



UNIVERSITY OF CALIFORNIA

Office of the Chief Investment Officer

Pension

Investment Review as of March 31, 2017

Growing Portfolios Building Partnerships

UC Investments

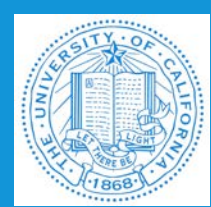


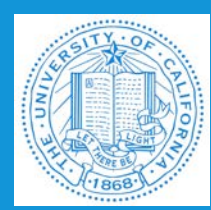
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UCRP Executive Summary

How is our Pension positioned?

How did our Pension perform?

How are we managing risk in our Pension?



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

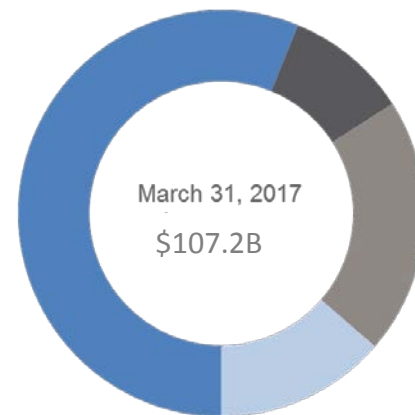
Growing Portfolios. Building Partnerships.

Delivering value through values.

Office of the CIO Facts

- ▶ Pension assets: \$59.7 billion (as of 3/31/17)
- ▶ 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)

\$107.2 billion across 6 products



- Pension: 56%, \$59.7B
- Retirement Savings: 20%, \$21.7B
- Endowment: 10%, \$10.4B
- Working Capital : 13%, \$14.5B
 - TRIP: \$8.9B
 - STIP: \$5.6B
 - Fiat Lux: 1%, \$0.9B



The team managing your money

Chief Investment Officer
Jagdeep Singh Bachher

Investment Management

Risk Management

Investment Services

Fixed Income
Steve Serman

Public Equity
Scott Chan

Asset Allocation
Samuel Kunz

Absolute Return
Edmond Fong

Private Equity
John Beil*

Real Estate
Gloria Gil

Real Assets
John Ritter

Risk Management
Rick Bookstaber

Chief Operating Officer
Arthur Guimaraes

Fixed Income Team

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Public Equity Team

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Asset Allocation Team

2

Absolute Return Team

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Private Equity Team

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Real Estate Team

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Risk Management Team

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Investment Services Team

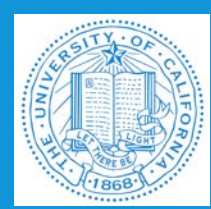
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Note: Excludes Admin (7), Treasury (7), Advisors/Fellows (7), and 15 vacancies

*Interim



UCRP Executive Summary



UCRP at a Glance

Global Markets

- Equities post strong performance
- International Equities meaningfully outperform US Equities over last 3 months
- High Yield spreads continue to tighten driving strong performance

Assets Under Management

- Assets of \$59 billion have grown by 40% over 5 years

Asset Allocation

- Overweight Public Equities
- Overweight Cash
- Underweight Other Investments

Risk Allocation

- Close to target risk allocation

Performance

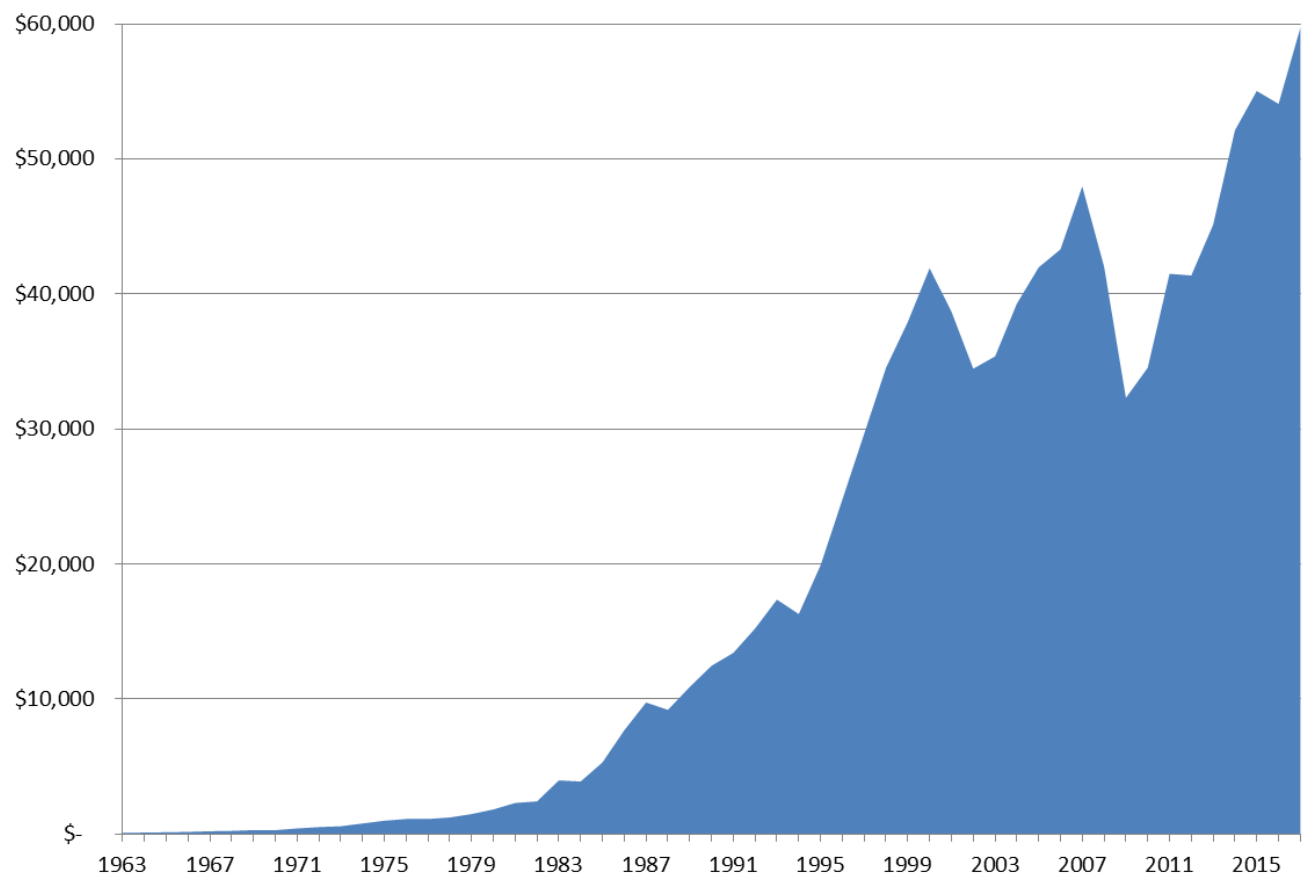
- Strong absolute and relative performance driven by equity markets
- Active management particularly in developed international markets paid off



UCRP Assets grow by over 40% in 5 years

UCRP Assets 1963 - 2017

5 Year Growth



March 31, 2017
\$59.7 billion

1 Year ago
\$53.5 billion

5 Years ago
\$42.5 billion

As of March 31, 2017



AUM growth driven by markets and value add

Assets Under Management Attribution





Assets Under Management June 30, 2016	\$54.08 billion
Market Gains	\$4.96 billion
Value Added	\$0.70 billion
Net Cash Flow	(\$0.02 billion)
Assets Under Management March 31, 2017	\$59.72 billion



How is our Pension Positioned?



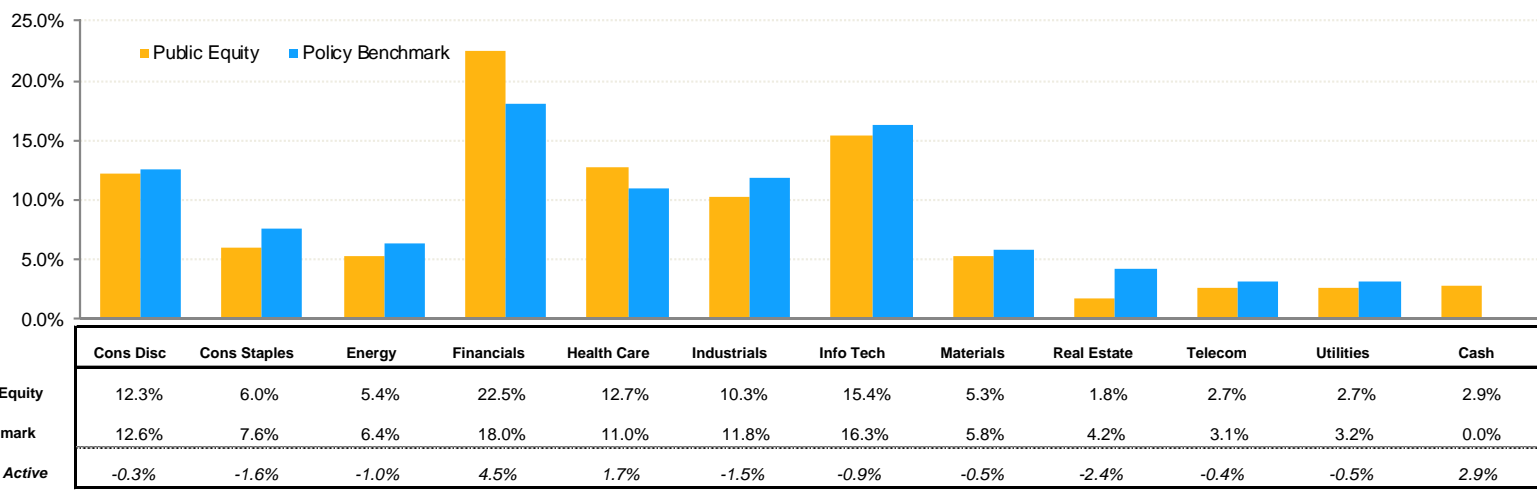
Asset Allocation

Relative Weight		Market Value in \$ Billions	Percentage	Over/Underweight Relative to Policy	Policy Weight
	Public Equity	34.1	57.1%	4.9%	52.2%
	Fixed Income	13.2	22.0%	0.5%	21.5%
	Core	8.0	13.4%	0.0%	13.4%
	High Yield	2.0	3.4%	0.5%	2.9%
	Emerging Market Debt	1.5	2.4%	0.0%	2.4%
	TIPS	1.7	2.8%	0.0%	2.8%
	Other Investments	9.6	16.2%	-7.3%	23.5%
	Absolute Return	3.0	5.0%	-2.3%	7.3%
	Private Equity	2.7	4.6%	-2.9%	7.5%
	Real Estate	3.0	5.0%	-1.3%	6.3%
	Real Asset	0.9	1.6%	-0.8%	2.4%
	Cash	2.8	4.7%	1.9%	2.8%
	Total	59.7	100.0%	0.0%	100.0%

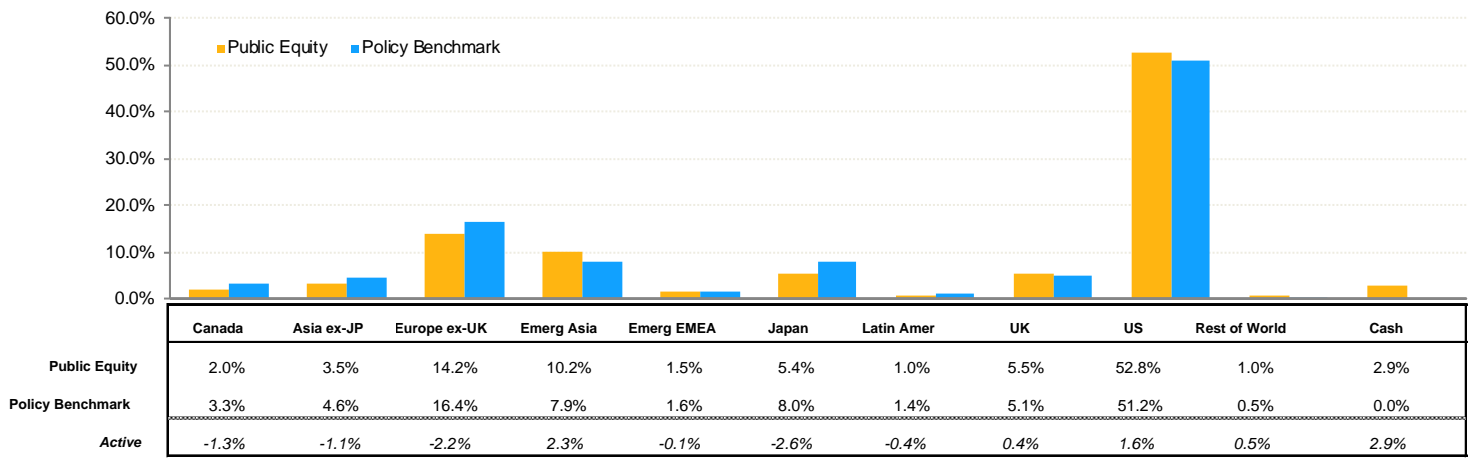


Public Equity Exposures

Sector Exposure:



Regional Exposure:

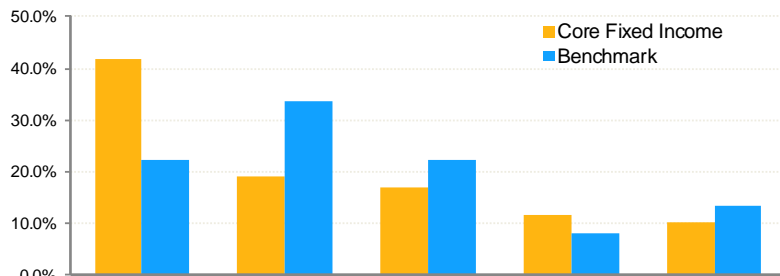




Pension Fixed Income Exposures

Core Fixed Income – \$8,016M

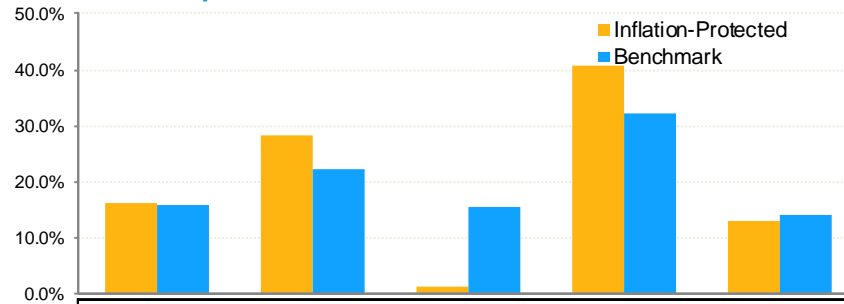
Summary of Duration Buckets:



	0 to 3	3 to 5	5 to 7	7 to 10	10 +
Core Fixed Income	41.9%	19.1%	17.1%	11.6%	10.3%
Benchmark	22.5%	33.6%	22.5%	8.0%	13.4%
Active	19.4%	-14.5%	-5.4%	3.6%	-3.1%

Treasury Inflation-Protected Securities – \$1,696M

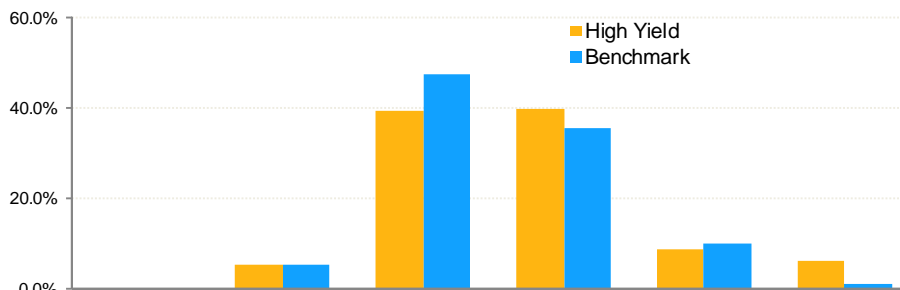
Summary of Duration Buckets:



	0 to 3	3 to 5	5 to 7	7 to 10	10 +
Inflation-Protected	16.3%	28.4%	1.3%	40.9%	13.1%
Benchmark	15.8%	22.5%	15.6%	32.1%	14.0%
Active	0.5%	5.9%	-14.3%	8.8%	-0.9%

High Yield – \$2,022M

Summary of Credit Rating

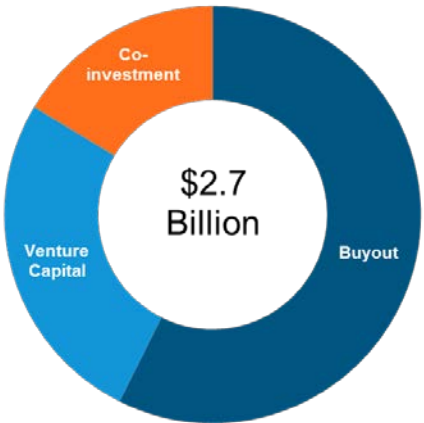


	AAA to A	BBB	BB	B	CCC or lower	NR
High Yield	0.0%	5.5%	39.6%	39.9%	8.8%	6.2%
Benchmark	0.0%	5.6%	47.6%	35.7%	9.9%	1.2%
Active	0.0%	-0.1%	-8.0%	4.2%	-1.1%	5.0%



Private Equity Exposures

Private Equity



-
- **Buyout: 57%**
\$1.5B
 - **Venture Capital: 26%**
\$0.7B
-
- **Co-investment: 17%**
\$0.5B



Absolute Return Exposures

Absolute Return



● **Relative Value Arbitrage: 29%**
\$0.9B

● **Event-Driven: 10%**
\$0.3B

● **Multi-Strategy: 35%**
\$1.1B

● **Global Macro: 22%**
\$0.6B

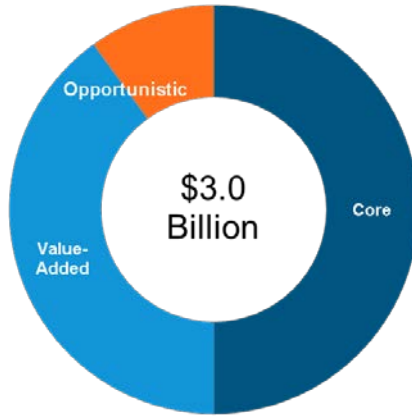
● **Distressed: 1%**
\$0.0B

● **Opportunistic: 3%**
\$0.1B



Real Estate Exposures

Real Estate

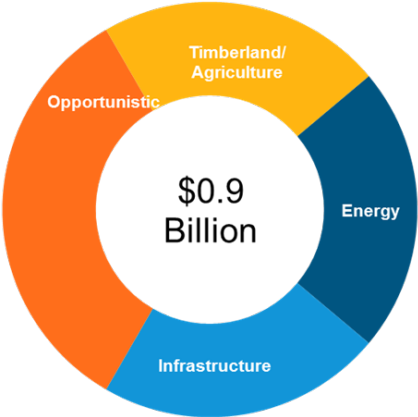


* Underlying strategy returns are calculated by an external consultant, and provided on a quarterly lag once quarterly values are finalized



Real Assets Exposures

Real Assets



● **Energy: 21%**
\$0.2B

● **Infrastructure: 27%**
\$0.2B

● **Opportunistic: 35%**
\$0.3B

● **Timberland/Agriculture: 17%**
\$0.2B



How did our Pension Perform?



Performance: Strong absolute and relative

Net Returns (%) As of March 31, 2017	Annualized Returns							
	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
UC Pension	4.7	10.5	11.9	5.6	7.8	8.0	5.1	7.2
UC Pension Benchmark	4.4	9.1	10.5	4.8	7.0	7.2	4.6	6.9
<i>Value Added</i>	0.3	1.4	1.4	0.8	0.8	0.8	0.5	0.3

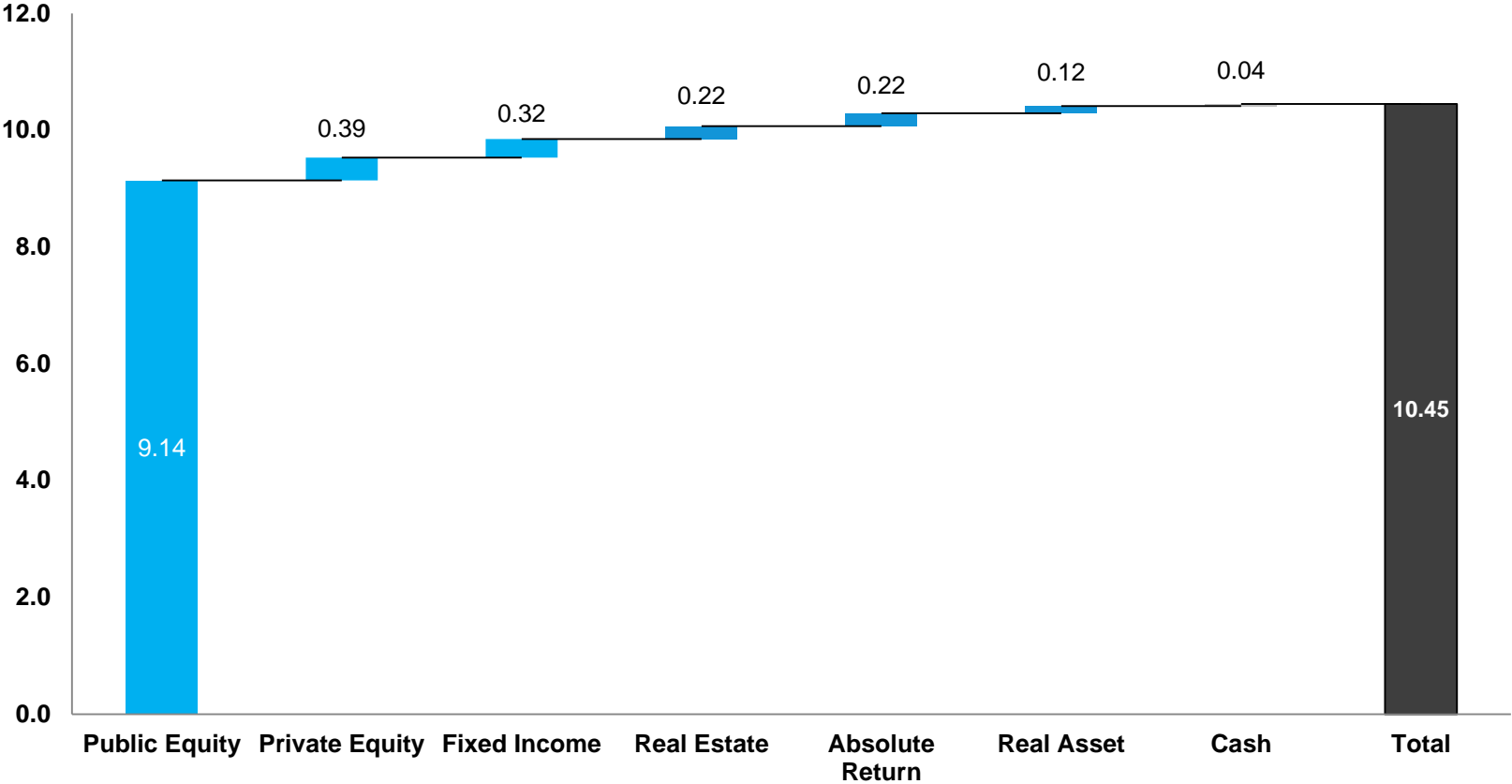
Net Returns (%) As of March 31	One Year Returns									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
UC Pension	11.9	(2.4)	7.8	12.0	10.3	3.9	13.3	36.1	(29.5)	0.3
UC Pension Benchmark	10.5	(1.7)	6.0	11.6	9.3	2.6	12.9	35.5	(29.6)	0.6
<i>Value Added</i>	1.4	(0.7)	1.8	0.4	1.0	1.3	0.4	0.6	0.1	(0.3)

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



Fiscal YTD return driven by Public Equity

9 Month Contribution to Return - Percentage (%)





Pension – Fiscal Year-to-Date

As of March 31, 2017	Average Weight	Active Weight	Allocation Attribution	Selection Attribution	Total Attribution
Public Equity	55.7	+3.5	+0.2	+1.2	+1.4
Fixed Income					
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
Other Investments					
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
Total	100%	+0.0%	+0.3%	+1.1%	+1.4%



Pension Public Equity Performance

Net Returns (%) As of March 31, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Public Equity	34,123	100.0%	7.0	16.8	17.9	6.0	9.4	8.9	4.6	6.6
MSCI All Country World Index Net - IMI - Tobacco Free			6.7	14.3	15.6	5.2	8.6	8.2	4.6	6.4
<i>Value Added</i>			0.3	2.5	2.3	0.8	0.8	0.7	0.0	0.2
U.S. Equity	18,548	54%	7.0	16.8	19.1	8.7	12.7	12.5	7.1	7.6
Russell 3000 Tobacco Free Index			5.6	15.1	18.0	9.6	13.1	12.8	7.4	8.1
<i>Value Added</i>			1.4	1.7	1.1	(0.9)	(0.4)	(0.3)	(0.3)	(0.5)
Non-U.S. Equity	10,763	32%	7.8	22.7	18.7	2.6	7.0	5.7	2.1	-
MSCI World ex-U.S. (net dividends) Tobacco Free			6.7	13.4	12.1	0.2	5.3	4.3	1.0	-
<i>Value Added</i>			1.1	9.3	6.6	2.4	1.7	1.4	1.1	-
Emerging Market	4,812	14%	10.1	8.3	8.9	0.1	0.3	1.7	2.4	-
MSCI Emerging Market (net dividends)			11.4	16.4	17.2	1.2	0.8	1.7	2.7	-
<i>Value Added</i>			(1.3)	(8.1)	(8.3)	(1.1)	(0.5)	0.0	(0.3)	-

*Prior to July 1, 2016, total public equity benchmark was aggregate of benchmarks for equity portfolios in the pool



Fixed Income Performance

Net Returns (%) As of March 31, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Fixed Income	13,164	100.0%	1.6	1.4	3.9	3.2	3.2	4.7	5.2	6.8
Policy Benchmark			0.8	(0.1)	2.7	3.0	2.7	4.3	4.9	6.3
<i>Value Added</i>			<i>0.8</i>	<i>1.5</i>	<i>1.2</i>	<i>0.2</i>	<i>0.5</i>	<i>0.4</i>	<i>0.3</i>	<i>0.5</i>
Core	8,016	61%	1.1	(0.3)	1.9	3.0	3.0	4.0	4.6	6.5
Barclays U.S. Aggregate Bond Index			0.8	(1.7)	0.4	2.7	2.3	3.5	4.4	6.0
<i>Value Added</i>			<i>0.3</i>	<i>1.4</i>	<i>1.5</i>	<i>0.3</i>	<i>0.7</i>	<i>0.5</i>	<i>0.2</i>	<i>0.5</i>
High Yield	2,022	15%	2.3	8.6	12.6	4.5	7.0	8.0	7.2	-
Merrill Lynch High Yield Cash Pay Index			2.7	10.4	16.7	4.6	6.8	7.7	7.3	-
<i>Value Added</i>			<i>(0.4)</i>	<i>(1.8)</i>	<i>(4.1)</i>	<i>(0.1)</i>	<i>0.2</i>	<i>0.3</i>	<i>(0.1)</i>	<i>-</i>
Emerging Market Debt	1,430	11%	3.8	2.9	7.1	4.3	3.7	5.3	6.1	-
JP Morgan Emerging Markets Bond Index Global Diversified			3.9	3.7	8.9	6.2	5.5	6.5	6.9	-
<i>Value Added</i>			<i>(0.1)</i>	<i>(0.8)</i>	<i>(1.8)</i>	<i>(1.9)</i>	<i>(1.8)</i>	<i>(1.2)</i>	<i>(0.8)</i>	<i>-</i>
TIPS	1,696	13%	1.5	0.3	1.9	2.2	1.2	3.7	4.5	-
Barclays U.S. TIPS			1.3	(0.2)	1.5	2.0	1.0	3.5	4.2	-
<i>Value Added</i>			<i>0.2</i>	<i>0.5</i>	<i>0.4</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 benchmarks for bond portfolios in the pool



Private Equity Performance

Net Returns (%) As of March 31, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Private Equity	2,723	100.0%	3.9	8.3	8.3	10.7	13.0	13.1	9.4	15.8
Actual Private Equity Returns			3.9	8.3	8.3	10.7	13.0	13.1	9.4	15.8
Buyout	1,549	57%	4.3	10.7	11.9	10.3	11.0	11.8	8.9	11.3
Venture Capital	704	26%	1.4	(0.8)	(3.7)	6.5	12.4	12.5	8.7	21.1
Co-investment	470	17%	7.6	16.0	19.0	27.2	37.7	28.6	-	-



Absolute Return Performance

Net Returns (%) As of March 31, 2017	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	7 Year	Since Inception
Absolute Return	2,997	100.0%	1.2	4.6	5.1	3.5	5.4	5.2	3.7
Custom Absolute Return Index			2.3	5.6	6.0	(0.3)	1.5	0.1	3.5
<i>Value Added</i>			<i>(1.1)</i>	<i>(1.0)</i>	<i>(0.9)</i>	<i>3.8</i>	<i>3.9</i>	<i>5.1</i>	<i>0.2</i>
Relative Value Arbitrage	863	29%	1.9	8.5	12.0	5.6	7.1	5.8	0.0
Event-Driven	303	10%	6.3	10.6	11.3	0.8	6.1	5.8	5.0
Multi-Strategy	1,061	35%	1.3	5.0	4.8	2.1	1.8	-	-
Global Macro	642	22%	-2.9	-2.0	-3.7	3.9	2.2	3.1	0.0
Opportunistic	95	3%	12.1	-	-	-	-	-	-
Distressed	33	1%	1.4	4.6	4.8	-1.2	3.3	4.1	0.9

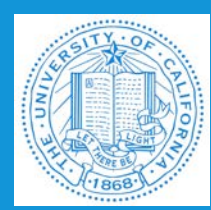
* Inception date for Absolute Return was July 1, 2007. Prior to March 1, 2009, the portfolio benchmark was 1 Month T-Bill+4.5%; thereafter it was 50% HFRX Absolute Return/50% HFRX Market Directional, until February 2016 when it became HFRX Absolute Return



Real Estate Performance

Net Returns (%) As of March 31, 2017	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	7 Year	10 Year
Real Estate	3,018	100.0%	2.1	4.2	8.0	12.0	12.4	13.5	1.2
NCREIF Funds Index-Open End Diversified Core Equity Index (lagged 3 months)			1.9	5.7	7.8	11.2	11.2	12.6	1.1
<i>Value Added</i>			<i>0.2</i>	<i>(1.5)</i>	<i>0.2</i>	<i>0.8</i>	<i>1.2</i>	<i>0.9</i>	<i>0.1</i>
Core	1,539	51%	2.7	4.4	7.4	11.9	12.1	-	-
Value-Added	1,146	38%	2.3	5.6	9.3	12.6	12.3	-	-
Opportunistic	333	11%	1.7	6.7	9.0	9.7	11.0	-	-

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



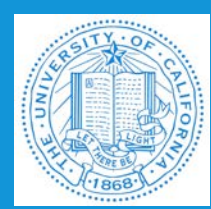
Real Assets Performance

Net Returns (%) As of March 31, 2017	Market Value		Annualized Returns					
	(\$ Million)	% Allocation	3 Month	Fiscal YTD	1 Year	3 Year	5 Year	Since Inception
Real Asset	934	100.0%	2.0	7.3	5.5	(3.4)	(0.2)	4.6
Actual Real Asset Returns			2.0	7.3	5.5	(3.4)	(0.2)	4.6
Energy	197	21%	2.1	21.3	10.9	(21.9)	(12.0)	(2.3)
Infrastructure	251	27%	3.7	7.5	7.9	9.7	10.4	8.8
Opportunistic	331	35%	(1.4)	2.6	4.1	4.4	5.5	6.0
Timberland/Agriculture	155	17%	2.8	1.4	-	5.6	3.2	5.2

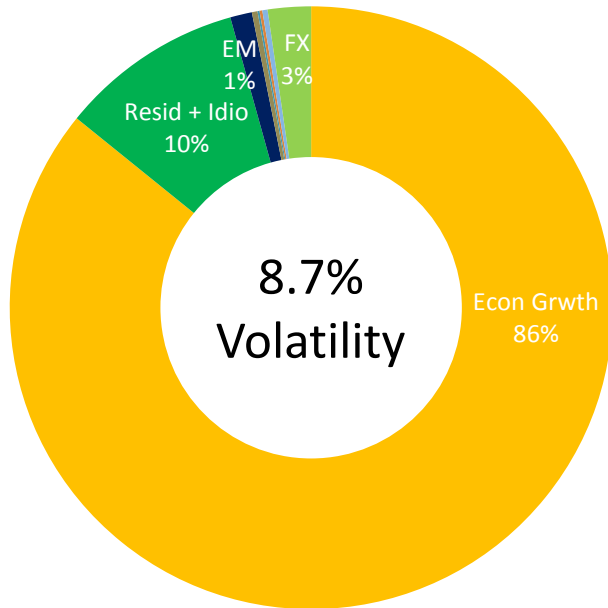
* Inception date for Real Assets is April 1, 2010



How are we Managing Risk in our Pension?



High Level Macroeconomic Risk Factors

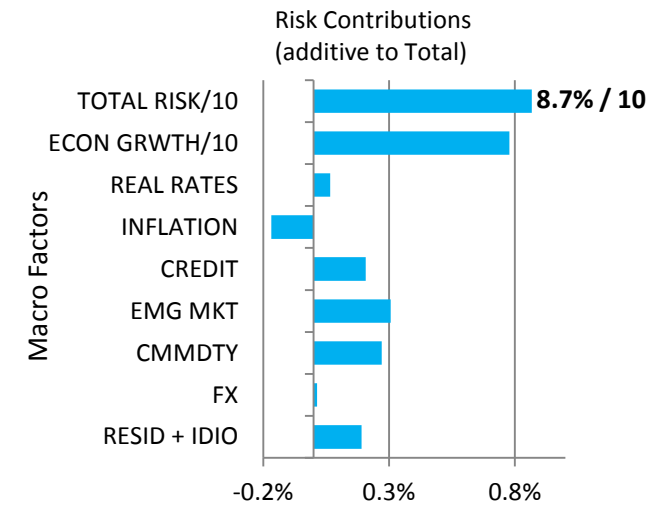
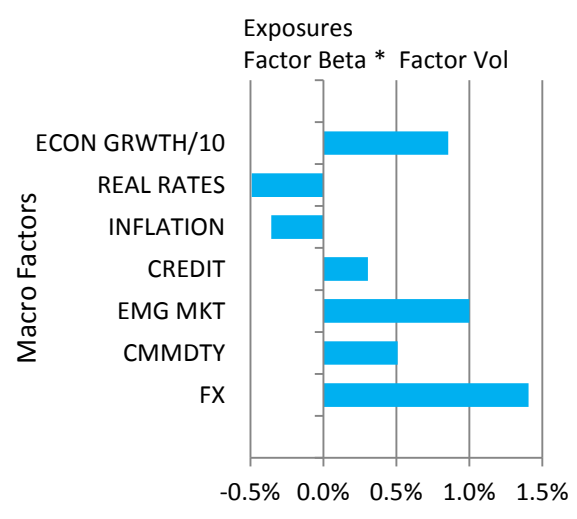
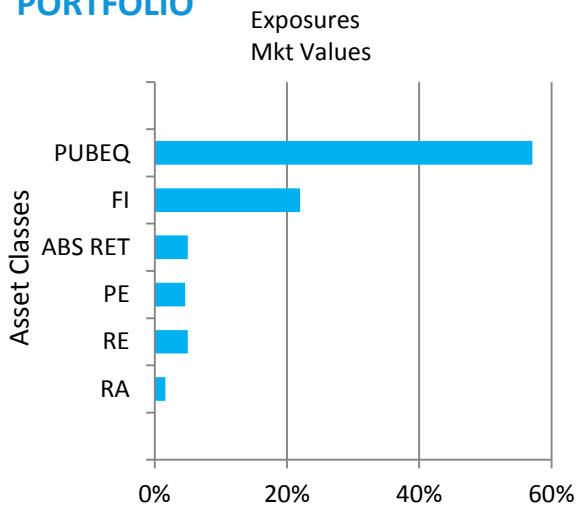


Factor Name	Factor Description
Economic Growth	Often correlated to broad-market equity index returns
Real Rates	Inflation-linked bond returns
Inflation	Return of long nominal bonds, short inflation-linked bonds portfolio
Credit	Return of long corporate bonds, short nominal bonds portfolio
Commodity	Weighted GSCI Commodity index returns
Emerging Markets	Equally weighted basket of EM Assets

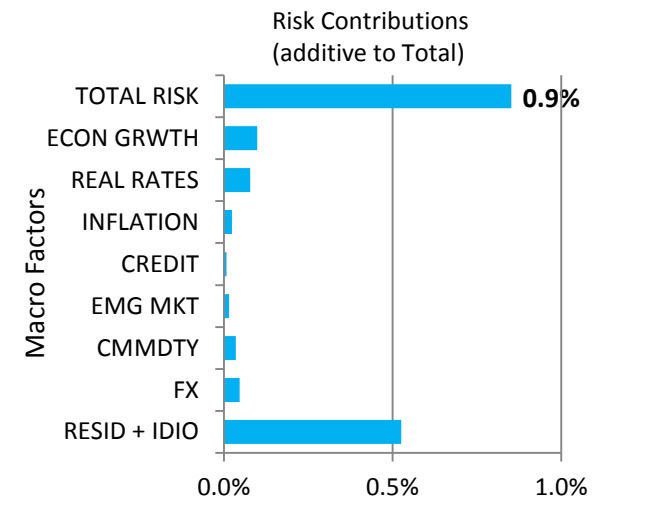
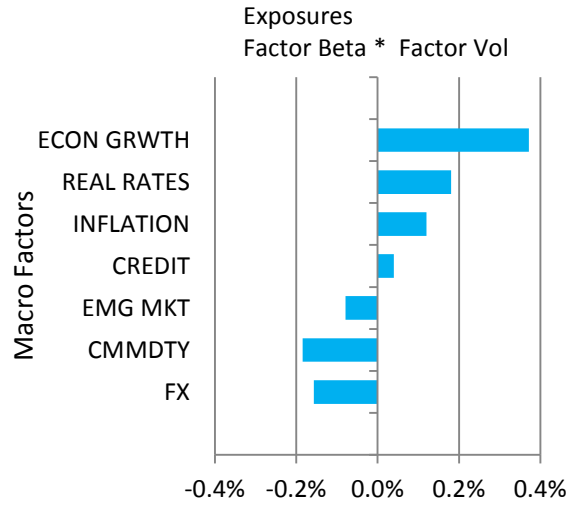
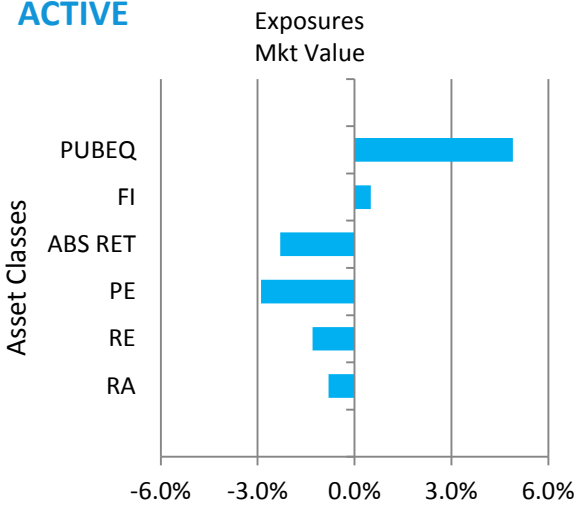


Asset Classes versus Macroeconomic Factors

PORTFOLIO



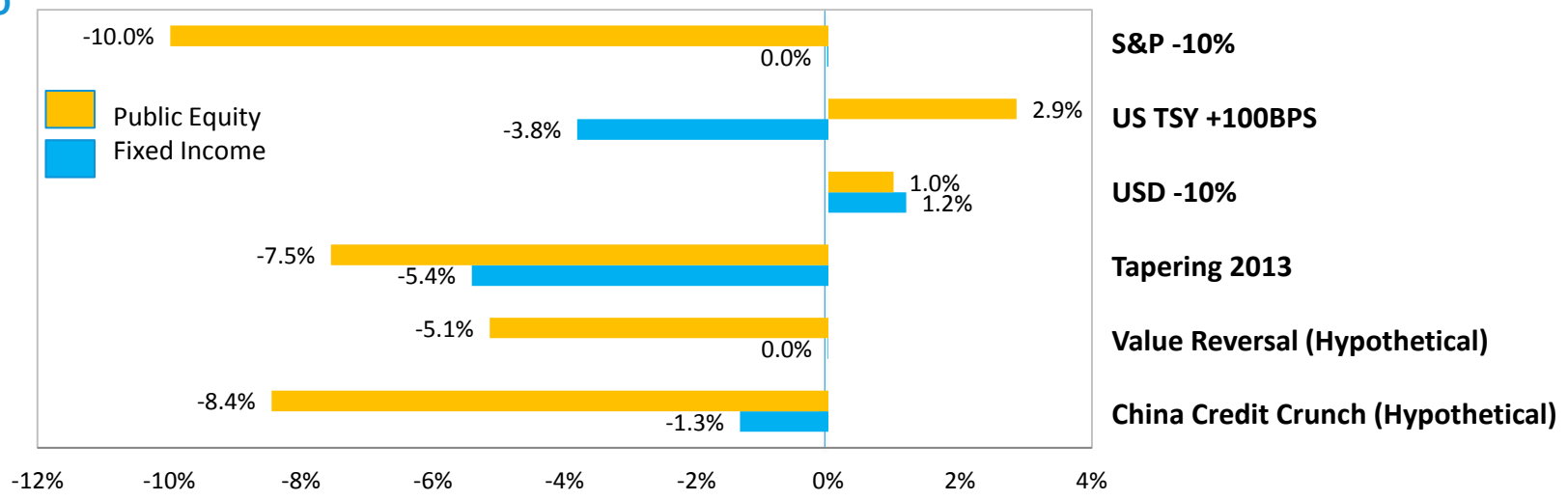
ACTIVE



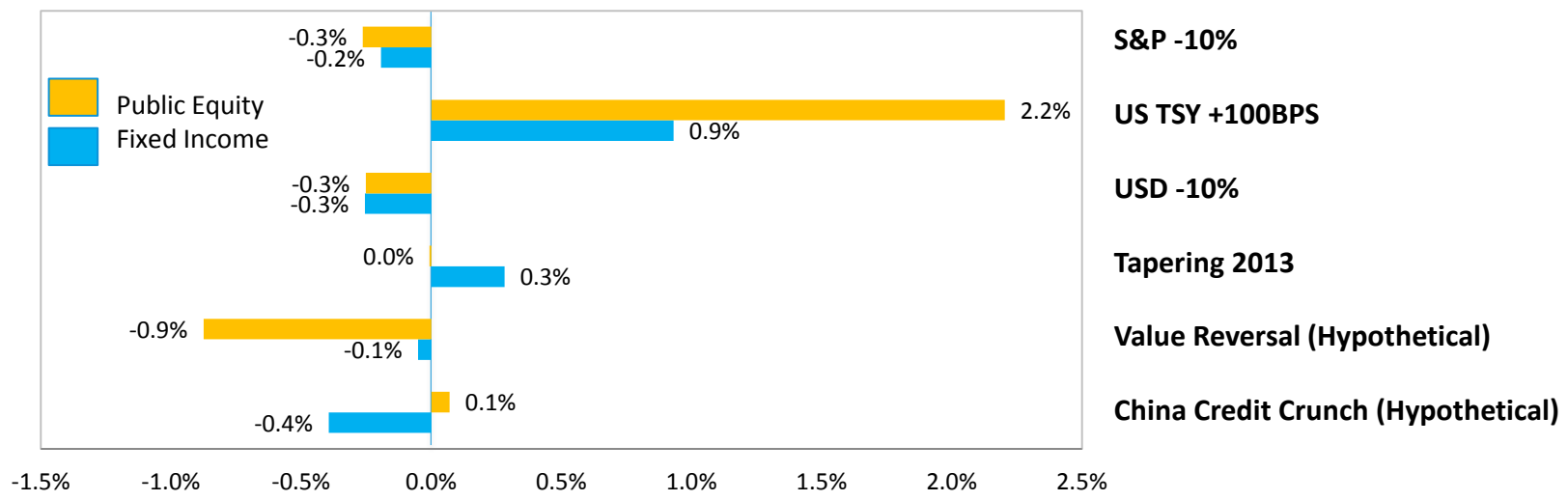


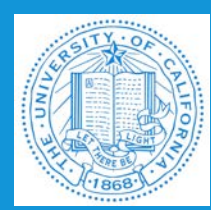
Stress Tests and Scenario Analysis

PORTFOLIO



ACTIVE





UCRP 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
UCRP Total	1.01	8.7	<i>(0.7)</i>	8.6	<i>(0.9)</i>	0.9	<i>(0.1)</i>
Public Equity	1.00	11.8	<i>(1.3)</i>	11.8	<i>(1.4)</i>	1.3	<i>(0.1)</i>
Fixed Income	0.86	2.8	<i>(0.2)</i>	3.3	<i>0.2</i>	0.6	<i>0.4</i>
Absolute Return	0.38	2.9	<i>0.4</i>	5.0	<i>(0.6)</i>	3.8	<i>(0.5)</i>
Private Equity ⁽¹⁾	1.00	21.2	<i>(1.3)</i>	21.2	<i>(1.3)</i>	0.0	<i>0.0</i>
Private Real Estate	1.30	13.2	<i>0.0</i>	9.8	<i>(0.5)</i>	4.7	<i>0.5</i>
Real Assets ⁽¹⁾	1.00	35.8	<i>(2.6)</i>	35.8	<i>(2.6)</i>	0.0	<i>0.0</i>
Cash	0.09	0.4	<i>(0.0)</i>	3.8	<i>(0.1)</i>	3.5	<i>(0.1)</i>

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



Pension Policy Benchmark

Asset Class	Policy Benchmark Component	Target
Total Public Equity	MSCI All Country World Index Net – IMI – Tobacco Free	52.2%
Total Fixed Income		21.5%
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%
Total Other Investments		23.5%
Private Equity	Actual Private Equity Returns	7.5%
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	7.3%
Real Estate	NCREIF Funds Index-Open End Diversified Core Equity Index	6.3%
Real Assets	None	2.4%
Cash		2.8%