

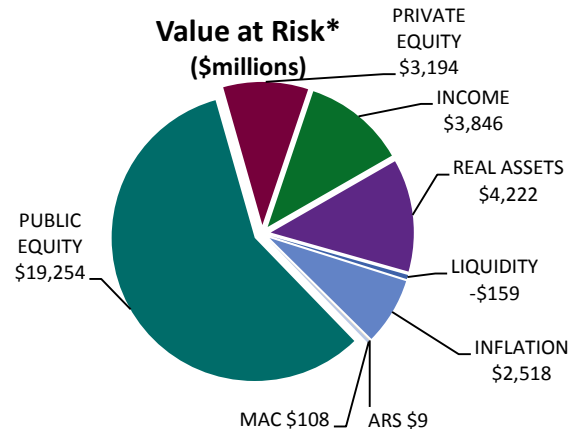
CalPERS Trust Level Review Risk Management Summary



Period Ending May 31, 2017

Investment Belief 9: Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error. CalPERS shall develop a broad set of investment and actuarial risk measures and clear processes for managing risk. The path of returns matters, because highly volatile returns can have unexpected impacts on contribution rates and funding status.

Total Fund Forecast Volatility Trends (%)				
	Policy Limit	Current 5/31/2017	Last Qtr 3/31/2017	Last Year 5/31/2016
Total	n/a	8.3	8.6	10.4
Benchmark	n/a	7.9	8.2	10.2
Tracking Error	< 1.5%	0.5	0.6	0.8
Allocation	< .75%	0.1	0.1	0.0
Selection	n/a	0.5	0.5	0.7



Comments:

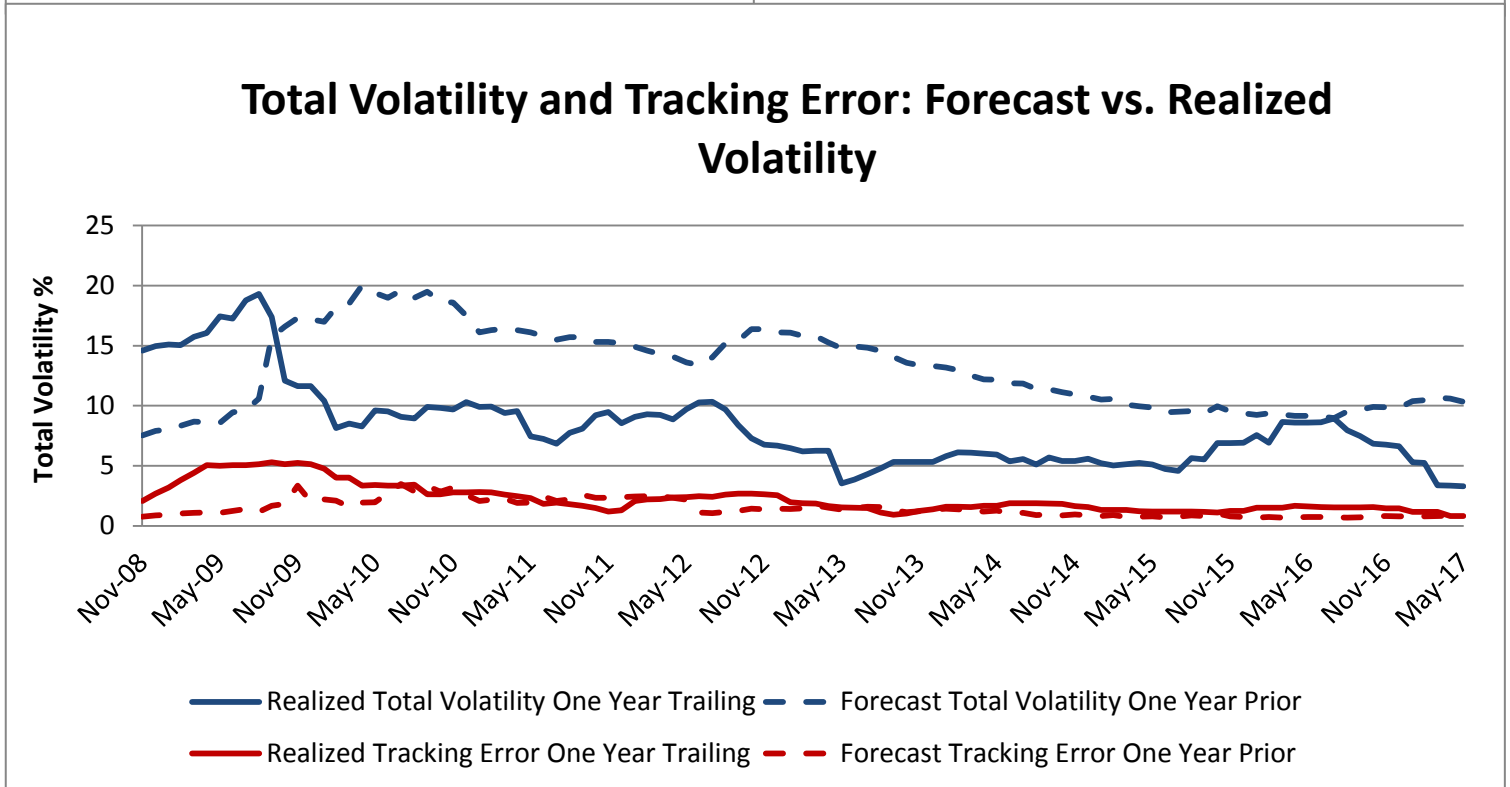
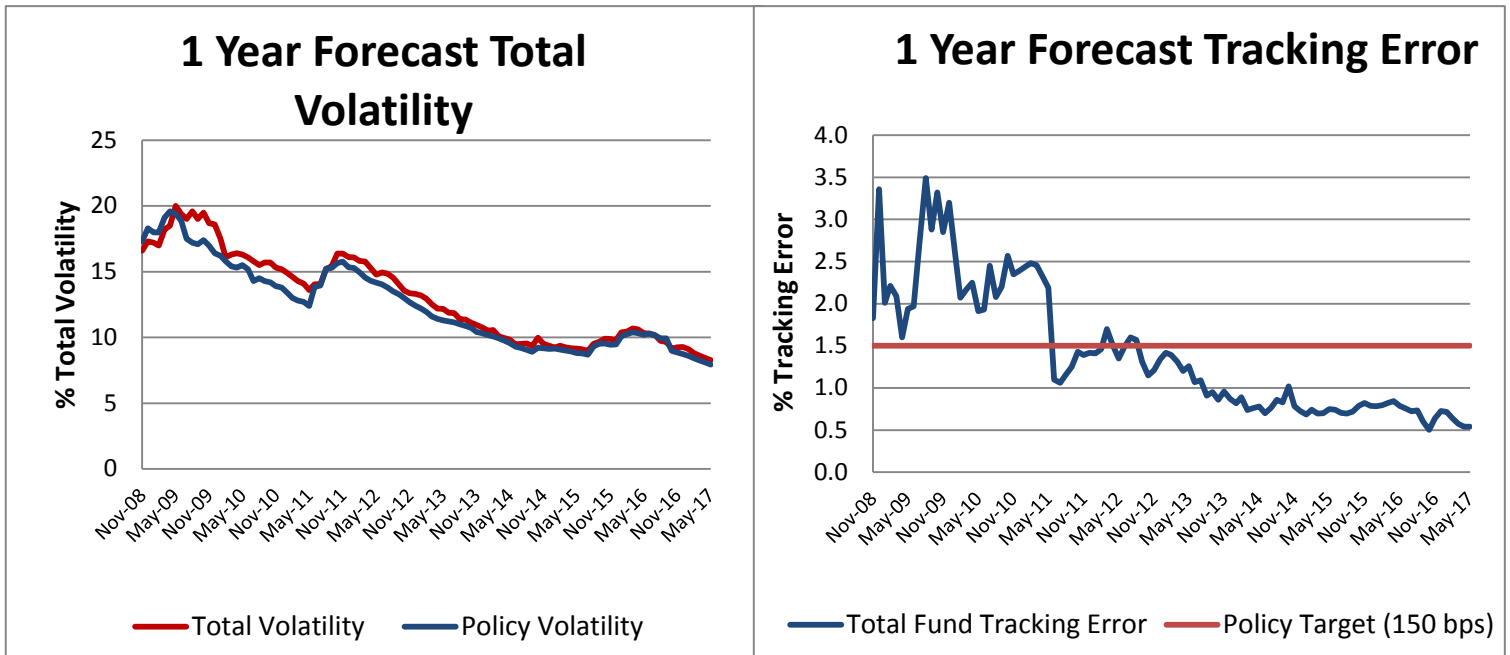
Forecast Total Volatility of the PERF decreased by 213 bps over the last year. Approximately 75% of the decrease is due to recent low market volatility and about 25% of the decrease is due to positioning changes.

Asset Class	Market Value (\$millions)	Total Forecast Volatility (%)	% Contribution to Total Vol	Tracking Error (%)	Value at Risk* (\$millions)	Conditional VaR* (\$millions)
PUBLIC EQUITY	\$ 155,093	12.3%	69.1%	0.2%	\$ 19,254	\$ 27,204
PRIVATE EQUITY	\$ 26,180	14.8%	12.7%	3.7%	\$ 3,194	\$ 4,811
INCOME	\$ 59,613	6.0%	1.9%	0.3%	\$ 3,846	\$ 5,340
REAL ASSETS	\$ 35,815	11.2%	11.7%	2.5%	\$ 4,222	\$ 5,921
LIQUIDITY	\$ 15,111	0.1%	0.0%	0.1%	\$ (159)	\$ (155)
INFLATION	\$ 25,571	7.8%	4.1%	0.8%	\$ 2,518	\$ 3,354
ARS	\$ 288	5.9%	0.0%	5.9%	\$ 9	\$ 17
MAC	\$ 1,278	9.0%	0.4%	9.0%	\$ 108	\$ 156
TOTAL FUND	\$ 322,202	8.3%	100.0%	0.5%	\$ 23,143	\$ 34,306

*1-year, 95% confidence Value at Risk. Conditional Value at Risk measures the mean of the tail distribution beyond the 95% confidence level. Both are adjusted to account for 1 year of expected returns of each asset class and the PERF using Wilshire June 2016 expected return assumptions.

Due to reporting constraints, all risk statistics are as of May 31, 2017 unless otherwise stated.

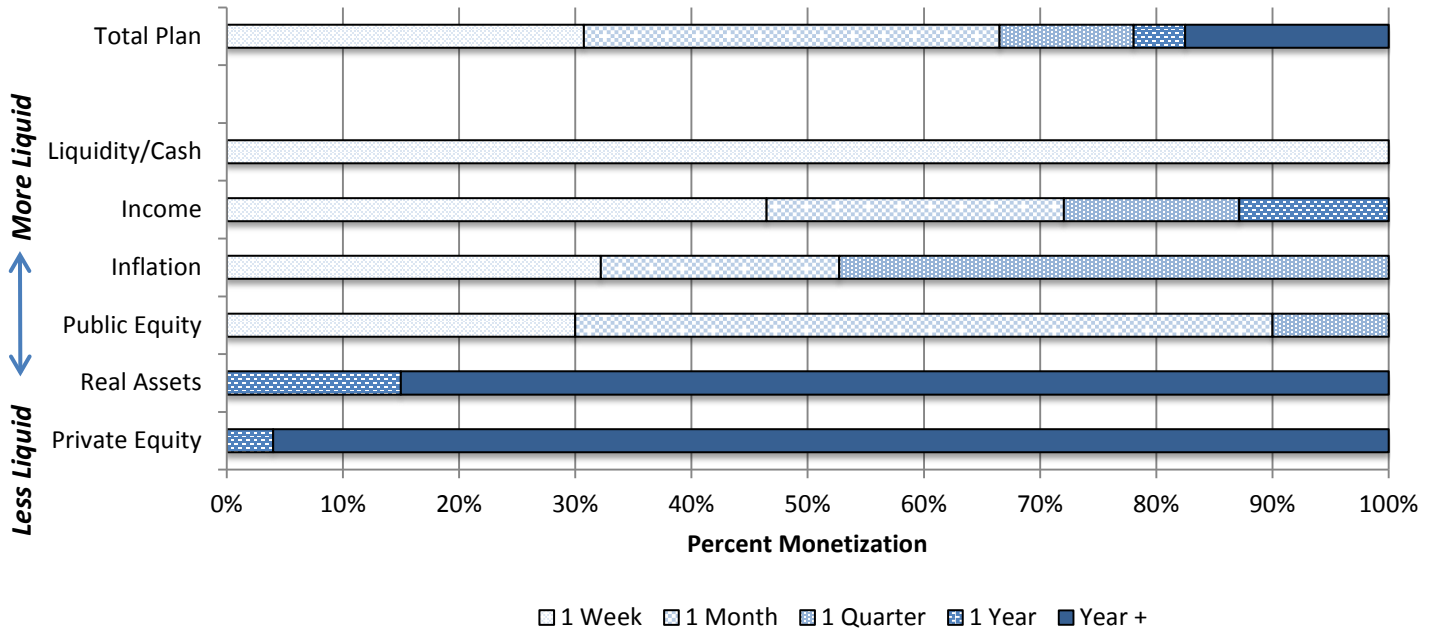
RISK MANAGEMENT TIME SERIES



The bottom chart plots the Forecast Total Volatility and Tracking Error for the Total Fund one year prior to each date vs. the Total Volatility and Tracking Error realized for that date. The graph shows the lagged nature of long term risk models that incorporate a larger backward estimation window which you can see from the realized volatility leading the forecast from the model and highlights the importance of looking at changes in realized volatility that may indicate a deviation from capital markets assumptions.

LIQUIDITY

Liquidity Analysis: Total Plan



Transactional liquidity is estimated for each asset class /strategy based on the current market environment while also accounting for legal structures or other factors that may impact liquidity. *Source: SSB, CalPERS*

PERF LIQUIDITY SNAPSHOT

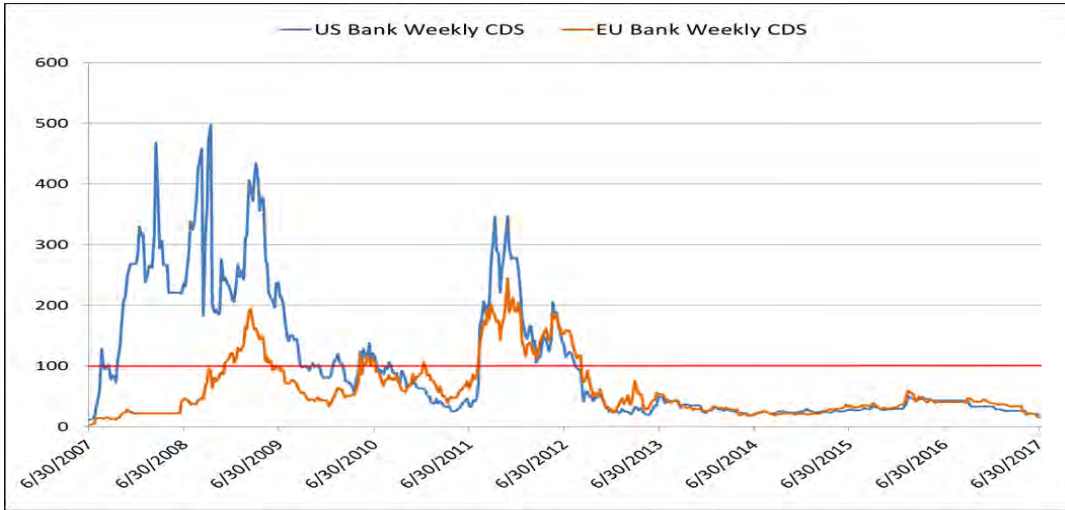
As of July 1, 2017

	Expected Cash Flows for 1 Month		
	Normal Conditions	Stress Scenario	
a Cash Equivalents in Liquidity Portfolio (< 30 days)*	\$9,294,625,244	\$9,285,116,332	
b Sources Total (cash flow in)	\$3,290,124,224	\$2,774,541,764	
c Uses Total (cash flow out)	(\$2,649,106,298)	(\$2,649,106,298)	
d Contingency Use**		(\$3,286,417,553)	
Expected Cash Equivalents (Period End)	\$9,935,643,170	\$6,124,134,245	
Liquidity Coverage Ratio	475%	203%	= (a+b)/-(c+d)

* Excludes borrowed liquidity i.e. cash available in asset classes and cash collateral from sec lending
 ** Contingency Use accounts for potential cash demands from derivatives positions, sec lending, and fund level contingent liabilities

Liquidity Coverage is computed from estimates of future cash inflows and outflows up to a 1 year horizon. In this table, the 1 month forward period is shown with Liquidity Coverage ratios for a normal environment and for a selected stress period (Sept 2008). The Liquidity Coverage ratios could be interpreted as how many times (4.75 times in normal market conditions) available liquid cash /cash equivalents could cover projected cash needs over a 1 month forward period. *Source: BarraOne, SSB, CalPERS*

COUNTERPARTY RISK



CDS spreads are regularly monitored for individual CalPERS counterparties. In addition, when aggregate spreads rise above 100 bps additional oversight measures are taken.

Counterparty	Net MTM FORWARDS (\$)	Net MTM OPTIONS (\$)	Net MTM SWAPS (\$)	CalPERS Exposure (\$)	Counter Party Exposure (\$)	Net MTM Total (\$)	Collateral Posted (\$)*	Net Credit Net Exposure (\$)
Australia and New Zealand Banking	226,922				226,922	✓ 226,922	(230,000)	(3,078)
Bank of Montreal	(1,866,504)			(1,866,528)	24	✓ (1,866,504)	1,900,000	33,496
Bank of America	(18,181,349)	(190,206)	17,127,052	(22,134,587)	20,890,084	✓ (1,244,503)	1,250,000	5,497
BNP Paribas	1,302,097		13,124,848	(5,812,780)	20,239,725	✓ 14,426,945	(14,450,000)	(23,055)
Barclays	(1,018,597)			(1,957,199)	938,602	✓ (1,018,597)	1,100,000	81,403
Citigroup	(4,088,477)		438,618	(5,852,674)	2,202,815	✓ (3,649,859)	3,650,000	141
Canadian Imperial Bank of Commerce	(2,254)		2,069,340	(2,254)	2,069,340	✓ 2,067,086	(2,070,000)	(2,914)
Credit Suisse International	(56,323)		(12,698)	(100,617)	31,596	✓ (69,021)	0	(69,021)
Deutsche Bank	(5,270,802)			(7,967,737)	2,696,935	✓ (5,270,802)	5,280,000	9,198
Goldman Sachs Intl.	311,469	1,521,373	29,066,996	(105,707,385)	136,607,223	✓ 30,899,838	(30,900,000)	(162)
HSBC	(2,362,093)		(5,426)	(21,418,244)	19,050,725	✓ (2,367,519)	2,400,000	32,481
JPMorgan Chase Bank	(23,529,685)	(10,450,600)	15,697,912	(41,158,360)	22,875,987	✓ (18,282,373)	18,290,000	7,627
Morgan Stanley Capital Group			2,169,798		2,169,798	✓ 2,169,798	(2,200,000)	(30,202)
Morgan Stanley Capital Service	74,636	(796,572)	(565,278)	(12,741,634)	11,454,420	✓ (1,287,214)	1,300,000	12,786
RBC Capital Markets	(1,272,959)			(1,272,959)		✓ (1,272,959)	1,280,000	7,041
Standard Chartered Bank	(10,994,026)			(11,111,852)	117,826	✓ (10,994,026)	11,000,000	5,974
Societe Generale	(21,590,125)	271,531	3,347,812	(30,070,375)	12,099,593	✓ (17,970,782)	17,980,000	9,218
State Street	468,841			(142,129)	610,970	✓ 468,841	(440,000)	28,841
Toronto Dominion	(18,133,456)			(18,683,436)	549,980	✓ (18,133,456)	18,140,000	6,544
UBS AGG	(8,021,006)	111		(8,835,616)	814,721	✓ (8,020,895)	8,050,000	29,105
Wells Fargo			11,140,251		11,140,251	✓ 11,140,251	(11,150,000)	(9,749)
Grand Total	(114,003,691)	(9,644,363)	93,599,225	(296,836,366)	266,787,537	✓ (30,048,829)	30,180,000	131,171

*As of 6/30 Counterparties posted 61mm to Counterparties which includes Internal and External Collateral

Above: Total market value exposure and net credit exposures are monitored for all of our OTC (over-the-counter) positions. The green check box in the OTC exposure table indicates that the total market value exposure is within our procedural tolerances.

Source: Blackrock, CalPERS

Below: FCM (Futures Commission Merchant) exposures are monitored for how much initial margin we have posted with our FCM in addition to reviewing key metrics that provide some insight on the FCM's risk profile such as Excess Net Capital (amount of additional capital the FCM has to support the business) and customer assets. Large changes in these metrics could be an indicator of potential credit or operational issues with the FCM and would trigger an internal review. Source: CalPERS, CFTC

FUTURES CLEARING MERCHANT EXPOSURE

Futures Commission Merchant	Collateral Posted	Procedure Check	Excess Net Capital	Procedure Check	Customers' Assets	Procedure Check
CITIGROUP GLOBAL MARKETS INC	269,673,620	✓	8,087,250,523	✓	8,282,621,651	✓
MERRILL LYNCH PIERCE FENNER & SMITH INCORPORATED	80,136,723	✓	10,759,033,596	✓	14,256,144,706	✓

*As of May 31, 2017

LEVERAGE

Total Fund Leverage Report

as of 06/30/17

Leverage changes a portfolio's risk profile through both impact on liquidity and amplification of returns volatility. As a metric, leverage has the benefit of being relatively straightforward to calculate, making it a good backstop to more nuanced but complex perspectives on risk that could suffer from model errors or flawed assumptions. However, since the leverage metric implicitly treats all assets as equally risky, and because it does not capture the interrelationships between assets (diversification), leverage should always be viewed in conjunction with other perspectives. For example, a low leverage portfolio could easily be more risky than a better-diversified moderate leverage portfolio.

Portfolio View of Plan Leverage:

"L1" captures exposures with full recourse to the total plan, and is most relevant from an immediate liquidity perspective. "L2" includes non-recourse borrowing, which can amplify risk and returns for a given \$ invested.

Company Embedded Leverage:

Some Fund assets embed leverage by their nature (i.e., private and public companies). In this case, leverage is not a result of a portfolio management decision, but does contribute to the assets' inherent riskiness.

Unfunded Commitments:

Represent potential draws on Fund liquidity, but are contingent in nature.

Portfolio View of Plan Leverage

Asset Class/ Program	Net Market Value (\$Billions) (A)	L1: Portfolio Leverage - Full Recourse					L2: Portfolio Leverage w/Non-Recourse			
		Sources of Leverage ¹			- Cash ²	Gross Risk Exposure (B)	Portfolio Leverage (B/A)	+ Sources of Leverage ¹	= Exposure (C)	Portfolio Leverage (C/A)
		Derivatives	Recourse Debt ³	Other				Non Recourse Debt		
Public Equity	156.2	11.3			6.7	160.7	1.03		160.7	1.03
Private Equity	25.9				0.0	25.9	1.00	1.7	27.6	1.07
Income	62.9	6.5			4.5	64.8	1.03		64.8	1.03
Liquidity	15.5				15.5	0.0	0.00		0.0	0.00
Real Assets	36.3		0.005		0.0	36.3	1.00	17.6	53.9	1.49 ⁴
Inflation	25.3	7.3			6.5	26.1	1.03		26.1	1.03
Securities Lending ⁵	0.0			4.4	4.4	0.0	N/M		0.0	N/M
Credit Enhancement	0.0			0.3		0.3	N/M		0.3	N/M
Other Trust Level ⁶	1.6					1.6	1.00		1.6	N/M
Total Fund	\$323.5	\$25.1	\$0.0	\$4.7	\$37.6	\$315.7	0.98	\$19.3	\$335.0	1.04

Company Embedded Leverage

	Net Market Value (\$B)	Estimated Enterprise Value (\$B)	Implied Leverage
Public Equity ⁷	156.2	213.9	1.37
Private Equity ⁸	25.9	43.7	1.69

Unfunded Commitments

	Net Market Value (\$B)	Unfunded Commitments (\$B) ⁹	% of Total Fund
Private Equity	25.9	14.2	4.4%
Real Assets	36.3	9.1	2.8%

1. FX Forwards used for hedging and fixed income duration shifting are not counted as leverage. Options are included based on delta adjusted notional value.

2. Cash is defined as assets meeting Liquidity program guidelines, and include cash holdings in the Fund except frictional balances with external managers.

3. Recourse Debt in Real Estate has not changed from the prior period.

4. Policy leverage for Real Assets is measured as a Loan-to-Value ratio and will differ from figure shown in table. LTV leverage as of 3/31/17 for Real Estate, Infrastructure and Forestland are: 31%, 46%, and 22%, respectively.

5. Securities lending includes only securities lent for cash collateral (which creates a source of financing).

6. Other Trust Level includes: Absolute Return Strategies, Multi-Asset Class Composite, Transition, and Plan Level Portfolios.

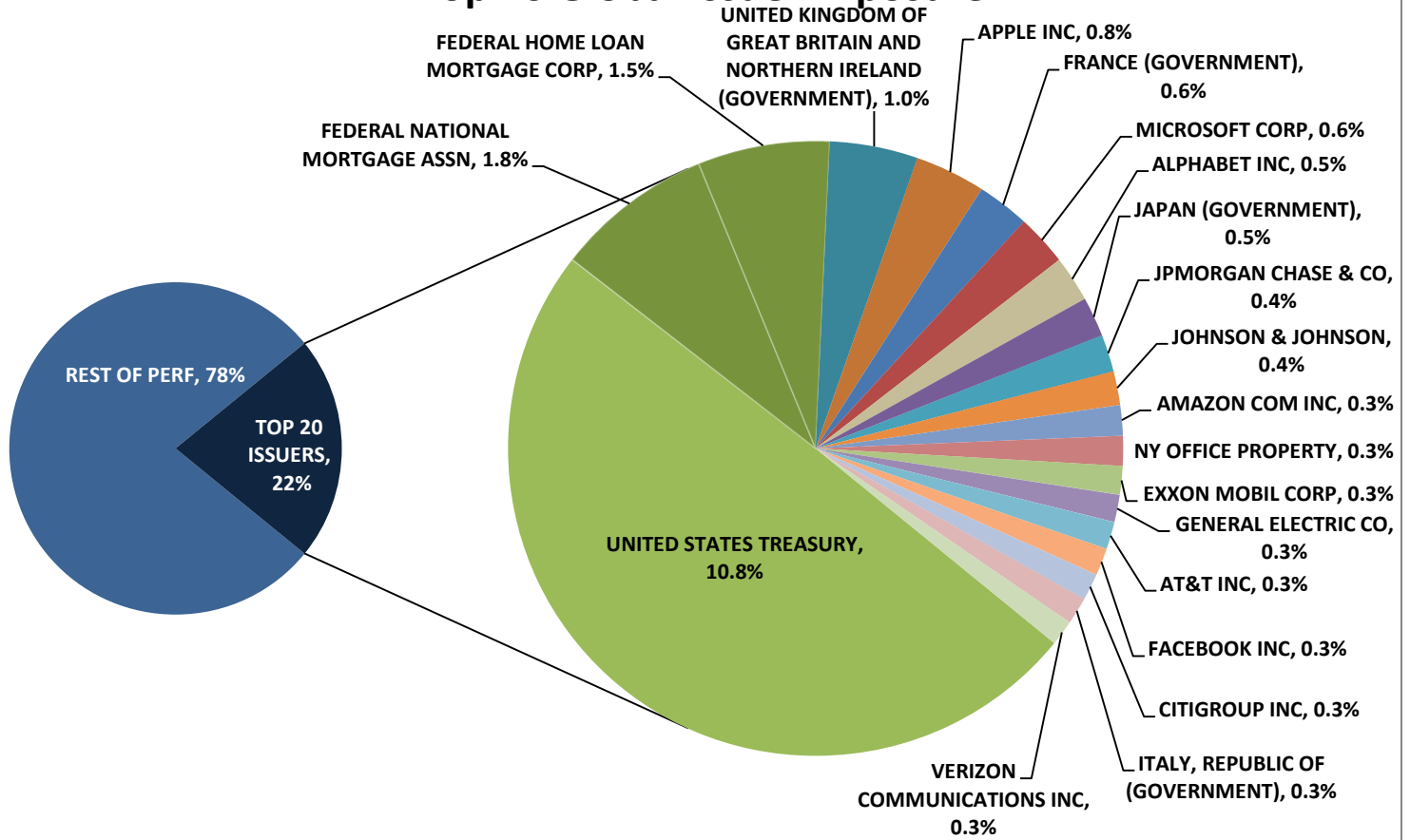
7. Embedded leverage for Public Equity is estimated using the Enterprise Value/Capital ratio for Public Equity. Source: Factset.

8. Embedded leverage for Private Equity represents debt exposure at the portfolio company level, and is estimated using the Enterprise Value/Equity ratio as of 12/31/15. Source: Private Equity program.

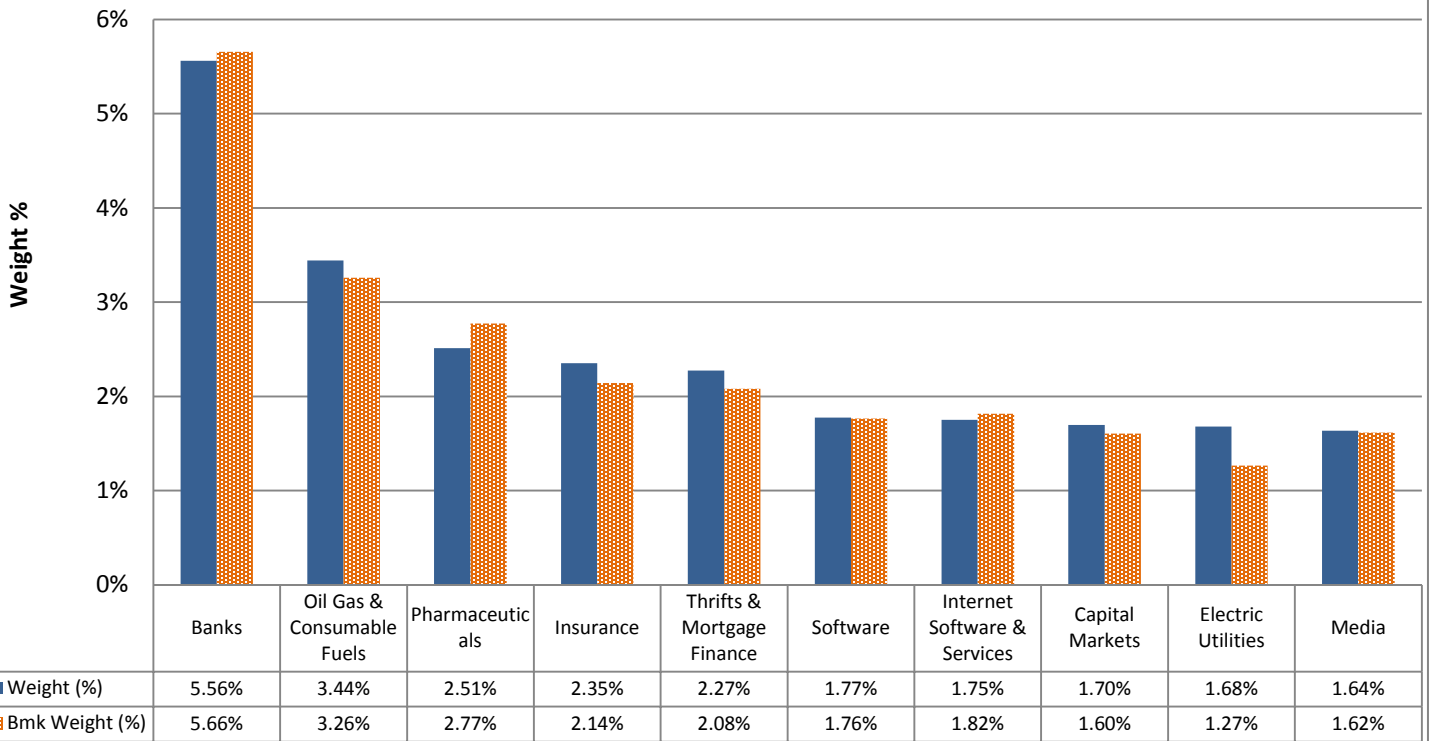
9. Unfunded commitments are as of 12/31/16.

CONCENTRATION REPORT

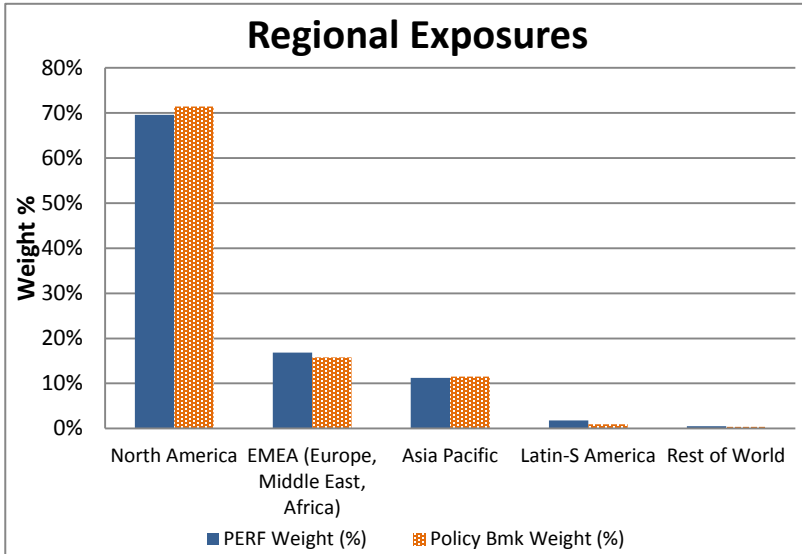
Top 20 Global Issuer Exposure



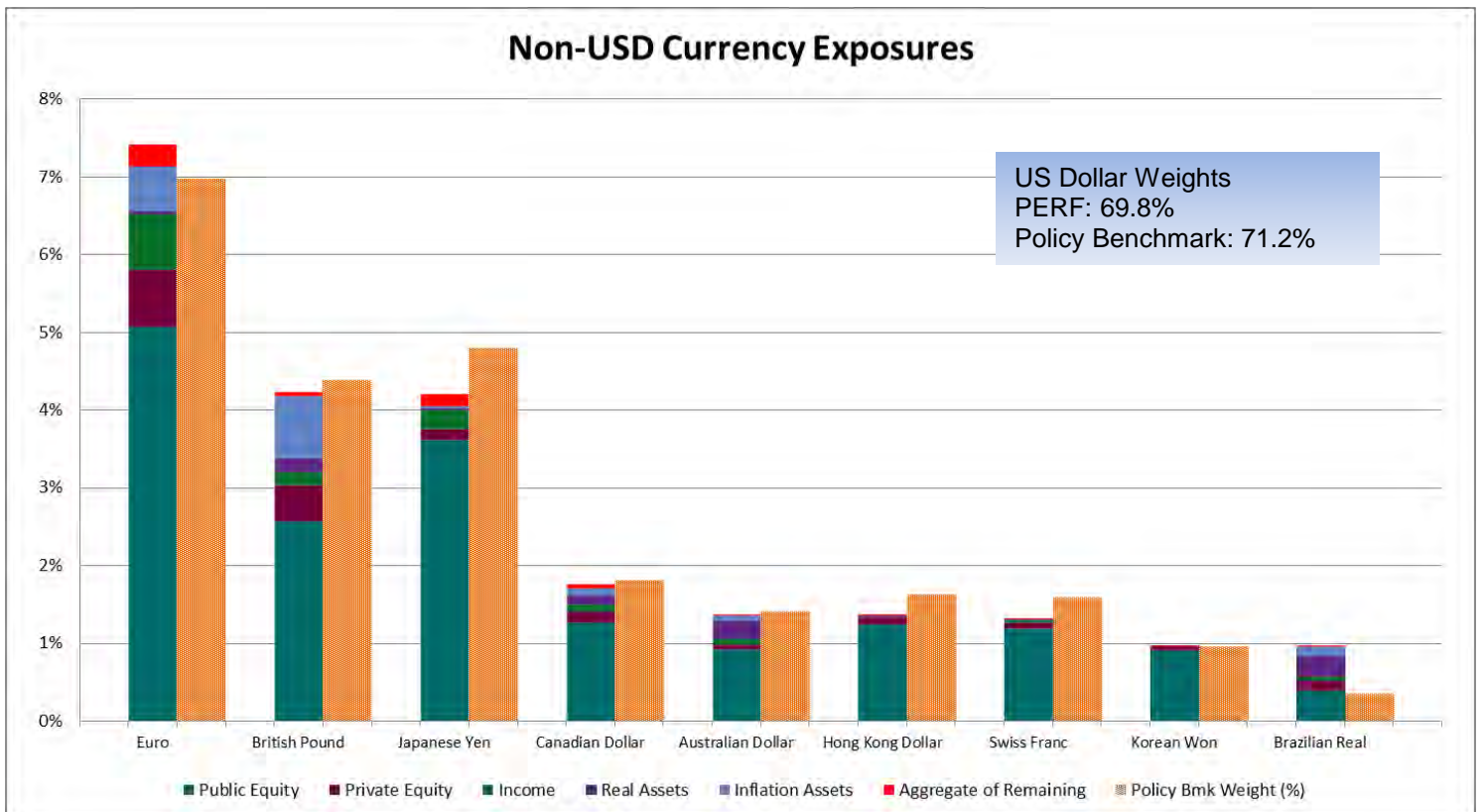
Top 10 GICS Industry Exposure



CONCENTRATION REPORT



Country	PERF Weight (%)	Policy Bmk Weight (%)	Active Weight (%)
United States	67.60%	69.34%	-1.75%
United Kingdom	4.32%	4.53%	-0.21%
Japan	4.23%	4.86%	-0.63%
France	2.28%	2.24%	0.05%
Canada	1.98%	2.07%	-0.08%
Germany	1.86%	2.05%	-0.19%
Australia	1.43%	1.43%	0.01%
Switzerland	1.34%	1.61%	-0.27%
China	0.99%	1.14%	-0.15%
Brazil	0.99%	0.37%	0.62%



HISTORICAL SCENARIOS

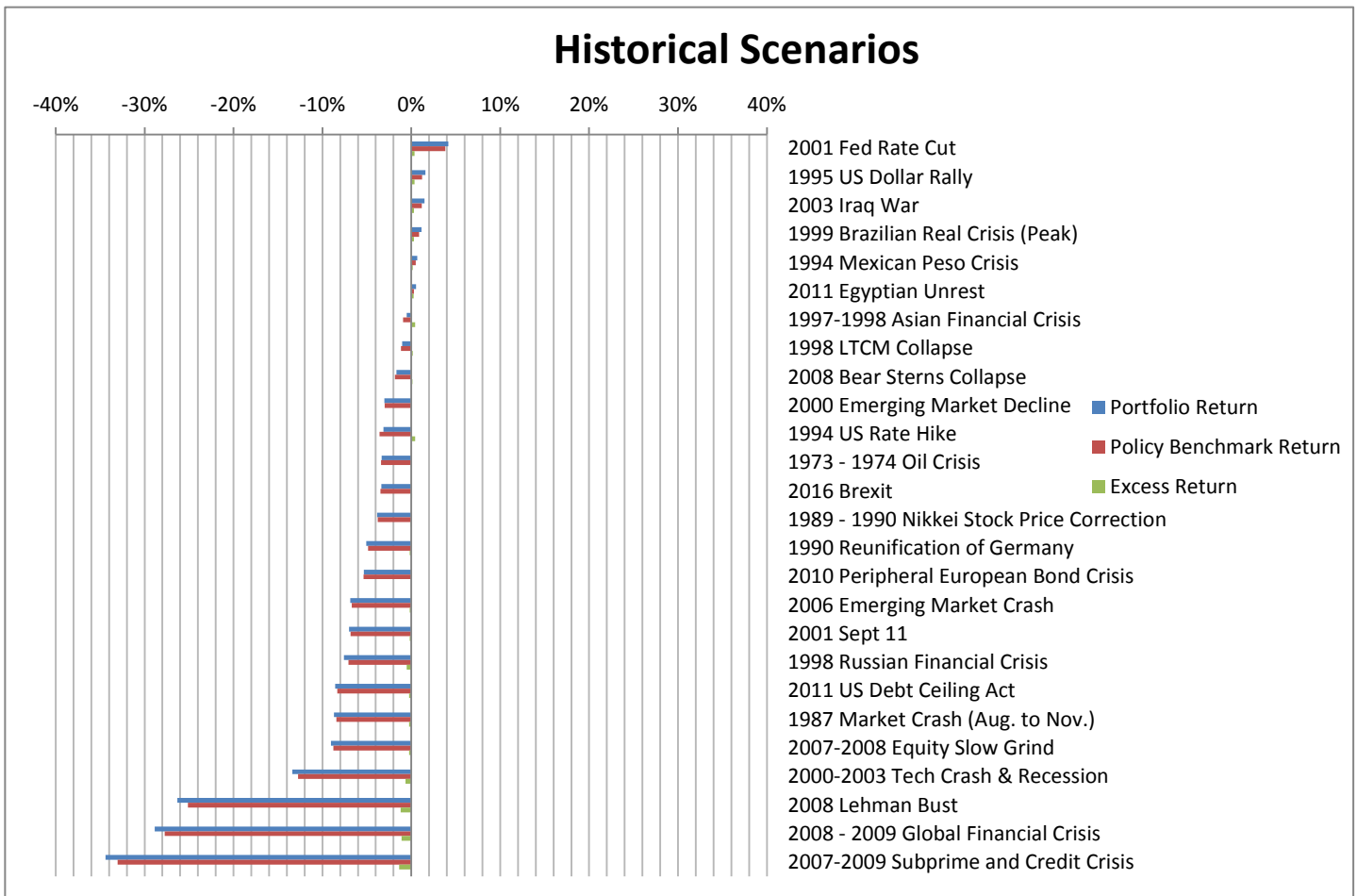
Historical scenarios highlight the sensitivity of the portfolio to past economic regimes or specific events. The scenarios can be used as a "what if" gauge of current portfolio positioning to understand the potential impact if a similar event or regime were to repeat.

Best and Worst Scenarios - Excess Return

Scenario	Portfolio Return	Policy Benchmark Return	Excess Return
1994 US Rate Hike	-3.1%	-3.6%	0.4%
1997-1998 Asian Financial Crisis	-0.5%	-0.9%	0.4%
1995 US Dollar Rally	1.6%	1.2%	0.4%
2008 - 2009 Global Financial Crisis	-28.9%	-27.7%	-1.1%
2008 Lehman Bust	-26.3%	-25.1%	-1.2%
2007-2009 Subprime and Credit Crisis	-34.4%	-33.0%	-1.4%

Best and Worst Scenarios - Portfolio Return

Scenario	Portfolio Return	Policy Benchmark Return	Excess Return
2001 Fed Rate Cut	4.2%	3.8%	0.4%
1995 US Dollar Rally	1.6%	1.2%	0.4%
2003 Iraq War	1.5%	1.2%	0.3%
2008 Lehman Bust	-26.3%	-25.1%	-1.2%
2008 - 2009 Global Financial Crisis	-28.9%	-27.7%	-1.1%
2007-2009 Subprime and Credit Crisis	-34.4%	-33.0%	-1.4%



Appendix

1. How to interpret the OTC Counterparty Risk Exposure section

OTC Derivative Counterparty Exposure Report								
Counterparty	Net MTM FORWARDS (\$)	Net MTM OPTIONS (\$)	Net MTM SWAPS (\$)	CalPERS Exposure (\$)	Counter Party Exposure (\$)	Net MTM Total (\$)	Collateral Posted (\$)*	Net Credit Exposure (\$)
Counterparty 123	10,386,714	(84,745)	11,735,283	27,147,091	(5,109,839)	22,037,252	(6,749,962)	15,287,290

NET MTM BY PRODUCT TYPE

- Columns reflect the net mark to market (MTM) of all OTC trades by product type with a Counterparty
- + amount = CalPERS has a gain on the positions
- - amount = CalPERS has a loss on the positions

DIRECTIONAL EXPOSURE

- The exposure columns reflect an un-net profit or loss (P&L) grouping across product type and is equivalent to the directional unwind exposure at a point in time
- Trades with positive P&L are bucketed together = CalPERS Exposure
- Trades with negative P&L are bucketed together = Counterparty Exposure

NET MTM TOTAL

- The net market to market column reflects the total current net profit or loss position across all open OTC trades with a counterparty
- + amount = CalPERS is owed money
- - amount = CalPERS owes money

COLLATERAL POSTED

- The collateral posted column reflects the dollar amount of collateral that is either posted to CalPERS or that CalPERS has posted to a counterparty to offset credit risk
- + amount = CalPERS has posted money out
- - amount = Counterparty has posted money to CalPERS

NET CREDIT EXPOSURE

- The net credit exposure column reflects the open uncollateralized credit exposure at risk if a Counterparty were to default with no change in mark to market prices
- + amounts reflect open credit risk where CalPERS is owed money

*Net mark to market (MTM): positions are adjusted to reflect current market values and then summed