

Asset Liability Management: Governance and Reporting

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Today's Topics

Building on February's Risk Appetite Discussion

Asset Liability Management (ALM) Governance

Current and Proposed Under TPA

Investment Performance Reporting

Current and Proposed Under TPA

Current ALM Governance

Board Adopted ALM Policy

- Delegates Board Oversight to Finance and Administration and Investment Committees
- Delegates ALM program coordination to the Chief Financial Officer
- Establishes 4-Year Cycle and Mid-Cycle Review
- Adopts Strategic Asset Allocation as Preferred Investment Approach
- Creates Management Deliverables to Inform Board Decisions

PERF ALM Year Prior to July 1 Implementation Date

- Education Sessions
- September First Reading of Proposals
- November Action of Proposals

**Stakeholder
Feedback is a
Critical Input to ALM**

Affiliate Funds ALM Follows PERF

ALM Management Deliverables To Inform Board Decisions

**No Change
Under TPA**

Investment Committee

- **Capital Market Assumptions (CMAs)**
- **Analysis of Current Risk Metrics Vs Targets**





Finance and Administration Committee

- **Economic Assumptions**
- **Actuarial Experience Study**

ALM Board Decisions

Current Proposed TPA

Investment Committee

- Target or Permissible Risk Levels  • Board Risk Appetite
 - Reference Portfolio (beta/passive)
 - Level of Discretion (alpha/active)
- Permissible Investment Asset Classes and Segments  • Permissible Investment Asset Classes
- Target or Policy Asset Allocation with Ranges  • Risk Appetite Now Primary Driver
- Investment Return Goal  • Target Investment Range of Returns

Finance & Administration Committee

- Discount Rate  • Discount Rate

Investment Reporting

Changes Under TPA

Current Reporting	Expected Extent of Content Change		
	High	Medium	Low
Trust Level Review (TLR)	X		
Annual Program Review (APR)		X	
Ad Hoc Investment Strategy Reports		X	
Global Investment Performance Standards (GIPS) Asset Owner Reports			X
Annual Comprehensive Financial Report (ACFR)			X

Areas of Emphasis in Reporting

Current

Under TPA

Total Return

Total Return

**Policy
Benchmark**

**Reference
Portfolio**

Moderate

Higher

**Asset Class
Mix**

**Strategy Mix
(Level Below Asset Class)**

Key Performance Metric

Reference Point for Value Add and Active Risk

Observed Deviation from Reference Point

Emphasis When Explaining Performance/ Positioning

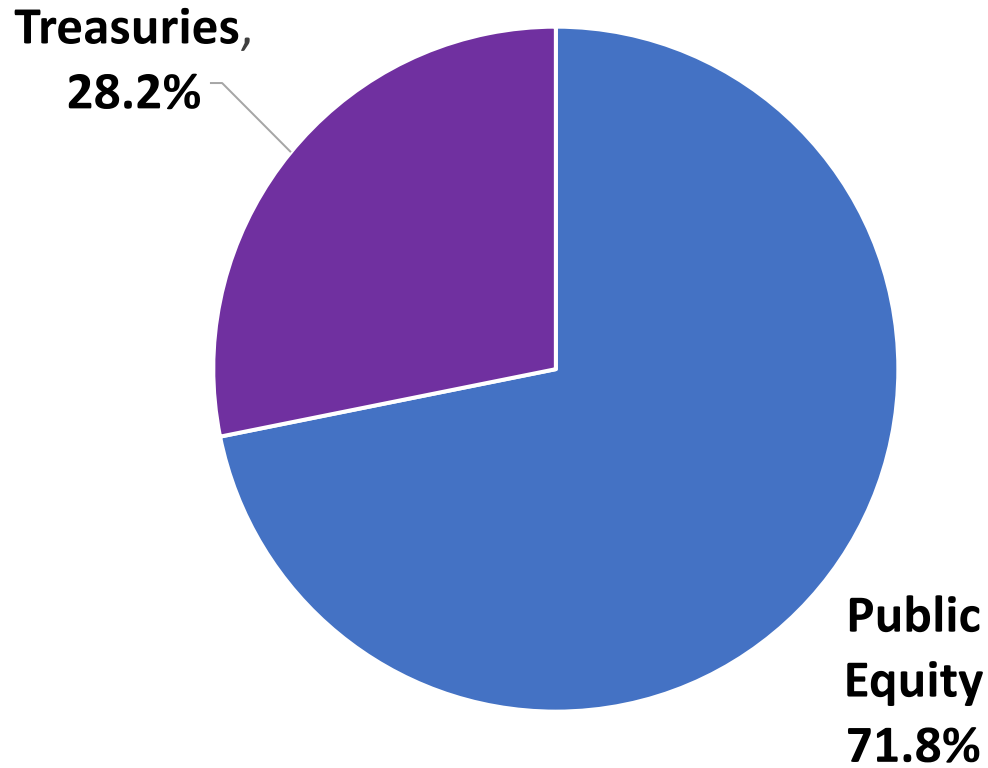
Reporting Under TPA

Key Questions of Positioning, Performance, and Risk

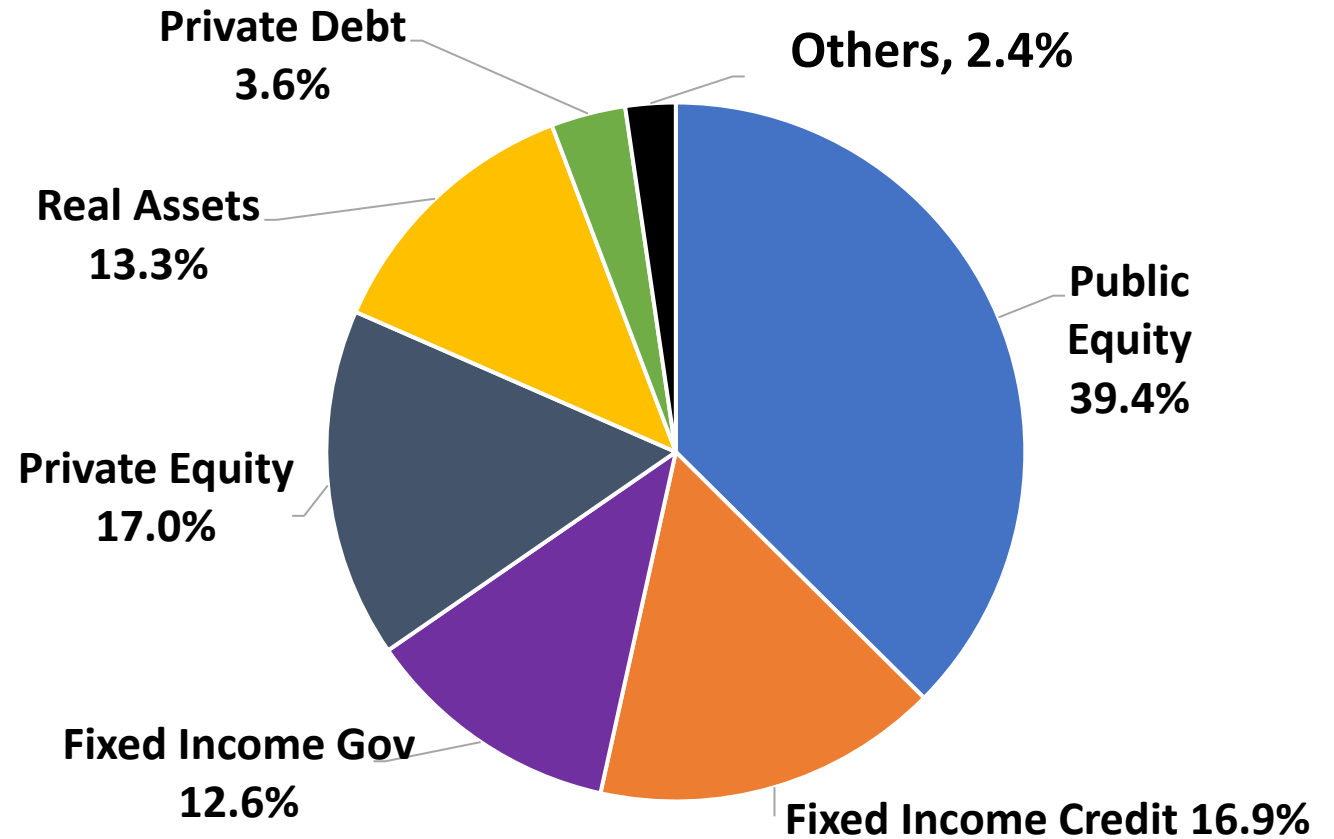
- 1 How is the portfolio positioned and why?
- 2 How did the portfolio perform and why?
- 3 What is the level of risk and is it in line with expectations?

Portfolio Position – Asset Mix

Illustrative Reference Portfolio

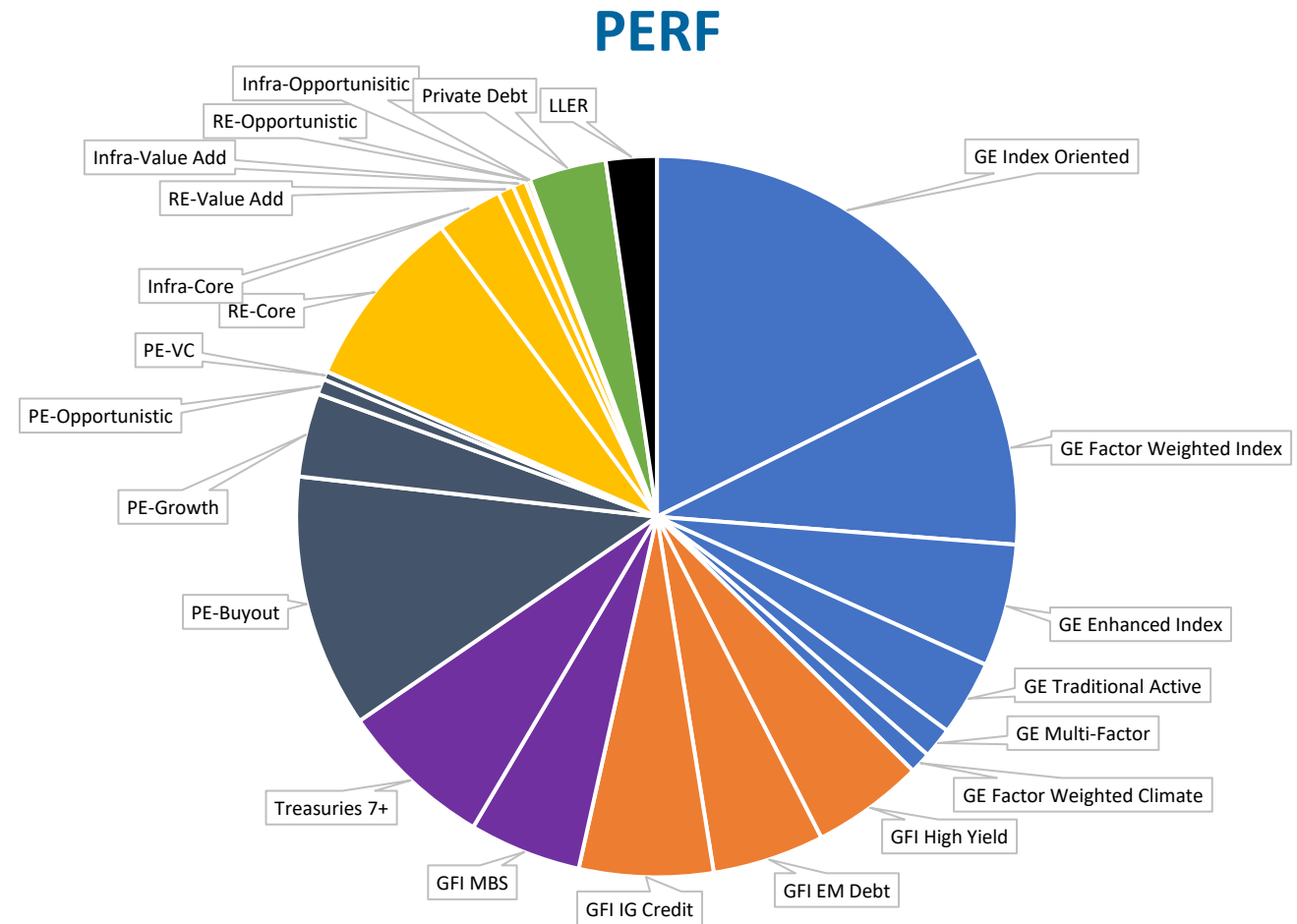
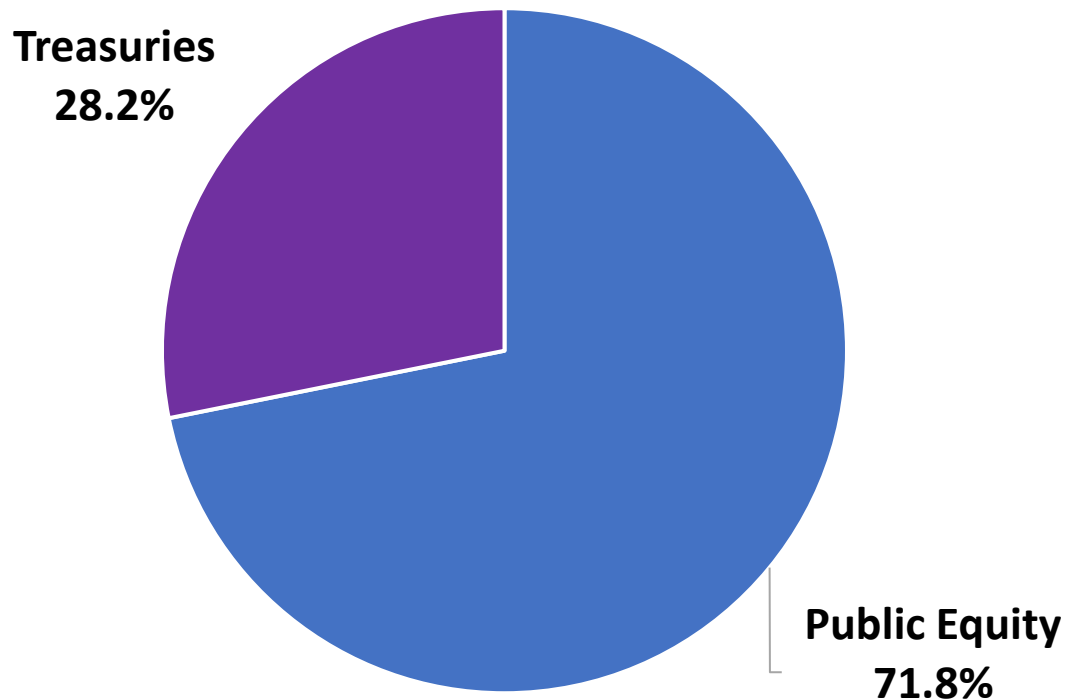


PERF



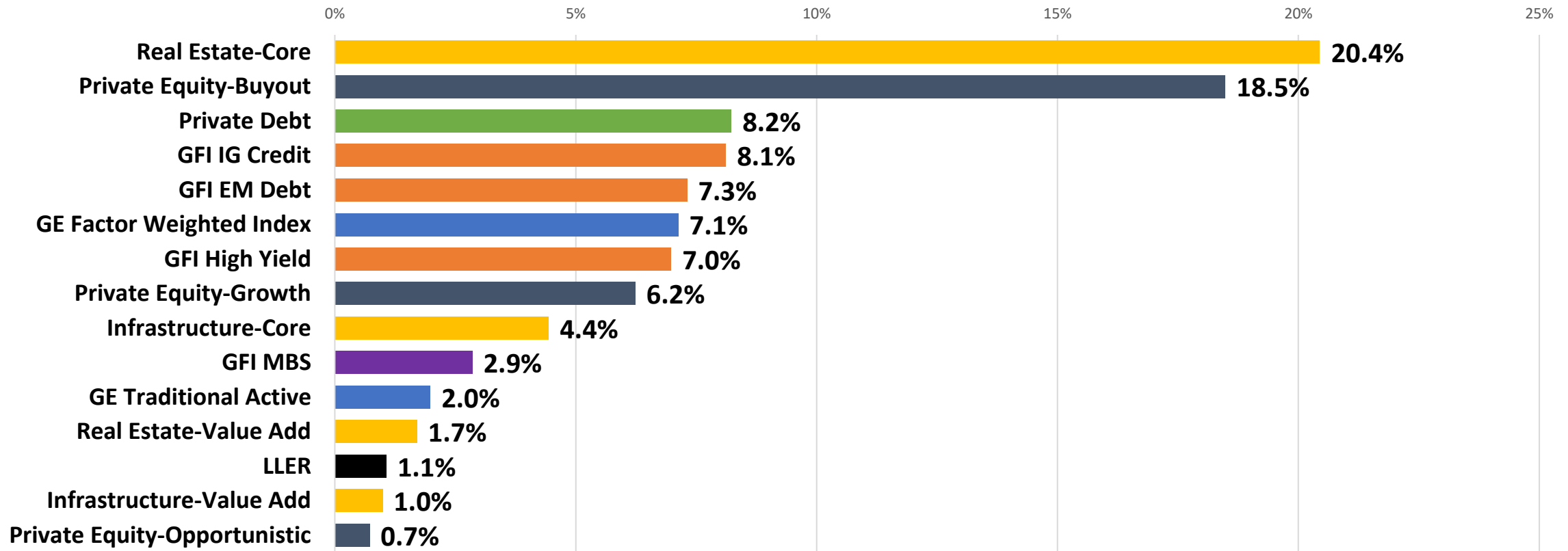
Portfolio Position – Strategies

Illustrative Reference Portfolio



Top 15 Strategies Contribution to Active Risk

% of PERF Active Risk vs. Illustrative Reference Portfolio

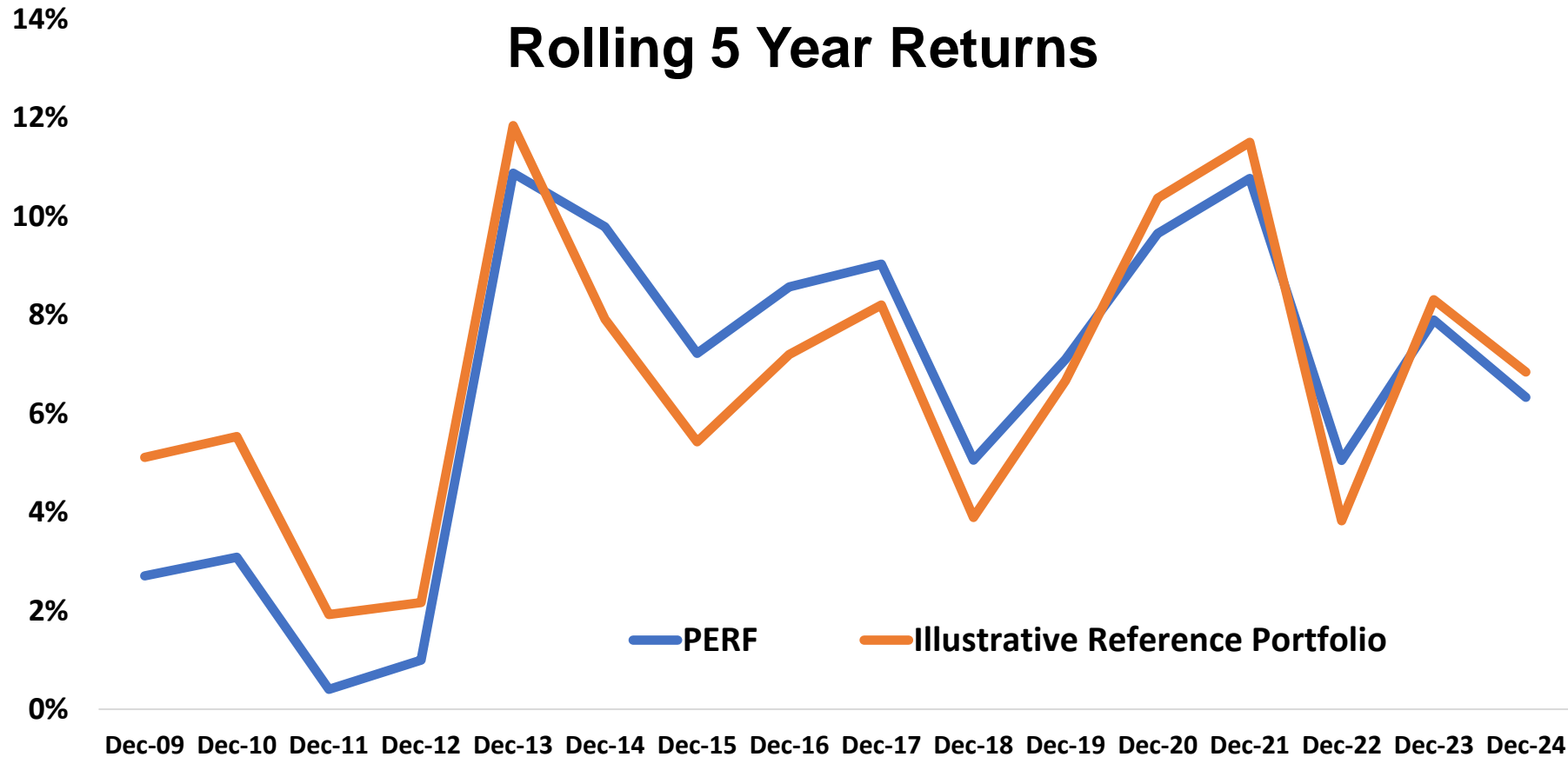


Reporting Under TPA

Key Questions of Positioning, Performance, and Risk

- 1 How is the portfolio positioned and why?
- 2 How did the portfolio perform and why?
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Total Return: PERF and Reference Portfolio

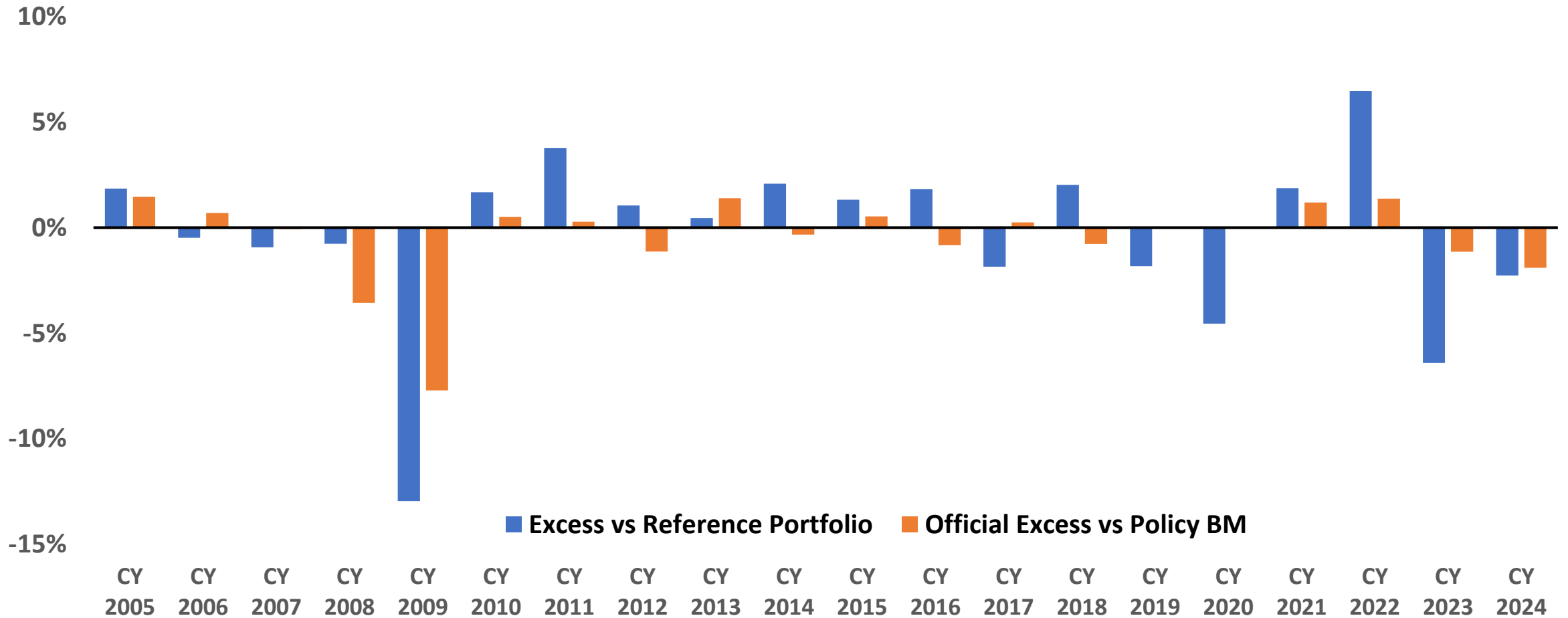


	PERF	Ref Port
20 Year	6.5%	6.6%
10 Year	6.7%	6.8%
5 Year	6.3%	6.8%
3 Year	2.2%	2.2%
1 Year	9.0%	11.3%

Excess Return

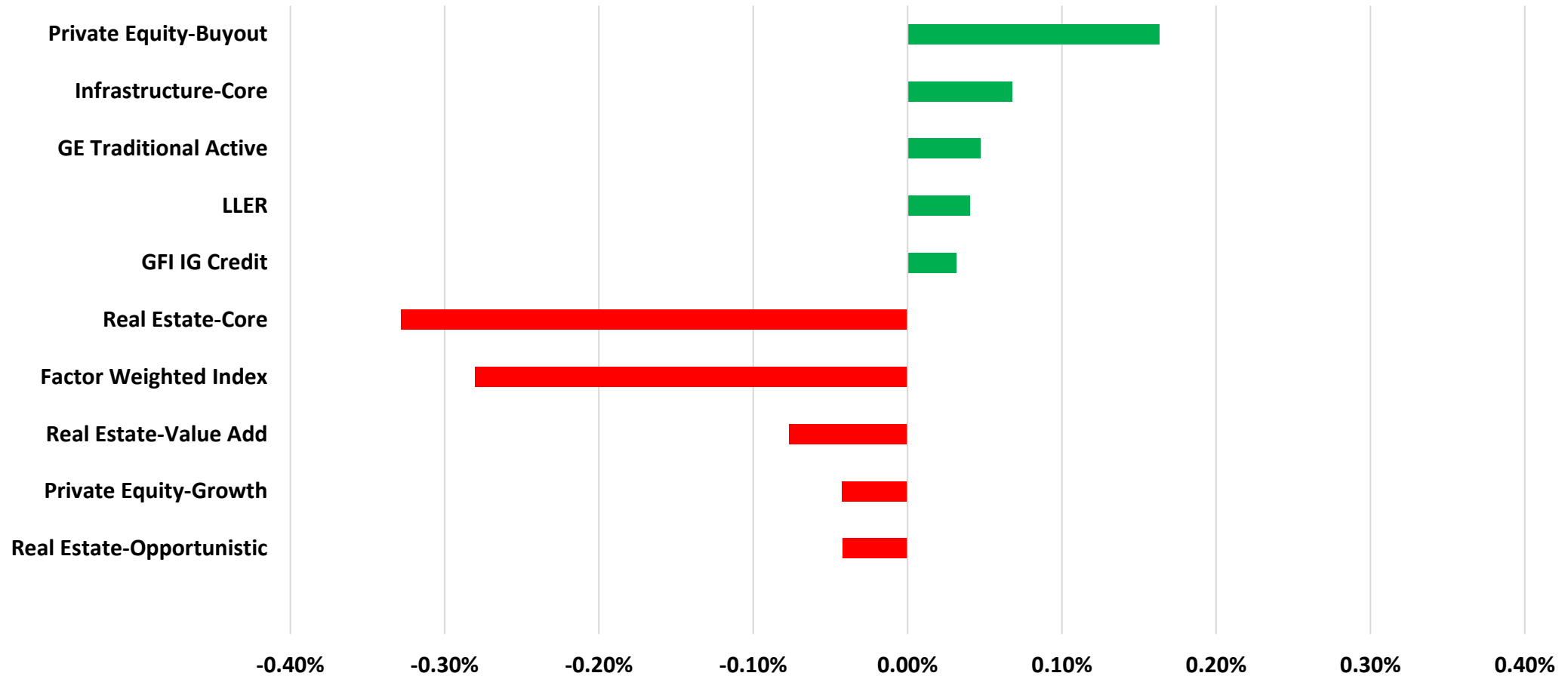
20 Year	-0.2%
10 Year	0.0%
5 Year	-0.5%
3 Year	0.0%
1 Year	-2.3%

Excess Return Variability



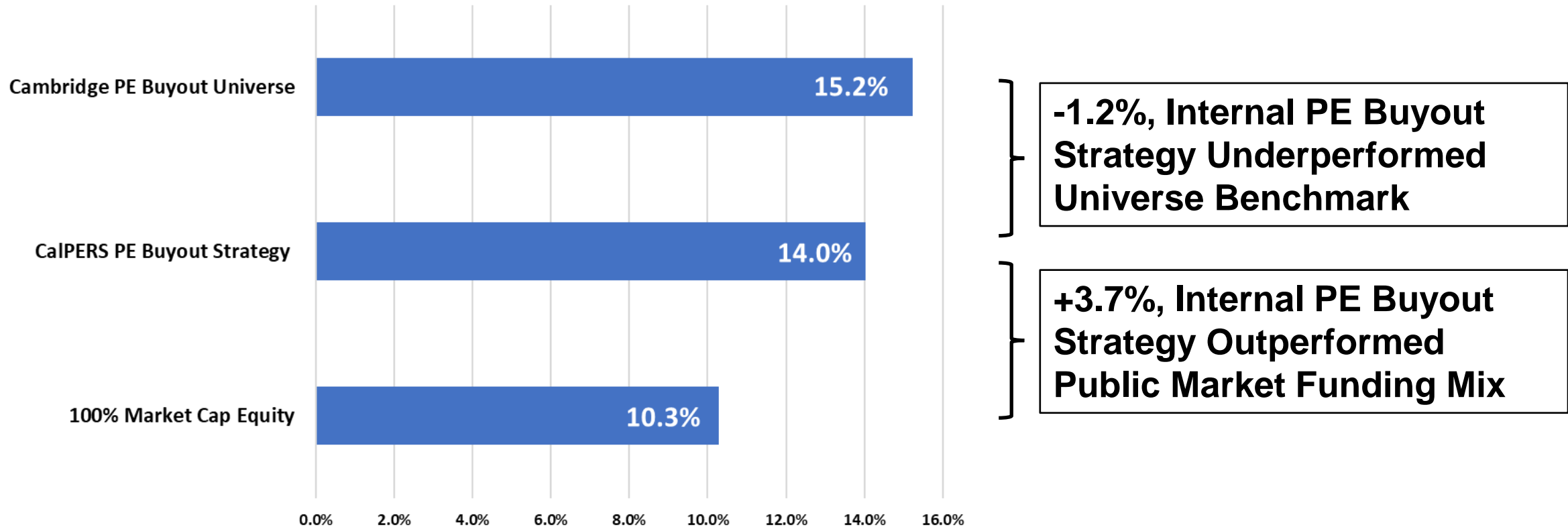
Strategy Level Contributors

5 Year Excess Returns By Strategy



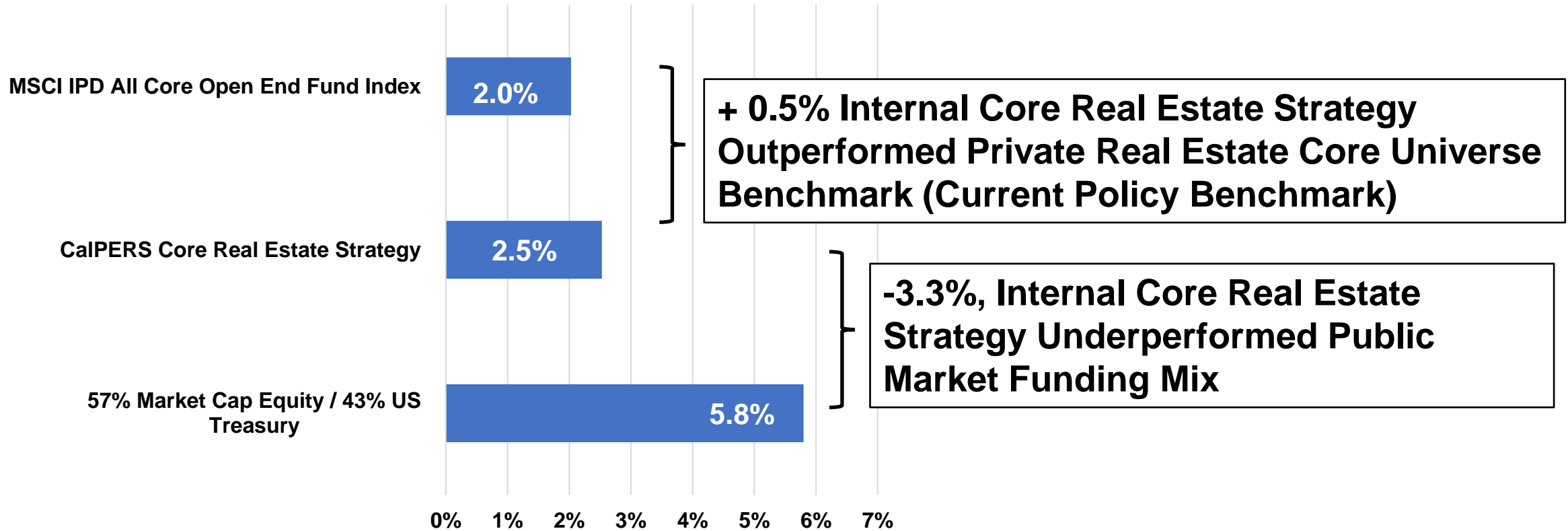
Strategy Zoom-In: Private Equity Buyout

5 YR returns as of 12/31/2024



Strategy Zoom-In: Core Real Estate

5 YR returns as of 12/31/2024



Detailed Performance by Asset Class

Today

	End Value (B)	5-Yr	1-Yr
Total PERF	\$ 523.4	6.3%	9.0%
<i>Benchmark</i>		6.4%	10.9%
<i>Excess</i>		(3) bps	(190) bps
<i>Cumulative Value Added (B)</i>	\$ (1.8)		\$ (8.8)
Public Equity	\$ 206.0	9.3%	16.0%
<i>Benchmark</i>		9.1%	15.7%
<i>Excess</i>		21 bps	30 bps
<i>Cumulative Value Added (B)</i>	\$ 2.0		\$ 0.6
Income	\$ 154.0	(0.4)%	1.2%
<i>Benchmark</i>		(0.5)%	1.0%
<i>Excess</i>		17 bps	26 bps
<i>Cumulative Value Added (B)</i>	\$ 1.1		\$ 0.4
Net Financing	\$ (27.6)	-	-
Other Trust Level	\$ 13.0	-	-

Hypothetical TPA

	End Value (B)	5-Yr	1-Yr
Total PERF	\$ 523.4	6.3%	9.0%
<i>Reference Portfolio</i>		6.8%	11.3%
<i>Excess</i>		(52) bps	(226) bps
<i>Cumulative Value Added (B)</i>	\$ (14.1)		\$ (10.7)
Public Equity	\$ 206.0	9.3%	16.0%
<i>Funding Mix</i>		9.8%	16.0%
<i>Excess</i>		(47) bps	0 bps
<i>Cumulative Value Added (B)</i>	\$ (0.6)		\$ 0.3
Income	\$ 154.0	(0.4)%	1.2%
<i>Funding Mix</i>		(0.2)%	1.2%
<i>Excess</i>		(16) bps	5 bps
<i>Cumulative Value Added (B)</i>	\$ 1.3		\$ 0.1
Net Financing	\$ (27.6)	-	-
Other Trust Level	\$ 13.0	-	-

Detailed Performance by Asset Class

Today

Hypothetical TPA

	End Value (B)	5-Yr	1-Yr
Total PERF	\$ 523.4	6.3%	9.0%
<i>Benchmark</i>		6.4%	10.9%
<i>Excess</i>		(3) bps	(190) bps
<i>Cumulative Value Added (B)</i>	\$ (1.8)		\$ (8.8)
Private Equity	\$ 89.0	13.3%	11.9%
<i>Benchmark</i>		14.1%	33.7%
<i>Excess</i>		(86) bps	(2,177) bps
<i>Cumulative Value Added (B)</i>	\$ (10.4)		\$ (14.4)
Real Assets	\$ 69.9	3.3%	(1.7)%
<i>Benchmark</i>		2.0%	(7.9)%
<i>Excess</i>		125 bps	621 bps
<i>Cumulative Value Added (B)</i>	\$ 3.0		\$ 4.3
Private Debt	\$ 19.0	-	14.5%
<i>Benchmark</i>		-	10.8%
<i>Excess</i>		-	364 bps
<i>Cumulative Value Added (B)</i>		-	\$ 0.4

	End Value (B)	5-Yr	1-Yr
Total PERF	\$ 523.4	6.3%	9.0%
<i>Reference Portfolio</i>		6.8%	11.3%
<i>Excess</i>		(52) bps	(226) bps
<i>Cumulative Value Added (B)</i>	\$ (14.1)		\$ (10.7)
Private Equity	\$ 89.0	13.3%	11.9%
<i>Funding Mix</i>		10.7%	18.0%
<i>Excess</i>		257 bps	(606) bps
<i>Cumulative Value Added (B)</i>	\$ 0.2		\$ (3.8)
Real Assets	\$ 69.9	3.3%	(1.7)%
<i>Funding Mix</i>		6.2%	10.4%
<i>Excess</i>		(290) bps	(1,208) bps
<i>Cumulative Value Added (B)</i>	\$ (11.2)		\$ (7.9)
Private Debt	\$ 19.0	-	14.5%
<i>Funding Mix</i>		-	12.3%
<i>Excess</i>		-	216 bps
<i>Cumulative Value Added (B)</i>		-	\$ 0.4

Reporting Under TPA

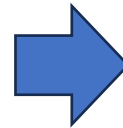
Key Questions of Positioning, Performance, and Risk

- 1 How is the portfolio positioned, and why?
- 2 How did the portfolio perform, and why?
- 3 What is the level of risk and is it in line with expectations?

Measuring the Level of Risk

CalPERS Investment Belief 9

Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error.



However, transparency and monitoring require CalPERS to select some core quantitative metrics as a common language. This is a technical decision involving the Board's consultants

Potential Focus For a Core Quantitative Metric:

- Total Risk
- Active Risk
- Equity Market Sensitivity

Additional Metrics to Report Regardless:

- Liquidity Metrics
- Sustainability Metrics
- Operational Metrics

Appendix

Reference Portfolios | Projected Returns Across Allocations

- As the equity allocation increases, the projected returns gradually rise, highlighting the expected higher return potential of equity-heavy portfolios.
- The portfolio optimization adds about 40 basis points above the reference portfolio's expected return based on current capital market assumptions (CMAs).

Equity/Bond Allocation: Portfolio Mixes

Allocation	50/50	60/40	70/30	80/20	90/10
Projected <u>Passive</u> Reference Portfolio Returns	6.13%	6.29%	6.40%	6.48%	6.51%
<u>Value-Add</u> from Risk-Equivalent Asset Selection	0.41%	0.41%	0.42%	0.42%	0.41%
Total Returns	6.54%	6.70%	6.82%	6.90%	6.92%
Return Range	5.2% - 7.6%	5.1% - 7.7%	5.1% - 7.9%	4.9% - 8.1%	4.8% - 8.4%
Portfolio Volatility	9.3%	10.3%	11.7%	13.3%	14.9%
Expected Tail Risk (95%)	-15.5%	-19.4%	-23.9%	-28.8%	-33.9%

See Appendix for full footnote details. CMAs as of 2024 Q2. The Value-Add metric is the difference in return between the Reference Portfolios and the risk-equivalent SAA portfolio, calculated using the internal SAA process with equal risk levels to the corresponding Reference Portfolios. Tail Risk 95% represents Conditional Value at Risk (95%), or the average loss in the worst 5% of simulated portfolio outcomes in rolling 3-years.

Appendix: Methodology Behind Equity Bond Allocation: Portfolio Mix Table

Data Sources and Inputs

- Analysis is based on the internal CMA Survey data as of (Q2, 2024), incorporating MSCI ACWI Global Equity index and US Treasuries (7+ year maturity) – Bloomberg US Treasury Total Return Unhedged USD with maturity 7+ years index*.

Value Add Calculation

- The Value-Add metric is the difference in return between the Reference Portfolios and the risk-equivalent SAA portfolio, calculated using the internal SAA process with equal risk levels to the corresponding Reference Portfolios.
- Reference Portfolios exclude alternative asset classes and alpha strategies (e.g., Private Equity and Private Real Estate). The Reference Portfolios represent various levels of Risk Appetite rather than actual or targeted portfolio positions. The objective of an actual portfolio is to outperform the Reference Portfolio by utilizing various investment vehicles and expertise, including additional asset classes and alpha-generating strategies.

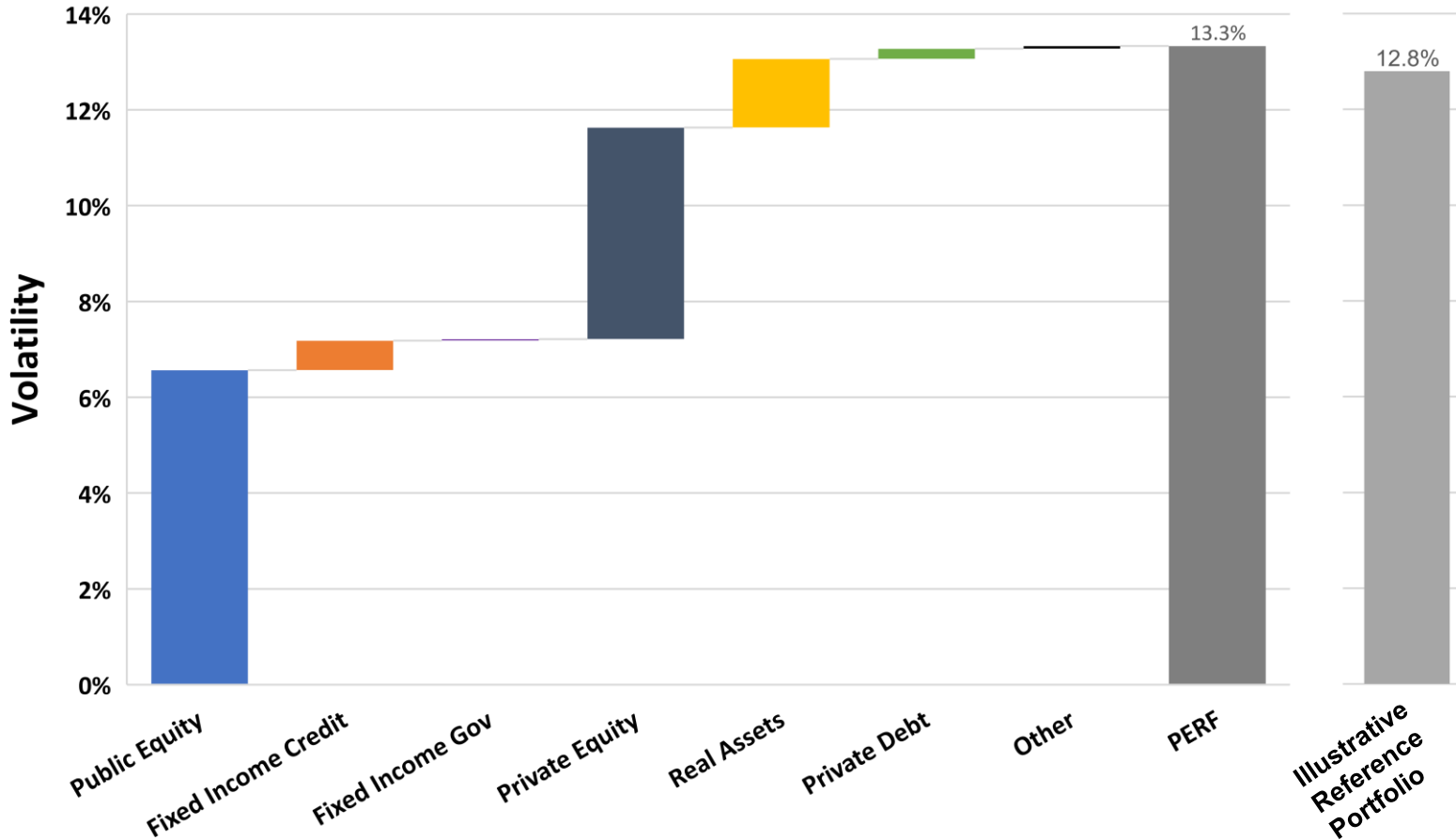
Tail Risk, or Conditional Value at Risk (CVaR 95%) Calculation

- Definition: CVaR 95% represents the average loss in the worst 5% of simulated portfolio outcomes in rolling 3-years.
- Methodology: The Conditional Value at Risk (CVaR 95%) is calculated by first determining the Value at Risk (VaR) at the 95% confidence level, which marks the threshold where only 5% of outcomes are worse. Losses beyond this threshold are then averaged to derive CVaR, using estimates generated through the current SAA asset simulation framework.

Potential Quantitative Risk Metrics

Potential Risk Perspective #1: Total Risk Build Up

Contribution to Volatility



Pros:

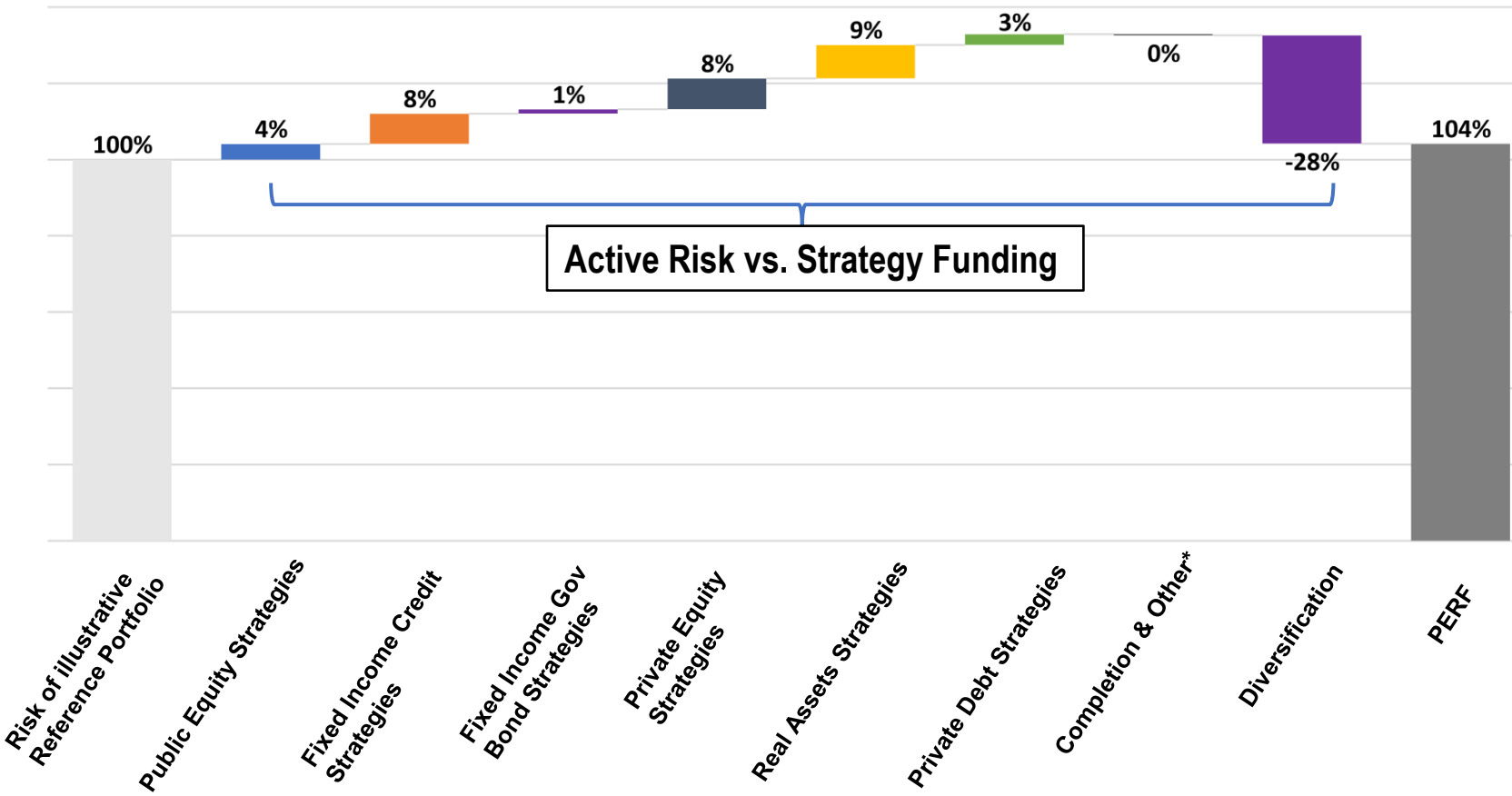
- Relatable to familiar concept of asset classes

Cons:

- Does not explain differences to Reference Portfolio
- Very dependent on modeling assumptions
- Meaning of “volatility” is difficult to intuit

Risk Perspective #2: Reference Portfolio Build Up

Forecast Risk Added to PERF as % of Reference Portfolio



Pros:

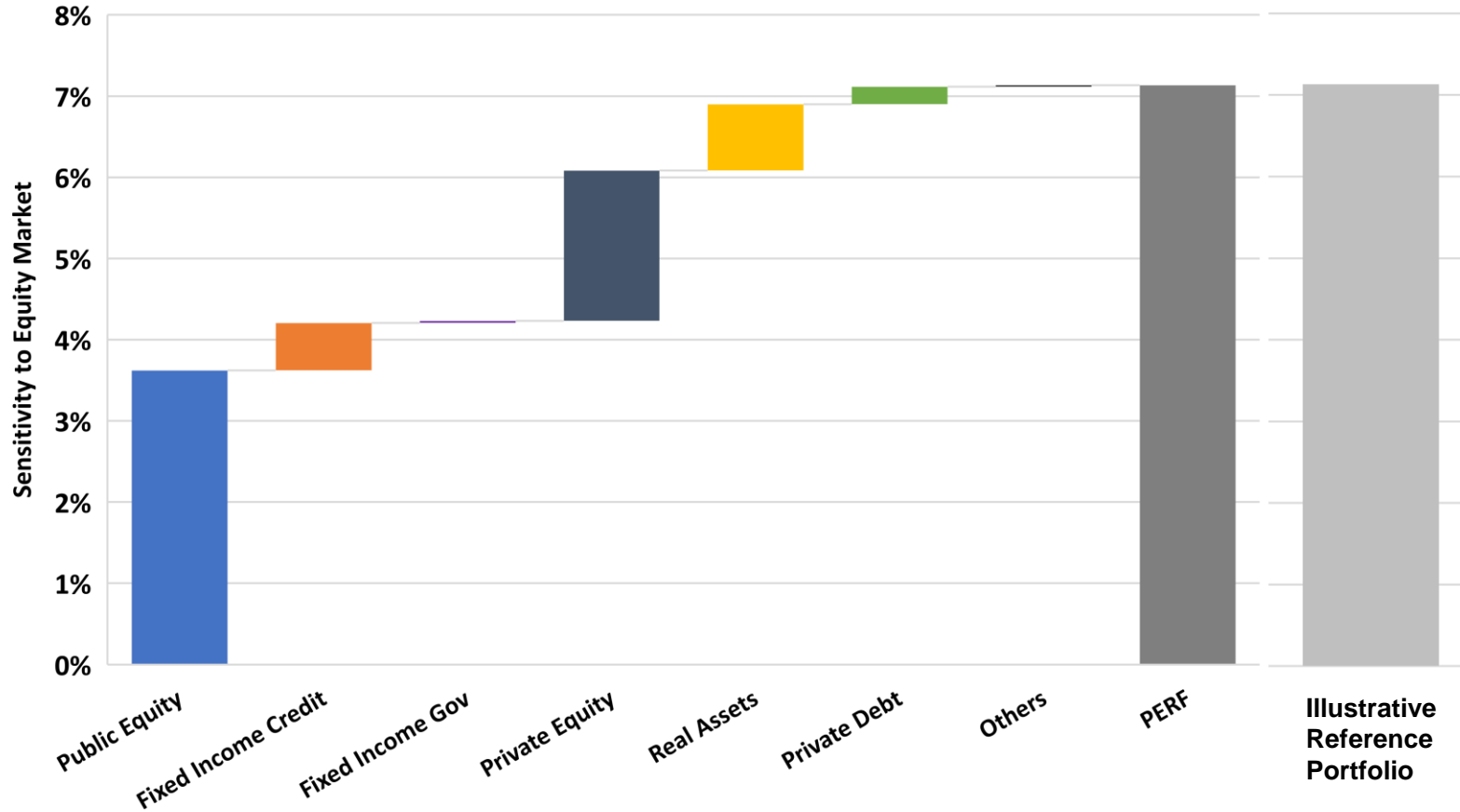
- Captures both total risk and active deviation

Cons:

- Breaking up risk between Reference Portfolio and active strategies can be unintuitive
- Very dependent on modeling assumptions

Risk Perspective #3: Equity Sensitivity

Forecast Change in Value for a 10% Equity Move



Pros:

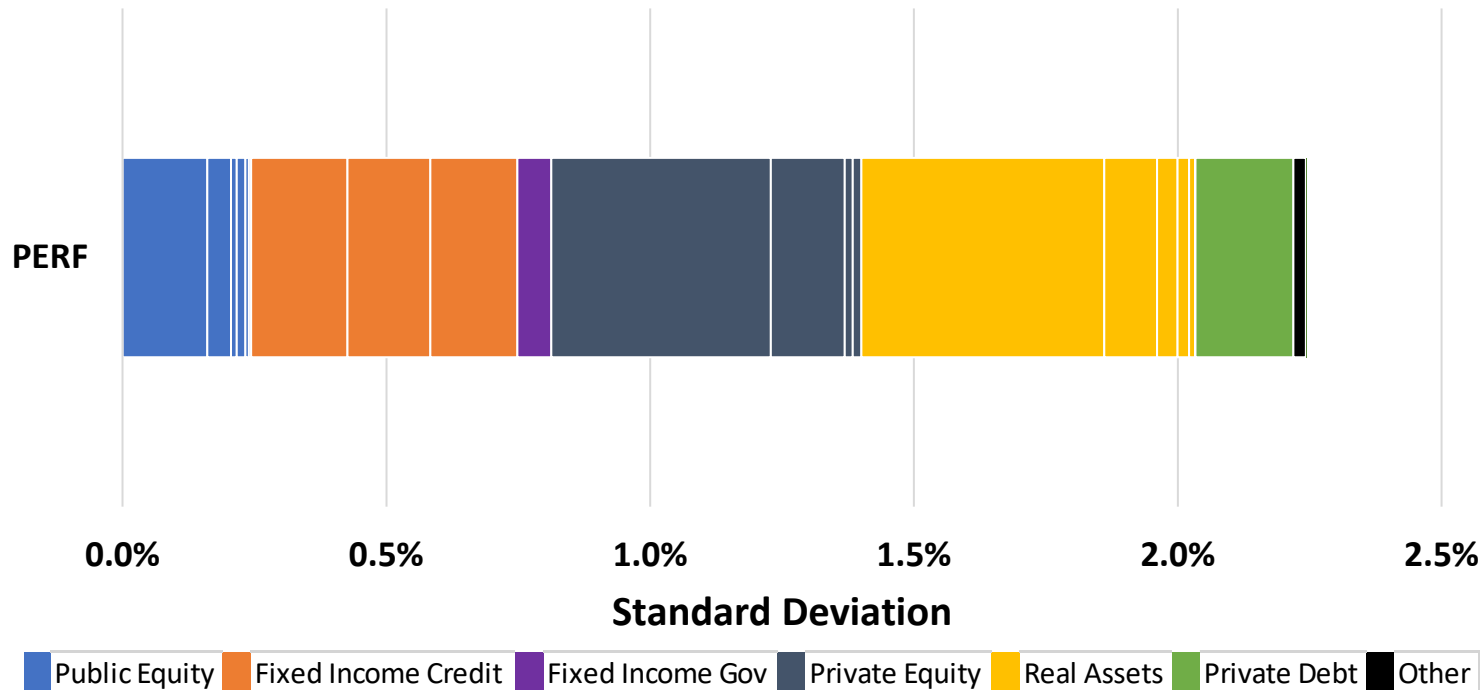
- Equity risk is dominant risk
- Less dependent on modeling assumptions

Cons:

- Equity-focused metric, does not capture other differences from reference portfolio

Risk Perspective #4: Active Risk

Active Risk Vs. Illustrative Reference Portfolio



Pros:

- Considers only the decisions management controls
- Traditional metric for monitoring investment teams

Cons:

- Not a total risk metric – leaves out majority of PERF risk
- Difficult to interpret
- Extremely dependent on modeling assumptions

Additional Risk Perspective: Liquidity

Liquidity risk will be monitored and reported regardless of other metrics

Sample Short Term Health Metrics

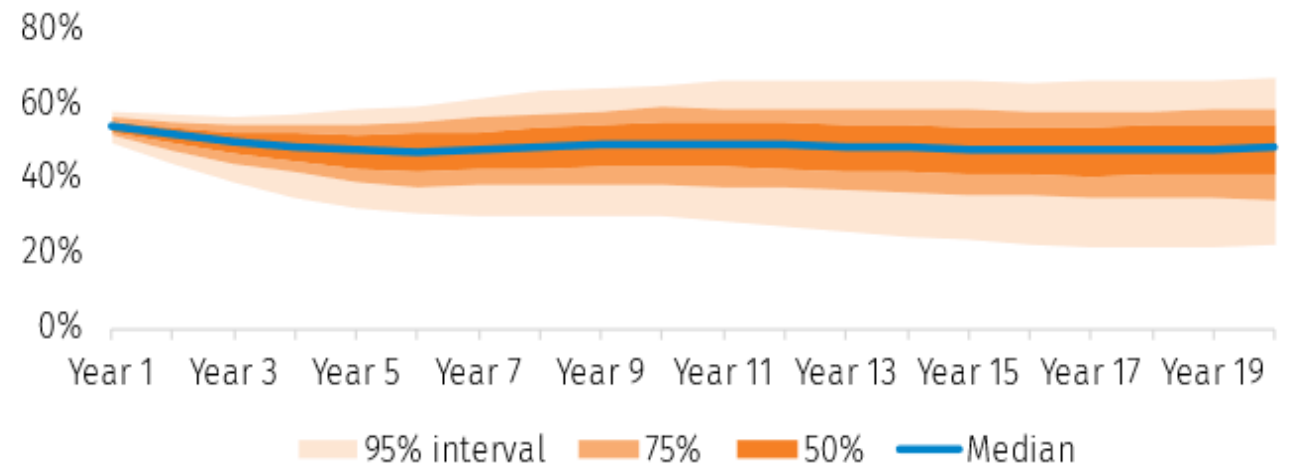
Cash Balance \$13.6b

30 Day Tier-1 Coverage Ratio:
2.0x

Market Stress Regime:
Low Stress

Sample Long Run Projection

Liquid Assets in Excess of Annual Gross Pension Payments and Capital Calls



CalPERS Trust Level Review

Stephen Gilmore, Chief Investment Officer

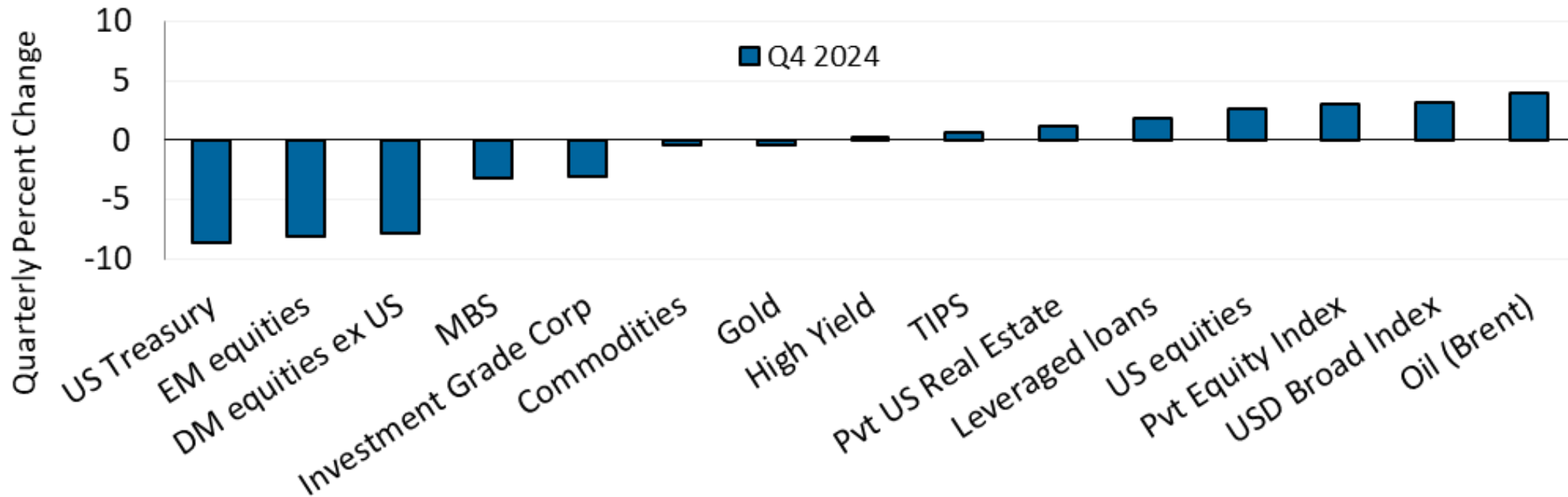
March 17, 2025

Trust Level Review, As of December 31, 2024 – PERF Metrics

<p>\$523.4bn Assets Under Management</p>	<p>6.7 10-Yr Total Return</p>	<p>4.1 Fiscal Year-to-Date Total Return</p>	<p>\$(1.8)bn 5-Yr Cumulative Value Added</p>	<p>\$(2.3)bn Fiscal Year to-Date Value Added</p>
<p>13.7% Forecasted Volatility</p>	<p>15bps Forecasted Actionable Tracking Error</p>	<p>31.6% Allocation to Private Assets</p>	<p>2.4x 30-Day Tier 1 Stress Liquidity Coverage Ratio</p>	<p>63.0% Allocation to Actively Managed Assets</p>

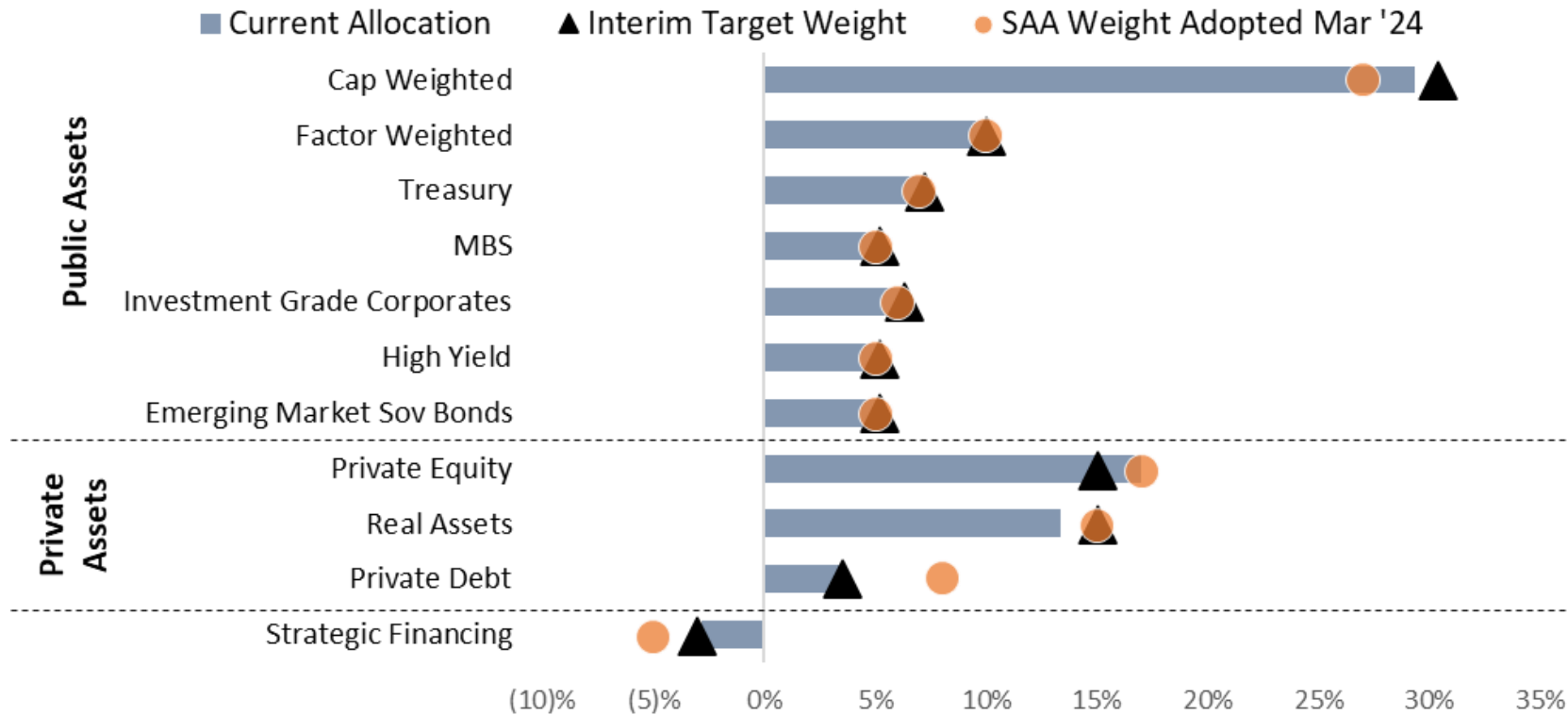
Trust Level Review, As of December 31, 2024 – Exhibit 3.1

Market-based asset returns over Q4 2024



Trust Level Review, As of December 31, 2024 – Exhibit 4.1

Interim Targets and Policy Bands



Trust Level Review, As of December 31, 2024 – Exhibit 5.1

Volatility – Current Levels

	Policy Limit	Current 12/31/2024	Last Qtr 9/30/2024	Last Year 12/29/2023
Total Fund Volatility (%)	-	13.7	13.5	13.6
Policy Benchmark Volatility (%)	-	12.0	12.2	12.3
Tracking Error (%)				
Actionable	< 1.00	0.15	0.13	0.15
Total Fund	-	2.21	1.91	1.83
Allocation	-	0.02	0.02	0.02