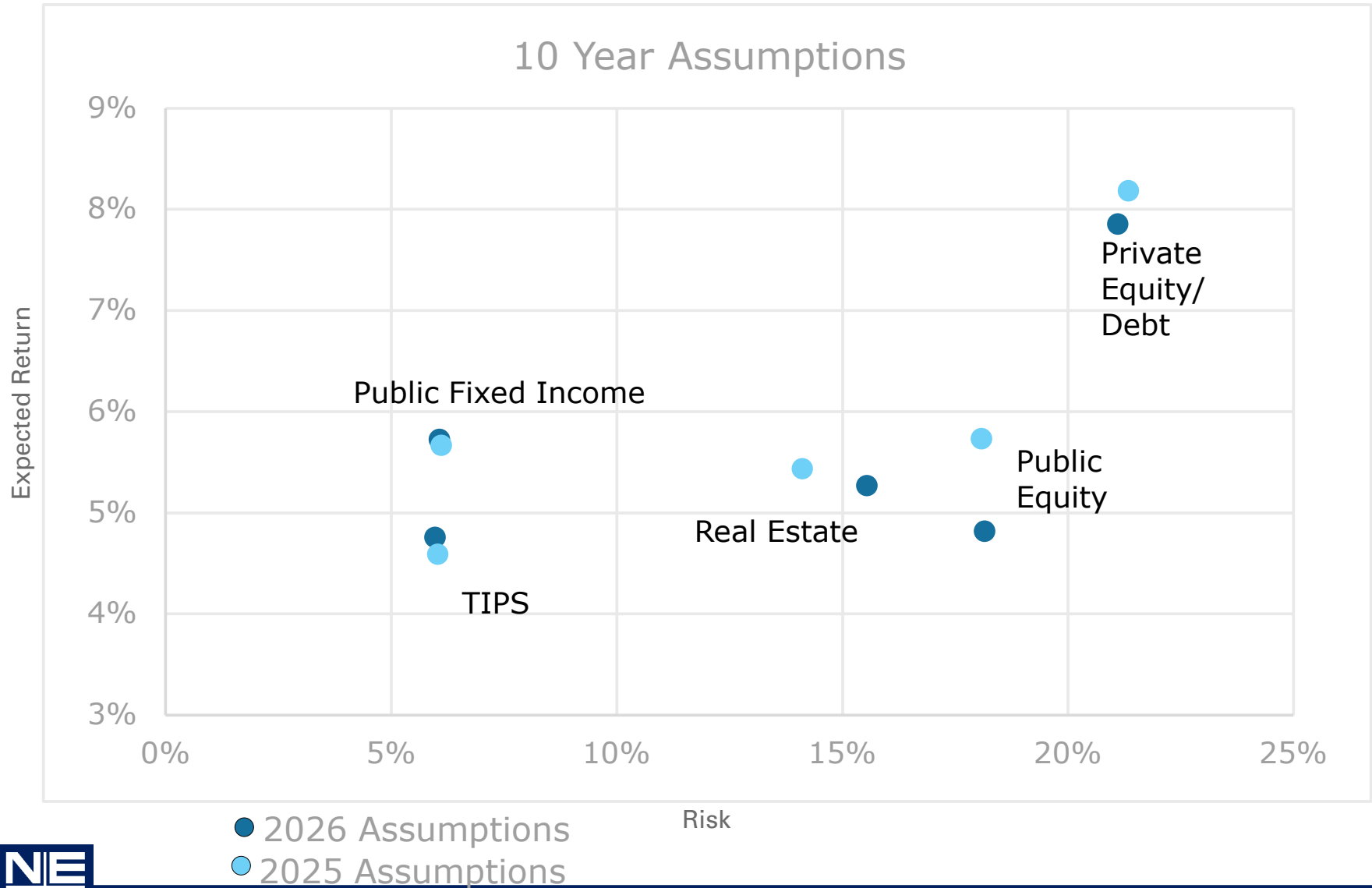
- Private investments offer an illiquidity premium well suited to long-term investors.
- Manager selection is critical given the difficulty of separating market and active returns.
- Manager performance dispersion is historically wide.
- Returns vary meaningfully across vintage years.
- Successful private investing requires both strong manager selection and vintage diversification

BACKGROUND & ASSUMPTIONS



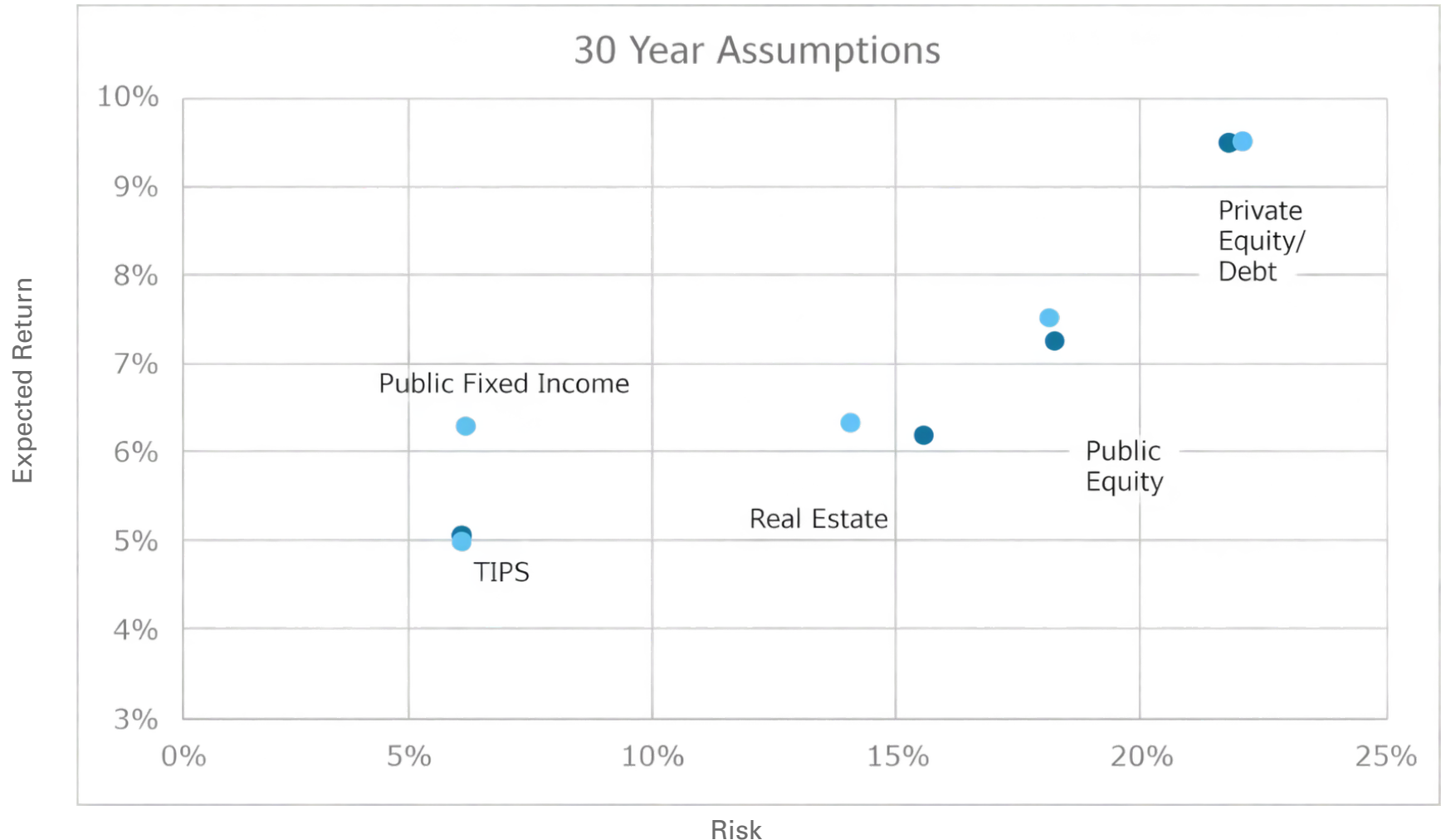
CURRENT AND PREVIOUS YEAR ASSUMPTIONS

10 YEARS



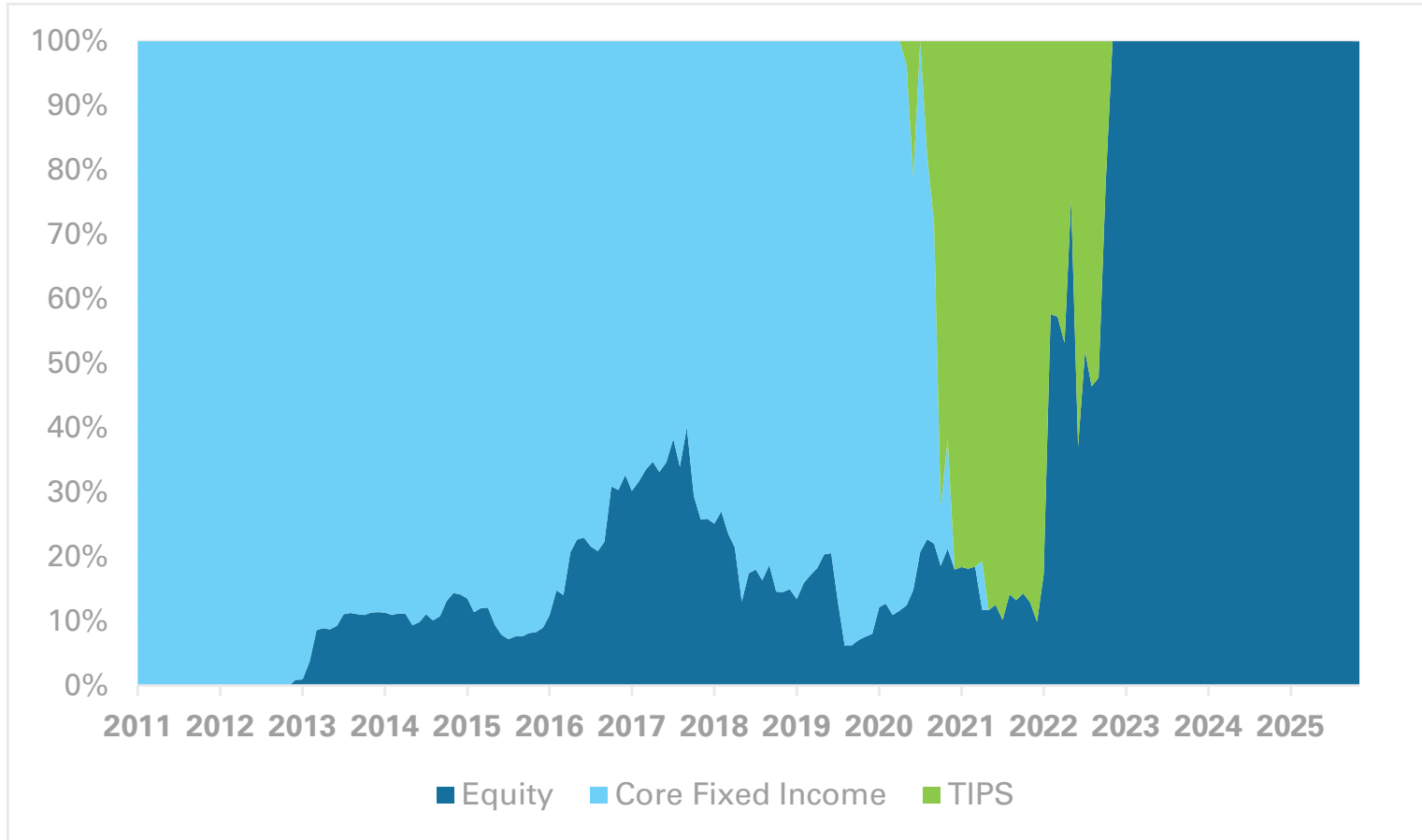
CURRENT AND PREVIOUS YEAR ASSUMPTIONS

30 YEARS



OPTIMAL ASSET ALLOCATION HAS SHIFTED CONSIDERABLY OVER TIME

Maximum Sharpe Ratio Allocation (Rolling Five-Year Periods)



- **Optimizing asset allocation over shorter periods is a difficult exercise**
 - The maximum Sharpe ratio allocation for historical rolling five-year periods has varied considerably

ASSET CLASS ASSUMPTIONS

DEVELOPMENT

- **Capital market assumptions are published for over 70 core asset classes and over 30 composites**
- **Market data as of 6/30/2026**
- **NEPC proprietary models used to develop return forecasts based on a building block approach**
- **The 10-year return outlook is intended to support strategic asset allocation analysis**
- **30-year return assumptions are used for actuarial inputs and long-term planning**

Asset Allocation Process

1. Finalize list of new asset classes
2. Calculate asset class volatility and correlation assumptions
3. Set model terminal values, growth, and inflation inputs
4. Model data updated at quarter-end
5. Review model outputs and produce asset class return assumptions
6. Assumptions released on the 15th calendar day after quarter-end

ASSET CLASS BUILDING BLOCKS

METHODOLOGY

- **Asset models reflect current and forecasted market data to inform expected returns**
- **Systematic inputs are paired with a long-term trend to terminal values**
- **Model inputs are aggregated to capture key return drivers for each asset class**
- **Building block inputs will differ across asset class categories**

Illiquidity Premium

Valuation

Inflation

Real Growth

Yield

10-YEAR RETURN ASSUMPTION OVERVIEW

	Asset Class	06/30/2026 10-Yr Return	06/30/2025 10-Yr Return	Delta
	Cash	3.9%	3.8%	+0.1%
	U.S. Inflation	2.5%	2.6%	-0.1%
Equity	U.S. Large-Cap Equity	4.5%	5.3%	-0.8%
	Non-U.S. Developed Equity	4.5%	5.3%	-0.8%
	Emerging Market Equity	4.5%	6.6%	-2.1%
	Global Equity*	4.8%	5.7%	-0.9%
	Private Equity*	8.1%	8.6%	-0.5%
Fixed Income	U.S. Treasury Bond	4.6%	4.4%	+0.2%
	U.S. Municipal Bond	3.7%	4.3%	-0.6%
	U.S. Aggregate Bond*	4.9%	4.8%	+0.1%
	U.S. TIPS	4.8%	4.6%	+0.2%
	U.S. High Yield Corporate Bond	6.3%	6.1%	+0.2%
	Private Debt*	8.3%	8.3%	-
Real Assets	Commodity Futures	4.2%	4.8%	-0.6%
	REIT	4.6%	5.5%	-0.9%
	Gold	3.9%	4.0%	-0.1%
	Real Estate - Core	5.3%	5.4%	-0.1%
	Private Real Assets - Infrastructure	5.1%	5.7%	-0.6%
Multi-Asset	60% S&P 500 & 40% U.S. Aggregate	5.0%	5.4%	-0.4%
	60% MSCI ACWI & 40% U.S. Agg.	5.2%	5.7%	-0.5%
	Hedge Fund*	6.1%	6.2%	-0.1%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

30-YEAR RETURN ASSUMPTION OVERVIEW

	Asset Class	06/30/2026 30-Yr Return	06/30/2025 30-Yr Return	Delta
	Cash	3.5%	3.5%	-
	U.S. Inflation	2.6%	2.7%	-0.1%
Equity	U.S. Large-Cap Equity	6.8%	7.0%	-0.2%
	Non-U.S. Developed Equity	6.4%	6.8%	-0.4%
	Emerging Market Equity	7.7%	8.6%	-0.9%
	Global Equity*	7.1%	7.4%	-0.3%
	Private Equity*	9.8%	9.9%	-0.1%
Fixed Income	U.S. Treasury Bond	4.8%	4.8%	-
	U.S. Municipal Bond	4.1%	4.3%	-0.2%
	U.S. Aggregate Bond*	5.3%	5.3%	-
	U.S. TIPS	5.0%	5.0%	-
	U.S. High Yield Corporate Bond	7.6%	7.5%	+0.1%
	Private Debt*	9.2%	9.1%	+0.1%
Real Assets	Commodity Futures	4.2%	4.3%	-0.1%
	REIT	6.8%	7.1%	-0.3%
	Gold	4.8%	4.8%	-
	Real Estate - Core	6.1%	6.2%	-0.1%
	Private Real Assets - Infrastructure	6.6%	6.8%	-0.2%
Multi-Asset	60% S&P 500 & 40% U.S. Aggregate	6.5%	6.6%	-0.1%
	60% MSCI ACWI & 40% U.S. Agg.	6.7%	6.9%	-0.2%
	Hedge Fund*	6.7%	6.7%	-

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time.

U.S. INFLATION ASSUMPTIONS

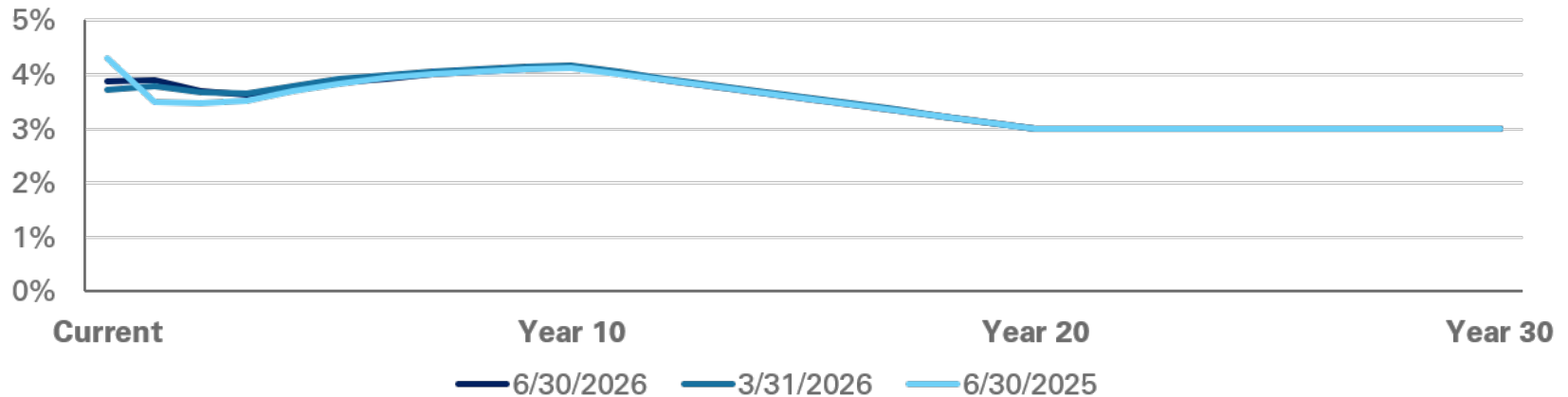
OVERVIEW

- Inflation is a key building block to develop asset class assumptions
- Inflation assumptions are model-driven and informed by multiple inputs for both the U.S. and global assets
- NEPC's inflation assumption forecasts near-term paths for major Consumer Price Index (CPI) components including food, energy, core services, and shelter costs
 - CPI is expected to converge with breakeven inflation forecast over the long-term
- The composite inflation assumption reflects a blend of NEPC's inflation forecast and market-implied breakeven inflation rates

U.S. Inflation Assumption		
Time Horizon	Current	12-Month Change
10-Year	2.5%	-0.1%
30-Year	2.6%	-0.1%

U.S. CASH

EXPECTATIONS



- **Cash is a foundational input for all asset class return expectations that reflects forward expectations of inflation and real interest rates**
 - Cash + risk premia is an input for long-term asset class return projections
- **The composite cash assumption is built from a blend of NEPC's cash forecast and market forward pricing of short-term interest rates**

Time Horizon	Current	12-Month Change
10-Year	3.9%	+0.1%
30-Year	3.5%	-

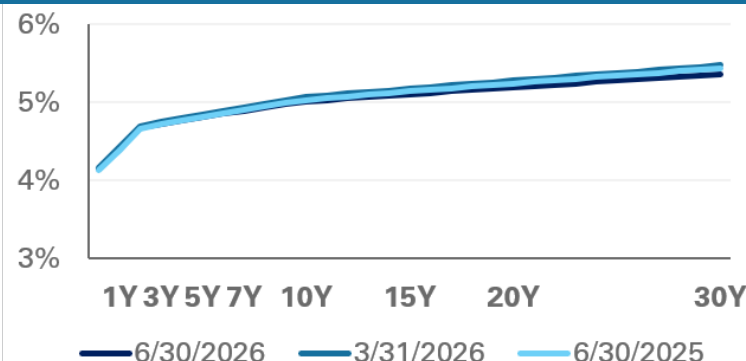
Sources: Bloomberg, FactSet, NEPC

GLOBAL INTEREST RATES

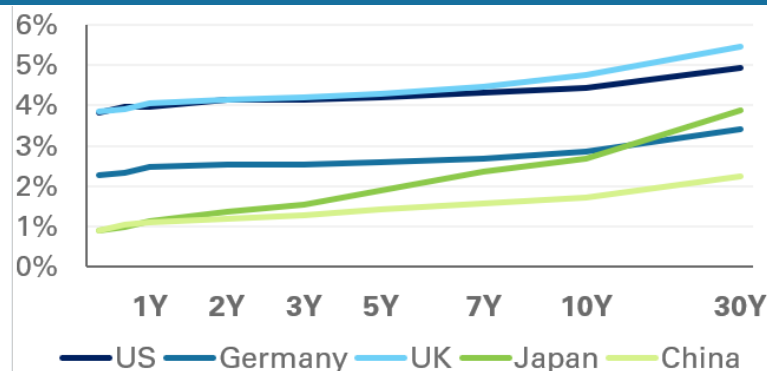
EXPECTATIONS

- **NEPC's outlook on U.S. interest rates has remained consistent over the past few years**
- **As interest rate expectations shift higher or lower, the return outlook for base rates gradually increases or decreases, respectively**
- **The outlook for non-U.S. developed markets has improved given a narrowing nominal yield differential relative to the U.S.**
 - Differing regional growth and inflation conditions have led to diverging central bank actions

NEPC 10-Year Forward U.S. Treasury Curve



Global Yield Curves





PREVIEW OF RECOMMENDATIONS AND SUPPORTING ANALYSIS



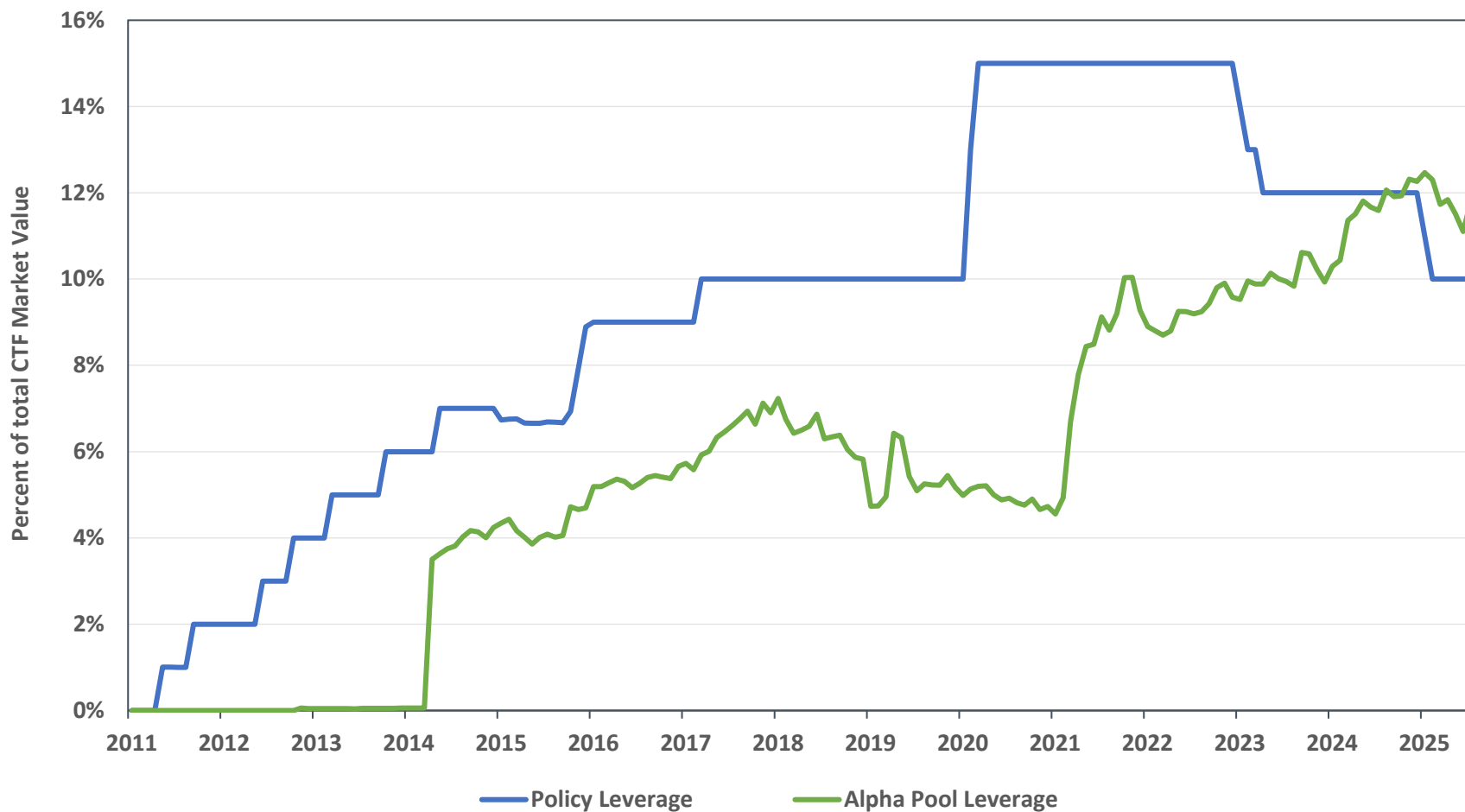
POLICY ALLOCATION APPROACH

Summary

- Liability-aware strategy balances target returns with downside risks, limiting the chance of higher contributions, underfunding, or lower dividends.
- GRS analysis in 2025 supports a 10-year target return between 6% and 7.5%, exceeding the 5% dividend adjustment hurdle while promoting stable contributions, lower funding shortfall risk, and sustainable dividend increases.
- The updated Policy Leverage framework supports a stable target allocation this year driven by only modest changes in expected excess return and volatility compared to 2025.
- Private investment pacing remains consistent this year with policy asset ranges; the updated baseline path incorporates a lower post-secondary sale starting allocation and a more measured commitment pace reflecting the opportunity set.
- Public Equity allocations contribute disproportionately to portfolio risk; diversifying allocations to TIPS, Treasuries, and Investment Grade Credit reduce total risk by increasing exposure to fixed-income duration.

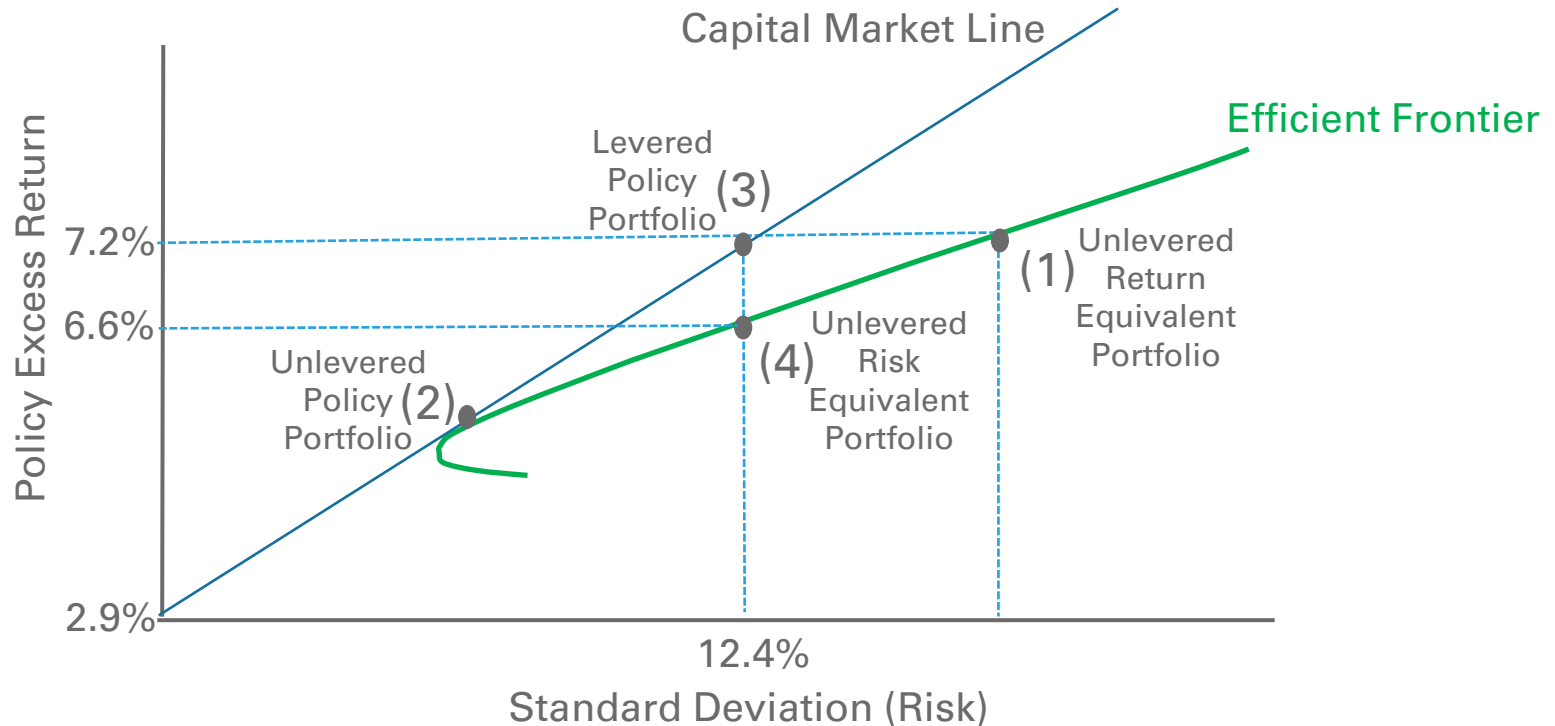
CTF POLICY AND ALPHA POOL LEVERAGE

(HISTORY OF CTF LEVERAGE)



POLICY LEVERAGE FRAMEWORK - REVIEW

(HISTORICAL LEVERAGE PREFERENCE)



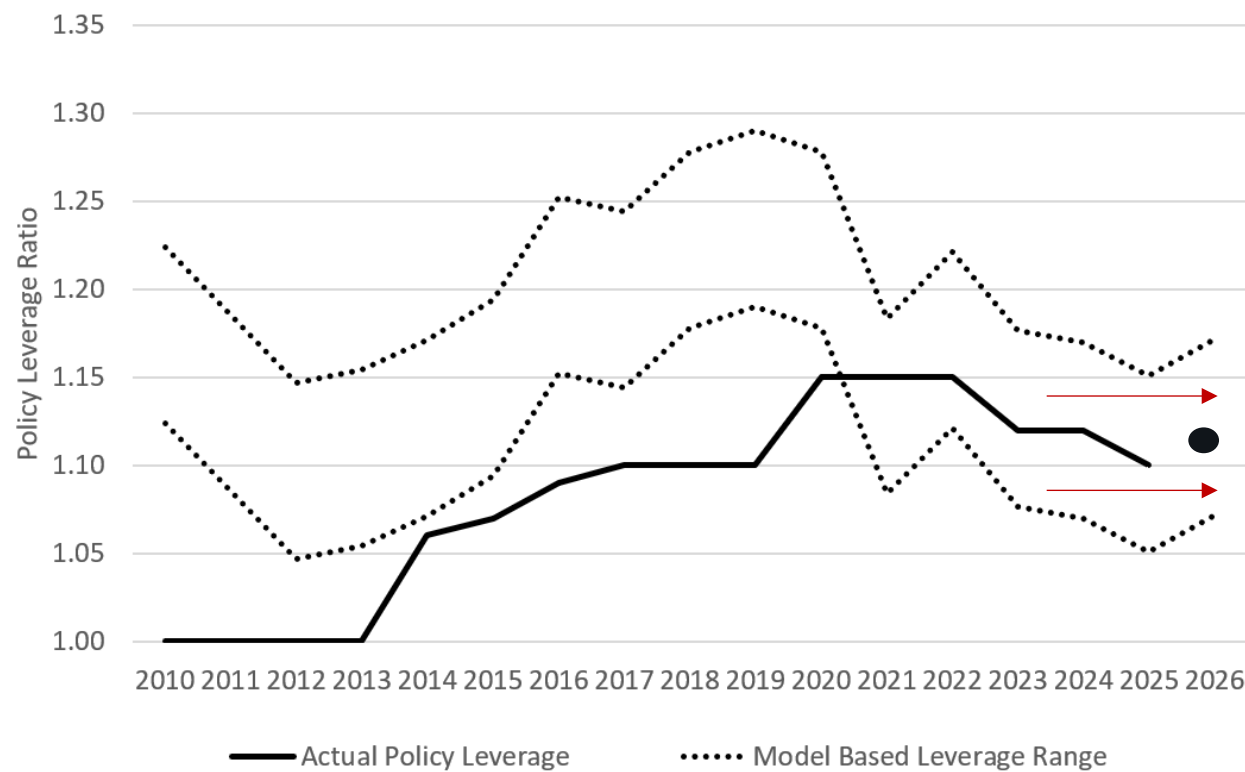
Steps:

1. Determine long term average return and risk for Policy Portfolio and cash
2. Determine long term average return of Unlevered Risk Equivalent Portfolio
3. Implied leverage preference over long term has averaged 1.16x.
4. Leverage changes over time:
 - Sharpe Ratio near term > Sharpe Ratio long term, Leverage ratio > 1.16x
 - Sharpe Ratio near term < Sharpe Ratio long term, Leverage ratio < 1.16x

FRAMEWORK SUGGESTS STABLE POLICY LEVERAGE

(ACTUAL POLICY LEVERAGE COMPARED TO MODEL-BASED LEVERAGE RANGE)

Model-Based Range in Policy Leverage
Compared to Actual Target Policy Leverage



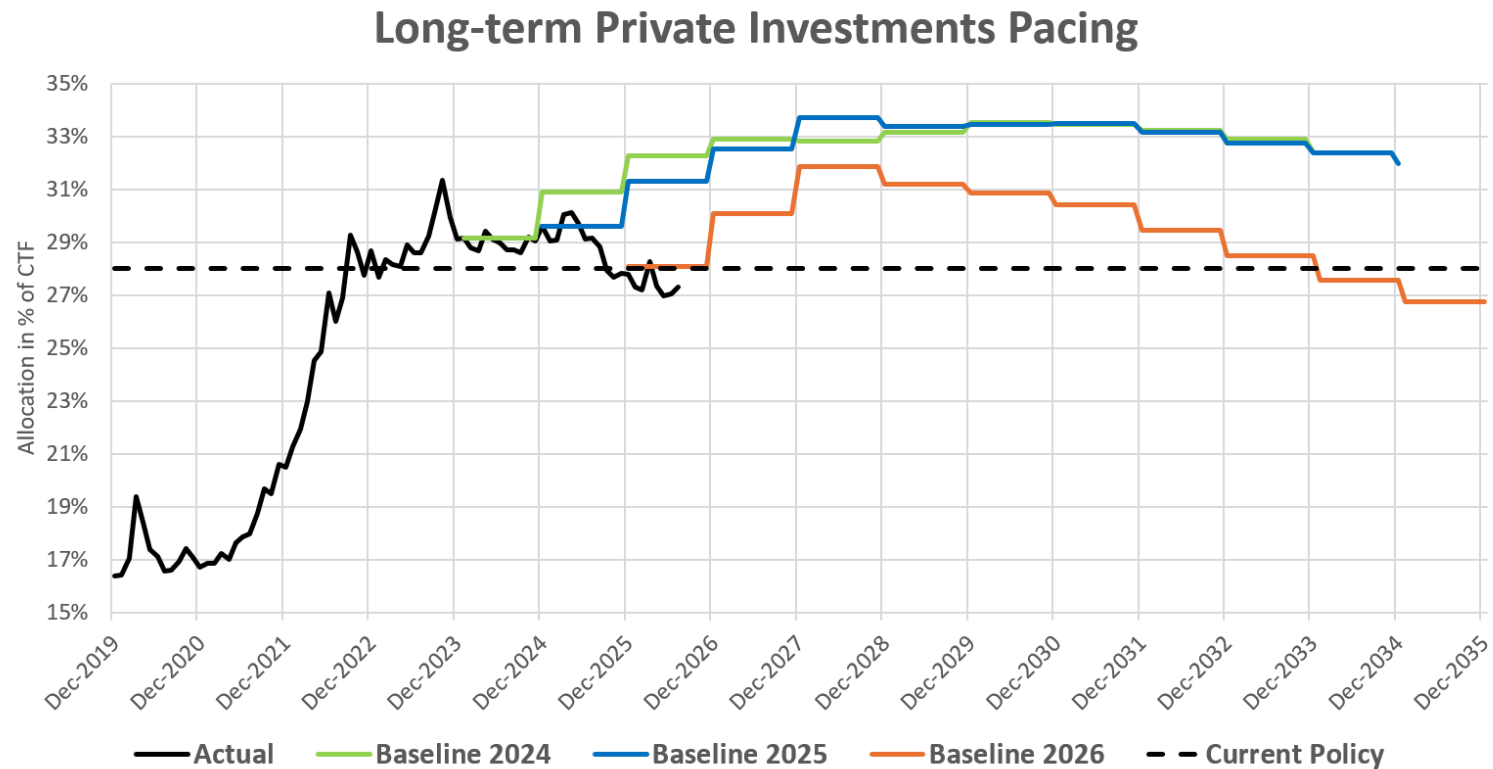
The Policy Leverage framework continues to support a stable target allocation, with only modest changes in expected excess return and volatility relative to 2025.

The model-implied range for Policy Leverage has declined in recent years, reflecting higher cash rates since 2022, lower realized excess returns, and increased portfolio volatility.

The updated framework reflects a modestly higher expected excess return with unchanged volatility, leaving the current target allocation comfortably within the recommended range.

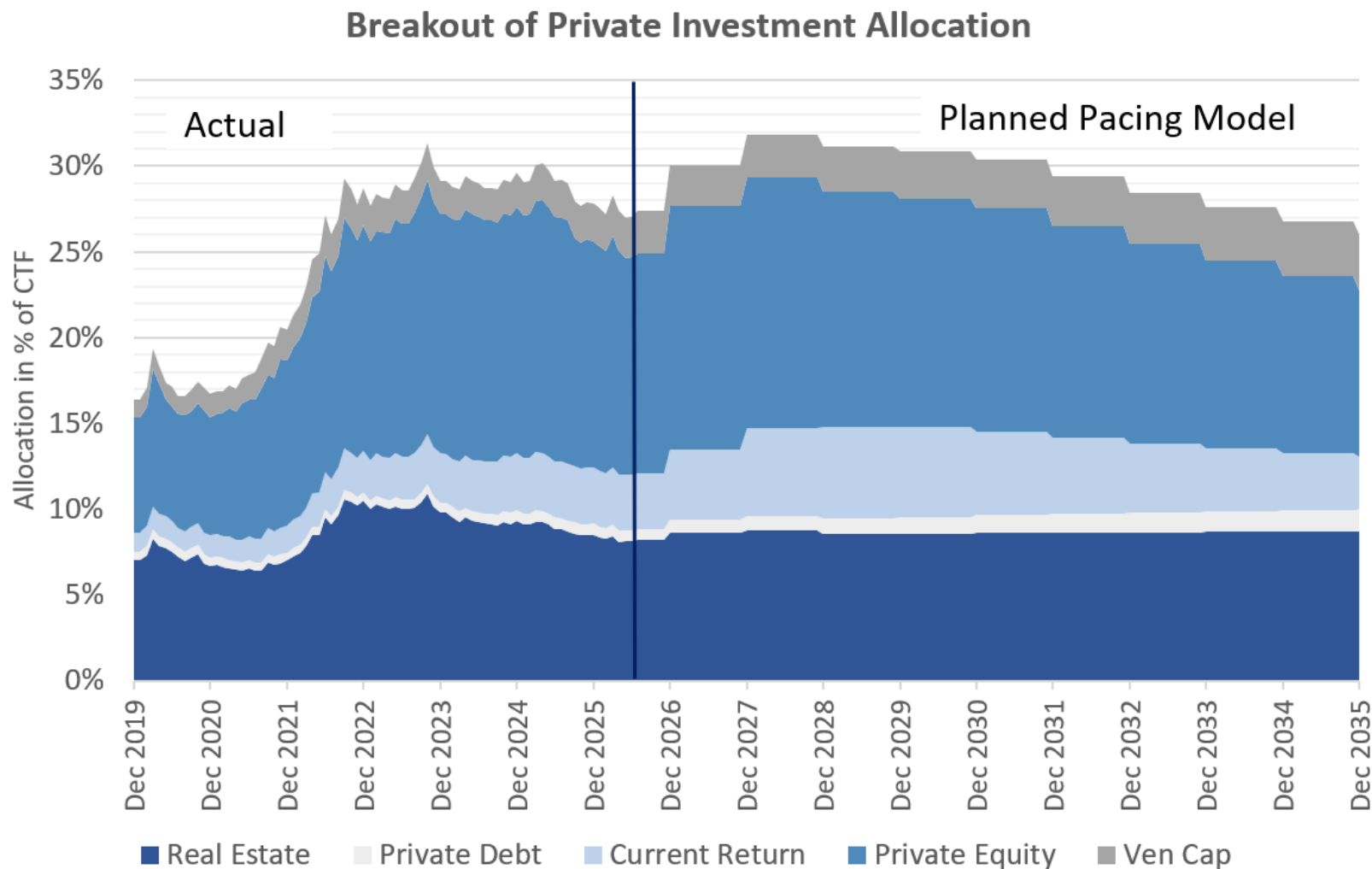


LONG-TERM PRIVATE INVESTMENTS PACING PLAN SUGGESTS NO CHANGE IN TARGET ALLOCATIONS



- The baseline plan reflects remaining commitments from vintage years nearing the end of their investment periods being called over the next two years and the assumed rate of distributions in later years.
- As compared to the 2024 and 2025 pacing plans, the 2026 baseline decreases more in future years due to the cumulative effect of lower expected private equity, current return, and venture capital commitments going forward.

COMPOSITION OF PRIVATE INVESTMENTS PACING PLAN BY SUB-ASSET

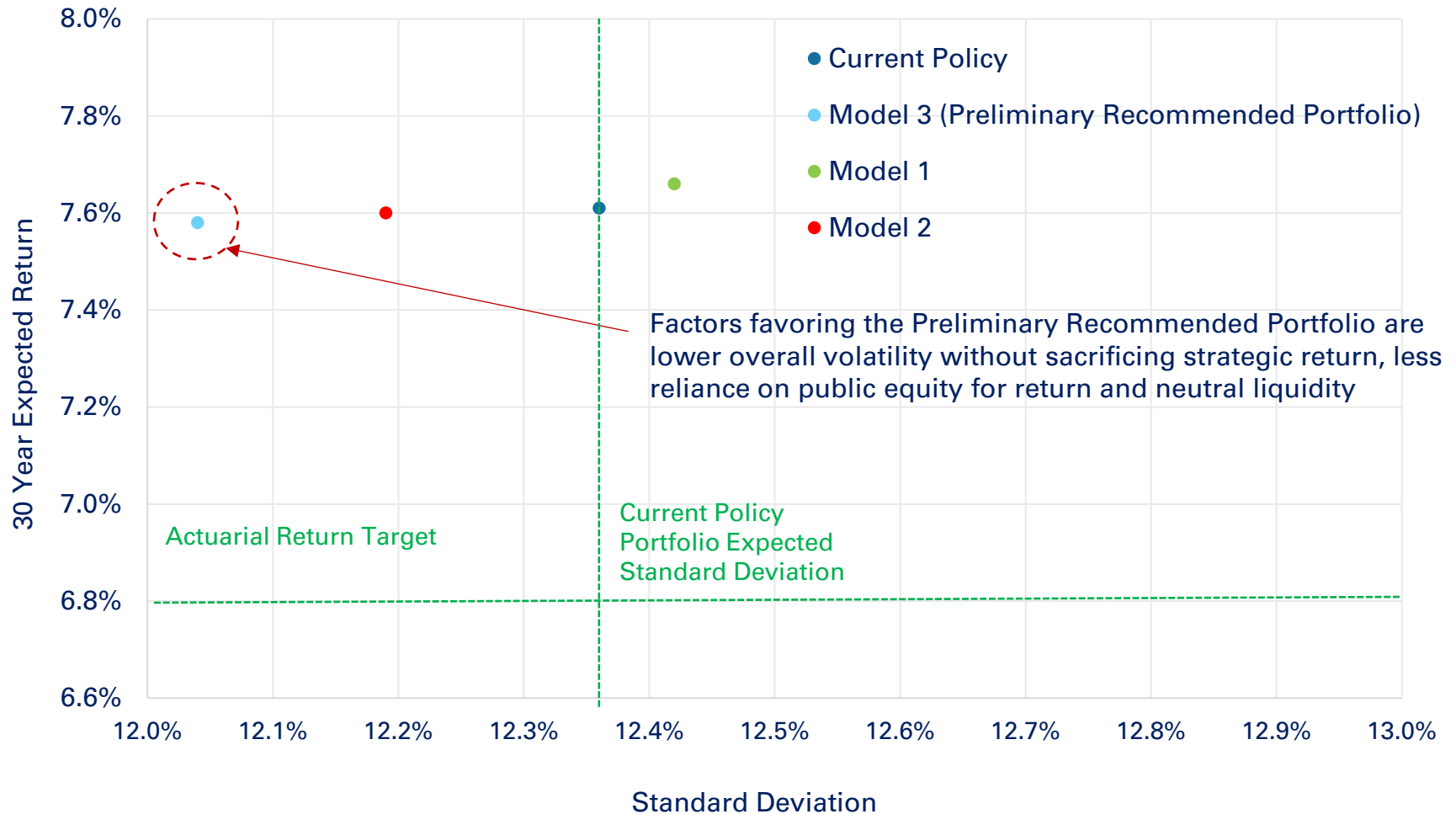


PRIVATE MARKET ALLOCATION ATTRIBUTION

Year Ending	Private Market Allocation (% CTF)	YoY Change in Private Market Allocation			
		Total	Denominator	PMG Alpha	Cash Flow
12/31/2019	16.4%				
12/31/2020	16.7%	0.4%	-0.7%	0.8%	0.2%
12/31/2021	20.5%	3.8%	2.1%	0.3%	1.3%
12/31/2022	28.7%	8.2%	5.8%	0.2%	2.1%
12/31/2023	29.1%	0.4%	-1.7%	0.5%	1.6%
12/31/2024	29.6%	0.5%	-0.5%	0.4%	0.6%
12/31/2025	27.8%	-1.8%	-0.8%	0.1%	-1.1%
Total Change from 2019		11.4%	4.3%	2.3%	4.8%

CURRENT POLICY AND MODEL PORTFOLIOS

Model Portfolios



CURRENT AND RECOMMENDED ALLOCATIONS

SUMMARY

Asset Class	10 Year Return Geometric Return	10 Year Risk / Return Ratio	30 Year Return Geometric Return	30 Year Risk / Return Ratio	Standard Deviation	Current Policy	Model 1	Model 2	Model 3 (Preliminary Recommended Portfolio)
Public Equity	4.8%	0.05	7.2%	0.20	18.2%	36%	34%	35%	34%
Public Fixed Income	5.7%	0.30	6.2%	0.45	6.1%	27%	27%	27%	28%
Inflation Sensitive (TIPS)	4.8%	0.15	5.0%	0.26	6.0%	19%	19%	20%	20%
Private Equity/Debt	7.9%	0.19	9.5%	0.28	21.1%	20%	22%	20%	20%
Real Estate	5.3%	0.09	6.1%	0.17	15.5%	8%	8%	8%	8%
Policy Leverage	4.1%	N/A	3.7%	N/A	0.7%	-10%	-10%	-10%	-10%
10 Year Compound Return						6.13%	6.19%	6.13%	6.14%
10 Year Risk/Return Ratio						0.18	0.19	0.18	0.19
30 Year Compound Return						7.61%	7.66%	7.60%	7.58%
30 Year Risk/Return Ratio						0.33	0.34	0.34	0.34
Standard Deviation						12.36%	12.42%	12.19%	12.04%
Duration:									
- CTF Fund Level (years)						2.53	2.53	2.60	2.66
- Public Fixed Income including TIPS (years)						5.51	5.51	5.53	5.54
VaR 95% CL 1-Yr Horizon (\$B)						-20.1	-20.1	-19.7	-19.3
Estimated T-Cost (\$M)						N/A	-2.4	-1.7	-3.6
Target Active Risk*						1.2%	1.2%	1.2%	1.2%

* Active risk range of +/- 0.6%

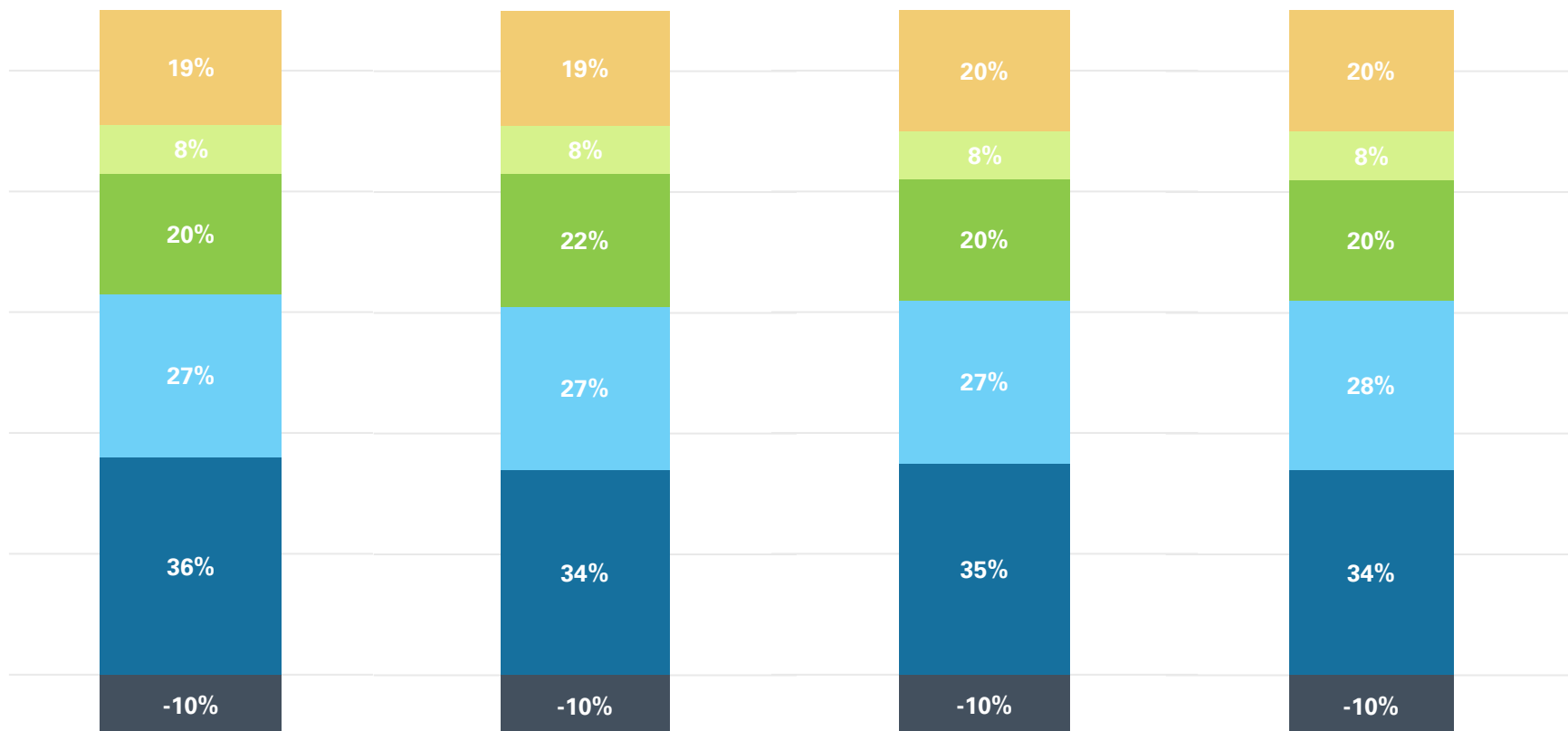
ASSET ALLOCATION

Model 3
(Preliminary
Recommended
Portfolio)

Current
Policy

Model 1

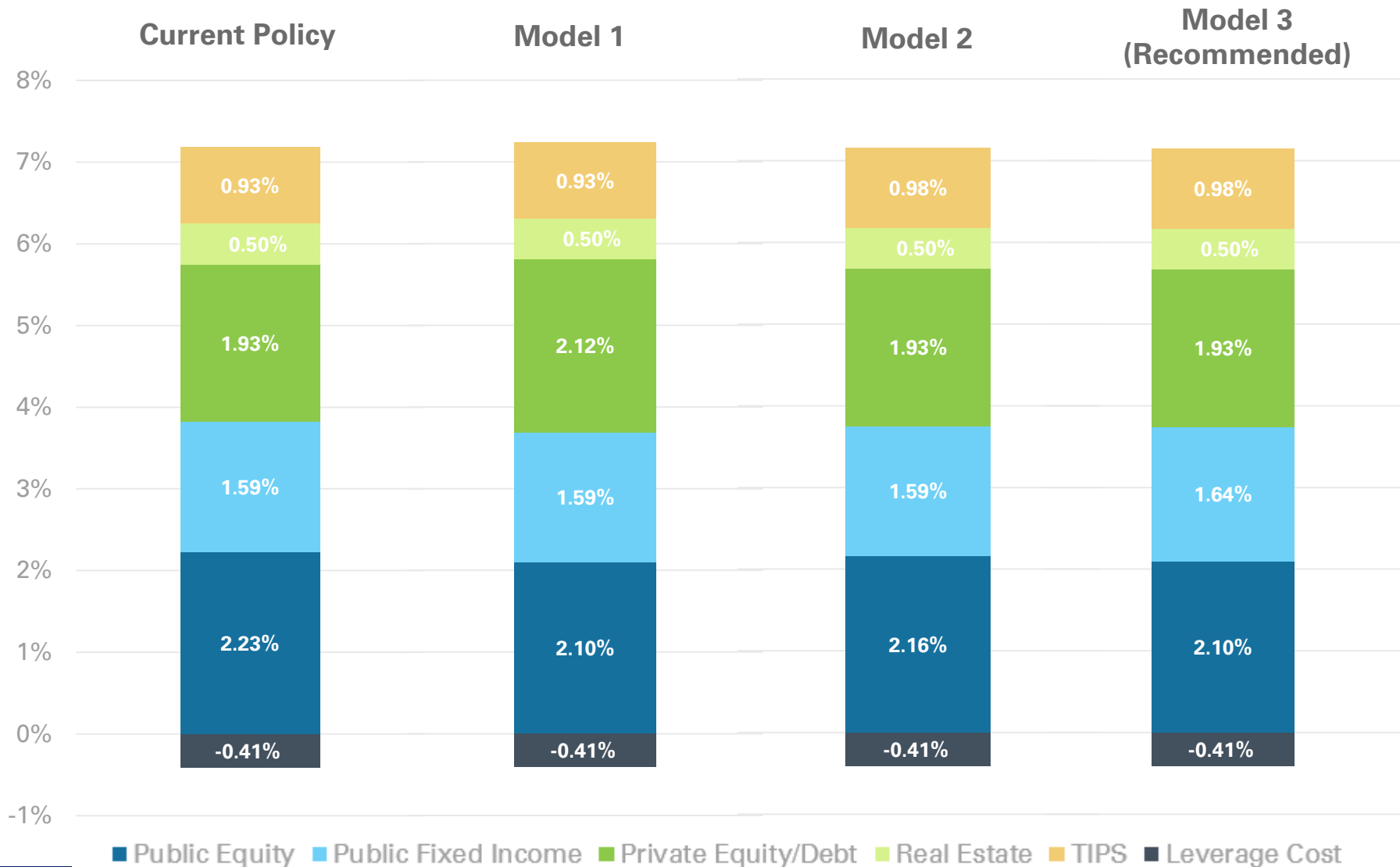
Model 2



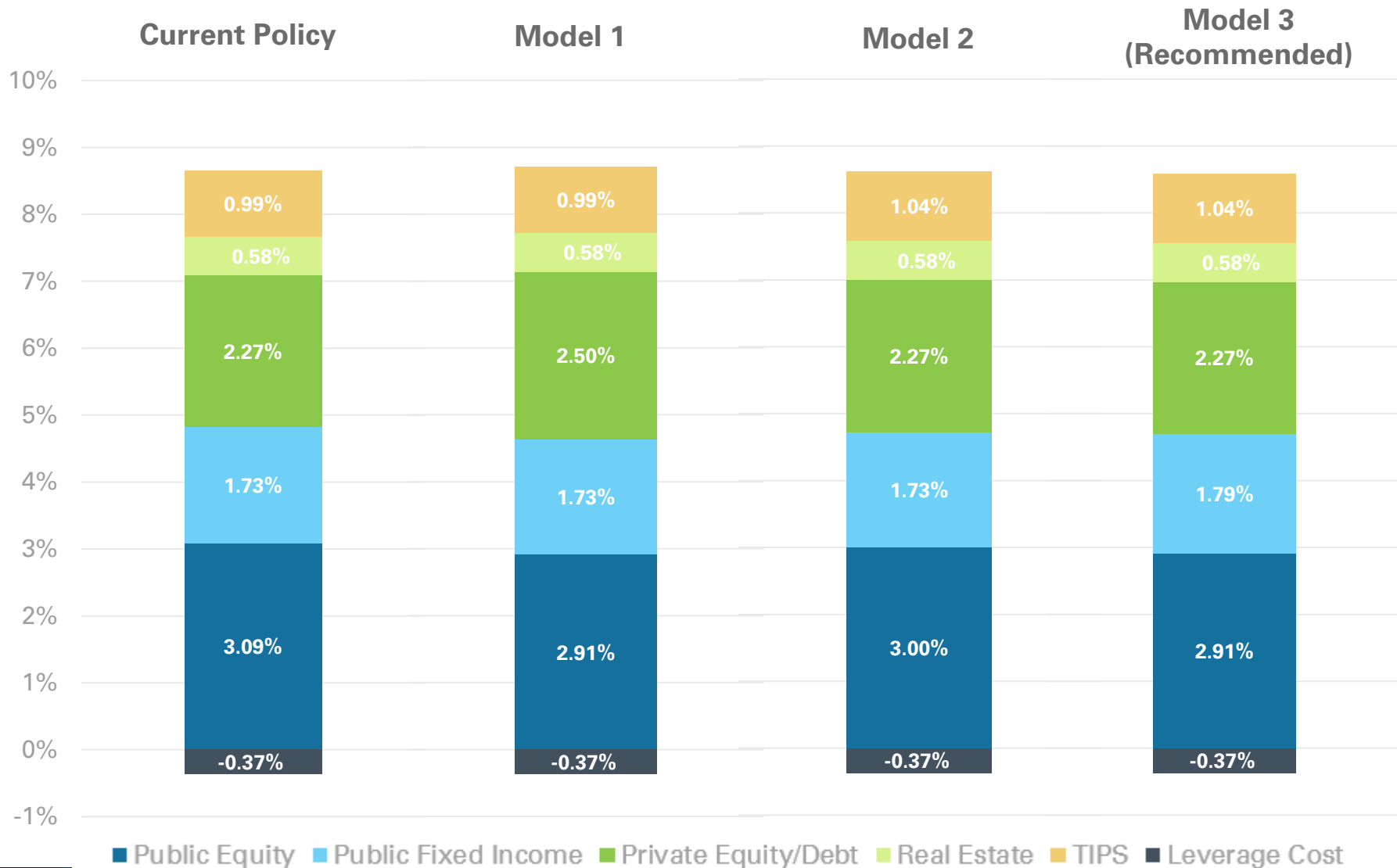
Public Equity Public Fixed Income Private Equity/Debt Real Estate TIPS Leverage Cost



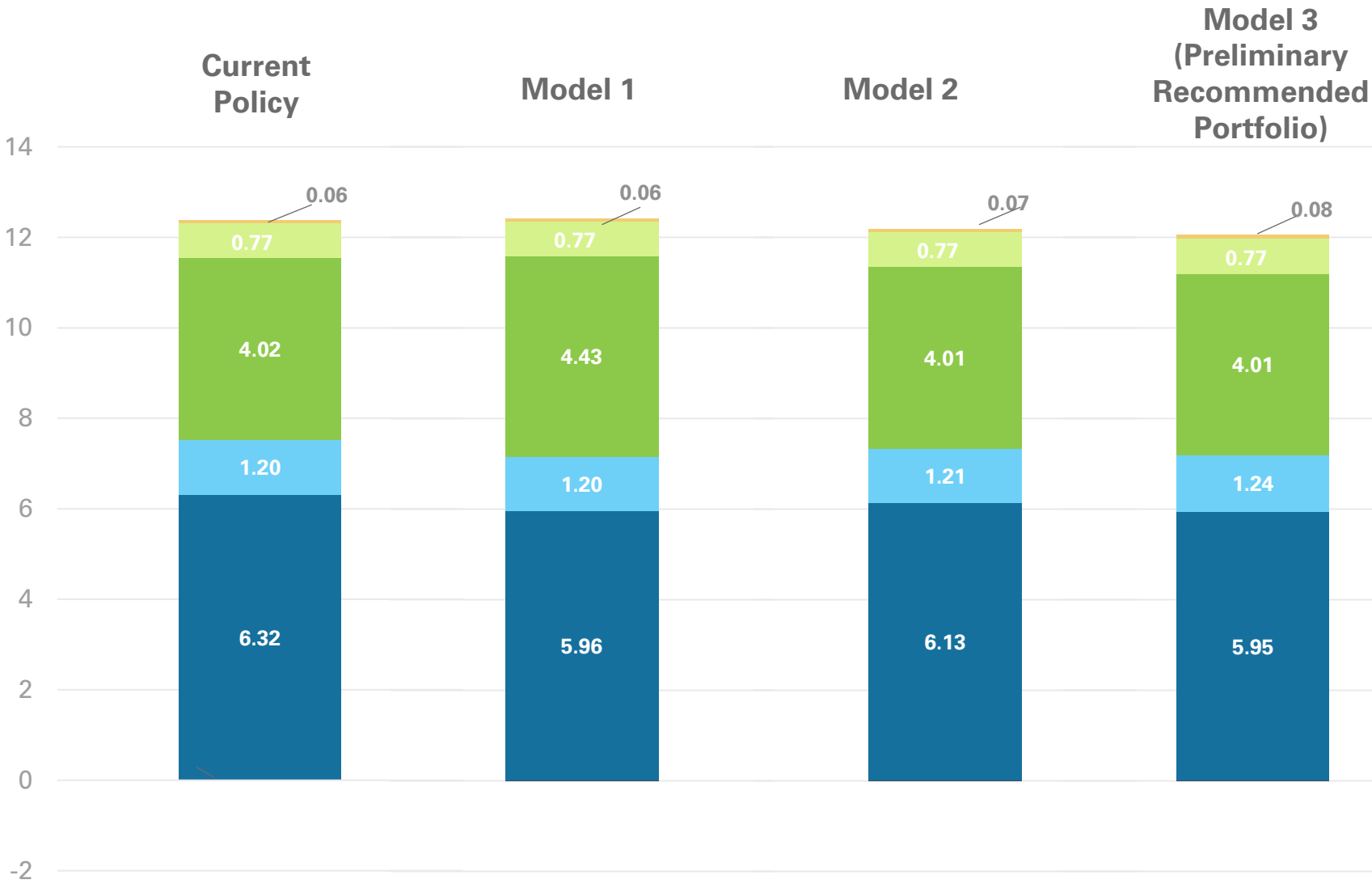
CONTRIBUTION TO EXPECTED RETURN 10 YEAR ASSUMPTIONS



CONTRIBUTION TO EXPECTED RETURN 30 YEAR ASSUMPTIONS



CONTRIBUTION TO ASSET RISK



■ Public Equity ■ Public Fixed Income ■ Private Equity/Debt ■ Real Estate ■ TIPS ■ Leverage Cost

PUBLIC EQUITY STRUCTURE

	Current Equity Allocation*	% of Total Portfolio	Preliminary Recommended Public Equity Allocation*	% of Total Portfolio
Global Equities	79.0%	28.4%	79.0%	26.9%
US Small Cap Equities	6.2%	2.2%	6.2%	2.1%
Int'l Small Cap Equities	3.5%	1.3%	3.5%	1.2%
Emerging Market Large Cap				
China	1.0%	0.4%	1.0%	0.4%
x-China	8.9%	3.2%	8.9%	3.0%
Emerging Market Small Cap	1.5%	0.5%	1.5%	0.5%
Total		36%		34%
10-Year Compound Return	4.8%		4.8%	
30-Year Compound Return	7.1%		7.1%	
Standard Deviation	18.2%		18.2%	
10-Year Return/Risk Ratio	0.05		0.05	
30-Year Return/Risk Ratio	0.20		0.20	

* Market capitalization weights as of June 30, 2026; Actual market capitalization weights will float with market moves over time. Provided for informational purposes.

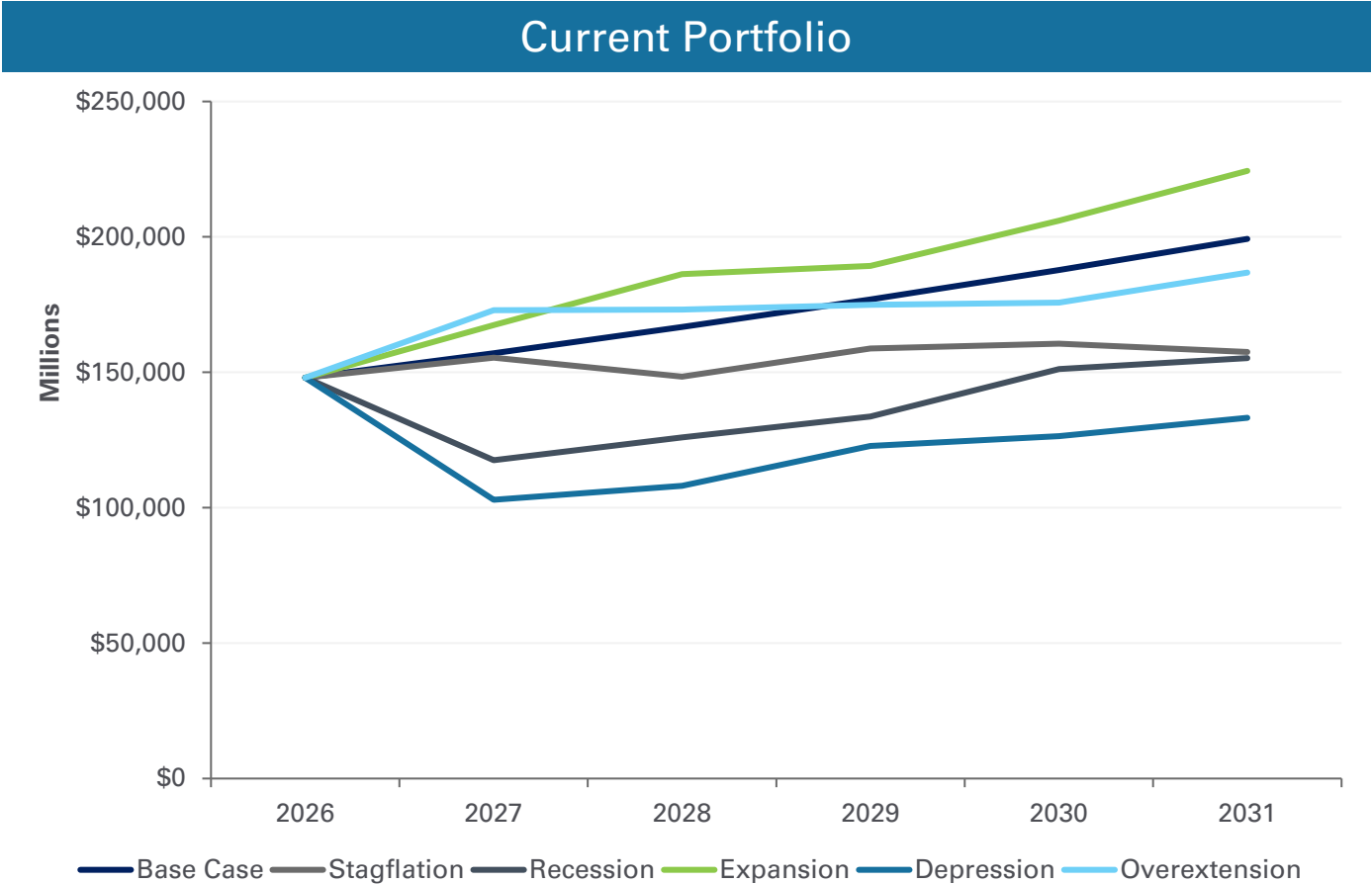
PUBLIC FIXED INCOME STRUCTURE

	Current Fixed Income Allocation	% of Total Portfolio	Preliminary Recommended Fixed Income Allocation	% of Total Portfolio
US Treasuries	28.0%	7.6%	28.8%	8.1%
US Investment Grade Credit	24.0%	6.5%	24.9%	7.0%
Mortgage-Backed	8.0%	2.2%	7.7%	2.2%
High Yield Bonds	20.0%	5.4%	19.3%	5.4%
Leveraged Loans	10.0%	2.7%	9.6%	2.7%
Emerging Market Debt	10.0%	2.7%	9.6%	2.7%
Total		27%		28%
10-Year Compound Return	5.7%		5.7%	
30-Year Compound Return	6.3%		6.2%	
Standard Deviation	6.1%		6.0%	
10-Year Return/Risk Ratio	0.304		0.303	
30-Year Return/Risk Ratio	0.453		0.452	
Duration (years)	4.79		4.84	

SCENARIO ANALYSIS

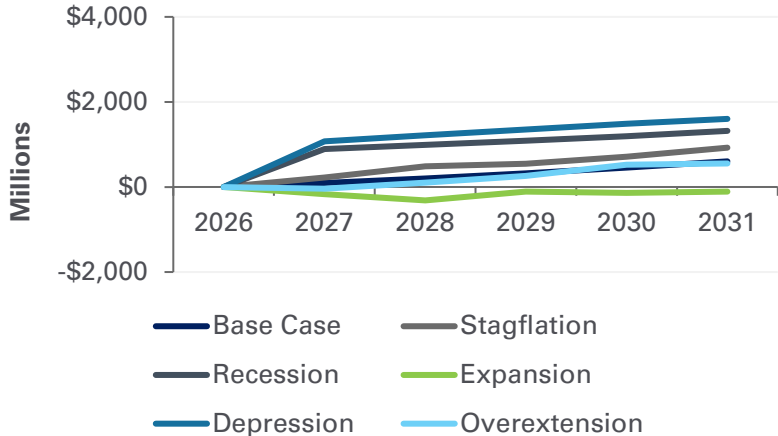


MACRO SCENARIOS: CURRENT PORTFOLIO

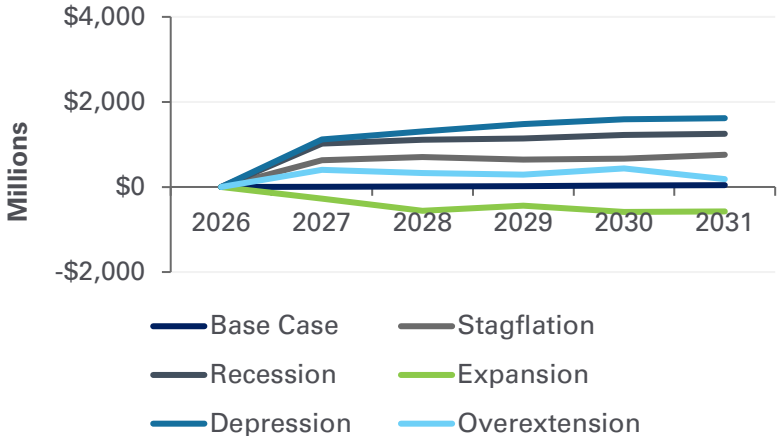


MACRO SCENARIOS: MODEL PORTFOLIOS RELATIVE TO CURRENT POLICY

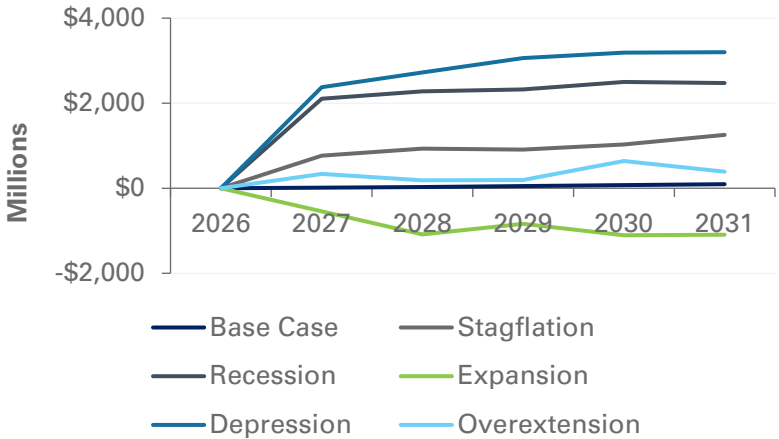
Model 1



Model 2



Model 3 (Preliminary Recommended Portfolio)



LIQUIDITY RISK UPDATE



FRAMEWORK FOR ANALYZING LIQUIDITY RISK

- **CTF liquidity risk metrics**

- Excess liquidity: liquid assets net of cash requirements as a % of CTF
- Liquidity Coverage Ratio: sources of liquidity divided by cash requirements

- **Simulation model evaluates CTF liquidity risk in the 10-year pacing plan**

- Simulation builds on the 2026 pacing model of expected commitments, capital calls and distributions
- Model generates 10,000 scenarios of random public and private asset returns, producing a distribution of potential liquidity outcomes each year in the 10-year pacing plan

- **Cash flow assumptions**

- Framework includes dynamic cash flow rules to simulate the relationship between capital calls, distributions and U.S. large cap equity returns
- Importantly, the simulation model does not include a commitment response rule that reflects SWIB's reaction to deviations from the pacing plan. The commitment response is evaluated in a separate stress-test.

LIQUIDITY PROFILE OF THE LONG-TERM PRIVATE INVESTMENT ALLOCATION

	Private Allocation in Year 10 of Simulation (% of CTF)			Excess Liquidity in Year 10 of Simulation (% of CTF)			Liquidity Coverage Ratio (LCR) in Year 10 of Simulation (1-year LCR)		
	Avg	75% CL	95% CL	Avg	25% CL	5% CL	Avg	25% CL	5% CL
SWIB Pacing Plan 2024*	34	42	58	28	23	12	4.1	3.1	1.8
SWIB Pacing Plan 2026*	28	33	45	34	27	11	5.1	3.6	1.7

* Based on the expected private investments allocation in Year 10 of the pacing plan.

Note: "CL" represents the statistical Confidence Level. For example, the column heading "95% CL" implies that the expected outcome is in the range 95% of the time and outside the range 5% of the time.

CURRENT CTF LIQUIDITY NEEDS AND COVERAGE

- 2026 CTF net liquidity (cash) needs on a full-year basis are estimated below:

<u>Uses</u>		<u>Sources</u>		
\$7.4B Benefit Payments		\$2.7B Contributions		
+		+		
\$6.9B Capital Calls (Illiquid Assets)	-	\$6.4B Distributions (Illiquid Assets)	=	\$5.2B Net Cash Needs

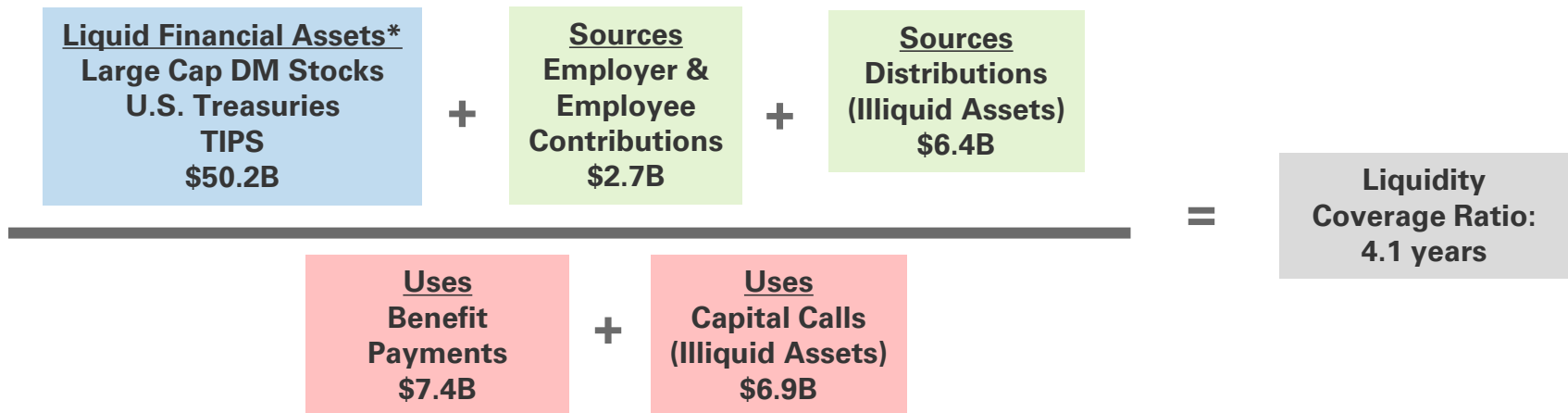
- CTF Net Excess Liquidity can be defined as follows:

<u>Liquid Financial Assets*</u>				
\$26.2B Large Cap Stocks				
\$6.8B Treasuries				
\$17.2B TIPS				
	-	\$5.2B Net Cash Needs	=	\$45.0B Net Excess Liquidity (32% of CTF)

- Net excess liquidity incorporates the following:
 - Adjusted for encumbered assets linked to leverage sourcing
 - Includes distributions at 1-year horizon, but it is also estimated at the monthly and quarterly horizons assuming no distributions

DEFINING THE LIQUIDITY COVERAGE RATIO (LCR)

- **Liquidity coverage can be expressed as a ratio by rearranging Liquid Financial Assets and Cashflow Sources and Uses.**
 - The Liquidity Coverage Ratio (LCR) at a 1-year horizon can be interpreted as years of available liquidity coverage



- **The LCR can also be expressed at a monthly or quarterly horizon.**
 - Evaluating liquidity coverage at different horizons helps to identify potential vulnerabilities to different market scenarios (sharp market downturn and reversal versus a drawn-out market decline)

SUMMARY

- **Updated NEPC capital market assumptions compared to 2025:**
 - Key changes include lower 10-year expected returns in Public Equity, Private Equity/Debt, and Real Estate and higher expected returns in TIPS.
 - At the 30-year horizon, the expected return of Public Equity continues to decline.
- **Liability-aware strategy:**
 - The liability-aware strategy balances target returns with downside risks, limiting the chance of higher contributions, underfunding, or lower dividends.
 - GRS analysis in 2025 supports a 10-year target return between 6% and 7.5%
- **Updated Policy Leverage framework and private investments pacing plan:**
 - The updated Policy Leverage framework supports a stable target allocation this year driven by only modest changes in expected excess return and volatility compared to 2025.
 - Private investment pacing remains consistent this year with policy asset ranges; the updated baseline path incorporates a lower post-secondary sale starting allocation and a more measured commitment pace reflecting the opportunity set.
- **Preview of recommendations:**
 - Reduce Public Equities 2%, add 1% TIPS, 0.5% Treasuries, and 0.5% IG Credit

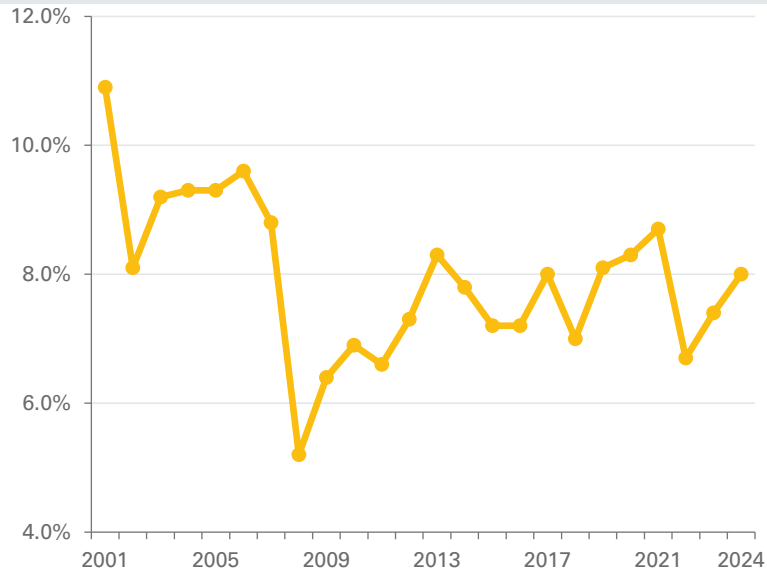
VARIABLE TRUST FUND



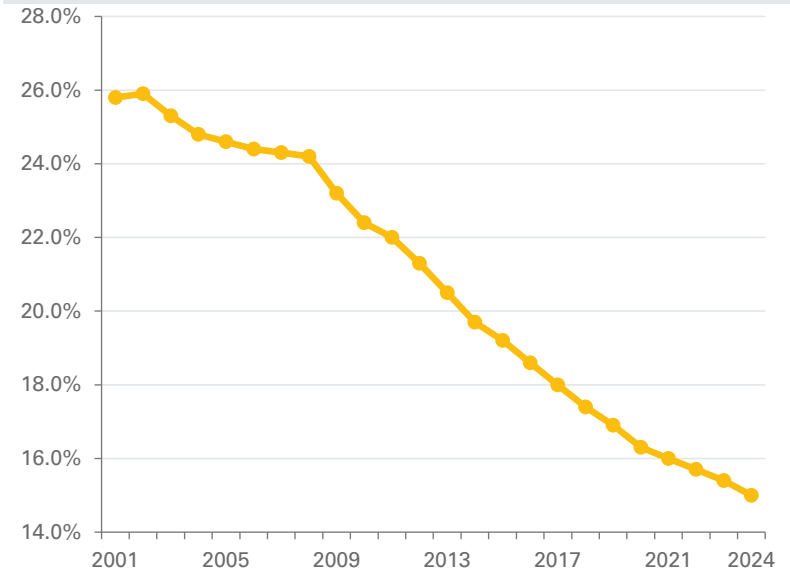
PARTICIPATION DECLINED WHILE VTF'S SHARE OF WRS ASSETS REMAINED BROADLY STABLE

VARIABLE RETIREMENT TRUST | KEY TRENDS, 2001–2024

VTF share of total WRS assets



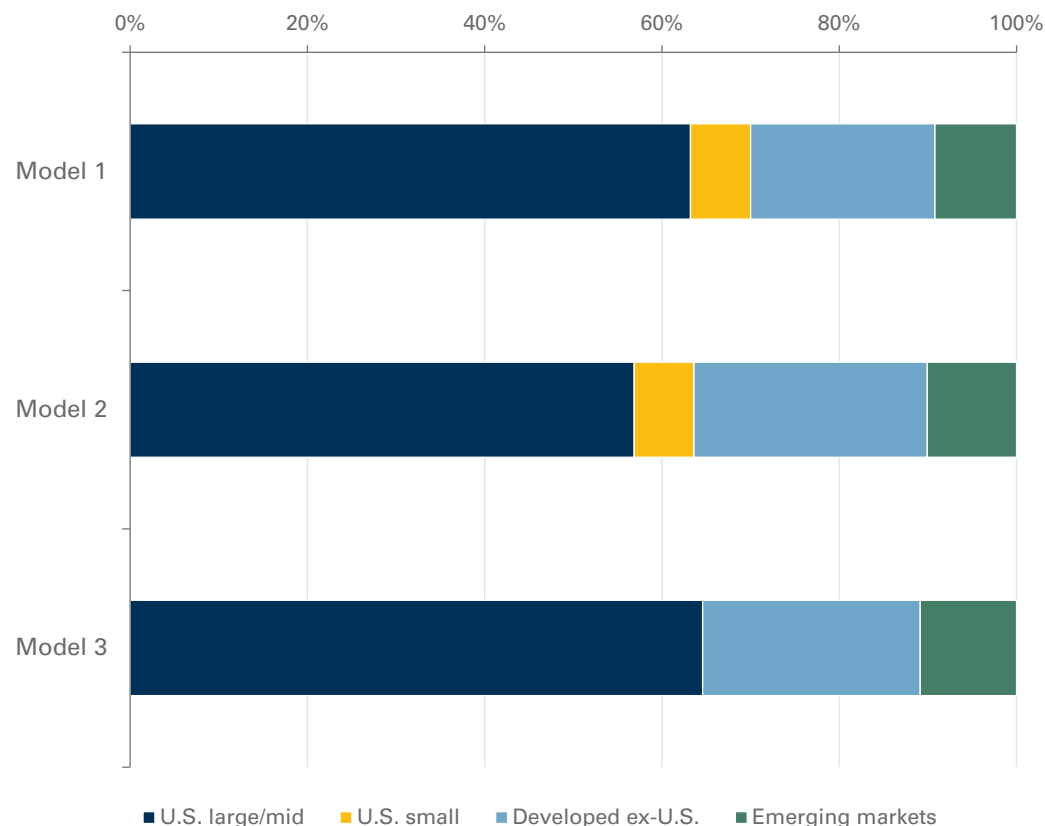
Total member participation rate



Since 2009, participation rate fell **23.2% → 15.0%**, while VTF remained **6.4%–8.7% of WRS assets**.

THREE VTF CANDIDATES DIFFER MAINLY IN REGIONAL AND SMALL-CAP IMPLEMENTATION

ALTERNATIVE VTF MODEL PORTFOLIOS | POLICY CONSTRUCTION



MODEL 1 | CURRENT VTF ALLOCATION

Fixed 70% U.S. / 30% non-U.S.; roughly ACWI by region, with a U.S. small-cap sleeve.

MODEL 2 | CTF PUBLIC EQUITY STRUCTURE

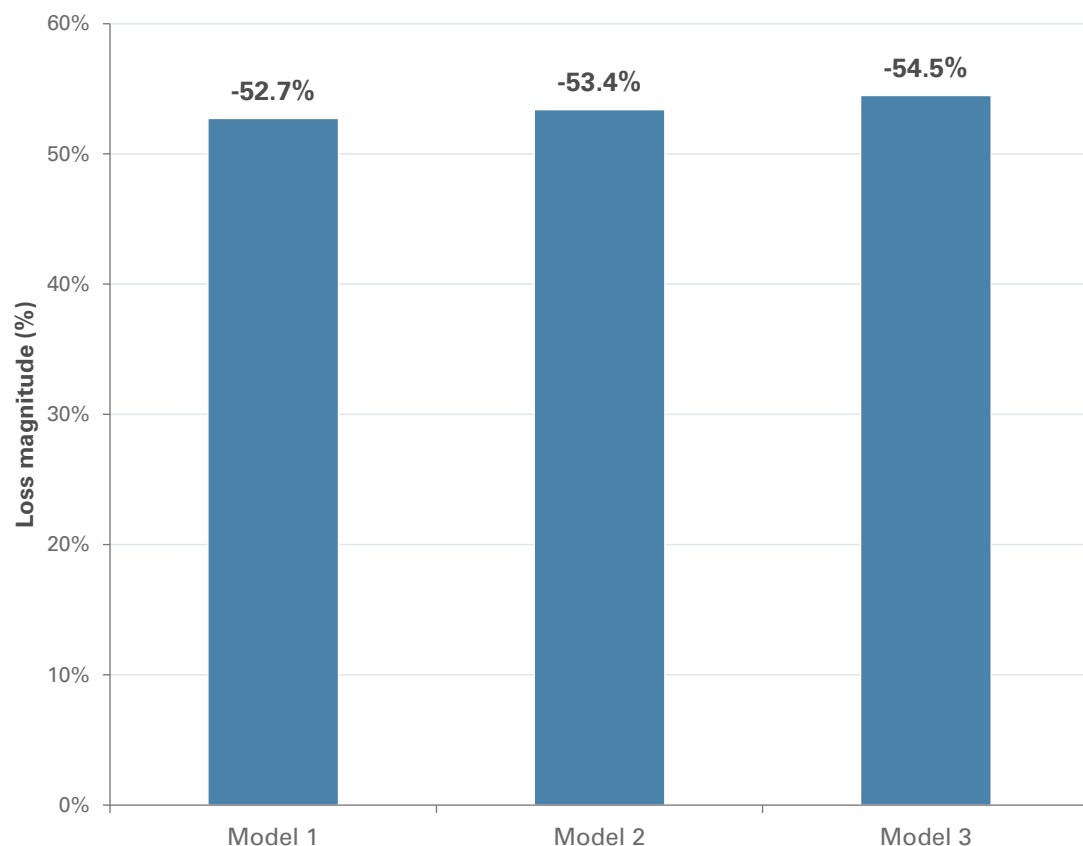
Uses CTF Public-Equity policy weights; broader small-cap and emerging-market sleeves.

MODEL 3 | MSCI ACWI

Global market-cap large/mid benchmark; no dedicated small-cap allocation.

SIMILAR HISTORICAL DOWNSIDE ACROSS ALL THREE VTF CANDIDATES

MAXIMUM DRAWDOWN | COMMON MONTHLY HISTORY, JULY 1994–JUNE 2026



COMMON CRISIS WINDOW

Peak: Oct. 2007

Trough: Feb. 2009

ABOUT 2 PERCENTAGE POINTS

Full range from -52.7% to -54.5% (1.8 pp).

POLICY READ-THROUGH

Model 1 was modestly the least severe, but no candidate portfolio delivered a material downside improvement.



Source: Bars show loss magnitude. Historical returns are descriptive, not forecasts.

FORWARD-LOOKING DIFFERENCES ARE TOO MODEST TO CHANGE THE POLICY CONCLUSION

JUNE 30, 2026 CAPITAL MARKET ASSUMPTIONS | STANDALONE AND CTF/VTF-BLENDED RESULTS

Model Portfolio	Expected VTF Return	VTF Volatility	VTF Sharpe	25% VTF Blended Sharpe	50% VTF Blended Return	50% VTF Blended Volatility	50% VTF Blended Sharpe	75% VTF Blended Sharpe
70/30 Current	6.05%	17.86%	0.122	0.199	6.42%	15.03%	0.169	0.144
CTF Public Equity	6.18%	18.07%	0.128	0.201	6.49%	15.13%	0.172	0.148
MSCI ACWI	6.04%	17.83%	0.121	0.199	6.42%	15.00%	0.169	0.143

METHODOLOGY

Member portfolio = $(1 - v) \times \text{current CTF} + v \times \text{candidate VTF}$. Returns are weighted averages; volatility uses the June 2026 covariance matrix. Risk-free rate = 3.8792%.

DECISION TAKEAWAY

The 50/50 blended Sharpe ratios range by only 0.003. Model 2 is marginally higher, but the difference is not material enough to support changing the VTF policy allocation.

Source: June 30, 2026 NEPC arithmetic CMAs and current CTF policy weights. No transaction costs or corridor treatment.



VARIABLE RETIREMENT TRUST ALLOCATION

	Current Policy Portfolio	Preliminary Recommended Policy Portfolio	Rebalancing Range
US Equities	70%	70%	65 - 75%
Int'l Equities incl. Emerging	30%	30%	25 - 35%
10-Year Compound Return	4.81%	4.81%	
30-Year Compound Return	7.12%	7.12%	
Standard Deviation	17.94%	17.94%	
10-Year Return/Risk Ratio	0.052	0.052	
30-Year Return/Risk Ratio	0.202	0.202	
Target Active Risk	0.0 - 0.9%	0.0 - 0.9%	

APPENDIX



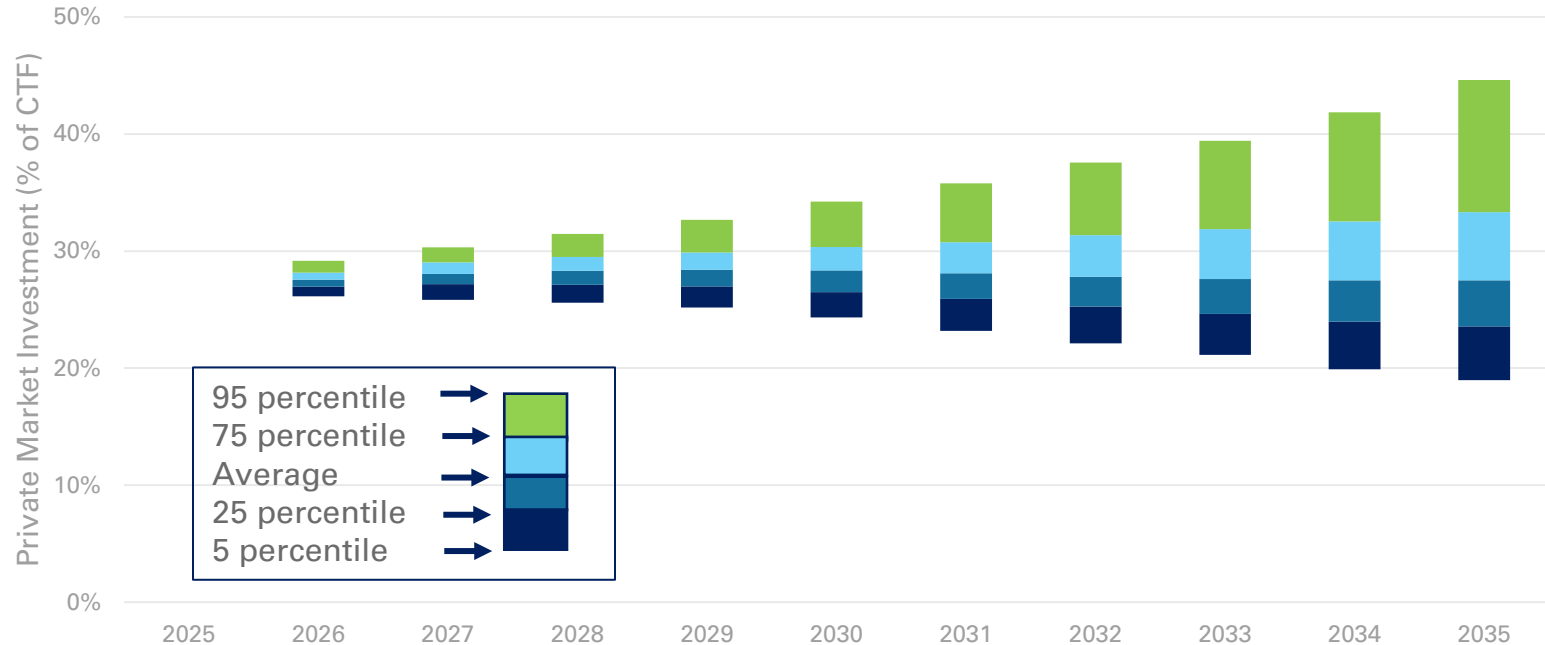
CTF REFERENCE PORTFOLIO ATTRIBUTION

	10-Year Expected Return	Standard Deviation	30-Year Expected Return
Reference Portfolio	5.03%	10.95%	6.55%
Private Markets	0.78%	0.50%	0.63%
Portfolio Structure	0.22%	0.36%	0.22%
Leverage	0.11%	0.22%	0.19%
Preliminary Recommended Portfolio	6.14%	12.04%	7.58%

SIMULATION OF PRIVATE ALLOCATIONS (% OF CTF)

RANGE OF POTENTIAL OUTCOMES BY YEAR

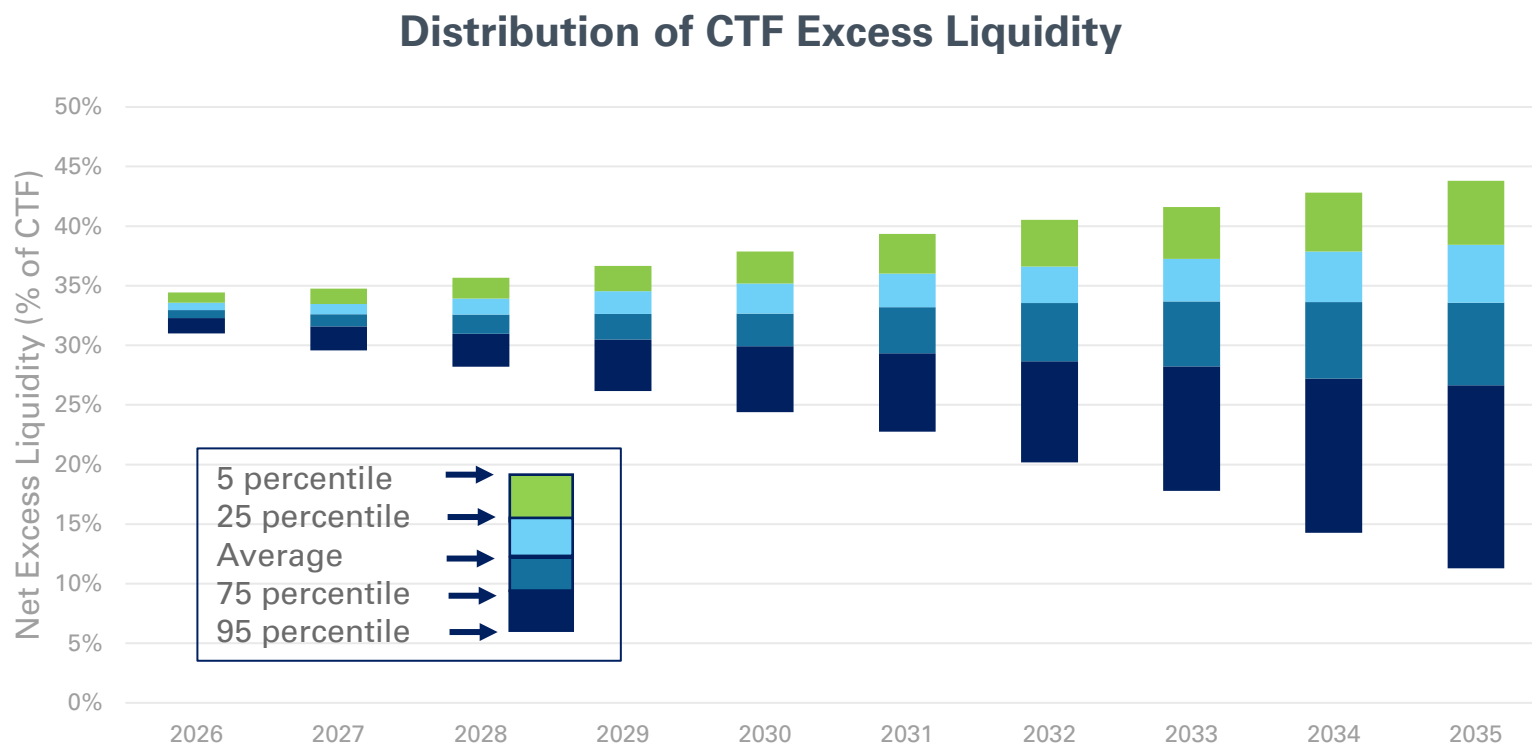
Distribution of Long-Term Private Investments



- In the first five years, the high end of the range for private market investments as a percent of CTF is approximately 35%
- In years 6-10, the allocation at the high end of the range can exceed 40% of CTF

SIMULATION OF EXCESS LIQUIDITY (% OF CTF)

RANGE OF POTENTIAL OUTCOMES BY YEAR

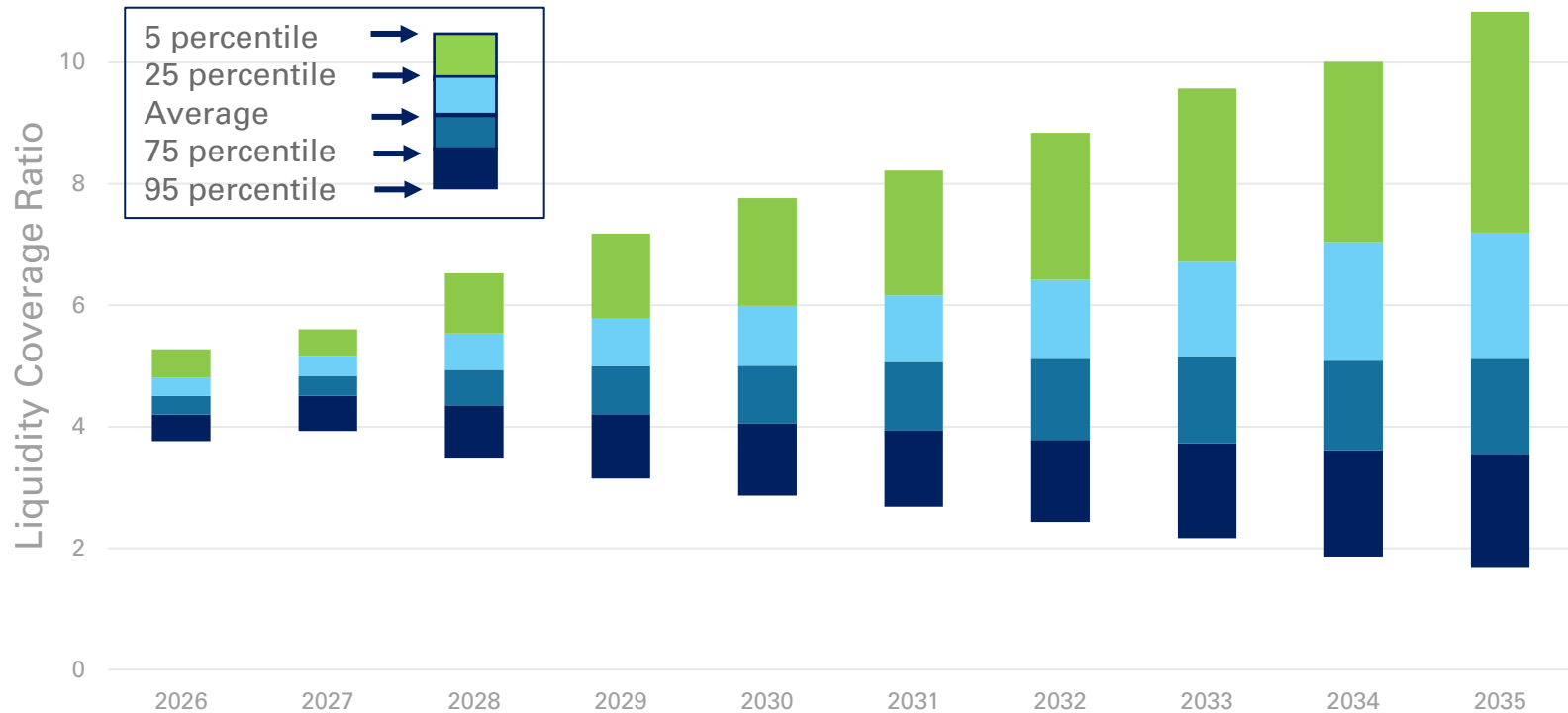


- In the first five years, the low end of the range for excess liquidity is roughly 25% of CTF
- In years 6-10, the excess liquidity only drops below 15% of CTF in extreme scenarios

SIMULATION OF LIQUIDITY COVERAGE RATIO (LCR)

RANGE OF POTENTIAL OUTCOMES BY YEAR

Distribution of LCR for Private Investment Pacing Plan



- In the first five years, the low end of the range for LCR is roughly 3.0
- In years 6-10, LCR only drops below 2.0 in extreme scenarios



JUNE 30, 2026 CAPITAL MARKET ASSUMPTIONS DETAIL



10-YEAR RETURN FORECASTS

EQUITY

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
U.S. Large-Cap Equity	4.5%	5.3%	-0.8%
U.S. Small/Mid-Cap Equity	4.8%	5.7%	-0.9%
Non-U.S. Developed Equity	4.5%	5.3%	-0.8%
Non-U.S. Developed Equity (USD Hedge)	4.7%	5.5%	-0.8%
Non-U.S. Developed Small-Cap Equity	5.1%	6.0%	-0.9%
Emerging Market Equity	4.5%	6.6%	-2.1%
Emerging Market Small-Cap Equity	6.3%	6.6%	-0.3%
Hedge Fund - Equity	5.4%	5.7%	-0.3%
Private Equity - Buyout	6.6%	7.3%	-0.7%
Private Equity - Growth	7.5%	8.2%	-0.7%
Private Equity - Early Stage Venture	8.7%	9.4%	-0.7%
Private Equity - Secondary	6.4%	7.0%	-0.6%
Non-U.S. Private Equity	8.7%	9.1%	-0.4%
China Equity	7.0%	7.0%	-
Global Equity*	4.8%	5.7%	-0.9%
Private Equity*	8.1%	8.6%	-0.5%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

10-YEAR RETURN FORECASTS

FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
Cash	3.9%	3.8%	+0.1%
US TIPS	4.8%	4.6%	+0.2%
US Treasury Bond	4.6%	4.4%	+0.2%
US Corporate Bond	5.7%	5.5%	+0.2%
US Corporate Bond - AAA	5.2%	4.9%	+0.3%
US Corporate Bond - AA	5.3%	5.0%	+0.3%
US Corporate Bond - A	5.5%	5.3%	+0.2%
US Corporate Bond - BBB	5.9%	5.8%	+0.1%
US Mortgage-Backed Securities	4.8%	4.7%	+0.1%
US Securitized Bond	5.1%	5.2%	-0.1%
US Collateralized Loan Obligation	5.4%	5.4%	-
US Municipal Bond	3.7%	4.3%	-0.6%
US Municipal Bond (1-10 Year)	3.3%	3.7%	-0.4%
US Short-Term Municipal Bond (1-3 Year)	3.0%	-	-
US Intermediate-Term Municipal Bond (3-10 Year)	3.4%	-	-
US Long-Term Municipal Bond (10-30 Year)	4.0%	-	-
US Taxable Municipal Bond	5.5%	5.6%	-0.1%

NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC



10-YEAR RETURN FORECASTS

FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
Non-US Government Bond	3.1%	2.7%	+0.4%
Non-US Government Bond (USD Hedge)	3.4%	2.9%	+0.5%
Non-US Inflation-Linked Bond (USD Hedge)	4.2%	3.9%	+0.3%
US Short-Term TIPS (1-3 Year)	4.5%	4.4%	+0.1%
US Short-Term Treasury Bond (1-3 Year)	4.4%	4.3%	+0.1%
US Short-Term Corporate Bond (1-3 Year)	5.3%	5.2%	+0.1%
US Intermediate-Term TIPS (3-10 Year)	4.7%	4.5%	+0.2%
US Intermediate-Term Treasury Bond (3-10 Year)	4.5%	4.3%	+0.2%
US Intermediate-Term Corporate Bond (3-10 Year)	5.8%	5.7%	+0.1%
US Long-Term TIPS (10-30 Year)	5.3%	5.2%	+0.1%
US Long-Term Treasury Bond (10-30 Year)	4.8%	4.7%	+0.1%
US Long-Term Corporate Bond (10-30 Year)	5.6%	5.4%	+0.2%
20+ Year US Treasury STRIPS	4.7%	4.5%	+0.2%
10 Year US Treasury Bond	4.7%	4.5%	+0.2%
10 Year Non-US Government Bond (USD Hedge)	3.4%	2.7%	+0.7%
US Aggregate Bond*	4.9%	4.8%	+0.1%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

10-YEAR RETURN FORECASTS

FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
US High Yield Corporate Bond	6.3%	6.1%	+0.2%
US Corporate Bond - BB	6.8%	6.6%	+0.2%
US Corporate Bond - B	6.3%	6.3%	-
US Corporate Bond - CCC/Below	-0.2%	0.0%	-0.2%
US Short-Term High Yield Corporate Bond (1-3 Year)	5.7%	5.6%	+0.1%
US Leveraged Loan	7.2%	7.0%	+0.2%
Emerging Market Investment Grade External Debt	5.1%	5.5%	-0.4%
Emerging Market High Yield External Debt	4.9%	7.4%	-2.5%
Emerging Market Local Currency Debt	6.4%	6.2%	+0.2%
US High Yield Securitized Bond	8.9%	8.8%	+0.1%
US High Yield Collateralized Loan Obligation	7.6%	7.6%	-
US High Yield Municipal Bond	5.4%	5.0%	+0.4%
Hedge Fund - Credit	6.7%	6.6%	+0.1%
Private Debt - Credit Opportunities	8.5%	8.3%	+0.2%
Private Debt - Distressed	8.1%	8.2%	-0.1%
Private Debt - Direct Lending	8.2%	8.1%	+0.1%
Private Debt*	8.3%	8.3%	-

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

10-YEAR RETURN FORECASTS

REAL ASSETS

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
Commodity Futures	4.2%	4.8%	-0.6%
Midstream Energy	3.6%	5.4%	-1.8%
REIT	4.6%	5.5%	-0.9%
Global Infrastructure Equity	3.9%	4.7%	-0.8%
Global Natural Resources Equity	4.5%	6.0%	-1.5%
Gold	3.9%	4.0%	-0.1%
Real Estate - Core	5.3%	5.4%	-0.1%
Real Estate – Value-Add	6.4%	6.5%	-0.1%
Real Estate - Opportunistic	7.5%	7.6%	-0.1%
Private Debt - Real Estate	6.2%	6.4%	-0.2%
Private Real Assets - Natural Resources	7.1%	8.0%	-0.9%
Private Real Assets - Infrastructure	5.1%	5.7%	-0.6%

NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

30-YEAR RETURN FORECASTS

EQUITY

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
U.S. Large-Cap Equity	6.8%	7.0%	-0.2%
U.S. Small/Mid-Cap Equity	6.9%	7.2%	-0.3%
Non-U.S. Developed Equity	6.4%	6.8%	-0.4%
Non-U.S. Developed Equity (USD Hedge)	6.7%	7.1%	-0.4%
Non-U.S. Developed Small-Cap Equity	7.3%	7.6%	-0.3%
Emerging Market Equity	7.7%	8.6%	-0.9%
Emerging Market Small-Cap Equity	8.2%	8.3%	-0.1%
Hedge Fund - Equity	6.1%	6.2%	-0.1%
Private Equity - Buyout	8.5%	8.7%	-0.2%
Private Equity - Growth	9.3%	9.5%	-0.2%
Private Equity - Early Stage Venture	10.1%	10.4%	-0.3%
Private Equity - Secondary	7.9%	8.2%	-0.3%
Non-U.S. Private Equity	10.3%	10.4%	-0.1%
China Equity	8.4%	8.5%	-0.1%
Global Equity*	7.1%	7.4%	-0.3%
Private Equity*	9.8%	9.9%	-0.1%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

30-YEAR RETURN FORECASTS

FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
Cash	3.5%	3.5%	-
US TIPS	5.0%	5.0%	-
US Treasury Bond	4.8%	4.8%	-
US Corporate Bond	6.4%	6.3%	+0.1%
US Corporate Bond - AAA	5.8%	5.7%	+0.1%
US Corporate Bond - AA	5.7%	5.6%	+0.1%
US Corporate Bond - A	6.0%	6.0%	-
US Corporate Bond - BBB	6.6%	6.6%	-
US Mortgage-Backed Securities	5.0%	5.0%	-
US Securitized Bond	5.6%	5.6%	-
US Collateralized Loan Obligation	5.1%	5.0%	+0.1%
US Municipal Bond	4.1%	4.3%	-0.2%
US Municipal Bond (1-10 Year)	3.7%	4.0%	-0.3%
US Short-Term Municipal Bond (1-3 Year)	3.1%	-	-
US Intermediate-Term Municipal Bond (3-10 Year)	3.9%	-	-
US Long-Term Municipal Bond (10-30 Year)	4.4%	-	-
US Taxable Municipal Bond	6.4%	6.4%	-

NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC



30-YEAR RETURN FORECASTS

FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
Non-US Government Bond	3.9%	3.3%	+0.6%
Non-US Government Bond (USD Hedge)	4.1%	3.6%	+0.5%
Non-US Inflation-Linked Bond (USD Hedge)	4.6%	4.0%	+0.6%
US Short-Term TIPS (1-3 Year)	4.5%	4.5%	-
US Short-Term Treasury Bond (1-3 Year)	4.4%	4.4%	-
US Short-Term Corporate Bond (1-3 Year)	5.4%	5.4%	-
US Intermediate-Term TIPS (3-10 Year)	5.0%	4.9%	+0.1%
US Intermediate-Term Treasury Bond (3-10 Year)	4.8%	4.7%	+0.1%
US Intermediate-Term Corporate Bond (3-10 Year)	6.4%	6.4%	-
US Long-Term TIPS (10-30 Year)	5.6%	5.5%	+0.1%
US Long-Term Treasury Bond (10-30 Year)	5.2%	5.2%	-
US Long-Term Corporate Bond (10-30 Year)	6.7%	6.7%	-
20+ Year US Treasury STRIPS	5.4%	5.4%	-
10 Year US Treasury Bond	5.4%	5.4%	-
10 Year Non-US Government Bond (USD Hedge)	4.4%	3.6%	+0.8%
US Aggregate Bond*	5.3%	5.3%	-

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

30-YEAR RETURN FORECASTS

FIXED INCOME

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
US High Yield Corporate Bond	7.6%	7.5%	+0.1%
US Corporate Bond - BB	7.8%	7.7%	+0.1%
US Corporate Bond - B	7.3%	7.3%	-
US Corporate Bond - CCC/Below	1.3%	1.4%	-0.1%
US Short-Term High Yield Corporate Bond (1-3 Year)	5.9%	5.9%	-
US Leveraged Loan	6.7%	6.6%	+0.1%
Emerging Market Investment Grade External Debt	6.5%	5.5%	+1.0%
Emerging Market High Yield External Debt	7.4%	7.4%	-
Emerging Market Local Currency Debt	5.7%	5.5%	+0.2%
US High Yield Securitized Bond	8.8%	8.8%	-
US High Yield Collateralized Loan Obligation	7.4%	7.4%	-
US High Yield Municipal Bond	5.5%	5.4%	+0.1%
Hedge Fund - Credit	7.2%	7.2%	-
Private Debt - Credit Opportunities	8.9%	8.9%	-
Private Debt - Distressed	9.4%	9.4%	-
Private Debt - Direct Lending	8.9%	8.9%	-
Private Debt*	9.2%	9.1%	+0.1%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

30-YEAR RETURN FORECASTS

REAL ASSETS

Geometric Expected Return			
Asset Class	06/30/2026	06/30/2025	Delta
Commodity Futures	4.2%	4.3%	-0.1%
Midstream Energy	5.8%	6.1%	-0.3%
REIT	6.8%	7.1%	-0.3%
Global Infrastructure Equity	5.9%	6.3%	-0.4%
Global Natural Resources Equity	6.5%	7.1%	-0.6%
Gold	4.8%	4.8%	-
Real Estate - Core	6.1%	6.2%	-0.1%
Real Estate – Value-Add	7.4%	7.5%	-0.1%
Real Estate - Opportunistic	8.3%	8.4%	-0.1%
Private Debt - Real Estate	6.7%	6.8%	-0.1%
Private Real Assets - Natural Resources	8.6%	8.9%	-0.3%
Private Real Assets - Infrastructure	6.6%	6.8%	-0.2%

NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

VOLATILITY FORECASTS

EQUITY

Volatility			
Asset Class	06/30/2026	06/30/2025	Delta
U.S. Large-Cap Equity	17.5%	17.4%	+0.1%
U.S. Small/Mid-Cap Equity	21.5%	21.4%	+0.1%
Non-U.S. Developed Equity	19.6%	19.6%	-
Non-U.S. Developed Equity (USD Hedge)	17.4%	17.4%	-
Non-U.S. Developed Small-Cap Equity	23.2%	23.3%	-0.1%
Emerging Market Equity	27.2%	27.4%	-0.2%
Emerging Market Small-Cap Equity	30.9%	30.6%	+0.3%
Hedge Fund - Equity	10.7%	10.9%	-0.2%
Private Equity - Buyout	20.8%	20.7%	+0.1%
Private Equity - Growth	31.1%	30.8%	+0.3%
Private Equity - Early Stage Venture	59.1%	48.0%	+11.1%
Private Equity - Secondary	20.8%	20.4%	+0.4%
Non-U.S. Private Equity	29.0%	29.0%	-
China Equity	30.6%	30.4%	+0.2%
Global Equity*	18.3%	18.2%	+0.1%
Private Equity*	26.7%	25.8%	+0.9%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

VOLATILITY FORECASTS

FIXED INCOME

Volatility			
Asset Class	06/30/2026	06/30/2025	Delta
Cash	0.6%	0.6%	-
US TIPS	6.0%	6.0%	-
US Treasury Bond	5.3%	5.5%	-0.2%
US Corporate Bond	7.8%	7.9%	-0.1%
US Corporate Bond - AAA	7.1%	7.0%	+0.1%
US Corporate Bond - AA	6.7%	6.7%	-
US Corporate Bond - A	7.6%	7.7%	-0.1%
US Corporate Bond - BBB	8.5%	8.6%	-0.1%
US Mortgage-Backed Securities	6.5%	6.5%	-
US Securitized Bond	7.7%	7.9%	-0.2%
US Collateralized Loan Obligation	5.5%	6.5%	-1.0%
US Municipal Bond	4.8%	6.0%	-1.2%
US Municipal Bond (1-10 Year)	3.1%	4.5%	-1.4%
US Short-Term Municipal Bond (1-3 Year)	1.7%	-	-
US Intermediate-Term Municipal Bond (3-10 Year)	3.6%	-	-
US Long-Term Municipal Bond (10-30 Year)	6.5%	-	-
US Taxable Municipal Bond	7.4%	7.5%	-0.1%

NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC



VOLATILITY FORECASTS

FIXED INCOME

Volatility			
Asset Class	06/30/2026	06/30/2025	Delta
Non-US Government Bond	9.4%	9.8%	-0.4%
Non-US Government Bond (USD Hedge)	3.9%	4.1%	-0.2%
Non-US Inflation-Linked Bond (USD Hedge)	6.7%	6.7%	-
US Short-Term TIPS (1-3 Year)	3.3%	3.3%	-
US Short-Term Treasury Bond (1-3 Year)	2.1%	2.3%	-0.2%
US Short-Term Corporate Bond (1-3 Year)	2.7%	2.8%	-0.1%
US Intermediate-Term TIPS (3-10 Year)	5.9%	5.8%	+0.1%
US Intermediate-Term Treasury Bond (3-10 Year)	5.3%	5.4%	-0.1%
US Intermediate-Term Corporate Bond (3-10 Year)	7.4%	7.4%	-
US Long-Term TIPS (10-30 Year)	12.5%	12.6%	-0.1%
US Long-Term Treasury Bond (10-30 Year)	12.3%	12.3%	-
US Long-Term Corporate Bond (10-30 Year)	12.4%	12.4%	-
20+ Year US Treasury STRIPS	20.8%	21.0%	-0.2%
10 Year US Treasury Bond	7.6%	7.6%	-
10 Year Non-US Government Bond (USD Hedge)	4.8%	4.9%	-0.1%
US Aggregate Bond*	5.7%	5.8%	-0.1%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

VOLATILITY FORECASTS

FIXED INCOME

Volatility			
Asset Class	06/30/2026	06/30/2025	Delta
US High Yield Corporate Bond	11.1%	11.3%	-0.2%
US Corporate Bond - BB	9.6%	9.7%	-0.1%
US Corporate Bond - B	11.6%	11.7%	-0.1%
US Corporate Bond - CCC/Below	20.1%	20.4%	-0.3%
US Short-Term High Yield Corporate Bond (1-3 Year)	8.1%	8.2%	-0.1%
US Leveraged Loan	7.2%	6.1%	+1.1%
Emerging Market Investment Grade External Debt	8.7%	8.7%	-
Emerging Market High Yield External Debt	17.1%	17.5%	-0.4%
Emerging Market Local Currency Debt	12.5%	12.6%	-0.1%
US High Yield Securitized Bond	12.7%	13.0%	-0.3%
US High Yield Collateralized Loan Obligation	18.3%	15.9%	+2.4%
US High Yield Municipal Bond	9.9%	12.0%	-2.1%
Hedge Fund - Credit	9.7%	9.7%	-
Private Debt - Credit Opportunities	14.2%	14.3%	-0.1%
Private Debt - Distressed	14.1%	13.9%	+0.2%
Private Debt - Direct Lending	11.0%	11.0%	-
Private Debt*	11.7%	11.8%	-0.1%

*Calculated as a blend of other asset classes. NEPC's capital market assumptions reflect proprietary forecasts for expected returns, volatility, and correlations. Return expectations may differ from an investor's realized returns after accounting for fees, taxes, or other aspects that can influence actual returns. Return forecasts and methodology are reviewed on an ongoing basis and are subject to change over time. Source: NEPC

VOLATILITY FORECASTS

REAL ASSETS

Volatility			
Asset Class	06/30/2026	06/30/2025	Delta
Commodity Futures	18.5%	18.5%	-
Midstream Energy	27.3%	27.7%	-0.4%
REIT	22.2%	22.4%	-0.2%
Global Infrastructure Equity	19.0%	19.3%	-0.3%
Global Natural Resources Equity	22.5%	22.9%	-0.4%
Gold	17.2%	16.6%	+0.6%
Real Estate - Core	15.5%	14.7%	+0.8%
Real Estate – Value-Add	23.9%	23.0%	+0.9%
Real Estate - Opportunistic	27.6%	27.3%	+0.3%
Private Debt - Real Estate	11.9%	11.9%	-
Private Real Assets - Natural Resources	30.5%	32.5%	-2.0%
Private Real Assets - Infrastructure	11.7%	10.6%	+1.1%

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Past performance is no guarantee of future results.

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Information on market indices was provided by sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.

All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.

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Liquidity Management and Beta Implementation Division Overview

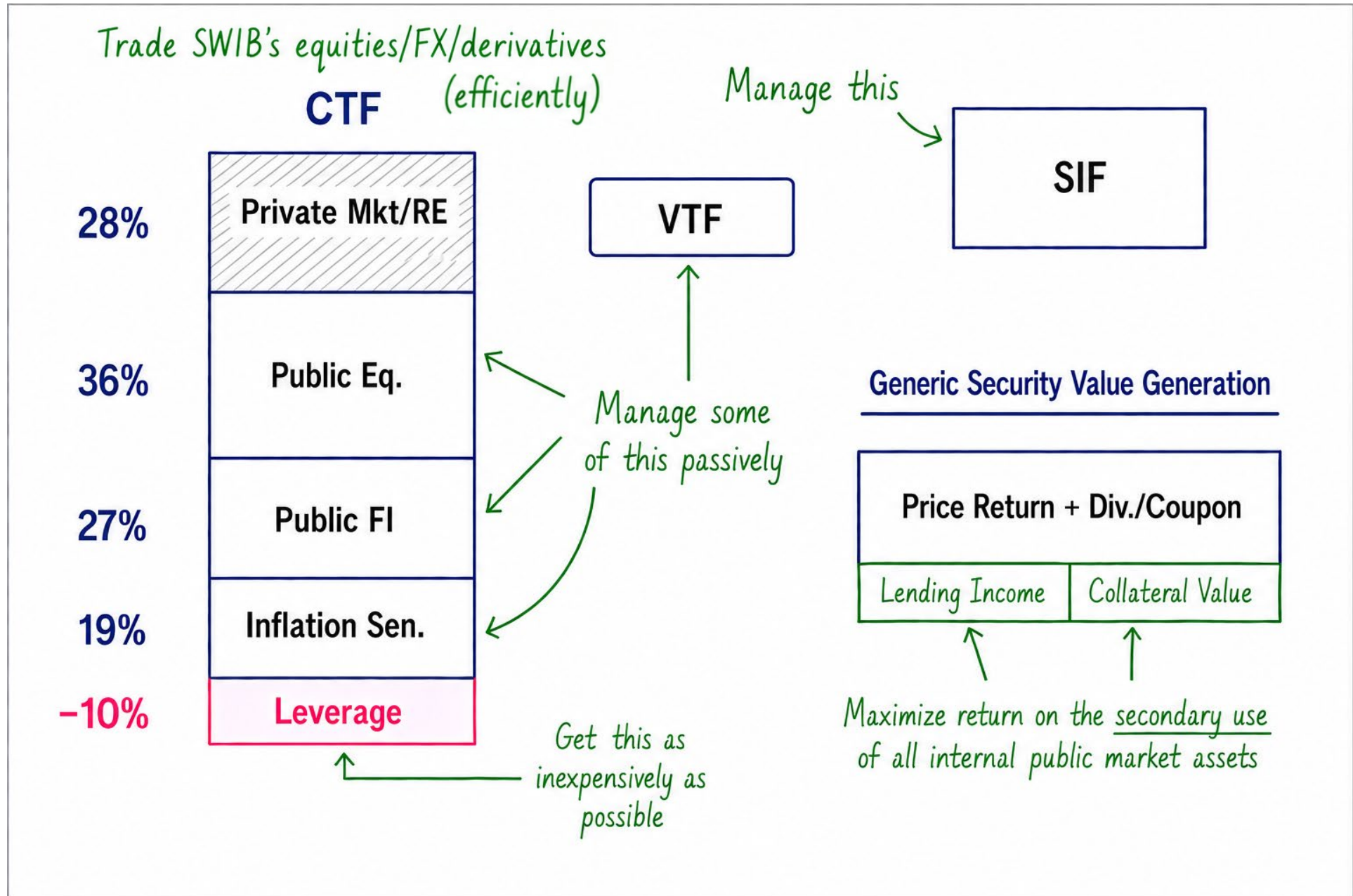
SWIB October Board Workshop – October 20, 2026

Nick Stanton, Head of Liquidity Management and Beta Implementation

Key Insights

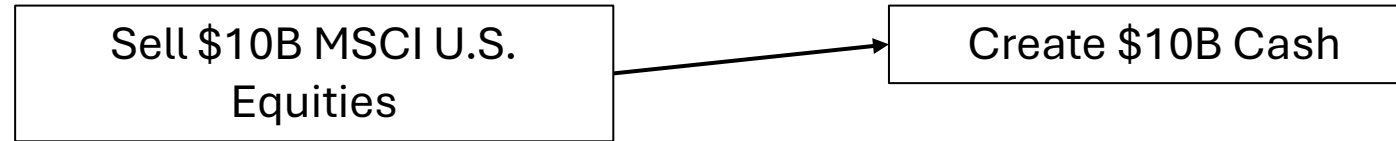
- The Liquidity Management and Beta Implementation (“LMBI”) Division was formed from parts of the Asset and Risk Allocation, Global Public Market Strategies, and Finance Divisions. It’s focused on the efficient management of SWIB’s passive assets, collateral, and liquidity.
- SWIB started using leverage in 2011 and has slowly grown its capabilities in that space over time.
- The leverage program and its associated effects have now grown large enough that they warrant dedicated focus. The LMBI Division is responsible for focusing on those areas.
- Although SWIB has made a lot of progress on evolving its capabilities, more opportunities exist. Maximizing these opportunities requires new architecture and rethinking SWIB’s leverage ecosystem.

What does LMBI do?



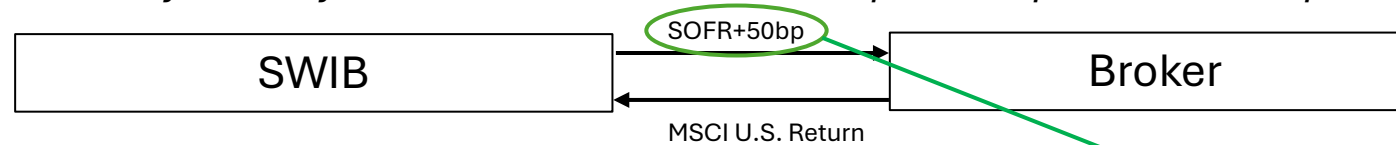
Equities Synthetic Replacement Example

Start: MSCI US Benchmark Exposure: \$50B SWIB Exposure: \$50B

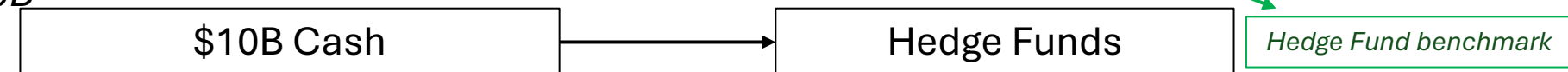


MSCI US Benchmark Exposure: \$50B SWIB Exposure: \$40B SWIB cash: \$10B

Buy \$10B Synthetic Notional MSCI U.S. Equities Exposure via swap



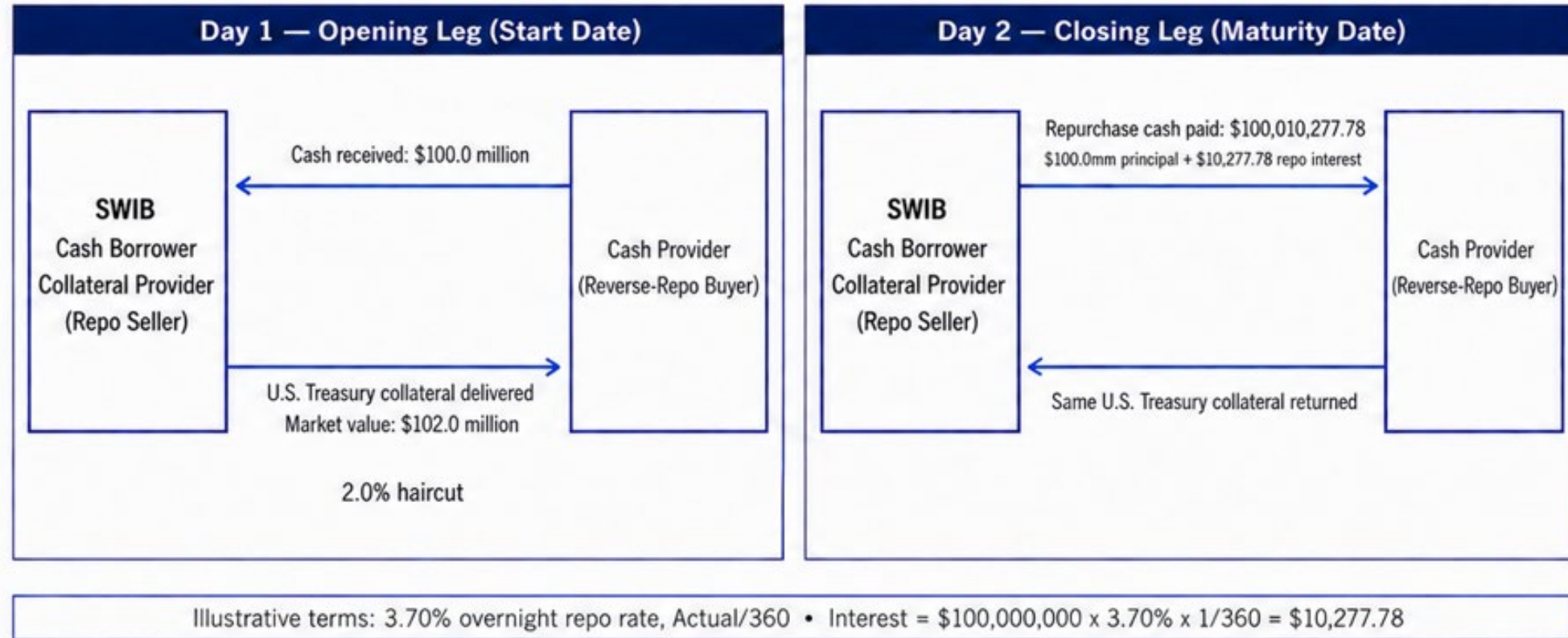
MSCI U.S. Benchmark Exposure: \$50B SWIB Exposure: \$50B SWIB cash: \$10B



End: MSCI U.S. Benchmark Exposure: \$50B SWIB Exposure: \$50B Hedge Funds: \$10B

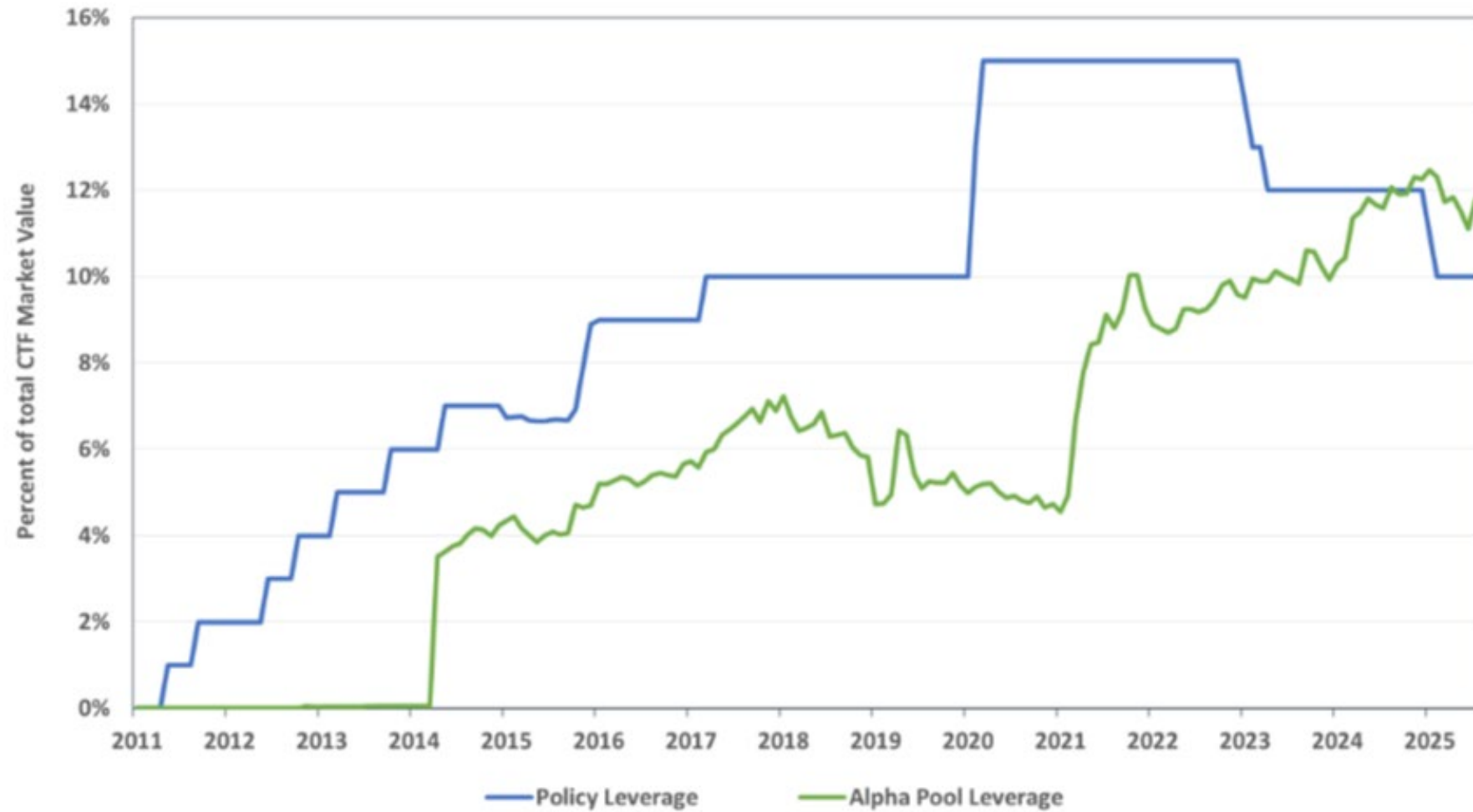
TIPS Repo

U.S. Treasury Bilateral Overnight Repo

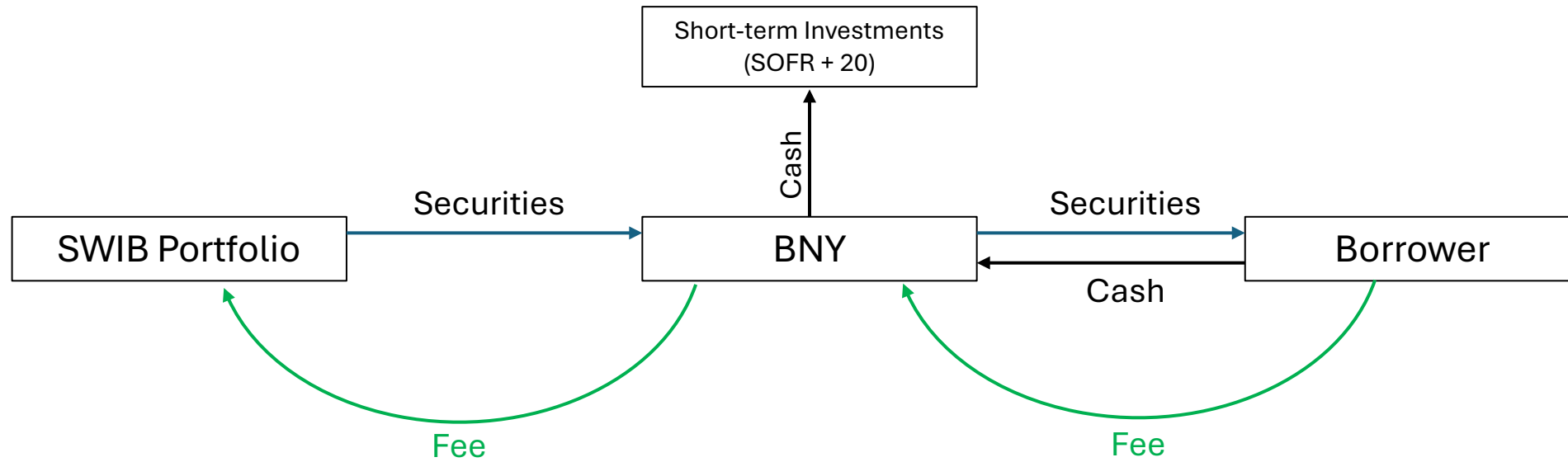


SWIB uses this inexpensive form of financing as a primary way to source Policy and Alpha Pool leverage.

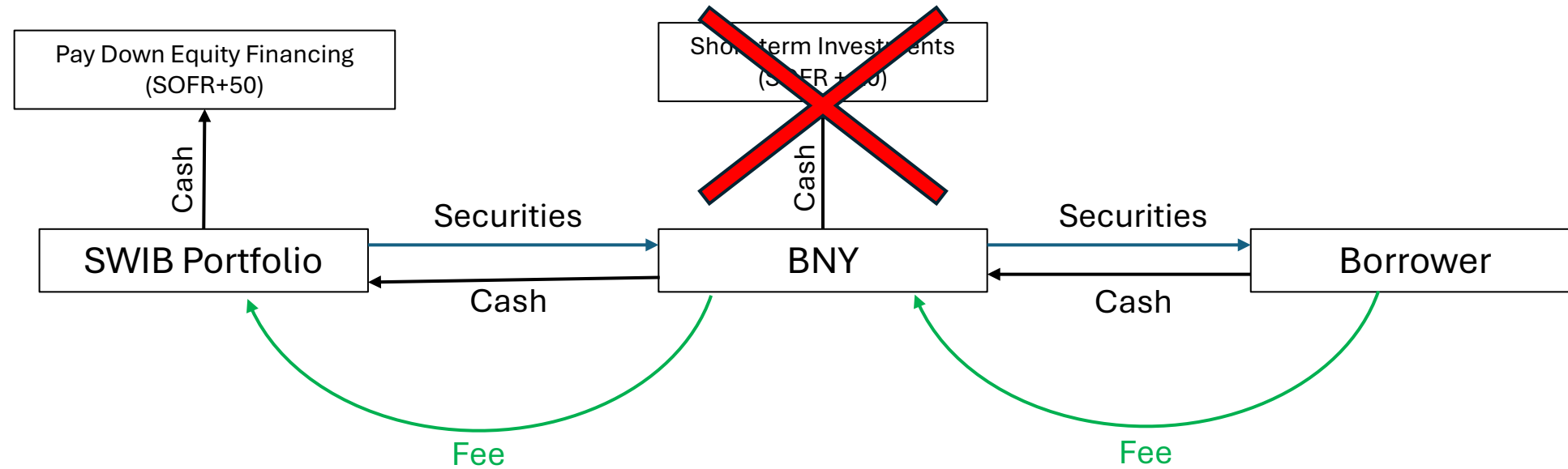
History of CTF Leverage



Securities Lending cash collateral



Securities Lending cash collateral



30 bps better financing on \$3B of cash collateral saves SWIB \$9m/year.

Agent-Sponsored Repo through the Fixed Income Clearing Corporation (FICC)

SWIB FICC-Sponsored Overnight Repo — Day 1

1. Execute & Settle Opening Leg (Done-With)



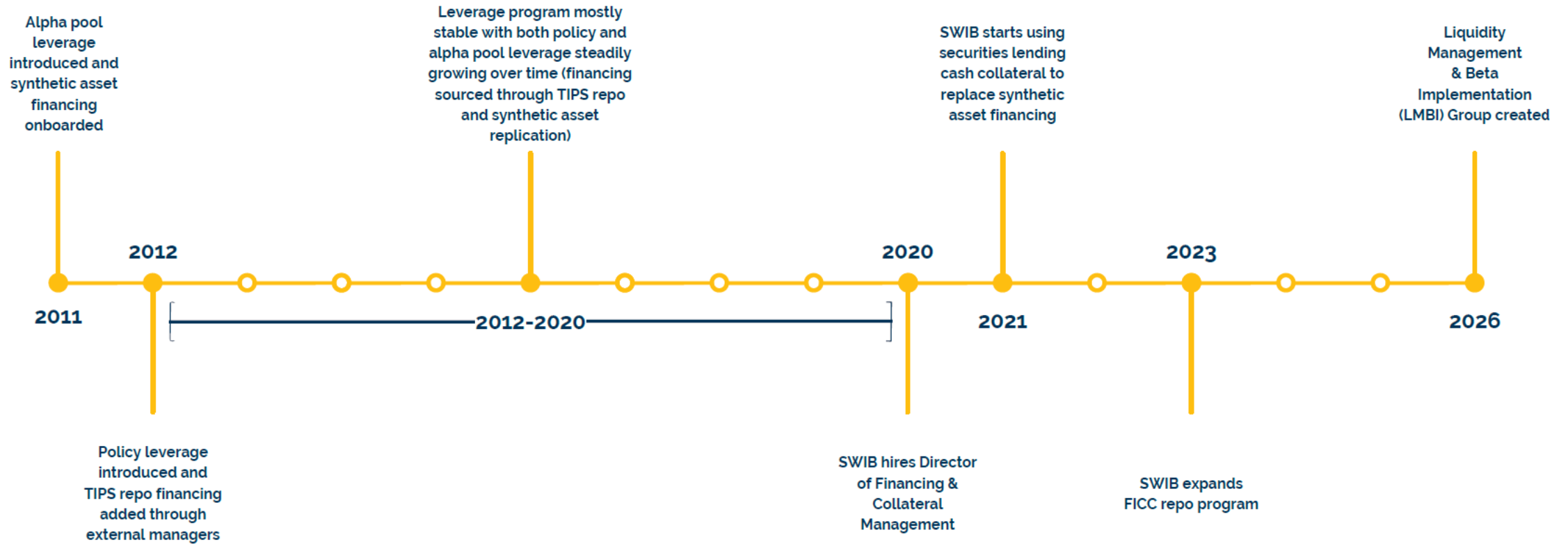
Submit for clearing

2. Submit, Match & Novate at FICC



Same-day done-with assumption: the opening leg settles between SWIB and the Sponsoring Member; FICC novates the matched trade and all end legs settle with FICC. The Sponsoring Member submits and processes SWIB's trade and guarantees SWIB's performance; FICC performs the novation. Diagram emphasizes SWIB's sponsored-member relationship with FICC; the Sponsoring Member's separate FICC counterparty leg is not shown.

Why LMBI?



Present/Future Initiatives

- SWIB has excess liquidity. First step is to measure how much excess exists.
 - Risk modeling
 - Guardrails
 - Real-time liquidity monitoring
- Take advantage of excess liquidity using existing opportunities.
 - Equity financing
 - Real Estate financing
 - Private Market subscription lines
- Expand and diversify leverage sources
 - Investment Grade Credit and Equity repo
 - Commercial Paper and Medium-term debt
 - More counterparties
- Optimize SWIB's architecture to take advantage of future opportunities
 - Account Consolidation
 - Unified in-house resource pricing



State Investment Fund Overview

October Workshop

October 20, 2026

Key Insights

- The State Investment Fund (“SIF”) is an investment vehicle for the State and its agencies, local governments, and the WRS.
- The SIF provides safety, liquidity and a competitive rate of return to participants.
- The SIF investment process includes cash flow forecasting, credit research, portfolio construction and trade execution.

What is the SIF?

- The SIF is a pool of cash balances of State and local governmental units, which is managed similar to a money market fund.
- The SIF serves as the State's cash management fund.

SIF History

- Created in 1957 by Section 25.14 of the state statutes
- Local Government Investment Pool (“LGIP”) was created in 1975

Benefits of the SIF

- Same day liquidity
- Safe investment option for the State and local governments
- Closely governed
- Strong investment performance over time

SIF Investment Objectives

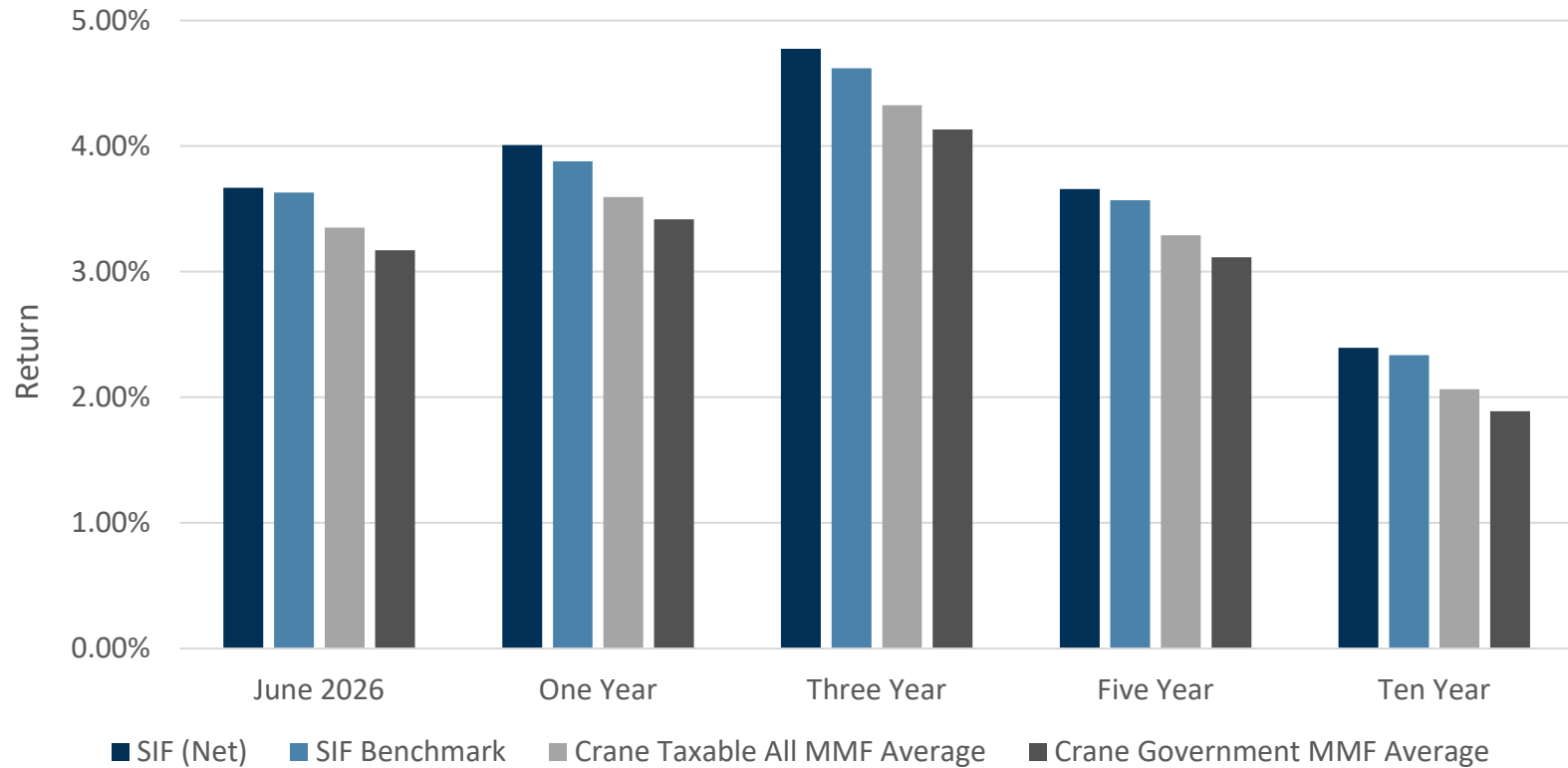
In order of importance:

- Safety of Principal
- Liquidity
- Competitive rate of return

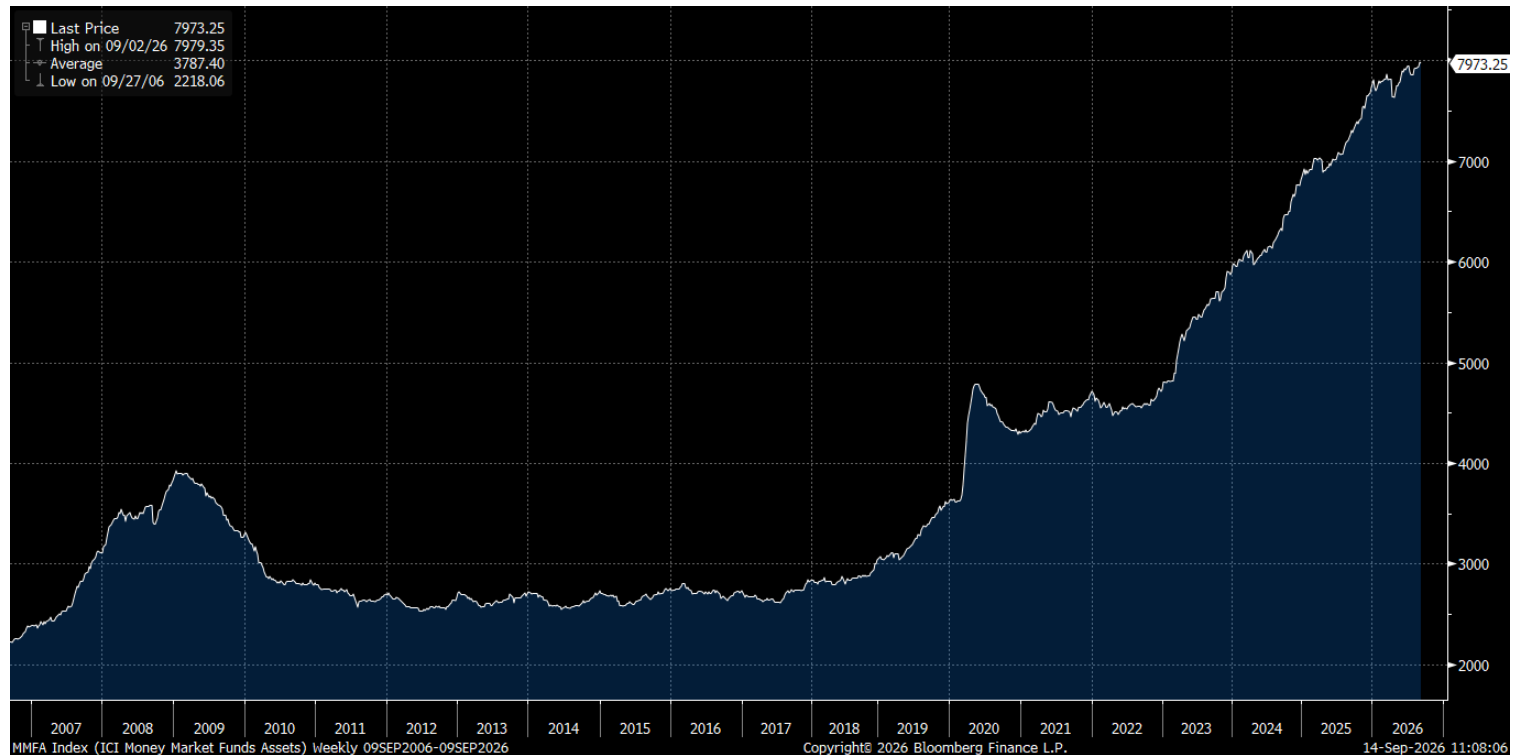
Types of Investments

- U.S. government and agency securities
- Repurchase agreements collateralized by U.S. government securities
- High-quality commercial bank and corporate debt obligations

SIF Performance



Money Market Fund Net Assets



Source: Bloomberg

- The market has seen unprecedented growth in money market fund assets.
- The significant increase in net assets has created more competition.

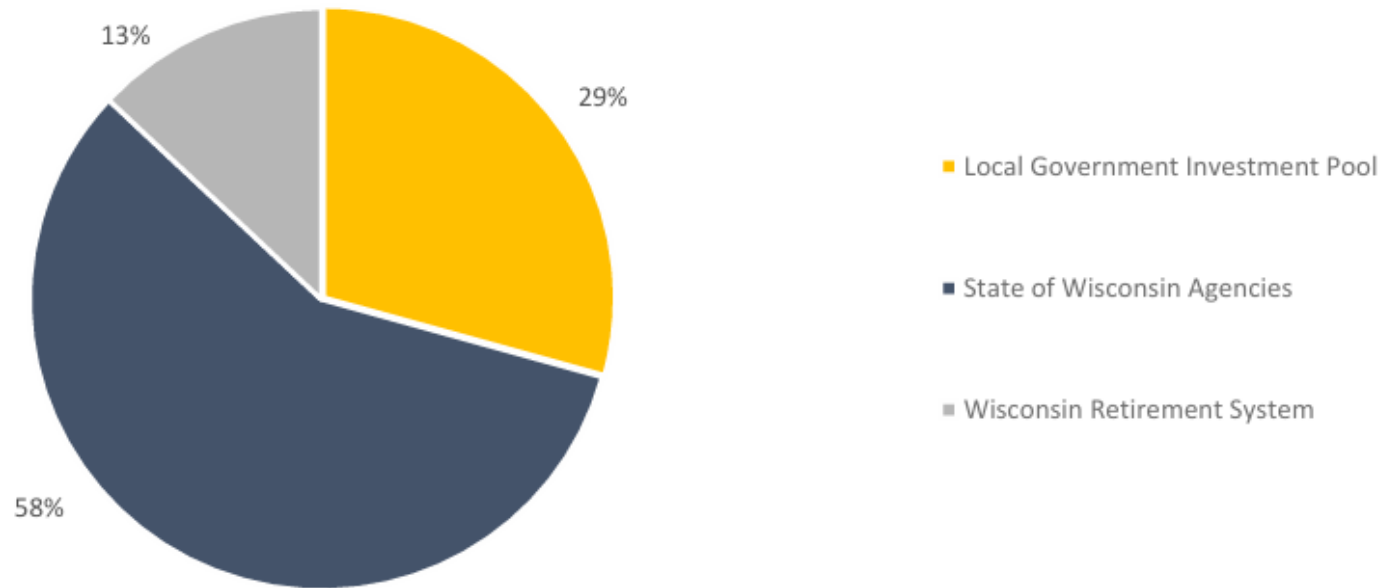
SIF AUM



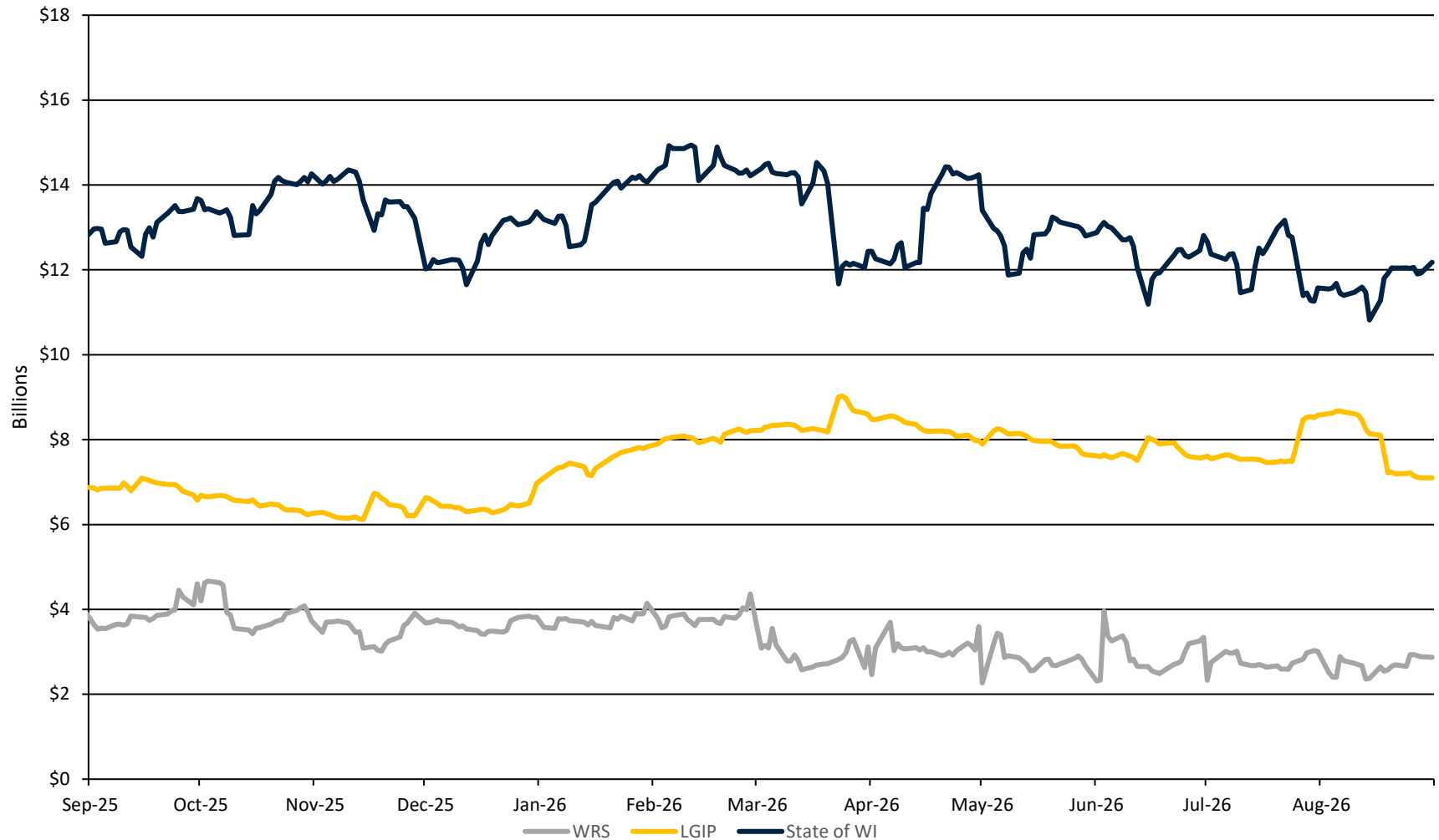
SIF Participant Groups

As of 9/30/26

STATE INVESTMENT FUND PARTICIPANTS



SIF Participant Balances



Local Government Investment Pool

Depositors as of September 30, 2026

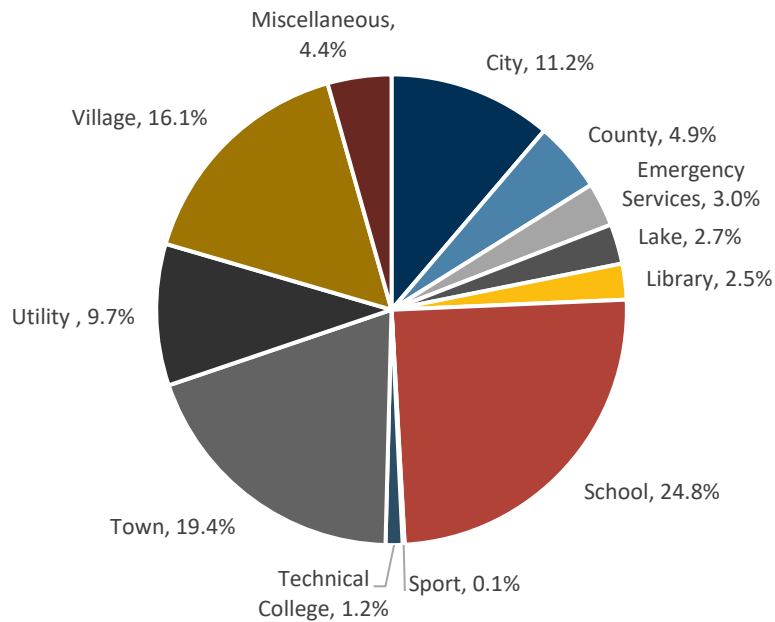
Depositor Type	Count	Total Balance	Average Balance per Participant	Largest Balance of a Participant
City	164	\$2,770,050,969.80	\$16,890,554.69	\$588,338,549.92
County	71	\$1,604,034,910.76	\$22,592,041.00	\$384,591,922.13
Emergency Services	44	\$9,616,559.84	\$218,558.18	\$1,464,091.74
Lake	40	\$4,624,579.79	\$115,614.49	\$698,773.91
Library	36	\$21,759,002.56	\$604,416.74	\$3,717,820.12
School	362	\$767,766,853.13	\$2,120,902.91	\$31,801,286.22
Sport	2	\$113,386,467.65	\$56,693,233.83	\$113,386,467.65
Technical College	17	\$271,930,033.47	\$15,995,884.32	\$88,168,855.22
Town	283	\$126,664,801.00	\$447,578.80	\$9,974,810.43
Utility	142	\$659,060,688.20	\$4,641,272.45	\$273,259,339.18
Village	235	\$688,443,418.91	\$2,929,546.46	\$71,857,512.83
Miscellaneous	64	\$27,903,512.52	\$435,992.38	\$7,177,971.54
Total	1,460	\$7,065,241,797.63		

Source: DOA

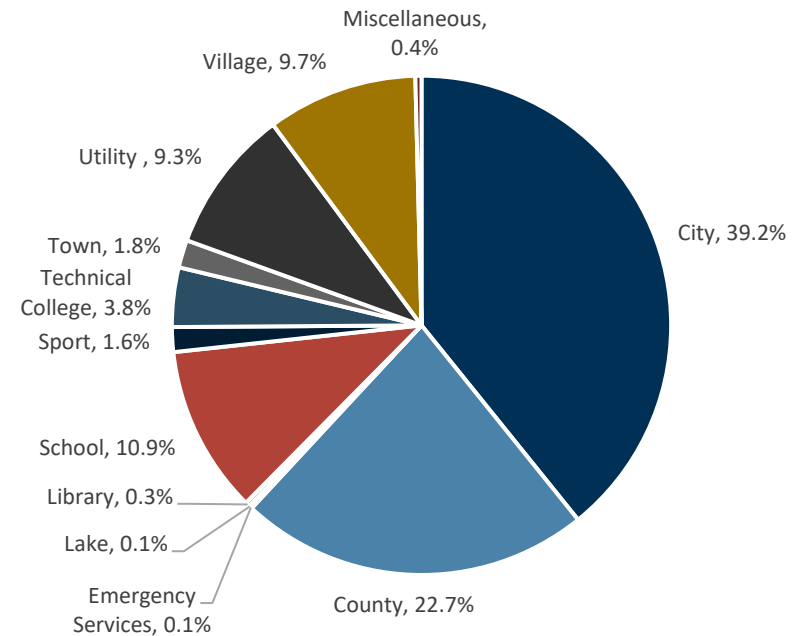
Note: Miscellaneous includes housing authorities and other smaller local government units.

LGIP Participants

Percent of Participants by Count



Percent of Total Balance by Participant



SIF Investment Process

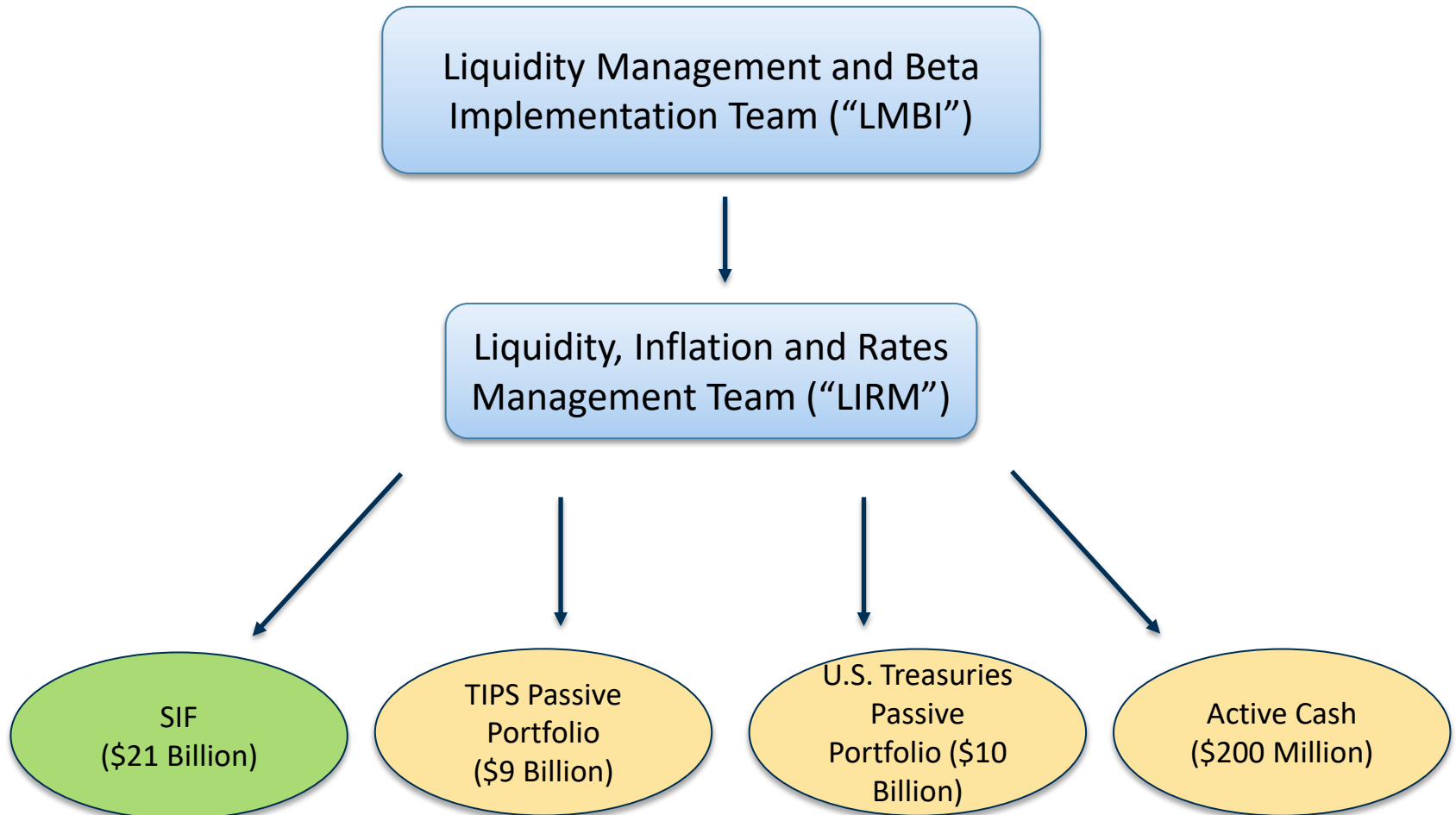
- Cash Flow Forecasting
- Credit Research
- Portfolio Construction
- Trade Execution

Summary

- The SIF is a unique fund, managed internally at SWIB, which serves the State and its agencies, local governments, and the WRS.
- The SIF offers a safe, liquid investment option that earns a competitive rate of return as a result of our investment process.

Appendix

Organizational Structure





Operational Risk Management Update

October Workshop

October 20, 2026

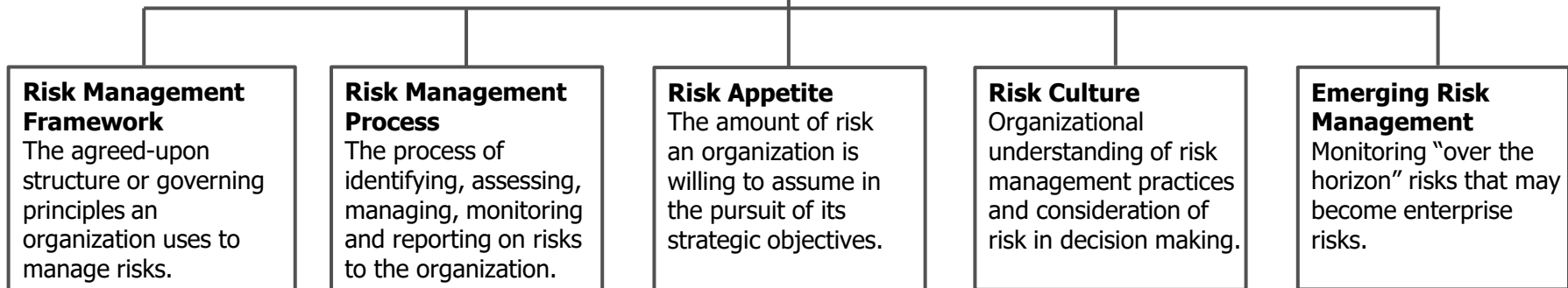
Operational Risk Management Update

Key Insights

- **SWIB is moving from primarily issue-driven risk discussions toward a consistent enterprise process for identifying, prioritizing, assessing, monitoring, and reporting non-investment risks.** The objective is to create clearer ownership, comparable assessments, and a more systematic basis for management and Board attention.
- **A common enterprise risk taxonomy has been developed to provide the foundation for that process.** It establishes a shared language for identifying risks across SWIB and distinguishes broad risk categories from the specific enterprise risks where ownership, monitoring, and mitigation can be assigned.
- **Management's initial prioritization identifies cybersecurity, people, AI & automation, and regulatory change among the risks receiving the broadest or highest-priority attention.** This is an initial prioritization of *unmitigated* risk regardless of their current state of mitigation—not a conclusion that these risks are inadequately controlled or represent SWIB's highest residual exposures.
- **The next step is to convert priority risks into actionable assessments and Board reporting.** For priority risks, Operational Risk will evaluate drivers, controls, residual exposure, mitigation actions, and indicators; future Board reporting is intended to focus on changes in top and emerging risks, mitigation efforts, and selected risk deep dives.

What is Operational Risk Management?

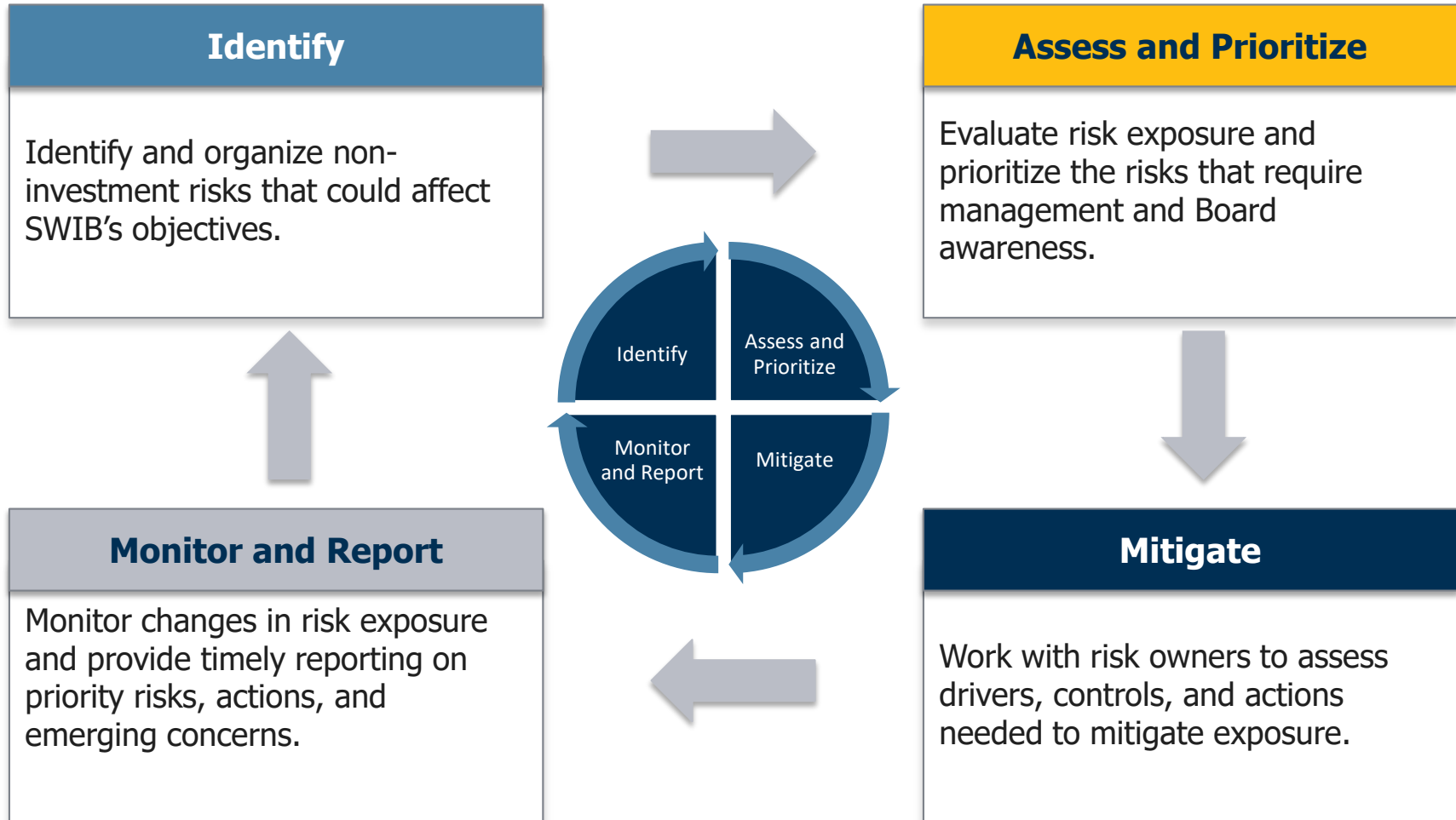
Key Risk Management Elements



Source: Gartner

G00857577

Operational Risk Management Process



Developing the Function

01

Internal Engagement

Meet with teams across SWIB to understand key processes, operational challenges, and areas where risk support can add value.

02

Peer Outreach

Built on peer survey and interviews from 2025. Conducted more in-depth discussions and calls. Participated in the Public Pension Fund ERM peer group quarterly calls.

03

External Learning and Support

Attended the Risk Americas Conference in May, annual Public Pension Fund Conference in September, and engaged Gartner, an industry leader, for additional resources and benchmarking.

04

Applied Risk Support

Supported issue-led process reviews, collaborated with Technology on AI assessments, participated in the IVAR review process, and developed an initial Business Continuity template.

RISK TAXONOMY

*A Framework for Understanding
Organizational Risk*

What is a Risk Taxonomy?

A risk taxonomy is a structured, hierarchical classification of the risks an organization faces. It creates a common language so that executives, business units, and control functions can identify, discuss, and report on risk consistently across the enterprise.

1

Level 1 — Risk Categories

Broad, top-down groupings of risk (e.g., Operational Risk, Technological Risk). They give executives a single-page view of the organization's overall risk landscape and serve as the anchor points for governance and reporting.

2

Level 2 — Enterprise Risks

The material risk areas nested within each Level 1 category — risks specific enough that they pose a tangible threat to the organization's strategic objectives if left unmanaged. This is where ownership, monitoring, and mitigation typically get assigned.

Together, Level 1 and Level 2 give the enterprise a shared map: broad categories for governance, and specific risks for accountability.

Enterprise Risk Taxonomy

Level 1 Risk Categories and Level 2 Enterprise Risk Areas

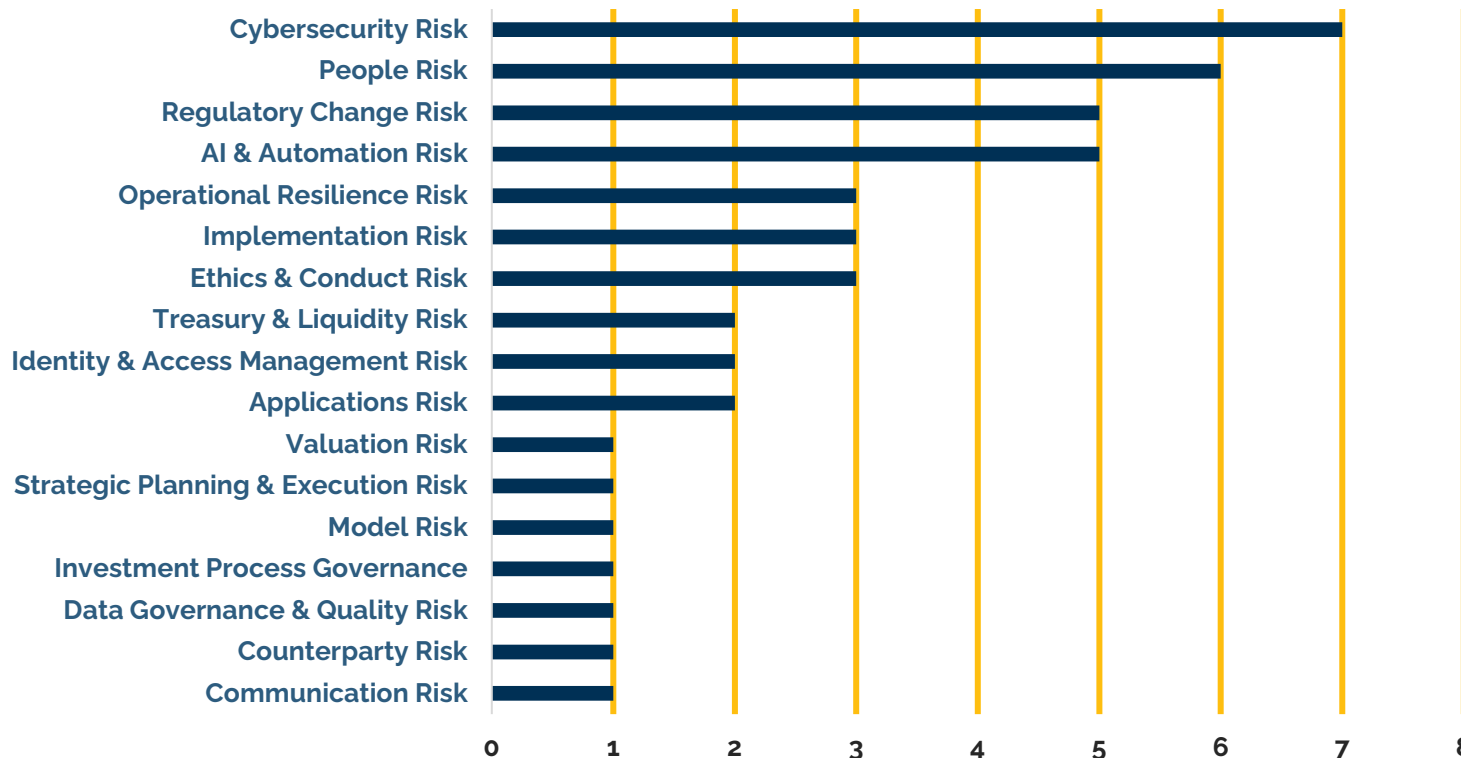


See appendix for definitions.

7

Top-5 Ranked Risks by Management, if Left Unmitigated

Level 2 Risk Priorities

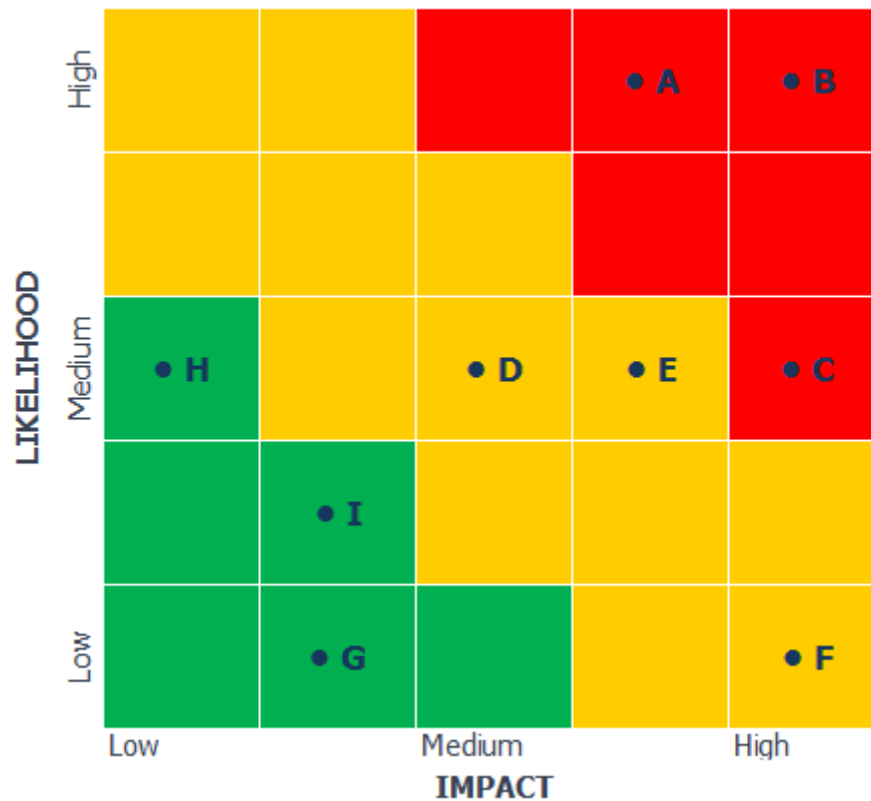


See appendix for definitions.

8

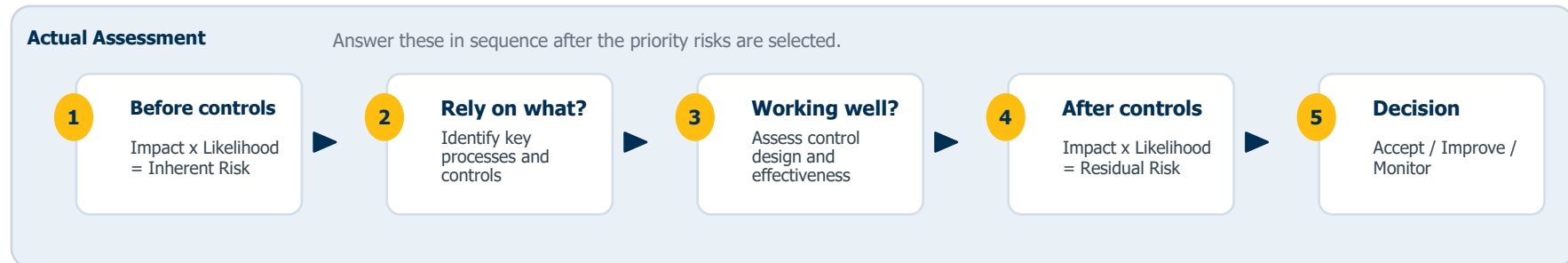
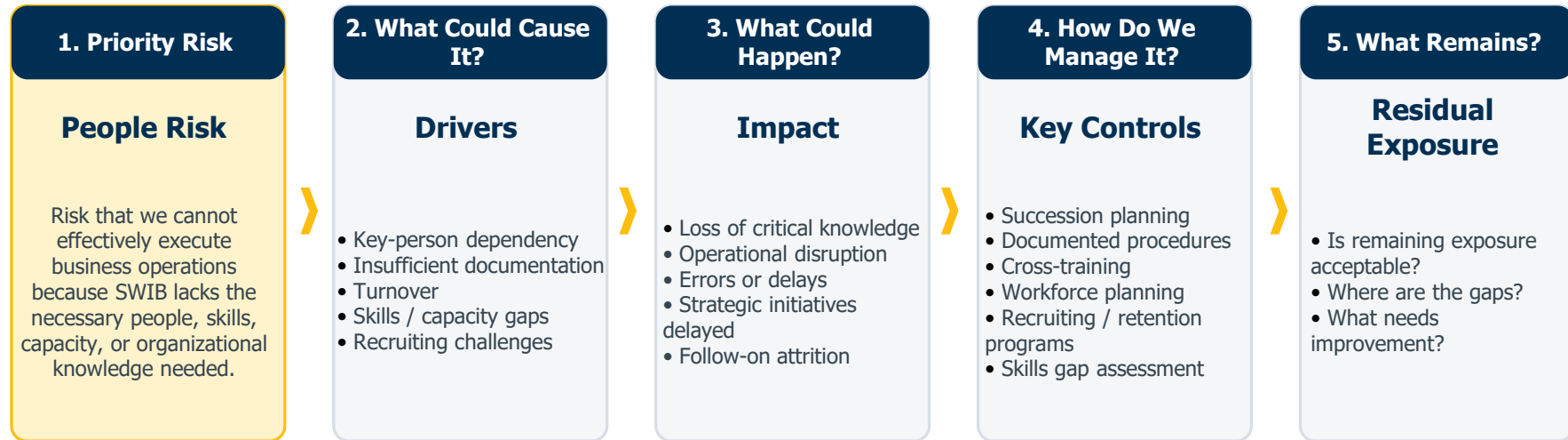
Proposed Risk Assessment Mapping

Through a risk assessment, top risks can be grouped into Tiers and presented visually.



Tier I Risk and Description	
A	
B	
C	
Tier II Risk and Description	
D	
E	
F	
Watch List Risk and Description	
G	
H	
I	

Example Assessment of a Priority Risk

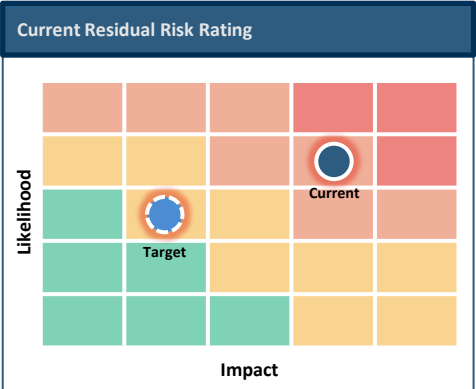


Core message: Prioritization determines where we focus. Assessment determines whether the risk is managed well enough.

Example of the process of moving from priority to assessment. Bullet points listed under drivers, impact, and key controls are examples and subject to change.

People Risk (Example Only)

Risk Definition	People Risk is the risk that SWIB lacks the workforce capacity, capabilities, leadership, talent, or organizational knowledge necessary to achieve its objectives and sustain operations.			
Risk Owner	Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer			
Risk Appetite Statement	Low appetite for personnel dependencies that could materially disrupt critical responsibilities; moderate appetite for managed workforce change supporting strategic objectives.			
Risk Drivers	Specialized knowledge concentration; staffing depth; competition for talent; changing skill needs; compensation competitiveness; personnel transitions.			
Mitigation Plan	Current Mitigation Strategy		Future Action Plan	
	• Succession, backup and cross-training • Workforce/capability planning and talent acquisition • McLagan benchmarking and Board oversight • Training, development and continuity practices		• Map critical-person dependencies • Formalize knowledge-transfer expectations • Close priority capability gaps • Quarterly review of People Risk indicators	
Contingency Plan	• Activate backup resources; prioritize critical responsibilities; temporarily reassign work; use external resources where appropriate; accelerate knowledge transfer/recruiting.			
Risk Assessment	Prior Reviewed: [03/2026]	Current Reviewed: [09/2026]	Target	Trend
	MEDIUM	MEDIUM	MEDIUM	Stable 
Risk Response Capacity	MEDIUM-HIGH: Established workforce, recruiting, continuity and compensation governance; selected specialized-role concentrations remain.			



Business Objectives Impacted	
1	Sustain critical operations
2	Maintain specialized capabilities
3	Execute strategic change
4	Effective oversight and decisions
5	Operational resilience

Source: Gartner

850363

APPENDIX

Enterprise Risk Taxonomy Definitions

FINANCIAL MANAGEMENT RISK

Treasury & Liquidity Risk

Risk that SWIB is unable to effectively manage cash, liquidity, funding, or collateral to meet financial, operational, or investment obligations when due.

Financial Reporting Risk

Risk that financial information is incomplete, inaccurate, or untimely, resulting in poor decision-making, regulatory issues, or loss of stakeholder confidence.

Valuation Risk

Risk that investment assets or liabilities are inaccurately or inconsistently valued, resulting in incorrect financial, investment, or stakeholder reporting.

Expense Management Risk

Risk that expenses, fees, or financial resources are not effectively managed, resulting in unnecessary costs or inefficient use of agency resources.

OPERATIONAL RISK

Investment Operations Risk

Risk that post-trade investment activities, including investment accounting, performance measurement, asset servicing, collateral management, and portfolio support, are performed inaccurately, incompletely, or untimely.

Implementation Risk

Risk that strategic initiatives, projects, or business changes are inadequately planned or executed, resulting in operational disruption, increased costs, or failure to achieve intended outcomes.

Operational Resilience Risk

Risk that SWIB is unable to maintain or recover critical business services following a disruption, resulting in prolonged operational impacts or financial loss.

Model Risk

Risk that models, end-user computing solutions, or quantitative methods are inaccurate, inadequately governed, or improperly used, resulting in incorrect business or investment decisions.

Health & Safety Risk

Risk that workplace hazards, incidents, or unsafe conditions adversely affect employee health, safety, or SWIB's ability to operate effectively.

Trading & Trade Processing Risk

Risk that investment transactions are incorrectly executed, captured, confirmed, processed, or settled, resulting in financial loss, operational disruption, or noncompliance.

Investment Process Governance Risk

Risk that investment decision-making, oversight, authorities, or adherence to investment policies are ineffective or inconsistently applied, resulting in decisions inconsistent with SWIB's objectives or fiduciary responsibilities.

Enterprise Risk Taxonomy Definitions

LEGAL & COMPLIANCE RISK

Compliance Risk

Risk that SWIB fails to comply with applicable laws, regulations, regulatory requirements, or internal policies, resulting in legal, regulatory, financial, or reputational consequences.

Legal Risk

Risk that contractual obligations, litigation, legal advice, or other legal matters are not effectively managed, resulting in financial loss, regulatory action, operational disruption, or reputational damage.

Ethics & Conduct Risk

Risk that unethical conduct, conflicts of interest, fraud, or behavior inconsistent with SWIB's values, fiduciary responsibilities, or legal obligations results in financial, legal, regulatory, or reputational harm.

Regulatory Change Risk

Risk that changes in the external legal, regulatory, governmental, or institutional framework affect SWIB's authority, responsibilities, operations, or ability to achieve its objectives.

STRATEGIC RISK

Strategic Planning & Execution Risk

Risk that strategic objectives are poorly defined, inadequately executed, or fail to adapt to changing internal or external conditions.

People Risk

Risk that SWIB lacks the workforce capacity, capabilities, leadership, talent, or organizational knowledge necessary to achieve its objectives and sustain operations.

Organizational Structure Risk

Risk that organizational design, governance, decision-making authority, roles, or accountability structures do not effectively support SWIB's mission or operating model.

THIRD-PARTY RISK

Vendor Risk

Risk that vendors, service providers, custodians, or other third parties fail to deliver services securely, reliably, or in accordance with contractual, operational, or regulatory expectations.

Counterparty Risk

Risk that a financial counterparty fails to meet its contractual or financial obligations, resulting in financial loss, liquidity constraints, or operational disruption.

External Manager Risk

Risk that external investment managers fail to meet investment objectives, contractual obligations, fiduciary expectations, or operational standards, resulting in financial, operational, legal, or reputational impacts to SWIB.

Enterprise Risk Taxonomy Definitions

REPUTATIONAL RISK

Stakeholder & Board Reporting Risk

Risk that information provided to the Board, Legislature, stakeholders, or oversight bodies is inaccurate, incomplete, or untimely, reducing confidence in SWIB's governance and decision-making.

Communication Risk

Risk that ineffective, inaccurate, or poorly managed internal or external communications negatively impact staff engagement, stakeholder confidence, or organizational reputation.

TECHNOLOGY RISK

Cybersecurity Risk

Risk that cyber threats compromise the confidentiality, integrity, or availability of SWIB's information, systems, or technology assets.

Applications Risk

Risk that business applications do not operate reliably, securely, or as intended, disrupting business processes, investment activities, or decision-making.

Infrastructure Risk

Risk that failures in technology infrastructure, networks, cloud services, or hardware adversely affect business operations or service availability.

Data Governance & Quality Risk

Risk that data is inaccurate, incomplete, inconsistent, unavailable, or inadequately governed, resulting in poor decision-making, investment or operational failures, or regulatory noncompliance.

Identity & Access Management Risk

Risk that inappropriate or unauthorized access to systems, applications, or information results in fraud, data loss, security incidents, or regulatory noncompliance.

AI & Automation Risk

Risk that artificial intelligence or automated decision-making solutions are inadequately designed, governed, monitored, or used, resulting in inaccurate, unintended, inappropriate, or insufficiently controlled outcomes.

The Return of Industrial Policy

Presented to the State of Wisconsin Investment Board

Kim Ruhl

Department of Economics · University of Wisconsin–Madison

October 21, 2026

Trump Policy Agenda

—
Tax reform

—
**Deregulation
and energy**

—
**Industrial
policy**

Today's focus

Roadmap

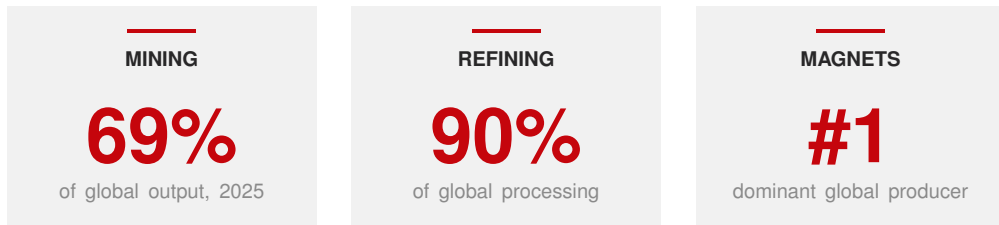
1. Why industrial policy is back
 - China as a geopolitical rival
 - Markets do not price in national security
2. How it is proceeding
 - Whole-of-government approach
 - A much bigger toolkit than tariffs
3. Long-term outlook
 - Political risks, macro effects, Wisconsin

Why It Needs to Be Done

China as a Geopolitical Rival

- ▶ Industrial policy
 - Subsidize and dominate key industries
 - Minerals, metals, chips, batteries, ...
- ▶ Export controls
 - Leverage over rivals and access to our supply chains
 - Rare earths, gallium, germanium, graphite, ...
- ▶ IP theft
 - Speed up development
 - AI is a recent example

Example: China and Rare Earths



Export controls as leverage



The Market Failure

- ▶ What a firm chooses
 - Lowest-cost supplier
 - Concentrated supply chains
- ▶ What a firm ignores
 - Security cost of dependence
 - Value of diversification to the nation
 - Military supply needs in a crisis
- ▶ An externality: optimal firm-level choices, suboptimal national outcome

U.S. Industrial Policy as a Counterweight

- ▶ Counteract China's industrial policy with our own
- ▶ Target security-critical sectors
- ▶ **Goal 1:** Decouple gracefully
 - Reduce dependence without a supply shock
- ▶ **Goal 2:** Military autonomy
 - Build what we need to defend ourselves

How It Is Proceeding

Largely Bipartisan

Trump I

- 232 tariffs: steel, alum
- 301 tariffs on China
- Huawei restrictions

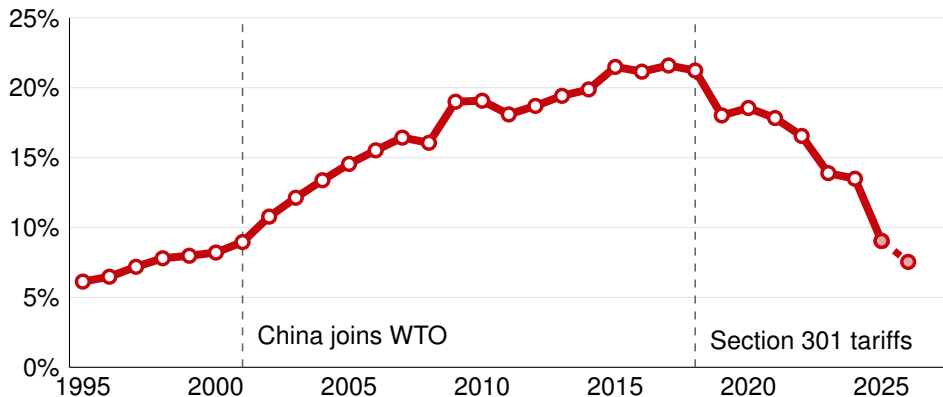
Biden

- Kept 232 and 301
- CHIPS Act, IRA
- Chip export controls

Trump II

- New 232 actions
- Equity stakes, price floors
- Critical-mineral stockpile

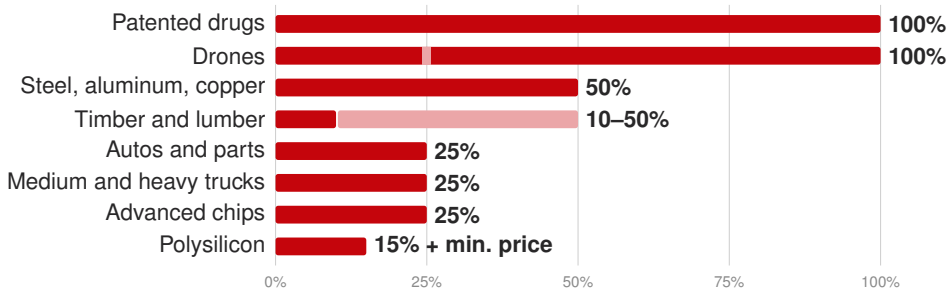
China's Share of U.S. Goods Imports



Tariffs Are the Most Visible

- ▶ Section 232 tariffs are most important
 - National-security statute, legally durable
 - Good-specific, after a Commerce investigation
 - Identifies industries the government intends to build at home
- ▶ IEEPA / Section 122 / Section 301
 - Meant as negotiating leverage
 - Country-specific; IEEPA and 122 legally shaky

The Section 232 Tariffs



Still under investigation

Commercial aircraft, jet engines; wind turbines;
robotics, industrial machinery; PPE, medical equipment

All Hands on Deck + Expanded Toolkit

Defense (War)	Equity, price floors, offtake agreements (MP Materials, Trilogy Metals)
Energy	Loans and equity (Lithium Americas)
Commerce	Section 232 investigations; CHIPS grants converted to equity (Intel)
EXIM	\$10 billion loan anchoring Project Vault, the minerals reserve
Treasury	Investment screening (CFIUS), outbound investment rules
Congress	NDAA, CHIPS Act, appropriations; broad bipartisan support

Case Study: MP Materials and Rare-Earth Magnets

EQUITY

\$400M

DoD preferred stock;
largest shareholder

PRICE FLOOR

\$110

per kg NdPr, 10
years (market ≈\$60)

OFFTAKE

100%

of new magnet plant
output, 10 years

CAPACITY

3.3×

magnets: 3,000
→ 10,000 t/yr

- ▶ Apple makes \$500M deal for magnets
- ▶ Template for later deals: Vulcan Elements, Trilogy Metals, Korea Zinc

Case Study: Project Vault

—
**STRATEGIC
MINERALS RESERVE**

\$12B

\$10B EXIM loan
+ private capital

- ▶ Covers USGS critical minerals
- ▶ Manufacturers choose materials and volumes
- ▶ Draw down during supply disruptions
- ▶ Public–private, independently governed

Case Study: Pharmaceuticals

PATENTED DRUGS

100%

Section 232 tariff
from July 31, 2026

- ▶ Tariffs to create leverage
 - 15% for EU, Japan, Korea, Switzerland
 - 20% with an approved U.S. onshoring plan
 - 0% with onshoring + drug-pricing (MFN) deal
- ▶ Harder to onshore smaller firms

International Cooperation

- ▶ Shift from multilateral to plurilateral agreements
 - Lower 232 rates for EU, Japan, Korea, UK
 - Minerals deals with allies
 - Project Vault designed for allied participation

Macro Effects and Long-Term Outlook

Risks

- ▶ Unintended consequences
 - Protecting an industry raises costs for its customers
- ▶ Slippery slope
 - Every industry can claim to be “strategic”
- ▶ Potential conflicts of interest
 - Government as shareholder, customer, and regulator
- ▶ Building is hard
 - Permitting and local opposition to mines and plants
- ▶ Lack of long-term credibility

Macroeconomic Effects

- ▶ Higher prices
 - Less competition from imports
- ▶ Lower productivity
 - Production shifts away from lowest-cost suppliers
- ▶ Higher interest rates
 - Onshoring raises demand for capital

What It Means for Wisconsin

Wisconsin Is More Exposed Than Most States

MANUFACTURING JOBS

15.0%

of nonfarm jobs; U.S.: 7.9%

GOODS EXPORTS, 2025

\$27.1B

Canada \$7.5B (27.7%);
Mexico \$4.0B; China \$1.0B

EMPLOYERS HURT BY TARIFFS

47%

report a negative
impact; 12% positive

- ▶ Support for tariffs: 86% (early 2025) → 70% (Jan 2026)

Tariff Effects on Wisconsin Companies

- ▶ From earnings calls, filings, reporting
- ▶ Companies reporting multimillion-dollar tariff bills
 - Harley-Davidson, Regal Rexnord
 - Oshkosh, Mercury, Generac
 - Manitowoc, Rockwell
 - Kohl's

Canada Is WI's Largest Export Market

Feb 20, 2026

IEEPA tariffs
struck down

Jul 1, 2026

USMCA not
renewed

Jul 20, 2026

Sec. 338: 50% on
Canadian goods

Aug 22, 2026

In effect, ≈\$20B
of goods

Sep 8, 2026

Canada hits
dairy, paper

CANADA'S SHARE

27.7%

of Wisconsin goods
exports, 2025

DAIRY

\$65–113M

per year of farm milk sales;
cheese 25–50%, whey 50%

PAPER

>\$500M

per year of sales to
Canada, now mostly at 50%

Federal Support in Wisconsin

- ▶ Defense
 - Decrease in funding to Marinette and Oshkosh
 - Defense spending will continue to rise
 - Product mix is changing
- ▶ Infrastructure and Jobs Act
 - Broadband build-out, bridges
- ▶ CHIPS Act
 - Biohealth Tech Hub

Takeaways

- ▶ Industrial policy is the new normal
 - Largely for security goals
 - Bipartisan, though for different reasons and goals
- ▶ Tariffs are most prevalent, but the toolkit has expanded
 - Section 232 tariffs are most meaningful
 - Equity stakes, price floors, offtake agreements, stockpiles
- ▶ Create pressure on higher prices and lower productivity



WRS Core Trust Fund Asset-Liability Model ("ALM")

How investment returns translate into participant outcomes

Board of Trustees Workshop | Wednesday, October 21, 2026

State of Wisconsin Investment Board

Asset and Risk Allocation

Key Insights

- The WRS has a unique risk-sharing design. Plan rules translate smoothed investment experience into contribution-rate and retiree annuity adjustments.
- Four plan mechanisms translate returns into participant outcomes: five-year return smoothing through the Market Recognition Account, the retiree dividend rule, the formula benefit floor, and 20-year contribution rate adjustments.
- When a large loss works through the plan, retiree dividends can fall or pause while contribution rates rise. As funding recovers, dividends resume and contribution rates move toward their long-run level.
- Asset and Risk Allocation (“ARA”) developed a detailed asset-liability model (“ALM”) that traces potential participant impacts across market return paths. This allows alternative policy portfolios to be compared by potential impacts on contribution rates, retiree dividends, and retiree funded status.

Portfolio Risk Is Only Half the WRS Question

A CONVENTIONAL DEFINED BENEFIT PLAN

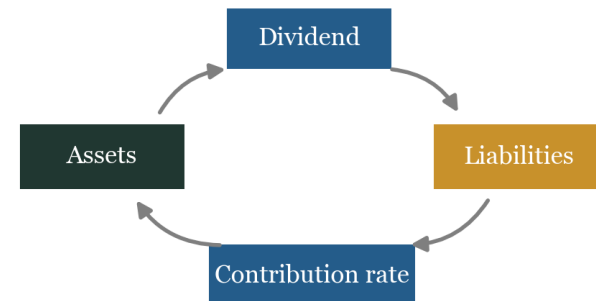
Traditional portfolio analysis focuses on expected return and risk. Market outcomes primarily drive funded status, although liabilities also change with interest rates, inflation, wage growth, and demographics.



The funded ratio absorbs the difference.

THE WRS CORE TRUST FUND

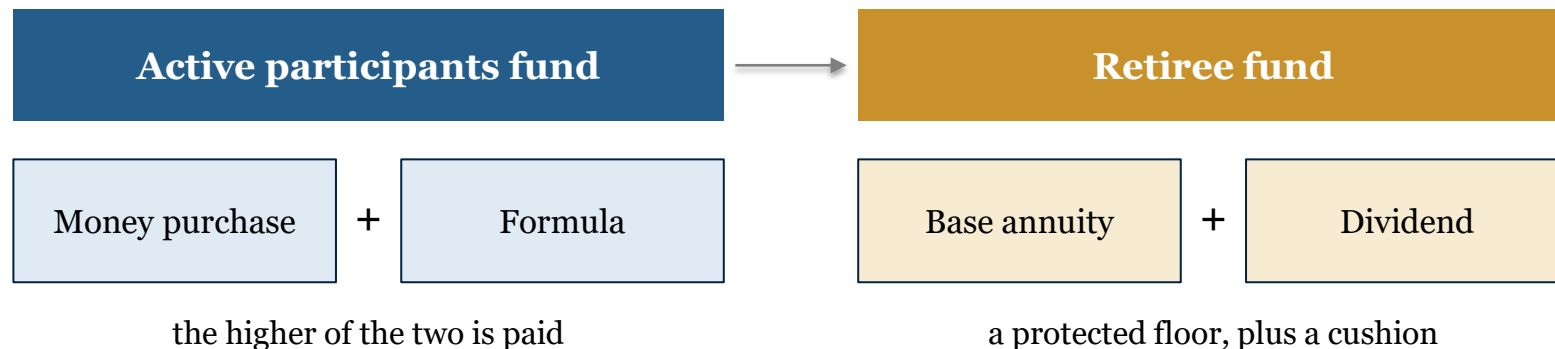
The WRS Core Trust Fund works differently. Plan rules translate portfolio outcomes into contribution rates and retiree annuity adjustments.



ARA can compare the asset-liability effects of alternative policy portfolios. This analysis aims to complement GRS's biennial stress testing and triennial Experience Study, which provide the plan's actuarial foundation.

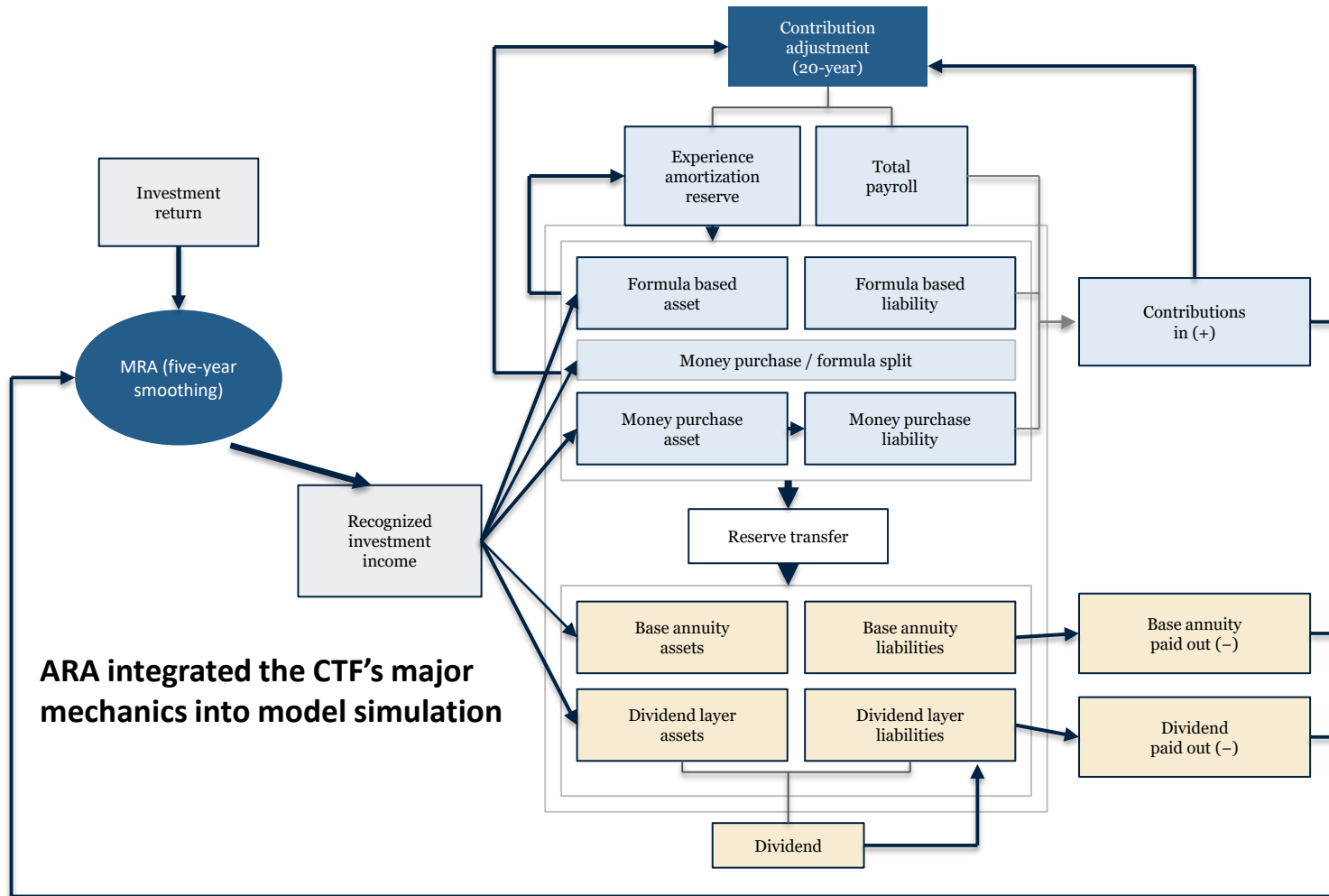
The CTF Has Two Sub-Funds

Notional balances transfer at retirement.



- The model tracks active participants and retirees separately, each with its own assets, liabilities, and funded status measure.
- Investment returns flow to participants through the four components shown above, with each detailed in the slides that follow.

ARA Modelled How the Complex CTF Mechanism Fits Together



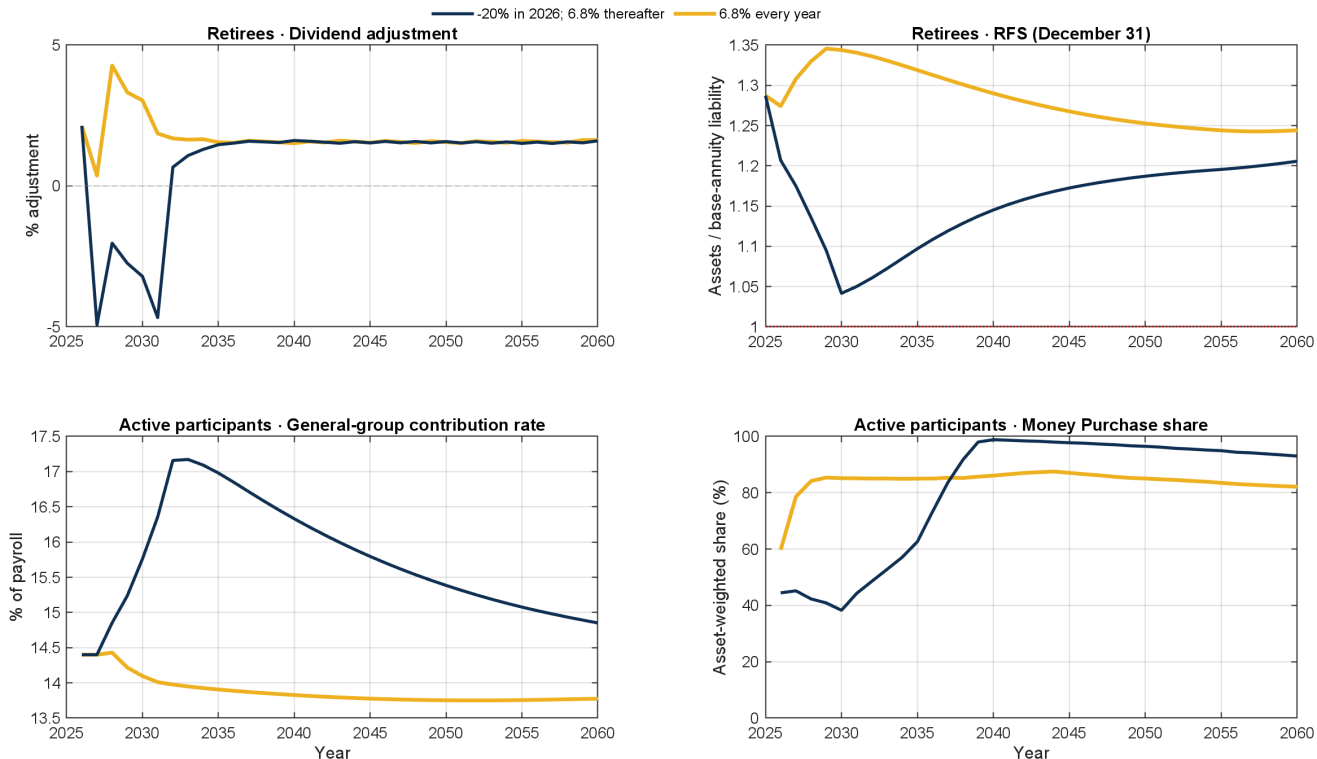
ARA integrated the CTF's major mechanics into model simulation

Four Core Concepts in the WRS Model

Term	What it means
Market Recognition Account ("MRA")	The plan's five-year return-smoothing mechanism. Gains and losses relative to the assumed return are recognized 20% annually, gradually affecting dividends and contribution rates.
Retiree Funded Status ("RFS")	Total retiree assets divided by base annuity liabilities. When RFS is above 1.0, excess assets can support dividends. When RFS is below 1.0, assets do not fully cover the protected base.
Money Purchase and formula benefit	Each active member has two benefit calculations. Money Purchase is based on contributions and investment returns. The formula benefit is based on service and pay. At retirement, the higher benefit is paid.
Experience Amortization Reserve ("EAR")	For members whose formula benefit is higher, EAR is the difference between the formula-based liability and the member's Money Purchase balance. Across formula members, these gaps add up to EAR and are funded over time through contribution adjustments.

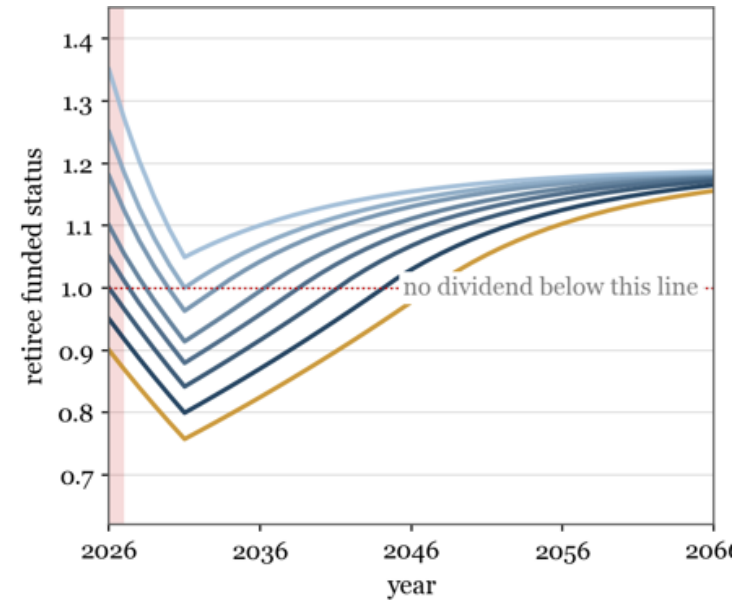
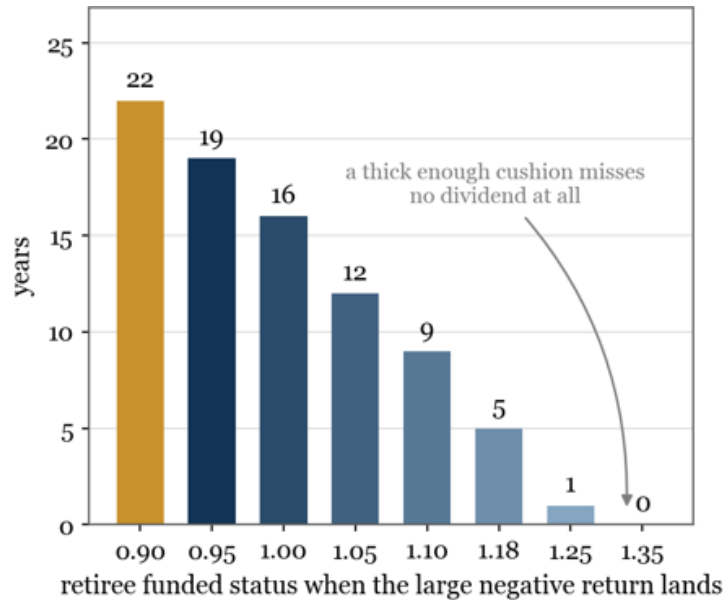
Case Study from the December 31, 2025 Valuation: A –20% Return in 2026

Illustration begins with December 31, 2025 balances. Yellow shows 6.8% in 2026 and thereafter; navy shows –20%, then 6.8% thereafter.



Timing note: The April 2026 dividend (2.1%) was determined from 2025 experience and is fixed at the starting point; the modeled 2026 return first affects the dividend effective April 2027. Subsequent dividends are recalculated dynamically.

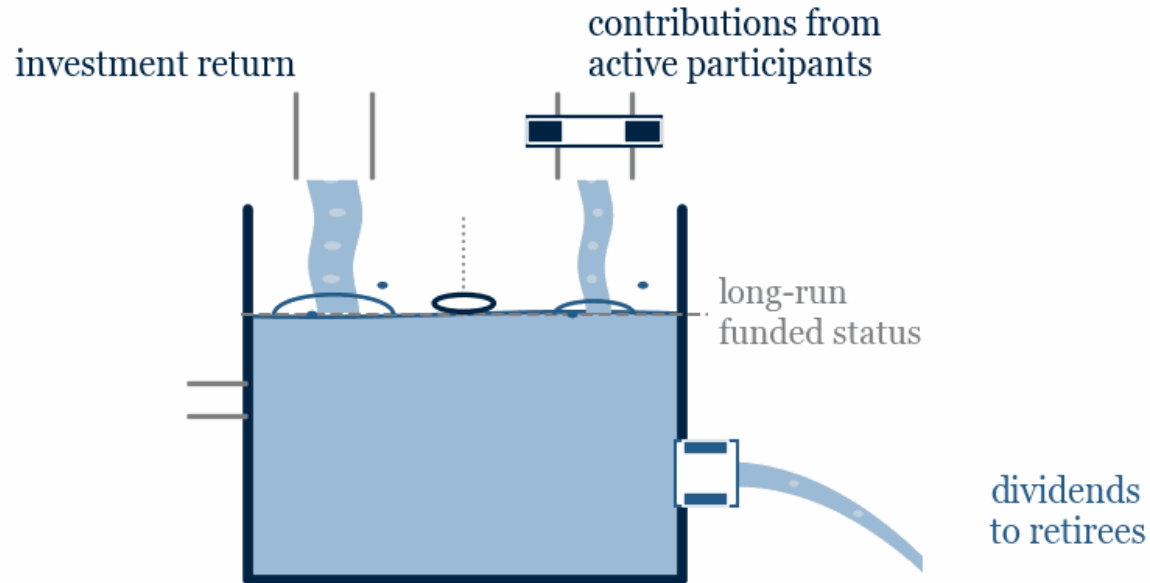
Initial Retiree Funded Status Determines How Long Dividends Pause After a -20% Return



- A large loss can exhaust the dividend cushion, creating a period without a positive dividend.
- The initial cushion determines how long that period lasts: zero years at 1.35 versus 22 years at 0.90 in this scenario.
- All paths eventually converge toward the same long-run level. Meanwhile, contribution rates bear more of the system's adjustment.

Plan Rules Adjust Both Flows to Support Funded Status

Contribution rates and annuity adjustments respond as funded status changes

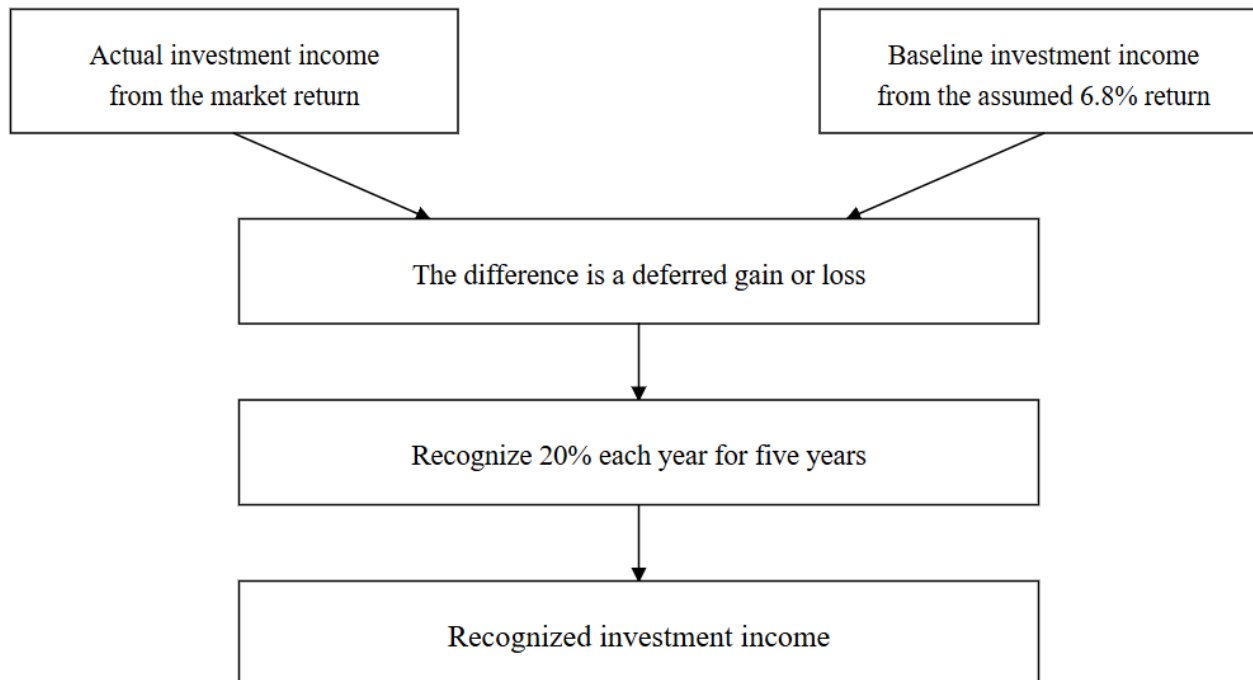


Animated in the presentation. Shown here as a still.

- The water level represents the plan's funded status. Investment gains raise it. Investment losses lower it.
- The valves represent contribution rates and retiree annuity adjustments. Under the plan's rules, both respond as funded status changes.
- Together, the adjustments help move funded status toward its long-run level. The next four slides follow an investment return through the system.

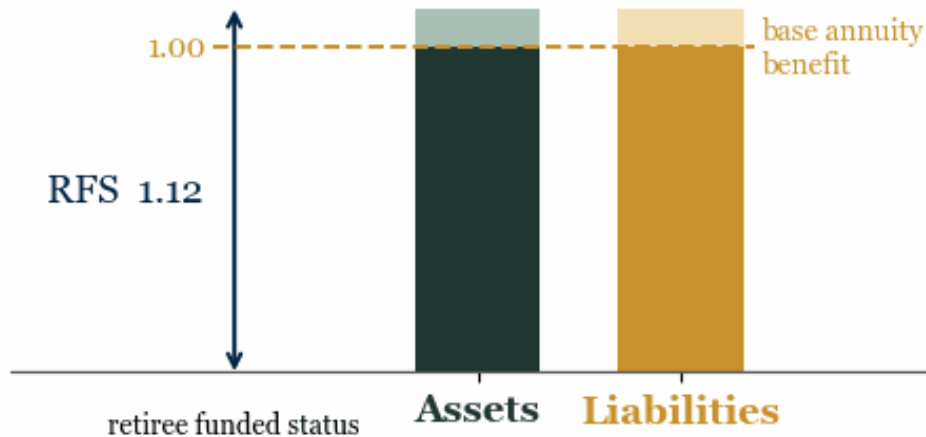
The MRA Converts Market Returns into Recognized Returns

- The Market Recognition Account (“MRA”) recognizes the assumed return immediately. Gains or losses relative to that return are recognized 20% per year for five years.
- The resulting recognized investment income, not the annual market return, drives the plan's contribution-rate and dividend rules.
- The diagram below illustrates the process.



What Retiree Funded Status (“RFS”) Measures

the difference is the dividend layer

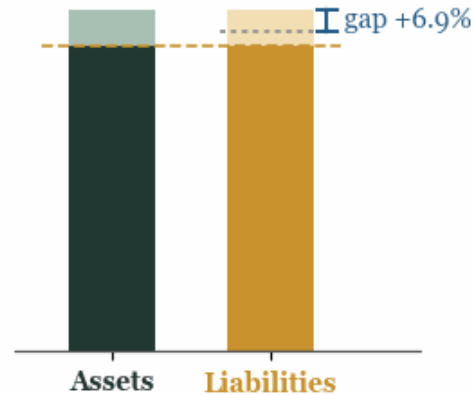
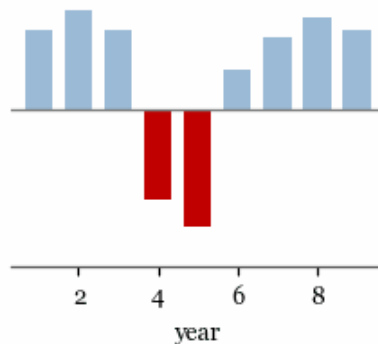


Animated in the presentation. Shown here as a still.

- RFS compares the retiree pool's assets with its base annuity liability.
- When RFS is above 1.0, excess assets support the dividend layer. When RFS is below 1.0, that layer is depleted.
- The base annuity remains the benefit floor. The dividend is adjustable.

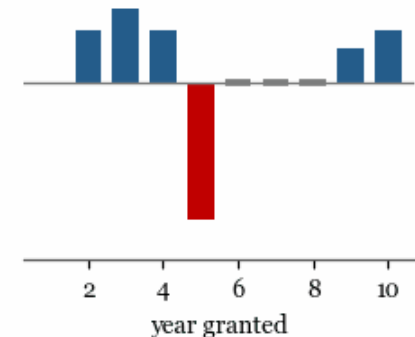
How One Year Produces the Next Dividend

Investment return



Animated in the presentation. Shown here as a still.

Dividend to retirees



- During the year, recognized investment income changes retiree assets. Base liabilities grow at the 5% actuarial rate and decline as annuities are paid.
- At year-end, the asset-liability gap is measured. If assets exceed liabilities, the surplus becomes a dividend adjustment at the start of the following year.
- The adjustment increases liabilities, not assets, bringing the two sides back toward balance.

Experiencing a -20% Investment Return Can Change Which Benefit Is Higher

the plan pays the higher of the two

the money purchase account
\$44,000 a year

the formula benefit
\$40,100 a year

\$40,100
now the higher

\$36,200

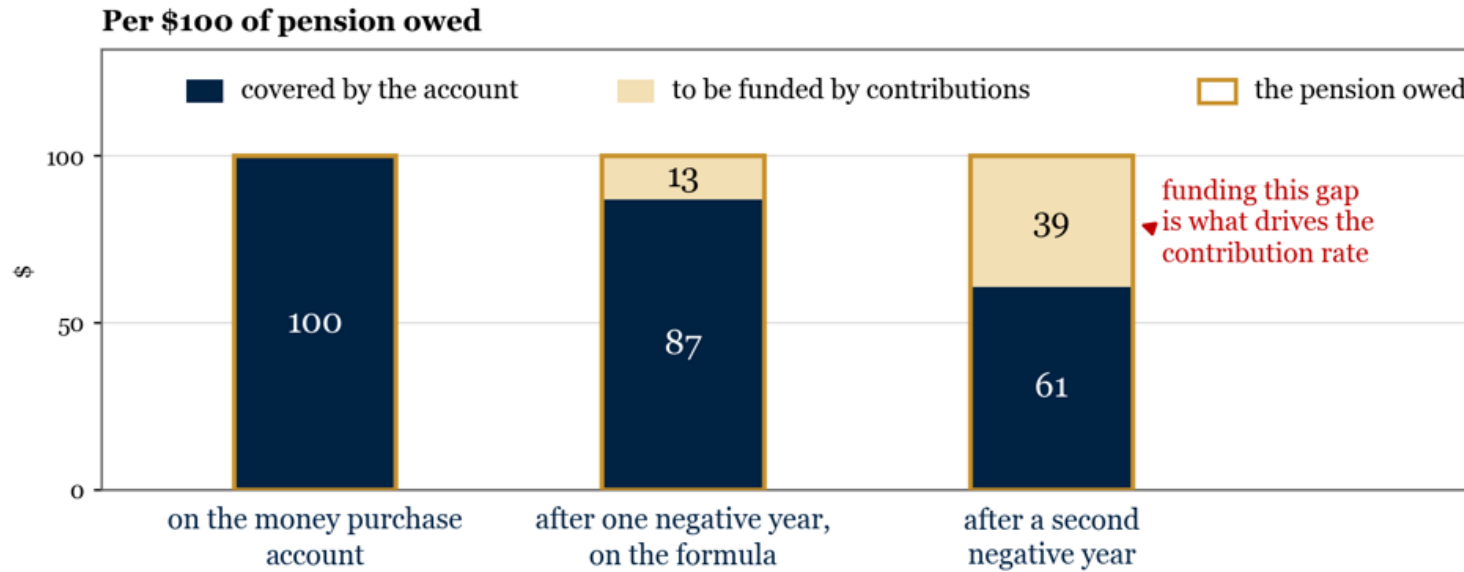
Today, at age 55

After one -20% year

Illustrative only. One member, an assumed final salary of \$60,000 a year, and every other year earning the assumed 6.8%. Not a benefit quotation.

- **Formula benefit:** Based on service, final-average earnings, and the plan multiplier. In this example, 30 years at 1.6% equals 48% of final-average earnings. It does not respond directly to investment returns.
- **Money Purchase benefit:** Based on employee and employer contributions plus credited investment returns, converted to a lifetime annuity. It responds directly to investment returns.
- At retirement, the member receives the higher calculation. In this illustration, a -20% year shifts the higher benefit from Money Purchase to the formula benefit.

Negative Returns Can Make the Formula Benefit Exceed the Money Purchase Benefit, Creating a Funding Gap



- When Money Purchase is higher, the member's account fully supports the benefit and the Experience Amortization Reserve (“EAR”) is zero.
- When the formula benefit is higher, EAR is the difference between the formula-based liability and the member's Money Purchase balance.
- In this illustration, one negative year creates a \$13 EAR for each \$100 of liability. A second negative year increases it to \$39.
- Across all formula members, these gaps add up to the plan's EAR, which is funded gradually through future contribution adjustments.

The Same Investment Return Affects Members Differently by Age

Age 25 when the shock occurs

- The -20% year reduces a relatively small Money Purchase balance, so the dollar loss is modest.
- Higher contributions are phased in over future years, most of which occur during this member's career.
- Those contributions and the longer recovery period rebuild the account. In this illustration, Money Purchase remains higher at retirement.

Age 60 when the return occurs

- The same contribution adjustment applies, but relatively few years occur before retirement.
- The loss affects a much larger Money Purchase balance, with little time to recover.
- In this illustration, the formula benefit becomes higher, and the resulting funding gap adds to the EAR.

The same investment return reaches members through different channels. The younger member is affected mainly through future contributions. The older member is affected mainly through the Money Purchase balance. When the formula benefit becomes higher than the Money Purchase benefit, the gap adds to EAR and is funded over time through future contributions.

What the Simulation Adds

Model feature	What ARA's ALM simulation captures
Investment returns	Simulated for every year of each portfolio path
Market Recognition Account	Converts market returns into recognized investment income
Active members	Modeled by age and service cohort
Money Purchase share	Asset-weighted share calculated from cohort outcomes, not a fixed ratio
Retiree pool	Tracks total and base asset-liability balance sheets
Contribution rates	Spreads formula-funding adjustments over 20 years
Retiree dividends	Determined by funded status and the plan's dividend rules
Policy portfolios	Allows alternative policy portfolios to be compared for their effects on contributions, dividends, and retiree funded status

- The simulation starts with portfolio return paths and carries them through smoothing, member cohorts, and plan rules to participant outcomes.
- Most importantly, the asset-weighted Money Purchase share is an output of the model. It changes with returns as the model recalculates which benefit is higher for each cohort.

Higher Investment Risk Changes Median Outcomes, but Downside Protection Peaks in the Middle Scenario

Measure	Lower return and volatility 4.5% geometric return assumption, 2.2% initial volatility	Middle scenario 6.5% geometric return assumption, 10.7% initial volatility	Higher return and volatility 8.5% geometric return assumption, 28.3% initial volatility
2046 median General-group contribution rate	16.7%	13.8%	12.3%
2046 median paid dividend adjustment	-0.7%	1.7%	6.4%
20-year downside retiree RFS	100%	105%	89%
Reading across	Lower case	Middle case	Higher case

Downside RFS is the fifth percentile of each path's minimum RFS during the first 20 projection years.

All scenarios use 1,000 paths and the report-calibrated December 31, 2025 starting values. The April 2026 dividend and 2026 contribution rate are historical anchors; subsequent dividends use the dynamic retiree-balance-sheet calculation.

The WRS Has Two Built-In Stabilizers

Stabilizer	When funding weakens	When funding improves
Contribution rates	Rise over time to address formula-funded shortfalls	Prior adjustments roll off
Retiree dividends	Decline or pause as the dividend layer is depleted	Resume as the dividend layer rebuilds

- Together, these built-in stabilizing mechanisms help move the plan toward long-run funding balance.
- With only one adjustment channel, more of the burden falls on either contributions or benefits.
- The mechanisms support recovery, but they do not guarantee full funding on every simulated path.

These stabilizers are structural. The speed and extent of recovery still depend on future investment and plan experience.

Conclusion

- The WRS translates investment experience through four plan mechanisms: five-year MRA smoothing, retiree dividend adjustments, the formula benefit floor, and 20-year amortization of formula-funded shortfalls.
- These mechanisms delay and redistribute risk. They do not eliminate it. The effects appear in retiree dividends, contribution rates, and retiree funded status on different timelines.
- Portfolio choice balances expected return against contribution-rate stability, dividend stability, and downside retiree funded status.

ARA can compare the asset-liability effects of alternative policy portfolios under the WRS's own rules before a policy portfolio is recommended.

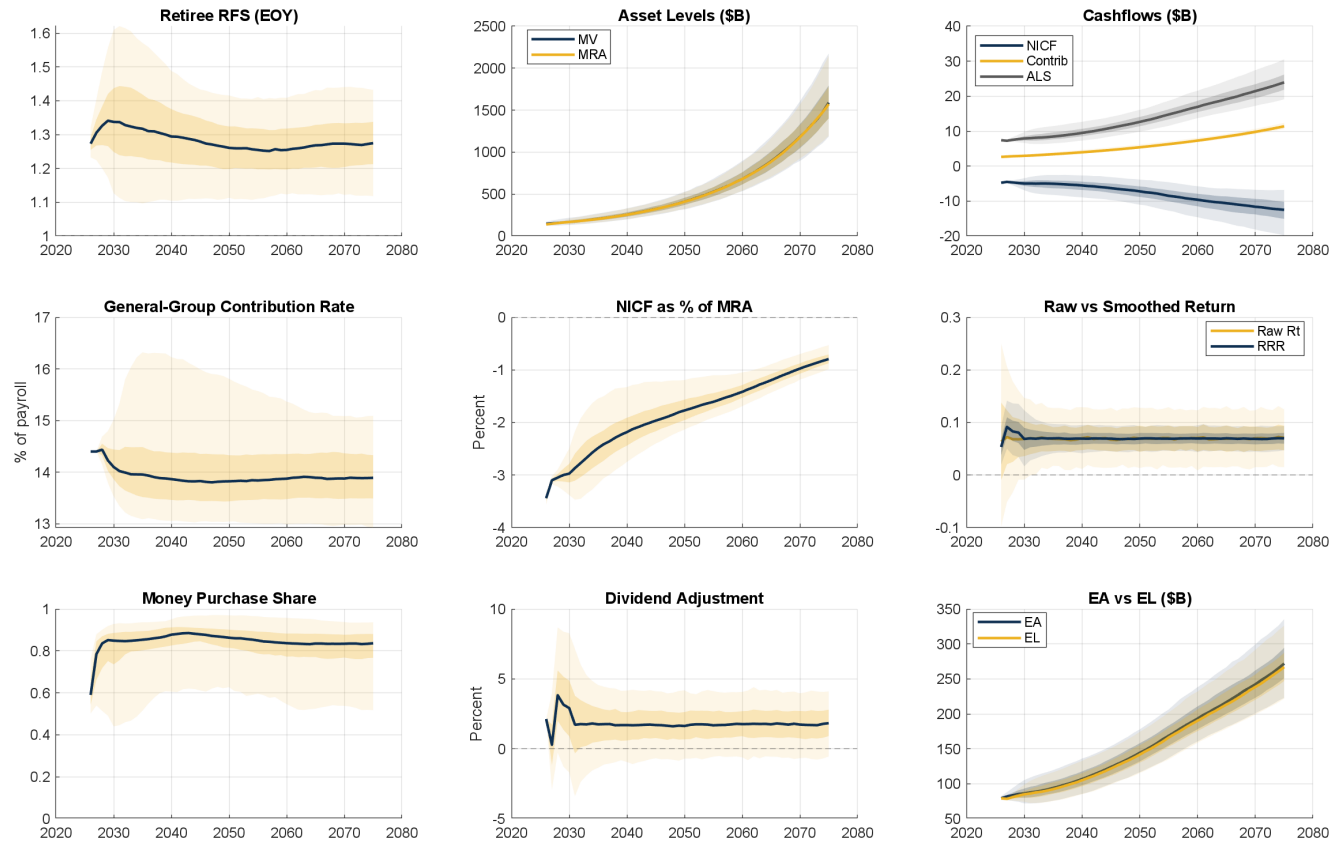
Appendix

Definitions of Terms Used in the ALM Stochastic Simulation

Variable label in charts	What it means
ALS	Annuities and lump-sum payments
BOY	Beginning of year; for RFS, BOY equals the prior Dec. 31 EOY ratio, before current-year experience
Contrib	Total participant and employer contributions
EA	Ending-year retiree assets
EL	Ending-year retiree liabilities
MRA	Market Recognition Account
MV	Market value
NICF	Net investment cash flow
Raw Rt	Annual simple return in year t; shifted lognormal and arithmetic-mean calibrated
RFS	Retiree assets divided by initial-benefit liability, measured at the labeled BOY or EOY timing
RRR	Recognized rate of return

Over Fifty Years, One Thousand Simulated Paths

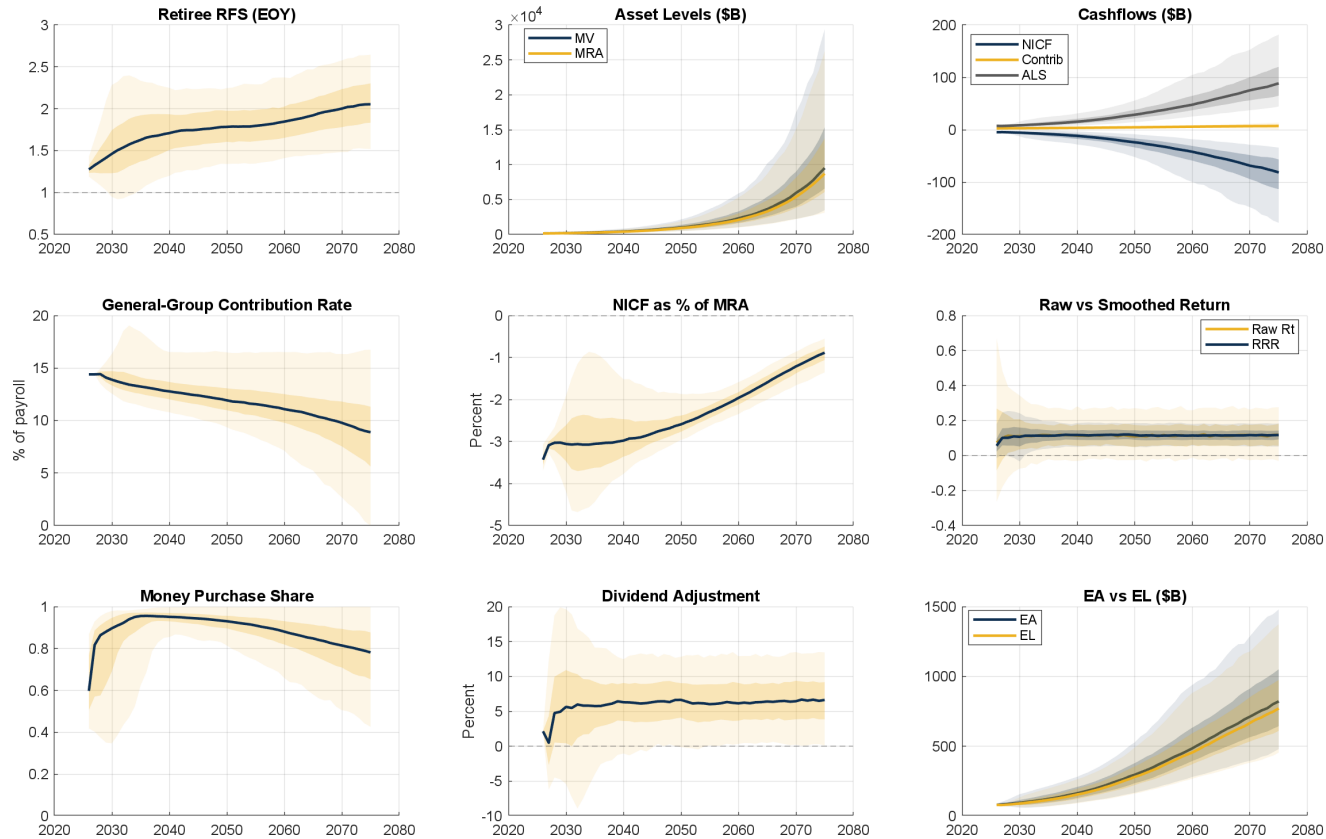
6.5% geometric return assumption | 10.7% initial volatility



Medians and 25th–75th/5th–95th bands. Starts from December 31, 2025: RFS 1.287, April 2026 dividend 2.1%, and 2026 contribution rate 14.4%; 2027 is held at 14.4% pending the next active-lives valuation. Subsequent dividends use the dynamic retiree-balance-sheet calculation.

Over Fifty Years, One Thousand Simulated Paths

8.5% geometric return assumption | 28.3% initial volatility



Medians and 25th–75th/5th–95th bands. Starts from December 31, 2025: RFS 1.287, April 2026 dividend 2.1%, and 2026 contribution rate 14.4%; 2027 is held at 14.4% pending the next active-lives valuation. Subsequent dividends use the dynamic retiree-balance-sheet calculation.