

UNIVERSITY
OF
CALIFORNIA

Pension

Investment Review as of June 30, 2019

UC INVESTMENTS

UC Pension

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

INVESTMENT OBJECTIVES

- 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.

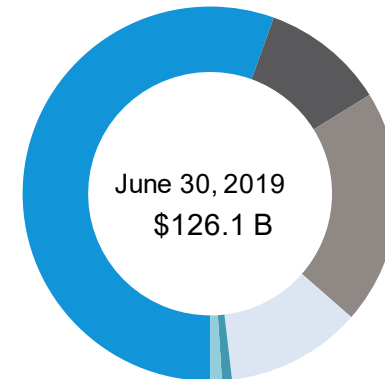
UC Investments

MISSION: Growing Portfolios. Building Partnerships. Delivering value through values.

INVESTMENT PRODUCTS

- **Pension** assets: \$70.0 billion (as of 6/30/2019).
- Investing **Endowment** assets since 1933 (87 years).
- Investing **Pension** assets since 1961 (59 years).
- Investing **Retirement Savings** assets since 1967 (53 years).
- Investing **Working Capital** since 1976 (44 years).
- Investing **Captive Insurance** assets since 2017 (3 years).
- Investing **Blue & Gold** assets since 2019 (0 years).

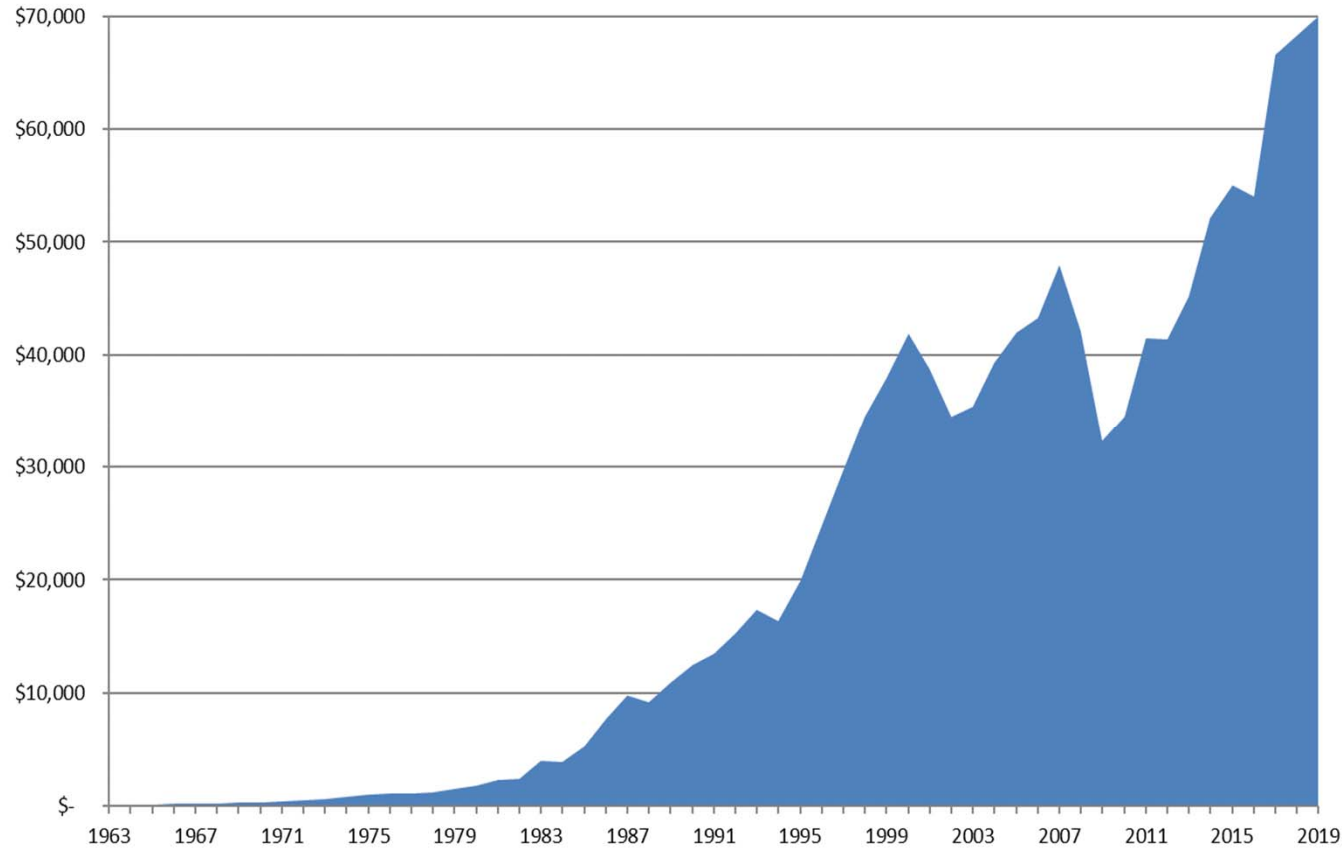
\$126.1 billion across 7 products



- **Pension: 55%, \$70.0B**
- Endowment: 11%, \$13.4B
- Retirement Savings: 20%, \$25.6B
- Working Capital: 12%, \$14.7B
- TRIP: \$9.2B
- STIP: \$5.6B
- Fiat Lux: 1%, \$1.1B
- Blue & Gold Pool: 1%, \$1.3B

Pension Asset Growth

UCRP ASSETS 1963 - 2019



5 Year Growth

June 30, 2019
\$70.0 billion





1 Year Ago
\$66.8 billion

5 Years Ago
\$52.1 billion

Assets Under Management

June 30, 2018	\$66.8 billion
Market Gains	\$4.0 billion
Value Added	\$0.0 billion
Net Cash Flow	(\$0.8 billion)
June 30, 2019	\$70.0 billion

Pension Asset Allocation

	As of June 30, 2019	Market Value in \$ Billions	Percentage	Over/Underweight Relative to Policy	Policy Weight
	Public Equity	37.0	52.9%	(2.3%)	55.2%
	Liquidity (Fixed Income)	15.2	21.8%	0.7%	21.1%
	Core	9.5	13.6%	(0.2%)	13.8%
	High Yield	2.2	3.1%	0.5%	2.6%
	Emerging Market Debt	1.7	2.5%	(0.1%)	2.6%
	TIPS	1.8	2.6%	0.5%	2.1%
	Other Investments	14.3	20.4%	0.6%	19.8%
	Absolute Return	4.4	6.2%	(0.1%)	6.3%
	Private Equity	4.1	5.8%	0.4%	5.4%
	Real Estate	4.3	6.1%	0.0%	6.1%
	Real Asset	1.5	2.2%	0.2%	2.0%
	Cash	3.4	4.9%	1.0%	3.9%
	Total	\$70.0	100.0%	0.0%	100.0%

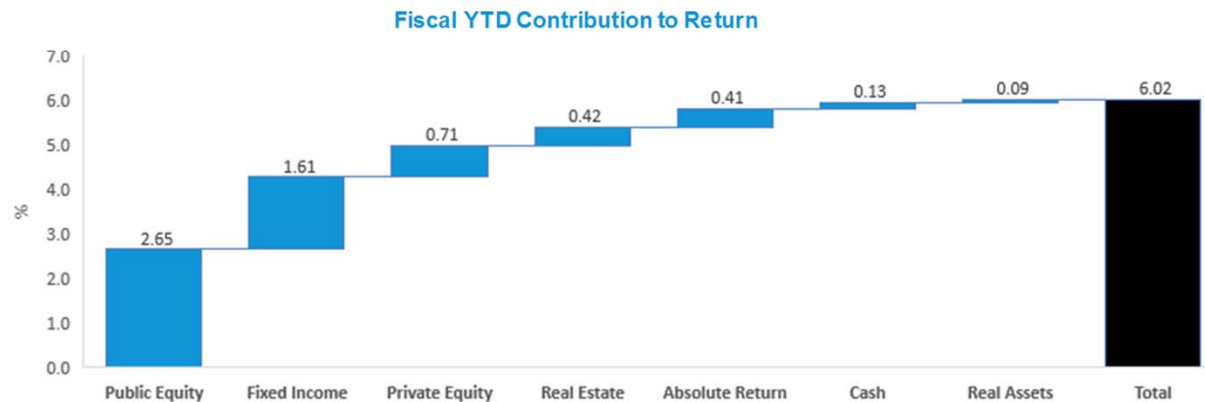
Pension Performance

Net Returns (%) As of June 30, 2019	Market Value (\$ Million)	Annualized Returns					
		3 Month	1 Year	3 Year	5 Year	10 Year	20 Year
UC Pension	69,981	3.6	6.0	9.4	6.0	9.3	5.7
Pension Policy Benchmark*		3.2	5.9	8.9	5.5	8.6	5.1
Value Added**		0.4	0.1	0.5	0.5	0.7	0.6

Net Returns (%) As of June 30, 2019	One Year Returns									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
UC Pension	6.0	7.90	14.36	(2.04)	4.46	17.42	11.71	0.37	22.45	12.73
Pension Policy Benchmark*	5.9	8.4	12.5	(0.8)	2.2	17.1	10.7	(0.6)	21.6	11.6
Value Added**	0.1	(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 June 30, 2019	Average Weight	Average Active Weight	Allocation Attribution	Selection Attribution	Total Attribution
Public Equity	54.4	0.2	(0.2)	0.3	0.1
Fixed Income					
Core	13.3	(0.4)	(0.1)	(0.1)	(0.1)
High Yield	3.1	0.4	0.0	(0.0)	(0.0)
Emerging Market Debt	2.4	(0.2)	(0.0)	(0.0)	(0.0)
TIPS	2.6	0.3	(0.0)	0.0	(0.0)
Other Investments					
Absolute Return	5.9	(0.6)	0.0	0.4	0.4
Private Equity	5.1	(0.9)	(0.1)	0.1	0.1
Real Estate	5.8	(0.3)	(0.0)	0.0	(0.0)
Real Assets	2.0	(0.2)	(0.0)	(0.0)	(0.0)
Cash	5.4	1.8	(0.2)	0.0	(0.1)
Total	100%	0.0%	(0.6%)	0.7%	0.1%

Pension Policy Benchmark

Asset Class	Policy Benchmark Component	Target	Allowable Ranges	
			Min	Max
Total Public Equity	MSCI All Country World Index Net IMI Tobacco Free	55.2%	45.2%	65.2%
Total Fixed Income				
U.S. Core Fixed Income	Barclays U.S. Aggregate Bond Index	13.8%	7.3%	20.3%
High Yield Debt	Merrill Lynch High Yield Cash Pay Index	2.6%	1.4%	3.9%
Emerging Market Debt	JP Morgan Emerging Markets Bond Index Global Diversified	2.6%	1.4%	3.9%
TIPS	Barclays U.S. TIPS	2.1%	1.1%	3.1%
Total Other Investments				
Private Equity	Russell 3000 + 1.5%	5.4%	2.0%	8.7%
Absolute Return	HFRI Fund of Funds Composite	6.3%	3.0%	9.6%
Real Estate	NCREIF ODCE Index	6.1%	3.7%	8.4%
Real Assets	Actual Real Asset Portfolio Returns	2.0%	1.0%	3.0%
Cash		3.9%	0.0%	14.0%

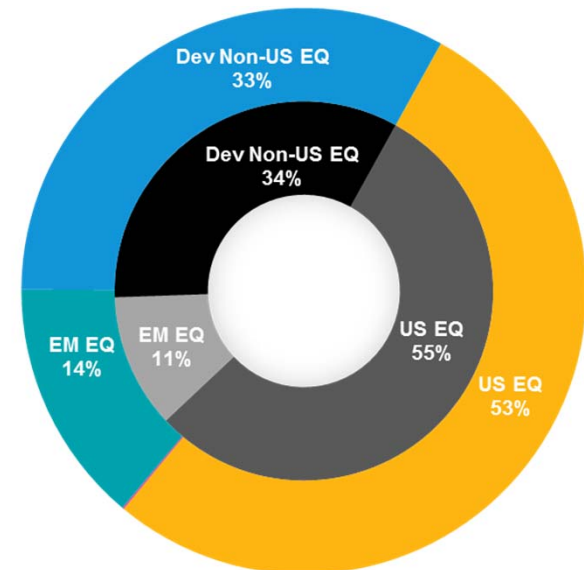
Public Equity

Net Returns (%) As of June 30, 2019	Market Value		Annualized Returns					
	(\$ Million)	% Allocation	3 Month	1 Year	3 Year	5 Year	10 Year	20 Year
Public Equity	37,041	100%	3.6	5.2	12.6	6.8	11.0	4.8
Pension Policy Benchmark*			3.5	4.7	11.7	6.2	10.6	5.5
Value Added			0.1	0.5	0.9	0.6	0.4	(0.7)

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

Regional Lookthrough Exposure

Pension ■ ■ ■
 Benchmark ■ ■ ■



Active Managers	# of funds	Weight
Global Generalist	5	17.5%
USA	3	6.3%
Developed Non-USA	4	3.7%
Global Sector Specialist	3	3.6%
Emerging Markets	3	3.9%
	18	35.0%

Passive Index Exposure	Strategy	Weight
MSCI ACWI IMI Tobacco Free	Global Passive	64.7%

Public Equity (cont.)

Attribution:

UCRP outperformance FYTD 2019 driven by solid returns from several large funds, with modest detractions from underperforming funds.

Top 3 Contributors FYTD	FYTD return	Weight
1. US large cap manager	12.0%	3.5%
2. China large cap manager	17.3%	2.4%
3. Global growth manager	10.0%	3.6%

Top 3 Detractors FYTD	FYTD return	Weight
1. Global value manager	-1.6%	3.7%
2. Japan small cap manager	-8.7%	0.7%
3. Non-US developed manager	-2.3%	1.1%

Geographic Exposures	Policy	Benchmark
US Equity	52.7%	54.8%
Developed Non-US Equity	27.3%	33.5%
Emerging Market Equity	16.3%	11.6%
Cash	3.7%	0.0%

Fixed Income (Liquidity) and Cash

Net Returns (%) As of June 30, 2019	Market Value (\$ Million)	% Allocation	Annualized Returns					
			3 Month	1 Year	3 Year	5 Year	10 Year	20 Year
Fixed Income	15,246	100%	2.9	7.6	3.7	3.3	5.2	5.9
Pension Policy Benchmark*			3.1	8.4	3.4	3.3	5.0	5.8
<i>Value Added</i>			<i>(0.2)</i>	<i>(0.8)</i>	<i>0.3</i>	<i>0.0</i>	<i>0.2</i>	<i>0.1</i>
Core	9,513	62%	2.9	7.4	2.9	3.2	4.4	5.5
Barclays U.S. Aggregate Bond Index			3.1	7.9	2.3	2.9	3.9	5.3
<i>Value Added</i>			<i>(0.2)</i>	<i>(0.5)</i>	<i>0.6</i>	<i>0.3</i>	<i>0.5</i>	<i>0.2</i>
High Yield	2,191	14%	2.4	7.0	6.9	4.6	9.2	-
Merrill Lynch High Yield Cash Pay Index			2.6	7.6	7.5	4.7	9.2	-
<i>Value Added</i>			<i>(0.2)</i>	<i>(0.6)</i>	<i>(0.6)</i>	<i>(0.1)</i>	<i>0.0</i>	<i>-</i>
Emerging Market Debt	1,723	11%	4.1	12.0	5.1	4.2	6.5	-
JPM EM Bond Index Global Diversified			4.1	12.4	5.5	5.3	7.5	-
<i>Value Added</i>			<i>0.0</i>	<i>(0.4)</i>	<i>(0.4)</i>	<i>(1.1)</i>	<i>(1.0)</i>	<i>-</i>
TIPS	1,819	12%	2.8	5.1	2.4	2.0	3.9	-
Barclays U.S. TIPS			2.9	4.8	2.1	1.8	3.6	-
<i>Value Added</i>			<i>(0.1)</i>	<i>0.3</i>	<i>0.3</i>	<i>0.2</i>	<i>0.3</i>	<i>-</i>

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

Net Returns (%) As of June 30, 2019	Market Value (\$ Million)	% Allocation	Annualized Returns				
			3 Month	1 Year	3 Year	5 Year	10 Year
Cash	3,981	100%	0.3	2.5	1.7	1.6	3.0

Absolute Return

Net Returns (%) As of June 30, 2019	Market Value (\$ Million)	% Allocation	Annualized Returns				
			3 Month	1 Year	3 Year	5 Year	10 Year
Absolute Return	4,369	100%	2.9	6.9	6.1	3.9	6.2
Pension Policy Benchmark*			1.7	1.1	4.3	1.0	1.5
<i>Value Added</i>			<i>1.2</i>	<i>5.8</i>	<i>1.8</i>	<i>2.9</i>	<i>4.7</i>
Opportunistic	2,430	56%	2.5	8.4	10.7	7.2	0.0
Relative Value	938	21%	3.2	7.3	8.4	7.8	8.5
Global Macro	561	13%	5.7	6.8	0.2	2.3	0.1
Event Driven	417	10%	1.5	1.5	9.7	3.8	7.8

* 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 HFRI Fund of Funds Composite.

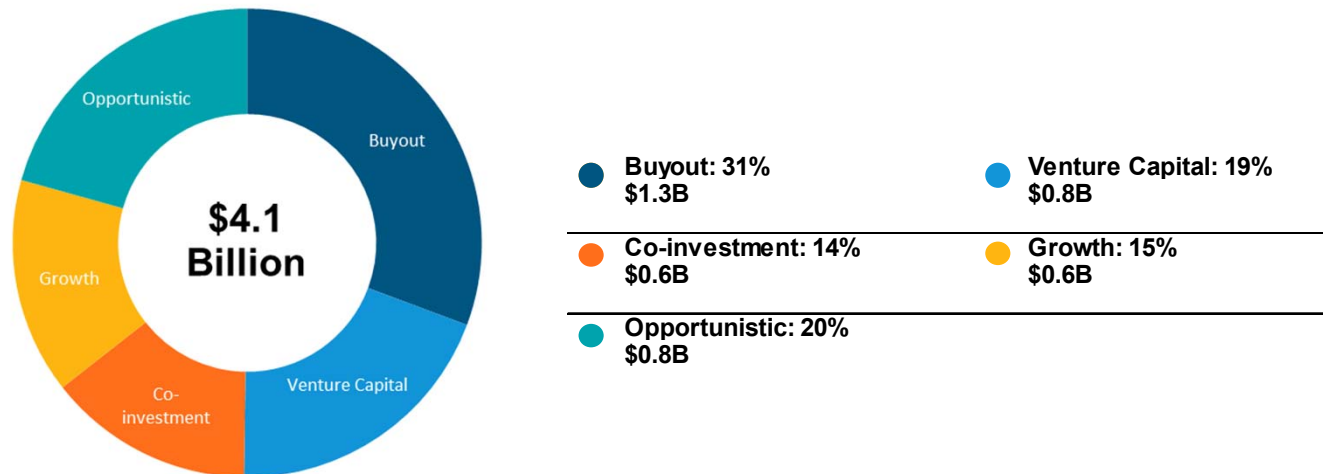


- **Event Driven: 10%**
\$0.4B
- **Global Macro: 13%**
\$0.6B
- **Opportunistic: 56%**
\$2.4B
- **Relative Value: 21%**
\$0.9B

Private Equity

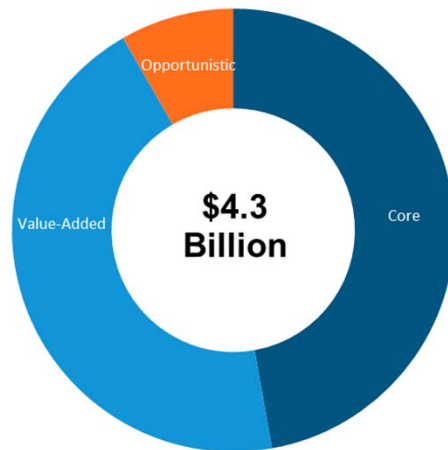
Net Returns (%) As of June 30, 2019	Market Value (\$ Million)	% Allocation	Annualized Returns					
			3 Month	1 Year	3 Year	5 Year	10 Year	20 Year
Private Equity	4,088	100%	9.4	13.7	15.5	13.1	14.4	13.6
Pension Policy Benchmark*			4.4	10.5	13.6	11.9	13.8	7.9
<i>Value Added</i>			<i>5.0</i>	<i>3.2</i>	<i>1.9</i>	<i>1.2</i>	<i>0.6</i>	<i>5.7</i>
Buyout	1,259	31%	9.2	7.9	12.9	11.7	13.2	-
Opportunistic	821	20%	5.6	18.9	4.5	4.1	17.6	-
Venture Capital	796	19%	10.2	17.6	14.6	14.0	14.0	-
Growth	628	15%	10.1	7.6	15.2	7.9	13.9	-
Co-investment	577	14%	15.8	26.6	32.9	30.0	-	-

* 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.



Real Estate

Net Returns (%) As of June 30, 2019	Market Value		Annualized Returns				
	(\$ Million)	% Allocation	3 Month	1 Year	3 Year	5 Year	10 Year
Real Estate	4,279	100%	3.7	6.6	7.7	10.5	7.4
Pension Policy Benchmark			1.2	6.5	7.0	9.3	6.7
<i>Value Added</i>			<i>2.5</i>	<i>0.1</i>	<i>0.7</i>	<i>1.2</i>	<i>0.7</i>
Core	2,029	48%	3.9	7.4	7.9	10.4	9.6
Value-Added	1,901	44%	4.4	6.7	7.7	9.7	6.0
Opportunistic	349	8%	0.2	2.4	4.0	7.6	6.8

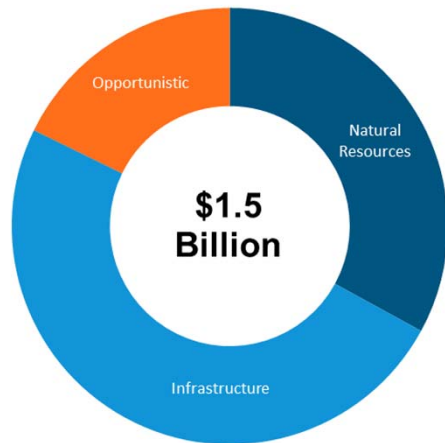


- Core: 46%
\$2.0B
- Value-Added: 44%
\$1.9B
- Opportunistic: 8%
\$0.3B

Real Assets

Net Returns (%) As of June 30, 2019	Market Value (\$ Million)	% Allocation	Annualized Returns			
			3 Month	1 Year	3 Year	5 Year
Real Assets	1,532	100%	5.5	3.8	7.2	(0.4)
Infrastructure	754	49%	8.0	10.1	12.7	12.9
Natural Resources	505	33%	2.0	(5.2)	2.6	(8.1)
Opportunistic	272	18%	5.4	7.0	5.3	4.7

* Inception date for Real Assets is April 1, 2010



- **Natural Resources: 33%**
\$0.5B
- **Infrastructure: 47%**
\$0.7B
- **Opportunistic: 17%**
\$0.3B

Risk 1.0: Risk Measurement

Portfolio volatility drops for the second straight quarter, after a large spike in Q4 2018
Tracking error little changed QoQ.

		Weight (%)	Portfolio Risk (%)		Benchmark Risk (%)		Active Risk (%)	
			Standalone Volatility	QoQ Change	Standalone Volatility	QoQ Change	Tracking Error	QoQ Change
Pension	Policy (Blend)	100	8.3	(0.7)	8.2	(0.6)	0.8	0.1
Public Equity	MSCI ACWI ex Tobacco	53	12.4	(0.8)	12.2	(0.9)	0.9	0.0
Fixed Income	Policy (Blend)	22	2.1	(0.1)	2.4	(0.1)	0.4	(0.0)
Absolute Return	HFRI FOF	6	3.2	(0.8)	2.6	(0.3)	2.2	(0.3)
Private Equity	Russell 3000	6	17.1	(2.4)	14.1	(1.3)	8.0	(0.8)
Private Real Estate	NFI-ODCE	6	10.1	(1.0)	10.3	0.5	6.0	(0.4)
Real Assets	Real Assets	2	18.2	(3.0)	18.2	(3.0)	0.0	0.0
Cash	Merrill Lynch 3M	5	0.2	0.0	0.1	0.0	0.2	0.0

As of June, 2019

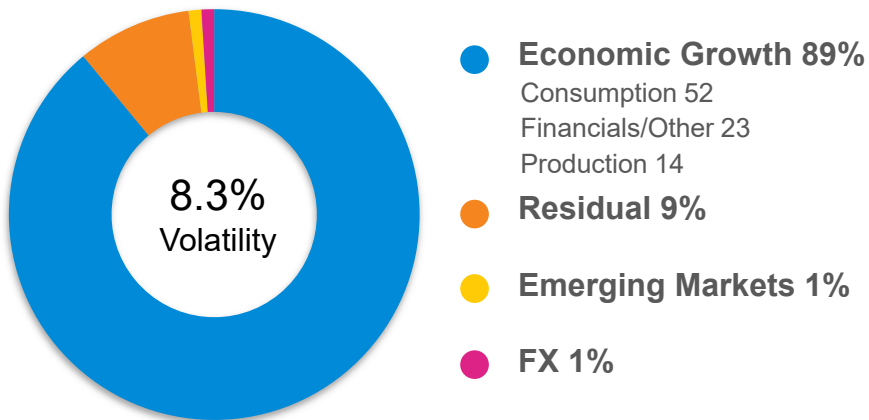
Macroeconomic Risk Factors

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

RETIREMENT PLAN

Portfolio Standalone Risk Factor Decomposition

As of June, 2019



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

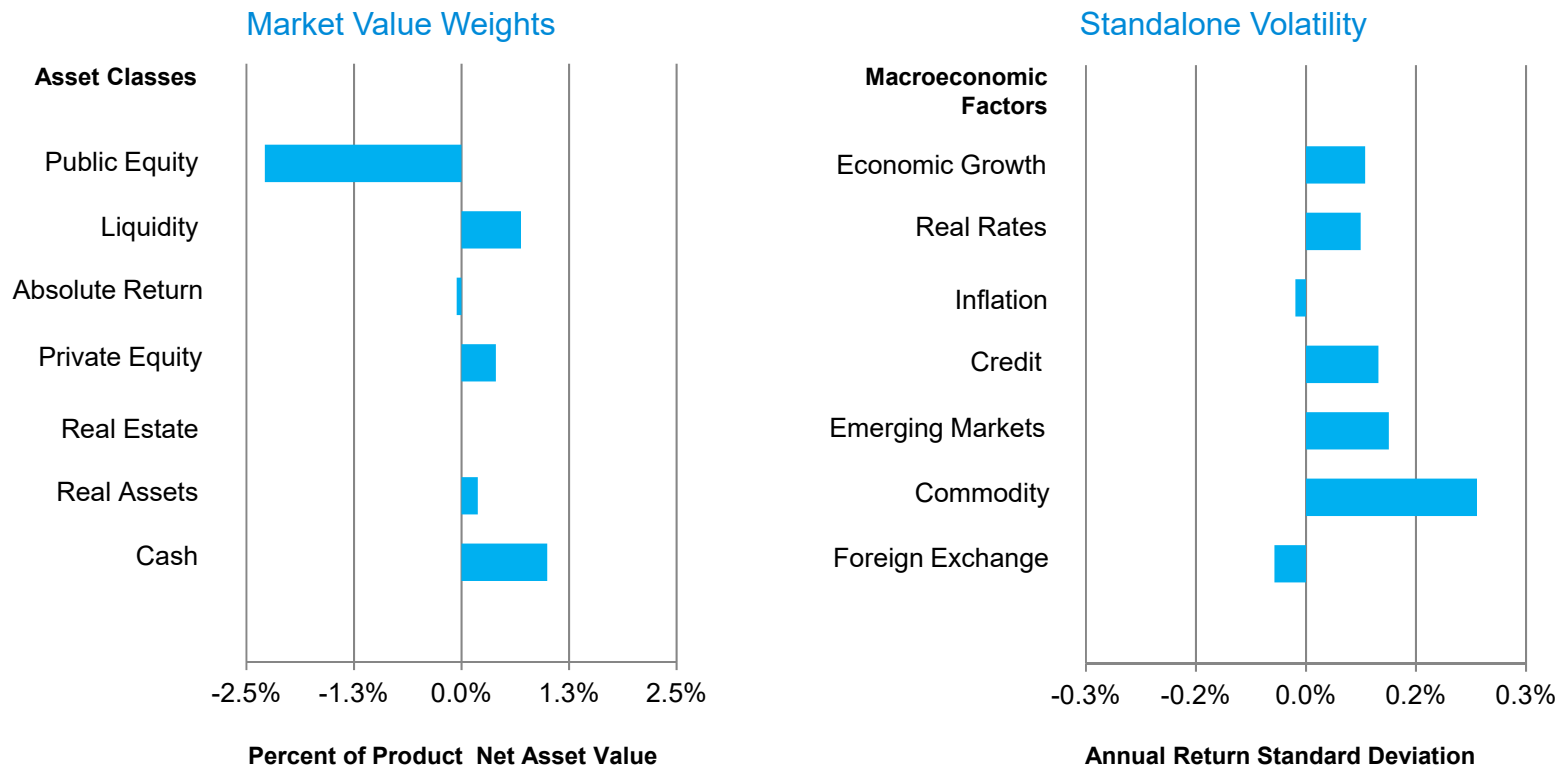
Risk 1.0: Two Views of Risk

Asset Classes versus Macroeconomic Factors

Portfolio slightly overweight Economic Growth, Credit, EM and Commodities (effective). Slightly underweight real rates duration and FX.

RETIREMENT PLAN ACTIVE EXPOSURES

As of June, 2019 Reference scale: active risk (tracking error) : 0.8%



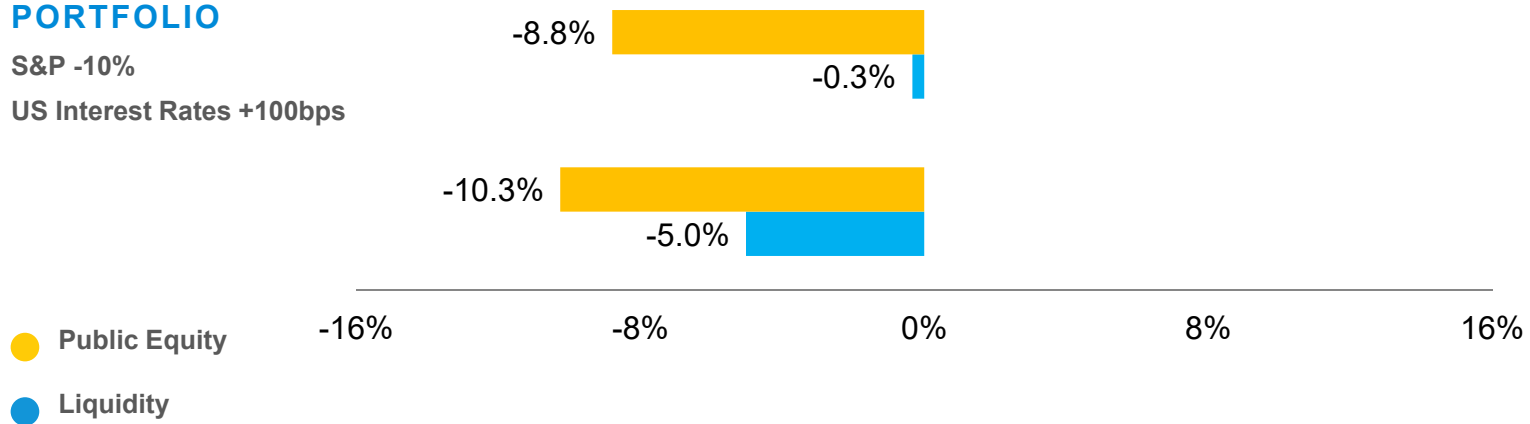
Risk 2.0: Stress Tests

Retirement Plan indicative stressed P&L for public markets investments

PORTFOLIO

S&P -10%

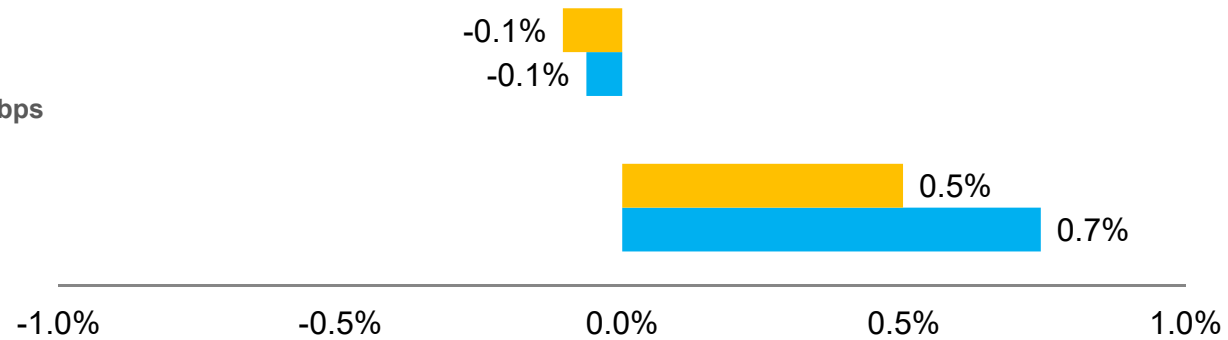
US Interest Rates +100bps



ACTIVE

S&P -10%

US Interest Rates +100bps



Risk 3.0: Scenario Analysis

US Scenarios

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

European Scenarios

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

Emerging Markets /Asia Scenarios

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

Global Scenarios

- Central Bank Policy
- Peak Oil
- Gulf Tensions

Interest Rate Scenarios

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

Market Technical Scenarios

- Volatility Regime Change
- Tech Calamity
- Value Reversal

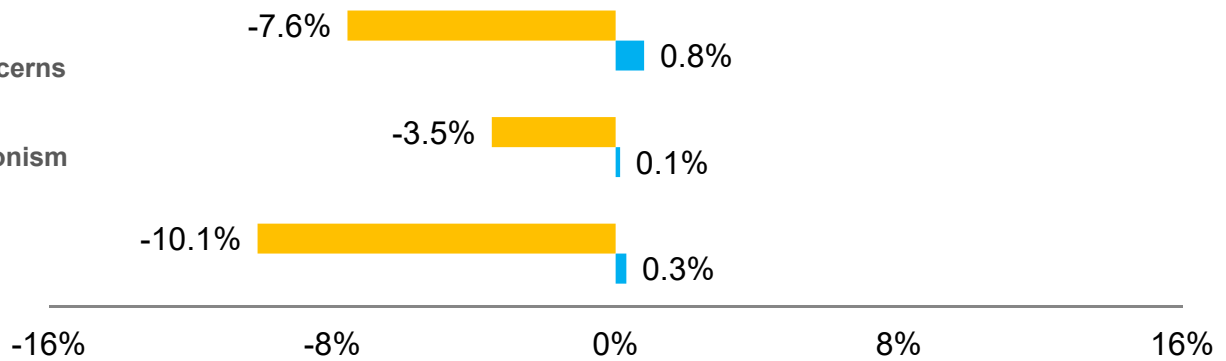
Risk 3.0: Scenario Analysis

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

- Public Equity
- Liquidity



ACTIVE

- US Fed Rate Pause: Growth Concerns
- Brexit: No Deal
- US-China Trade: Global Protectionism

