



# UNIVERSITY OF CALIFORNIA

Office of the Chief Investment Officer

## Endowment

Investment Review as of September 30, 2017

**Growing Portfolios** Building Partnerships

**UC Investments**























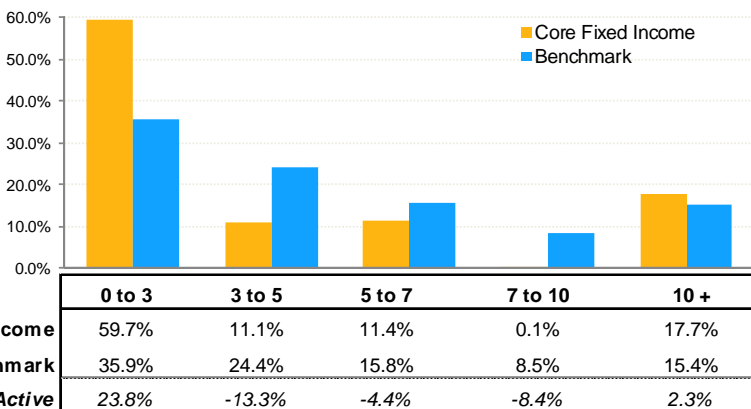




# Fixed Income Exposures

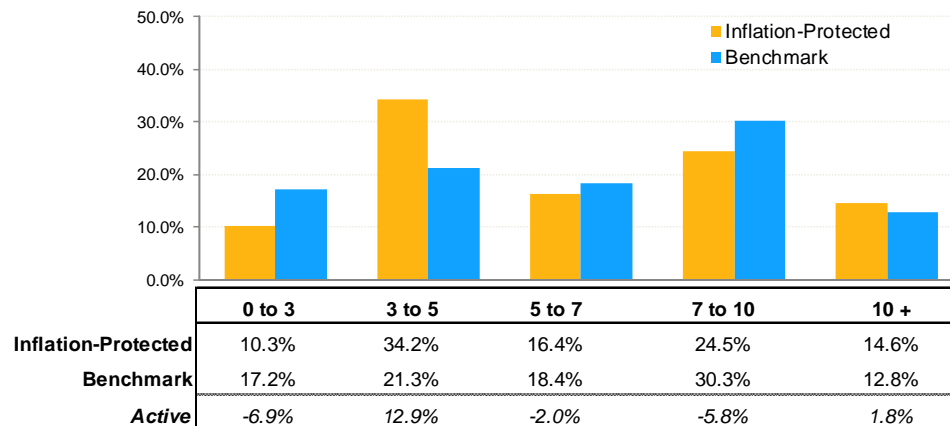
## Government/Treasury Portfolio – \$375M

### Summary of Duration Buckets:



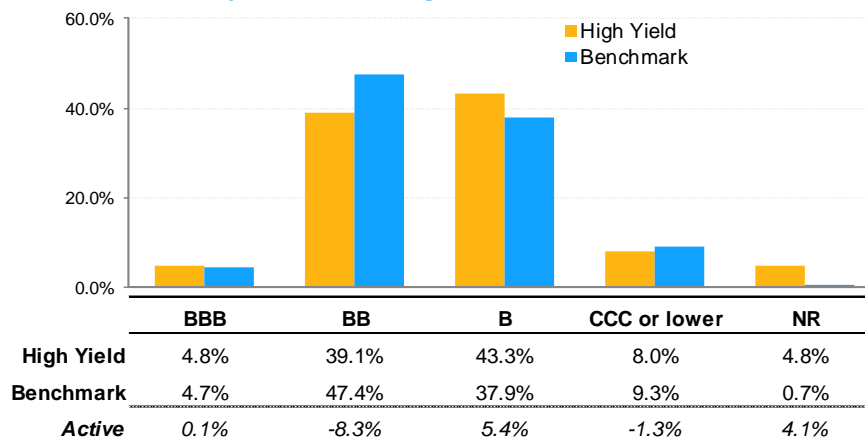
## Treasury Inflation-Protected Securities – \$193M

### Summary of Duration Buckets:



## High Yield – \$373M

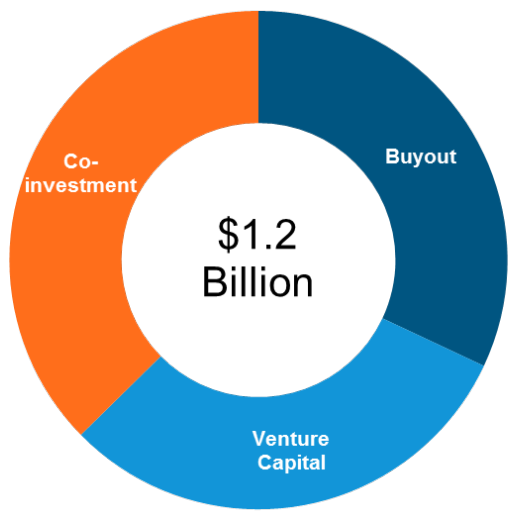
### Summary of Credit Rating





# Private Equity Exposures

## Private Equity



● Buyout: 32%  
\$0.4B

● Venture Capital: 31%  
\$0.4B

● Co-investment: 37%  
\$0.4B



# Absolute Return Exposures

## Absolute Return

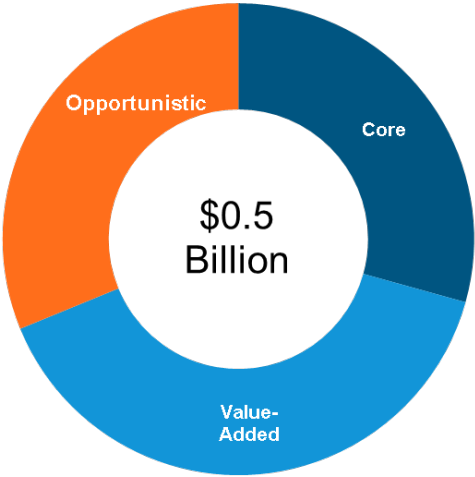


- **Opportunistic: 22%**  
\$0.4B
- **Alternative Risk Premia: 10%**  
\$0.2B
- **Relative Value: 35%**  
\$0.7B
- **Global Macro: 20%**  
\$0.4B
- **Event Driven: 12%**  
\$0.3B
- **Fund of Funds: 0%**  
\$0.1B
- **Distressed: 1%**  
\$0.0B



# Real Assets (Real Estate) Exposures

## Real Assets (Real Estate)



● Core: 28%  
\$0.1B

● Value-Added: 36%  
\$0.2B

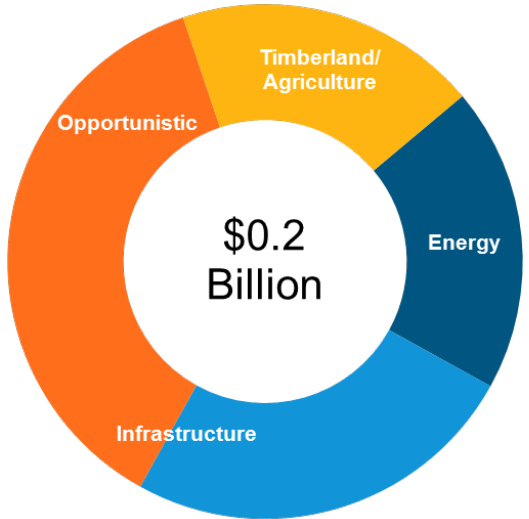
● Opportunistic: 36%  
\$0.2B





# Real Assets (Non-Real Estate) Exposures

## Real Assets (Non-Real Estate)



● Energy: 19% \$0.03B	● Infrastructure: 25% \$0.06B
● Opportunistic: 37% \$0.08B	● Timberland/Agriculture: 19% \$0.04B



# How did our Endowment Perform?



# Performance: Strong absolute

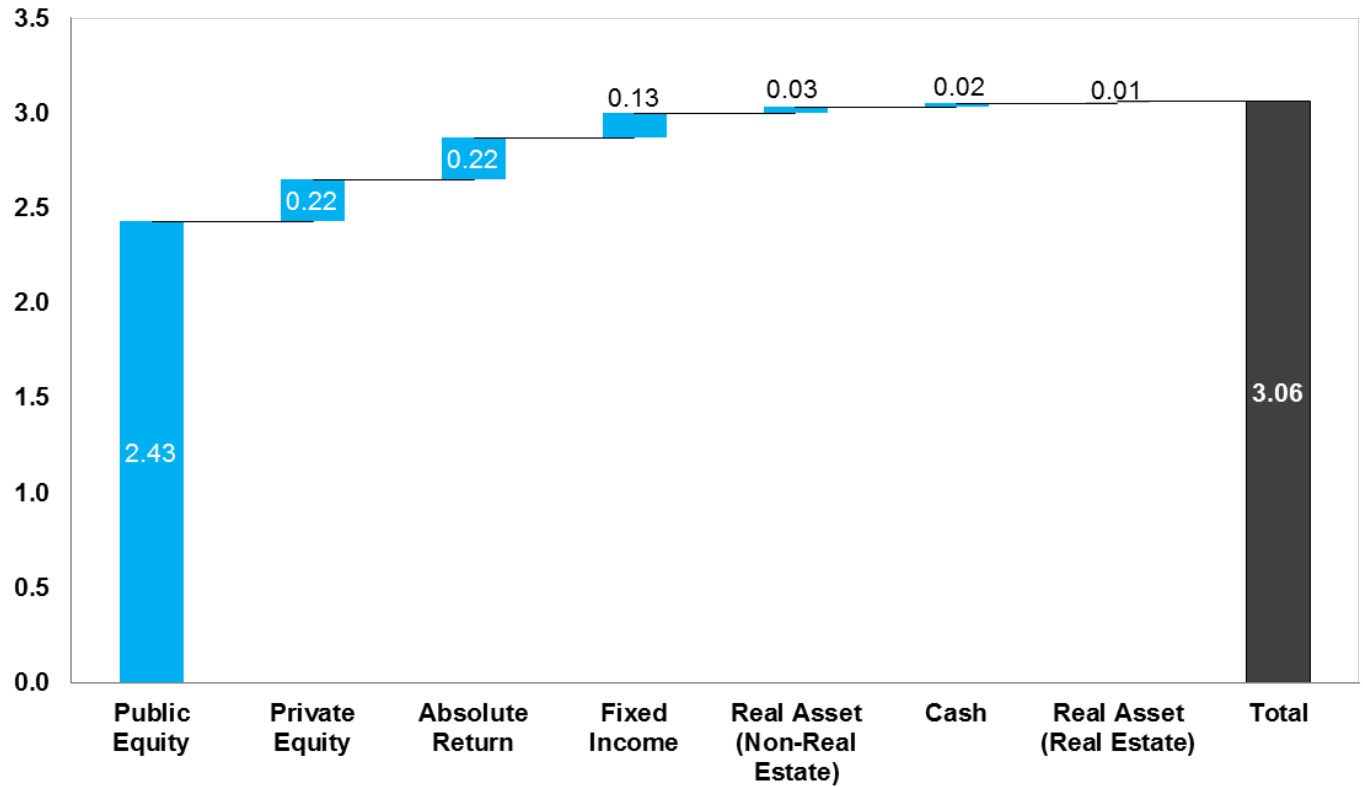
Net Returns (%) As of September 30, 2017	Annualized Returns							
	3 Month	YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
UC Endowment	3.1	10.8	13.5	6.9	9.2	8.7	5.4	7.1
UC Endowment Benchmark	3.6	11.3	12.3	5.9	7.9	7.1	4.8	6.6
Value Added	(0.5)	(0.5)	1.2	1.0	1.3	1.6	0.6	0.5

Net Returns (%) As of June 30, 2017	One Year Returns									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
UC Endowment	14.8	(3.5)	6.1	19.0	12.0	(0.7)	20.2	11.3	(18.2)	(1.5)
UC Endowment Benchmark	12.2	(1.7)	3.7	16.6	10.1	(2.4)	17.9	9.1	(13.1)	0.1
Value Added	2.6	(1.8)	2.4	2.4	1.9	1.7	2.3	2.2	(5.1)	(1.6)



# Fiscal YTD return driven by Public Equity

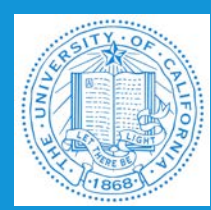
FYTD Contribution to Return - Percentage (%)





# Endowment Attribution – Fiscal Year-to-Date

As of September 30, 2017	Average Weight	Average Active Weight	Allocation Attribution	Selection Attribution	Total Attribution
<b>Public Equity</b>	44.0	+1.5	-0.1	+0.1	+0.0
<b>Liquidity (Income)</b>					
Government/Treasury	3.5	-1.5	+0.0	+0.0	+0.0
High Yield	3.5	+1.0	+0.0	+0.0	+0.0
Emerging Market Debt	2.2	-0.3	+0.0	+0.0	+0.0
TIPS	1.9	-0.6	+0.0	+0.0	+0.0
<b>Other Investments</b>					
Absolute Return	17.9	-5.1	+0.1	-0.2	-0.1
Private Equity	11.2	-0.3	+0.0	-0.1	-0.1
Real Assets (Real Estate)	4.5	-3.0	+0.1	-0.1	+0.0
Real Assets (Non-Real Estate)	2.0	-1.0	+0.0	+0.0	+0.0
Cash	9.3	9.3	-0.3	+0.0	-0.3
<b>Total GEP</b>	<b>100.0%</b>	<b>+0.0%</b>	<b>-0.2%</b>	<b>-0.3%</b>	<b>-0.5%</b>



# Public Equity Performance

Net Returns (%) As of September 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Public Equity	4,917	100%	5.9	18.8	22.4	7.9	10.9	9.9	4.5	6.3
GEP Public Equity Policy Benchmark			5.5	18.0	19.5	7.7	10.3	9.4	4.3	6.1
Value Added			0.4	0.8	2.9	0.2	0.6	0.5	0.2	0.2
U.S. Equity	2,540	52%	3.5	8.8	14.6	6.5	11.8	12.5	6.2	6.4
Russell 3000 Tobacco Free Index			4.8	13.9	18.7	10.7	14.2	14.2	7.5	7.2
Value Added			(1.3)	(5.1)	(4.1)	(4.2)	(2.4)	(1.7)	(1.3)	(0.8)
Non-U.S. Equity	1,810	37%	6.4	24.2	30.0	6.6	9.2	7.2	2.3	-
MSCI World ex-U.S. (net dividends) Tobacco Free			5.8	19.4	19.2	4.6	7.8	6.0	1.2	-
Value Added			0.6	4.8	10.8	2.0	1.4	1.2	1.1	-
Emerging Market	567	12%	9.6	33.1	24.1	7.4	5.8	4.0	2.4	-
MSCI Emerging Market (net dividends)			7.9	27.8	22.5	4.9	4.0	2.5	1.3	-
Value Added			1.7	5.3	1.6	2.5	1.8	1.5	1.1	-

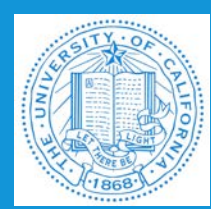
\* Total public equity benchmark is an aggregate of benchmarks for equity portfolios in the pool prior to Jul 1, 2017; thereafter MSCI ACWI IMI Tobacco Free.



# Liquidity (Income) Performance

Net Returns (%) As of September 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
<b>Fixed Income</b>	1,257	100%	1.4	4.7	2.7	3.1	2.7	4.2	5.3	6.0
Policy Benchmark			0.9	4.0	1.5	3.4	2.8	4.1	5.4	6.2
Value Added			0.5	0.7	1.2	-0.3	-0.1	0.1	-0.1	-0.2
Government/Treasury	425	34%	0.6	2.7	-0.6	1.6	1.7	2.7	3.9	5.3
Barclays US Government Bond Index			0.4	2.3	-1.6	1.9	1.6	2.6	4.0	5.4
Value Added			0.2	0.4	1.0	-0.3	0.1	0.1	-0.1	-0.1
High Yield	373	30%	1.8	6.9	7.9	5.5	6.4	7.5	7.4	-
Merrill Lynch High Yield Cash Pay Index			2.0	7.1	9.1	5.9	6.4	7.3	7.7	-
Value Added			-0.2	-0.2	-1.2	-0.4	0.0	0.2	-0.3	-
Emerging Market Debt	266	21%	2.7	8.5	3.6	-	-	-	-	-
JP Morgan Emerging Markets Bond Index Global Diversified			2.6	9.0	4.6	-	-	-	-	-
Value Added			0.1	-0.5	-1.0	-	-	-	-	-
TIPS	193	15%	0.9	1.9	0.1	1.9	0.2	2.8	4.2	-
Barclays U.S. TIPS			0.9	1.7	-0.7	1.6	0.0	2.6	3.9	-
Value Added			0.0	0.2	0.8	0.3	0.2	0.2	0.3	-

*Policy benchmark for Core Fixed Income prior to July 1, 2016 was the Barclay's US Aggregate Bond Index. Policy would be a weighted average composite of the historical policy benchmarks and targets. Starting July 1, 2017, the benchmark is resumed to the Barclay's US Aggregate Bond Index.*



# Private Equity Performance

Net Returns (%) As of September 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Private Equity	1,194	100%	2.2	12.5	17.8	17.9	20.1	17.8	12.9	17.7
GEP Non-Lagged Private Eq Policy Index			5.1	15.8	21.2	19.0	20.8	18.2	13.2	10.6
Value Added			(2.9)	(3.3)	(3.4)	(1.1)	(0.7)	(0.4)	(0.3)	7.1
Buyout	382	32%	2.0	13.1	26.8	24.3	20.2	17.3	13.2	13.6
Venture Capital	366	31%	-4.8	6.8	9.7	8.1	14.1	14.3	10.1	22.3
Co-investment	446	37%	10.6	21.5	22.3	23.4	33.9	31.4	-	-





# Absolute Return Performance

Net Returns (%) As of September 30, 2017	Market Value (\$ Million)	% Allocation	3 Month	YTD	1 Year	Annualized Returns			
						3 Year	5 Year	7 Year	10 Year
<b>Absolute Return</b>	1,972	100%	1.3	2.8	4.1	2.4	5.6	5.1	3.7
Custom Absolute Return Index			2.3	3.8	3.4	(1.2)	1.4	(0.4)	1.9
Value Added			(1.0)	(1.0)	0.7	3.6	4.2	5.5	1.8
Opportunistic	435	22%	1.3	6.3	6.5	7.5	-	-	-
Alternative Risk Premia	195	10%	1.0	-0.2	-2.6	-6.2	3.1	-	-
Relative Value	700	35%	3.3	6.6	9.5	5.5	7.2	-	-
Global Macro	404	20%	-1.9	-8.0	-5.8	1.9	1.6	-	-
Event Driven	239	12%	1.9	13.4	13.4	0.8	7.2	-	-
Fund of Funds	13	0%	3.0	6.5	6.4	-1.1	2.1	-	-
Distressed	16	1%	1.3	1.4	8.7	-2.0	3.1	-	-

From April 1, 2003 to March 1, 2009, the portfolio benchmark was 1 Month T-Bill+4.5%; thereafter the benchmark changed to 50% HFRX Absolute Return/50% HFRX Market Directional until February 2016 when it became HFRX Absolute Return. As of July 1, 2017, the benchmark is HFRI Fund of Funds Composite



# Real Assets Performance

Net Returns (%) As of September 30, 2017	Market Value		Annualized Returns							
	(\$ Million)	% Allocation	3 Month	YTD	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
Real Assets	700	100%	0.7	2.7	10.0	6.8	9.0	10.4	(0.6)	-
GEP TOTAL REAL ASSETS BLENDED BENCHMARK			1.6	4.7	6.6	5.1	7.7	9.6	0.3	-
Value Added			(0.8)	(2.0)	3.4	1.6	1.4	0.9	(0.84)	-
Real Assets (Real Estate)	481	69%	0.2	2.1	11.0	11.3	11.8	13.2	1.0	-
NCREIF Funds Index-Open End Diversified Core Equity Index (lagged 3 months)			1.5	5.0	6.9	10.5	10.9	12.6	2.0	-
Value Added			(1.3)	(2.9)	4.1	0.8	0.9	0.6	(1.0)	-
Core	135	28%	0.9	6.5	8.5	10.7	11.7	12.3	6.2	-
Value-Added	173	36%	0.8	5.0	5.7	10.5	10.4	11.7	0.7	-
Opportunistic	173	36%	2.6	7.2	10.3	10.8	12.4	14.6	0.6	-
Real Assets (Non-Real Estate)	219	31%	1.8	3.9	5.9	(6.7)	0.1	0.6	-	-
GEP REAL ASSETS LAGGED BENCHMARK			1.8	3.9	5.9	(6.7)	0.1	0.5	-	-
Value Added			0.0	0.0	0.0	0.0	0.0	0.1	-	-
Energy	42	19%	3.0	-2.4	6.3	-27.9	-12.8	-7.6	-2.8	-
Infrastructure	55	25%	11.3	26.3	27.4	11.4	14.0	11.3	11.2	-
Opportunistic	80	37%	1.7	5.5	7.8	6.0	5.6	0.0	6.7	-
Timberland/Agriculture	42	19%	-0.3	4.7	4.3	3.1	4.0	2.6	5.1	-

Inception Date for Real Assets is April 1, 2010.



# How are we Managing Risk in our Endowment?

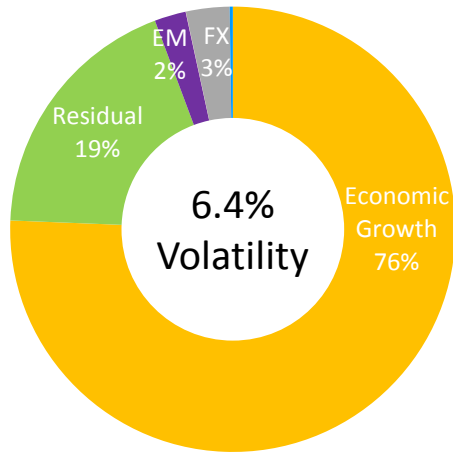


# Endowment Risk Measurement

Name	Beta vs Benchmark	Portfolio Risk (%)		Benchmark Risk (%)		Active Risk (%)	
	Current	Standalone Volatility	QoQ Change	Standalone Volatility	QoQ Change	Tracking Error	QoQ Change
<b>GEP Total</b>		6.4	(0.8)	6.8	(0.7)	1.7	0.5
Public Equity	0.92	8.7	(1.0)	9.1	(1.4)	2.2	(0.1)
Fixed Income	0.85	2.3	(0.6)	2.9	(0.1)	1.6	1.4
Absolute Return	0.93	3.4	0.1	2.2	1.0	2.8	(0.4)
Private Equity	1.54	19.8	(2.6)	11.0	(11.4)	13.9	13.9
Private Real Estate	1.19	10.0	(1.3)	7.5	(1.2)	4.7	(0.0)
Real Assets	1.00	25.2	(3.3)	25.2	(3.3)	0.0	0.0
Cash	0.00	0.3	(0.0)	0.0	0.0	0.3	(0.0)



# High Level Macroeconomic Risk Factors



Portfolio Standalone Risk Factor Decomposition

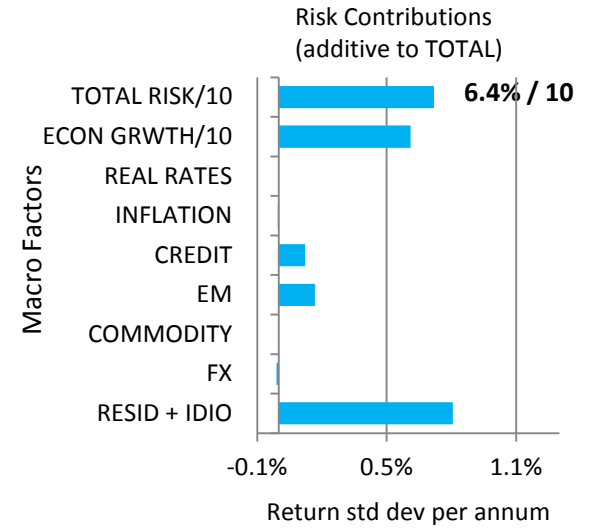
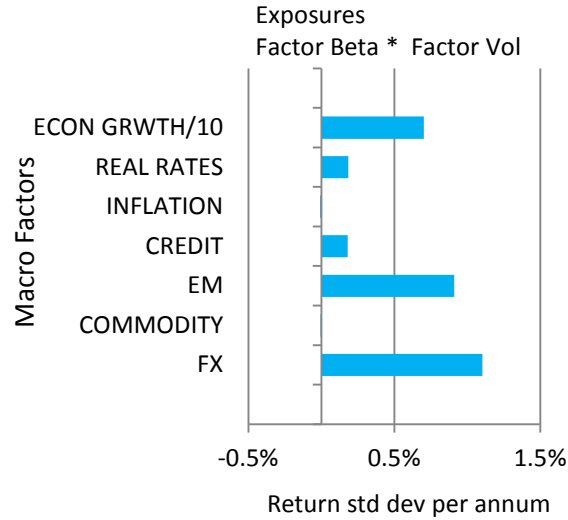
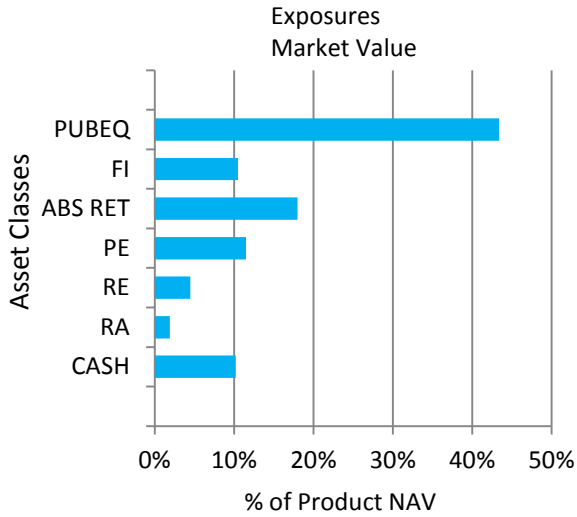
Factor Name	Factor Description
Economic Growth	Proxied by broad, developed market equity index returns
Real Rates	Inflation-linked bond returns
Inflation	Return of long nominal bonds, short inflation-linked bonds portfolio
Credit	Return of long corporate bonds, short nominal bonds portfolio
Commodity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

\* "Residual Risk" is any risk which does not load on to the high level macro factors. This risk generally corresponds to non-strategic, non-tactical level risk decisions, e.g. individual public equity manager sector tilts and stock selection decisions. This finer scale risk is captured separately, with more granular risk models.

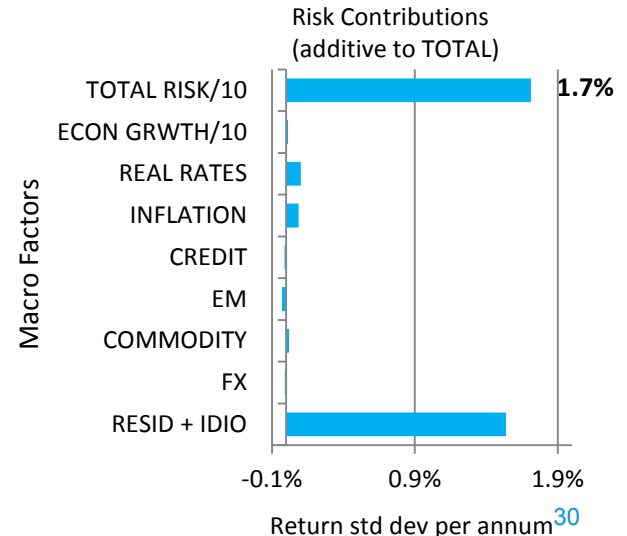
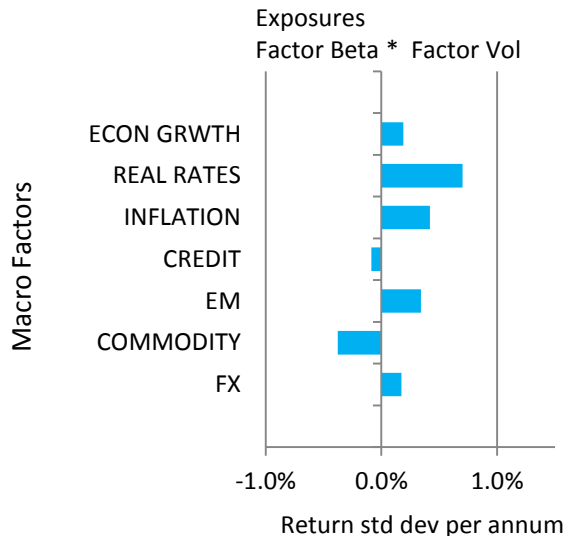
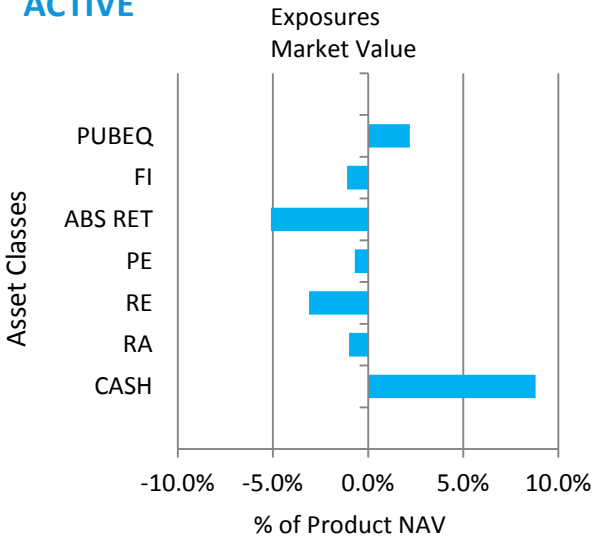


# Asset Classes versus Macroeconomic Risk Factors

## PORTFOLIO



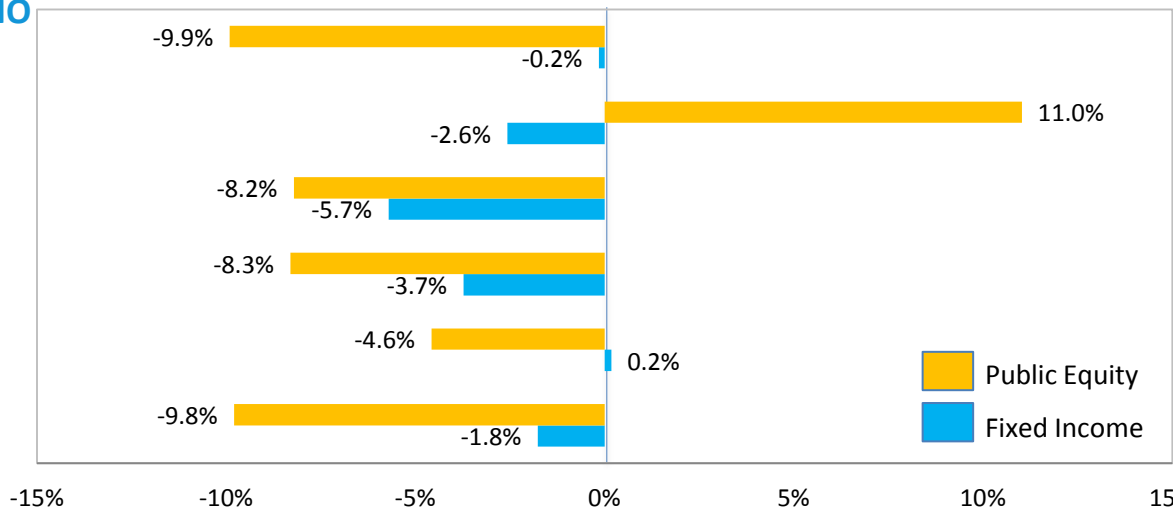
## ACTIVE





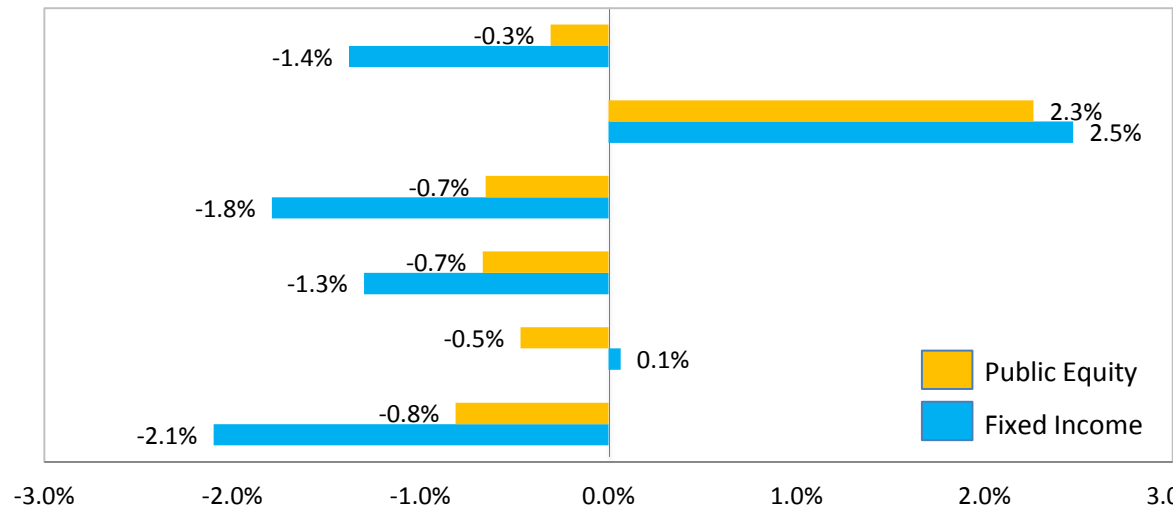
# Stress Tests and Scenario Analysis

## PORTFOLIO



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

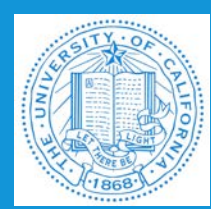
## ACTIVE



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

As of September 30, 2017

\* Public Equity P&L driven by more recent strong correlation between rates and : financials, IT, consumer discretionary and industrials. 31  
 The rates/equity beta and correlation may not be robust across time or interest rate levels, cf. "reflation" versus "inflation" / "stagflation"



# Endowment Policy Benchmark

Asset Class	Policy Benchmark Component	Target
<b>Total Public Equity</b>	*MSCI All Country World Index Net IMI Tobacco Free	<b>42.5%</b>
<b>Liquidity (Income)</b>	*Barclays US Aggregate Bond Index	<b>12.5%</b>
<b>Total Other Investments</b>		<b>45.0%</b>
Absolute Return	HFRX Absolute Return Index (Prior to February 2016 blended weighted composite)	23.0%
Private Equity	*Russell 3000 + 1.5%	11.5%
Real Assets (Real Estate)	*GEP Total Real Assets Benchmark	10.5%
Real Assets (Non-Real Estate)		

\*As of July 1, 2017