



# UNIVERSITY OF CALIFORNIA

Office of the Chief Investment Officer

## Pension

Investment Review as of March 31, 2019

**Growing Portfolios. Building Partnerships.**

**UC Investments**



# UC Pension

1. Asset Allocation
2. Performance
3. Asset Classes
4. Risk

## **Investment Objective**

- Maximize real, long-term total returns (income plus capital appreciation adjusted for inflation), while assuming appropriate levels of risk.
- Maximize the probability of meeting the Plan's liabilities, subject to the Regents' funding policy.



# UC Investments

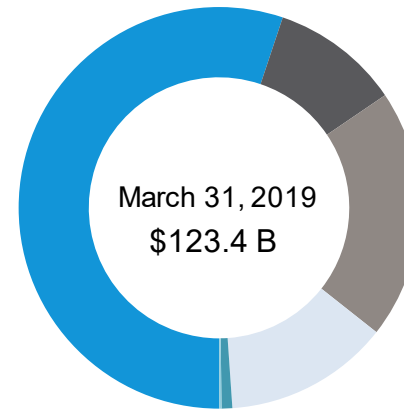
## Mission

Growing Portfolios. Building Partnerships.  
Delivering value through values.

## Investment Products

- ▶ **Pension** assets: \$68.0 billion (as of 3/31/2019).
- ▶ Investing **Endowment** assets since 1933 (86 years).
- ▶ Investing **Pension** assets since 1961 (58 years).
- ▶ Investing **Retirement Savings** assets since 1967 (52 years).
- ▶ Investing **Working Capital** since 1976 (43 years).
- ▶ Investing **Captive Insurance** assets since 2017 (2 years).
- ▶ Investing **Blue & Gold** assets since 2019 (0 years).

## \$123.4 billion across 7 products

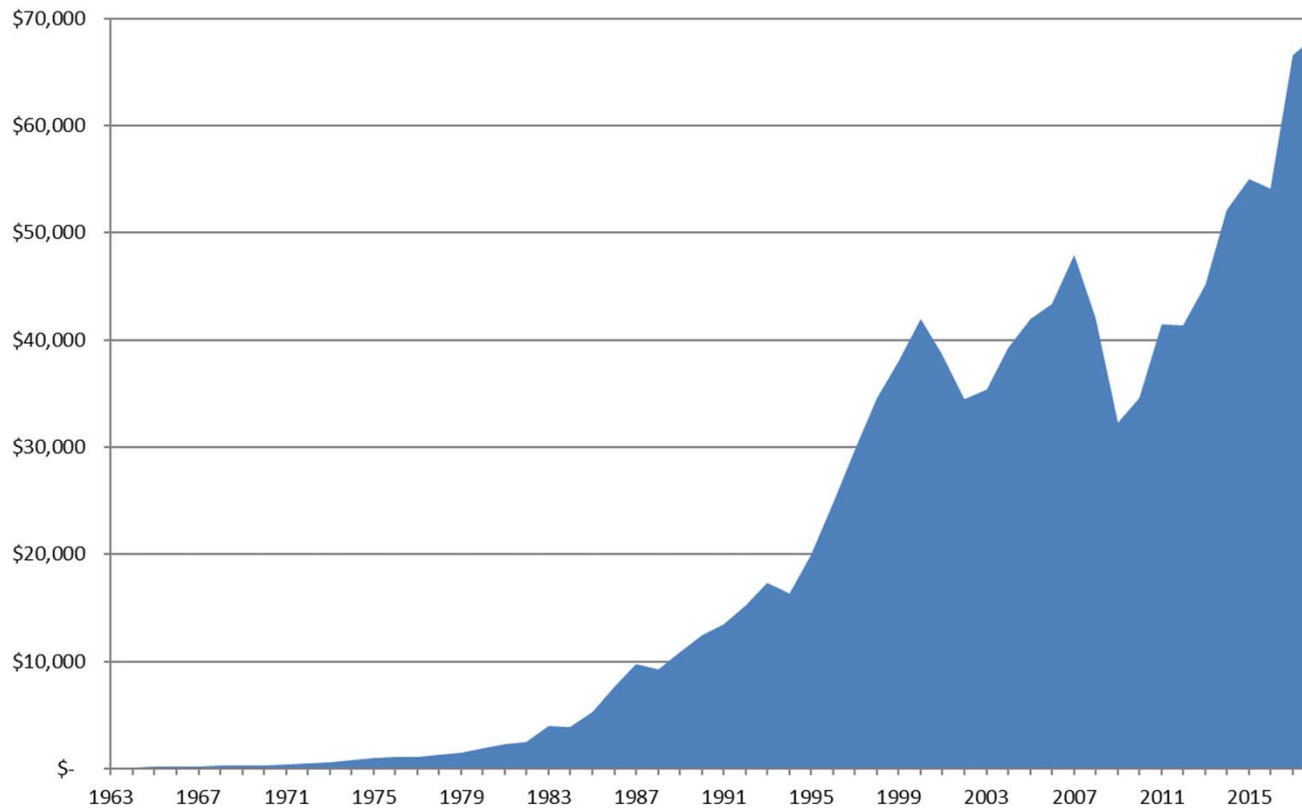


- **Pension: 55%, \$68.0B**
- Endowment: 10%, \$12.8B
- Retirement Savings: 20%, \$24.8B
- Working Capital: 13%, \$16.4B
  - TRIP: \$9.2B
  - STIP: \$7.2B
- Fiat Lux: 1%, \$1.1B
- Blue & Gold: 0%, \$0.3B



# Pension Asset Growth

UCRP Assets 1963 - 2019



5 Year Growth

**March 31, 2019**  
**\$68.0 billion**



**1 Year ago**  
**\$66.7 billion**



**5 Year ago**  
**\$49.9 billion**







# Assets Under Management

December 31, 2018	\$63.3 billion
Market Gains	\$5.5 billion
Value Added	(\$0.7 billion)
Net Cash Flow	(\$0.1 billion)
<b>March 31, 2019</b>	<b>\$68.0 billion</b>



# Pension Asset Allocation

Relative Weight	As of March 31, 2019	Market Value in \$ Billions	Percentage	Over/Underweight Relative to Policy	Policy Weight
	<b>Public Equity</b>	<b>36.1</b>	<b>53.1%</b>	<b>(1.8%)</b>	<b>54.9%</b>
	<b>Liquidity (Fixed Income)</b>	<b>14.8</b>	<b>21.7%</b>	<b>0.3%</b>	<b>21.4%</b>
	Core	9.2	13.6%	(0.3%)	13.9%
	High Yield	2.1	3.1%	0.4%	2.7%
	Emerging Market Debt	1.7	2.4%	(0.3%)	2.7%
	TIPS	1.8	2.6%	0.5%	2.1%
	<b>Other Investments</b>	<b>13.1</b>	<b>19.3%</b>	<b>(0.3%)</b>	<b>19.6%</b>
	Absolute Return	4.0	5.9%	(0.2%)	6.1%
	Private Equity	3.5	5.1%	(0.3%)	5.4%
	Real Estate	4.2	6.2%	0.1%	6.1%
	Real Asset	1.4	2.0%	0.0%	2.0%
	<b>Cash</b>	<b>4.0</b>	<b>5.8%</b>	<b>1.7%</b>	<b>4.1%</b>
	<b>Total</b>	<b>\$68.0</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>



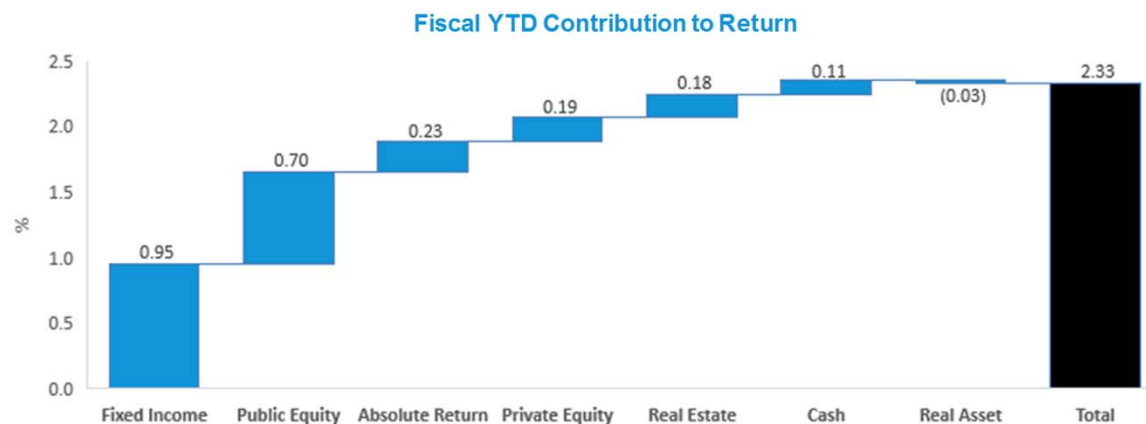
# Pension Performance

Net Returns (%) As of March 31, 2019	Market Value (\$ Million)	Annualized Returns							
		3 Month	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 Year
UC Pension	68,047	7.6	2.3	2.7	8.6	6.1	10.3	5.8	8.5
Pension Policy Benchmark*		8.7	2.6	3.6	8.3	5.7	9.7	5.2	8.1
Value Added**		(1.1)	(0.3)	(0.9)	0.3	0.4	0.6	0.6	0.4

Net Returns (%) As of June 30	One Year Returns								
	2018	2017	2016	2015	2014	2013	2012	2011	2010
UC Pension	7.9	14.4	(2.0)	4.5	17.4	11.7	0.4	22.4	12.7
Pension Policy Benchmark*	8.4	12.5	(0.8)	2.2	17.1	10.7	(0.6)	21.6	11.6
Value Added**	(0.5)	1.9	(1.2)	2.3	0.3	1.0	1.0	0.8	1.1

\* The Policy Benchmark is a weighted average of investment policy targets

\*\*Value add calculation may be slightly off due to rounding and the level of precision used for returns





# Pension Attribution – FY 2018/19

As of March 31, 2019	Average Weight	Average Active Weight	Allocation Attribution	Selection Attribution	Total Attribution
<b>Public Equity</b>	54.7	2.5	(0.1)	0.3	0.2
<b>Fixed Income</b>					
Core	13.2	(0.2)	(0.1)	0.0	(0.1)
High Yield	3.1	0.2	0.0	0.0	0.0
Emerging Market Debt	2.4	0.0	0.0	0.0	0.0
TIPS	2.6	(0.2)	0.0	0.0	0.0
<b>Other Investments</b>					
Absolute Return	5.9	(1.4)	0.0	0.2	0.2
Private Equity	5.1	(2.4)	(0.1)	(0.2)	(0.3)
Real Estate	5.7	(0.6)	0.0	(0.1)	(0.1)
Real Asset	1.9	(0.5)	0.0	0.0	0.0
Cash	5.4	2.6	(0.2)	0.0	(0.2)
<b>Total</b>	<b>100%</b>	<b>0.0%</b>	<b>(0.5%)</b>	<b>0.2%</b>	<b>(0.3%)</b>





# Pension Policy Benchmark

Asset Class	Policy Benchmark Component	Target	Allowable Ranges	
			Min	Max
<b>Total Public Equity</b>	MSCI All Country World Index Net IMI Tobacco Free	54.9%	44.9%	64.9%
<b>Total Fixed Income</b>				
U.S. Core Fixed Income	Barclays U.S. Aggregate Bond Index	13.9%	7.4%	20.4%
High Yield Debt	Merrill Lynch High Yield Cash Pay Index	2.7%	1.4%	3.9%
Emerging Market Debt	JP Morgan Emerging Markets Bond Index Global Diversified	2.7%	1.4%	3.9%
TIPS	Barclays U.S. TIPS	2.1%	1.1%	3.1%
<b>Total Other Investments</b>				
Private Equity	Russell 3000 + 1.5%	5.4%	2.1%	8.7%
Absolute Return	HFRI Fund of Funds Composite	6.1%	2.8%	9.5%
Real Estate	NCREIF ODCE Index	6.1%	3.8%	8.4%
Real Assets	Actual Real Asset Portfolio Returns	2.0%	1.0%	3.0%
<b>Cash</b>		4.1%	0.0%	14.0%

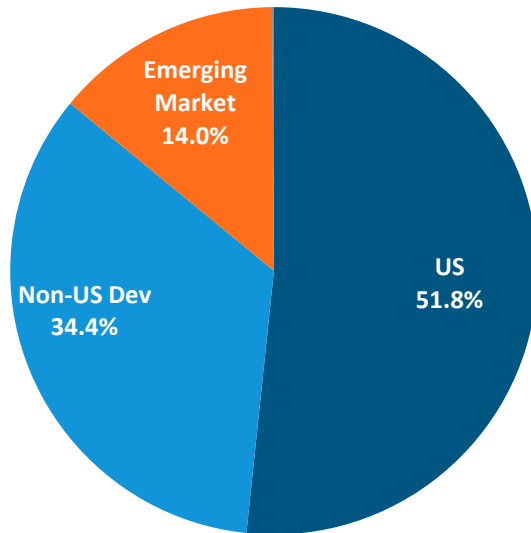


# Public Equity

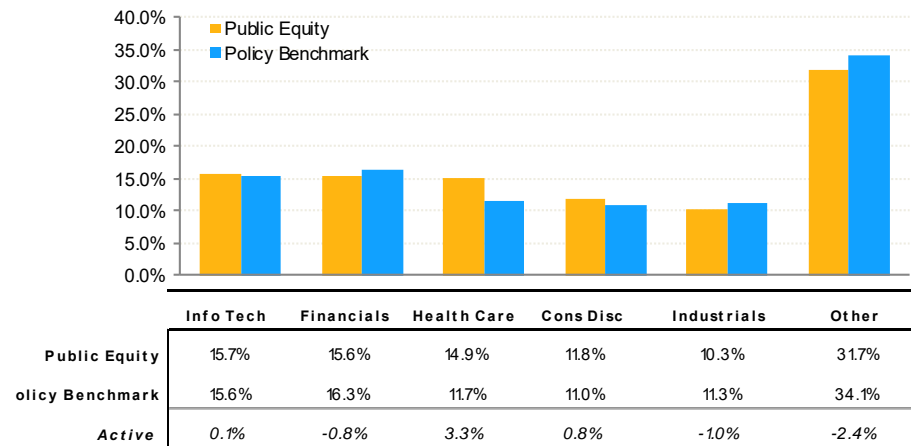
Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year
Public Equity	36,133	100%	12.5	1.6	1.4	11.6	7.0	12.8	5.0
Pension Policy Benchmark*			12.2	1.2	2.0	10.8	6.5	12.4	5.6
<i>Value Added</i>			0.3	0.4	(0.6)	0.8	0.5	0.4	(0.6)

\* Prior to July 1, 2016, the total public equity benchmark was an aggregate of benchmarks for underlying equity portfolios.

## Regional Exposure



## Sector Exposure





# Fixed Income (Liquidity) and Cash

Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year
Fixed Income	14,793	100%	3.9	4.5	4.1	3.5	3.3	5.4	5.6
Pension Policy Benchmark*			4.0	5.1	4.7	3.3	3.2	5.2	5.5
Value Added			(0.1)	(0.6)	(0.6)	0.2	0.1	0.2	0.1
Core	9,241	62%	2.9	4.4	4.1	2.7	3.0	4.5	5.2
Barclays U.S. Aggregate Bond Index			2.9	4.6	4.5	2.0	2.7	3.7	5.0
Value Added			0.0	(0.2)	(0.4)	0.7	0.3	0.8	0.2
High Yield	2,127	14%	6.6	4.5	5.4	7.3	4.6	10.9	-
Merrill Lynch High Yield Cash Pay Index			7.4	4.9	6.0	8.6	4.7	11.1	-
Value Added			(0.8)	(0.4)	(0.6)	(1.3)	(0.1)	(0.2)	-
Emerging Market Debt	1,656	11%	6.7	7.6	3.8	5.2	4.2	7.1	-
JP Morgan Emerging Markets Bond Index Global Diversified			7.0	8.0	4.2	5.8	5.4	8.2	-
Value Added			(0.3)	(0.4)	(0.4)	(0.6)	(1.2)	(1.1)	-
TIPS	1,769	12%	3.2	2.2	3.0	2.0	2.1	3.6	-
Barclays U.S. TIPS			3.2	1.9	2.7	1.7	1.9	3.4	-
Value Added			0.0	0.3	0.3	0.3	0.2	0.2	-

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

Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year	
Cash	3,981	100%	1.0	2.2	2.7	1.7	1.6	3.3	



# Absolute Return

Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns					
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year
Absolute Return	4,041	100%	3.1	3.9	5.3	5.2	4.2	6.5
Pension Policy Benchmark*			5.0	0.0	0.8	4.1	1.0	1.8
<i>Value Added</i>			<i>(1.9)</i>	<i>3.9</i>	<i>4.5</i>	<i>1.1</i>	<i>3.2</i>	<i>4.7</i>
Event Driven	412	10%	3.4	0.0	3.8	9.4	4.2	8.6
Global Macro	531	13%	6.3	1.0	2.7	(2.2)	1.4	(0.8)
Opportunistic	2,165	54%	3.4	5.8	10.1	11.49	7.69	-
Relative Value	909	22%	0.2	4.1	5.3	8.2	7.5	9.0

\* 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. As of July 2016, the benchmark is HFRX Fund of Funds Composite.



● **Event Driven: 10%**  
**\$0.4B**

● **Global Macro: 13%**  
**\$0.5B**

● **Opportunistic: 54%**  
**\$2.2B**

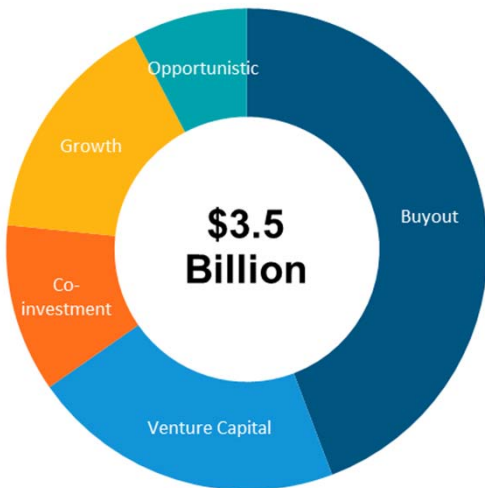
● **Relative Value: 22%**  
**\$0.9B**



# Private Equity

Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns						
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year
Private Equity	3,499	100%	(2.1)	3.9	9.5	12.1	12.0	13.0	13.7
Pension Policy Benchmark*			14.5	5.9	10.2	12.0	11.9	13.0	8.1
<i>Value Added</i>			(16.6)	(2.0)	(0.7)	0.1	0.1	0.0	5.6
Buyout	1,546	44%	(3.3)	1.3	3.0	10.4	10.9	11.8	-
Venture Capital	736	21%	0.1	6.7	16.3	9.5	13.0	12.8	-
Co-investment	395	11%	(1.0)	8.9	17.9	27.5	29.1	21.6	-
Growth	547	16%	(3.0)	(2.3)	11.1	11.8	6.9	12.3	-
Opportunistic	270	8%	(1.7)	20.2	19.8	6.1	(1.5)	18.0	-

\* As of July 1, 2017, the Private Equity policy benchmark is the Russell 3000 +1.5%. From March 2005 to June 2017, the Private Equity benchmark was the actual private equity return. From January 2001 to February 2005, the Private Equity benchmark was Russell 3000 + 3% lagged one quarter. Prior to that, it was the S&P 500 + 5% lagged by a quarter.

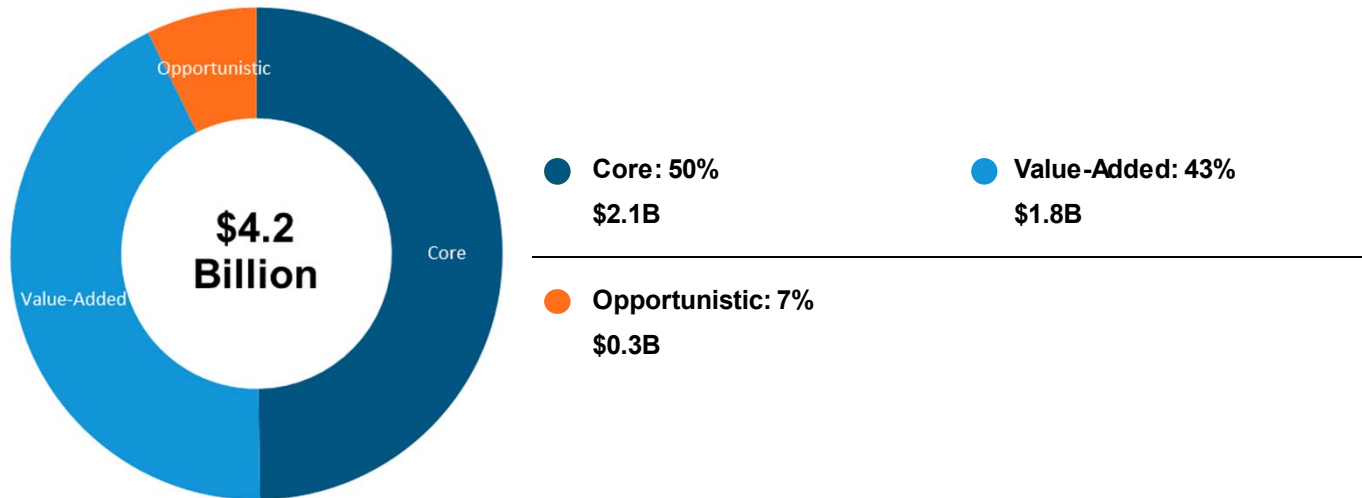


- Buyout: 44%  
\$1.5B
- Venture Capital: 21%  
\$0.7B
- Co-investment: 11%  
\$0.4B
- Growth: 16%  
\$0.5B
- Opportunistic: 8%  
\$0.3B



# Real Estate

Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns					
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year
Real Estate	4,215	100%	2.6	2.8	7.5	7.7	10.2	5.2
Pension Policy Benchmark			1.5	5.3	7.4	7.3	9.5	4.8
<i>Value Added</i>			1.1	(2.5)	0.1	0.4	0.7	0.4
Core	2,098	50%	2.5	3.3	8.3	7.6	10.1	8.6
Value-Added	1,811	43%	2.9	2.3	6.9	7.6	9.3	3.1
Opportunistic	306	7%	1.3	2.1	5.7	5.5	8.1	3.6

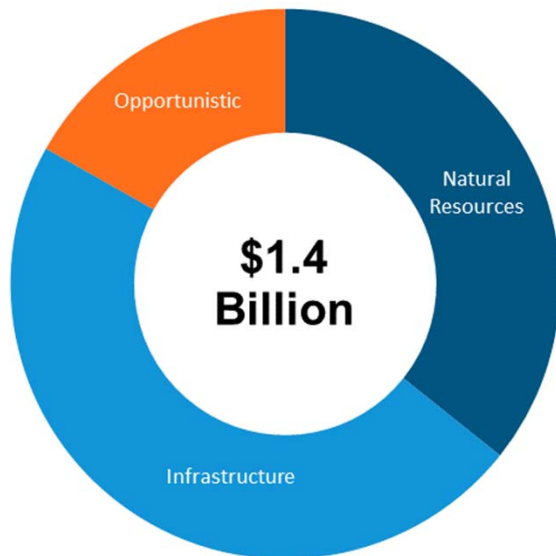




# Real Assets

Net Returns (%) As of March 31, 2019	Market Value		Annualized Returns				
	(\$ Million)	% Allocation	3 Month	FYTD	1 Year	3 Year	5 Year
<b>Real Assets</b>	<b>1,385</b>	<b>100%</b>	<b>(0.5)</b>	<b>(1.6)</b>	<b>1.5</b>	<b>4.7</b>	<b>(0.4)</b>
Natural Resources	494	36%	(2.5)	(7.1)	(1.6)	0.5	(6.8)
Infrastructure	657	47%	1.8	1.9	3.1	10.5	12.8
Opportunistic	233	17%	(2.8)	1.4	1.6	3.6	3.6

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



- **Natural Resources: 36%**  
\$0.5B
- **Infrastructure: 47%**  
\$0.7B
- **Opportunistic: 17%**  
\$0.2B

# Risk 1.0 : Risk Measurement

*Portfolio volatility drops slightly, quarter on quarter, after a large spike in Q4 2018  
Tracking error little changed.*

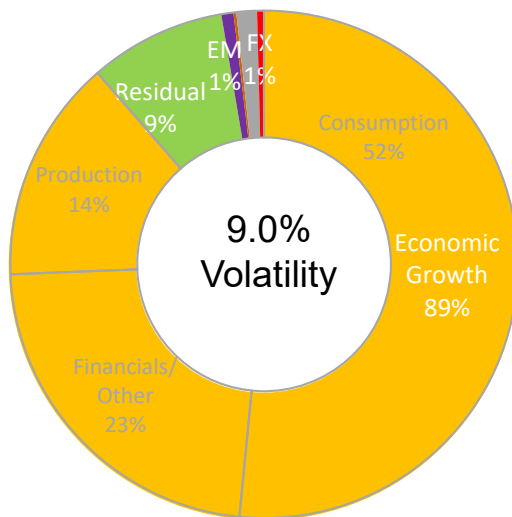
Name	Benchmark	Weight (%)	Portfolio Risk (%)		Benchmark Risk (%)		Active Risk (%)	
			Standalone Volatility	QoQ Change	Standalone Volatility	QoQ Change	Tracking Error	QoQ Change
<b>UCRP Total</b>	<b>Policy (Blend)</b>	<b>100</b>	<b>9.0</b>	↓ <b>(0.4)</b>	<b>8.8</b>	<b>(0.4)</b>	<b>0.8</b>	<b>0.1</b>
Public Equity	MSCI ACWI ex Tobacco	53	13.2	↓ <b>(0.4)</b>	13.1	<b>(0.7)</b>	0.8	0.0
Fixed Income	Policy (Blend)	22	2.2	↓ <b>(0.1)</b>	2.5	<b>(0.0)</b>	0.4	0.0
Absolute Return	HFRI FOF	6	4.1	↓ <b>(0.2)</b>	2.9	<b>(0.2)</b>	2.5	0.2
Private Equity	Russell 3000	5	19.5	↓ <b>(1.5)</b>	15.4	<b>(1.1)</b>	8.8	<b>(0.2)</b>
Private Real Estate	NCREIF	6	11.1	↑ <b>0.5</b>	9.9	2.2	6.5	0.8
Real Assets	Real Assets	2	21.2	↓ <b>(1.8)</b>	21.2	<b>(1.8)</b>	0.0	0.0
Cash	Merrill Lynch 3M	6	0.2	↓ <b>(0.1)</b>	0.1	<b>(0.0)</b>	0.2	<b>(0.1)</b>



# Macroeconomic Risk Factors

*Portfolio systematic risk generally dominated by “Economic Growth” risk.  
Within Economic Growth, “Consumption” dominates.*

## Retirement Plan



**Portfolio Standalone  
Risk Factor Decomposition**

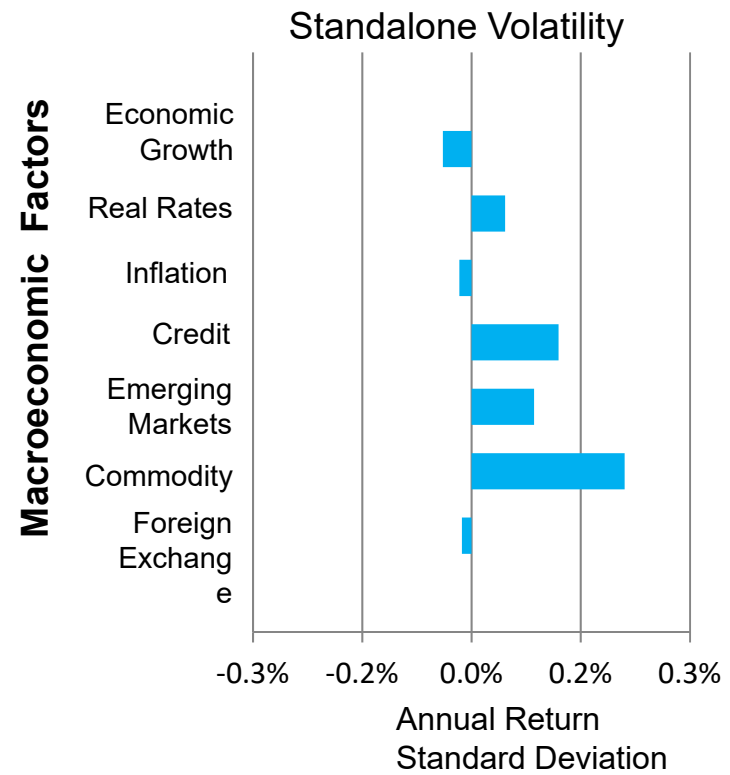
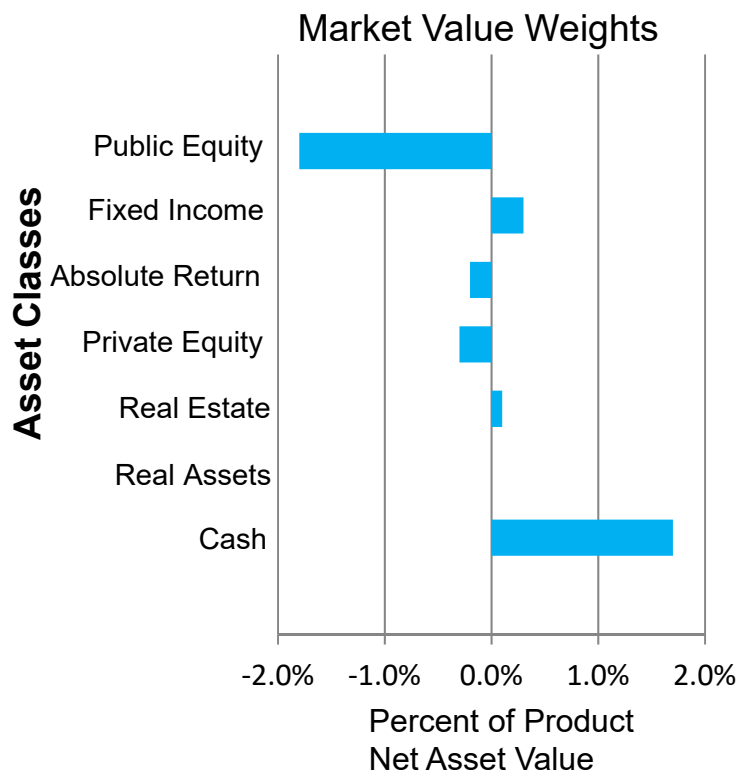
<b>Factor Name</b>	<b>Factor Description</b>
Economic Growth	Proxied by broad, developed market equity index returns
Real Rates	Inflation-linked bond returns
Inflation	Return of long nominal bonds, short inflation-linked bonds portfolio
Credit	Return of long corporate bonds, short nominal bonds portfolio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

# Risk 1.0 : Two Views of Risk

## Asset Classes versus Macroeconomic Factors

*Portfolio slightly underweight Economic Growth factor and Real Rates duration, Slightly overweight Credit, EM and Commodities factors.*

### Retirement Plan Active Exposures

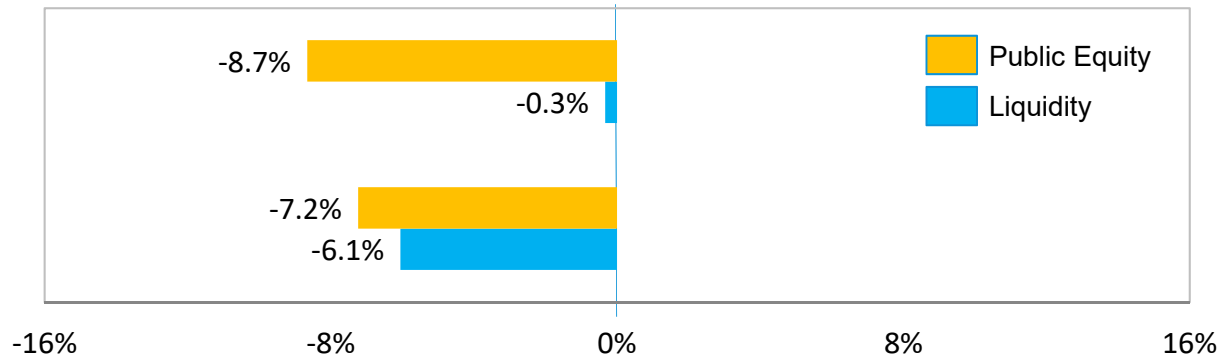


*Reference scale: active risk (tracking error) : 0.8%*

# Risk 2.0 : Stress Tests

Retirement Plan indicative stressed P&L for public markets investments

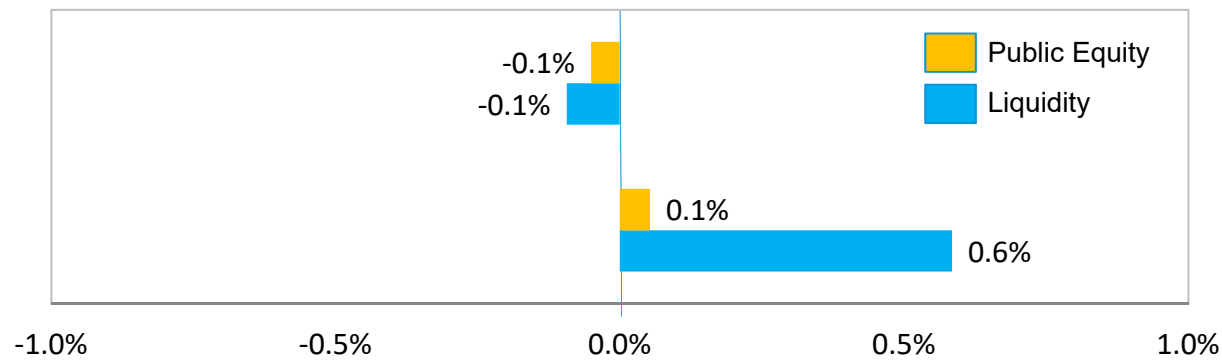
## PORTFOLIO



**S&P -10%**

**US Interest Rates  
+100bps**

## ACTIVE



**S&P -10%**

**US Interest Rates  
+100bps**

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# Risk 3.0 : Scenario Analysis

src : BlackRock



## US Scenarios

**Federal Reserve Rate Regimes**  
Fiscal Policy Stance  
Tax Reform

## Global Scenarios

Central Bank Policy  
Peak Oil  
Gulf Tensions

## European Scenarios

**Brexit Negotiations**  
Europe Fragmentation/Breakup  
Eurozone Populist Elections

## Interest Rate Scenarios

US Rates Paradigm Shift  
Reflation - Deflation  
Rising Inflation – Global Rate Hikes

## Emerging Markets /Asia Scenarios

**US-China Trade Relations**  
Abenomics- Helicopter Money  
North Korea Tensions

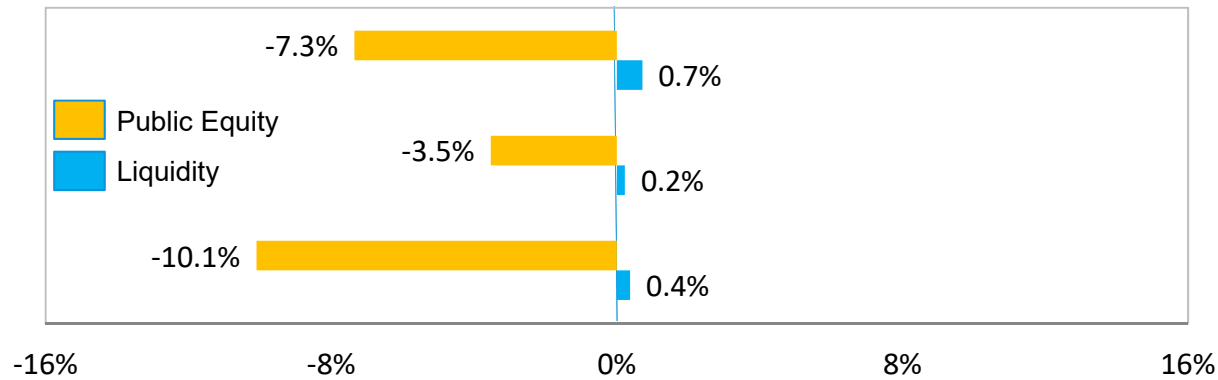
## Market Technical Scenarios

Volatility Regime Change  
Tech Calamity  
Value Reversal

# Risk 3.0 : Scenario Analysis

Retirement Plan indicative stressed P&L for public markets investments

## PORTFOLIO

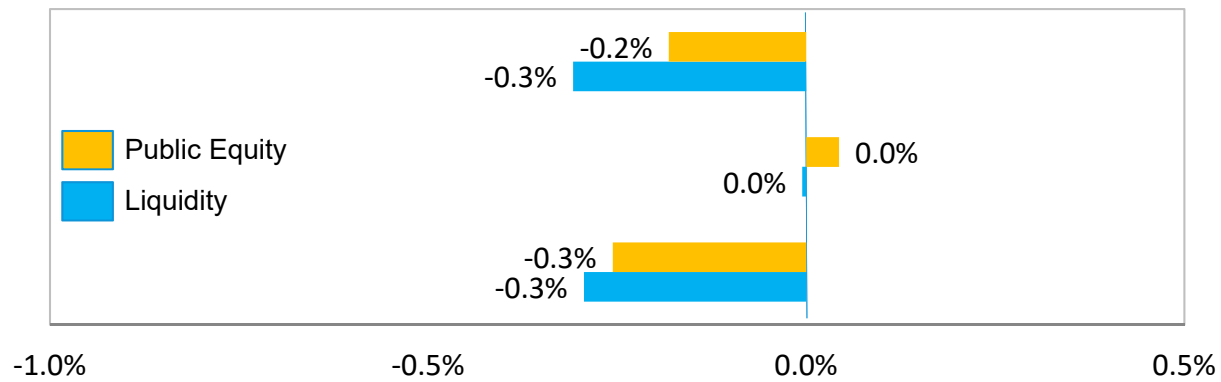


**US Fed Rate Pause :  
Growth Concerns**

**Brexit : No Deal**

**US-China Trade :  
Global Protectionism**

## ACTIVE



**US Fed Rate Pause :  
Growth Concerns**

**Brexit : No Deal**

**US-China Trade :  
Global Protectionism**