



# WILSHIRE ASSOCIATES

Wilshire Consulting



## Kentucky Retirement Systems Insurance

Executive Summary of Investment Performance

*December 31, 2018*



# MARKET ENVIRONMENT

# ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 12/2018
2013	2014	2015	2016	2017	2018 YTD	
U.S. Equity 33.1%	REITs 31.8%	REITs 4.2%	MLPs 18.3%	Emrg Mrkts 37.7%	T-Bills 1.9%	U.S. Equity 8.1%
MLPs 27.6%	U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	Core Bond 0.0%	REITs 7.9%
Developed 23.3%	Core Bond 6.0%	Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	U.S. TIPS -1.3%	High Yield 3.8%
High Yield 7.4%	MLPs 4.8%	T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	High Yield -2.1%	Core Bond 2.5%
REITs 1.9%	U.S. TIPS 3.6%	Developed -0.4%	Emrg Mrkts 11.6%	REITs 4.2%	REITs -4.8%	Emrg Mrkts 2.0%
T-Bills 0.1%	High Yield 2.5%	U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. Equity -5.3%	U.S. TIPS 1.7%
Core Bond -2.0%	T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	Commodities -11.2%	Developed 1.0%
Emrg Mrkts -2.3%	Emrg Mrkts -1.8%	Emrg Mrkts -14.6%	Core Bond 2.6%	Commodities 1.7%	MLPs -12.4%	T-Bills 0.6%
U.S. TIPS -8.6%	Developed -4.5%	Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Developed -13.4%	MLPs -7.3%
Commodities -9.5%	Commodities -17.0%	MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mrkts -14.2%	Commodities -8.8%

Data sources: Wilshire Compass

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

# MARKET COMMENTARY

## U.S. Equity

The U.S. stock market was down -14.3% for the fourth quarter of 2018. This marks the worst quarter for U.S. equities since 2011 and the first down year since the credit crisis sell-off of 2008. Concerns of an economic slowdown weighed on stock prices as did fears that additional rate increases by the Federal Reserve could weaken future prospects for economic growth.

The yield curve ended 2018 with a very unusual shape – which will likely be a source of debate if it persists, largely focusing on the Fed’s December rate hike. Some fear that it could be enough to slow the economy and are therefore selling shorter-term bonds, pushing rates higher. Others highlight the fact that the Fed’s mandate focuses on both growth and inflation and that a 0.25% increase is not likely to stop the U.S. economy cold. Ultimately, the Fed makes their final decisions based on all available data and can decide to adjust their course of action.

## Non-U.S. Equity

Equity markets outside of the U.S. suffered during the quarter, although they generally outperformed U.S. equity. While the EU began the year in sound economic condition, growth declined steadily while gains in unemployment stalled and industrial production reversed course. While there were some positive signals on U.S.-China trade, investors will likely wait until a scheduled meeting in January before fully evaluating the current global trade environment.

## Fixed Income

The U.S. Treasury yield curve fell across most maturities with the 10-year Treasury yield at 2.69%, down 37 basis points. The Federal Open Market Committee increased its overnight rate by 25 basis points but adjusted downward their forecast for future rates. Credit spreads widened during the quarter within both the investment grade and high yield markets.

# DECEMBER 2018 ASSET CLASS ASSUMPTIONS

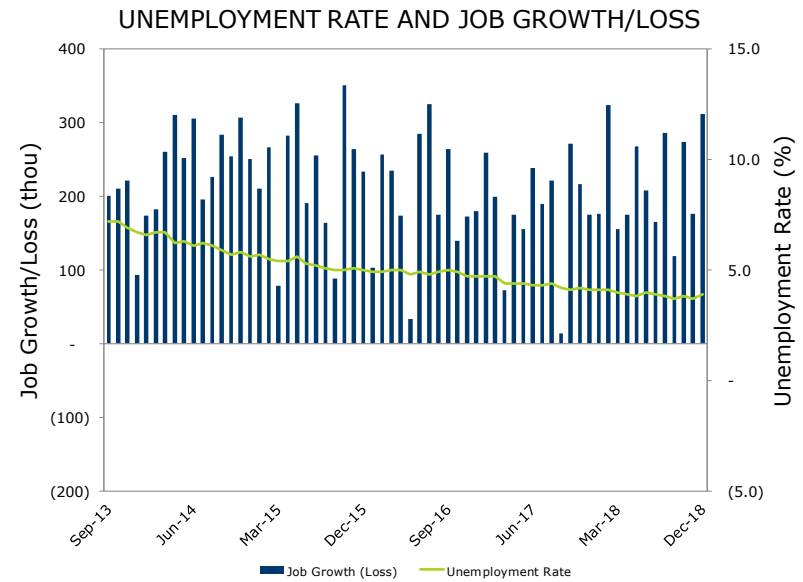
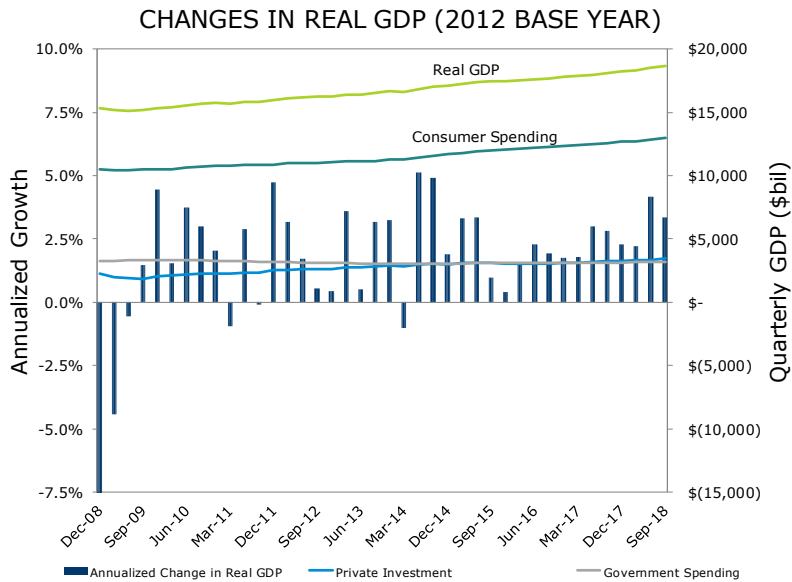
	EQUITY						FIXED INCOME						REAL ASSETS					
	US STOCK	DEV EX-US STOCK	EMG MRKT STOCK	GLOBAL		PRIVATE EQUITY	CASH	CORE BOND	LT		HIGH YIELD	NON-US BOND (HDG)	REAL ESTATE			REAL ASSETS	US CPI	
		EX-US STOCK	GLOBAL STOCK	EX-US STOCK	GLOBAL STOCK				CORE BOND	US TIPS			US RES	GLOBAL RES	PRIVATE RE			CMDTY
EXPECTED COMPOUND RETURN (%)	7.00	7.50	7.50	7.75	7.45	10.05	2.65	3.85	4.25	3.00	5.90	1.25	5.65	5.85	6.65	4.35	6.40	1.70
EXPECTED ARITHMETIC RETURN (%)	8.30	8.95	10.45	9.35	8.75	13.35	2.65	4.00	4.70	3.15	6.35	1.30	7.00	7.00	7.55	5.40	6.75	1.70
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 (%)	2.15	3.50	2.50	3.25	2.65	0.00	2.65	4.05	5.00	3.55	8.95	1.80	4.40	4.40	2.70	2.65	3.00	0.00
<b>CORRELATIONS</b>																		
US STOCK	1.00																	
DEV EX-US STOCK (USD)	0.81	1.00																
EMERGING MARKET 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									
US 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							
NON-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 ASSET BASKET	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 DEC. 31, 2018 KEY ECONOMIC INDICATORS

CPI (ALL ITEMS)	MONTHLY CHANGE		CUMULATIVE CHANGE	
SEASONALLY ADJUSTED	Dec-18	-0.1	3-Mo.	0.3
	Nov-18	0.0	12-Mo.	1.9
	Oct-18	0.3	10-Yr. (Annual)	1.8
	10-Yr.	1.7		
BREAKEVEN INFLATION				
CONSUMER SENTIMENT	Dec-18	98.3		
U. OF MICHIGAN SURVEY	Nov-18	97.5		
	1-Yr. Ago	95.9	10-Yr. Avg	82.5
MANUFACTURING	Dec-18	54.1	CHANGE IN SECTOR	
INST. FOR SUPPLY MGMT	Nov-18	59.3	>50	Expansion
PURCHASING MNGRS' IDX	1-Yr. Avg.	58.8	<50	Contraction

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

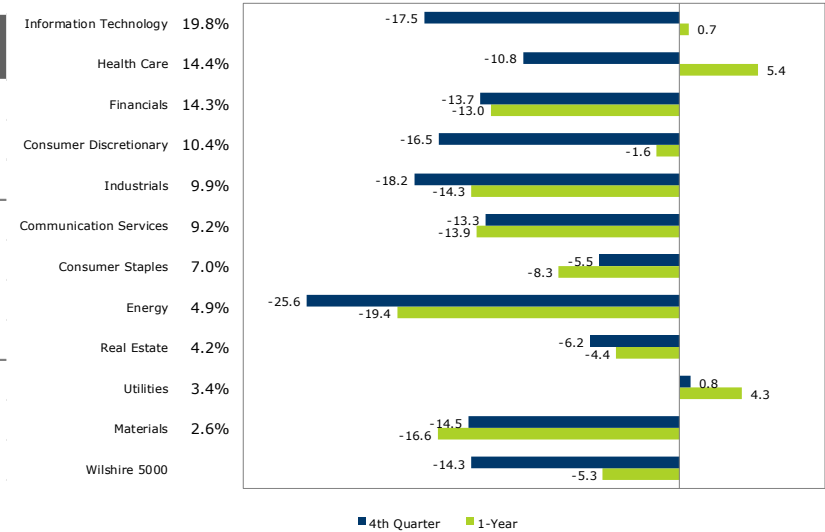


Data sources: Bureau of Labor Statistics, U.S. Treasury, University of Michigan, Institute for Supply Management, Bureau of Economic Analysis

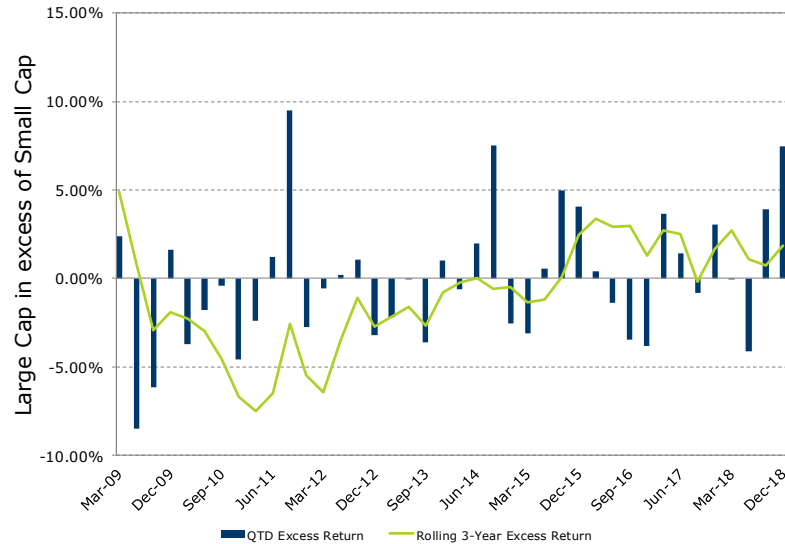
# U.S. EQUITY MARKET

AS OF DECEMBER 31, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	-14.3	-5.3	-5.3	9.1	8.1	13.2
WILSHIRE U.S. LARGE CAP	-13.7	-4.6	-4.6	9.3	8.5	13.1
WILSHIRE U.S. SMALL CAP	-19.7	-10.8	-10.8	7.4	4.7	13.9
WILSHIRE U.S. LARGE GROWTH	-16.8	-3.6	-3.6	10.3	9.6	14.6
WILSHIRE U.S. LARGE VALUE	-10.8	-5.9	-5.9	8.1	7.2	11.6
WILSHIRE U.S. SMALL GROWTH	-20.6	-9.7	-9.7	8.1	4.5	14.7
WILSHIRE U.S. SMALL VALUE	-18.7	-12.0	-12.0	6.5	4.7	12.9
WILSHIRE REIT INDEX	-6.9	-4.8	-4.8	2.1	7.9	12.2
MSCI USA MIN. VOL. INDEX	-7.7	0.9	0.9	9.5	9.8	12.6
FTSE RAFI U.S. 1000 INDEX	-13.8	-8.3	-8.3	7.9	6.6	14.1

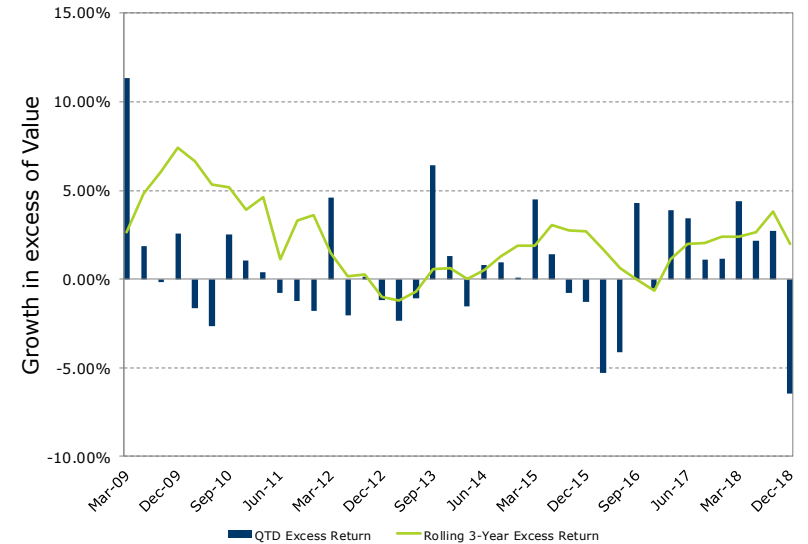
WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)



LARGE CAP VS SMALL CAP



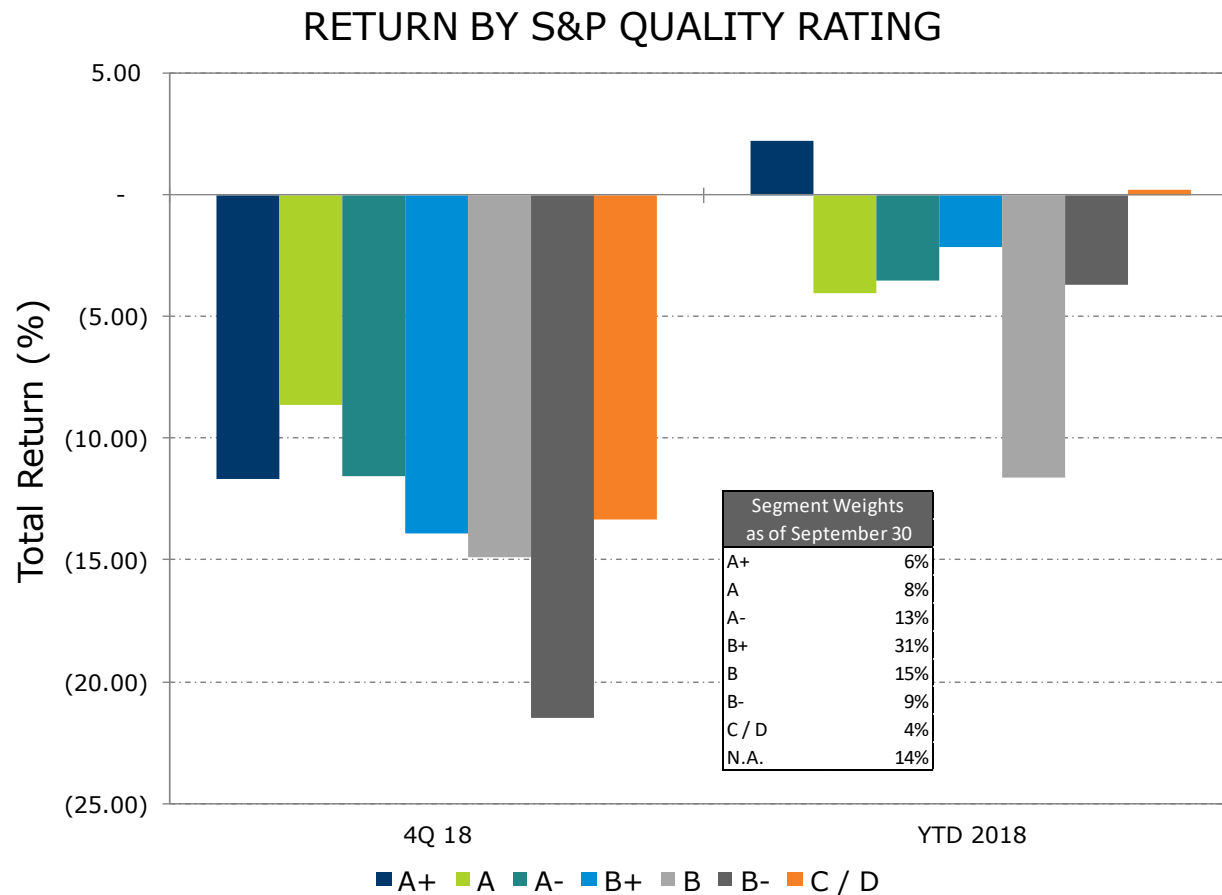
GROWTH VS VALUE



Data sources: Wilshire Compass, Wilshire Atlas

# RETURNS BY QUALITY SEGMENT

Highest quality names produced a positive return for the year but are among the lowest weight within the broad market



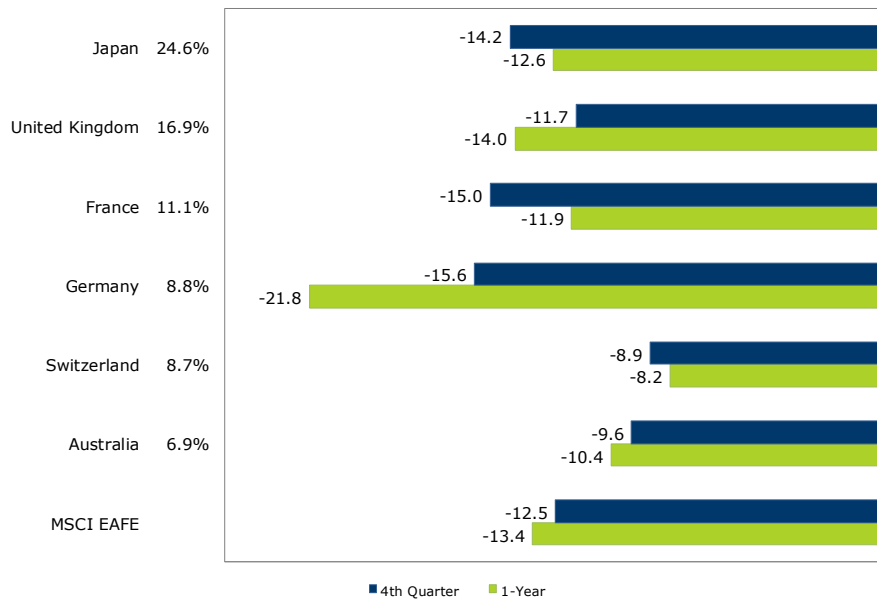
Data sources: Wilshire Atlas



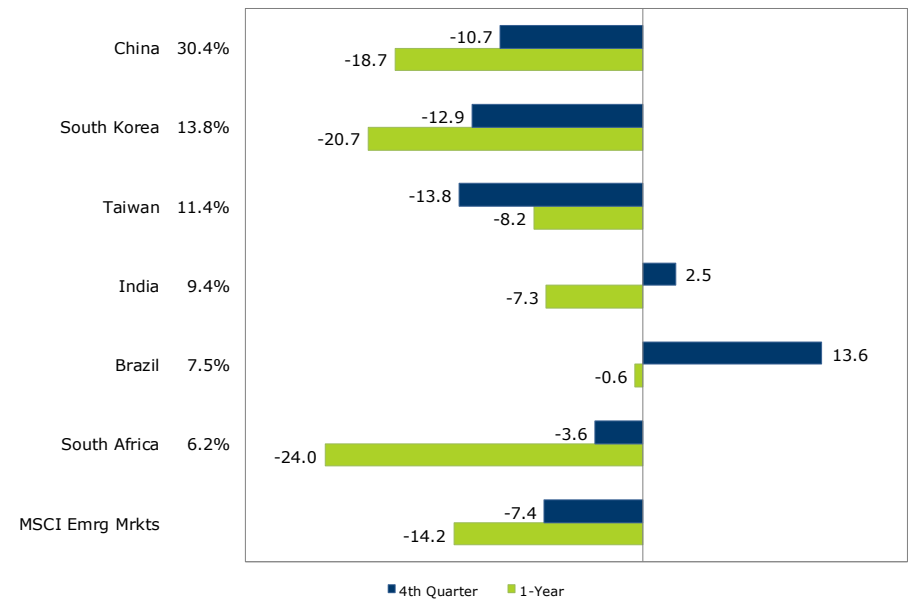
# NON-U.S. EQUITY MARKET

AS OF DECEMBER 31, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	-11.4	-13.8	-13.8	5.0	1.1	7.1
MSCI EAFE (\$G)	-12.5	-13.4	-13.4	3.4	1.0	6.8
MSCI EMERGING MARKETS (\$G)	-7.4	-14.2	-14.2	9.6	2.0	8.4
MSCI FRONTIER MARKETS (\$G)	-4.3	-16.2	-16.2	4.6	1.1	5.4
MSCI ACWI EX-US GROWTH (\$G)	-12.2	-14.1	-14.1	4.6	2.1	7.5
MSCI ACWI EX-US VALUE (\$G)	-10.6	-13.4	-13.4	5.4	0.2	6.6
MSCI ACWI EX-US SMALL (\$G)	-14.4	-17.9	-17.9	4.4	2.4	10.5
MSCI ACWI MINIMUM VOLATILITY	-6.5	-1.0	-1.0	8.3	7.9	10.5
MSCI EAFE MINIMUM VOLATILITY	-7.3	-5.2	-5.2	4.5	5.4	8.1
FTSE RAFI DEVELOPED EX-US	-12.8	-14.5	-14.5	4.9	0.9	7.3
MSCI EAFE LC (G)	-12.2	-10.5	-10.5	3.1	4.3	8.0

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



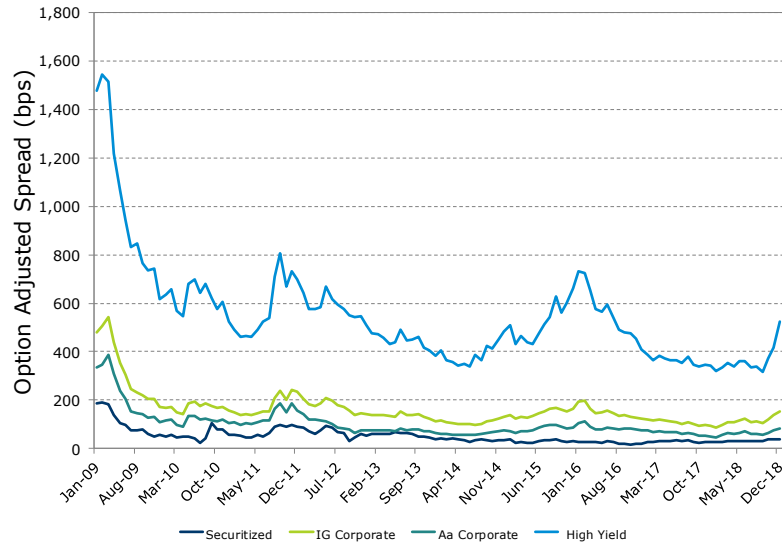
Data sources: Wilshire Compass

# U.S. FIXED INCOME

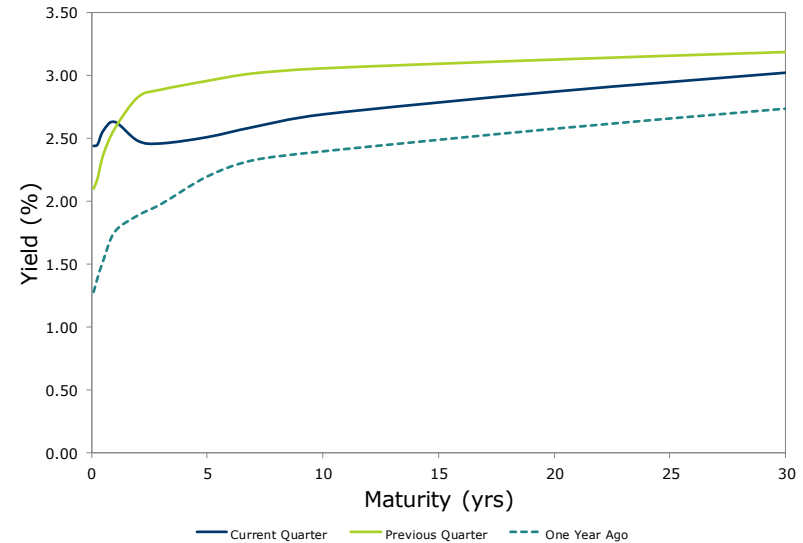
AS OF DECEMBER 31, 2018	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	3.3	5.9	1.6	0.0	0.0	2.1	2.5	3.5
BLOOMBERG BARCLAYS TREASURY	2.6	6.1	2.6	0.9	0.9	1.4	2.0	2.1
BLOOMBERG BARCLAYS GOV'T-REL.	3.4	5.3	1.2	0.3	0.3	2.4	2.6	2.9
BLOOMBERG BARCLAYS SECURITIZED	3.4	4.7	2.0	1.0	1.0	1.8	2.5	3.4
BLOOMBERG BARCLAYS CORPORATE	4.2	7.1	-0.2	-2.5	-2.5	3.3	3.3	5.9
BLOOMBERG BARCLAYS LT G/C	4.1	15.0	0.8	-4.7	-4.7	4.0	5.4	5.9
BLOOMBERG BARCLAYS LT TREASURY	3.0	17.4	4.2	-1.8	-1.8	2.6	5.9	4.1
BLOOMBERG BARCLAYS LT GOV't-REL.	4.6	11.8	0.0	-3.2	-3.2	4.7	5.6	5.7
BLOOMBERG BARCLAYS LT CORP.	4.9	13.5	-1.8	-7.2	-7.2	4.9	5.0	7.6
BLOOMBERG BARCLAYS U.S. TIPS *	2.7	7.6	-0.4	-1.3	-1.3	2.1	1.7	3.6
BLOOMBERG BARCLAYS HIGH YIELD	8.0	4.0	-4.5	-2.1	-2.1	7.2	3.8	11.1
TREASURY BILLS	2.5	0.25	0.6	1.9	1.9	1.0	0.6	0.4

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

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



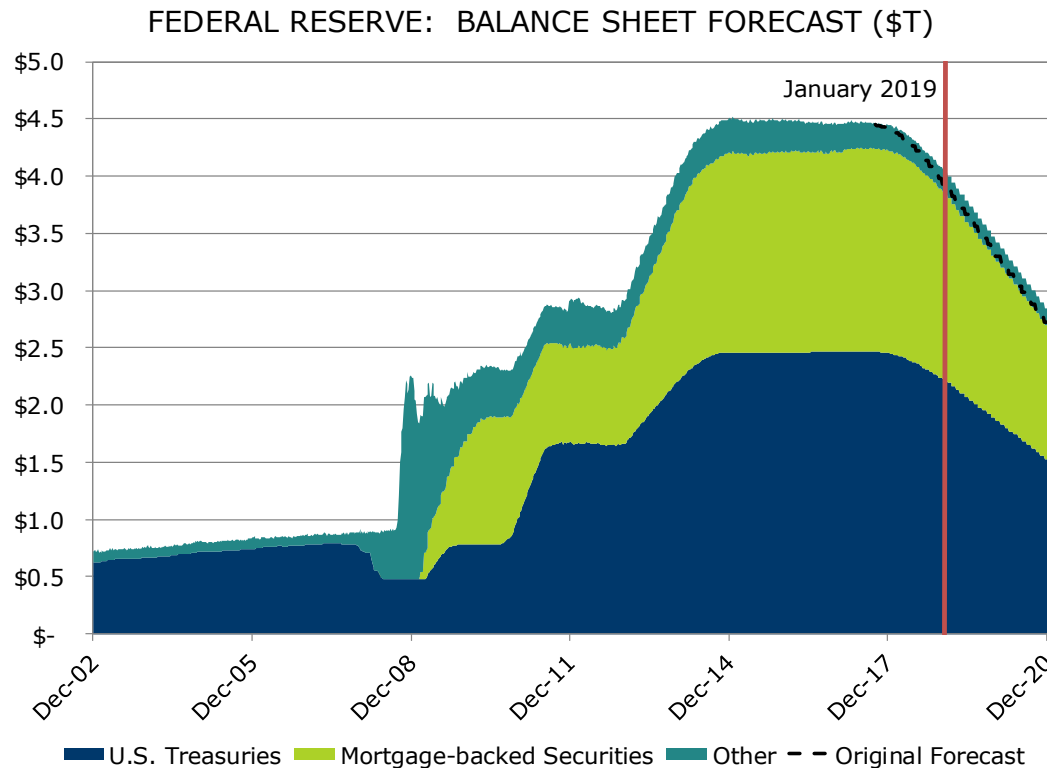
TREASURY YIELD CURVE



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

# FEDERAL RESERVE

- 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
- Generally on pace with their initial plan, the Federal Reserve has reduced their total assets by \$406 billion through mid-January 2019

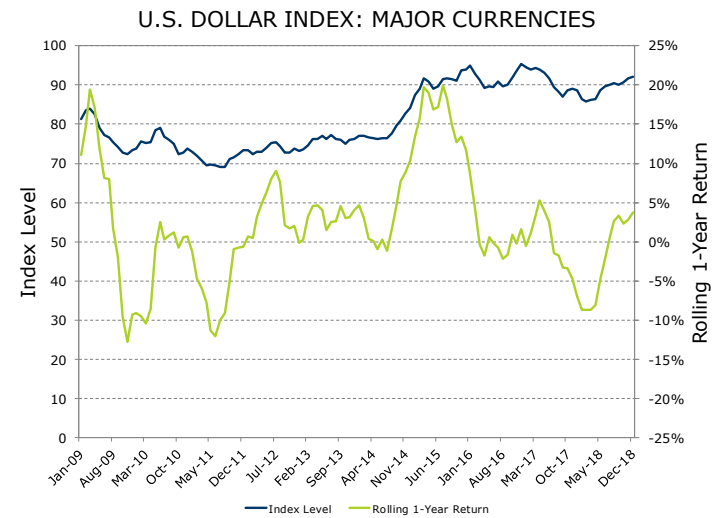
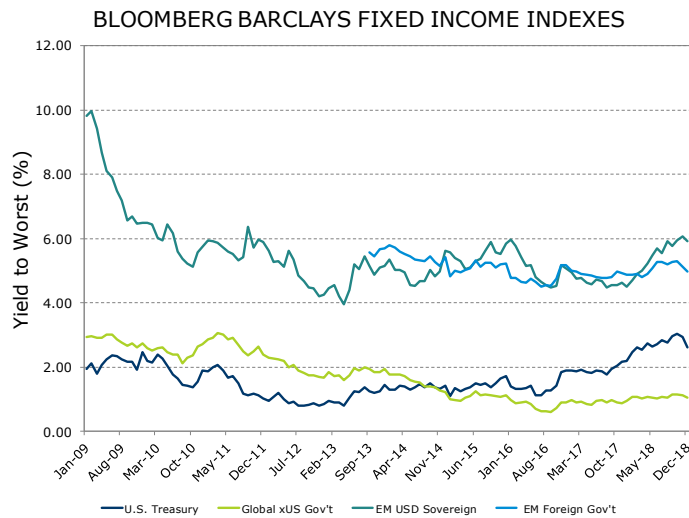


Data sources: Federal Reserve

# NON-U.S. FIXED INCOME

AS OF DECEMBER 31, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
<b>DEVELOPED MARKETS</b>						
BLMBRG BRCLYS GLBL AGGREGATE xUS	0.9	-2.1	-2.1	3.2	0.0	1.7
BLMBRG BRCLYS GLBL AGGREGATE xUS *	1.9	3.2	3.2	3.5	4.1	4.0
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-1.1	-5.9	-5.9	3.1	1.0	3.8
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	1.4	1.3	1.3	6.2	6.3	5.8
<b>EMERGING MARKETS (HARD CURRENCY)</b>						
BLMBRG BRCLYS EM USD AGGREGATE	-0.2	-2.5	-2.5	5.0	4.2	8.5
<b>EMERGING MARKETS (FOREIGN CURRENCY)</b>						
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	2.5	-3.4	-3.4	5.3	0.5	4.1
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	2.6	2.7	2.7	3.2	2.9	3.2
EURO vs. DOLLAR	-1.6	-4.8	-4.8	1.7	-3.7	-2.0
YEN vs. DOLLAR	3.5	2.7	2.7	3.1	-0.9	-1.9
POUND vs. DOLLAR	-2.3	-5.9	-5.9	-4.7	-5.1	-1.2

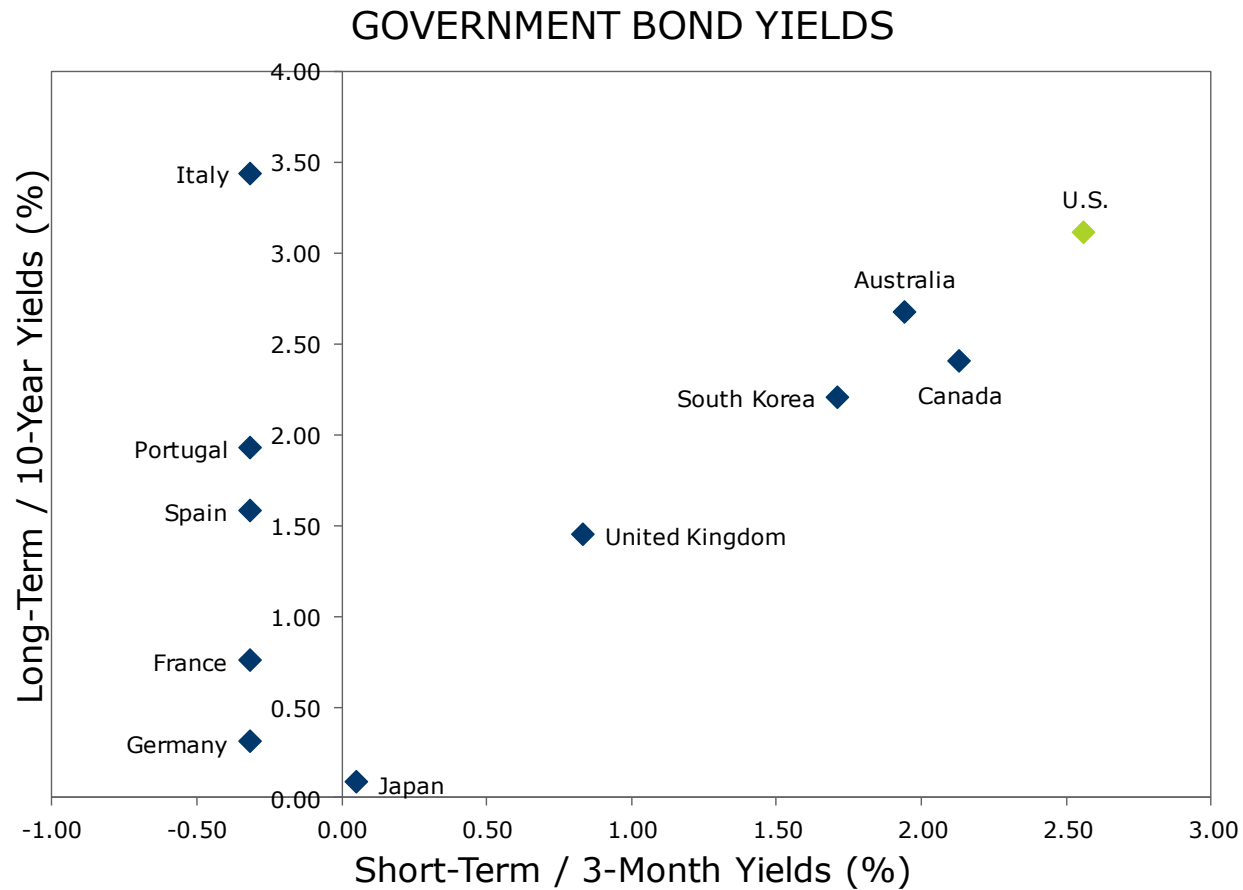
\* Returns are reported in terms of local market investors, which removes currency effects.



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

# GLOBAL INTEREST RATES

Negative short-term rates remain in Europe; Long rates jumped in Italy during the quarter

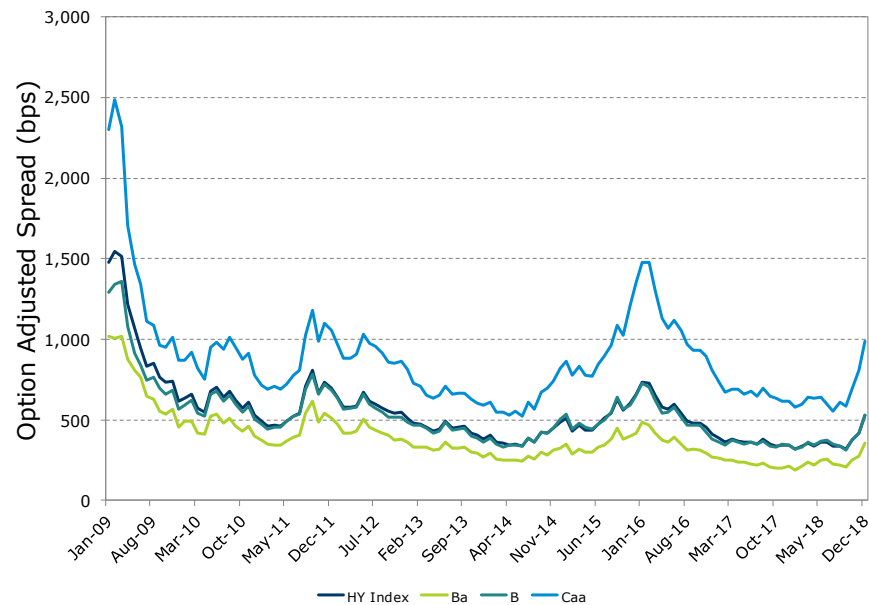


Data sources: Organization for Economic Co-operation and Development

# HIGH YIELD BOND MARKET

AS OF DECEMBER 31, 2018		QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS HIGH YIELD		-4.5	-2.1	-2.1	7.2	3.8	11.1
CREDIT SUISSE LEVERAGED LOAN		-3.1	1.1	1.1	5.0	3.3	8.3
<b>HIGH YIELD QUALITY DISTRIBUTION</b>	<b>WEIGHT</b>						
Ba U.S. HIGH YIELD	46.1%	-2.9	-2.4	-2.4	5.7	4.3	10.2
B U.S. HIGH YIELD	39.7%	-4.4	-1.3	-1.3	6.8	3.3	9.7
Caa U.S. HIGH YIELD	13.3%	-9.3	-3.8	-3.8	11.7	3.9	13.9
Ca to D U.S. HIGH YIELD	0.6%	-24.1	-1.3	-1.3	27.2	-11.2	7.4
Non-Rated U.S. HIGH YIELD	0.2%	-1.7	1.2	1.2	5.3	-0.5	6.9

BLOOMBERG BARCLAYS HIGH YIELD INDEXES



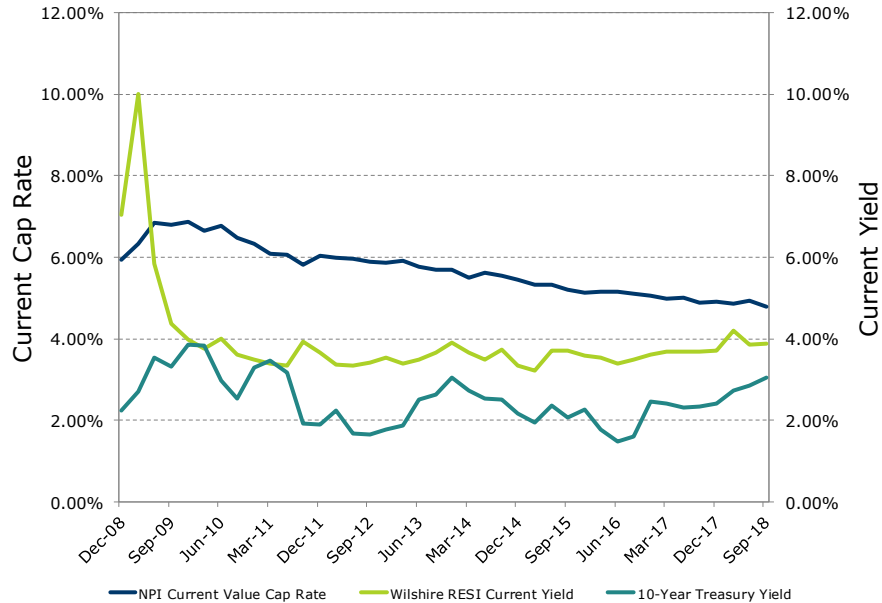
Data sources: Wilshire Compass, Bloomberg Barclays

# Wilshire Consulting REAL ASSETS

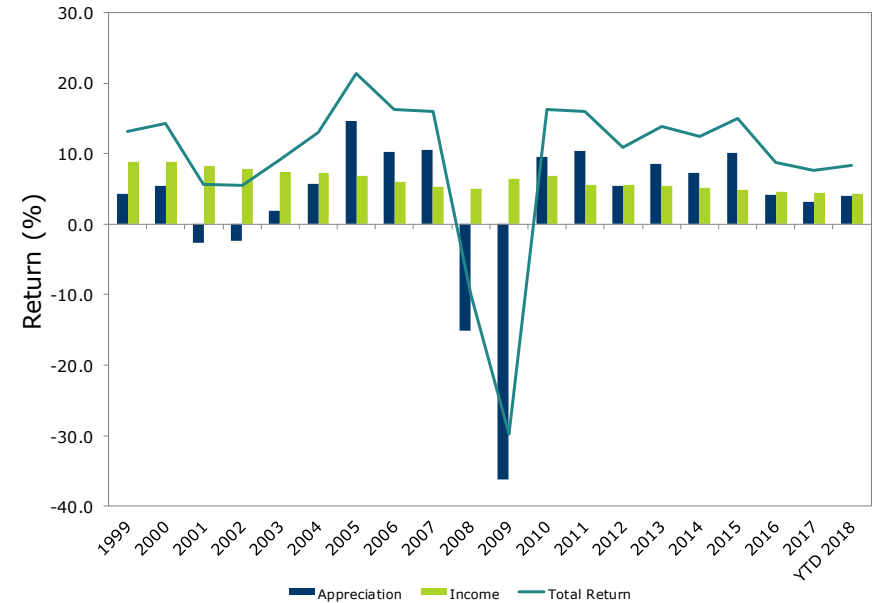


AS OF DECEMBER 31, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	-0.4	-1.3	-1.3	2.1	1.7	3.6
BLOOMBERG COMMODITY INDEX	-9.4	-11.2	-11.2	0.3	-8.8	-3.8
WILSHIRE GLOBAL RESI INDEX	-6.1	-5.4	-5.4	3.3	6.1	11.6
NCREIF ODCE FUND INDEX	1.8	8.3	8.3	8.2	10.4	7.0
NCREIF TIMBERLAND INDEX	1.0	3.4	3.4	3.2	5.0	3.8
ALERIAN MLP INDEX (OIL & GAS)	-17.3	-12.4	-12.4	-1.1	-7.3	9.6

REAL ESTATE VALUATION



NCREIF ODCE FUND INDEX RETURN



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



# TOTAL FUND

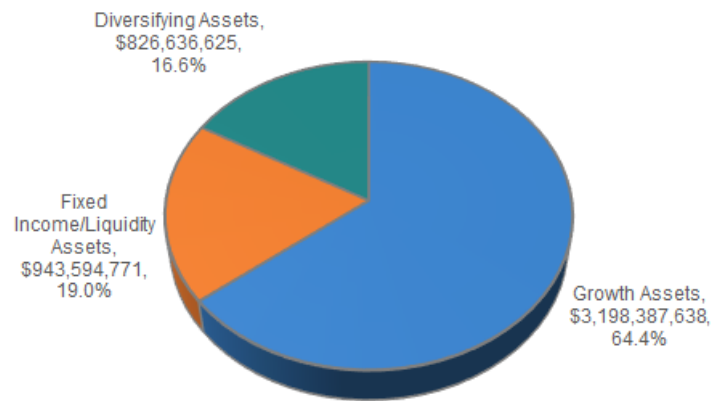


# ACTUAL ALLOCATION VS POLICY ALLOCATION

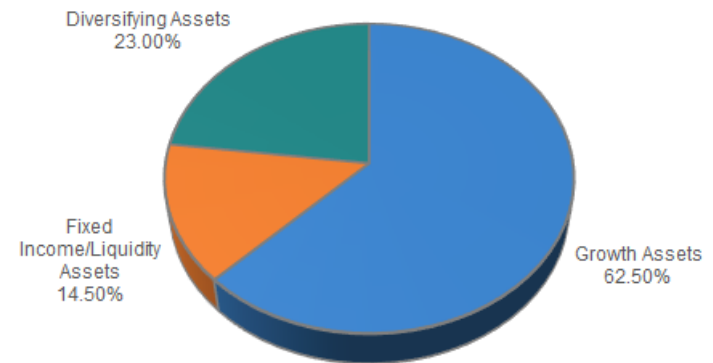
KRS Insurance Plan Composite  
Asset Class Bucketing

As of December 31, 2018

**Total Fund**



**Policy Index**



**\$4,968,619,034**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

KRS Insurance Plan Composite

Asset Class Bucketing

As of December 31, 2018

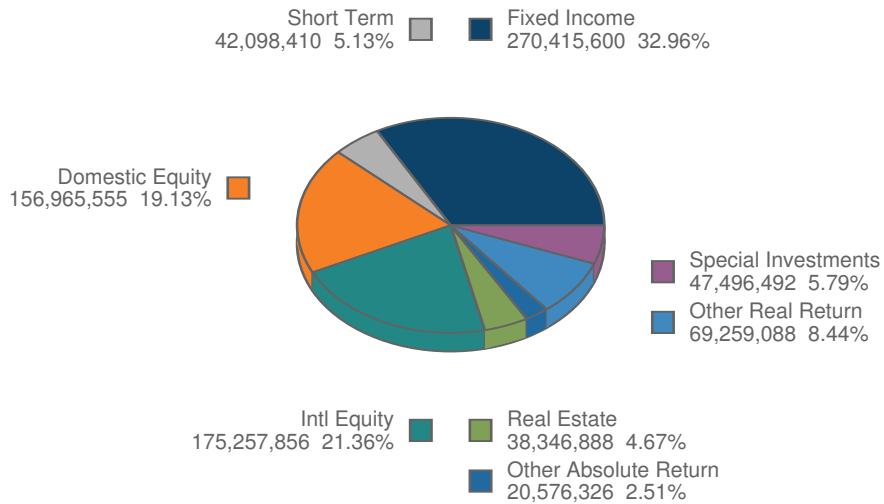
Asset Class / Bucket	Total Insurance Allocation		Policy Index	Relative (+/-)
	(\$)	(%)		
U.S. Equity	\$864,106,948	17.4%	17.5%	-0.1%
Non-U.S. Equity	\$990,213,280	19.9%	17.5%	2.4%
Private Equity	\$566,696,035	11.4%	10.0%	1.4%
Credit / High Yield	\$777,371,375	15.6%	24.0%	-8.4%
<b>Growth Assets</b>	<b>\$3,198,387,638</b>	<b>64.4%</b>	<b>69.0%</b>	<b>-4.6%</b>
Core Fixed Income	\$777,371,375	15.6%	4.0%	11.6%
Cash	\$166,223,396	3.3%	2.0%	1.3%
<b>Fixed Income/Liquidity Assets</b>	<b>\$943,594,771</b>	<b>19.0%</b>	<b>6.0%</b>	<b>13.0%</b>
Real Estate	\$272,091,776	5.5%	5.0%	0.5%
Real Return	\$424,045,095	8.5%	10.0%	-1.5%
Absolute Return	\$130,499,754	2.6%	10.0%	-7.4%
<b>Diversifying Assets</b>	<b>\$826,636,625</b>	<b>16.6%</b>	<b>25.0%</b>	<b>-8.4%</b>
<b>Total Fund</b>	<b>\$4,968,619,034</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

# ACTUAL ALLOCATION VS POLICY ALLOCATION

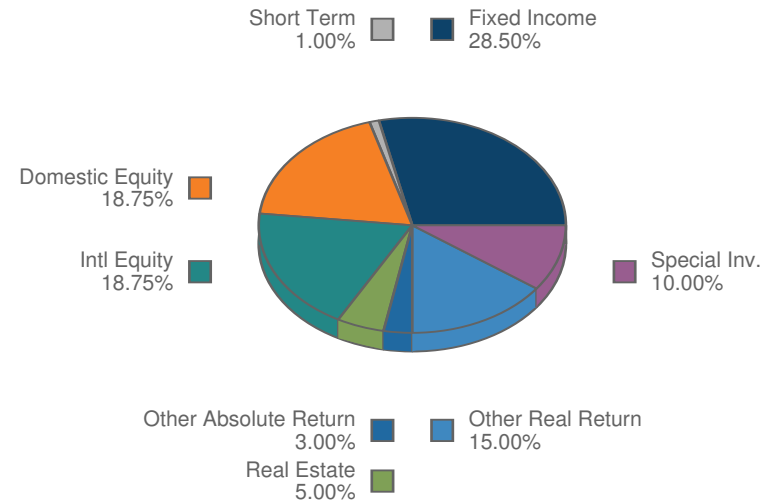
KERS Insurance Plan Composite

As of December 31, 2018

**Total Fund**



**Policy Index**



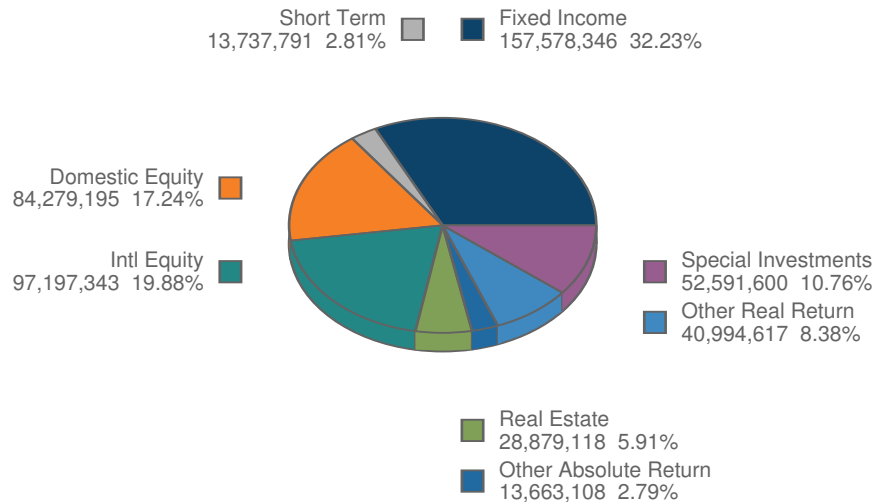
**\$820,416,216**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

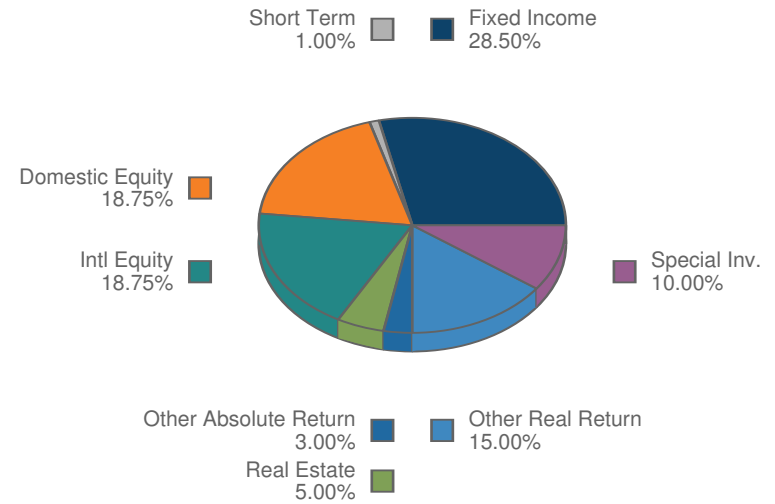
KERS (H) Insurance Plan Composite

As of December 31, 2018

**Total Fund**



**Policy Index**



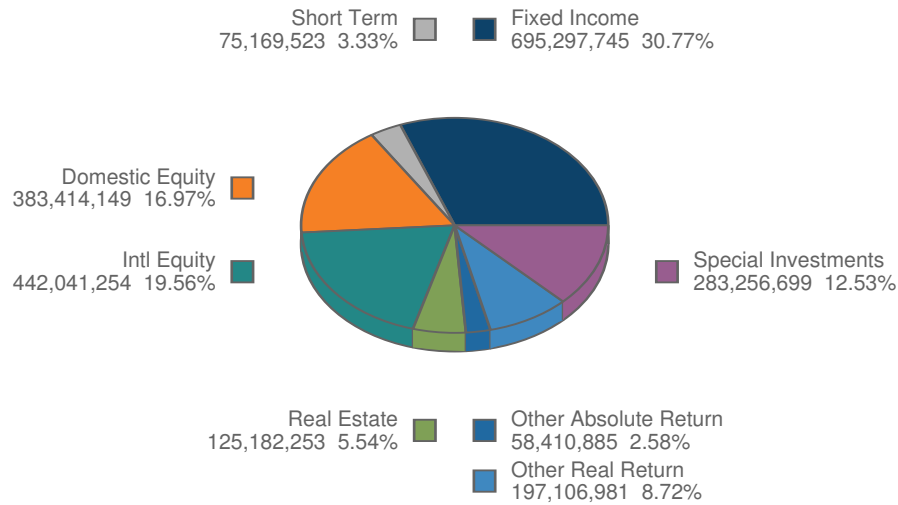
**\$488,921,119**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

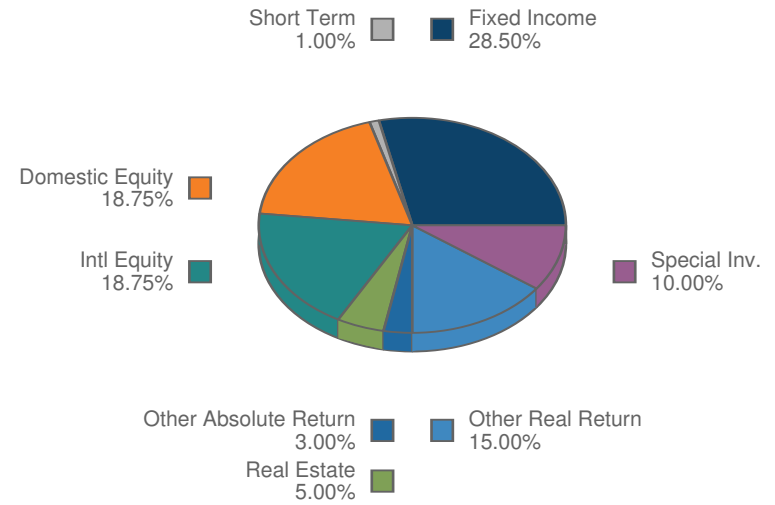
## CERS Insurance Plan Composite

As of December 31, 2018

**Total Fund**



**Policy Index**



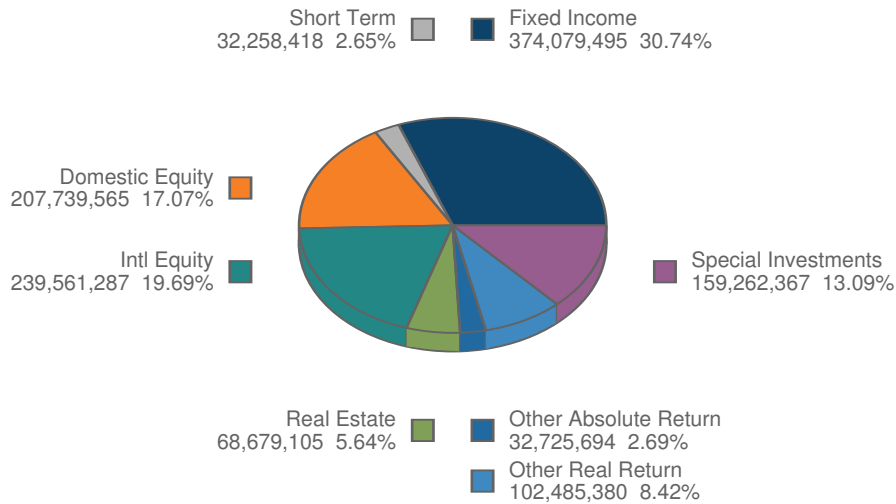
**\$2,259,879,488**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

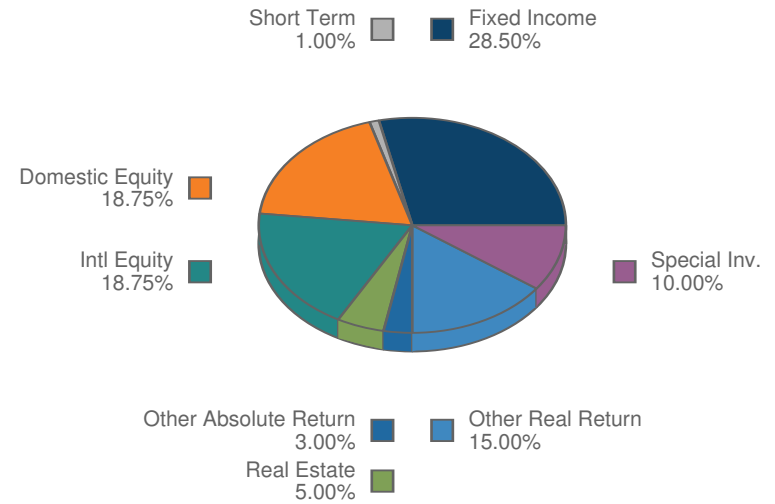
CERS (H) Insurance Plan Composite

As of December 31, 2018

**Total Fund**



**Policy Index**



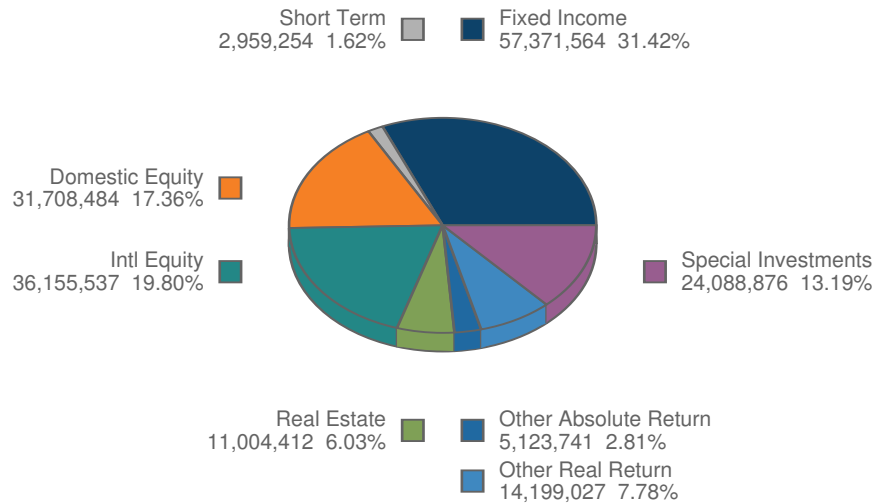
**\$1,216,791,311**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

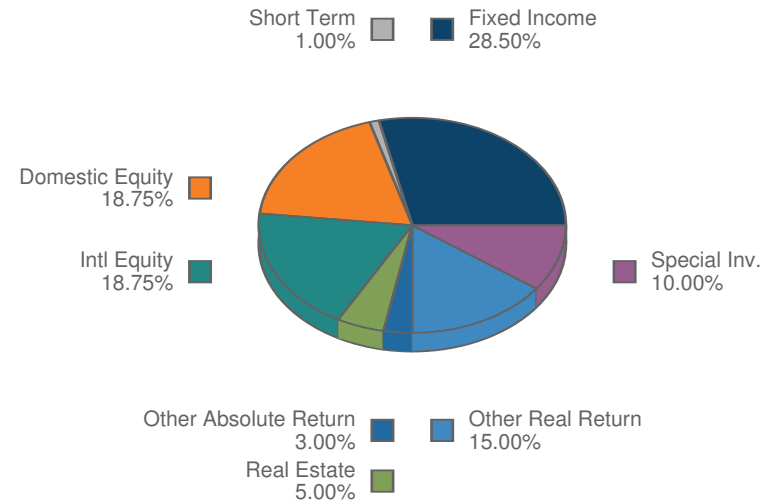
SPRS Insurance Plan Composite

As of December 31, 2018

## Total Fund



## Policy Index

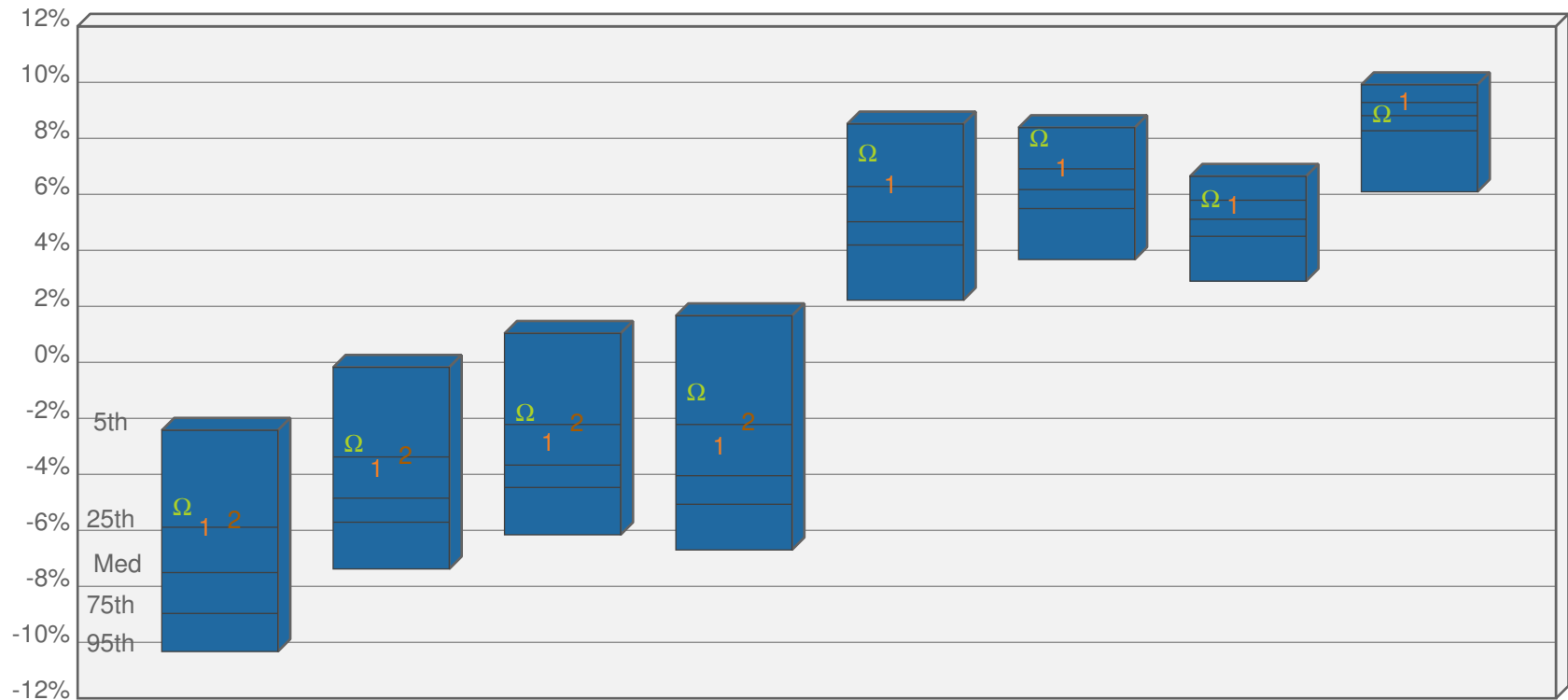


**\$182,610,895**

# PERFORMANCE COMPARISON

## KRS Insurance Plan Composite

Periods Ended December 31, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Ω KRS Insurance Plan	-5.16 (19)	-2.87 (18)	-1.77 (17)	-1.06 (13)	7.49 (10)	8.03 ( 6)	5.85 (22)	8.88 (45)
1 KRS Allocation I	-5.89 (25)	-3.77 (30)	-2.86 (36)	-2.99 (34)	6.35 (24)	6.94 (24)	5.63 (30)	9.33 (22)
2 KRS IPS Benchmark	-5.60 (21)	-3.33 (23)	-2.15 (23)	-2.13 (22)				
5th %tile	-2.43	-0.18	1.03	1.66	8.51	8.38	6.64	9.91
25th %tile	-5.89	-3.38	-2.22	-2.22	6.28	6.91	5.79	9.28
Median	-7.51	-4.85	-3.67	-4.05	5.02	6.17	5.11	8.81
75th %tile	-8.97	-5.71	-4.47	-5.07	4.19	5.49	4.50	8.27
95th %tile	-10.33	-7.38	-6.16	-6.70	2.22	3.67	2.90	6.09
Number of Funds	150	149	149	147	142	137	131	119

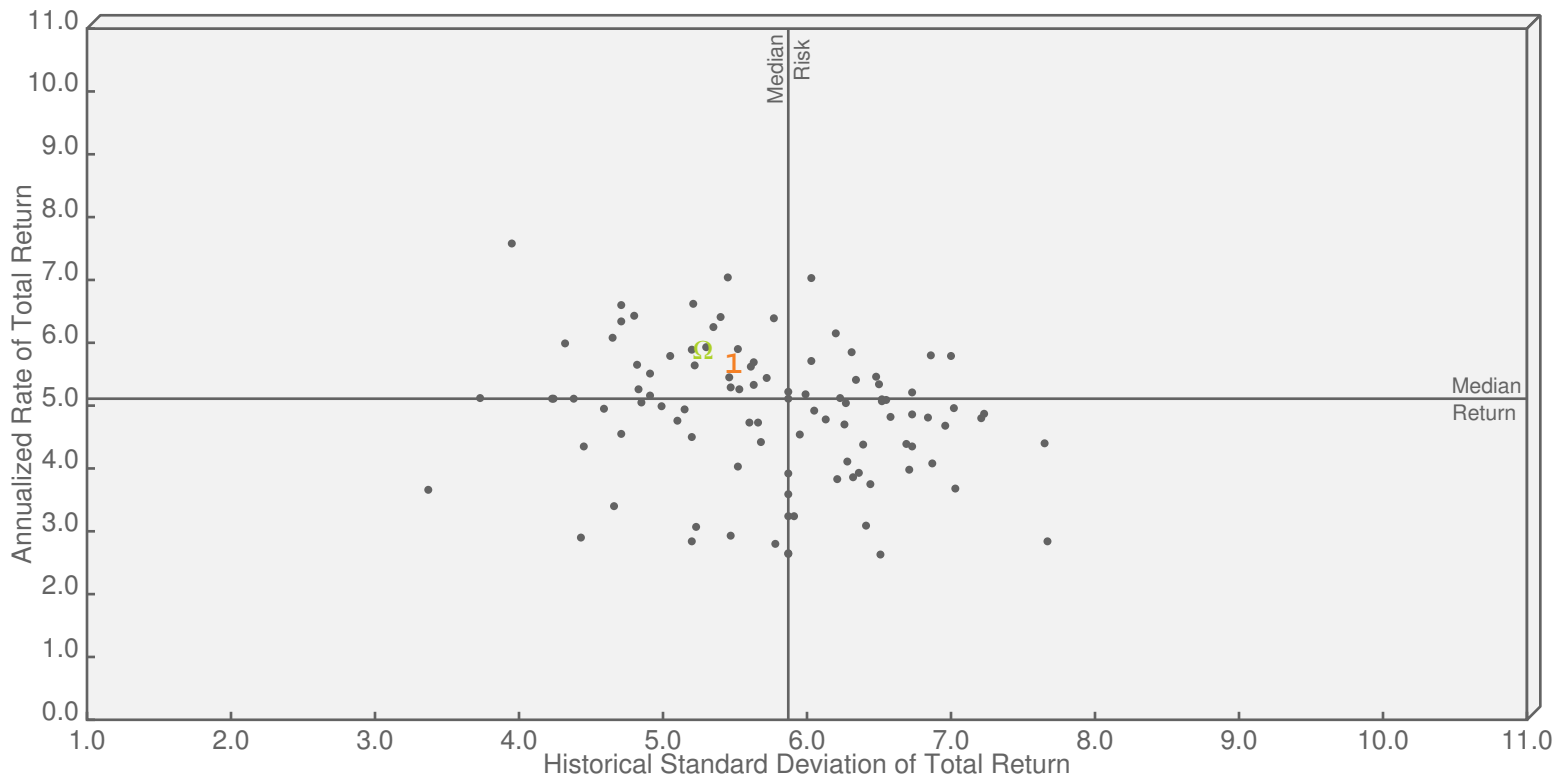
\*TUCS Total Ret of Master Trusts - Public Universe - Gross of Fees



# RISK / RETURN ANALYSIS

## KRS Insurance Plan

Five Years Ending December 31, 2018



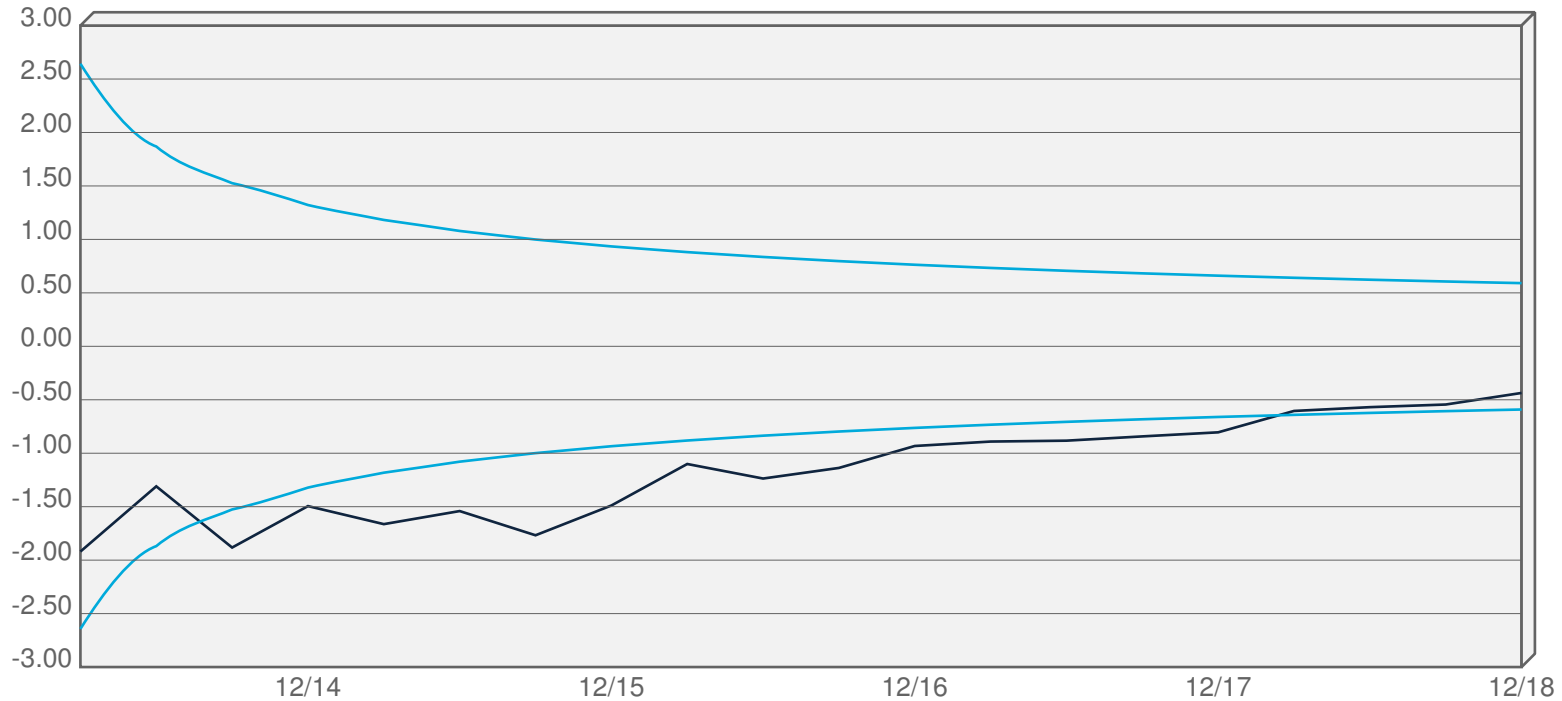
Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
KRS Insurance Plan	Ω	5.85	22	5.31	68
KRS Allocation Index	1	5.63	30	5.53	59
Median		5.11		5.87	

\*TUCS Total Returns of Master Trusts - Public Universe - Gross of Fees

# CUMULATIVE SKILL ANALYSIS

KRS Insurance Plan Composite

Five Years Ending December 31, 2018



— Quarterly NOF Value Added vs. KRS Allocation Index

— 80% Confidence Band

Excess Return:	-0.44	Information Ratio:	-0.54
Excess Risk:	0.80	T-Stat:	-1.21

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>KRS Insurance Plan</b>									
<b>Net of Fee Return</b>	<b>-5.43</b>	<b>-3.32</b>	<b>-2.41</b>	<b>-1.94</b>	<b>7.25</b>	<b>5.18</b>	<b>8.48</b>	<b>3/31/87</b>	<b>7.23</b>
KRS Allocation Index	-5.89	-3.77	-2.86	-2.99	6.94	5.63	9.33	3/31/87	7.61
Value Added	0.46	0.45	0.45	1.04	0.30	-0.45	-0.85	3/31/87	-0.38
KRS IPS Benchmark	-5.60	-3.33	-2.15	-2.13					
<b>KERS Insurance Plan</b>									
<b>Net of Fee Return</b>	<b>-6.15</b>	<b>-4.14</b>	<b>-3.52</b>	<b>-3.41</b>	<b>6.54</b>	<b>4.60</b>	<b>8.15</b>	<b>3/31/87</b>	<b>7.13</b>
KERS Allocation Index	-6.41	-4.34	-3.65	-3.91	6.59	5.25	9.17	3/31/87	7.56
Value Added	0.26	0.20	0.12	0.50	-0.05	-0.65	-1.02	3/31/87	-0.43
KERS IPS Benchmark	-5.58	-3.33	-2.31	-2.44					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					
<b>KERS (H) Insurance Plan</b>									
<b>Net of Fee Return</b>	<b>-5.40</b>	<b>-3.33</b>	<b>-2.47</b>	<b>-2.05</b>	<b>7.17</b>	<b>5.11</b>	<b>8.47</b>	<b>3/31/87</b>	<b>7.23</b>
KERS (H) Allocation Index	-5.76	-3.63	-2.70	-2.86	6.99	5.49	9.29	3/31/87	7.60
Value Added	0.36	0.30	0.23	0.80	0.18	-0.38	-0.82	3/31/87	-0.37
KERS (H) IPS Benchmark	-5.60	-3.33	-2.17	-2.18					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					
<b>CERS Insurance Plan</b>									
<b>Net of Fee Return</b>	<b>-5.29</b>	<b>-3.17</b>	<b>-2.21</b>	<b>-1.69</b>	<b>7.35</b>	<b>5.27</b>	<b>8.54</b>	<b>3/31/87</b>	<b>7.25</b>
CERS Allocation Index	-5.76	-3.63	-2.68	-2.80	7.02	5.51	9.30	3/31/87	7.60
Value Added	0.47	0.47	0.46	1.11	0.33	-0.24	-0.76	3/31/87	-0.35
CERS IPS Benchmark	-5.60	-3.33	-2.14	-2.12					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>CERS (H) Insurance Plan</b>									
<b>Net of Fee Return</b>	<b>-5.28</b>	<b>-3.13</b>	<b>-2.15</b>	<b>-1.59</b>	<b>7.43</b>	<b>5.33</b>	<b>8.57</b>	<b>3/31/87</b>	<b>7.26</b>
CERS (H) Allocation Index	-5.76	-3.63	-2.67	-2.78	7.02	5.51	9.30	3/31/87	7.60
Value Added	0.49	0.49	0.52	1.19	0.41	-0.18	-0.73	3/31/87	-0.34
CERS (H) IPS Benchmark	-5.60	-3.32	-2.13	-2.10					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					
<b>SPRS Insurance Plan</b>									
<b>Net of Fee Return</b>	<b>-5.31</b>	<b>-3.15</b>	<b>-2.19</b>	<b>-1.61</b>	<b>7.41</b>	<b>5.31</b>	<b>8.56</b>	<b>3/31/87</b>	<b>7.25</b>
SPRS Allocation Index	-5.76	-3.63	-2.71	-2.83	7.00	5.50	9.30	3/31/87	7.60
Value Added	0.45	0.48	0.52	1.22	0.40	-0.20	-0.74	3/31/87	-0.35
SPRS IPS Benchmark	-5.60	-3.33	-2.18	-2.15					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>US Equity Composite</b>									
<b>Net of Fee Return</b>	<b>-14.71</b>	<b>-9.50</b>	<b>-5.73</b>	<b>-6.38</b>	<b>8.58</b>	<b>7.10</b>	<b>12.36</b>	<b>6/30/92</b>	<b>9.14</b>
Russell 3000	-14.30	-8.20	-4.63	-5.24	8.97	7.91	13.18	6/30/92	9.34
Value Added	-0.41	-1.30	-1.11	-1.14	-0.39	-0.82	-0.82	6/30/92	-0.20
<b>Non-US Equity Composite</b>									
<b>Net of Fee Return</b>	<b>-12.49</b>	<b>-11.92</b>	<b>-13.60</b>	<b>-13.53</b>	<b>5.12</b>	<b>1.43</b>	<b>4.82</b>	<b>3/31/00</b>	<b>1.67</b>
Policy Index	-11.88	-11.53	-13.84	-14.76	4.69	0.98	6.54	3/31/00	1.95
Value Added	-0.61	-0.38	0.24	1.23	0.44	0.45	-1.72	3/31/00	-0.27
<b>Core Fixed Composite</b>									
<b>Net of Fee Return</b>	<b>0.93</b>							<b>9/30/18</b>	<b>0.93</b>
Bloomberg Universal	1.17							9/30/18	1.17
Value Added	-0.24							9/30/18	-0.24
<b>Opportunistic Fixed Composite</b>									
<b>Net of Fee Return</b>	<b>-0.99</b>							<b>9/30/18</b>	<b>-0.99</b>
Bloomberg High Yield	-4.53							9/30/18	-4.53
Value Added	3.54							9/30/18	3.54
<b>Fixed Income Composite</b>									
<b>Net of Fee Return</b>	<b>-0.23</b>	<b>1.01</b>	<b>0.85</b>	<b>0.57</b>	<b>4.40</b>	<b>3.49</b>	<b>5.06</b>	<b>6/30/92</b>	<b>6.22</b>
Policy Index	-1.70	-0.39	-0.02	-1.14	4.90	4.12	5.20	6/30/92	6.16
Value Added	1.48	1.40	0.87	1.71	-0.51	-0.63	-0.13	6/30/92	0.06
Bloomberg Global Aggregate	1.20	0.26	-2.53	-1.20	2.70	1.08	2.49	6/30/92	4.94
<b>Real Return Composite</b>									
<b>Net of Fee Return</b>	<b>-3.60</b>	<b>-3.14</b>	<b>-3.06</b>	<b>-3.38</b>	<b>4.40</b>	<b>2.08</b>		<b>6/30/11</b>	<b>2.75</b>
Real Return Index (I)	-2.76	-2.42	-1.07	-2.66	2.56	1.42		6/30/11	2.10
Value Added	-0.84	-0.71	-1.99	-0.73	1.84	0.66		6/30/11	0.65

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Real Estate Composite</b>									
<b>Net of Fee Return</b>	<b>1.83</b>	<b>4.55</b>	<b>6.66</b>	<b>9.08</b>	<b>9.79</b>	<b>9.16</b>		<b>6/30/09</b>	<b>9.22</b>
NCREIF ODCE NOF 1 Quarter Lag	1.87	3.71	5.76	7.71	7.83	9.71		6/30/09	7.85
Value Added	-0.04	0.84	0.90	1.36	1.96	-0.56		6/30/09	1.36
<b>Absolute Return Composite</b>									
<b>Net of Fee Return</b>	<b>-1.12</b>	<b>-0.97</b>	<b>-0.41</b>	<b>1.16</b>	<b>2.05</b>	<b>2.54</b>		<b>3/31/10</b>	<b>3.73</b>
HFRI FOF Div (1 Month Lag)	-3.16	-2.81	-2.39	-0.97	1.53	2.01		3/31/10	2.54
Value Added	2.03	1.84	1.97	2.12	0.52	0.54		3/31/10	1.19
<b>Private Equity Composite</b>									
<b>Net of Fee Return</b>	<b>3.63</b>	<b>8.17</b>	<b>13.15</b>	<b>18.19</b>	<b>14.90</b>	<b>15.62</b>	<b>13.89</b>	<b>6/30/02</b>	<b>10.47</b>
KRS Short Term PE Index	3.63	8.17	13.15	18.19	14.90	15.62	13.89	6/30/02	10.47
Value Added	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	6/30/02	-0.00
Russell 3000 +3% Qtr Lag	7.91	12.94	13.05	21.10	21.33	17.61	18.39	6/30/02	11.42
<b>Cash Composite</b>									
<b>Net of Fee Return</b>	<b>0.60</b>	<b>1.10</b>	<b>1.60</b>	<b>2.10</b>	<b>1.32</b>	<b>0.87</b>	<b>0.58</b>	<b>6/30/92</b>	<b>2.65</b>
91-Day Treasury Bill	0.57	1.06	1.52	1.88	1.02	0.63	0.37	6/30/92	2.62
Value Added	0.03	0.04	0.08	0.22	0.30	0.24	0.21	6/30/92	0.04

# CUSTOM BENCHMARK SPECIFICATION

KRS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
KRS Allocation Index	6/87	6/17	100.00	KRS Allocation Index	
	9/17	9/17	10.00	HFRI Diversified Index	
			2.00	91-Day Treasury Bill	
			10.00	KRS Short Term PE Benchmark	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			8.00	Real Return Index (I)	
			6.00	Bloomberg High Yield	
			6.00	Bloomberg Universal	
			26.50	Russell 3000	
	12/17	3/18	26.50	MSCI ACWI Ex USA IMI Index (\$G)	
			10.00	HFRI Diversified Index	
			8.00	Bloomberg High Yield	
			8.00	Bloomberg Universal	
			2.00	91-Day Treasury Bill	
			8.00	Real Return Index (I)	
			24.50	MSCI ACWI Ex USA IMI (\$N)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	KRS Short Term PE Benchmark	
			24.50	Russell 3000	
			6/18	12/18	17.90
21.90					MSCI ACWI Ex USA IMI (\$N)
10.00	HFRI Diversified Index				
10.00	Real Return Index (I)				
11.00	Bloomberg High Yield				
13.00	Bloomberg Universal				
5.00	NCREIF ODCE NOF 1 Quarter Lag				
9.20	KRS Short Term PE Benchmark				
2.00	91-Day Treasury Bill				
KRS IPS Benchmark	9/17	9/17	2.00	91-Day Treasury Bill	

# CUSTOM BENCHMARK SPECIFICATION

KRS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
KRS IPS Benchmark (cont.)			10.00	KRS Short Term PE Benchmark	
			10.00	HFRI FOF Div (1 Month Lag)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	Real Return Index (I)	
			4.00	Bloomberg Universal	
			24.00	Bloomberg High Yield	
			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			17.50	Russell 3000	
		12/17	6/18	2.00	91-Day Treasury Bill
				10.00	KRS Short Term PE Benchmark
				10.00	HFRI FOF Div (1 Month Lag)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	Real Return Index (I)
				4.00	Bloomberg Universal
				24.00	Bloomberg High Yield
				17.50	MSCI ACWI Ex USA IMI (\$N)
				17.50	Russell 3000
		9/18	12/18	1.00	91-Day Treasury Bill
				10.00	KRS Short Term PE Benchmark
				15.00	Real Return Index (I)
				3.00	HFRI Diversified Index
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				15.00	Bloomberg High Yield
				13.50	Bloomberg Universal
				18.75	MSCI ACWI Ex USA IMI (\$N)
			18.75	Russell 3000	



# CUSTOM BENCHMARK SPECIFICATION

KERS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description
KERS Allocation Index	6/87	6/17	100.00	KERS Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			26.50	MSCI ACWI Ex USA IMI Index (\$G)
			26.50	Russell 3000
			6.00	Bloomberg Universal
			6.00	Bloomberg High Yield
			8.00	Real Return Index (I)
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			10.00	KERS Short Term PE Benchmark
			2.00	91-Day Treasury Bill
	12/17	3/18	10.00	HFRI Diversified Index
			8.00	Bloomberg High Yield
			8.00	Bloomberg Universal
2.00			91-Day Treasury Bill	
8.00			Real Return Index (I)	
24.50			MSCI ACWI Ex USA IMI (\$N)	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
6/18	12/18	10.00	KERS Short Term PE Benchmark	
		24.50	Russell 3000	
		19.50	Russell 3000	
		23.50	MSCI ACWI Ex USA IMI (\$N)	
		10.00	HFRI Diversified Index	
		10.00	Real Return Index (I)	
		11.00	Bloomberg High Yield	
13.00	Bloomberg Universal			
5.00	NCREIF ODCE NOF 1 Quarter Lag			
6.00	KERS Short Term PE Benchmark			
2.00	91-Day Treasury Bill			
KERS IPS Benchmark	9/17	9/17	2.00	91-Day Treasury Bill

# CUSTOM BENCHMARK SPECIFICATION

KERS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
KERS IPS Benchmark (cont.)			10.00	KERS Short Term PE Benchmark	
			10.00	HFRI FOF Div (1 Month Lag)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	Real Return Index (I)	
			4.00	Bloomberg Universal	
			24.00	Bloomberg High Yield	
			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			17.50	Russell 3000	
		12/17	6/18	2.00	91-Day Treasury Bill
				10.00	KERS Short Term PE Benchmark
				10.00	HFRI FOF Div (1 Month Lag)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	Real Return Index (I)
				4.00	Bloomberg Universal
				24.00	Bloomberg High Yield
				17.50	MSCI ACWI Ex USA IMI (\$N)
				17.50	Russell 3000
		9/18	12/18	18.75	Russell 3000
				18.75	MSCI ACWI Ex USA IMI (\$N)
				13.50	Bloomberg Universal
				15.00	Bloomberg High Yield
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				3.00	HFRI Diversified Index
			15.00	Real Return Index (I)	
			10.00	KERS Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	12/18	100.00	Assumed Rate 6.25%	

# CUSTOM BENCHMARK SPECIFICATION

KERS (H) Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description
KERS (H) Allocation Index	6/87	6/17	100.00	KERS (H) Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			2.00	91-Day Treasury Bill
			10.00	KERS (H) Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			8.00	Real Return Index (I)
			6.00	Bloomberg High Yield
			6.00	Bloomberg Universal
			26.50	Russell 3000
	26.50	MSCI ACWI Ex USA IMI Index (\$G)		
	12/17	3/18	10.00	HFRI Diversified Index
			24.50	Russell 3000
			10.00	KERS (H) Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			24.50	MSCI ACWI Ex USA IMI (\$N)
8.00			Real Return Index (I)	
2.00			91-Day Treasury Bill	
8.00			Bloomberg Universal	
8.00	Bloomberg High Yield			
6/18	12/18	2.00	91-Day Treasury Bill	
		10.00	KERS (H) Short Term PE Benchmark	
		5.00	NCREIF ODCE NOF 1 Quarter Lag	
		13.00	Bloomberg Universal	
		11.00	Bloomberg High Yield	
		10.00	Real Return Index (I)	
		10.00	HFRI Diversified Index	
		21.50	MSCI ACWI Ex USA IMI (\$N)	
17.50	Russell 3000			
KERS (H) IPS Benchmark	9/17	9/17	17.50	Russell 3000

# CUSTOM BENCHMARK SPECIFICATION

KERS (H) Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
KERS (H) IPS Benchmark (cont.)			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			24.00	Bloomberg High Yield	
			4.00	Bloomberg Universal	
			10.00	Real Return Index (I)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	HFRI FOF Div (1 Month Lag)	
			10.00	KERS (H) Short Term PE Benchmark	
			2.00	91-Day Treasury Bill	
		12/17	6/18	17.50	Russell 3000
				17.50	MSCI ACWI Ex USA IMI (\$N)
				24.00	Bloomberg High Yield
				4.00	Bloomberg Universal
				10.00	Real Return Index (I)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	HFRI FOF Div (1 Month Lag)
				10.00	KERS (H) Short Term PE Benchmark
				2.00	91-Day Treasury Bill
		9/18	12/18	18.75	Russell 3000
				18.75	MSCI ACWI Ex USA IMI (\$N)
				15.00	Bloomberg High Yield
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				3.00	HFRI Diversified Index
				15.00	Real Return Index (I)
				10.00	KERS (H) Short Term PE Benchmark
			1.00	91-Day Treasury Bill	
			13.50	Bloomberg Universal	
Assumed Rate 6.25%	9/17	12/18	100.00	Assumed Rate 6.25%	

# CUSTOM BENCHMARK SPECIFICATION

CERS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description
CERS Allocation Index	6/87	6/17	100.00	CERS Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			2.00	91-Day Treasury Bill
			10.00	CERS Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			8.00	Real Return Index (I)
			6.00	Bloomberg High Yield
			6.00	Bloomberg Universal
			26.50	Russell 3000
	26.50	MSCI ACWI Ex USA IMI Index (\$G)		
	12/17	3/18	10.00	HFRI Diversified Index
			8.00	Bloomberg High Yield
			8.00	Bloomberg Universal
			2.00	91-Day Treasury Bill
			8.00	Real Return Index (I)
24.50			MSCI ACWI Ex USA IMI (\$N)	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
10.00			CERS Short Term PE Benchmark	
24.50	Russell 3000			
6/18	12/18	2.00	91-Day Treasury Bill	
		10.00	CERS Short Term PE Benchmark	
		5.00	NCREIF ODCE NOF 1 Quarter Lag	
		13.00	Bloomberg Universal	
		11.00	Bloomberg High Yield	
		10.00	Real Return Index (I)	
		10.00	HFRI Diversified Index	
		21.50	MSCI ACWI Ex USA IMI (\$N)	
17.50	Russell 3000			
CERS IPS Benchmark	9/17	9/17	17.50	Russell 3000

# CUSTOM BENCHMARK SPECIFICATION

CERS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
CERS IPS Benchmark (cont.)			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			24.00	Bloomberg High Yield	
			4.00	Bloomberg Universal	
			10.00	Real Return Index (I)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	HFRI FOF Div (1 Month Lag)	
			10.00	CERS Short Term PE Benchmark	
			2.00	91-Day Treasury Bill	
		12/17	6/18	2.00	91-Day Treasury Bill
				10.00	CERS Short Term PE Benchmark
				10.00	HFRI FOF Div (1 Month Lag)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	Real Return Index (I)
				4.00	Bloomberg Universal
				24.00	Bloomberg High Yield
				17.50	MSCI ACWI Ex USA IMI (\$N)
				17.50	Russell 3000
		9/18	12/18	18.75	Russell 3000
				18.75	MSCI ACWI Ex USA IMI (\$N)
				13.50	Bloomberg Universal
				15.00	Bloomberg High Yield
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				3.00	HFRI Diversified Index
			15.00	Real Return Index (I)	
			10.00	CERS Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	12/18	100.00	Assumed Rate 6.25%	

# CUSTOM BENCHMARK SPECIFICATION

## CERS (H) Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description
CERS (H) Allocation Index	6/87	6/17	100.00	CERS (H) Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			2.00	91-Day Treasury Bill
			10.00	CERS (H) Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			8.00	Real Return Index (I)
			6.00	Bloomberg High Yield
			6.00	Bloomberg Universal
			26.50	Russell 3000
	26.50	MSCI ACWI Ex USA IMI Index (\$G)		
	12/17	3/18	10.00	HFRI Diversified Index
			24.50	Russell 3000
			10.00	CERS (H) Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			24.50	MSCI ACWI Ex USA IMI (\$N)
			8.00	Real Return Index (I)
			2.00	91-Day Treasury Bill
			8.00	Bloomberg Universal
	8.00	Bloomberg High Yield		
	6/18	12/18	2.00	91-Day Treasury Bill
10.00			CERS (H) Short Term PE Benchmark	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
13.00			Bloomberg Universal	
11.00			Bloomberg High Yield	
10.00			Real Return Index (I)	
10.00			HFRI Diversified Index	
21.50			MSCI ACWI Ex USA IMI (\$N)	
17.50	Russell 3000			
CERS (H) IPS Benchmark	9/17	9/17	17.50	Russell 3000

# CUSTOM BENCHMARK SPECIFICATION

CERS (H) Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
CERS (H) IPS Benchmark (cont.)			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			24.00	Bloomberg High Yield	
			4.00	Bloomberg Universal	
			10.00	Real Return Index (I)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	HFRI FOF Div (1 Month Lag)	
			10.00	CERS (H) Short Term PE Benchmark	
			2.00	91-Day Treasury Bill	
		12/17	6/18	17.50	Russell 3000
				17.50	MSCI ACWI Ex USA IMI (\$N)
				24.00	Bloomberg High Yield
				4.00	Bloomberg Universal
				10.00	Real Return Index (I)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	HFRI FOF Div (1 Month Lag)
				10.00	CERS (H) Short Term PE Benchmark
				2.00	91-Day Treasury Bill
		9/18	12/18	18.75	Russell 3000
				18.75	MSCI ACWI Ex USA IMI (\$N)
				13.50	Bloomberg Universal
				15.00	Bloomberg High Yield
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				3.00	HFRI Diversified Index
			15.00	Real Return Index (I)	
			10.00	CERS (H) Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	12/18	100.00	Assumed Rate 6.25%	



# CUSTOM BENCHMARK SPECIFICATION

SPRS Insurance Plan

December 31, 2018

	Quarter Start	Quarter End	Percent	Description
SPRS Allocation Index	6/87	6/17	100.00	SPRS Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			26.50	Russell 3000
			6.00	Bloomberg Universal
			6.00	Bloomberg High Yield
			8.00	Real Return Index (I)
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			10.00	SPRS Short Term PE Benchmark
			2.00	91-Day Treasury Bill
	12/17	3/18	26.50	MSCI ACWI Ex USA IMI Index (\$G)
			10.00	HFRI Diversified Index
			24.50	Russell 3000
			10.00	SPRS Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			24.50	MSCI ACWI Ex USA IMI (\$N)
8.00			Real Return Index (I)	
2.00			91-Day Treasury Bill	
6/18	12/18	8.00	Bloomberg Universal	
		8.00	Bloomberg High Yield	
		2.00	91-Day Treasury Bill	
		10.00	SPRS Short Term PE Benchmark	
		5.00	NCREIF ODCE NOF 1 Quarter Lag	
		13.00	Bloomberg Universal	
		11.00	Bloomberg High Yield	
		10.00	Real Return Index (I)	
9/17	9/17	10.00	HFRI Diversified Index	
		21.50	MSCI ACWI Ex USA IMI (\$N)	
		17.50	Russell 3000	
SPRS IPS Benchmark	9/17	9/17	17.50	Russell 3000

# CUSTOM BENCHMARK SPECIFICATION

SPRS Insurance Plan

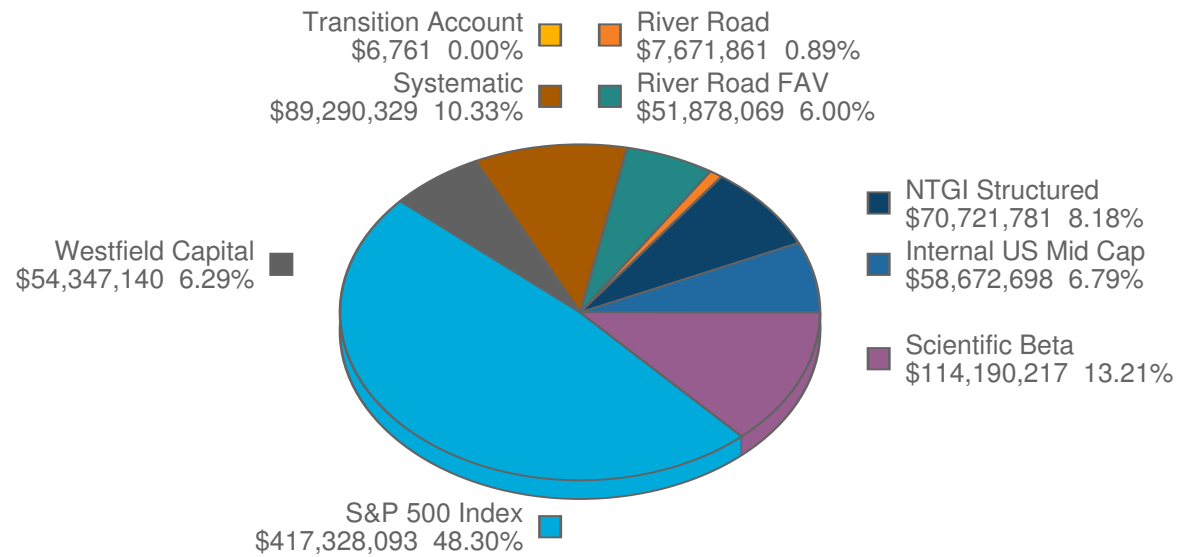
December 31, 2018

	Quarter Start	Quarter End	Percent	Description	
SPRS IPS Benchmark (cont.)			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			24.00	Bloomberg High Yield	
			4.00	Bloomberg Universal	
			10.00	Real Return Index (I)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	HFRI FOF Div (1 Month Lag)	
			10.00	SPRS Short Term PE Benchmark	
			2.00	91-Day Treasury Bill	
		12/17	6/18	17.50	Russell 3000
				17.50	MSCI ACWI Ex USA IMI (\$N)
				24.00	Bloomberg High Yield
				4.00	Bloomberg Universal
				10.00	Real Return Index (I)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	HFRI FOF Div (1 Month Lag)
				10.00	SPRS Short Term PE Benchmark
				2.00	91-Day Treasury Bill
		9/18	12/18	18.75	Russell 3000
				18.75	MSCI ACWI Ex USA IMI (\$N)
				13.50	Bloomberg Universal
				15.00	Bloomberg High Yield
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				3.00	HFRI Diversified Index
				15.00	Real Return Index (I)
			10.00	SPRS Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	12/18	100.00	Assumed Rate 6.25%	



# US EQUITY

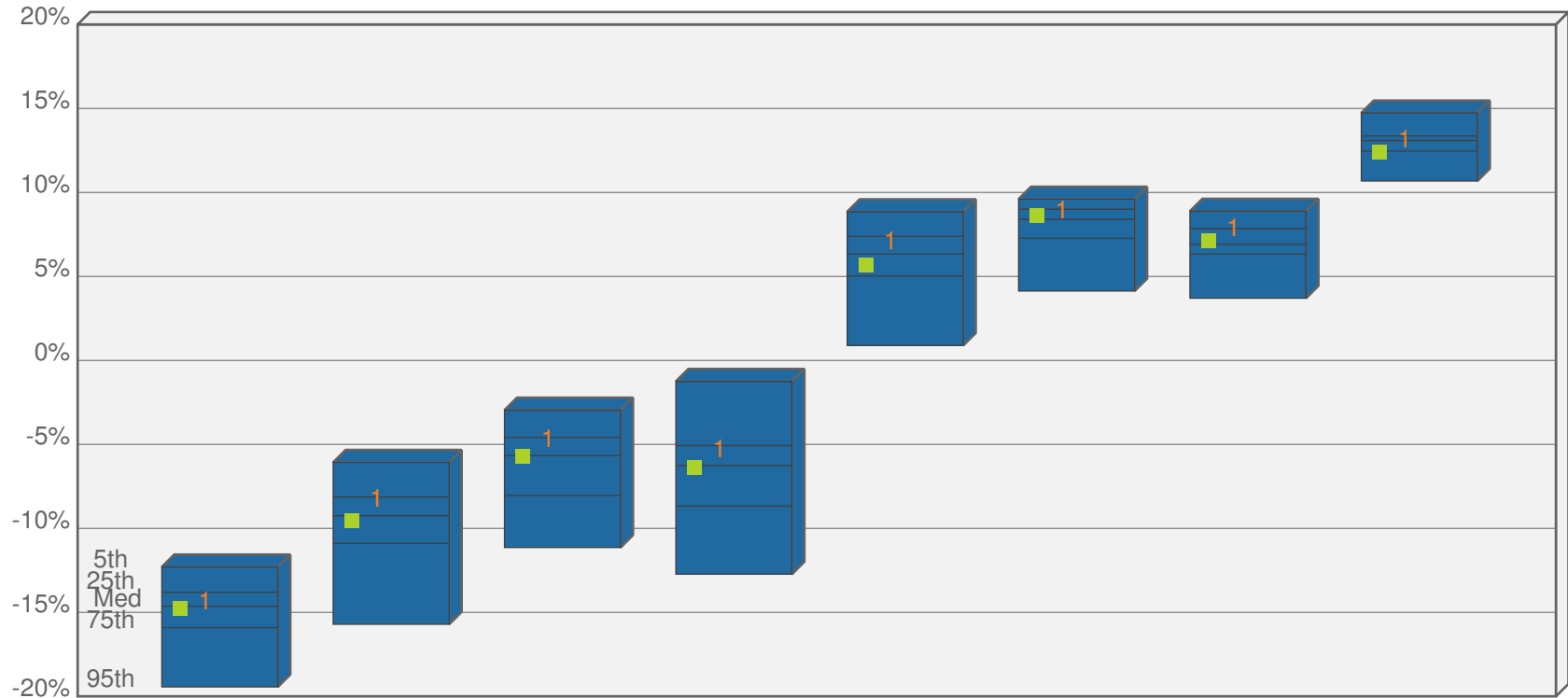
Wilshire Consulting  
**MANAGER ALLOCATION**  
 US Equity Composite  
*As of December 31, 2018*



# PERFORMANCE COMPARISON

## US Equity Composite

Periods Ended December 31, 2018



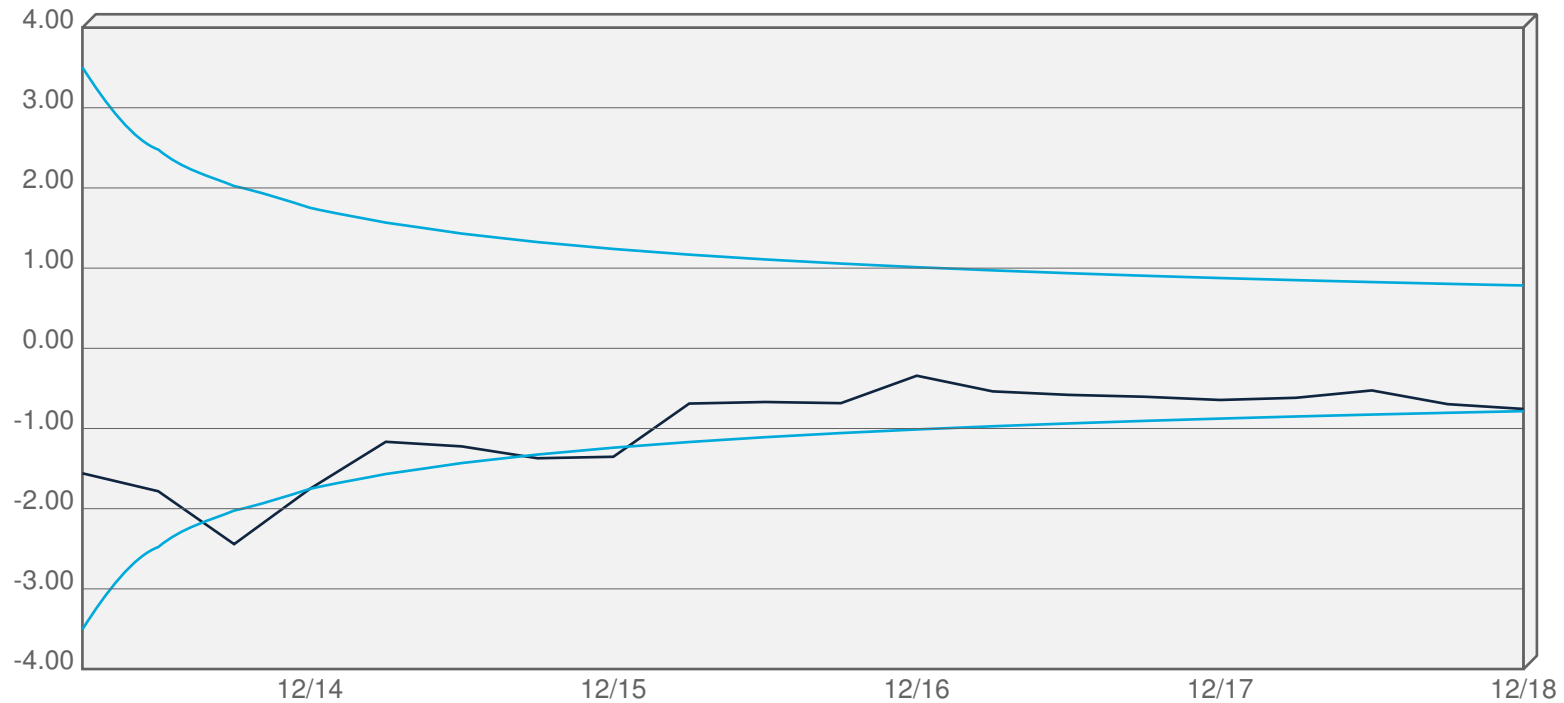
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ US Equity Composite	-14.68 (52)	-9.45 (54)	-5.66 (50)	-6.28 (52)	5.77 (68)	8.69 (40)	7.21 (47)	12.46 (75)
┆ Russell 3000	-14.30 (39)	-8.20 (27)	-4.63 (27)	-5.24 (32)	7.14 (31)	8.97 (25)	7.91 (23)	13.18 (43)
5th %tile	-12.30	-6.07	-2.96	-1.25	8.85	9.60	8.88	14.73
25th %tile	-13.80	-8.14	-4.59	-5.07	7.39	9.00	7.85	13.36
Median	-14.64	-9.25	-5.66	-6.26	6.33	8.40	6.92	13.09
75th %tile	-15.91	-10.89	-8.04	-8.68	5.03	7.27	6.33	12.46
95th %tile	-19.44	-15.71	-11.14	-12.73	0.89	4.13	3.70	10.68
Number of Funds	142	141	138	134	121	117	108	80

\*TUCS Total Ret of US Equity Investment Pools Universe - Gross of Fees

# CUMULATIVE SKILL ANALYSIS

US Equity Composite

Five Years Ending December 31, 2018



— Quarterly NOF Value Added vs. Russell 3000

— 80% Confidence Band

Excess Return:	-0.76	Information Ratio:	-0.71
Excess Risk:	1.07	T-Stat:	-1.59

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>S&amp;P 500 Index</b>									
<b>Net of Fee Return</b>	<b>-13.38</b>	<b>-6.87</b>	<b>-3.40</b>	<b>-4.10</b>	<b>9.35</b>	<b>8.55</b>	<b>13.29</b>	<b>6/30/01</b>	<b>6.75</b>
Standard & Poor's 500	-13.52	-6.85	-3.65	-4.38	9.26	8.50	13.12	6/30/01	6.29
Value Added	0.14	-0.02	0.25	0.28	0.09	0.06	0.18	6/30/01	0.46
<b>Scientific Beta</b>									
<b>Net of Fee Return</b>	<b>-12.69</b>	<b>-7.96</b>	<b>-5.86</b>	<b>-5.61</b>				<b>6/30/16</b>	<b>6.47</b>
Standard & Poor's 500	-13.52	-6.85	-3.65	-4.38				6/30/16	9.55
Value Added	0.83	-1.11	-2.21	-1.23				6/30/16	-3.08
<b>River Road</b>									
<b>Net of Fee Return</b>								<b>6/30/11</b>	
Russell 3000 Value								6/30/11	
Value Added								6/30/11	
<b>River Road FAV</b>									
<b>Net of Fee Return</b>	<b>-12.56</b>	<b>-6.90</b>	<b>-2.95</b>	<b>-2.85</b>				<b>6/30/16</b>	<b>10.51</b>
Russell 3000 Value	-12.24	-7.51	-5.92	-8.58				6/30/16	5.85
Value Added	-0.32	0.61	2.98	5.72				6/30/16	4.66
<b>Westfield Capital</b>									
<b>Net of Fee Return</b>	<b>-16.67</b>	<b>-9.98</b>	<b>-5.95</b>	<b>-3.33</b>	<b>8.14</b>	<b>7.06</b>		<b>6/30/11</b>	<b>10.64</b>
Russell 3000 Growth	-16.33	-8.90	-3.55	-2.12	10.85	9.99		6/30/11	12.24
Value Added	-0.34	-1.08	-2.40	-1.21	-2.72	-2.93		6/30/11	-1.60
<b>Systematic</b>									
<b>Net of Fee Return</b>	<b>-18.93</b>	<b>-16.48</b>	<b>-13.75</b>	<b>-16.57</b>	<b>5.05</b>	<b>2.93</b>		<b>6/30/12</b>	<b>8.46</b>
Russell Mid Cap Value	-14.95	-12.15	-10.04	-12.29	6.06	5.44		6/30/12	10.49
Value Added	-3.98	-4.33	-3.71	-4.28	-1.01	-2.51		6/30/12	-2.03

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Internal US Mid Cap</b>									
<b>Net of Fee Return</b>	<b>-16.99</b>	<b>-13.65</b>	<b>-9.24</b>	<b>-9.78</b>	<b>8.37</b>			<b>9/30/14</b>	<b>6.76</b>
S&P 400 Mid Cap	-17.28	-14.08	-10.39	-11.08	7.66			9/30/14	6.34
Value Added	0.29	0.43	1.16	1.31	0.71			9/30/14	0.42
<b>NTGI Structured</b>									
<b>Net of Fee Return</b>	<b>-18.35</b>	<b>-15.20</b>	<b>-8.67</b>	<b>-8.78</b>	<b>8.19</b>	<b>5.33</b>		<b>6/30/11</b>	<b>9.34</b>
Russell 2000	-20.20	-17.35	-10.94	-11.01	7.36	4.41		6/30/11	8.22
Value Added	1.85	2.14	2.27	2.23	0.83	0.92		6/30/11	1.12
<b>US Equity Composite</b>									
<b>Net of Fee Return</b>	<b>-14.71</b>	<b>-9.50</b>	<b>-5.73</b>	<b>-6.38</b>	<b>8.58</b>	<b>7.10</b>	<b>12.36</b>	<b>6/30/92</b>	<b>9.14</b>
Russell 3000	-14.30	-8.20	-4.63	-5.24	8.97	7.91	13.18	6/30/92	9.34
Value Added	<b>-0.41</b>	<b>-1.30</b>	<b>-1.11</b>	<b>-1.14</b>	<b>-0.39</b>	<b>-0.82</b>	<b>-0.82</b>	6/30/92	<b>-0.20</b>

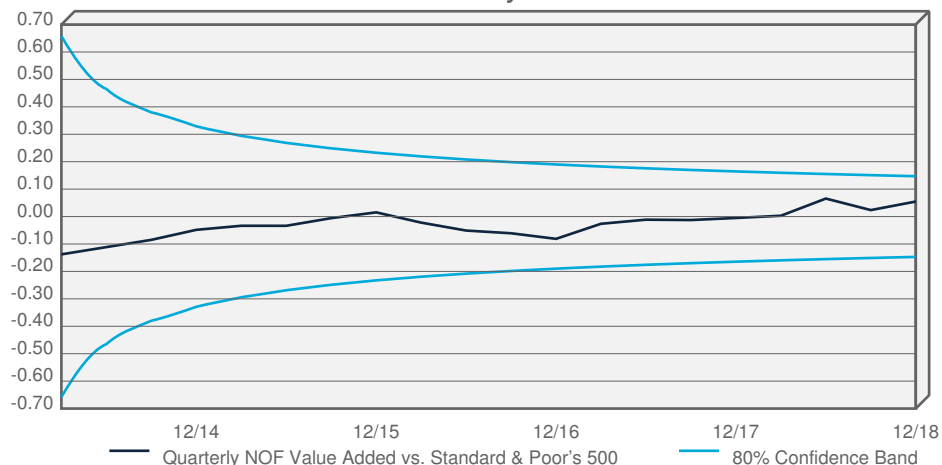


# INVESTMENT MANAGER ANALYSIS

S&P 500 Index

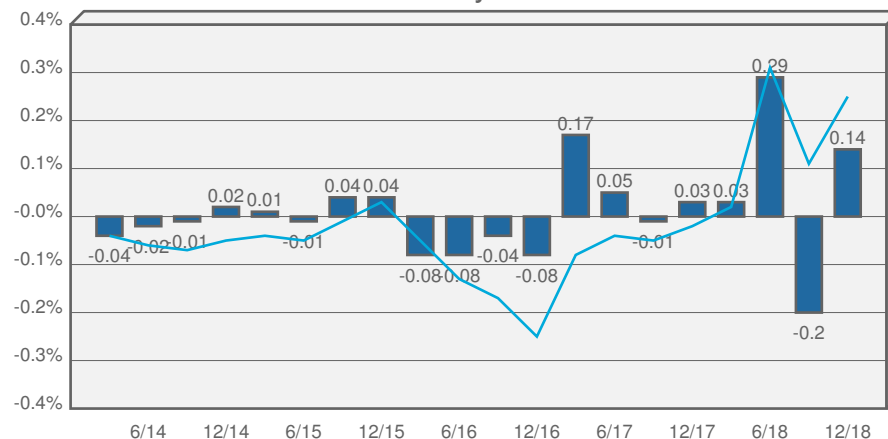
December 31, 2018

Cumulative Skill Analysis vs Benchmark



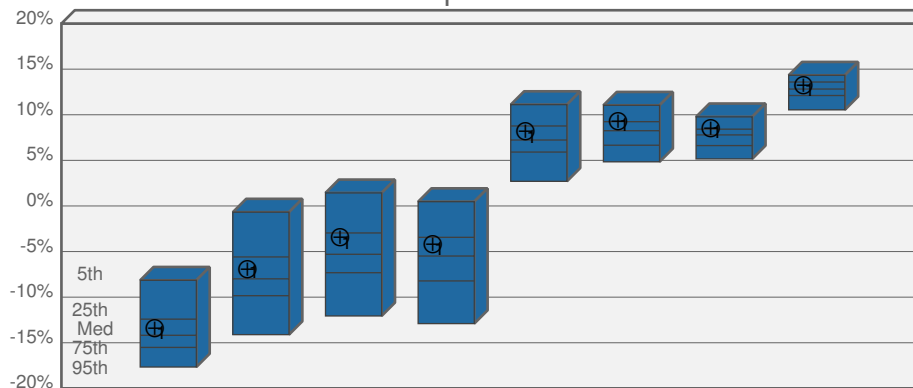
Excess Return:	0.05	Information Ratio:	0.27
Excess Risk:	0.20	T-Stat:	0.61

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. Standard & Poor's 500  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊕ S&P 500 Index	-13.38 (33)	-6.87 (38)	-3.40 (27)	-4.10 (31)	8.21 (31)	9.35 (22)	8.56 (19)	13.30 (33)
1 Standard & Poo	-13.52 (37)	-6.85 (38)	-3.65 (28)	-4.38 (36)	7.93 (36)	9.26 (24)	8.50 (21)	13.12 (37)
Median	-14.18	-7.99	-5.30	-5.49	7.23	8.25	7.79	12.82
Number of Funds	119	119	119	119	118	117	114	99

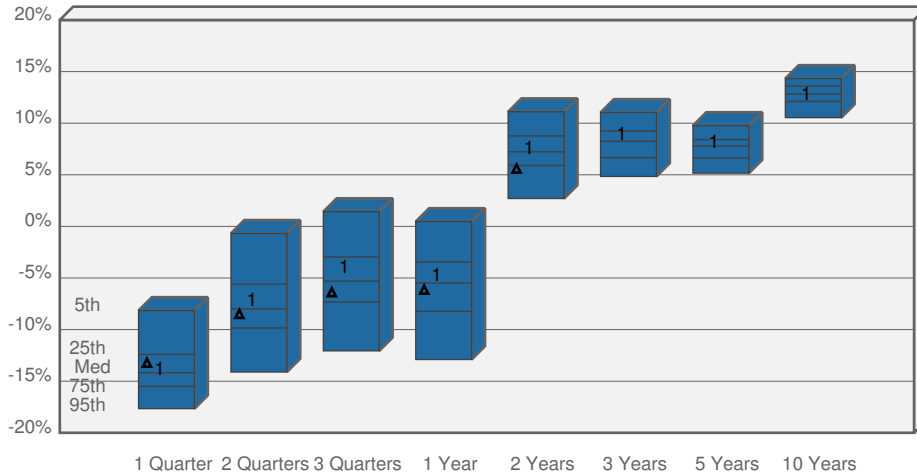
\*Compass Total Returns of Active Large Core Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Scientific Beta

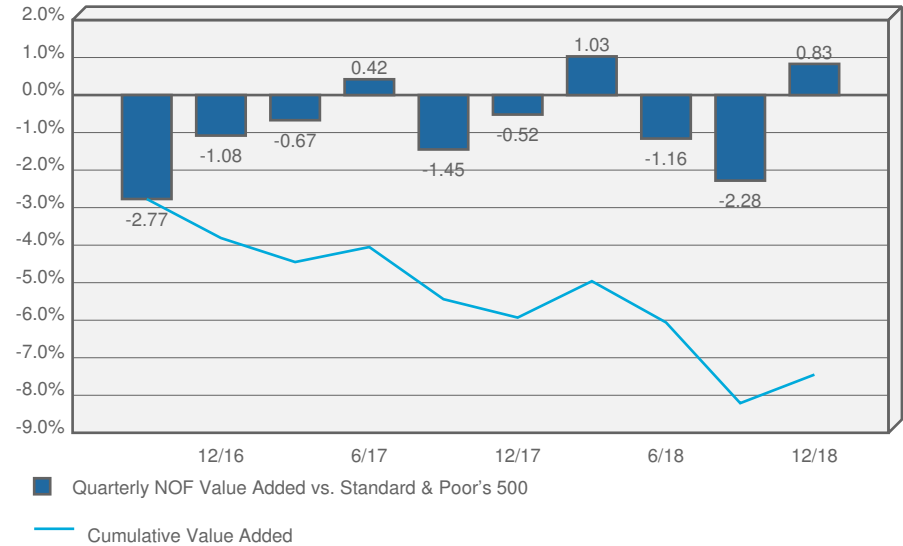
December 31, 2018

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▲ Scientific Bet	-12.69 (25)	-7.96 (49)	-5.86 (58)	-5.61 (52)	6.12 (71)			
1 Standard & Poo	-13.52 (37)	-6.85 (38)	-3.65 (28)	-4.38 (36)	7.93 (36)	9.26 (24)	8.50 (21)	13.12 (37)
Median	-14.18	-7.99	-5.30	-5.49	7.23	8.25	7.79	12.82
Number of Funds	119	119	119	119	118	117	114	99

Value-Added Analysis vs Benchmark



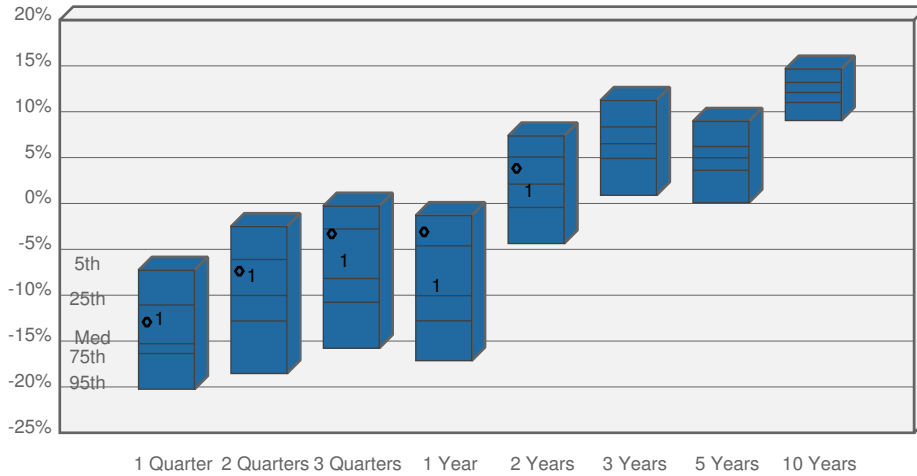
\*Compass Total Returns of Active Large Core Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

River Road FAV

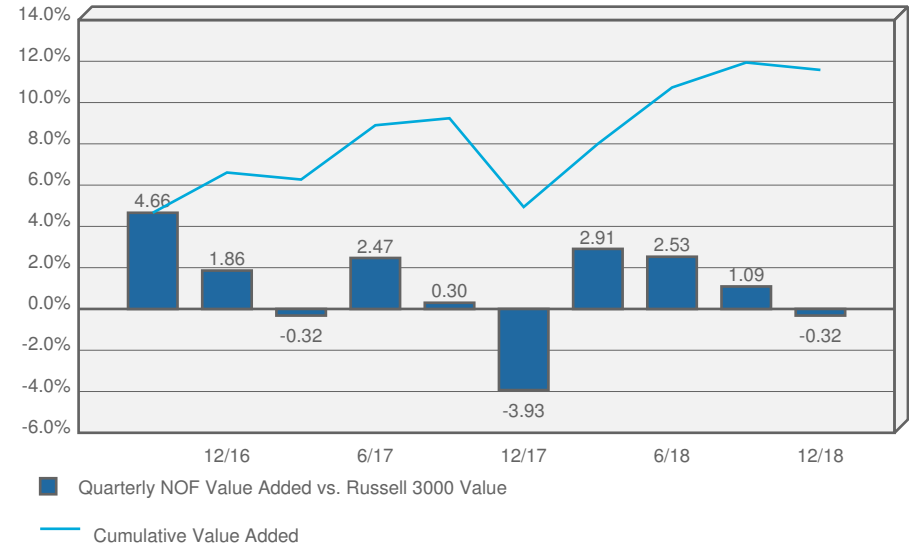
December 31, 2018

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
○ River Road FAV	-12.35 (33)	-6.80 (29)	-2.73 (24)	-2.52 ( 9)	4.41 (32)			
■ Russell 3000 V	-12.24 (33)	-7.51 (32)	-5.92 (40)	-8.58 (43)	1.73 (53)			
Median	-15.29	-10.03	-8.18	-10.05	2.11	6.52	4.98	12.10
Number of Funds	62	62	62	62	62	62	57	50

Value-Added Analysis vs Benchmark



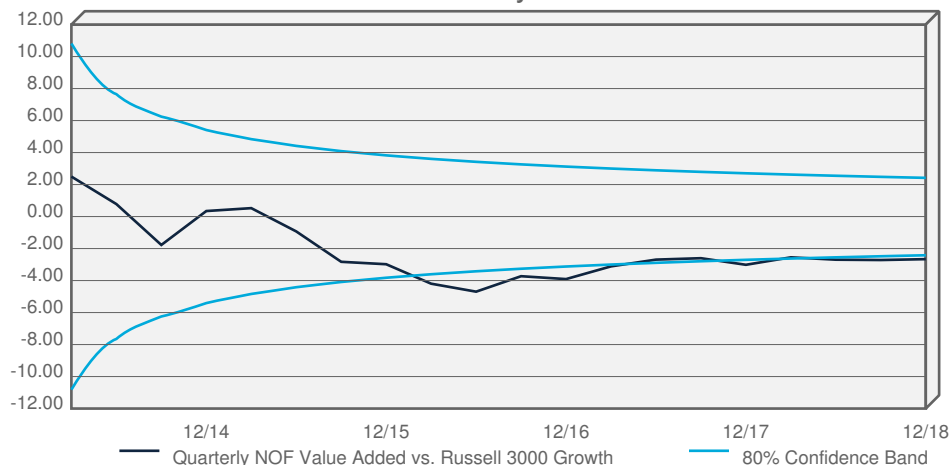
\*Compass Total Returns of Active Combination Value Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Westfield Capital

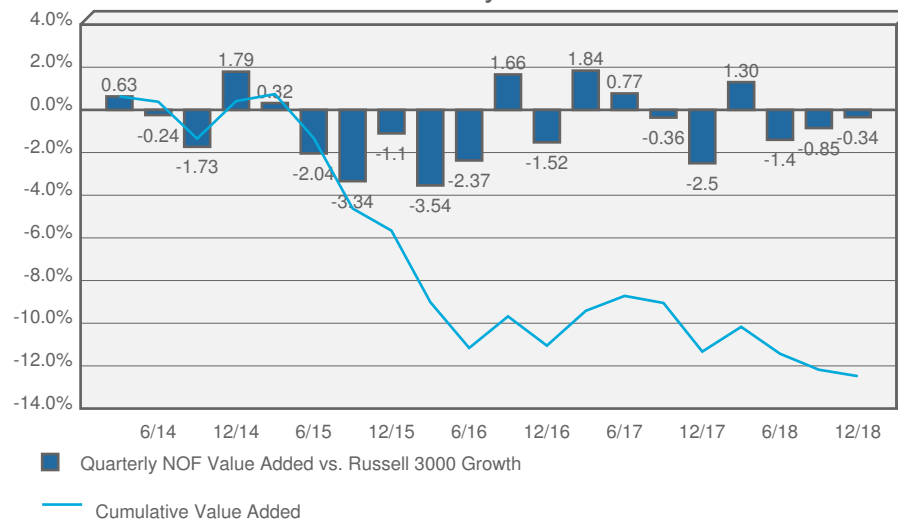
December 31, 2018

Cumulative Skill Analysis vs Benchmark

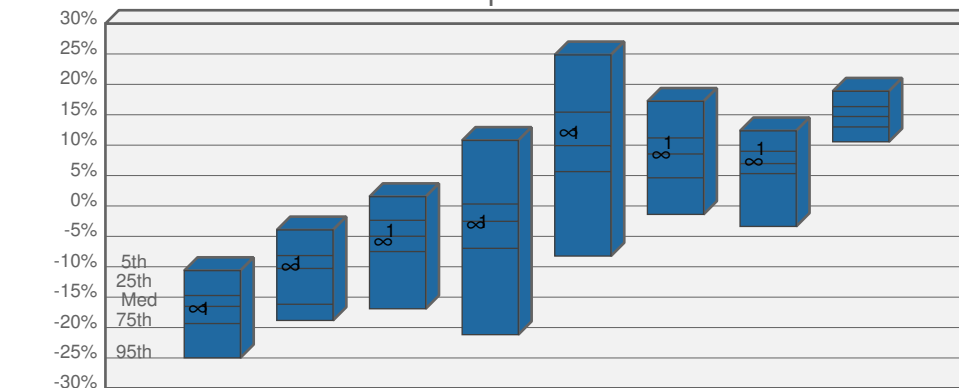


Excess Return:	-2.66	Information Ratio:	-0.81
Excess Risk:	3.29	T-Stat:	-1.81

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
∞ Westfield Capi	-16.54 (52)	-9.72 (45)	-5.54 (56)	-2.75 (52)	12.40 (35)	8.74 (46)	7.66 (43)	
1 Russell 3000 G	-16.33 (45)	-8.90 (33)	-3.55 (39)	-2.12 (49)	12.62 (35)	10.85 (25)	9.99 (17)	
Median	-16.52	-10.28	-4.98	-2.53	9.92	8.55	6.97	14.71
Number of Funds	48	48	48	48	48	47	46	40

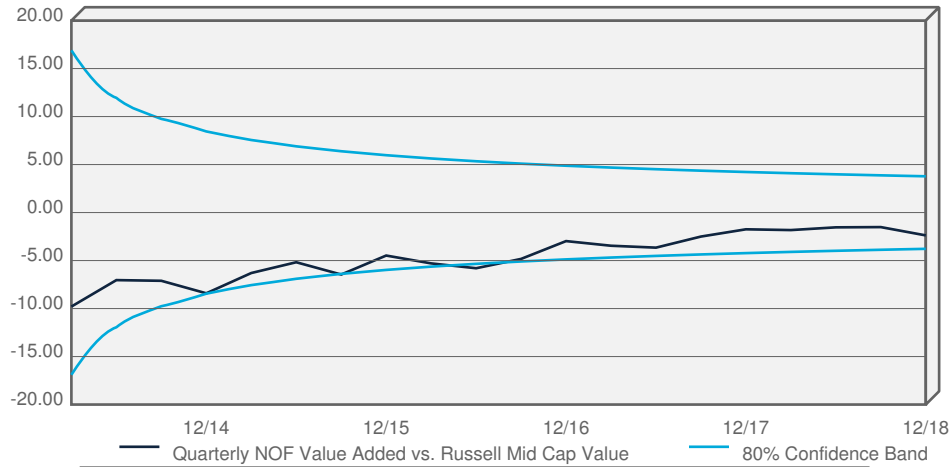
\*Compass Total Returns of Active Combination Growth Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

## Systematic

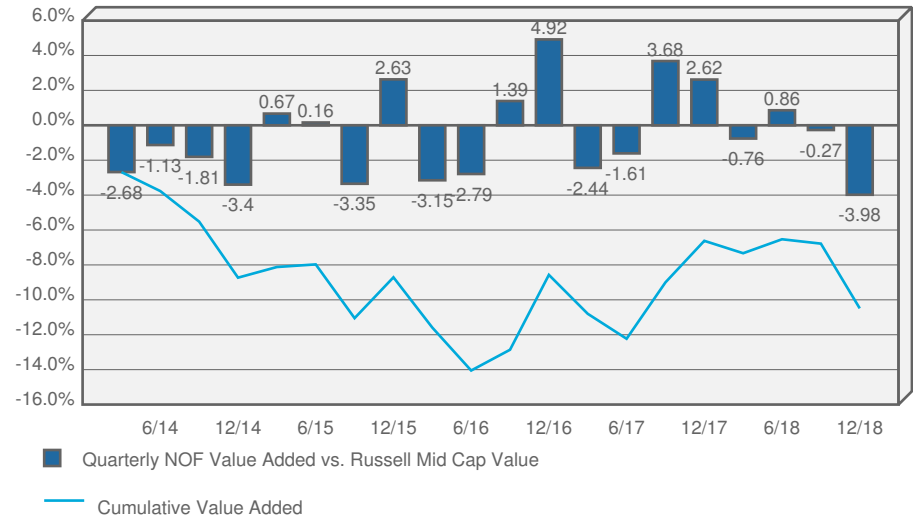
December 31, 2018

Cumulative Skill Analysis vs Benchmark

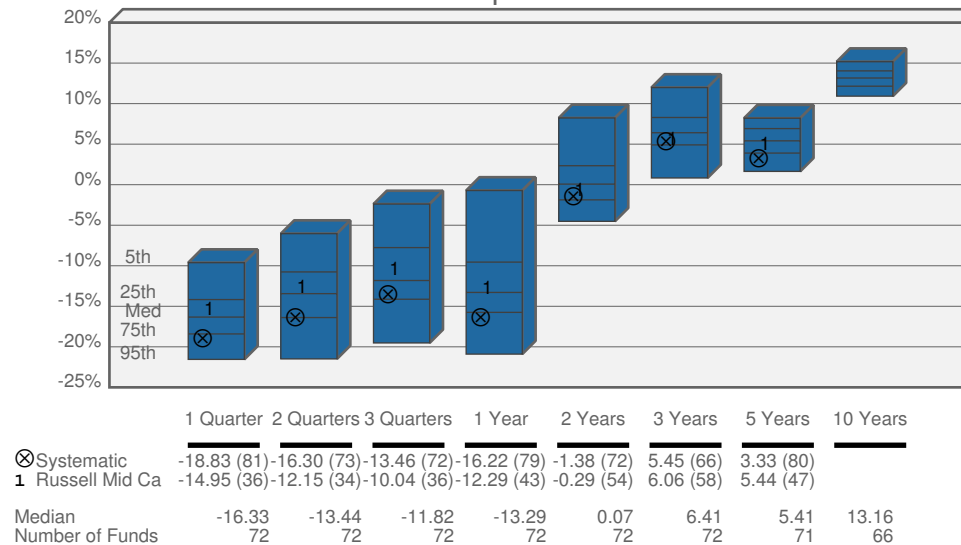


Excess Return:	-2.38	Information Ratio:	-0.46
Excess Risk:	5.14	T-Stat:	-1.04

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



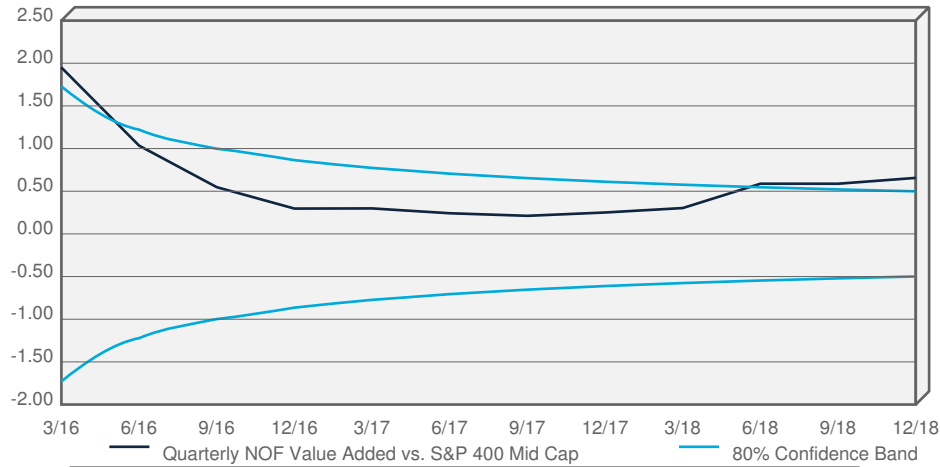
\*Compass Total Returns of Active Midcap Value Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Internal US Mid Cap

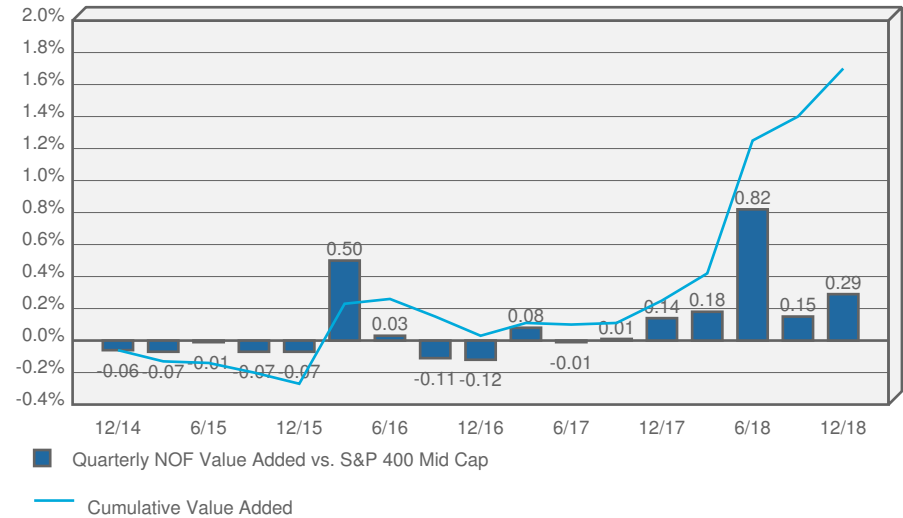
December 31, 2018

Cumulative Skill Analysis vs Benchmark

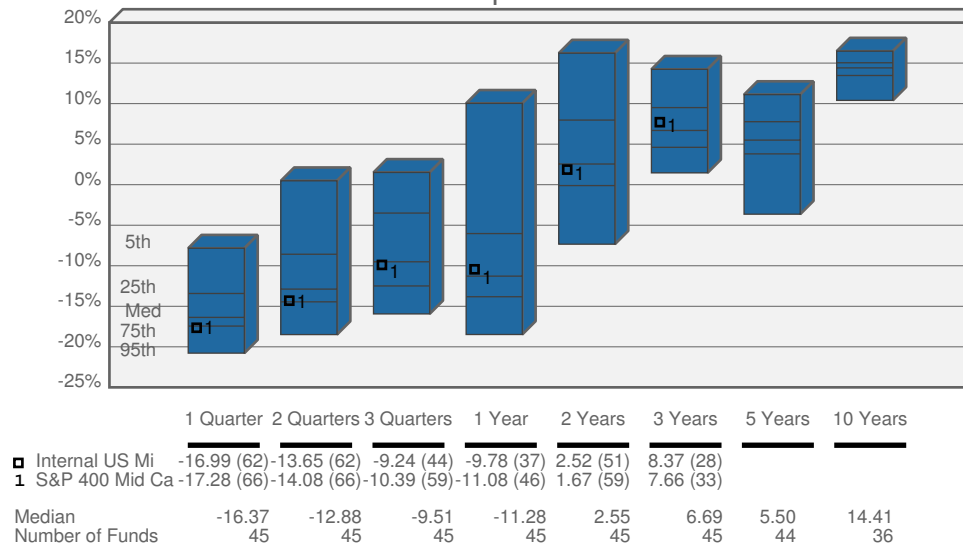


Excess Return:	0.66	Information Ratio:	1.25
Excess Risk:	0.53	T-Stat:	2.16

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



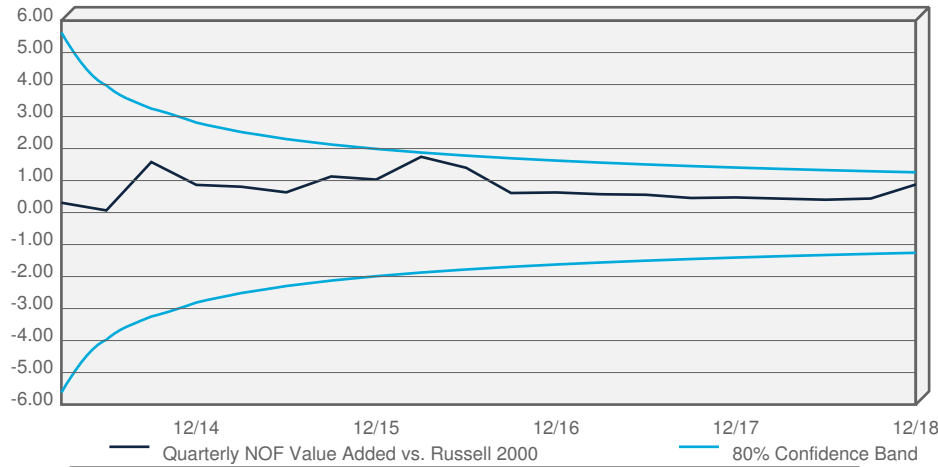
\*Compass Total Returns of Active Midcap Core Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

NTGI Structured

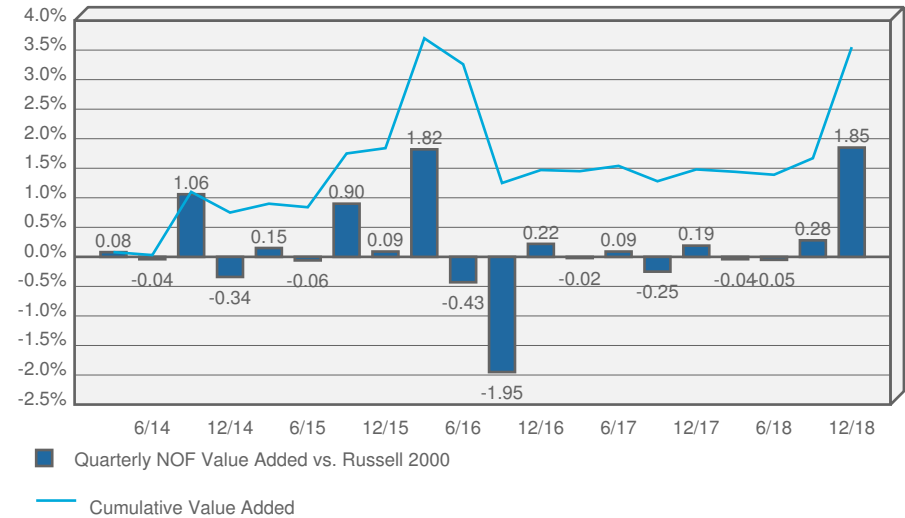
December 31, 2018

Cumulative Skill Analysis vs Benchmark

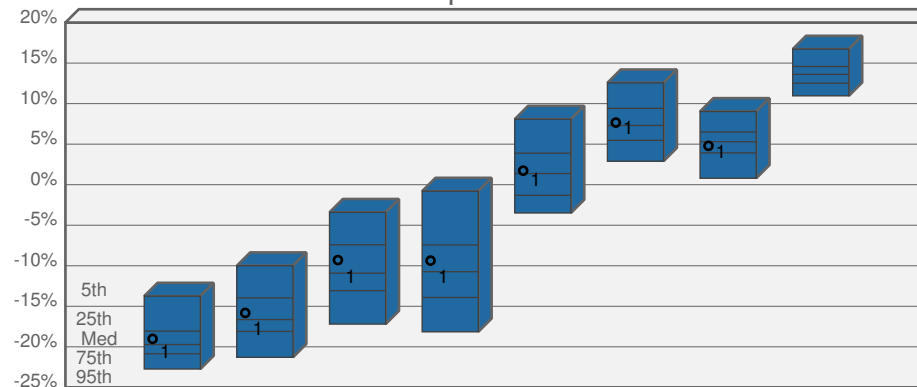


Excess Return:	0.88	Information Ratio:	0.51
Excess Risk:	1.71	T-Stat:	1.15

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
○ NTGI Structure	-18.36 (27)	-15.16 (36)	-8.64 (34)	-8.71 (31)	2.39 (38)	8.32 (32)	5.45 (46)	
■ Russell 2000	-20.20 (58)	-17.35 (59)	-10.94 (50)	-11.01 (52)	1.00 (55)	7.36 (49)	4.41 (67)	
Median	-19.72	-16.64	-10.91	-10.73	1.38	7.31	5.30	13.61
Number of Funds	104	104	104	104	103	102	99	88

\*Compass Total Returns of Active Small Cap Core Equity Portfolios Universe - Gross of Fees

# CUSTOM BENCHMARK SPECIFICATION

US Equity Composite

*December 31, 2018*

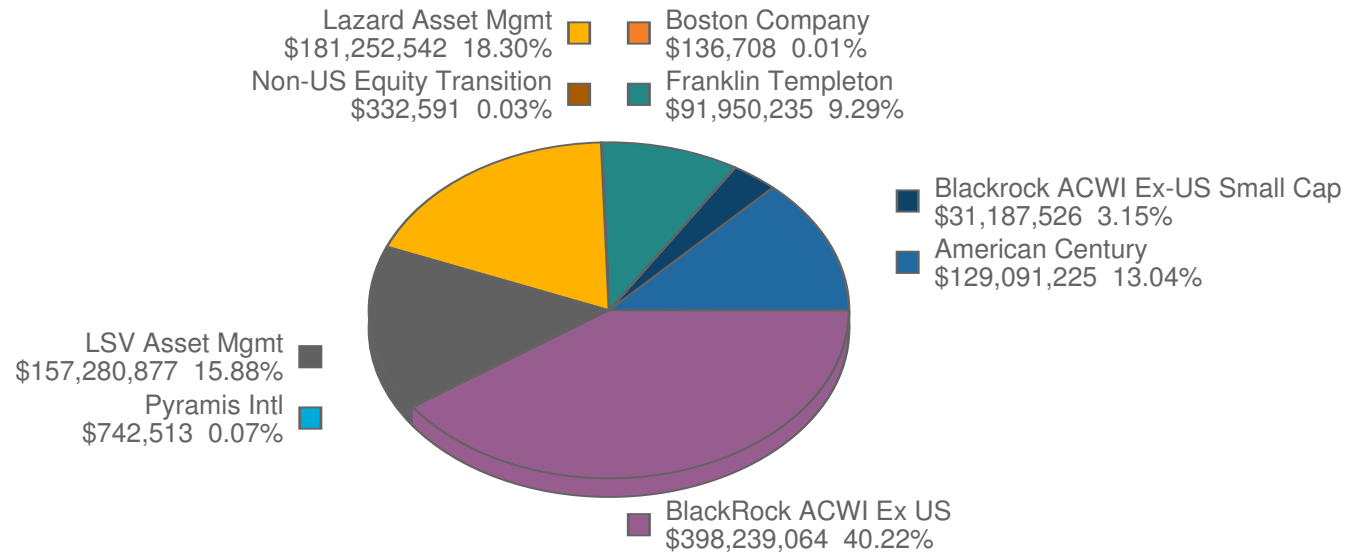
	Quarter Start	Quarter End	Percent	Description
Russell 3000	6/84	12/18	100.00	Russell 3000





# NON-US EQUITY

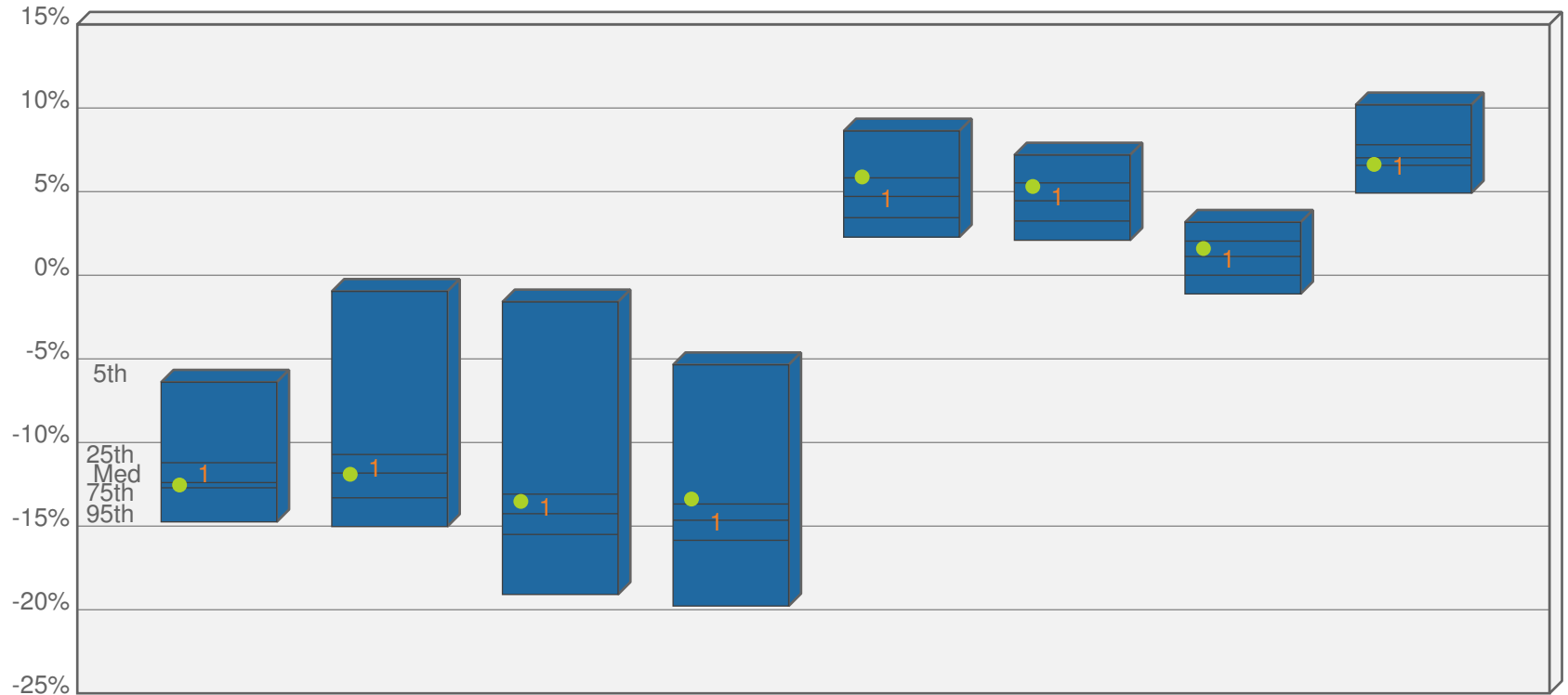
Wilshire Consulting  
**MANAGER ALLOCATION**  
 Non-US Equity Composite  
*As of December 31, 2018*



# PERFORMANCE COMPARISON

## Non-US Equity Composite

Periods Ended December 31, 2018



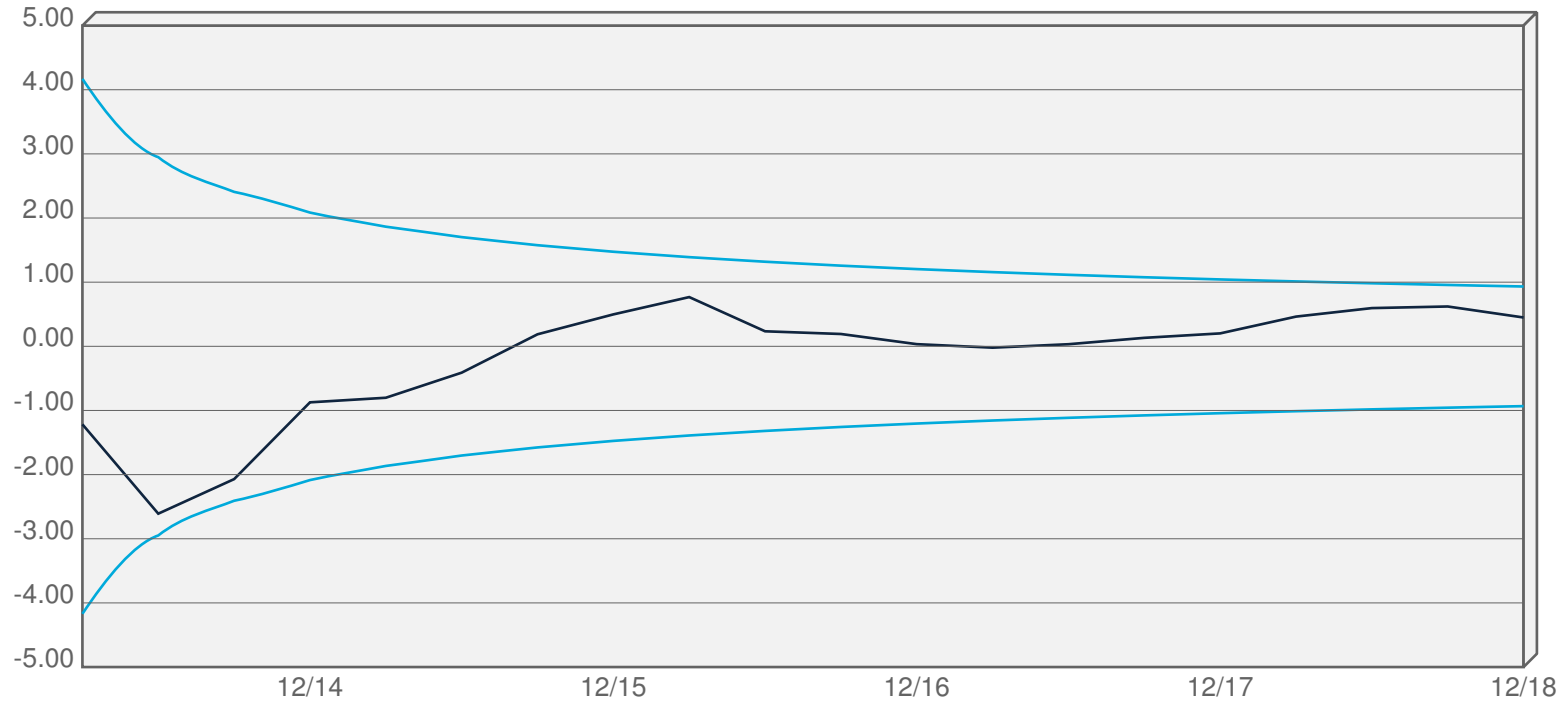
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
● Non-US Equity Composite	-12.47 (67)	-11.83 (50)	-13.45 (33)	-13.31 (21)	5.95 (22)	5.38 (28)	1.67 (36)	6.70 (66)
┆ Policy Index	-11.88 (37)	-11.53 (42)	-13.84 (36)	-14.76 (56)	4.58 (53)	4.69 (39)	0.98 (57)	6.54 (77)
5th %tile	-6.40	-0.97	-1.60	-5.36	8.62	7.18	3.16	10.18
25th %tile	-11.21	-10.72	-13.09	-13.68	5.82	5.52	2.04	7.80
Median	-12.40	-11.83	-14.26	-14.65	4.71	4.45	1.12	7.02
75th %tile	-12.71	-13.31	-15.50	-15.85	3.44	3.24	0.00	6.57
95th %tile	-14.75	-15.03	-19.09	-19.78	2.28	2.09	-1.12	4.91
Number of Funds	87	86	84	81	76	75	70	49

\*TUCS Total Ret of Non-US Equity Investment Pools Universe - Gross of Fees

# CUMULATIVE SKILL ANALYSIS

Non-US Equity Composite

Five Years Ending December 31, 2018



— Quarterly NOF Value Added vs. Policy Index

— 80% Confidence Band

Excess Return:	0.45	Information Ratio:	0.35
Excess Risk:	1.27	T-Stat:	0.79

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>BlackRock ACWI Ex US</b>									
<b>Net of Fee Return</b>	<b>-11.46</b>	<b>-10.84</b>	<b>-12.98</b>	<b>-14.16</b>	<b>4.84</b>	<b>0.89</b>		<b>6/30/12</b>	<b>4.88</b>
MSCI ACWI X US (N)	-11.46	-10.84	-13.17	-14.20	4.48	0.68		6/30/12	4.79
Value Added	0.01	0.00	0.19	0.03	0.37	0.22		6/30/12	0.09
<b>American Century</b>									
<b>Net of Fee Return</b>	<b>-15.52</b>	<b>-15.88</b>	<b>-15.20</b>	<b>-12.55</b>	<b>4.03</b>			<b>6/30/14</b>	<b>1.05</b>
Policy Index	-11.88	-11.53	-13.84	-14.76	4.63			6/30/14	-0.23
Value Added	-3.64	-4.35	-1.36	2.21	-0.60			6/30/14	1.28
<b>Franklin Templeton</b>									
<b>Net of Fee Return</b>	<b>-17.65</b>	<b>-19.46</b>	<b>-16.44</b>	<b>-14.47</b>	<b>6.14</b>			<b>6/30/14</b>	<b>2.47</b>
Policy Index	-11.88	-11.53	-13.84	-14.76	4.63			6/30/14	-0.23
Value Added	-5.78	-7.93	-2.60	0.29	1.51			6/30/14	2.70
<b>Lazard Asset Mgmt</b>									
<b>Net of Fee Return</b>	<b>-10.69</b>	<b>-10.08</b>	<b>-13.31</b>	<b>-11.92</b>	<b>4.18</b>			<b>6/30/14</b>	<b>1.06</b>
Policy Index	-11.88	-11.53	-13.84	-14.76	4.63			6/30/14	-0.23
Value Added	1.19	1.46	0.53	2.84	-0.46			6/30/14	1.29
<b>LSV Asset Mgmt</b>									
<b>Net of Fee Return</b>	<b>-11.09</b>	<b>-7.81</b>	<b>-12.10</b>	<b>-13.14</b>	<b>5.23</b>			<b>6/30/14</b>	<b>0.12</b>
Policy Index	-11.88	-11.53	-13.84	-14.76	4.63			6/30/14	-0.23
Value Added	0.79	3.73	1.75	1.62	0.60			6/30/14	0.35
<b>Blackrock ACWI Ex-US Small Cap</b>									
<b>Net of Fee Return</b>	<b>-14.47</b>	<b>-15.46</b>	<b>-17.67</b>	<b>-18.16</b>	<b>3.85</b>	<b>2.05</b>		<b>6/30/13</b>	<b>5.33</b>
MSCI ACWI X US Small Cap (N)	-14.43	-15.72	-17.91	-18.20	3.82	1.96		6/30/13	4.82
Value Added	-0.05	0.26	0.24	0.04	0.03	0.10		6/30/13	0.51

# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended December 31, 2018*

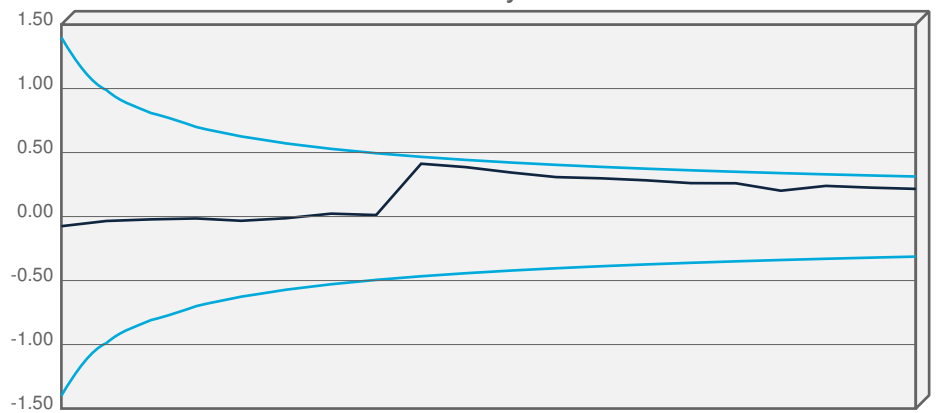
	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Non-US Equity Composite</b>									
<b>Net of Fee Return</b>	<b>-12.49</b>	<b>-11.92</b>	<b>-13.60</b>	<b>-13.53</b>	<b>5.12</b>	<b>1.43</b>	<b>4.82</b>	<b>3/31/00</b>	<b>1.67</b>
Policy Index	-11.88	-11.53	-13.84	-14.76	4.69	0.98	6.54	3/31/00	1.95
Value Added	<b>-0.61</b>	<b>-0.38</b>	0.24	1.23	0.44	0.45	<b>-1.72</b>	3/31/00	<b>-0.27</b>

# INVESTMENT MANAGER ANALYSIS

BlackRock ACWI Ex US

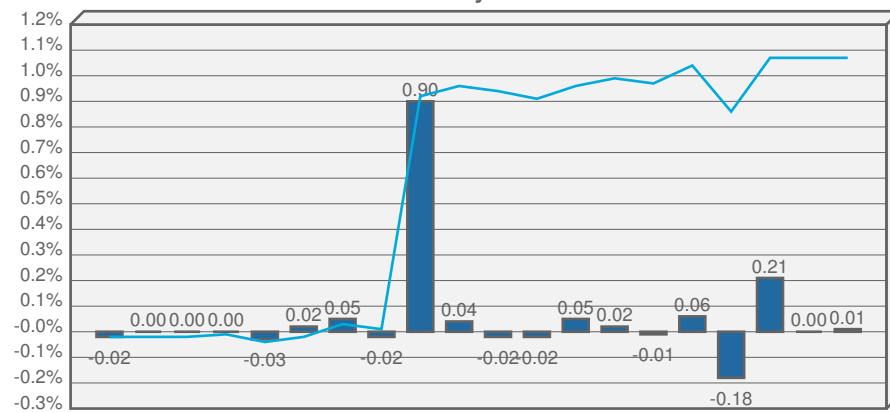
December 31, 2018

Cumulative Skill Analysis vs Benchmark



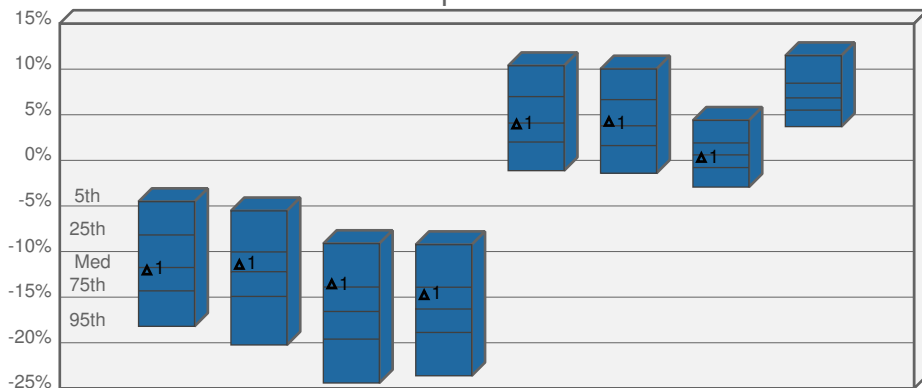
Quarterly NOF Value Added vs. MSCI ACWI X US (N)		80% Confidence Band
Excess Return:	0.22	Information Ratio: 0.51
Excess Risk:	0.43	T-Stat: 1.14

Value-Added Analysis vs Benchmark



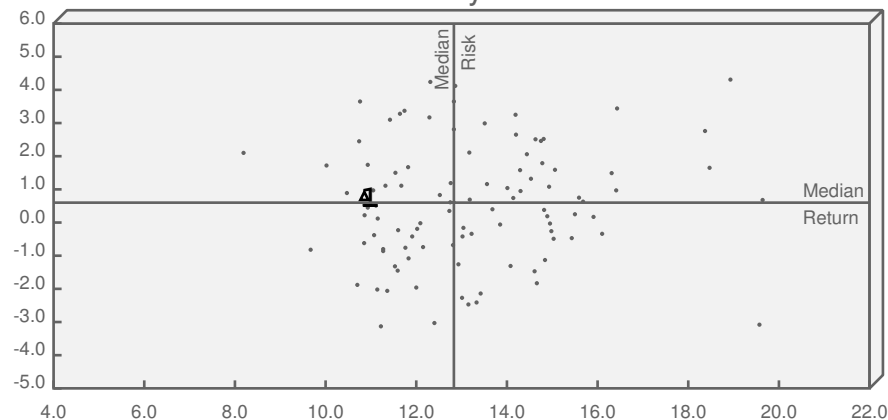
Quarterly NOF Value Added vs. MSCI ACWI X US (N)		Cumulative Value Added
--	--	------------------------

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▲ BlackRock ACWI-11.46 (46)	-10.84 (33)	-12.98 (18)	-14.16 (27)	4.55 (44)	4.84 (40)	0.89 (43)		
■ MSCI ACWI X US11.46 (46)	-10.84 (33)	-13.17 (20)	-14.20 (28)	4.47 (45)	4.48 (44)	0.68 (48)		
Median	-11.75	-12.21	-16.57	-16.30	4.09	3.79	0.60	6.85
Number of Funds	2532	2485	2447	2408	2220	2050	1588	957

Five Year Risk/Return Analysis vs Peer Universe\*



Description	Legend	Net Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
BlackRock ACWI Ex US	▲	0.89	43	11.09	82
MSCI ACWI X US (N)	■	0.68	48	11.10	82
Median		0.60		12.83	

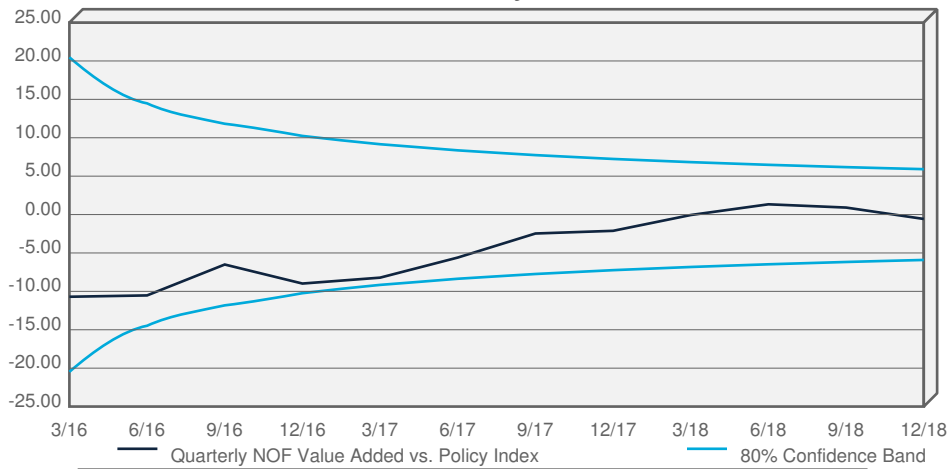
\*Lipper Total Returns of International Equity Mutual Funds Universe - Net of Fees

# INVESTMENT MANAGER ANALYSIS

American Century

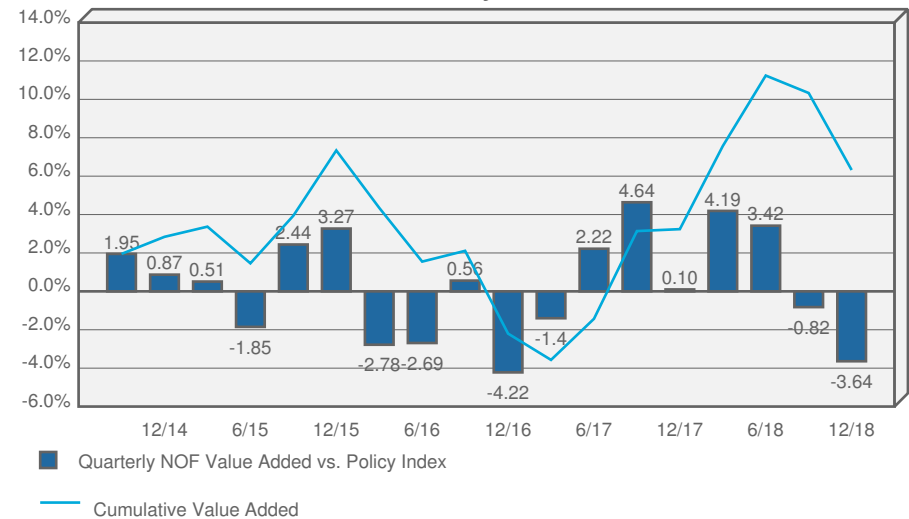
December 31, 2018

Cumulative Skill Analysis vs Benchmark

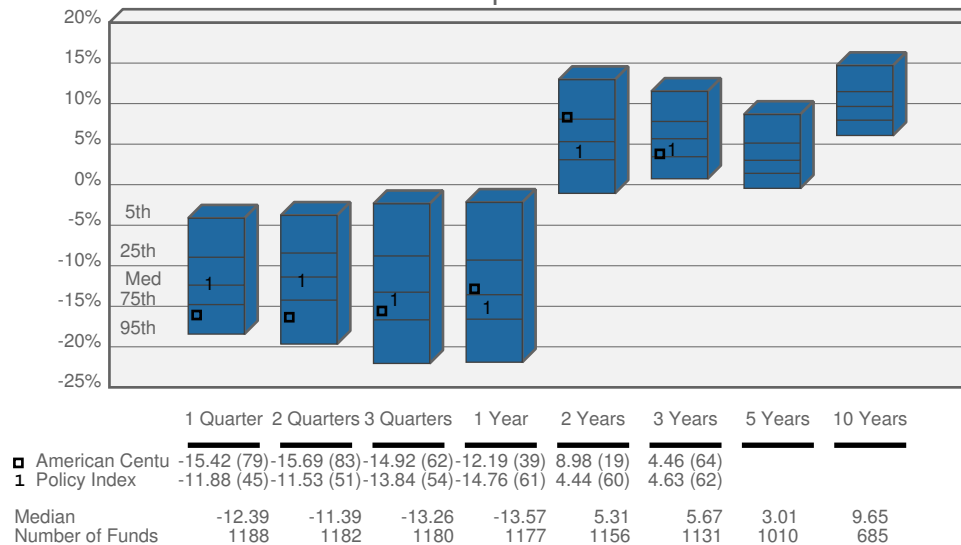


Excess Return:	-0.57	Information Ratio:	-0.09
Excess Risk:	6.22	T-Stat:	-0.16

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

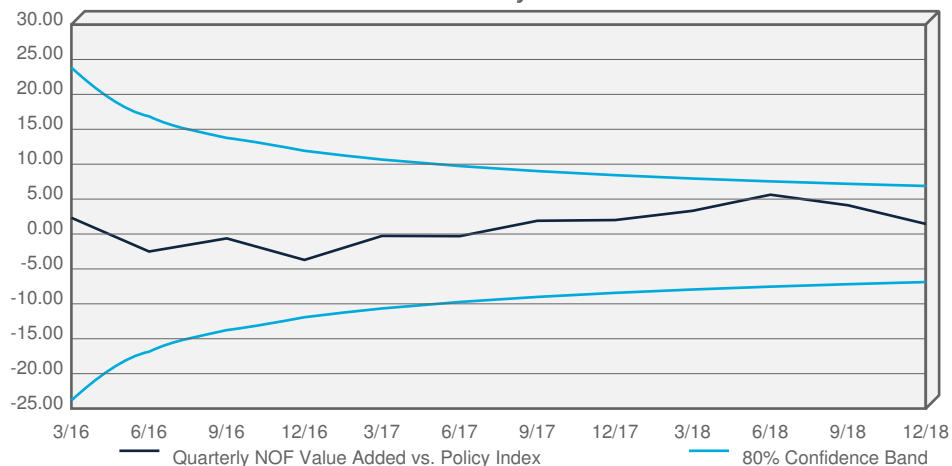


# INVESTMENT MANAGER ANALYSIS

Franklin Templeton

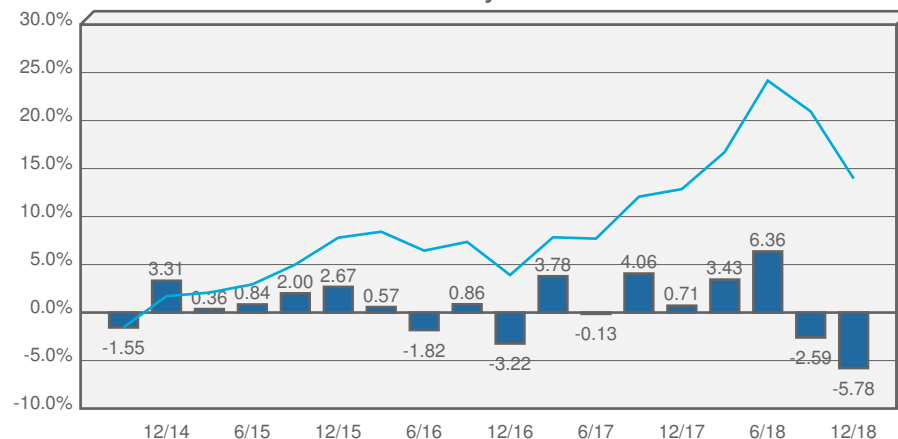
December 31, 2018

Cumulative Skill Analysis vs Benchmark



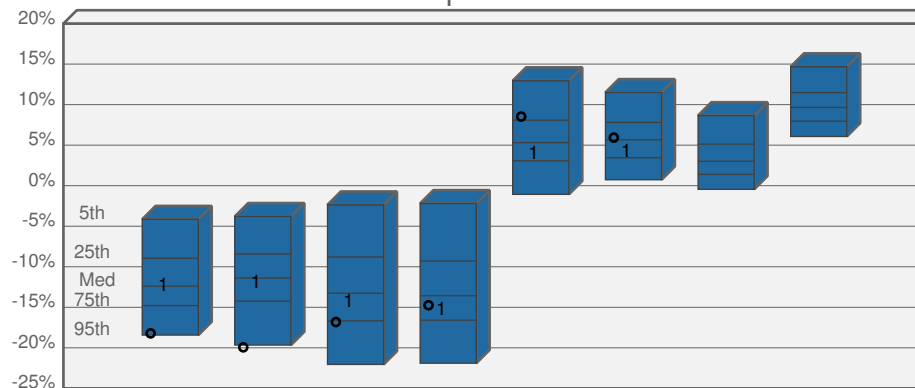
Excess Return:	1.44	Information Ratio:	0.20
Excess Risk:	7.25	T-Stat:	0.35

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. Policy Index  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
○ Franklin Templ	-17.56 (92)	-19.28 (94)	-16.16 (71)	-14.09 (54)	9.18 (17)	6.59 (39)		
■ Policy Index	-11.88 (45)	-11.53 (51)	-13.84 (54)	-14.76 (61)	4.44 (60)	4.63 (62)		
Median	-12.39	-11.39	-13.26	-13.57	5.31	5.67	3.01	9.65
Number of Funds	1188	1182	1180	1177	1156	1131	1010	685

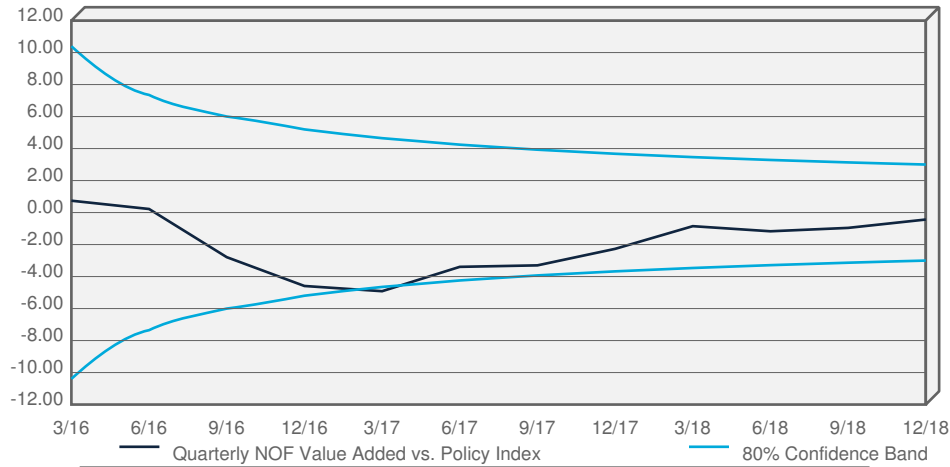
\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Lazard Asset Mgmt

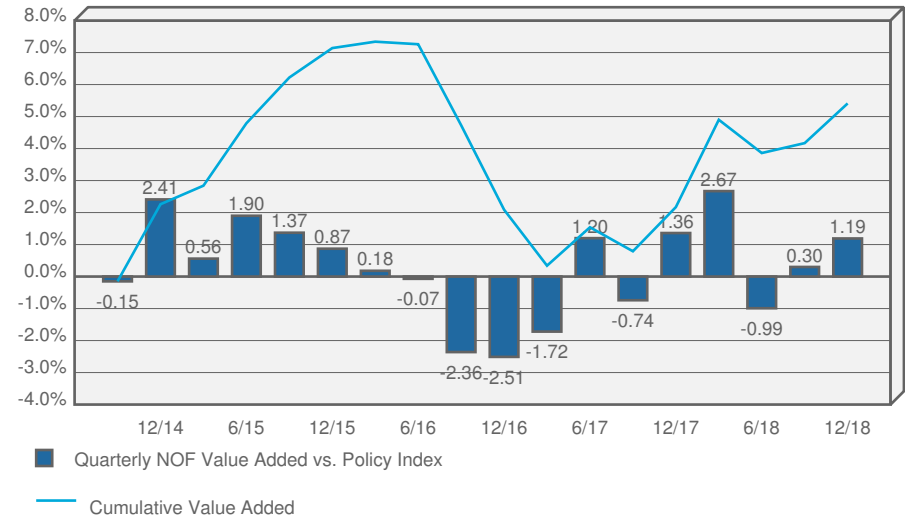
December 31, 2018

Cumulative Skill Analysis vs Benchmark

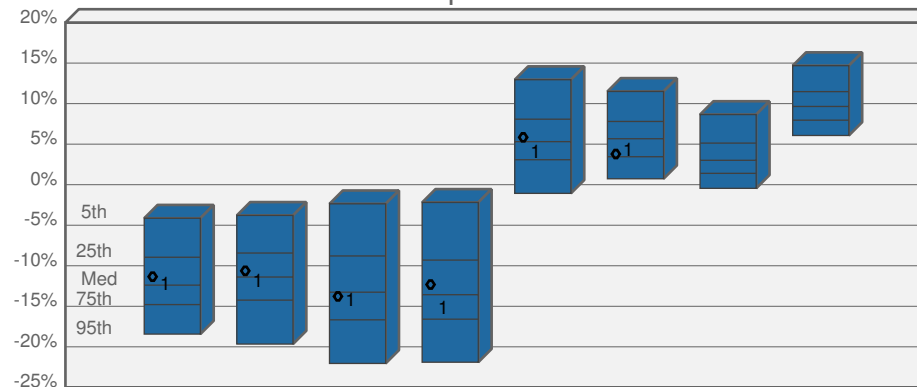


Excess Return:	-0.44	Information Ratio:	-0.14
Excess Risk:	3.16	T-Stat:	-0.24

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
○ Lazard Asset M	-10.69 (35)	-9.97 (34)	-13.12 (49)	-11.66 (36)	6.50 (37)	4.44 (64)		
1 Policy Index	-11.88 (45)	-11.53 (51)	-13.84 (54)	-14.76 (61)	4.44 (60)	4.63 (62)		
Median	-12.39	-11.39	-13.26	-13.57	5.31	5.67	3.01	9.65
Number of Funds	1188	1182	1180	1177	1156	1131	1010	685

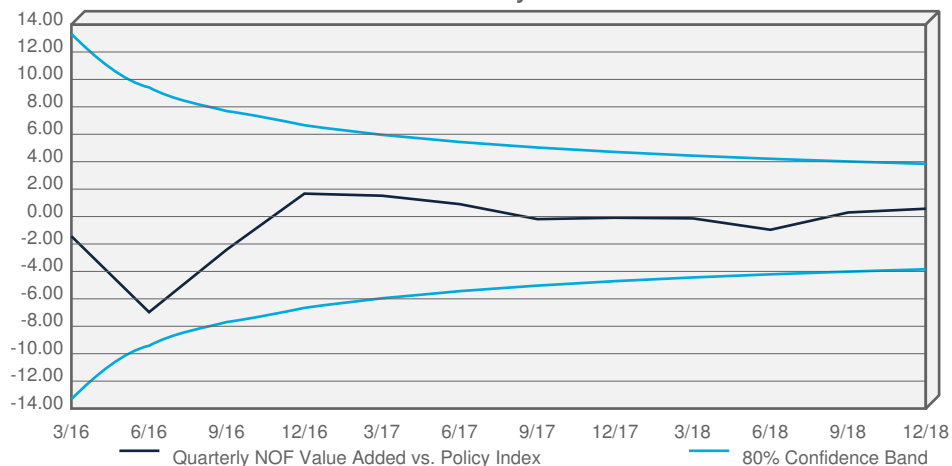
\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

LSV Asset Mgmt

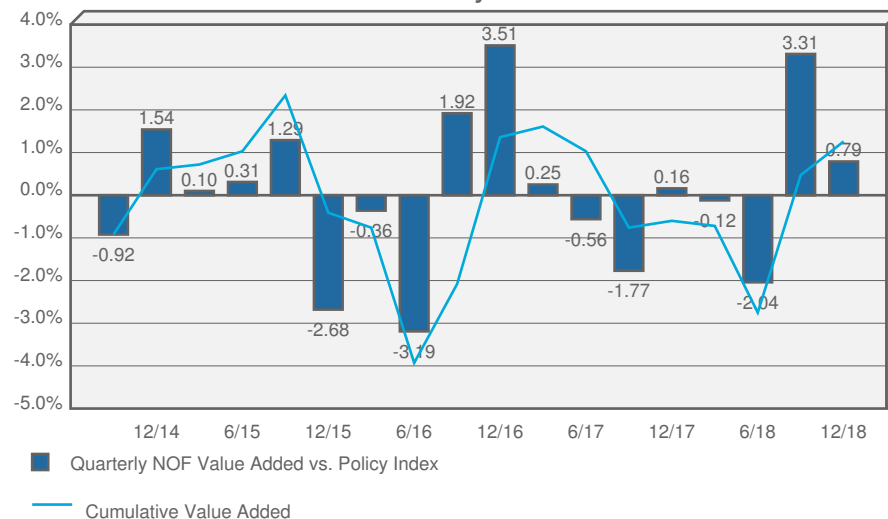
December 31, 2018

Cumulative Skill Analysis vs Benchmark

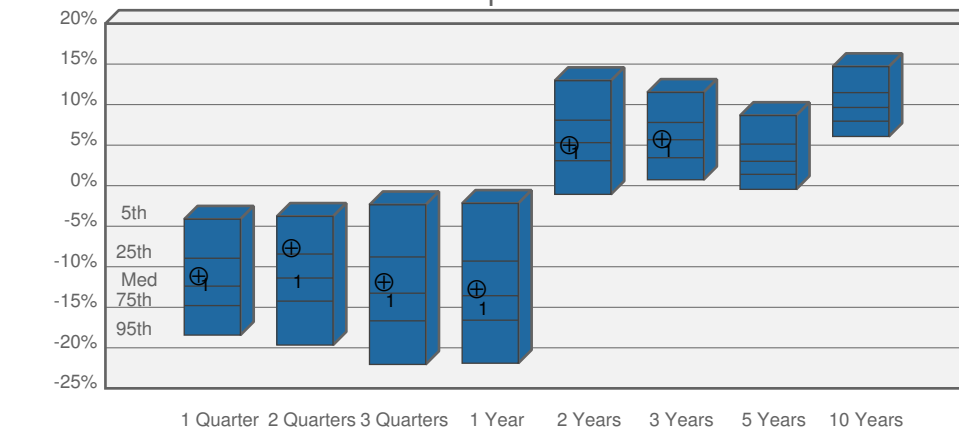


Excess Return:	0.57	Information Ratio:	0.14
Excess Risk:	4.05	T-Stat:	0.24

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊕ LSV Asset Mgmt	-11.08 (37)	-7.68 (20)	-11.82 (40)	-12.73 (43)	5.03 (53)	5.79 (48)		
⊖ Policy Index	-11.88 (45)	-11.53 (51)	-13.84 (54)	-14.76 (61)	4.44 (60)	4.63 (62)		
Median	-12.39	-11.39	-13.26	-13.57	5.31	5.67	3.01	9.65
Number of Funds	1188	1182	1180	1177	1156	1131	1010	685

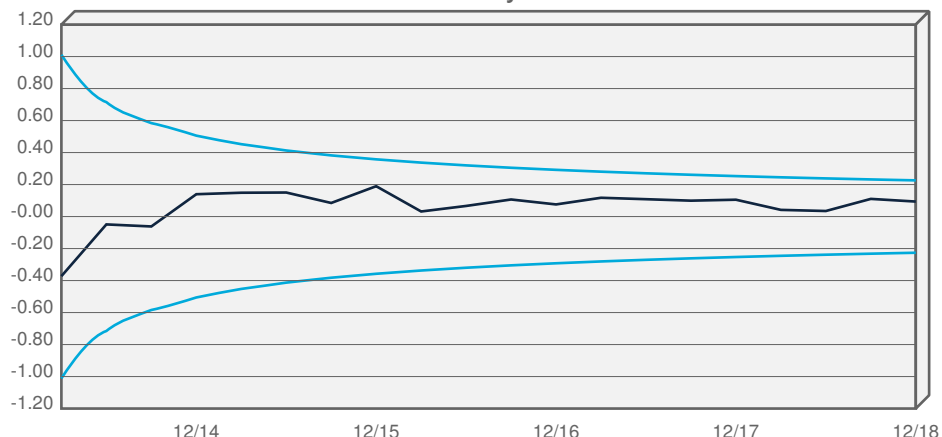
\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

## Blackrock ACWI Ex-US Small Cap

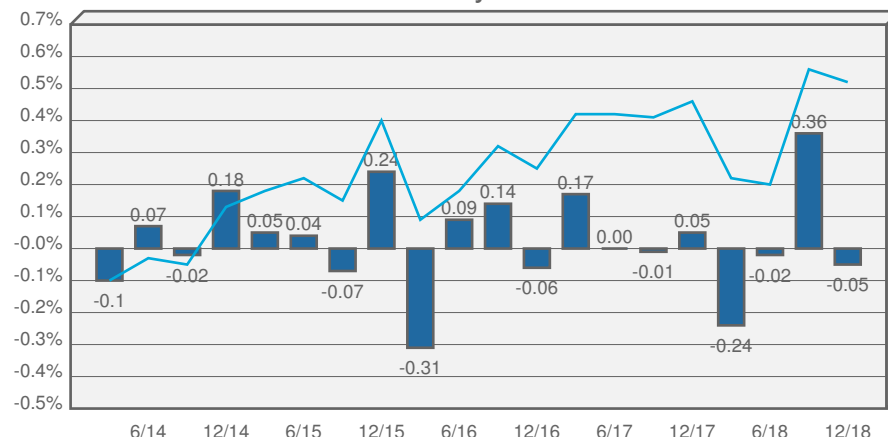
December 31, 2018

Cumulative Skill Analysis vs Benchmark



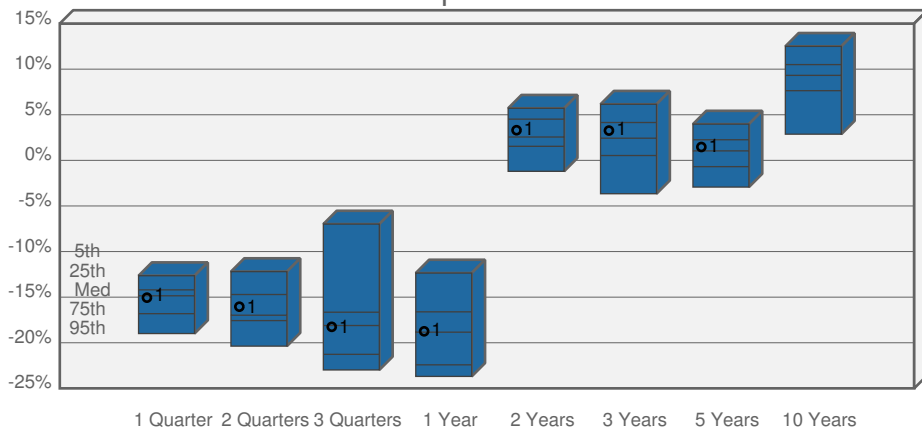
Excess Return:	0.09	Information Ratio:	0.30
Excess Risk:	0.31	T-Stat:	0.68

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. MSCI ACWI X US Small Cap (N)  
 — Cumulative Value Added

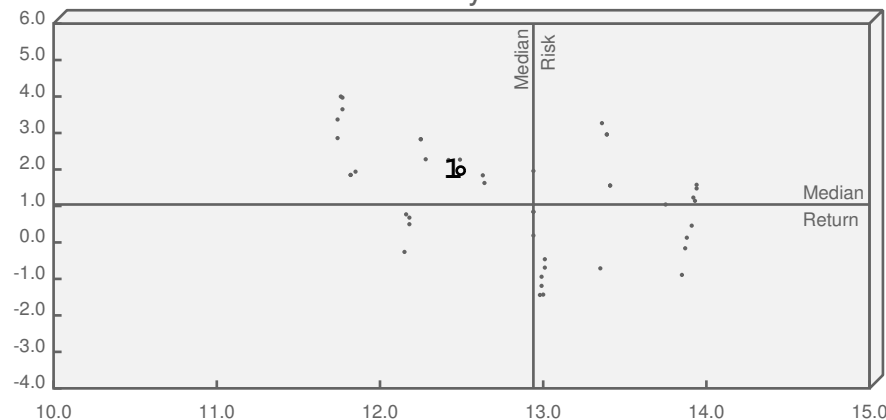
Performance Comparison vs Peer Universe\*



○ Blackrock ACWI	-14.47 (37)	-15.46 (39)	-17.67 (40)	-18.16 (39)	3.89 (28)	3.85 (28)	2.05 (25)
■ MSCI ACWI X US	14.43 (35)	-15.72 (39)	-17.91 (45)	-18.20 (39)	3.77 (28)	3.82 (28)	1.96 (27)

Median	-14.85	-16.98	-18.11	-18.84	2.56	2.43	1.04	9.32
Number of Funds	65	64	63	63	60	52	44	27

Five Year Risk/Return Analysis vs Peer Universe\*



Description	Legend	Net Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
Blackrock ACWI Ex-US Small Cap	○	2.05	25	12.56	54
MSCI ACWI X US Small Cap (N)	■	1.96	27	12.48	56
Median		1.04		12.94	

\*Lipper Total Returns of Intl Equity Small/Mid Core Mutual Funds Universe - Net of Fees

# CUSTOM BENCHMARK SPECIFICATION

Non-US Equity Composite

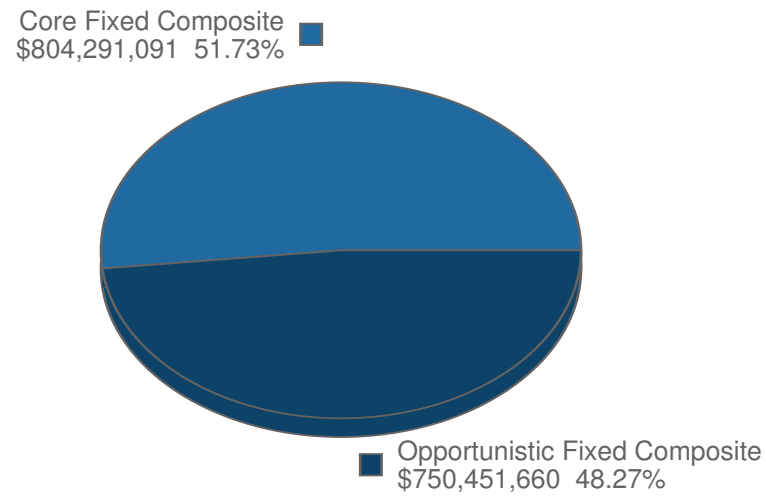
*December 31, 2018*

	Quarter Start	Quarter End	Percent	Description
Policy Index	6/00	6/17	100.00	Blended Non-US Benchmark
	9/17	9/17	100.00	MSCI ACWI Ex USA IMI Index (\$G)
	12/17	12/18	100.00	MSCI ACWI Ex USA IMI (\$N)

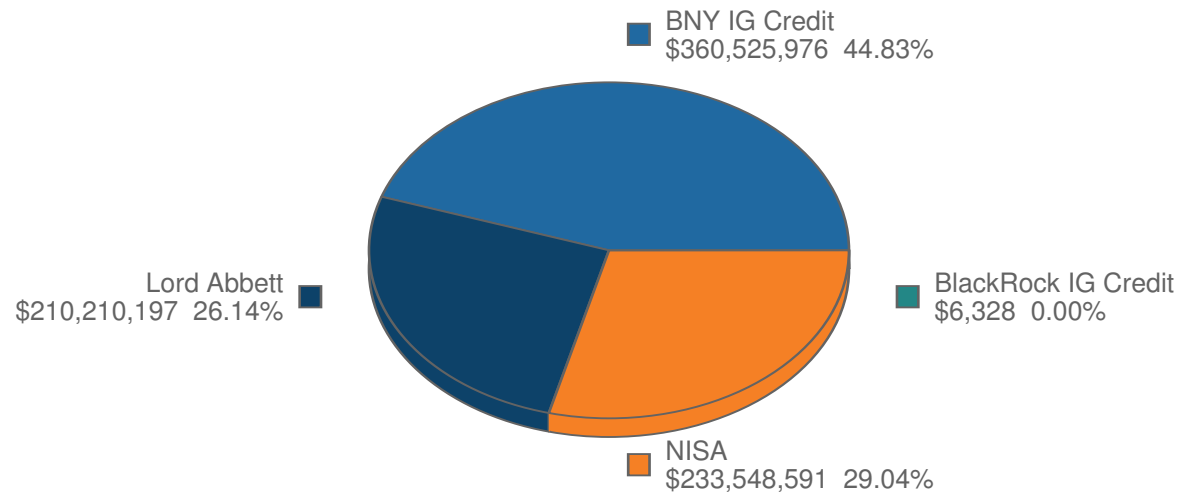


# FIXED INCOME

Wilshire Consulting  
MANAGER ALLOCATION  
Fixed Income Composite  
*As of December 31, 2018*

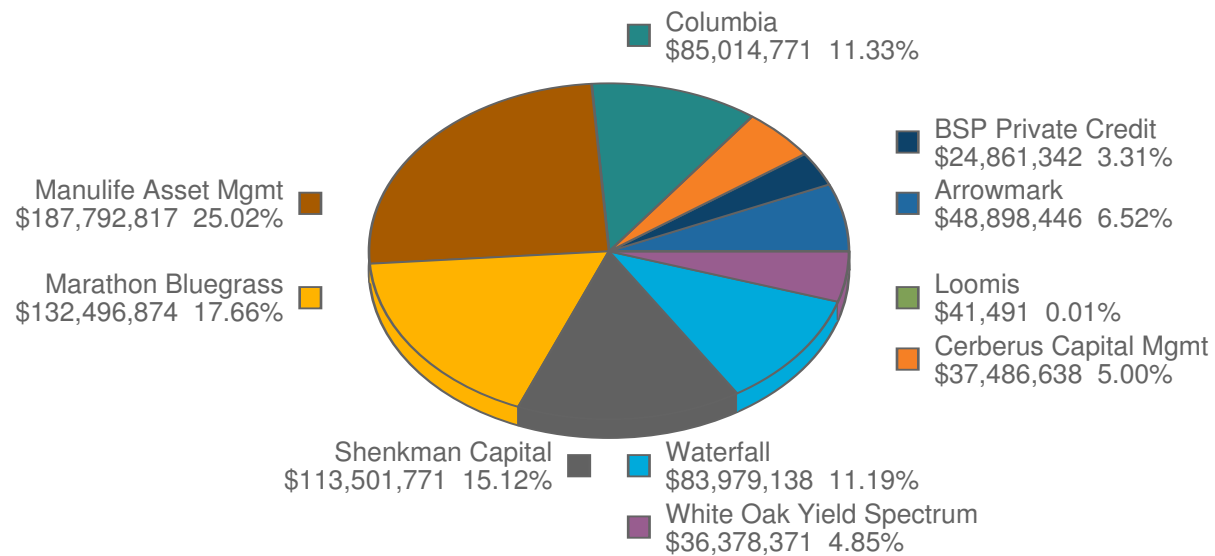


Wilshire Consulting  
MANAGER ALLOCATION  
Core Fixed Composite  
As of December 31, 2018





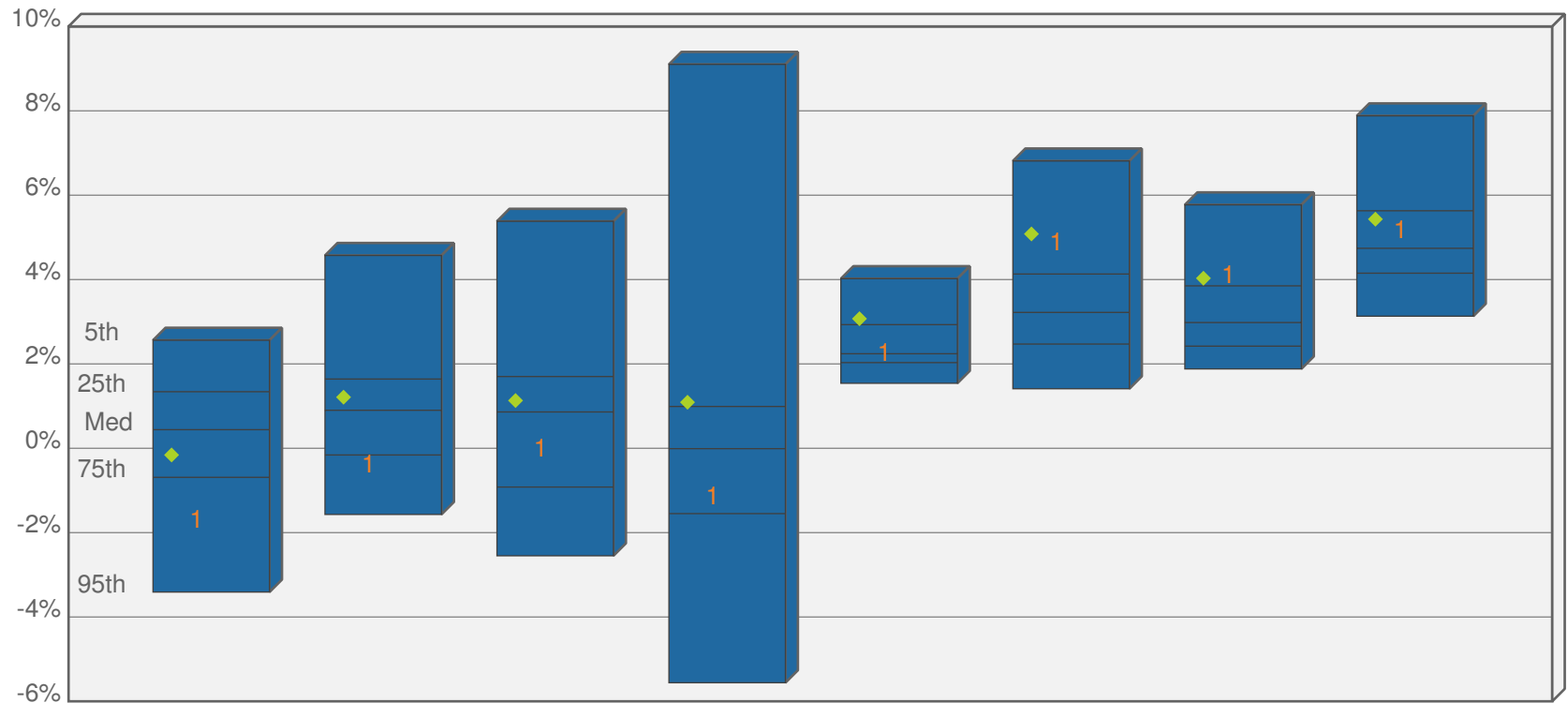
Wilshire Consulting  
**MANAGER ALLOCATION**  
 Opportunistic Fixed Composite  
 As of December 31, 2018



# PERFORMANCE COMPARISON

## Fixed Income Composite

Periods Ended December 31, 2018



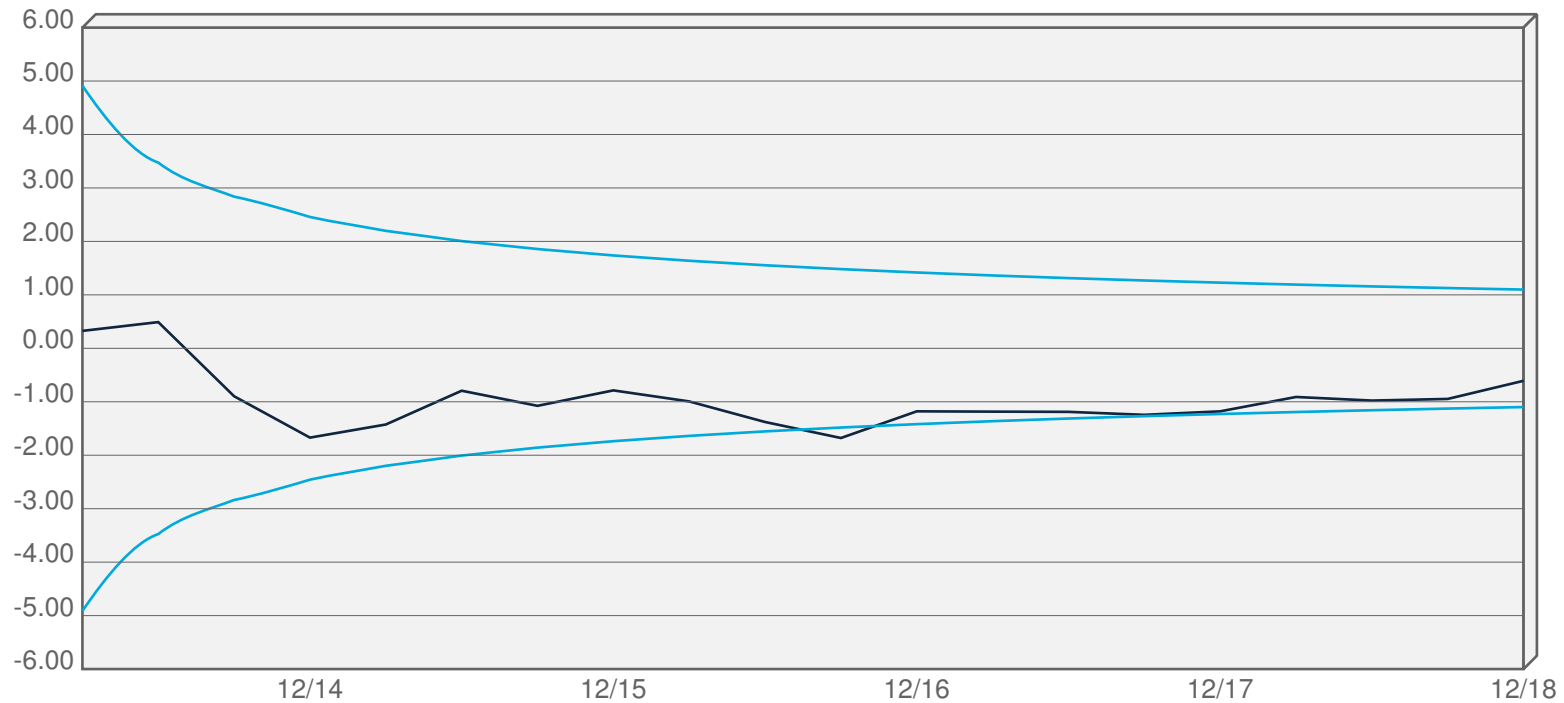
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
◆ Fixed Income Composite	-0.13 (57)	1.24 (44)	1.16 (45)	1.12 (21)	3.10 (20)	5.11 (11)	4.06 (15)	5.46 (31)
1 Policy Index	-1.68 (89)	-0.37 (83)	0.01 (62)	-1.12 (71)	2.27 (47)	4.91 (14)	4.13 (13)	5.20 (35)
5th %tile	2.56	4.57	5.38	9.10	4.02	6.81	5.77	7.88
25th %tile	1.34	1.64	1.70	0.99	2.93	4.13	3.85	5.63
Median	0.44	0.90	0.86	-0.01	2.24	3.22	2.98	4.74
75th %tile	-0.69	-0.16	-0.92	-1.55	2.03	2.47	2.42	4.15
95th %tile	-3.41	-1.57	-2.55	-5.56	1.54	1.41	1.88	3.13
Number of Funds	137	135	132	126	100	95	89	59

\*TUCS Total Ret of Fixed Income Investment Pools Universe - Gross of Fees

# CUMULATIVE SKILL ANALYSIS

Fixed Income Composite

Five Years Ending December 31, 2018



— Quarterly NOF Value Added vs. Policy Index

— 80% Confidence Band

Excess Return:	-0.61	Information Ratio:	-0.41
Excess Risk:	1.49	T-Stat:	-0.91

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>BNY IG Credit</b>									
<b>Net of Fee Return</b>	<b>0.75</b>	<b>1.49</b>	<b>1.48</b>	<b>0.04</b>				<b>12/31/17</b>	<b>0.04</b>
Bloomberg Int Credit	0.75	1.48	1.40	0.01				12/31/17	0.01
Value Added	-0.00	0.01	0.08	0.03				12/31/17	0.03
<b>Lord Abbett</b>									
<b>Net of Fee Return</b>	<b>0.54</b>							<b>9/30/18</b>	<b>0.54</b>
10Bloomberg Aggregate	1.64							9/30/18	1.64
Value Added	-1.10							9/30/18	-1.10
<b>NISA</b>									
<b>Net of Fee Return</b>	<b>1.57</b>	<b>1.54</b>	<b>1.34</b>	<b>-0.09</b>	<b>2.22</b>	<b>2.70</b>		<b>6/30/11</b>	<b>2.76</b>
Bloomberg Aggregate	1.64	1.66	1.49	0.01	2.06	2.52		6/30/11	2.62
Value Added	-0.06	-0.12	-0.16	-0.11	0.16	0.18		6/30/11	0.14
<b>Core Fixed Composite</b>									
<b>Net of Fee Return</b>	<b>0.93</b>							<b>9/30/18</b>	<b>0.93</b>
Bloomberg Universal	1.17							9/30/18	1.17
Value Added	-0.24							9/30/18	-0.24
<b>Arrowmark</b>									
<b>Net of Fee Return</b>	<b>2.17</b>	<b>4.81</b>						<b>6/30/18</b>	<b>4.81</b>
S&P LSTA Leverage Loan Index	-3.45	-1.68						6/30/18	-1.68
Value Added	5.63	6.49						6/30/18	6.49
<b>BSP Private Credit</b>									
<b>Net of Fee Return</b>	<b>2.42</b>	<b>2.79</b>	<b>2.49</b>					<b>3/31/18</b>	<b>2.49</b>
S&P LSTA Leverage Loan Index	-3.45	-1.68	-0.99					3/31/18	-0.99
Value Added	5.87	4.47	3.48					3/31/18	3.48

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Cerberus Capital Mgmt</b>									
<b>Net of Fee Return</b>	<b>2.74</b>	<b>5.50</b>	<b>7.23</b>	<b>9.79</b>	<b>8.62</b>			<b>9/30/14</b>	<b>8.54</b>
S&P LSTA Leverage Loan	-3.45	-1.68	-0.99	0.44	4.83			9/30/14	3.10
Value Added	6.20	7.18	8.22	9.35	3.78			9/30/14	5.45
<b>Columbia</b>									
<b>Net of Fee Return</b>	<b>-4.65</b>	<b>-1.82</b>	<b>-1.50</b>	<b>-3.07</b>	<b>5.21</b>	<b>3.96</b>		<b>12/31/11</b>	<b>5.90</b>
Bloomberg High Yield	-4.53	-2.24	-1.24	-2.08	7.23	3.83		12/31/11	5.98
Value Added	-0.12	0.42	-0.27	-0.98	-2.02	0.13		12/31/11	-0.08
<b>Manulife Asset Mgmt</b>									
<b>Net of Fee Return</b>	<b>-1.27</b>	<b>-0.45</b>	<b>-2.06</b>	<b>-2.48</b>	<b>2.06</b>	<b>1.96</b>		<b>12/31/11</b>	<b>3.38</b>
Policy Index	1.17	1.44	1.17	-0.25	2.56	0.95		12/31/11	1.04
Value Added	-2.44	-1.89	-3.23	-2.22	-0.50	1.02		12/31/11	2.34
<b>Marathon Bluegrass</b>									
<b>Net of Fee Return</b>	<b>0.09</b>	<b>3.41</b>	<b>3.60</b>	<b>5.01</b>	<b>7.40</b>			<b>12/31/15</b>	<b>7.40</b>
Bloomberg High Yield	-4.53	-2.24	-1.24	-2.08	7.23			12/31/15	7.23
Value Added	4.62	5.65	4.84	7.09	0.17			12/31/15	0.17
<b>Shenkman Capital</b>									
<b>Net of Fee Return</b>	<b>-3.09</b>	<b>-1.15</b>	<b>-0.90</b>	<b>0.58</b>	<b>4.13</b>	<b>2.11</b>		<b>6/30/11</b>	<b>3.54</b>
S&P LSTA Leverage Loan	-3.45	-1.68	-0.99	0.44	4.83	3.33		6/30/11	4.66
Value Added	0.37	0.53	0.09	0.14	-0.70	-1.22		6/30/11	-1.11
<b>Waterfall</b>									
<b>Net of Fee Return</b>	<b>0.84</b>	<b>2.62</b>	<b>4.14</b>	<b>7.32</b>	<b>9.29</b>	<b>7.89</b>		<b>6/30/11</b>	<b>9.93</b>
Policy Index	-2.67	-0.97	-0.07	-0.31	5.54	3.16		6/30/11	4.05
Value Added	3.51	3.59	4.21	7.63	3.75	4.73		6/30/11	5.88

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

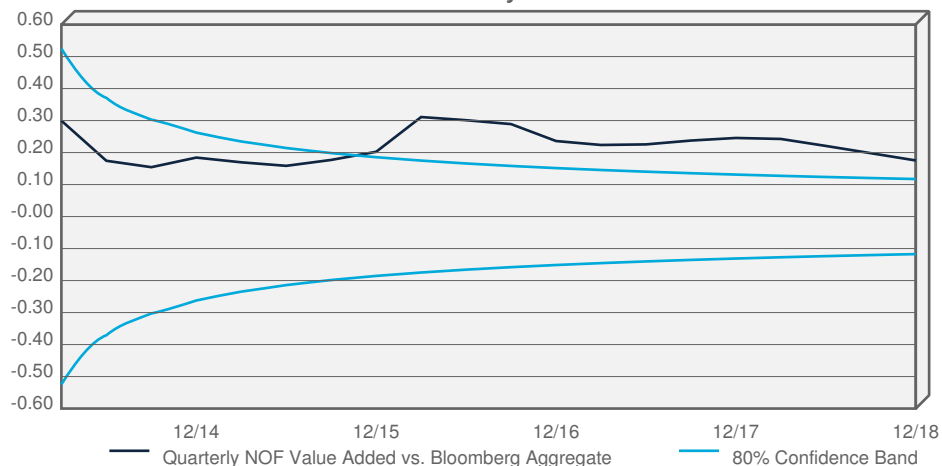
	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>White Oak Yield Spectrum</b>									
<b>Net of Fee Return</b>	<b>1.17</b>	<b>2.41</b>	<b>2.76</b>					<b>3/31/18</b>	<b>2.76</b>
S&P LSTA Leverage Loan Index	-3.45	-1.68	-0.99					3/31/18	-0.99
Value Added	4.62	4.09	3.75					3/31/18	3.75
<b>Opportunistic Fixed Composite</b>									
<b>Net of Fee Return</b>	<b>-0.99</b>							<b>9/30/18</b>	<b>-0.99</b>
Bloomberg High Yield	-4.53							9/30/18	-4.53
Value Added	3.54							9/30/18	3.54
<b>Fixed Income Composite</b>									
<b>Net of Fee Return</b>	<b>-0.23</b>	<b>1.01</b>	<b>0.85</b>	<b>0.57</b>	<b>4.40</b>	<b>3.49</b>	<b>5.06</b>	<b>6/30/92</b>	<b>6.22</b>
Policy Index	-1.70	-0.39	-0.02	-1.14	4.90	4.12	5.20	6/30/92	6.16
Value Added	1.48	1.40	0.87	1.71	-0.51	-0.63	-0.13	6/30/92	0.06
Bloomberg Global Aggregate	1.20	0.26	-2.53	-1.20	2.70	1.08	2.49	6/30/92	4.94

# INVESTMENT MANAGER ANALYSIS

NISA

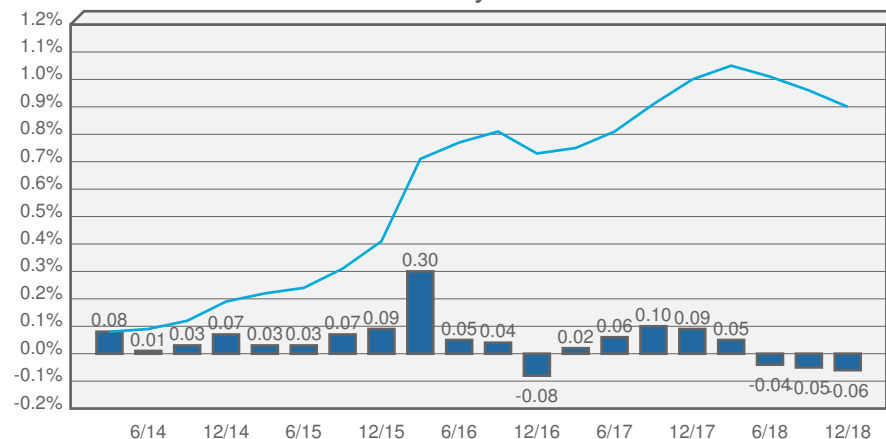
December 31, 2018

Cumulative Skill Analysis vs Benchmark



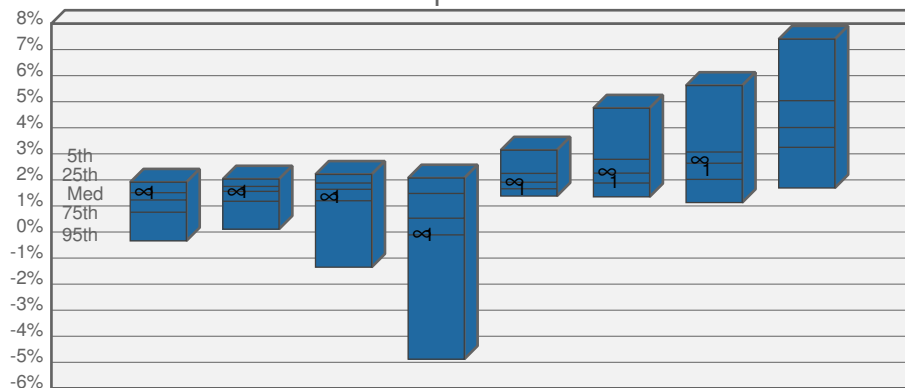
Excess Return:	0.18	Information Ratio:	1.10
Excess Risk:	0.16	T-Stat:	2.46

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. Bloomberg Aggregate  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
∞ NISA	1.61 (17)	1.61 (42)	1.43 (66)	0.03 (68)	1.99 (40)	2.41 (41)	2.87 (35)	
1 Bloomberg Aggr	1.64 (14)	1.65 (37)	1.49 (61)	0.01 (69)	1.76 (63)	2.06 (62)	2.52 (55)	
Median	1.23	1.56	1.64	0.53	1.91	2.26	2.64	4.01
Number of Funds	335	334	331	331	329	325	313	271

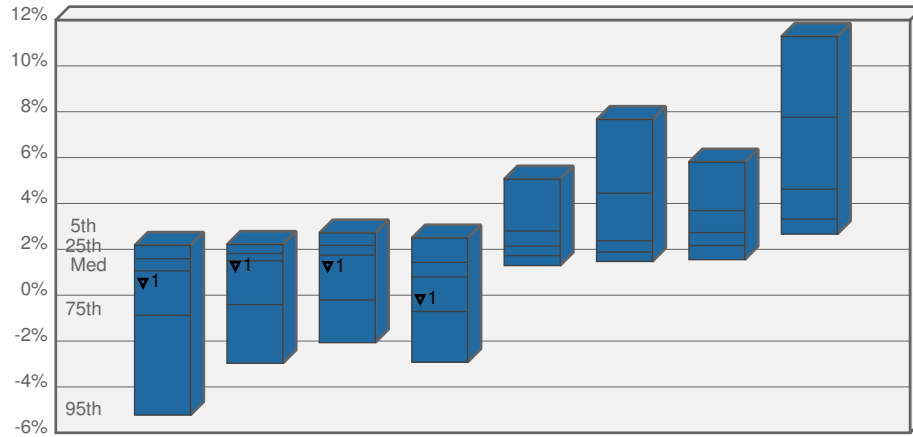
\*Compass Total Returns of Active Core Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

BNY IG Credit

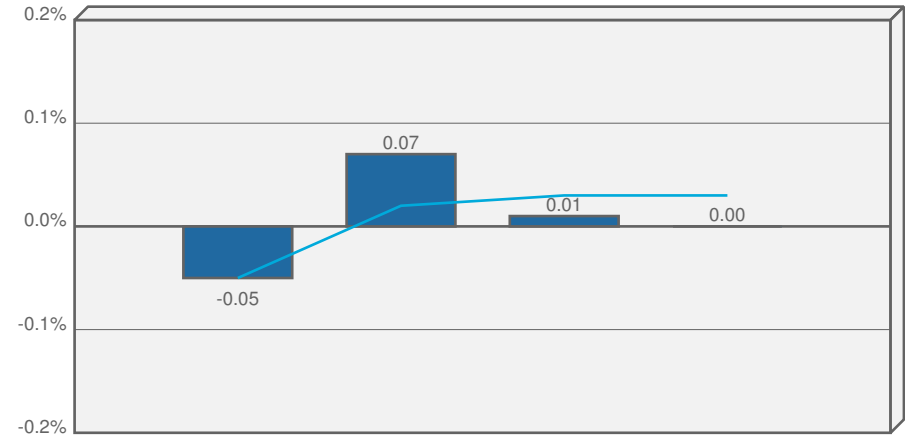
December 31, 2018

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▼ BNY IG Credit	0.76 (57)	1.50 (50)	1.49 (57)	0.05 (65)				
1 Bloomberg Int	0.75 (57)	1.48 (50)	1.40 (59)	0.01 (65)				
Median	1.06	1.50	1.75	0.79	2.14	2.37	2.73	4.62
Number of Funds	353	353	350	350	348	346	329	288

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. Bloomberg Int Credit  
 — Cumulative Value Added

\*Compass Total Returns of Active Intermediate Fixed Income Portfolios Universe - Gross of Fees

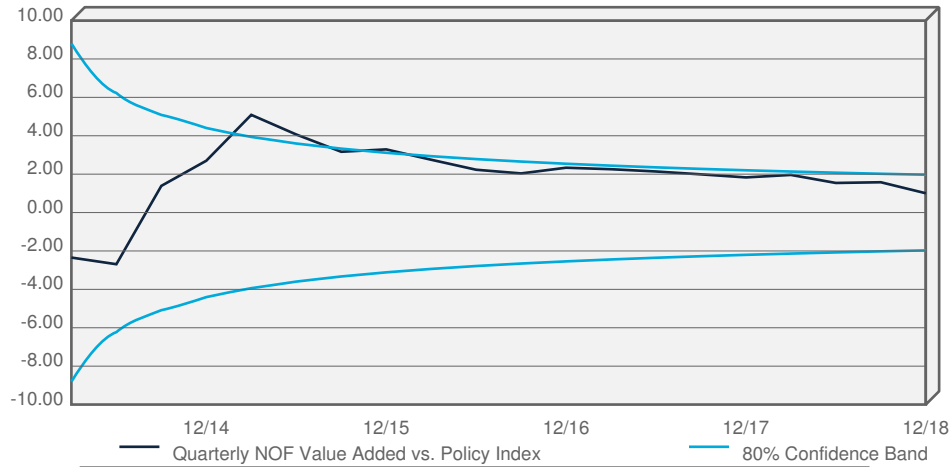


# INVESTMENT MANAGER ANALYSIS

Manulife Asset Mgmt

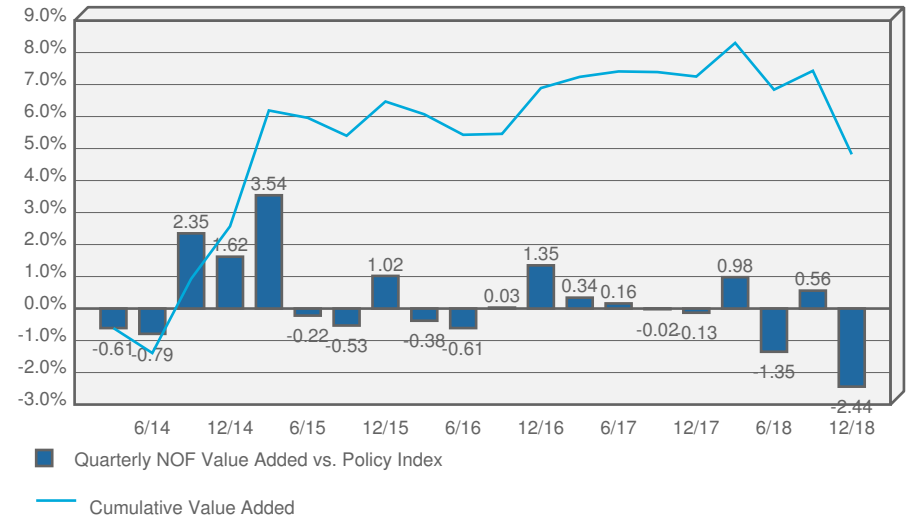
December 31, 2018

Cumulative Skill Analysis vs Benchmark

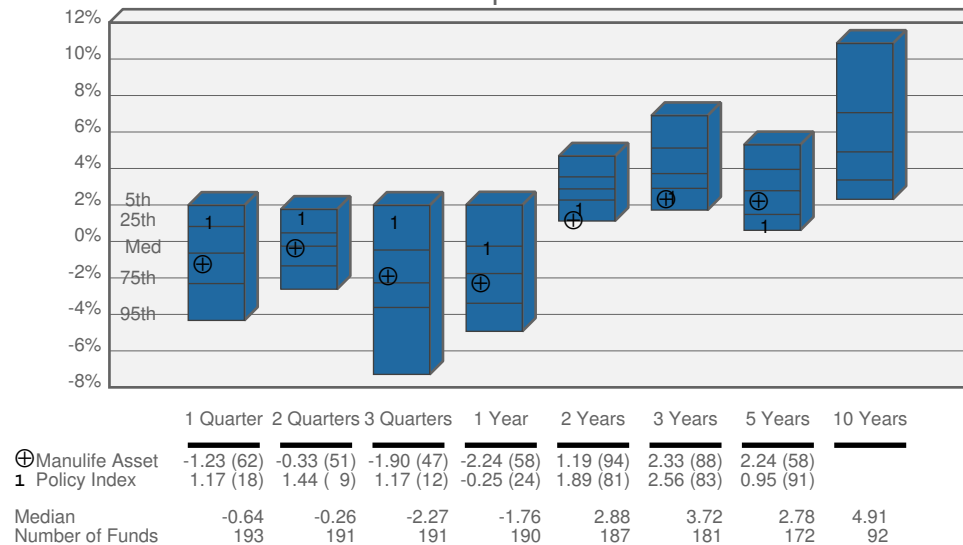


Excess Return:	1.01	Information Ratio:	0.38
Excess Risk:	2.68	T-Stat:	0.84

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



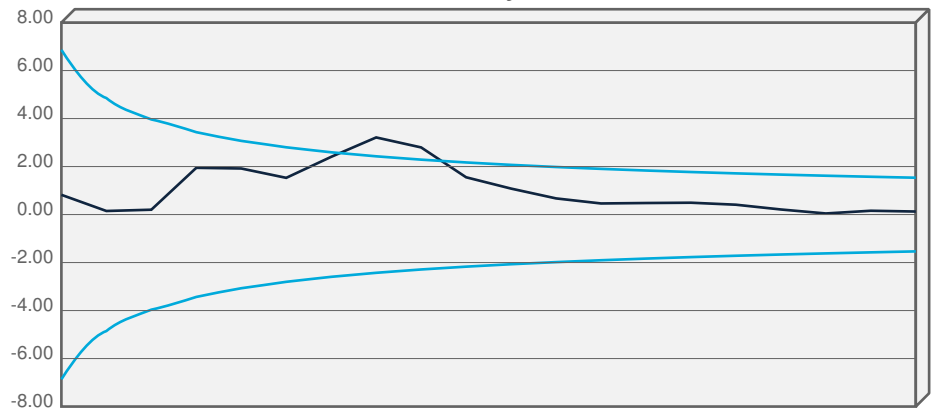
\*Compass Total Returns of Active Global Intl Fixed Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Columbia

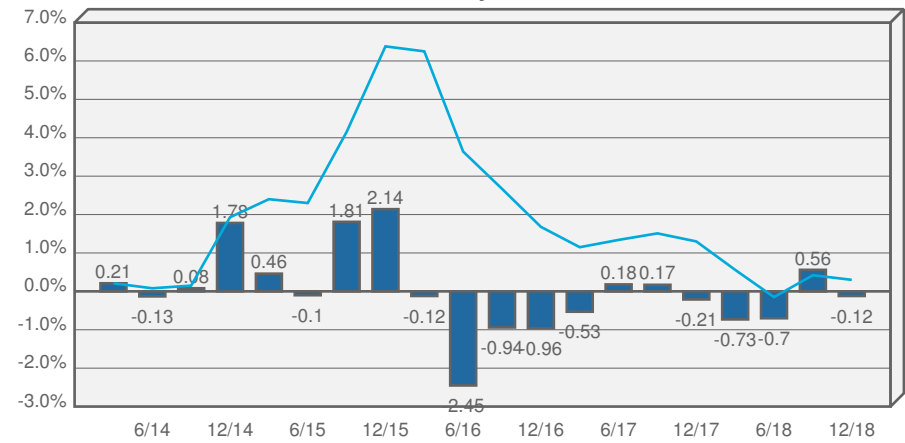
December 31, 2018

Cumulative Skill Analysis vs Benchmark



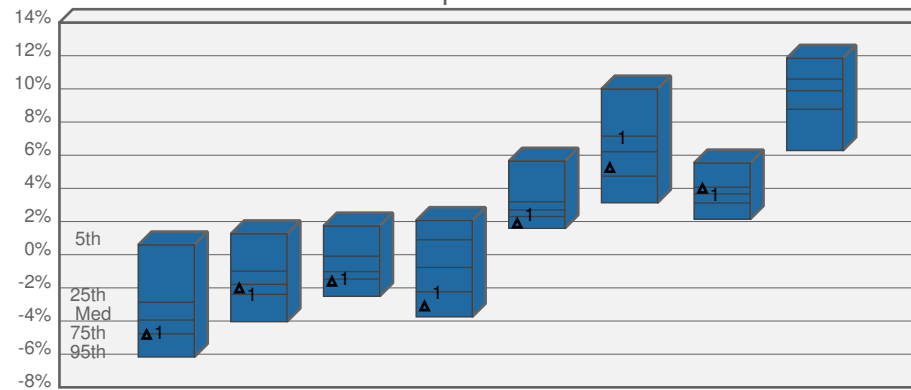
Excess Return:	0.13	Information Ratio:	0.06
Excess Risk:	2.09	T-Stat:	0.13

Value-Added Analysis vs Benchmark



Quarterly NOF Value Added vs. Bloomberg High Yield  
Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▲ Columbia	-4.49 (69)	-1.70 (46)	-1.29 (66)	-2.78 (87)	2.22 (78)	5.57 (61)	4.32 (21)	
▮ Bloomberg High	-4.53 (70)	-2.24 (70)	-1.24 (63)	-2.08 (71)	2.60 (56)	7.23 (24)	3.83 (36)	
Median	-3.94	-1.79	-1.02	-0.77	2.70	6.21	3.67	9.89
Number of Funds	182	182	182	182	179	176	165	108

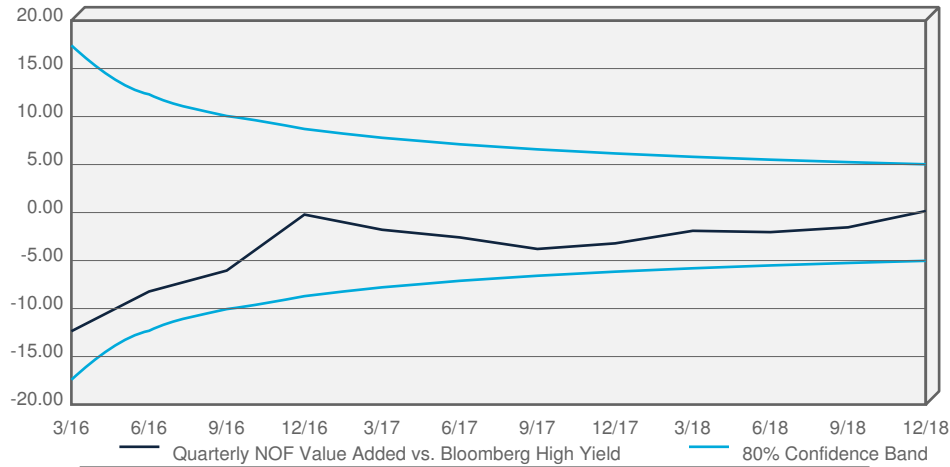
\*Compass Total Returns of Active High Yield Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

## Marathon Bluegrass

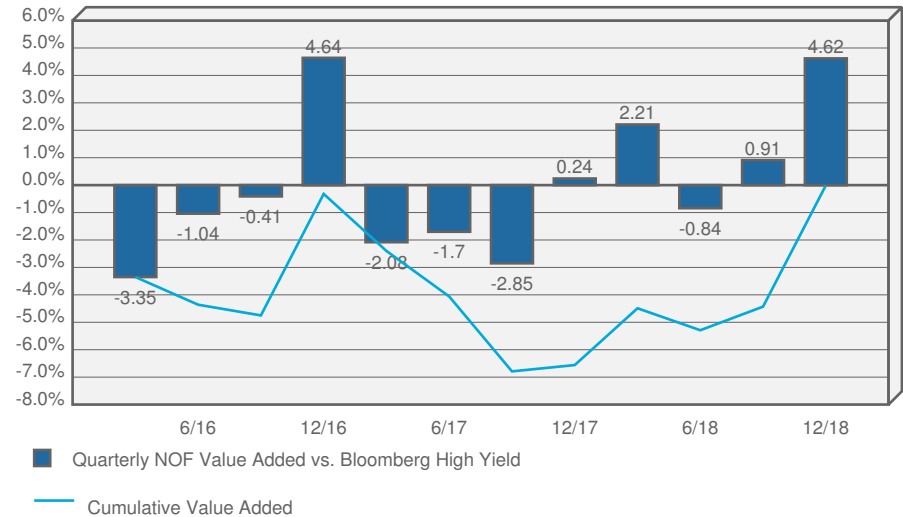
December 31, 2018

Cumulative Skill Analysis vs Benchmark

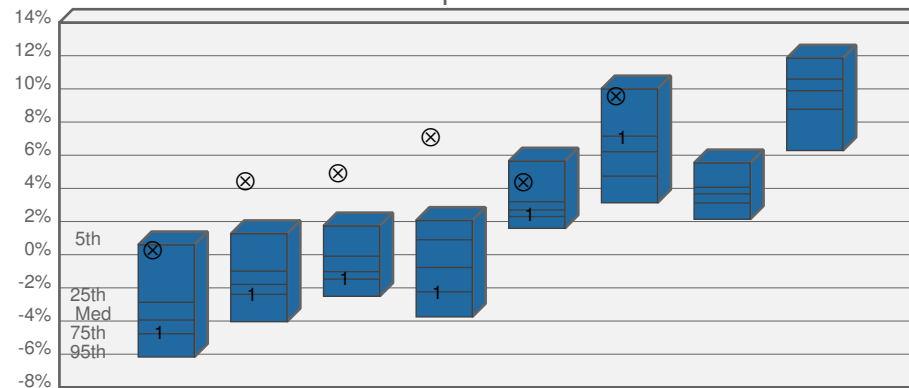


Excess Return:	0.15	Information Ratio:	0.03
Excess Risk:	5.29	T-Stat:	0.05

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊗ Marathon Blue	0.32 ( 5)	4.47 ( 1)	4.92 ( 1)	7.12 ( 1)	4.42 ( 8)	9.61 ( 5)		
1 Bloomberg High	-4.53 (70)	-2.24 (70)	-1.24 (63)	-2.08 (71)	2.60 (56)	7.23 (24)		
Median	-3.94	-1.79	-1.02	-0.77	2.70	6.21	3.67	9.89
Number of Funds	182	182	182	182	179	176	165	108

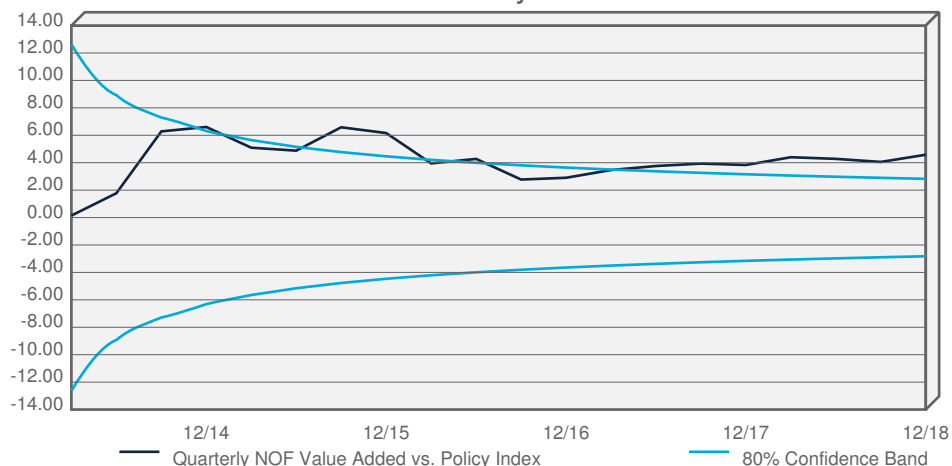
\*Compass Total Returns of Active High Yield Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

## Waterfall

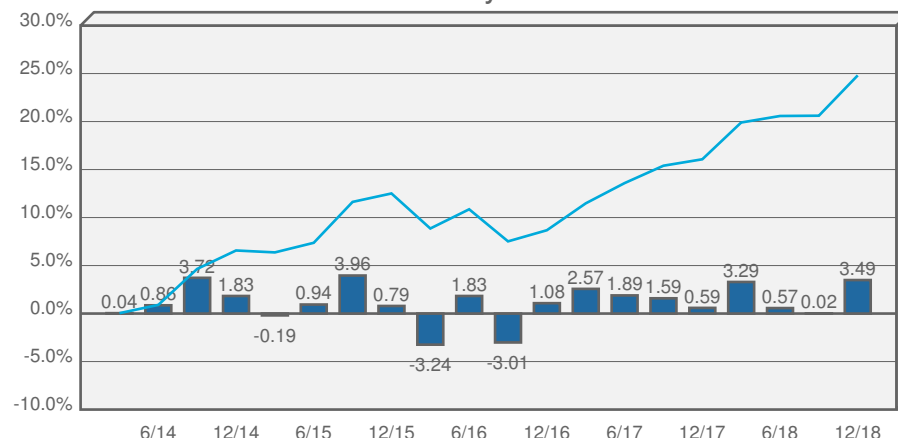
December 31, 2018

Cumulative Skill Analysis vs Benchmark



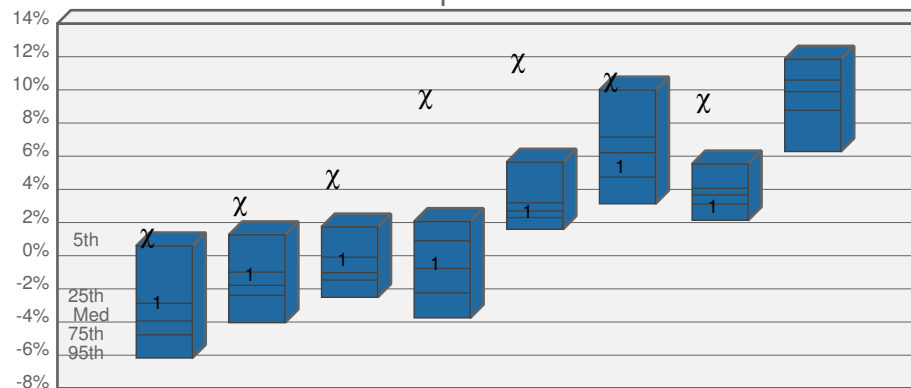
Excess Return:	4.58	Information Ratio:	1.19
Excess Risk:	3.84	T-Stat:	2.67

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. Policy Index  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
X Waterfall	0.93 ( 2)	2.83 ( 1)	4.47 ( 1)	9.30 ( 1)	11.44 ( 1)	10.32 ( 3)	9.07 ( 1)	
1 Policy Index	-2.65 (22)	-0.95 (24)	-0.05 (23)	-0.29 (46)	2.82 (44)	5.55 (61)	3.16 (73)	
Median	-3.94	-1.79	-1.02	-0.77	2.70	6.21	3.67	9.89
Number of Funds	182	182	182	182	179	176	165	108

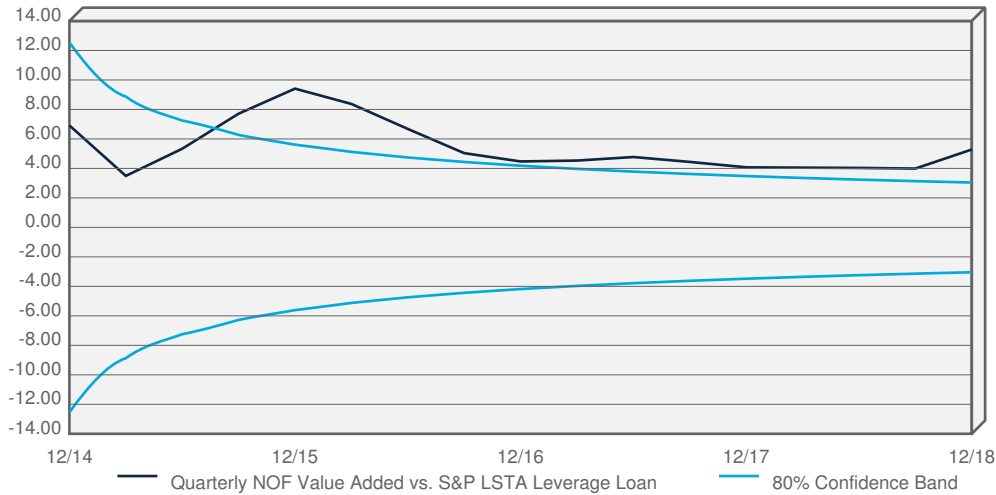
\*Compass Total Returns of Active High Yield Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Cerberus Capital Mgmt

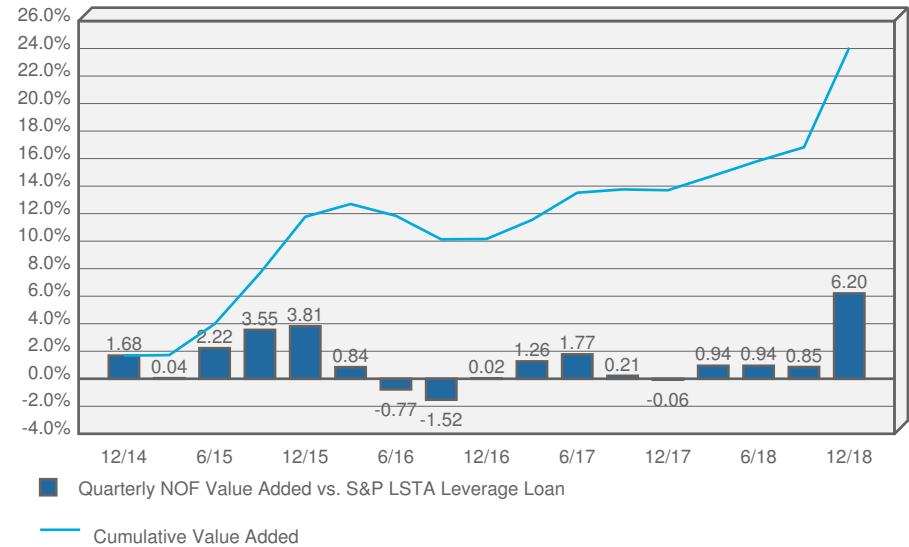
December 31, 2018

Cumulative Skill Analysis vs Benchmark



Excess Return:	5.28	Information Ratio:	1.38
Excess Risk:	3.81	T-Stat:	2.77

Value-Added Analysis vs Benchmark

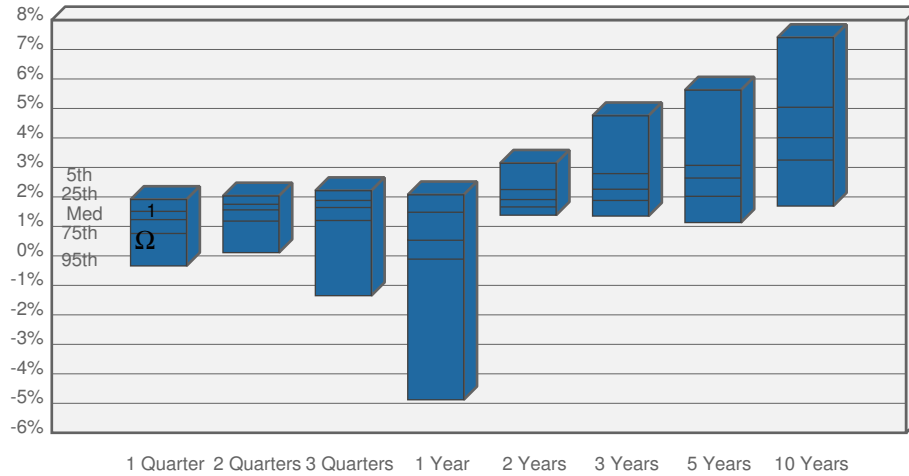


# INVESTMENT MANAGER ANALYSIS

Lord Abbett

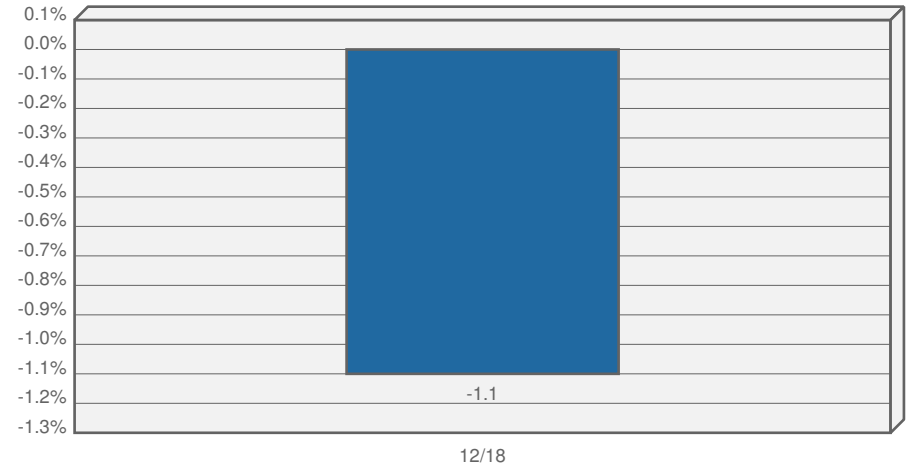
December 31, 2018

Performance Comparison vs Peer Universe\*



Ω Lord Abbett	0.55 (85)
1 10 Bloomberg Ag	1.64 (14)
Median	1.23
Number of Funds	335

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. 10Bloomberg Aggregate  
 — Cumulative Value Added

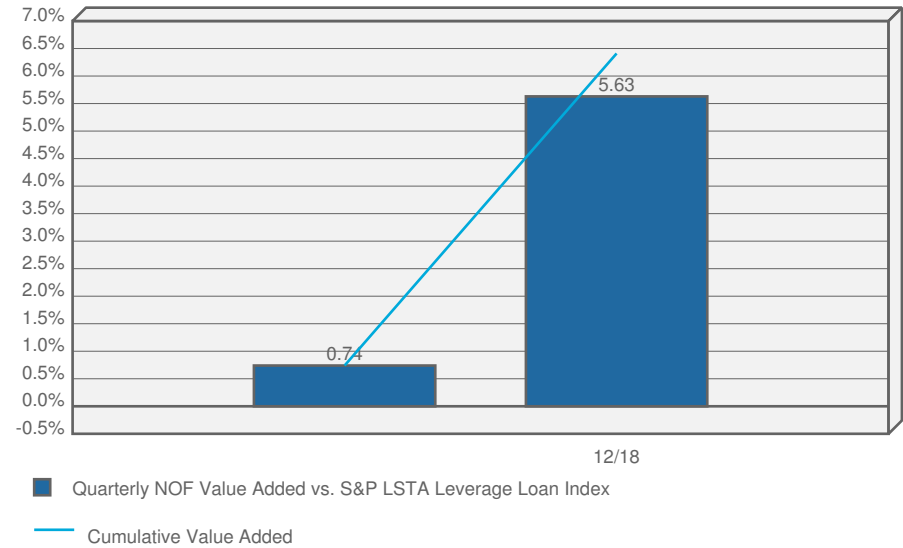
\*Compass Total Returns of Active Core Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Arrowmark

December 31, 2018

Value-Added Analysis vs Benchmark

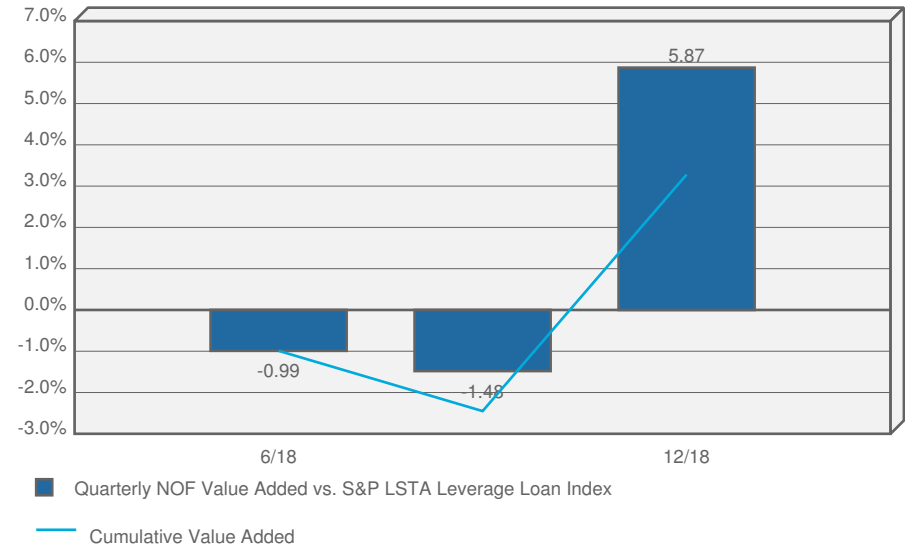


# INVESTMENT MANAGER ANALYSIS

BSP Private Credit

December 31, 2018

Value-Added Analysis vs Benchmark



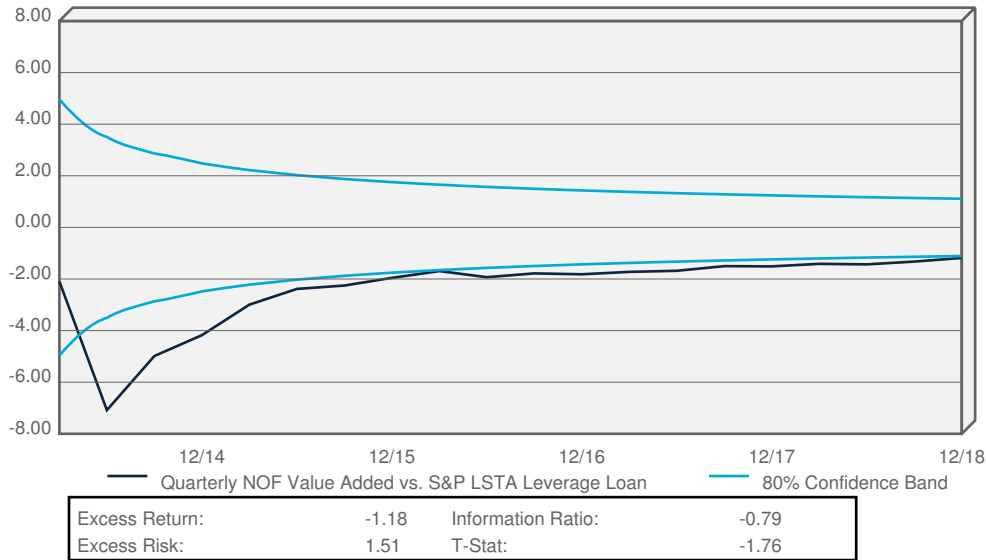


# INVESTMENT MANAGER ANALYSIS

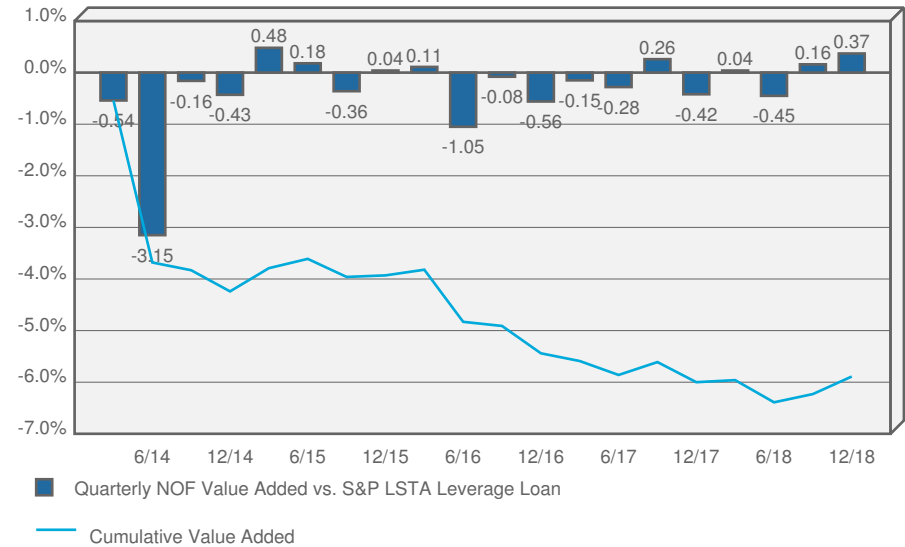
Shenkman Capital

December 31, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark

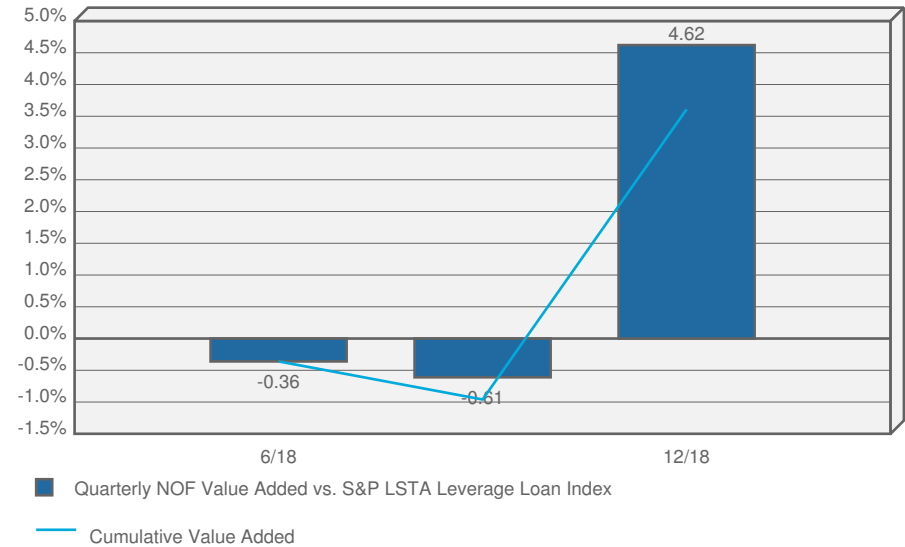


# INVESTMENT MANAGER ANALYSIS

White Oak Yield Spectrum

December 31, 2018

Value-Added Analysis vs Benchmark



# CUSTOM BENCHMARK SPECIFICATION

Fixed Income Composite

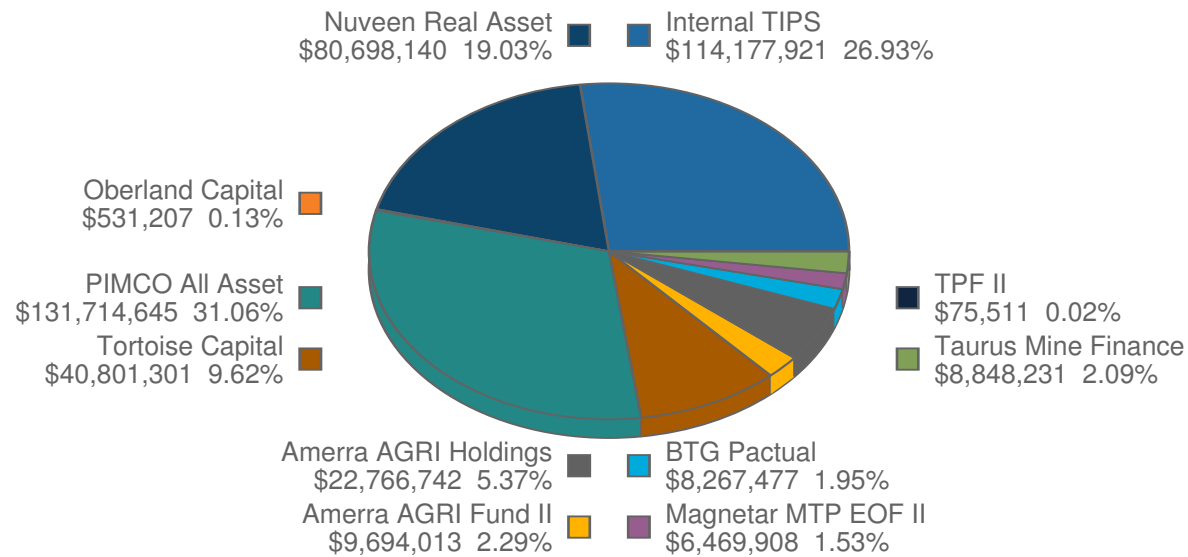
December 31, 2018

	Quarter Start	Quarter End	Percent	Description
Policy Index	9/92	6/17	100.00	Blended Fixed Benchmark
	9/17	12/18	50.00 50.00	Bloomberg Universal Bloomberg High Yield
Bloomberg Global Aggregate	9/92	12/18	100.00	Bloomberg Global Aggregate



# REAL RETURN

Wilshire Consulting  
**MANAGER ALLOCATION**  
 Real Return Composite  
*As of December 31, 2018*



# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Internal TIPS</b>									
<b>Net of Fee Return</b>	<b>-0.03</b>	<b>-0.20</b>	<b>0.35</b>	<b>0.01</b>	<b>1.96</b>	<b>1.83</b>	<b>3.68</b>	<b>9/30/03</b>	<b>4.08</b>
Bloomberg 1-10 Yrs TIPS	-0.05	-0.47	0.15	-0.25	1.87	1.54	3.56	9/30/03	3.79
Value Added	0.02	0.27	0.20	0.27	0.09	0.29	0.12	9/30/03	0.30
<b>PIMCO All Asset</b>									
<b>Net of Fee Return</b>	<b>-3.30</b>	<b>-2.97</b>	<b>-5.27</b>	<b>-2.97</b>	<b>7.70</b>	<b>2.94</b>		<b>12/31/11</b>	<b>4.53</b>
Bloomberg 1-10 Yrs TIPS	-0.05	-0.47	0.15	-0.25	1.87	1.20		12/31/11	0.73
Value Added	-3.25	-2.51	-5.41	-2.72	5.83	1.75		12/31/11	3.79
<b>Tortoise Capital</b>									
<b>Net of Fee Return</b>	<b>-16.21</b>	<b>-13.78</b>	<b>-4.42</b>	<b>-13.77</b>	<b>-1.12</b>	<b>-4.09</b>		<b>9/30/09</b>	<b>9.25</b>
Alerian MLP	-17.30	-11.86	-1.46	-12.42	-1.06	-7.31		9/30/09	5.57
Value Added	1.08	-1.92	-2.96	-1.35	-0.06	3.21		9/30/09	3.68
<b>Nuveen Real Asset</b>									
<b>Net of Fee Return</b>	<b>-5.19</b>	<b>-3.88</b>	<b>-2.11</b>	<b>-4.92</b>	<b>5.59</b>			<b>3/31/15</b>	<b>3.09</b>
Policy Index	-5.27	-5.47	-2.50	-6.22	4.73			3/31/15	2.73
Value Added	0.08	1.59	0.39	1.30	0.87			3/31/15	0.36
<b>Amerra AGRI Fund II</b>									
<b>Net of Fee Return</b>	<b>1.44</b>	<b>0.01</b>	<b>-2.30</b>	<b>-3.07</b>	<b>0.04</b>	<b>4.46</b>		<b>12/31/12</b>	<b>3.71</b>
<b>Amerra AGRI Holdings</b>									
<b>Net of Fee Return</b>	<b>-0.52</b>	<b>-2.33</b>	<b>-2.86</b>	<b>-3.98</b>	<b>-1.79</b>			<b>9/30/15</b>	<b>-1.76</b>
<b>BTG Pactual</b>									
<b>Net of Fee Return</b>	<b>4.97</b>	<b>-2.37</b>	<b>-2.66</b>	<b>-6.76</b>	<b>-6.20</b>			<b>12/31/14</b>	<b>-9.14</b>

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended December 31, 2018

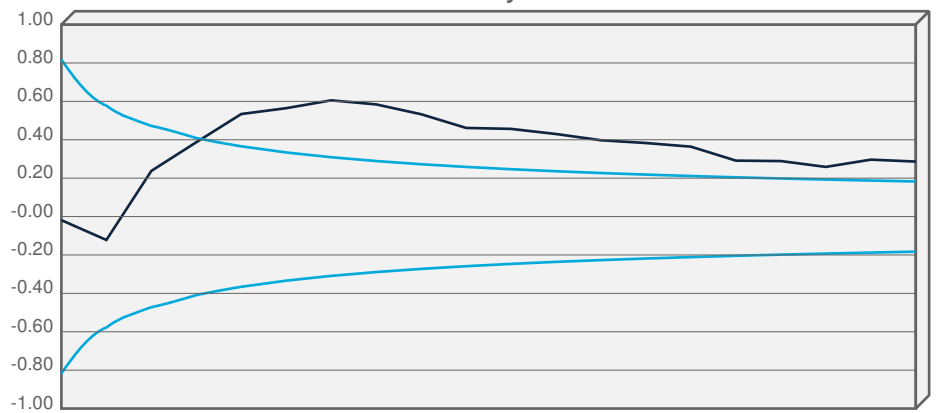
	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Magnetar MTP EOF II Net of Fee Return</b>	<b>2.83</b>	<b>6.26</b>	<b>5.92</b>	<b>9.58</b>	<b>3.61</b>			<b>9/30/15</b>	<b>3.33</b>
<b>Oberland Capital Net of Fee Return</b>	<b>23.41</b>							<b>9/30/18</b>	<b>23.41</b>
<b>Taurus Mine Finance Net of Fee Return</b>	<b>2.21</b>	<b>9.51</b>	<b>9.86</b>	<b>14.24</b>	<b>17.72</b>			<b>3/31/15</b>	<b>14.09</b>
<b>TPF II Net of Fee Return</b>	<b>-0.29</b>	<b>-0.62</b>	<b>-0.91</b>	<b>-1.19</b>	<b>-7.83</b>	<b>-1.93</b>	<b>-2.33</b>	<b>9/30/08</b>	<b>-3.50</b>
<b>Real Return Composite Net of Fee Return</b>	<b>-3.60</b>	<b>-3.14</b>	<b>-3.06</b>	<b>-3.38</b>	<b>4.40</b>	<b>2.08</b>		<b>6/30/11</b>	<b>2.75</b>
Real Return Index (I)	-2.76	-2.42	-1.07	-2.66	2.56	1.42		6/30/11	2.10
Value Added	-0.84	-0.71	-1.99	-0.73	1.84	0.66		6/30/11	0.65

# INVESTMENT MANAGER ANALYSIS

## Internal TIPS

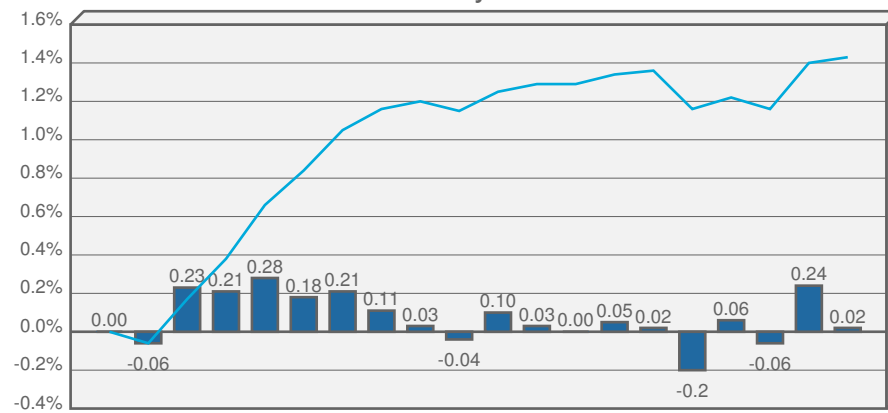
December 31, 2018

Cumulative Skill Analysis vs Benchmark



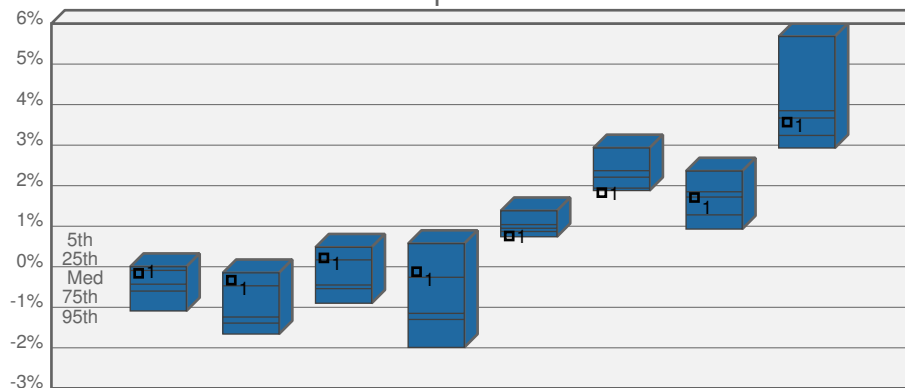
Excess Return:	0.29	Information Ratio:	1.15
Excess Risk:	0.25	T-Stat:	2.58

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. Bloomberg 1-10 Yrs TIPS  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Internal TIPS	-0.03 ( 6)	-0.20 ( 6)	0.35 (12)	0.01 ( 9)	0.89 (67)	1.96 (73)	1.84 (33)	3.70 (47)
Bloomberg 1-10	-0.05 ( 9)	-0.47 (28)	0.14 (31)	-0.25 (24)	0.82 (83)	1.87 (96)	1.54 (63)	3.56 (59)
Median	-0.43	-1.24	-0.45	-1.15	0.95	2.21	1.72	3.67
Number of Funds	32	32	32	32	31	30	30	25

\*Compass Total Returns of Active TIPS Portfolios Universe - Gross of Fees

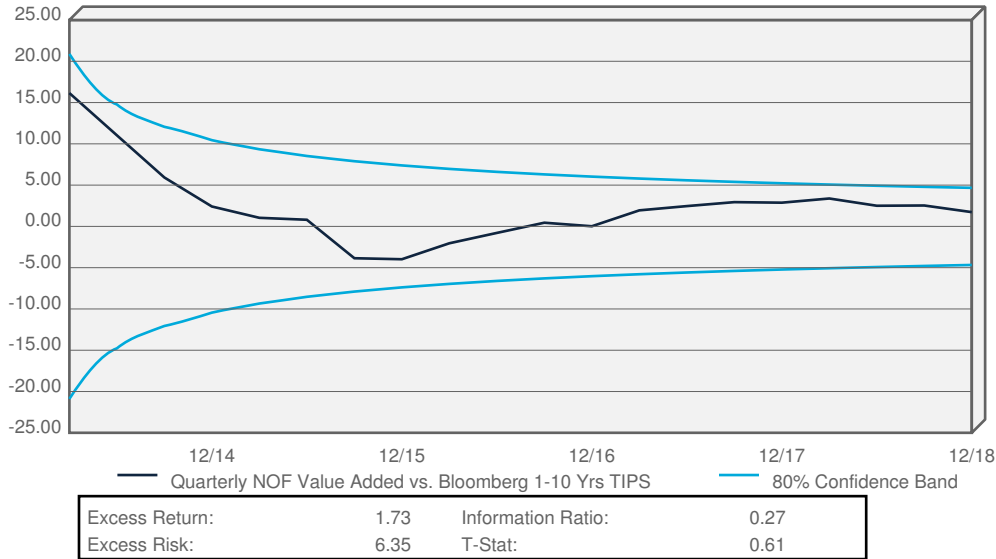


# INVESTMENT MANAGER ANALYSIS

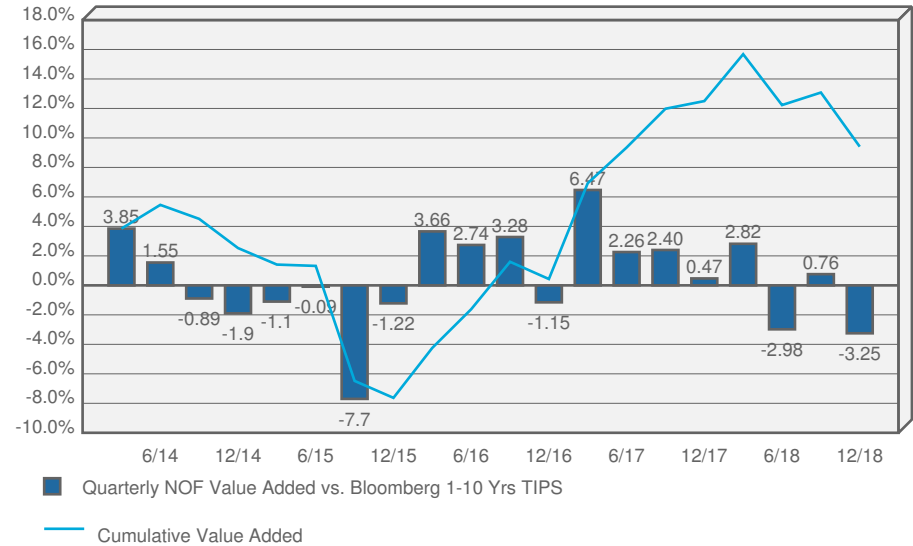
PIMCO All Asset

December 31, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark

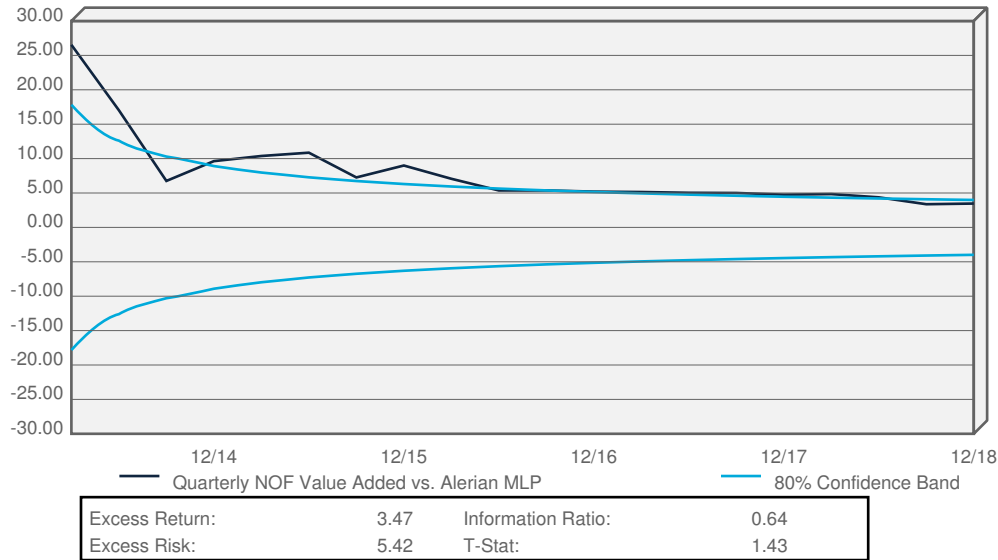


# INVESTMENT MANAGER ANALYSIS

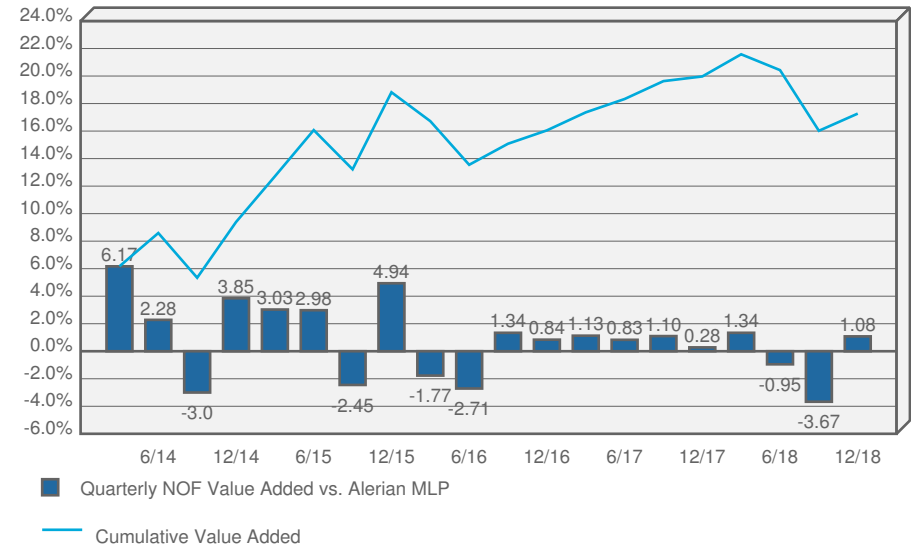
Tortoise Capital

December 31, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark

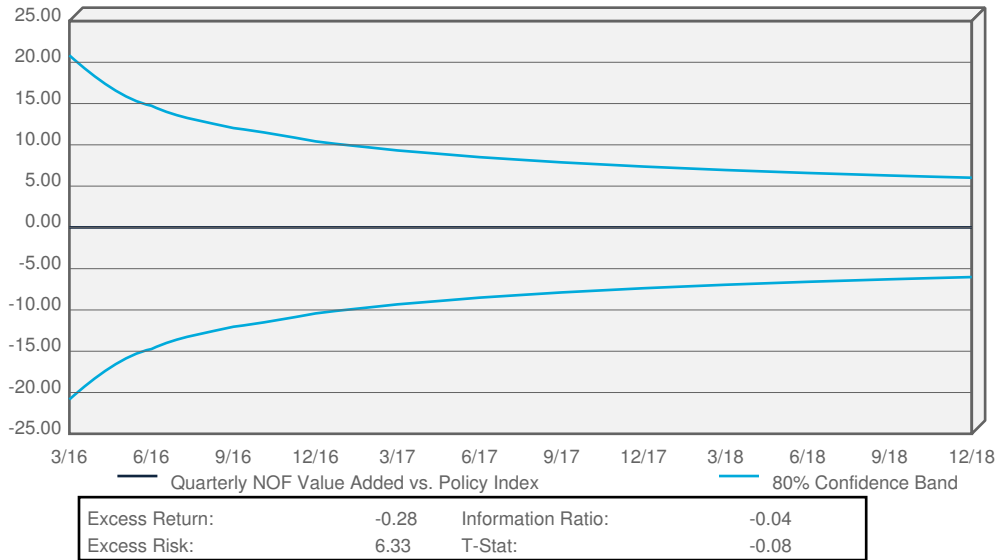


# INVESTMENT MANAGER ANALYSIS

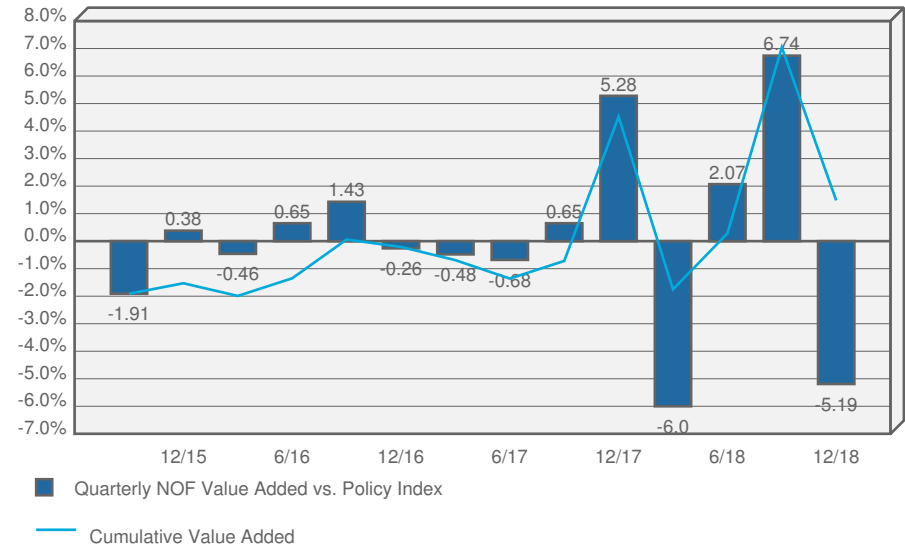
Nuveen Real Asset

December 31, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark



# CUSTOM BENCHMARK SPECIFICATION

Real Return Composite

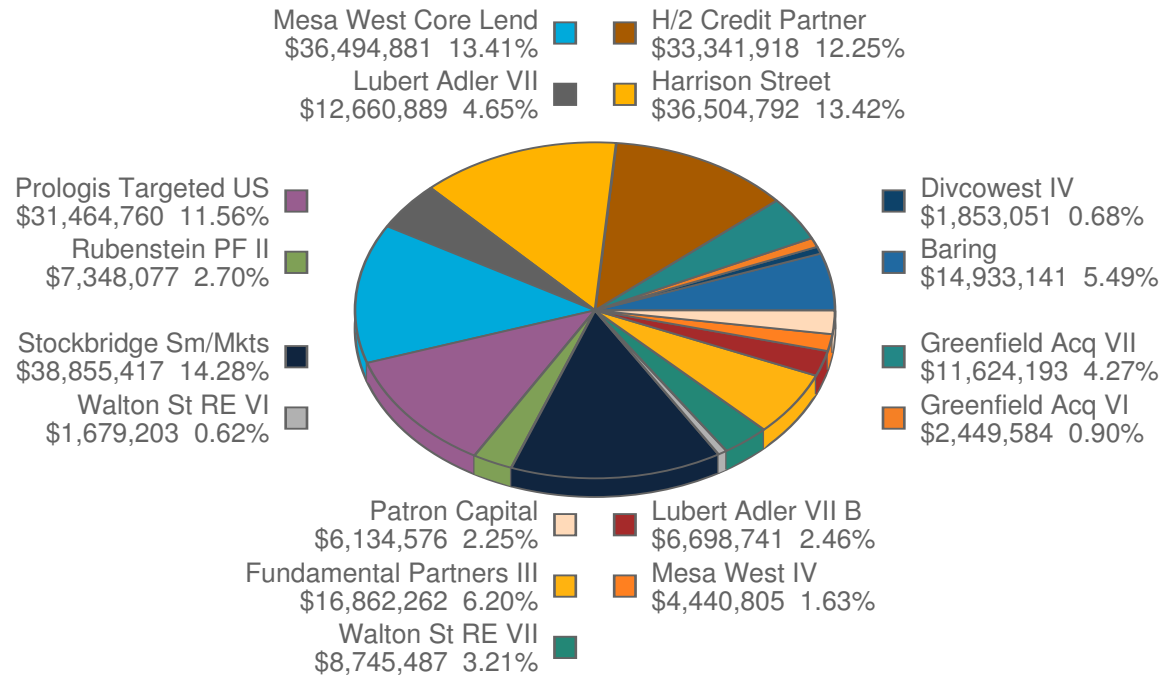
*December 31, 2018*

	Quarter Start	Quarter End	Percent	Description
Real Return Index (I)	9/11	12/18	100.00	Real Return Index (I)



# REAL ESTATE

Wilshire Consulting  
**MANAGER ALLOCATION**  
 Real Estate Composite  
*As of December 31, 2018*



# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended December 31, 2018*

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Divcowest IV</b>									
<b>Net of Fee Return</b>	<b>2.68</b>	<b>10.29</b>	<b>15.69</b>	<b>28.88</b>	<b>27.42</b>			<b>3/31/14</b>	<b>24.08</b>
<b>Greenfield Acq VI</b>									
<b>Net of Fee Return</b>	<b>-0.39</b>	<b>-11.51</b>	<b>-8.49</b>	<b>-19.88</b>	<b>-3.61</b>	<b>4.40</b>		<b>12/31/12</b>	<b>5.52</b>
<b>Greenfield Acq VII</b>									
<b>Net of Fee Return</b>	<b>0.45</b>	<b>5.68</b>	<b>6.40</b>	<b>12.94</b>	<b>13.54</b>			<b>6/30/14</b>	<b>11.77</b>
<b>H/2 Credit Partner</b>									
<b>Net of Fee Return</b>	<b>-0.70</b>	<b>0.47</b>	<b>1.38</b>	<b>1.44</b>	<b>6.11</b>	<b>5.39</b>		<b>6/30/11</b>	<b>5.76</b>
<b>Harrison Street</b>									
<b>Net of Fee Return</b>	<b>1.78</b>	<b>5.32</b>	<b>7.36</b>	<b>9.92</b>	<b>10.26</b>	<b>9.95</b>		<b>6/30/12</b>	<b>8.75</b>
<b>Lubert Adler VII</b>									
<b>Net of Fee Return</b>	<b>0.23</b>	<b>3.19</b>	<b>6.72</b>	<b>8.28</b>	<b>7.20</b>			<b>6/30/14</b>	<b>-1.35</b>
<b>Mesa West Core Lend</b>									
<b>Net of Fee Return</b>	<b>1.88</b>	<b>5.19</b>	<b>6.90</b>	<b>8.73</b>	<b>7.80</b>	<b>7.07</b>		<b>6/30/13</b>	<b>6.93</b>
<b>Prologis Targeted US</b>									
<b>Net of Fee Return</b>	<b>3.36</b>	<b>8.59</b>	<b>14.13</b>	<b>18.48</b>	<b>17.79</b>			<b>9/30/14</b>	<b>15.66</b>
<b>Rubenstein PF II</b>									
<b>Net of Fee Return</b>	<b>3.91</b>	<b>8.96</b>	<b>12.61</b>	<b>16.11</b>	<b>10.15</b>	<b>16.51</b>		<b>6/30/13</b>	<b>14.16</b>
<b>Stockbridge Sm/Mkts</b>									
<b>Net of Fee Return</b>	<b>3.47</b>	<b>5.14</b>	<b>6.93</b>	<b>8.94</b>	<b>8.98</b>			<b>6/30/14</b>	<b>9.72</b>

# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended December 31, 2018*

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Walton St RE VI</b>									
<b>Net of Fee Return</b>	<b>2.20</b>	<b>4.48</b>	<b>6.90</b>	<b>9.40</b>	<b>4.05</b>	<b>8.18</b>		<b>6/30/09</b>	<b>-17.24</b>
<b>Walton St RE VII</b>									
<b>Net of Fee Return</b>	<b>-0.08</b>	<b>0.18</b>	<b>1.97</b>	<b>4.52</b>	<b>9.42</b>	<b>11.99</b>		<b>6/30/13</b>	<b>11.96</b>
<b>Fundamental Partners III</b>									
<b>Net of Fee Return</b>	<b>3.34</b>	<b>5.11</b>	<b>5.12</b>	<b>6.76</b>				<b>6/30/17</b>	<b>5.75</b>
<b>Lubert Adler VII B</b>									
<b>Net of Fee Return</b>	<b>0.37</b>	<b>2.50</b>	<b>4.11</b>	<b>3.54</b>				<b>6/30/17</b>	<b>-0.47</b>
<b>Mesa West IV</b>									
<b>Net of Fee Return</b>	<b>2.61</b>	<b>5.05</b>	<b>6.67</b>	<b>9.04</b>				<b>3/31/17</b>	<b>5.35</b>
<b>Patron Capital</b>									
<b>Net of Fee Return</b>	<b>2.80</b>	<b>5.15</b>	<b>4.48</b>	<b>25.91</b>				<b>9/30/16</b>	<b>1.42</b>
<b>Real Estate Composite</b>									
<b>Net of Fee Return</b>	<b>1.83</b>	<b>4.55</b>	<b>6.66</b>	<b>9.08</b>	<b>9.79</b>	<b>9.16</b>		<b>6/30/09</b>	<b>9.22</b>
NCREIF ODCE NOF 1 Quarter Lag	1.87	3.71	5.76	7.71	7.83	9.71		6/30/09	7.85
Value Added	-0.04	0.84	0.90	1.36	1.96	-0.56		6/30/09	1.36



# CUSTOM BENCHMARK SPECIFICATION

Real Estate Composite

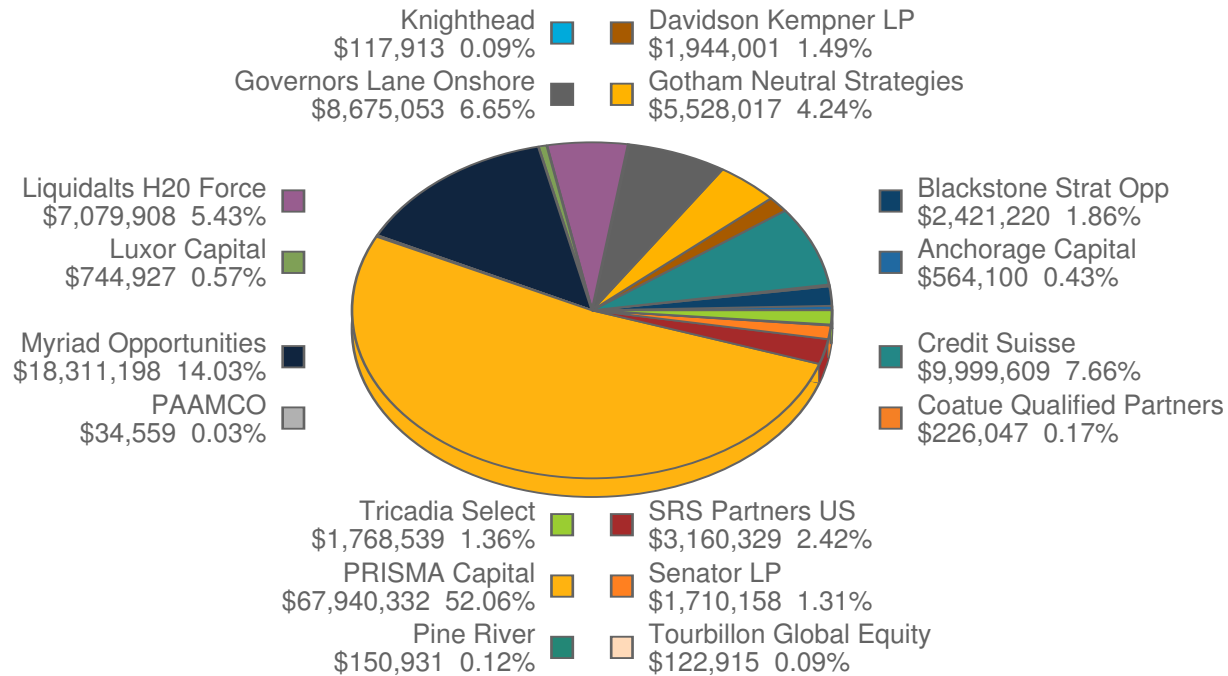
*December 31, 2018*

	Quarter Start	Quarter End	Percent	Description
NCREIF ODCE NOF 1 Quarter Lag	9/84	12/18	100.00	NCREIF ODCE NOF 1 Quarter Lag



# ABSOLUTE RETURN

Wilshire Consulting  
**MANAGER ALLOCATION**  
 Absolute Return Composite  
 As of December 31, 2018



# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended December 31, 2018*

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Anchorage Capital Net of Fee Return</b>	0.48	2.39	3.04	3.69				9/30/16	5.66
<b>Blackstone Strat Opp Net of Fee Return</b>	0.35	1.88	4.25	6.64				9/30/17	6.39
<b>Coatue Qualified Partners Net of Fee Return</b>	0.00	0.00	2.63	8.58	12.46			6/30/15	12.43
<b>Credit Suisse Net of Fee Return</b>	1.98	3.55	5.50	7.11				6/30/17	7.14
<b>Davidson Kempner LP Net of Fee Return</b>	0.00	0.76	0.28	2.33				3/31/16	5.83
<b>Gotham Neutral Strategies Net of Fee Return</b>	0.25	-0.92	-1.22	1.39				3/31/17	-1.90
<b>Governors Lane Onshore Net of Fee Return</b>	-5.31	-3.53	-4.92	-5.05				3/31/17	-1.57
<b>Knighthead Net of Fee Return</b>	0.00	-0.08	0.17	1.63	5.26	2.03		12/31/13	2.03
<b>Liquidalts H20 Force Net of Fee Return</b>	3.08	4.84	1.65	4.93				9/30/16	6.47
<b>Luxor Capital Net of Fee Return</b>	9.47	9.75	10.70	18.27	14.35			3/31/14	3.42

# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended December 31, 2018*

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Myriad Opportunities Net of Fee Return</b>	-2.24	-6.04	-6.54	-5.31				6/30/16	4.88
<b>PAAMCO Net of Fee Return</b>								9/30/11	
<b>Pine River Net of Fee Return</b>								6/30/14	
<b>PRISMA Capital Net of Fee Return</b>	-1.17	-0.34	0.45	2.83	2.05	2.37		9/30/11	3.63
<b>Senator LP Net of Fee Return</b>	-8.63	-7.82	-6.27	-8.87				9/30/16	1.51
<b>SRS Partners US Net of Fee Return</b>	7.64	-0.98	2.05	2.47				9/30/17	4.41
<b>Tourbillon Global Equity Net of Fee Return</b>	-4.13	-5.24	0.02	-5.65	-9.36			12/31/15	-9.36
<b>Tricadia Select Net of Fee Return</b>	-3.19	-8.63	-21.58	-20.87				9/30/17	-19.75
<b>Absolute Return Composite Net of Fee Return</b>	-1.12	-0.97	-0.41	1.16	2.05	2.54		3/31/10	3.73
HFRI FOF Div (1 Month Lag)	-3.16	-2.81	-2.39	-0.97	1.53	2.01		3/31/10	2.54
Value Added	2.03	1.84	1.97	2.12	0.52	0.54		3/31/10	1.19

# CUSTOM BENCHMARK SPECIFICATION

Absolute Return Composite

*December 31, 2018*

	Quarter Start	Quarter End	Percent	Description
HFRI FOF Div (1 Month Lag)	6/10	12/18	100.00	HFRI FOF Div (1 Month Lag)