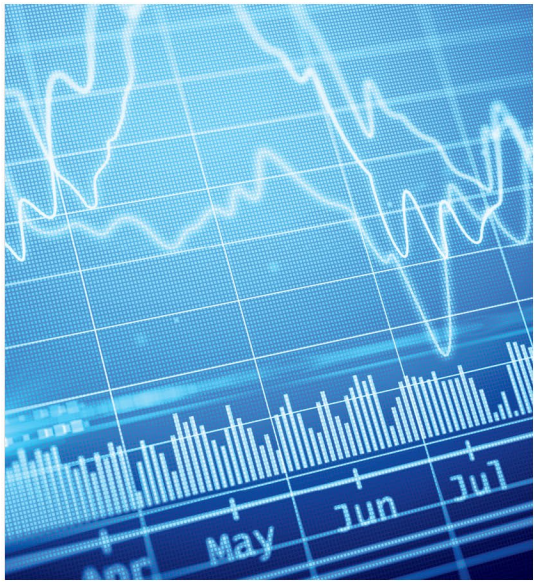
CalPERS | Investment Office



Trust Level Review

As of September 30, 2024

Contents

Section		Page
I.	PERF Summary	3
II.	Performance Tables	4
III.	Markets and Economy	10
IV.	PERF Allocation	11
V.	PERF Risk Detail	12

Appendices

Appendix 1: PERF Benchmarks	15
Appendix 2: Definitions	16

Section I. PERF Summary

As of September 30, 2024

Public Employees' Retirement Fund (PERF) Metrics

$531.6bn Assets Under Management	**6.9%** 10-Yr Total Return	**5.3%** Fiscal Year-to-Date Total Return	**$0.8bn** 5-Yr Cumulative Value Added	**$(0.2)bn** Fiscal Year to-Date Value Added
13.5% Forecasted Volatility	**13bps** Forecasted Actionable Tracking Error	**30.6%** Allocation to Private Assets	**2.6x** 30-Day Tier 1 Stress Liquidity Coverage Ratio[1]	**61%** Allocation to Actively Managed Assets

Quarter-End Highlights

Capital Markets

- Global public equity markets rose further, supported by the Fed's 50 bps rate cut and strong corporate earnings. Market breadth expanded beyond the Magnificent 7, and emerging markets led regional returns with 10.9% returns due to China's stimulus. The Global Public Equity portfolio posted strong 7.4% returns but underperformed its benchmark by 16 bps.
- The Income Segment returned 6.3% for the quarter, driven by falling interest rates and expectations of aggressive Fed rate cuts. All sector portfolios posted positive returns, with the 1-year return rising to 15.5%, mainly due to spread tightening and falling rates, with the longest-duration portfolios contributing the most.

Private Markets

- Strong absolute 1-year returns from Private Debt (+16%) & Private Equity (+12%) with a markdown from Real Asset (-6.5%) due to weakness in Real Estate markets.
- Strong relative outperformance from Private Debt & Real Assets with underperformance from Private Equity due to strong public equity market performance.

Total Fund Risk

- No significant changes in PERF risk profile over the past quarter. Current market volatility and funding conditions remain stable, and all key risk parameters are in expected ranges.
- Latent risks include elevated asset valuations and the potential for a reversal of inflation pressures, potentially limiting central banks' abilities to ease policy.

Investment Process

- The recruitment for the Managing Investment Director for the Private Debt program is currently underway.
- The team continues to progress the FY 2024-25 Initiatives of Talent & Culture, Data & Technology, Portfolio Resilience/ ALM & Sustainable Investments.

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

[1] *As of 10/2/24*

Section II. Performance Tables

As of September 30, 2024

PERF Returns

PERF returned 18.0% for the trailing 1-Yr and 7.4% for the trailing 5-Yr

- Equity and Income 1-Yr returns were strong at 30.3% and 15.5% respectively
- 1-Yr Private Markets returns were mixed, with Real Assets delivering negative absolute return (6.5)% but with strong relative outperformance, whilst Private Debt and Private Equity delivered positive absolute but with negative relative return for Private Equity.
- Overall PERF returns over the 5-Yr, 10-Yr, and 20-Yr periods are above the current 6.8% discount rate

	End Value (B)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Total PERF	**$ 531.6**	**6.9%**	**6.9%**	**7.4%**	**18.0%**	**5.3%**	**5.3%**
Benchmark		7.4%	7.0%	7.3%	18.8%	5.4%	5.4%
Excess		(49) bps	(5) bps	8 bps	(76) bps	(4) bps	(4) bps
Cumulative Value Added (B)		$ (19.3)	$ (2.2)	$ 0.8	$ (3.4)	$ (0.2)	$ (0.2)
Public Equity	**$ 219.3**	**8.3%**	**9.3%**	**11.3%**	**30.3%**	**7.4%**	**7.4%**
Benchmark		8.5%	9.3%	11.1%	30.2%	7.6%	7.6%
Excess		(13) bps	6 bps	20 bps	14 bps	(16) bps	(16) bps
Cumulative Value Added (B)		$ (0.3)	$ 1.1	$ 1.9	$ 0.2	$ (0.3)	$ (0.3)
Income	**$ 158.2**	**4.6%**	**2.6%**	**0.4%**	**15.5%**	**6.3%**	**6.3%**
Benchmark		4.0%	2.3%	0.3%	15.2%	6.2%	6.2%
Excess		55 bps	34 bps	16 bps	22 bps	5 bps	5 bps
Cumulative Value Added (B)		$ 5.3	$ 2.7	$ 1.0	$ 0.3	$ 0.1	$ 0.1
Private Equity	**$ 85.4**	**12.1%**	**10.9%**	**12.8%**	**11.8%**	**3.1%**	**3.1%**
Benchmark		13.5%	11.3%	12.6%	21.1%	2.9%	2.9%
Excess		(141) bps	(37) bps	14 bps	(928) bps	17 bps	17 bps
Cumulative Value Added (B)		$ (16.1)	$ (7.7)	$ (6.3)	$ (6.7)	$ 0.3	$ 0.3
Real Assets	**$ 67.3**	**4.4%**	**5.3%**	**3.1%**	**(6.5)%**	**(1.0)%**	**(1.0)%**
Benchmark		7.1%	5.2%	2.2%	(10.0)%	(0.7)%	(0.7)%
Excess		(262) bps	13 bps	88 bps	346 bps	(34) bps	(34) bps
Cumulative Value Added (B)		$ (11.0)	$ 0.6	$ 1.6	$ 2.3	$ (0.2)	$ (0.2)
Private Debt	**$ 16.4**	**-**	**-**	**-**	**16.1%**	**3.2%**	**3.2%**
Benchmark		-	-	-	12.1%	2.4%	2.4%
Excess		-	-	-	402 bps	79 bps	79 bps
Cumulative Value Added (B)		-	-	-	$ 0.4	$ 0.1	$ 0.1
Net Financing	**$ (26.3)**	**-**	**-**	**-**	**-**	**-**	**-**
Other Trust Level	**$ 11.2**	**-**	**-**	**-**	**-**	**-**	**-**

Exhibit 2.1

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

Section II. Performance Tables

As of September 30, 2024

PERF Capital Market Returns

All Capital Market segments had positive returns over all periods except Treasury, which was negative for the trailing 5-Yr period

- Equity performance was strong over the trailing 1-Yr with 31.9% for Cap Weighted and 26.5% for Factor Weighted
- Treasury turned sharply positive for the trailing 1-Yr with a 13.9% return though trailing 5-Yr performance is still negative at (3.2)%

	End Value (B)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Cap Weighted	**$ 166.3**	**8.6%**	**9.8%**	**12.7%**	**31.9%**	**6.6%**	**6.6%**
Benchmark		8.7%	9.8%	12.5%	31.7%	6.8%	6.8%
Excess		(12) bps	7 bps	23 bps	14 bps	(20) bps	(20) bps
Cumulative Value Added (B)		$ (0.6)	$ 0.8	$ 1.5	$ 0.2	$ (0.3)	$ (0.3)
Factor Weighted	**$ 53.0**	**-**	**-**	**7.4%**	**26.5%**	**9.8%**	**9.8%**
Benchmark		-	-	7.4%	26.3%	9.8%	9.8%
Excess		-	-	6 bps	15 bps	(2) bps	(2) bps
Cumulative Value Added (B)		-	-	$ 0.2	$ 0.1	$ (0.0)	$ (0.0)
Treasury	**$ 39.2**	**-**	**0.9%**	**(3.2)%**	**13.9%**	**7.1%**	**7.1%**
Benchmark		-	1.0%	(3.1)%	13.9%	7.1%	7.1%
Excess		-	(2) bps	(8) bps	0 bps	0 bps	0 bps
Cumulative Value Added (B)		-	$ (0.2)	$ (0.2)	$ 0.0	$ 0.0	$ 0.0
MBS	**$ 28.3**	**3.7%**	**2.0%**	**0.3%**	**12.5%**	**5.4%**	**5.4%**
Benchmark		3.0%	1.5%	0.1%	12.2%	5.4%	5.4%
Excess		63 bps	56 bps	14 bps	30 bps	(9) bps	(9) bps
Cumulative Value Added (B)		$ 1.2	$ 0.7	$ 0.2	$ 0.1	$ (0.0)	$ (0.0)
IG Corporates	**$ 34.3**	**5.5%**	**3.4%**	**0.4%**	**18.0%**	**7.6%**	**7.6%**
Benchmark		5.0%	3.2%	0.2%	18.0%	7.5%	7.5%
Excess		55 bps	27 bps	23 bps	3 bps	12 bps	12 bps
Cumulative Value Added (B)		$ 1.3	$ 0.4	$ 0.3	$ 0.0	$ 0.0	$ 0.0
High Yield	**$ 28.3**	**-**	**-**	**4.1%**	**14.7%**	**4.5%**	**4.5%**
Benchmark		-	-	4.1%	14.7%	4.5%	4.5%
Excess		-	-	1 bps	(5) bps	1 bps	1 bps
Cumulative Value Added (B)		-	-	$ 0.0	$ (0.0)	$ 0.0	$ 0.0
EM Sovereign Bonds	**$ 28.3**	**-**	**-**	**-**	**17.6%**	**6.3%**	**6.3%**
Benchmark		-	-	-	16.9%	6.1%	6.1%
Excess		-	-	-	73 bps	19 bps	19 bps
Cumulative Value Added (B)		-	-	-	$ 0.2	$ 0.1	$ 0.1

Exhibit 2.2

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

Section II. Performance Tables

As of September 30, 2024

PERF Private Market Returns

Private Equity, Private Debt, and Infrastructure have positive returns over all periods

- Private Equity excess performance can fluctuate rapidly over short periods with mark to market changes in its public benchmark
- Private assets have positive performance over the trailing 5-Yr, 10-Yr, and 20-Yr periods except for Forestland's trailing 10-Yr return
- Infrastructure outperformed Real Estate over all periods

	End Value (B)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Private Equity	**$ 85.4**	**12.1%**	**10.9%**	**12.8%**	**11.8%**	**3.1%**	**3.1%**
Benchmark		13.5%	11.3%	12.6%	21.1%	2.9%	2.9%
Excess		(141) bps	(37) bps	14 bps	(928) bps	17 bps	17 bps
Cumulative Value Added (B)		$ (16.1)	$ (7.7)	$ (6.3)	$ (6.7)	$ 0.3	$ 0.3
Private Debt	**$ 16.4**	**-**	**-**	**-**	**16.1%**	**3.2%**	**3.2%**
Benchmark		-	-	-	12.1%	2.4%	2.4%
Excess		-	-	-	402 bps	79 bps	79 bps
Cumulative Value Added (B)		-	-	-	$ 0.4	$ 0.1	$ 0.1
Infrastructure	**$ 18.0**	**-**	**9.2%**	**6.5%**	**5.0%**	**1.8%**	**1.8%**
Benchmark		-	3.8%	2.2%	(10.0)%	(0.7)%	(0.7)%
Excess		-	540 bps	424 bps	1,495 bps	251 bps	251 bps
Cumulative Value Added (B)		-	$ 4.5	$ 3.5	$ 2.4	$ 0.4	$ 0.4
Real Estate	**$ 49.0**	**3.9%**	**4.9%**	**2.1%**	**(10.0)%**	**(2.0)%**	**(2.0)%**
Benchmark		7.5%	5.4%	2.2%	(10.0)%	(0.7)%	(0.7)%
Excess		(360) bps	(57) bps	(15) bps	1 bps	(135) bps	(135) bps
Cumulative Value Added (B)		$ (15.1)	$ (3.2)	$ (1.8)	$ (0.1)	$ (0.7)	$ (0.7)
Forestland	**$ 0.3**	**-**	**(0.1)%**	**3.7%**	**2.2%**	**(1.0)%**	**(1.0)%**
Benchmark		-	3.8%	2.2%	(10.0)%	(0.7)%	(0.7)%
Excess		-	(387) bps	143 bps	1,221 bps	(30) bps	(30) bps
Cumulative Value Added (B)		-	$ (0.9)	$ (0.1)	$ 0.0	$ (0.0)	$ (0.0)

Exhibit 2.3

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

Section II. Performance Tables

As of September 30, 2024

Affiliate Investments Returns

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 (M)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Judges' Retirement Fund	**$ 56.8**	**1.8%**	**1.8%**	**2.5%**	**5.7%**	**1.4%**	**1.4%**
Benchmark		1.6%	1.6%	2.3%	5.5%	1.4%	1.4%
Excess		15 bps	16 bps	18 bps	20 bps	1 bps	1 bps
Judges' Retirement System Fund II	**$ 2,847.6**	**6.9%**	**6.7%**	**7.5%**	**25.3%**	**8.1%**	**8.1%**
Benchmark		6.7%	6.4%	7.2%	25.0%	8.1%	8.1%
Excess		16 bps	26 bps	27 bps	26 bps	4 bps	4 bps
Legislators' Retirement System Fund	**$ 96.3**	**5.4%**	**4.2%**	**3.6%**	**17.3%**	**6.4%**	**6.4%**
Benchmark		5.2%	4.1%	3.5%	17.2%	6.3%	6.3%
Excess		21 bps	15 bps	9 bps	2 bps	5 bps	5 bps
Health Care Fund	**$ 74.5**	**3.2%**	**1.5%**	**(0.4)%**	**7.4%**	**1.4%**	**1.4%**
Benchmark		3.1%	1.5%	(0.4)%	7.5%	1.4%	1.4%
Excess		11 bps	5 bps	(3) bps	(9) bps	2 bps	2 bps
Long-Term Care Fund	**$ 4,617.6**	**5.0%**	**4.0%**	**3.7%**	**20.8%**	**6.5%**	**6.5%**
Benchmark		4.8%	3.9%	3.7%	20.8%	6.6%	6.6%
Excess		16 bps	7 bps	2 bps	4 bps	(6) bps	(6) bps
CERBT Strategy 1 Fund	**$20,011.7**	**-**	**6.7%**	**7.6%**	**24.9%**	**8.1%**	**8.1%**
Benchmark		-	6.4%	7.4%	24.7%	8.1%	8.1%
Excess		-	29 bps	21 bps	19 bps	3 bps	3 bps
CERBT Strategy 2 Fund	**$ 2,147.9**	**-**	**5.5%**	**5.5%**	**22.0%**	**7.8%**	**7.8%**
Benchmark		-	5.2%	5.4%	21.9%	7.8%	7.8%
Excess		-	24 bps	14 bps	17 bps	3 bps	3 bps
CERBT Strategy 3 Fund	**$ 839.5**	**-**	**4.4%**	**4.1%**	**19.6%**	**7.4%**	**7.4%**
Benchmark		-	4.3%	4.0%	19.5%	7.4%	7.4%
Excess		-	20 bps	10 bps	15 bps	3 bps	3 bps
CEPPT Strategy 1 Fund	**$ 209.0**	**-**	**-**	**5.5%**	**20.9%**	**7.2%**	**7.2%**
Benchmark		-	-	5.5%	20.9%	7.3%	7.3%
Excess		-	-	2 bps	(5) bps	(4) bps	(4) bps
CEPPT Strategy 2 Fund	**$ 65.3**	**-**	**-**	**-**	**16.9%**	**6.4%**	**6.4%**
Benchmark		-	-	-	16.9%	6.4%	6.4%
Excess		-	-	-	(3) bps	(0) bps	(0) bps

Exhibit 2.4

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

Section II. Performance Tables

As of September 30, 2024

Affiliate Investments Returns

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 (M)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
Target Income Fund	**$ 197.2**	**-**	**4.2%**	**4.9%**	**17.1%**	**5.4%**	**5.4%**
Benchmark		-	4.1%	4.7%	17.1%	5.4%	5.4%
Excess		-	12 bps	13 bps	2 bps	(2) bps	(2) bps
Target 2020 Fund	**$ 170.7**	**-**	**4.9%**	**6.2%**	**18.5%**	**5.6%**	**5.6%**
Benchmark		-	4.8%	6.1%	18.5%	5.6%	5.6%
Excess		-	13 bps	15 bps	2 bps	(2) bps	(2) bps
Target 2025 Fund	**$ 243.3**	**-**	**5.9%**	**7.7%**	**21.3%**	**5.9%**	**5.9%**
Benchmark		-	5.7%	7.5%	21.3%	5.9%	5.9%
Excess		-	14 bps	17 bps	1 bps	(3) bps	(3) bps
Target 2030 Fund	**$ 277.7**	**-**	**6.6%**	**8.9%**	**23.5%**	**6.1%**	**6.1%**
Benchmark		-	6.5%	8.8%	23.5%	6.1%	6.1%
Excess		-	11 bps	11 bps	0 bps	(3) bps	(3) bps
Target 2035 Fund	**$ 202.9**	**-**	**7.5%**	**10.2%**	**26.0%**	**6.4%**	**6.4%**
Benchmark		-	7.3%	10.1%	26.0%	6.4%	6.4%
Excess		-	12 bps	13 bps	(0) bps	(4) bps	(4) bps
Target 2040 Fund	**$ 193.8**	**-**	**8.3%**	**11.4%**	**28.7%**	**6.7%**	**6.7%**
Benchmark		-	8.1%	11.3%	28.7%	6.7%	6.7%
Excess		-	12 bps	12 bps	(1) bps	(4) bps	(4) bps
Target 2045 Fund	**$ 121.4**	**-**	**8.7%**	**11.6%**	**29.8%**	**6.8%**	**6.8%**
Benchmark		-	8.5%	11.5%	29.8%	6.8%	6.8%
Excess		-	12 bps	13 bps	(1) bps	(5) bps	(5) bps
Target 2050 Fund	**$ 77.5**	**-**	**8.7%**	**11.6%**	**29.8%**	**6.8%**	**6.8%**
Benchmark		-	8.5%	11.5%	29.8%	6.8%	6.8%
Excess		-	12 bps	13 bps	(1) bps	(5) bps	(5) bps
Target 2055 Fund	**$ 31.8**	**-**	**8.7%**	**11.6%**	**29.8%**	**6.8%**	**6.8%**
Benchmark		-	8.5%	11.5%	29.8%	6.8%	6.8%
Excess		-	13 bps	13 bps	(1) bps	(5) bps	(5) bps
Target 2060 Fund	**$ 15.4**	**-**	**-**	**11.6%**	**29.8%**	**6.8%**	**6.8%**
Benchmark		-	-	11.5%	29.8%	6.8%	6.8%
Excess		-	-	10 bps	(1) bps	(5) bps	(5) bps
Target 2065 Fund[1]	**$ 4.4**	**-**	**-**	**-**	**29.8%**	**6.8%**	**6.8%**
Benchmark		-	-	-	29.8%	6.8%	6.8%
Excess		-	-	-	(1) bps	(5) bps	(5) bps

Exhibit 2.5

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

Section II. Performance Tables

As of September 30, 2024

Affiliate Investments Returns

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 (M)	20-Yr	10-Yr	5-Yr	1-Yr	FYTD	1-Qtr
SSgA STIF	**$ 119.1**	-	**1.8%**	**2.5%**	**5.7%**	**1.4%**	**1.4%**
Benchmark		-	1.6%	2.3%	5.5%	1.4%	1.4%
Excess		-	19 bps	18 bps	20 bps	0 bps	0 bps
SIP US Short Term Bond Core	**$ 38.3**	-	**1.6%**	**1.7%**	**7.1%**	**2.9%**	**2.9%**
Benchmark		-	1.6%	1.7%	7.2%	3.0%	3.0%
Excess		-	(8) bps	(3) bps	(5) bps	(1) bps	(1) bps
SIP US Bond Core	**$ 54.0**	-	**1.9%**	**0.3%**	**11.6%**	**5.2%**	**5.2%**
Benchmark		-	1.8%	0.3%	11.6%	5.2%	5.2%
Excess		-	3 bps	1 bps	0 bps	(1) bps	(1) bps
SIP Real Asset Core	**$ 18.5**	-	**4.4%**	**8.0%**	**13.1%**	**6.3%**	**6.3%**
Benchmark		-	4.4%	7.9%	13.1%	6.3%	6.3%
Excess		-	0 bps	8 bps	(2) bps	0 bps	0 bps
SIP Russell All Cap Core	**$ 845.5**	-	**12.8%**	**15.3%**	**35.2%**	**6.2%**	**6.2%**
Benchmark		-	12.8%	15.3%	35.2%	6.2%	6.2%
Excess		-	2 bps	3 bps	(2) bps	0 bps	0 bps
SIP Global All Cap EX-US	**$ 84.2**	-	**5.5%**	**7.9%**	**25.0%**	**8.1%**	**8.1%**
Benchmark		-	5.3%	7.7%	25.1%	8.2%	8.2%
Excess		-	22 bps	20 bps	(2) bps	(12) bps	(12) bps

Exhibit 2.6

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

Section III. Markets and Economy

As of September 30, 2024

Macroeconomic Drivers and Outlook

Synchronicity in policy easing supported asset market returns in Q3

Asset markets delivered positive returns

- Asset market returns over the quarter fluctuated but ended broadly positive. Reductions in central bank policy rates, including a 50bp point reduction by the Federal Reserve, boosted returns for growth assets and fixed income products.
- The synchronicity in policy rate cuts across developed market economies comes despite a wide variation of growth outcomes. Economic data in Japan have improved, while data outturns in the United States have been mixed. Macroeconomic data releases in Europe remain somber, as have headline data released from China. Taken together, 2024 global economic activity is expected to grow 3.2% in real terms, as private domestic demand moderates from its post-covid pace.
- Market outcomes this quarter were bolstered by the combination of the rate cutting cycle and the expectation of a soft landing in the United States economy. Known event risks, such as the Middle East conflict and uncertainty around the outcome of the upcoming United States election have not weighed on markets. By contrast, surprise (unknown) events have resulted in rapid market moves. For example, the temporary pull-back in equity markets and the yen exchange rate in early August and the appreciation of China's stock market after fresh China government stimulus was announced. Over the September quarter, asset returns remained positive.
- The consensus expects central banks to support economies as disinflation continues and economic momentum slows, but pockets of risk remain. Risks to the growth outlook are to the downside: the average United States consumer has a strong balance sheet, but households are showing signs of stress, corporate profits are slowing, and businesses are paring back their hiring intentions. Commercial real estate markets remain challenged, forward earnings expectations for the US are lofty, and credit spreads are at or near historical lows (tight). On the inflation outlook, risks are to the upside: surprise or outsized geopolitical events have the potential to derail the disinflationary process.

Central bank policy rate and market expectations

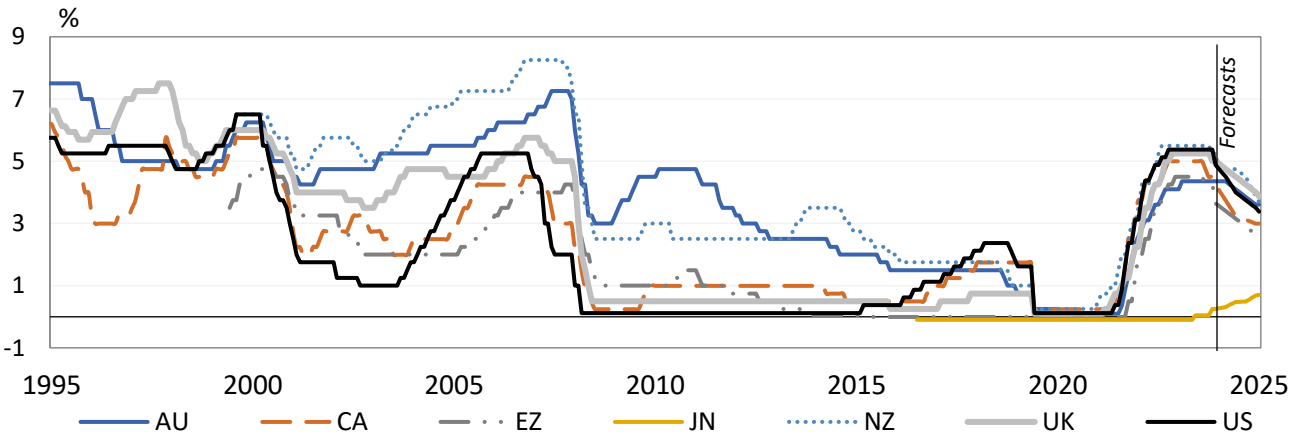


Exhibit 3.1
Source: Haver Analytics, Bloomberg Finance L.P., CalPERS calculations based on OIS curves

Section IV. PERF Allocation

As of September 30, 2024

Strategic Asset Allocation

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 roughly reflect expected pacing towards the long-term SAA
- The charts below show current positioning versus current interim targets
- Illiquid Private allocations cannot be precisely targeted and fluctuate significantly due to public vs. private valuation changes. The policy bands exist in part to allow for a reasonable level of variation over time

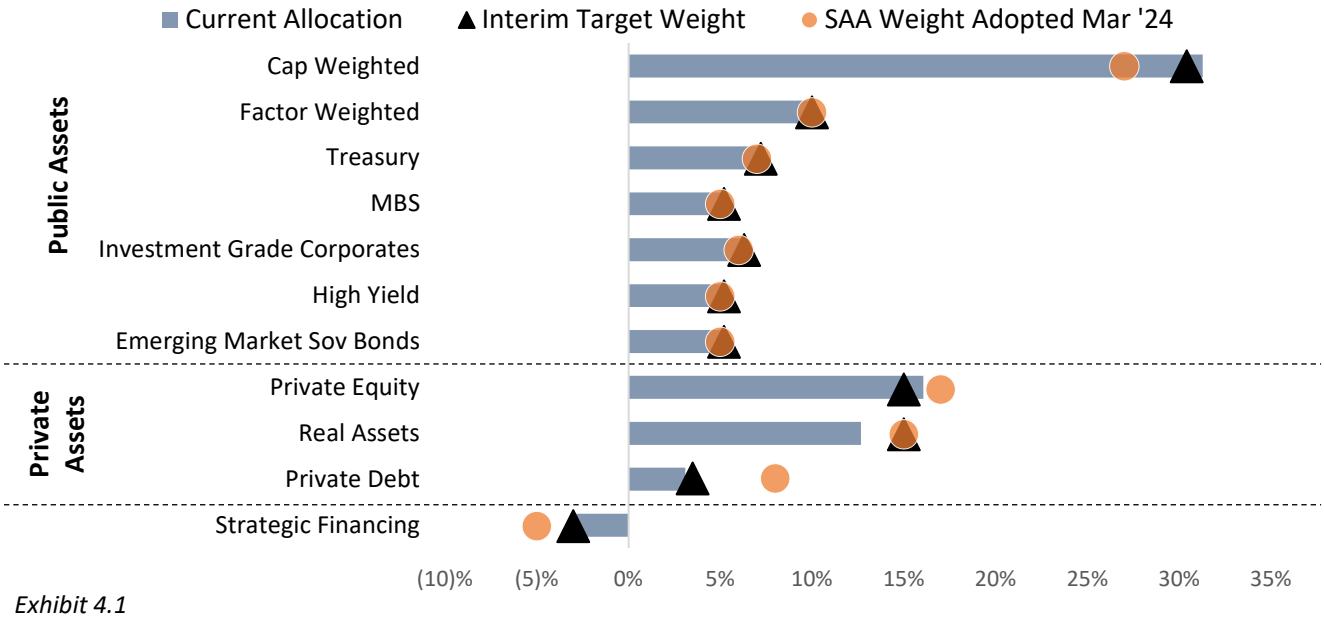


Exhibit 4.1

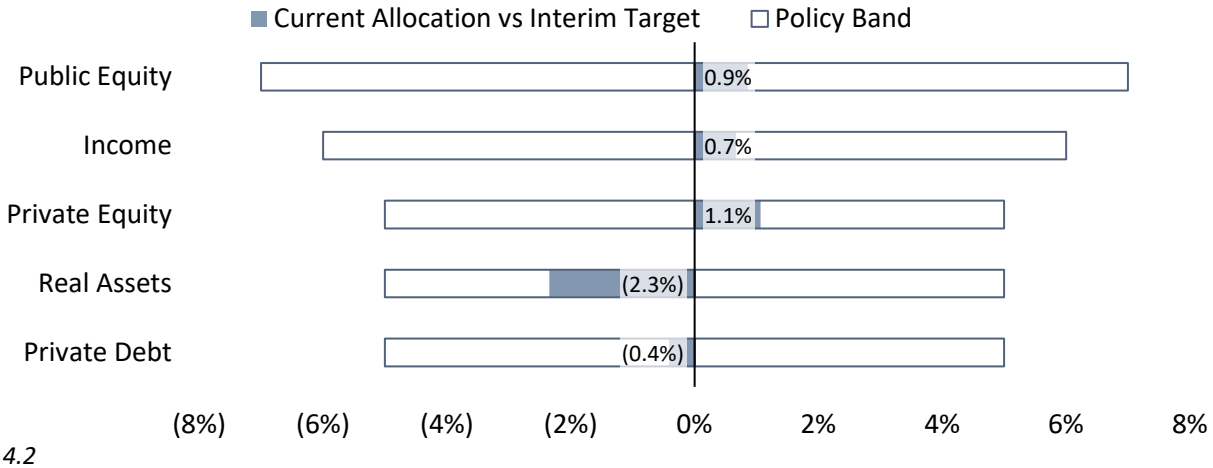


Exhibit 4.2

[1] *Income current allocation does not include Tactical Fixed Income.*

Section V. Risk Detail

As of September 30, 2024

Volatility

Total portfolio volatility has been in line with expectations

Current Levels

- Main total fund metrics, such as Total Fund Volatility, Tracking Error, and Actionable Tracking Error, have been stable for the past year
- The Actionable Tracking Error metric captures deviations from benchmarks for all public market programs, out-of-benchmark opportunistic investments, and asset allocation. The current level of 13 basis points relative to the Policy Limit of 100 basis points indicates available leeway to increase active management in these spheres. There is no equivalent quantitative metric for private programs due to inherent limitations in modeling, measurement, and benchmarking

	Policy Limit	Current 9/30/2024	Last Qtr 6/30/2024	Last Year 9/29/2023
Total Fund Volatility (%)	-	13.5	13.5	13.5
Policy Benchmark Volatility (%)	-	12.2	12.0	12.3
Tracking Error (%)				
Actionable	< 1.00	0.13	0.15	0.16
Total Fund	-	1.91	2.02	1.81
Allocation	-	0.02	0.03	0.04

Exhibit 5.1

Section V. Risk Detail

As of September 30, 2024

Risk Decomposition

Growth oriented asset classes dominate overall risk

% Contribution to Total Portfolio Volatility

- Growth-oriented assets dominate Total Fund Volatility: public and private equities contribute approximately 84% and the remaining asset classes have also significant growth component. For Income, diversification benefits offset much of the inherent volatility

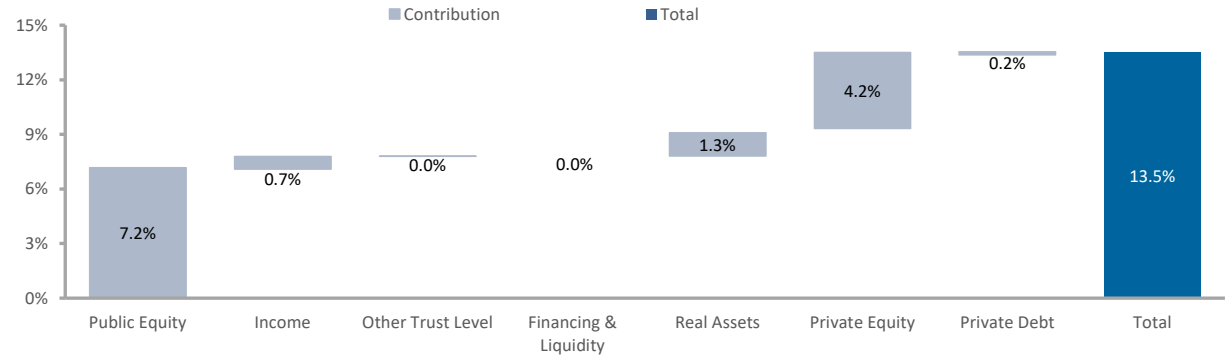


Exhibit 5.2

Asset Class	Market Value[1] ($ Millions)	Total Forecasted Volatility (%)	% Contribution to Total Volatility	5-Year Realized Volatility (%)
Public Asset Classes				
Public Equity	**218,869**	**17.7**	**53.0**	**16.1**
Cap Weighted	165,905	18.8	42.5	17.5
Factor Weighted	52,965	14.7	10.6	13.4
Income	**158,211**	**5.9**	**5.1**	**8.9**
Treasury	39,189	10.9	-0.2	11.9
IG Corp	34,252	9.9	1.5	12.9
High Yield	28,256	4.7	1.3	9.1
EM Sov Debt	28,265	8.1	2.1	-
MBS	28,249	5.1	0.3	6.4
Other Trust Level	**11,128**	**2.5**	**0.2**	**-**
LLER	10,714	2.5	0.2	3.1
Opportunistic	228	2.9	0.0	-
Tactical Fixed Income	3	0.0	0.0	-
Other	183	10.3	0.0	-
Financing & Liquidity	**(27,984)**	**-**	**0.0**	**-**
Liquidity	10,607	0.0	0.0	0.0
Trust Level Financing	(38,591)	-	0.0	-
Private Asset Classes				
Private Equity	**85,450**	**26.8**	**30.9**	**10.4**
Real Assets	**67,316**	**11.3**	**9.4**	**6.1**
Private Debt	**16,429**	**6.9**	**1.3**	**-**
TOTAL PERF	**529,419**	**13.5**	**100.0**	**9.5**

Exhibit 5.3

[1] *Data source: Blackrock's Aladdin; some differences with State Street primarily due to timing of recording some cash flows*

Section V. Risk Detail

Risk Decomposition (cont.)

Active equities and LLER are the largest contributors to Actionable TE

% Contribution to Actionable Tracking Error

- Total Fund Actionable Tracking Error (TE) is at 13 basis points vs. a policy limit of 100 basis points
- The primary contributors are external public equity managers; other meaningful contributors are allocation management and the Low Liquidity Enhanced Return (LLER) program

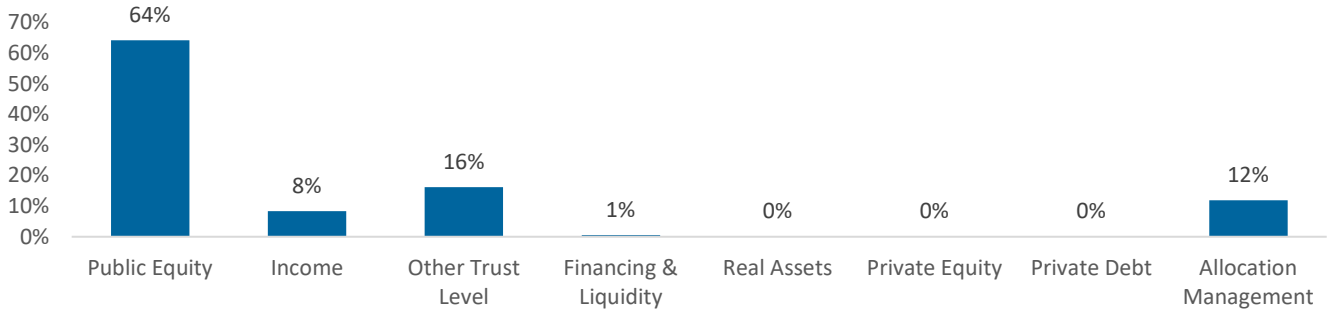


Exhibit 5.4

Asset Class	Forecasted Tracking Error (basis points)	% Contribution to Actionable TE	5-Year Realized TE (basis points)
Public Equity	**27**	**64**	**18**
Cap Weighted	35	65	24
Factor Weighted	10	-1	12
Income	**19**	**8**	**22**
Treasury	10	0	36
IG Corp	33	0	43
High Yield	48	-4	29
EM Sov Debt	56	6	-
MBS	53	6	32
Other Trust Level	**214**	**16**	**-**
LLER	251	15	294
Opportunistic	295	0	-
Tactical Fixed Income	16	0	-
Other	1,028	0	-
Financing & Liquidity	-	**1**	**-**
Liquidity	16	1	-
Trust Level Financing	-	0	-
Allocation Management	**2**	**12**	-
TOTAL PERF Actionable	**13**	**100**	**14**
Private Equity	**1,035**		**1,340**
Real Assets	**359**		**280**
Private Debt	**467**		**-**
TOTAL PERF	**191**		**169**

Exhibit 5.5

Appendix 1: PERF Benchmarks

Asset Class	Policy Benchmark
Public Equity – Cap Weighted	Custom FTSE All World, All Cap Equity
Public Equity – Factor Weighted	Custom FTSE Factor Weighted Index
Private Equity	Custom FTSE All World, All Cap Equity + 150 basis points, Quarter Lag
Income - Treasury	Custom Bloomberg Government
Income - MBS	Custom Bloomberg Mortgage
Income - IG Corporates	Custom Bloomberg Corporate ex Sov
Income - High Yield	Custom Bloomberg High Yield
Income - EM Sovereign Bonds	Custom JP Morgan EMBIG Diversified
Real Assets	MSCI/PREA U.S. ACOE Quarterly Property Fund Index (Unfrozen), Quarter Lag
Private Debt	Morningstar LSTA U.S. Leveraged Loan 100 Index + 125 bps, Quarter Lag
Strategic Leverage	ICE BofA US 3-Month Treasury Bill Index +50 bps

Appendix 2: 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.

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.

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).

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.

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.

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.