



INVESTMENT COMMITTEE MEETING VIRTUAL

April 28, 2020 at 1:00pm MT

COMMITTEE MEMBERS

Steve Neel, Chair
Dan Mayfield, Vice-Chair
John Melia
Shirley Ragin
Paula Fisher

AGENDA

1. Roll Call
2. Approval of Agenda
3. Approval of Consent Agenda
4. Current Business

ITEM	PRESENTER
<p>A <u>Information Item:</u> Market & Portfolio Update</p> <ol style="list-style-type: none"> 1. CIO Update 2. Market Review 3. Performance Review 	<p style="text-align: right;">Dominic Garcia Chief Investment Officer</p> <p style="text-align: right;">Thomas Toth Managing Director, Wilshire</p>
<p>B <u>Information Item:</u> Quarterly Staff Consultant Report Credit Portfolio</p>	<p style="text-align: right;">Joaquin Lujan Co-Head of Alpha</p> <p style="text-align: right;">Thomas Toth, Wilshire James Walsh, Albourn</p>
<p>C <u>Information Item:</u> Liquidity & Leverage Re-Education</p> <p><u>Action Item:</u> Approval of Liquidity Risk Management Parameters, IPS amendment</p>	<p style="text-align: right;">Thomas Toth, Managing Director, Wilshire</p> <p style="text-align: right;">Dominic Garcia Chief Investment Officer</p>
<p>D <u>Information Item:</u> Review of Risk Budget (Deferred)</p> <ol style="list-style-type: none"> 1. Risk Budget review & recommendation 2. Review of Active Components 3. Portable Alpha re-education 4. Portable Alpha retrospective <p><u>Action Item:</u> Approval of Annual Active Risk Budget & Active Target Return</p>	<p style="text-align: right;">Thomas Toth Managing Director, Wilshire</p> <p style="text-align: right;">Dominic Garcia Chief Investment Officer</p> <p style="text-align: right;">Joaquin Lujan Co-Head of Alpha</p>

E	<u>Action Item:</u> 2020 Investment Committee Work Plan (Deferred)	Dominic Garcia Chief Investment Officer
F	<u>Information Item:</u> Investment Division Updates (Deferred) 1. Manager Selection Activity Report 2. Cash Activity & Rebalance Update (Q4 2019 & Q1 2020) 3. Securities Lending Update (Q4 2019 & Q1 2020)	LeAnne Larranaga-Ruffy Co-Head of Alpha Joaquin Lujan Co-Head of Alpha Kristin Varela Deputy Chief Investment Officer

5. Adjournment

Consent Agenda

Approval of minutes of November 12, 2019 Investments Committee meeting.

Any person with a disability who is in need of a reader, amplifier, qualified sign language interpreter, or any other form of auxiliary aid or service to attend or participate in the hearing or meeting, please contact Trish Winter at (505) 476-9305 at least one week prior to the meeting, or as soon as possible. Public documents, including the agenda and minutes, can be provided in various accessible formats. Please contact Trish Winter if a summary or other type of accessible format is needed.



PERA

Chief Investment Officer's Update

April 28, 2020

Dominic Garcia,
Chief Investment Officer

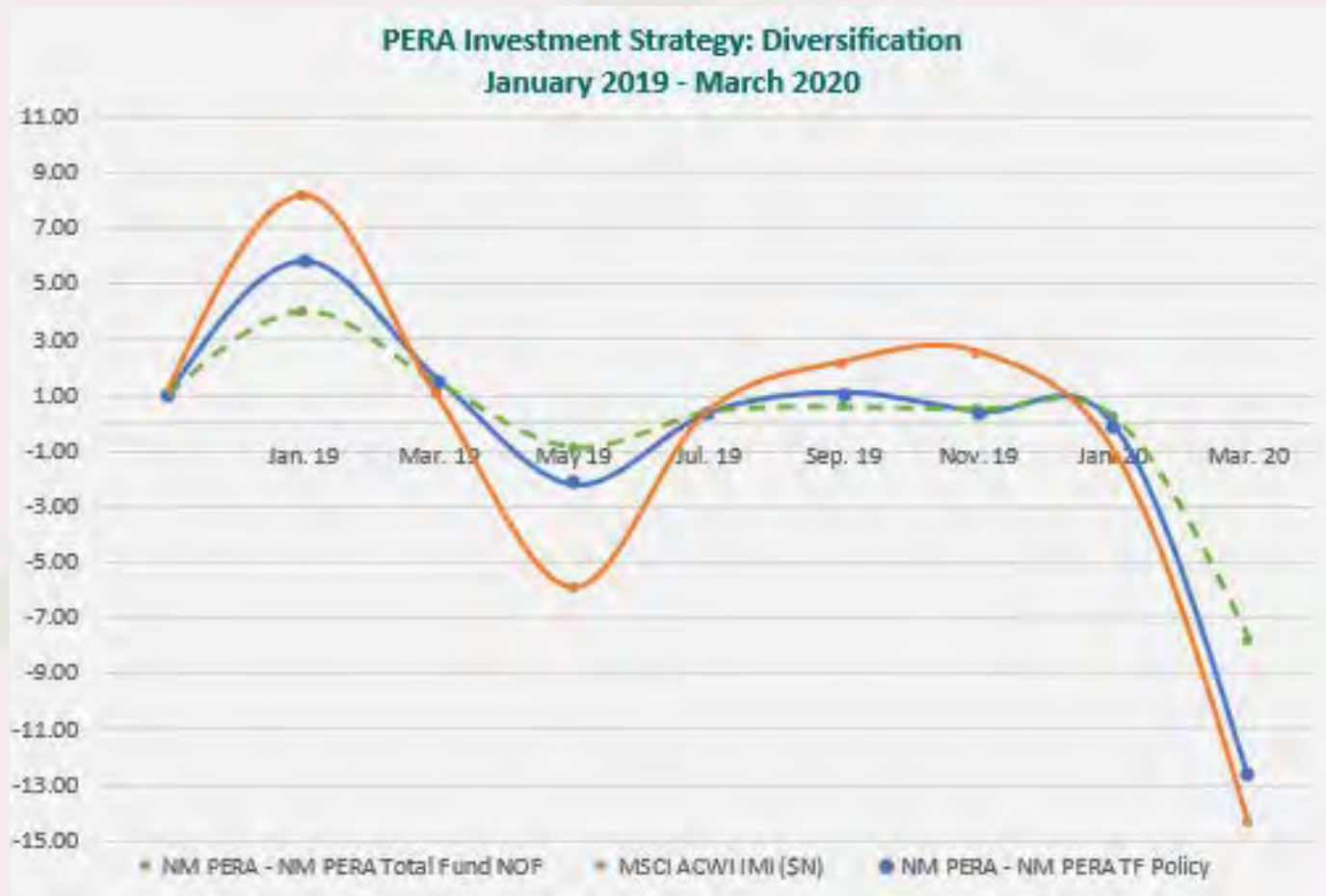
Today's Agenda

1. CIO Update: Investment Objectives Scorecard & Introduction to Recommendations
 - a. Quarterly performance for end of 2019 available
 - b. Focus time and discussion on performance through March 2020
2. Credit Portfolio Review
3. Liquidity & Leverage Re-education
 - a. Recommendation: include liquidity risk management parameters in policy
4. Risk Budget Review & Approval
 - a. No Change: Maintain 2019 Risk Budget: 1.5% active risk; +/- 0.50% band
 - b. Provide detail of Risk Budget & portable alpha re-education
5. 2020 Work Plan
6. Monitoring Items

PERA Investment Strategy: Diversification



Actual Experience



Investment Strategic Goals

1. Set Strategic Asset Allocation (Policy Portfolio) to meet the actuarial discount rate (7.25%) over the long-run.
2. Produce returns to meet or exceed benchmarks
 - A. Meet or exceed the Policy Portfolio over the intermediate and long-term
 - B. Meet or exceed the Reference Portfolio over the long-term
3. Be Cost-Efficient
 - Achieve a total investment cost at or below the benchmark cost relative to peers adjusted for fund size, risk-adjusted returns, and strategy.

Investment Governance: Decision Waterfall

Decision #1: Board sets long-term actuarial discount rate (currently 7.25%) to be achieved over 10 years or longer.

Decision #2: Board sets strategic asset allocation (Policy Portfolio) and benchmarks to meet discount rate over 10 years or longer.

- A. Policy Portfolio Benchmark
- B. Reference Portfolio Benchmark

Decision #3: Board delegates implementation of Policy Portfolio to Staff, with assistance of selection consultants.

Decision #4: Board delegates to Staff additional risk (Active Risk) beyond the Policy Portfolio to produce value add. The Active Risk Budget is the governing tool.

Recommend No Change. But, will review and examine in detail

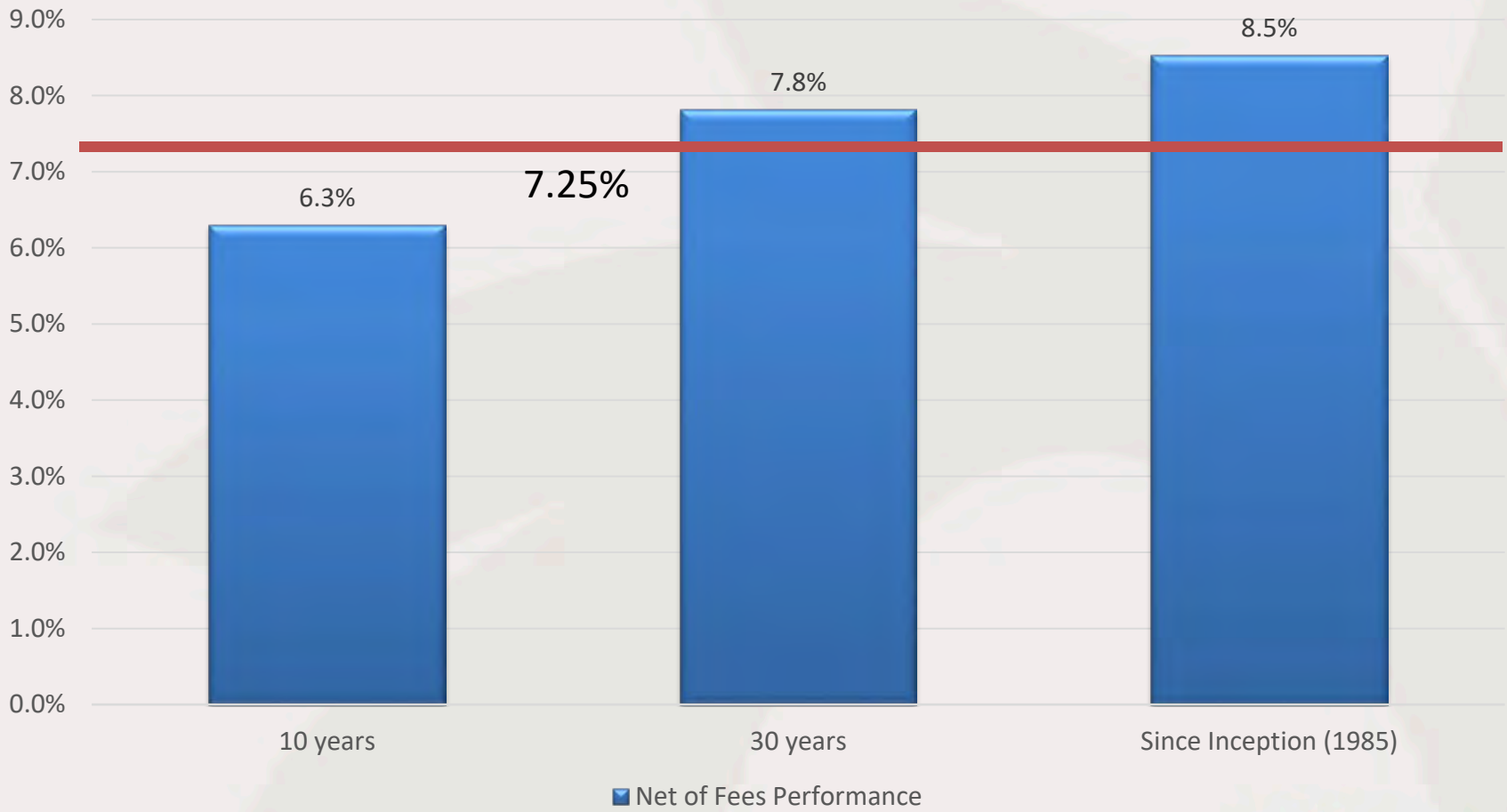
- A. Additional Risk Budget: 1.5% +/- 0.5% band
- B. Target Additional Return: 1.0%

PERA Investment Goals Scorecard

PERA Investment Goals	Actual Results
Set Strategic Asset Allocation (Policy Portfolio) to meet the actuarial discount rate (7.25%) over the long-run (10 years and longer).	✓ Exceeded actuarial hurdle rates for 30 years, and since data inception (1985)
<p>Produce returns to meet or exceed benchmarks</p> <p>Meet or exceed the Policy Portfolio over the intermediate (5 years) and long-term (10 years and longer)</p> <p>Meet or exceed the Reference Portfolio over the long-term</p>	<p>✓ Exceeded Policy Portfolio Benchmark over all relevant time periods</p> <p>✓ Exceeded Reference Portfolio</p>
<p>Achieve a total investment cost at or below a benchmark cost relative to peers adjusted for fund size and asset mix.</p> <p>As of 3/31/2020</p>	✓ Compared to 334 Global funds in a custom benchmark cost, PERA is low cost and saves approximately \$27m in fees and costs.

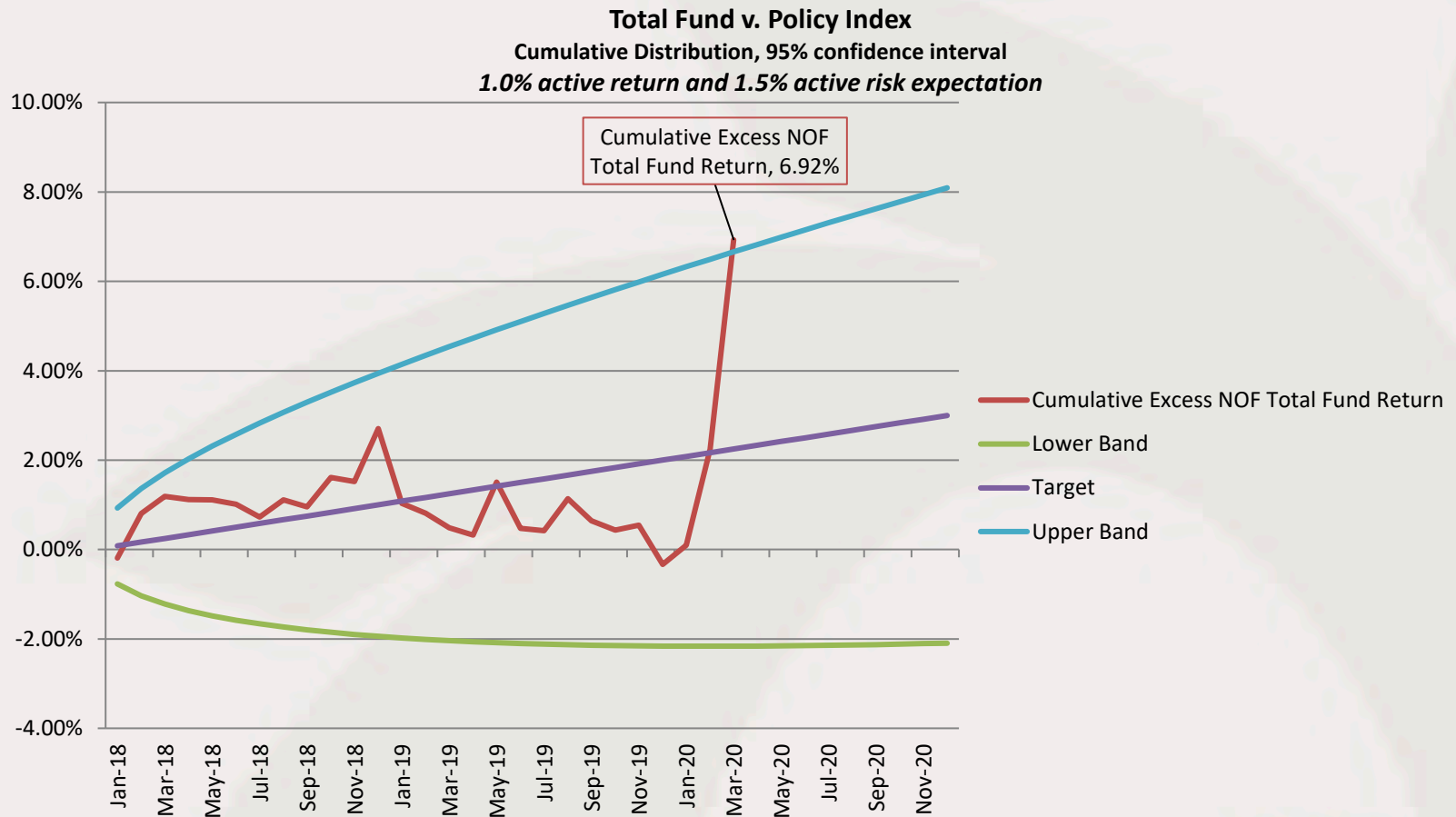
Scorecard:

Goal #1 Meet Actuarial Hurdle Over Long-Term



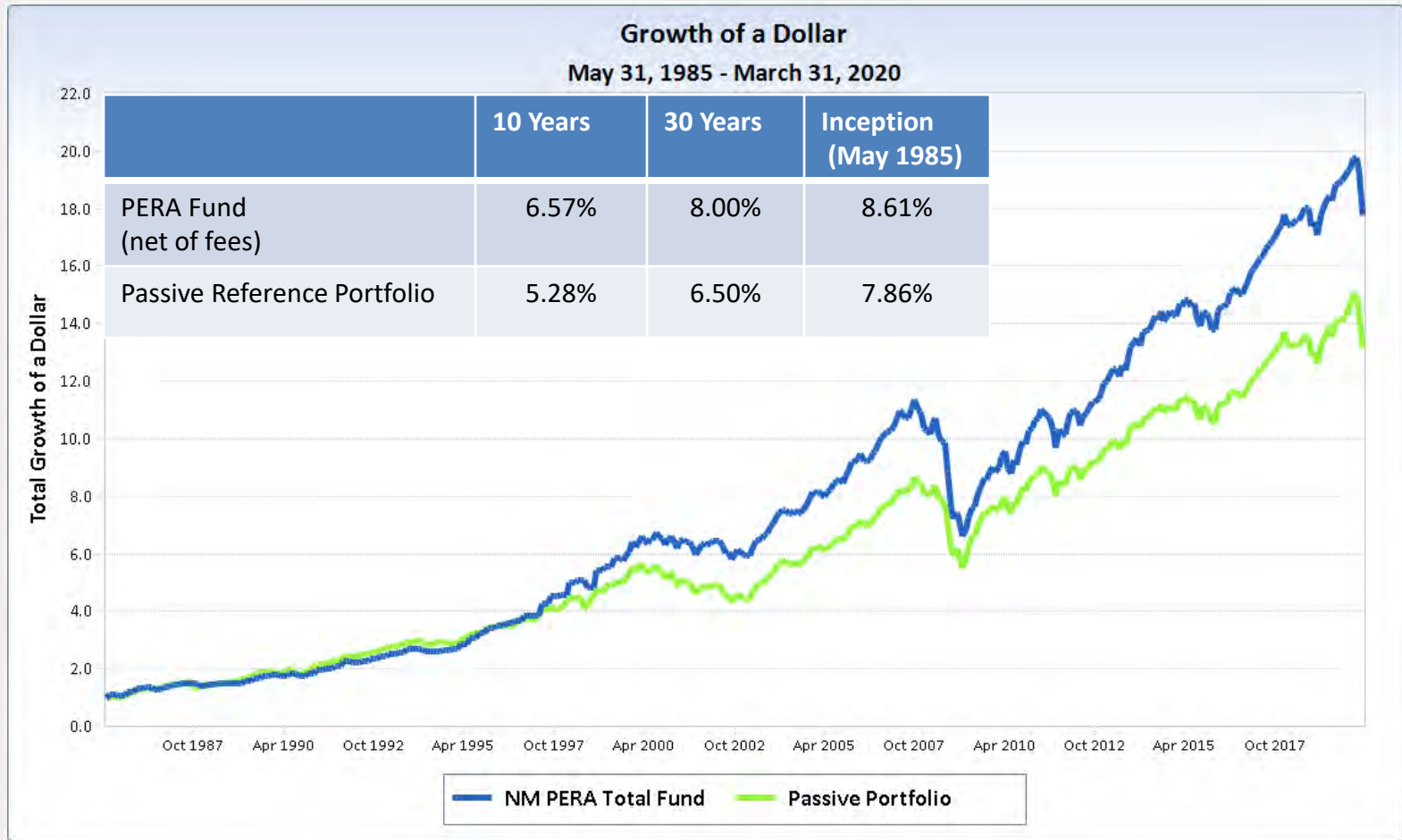
Scorecard:

Goal #2a Meet or Exceed Policy Portfolio



Scorecard:

Goal #2b Meet or Exceed Reference Portfolio Over Long Term



Scorecard:

Goal #3 Cost Effective

- In a global database of 334 global funds, PERA produced \$27 million in savings vs. custom benchmark cost

	*CEM Total Investment Cost Benchmark (2018)	*PERA Cost (Calendar Year 2018)	PERA Cost FY 2019
	85.5 bps	67.6 bps	47 bps
Lower cost implementation savings (\$)	N/A	\$18 million	N/A
Paying less than peers for external services (\$)	N/A	\$9 million	N/A
Total Cost Savings (\$)	N/A	\$27 million	N/A

*Source: CEM Benchmarking

Big Picture Going Forward

- **Potential Economic Regimes can vary widely with equal probability**
 - Good Times: High Growth, Low Inflation
 - So, So Times: Low Growth, Low Inflation
 - Inflationary: High Growth, High Inflation
 - Stagnation: Low Growth, High Inflation
 - Depression: No Growth or Negative Growth, deflation
- **Low Return Environment Persists**
 - Past 30 years (as of Dec. 2019):
 - Cash Return = ~3% returns
 - 60/40 portfolio (over cash)= ~5.6%
 - Total Return= ~8.6%
 - Cash is now ZERO, and will be Lower for Longer; Need to make up 2%-3%.
- **PERA Sustainability**
 - SB72 helps us weather this storm, sustain, and eventually thrive
 - @ 6% long-term return; cash flow and system stable for next 10-12 years
 - Afterwards, TIER 2 really kicks-in: cash flow & funding ratios improve

New Mexico Profit Share Plan

Total Benefit = Defined Benefit + Profit Share COLA

Total Discount
Rate = 7.25%

Profit Share COLA

Excess Earnings*Funding Status =
Available COLA Pool

Defined Benefit

(Investment Cost = 5.50%-6.0%)

Additional, Awarded Benefit:

- Profit Share COLA shared based on earnings
- COLA 0.5% to 3.0% up to 5%
- 1 year after retirement
- No age limit

Guaranteed Benefit:

Tier 1

Tier 2

Note: contribution rates are dynamic to the downside with triggers based on funding ratio

Risk Budget: Stay the Course & *Lean In*

- Maintain 2019 Approved Risk Budget parameters: 1.5% active risk; +/-0.50% band
- Re-allocate within and flex into active opportunities due to market dislocation
- Improved expected net return



Risk Budget: Active Opportunity Set

Private/Illiquid Management

- Distressed markets tend to be some of the best vintage year returns
- For now, Stay the Course with targets and pacing plans

Public Active Management

- Credit
 - Buy What the Fed Buys: Investment Grade Credit, Fallen Angels
 - TALF (Term Asset Lending Facility): Vehicles backed by the Fed to buy securitized bonds (i.e. ABS consumer, MBS, CMBS)
 - Distressed
 - Contingent Capital Vehicle
- Manager Selection
 - Strong opportunity set for security selection in dislocation
 - Flex manager guidelines with high conviction managers and areas (Core Bonds, US Small Cap, REITS)
 - Long-short strategies, i.e. portable alpha

Risk Budget: Active Risk Outcomes

Stay the Course

- 1.5% active risk target; +/-0.5% band

Modestly Increase Active vs. Passive allocation in Public Markets from ~40% to 45%

- Flex Allocations Into: Credit (investment grade & high yield) & Portable Alpha

Net Return

- Bigger bang for the active buck in Public Active. More efficient allocation with higher expected active net return.

Total Cost

- Increase in total cost approximately 18 bps, but still meeting cost objectives at or below benchmark total cost.
 - FY 2019 Total Costs = 47 bps. Approximately increase cost to ~65 bps.

Pre-Crisis Liquidity

In 2019, established liquidity accounts in each asset class. Over-layed with policy exposure. Goal was to be able to provide liquidity at total fund and for benefits, transact in times of stress, and to deploy liquidity into opportunities *after* distress.

Total Liquidity: ~\$1 billion.

Equities

- \$90m, over-layed with equity derivatives

Credit

- \$500m, over-layed with credit derivatives

Risk Mitigation

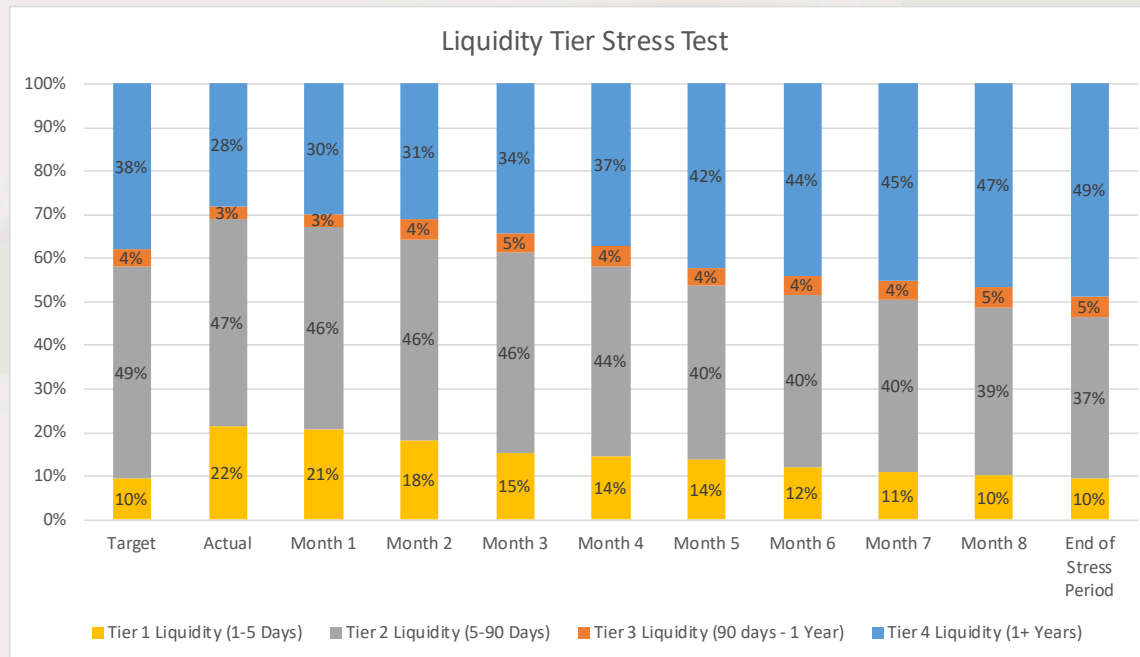
- \$230m, over-layed with rate derivatives

Real Assets

- \$190m, over-layed with REIT and Commodity derivatives

Liquidity Stress: June 2008-February 2009

- Simulated current portfolio with Risk Budget active recommendations
- Able to maintain liquidity needs after stress period; nearly 50% of portfolio liquid in 90 days
- Post stress period, Tier 1 liquidity (available immediately) would be nearly \$1 billion approx. 9-10 months of liquidity
- *Recommendation: maintain minimum 10% Tier 1 liquidity*



Key Next Steps

Today

Credit Asset Class Review

Re-Education Liquidity & Leverage

Approval of Liquidity Risk Management Parameters (Action)

Risk Budget Review & Approval (Action)

- Detail review
- Re-education Portable Alpha

May

Re-education Risk Parity

Risk Budget Implementation Update

Board Retreat (TBD)

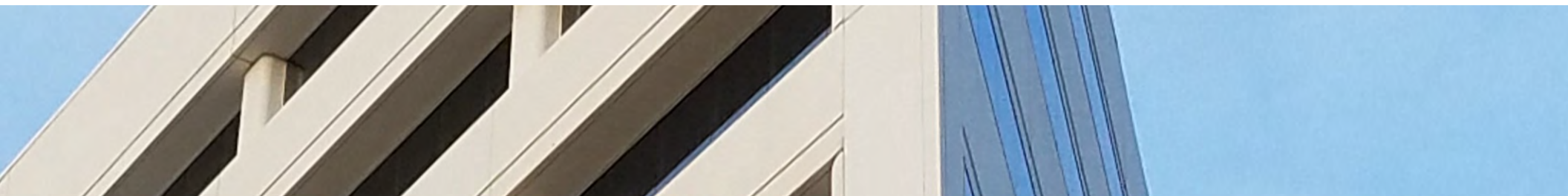
Strategic Asset Allocation Review (Possible Action)

- Review/discussion of private assets & leverage in asset allocation



WILSHIRE ASSOCIATES

Wilshire Consulting



Quarterly Market Review

Thomas Toth, CFA
Managing Director

April 2020

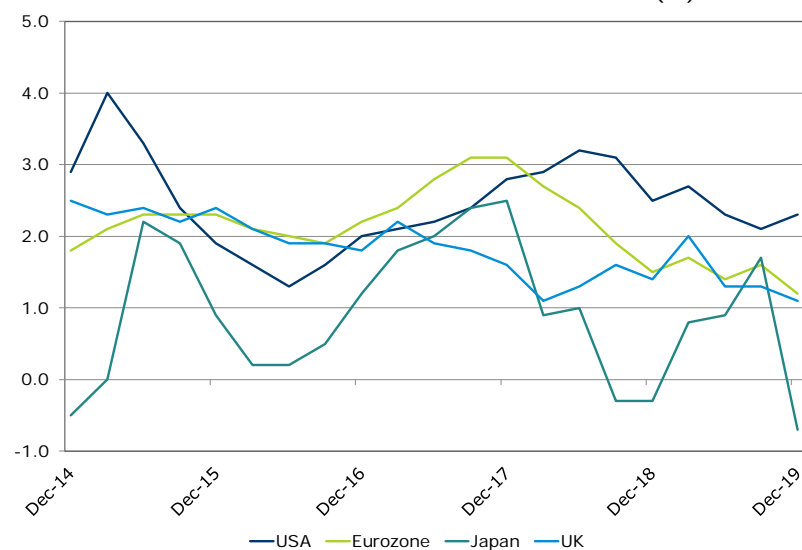
ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST					
2015	2016	2017	2018	2019	2020 YTD
REITs 4.2%	MLPs 18.3%	Emrg Mrkts 37.7%	T-Bills 1.9%	U.S. Equity 31.0%	Core Bond 3.2%
U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	Core Bond 0.0%	REITs 25.8%	U.S. TIPS 1.7%
Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	U.S. TIPS -1.3%	Developed 22.7%	T-Bills 0.6%
T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	High Yield -2.1%	Emrg Mrkts 18.9%	High Yield -12.7%
Developed -0.4%	Emrg Mrkts 11.6%	REITs 4.2%	REITs -4.8%	High Yield 14.3%	U.S. Equity -20.7%
U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. Equity -5.3%	Core Bond 8.7%	Developed -22.7%
High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	Commodities -11.2%	U.S. TIPS 8.4%	Commodities -23.3%
Emrg Mrkts -14.6%	Core Bond 2.6%	Commodities 1.7%	MLPs -12.4%	Commodities 7.7%	Emrg Mrkts -23.6%
Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Developed -13.4%	MLPs 6.6%	REITs -25.6%
MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mrkts -14.2%	T-Bills 2.3%	MLPs -57.2%

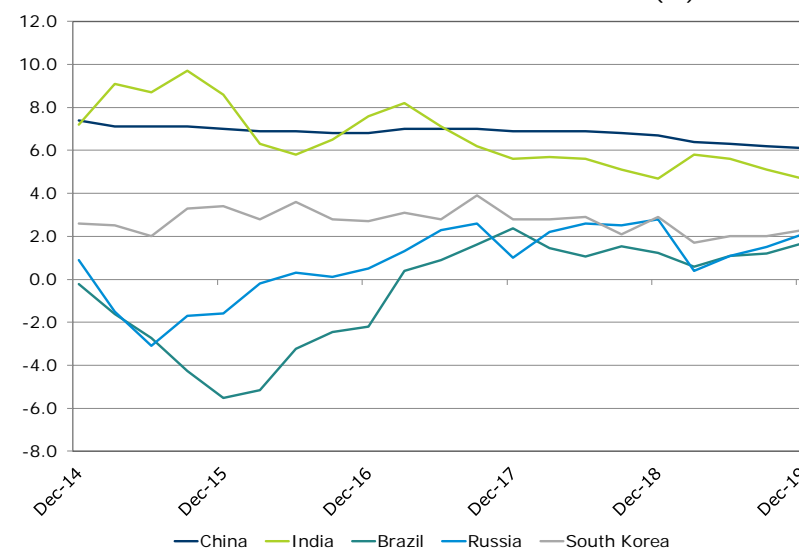
ANNUALIZED 5-YEAR AS OF 3/2020
U.S. Equity 6.0%
Core Bond 3.4%
High Yield 2.8%
U.S. TIPS 2.7%
T-Bills 1.2%
Emrg Mrkts 0.0%
Developed -0.1%
REITs -0.2%
Commodities -7.8%
MLPs -20.7%

GROWTH AND INFLATION

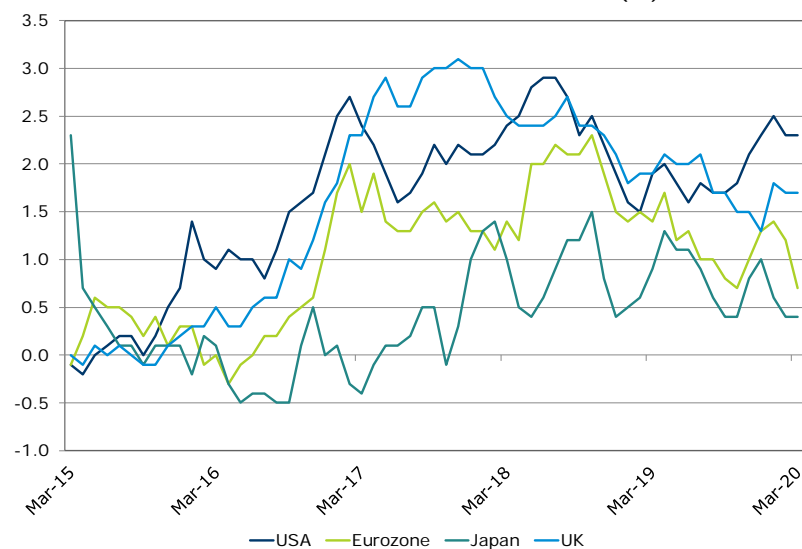
DEVELOPED MARKETS REAL GDP GROWTH YoY (%)



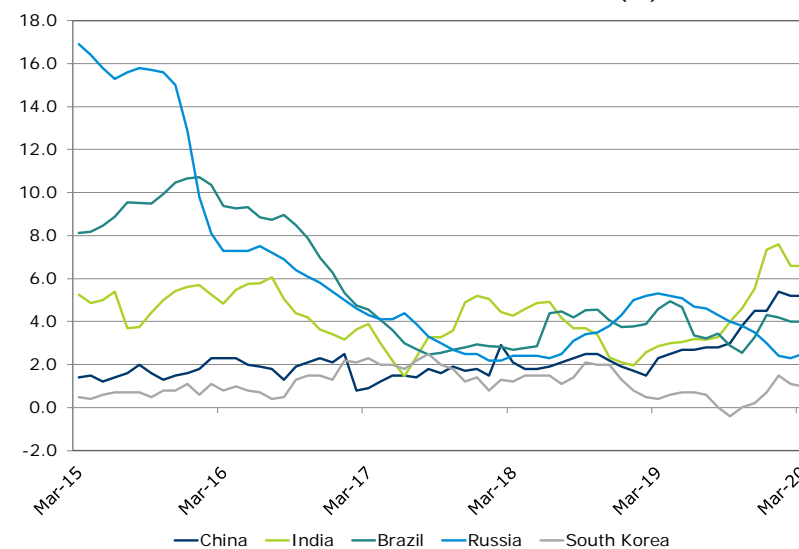
EMERGING MARKETS REAL GDP GROWTH YoY (%)



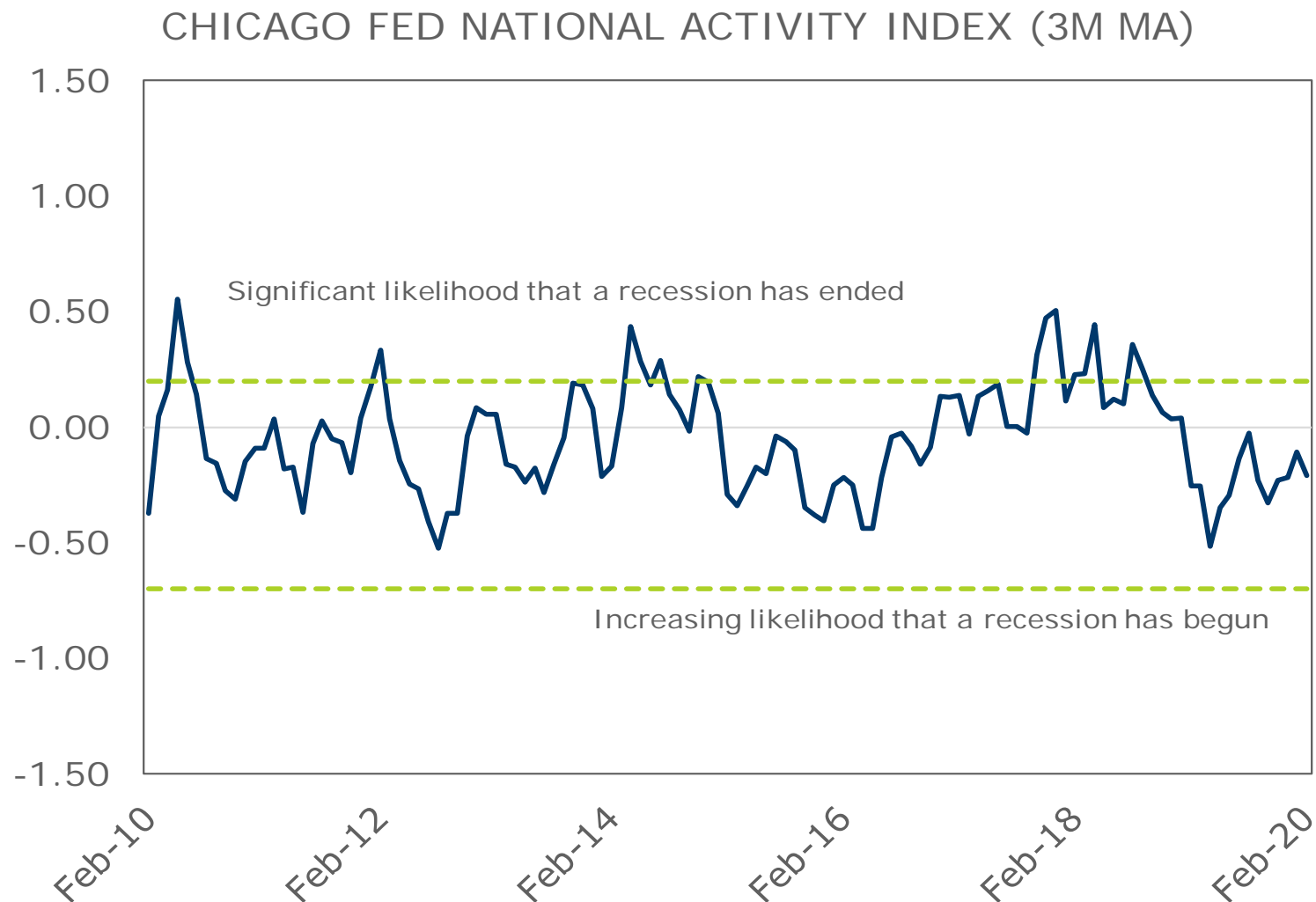
DEVELOPED MARKETS CPI GROWTH YoY (%)



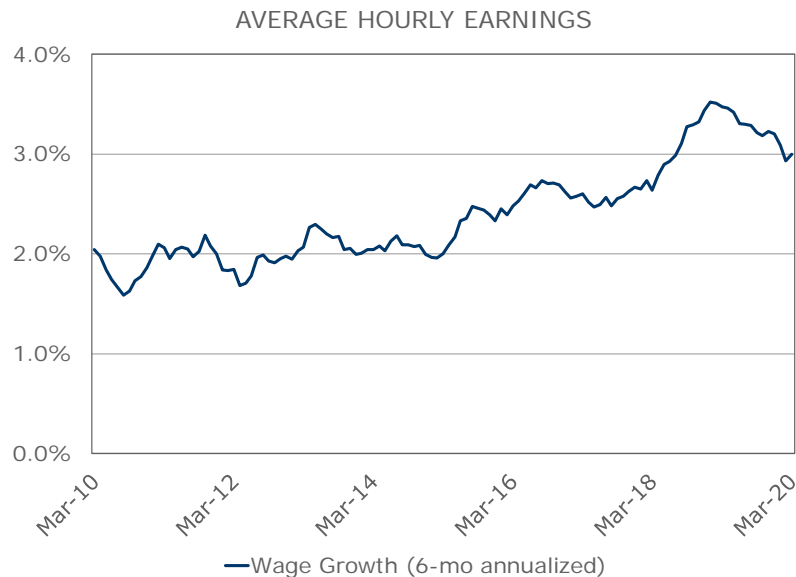
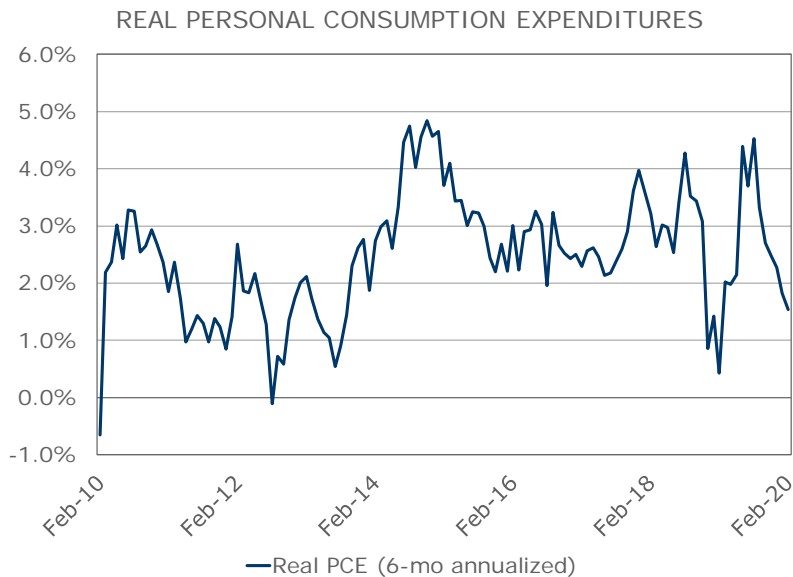
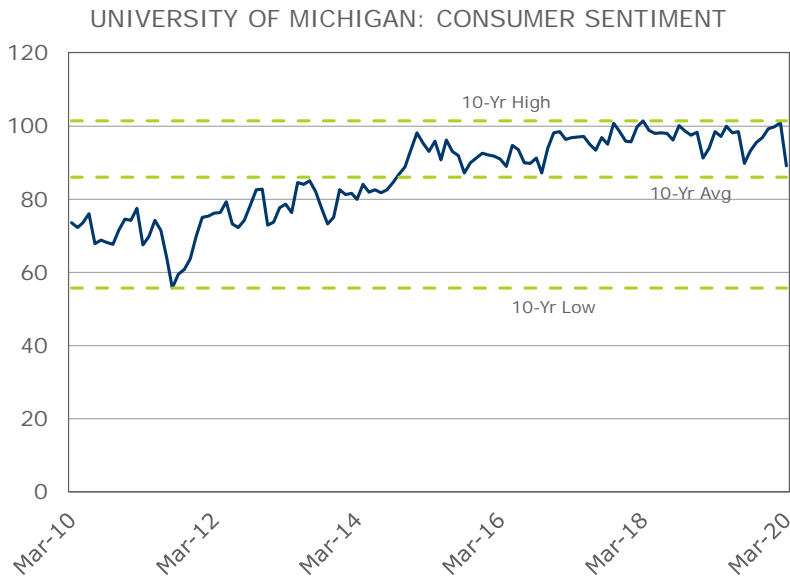
EMERGING MARKETS CPI GROWTH YoY (%)



ECONOMIC GROWTH

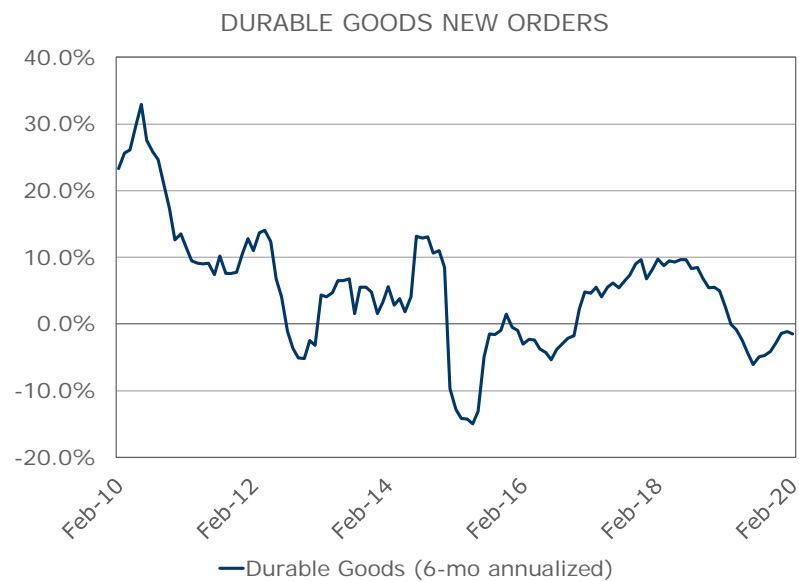
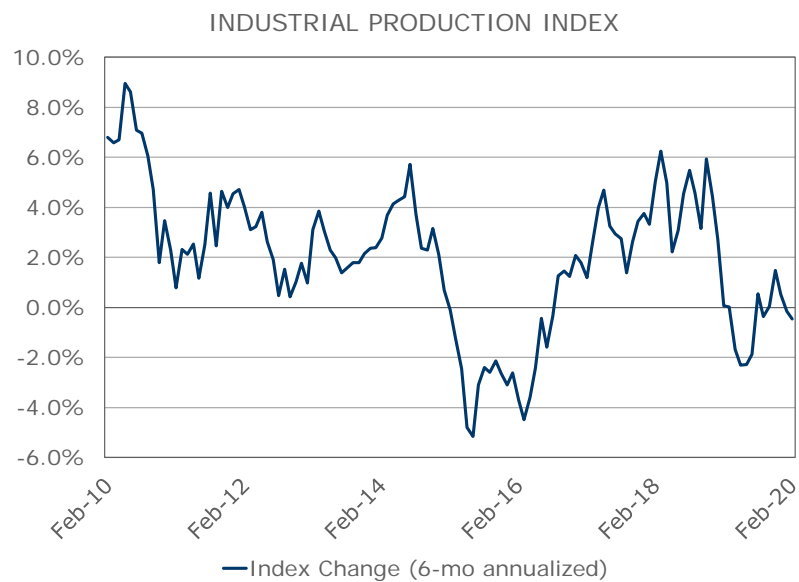
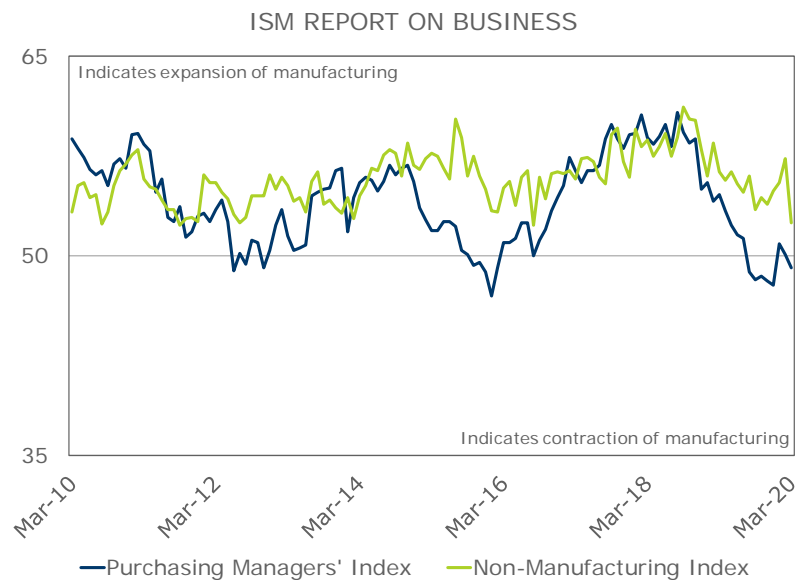


CONSUMER ACTIVITY

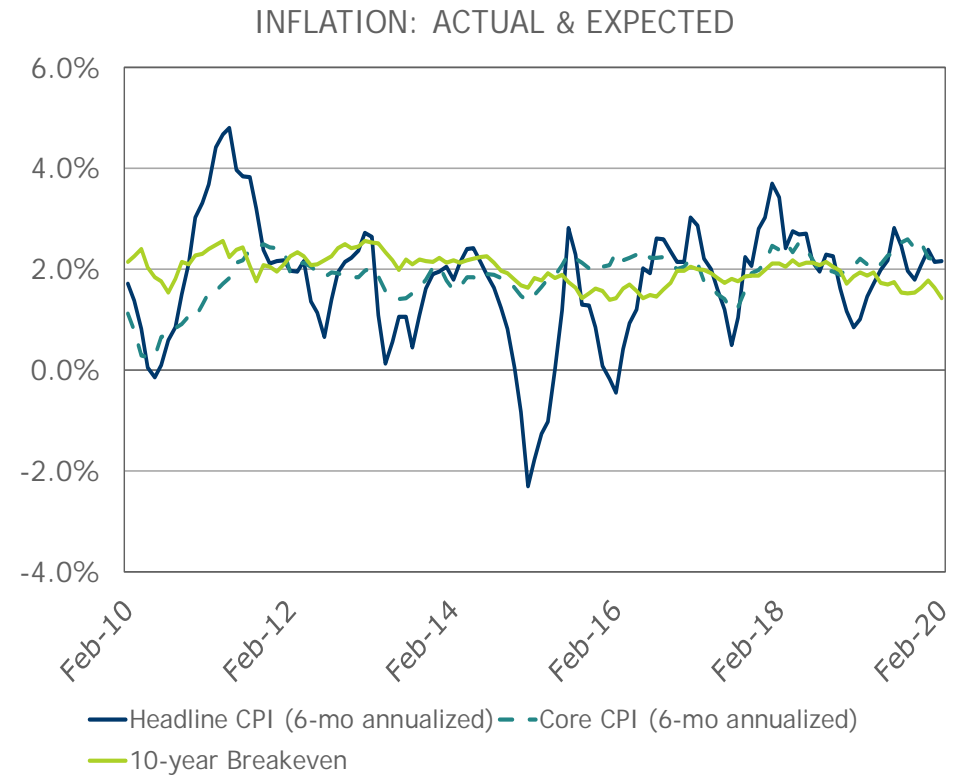


Wilshire Consulting

BUSINESS ACTIVITY

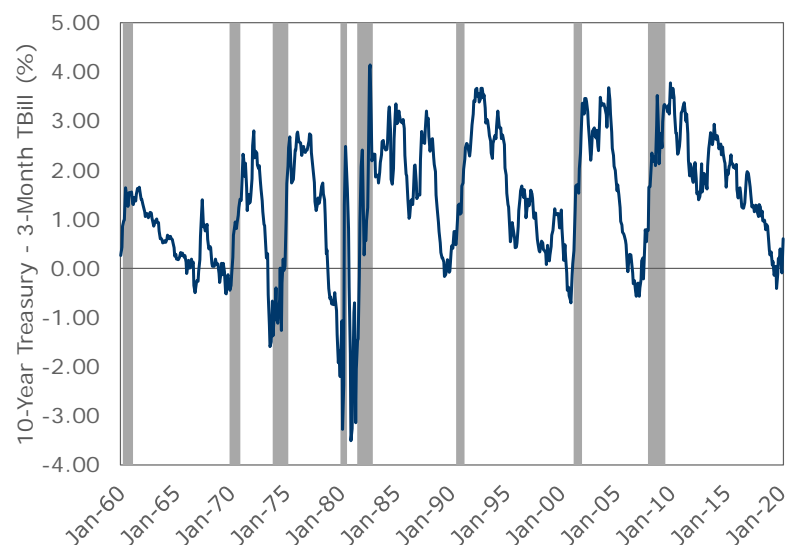


INFLATION AND EMPLOYMENT

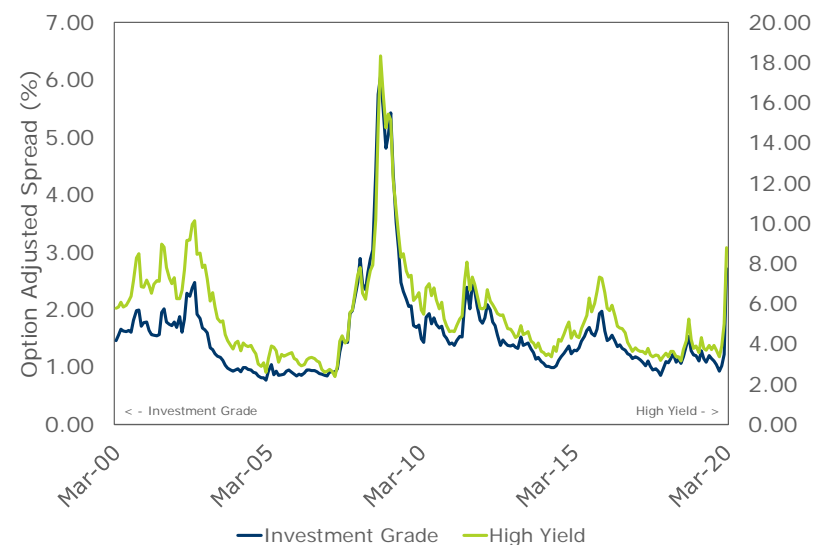


RISK MONITOR

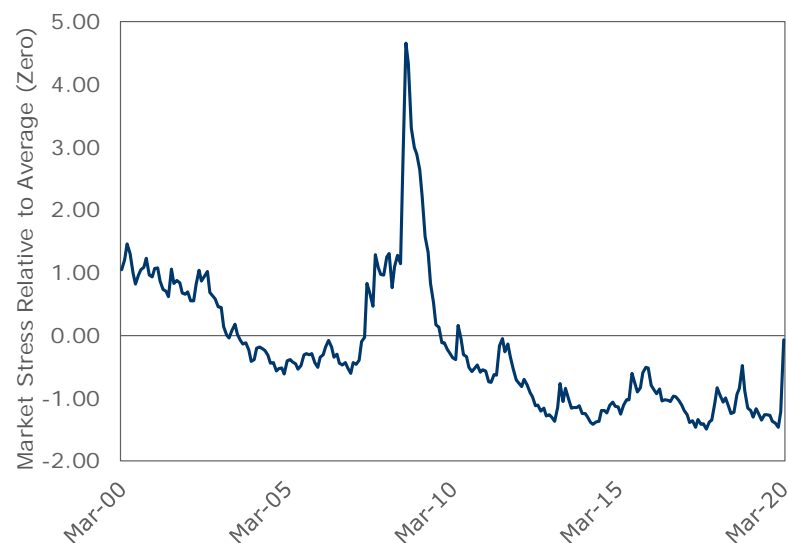
YIELD CURVE SLOPE VS RECESSIONS (IN GRAY)



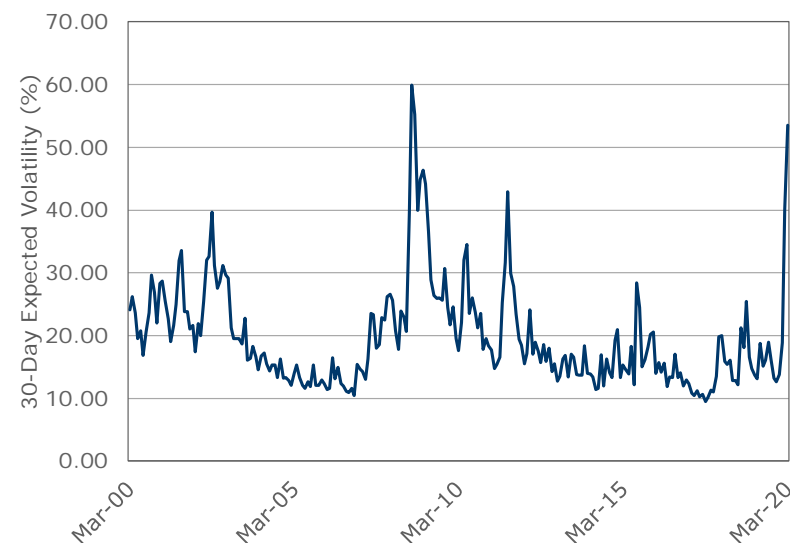
BLOOMBERG BARCLAYS CREDIT INDEXES



ST. LOUIS FED FINANCIAL STRESS INDEX



CBOE VOLATILITY INDEX



ASSET ASSUMPTIONS - EQUITY

- Public equity assumption up 1.00% since December 31
 - DDM = 6.50%
 - IGV = 7.90%
 - CAPE = 9.00%
- Although assumption well below IGV signal, there is massive uncertainty around 2020 EPS estimates, along with uncertainty regarding timing of re-opening U.S. economy
- Private Equity assumption is up for the quarter but less than public equity due to changes in leverage costs

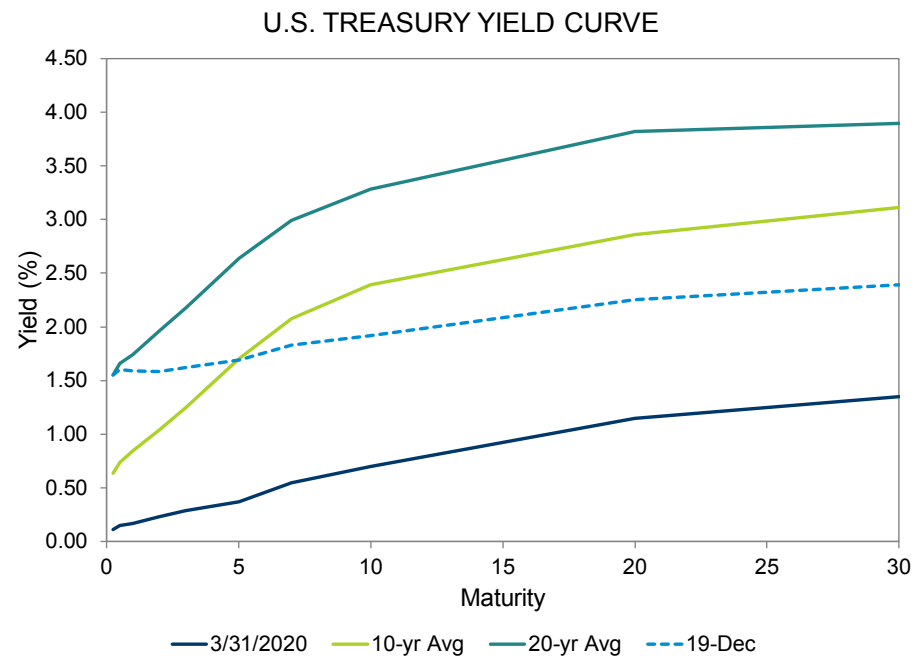
	TOTAL RETURN (%)			RISK (%)
	MAR 2020	DEC 2019	CHANGE	
U.S. STOCKS	6.75	5.75	1.00	17.00
DEV. EX-U.S. STOCKS	7.25	6.25	1.00	18.00
EMERGING MARKET STOCKS	7.25	6.25	1.00	26.00
GLOBAL STOCKS	7.20	6.20	1.00	17.10
PRIVATE EQUITY	8.40	7.95	0.45	28.00

ASSET ASSUMPTIONS - FIXED INCOME

- Investment grade fixed income assumptions are down for the quarter on a much lower yield curve
 - Yield on 10-year Treasury is down 1.24%, currently at 0.70%
 - Yield curve is down across the maturity spectrum

- High yield spreads are up big this quarter, +5.42%
- Average spread on the index was 8.99% on March 31st

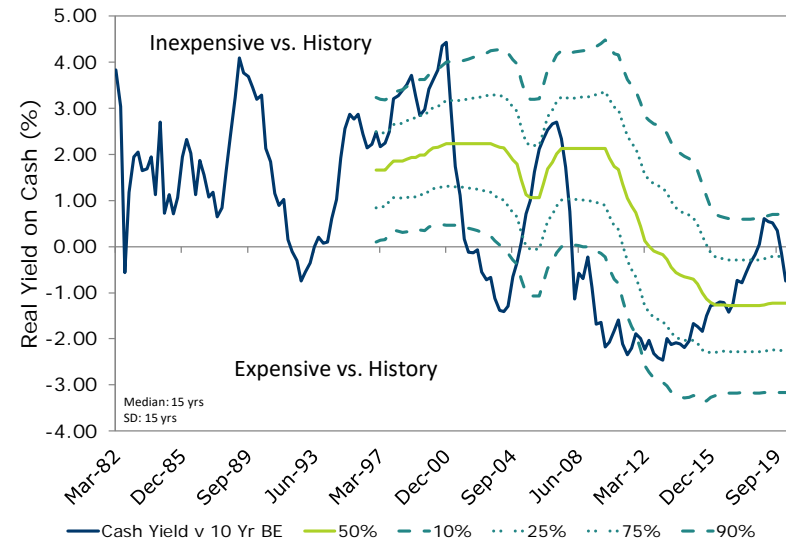
	TOTAL RETURN (%)			RISK (%)
	MAR 2020	DEC 2019	CHANGE	
CASH EQUIVALENTS	0.70	1.85	-1.15	1.25
CORE BONDS	1.80	2.85	-1.05	5.15
LT CORE BONDS	2.70	3.25	-0.55	9.85
U.S. TIPS	0.70	2.15	-1.45	6.00
HIGH YIELD BONDS	5.40	4.30	1.10	10.00
EMD LOCAL CURRENCY (HDG)	5.10	4.35	0.75	5.00



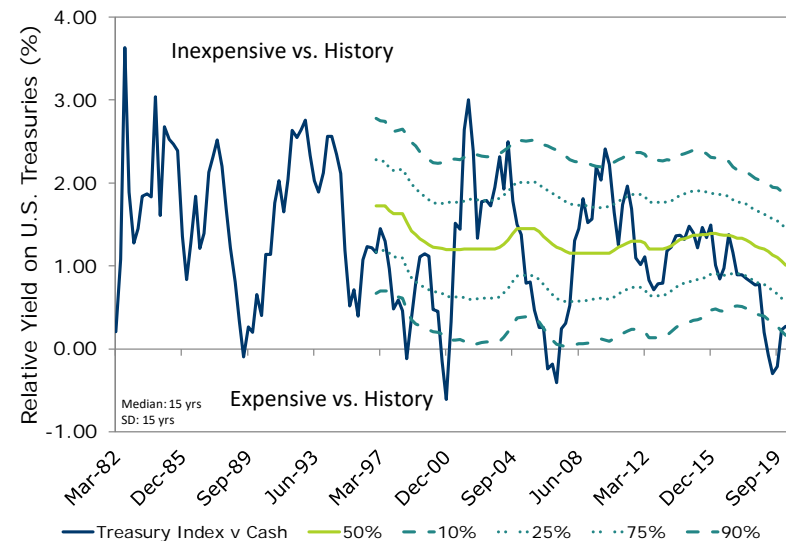
VALUATION - CASH AND TREASURY BONDS

- Real yield on cash is again below zero
 - 3-month Treasury = 0.30%; Breakeven inflation = 1.04%
 - Yield on 10-year TIPS is negative (-0.17%) but has generally been positive since 2013
- Spread between the broad Treasury market index and cash is again positive (0.28%)
- Although yields have fallen dramatically in 2020, the curve is at least upward sloping across all maturities

CASH YIELD VS 10-YEAR BREAKEVEN

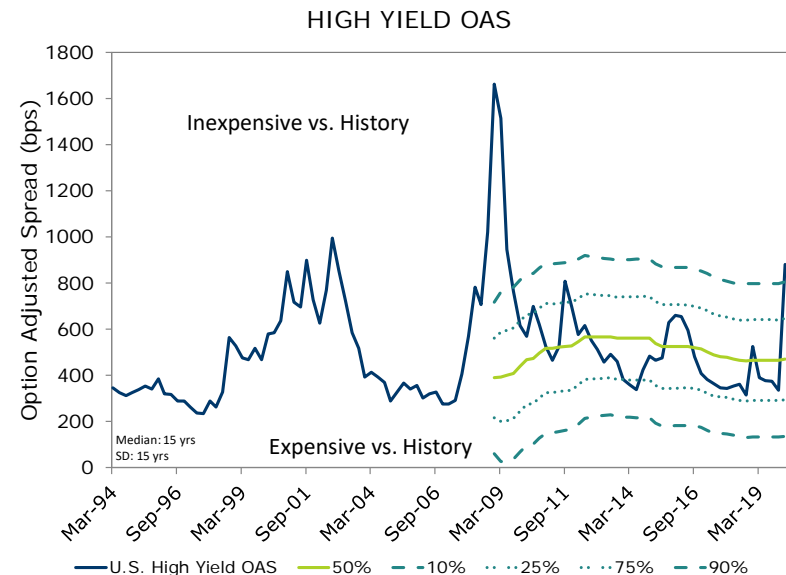
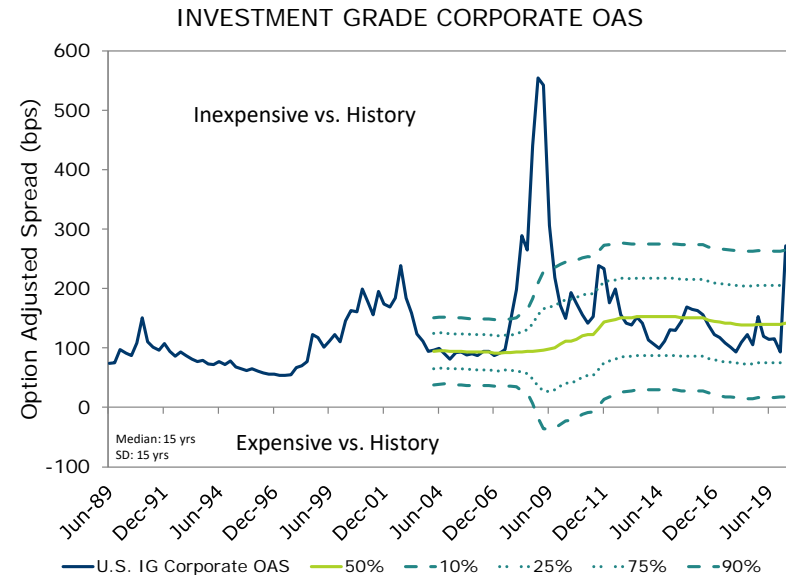


TREASURY INDEX VS CASH



VALUATION - RELATIVE FIXED INCOME YIELDS

- Spread versus Treasuries on the investment grade index spiked during the quarter and is at the 91%-percentile outcome versus its 15-year history
- Spread on high yield bonds is also at an extreme versus history, currently at the 94%-percentile outcome



CONCLUDING THOUGHTS

- Inflation assumption is down 60 basis points from December 2019
 - Market signal = 0.87%
 - Extreme liquidity conditions likely distorted bond prices, and therefore breakeven
- Real estate securities are up on higher current yields; commodities are down on lower inflation and cash
- Expected real return (return in excess of inflation) on cash is again negative

	TOTAL RETURN (%)			RISK (%)
	MAR 2020	DEC 2019	CHANGE	
U.S. STOCKS	6.75	5.75	1.00	17.00
DEV. EX-U.S. STOCKS	7.25	6.25	1.00	18.00
EMERGING MARKET STOCKS	7.25	6.25	1.00	26.00
GLOBAL STOCKS	7.20	6.20	1.00	17.10
PRIVATE EQUITY	8.40	7.95	0.45	28.00
CASH EQUIVALENTS	0.70	1.85	-1.15	1.25
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LT CORE BONDS	2.70	3.25	-0.55	9.85
U.S. TIPS	0.70	2.15	-1.45	6.00
HIGH YIELD BONDS	5.40	4.30	1.10	10.00
EMD LOCAL CURRENCY (HDG)	5.10	4.35	0.75	5.00
U.S. RE SECURITIES	5.60	5.00	0.60	17.00
PRIVATE REAL ESTATE	7.00	6.60	0.40	14.00
COMMODITIES	1.85	3.60	-1.75	15.00
MIDSTREAM ENERGY INFRA.	9.25	7.70	1.55	19.00
GLOBAL LISTED INFRA.	6.00	5.30	0.70	17.00
PRIVATE INFRASTRUCTURE	8.35	6.95	1.40	25.00
REAL ASSET BASKET	5.65	5.90	-0.25	8.75
INFLATION	1.15	1.75	-0.60	1.75
RETURNS MINUS INFLATION				
U.S. STOCKS	5.60	4.00	1.60	
U.S. BONDS	0.65	1.10	-0.45	
CASH EQUIVALENTS	-0.45	0.10	-0.55	
STOCKS MINUS BONDS	4.95	2.90	2.05	
BONDS MINUS CASH	1.10	1.00	0.10	

Q1 2020 CORRELATION MATRIX

	EQUITY						FIXED INCOME						REAL ASSETS					
	US Stock	Dev	Emg Stock	Global	Global Stock	Private Equity	Cash	Core Bond	LT		High Yield	Dev ex- US Bond (Hdg)	Real Estate			Cmddy	Real Assets	US CPI
		ex-US		ex-US					Private									
		RES		RES						RE								
COMPOUND RETURN (%)	6.75	7.25	7.25	7.50	7.20	8.40	0.70	1.80	2.70	0.70	5.40	0.80	5.60	5.80	7.00	1.85	5.65	1.15
ARITHMETIC RETURN (%)	8.05	8.70	10.20	9.10	8.50	11.75	0.70	1.95	3.15	0.90	5.85	0.85	6.95	6.95	7.90	2.95	6.00	1.15
EXPECTED RISK (%)	17.00	18.00	26.00	18.95	17.10	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75
CASH YIELD (%)	2.25	3.75	3.00	3.55	2.80	0.00	0.70	1.90	2.65	1.15	7.40	1.10	4.75	4.75	2.95	0.70	2.50	0.00
CORRELATIONS																		
US Stock	1.00																	
Dev ex-US Stock (USD)	0.81	1.00																
Emerging Mkt Stock	0.74	0.74	1.00															
Global ex-US Stock	0.83	0.96	0.87	1.00														
Global Stock	0.95	0.92	0.83	0.94	1.00													
Private Equity	0.74	0.64	0.62	0.67	0.74	1.00												
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
Core Bond	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00										
LT Core Bond	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.93	1.00									
TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.60	0.47	1.00								
High Yield Bond	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.66	0.39	0.26	1.00						
US RE Securities	0.59	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00					
Global RE Securities	0.65	0.59	0.56	0.62	0.66	0.58	-0.05	0.17	0.22	0.11	0.62	0.03	0.94	1.00				
Private Real Estate	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.78	0.76	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.42	0.43	0.50	0.48	0.47	0.43	0.01	0.24	0.25	0.41	0.53	0.06	0.65	0.69	0.69	0.59	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	-0.08	0.05	0.03	0.05	0.44	0.26	1.00



APPENDIX

MARKET COMMENTARY

U.S. Equity

The U.S. stock market was down -20.7% for the first quarter, the worst quarter since the Global Financial Crisis. Uncertainty and a declining outlook were the driving forces behind the sell-off as the COVID-19 pandemic worsened, resulting in significant limitations on global commerce. Government action so far has included cutting short-term rates to near zero and the passage of a \$2 trillion stimulus bill.

The world of investing has been introduced to an unprecedented set of conditions in 2020. As the COVID-19 virus spreads globally, the response has been to separate people and close nonessential businesses, with others working remotely. The economic expectations are that the unemployment rate will rise into the teens and U.S. GDP will fall by one-third. Investors are facing challenges reminiscent of the Global Financial Crisis.

Non-U.S. Equity

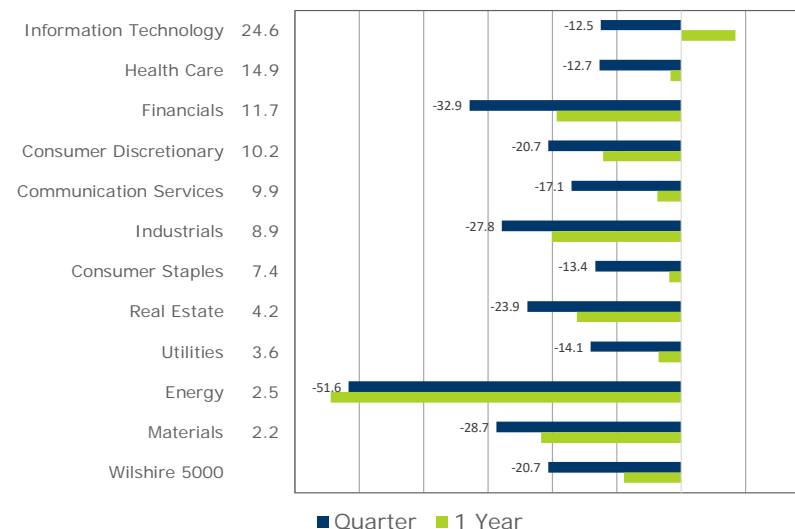
Economic growth in the U.K. was already nonexistent during the fourth quarter, before the country had to deal with the virus in earnest. Across continental Europe, quarantine efforts are starting to bear fruit as cases in Italy and Spain appear to be approaching a peak. China has recently been relaxing severe travel restrictions while the official Purchasing Manager's Index for China indicates that manufacturing in the country expanded during March after a dramatic slowdown.

Fixed Income

The U.S. Treasury yield curve fell dramatically during the quarter. The 10-year Treasury yield ended the quarter at 0.70%, down 122 basis points. The FOMC decreased its overnight rate by a total of 1.50% during two unscheduled meetings in March. The Fed also announced quantitative easing measures totaling at least \$700 billion over the coming months.

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	-20.7	-20.7	-8.9	4.1	6.0	10.2
WILSHIRE U.S. LARGE CAP	-19.7	-19.7	-7.3	5.0	6.7	10.5
WILSHIRE U.S. SMALL CAP	-31.4	-31.4	-25.0	-5.0	-0.5	7.4
WILSHIRE U.S. LARGE GROWTH	-17.1	-17.1	-2.7	8.6	8.5	11.9
WILSHIRE U.S. LARGE VALUE	-22.1	-22.1	-11.5	1.5	4.7	9.1
WILSHIRE U.S. SMALL GROWTH	-28.2	-28.2	-20.0	-1.1	1.0	8.8
WILSHIRE U.S. SMALL VALUE	-34.5	-34.5	-29.6	-8.9	-2.1	6.0
WILSHIRE REIT INDEX	-25.6	-25.6	-19.4	-2.5	-0.2	7.7
MSCI USA MIN. VOL. INDEX	-17.1	-17.1	-5.9	6.6	7.9	11.8
FTSE RAFI U.S. 1000 INDEX	-26.4	-26.4	-16.1	-0.9	2.8	8.6

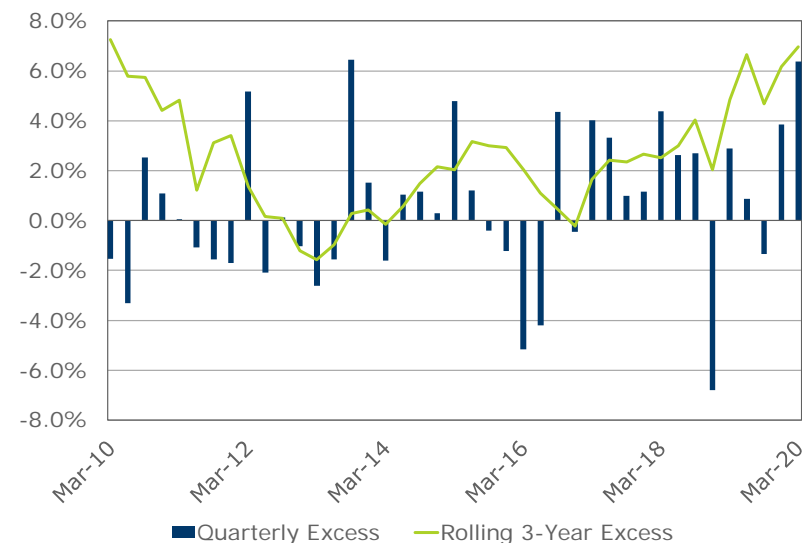
U.S. SECTOR WEIGHT AND RETURN (%)



LARGE CAP VS SMALL CAP



LARGE GROWTH VS LARGE VALUE

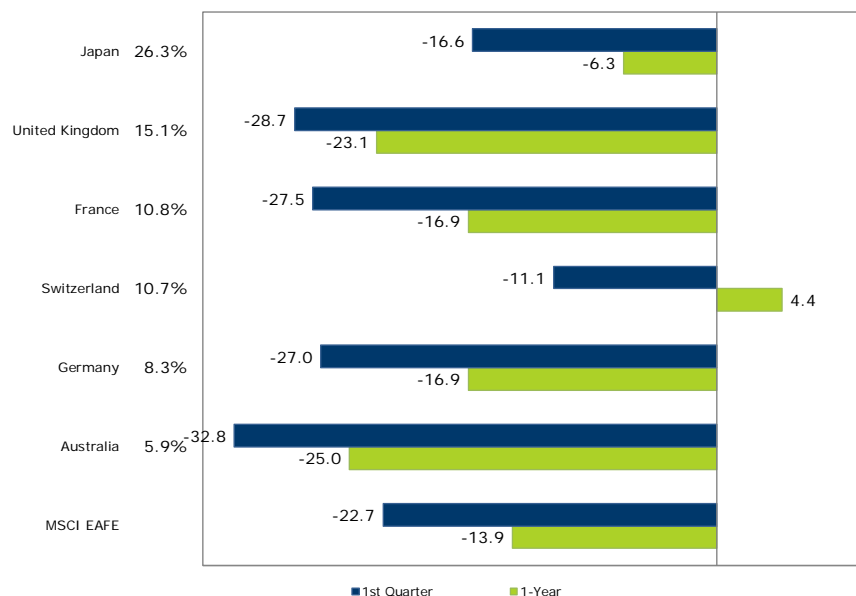


Data sources: Wilshire Compass, Wilshire Atlas

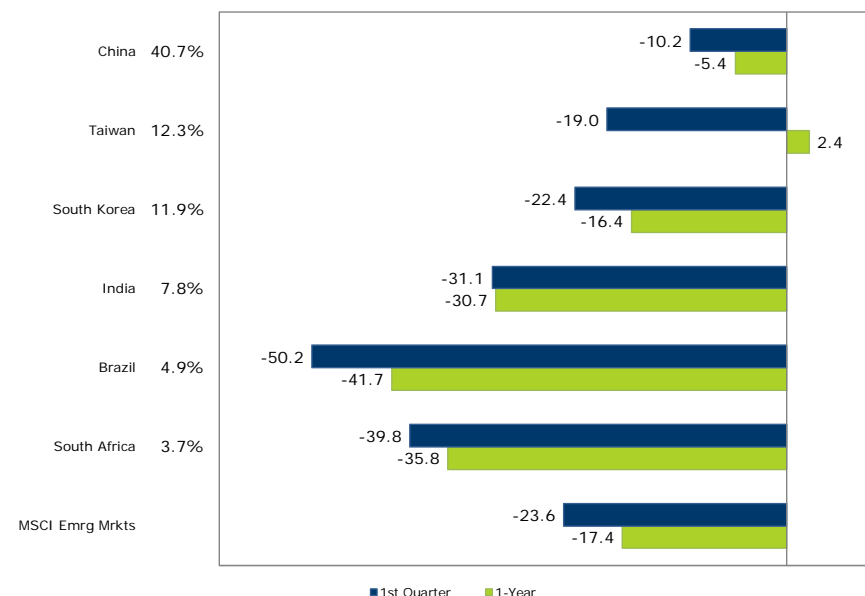
NON-U.S. EQUITY MARKET

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	-23.3	-23.3	-15.1	-1.5	-0.2	2.5
MSCI EAFE (\$G)	-22.7	-22.7	-13.9	-1.3	-0.1	3.2
MSCI EMERGING MARKETS (\$G)	-23.6	-23.6	-17.4	-1.3	0.0	1.0
MSCI FRONTIER MARKETS (\$G)	-26.6	-26.6	-18.7	-4.0	-2.5	1.4
MSCI ACWI EX-US GROWTH (\$G)	-18.2	-18.2	-6.9	2.9	2.5	4.3
MSCI ACWI EX-US VALUE (\$G)	-28.5	-28.5	-23.2	-5.9	-2.9	0.7
MSCI ACWI EX-US SMALL (\$G)	-28.9	-28.9	-20.8	-4.5	-0.3	3.2
MSCI ACWI MINIMUM VOLATILITY	-15.9	-15.9	-7.0	4.3	5.3	8.7
MSCI EAFE MINIMUM VOLATILITY	-16.3	-16.3	-9.0	2.1	2.7	6.1
FTSE RAFI DEVELOPED EX-US	-27.6	-27.6	-20.8	-4.7	-1.8	1.8
MSCI EAFE LC (G)	-20.4	-20.4	-12.1	-1.3	0.3	4.9

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



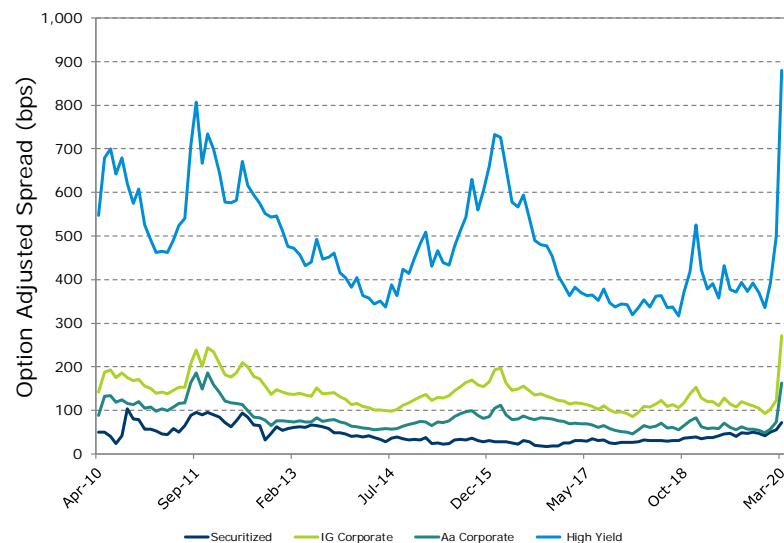
Data sources: Wilshire Compass

U.S. FIXED INCOME

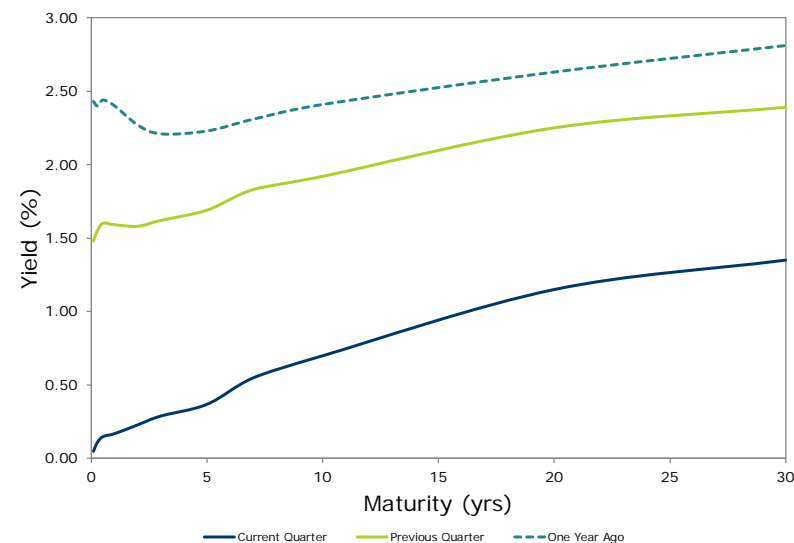
AS OF 3/31/2020	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	1.6	5.7	3.2	3.2	8.9	4.8	3.4	3.9
BLOOMBERG BARCLAYS TREASURY	0.6	7.0	8.2	8.2	13.2	5.8	3.6	3.8
BLOOMBERG BARCLAYS GOV'T-REL.	2.0	5.6	0.5	0.5	6.2	4.1	2.9	3.4
BLOOMBERG BARCLAYS SECURITIZED	1.4	1.9	2.7	2.7	6.9	4.0	2.9	3.4
BLOOMBERG BARCLAYS CORPORATE	3.4	8.0	-3.6	-3.6	5.0	4.2	3.4	4.9
BLOOMBERG BARCLAYS LT G/C	2.7	16.4	6.2	6.2	19.3	9.7	6.0	8.1
BLOOMBERG BARCLAYS LT TREASURY	1.3	19.2	20.9	20.9	32.6	13.4	7.3	9.0
BLOOMBERG BARCLAYS LT GOV't-REL.	3.9	12.6	-3.6	-3.6	7.3	6.3	4.3	7.0
BLOOMBERG BARCLAYS LT CORP.	3.9	14.5	-4.5	-4.5	9.6	6.7	4.7	7.3
BLOOMBERG BARCLAYS U.S. TIPS *	0.7	7.8	1.7	1.7	6.8	3.5	2.7	3.5
BLOOMBERG BARCLAYS HIGH YIELD	9.5	4.1	-12.7	-12.7	-6.9	0.8	2.8	5.6
TREASURY BILLS	0.1	0.25	0.6	0.6	2.2	1.8	1.2	0.6

* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



TREASURY YIELD CURVE

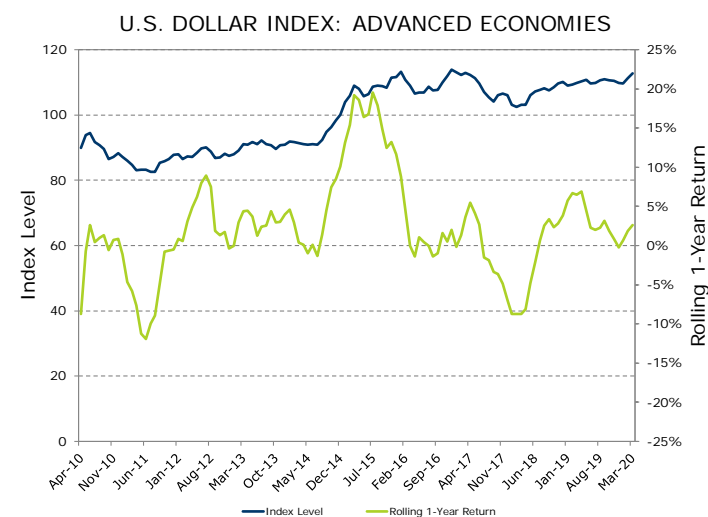
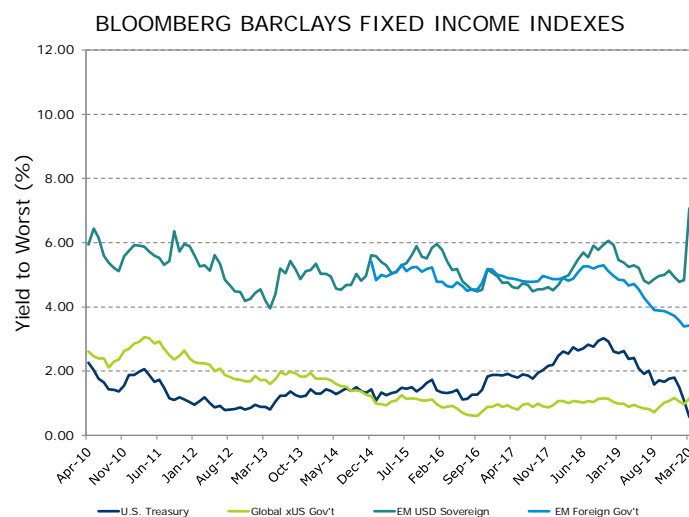


Data sources: Wilshire Compass, Bloomberg Barclays, U.S. Treasury

NON-U.S. FIXED INCOME

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DEVELOPED MARKETS						
BLMBRG BRCLYS GLBL AGGREGATE xUS	-2.7	-2.7	0.7	2.6	2.0	1.4
BLMBRG BRCLYS GLBL AGGREGATE xUS *	0.5	0.5	5.0	4.5	3.6	4.2
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-5.9	-5.9	-2.8	2.0	1.3	2.9
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	-0.7	-0.7	2.8	3.9	4.4	5.5
EMERGING MARKETS (HARD CURRENCY)						
BLMBRG BRCLYS EM USD AGGREGATE	-9.5	-9.5	-2.9	1.5	3.3	5.1
EMERGING MARKETS (FOREIGN CURRENCY)						
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	-7.6	-7.6	-1.1	1.5	1.7	2.1
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	0.7	0.7	6.9	4.6	3.5	3.6
EURO vs. DOLLAR	-2.2	-2.2	-2.3	0.9	0.4	-2.1
YEN vs. DOLLAR	0.7	0.7	2.5	1.1	2.1	-1.4
POUND vs. DOLLAR	-6.4	-6.4	-4.8	-0.3	-3.5	-2.0

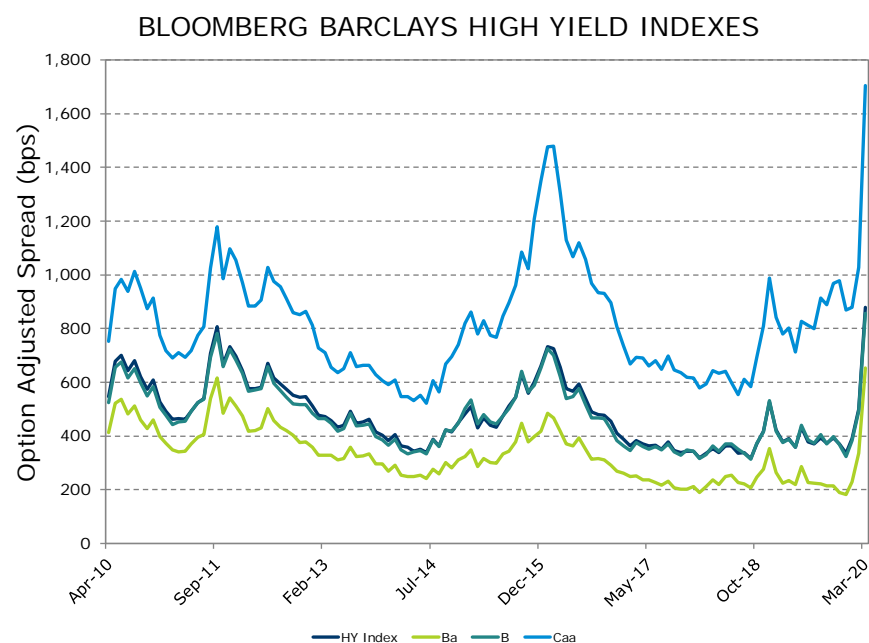
* Returns are reported in terms of local market investors, which removes currency effects.



Data sources: Wilshire Compass, Bloomberg Barclays, Federal Reserve Bank of St. Louis

HIGH YIELD BOND MARKET

AS OF 3/31/2020		YTW	QTR	YTD	1 YR	3 YR	5 YR
BLOOMBERG BARCLAYS HIGH YIELD		9.4	-12.7	-12.7	-6.9	0.8	2.8
S&P LSTA LEVERAGE LOAN INDEX		7.3	-9.9	-9.9	-5.1	0.5	1.6
HIGH YIELD QUALITY DISTRIBUTION	WEIGHT						
Ba U.S. HIGH YIELD	52.3%	7.2	-10.2	-10.2	-3.2	2.1	3.4
B U.S. HIGH YIELD	34.8%	9.2	-13.0	-13.0	-6.8	0.8	2.5
Caa U.S. HIGH YIELD	11.9%	17.5	-20.6	-20.6	-18.8	-4.1	0.9
Ca to D U.S. HIGH YIELD	0.8%	44.2	-29.7	-29.7	-40.3	-10.2	-8.2
Non-Rated U.S. HIGH YIELD	0.3%	11.8	-11.9	-11.9	-9.6	-0.6	-1.8

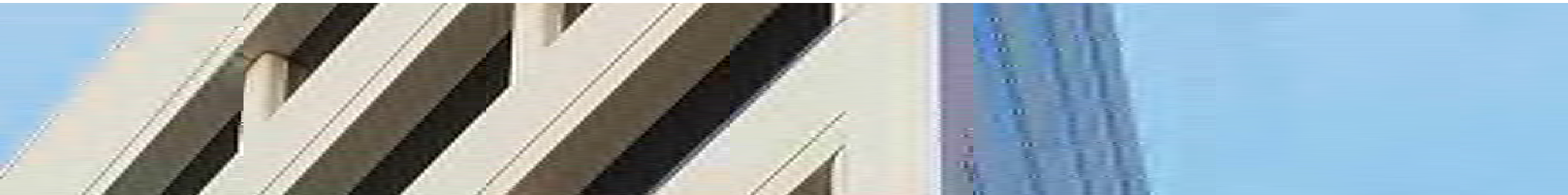


Data sources: Wilshire Compass, Bloomberg Barclays



WILSHIRE ASSOCIATES

Wilshire Consulting



Quarterly Market Review

Fourth Quarter 2019

Wilshire Consulting
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38th Annual Client Conference

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The Ritz-Carlton
Marina del Rey, California



Designed to review the current market environment, propose thought-leading investment strategies, and provide networking opportunities for our clients.

MARKET COMMENTARY

U.S. Equity

The U.S. stock market was up 9.1% for the fourth quarter of 2019 and 31.0% for the full year. This marks the strongest year for U.S. equities since 2013. In December, the U.S. and China agreed to terms on a “Phase One” trade deal that is reported to reduce U.S. tariffs and increase Chinese purchases of some U.S. products.

The year 2019 was a sensational year for investing. U.S. equities were as strong as they have been in six years – while international equities also produced double-digit returns. U.S. core bonds were even more remarkable with returns not seen since 2002. Of course, the important question is what can we expect from here? The curve is no longer inverted so there is some reward for taking duration risk. The equity risk premium is higher than what is typical but the absolute equity forecast is still quite depressed.

Non-U.S. Equity

News out of Britain is mixed with notable economic weakness in the manufacturing and services sectors. However, consumer sentiment surveys are improving after a fourth-quarter election resulted in strong support for a pro-Brexit government. Japan experienced its fourth consecutive quarter of expansion during 2019, while also beating forecasts. China benefitted from good news on the trade front although the country’s economic growth has cooled to near 30-year lows.

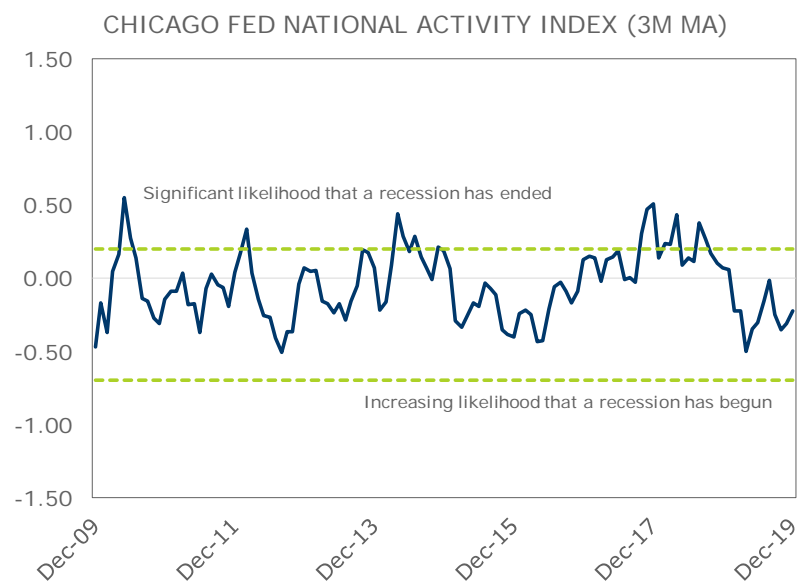
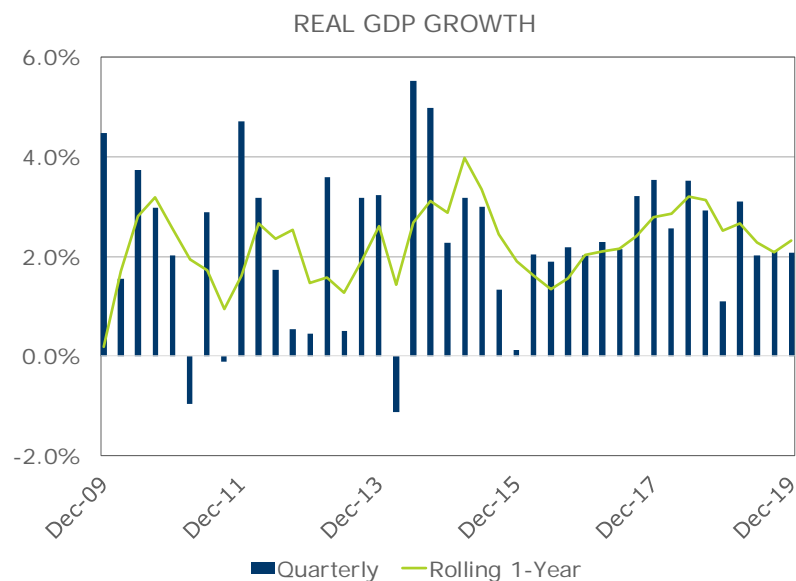
Fixed Income

The U.S. Treasury yield curve fell in the short portion of the curve but rose across intermediate and long-term maturities. The FOMC decreased its overnight rate by 0.25% at the October meeting. The committee members are nearly unanimous about not changing rates at all during 2020.

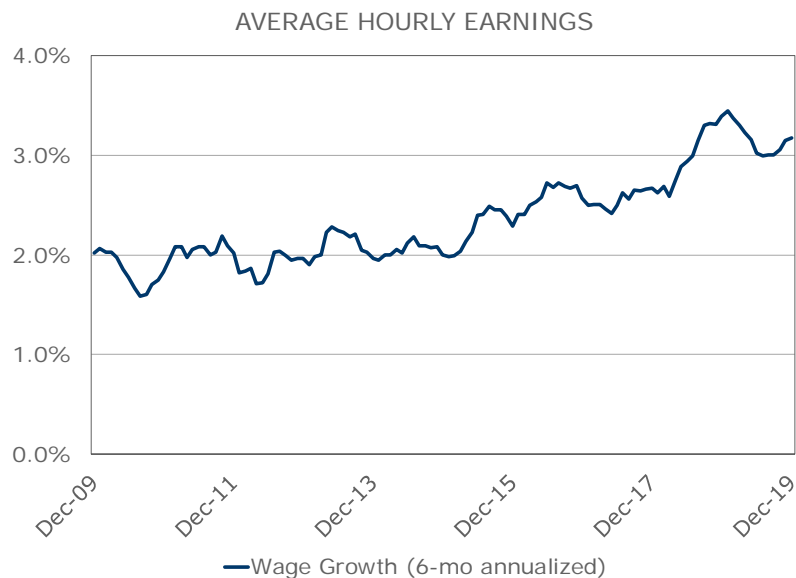
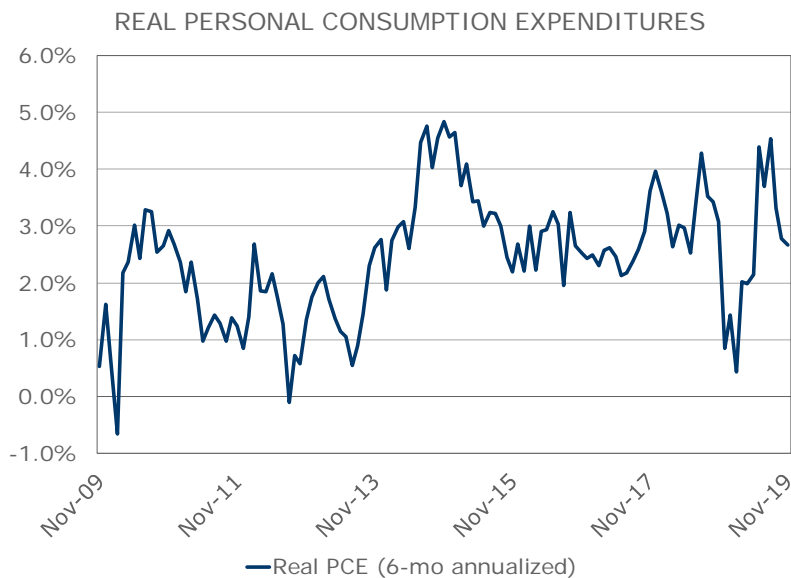
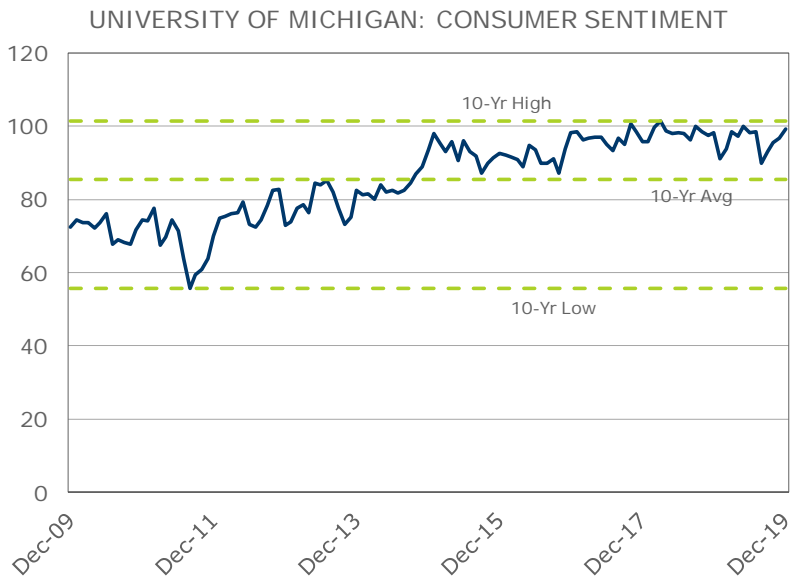
DECEMBER 2019 ASSET CLASS ASSUMPTIONS

	EQUITY						FIXED INCOME					REAL ASSETS							
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT		High Yield	Dev ex- US Bond (Hdg)	Real Estate			Cmdty	Real Assets	US CPI	
		US RES		Global RES					Private RE										
COMPOUND RETURN (%)	5.75	6.25	6.25	6.50	6.20	7.95	1.85	2.85	3.25	2.15	4.30	1.05	5.00	5.20	6.60	3.60	5.90	1.75	
ARITHMETIC RETURN (%)	7.05	7.70	9.20	8.10	7.55	11.30	1.85	3.00	3.70	2.35	4.75	1.10	6.35	6.35	7.50	4.65	6.25	1.75	
EXPECTED RISK (%)	17.00	18.00	26.00	18.95	17.10	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75	
CASH YIELD (%)	1.75	3.25	2.50	3.05	2.30	0.00	1.85	3.10	4.30	2.45	7.80	1.70	3.70	3.70	2.55	1.85	2.50	0.00	
CORRELATIONS																			
US Stock	1.00																		
Dev ex-US Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-US Stock	0.83	0.96	0.87	1.00															
Global Stock	0.95	0.92	0.83	0.94	1.00														
Private Equity	0.74	0.64	0.62	0.67	0.74	1.00													
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00												
Core Bond	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00											
LT Core Bond	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.93	1.00										
TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.60	0.47	1.00									
High Yield Bond	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00								
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.66	0.39	0.26	1.00							
US RE Securities	0.59	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00						
Global RE Securities	0.65	0.59	0.56	0.62	0.66	0.58	-0.05	0.17	0.22	0.11	0.62	0.03	0.94	1.00					
Private Real Estate	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.78	0.76	1.00				
Commodities	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00			
Real Assets	0.42	0.43	0.50	0.48	0.47	0.43	0.01	0.24	0.25	0.41	0.53	0.06	0.65	0.69	0.69	0.59	1.00		
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	-0.08	0.05	0.03	0.05	0.44	0.26	1.00	

ECONOMIC GROWTH

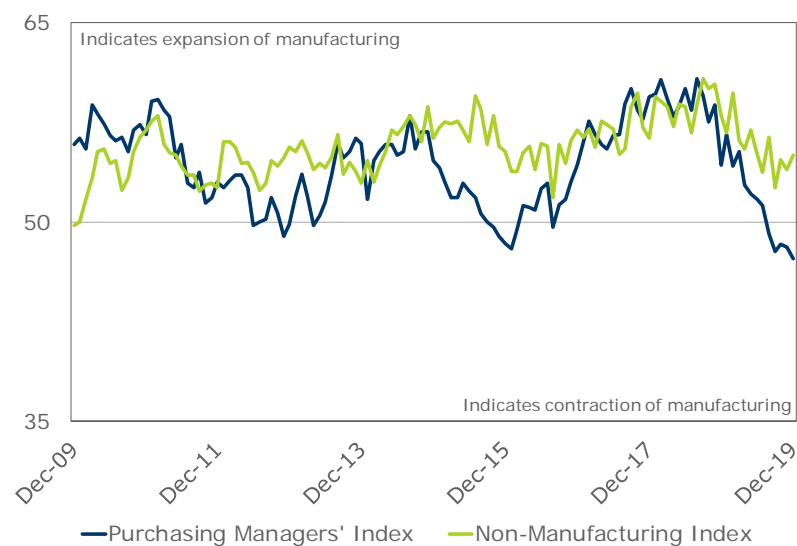


CONSUMER ACTIVITY

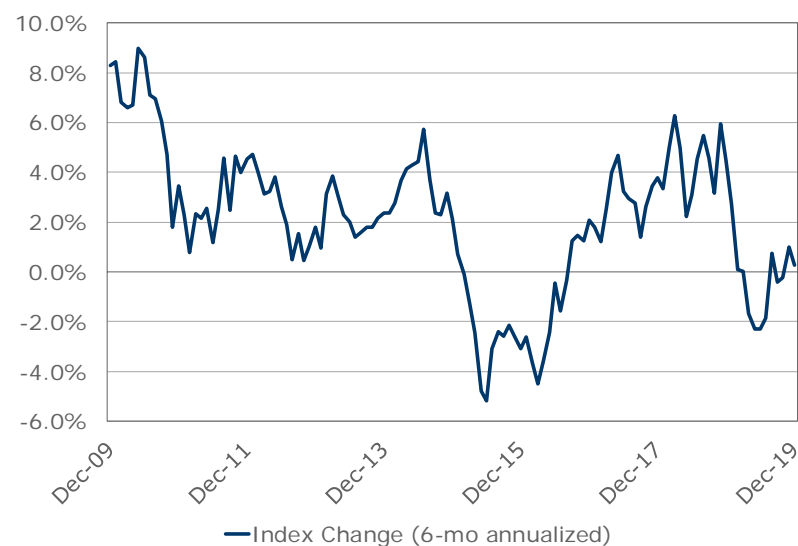


BUSINESS ACTIVITY

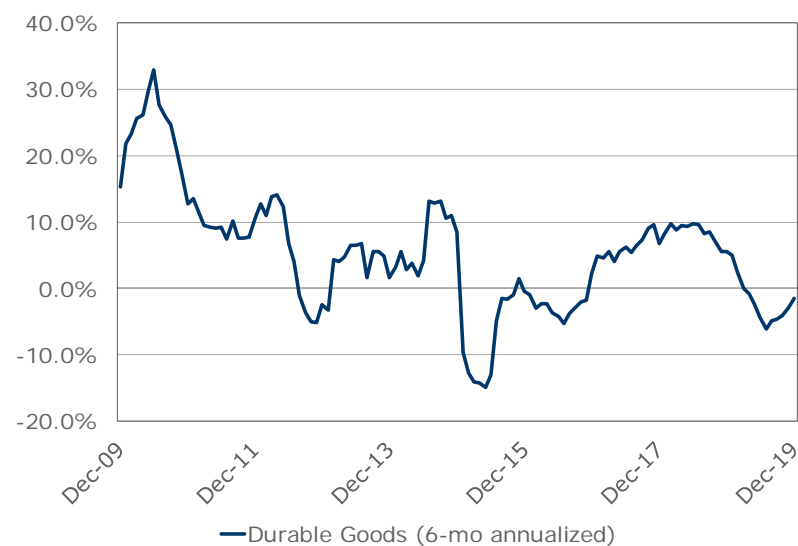
ISM REPORT ON BUSINESS



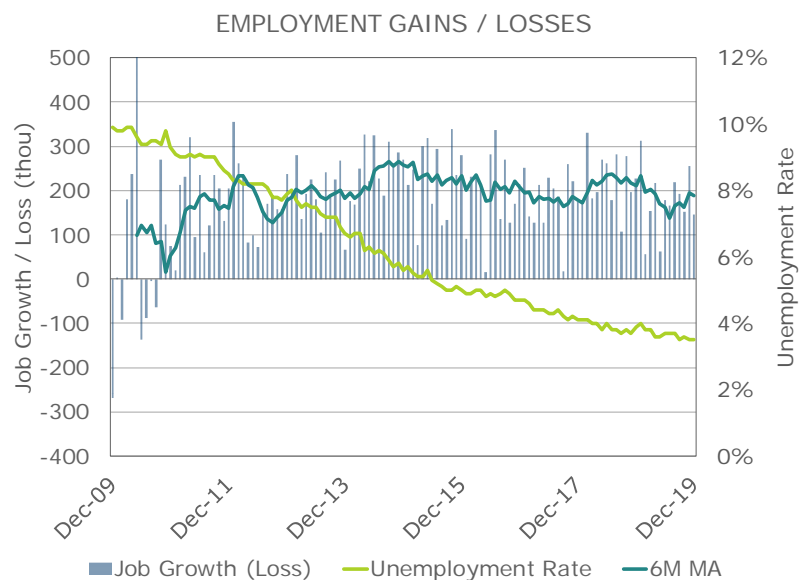
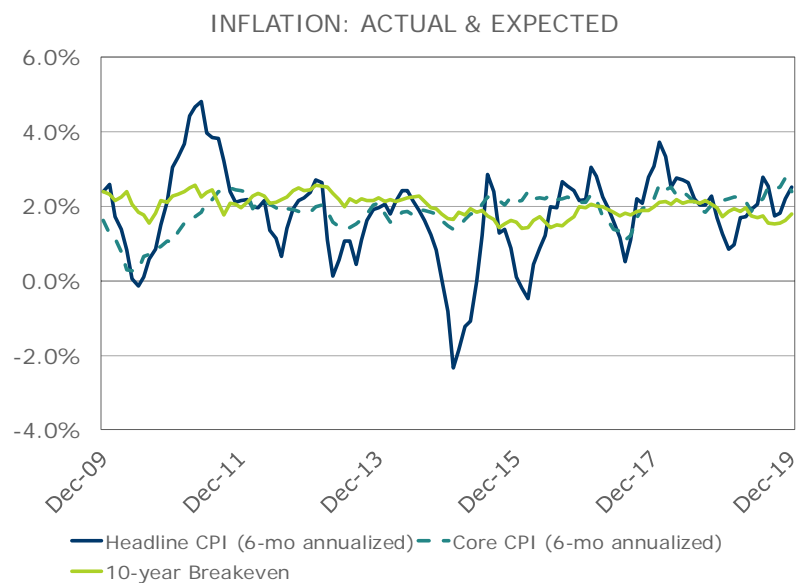
INDUSTRIAL PRODUCTION INDEX



DURABLE GOODS NEW ORDERS



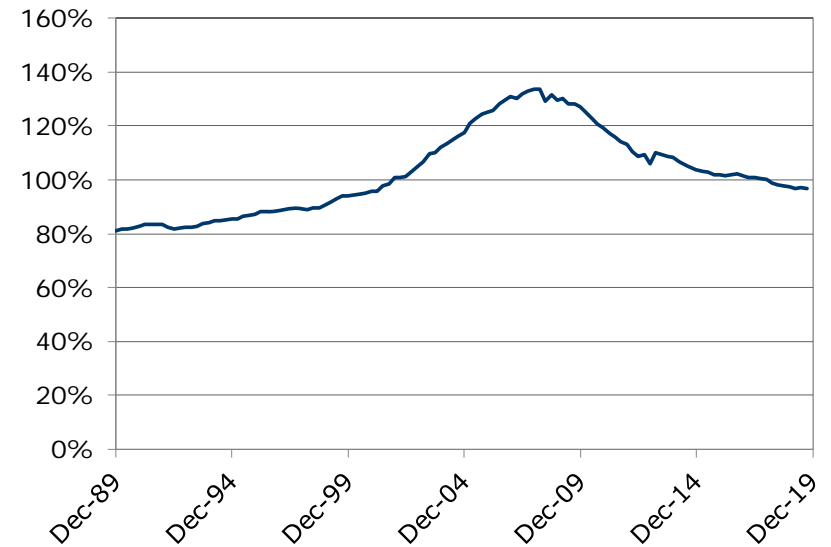
INFLATION AND EMPLOYMENT



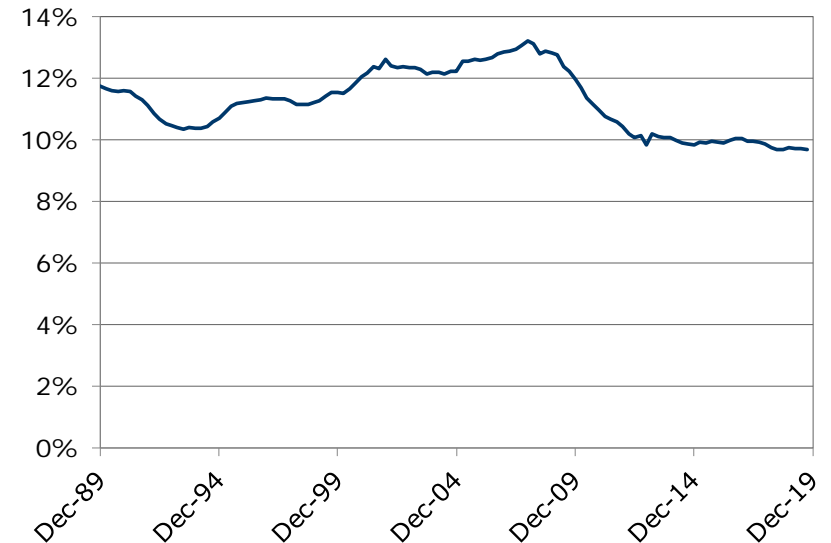
HOUSEHOLD DEBT

- Consumers continue to improve their outstanding debt conditions, now holding less debt than their disposable personal income
- Service payments – the amount necessary to pay interest and principal on outstanding debt – are as low as they have been in decades, again as a percent of disposable income

HH DEBT / DISPOSABLE INCOME

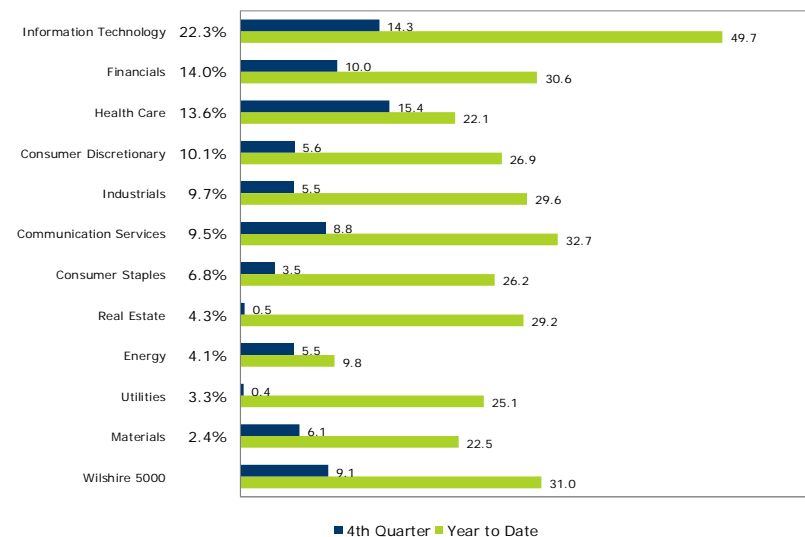


SERVICE PAYMENTS / DISPOSABLE INCOME

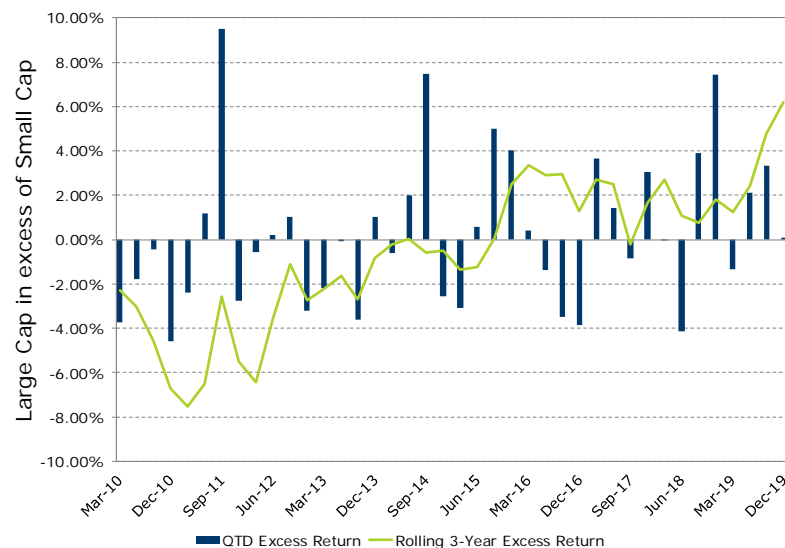


AS OF DEC 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	9.1	31.0	31.0	14.5	11.4	13.4
WILSHIRE U.S. LARGE CAP	9.1	31.5	31.5	15.2	11.7	13.5
WILSHIRE U.S. SMALL CAP	9.0	26.2	26.2	8.5	8.3	12.6
WILSHIRE U.S. LARGE GROWTH	11.2	35.8	35.8	18.7	13.5	14.5
WILSHIRE U.S. LARGE VALUE	7.1	27.7	27.7	11.8	9.9	12.6
WILSHIRE U.S. SMALL GROWTH	10.1	29.5	29.5	11.8	9.1	13.3
WILSHIRE U.S. SMALL VALUE	8.0	23.1	23.1	5.2	7.3	11.7
WILSHIRE REIT INDEX	-1.1	25.8	25.8	7.6	6.9	11.9
MSCI USA MIN. VOL. INDEX	2.9	27.1	27.1	14.9	11.8	13.5
FTSE RAFI U.S. 1000 INDEX	8.3	28.0	28.0	11.0	9.4	12.9

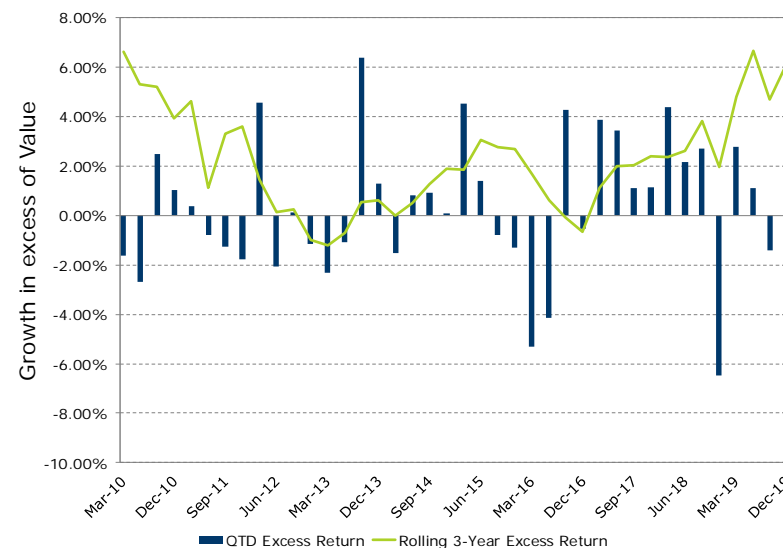
WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)



LARGE CAP VS SMALL CAP



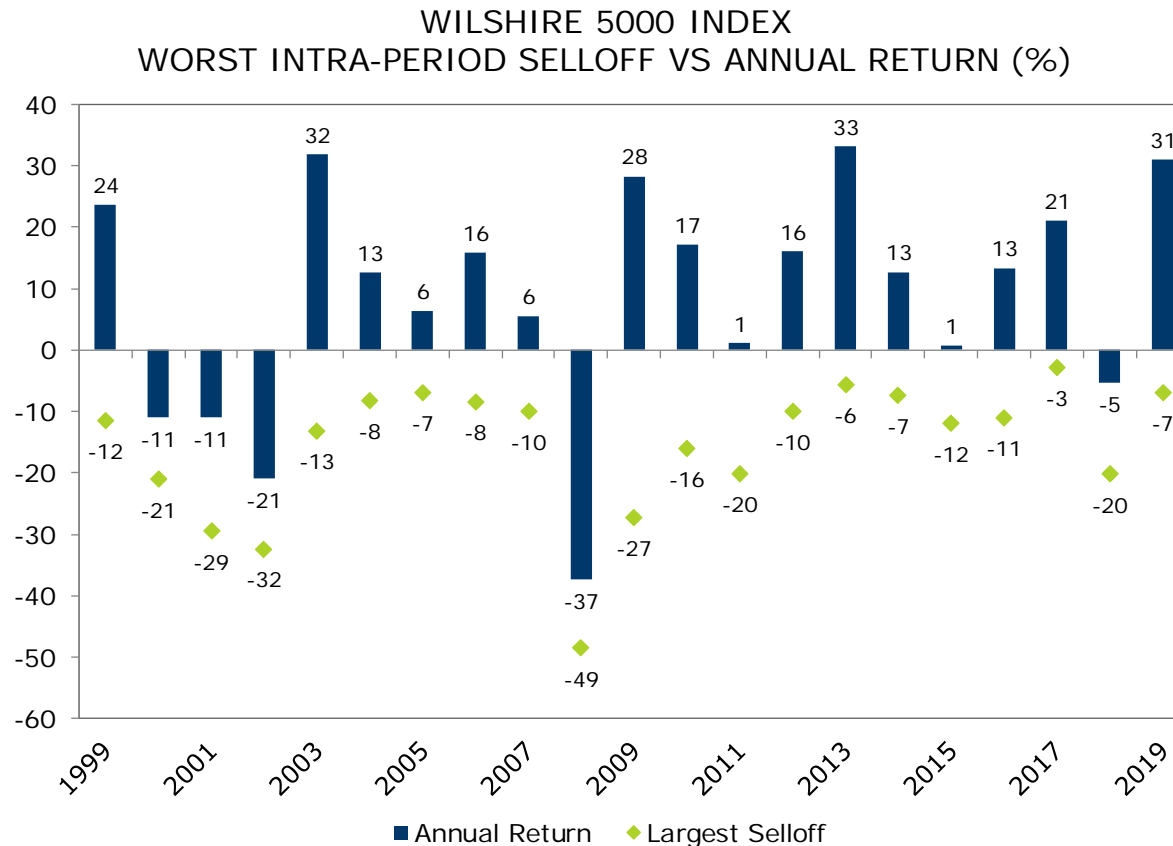
GROWTH VS VALUE



Data sources: Wilshire Compass, Wilshire Atlas

ANNUAL RETURNS

- Last year was the strongest year for equities since 2013
- Worst sell-off last year was relatively mild compared to the past 20 years

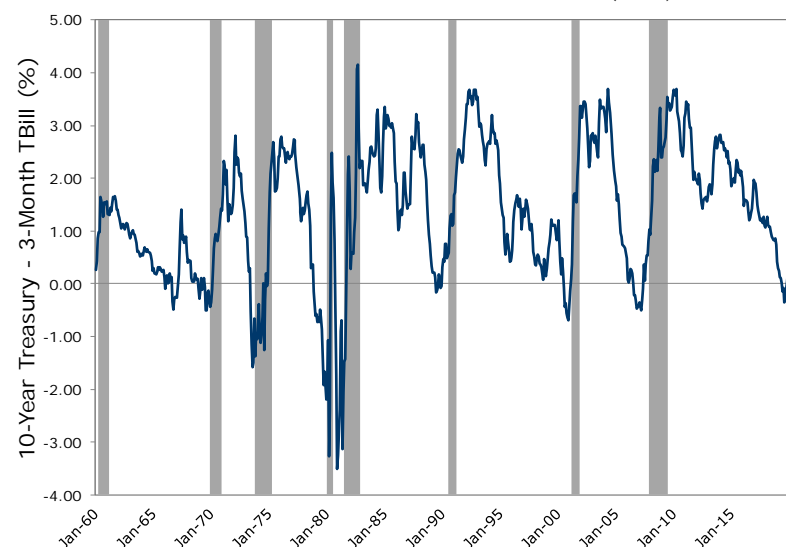


Wilshire Consulting

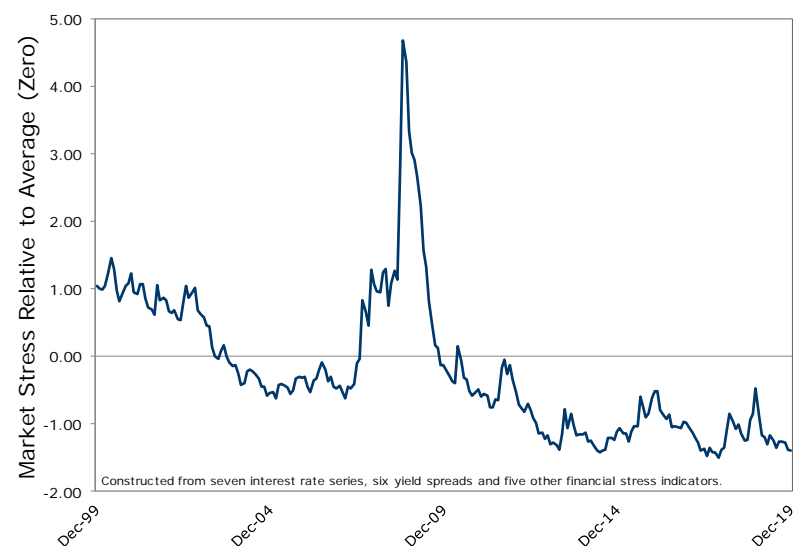
RISK MONITOR



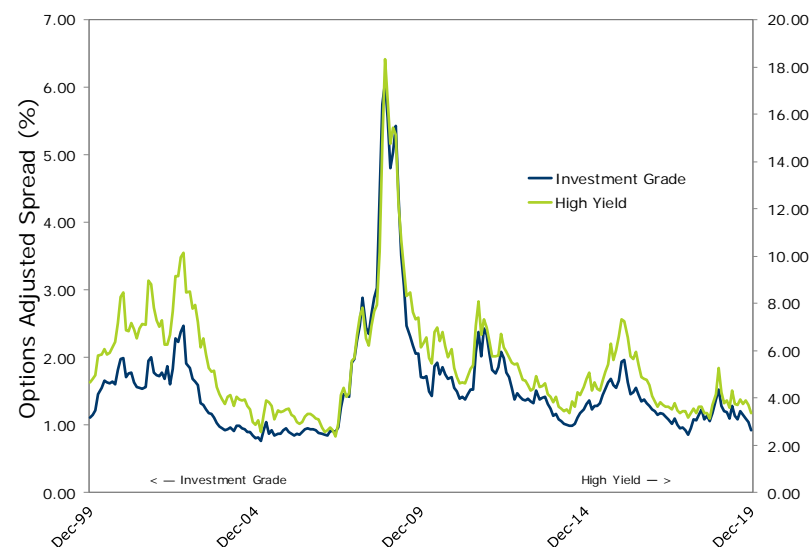
YIELD CURVE SLOPE VS RECESSIONS (IN GRAY)



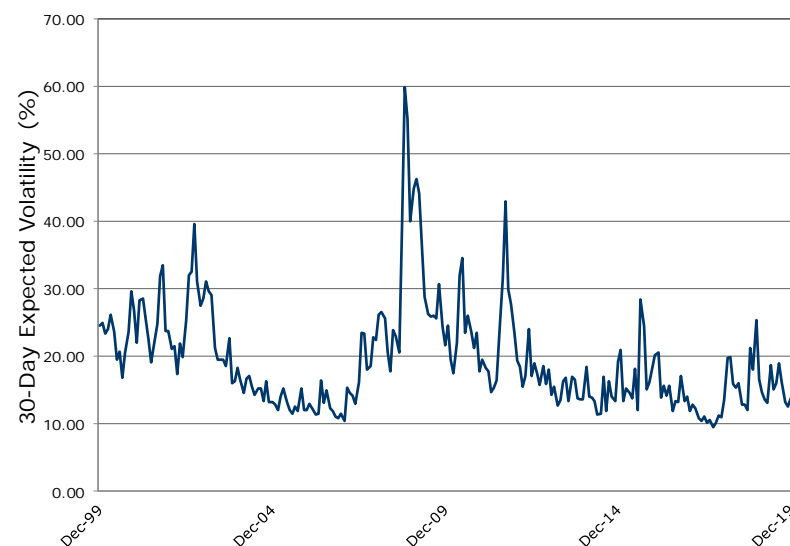
ST. LOUIS FED FINANCIAL STRESS INDEX



BLOOMBERG BARCLAYS CREDIT INDEXES



CBOE VOLATILITY INDEX

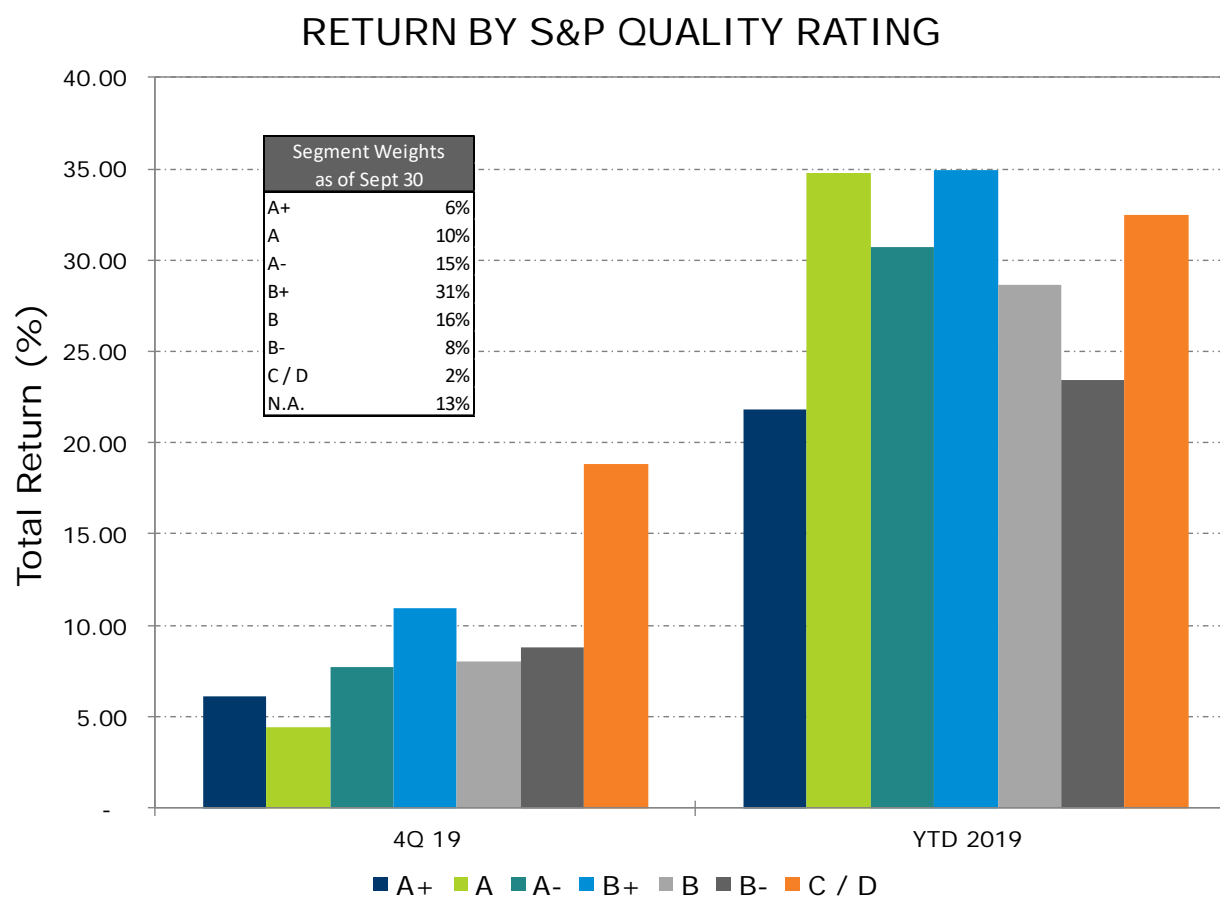


Data sources: Federal Reserve, Bloomberg Barclays

©2020 Wilshire Associates.

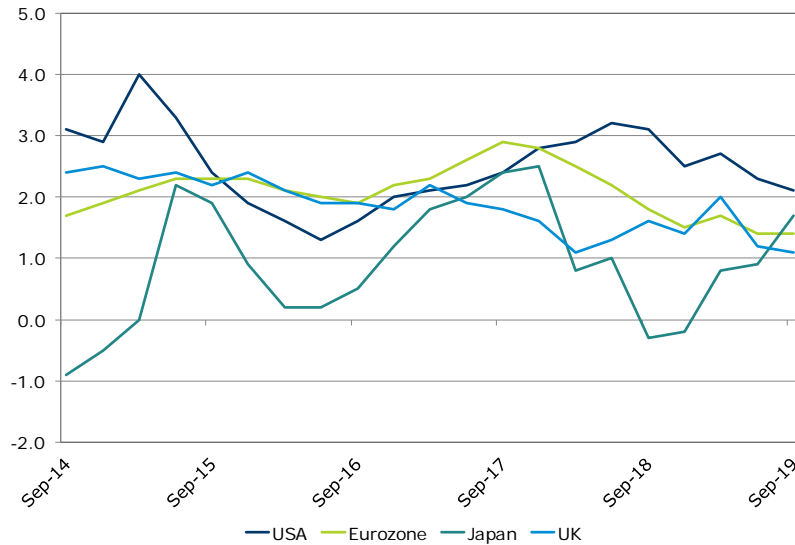
RETURNS BY QUALITY SEGMENT

Higher quality names trailed for the fourth quarter but were strong for the year

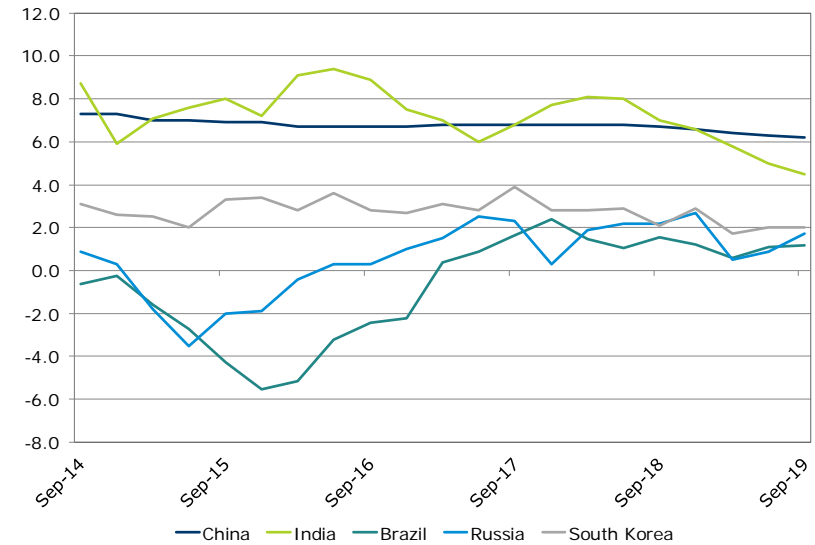


NON-U.S. GROWTH AND INFLATION

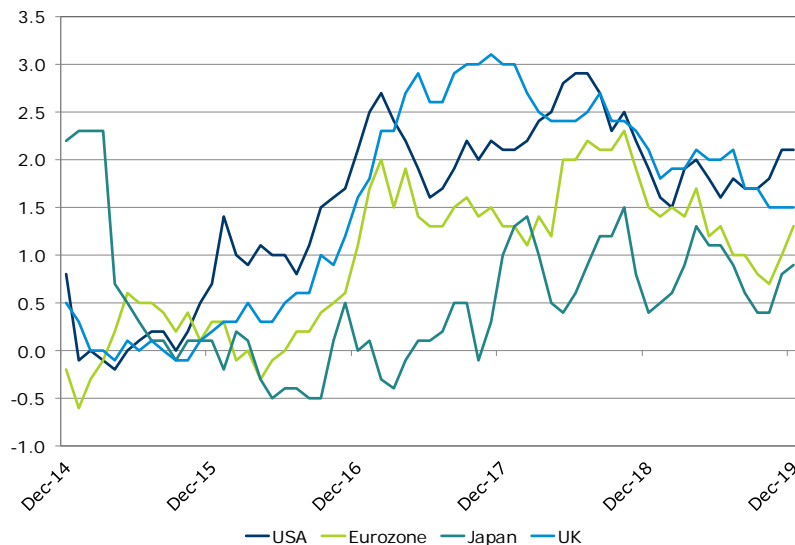
DEVELOPED MARKETS REAL GDP GROWTH YoY (%)



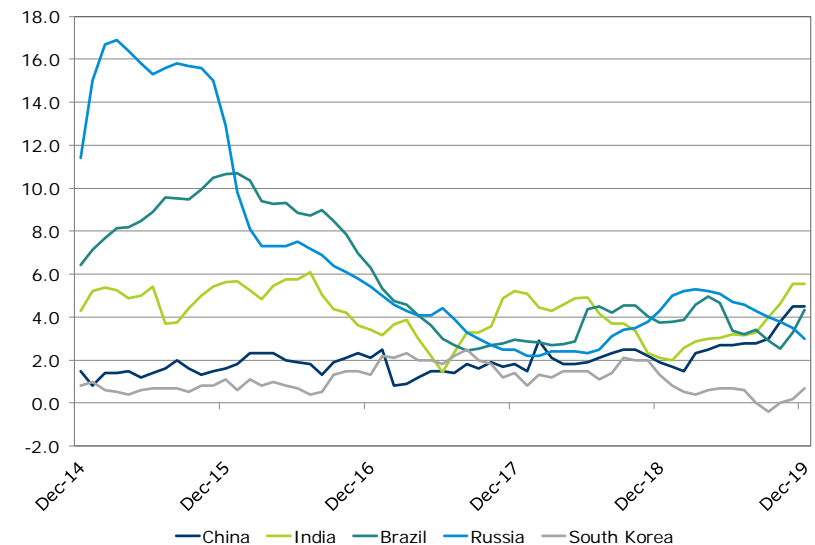
EMERGING MARKETS REAL GDP GROWTH YoY (%)



DEVELOPED MARKETS CPI GROWTH YoY (%)



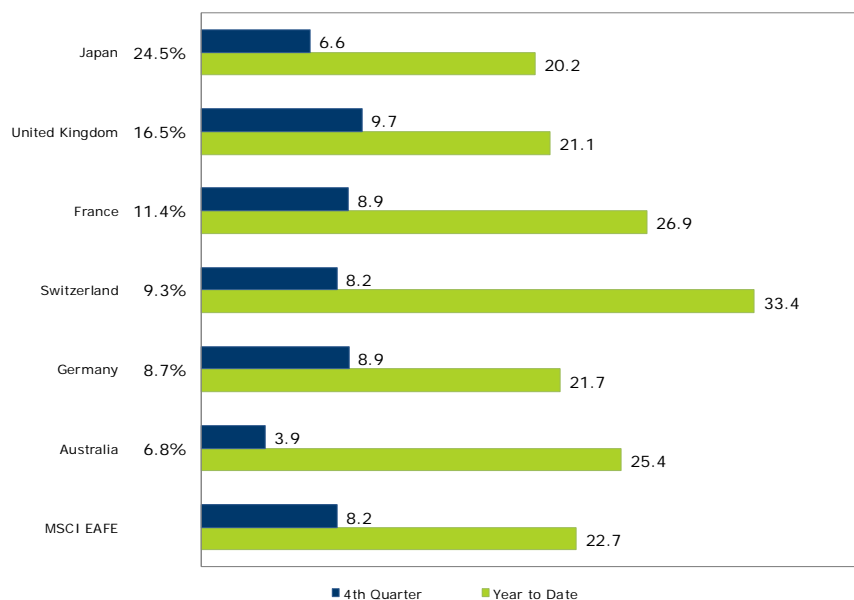
EMERGING MARKETS CPI GROWTH YoY (%)



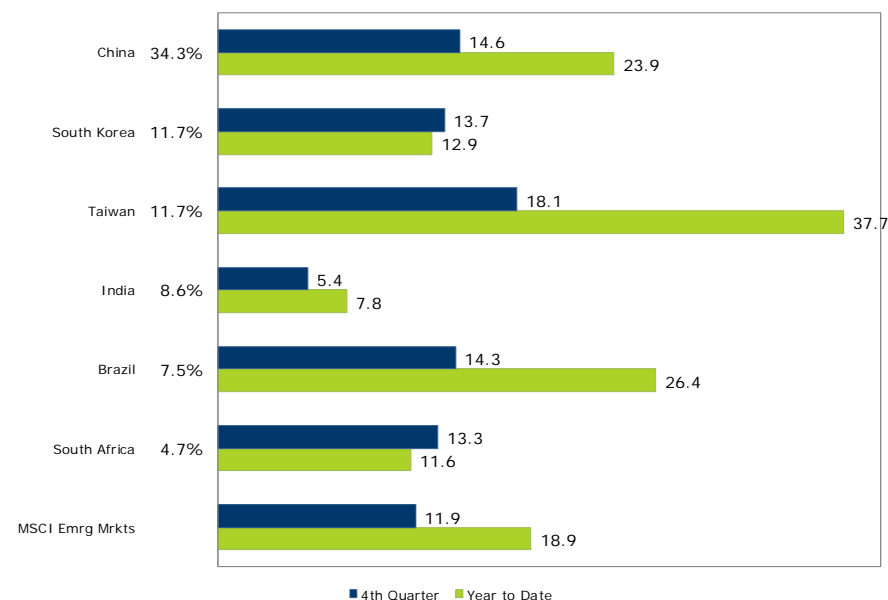
NON-U.S. EQUITY MARKET

AS OF DEC 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	9.0	22.1	22.1	10.4	6.0	5.4
MSCI EAFE (\$G)	8.2	22.7	22.7	10.1	6.2	6.0
MSCI EMERGING MARKETS (\$G)	11.9	18.9	18.9	12.0	6.0	4.0
MSCI FRONTIER MARKETS (\$G)	6.6	18.3	18.3	9.5	3.1	5.7
MSCI ACWI EX-US GROWTH (\$G)	9.6	27.8	27.8	13.3	7.7	6.6
MSCI ACWI EX-US VALUE (\$G)	8.3	16.5	16.5	7.5	4.3	4.2
MSCI ACWI EX-US SMALL (\$G)	11.1	22.9	22.9	10.1	7.5	7.4
MSCI ACWI MINIMUM VOLATILITY	3.1	21.8	21.8	12.7	9.9	10.9
MSCI EAFE MINIMUM VOLATILITY	4.5	17.4	17.4	10.8	7.7	8.1
FTSE RAFI DEVELOPED EX-US	8.2	18.8	18.8	8.5	5.5	5.2
MSCI EAFE LC (G)	5.2	22.3	22.3	8.2	7.2	7.7

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



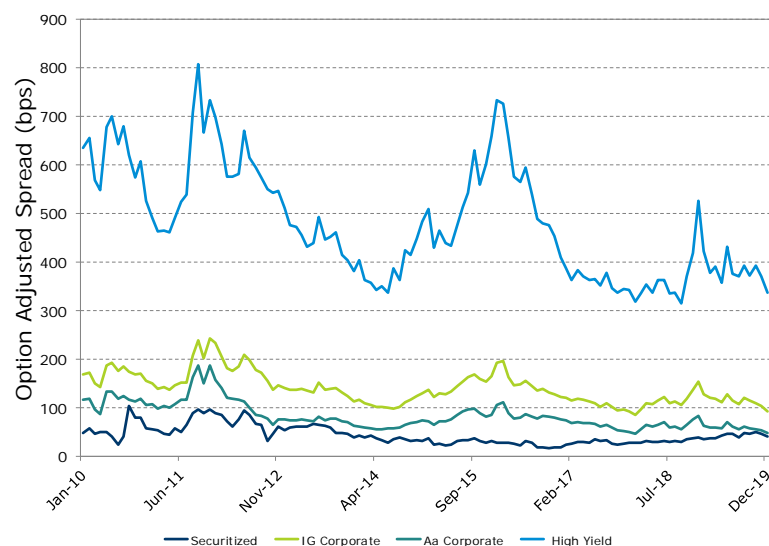
Data sources: Wilshire Compass

U.S. FIXED INCOME

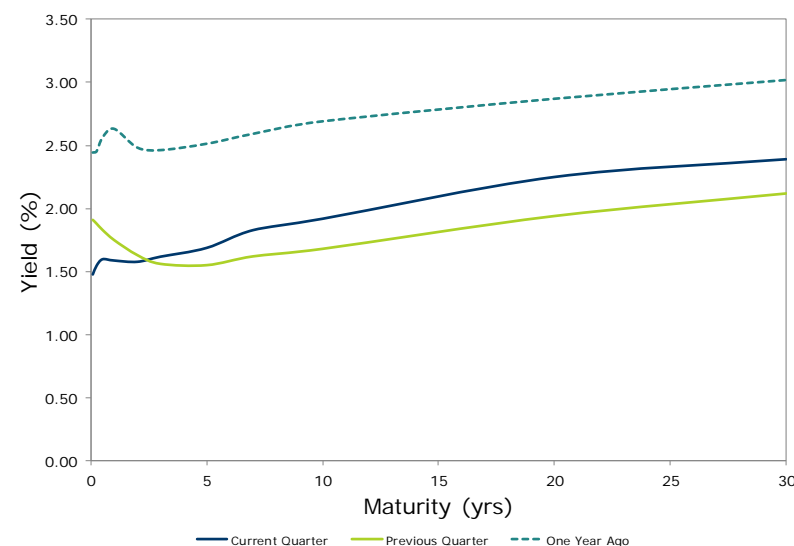
AS OF DEC 31, 2019	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	2.3	5.9	0.2	8.7	8.7	4.0	3.1	3.7
BLOOMBERG BARCLAYS TREASURY	1.8	6.5	-0.8	6.9	6.9	3.3	2.4	3.1
BLOOMBERG BARCLAYS GOV'T-REL.	2.4	5.9	0.2	9.0	9.0	4.4	3.1	3.5
BLOOMBERG BARCLAYS SECURITIZED	2.5	3.3	0.6	6.4	6.4	3.3	2.6	3.3
BLOOMBERG BARCLAYS CORPORATE	2.9	7.9	1.2	14.5	14.5	5.9	4.6	5.5
BLOOMBERG BARCLAYS LT G/C	3.1	15.8	-1.1	19.6	19.6	8.1	5.4	7.6
BLOOMBERG BARCLAYS LT TREASURY	2.3	18.1	-4.1	14.8	14.8	7.0	4.1	7.0
BLOOMBERG BARCLAYS LT GOV'T-REL.	3.6	12.7	-0.1	18.7	18.7	8.8	5.6	7.7
BLOOMBERG BARCLAYS LT CORP.	3.6	14.5	1.3	23.9	23.9	8.8	6.4	8.0
BLOOMBERG BARCLAYS U.S. TIPS *	1.9	7.6	0.8	8.4	8.4	3.3	2.6	3.4
BLOOMBERG BARCLAYS HIGH YIELD	6.0	3.0	2.6	14.3	14.3	6.4	6.1	7.6
TREASURY BILLS	1.6	0.25	0.5	2.3	2.3	1.7	1.1	0.6

* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



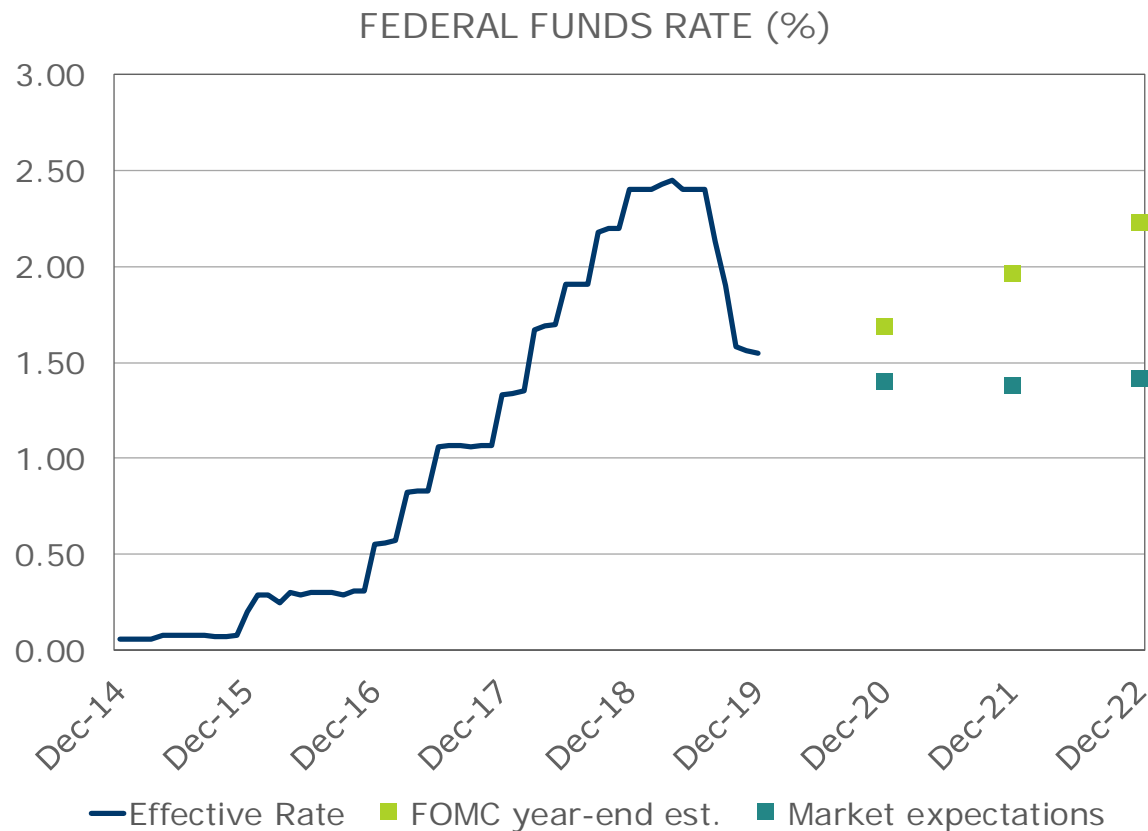
TREASURY YIELD CURVE



Data sources: Wilshire Compass, Bloomberg Barclays, U.S. Treasury

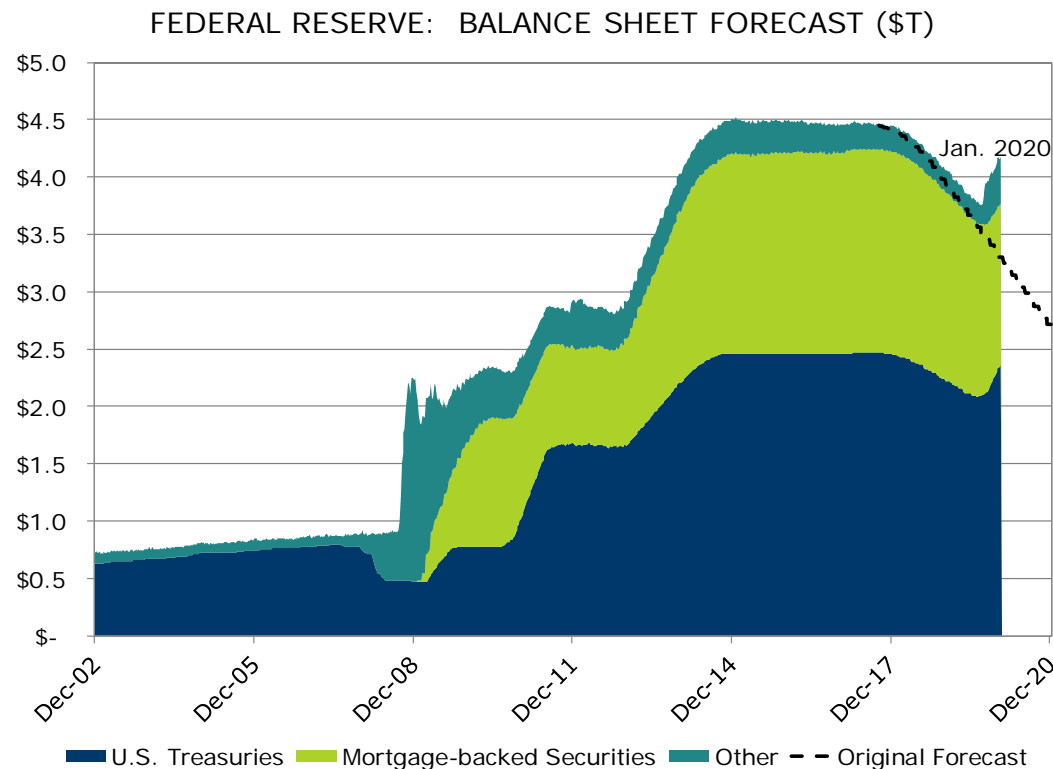
SHORT-TERM RATES

- Federal Reserve decreased their short-term rate 3 times during the second half of 2019
- Markets aren't expecting the overnight rate to move at all during the next few years



FED BALANCE SHEET

- Federal Reserve began their balance sheet normalization program during October 2017; targeting \$10B in reductions per month while increasing to \$50B per month in Q4 2018
- Began buying Treasury bills in September to address a liquidity shortage in the repo market
- Fed stated purchases will continue “at least into the second quarter,” potentially reversing their previous balance sheet contraction efforts



Data sources: Federal Reserve

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NON-U.S. FIXED INCOME

AS OF DEC 31, 2019

QTR

YTD

1 YR

3 YR

5 YR

10 YR

DEVELOPED MARKETS

BLMBRG BRCLYS GLBL AGGREGATE xUS	0.7	5.1	5.1	4.4	1.6	1.5
BLMBRG BRCLYS GLBL AGGREGATE xUS *	-1.1	7.6	7.6	4.4	3.9	4.3
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-0.6	7.8	7.8	4.6	1.8	3.2
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	-5.2	8.0	8.0	4.2	5.3	5.8

EMERGING MARKETS (HARD CURRENCY)

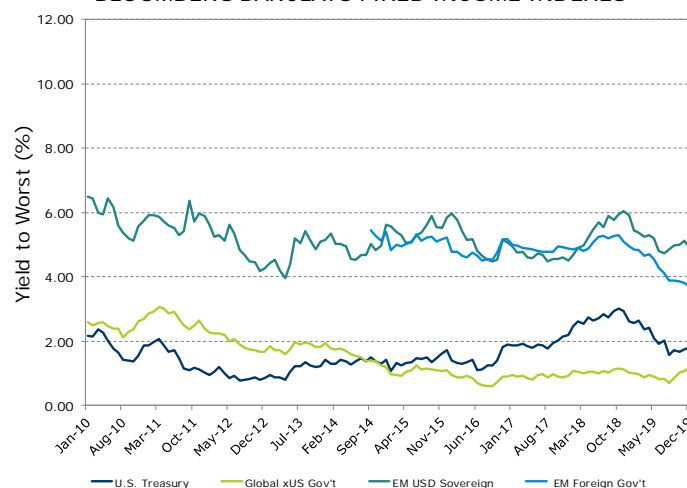
BLMBRG BRCLYS EM USD AGGREGATE	2.1	13.1	13.1	6.1	5.8	6.6
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EMERGING MARKETS (FOREIGN CURRENCY)

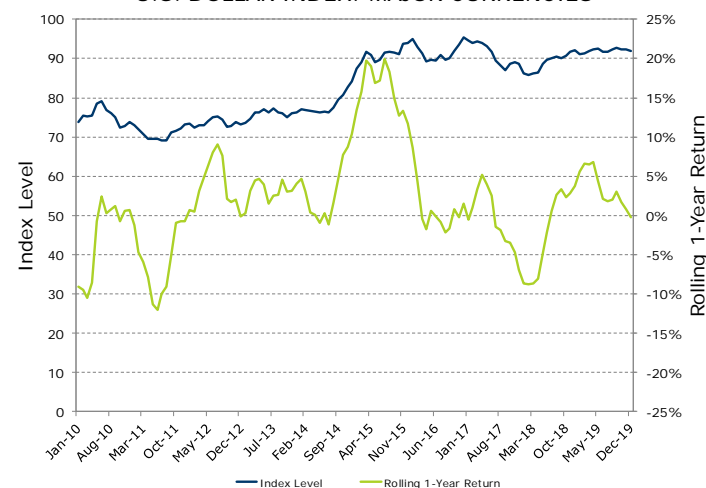
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	4.0	9.5	9.5	6.5	2.8	3.4
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	0.5	8.5	8.5	4.9	3.6	3.7
EURO vs. DOLLAR	3.0	-1.8	-1.8	2.1	-1.5	-2.4
YEN vs. DOLLAR	-0.6	1.0	1.0	2.4	2.0	-1.5
POUND vs. DOLLAR	7.5	4.0	4.0	2.4	-3.2	-2.0

* Returns are reported in terms of local market investors, which removes currency effects.

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



U.S. DOLLAR INDEX: MAJOR CURRENCIES

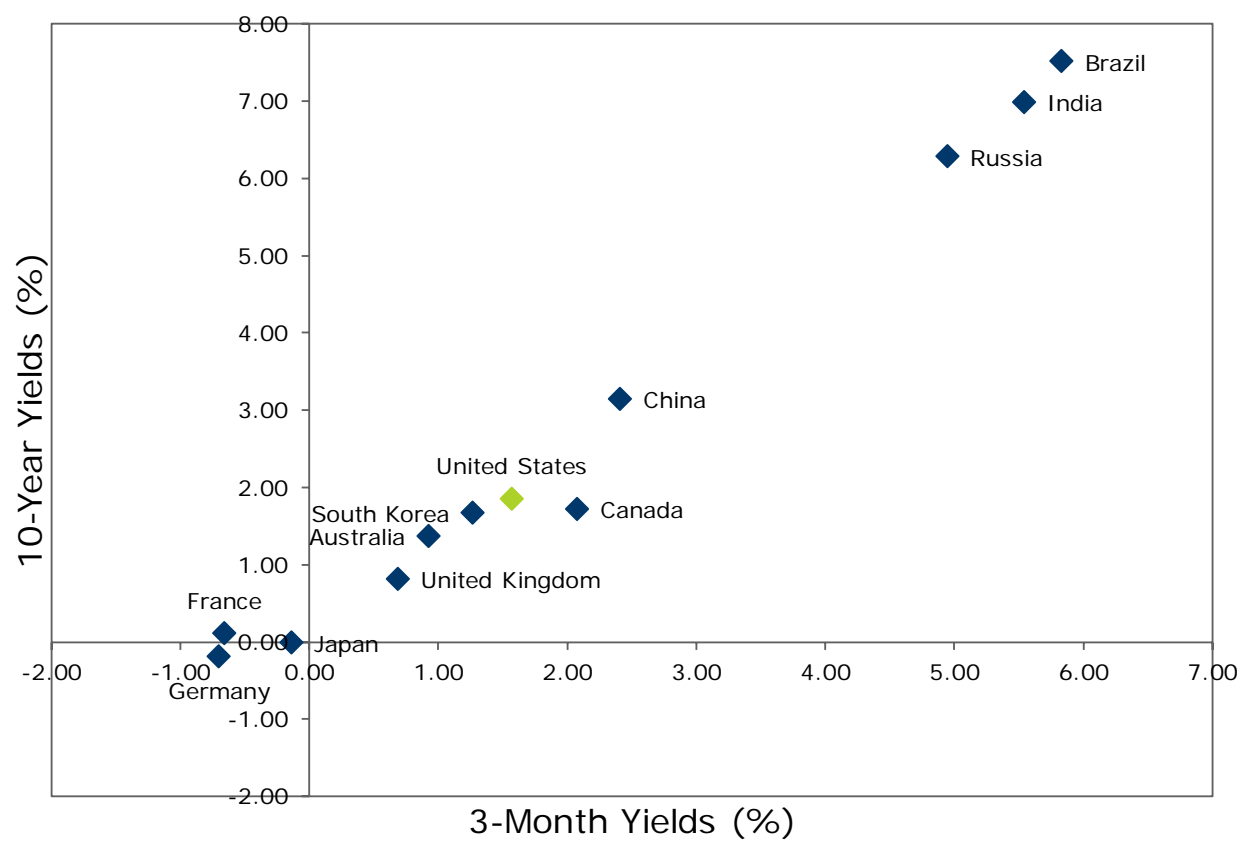


Data sources: Wilshire Compass, Bloomberg Barclays, Federal Reserve Bank of St. Louis

GLOBAL INTEREST RATES

Much of Europe and Japan exhibit negative rates; Long rates are up, however, in those same regions during the past six months

GOVERNMENT BOND YIELDS

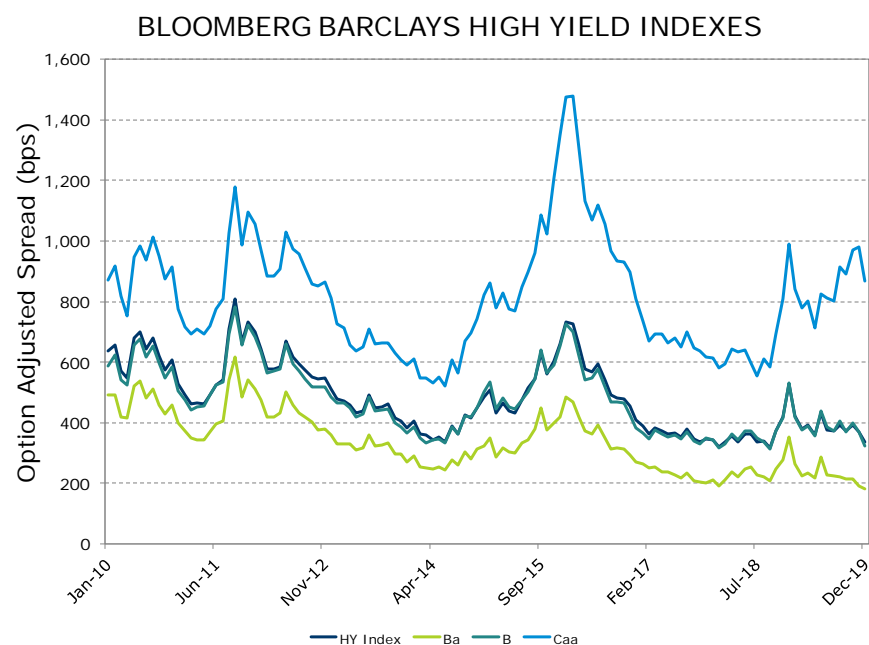


Data sources: Bloomberg

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HIGH YIELD BOND MARKET

AS OF DEC 31, 2019		YTW	QTR	YTD	1 YR	3 YR	5 YR
BLOOMBERG BARCLAYS HIGH YIELD		5.2	2.6	14.3	14.3	6.4	6.1
S&P LSTA LEVERAGE LOAN INDEX		0.0	0.0	8.2	8.2	3.6	3.7
HIGH YIELD QUALITY DISTRIBUTION	WEIGHT						
Ba U.S. HIGH YIELD	47.7%	3.6	2.5	15.5	15.5	6.6	6.2
B U.S. HIGH YIELD	38.8%	5.1	2.6	14.8	14.8	6.5	5.9
Caa U.S. HIGH YIELD	12.5%	10.4	3.7	9.5	9.5	5.1	6.1
Ca to D U.S. HIGH YIELD	0.7%	21.0	-7.3	-0.3	-0.3	3.9	-2.1
Non-Rated U.S. HIGH YIELD	0.3%	6.6	1.9	6.3	6.3	5.5	-0.1



Data sources: Wilshire Compass, Bloomberg Barclays

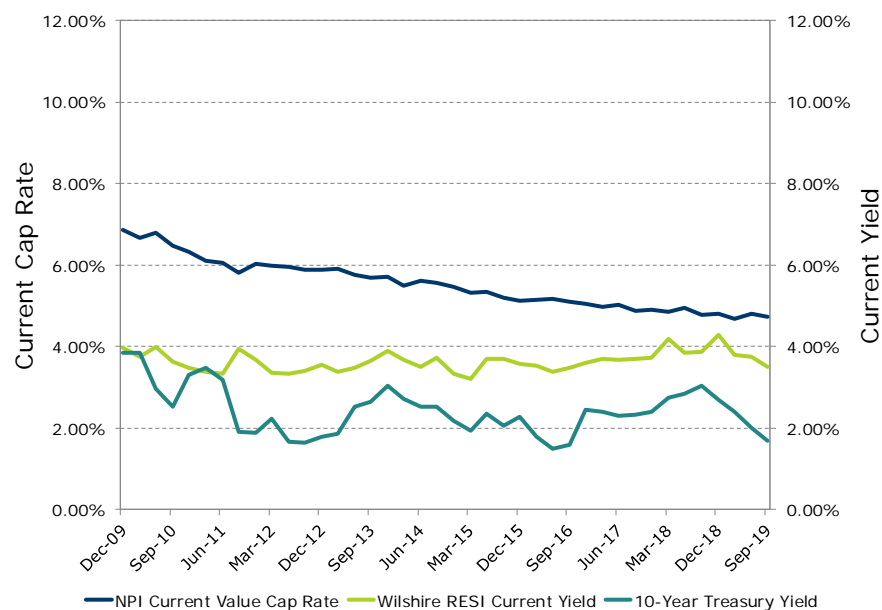
Wilshire Consulting

REAL ASSETS

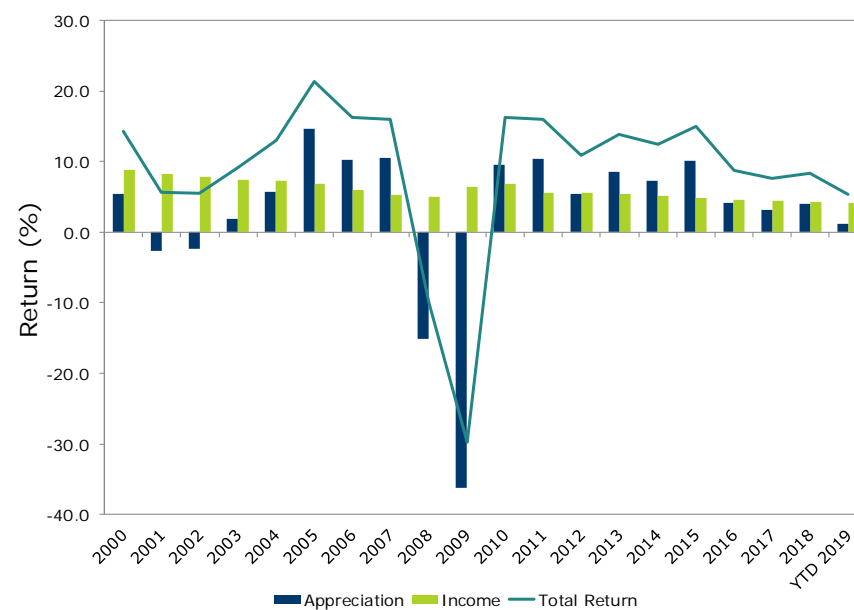


AS OF DEC 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	0.8	8.4	8.4	3.3	2.6	3.4
BLOOMBERG COMMODITY INDEX	4.4	7.7	7.7	-0.9	-3.9	-4.7
WILSHIRE GLOBAL RESI INDEX	1.2	24.2	24.2	9.0	6.8	10.5
NCREIF ODCE FUND INDEX	1.5	5.4	5.4	7.1	9.0	11.4
NCREIF TIMBERLAND INDEX	0.0	1.3	1.3	2.7	3.1	4.4
ALERIAN MLP INDEX (OIL & GAS)	-4.1	6.6	6.6	-4.4	-7.0	4.2

REAL ESTATE VALUATION



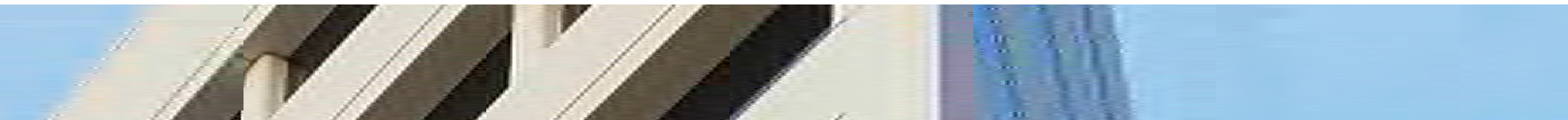
NCREIF ODCE FUND INDEX RETURN



Data sources: Wilshire Compass, National Council of Real Estate Investment Fiduciaries

ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 12/2019
2014	2015	2016	2017	2018	2019 YTD	
REITs 31.8%	REITs 4.2%	MLPs 18.3%	Emrg Mkts 37.7%	T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 11.4%
U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	Core Bond 0.0%	REITs 25.8%	REITs 6.9%
Core Bond 6.0%	Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	U.S. TIPS -1.3%	Developed 22.7%	Developed 6.2%
MLPs 4.8%	T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	High Yield -2.1%	Emrg Mkts 18.9%	High Yield 6.1%
U.S. TIPS 3.6%	Developed -0.4%	Emrg Mkts 11.6%	REITs 4.2%	REITs -4.8%	High Yield 14.3%	Emrg Mkts 6.0%
High Yield 2.5%	U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. Equity -5.3%	Core Bond 8.7%	Core Bond 3.1%
T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	Commodities -11.2%	U.S. TIPS 8.4%	U.S. TIPS 2.6%
Emrg Mkts -1.8%	Emrg Mkts -14.6%	Core Bond 2.6%	Commodities 1.7%	MLPs -12.4%	Commodities 7.7%	T-Bills 1.1%
Developed -4.5%	Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Developed -13.4%	MLPs 6.6%	Commodities -3.9%
Commodities -17.0%	MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mkts -14.2%	T-Bills 2.3%	MLPs -7.0%



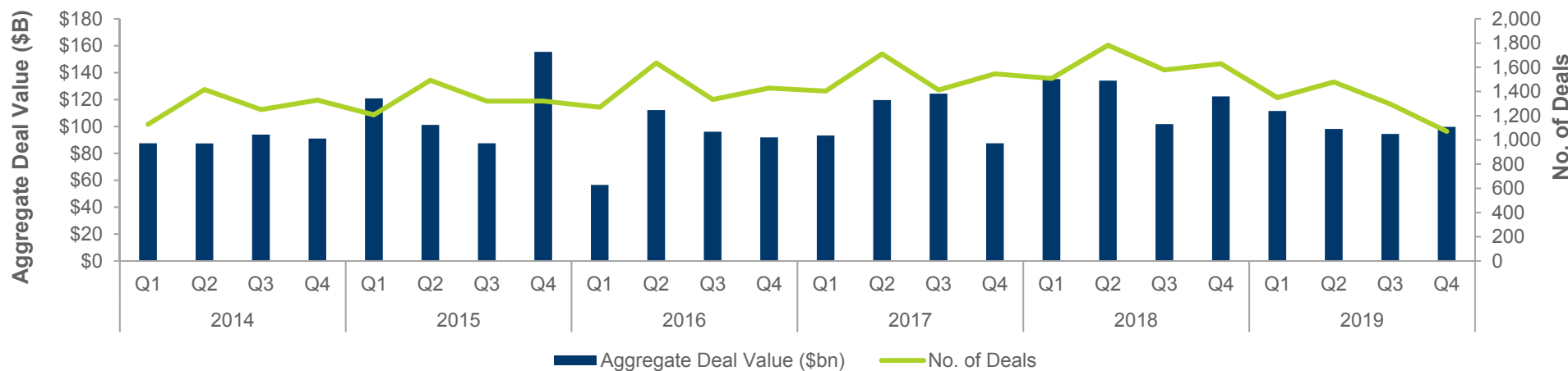
APPENDIX: PRIVATE MARKETS UPDATE

PRIVATE EQUITY – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Equity Fundraising (Q1 2014 - Q4 2019)



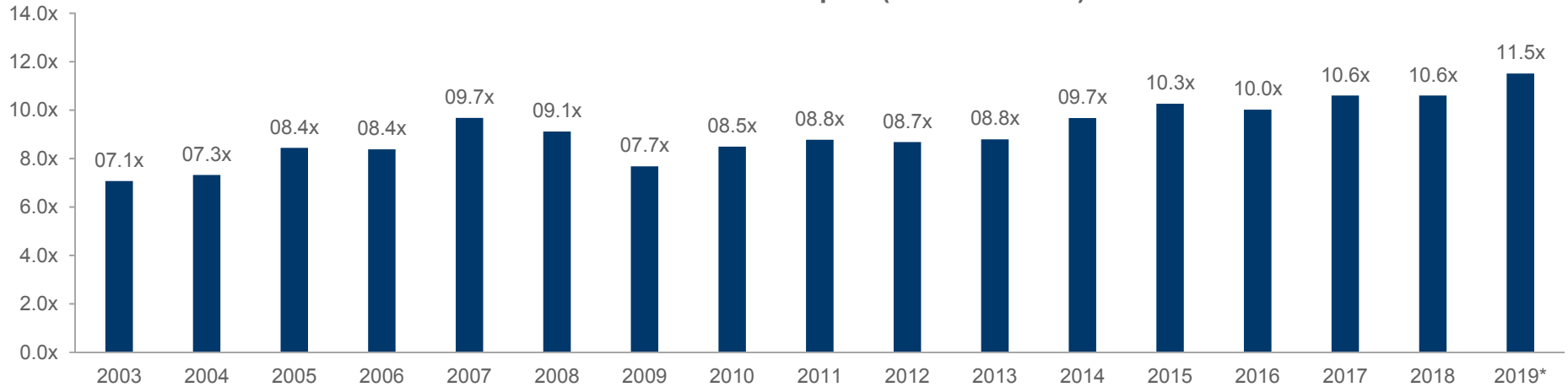
Global Quarterly Private Equity-Backed Buyout Deals (Q1 2014 – Q4 2019)



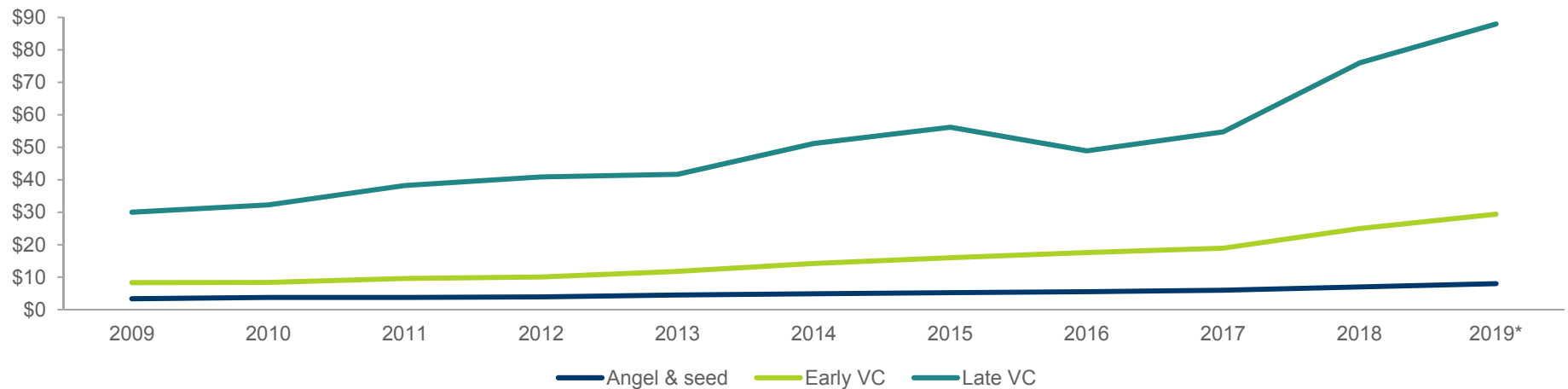
Source: Preqin, as of December 31, 2019.

PRIVATE EQUITY – PRICING & VALUATIONS

LBO Purchase Price Multiples (2003 - Q4 2019)



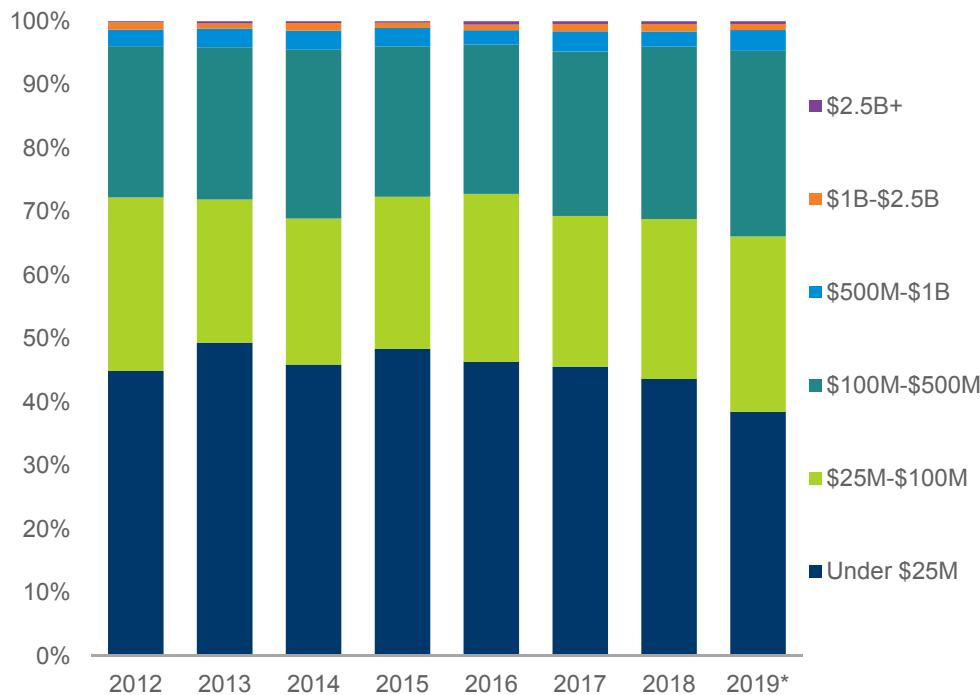
Venture Capital Pre-Money Valuations (\$M) (2009 – Q4 2019)



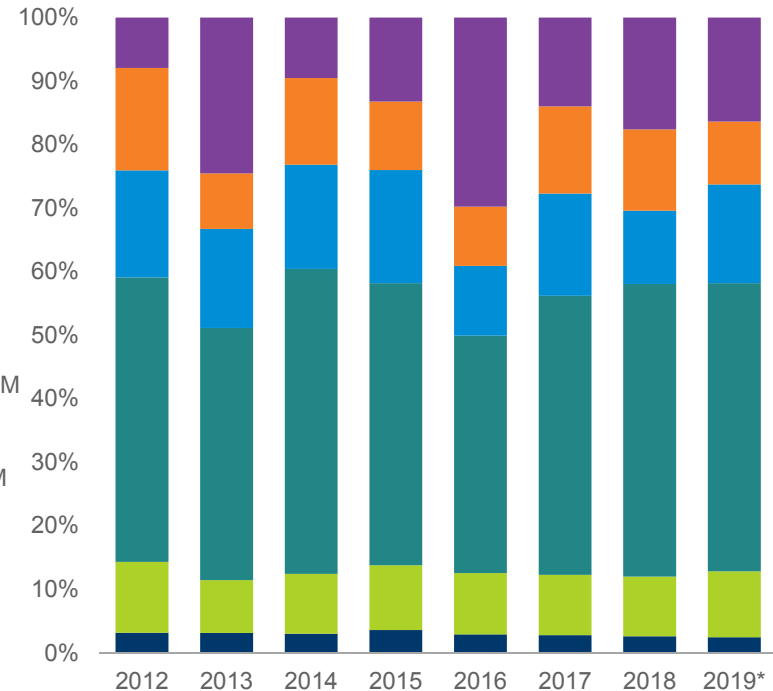
Source: S&P LBO; PitchBook, *as of December 31, 2019.

U.S. INVESTMENT ACTIVITY BY DEAL SIZE

Percentage of Deal Volume by Deal Size (by Count)*



Percentage of Deal Volume by Deal Size (by Dollars)*

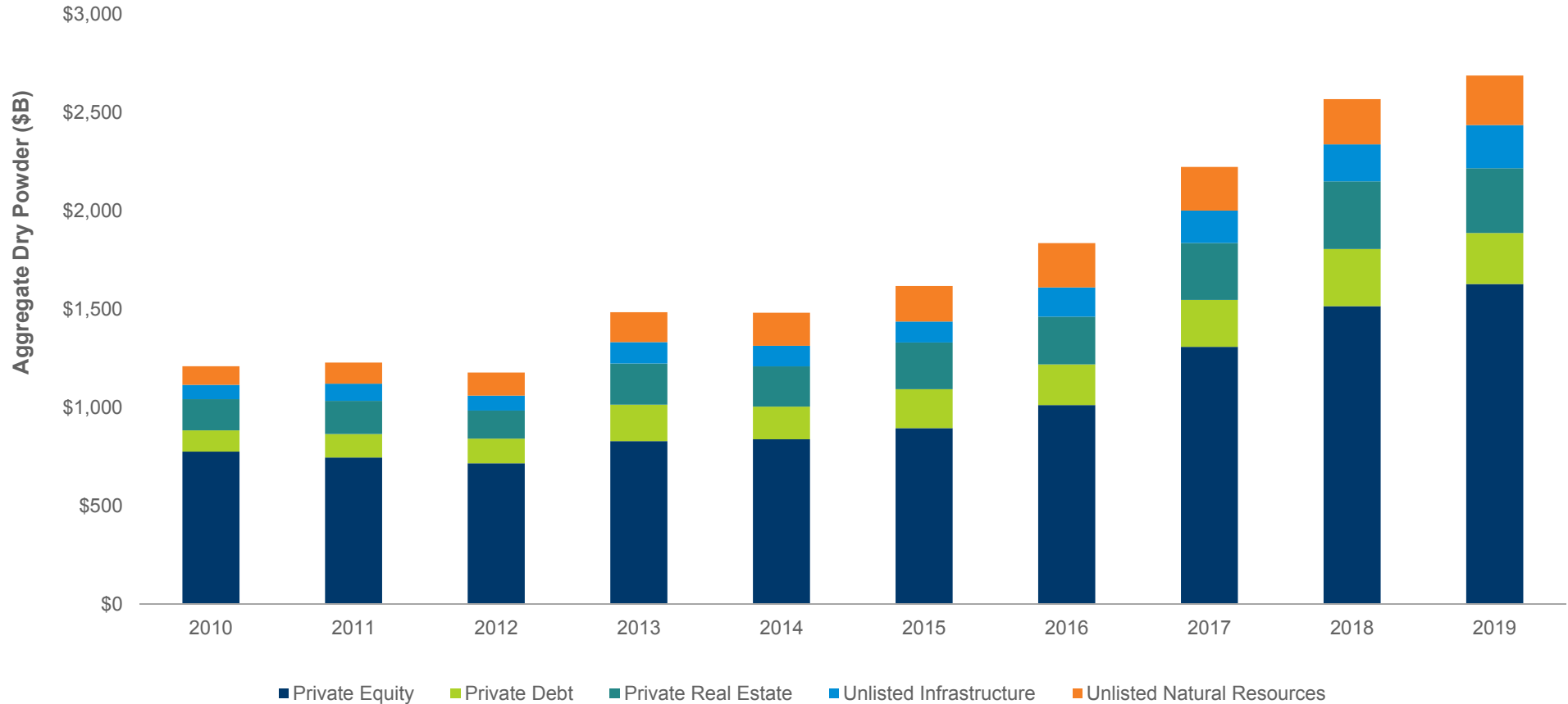


- Deal volume continues to be dominated by lower middle market deals with investment sizes below \$100 million through the fourth quarter of 2019
- However, deals with below \$100 million check sizes comprised only 12% of all deal volume by amount of capital invested in the fourth quarter of 2019

Source: PitchBook, *as of December 31, 2019.

PRIVATE CAPITAL DRY POWDER

Private Capital Dry Powder by Fund Type (2010 - Q4 2019)



- Global private capital dry powder continues to increase, topping \$2.6 trillion across all fund types
- Private equity comprises just over 60% of total dry powder in the market as of Q4 2019

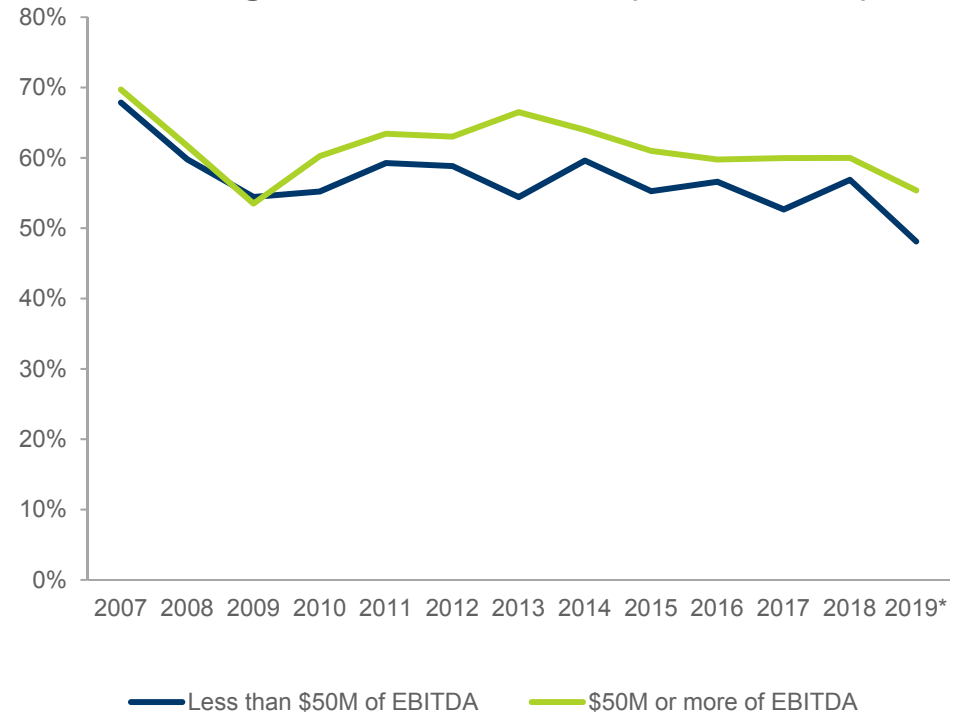
Source: Preqin, as of December 31, 2019.

PRIVATE EQUITY - U.S. DEBT MARKETS

Total U.S. LBO Loan Volume (\$B) (2003 - Q4 2019)



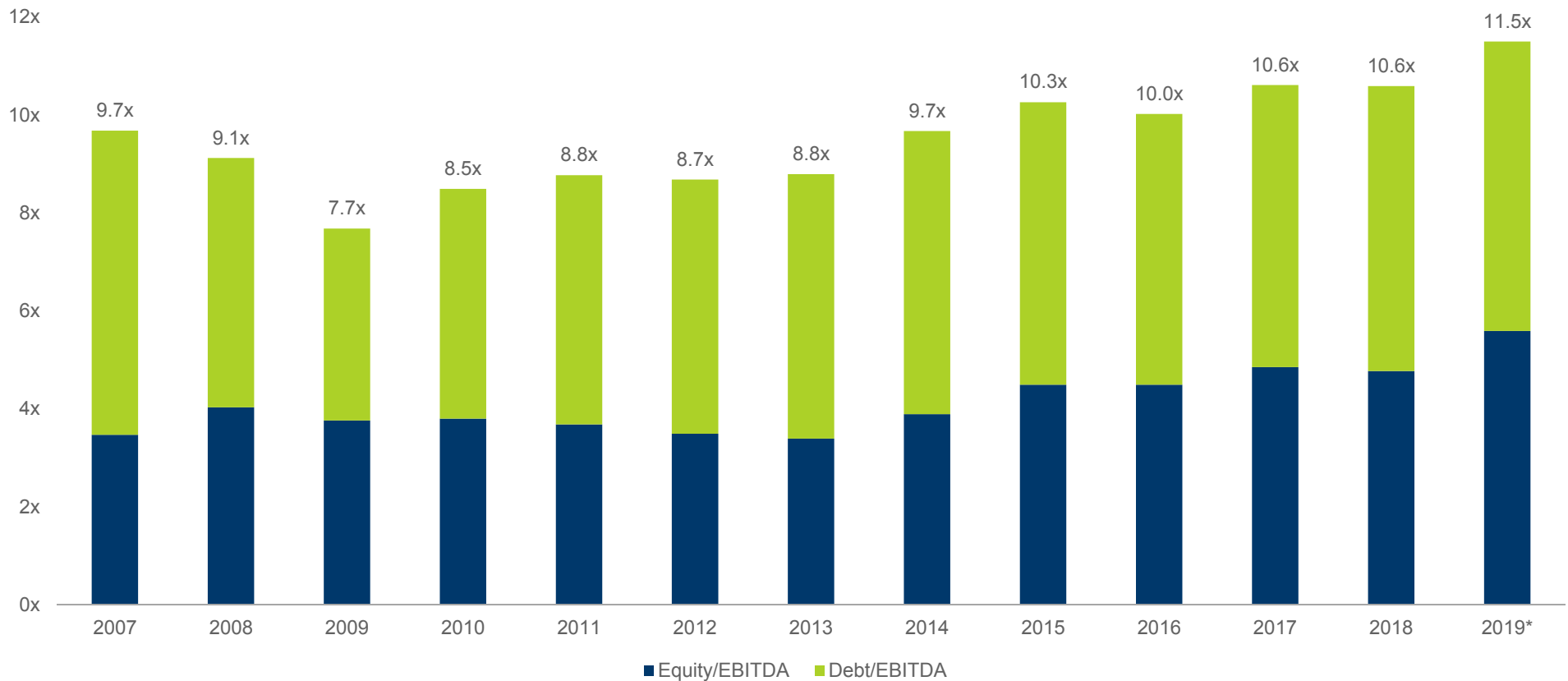
Percentage of Debt Used in LBOs (2007 - Q4 2019)



- 2019 has generated approximately \$106 billion in loan volume and for the first time since 2015, LBO's did not see an increase in loan volume from the prior year
- As debt capital becomes less available, the percentage of debt used to finance leveraged buyouts through the fourth quarter of 2019 has dropped from 2018 marks

PRIVATE EQUITY - U.S. LBO PURCHASE PRICE MULTIPLES

Purchase Price Multiples of U.S. LBO Transactions (2007 - Q4 2019)



- Due to the amount of equity that is readily available, purchase price multiples for U.S. LBOs have continued to rise through Q4 2019, relative to 2018 levels

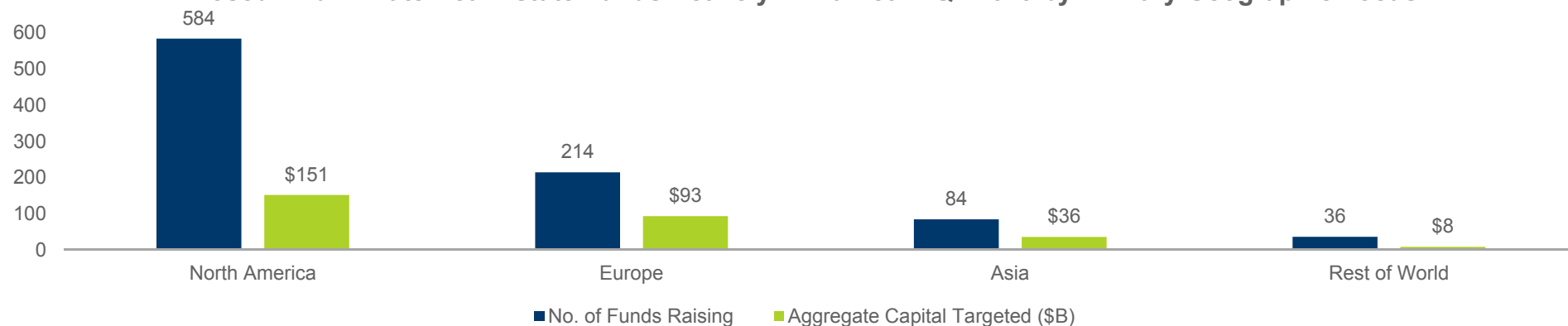
Source: S&P LBO, *as of December 31, 2019.

PRIVATE REAL ESTATE – FUNDRAISING ACTIVITY

Global Quarterly Closed-End Private Real Estate Fundraising (Q1 2014 - Q4 2019)



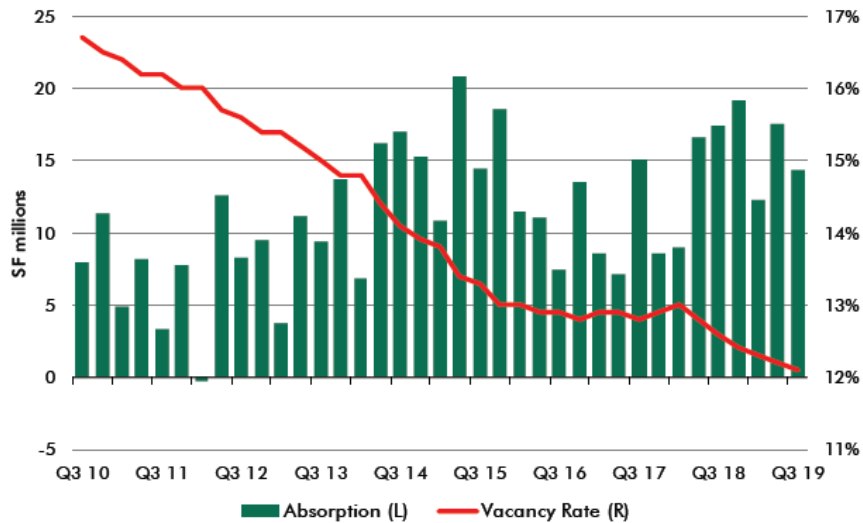
Closed-End Private Real Estate Funds Actively in Market in Q4 2019 by Primary Geographic Focus



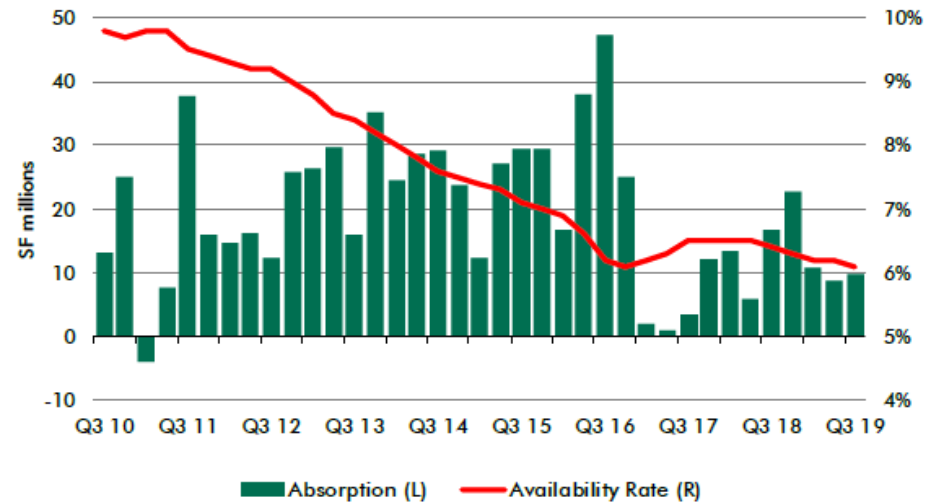
Source: Preqin, as of December 31, 2019.

COMMERCIAL PROPERTY

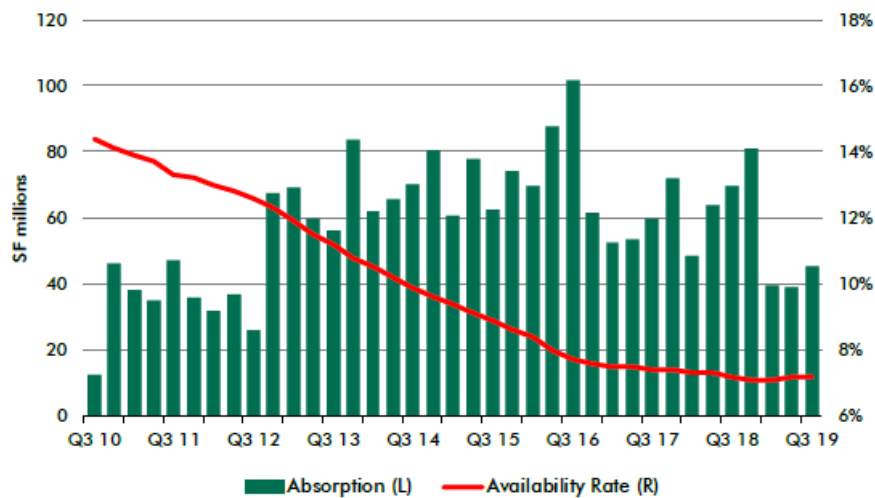
OFFICE



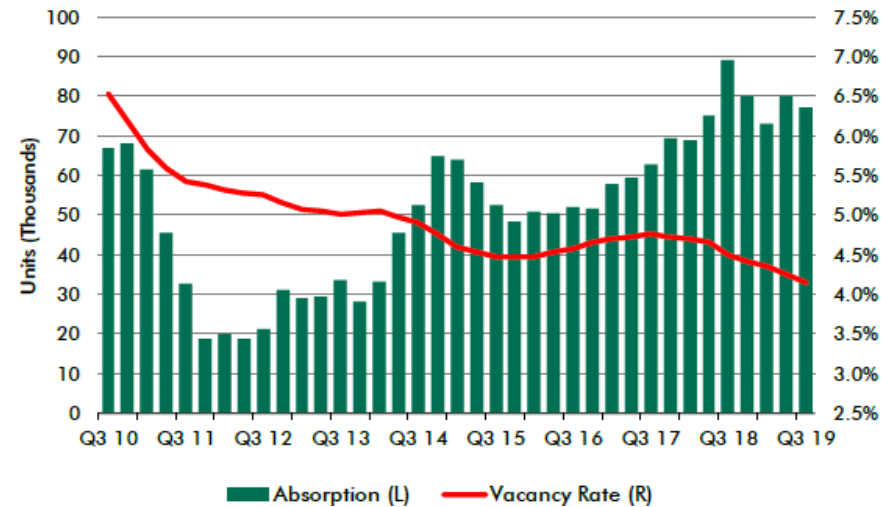
RETAIL



INDUSTRIAL



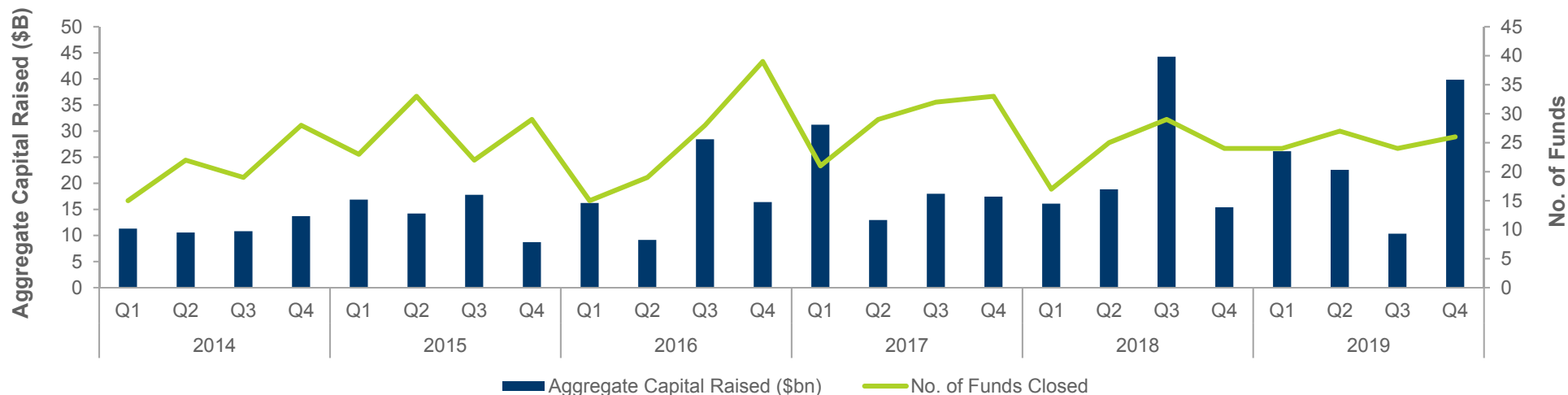
APARTMENTS



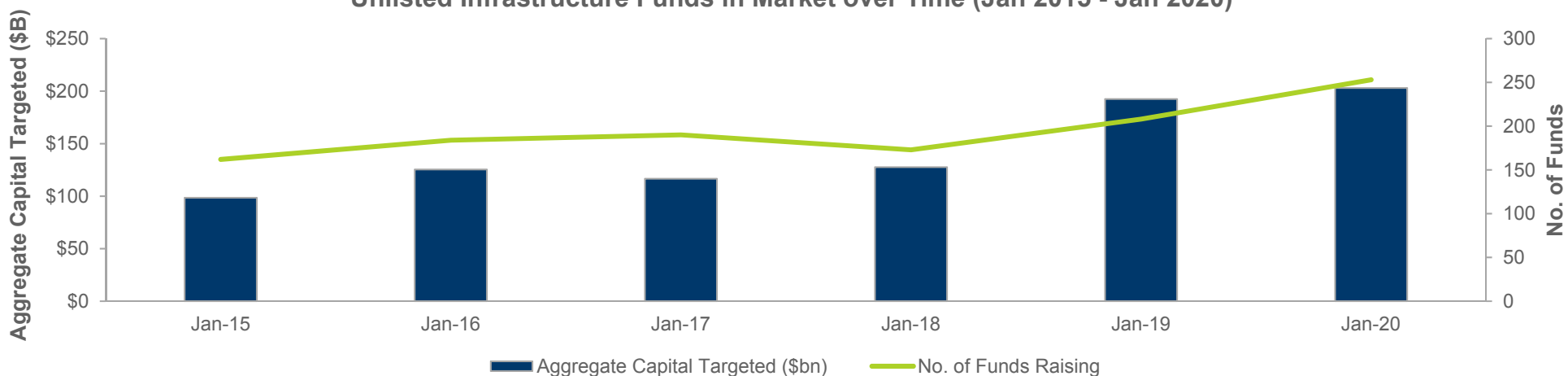
Data sources: CB Richard Ellis

UNLISTED INFRASTRUCTURE – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Unlisted Infrastructure Fundraising (Q1 2014 - Q4 2019)

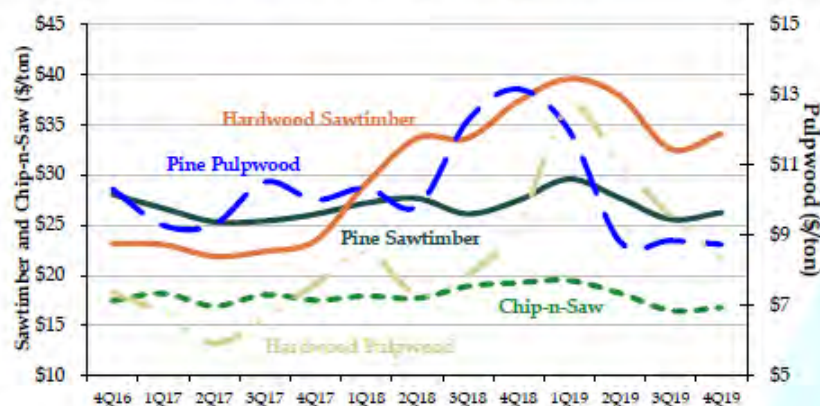


Unlisted Infrastructure Funds in Market over Time (Jan 2015 - Jan 2020)



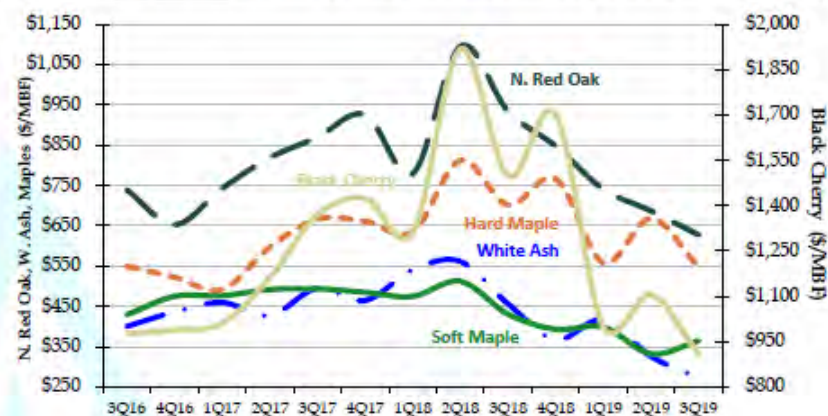
Source: Preqin, as of December 31, 2019.

Southeastern Timber Prices



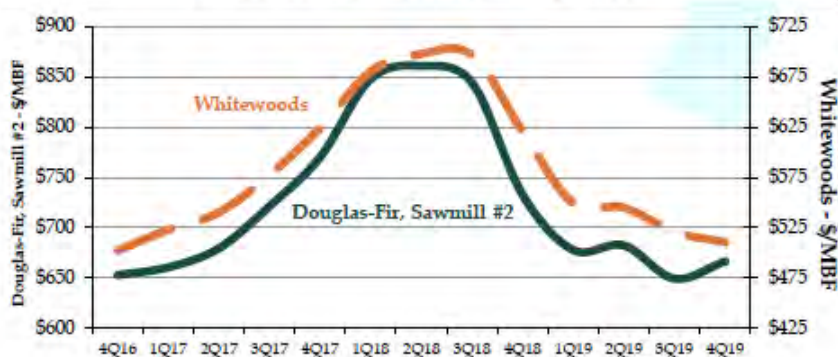
Source: Forest2Market®

Northeastern Hardwood Timber Prices



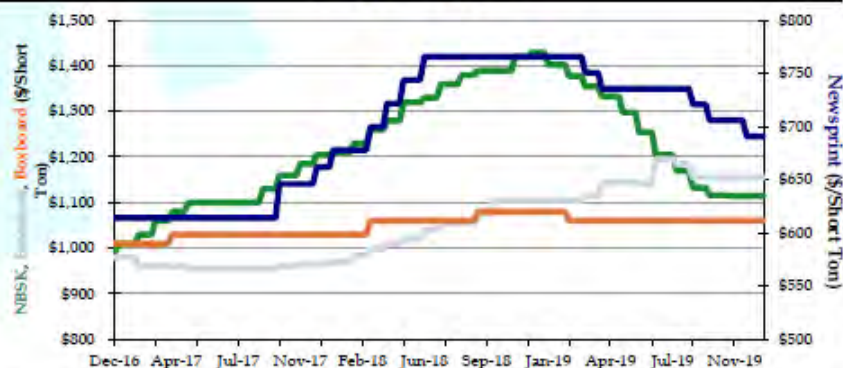
Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

Pacific Northwest Timber Prices



Source: Fastmarkets RISI - Log Lines®

Pulp and Paper



Source: Fastmarkets RISI

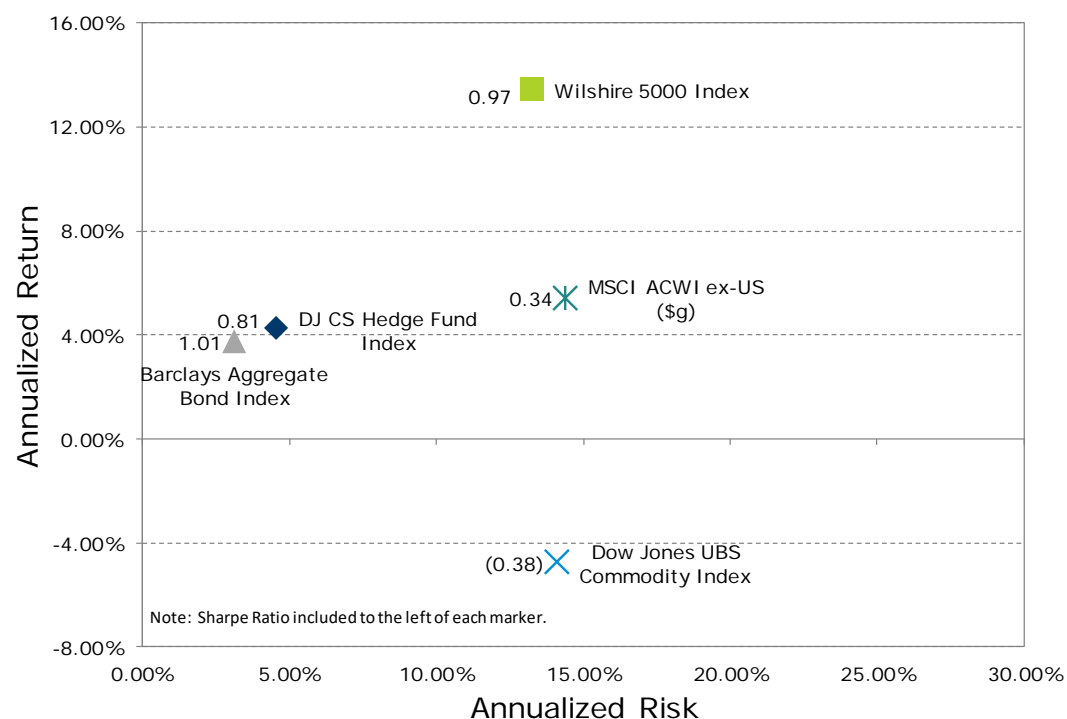
Data sources: Forest Investment Associates

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HEDGE FUND PERFORMANCE

AS OF DECEMBER 31, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DJ CS HEDGE FUND INDEX	2.4	9.3	9.3	4.3	2.6	4.3
EVENT DRIVEN	2.2	8.2	8.2	3.4	1.2	3.5
GLOBAL MACRO	0.8	10.4	10.4	4.0	3.2	4.7
LONG/SHORT EQUITY	5.1	12.2	12.2	6.7	3.9	5.2
MULTI-STRATEGY	1.3	7.2	7.2	4.3	4.2	6.0
WILSHIRE 5000	9.1	31.0	31.0	14.5	11.4	13.4
MSCI ACWI EX-US (\$G)	9.0	22.1	22.1	10.4	6.0	5.4
BLOOMBERG BARCLAYS AGGREGATE	0.2	8.7	8.7	4.0	3.1	3.7
DOW JONES UBS COMMODITY	4.4	7.7	7.7	-0.9	-3.9	-4.7

HEDGE FUND 10-YEAR RISK/RETURN



Data sources: Wilshire Compass



Performance and Risk Update: Q3 FY20

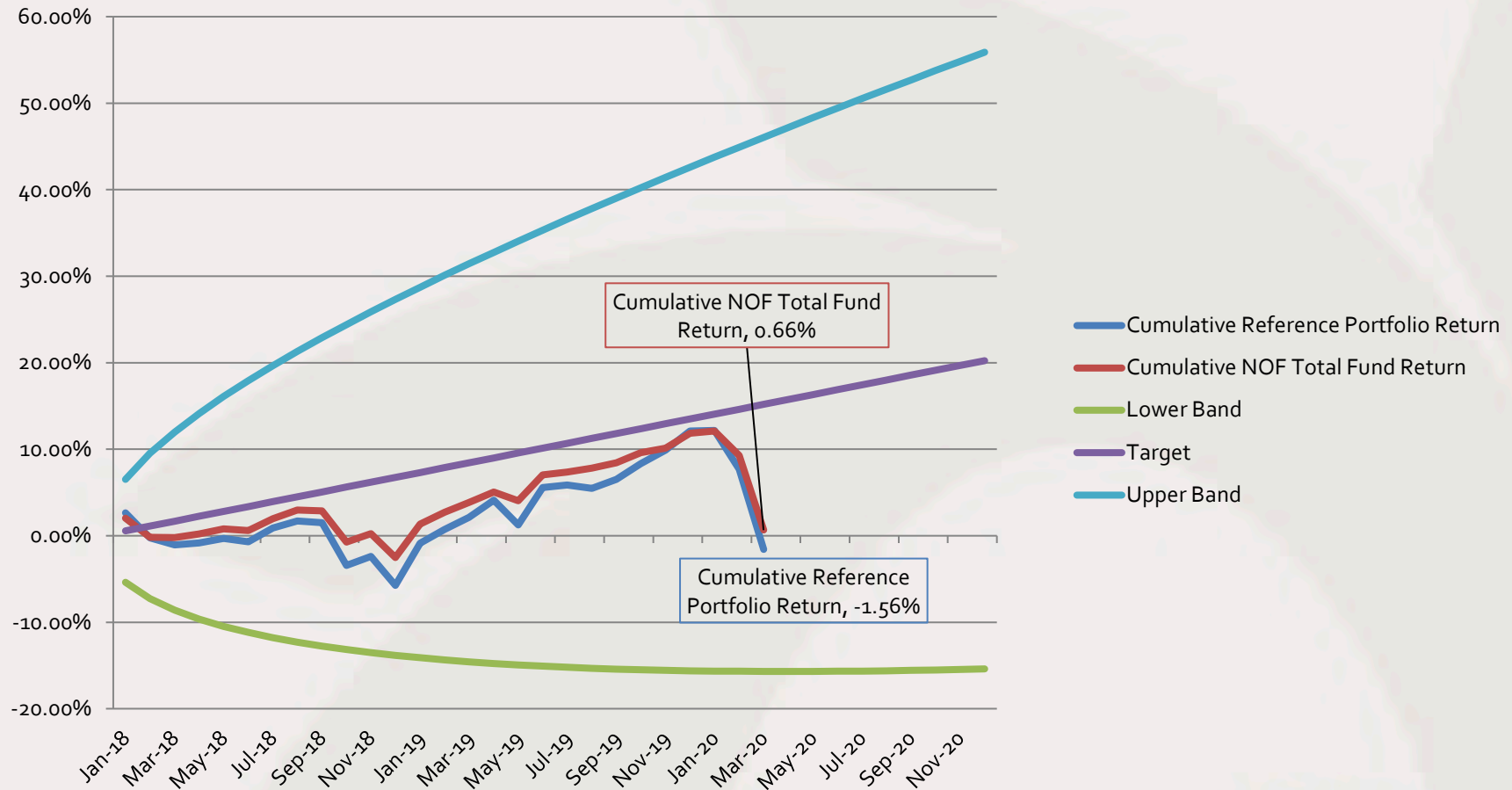
April 2020

Thomas Toth, Managing Director – Wilshire Associates

Total Fund versus Reference Portfolio

December 31, 2017 start date

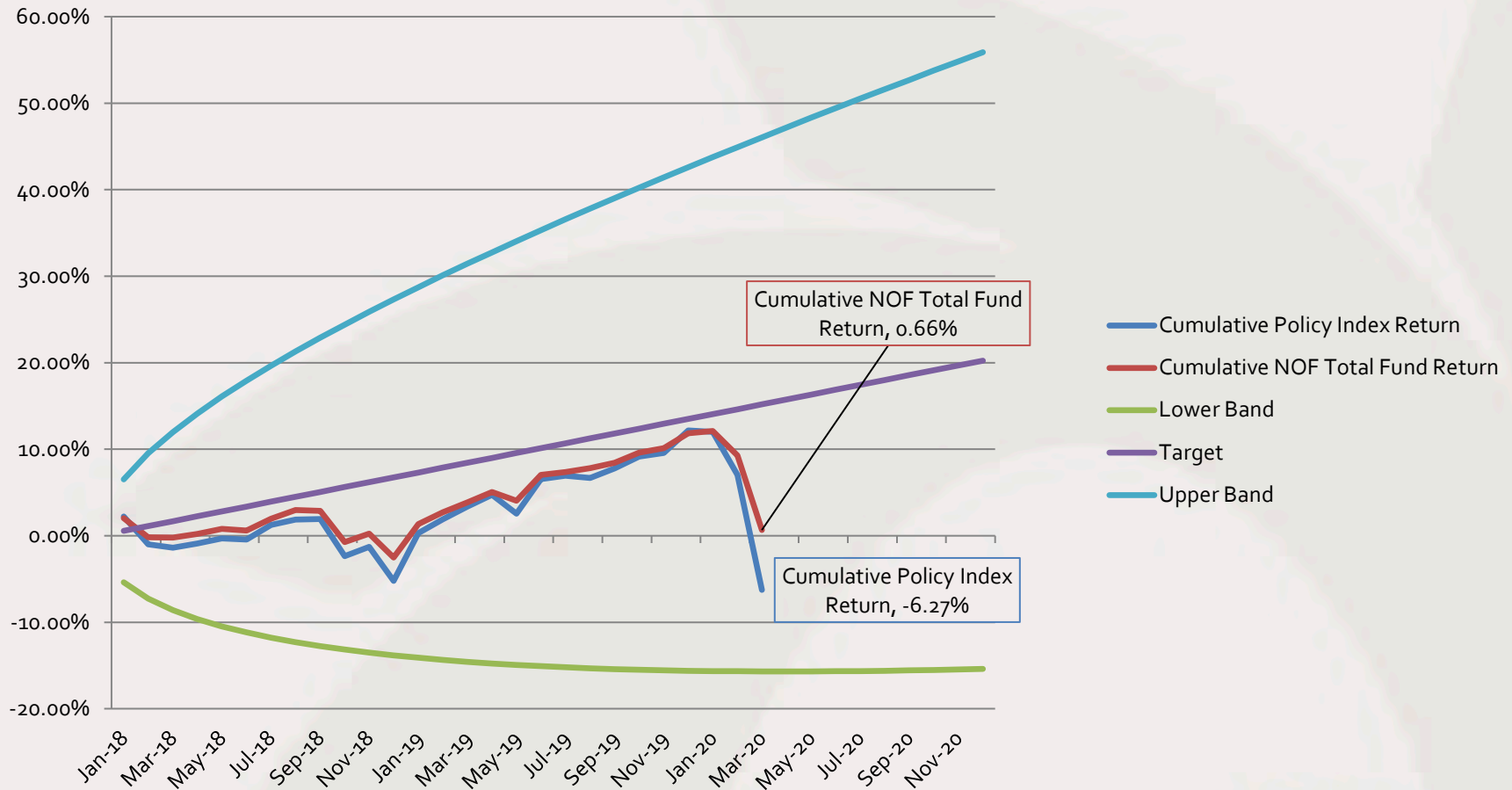
Total Fund v. Reference Portfolio
Cumulative Distribution, 95% confidence interval
6.75% return and 10.50% risk expectation



Total Fund versus Policy Portfolio

December 31, 2017 start date

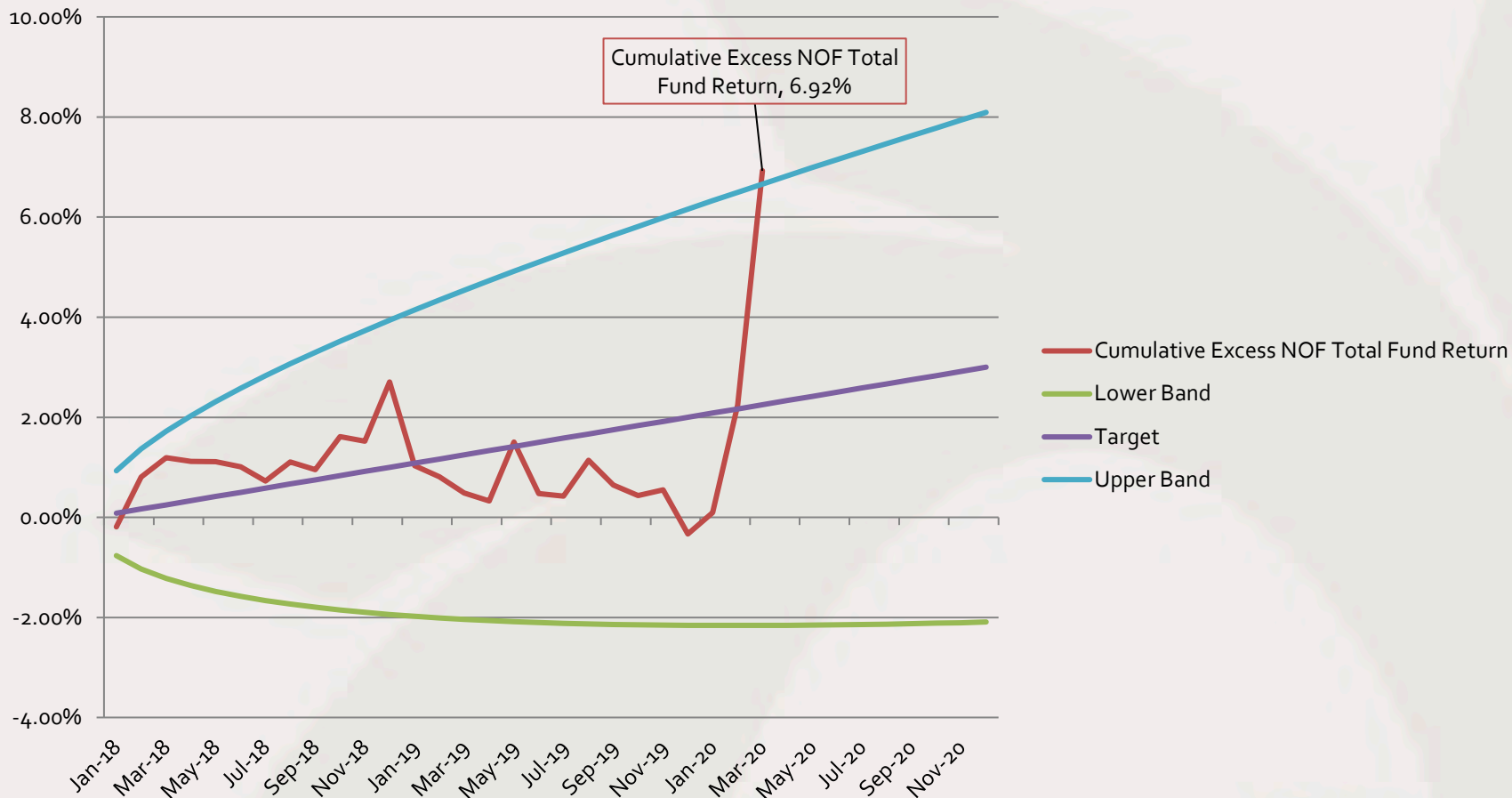
Total Fund v. Policy Portfolio
Cumulative Distribution, 95% confidence interval
6.75% return and 10.50% risk expectation



Active Risk versus Expectations – Cumulative Months

December 31, 2017 start date

Total Fund v. Policy Index
Cumulative Distribution, 95% confidence interval
1.0% active return and 1.5% active risk expectation



Arithmetic Calculation

Slide 4



Attribution Q1 2020

Quarter - 3/31/20	NM PERA		Policy		Difference		Net Management Effects		
	Weight	Return	Weight	Return	Weight	Return	Allocation	Selection	Total
GLOBAL EQUITY	37.90	-15.73	37.71	-21.26	0.19	5.53	0.08	2.04	2.12
Global Public Stock	23.56	-22.35	21.71	-22.44	1.85	0.09	-0.12	0.03	-0.09
Global Low Volatility	6.95	-15.93	5.00	-16.00	1.95	0.07	0.00	0.01	0.01
Hedged Equity	0.01	-7.20	2.00	-16.00	-1.99	8.80	-0.01	0.00	-0.01
Private Equity	7.40	4.94	9.00	-22.44	-1.60	27.38	0.10	2.01	2.11
LGIMA Global Equity Overlay	-0.02	-69.53	0.00	0.00	-0.02	-69.53	0.10	0.00	0.10
RISK REDUCTION & MITIGATION	20.19	1.74	20.05	2.94	0.14	-1.20	0.01	-0.21	-0.20
Domestic Core Fixed Income	16.60	1.76	17.55	3.15	-0.95	-1.39	-0.20	-0.21	-0.41
Global Core Fixed Income	2.58	1.34	2.50	1.45	0.08	-0.11	0.02	0.00	0.02
Cash	0.85	4.86	0.00	0.00	0.85	4.86	0.18	0.00	0.18
LGIMA Overlay Collateral	0.00	128.81	0.00	0.00	0.00	128.81	0.00	0.00	0.00
LGIMA TAA Overlay	0.15	-13.15	0.00	0.00	0.15	-13.15	0.01	0.00	0.01
CREDIT ORIENTED FIXED INCOME	14.25	-2.62	15.00	-14.48	-0.75	11.86	-0.02	1.66	1.64
Liquid Credit	6.78	-3.91	3.00	-14.53	3.78	10.62	0.07	0.71	0.78
Emerging Market Debt	2.21	-7.86	3.00	-14.28	-0.79	6.42	-0.02	0.14	0.12
Illiquid Credit - PE/RE Debt	4.75	1.29	6.00	-14.53	-1.25	15.82	-0.03	0.74	0.71
Illiquid Credit - CO HF	0.51	1.16	3.00	-14.53	-2.49	15.69	-0.05	0.08	0.03
REAL ASSETS	19.84	-9.75	20.00	-24.62	-0.16	14.87	0.01	3.03	3.04
Liquid Real Estate	1.89	-21.86	2.00	-27.52	-0.11	5.66	0.01	0.11	0.13
Illiquid Real Estate	5.05	5.29	5.00	-27.52	0.05	32.81	-0.02	1.67	1.65
Liquid Real Assets	8.09	-21.22	8.00	-23.53	0.09	2.31	0.00	0.19	0.20
Illiquid Real Assets	4.80	-0.80	5.00	-22.47	-0.20	21.67	0.01	1.05	1.07
Market Neutral HF	0.01	-0.24	0.00	0.00	0.01	-0.24	0.00	0.00	0.00
MULTI-RISK ALLOCATION	7.83	-20.47	7.23	-21.19	0.60	0.72	-0.10	0.07	-0.03
TOTAL	100.0	-9.82	100.0	-16.39			-0.02	6.59	6.57

Attribution FY 2020

FYTD - 3/31/20	NM PERA		Policy		Difference		Net Management Effects		
	Weight	Return	Weight	Return	Weight	Return	Allocation	Selection	Total
GLOBAL EQUITY	39.77	-9.27	39.57	-14.72	0.20	5.45	0.09	1.93	2.02
Global Public Stock	25.62	-15.68	23.57	-15.57	2.05	-0.11	-0.06	-0.03	-0.09
Global Low Volatility	6.89	-10.91	5.00	-11.14	1.89	0.23	0.01	0.02	0.02
Hedged Equity	0.19	-3.66	2.00	-11.14	-1.81	7.48	-0.02	0.00	-0.02
Private Equity	7.07	11.88	9.00	-15.57	-1.93	27.45	0.05	1.95	2.01
LGIMA Global Equity Overlay	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
RISK REDUCTION & MITIGATION	20.81	4.28	20.57	5.41	0.24	-1.13	0.02	-0.22	-0.20
Domestic Core Fixed Income	17.50	4.29	18.07	5.68	-0.57	-1.39	-0.20	-0.21	-0.42
Global Core Fixed Income	2.57	3.33	2.50	3.57	0.07	-0.24	0.02	-0.01	0.01
Cash	0.66	9.05	0.00	0.00	0.66	9.05	0.19	0.00	0.19
LGIMA Overlay Collateral	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LGIMA TAA Overlay	0.08	-8.62	0.00	0.00	0.08	-8.62	0.01	0.00	0.01
CREDIT ORIENTED FIXED INCOME	14.39	-0.65	15.00	-11.63	-0.61	10.98	-0.02	1.59	1.57
Liquid Credit	5.86	-2.94	3.00	-11.80	2.86	8.86	0.03	0.63	0.67
Emerging Market Debt	2.18	-4.98	3.00	-10.94	-0.82	5.96	-0.01	0.13	0.12
Illiquid Credit - PE/RE Debt	4.22	5.77	6.00	-11.80	-1.78	17.57	0.01	0.82	0.83
Illiquid Credit - CO HF	2.14	1.06	3.00	-11.80	-0.86	12.86	-0.05	0.00	-0.05
REAL ASSETS	19.87	-6.85	20.00	-21.98	-0.13	15.13	0.01	3.14	3.14
Liquid Real Estate	2.21	-16.84	2.00	-22.66	0.21	5.82	0.02	0.11	0.13
Illiquid Real Estate	4.88	13.39	5.00	-22.66	-0.12	36.05	-0.03	1.79	1.76
Liquid Real Assets	8.03	-19.83	8.00	-23.22	0.03	3.39	0.00	0.30	0.30
Illiquid Real Assets	4.73	-1.02	5.00	-19.47	-0.27	18.45	0.02	0.93	0.95
Market Neutral HF	0.02	5.19	0.00	0.00	0.02	5.19	0.00	0.00	0.00
MULTI-RISK ALLOCATION	5.15	-15.06	4.86	-15.02	0.29	-0.04	-0.10	0.04	-0.07
TOTAL	100.0	-5.52	100.0	-11.99			-0.01	6.48	6.47



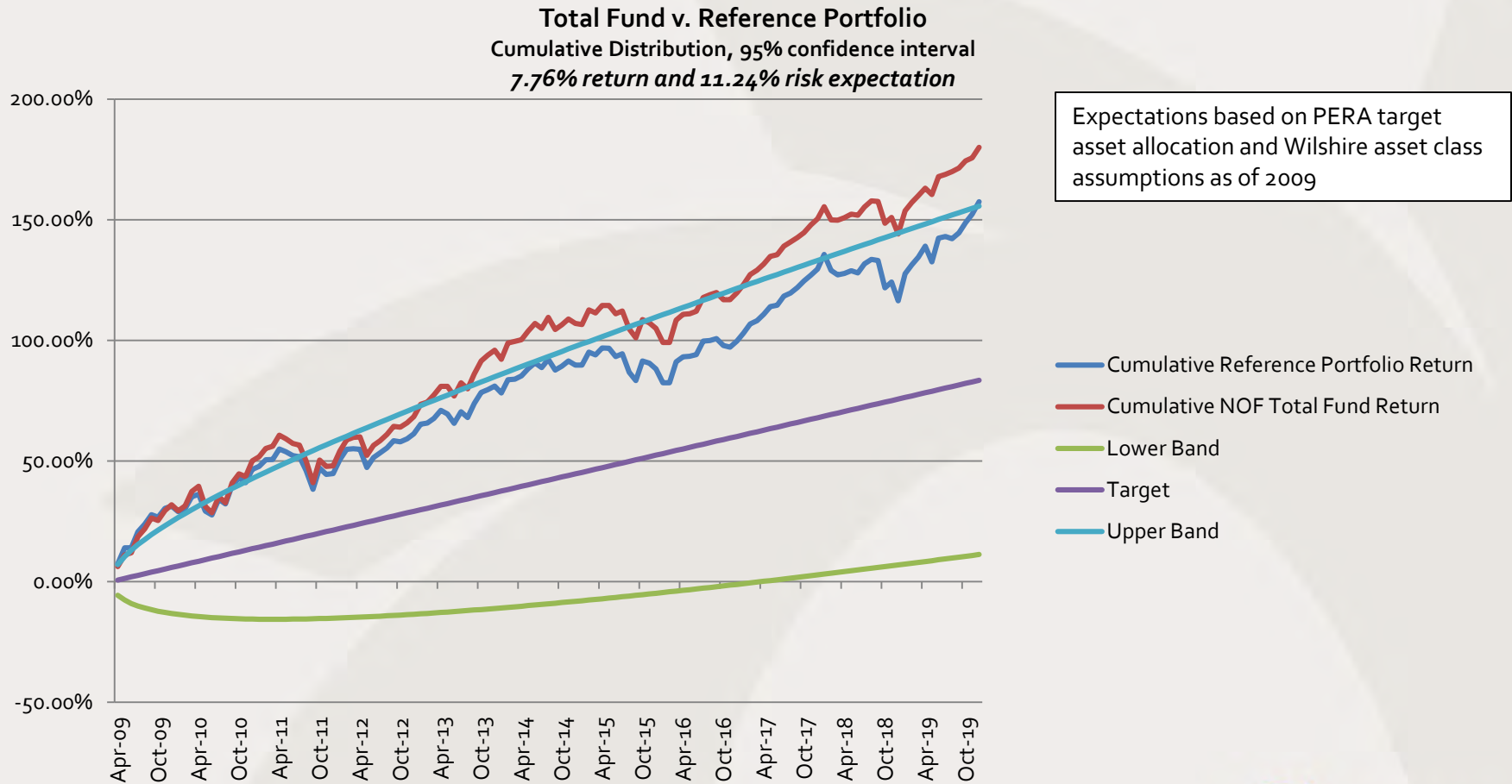
Performance and Risk Update: Q2 FY20

February 2020

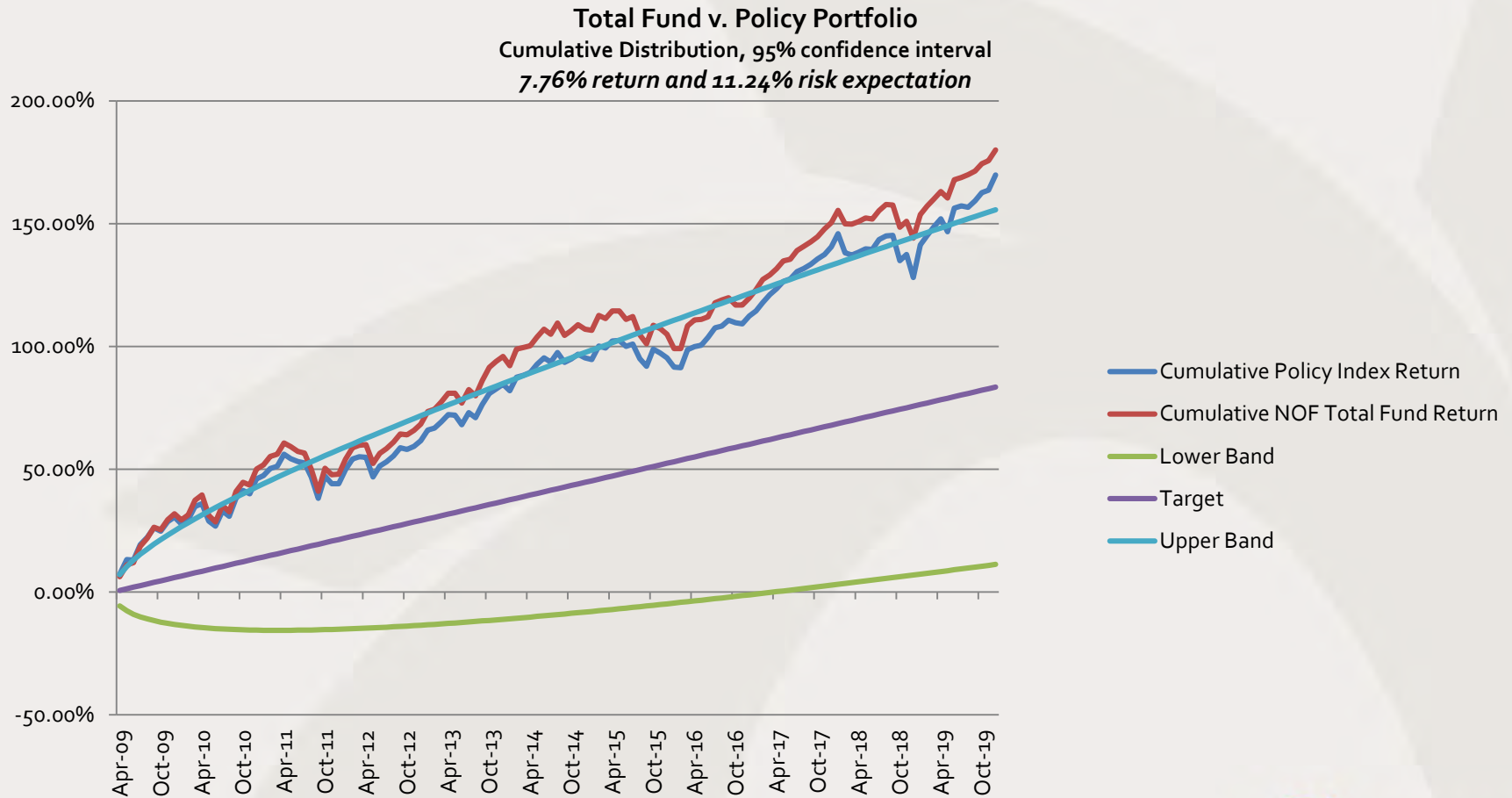
Thomas Toth, Managing Director – Wilshire Associates

Kristin Varela, Deputy CIO

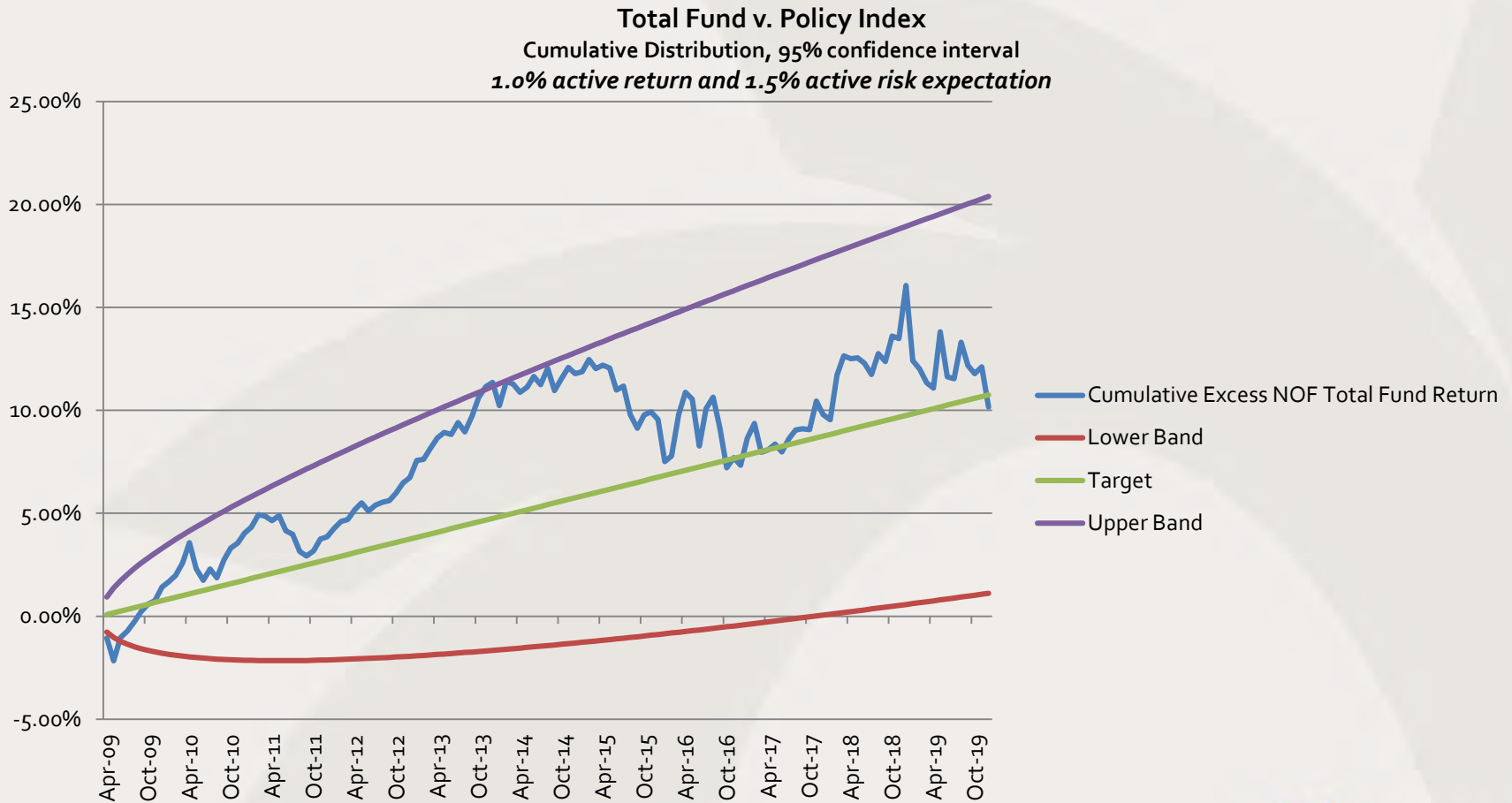
Total Fund versus Reference Portfolio – 10 Years



Total Fund versus Policy Index – 10 Years



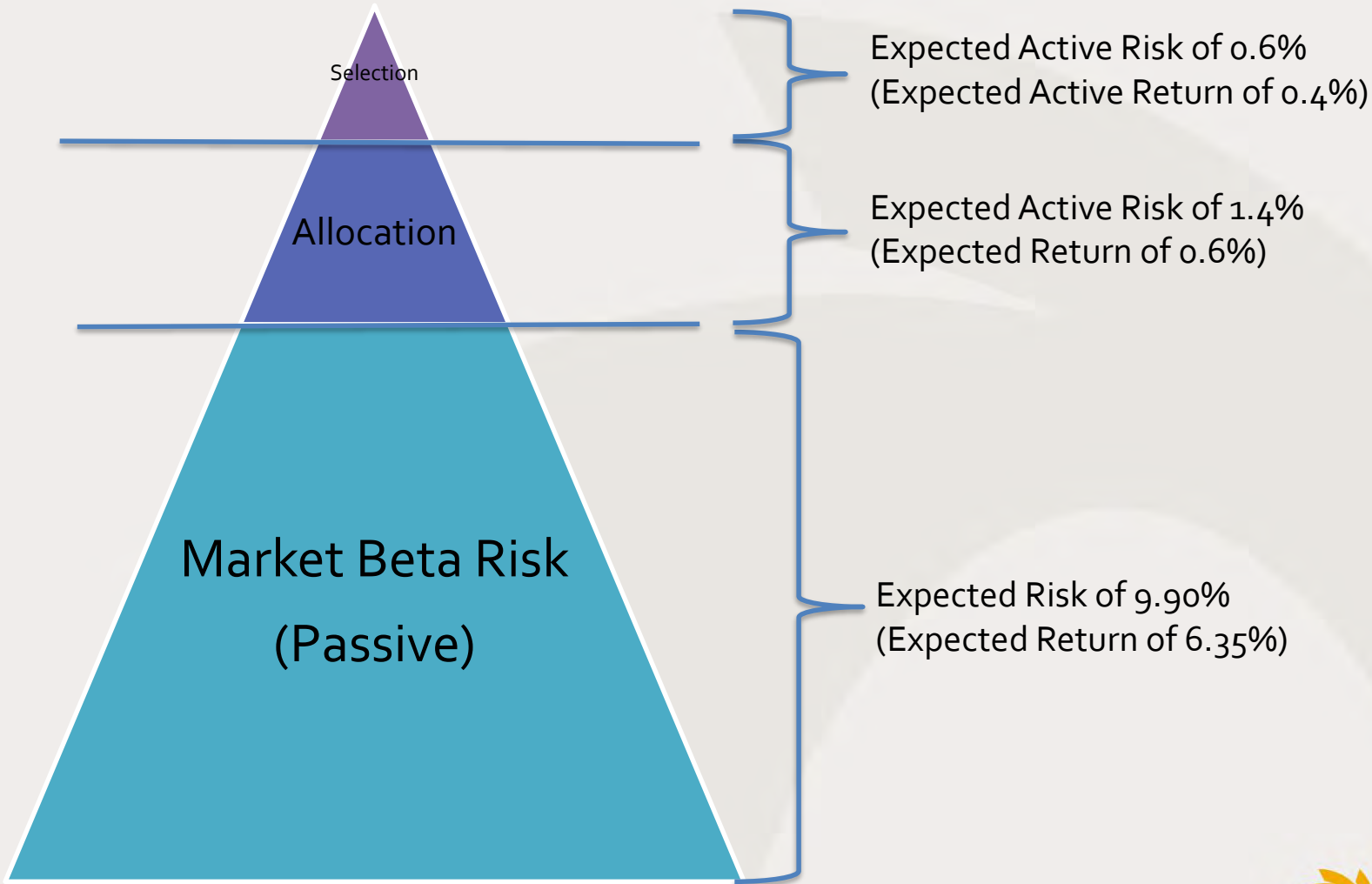
Total Fund Active versus Policy Index – 10 Years



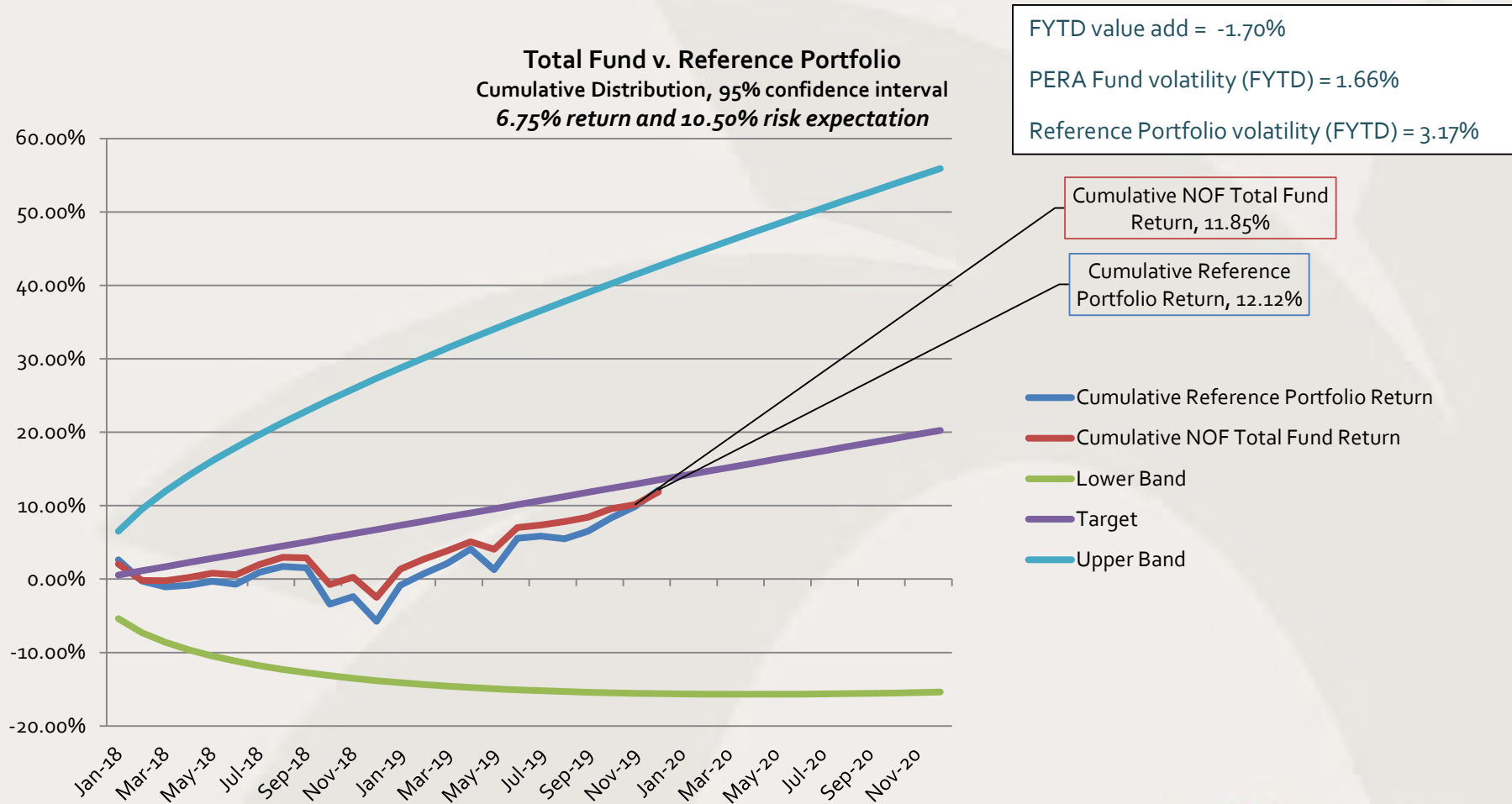
2019 Total Fund Risk Budget

Target Return= 7.35%

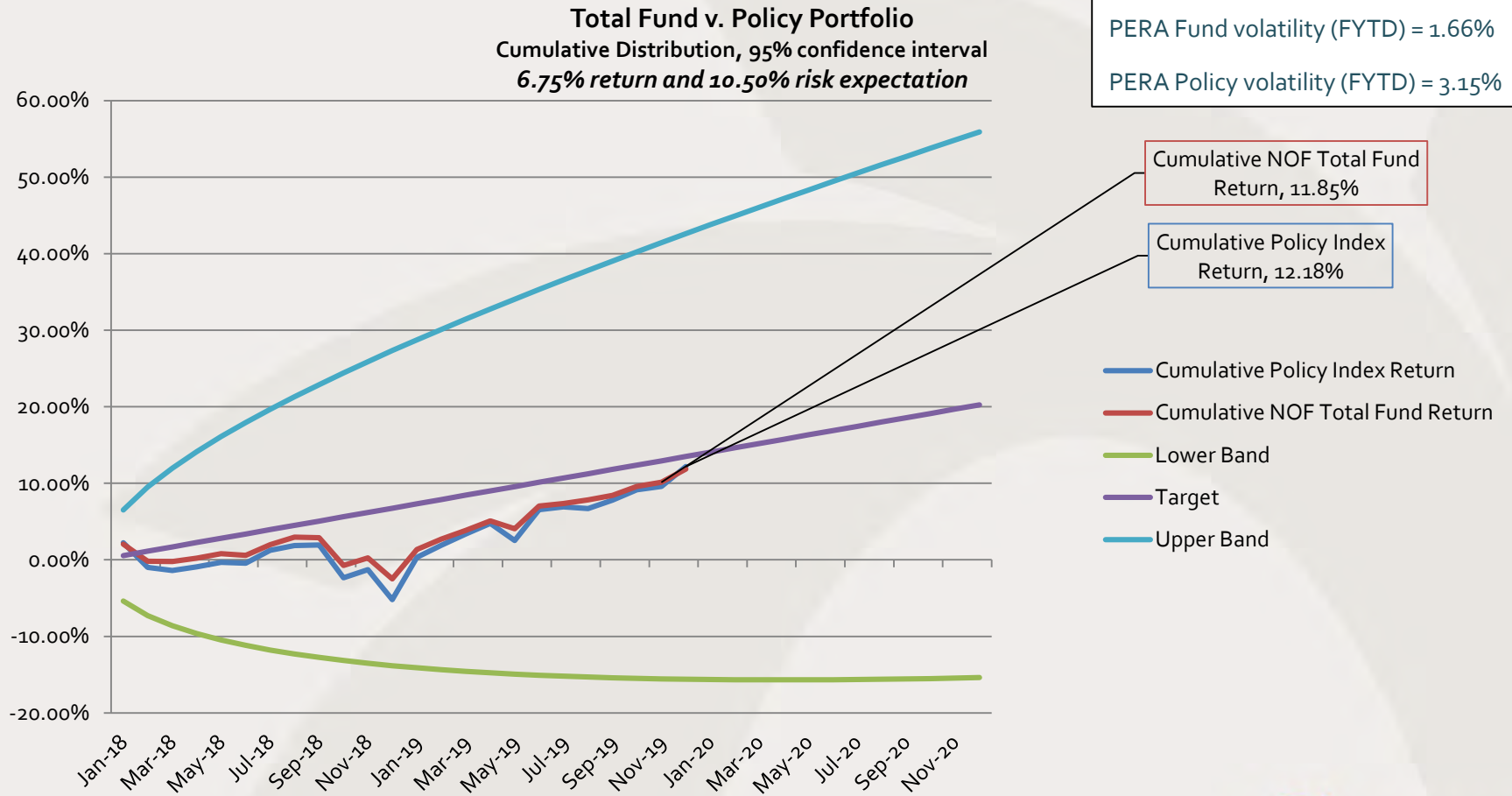
Target Risk = 10.2%



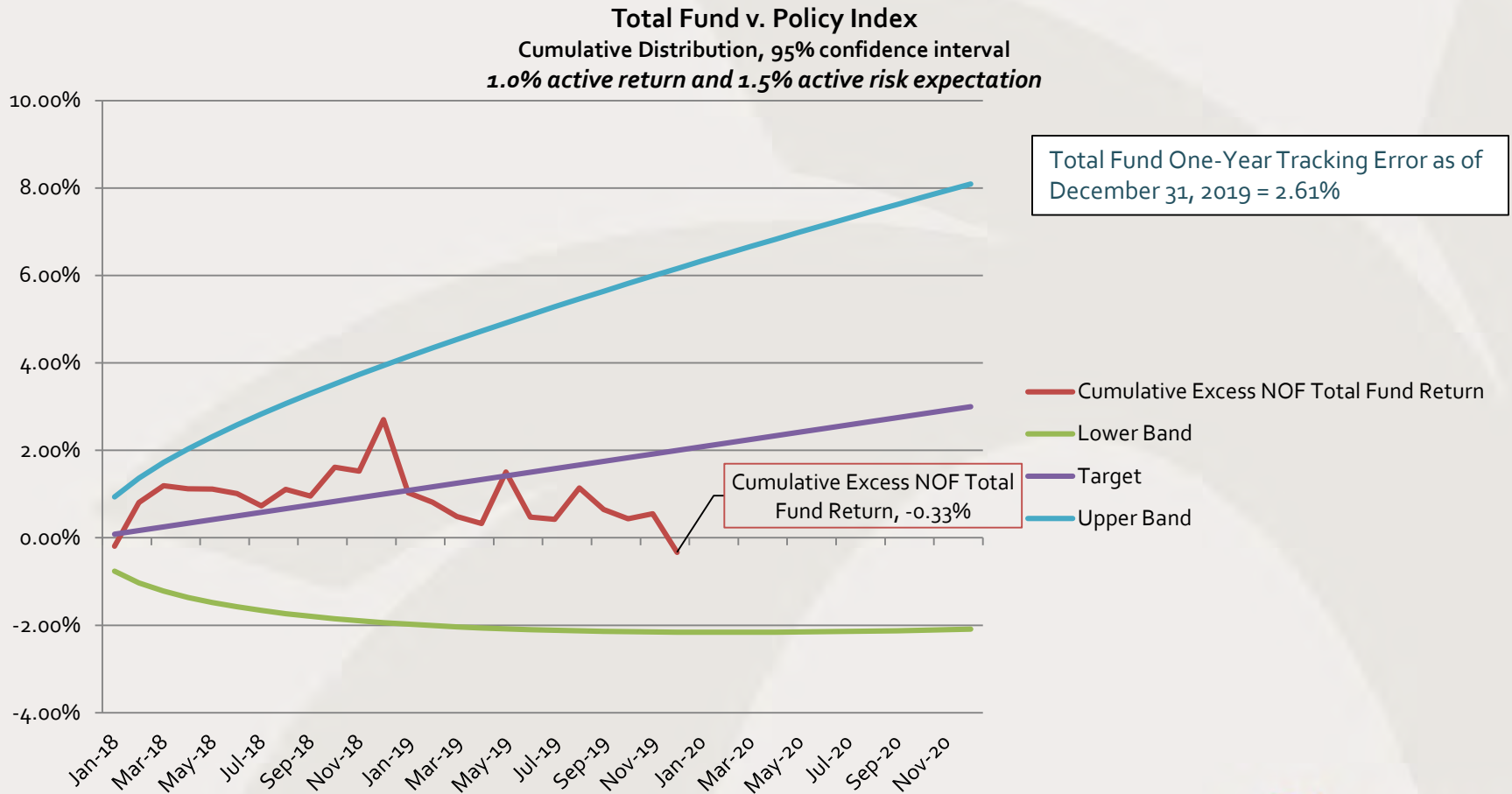
Total Fund versus Reference Portfolio



Total Fund versus Policy Portfolio



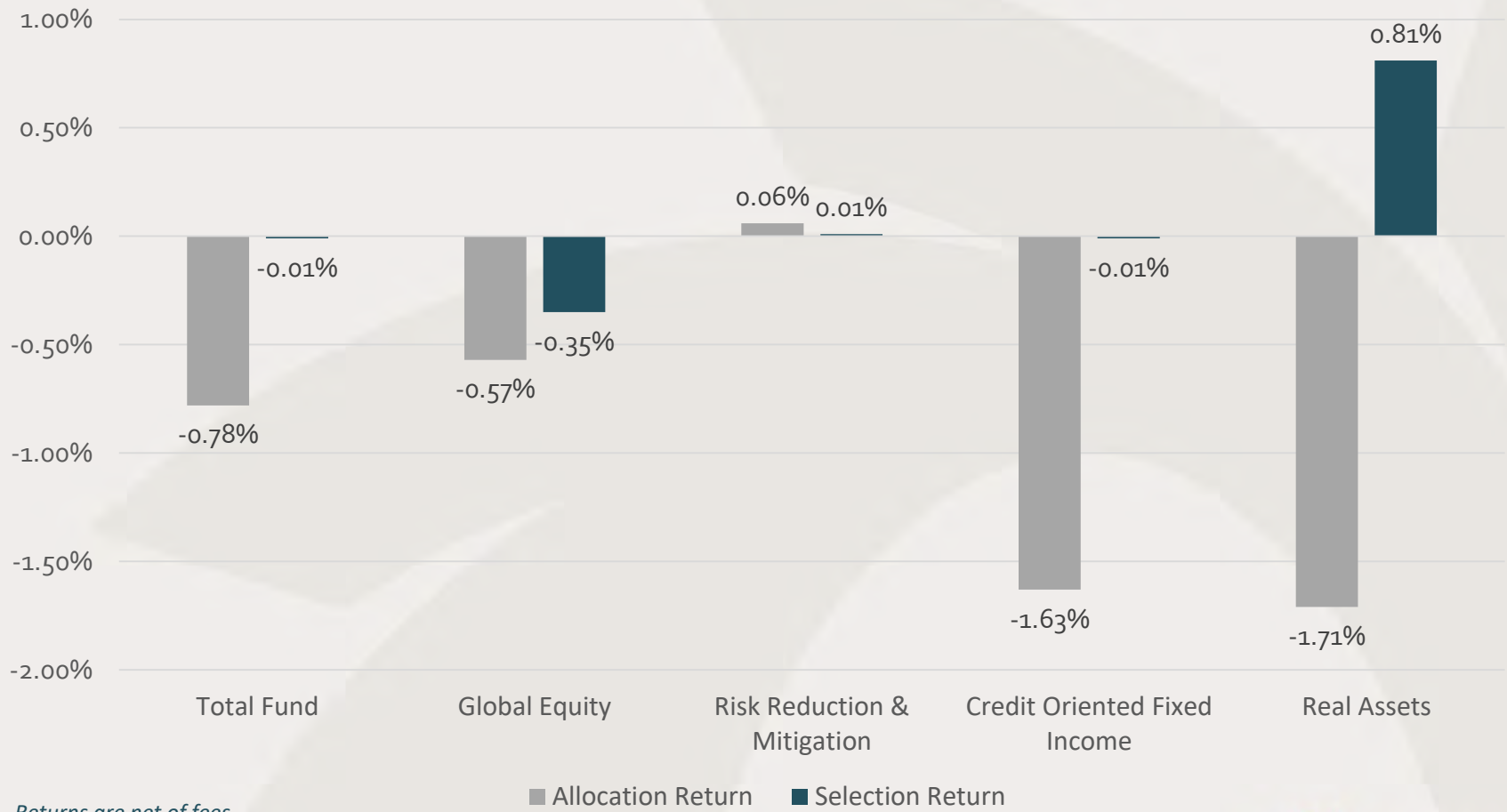
Active Risk versus Expectations – Cumulative Months



Performance Detail – Asset Class

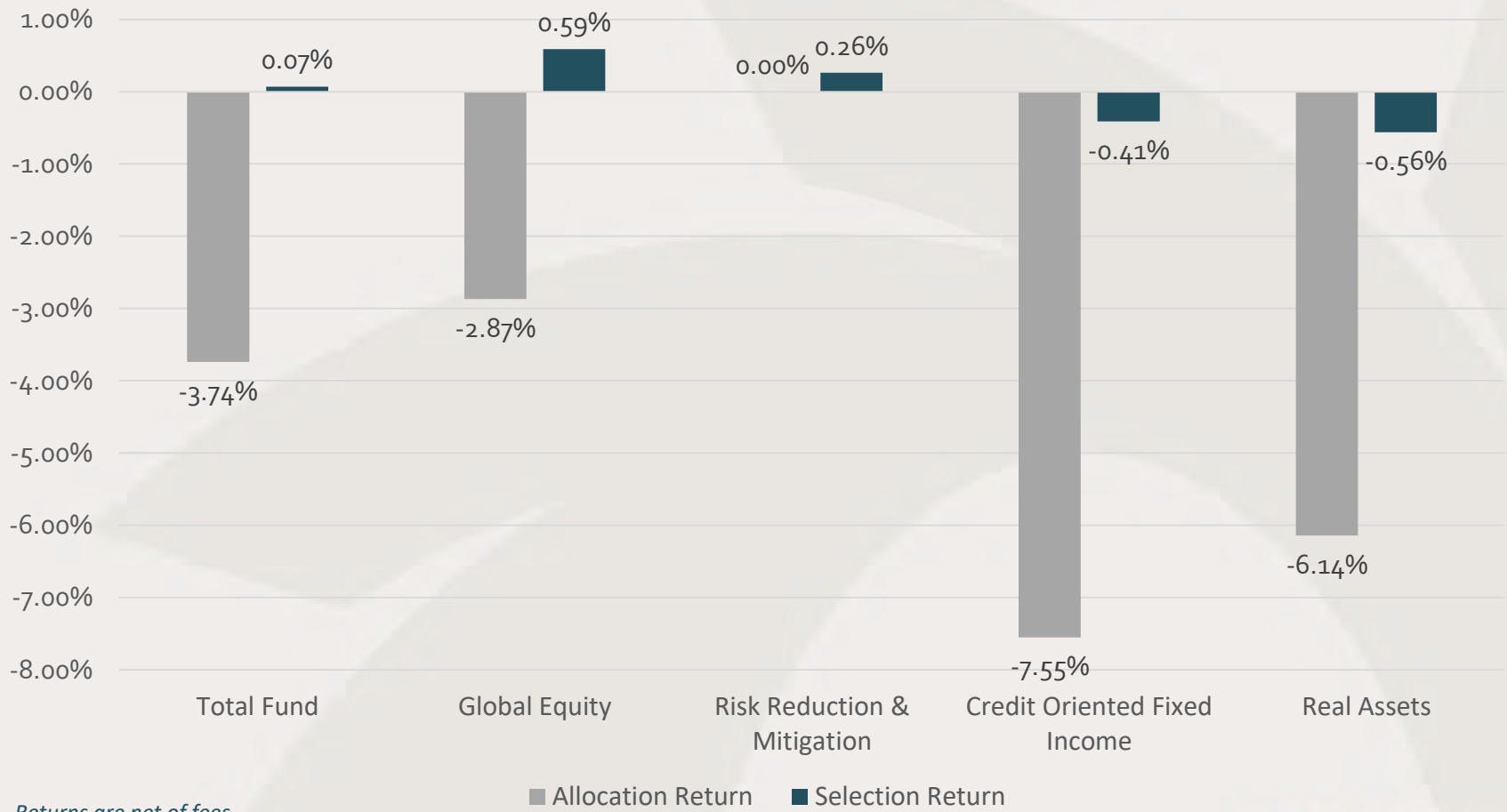
As of 12/31/2019	Market Value	% Market Value	% Target	Total Fund Performance	Q2 FY20	FYTD	1-yr	3-yr	5-yr	10-yr
TOTAL FUND	\$16.0b	100.0%		NOF Return	3.15%	4.50%	14.69%	8.40%	6.21%	7.86%
				Value Add v. Policy	-0.93%	-0.79%	-3.66%	0.09%	-0.47%	0.17%
Global Equity	\$6.3b	39.2%	39.0%	NOF Return	6.42%	7.45%	23.27%	12.59%	8.74%	
				Value Add v. Policy	-1.63%	-0.92%	-2.27%	0.31%	-0.49%	
Risk Reduction	\$3.2b	20.2%	20.4%	NOF Return	0.04%	2.48%	8.92%	4.13%	3.40%	
				Value Add v. Policy	-0.06%	0.06%	0.26%	0.08%	0.31%	
Credit	\$2.2b	14.0%	15.0%	NOF Return	1.02%	1.69%	5.58%	5.10%	4.16%	
				Value Add v. Policy	-2.11%	-1.64%	-7.97%	-0.90%	-1.63%	
Real Assets	\$3.2b	19.9%	20.0%	NOF Return	1.90%	2.59%	10.22%	5.42%	3.08%	
				Value Add v. Policy	0.25%	-0.91%	-6.70%	-0.14%	0.03%	
Risk Parity	\$1.1b	6.7%	5.6%	NOF Return	0.73%	6.88%				
				Value Add v. Policy	-0.60%	-0.95%				

FYTD Performance Attribution: Active Risk Budget Framework

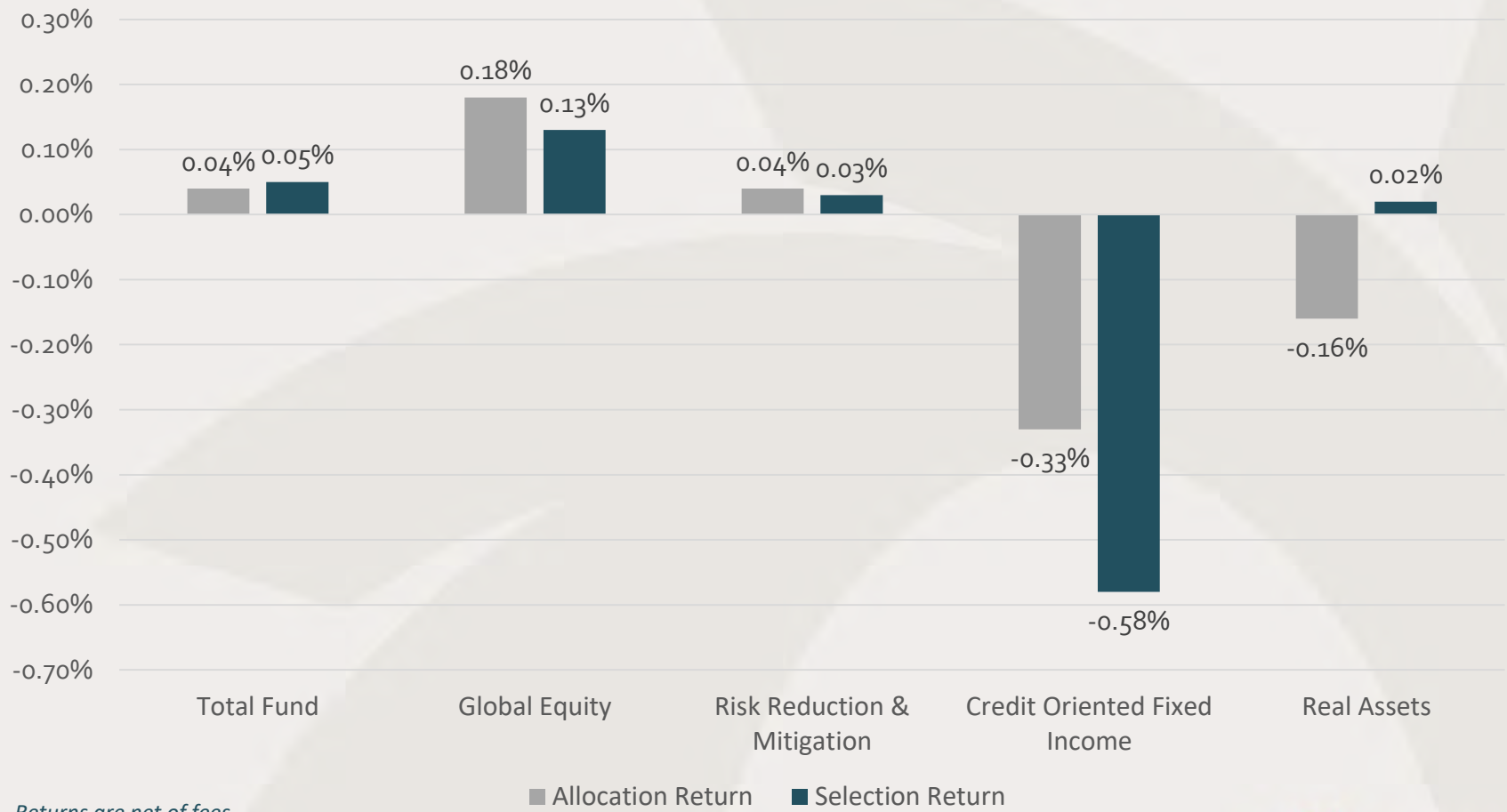


Returns are net of fees

1-year Performance Attribution: Active Risk Budget Framework

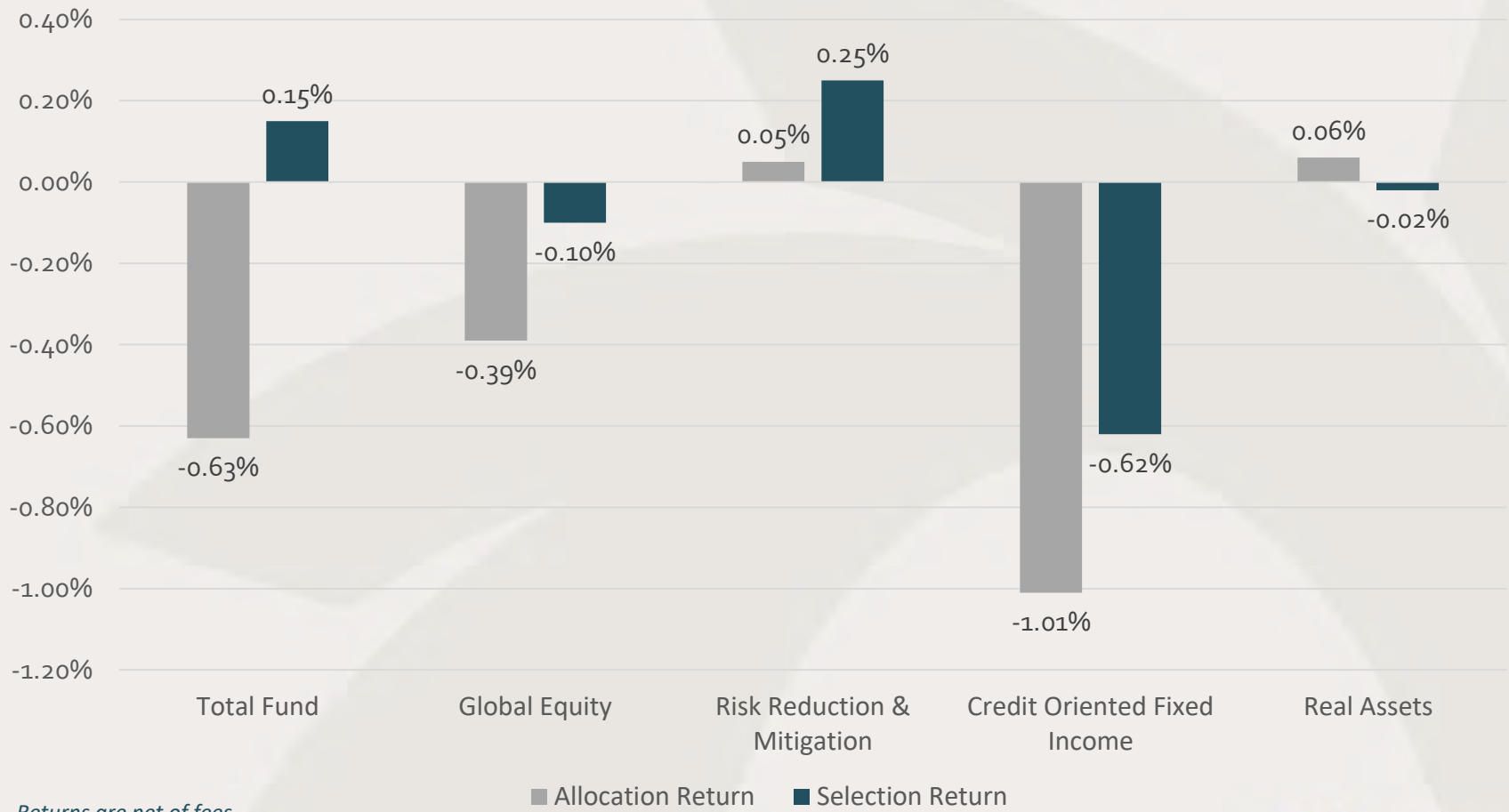


3-year Performance Attribution: Active Risk Budget Framework



Returns are net of fees

5-year Performance Attribution: Active Risk Budget Framework



Historical Risk Measurements (1-Year)

As of Dec 2019	Capital Allocation	Volatility (σ)	Sharpe Ratio	Tracking Error	Information Ratio	Beta	Alpha*
Total Fund	100%	4.37%	2.78	2.61%	-1.18	0.62	2.46%
Policy Benchmark		6.94%	2.26				
Global Equity	39.2%	8.79%	2.34	2.95%	-0.61	0.76	3.32%
Risk Reduction	20.2%	3.46%	1.88	0.20%	1.27	1.02	0.14%
Credit	14.0%	1.36%	2.37	4.82%	-1.45	0.13	1.84%
Real Assets	19.9%	4.10%	1.91	4.58%	-1.24	0.46	1.26%
Risk Parity	6.7%						

*Jensen's alpha

Summary

- Long term 10 year performance on both an absolute and relative basis remains strong for the PERA Total Fund
- The PERA fund underperformed the policy benchmark by 93 bps for Q2 FY20, and trailed the policy benchmark by 366 bps for the 1-year period, net of fees
- The PERA fund underperformed the passive reference portfolio by 211 bps for Q2 FY20, and lagged by 423 bps for the 1-year period, net of fees
- As of December 31st, the fund is at target weights for all asset classes (+/- 1%)

Appendix (Formulas)

- **Selection return** = *(portfolio return – dynamically weighted selection benchmark return)*
- **Allocation return**= *(dynamically weighted selection benchmark return – policy benchmark return)*
- **Historical Alpha** = $(R - \text{Beta} * P) * \sqrt{12}$

Where:

Beta is portfolio beta;

R - mean of the portfolio real returns (portfolio return- 91 day Tbill return) ;

P - mean of the policy real returns (policy return – 91 day Tbill return)

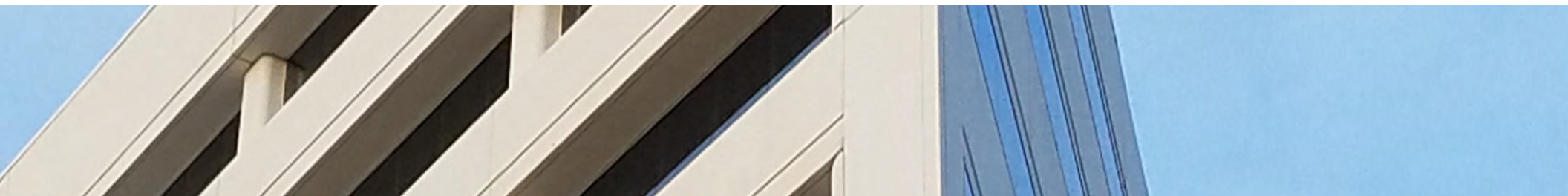


PERA

Public Employees
Retirement Association
of New Mexico

WILSHIRE ASSOCIATES

New Mexico PERA



Credit Portfolio Review

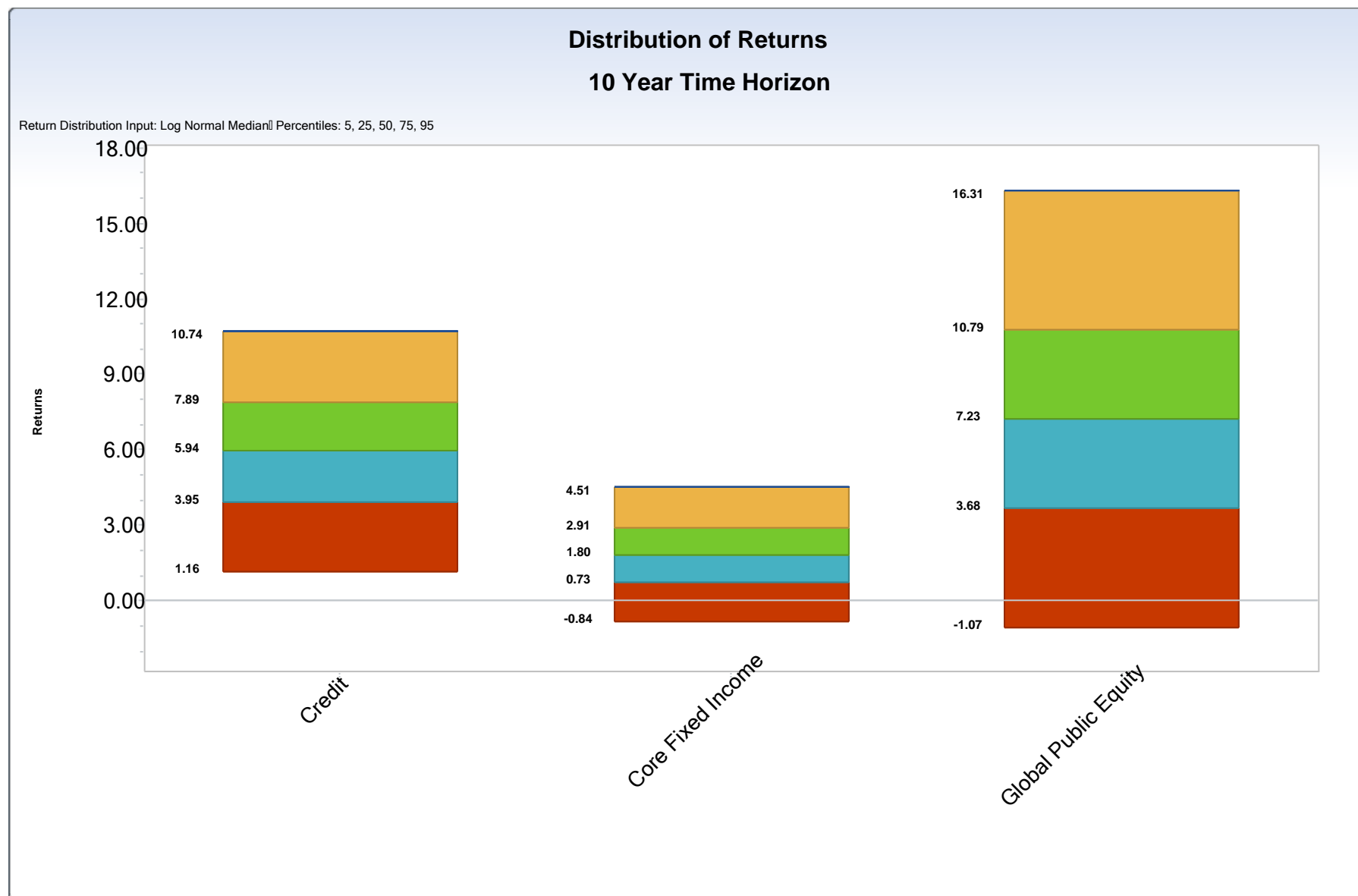
Thomas Toth, CFA – Managing Director

April 2020

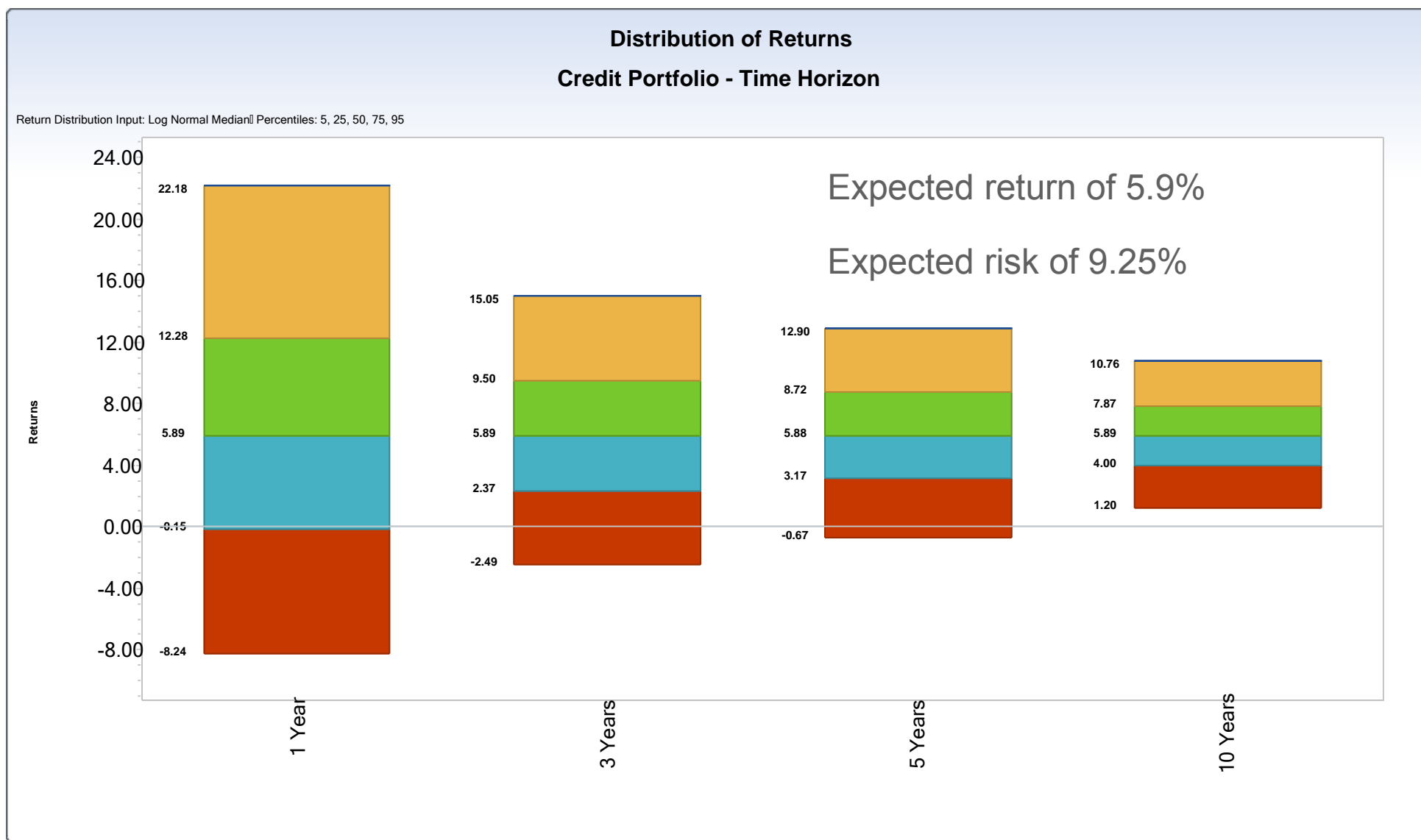
Strategic Rationale for Credit Assets

- Balance of exposures to economic growth and higher income opportunities
 - Growth opportunities driven by improving economic fundamentals
 - Income generation with current yields above government securities and investment grade fixed income
 - Opportunities to generate alpha through idiosyncratic exposure in both liquid and private markets
 - Broad opportunity set provides diversification benefits to the Total Fund

Credit Oriented Portfolio Return Expectation



Credit Oriented Portfolio



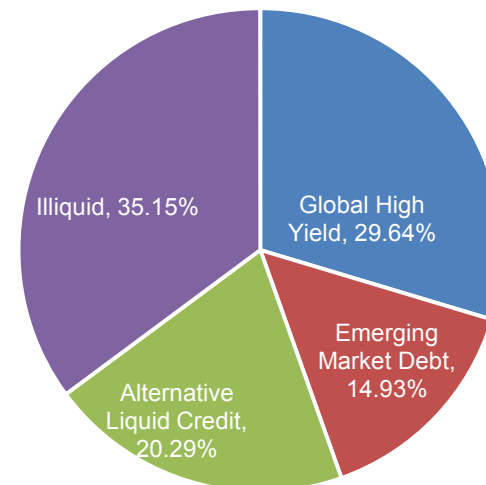
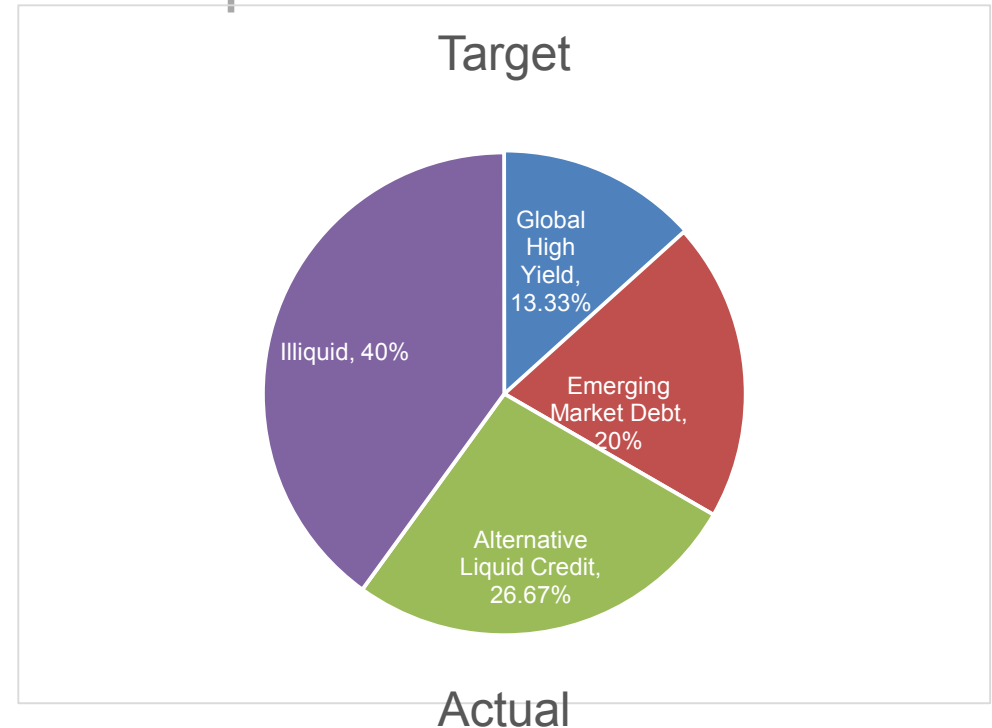
Key Credit Risks

Risk Category	Elements of Consideration
Macro-economic / Cyclical	<ul style="list-style-type: none"> • Credit risk (corporate debt) • Default rate (distressed debt)
Credit Risk	<ul style="list-style-type: none"> • Default rate • Loss rate • Recovery rate • Covenants • Private equity sponsorship
Interest-rate Risk	<ul style="list-style-type: none"> • Fixed vs. floating • Duration
Illiquidity	<ul style="list-style-type: none"> • Size • Illiquidity premium
Manager selection	<ul style="list-style-type: none"> • Market efficiency & ability to differentiate • Sourcing advantage • Strategy complexity & due diligence insight
Regulatory	<ul style="list-style-type: none"> • Bank lending activity

Credit Oriented Portfolio Exposures

- Portfolio Construction Building Blocks

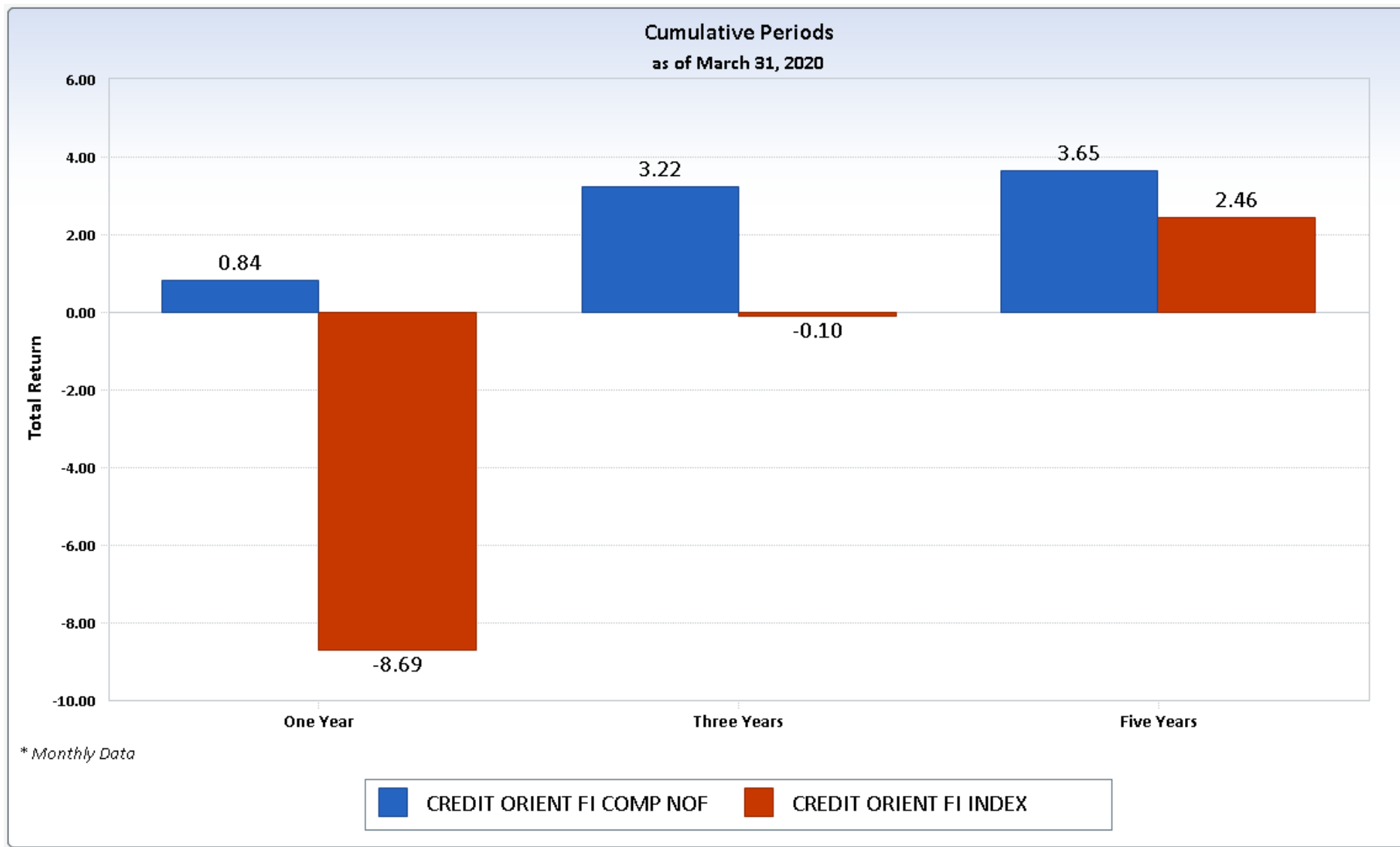
- Global High Yield
- Alternative Liquid Credit
 - » Bank Loans
 - » Securitized Credit
 - » Credit Hedge Funds
- Emerging Market Debt
 - » Hard Currency
 - » Local Currency
 - » Corporate
- Illiquid Credit
 - » Contingent capital
 - » Distressed
 - » Private lending



Credit Oriented Portfolio Performance

- During 2019, credit spreads across the risk spectrum moved lower, boosting market returns, as expectations for continued economic growth were widespread
- 2020 has marked a meaningful change in the volatility environment in credit (and all capital markets), with a sharp widening in credit spreads
 - Absolute performance has declined, while active positioning has protected on the downside
 - Current opportunity set has increased as dislocations persist
- Following slides detail the performance evolution of the total Credit portfolio over the last few years

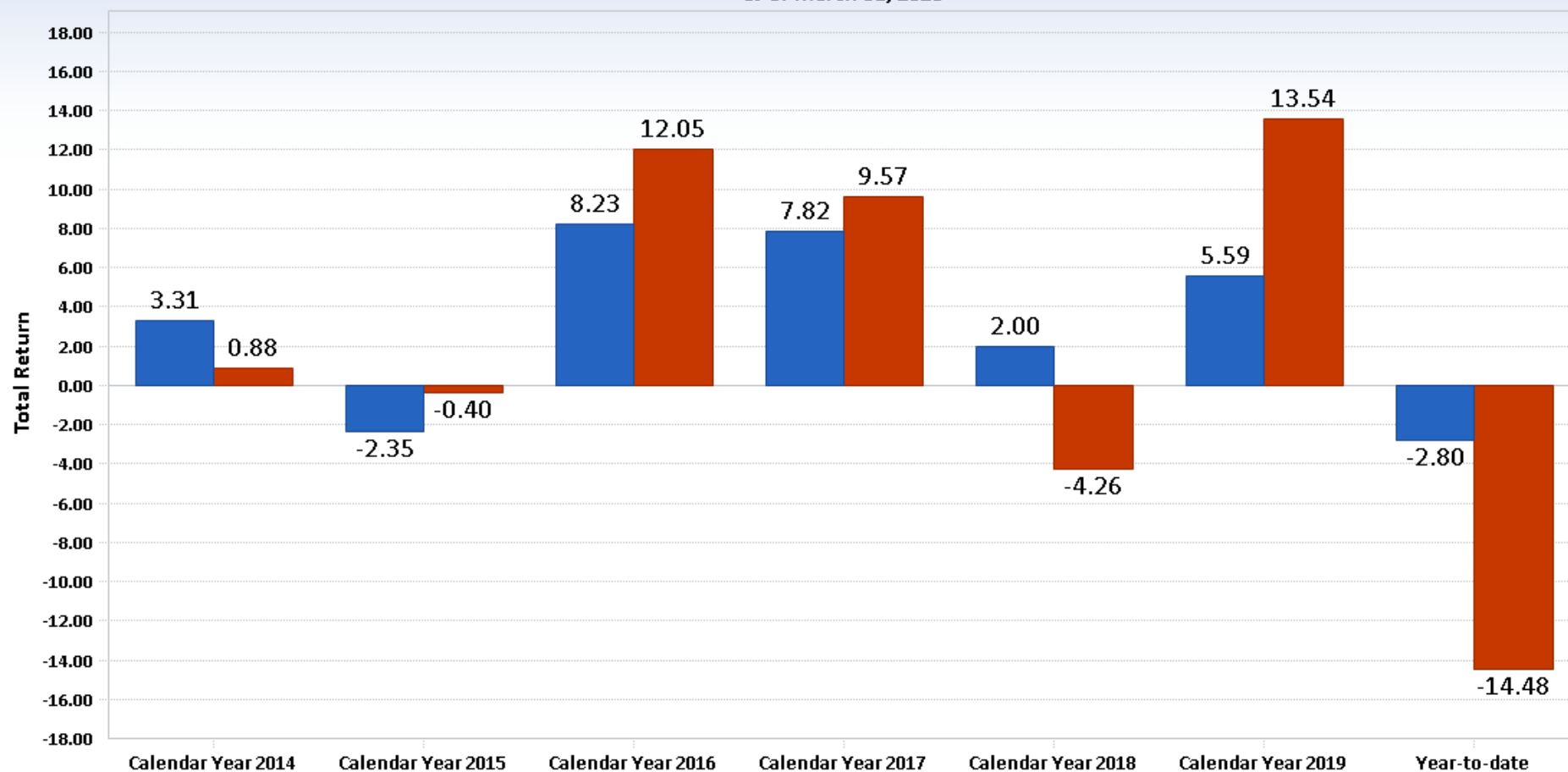
Credit Oriented Fixed Income Performance



Note: Preliminary

Credit Oriented Fixed Income Performance

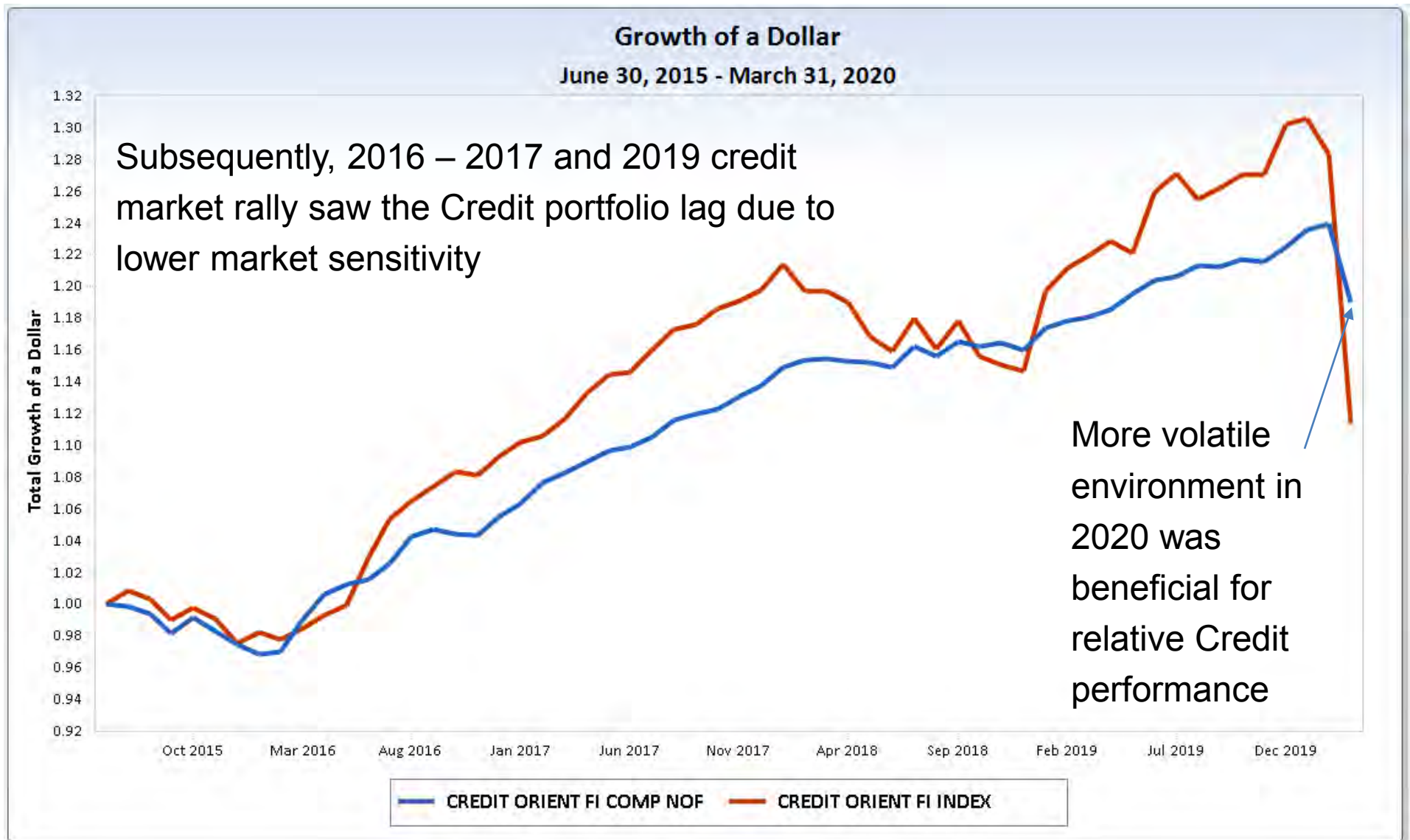
Cumulative Periods
as of March 31, 2020



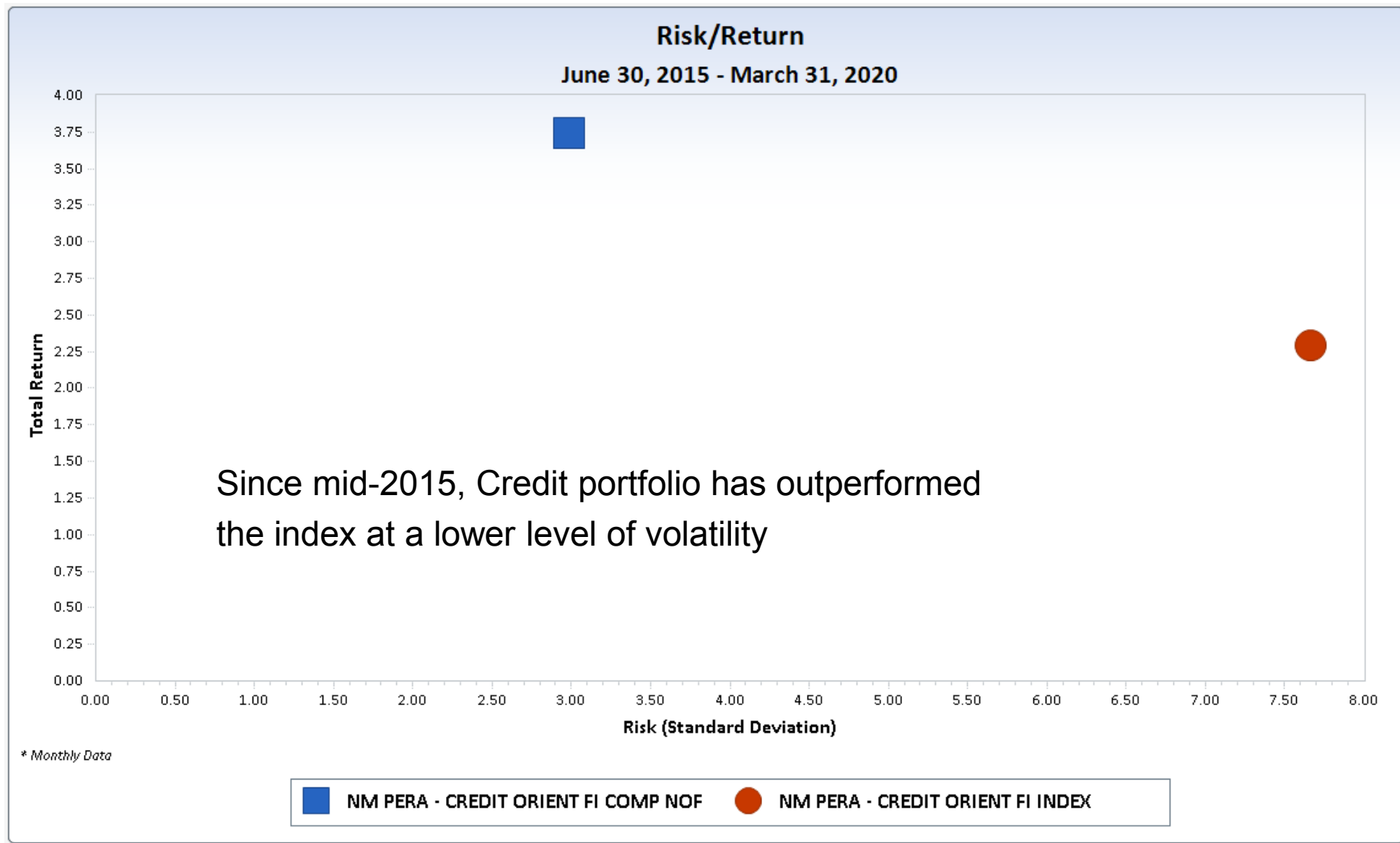
* Monthly Data

■ CREDIT ORIENT FI COMP NOF
 ■ CREDIT ORIENT FI INDEX

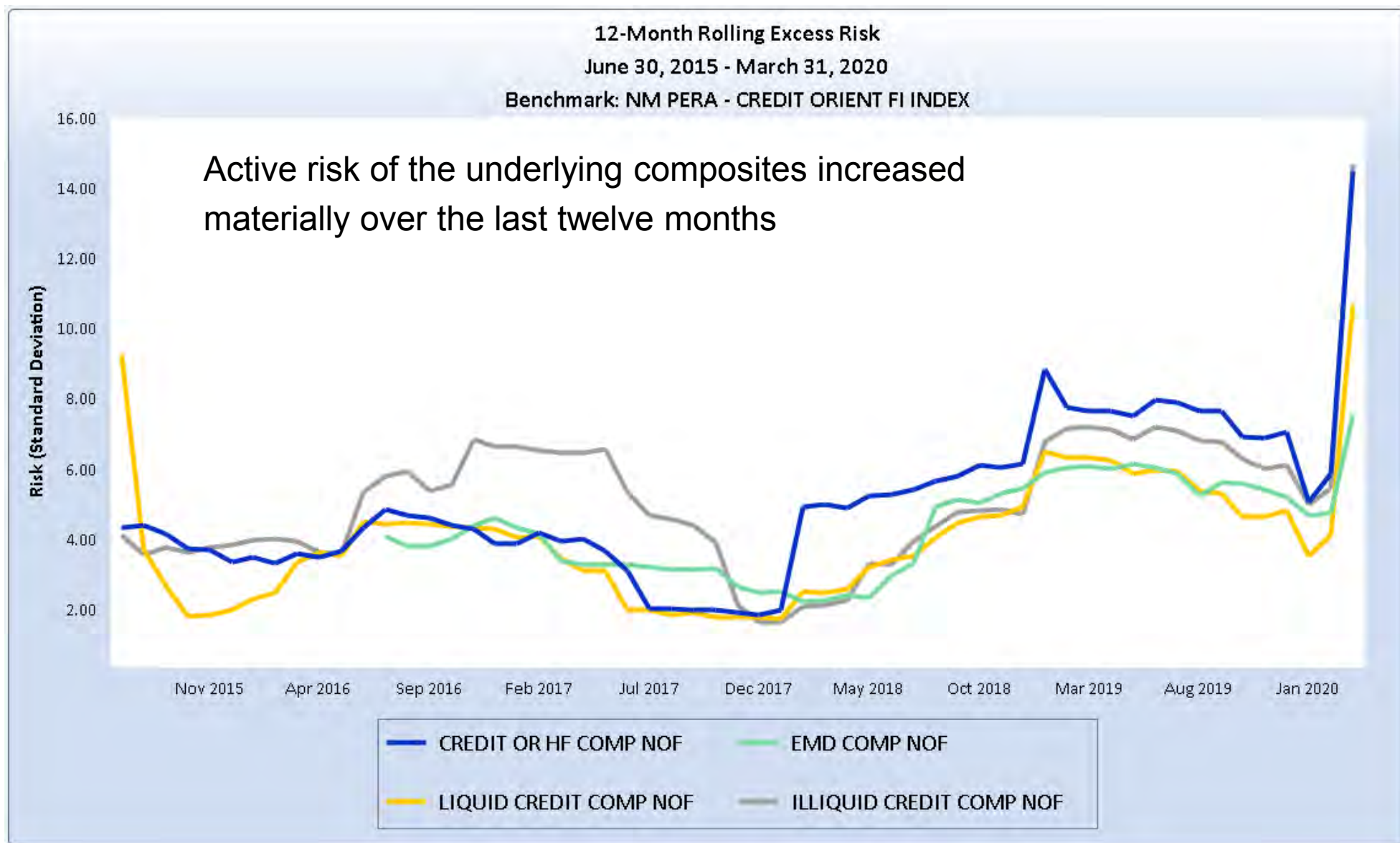
Credit Oriented Fixed Income Performance



Credit Oriented Fixed Income Performance



Credit Oriented Fixed Income Performance



Credit Oriented Fixed Income Performance

NM PERA - CREDIT ORIENT FI COMP NOF

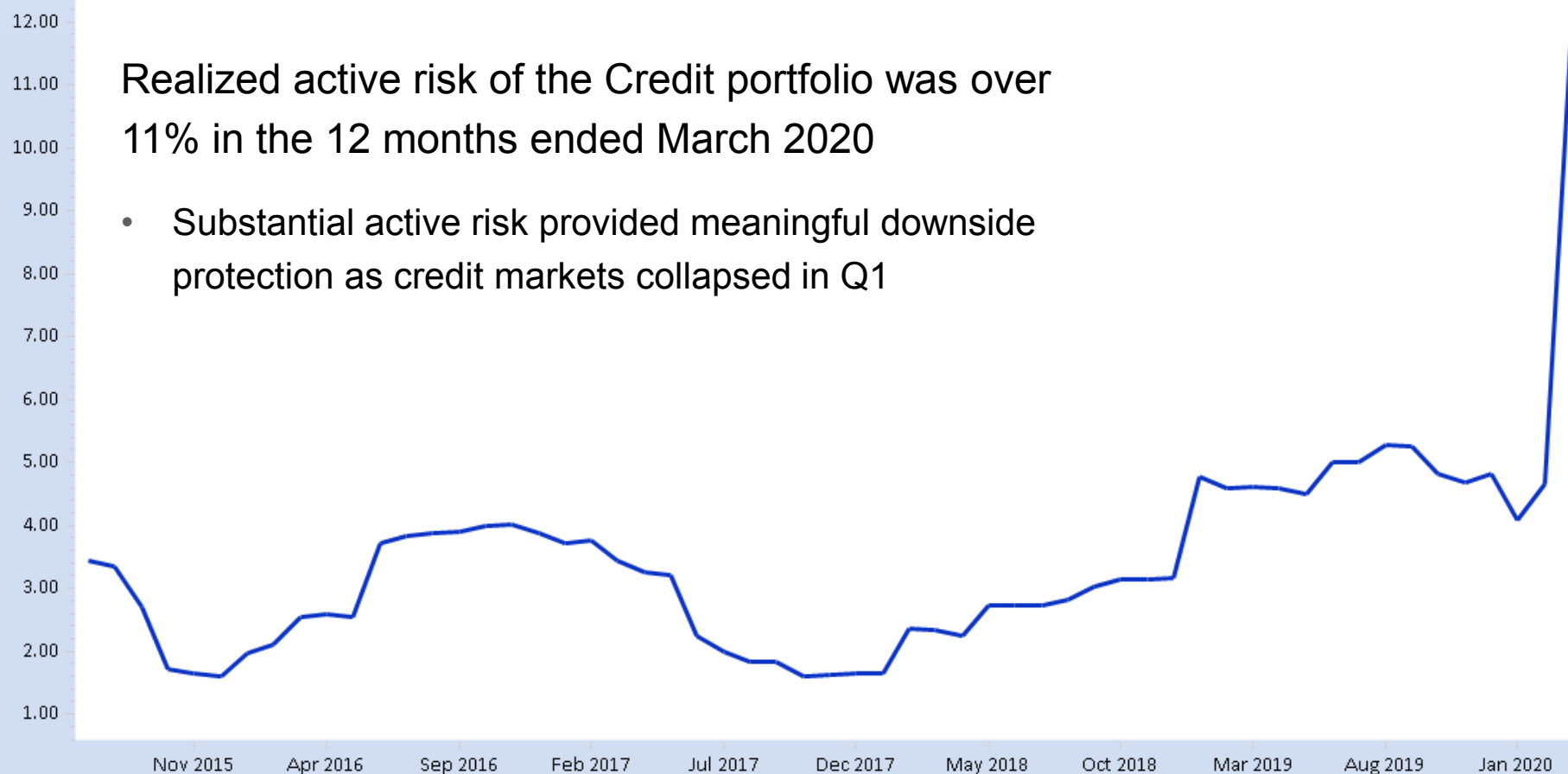
12-Month Rolling Excess Periods

12-Month Risk (Standard Deviation)

Benchmark: NM PERA - CREDIT ORIENT FI INDEX

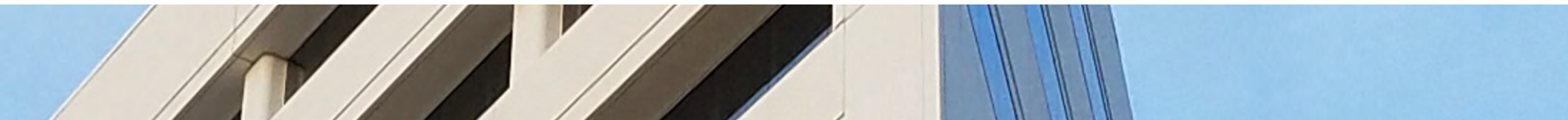
Realized active risk of the Credit portfolio was over 11% in the 12 months ended March 2020

- Substantial active risk provided meaningful downside protection as credit markets collapsed in Q1



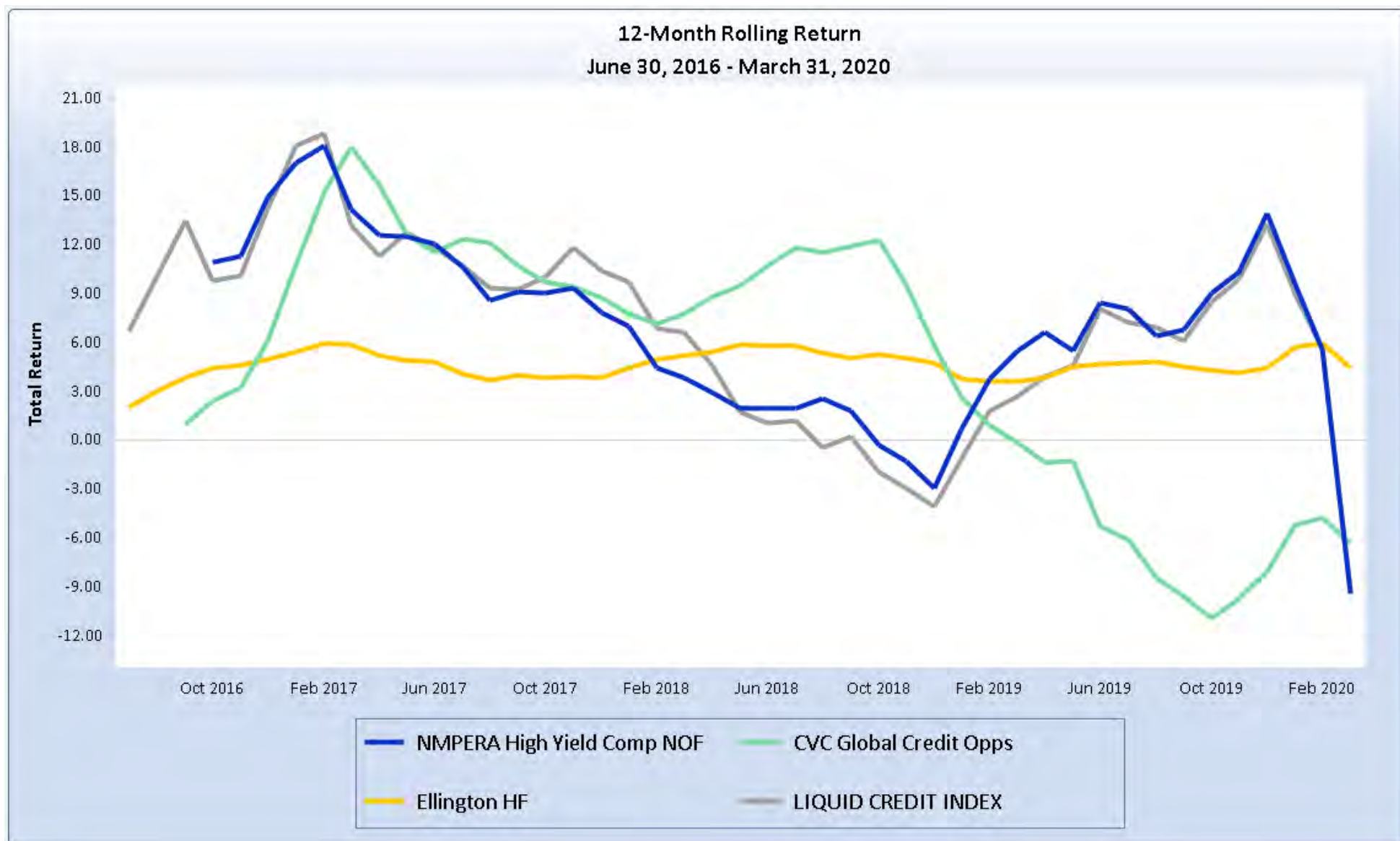
Credit Oriented Portfolio Summary

- Portfolio Positioning
 - Defensively positioned from a market exposure (beta) perspective
 - » Lagged the benchmark in 2019, but substantially outperformed during COVID-19 sell off through March 2020
 - EMD mandate adjustment was beneficial as the portfolio's risk profile shifted to be more conservative in mid 2019, and has shifted back to a more market oriented risk profile after the recent market volatility
 - Remains diversified across credit opportunity set
 - » Opportunities on both the liquid and illiquid side continue to be evaluated to improve portfolio outcomes
 - » Distressed and Special Situation opportunities are likely to be significantly more prevalent with the extraordinary economic challenges resulting from pandemic
 - At the last review:
 - » “Credit portfolio underweight to market sensitivity (beta) seems prudent at this point in the cycle”
 - That decision now allows the portfolio to examine adding credit risk in a measured way to take advantage of opportunities



LIQUID CREDIT

Credit Oriented Fixed Income Performance - Liquid



Credit Oriented Fixed Income Performance - Liquid



Credit Oriented Fixed Income Performance - EMD

12-Month Rolling Return
June 30, 2016 - March 31, 2020



Credit Oriented Fixed Income Performance - EMD



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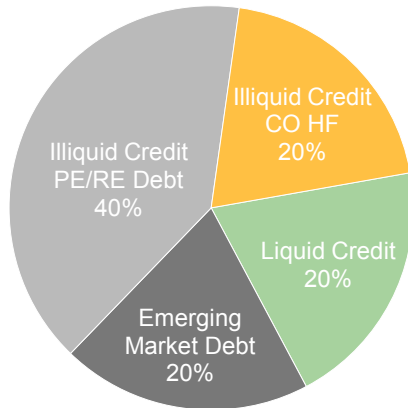
New Mexico Public Employees Retirement Association

Credit Oriented Fixed Income Quarterly Portfolio Review

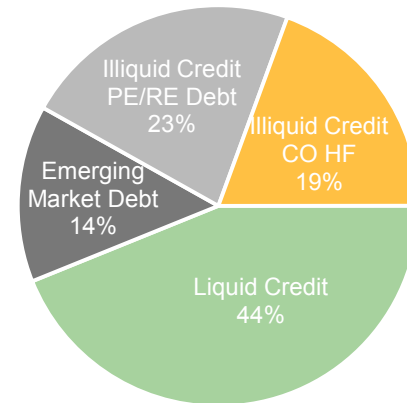
4Q 2019

Exposures by Sub Strategy

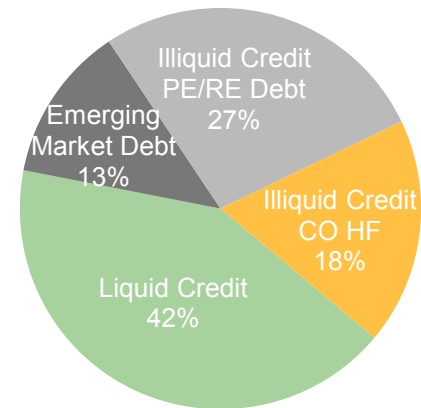
Target Allocation



Market Value as of Dec 31, 2019



Commitments as of Dec 31, 2019



Source: Albourne America

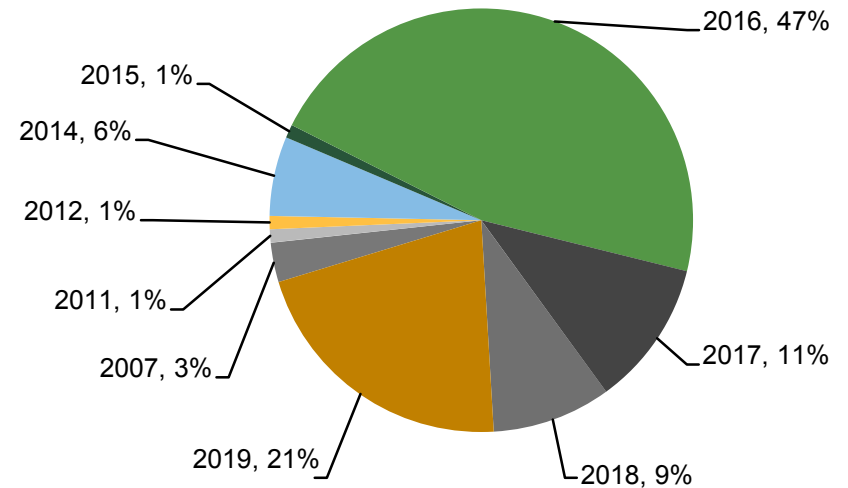
Exposures by Vintage Year

Portfolio Vintage Exposure by Market Value as of 31 Dec 2019

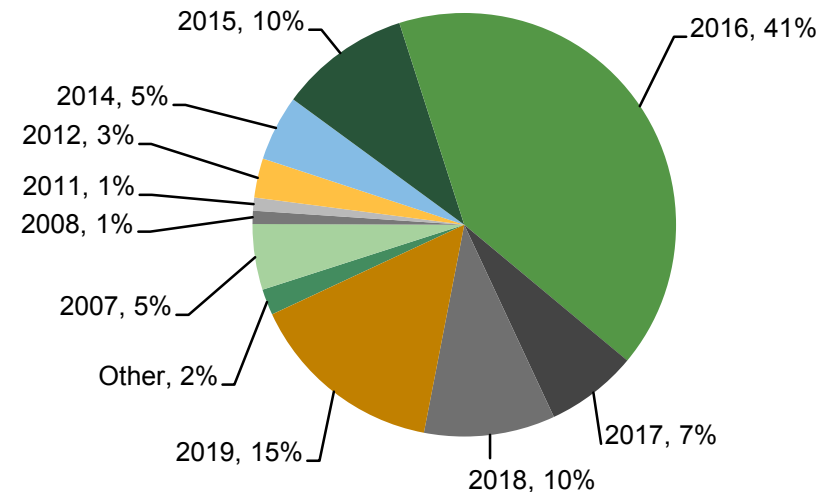
- Allocations in 2016-2019 predominate.
- Vintage year diversification is less relevant for this portfolio compared with a typical private markets portfolio given that the majority of the assets are in open ended or evergreen fund-of-one structures.
- Over time, vintage year classifications for the open ended and evergreen fund-of-one structures may become less applicable to the underlying securities as managers recycle capital and rotate into new investments.

Source: Albourne America

Market Value as of Dec 31, 2019



Commitments as of Dec 31, 2019

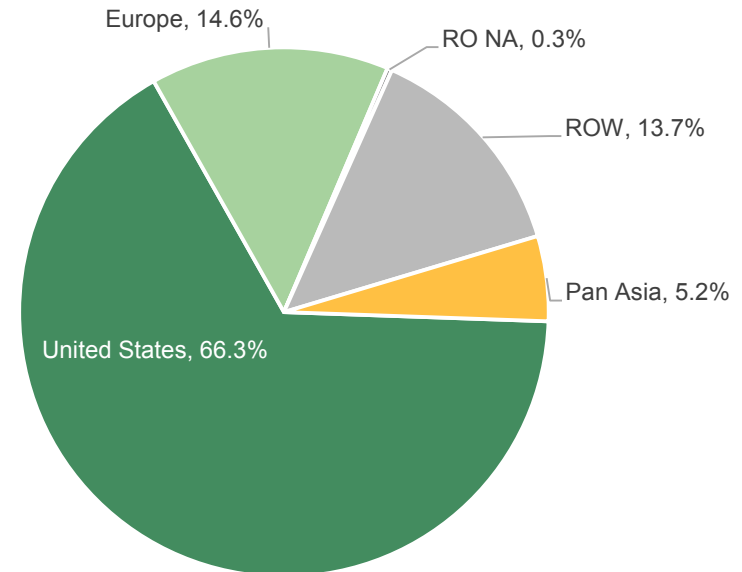


Exposures by Region

- The bulk of the portfolio's current regional exposure is in the US, which reduces currency risk.
- Regional exposure is similar to the composition of Barclays Global High Yield Index, which is ~65% US.
- Current regional exposures are expected to remain stable in the near future, as the level of undrawn commitments is low relative to portfolio size.
- Debt markets in Asia have been developing along with economies in that region and we expect them to grow in importance for institutional investors over the coming years.

Source: Albourne America

Market Value as of 31 Dec 2019*



Horizon IRRs & PME vs. Policy Benchmark

- Short term numbers are prone to reversion as traditional markets generally show more volatility to the upside and downside
- Long term alpha of illiquid credit has been strong historically but recently subsumed by 2019's High Yield return of 12.56%
- Alpha highly likely to re-emerge when Q1 High Yield Index drawdown flows through (March GHY Index -15.02%).

As of 31 December 2019

		1-Year	3-Year	5-Year	10-Year	Since Inception
NM PERA Credit Oriented HF	IRRs	6.3%	5.8%	4.7%	6.1%	6.2%
	Direct Alpha vs. Barclays Global HY	-5.6%	0.1%	-0.4%	-0.8%	-0.8%
NM PERA Illiquid PE/RE Debt	IRRs	5.7%	8.6%	7.1%	13.4%	9.7%
	Direct Alpha vs. Barclays Global HY	-4.8%	-1.1%	-0.7%	0.6%	0.6%

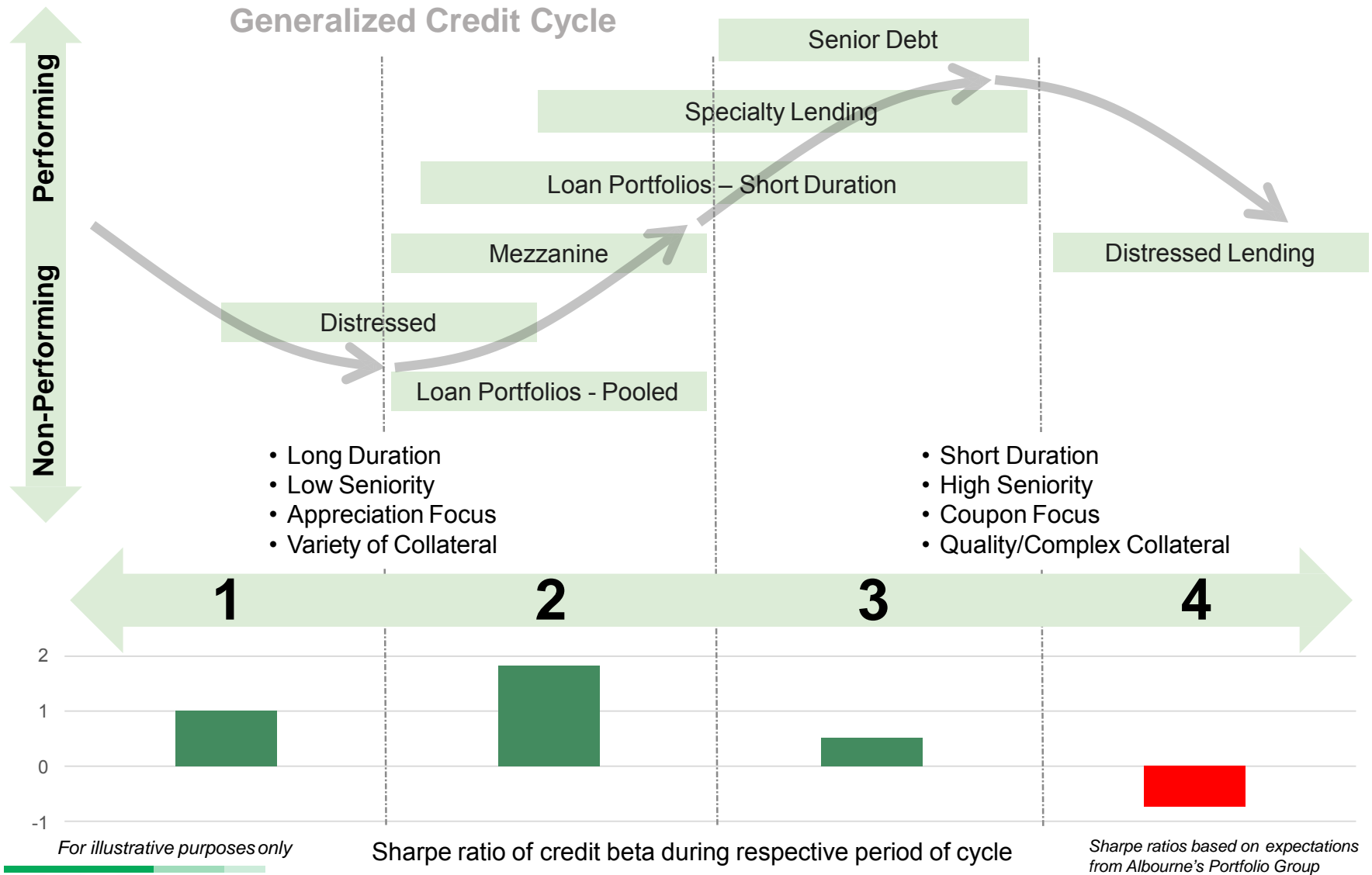
Source: Albourne America and Bloomberg
NM PERA data as of December 31, 2019

PME Direct Alpha run against policy benchmarks. NMPERA Composite – PC Policy Benchmark; NMPERA Credit Oriented HF – Bloomberg Barclays Global High Yield; NM PERA Emerging Market Debt – JP Morgan Emerging Market SOV50 LM50 Blend; NMPERA Illiquid PE/RE Debt – Bloomberg Barclays Global High Yield; NMPERA Liquid Credit – Bloomberg Barclays Global High Yield

Credit Strategies – current rankings

Strategy	Typical Structure	Returns						Risk-Adjusted	
		Rating	6m Δ	Rank	6m Δ	Quartile	6m Δ	Rank	6m Δ
Asia Private Lending	PM	A-	-	1	-	1	-	1	-
Asia Distressed	PM	B	↓	2	-		-	2	-
Asia Relative Value Credit	HF	B-	↓	3	↑		↑	3	↓
Europe Loan Portfolios	PM	B-	-	4	↓	2	↓	9	↑
Structured Product	HF & PM	B-	↑	5	↑		↑	7	↓
North America Distressed	HF & PM	C+	↑	6	↑		↑	4	↓
North America Relative Value Credit	HF	C+	-	7	↑	3	-	5	↓
North America Private Lending	PM	C	↓	8	↓		↓	6	↓
Europe Private Lending	PM	C	↓	9	↓		↓	8	↓
North America Loan Portfolios	PM	C	↓	10	↓	4	↓	12	↓
Emerging Market (ex-Asia) Distressed	HF	C	↑	11	↑		-	10	↓
Europe Distressed	HF & PM	C-	-	12	↓		-	11	↑
Overall		C+	↑						

Strategies and the Economic Cycle



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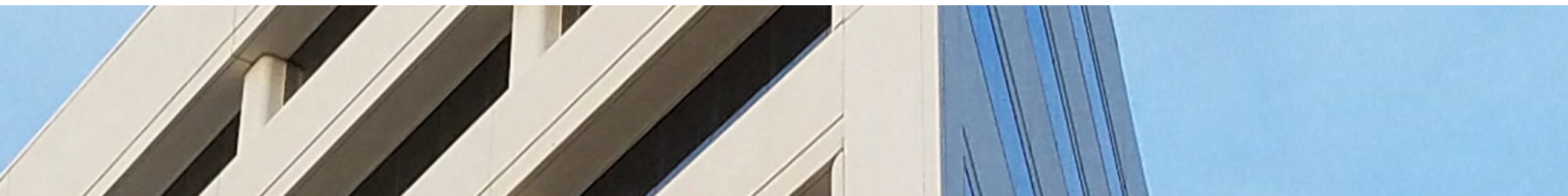


PERA

Public Employees
Retirement Association
of New Mexico

WILSHIRE ASSOCIATES

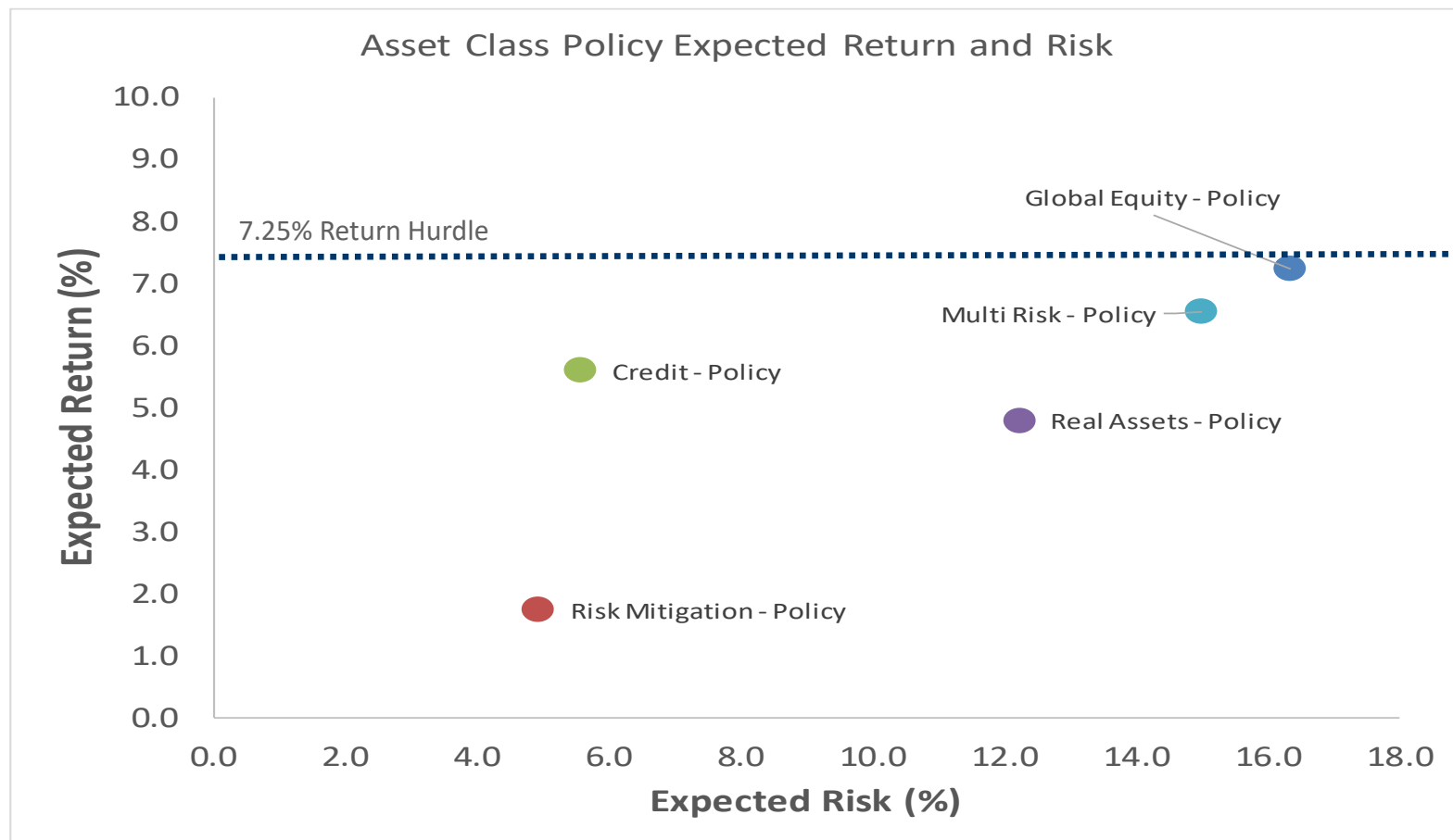
Leverage and Liquidity Education



April 2020

PORTFOLIO CONSTRUCTION LINK TO RETURN TARGET

- Return target for PERA is 7.25% over long-term time horizon
- Policy asset class expectations make that a challenging level of return to achieve



PORTFOLIO CONSTRUCTION

- High portfolio risk concentration stems from a combination of return objectives, market opportunities, and constraints
 - If an investor knows with certainty that an asset class will outperform, a concentrated portfolio in that asset will produce the best results
 - Portfolio diversification acknowledges that uncertainty is inherent in all investing
- Which can we change?
 - Return targets?
 - Sure, but at what cost?
 - Market opportunities?
 - We can keep looking for new opportunities, but few are truly unique (i.e. diversifying)
 - PERA utilizes the full beta opportunity set across the portfolio, liquid and illiquid
 - Loosen constraints?
 - Sure, but it is important to understand risk

LEVERAGE CONSTRAINT

- **Leverage is a tool that investors often . . .**
 - Misunderstand
 - Consider too risky
 - Under-utilize
- Leverage can serve as a tool for risk reduction, balance contributions to risk, and improve diversification while improving total return
 - For example, leverage in stable, cash flow generating assets (core fixed income, real estate, infrastructure) can enhance the return profile

LEVERAGE CONSTRAINT

- **Leverage** is the use of borrowed capital (explicit) or through financial instruments (embedded) to increase potential returns
- **Accounting Leverage** results when “total assets are greater than net assets, i.e., whenever some part of the assets are financed by liabilities or borrowing.”
- **Economic Leverage** results when “the return from a portfolio is expected to be proportionately more volatile than the return from a benchmark (unleveraged) portfolio.”
 - Example: Equity index futures used to gain or increase market beta or interest rate futures used to increase portfolio duration.
- PERA has examples of leverage in different areas of the portfolio already.
 - **Private Equity, Private Real Estate, Hedge Funds, REITs, Risk Parity**

- **Governance**

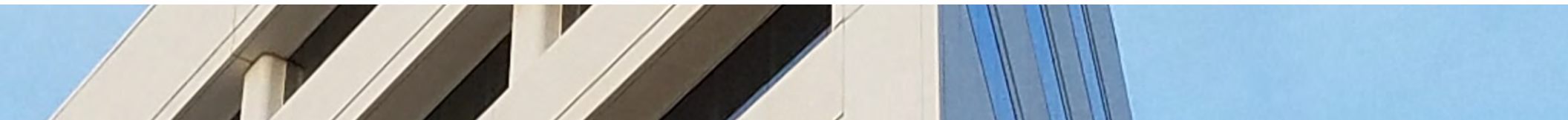
- Addressing leverage in a comprehensive framework is best practice
- The Board sets asset allocation policy to target risk and return and should, therefore, also specify guidelines and constraints on leverage
- Objective is to adopt a standardized measure of leverage that allows for aggregation of leverage to the total portfolio level including explicit and embedded leverage
 - » Explicit leverage is directly controlled by PERA
 - » Embedded leverage is incorporated in strategies across the portfolio such that reporting requirements are necessary to aggregate information
- Identify not only what investment purpose is sought with leverage, but also develop contingency plans when certain risks (e.g. liquidity) materialize during stressed market periods

LEVERAGE CONSTRAINT

- Leverage introduces additional complexities into portfolio management
 - Cash flow uncertainty
 - Amplification of upside and downside movements in asset values
- Leverage does necessitate sophisticated risk management
 - Liquidity risk (leverage assets that naturally self-finance through their cash flows)
 - Counterparty risk (reduced through use of listed derivatives and improved regulation)
 - Market risk (different impact from leveraging risky assets versus diversifying assets)

LEVERAGE CONSTRAINT

- Current management of leverage
 - Leverage is currently predominantly managed within each of the individual asset class strategies/mandates
 - Management of exposures and liquidity are more challenging in a decentralized structure
- Future management of leverage
 - Board sets investment policy around utilization of leverage, including limits
 - Holistic view on uses of leverage across the Total Fund
 - Focus on balancing portfolio priorities in determining where and when to apply leverage
 - » In pursuit of alpha or in pursuit of better risk balance in the beta portfolio?
 - » Combination of the two?



MANAGING LIQUIDITY

THE WORLD THROUGH RISK LENSES

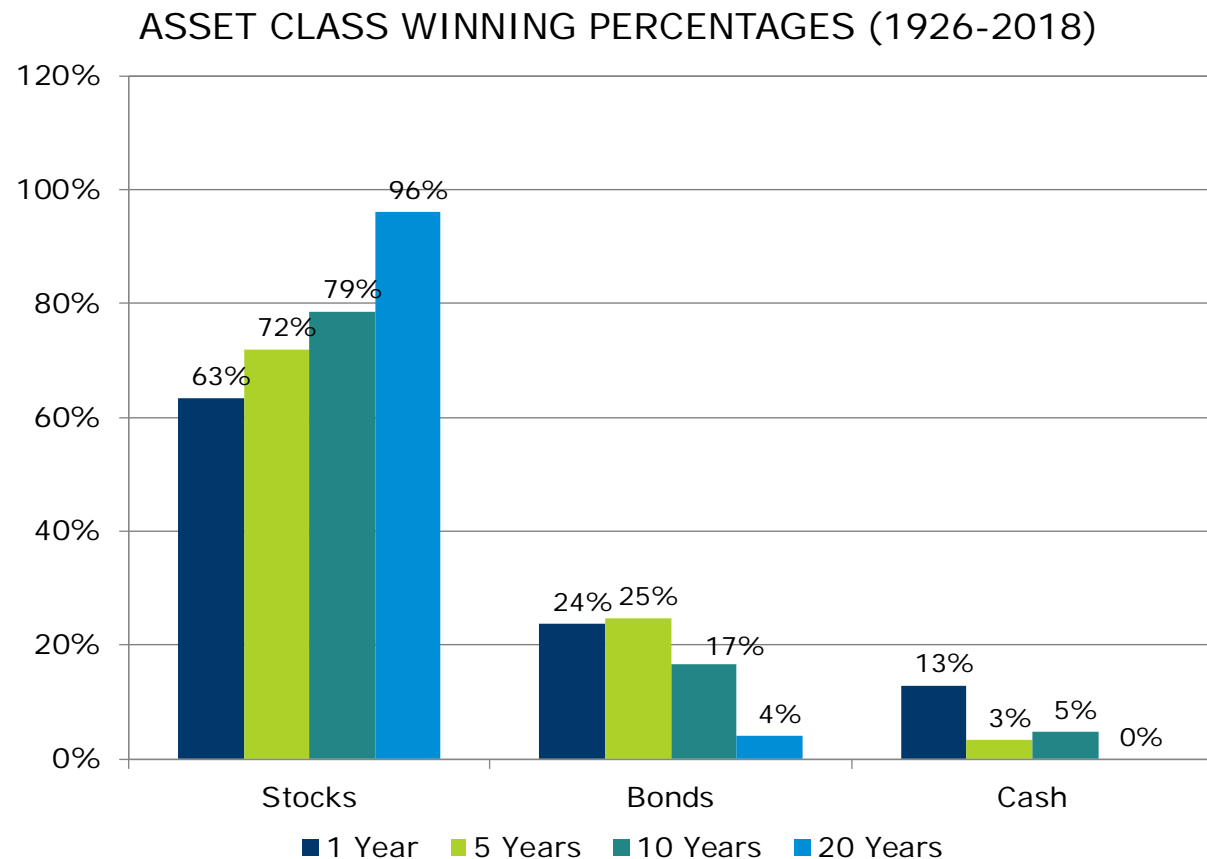
- Liquidity Risk is one of Wilshire's six essential Risk Lenses faced by all investors
- Its interaction with other risks may make managing illiquidity risk the single most important risk to address in avoiding financial calamity
- Liquidity management is the exercise of ensuring sufficient cash is on hand to meet financial commitments (i.e. pay the bills when they come due)
- May seem simple on the surface, but properly balancing liquidity requirements against other portfolio objectives can sometimes prove to be a complex risk to manage in practice



WHY LIQUIDITY MATTERS

Default/Insolvency is the most severe outcome from having insufficient liquidity, but there are many other, more likely, disruptive impacts that a lack of liquidity can impose on an investment portfolio

- Liquidity breaches can rob an investor of their biggest advantage: a long-term investment horizon
- The timing and price of such sales dictated by liquidity needs rather than by explicit investment rationale
- Can destroy portfolio value and effectively strip a portfolio from its ability to recover from market sell-offs

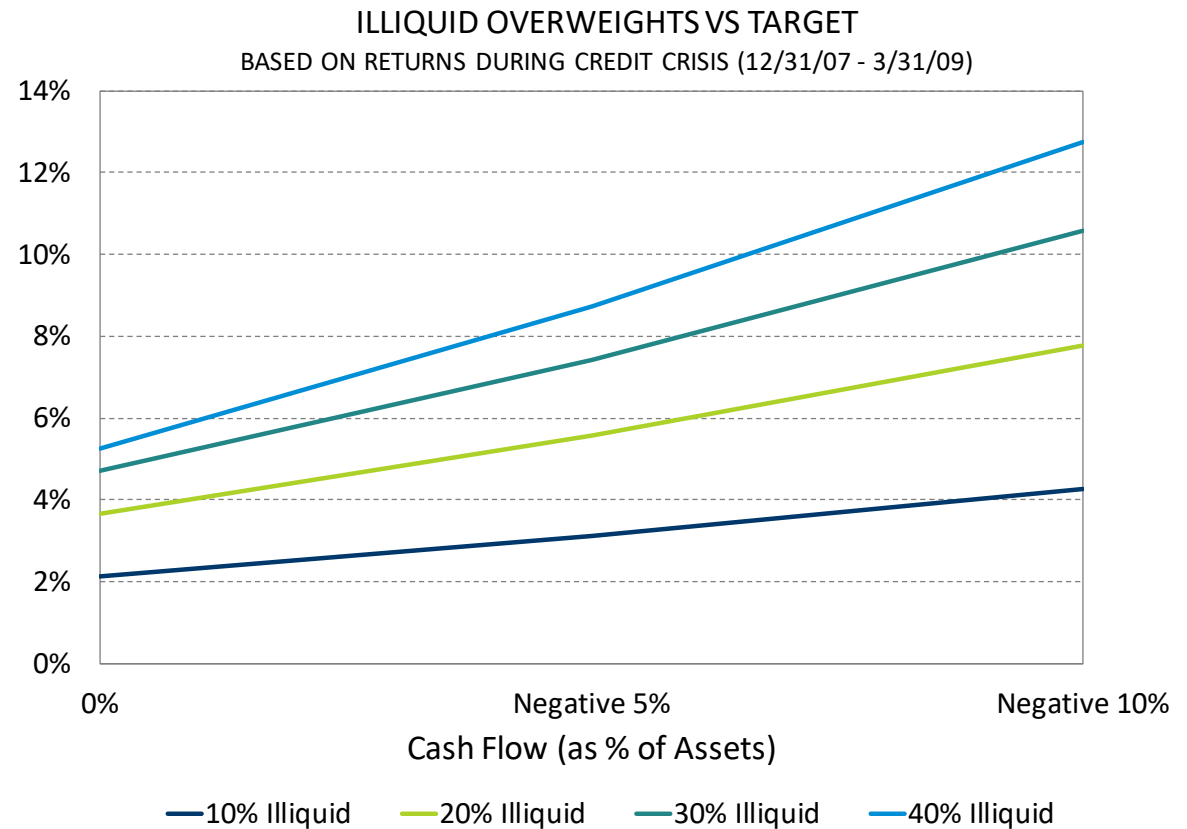


WHY LIQUIDITY MATTERS

Meeting liquidity needs with a “sell as you go” process can tear portfolios away from their asset allocation targets during stressed market environments — potentially leading to undesirable risk characteristics and/or increased market vulnerability

The threat of being pushed away from allocation targets increases...

- With larger required cash outflows (i.e., greater liquidity needs)
- With larger allocations to illiquid assets



APPROACHES FOR MANAGING LIQUIDITY

Two basic approaches (best if used in combination):

- **Direct Approach** – appropriate to set governance guidelines and ensure liquidity is available on an ongoing basis
- **Indirect Approach** – useful for evaluating strategic alternative policy targets during the asset allocation process

Direct Approach

- Set a minimum % of assets aside to meet X months of net cash outflows (“Encumbered Liquidity”) plus additional funds to manage against unexpected outflows (“Full Liquidity”)
- Cash allocation size is dependent on investor’s liquidity risk tolerance and the volatility of non-cash (“Convertible Liquidity”) assets

Advantage: can dampen the risk of forced selling in a down market through a more manageable and orderly cash harvesting process

A DEFINITIONAL FRAMEWORK

In its purest sense, full liquidity represents full, unencumbered and immediate access to one's assets or wealth.

We more clearly define liquidity via a structural hierarchy that moves from its purest sense to three other investment classifications that typically provide lower levels of liquidity.

Liquidity Definitional Hierarchy

- **Full Liquidity:** Purest form of liquidity, consisting of cash that has not been allocated to any other purpose (i.e., it is not callable or committed to other investments)
- **Encumbered Liquidity:** Cash that has been set aside for a specific future purpose (e.g., allocated cash not deployed by investment managers, known capital calls, projected benefit payments etc.)
- **Convertible Liquidity:** A level of access to liquidity from assets that can be sold (i.e., liquidated) within X days at a maximum discount of Y% of their current market value
- **Delayed Liquidity:** Captures all remaining assets that could be sold (or liquidated), but at greater expense and/or over longer timeframes than for “Convertible Liquidity” (e.g., private market investments, public market investment through limited partners with infrequent openings, hedge fund investments, funds with longer commitments and other related fund vehicles with lengthy redemption periods or restrictive terms, etc.)

Full and Encumbered liquidity exist within the PERA portfolio as frictional cash, but do not have a permanent allocation target

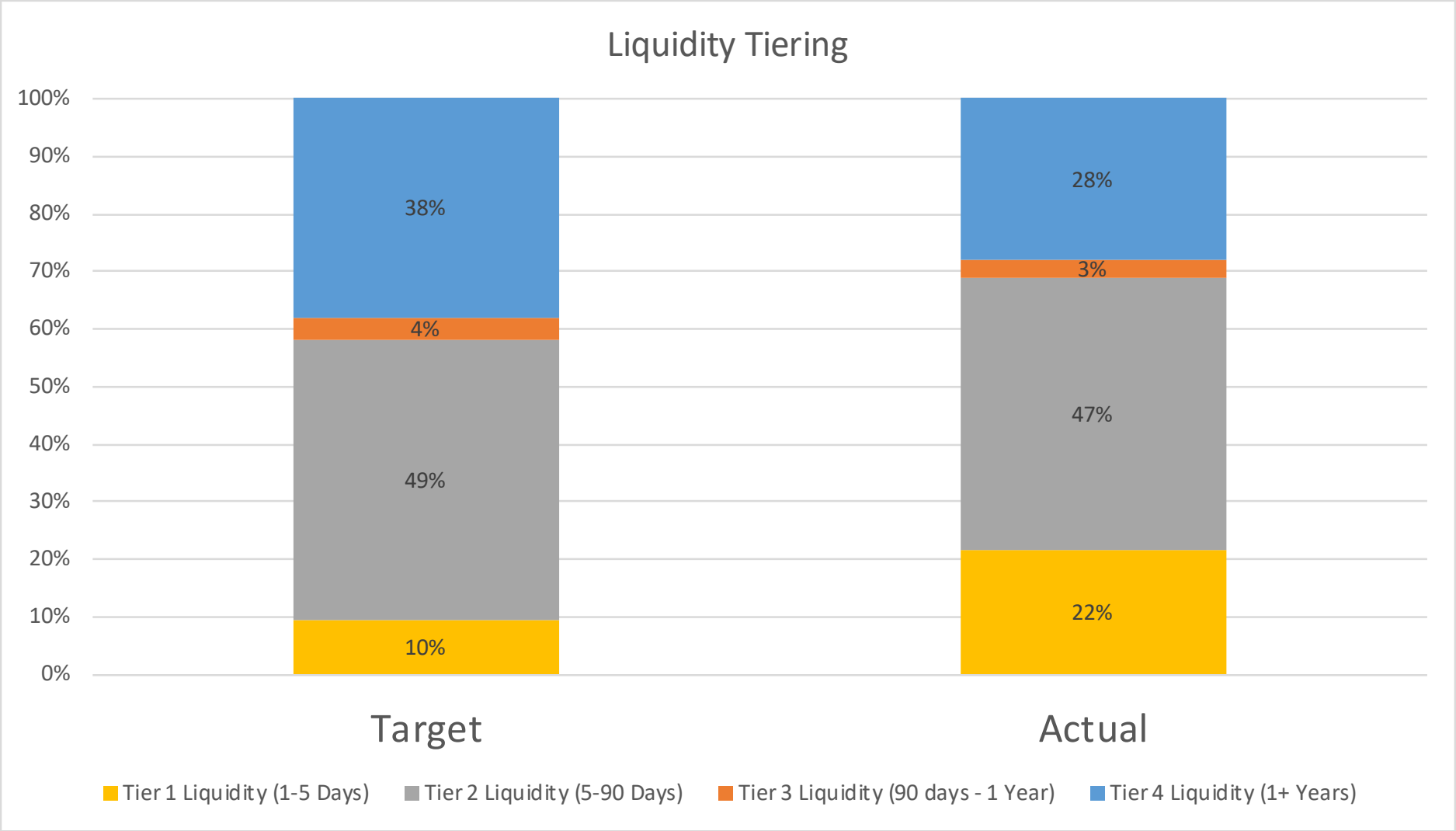
- Structured to avoid return penalty associated with an allocation to cash – i.e. cash drag

DIRECT APPROACH

For portfolio management and governance purposes, guidelines should be set for Convertible and Delayed categories to ensure adequate liquidity exists to meet PERA obligations over time

- **Convertible Liquidity**
 - Tier 1 are assets available within 1 – 5 days
 - » Include core fixed income and cash
 - » Include liquidity accounts that are readily adjusted
 - Tier 2 are assets available within 5 – 90 days
 - » Include all liquid equity, risk mitigation, high yield, emerging market debt, and real asset mandates
 - » Include Multi-Risk Allocation assets, and terms are close to 30 day time frame
- **Delayed Liquidity**
 - Tier 3 are assets available with 90 days – 12 months
 - » Include Alternative Liquid Credit and other Limited Partnerships with available but less frequent liquidity windows
 - Tier 4 are assets available 12 months +
 - » Include all private market investments across equity, credit, and real assets

DIRECT APPROACH



INDIRECT APPROACH

Indirect Approach

- Approach attempts to constrain asset class weights to manage liquidity risk
- Public (“liquid”) vs. private (“illiquid”) asset classes, where constraints are applied on the maximum allocation to private assets
- While simple, this approach generally ignores the volatility and liquidity characteristics of public market (“liquid”) asset classes

Wilshire’s Liquidity Metric

- Improves on the indirect approach by attaching liquidity metrics, or scores, to all asset classes and was a decision factor in the 2018 asset allocation process.
 - Provide more information than the simple “liquid” or “illiquid” binary approach
 - Allows for trade-offs within public market (“liquid”) asset classes
 - Designed to capture distinguishing characteristics within “Convertible Liquidity” and “Delayed Liquidity” assets (i.e., from the definitional framework)

WILSHIRE LIQUIDITY METRIC

Wilshire's Liquidity Metric framework has multiple levels:

- Market Level of Liquidity
- Stressed Liquidity Metric

Market Level of Liquidity

- Quantified on scale from 0% (low liquidity) to 100% (high liquidity)
- Designed to capture general notion of marketable versus private/off-market transactions
 - Marketable asset classes typically reflect a 90% or 100%
 - Private asset classes reflect 0%

Stressed Liquidity Metric

Includes a penalty process to reflect the loss in practical liquidity due to asset class volatility and sensitivity to particular economic environments

Penalty Components

Growth Penalty:

- Impacts asset classes with vulnerability to slowing growth
- Recognizes the hit to liquidity that can occur during growth related bear markets

Inflation Penalty:

- Impacts asset classes with vulnerability to rising inflation
- Recognizes the hit to liquidity that can occur during inflation driven bear markets

Volatility Penalty:

- Impacts higher volatility asset classes
- Recognizes the hit to liquidity that can occur from any form of volatility

WILSHIRE LIQUIDITY METRIC

PUTTING IT ALL TOGETHER

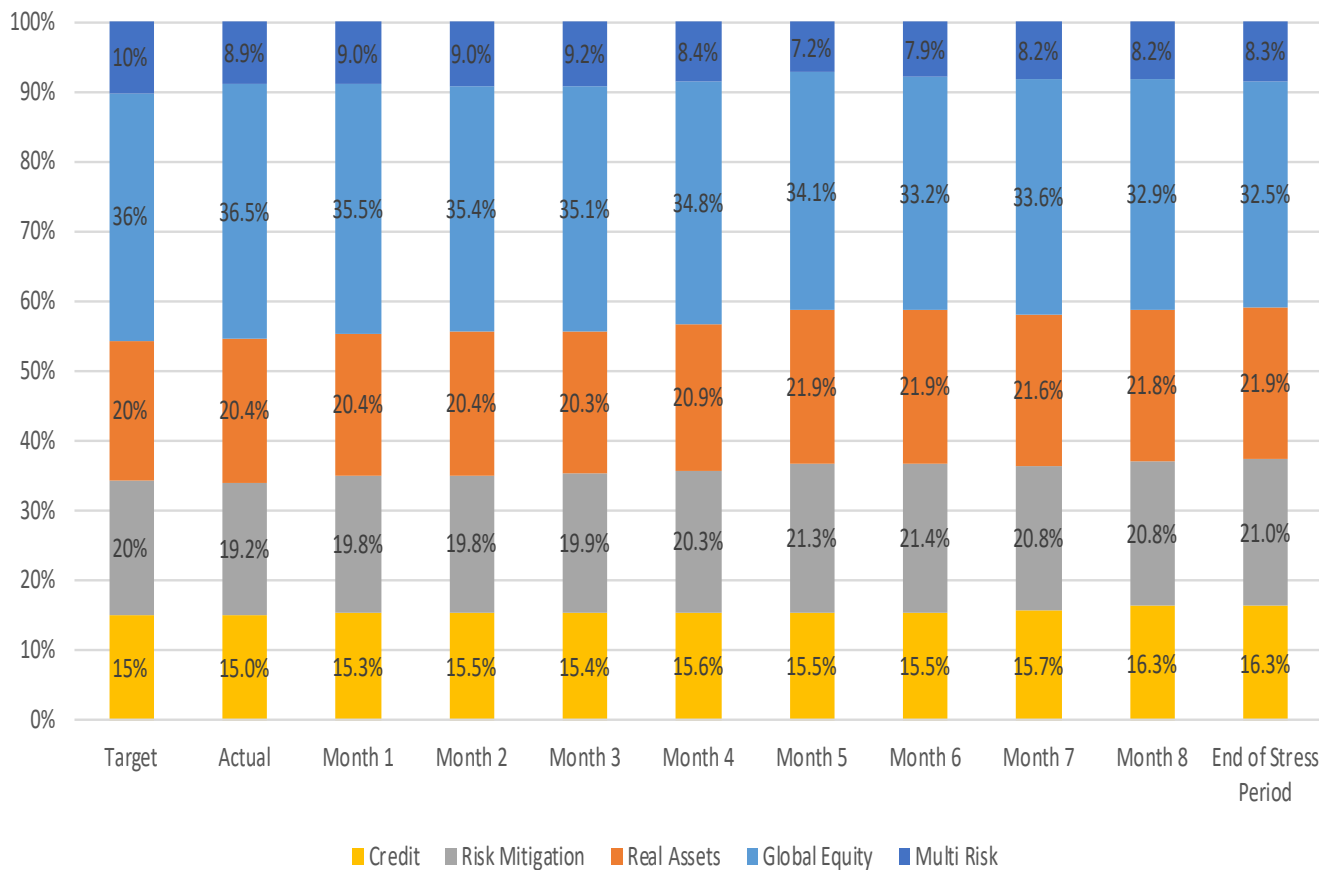
Standard ACA (10 Years)	Liquidity Market Level	Liquidity Stressed Metric
Global Public Equity	90.0%	2.5%
Global Low Volatility Equity	90.0%	2.5%
Private Equity (Blend)	0.0%	0.0%
Core US Fixed Income	100.0%	86.0%
Global Core Fixed Income	100.0%	82.5%
Global High Yield	81.0%	12.0%
Emerging Market Debt	75.0%	40.0%
Alternative Liquid Credit (Blend)	95.0%	64.0%
Private Credit (Blend)	0.0%	0.0%
Global Real Estate Securities	90.0%	2.5%
Public Real Assets (Blend)	90.0%	2.5%
US TIPS	90.0%	86.5%
Commodities	90.0%	55.0%
Global Listed Infrastructure	90.0%	2.5%
Master Limited Partnerships	90.0%	20.0%
Private Real Estate (Blend)	0.0%	0.0%
Private Real Assets (Blend)	0.0%	0.0%
Risk Parity (15% Volatility)	89.0%	13.0%
Cash Borrowing	100.0%	100.0%

- Based on underlying asset class assumptions
- Vehicle structuring can impact available liquidity regardless of underlying assets

LIQUIDITY STRESS TEST

Simulated current PERA portfolio through stress period of Global Financial Crisis (June 2008-February 2009)

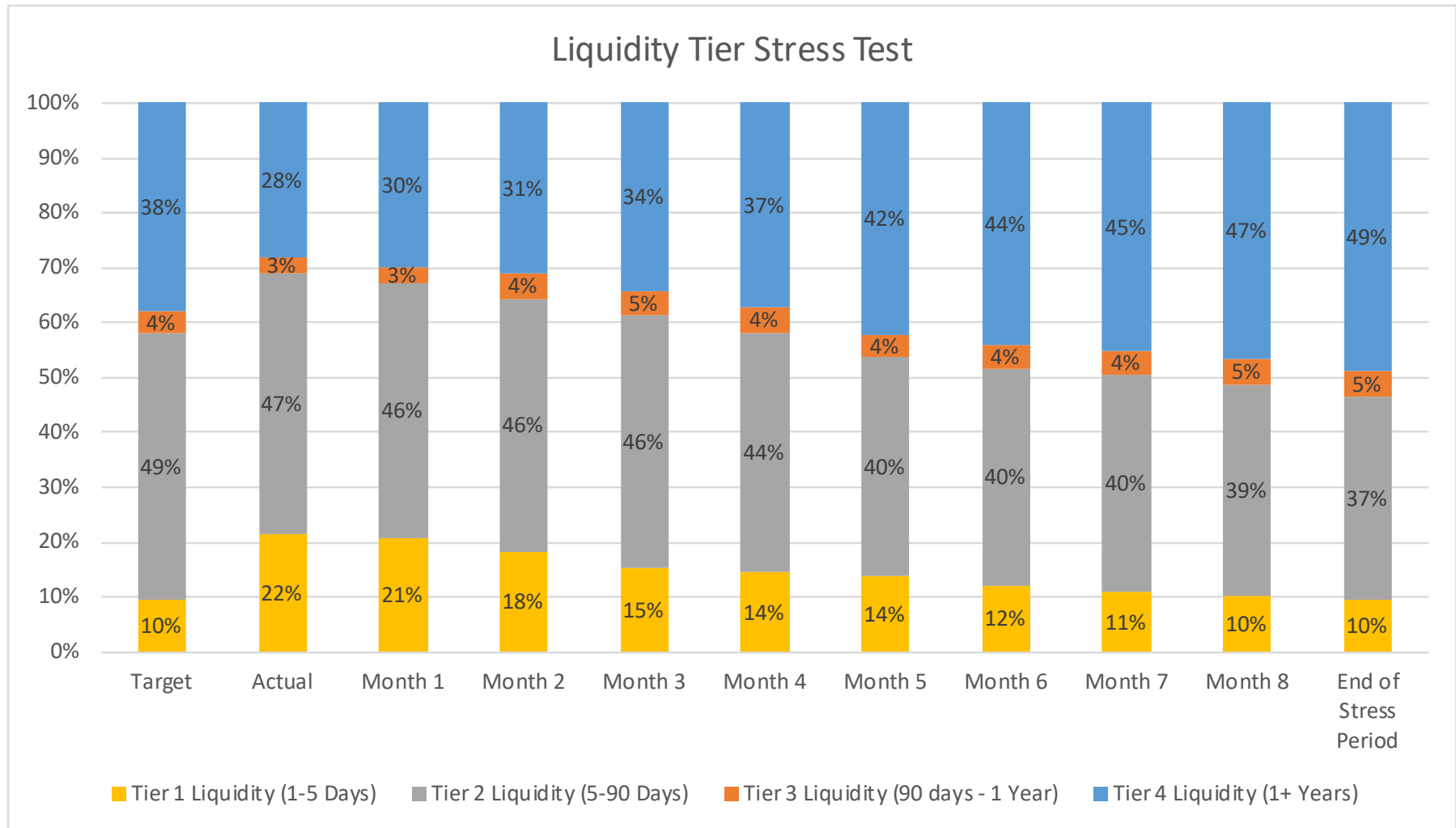
Asset Allocation Evolution



- Examined impact of raising net cash each month utilizing only liquid sources
- Increased allocation to credit and less liquid portable alpha strategies
- Maintain overall broad asset allocation, but do see decline in overall portfolio liquidity through stress period

LIQUIDITY STRESS TEST

Simulated current PERA portfolio through stress period of Global Financial Crisis (June 2008-February 2009)



FINAL CONSIDERATIONS

Summary

- Direct and Indirect approaches have a place in risk management.
 - Indirect approach utilizing Wilshire's liquidity metrics are included in asset allocation modeling as a decision factor
- Propose including a direct liquidity governance limit as a portfolio management guideline specified and approved in the Investment Policy Statement
 - Recommend placing a minimum of 10% in Tier 1 liquidity
 - Post Stress Period, that would equate to \$970 million or \$80 million per month for the current portfolio

Considerations

- Liquidity targets will shift based on key initiatives for 2020
 - Tilt towards less liquid opportunities to enhance return potential of the Total Fund

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THE PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF NEW MEXICO



INVESTED IN TOMORROW.

INVESTMENT POLICY

Revised

~~July 26, 2018~~ April 30, 2020

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THE PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF NEW MEXICO

INVESTMENT POLICY

I. INTRODUCTION

A. Statutory Authority

The Public Employees' Retirement Association of New Mexico (PERA) was created by law in 1947 and is authorized to administer the Public Employees Retirement Act of New Mexico, NMSA 1978, Sections 10-11-1 to 10-11-142, as amended (the PERA Act), the Volunteer Firefighters Retirement Act, NMSA 1978, Sections 10-11A-1 to 10-11A-8, as amended, the Judicial Retirement Act, NMSA 1978, Sections 10-12B-1 to 10-12B-19, as amended, the Magistrate Retirement Act, NMSA 1978, Sections 10-12C-1 to 10-12C-18, as amended, and the Public Employees Reciprocity Act, NMSA 1978, Sections 10-13A-1 to 10-13A-4, as well as other federal and State laws relating to the administration of public employees' retirement systems in the State of New Mexico. As of April 2016, PERA administers thirty-one retirement plans under a defined benefit structure for state employees, municipal employees, county employees, police, firefighters, judges, magistrates, and legislators. PERA is governed by the Retirement Board (the Board).

B. Authority and Duties of the Board

Article XX, Section 22 of the New Mexico Constitution obligates the Board to administer and invest the PERA trust funds (the Fund) for the sole and exclusive benefit of the members, retirees and other beneficiaries of PERA. The PERA Act, NMSA 1978 §§ 10-11-132 and 10-11-133 generally describe the authority of the Board to invest the Fund. Both those sections incorporate and adopt the Uniform Prudent Investor Act (UPIA), NMSA 1978, §§ 45-7-601 to 45-7-612, which require the Board to exercise the reasonable care, skill, and caution of a prudent investor when it invests and manages assets in its capacity as trustee of the Fund. Among other things, the UPIA requires that Fund investments be diversified to minimize the risk of large losses, unless under the circumstances, it is clearly prudent not to do so. The Board also recognizes that care must be exercised to maintain PERA's status as a government plan that is exempt from the requirements of the federal Employees Retirement Income Security Act of 1974 and as a qualified plan that is exempt from taxation under the Internal Revenue Code.

C. Mission Statement

In recognition of its fiduciary responsibility, the Board adopts the following as the mission statement for PERA:

The mission of the Board of the Public Employees Retirement Association is to preserve, protect, and administer the trust to meet its current and future obligations and provide quality services to Association members.

D. PERA Roles and Responsibilities/Delegations of Authority

To accomplish its mission, the Board relies on PERA employees and third-party investment consultants (Investment Consultants) to properly administer the Fund and implement the investment strategies it adopts. Because of the number of parties involved, their roles in investing and managing the Fund must be clearly explained. Doing so increases operational efficiency, ensures clear lines of responsibility, and reduces or eliminates duplication of effort.

Ethics and Conflicts of Interest

The Board, and PERA employees are obligated to act in the exclusive interest of PERA members, retirees, and beneficiaries. Investment Consultants serve in a fiduciary capacity to PERA. Board members and PERA employees shall refrain from personal business activity that could conflict with the proper execution and management of the investment program, or that could impair their ability to make decisions in accordance with PERA's mission statement.

Board of Trustees

The primary fiduciary responsibility of the Board is to ensure prudent investment and management of the Fund. It is the responsibility of the Board to ensure that PERA employees administer investments of the Fund at reasonable cost, while preserving the quality of investments. All principal investment policy decisions are subject to approval by the Board. The Board shall oversee the management of the Fund in compliance with this Investment Policy and all applicable federal and State laws and regulations concerning the administration of a government pension plan. The Board, with the assistance of PERA investment staff (Staff) and consultants, determines the strategic direction of investment of the Fund including the strategic asset allocation target, adoption of a risk budget, and the active management strategy target, all of which shall be reviewed at least semiannually.

Investment Committee

To assist the Board in carrying out its duties, it established an Investment Committee (the Committee). The Committee makes recommendations to the Board on strategic asset allocation target, the risk budget, and the active management strategy target. The Committee establishes benchmarks, including a reference portfolio, for evaluating the performance of the total investment portfolio. The Committee shall also adopt an annual work plan and, at least quarterly, review all principal investment policy actions and performance of the portfolio. The Committee may invite Staff and Investment Consultants to inform and make recommendations to the Committee on any topic or issue pertinent to PERA's investment operations. The Committee Chair shall have the duty and the authority to set Committee meeting agendas and request specific analyses and reports from Staff and Investment Consultants.

Executive Director

The Board appoints the Executive Director (the Director). The Director is responsible for planning, organizing, and administering the operations of PERA under policy guidance and direction from the Board. In fulfilling these investment responsibilities, the Director retains and relies on Staff and Investment Consultants.

Chief Investment Officer and Investment Staff

Staff reports directly to the Chief Investment Officer (the CIO) who in turn reports to the Director. The CIO, with the assistance of Staff, has the responsibility and authority to assist the Board and the Committee in establishing investment and administrative policies. The CIO and Staff are responsible for implementing the policies and programs established by the Board. The CIO has primary responsibility to implement and direct all decisions necessary and appropriate to carry out the Board's investment policies, including the strategic asset allocation target, risk budget, and active management strategic target approved by the Board. The CIO shall report on all decisions and the progress of implementation of those decisions to the Committee.

The CIO and Staff shall manage the portfolio according to the Board's policies, advise and inform the Board about investments, assist with development and review of investment policies and procedures, report on the progress of the Fund in meeting its investment objectives, and monitor and report to the Board on the performance of the Fund against the appropriate benchmarks. The CIO and staff shall have

the delegated authority to evaluate, select, monitor and terminate investment vehicles and managers necessary and appropriate to implement the Board's policies. Their actions shall be disclosed to the Board periodically, as directed by the Committee. Staff exercises the same fiduciary responsibility under applicable law as the Board.

General Counsel and Legal Staff

The Office of General Counsel and legal staff (Legal Counsel) are primarily responsible for legal compliance of the investment program and advises the Board, the Director, the CIO, and Staff on investment-related legal matters. Legal Counsel exercises the same fiduciary responsibility under applicable law as the Board.

Third Party Service Providers

- **Investment Consultants.** Investment Consultants are hired by and accountable to the Board through the authority of the Director. Investment Consultants shall report to the Board or the Committee as directed. An Investment Consultant's duty is to work with the Board and Staff in the oversight and implementation of investment objectives.

The Board's investment strategic consultant shall provide advice and recommendations to the Board or Committee regarding its strategic objectives, risk budget, and oversight and implementation of principal investment objectives.

Investment selection and monitoring consultants shall provide advice and recommendations regarding selection of investment managers and portfolio monitoring to the CIO and Staff.

- **Custodian Bank.** The Custodian Bank serves as the bank of record for the assets comprising the Fund and is responsible for maintaining the official book of record under the supervision of Staff, calculating investment performance, and serving as the primary layer of risk control in the safekeeping of Fund assets. The Custodian Bank is responsible for the ongoing pricing and valuation of all assets, collection of income generated by those assets, and any corporate action notification. The Custodian Bank cooperates with and provides assistance to Staff and Investment Managers in the reconciliation process. PERA may opt to designate other duties to the Custodian Bank as stipulated in the professional services agreement.
- **Investment Managers.** The Board believes that external management of Fund assets optimizes the potential to maximize risk-adjusted returns and minimize the associated expenses. Investment Managers are selected by the CIO and, subject to the terms and conditions of this Policy, serve PERA through contracts that specify in principal part: investment guidelines, administrative requirements, responsibilities, and performance expectations for management of each mandate. Proxy voting is considered to be a component of the investment decision process and will be exercised in accordance with the established PERA Proxy Voting Policy. Investment Managers will report to Staff on the performance of the Fund using formats and at intervals specified by Staff. This information will be synthesized by Staff and presented to the Committee on at least a quarterly basis in accordance with established performance monitoring and oversight procedures.
- **External Legal Counsel.** The General Counsel may retain external legal counsel to advise Staff and negotiate and prepare contracts with Investment Consultants and Investment Managers to protect PERA's interests and status as a tax-exempt government plan.

II. OVERVIEW OF INVESTMENT POLICY

A. Purpose of the Investment Policy

The purpose of the Investment Policy (the Policy) is to explain implementation of the investment principles and objectives of the Board. The Policy provides a reference point for the management of PERA's assets. The Policy provides guidance to the Board and Staff, as well as Investment Consultants, Investment Managers, and the Custodian Bank. The Policy is intended to provide parameters that ensure prudence and care in the execution of the investment program.

It is the intent of the Policy to provide the foundation for prudent management of the Fund, including the standards and disciplines by which the Board can evaluate Staff, Investment Consultants, Investment Managers, and the Custodian Bank.

B. Investment Principles

Accordingly, the Board adopts the following principles and objectives to guide its investment strategies and decisions:

- Preserve the long-term principal of the Fund.
- Maximize total return within prudent risk parameters.
- Maintain sufficient liquidity to meet PERA's obligations.

III. INVESTMENT OBJECTIVES

A. Primary Objective

PERA's primary objective is to prudently invest assets in order to meet its statutory obligations to its members. The Board will manage the Fund in a manner that reflects the Fund's unique liabilities and funding resources, incorporates accepted investment theory, and targets growth and returns appropriate to prudent levels of risk based on reliable empirical evidence. Accordingly, the Board adopts the following principles:

- Strategic asset allocation is the most significant factor influencing the Fund's ability to meet its stated investment objectives.
- Risk is an unavoidable component of investing and shall be taken into account in assessing investment policy and strategy. In evaluating specific investments, both the risks associated with that investment as well as the impact of the investment to the overall portfolio shall be considered.
- Diversification distributes a portfolio across asset categories to avoid excessive exposure to any one source of risk.
- The Fund's liabilities are long-term and the investment strategy must incorporate the appropriate balance between short- and long-term considerations.
- Sufficient liquidity will be maintained to meet the anticipated cash flow requirements of the Fund.

B. Long-Term Returns

Due to the long-term nature of PERA's pension obligations and the inherent risks in short-term tactical investing, PERA must maintain a long-term perspective in formulating and implementing its investment policy, and in evaluating its investment performance. Therefore, the Board: (1) targets a long-term rate of return commensurate with the actuarial assumed rate of return; (2) adopts an allocation policy

developed to meet the targeted rate of return over long periods of time, while minimizing volatility (risk); (3) adopts a risk budget developed to identify the risk tolerances of the total portfolio; (4) adopts an active management strategic target; and (5) minimizes the costs of investing through efficient use of internal and/or external resources.

Investment performance is measured by the following long-term objectives:

- The actuarial assumed target rate of return is the key actuarial assumption affecting future funding rates and payment of pension obligations. Investment performance that exceeds or underperforms the target rate may materially impact future funding rates. The Board seeks to have long-term investment performance that will meet or exceed its actuarial assumed rate of return while managing risk.
- The policy benchmark is calculated by applying the investment performance of the asset class benchmarks to the Fund's asset allocation targets. The policy benchmark permits the Board to compare the Fund's actual performance to a total fund benchmark and to measure the contribution of active investment management and policy adherence.

PERA's progress in meeting these return measures will be reported to the Committee on at least a quarterly basis.

C. Evaluation of Risk

The Board adopts a strategic asset allocation target that is appropriate for existing and anticipated circumstances. In targeting returns, the Board takes into account the benefit levels and structure of the plans supported by the Fund. PERA will periodically conduct and present to the Committee an asset/liability study to determine the extent to which the long-term asset allocation is consistent with the liabilities of the retirement plans that it administers. In determining a prudent level of risk for the targeted returns, PERA shall consider the total Fund risk, expected volatility, liquidity, and general sensitivity of the overall asset allocation by monitoring the major assets classes utilized by the Fund and develop a risk budget. PERA will regularly measure and monitor Fund risks in its management of the Fund.

In accordance with generally accepted principles for prudent investors, the allocation of capital across asset categories increases the probability of meeting or exceeding the Fund's objectives at a prudent level of risk. In establishing its risk tolerance, PERA will consider its ability to withstand short- and intermediate-term volatility in investment performance and fluctuations in financial condition of the Fund.

IV. ASSET ALLOCATION

A. Strategic Asset Allocation Targets

Based on recommendations by Staff and Investment Consultants, the Board shall choose the strategic asset allocation target based on its determination of the appropriate risk tolerance for PERA, and its long-term return expectations. Each asset class allocation percentage has a long-term target position within the overall portfolio and a maximum and minimum range around that target allocation. Asset class policy targets and ranges are listed in Appendix A, which is separately adopted by the Board.

The Board recognizes that the long-term target allocation may take an extended period to implement. Staff and Investment Consultants will provide the Board with regular updates on the status of targeted asset allocation of the Fund as a whole and the component asset classes. The Board will prudently monitor this progress and the Fund's performance throughout the implementation period.

The target allocation will be reviewed annually for significant economic and market changes, and as appropriate, to changes in the Fund's long-term goals and objectives. A comprehensive asset allocation study should be conducted at least every three years to verify or revise the targets.

B. Active Management Strategic Target

Based on recommendations by Staff and Investment Consultants, the Board shall choose the active management strategic target that seeks an additional return expectation for active management over and above the strategic asset allocation target.

C. Risk Budgeting

Based on recommendations by Staff and Investment Consultants, the Board shall set a risk budget that identifies the risk tolerance of the total Fund that is budgeted into two key components; 1) strategic asset allocation target risk; and 2) active risk. Active risk is the additional risk or deviation from the strategic asset allocation benchmark to achieve the active management strategic target.

D. Rebalancing Strategy

The Board authorizes the CIO and Staff to rebalance the portfolio in accordance with policy guidelines and established procedures on an ongoing basis. The goal in implementing the rebalancing policy is to minimize transaction costs, market impact, and opportunity costs.

The Board adopts a rebalancing policy that considers allocation ranges rather than time periods. Upper and lower allocation limits established for each asset class are defined in Appendix A. When the allocation to all asset classes remains within these limits, Staff will use cash flow to maintain the overall allocation as closely as possible to the target.

In the event that a liquid strategy within an asset class deviates from an upper or lower allocation limit, the asset class will be rebalanced to return to its strategic asset allocation target range within ninety (90) days. Within this ninety-day window it may be impractical or costly to reallocate capital towards less liquid investment strategies within each major asset category.

Rebalancing shall consider liquidity so that investments can be converted into cash in a short time, with little or no loss in value, as necessary to facilitate the objectives of the Fund. The marketability of an asset will be considered when rebalancing within each asset category. The rebalancing strategy may be implemented through the use of the cash overlay program.

Staff will report the results of rebalancing activities to the Committee by no later than the subsequent regular meeting.

V. PERFORMANCE BENCHMARKS

A. Total Fund Benchmark

Each asset class is described by an associated benchmark that describes, in general terms, the opportunity set and return characteristics associated with the asset class. For certain private or more complex asset classes the benchmark serves as a proxy for expected returns rather than an approximation of the actual investments that will characterize that component of the portfolio. Those benchmarks are referred to as the "Policy Index" and are identified in Appendix B, which is separately adopted by the Committee. The Board may use the Policy Index to compare the Fund's actual performance to its Total Fund Benchmark, and to measure the contributions of active investment management and policy adherence.

B. Mandate-Level Benchmarks

Benchmarks relevant to an investment shall be used as standards to measure the performance of Investment Managers. Acceptable benchmarks include but are not limited to:

- the appropriate market indices on a nominal and risk-adjusted basis;
- the performance of peers within their style group;
- adherence of the Investment Manager to the stated investment philosophy and style; and
- adherence to this Policy and the guidelines established in the investment contract.

The Board will work with Staff and the Investment Consultants to identify appropriate sub-asset class benchmarks. Staff and Investment Consultants will review the appropriateness of these benchmarks and report to the Committee on a regular basis.

VI. INVESTMENT GUIDELINES

Recognizing that capital markets are global in nature, the Board shall consider asset classes that represent all investment opportunities appropriate for PERA, as long as such investments comply with the UPIA. The terms and conditions of investment contracts are subject to legal review for compliance with applicable law and applicable investment standards.

A. Investments

Global Equity

An appropriately diversified Fund should include, commensurate with market conditions, global equity investments, both public and private. This allocation is structured to help the Fund meet its total return goals and will be implemented through strategies that include both liquid and illiquid mandates.

- **Public Equity.** The objective of public equity investments is to provide exposure to global economic growth opportunities and seek to capture capital appreciation and current income. The public equity allocation must anticipate long-term capital appreciation as it targets economic growth with an acceptable exposure to price volatility and the risk of loss. Public equity includes hedged investments that reduce broad market risks by isolating security-specific returns. The vehicles will utilize long and short positions along with leverage to accomplish their investment objectives. Equity-hedged investments will retain some broad market risk, but will generally be less volatile and have a lower correlation to broad equity markets over a full cycle.
- **Private Equity.** The objective of the private equity allocation is to capture a premium from making long-term, illiquid investments in predominantly non-publicly traded equity securities. In making private equity investments, PERA shall consider that private equity Investment Managers typically have concentrated portfolios and generate returns by making operational changes to the acquired businesses and often employ leverage to generate superior returns.

Risk Reduction and Mitigation

An appropriately diversified Fund should include, commensurate with market conditions, an allocation of assets for risk reduction and mitigation to provide diversification, a dependable source of current income, and downside protection. PERA shall consider the risk reduction and mitigation allocation as a component of the total investment portfolio that provides lower expected volatility and a greater expectation for the preservation of capital. The risk reduction and mitigation allocation includes, but is

not limited to the following investment types:

- **Core and Global Fixed Income.** Bonds, notes or other obligations of the U.S. government, its agencies, government-sponsored enterprises, corporations, or collateralized obligations, including but not limited to mortgages are targeted to achieve risk reduction and mitigation. In addition, these portfolios may include debt obligations of non-U.S. governmental or quasi-governmental entities and corporations with an investment grade rating, which may be denominated in foreign currencies.
- **Operating Cash Management.** In order to mitigate risk and ensure liquidity, commensurate with market conditions, the services of the State Treasurer may be used for overnight investment of short-term assets. Use of a separate or commingled short-term investment fund administered by the Custodian Bank may be considered.
- **Currency.** As means to mitigate risk while realizing returns, PERA should consider active currency strategies that do not necessarily hedge existing international holdings, but instead, seek absolute return which may include leverage, cross-hedging, emerging markets, and interest-rate futures.
- **Securities Lending:** The Board may authorize a securities lending program for all or any portion of the assets held as investments by PERA. Securities may only be loaned by the designated agent(s) by contracting for the temporary exchange of securities, for a specified fee or consideration for periods not to exceed one year, with broker-dealers, banks or other recognized institutional investors.
- **Cash Overlay:** Overlay strategies may be used to manage risk, asset allocation, and market exposures through futures, options, swap agreements, or forward agreements.

Credit-Oriented Fixed Income

An appropriately diversified Fund should include, commensurate with market conditions, global credit-oriented fixed income investments to deliver positive returns over a complete market cycle while maintaining sufficient liquidity. Credit-oriented fixed income investments shall be targeted to provide current income and total return with a strong focus on preservation of capital. In making these investments, PERA shall consider the potential volatility as compared to the risk reduction and mitigation allocation. PERA shall also consider credit-oriented fixed income investments that utilize leverage, shorting, derivatives, and illiquidity to generate greater risk-adjusted returns. Credit-oriented fixed income investments include similar types of securities as those in the risk reduction and mitigation allocation, but may have different credit characteristics at the time of purchase.

Real Assets

An appropriately diversified Fund should include, commensurate with market conditions, investments in real assets to generate current income and provide capital appreciation. In making such investments, PERA shall consider the benefits of diversification that these investments provide as a hedge against inflation. Real assets investments may include but are not limited to liquid and illiquid securities in real estate, infrastructure, commodities, natural resources, timber, agriculture and farmland. The real assets portfolio includes market neutral strategies—these portfolios seek to avoid elevated exposure to broad market risk through the use of hedges. Market neutral strategies shall target a zero correlation with broad market movements and provide diversification benefits for the total fund.

Multi-Risk Allocation

An appropriately diversified Fund should include, commensurate with market conditions, investments

in balanced risk-based exposures to equalize the risk contribution of asset classes or risk factors comprised in the portfolio. In making such investments, PERA shall consider the benefits of diversification that these investments provide as a liability hedge and stabilized return generator. Multi-risk investments shall include, but are not limited to, Risk Balanced/Parity strategies. PERA shall also consider multi-risk investments that utilize leverage and derivatives to generate a greater risk adjusted return.

B. Other Investment Considerations

The Board may, after consideration of pertinent investment risk and reward attributes, and liquidity, cost and administrative complexity, authorize any investment except as otherwise expressly prohibited.

Securities Regulations

PERA shall consider, based on market considerations, whether engagement of Investment Managers registered under the Investment Company Act of 1940 is appropriate. This Act governs the operations of investment companies and their managers. PERA should work with its Investment Consultants and Investment Managers to ensure compliance with all federal and state securities laws including, but not limited to, the Securities Act of 1933 and the Investment Advisers Act of 1940. PERA recognizes that such registration is not applicable to all investment strategies or to investment opportunities located outside the United States.

Leverage

Leverage is implicit in many investment strategies and leverage in and of itself is not strictly prohibited so long as activities do not materially increase the risk level of the Plan. Leverage will be considered when deciding to retain an Investment Manager, and the Board, in conjunction with Staff, Investment Consultants, and Investment Managers, will avoid managers who employ unreasonable levels of leverage.

Liquidity

The Fund must maintain an easily accessible balance of cash equivalents and other reasonably liquid assets for the purposes of meeting the financial obligations of the Fund. The Board will govern these liquidity requirements through the utilization of a structural hierarchy, which -will classify asset classes according to liquidity availability and pricing sensitivity during market stress. Convertible Liquidity is defined as a level of access from asset classes that can be liquidated in a relatively short amount of time with minimal pricing impact. Delayed Liquidity will capture all remaining asset classes that can be sold, but at a greater expense and/or over a longer time frame. Within these two classifications asset classes will be further classified across tiered availability. Liquidity guidelines are listed in Appendix C, which is separately adopted by the Board.

Derivatives

Investment Managers may use derivative instruments such as futures, options, swaps, and forwards, to implement investment strategies in a low cost, efficient manner or construct portfolios with risk and return characteristics that cannot be created with cash market securities. Derivatives may also be used within the context of a cash overlay program. The cash overlay program, administered by an Investment Manager, may buy, sell, and hold exchanged-traded derivative instruments and exchange-traded funds.

C. Prohibited Investments

In accordance with UPIA guidelines, the Board, Staff, Investment Consultants, and Investment Managers are expected to perform their fiduciary duties as a prudent investor would and to conform to all applicable federal and state statutes governing the investment of retirement funds for a qualified government plan. Accordingly, the following investments are prohibited:

Investments precluded by law or regulation:

- Transactions that involve a broker acting as a "principal" where such broker is also the Investment Manager who is making the transaction are prohibited unless otherwise approved in each manager's respective PSA.
- Any other investments as specified in each Investment Manager's respective contract.
- An investment that violates the placement agent limitations set forth in the PERA Act.

VII. REVIEW AND APPROVAL OF INVESTMENT POLICY

The Board shall review the Policy from time-to-time to determine if modifications are necessary or desirable but will delegate Staff to review the Policy on an annual basis. Staff will recommend modifications as warranted. If modifications are made, they shall be promptly communicated to all Investment Managers and other interested persons.

By signing this Investment Policy the Board through its Chair, indicates its agreement therewith.

Adopted: June 25, 1992
Amended: September 14, 1993
April 28, 1994
September 28, 1995
January 29, 1998
March 23, 1998
January 27, 2000
September 26, 2002
July 31, 2003
October 31, 2003
July 1, 2005
September 28, 2005
December 29, 2005
July 27, 2006
August 31, 2006
September 28, 2006
June 1, 2007
August 30, 2007
July 31, 2008
June 24, 2010
November 29, 2012
August 28, 2014
December 18, 2014
September 24, 2015
April 28, 2016
December 14, 2017
July 26, 2018
April 30, 2020

By: _____
~~James Maxon~~ John Melia, Board Chair
Public Employees Retirement Association of New Mexico

APPENDIX A. ASSET ALLOCATION TARGETS AND REBALANCING RANGES

Effective July 26, 2018

Asset Class	Lower Limit	Strategic Asset Allocation Target	Upper Limit
Global Equity	30.5%	35.5%	40.5%
Risk Reduction and Mitigation	16.5%	19.5%	22.5%
Credit Oriented Fixed Income	11.0%	15.0%	19.0%
Real Assets	16.0%	20.0%	24.0%
Multi-Risk Allocation	06.0%	10.0%	14.0%

Adopted: July 26, 2018

By:

James Maxon, Board Chair
Public Employees' Retirement Association of New Mexico

APPENDIX B. BENCHMARKS

Effective: January 1, 2019

Global Equity	Custom Blended Benchmark
Global Public Stock	MSCI ACWI IMI (\$net)
Global Low Volatility Equity	MSCI ACWI Minimum Volatility (\$net)
Hedged Equity	MSCI ACWI Minimum Volatility (\$net)
Private Equity	MSCI ACWI IMI (\$net)
Risk Reduction & Mitigation	Custom Blended Benchmark
Core Fixed Income	Bloomberg Barclays U.S. Aggregate
Global Core Fixed Income	Bloomberg Barclays Global Aggregate (Hedged)
Credit Oriented Fixed Income	Custom Blended Benchmark
Liquid Credit	Bloomberg Barclays Global High Yield (Hedged)
Emerging Market Debt	50% JP Morgan EMBI Global Diversified (\$) 50% JP Morgan GBI (\$)
Illiquid Credit	Bloomberg Barclays Global High Yield (Hedged)
Credit Oriented Hedge Funds	Bloomberg Barclays Global High Yield (Hedged)
Real Assets	Custom Blended Benchmark
Liquid Real Estate	Wilshire Global REITs
Illiquid Real Estate	Wilshire Global REITs
Liquid Real Assets	Alerian MLP Index / Dow Jones – Brookfield Global Infrastructure Index / Bloomberg Barclays – U.S. TIPS / Bloomberg Commodity – Commodity Index (TR)
Illiquid Real Assets	Dow Jones – Brookfield Global Infrastructure Index / Bloomberg Commodity – Commodity Index (TR)
Multi-Risk Allocation	Custom Blended Benchmark
Risk Balance	Custom Blended Benchmark

Adopted: November 29, 2018

By: _____
James Maxon, Board Chair
Public Employees' Retirement Association of New Mexico

APPENDIX C. LIQUIDITY GUIDELINES

Effective: April 30, 2020

At no time shall Tier 1 assets fall below 10% of the total fund market value. For the purposes of liquidity, tier classifications and their corresponding asset classes are as follows:

<u>Convertible Liquidity</u>		
<u>Tier 1</u>	<u>1-5 Day Liquidity</u>	<u>Core Fixed Income</u> <u>Global Core Fixed Income</u> <u>Cash and Cash Overlay</u>
<u>Tier 2</u>	<u>5-90 Day Liquidity</u>	<u>Global Public Stock</u> <u>Global Low Volatility Equity</u> <u>Liquid Credit</u> <u>Emerging Market Debt</u> <u>Liquid Real Estate</u> <u>Liquid Real Assets</u> <u>Risk Balance</u>
<u>Delayed Liquidity</u> - -		
<u>Tier 3</u>	<u>90-365 Day Liquidity</u>	<u>Hedged Equity</u> <u>Hedged Credit / Alternative Credit</u>
<u>Tier 4</u>	<u>1 Year + Liquidity</u>	<u>Private Equity</u> <u>Illiquid Credit</u> <u>Illiquid Real Estate</u> <u>Illiquid Real Assets</u> <u>Bond Plus/Portable Alpha</u>

Adopted: April 30, 2020

By: _____

John Melia, Board Chair

Public Employees' Retirement Association of New Mexico

THE PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF NEW MEXICO



INVESTED IN TOMORROW.

INVESTMENT POLICY

Revised
April 30, 2020

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THE PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF NEW MEXICO

INVESTMENT POLICY

I. INTRODUCTION

A. Statutory Authority

The Public Employees' Retirement Association of New Mexico (PERA) was created by law in 1947 and is authorized to administer the Public Employees Retirement Act of New Mexico, NMSA 1978, Sections 10-11-1 to 10-11-142, as amended (the PERA Act), the Volunteer Firefighters Retirement Act, NMSA 1978, Sections 10-11A-1 to 10-11A-8, as amended, the Judicial Retirement Act, NMSA 1978, Sections 10-12B-1 to 10-12B-19, as amended, the Magistrate Retirement Act, NMSA 1978, Sections 10-12C-1 to 10-12C-18, as amended, and the Public Employees Reciprocity Act, NMSA 1978, Sections 10-13A-1 to 10-13A-4, as well as other federal and State laws relating to the administration of public employees' retirement systems in the State of New Mexico. As of April 2016, PERA administers thirty-one retirement plans under a defined benefit structure for state employees, municipal employees, county employees, police, firefighters, judges, magistrates, and legislators. PERA is governed by the Retirement Board (the Board).

B. Authority and Duties of the Board

Article XX, Section 22 of the New Mexico Constitution obligates the Board to administer and invest the PERA trust funds (the Fund) for the sole and exclusive benefit of the members, retirees and other beneficiaries of PERA. The PERA Act, NMSA 1978 §§ 10-11-132 and 10-11-133 generally describe the authority of the Board to invest the Fund. Both those sections incorporate and adopt the Uniform Prudent Investor Act (UPIA), NMSA 1978, §§ 45-7-601 to 45-7-612, which require the Board to exercise the reasonable care, skill, and caution of a prudent investor when it invests and manages assets in its capacity as trustee of the Fund. Among other things, the UPIA requires that Fund investments be diversified to minimize the risk of large losses, unless under the circumstances, it is clearly prudent not to do so. The Board also recognizes that care must be exercised to maintain PERA's status as a government plan that is exempt from the requirements of the federal Employees Retirement Income Security Act of 1974 and as a qualified plan that is exempt from taxation under the Internal Revenue Code.

C. Mission Statement

In recognition of its fiduciary responsibility, the Board adopts the following as the mission statement for PERA:

The mission of the Board of the Public Employees Retirement Association is to preserve, protect, and administer the trust to meet its current and future obligations and provide quality services to Association members.

D. PERA Roles and Responsibilities/Delegations of Authority

To accomplish its mission, the Board relies on PERA employees and third-party investment consultants (Investment Consultants) to properly administer the Fund and implement the investment strategies it adopts. Because of the number of parties involved, their roles in investing and managing the Fund must be clearly explained. Doing so increases operational efficiency, ensures clear lines of responsibility, and reduces or eliminates duplication of effort.

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The Board appoints the Executive Director (the Director). The Director is responsible for planning, organizing, and administering the operations of PERA under policy guidance and direction from the Board. In fulfilling these investment responsibilities, the Director retains and relies on Staff and Investment Consultants.

Chief Investment Officer and Investment Staff

Staff reports directly to the Chief Investment Officer (the CIO) who in turn reports to the Director. The CIO, with the assistance of Staff, has the responsibility and authority to assist the Board and the Committee in establishing investment and administrative policies. The CIO and Staff are responsible for implementing the policies and programs established by the Board. The CIO has primary responsibility to implement and direct all decisions necessary and appropriate to carry out the Board's investment policies, including the strategic asset allocation target, risk budget, and active management strategic target approved by the Board. The CIO shall report on all decisions and the progress of implementation of those decisions to the Committee.

The CIO and Staff shall manage the portfolio according to the Board's policies, advise and inform the Board about investments, assist with development and review of investment policies and procedures, report on the progress of the Fund in meeting its investment objectives, and monitor and report to the Board on the performance of the Fund against the appropriate benchmarks. The CIO and staff shall have

the delegated authority to evaluate, select, monitor and terminate investment vehicles and managers necessary and appropriate to implement the Board's policies. Their actions shall be disclosed to the Board periodically, as directed by the Committee. Staff exercises the same fiduciary responsibility under applicable law as the Board.

General Counsel and Legal Staff

The Office of General Counsel and legal staff (Legal Counsel) are primarily responsible for legal compliance of the investment program and advises the Board, the Director, the CIO, and Staff on investment-related legal matters. Legal Counsel exercises the same fiduciary responsibility under applicable law as the Board.

Third Party Service Providers

- **Investment Consultants.** Investment Consultants are hired by and accountable to the Board through the authority of the Director. Investment Consultants shall report to the Board or the Committee as directed. An Investment Consultant's duty is to work with the Board and Staff in the oversight and implementation of investment objectives.

The Board's investment strategic consultant shall provide advice and recommendations to the Board or Committee regarding its strategic objectives, risk budget, and oversight and implementation of principal investment objectives.

Investment selection and monitoring consultants shall provide advice and recommendations regarding selection of investment managers and portfolio monitoring to the CIO and Staff.

- **Custodian Bank.** The Custodian Bank serves as the bank of record for the assets comprising the Fund and is responsible for maintaining the official book of record under the supervision of Staff, calculating investment performance, and serving as the primary layer of risk control in the safekeeping of Fund assets. The Custodian Bank is responsible for the ongoing pricing and valuation of all assets, collection of income generated by those assets, and any corporate action notification. The Custodian Bank cooperates with and provides assistance to Staff and Investment Managers in the reconciliation process. PERA may opt to designate other duties to the Custodian Bank as stipulated in the professional services agreement.
- **Investment Managers.** The Board believes that external management of Fund assets optimizes the potential to maximize risk-adjusted returns and minimize the associated expenses. Investment Managers are selected by the CIO and, subject to the terms and conditions of this Policy, serve PERA through contracts that specify in principal part: investment guidelines, administrative requirements, responsibilities, and performance expectations for management of each mandate. Proxy voting is considered to be a component of the investment decision process and will be exercised in accordance with the established PERA Proxy Voting Policy. Investment Managers will report to Staff on the performance of the Fund using formats and at intervals specified by Staff. This information will be synthesized by Staff and presented to the Committee on at least a quarterly basis in accordance with established performance monitoring and oversight procedures.
- **External Legal Counsel.** The General Counsel may retain external legal counsel to advise Staff and negotiate and prepare contracts with Investment Consultants and Investment Managers to protect PERA's interests and status as a tax-exempt government plan.

II. OVERVIEW OF INVESTMENT POLICY

A. Purpose of the Investment Policy

The purpose of the Investment Policy (the Policy) is to explain implementation of the investment principles and objectives of the Board. The Policy provides a reference point for the management of PERA's assets. The Policy provides guidance to the Board and Staff, as well as Investment Consultants, Investment Managers, and the Custodian Bank. The Policy is intended to provide parameters that ensure prudence and care in the execution of the investment program.

It is the intent of the Policy to provide the foundation for prudent management of the Fund, including the standards and disciplines by which the Board can evaluate Staff, Investment Consultants, Investment Managers, and the Custodian Bank.

B. Investment Principles

Accordingly, the Board adopts the following principles and objectives to guide its investment strategies and decisions:

- Preserve the long-term principal of the Fund.
- Maximize total return within prudent risk parameters.
- Maintain sufficient liquidity to meet PERA's obligations.

III. INVESTMENT OBJECTIVES

A. Primary Objective

PERA's primary objective is to prudently invest assets in order to meet its statutory obligations to its members. The Board will manage the Fund in a manner that reflects the Fund's unique liabilities and funding resources, incorporates accepted investment theory, and targets growth and returns appropriate to prudent levels of risk based on reliable empirical evidence. Accordingly, the Board adopts the following principles:

- Strategic asset allocation is the most significant factor influencing the Fund's ability to meet its stated investment objectives.
- Risk is an unavoidable component of investing and shall be taken into account in assessing investment policy and strategy. In evaluating specific investments, both the risks associated with that investment as well as the impact of the investment to the overall portfolio shall be considered.
- Diversification distributes a portfolio across asset categories to avoid excessive exposure to any one source of risk.
- The Fund's liabilities are long-term and the investment strategy must incorporate the appropriate balance between short- and long-term considerations.
- Sufficient liquidity will be maintained to meet the anticipated cash flow requirements of the Fund.

B. Long-Term Returns

Due to the long-term nature of PERA's pension obligations and the inherent risks in short-term tactical investing, PERA must maintain a long-term perspective in formulating and implementing its investment policy, and in evaluating its investment performance. Therefore, the Board: (1) targets a long-term rate of return commensurate with the actuarial assumed rate of return; (2) adopts an allocation policy

developed to meet the targeted rate of return over long periods of time, while minimizing volatility (risk); (3) adopts a risk budget developed to identify the risk tolerances of the total portfolio; (4) adopts an active management strategic target; and (5) minimizes the costs of investing through efficient use of internal and/or external resources.

Investment performance is measured by the following long-term objectives:

- The actuarial assumed target rate of return is the key actuarial assumption affecting future funding rates and payment of pension obligations. Investment performance that exceeds or underperforms the target rate may materially impact future funding rates. The Board seeks to have long-term investment performance that will meet or exceed its actuarial assumed rate of return while managing risk.
- The policy benchmark is calculated by applying the investment performance of the asset class benchmarks to the Fund's asset allocation targets. The policy benchmark permits the Board to compare the Fund's actual performance to a total fund benchmark and to measure the contribution of active investment management and policy adherence.

PERA's progress in meeting these return measures will be reported to the Committee on at least a quarterly basis.

C. Evaluation of Risk

The Board adopts a strategic asset allocation target that is appropriate for existing and anticipated circumstances. In targeting returns, the Board takes into account the benefit levels and structure of the plans supported by the Fund. PERA will periodically conduct and present to the Committee an asset/liability study to determine the extent to which the long-term asset allocation is consistent with the liabilities of the retirement plans that it administers. In determining a prudent level of risk for the targeted returns, PERA shall consider the total Fund risk, expected volatility, liquidity, and general sensitivity of the overall asset allocation by monitoring the major assets classes utilized by the Fund and develop a risk budget. PERA will regularly measure and monitor Fund risks in its management of the Fund.

In accordance with generally accepted principles for prudent investors, the allocation of capital across asset categories increases the probability of meeting or exceeding the Fund's objectives at a prudent level of risk. In establishing its risk tolerance, PERA will consider its ability to withstand short- and intermediate-term volatility in investment performance and fluctuations in financial condition of the Fund.

IV. ASSET ALLOCATION

A. Strategic Asset Allocation Targets

Based on recommendations by Staff and Investment Consultants, the Board shall choose the strategic asset allocation target based on its determination of the appropriate risk tolerance for PERA, and its long-term return expectations. Each asset class allocation percentage has a long-term target position within the overall portfolio and a maximum and minimum range around that target allocation. Asset class policy targets and ranges are listed in Appendix A, which is separately adopted by the Board.

The Board recognizes that the long-term target allocation may take an extended period to implement. Staff and Investment Consultants will provide the Board with regular updates on the status of targeted asset allocation of the Fund as a whole and the component asset classes. The Board will prudently monitor this progress and the Fund's performance throughout the implementation period.

The target allocation will be reviewed annually for significant economic and market changes, and as appropriate, to changes in the Fund's long-term goals and objectives. A comprehensive asset allocation study should be conducted at least every three years to verify or revise the targets.

B. Active Management Strategic Target

Based on recommendations by Staff and Investment Consultants, the Board shall choose the active management strategic target that seeks an additional return expectation for active management over and above the strategic asset allocation target.

C. Risk Budgeting

Based on recommendations by Staff and Investment Consultants, the Board shall set a risk budget that identifies the risk tolerance of the total Fund that is budgeted into two key components; 1) strategic asset allocation target risk; and 2) active risk. Active risk is the additional risk or deviation from the strategic asset allocation benchmark to achieve the active management strategic target.

D. Rebalancing Strategy

The Board authorizes the CIO and Staff to rebalance the portfolio in accordance with policy guidelines and established procedures on an ongoing basis. The goal in implementing the rebalancing policy is to minimize transaction costs, market impact, and opportunity costs.

The Board adopts a rebalancing policy that considers allocation ranges rather than time periods. Upper and lower allocation limits established for each asset class are defined in Appendix A. When the allocation to all asset classes remains within these limits, Staff will use cash flow to maintain the overall allocation as closely as possible to the target.

In the event that a liquid strategy within an asset class deviates from an upper or lower allocation limit, the asset class will be rebalanced to return to its strategic asset allocation target range within ninety (90) days. Within this ninety-day window it may be impractical or costly to reallocate capital towards less liquid investment strategies within each major asset category.

Rebalancing shall consider liquidity so that investments can be converted into cash in a short time, with little or no loss in value, as necessary to facilitate the objectives of the Fund. The marketability of an asset will be considered when rebalancing within each asset category. The rebalancing strategy may be implemented through the use of the cash overlay program.

Staff will report the results of rebalancing activities to the Committee by no later than the subsequent regular meeting.

V. PERFORMANCE BENCHMARKS

A. Total Fund Benchmark

Each asset class is described by an associated benchmark that describes, in general terms, the opportunity set and return characteristics associated with the asset class. For certain private or more complex asset classes the benchmark serves as a proxy for expected returns rather than an approximation of the actual investments that will characterize that component of the portfolio. Those benchmarks are referred to as the "Policy Index" and are identified in Appendix B, which is separately adopted by the Committee. The Board may use the Policy Index to compare the Fund's actual performance to its Total Fund Benchmark, and to measure the contributions of active investment management and policy adherence.

B. Mandate-Level Benchmarks

Benchmarks relevant to an investment shall be used as standards to measure the performance of Investment Managers. Acceptable benchmarks include but are not limited to:

- the appropriate market indices on a nominal and risk-adjusted basis;
- the performance of peers within their style group;
- adherence of the Investment Manager to the stated investment philosophy and style; and
- adherence to this Policy and the guidelines established in the investment contract.

The Board will work with Staff and the Investment Consultants to identify appropriate sub-asset class benchmarks. Staff and Investment Consultants will review the appropriateness of these benchmarks and report to the Committee on a regular basis.

VI. INVESTMENT GUIDELINES

Recognizing that capital markets are global in nature, the Board shall consider asset classes that represent all investment opportunities appropriate for PERA, as long as such investments comply with the UPIA. The terms and conditions of investment contracts are subject to legal review for compliance with applicable law and applicable investment standards.

A. Investments

Global Equity

An appropriately diversified Fund should include, commensurate with market conditions, global equity investments, both public and private. This allocation is structured to help the Fund meet its total return goals and will be implemented through strategies that include both liquid and illiquid mandates.

- **Public Equity.** The objective of public equity investments is to provide exposure to global economic growth opportunities and seek to capture capital appreciation and current income. The public equity allocation must anticipate long-term capital appreciation as it targets economic growth with an acceptable exposure to price volatility and the risk of loss. Public equity includes hedged investments that reduce broad market risks by isolating security-specific returns. The vehicles will utilize long and short positions along with leverage to accomplish their investment objectives. Equity-hedged investments will retain some broad market risk, but will generally be less volatile and have a lower correlation to broad equity markets over a full cycle.
- **Private Equity.** The objective of the private equity allocation is to capture a premium from making long-term, illiquid investments in predominantly non-publicly traded equity securities. In making private equity investments, PERA shall consider that private equity Investment Managers typically have concentrated portfolios and generate returns by making operational changes to the acquired businesses and often employ leverage to generate superior returns.

Risk Reduction and Mitigation

An appropriately diversified Fund should include, commensurate with market conditions, an allocation of assets for risk reduction and mitigation to provide diversification, a dependable source of current income, and downside protection. PERA shall consider the risk reduction and mitigation allocation as a component of the total investment portfolio that provides lower expected volatility and a greater expectation for the preservation of capital. The risk reduction and mitigation allocation includes, but is

not limited to the following investment types:

- **Core and Global Fixed Income.** Bonds, notes or other obligations of the U.S. government, its agencies, government-sponsored enterprises, corporations, or collateralized obligations, including but not limited to mortgages are targeted to achieve risk reduction and mitigation. In addition, these portfolios may include debt obligations of non-U.S. governmental or quasi-governmental entities and corporations with an investment grade rating, which may be denominated in foreign currencies.
- **Operating Cash Management.** In order to mitigate risk and ensure liquidity, commensurate with market conditions, the services of the State Treasurer may be used for overnight investment of short-term assets. Use of a separate or commingled short-term investment fund administered by the Custodian Bank may be considered.
- **Currency.** As means to mitigate risk while realizing returns, PERA should consider active currency strategies that do not necessarily hedge existing international holdings, but instead, seek absolute return which may include leverage, cross-hedging, emerging markets, and interest-rate futures.
- **Securities Lending:** The Board may authorize a securities lending program for all or any portion of the assets held as investments by PERA. Securities may only be loaned by the designated agent(s) by contracting for the temporary exchange of securities, for a specified fee or consideration for periods not to exceed one year, with broker-dealers, banks or other recognized institutional investors.
- **Cash Overlay:** Overlay strategies may be used to manage risk, asset allocation, and market exposures through futures, options, swap agreements, or forward agreements.

Credit-Oriented Fixed Income

An appropriately diversified Fund should include, commensurate with market conditions, global credit-oriented fixed income investments to deliver positive returns over a complete market cycle while maintaining sufficient liquidity. Credit-oriented fixed income investments shall be targeted to provide current income and total return with a strong focus on preservation of capital. In making these investments, PERA shall consider the potential volatility as compared to the risk reduction and mitigation allocation. PERA shall also consider credit-oriented fixed income investments that utilize leverage, shorting, derivatives, and illiquidity to generate greater risk-adjusted returns. Credit-oriented fixed income investments include similar types of securities as those in the risk reduction and mitigation allocation, but may have different credit characteristics at the time of purchase.

Real Assets

An appropriately diversified Fund should include, commensurate with market conditions, investments in real assets to generate current income and provide capital appreciation. In making such investments, PERA shall consider the benefits of diversification that these investments provide as a hedge against inflation. Real assets investments may include but are not limited to liquid and illiquid securities in real estate, infrastructure, commodities, natural resources, timber, agriculture and farmland. The real assets portfolio includes market neutral strategies—these portfolios seek to avoid elevated exposure to broad market risk through the use of hedges. Market neutral strategies shall target a zero correlation with broad market movements and provide diversification benefits for the total fund.

Multi-Risk Allocation

An appropriately diversified Fund should include, commensurate with market conditions, investments

in balanced risk-based exposures to equalize the risk contribution of asset classes or risk factors comprised in the portfolio. In making such investments, PERA shall consider the benefits of diversification that these investments provide as a liability hedge and stabilized return generator. Multi-risk investments shall include, but are not limited to, Risk Balanced/Parity strategies. PERA shall also consider multi-risk investments that utilize leverage and derivatives to generate a greater risk adjusted return.

B. Other Investment Considerations

The Board may, after consideration of pertinent investment risk and reward attributes, and liquidity, cost and administrative complexity, authorize any investment except as otherwise expressly prohibited.

Securities Regulations

PERA shall consider, based on market considerations, whether engagement of Investment Managers registered under the Investment Company Act of 1940 is appropriate. This Act governs the operations of investment companies and their managers. PERA should work with its Investment Consultants and Investment Managers to ensure compliance with all federal and state securities laws including, but not limited to, the Securities Act of 1933 and the Investment Advisers Act of 1940. PERA recognizes that such registration is not applicable to all investment strategies or to investment opportunities located outside the United States.

Leverage

Leverage is implicit in many investment strategies and leverage in and of itself is not strictly prohibited so long as activities do not materially increase the risk level of the Plan. Leverage will be considered when deciding to retain an Investment Manager, and the Board, in conjunction with Staff, Investment Consultants, and Investment Managers, will avoid managers who employ unreasonable levels of leverage.

Liquidity

The Fund must maintain an easily accessible balance of cash equivalents and other reasonably liquid assets for the purposes of meeting the financial obligations of the Fund. The Board will govern these liquidity requirements through the utilization of a structural hierarchy, which will classify asset classes according to liquidity availability and pricing sensitivity during market stress. Convertible Liquidity is defined as a level of access from asset classes that can be liquidated in a relatively short amount of time with minimal pricing impact. Delayed Liquidity will capture all remaining asset classes that can be sold, but at a greater expense and/or over a longer time frame. Within these two classifications asset classes will be further classified across tiered availability. Liquidity guidelines are listed in Appendix C, which is separately adopted by the Board.

Derivatives

Investment Managers may use derivative instruments such as futures, options, swaps, and forwards, to implement investment strategies in a low cost, efficient manner or construct portfolios with risk and return characteristics that cannot be created with cash market securities. Derivatives may also be used within the context of a cash overlay program. The cash overlay program, administered by an Investment Manager, may buy, sell, and hold exchanged-traded derivative instruments and exchange-traded funds.

C. Prohibited Investments

In accordance with UPIA guidelines, the Board, Staff, Investment Consultants, and Investment

Managers are expected to perform their fiduciary duties as a prudent investor would and to conform to all applicable federal and state statutes governing the investment of retirement funds for a qualified government plan. Accordingly, the following investments are prohibited:

Investments precluded by law or regulation:

- Transactions that involve a broker acting as a "principal" where such broker is also the Investment Manager who is making the transaction are prohibited unless otherwise approved in each manager's respective PSA.
- Any other investments as specified in each Investment Manager's respective contract.
- An investment that violates the placement agent limitations set forth in the PERA Act.

VII. REVIEW AND APPROVAL OF INVESTMENT POLICY

The Board shall review the Policy from time-to-time to determine if modifications are necessary or desirable but will delegate Staff to review the Policy on an annual basis. Staff will recommend modifications as warranted. If modifications are made, they shall be promptly communicated to all Investment Managers and other interested persons.

By signing this Investment Policy the Board through its Chair, indicates its agreement therewith.

Adopted: June 25, 1992
Amended: September 14, 1993
April 28, 1994
September 28, 1995
January 29, 1998
March 23, 1998
January 27, 2000
September 26, 2002
July 31, 2003
October 31, 2003
July 1, 2005
September 28, 2005
December 29, 2005
July 27, 2006
August 31, 2006
September 28, 2006
June 1, 2007
August 30, 2007
July 31, 2008
June 24, 2010
November 29, 2012
August 28, 2014
December 18, 2014
September 24, 2015
April 28, 2016
December 14, 2017
July 26, 2018
April 30, 2020

By: _____
John Melia, Board Chair
Public Employees Retirement Association of New Mexico

APPENDIX A. ASSET ALLOCATION TARGETS AND REBALANCING RANGES

Effective July 26, 2018

Asset Class	Lower Limit	Strategic Asset Allocation Target	Upper Limit
Global Equity	30.5%	35.5%	40.5%
Risk Reduction and Mitigation	16.5%	19.5%	22.5%
Credit Oriented Fixed Income	11.0%	15.0%	19.0%
Real Assets	16.0%	20.0%	24.0%
Multi-Risk Allocation	06.0%	10.0%	14.0%

Adopted: July 26, 2018

By:

James Maxon, Board Chair
Public Employees' Retirement Association of New Mexico

APPENDIX B. BENCHMARKS

Effective: January 1, 2019

Global Equity	Custom Blended Benchmark
Global Public Stock	MSCI ACWI IMI (\$net)
Global Low Volatility Equity	MSCI ACWI Minimum Volatility (\$net)
Hedged Equity	MSCI ACWI Minimum Volatility (\$net)
Private Equity	MSCI ACWI IMI (\$net)
Risk Reduction & Mitigation	Custom Blended Benchmark
Core Fixed Income	Bloomberg Barclays U.S. Aggregate
Global Core Fixed Income	Bloomberg Barclays Global Aggregate (Hedged)
Credit Oriented Fixed Income	Custom Blended Benchmark
Liquid Credit	Bloomberg Barclays Global High Yield (Hedged)
Emerging Market Debt	50% JP Morgan EMBI Global Diversified (\$) 50% JP Morgan GBI (\$)
Illiquid Credit	Bloomberg Barclays Global High Yield (Hedged)
Credit Oriented Hedge Funds	Bloomberg Barclays Global High Yield (Hedged)
Real Assets	Custom Blended Benchmark
Liquid Real Estate	Wilshire Global REITs
Illiquid Real Estate	Wilshire Global REITs
Liquid Real Assets	Alerian MLP Index / Dow Jones – Brookfield Global Infrastructure Index / Bloomberg Barclays – U.S. TIPS / Bloomberg Commodity – Commodity Index (TR)
Illiquid Real Assets	Dow Jones – Brookfield Global Infrastructure Index / Bloomberg Commodity – Commodity Index (TR)
Multi-Risk Allocation	Custom Blended Benchmark
Risk Balance	Custom Blended Benchmark

Adopted: November 29, 2018

By: _____
James Maxon, Board Chair
Public Employees' Retirement Association of New Mexico

APPENDIX C. LIQUIDITY GUIDELINES

Effective: April 30, 2020

At no time shall Tier 1 assets fall below 10% of the total fund market value. For the purposes of liquidity, tier classifications and their corresponding asset classes are as follows:

Convertible Liquidity		
Tier 1	1-5 Day Liquidity	Core Fixed Income Global Core Fixed Income Cash and Cash Overlay
Tier 2	5-90 Day Liquidity	Global Public Stock Global Low Volatility Equity Liquid Credit Emerging Market Debt Liquid Real Estate Liquid Real Assets Risk Balance
Delayed Liquidity		
Tier 3	90-365 Day Liquidity	Hedged Equity Hedged Credit / Alternative Credit
Tier 4	1 Year + Liquidity	Private Equity Illiquid Credit Illiquid Real Estate Illiquid Real Assets Bond Plus/Portable Alpha

Adopted: April 30, 2020

By: _____

John Melia, Board Chair

Public Employees' Retirement Association of New Mexico