



# UNIVERSITY OF CALIFORNIA

Office of the Chief Investment Officer

## Pension

Investment Review as of June 30, 2017

**Growing Portfolios** Building Partnerships

**UC Investments**



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# Office of the Chief Investment Officer

- The overall **investment objective** for all University of California Retirement Plan (“UCRP”) assets is to maximize real, long-term total returns (income plus capital appreciation adjusted for inflation), while assuming appropriate levels of risk.
- UCRP’s specific objective is to maximize the probability of meeting the Plan’s liabilities, subject to the Regents’ funding policy, and to preserve the real (inflation adjusted) purchasing power of assets.



# Office of the CIO at a glance

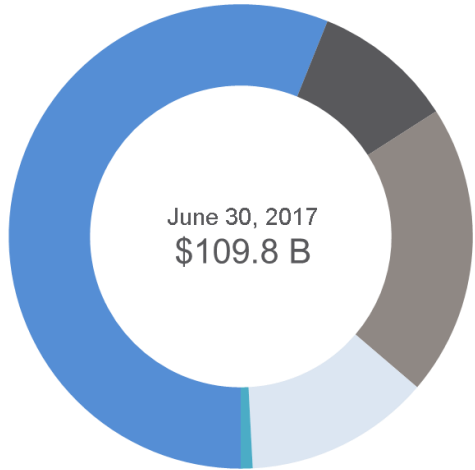
## Office of the Chief Investment Officer

Growing Portfolios. Building Partnerships.  
Delivering value through values.

### Office of the CIO Facts

- ▶ Pension assets: \$61.6 billion (as of 6/30/17)
- ▶ Investing pension assets since 1961 (56 years)
- ▶ Investing defined contribution assets since 1967 (50 years)
- ▶ Serving more than 150,000 pension members
- ▶ Serving more than 300,000 DC participants
- ▶ Investing Endowment assets since 1933 (84 years)

### \$109.8 billion across 6 products



- Pension: 56%, \$61.6B
- Endowment: 10%, \$10.8B
- Retirement Savings: 20%, \$22.3B
- Working Capital: 13%, \$14.2B
- TRIP: \$8.9B
- STIP: \$5.3B
- Fiat Lux: 1%, \$0.9B



# The team managing your money





# UCRP Executive Summary



# UCRP at a Glance

## Global Markets

- Equities post strong performance
- International Equities meaningfully outperform US Equities over the past year
- High Yield spreads continue to tighten driving strong performance

## Assets Under Management

- Assets of \$61.6 billion have grown by 40% over 5 years

## Asset Allocation

- Overweight Public Equities
- Overweight Cash
- Underweight Alternatives (Private Equity, Absolute Return, Real Estate, and Real Assets)

## Risk Allocation

- Close to target risk allocation

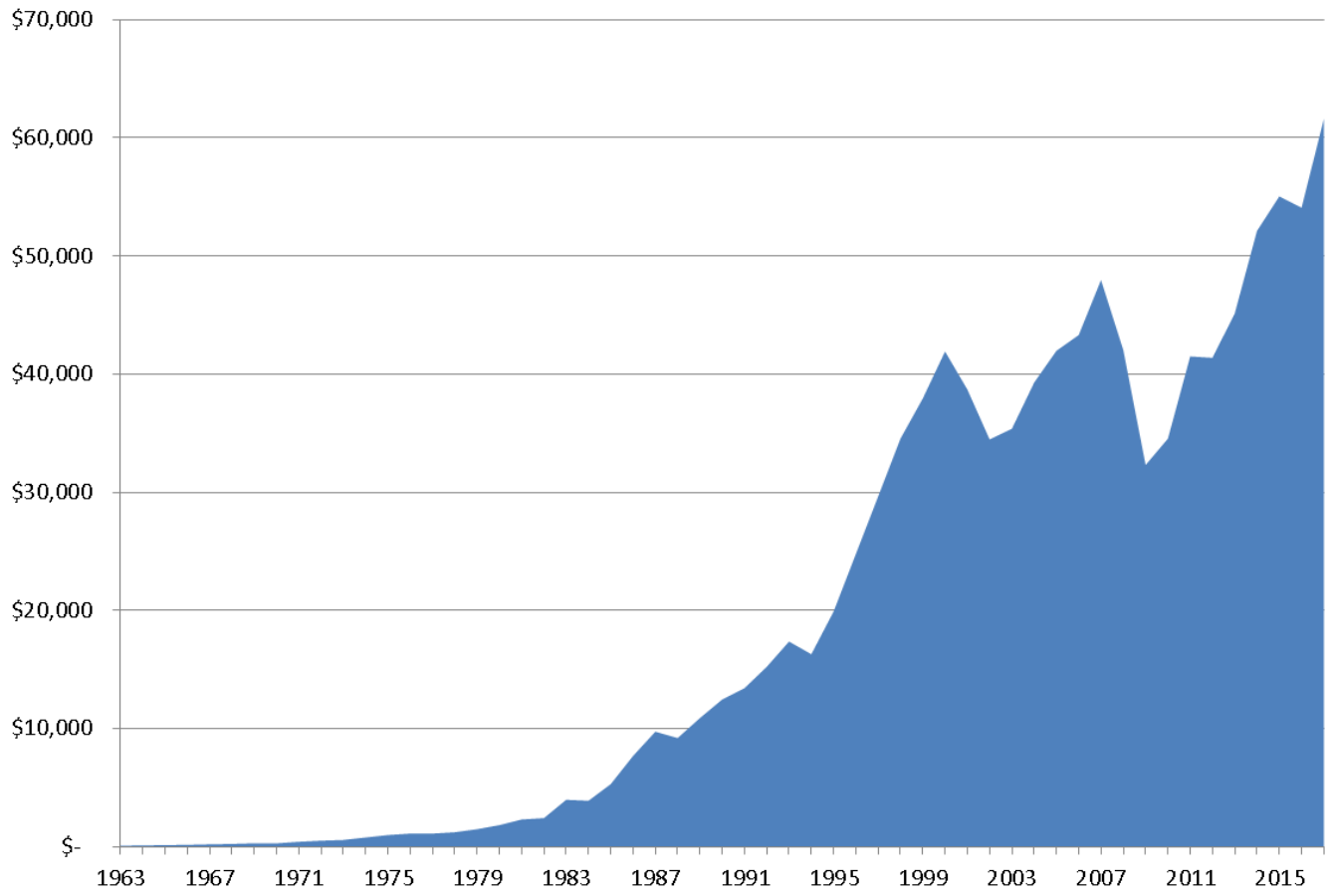
## Performance

- Strong absolute and relative performance driven by equity markets
- Active management particularly in developed international markets paid off



# UCRP Assets grow by over 40% in 5 years

UCRP Assets 1963 - 2017



5 Year Growth

**June 30, 2017**  
**\$61.6 billion**

**1 Year ago**  
**\$54.1 billion**

**5 Years ago**  
**\$41.4 billion**





# AUM growth driven by markets and value add

## Assets Under Management Attribution





Assets Under Management June 30, 2016	\$54.1 billion
Market Gains	\$6.8 billion
Value Added	\$1.0 billion
Net Cash Flow	(\$0.3 billion)
<b>Assets Under Management June 30, 2017</b>	<b>\$61.6 billion</b>



# How is our Pension Positioned?



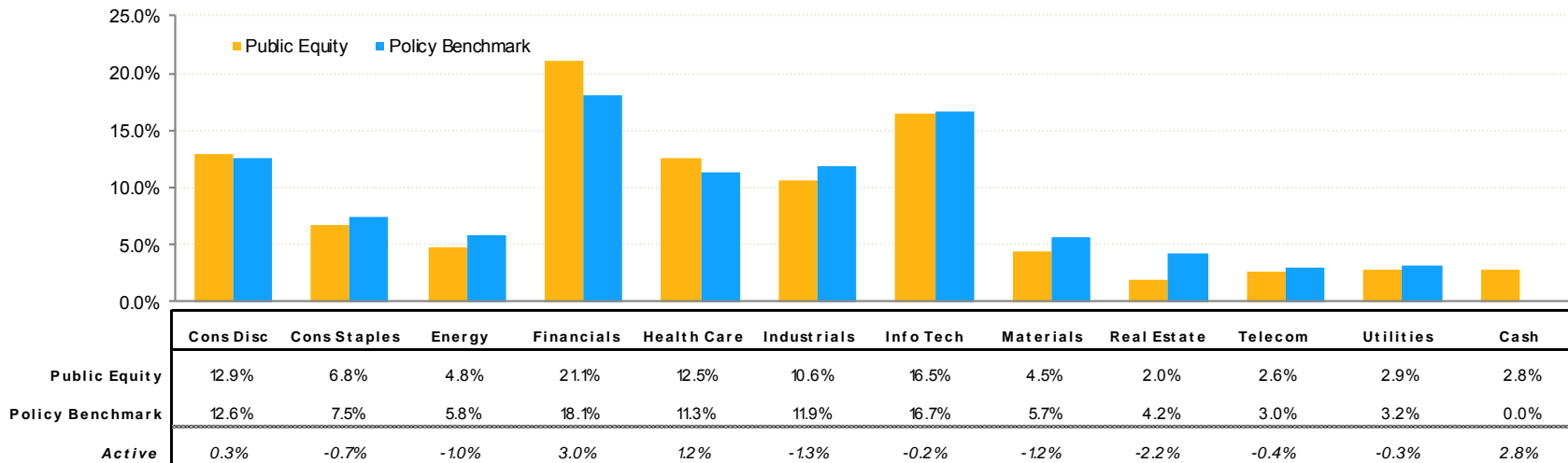
# Asset Allocation

Relative Weight	As of June 30, 2017	Market Value in \$ Billions	Percentage	Over/Underweight Relative to Policy	Policy Weight
	<b>Public Equity</b>	<b>34.7</b>	<b>56.3%</b>	<b>4.1%</b>	<b>52.2%</b>
	<b>Fixed Income</b>	<b>13.4</b>	<b>21.7%</b>	<b>0.2%</b>	<b>21.5%</b>
	Core	8.1	13.2%	-0.2%	13.4%
	High Yield	2.1	3.4%	0.5%	2.9%
	Emerging Market Debt	1.5	2.4%	0.0%	2.4%
	TIPS	1.7	2.7%	-0.1%	2.8%
	<b>Other Investments</b>	<b>9.8</b>	<b>15.9%</b>	<b>-7.6%</b>	<b>23.5%</b>
	Absolute Return	3.0	4.9%	-2.4%	7.3%
	Private Equity	2.8	4.6%	-2.9%	7.5%
	Real Estate	3.1	5.0%	-1.3%	6.3%
	Real Asset	0.9	1.4%	-1.0%	2.4%
	<b>Cash</b>	<b>3.7</b>	<b>6.1%</b>	<b>3.3%</b>	<b>2.8%</b>
	<b>Total</b>	<b>61.6</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>

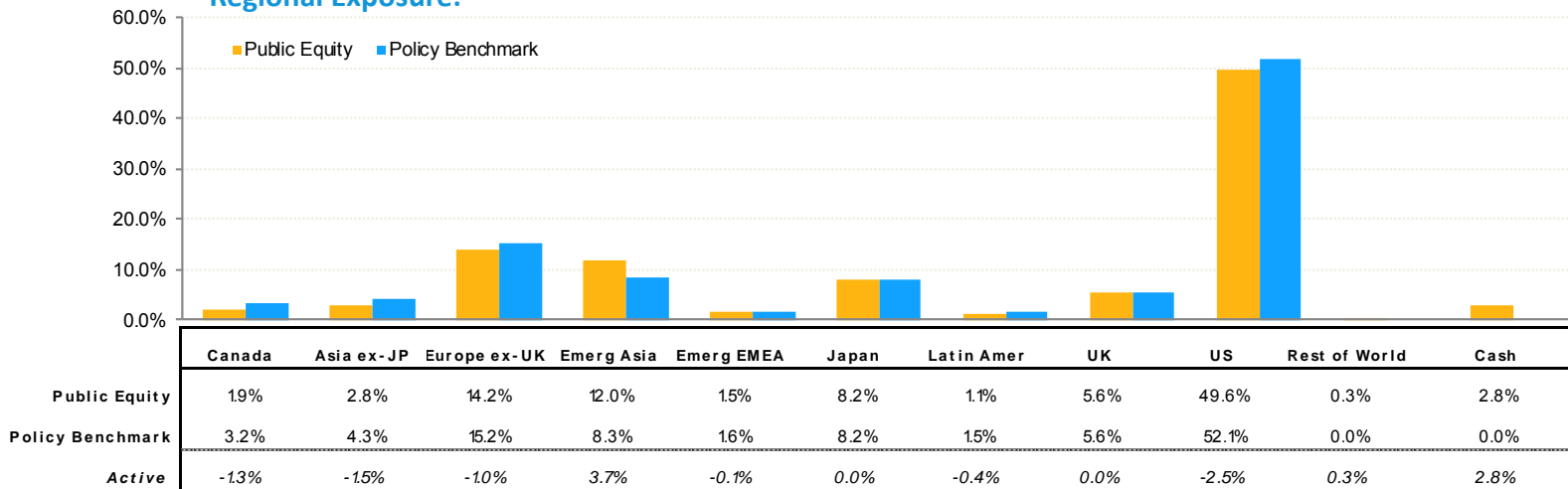


# Public Equity Exposures

## Sector Exposure:



## Regional Exposure:

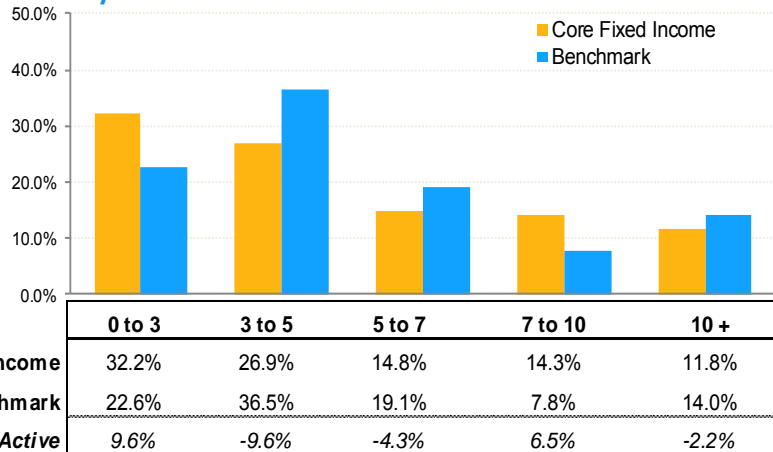




# Pension Fixed Income Exposures

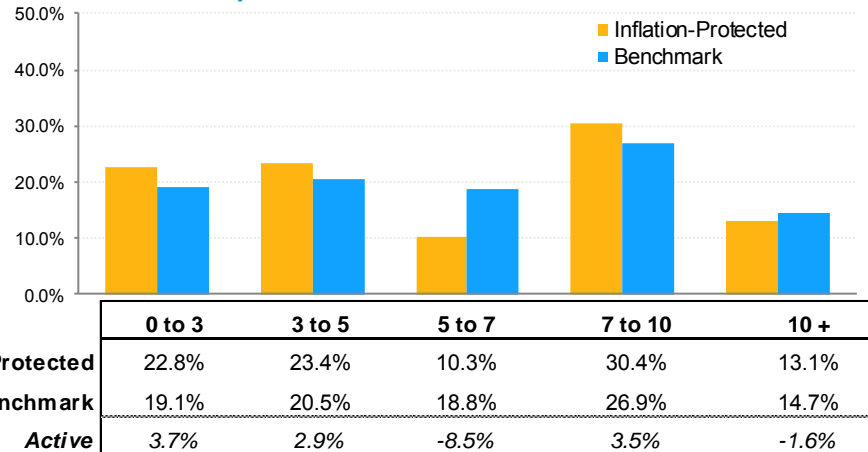
## Core Fixed Income – \$8,149M

### Summary of Duration Buckets:



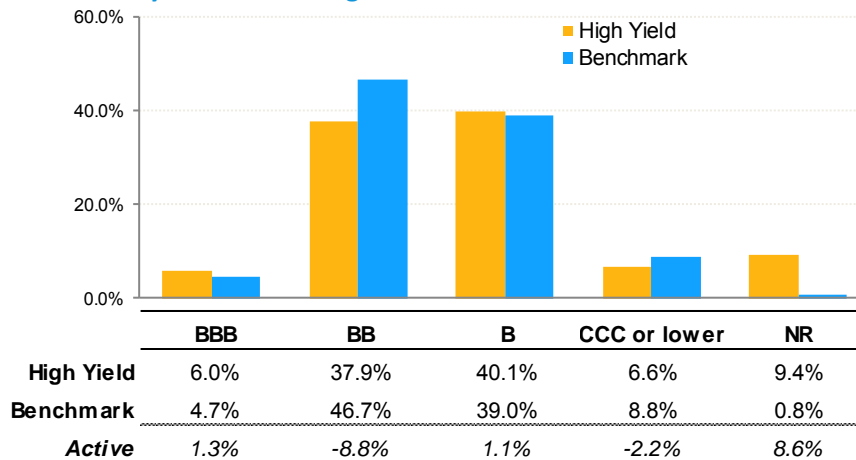
## Treasury Inflation-Protected Securities – \$1,690M

### Summary of Duration Buckets:



## High Yield – \$2,064M

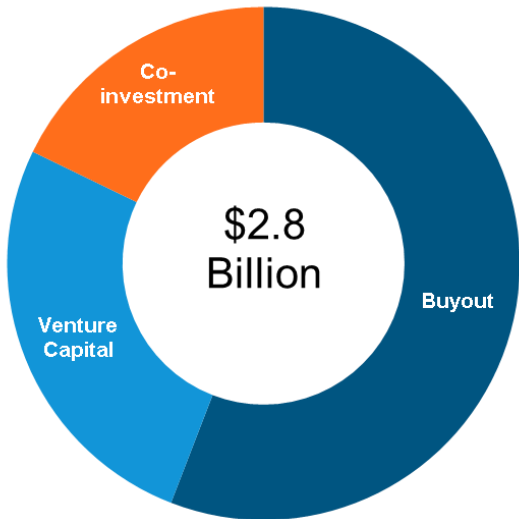
### Summary of Credit Rating





# Private Equity Exposures

## Private Equity



- Buyout: 56%  
\$1.6B
- Venture Capital: 26%  
\$0.7B
- Co-investment: 18%  
\$0.5B



# Absolute Return Exposures

## Absolute Return

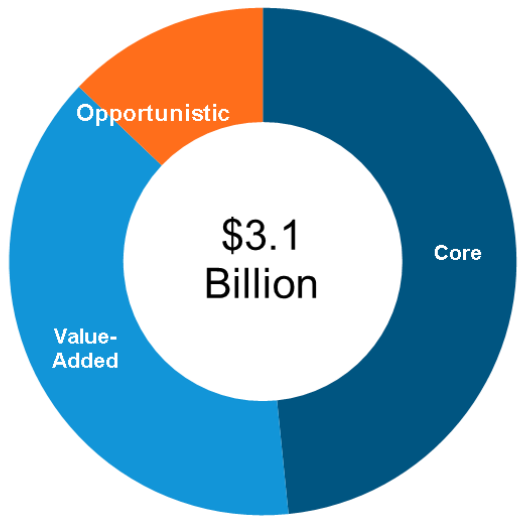


- **Opportunistic: 21%**  
\$0.6B
- **Alternative Risk Premia: 10%**  
\$0.3B
- **Relative Value Arbitrage: 35%**  
\$1.1B
- **Global Macro: 21%**  
\$0.7B
- **Event Driven: 11%**  
\$0.3B
- **Fund of Funds: 1%**  
\$0.0B
- **Distressed: 1%**  
\$0.0B



# Real Estate Exposures

## Real Estate



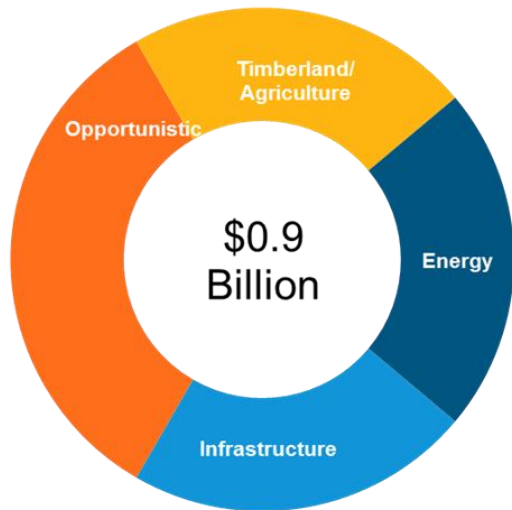
- 
- Core: 49%  
\$1.5B
  - Value-Added: 38%  
\$1.2B
- 
- Opportunistic: 13%  
\$0.4B





# Real Assets Exposures

## Real Assets



● Energy: 19%  
\$0.2B

● Infrastructure: 22%  
\$0.2B

● Opportunistic: 40%  
\$0.3B

● Timberland/Agriculture: 19%  
\$0.2B



# How did our Pension Perform?



# Performance: Strong absolute and relative

Net Returns (%) As of June 30, 2017	Annualized Returns							
	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
UC Pension	3.6	8.4	14.4	5.4	9.0	9.5	5.0	6.7
UC Pension Benchmark	3.1	7.7	12.5	4.5	8.1	8.6	4.4	6.4
<i>Value Added</i>	0.5	0.7	1.9	0.9	0.9	0.9	0.6	0.3

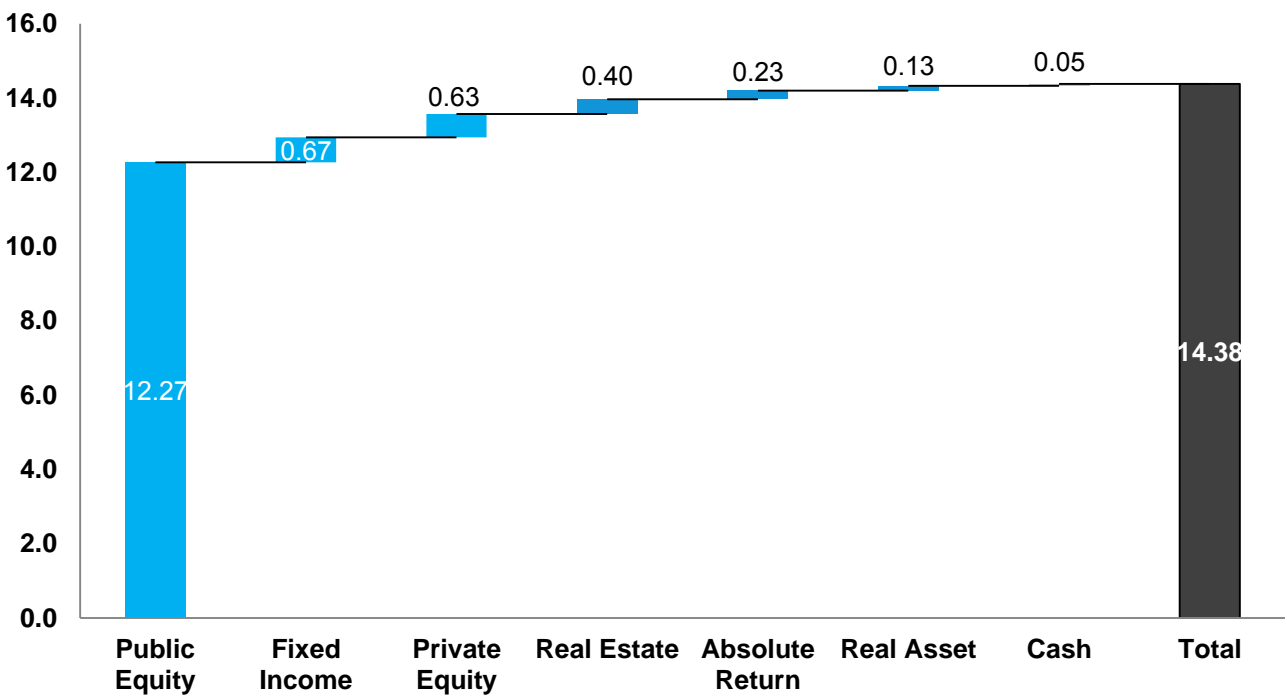
Net Returns (%) As of June 30	One Year Returns									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
UC Pension	14.4	(2.0)	4.5	17.4	11.7	0.4	22.4	12.7	(18.8)	(5.7)
UC Pension Benchmark	12.5	(0.8)	2.2	17.1	10.7	(0.6)	21.6	11.6	(18.9)	(4.7)
<i>Value Added</i>	1.9	(1.2)	2.3	0.3	1.0	1.0	0.8	1.1	0.1	(1.0)

- The Policy Benchmark is a weighted average of investment policy targets



# Fiscal YTD return driven by Public Equity

1 Year Contribution to Return - Percentage (%)





# Pension – FY 2016/17

As of March 31, 2017	Average Weight	Average Active Weight	Allocation Attribution	Selection Attribution	Total Attribution
<b>Public Equity</b>	55.7	+3.5	+0.2	+1.2	+1.4
<b>Fixed Income</b>					
Core	14.0	+0.6	+0.1	+0.1	+0.2
High Yield	3.4	+0.5	+0.0	-0.1	-0.1
Emerging Market Debt	2.4	+0.0	+0.0	+0.0	+0.0
TIPS	3.0	+0.2	+0.0	+0.0	+0.0
<b>Other Investments</b>					
Absolute Return	5.0	-2.3	+0.1	+0.0	+0.1
Private Equity	4.8	-2.7	+0.0	+0.0	+0.0
Real Estate	5.4	-0.9	+0.1	-0.1	+0.0
Real Asset	1.6	-0.8	+0.0	+0.0	+0.0
Cash	4.7	1.9	-0.2	+0.0	-0.2
<b>Total</b>	<b>100%</b>	<b>+0.0%</b>	<b>+0.3%</b>	<b>+1.1%</b>	<b>+1.4%</b>



# Pension Public Equity Performance

Net Returns (%) As of June 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
<b>Public Equity</b>	<b>34,690</b>	<b>100.0%</b>	<b>4.9</b>	<b>12.2</b>	<b>22.5</b>	<b>6.1</b>	<b>11.6</b>	<b>11.6</b>	<b>4.4</b>	<b>6.0</b>
MSCI All Country World Index Net - IMI - Tobacco Free			4.2	11.2	19.1	4.9	10.8	10.8	4.3	6.2
<i>Value Added</i>			<i>0.7</i>	<i>1.0</i>	<i>3.4</i>	<i>1.2</i>	<i>0.8</i>	<i>0.8</i>	<i>0.1</i>	<i>(0.2)</i>
<b>U.S. Equity</b>	<b>17,698</b>	<b>51%</b>	<b>3.7</b>	<b>11.0</b>	<b>21.1</b>	<b>8.4</b>	<b>14.3</b>	<b>15.1</b>	<b>6.9</b>	<b>6.9</b>
Russell 3000 Tobacco Free Index			3.0	8.8	18.5	8.9	14.6	15.2	7.1	7.4
<i>Value Added</i>			<i>0.7</i>	<i>2.2</i>	<i>2.6</i>	<i>(0.5)</i>	<i>(0.3)</i>	<i>(0.1)</i>	<i>(0.2)</i>	<i>(0.5)</i>
<b>Non-U.S. Equity</b>	<b>11,686</b>	<b>34%</b>	<b>7.1</b>	<b>15.4</b>	<b>31.4</b>	<b>3.6</b>	<b>10.1</b>	<b>8.9</b>	<b>2.1</b>	<b>-</b>
MSCI World ex-U.S. (net dividends) Tobacco Free			5.7	12.8	19.8	0.6	8.1	7.4	0.9	-
<i>Value Added</i>			<i>1.4</i>	<i>2.6</i>	<i>11.6</i>	<i>3.0</i>	<i>2.0</i>	<i>1.5</i>	<i>1.2</i>	<i>-</i>
<b>Emerging Market</b>	<b>5,306</b>	<b>15%</b>	<b>8.9</b>	<b>19.9</b>	<b>17.9</b>	<b>0.7</b>	<b>3.7</b>	<b>4.2</b>	<b>1.8</b>	<b>-</b>
MSCI Emerging Market (net dividends)			6.3	18.4	23.7	1.1	4.0	3.9	1.9	-
<i>Value Added</i>			<i>2.6</i>	<i>1.5</i>	<i>(5.8)</i>	<i>(0.4)</i>	<i>(0.3)</i>	<i>0.3</i>	<i>(0.1)</i>	<i>-</i>



# Fixed Income Performance

Net Returns (%) As of June 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
<b>Fixed Income</b>	<b>13,364</b>	<b>100.0%</b>	<b>1.5</b>	<b>3.1</b>	<b>2.9</b>	<b>2.8</b>	<b>3.0</b>	<b>4.5</b>	<b>5.4</b>	<b>6.5</b>
Policy Benchmark			1.4	2.9	2.0	2.8	2.6	4.1	5.3	6.2
<i>Value Added</i>			<i>0.1</i>	<i>0.2</i>	<i>0.9</i>	<i>0.0</i>	<i>0.4</i>	<i>0.4</i>	<i>0.1</i>	<i>0.3</i>
Core	8,149	61%	1.7	2.7	1.3	2.8	2.9	3.8	4.9	6.2
Barclays U.S. Aggregate Bond Index			1.4	2.3	(0.3)	2.5	2.2	3.2	4.7	5.8
<i>Value Added</i>			<i>0.3</i>	<i>0.4</i>	<i>1.6</i>	<i>0.3</i>	<i>0.7</i>	<i>0.6</i>	<i>0.2</i>	<i>0.4</i>
High Yield	2,064	15%	2.2	4.6	11.0	4.4	7.1	8.3	7.4	-
Merrill Lynch High Yield Cash Pay Index			2.2	4.9	12.8	4.5	6.9	8.0	7.5	-
<i>Value Added</i>			<i>0.0</i>	<i>(0.3)</i>	<i>(1.8)</i>	<i>(0.1)</i>	<i>0.2</i>	<i>0.3</i>	<i>(0.1)</i>	<i>-</i>
Emerging Market Debt	1,461	11%	2.2	6.0	5.1	3.5	3.9	5.4	6.3	-
JP Morgan Emerging Markets Bond Index Global Diversified			2.2	6.2	6.0	5.4	5.7	6.7	7.4	-
<i>Value Added</i>			<i>0.0</i>	<i>(0.2)</i>	<i>(0.9)</i>	<i>(1.9)</i>	<i>(1.8)</i>	<i>(1.3)</i>	<i>(1.1)</i>	<i>-</i>
TIPS	1,690	13%	(0.4)	1.1	(0.1)	0.8	0.5	3.1	4.6	-
Barclays U.S. TIPS			(0.4)	0.9	(0.6)	0.6	0.3	2.9	4.3	-
<i>Value Added</i>			<i>0.0</i>	<i>0.2</i>	<i>0.5</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.3</i>	<i>-</i>

\*total fixed income policy benchmark is an aggregate of underlying portfolio benchmarks



# Private Equity Performance

Net Returns (%) As of June 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Private Equity	2,800	100.0%	5.3	9.4	14.0	11.0	13.2	13.2	9.2	15.9
Actual Private Equity Returns			5.3	9.4	14.0	11.0	13.2	13.2	9.2	15.9
Buyout	1,565	56%	4.9	9.3	16.1	10.9	11.2	11.7	8.6	11.7
Venture Capital	736	26%	5.9	7.3	5.1	6.9	12.8	13.1	8.8	21.1
Co-investment	499	18%	8.1	16.3	25.4	25.5	35.4	30.0	-	-





# Absolute Return Performance

Net Returns (%) As of June 30, 2017	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year
Absolute Return	3,018	100.0%	0.2	1.4	4.8	2.1	5.9	5.6	3.6
Custom Absolute Return Index			0.7	3.1	6.4	(0.4)	2.2	0.5	2.4
<i>Value Added</i>			<i>(0.5)</i>	<i>(1.7)</i>	<i>(1.6)</i>	<i>2.5</i>	<i>3.7</i>	<i>5.1</i>	<i>1.2</i>
Opportunistic	625	21%	1.1	5.0	12.4	7.5	-	-	-
Alternative Risk Premia	301	10%	-1.2	-1.2	-3.3	-6.2	3.1	-	-
Relative Value	1,059	35%	1.1	3.2	10.0	5.5	7.2	-	-
Global Macro	643	21%	-3.4	-6.2	-5.3	1.9	1.6	-	-
Event Driven	337	11%	4.7	11.2	15.8	0.8	7.2	-	-
Fund of Funds	22	1%	2.7	3.5	5.1	-1.1	2.1	-	-
Distressed	31	1%	-1.3	0.1	2.9	-2.0	3.1	-	-

\* Inception date for Absolute Return was July 1, 2007. Prior to March 1, 2009, the portfolio benchmark was 1 Month T-Bill+4.5%; thereafter it was 50% HFRX Absolute Return/50% HFRX Market Directional, until February 2016 when it became HFRX Absolute Return



# Real Estate Performance

Net Returns (%) As of June 30, 2017	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year
Real Estate	3,101	100.0%	3.4	5.6	7.7	12.4	12.1	13.8	1.0
NCREIF Funds Index-Open End Diversified Core Equity Index (lagged 3 months)			1.5	3.5	7.4	10.9	11.0	12.6	0.9
<i>Value Added</i>			<i>1.9</i>	<i>2.1</i>	<i>0.3</i>	<i>1.5</i>	<i>1.1</i>	<i>1.2</i>	<i>0.1</i>
Core	1,521	49%	1.6	4.4	6.1	11.6	11.9	13.2	6.1
Value-Added	1,163	38%	2.1	4.4	7.4	12.5	11.4	12.7	1.2
Opportunistic	417	13%	2.0	2.6	7.7	9.1	10.8	13.5	(1.6)

\* Underlying strategy returns are calculated by an external consultant, and provided on a quarterly lag once quarterly values are finalized



# Real Assets Performance

Net Returns (%) As of June 30, 2017	Market Value		Annualized Returns					Since Inception
	(\$ Million)	% Allocation	3 Month	6 Month	1 Year	3 Year	5 Year	
<b>Real Asset</b>	<b>855</b>	<b>100.0%</b>	<b>1.1</b>	<b>3.1</b>	<b>8.6</b>	<b>(4.7)</b>	<b>0.1</b>	<b>4.6</b>
Actual Real Asset Returns			1.1	3.1	8.6	(4.7)	0.1	4.6
Energy	167	19%	(7.2)	(5.2)	12.6	(26.3)	(13.7)	(3.2)
Infrastructure	189	22%	9.4	13.4	17.6	10.7	11.2	9.9
Opportunistic	339	40%	5.2	3.8	7.9	6.1	5.8	6.7
Timberland/Agriculture	160	19%	2.1	5.0	3.6	6.6	4.0	5.4

\* Inception date for Real Assets is April 1, 2010



# How are we Managing Risk in our Pension?



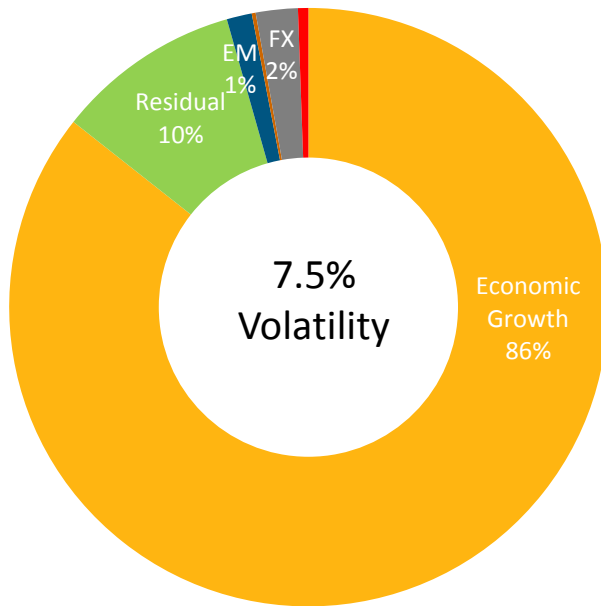
# Pension Risk Measurement

Name	Beta vs Benchmark	Portfolio Risk (%)		Benchmark Risk (%)		Active Risk (%)	
	Current	Standalone Volatility	QoQ Change	Standalone Volatility	QoQ Change	Tracking Error	QoQ Change
<b>UCRP Total</b>		<b>7.5</b>	<i>(1.2)</i>	<b>7.7</b>	<i>(0.9)</i>	<b>0.9</b>	<i>0.1</i>
Public Equity	0.98	10.4	<i>(1.4)</i>	10.6	<i>(1.3)</i>	1.1	<i>(0.2)</i>
Fixed Income	0.87	2.6	<i>(0.2)</i>	3.0	<i>(0.2)</i>	0.5	<i>(0.1)</i>
Absolute Return	0.35	3.4	<i>0.5</i>	4.7	<i>(0.2)</i>	4.3	<i>0.5</i>
Private Equity <sup>(1)</sup>	1.00	20.7	<i>(0.5)</i>	20.7	<i>(0.5)</i>	0.0	<i>0.0</i>
Private Real Estate	1.28	11.9	<i>(1.3)</i>	8.8	<i>(1.0)</i>	4.6	<i>(0.1)</i>
Real Assets <sup>(1)</sup>	1.00	32.5	<i>(3.3)</i>	32.5	<i>(3.3)</i>	0.0	<i>0.0</i>
Cash	0.05	0.2	<i>(0.2)</i>	3.6	<i>(0.2)</i>	3.5	<i>(0.0)</i>

(1) Private Equity and Real Assets do not have standalone (line item) tracking error as per policy, but may contribute to total portfolio Tracking Error due to strategic asset allocation over/underweights



# High Level Macroeconomic Risk Factors



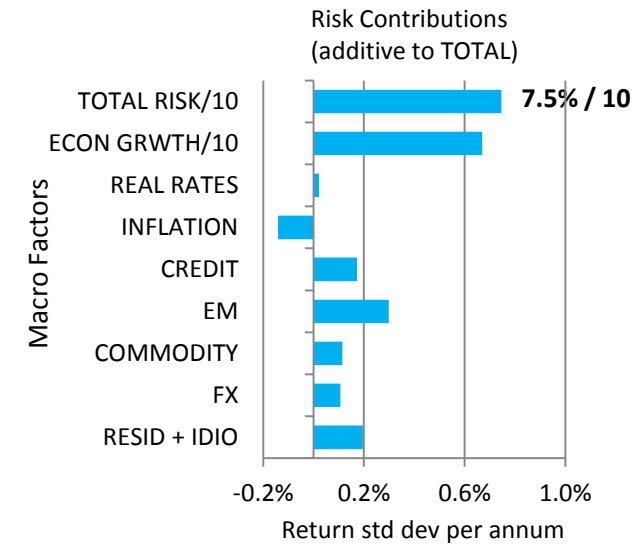
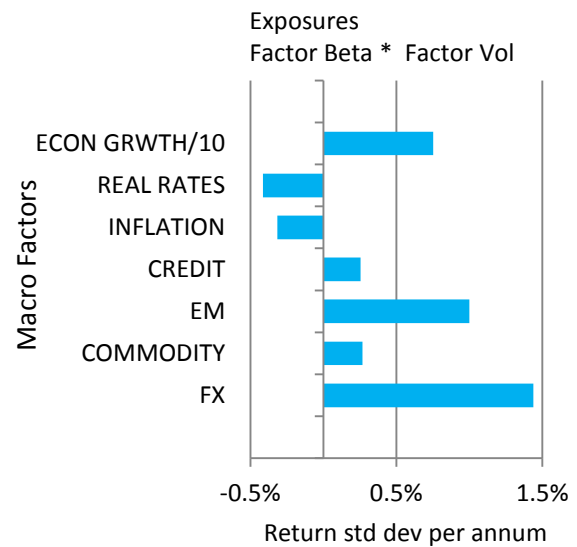
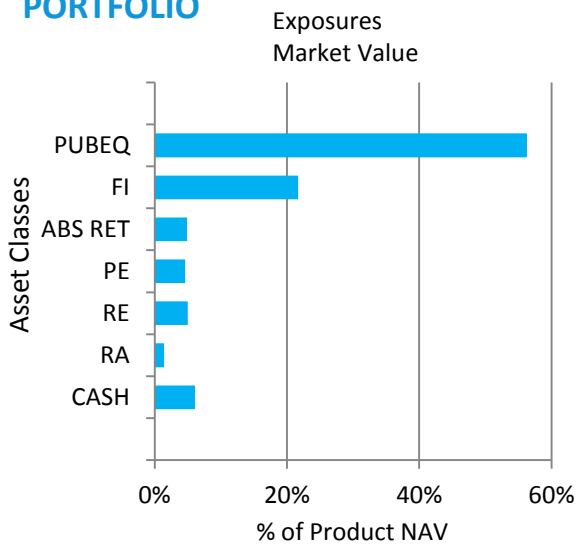
Portfolio Standalone Risk Factor Decomposition

<b>Factor Name</b>	<b>Factor Description</b>
Economic Growth	Proxied by broad, developed market equity index returns
Real Rates	Inflation-linked bond returns
Inflation	Return of long nominal bonds, short inflation-linked bonds portfolio
Credit	Return of long corporate bonds, short nominal bonds portfolio
Commodity	Weighted GSCI Commodity index returns
Emerging Markets (EM)	Equally weighted basket of EM Assets

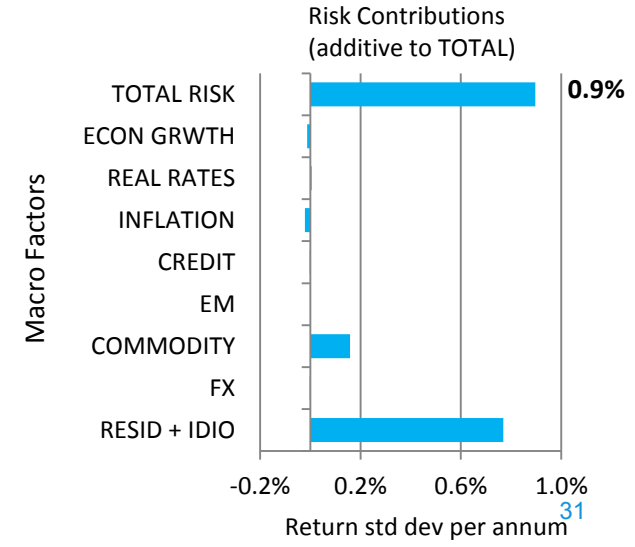
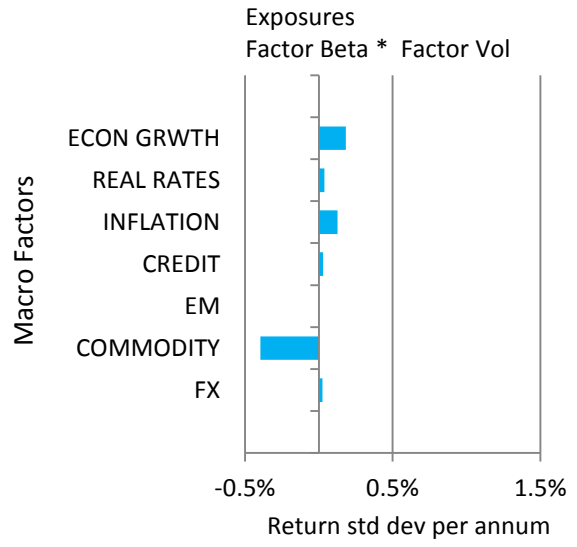
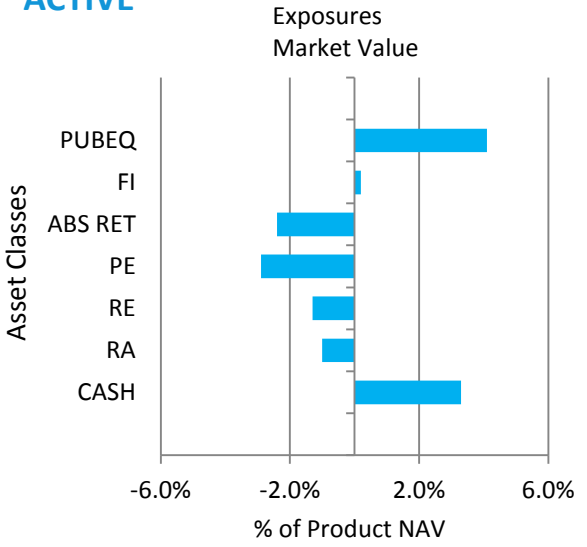


# Asset Classes versus Macroeconomic Risk Factors

## PORTFOLIO



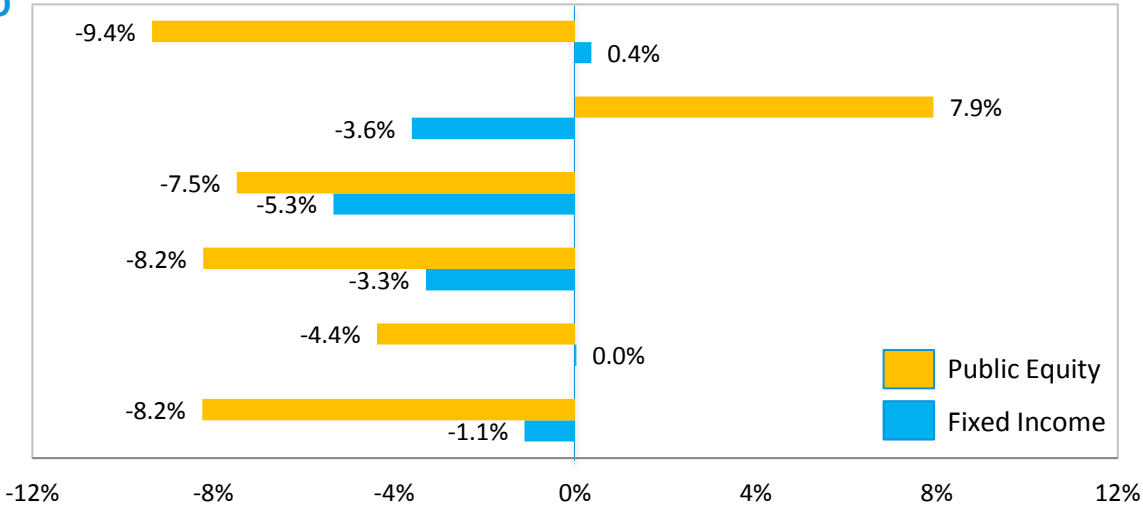
## ACTIVE





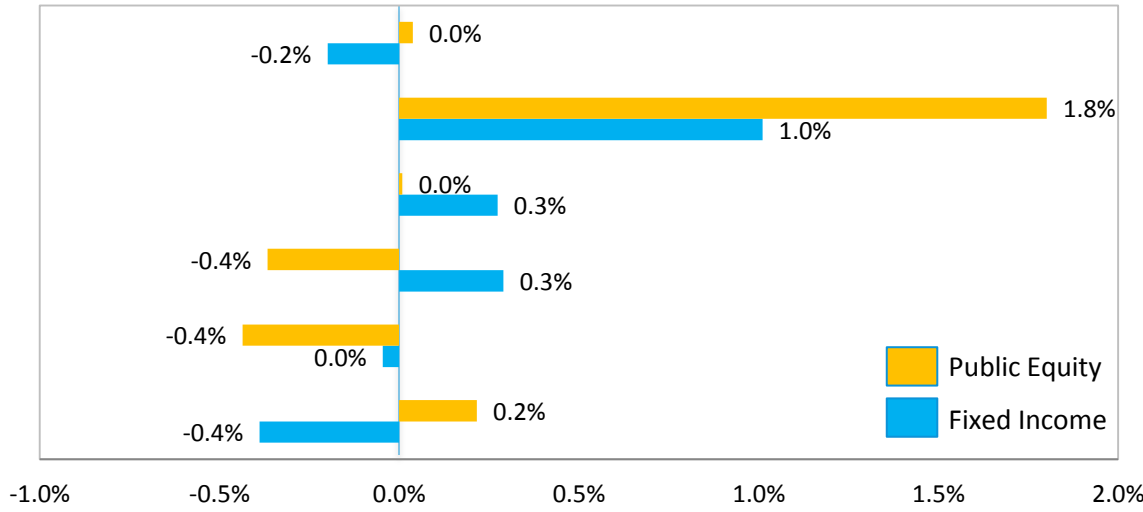
# Stress Tests and Scenario Analysis

## PORTFOLIO



- S&P -10%
- US TSY +100BPS \*
- "Taper Tantrum" 2013
- Volatility Regime Change (Hypothetical)
- Value Reversal (Hypothetical)
- China Credit Crunch (Hypothetical)

## ACTIVE



- S&P -10%
- US TSY +100BPS \*
- "Taper Tantrum" 2013
- Volatility Regime Change (Hypothetical)
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# Pension Policy Benchmark

Asset Class	Benchmark Component	Target
<b>Total Public Equity</b>	MSCI All Country World Index Net - IMI - Tobacco Free	<b>52.2%</b>
<b>Total Fixed Income</b>		<b>21.5%</b>
U.S. Core Fixed Income	Barclays U.S. Aggregate Bond Index	13.4%
High Yield Debt	Merrill Lynch High Yield Cash Pay Index	2.9%
Emerging Market Debt	JP Morgan Emerging Markets Bond Index Global Diversified	2.4%
TIPS	Barclays U.S. TIPS	2.8%
<b>Total Other Investments</b>		<b>23.5%</b>
Absolute Return	HFRF Fund of Funds Index effective July 2016. Prior was a combination of weighting of HFRX Absolute Return and HFRX Absolute Return Market Directional since 2009	7.5%
Private Equity	Actual Private Equity Returns	7.3%
Real Estate (Private)	NCREIF Funds Index-Open End Diversified Core Equity Index	6.3%
Real Assets	Actual Real Assets Portfolio Returns	2.4%
<b>Cash</b>		<b>2.8%</b>