



Executive Summary of Performance

Prepared For

California Public Employees' Retirement System

Judges II

Legislators' Fund

Long-Term Care

California Employers' Retiree Benefit Trust

Health Care Fund

Supplemental Income Plans

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Capital Market Overview

U.S. Equity Market

The U.S. stock market, represented by the Wilshire 5000 Total Market IndexSM, was down -14.29% for the fourth quarter of 2018 and -5.27% for the year. This marks the worst quarter for U.S. equities since 2011 and the first down year since the credit crisis sell-off of 2008. The index had been down by double-digits for the year in late-December before gaining nearly 7% during the final few trading days. Concerns of an economic slowdown weighed on stock prices as did fears that additional rate increases by the Federal Reserve could weaken future prospects for economic growth. Ongoing trade negotiations between China and the U.S. continued to be a factor affecting market activity during the quarter with the eventual resolutions standing as a major unknown entering the new year.

Large capitalization stocks far outperformed small caps for the quarter as the Wilshire Large-Cap IndexSM was down -13.69% versus a loss of -19.67% for the Wilshire US Small-Cap IndexSM. The large-cap segment of the market leads small-caps for the past twelve months, as well. The Wilshire US Micro-Cap IndexSM was down -23.50% for the quarter and -15.58% for the one-year. Growth stocks trailed value, generally, during the fourth quarter but outperformed during the past twelve months.

Nearly all of the eleven major sectors were in negative territory during the fourth quarter. The only positive sector was Utilities (+0.8%) with Energy (-25.6%), Industrials (-18.2%) and Information Technology (-17.5%) down the most.

Fixed Income Market

The U.S. Treasury yield curve fell across most maturities during the quarter with the biggest decreases occurring in the intermediate to longer segment of the curve. The bellwether 10-year Treasury yield ended the quarter at 2.69%, down 37 basis points from September. The Federal Open Market Committee decided to increase its overnight rate by 25 basis points in December to a range of 2.25% to 2.50%. The committee adjusted their forecast for future rates, communicated through their "dot plot," from three rate increases in 2019 to only two. Credit spreads widened during the quarter within both the investment grade and high yield markets.

The yield curve ended 2018 with a very unusual shape – which will likely be a source of debate if it persists, largely focusing on the Fed's December rate hike. Some fear that it could be enough to slow the economy and are therefore selling shorter-term bonds, pushing rates higher. Others highlight the fact that the Fed's mandate focuses on both growth and inflation and that a 0.25% increase is not likely to stop the U.S. economy cold. While history has shown that an inverted curve often precedes a recession, the time between the events can be as much as a year. Also, the Fed makes their final decisions based on all available data and can decide to adjust their course of action.

Non-U.S. Markets

Equity markets outside of the U.S. also suffered during the fourth quarter of 2018, although they generally outperformed the U.S. equity market. For all of 2018, however, foreign equities significantly underperformed, falling by double digits. While the European Union began the year in sound condition, economically, growth declined steadily during the year while gains in unemployment stalled and industrial production reversed course. News out of Japan was grim with a report showing a serious economic contraction during the third quarter that threatens to end Japan's longest expansion since the 1980's. Emerging markets actually led global equity for the quarter but still exhibited a meaningful loss. While there were some positive signals on the U.S.-China trade front, investors will likely wait until after a scheduled meeting in January between the two countries before fully evaluating the current global trade environment.

Real Assets Markets

Real estate securities outperformed broader equities during the quarter but were still down in absolute terms. The same is true for 2018 although Real Estate maintained only a slight margin. Commodity results were down for the quarter as crude oil fell -38.0% to \$45.41 per barrel. Natural gas prices were down -2.3%, ending the quarter at \$2.94 per million BTUs. MLP returns were in negative territory for the quarter (-17.30%) and are down double-digits for the year. Finally, gold prices were up and finished at approximately \$1,281 per troy ounce, up +7.1% from last quarter.

Summary of Index Returns

For Periods Ended December 31, 2018

	<u>Quarter</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>	<u>Ten Years</u>
Domestic Equity					
Standard & Poor's 500	-	-			
	13.52%	4.38%	9.26%	8.50%	13.12%
Wilshire 5000	-14.29	-5.27	9.12	8.07	13.20
Wilshire 4500	-17.96	-9.53	8.11	5.84	13.85
Wilshire Large Cap	-13.69	-4.64	9.33	8.47	13.11
Wilshire Small Cap	-19.67	-10.84	7.38	4.70	13.88
Wilshire Micro Cap	-23.50	-15.58	4.79	2.54	13.00
Domestic Equity					
Wilshire Large Value	-	-			
	10.75%	5.94%	8.09%	7.20%	11.57%
Wilshire Large Growth	-16.82	-3.58	10.30	9.63	14.60
Wilshire Mid Value	-14.16	-8.47	7.65	6.63	13.35
Wilshire Mid Growth	-18.55	-10.47	7.60	5.01	14.73
Wilshire Small Value	-18.73	-12.04	6.45	4.71	12.93
Wilshire Small Growth	-20.59	-9.71	8.08	4.51	14.72
International Equity					
MSCI All World ex U.S. (USD)	-	-			
	11.46%	14.20%	4.48%	0.68%	6.57%
MSCI All World ex U.S. (local currency)	-10.47	-9.17	5.28	5.06	8.60
MSCI EAFE	-12.54	-13.79	2.87	0.53	6.32
MSCI Europe	-12.72	-14.86	2.09	-0.61	6.15
MSCI Pacific	-12.20	-12.02	4.53	2.73	6.76
MSCI Emerging Markets Index	-7.47	-14.58	9.25	1.65	8.02
Domestic Fixed Income					
Barclays Aggregate Bond					
	1.64%	0.01%	2.06%	2.52%	3.48%
Barclays Credit	0.01	-2.11	3.16	3.22	5.52
Barclays Mortgage	2.08	0.99	1.71	2.53	3.11
Barclays Treasury	2.57	0.86	1.40	2.01	2.08
Citigroup High Yield Cash Pay	-4.69	-2.16	7.17	3.46	10.44
Barclays US TIPS	-0.42	-1.26	2.11	1.69	3.64
91-Day Treasury Bill	0.57	1.88	1.02	0.63	0.37
International Fixed Income					
Citigroup Non-U.S. Gov. Bond		-			
	1.31%	1.82%	3.32%	0.28%	1.27%
Citigroup World Gov. Bond	1.75	-0.84	2.69	0.77	1.52
Citigroup Hedged Non-U.S. Gov.					3.76
	2.29	3.49	3.55	4.36	

Currency*					
Euro vs. \$		-			
	-1.58%	4.80%	1.71%	-3.67%	-1.94%
Yen vs. \$	3.53	2.68	3.12	-0.85	-1.89
Pound vs. \$	-2.34	-5.85	-4.75	-5.12	-1.21
Real Estate					
Wilshire REIT Index		-			
	-6.93%	4.84%	2.06%	7.87%	12.19%
Wilshire RESI	-6.98	-4.80	2.41	8.17	12.41

*Positive values indicate dollar depreciation.

Summary Review of Plans

Periods Ended 12/31/2018

	<u>Market Value</u>	<u>Qtr</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>
TOTAL FUND for PERF	\$337.2 bil	-6.2%	-3.5%	6.3%	5.1%	7.9%
<i>Total Fund Policy Benchmark ¹</i>		-5.7%	-2.7%	6.8%	5.3%	8.7%
<i>Actuarial Rate</i>		1.8%	7.3%	7.4%	7.5%	7.6%
Affiliate Funds						
JudgesI	\$34.4 mil	0.6%	2.0%	1.2%	0.8%	0.5%
<i>91-Day Treasury Bill</i>		0.6%	1.9%	1.0%	0.6%	0.4%
JudgesII	\$1,464.4 mil	-7.5%	-6.1%	5.3%	3.8%	8.4%
<i>Weighted Policy Benchmark</i>		-7.7%	-6.3%	5.0%	3.6%	8.1%
Legislators' Retirement System	\$106.6 mil	-3.9%	-3.7%	4.1%	3.4%	7.0%
<i>Weighted Policy Benchmark</i>		-4.0%	-3.9%	3.8%	3.2%	6.5%
Long-Term Care ("LTC")	\$4,334.6 mil	-3.8%	-4.3%	3.2%	2.8%	6.5%
<i>Weighted Policy Benchmark</i>		-3.7%	-4.3%	3.2%	2.7%	6.2%
CERBT Strategy 1	\$6,555.1 mil	-8.6%	-6.9%	5.3%	3.8%	8.5%
<i>CERBT Strategy 1 Policy Benchmark</i>		-8.7%	-7.2%	4.8%	3.4%	8.2%
CERBT Strategy 2	\$1,094.3 mil	-6.1%	-5.3%	4.7%	3.5%	-.%
<i>CERBT Strategy 2 Policy Benchmark</i>		-6.2%	-5.6%	4.2%	3.2%	-.%
CERBT Strategy 3	\$598.2 mil	-3.9%	-3.9%	4.0%	3.3%	-.%
<i>CERBT Strategy 3 Policy Benchmark</i>		-4.0%	-4.1%	3.6%	3.0%	-.%
Health Care Fund	\$450.6 mil	1.7%	0.1%	2.1%	2.7%	4.2%
<i>Bardays U.S. Aggregate</i>		1.6%	0.0%	2.1%	2.5%	3.5%
Supplemental Contribution Plan	\$99.4 mil	-7.2%	-6.2%	2.5%	2.0%	6.4%
<i>CalPERS Custom SCP Plan Index</i>		-7.2%	-6.3%	2.5%	2.2%	7.0%
457 Program	\$1,430.3 mil	-9.4%	-5.7%	4.8%	3.8%	7.1%
<i>CalPERS Custom 457 Plan Index</i>		-9.4%	-5.7%	4.7%	3.9%	7.4%

¹ The Total Fund Policy Benchmark return equals the return for each asset class benchmark weighted at the current target asset allocation.

Total Fund Review PERF

Periods Ended 12/31/2018

	Market Value	5-Year Ratios							
		Qtr	1-Year	3-Year	5-Year	10-Year	VaR ¹³	Sharpe ¹⁴	Info ¹⁵
TOTAL FUND	\$337.2 bil	-6.2%	-3.5%	6.3%	5.1%	7.9%	\$42.0 bil	0.8	-0.2
<i>Total Fund Policy Benchmark ²</i>		-5.7%	-2.7%	6.8%	5.3%	8.7%		0.8	0.0
<i>Actuarial Rate</i>		1.8%	7.3%	7.4%	7.5%	7.6%			
GROWTH	188.0	-10.6%	-6.1%	8.1%	5.8%	10.3%	\$38.3 bil	0.6	-0.3
<i>Growth Policy Benchmark ³</i>		-10.2%	-5.6%	9.0%	6.3%	11.1%		0.6	0.0
PUBLIC EQUITY	160.1	-12.5%	-8.9%	7.4%	4.8%	10.4%	\$31.2 bil	0.4	-0.1
<i>Public Equity Policy Benchmark ⁴</i>		-12.5%	-8.6%	7.4%	4.9%	10.4%		0.4	0.0
PRIVATE EQUITY	27.8	2.1%	12.5%	12.3%	11.3%	11.4%	\$10.7 bil	3.2	-0.2
<i>Private Equity Policy Benchmark ⁵</i>		4.5%	13.0%	17.5%	13.2%	14.5%		1.3	0.0
INCOME	94.3	0.9%	-1.8%	3.5%	3.7%	6.2%	\$7.2 bil	0.7	1.0
<i>Income Policy Benchmark ⁶</i>		0.9%	-2.2%	2.8%	3.2%	4.5%		0.6	0.0
REAL ASSETS ⁷	39.9	0.1%	4.2%	6.1%	9.0%	1.4%	\$5.7 bil	1.5	0.0
<i>Real Assets Policy Benchmark ⁸</i>		1.9%	7.5%	7.4%	9.1%	6.7%		2.3	0.0
INFLATION	7.5	-6.4%	-5.3%	2.3%	-2.1%	2.0%	\$0.5 bil	-0.5	0.8
<i>Inflation Policy Benchmark ⁹</i>		-6.6%	-5.4%	2.2%	-2.6%	1.3%		-0.5	0.0
LIQUIDITY	3.8	0.6%	2.2%	1.3%	1.2%	1.0%	\$0.0 bil	0.7	-0.1
<i>Liquidity Policy Benchmark ¹⁰</i>		0.5%	1.7%	1.0%	1.2%	1.1%		0.5	0.0
ABSOLUTE RETURN STRATEGIES ¹¹	0.2	-.%	-.%	-.%	-.%	-.%		N/A	N/A
<i>Absolute Return Strategies Policy Benchmark ¹¹</i>		-.%	-.%	-.%	-.%	-.%		N/A	N/A
EXTERNAL MULTI-ASSET CLASS COMPOSITE	2.4	-6.5%	-10.5%	1.7%	3.1%	-.%		N/A	N/A
<i>Total MAC Custom Benchmark ¹²</i>		-8.4%	-6.3%	5.2%	4.2%	-.%		N/A	N/A
TRUST LEVEL PORTFOLIO MANAGEMENT / OTHER	1.1	-.%	-.%	-.%	-.%	-.%		N/A	N/A
TERMINATED AGENCY POOL	0.1	0.4%	-1.6%	2.8%	3.8%	-.%		N/A	N/A
TOTAL FUND PLUS TAP	337.3	-6.2%	-3.5%	6.3%	5.1%	7.9%		N/A	N/A

² The Total Fund Policy Benchmark return equals the return for each asset class benchmark weighted at the current target asset allocations.

³ Growth Policy Benchmark equals the benchmark returns of public equity and private equity weighted at policy allocation target percentages.

⁴ The Public Equity Policy Benchmark is a custom global benchmark maintained by FTSE.

⁵ The Private Equity Policy Benchmark is currently 1-quarter lagged (67% FTSE US TMI + 33% FTSE AW x-US TMI) with a hurdle of + 3%.

⁶ The Income Policy Benchmark equals the benchmark returns of domestic and international fixed income components weighted at policy allocation target percentages.

⁷ Real Assets include real estate, whose returns are net of investment management fees and all expenses, including property level operations expenses netted from property income. This method differs from GASB 31, which requires all investment expenses be identified for inclusion in the System's general purpose financial statements.

⁸ The Real Assets Policy Benchmark is currently PREA/IPD U.S. Quarterly Fund Index NTR. Prior to 7/01/2018 it was the benchmark returns of real estate, timber, and infrastructure weighted at policy allocation target percentages.

⁹ The Inflation Policy Benchmark equals the benchmark returns of commodities and TIPS weighted at policy allocation target percentages.

¹⁰ The Liquidity Policy Benchmark is a custom index maintained by State Street Bank.

¹¹ The Absolute Return Strategies program was excluded from Public Equity on July 1, 2011. Public Equity history does not include Absolute Return Strategies performance. The Absolute Return Strategies Policy Benchmark is currently Merrill Lynch Treasury 1-Year Note + 5%.

¹² The Total MAC Custom Benchmark is currently the CalPERS Reference Portfolio. Prior to 7/01/2018 it was Absolute 7.5%.

¹³ VaR (Value at Risk) measures how much the portfolio might decrease over a 12 month period in extreme cases. The VAR estimate shows how much the portfolio value might fall in the worst 5% of 12 month periods. VAR is calculated using total risk (standard deviation) and market value ((Expected Return – (1.65 X SD)) X MV).

¹⁴ The Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the total risk taken. The 5-year period was selected to provide sufficient data points for a meaningful calculation, but is still short enough to reflect the changes to the investment programs over the last few years.

¹⁵ The "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per unit of excess risk ventured.

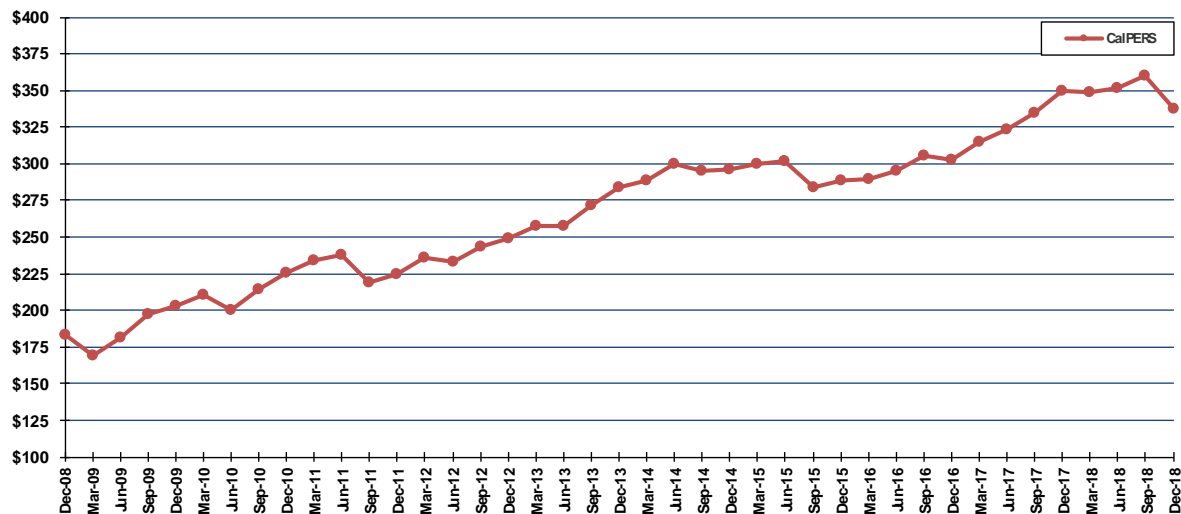
Total Fund Review for PERF (continued)

Periods Ended 12/31/2018

Total Fund Flow

	2009	2010	2011	2012	2013	2014	2015	2016	2017	1Q18	2Q18	3Q18	4Q18
Market Value (\$bil)	203.3	225.7	225.0	248.6	283.6	295.8	288.9	302.8	350.0	348.7	351.8	360.1	337.2

Total Fund Market Value



Asset Allocation

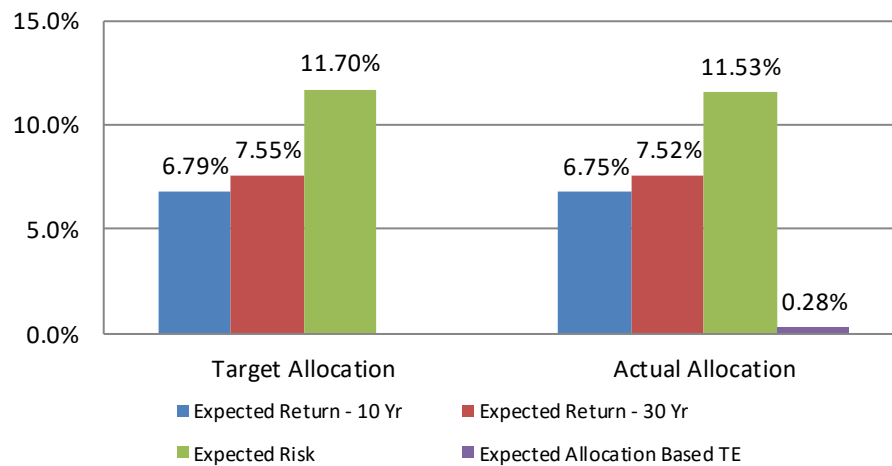
Asset Class	Actual (%)	Policy (%)	Difference (%)
Growth	55.7	58.0	-2.3
Income	28.0	26.8	+1.2
Real Assets	11.8	12.0	-0.2
Inflation	2.2	2.2	0.0
Liquidity	1.1	1.0	+0.1
Multi-Asset/TLPM	1.0	0.0	+1.0
ARS/Other PERF	0.1	0.0	+0.1
Total	100.0	100.0	0.0

* Asset allocation targets are in the process of shifting to the new targets adopted by the Investment Committee in September 2016. Transitions accounts are included with their respective asset classes.

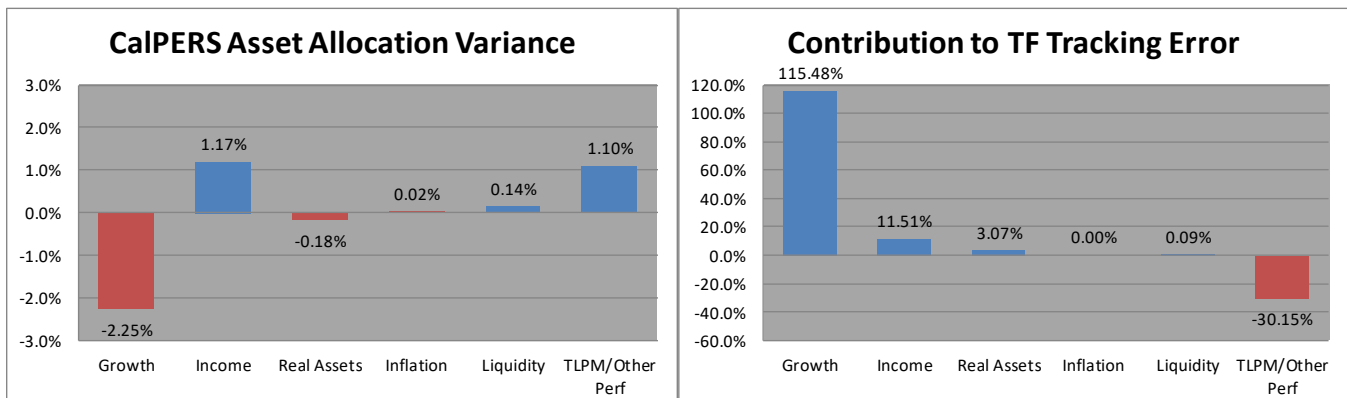
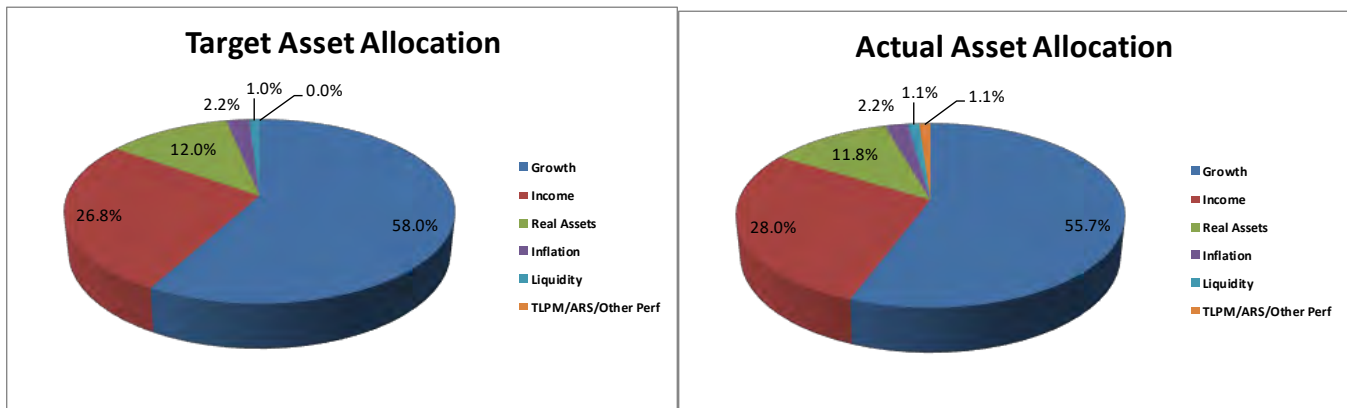
Total Fund Review for PERF (continued)

Periods Ended 12/31/2018

Expected Return/Risk and Tracking Error based on Wilshire's Asset Class Assumptions



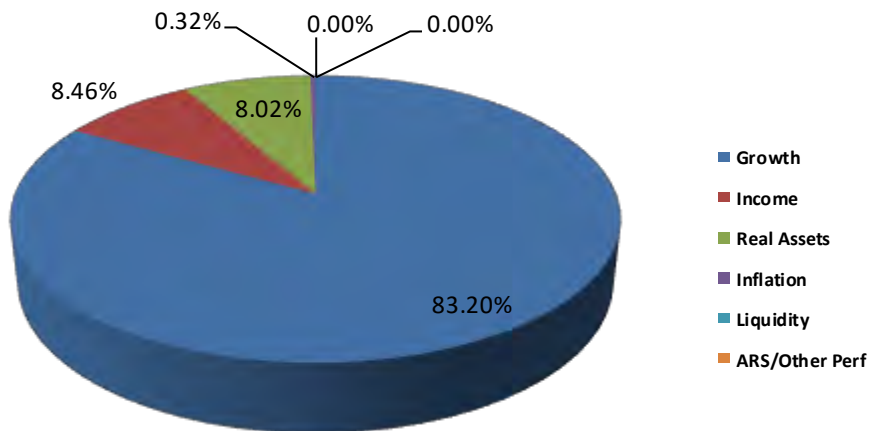
Total Fund Asset Allocation



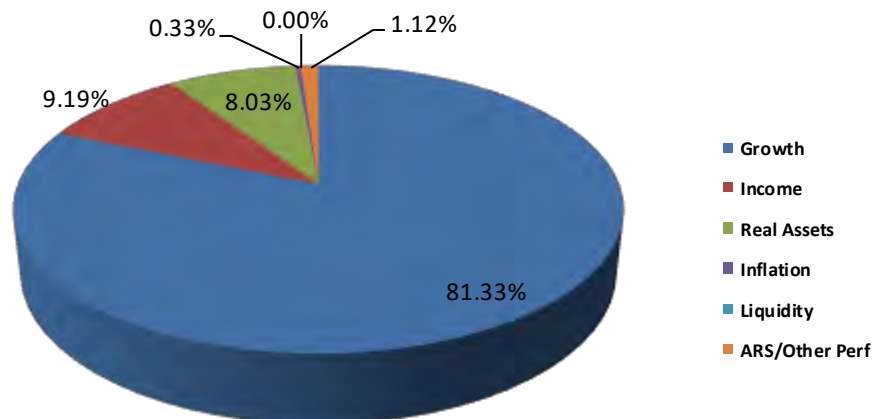
Total Fund Review for PERF (continued)
Periods Ended 12/31/2018

Contribution to Total Risk based on Wilshire's Asset Class Assumptions

Contribution to Total Risk - Target Allocation



Contribution to Total Risk - Actual Allocation



California Public Employees' Retirement System
Total Fund Attribution - Quarter
As of 12/31/2018

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
Growth	55.65	-10.57	57.33	-10.20	-1.69	-0.37	0.09	0.01	-0.20	-0.10
Public Equity	47.73	-12.50	49.33	-12.47	-1.60	-0.03	0.11	0.00	-0.02	0.10
Private Equity	7.92	2.08	8.00	4.47	-0.08	-2.39	-0.02	0.01	-0.18	-0.20
Income	25.66	0.88	25.73	0.87	-0.07	0.01	-0.01	0.00	0.00	-0.01
Real Assets	11.24	0.08	12.00	1.86	-0.76	-1.78	-0.07	0.01	-0.20	-0.26
Inflation	3.23	-6.44	3.30	-6.61	-0.07	0.17	0.00	0.00	0.01	0.00
Ext. MAC/ARS/TLPM/Other	2.63	-8.16	0.00	-8.44	2.63	0.28	-0.08	0.01	0.00	-0.07
Liquidity	1.59	0.63	1.63	0.51	-0.04	0.11	0.00	0.00	0.00	0.01
Monthly Linked Return	100.00	-6.13	100.00	-5.67		-0.46	-0.07	0.03	-0.39	-0.46
Trading/Hedging/Other		-0.03		0.00		-0.03				-0.03
Total		-6.15		-5.67		-0.48				-0.48

The Total Fund Attribution displays the return contribution of each asset class to the total fund. This is done by monthly linking each program's allocation at the beginning of the month with each month's returns to determine if tactical allocation and active management within asset classes helped or hurt performance. The interaction effect is a cross-factor, used to help further explain the combined impact of a portfolio's selection and allocation decisions within a segment.

California Public Employees' Retirement System
Total Fund Attribution - Calendar Year-to-Date
As of 12/31/2018

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
Growth	56.64	-6.15	56.35	-5.60	0.29	-0.55	0.03	0.01	-0.27	-0.23
Public Equity	48.93	-8.90	48.35	-8.55	0.58	-0.34	0.09	0.00	-0.18	-0.09
Private Equity	7.71	12.47	8.00	13.04	-0.29	-0.58	-0.05	0.00	-0.07	-0.12
Income	22.05	-1.82	22.63	-2.17	-0.59	0.35	0.05	0.00	0.07	0.12
Real Assets	10.77	4.19	12.25	7.53	-1.48	-3.33	-0.12	0.02	-0.37	-0.47
Inflation	5.85	-5.28	5.98	-5.41	-0.13	0.13	-0.02	0.00	0.00	-0.01
Ext. MAC/ARS/TLPM/Other	1.45	-11.97	0.00	-2.85	1.45	-9.12	-0.06	-0.08	0.00	-0.14
Liquidity	3.24	2.21	2.78	1.74	0.46	0.47	0.00	0.00	0.01	0.01
Monthly Linked Return	100.00	-3.46	100.00	-2.73		-0.72	-0.12	-0.05	-0.56	-0.72
Trading/Hedging/Other		-0.05		0.00		-0.05				-0.05
Total		-3.51		-2.73		-0.77				-0.77

The Total Fund Attribution displays the return contribution of each asset class to the total fund. This is done by monthly linking each program's allocation at the beginning of the month with each month's returns to determine if tactical allocation and active management within asset classes helped or hurt performance. The interaction effect is a cross-factor, used to help further explain the combined impact of a portfolio's selection and allocation decisions within a segment.

California Public Employees' Retirement System
Total Fund Attribution - Fiscal Year-to-Date
As of 12/31/2018

Asset Class	Actual (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
Growth	56.08	-6.78	57.20	-6.77	-1.12	-0.01	0.09	0.00	0.02	0.11
Public Equity	48.29	-8.78	49.20	-8.78	-0.91	0.00	0.11	0.00	0.00	0.11
Private Equity	7.79	6.31	8.00	5.91	-0.21	0.40	-0.02	0.00	0.02	0.00
Income	24.25	0.49	24.27	0.40	-0.02	0.09	-0.02	0.00	0.02	0.00
Real Assets	10.99	0.84	12.00	3.71	-1.01	-2.86	-0.06	0.02	-0.33	-0.37
Inflation	4.37	-6.91	4.47	-7.07	-0.09	0.17	0.00	0.00	0.01	0.01
Ext. MAC/ARS/TLPM/Other	2.01	-6.30	0.00	-6.30	2.01	0.00	-0.09	0.01	0.00	-0.07
Liquidity	2.30	1.22	2.07	0.98	0.23	0.24	-0.01	0.00	0.00	0.00
Monthly Linked Return	100.00	-3.90	100.00	-3.54	-0.35		-0.08	0.03	-0.28	-0.35
Trading/Hedging/Other		-0.04		0.00		-0.04				-0.04
Total		-3.94		-3.54		-0.40				-0.40

The Total Fund Attribution displays the return contribution of each asset class to the total fund. This is done by monthly linking each program's allocation at the beginning of the month with each month's returns to determine if tactical allocation and active management within asset classes helped or hurt performance. The interaction effect is a cross-factor, used to help further explain the combined impact of a portfolio's selection and allocation decisions within a segment.

Total Fund Review for PERF (continued)

Periods Ended 12/31/2018

- ◆ The California Public Employees' Retirement System ("CalPERS, the System") generated a total fund return of -6.15%, for the quarter ended December 31, 2018. CalPERS' return can be attributed as follows:

-5.67%	Strategic Policy Allocation
-0.07%	Actual/Tactical Asset Allocation
-0.39%	Active Management
0.03%	Interaction
<u>-0.03%</u>	Trading/Currency Hedging
-6.15%	Total Return

- ◆ The total fund attribution table on the previous page displays the return contribution of each asset class to the total fund. This table will allow the Board to see if tactical allocation and active management within asset classes helped or hurt performance during the quarter.
 - Strategic Policy: The contribution to total return from each asset class, calculated as the percentage allocated to each asset class multiplied by the benchmark for that asset class.
 - Actual Allocation: The return contribution during the quarter due to differences in the actual allocation from the policy allocation (i.e. the actual allocation to total equity was higher than the policy allocation). A positive number would indicate an overweight benefited performance and vice versa.
 - Active Management: The return contribution from active management. The number would be positive if the asset class outperformed the designated policy index and vice versa (i.e. the US fixed income segment outperformed its custom benchmark during the quarter and contributed positively to active management).
 - Interaction: Captures the interaction of managers' performance and asset class weighting differences.
 - Actual Return: The actual return of the asset classes if allocations to them were static during the quarter. These returns will not match exactly with the actual segment returns since asset class allocations change during the quarter due to market movement, cash flows, etc.
- ◆ Wilshire's attribution showed that active management was the primary factor that led to this quarter's relative underperformance, costing -39 bps. Almost all of this negative margin was attributed to the soft results of Real Assets and Growth (Private Equity in particular), as these asset classes' 4th quarter returns trailed their respective benchmarks by -178 bps and -37 bps respectively. Asset allocation variance was also a small negative, with a -7 bps deduction that mainly came from under-exposure to the mildly positive Real Assets segment (when most other risk assets fell during the quarter) as well as the System's small TLPM program which did not do so well in Q4.

Total Fund Review for PERF (continued)

Periods Ended 12/31/2018

Relative to the Total Fund Policy Benchmark:

- ◆ **Growth Exposure:** The favorable momentum enjoyed by equity investors for much of the year came to a crashing end during the fourth quarter. Primarily driven by political uncertainties and concerns of potentially weakening global growth, material weaknesses emanated from the U.S. early in the quarter and echoed through global markets, intensifying as the quarter wore on. Performance of the Growth composite was notably handicapped amid surging market volatility and plummeting investor confidence, closing out the quarter down -10.6%. This double-digit decline came in at the bottom of the leaderboard among the five major CalPERS asset classes, and was below the total fund policy benchmark by -489 bps. Impact of the macro overhang was fully reflected in the Growth composite's public equity component, as it reported an overall loss of -12.5% for the quarter. For the third time this year, the private equity program posted better quarterly results with a 2.1% gain.
- ◆ **Income Exposure:** U.S. Treasury yields had steadily climbed to a multi-year high in early November, but took a U-turn in the second half of Q4 amid a rash of risk assets sell-off. Investors, spooked by potentially growth-snuffing development of an over-tightening Fed and the escalating US-China trade spat, as well as by some of the slipping forward-looking manufacturing surveys, scrambled for shelter in Treasuries and sharply drove down yield across most maturities. The drop in Treasury yields was a boost to CalPERS' Income asset class overall, which netted a 0.9% gain during Q4 that was on par with the Income policy benchmark while comparing favorably to the total fund policy benchmark.
- ◆ **Real Assets Exposure:** Quarterly returns of Real Assets has averaged in the high 1% range over the past two years, but coinciding with a general rise in market volatility and growth-concern driven de-risking, its return notably dipped in the fourth quarter to just 0.1%. This limited rate of return missed Real Assets' own benchmark by a margin of -178 bps, but did still fare better relative to the -5.7% decline of the total fund policy benchmark. Looking beyond Q4's rare dip, Real Assets' trailing 12-months and 3-year returns stand on a more consistent pace of 4.2% and 6.1% respectively, and the overall asset class currently holds a 9.0% annualized gains over the past five years that is nearly on par with the asset class benchmark.
- ◆ **Inflation Exposure:** Similar to Growth, the Inflation asset class performance turned sharply lower in the fourth quarter in light of a -38% drop in crude oil prices and to a lesser extent, moderating inflation expectations (which is also due in part to weakening commodity prices). Inflation's -6.4% Q4 total return was marginally better than the asset class benchmark (-6.6%), but came in -76 bps behind the total fund policy.
- ◆ **Liquidity:** With a high correlation to short-term interest rates, which has steadily risen since the Fed kicked off the monetary policy normalization process and raising the Fed Funds Rate (with 4 hikes in 2018), the Liquidity asset class saw its return slowly climbed during this past year. Up 0.6% in Q4, this was Liquidity's highest quarterly return in nearly four years, finishing just ahead of its own asset class benchmark and compared favorably to the total fund policy benchmark's -5.7% rate. Starting Q3 2015, this composite is solely comprised of short-term investment funds.

- ◆ **External Multi-Asset Class Composite:** Results of the System's Multi-Asset Class program (MAC) were soft this quarter, as it dropped -6.5% that was its worst quarterly finish over the last five years. This rate of return compared better than the program's own custom benchmark, but came in below the total fund policy benchmark.

Growth Review for PERF

Periods Ended 12/31/2018

Growth Allocation

Asset Allocation: Actual versus Target Weights

Asset Class	Actual Asset Allocation	Target Asset Allocation	Difference
<u>Growth</u>	<u>55.7%</u>	<u>58.0%</u>	<u>-2.3%</u>
Public Equity	47.5%	50.0%	-2.5%
Private Equity	8.3%	8.0%	+0.3%

Growth Segment Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	Var ²⁰	5-year Sharpe Ratio ²¹	5-year Info Ratio ²²
GROWTH	188.0	-10.6%	-6.1%	8.1%	5.8%	10.3%	\$38.3 bil	0.6	-0.3
<i>Growth Policy Benchmark</i>		-10.2%	-5.6%	9.0%	6.3%	11.1%		0.6	0.0
<i>Value Added</i>		-0.4%	-0.5%	-0.9%	-0.5%	-0.8%			
PUBLIC EQUITY¹⁶	160.1	-12.5%	-8.9%	7.4%	4.8%	10.4%	\$31.2 bil	0.4	-0.1
<i>Custom Global Public Equity BM¹⁷</i>		-12.5%	-8.6%	7.4%	4.9%	10.4%		0.4	0.0
<i>Value Added</i>		0.0%	-0.3%	0.0%	-0.1%	0.0%			
PRIVATE EQUITY¹⁸	27.8	2.1%	12.5%	12.3%	11.3%	11.4%	\$10.7 bil	3.2	-0.2
<i>PE Policy Benchmark¹⁹</i>		4.5%	13.0%	17.5%	13.2%	14.5%		1.3	0.0
<i>Value Added</i>		-2.4%	-0.5%	-5.2%	-1.9%	-3.1%			

Private Equity Review for PERF – Partnership Investments

¹⁶ Includes domestic equity, international equity, corporate governance, and MDP ventures. It does not include asset allocation transition accounts; those accounts are reflected in total fund but are not included in any composite.

¹⁷ The Custom Global Public Equity Benchmark is a custom global benchmark maintained by FTSE.

¹⁸ The performance of CalPERS' private equity (AIM) investments is 1-quarter lagged.

¹⁹ The AIM Policy Benchmark currently equals 3% + 1-quarter lagged (67% FTSE US TMI + 33% FTSE AW x-US TMI), and is linked historically to its prior benchmarks.

²⁰ VaR (Value at Risk) measures how much the portfolio might decrease over a 12 month period in extreme cases. The VAR estimate shows how much the portfolio value might fall in the worst 5% of 12 month periods. VAR is calculated using total risk (standard deviation) and market value.

²¹ The Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken.

²² The "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per unit of excess risk ventured.

	<u>Market</u> <u>Value</u>	<u>Qtr</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>	<u>Date</u>
Private Equity	27.8	2.1%	12.5%	12.3%	11.3%	11.4%	3/90
<i>PE Policy Benchmark</i>		4.5%	13.0%	17.5%	13.2%	14.5%	
<i>Value Added</i>		-2.4%	-0.5%	-5.2%	-1.9%	-3.1%	
Private Equity Partnership Investments	27.8	2.1%	12.6%	12.3%	11.4%	11.4%	3/90
Private Equity Distribution Stock	0.0	-8.8%	11.0%	2.1%	-14.2%	-8.0%	12/99

Growth Review for PERF (continued)

Comments Regarding Growth Segment Performance

Helped Performance:

- ◆ **Private Equity Exposure:** Riding on an 11-quarter streak of positive returns, CalPERS' private equity program saw its positive momentum moderated somewhat in the last quarter of 2018. Nevertheless, this program's 2.1% Q4 return continued the trend of producing modest yet steady gains for the System, and once again provided diversification benefit during this volatile period when public equities notably struggled. This quarter's gains compared very favorably to the Growth policy benchmark's -10.2% return, and helped offset the public equity program's -12.5% decline.

Impeded Performance:

- ◆ **U.S. Equity Exposure:** U.S. stocks, once the sole bright spot within the global equity market, finally cracked under a host of old and new concerns. A continued disruptive trade policy in the pursue of economic nationalism and the Fed's rate-hiking determination triggered anxieties over weakening growth expectations, while rising political spat (over border wall funding that led to a partial U.S. government shutdown) further overwhelmed investor sentiment. The intertwined economic and political uncertainty led to a spike in volatility and weighed heavily on the broad U.S. stock market. Outside of a brief period of optimism following the November mid-term election, CalPERS' U.S. equity composite experienced sharp pullbacks in October and December to end Q4 firmly in the red, dropping -14.5%. This result was a near-image of the composite's own policy measure, but fell short of the Growth policy benchmark by -427 bps. Within the composite, the internal U.S. equity composite largely trended with the market and was down -14.3% for the quarter; the smaller external U.S. equity component saw a steeper decline and was -16.0% lower.
- ◆ **International Equity Exposure:** Similar to U.S. stocks, international equities also saw their performance hobbled by a range of issues in Q4. There were growth concerns from the slowing of bellwether German and Japanese economies, which occurred just when ECB concluded its QE bond purchasing program, plus political distractions generated by the Brexit negotiation impasse, Frances social unrest, doubts over left-leaning new Mexico president's ability to reform, and China's on-going trade tussles with the U.S. For the quarter, the international equity composite mimicked the struggle of its own custom benchmark to reach a -12.2% return, but missed the Growth policy benchmark's -10.2% return. Results

within the international equity segment were fairly similar, with the larger-sized internally managed composite retreating -12.3% while the smaller externally managed composite finishing down -12.0%.

Income Review for PERF

Periods Ended 12/31/2018

Income Allocation

Asset Allocation: Actual versus Target Weights

Asset Class	Actual Asset Allocation	Target Asset Allocation	Difference
Income	28.0%	26.8%	+1.2%

Income Segment Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR ²⁶	5-year Sharpe Ratio ²⁷	5-year Info Ratio ²⁸
INCOME	94.3	0.9%	-1.8%	3.5%	3.7%	6.2%	\$7.2 bil	0.7	1.0
<i>Income Policy Benchmark</i> ²³		0.9%	-2.2%	2.8%	3.2%	4.5%		0.6	0.0
<i>Value Added</i>		0.0%	0.4%	0.7%	0.5%	1.7%			
U.S. Income	86.6	0.9%	-1.6%	3.6%	4.2%	6.7%		0.8	0.6
<i>U.S. Income Policy Benchmark</i> ²⁴		1.4%	-1.6%	2.9%	3.8%	4.9%		0.7	0.0
<i>Value Added</i>		-0.5%	0.0%	0.7%	0.4%	1.8%			
Non-U.S. Income	7.7	0.3%	-4.1%	3.6%	-0.3%	2.1%		-0.1	0.8
<i>Non-US Income Policy Benchmark</i> ²⁵		0.2%	-3.9%	3.2%	-0.8%	0.8%		-0.2	0.0
<i>Value Added</i>		0.1%	-0.2%	0.4%	0.5%	1.3%			

Comments Regarding Income Segment Performance

Helped Performance:

- ◆ **Government Bonds:** The overall internal Treasuries and government-sponsored bonds portfolio was the clear beneficiary of Q4's safe haven-seeking rotation, rallying 3.1% for the quarter to finish atop the leaderboard among all PERS bond portfolios. This compared favorably to the Income policy's 0.9% return for the same period and was deemed a performance contributor.

²³ The Income Policy Benchmark return equals the benchmark returns for domestic and international fixed income components weighted at policy allocation target percentages.

²⁴ The US Fixed Income Policy Benchmark consists of the Barclays Long Liability Index and is linked historically to its prior benchmark.

²⁵ The Non-US Fixed Income Policy Benchmark consists of the Barclays International Fixed Income and is linked historically to its prior benchmark.

²⁶ VaR (Value at Risk) measures how much the portfolio might decrease over a 12 month period in extreme cases. The VAR estimate shows how much the portfolio value might fall in the worst 5% of 12 month periods. VAR is calculated using total risk (standard deviation) and market value.

²⁷ The Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken.

²⁸ The "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per risk ventured.

Income Review for PERF (Continued)

Comments Regarding Income Segment Performance

- ◆ **Mortgage Bonds:** Mortgage-backed securities weathered the volatile 4th quarter well and remains one of the better performing investment grade fixed income segments. The System's mortgage bonds portfolio generated the second highest return behind Treasuries, finishing up 1.9% this quarter and beat out the Income policy benchmark's 0.9% return. The smaller-sized long duration mortgage portfolio also produced solid gains of 1.1% and outperformed relative to the Income policy.

Impeded Performance:

- ◆ **Corporate Bonds:** This quarter's risk-off shift caused notable credit spread widening, and as a result most spread sectors were the laggards during Q4, highlighted by the -1.0% loss registered by CalPERS' \$16.6 billion corporate bond portfolio. The smaller long duration corporate bond portfolio behaved similarly, turning in a -0.7% return for Q4 that also detracted.
- ◆ **High Yield Bonds:** Non-investment grade credits fared poorly this quarter, as the previously tight high yield spreads meaningfully reversed course after early October. Both of the CalPERS internal and external high yield portfolios lost ground, giving up -2.8% and -4.6% respectively, and underperformed the Income policy benchmark for Q4.
- ◆ **International Fixed Income / Sovereign Bonds:** CalPERS' international fixed income and sovereign bonds portfolios held up well in the fourth quarter, gaining 0.3% apiece. Although in relative terms both trailed the Income policy benchmark's 0.9% return.

Income Review for PERF (Continued)

Income Portfolios Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	Date
INCOME	94.3	0.9%	-1.8%	3.5%	3.7%	6.2%	6/88
<i>Income Policy Benchmark</i> ²⁹		0.9%	-2.2%	2.8%	3.2%	4.5%	
<i>Value Added</i>		0.0%	0.4%	0.7%	0.5%	1.7%	
U.S. Income	86.6	0.9%	-1.6%	3.6%	4.2%	6.7%	12/95
Mortgage Bonds	19.3	1.9%	1.4%	2.4%	3.6%	5.4%	12/82
Long Duration Mortgages	2.7	1.1%	-0.1%	3.0%	4.0%	7.4%	6/05
Corporate Bonds	16.6	-1.0%	-4.9%	5.3%	4.9%	8.3%	3/02
U.S. Government	34.5	3.1%	-0.3%	2.9%	4.2%	3.0%	1/00
Sovereign Bonds	2.4	0.3%	-2.3%	4.5%	5.0%	-.%	7/09
Long Duration Corporates	0.3	-0.7%	-6.9%	2.8%	2.1%	8.9%	9/05
Internal High Yield Bonds*	8.7	-4.3%	-0.1%	10.2%	7.7%	11.5%	9/99
External High Yield*	1.7	-4.6%	-1.0%	7.3%	4.1%	10.2%	3/02
Non-U.S. Income	7.7	0.3%	-4.1%	3.6%	-0.3%	2.1%	3/89
<i>Custom Benchmark</i> ³⁰		0.2%	-3.9%	3.2%	-0.8%	0.8%	
<i>Value Added</i>		0.1%	-0.2%	0.4%	0.5%	1.3%	

Securities Lending Performance

Internal Active Short Term**	4.2	0.6%	2.2%	1.3%	0.9%	-.%	3/11
<i>Custom Benchmark</i>		0.6%	2.0%	1.1%	0.7%	-.%	
<i>Value Added</i>		0.0%	0.2%	0.2%	0.2%	-.%	
CalPERSESECash Collateral**	0.7	0.6%	1.7%	1.0%	0.7%	-.%	6/10
<i>Custom Benchmark</i>		0.6%	1.8%	1.1%	0.7%	-.%	
<i>Value Added</i>		0.0%	-0.1%	-0.1%	0.0%	-.%	

²⁹ The Income Policy Benchmark return equals the benchmark returns for domestic and international fixed income components weighted at policy allocation target percentages.

³⁰ The custom benchmark consists of the Barclays International Fixed Income Index and is linked historically to its prior benchmark.

* These portfolios and/or composites are unitized and represent ownership of both the PERF and other Affiliates Investment Programs.

** These portfolios hold the collateral for the security lending program.

Inflation Performance for PERF

Period Ended 12/31/2018

Inflation Allocation

Asset Allocation: Actual versus Target Weights

Asset Class	Actual Asset Allocation	Target Asset Allocation	Difference
Inflation	2.2%	2.2%	0.0%

Inflation Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR ³²	5-year Sharpe Ratio ³³	5-year Info Ratio ³⁴
INFLATION	7.5	-6.4%	-5.3%	2.3%	-2.1%	2.0%	\$0.5 bil	-0.5	0.8
<i>Inflation Policy Benchmark</i> ³¹		-6.6%	-5.4%	2.2%	-2.6%	1.3%		-0.5	0.0
<i>Value Added</i>		0.2%	0.1%	0.1%	0.5%	0.7%			
Commodities Passive	0.1	-24.2%	-14.9%	0.0%	-.%	-.%			
<i>GSCI Total Return Index</i>		-22.9%	-13.8%	0.5%	-.%	-.%			
<i>Value Added</i>		-1.3%	-1.1%	-0.5%	-.%	-.%			
Commodities Active	1.0	-23.1%	-14.0%	0.5%	-14.3%	-5.7%			
<i>GSCI Total Return Index</i>		-22.9%	-13.8%	0.5%	-14.5%	-5.8%			
<i>Value Added</i>		-0.2%	-0.2%	0.0%	0.2%	0.1%			
Core Inflation Linked Bonds	5.2	-0.4%	-2.6%	2.6%	1.5%	3.8%			
<i>Custom Benchmark</i>		-0.8%	-3.0%	2.5%	1.2%	3.6%			
<i>Value Added</i>		0.4%	0.4%	0.1%	0.3%	0.2%			
Tactical Commodities	0.5	-23.2%	-15.5%	-0.3%	-14.9%	-.%			
<i>GSCI Total Return Index</i>		-22.9%	-13.8%	0.5%	-14.5%	-.%			
<i>Value Added</i>		-0.3%	-1.7%	-0.8%	-0.4%	-.%			
Tactical TIPS	0.6	-0.5%	-1.3%	2.0%	1.6%	-.%			
<i>CalPERS TIPS</i>		-0.4%	-1.3%	2.1%	1.7%	-.%			
<i>Value Added</i>		-0.1%	0.0%	-0.1%	-0.1%	-.%			

- ◆ The sizable drop incurred by CalPERS' Inflation asset class during this past quarter was primarily influenced by its commodities exposure, which did not perform well in the second half of 2018. The commodities investments, albeit smaller in size (approx. 22% of Inflation's assets), experienced significant macro headwinds where both industrial metals and energy prices turned sharply lower during Q4 (with the collapse of oil prices in particular). As a result, all of the System's commodities portfolios registered declines in excess of 20% and weighed on Inflation's overall return. The rest of Inflation's assets, invested in inflation-linked bonds, behaved much milder this quarter but did also

³¹ The Inflation Policy Benchmark equals the benchmark returns of commodities and TIPS weighted at policy allocation target percentages.

³² VaR (Value at Risk) measures how much the portfolio might decrease over a 12 month period in extreme cases. The VAR estimate shows how much the portfolio value might fall in the worst 5% of 12 month periods. VAR is calculated using total risk (standard deviation) and market value.

³³ The Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken.

³⁴ The "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per unit of excess risk ventured.

record narrow losses (-0.4% by the Core TIPS portfolio and -0.5% by the Tactical TIPS portfolio) amid a recent softening of inflation trends. The tremendous commodity drag also ensured that Inflation finished the year well in the red, but over the past decade this asset class has modest gains for CalPERS while also consistently added value relative to its own policy benchmark.

Real Assets Review for PERF

Period Ended 12/31/2018

Real Assets Allocation

Asset Allocation: Actual versus Target Weights

Asset Class	Actual Asset Allocation	Target Asset Allocation	Difference
Real Assets	11.8%	12.0%	-0.2%

Real Assets Segment Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR ⁴¹	5-year Sharpe Ratio ⁴²	5-year Info Ratio ⁴³
REAL ASSETS	39.9	0.1%	4.2%	6.1%	9.0%	1.4%	\$5.7 bil	1.5	0.0
<i>Real Assets Policy Benchmark</i> ³⁵		1.9%	7.5%	7.4%	9.1%	6.7%		2.3	0.0
<i>Value Added</i>		-1.8%	-3.3%	-1.3%	-0.1%	-5.3%			
Real Estate ³⁶	33.9	-0.3%	4.0%	6.2%	9.4%	1.2%	\$4.9 bil	1.5	-0.1
<i>Real Estate Policy Benchmark</i> ³⁷		1.9%	7.7%	7.8%	9.7%	7.9%		2.2	0.0
<i>Value Added</i>		-2.2%	-3.7%	-1.6%	-0.3%	-6.7%			
Forestland ³⁸	1.3	-1.1%	-11.1%	-6.7%	-3.4%	-2.4%			
<i>Forestland Policy Benchmark</i> ³⁹		1.9%	6.3%	4.3%	6.5%	4.2%			
<i>Value Added</i>		-3.0%	-17.4%	-11.0%	-9.9%	-6.6%			
Infrastructure ³⁸	4.6	3.2%	11.3%	12.6%	14.3%	15.2%			
<i>Infrastructure Policy Benchmark</i> ⁴⁰		1.9%	6.9%	6.3%	5.7%	6.2%			
<i>Value Added</i>		1.3%	4.4%	6.3%	8.6%	9.0%			

³⁵ The Real Assets Policy Benchmark is PREA/IPD U.S. Quarterly Property Fund Index NTR effective 7/01/2018. Prior to this it was composed of the benchmark returns of real estate, timber, and infrastructure weighted at policy allocation target percentages.

³⁶ The Real Estate performance is reported on a 1-quarter lagged basis. The Real Estate total returns are net of investment management fees and all expenses, including property level operations expenses netted from property income. This method differs from GASB 31, which requires all investment expenses be identified for inclusion in the System's general purpose financial statements.

³⁷ The Real Estate Policy Benchmark is PREA/IPD U.S. Quarterly Property Fund Index NTR effective 7/01/2018. Prior to this it consisted of the NCREIF ODCE Index (1-quarter lagged) and the FTSE EPRA/NAREIT Developed Index weighted at their policy allocation target percentages, and historically linked to its prior benchmarks.

³⁸ These investments are reported on a 1-quarter lagged basis.

³⁹ The Forestland Policy Benchmark is PREA/IPD U.S. Quarterly Property Fund Index NTR effective 7/01/2018. Prior to this it was NCREIF Timberland Index.

⁴⁰ The Infrastructure Policy Benchmark is PREA/IPD U.S. Quarterly Property Fund Index NTR effective 7/01/2018. Prior to this it was CPI + 400 bps 1-Quarter Lagged.

⁴¹ VaR (Value at Risk) measures how much the portfolio might decrease over a 12 month period in extreme cases. The VAR estimate shows how much the portfolio value might fall in the worst 5% of 12 month periods. VAR is calculated using total risk (standard deviation) and market value.

⁴² The Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken.

⁴³ The "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per unit of excess risk ventured.

- ◆ The Real Assets asset class's performance often displays a high degree of correlation with the Real Estate component (one of the three programs within RA), given that the latter represents nearly 84% of this asset class's assets. Q4's results did not deviate too far from this pattern, as Real Assets posted a -178 bps under-performance and finished essentially flat amid weaknesses from the Real Estate portfolio, which surprisingly broke a long trend of steady positive gains to record its first quarterly loss (of -0.3%) in more than eight years. The Forestland portfolio's -1.1% return was also a small detractor, but its drag was easily offset by the 3.2% total return earned by the Infrastructure portfolio, which has enjoyed positive momentum throughout 2018.

Liquidity Review for PERF

Period Ended 12/31/2018

Liquidity Allocation

Asset Allocation: Actual versus Target Weights

Asset Class	Actual Asset Allocation	Target Asset Allocation	Difference
Liquidity	1.1%	1.0%	+0.1%

Liquidity Segment Performance

	Market Value	Qtr	1-Year	3-Year	5-Year	10-Year	VaR ⁴⁶	5-year Sharpe Ratio ⁴⁷	5-year Info Ratio ⁴⁸
LIQUIDITY	3.8	0.6%	2.2%	1.3%	1.2%	1.0%	\$0.0 bil	N/A	N/A
<i>Liquidity Policy Benchmark</i> ⁴⁴		0.5%	1.7%	1.0%	1.2%	1.1%			
<i>Value Added</i>		0.1%	0.5%	0.3%	0.0%	-0.1%			
Cash Composite	3.8	0.6%	2.2%	1.3%	0.9%	0.6%			
<i>Custom STIF</i> ⁴⁵		0.6%	2.0%	1.1%	0.7%	0.5%			
<i>Value Added</i>		0.0%	0.2%	0.2%	0.2%	0.1%			

⁴⁴The Liquidity Policy Benchmark is a custom index maintained by State Street Bank.

⁴⁵ The Custom STIF Policy Benchmark is a custom index maintained by State Street Bank.

⁴⁶ VaR (Value at Risk) measures how much the portfolio might decrease over a 12 month period in extreme cases. The VAR estimate shows how much the portfolio value might fall in the worst 5% of 12 month periods. VAR is calculated using total risk (standard deviation) and market value.

⁴⁷ The Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken.

⁴⁸ The "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per unit of excess risk ventured.

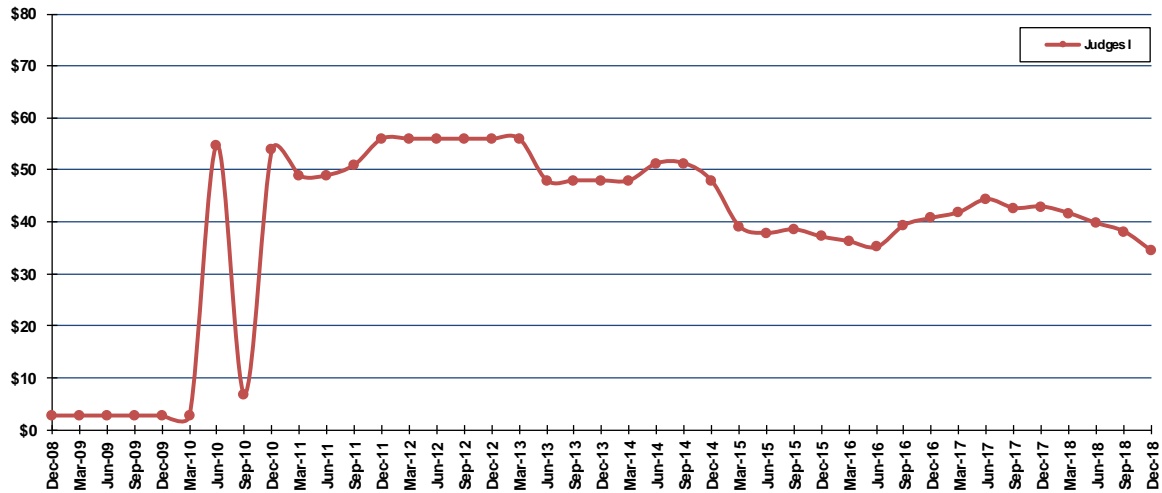
Affiliate Fund Information

Judges' Retirement System I Fund

Judges I Performance

Periods Ended December 31, 2018

Growth in Assets (in \$Millions)



Net of Fee Plan Performance Results – Judges I

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
Judges I	\$34.4 mil	0.6%	2.0%	1.2%	0.8%	0.5%
<i>91-Day Treasury Bill</i>		0.6	1.9	1.0	0.6	0.4
Judges I Internal Short-	\$34.4 mil	0.6	2.0	1.2	0.8	0.5
<i>91-Day Treasury Bill</i>		0.6	1.9	1.0	0.6	0.4

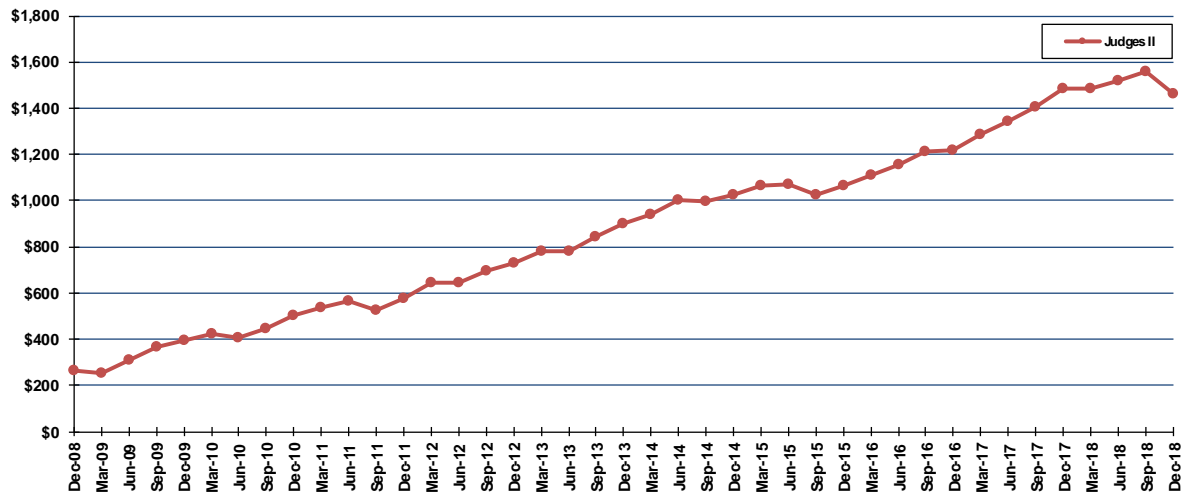
* JRS I maintains a reserve balance of approximately two months of benefit payments. Prior to 2009-2010 fiscal year, the fund held approximately one month of benefit reserve with the majority of funds held at the State Treasurer's Office. The cash balance experienced spikes in 2010 due to delayed passage of the 2010-2011 fiscal year budget by the Legislature, which the Governor signed on October 8, 2010.

Judges' Retirement System II Fund

Judges II Performance

Period Ended December 31, 2018

Growth in Assets (in \$Millions)



Total Plan Asset Allocation

Asset Class	Actual (%)	Policy (%)	Difference (%)
Global Equity	51.5	52.0	-0.5
US Fixed Income	32.8	32.0	+0.8
TIPS	5.1	5.0	+0.1
REITS	7.7	8.0	-0.3
Commodities	2.8	3.0	-0.2
Cash/Short-Term	0.0	0.0	0.0
Total Judges II	100.0	100.0	0.0

Commentary – Judges II

- ◆ Volatility rocked most major asset classes during the fourth quarter of 2018, where plummeting investor sentiment resulting from a myriad of growth-blunting concerns prompted sharp pullback in risk assets. The continued stimulus withdrawals/rate hikes by global central banks, downside surprises on growth in major developed ex-US and emerging economies, political uncertainties in the U.S. and elsewhere, and the broad-reaching negative implications of the U.S.-China trade dispute all contributed to mounting investor angst as 2018 drew to a close. These concerns of a lack of clarity on global economic health triggered a rout in global equities and other risk assets that also adversely impacted the Q4 results of the Judges II (“JRS II, the Plan”). The Plan, with approximately one third of its assets invested in stable core fixed income instruments, ultimately surrendered -7.5% this quarter due to sizable losses incurred by its equities and commodities portfolios. The Plan’s weighted policy benchmark was also down sharply for the same period, but came in at a slightly steeper drop of -7.7%. Despite Q4’s sizable (but unusual) losses, there are currently no concerns with JRS II’s performance over longer-term horizon, where it has averaged returns near the mid-single digit range that also compare well against the policy benchmark.
- ◆ At the end of Q4, Judges II’s asset allocation showed small overweight in U.S. fixed income and TIPS while having minor underweight in global equity, REITs, and commodities.
- ◆ World equity markets turned sharply lower in the fourth quarter, as rising concerns of slowing global economic growth and political uncertainties fueled volatility and ignited waves of selling pressure. The global equity fund did not deviate much from this market pattern, closely following its custom benchmark’s steps to net a double-digit decline this quarter, -13.2% vs. -13.3%. This steep drop also wiped out the fund’s full-year gains and caused it to end 2018 on a losing note of -9.5%. Longer-term track record of the fund does still remain in good shape, as it continues perform in line with expectations by carrying market-like gains beyond the 1-year mark.
- ◆ In light of the equity selloff and risk-off rotation during Q4, the U.S. fixed income fund emerged as the Judges II’s best performing major investment, generating a welcoming 1.4% of gain that virtually matched the custom Bloomberg Barclays benchmark’s pace. This benchmark-tying performance also allowed the U.S. fixed income fund to maintain its long-term edge in relative terms.
- ◆ The TIPS segment lost ground for the second straight quarter, as broader inflation pressure has eased in the second half of 2018 with a string of benign CPI readings coinciding with the decline of oil prices. Within this backdrop, the JRS II TIPS portfolio recorded a minor pullback of -0.4% and mirrored the output of the Bloomberg Barclays U.S. TIPS Index.
- ◆ The JRS II REIT portfolio was not immune to the fourth quarter’s challenging financial market condition, but overall speaking it fared better than the broader global equity fund with a less severe drop of -4.9%. For the full year the fund posted a total return of -4.1%. Both of these figures were modestly above the REIT custom benchmark’s respective returns of -5.1% and -4.7%.
- ◆ The commodities segment bore the brunt of the growth concern-driven risk assets selloff during the last quarter of 2018, particularly notable was the collapse of crude oil prices (-38.0% by WTI, to \$45.41

per barrel). As a result, the commodities portfolio was also down for the quarter, losing -23.0% that was on par with the benchmark GSCI Commodity Total Return Index. The Q4 selloff landed both the portfolio and benchmark's 2018 full year return in the red, too, at -13.7% and -13.8% respectively.

Net of Fee Plan Performance Results – Judges II

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
Judges II	\$1,464.4	-7.5%	-6.1%	5.3%	3.8%	8.4%
<i>Weighted Policy</i>		-7.7	-6.3	5.0	3.6	8.1
JRS II Global Equity	\$753.9 mil	-13.2	-9.5	7.1	4.7	9.7
<i>Global Equity Benchmark</i> ⁵⁰		-13.3	-9.7	7.0	4.6	9.6
JRS II US Fixed Income	\$481.0 mil	1.4	-1.3	3.6	4.2	6.3
<i>Custom Benchmark</i> ⁵¹		1.4	-1.6	2.9	3.8	4.9
JRS II TIPS	\$74.8 mil	-0.4	-1.2	2.1	1.6	-.-
<i>Custom Benchmark</i> ⁵²		-0.4	-1.3	2.1	1.7	-.-
JRS II REITs	\$113.3 mil	-4.9	-4.1	3.9	5.4	8.8
<i>Custom Benchmark</i> ⁵³		-5.1	-4.7	3.7	5.3	8.9
JRS II Commodities	\$41.3 mil	-23.0	-13.7	0.7	-14.3	-.-
<i>GSCI Total Return Index</i>		-22.9	-13.8	0.5	-14.5	-.-
JRS II Cash/Short-Term	\$0.02 mil	NM	NM	NM	NM	NM
<i>91-Day Treasury Bill</i>		0.6	1.9	1.0	0.6	0.4

⁴⁹ The weighted policy benchmark returns are calculated based on asset class index returns weighted by asset class policy targets.

⁵⁰ The JRS II Global Equity Benchmark is a custom global benchmark maintained by MSCI (ACWI IMI Net) starting 6/07/2018.

Between 6/06/2018 and 9/08/2011 the custom benchmark was run by FTSE. Prior of that it was calculated as an asset weighted benchmark of its underlying domestic and international funds.

⁵¹ The current US Fixed Income Custom Benchmark is the Bloomberg Barclays Long Liability Index. Barclays Long Liability ex TIPS was used as the benchmark between June 2005 and May 2007. Prior of that the benchmark was Citigroup LPF.

⁵² The TIPS benchmark is the Bloomberg Barclays U.S. TIPS Index.

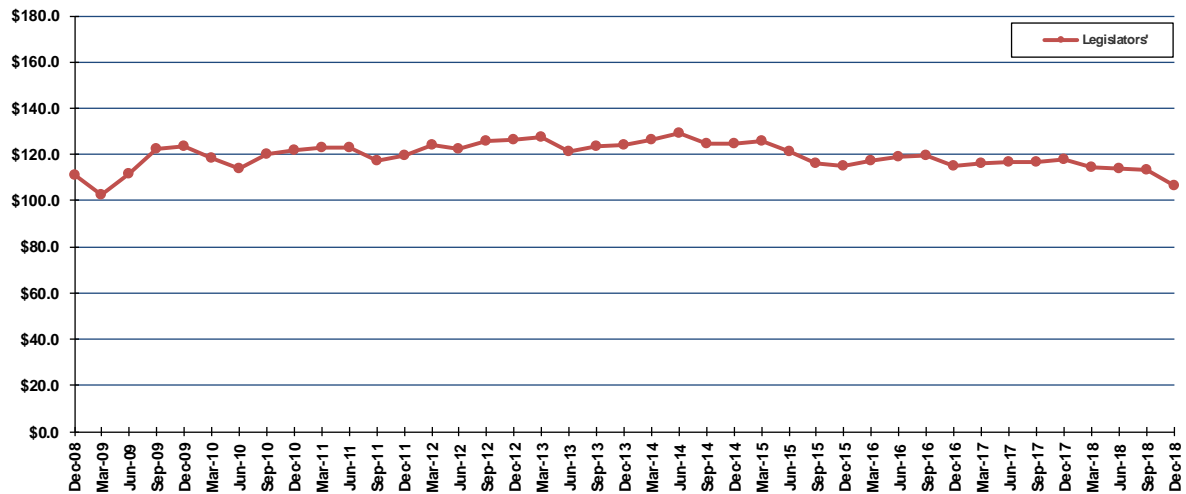
⁵³ The REIT Custom Benchmark is the FTSE EPRA/NAREIT Developed Liquid (net) Index starting 6/07/2018. Between 6/06/2018 and 9/08/2011 the benchmark was FTSE EPRA/NAREIT Developed (TR) Index. Prior of that it was the Wilshire RESI and REIT Indices.

Legislators' Retirement System Fund

LRS Performance

Period Ended December 31, 2018

Growth in Assets (in \$Millions)



Total Plan Asset Allocation

Asset Class	Actual (%)	Policy (%)	Difference (%)
Global Equity	21.6	22.0	-0.4
US Fixed Income	49.9	49.0	+0.9
TIPS	16.2	16.0	+0.2
REITS	7.7	8.0	-0.3
Commodities	4.7	5.0	-0.3
Cash/Short-Term	0.0	0.0	0.0
Total LRS	100.0	100.0	0.0

Commentary – LRS

- ◆ The California Legislators' Retirement System's ("LRS, the System") higher allocation to fixed income (50% to U.S. fixed income and 16% to TIPS) effectively served as a buffer, negating a lot of the negative impact from the global equity and commodities exposures, both of which suffered double-digit rate of losses during the volatile fourth quarter. The System did still conclude the quarter with an overall loss of -3.9%, but this was a much less severe rate compared to the Judges II; this performance also measured well to the weighted policy benchmark's -4.0% return. Given LRS's conservative asset allocation and its utilization of investment grade fixed income, the long-term track record exhibits a relatively consistent pace. This is readily observed as the System's 3- and 5-year returns have both averaged at or near the 4% range, while also modestly outpacing the weighted policy benchmark.
- ◆ As of December 31, the System was overweight in U.S. fixed income and TIPS while underweight in global equity, REITs and commodities.
- ◆ World equity markets turned sharply lower in the fourth quarter, as rising concerns of slowing global economic growth and political uncertainties fueled volatility and ignited waves of selling pressure. The LRS global equity fund did not deviate much from this market pattern, closely following its custom benchmark's steps to net a double-digit decline this quarter, -13.2% vs. -13.3%. This steep drop also wiped out the fund's full-year gains and caused it to end 2018 on a losing note of -9.5%. Longer-term track record of the fund does still remain in good shape, as it continues perform in line with expectations by carrying market-like gains beyond the 1-year mark.
- ◆ In light of the equity selloff and risk-off rotation during Q4, the U.S. fixed income fund emerged as the LRS's best performing major investment, generating a welcoming 1.3% of gain that virtually matched the custom Bloomberg Barclays benchmark's pace. This benchmark-tying performance also allowed the U.S. fixed income fund to maintain its long-term edge in relative terms.
- ◆ The TIPS segment lost ground for the second straight quarter, as broader inflation pressure has eased in the second half of 2018 with a string of benign CPI readings coinciding with the decline of oil prices. Within this backdrop, the LRS TIPS portfolio recorded a minor pullback of -0.4% and mirrored the output of the Bloomberg Barclays U.S. TIPS Index.
- ◆ The LRS REIT portfolio was not immune to the fourth quarter's challenging financial market condition, but overall speaking it fared better than the broader global equity fund with a less severe drop of -4.9%. For the full year the fund posted a total return of -4.1%. Both of these figures were modestly above the REIT custom benchmark's respective returns of -5.1% and -4.7%.
- ◆ The commodities segment bore the brunt of the growth concern-driven risk assets selloff during the last quarter of 2018, particularly notable was the collapse of crude oil prices (-38.0% by WTI, to \$45.41 per barrel). As a result, the commodities portfolio was also down for the quarter, losing -22.0% that was near-par with the benchmark GSCI Commodity Total Return Index (-22.9%). The Q4 selloff landed both the portfolio and benchmark's 2018 full year return in the red, too, at -12.7% and -13.8% respectively.

Net of Fee Plan Performance Results – LRS

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
LRS	\$106.6 mil	-3.9%	-3.7%	4.1%	3.4%	7.0%
<i>Weighted Policy</i>		-4.0	-3.9	3.8	3.2	6.5
LRS Global Equity	\$23.0 mil	-13.2	-9.5	7.1	4.7	9.8
<i>Global Equity Benchmark</i> ⁵⁵		-13.3	-9.7	7.0	4.6	9.7
LRS US Fixed Income	\$53.2 mil	1.3	-1.4	3.6	4.2	6.3
<i>Custom Benchmark</i> ⁵⁶		1.4	-1.6	2.9	3.8	4.9
LRS TIPS	\$17.3 mil	-0.4	-1.2	2.2	1.7	3.5
<i>Custom Benchmark</i> ⁵⁷		-0.4	-1.3	2.1	1.7	3.6
LRS REITs	\$8.2 mil	-4.9	-4.1	3.9	5.4	-.-
<i>Custom Benchmark</i> ⁵⁸		-5.1	-4.7	3.7	5.3	-.-
LRS Commodities	\$5.0 mil	-22.0	-12.7	1.1	-14.1	-.-
<i>GSCI Total Return Index</i>		-22.9	-13.8	0.5	-14.5	-.-
LRS Cash/Short-Term	\$0.004 mil	NM	NM	NM	NM	NM
<i>91-Day Treasury Bill</i>		0.6	1.9	1.0	0.6	0.4

⁵⁴ The weighted policy benchmark returns are calculated based on asset class index returns weighted by asset class policy targets.

⁵⁵ The LRS Global Equity Benchmark is a custom global benchmark maintained by MSCI (ACWI IMI Net) starting 6/07/2018. Between 6/06/2018 and 9/08/2011 the custom benchmark was run by FTSE. Prior of that it was calculated as an asset weighted benchmark of its underlying domestic and international funds.

⁵⁶ The current benchmark is the Bloomberg Barclays Long Liability Index. Barclays Long Liability ex TIPS was used as the benchmark between June 2005 and May 2007. Prior of that the benchmark was Citigroup LPF.

⁵⁷ The current benchmark is the Bloomberg Barclays U.S. TIPS Index. Prior of July 2007 the benchmark was the Barclays Long Liability TIPS Index.

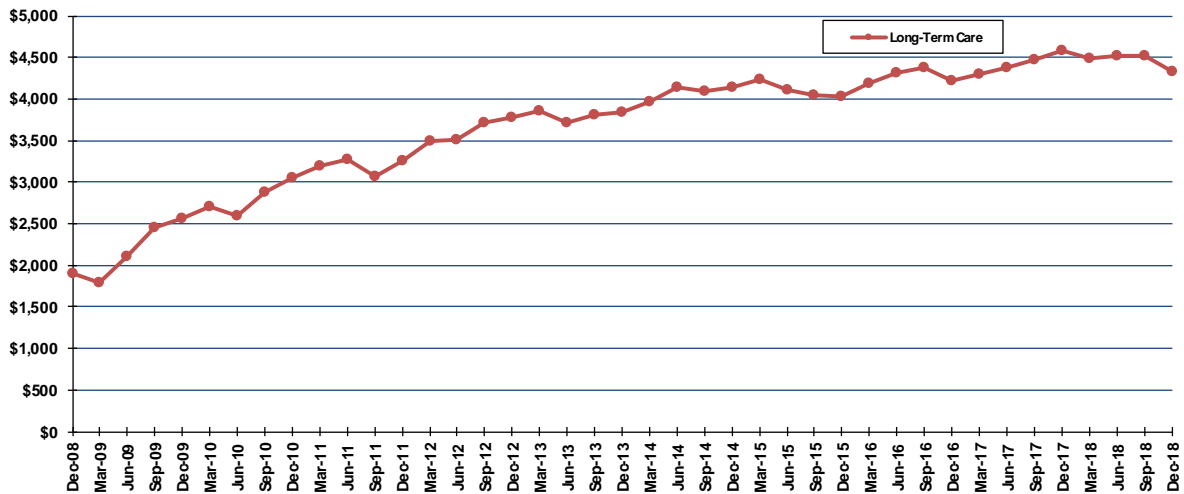
⁵⁸ The REIT Custom Benchmark is the FTSE EPRA/NAREIT Developed Liquid (net) Index starting 6/07/2018. Between 6/06/2018 and 9/08/2011 the benchmark was FTSE EPRA/NAREIT Developed (TR) Index. Prior of that it was the Wilshire RESI and REIT Indices.

Long-Term Care Fund

LTC Performance

Period Ended December 31, 2018

Growth in Assets (in \$Millions)



Total Plan Asset Allocation

Asset Class	Actual (%)	Policy (%)	Difference (%)
Global Equity	15.5	15.0	+0.5
US Fixed Income	61.2	60.0	+1.2
TIPS	5.9	6.0	-0.1
REITS	10.6	11.0	-0.4
Commodities	6.9	8.0	-1.1
Cash/Short-Term	0.0	0.0	0.0
Total LTC	100.0	100.0	0.0

Commentary – LTC

- ◆ Among the three major Affiliates programs, the Long-Term Care Program has the lowest exposure to global equities, currently at 16%. While this limited allocation was definitively a positive amid Q4's global equity pullback, part of this benefit was offset by LTC's higher REITs and commodities allocation, which both sold off during the quarter as well. In the end, the Program ended the fourth quarter on a similar note to the Legislators' Retirement System, retreating -3.8%. For the same period, the Program's own policy benchmark returned -3.7%. Over longer time horizon, the LTC has done relatively well as its track record currently sits comfortably ahead of the policy benchmark over time periods 5-year and beyond.
- ◆ The LTC's asset allocation showed that it was overweight in global equity and U.S. fixed income, while underweight in TIPS, REITs and commodities.
- ◆ World equity markets turned sharply lower in the fourth quarter, as rising concerns of slowing global economic growth and political uncertainties fueled volatility and ignited waves of selling pressure. The LTC global equity fund did not deviate much from this market pattern, closely following its custom benchmark's steps to net a double-digit decline this quarter, -13.2% vs. -13.3%. This steep drop also wiped out the fund's full-year gains and caused it to end 2018 on a losing note of -9.8%. Longer-term track record of the fund does still remain in good shape, as it continues perform in line with expectations by carrying market-like gains beyond the 1-year mark.
- ◆ In light of the equity selloff and risk-off rotation during Q4, the U.S. fixed income fund emerged as the LTC's best performing major investment, generating a welcoming 1.4% of gain that virtually matched the custom Bloomberg Barclays benchmark's pace. This benchmark-tying performance also allowed the U.S. fixed income fund to maintain its long-term edge in relative terms.
- ◆ The TIPS segment lost ground for the second straight quarter, as broader inflation pressure has eased in the second half of 2018 with a string of benign CPI readings coinciding with the decline of oil prices. Within this backdrop, the LTC TIPS portfolio recorded a minor pullback of -0.5% and mirrored the output of the Bloomberg Barclays U.S. TIPS Index.
- ◆ The LTC REIT portfolio was not immune to the fourth quarter's challenging financial market condition, but overall speaking it fared better than the broader global equity fund with a less severe drop of -4.9%. For the full year the fund posted a total return of -4.5%. Both of these figures were modestly above the REIT custom benchmark's respective returns of -5.1% and -5.5%.
- ◆ The commodities segment bore the brunt of the growth concern-driven risk assets selloff during the last quarter of 2018, particularly notable was the collapse of crude oil prices (-38.0% by WTI, to \$45.41 per barrel). As a result, the commodities portfolio was also down for the quarter, losing -23.0% that was near-par with the benchmark GSCI Commodity Total Return Index (-22.9%). The Q4 selloff landed both the portfolio and benchmark's 2018 full year return in the red, too, at -14.0% and -13.8% respectively.

Net of Fee Plan Performance Results – LTC

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
Long-Term Care ("LTC")	\$4,334.6	-3.8%	-4.3%	3.2%	2.8%	6.5%
<i>Weighted Policy</i>		-3.7	-4.3	3.2	2.7	6.2
LTC Global Equity	\$671.8 mil	-13.2	-9.8	6.8	4.5	9.7
<i>Custom Benchmark ⁶⁰</i>		-13.3	-10.1	6.5	4.2	9.6
LTC US Fixed Income	\$2,650.9mil	1.4	-1.6	2.8	3.7	5.8
<i>Custom Benchmark ⁶¹</i>		1.4	-1.6	2.9	3.8	4.9
LTC TIPS	\$256.2 mil	-0.5	-1.3	2.1	1.7	3.5
<i>Bloomberg Barclays U.S. TIPS Index</i>		-0.4	-1.3	2.1	1.7	3.6
LTC REITs	\$457.8 mil	-4.9	-4.5	3.0	4.9	8.3
<i>Custom Benchmark ⁶²</i>		-5.1	-5.5	2.2	4.1	8.1
LTC Commodities	\$297.8 mil	-23.0	-14.0	0.4	-14.6	-. -
<i>GSCI Total Return Index</i>		-22.9	-13.8	0.5	-14.5	-. -
LTC Cash/Short-Term	\$0.06 mil	NM	NM	NM	NM	NM
<i>91-Day Treasury Bill</i>		0.6	1.9	1.0	0.6	0.4

⁵⁹ The weighted policy benchmark returns are calculated based on asset class index returns weighted by asset class policy targets.

⁶⁰ Effective 12/12/2012 the domestic and international equity asset classes were aggregated into a single global equity asset class, benchmarked against the MSCI ACWI IMI (net).

⁶¹ The LTC US Fixed Income Custom Benchmark is the Bloomberg Barclays Long Liability Index. Barclays Long Liability ex TIPS ex High Yield was the benchmark between June 2007 and July 2005. Prior of that the benchmark was the Barclays Aggregate Bond Index.

⁶² Effective 12/12/2012, the REIT Custom Benchmark changed to the FTSE EPRA/NAREIT Developed Liquid (net) Index.

California Employees' Retiree Benefit Trust

Capital Market Overview

U.S. Equity Market

The U.S. stock market, represented by the Wilshire 5000 Total Market IndexSM, was down -14.29% for the fourth quarter of 2018 and -5.27% for the year. This marks the worst quarter for U.S. equities since 2011 and the first down year since the credit crisis sell-off of 2008. The index had been down by double-digits for the year in late-December before gaining nearly 7% during the final few trading days. Concerns of an economic slowdown weighed on stock prices as did fears that additional rate increases by the Federal Reserve could weaken future prospects for economic growth. Ongoing trade negotiations between China and the U.S. continued to be a factor affecting market activity during the quarter with the eventual resolutions standing as a major unknown entering the new year.

Large capitalization stocks far outperformed small caps for the quarter as the Wilshire Large-Cap IndexSM was down -13.69% versus a loss of -19.67% for the Wilshire US Small-Cap IndexSM. The large-cap segment of the market leads small-caps for the past twelve months, as well. The Wilshire US Micro-Cap IndexSM was down -23.50% for the quarter and -15.58% for the one-year. Growth stocks trailed value, generally, during the fourth quarter but outperformed during the past twelve months.

Nearly all of the eleven major sectors were in negative territory during the fourth quarter. The only positive sector was Utilities (+0.8%) with Energy (-25.6%), Industrials (-18.2%) and Information Technology (-17.5%) down the most.

Fixed Income Market

The U.S. Treasury yield curve fell across most maturities during the quarter with the biggest decreases occurring in the intermediate to longer segment of the curve. The bellwether 10-year Treasury yield ended the quarter at 2.69%, down 37 basis points from September. The Federal Open Market Committee decided to increase its overnight rate by 25 basis points in December to a range of 2.25% to 2.50%. The committee adjusted their forecast for future rates, communicated through their "dot plot," from three rate increases in 2019 to only two. Credit spreads widened during the quarter within both the investment grade and high yield markets.

The yield curve ended 2018 with a very unusual shape – which will likely be a source of debate if it persists, largely focusing on the Fed's December rate hike. Some fear that it could be enough to slow the economy and are therefore selling shorter-term bonds, pushing rates higher. Others highlight the fact that the Fed's mandate focuses on both growth and inflation and that a 0.25% increase is not likely to stop the U.S. economy cold. While history has shown that an inverted curve often precedes a recession, the time between the events can be as much as a year. Also, the Fed makes their final decisions based on all available data and can decide to adjust their course of action.

Non-U.S. Markets

Equity markets outside of the U.S. also suffered during the fourth quarter of 2018, although they generally outperformed the U.S. equity market. For all of 2018, however, foreign equities significantly underperformed, falling by double digits. While the European Union began the year in sound condition, economically, growth declined steadily during the year while gains in unemployment stalled and industrial production reversed course. News out of Japan was grim with a report showing a serious economic contraction during the third quarter that threatens to end Japan's longest expansion since the 1980's. Emerging markets actually led global equity for the quarter but still exhibited a meaningful loss. While there were some positive signals on the U.S.-China trade front, investors will likely wait until after a scheduled meeting in January between the two countries before fully evaluating the current global trade environment.

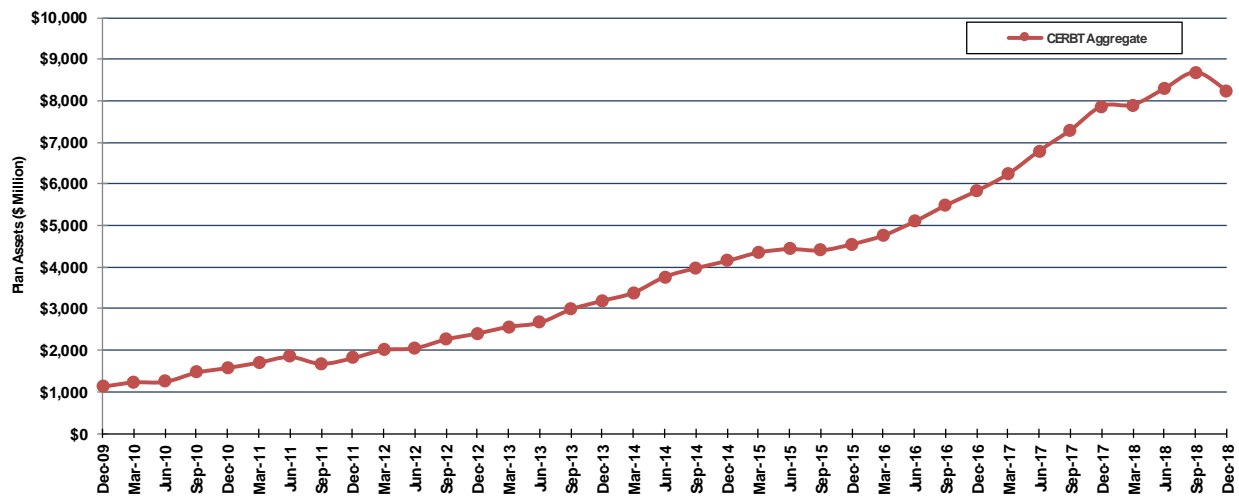
Real Assets Markets

Real estate securities outperformed broader equities during the quarter but were still down in absolute terms. The same is true for 2018 although Real Estate maintained only a slight margin. Commodity results were down for the quarter as crude oil fell -38.0% to \$45.41 per barrel. Natural gas prices were down -2.3%, ending the quarter at \$2.94 per million BTUs. MLP returns were in negative territory for the quarter (-17.30%) and are down double-digits for the year. Finally, gold prices were up and finished at approximately \$1,281 per troy ounce, up +7.1% from last quarter.

California Employers' Retiree Benefit Trust Aggregate

Periods Ended December 31, 2018

Growth in Assets (in \$Millions)



Net of Fee Trust Performance – Aggregate

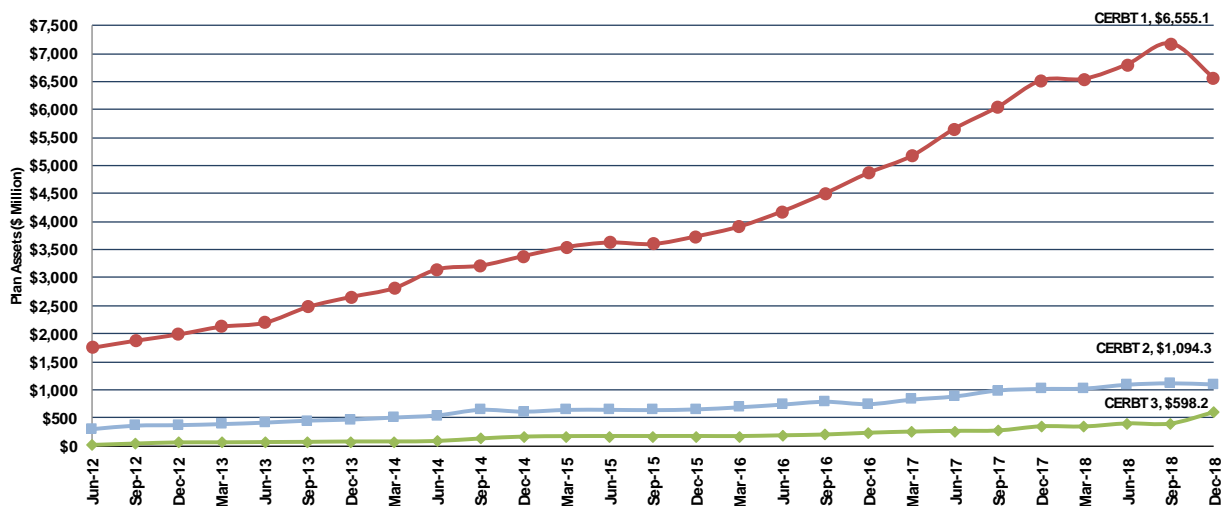
Periods Ended December 31, 2018

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
CERBT Aggregate	\$8,247.6 mil	-8.0%	-6.6%	5.2%	3.7%	8.4%
<i>CERBT Trust Aggregate</i>		-8.1	-6.8	4.7	3.3	8.1
<i>Benchmark</i>						

California Employers' Retiree Benefit Trust Strategy 1, 2, 3

Periods Ended December 31, 2018

Growth in Assets (in \$Millions)



California Employers' Retiree Benefit Trust Strategy 1

Asset Allocation

Asset Class	Actual	Policy	Difference
Global Equity	59.3%	59.0%	+0.3%
US Bonds	24.9	25.0	-0.1
TIPS	5.0	5.0	0.0
REITS	7.8	8.0	-0.2
Commodities	2.9	3.0	-0.1
Cash/Short-Term [±]	0.1	0.0	+0.1
Total CERBT 1	100.0	100.0	0.0

Net of Fee Trust Performance Results

Trust Performance Periods Ended December 31, 2018

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
CERBT Strategy 1	\$6,555.1 mil	-8.6%	-6.9%	5.3%	3.8%	8.5%
<i>Total CERBT Strat. 1</i>		-8.7	-7.2	4.8	3.4	8.2
Global Equity	3,889.0	-13.2	-9.8	6.9	4.5	9.7
<i>CERBT Global Equity Benchmark</i>		-13.3	-10.1	6.5	4.2	9.5
Domestic Fixed Income	1,631.5	1.4	-1.3	3.6	4.3	6.3
<i>CalPERS Custom Long Liability</i>		1.4	-1.6	2.9	3.8	4.9
TIPS	325.7	-0.5	-1.2	2.1	1.6	-.-
<i>CalPERS TIPS</i>		-0.4	-1.3	2.1	1.7	-.-
REITs	512.9	-4.9	-4.5	3.1	4.9	8.3
<i>PERS FTSE/EPRA NAREIT Dev.</i>		-5.1	-5.5	2.2	4.1	8.1
Commodities	189.5	-23.0	-13.7	0.5	-14.5	-.-
<i>GSCI Total Return</i>		-22.9	-13.8	0.5	-14.5	-.-
Cash/Short-Term[±]	6.4	NM	NM	NM	NM	NM
<i>91-Day T-Bill</i>		0.6	1.9	1.0	0.6	0.4

[±] Cash balances are inclusive of employer fund contributions that are in the process of being invested into asset classes. These contributions occur daily, but tend to be higher at the end of each quarter.

California Employers' Retiree Benefit Trust Strategy 2

Asset Allocation

Asset Class	Actual	Policy	Difference
Global Equity	40.2%	40.0%	+0.2%
US Bonds	42.8	43.0	-0.2
TIPS	5.0	5.0	0.0
REITS	7.8	8.0	-0.2
Commodities	3.8	4.0	-0.2
Cash/Short-Term [±]	0.4	0.0	+0.4
Total CERBT 2	100.0	100.0	0.0

Net of Fee Trust Performance Results

Trust Performance Periods Ended December 31, 2018

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
CERBT Strategy 2	\$1,094.3 mil	-6.1%	-5.3%	4.7%	3.5%	-.-%
<i>Total CERBT Strat. 2</i>		-6.2	-5.6	4.2	3.2	-.%
Global Equity	439.8 mil	-13.2	-9.8	6.9	4.5	-.%
<i>CERBT Global Equity Benchmark</i>		-13.3	-10.1	6.5	4.2	-.%
Domestic Fixed Income	468.0 mil	1.4	-1.4	3.6	4.2	-.%
<i>CalPERS Custom Long Liability</i>		1.4	-1.6	2.9	3.8	-.%
TIPS	54.3 mil	-0.4	-1.2	2.1	1.6	-.%
<i>CalPERS TIPS</i>		-0.4	-1.3	2.1	1.7	-.%
REITs	85.5 mil	-4.9	-4.5	3.1	4.9	-.%
<i>PERS FTSE/EPRA NAREIT Dev</i>		-5.1	-5.5	2.2	4.1	-.%
Commodities	42.0 mil	-22.5	-13.1	0.7	-14.3	-.%
<i>GSCI Total Return</i>		-22.9	-13.8	0.5	-14.5	-.%
Cash/Short-Term[±]	4.7 mil	NM	NM	NM	NM	-.%
<i>91-Day T-Bill</i>		0.6	1.9	1.0	0.6	-.%

[±] Cash balances are inclusive of employer fund contributions that are in the process of being invested into asset classes. These contributions occur daily, but tend to be higher at the end of each quarter.

California Employers' Retiree Benefit Trust Strategy 3

Asset Allocation

Asset Class	Actual	Policy	Difference
Global Equity	22.2%	22.0%	+0.2%
US Bonds	49.0	49.0	0.0
TIPS	16.0	16.0	0.0
REITS	7.9	8.0	-0.1
Commodities	4.8	5.0	-0.2
Cash/Short-Term [±]	0.1	0.0	+0.1
Total CERBT 3	100.0	100.0	0.0

Net of Fee Trust Performance Results

Trust Performance Periods Ended December 31, 2018

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
CERBT Strategy 3	\$598.2 mil	-3.9%	-3.9%	4.0%	3.3%	-.-%
<i>Total CERBT Strat. 3</i>		-4.0	-4.1	3.6	3.0	-.%
Global Equity	132.9	-13.2	-9.8	6.8	4.5	-.%
<i>CERBT Global Equity Benchmark</i>		-13.3	-10.1	6.5	4.2	-.%
Domestic Fixed Income	293.2	1.3	-1.4	3.6	4.2	-.%
<i>CalPERS Custom Long Liability</i>		1.4	-1.6	2.9	3.8	-.%
TIPS	95.6	-0.4	-1.2	2.1	1.7	-.%
<i>CalPERS TIPS</i>		-0.4	-1.3	2.1	1.7	-.%
REITs	47.0	-4.8	-4.4	3.0	4.9	-.%
<i>PERS FTSE/EPRA NAREIT Dev.</i>		-5.1	-5.5	2.2	4.1	-.%
Commodities	28.9	-22.0	-12.5	1.1	-14.1	-.%
<i>GSCI Total Return</i>		-22.9	-13.8	0.5	-14.5	-.%
Cash/Short-Term[±]	0.6	NM	NM	NM	NM	-.%
<i>91-Day T-Bill</i>		0.6	1.9	1.0	0.6	-.%

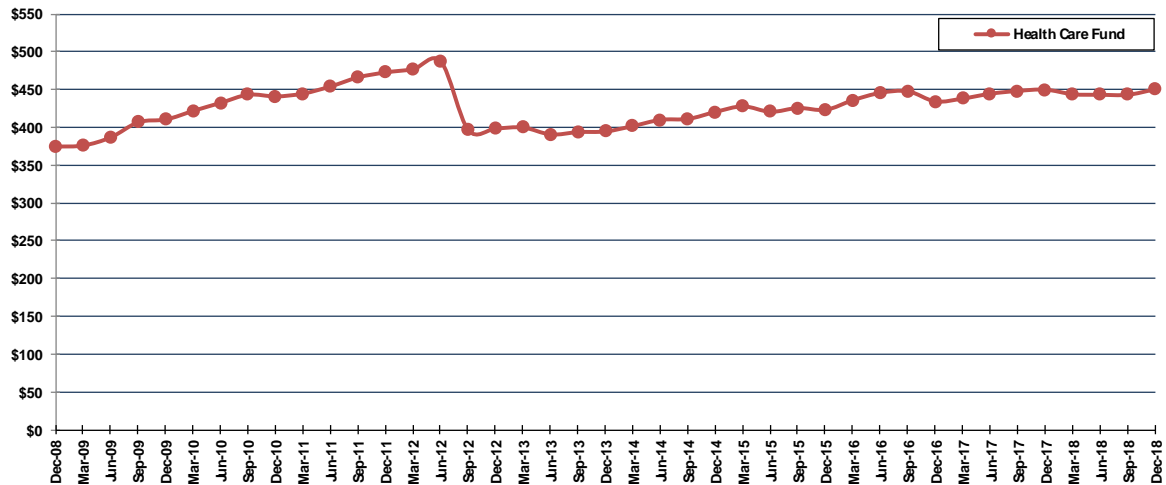
[±] Cash balances are inclusive of employer fund contributions that are in the process of being invested into asset classes. These contributions occur daily, but tend to be higher at the end of each quarter.

Health Care Fund

Health Care Fund

Periods Ended December 31, 2018

Growth in Assets (in \$Millions)⁶³



Net of Fee Fund Performance

Fund Performance

Periods Ended December 31, 2018

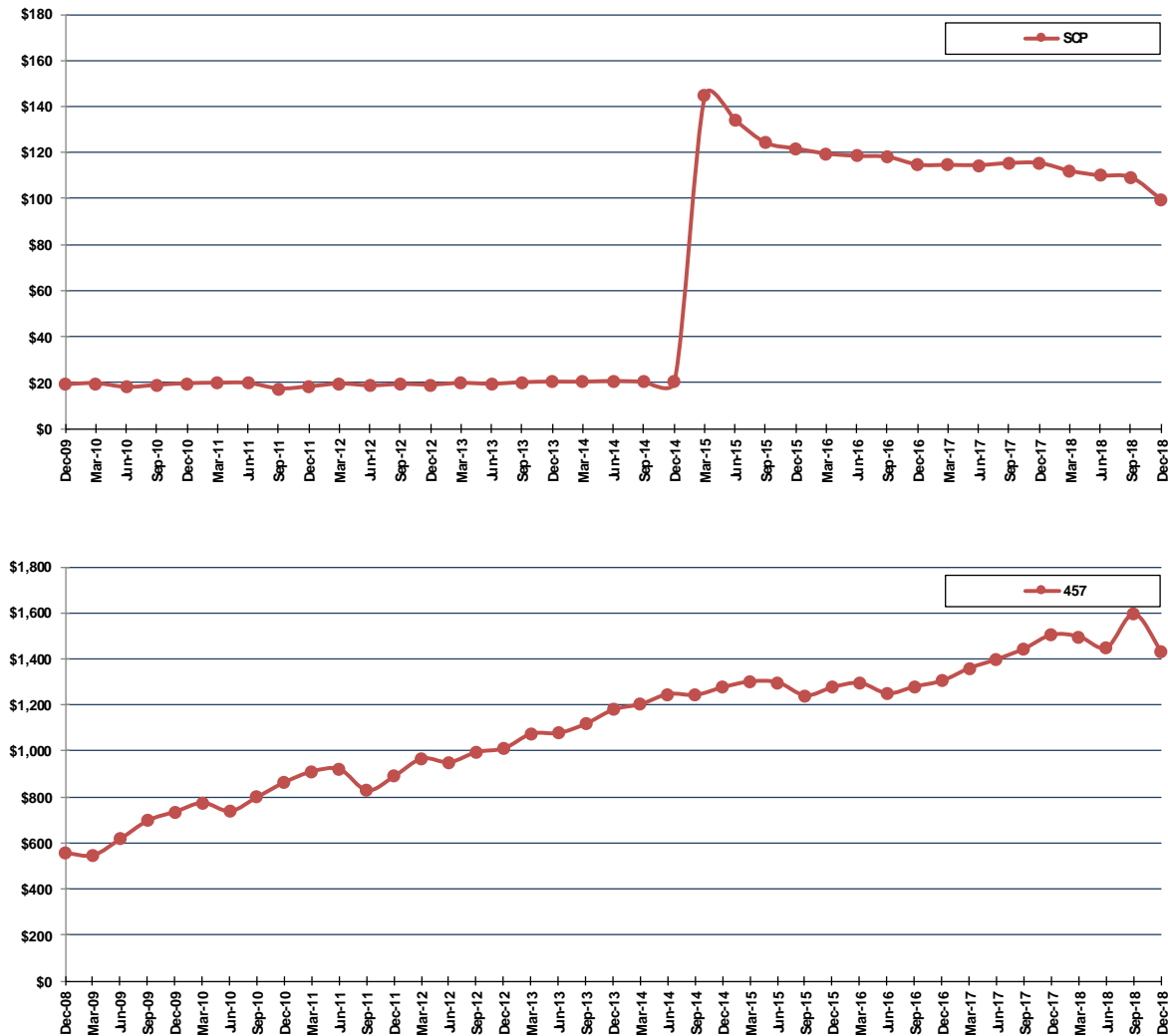
	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
Health Care Fund	\$450.6 mil	1.7%	0.1%	2.1%	2.7%	4.2%
<i>Barclays US Aggregate Bond</i>		1.6	0.0	2.1	2.5	3.5

⁶³ The decline in assets in the third quarter of 2012 was due to a \$100 million withdrawal from the fund.

Supplemental Income Plans

Supplemental Income Plan Performance⁶⁴

Growth in Assets (in \$Millions)



⁶⁴ SCP experienced a steep increase in assets during the first quarter of 2015. This was due to the termination of the State Peace Officers' and Firefighters' (POFF) Defined Contribution Plan, which took place June 1, 2014. The termination required distributions of participant's money in the POFF DC Plan in accordance with state and federal law, and SCP was designated as the default plan for participants who did not make an affirmative election to take a distribution.

Net Fund Performance – Supplemental Contribution Plan

Periods Ended December 31, 2018

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
CalPERS Target Income Fund	\$16.4 mil	-3.3%	-3.1%	2.2%	2.1%	-.-
<i>SIP Income Policy</i>		-3.4	-3.2	2.1	2.0	-.-
CalPERS Target 2015 Fund	\$14.3 mil	-4.4	-4.2	1.9	1.9	-.-
<i>SIP 2015 Policy</i>		-4.4	-4.3	1.8	1.8	-.-
CalPERS Target 2020 Fund	\$20.7 mil	-6.2	-5.9	1.8	1.8	-.-
<i>SIP 2020 Policy</i>		-6.3	-5.9	1.7	1.7	-.-
CalPERS Target 2025 Fund	\$18.2 mil	-7.9	-7.1	2.8	2.2	-.-
<i>SIP 2025 Policy</i>		-8.0	-7.2	2.6	2.1	-.-
CalPERS Target 2030 Fund	\$13.5 mil	-9.8	-8.8	3.2	2.3	-.-
<i>SIP 2030 Policy</i>		-9.9	-8.8	3.1	2.2	-.-
CalPERS Target 2035 Fund	\$6.1 mil	-11.5	-10.1	3.8	2.5	-.-
<i>SIP 2035 Policy</i>		-11.5	-10.2	3.6	2.4	-.-
CalPERS Target 2040 Fund	\$3.2 mil	-12.2	-10.6	4.7	2.9	-.-
<i>SIP 2040 Policy</i>		-12.3	-10.6	4.6	2.8	-.-
CalPERS Target 2045 Fund	\$0.7 mil	-12.2	-10.2	5.7	3.4	-.-
<i>SIP 2045 Policy</i>		-12.3	-10.3	5.5	3.3	-.-
CalPERS Target 2050 Fund	\$0.1 mil	-12.2	-10.2	5.7	3.4	-.-
<i>SIP 2050 Policy</i>		-12.3	-10.3	5.5	3.3	-.-
CalPERS Target 2055 Fund	\$0.09 mil	-12.2	-10.2	5.7	-.-	-.-
<i>SIP 2055 Policy</i>		-12.3	-10.3	5.5	-.-	-.-
SSgA Russell All Cap Index SL	\$3.8 mil	-14.3	-5.3	9.0	7.9	-.-
<i>Russell 3000</i>		-14.3	-5.2	9.0	7.9	-.-
SSgA Global All Cap ex-US SL	\$0.5 mil	-11.9	-14.6	4.8	1.0	-.-
<i>MSCI ACWI ex-US IMI (N)</i>		-11.9	-14.8	4.4	0.8	-.-
SSgA US Bond Index SL	\$0.3 mil	1.6	0.1	2.1	2.6	-.-
<i>Barclays Aggregate Bond Index</i>		1.6	0.0	2.1	2.5	-.-
SSgA US Short Term Bond	\$0.3 mil	1.2	1.5	1.1	0.9	-.-
<i>Barclays US Gov/Credit</i>		1.2	1.6	1.2	1.0	-.-
SSgA Real Asset NL	\$0.2 mil	-7.2	-7.2	4.8	-0.5	-.-
<i>Real Assets Blended Index</i>		-7.2	-7.0	5.0	-0.3	-.-
SSgA STIF	\$1.1 mil	0.6	2.3	1.3	-.-	-.-
<i>BofAML 3 Month US TBill</i>		0.6	1.9	1.0	-.-	-.-
SCP AGGREGATE	\$99.4 mil					
<i>CalPERS CUSTOM SCP PLAN INDEX</i>						

Net Fund Performance – 457 Program

Periods Ended December 31, 2018						
	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
CalPERS Target Income Fund <i>SIP Income Policy</i>	\$79.3 mil	-3.3% -3.4	-3.1% -3.2	2.2% 2.1	2.1% 2.0	5.0% 5.0
CalPERS Target 2015 Fund <i>SIP 2015 Policy</i>	\$70.5 mil	-4.4 -4.4	-4.1 -4.3	1.9 1.8	1.9 1.8	6.2 6.3
CalPERS Target 2020 Fund <i>SIP 2020 Policy</i>	\$130.3 mil	-6.2 -6.3	-5.9 -5.9	1.8 1.7	1.8 1.7	6.6 6.7
CalPERS Target 2025 Fund <i>SIP 2025 Policy</i>	\$129.7 mil	-7.9 -8.0	-7.1 -7.2	2.8 2.6	2.2 2.1	7.3 7.4
CalPERS Target 2030 Fund <i>SIP 2030 Policy</i>	\$111.0 mil	-9.8 -9.9	-8.8 -8.8	3.2 3.1	2.3 2.2	8.0 8.1
CalPERS Target 2035 Fund <i>SIP 2035 Policy</i>	\$64.9 mil	-11.5 -11.5	-10.1 -10.2	3.8 3.6	2.5 2.4	8.5 8.7
CalPERS Target 2040 Fund <i>SIP 2040 Policy</i>	\$59.7 mil	-12.2 -12.3	-10.5 -10.6	4.7 4.6	2.9 2.8	8.9 9.0
CalPERS Target 2045 Fund <i>SIP 2045 Policy</i>	\$30.9 mil	-12.2 -12.3	-10.2 -10.3	5.7 5.5	3.4 3.3	9.2 9.3
CalPERS Target 2050 Fund <i>SIP 2050 Policy</i>	\$15.2 mil	-12.2 -12.3	-10.2 -10.3	5.7 5.5	3.4 3.3	9.2 9.3
CalPERS Target 2055 Fund <i>SIP 2055 Policy</i>	\$6.8 mil	-12.2 -12.3	-10.2 -10.3	5.7 5.5	3.4 3.3	-- --
CalPERS Target 2060 Fund <i>SIP 2060 Policy</i>	\$0.5 mil	-- --	-- --	-- --	-- --	-- --
SSgA Russell All Cap Index SL <i>Russell 3000</i>	\$474.4 mil	-14.3 -14.3	-5.3 -5.2	9.0 9.0	7.9 7.9	-- --
SSgA Global All Cap ex-US SL <i>MSCI ACWI ex-US IMI (N)</i>	\$59.4 mil	-11.9 -11.9	-14.6 -14.8	4.8 4.4	1.0 0.8	-- --
SSgA US Bond Index SL <i>Barclays Aggregate Bond Index</i>	\$54.7 mil	1.6 1.6	0.1 0.0	2.1 2.1	2.6 2.5	-- --
SSgA US Short Term Bond <i>Barclays US Gov/Credit</i>	\$34.0 mil	1.2 1.2	1.6 1.6	1.1 1.2	0.9 1.0	-- --

Net Fund Performance – 457 Program Continued

Periods Ended December 31, 2018

	Market Value	Qtr	One Year	Three Year	Five Year	Ten Year
SSgA Real Asset NL	\$6.1 mil	-7.2	-7.2	4.8	-0.4	-.-
<i>Real Assets Blended Index</i>		-7.2	-7.0	5.0	-0.3	-.-
SSgA STIF	\$102.8 mil	0.6	2.3	1.3	-.-	-.-
<i>BofAML 3 Month US TBill</i>		0.6	1.9	1.0	-.-	-.-
457 AGGREGATE	\$1,430.3 mil					
<i>CalPERS CUSTOM 457 PLAN INDEX</i>						

Appendix: ARS Performance

Absolute Return Strategies Review for PERF

Period Ended 12/31/2018

ARS Allocation

Asset Allocation: Actual versus Target Weights

Asset Class	Actual Asset Allocation	Target Asset Allocation	Difference
ARS	0.1%	0.0%	+0.1%

ARS Segment Performance

	<u>Market Value</u>	<u>Qtr</u>	<u>1-Year</u>	<u>3-Year</u>	<u>5-Year</u>	<u>10-Year</u>	<u>5-Year Info Ratio⁶⁶</u>	<u>5-Year Up Capture Ratio</u>	<u>5-Year Sharpe Ratio⁶⁷</u>	<u>5-Year Sortino Ratio⁶⁸</u>
Absolute Return Strategies	0.2	4.9%	-4.0%	-1.5%	0.4%	3.3%	N/A	0.1	N/A	-0.1
ARS Policy Benchmark ⁶⁵		2.0%	6.9%	6.1%	5.7%	5.6%				
Value Added		2.9%	-10.9%	-7.6%	-5.3%	-2.3%				
Total Direct Investments	0.2	4.8%	-4.3%	-1.6%	0.3%	3.8%				
HFRI Fund of Funds Index		-4.4%	-3.3%	1.6%	1.5%	3.2%				

ARS Characteristics

Percentage of positive Months	Beta vs. S&P 500	Rolling Correlations vs. Index			
		Domestic			
		MSCI AW x- US	Fixed Benchmark	Real Estate Benchmark	
61%	0.0	-0.1	0.0	0.2	-0.1

- ◆ Beta vs. S&P 500: This measures the amount of stock market risk in the portfolio. A beta of 1.0 would indicate that the portfolio's performance should closely track the stock market, while a beta higher than 1.0 implies greater-than-market risk and possibly leverage. The portfolio's beta is currently at 0.0, implying that there are no relationship between the portfolio's expected return and the stock market return, which is appropriate for this program.
- ◆ Correlation vs. various indices: We have calculated the historical correlation between the ARS and CalPERS' other main asset classes. Over a market cycle, the ARS has shown little to no correlation to

⁶⁵he ARS Policy Benchmark consists of the Merrill Lynch 1-Year Treasury Note + 5% and is linked historically to its prior benchmark.

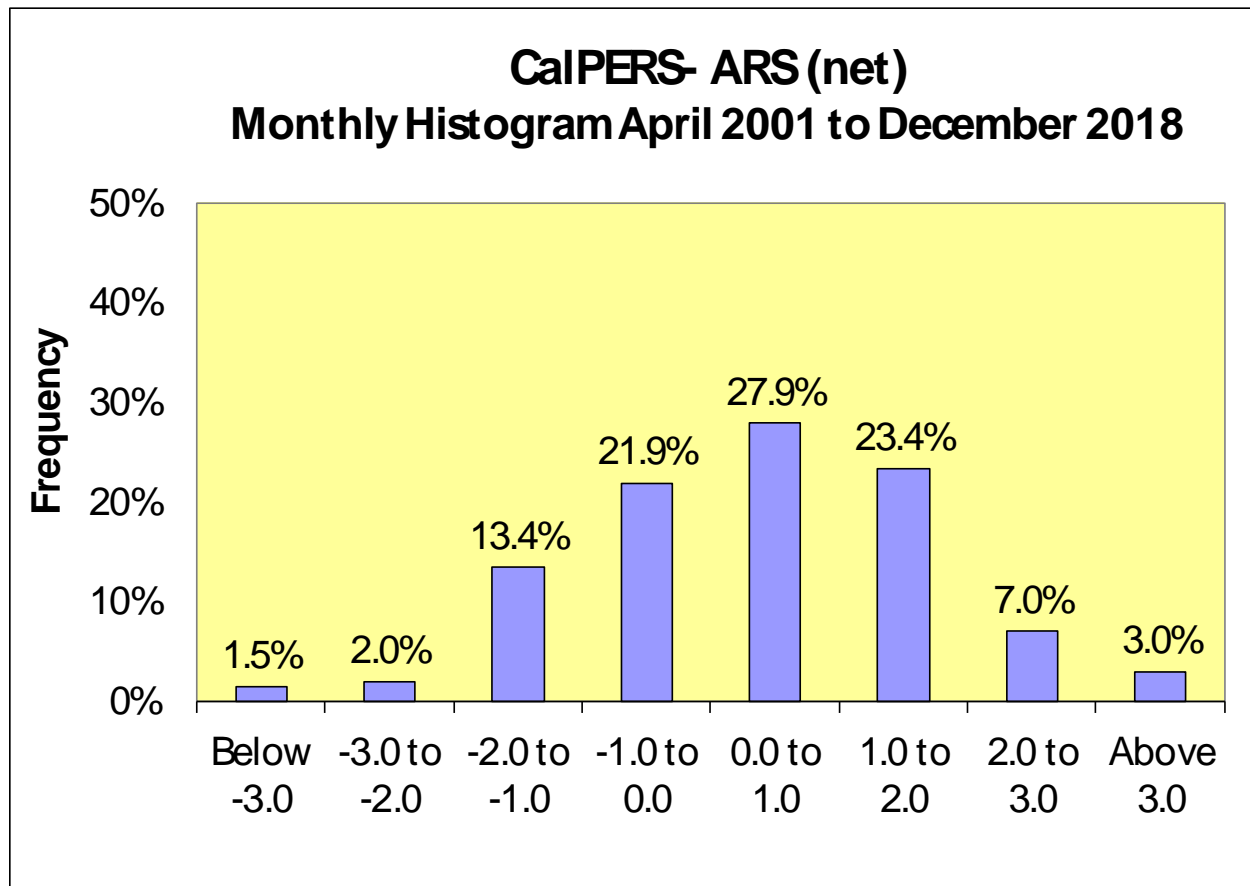
⁶⁶he "Information Ratio" calculates the amount of excess performance earned per unit of excess risk, as measured by tracking error. Higher information ratios imply a greater return per risk ventured.

⁶⁷he Sharpe Ratio or reward-to-variability ratio is a measure of the mean excess return per unit of risk in an investment strategy. The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken.

⁶⁸he Sortino Ratio is measure of a risk-adjusted return of an investment asset. It is an extension of the Sharpe Ratio. While the Sharpe ratio takes into account any volatility, in return of an asset, Sortino ratio differentiates volatility due to up and down movements. The up movements are considered desirable and not accounted in the volatility.

the public equity and real estate markets while also exhibiting very low correlation with fixed income markets.

Absolute Return Strategies Review for PERF (Continued)
Period Ended 12/31/2018



- ◆ Histogram: The ARS is designed to generate small amounts of return on a consistent basis. This chart shows the frequency of monthly performance results. A significant number of outlying monthly performance returns would indicate insufficient risk controls. We believe that the distribution of monthly returns is as expected.