Trust Level Report

March 2023

CalPERS

Executive Summary

PERF Key Metrics (as of 12/31/22)

7.0% 10-Yr Total Return	**5.0%** 5-Yr Total Return	**(11.2)%** 1-Yr Total Return	**13.7%** Forecasted Volatility	**10 bps** Forecasted Actionable Tracking Error
29 bps 10-Yr Excess Return	**37 bps** 5-Yr Excess Return	**137 bps** 1-Yr Excess Return	**6.7%** Total Fund Leverage	**1.6x** 30-Day Stress Liquidity Coverage Ratio

Report Highlights

Capital Markets

- In 2022, all public market segments generated negative returns
- The public equity allocation returned (15.8)%
- The Factor Weighted segment posted a return of (11.0)% vs (17.9)% for the Cap Weighted segment, which partially muted the public equity drawdown
- The CalPERS team notes continued uncertainty about future growth/inflation and its impact on asset returns

Private Markets

- In 2022, private markets offered mixed results with Private Equity returning (2.3)% and Real Assets returning 14.3%
- Private markets did not experience the magnitude of drawdowns observed in public markets
- Unfunded commitments to private markets continue to grow, reflecting CalPERS' belief private asset classes will provide incremental return and diversification benefits relative to public markets

Total Fund Risk

- Total volatility increased slightly from the prior year, in line with the transition to the new Strategic Asset Allocation (SAA)
- The actionable tracking error (allocation and public market strategies) remains small at 10 bps compared with the 100 bps limit
- The plan maintains adequate liquidity with 1.6x coverage in 30-day stress scenario
- PERF leverage is 6.7%, of which 1.4% is strategic leverage (being phased in to a 5% target)

Investment Process

- The PERF began to transition to the new long-term SAA, approved by the Investment Committee in November 2021
- The new SAA features increased allocation to existing private assets, introduced Private Debt and Emerging Markets Sovereign Bonds segments, and introduced strategic leverage
- During the last six months, PERF traded $80B in public market gross notional exposure to implement SAA changes

All performance reported net of investment expenses and annualized for periods greater than 1-Yr.

Content

Section I. Performance Summary

PERF Returns *(as of 12/31/2022)*

PERF returned (11.2)% in 2022; over longer periods the PERF exceeded its return target

- PERF calendar year 2022 performance was (11.2)%
- All asset classes posted negative returns for 2022 except Real Assets, which returned 14.3%
- Returns for the 10-Yr and 20-Yr periods were at or above a 7.0% return
- Over the past 10 years, the PERF has generated 29 bps/Yr of excess performance, or +$12.1B in value add to returns

	End Value (bn)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Total PERF	**$ 442.2**	**7.2%**	**7.0%**	**5.0%**	**(11.2)%**	**0.1%**	**5.5%**
Benchmark		7.5%	6.7%	4.7%	(12.6)%	(1.5)%	4.7%
Excess		(27) bps	29 bps	37 bps	137 bps	157 bps	79 bps
Cumulative Value Added (bn)		$ (4.6)	$ 12.1	$ 9.7	$ 6.4	$ 6.6	$ 3.3
Public Equity	**$ 210.1**	**8.2%**	**8.5%**	**5.3%**	**(15.8)%**	**2.3%**	**9.9%**
Benchmark		8.4%	8.4%	5.2%	(16.0)%	2.2%	9.8%
Excess		(13) bps	13 bps	4 bps	18 bps	8 bps	12 bps
Cumulative Value Added (bn)		$ (0.4)	$ 2.0	$ 0.7	$ 0.4	$ 0.2	$ 0.2
Private Equity	**$ 50.3**	**11.9%**	**12.4%**	**12.1%**	**(2.3)%**	**(6.0)%**	**0.1%**
Benchmark		11.5%	10.8%	6.5%	(19.6)%	(20.6)%	(6.3)%
Excess		41 bps	154 bps	565 bps	1,728 bps	1,462 bps	635 bps
Cumulative Value Added (bn)		$ 2.7	$ 7.5	$ 11.6	$ 9.0	$ 7.6	$ 3.2
Income	**$ 105.0**	**4.7%**	**1.6%**	**(0.1)%**	**(18.5)%**	**(3.5)%**	**2.6%**
Benchmark		3.9%	1.0%	(0.4)%	(18.4)%	(3.4)%	2.7%
Excess		77 bps	52 bps	25 bps	(10) bps	(7) bps	(13) bps
Cumulative Value Added (bn)		$ 6.7	$ 3.3	$ 1.4	$ (0.1)	$ (0.1)	$ (0.1)
Real Assets	**$ 73.7**	**6.3%**	**9.2%**	**7.9%**	**14.3%**	**2.7%**	**(0.0)%**
Benchmark		9.1%	9.5%	9.1%	20.9%	4.7%	0.2%
Excess		(280) bps	(33) bps	(120) bps	(651) bps	(194) bps	(27) bps
Cumulative Value Added (bn)		$ (15.0)	$ (3.0)	$ (3.8)	$ (3.9)	$ (1.4)	$ (0.2)
Private Debt	**$ 8.9**	**-**	**-**	**-**	**-**	**1.8%**	**1.8%**
Benchmark		-	-	-	-	(3.5)%	1.6%
Excess		-	-	-	-	527 bps	21 bps
Cumulative Value Added (bn)		-	-	-	-	$ 0.4	$ 0.0
Leverage	**$ (22.4)**						
Other Trust Level	**$ 16.6**						

Exhibit 1.1
All performance reported net of investment expenses and annualized for periods greater than 1-Yr unless noted as cumulative.

Section I. Performance Summary

Affiliate Investment Program Returns *(as of 12/31/2022)*

Affiliate returns were in line with respective asset allocations

- Affiliate funds are passively managed strategies, except for Long-Term Care Fund, with realized returns and volatility in line with the assigned asset allocation and benchmarks
- Positive excess returns are largely due to structural tax advantages of public equity and real estate investment trusts (REITs) funds vs their respective benchmarks

Defined Benefit, Health, and OPEB Plans	End Value (mm)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Judges' Retirement Fund	**$ 47.6**	**1.4%**	**0.9%**	**1.4%**	**1.8%**	**1.6%**	**1.0%**
Benchmark		1.3%	0.8%	1.3%	1.5%	1.3%	0.8%
Excess		12 bps	10 bps	11 bps	35 bps	26 bps	13 bps
Judges' Retirement System Fund II	**$ 2,134.0**	**6.7%**	**5.8%**	**3.6%**	**(17.2)%**	**(0.5)%**	**7.1%**
Benchmark		6.5%	5.5%	3.4%	(17.3)%	(0.6)%	7.0%
Excess		17 bps	25 bps	25 bps	17 bps	7 bps	2 bps
Legislators' Retirement System Fund	**$ 95.6**	**5.6%**	**3.6%**	**2.2%**	**(16.6)%**	**(3.3)%**	**4.0%**
Benchmark		5.4%	3.4%	2.1%	(16.5)%	(3.2)%	4.2%
Excess		21 bps	23 bps	11 bps	(7) bps	(12) bps	(14) bps
Health Care Fund	**$ 200.5**	**3.0%**	**1.2%**	**(0.0)%**	**(13.2)%**	**(3.2)%**	**1.7%**
Benchmark		2.9%	1.1%	0.0%	(13.0)%	(3.0)%	1.9%
Excess		9 bps	16 bps	(3) bps	(18) bps	(21) bps	(21) bps
Long-Term Care Fund	**$ 4,675.1**	**5.2%**	**2.7%**	**1.7%**	**(16.3)%**	**(4.1)%**	**3.7%**
Benchmark		5.0%	2.5%	1.6%	(16.2)%	(4.0)%	3.9%
Excess		20 bps	13 bps	3 bps	(3) bps	(12) bps	(14) bps
CERBT Strategy 1 Fund	**$ 13,213.5**	**-**	**5.9%**	**3.7%**	**(17.8)%**	**(0.9)%**	**6.8%**
Benchmark		-	5.6%	3.5%	(17.9)%	(0.9)%	6.9%
Excess		-	31 bps	20 bps	8 bps	(5) bps	(3) bps
CERBT Strategy 2 Fund	**$ 1,682.6**	**-**	**4.6%**	**2.8%**	**(17.6)%**	**(2.3)%**	**5.5%**
Benchmark		-	4.4%	2.7%	(17.6)%	(2.2)%	5.6%
Excess		-	27 bps	14 bps	(2) bps	(10) bps	(10) bps
CERBT Strategy 3 Fund	**$ 743.1**	**-**	**3.5%**	**2.2%**	**(16.4)%**	**(3.1)%**	**4.4%**
Benchmark		-	3.3%	2.1%	(16.3)%	(3.0)%	4.6%
Excess		-	26 bps	9 bps	(7) bps	(11) bps	(14) bps
CEPPT Strategy 1 Fund	**$ 71.4**	**-**	**-**	**-**	**(15.8)%**	**(0.9)%**	**5.5%**
Benchmark		-	-	-	(15.9)%	(0.9)%	5.5%
Excess		-	-	-	8 bps	(6) bps	(4) bps
CEPPT Strategy 2 Fund	**$ 33.2**	**-**	**-**	**-**	**(14.2)%**	**(2.0)%**	**3.8%**
Benchmark		-	-	-	(14.1)%	(1.8)%	4.0%
Excess		-	-	-	(10) bps	(17) bps	(21) bps

Exhibit 1.2
All performance reported net of investment expenses and annualized for periods greater than 1-Yr.

Section I. Performance Summary

Affiliate Investment Program Returns (cont.) *(as of 12/31/2022)*

Target Date Fund returns were in line with respective asset allocations

- Target Date Funds closely tracked their respective benchmarks
- Positive excess returns are largely due to structural tax advantages of public equity and real asset investments vs their respective benchmarks

Supplemental Income Plans (457/SCP Plan)	End Value (mm)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Target Income Fund	**$ 178.8**	-	**3.2%**	**2.4%**	**(12.9)%**	**(0.9)%**	**4.5%**
Benchmark		-	3.0%	2.3%	(12.9)%	(0.8)%	4.5%
Excess		-	15 bps	11 bps	2 bps	(7) bps	(1) bps
Target 2020 Fund	**$ 152.8**	-	**4.3%**	**3.1%**	**(13.7)%**	**(0.4)%**	**5.4%**
Benchmark		-	4.1%	2.9%	(13.8)%	(0.3)%	5.4%
Excess		-	15 bps	13 bps	5 bps	(6) bps	3 bps
Target 2025 Fund	**$ 204.8**	-	**5.1%**	**3.6%**	**(14.6)%**	**0.3%**	**6.4%**
Benchmark		-	5.0%	3.4%	(14.7)%	0.3%	6.4%
Excess		-	18 bps	15 bps	8 bps	(5) bps	8 bps
Target 2030 Fund	**$ 197.1**	-	**5.8%**	**4.0%**	**(15.4)%**	**0.9%**	**7.4%**
Benchmark		-	5.7%	3.9%	(15.5)%	0.9%	7.3%
Excess		-	15 bps	9 bps	11 bps	(3) bps	12 bps
Target 2035 Fund	**$ 129.2**	-	**6.5%**	**4.4%**	**(16.4)%**	**1.5%**	**8.5%**
Benchmark		-	6.4%	4.3%	(16.5)%	1.6%	8.4%
Excess		-	16 bps	12 bps	14 bps	(2) bps	18 bps
Target 2040 Fund	**$ 120.0**	-	**7.1%**	**4.8%**	**(17.2)%**	**2.2%**	**9.6%**
Benchmark		-	7.0%	4.7%	(17.3)%	2.2%	9.4%
Excess		-	18 bps	12 bps	17 bps	(1) bps	23 bps
Target 2045 Fund	**$ 71.5**	-	**7.4%**	**4.9%**	**(17.0)%**	**2.4%**	**9.8%**
Benchmark		-	7.2%	4.8%	(17.2)%	2.4%	9.5%
Excess		-	18 bps	13 bps	18 bps	(0) bps	24 bps
Target 2050 Fund	**$ 43.5**	-	**7.4%**	**4.9%**	**(17.0)%**	**2.4%**	**9.8%**
Benchmark		-	7.2%	4.8%	(17.2)%	2.4%	9.5%
Excess		-	17 bps	13 bps	18 bps	(0) bps	23 bps
Target 2055 Fund	**$ 16.1**	-	-	**4.9%**	**(17.0)%**	**2.4%**	**9.8%**
Benchmark		-	-	4.8%	(17.2)%	2.4%	9.5%
Excess		-	-	13 bps	18 bps	(0) bps	24 bps
Target 2060 Fund	**$ 8.5**	-	-	-	**(17.0)%**	**2.4%**	**9.8%**
Benchmark		-	-	-	(17.2)%	2.4%	9.5%
Excess		-	-	-	18 bps	(0) bps	23 bps
Target 2065 Fund[1]	**$ 0.3**	-	-	-	-	-	-
Benchmark		-	-	-	-	-	-
Excess		-	-	-	-	-	-

Exhibit 1.3

All performance reported net of investment expenses and annualized for periods greater than 1-Yr.

[1] Performance is not shown for the Target 2065 Fund, because it incepted Nov 2022 and does not yet have a full quarter of performance.

Section I. Performance Summary

Affiliate Investment Program Returns (cont.) *(as of 12/31/2022)*

Core Fund returns were in line with benchmarks

- Core Funds closely track their respective benchmarks
- Positive excess returns are largely due to structural tax advantages of the Global All Cap ex-US public equity and Real Assets funds vs their respective benchmarks

Supplemental Income Plans (457/SCP Plan) (cont.)	End Value (mm)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
SSgA STIF	**$ 121.1**	-	**0.9%**	**1.4%**	**1.8%**	**1.6%**	**1.0%**
Benchmark		-	0.8%	1.3%	1.5%	1.3%	0.8%
Excess		-	13 bps	17 bps	36 bps	27 bps	14 bps
SIP US Short Term Bond Core	**$ 37.8**	-	-	**0.9%**	**(3.7)%**	**(0.6)%**	**0.9%**
Benchmark		-	-	0.9%	(3.7)%	(0.6)%	0.9%
Excess		-	-	(6) bps	(6) bps	(3) bps	(2) bps
SIP US Bond Core	**$ 52.3**	-	-	**0.0%**	**(13.1)%**	**(3.1)%**	**1.7%**
Benchmark		-	-	0.0%	(13.0)%	(3.0)%	1.9%
Excess		-	-	(1) bps	(11) bps	(16) bps	(19) bps
SIP Real Asset Core	**$ 21.5**	-	-	**6.3%**	**3.1%**	**1.2%**	**7.1%**
Benchmark		-	-	6.3%	3.2%	1.3%	7.1%
Excess		-	-	5 bps	(6) bps	(6) bps	3 bps
SIP Russell All Cap Core	**$ 583.9**	-	-	**8.8%**	**(19.1)%**	**2.4%**	**7.2%**
Benchmark		-	-	8.8%	(19.2)%	2.4%	7.2%
Excess		-	-	2 bps	12 bps	1 bps	6 bps
SIP Global All Cap EX-US	**$ 64.6**	-	-	**1.1%**	**(16.3)%**	**3.1%**	**14.7%**
Benchmark		-	-	0.8%	(16.6)%	3.1%	14.1%
Excess		-	-	23 bps	29 bps	(2) bps	56 bps

Exhibit 1.4
All performance reported net of investment expenses and annualized for periods greater than 1-Yr.

Section II. CalPERS Investment Insights

Market Overview

Most asset classes moved together (and lower) over 2022

Calendar Year 2022 Market Returns

With exception of commodities, most global markets generated negative returns

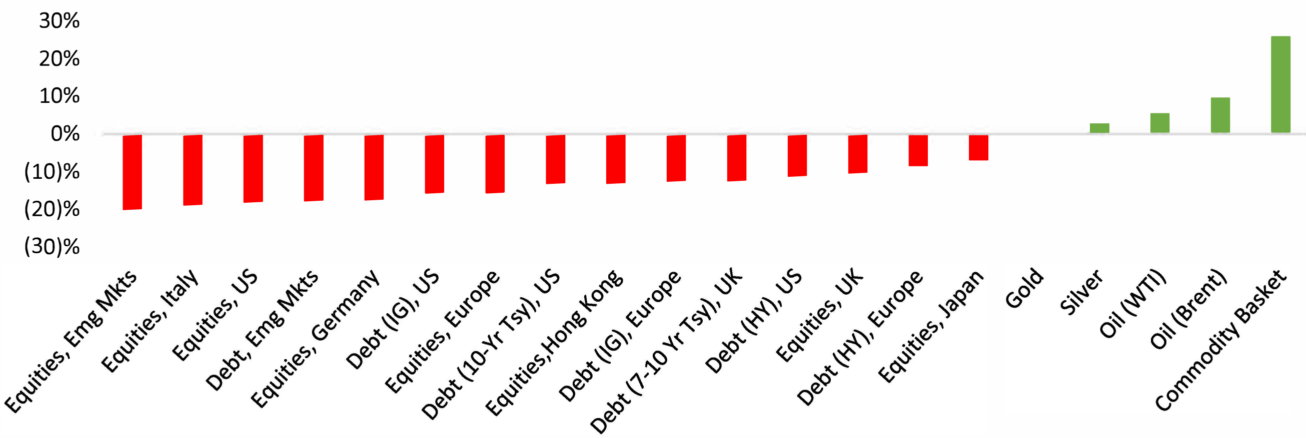


Exhibit 2.1

Stock and Bond Returns

Last year was only the fourth time since 1928 that both stock and bond total returns were negative

S&P 500 versus U.S. 10-Yr constant maturity Treasury Note (1928 – 2022)

Exhibit 2.2
Source: Shiller. CalPERS calculations, as at December calendar year-end

Section II. CalPERS Investment Insights

Market Overview (cont.)

Markets were impacted by an extraordinary combination of rapid central bank tightening and low starting yields

Last year experienced the fastest one-year increase in policy interest rates by the Federal Reserve since the early 1980s, with similar shifts by most major global central banks. Markets priced in higher yields in the future, reducing the value of future cashflows of both bonds and equities

Change in Federal Funds rate a year after Federal Reserve begins raising rates 1945-2022

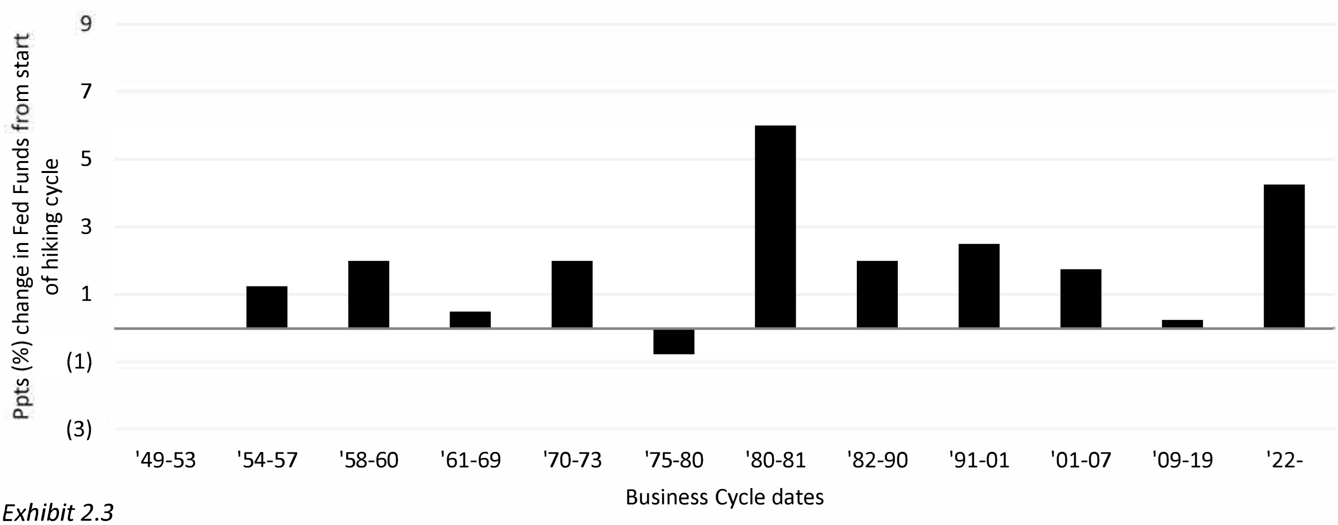


Exhibit 2.3
Sources: Haver Analytics, CalPERS

Historically low starting interest rates contributed to high starting valuations across risk assets, making markets further susceptible to repricing

10-Yr Treasury Note Yield

Exhibit 2.4
Source: Haver Analytics

Section II. CalPERS Investment Insights

Market Overview (cont.)

If an inflationary regime persists, diversification benefit from bonds may continue to be lower than we are used to…

- The particularly dramatic negative returns of fixed income in 2022 may have been unusual, but in general during environments where inflation - especially, inflation uncertainty - is a dominant consideration, bonds have been less effective as a diversifier
- Going forward, markets are pricing inflation to revert to the low, stable regime we have experienced over the past 20-30 years, in which case high quality fixed income could once again revert to its role as a relatively reliable diversifier to equity drawdowns (red ellipse)
- However, if inflation unexpectedly persists and becomes an ongoing challenge for policymakers, we could expect to see more periods where bonds are less effective diversifiers
- This is because higher-inflation periods tend to also feature higher inflation volatility, which leads assets with fixed future income streams to reprice in response

Inflation vs. Stock-Bond Correlation (monthly rolling 5-Yr periods 1953-2022)

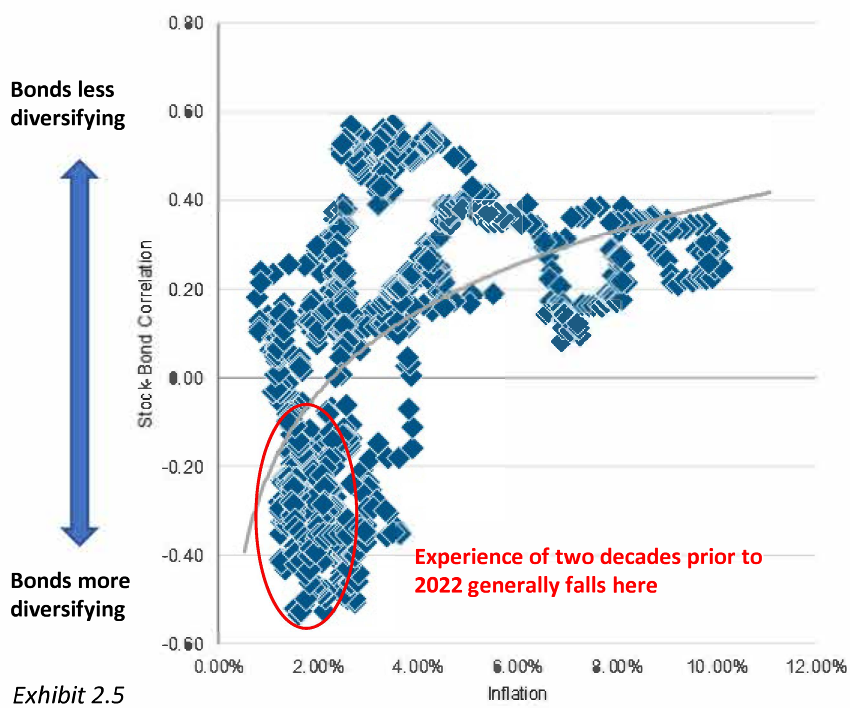


Exhibit 2.5

Above chart provided by PIMCO with annotations by CalPERS (arrow and labels on correlation, red circle/comment, and title parenthetical). Content redistributed with approval from PIMCO and following disclosures:

As of December 2022. SOURCE: PIMCO, Shiller, and Global Financial Data (GFD). ***Hypothetical example for illustrative purposes only.*** *Base currency is U.S. dollar.*

Monthly data from April 1953 to December 2022. Equity returns based on GFD S&P 500 Total Return Index. Bond returns based on GFD 10-Yr US Government Bond Total Return Index. Inflation calculated using CPI data from Shiller. Realized 5-Yr correlation between stock and bond monthly returns and realized 5-Yr CPI inflation shown.

Section II. CalPERS Investment Insights

Market Overview (cont.)

…but even in inflationary periods, bonds can still provide some diversification to the portfolio, especially given higher starting yields

- Bonds have outperformed stocks in nine out of the last ten recessions, even during periods of overall positive stock-bond correlation[1]
- During these periods, yields fell an average of around 1% (falling yields means positive bond returns). The repricing of bonds in 2022 reset yields to a higher level, providing room for yields to fall in future recessions

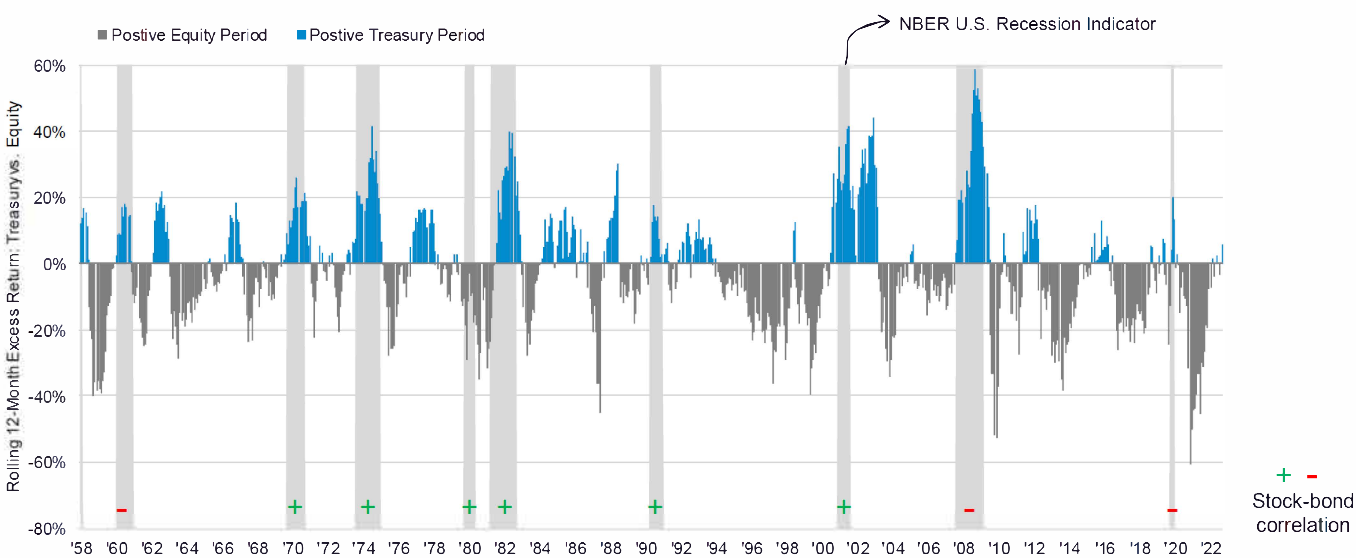


Exhibit 2.6

Above chart provided by PIMCO. Content redistributed with approval from PIMCO and following disclosures:

As of 31 December 2022. SOURCE: PIMCO, Bloomberg, FRED, and ICE BofAML. Shaded regions correspond to NBER U.S. Recession Indicator. Equity returns based on Bloomberg total return SPX. Bond returns based on ICE BofAML 7-10 Yr US Treasury Index from 1976 to 2018 and Bloomberg US Treasury Index thereafter. Risk free rate based on ICE BofAML 3M US Treasury Index from 1978 to 2018. Missing treasury returns are estimated from FRED Constant Maturity Rates.

[1]Reference: Stocks, Bonds and Causality. The Journal of Portfolio Management, April 2019. Full paper at: https://www.pimco.com/en-us/insights/viewpoints/quantitative-research-and-analytics/stocks-bonds-and-causality

Section II. CalPERS Investment Insights

Impact of Markets on PERF

2022 was challenging for almost all PERF segments

- Consistent with broader market outcomes, all PERF public market segments posted losses
- Treasuries posted the lowest returns of any segment at (24.9)%
- As a component of the larger allocation to public equities, the Factor Weighted segment served its purpose of dampening drawdowns during 2022 by returning (11.0)% vs (17.9)% for the Cap Weighted segment
- Private Equity losses during the second half of the year more than erased any gains it had during the first half of the year and brought calendar year 2022 results to (2.3)%
- With a return of 14.3%, Real Assets was the only segment that generated positive returns in 2022

Segment Total Returns *(as of 12/31/2022)*

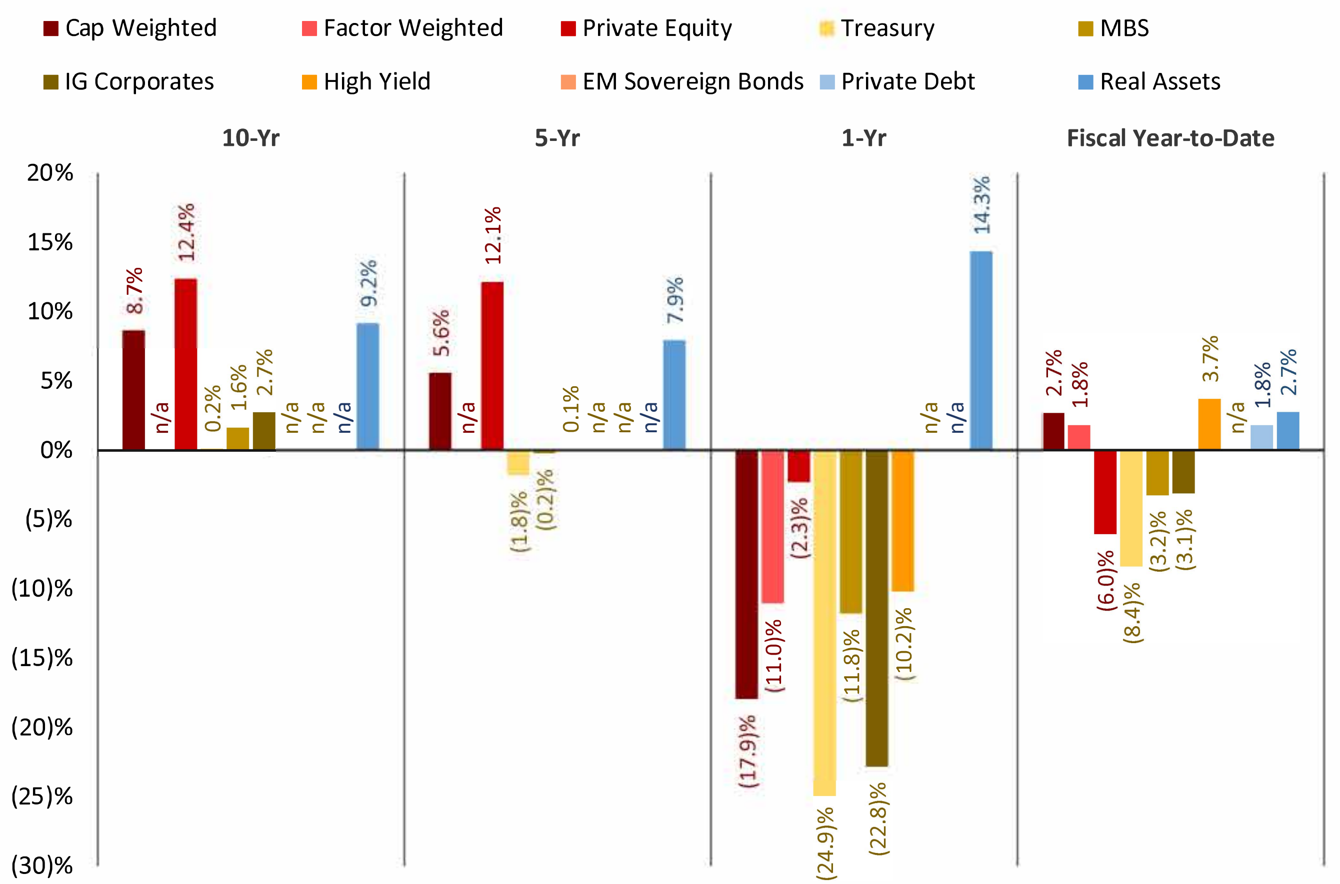


Exhibit 2.7
All performance reported net of investment expenses and annualized for periods greater than 1-Yr.

Section II. CalPERS Investment Insights

PERF Risk Highlights

Total Risk

Total risk increased slightly in 2022 in line with new Strategic Asset Allocation

- The total risk of the portfolio, as measured by volatility, was 13.7% at the end of the calendar year, an increase of 0.8ppts from the prior year (applying a consistent risk model)
- The increase is in line with expectations for trading to implement the new Strategic Asset Allocation during the latter half of the calendar year. While we transition into higher allocations to private assets and strategic leverage, we expect to hold a slightly higher allocation to equities in the interim

Risk Drivers

PERF risk is dominated by equities and growth-related assets

- CalPERS' risk model indicates equity is the dominating risk factor in the portfolio, explaining 73% of total volatility. The other material contributors (privates, spreads, and foreign exchange) also have growth biases, so in aggregate close to 100% of the portfolio's expected volatility is coming from growth-sensitive factors
- Recent changes to the Strategic Asset Allocation do improve diversification within these factors but will not fundamentally alter this relationship
- Also note the model imputes a very low contribution from "idiosyncratic" risk, meaning exposure to individual issuers' specific situations. This outcome is a function of CalPERS' large size and large number of individual holdings

Risk Factor Decomposition

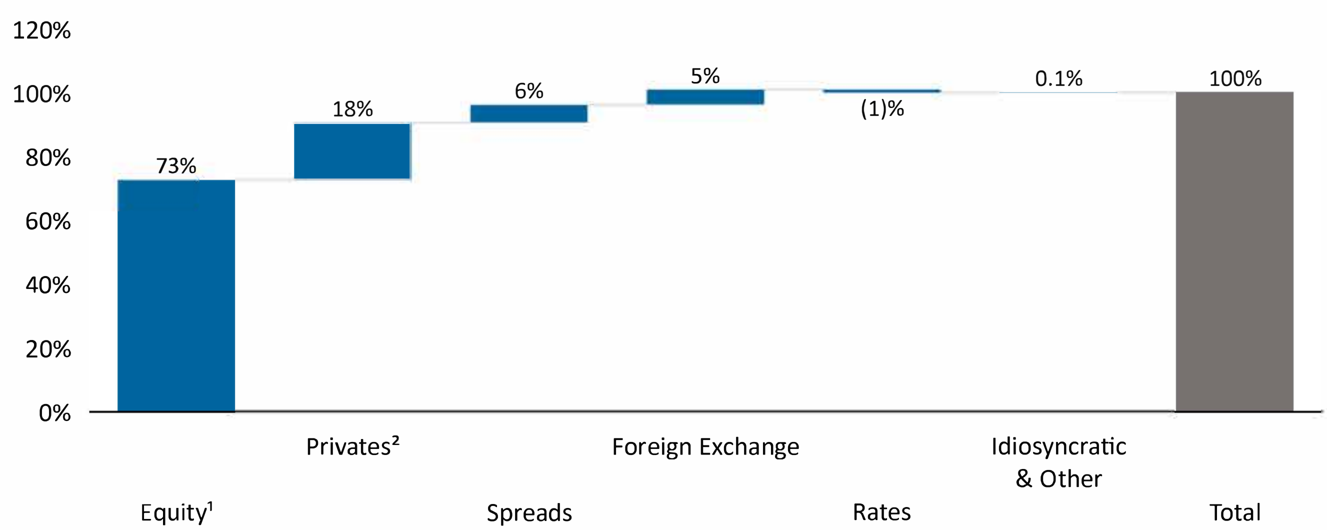


Exhibit 2.8

[1] *"Equity" factor includes the portion of private equity risk explained by public equity factors.*

[2] *"Privates" includes contribution from Real Assets plus residual Private Equity risk not explained by public equity factors.*

Section II. CalPERS Investment Insights

PERF Risk Highlights (cont.)

Liquidity and Leverage

CalPERS liquidity coverage remained adequate as strategic leverage is phased in

- Total fund leverage at year end was 6.7%, of which 1.4% was Strategic Leverage (which we began implementing this year in line with the new SAA), and 5.3% was Active Leverage
- Active Leverage is primarily supporting the Low Liquidity Enhanced Return program assets and slightly above-benchmark leverage in stable core real estate. Both of these uses of leverage can be viewed as utilizing excess liquidity over medium horizons to harvest additional premium from relatively lower-beta assets
- Liquidity Coverage Ratio (LCR) in the 30-day Tier 1 stress scenario was 1.6x at year end. CalPERS manages its financing and cash holdings to maintain adequate coverage and dynamically adjust with financial conditions. The conservative process stress-tests the portfolio across a range of scenarios while optimizing costs and taking advantage of tactical opportunities to provide liquidity when funding markets are inefficiently priced

Diversification

PERF's size and broad range of assets limit concentration risk

- The PERF holds over 10,000 individual securities and investments across a broad range of asset classes, limiting concentration to any single issuer. The largest issuer exposure is the US Treasury at 2.2%
- Non-US assets comprise 31% of the portfolio, primarily in developed markets and closely tracking global equity benchmarks. Non-US exposures in aggregate are expected to offer either diversification or return benefits as compensation for country-specific risk
- Non-USD currency exposure comprises 25% of the portfolio (the difference between country and currency risk is mainly a function of non-US entities issuing in USD) and contributes 5% to total risk. The potential risk reduction benefits of hedging are balanced against offsetting cashflow, operational, and timing considerations
- CalPERS' industry exposures also closely track global cap weighted equities. Global weighting helps further diversify industry exposure as different countries can be concentrated in certain sectors

Section II. CalPERS Investment Insights

Investment Program Highlights

Private Equity

Aimed at being the best scaled Private Equity investor in the United States

Focused on several activities:

- Rationalize the primary fund pipeline to improve manager quality and create capacity for co-investment
- Scale co-investment to deploy more capital with high-conviction managers and reduce cost, enhancing net returns
- Collaborate with the Total Fund to refine liquidity analysis and determine the optimal allocation to Private Equity
- Reduce proportion of the portfolio in Buyout and increase allocation to strategies that use less or no leverage; launch a Venture program to diversify the Private Equity program and enhance returns
- Reconstitute the Buyout portfolio to focus on sector specialists and the Middle Market

Real Assets

Positioned to provide resilience amid economic uncertainty and market volatility

- The portfolio is comprised predominantly of core assets with moderate leverage
- Consistent with 2021 SAA, deployed additional capital to achieve target allocation and expanding role of infrastructure
- Real Estate and Infrastructure assets generally fulfilled their role as an inflation hedge, providing income stability and some value protection
- Strong absolute returns over 1, 3, 5, 10-Yr periods
- Higher interest rates, broader economic uncertainty, and a recessionary outlook have stalled markets putting downward pressure on asset values and returns

Private Debt

Current market environment has created attractive opportunities

- The Private Debt program was added to the Strategic Asset Allocation in July 2022
- Broadly Syndicated Loan (BSL) new issuance was at a muted level, compared to history
- Companies have relied more on private markets for debt financing needs, which has enabled Direct Lenders to extract better economics
- A rising rate environment will be an added benefit given the floating rate nature of the asset class

Section II. CalPERS Investment Insights

Investment Program Highlights (cont.)

Public Equity

Worst markets since Global Financial Crisis; Factor Weighted diversified

- In 2022, global public equity markets recorded their worst annual returns since the Global Financial Crisis
- The rout in the equity markets was widespread impacting most regions, sectors, and factors
- The global public equity portfolio continues to be repositioned away from index-orientation and more towards active strategies to take advantage of the dispersion in stock returns and higher volatility in the markets
- With inflation seeming to moderate, market expectations have shifted from worrying about the likelihood of the Fed's hikes causing an economic recession, to expecting the Fed to cut interest rates in the second half of 2023 and to a soft landing in the economy
- We believe the current market conditions are more favorable to active management; however, given the uncertainty regarding an economic recession, we believe we should not make extreme factor, sector, and regional bets

Fixed Income

Challenging bond markets over 2022; levels are now more attractive

- During 2022, fixed income and equity were more correlated than the last few decades
- Long-term expected bond returns are the most attractive they have been in quite some time
- Deployment of the Strategic Allocation to Emerging Market Debt has gone more quickly than anticipated
- The U.S. bond market is pricing in interest rate cuts later this year. The Federal Reserve has not indicated this will happen
- Key focus: if the current focus on falling inflation pivots to concerns of a weaker economic and corporate earnings environment

Section II. CalPERS Investment Insights

Investment Program Highlights (cont.)

Affiliate Investment Program

Trusts managed in line with respective Strategic Asset Allocations

- Non-Supplemental Income Plans:
  - From a total return perspective, public equities and fixed income markets were more highly correlated than historical norms and both were challenged with negative returns this year
  - The trusts' component asset classes (public equities, REITs, commodities, and fixed income) effectively rallied in the 4th quarter
- Supplemental Income Plans:
  - Non-US equities outperformed US equities in the 4th quarter as well as for the calendar year
  - With yields increasing significantly over the course of the year, shorter-duration fixed income investment vehicles out-performed the longer-duration options
  - Real Assets (which includes commodities) helped provide a diversified set of returns compared to other risk assets and fixed income

Investment Operations

Supported implementation of leverage in SAA, significant trading volume

- In support of leverage in SAA:
  - Executed multiple trading agreements
  - Established front to back transaction flows for new transaction types
  - Effectively sustained significant transaction volume growth
- During last 6 months of 2022, successfully managed large scale trading operations across asset types to implement new SAA

Investment Controls

No policy violations during 2022, several key accomplishments

- Revisions to the Total Fund Investment Policy were presented following the Investment Committee's approval of the new Strategic Asset Allocation
- The team implemented and validated compliance with various sanctions imposed by the U.S. Treasury's Office of Foreign Assets Control (OFAC)
- Participated in peer interviews surveying for best practices relating to Federal and international investment regulatory initiatives
- Implemented CIO-led Investment Office (INVO) governance structures to support operational, underwriting, and total fund management decision making

Section II. CalPERS Investment Insights

Investment Program Highlights (cont.)

People and Culture

Inception of an Investment Office Talent and Culture Program

- In collaboration with CalPERS Human Resources, the program is tasked to ensure talent capabilities, risk tolerances, and a culture of innovation aligned with strategic goals
- This year the INVO People Strategy was launched, which focused on improving Investment Office talent management and development disciplines grounded in a culture that promotes accountability, innovation, resiliency, and engagement through a lens of diversity, equity, inclusion, and belonging
- Led organizational realignment activities during the first half of FY 2022-23 including the establishment of Chief Operating Investment Officer (COIO) and Deputy Chief Investment Officer Private Markets (DCIO Private Markets) positions
- INVO team members donated $25,201.28 to the CA State Employees Food Drive helping CalPERS to the #1 spot across all state agencies for donations this fiscal year.
- Beginning in January 2023, launched INVO Onsite Core Days every Wednesday. The goal is for 100% of INVO team members to be onsite; INVO's first in-person All Staff Event on Wednesday, January 11, 2023 was standing room only audience in the Lincoln Plaza North Board Auditorium

Innovation and Resiliency

Progress on several key initiatives

- Completed initial phase of the Active Risk Innovation (ARI) Initiative, with the first investment recommendation presented to the Total Fund Management Committee in November
- Committed $1B in support of seeding small, emerging, and diverse private equity firms
- Executed a contract with external consultant to assist in the development of a long-term Investment Data and Technology Strategy
- Identified and engaged with ~ten current and potential partnerships and vendors on climate-related policies, adaptation, and mitigation efforts by specific metro areas that could impact Real Estate

Sustainable Investing

Continued leadership and engagement on multiple fronts

- Over the calendar year, there was continued leadership in the Climate Action 100+ coalition and focus on key themes of human capital management, climate risk and oversight, executive pay and capital allocation
- The team engaged the Laborers' International Union of North America and CalPERS' Responsible Contractor Program (RCP)
- Comment letters supporting three key industry activities were submitted:
  - Financial Accounting Standards Board's (FASB) Exposure Draft on Segment Reporting;
  - Security and Exchange Commission's (SEC) 2022-2026 Strategic Plan; and
  - Federal Reserve Board's Proposed Principles on Climate Change
- Continue to file shareholder proposals on key areas around climate and governance
- Areas of proxy voting in 2023 include diversity, climate risk/opportunity and compensation

Section III. Economy and Markets

Macroeconomic Drivers of 2022 Returns

The global economy began 2022 with historically high growth; slowed more than anticipated

2022 Growth Expectations in Review

- The year 2022 was unusual. Real global economic growth ended 2021 at 5.9% year over year (yoy), a 48-Yr high, and was anticipated to slow towards historical averages over the coming years. Equity markets began the year in overvalued territory
- Several events revised down growth expectations further throughout 2022. For example, in the first quarter of 2022, the Russia/Ukraine conflict heightened uncertainty around the outlook; by the middle of 2022, COVID-related lockdowns and a worsening property market contraction in China were impacting Chinese (and thus global) growth; inflation and wage growth were at multiyear highs (reducing profitability); and central banks globally were pursuing the *"fastest [rate hiking] pace in more than 40 years"*, raising financing costs (WSJ, Oct 5, 2022)
- The combination of these events was unusual and collectively weighed on growth expectations. For example, in January 2022, the International Monetary Fund (IMF) forecast 4.4% yoy for 2022 world Gross Domestic Product (GDP) growth; one year later this growth expectation is 3.4% yoy
- Consequently, equity returns declined on a calendar year basis

Real GDP growth expectations for 2022 were revised lower

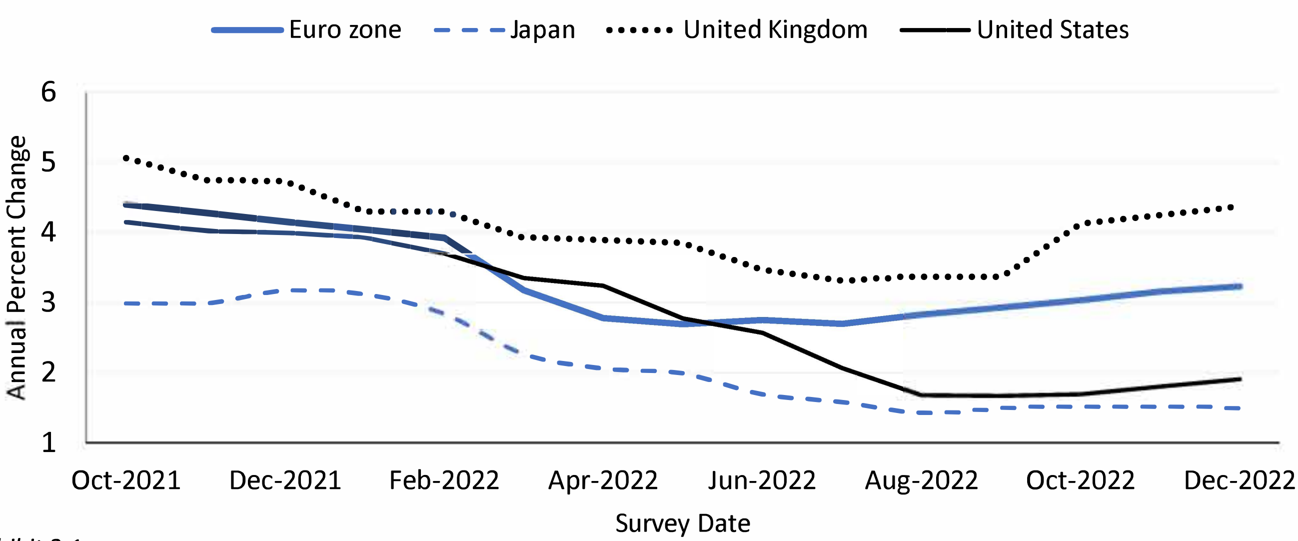


Exhibit 3.1
Source: Consensus Economics Inc

Section III. Economy and Markets

Macroeconomic Drivers of 2022 Returns (cont.)

Inflation reaches the highest level since 1970s; Fed raises rates

Elevated Inflation Going into 2022

- In the post-pandemic rebound of 2021, inflation had started to move higher, contributed by strong fiscal support, sluggish labor supply pushing up wages, and supply-chain constraints reducing supply as the global economy re-opened. For example, US CPI inflation rose from 1.4% in December 2020 to 6.5% in December 2021
- Rising prices continued into mid-2022, exacerbated in Europe by the Russia/Ukraine conflict. US headline inflation peaked at 9.1% in June, while countries closer to Russia, such as the Euro Zone, experienced double-digit inflation
- These levels have not been experienced since the early 1980s (see below chart)

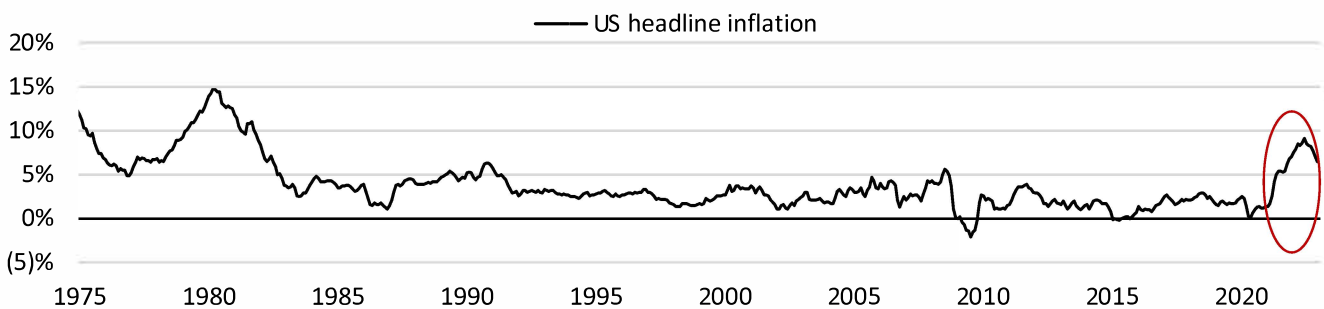


Exhibit 3.2
Source: Haver Analytics

Federal Reserve Responds to Inflation

- Since the 1990s, the US Federal Reserve uses policy rates to keep inflation near its flexible inflation targeted rate of around 2%
- In 2022, the US Federal Reserve and global central banks raised policy rates to head off rising inflation
- This tightening was faster and higher than financial markets priced in and consequently, rising policy rates and elevated inflation pushed the yield curve higher (declines in bond returns)

Federal Funds rate rose further and faster than market pricing expected

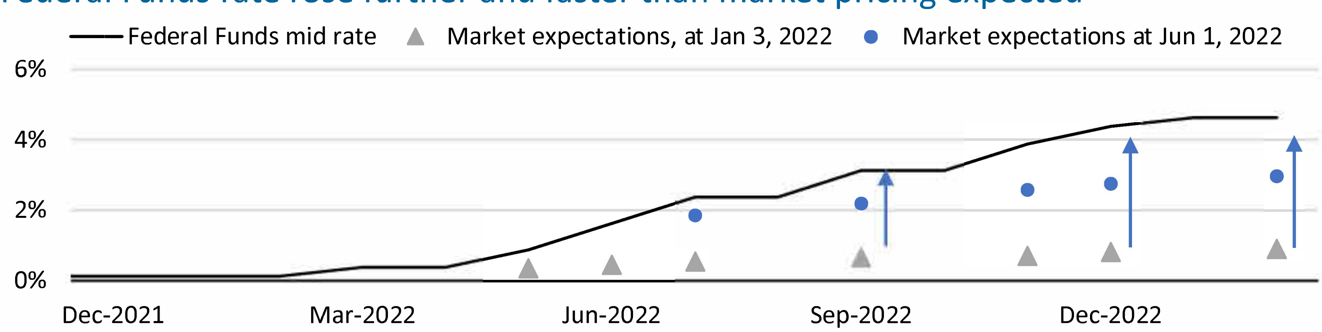


Exhibit 3.3
Sources: Haver Analytics, Bloomberg Financial L.P., CalPERS-derived forward rates based on overnight indexed swap market, smoothed.

Section III. Economy and Markets

Macroeconomic Outlook

Global growth is expected to slow in 2023; near-term risks

Outlook

- Challenges weigh on the global economy moving into 2023, with a bounce-back in growth expected in 2024 and beyond, although there are diverse opinions around the economic slowdown and recovery
- Central banks are moving policy into restrictive territory in order to bring inflation back towards their respective targets. Restrictive policy is designed to slow economic growth
- Analysts have not formed a consensus if the global – or US – economy can withstand the recent speed of policy tightening (higher policy rates) without slipping into recession. A key risk to this outcome is the trajectory of inflation: the pace of disinflation will influence where the level of policy rates peak. Diverse opinions around this outlook creates uncertainty and higher inflation volatility presents risks for unanticipated surprises in either direction

- The IMF predicts a third of the world will be in recession in 2023. Foreign countries experiencing recessions are headwinds for the US economy in 2023, and the US is expected to slow towards stall-speed (Consensus Economics survey respondents expect 0.3% annual average percent change real GDP growth in 2023). An economy growing slowly is more vulnerable to a negative event or surprise, which in turn also raises uncertainty around the outlook

- In addition, there are three known event risks for investors this year:
  1. The US debt-ceiling could be reached as early as June without bi-partisan agreement;
  2. Geopolitical and foreign country political uncertainty remains elevated; and
  3. The Chinese economy is re-opening. The risks are two-sided, which in turn heightens volatility

- All told, higher macroeconomic volatility and a wide range of views equates to greater uncertainty around the outlook

Size of recent macroeconomic data outturns have not been experienced for 40 years

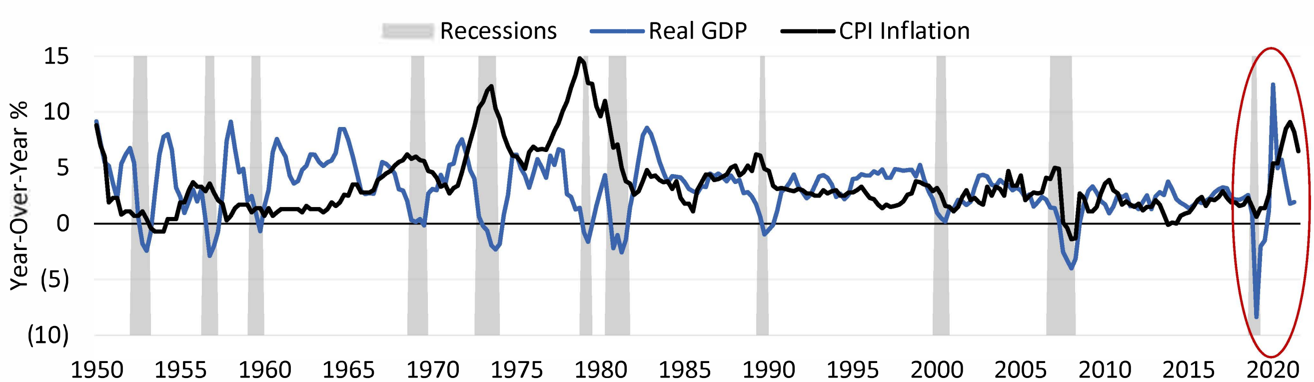


Exhibit 3.4
Source: Haver Analytics

Section IV. PERF Allocation

Strategic Asset Allocation *(as of 12/31/2022)*

Current allocation reflects ongoing transition to more private assets and use of leverage to diversify from equities

Portfolio vs. Long-Term Strategic Asset Allocation

- During 2022, the PERF began transitioning to the Strategic Asset Allocation (SAA) approved by the Investment Committee in November 2021
- The new SAA features increased allocation to existing private assets, the introduction of Private Debt and Emerging Market Sovereign Bonds segments, and the introduction of strategic leverage
- Relative to the Long-Term SAA, PERF is currently overweight Equities, offsetting corresponding underweights in Private Equity, Private Debt, Corporate Bonds, and Emerging Market Sovereign Bonds due to a measured approach to implement leverage

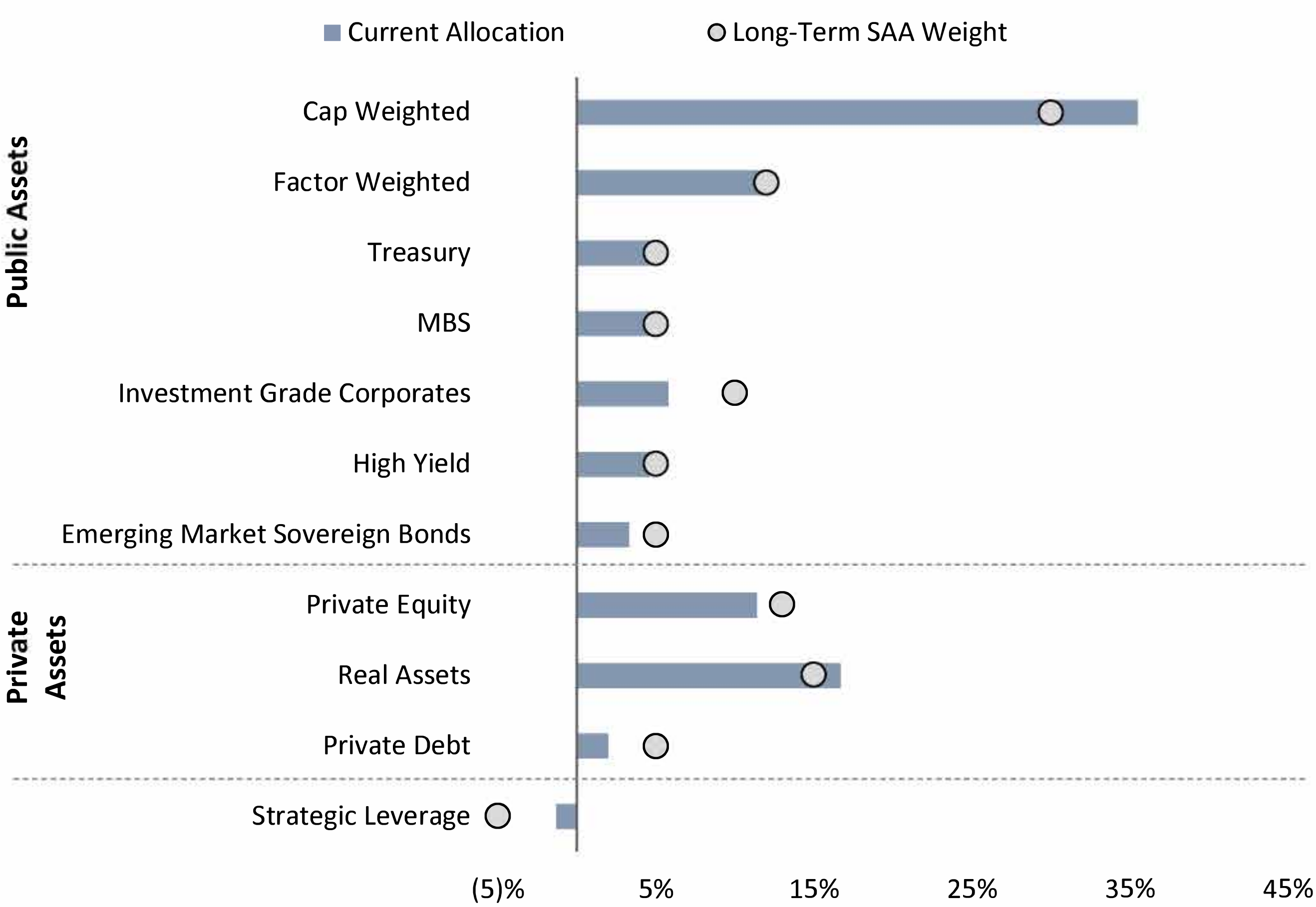


Exhibit 4.1

Section IV. PERF Allocation

Strategic Asset Allocation (cont.) *(as of 12/31/2022)*

Significant allocation changes in 2022 reflecting both trading activity and public vs. private valuation effects

Changes vs. Prior Year

- Over the last six months of 2022, CalPERS traded over $80B in gross notional exposure in our public market segments. These changes were managed to rapidly effectuate the overall return and risk profile of the long-term SAA, minimizing market impact
- Increased allocations to private markets and use of strategic leverage are expected to take longer. Net capital deployed into private assets during the year was $16.4B
- The other driver of allocation changes in 2022 was the so-called “denominator effect” as public market assets fell while private asset valuations remained stable or positive. For example, an asset with a starting weight of 10% in the portfolio and flat returns will end at around 11% if the rest of the portfolio falls 10% in value

1-Yr Allocation Change

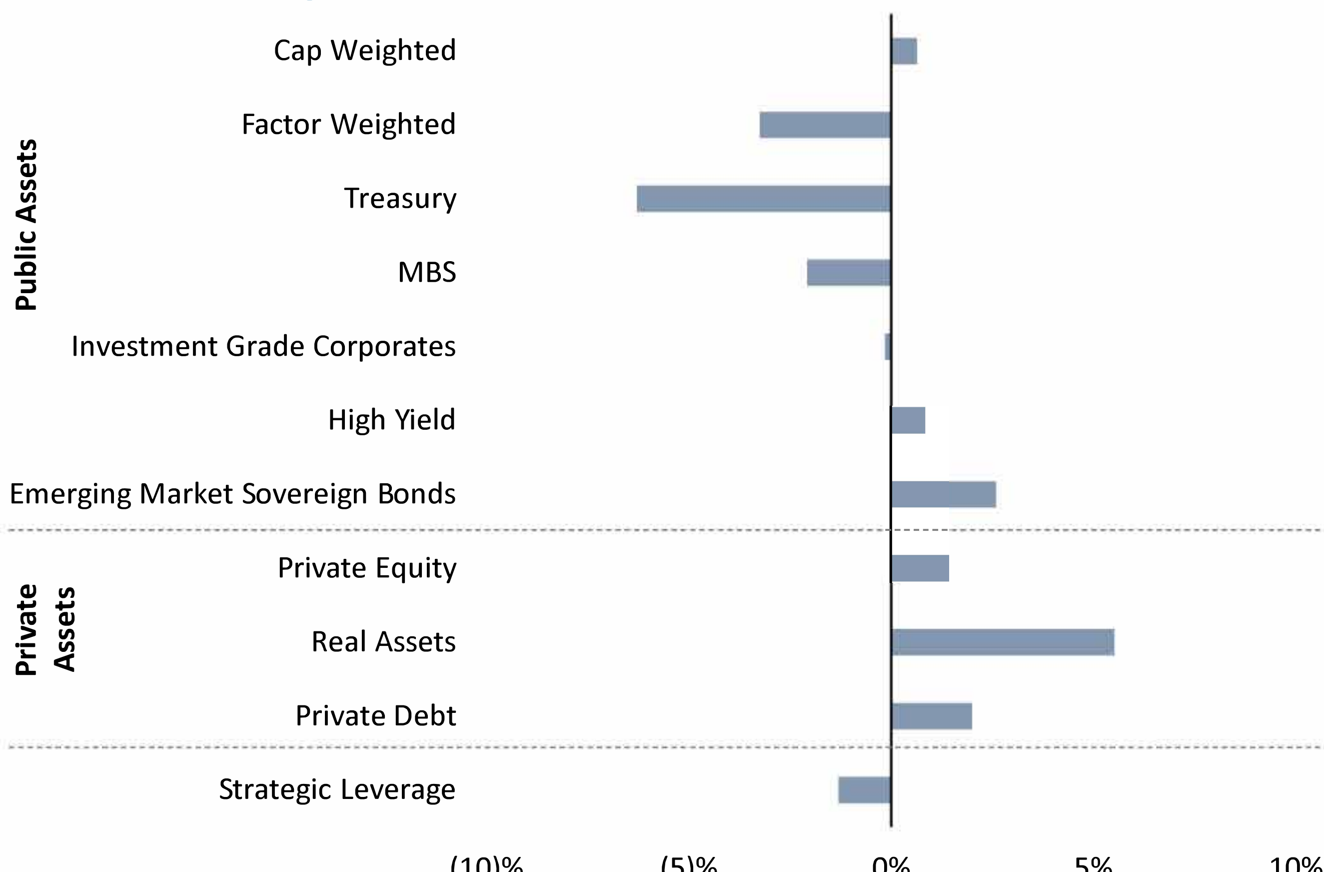


Exhibit 4.2

Section IV. PERF Allocation

Strategic Asset Allocation (cont.) *(as of 12/31/2022)*

Allocation remains within policy bands

Interim Targets and Policy Bands

- The Board's General Pension Consultant, in consultation with the Investment Committee and staff, establishes Interim Allocation Targets to reflect reasonable expected pacing to implement the long-term SAA
- The charts below show current positioning versus current interim targets. In contrast to positioning versus the long-term SAA shown earlier, PERF is "ahead of schedule" in all private assets relative to these interim targets, a function of both significant deployment activity and of the relative valuation changes discussed previously

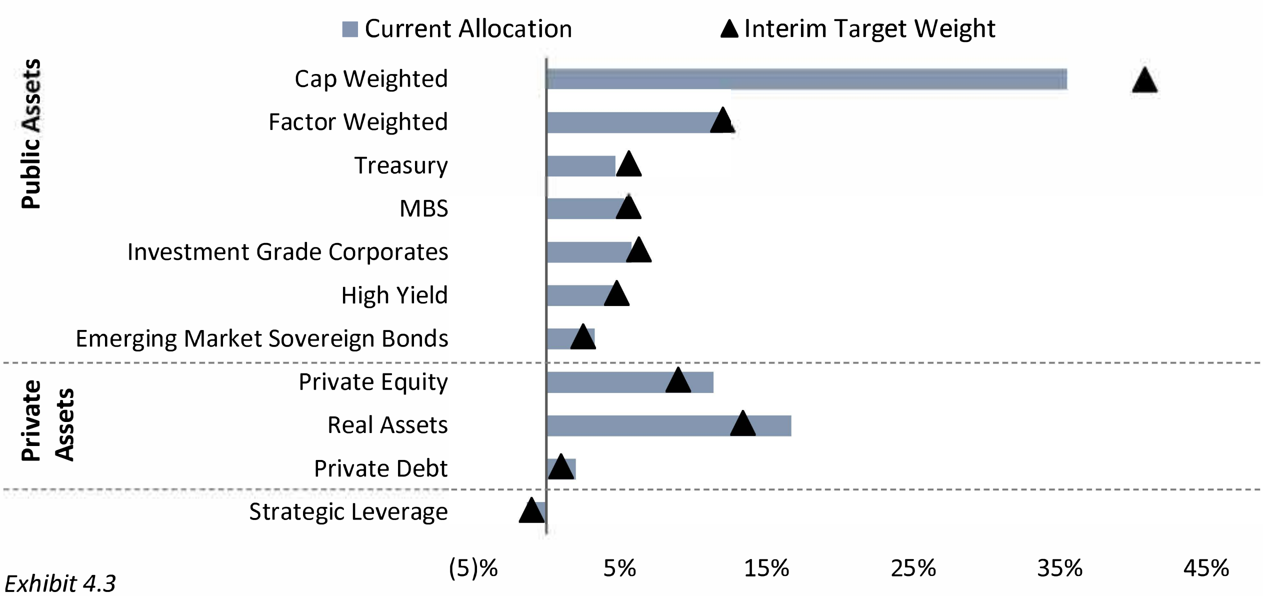


Exhibit 4.3

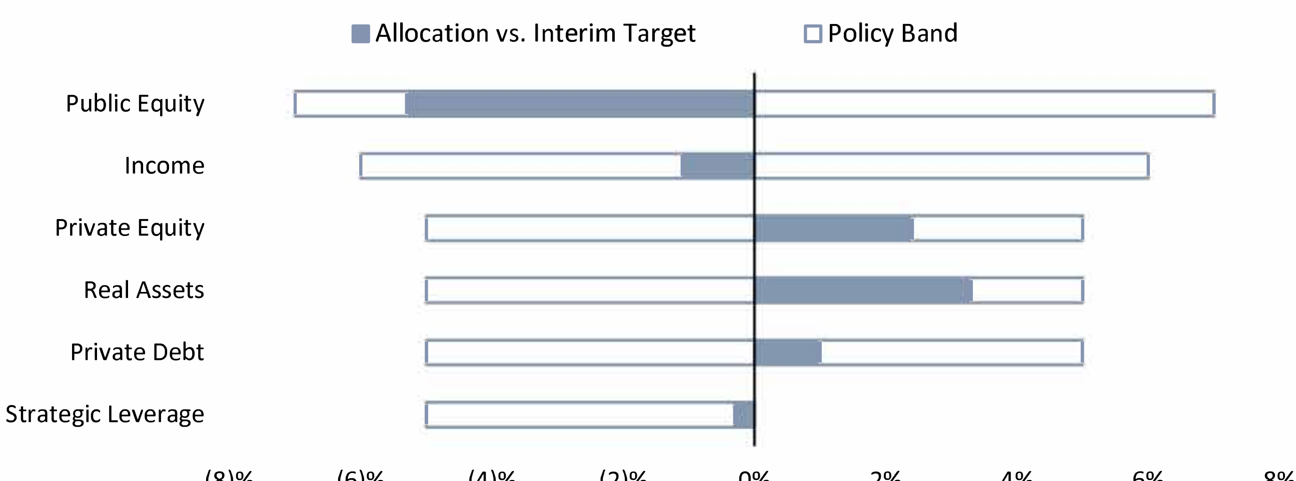


Exhibit 4.4

Section IV. PERF Allocation

Private Asset Commitments and Pacing *(as of 12/31/2022)*

Ongoing growth in private asset commitments

- Total unfunded commitments to private assets ended 2022 at $64.2B, an increase of $8.4B from the prior year value of $55.8B
- The growth in commitments reflects CalPERS' belief in the potential of private asset classes to provide incremental return and diversification benefits relative to public markets. The new SAA, adopted in November 2021, called for increased allocation to Private Equity and Real Assets and established an allocation to the Private Debt program
- Liquidity to fund outstanding commitments is maintained by retaining sufficient capacity in certain public asset classes, which are systematically sold down as commitments are called

		Unfunded Commitments ($mm)	
Asset Class	**Net Asset Value ($mm)**	**Total**	**Excluding opt-out and revocable commitments**
Private Equity	50,290	32,400	23,559
Real Estate	59,976	9,607	1,689
Infrastructure	13,061	5,252	1,904
Private Debt	8,872	15,360	15,360
Opportunistic	210	1,581	1,581
Total	-	64,199	44,092

Exhibit 4.5

Unfunded Commitments / 12 Month Average PERF NAV

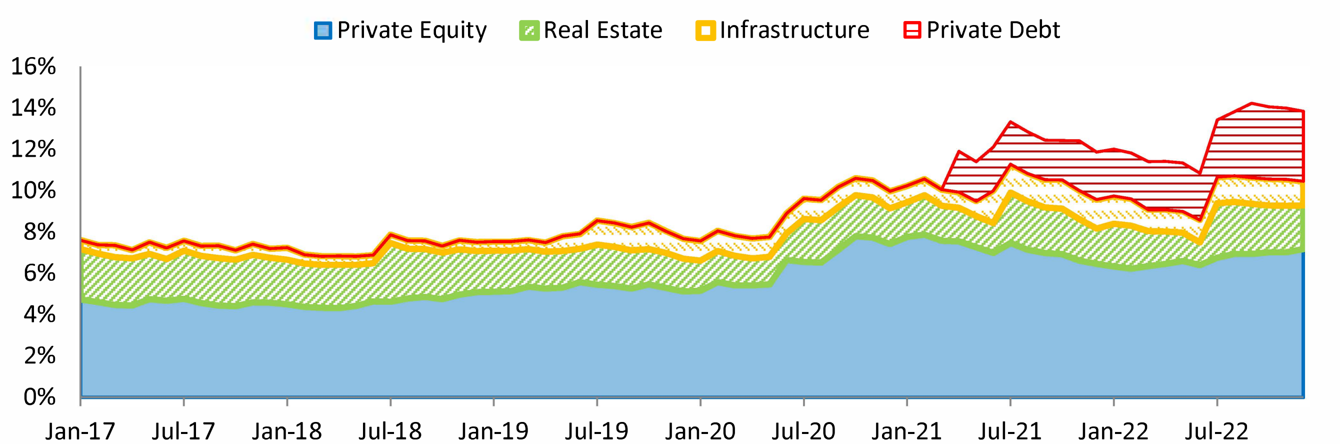


Exhibit 4.6

Section IV. PERF Allocation

Private Asset Commitments and Pacing (cont.) *(as of 12/31/2022)*

CalPERS deployed $30.5B in private market programs in 2022

- Net capital deployed (i.e., contributions minus distributions) was +$16.4B
- The net total change in private program investments, also factoring in valuation changes, was +$24.1B

Drivers of One Year Change in Net Asset Value

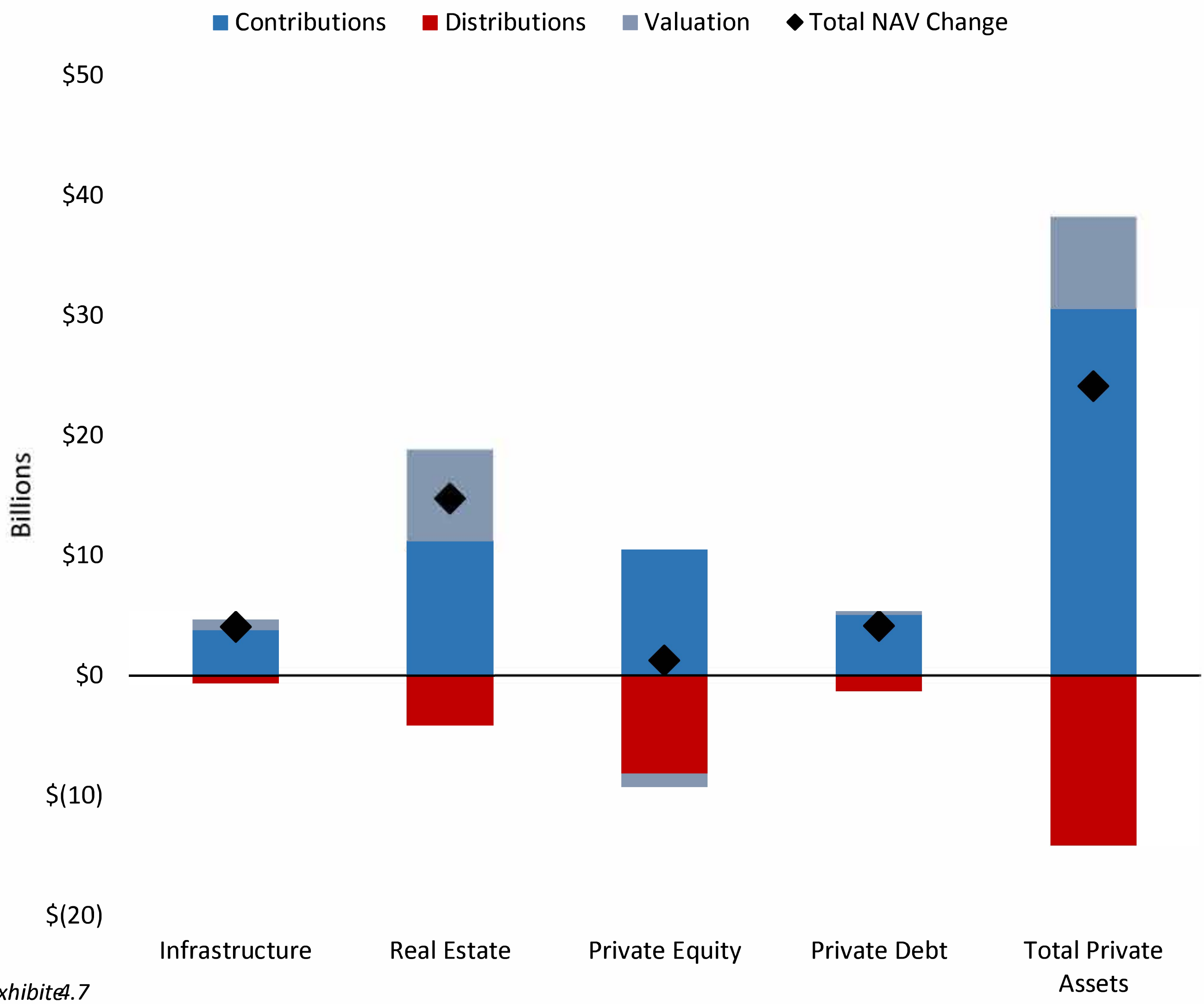


Exhibit 4.7

Section IV. PERF Allocation

Internal vs External Management *(as of 12/31/2022)*

PERF may have opportunities to add value by adjusting internal/external management mix over time

- Roughly two-thirds of PERF assets are internally managed, generally split along public/private lines
- In private assets, the preponderance of external management today may offer opportunities for cost reduction and greater director control of exposure if greater internal share can be achieved
- In contrast, in public markets, there may be opportunity to make greater use of external partnerships to generate value add and complement internal skillsets

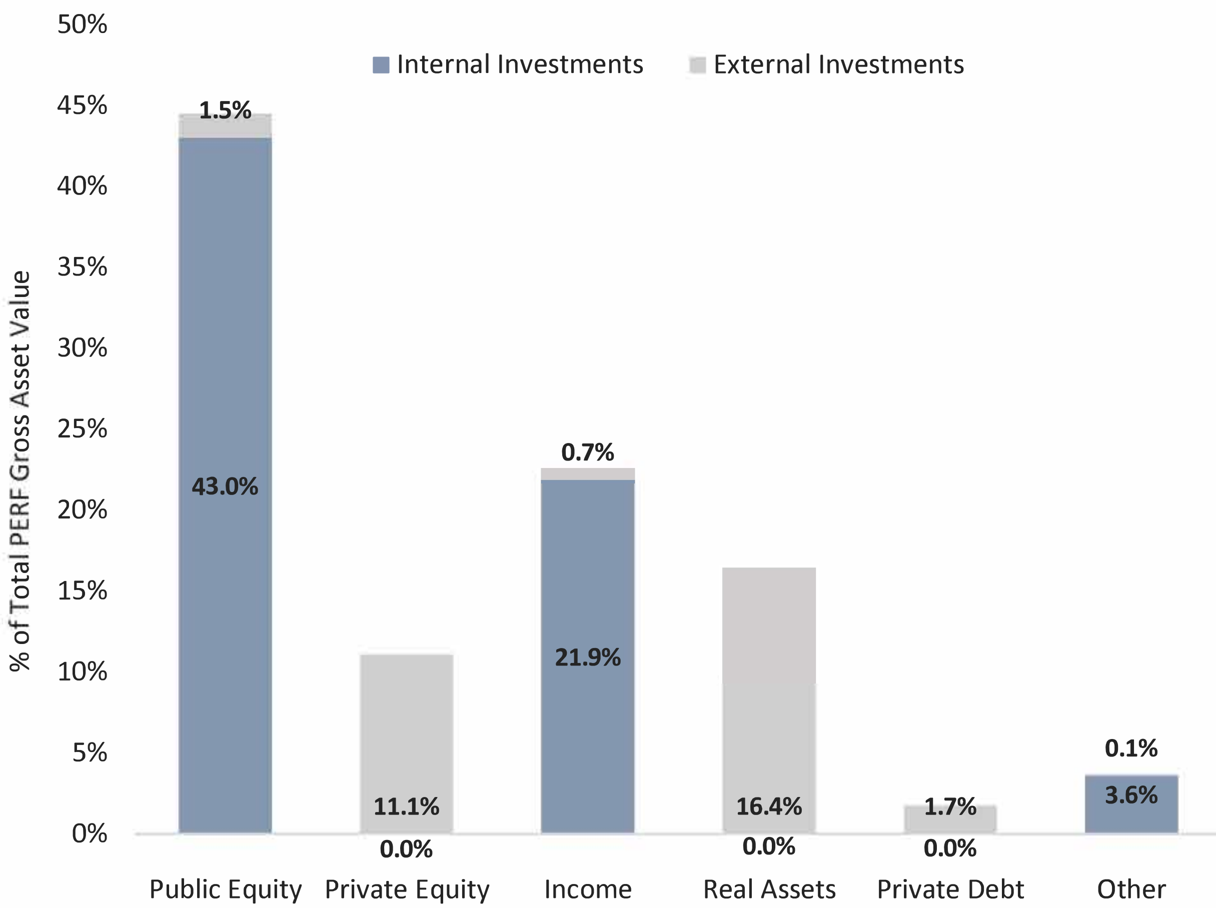


Exhibit 4.8

Section IV. PERF Allocation

Active vs Indexed Management *(as of 12/31/2022)*

Public equity is the primary asset class using indexing strategies

- Overall, 48% of PERF is managed via indexed strategies
- Indexed approaches are dominant in public equity, in part reflecting the size of the asset class that makes material departures from market weighting difficult or expensive
- Indexed strategies do not imply "passive" investing. The Factor Weighted segment is a deliberate departure from cap weighting that is managed in an indexed fashion. Even within the cap weighted segment, indexing offers opportunities to optimize the trade off between costs and tracking error. CalPERS' extensive corporate governance activities are enabled regardless of management style

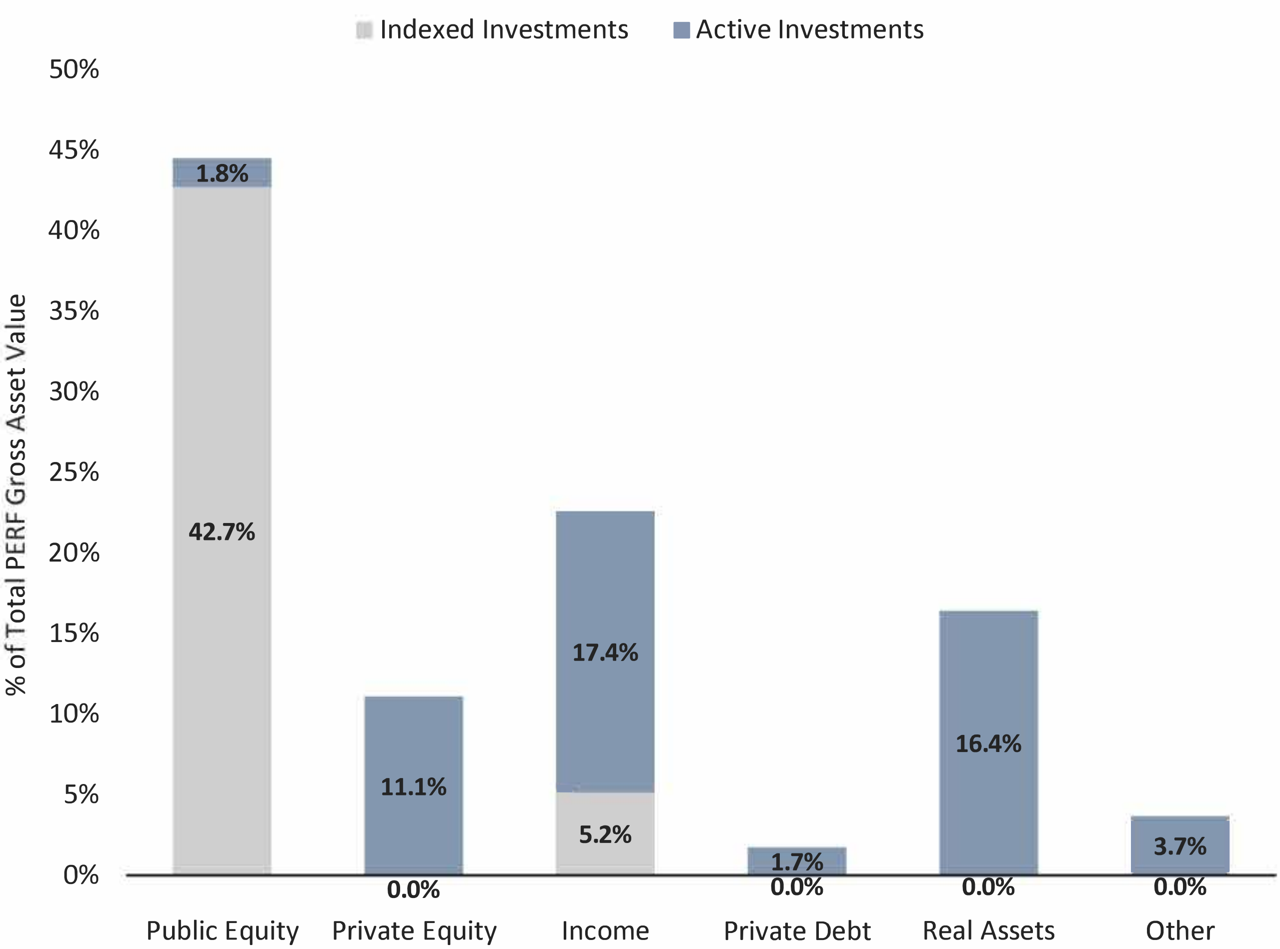


Exhibit 4.9

Section V. PERF Performance Detail

Realized Outcomes vs Expectations *(as of 12/31/2022)*

Despite volatility, returns are within long-term expectations

- Based on Capital Market Assumptions adopted September 2021, the PERF SAA has an expected return of 6.8%/Yr with an annualized volatility of around 12%. This means 7 out of 10 years the PERF is expected to generate a return between (5.2)% and 18.8%. The other 3 years the PERF is expected to generate a return below (5.2)% or above 18.8%
- This range of outcomes accounts for uncertainty in markets over short time periods and assumes returns will average out over time
- This volatility is reflected in actual PERF returns. Over shorter 1-Yr periods, we see returns ranging from (31.1)% to 29.6% while long-term returns (10-Yr) remain relatively stable in the range of 4.3% to 9.7%
- Outcomes for the first 6-months of the current ALM cycle (July 2022 to Dec 2022) are within the range of expectations

Rolling 10-Yr Annualized Total Return vs Rolling 1-Yr Total Return

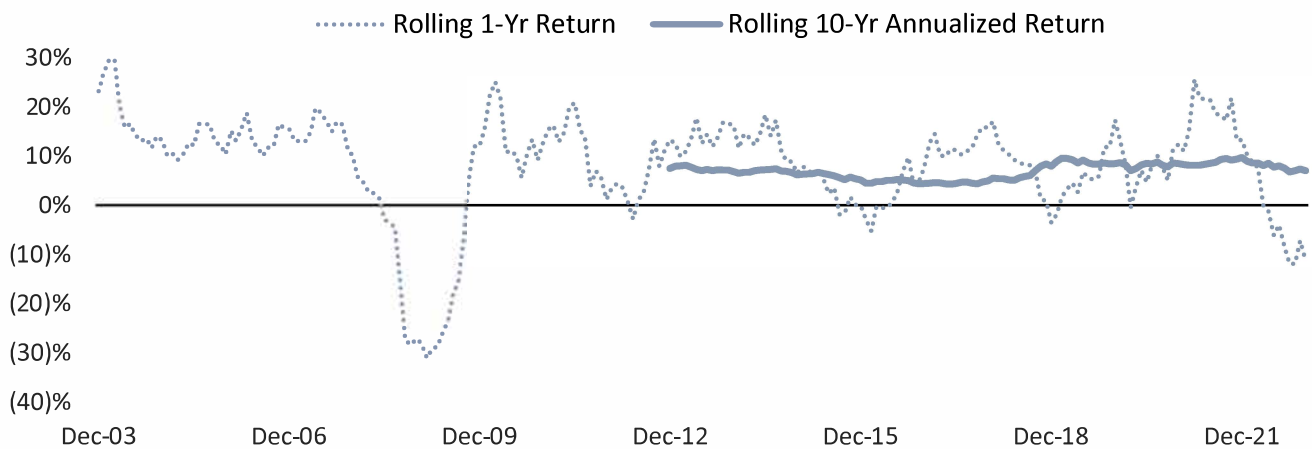


Exhibit 5.1

Current ALM Cycle: Realized Outcome vs 2021 ALM Expectations

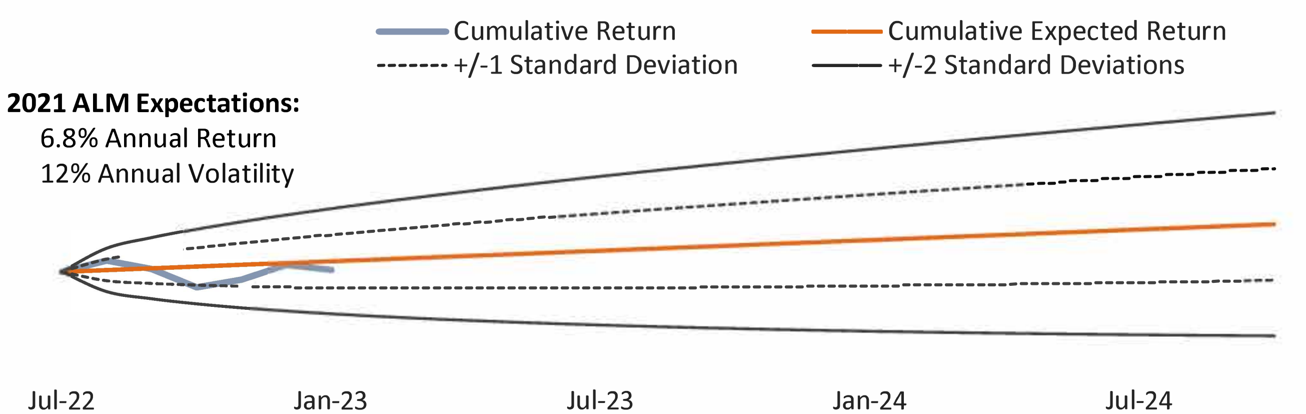


Exhibit 5.2

All performance reported net of investment expenses and annualized for periods greater than 1-Yr unless noted as cumulative.

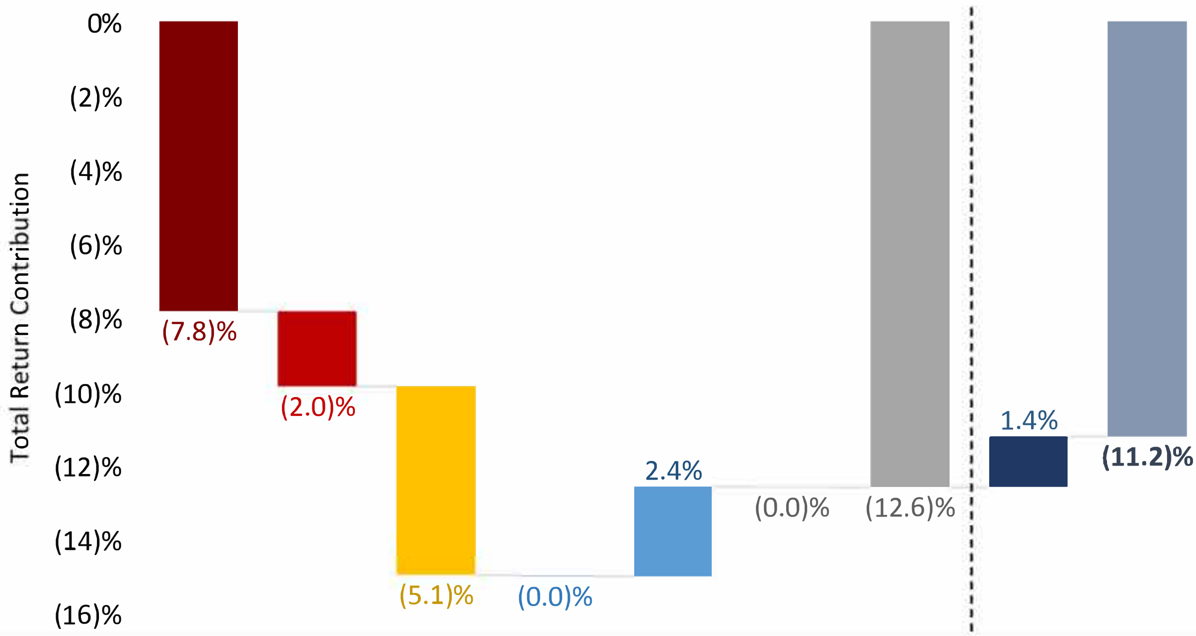
Section V. PERF Performance Detail

Sources of PERF NAV Change and Total Return *(as of 12/31/2022)*

Public programs drove decline in 2022 returns

- PERF NAV dropped more than $50B during 2022, most of which was driven by public markets
- 1-Yr PERF Performance of (11.2)% was driven by Public Equity and Fixed Income, which returned (16.0)% and (18.6)% respectively. In aggregate, those two asset classes account for more than 70% of the PERF NAV. The strong performance of Real Assets, which returned 20.9%, offset some these losses

1-Yr Total Return Contribution



	Contribution from Policy Benchmark Components								
	Public Equity	Private Equity	Income	Private Debt[1]	Real Assets	Other[2]	Total Policy BM	Value Added	Total Fund
Average Weight	47.3%	11.0%	26.4%	0.9%	14.4%	0.0%	100%	-	-
Return	(16.0)%	(19.6)%	(18.4)%	-	20.9%	-	(12.6)%	-	**(11.2)%**
Cumul Dollar Return (bn)	$(38.5)	$(8.7)	$(25.5)	$(0.2)	$12.4	$(1.9)	$(62.4)	$6.4	**$(56.1)**

Exhibit 5.3

All performance reported net of investment expenses.

[1] Private Debt was part of the Opportunistic Strategies Program prior to 7/1/2022.

[2] Other includes impact from historical Policy Benchmark allocations that are not part of the current Policy Benchmark.

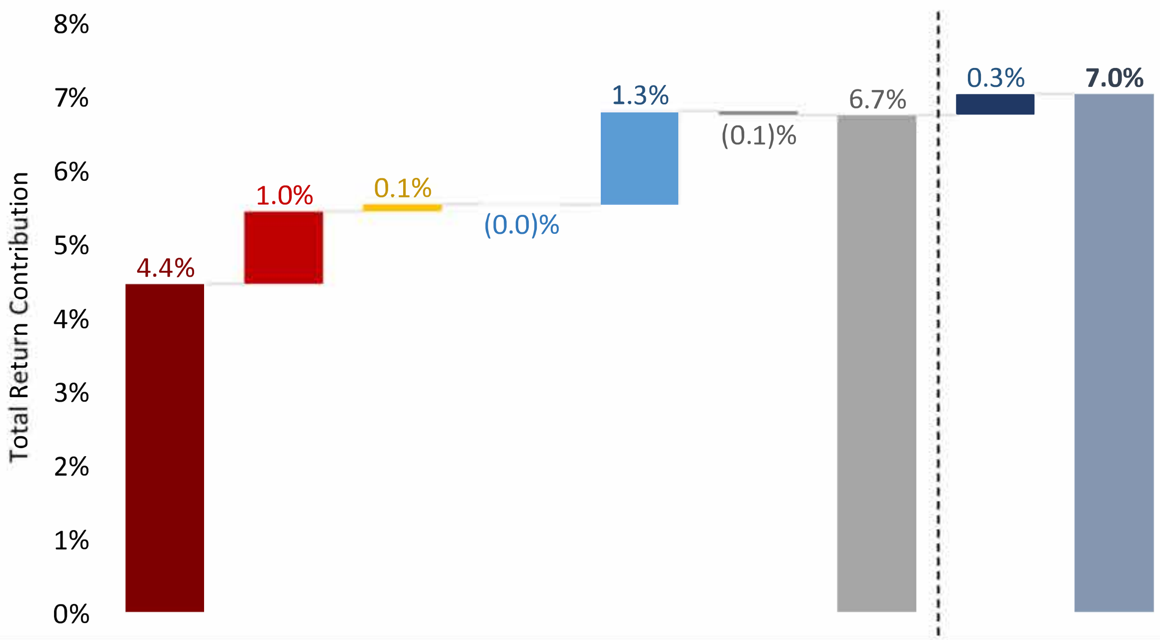
Section V. PERF Performance Detail

Sources of PERF NAV Change and Total Return *(as of 12/31/2022)*

Growth assets drove 10-Yr return

- Over the past 10 years, the PERF NAV has increased by nearly $200B
- Over longer periods, all programs generated positive returns
- PERF returns are typically driven by “growth” assets (e.g., public and private equity). Looking at 10-Yr performance, we see Public and Private Equity account for 5.4% (or 77%) of the PERF Total return of 7.0%

10-Yr Total Return Contribution



	Contribution from Policy Benchmark Components								
	Public Equity	**Private Equity**	**Income**	**Private Debt[1]**	**Real Assets**	**Other[2]**	**Total Policy BM**	**Value Added**	**Total Fund**
Average Weight	49.6%	9.5%	22.9%	0.1%	12.0%	6.5%	100%	-	-
Return	8.4%	10.8%	1.0%	-	9.5%	-	6.7%	-	**7.0%**
Cumul Dollar Return (bn)	$143.8	$24.7	$2.6	$(0.2)	$37.7	$3.8	$212.3	$12.1	**$224.4**

Exhibit 5.4

All performance reported net of investment expenses and annualized unless noted as cumulative.

[1] Private Debt was part of the Opportunistic Strategies Program prior to 7/1/2022.

[2] Other includes impact from historical Policy Benchmark allocations that are not part of the current Policy Benchmark.

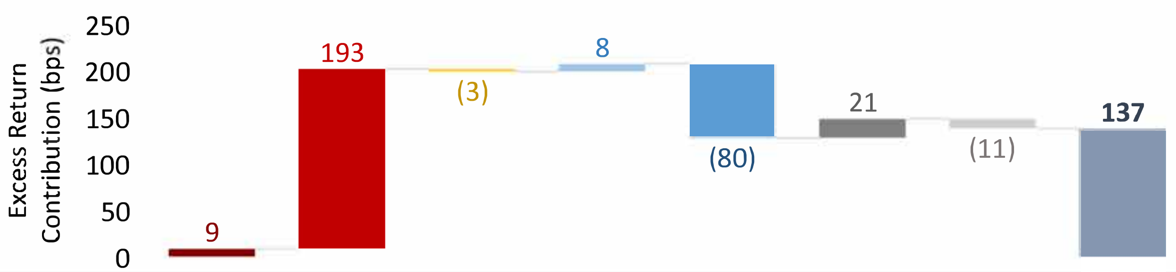
Section V. PERF Performance Detail

Attribution of PERF Excess Return *(as of 12/31/2022)*

Private assets dominate PERF Excess Return

- Although Private Assets comprised 20-25% of PERF NAV, those programs account for more than 80% of the excess return for the 1-Yr and 5-Yr periods
- The largest driver of excess returns for 1-Yr and 5-Yr periods is Private Equity, with the 5-Yr period being significantly impacted by the recent 1-Yr outperformance
- Private asset excess performance is best evaluated over longer periods due to challenges with benchmarking

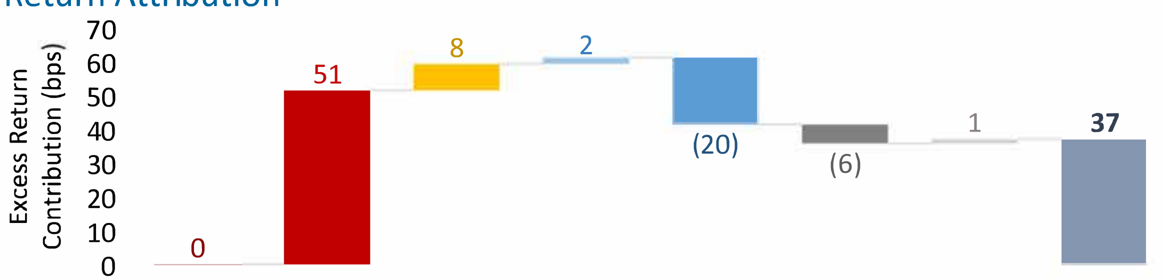
1-Yr Excess Return Attribution



	Public Equity	Private Equity	Income	Private Debt[1]	Real Assets	Allocation	Other[2]	Total Fund
Average Weight	47.2%	11.1%	26.2%	0.9%	14.5%	-	0.2%	**100%**
Return	(15.8)%	(2.3)%	(18.5)%	-	14.4%	-	-	**(11.2)%**
Benchmark Return	(16.0)%	(19.6)%	(18.4)%	-	20.9%	-	-	**(12.6)%**
Excess Return (bps)	18	1,728	(10)	-	(651)	-	-	**137**
Cumul Value Added (bn)	$0.4	$9.0	$(0.1)	$0.4	$(3.9)	$0.7	$(0.1)	**$6.4**

Exhibit 5.5

5-Yr Excess Return Attribution



	Public Equity	Private Equity	Income	Private Debt[1]	Real Assets	Allocation	Other[2]	Total Fund
Average Weight	50.0%	8.2%	27.0%	0.2%	11.5%	-	3.2%	**100%**
Return	5.3%	12.1%	(0.1)%	-	7.9%	-	-	**5.0%**
Benchmark Return	5.2%	6.5%	(0.4)%	-	9.1%	-	-	**4.7%**
Excess Return (bps)	4	565	25	-	(120)	-	-	**37**
Cumul Value Added (bn)	$0.7	$11.6	$1.4	$0.4	$(3.8)	$(0.9)	$0.3	**$9.7**

Exhibit 5.6

All performance reported net of investment expenses and annualized for periods greater than 1-Yr unless noted as cumulative.

[1] Private Debt was part of the Opportunistic Strategies Program prior to 7/1/2022.

[2] Other includes impact from investments in Non-SAA segments.

Section VI. PERF Risk Detail

Volatility

Slight increase in volatility from prior year in line with implementation of new Strategic Asset Allocation

Current Levels

- Total Forecasted Volatility for PERF increased by 0.8% from the prior year, in line with expectations and driven by trading to implement the new Strategic Asset Allocation adopted in November 2021
- Actionable Tracking Error is well below the Policy Limit of 100 bps and indicative of opportunities to increase active management. This metric captures deviations from benchmarks for all public market programs, Opportunistic, and asset allocation. There is no equivalent quantitative metric for private programs due to inherent limitations in modeling, measurement, and benchmarking

	Policy Limit	Current 12/30/2022	Last Qtr 6/30/2022	Last Year 1/4/2022[1]
Total Fund Volatility (%)	-	13.7	12.9	12.9
Policy Benchmark Volatility (%)	-	12.6	11.7	11.4
Actionable Tracking Error (%)	< 1.00	0.10	0.10	0.13
Total Fund Tracking Error (%)	-	1.59	1.63	1.87
Allocation (%)	-	0.00	0.00	0.01

Exhibit 6.1

Trends

- Forecast and realized volatility metrics indicate that active strategies in the portfolio have generally not materially increased overall volatility relative to the benchmark
- Note that the fluctuations in forecast volatility should not be interpreted as necessarily reflecting changes in the portfolio. Most of the variation below is the result of changing market conditions and model changes
- Similarly, comparison of forecast and realized volatility is also challenging, as realized volatility is lagged and biased downwards due to smoothed valuations in private assets

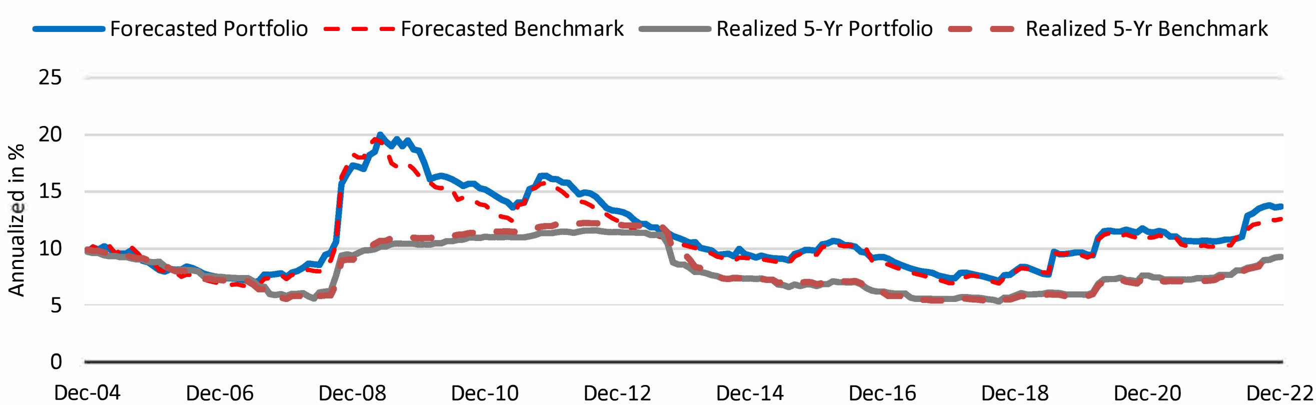


Exhibit 6.2

[1] *Risk estimates are from Aladdin risk model. Reported numbers in prior year report were from Barra risk model, showing Total Fund volatility of 10.6%. The lower value from Barra represents different modeling approaches between the vendors' models.*

Section VI. PERF Risk Detail

Historical Simulation

Significant PERF drawdowns should be expected in stress scenarios

Historical Stress Scenarios

- Historical stress testing is a complementary way to model the level of risk in a portfolio. It can provide a better intuitive feel than the statistical metric of standard deviation (volatility) while also exploring tail events
- The current PERF portfolio would have incurred significant drawdowns in recent market stress events, most notably the Global Financial Crisis of 2008. This result is in line with expectations given the portfolio's growth-sensitive composition
- Stress testing also reveals the portfolio would have closely tracked the benchmark, with slightly higher losses in the more extreme events

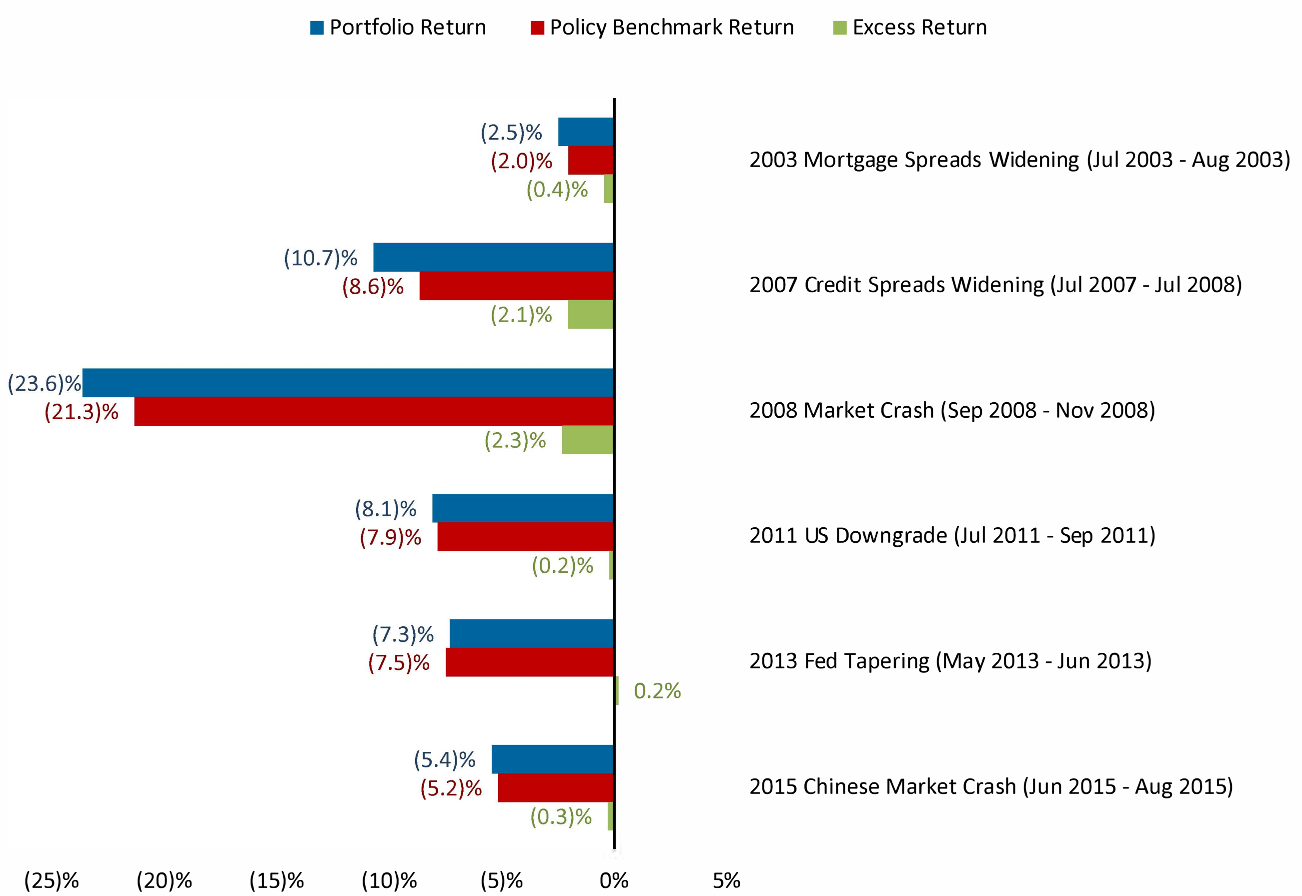


Exhibit 6.3

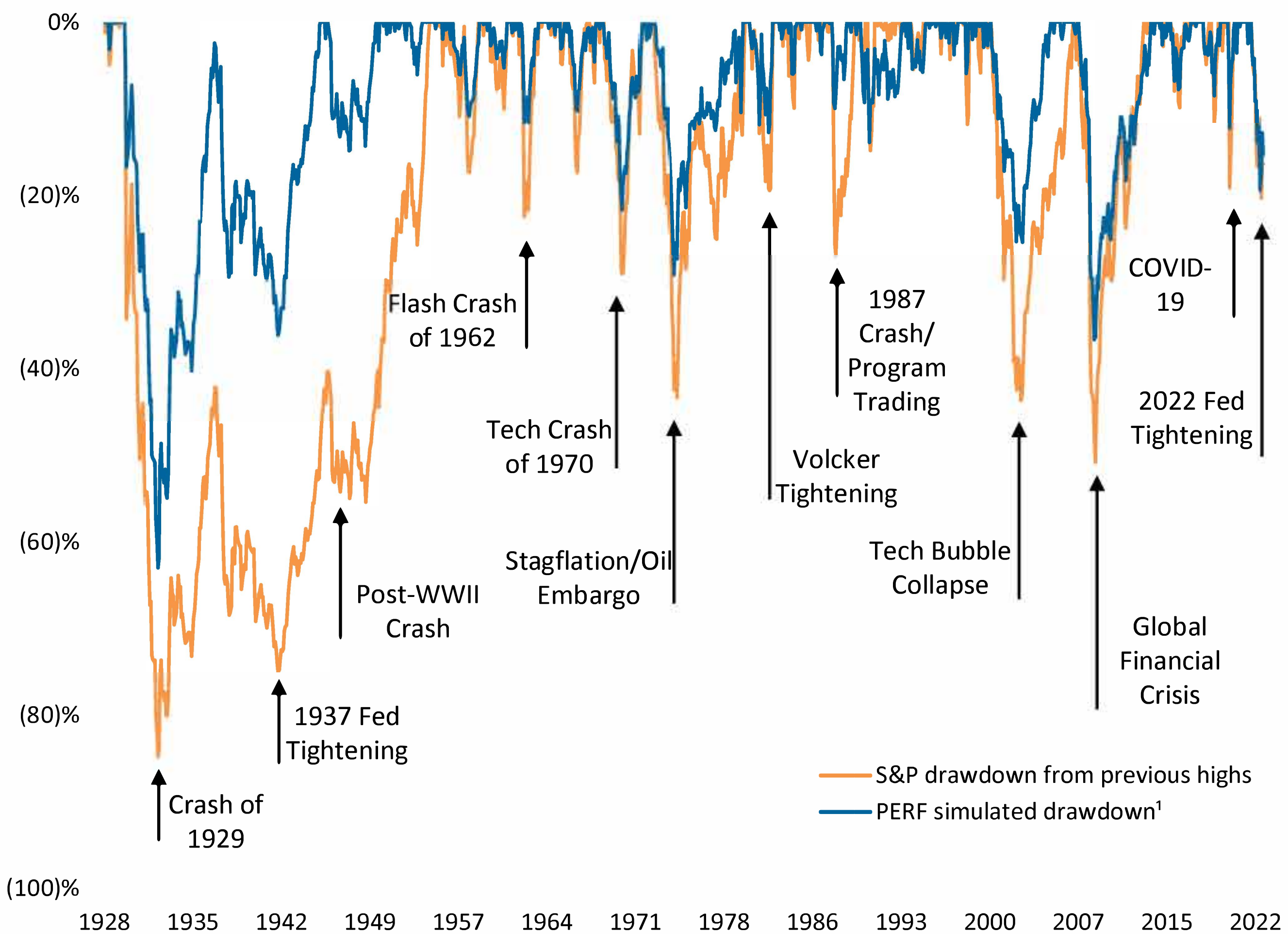
Section VI. PERF Risk Detail

Historical Simulation (cont.)

PERF risk profile closely tracks the equity market, though with lower overall risk

Simulated Drawdowns of PERF Strategic Allocation vs. S&P 500

- Longer-term historical simulation underscores a strong relationship between PERF's allocation and the stock market. We also note the level of drawdowns was generally lower than equity markets, reflecting the impact of diversification and a lower absolute risk level
- The analytical technique employed here provides a broader historical perspective than the stress tests shown on the prior page. However, it employs a less robust proxy-based methodology and does not offer resolution into active positions



Exhibite6.4

[1] *Simulated performance of PERF asset allocation rebalanced quarterly to the current policy targets assuming historical returns for current benchmarks. For historical periods when performance data is not available for some asset classes risk-comparable proxies are used.*

Section VI. PERF Risk Detail

Risk Decomposition *(as of 12/30/2022)*

Growth oriented asset classes dominate overall volatility

% Contribution to Total Portfolio Volatility

- Public and Private Equities contribute approximately 80% of Total Fund Volatility. The remaining asset classes are also either growth-oriented (e.g., Real Assets) or contain growth-oriented components (e.g., High Yield in fixed income)

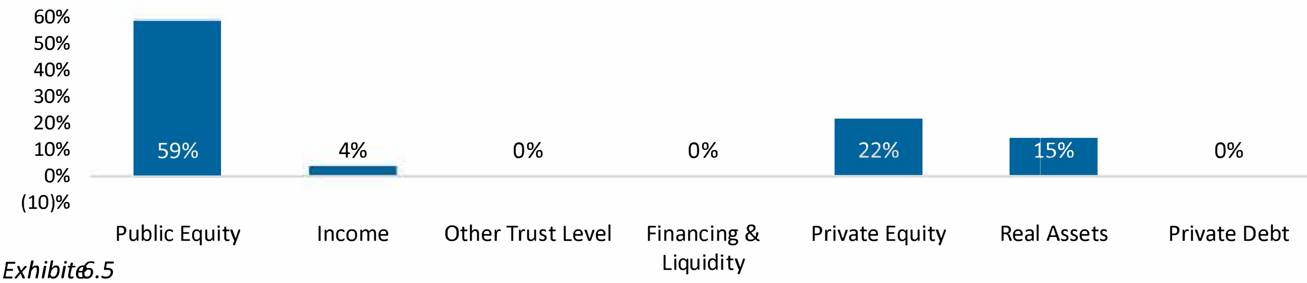


Exhibit 6.5

Asset Class		Market Value ($mm)	Total Forecasted Volatility (%)	% Contribution to Total Volatility
Public Asset Classes				
Public Equity	**$**	**210,114**	**17.4**	**59.1**
Cap Weighted	$	156,900	18.7	47.4
Factor Weighted	$	53,217	13.8	11.7
Income	**$**	**105,027**	**6.5**	**3.8**
IG Corp	$	25,734	9.5	1.1
MBS	$	23,639	6.1	0.2
High Yield	$	20,288	6.9	1.6
Treasury	$	14,692	11.2	(0.2)
EM Sov Debt	$	14,493	7.9	1.2
Total Fund Income	$	6,181	11.1	(0.1)
Other Trust Level	**$**	**16,594**	**2.7**	**0.3**
LLER	$	14,206	2.9	0.3
Opportunistic	$	210	4.5	0.0
Other	$	2,178	3.3	0.0
Financing & Liquidity	**$**	**(22,407)**	**-**	**0.0**
Liquidity	$	9,788	0.0	0.0
Trust Level Financing	$	(32,195)	-	0.0
Private Asset Classes				
Real Assets	**$**	**73,742**	**13.5**	**14.5**
Private Equity	**$**	**50,283**	**27.4**	**21.8**
Private Debt	**$**	**8,872**	**6.7**	**0.5**
TOTAL PERF	**$**	**442,228**	**13.7**	**100.0**

Exhibit 6.6

Section VI. PERF Risk Detail

Risk Decomposition (cont.) *(as of 12/30/2022)*

LLER is the largest contributor to actionable tracking error

% Contribution to Actionable Tracking Error

- Total Fund Actionable Tracking Error (TE) is small at 10 bps vs. a policy limit of 100 bps
- The primary contributor to Actionable TE is the Low Liquidity Enhanced Return (LLER) program. This is an active strategy which makes use of leverage to earn incremental return on excess PERF liquidity

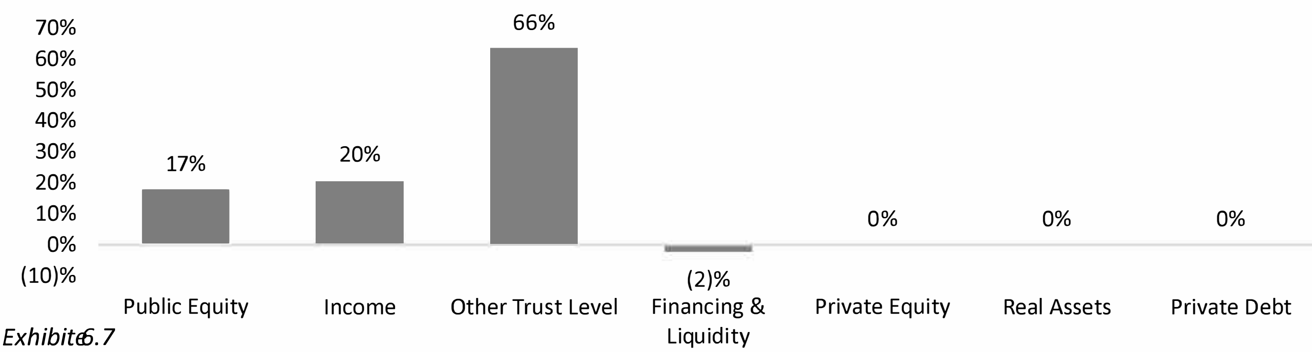


Exhibit 6.7

Asset Class	Tracking Error (bps)	% Contribution to Actionable Tracking Error
Public Equity	**11**	**17**
Cap Weighted	15	17
Factor Weighted	5	0
Income	**20**	**20**
IG Corp	56	7
MBS	50	9
High Yield	27	1
Treasury	16	0
EM Sov Debt	35	0
Total Fund Income	61	3
Other Trust Level	**266**	**66**
LLER	288	61
Opportunistic	446	1
Other	334	4
Financing & Liquidity	**-**	**(2)**
Liquidity	18	1
Trust Level Financing	-	(4)
TOTAL PERF Actionable	**10**	**100**
Real Assets	**425**	**-**
Private Equity	**1,094**	**-**
Private Debt	**225**	**-**
TOTAL PERF	**159**	**-**

Exhibit 6.8

Section VI. PERF Risk Detail

Diversification Characteristics *(as of 12/30/2022)*

PERF is mainly invested in the United States

Regional Exposures

- Non-US portfolio holdings are approximately 30% and widely diversified across regions and countries
- Lower portfolio weight in US relative to Policy Benchmark is due to international investments in Real Estate and Infrastructure

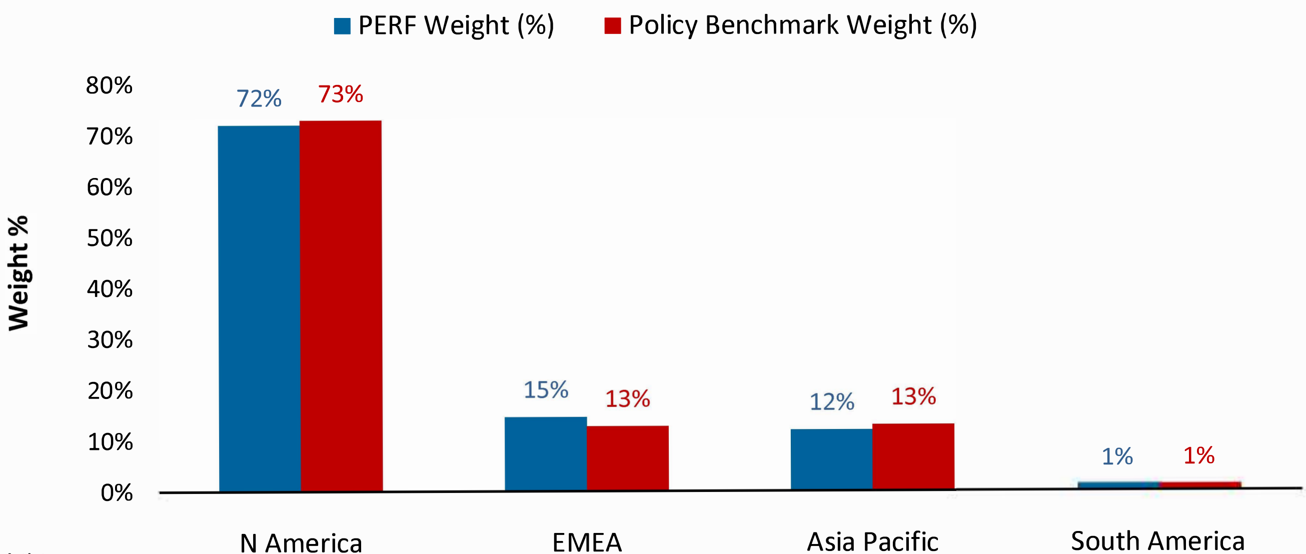


Exhibit 6.9

Top 10 Countries	PERF Weight (%)	Policy Benchmark Weight (%)	Active Weight (%)
United States	68.9%	70.4%	(1.5)%
Japan	3.8%	4.4%	(0.6)%
United Kingdom	3.1%	2.3%	0.8%
China[1]	2.6%	2.8%	(0.2)%
Canada	2.1%	2.1%	0.0%
Switzerland	1.5%	1.9%	(0.4)%
France	1.4%	1.4%	0.0%
Germany	1.3%	1.1%	0.2%
India	1.2%	1.1%	0.1%
Australia	1.2%	1.2%	0.0%

Exhibit 6.10

[1] Including Hong Kong

Section VI. PERF Risk Detail

Diversification Characteristics (cont.) *(as of 12/30/2022)*

25% foreign currency exposure

Foreign Currency Exposures

- PERF non-USD exposure is 24.9% versus 24.4% in the Policy Benchmark. Foreign currency exposure in the Policy Benchmark comes entirely from the public and private equity segments, which are global capitalization weighted
- PERF non-USD active exposure is small and reflects foreign unhedged holdings in Real Assets and differences between portfolio and benchmark in Private Equity

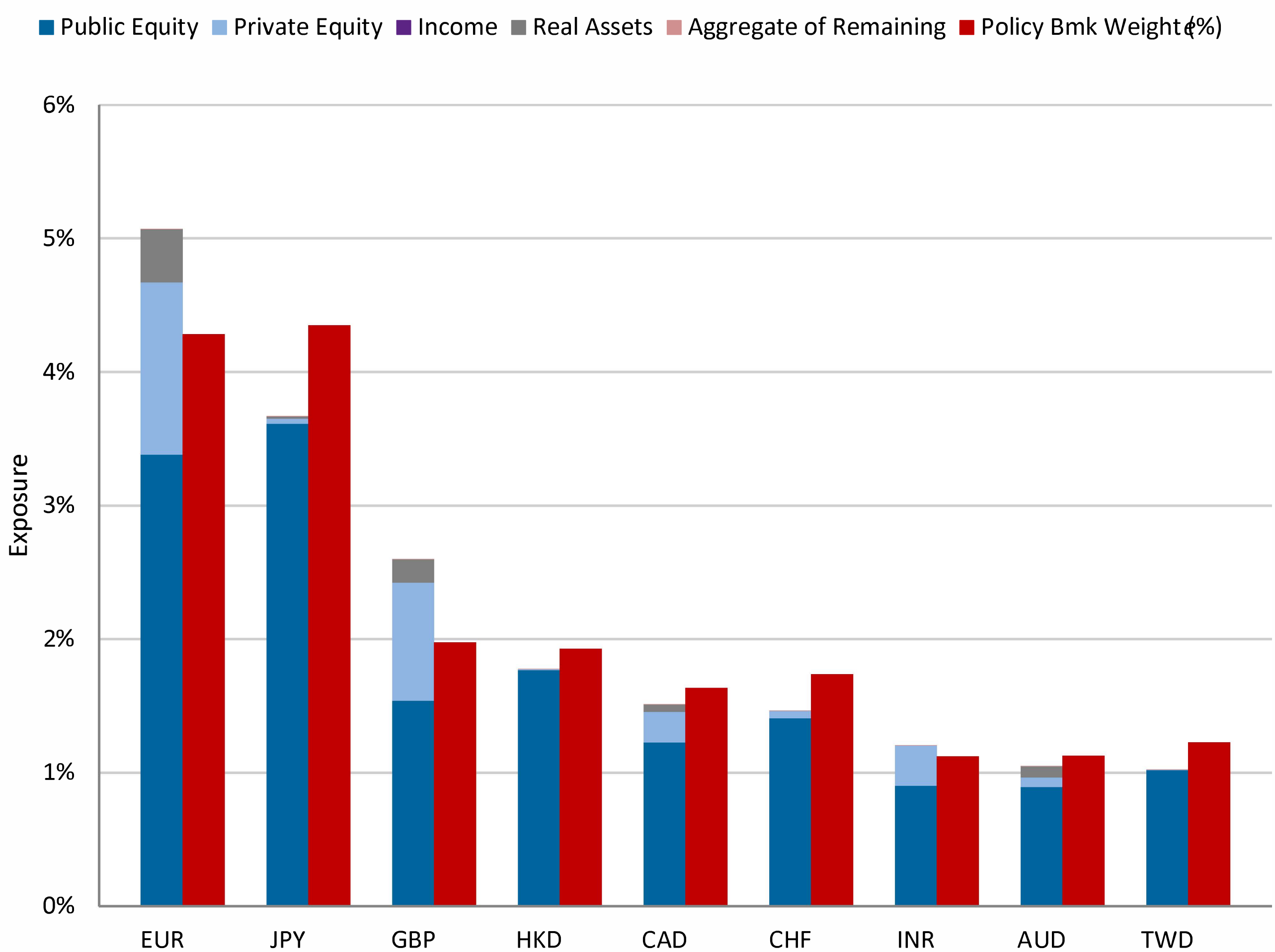


Exhibit 6.11

Section VI. PERF Risk Detail

Diversification Characteristics (cont.) *(as of 12/30/2022)*

PERF is diversified to individual issuers and industries

Issuer Concentration

- PERF is diversified across individual issuers
- The largest individual exposure is to the United States Government (2.2%)

Top 20 Issuers

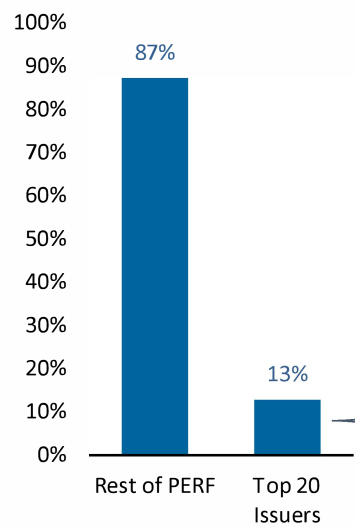


Exhibit 6.12

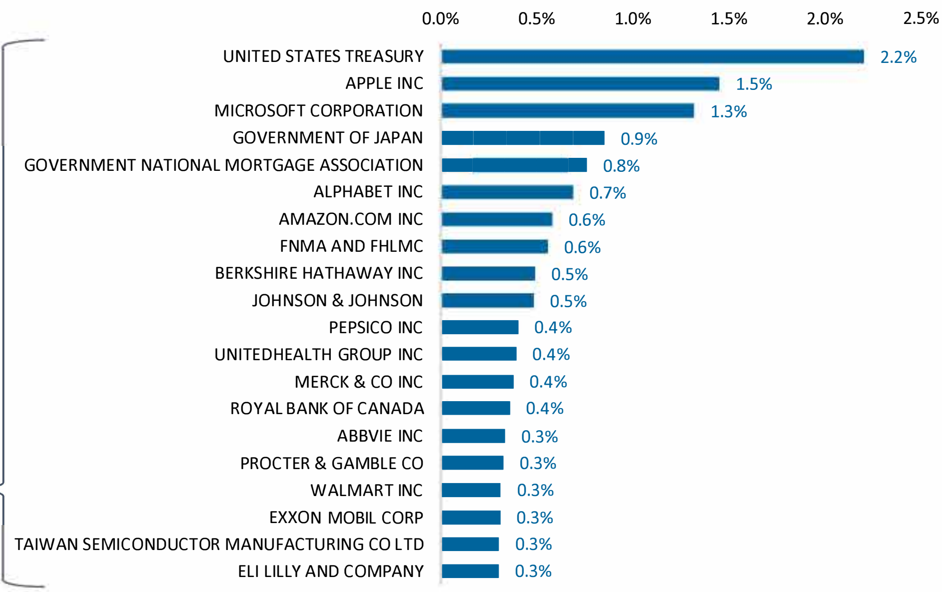


Exhibit 6.13

Industry Concentration – Top 10

- PERF industry mix closely tracks broad market's distribution

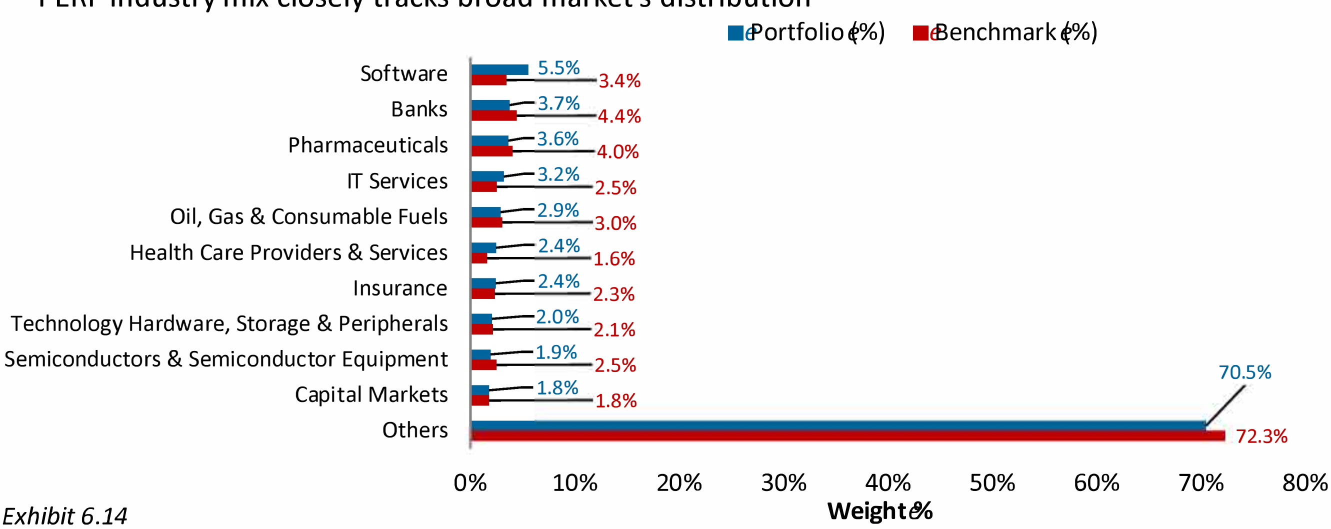


Exhibit 6.14

Section VI. PERF Risk Detail

Leverage *(as of 12/31/2022)*

PERF maintains modest leverage

Policy Leverage

- As of December 31, 2022, PERF total leverage was 6.7%. This reflects the combination of strategic leverage of 1.4% and active leverage of 5.3%
- Strategic leverage is on path towards the 5% target established in the November 2021 Strategic Asset Allocation
- Active leverage remains well within the 15% policy limit and primarily supports the Low Liquidity Enhanced Return Program (LLER)

PERF Leverage Breakdown[1,2]	Value ($mm)	Share of PERF NAV (%)
Fund Level		
LLER	14,178	3.2%
Opportunistic Strategies	210	0.0%
Forward Sale of Private Equity Holdings	2,028	0.5%
Other Trust Level	150	0.0%
Strategic Leverage - Portfolio	6,066	1.4%
Total - Fund Level	22,632	5.1%
Program Level vs Benchmark		
Public Equity	(220)	0.0%
Private Equity	0	0.0%
Income	(1,226)	(0.3)%
Real Assets[3]	8,322	1.9%
Real Estate (Program Leverage)	23,338	
Real Estate (Benchmark Leverage)	(15,015)	
Private Debt	0	0.0%
Other Trust Level (Forward Settlements)	0	0.0%
Total - Program Level	6,877	1.6%
Total - PERF	**29,509**	**6.7%**
Strategic Leverage – Benchmark	**6,066**	**1.4%**
Active Leverage	**23,443**	**5.3%**

Exhibit 6.15

1 FX Forwards used for hedging are not counted as leverage. Options are included based on delta adjusted notional value. Cash includes assets meeting Liquidity program guidelines.

2 On July 1, 2022, in connection with the new SAA, CalPERS updated the Leverage policy related procedures, and this table reflects the changes.

3 Real Assets debt is currently non-recourse.

Section VI. PERF Risk Detail

Leverage (cont.)

Implicit Leverage

- The prior page describes leverage managed and measured explicitly as part of implementation of the PERF portfolio, in line with the Total Fund Leverage Policy. In general, this leverage reflects deliberate investment choices made by CalPERS staff or its agents
- There is additional leverage in the portfolio that is an implicit characteristic of many of the assets we hold. For example, most private and public companies in the portfolio use leverage on their balance sheets
- This type of leverage is not a direct lever of portfolio management decisions. However, it forms part of the considerations that inform overall portfolio construction. For example, the leverage embedded in equities is one of the drivers of their relatively higher return and risk expectations, which are embedded in the Capital Market Assumptions which in turn impact asset allocation decisions
- The table below provides an indication of the level of embedded leverage in the three primary asset classes employed in PERF (in this representation, “1.59x” equates to 59% as reported for PERF policy leverage)

Asset Class	Embedded Leverage[1]
Public Equity	1.59 x
Private Equity	2.22 x
Real Estate (Benchmark)	1.27 x

Exhibit 6.16

[1] Embedded leverage shown represents Enterprise Value to Equity Ratio. Embedded leverage for Public Equity and Private Equity is estimated based on industry research.

Section VI. PERF Risk Detail

Liquidity *(as of 12/31/2022)*

PERF remains highly liquid

Liquidity by Asset Class

- The illustrative estimates below indicate some of the largest asset classes in PERF are also the most liquid

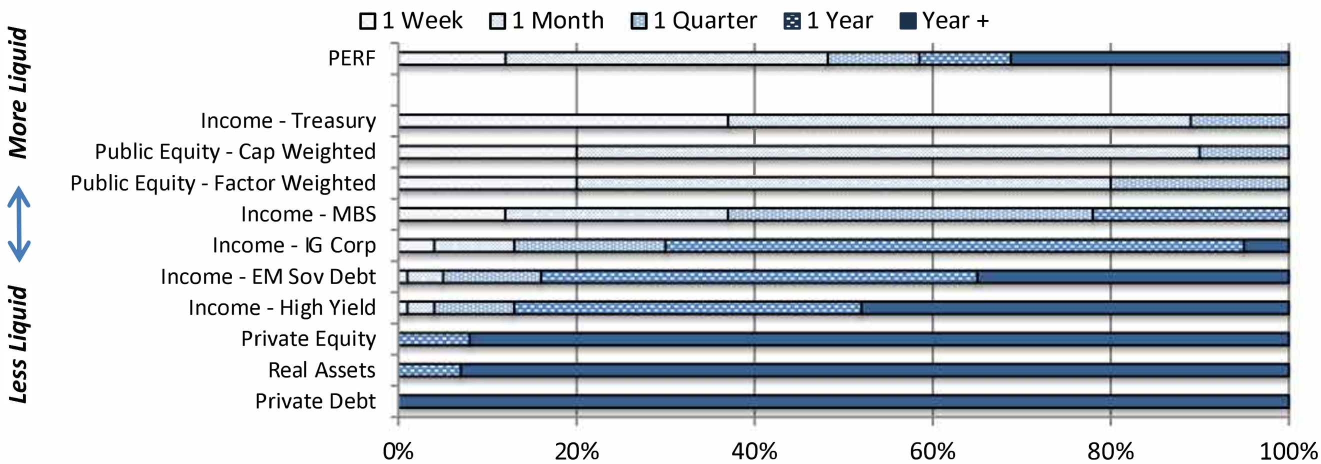


Exhibit 6.17

30-Day Operating Liquidity Coverage

- Day to day operating liquidity is adequate to cover extreme market stress scenarios

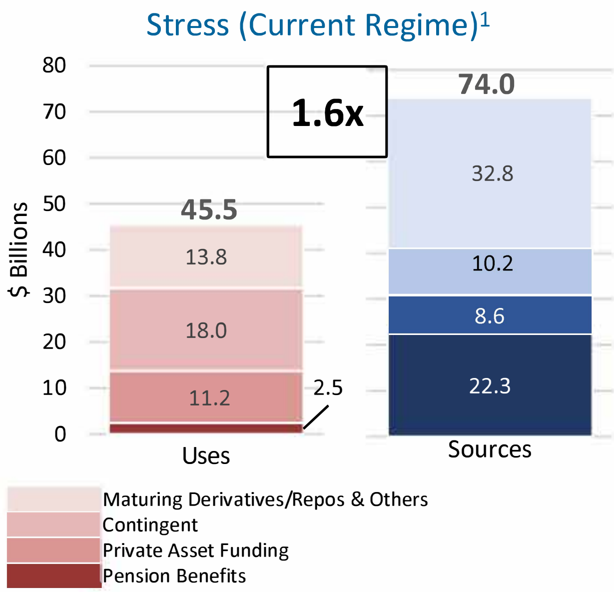


Exhibit 6.18

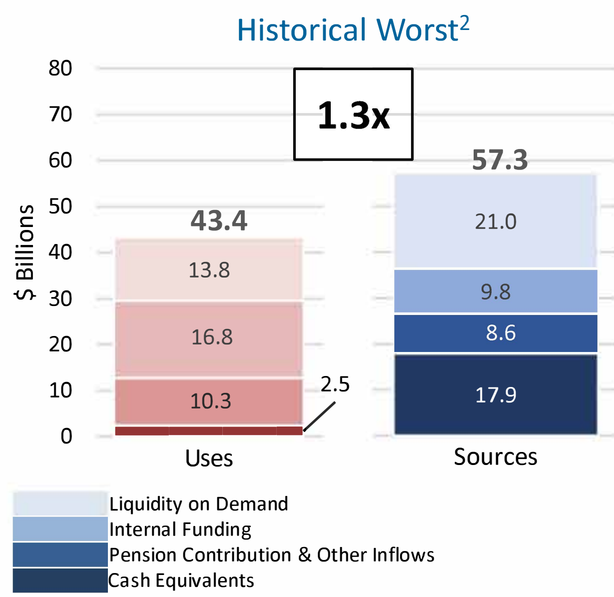


Exhibit 6.19

[1] ***Stress (Current Regime)** - Regime-dependent scenario to capture a "worst contemplated" outcome across liquidity uses and sources given current market conditions.*

[2] ***Historical Worst** - Historical experience for the 30-day period: 9/27/08-10/27/08 (the worst 30-day equity drawdown in the past 20 years) applied to current portfolio.*

Section VI. PERF Risk Detail

Counterparty Risk *(as of 12/31/2022)*

Counterparty risk is managed aggressively via monitoring and collateralization

- Counterparty risk is the risk that, in the event a counterparty fails, CalPERS would not have received enough collateral to cover the value cost in the contract with such counterparty. CalPERS seeks to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, posting collateral, monitoring procedures and entering into market accepted standard agreements
- CalPERS holds positions in swaps, options, futures, rights and warrants, forward foreign currency exchange, repurchase and reverse repurchase, forward purchase and securities lending contracts
- External investment managers might also hold such instruments. This report describes exposures directly contracted by CalPERS, and not by the external investment managers. External investment managers are required to have strict guidelines to manage and control counterparty risk
- CalPERS monitors and receives daily collateral on bilateral contracts
- Relative to the NAV, the net exposure owed to CalPERS is small and less than 1% of PERF NAV

Historical Bank Credit Default Swap Spreads (From June 2007 – Present)

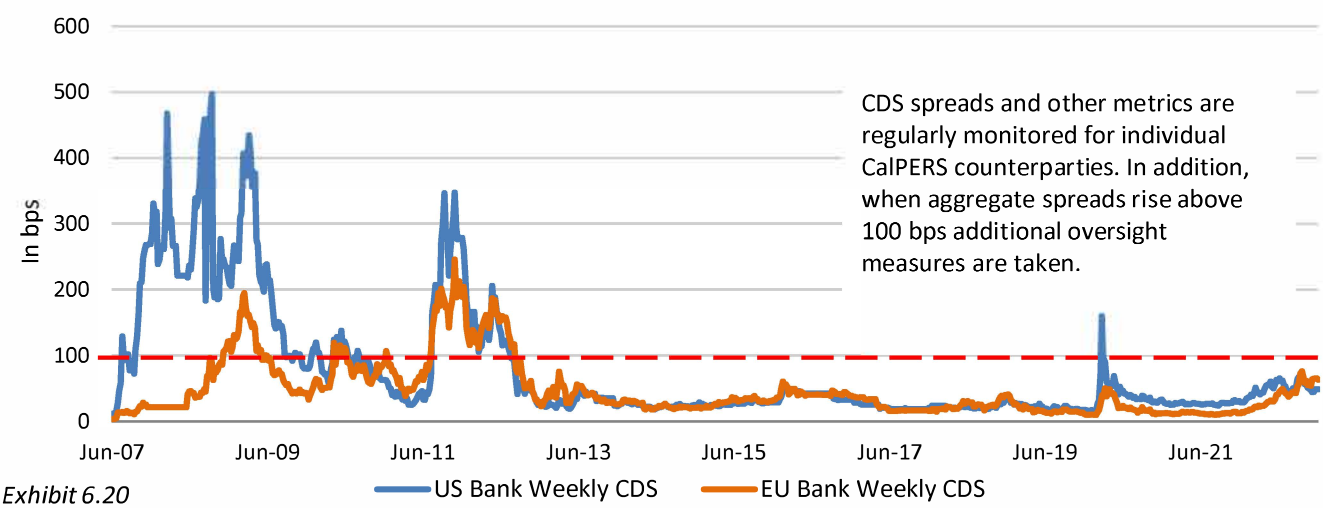


Exhibit 6.20

Futures Commission Merchant Exposure (Exchange traded derivatives/futures)

Counterparty	Collateral Posted ($mm)
Citigroup Global Markets Inc.	410.4
BOFA Securities Inc.	343.6
Total	**754.0**

Exhibit 6.21

Amounts Owed to CalPERS by Type of Contract

By Contract ($mm)	Mark-to-Market Exposure	Collateral Received	Net Owed to CalPERS
ISDA	835.6	840.8	(5.2)
MRA	2,598.7	2,688.0	(89.3)
SLA	45,299.6	47,660.0	(2,260.3)
MFSTA	-	-	-

Exhibit 6.22

Section VII. Definitions

Term	Definition
10 Year U.S. Treasury	The 10-Yr Treasury note (bond) is a debt obligation issued by the United States government with a maturity of 10 years upon initial issuance. A 10-Yr Treasury note pays interest at a fixed rate once every six months and pays the face value to the holder at maturity. The “10-Yr” is viewed as a sign of investor sentiment about the economy. A rising yield for the 10-Yr indicates falling demand for Treasury bonds, which means investors prefer higher-risk, higher-reward investments. A falling yield suggests the opposite.
Annual average percent change (aapc)	The change in a variable between one entire year and the prior entire year. This differs to an annual percent change, which looks at one point in time compared with the same point in time a year earlier.
Actionable Tracking Error	Investment Policy definition of the Total Fund tracking error that excludes the effect of active exposure from private asset classes arising from the modeling challenges and the non-investible nature of their benchmarks.
Active Leverage	The portion of Total Fund leverage that is controlled by staff and used to fund exposures incremental to the Strategic Asset Allocation.
Alpha	The measure of the return of an investment relative to an appropriate benchmark.
Basis Point (BP)	1 basis point is 1/100 of a percent or 0.01%.
Beta	A statistical measure of investment or portfolio return sensitivity to the market where the market is typically defined by a market index. A beta of 1.0 means the investment moves in synch with the market. A beta of 0.5 means the investment moves 50% as much as the market. A beta of 1.5 means the investment moves 150% as much as the market. For example, a portfolio with a beta of 0.8 is expected to have an 8% return when the market returns 10%.
Benchmark	A collection of assets to compare against the portfolio’s assets. These are typically market indices (e.g., SP500 or Bloomberg Barclays Global Aggregate). Benchmarks can be a useful tool to evaluate performance and risk.
Central Banks	The principal monetary authority of a nation, a central bank performs several key functions, including issuing currency and regulating the supply of credit in the economy. The Federal Reserve is the central bank of the United States.

Section VII. Definitions

Term	Definition
Consensus Economics	Consensus Economics is a global macroeconomic survey firm that polls more than 700 economists monthly for their forecasts for over 2,000 macroeconomic indicators in 115 countries. The company is headquartered in London, United Kingdom.
Consumer Prices Index (CPI)	An index which measures changes in the prices of a (weighted average) basket of goods and services. This basket is representative of aggregate U.S. consumer spending and is a common reference point for inflation.
Counterparty	The legal entity that holds the other side of a contract or financial transaction.
Economic Activity	Any action that involves producing, distributing, or consuming products or services is an economic activity. Used synonymously with real GDP growth.
Event Risk	Refers to any future potential occurrence that can cause losses for investors or other stakeholders in a company or investment.
Excess Return	The portfolio return minus the portfolio benchmark return. Time-weighted excess return is not affected by the amount of capital invested.
Federal Reserve Open Market Committee (FOMC)	A twelve-member committee made up of the seven members of the Board of Governors; the president of the Federal Reserve Bank of New York; and, on a rotating basis, the presidents of four other Reserve Banks. The FOMC meets eight times a year to set Federal Reserve guidelines regarding the purchase and sale of government securities in the open market and the policy (overnight) interest rate as a means of influencing the volume of bank credit and money in the economy.
Financial Market Pricing	Current price at which an asset or service can be bought or sold. The market price of an asset or service is determined by the forces of supply and demand and, when traded in real time on global financial markets, can be influenced by (unrealized) expectations around the future.
Future Commission Merchant (FCM)	Highly regulated entities that accept orders for exchange traded contracts in Central Counterparty Clearing House (CCPs). Collateral posted at the FCM is mostly used to meet the margin requirements at the CCPs. The collateral in the counterparty section has been provided to the FCM to post at the CCPs on behalf of CalPERS and bridging operational timing and processing gaps in collateral transfer.
High Yield (HY)	Compared to Investment Grade, these bonds have a lower credit rating meaning they have a relatively higher risk of default. Due to their higher probability of default, they pay a higher yield to compensate investors for the additional risk.

Section VII. Definitions

Term	Definition
Inflation	A rate of increase in the general price level of goods and services. The general term 'inflation' usually refers to the change in the CPI index over one year.
International Monetary Fund (IMF)	An international organization with 146 members, including the United States. The main functions of the IMF are to lend funds to member nations to finance temporary balance of payments problems, to facilitate the expansion and balanced growth of international trade, and to promote international monetary cooperation among nations. The IMF also creates special drawing rights (SDR's), which provide member nations with a source of additional reserves. Member nations are required to subscribe to a Fund quota, paid mainly in their own currency. The IMF grew out of the Bretton Woods Conference of 1944.
International Swaps and Derivatives Association (ISDA)	A trade organization of market participants that facilitates standardization of contractual agreements to trade over-the-counter derivative contacts. CalPERS enters into ISDA agreements to trade derivatives; for example, FX forwards, total return and interest rate swaps.
Investment Grade (IG)	Bonds with a higher credit rating meaning they have a relatively low risk of default.
Liquidity Coverage Ratio	Metric refers to the proportion of liquid assets to meet short term obligations under a stress scenario (within 30 days). The ratio divides Sources of Liquidity by Uses of Liquidity.
Liquidity (sources of)	Includes: Cash Equivalents, Pension Contributions & Other Inflows, Internal Funding and Liquidity on Demand.
Liquidity (uses of)	Includes: Pension Benefits, Private Asset Funding, Contingent uses and Maturing Derivatives/Repos & Others.
Macroeconomics	A branch of economics that studies how an overall economy (markets, businesses, consumers, and governments) behave. Macroeconomics examines economy-wide phenomena such as inflation, price levels, rate of economic growth, national income, gross domestic product (GDP), and changes in unemployment.
Master Repurchase Agreement (MRA)	The bilateral agreement that governs the collateralized loans of securities. CalPERS uses this contract to enter into forward purchase/repurchase of US Treasuries and Mortgage securities and to post/receive collateral in return (also known as Repo and Reverse Repo).

Section VII. Definitions

Term	Definition
Master Securities Forward Transaction Agreement (MFSTA)	The bilateral agreement that CalPERS uses to enter into forward purchase or sale of mortgage bonds and "TBA" instruments.
Net Asset Value (NAV)	The value of an investment fund's assets less its liabilities.
Net Return	Performance net of internal and external investment office management expenses. CalPERS’ performance uses a daily Modified-Dietz methodology which is geometrically linked to produce time-weighted returns for longer periods. Daily Rate of Return Formula • 6/30/2016 & Prior: Dollar Value Added / (Beginning Market Value + Net Cash Flows) • 7/1/2016 to Present: Dollar Value Added / Beginning Market Value • Dollar Value Added = Gains/losses due to price appreciation and income Daily returns are geometrically linked to produce longer period returns.
Unfunded Commitments	A legally binding commitment to a private asset investment fund/vehicle for which the capital has not yet been drawn.
Oil (Brent)	A crude oil blend commonly referred to as Brent Blend, London Brent, or Brent petroleum. It is the main global benchmark for oil prices.
Oil (WTI)	West Texas Intermediate is also crude oil blend. It serves as the main US benchmark for oil prices.
Over the Counter (OTC)	A decentralized market where participants trade stocks, bonds, currencies, or derivatives without a centralized exchange or broker.
Public Employee’s Retirement Fund (PERF)	An investment fund created under California state statute and exclusively controlled by the CalPERS Board. The fund is managed with the expressed purpose of paying retirement benefits to participating members.
Policy Rate	The policy interest rate is that at which the central bank will pay or charge commercial banks for their deposits or loans. This rate affects the interest rate that commercial banks apply with their customers, both borrowers and depositors, and more generally, impacts on the general price (rate) of credit in the economy.

Section VII. Definitions

Term	Definition
Portfolio Market Value	The sum of the underlying investment values +/- any open receivables or payables (uninvested assets), consistent with the Net Asset Value or Total Net Assets reported in accounting. • Public Asset Market Values are calculated as units held x price per unit + accrued income. • Private Asset Market Values represent an opinion of value as of a certain date as stated by either the investment advisor or independent appraiser. Market value differs from amount funded or net investment in that the value includes unrealized gains or losses during the holding period.
Real Gross Domestic Product (GDP)	Measures the total economic output of a country over a specified period (often a year) adjusted for changes in price. The total economic output refers to the volume of all goods and services produced by an economy. It is often referred to as constant-price GDP or constant dollar GDP.
SLA/Sec Lending	Refers to the Securities Lending Agreement ("SLA") under which CalPERS lends securities and receives either cash or other securities as collateral.
Supply-Chain	A network of individuals and companies who are involved in creating a product and delivering it to the consumer. Links on the chain begin with the producers of the raw materials and end when the finished product is delivered to the end user.
Supplemental Income Plans (SIP)	Refers to the combined program for the Public Employees' Deferred Compensation Fund and the Supplemental Contributions Program.
Tracking Error	Standard deviation of the differential return between the portfolio and an equal investment in the benchmark.
Uncertainty	The range of possible values or paths. These are unknown.
Value Added	The incremental gain or loss in dollars resulting from portfolio implementation, active management, and imperfectly investible benchmarks. Over shorter time horizons, the benchmark component can create significant variability in outcomes. Unlike a time-weighted excess return which does not account for the size of the investment, value added will vary with the amount of capital invested. Also referred to as “Dollar Value Added”.
Volatility	A measure of the distribution of portfolio returns (or a given security). It is typically defined as the statistical standard deviation of returns, annualized.

Section VII. Definitions

Term	**Definition**
Wage Growth	Wages are the compensation paid to employees for the work or services they perform over a specified period. In the US it is often described as average hourly earnings. Wage growth typically refers to the annual change in wages.
Yield Curve	A yield curve is a line that plots yields (interest rates) of bonds having equal credit quality but differing maturity dates. The slope of the yield curve gives an idea of future interest rate changes and economic activity. There are three main yield curve shapes: normal (upward sloping curve), inverted (downward sloping curve), and flat.