



# WILSHIRE ASSOCIATES

Wilshire Consulting



## Kentucky Retirement Systems Pension

Quarterly Executive Summary

*September 30, 2019*

## Table Of Contents

1	Capital Market Update	3
2	KRS Pension Plan	34
3	US Equity Composite	61
4	Non-US Equity Composite	89
5	Fixed Income Composite	111
6	Real Return Composite	154
7	Real Estate Composite	170
8	Absolute Return Composite	173
9	Private Equity Composite	176



# Capital Market Update

Wilshire Consulting

YOU'RE INVITED!

# 38<sup>th</sup> Annual Client Conference

Sunday, April 5th – Tuesday, April 7th

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 1.2% for the third quarter of 2019 and 20.1% for the year. Trade talks with China continue to be an important unknown while the Federal Reserve's possible continued monetary easing has added to the uncertainty surrounding markets. Investors are encouraged, however, as the U.S. economy remains sound, especially compared to global economic conditions.

The 10-year U.S. Treasury yield has fallen a full 1% this year. The problem for investors in search of yield is the U.S. currently offers some of the best rates in the developed world. Also, some of the world's major economies such as France and Germany are experiencing negative rates both in the short and long-term portion of the curve. A recent study by the Bank for International Settlements shows there is a record \$17 trillion in global debt that carries a negative yield, equal to approximately 20% of global GDP.

## Non-U.S. Equity

Equity markets outside of the U.S. continue to enjoy a strong 2019. Germany's manufacturing recession worsened during the quarter to levels last seen during the global financial crisis. News out of Britain is more encouraging although the looming Brexit deadline of October 31 is rapidly approaching without an exit deal. Emerging Markets were down, in aggregate, largely due to a negative quarter for China, which comprises nearly one-third of the index.

## Fixed Income

The U.S. Treasury yield curve fell across all maturities with the biggest decreases occurring in the long end of the curve. The Federal Open Market Committee decreased its overnight rate by 0.25% at both the July and September meetings. Credit spreads were little changed by quarter-end within both the investment grade and high yield markets.

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# SEPTEMBER 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 Core Bond	TIPS	High Yield	Dev ex-US Bond (Hdg)	Real Estate			Comdty	Real Assets	US CPI
		US RES	Global RES	Private RE	US RES	Global RES			Private RE									
COMPOUND RETURN (%)	6.00	6.50	6.50	6.75	6.45	8.05	1.60	2.70	3.25	1.90	4.20	0.75	4.70	4.90	6.60	3.15	5.70	1.55
ARITHMETIC RETURN (%)	7.30	7.95	9.45	8.35	7.75	11.40	1.60	2.85	3.70	2.10	4.65	0.80	6.05	6.05	7.50	4.20	6.05	1.55
EXPECTED RISK (%)	17.00	18.00	26.00	18.80	17.05	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 (%)	2.00	3.50	2.50	3.25	2.55	0.00	1.60	2.80	4.05	2.10	7.55	1.35	3.55	3.55	2.60	1.60	2.35	0.00
<b>CORRELATIONS</b>																		
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	0.86	1.00														
Global Stock	0.94	0.92	0.82	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	0.77	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

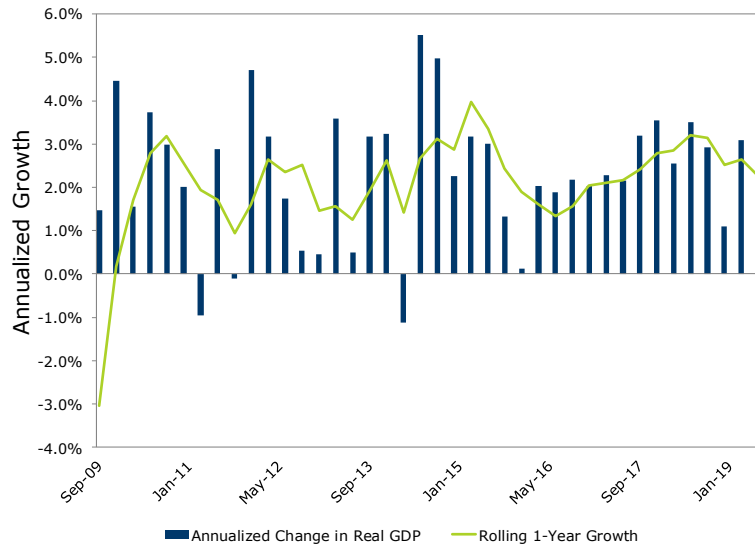
# ECONOMIC REVIEW

AS OF SEPT 30, 2019 KEY ECONOMIC INDICATORS

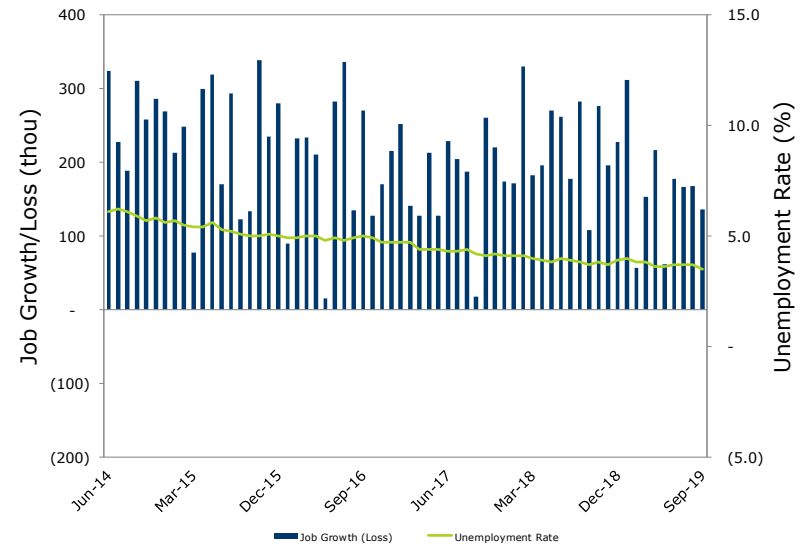
CPI (ALL ITEMS)	MONTHLY CHANGE		CUMULATIVE CHANGE	
SEASONALLY ADJUSTED	Sep-19	0.0	3-Mo.	0.4
	Aug-19	0.1	12-Mo.	1.7
	Jul-19	0.3	10-Yr. (Annual)	1.7
BREAKEVEN INFLATION	10-Yr.	1.5		
CONSUMER SENTIMENT	Sep-19	93.2		
U. OF MICHIGAN SURVEY	Aug-19	89.8		
	1-Yr. Ago	100.1	10-Yr. Avg	84.8
MANUFACTURING	Sep-19	47.8	CHANGE IN SECTOR	
INST. FOR SUPPLY MGMT	Aug-19	49.1	>50	Expansion
PURCHASING MNGRS' IDX	1-Yr. Avg.	53.5	<50	Contraction

Note: Seasonally adjusted CPI data is utilized to better reflect short-term pricing activity.

CHANGES IN REAL GDP (2012 BASE YEAR)



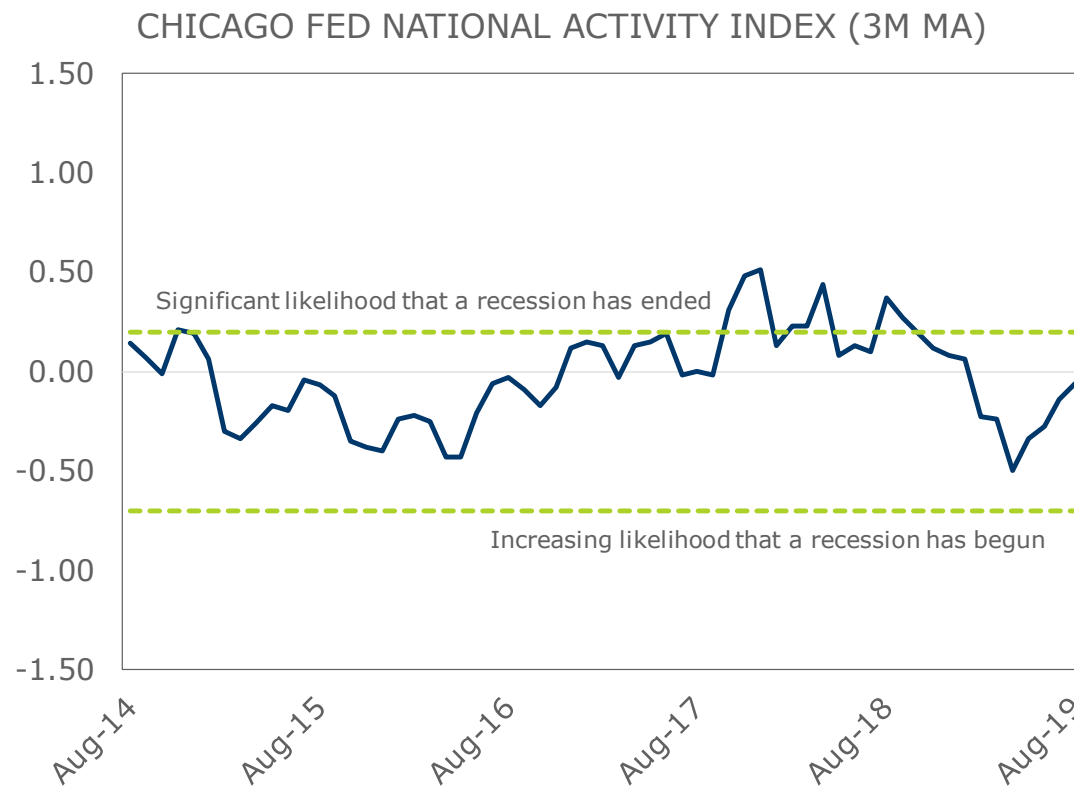
UNEMPLOYMENT RATE AND JOB GROWTH/LOSS



Data sources: Bureau of Labor Statistics, U.S. Treasury, University of Michigan, Institute for Supply Management, Bureau of Economic Analysis

# NATIONAL ACTIVITY INDEX

- Weighted average of 85 monthly indicators including 1) production and income, 2) employment, 3) consumption and housing and 4) sales, orders, and inventories (all inflation adjusted)
- Aims to identify when a recession may begin (during periods of growth) or end (when already experiencing a recession)

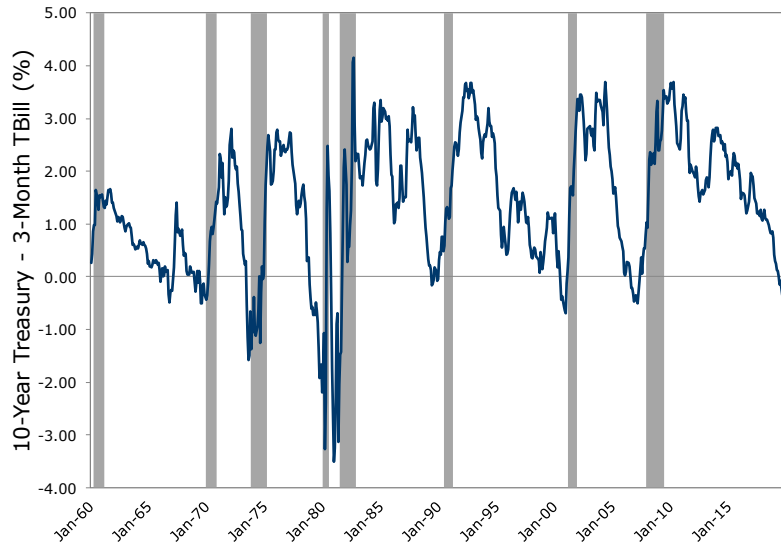




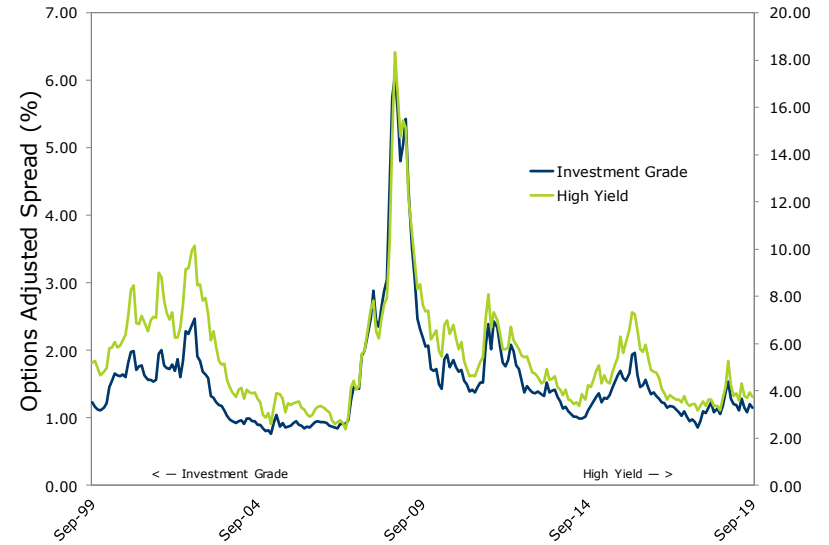
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## RISK MONITOR

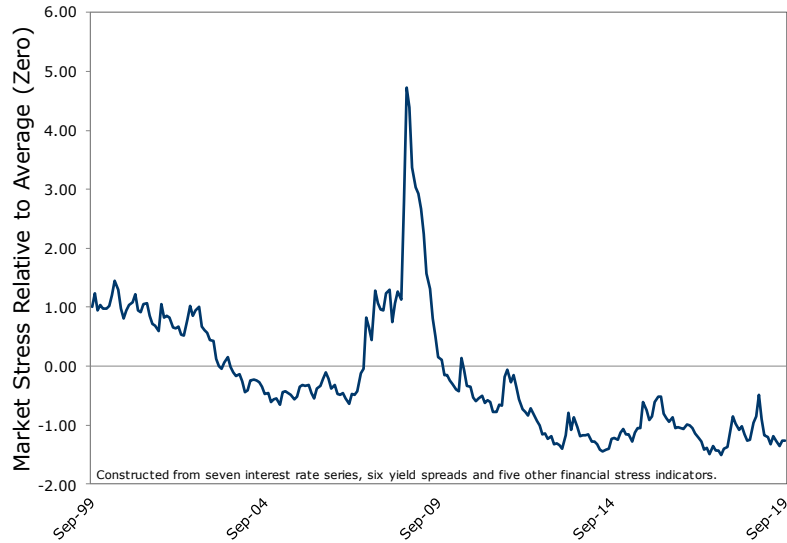
YIELD CURVE SLOPE VS RECESSIONS (IN GRAY)



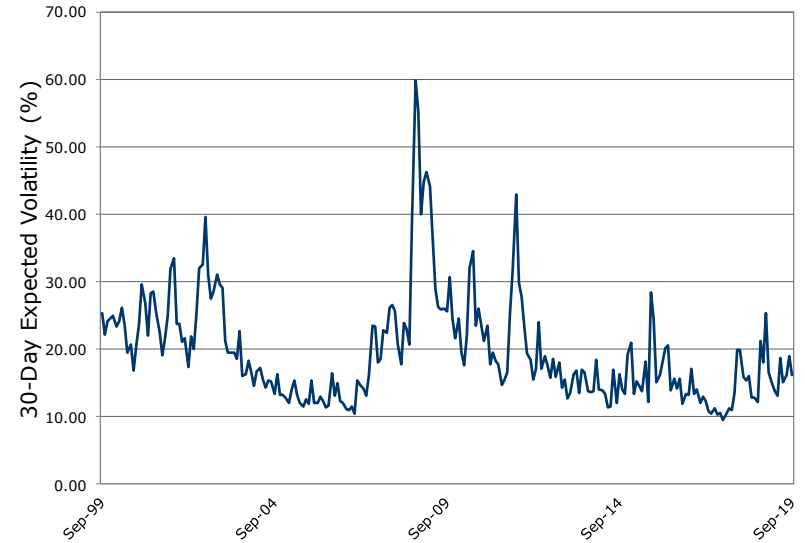
BLOOMBERG BARCLAYS CREDIT INDEXES



ST. LOUIS FED FINANCIAL STRESS INDEX



CBOE VOLATILITY INDEX



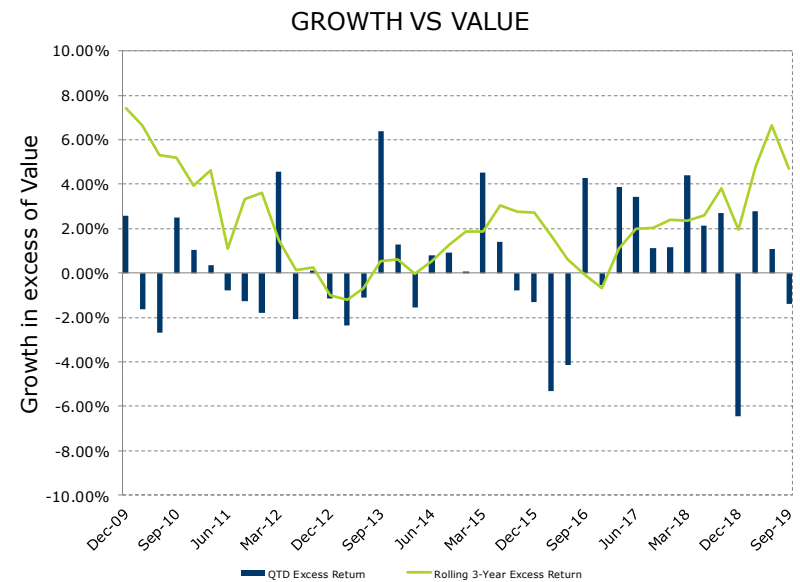
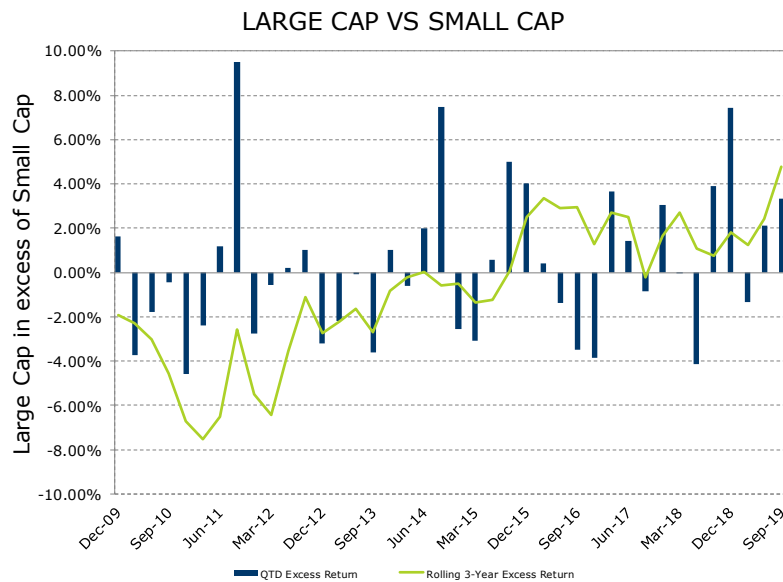
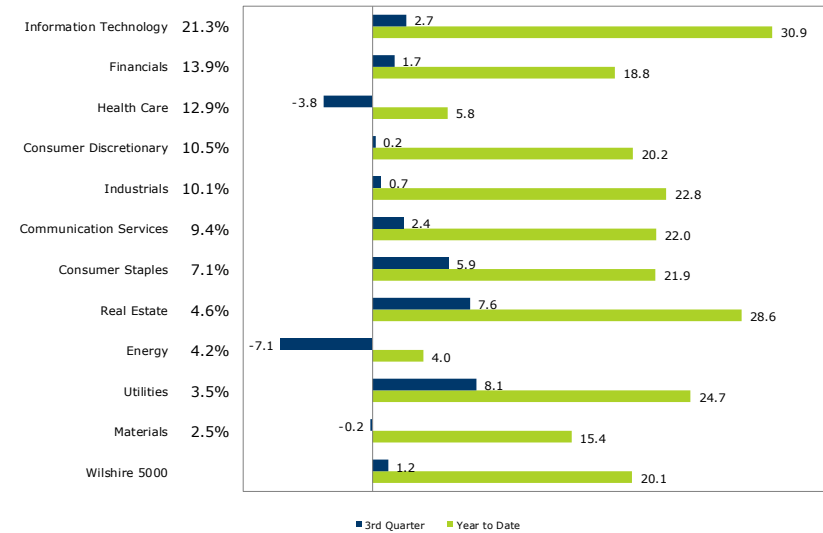
Data sources: Federal Reserve, Bloomberg Barclays

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## U.S. EQUITY MARKET

AS OF SEPT 30, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	1.2	20.1	3.0	12.9	10.6	13.1
WILSHIRE U.S. LARGE CAP	1.5	20.6	4.0	13.4	10.9	13.2
WILSHIRE U.S. SMALL CAP	-1.8	15.8	-7.0	8.2	8.0	12.1
WILSHIRE U.S. LARGE GROWTH	0.8	22.1	1.5	16.0	12.3	14.1
WILSHIRE U.S. LARGE VALUE	2.2	19.2	6.4	10.8	9.4	12.3
WILSHIRE U.S. SMALL GROWTH	-2.7	17.6	-6.6	11.0	8.5	12.7
WILSHIRE U.S. SMALL VALUE	-0.9	13.9	-7.4	5.5	7.4	11.4
WILSHIRE REIT INDEX	7.9	27.2	18.4	7.2	10.2	13.1
MSCI USA MIN. VOL. INDEX	4.1	23.5	14.0	13.8	12.9	13.7
FTSE RAFI U.S. 1000 INDEX	1.7	18.1	1.8	10.6	8.7	12.2

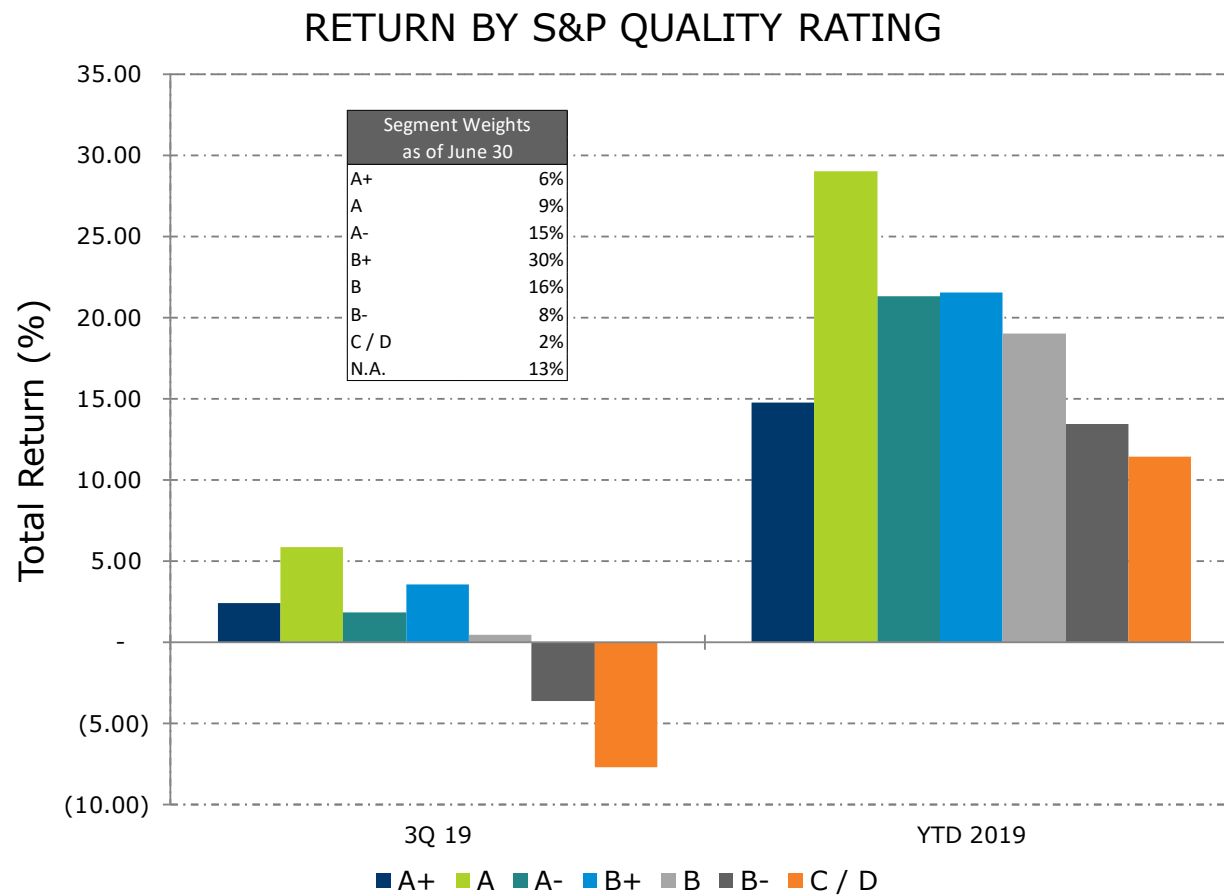
WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)



Data sources: Wilshire Compass, Wilshire Atlas

# RETURNS BY QUALITY SEGMENT

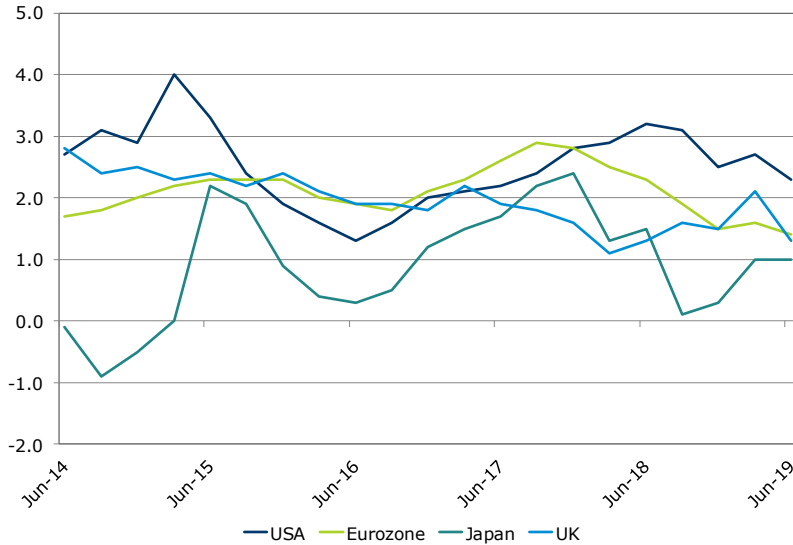
Higher quality names continue to lead the market during the third quarter



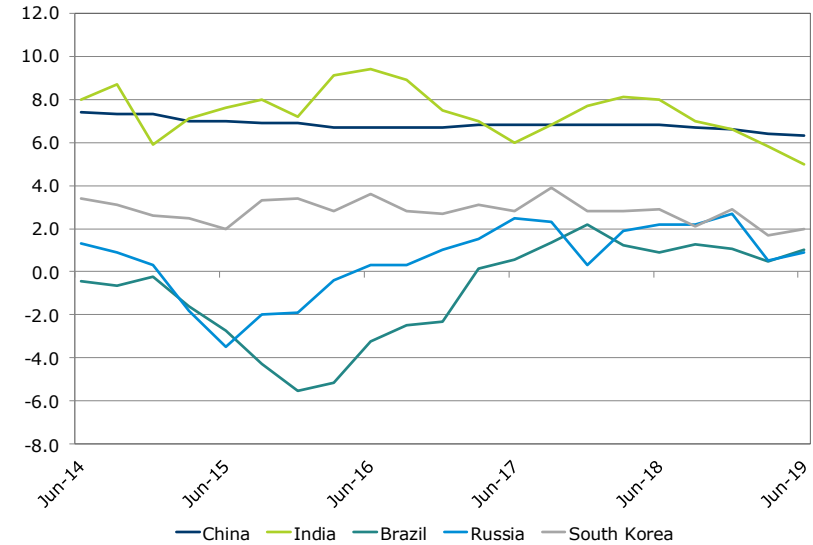
Data sources: Wilshire Atlas

# NON-U.S. GROWTH AND INFLATION

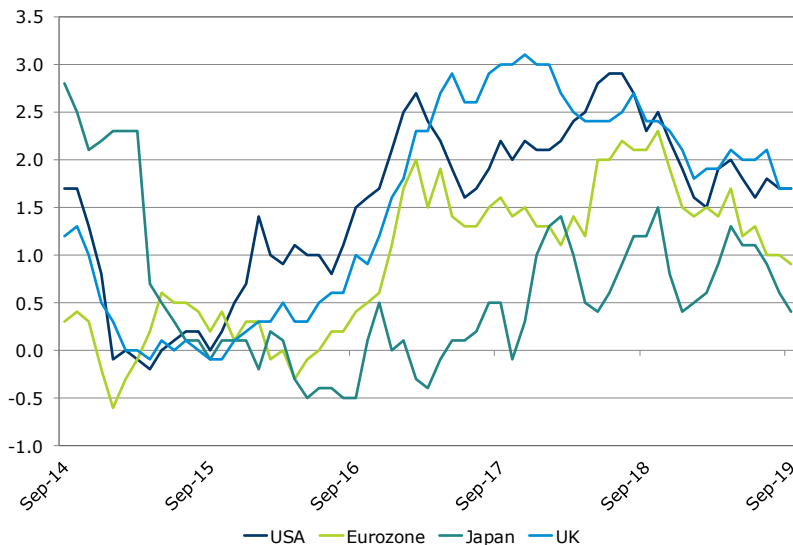
DEVELOPED MARKETS REAL GDP GROWTH YoY (%)



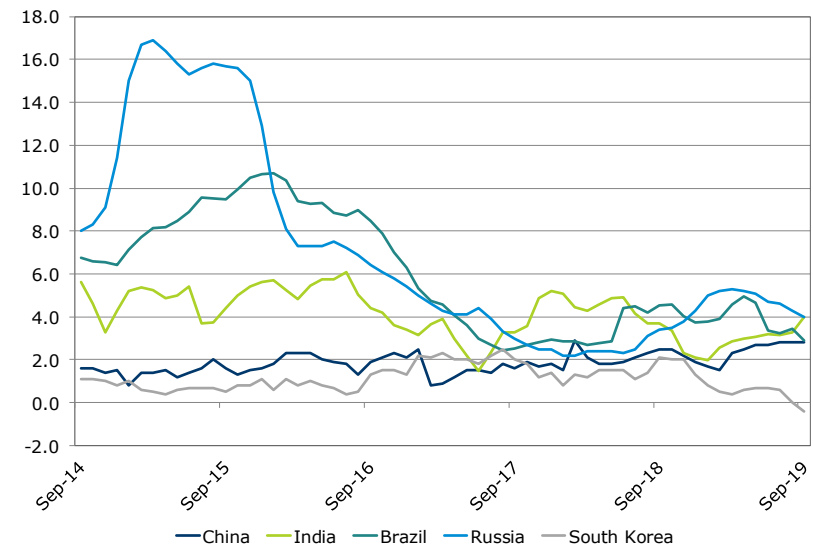
EMERGING MARKETS REAL GDP GROWTH YoY (%)



DEVELOPED MARKETS CPI GROWTH YoY (%)



EMERGING MARKETS CPI GROWTH YoY (%)



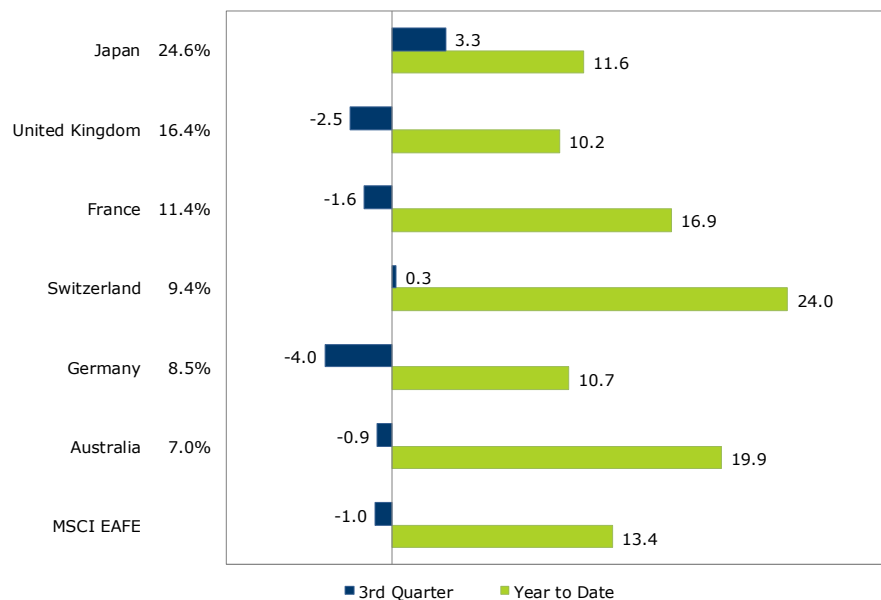
Data sources: Bloomberg

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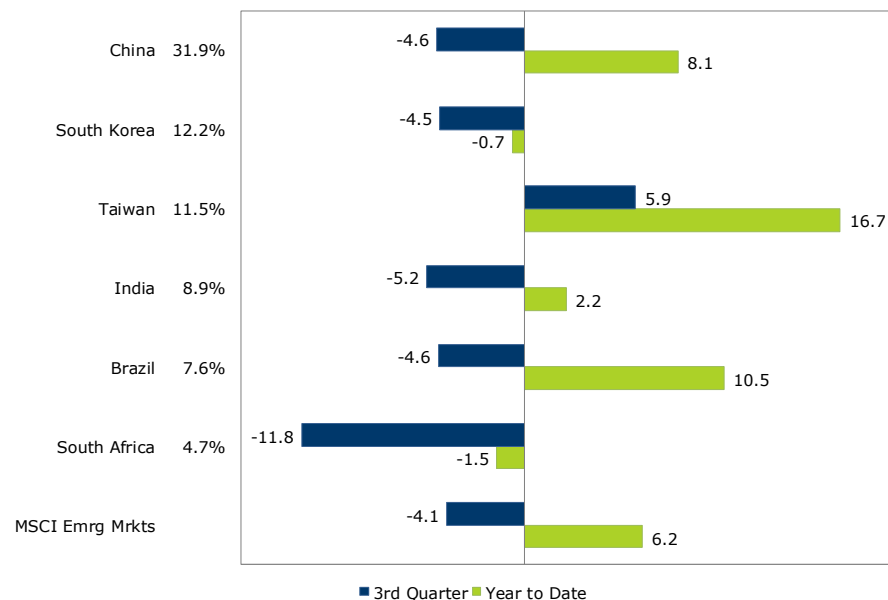
# NON-U.S. EQUITY MARKET

AS OF SEPT 30, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	-1.7	12.1	-0.7	6.8	3.4	4.9
MSCI EAFE (\$G)	-1.0	13.4	-0.8	7.0	3.8	5.4
MSCI EMERGING MARKETS (\$G)	-4.1	6.2	-1.6	6.4	2.7	3.7
MSCI FRONTIER MARKETS (\$G)	-1.0	11.0	6.2	7.4	-0.9	4.0
MSCI ACWI EX-US GROWTH (\$G)	-0.8	16.6	2.4	7.8	5.2	6.2
MSCI ACWI EX-US VALUE (\$G)	-2.7	7.5	-3.9	5.9	1.5	3.6
MSCI ACWI EX-US SMALL (\$G)	-1.1	10.7	-5.2	5.0	4.5	6.8
MSCI ACWI MINIMUM VOLATILITY	2.9	18.2	10.5	10.5	10.1	10.9
MSCI EAFE MINIMUM VOLATILITY	0.9	12.4	4.1	6.7	6.8	7.7
FTSE RAFI DEVELOPED EX-US	-1.3	9.9	-4.2	7.0	2.8	4.2
MSCI EAFE LC (G)	1.8	16.2	2.1	8.8	6.5	7.5

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)

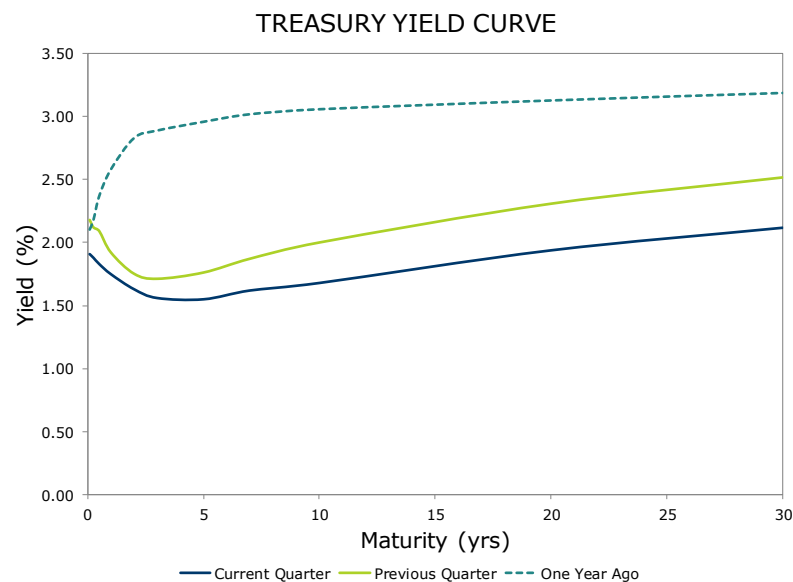
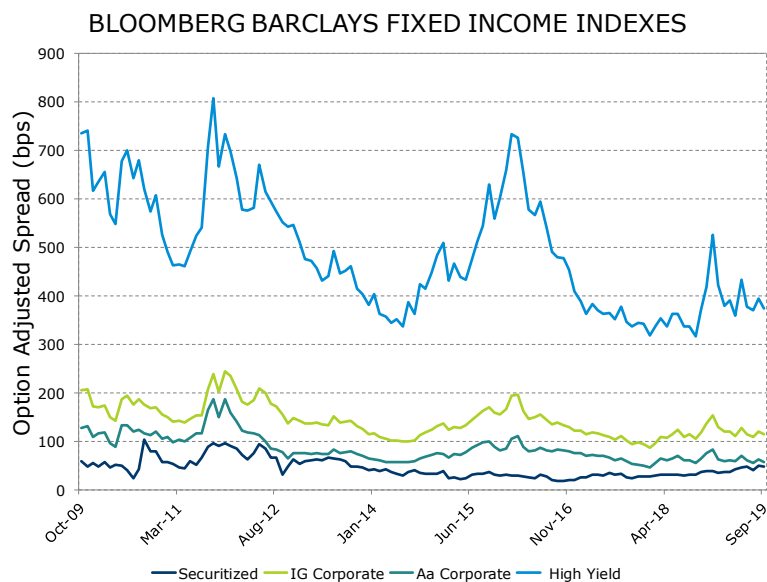


Data sources: Wilshire Compass

# U.S. FIXED INCOME

AS OF SEPT 30, 2019	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	2.3	5.8	2.3	8.5	10.3	2.9	3.4	3.7
BLOOMBERG BARCLAYS TREASURY	1.7	6.6	2.4	7.7	10.5	2.2	2.9	3.1
BLOOMBERG BARCLAYS GOVT-REL.	2.4	5.8	2.4	8.8	10.1	3.2	3.4	3.5
BLOOMBERG BARCLAYS SECURITIZED	2.4	2.9	1.4	5.8	7.9	2.4	2.8	3.3
BLOOMBERG BARCLAYS CORPORATE	2.9	7.8	3.1	13.2	13.0	4.5	4.7	5.6
BLOOMBERG BARCLAYS LT G/C	3.0	15.9	6.6	20.9	21.9	5.6	6.8	7.4
BLOOMBERG BARCLAYS LT TREASURY	2.1	18.3	7.9	19.8	24.8	4.1	6.8	6.9
BLOOMBERG BARCLAYS LT GOV't-REL.	3.5	12.7	5.6	18.8	18.8	6.0	6.5	7.3
BLOOMBERG BARCLAYS LT CORP.	3.6	14.4	5.6	22.3	20.1	6.5	7.0	7.8
BLOOMBERG BARCLAYS U.S. TIPS *	1.6	7.6	1.4	7.6	7.1	2.2	2.4	3.5
BLOOMBERG BARCLAYS HIGH YIELD	6.3	3.1	1.3	11.4	6.4	6.1	5.4	7.9
TREASURY BILLS	1.9	0.25	0.6	1.8	2.4	1.5	1.0	0.5

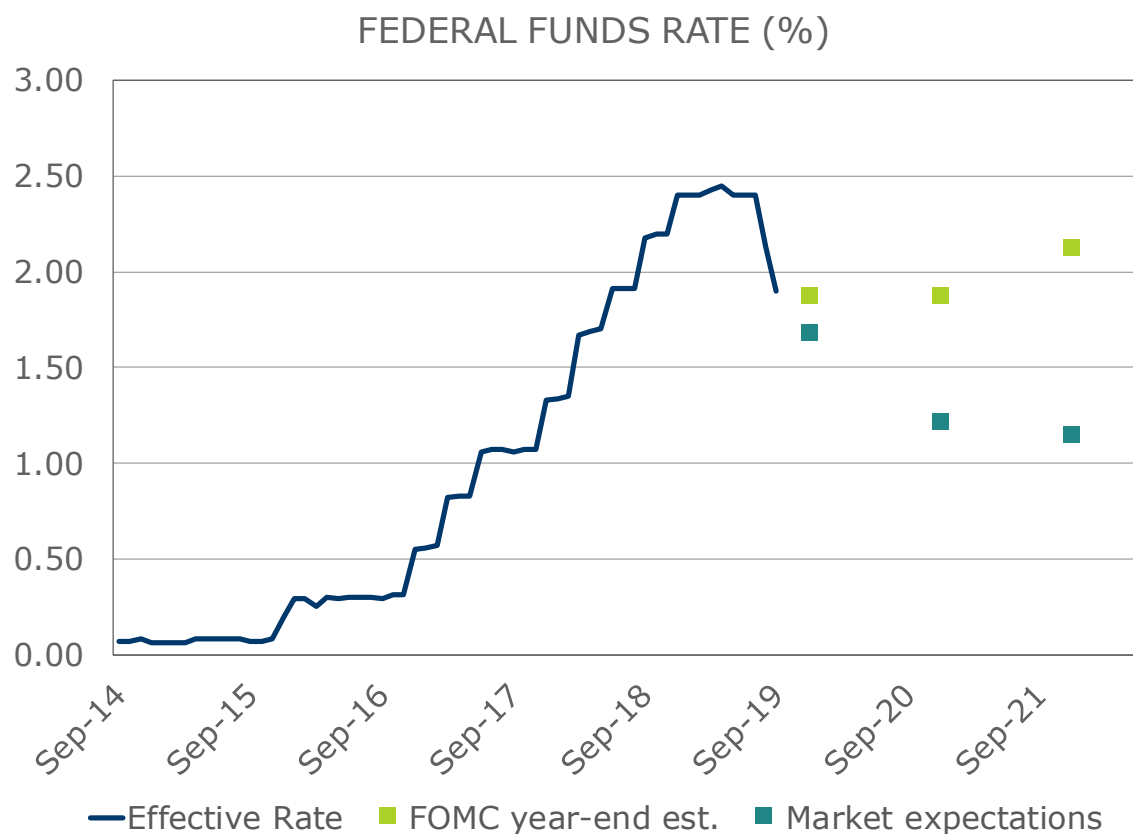
\* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index



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

# SHORT-TERM RATES

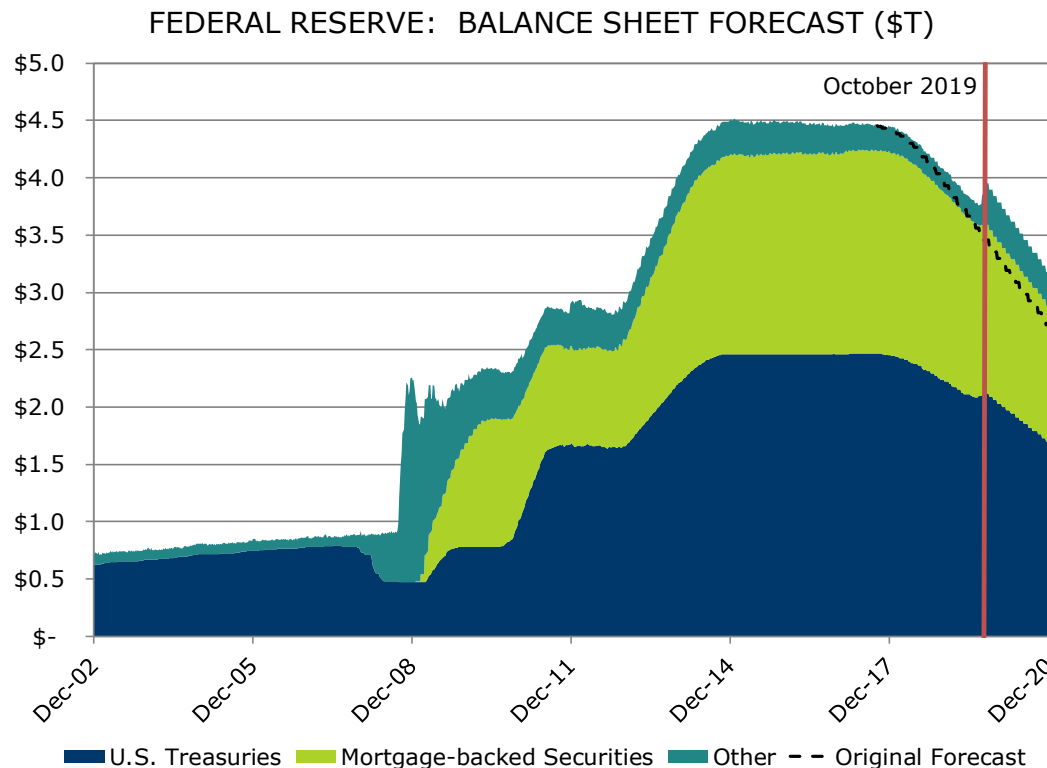
- Federal Reserve decreased their short-term rate twice during the 3<sup>rd</sup> quarter
- Markets are far more dovish, expecting additional decreases this year and next



Data sources: Federal Reserve, Bloomberg

# 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
- A liquidity shortage in the repo market in September forced the Fed to supply cash to the market; will continue to offer liquidity to money markets when necessary



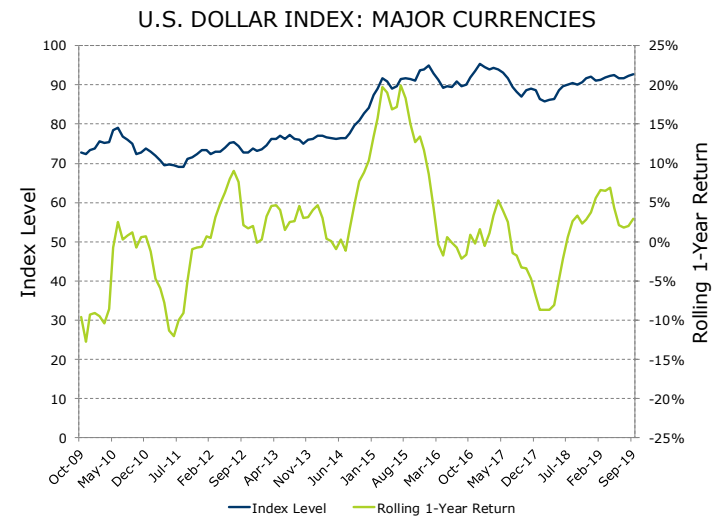
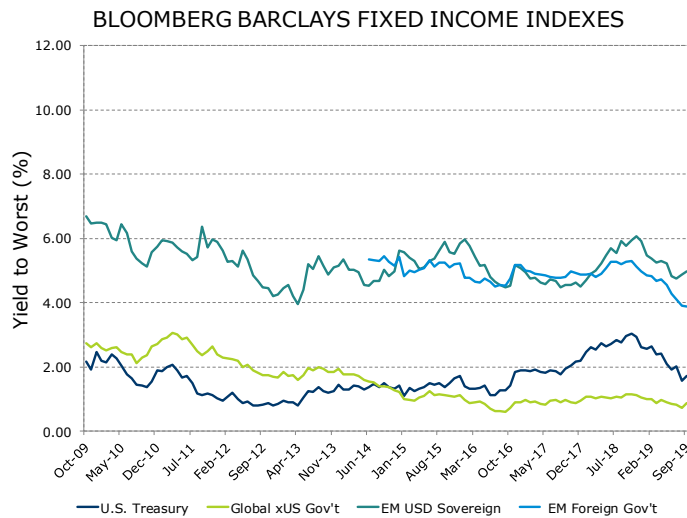
Data sources: Federal Reserve



# NON-U.S. FIXED INCOME

AS OF SEPT 30, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
<b>DEVELOPED MARKETS</b>						
BLMBRG BRCLYS GLBL AGGREGATE xUS	-0.6	4.4	5.3	0.4	0.9	1.3
BLMBRG BRCLYS GLBL AGGREGATE xUS *	2.8	8.8	10.8	4.1	4.6	4.4
BLMBRG BRCLYS GLOBAL INF LNKD xUS	2.0	8.4	7.2	2.1	1.9	3.3
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	6.0	13.9	15.4	5.5	7.3	6.5
<b>EMERGING MARKETS (HARD CURRENCY)</b>						
BLMBRG BRCLYS EM USD AGGREGATE	1.3	10.8	10.6	4.4	5.0	6.7
<b>EMERGING MARKETS (FOREIGN CURRENCY)</b>						
BLMBRG BRCLYS EM LOCAL CURR. GOVT	-0.6	5.3	7.9	2.4	1.1	3.3
BLMBRG BRCLYS EM LOCAL CURR. GOVT *	2.8	7.9	10.7	3.7	3.8	3.8
EURO vs. DOLLAR	-4.3	-4.6	-6.1	-1.0	-2.9	-2.9
YEN vs. DOLLAR	-0.3	1.5	5.1	-2.1	0.3	-1.9
POUND vs. DOLLAR	-3.2	-3.2	-5.5	-1.7	-5.3	-2.6

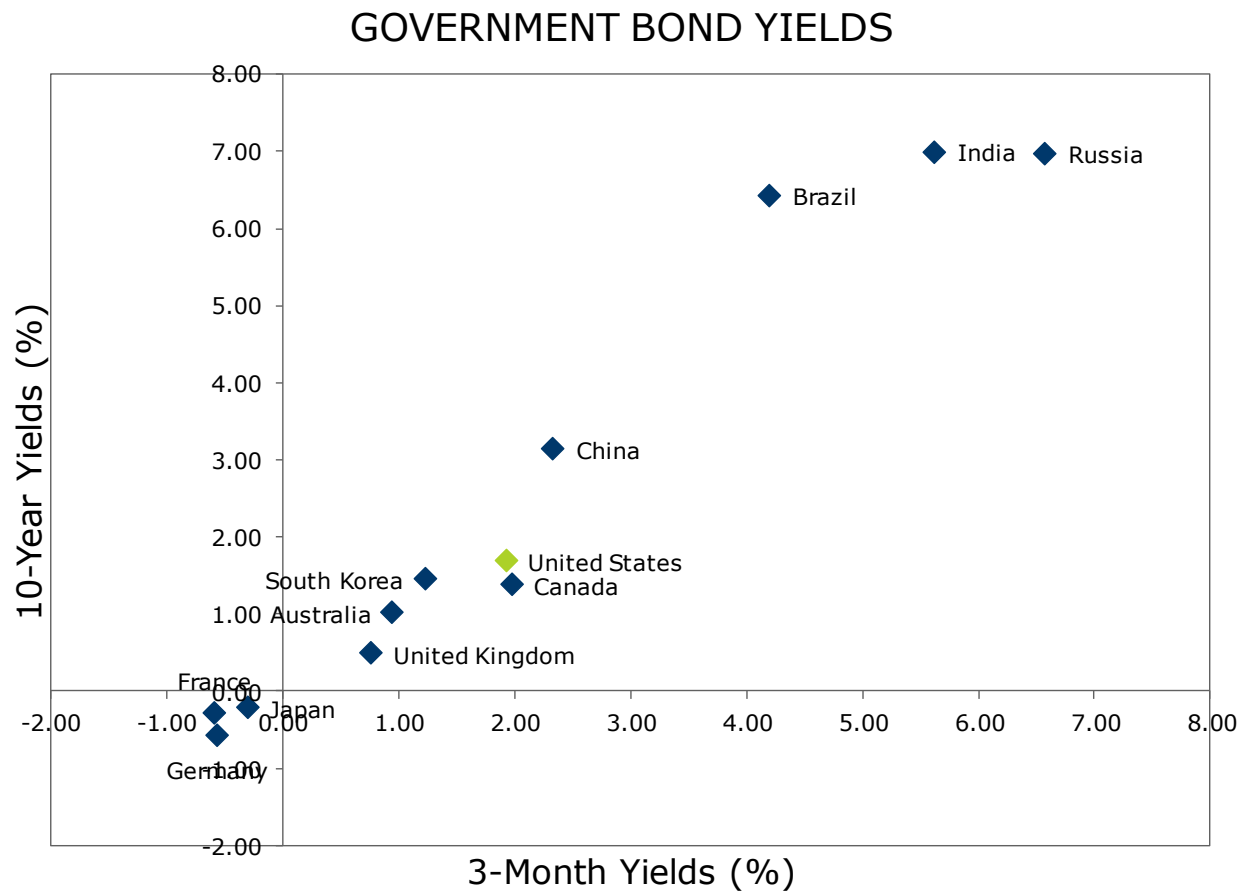
\* Returns are reported in terms of local market investors, which removes currency effects.



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

# GLOBAL INTEREST RATES

Much of Europe and Japan exhibit negative rates; Long rates are down globally during the past six months



Data sources: Bloomberg

# NEGATIVE RATES

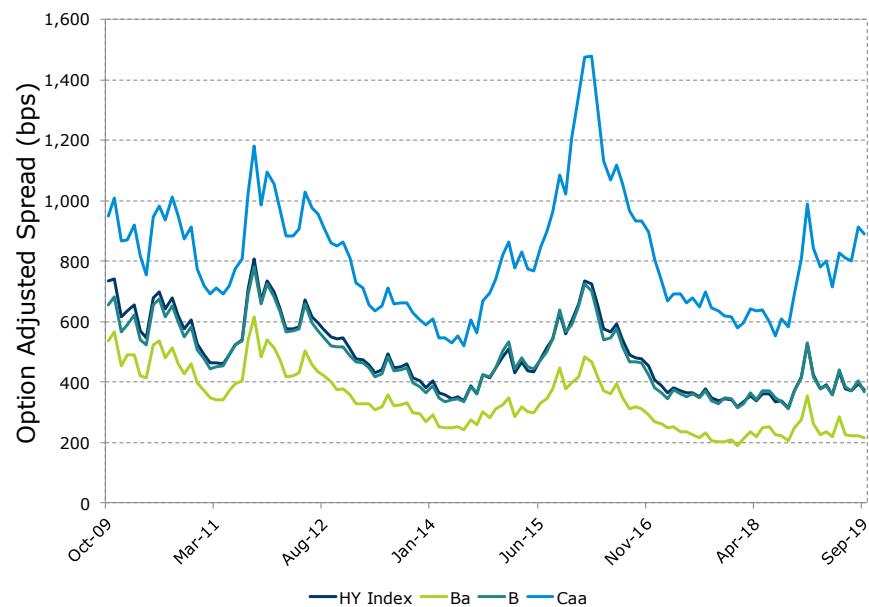
- Pricing in some markets is such that short-term rates are discounted to remain negative
- Main concern with negative rates is that market participants hold cash rather than bank deposits
  - Minimum deposit rates and tiered bank reserves partially protect against negative interest
  - However, this limits the effectiveness of rate cuts below zero
- Markets with negative rates are thought to provide less diversification benefits to a diversified portfolio, although low but positive yields can still lower overall portfolio risk

	Expected 1-Year Cash Rate (Years Forward)			
	0	1	2	3
Switzerland	-0.97%	-0.99%	-1.06%	-1.10%
Denmark	-0.86%	-0.91%	-0.94%	-0.93%
Germany	-0.71%	-0.91%	-1.00%	-0.98%
France	-0.65%	-0.79%	-0.80%	-0.72%
Sweden	-0.64%	-0.83%	-0.87%	-0.81%
Japan	-0.29%	-0.44%	-0.56%	-0.62%
United Kingdom	0.49%	0.16%	-0.01%	-0.07%
Australia	0.69%	0.47%	0.39%	0.44%
Canada	1.61%	1.29%	1.10%	1.00%
United States	1.69%	1.34%	1.21%	1.20%
China	2.76%	3.24%	3.10%	3.68%

# HIGH YIELD BOND MARKET

AS OF SEPT 30, 2019		QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS HIGH YIELD		1.3	11.4	6.4	6.1	5.4	7.9
CREDIT SUISSE LEVERAGED LOAN		0.9	6.4	3.1	4.7	4.1	5.4
<b>HIGH YIELD QUALITY DISTRIBUTION</b>	<b>WEIGHT</b>						
Ba U.S. HIGH YIELD	47.8%	2.0	12.8	9.5	5.8	5.9	7.9
B U.S. HIGH YIELD	38.7%	1.7	11.9	7.0	6.2	5.0	7.5
Caa U.S. HIGH YIELD	12.7%	-1.8	5.6	-4.2	5.5	4.5	8.2
Ca to D U.S. HIGH YIELD	0.6%	-6.7	7.6	-18.3	10.7	-5.8	0.7
Non-Rated U.S. HIGH YIELD	0.2%	-0.5	4.3	2.5	5.3	-1.0	5.6

BLOOMBERG BARCLAYS HIGH YIELD INDEXES



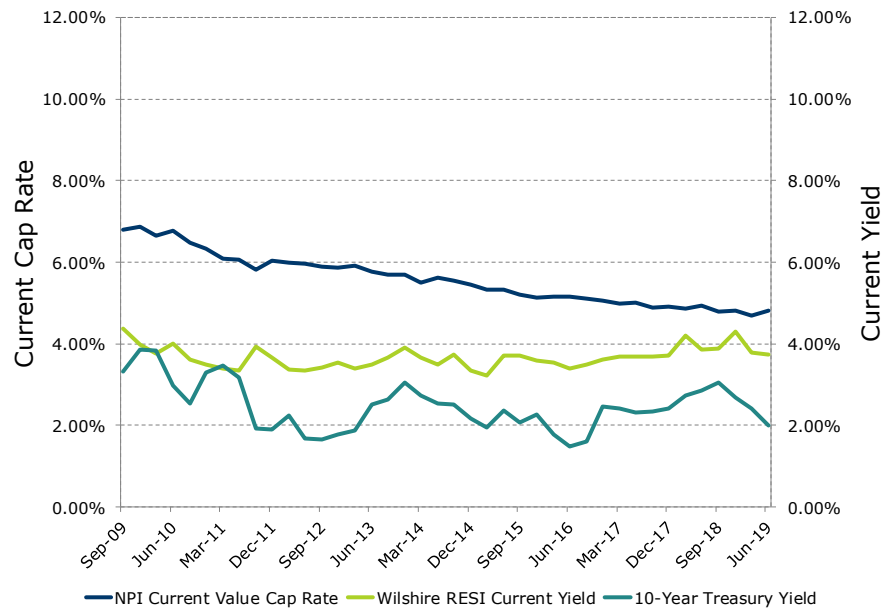
Data sources: Wilshire Compass, Bloomberg Barclays

# Wilshire Consulting

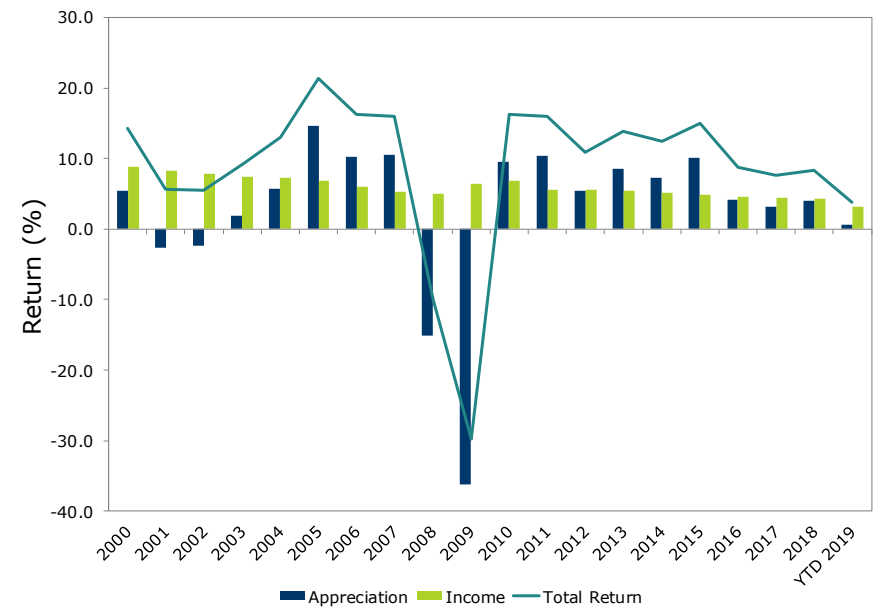
## REAL ASSETS

AS OF SEPT 30, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	1.4	7.6	7.1	2.2	2.4	3.5
BLOOMBERG COMMODITY INDEX	-1.8	3.1	-6.6	-1.5	-7.2	-4.3
WILSHIRE GLOBAL RESI INDEX	5.2	22.8	15.3	7.1	8.4	10.9
NCREIF ODCE FUND INDEX	1.3	3.8	5.6	7.3	9.3	10.9
NCREIF TIMBERLAND INDEX	0.2	1.3	2.1	3.1	4.4	4.0
ALERIAN MLP INDEX (OIL & GAS)	-5.0	11.1	-8.1	-2.5	-8.6	6.3

### 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 9/2019
2014	2015	2016	2017	2018	2019 YTD	
REITs 31.8%	REITs 4.2%	MLPs 18.3%	Emrg Mrkts 37.7%	T-Bills 1.9%	REITs 27.2%	U.S. Equity 10.6%
U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	Core Bond 0.0%	U.S. Equity 20.1%	REITs 10.2%
Core Bond 6.0%	Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	U.S. TIPS -1.3%	Developed 13.4%	High Yield 5.4%
MLPs 4.8%	T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	High Yield -2.1%	High Yield 11.4%	Developed 3.8%
U.S. TIPS 3.6%	Developed -0.4%	Emrg Mrkts 11.6%	REITs 4.2%	REITs -4.8%	MLPs 11.1%	Core Bond 3.4%
High Yield 2.5%	U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. Equity -5.3%	Core Bond 8.5%	Emrg Mrkts 2.7%
T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	Commodities -11.2%	U.S. TIPS 7.6%	U.S. TIPS 2.4%
Emrg Mrkts -1.8%	Emrg Mrkts -14.6%	Core Bond 2.6%	Commodities 1.7%	MLPs -12.4%	Emrg Mrkts 6.2%	T-Bills 1.0%
Developed -4.5%	Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Developed -13.4%	Commodities 3.1%	Commodities -7.2%
Commodities -17.0%	MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mrkts -14.2%	T-Bills 1.8%	MLPs -8.6%

Data sources: Wilshire Compass

Note: Developed asset class is developed equity markets ex-U.S., ex-Canada



# APPENDIX: PRIVATE MARKETS UPDATE

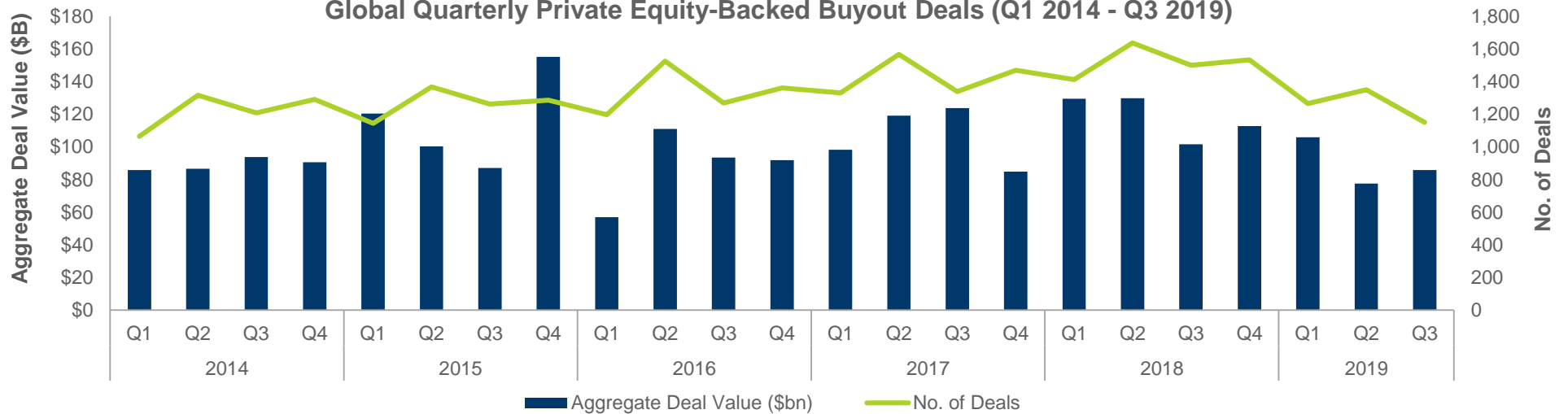
## Wilshire Private Markets

# PRIVATE EQUITY – FUNDRAISING & INVESTMENT ACTIVITY

### Global Quarterly Private Equity Fundraising (Q1 2014 - Q3 2019)



### Global Quarterly Private Equity-Backed Buyout Deals (Q1 2014 - Q3 2019)



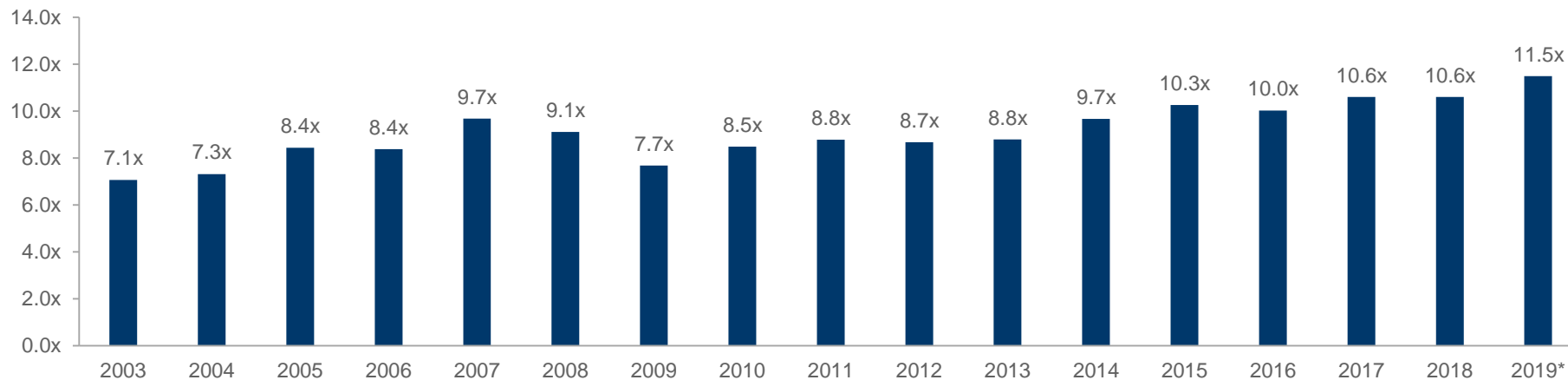
Source: Preqin, as of September 30, 2019.



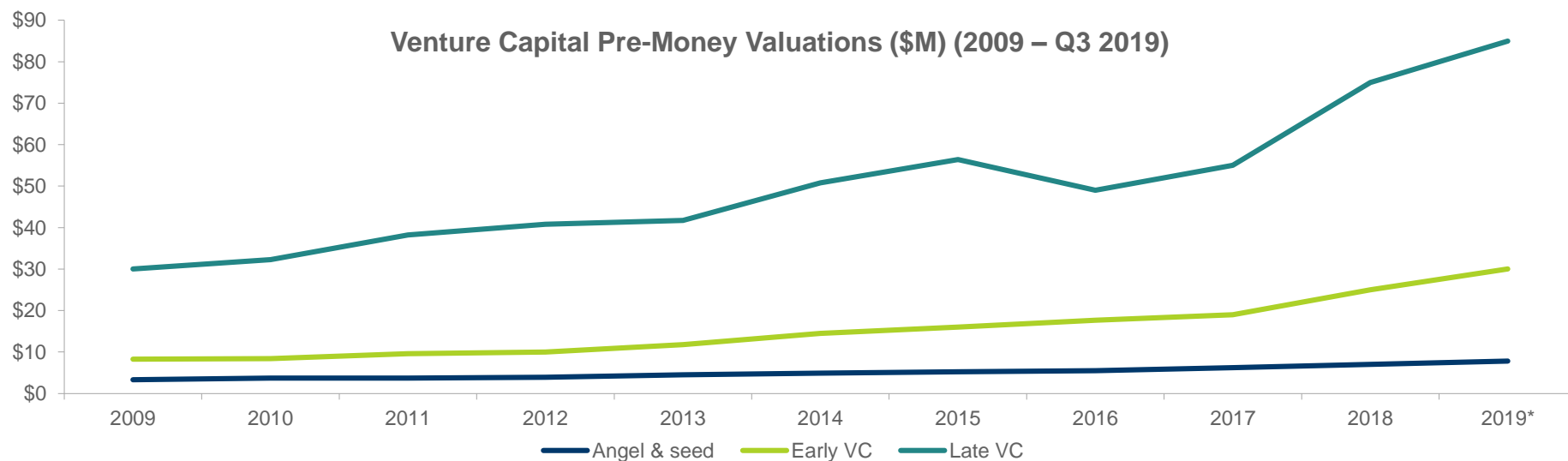
## Wilshire Private Markets

# PRIVATE EQUITY – PRICING & VALUATIONS

LBO Purchase Price Multiples (2003 - Q3 2019)



Venture Capital Pre-Money Valuations (\$M) (2009 – Q3 2019)

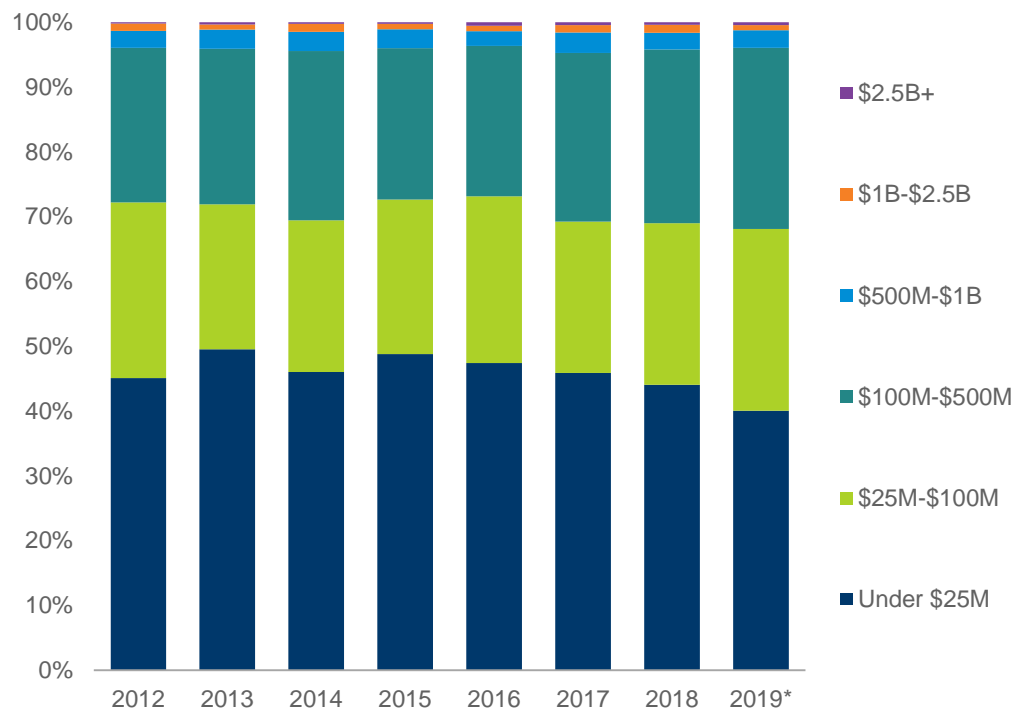


Source: S&P LBO; PitchBook, \*as of September 30, 2019.

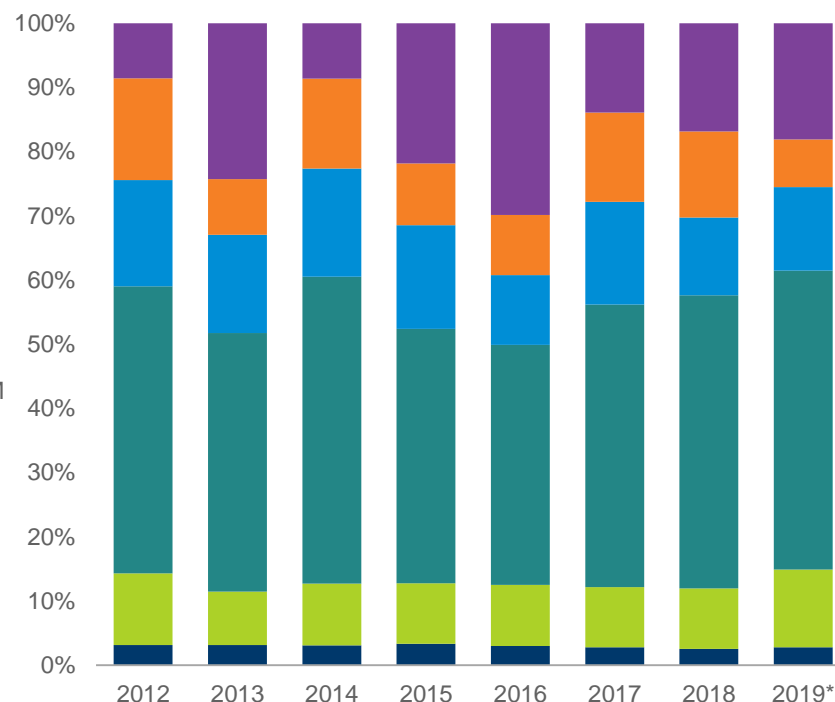
## Wilshire Private Markets

# 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)\*



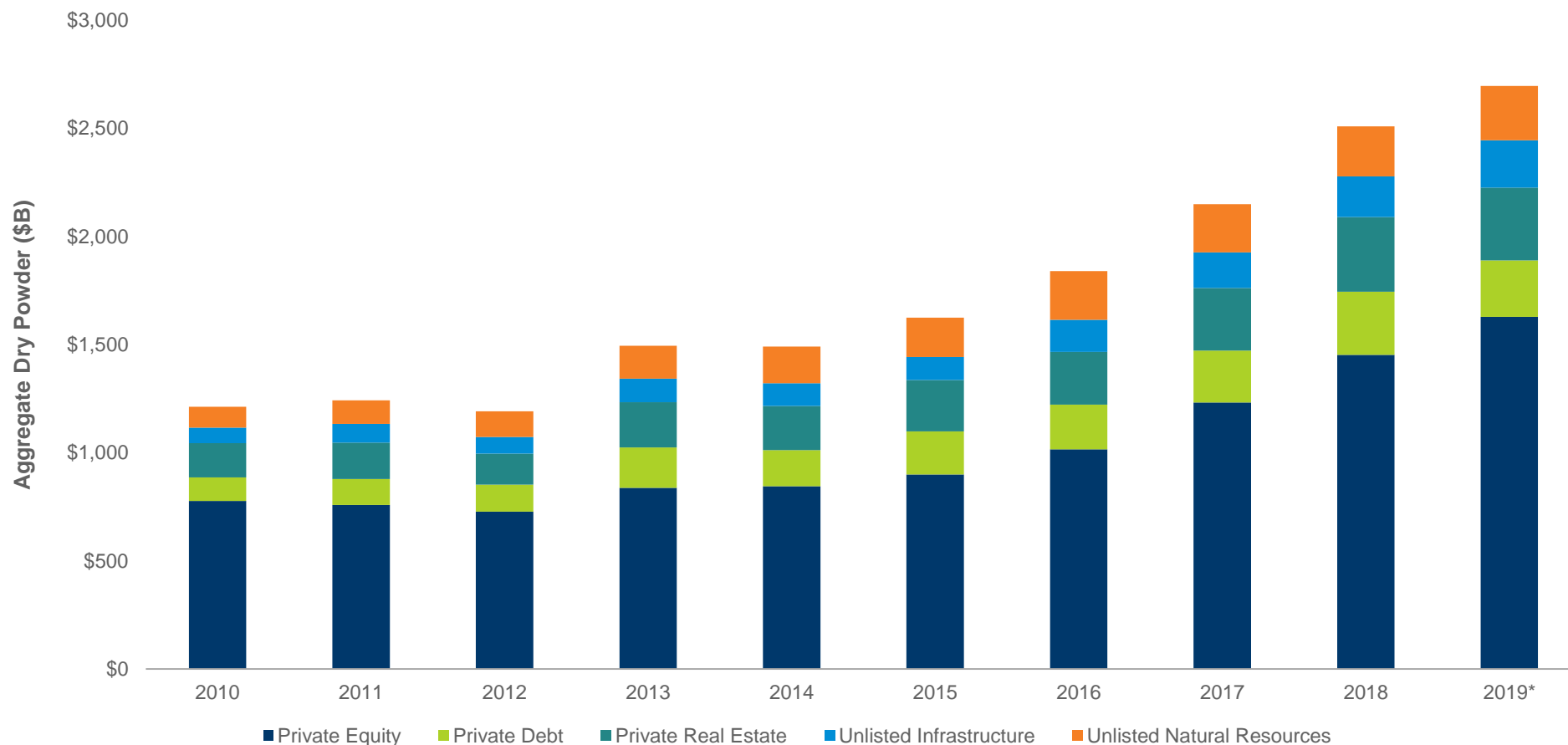
- Deal volume continues to be dominated by lower middle market deals with investment sizes below \$100 million through the third quarter of 2019
- However, deals with below \$100 million check sizes comprised only 15% of all deal volume by amount of capital invested in the third quarter of 2019

Source: PitchBook, \*as of September 30, 2019.

## Wilshire Private Markets

# PRIVATE CAPITAL DRY POWDER

Private Capital Dry Powder by Fund Type (2010 - Q3 2019)



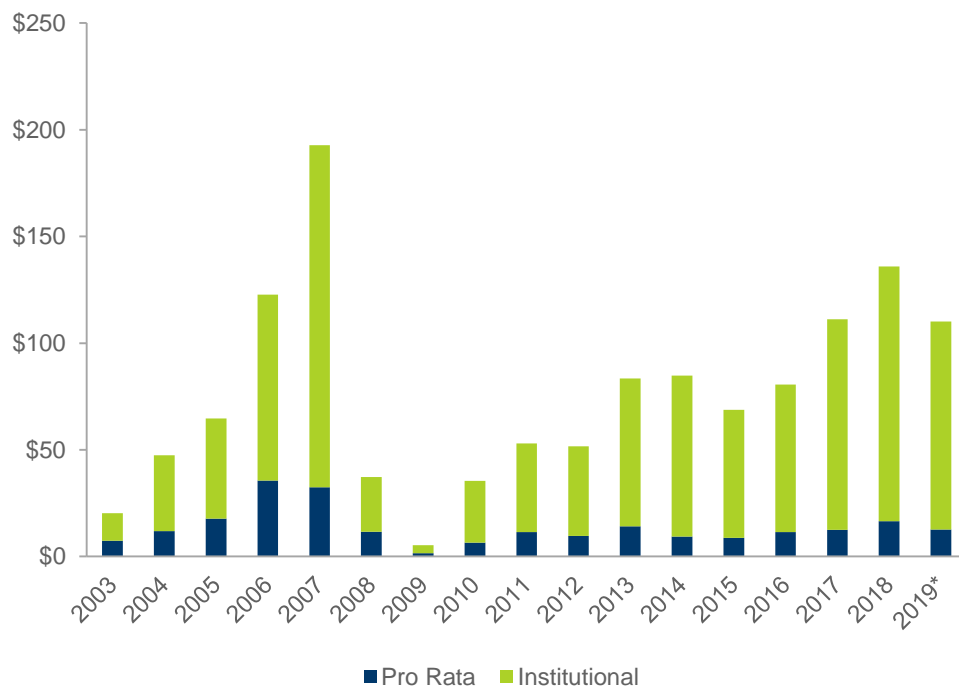
- Global private capital dry powder continues to increase, topping \$2.5 trillion across all fund types
- Private equity comprises just over 60% of total dry powder in the market as of Q3 2019

Source: Preqin, \*as of October 23, 2019.

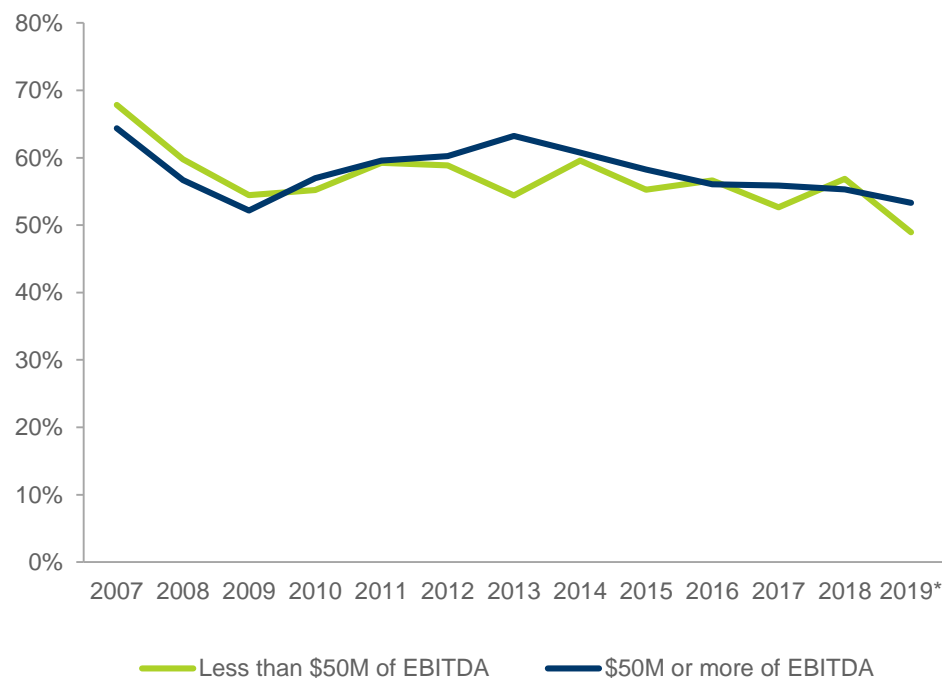
## Wilshire Private Markets

# PRIVATE EQUITY - U.S. DEBT MARKETS

Total U.S. LBO Loan Volume (\$B) (2003 - Q3 2019)



Percentage of Debt Used in LBOs (2007 - Q3 2019)



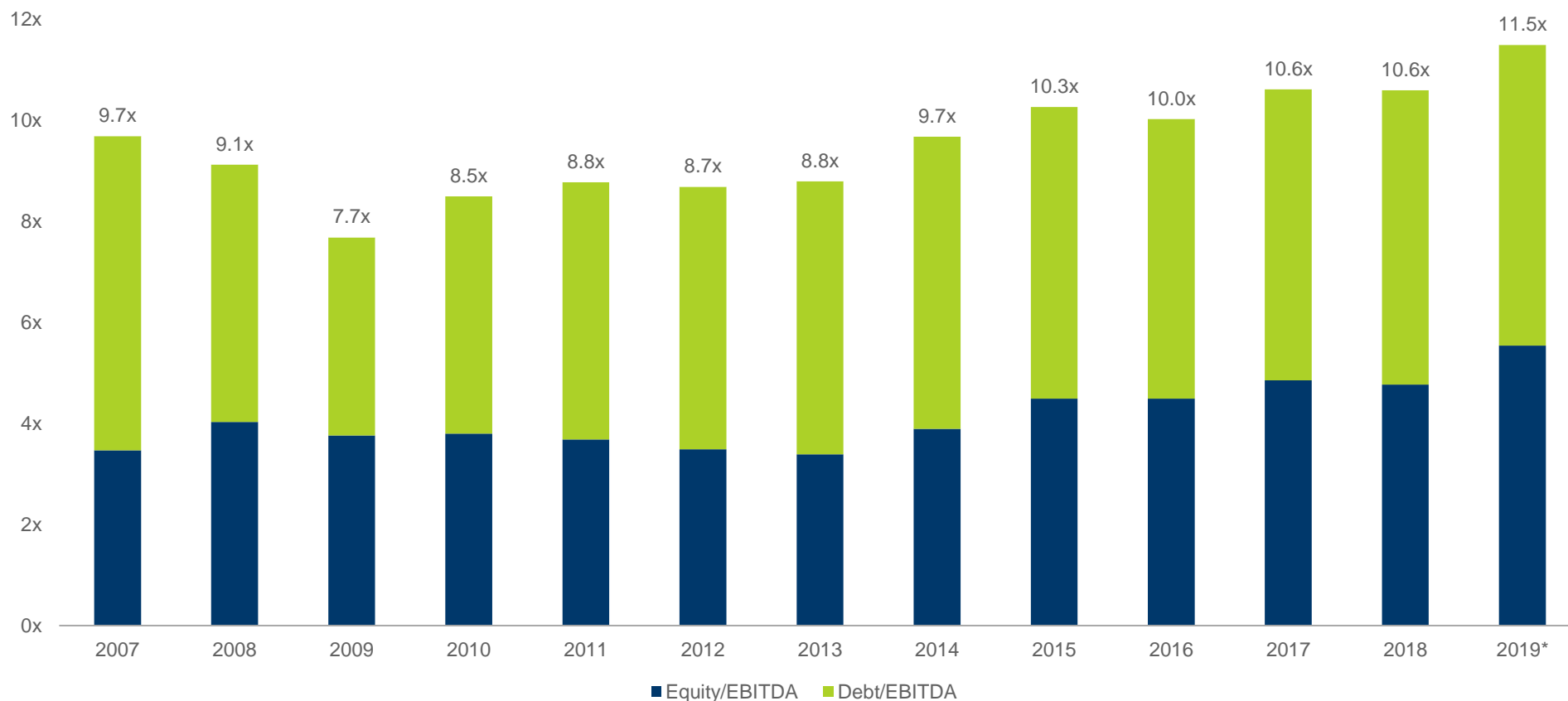
- 2019 has generated approximately \$110 billion in loan volume and is on pace to once again increase year-over-year through the fourth quarter of 2019
- As debt capital becomes less available, the percentage of debt used to finance leveraged buyouts of less than \$50 million of EBITDA through the third quarter of 2019 has dropped from 2018 marks

Source: S&P LBO, \*as of September 30, 2019.

## Wilshire Private Markets

# PRIVATE EQUITY - U.S. LBO PURCHASE PRICE MULTIPLES

Purchase Price Multiples of U.S. LBO Transactions (2007 - Q3 2019)



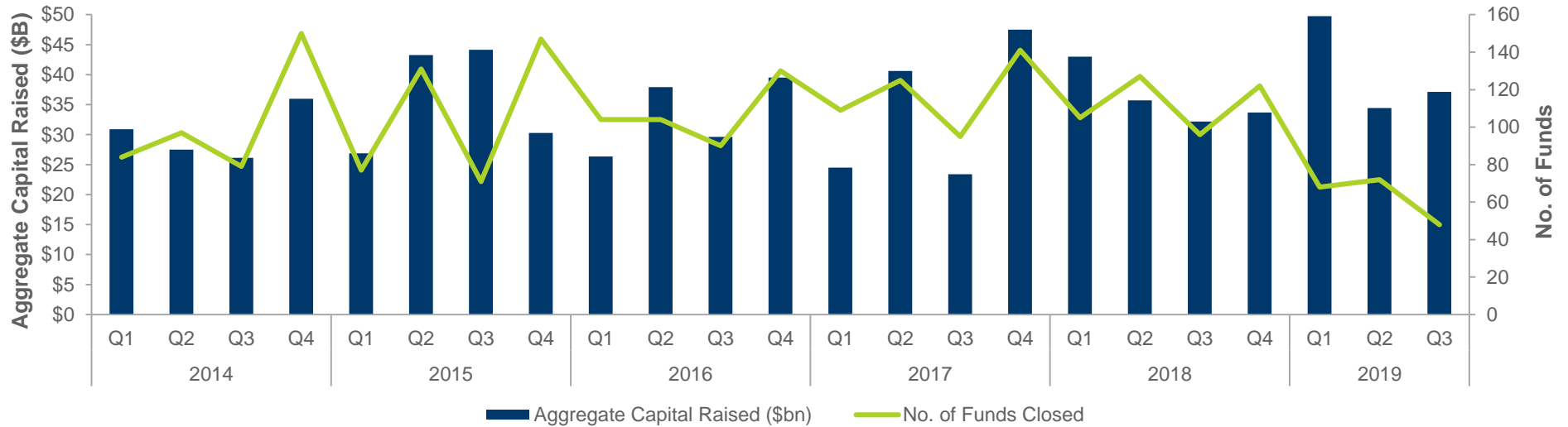
- Due to the amount of equity that is readily available, purchase price multiples for U.S. LBOs have continued to rise through Q3 2019, relative to 2018 levels

Source: S&P LBO, \*as of September 30, 2019.

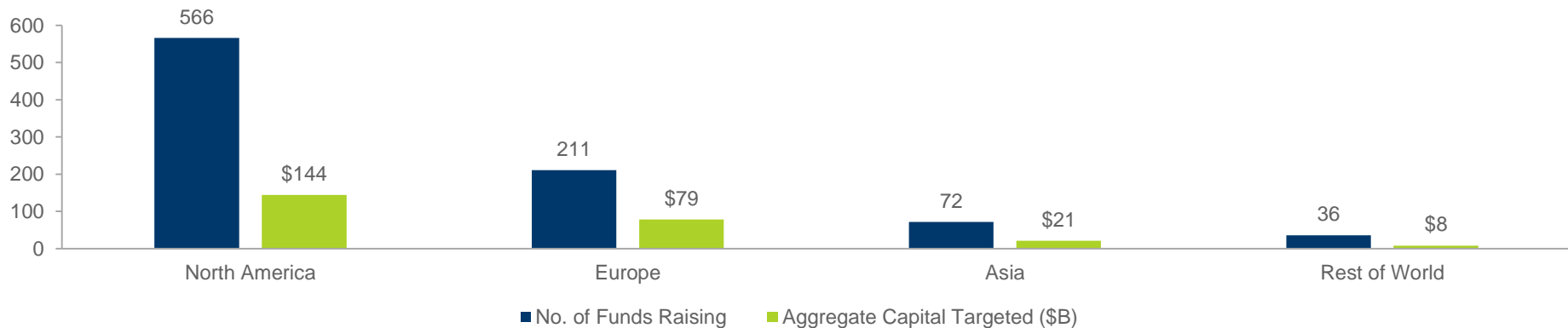
## Wilshire Private Markets

# PRIVATE REAL ESTATE – FUNDRAISING ACTIVITY

Global Quarterly Closed-End Private Real Estate Fundraising (Q1 2014 - Q3 2019)



Closed-End Private Real Estate Fund Actively in Market in Q3 2019 by Primary Geographic Focus

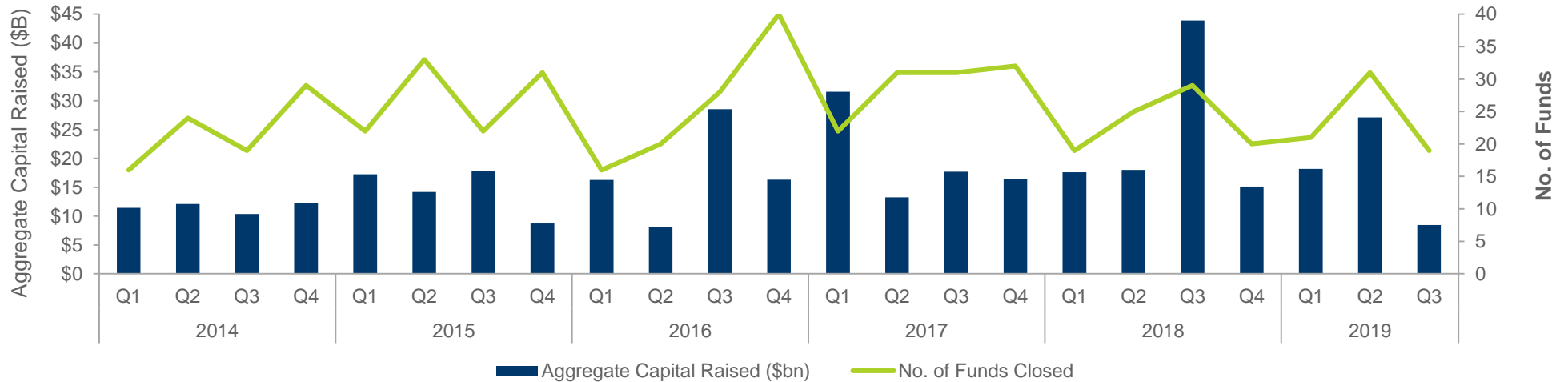


Source: Preqin, as of September 30, 2019.

## Wilshire Private Markets

# UNLISTED INFRASTRUCTURE – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Unlisted Infrastructure Fundraising (Q1 2014 - Q3 2019)



Unlisted Infrastructure Funds in Market over Time (Jan 2015 - Oct 2019)

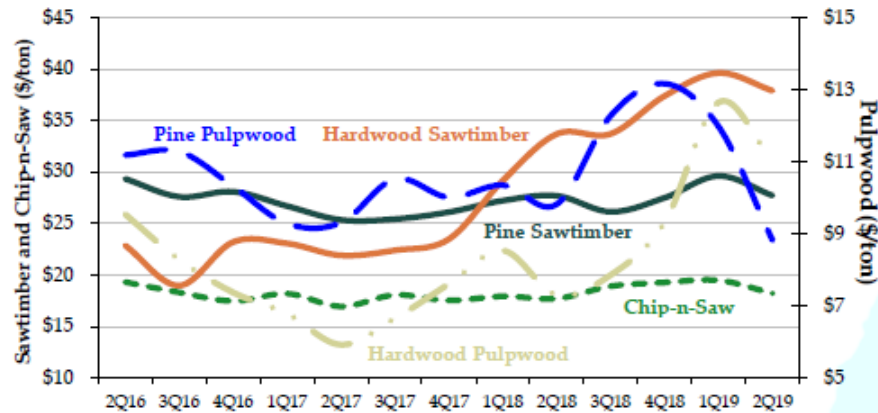


Source: Preqin, as of September 30, 2019.

# Wilshire Consulting

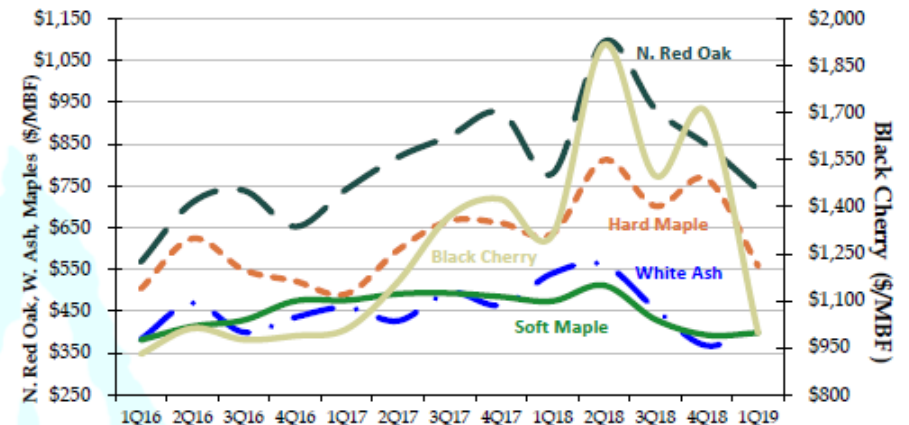
## TIMBER

### Southeastern Timber Prices



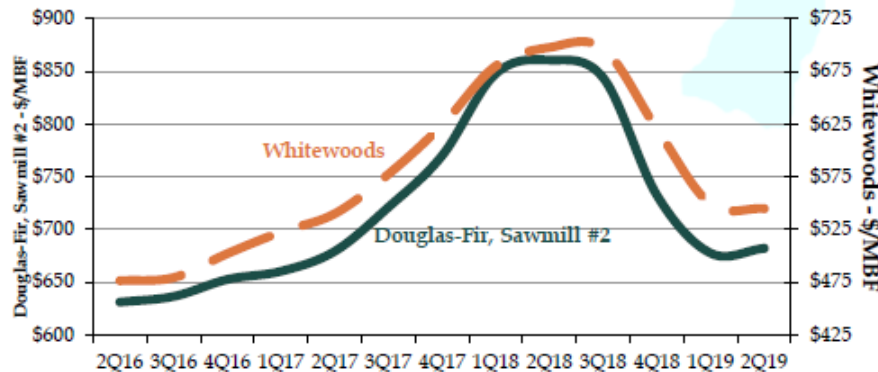
Source: Forest2Market®

### Northeastern Hardwood Timber Prices



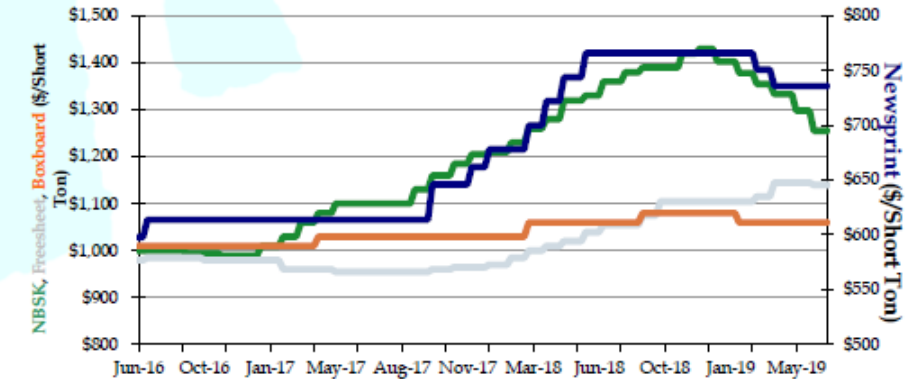
Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

### Pacific Northwest Timber Prices



Source: Log Lines®

### Pulp and Paper



Source: FOEX Indexes, Ltd., RISI Pulp & Paper Week

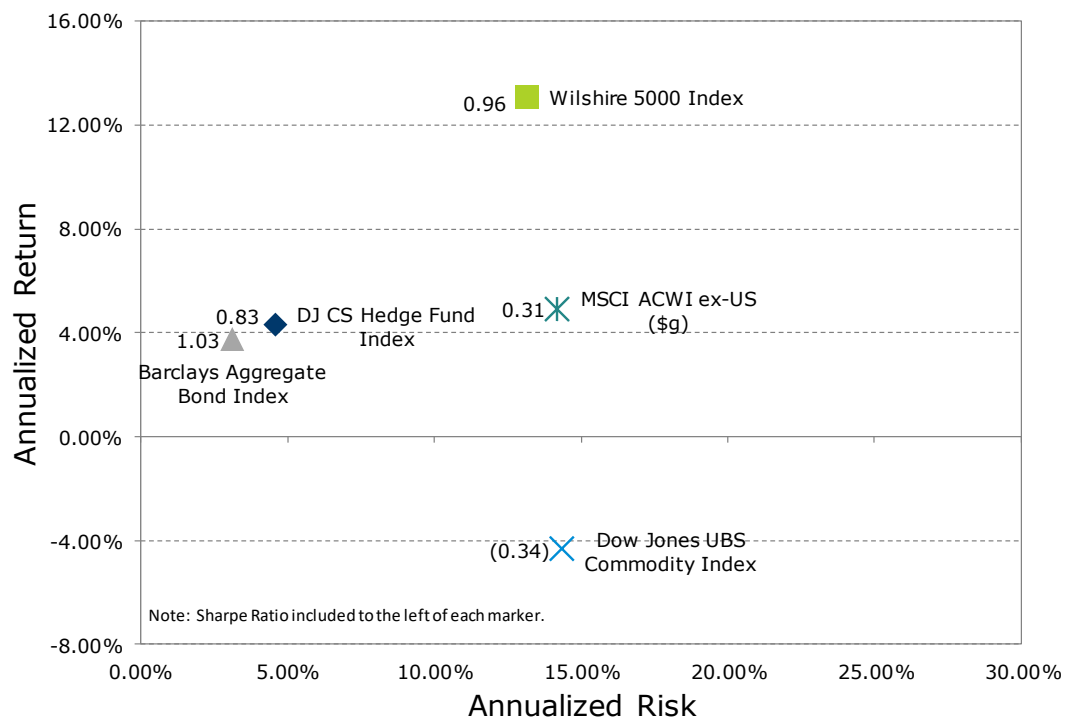
Data sources: Forest Investment Associates



# HEDGE FUND PERFORMANCE

AS OF SEPTEMBER 30, 2019	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DJ CS HEDGE FUND INDEX	0.3	6.7	2.1	3.8	2.3	4.3
EVENT DRIVEN	-1.5	5.9	-0.7	3.4	0.4	3.8
GLOBAL MACRO	2.1	9.6	7.7	5.3	3.1	4.9
LONG/SHORT EQUITY	0.1	6.8	-0.4	4.9	3.4	4.9
MULTI-STRATEGY	0.7	5.9	1.9	4.2	4.2	6.2
WILSHIRE 5000	1.2	20.1	3.0	12.9	10.6	13.1
MSCI ACWI EX-US (\$G)	-1.7	12.1	-0.7	6.8	3.4	4.9
BLOOMBERG BARCLAYS AGGREGATE	2.3	8.5	10.3	2.9	3.4	3.7
DOW JONES UBS COMMODITY	-1.8	3.1	-6.6	-1.5	-7.2	-4.3

HEDGE FUND 10-YEAR RISK/RETURN



Data sources: Wilshire Compass



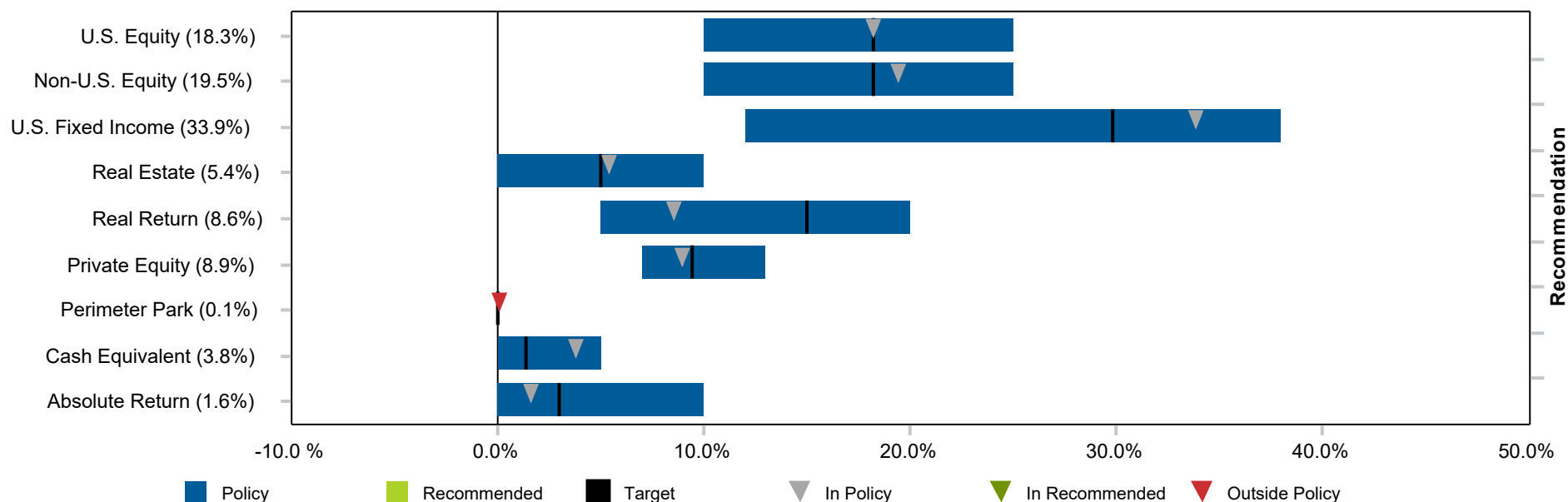
# KRS Pension Plan

# Asset Allocation Compliance

KRS Pension Plan

Periods Ended As of September 30, 2019

## Executive Summary



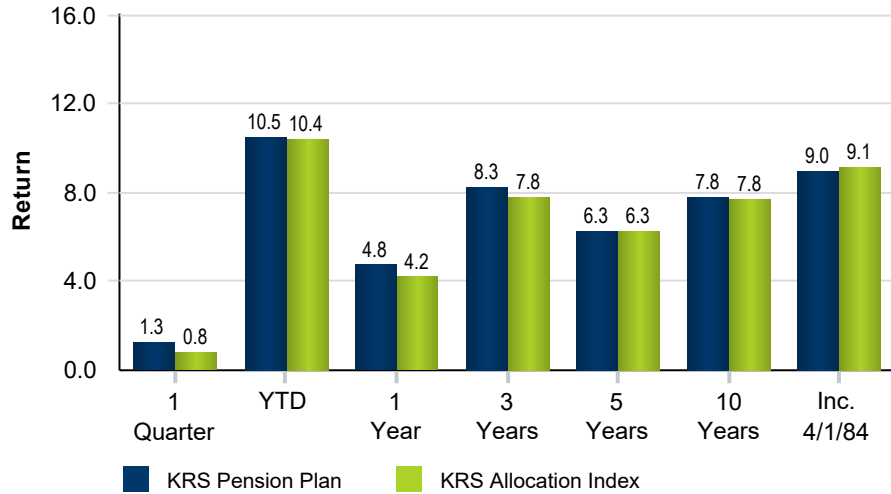
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
U.S. Equity	2,355,442,991	18.3	10.0	25.0	18.2	-7,263,987
Non-U.S. Equity	2,511,768,194	19.5	10.0	25.0	18.2	-163,589,189
U.S. Fixed Income	4,374,498,036	33.9	12.0	38.0	29.9	-523,226,427
Real Estate	699,947,105	5.4	0.0	10.0	5.0	-54,842,983
Real Return	1,106,599,987	8.6	5.0	20.0	15.0	828,712,379
Private Equity	1,153,844,068	8.9	7.0	13.0	9.4	58,951,682
Perimeter Park	7,300,000	0.1	0.0	0.0	0.0	-7,300,000
Cash Equivalent	488,488,198	3.8	0.0	5.0	1.4	-314,310,085
Absolute Return	204,193,864	1.6	0.0	10.0	3.0	182,868,609
Total Fund	12,902,082,442	100.0			100.0	

# Total Fund Summary

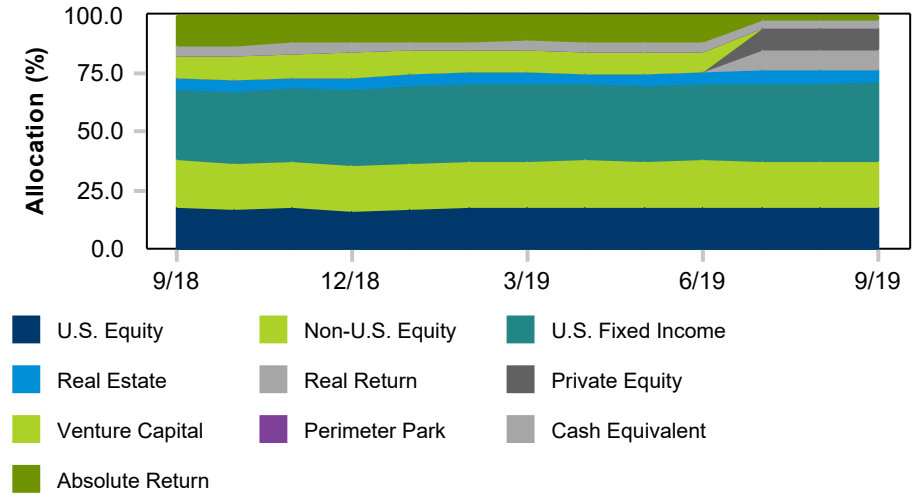
KRS Pension Plan

Periods Ended September 30, 2019

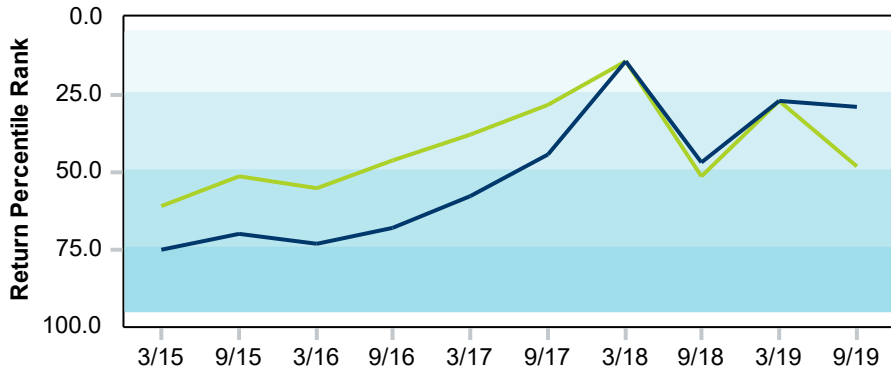
## Comparative Performance



## Historical Asset Allocation by Segment

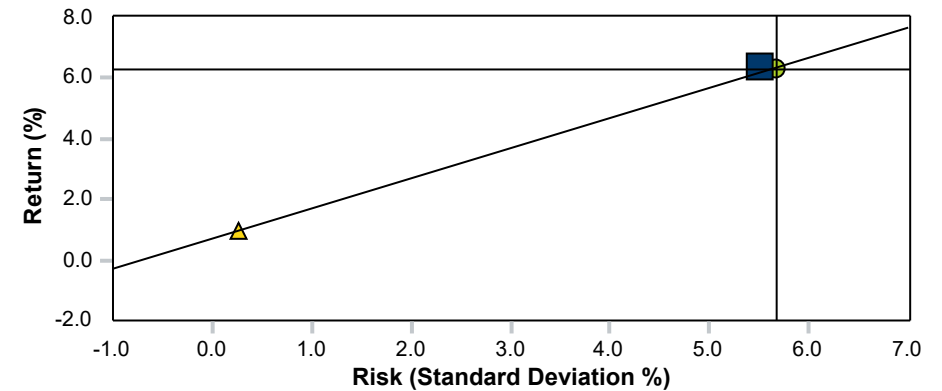


## Rolling Percentile Rank: All Public Plans-Total Fund



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
— KRS Pension Plan	10	1 (10%)	4 (40%)	5 (50%)	0 (0%)
— Benchmark	10	1 (10%)	5 (50%)	4 (40%)	0 (0%)

## Risk and Return 10/1/14 - 09/30/19



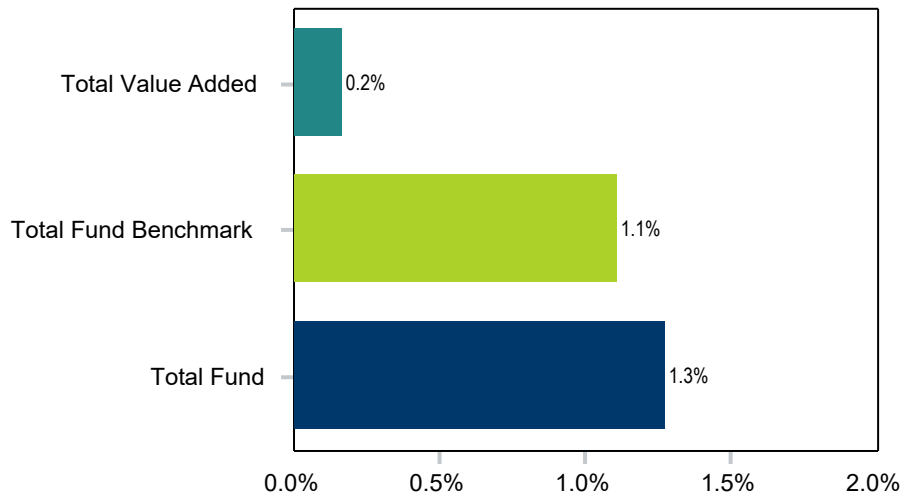
- KRS Pension Plan
- KRS Allocation Index
- ▲ 90 Day US Treasury Bill

# Total Fund Attribution

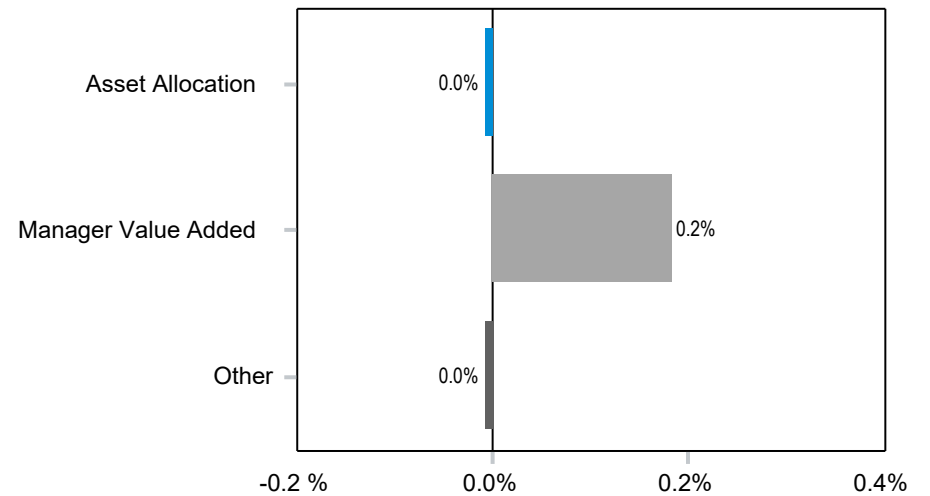
KRS Pension Plan

Periods Ended 1 Quarter Ending September 30, 2019

**Total Fund Performance**



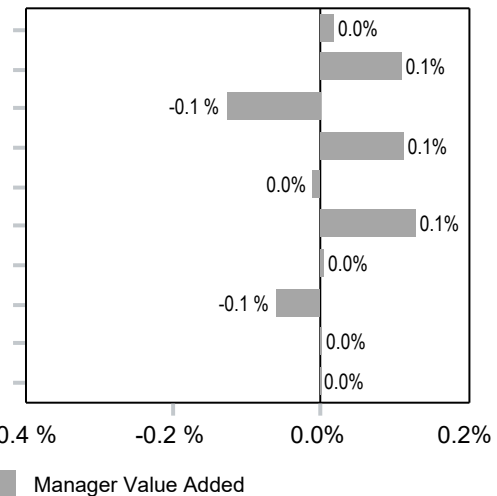
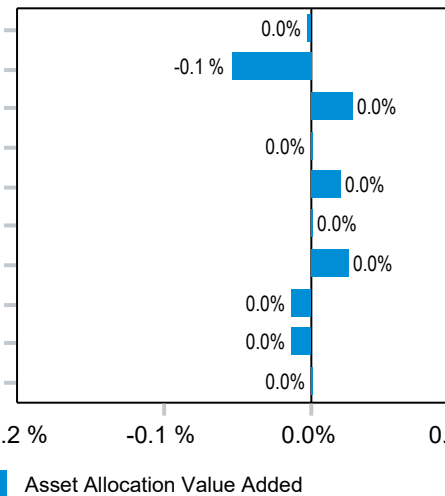
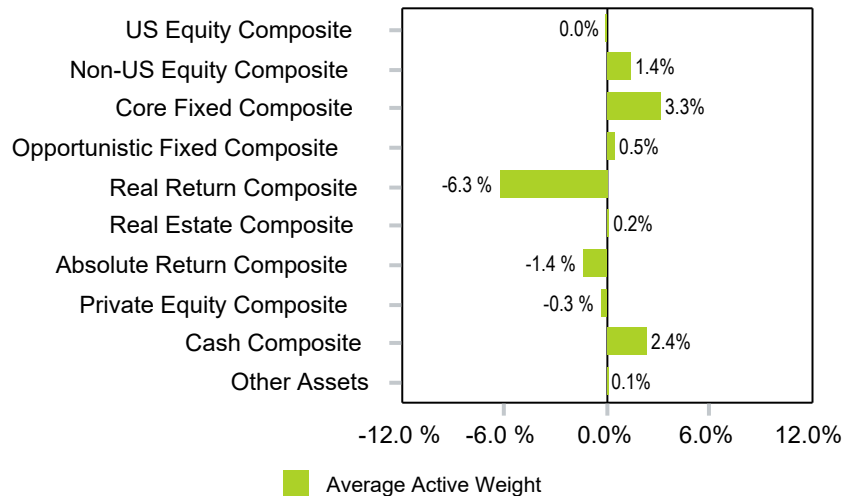
**Total Value Added:0.2%**



**Total Asset Allocation:0.0%**

**Asset Allocation Value Added:0.0%**

**Total Manager Value Added:0.2%**



# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees								
	Market Value \$	%	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>KRS Pension Plan</b>	<b>12,902,082,442</b>	<b>100.00</b>	<b>1.32</b>	<b>1.28</b>	<b>10.49</b>	<b>1.28</b>	<b>4.78</b>	<b>8.28</b>	<b>6.33</b>	<b>9.02</b>	<b>4/1/1984</b>
KRS Allocation Index			0.99	0.81	10.40	0.81	4.23	7.84	6.32	9.13	
Value Added			0.33	0.47	0.09	0.47	0.55	0.44	0.01	-0.11	
KRS IPS Index			1.01	1.04	10.81	1.04	4.90				
Value Added			0.31	0.24	-0.32	0.24	-0.12				
<b>KERS Pension Plan</b>	<b>2,277,762,393</b>	<b>17.65</b>	<b>1.08</b>	<b>1.40</b>	<b>9.34</b>	<b>1.40</b>	<b>4.77</b>	<b>7.60</b>	<b>5.84</b>	<b>8.96</b>	<b>4/1/1984</b>
KERS Allocation Index			0.90	1.14	10.07	1.14	4.72	7.15	5.80	9.05	
Value Added			0.18	0.26	-0.73	0.26	0.05	0.45	0.04	-0.09	
KERS IPS Index			0.85	1.16	10.35	1.16	5.06				
Value Added			0.23	0.24	-1.01	0.24	-0.29				
Assumed Rate 5.25%			0.43	1.29	3.91	1.29	5.25				
Value Added			0.65	0.11	5.43	0.11	-0.48				
<b>KERS (H) Pension Plan</b>	<b>692,431,656</b>	<b>5.37</b>	<b>1.32</b>	<b>1.24</b>	<b>10.48</b>	<b>1.24</b>	<b>4.60</b>	<b>8.29</b>	<b>6.35</b>	<b>9.02</b>	<b>4/1/1984</b>
KERS (H) Allocation Index			1.04	0.80	10.49	0.80	4.19	8.14	6.32	9.13	
Value Added			0.28	0.44	-0.01	0.44	0.41	0.15	0.03	-0.11	
KERS (H) IPS Index			1.05	1.04	10.91	1.04	4.87				
Value Added			0.27	0.20	-0.43	0.20	-0.27				
Assumed Rate 6.25%			0.51	1.53	4.65	1.53	6.25				
Value Added			0.81	-0.29	5.83	-0.29	-1.65				
<b>CERS Pension Plan</b>	<b>7,215,246,567</b>	<b>55.92</b>	<b>1.38</b>	<b>1.23</b>	<b>10.66</b>	<b>1.23</b>	<b>4.67</b>	<b>8.37</b>	<b>6.41</b>	<b>9.03</b>	<b>4/1/1984</b>
CERS Allocation Index			1.04	0.78	10.48	0.78	4.17	8.15	6.32	9.13	
Value Added			0.34	0.45	0.18	0.45	0.50	0.22	0.09	-0.10	
CERS IPS Index			1.05	1.01	10.90	1.01	4.85				
Value Added			0.33	0.22	-0.24	0.22	-0.18				
Assumed Rate 6.25%			0.51	1.53	4.65	1.53	6.25				
Value Added			0.87	-0.30	6.01	-0.30	-1.58				

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees									
	Market Value \$	%	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	
<b>CERS (H) Pension Plan</b>	<b>2,430,493,410</b>	<b>18.84</b>	<b>1.35</b>	<b>1.20</b>	<b>10.65</b>	<b>1.20</b>	<b>4.67</b>	<b>8.36</b>	<b>6.43</b>	<b>9.03</b>	<b>4/1/1984</b>	
CERS (H) Allocation Index			1.03	0.75	10.50	0.75	4.19	8.18	6.34	9.14		
Value Added			0.32	0.45	0.15	0.45	0.48	0.18	0.09	-0.11		
CERS (H) IPS Index			1.04	0.99	10.91	0.99	4.87					
Value Added			0.31	0.21	-0.26	0.21	-0.20					
Assumed Rate 6.25%			0.51	1.53	4.65	1.53	6.25					
Value Added			0.84	-0.33	6.00	-0.33	-1.58					
<b>SPRS Pension Plan</b>	<b>286,148,414</b>	<b>2.22</b>	<b>1.15</b>	<b>1.35</b>	<b>9.87</b>	<b>1.35</b>	<b>4.90</b>	<b>7.80</b>	<b>5.74</b>	<b>8.93</b>	<b>4/1/1984</b>	
SPRS Allocation Index			1.08	1.36	10.07	1.36	4.88	7.92	6.21	9.12		
Value Added			0.07	-0.01	-0.20	-0.01	0.02	-0.12	-0.47	-0.19		
SPRS IPS Index			0.90	1.18	10.47	1.18	5.14					
Value Added			0.25	0.17	-0.60	0.17	-0.24					
Assumed Rate 5.25%			0.43	1.29	3.91	1.29	5.25					
Value Added	0.72	0.06	5.96	0.06	-0.35							

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>KRS Pension Plan</b>	<b>12,902,082,442</b>	<b>100.00</b>	<b>1.28</b>	<b>10.49</b>	<b>1.28</b>	<b>4.78</b>	<b>8.28</b>	<b>6.33</b>	<b>9.02</b>	<b>4/1/1984</b>
KRS Allocation Index			0.81	10.40	0.81	4.23	7.84	6.32	9.13	
Value Added			0.47	0.09	0.47	0.55	0.44	0.01	-0.11	
KRS IPS Index			1.04	10.81	1.04	4.90				
Value Added			0.24	-0.32	0.24	-0.12				
<b>US Equity Composite</b>	<b>2,355,442,991</b>	<b>18.26</b>	<b>1.26</b>	<b>20.60</b>	<b>1.26</b>	<b>2.80</b>	<b>12.25</b>	<b>9.85</b>	<b>11.22</b>	<b>4/1/1984</b>
Russell 3000 Index			1.16	20.09	1.16	2.92	12.83	10.44	11.08	
Value Added			0.10	0.51	0.10	-0.12	-0.58	-0.59	0.14	
<b>S&amp;P 500 Index</b>	<b>1,262,163,454</b>	<b>9.78</b>	<b>1.69</b>	<b>20.59</b>	<b>1.69</b>	<b>4.44</b>	<b>13.51</b>	<b>10.87</b>	<b>7.51</b>	<b>7/1/2001</b>
S&P 500			1.70	20.55	1.70	4.25	13.39	10.84	7.11	
Value Added			-0.01	0.04	-0.01	0.19	0.12	0.03	0.40	
<b>Scientific Beta</b>	<b>427,223,516</b>	<b>3.31</b>	<b>2.27</b>	<b>21.52</b>	<b>2.27</b>	<b>6.10</b>	<b>11.99</b>		<b>11.87</b>	<b>7/1/2016</b>
S&P 500			1.70	20.55	1.70	4.25	13.39		13.62	
Value Added			0.57	0.97	0.57	1.85	-1.40		-1.75	
<b>River Road FAV</b>	<b>164,931,412</b>	<b>1.28</b>	<b>1.17</b>	<b>22.87</b>	<b>1.17</b>	<b>7.23</b>	<b>13.29</b>		<b>15.07</b>	<b>7/1/2016</b>
Russell 3000 Value Index			1.23	17.47	1.23	3.10	9.24		9.78	
Value Added			-0.06	5.40	-0.06	4.13	4.05		5.29	
<b>Westfield Capital</b>	<b>158,259,148</b>	<b>1.23</b>	<b>0.78</b>	<b>26.33</b>	<b>0.78</b>	<b>5.27</b>	<b>16.27</b>	<b>10.98</b>	<b>12.69</b>	<b>7/1/2011</b>
Russell 3000 Growth Index			1.10	22.75	1.10	2.70	16.37	13.07	13.86	
Value Added			-0.32	3.58	-0.32	2.57	-0.10	-2.09	-1.17	
<b>Internal US Mid Cap</b>	<b>160,948,473</b>	<b>1.25</b>	<b>-0.02</b>	<b>18.12</b>	<b>-0.02</b>	<b>-2.04</b>	<b>9.99</b>	<b>9.16</b>	<b>8.91</b>	<b>8/1/2014</b>
S&P MidCap 400 Index			-0.09	17.87	-0.09	-2.49	9.38	8.88	8.65	
Value Added			0.07	0.25	0.07	0.45	0.61	0.28	0.26	



# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>NTGI Structured</b>	<b>181,863,990</b>	<b>1.41</b>	<b>-1.42</b>	<b>15.49</b>	<b>-1.42</b>	<b>-5.76</b>	<b>9.82</b>	<b>9.38</b>	<b>9.76</b>	<b>10/1/1999</b>
Russell 2000 Index			-2.40	14.18	-2.40	-8.89	8.23	8.19	7.99	
Value Added			0.98	1.31	0.98	3.13	1.59	1.19	1.77	
<b>Invesco</b>	<b>40,203</b>	<b>0.00</b>								
<b>Transition Account</b>	<b>12,795</b>	<b>0.00</b>								
<b>Non-US Equity Composite</b>	<b>2,511,768,194</b>	<b>19.47</b>	<b>-1.16</b>	<b>13.49</b>	<b>-1.16</b>	<b>-0.69</b>	<b>7.57</b>	<b>4.37</b>	<b>3.19</b>	<b>7/1/2000</b>
Policy Index			-1.72	11.39	-1.72	-1.84	6.26	3.10	3.23	
Value Added			0.56	2.10	0.56	1.15	1.31	1.27	-0.04	
<b>BlackRock ACWI Ex US</b>	<b>981,045,631</b>	<b>7.60</b>	<b>-1.79</b>	<b>11.78</b>	<b>-1.79</b>	<b>-1.00</b>	<b>6.61</b>	<b>3.18</b>	<b>6.42</b>	<b>7/1/2009</b>
MSCI AC World ex USA (Net)			-1.80	11.56	-1.80	-1.23	6.33	2.90	6.19	
Value Added			0.01	0.22	0.01	0.23	0.28	0.28	0.23	
<b>American Century</b>	<b>353,734,413</b>	<b>2.74</b>	<b>0.62</b>	<b>20.96</b>	<b>0.62</b>	<b>2.21</b>	<b>10.47</b>	<b>5.60</b>	<b>4.67</b>	<b>7/1/2014</b>
Policy Index			-1.72	11.39	-1.72	-1.84	6.28	3.06	1.87	
Value Added			2.34	9.57	2.34	4.05	4.19	2.54	2.80	
<b>Franklin Templeton</b>	<b>256,545,583</b>	<b>1.99</b>	<b>0.88</b>	<b>21.39</b>	<b>0.88</b>	<b>0.06</b>	<b>11.27</b>	<b>7.94</b>	<b>6.10</b>	<b>7/1/2014</b>
Policy Index			-1.72	11.39	-1.72	-1.84	6.28	3.06	1.87	
Value Added			2.60	10.00	2.60	1.90	4.99	4.88	4.23	
<b>Lazard Asset Mgmt</b>	<b>453,356,512</b>	<b>3.51</b>	<b>-1.92</b>	<b>12.49</b>	<b>-1.92</b>	<b>0.47</b>	<b>7.02</b>	<b>4.60</b>	<b>3.30</b>	<b>7/1/2014</b>
Policy Index			-1.72	11.39	-1.72	-1.84	6.28	3.06	1.87	
Value Added			-0.20	1.10	-0.20	2.31	0.74	1.54	1.43	

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>LSV Asset Mgmt</b>	<b>385,877,672</b>	<b>2.99</b>	<b>-1.65</b>	<b>8.46</b>	<b>-1.65</b>	<b>-3.73</b>	<b>6.48</b>	<b>3.19</b>	<b>1.82</b>	<b>7/1/2014</b>
Policy Index			-1.72	11.39	-1.72	-1.84	6.28	3.06	1.87	
Value Added			0.07	-2.93	0.07	-1.89	0.20	0.13	-0.05	
<b>NTGI Int'l Small Cap</b>	<b>76,963,971</b>	<b>0.60</b>	<b>-1.05</b>	<b>10.78</b>	<b>-1.05</b>	<b>-5.09</b>	<b>4.98</b>	<b>4.30</b>	<b>10.76</b>	<b>12/1/2008</b>
MSCI AC World ex USA Small Cap (Net)			-1.19	10.28	-1.19	-5.63	4.64	3.98	10.98	
Value Added			0.14	0.50	0.14	0.54	0.34	0.32	-0.22	
<b>Boston Company</b>	<b>722,107</b>	<b>0.01</b>								
<b>Pyramis Intl</b>	<b>2,093,233</b>	<b>0.02</b>								
<b>Non-US Equity Transition</b>	<b>1,429,071</b>	<b>0.01</b>								
<b>Fixed Income Composite</b>	<b>4,374,498,036</b>	<b>33.91</b>	<b>1.73</b>	<b>7.82</b>	<b>1.73</b>	<b>7.58</b>	<b>4.63</b>	<b>4.70</b>	<b>7.47</b>	<b>4/1/1984</b>
Policy Index			1.72	8.84	1.72	7.54	4.44	5.15	7.31	
Value Added			0.01	-1.02	0.01	0.04	0.19	-0.45	0.16	
Blmbg. Barc. Global Aggregate			0.71	6.32	0.71	7.60	1.59	2.00		
Value Added			1.02	1.50	1.02	-0.02	3.04	2.70		
<b>Core Fixed Composite</b>	<b>2,341,871,101</b>	<b>18.15</b>	<b>1.43</b>	<b>6.98</b>	<b>1.43</b>	<b>7.98</b>			<b>7.98</b>	<b>10/1/2018</b>
Blmbg. Barc. U.S. Aggregate			2.27	8.52	2.27	10.30			10.30	
Value Added			-0.84	-1.54	-0.84	-2.32			-2.32	
<b>BNY IG Credit</b>	<b>104,227,673</b>	<b>0.81</b>	<b>1.71</b>	<b>8.54</b>	<b>1.71</b>	<b>9.35</b>			<b>4.47</b>	<b>12/1/2017</b>
Blmbg. Barc. U.S. Intermediate Credit			1.70	8.46	1.70	9.27			4.68	
Value Added			0.01	0.08	0.01	0.08			-0.21	

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>Loomis Sayles Intmd</b>	<b>583,305,068</b>	<b>4.52</b>	<b>1.37</b>		<b>1.37</b>				<b>5.46</b>	<b>2/1/2019</b>
Blmbg. Barc. U.S. Intermediate Aggregate			1.38		1.38				5.29	
Value Added			-0.01		-0.01				0.17	
<b>Lord Abbett</b>	<b>1,028,423,837</b>	<b>7.97</b>	<b>0.93</b>	<b>4.98</b>	<b>0.93</b>	<b>5.54</b>			<b>5.54</b>	<b>10/1/2018</b>
ICE BofAML 1-3 Year U.S. Corporate			1.00	4.51	1.00	5.35			5.35	
Value Added			-0.07	0.47	-0.07	0.19			0.19	
<b>NISA</b>	<b>625,914,524</b>	<b>4.85</b>	<b>2.26</b>	<b>8.67</b>	<b>2.26</b>	<b>10.39</b>	<b>3.05</b>	<b>3.61</b>	<b>4.33</b>	<b>2/1/2009</b>
Blmbg. Barc. U.S. Aggregate			2.27	8.52	2.27	10.30	2.92	3.38	4.14	
Value Added			-0.01	0.15	-0.01	0.09	0.13	0.23	0.19	
<b>Opportunistic Fixed Composite</b>	<b>2,032,626,935</b>	<b>15.75</b>	<b>2.07</b>	<b>8.79</b>	<b>2.07</b>	<b>7.35</b>			<b>7.35</b>	<b>10/1/2018</b>
Policy Index			1.16	9.09	1.16	4.73			4.73	
Value Added			0.91	-0.30	0.91	2.62			2.62	
<b>Arrowmark</b>	<b>139,104,289</b>	<b>1.08</b>	<b>2.51</b>	<b>8.19</b>	<b>2.51</b>	<b>10.54</b>			<b>9.89</b>	<b>6/1/2018</b>
S&P/LSTA Leverage Loan Index			0.99	6.79	0.99	3.10			3.82	
Value Added			1.52	1.40	1.52	7.44			6.07	
<b>BSP Private Credit</b>	<b>61,295,948</b>	<b>0.48</b>	<b>1.67</b>	<b>3.29</b>	<b>1.67</b>	<b>5.79</b>			<b>3.48</b>	<b>2/1/2018</b>
S&P/LSTA Leverage Loan Index			0.99	6.79	0.99	3.10			3.70	
Value Added			0.68	-3.50	0.68	2.69			-0.22	
<b>Cerberus Capital Mgmt</b>	<b>93,159,808</b>	<b>0.72</b>	<b>2.62</b>	<b>7.20</b>	<b>2.62</b>	<b>10.15</b>	<b>8.95</b>	<b>8.72</b>	<b>8.57</b>	<b>9/1/2014</b>
S&P/LSTA Leverage Loan Index			0.99	6.79	0.99	3.10	4.53	3.98	3.79	
Value Added			1.63	0.41	1.63	7.05	4.42	4.74	4.78	

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>Columbia</b>	<b>360,549,944</b>	<b>2.79</b>	<b>2.22</b>	<b>14.22</b>	<b>2.22</b>	<b>8.85</b>	<b>6.15</b>	<b>5.89</b>	<b>7.08</b>	<b>11/1/2011</b>
Blmbg. Barc. U.S. Corp: High Yield			1.33	11.41	1.33	6.36	6.07	5.37	6.78	
Value Added			0.89	2.81	0.89	2.49	0.08	0.52	0.30	
<b>Manulife Asset Mgmt</b>	<b>472,827,632</b>	<b>3.66</b>	<b>2.09</b>	<b>9.66</b>	<b>2.09</b>	<b>8.16</b>	<b>3.26</b>	<b>3.33</b>	<b>4.26</b>	<b>12/1/2011</b>
Policy Index			2.12	8.80	2.12	10.07	3.23	2.33	2.11	
Value Added			-0.03	0.86	-0.03	-1.91	0.03	1.00	2.15	
<b>Marathon Bluegrass</b>	<b>356,299,792</b>	<b>2.76</b>	<b>2.21</b>	<b>6.17</b>	<b>2.21</b>	<b>6.35</b>	<b>6.24</b>		<b>7.52</b>	<b>1/1/2016</b>
Blmbg. Barc. U.S. Corp: High Yield			1.33	11.41	1.33	6.36	6.07		8.83	
Value Added			0.88	-5.24	0.88	-0.01	0.17		-1.31	
<b>Shenkman Capital</b>	<b>239,509,838</b>	<b>1.86</b>	<b>1.15</b>	<b>7.26</b>	<b>1.15</b>	<b>3.66</b>	<b>4.26</b>	<b>3.57</b>	<b>4.68</b>	<b>10/1/2010</b>
S&P/LSTA Leverage Loan Index			0.99	6.79	0.99	3.10	4.53	3.98	4.62	
Value Added			0.16	0.47	0.16	0.56	-0.27	-0.41	0.06	
<b>Waterfall</b>	<b>200,975,287</b>	<b>1.56</b>	<b>2.45</b>	<b>7.87</b>	<b>2.45</b>	<b>8.53</b>	<b>11.20</b>	<b>8.73</b>	<b>11.55</b>	<b>2/1/2010</b>
Policy Index			1.02	7.64	1.02	4.77	5.01	4.13	5.21	
Value Added			1.43	0.23	1.43	3.76	6.19	4.60	6.34	
<b>White Oak Yield Spectrum</b>	<b>97,368,516</b>	<b>0.75</b>	<b>1.64</b>	<b>4.15</b>	<b>1.64</b>	<b>5.37</b>			<b>4.38</b>	<b>3/1/2018</b>
S&P/LSTA Leverage Loan Index			0.99	6.79	0.99	3.10			3.77	
Value Added			0.65	-2.64	0.65	2.27			0.61	
<b>Loomis</b>	<b>40,061</b>	<b>0.00</b>								

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>Real Return Composite</b>	<b>1,106,599,987</b>	<b>8.58</b>	<b>0.65</b>	<b>9.72</b>	<b>0.65</b>	<b>5.07</b>	<b>3.96</b>	<b>2.73</b>	<b>3.84</b>	<b>7/1/2011</b>
Real Return Index (P)			0.78	9.20	0.78	5.49	2.78	2.06	2.88	
Value Added			-0.13	0.52	-0.13	-0.42	1.18	0.67	0.96	
<b>Internal TIPS</b>	<b>210,530,378</b>	<b>1.63</b>	<b>0.29</b>	<b>4.24</b>	<b>0.29</b>	<b>4.35</b>	<b>1.52</b>	<b>1.98</b>	<b>4.74</b>	<b>5/1/2002</b>
Blmbg. Barc. U.S. TIPS 1-10 Year			0.60	5.80	0.60	5.75	1.94	1.95	4.14	
Value Added			-0.31	-1.56	-0.31	-1.40	-0.42	0.03	0.60	
<b>PIMCO All Asset</b>	<b>343,782,355</b>	<b>2.66</b>	<b>0.27</b>	<b>8.51</b>	<b>0.27</b>	<b>4.92</b>	<b>5.40</b>	<b>3.38</b>	<b>4.71</b>	<b>12/1/2011</b>
Blmbg. Barc. U.S. TIPS 1-10 Year			0.60	5.80	0.60	5.75	1.94	1.95	1.36	
Value Added			-0.33	2.71	-0.33	-0.83	3.46	1.43	3.35	
<b>Tortoise Capital</b>	<b>141,673,384</b>	<b>1.10</b>	<b>-6.14</b>	<b>10.48</b>	<b>-6.14</b>	<b>-7.44</b>	<b>-1.75</b>	<b>-6.48</b>	<b>9.43</b>	<b>8/1/2009</b>
Alerian MLP Index			-5.02	11.08	-5.02	-8.13	-2.46	-8.65	6.29	
Value Added			-1.12	-0.60	-1.12	0.69	0.71	2.17	3.14	
<b>Nuveen Real Asset</b>	<b>224,178,763</b>	<b>1.74</b>	<b>3.79</b>	<b>18.96</b>	<b>3.79</b>	<b>12.73</b>	<b>7.04</b>		<b>6.37</b>	<b>2/1/2015</b>
Policy Index			2.72	18.69	2.72	12.35	6.62		6.00	
Value Added			1.07	0.27	1.07	0.38	0.42		0.37	
<b>Amerra AGRI Fund II</b>	<b>21,647,385</b>	<b>0.17</b>	<b>0.92</b>	<b>2.53</b>	<b>0.92</b>	<b>4.01</b>	<b>-0.37</b>	<b>3.95</b>	<b>3.78</b>	<b>12/1/2012</b>
<b>Amerra AGRI Holdings</b>	<b>44,217,010</b>	<b>0.34</b>	<b>2.07</b>	<b>1.83</b>	<b>2.07</b>	<b>1.30</b>	<b>-1.58</b>		<b>-0.95</b>	<b>8/1/2015</b>
<b>BTG Pactual</b>	<b>23,572,456</b>	<b>0.18</b>	<b>0.53</b>	<b>4.17</b>	<b>0.53</b>	<b>9.35</b>	<b>1.04</b>		<b>-6.84</b>	<b>12/1/2014</b>
<b>IFM Infrastructure</b>	<b>23,803,439</b>	<b>0.18</b>	<b>1.06</b>		<b>1.06</b>				<b>1.06</b>	<b>7/1/2019</b>
<b>Magnetar MTP EOF II</b>	<b>33,226,933</b>	<b>0.26</b>	<b>2.67</b>	<b>4.32</b>	<b>2.67</b>	<b>7.27</b>	<b>7.01</b>		<b>3.63</b>	<b>8/1/2015</b>
<b>Oberland Capital</b>	<b>3,635,301</b>	<b>0.03</b>	<b>19.16</b>	<b>10.94</b>	<b>19.16</b>	<b>36.91</b>			<b>14.49</b>	<b>8/1/2018</b>
<b>Taurus Mine Finance</b>	<b>35,556,058</b>	<b>0.28</b>	<b>10.92</b>	<b>20.89</b>	<b>10.92</b>	<b>23.57</b>	<b>18.28</b>		<b>16.42</b>	<b>4/1/2015</b>

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>TPF II</b>	<b>776,526</b>	<b>0.01</b>	<b>-0.08</b>	<b>14.26</b>	<b>-0.08</b>	<b>13.93</b>	<b>5.94</b>	<b>1.06</b>	<b>-2.08</b>	<b>10/1/2008</b>
<b>Real Estate Composite</b>	<b>699,947,105</b>	<b>5.43</b>	<b>3.22</b>	<b>5.94</b>	<b>3.22</b>	<b>7.84</b>	<b>9.26</b>	<b>9.00</b>	<b>6.14</b>	<b>7/1/1984</b>
NCREIF ODCE NOF 1 Quarter Lag			0.77	3.53	0.77	5.46	6.61	8.76		
Value Added			2.45	2.41	2.45	2.38	2.65	0.24		
<b>Baring</b>	<b>51,086,992</b>	<b>0.40</b>	<b>23.96</b>	<b>23.48</b>	<b>23.96</b>				<b>23.48</b>	<b>1/1/2019</b>
<b>Divcowest IV</b>	<b>3,808,507</b>	<b>0.03</b>	<b>20.75</b>	<b>20.38</b>	<b>20.75</b>	<b>23.61</b>	<b>24.49</b>	<b>27.55</b>	<b>23.95</b>	<b>3/1/2014</b>
<b>Fundamental Partners III</b>	<b>40,066,147</b>	<b>0.31</b>	<b>5.08</b>	<b>10.13</b>	<b>5.08</b>	<b>13.81</b>			<b>8.46</b>	<b>5/1/2017</b>
<b>Greenfield Acq VI</b>	<b>1,905,919</b>	<b>0.01</b>	<b>-25.10</b>	<b>-38.14</b>	<b>-25.10</b>	<b>-38.38</b>	<b>-17.92</b>	<b>-7.87</b>	<b>-2.28</b>	<b>12/1/2012</b>
<b>Greenfield Acq VII</b>	<b>18,903,450</b>	<b>0.15</b>	<b>10.33</b>	<b>15.83</b>	<b>10.33</b>	<b>16.35</b>	<b>14.75</b>	<b>13.83</b>	<b>13.13</b>	<b>7/1/2014</b>
<b>H/2 Credit Partner</b>	<b>83,735,494</b>	<b>0.65</b>	<b>-0.15</b>	<b>-2.32</b>	<b>-0.15</b>	<b>-3.01</b>	<b>3.95</b>	<b>3.57</b>	<b>4.95</b>	<b>7/1/2011</b>
<b>Harrison Street</b>	<b>81,659,384</b>	<b>0.63</b>	<b>1.24</b>	<b>2.60</b>	<b>1.24</b>	<b>4.49</b>	<b>8.06</b>	<b>9.08</b>	<b>8.43</b>	<b>5/1/2012</b>
<b>Lubert Adler VII</b>	<b>28,719,606</b>	<b>0.22</b>	<b>0.22</b>	<b>9.96</b>	<b>0.22</b>	<b>10.21</b>	<b>9.14</b>	<b>2.00</b>	<b>0.64</b>	<b>7/1/2014</b>
<b>Lubert Adler VII B</b>	<b>26,970,962</b>	<b>0.21</b>	<b>3.53</b>	<b>11.93</b>	<b>3.53</b>	<b>12.34</b>			<b>4.80</b>	<b>7/1/2017</b>
<b>Mesa West IV</b>	<b>16,196,875</b>	<b>0.13</b>	<b>2.70</b>	<b>4.16</b>	<b>2.70</b>	<b>6.87</b>			<b>5.24</b>	<b>3/1/2017</b>
<b>Mesa West Core Lend</b>	<b>59,668,309</b>	<b>0.46</b>	<b>3.40</b>	<b>5.32</b>	<b>3.40</b>	<b>7.35</b>	<b>8.31</b>	<b>7.42</b>	<b>7.01</b>	<b>5/1/2013</b>
<b>Patron Capital</b>	<b>16,632,302</b>	<b>0.13</b>	<b>1.08</b>	<b>7.80</b>	<b>1.08</b>	<b>10.80</b>	<b>3.18</b>		<b>2.90</b>	<b>8/1/2016</b>
<b>Prologis Targeted US</b>	<b>136,728,647</b>	<b>1.06</b>	<b>2.89</b>	<b>9.48</b>	<b>2.89</b>	<b>13.16</b>	<b>17.20</b>	<b>15.27</b>	<b>15.27</b>	<b>10/1/2014</b>
<b>Rubenstein PF II</b>	<b>18,022,367</b>	<b>0.14</b>	<b>5.88</b>	<b>8.48</b>	<b>5.88</b>	<b>12.72</b>	<b>13.10</b>	<b>10.42</b>	<b>13.84</b>	<b>7/1/2013</b>

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>Stockbridge Sm/Mkts</b>	89,198,631	0.69	1.35	5.40	1.35	9.08	8.55	9.48	9.10	5/1/2014
<b>Walton St RE VI</b>	13,586,368	0.11	-0.37	-2.57	-0.37	-0.43	2.17	4.86	-16.06	5/1/2009
<b>Walton St RE VII</b>	13,057,144	0.10	-1.00	-2.48	-1.00	-2.55	5.56	9.11	10.01	7/1/2013
<b>Absolute Return Composite</b>	204,193,864	1.58	-0.43	0.06	-0.43	-1.08	2.48	1.58	3.49	4/1/2010
HFRI FOF Div 1 Month Lag			1.34	4.32	1.34	1.06	3.48	2.09	2.80	
Value Added			-1.77	-4.26	-1.77	-2.14	-1.00	-0.51	0.69	
<b>Blackstone Strat Opp</b>	3,958,199	0.03	-1.98	-6.58	-1.98	-6.26			-0.20	8/1/2017
<b>Credit Suisse</b>	415,818	0.00	0.67	3.99	0.67	6.05			6.71	6/1/2017
<b>Gotham Neutral Strategies</b>	12,908,852	0.10	-0.01	-3.00	-0.01	-2.77			-2.53	4/1/2017
<b>Governors Lane Onshore</b>	16,247,946	0.13	1.09	3.86	1.09	-1.65			0.40	4/1/2017
<b>Liquidalts H20 Force</b>	17,097,306	0.13	1.23	1.44	1.23	4.57	5.31		5.73	8/1/2016
<b>Luxor Capital</b>	1,603,029	0.01	-3.77	5.18	-3.77	15.15	20.72	4.57	3.90	4/1/2014
<b>Myriad Opportunities</b>	43,411,239	0.34	-1.58	-5.59	-1.58	-7.69	1.34		2.26	5/1/2016
<b>PAAMCO</b>	7,095	0.00	0.05	28.02	0.05	-56.65	-29.23	-19.55	-9.95	9/1/2011
<b>Pine River</b>	253,596	0.00	6.49	17.84	6.49	23.36	5.22	2.97	2.82	5/1/2014
<b>PRISMA Capital</b>	96,376,598	0.75	-0.48	0.95	-0.48	-0.23	3.03	1.95	3.35	9/1/2011
<b>SRS Partners US</b>	8,349,395	0.06	-0.77	4.14	-0.77	12.09			9.35	8/1/2017
<b>Tricadia Select</b>	3,564,792	0.03	1.05	2.21	1.05	-1.06			-11.55	9/1/2017

# Asset Allocation & Performance

KRS Pension Plan

Periods Ended September 30, 2019

	Allocation		Performance (%) net of fees							
	Market Value \$	%	1 Quarter	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>Private Equity Composite</b>	<b>1,153,844,068</b>	<b>8.94</b>	<b>5.09</b>	<b>6.50</b>	<b>5.09</b>	<b>11.15</b>	<b>14.08</b>	<b>11.52</b>	<b>11.35</b>	<b>7/1/2002</b>
KRS Short-Term PE Index			5.09	6.50	5.09	11.15	14.08	11.52	11.35	
Value Added			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Russell 3000 +3% 1 Quarter Lag			4.87	4.02	4.87	12.25	17.44	13.50	11.25	
Value Added			0.22	2.48	0.22	-1.10	-3.36	-1.98	0.10	
<b>Cash Composite</b>	<b>488,488,198</b>	<b>3.79</b>	<b>0.62</b>	<b>2.03</b>	<b>0.62</b>	<b>2.64</b>	<b>2.00</b>	<b>1.34</b>	<b>3.55</b>	<b>1/1/1988</b>
90 Day US Treasury Bill			0.56	1.81	0.56	2.38	1.54	0.96	3.17	
Value Added			0.06	0.22	0.06	0.26	0.46	0.38	0.38	
<b>Perimeter Park</b>	<b>7,300,000</b>	<b>0.06</b>								



# Historical Hybrid Composition

Kentucky Retirement Systems Pension

Periods Ended September 30, 2019

Policy Index	Weight (%)
<b>KRS Allocation Index : Apr-1984</b>	
KRS Allocation Index	100.00
<b>KRS Allocation Index : Jul-2017</b>	
Russell 3000 Index	25.60
MSCI AC World ex USA IMI	25.20
KRS Short-Term PE Index	10.00
HFRI FOF: Diversified Index	10.00
Real Return Index (P)	8.00
Blmbg. Barc. U.S. Corp: High Yield	7.00
Blmbg. Barc. U.S. Universal Index	7.00
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	2.20
<b>KRS Allocation Index : Oct-2017</b>	
Russell 3000 Index	23.60
MSCI AC World ex USA IMI (Net)	23.20
KRS Short-Term PE Index	10.00
HFRI FOF: Diversified Index	10.00
Real Return Index (P)	8.00
Blmbg. Barc. U.S. Corp: High Yield	9.00
Blmbg. Barc. U.S. Universal Index	9.00
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	2.20

Policy Index	Weight (%)
<b>KRS Allocation Index : Apr-2018</b>	
Russell 3000 Index	17.00
MSCI AC World ex USA IMI (Net)	21.00
KRS Short-Term PE Index	9.40
HFRI FOF: Diversified Index	10.00
Real Return Index (P)	10.00
Blmbg. Barc. U.S. Corp: High Yield	12.40
Blmbg. Barc. U.S. Universal Index	13.00
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	2.20
<b>KRS Allocation Index : Oct-2018</b>	
Russell 3000 Index	17.00
MSCI AC World ex USA IMI (Net)	21.00
KRS Short-Term PE Index	9.40
HFRI FOF: Diversified Index	10.00
Real Return Index (P)	10.00
Blmbg. Barc. U.S. Aggregate	12.70
Blmbg. Barc. U.S. Corp: High Yield	6.35
S&P/LSTA Leverage Loan Index	6.35
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	2.20

# Historical Hybrid Composition

Kentucky Retirement Systems Pension

*Periods Ended September 30, 2019*

Policy Index	Weight (%)
<b>KRS IPS Index : Jul-2017</b>	
Russell 3000 Index	17.50
MSCI AC World ex USA IMI	17.50
KRS Short-Term PE Index	10.00
HFRI FOF Div 1 Month Lag	10.00
Real Return Index (P)	10.00
Blmbg. Barc. U.S. Corp: High Yield	22.70
Blmbg. Barc. U.S. Universal Index	5.10
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	2.20

Policy Index	Weight (%)
<b>KRS IPS Index : Oct-2017</b>	
Russell 3000 Index	17.50
MSCI AC World ex USA IMI (Net)	17.50
KRS Short-Term PE Index	10.00
HFRI FOF Div 1 Month Lag	10.00
Real Return Index (P)	10.00
Blmbg. Barc. U.S. Corp: High Yield	22.70
Blmbg. Barc. U.S. Universal Index	5.10
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	2.20

# Historical Hybrid Composition

Kentucky Retirement Systems Pension

Periods Ended September 30, 2019

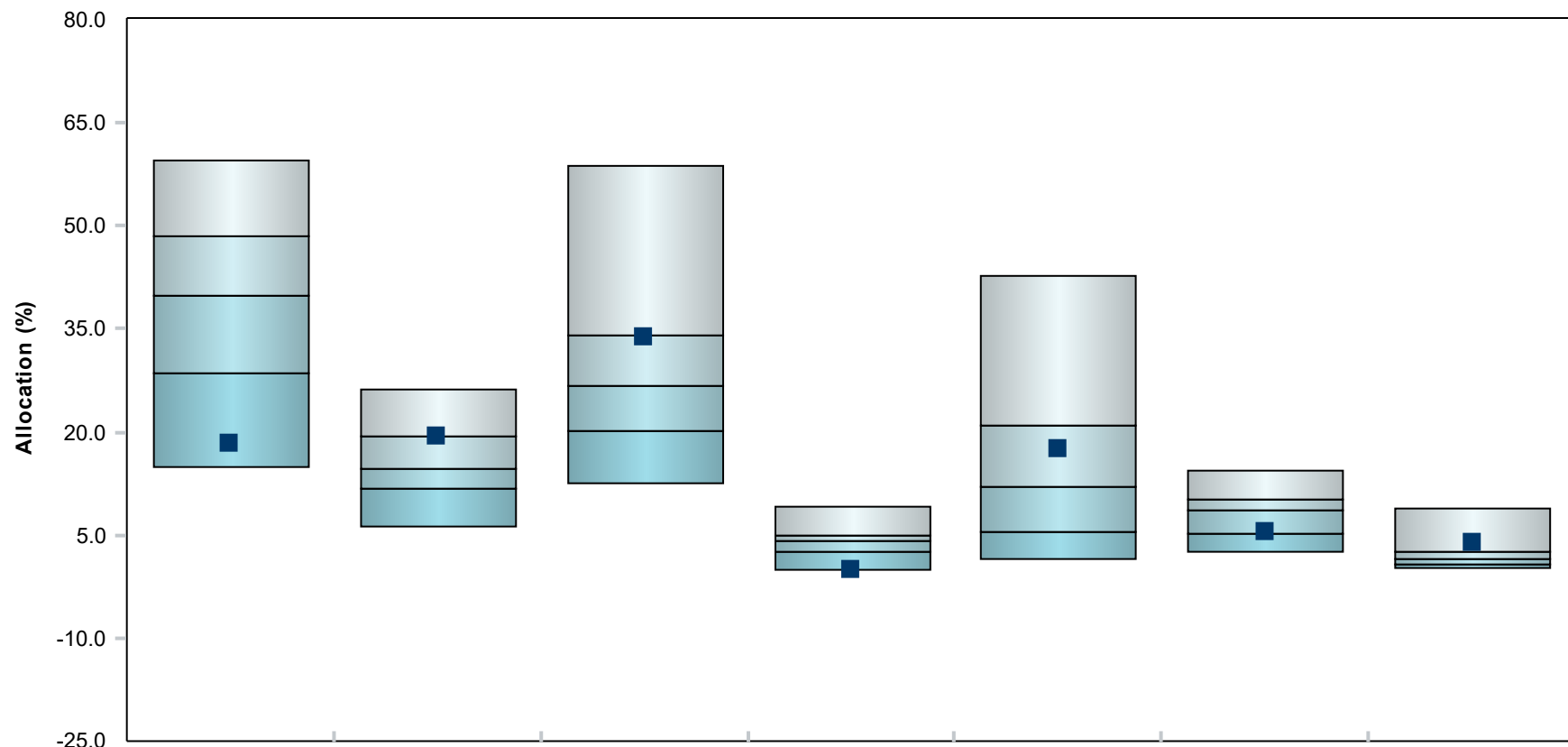
Policy Index	Weight (%)
<b>KRS IPS Index : Jul-2018</b>	
Russell 3000 Index	18.25
MSCI AC World ex USA IMI (Net)	18.25
KRS Short-Term PE Index	9.50
HFRI FOF: Diversified Index	3.00
Real Return Index (P)	15.00
Blmbg. Barc. U.S. Corp: High Yield	15.00
Blmbg. Barc. U.S. Universal Index	14.75
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	1.25

Policy Index	Weight (%)
<b>KRS IPS Index : Oct-2018</b>	
Russell 3000 Index	18.25
MSCI AC World ex USA IMI (Net)	18.25
KRS Short-Term PE Index	9.50
HFRI FOF: Diversified Index	3.00
Real Return Index (P)	15.00
Blmbg. Barc. U.S. Aggregate	14.88
Blmbg. Barc. U.S. Corp: High Yield	7.44
S&P/LSTA Leverage Loan Index	7.44
NCREIF ODCE NOF 1 Quarter Lag	5.00
90 Day US Treasury Bill	1.25

# Plan Sponsor TF Asset Allocation

KRS Pension Plan vs All Public Plans-Total Fund

Periods Ended September 30, 2019

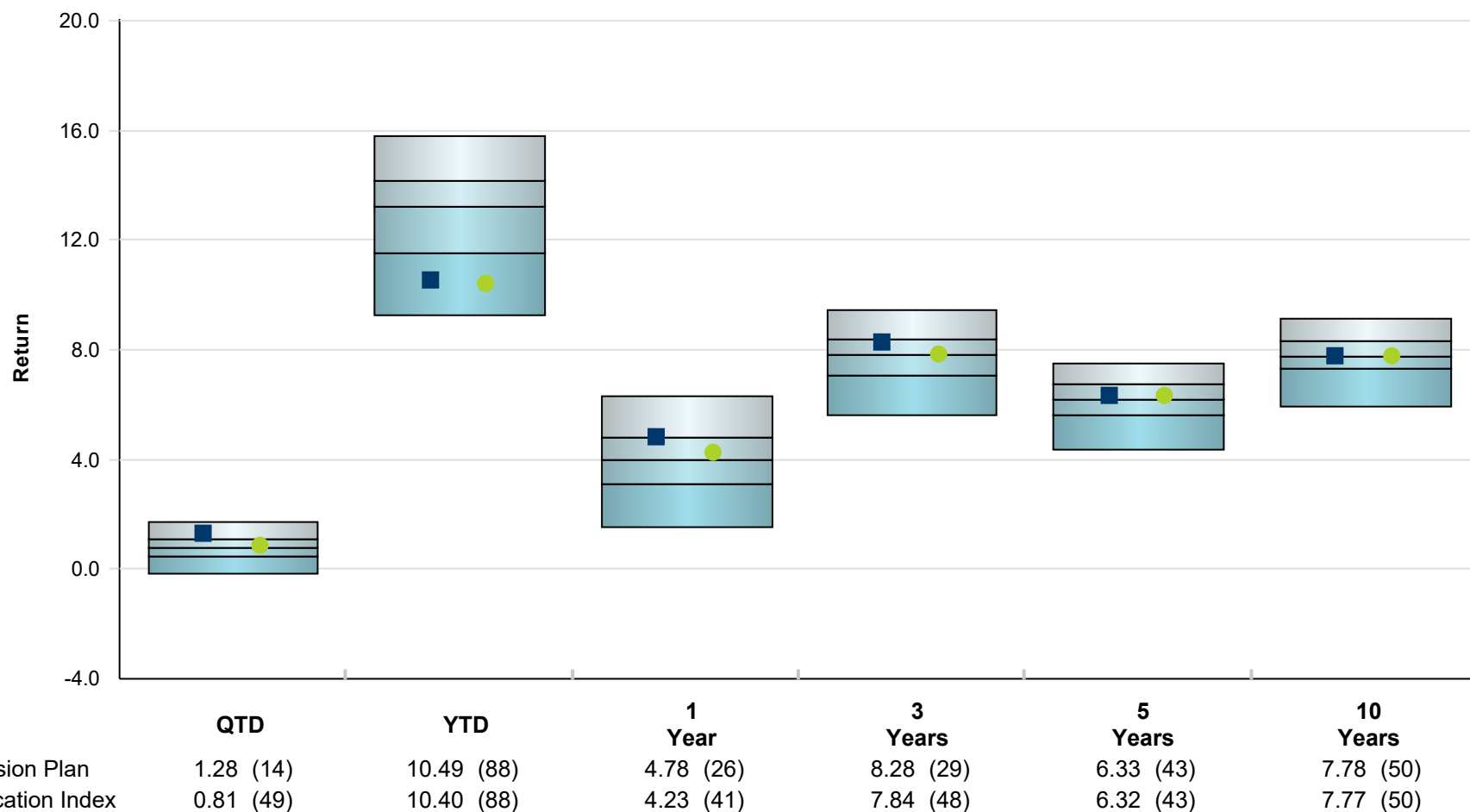


	US Equity	Intl. Equity	US Fixed Income	Intl. Fixed Income	Alternative Inv.	Real Estate	Cash
■ KRS Pension Plan	18.26	19.47	33.91	0.00	17.52	5.48	3.79
5th Percentile	59.58	26.12	58.86	9.20	42.63	14.37	8.85
1st Quartile	48.50	19.46	34.16	4.89	20.82	10.25	2.54
Median	39.72	14.55	26.82	4.15	11.93	8.55	1.40
3rd Quartile	28.59	11.88	20.14	2.48	5.54	5.14	0.60
95th Percentile	14.83	6.30	12.66	0.05	1.46	2.56	0.07

# Plan Sponsor Peer Group Analysis

KRS Pension Plan vs All Public Plans-Total Fund

Periods Ended September 30, 2019



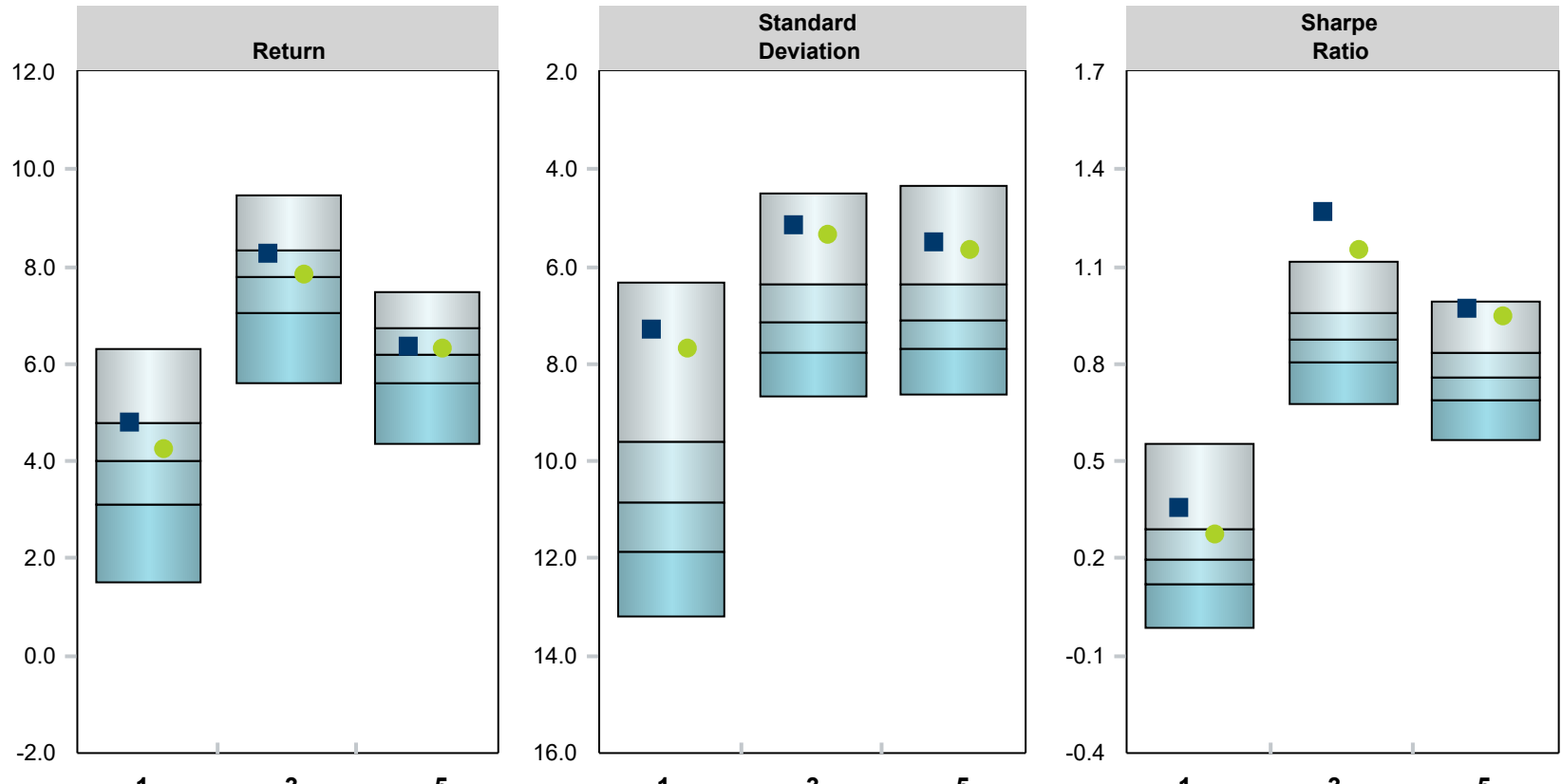
5th Percentile	1.70	15.81	6.29	9.46	7.49	9.11
1st Quartile	1.07	14.18	4.78	8.35	6.72	8.32
Median	0.80	13.21	4.00	7.79	6.19	7.76
3rd Quartile	0.46	11.53	3.11	7.06	5.61	7.28
95th Percentile	-0.14	9.28	1.50	5.61	4.37	5.92

Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

# Plan Sponsor Peer Group Analysis-Multi Statistics

KRS Pension Plan

Periods Ended September 30, 2019



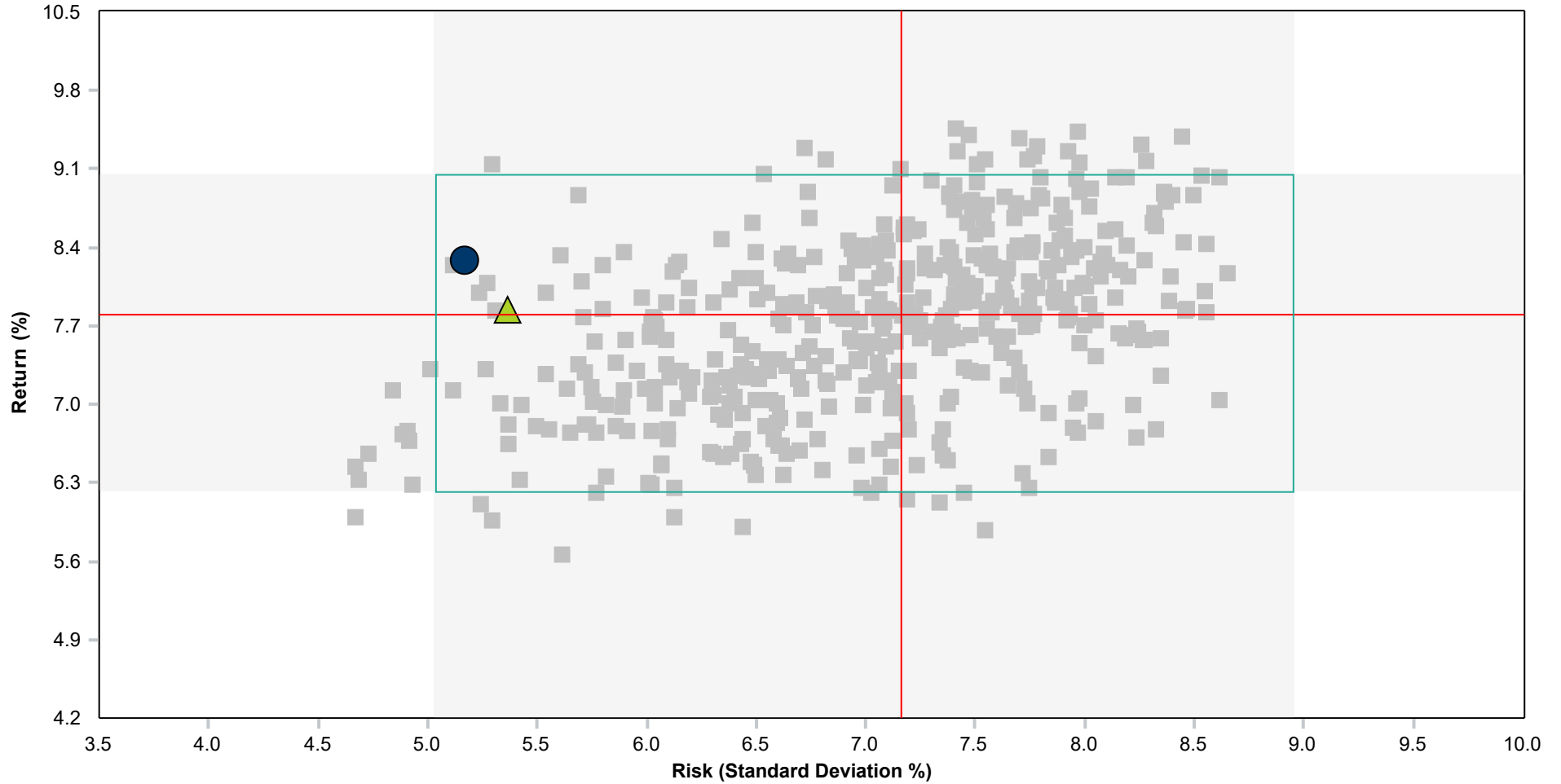
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ KRS Pension Plan	4.78 (26)	8.28 (29)	6.33 (43)	7.31 (7)	5.17 (7)	5.51 (8)	0.35 (15)	1.27 (3)	0.97 (7)
● KRS Allocation Index	4.23 (41)	7.84 (48)	6.32 (43)	7.69 (8)	5.37 (9)	5.67 (10)	0.27 (29)	1.15 (4)	0.94 (10)
5th Percentile	6.29	9.46	7.49	6.35	4.49	4.34	0.55	1.12	0.99
1st Quartile	4.78	8.35	6.72	9.62	6.39	6.38	0.29	0.95	0.84
Median	4.00	7.79	6.19	10.85	7.16	7.12	0.20	0.88	0.76
3rd Quartile	3.11	7.06	5.61	11.85	7.77	7.69	0.12	0.80	0.69
95th Percentile	1.50	5.61	4.37	13.21	8.68	8.63	-0.01	0.68	0.56

Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

# Plan Sponsor Scattergram

KRS Pension Plan vs All Public Plans-Total Fund

Periods Ended October 1, 2016 To September 30, 2019



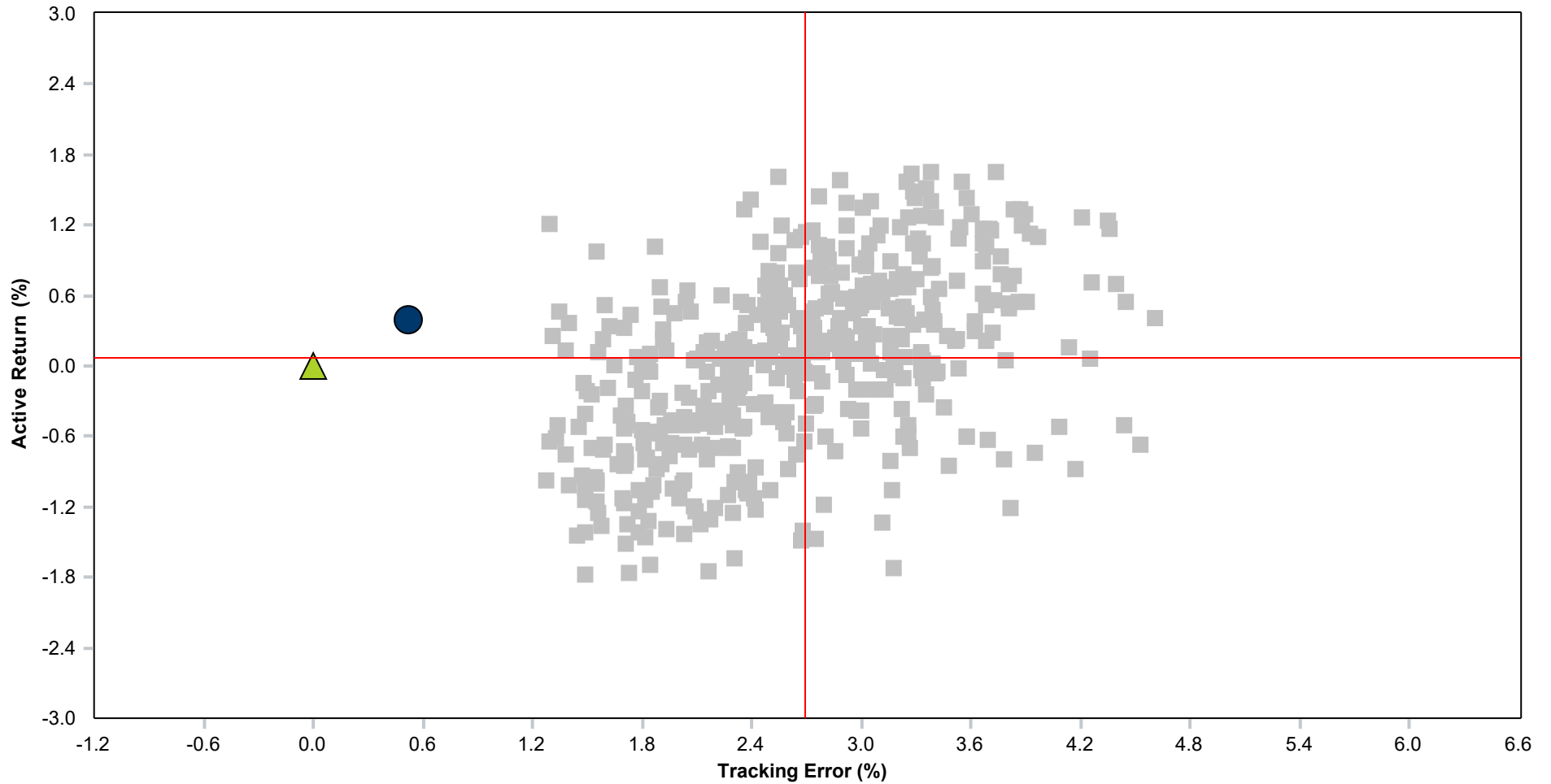
	Return	Standard Deviation
● KRS Pension Plan	8.28	5.17
▲ KRS Allocation Index	7.84	5.37
— Median	7.79	7.16

Calculation based on monthly periodicity.

# Plan Sponsor Scattergram

KRS Pension Plan vs All Public Plans-Total Fund

Periods Ended October 1, 2016 To September 30, 2019



	Active Return	Tracking Error
● KRS Pension Plan	0.39	0.52
▲ KRS Allocation Index	0.00	0.00
— Median	0.07	2.69

Calculation based on monthly periodicity.



# Cash Flow Summary

KRS Pension Plan

1 Quarter Ending September 30, 2019

	Begin Value	Contributions	Distributions	Fees	Expenses	Capital Apprec./ Deprec.	End Value
<b>KRS Pension Plan</b>	<b>12,745,732,924</b>	<b>2,099,680,720</b>	<b>-2,105,037,458</b>	<b>-15,258,003</b>	<b>-19,210,874</b>	<b>196,175,132</b>	<b>12,902,082,442</b>
<b>US Equity Composite</b>	<b>2,325,593,793</b>	<b>123,585,000</b>	<b>-122,495,193</b>	<b>-390,540</b>	<b>-732,807</b>	<b>29,882,738</b>	<b>2,355,442,991</b>
S&P 500 Index	1,136,506,652	113,085,000	-7,522,065		-82,778	20,176,644	1,262,163,454
Scientific Beta	420,958,654		-3,058,089		-189,475	9,512,427	427,223,516
River Road FAV	158,522,636	5,250,000	-496,754	-113,546	-92,386	1,861,462	164,931,412
Westfield Capital	152,281,009	5,250,000	-368,912	-217,705	-28,598	1,343,354	158,259,148
Internal US Mid Cap	271,846,723		-110,279,634		-168,232	-450,384	160,948,473
NTGI Structured	185,453,373		-769,740	-59,289	-171,339	-2,589,015	181,863,990
Invesco	7,596					32,606	40,203
Transition Account	17,152					-4,356	12,795
<b>Non-US Equity Composite</b>	<b>2,557,201,639</b>		<b>-15,597,630</b>	<b>-1,712,079</b>	<b>-26,150</b>	<b>-28,097,587</b>	<b>2,511,768,194</b>
BlackRock ACWI Ex US	1,008,689,192		-9,668,445	-133,409		-17,841,707	981,045,631
American Century	352,102,039		-532,972	-370,600	-17,368	2,553,315	353,734,413
Franklin Templeton	255,001,836		-742,302	-258,628	38,918	2,505,759	256,545,583
Lazard Asset Mgmt	464,855,732		-2,505,595	-336,553	-13,372	-8,643,699	453,356,512
LSV Asset Mgmt	394,581,022		-2,148,234	-594,736	-33,758	-5,963,546	385,877,672
NTGI Int'l Small Cap	77,780,166			-18,152		-798,043	76,963,971
Boston Company	758,964					68	722,107
Pyramis Intl	2,094,118					-885	2,093,233
Non-US Equity Transition	1,338,569		-81		-569	91,152	1,429,071
<b>Fixed Income Composite</b>	<b>4,255,220,789</b>	<b>512,909,148</b>	<b>-463,950,610</b>	<b>-5,290,285</b>	<b>-2,257,379</b>	<b>77,866,373</b>	<b>4,374,498,036</b>
<b>Core Fixed Composite</b>	<b>2,286,911,684</b>	<b>455,000,000</b>	<b>-431,006,006</b>	<b>-724,163</b>	<b>-424,188</b>	<b>32,113,774</b>	<b>2,341,871,101</b>
BNY IG Credit	528,175,362		-425,000,000			1,052,311	104,227,673
Loomis Sayles Intmd	576,326,427		-752,636	-87,301	-141,858	7,960,435	583,305,068
Lord Abbett	565,663,902	455,000,000	-609,670	-397,852	-188,076	8,955,533	1,028,423,837
NISA	616,745,994		-4,643,700	-239,010	-94,255	14,145,495	625,914,524

# Cash Flow Summary

KRS Pension Plan

1 Quarter Ending September 30, 2019

	Begin Value	Contributions	Distributions	Fees	Expenses	Capital Apprec./ Deprec.	End Value
<b>Opportunistic Fixed Composite</b>	<b>1,968,309,105</b>	<b>57,909,148</b>	<b>-32,944,604</b>	<b>-4,566,122</b>	<b>-1,833,191</b>	<b>45,752,599</b>	<b>2,032,626,935</b>
Arrowmark	117,663,130	21,146,311	-2,716,479	-566,352		3,577,679	139,104,289
BSP Coinvestment		11,495,821					11,495,821
BSP Private Credit	55,055,955	6,600,660	-1,265,113	-140,473		1,044,919	61,295,948
Cerberus Capital Mgmt	91,377,553	14,000,000	-14,350,000	-541,839	-376,280	3,050,374	93,159,808
Columbia	359,037,026		-5,926,930	-340,529	-380,333	8,160,710	360,549,944
Manulife Asset Mgmt	468,479,717		-5,249,696	-323,799	-137,985	10,059,395	472,827,632
Marathon Bluegrass	348,580,835			-1,848,994		9,567,951	356,299,792
Shenkman Capital	239,064,280		-1,718,647	-300,012	-575,436	3,039,653	239,509,838
Waterfall	196,170,087			-275,071	-225	5,080,495	200,975,287
White Oak Yield Spectrum	92,840,460	4,666,356	-1,717,549	-229,054	-362,932	2,171,235	97,368,516
Loomis	40,063		-190			188	40,061
<b>Real Return Composite</b>	<b>1,105,913,926</b>	<b>29,974,288</b>	<b>-36,242,115</b>	<b>-1,073,768</b>	<b>-958,084</b>	<b>8,985,740</b>	<b>1,106,599,987</b>
Internal TIPS	234,800,407		-25,009,058		-9,065	748,094	210,530,378
PIMCO All Asset	345,838,204		-2,960,761			904,912	343,782,355
Tortoise Capital	151,096,037		-18,379	-102,140	-95,393	-9,206,741	141,673,384
Nuveen Real Asset	219,307,051		-3,287,843	-372,997	-57,016	8,589,569	224,178,763
Amerra AGRI Fund II	21,711,032		-262,178	-48,513	-40,101	287,145	21,647,385
Amerra AGRI Holdings	43,818,717		-500,498	-231,260	-231,127	1,361,178	44,217,010
BTG Pactual	24,022,028		-574,703	-103,981	-9,147	238,258	23,572,456
IFM Infrastructure		23,554,114		-20,156	52,109	217,373	23,803,439
Magnetar MTP EOF II	35,305,820		-2,977,056	-100,947	-224,542	1,223,658	33,226,933
Oberland Capital	3,602,583		-651,638	-93,773	-343,802	1,121,931	3,635,301
Taurus Mine Finance	25,634,897	6,420,174				3,500,987	35,556,058
TPF II	777,151					-625	776,526
<b>Real Estate Composite</b>	<b>623,590,059</b>	<b>67,551,409</b>	<b>-15,006,740</b>	<b>-4,846,105</b>	<b>-6,549,400</b>	<b>35,207,882</b>	<b>699,947,105</b>

# Cash Flow Summary

KRS Pension Plan

1 Quarter Ending September 30, 2019

	Begin Value	Contributions	Distributions	Fees	Expenses	Capital Apprec./ Deprec.	End Value
Baring	37,696,396	3,179,408			-4,190,453	14,401,641	51,086,992
Divcowest IV	3,154,180			-24,409	-274,937	953,673	3,808,507
Fundamental Partners III	38,731,858	3,584,653	-4,229,607	-262,500	-1,457,893	3,699,636	40,066,147
Greenfield Acq VI	2,544,455			97,195		-735,731	1,905,919
Greenfield Acq VII	19,590,354		-2,456,698	-480,873		2,250,667	18,903,450
H/2 Credit Partner	83,865,628					-130,135	83,735,494
Harrison Street	81,454,328		-799,391	-153,111		1,157,558	81,659,384
Lubert Adler VII	29,714,833		-1,057,609	-67,212	-23,797	153,392	28,719,606
Lubert Adler VII B	20,539,159	5,512,500		-49,906	-484,510	1,453,720	26,970,962
Mesa West IV	16,029,550		-265,414	-243,000	-14,648	690,387	16,196,875
Mesa West Core Lend	58,668,822		-977,911	-236,665		2,214,063	59,668,309
Patron Capital	14,093,427	4,274,849	-1,910,025		-103,162	277,213	16,632,302
Prologis Targeted US	82,979,244	51,000,000	-643,077	-2,911,194		6,303,674	136,728,647
Rubenstein PF II	17,021,658			-106,368		1,107,077	18,022,367
Stockbridge Sm/Mkts	88,890,967		-877,636	-189,916		1,375,217	89,198,631
Walton St RE VI	13,637,377			-36,186		-14,823	13,586,368
Walton St RE VII	14,977,823		-1,789,372	-181,961		50,654	13,057,144
<b>Absolute Return Composite</b>	<b>218,572,402</b>		<b>-13,550,237</b>	<b>-232,262</b>		<b>-596,038</b>	<b>204,193,864</b>
Blackstone Strat Opp	4,038,203					-80,004	3,958,199
Credit Suisse	8,283,280		-7,900,544	-18,705		51,787	415,818
Gotham Neutral Strategies	12,909,848			-21,750		20,753	12,908,852
Governors Lane Onshore	21,457,680		-5,454,603	-69,068		313,937	16,247,946
Liquidalts H2O Force	16,888,580					208,726	17,097,306
Luxor Capital	1,665,897					-62,868	1,603,029
Myriad Opportunities	44,107,645			-109,634		-586,773	43,411,239
PAAMCO	164,785		-157,694			4	7,095
Pine River	274,855		-37,397	-326		16,463	253,596
PRISMA Capital	96,840,006					-463,408	96,376,598

# Cash Flow Summary

KRS Pension Plan

1 Quarter Ending September 30, 2019

	Begin Value	Contributions	Distributions	Fees	Expenses	Capital Apprec./ Deprec.	End Value
SRS Partners US	8,413,921			-10,888		-53,638	8,349,395
Tricadia Select	3,527,703			-1,892		38,981	3,564,792
<b>Private Equity Composite</b>	<b>1,181,283,403</b>	<b>21,841,318</b>	<b>-109,710,641</b>	<b>-1,712,963</b>	<b>-7,890,910</b>	<b>70,033,860</b>	<b>1,153,844,068</b>
<b>Cash Composite</b>	<b>471,056,912</b>	<b>1,343,819,558</b>	<b>-1,328,484,292</b>		<b>-796,144</b>	<b>2,892,164</b>	<b>488,488,198</b>
Perimeter Park	7,300,000						7,300,000



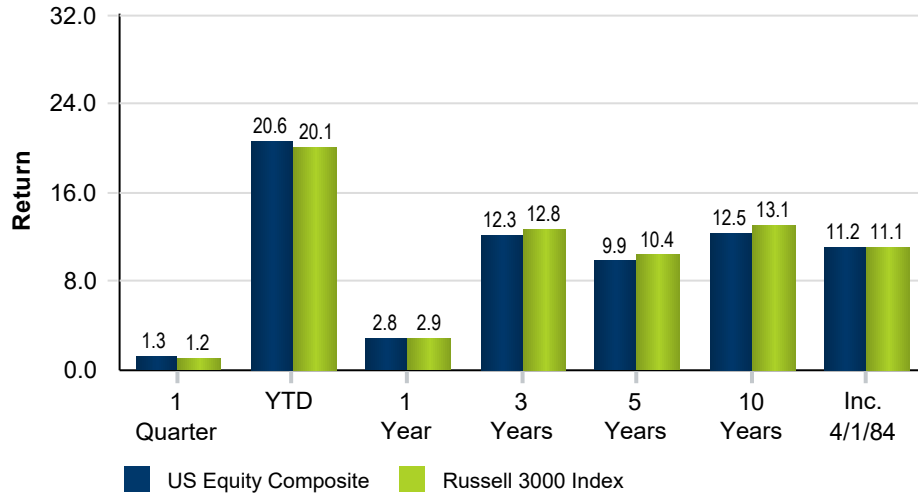
# US Equity Composite

# Composite Performance Summary

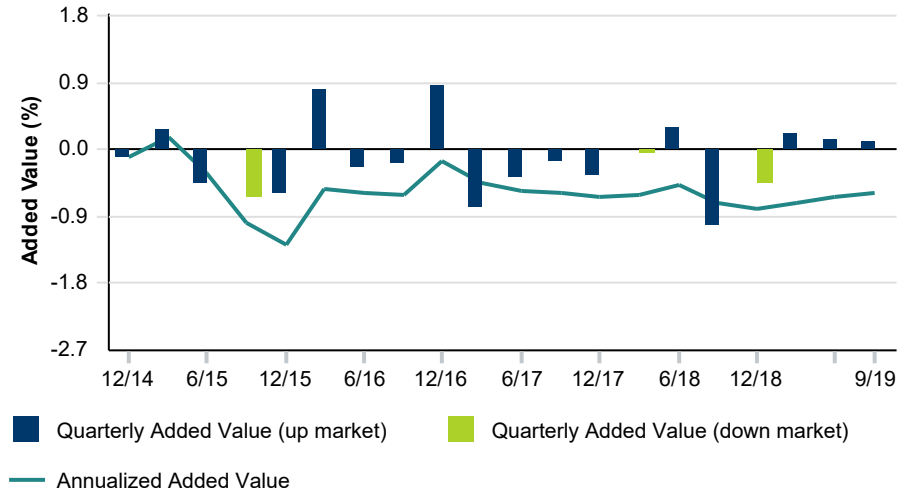
US Equity Composite

Periods Ended September 30, 2019

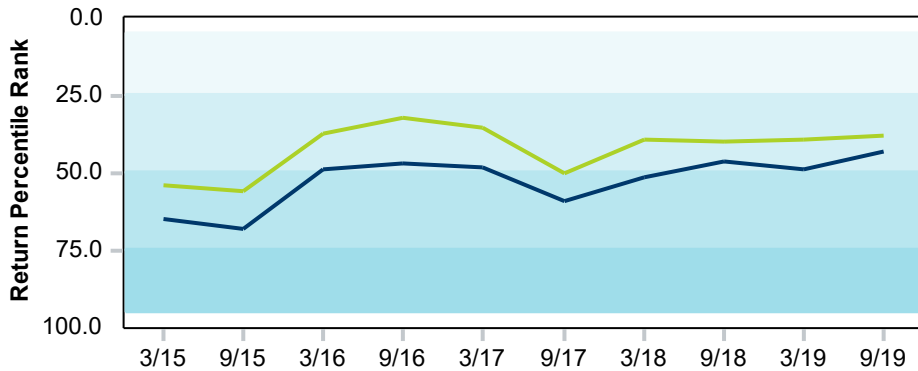
**Comparative Performance**



**Added Value History**

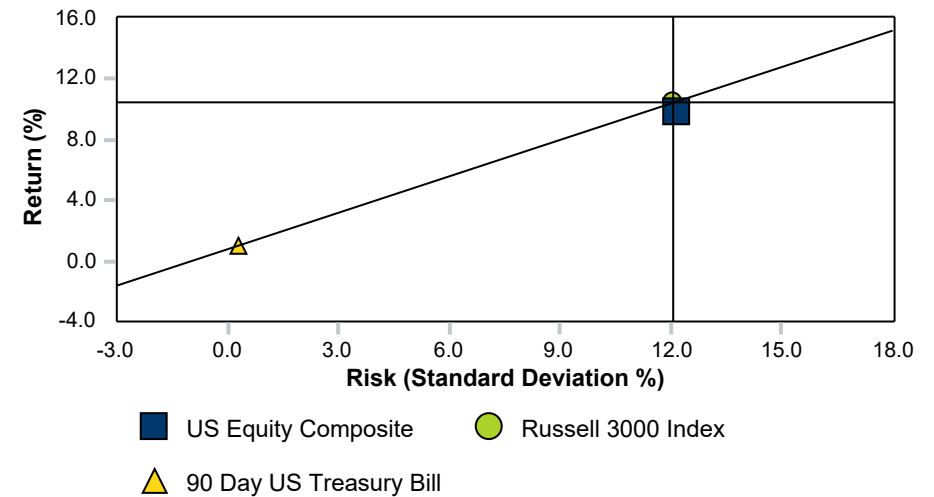


**Rolling Percentile Rank: IM U.S. Equity (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
US Equity Composite	10	0 (0%)	6 (60%)	4 (40%)	0 (0%)
Benchmark	10	0 (0%)	8 (80%)	2 (20%)	0 (0%)

**Risk and Return 10/1/14 - 09/30/19**

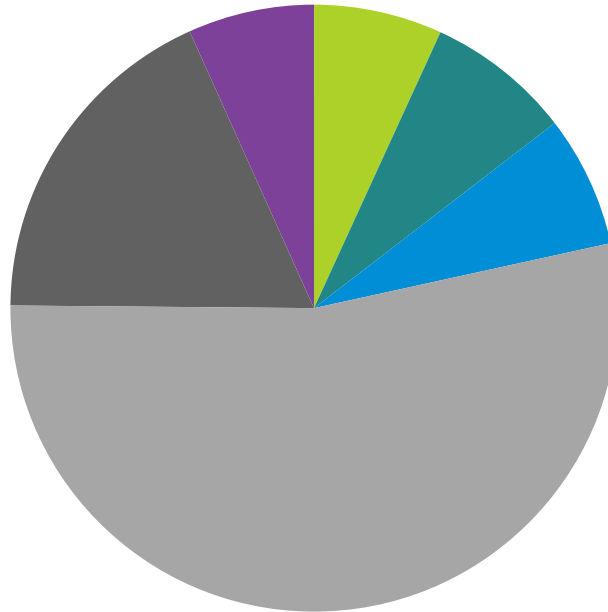


# Asset Allocation By Manager

US Equity Composite

Periods Ended September 30, 2019

Sep-2019 : 2,355,442,991

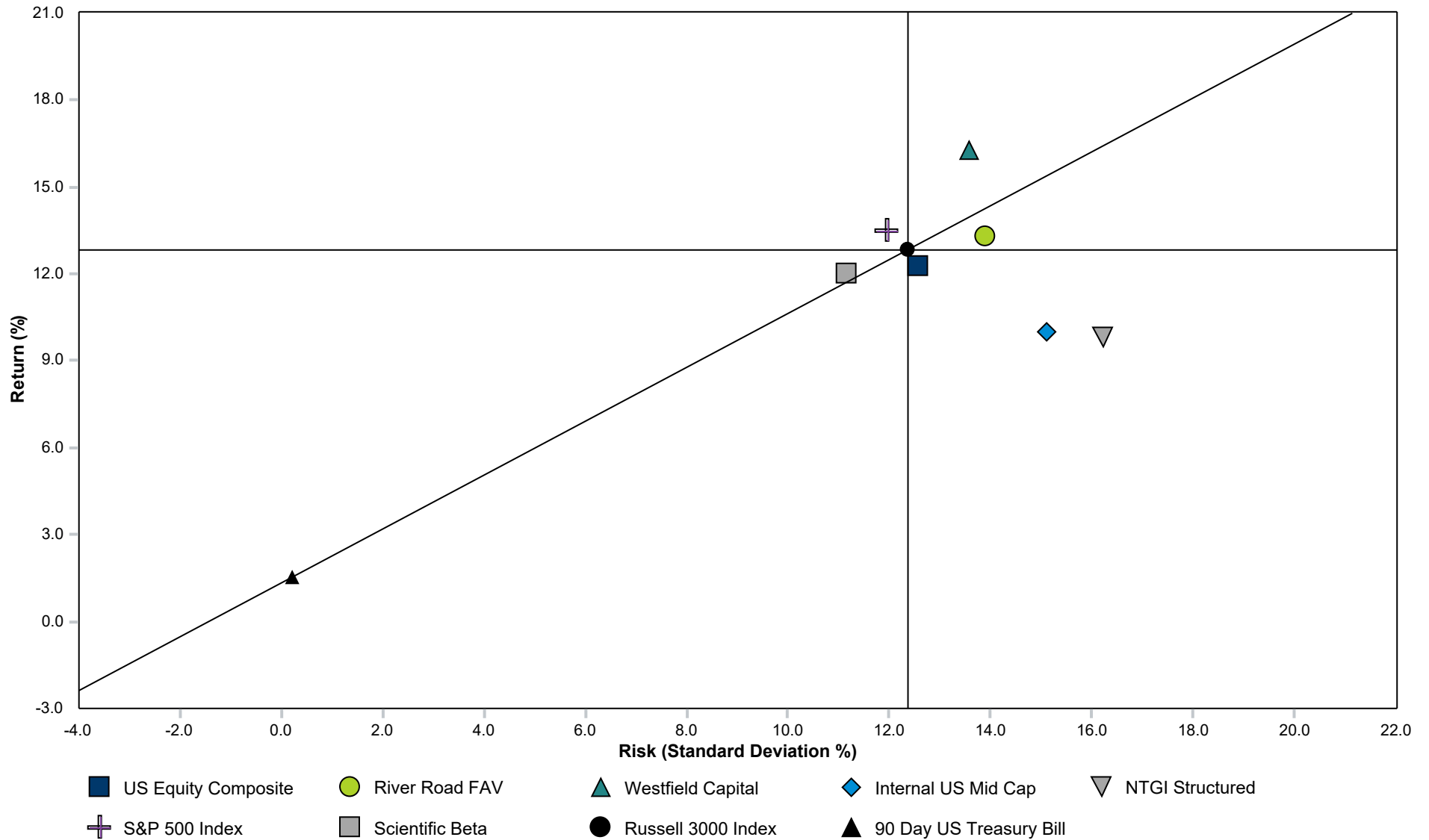


	Market Value \$	Allocation (%)
■ Invesco	40,203	0.0
■ Internal US Mid Cap	160,948,473	6.8
■ NTGI Structured	181,863,990	7.7
■ River Road FAV	164,931,412	7.0
■ S&P 500 Index	1,262,163,454	53.6
■ Scientific Beta	427,223,516	18.1
■ Transition Account	12,795	0.0
■ Westfield Capital	158,259,148	6.7

# Risk vs. Return

US Equity Composite

Periods Ended 3 Years Ending September 30, 2019



Calculation based on monthly periodicity.

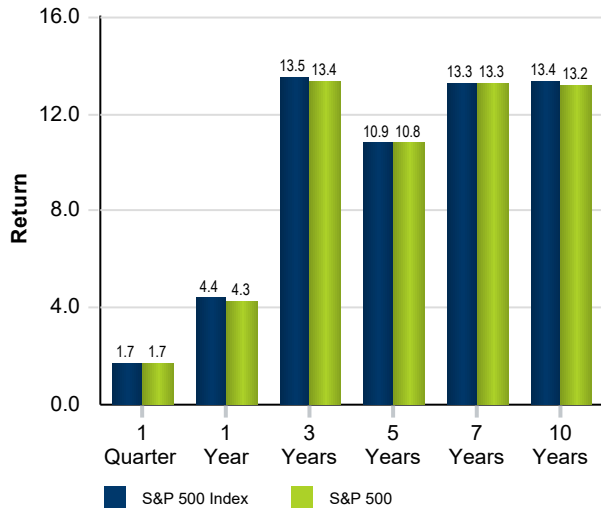


# Performance Summary

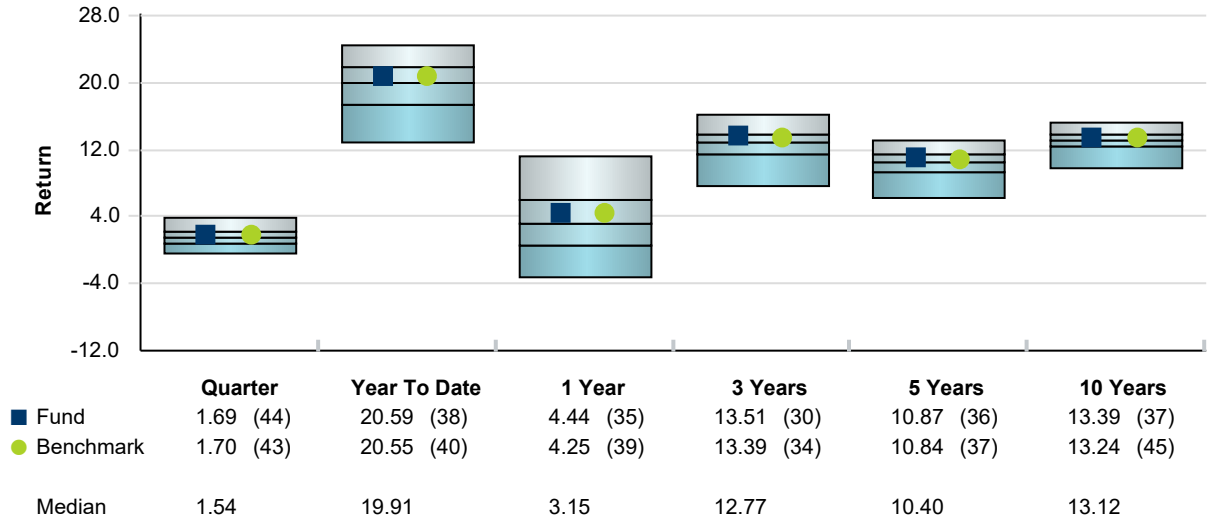
S&P 500 Index

Periods Ended September 30, 2019

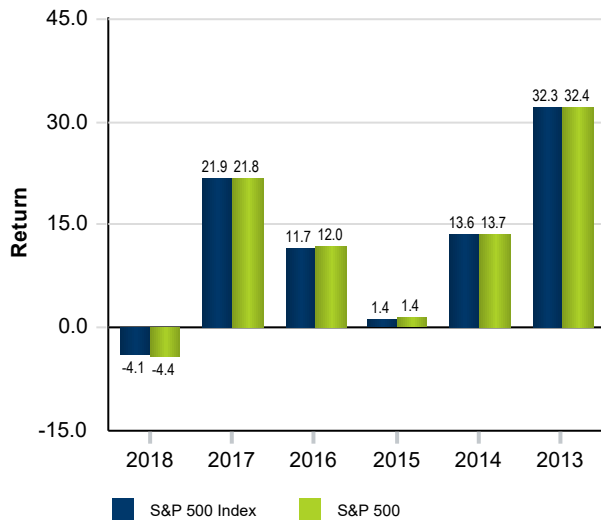
## Comparative Performance



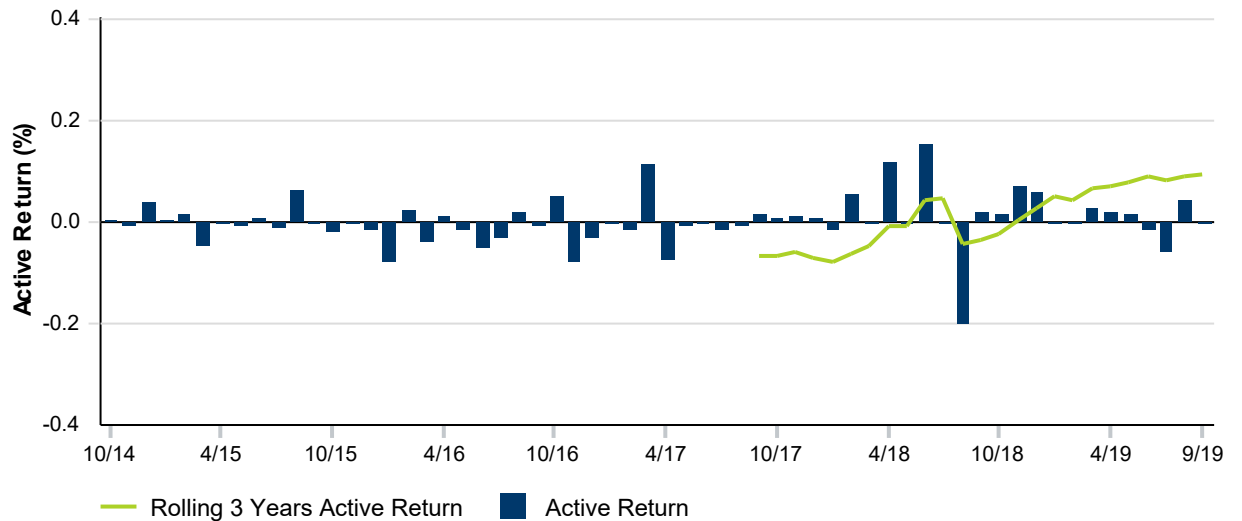
## Peer Group Analysis: IM U.S. Large Cap Core Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

S&P 500 Index

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>S&amp;P 500 Index</u>	<u>S&amp;P 500</u>
Maximum Return	8.01	8.01
Minimum Return	-8.97	-9.03
Return	4.44	4.25
Cumulative Return	4.44	4.25
Active Return	0.17	0.00
Excess Return	3.62	3.45

## Risk Summary Statistics

	<u>S&amp;P 500 Index</u>	<u>S&amp;P 500</u>
Upside Risk	3.58	3.58
Downside Risk	13.02	13.08
Beta	1.00	1.00

## Risk/Return Summary Statistics

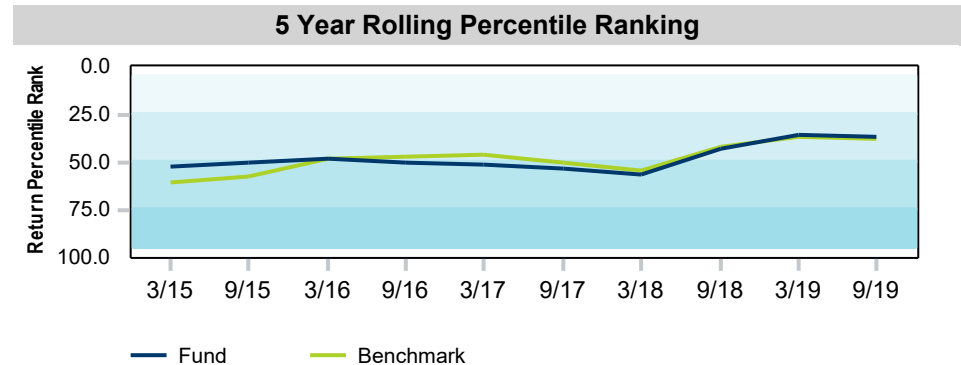
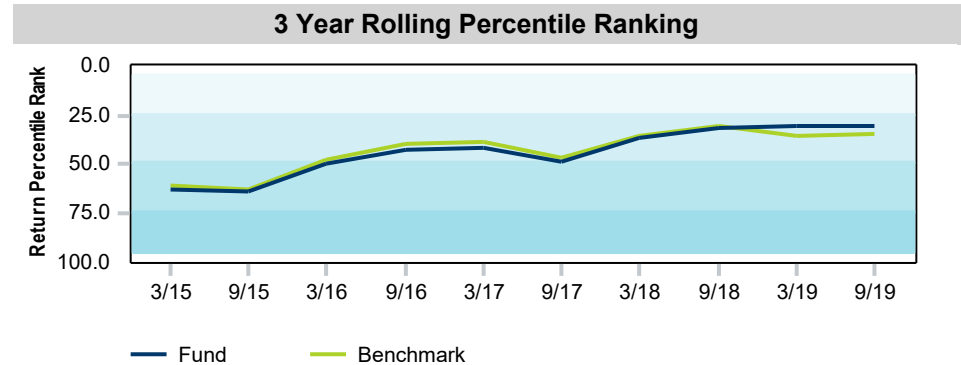
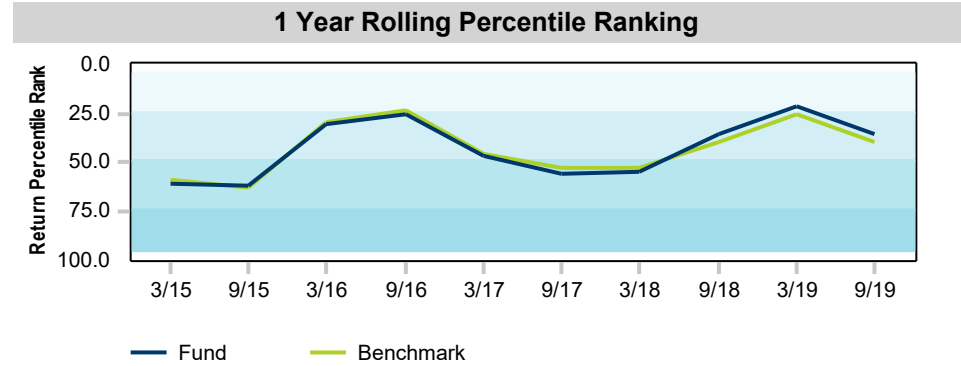
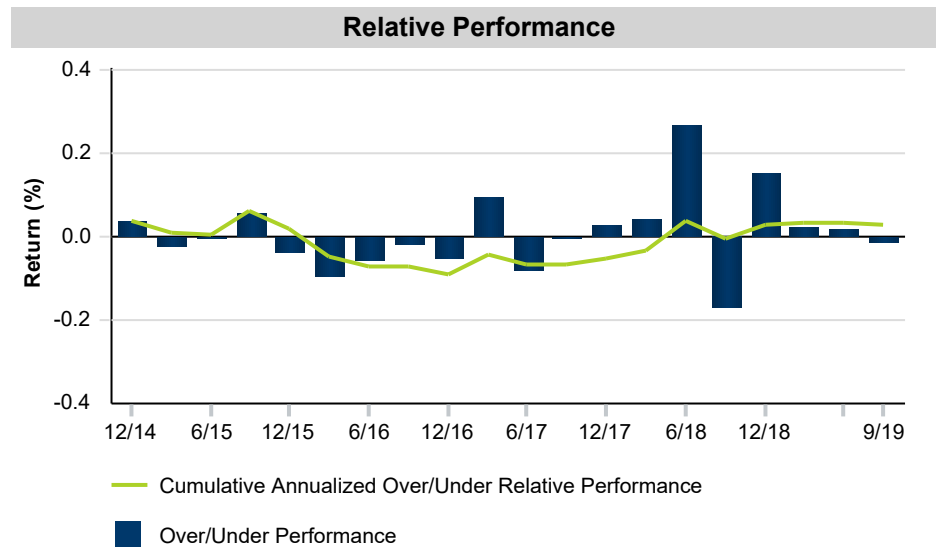
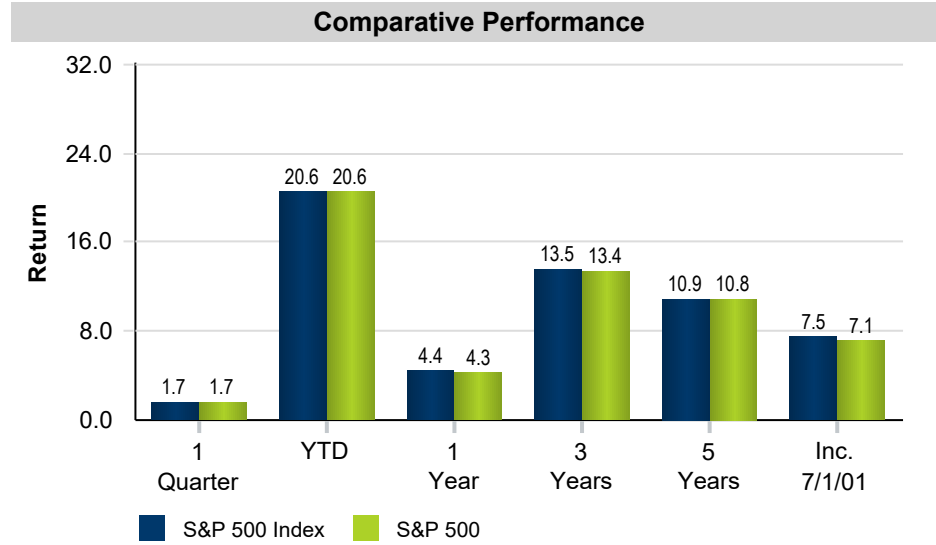
	<u>S&amp;P 500 Index</u>	<u>S&amp;P 500</u>
Standard Deviation	17.91	17.96
Alpha	0.19	0.00
Active Return/Risk	0.01	0.00
Tracking Error	0.12	0.00
Information Ratio	1.49	
Sharpe Ratio	0.20	0.19

## Correlation Statistics

	<u>S&amp;P 500 Index</u>	<u>S&amp;P 500</u>
R-Squared	1.00	1.00
Actual Correlation	1.00	1.00

# Manager Summary

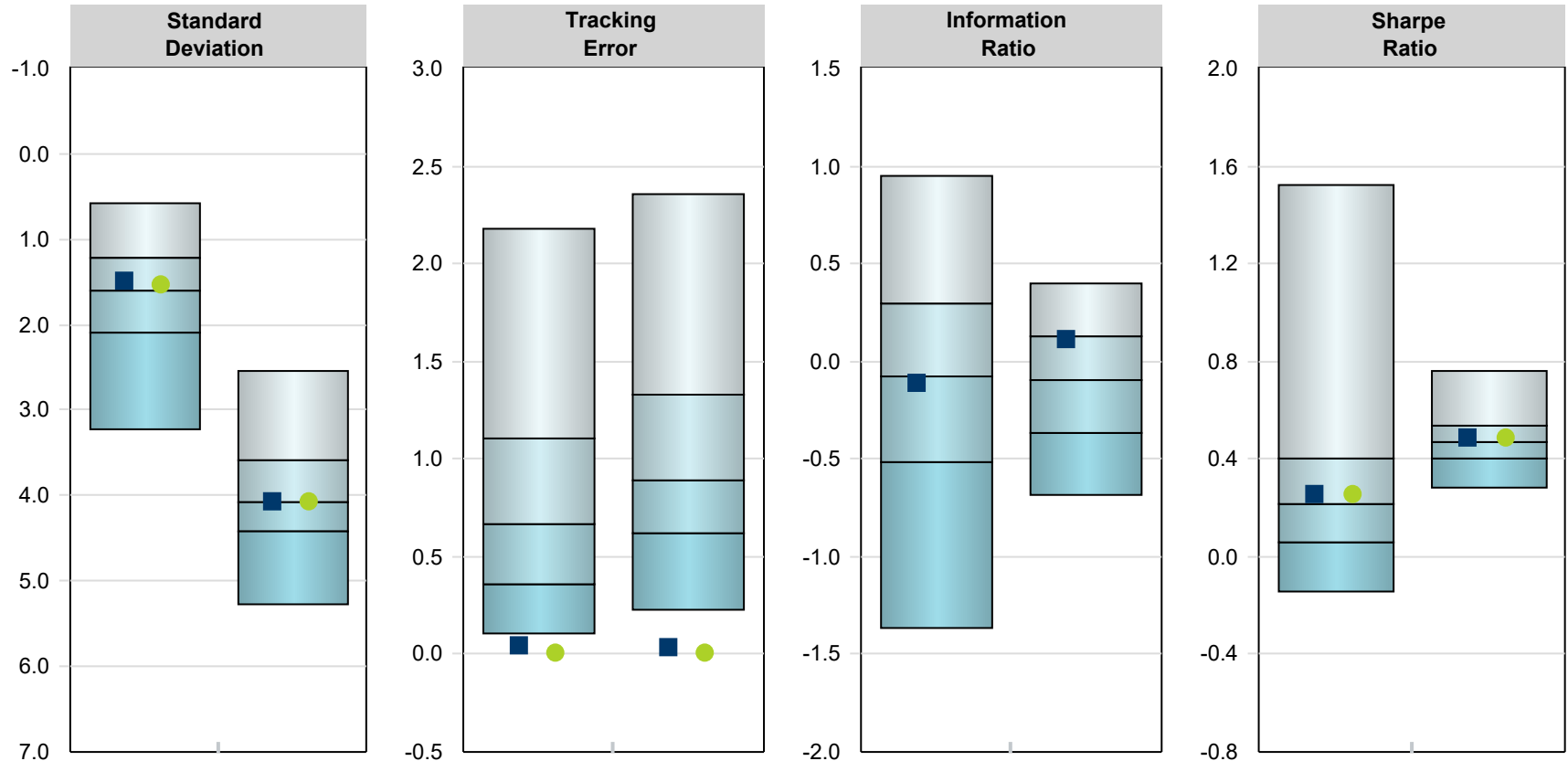
S&P 500 Index vs IM U.S. Large Cap Core Equity (SA+CF)  
 Periods Ended September 30, 2019



# Peer Group Analysis - Multi Statistics

S&P 500 Index

Periods Ended September 30, 2019



	QTD	YTD	QTD	YTD	QTD	YTD	QTD	YTD
■ S&P 500 Index	1.51 (41)	4.07 (48)	0.04 (97)	0.03 (98)	-0.11 (53)	0.11 (28)	0.25 (38)	0.49 (40)
● S&P 500	1.54 (43)	4.08 (49)	0.00 (100)	0.00 (100)			0.25 (40)	0.48 (41)
5th Percentile	0.58	2.55	2.18	2.36	0.95	0.39	1.53	0.76
1st Quartile	1.23	3.60	1.10	1.33	0.30	0.13	0.40	0.54
Median	1.61	4.08	0.66	0.89	-0.08	-0.10	0.22	0.47
3rd Quartile	2.10	4.41	0.36	0.62	-0.51	-0.37	0.06	0.40
95th Percentile	3.21	5.28	0.10	0.23	-1.36	-0.68	-0.14	0.28

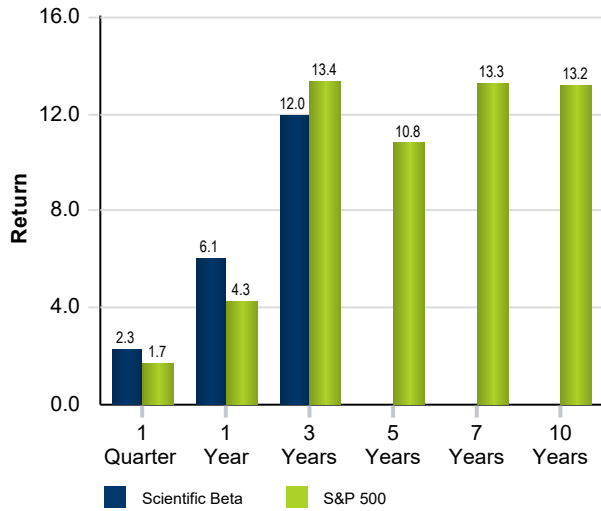
Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

# Performance Summary

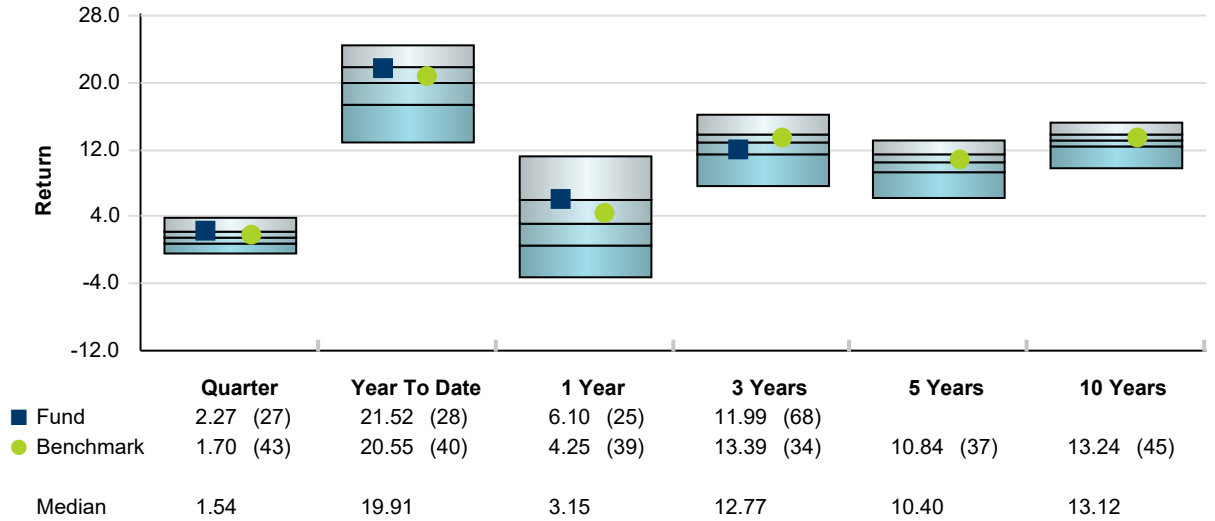
Scientific Beta

Periods Ended September 30, 2019

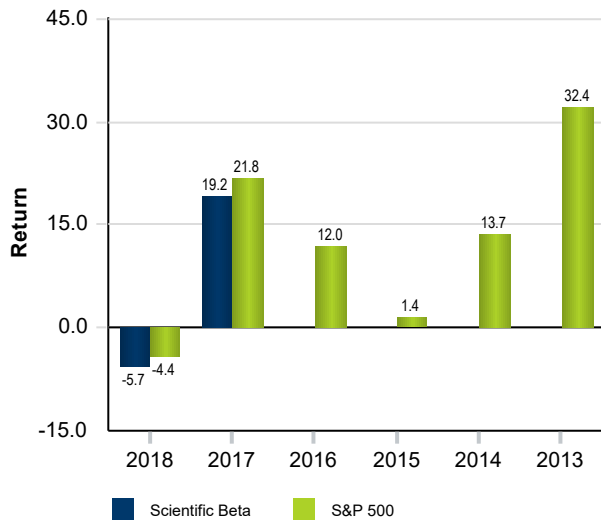
## Comparative Performance



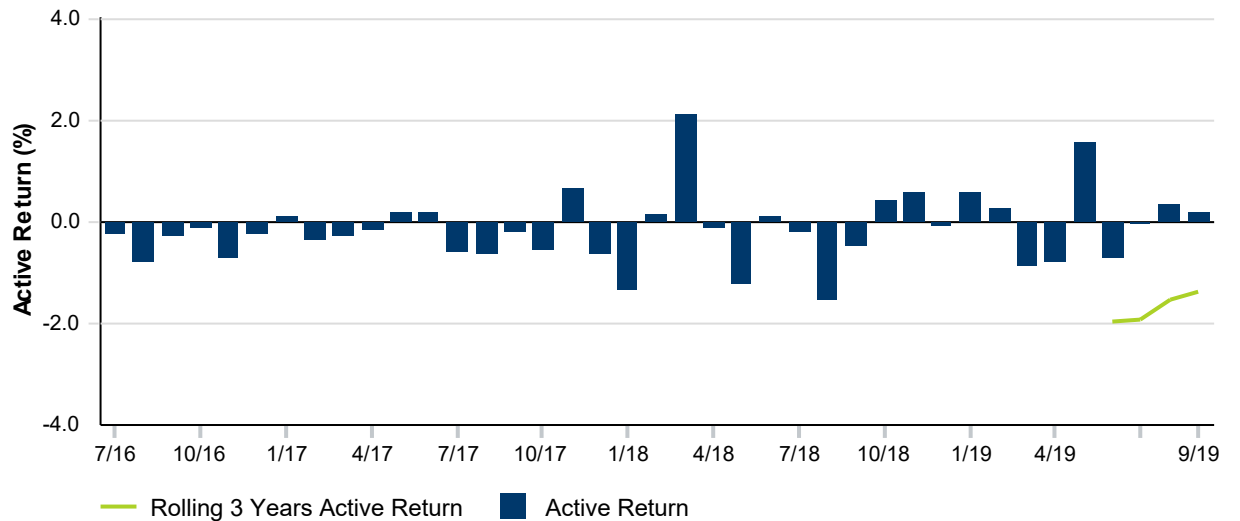
## Peer Group Analysis: IM U.S. Large Cap Core Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

## Scientific Beta

Periods Ended 1 Year Ending September 30, 2019

### Return Summary Statistics

	<u>Scientific Beta</u>	<u>S&amp;P 500</u>
Maximum Return	8.61	8.01
Minimum Return	-9.09	-9.03
Return	6.10	4.25
Cumulative Return	6.10	4.25
Active Return	1.62	0.00
Excess Return	5.07	3.45

### Risk Summary Statistics

	<u>Scientific Beta</u>	<u>S&amp;P 500</u>
Upside Risk	3.55	3.58
Downside Risk	12.17	13.08
Beta	0.95	1.00

### Risk/Return Summary Statistics

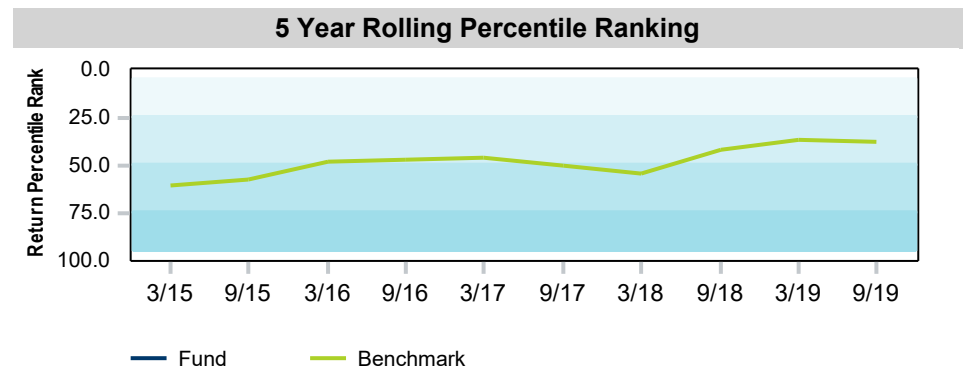
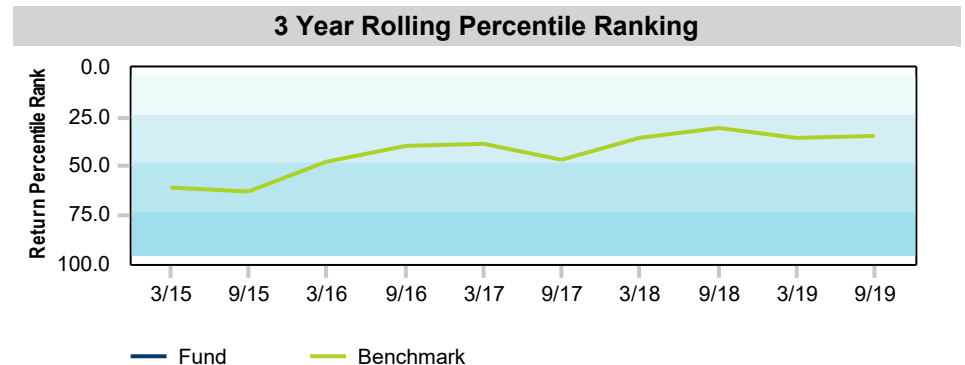
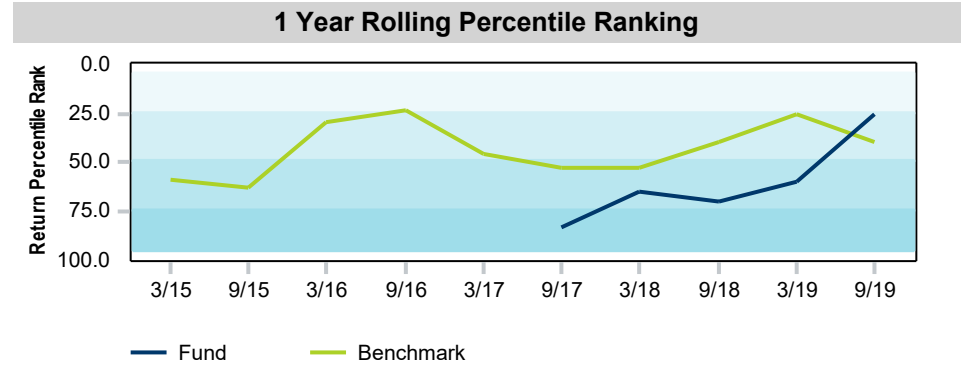
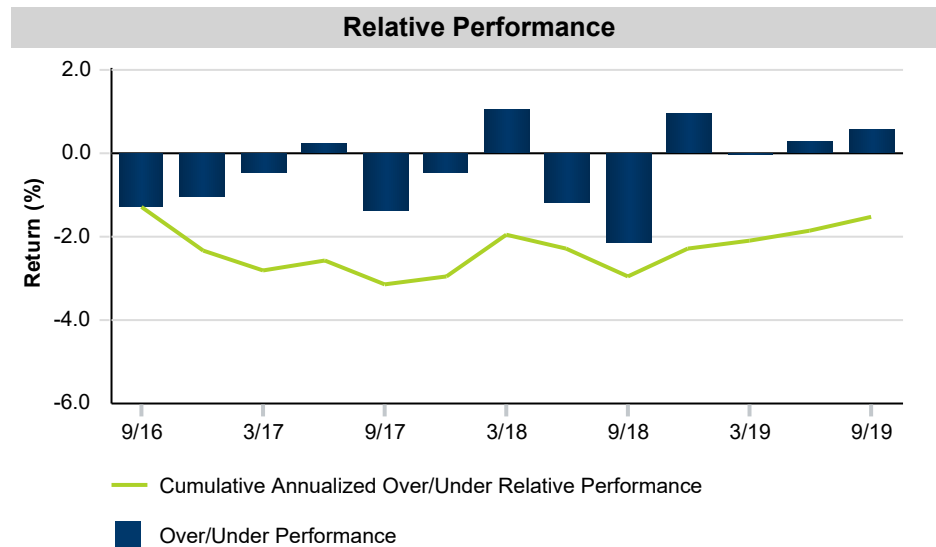
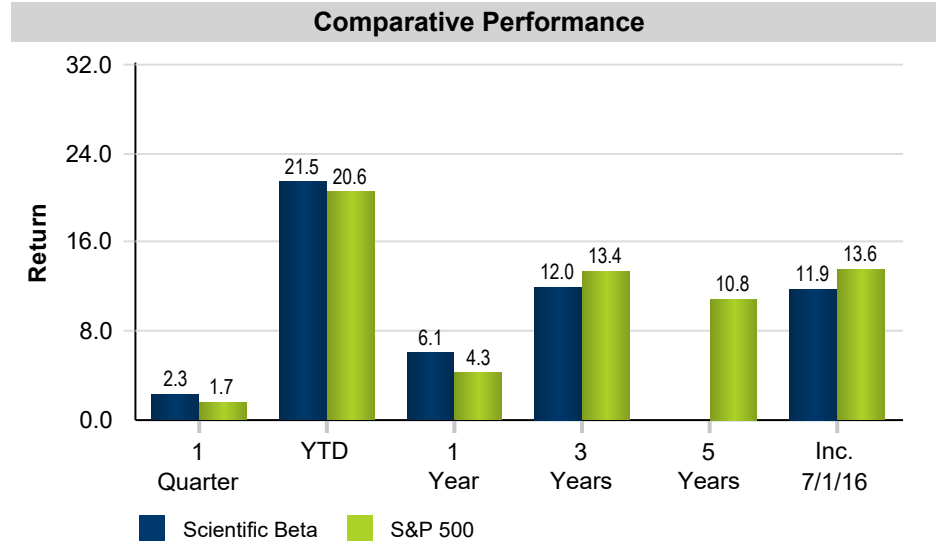
	<u>Scientific Beta</u>	<u>S&amp;P 500</u>
Standard Deviation	17.18	17.96
Alpha	1.93	0.00
Active Return/Risk	0.09	0.00
Tracking Error	2.29	0.00
Information Ratio	0.71	
Sharpe Ratio	0.30	0.19

### Correlation Statistics

	<u>Scientific Beta</u>	<u>S&amp;P 500</u>
R-Squared	0.99	1.00
Actual Correlation	0.99	1.00

# Manager Summary

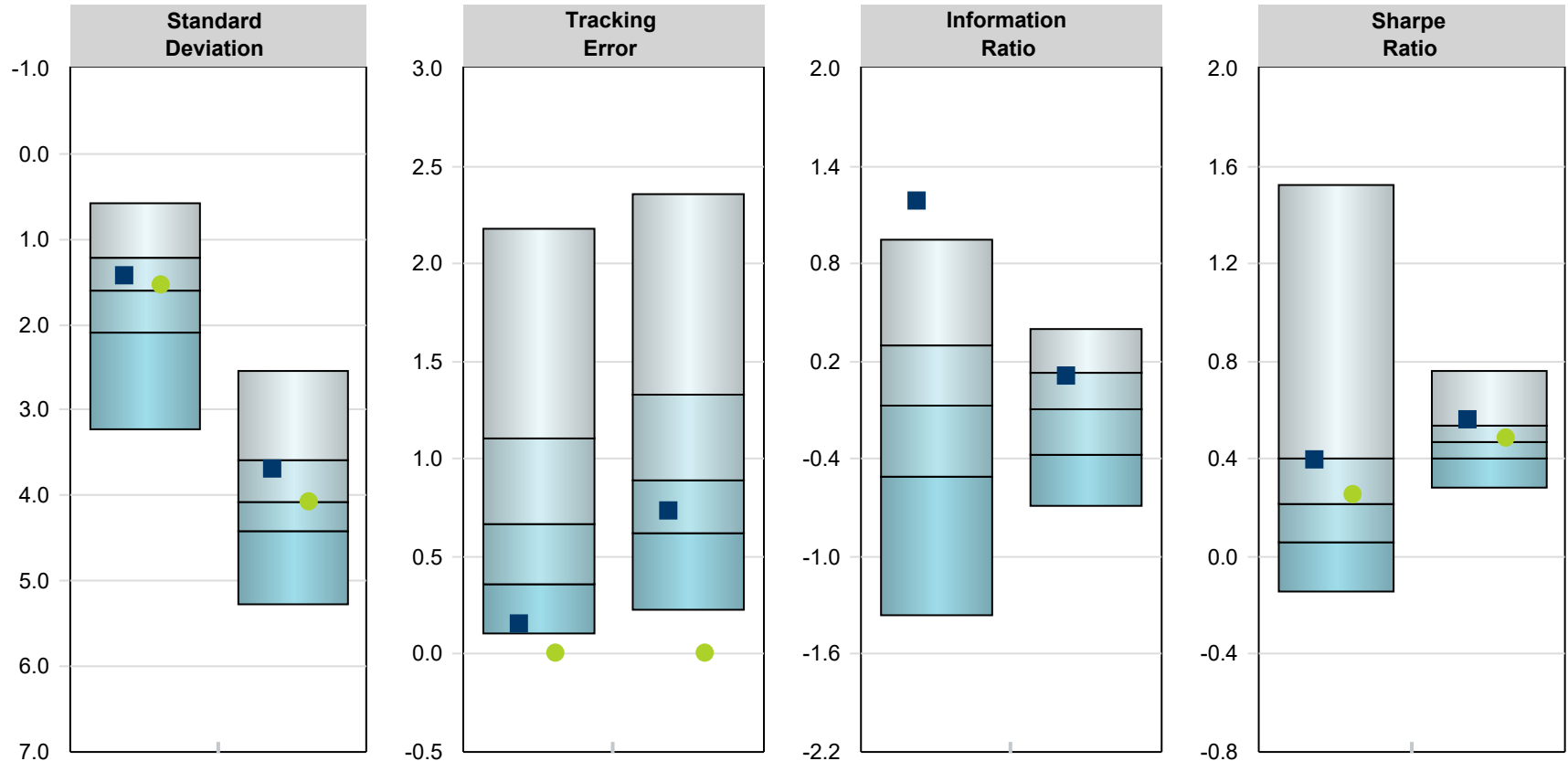
Scientific Beta vs IM U.S. Large Cap Core Equity (SA+CF)  
 Periods Ended September 30, 2019



# Peer Group Analysis - Multi Statistics

Scientific Beta

Periods Ended September 30, 2019



	Standard Deviation		Tracking Error		Information Ratio		Sharpe Ratio	
	QTD	YTD	QTD	YTD	QTD	YTD	QTD	YTD
■ Scientific Beta	1.43 (37)	3.70 (28)	0.16 (92)	0.74 (63)	1.18 (5)	0.10 (28)	0.40 (26)	0.56 (23)
● S&P 500	1.54 (43)	4.08 (49)	0.00 (100)	0.00 (100)			0.25 (40)	0.48 (41)
5th Percentile	0.58	2.55	2.18	2.36	0.95	0.39	1.53	0.76
1st Quartile	1.23	3.60	1.10	1.33	0.30	0.13	0.40	0.54
Median	1.61	4.08	0.66	0.89	-0.08	-0.10	0.22	0.47
3rd Quartile	2.10	4.41	0.36	0.62	-0.51	-0.37	0.06	0.40
95th Percentile	3.21	5.28	0.10	0.23	-1.36	-0.68	-0.14	0.28

Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

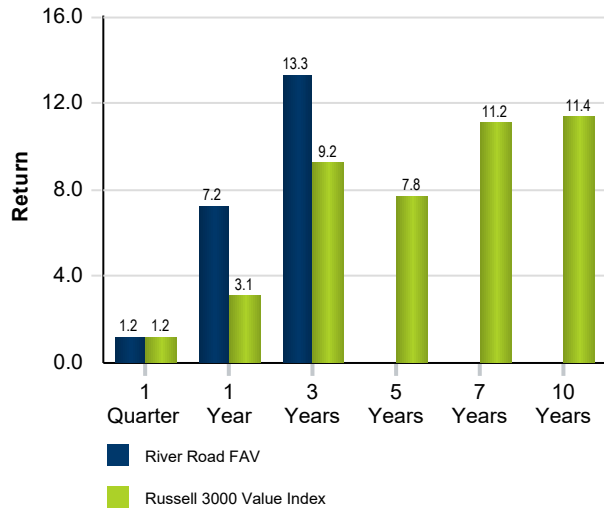


# Performance Summary

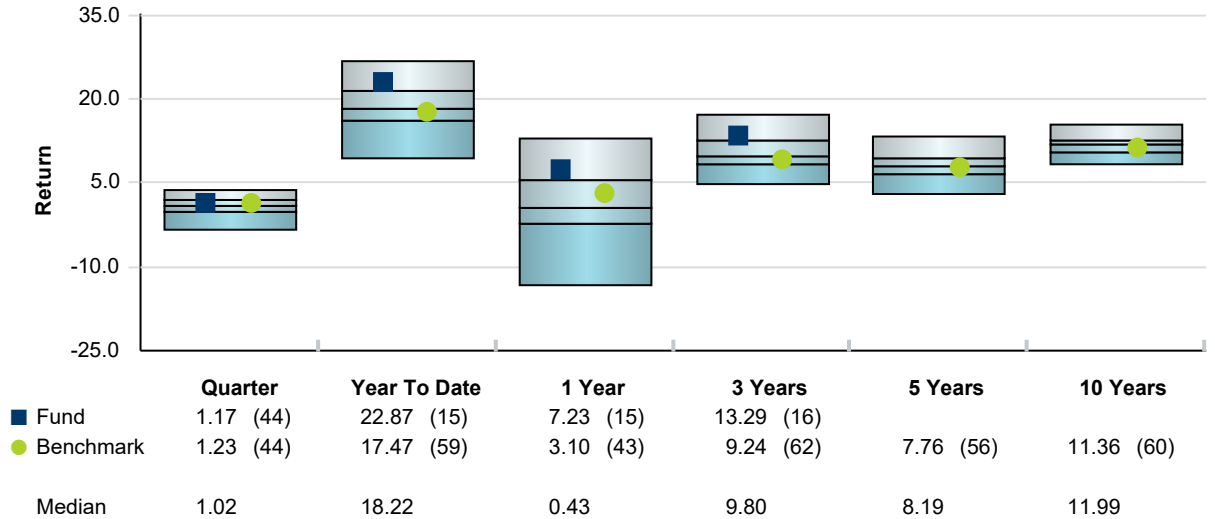
River Road FAV

Periods Ended September 30, 2019

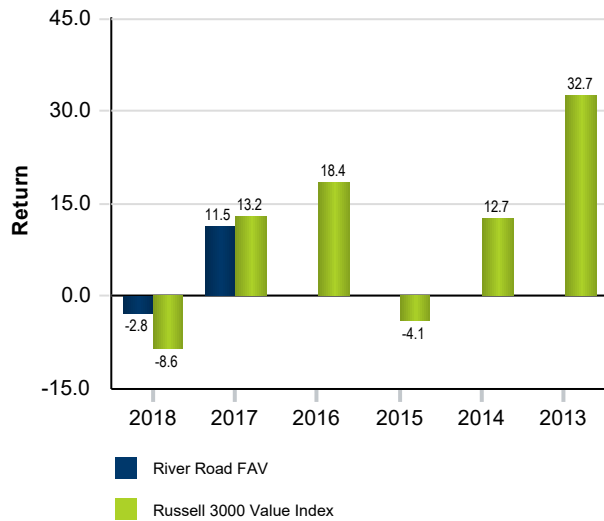
## Comparative Performance



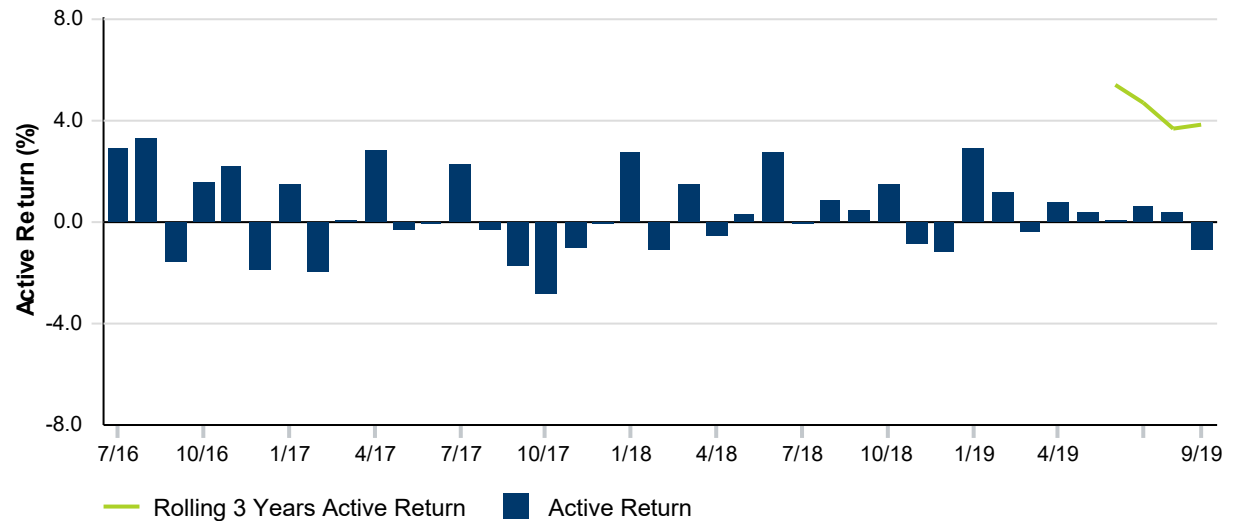
## Peer Group Analysis: IM U.S. All Cap Value Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

River Road FAV

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>River Road FAV</u>	<u>Russell 3000 Value Index</u>
Maximum Return	10.88	8.00
Minimum Return	-10.93	-9.78
Return	7.23	3.10
Cumulative Return	7.23	3.10
Active Return	4.23	0.00
Excess Return	6.63	2.40

## Risk Summary Statistics

	<u>River Road FAV</u>	<u>Russell 3000 Value Index</u>
Upside Risk	4.30	3.66
Downside Risk	13.45	13.34
Beta	1.07	1.00

## Risk/Return Summary Statistics

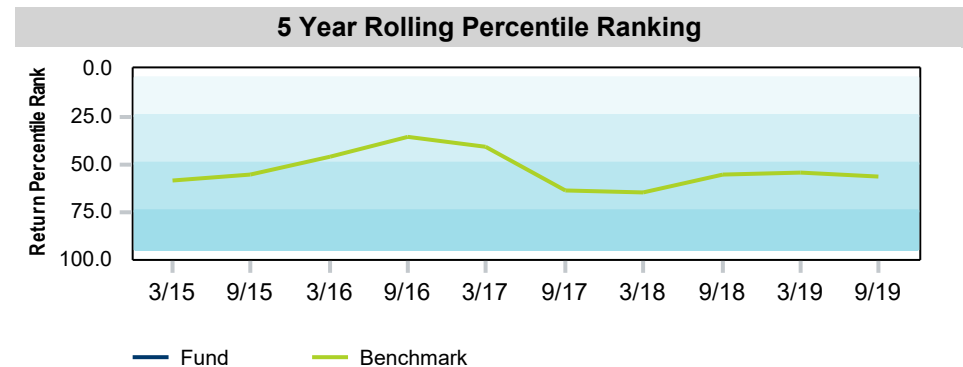
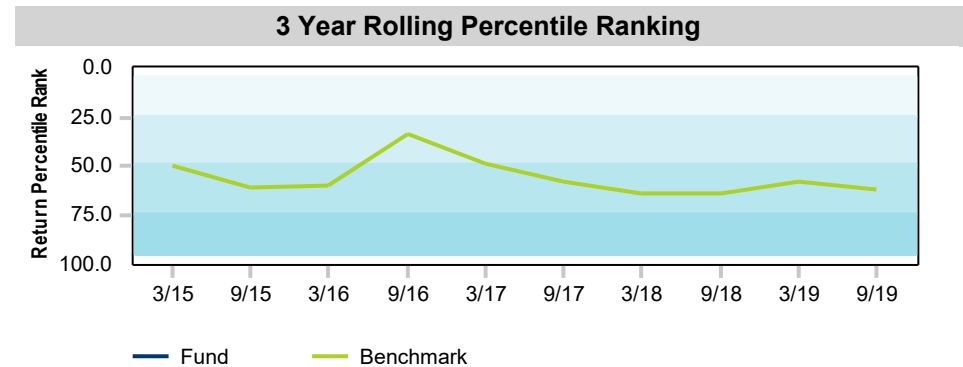
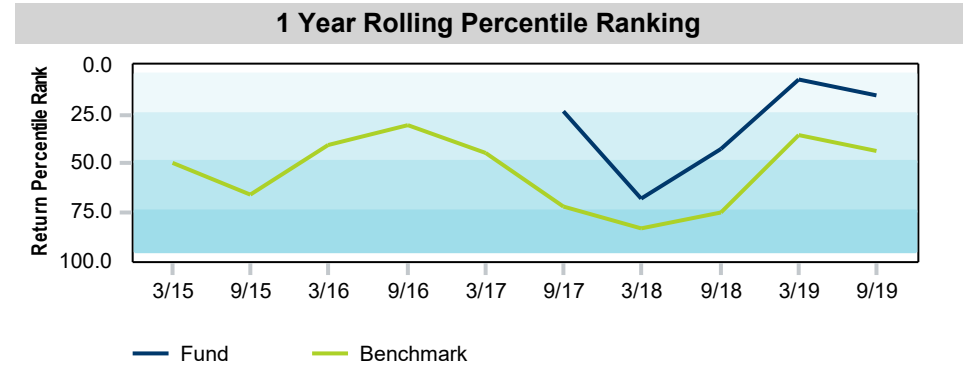
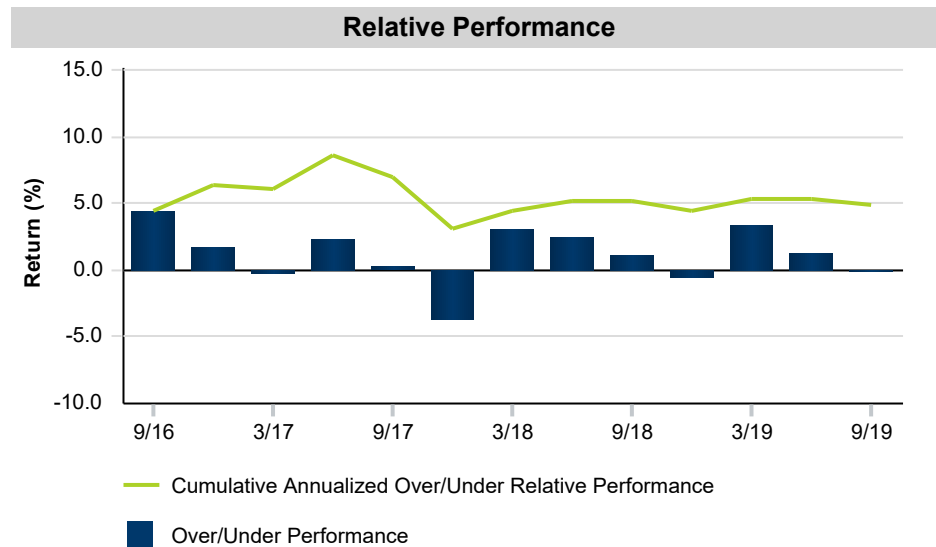
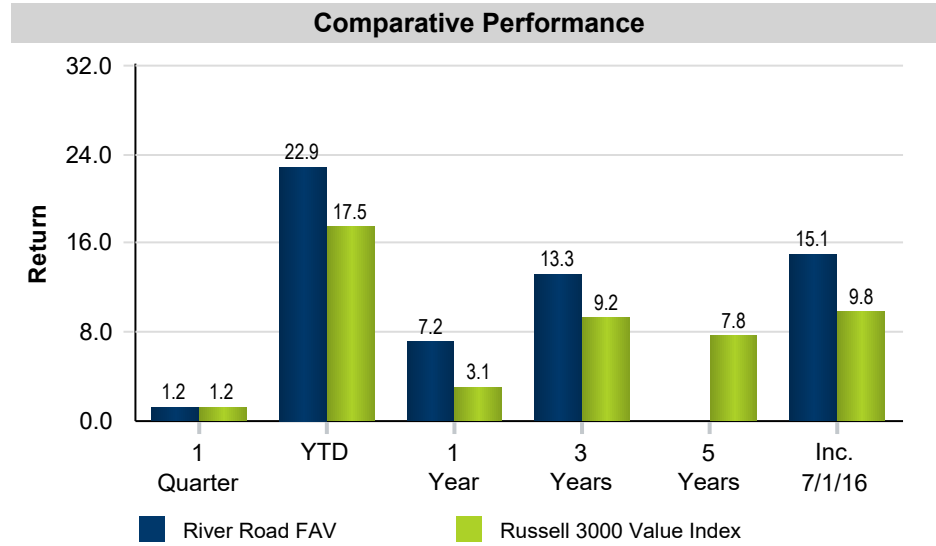
	<u>River Road FAV</u>	<u>Russell 3000 Value Index</u>
Standard Deviation	19.89	18.35
Alpha	3.99	0.00
Active Return/Risk	0.21	0.00
Tracking Error	3.87	0.00
Information Ratio	1.09	
Sharpe Ratio	0.33	0.13

## Correlation Statistics

	<u>River Road FAV</u>	<u>Russell 3000 Value Index</u>
R-Squared	0.97	1.00
Actual Correlation	0.98	1.00

# Manager Summary

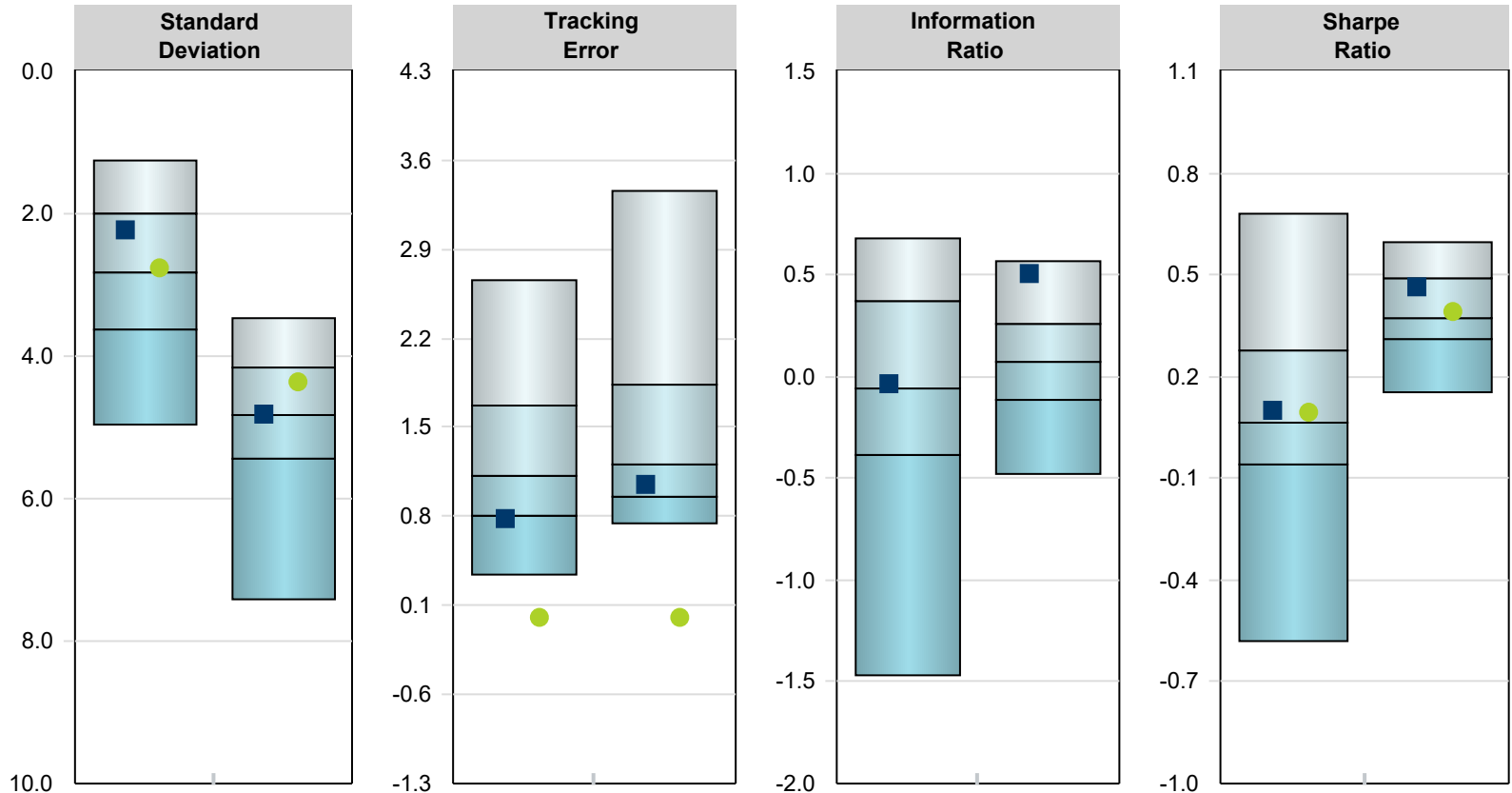
River Road FAV vs IM U.S. All Cap Value Equity (SA+CF)  
 Periods Ended September 30, 2019



# Peer Group Analysis - Multi Statistics

River Road FAV

Periods Ended September 30, 2019



	Standard Deviation		Tracking Error		Information Ratio		Sharpe Ratio	
	QTD	YTD	QTD	YTD	QTD	YTD	QTD	YTD
■ River Road FAV	2.25 (35)	4.83 (48)	0.77 (78)	1.04 (63)	-0.04 (46)	0.51 (9)	0.10 (44)	0.46 (30)
● Russell 3000 Value Index	2.78 (49)	4.38 (33)	0.00 (100)	0.00 (100)			0.09 (46)	0.39 (47)
5th Percentile	1.25	3.48	2.66	3.36	0.68	0.56	0.68	0.60
1st Quartile	1.99	4.15	1.67	1.84	0.37	0.26	0.28	0.49
Median	2.83	4.83	1.11	1.21	-0.06	0.07	0.07	0.37
3rd Quartile	3.63	5.44	0.81	0.96	-0.39	-0.12	-0.06	0.31
95th Percentile	4.96	7.41	0.34	0.75	-1.47	-0.48	-0.58	0.15

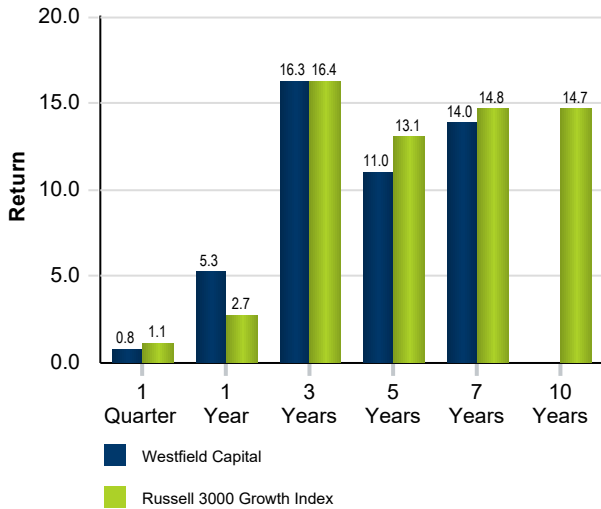
Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

# Performance Summary

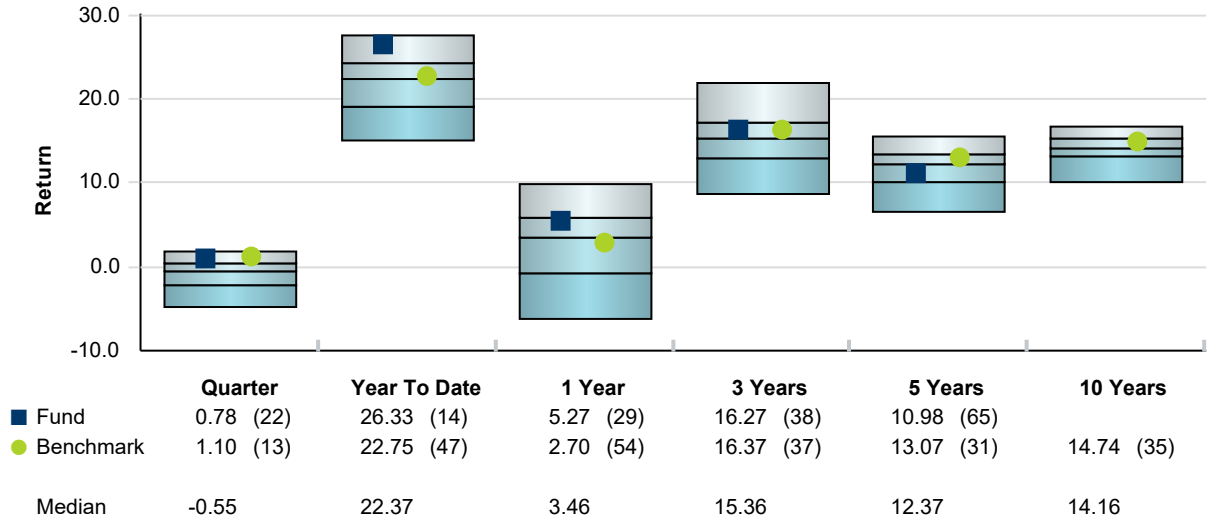
Westfield Capital

Periods Ended September 30, 2019

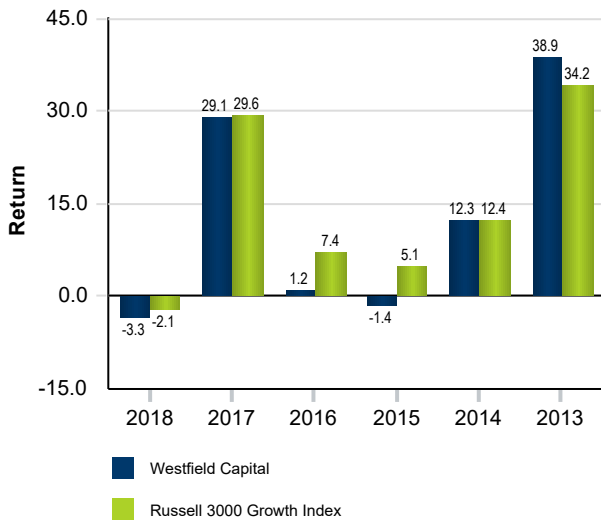
## Comparative Performance



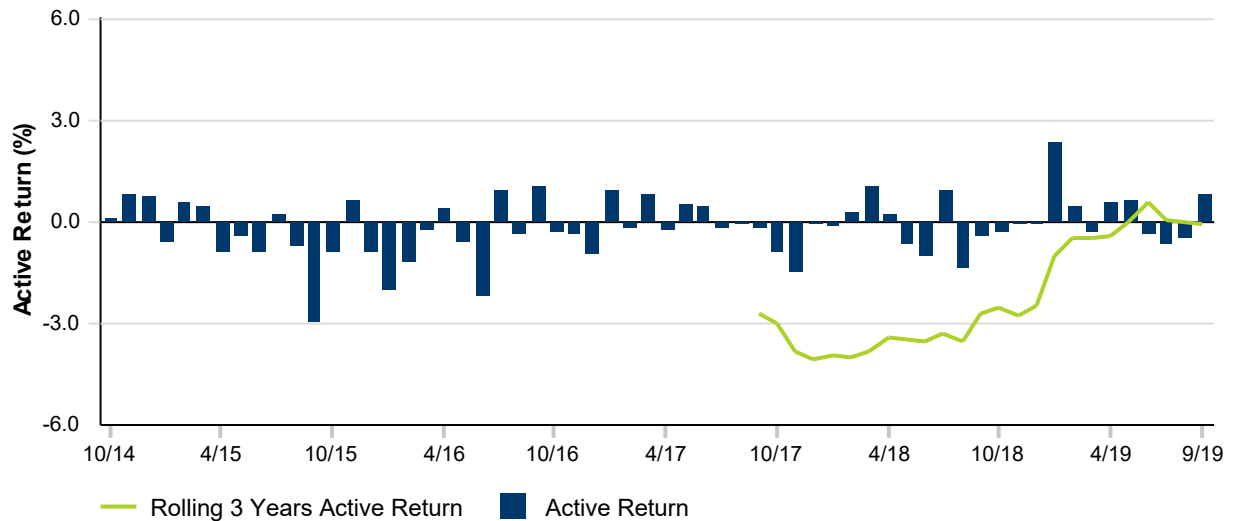
## Peer Group Analysis: IM U.S. All Cap Growth Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Westfield Capital

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Westfield Capital</u>	<u>Russell 3000 Growth Index</u>
Maximum Return	11.54	9.18
Minimum Return	-9.55	-9.23
Return	5.27	2.70
Cumulative Return	5.27	2.70
Active Return	2.70	0.00
Excess Return	4.94	2.25

## Risk Summary Statistics

	<u>Westfield Capital</u>	<u>Russell 3000 Growth Index</u>
Upside Risk	4.36	3.85
Downside Risk	14.30	14.32
Beta	1.05	1.00

## Risk/Return Summary Statistics

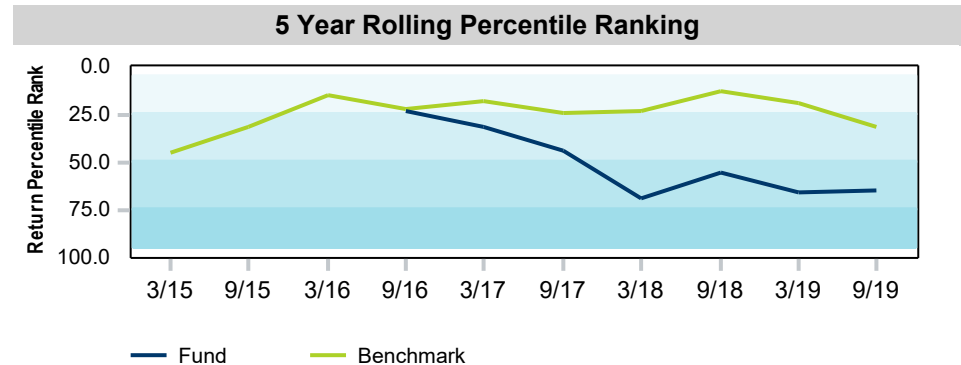
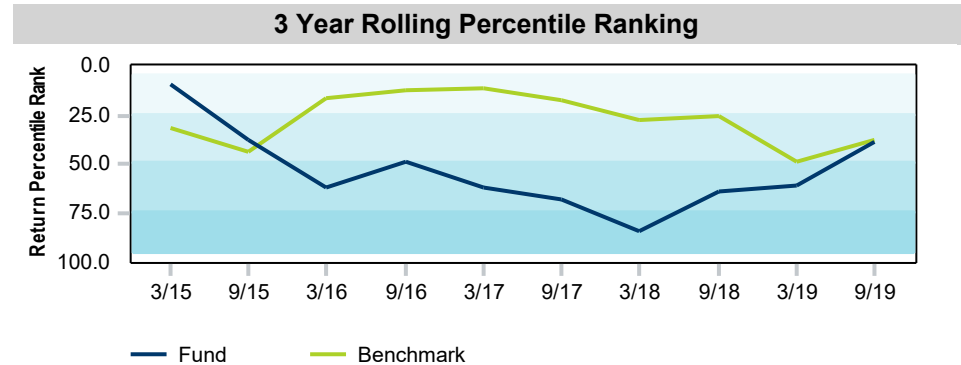
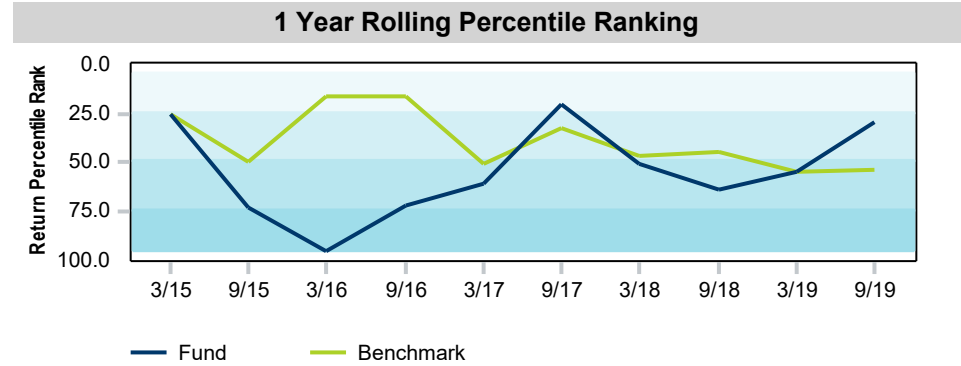
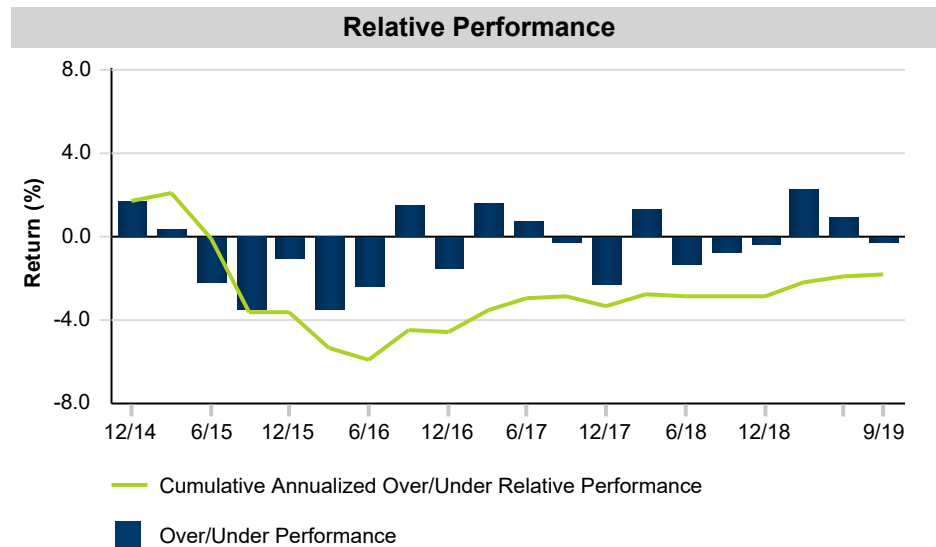
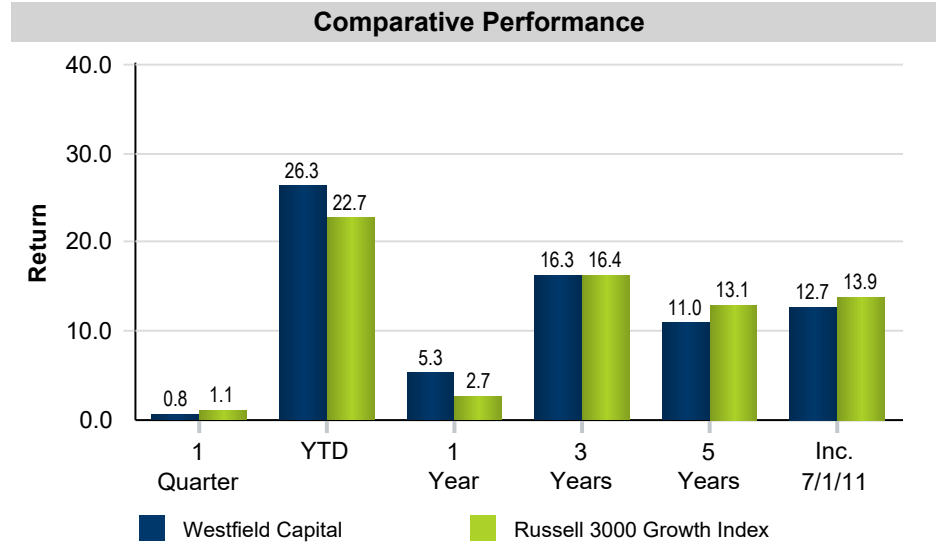
	<u>Westfield Capital</u>	<u>Russell 3000 Growth Index</u>
Standard Deviation	20.70	19.53
Alpha	2.49	0.00
Active Return/Risk	0.13	0.00
Tracking Error	2.76	0.00
Information Ratio	0.98	
Sharpe Ratio	0.24	0.12

## Correlation Statistics

	<u>Westfield Capital</u>	<u>Russell 3000 Growth Index</u>
R-Squared	0.98	1.00
Actual Correlation	0.99	1.00

# Manager Summary

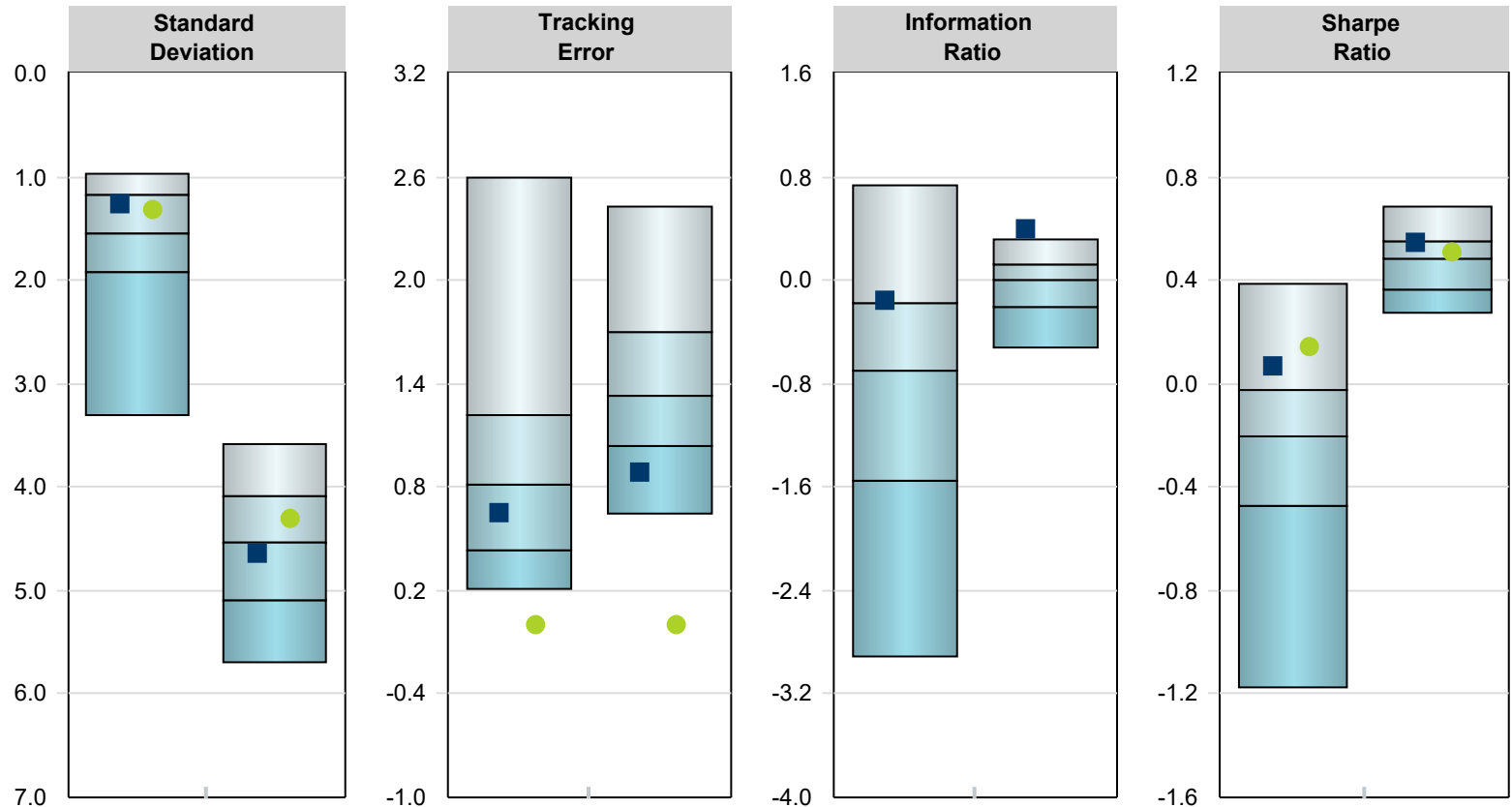
Westfield Capital vs IM U.S. All Cap Growth Equity (SA+CF)  
 Periods Ended September 30, 2019



# Peer Group Analysis - Multi Statistics

Westfield Capital

Periods Ended September 30, 2019



	QTD	YTD	QTD	YTD	QTD	YTD	QTD	YTD
■ Westfield Capital	1.27 (31)	4.65 (55)	0.65 (57)	0.89 (79)	-0.17 (21)	0.38 (4)	0.06 (22)	0.54 (27)
● Russell 3000 Growth Index	1.33 (33)	4.31 (36)	0.00 (100)	0.00 (100)			0.14 (13)	0.51 (38)
5th Percentile	0.98	3.58	2.60	2.42	0.73	0.31	0.39	0.68
1st Quartile	1.18	4.09	1.22	1.70	-0.18	0.12	-0.03	0.55
Median	1.55	4.54	0.81	1.33	-0.70	0.00	-0.20	0.48
3rd Quartile	1.92	5.10	0.43	1.04	-1.56	-0.20	-0.47	0.37
95th Percentile	3.31	5.69	0.21	0.65	-2.90	-0.52	-1.18	0.27

Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

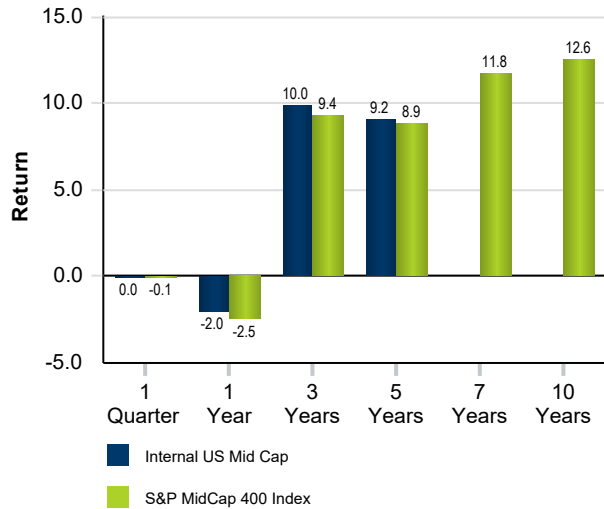


# Performance Summary

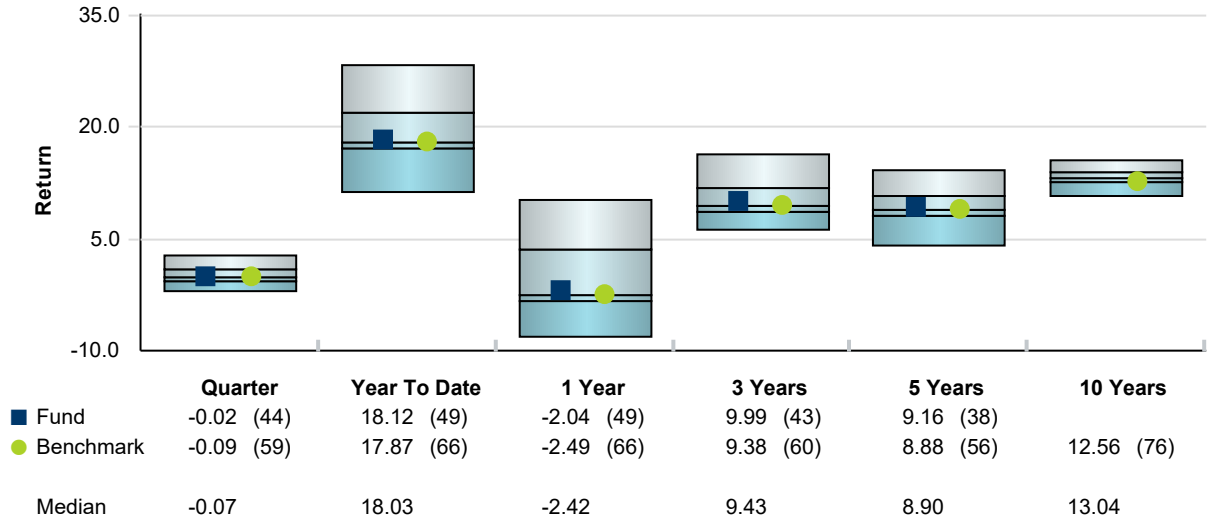
Internal US Mid Cap

Periods Ended September 30, 2019

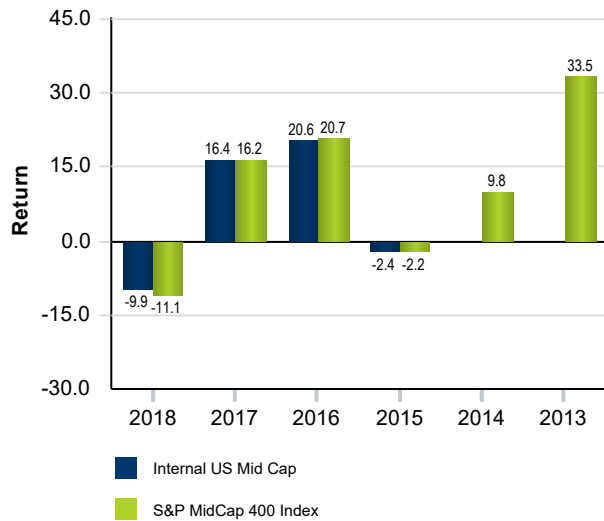
## Comparative Performance



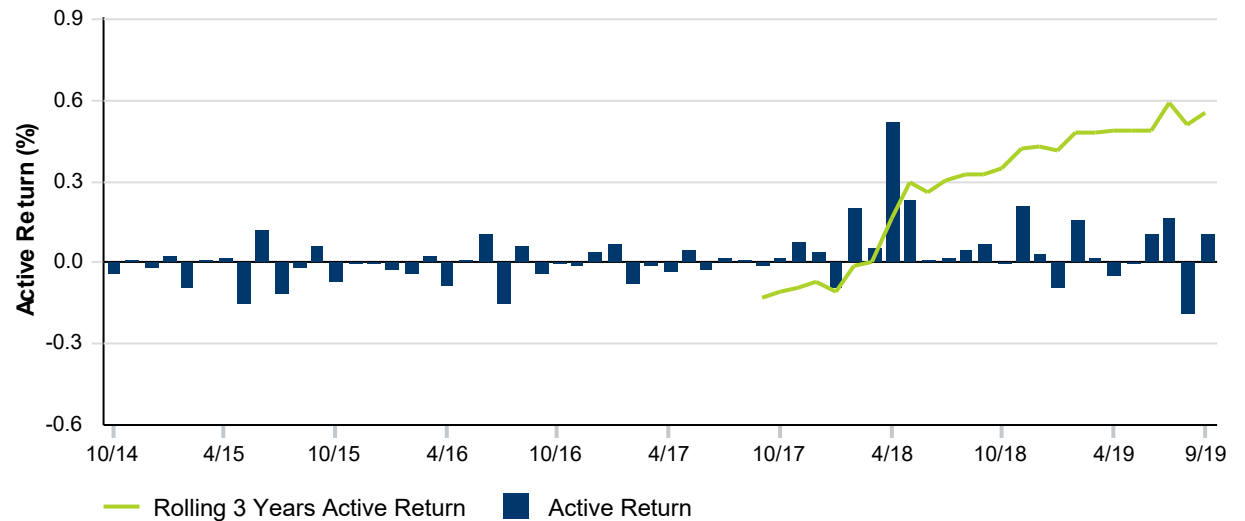
## Peer Group Analysis: IM U.S. Mid Cap Core Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Internal US Mid Cap

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Internal US Mid Cap</u>	<u>S&amp;P MidCap 400 Index</u>
Maximum Return	10.37	10.46
Minimum Return	-11.28	-11.32
Return	-2.04	-2.49
Cumulative Return	-2.04	-2.49
Active Return	0.48	0.00
Excess Return	-1.74	-2.22

## Risk Summary Statistics

	<u>Internal US Mid Cap</u>	<u>S&amp;P MidCap 400 Index</u>
Upside Risk	4.34	4.31
Downside Risk	17.36	17.34
Beta	1.00	1.00

## Risk/Return Summary Statistics

	<u>Internal US Mid Cap</u>	<u>S&amp;P MidCap 400 Index</u>
Standard Deviation	22.95	22.87
Alpha	0.48	0.00
Active Return/Risk	0.02	0.00
Tracking Error	0.38	0.00
Information Ratio	1.25	
Sharpe Ratio	-0.08	-0.10

## Correlation Statistics

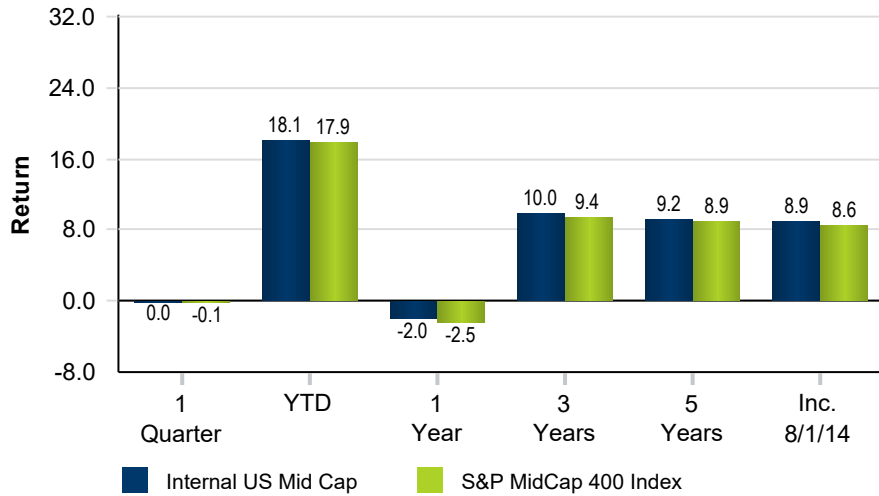
	<u>Internal US Mid Cap</u>	<u>S&amp;P MidCap 400 Index</u>
R-Squared	1.00	1.00
Actual Correlation	1.00	1.00

# Manager Summary

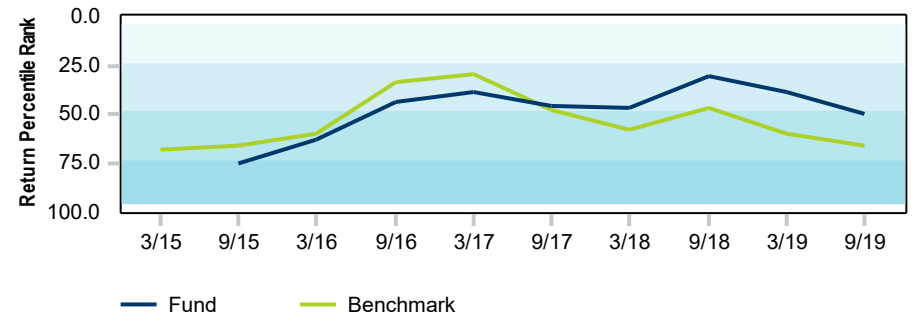
Internal US Mid Cap vs IM U.S. Mid Cap Core Equity (SA+CF)

Periods Ended September 30, 2019

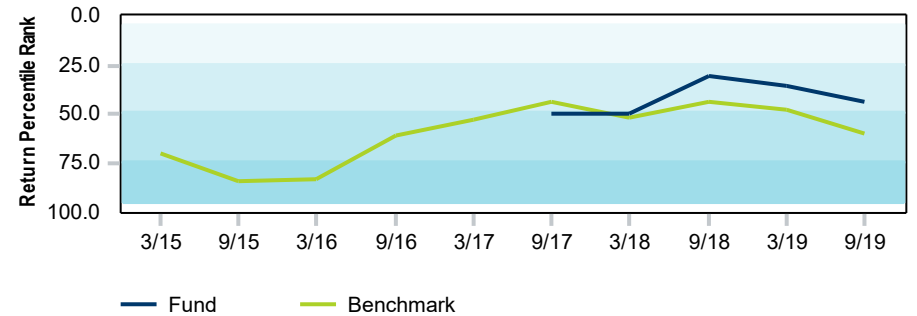
## Comparative Performance



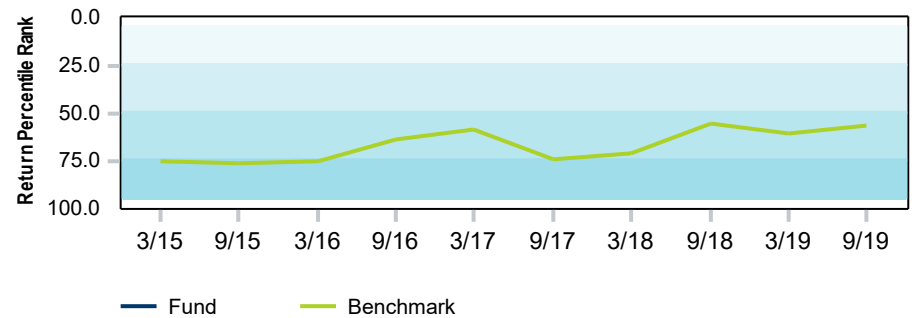
## 1 Year Rolling Percentile Ranking



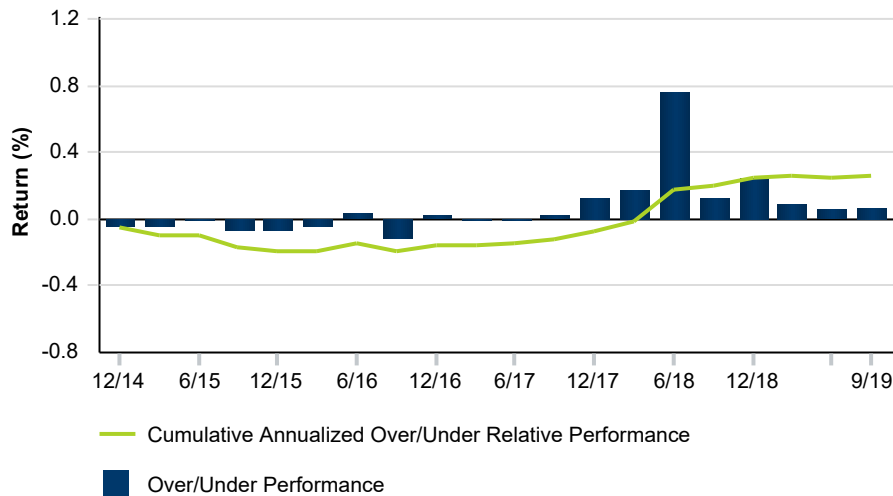
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



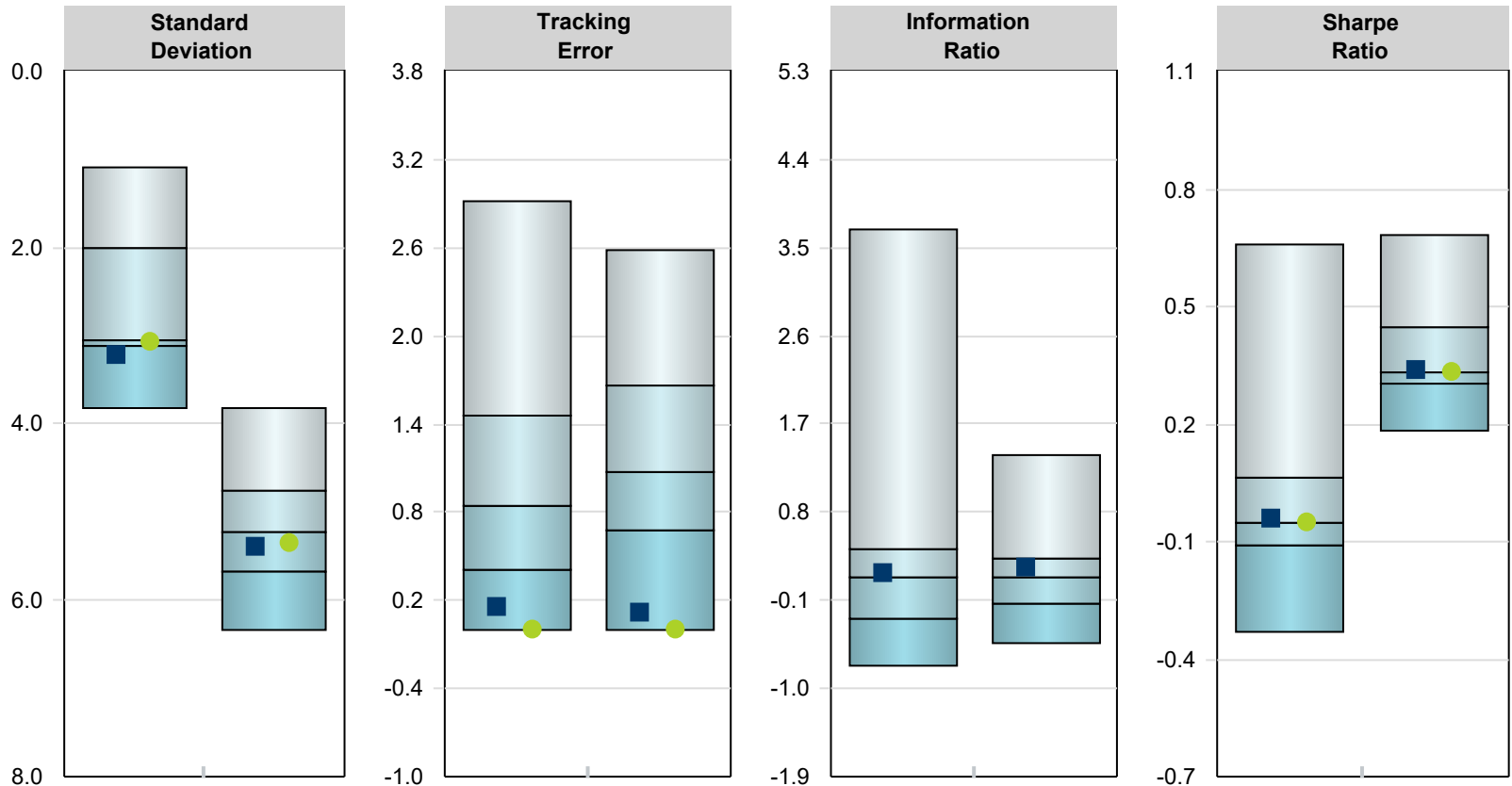
## Relative Performance



# Peer Group Analysis - Multi Statistics

Internal US Mid Cap

Periods Ended September 30, 2019



	Standard Deviation		Tracking Error		Information Ratio		Sharpe Ratio	
	QTD	YTD	QTD	YTD	QTD	YTD	QTD	YTD
■ Internal US Mid Cap	3.22 (78)	5.39 (71)	0.15 (81)	0.11 (82)	0.18 (48)	0.23 (37)	-0.04 (44)	0.34 (48)
● S&P MidCap 400 Index	3.08 (71)	5.36 (63)	0.00 (100)	0.00 (100)			-0.05 (57)	0.33 (62)
5th Percentile	1.10	3.82	2.91	2.59	3.69	1.38	0.66	0.68
1st Quartile	2.00	4.75	1.45	1.66	0.42	0.34	0.06	0.45
Median	3.04	5.24	0.84	1.07	0.14	0.13	-0.05	0.33
3rd Quartile	3.12	5.66	0.40	0.68	-0.28	-0.13	-0.11	0.30
95th Percentile	3.81	6.34	0.00	0.00	-0.77	-0.53	-0.33	0.18

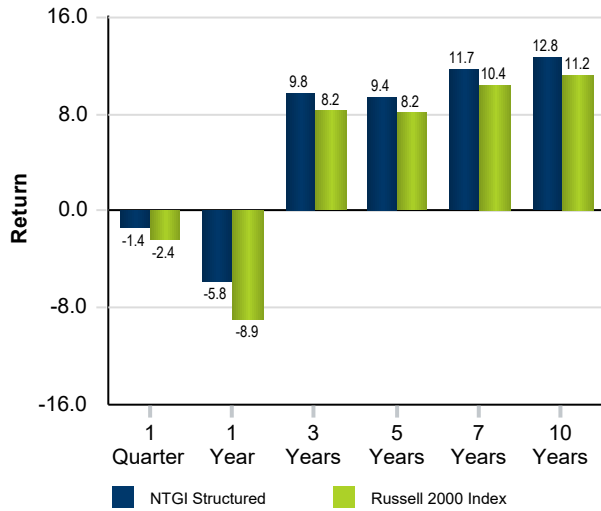
Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.

# Performance Summary

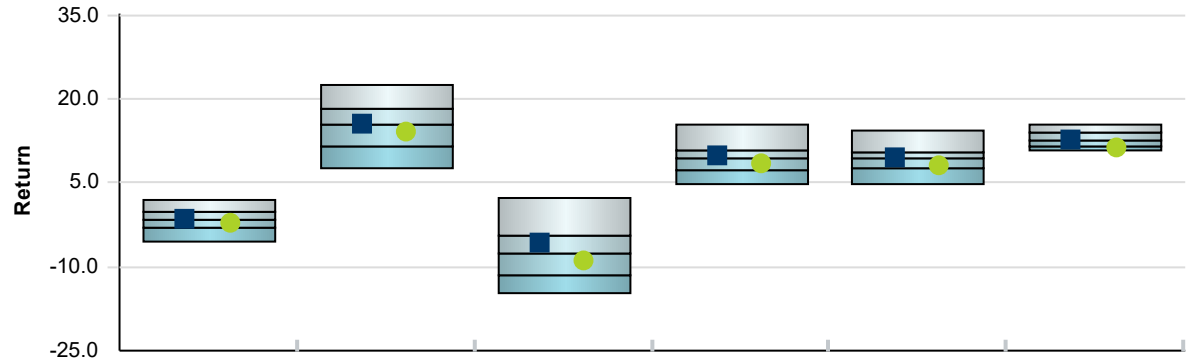
NTGI Structured

Periods Ended September 30, 2019

## Comparative Performance

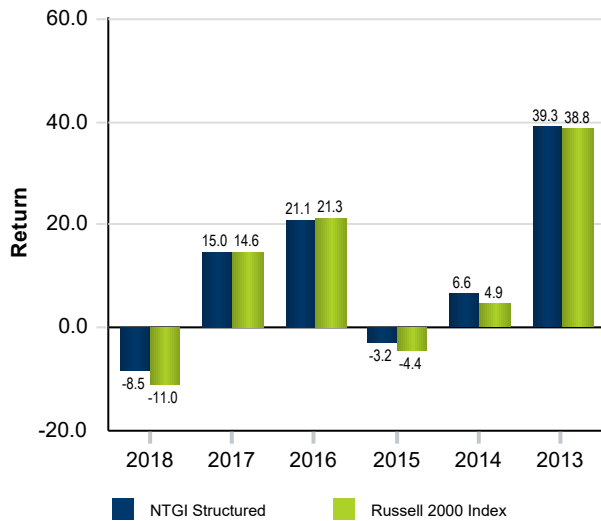


## Peer Group Analysis: IM U.S. Small Cap Core Equity (SA+CF)

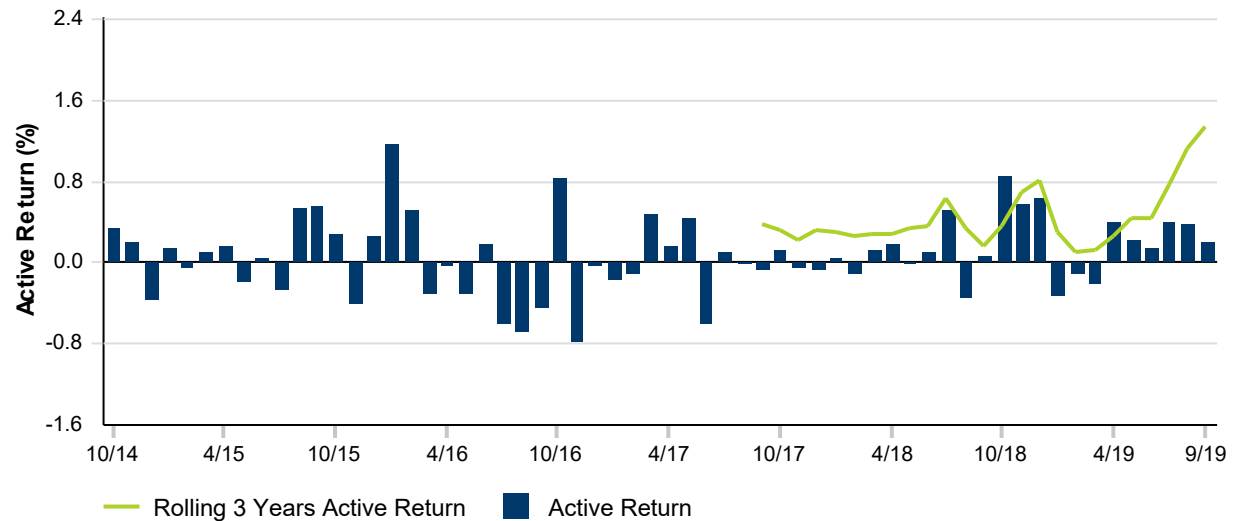


	Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years
■ Fund	-1.42 (46)	15.49 (51)	-5.76 (40)	9.82 (39)	9.38 (51)	12.77 (49)
● Benchmark	-2.40 (66)	14.18 (58)	-8.89 (64)	8.23 (68)	8.19 (71)	11.19 (87)
Median	-1.67	15.60	-7.60	9.28	9.39	12.72

## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

NTGI Structured

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>NTGI Structured</u>	<u>Russell 2000 Index</u>
Maximum Return	10.92	11.25
Minimum Return	-11.24	-11.88
Return	-5.76	-8.89
Cumulative Return	-5.76	-8.89
Active Return	3.17	0.00
Excess Return	-5.58	-8.75

## Risk Summary Statistics

	<u>NTGI Structured</u>	<u>Russell 2000 Index</u>
Upside Risk	4.31	4.30
Downside Risk	17.60	18.66
Beta	0.97	1.00

## Risk/Return Summary Statistics

	<u>NTGI Structured</u>	<u>Russell 2000 Index</u>
Standard Deviation	23.05	23.82
Alpha	3.00	0.00
Active Return/Risk	0.14	0.00
Tracking Error	1.17	0.00
Information Ratio	2.71	
Sharpe Ratio	-0.24	-0.37

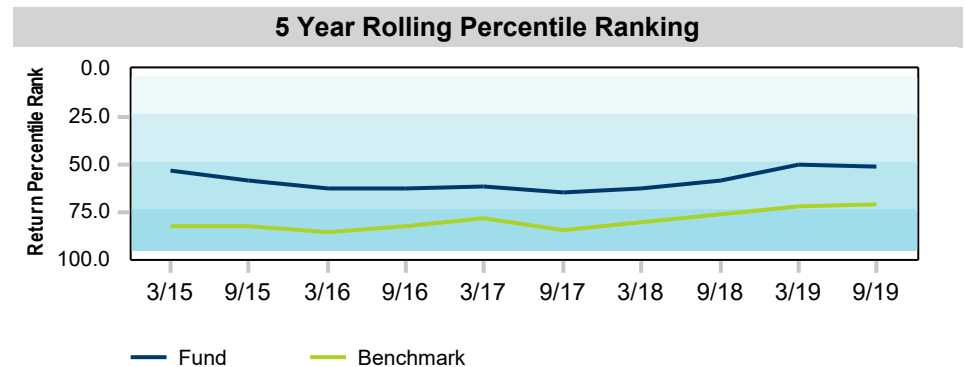
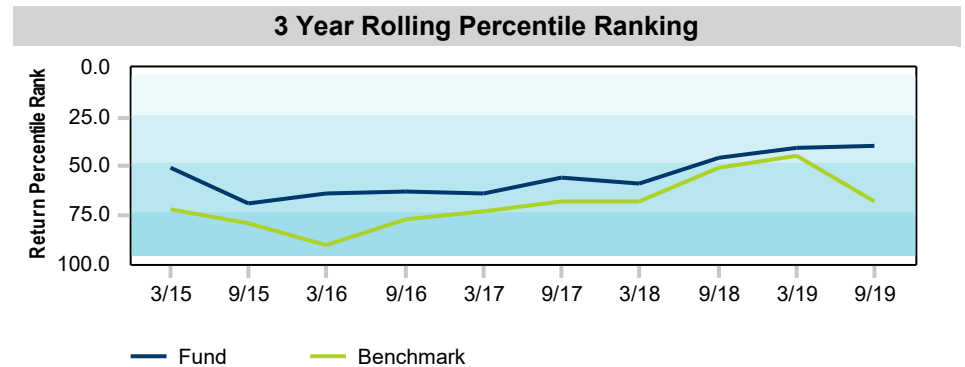
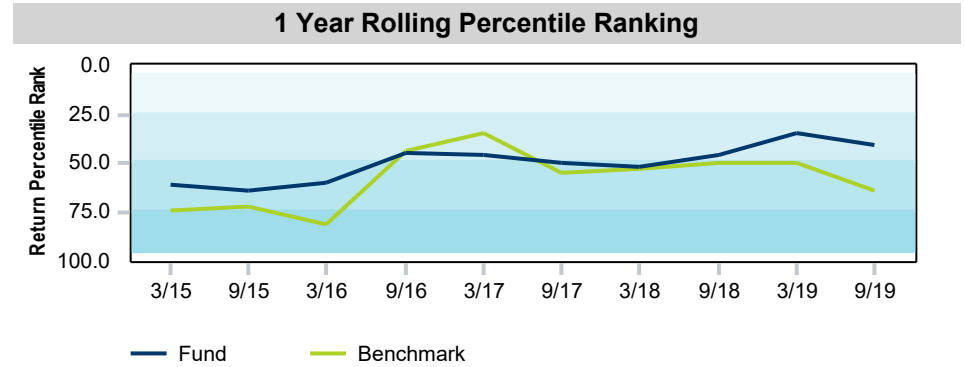
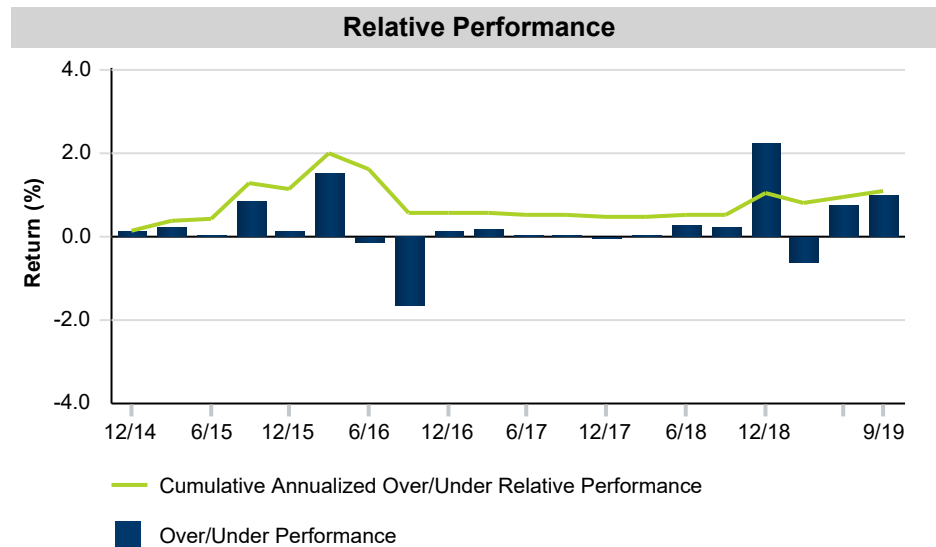
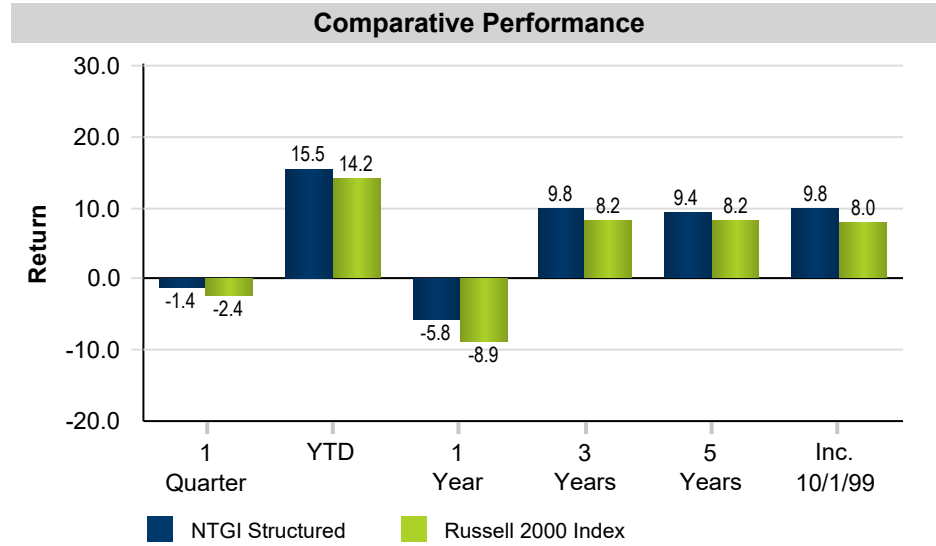
## Correlation Statistics

	<u>NTGI Structured</u>	<u>Russell 2000 Index</u>
R-Squared	1.00	1.00
Actual Correlation	1.00	1.00

# Manager Summary

NTGI Structured vs IM U.S. Small Cap Core Equity (SA+CF)

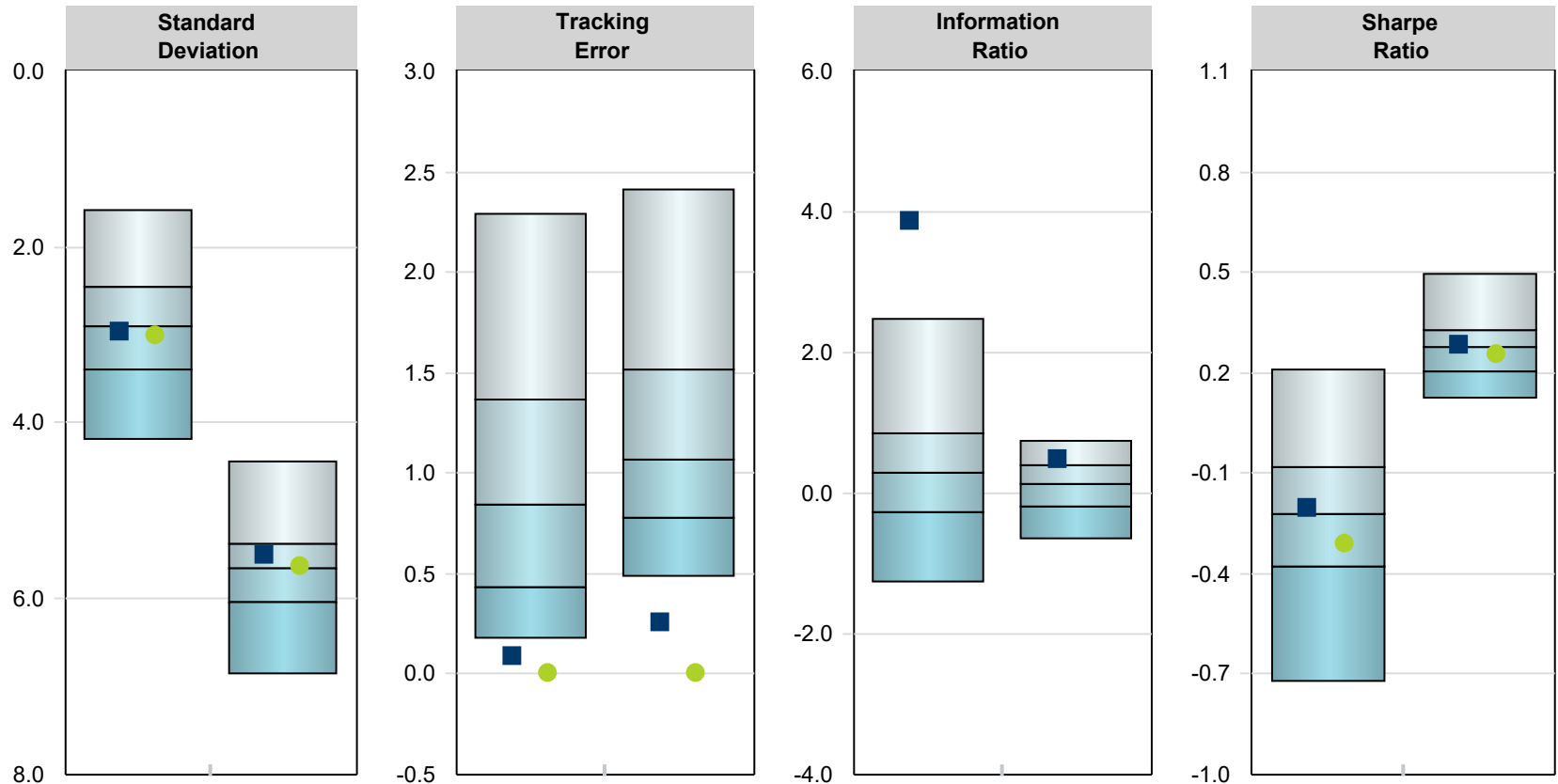
Periods Ended September 30, 2019



# Peer Group Analysis - Multi Statistics

NTGI Structured

Periods Ended September 30, 2019



	QTD	YTD	QTD	YTD	QTD	YTD	QTD	YTD
■ NTGI Structured	2.96 (52)	5.51 (33)	0.09 (99)	0.26 (99)	3.86 (1)	0.47 (17)	-0.21 (48)	0.28 (48)
● Russell 2000 Index	3.02 (59)	5.63 (44)	0.00 (100)	0.00 (100)			-0.31 (67)	0.26 (58)
5th Percentile	1.58	4.43	2.29	2.41	2.49	0.74	0.21	0.50
1st Quartile	2.45	5.37	1.37	1.52	0.87	0.39	-0.08	0.33
Median	2.91	5.66	0.84	1.07	0.29	0.13	-0.22	0.28
3rd Quartile	3.39	6.04	0.43	0.78	-0.28	-0.20	-0.38	0.21
95th Percentile	4.19	6.85	0.19	0.48	-1.24	-0.65	-0.72	0.13

Parenteses contain percentile rankings.  
Calculation based on monthly periodicity.





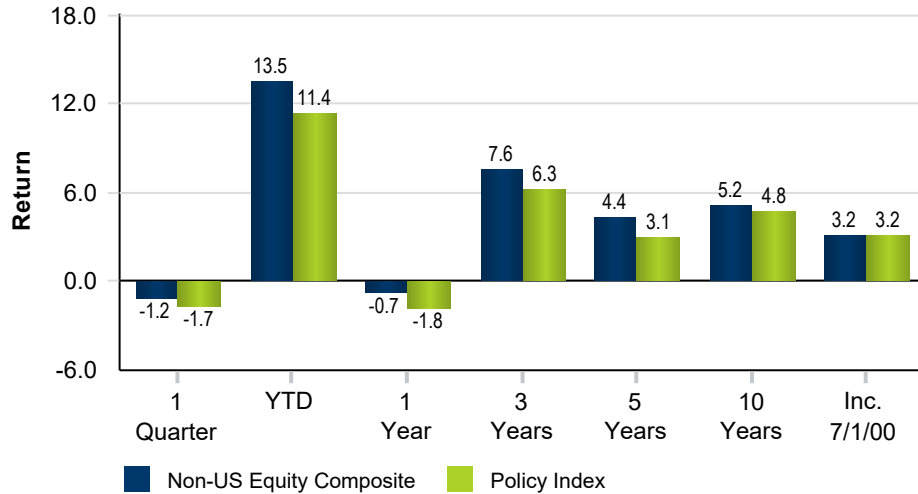
# Non-US Equity Composite

# Composite Performance Summary

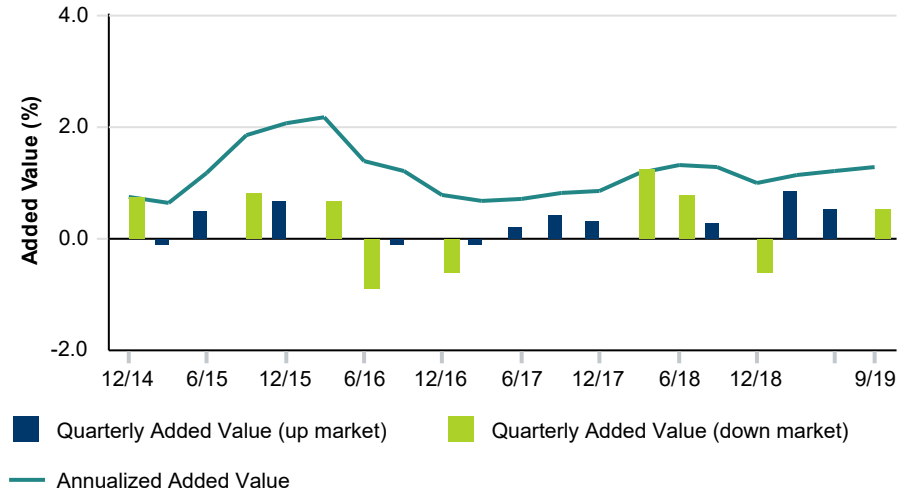
Non-US Equity Composite

Periods Ended September 30, 2019

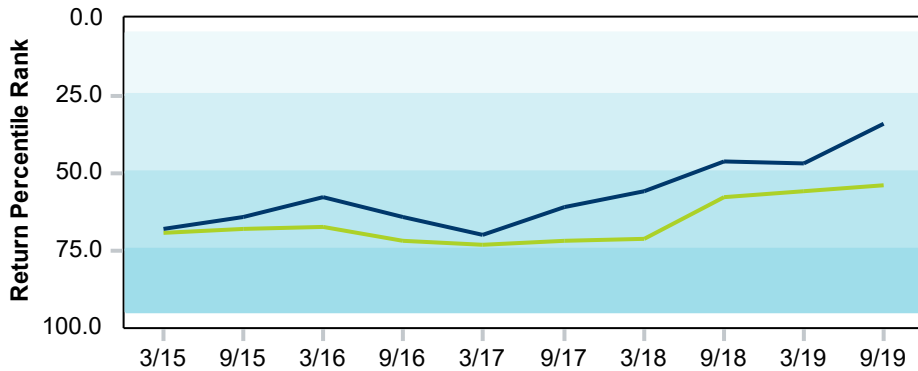
**Comparative Performance**



**Added Value History**

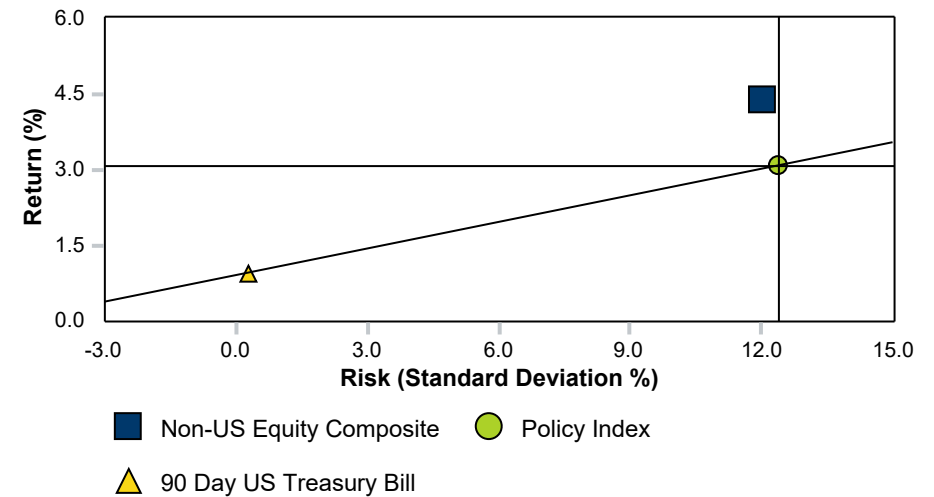


**Rolling Percentile Rank: IM International Equity (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Non-US Equity Composite	10	0 (0%)	3 (30%)	7 (70%)	0 (0%)
Benchmark	10	0 (0%)	0 (0%)	10 (100%)	0 (0%)

**Risk and Return 10/1/14 - 09/30/19**

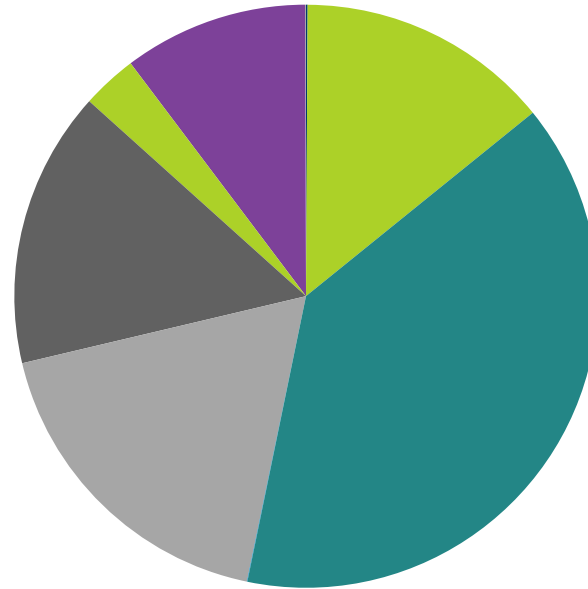


# Asset Allocation By Manager

Non-US Equity Composite

Periods Ended September 30, 2019

Sep-2019 : 2,511,768,194

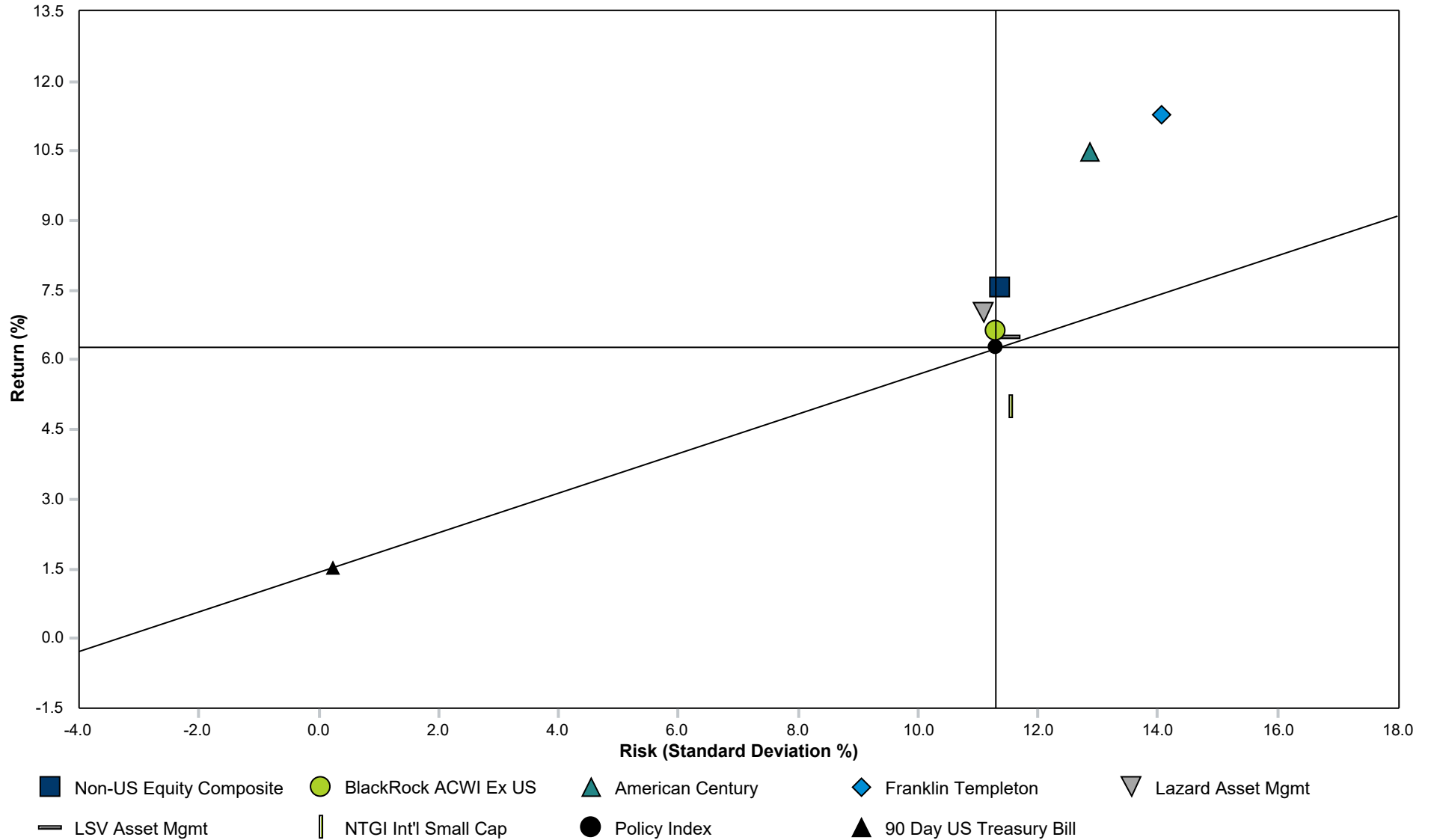


	Market Value \$	Allocation (%)
■ Pyramis Intl	2,093,233	0.1
■ American Century	353,734,413	14.1
■ BlackRock ACWI Ex US	981,045,631	39.1
■ Boston Company	722,107	0.0
■ Lazard Asset Mgmt	453,356,512	18.0
■ LSV Asset Mgmt	385,877,672	15.4
■ NTGI Int'l Small Cap	76,963,971	3.1
■ Franklin Templeton	256,545,583	10.2
■ Non-US Equity Transition	1,429,071	0.1

# Risk vs. Return

Non-US Equity Composite

Periods Ended 3 Years Ending September 30, 2019



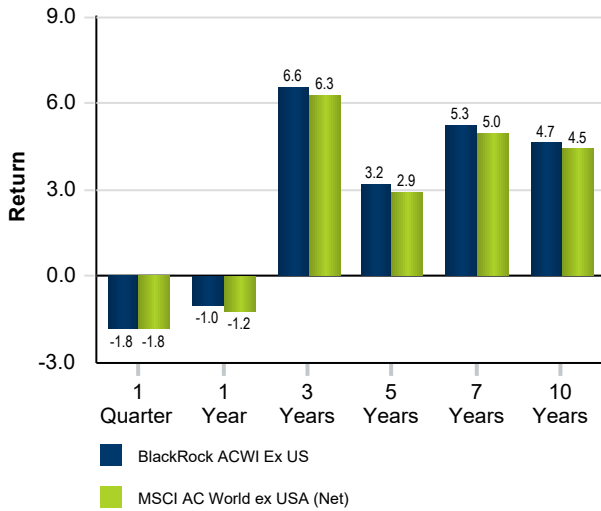
Calculation based on monthly periodicity.

# Performance Summary

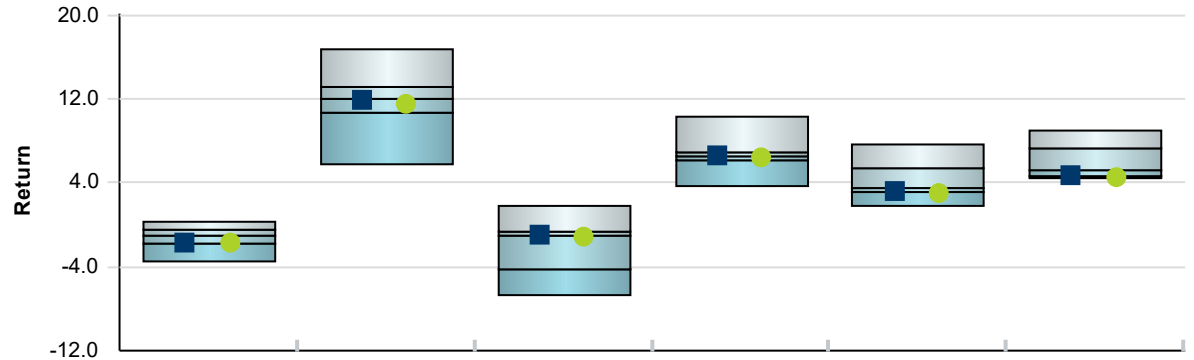
BlackRock ACWI Ex US

Periods Ended September 30, 2019

## Comparative Performance

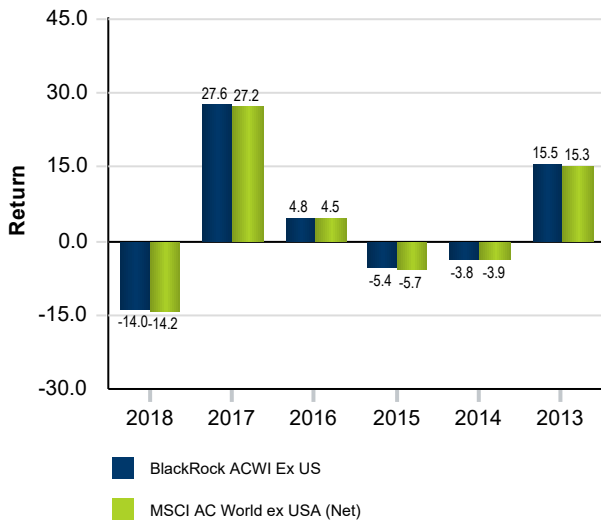


## Peer Group Analysis: IM Enhanced and Indexed International Equity (SA+CF)

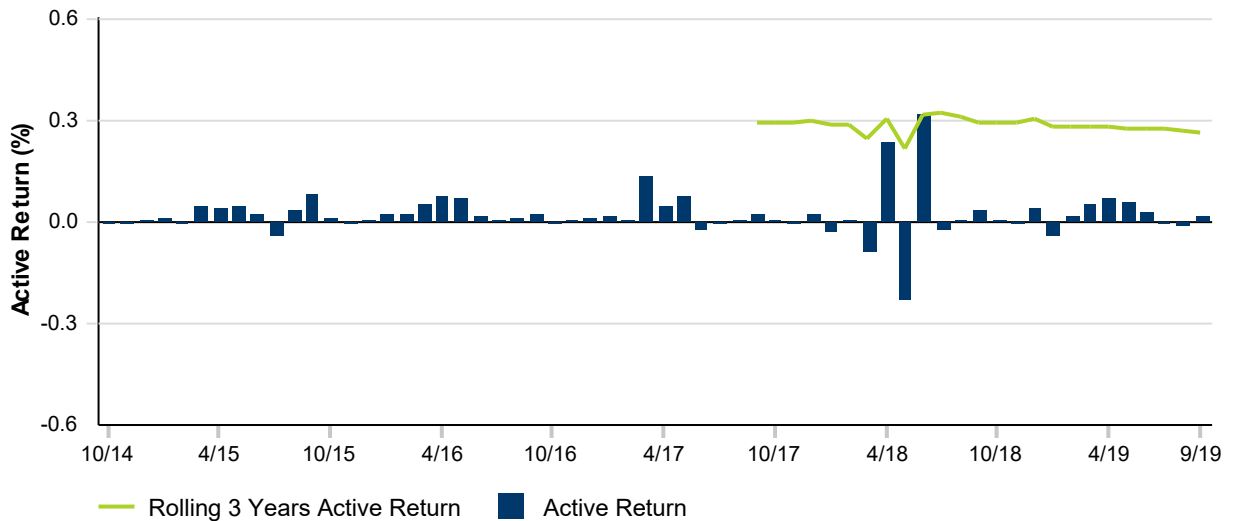


	Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years
<b>Fund</b>	-1.79 (80)	11.78 (69)	-1.00 (53)	6.61 (54)	3.18 (77)	4.69 (93)
<b>Benchmark</b>	-1.80 (80)	11.56 (71)	-1.23 (59)	6.33 (67)	2.90 (86)	4.46 (95)
<b>Median</b>	-1.10	12.12	-0.99	6.62	3.62	5.31

## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

BlackRock ACWI Ex US

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>BlackRock ACWI Ex US</u>	<u>MSCI AC World ex USA (Net)</u>
Maximum Return	7.52	7.56
Minimum Return	-8.13	-8.13
Return	-1.00	-1.23
Cumulative Return	-1.00	-1.23
Active Return	0.23	0.00
Excess Return	-2.17	-2.40

## Risk Summary Statistics

	<u>BlackRock ACWI Ex US</u>	<u>MSCI AC World ex USA (Net)</u>
Upside Risk	3.06	3.06
Downside Risk	11.20	11.25
Beta	1.00	1.00

## Risk/Return Summary Statistics

	<u>BlackRock ACWI Ex US</u>	<u>MSCI AC World ex USA (Net)</u>
Standard Deviation	15.42	15.44
Alpha	0.23	0.00
Active Return/Risk	0.01	0.00
Tracking Error	0.11	0.00
Information Ratio	2.15	
Sharpe Ratio	-0.14	-0.16

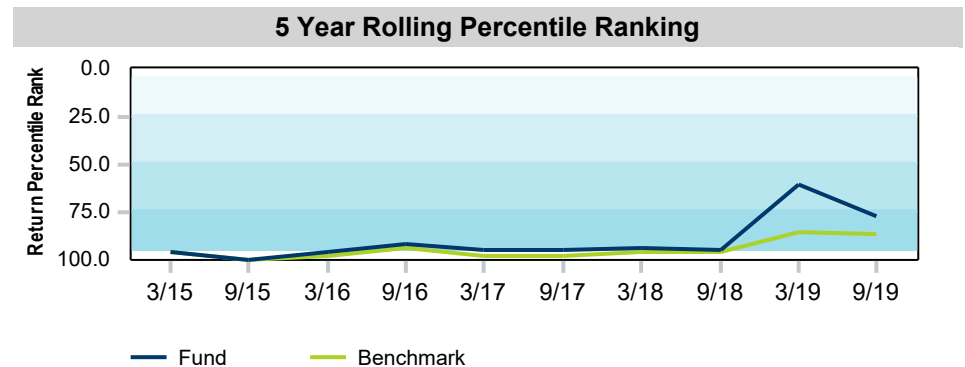
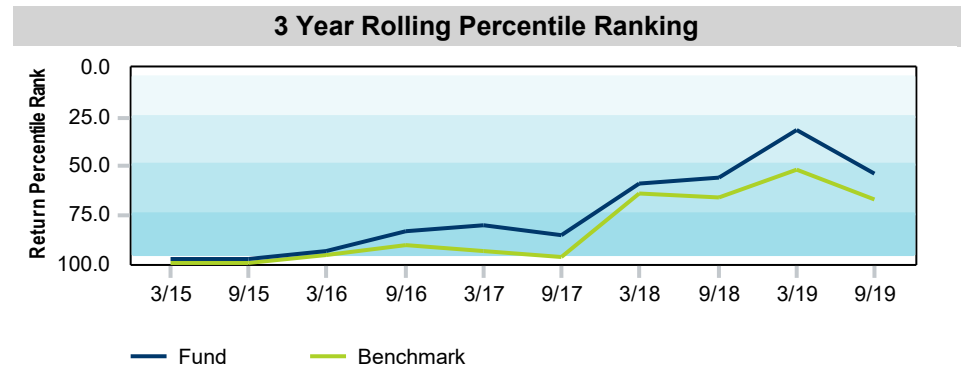
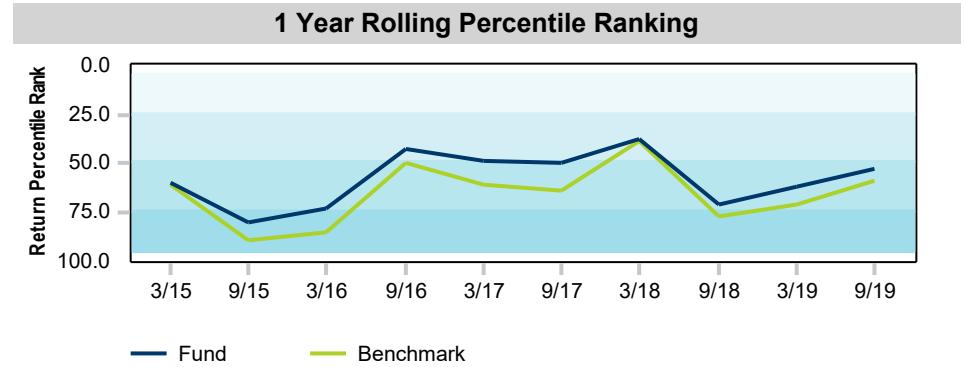
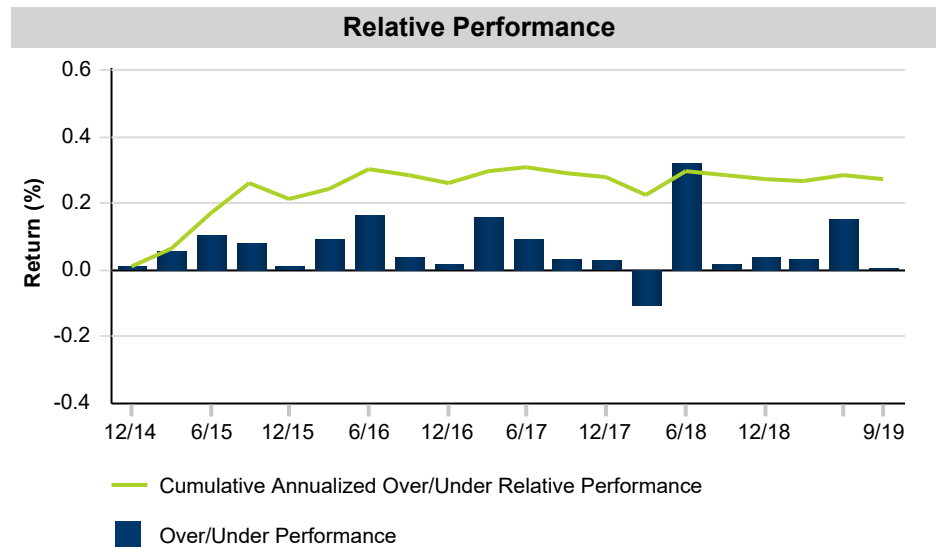
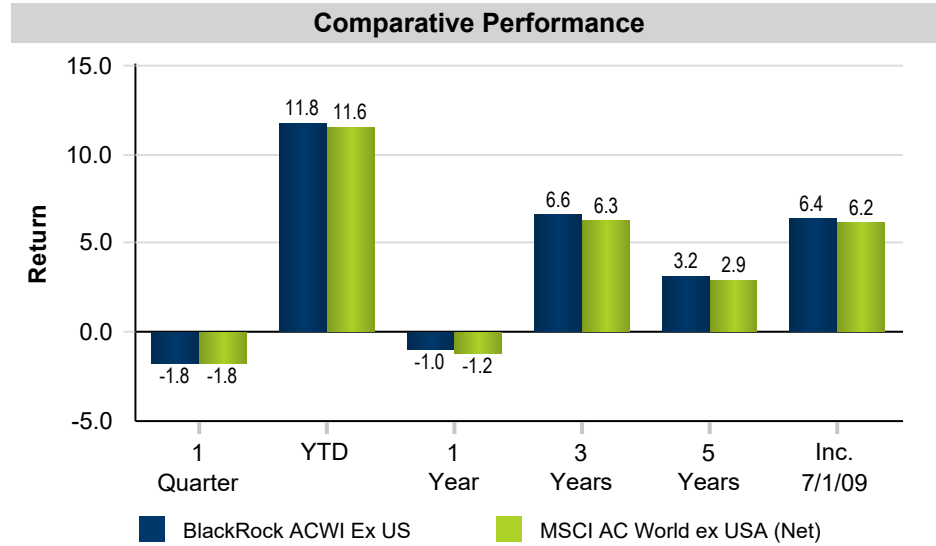
## Correlation Statistics

	<u>BlackRock ACWI Ex US</u>	<u>MSCI AC World ex USA (Net)</u>
R-Squared	1.00	1.00
Actual Correlation	1.00	1.00

# Manager Summary

BlackRock ACWI Ex US vs IM Enhanced and Indexed International Equity (SA+CF)

Periods Ended September 30, 2019

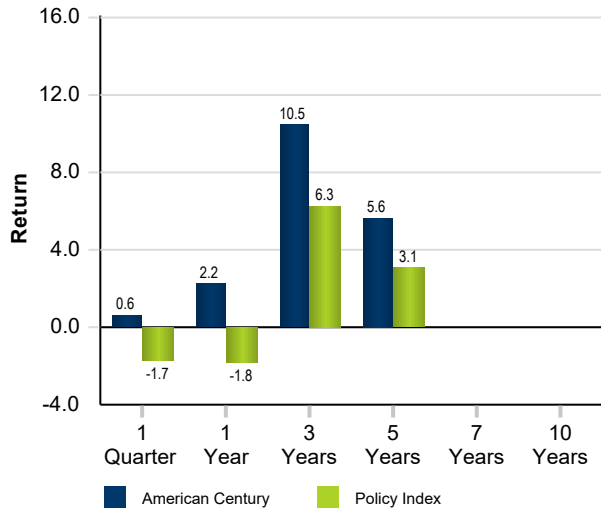


# Performance Summary

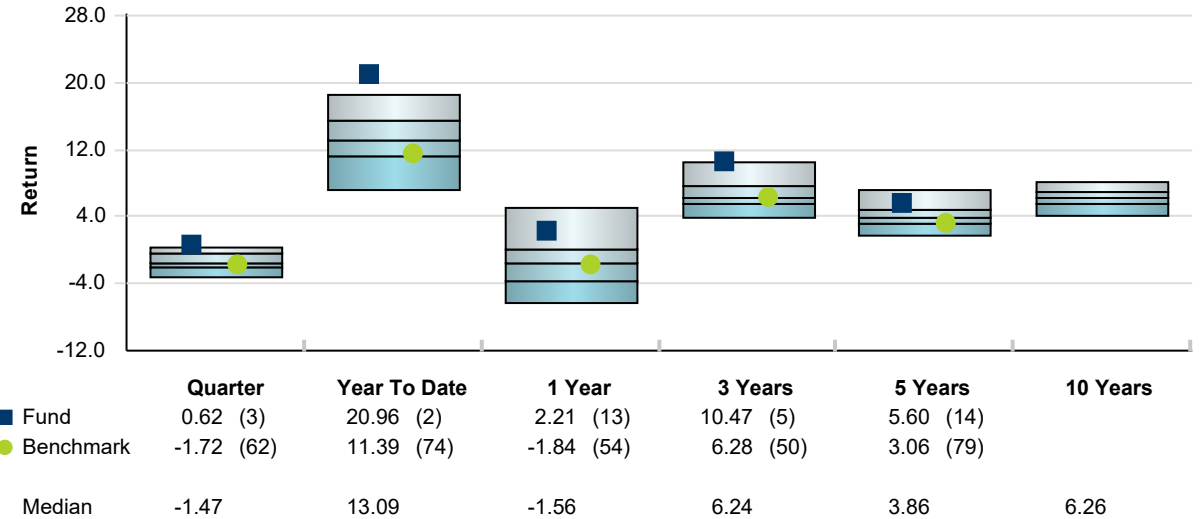
American Century

Periods Ended September 30, 2019

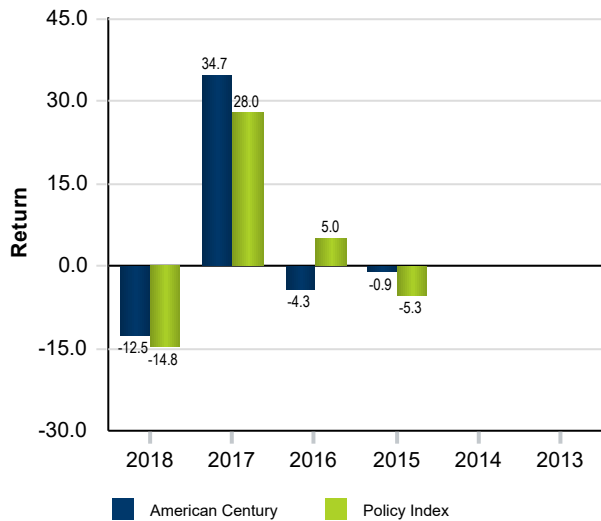
## Comparative Performance



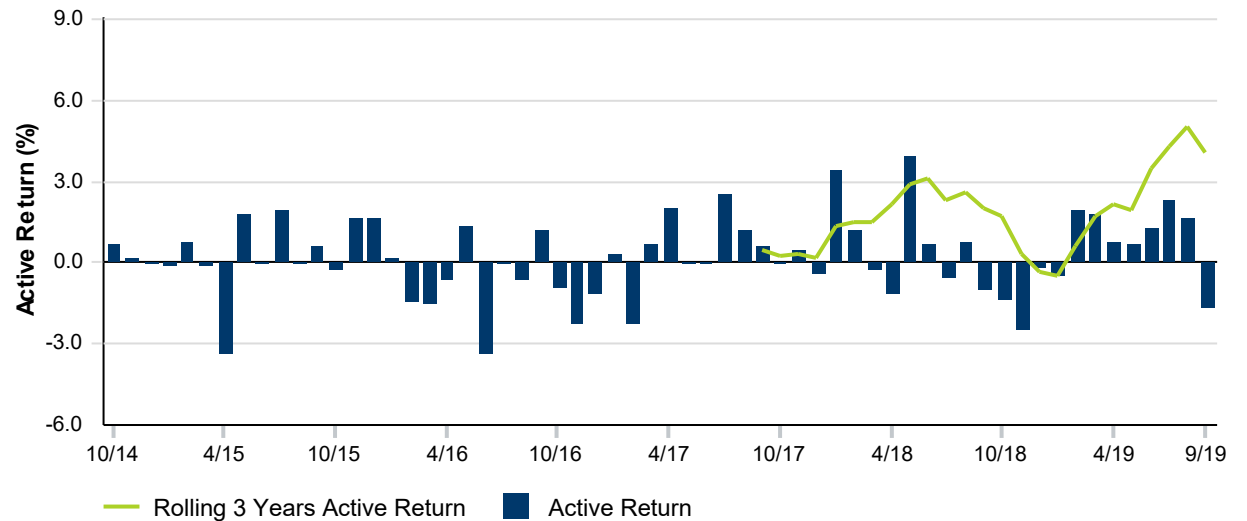
## Peer Group Analysis: IM International Large Cap Core Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance





# Summary Statistics

American Century

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>American Century</u>	<u>Policy Index</u>
Maximum Return	7.13	7.60
Minimum Return	-9.71	-8.36
Return	2.21	-1.84
Cumulative Return	2.21	-1.84
Active Return	4.25	0.00
Excess Return	1.24	-3.01

## Risk Summary Statistics

	<u>American Century</u>	<u>Policy Index</u>
Upside Risk	3.36	3.02
Downside Risk	12.02	11.43
Beta	1.02	1.00

## Risk/Return Summary Statistics

	<u>American Century</u>	<u>Policy Index</u>
Standard Deviation	16.70	15.50
Alpha	4.35	0.00
Active Return/Risk	0.25	0.00
Tracking Error	5.25	0.00
Information Ratio	0.81	
Sharpe Ratio	0.07	-0.19

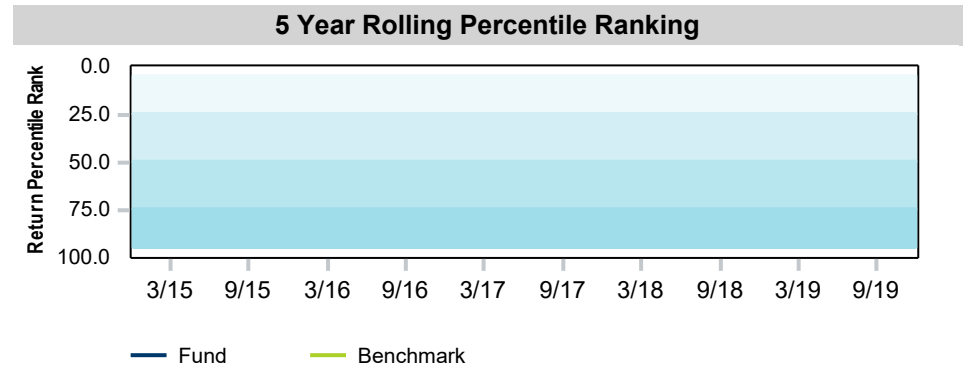
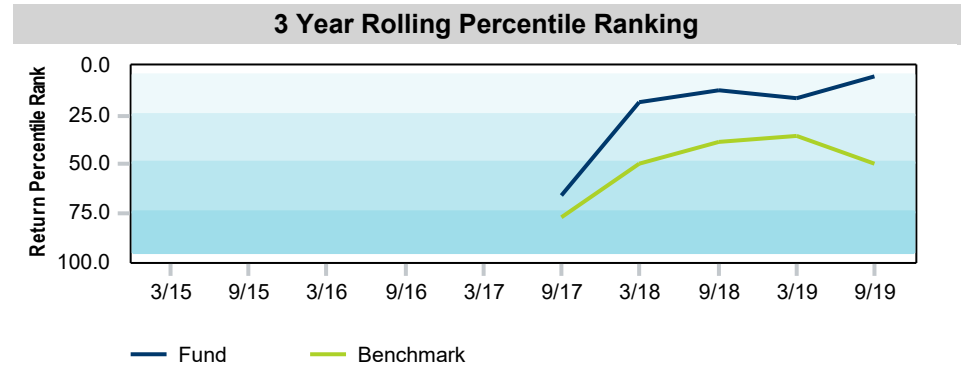
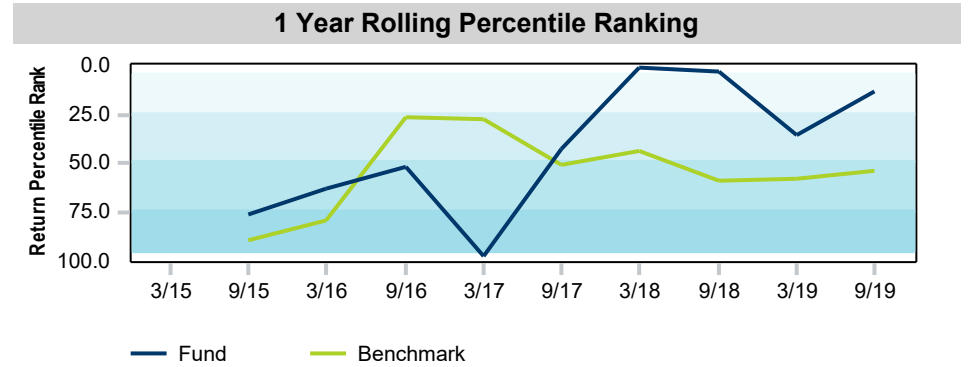
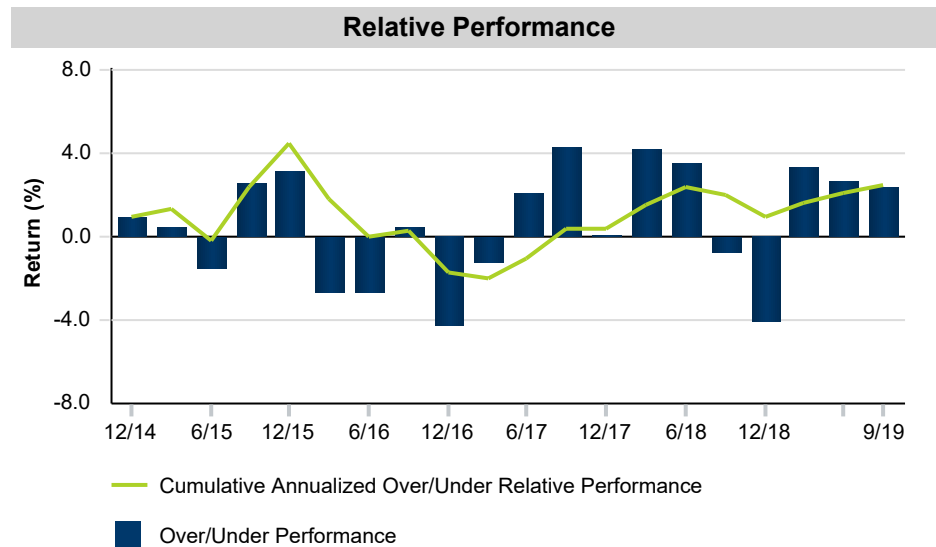
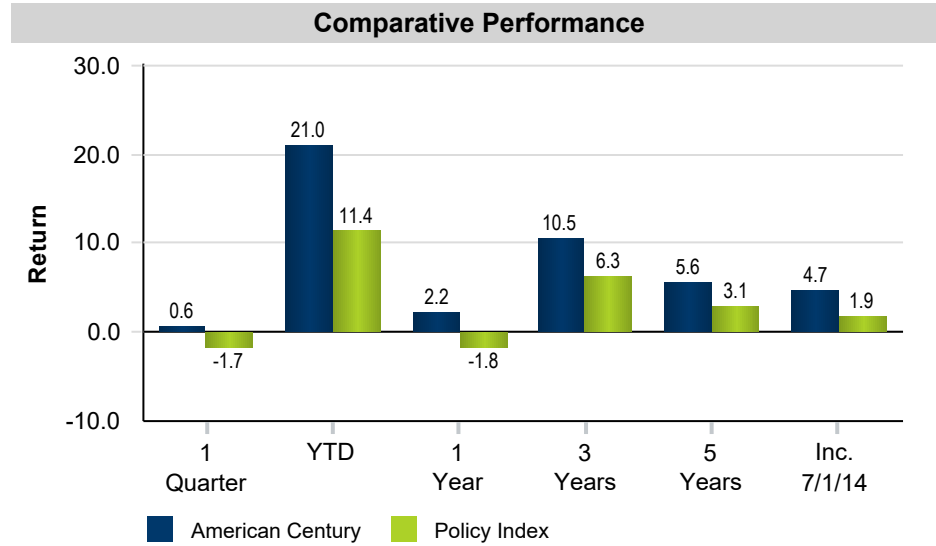
## Correlation Statistics

	<u>American Century</u>	<u>Policy Index</u>
R-Squared	0.90	1.00
Actual Correlation	0.95	1.00

# Manager Summary

American Century vs IM International Large Cap Core Equity (SA+CF)

Periods Ended September 30, 2019

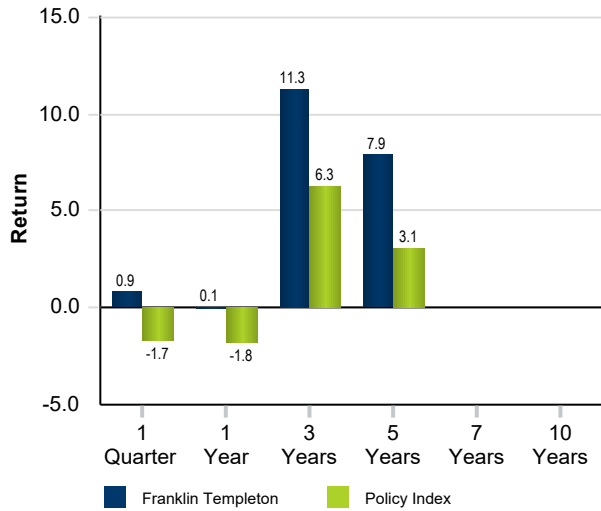


# Performance Summary

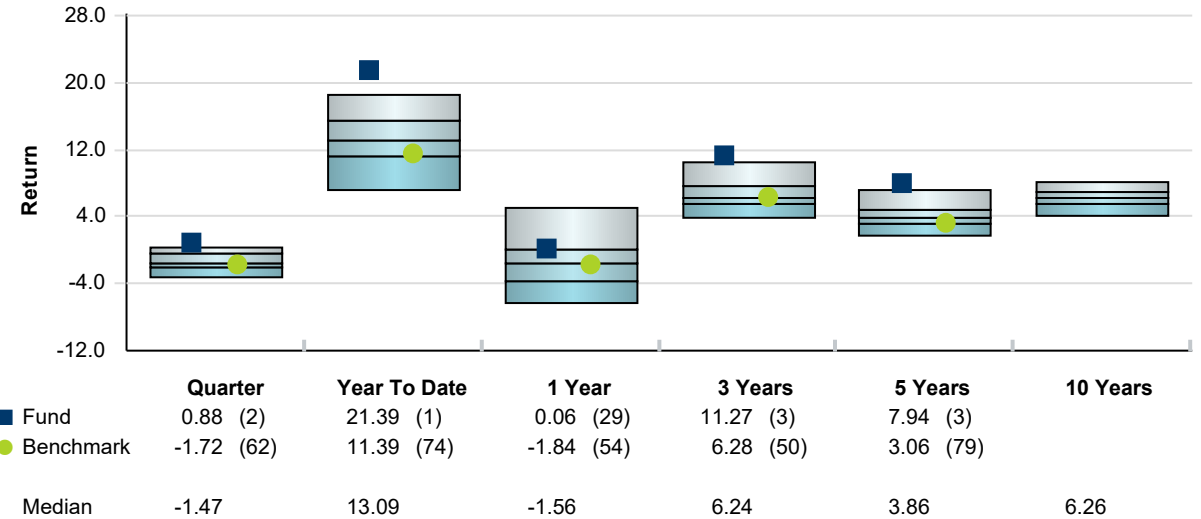
Franklin Templeton

Periods Ended September 30, 2019

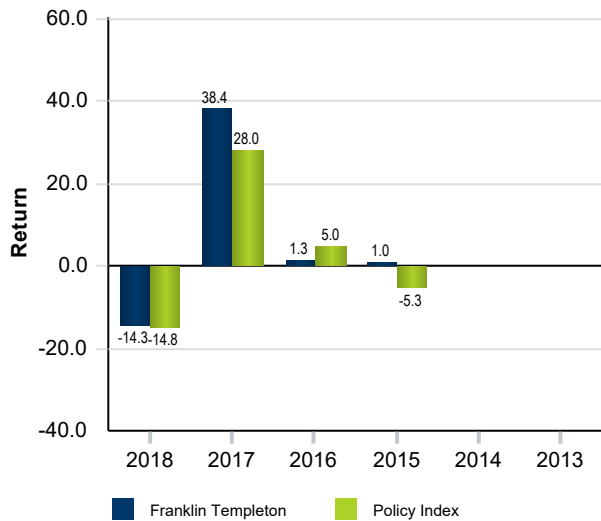
## Comparative Performance



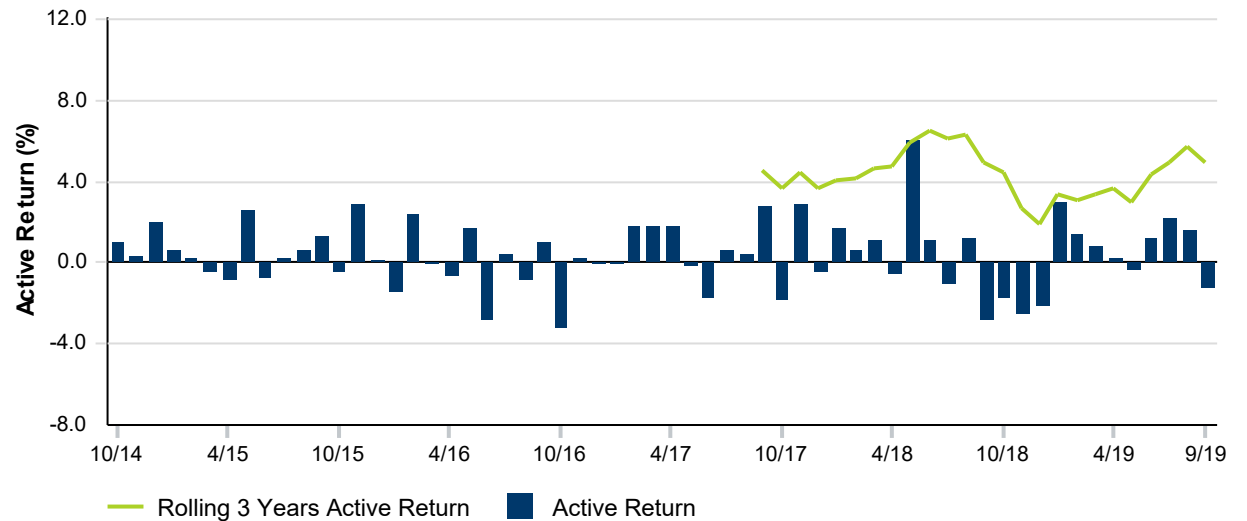
## Peer Group Analysis: IM International Large Cap Core Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Franklin Templeton

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Franklin Templeton</u>	<u>Policy Index</u>
Maximum Return	10.58	7.60
Minimum Return	-10.12	-8.36
Return	0.06	-1.84
Cumulative Return	0.06	-1.84
Active Return	2.57	0.00
Excess Return	-0.44	-3.01

## Risk Summary Statistics

	<u>Franklin Templeton</u>	<u>Policy Index</u>
Upside Risk	3.93	3.02
Downside Risk	13.61	11.43
Beta	1.20	1.00

## Risk/Return Summary Statistics

	<u>Franklin Templeton</u>	<u>Policy Index</u>
Standard Deviation	19.25	15.50
Alpha	2.73	0.00
Active Return/Risk	0.13	0.00
Tracking Error	5.95	0.00
Information Ratio	0.43	
Sharpe Ratio	-0.02	-0.19

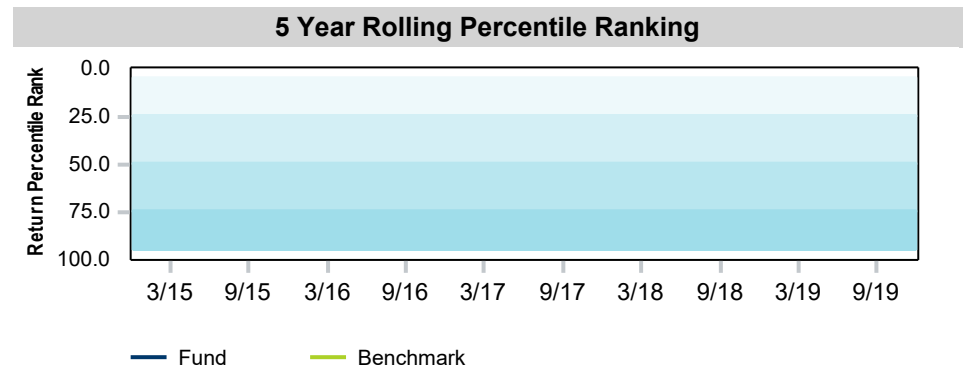
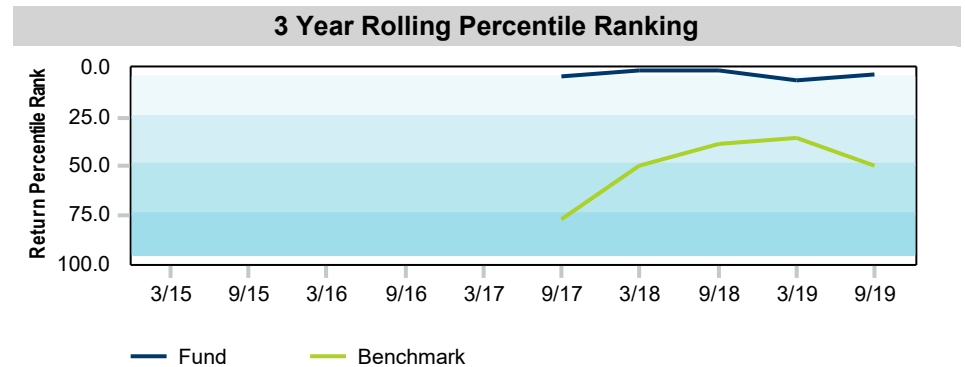
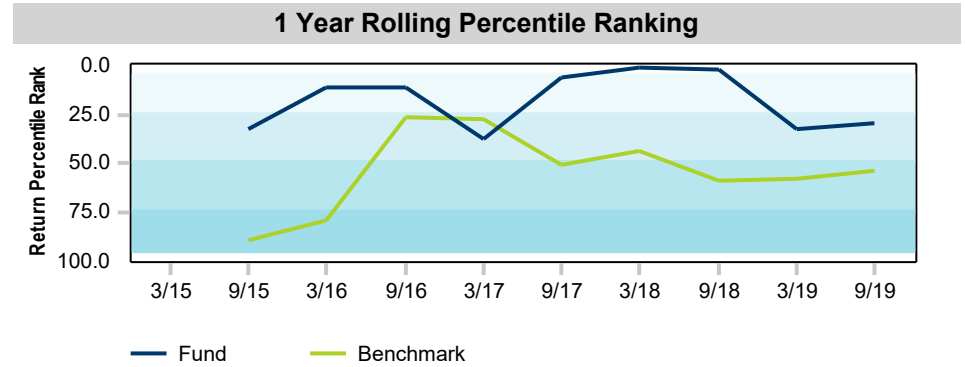
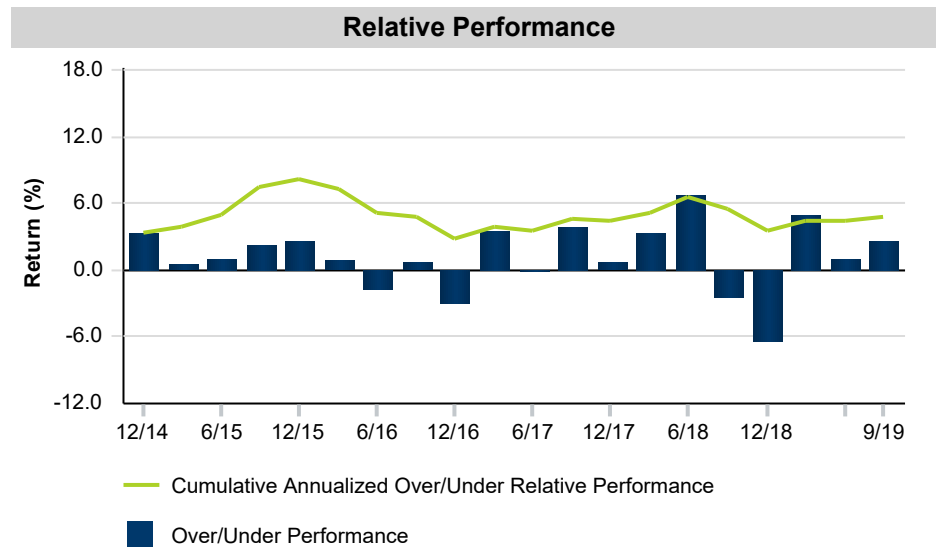
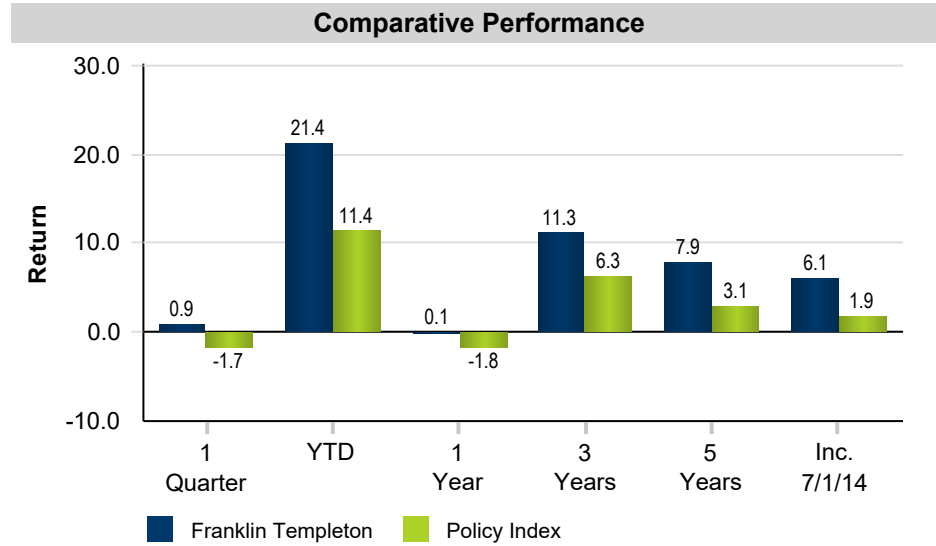
## Correlation Statistics

	<u>Franklin Templeton</u>	<u>Policy Index</u>
R-Squared	0.93	1.00
Actual Correlation	0.96	1.00

# Manager Summary

Franklin Templeton vs IM International Large Cap Core Equity (SA+CF)

Periods Ended September 30, 2019

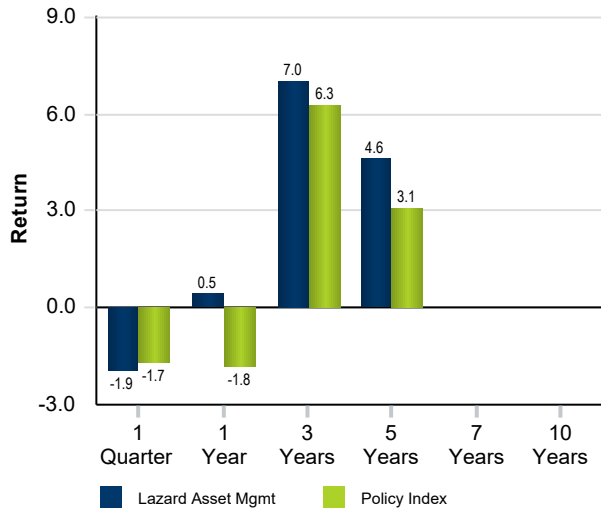


# Performance Summary

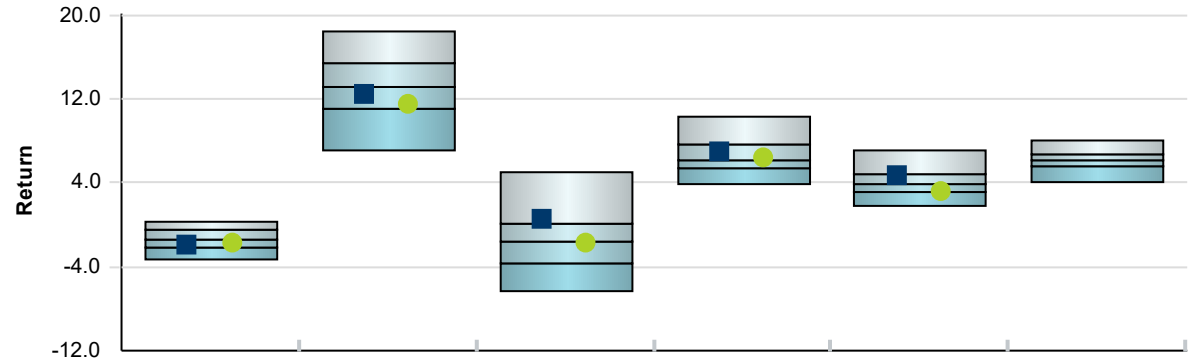
Lazard Asset Mgmt

Periods Ended September 30, 2019

## Comparative Performance

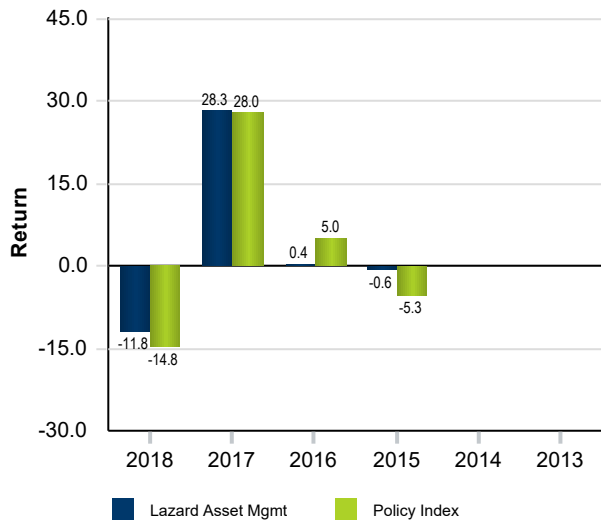


## Peer Group Analysis: IM International Large Cap Core Equity (SA+CF)

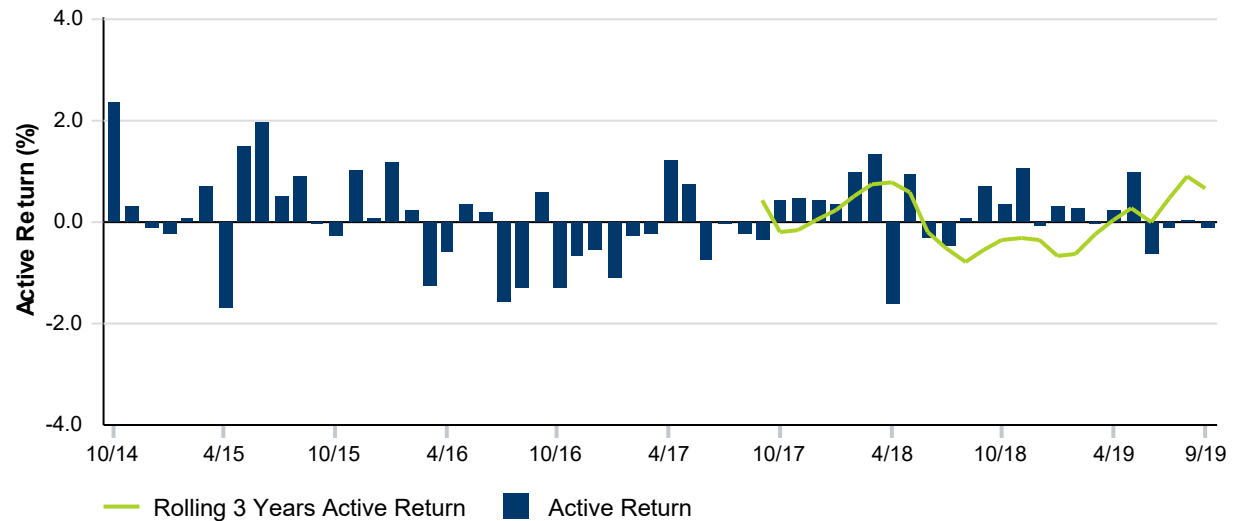


	Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years
■ Fund	-1.92 (68)	12.49 (65)	0.47 (24)	7.02 (37)	4.60 (30)	
● Benchmark	-1.72 (62)	11.39 (74)	-1.84 (54)	6.28 (50)	3.06 (79)	
Median	-1.47	13.09	-1.56	6.24	3.86	6.26

## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Lazard Asset Mgmt

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Lazard Asset Mgmt</u>	<u>Policy Index</u>
Maximum Return	7.91	7.60
Minimum Return	-8.02	-8.36
Return	0.47	-1.84
Cumulative Return	0.47	-1.84
Active Return	2.27	0.00
Excess Return	-0.74	-3.01

## Risk Summary Statistics

	<u>Lazard Asset Mgmt</u>	<u>Policy Index</u>
Upside Risk	3.06	3.02
Downside Risk	10.79	11.43
Beta	0.97	1.00

## Risk/Return Summary Statistics

	<u>Lazard Asset Mgmt</u>	<u>Policy Index</u>
Standard Deviation	15.11	15.50
Alpha	2.27	0.00
Active Return/Risk	0.15	0.00
Tracking Error	1.55	0.00
Information Ratio	1.46	
Sharpe Ratio	-0.05	-0.19

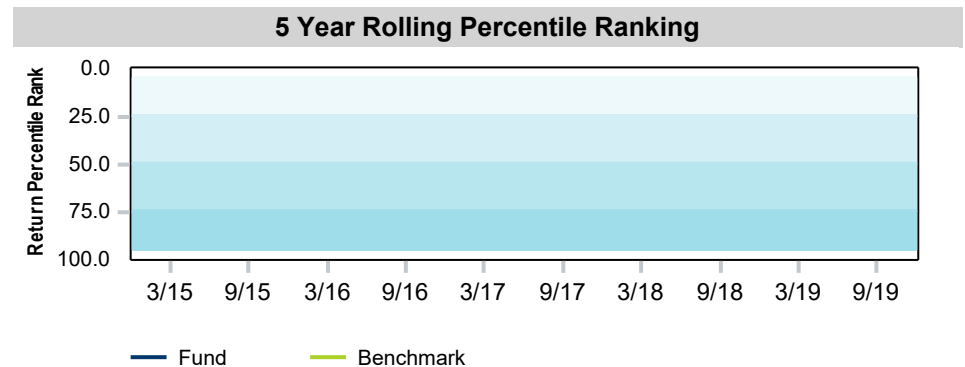
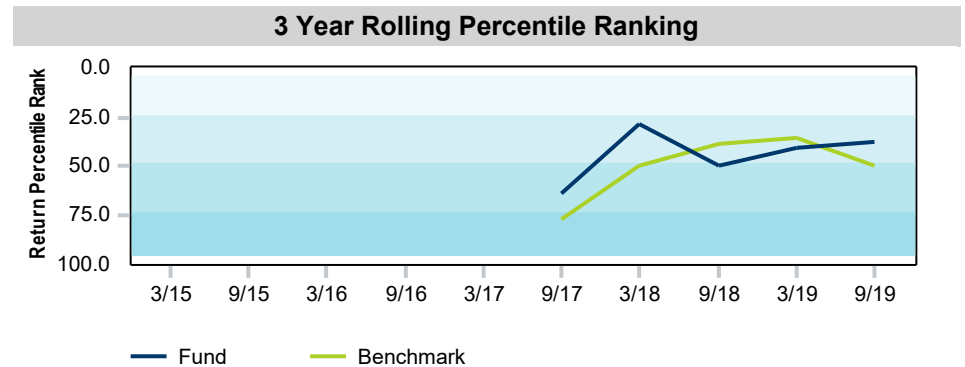
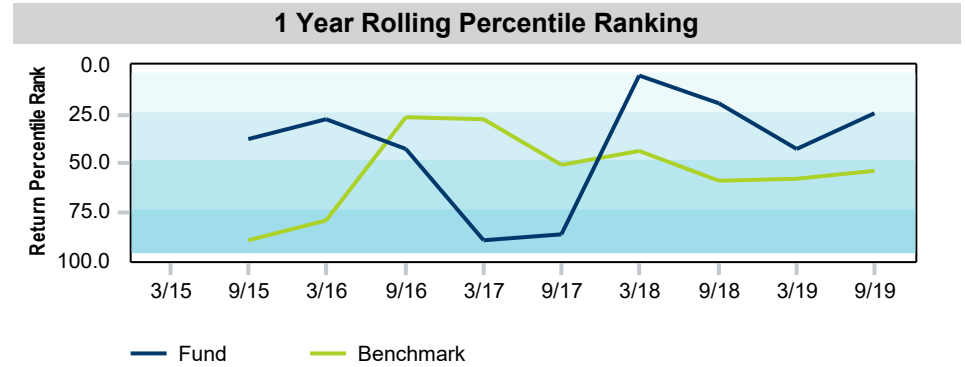
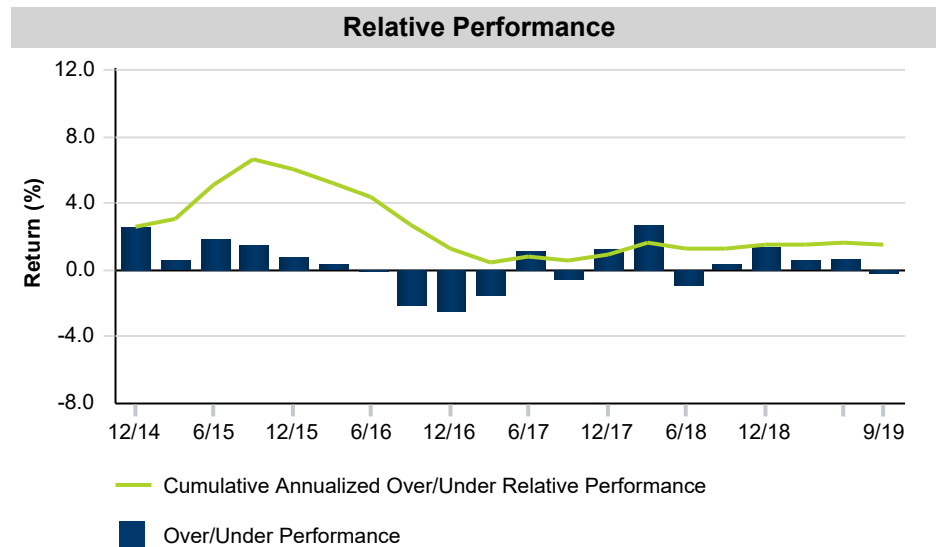
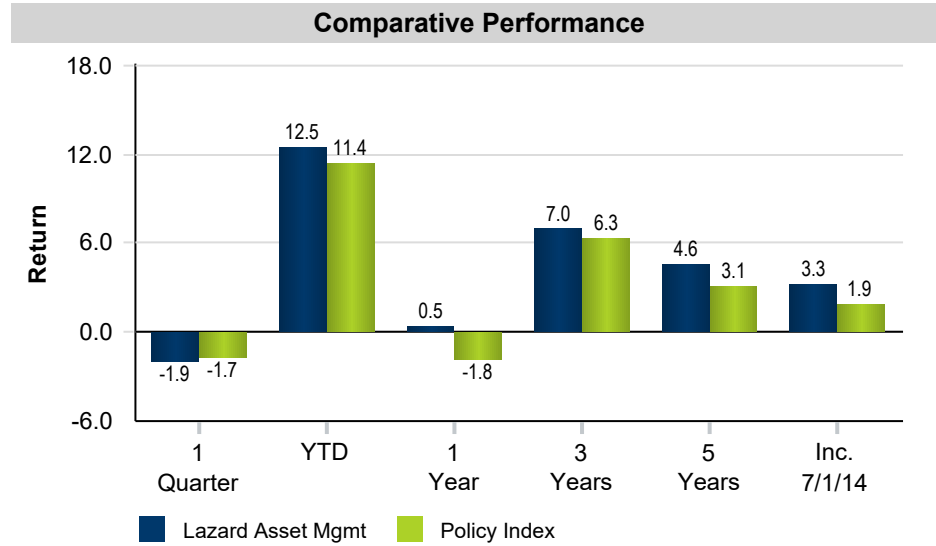
## Correlation Statistics

	<u>Lazard Asset Mgmt</u>	<u>Policy Index</u>
R-Squared	0.99	1.00
Actual Correlation	1.00	1.00

# Manager Summary

Lazard Asset Mgmt vs IM International Large Cap Core Equity (SA+CF)

Periods Ended September 30, 2019



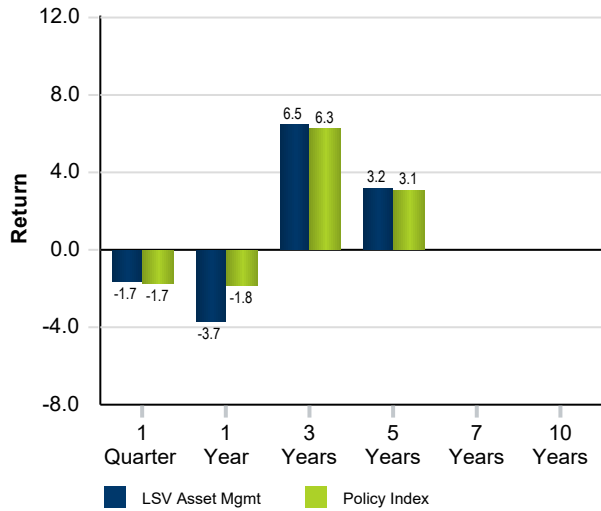


# Performance Summary

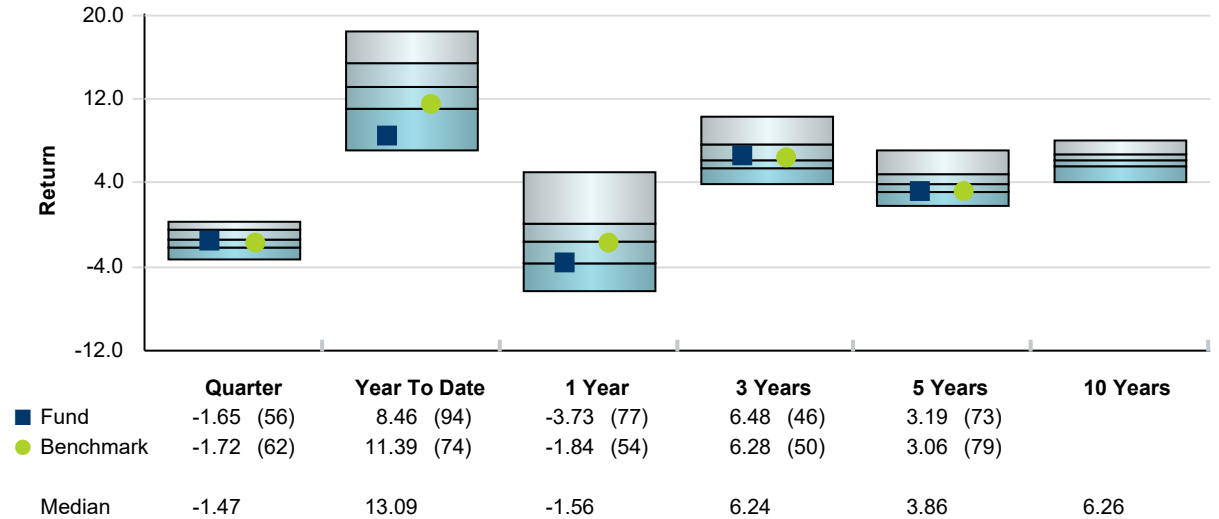
LSV Asset Mgmt

Periods Ended September 30, 2019

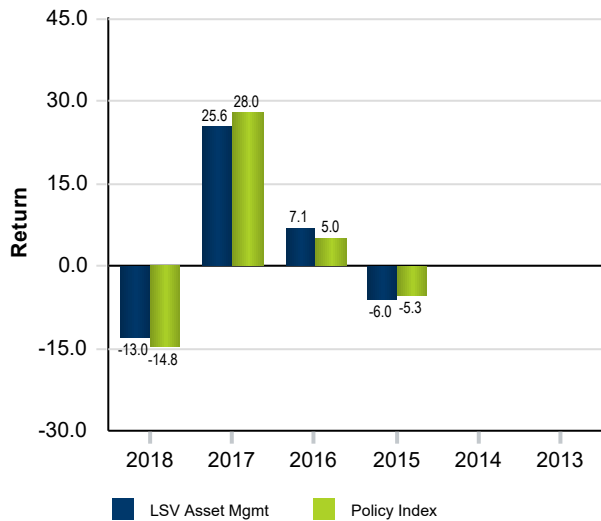
## Comparative Performance



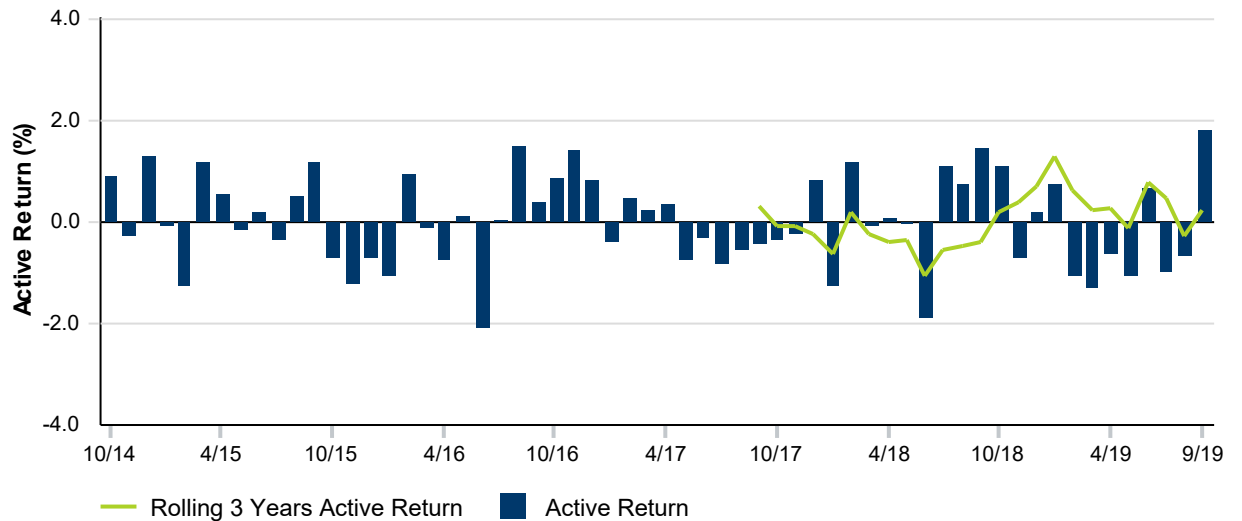
## Peer Group Analysis: IM International Large Cap Core Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

LSV Asset Mgmt

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>LSV Asset Mgmt</u>	<u>Policy Index</u>
Maximum Return	8.36	7.60
Minimum Return	-7.25	-8.36
Return	-3.73	-1.84
Cumulative Return	-3.73	-1.84
Active Return	-1.81	0.00
Excess Return	-4.82	-3.01

## Risk Summary Statistics

	<u>LSV Asset Mgmt</u>	<u>Policy Index</u>
Upside Risk	3.36	3.02
Downside Risk	11.50	11.43
Beta	1.03	1.00

## Risk/Return Summary Statistics

	<u>LSV Asset Mgmt</u>	<u>Policy Index</u>
Standard Deviation	16.35	15.50
Alpha	-1.77	0.00
Active Return/Risk	-0.11	0.00
Tracking Error	3.40	0.00
Information Ratio	-0.53	
Sharpe Ratio	-0.29	-0.19

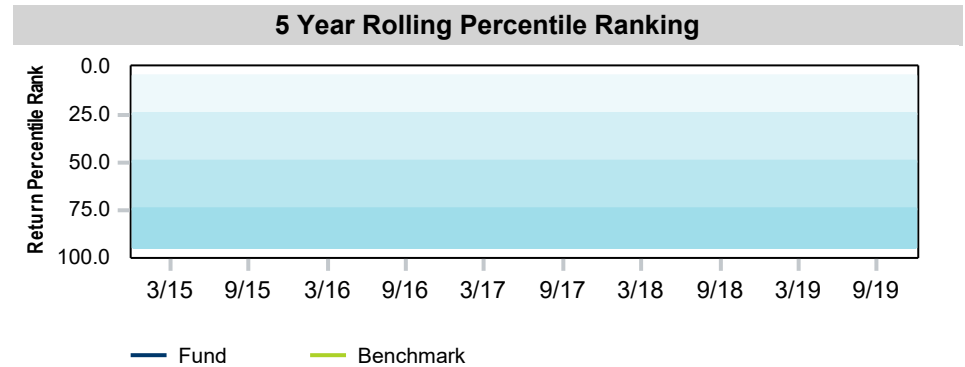
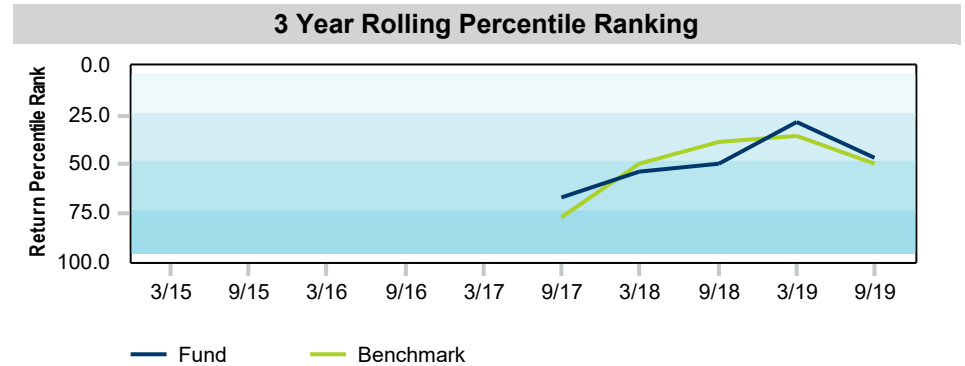
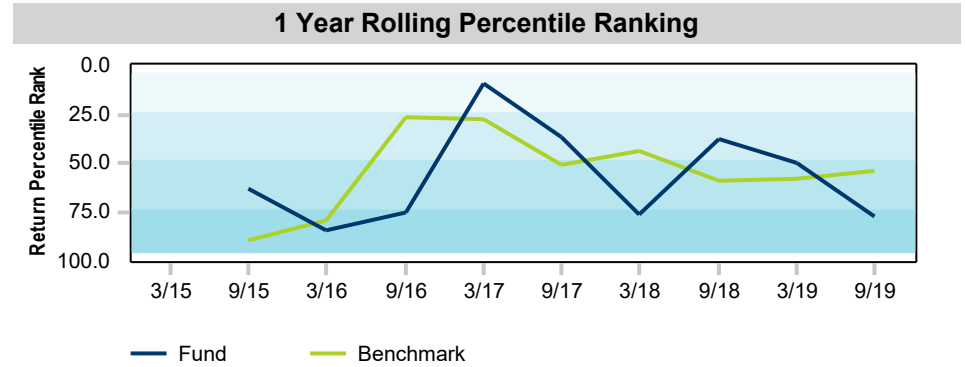
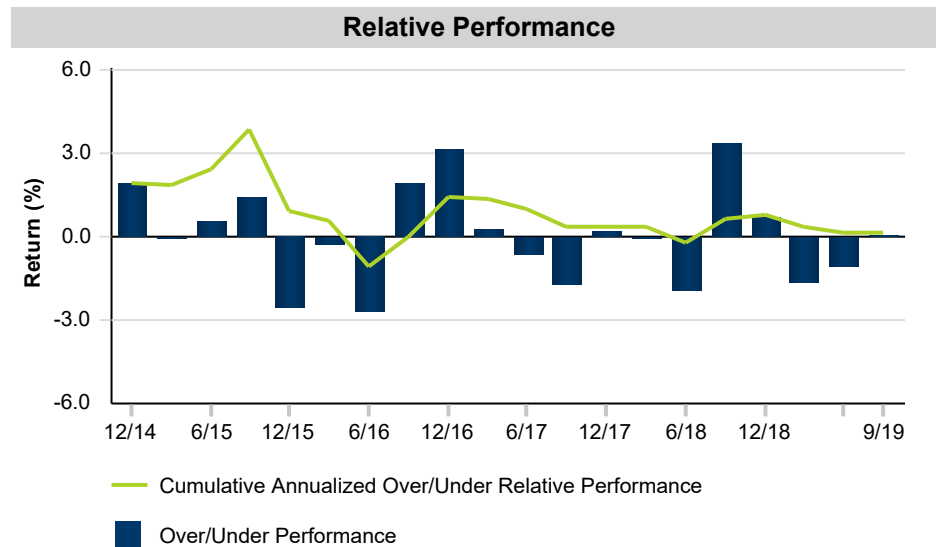
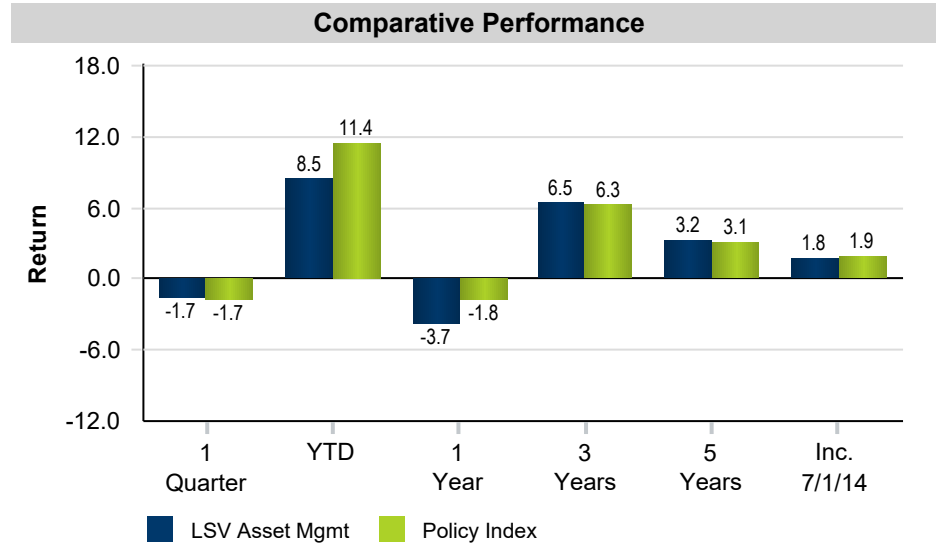
## Correlation Statistics

	<u>LSV Asset Mgmt</u>	<u>Policy Index</u>
R-Squared	0.96	1.00
Actual Correlation	0.98	1.00

# Manager Summary

LSV Asset Mgmt vs IM International Large Cap Core Equity (SA+CF)

Periods Ended September 30, 2019

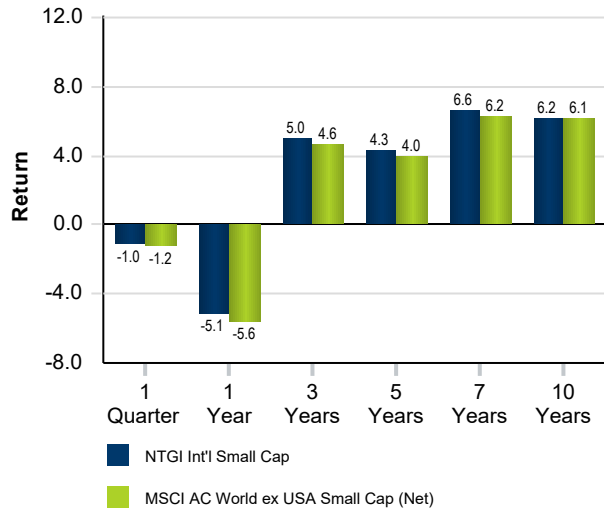


# Performance Summary

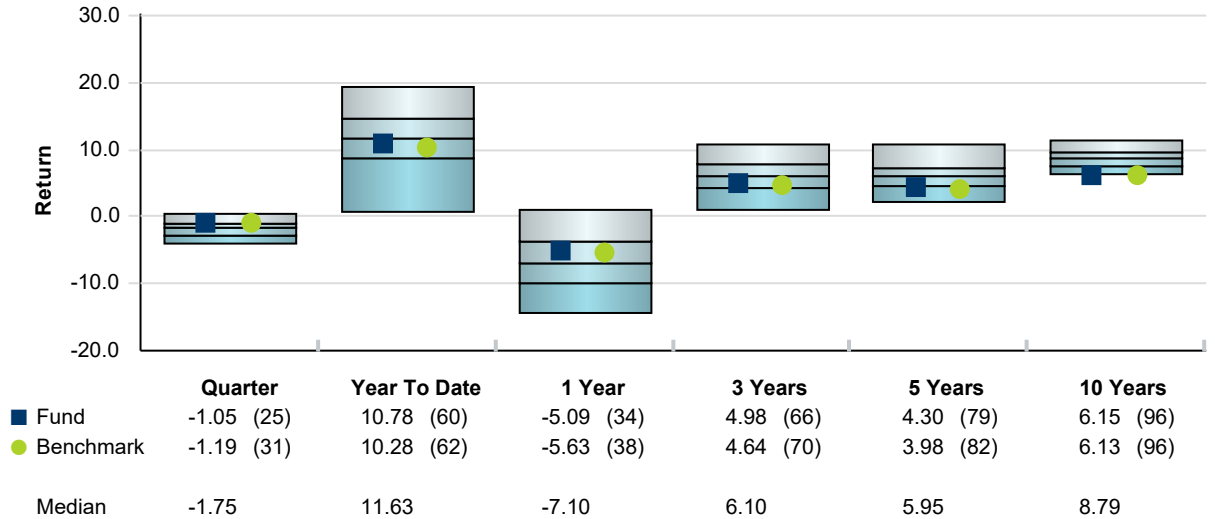
NTGI Int'l Small Cap

Periods Ended September 30, 2019

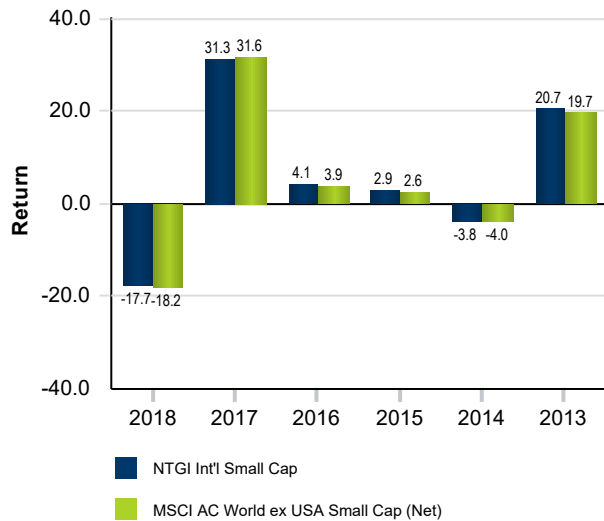
## Comparative Performance



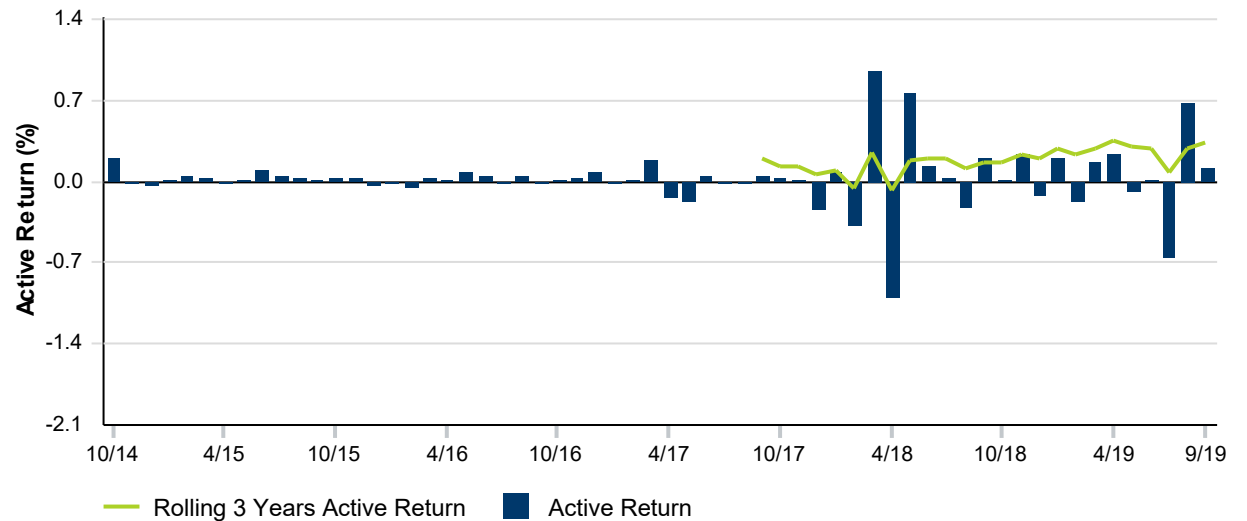
## Peer Group Analysis: IM International Small Cap Equity (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

NTGI Int'l Small Cap

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>NTGI Int'l Small Cap</u>	<u>MSCI AC World ex USA Small Cap (Net)</u>
Maximum Return	8.04	7.83
Minimum Return	-9.71	-9.73
Return	-5.09	-5.63
Cumulative Return	-5.09	-5.63
Active Return	0.59	0.00
Excess Return	-6.26	-6.85

## Risk Summary Statistics

	<u>NTGI Int'l Small Cap</u>	<u>MSCI AC World ex USA Small Cap (Net)</u>
Upside Risk	2.90	2.83
Downside Risk	12.63	12.63
Beta	1.01	1.00

## Risk/Return Summary Statistics

	<u>NTGI Int'l Small Cap</u>	<u>MSCI AC World ex USA Small Cap (Net)</u>
Standard Deviation	16.09	15.94
Alpha	0.63	0.00
Active Return/Risk	0.04	0.00
Tracking Error	1.06	0.00
Information Ratio	0.56	
Sharpe Ratio	-0.39	-0.43

## Correlation Statistics

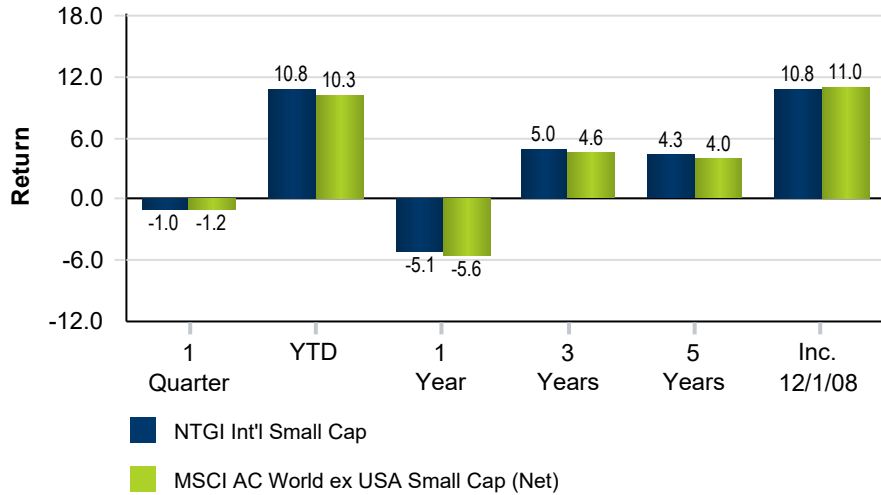
	<u>NTGI Int'l Small Cap</u>	<u>MSCI AC World ex USA Small Cap (Net)</u>
R-Squared	1.00	1.00
Actual Correlation	1.00	1.00

# Manager Summary

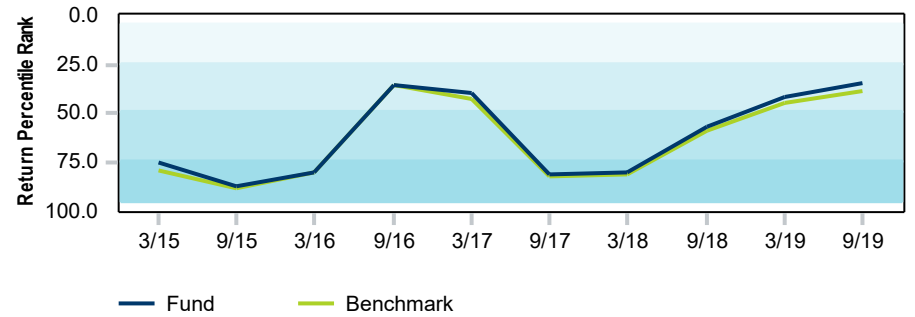
NTGI Int'l Small Cap vs IM International Small Cap Equity (SA+CF)

Periods Ended September 30, 2019

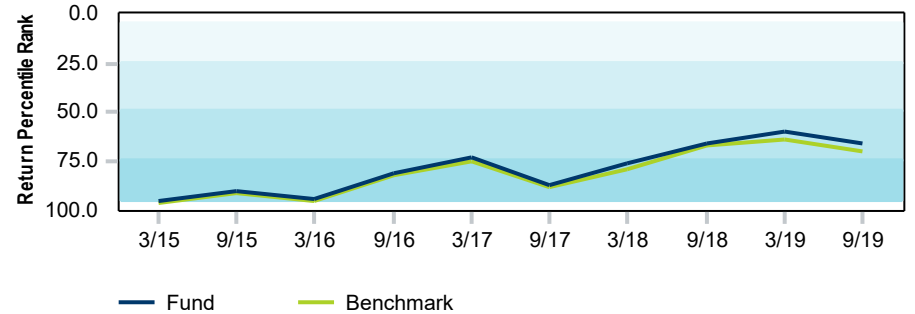
## Comparative Performance



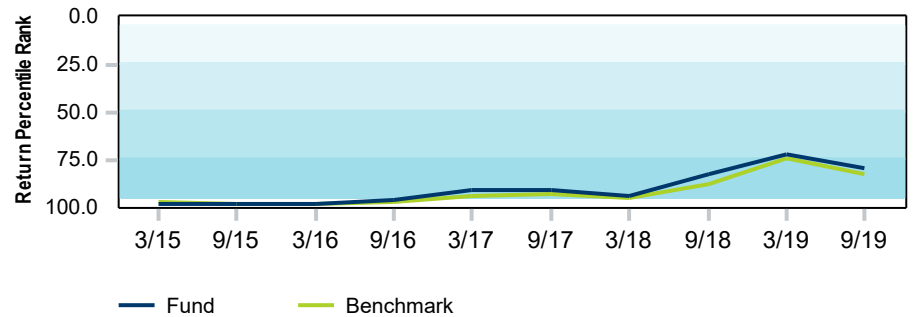
## 1 Year Rolling Percentile Ranking



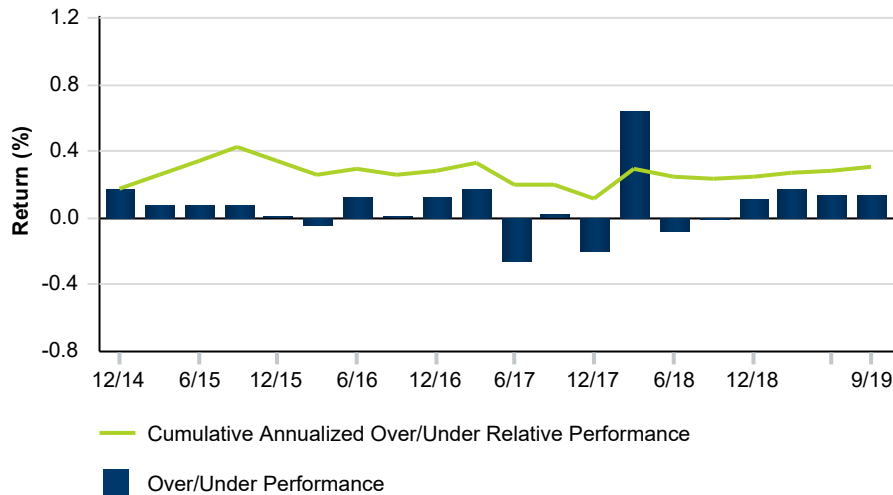
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Relative Performance





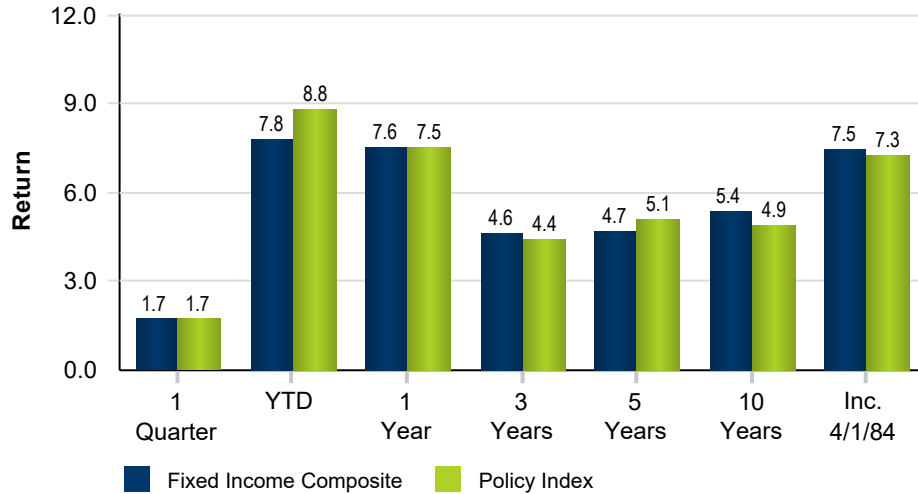
# Fixed Income Composite

# Composite Performance Summary

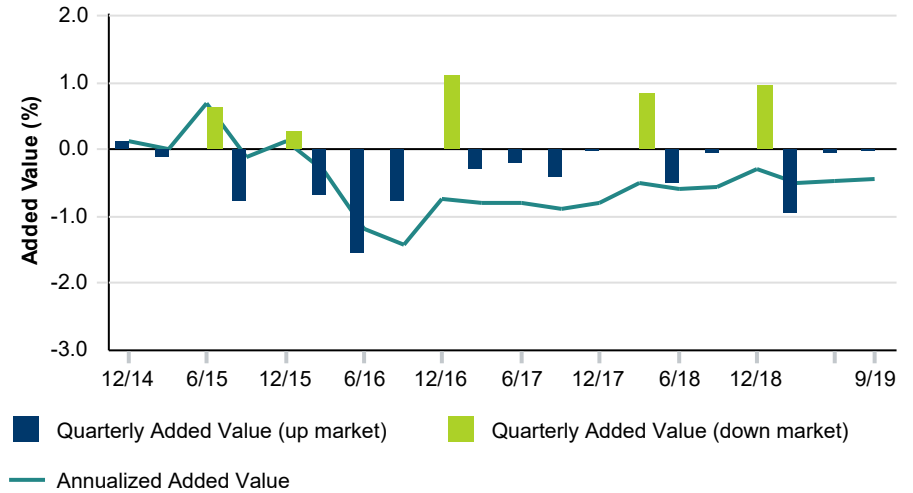
Fixed Income Composite

Periods Ended September 30, 2019

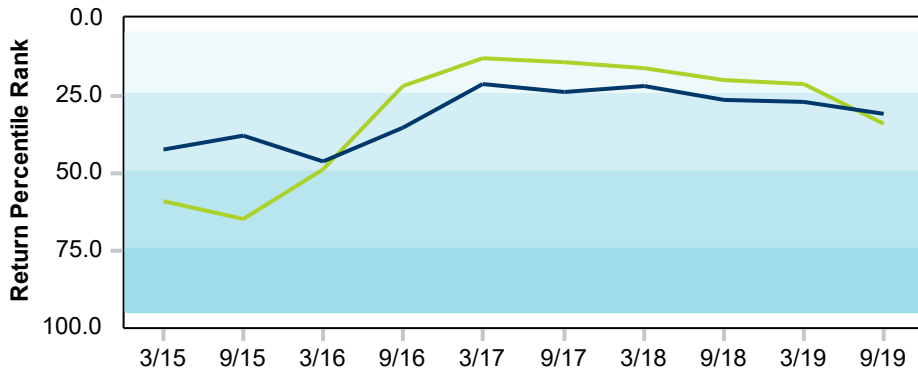
**Comparative Performance**



**Added Value History**

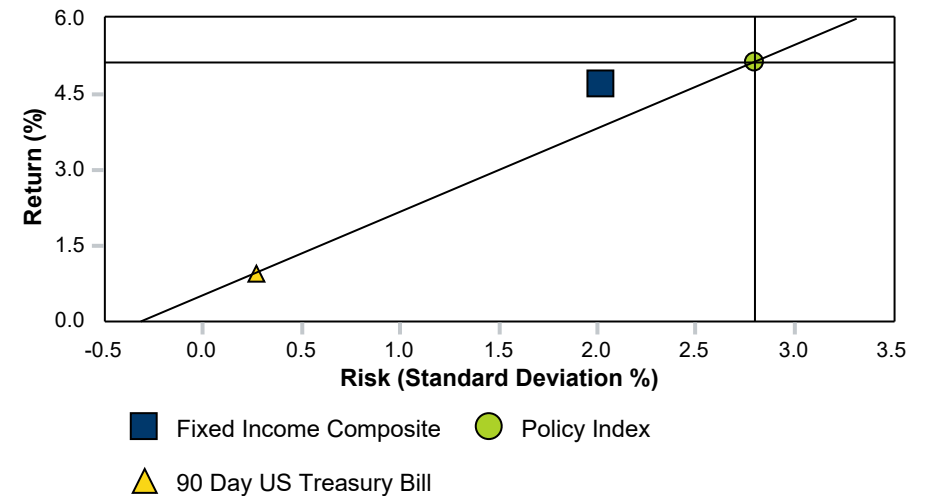


**Rolling Percentile Rank: IM U.S. Fixed Income (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Fixed Income Composite	10	3 (30%)	7 (70%)	0 (0%)	0 (0%)
Benchmark	10	6 (60%)	2 (20%)	2 (20%)	0 (0%)

**Risk and Return 10/1/14 - 09/30/19**



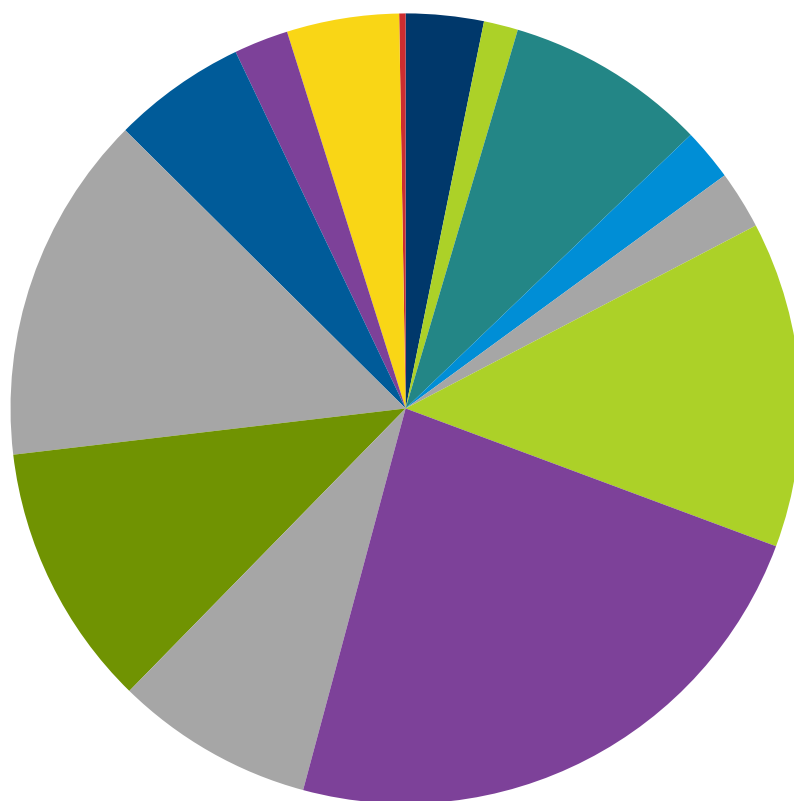


# Asset Allocation By Manager

Fixed Income Composite

Periods Ended September 30, 2019

Sep-2019 : 4,374,498,036

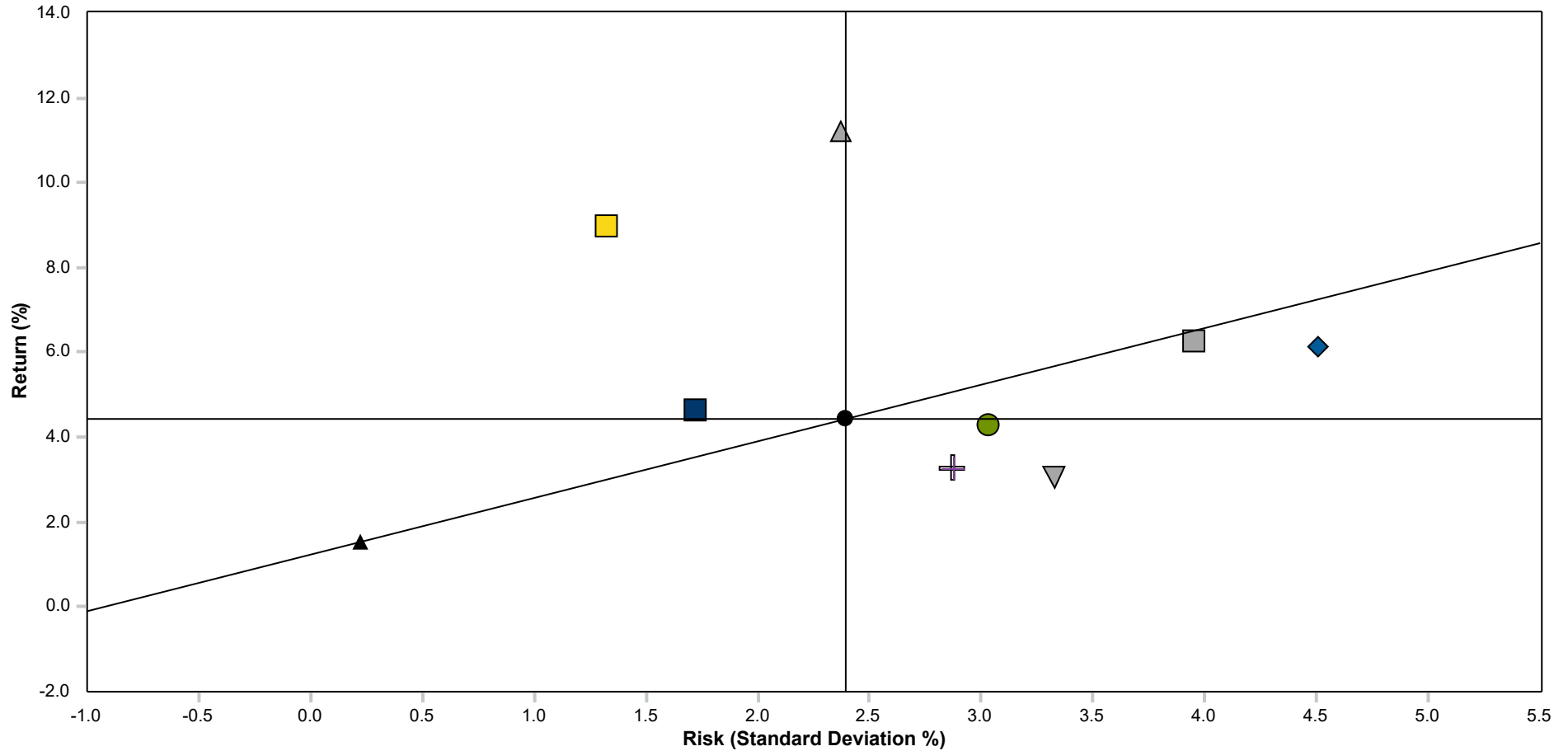


	Market Value \$	Allocation (%)
Arrowmark	139,104,289	3.2
BSP Private Credit	61,295,948	1.4
Columbia	360,549,944	8.2
Cerberus Capital Mgmt	93,159,808	2.1
BNY IG Credit	104,227,673	2.4
Loomis	40,061	0.0
Loomis Sayles Intmd	583,305,068	13.3
Lord Abbett	1,028,423,837	23.5
Marathon Bluegrass	356,299,792	8.1
Manulife Asset Mgmt	472,827,632	10.8
NISA	625,914,524	14.3
Shenkman Capital	239,509,838	5.5
White Oak Yield Spectrum	97,368,516	2.2
Waterfall	200,975,287	4.6
BSP Coinvestment	11,495,821	0.3

# Risk vs. Return

Fixed Income Composite

Periods Ended 3 Years Ending September 30, 2019



- Fixed Income Composite
- BNY IG Credit
- ▲ Loomis Sayles Intmd
- ◆ Lord Abbett
- ▼ NISA
- Arrowmark
- ⊕ Manulife Asset Mgmt
- Marathon Bluegrass
- Shenkman Capital
- ▲ Waterfall
- ◆ Columbia
- ▼ BSP Private Credit
- Cerberus Capital Mgmt
- White Oak Yield Spectrum
- Policy Index
- ▲ 90 Day US Treasury Bill

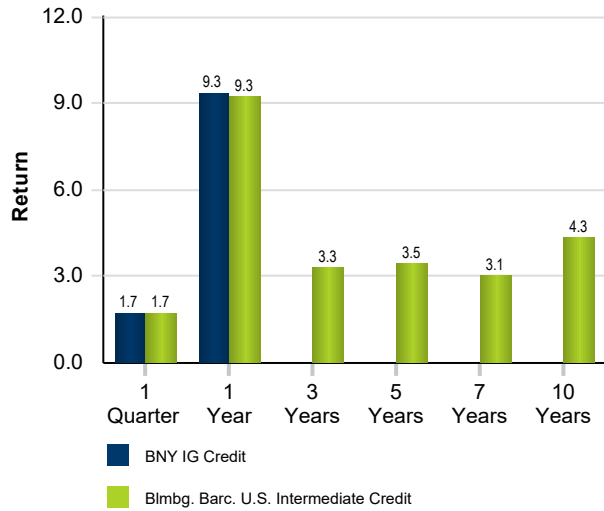
Calculation based on monthly periodicity.

# Performance Summary

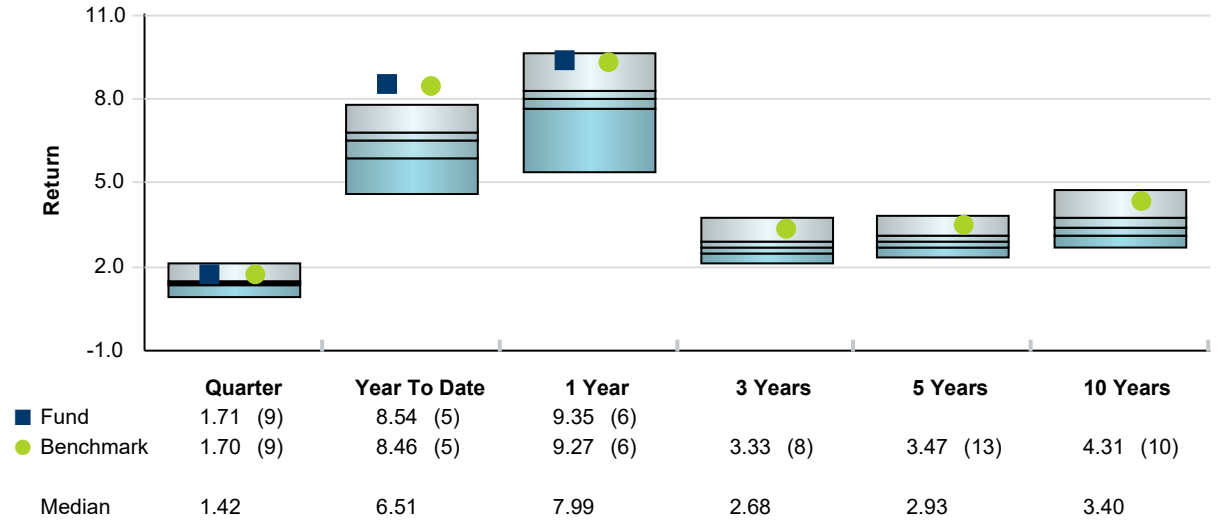
BNY IG Credit

Periods Ended September 30, 2019

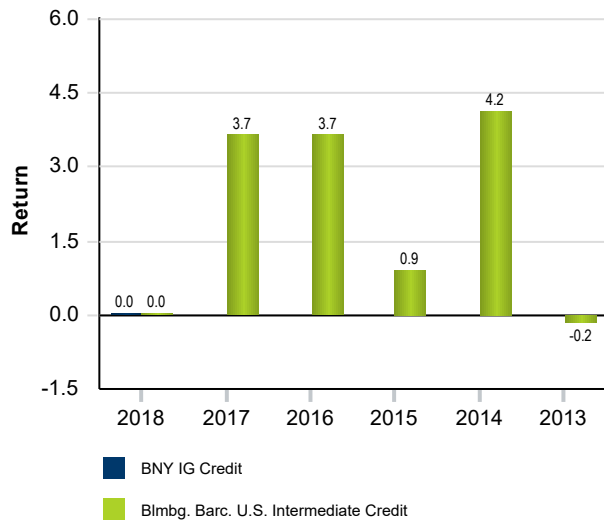
## Comparative Performance



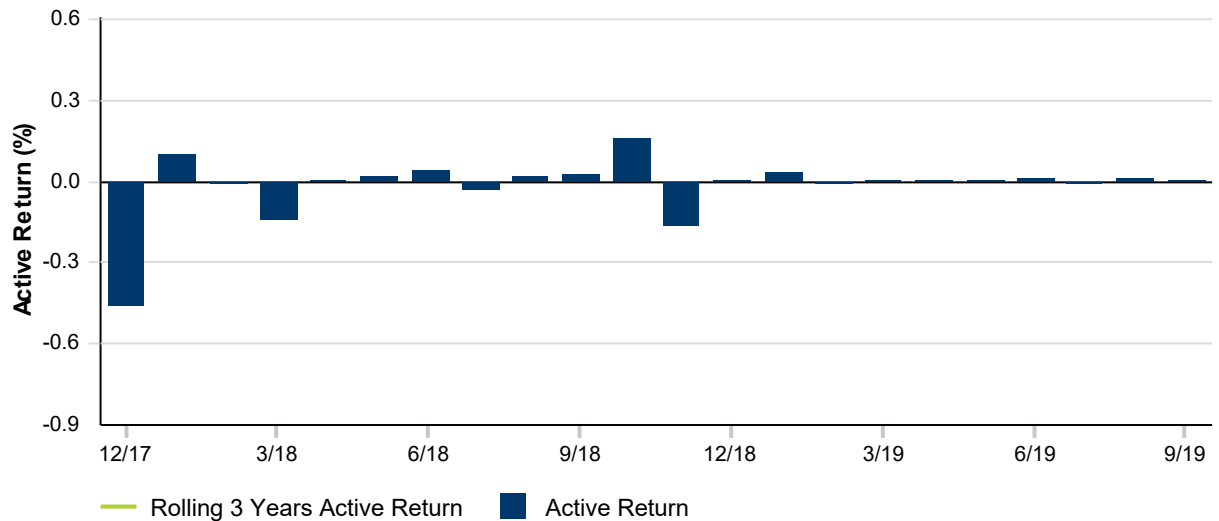
## Peer Group Analysis: IM U.S. Intermediate Duration (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

BNY IG Credit

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>BNY IG Credit</u>	<u>Blmbg. Barc. U.S. Intermediate Credit</u>
Maximum Return	1.74	1.73
Minimum Return	-0.26	-0.42
Return	9.35	9.27
Cumulative Return	9.35	9.27
Active Return	0.07	0.00
Excess Return	6.64	6.57

## Risk Summary Statistics

	<u>BNY IG Credit</u>	<u>Blmbg. Barc. U.S. Intermediate Credit</u>
Upside Risk	1.04	1.04
Downside Risk	0.36	0.48
Beta	1.00	1.00

## Risk/Return Summary Statistics

	<u>BNY IG Credit</u>	<u>Blmbg. Barc. U.S. Intermediate Credit</u>
Standard Deviation	2.54	2.54
Alpha	0.09	0.00
Active Return/Risk	0.03	0.00
Tracking Error	0.23	0.00
Information Ratio	0.30	
Sharpe Ratio	2.66	2.63

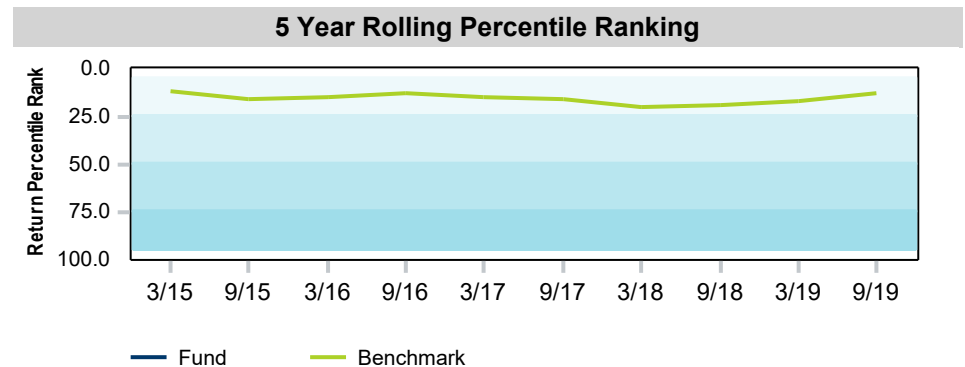
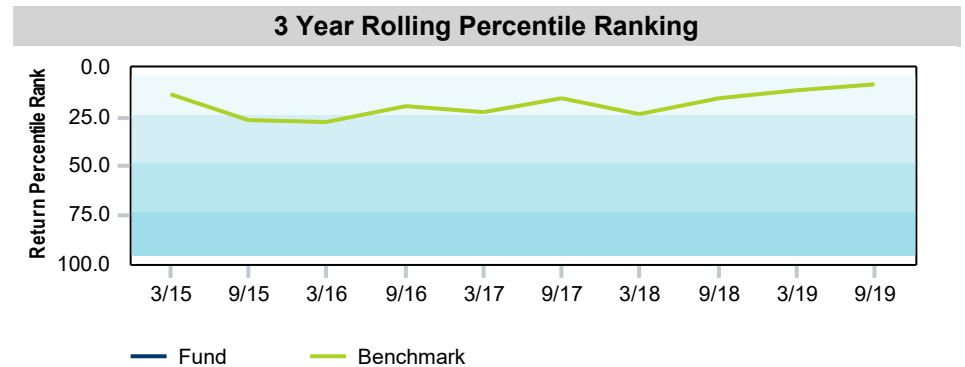
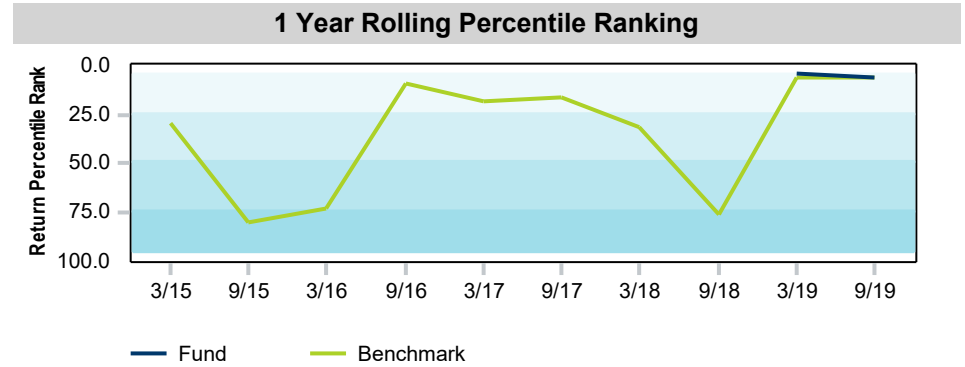
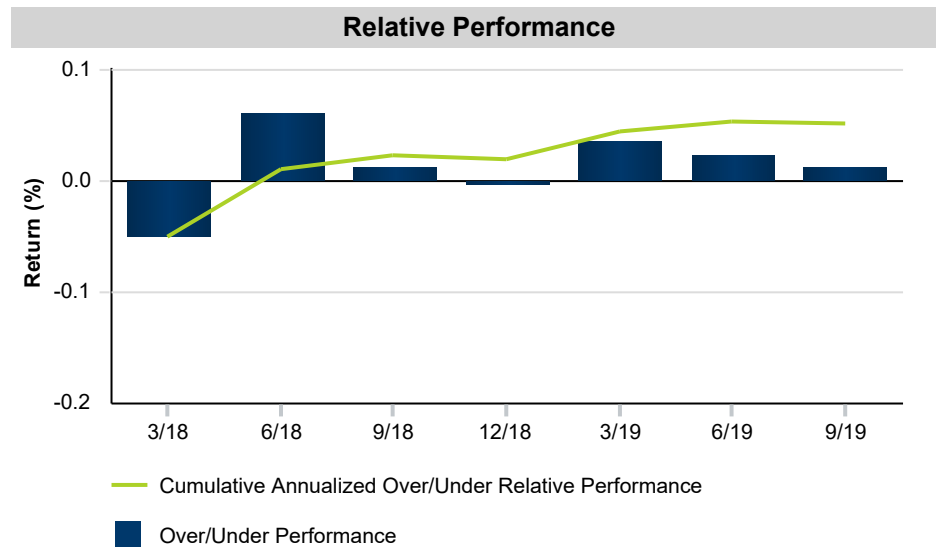
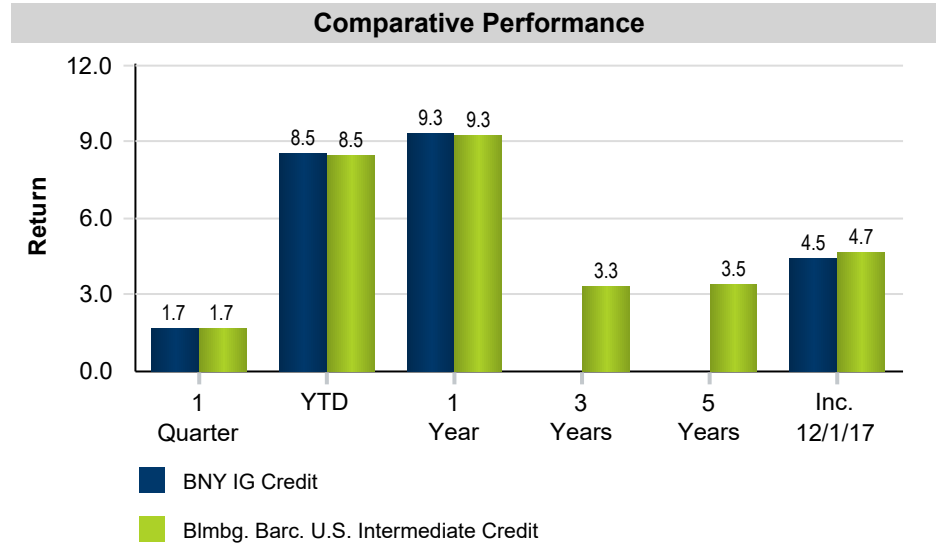
## Correlation Statistics

	<u>BNY IG Credit</u>	<u>Blmbg. Barc. U.S. Intermediate Credit</u>
R-Squared	0.99	1.00
Actual Correlation	1.00	1.00

# Manager Summary

BNY IG Credit vs IM U.S. Intermediate Duration (SA+CF)

Periods Ended September 30, 2019

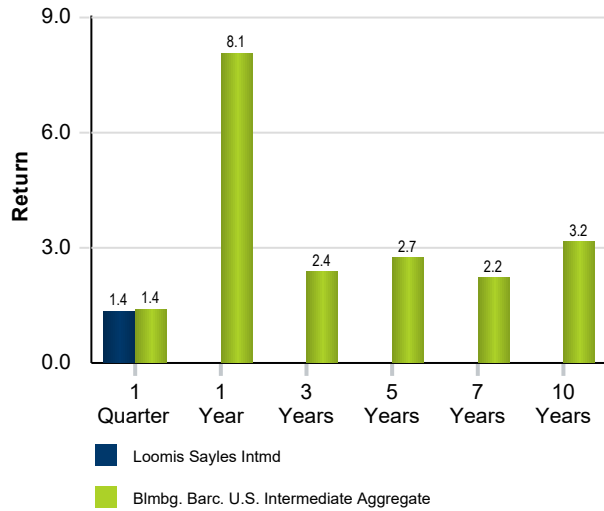


# Performance Summary

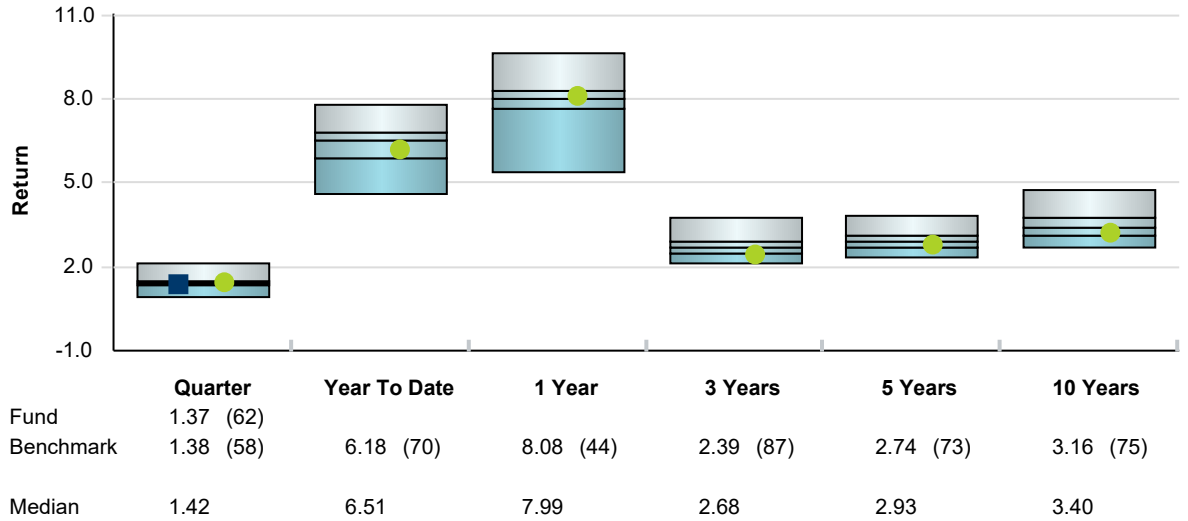
Loomis Sayles Intmd

Periods Ended September 30, 2019

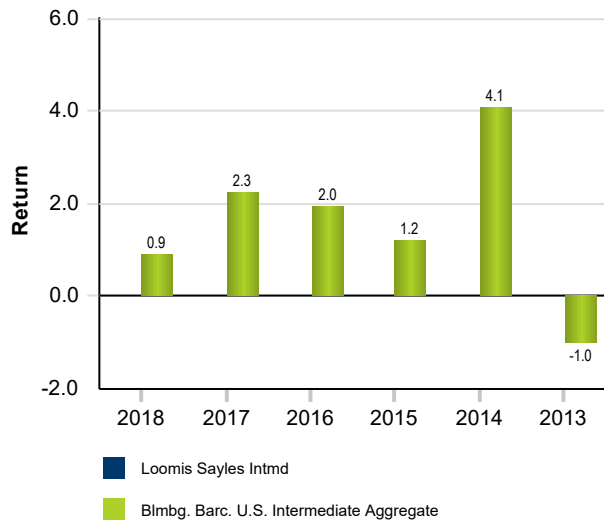
## Comparative Performance



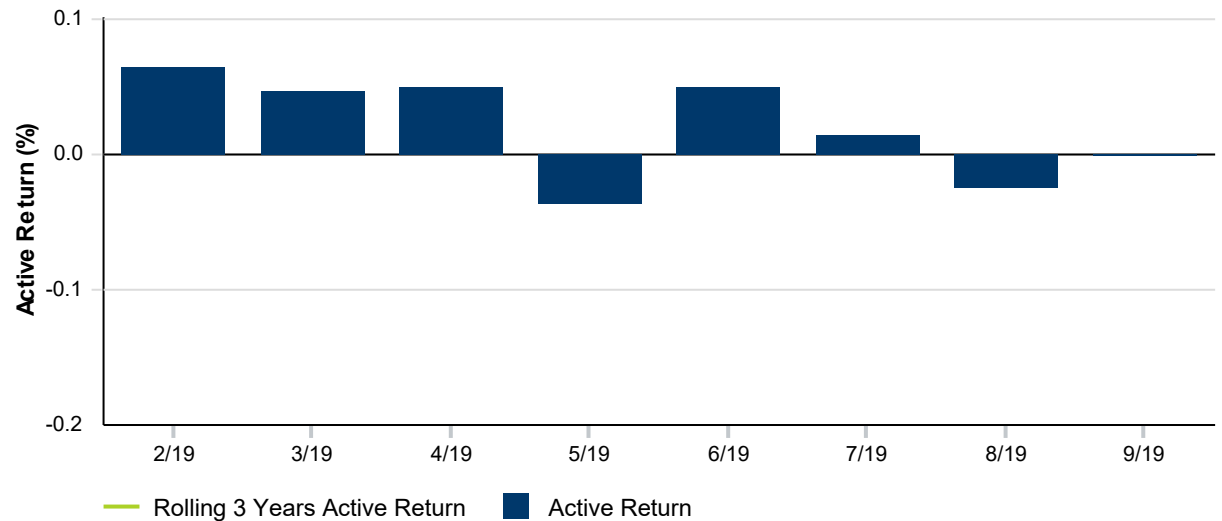
## Peer Group Analysis: IM U.S. Intermediate Duration (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Loomis Sayles Intmd

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Loomis Sayles Intmd</u>	<u>Blmbg. Barc. U.S. Intermediate Aggregate</u>
Maximum Return		1.50
Minimum Return		-0.31
Return		8.08
Cumulative Return		8.08
Active Return		0.00
Excess Return		5.47

## Risk Summary Statistics

	<u>Loomis Sayles Intmd</u>	<u>Blmbg. Barc. U.S. Intermediate Aggregate</u>
Upside Risk		0.92
Downside Risk		0.38
Beta		1.00

## Risk/Return Summary Statistics

	<u>Loomis Sayles Intmd</u>	<u>Blmbg. Barc. U.S. Intermediate Aggregate</u>
Standard Deviation		2.28
Alpha		0.00
Active Return/Risk		0.00
Tracking Error		0.00
Information Ratio		
Sharpe Ratio		2.45

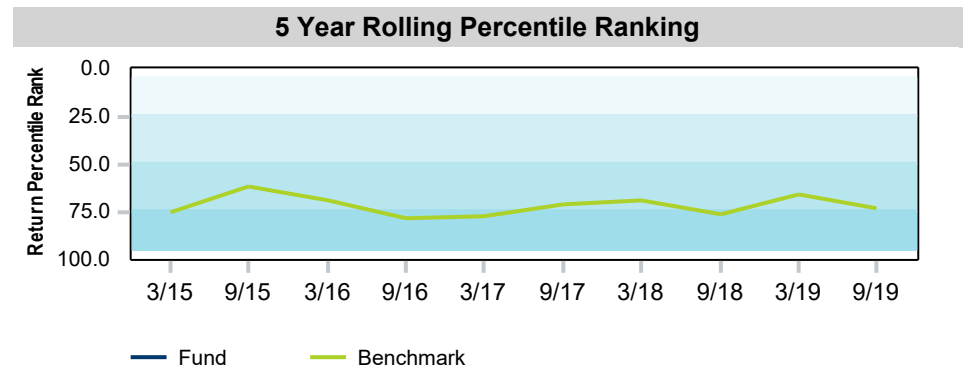
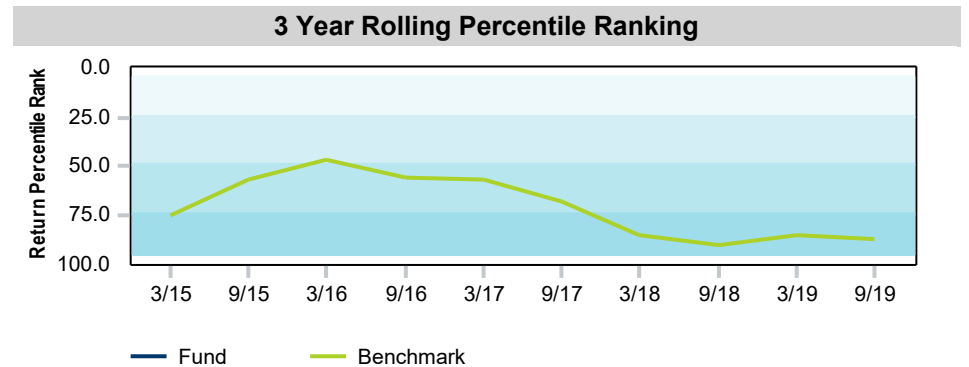
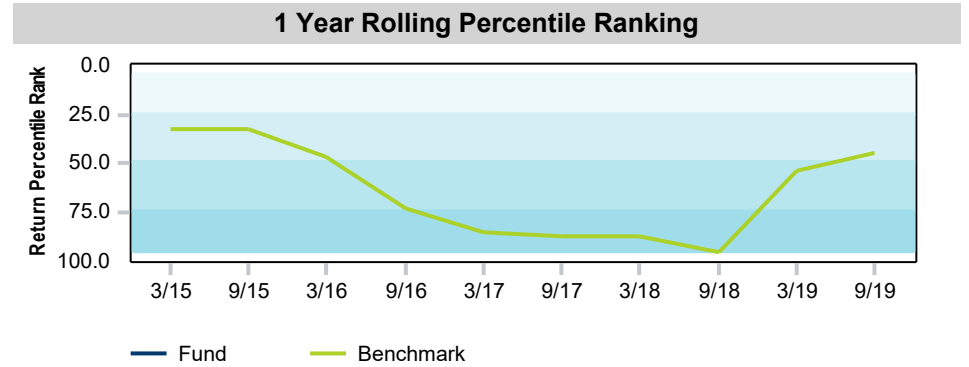
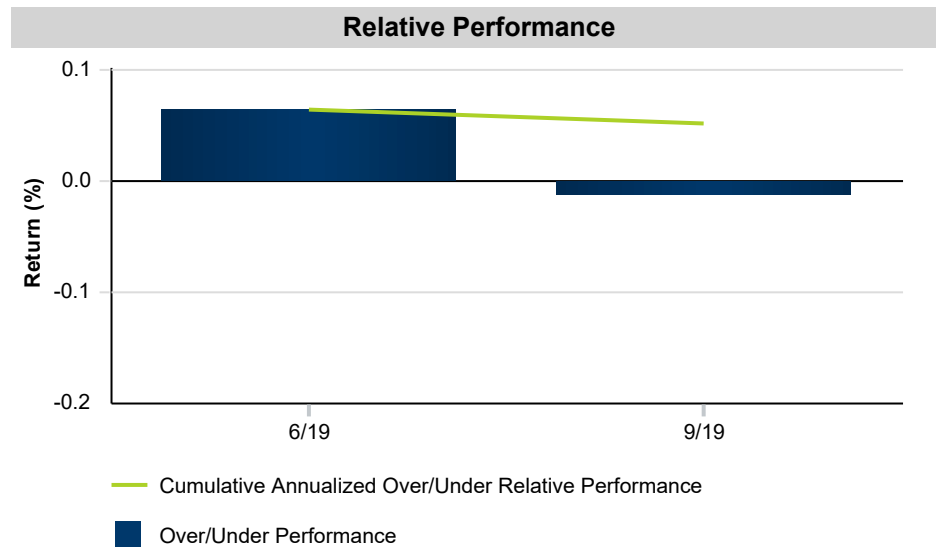
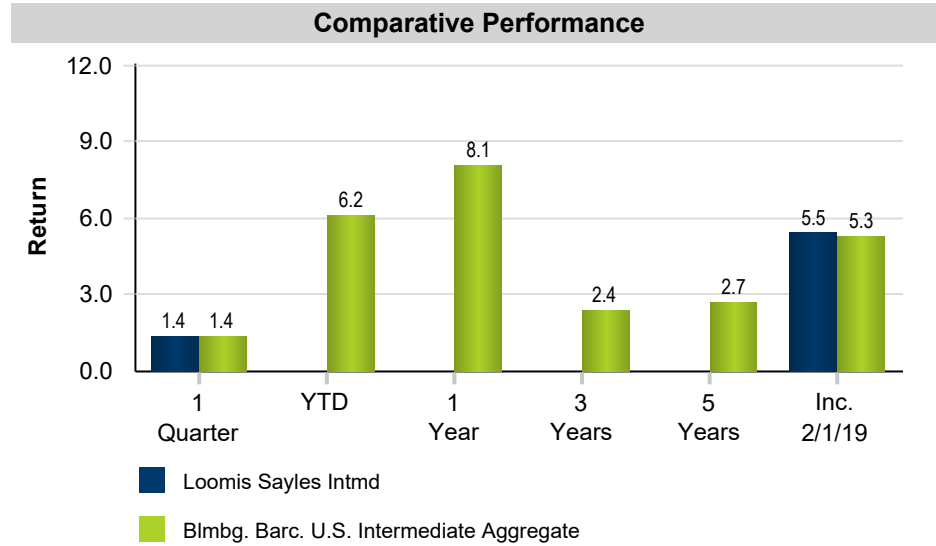
## Correlation Statistics

	<u>Loomis Sayles Intmd</u>	<u>Blmbg. Barc. U.S. Intermediate Aggregate</u>
R-Squared		1.00
Actual Correlation		1.00

# Manager Summary

Loomis Sayles Intmd vs IM U.S. Intermediate Duration (SA+CF)

Periods Ended September 30, 2019



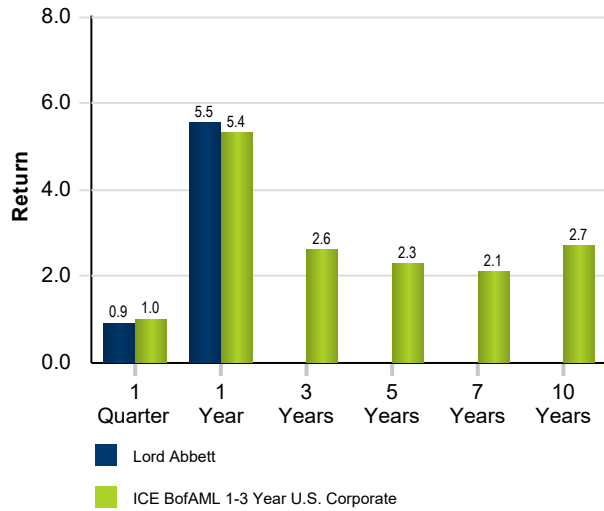


# Performance Summary

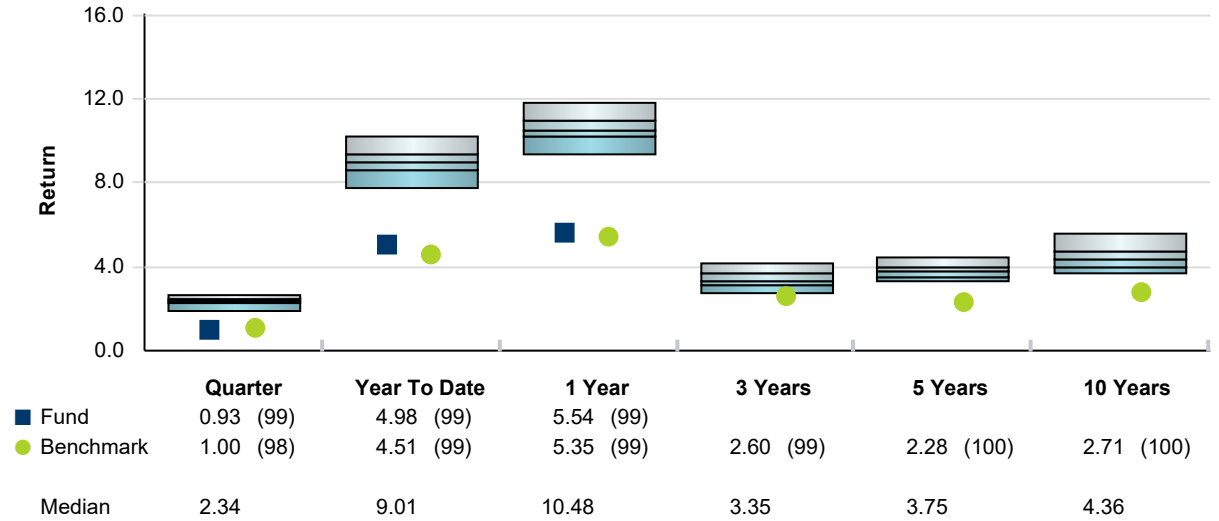
Lord Abbett

Periods Ended September 30, 2019

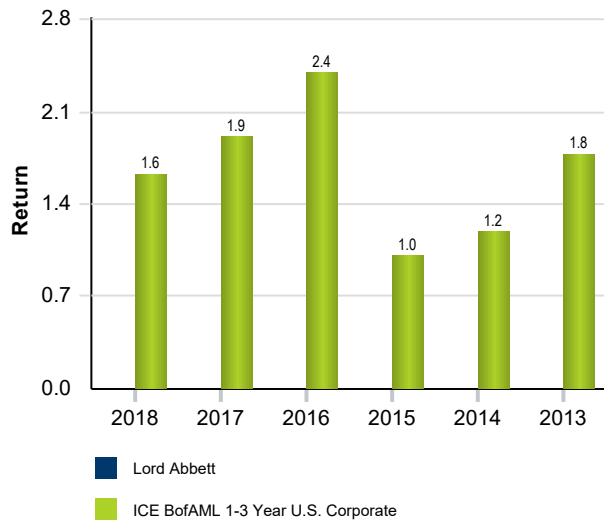
## Comparative Performance



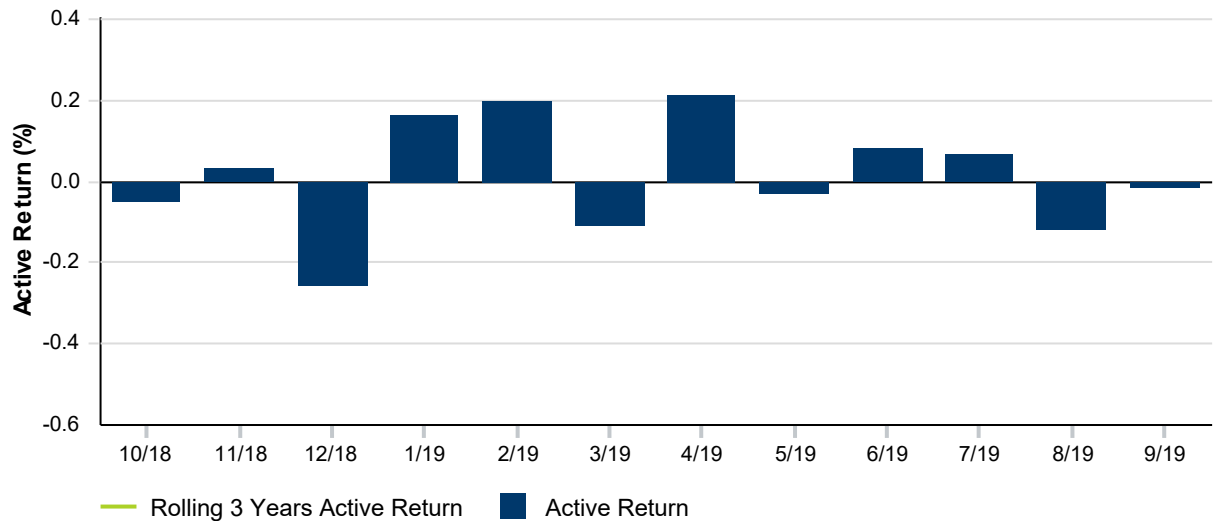
## Peer Group Analysis: IM U.S. Broad Market Core Fixed Income (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Lord Abbett

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Lord Abbett</u>	<u>ICE BofAML 1-3 Year U.S. Corporate</u>
Maximum Return	0.87	0.78
Minimum Return	-0.03	0.02
Return	5.54	5.35
Cumulative Return	5.54	5.35
Active Return	0.18	0.00
Excess Return	3.05	2.87

## Risk Summary Statistics

	<u>Lord Abbett</u>	<u>ICE BofAML 1-3 Year U.S. Corporate</u>
Upside Risk	0.53	1.80
Downside Risk	0.03	0.00
Beta	0.87	1.00

## Risk/Return Summary Statistics

	<u>Lord Abbett</u>	<u>ICE BofAML 1-3 Year U.S. Corporate</u>
Standard Deviation	0.96	0.98
Alpha	0.88	0.00
Active Return/Risk	0.19	0.00
Tracking Error	0.47	0.00
Information Ratio	0.38	
Sharpe Ratio	3.29	3.04

## Correlation Statistics

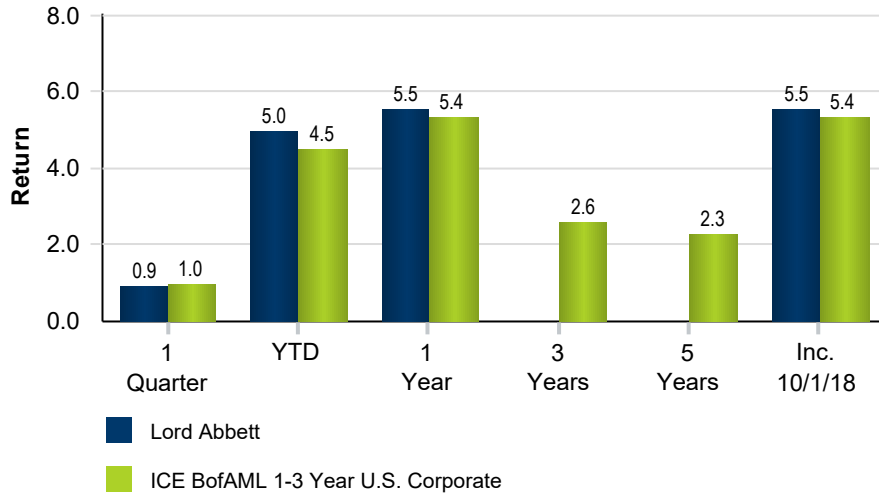
	<u>Lord Abbett</u>	<u>ICE BofAML 1-3 Year U.S. Corporate</u>
R-Squared	0.78	1.00
Actual Correlation	0.88	1.00

# Manager Summary

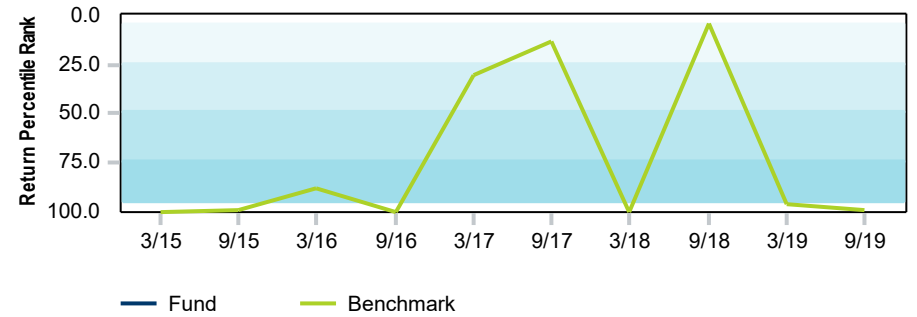
Lord Abbett vs IM U.S. Broad Market Core Fixed Income (SA+CF)

Periods Ended September 30, 2019

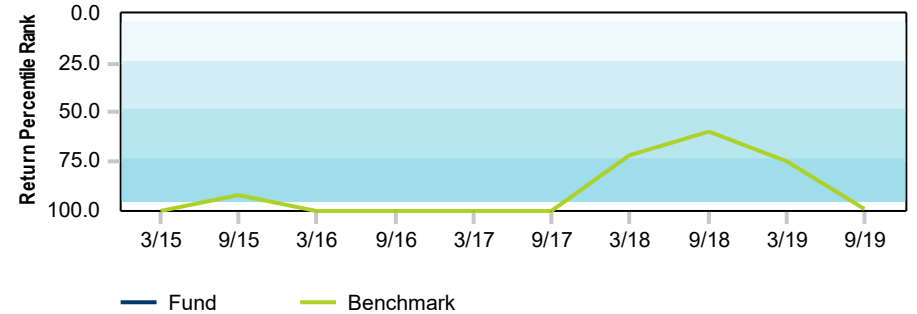
## Comparative Performance



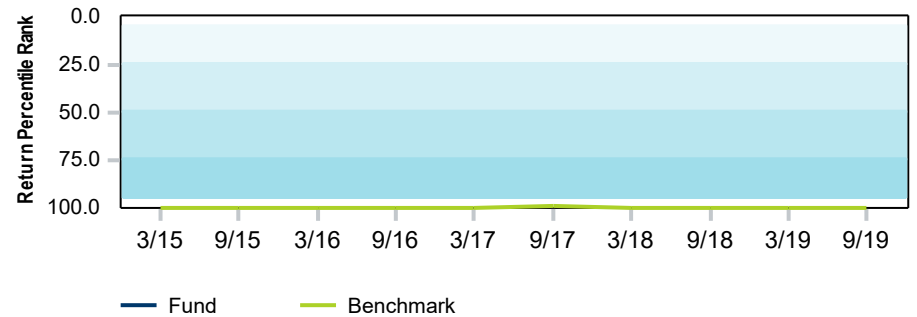
## 1 Year Rolling Percentile Ranking



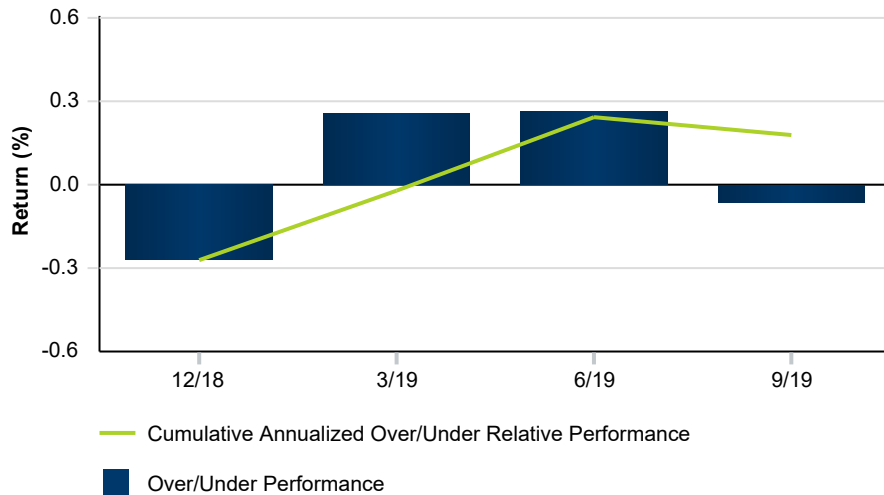
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Relative Performance

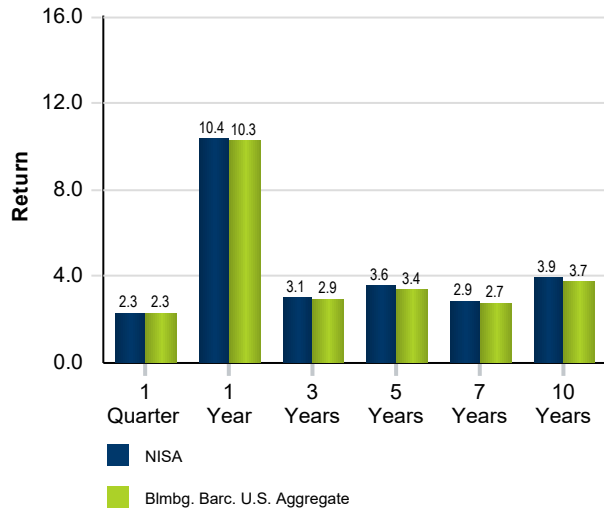


# Performance Summary

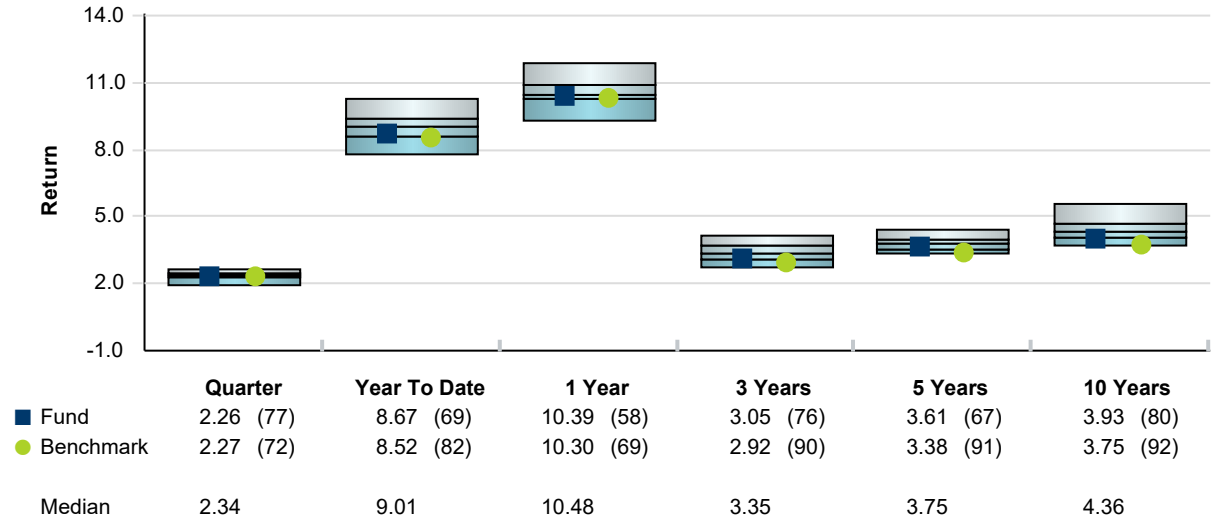
NISA

Periods Ended September 30, 2019

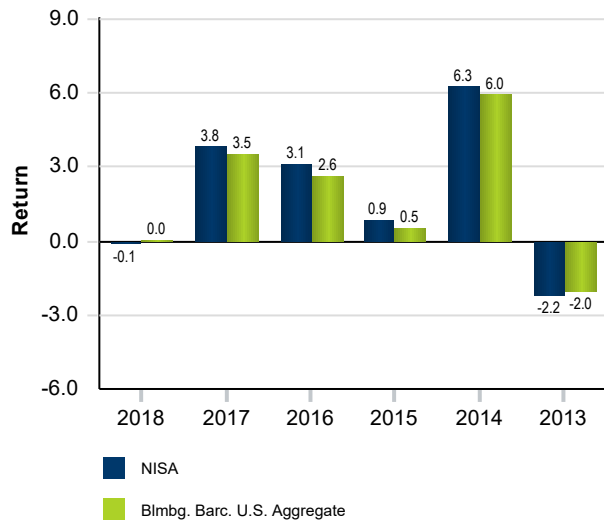
## Comparative Performance



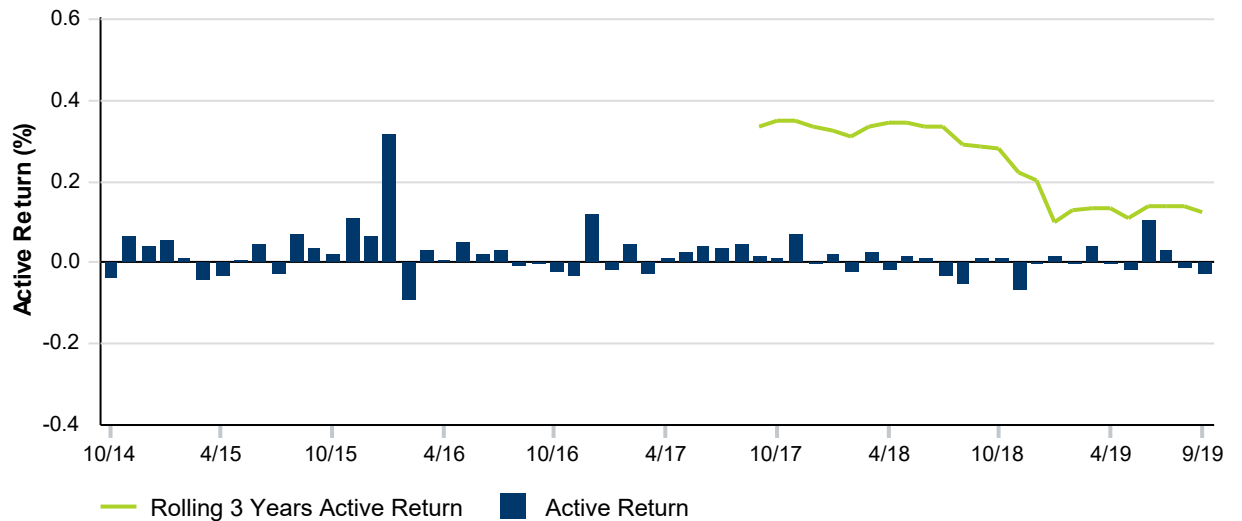
## Peer Group Analysis: IM U.S. Broad Market Core Fixed Income (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

NISA

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>NISA</u>	<u>Blmbg. Barc. U.S. Aggregate</u>
Maximum Return	2.58	2.59
Minimum Return	-0.78	-0.79
Return	10.39	10.30
Cumulative Return	10.39	10.30
Active Return	0.09	0.00
Excess Return	7.63	7.55

## Risk Summary Statistics

	<u>NISA</u>	<u>Blmbg. Barc. U.S. Aggregate</u>
Upside Risk	1.30	1.29
Downside Risk	0.96	0.95
Beta	1.01	1.00

## Risk/Return Summary Statistics

	<u>NISA</u>	<u>Blmbg. Barc. U.S. Aggregate</u>
Standard Deviation	3.60	3.57
Alpha	0.03	0.00
Active Return/Risk	0.02	0.00
Tracking Error	0.14	0.00
Information Ratio	0.63	
Sharpe Ratio	2.15	2.14

## Correlation Statistics

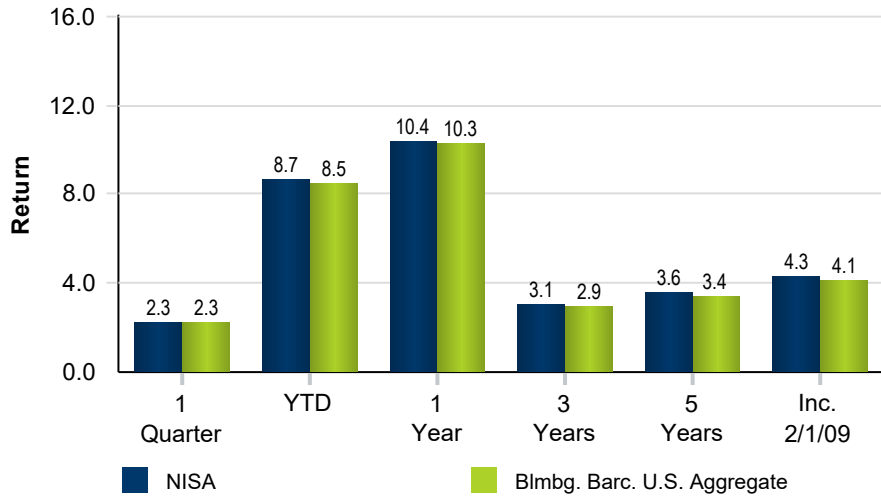
	<u>NISA</u>	<u>Blmbg. Barc. U.S. Aggregate</u>
R-Squared	1.00	1.00
Actual Correlation	1.00	1.00

# Manager Summary

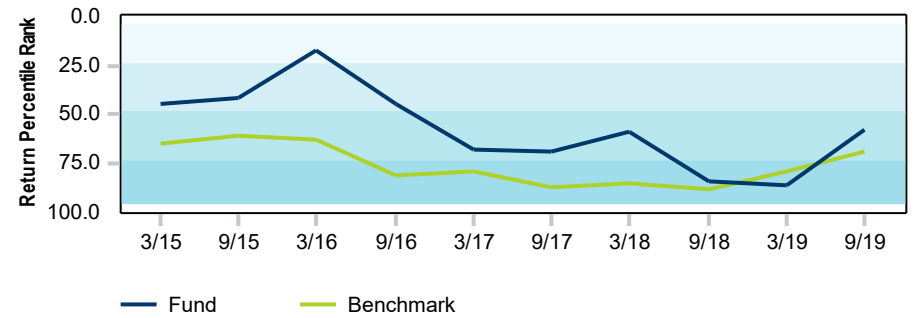
NISA vs IM U.S. Broad Market Core Fixed Income (SA+CF)

Periods Ended September 30, 2019

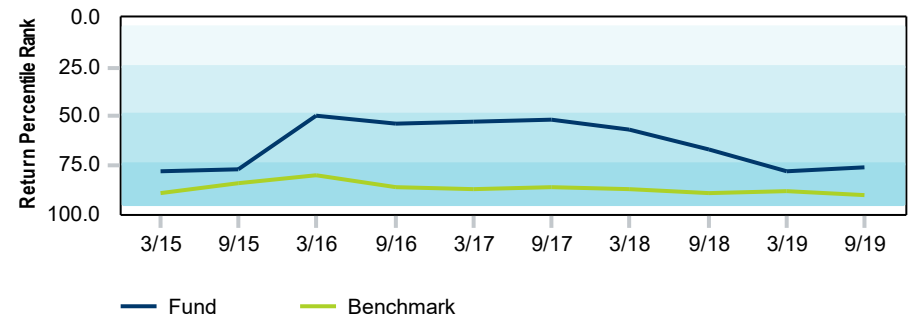
## Comparative Performance



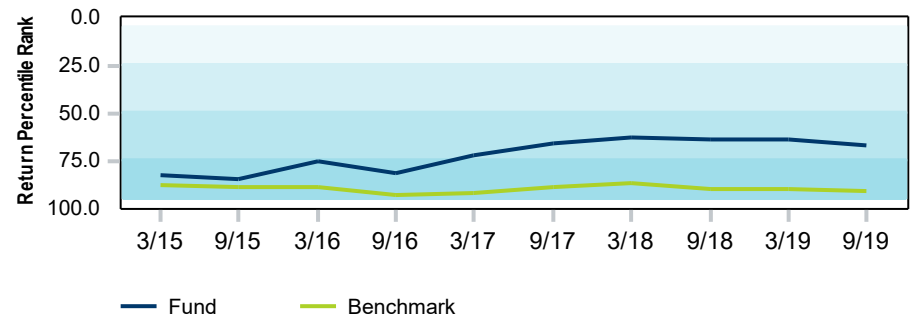
## 1 Year Rolling Percentile Ranking



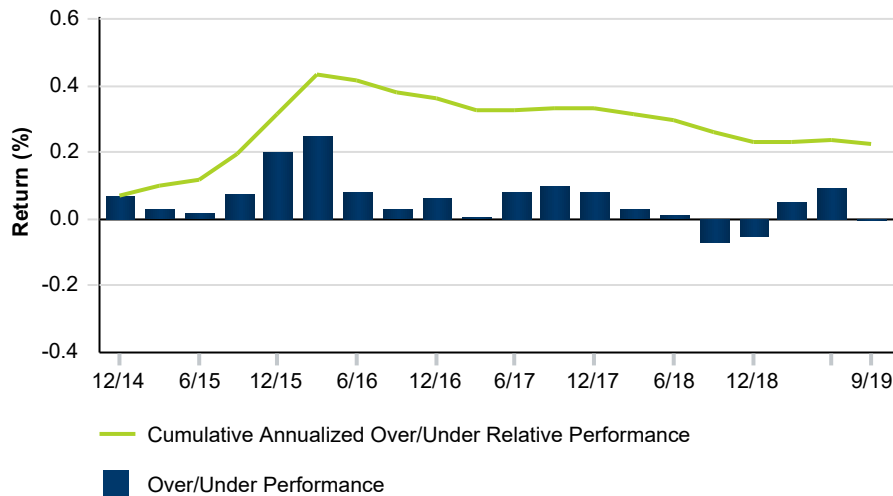
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Relative Performance

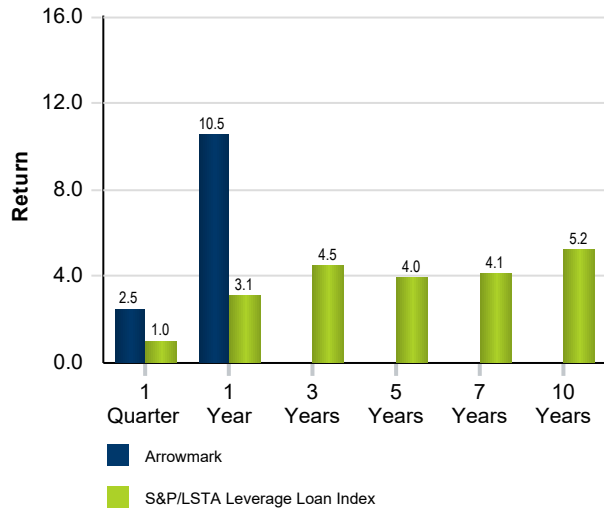


# Performance Summary

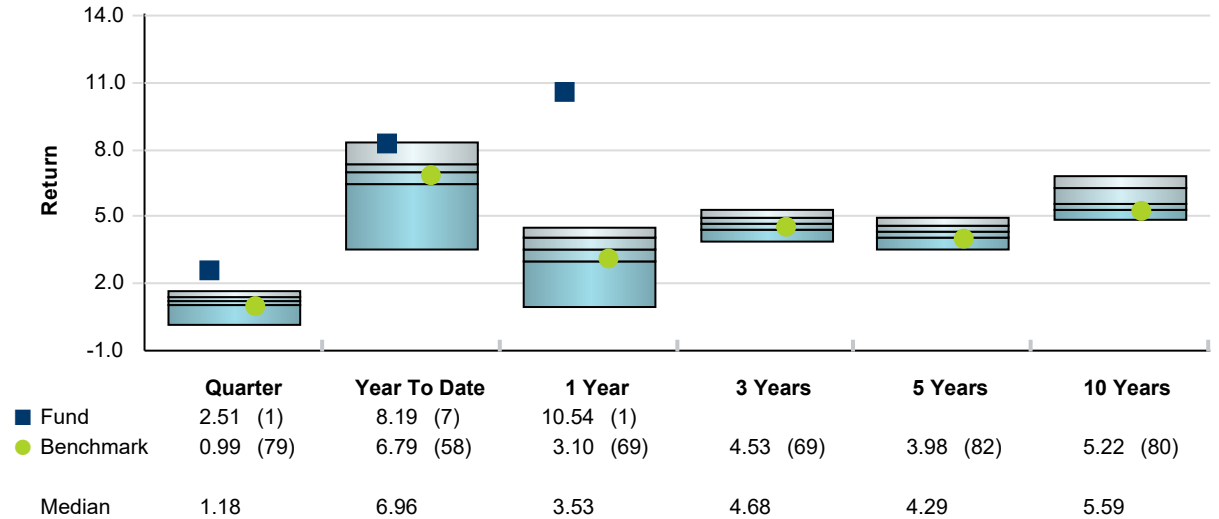
Arrowmark

Periods Ended September 30, 2019

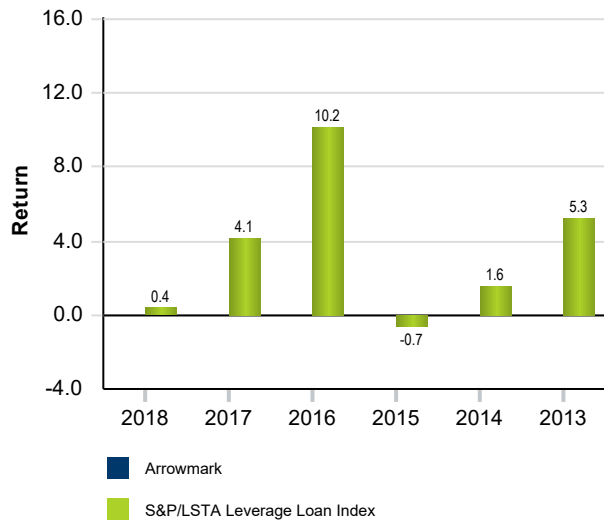
## Comparative Performance



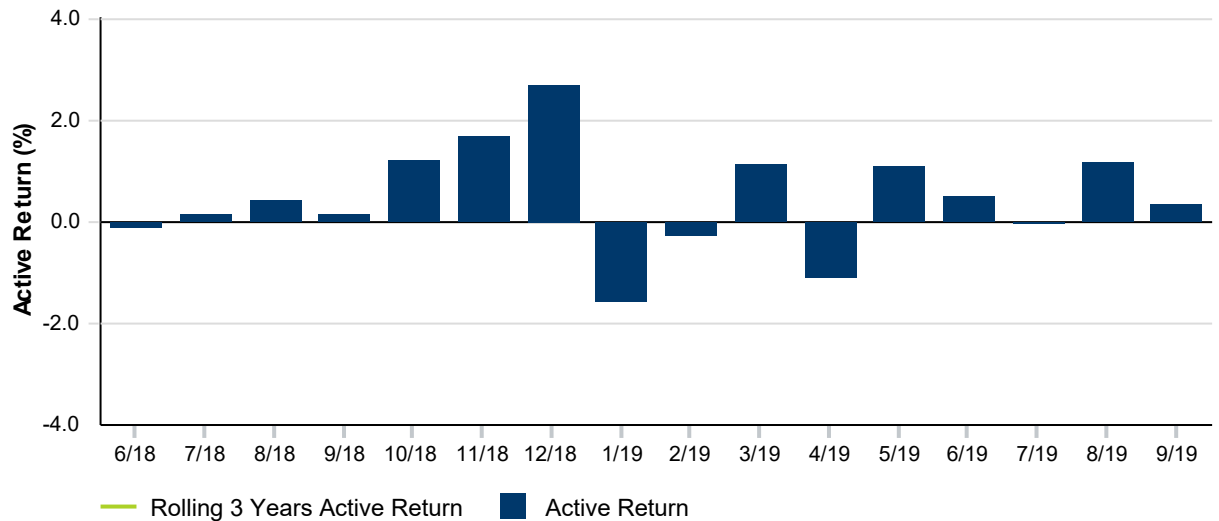
## Peer Group Analysis: IM U.S. Bank Loans (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Arrowmark

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Arrowmark</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Maximum Return	1.33	2.55
Minimum Return	0.18	-2.54
Return	10.54	3.10
Cumulative Return	10.54	3.10
Active Return	6.91	0.00
Excess Return	7.71	0.80

## Risk Summary Statistics

	<u>Arrowmark</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Upside Risk	3.06	1.03
Downside Risk	0.00	2.73
Beta	0.11	1.00

## Risk/Return Summary Statistics

	<u>Arrowmark</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Standard Deviation	0.97	4.39
Alpha	10.16	0.00
Active Return/Risk	7.13	0.00
Tracking Error	3.98	0.00
Information Ratio	1.74	
Sharpe Ratio	7.91	0.18

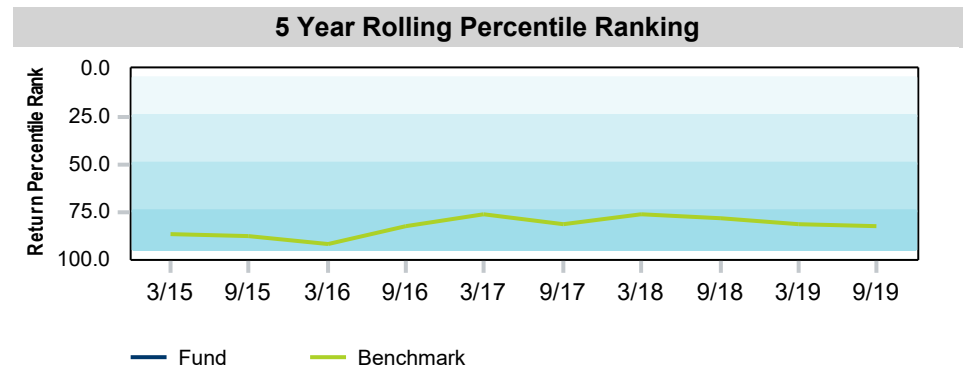
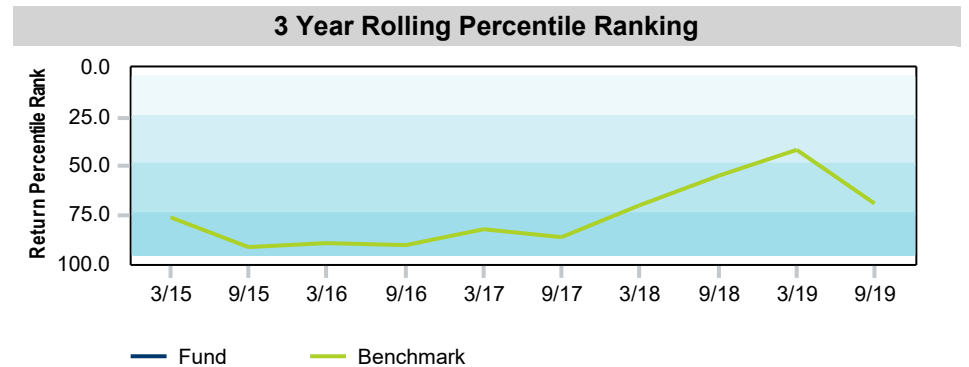
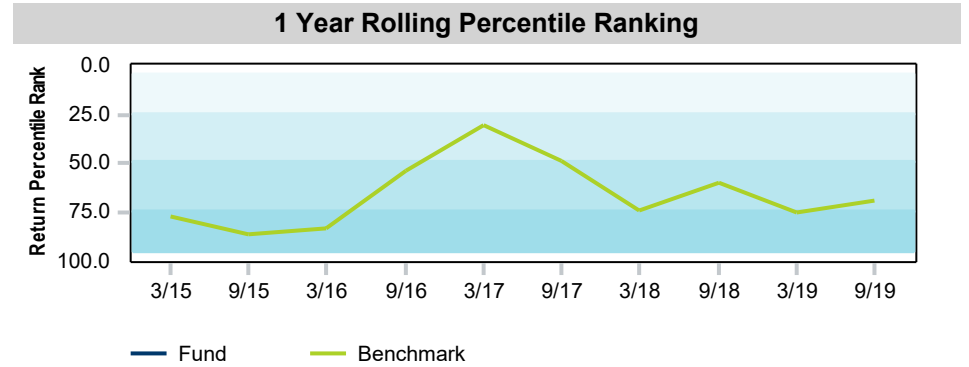
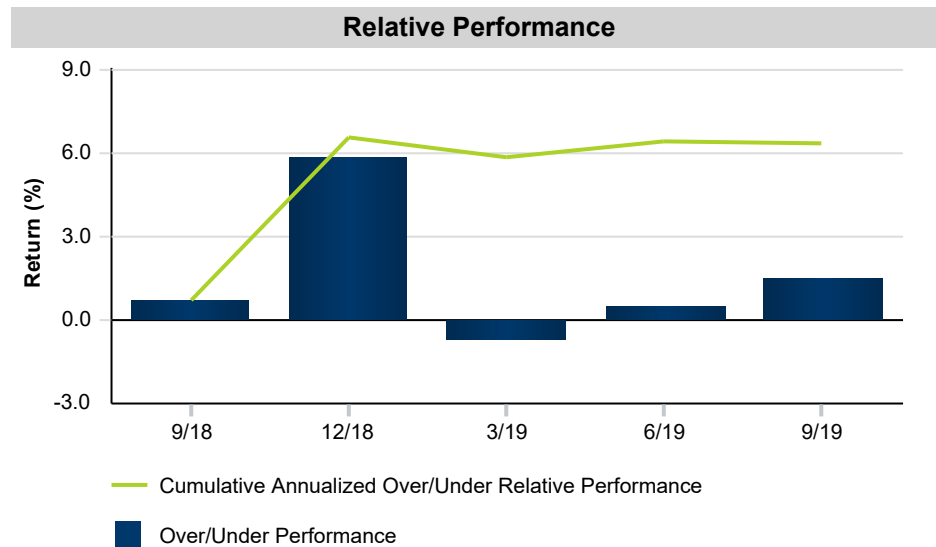
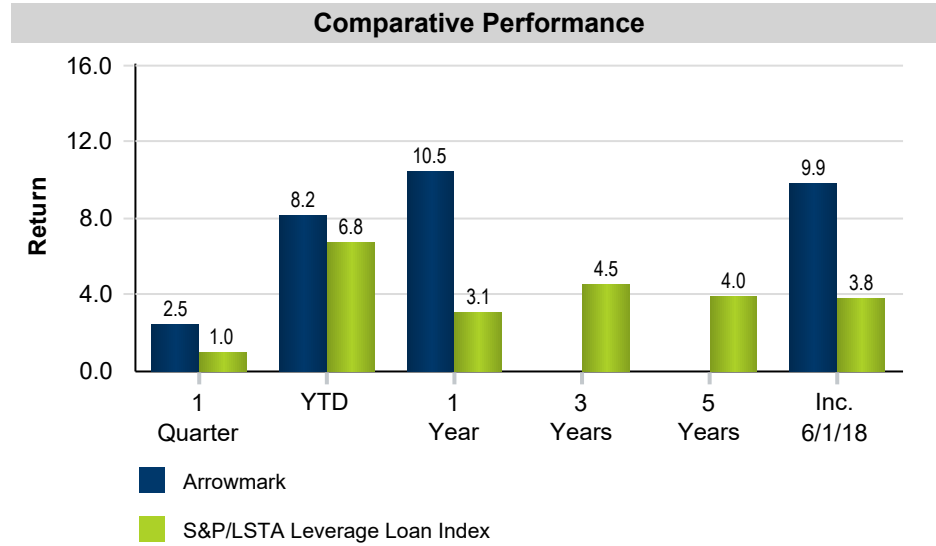
## Correlation Statistics

	<u>Arrowmark</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
R-Squared	0.27	1.00
Actual Correlation	0.51	1.00



# Manager Summary

Arrowmark vs IM U.S. Bank Loans (SA+CF)  
 Periods Ended September 30, 2019

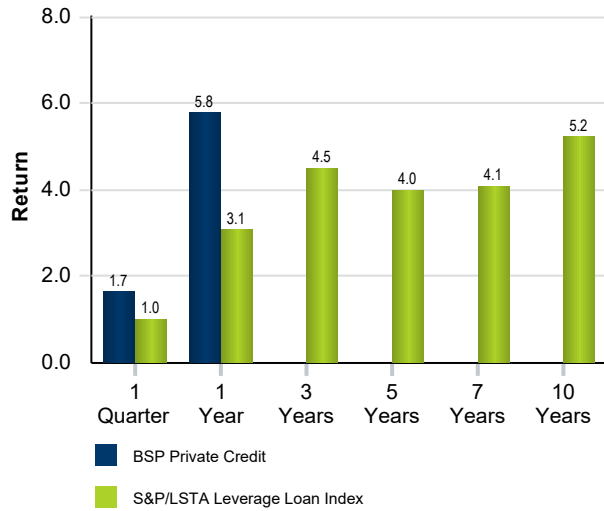


# Performance Summary

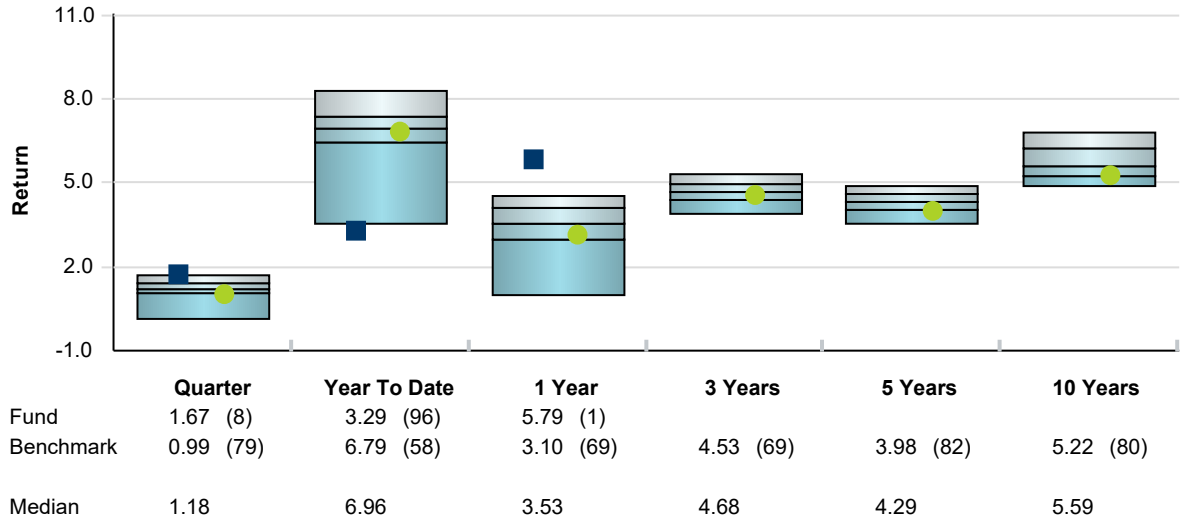
BSP Private Credit

Periods Ended September 30, 2019

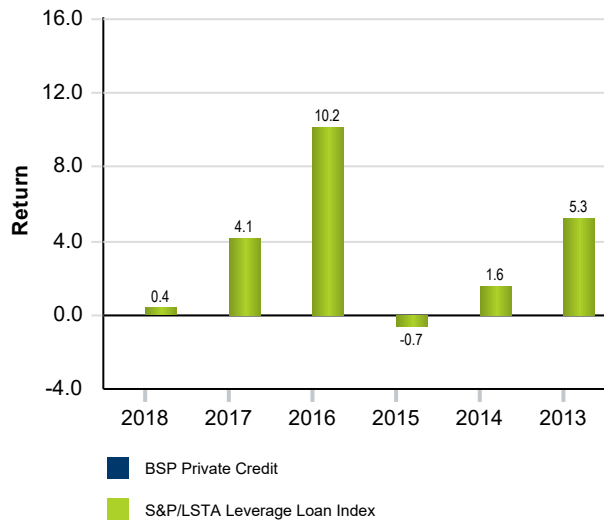
## Comparative Performance



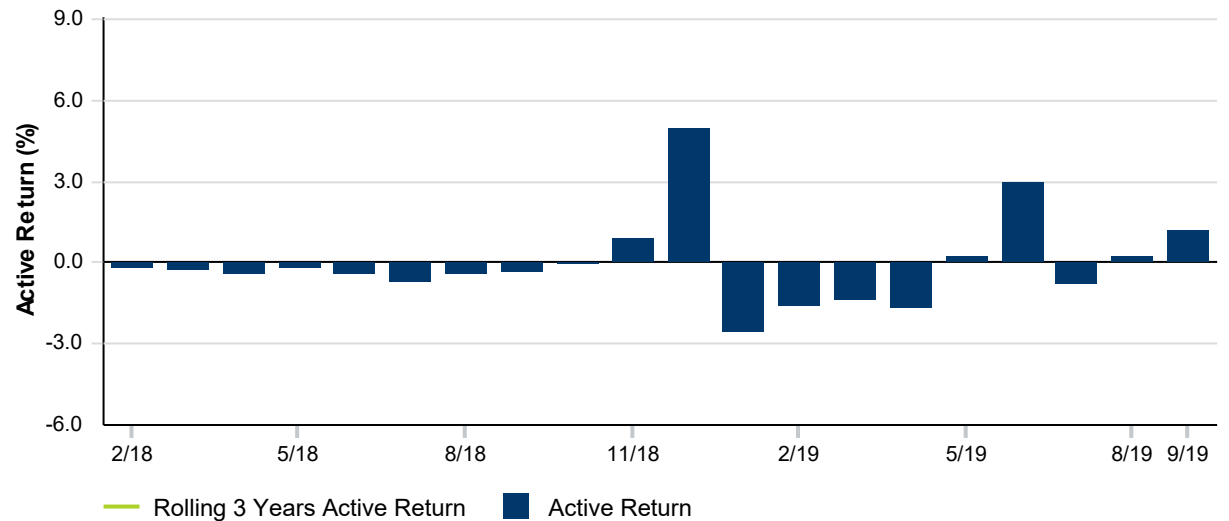
## Peer Group Analysis: IM U.S. Bank Loans (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

BSP Private Credit

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>BSP Private Credit</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Maximum Return	3.20	2.55
Minimum Return	-1.56	-2.54
Return	5.79	3.10
Cumulative Return	5.79	3.10
Active Return	2.57	0.00
Excess Return	3.37	0.80

## Risk Summary Statistics

	<u>BSP Private Credit</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Upside Risk	1.25	1.03
Downside Risk	1.56	2.73
Beta	-0.30	1.00

## Risk/Return Summary Statistics

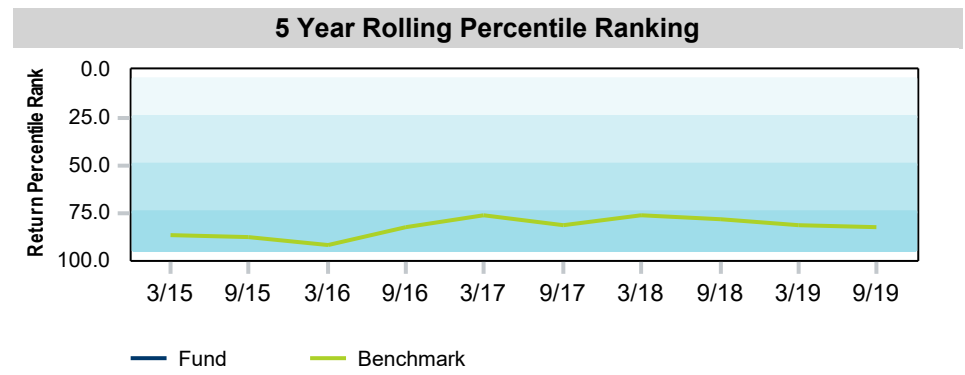
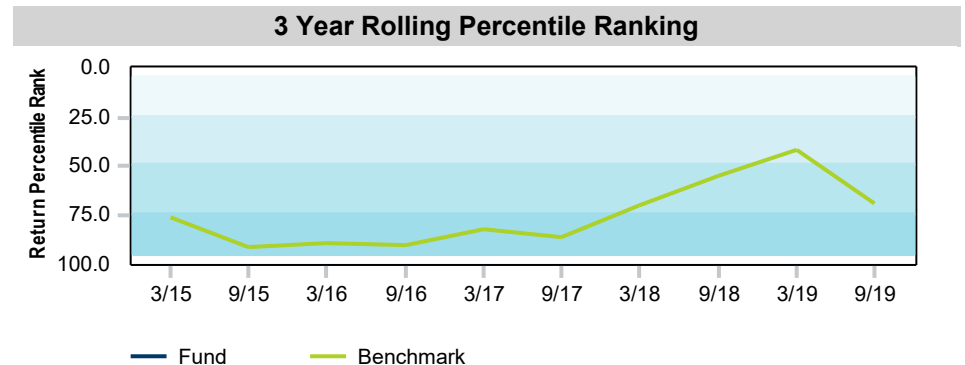
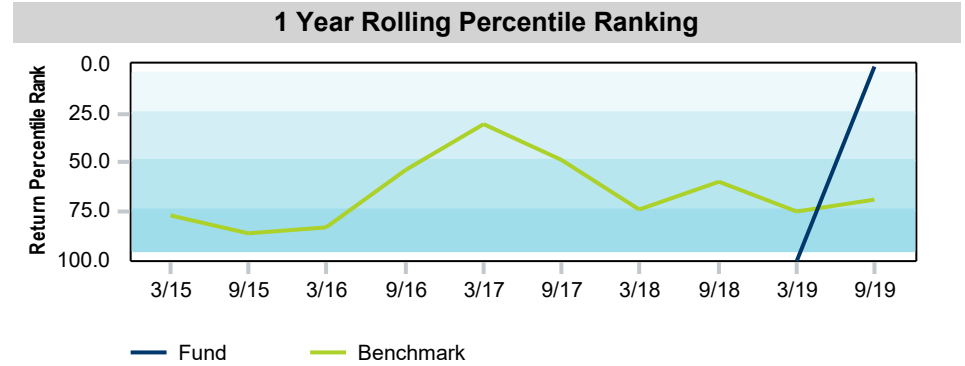
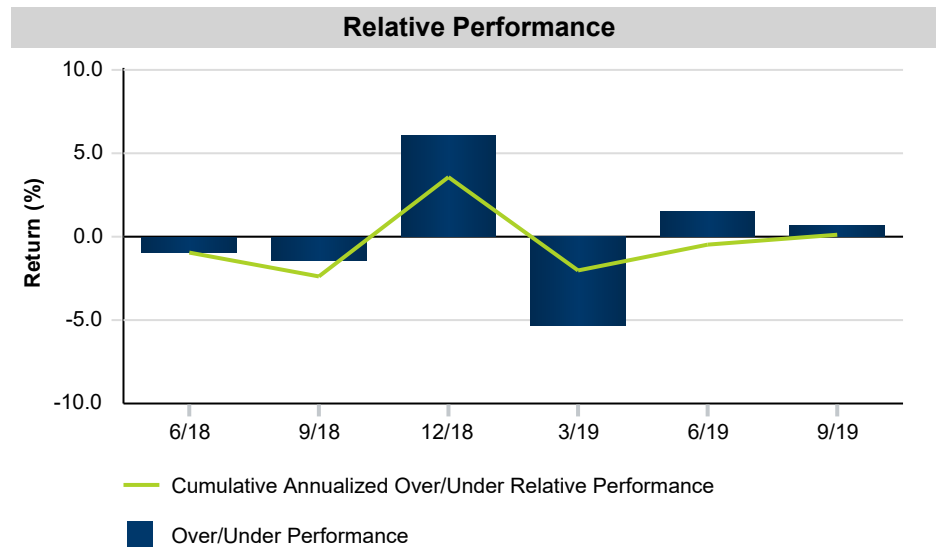
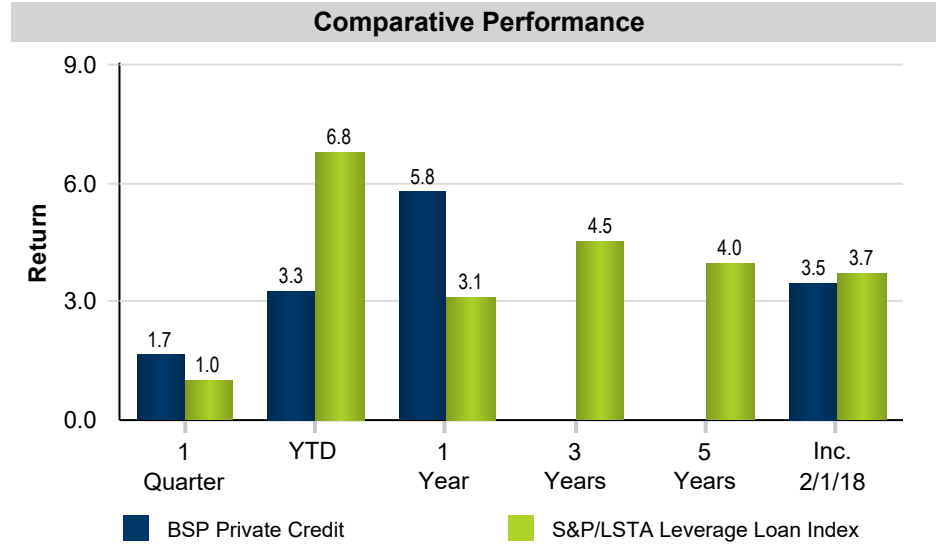
	<u>BSP Private Credit</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Standard Deviation	4.31	4.39
Alpha	6.89	0.00
Active Return/Risk	0.60	0.00
Tracking Error	7.04	0.00
Information Ratio	0.37	
Sharpe Ratio	0.78	0.18

## Correlation Statistics

	<u>BSP Private Credit</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
R-Squared	0.10	1.00
Actual Correlation	-0.31	1.00

# Manager Summary

BSP Private Credit vs IM U.S. Bank Loans (SA+CF)  
 Periods Ended September 30, 2019

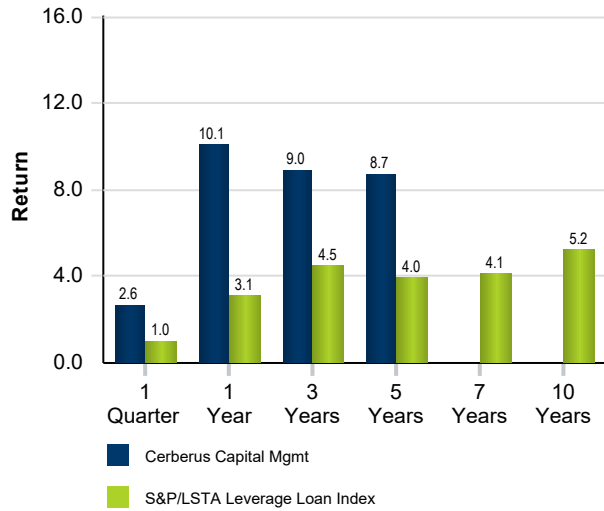


# Performance Summary

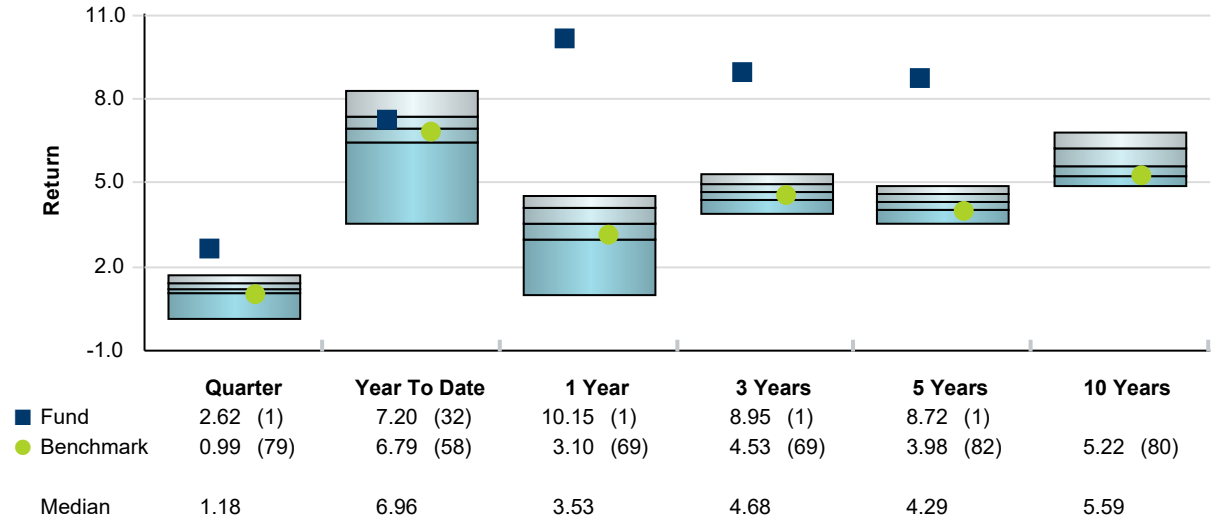
Cerberus Capital Mgmt

Periods Ended September 30, 2019

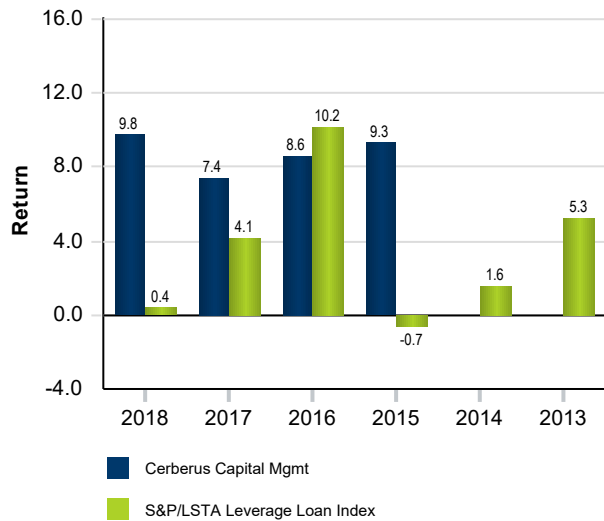
## Comparative Performance



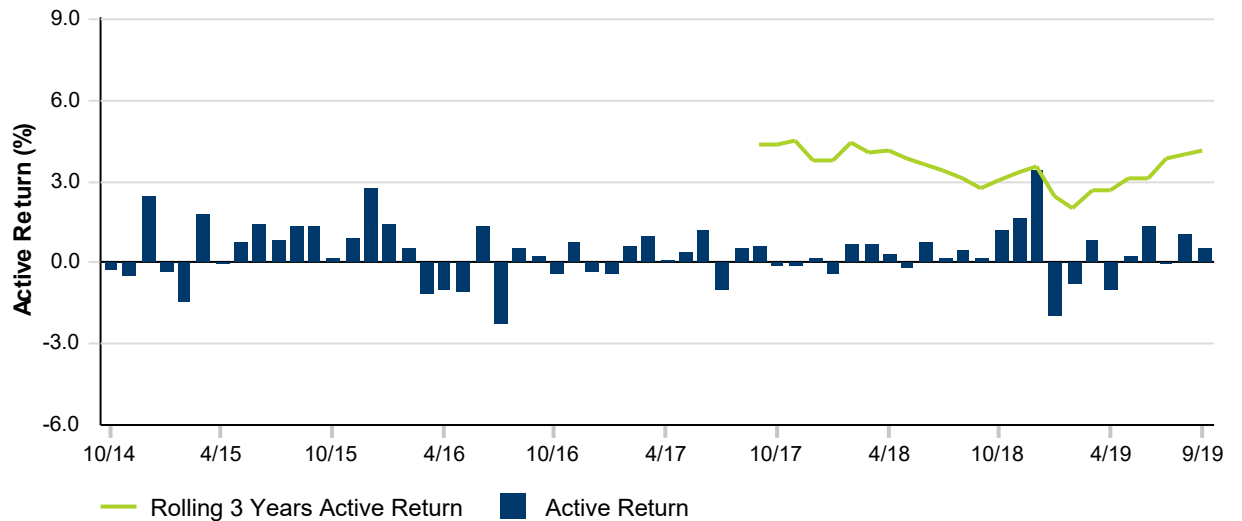
## Peer Group Analysis: IM U.S. Bank Loans (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Cerberus Capital Mgmt

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Cerberus Capital Mgmt</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Maximum Return	1.63	2.55
Minimum Return	0.00	-2.54
Return	10.15	3.10
Cumulative Return	10.15	3.10
Active Return	6.55	0.00
Excess Return	7.35	0.80

## Risk Summary Statistics

	<u>Cerberus Capital Mgmt</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Upside Risk	3.07	1.03
Downside Risk	0.00	2.73
Beta	-0.02	1.00

## Risk/Return Summary Statistics

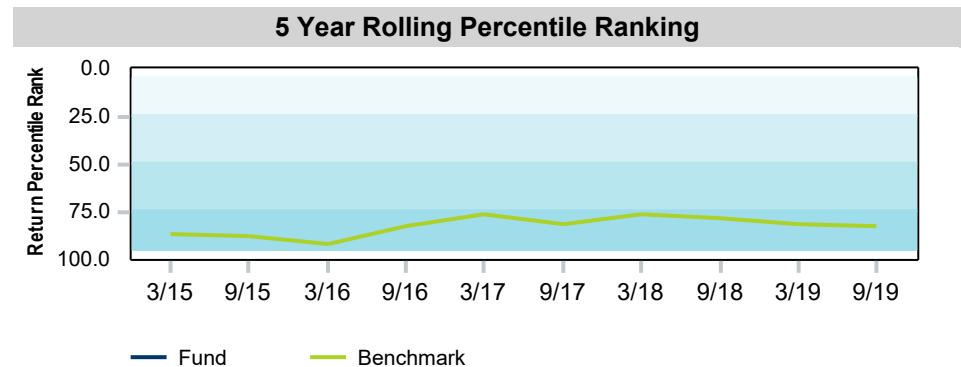
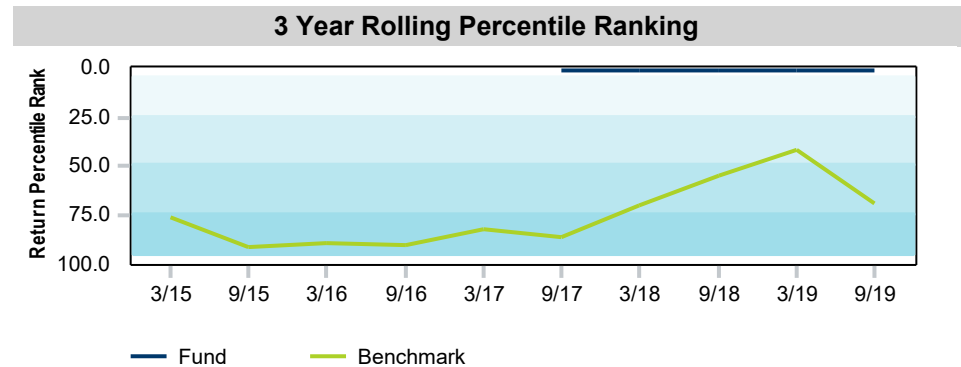
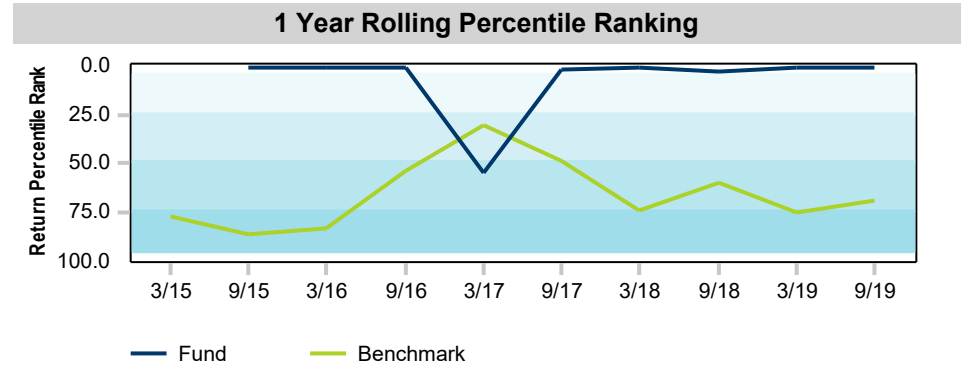
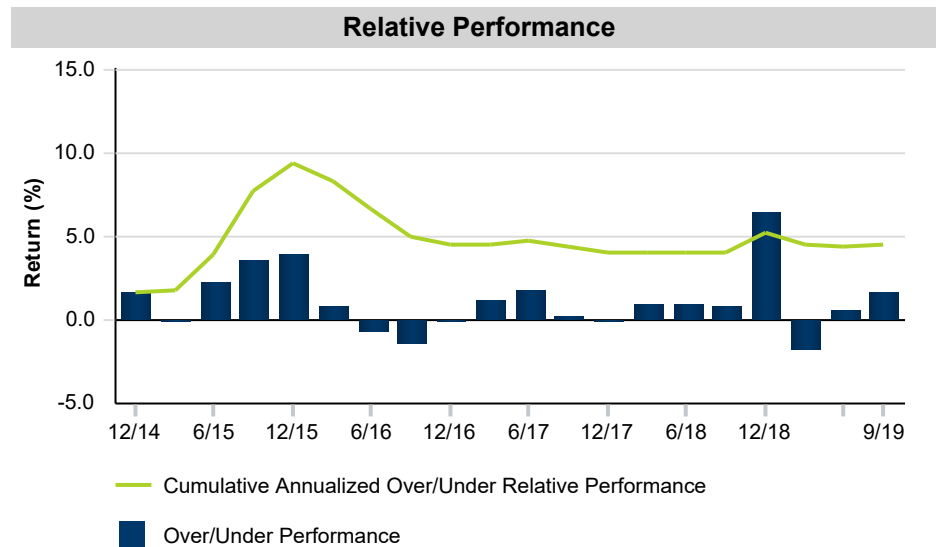
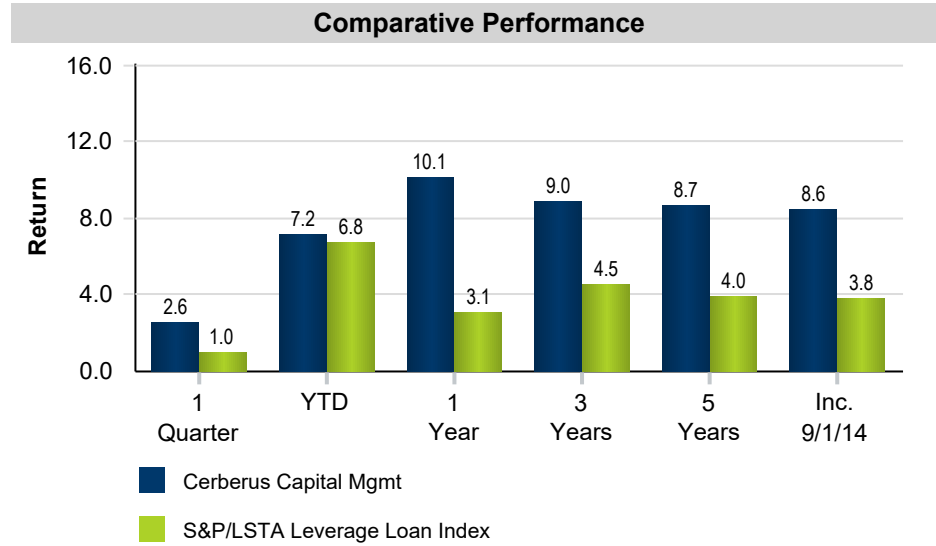
	<u>Cerberus Capital Mgmt</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Standard Deviation	1.26	4.39
Alpha	10.21	0.00
Active Return/Risk	5.21	0.00
Tracking Error	4.64	0.00
Information Ratio	1.41	
Sharpe Ratio	5.76	0.18

## Correlation Statistics

	<u>Cerberus Capital Mgmt</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
R-Squared	0.00	1.00
Actual Correlation	-0.06	1.00

# Manager Summary

Cerberus Capital Mgmt vs IM U.S. Bank Loans (SA+CF)  
 Periods Ended September 30, 2019

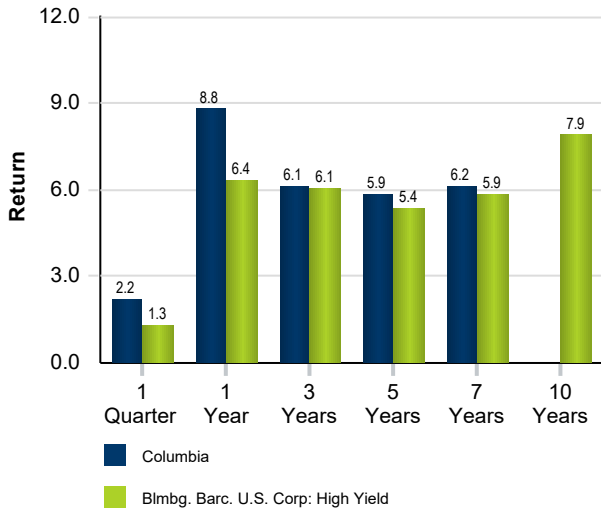


# Performance Summary

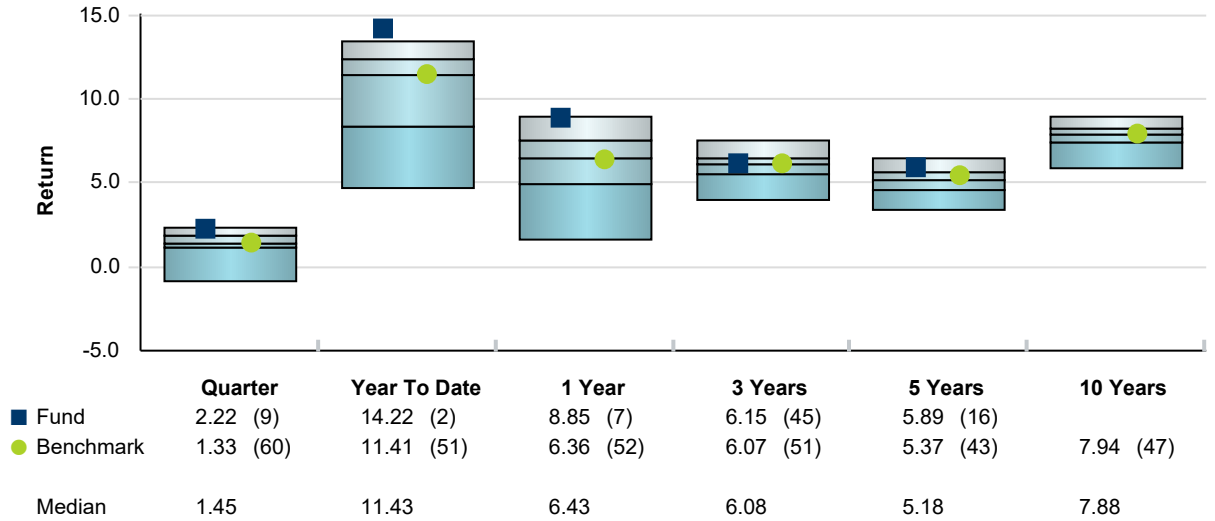
Columbia

Periods Ended September 30, 2019

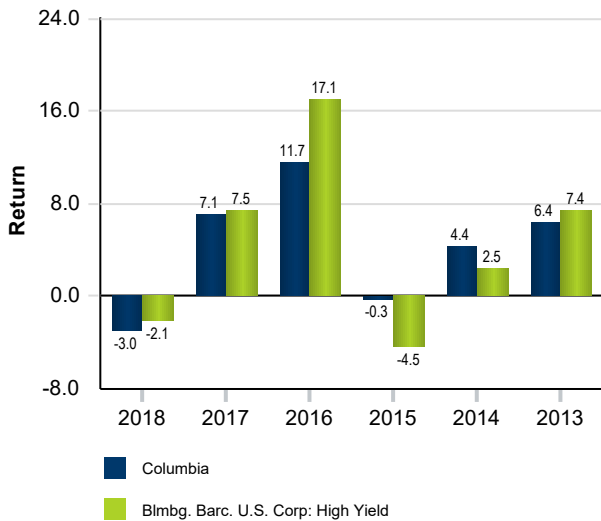
## Comparative Performance



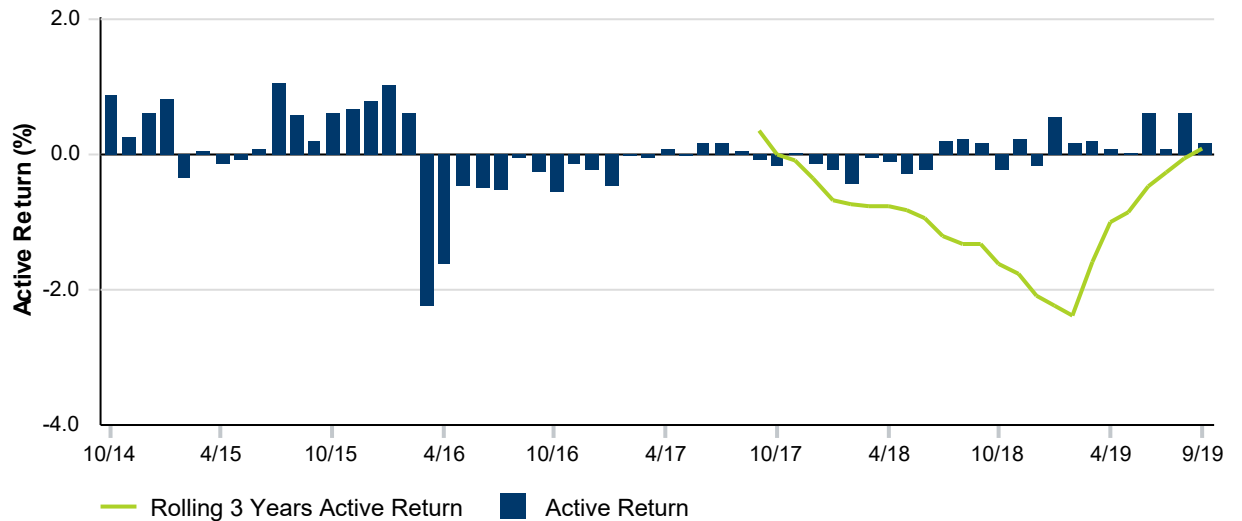
## Peer Group Analysis: IM U.S. High Yield Bonds (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance





# Summary Statistics

Columbia

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Columbia</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
Maximum Return	5.07	4.52
Minimum Return	-2.32	-2.14
Return	8.85	6.36
Cumulative Return	8.85	6.36
Active Return	2.38	0.00
Excess Return	6.38	4.01

## Risk Summary Statistics

	<u>Columbia</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
Upside Risk	1.89	1.63
Downside Risk	3.23	3.05
Beta	1.11	1.00

## Risk/Return Summary Statistics

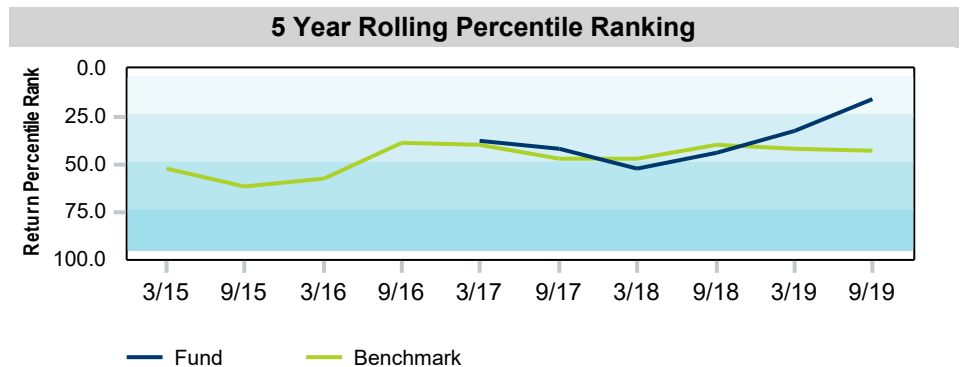
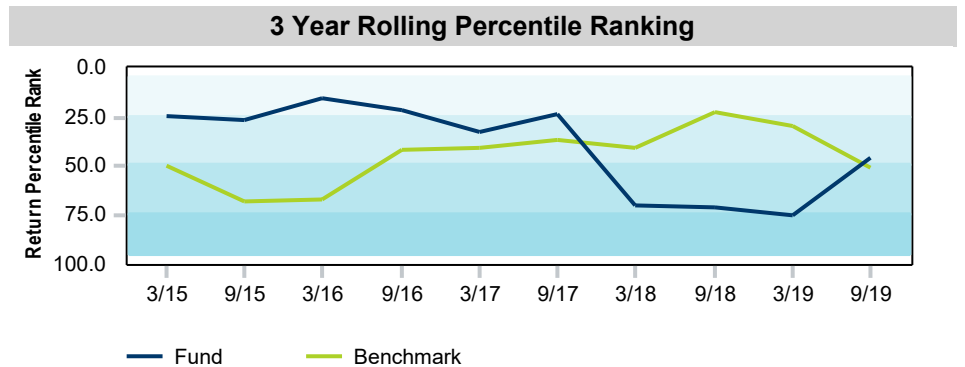
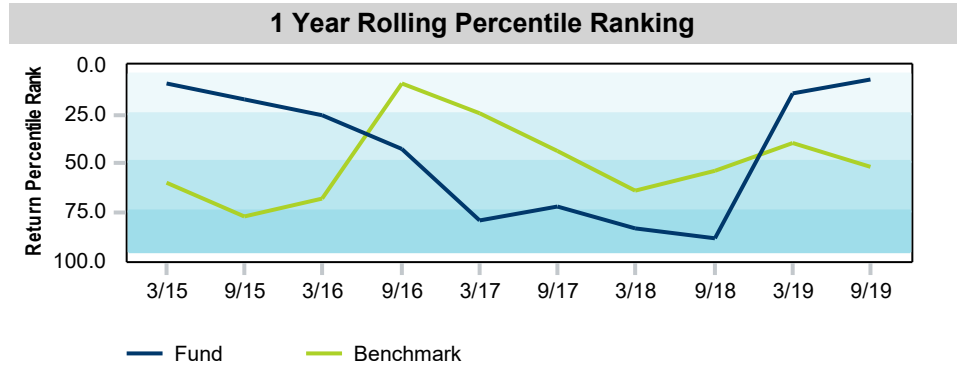
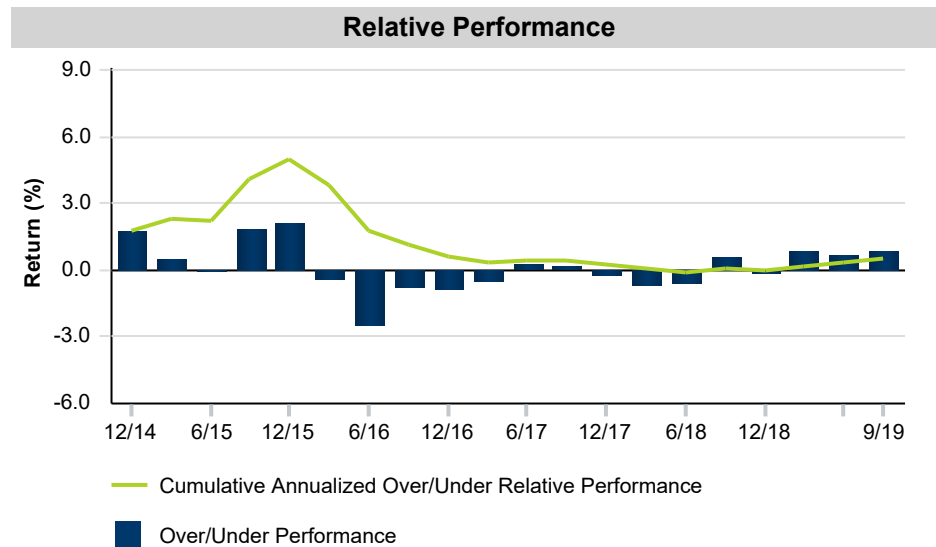
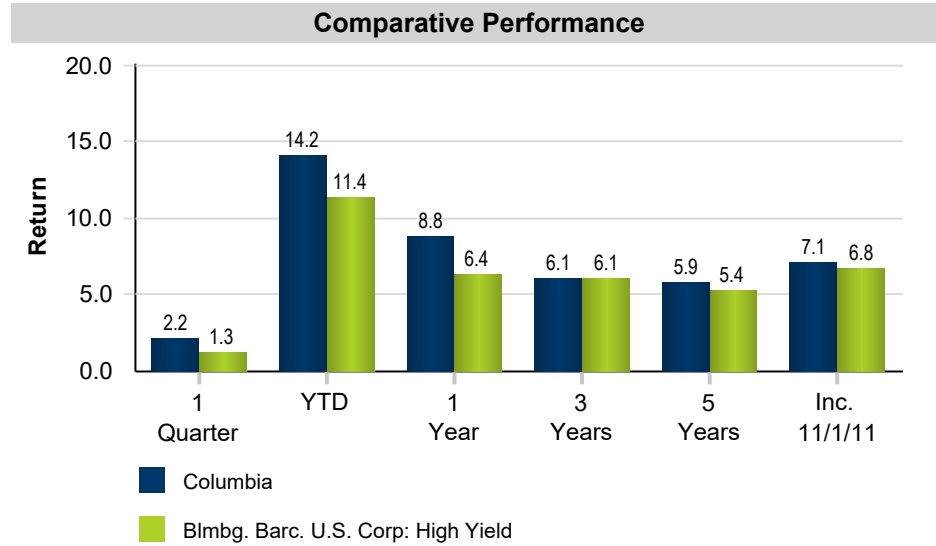
	<u>Columbia</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
Standard Deviation	6.85	6.15
Alpha	1.70	0.00
Active Return/Risk	0.35	0.00
Tracking Error	0.93	0.00
Information Ratio	2.55	
Sharpe Ratio	0.93	0.65

## Correlation Statistics

	<u>Columbia</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
R-Squared	0.99	1.00
Actual Correlation	1.00	1.00

# Manager Summary

Columbia vs IM U.S. High Yield Bonds (SA+CF)  
 Periods Ended September 30, 2019

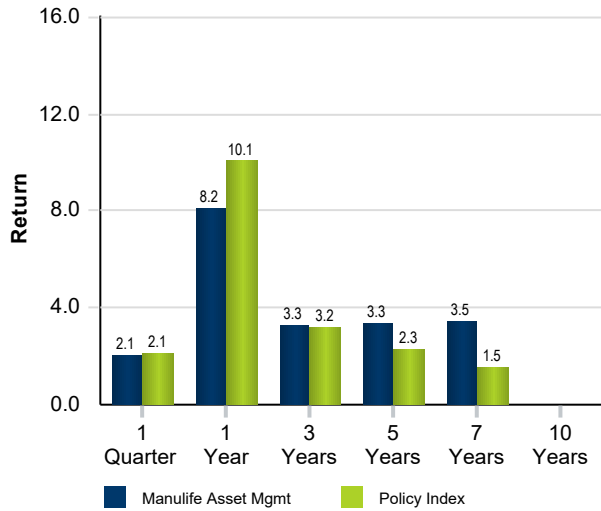


# Performance Summary

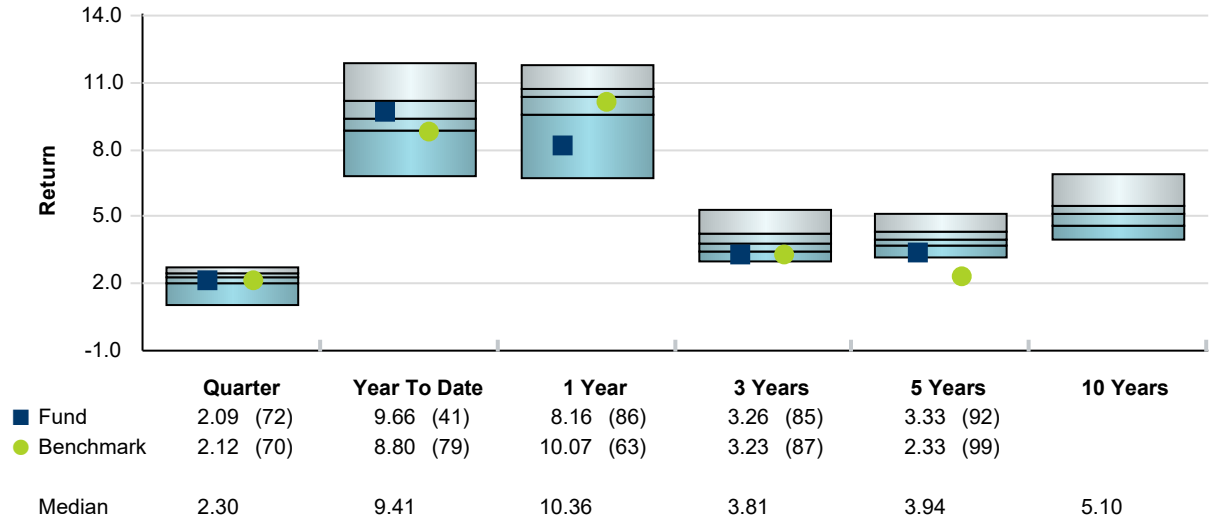
Manulife Asset Mgmt

Periods Ended September 30, 2019

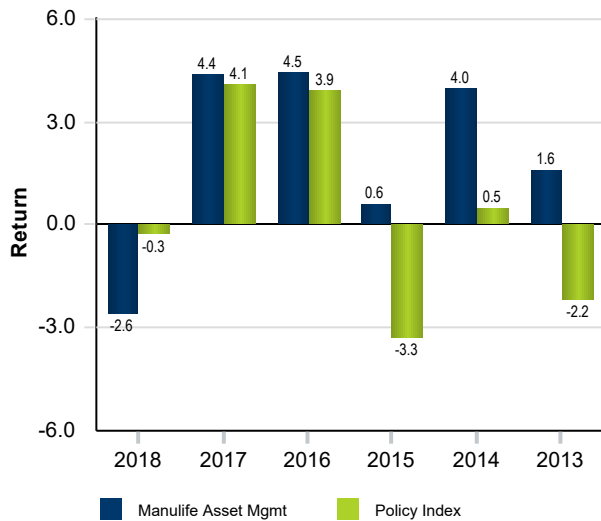
## Comparative Performance



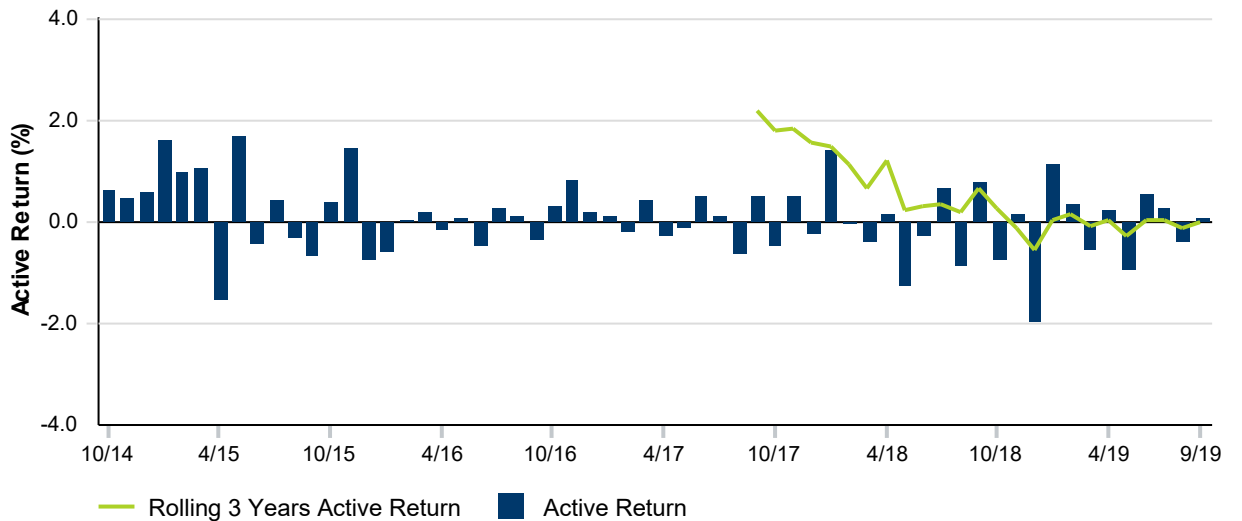
## Peer Group Analysis: IM U.S. Broad Market Core+ Fixed Income (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Manulife Asset Mgmt

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Manulife Asset Mgmt</u>	<u>Policy Index</u>
Maximum Return	2.52	2.26
Minimum Return	-1.57	-0.84
Return	8.16	10.07
Cumulative Return	8.16	10.07
Active Return	-1.74	0.00
Excess Return	5.58	7.33

## Risk Summary Statistics

	<u>Manulife Asset Mgmt</u>	<u>Policy Index</u>
Upside Risk	1.18	1.20
Downside Risk	1.66	0.94
Beta	0.83	1.00

## Risk/Return Summary Statistics

	<u>Manulife Asset Mgmt</u>	<u>Policy Index</u>
Standard Deviation	3.78	3.24
Alpha	-0.09	0.00
Active Return/Risk	-0.46	0.00
Tracking Error	2.71	0.00
Information Ratio	-0.64	
Sharpe Ratio	1.49	2.30

## Correlation Statistics

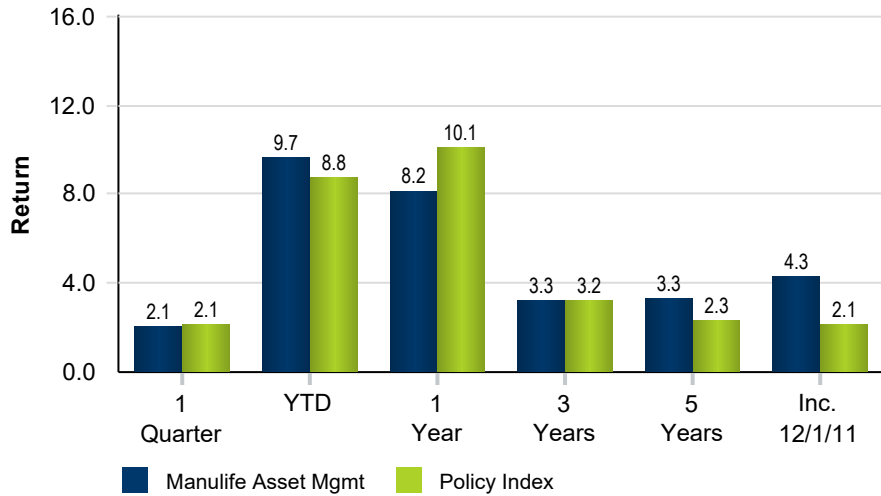
	<u>Manulife Asset Mgmt</u>	<u>Policy Index</u>
R-Squared	0.51	1.00
Actual Correlation	0.71	1.00

# Manager Summary

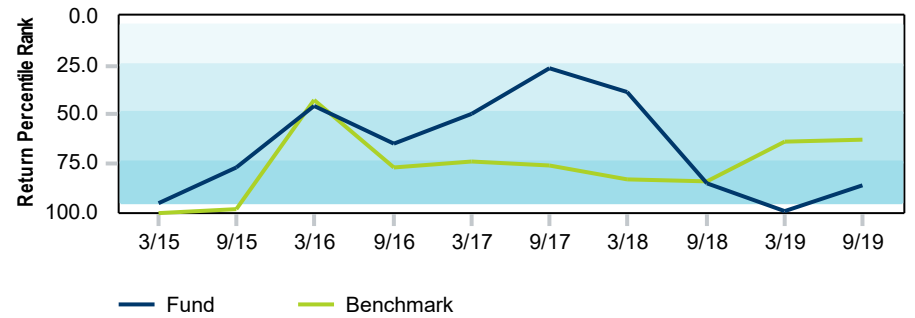
Manulife Asset Mgmt vs IM U.S. Broad Market Core+ Fixed Income (SA+CF)

Periods Ended September 30, 2019

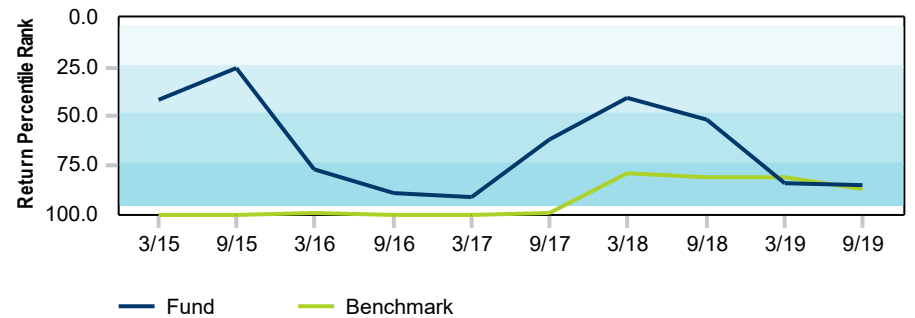
## Comparative Performance



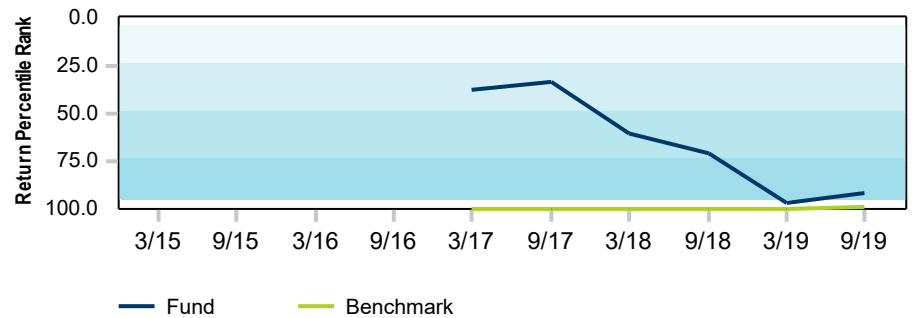
## 1 Year Rolling Percentile Ranking



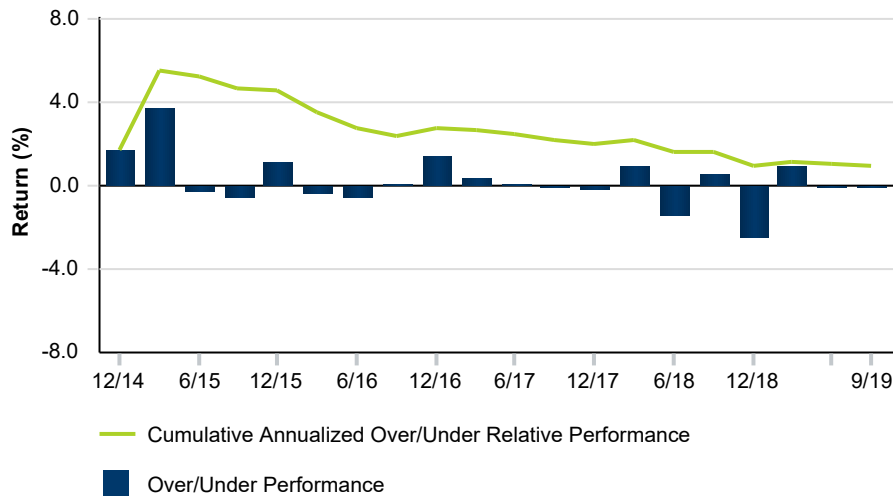
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Relative Performance

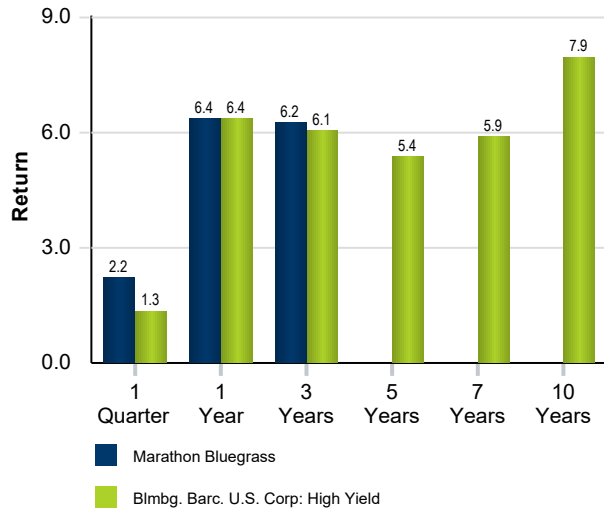


# Performance Summary

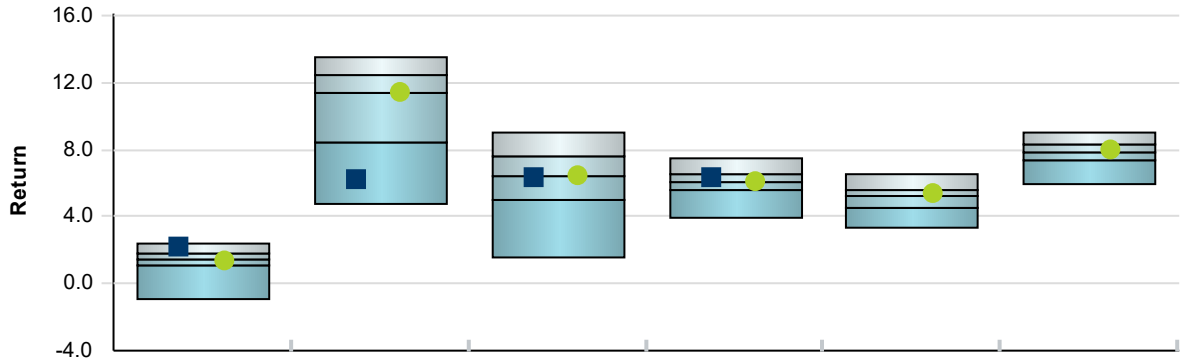
Marathon Bluegrass

Periods Ended September 30, 2019

## Comparative Performance

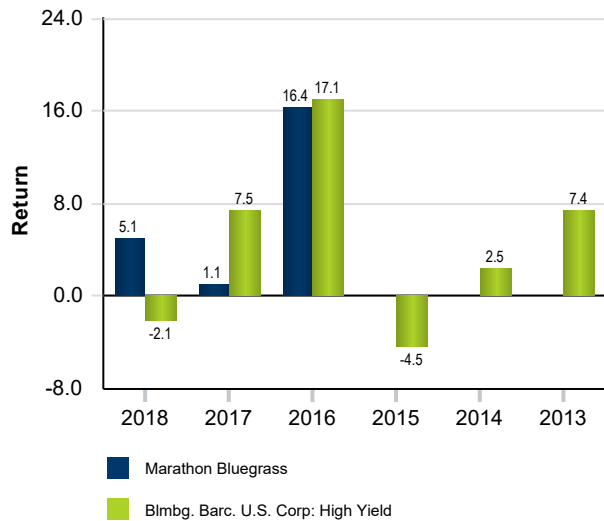


## Peer Group Analysis: IM U.S. High Yield Bonds (SA+CF)

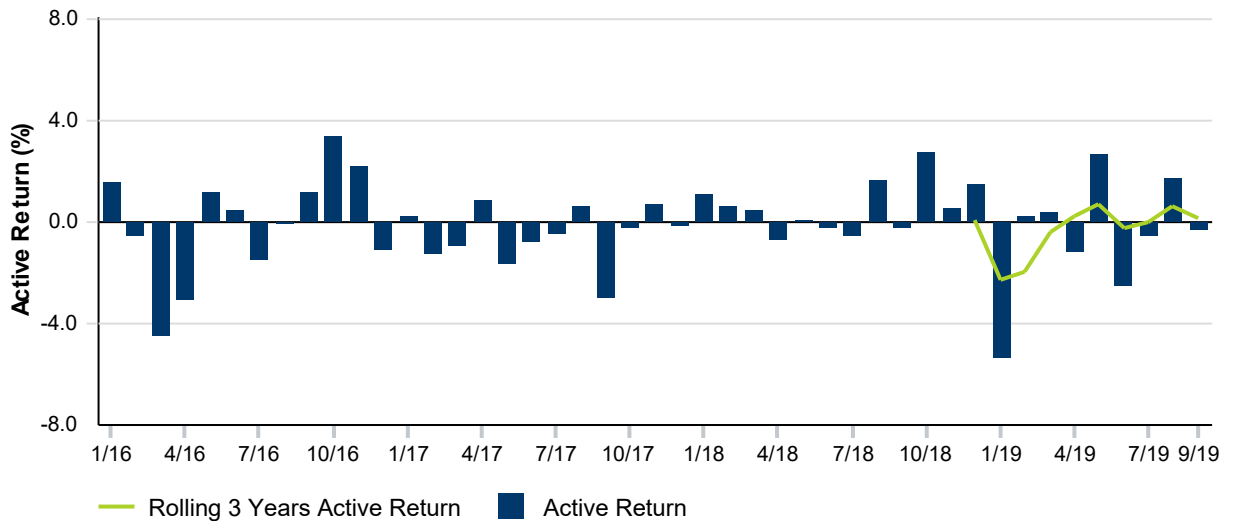


	Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years
Fund	2.21 (9)	6.17 (89)	6.35 (52)	6.24 (39)	-	-
Benchmark	1.33 (60)	11.41 (51)	6.36 (52)	6.07 (51)	5.37 (43)	7.94 (47)
Median	1.45	11.43	6.43	6.08	5.18	7.88

## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

## Marathon Bluegrass

Periods Ended 1 Year Ending September 30, 2019

### Return Summary Statistics

	<u>Marathon Bluegrass</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
Maximum Return	2.15	4.52
Minimum Return	-0.80	-2.14
Return	6.35	6.36
Cumulative Return	6.35	6.36
Active Return	-0.13	0.00
Excess Return	3.87	4.01

### Risk Summary Statistics

	<u>Marathon Bluegrass</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
Upside Risk	1.06	1.63
Downside Risk	1.11	3.05
Beta	-0.10	1.00

### Risk/Return Summary Statistics

	<u>Marathon Bluegrass</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
Standard Deviation	3.37	6.15
Alpha	7.08	0.00
Active Return/Risk	-0.04	0.00
Tracking Error	7.53	0.00
Information Ratio	-0.02	
Sharpe Ratio	1.15	0.65

### Correlation Statistics

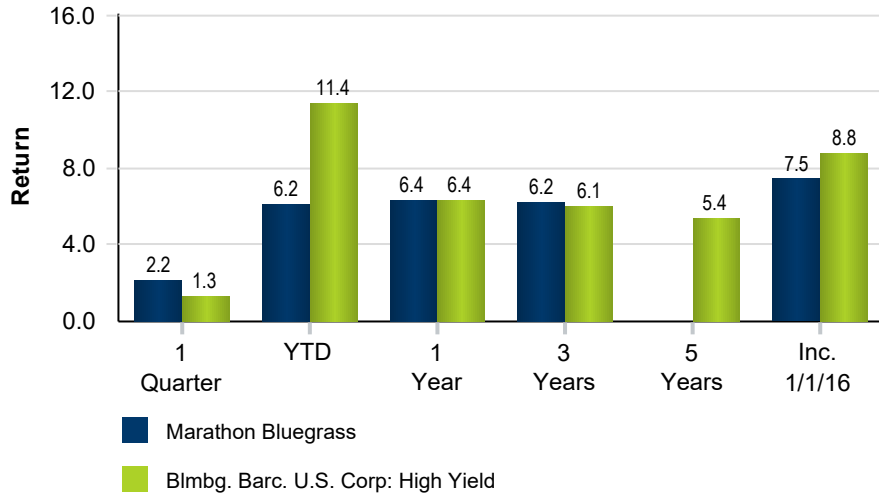
	<u>Marathon Bluegrass</u>	<u>Blmbg. Barc. U.S. Corp: High Yield</u>
R-Squared	0.03	1.00
Actual Correlation	-0.18	1.00

# Manager Summary

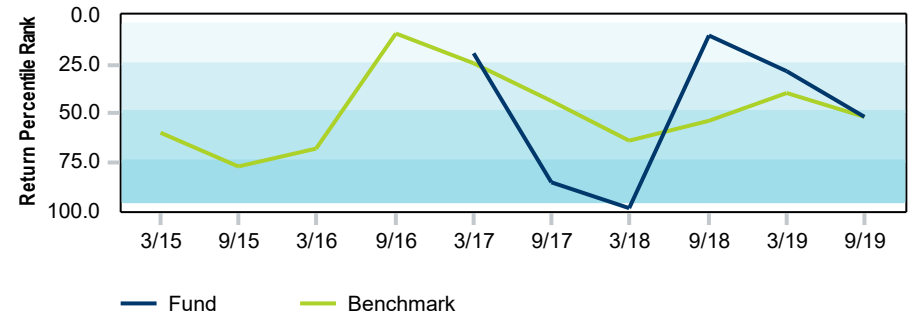
Marathon Bluegrass vs IM U.S. High Yield Bonds (SA+CF)

Periods Ended September 30, 2019

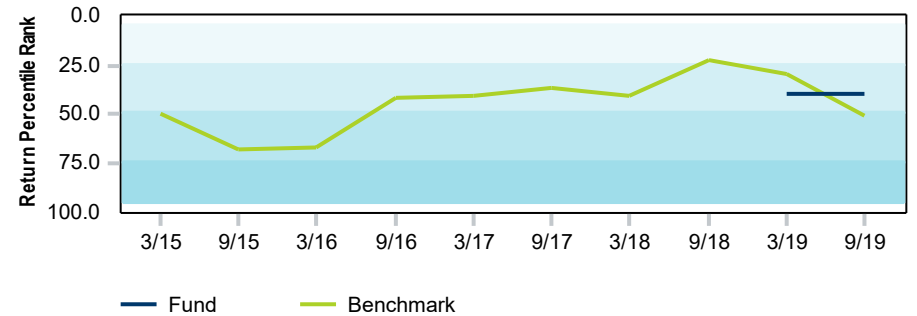
## Comparative Performance



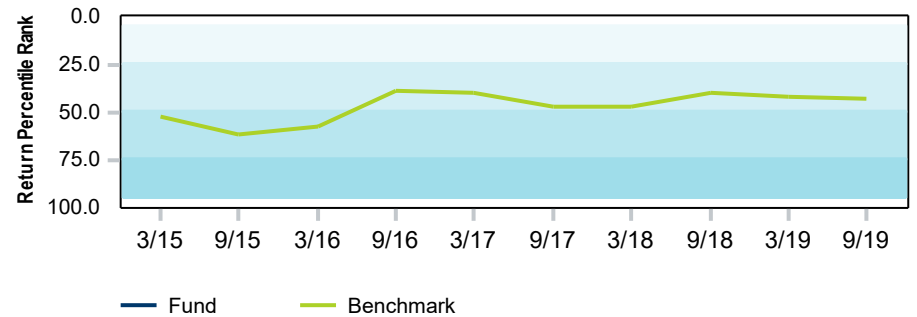
## 1 Year Rolling Percentile Ranking



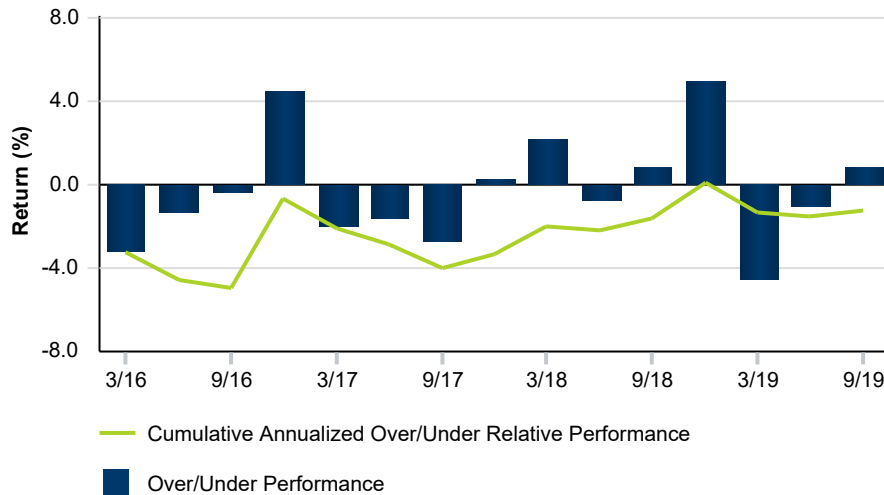
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Relative Performance



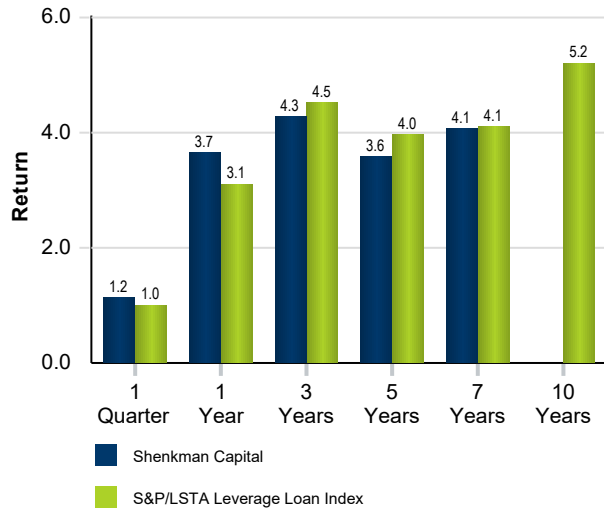


# Performance Summary

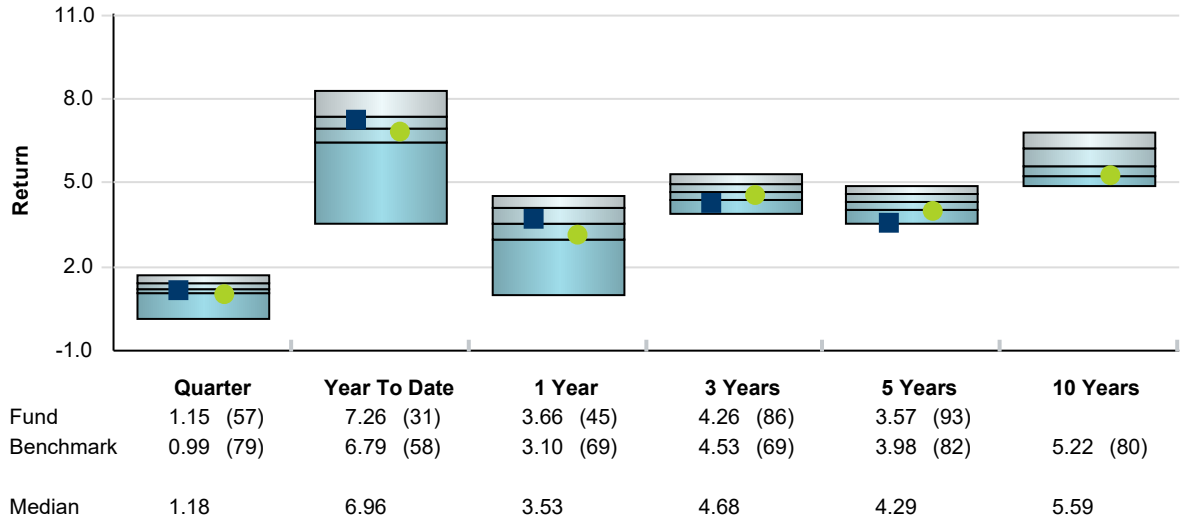
Shenkman Capital

Periods Ended September 30, 2019

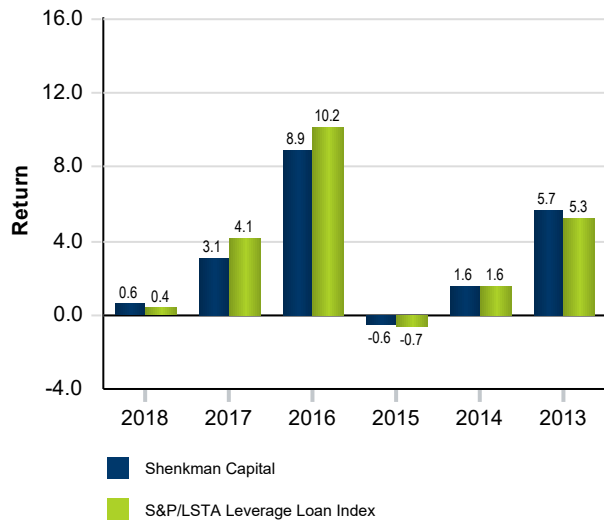
## Comparative Performance



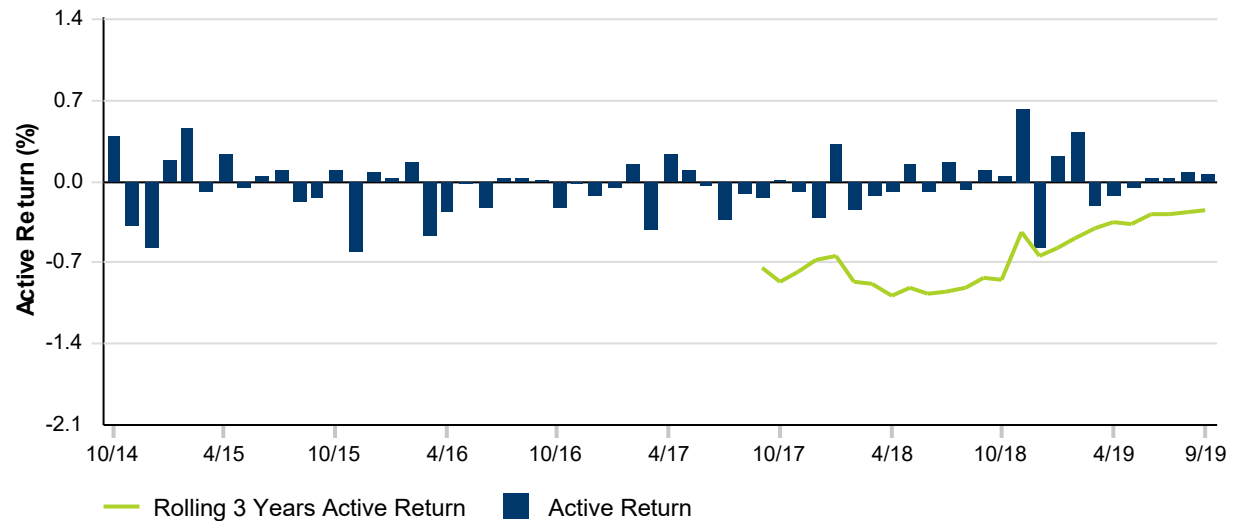
## Peer Group Analysis: IM U.S. Bank Loans (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Shenkman Capital

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Shenkman Capital</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Maximum Return	2.76	2.55
Minimum Return	-3.11	-2.54
Return	3.66	3.10
Cumulative Return	3.66	3.10
Active Return	0.57	0.00
Excess Return	1.36	0.80

## Risk Summary Statistics

	<u>Shenkman Capital</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Upside Risk	1.12	1.03
Downside Risk	3.16	2.73
Beta	1.09	1.00

## Risk/Return Summary Statistics

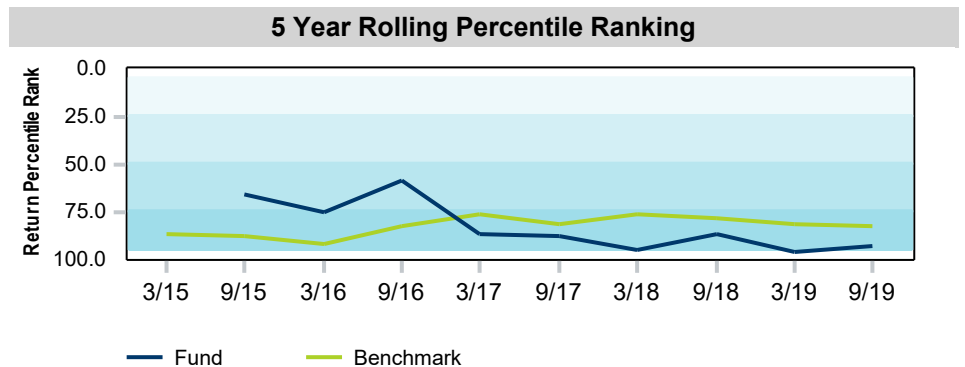
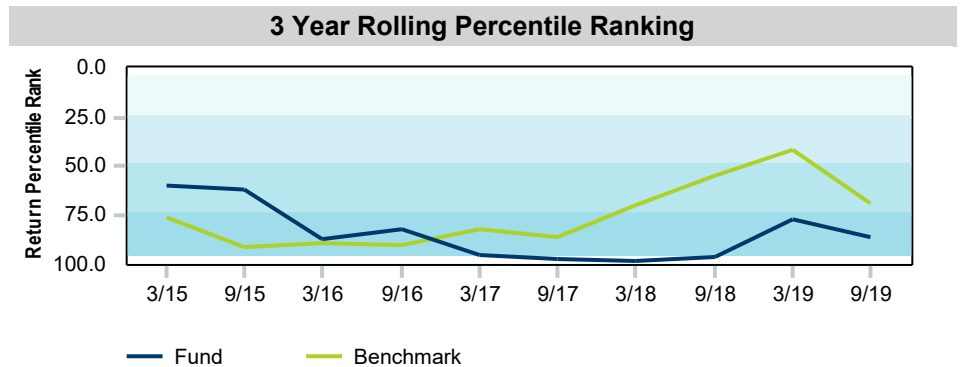
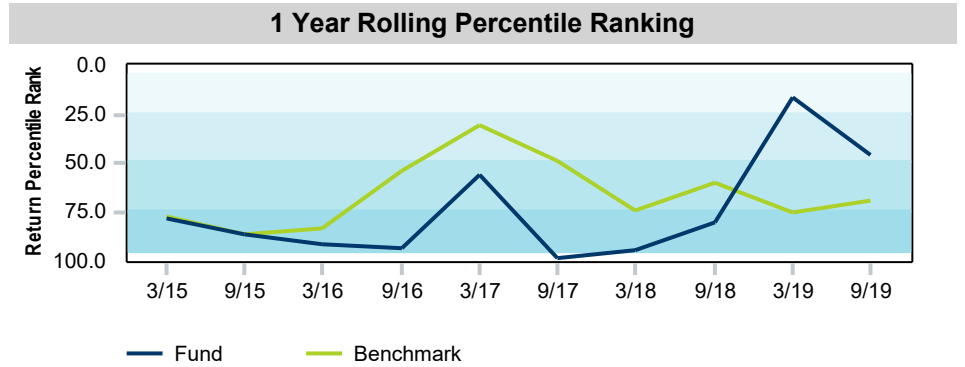
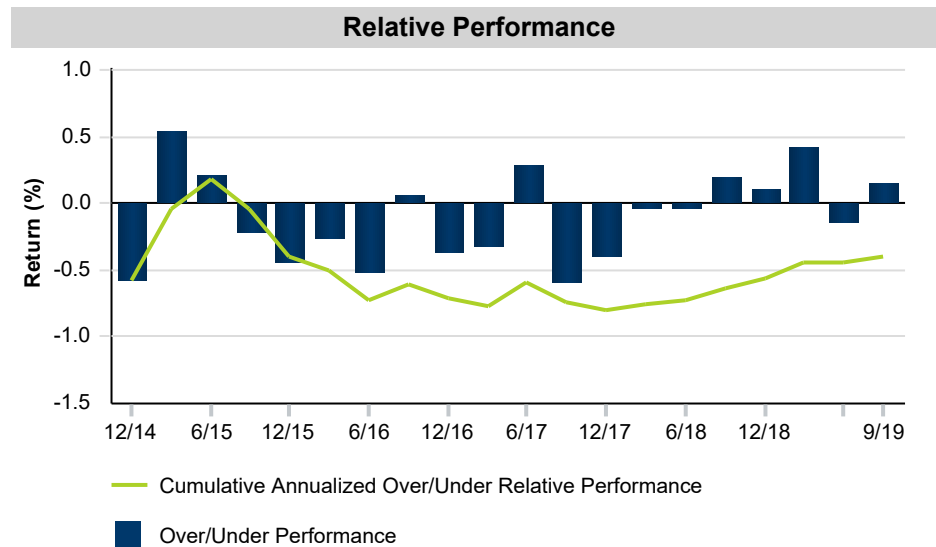
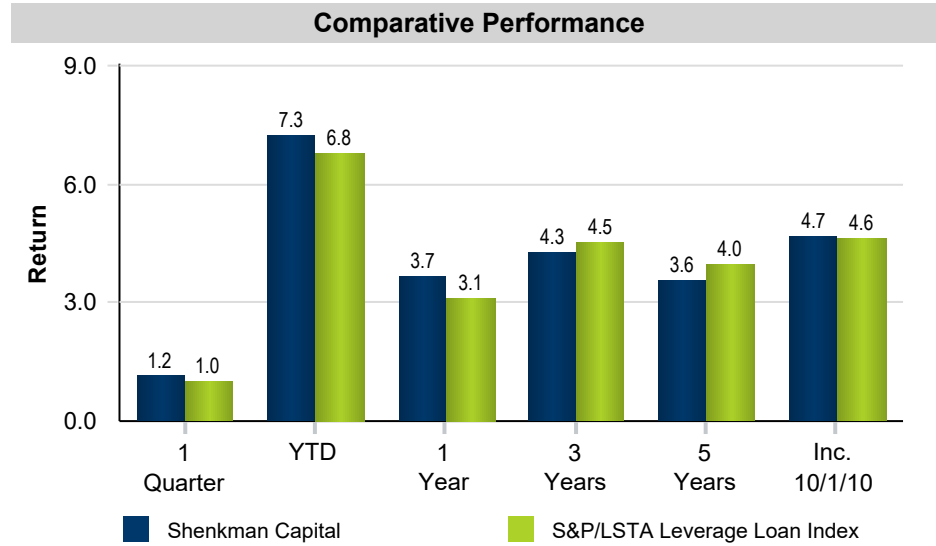
	<u>Shenkman Capital</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Standard Deviation	4.89	4.39
Alpha	0.27	0.00
Active Return/Risk	0.12	0.00
Tracking Error	1.00	0.00
Information Ratio	0.57	
Sharpe Ratio	0.28	0.18

## Correlation Statistics

	<u>Shenkman Capital</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
R-Squared	0.97	1.00
Actual Correlation	0.98	1.00

# Manager Summary

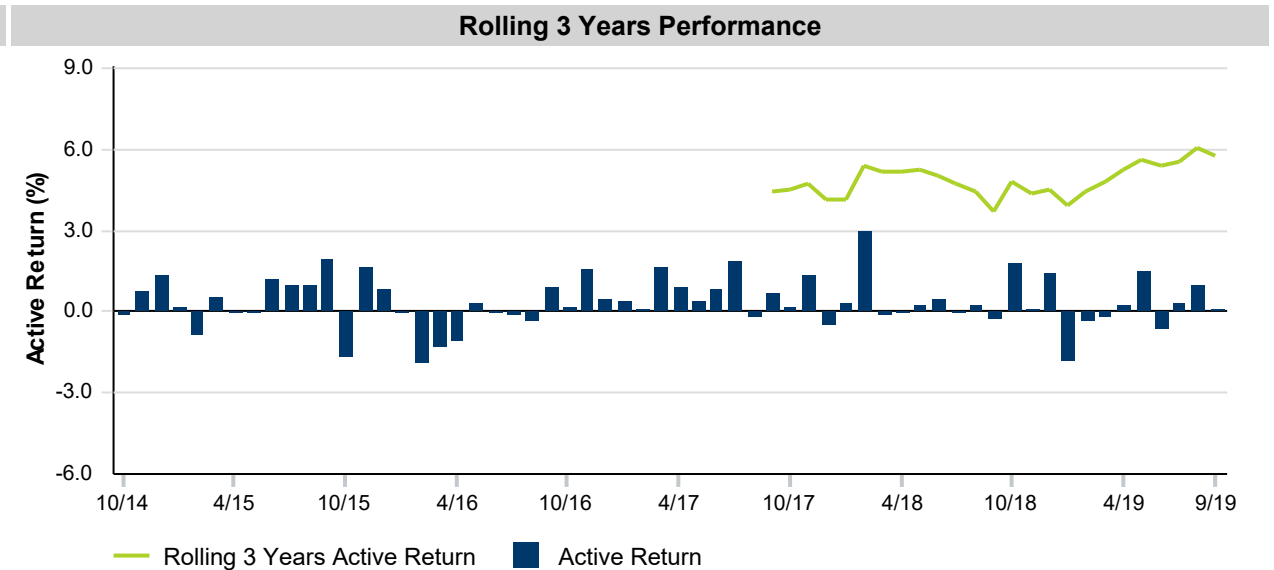
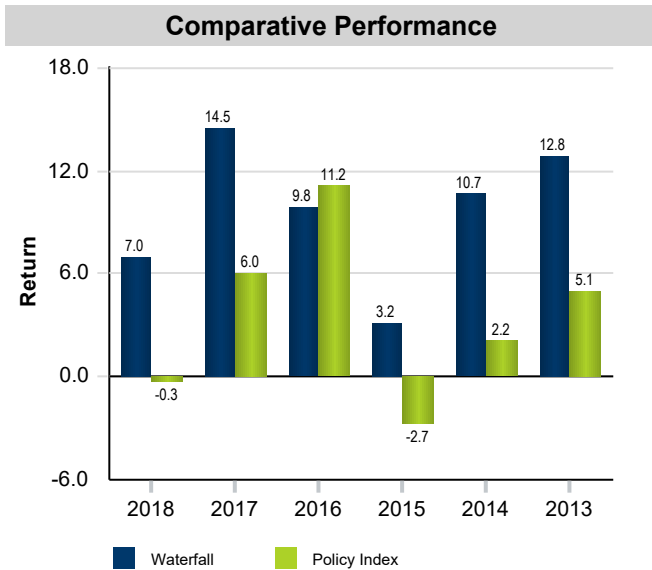
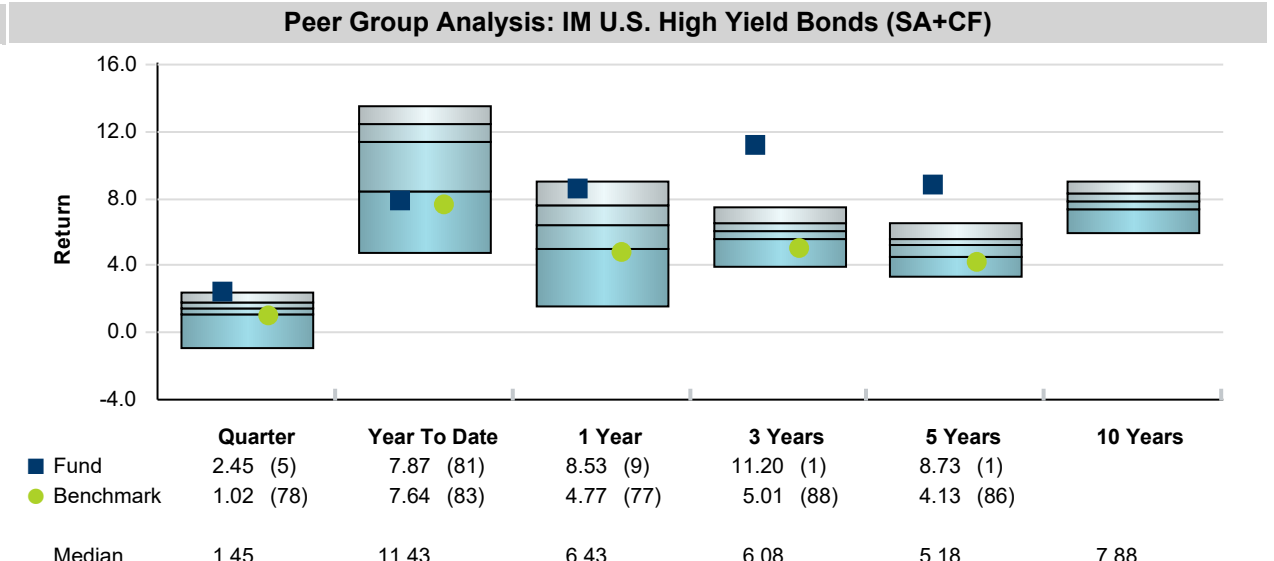
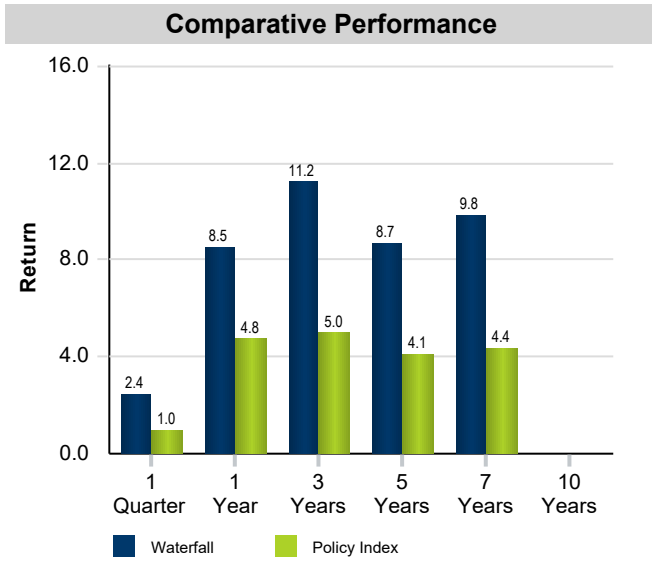
Shenkman Capital vs IM U.S. Bank Loans (SA+CF)  
 Periods Ended September 30, 2019



# Performance Summary

## Waterfall

Periods Ended September 30, 2019



# Summary Statistics

## Waterfall

Periods Ended 1 Year Ending September 30, 2019

### Return Summary Statistics

	<u>Waterfall</u>	<u>Policy Index</u>
Maximum Return	1.27	2.85
Minimum Return	-0.39	-1.27
Return	8.53	4.77
Cumulative Return	8.53	4.77
Active Return	3.49	0.00
Excess Return	5.87	2.38

### Risk Summary Statistics

	<u>Waterfall</u>	<u>Policy Index</u>
Upside Risk	0.81	1.05
Downside Risk	0.39	1.78
Beta	0.19	1.00

### Risk/Return Summary Statistics

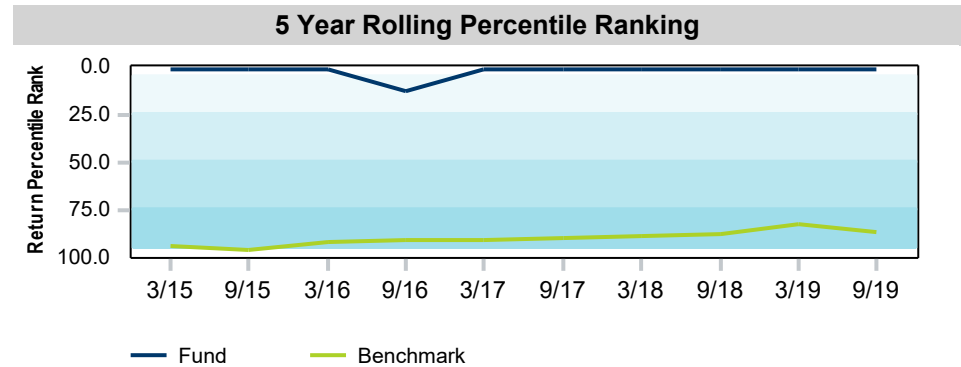
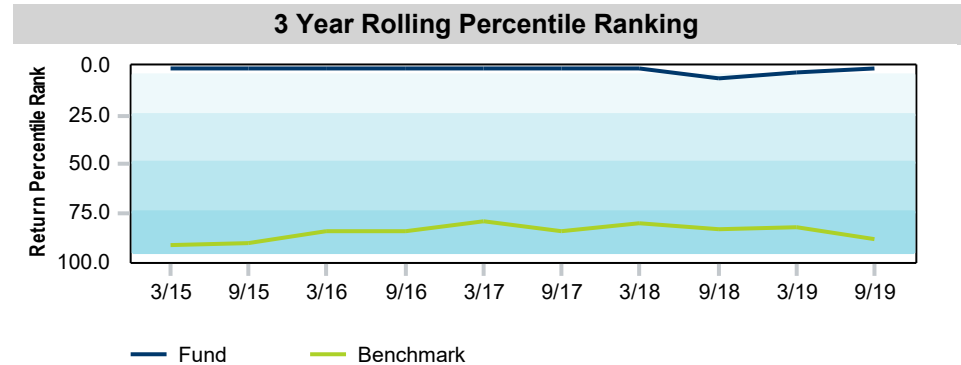
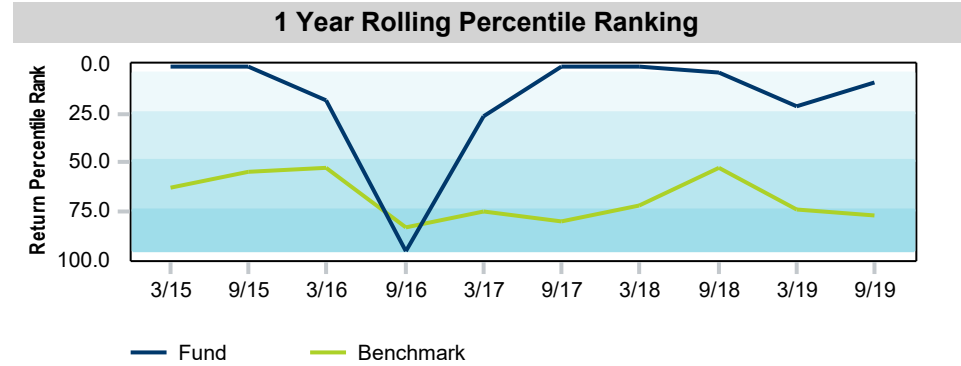
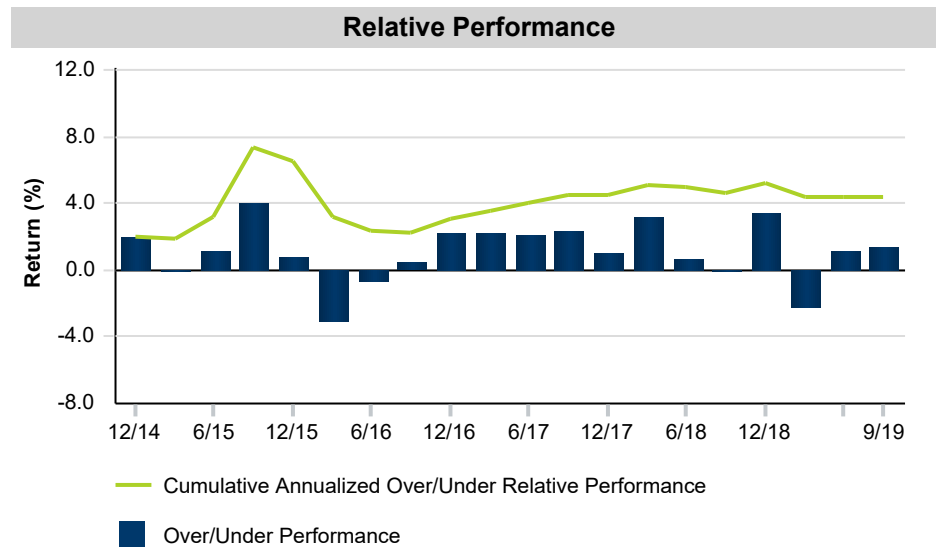
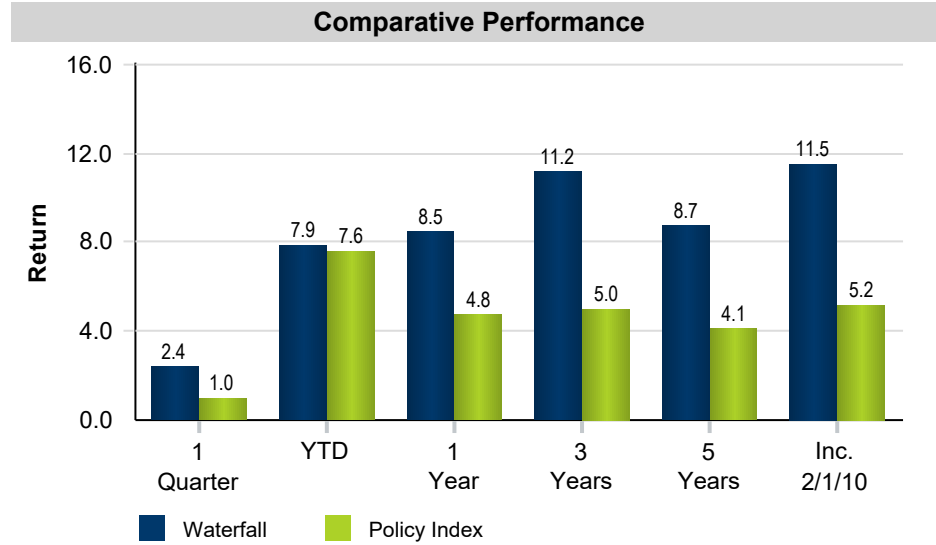
	<u>Waterfall</u>	<u>Policy Index</u>
Standard Deviation	1.57	3.82
Alpha	7.58	0.00
Active Return/Risk	2.23	0.00
Tracking Error	3.39	0.00
Information Ratio	1.03	
Sharpe Ratio	3.74	0.62

### Correlation Statistics

	<u>Waterfall</u>	<u>Policy Index</u>
R-Squared	0.22	1.00
Actual Correlation	0.46	1.00

# Manager Summary

Waterfall vs IM U.S. High Yield Bonds (SA+CF)  
 Periods Ended September 30, 2019

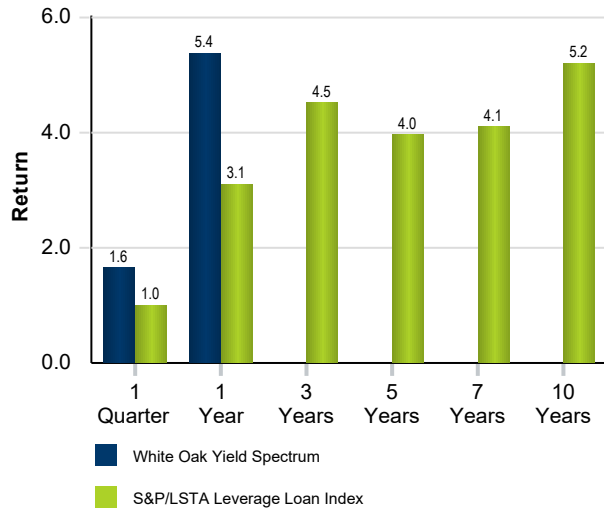


# Performance Summary

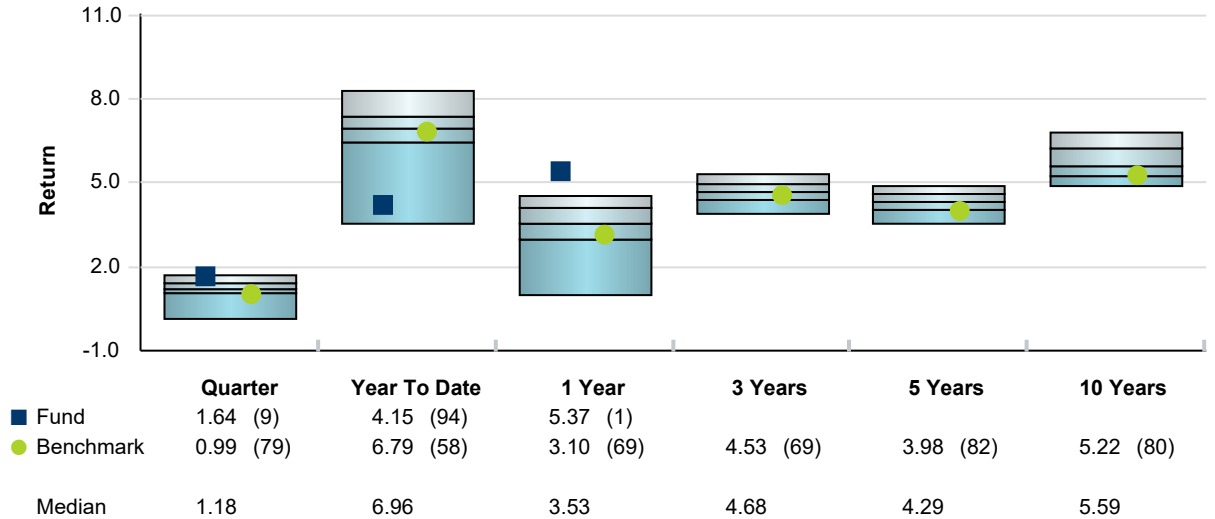
White Oak Yield Spectrum

Periods Ended September 30, 2019

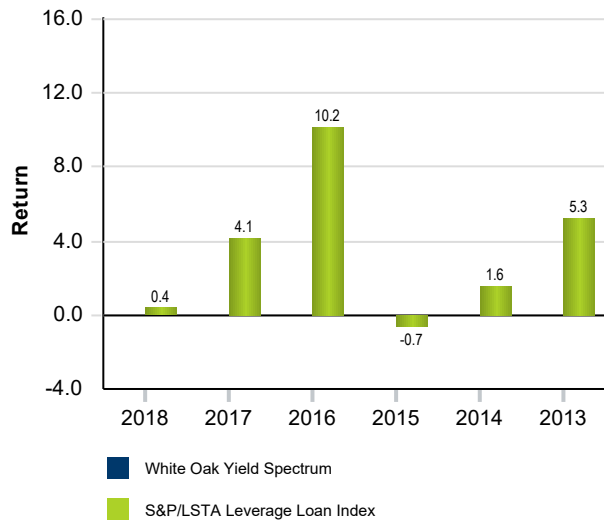
## Comparative Performance



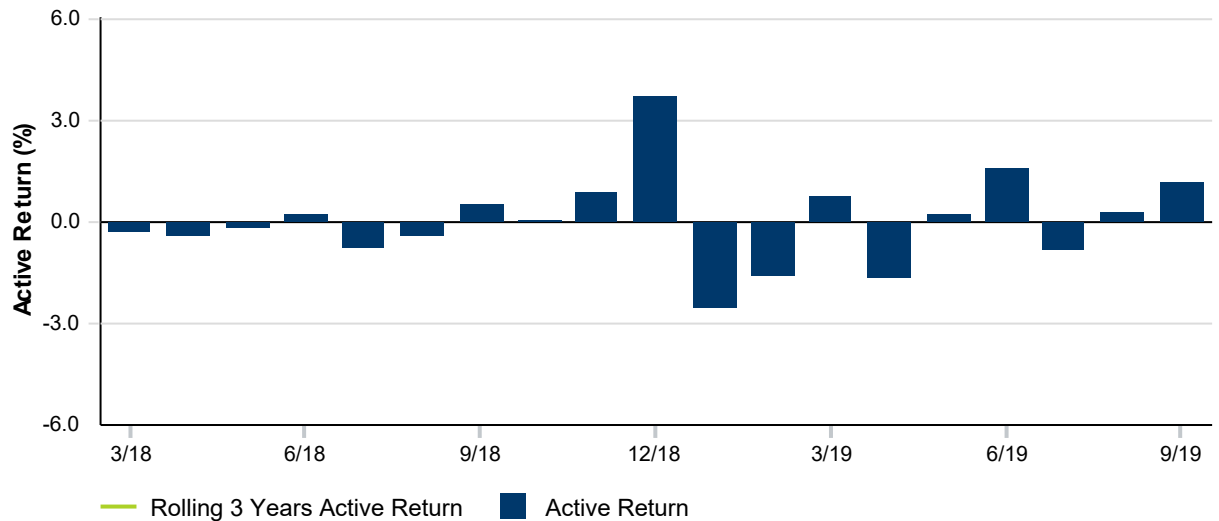
## Peer Group Analysis: IM U.S. Bank Loans (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

White Oak Yield Spectrum

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>White Oak Yield Spectrum</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Maximum Return	1.85	2.55
Minimum Return	0.00	-2.54
Return	5.37	3.10
Cumulative Return	5.37	3.10
Active Return	2.11	0.00
Excess Return	2.91	0.80

## Risk Summary Statistics

	<u>White Oak Yield Spectrum</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Upside Risk	2.80	1.03
Downside Risk	0.00	2.73
Beta	-0.17	1.00

## Risk/Return Summary Statistics

	<u>White Oak Yield Spectrum</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
Standard Deviation	2.35	4.39
Alpha	5.96	0.00
Active Return/Risk	0.90	0.00
Tracking Error	5.60	0.00
Information Ratio	0.38	
Sharpe Ratio	1.24	0.18

## Correlation Statistics

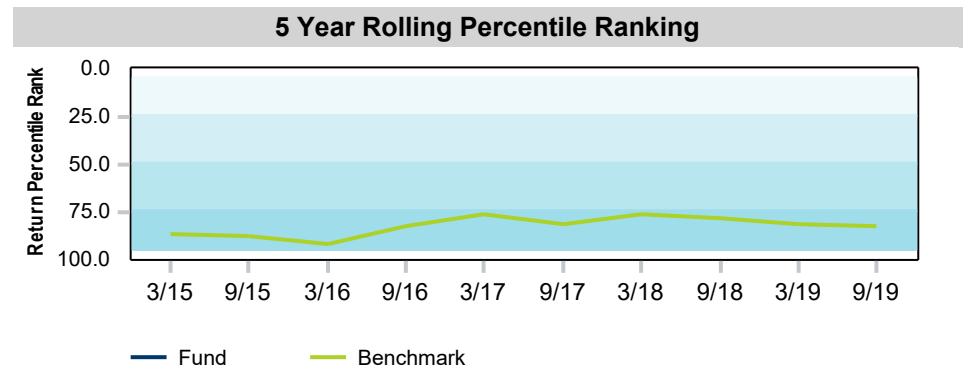
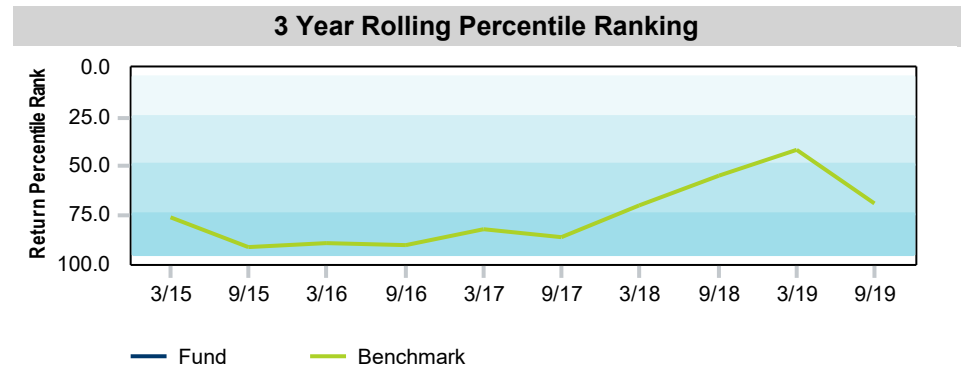
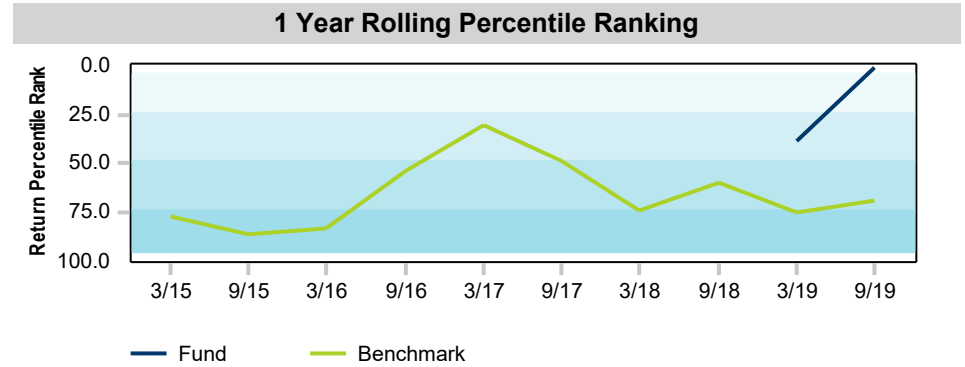
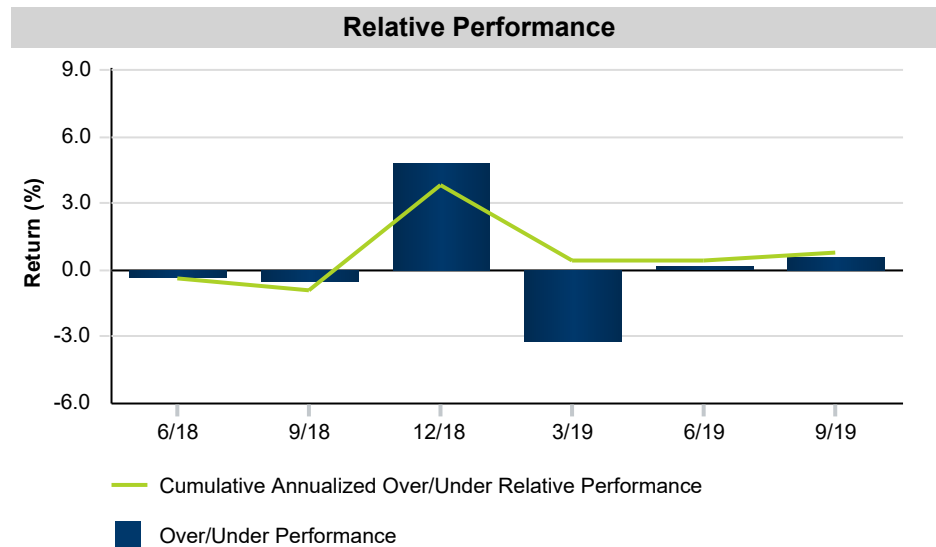
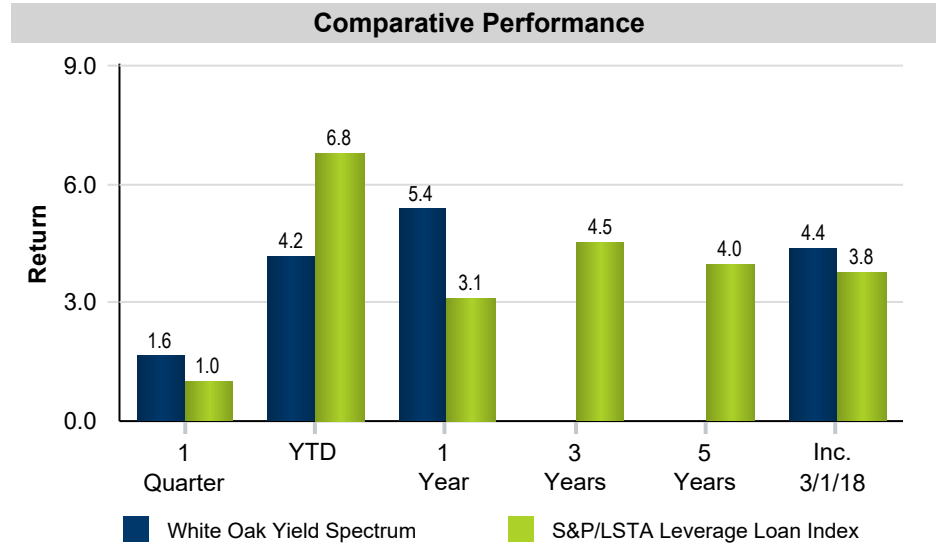
	<u>White Oak Yield Spectrum</u>	<u>S&amp;P/LSTA Leverage Loan Index</u>
R-Squared	0.10	1.00
Actual Correlation	-0.32	1.00



# Manager Summary

White Oak Yield Spectrum vs IM U.S. Bank Loans (SA+CF)

Periods Ended September 30, 2019





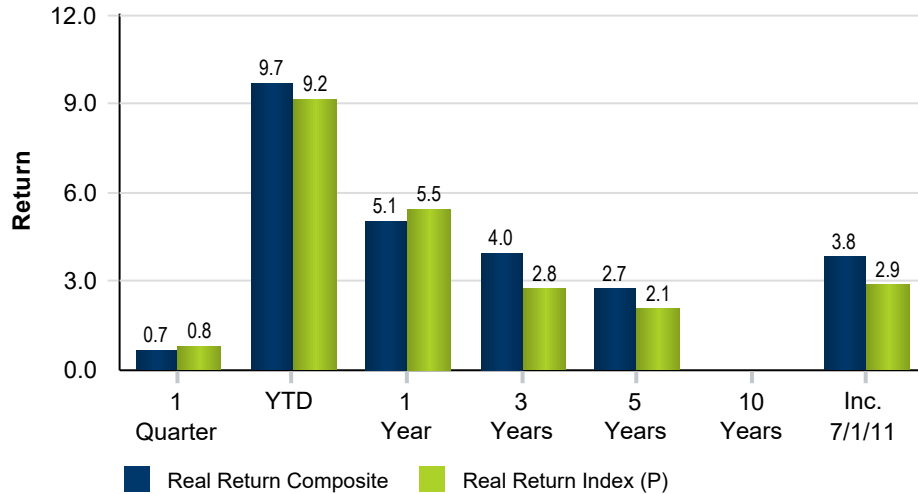
# Real Return Composite

# Composite Performance Summary

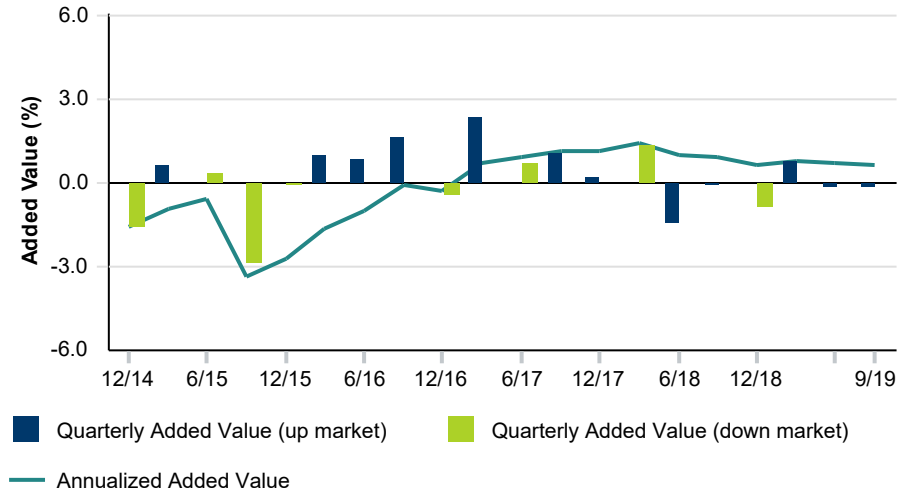
Real Return Composite

Periods Ended September 30, 2019

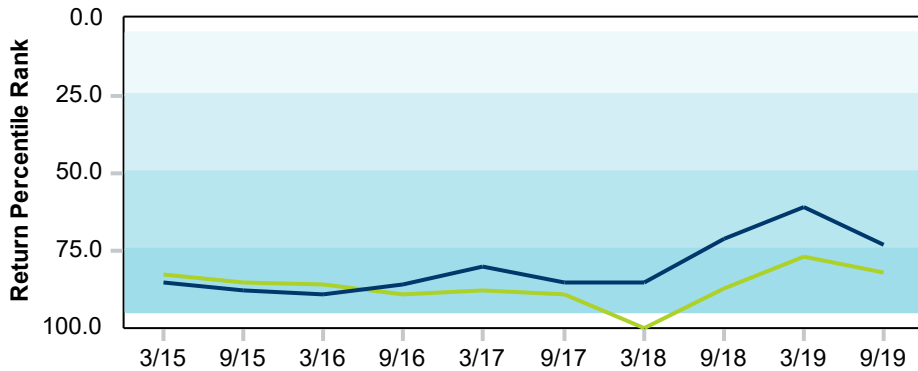
**Comparative Performance**



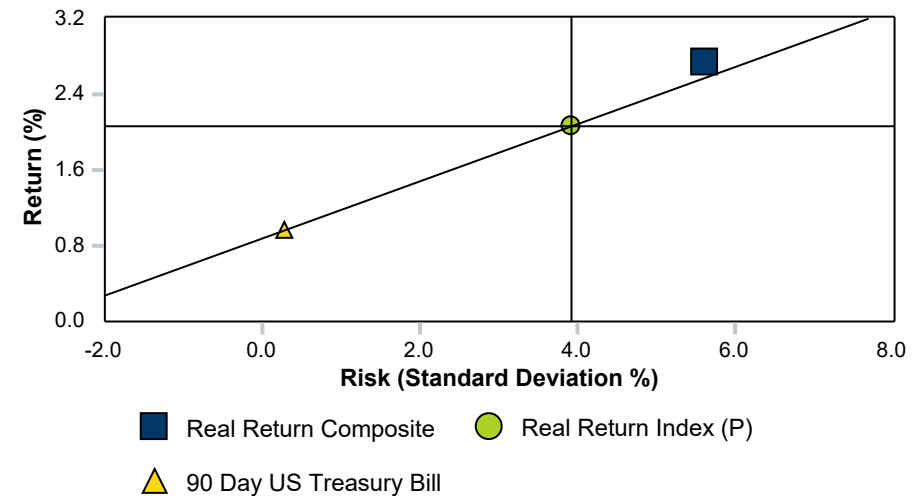
**Added Value History**



**Rolling Percentile Rank: IM U.S. Tactical Asset Allocation (TAA) (SA+CF)**



**Risk and Return 10/1/14 - 09/30/19**



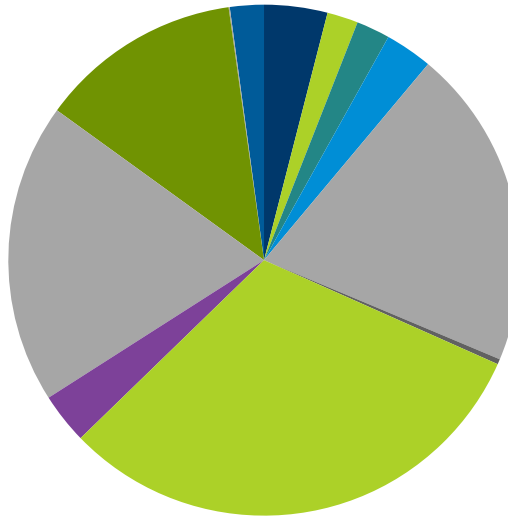
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Real Return Composite	10	0 (0%)	0 (0%)	3 (30%)	7 (70%)
Benchmark	10	0 (0%)	0 (0%)	0 (0%)	10 (100%)

# Asset Allocation By Manager

Real Return Composite

Periods Ended September 30, 2019

Sep-2019 : 1,106,599,987

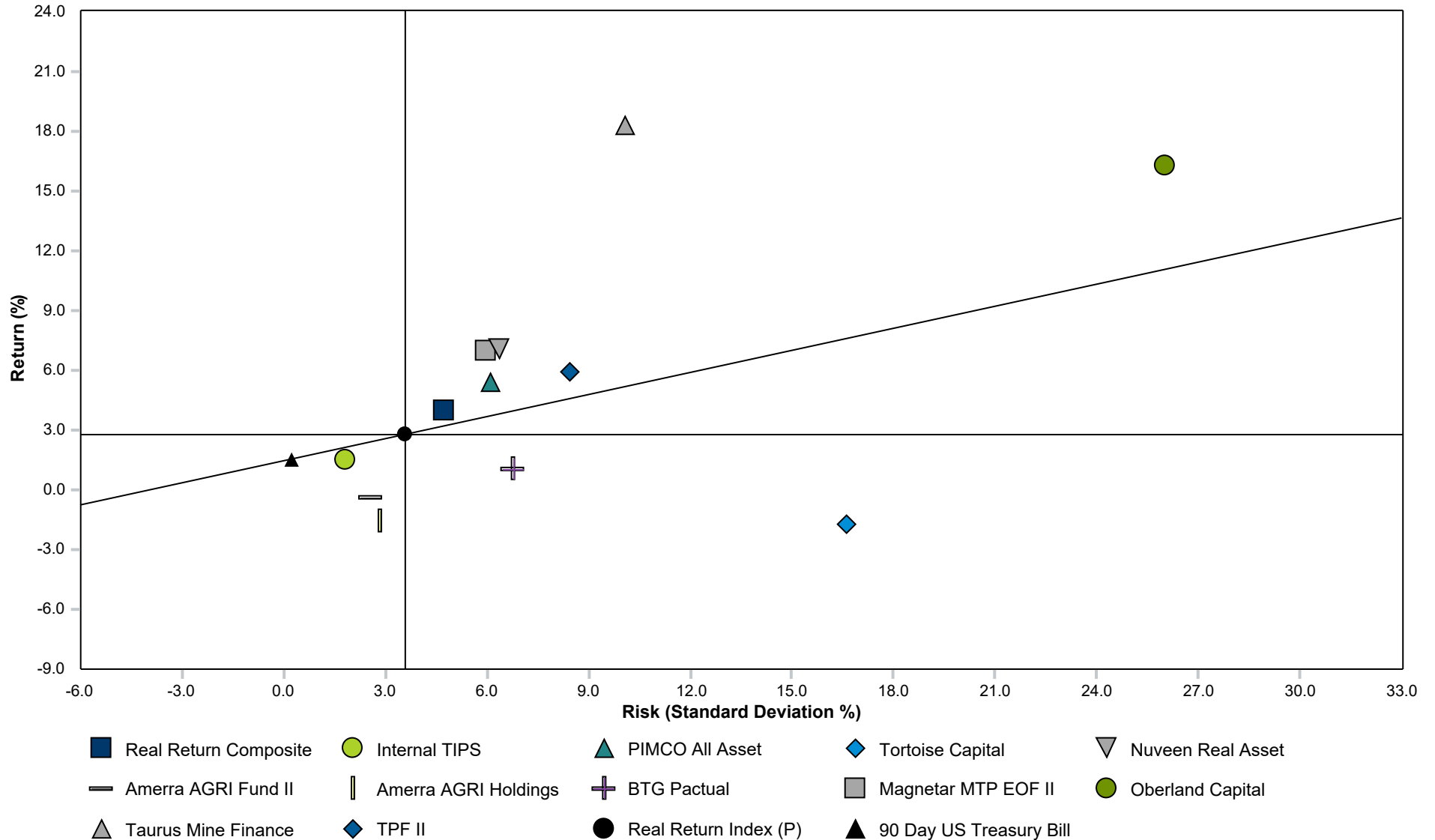


	Market Value \$	Allocation (%)
Amerra AGRI Holdings	44,217,010	4.0
Amerra AGRI Fund II	21,647,385	2.0
BTG Pactual	23,572,456	2.1
Magnetar MTP EOF II	33,226,933	3.0
Nuveen Real Asset	224,178,763	20.3
Oberland Capital	3,635,301	0.3
PIMCO All Asset	343,782,355	31.1
Taurus Mine Finance	35,556,058	3.2
Internal TIPS	210,530,378	19.0
Tortoise Capital	141,673,384	12.8
TPF II	776,526	0.1
IFM Infrastructure	23,803,439	2.2

# Risk vs. Return

Real Return Composite

Periods Ended 3 Years Ending September 30, 2019



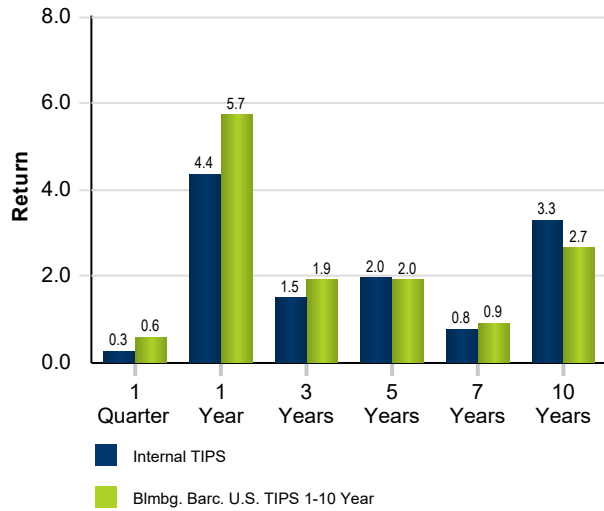
Calculation based on monthly periodicity.

# Performance Summary

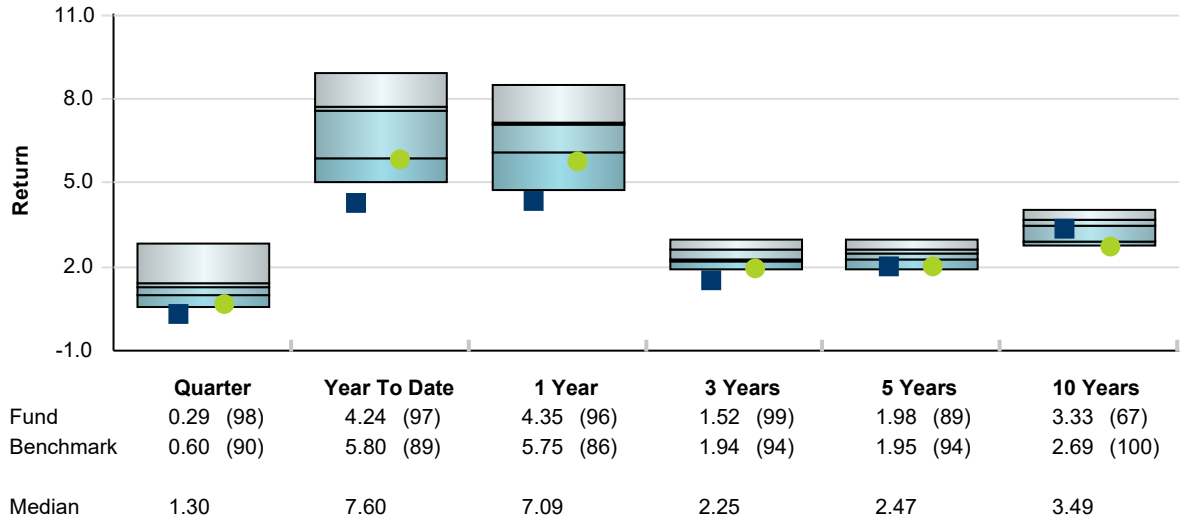
Internal TIPS

Periods Ended September 30, 2019

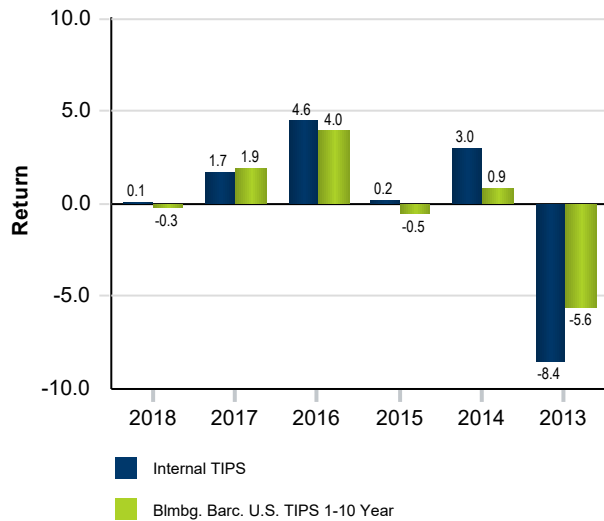
## Comparative Performance



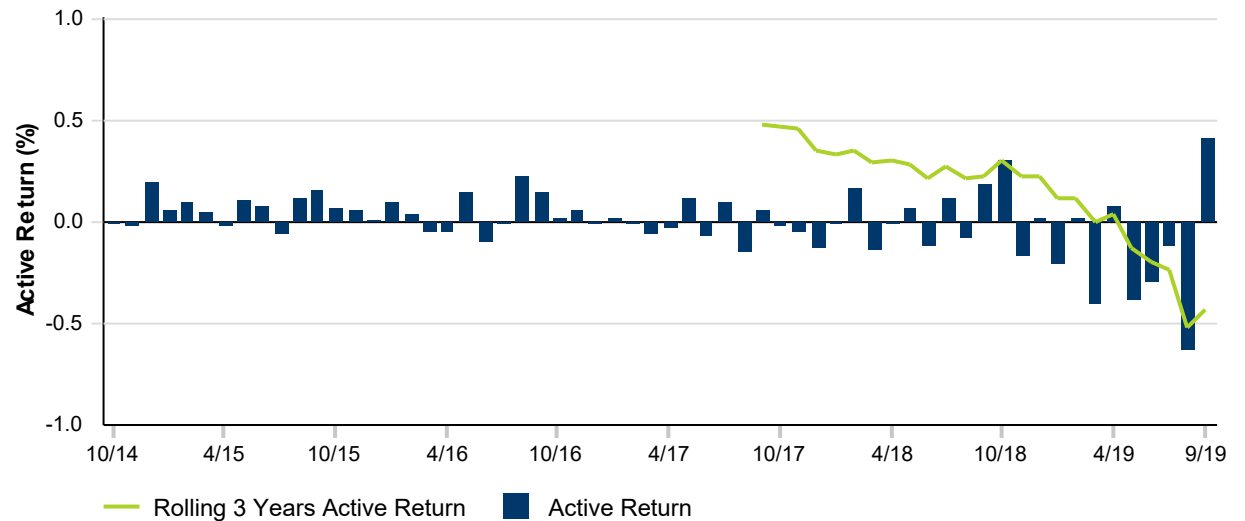
## Peer Group Analysis: IM U.S. TIPS (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

## Internal TIPS

Periods Ended 1 Year Ending September 30, 2019

### Return Summary Statistics

	<u>Internal TIPS</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
Maximum Return	0.93	1.33
Minimum Return	-0.47	-0.82
Return	4.35	5.75
Cumulative Return	4.35	5.75
Active Return	-1.35	0.00
Excess Return	1.92	3.27

### Risk Summary Statistics

	<u>Internal TIPS</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
Upside Risk	0.55	0.78
Downside Risk	0.62	1.13
Beta	0.62	1.00

### Risk/Return Summary Statistics

	<u>Internal TIPS</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
Standard Deviation	1.57	2.44
Alpha	0.77	0.00
Active Return/Risk	-0.86	0.00
Tracking Error	0.99	0.00
Information Ratio	-1.36	
Sharpe Ratio	1.26	1.37

### Correlation Statistics

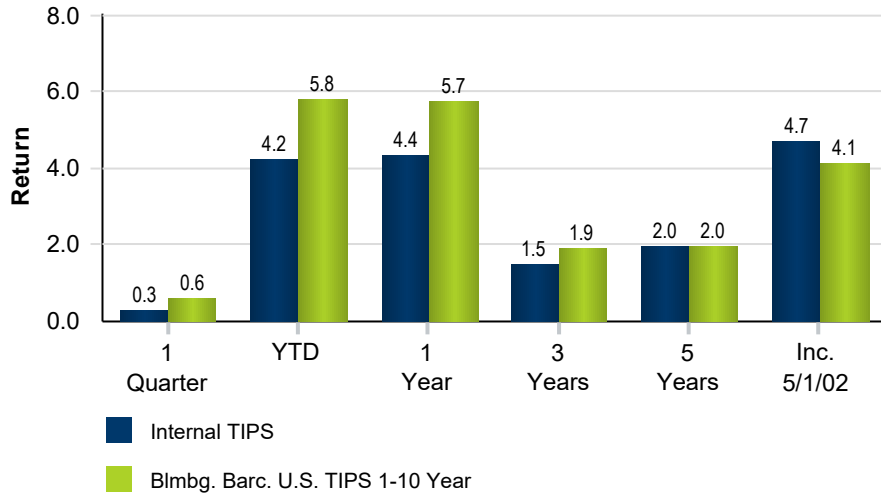
	<u>Internal TIPS</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
R-Squared	0.94	1.00
Actual Correlation	0.97	1.00

# Manager Summary

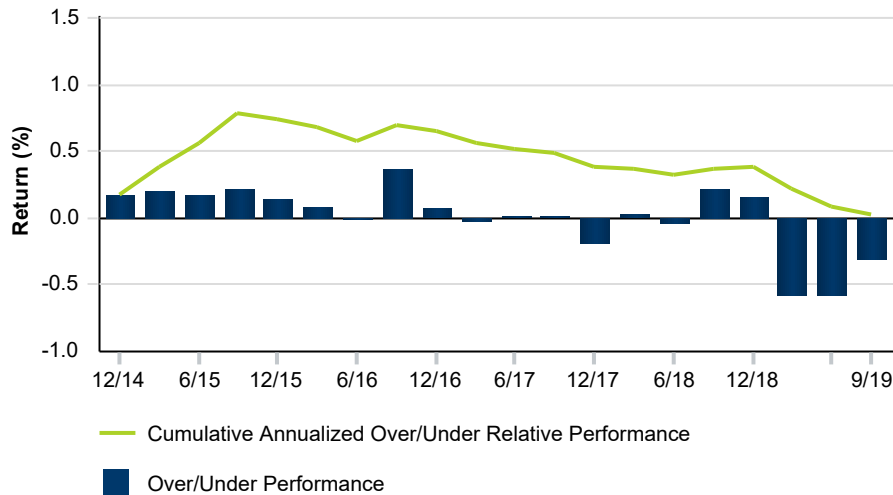
Internal TIPS vs IM U.S. TIPS (SA+CF)

Periods Ended September 30, 2019

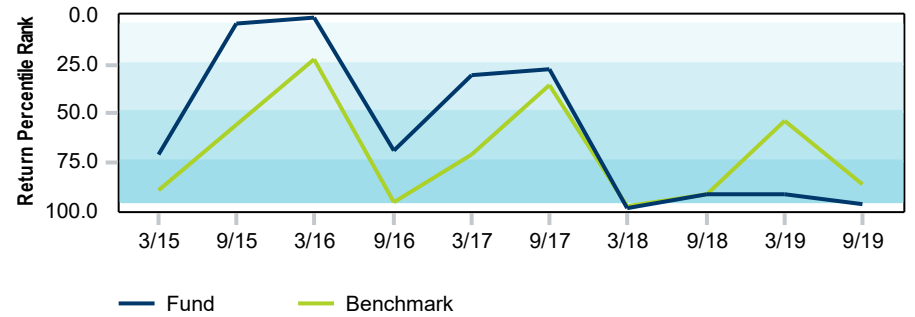
## Comparative Performance



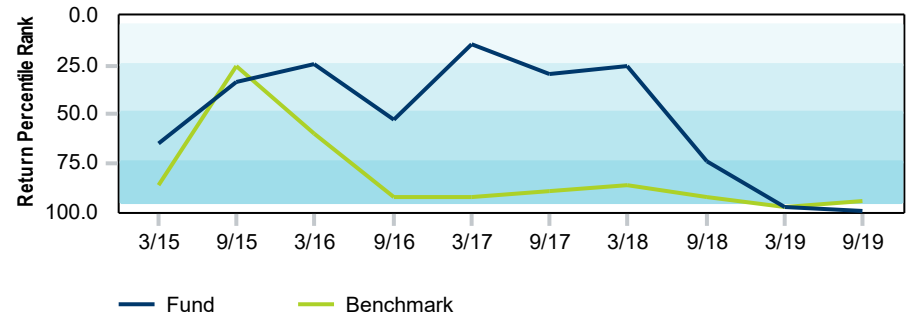
## Relative Performance



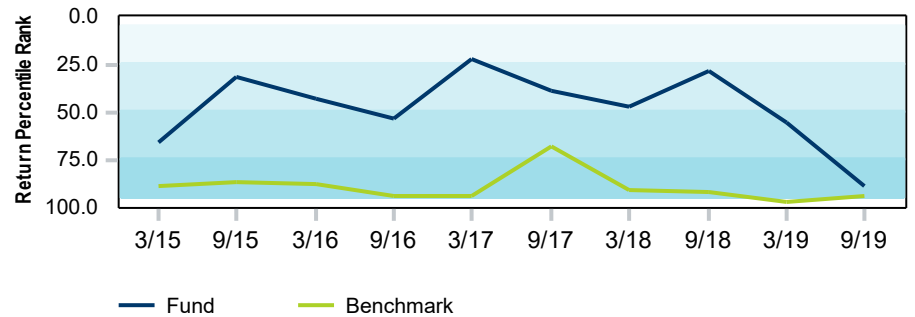
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



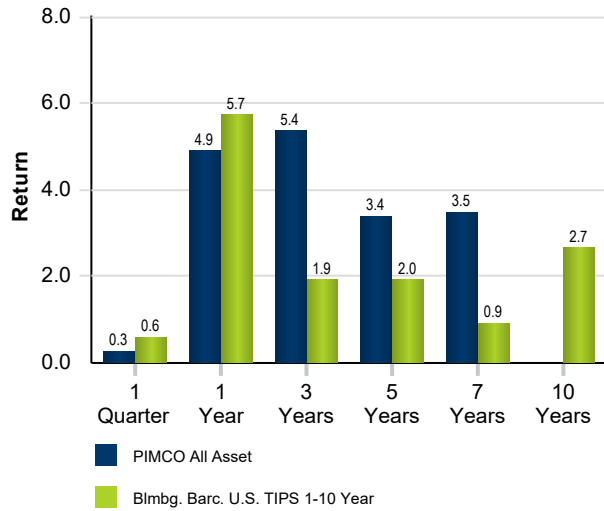


# Performance Summary

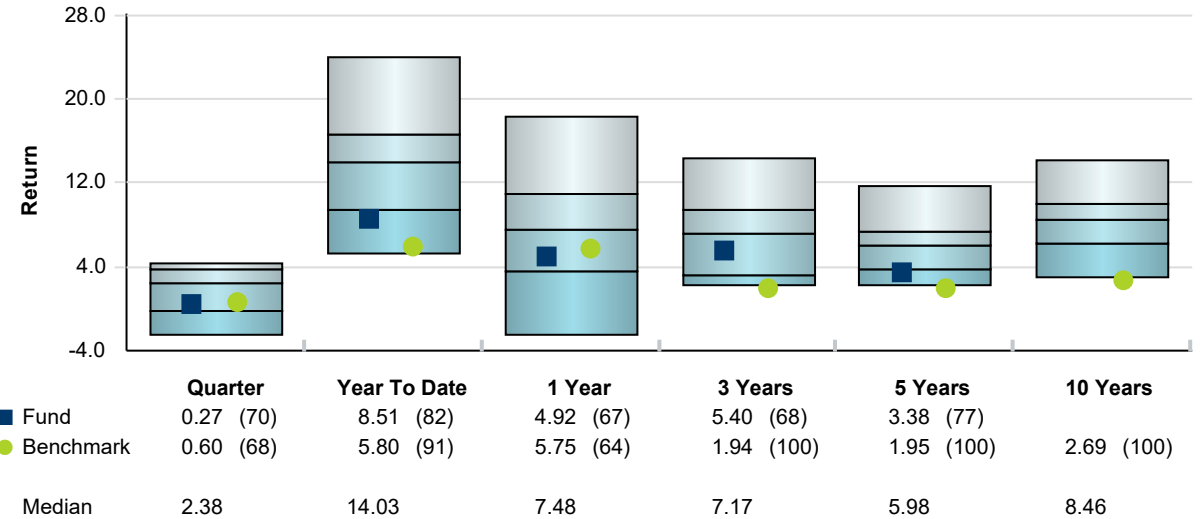
PIMCO All Asset

Periods Ended September 30, 2019

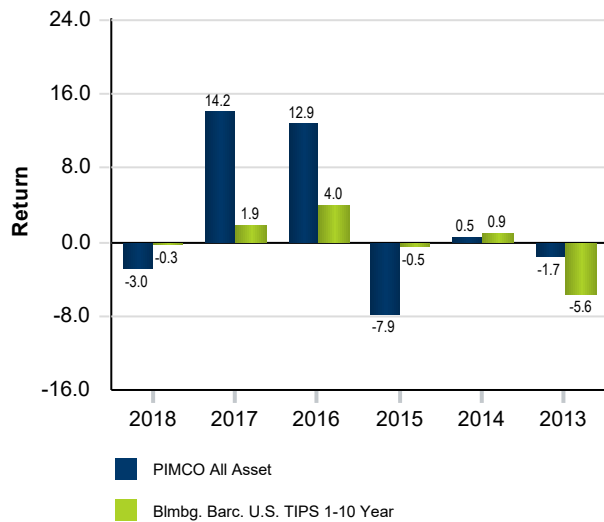
## Comparative Performance



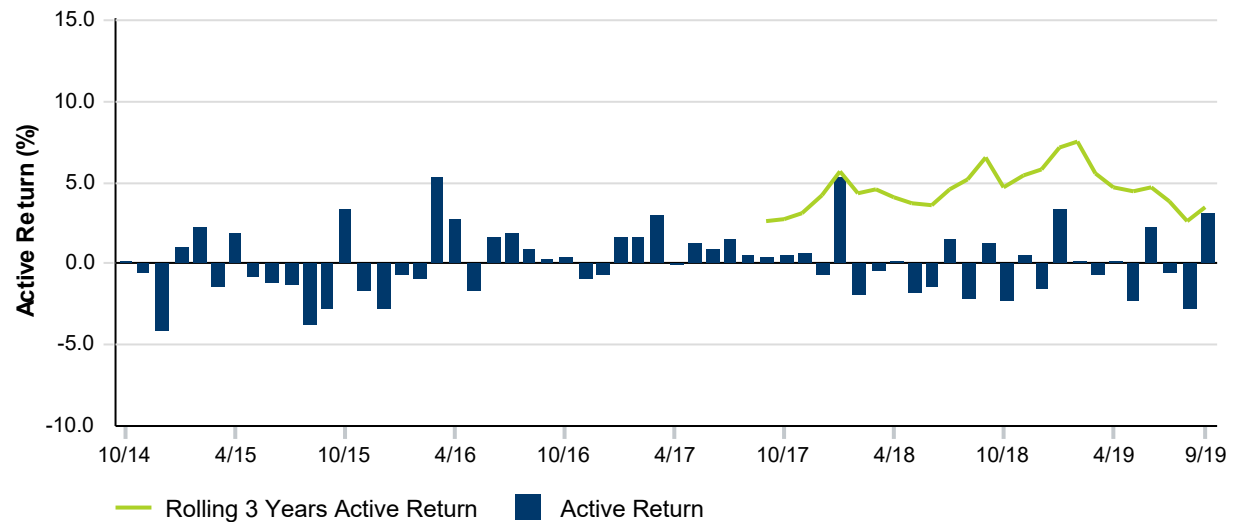
## Peer Group Analysis: IM U.S. Tactical Asset Allocation (TAA) (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

PIMCO All Asset

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>PIMCO All Asset</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
Maximum Return	4.48	1.33
Minimum Return	-3.08	-0.82
Return	4.92	5.75
Cumulative Return	4.92	5.75
Active Return	-0.57	0.00
Excess Return	2.70	3.27

## Risk Summary Statistics

	<u>PIMCO All Asset</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
Upside Risk	1.76	0.78
Downside Risk	3.81	1.13
Beta	0.67	1.00

## Risk/Return Summary Statistics

	<u>PIMCO All Asset</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
Standard Deviation	7.04	2.44
Alpha	1.29	0.00
Active Return/Risk	-0.08	0.00
Tracking Error	6.90	0.00
Information Ratio	-0.08	
Sharpe Ratio	0.38	1.37

## Correlation Statistics

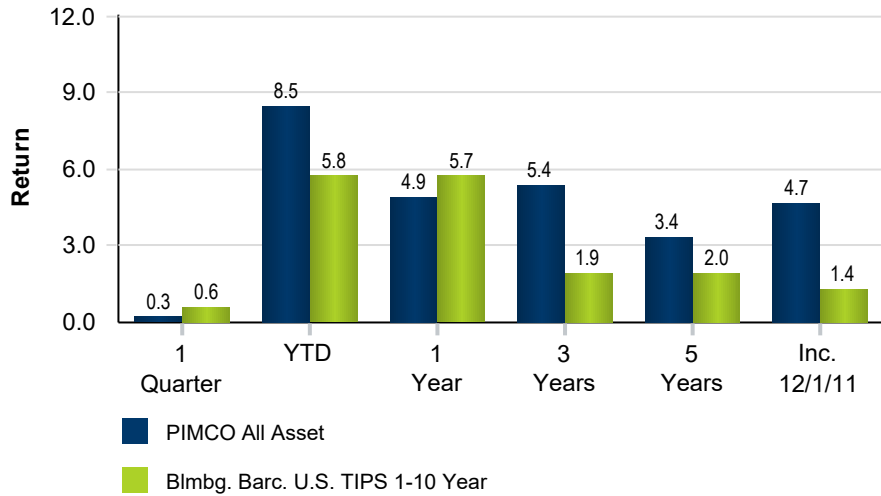
	<u>PIMCO All Asset</u>	<u>Blmbg. Barc. U.S. TIPS 1-10 Year</u>
R-Squared	0.05	1.00
Actual Correlation	0.23	1.00

# Manager Summary

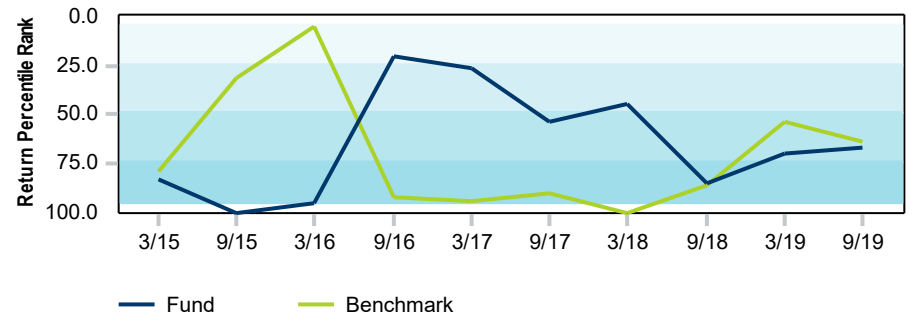
PIMCO All Asset vs IM U.S. Tactical Asset Allocation (TAA) (SA+CF)

Periods Ended September 30, 2019

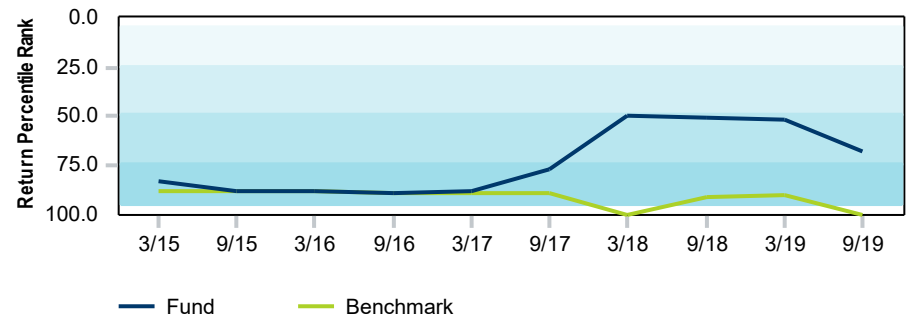
## Comparative Performance



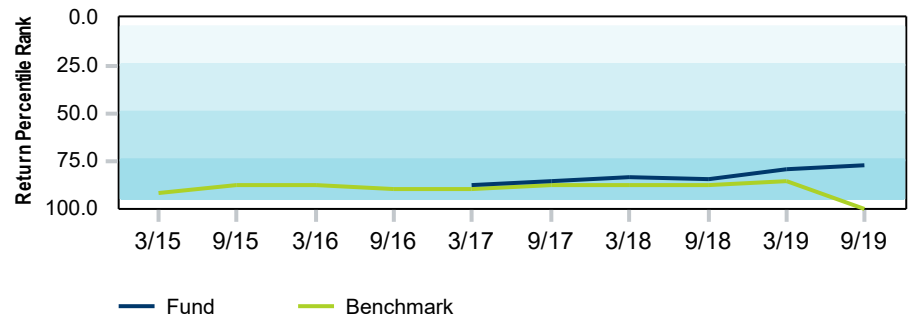
## 1 Year Rolling Percentile Ranking



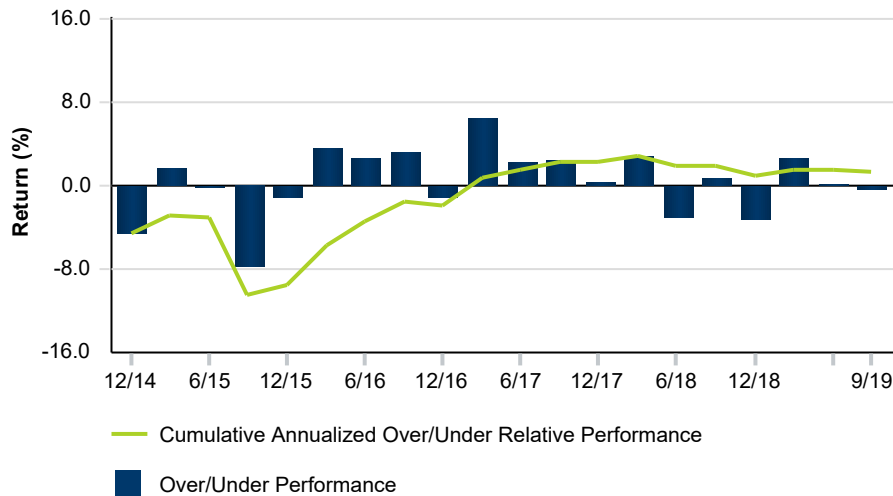
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Relative Performance

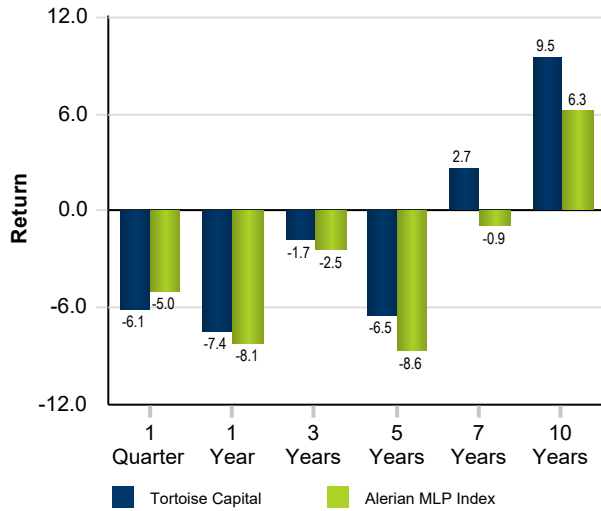


# Performance Summary

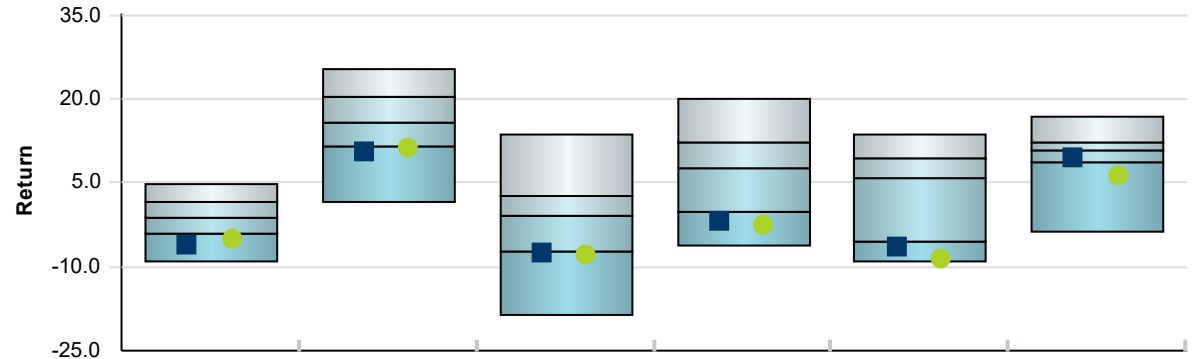
Tortoise Capital

Periods Ended September 30, 2019

## Comparative Performance

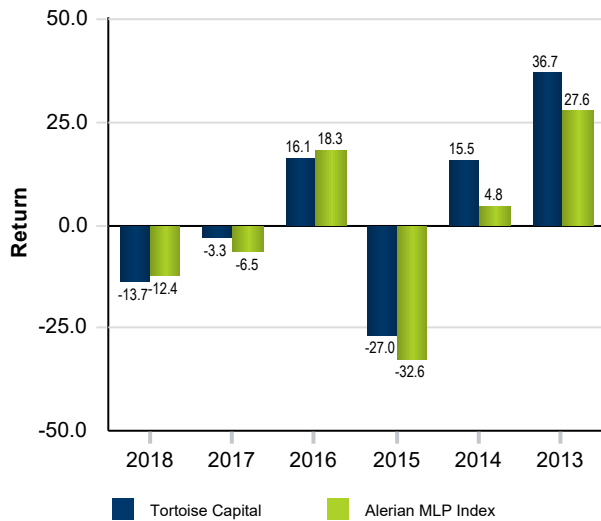


## Peer Group Analysis: IM U.S. Other Equity (SA+CF)

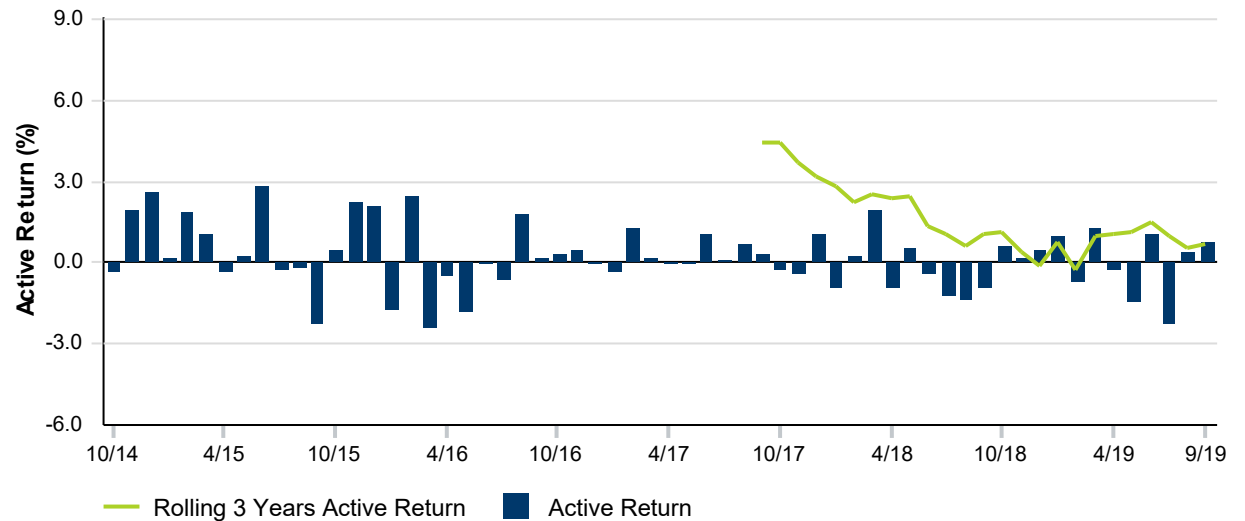


	Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years
Fund	-6.14 (91)	10.48 (79)	-7.44 (77)	-1.75 (88)	-6.48 (82)	9.48 (68)
Benchmark	-5.02 (86)	11.08 (77)	-8.13 (84)	-2.46 (89)	-8.65 (94)	6.25 (88)
Median	-1.13	15.71	-0.96	7.50	5.90	10.90

## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Tortoise Capital

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Tortoise Capital</u>	<u>Alerian MLP Index</u>
Maximum Return	13.59	12.64
Minimum Return	-8.90	-9.36
Return	-7.44	-8.13
Cumulative Return	-7.44	-8.13
Active Return	0.89	0.00
Excess Return	-8.13	-9.02

## Risk Summary Statistics

	<u>Tortoise Capital</u>	<u>Alerian MLP Index</u>
Upside Risk	4.31	3.86
Downside Risk	13.28	13.62
Beta	1.03	1.00

## Risk/Return Summary Statistics

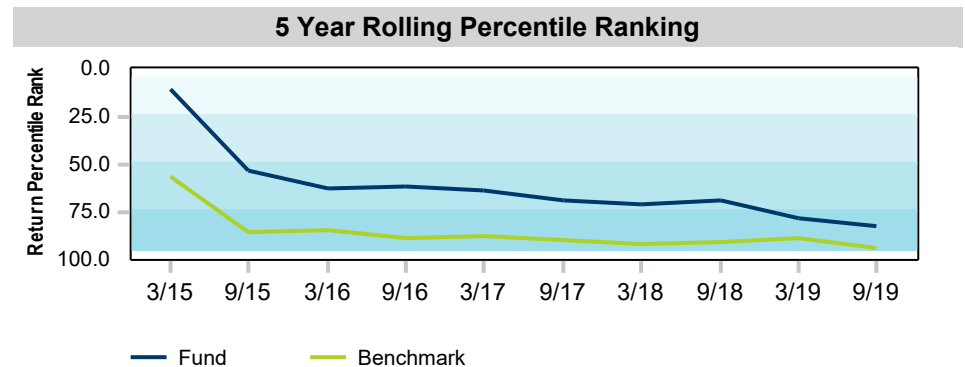
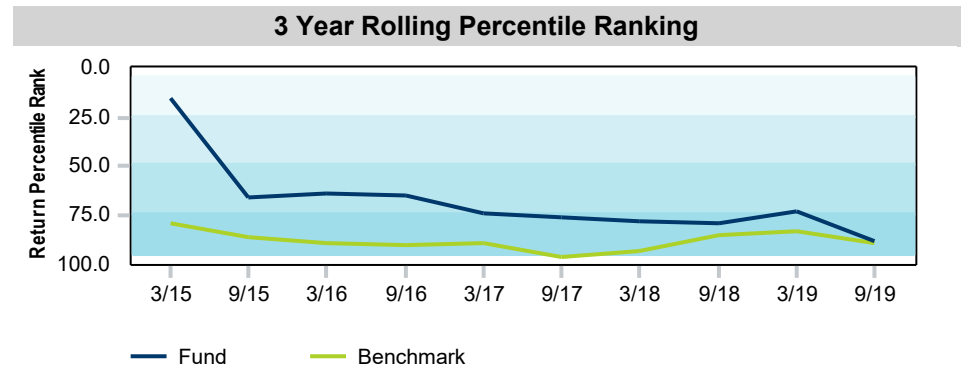
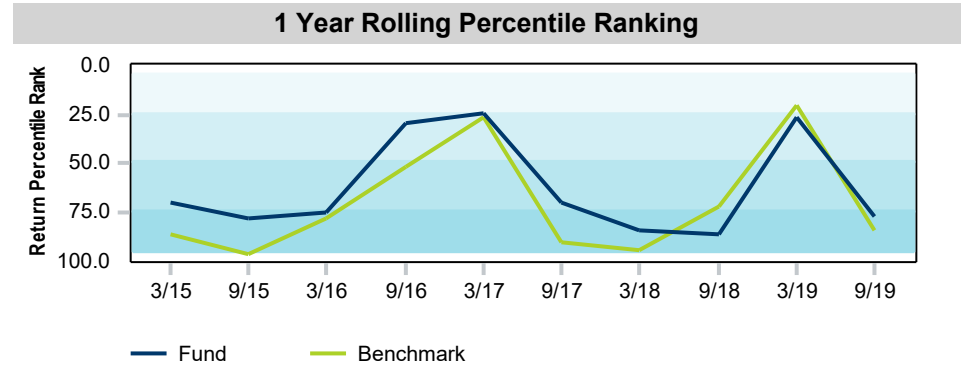
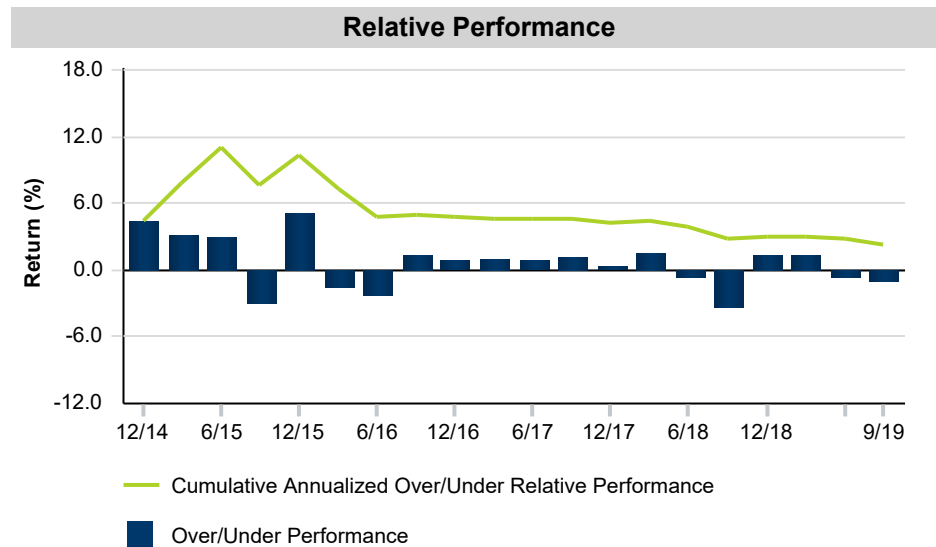
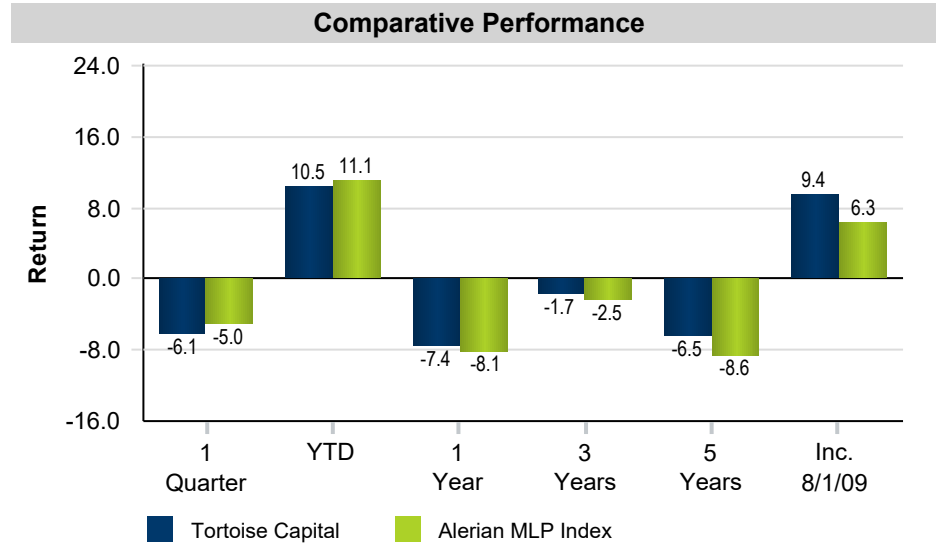
	<u>Tortoise Capital</u>	<u>Alerian MLP Index</u>
Standard Deviation	19.90	19.00
Alpha	1.11	0.00
Active Return/Risk	0.04	0.00
Tracking Error	3.56	0.00
Information Ratio	0.25	
Sharpe Ratio	-0.41	-0.48

## Correlation Statistics

	<u>Tortoise Capital</u>	<u>Alerian MLP Index</u>
R-Squared	0.97	1.00
Actual Correlation	0.98	1.00

# Manager Summary

Tortoise Capital vs IM U.S. Other Equity (SA+CF)  
 Periods Ended September 30, 2019

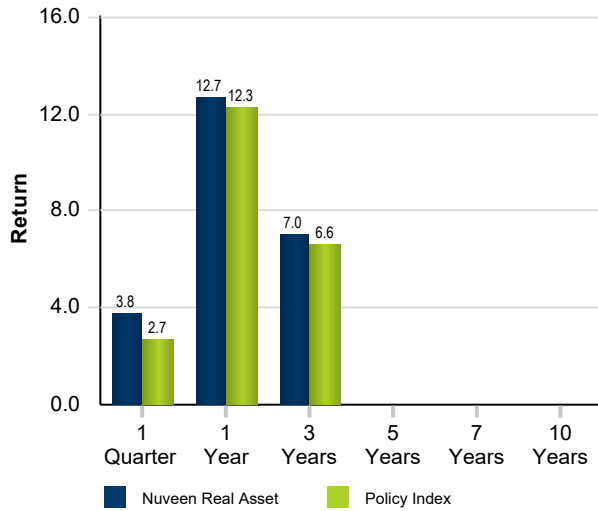


# Performance Summary

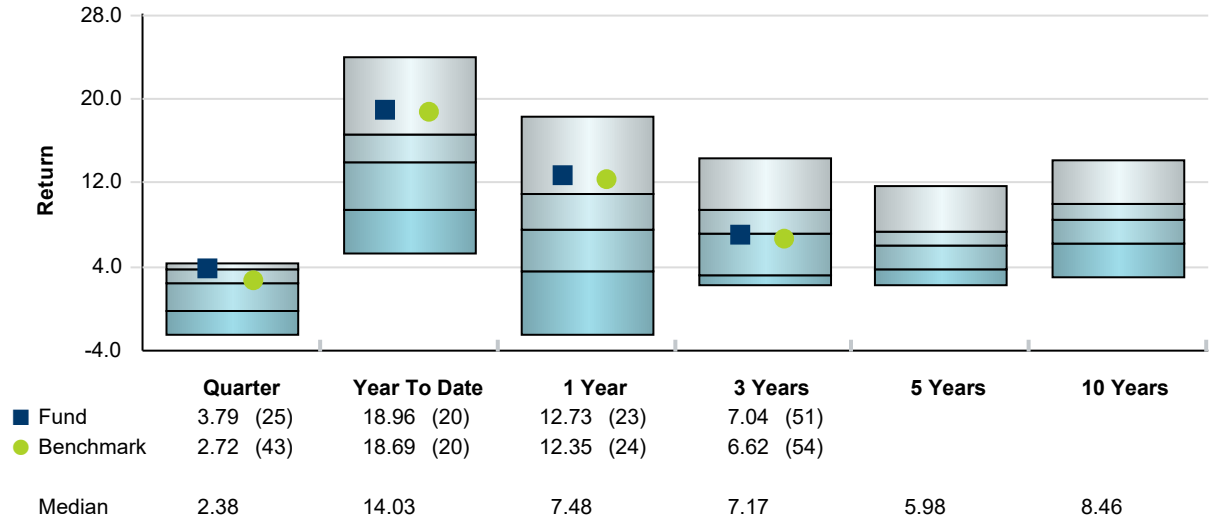
Nuveen Real Asset

Periods Ended September 30, 2019

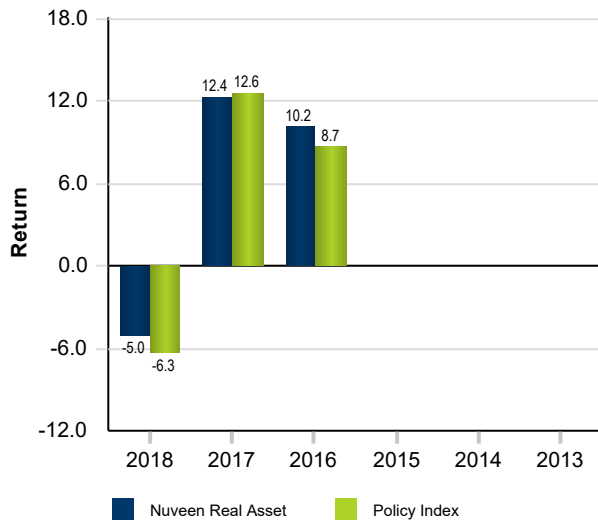
## Comparative Performance



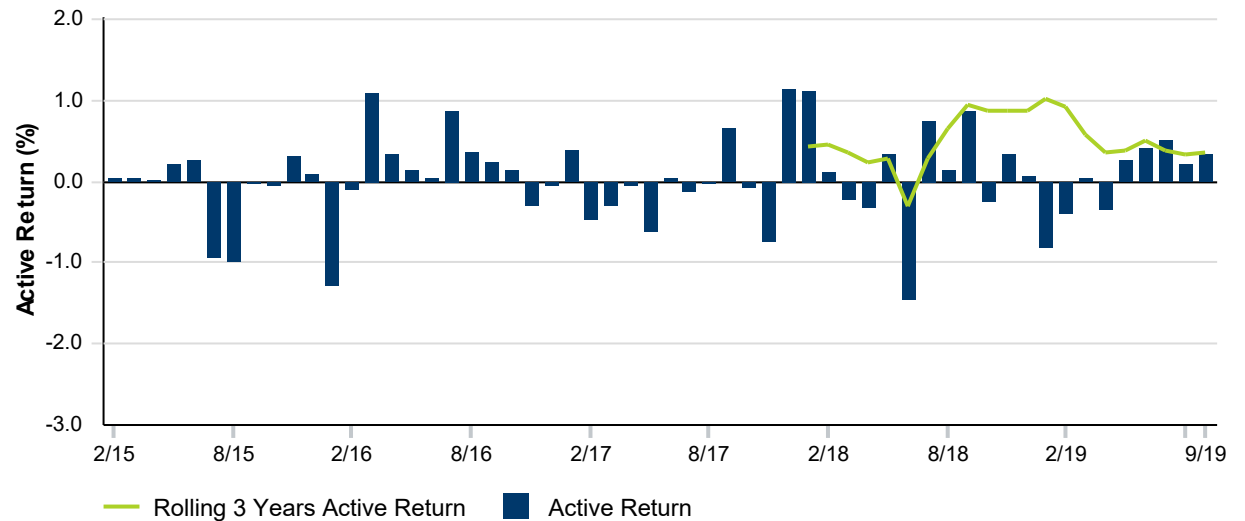
## Peer Group Analysis: IM U.S. Tactical Asset Allocation (TAA) (SA+CF)



## Comparative Performance



## Rolling 3 Years Performance



# Summary Statistics

Nuveen Real Asset

Periods Ended 1 Year Ending September 30, 2019

## Return Summary Statistics

	<u>Nuveen Real Asset</u>	<u>Policy Index</u>
Maximum Return	6.64	7.46
Minimum Return	-3.14	-2.87
Return	12.73	12.35
Cumulative Return	12.73	12.35
Active Return	0.31	0.00
Excess Return	10.03	9.72

## Risk Summary Statistics

	<u>Nuveen Real Asset</u>	<u>Policy Index</u>
Upside Risk	2.38	2.52
Downside Risk	3.99	3.84
Beta	0.94	1.00

## Risk/Return Summary Statistics

	<u>Nuveen Real Asset</u>	<u>Policy Index</u>
Standard Deviation	8.42	8.88
Alpha	1.06	0.00
Active Return/Risk	0.04	0.00
Tracking Error	1.33	0.00
Information Ratio	0.23	
Sharpe Ratio	1.19	1.10

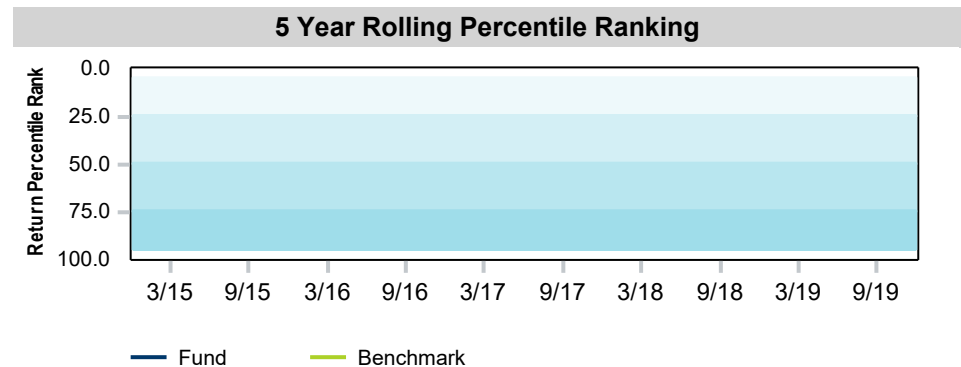
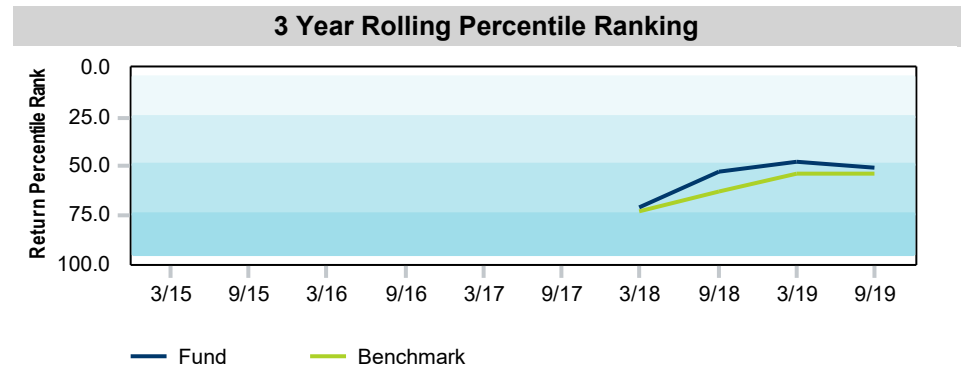
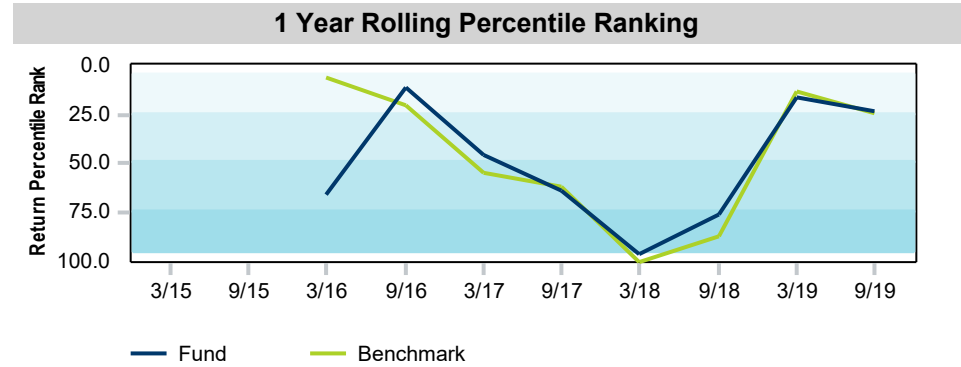
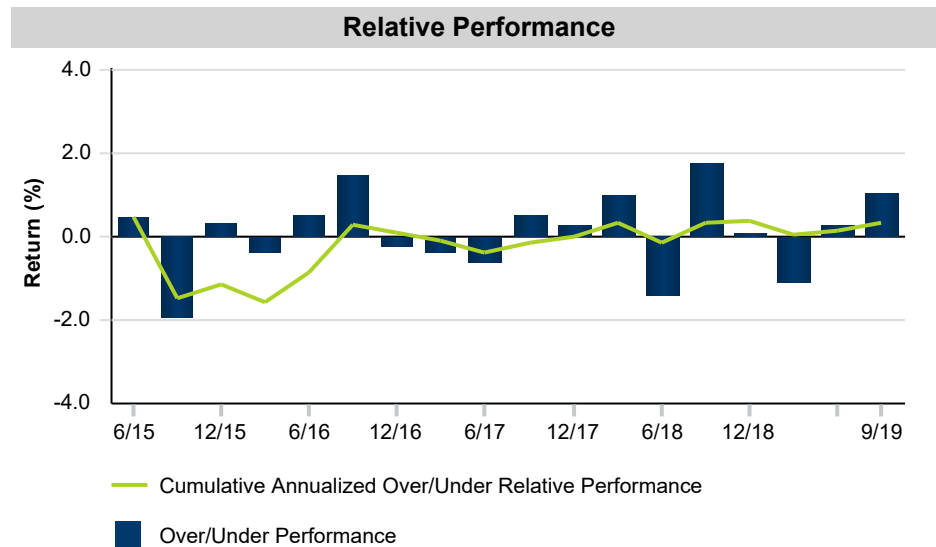
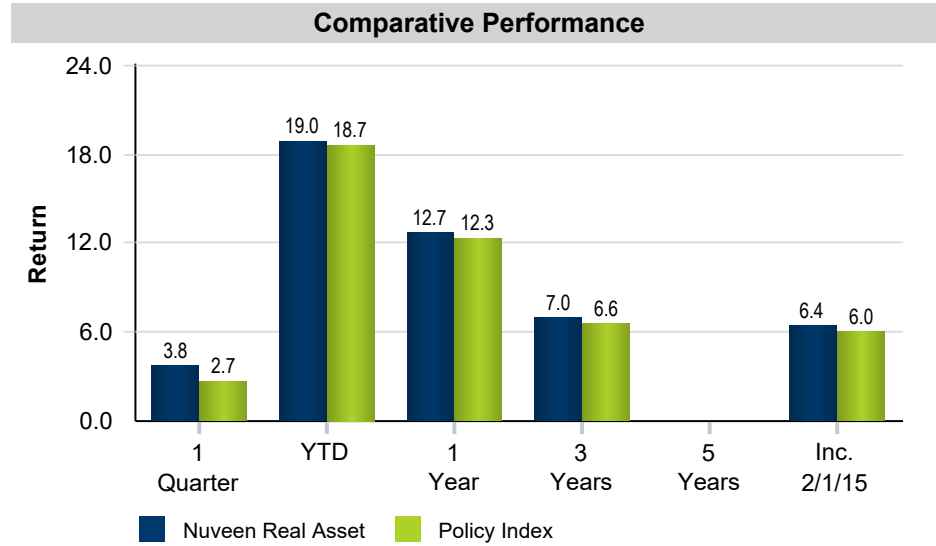
## Correlation Statistics

	<u>Nuveen Real Asset</u>	<u>Policy Index</u>
R-Squared	0.98	1.00
Actual Correlation	0.99	1.00



# Manager Summary

Nuveen Real Asset vs IM U.S. Tactical Asset Allocation (TAA) (SA+CF)  
 Periods Ended September 30, 2019





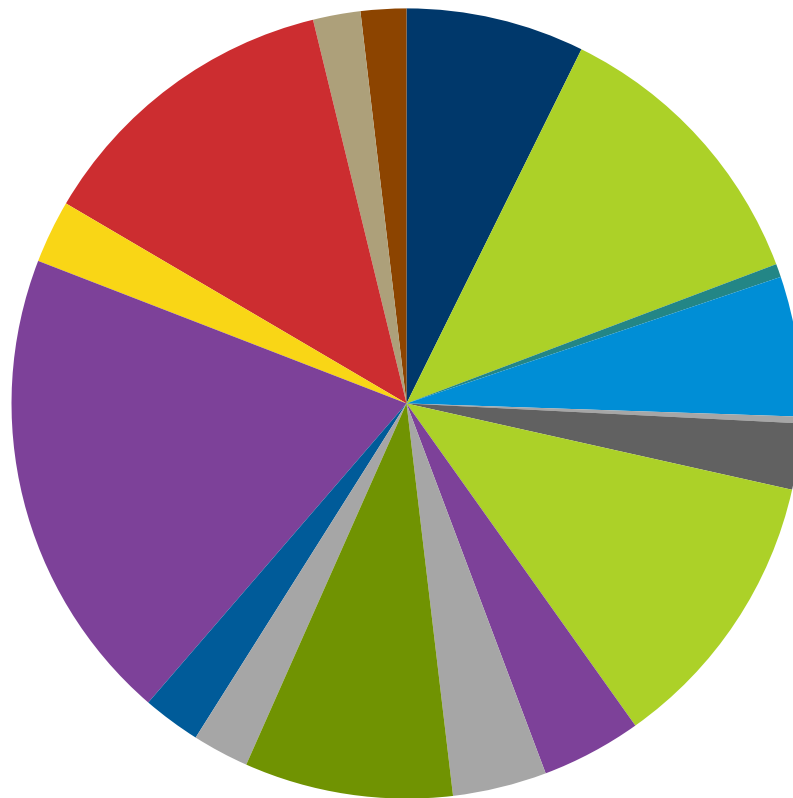
# Real Estate Composite

# Asset Allocation By Manager

Real Estate Composite

Periods Ended September 30, 2019

Sep-2019 : 699,947,105

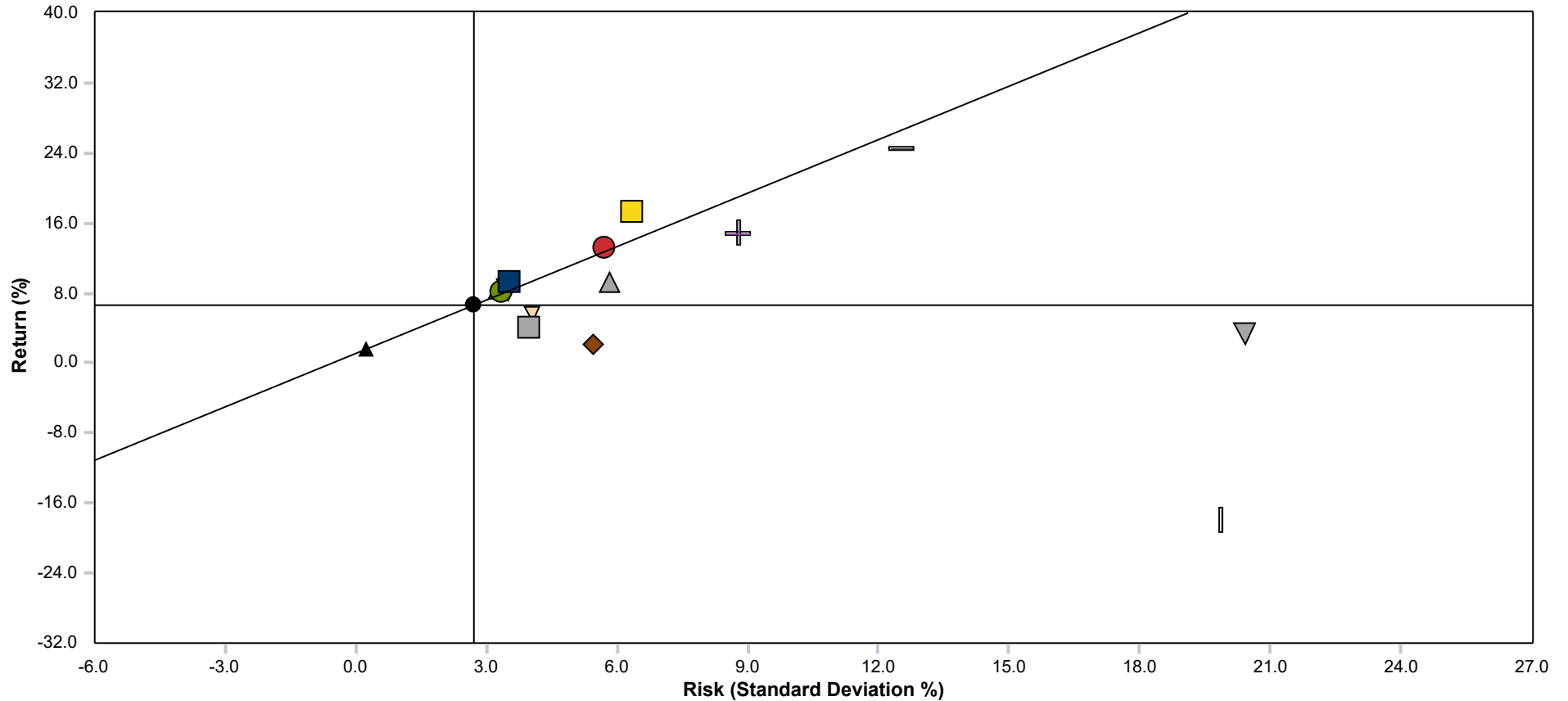


	Market Value \$	Allocation (%)
Baring	51,086,992	7.3
H/2 Credit Partner	83,735,494	12.0
Divcowest IV	3,808,507	0.5
Fundamental Partners III	40,066,147	5.7
Greenfield Acq VI	1,905,919	0.3
Greenfield Acq VII	18,903,450	2.7
Harrison Street	81,659,384	11.7
Lubert Adler VII	28,719,606	4.1
Lubert Adler VII B	26,970,962	3.9
Mesa West Core Lend	59,668,309	8.5
Mesa West IV	16,196,875	2.3
Patron Capital	16,632,302	2.4
Prologis Targeted US	136,728,647	19.5
Rubenstein PF II	18,022,367	2.6
Stockbridge Sm/Mkts	89,198,631	12.7
Walton St RE VI	13,586,368	1.9
Walton St RE VII	13,057,144	1.9

# Risk vs. Return

Real Estate Composite

Periods Ended 3 Years Ending September 30, 2019



- |                         |                        |                                 |                           |
|-------------------------|------------------------|---------------------------------|---------------------------|
| ■ Real Estate Composite | ● Baring               | ▲ Fundamental Partners III      | ◆ Lubert Adler VII B      |
| ▽ Patron Capital        | — Divcowest IV         | Greenfield Acq VI               | + Greenfield Acq VII      |
| ■ H/2 Credit Partner    | ● Harrison Street      | ▲ Lubert Adler VII              | ◆ Mesa West IV            |
| ▽ Mesa West Core Lend   | ■ Prologis Targeted US | ● Rubenstein PF II              | ▲ Stockbridge Sm/Mkts     |
| ◆ Walton St RE VI       | ▽ Walton St RE VII     | ● NCREIF ODCE NOF 1 Quarter Lag | ▲ 90 Day US Treasury Bill |

Calculation based on monthly periodicity.



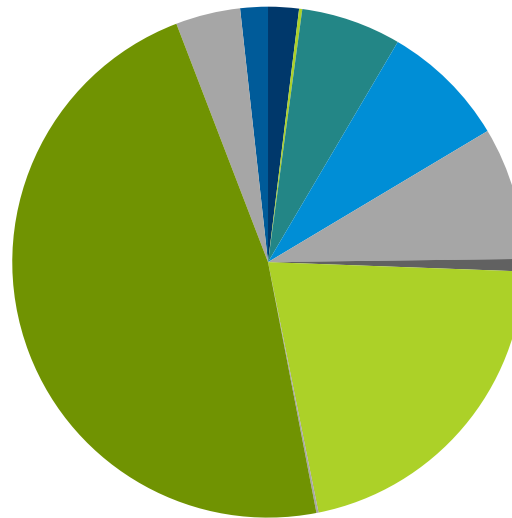
# Absolute Return Composite

# Asset Allocation By Manager

Absolute Return Composite

Periods Ended September 30, 2019

Sep-2019 : 204,193,864

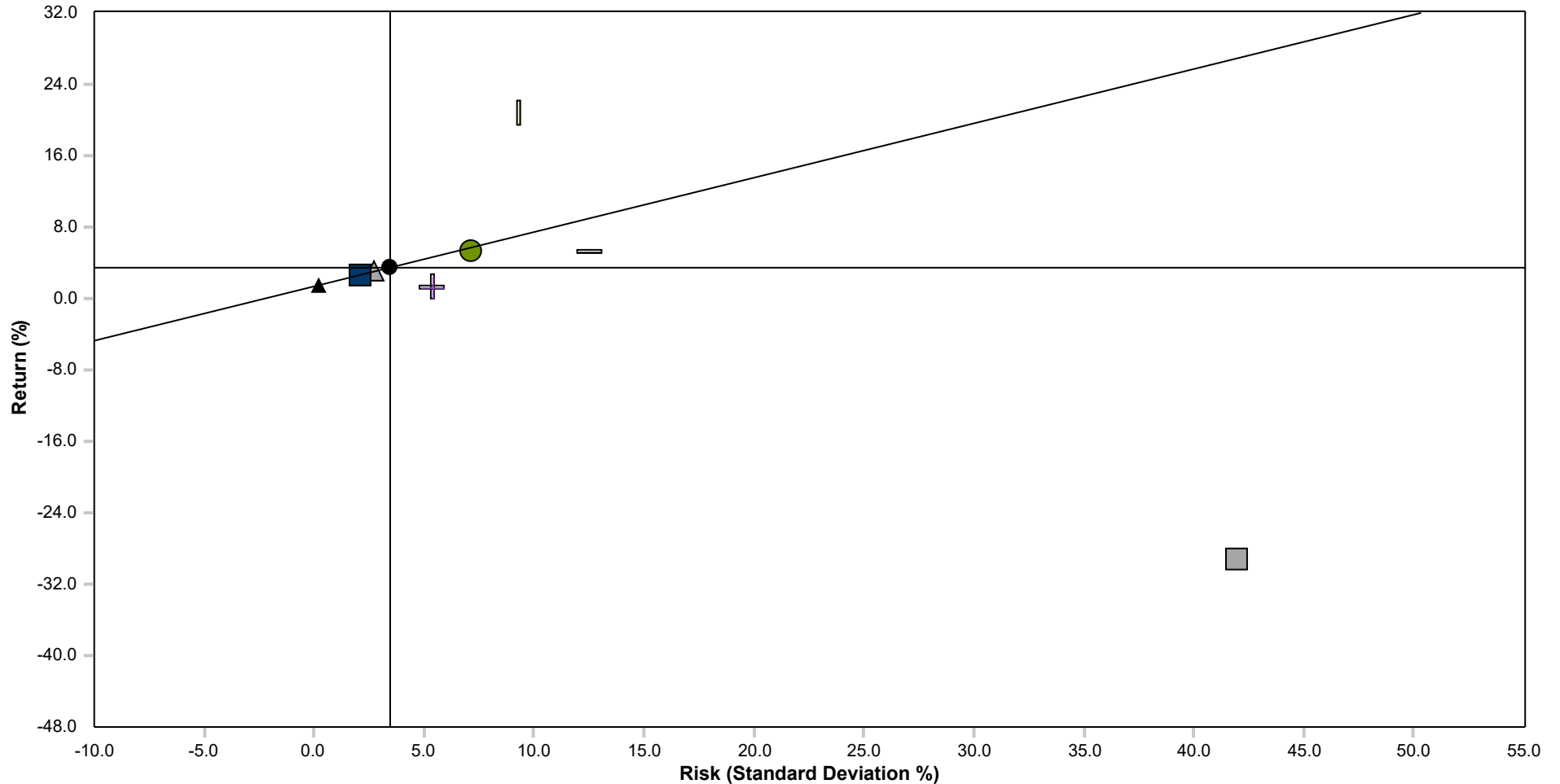


	Market Value \$	Allocation (%)
Blackstone Strat Opp	3,958,199	1.9
Credit Suisse	415,818	0.2
Gotham Neutral Strategies	12,908,852	6.3
Governors Lane Onshore	16,247,946	8.0
Liquidalts H2O Force	17,097,306	8.4
Luxor Capital	1,603,029	0.8
Myriad Opportunities	43,411,239	21.3
PAAMCO	7,095	0.0
Pine River	253,596	0.1
PRISMA Capital	96,376,598	47.2
SRS Partners US	8,349,395	4.1
Tricadia Select	3,564,792	1.7

# Risk vs. Return

Absolute Return Composite

Periods Ended 3 Years Ending September 30, 2019



- Absolute Return Composite
  Blackstone Strat Opp
  Credit Suisse
  Gotham Neutral Strategies
  Governors Lane Onshore
- Liquidalts H2O Force
  Luxor Capital
  Myriad Opportunities
  PAAMCO
  Pine River
- PRISMA Capital
  SRS Partners US
  Tricadia Select
  HFRI FOF Div 1 Month Lag
  90 Day US Treasury Bill

Calculation based on monthly periodicity.



# Private Equity Composite



# Private Equity Composite Overview

Private Equity Composite

Periods Ended As of September 30, 2019

## Cash Flow Analysis

