



# UNIVERSITY OF CALIFORNIA

Office of the Chief Investment Officer

## Endowment

Investment Review as of June 30, 2016

**Growing Portfolios** Building Partnerships

**UC Investments**



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Office of the Chief Investment Officer

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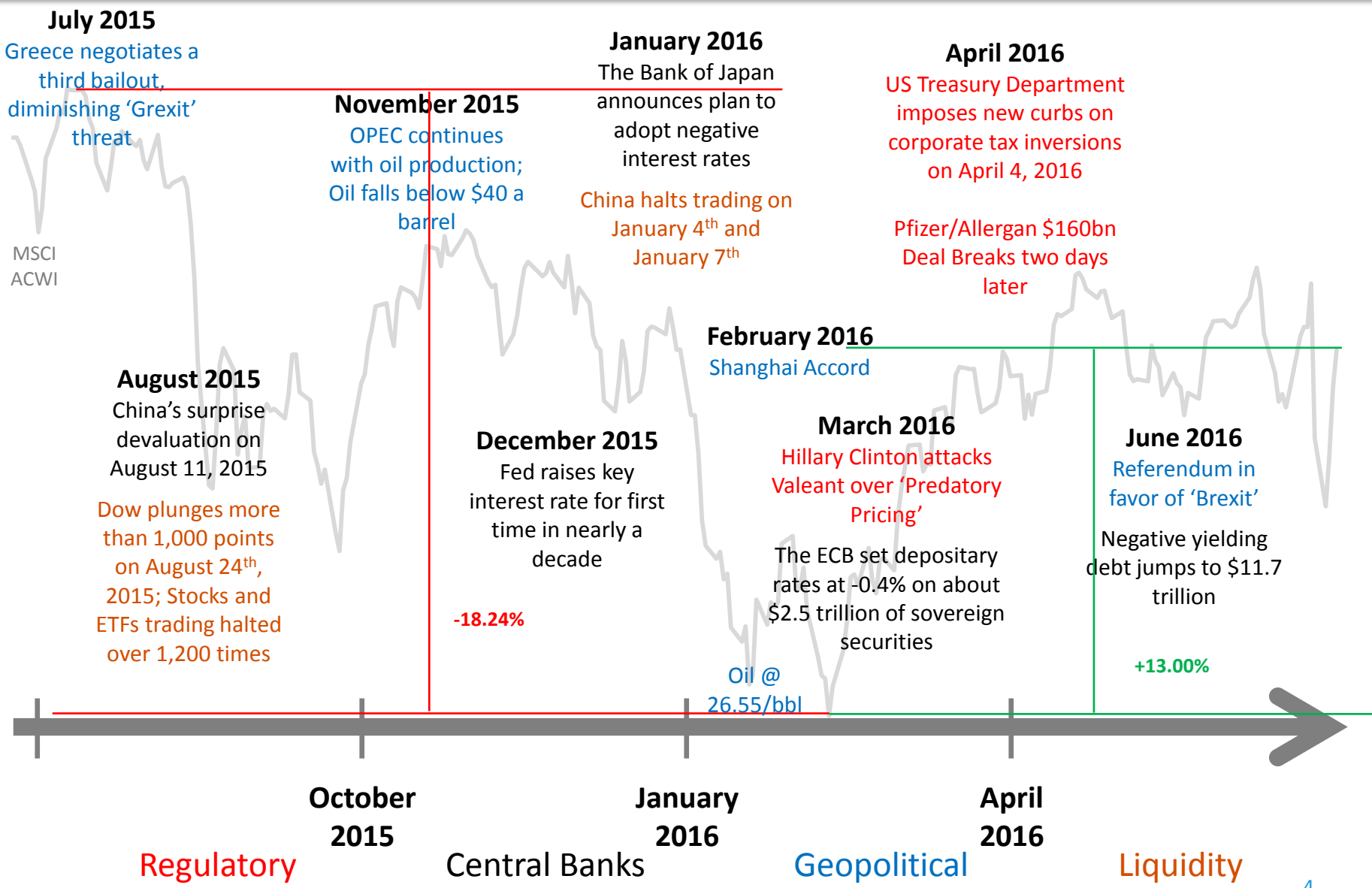
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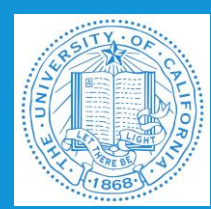


# Market Environment



# Summary of the Year – Four Sources of Risk





# Market Drivers and Themes

*Elevated geopolitical, regulatory and market factors culminated in a macro-driven environment characterized by volatility swings, exogenous shocks, and valuation dislocations*

## Geopolitical

(The Rise of Nationalism)

## Central Banks

(QE, Helicopter Money)

## Regulatory

(Volcker Rule, Drug pricing, Tax Inversion Regulations)

## Liquidity

(Declining Bank Inventories)

## Macro vs. fundamental focus

Capital chasing risk assets and yield/quality in slower growth, low rate environment; valuation distortion

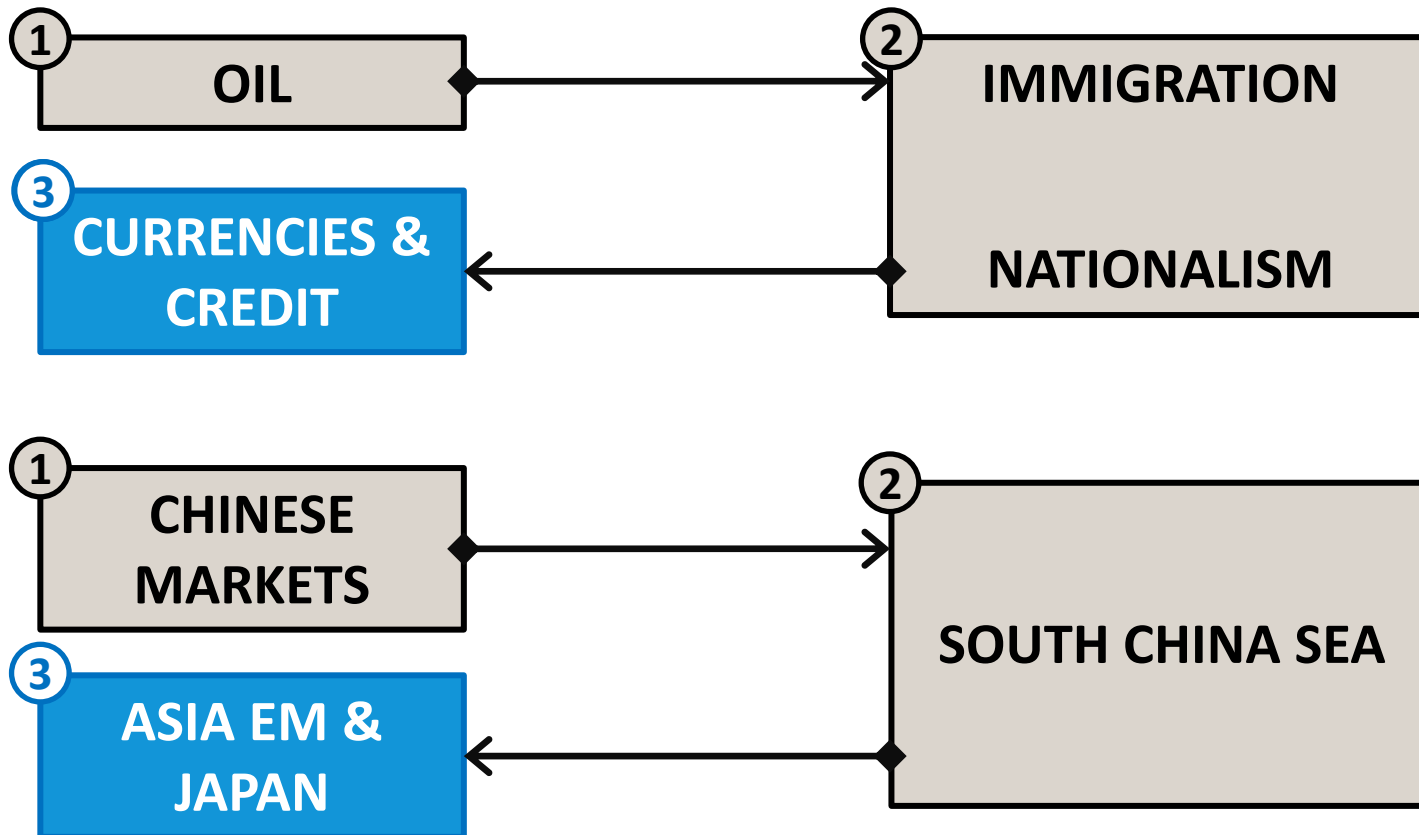
Bank deleveraging forcing asset sales, exit from “riskier” markets  
Regulatory uncertainty pressuring valuation of financial, healthcare sectors; M&A deal breaks

Dislocations in structured credit and equity markets – forced selling  
Index/ETF flows impacting pricing



# The Dynamics of Risk

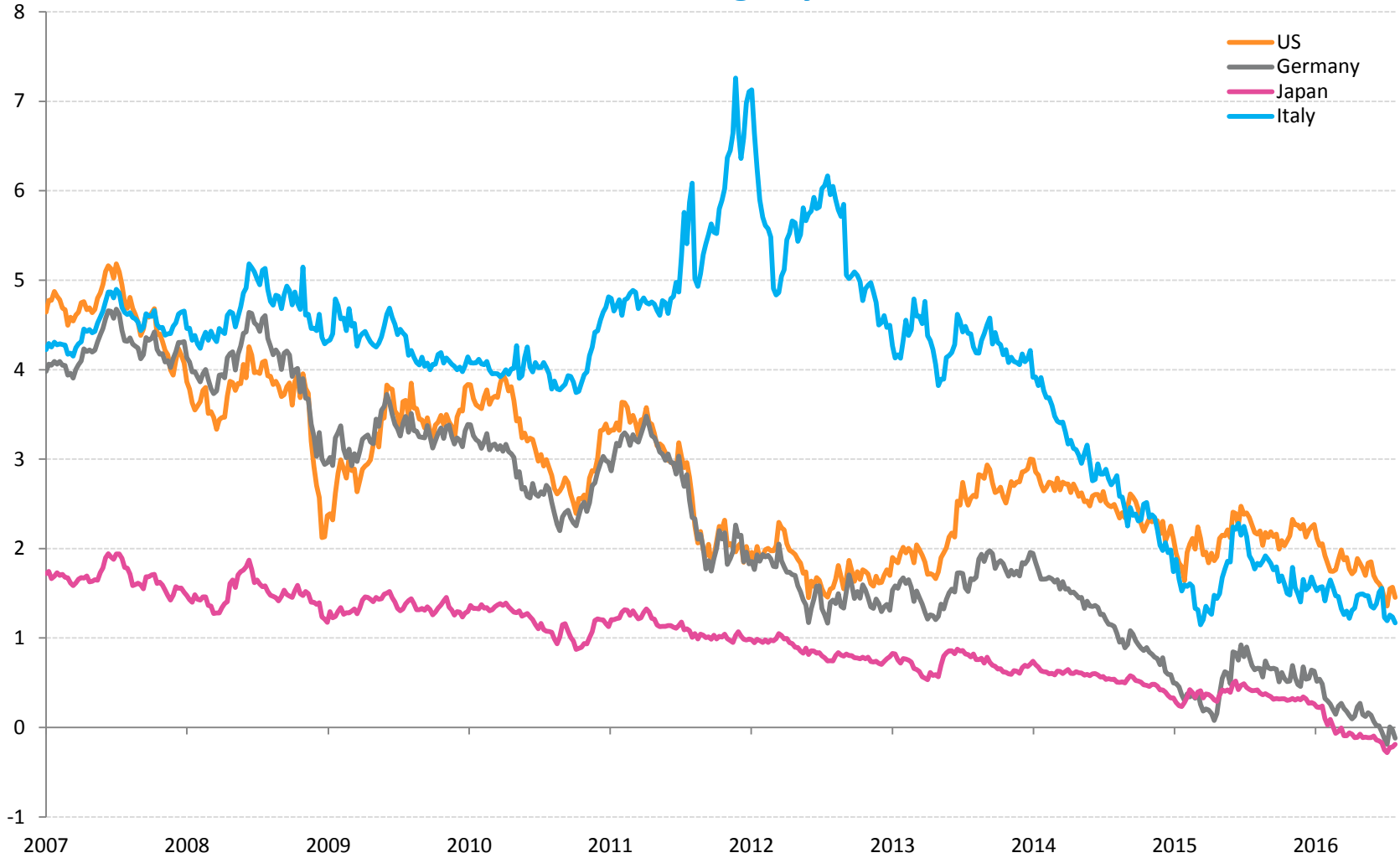
## MARKET RISKS ↔ GEOPOLITICAL RISKS





# Global Bond Yields

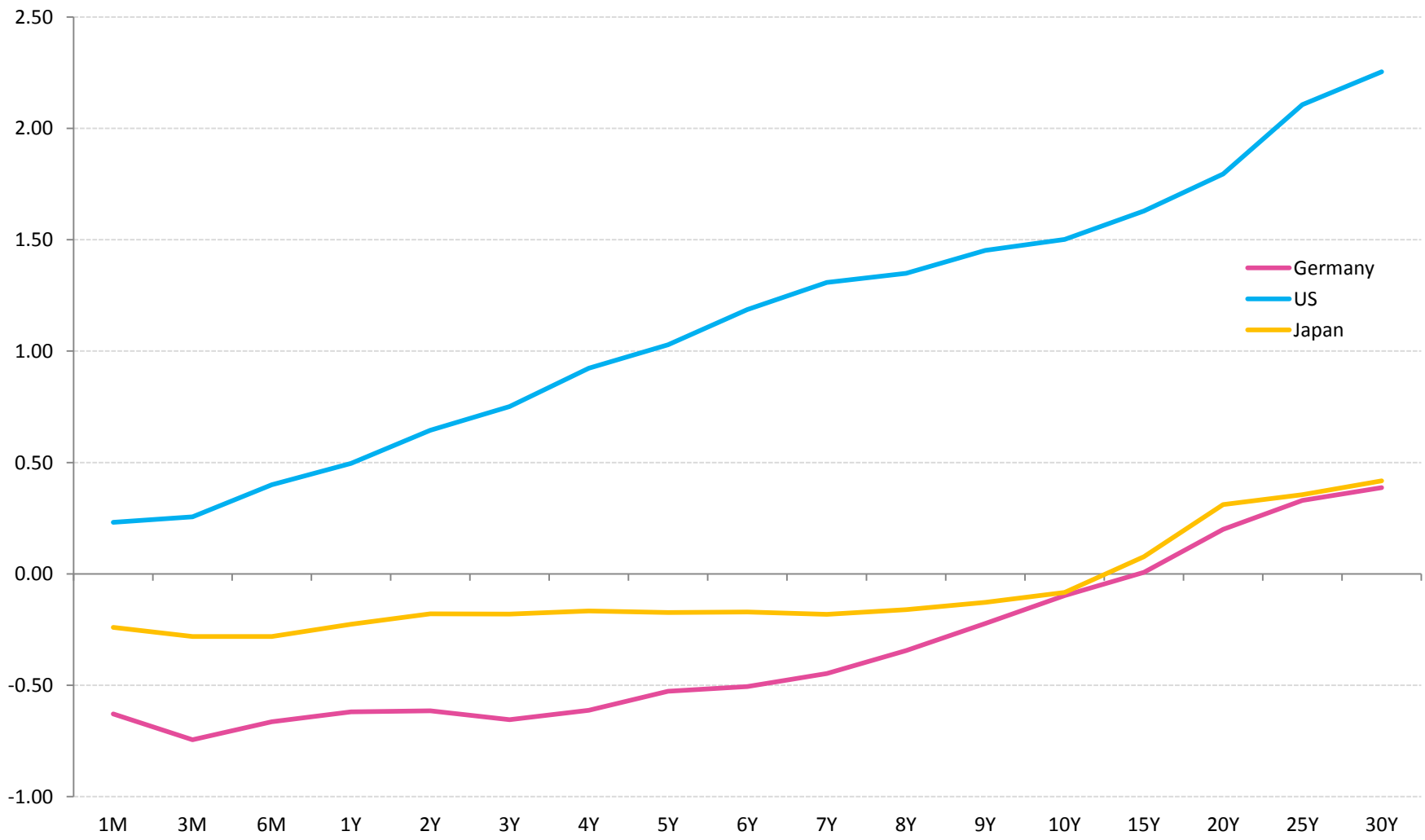
Bond Yields have declined around the world  
US now a "high" yielder





# Negative Global Rates

## Yield Curves Dip Below Zero

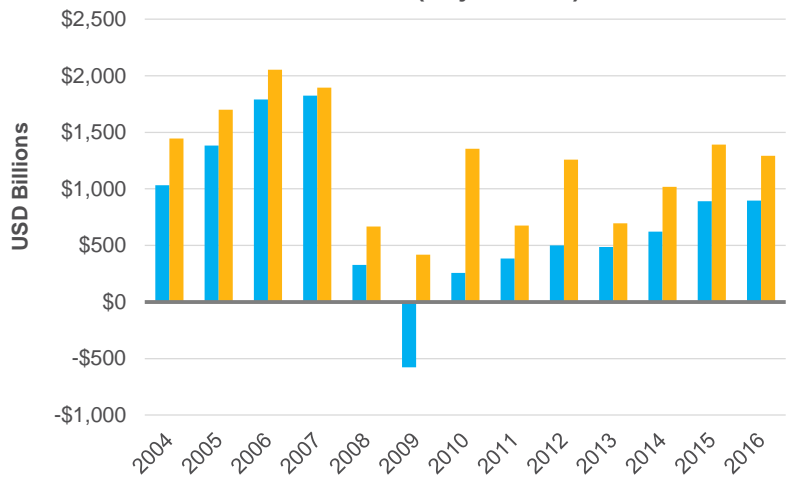






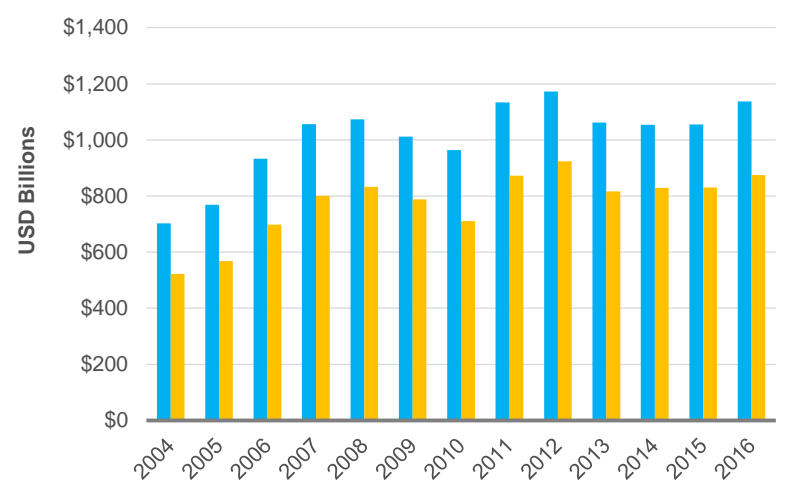
# Lack of Investable Assets

**Net Issuance (Adj. for Fed)**



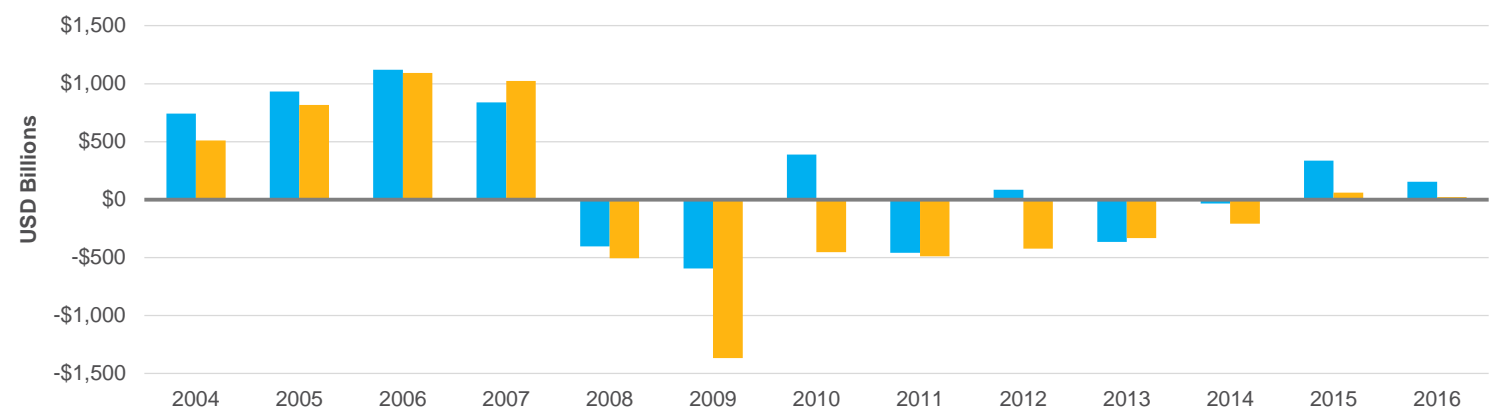
- Fed adjusted - Total spread product net issuance
- Fed adjusted - Total fixed income net issuance (incl tsys and agencies)

**Coupons Reinvested**



- All Fixed Income
- Spread Product

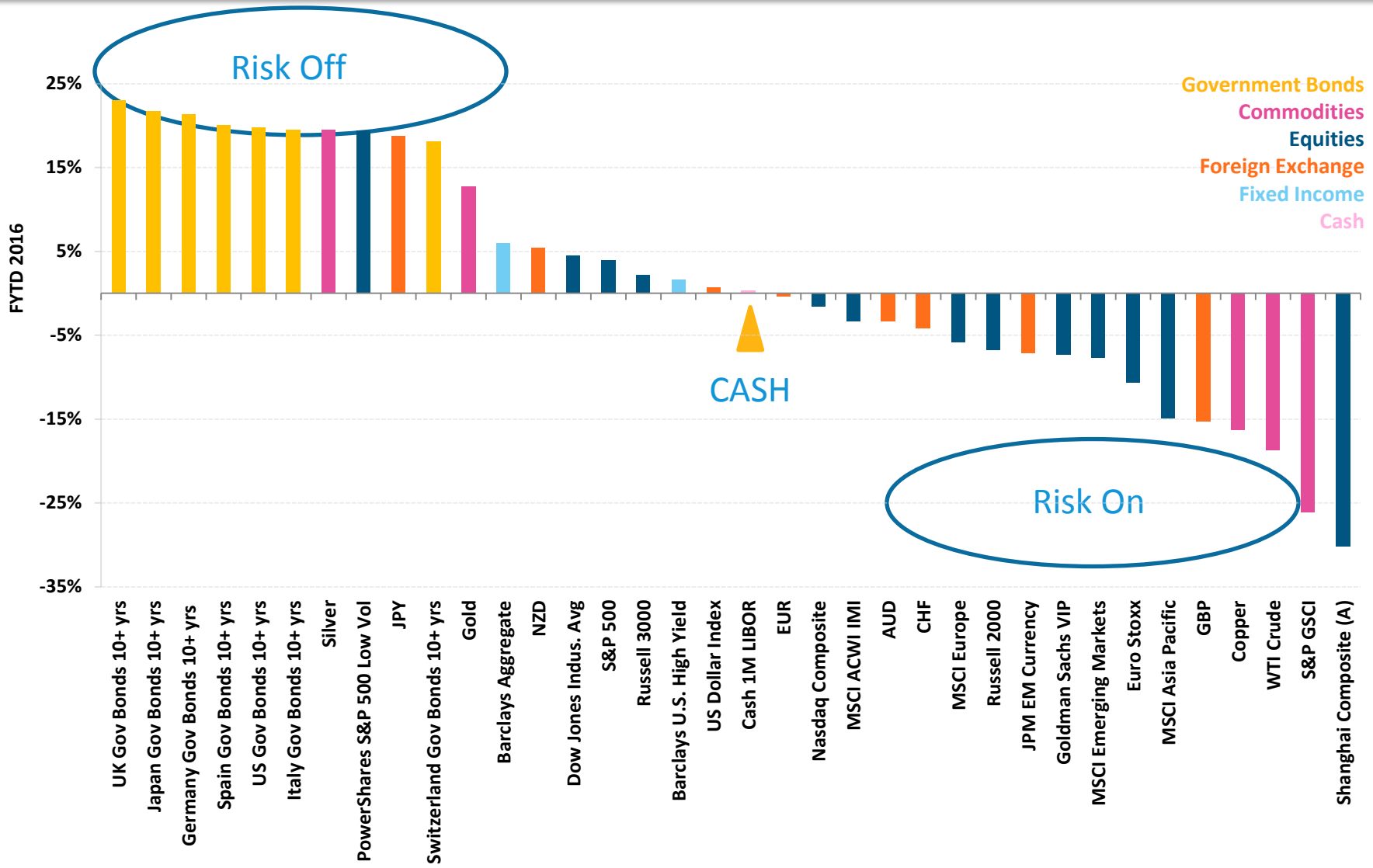
**Net Issuance Net of Coupon**



- All Fixed Income
- Spread Product



# Capital Markets Performance



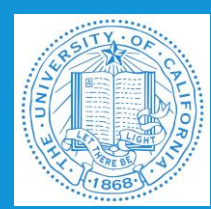


# Office of the Chief Investment Officer



# Our Products: \$9.1 Billion Endowment represents 9% of our \$98 Billion of assets

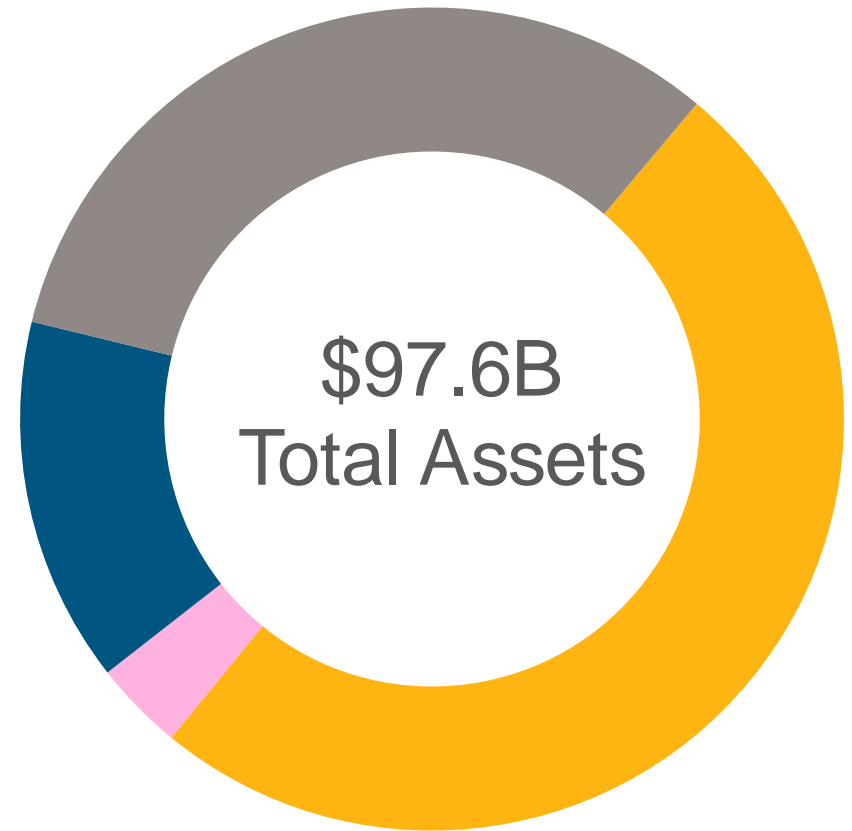
	Market Value in Billions (\$)		
	June 30, 2016	1 Year Ago June 30, 2015	5 Years Ago June 30, 2011
<b>Endowment</b>	\$9.1	\$8.9	\$6.7
<b>Pension</b>	\$54.1	\$55.0	\$41.5
<b>Retirement Savings</b>	\$20.2	\$20.1	\$13.9
<b>Working Capital</b>			
Total Return	\$8.9	\$7.4	\$3.1
<b>Short Term</b>	\$5.3	\$6.8	\$7.9
<b>Total</b>	<b>\$97.6B</b>	<b>\$98.2B</b>	<b>\$73.1B</b>



# How we invest our assets

As of June 30, 2016

●	Public Equity: \$48.5B	50%
●	Fixed Income: \$31.4B	32%
●	Other Investments: \$14.1B	14%
	Absolute Return: \$5.3B	5%
	Private Equity: \$4.0B	4%
	Real Estate: \$3.6B	4%
	Real Asset: \$1.2B	1%
●	Cash: \$3.6B	4%



**\$97.6 Billion**

**100%**



# How we invest our assets: Fixed Income primarily internally managed and all other investments externally managed

			Active		Passive		External		Internal	
	\$ Billions	% of Entity	\$ Billions	%	\$ Billions	%	\$ Billions	%	\$ Billions	%
<b>Public Equity</b>	\$ 48.5	50%	\$27.2	56%	\$21.3	44%	\$48.5	100%	\$0.0	0%
<b>Fixed Income</b>	\$ 31.4	32%	\$30.7	98%	\$0.7	2%	\$2.1	7%	\$29.3	93%
<b>Other Investments</b>	\$ 14.1	14%	\$14.1	100%	\$0.0	0%	\$14.1	100%	\$0.0	0%
<b>Absolute Return</b>	\$ 5.3	5%	\$5.3	100%	\$0.0	0%	\$5.3	100%	\$0.0	0%
<b>Private Equity</b>	\$ 4.0	4%	\$4.0	100%	\$0.0	0%	\$4.0	100%	\$0.0	0%
<b>Real Estate</b>	\$ 3.6	4%	\$3.6	100%	\$0.0	0%	\$3.6	100%	\$0.0	0%
<b>Real Assets</b>	\$ 1.2	1%	\$1.2	100%	\$0.0	0%	\$1.2	100%	\$0.0	0%
<b>Cash</b>	\$ 3.6	4%	\$3.6	0%	\$0.0	100%	\$0.0	0%	\$3.6	100%
<b>Total</b>	<b>\$97.6</b>	<b>100%</b>	<b>\$75.6</b>	<b>77%</b>	<b>\$22.0</b>	<b>23%</b>	<b>\$64.7</b>	<b>66%</b>	<b>\$32.9</b>	<b>34%</b>



# Investment Highlights



The **mission** of the General Endowment Pool (“GEP”) is to provide a common investment vehicle, which will generate a stable and continuously growing income stream, for (most but not all of) the University’s endowments and quasi-endowments, for which the University is both trustee and beneficiary.

The overall investment goal of the GEP is to preserve the purchasing power of the future stream of endowment payout for those funds and activities supported by the endowments, and to the extent this is achieved, cause the principal to grow in value over time.





# Endowment Change in Assets

## Assets Under Management Attribution

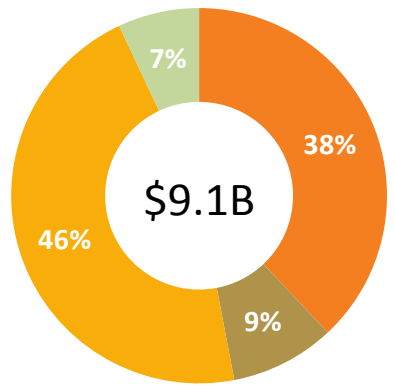
Assets Under Management June 30, 2015	\$8.93 billion
Market Gains	(\$0.16 billion)
Value Added	(\$0.15 billion)
Net Cash Flow	\$0.49 billion
<b>Assets Under Management June 30, 2016</b>	<b>\$9.11 billion</b>



# Endowment Shifts in Asset Allocation

**Current**

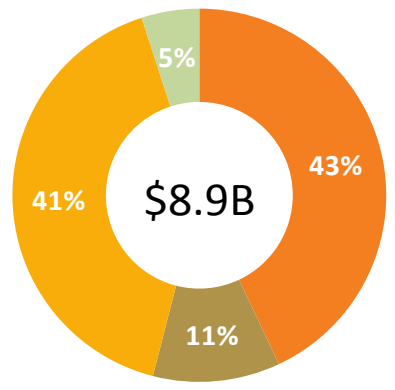
June 30, 2016



● Equity

**1 Year Ago**

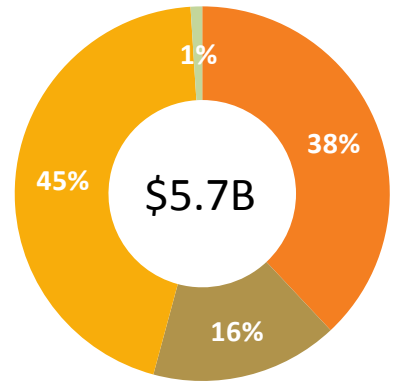
June 30, 2015



● Fixed Income

**5 Years Ago**

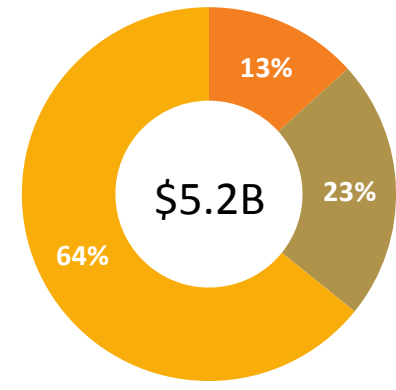
June 30, 2011



● Other Investments

**10 Years Ago**

June 30, 2006



● Cash



# Endowment Asset Allocation

As of June 30, 2016	Market Value in \$ Billions	Percentage	Over/Underweight Relative to Policy	Policy Weight
<b>Public Equity</b>	<b>4.2</b>	<b>46.3%</b>	<b>3.1%</b>	<b>43.2%</b>
<b>Fixed Income</b>	<b>0.8</b>	<b>9.0%</b>	<b>-4.0%</b>	<b>13.0%</b>
Core	0.3	3.0%	-2.2%	5.2%
High Yield	0.3	3.2%	0.6%	2.6%
Emerging Market Debt	0.0	0.5%	-2.1%	2.6%
TIPS	0.2	2.3%	-0.3%	2.6%
<b>Other Investments</b>	<b>3.5</b>	<b>37.8%</b>	<b>-6.0%</b>	<b>43.8%</b>
Absolute Return	1.7	18.2%	-6.3%	24.5%
Private Equity	1.1	11.7%	2.3%	9.4%
Real Estate	0.5	5.9%	-1.1%	7.0%
Real Asset	0.2	2.0%	-0.9%	2.9%
<b>Cash</b>	<b>0.6</b>	<b>6.9%</b>	<b>6.9%</b>	<b>0.0%</b>
<b>Total</b>	<b>9.1</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>



# Endowment Performance

Net Returns (%) As of June 30, 2016	Annualized Returns							
	3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year
UC Endowment	0.8	(0.9)	(3.4)	7.1	6.5	9.0	5.9	7.7
UC Endowment Benchmark	1.5	1.6	(1.7)	5.8	4.9	7.4	5.2	7.3
<i>Value Added</i>	<i>(0.7)</i>	<i>(2.5)</i>	<i>(1.7)</i>	<i>1.3</i>	<i>1.6</i>	<i>1.6</i>	<i>0.7</i>	<i>0.4</i>

The Policy Benchmark is a weighted average of investment policy targets

Net Returns (%) As of June 30	Fiscal Year Returns								
	2016	2015	2014	2013	2012	2011	2010	2009	2008
UC Endowment	(3.4)	7.2	18.7	11.6	(0.4)	20.5	10.9	(17.8)	(1.9)
UC Endowment Benchmark	(1.7)	3.5	16.6	10.1	(2.5)	18.0	9.6	(14.0)	(0.2)
<i>Value Added</i>	<i>(1.7)</i>	<i>3.7</i>	<i>2.1</i>	<i>1.5</i>	<i>2.1</i>	<i>2.5</i>	<i>1.3</i>	<i>(3.8)</i>	<i>(1.7)</i>



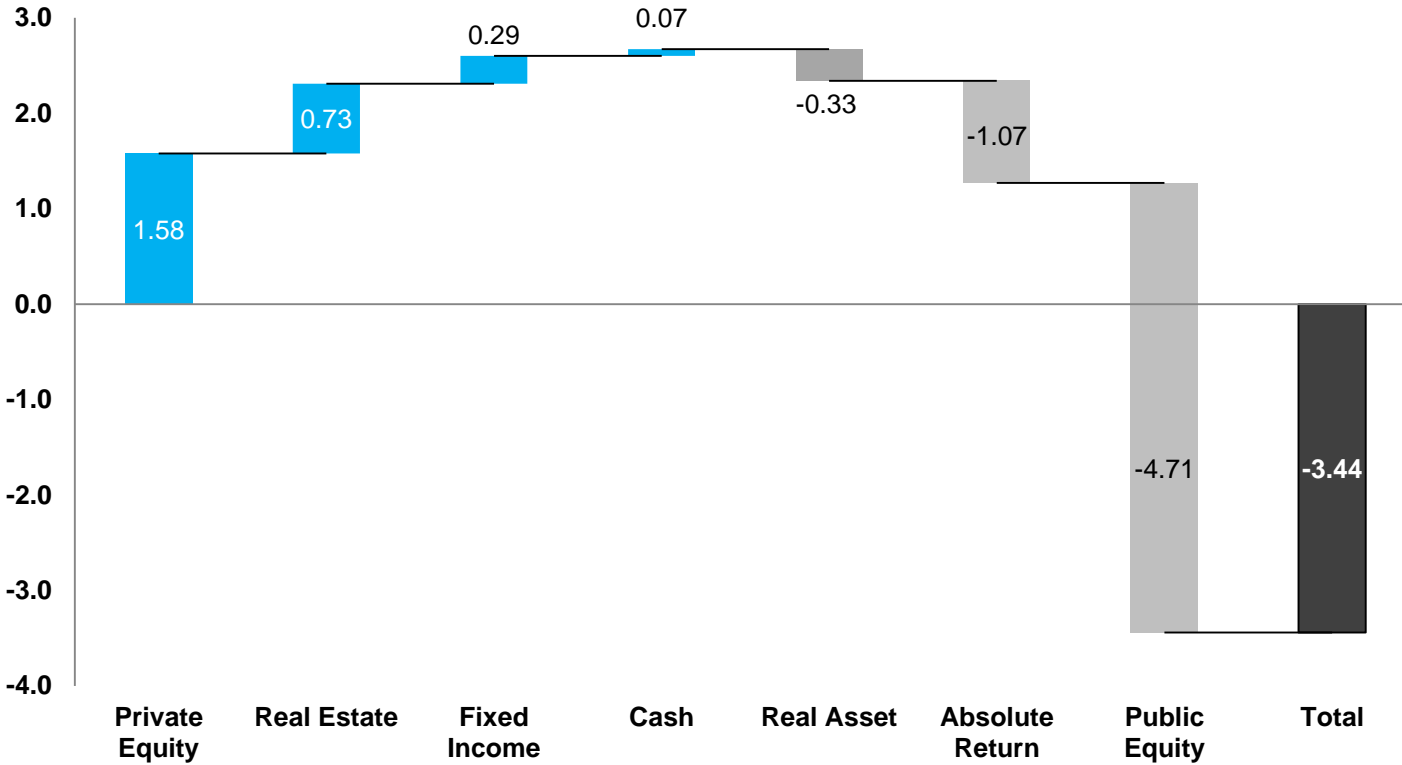
# Endowment Policy Benchmark

Asset Class	Benchmark Component	June 30, 2016 Target	July 1, 2016 Target
<b>Total Public Equity</b>		<b>43.2%</b>	<b>42.5%</b>
U.S. Equity	Russell 3000 Tobacco Free Index	16.1%	21.0%
Developed Equity	MSCI World ex-U.S. (net dividends) Tobacco Free	10.4%	14.0%
Emerging Market Equity	MSCI Emerging Market (net dividends)	6.3%	7.5%
Global Equity	MSCI All Country World Index (net dividends)	10.4%	0.0%
<b>Total Fixed Income</b>		<b>13.0%</b>	<b>12.5%</b>
U.S. Core Fixed Income	Barclays U.S. Aggregate Bond Index	5.2%	5.0%
High Yield Debt	Merrill Lynch High Yield Cash Pay Index	2.6%	2.5%
Emerging Market Debt	JP Morgan Emerging Markets Bond Index Global Diversified	2.6%	2.5%
TIPS	Barclays U.S. TIPS	2.6%	2.5%
<b>Total Other Investments</b>		<b>43.8%</b>	<b>45.0%</b>
Absolute Return	HFRX Absolute Return Index (Prior to February 2016 blended weighted composite)	24.5%	23.0%
Private Equity	Actual Private Equity Returns	9.4%	11.5%
Real Estate	NCREIF Funds Index-Open End Diversified Core Equity Index	7.0%	7.5%
Real Assets	Actual Real Assets Portfolio Returns	2.9%	3.0%



# Contribution to Endowment Return

12 Months Contribution to Return - Percentage (%)



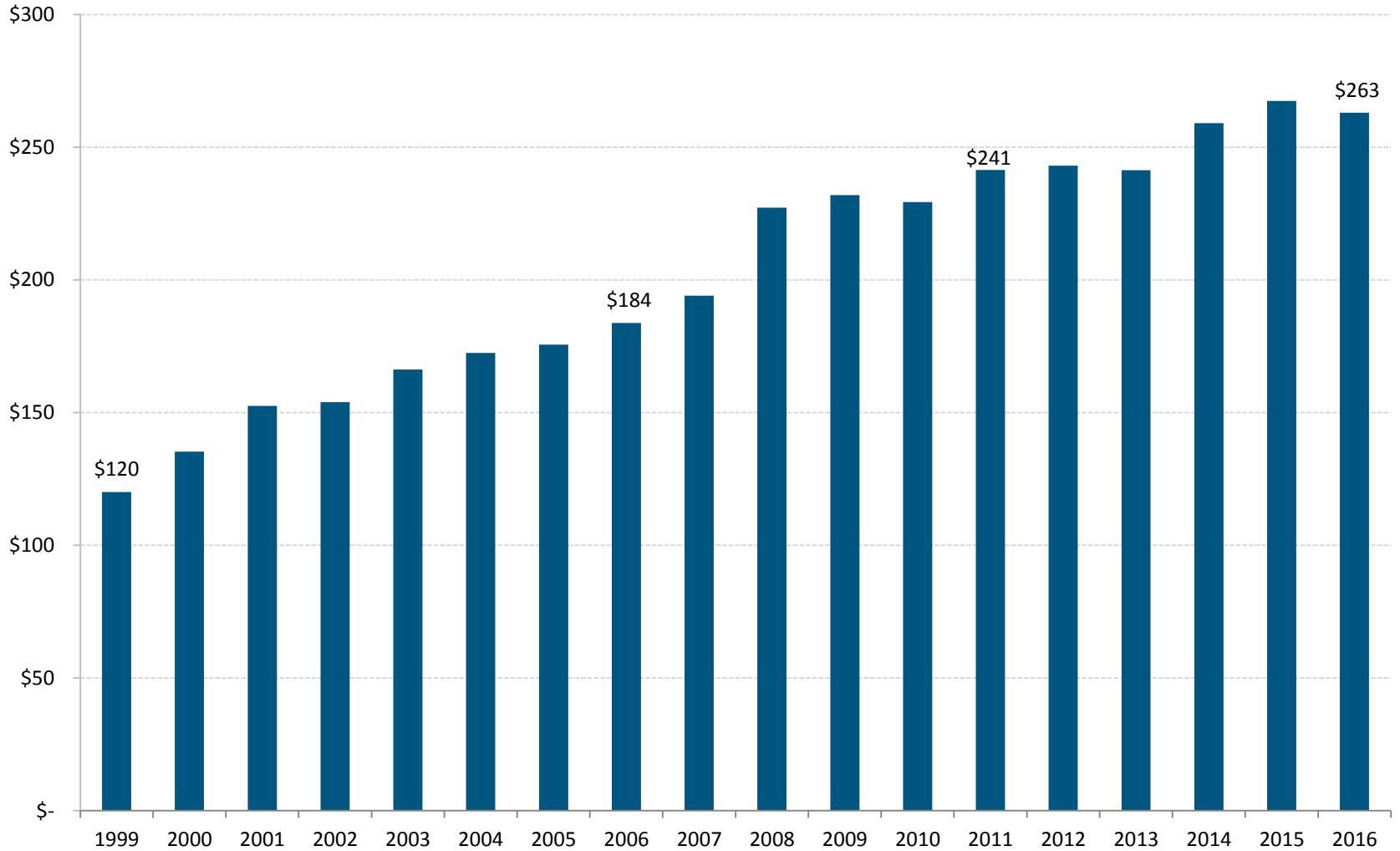


# Endowment Attribution – Fiscal Year 2015-16

As of June 30, 2016	Average Weight	Active Weight	Allocation Attribution	Selection Attribution	Total Attribution
<b>Public Equity</b>	45.9	+2.7	-0.4	-0.9	-1.3
<b>Fixed Income</b>					
Core	3.0	-2.2	+0.0	+0.0	+0.0
High Yield	3.0	+0.4	+0.0	-0.1	-0.1
Emerging Market Debt	0.3	-2.3	+0.0	-0.1	-0.1
TIPS	2.3	-0.3	+0.0	+0.0	+0.0
<b>Other Investments</b>					
Absolute Return	18.3	-6.2	-0.1	+0.0	-0.1
Private Equity	11.6	+2.2	-0.1	+0.0	-0.1
Real Estate	5.8	-1.2	-0.1	+0.3	+0.2
Real Asset	2.0	-0.9	+0.0	+0.0	+0.0
Cash	7.8	7.8	-0.2	+0.0	-0.2
<b>Total GEP</b>	<b>100.0%</b>	<b>+0.0%</b>	<b>-0.9%</b>	<b>-0.8%</b>	<b>-1.7%</b>



# Endowment Gross Payout



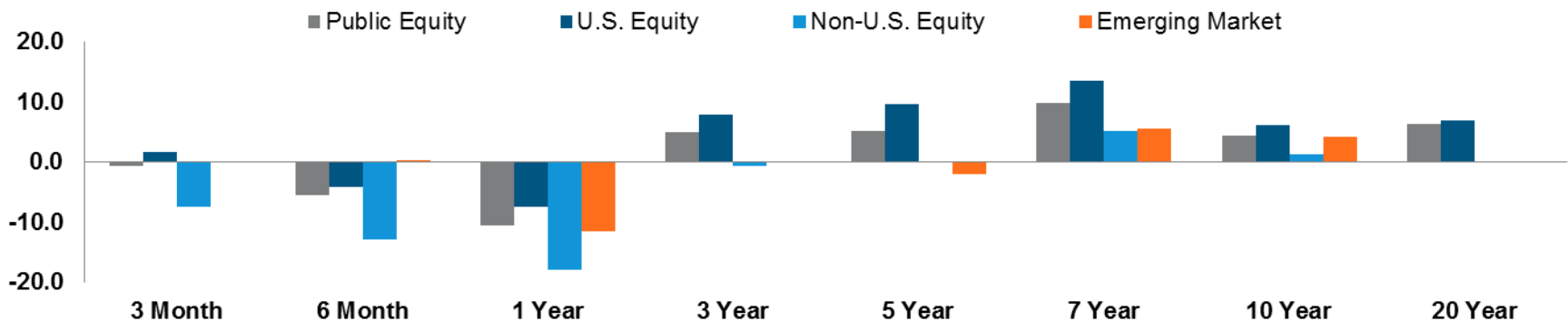




# Endowment Public Equity Performance

Net Returns (%) As of June 30, 2016	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>	4,217	46.3%	(0.7)	(5.5)	(10.6)	5.0	5.1	9.7	4.3	6.4
Policy Benchmark			1.1	1.7	(4.5)	5.7	5.2	9.6	4.3	6.9
Value Added			(1.8)	(7.2)	(6.1)	(0.7)	(0.1)	0.1	0.0	(0.5)
<b>U.S. Equity</b>	2,200	21.6%	1.6	(4.2)	(7.5)	8.0	9.7	13.6	6.2	6.9
Russell 3000 Tobacco Free Index			2.6	3.4	1.7	11.0	11.5	14.8	7.3	8.1
Value Added			(1.0)	(7.6)	(9.2)	(3.0)	(1.8)	(1.2)	(1.1)	(1.2)
<b>Non-U.S. Equity</b>	1,522	15.5%	(7.5)	(12.9)	(18.0)	(0.7)	0.0	5.1	1.4	-
MSCI World ex-U.S. (net dividends) Tobacco Free			(1.1)	(3.2)	(10.3)	1.7	1.1	5.6	1.5	-
Value Added			(6.4)	(9.7)	(7.7)	(2.4)	(1.1)	(0.5)	(0.1)	-
<b>Emerging Market</b>	495	9.2%	0.1	0.4	(11.5)	0.2	(1.9)	5.5	4.1	-
MSCI Emerging Market (net dividends)			0.7	6.4	(12.1)	(1.6)	(3.8)	3.8	3.5	-
Value Added			(0.6)	(6.0)	0.6	1.8	1.9	1.7	0.6	-

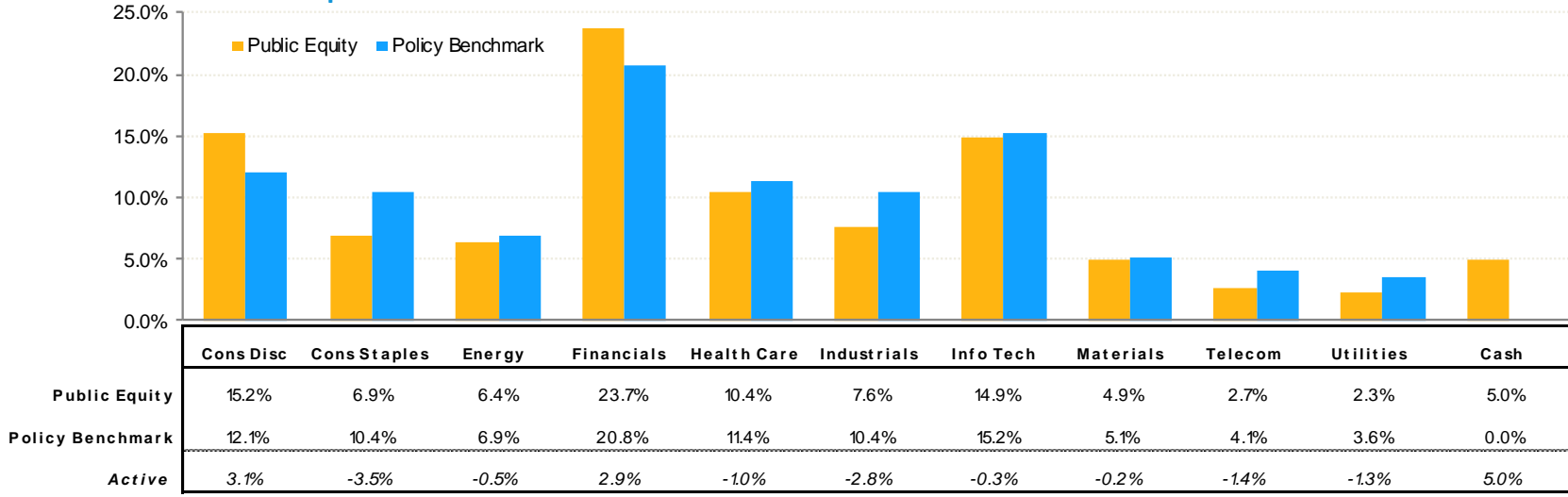
- The Policy Benchmark is a weighted average of investment policy targets



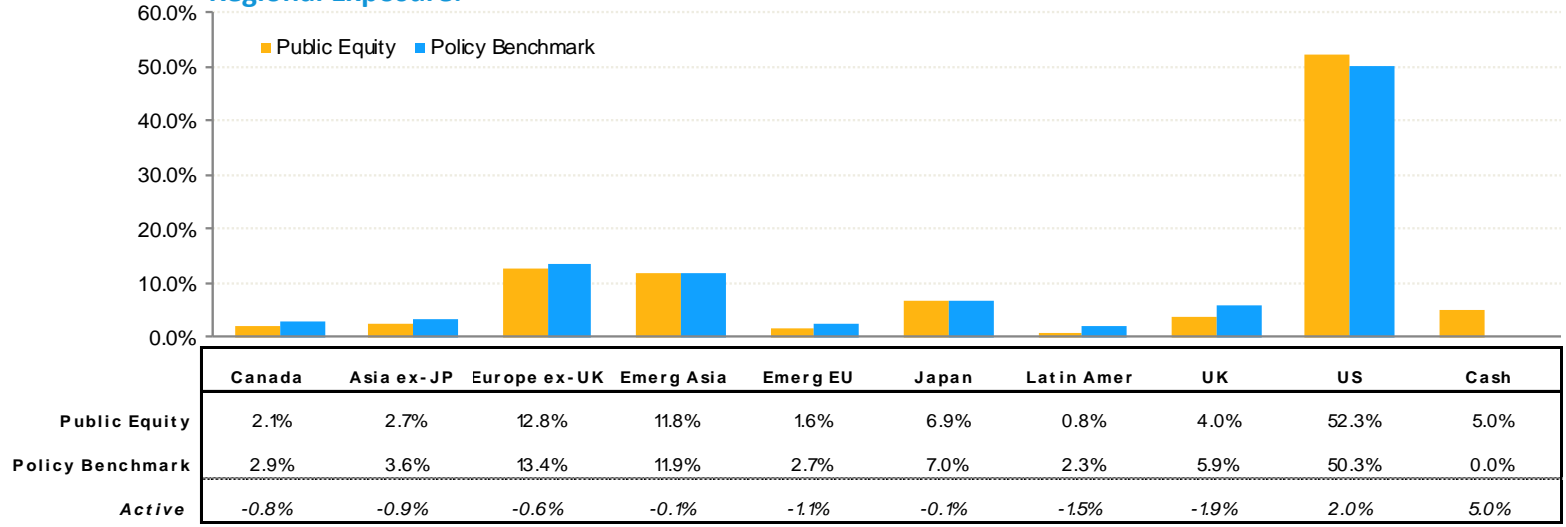


# Endowment Public Equity Sector and Regional Allocation

## Sector Exposure:



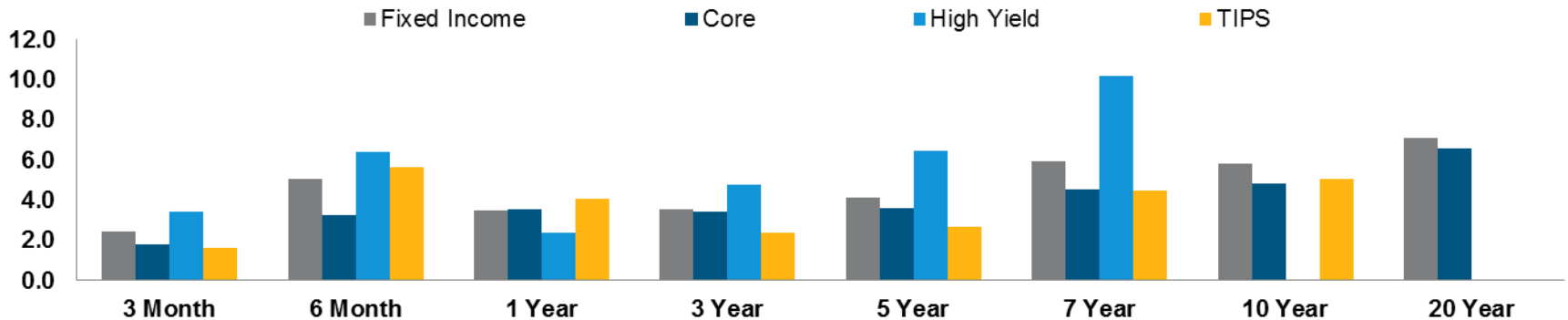
## Regional Exposure:





# Endowment Fixed Income Performance

Net Returns (%) As of June 30, 2016	Market Value (\$ Million)	Annualized Returns								
		3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year	
<b>Fixed Income</b>	816	9.0%	2.4	5.0	3.5	3.5	4.1	5.9	5.8	7.1
Policy Benchmark			3.4	7.3	5.6	4.5	4.4	6.2	6.1	6.7
Value Added			(1.0)	(2.3)	(2.1)	(1.0)	(0.3)	(0.3)	(0.3)	0.4
<b>Core</b>	276	3.0%	1.8	3.3	3.5	3.4	3.6	4.5	4.8	6.6
Barclays U.S. Aggregate Bond Index			2.2	5.3	6.0	4.1	3.8	4.6	5.1	6.3
Value Added			(0.4)	(2.0)	(2.5)	(0.7)	(0.2)	(0.1)	(0.3)	0.3
<b>High Yield</b>	286	3.2%	3.4	6.4	2.4	4.8	6.5	10.2	-	-
Merrill Lynch High Yield Cash Pay Index			5.8	9.2	1.7	4.2	5.7	9.9	-	-
Value Added			(2.4)	(2.8)	0.7	0.6	0.8	0.3	-	-
<b>Emerging Market Debt</b>	46	0.5%	2.2	-	-	-	-	-	-	-
JP Morgan Emerging Markets Bond Index Global Diversified			5.0	-	-	-	-	-	-	-
Value Added			(2.8)	-	-	-	-	-	-	-
<b>TIPS</b>	208	2.3%	1.6	5.6	4.1	2.3	2.7	4.5	5.0	-
Barclays U.S. TIPS			1.7	6.2	4.4	2.3	2.6	4.3	4.7	-
Value Added			(0.1)	(0.6)	(0.3)	0.0	0.1	0.2	0.3	-

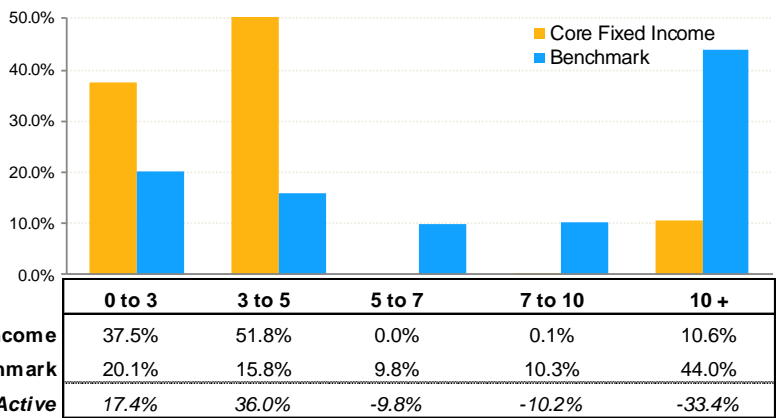




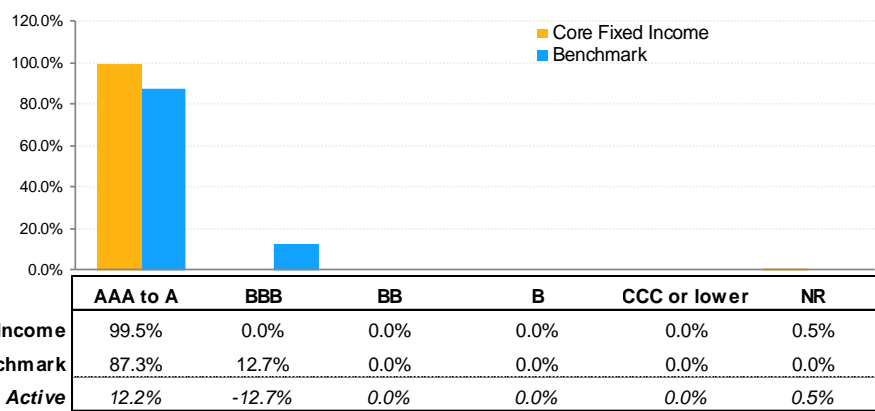
# Endowment Fixed Income Exposures

## Core Fixed Income – \$276M

Summary of Duration Buckets:

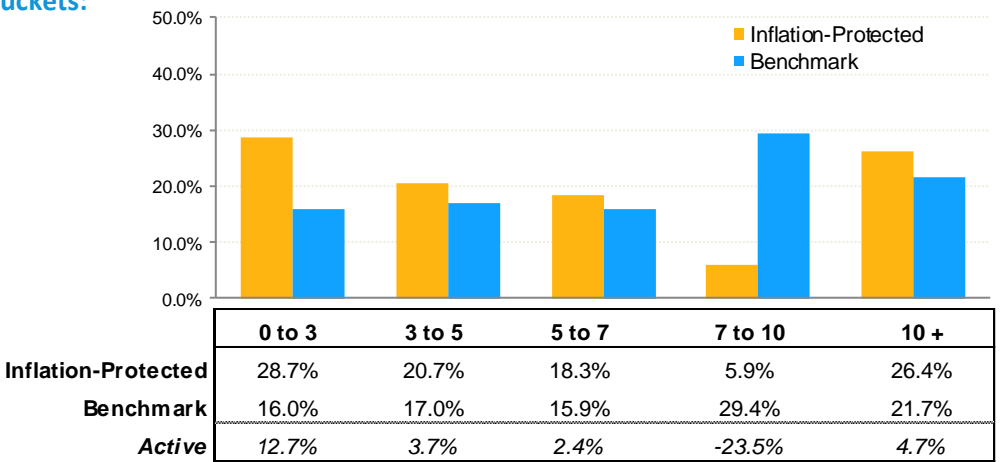


Summary of Credit Rating



## Treasury Inflation-Protected Securities – \$208M

Summary of Duration Buckets:





# Endowment Fixed Income Exposures

## Emerging Market Debt – \$46M

### Top 10 Country Active Weight vs the Benchmark

Mexico	1.2%
Indonesia	1.0%
Turkey	0.9%
Philippines	0.9%
Argentina	0.8%
Russia	0.8%
Colombia	0.7%
Brazil	0.6%
Hungary	0.6%
Poland	0.6%

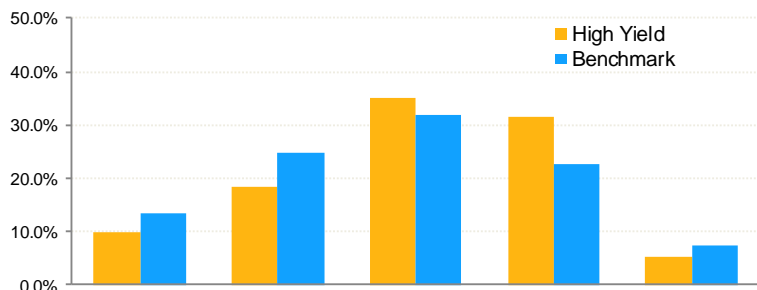
### Bottom 10 Country Weight vs the Benchmark

Mongolia	-0.4%
Trinidad And Tobago	-0.4%
Nigeria	-0.4%
Guatemala	-0.5%
Jamaica	-0.7%
Costa Rica	-0.8%
India	-0.9%
Panama	-0.9%
El Salvador	-1.0%
Chile	-1.1%

The Benchmark for Emerging Market Debt is the JP Morgan EMBI Global Diversified

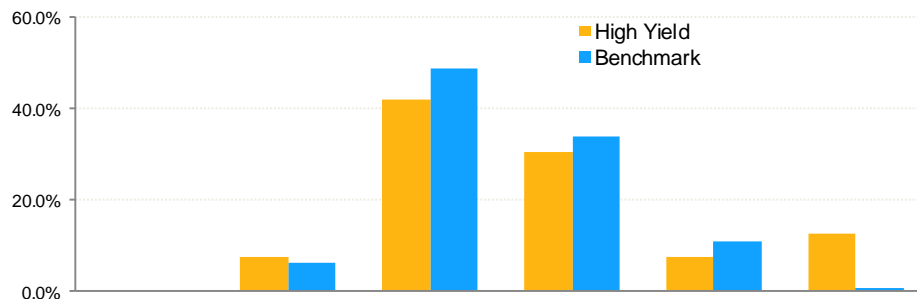
## High Yield – \$286M

### Summary of Duration Buckets:



	0 to 3	3 to 5	5 to 7	7 to 10	10 +
High Yield	9.8%	18.5%	35.0%	31.4%	5.3%
Benchmark	13.5%	24.8%	31.8%	22.6%	7.3%
Active	-3.7%	-6.3%	3.2%	8.8%	-2.0%

### Summary of Credit Rating

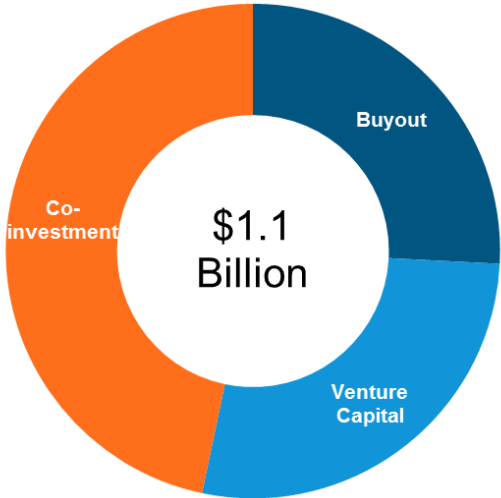


	AAA to A	BBB	BB	B	CCC or lower	NR
High Yield	0.0%	7.5%	42.1%	30.3%	7.6%	12.5%
Benchmark	0.0%	6.0%	48.8%	33.8%	10.8%	0.6%
Active	0.0%	1.5%	-6.7%	-3.5%	-3.2%	11.9%



# Endowment Other Investments: Private Equity

Net Returns (%) As of June 30, 2016	Market Value (\$ Million)	Annualized Returns								
		3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	20 Year	
Private Equity	1,065	11.7%	4.8	9.9	14.4	22.9	17.1	17.4	12.3	18.4
Actual Private Equity Returns			4.8	9.9	14.4	22.9	17.1	17.4	12.3	18.4
Buyout	275		13.4	19.6	30.6	19.6	14.4	16.1	11.3	12.7
Venture Capital	293		-1.0	3.6	10.0	17.4	14.8	14.9	10.6	25.6
Co-investment	497		2.5	7.1	4.3	39.2	34.2	-	-	-



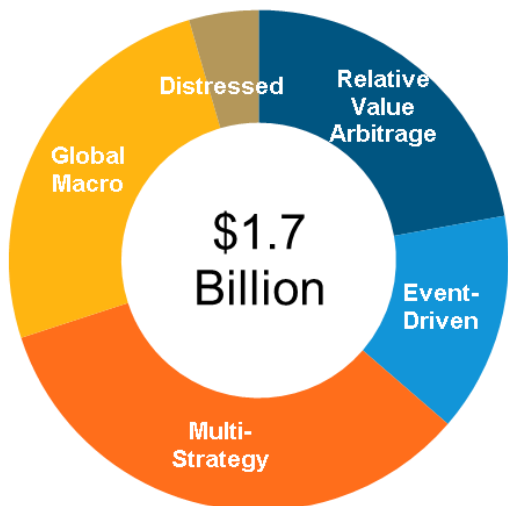
- Buyout: 26%  
\$0.3B
- Venture Capital: 27%  
\$0.3B
- Co-investment: 47%  
\$0.5B



# Endowment Other Investments: Absolute Return

Net Returns (%) As of June 30, 2016	Market Value (\$ Million)	Annualized Returns							
		3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	
Absolute Return	1,656	18.2%	0.5	(1.5)	(4.9)	5.3	4.4	6.2	4.8
Custom Absolute Return Index			0.3	(4.5)	(9.4)	(0.3)	(1.1)	0.4	2.7
Value Added			0.2	3.0	4.5	5.6	5.5	5.8	2.1
Relative Value Arbitrage	367		3.1	2.8	2.0	5.1	5.3	7.2	-
Event-Driven	235		0.6	(6.8)	(14.9)	1.7	3.9	7.2	5.3
Multi-Strategy	557		(0.2)	2.8	(6.0)	7.6	0.4	-	-
Global Macro	422		(1.8)	(3.1)	5.9	4.5	3.0	3.1	-
Distressed	75		0.2	(1.2)	(3.0)	0.3	2.5	6.0	1.8

\* 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



● Relative Value Arbitrage: 22%  
\$0.4B

● Event-Driven: 14%  
\$0.2B

● Multi-Strategy: 34%  
\$0.6B

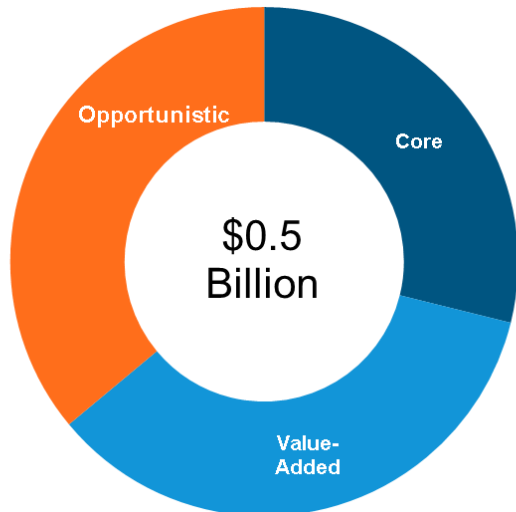
● Global Macro: 26%  
\$0.4B

● Distressed: 4%  
\$0.1B



# Endowment Other Investments: Real Estate

Net Returns (%) As of June 30, 2016	Market Value (\$ Million)	Annualized Returns							
		3 Month	6 Month	1 Year	3 Year	5 Year	7 Year	10 Year	
Real Estate	538	5.9%	5.5	5.3	10.8	14.2	13.1	7.0	3.4
NCREIF Funds Index-Open End Diversified Core Equity Index (lagged 3 months)			2.0	5.1	12.6	12.7	12.3	7.0	3.2
Value Added			3.5	0.2	(1.8)	1.5	0.8	0.0	0.2
Core	155		4.3	8.2	14.6	14.3	14.0	-	-
Value-Added	189		4.2	6.1	13.8	13.1	13.1	-	-
Opportunistic	194		3.1	4.9	3.0	13.5	11.7	-	-



- Core: 29%  
\$0.1B
- Value-Added: 35%  
\$0.2B
- Opportunistic: 36%  
\$0.2B

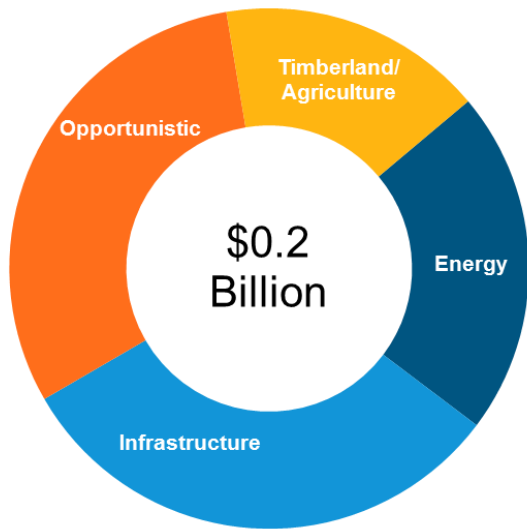




# Endowment Other Investments: Real Assets

Net Returns (%) As of June 30, 2016	Market Value (\$ Million)	Annualized Returns						
		3 Month	6 Month	1 Year	3 Year	5 Year	Since Inception	
Real Asset	183	2.0%	(1.9)	(10.6)	(14.3)	(3.4)	(1.6)	3.5
Actual Portfolio Returns for Others			(1.9)	(10.6)	(14.3)	(3.4)	(1.6)	3.5
Energy	39		(8.6)	(37.4)	(45.6)	(24.3)	(14.2)	(5.5)
Infrastructure	58		0.4	(2.6)	2.0	10.8	9.1	8.6
Opportunistic	56		1.5	1.3	2.6	4.7	0.0	6.4
Timberland/Agriculture	30		(1.5)	6.7	(3.0)	4.6	3.3	5.6

\* Inception Date for Real Assets is April 1, 2010.



- Energy: 21%  
\$0.04B
- Infrastructure: 31%  
\$0.06B
- Opportunistic: 31%  
\$0.05B
- Timberland/Agriculture: 17%  
\$0.03B

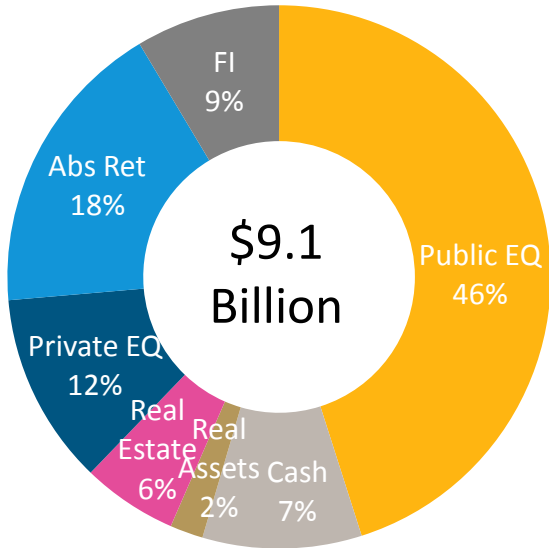


# Risk Management

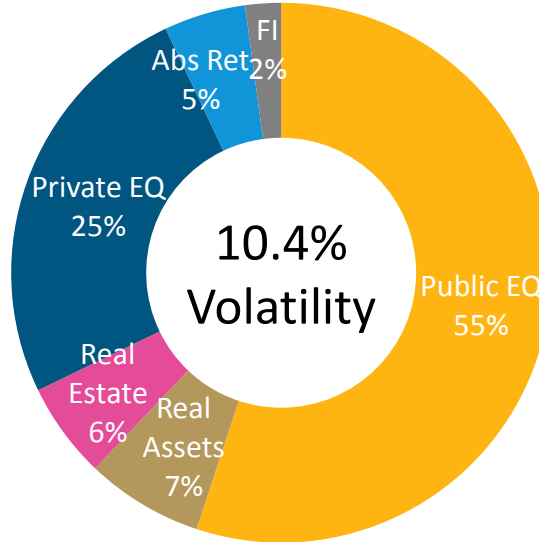


# GEP Risk Exposure and Factors : dominant contribution from equity risk

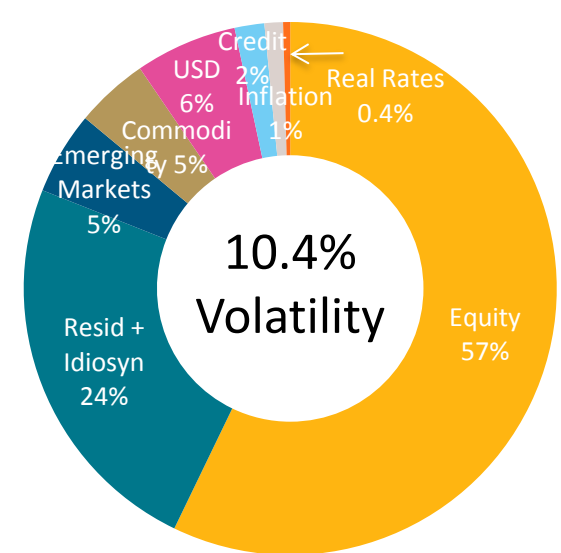
## 1. Asset Allocation



## 2. Asset Allocation adjusted for Standalone Volatility



## 3. Macro Factor Standalone Volatility Breakdown



1. The Asset allocation mix provides the lowest order view of risk of GEP
2. Adjusting the asset allocation for the standalone volatility of each asset class shows the dominance of both Public and Private Equity risk.
3. Alternatively, decomposing the risk of the portfolio into seven fundamental “macroeconomic factors”, with “Equity” interpreted as proxy for general economic growth, provides another view of the factors contributing to the total risk of the portfolio.



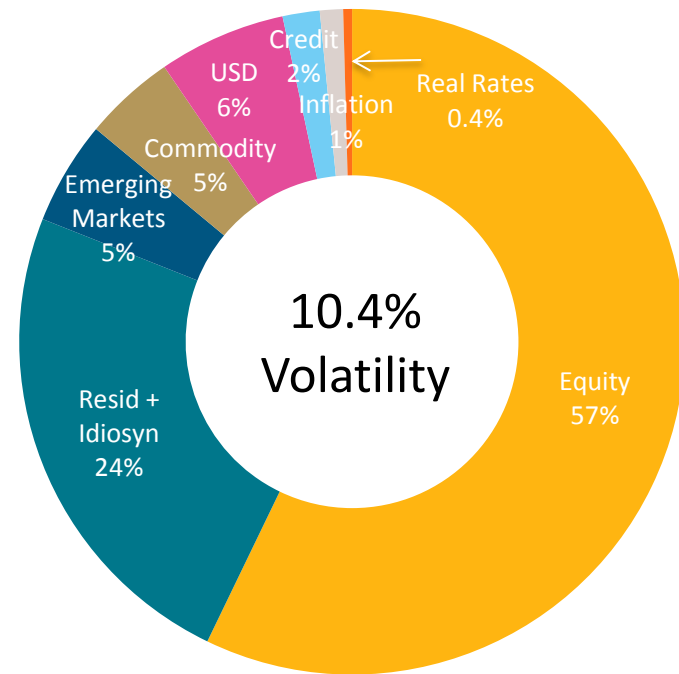
# Endowment Risk Measurement

Name	Beta vs Benchmark	Benchmark Risk (%)	Portfolio Risk (%)		Active Risk (%)	
		Standalone Volatility	Standalone Volatility	Volatility Contributions*	Tracking Error TE	TE Contributions*
<b>GEP Total</b>	<b>0.90</b>	<b>11.5</b>	<b>10.4</b>	<b>10.4</b>	<b>1.6</b>	<b>1.6</b>
Public Equity	0.94	15.3	14.2	6.3	2.0	0.7
Fixed Income	0.54	3.4	2.9	0.1	0.6	0.0
Absolute Return	0.23	7.2	3.2	0.4	6.2	0.9
Private Equity	1.00	25.6	25.6	2.6	0.0	0.0
Private Real Estate	1.13	9.8	11.8	0.3	4.1	-0.1
Real Assets	1.00	41.4	41.4	0.7	0.0	0.0
Cash	0.00	0.0	0.0	0.0	0.0	0.0

\* Additive to Total    \*\* PE and Real Assets do not contribute to total Tracking Error as per Policy



# Describing the Macro Factors

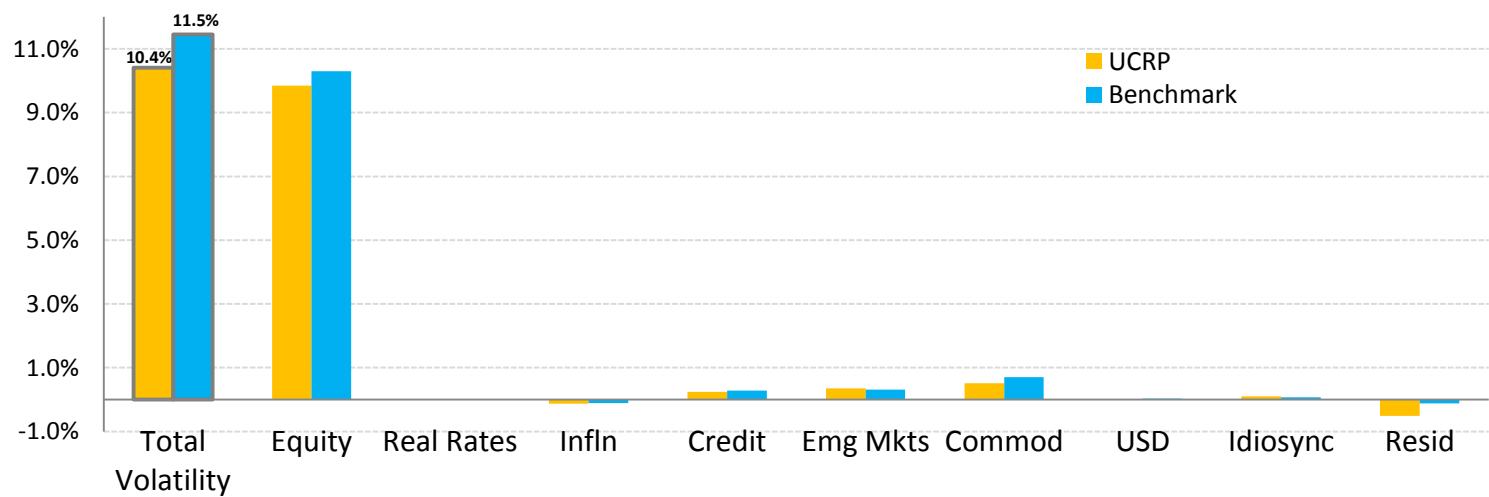


<b>Factor Name</b>	<b>Factor Description</b>
Equity	Broad-market equity index returns
Real Rates	Inflation-linked bond returns
Inflation	Return of long nominal bonds, short inflation-linked bonds portfolio
Credit	Return of long corporate bonds, short nominal bonds portfolio
Commodity	Weighted GSCI Commodity index returns
Emerging Markets	Equally weighted basket of EM Assets



# Endowment Factors and Stress Tests

## Macro Factor Volatility Contributions



\*Each color additive to Total Volatility

## Historical Stress Tests and Scenario Analysis

