



# WILSHIRE ASSOCIATES

Wilshire Consulting



## Kentucky Retirement Systems Pension

Executive Summary of Investment Performance

*September 30, 2018*



# MARKET ENVIRONMENT

# ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 9/2018
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%	U.S. Equity 10.5%	U.S. Equity 13.6%
MLPs 27.6%	U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	MLPs 5.9%	REITs 9.2%
Developed 23.3%	Core Bond 6.0%	Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	High Yield 2.6%	High Yield 5.5%
High Yield 7.4%	MLPs 4.8%	T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	REITs 2.3%	Developed 4.9%
REITs 1.9%	U.S. TIPS 3.6%	Developed -0.4%	Emrg Mrkts 11.6%	REITs 4.2%	T-Bills 1.3%	Emrg Mrkts 4.0%
T-Bills 0.1%	High Yield 2.5%	U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. TIPS -0.8%	Core Bond 2.2%
Core Bond -2.0%	T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	Developed -1.0%	U.S. TIPS 1.4%
Emrg Mrkts -2.3%	Emrg Mrkts -1.8%	Emrg Mrkts -14.6%	Core Bond 2.6%	Commodities 1.7%	Core Bond -1.6%	T-Bills 0.5%
U.S. TIPS -8.6%	Developed -4.5%	Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Commodities -2.0%	MLPs -2.7%
Commodities -9.5%	Commodities -17.0%	MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mrkts -7.4%	Commodities -7.2%

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 up 7.3% for the third quarter of 2018, the strongest quarter in nearly five years. Economic data continues to be strong including the largest increase in real GDP in four years at 4.2% during the second quarter. Third quarter growth was strong, as well, at 3.5%. The U.S. made positive strides on trade with a preliminary, renegotiated trade deal with the European Commission and a finalized deal with South Korea.

The U.S. trade deficit has had a major effect on real GDP during the past six months. A shrinking deficit during the second quarter contributed more to real GDP growth than in any quarter during the past five years. However, the success was short lived as the deficit grew during the third quarter. One specific example of tariff-driven effects is China discontinuing purchases of U.S. soybeans in retaliation for U.S. tariffs.

## Non-U.S. Equity

Equity markets outside of the U.S. produced mixed results and trailed the U.S. equity market. Trade tensions weighed heavy on foreign markets while political turmoil in Italy was cause for concern just as the quarter ended. Emerging markets continue to underperform and, in fact, entered a technical bear market during the quarter, down -20% since late January. China's central bank communicated a lack of desire to offer monetary stimulus and liquidity issues have led to a number of corporate bond defaults.

## Fixed Income

The U.S. Treasury yield curve rose across all maturities and the bellwether 10-year Treasury yield ended the quarter at 3.05%. The FOMC decided to increase its overnight rate by 25 basis points in September while Fed chair Jerome Powell said it was a "particularly bright moment" for the U.S. economy.

# SEPTEMBER 2018 ASSET CLASS ASSUMPTIONS

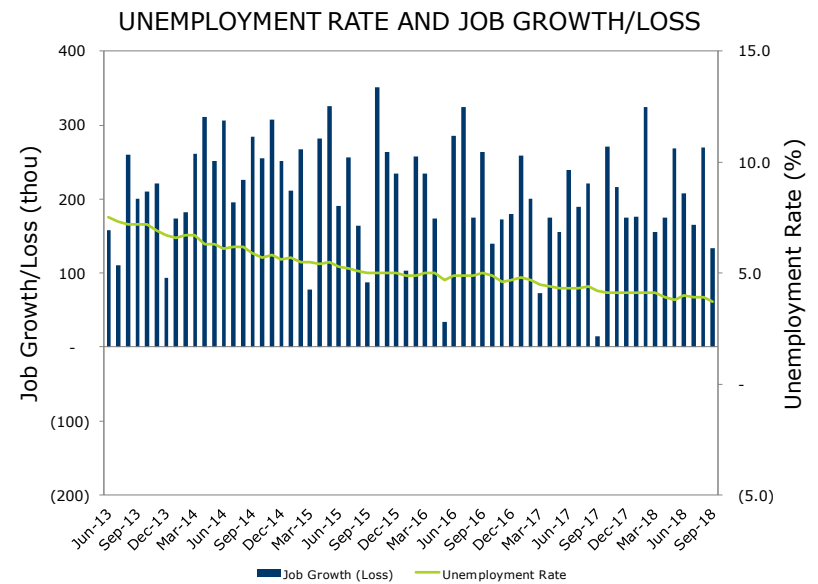
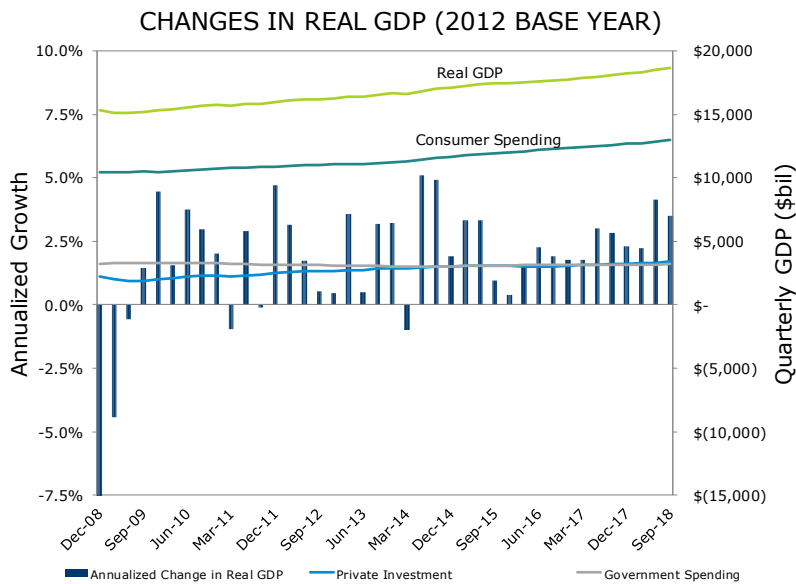
	EQUITY						FIXED INCOME						REAL ASSETS					
	US STOCK	DEV	EMG	GLOBAL		PRIVATE EQUITY	CASH	CORE BOND	LT	US TIPS	HIGH YIELD	NON-US BOND (HDG)	REAL ESTATE			CMDTY	REAL ASSETS	US CPI
		EX-US STOCK	MRKT STOCK	EX-US STOCK	GLOBAL STOCK				CORE BOND				US RES	GLOBAL RES	PRIVATE RE			
EXPECTED COMPOUND RETURN (%)	6.25	6.25	6.25	6.50	6.50	9.15	2.80	4.00	4.20	3.40	5.15	1.35	5.60	5.80	6.95	4.95	6.65	2.15
EXPECTED ARITHMETIC RETURN (%)	7.55	7.70	9.20	8.10	7.85	12.50	2.80	4.15	4.65	3.55	5.60	1.40	6.95	6.95	7.85	6.00	7.00	2.15
EXPECTED RISK (%)	17.00	18.00	26.00	18.75	17.10	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75
CASH YIELD (%)	1.75	3.00	2.50	2.90	2.30	0.00	2.80	4.10	5.20	3.55	8.60	1.75	4.00	4.00	2.70	2.80	3.15	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	0.64	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 SEPT. 30, 2018 KEY ECONOMIC INDICATORS

CPI (ALL ITEMS)	MONTHLY CHANGE		CUMULATIVE CHANGE	
SEASONALLY ADJUSTED	Sep-18	0.1	3-Mo.	0.5
	Aug-18	0.2	12-Mo.	2.3
	Jul-18	0.2	10-Yr. (Annual)	1.4
BREAKEVEN INFLATION	10-Yr.	2.2		
CONSUMER SENTIMENT	Sep-18	100.1		
U. OF MICHIGAN SURVEY	Aug-18	96.2		
	1-Yr. Ago	95.1	10-Yr. Avg	81.5
MANUFACTURING	Sep-18	59.8	CHANGE IN SECTOR	
INST. FOR SUPPLY MGMT	Aug-18	61.3	>50	Expansion
PURCHASING MNGRS' IDX	1-Yr. Avg.	59.2	<50	Contraction

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

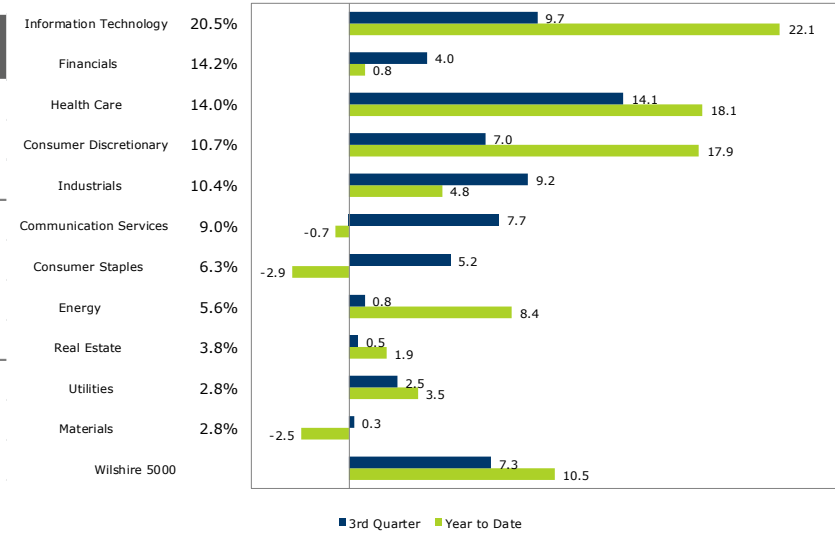


Data sources: Bureau of Labor Statistics, U.S. Treasury, University of Michigan, Institute for Supply Management, Bureau of Economic Analysis

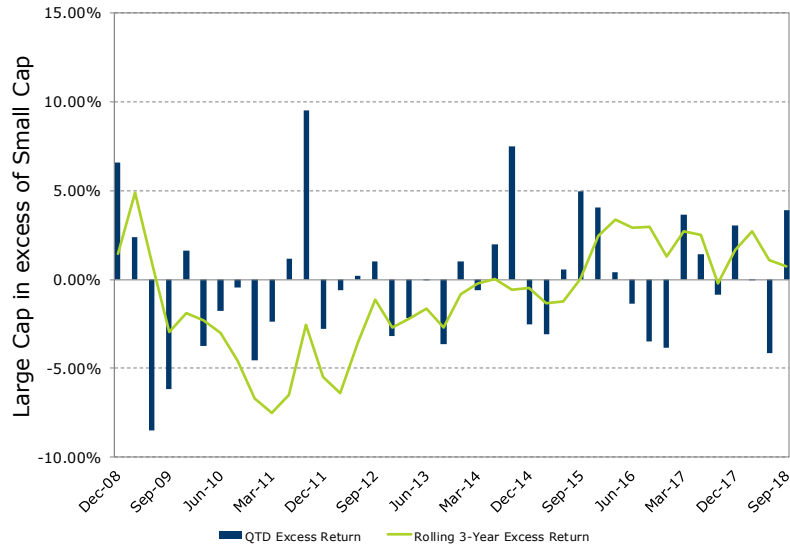
# U.S. EQUITY MARKET

AS OF SEPTEMBER 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	7.3	10.5	17.6	17.3	13.6	12.0
WILSHIRE U.S. LARGE CAP	7.7	10.5	17.9	17.4	13.9	11.9
WILSHIRE U.S. SMALL CAP	3.7	11.0	14.9	16.5	11.3	12.8
WILSHIRE U.S. LARGE GROWTH	9.2	15.9	24.4	19.6	16.2	13.7
WILSHIRE U.S. LARGE VALUE	6.3	5.4	11.8	15.0	11.7	10.2
WILSHIRE U.S. SMALL GROWTH	5.3	13.7	18.4	17.4	11.3	13.5
WILSHIRE U.S. SMALL VALUE	2.0	8.2	11.4	15.4	11.2	12.0
WILSHIRE REIT INDEX	0.7	2.3	4.0	7.1	9.2	7.4
MSCI USA MIN. VOL. INDEX	7.7	9.2	14.9	14.7	13.1	11.1
FTSE RAFI U.S. 1000 INDEX	6.1	6.5	13.4	15.5	12.1	12.6

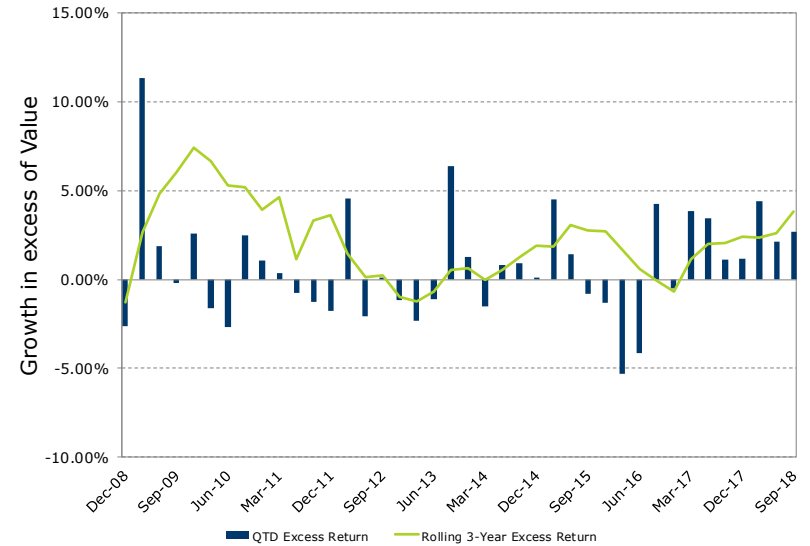
WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)



LARGE CAP VS SMALL CAP



GROWTH VS VALUE

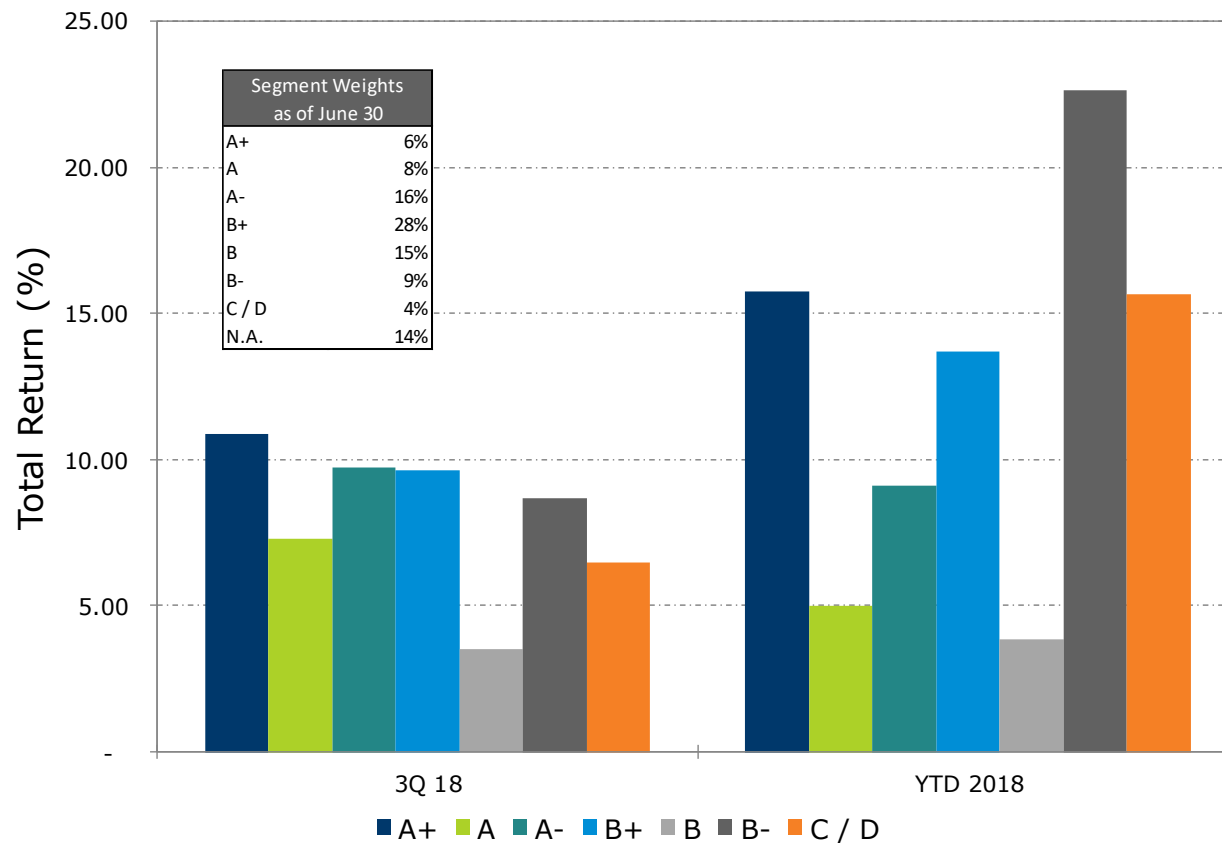


Data sources: Wilshire Compass, Wilshire Atlas

# RETURNS BY QUALITY SEGMENT

Returns by quality are mixed during 2018 with both the highest and lowest ranked names leading the market

RETURN BY S&P QUALITY RATING



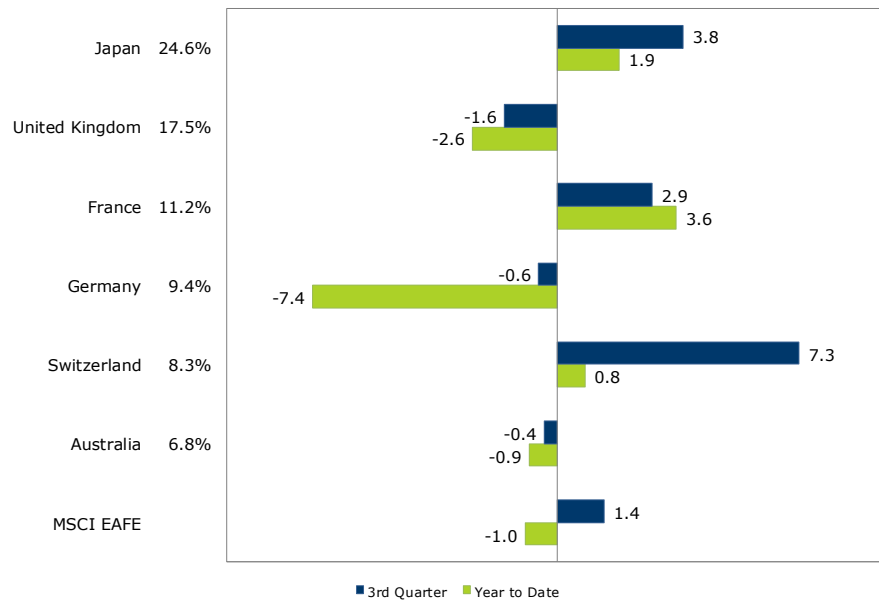
Data sources: Wilshire Atlas



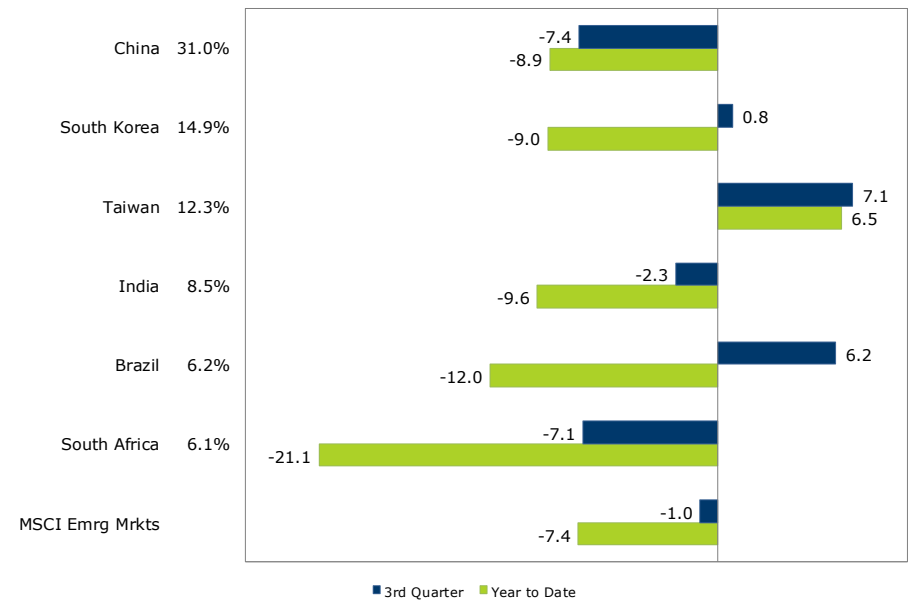
# NON-U.S. EQUITY MARKET

AS OF SEPTEMBER 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	0.8	-2.7	2.3	10.5	4.6	5.7
MSCI EAFE (\$G)	1.4	-1.0	3.2	9.8	4.9	5.9
MSCI EMERGING MARKETS (\$G)	-1.0	-7.4	-0.4	12.8	4.0	5.8
MSCI FRONTIER MARKETS (\$G)	-1.9	-12.4	-7.5	5.7	3.3	0.5
MSCI ACWI EX-US GROWTH (\$G)	-0.2	-2.2	3.5	11.0	5.7	6.2
MSCI ACWI EX-US VALUE (\$G)	1.9	-3.1	1.0	9.9	3.5	5.1
MSCI ACWI EX-US SMALL (\$G)	-1.4	-4.1	2.2	11.8	6.6	9.2
MSCI ACWI MINIMUM VOLATILITY	5.9	5.9	11.1	12.7	10.2	9.6
MSCI EAFE MINIMUM VOLATILITY	2.3	2.3	5.9	9.3	7.5	7.8
FTSE RAFI DEVELOPED EX-US	1.6	-2.0	2.6	11.0	5.0	6.2
MSCI EAFE LC (G)	2.4	1.8	5.6	9.9	8.4	7.2

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



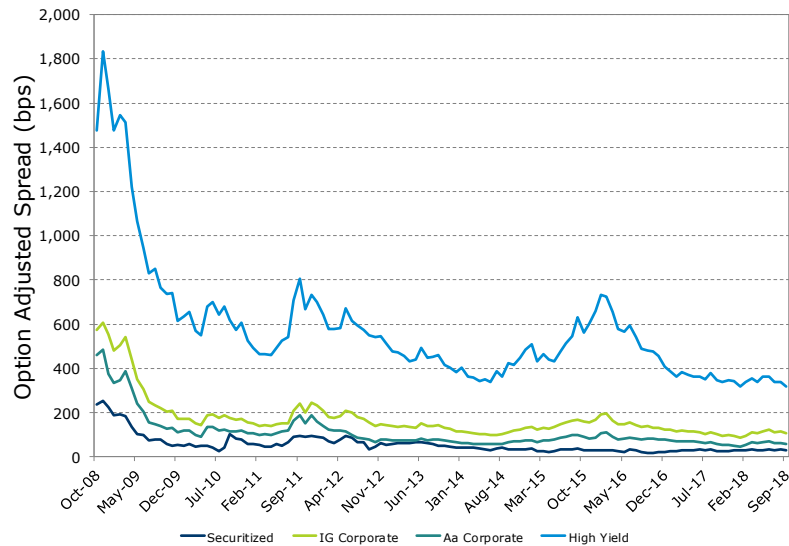
Data sources: Wilshire Compass

# U.S. FIXED INCOME

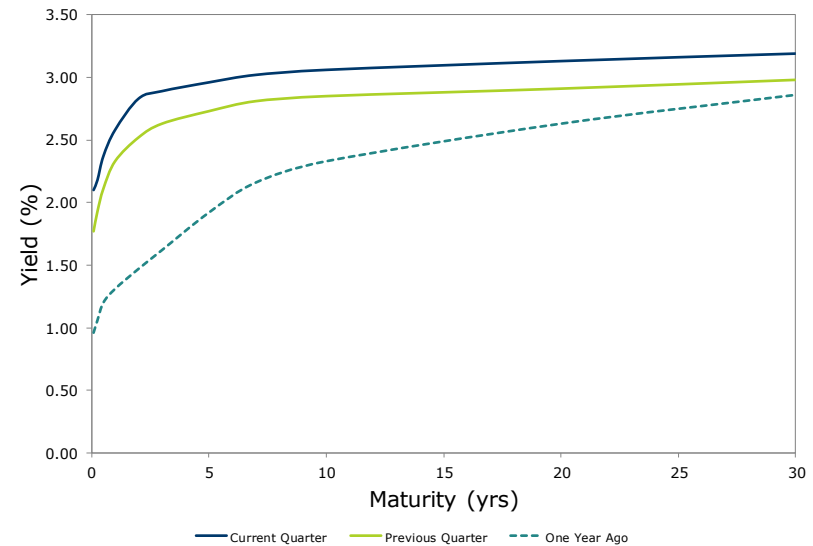
AS OF SEPTEMBER 30, 2018	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	3.5	6.0	0.0	-1.6	-1.2	1.3	2.2	3.8
BLOOMBERG BARCLAYS TREASURY	2.9	6.0	-0.6	-1.7	-1.6	0.2	1.3	2.7
BLOOMBERG BARCLAYS GOV'T-REL.	3.5	5.3	0.4	-0.9	-0.6	1.8	2.3	3.3
BLOOMBERG BARCLAYS SECURITIZED	3.6	5.2	-0.1	-1.0	-0.9	1.0	2.0	3.5
BLOOMBERG BARCLAYS CORPORATE	4.1	7.2	1.0	-2.3	-1.2	3.1	3.5	6.4
BLOOMBERG BARCLAYS LT G/C	4.1	14.8	-0.5	-5.4	-2.7	3.4	5.2	7.1
BLOOMBERG BARCLAYS LT TREASURY	3.2	17.0	-2.9	-5.8	-3.6	0.7	4.4	5.4
BLOOMBERG BARCLAYS LT GOV'T-REL.	4.5	12.0	0.6	-3.2	-1.2	4.8	5.6	6.7
BLOOMBERG BARCLAYS LT CORP.	4.7	13.6	1.3	-5.5	-2.4	5.2	5.7	8.7
BLOOMBERG BARCLAYS U.S. TIPS *	3.0	7.6	-0.8	-0.8	0.4	2.0	1.4	3.3
BLOOMBERG BARCLAYS HIGH YIELD	6.5	3.8	2.4	2.6	3.0	8.1	5.5	9.5
TREASURY BILLS	2.2	0.25	0.5	1.3	1.6	0.8	0.5	0.3

\* 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



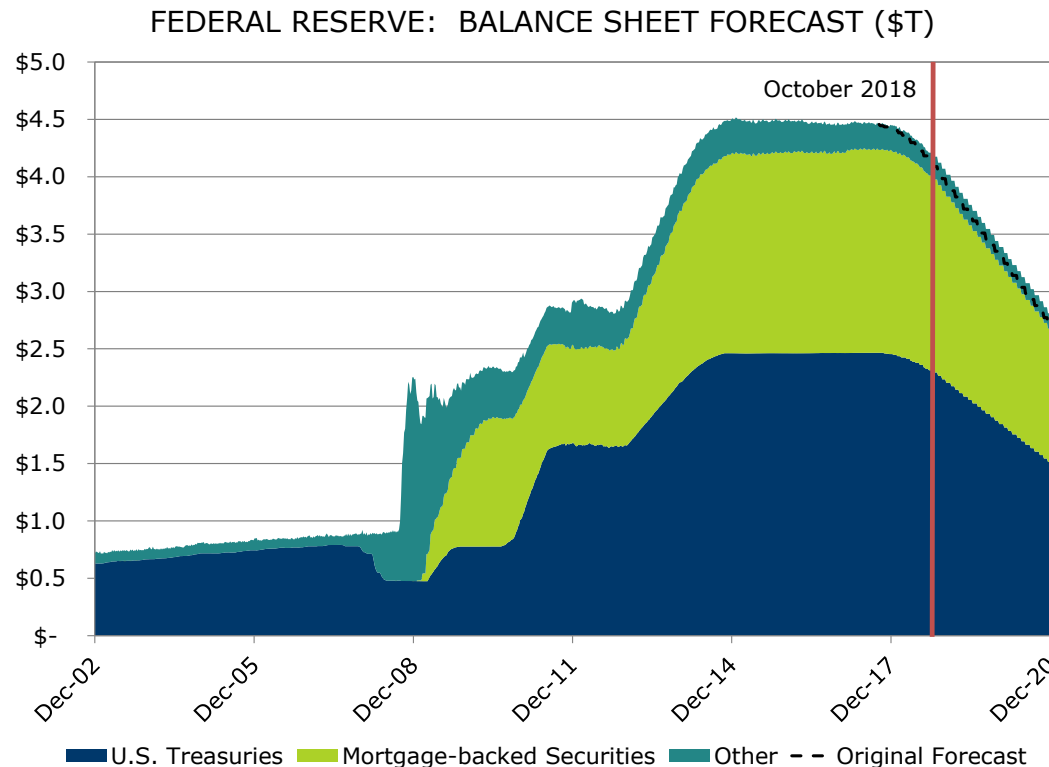
TREASURY YIELD CURVE



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 \$280 billion through September 2018

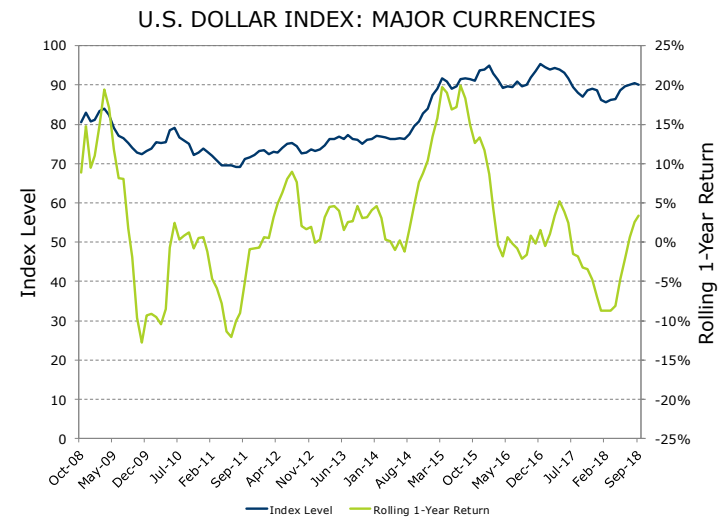
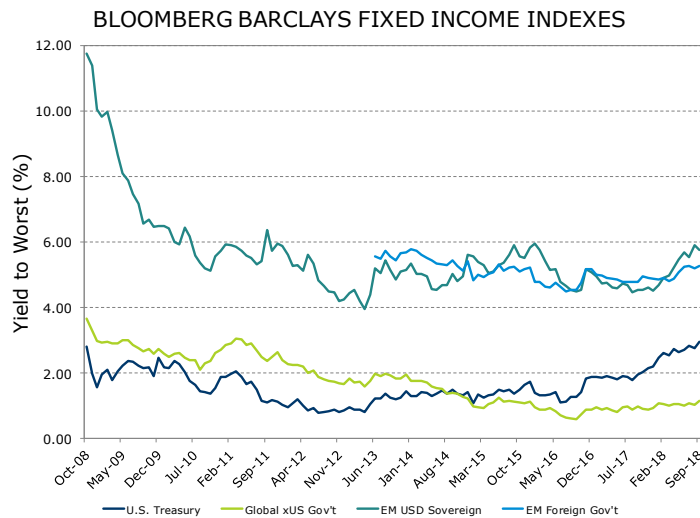


Data sources: Federal Reserve

# NON-U.S. FIXED INCOME

AS OF SEPTEMBER 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
<b>DEVELOPED MARKETS</b>						
BLMBRG BRCLYS GLBL AGGREGATE xUS	-1.7	-3.0	-1.4	2.4	-0.3	2.2
BLMBRG BRCLYS GLBL AGGREGATE xUS *	-0.2	1.3	2.4	3.1	3.8	4.2
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-2.2	-4.9	-1.2	2.2	1.4	3.1
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	-0.8	0.0	3.3	5.3	5.9	5.6
<b>EMERGING MARKETS (HARD CURRENCY)</b>						
BLMBRG BRCLYS EM USD AGGREGATE	1.6	-2.3	-1.7	5.4	4.5	7.4
<b>EMERGING MARKETS (FOREIGN CURRENCY)</b>						
BLMBRG BRCLYS EM LOCAL CURR. GOVT	-0.3	-5.8	-3.7	4.8	0.0	3.3
BLMBRG BRCLYS EM LOCAL CURR. GOVT *	0.5	0.2	0.2	2.5	2.3	3.5
EURO vs. DOLLAR	-0.5	-3.3	-1.8	1.3	-3.0	-1.9
YEN vs. DOLLAR	-2.5	-0.8	-0.9	1.8	-2.9	-0.7
POUND vs. DOLLAR	-1.2	-3.6	-2.8	-4.9	-4.2	-3.1

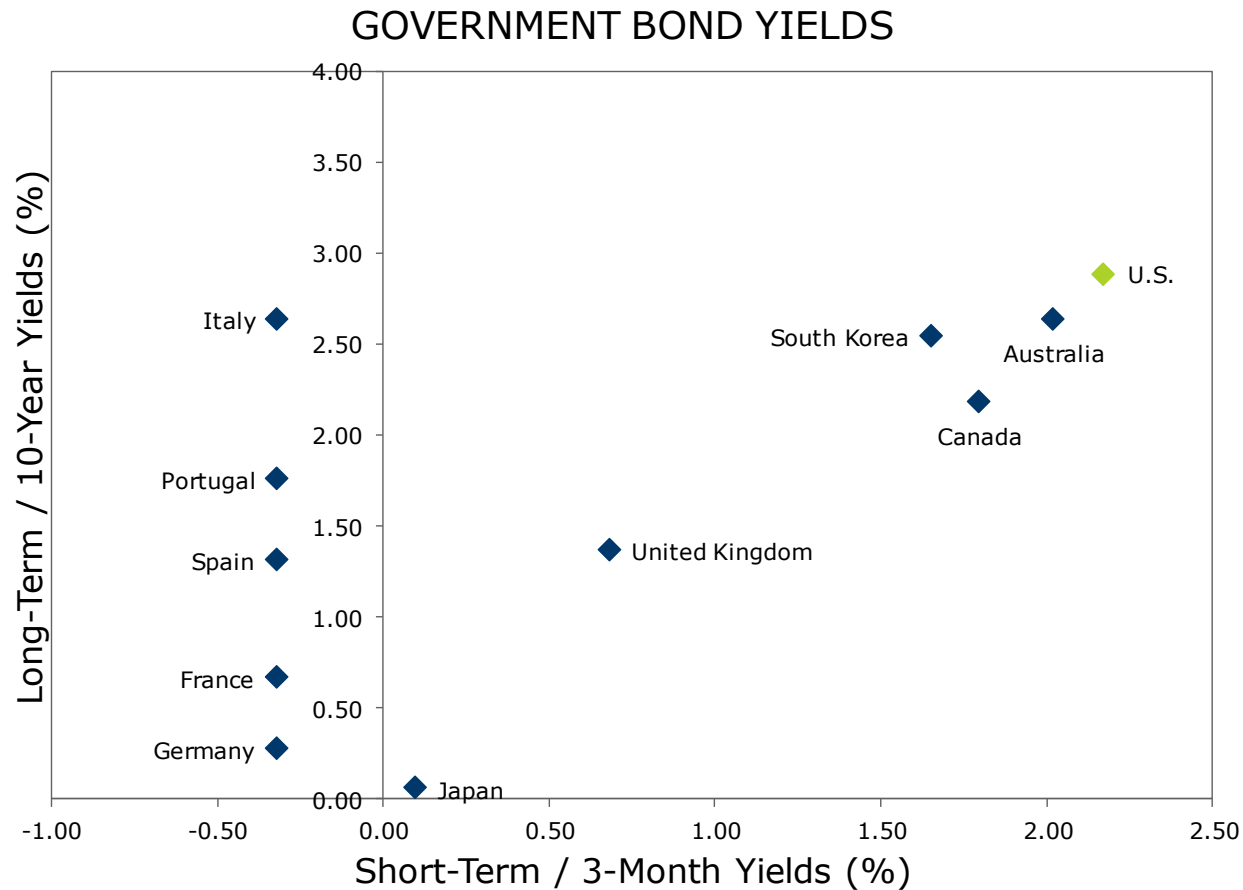
\* Returns are reported in terms of local market investors, which removes currency effects.



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

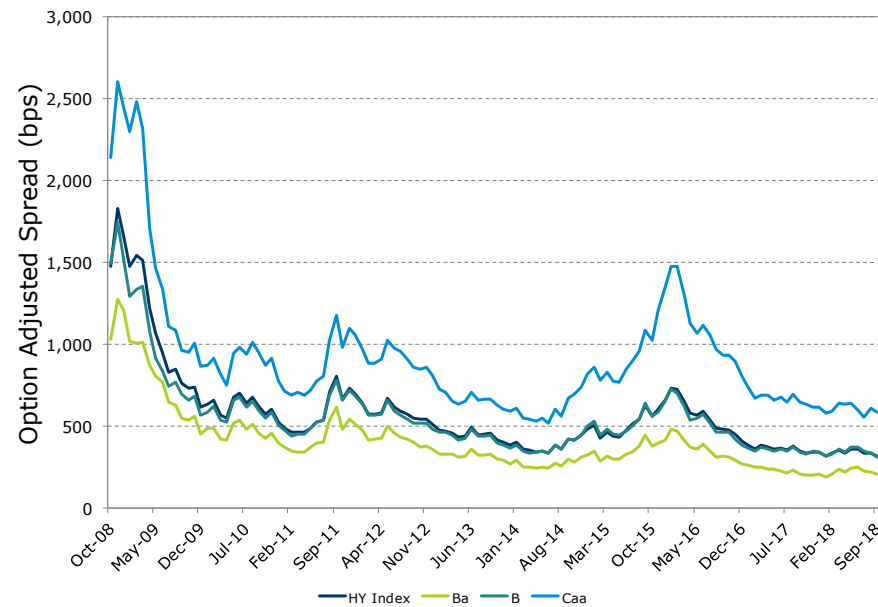


Data sources: Organization for Economic Co-operation and Development

# HIGH YIELD BOND MARKET

AS OF SEPTEMBER 30, 2018		QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS HIGH YIELD		2.4	2.6	3.0	8.1	5.5	9.5
CREDIT SUISSE LEVERAGED LOAN		1.9	4.3	5.6	5.4	4.4	5.8
<b>HIGH YIELD QUALITY DISTRIBUTION</b>	<b>WEIGHT</b>						
Ba U.S. HIGH YIELD	42.8%	2.3	0.5	0.9	6.7	5.5	9.0
B U.S. HIGH YIELD	41.9%	2.3	3.2	3.5	7.6	5.0	8.1
Caa U.S. HIGH YIELD	14.3%	2.7	6.0	7.1	12.5	6.9	10.2
Ca to D U.S. HIGH YIELD	0.8%	7.0	30.1	31.1	28.3	-4.4	9.4
Non-Rated U.S. HIGH YIELD	0.2%	1.5	2.9	0.9	1.8	0.6	3.2

BLOOMBERG BARCLAYS HIGH YIELD INDEXES



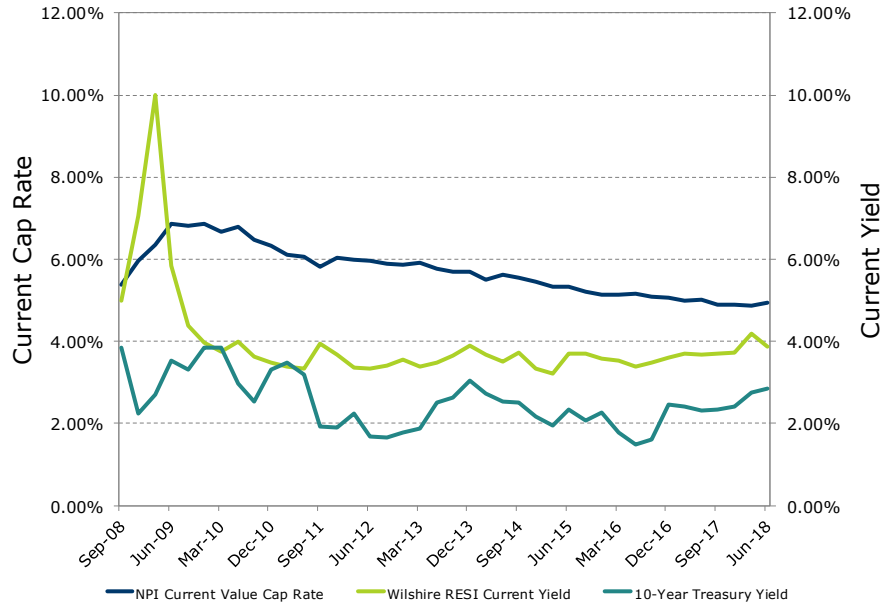
Data sources: Wilshire Compass, Bloomberg Barclays

# Wilshire Consulting REAL ASSETS

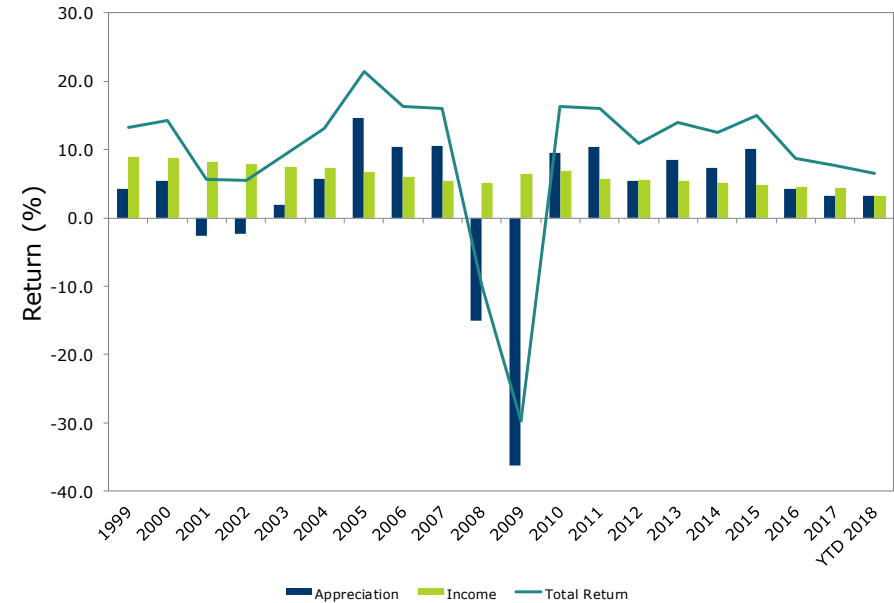


AS OF SEPTEMBER 30, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	-0.8	-0.8	0.4	2.0	1.4	3.3
BLOOMBERG COMMODITY INDEX	-2.0	-2.0	2.6	-0.1	-7.2	-6.2
WILSHIRE GLOBAL RESI INDEX	0.3	0.8	4.0	7.2	7.3	7.6
NCREIF ODCE FUND INDEX	2.1	6.5	8.7	8.8	10.7	5.6
NCREIF TIMBERLAND INDEX	1.0	2.4	4.0	3.5	6.0	4.0
ALERIAN MLP INDEX (OIL & GAS)	6.6	5.9	4.9	4.4	-2.7	9.2

REAL ESTATE VALUATION



NCREIF ODCE FUND INDEX RETURN



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



# TOTAL FUND



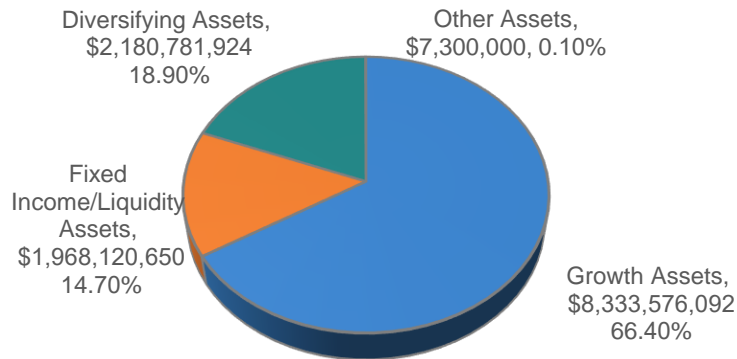
# ACTUAL ALLOCATION VS POLICY ALLOCATION

KRS Pension Plan Composite

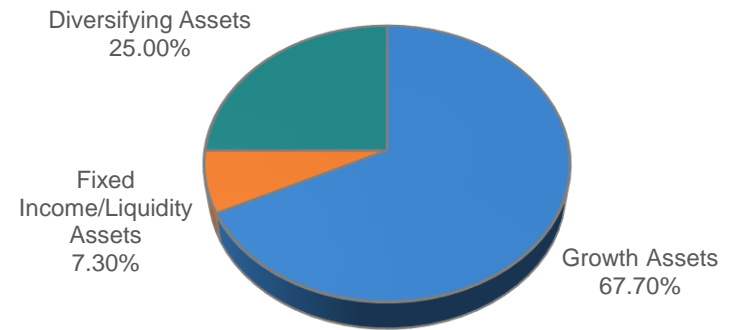
Asset Class Bucketing

As of September 30, 2018

**Total Fund**



**Policy Index**



**\$12,489,778,668**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

KRS Pension Plan Composite

Asset Class Bucketing

As of September 30, 2018

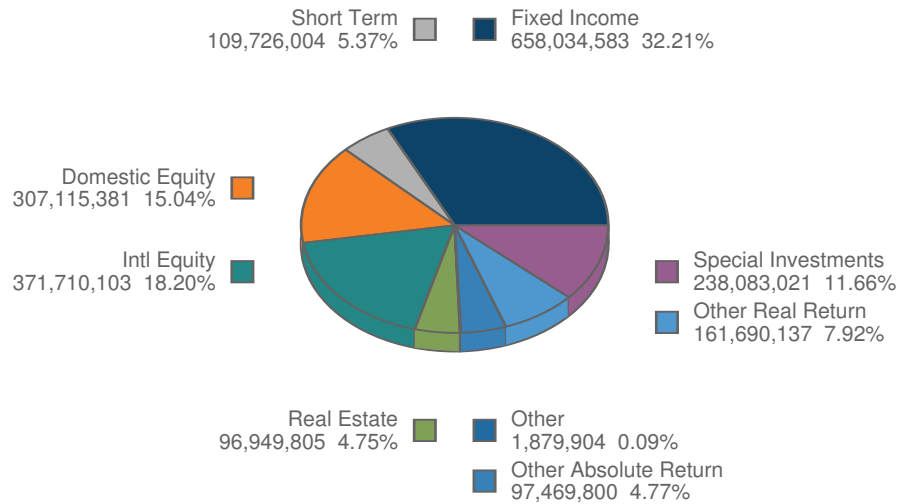
Asset Class / Bucket	Total Pension Allocation		Policy Index	Relative (+/-)
	(\$)	(%)		
U.S. Equity	\$2,237,889,359	20.2%	17.5%	2.7%
Non-U.S. Equity	\$2,592,694,321	24.7%	17.5%	7.2%
Private Equity	\$1,240,097,473	9.9%	10.0%	-0.1%
Credit / High Yield	\$2,262,894,939	11.6%	22.7%	-11.1%
<b>Growth Assets</b>	<b>\$8,333,576,092</b>	<b>66.4%</b>	<b>67.7%</b>	<b>-1.3%</b>
Core Fixed Income	\$1,473,015,184	11.2%	5.1%	6.1%
Cash	\$495,105,466	3.5%	2.2%	1.3%
<b>Fixed Income/Liquidity Assets</b>	<b>\$1,968,120,650</b>	<b>14.7%</b>	<b>7.3%</b>	<b>7.4%</b>
Real Estate	\$583,590,341	4.6%	5.0%	-0.4%
Real Return	\$1,062,850,954	8.0%	10.0%	-2.0%
Absolute Return	\$534,340,629	6.3%	10.0%	-3.7%
<b>Diversifying Assets</b>	<b>\$2,180,781,924</b>	<b>18.9%</b>	<b>25.0%</b>	<b>-6.1%</b>
<b>Other Assets</b>	<b>\$7,300,000</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.1%</b>
<b>Total Fund</b>	<b>\$12,489,778,668</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

# ACTUAL ALLOCATION VS POLICY ALLOCATION

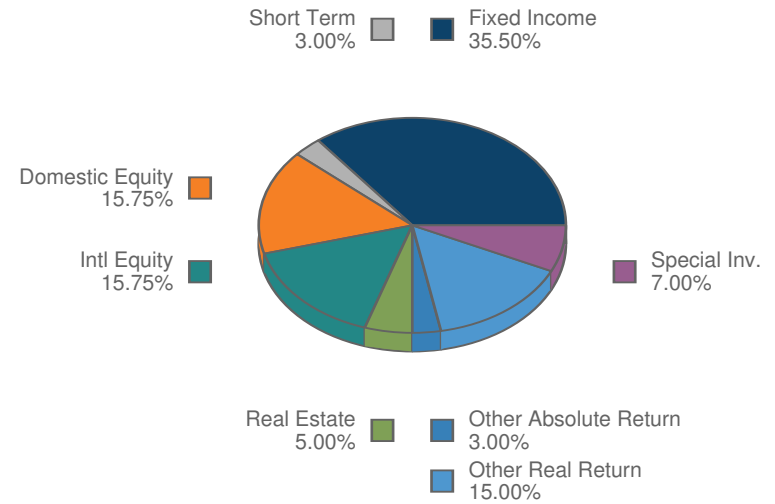
KERS Pension Plan Composite

As of September 30, 2018

**Total Fund**



**Policy Index**



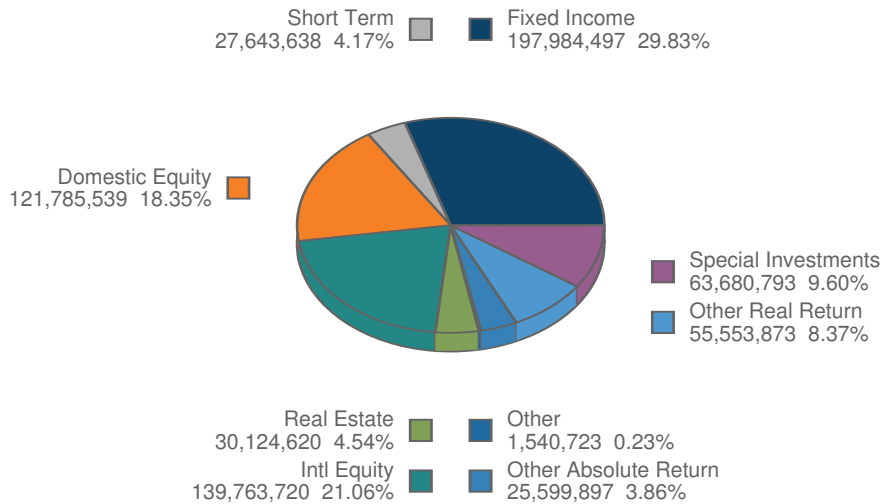
**\$2,042,658,737**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

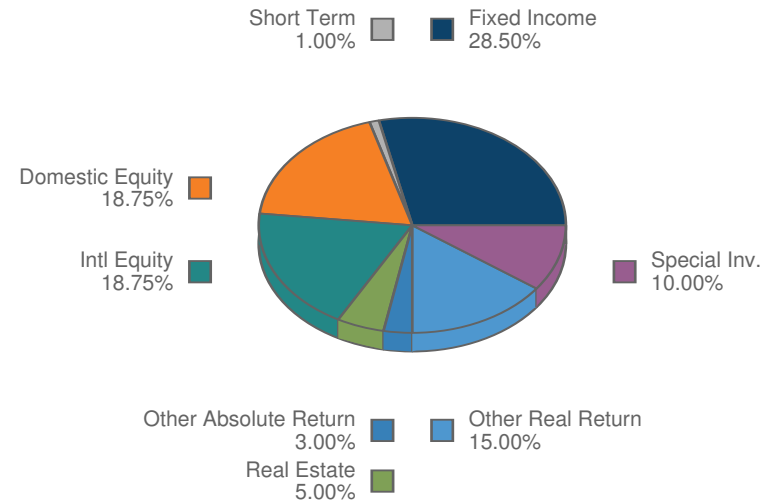
KERS (H) Pension Plan Composite

As of September 30, 2018

**Total Fund**



**Policy Index**



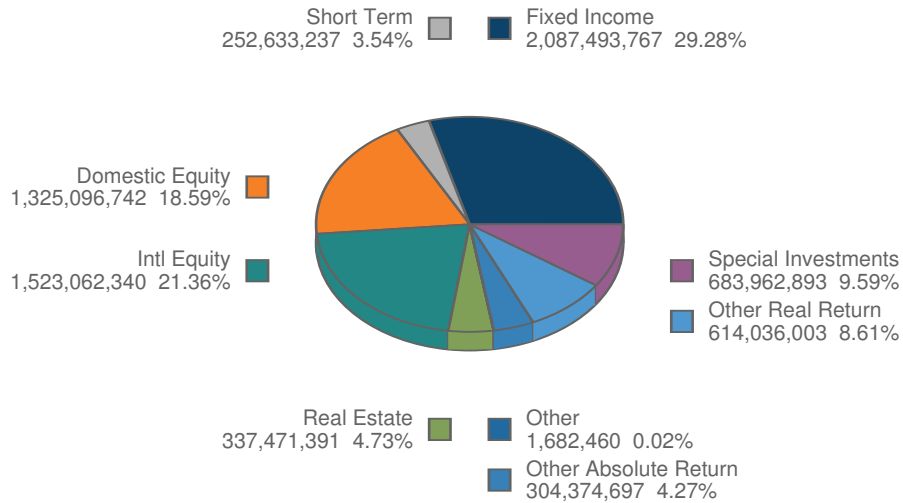
**\$663,677,300**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

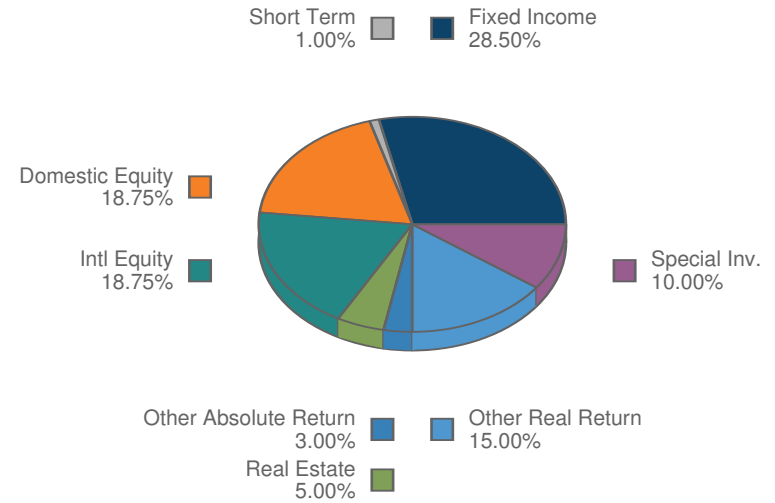
## CERS Pension Plan Composite

As of September 30, 2018

**Total Fund**



**Policy Index**



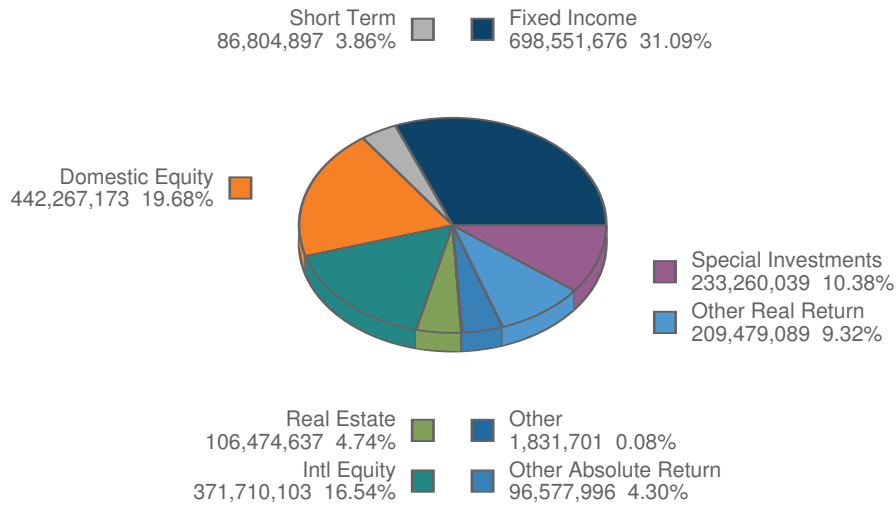
**\$7,129,813,530**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

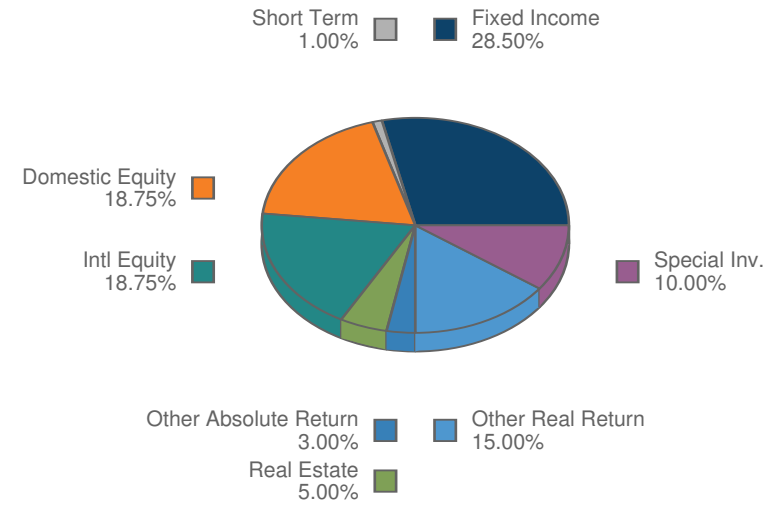
CERS (H) Pension Plan Composite

As of September 30, 2018

**Total Fund**



**Policy Index**



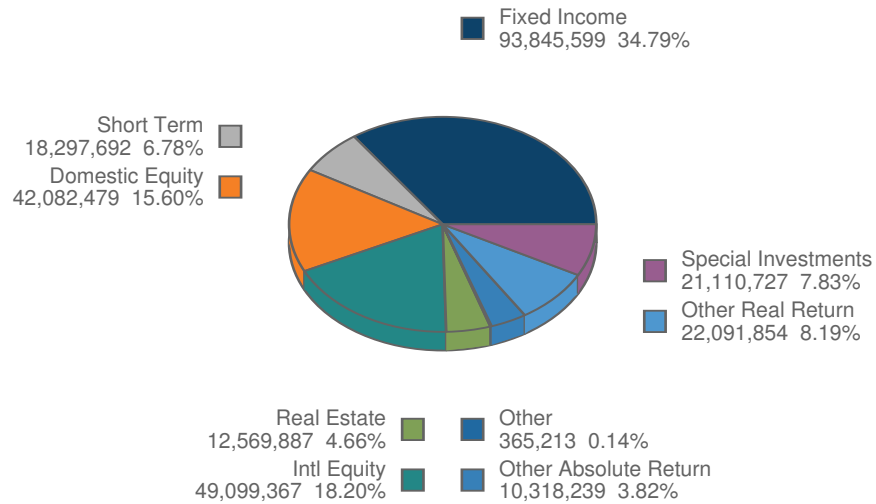
**\$2,246,957,311**

# ACTUAL ALLOCATION VS POLICY ALLOCATION

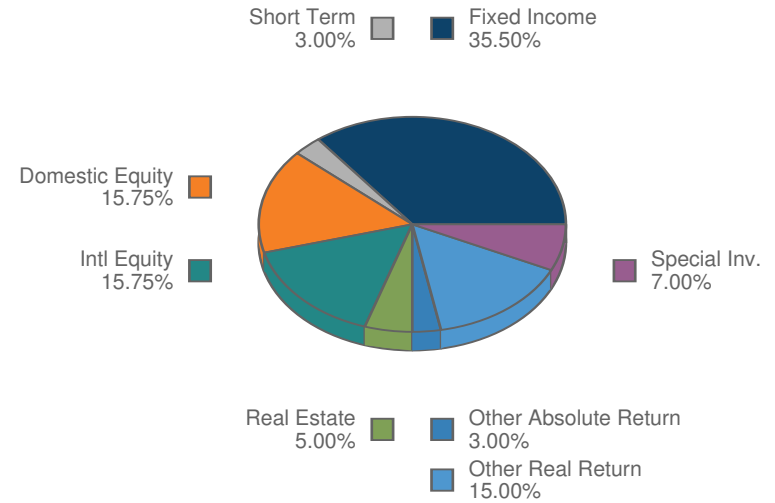
## SPRS Pension Plan Composite

As of September 30, 2018

**Total Fund**



**Policy Index**

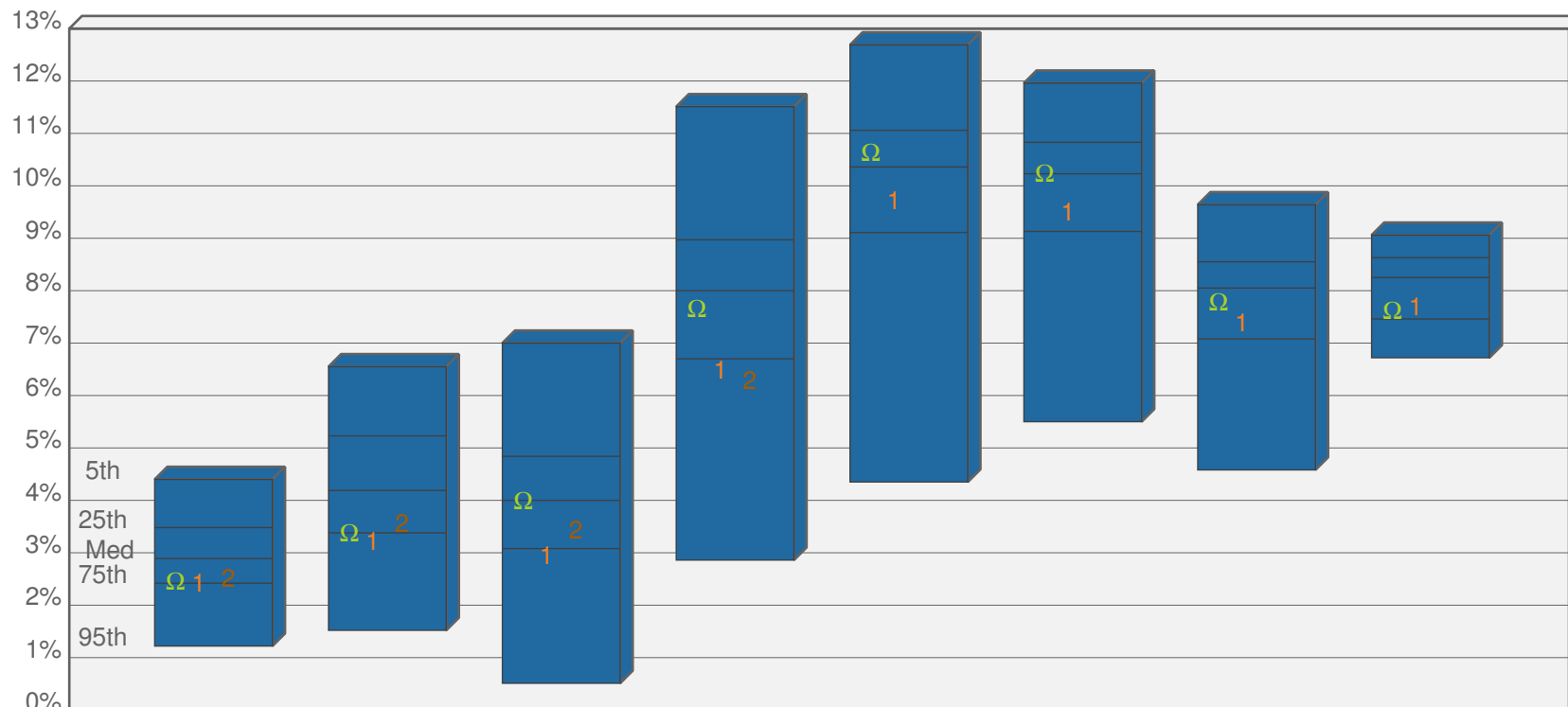


**\$269,781,057**

# PERFORMANCE COMPARISON

## KRS Pension Plan Composite

Periods Ended September 30, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Ω KRS Pension Plan	2.46 (74)	3.38 (75)	4.00 (50)	7.66 (59)	10.65 (38)	10.25 (48)	7.80 (61)	7.63 (71)
1 KRS Allocation I	2.43 (74)	3.23 (77)	2.96 (75)	6.49 (77)	9.72 (63)	9.50 (68)	7.39 (69)	7.71 (69)
2 KRS IPS Benchmark	2.52 (71)	3.56 (70)	3.44 (63)	6.30 (80)				
5th %tile	4.40	6.55	7.00	11.51	12.69	11.96	9.64	9.06
25th %tile	3.48	5.23	4.84	8.97	11.06	10.83	8.55	8.63
Median	2.89	4.19	4.00	8.00	10.36	10.23	8.05	8.25
75th %tile	2.42	3.38	3.08	6.70	9.11	9.13	7.08	7.46
95th %tile	1.22	1.52	0.51	2.86	4.35	5.50	4.58	6.72
Number of Funds	166	165	163	163	158	153	148	130

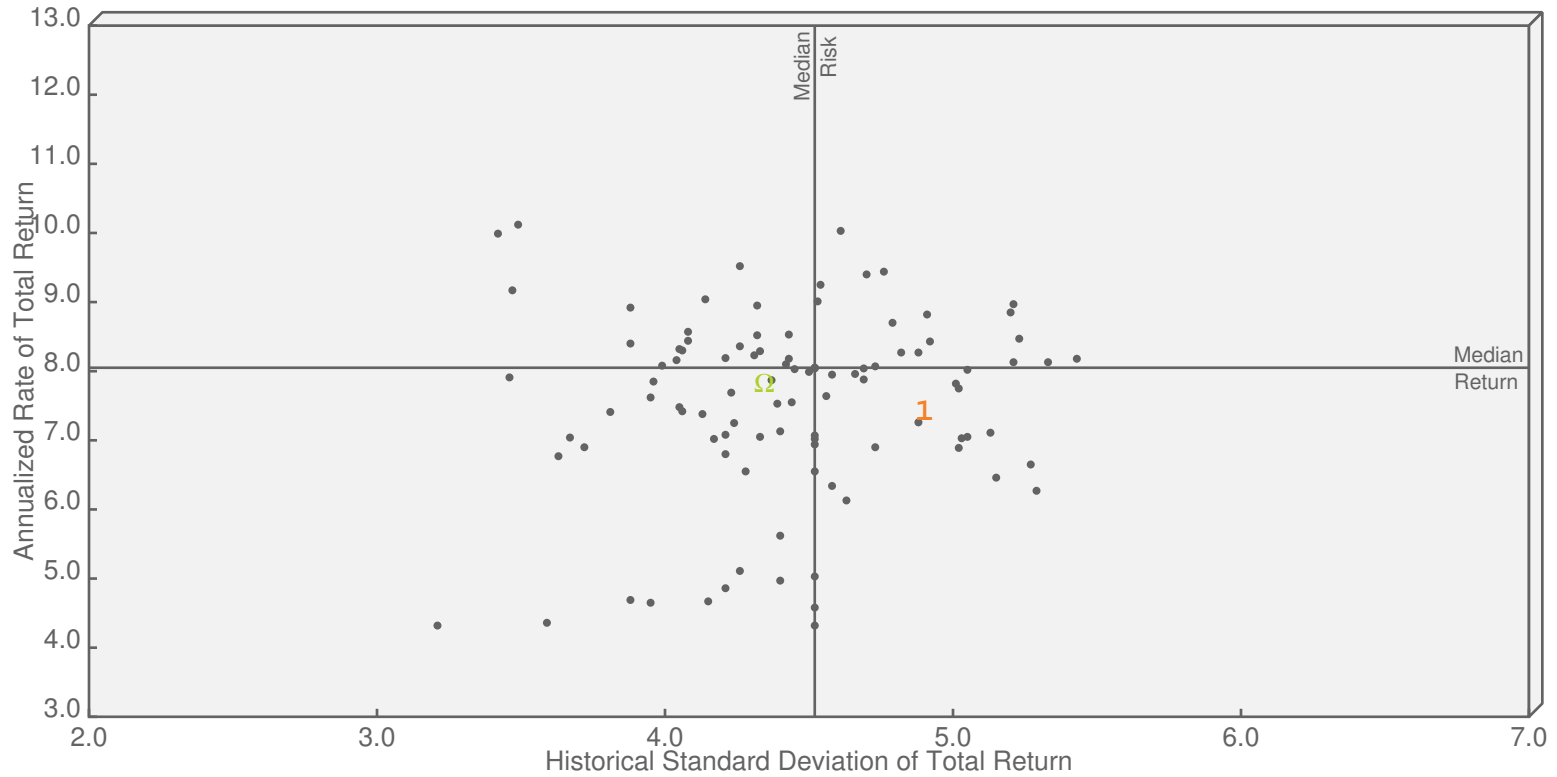
\*TUCS Total Ret of Master Trusts - Public Universe - Gross of Fees



# RISK / RETURN ANALYSIS

## KRS Pension Plan

Five Years Ending September 30, 2018



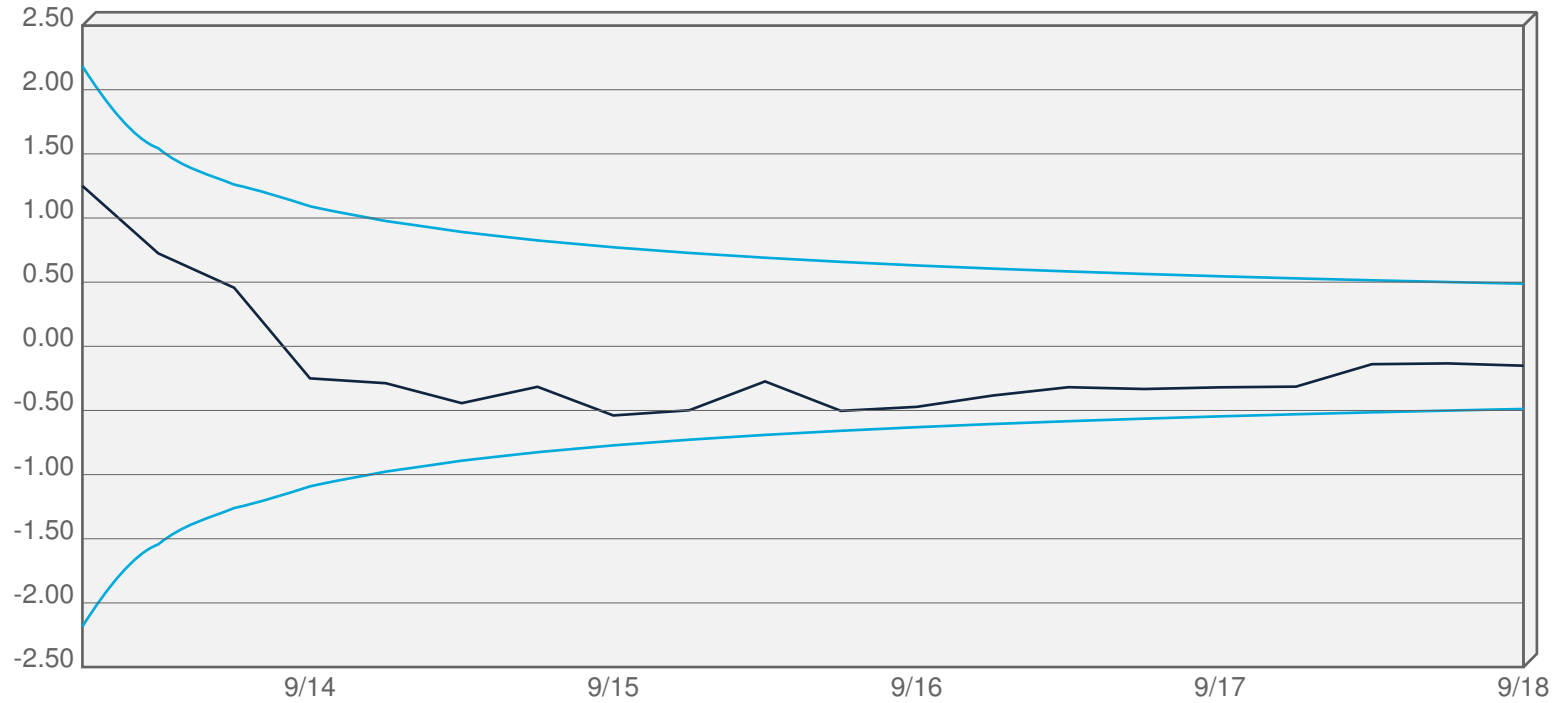
Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
KRS Pension Plan	Ω	7.80	61	4.36	59
KRS Allocation Index	1	7.39	69	4.92	24
Median		8.05		4.52	

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

# CUMULATIVE SKILL ANALYSIS

KRS Pension Plan Composite

Five Years Ending September 30, 2018



— Quarterly NOF Value Added vs. KRS Allocation Index

— 80% Confidence Band

Excess Return:	-0.15	Information Ratio:	-0.23
Excess Risk:	0.66	T-Stat:	-0.51

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>KRS Pension Plan</b>									
Net of Fee Return	2.30	3.09	3.51	7.01	9.61	7.22	7.28	3/31/84	9.14
KRS Allocation Index	2.43	3.23	2.96	6.49	9.50	7.39	7.71	3/31/84	9.28
Value Added	-0.13	-0.13	0.55	0.52	0.11	-0.17	-0.43	3/31/84	-0.13
KRS IPS Benchmark	2.52	3.56	3.44	6.30					
<b>KERS Pension Plan</b>									
Net of Fee Return	2.32	2.99	3.30	6.32	8.47	6.82	7.06	3/31/84	9.08
KERS Allocation Index	2.40	3.06	2.58	5.57	8.47	6.73	7.39	3/31/84	9.18
Value Added	-0.07	-0.06	0.72	0.74	-0.01	0.09	-0.33	3/31/84	-0.10
KERS IPS Benchmark	2.26	3.07	2.73	5.51					
Assumed Rate 5.25%	1.29	2.59	3.91	5.25					
<b>KERS (H) Pension Plan</b>									
Net of Fee Return	2.30	3.09	3.49	7.05	9.73	7.28	7.31	3/31/84	9.15
KERS (H) Allocation Index	2.46	3.30	3.07	6.73	9.76	7.38	7.73	3/31/84	9.28
Value Added	-0.16	-0.21	0.42	0.32	-0.03	-0.11	-0.42	3/31/84	-0.13
KERS (H) IPS Benchmark	2.57	3.64	3.56	6.43					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					
<b>CERS Pension Plan</b>									
Net of Fee Return	2.28	3.10	3.53	7.12	9.86	7.29	7.32	3/31/84	9.15
CERS Allocation Index	2.45	3.31	3.10	6.77	9.78	7.39	7.74	3/31/84	9.28
Value Added	-0.16	-0.21	0.43	0.35	0.08	-0.10	-0.42	3/31/84	-0.13
CERS IPS Benchmark	2.56	3.65	3.59	6.47					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>CERS (H) Pension Plan</b>									
<b>Net of Fee Return</b>	<b>2.29</b>	<b>3.14</b>	<b>3.57</b>	<b>7.15</b>	<b>9.85</b>	<b>7.31</b>	<b>7.33</b>	<b>3/31/84</b>	<b>9.16</b>
CERS (H) Allocation Index	2.45	3.35	3.15	6.82	9.80	7.40	7.74	3/31/84	9.29
Value Added	-0.16	-0.21	0.42	0.33	0.05	-0.10	-0.42	3/31/84	-0.13
CERS (H) IPS Benchmark	2.57	3.69	3.64	6.52					
Assumed Rate 6.25%	1.53	3.08	4.65	6.25					
<b>SPRS Pension Plan</b>									
<b>Net of Fee Return</b>	<b>2.12</b>	<b>2.78</b>	<b>3.02</b>	<b>6.18</b>	<b>8.70</b>	<b>6.57</b>	<b>6.96</b>	<b>3/31/84</b>	<b>9.05</b>
SPRS Allocation Index	2.65	3.52	3.14	6.39	9.34	7.12	7.60	3/31/84	9.24
Value Added	-0.53	-0.74	-0.12	-0.21	-0.64	-0.55	-0.64	3/31/84	-0.19
SPRS IPS Benchmark	2.22	3.11	2.87	5.69					
Assumed Rate 5.25%	1.29	2.59	3.91	5.25					

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 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>6.10</b>	<b>10.55</b>	<b>9.79</b>	<b>16.37</b>	<b>16.45</b>	<b>12.48</b>	<b>11.37</b>	<b>3/31/84</b>	<b>11.47</b>
Russell 3000	7.12	11.29	10.57	17.58	17.07	13.46	11.95	3/31/84	11.52
Value Added	-1.02	-0.74	-0.78	-1.21	-0.63	-0.98	-0.58	3/31/84	-0.05
<b>Non-US Equity Composite</b>									
<b>Net of Fee Return</b>	<b>0.67</b>	<b>-1.17</b>	<b>-0.98</b>	<b>4.50</b>	<b>11.44</b>	<b>5.35</b>	<b>6.37</b>	<b>6/30/00</b>	<b>3.41</b>
Policy Index	0.39	-2.23	-3.27	1.78	10.38	4.54	5.79	6/30/00	3.51
Value Added	0.28	1.06	2.29	2.72	1.06	0.82	0.58	6/30/00	-0.10
<b>Fixed Income Composite</b>									
<b>Net of Fee Return</b>	<b>1.29</b>	<b>1.18</b>	<b>0.88</b>	<b>1.33</b>	<b>4.59</b>	<b>4.16</b>	<b>5.30</b>	<b>3/31/84</b>	<b>7.47</b>
Policy Index	1.33	1.72	0.57	1.01	5.31	4.53	5.08	3/31/84	7.31
Value Added	-0.04	-0.54	0.31	0.31	-0.73	-0.37	0.22	3/31/84	0.16
Bloomberg Global Aggregate	-0.92	-3.68	-2.37	-1.32	1.98	0.75	2.89		
<b>Real Return Composite</b>									
<b>Net of Fee Return</b>	<b>0.66</b>	<b>0.88</b>	<b>0.36</b>	<b>1.11</b>	<b>5.90</b>	<b>2.86</b>		<b>6/30/11</b>	<b>3.67</b>
Real Return Index (P)	0.62	2.25	0.37	0.92	3.38	1.62		6/30/11	2.52
Value Added	0.03	-1.37	-0.01	0.20	2.53	1.24		6/30/11	1.15
<b>Real Estate Composite</b>									
<b>Net of Fee Return</b>	<b>2.66</b>	<b>4.76</b>	<b>7.19</b>	<b>9.65</b>	<b>9.44</b>	<b>9.12</b>	<b>8.46</b>	<b>6/30/84</b>	<b>6.09</b>
NCREIF ODCE NOF 1 Quarter Lag	1.85	3.86	5.78	7.51	8.39	10.04	4.34		
Value Added	0.81	0.91	1.41	2.14	1.05	-0.92	4.12		
<b>Absolute Return Composite</b>									
<b>Net of Fee Return</b>	<b>0.23</b>	<b>0.80</b>	<b>2.39</b>	<b>3.72</b>	<b>2.34</b>	<b>3.60</b>		<b>3/31/10</b>	<b>4.06</b>
HFRI FOF Div (1 Month Lag)	0.99	1.43	2.91	4.63	2.60	3.53		3/31/10	3.08
Value Added	-0.76	-0.63	-0.52	-0.91	-0.27	0.07		3/31/10	0.97

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Private Equity Composite</b>									
<b>Net of Fee Return</b>	<b>5.43</b>	<b>8.17</b>	<b>11.84</b>	<b>15.37</b>	<b>11.58</b>	<b>13.52</b>	<b>9.48</b>	<b>6/30/02</b>	<b>11.36</b>
KRS Short Term PE Index	5.43	8.17	11.85	15.37	11.58	13.52	9.49	6/30/02	11.36
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	4.66	4.76	12.22	18.22	15.76	17.41	14.68	6/30/02	11.09
<b>Cash Composite</b>									
<b>Net of Fee Return</b>	<b>0.51</b>	<b>0.96</b>	<b>1.54</b>	<b>2.20</b>	<b>1.29</b>	<b>0.85</b>	<b>0.76</b>	<b>12/31/87</b>	<b>3.58</b>
91-Day Treasury Bill	0.49	0.94	1.30	1.58	0.84	0.52	0.34	12/31/87	3.28
Value Added	0.02	0.02	0.24	0.62	0.46	0.34	0.42	12/31/87	0.30
<b>Other Assets</b>									
<b>Net of Fee Return</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.18</b>	<b>3/31/99</b>	<b>3.12</b>

# CUSTOM BENCHMARK SPECIFICATION

KRS Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
KRS Allocation Index	6/84	6/17	100.00	KRS Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			25.20	MSCI ACWI Ex USA IMI Index (\$G)
			25.60	Russell 3000
			7.00	Bloomberg Universal
			7.00	Bloomberg High Yield
			8.00	Real Return Index (P)
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			10.00	KRS Short Term PE Benchmark
			2.20	91-Day Treasury Bill
	12/17	3/18	10.00	HFRI Diversified Index
			9.00	Bloomberg High Yield
			9.00	Bloomberg Universal
			2.20	91-Day Treasury Bill
			23.20	MSCI ACWI Ex USA IMI (\$N)
5.00			NCREIF ODCE NOF 1 Quarter Lag	
8.00			Real Return Index (P)	
10.00			KRS Short Term PE Benchmark	
23.60			Russell 3000	
6/18	9/18	17.00	Russell 3000	
		21.00	MSCI ACWI Ex USA IMI (\$N)	
		10.00	HFRI Diversified Index	
		10.00	Real Return Index (P)	
		12.40	Bloomberg High Yield	
		13.00	Bloomberg Universal	
		5.00	NCREIF ODCE NOF 1 Quarter Lag	
		9.40	KRS Short Term PE Benchmark	
2.20	91-Day Treasury Bill			
KRS IPS Benchmark	9/17	9/17	17.50	Russell 3000

# CUSTOM BENCHMARK SPECIFICATION

KRS Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description	
KRS IPS Benchmark (cont.)			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			22.70	Bloomberg High Yield	
			5.10	Bloomberg Universal	
			10.00	Real Return Index (P)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	HFRI FOF Div (1 Month Lag)	
			10.00	KRS Short Term PE Benchmark	
			2.20	91-Day Treasury Bill	
		12/17	6/18	2.20	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 (P)
				5.10	Bloomberg Universal
				22.70	Bloomberg High Yield
				17.50	MSCI ACWI Ex USA IMI (\$N)
				17.50	Russell 3000
		9/18	9/18	18.25	Russell 3000
				18.25	MSCI ACWI Ex USA IMI (\$N)
				14.75	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 (P)
				9.50	KRS Short Term PE Benchmark
				1.25	91-Day Treasury Bill



# CUSTOM BENCHMARK SPECIFICATION

KERS Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
KERS Allocation Index	6/84	6/17	100.00	KERS Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			5.00	91-Day Treasury Bill
			10.00	KERS Short Term PE Benchmark
			3.00	NCREIF ODCE NOF 1 Quarter Lag
			10.00	Real Return Index (P)
			5.00	Bloomberg Global Aggregate
			5.00	Bloomberg High Yield
			10.00	Bloomberg Aggregate
			22.00	Russell 3000
			20.00	MSCI ACWI Ex USA IMI Index (\$G)
	12/17	3/18	10.00	HFRI Diversified Index
			20.00	Russell 3000
			10.00	KERS Short Term PE Benchmark
			8.00	Real Return Index (P)
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			18.00	MSCI ACWI Ex USA IMI (\$N)
			3.00	91-Day Treasury Bill
			12.00	Bloomberg Universal
	6/18	9/18	14.00	Bloomberg High Yield
			3.00	91-Day Treasury Bill
10.00			KERS Short Term PE Benchmark	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
15.00			Bloomberg Universal	
15.00			Bloomberg High Yield	
11.50			Real Return Index (P)	
7.00	HFRI Diversified Index			
18.75	MSCI ACWI Ex USA IMI (\$N)			
14.75	Russell 3000			

# CUSTOM BENCHMARK SPECIFICATION

KERS Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
KERS IPS Benchmark	9/17	9/17	17.50	Russell 3000
			17.50	MSCI ACWI Ex USA IMI Index (\$G)
			17.00	Bloomberg High Yield
			10.00	Bloomberg Universal
			10.00	Real Return Index (P)
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			10.00	HFRI FOF Div (1 Month Lag)
			10.00	KERS Short Term PE Benchmark
			3.00	91-Day Treasury Bill
	12/17	6/18	17.50	Russell 3000
			17.50	MSCI ACWI Ex USA IMI (\$N)
			17.00	Bloomberg High Yield
			10.00	Bloomberg Universal
			10.00	Real Return Index (P)
			5.00	NCREIF ODCE NOF 1 Quarter Lag
10.00			HFRI FOF Div (1 Month Lag)	
10.00			KERS Short Term PE Benchmark	
3.00			91-Day Treasury Bill	
9/18	9/18	3.00	91-Day Treasury Bill	
		5.00	NCREIF ODCE NOF 1 Quarter Lag	
		15.75	MSCI ACWI Ex USA IMI (\$N)	
	9/18	15.75	Russell 3000	
		3.00	HFRI Diversified Index	
		15.00	Bloomberg High Yield	
		7.00	KERS Short Term PE Benchmark	
		20.50	Bloomberg Universal	
		15.00	Real Return Index (P)	
Assumed Rate 5.25%	9/17	9/18	100.00	Assumed Rate 5.25%

# CUSTOM BENCHMARK SPECIFICATION

KERS (H) Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
KERS (H) Allocation Index	6/84	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 (P)
			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
	24.50	Russell 3000		
	10.00	KERS (H) Short Term PE Benchmark		
	8.00	Real Return Index (P)		
	5.00	NCREIF ODCE NOF 1 Quarter Lag		
	24.50	MSCI ACWI Ex USA IMI (\$N)		
	2.00	91-Day Treasury Bill		
	8.00	Bloomberg Universal		
	8.00	Bloomberg High Yield		
	6/18	9/18		
10.00			KERS (H) Short Term PE Benchmark	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
12.00			Bloomberg Universal	
11.00			Bloomberg High Yield	
11.00			Real Return Index (P)	
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

# CUSTOM BENCHMARK SPECIFICATION

KERS (H) Pension Plan

September 30, 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 (P)	
			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 (P)
				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	9/18	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 (P)
			10.00	KERS (H) Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	9/18	100.00	Assumed Rate 6.25%	

# CUSTOM BENCHMARK SPECIFICATION

## CERS Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
CERS Allocation Index	6/84	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 (P)
			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
	24.50	Russell 3000		
	10.00	CERS Short Term PE Benchmark		
	8.00	Real Return Index (P)		
	5.00	NCREIF ODCE NOF 1 Quarter Lag		
	24.50	MSCI ACWI Ex USA IMI (\$N)		
	2.00	91-Day Treasury Bill		
	8.00	Bloomberg Universal		
	8.00	Bloomberg High Yield		
	6/18	9/18		
10.00			CERS Short Term PE Benchmark	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
12.00			Bloomberg Universal	
11.00			Bloomberg High Yield	
11.00			Real Return Index (P)	
10.00			HFRI Diversified Index	
21.50			MSCI ACWI Ex USA IMI (\$N)	
17.50			Russell 3000	
CERS IPS Benchmark			9/17	9/17

# CUSTOM BENCHMARK SPECIFICATION

CERS Pension Plan

September 30, 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 (P)	
			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	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 (P)
				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
		9/18	9/18	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 (P)
			10.00	CERS Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	9/18	100.00	Assumed Rate 6.25%	

# CUSTOM BENCHMARK SPECIFICATION

CERS (H) Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
CERS (H) Allocation Index	6/84	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 (P)
			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
			24.50	MSCI ACWI Ex USA IMI (\$N)
5.00			NCREIF ODCE NOF 1 Quarter Lag	
8.00			Real Return Index (P)	
10.00			CERS (H) Short Term PE Benchmark	
24.50	Russell 3000			
6/18	9/18	2.00	91-Day Treasury Bill	
		10.00	CERS (H) Short Term PE Benchmark	
		5.00	NCREIF ODCE NOF 1 Quarter Lag	
		12.00	Bloomberg Universal	
		11.00	Bloomberg High Yield	
		11.00	Real Return Index (P)	
		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) Pension Plan

September 30, 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 (P)	
			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	2.00	91-Day Treasury Bill
				10.00	CERS (H) 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 (P)
				4.00	Bloomberg Universal
				24.00	Bloomberg High Yield
				17.50	MSCI ACWI Ex USA IMI (\$N)
				17.50	Russell 3000
		9/18	9/18	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 (P)	
			10.00	CERS (H) Short Term PE Benchmark	
			1.00	91-Day Treasury Bill	
Assumed Rate 6.25%	9/17	9/18	100.00	Assumed Rate 6.25%	



# CUSTOM BENCHMARK SPECIFICATION

SPRS Pension Plan

September 30, 2018

	Quarter Start	Quarter End	Percent	Description
SPRS Allocation Index	6/84	6/17	100.00	SPRS Allocation Index
	9/17	9/17	10.00	HFRI Diversified Index
			3.00	91-Day Treasury Bill
			10.00	SPRS Short Term PE Benchmark
			5.00	NCREIF ODCE NOF 1 Quarter Lag
			8.00	Real Return Index (P)
			9.00	Bloomberg High Yield
			9.00	Bloomberg Universal
			23.00	Russell 3000
			23.00	MSCI ACWI Ex USA IMI Index (\$G)
			12/17	3/18
	21.00	Russell 3000		
	10.00	SPRS Short Term PE Benchmark		
	8.00	Real Return Index (P)		
	5.00	NCREIF ODCE NOF 1 Quarter Lag		
	21.00	MSCI ACWI Ex USA IMI (\$N)		
	3.00	91-Day Treasury Bill		
	11.00	Bloomberg Universal		
	11.00	Bloomberg High Yield		
	6/18	9/18		
15.00			SPRS Short Term PE Benchmark	
5.00			NCREIF ODCE NOF 1 Quarter Lag	
7.00			Bloomberg Universal	
15.00			Bloomberg High Yield	
11.50			Real Return Index (P)	
10.00			HFRI Diversified Index	
18.75			MSCI ACWI Ex USA IMI (\$N)	
14.75			Russell 3000	
SPRS IPS Benchmark			9/17	9/17

# CUSTOM BENCHMARK SPECIFICATION

SPRS Pension Plan

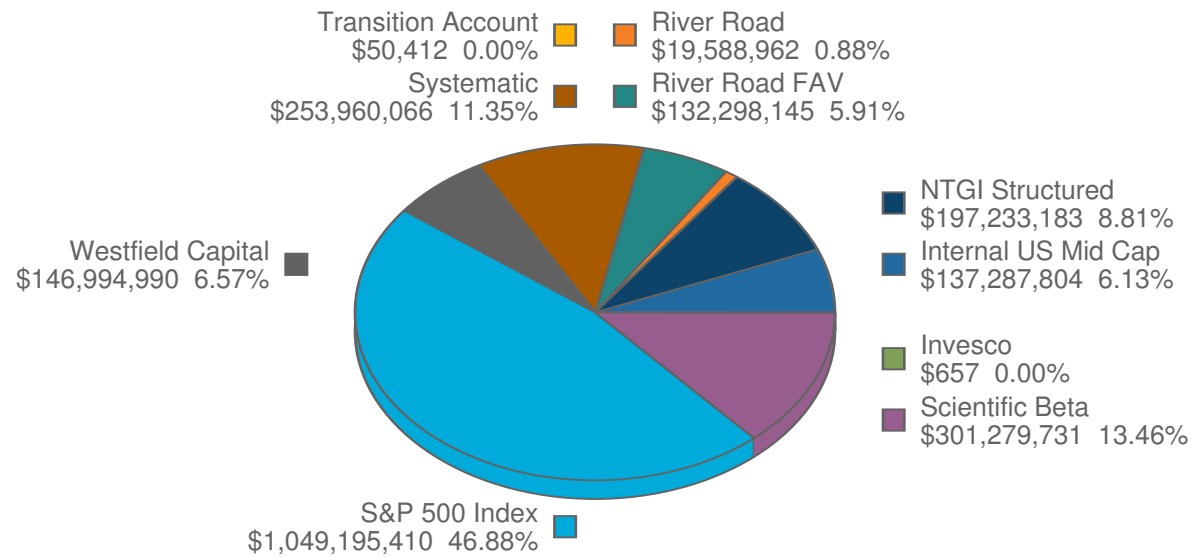
September 30, 2018

	Quarter Start	Quarter End	Percent	Description	
SPRS IPS Benchmark (cont.)			17.50	MSCI ACWI Ex USA IMI Index (\$G)	
			17.00	Bloomberg High Yield	
			10.00	Bloomberg Universal	
			10.00	Real Return Index (P)	
			5.00	NCREIF ODCE NOF 1 Quarter Lag	
			10.00	HFRI FOF Div (1 Month Lag)	
			10.00	SPRS Short Term PE Benchmark	
			3.00	91-Day Treasury Bill	
		12/17	6/18	17.50	Russell 3000
				17.50	MSCI ACWI Ex USA IMI (\$N)
				17.00	Bloomberg High Yield
				10.00	Bloomberg Universal
				10.00	Real Return Index (P)
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				10.00	HFRI FOF Div (1 Month Lag)
				10.00	SPRS Short Term PE Benchmark
				3.00	91-Day Treasury Bill
		9/18	9/18	3.00	91-Day Treasury Bill
				7.00	SPRS Short Term PE Benchmark
				15.00	Real Return Index (P)
				3.00	HFRI Diversified Index
				5.00	NCREIF ODCE NOF 1 Quarter Lag
				15.00	Bloomberg High Yield
			20.50	Bloomberg Universal	
			15.75	MSCI ACWI Ex USA IMI (\$N)	
			15.75	Russell 3000	
Assumed Rate 5.25%	9/17	9/18	100.00	Assumed Rate 5.25%	



# US EQUITY

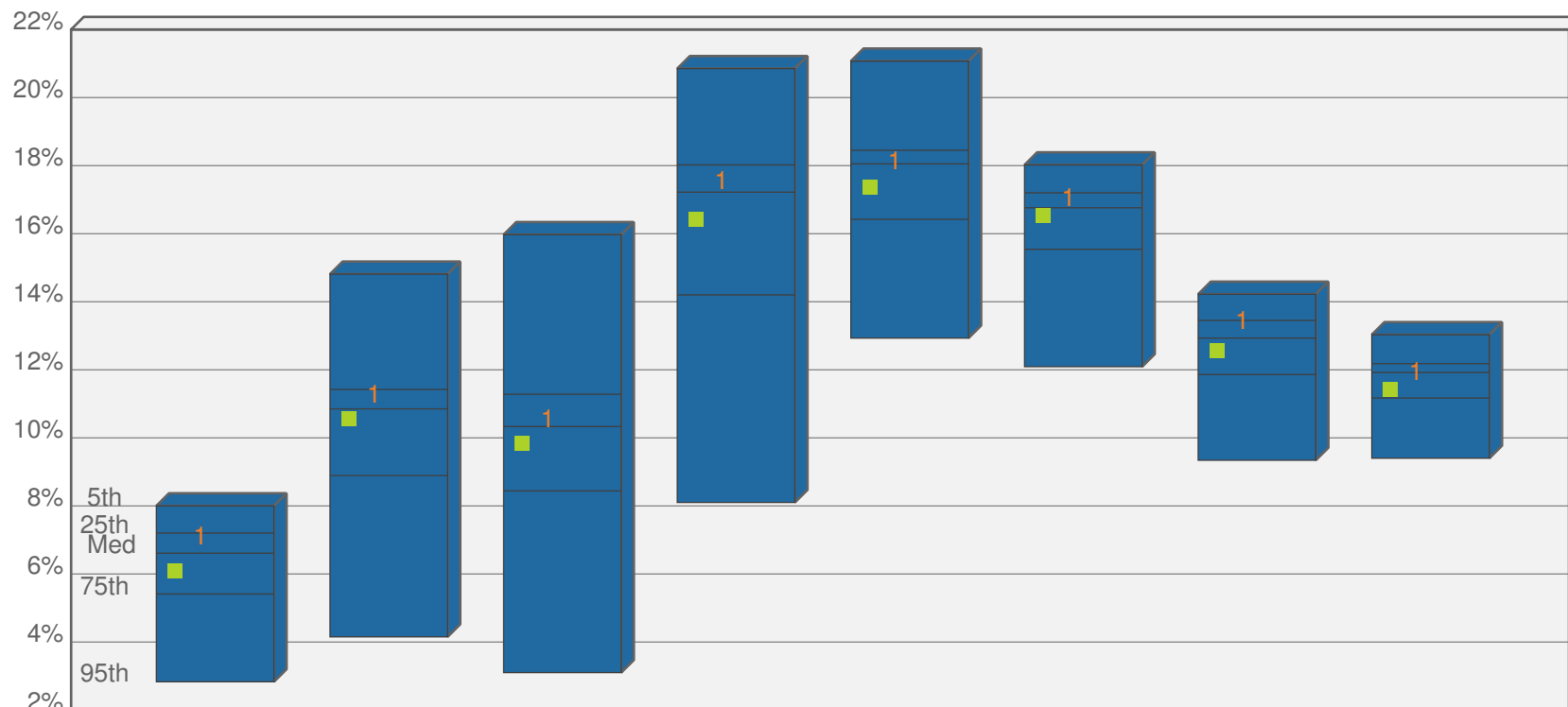
Wilshire Consulting  
**MANAGER ALLOCATION**  
 US Equity Composite  
*As of September 30, 2018*



# PERFORMANCE COMPARISON

## US Equity Composite

Periods Ended September 30, 2018



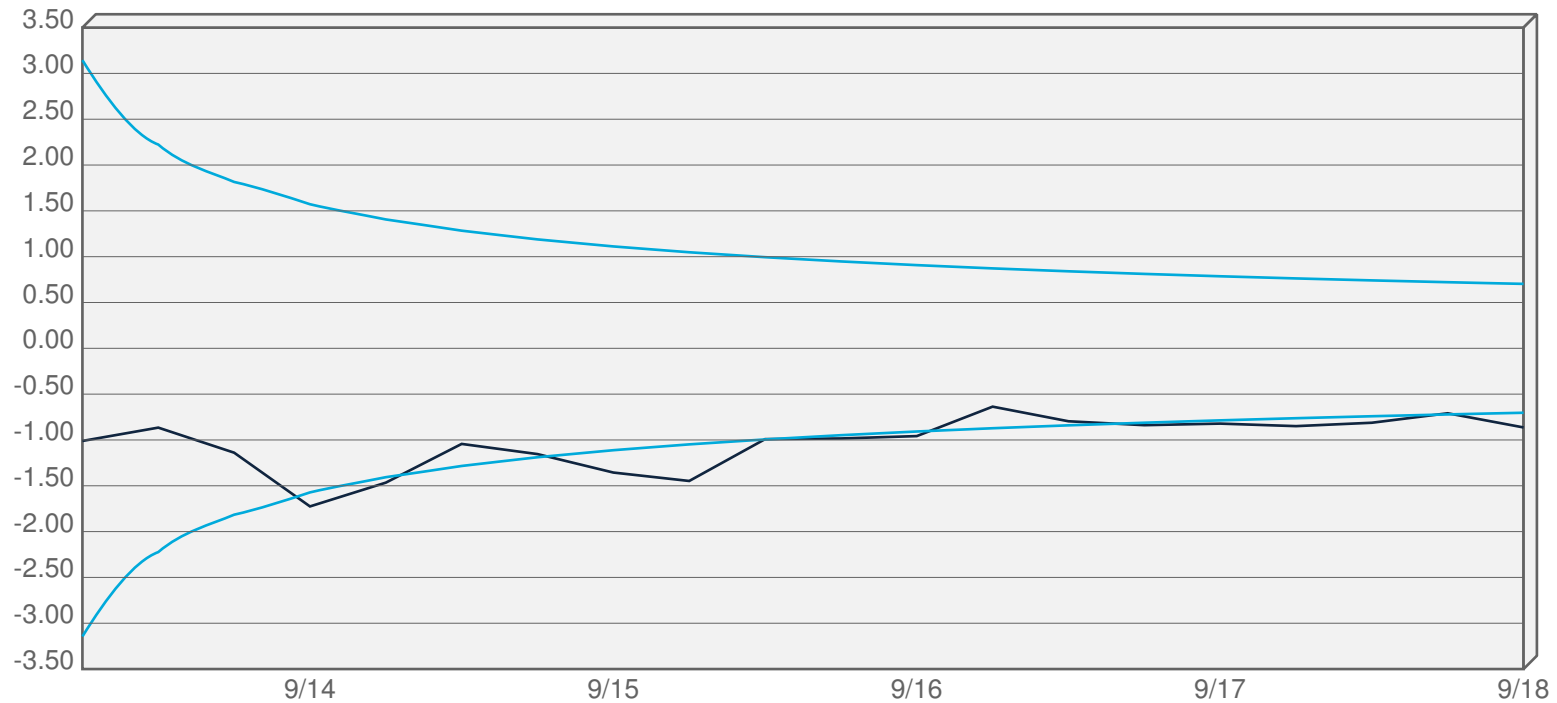
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ US Equity Composite	6.12 (68)	10.60 (60)	9.87 (62)	16.46 (60)	17.40 (65)	16.56 (56)	12.60 (59)	11.46 (65)
┆ Russell 3000	7.12 (29)	11.29 (33)	10.57 (42)	17.58 (43)	18.14 (46)	17.07 (31)	13.46 (24)	11.95 (48)
5th %tile	8.00	14.81	15.97	20.85	21.07	18.02	14.22	13.03
25th %tile	7.20	11.42	11.28	18.02	18.45	17.20	13.45	12.18
Median	6.61	10.85	10.33	17.22	18.05	16.76	12.93	11.92
75th %tile	5.41	8.89	8.44	14.20	16.42	15.54	11.86	11.17
95th %tile	2.83	4.15	3.10	8.10	12.93	12.09	9.34	9.40
Number of Funds	140	137	133	132	116	111	100	76

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

# CUMULATIVE SKILL ANALYSIS

US Equity Composite

Five Years Ending September 30, 2018



— Quarterly NOF Value Added vs. Russell 3000

— 80% Confidence Band

Excess Return:	-0.86	Information Ratio:	-0.90
Excess Risk:	0.96	T-Stat:	-2.02

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 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>7.52</b>	<b>11.51</b>	<b>10.72</b>	<b>18.11</b>	<b>17.27</b>	<b>13.91</b>	<b>12.11</b>	<b>6/30/01</b>	<b>7.69</b>
Standard & Poor's 500	7.71	11.41	10.57	17.92	17.31	13.95	11.96	6/30/01	7.28
Value Added	-0.19	0.10	0.15	0.19	-0.04	-0.04	0.15	6/30/01	0.41
<b>Scientific Beta</b>									
<b>Net of Fee Return</b>	<b>5.34</b>	<b>7.65</b>	<b>7.96</b>	<b>14.58</b>				<b>6/30/16</b>	<b>14.49</b>
Standard & Poor's 500	7.71	11.41	10.57	17.92				6/30/16	18.04
Value Added	-2.37	-3.76	-2.60	-3.34				6/30/16	-3.55
<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>6.69</b>	<b>11.26</b>	<b>11.40</b>	<b>12.70</b>				<b>6/30/16</b>	<b>18.74</b>
Russell 3000 Value	5.39	7.19	4.17	9.46				6/30/16	12.89
Value Added	1.30	4.07	7.23	3.24				6/30/16	5.86
<b>Westfield Capital</b>									
<b>Net of Fee Return</b>	<b>8.02</b>	<b>12.86</b>	<b>16.05</b>	<b>21.97</b>	<b>17.13</b>	<b>13.40</b>		<b>6/30/11</b>	<b>13.75</b>
Russell 3000 Growth	8.88	15.28	16.99	25.89	20.36	16.23		6/30/11	15.50
Value Added	-0.86	-2.42	-0.94	-3.92	-3.22	-2.83		6/30/11	-1.75
<b>Systematic</b>									
<b>Net of Fee Return</b>	<b>2.99</b>	<b>6.37</b>	<b>2.91</b>	<b>11.27</b>	<b>14.78</b>	<b>9.09</b>		<b>6/30/12</b>	<b>12.56</b>
Russell Mid Cap Value	3.30	5.78	3.13	8.81	13.09	10.72		6/30/12	13.84
Value Added	-0.30	0.58	-0.22	2.46	1.68	-1.62		6/30/12	-1.29

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 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>4.00</b>	<b>9.28</b>	<b>8.62</b>	<b>15.56</b>	<b>16.06</b>			<b>9/30/14</b>	<b>12.15</b>
S&P 400 Mid Cap	3.86	8.32	7.49	14.21	15.68			9/30/14	11.93
Value Added	0.13	0.96	1.13	1.35	0.38			9/30/14	0.23
<b>NTGI Structured</b>									
<b>Net of Fee Return</b>	<b>3.73</b>	<b>12.09</b>	<b>12.05</b>	<b>15.78</b>	<b>17.41</b>	<b>11.87</b>	<b>12.59</b>	<b>9/30/99</b>	<b>10.64</b>
Russell 2000	3.58	11.61	11.51	15.24	17.12	11.07	11.11	9/30/99	8.96
Value Added	0.15	0.49	0.54	0.54	0.29	0.79	1.48	9/30/99	1.68
<b>Transition Account</b>									
<b>Net of Fee Return</b>								<b>6/30/11</b>	
<b>US Equity Composite</b>									
<b>Net of Fee Return</b>	<b>6.10</b>	<b>10.55</b>	<b>9.79</b>	<b>16.37</b>	<b>16.45</b>	<b>12.48</b>	<b>11.37</b>	<b>3/31/84</b>	<b>11.47</b>
Russell 3000	7.12	11.29	10.57	17.58	17.07	13.46	11.95	3/31/84	11.52
Value Added	-1.02	-0.74	-0.78	-1.21	-0.63	-0.98	-0.58	3/31/84	-0.05

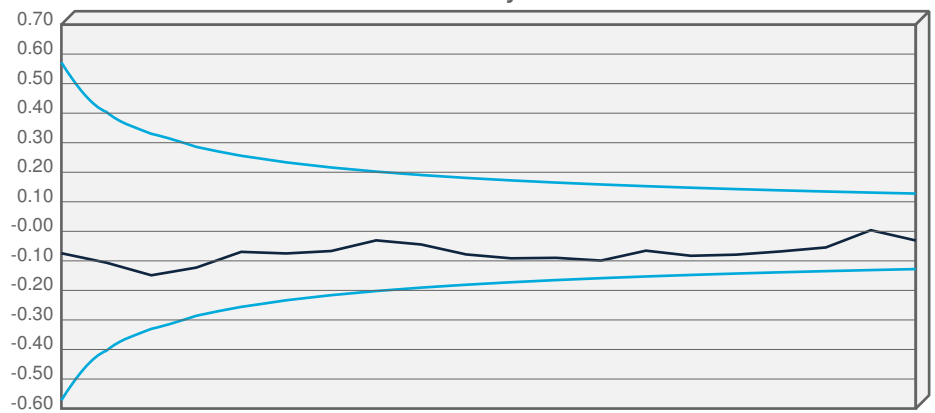


# INVESTMENT MANAGER ANALYSIS

S&P 500 Index

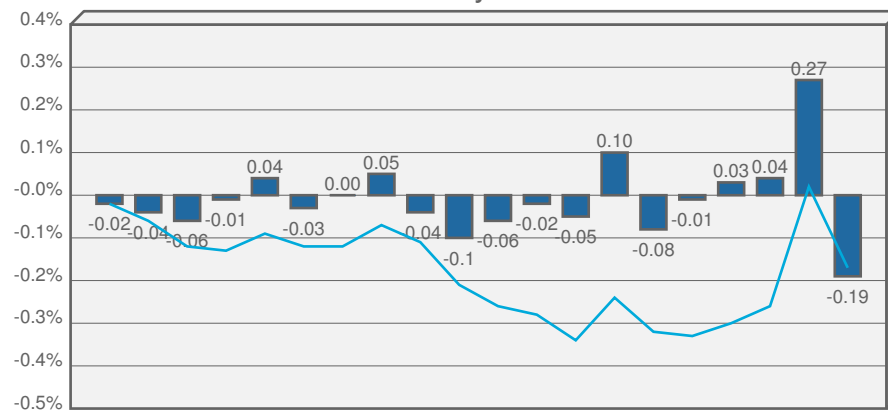
September 30, 2018

Cumulative Skill Analysis vs Benchmark



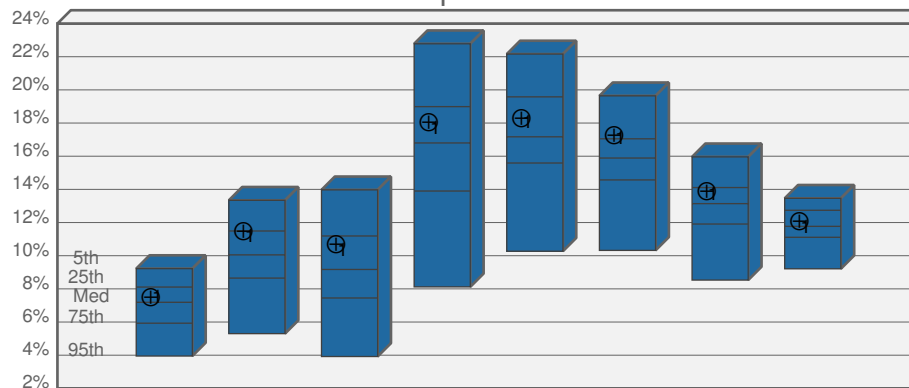
Quarterly NOF Value Added vs. Standard & Poor's 500	80% Confidence Band
Excess Return: -0.03	Information Ratio: -0.18
Excess Risk: 0.17	T-Stat: -0.40

Value-Added Analysis vs Benchmark



Quarterly NOF Value Added vs. Standard & Poor's 500	Cumulative Value Added
3/14: -0.02	9/14: -0.06
9/14: -0.01	3/15: -0.03
3/15: 0.04	9/15: 0.05
9/15: 0.00	3/16: -0.04
3/16: -0.1	9/16: -0.06
9/16: -0.02	3/17: 0.10
3/17: -0.05	9/17: -0.08
9/17: -0.01	3/18: 0.03
3/18: 0.04	9/18: 0.27
9/18: -0.19	

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	7.52 (42)	11.51 (24)	10.72 (32)	18.11 (34)	18.33 (39)	17.27 (23)	13.92 (33)	12.11 (40)
⊕ Standard & Poo	7.71 (36)	11.41 (26)	10.57 (33)	17.92 (37)	18.26 (39)	17.31 (23)	13.95 (32)	11.96 (45)
Median	7.19	10.05	9.17	16.80	17.17	15.89	13.14	11.77
Number of Funds	153	153	153	152	150	149	145	119

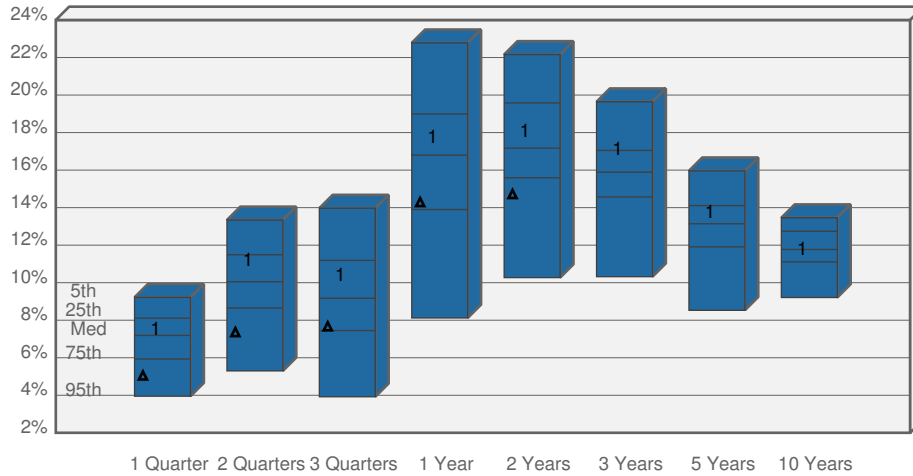
\*Compass Total Returns of Active Large Core Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Scientific Beta

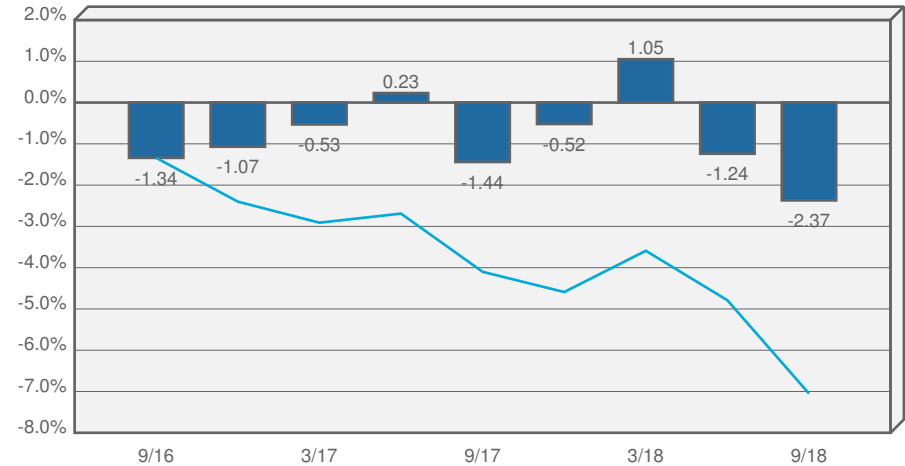
September 30, 2018

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▲ Scientific Bet	5.34 (85)	7.65 (81)	7.96 (67)	14.58 (70)	15.01 (79)			
1 Standard & Poo	7.71 (36)	11.41 (26)	10.57 (33)	17.92 (37)	18.26 (39)	17.31 (23)	13.95 (32)	11.96 (45)
Median	7.19	10.05	9.17	16.80	17.17	15.89	13.14	11.77
Number of Funds	153	153	153	152	150	149	145	119

Value-Added Analysis vs Benchmark



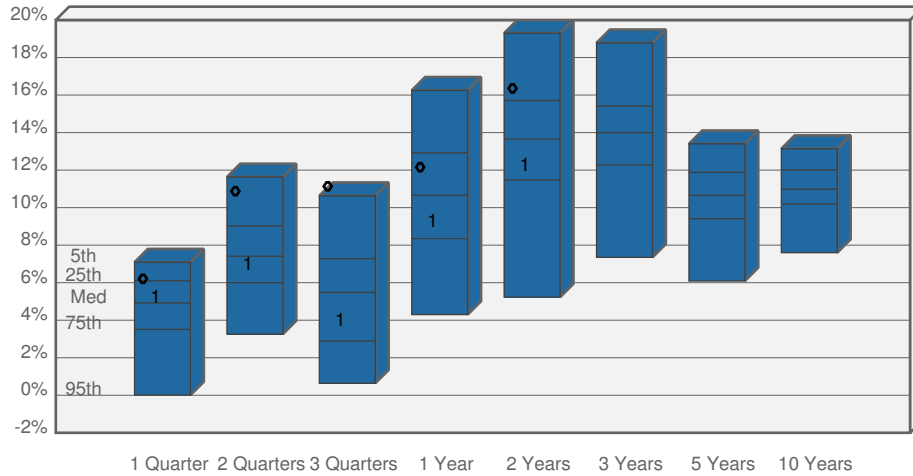
■ Quarterly NOF Value Added vs. Standard & Poor's 500  
 — Cumulative Value Added

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

# INVESTMENT MANAGER ANALYSIS

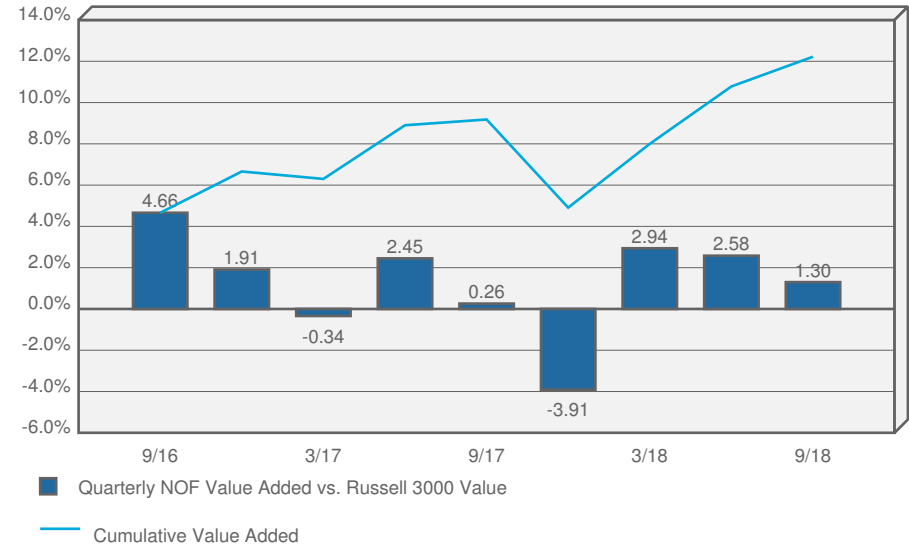
River Road FAV  
September 30, 2018

Performance Comparison vs Peer Universe\*



○ River Road FAV	6.49 (16)	11.16 ( 5)	11.42 ( 3)	12.44 (33)	16.64 (14)			
1 Russell 3000 V	5.39 (40)	7.19 (55)	4.17 (64)	9.46 (61)	12.45 (60)			
Median	4.92	7.41	5.48	10.66	13.65	14.00	10.66	10.98
Number of Funds	84	84	84	84	84	84	77	63

Value-Added Analysis vs Benchmark



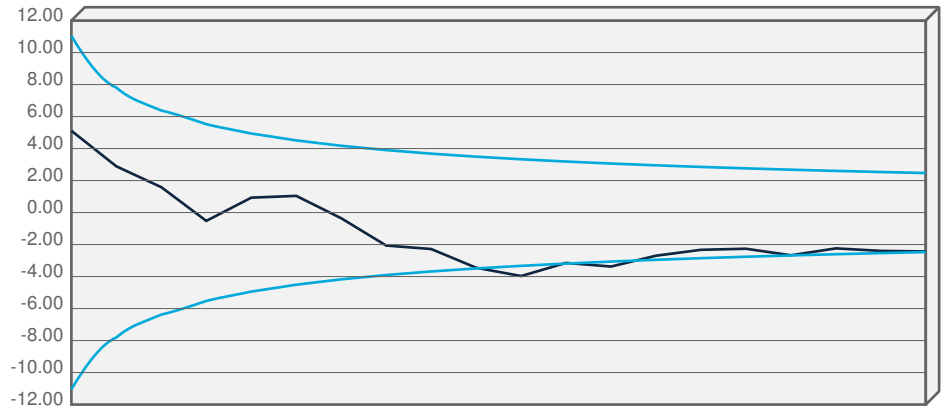
\*Compass Total Returns of Active Combination Value Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Westfield Capital

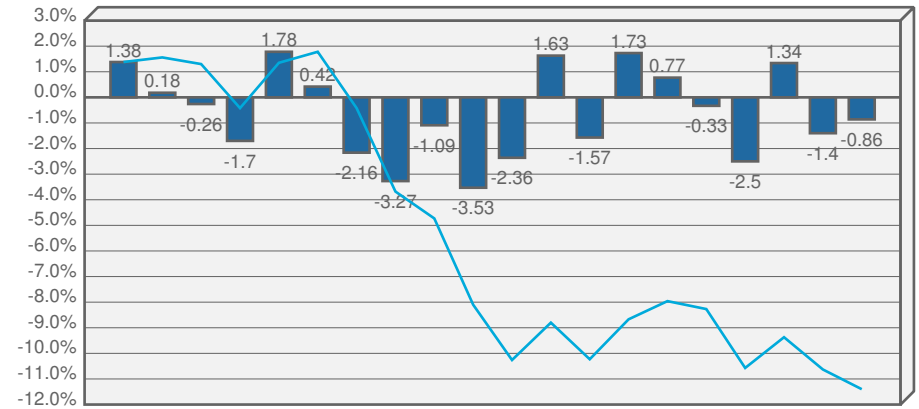
September 30, 2018

Cumulative Skill Analysis vs Benchmark



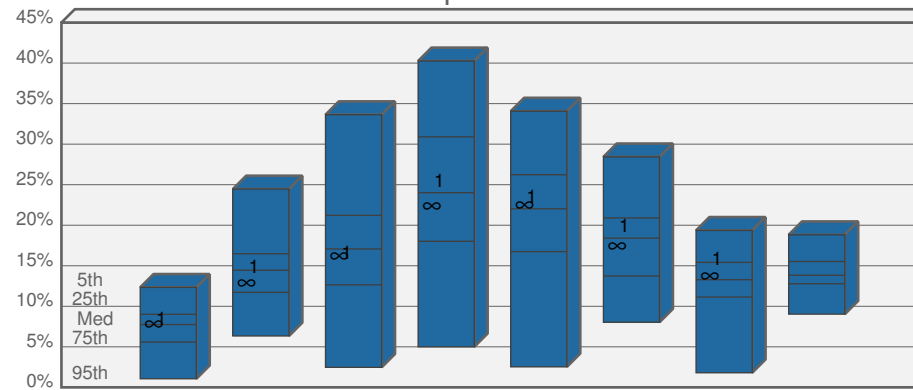
Excess Return:	-2.43	Information Ratio:	-0.72
Excess Risk:	3.36	T-Stat:	-1.62

Value-Added Analysis vs Benchmark



Quarterly NOF Value Added vs. Russell 3000 Growth  
Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
∞ Westfield Capi	8.16 (44)	13.16 (60)	16.53 (53)	22.65 (56)	22.84 (43)	17.77 (54)	14.04 (46)	
1 Russell 3000 G	8.88 (27)	15.28 (39)	16.99 (51)	25.89 (43)	23.86 (42)	20.36 (29)	16.23 (21)	
Median	7.75	14.45	17.07	24.01	22.03	18.41	13.28	13.83
Number of Funds	58	58	58	58	57	57	56	45

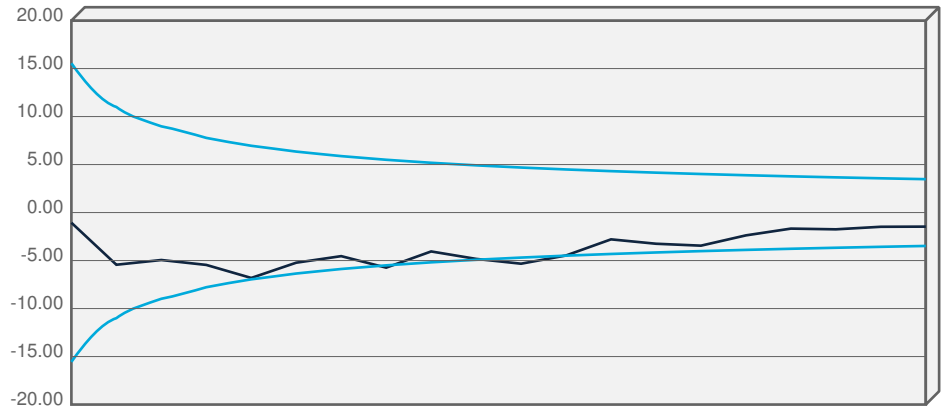
\*Compass Total Returns of Active Combination Growth Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

## Systematic

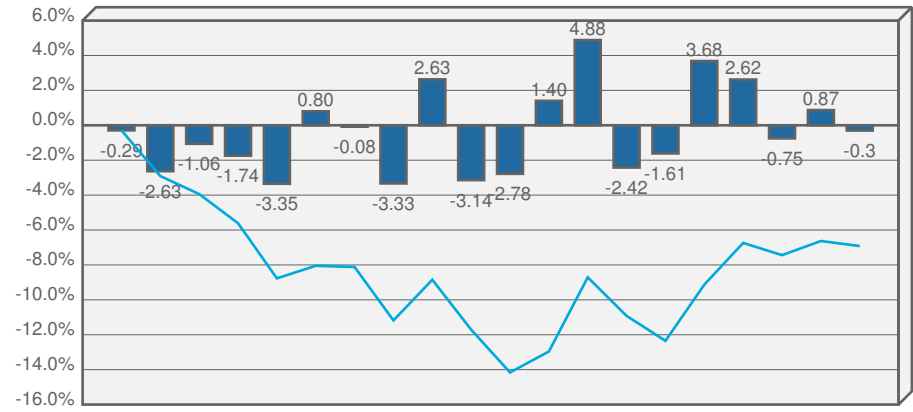
September 30, 2018

Cumulative Skill Analysis vs Benchmark



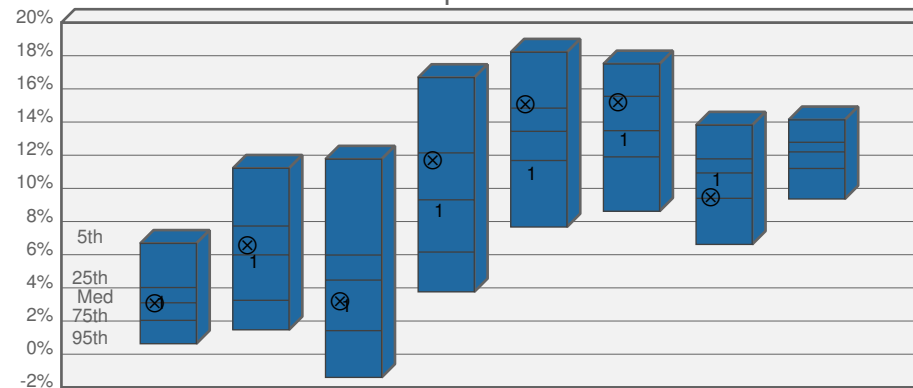
—	Quarterly NOF Value Added vs. Russell Mid Cap Value	—	80% Confidence Band
Excess Return:	-1.47	Information Ratio:	-0.31
Excess Risk:	4.73	T-Stat:	-0.69

Value-Added Analysis vs Benchmark



■	Quarterly NOF Value Added vs. Russell Mid Cap Value	—	Cumulative Value Added
---	---	---	------------------------

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊗ Systematic	3.11 (49)	6.59 (37)	3.24 (58)	11.73 (30)	15.08 (21)	15.22 (32)	9.52 (73)	
■ Russell Mid Ca	3.30 (45)	5.78 (55)	3.13 (59)	8.81 (55)	11.06 (79)	13.09 (56)	10.72 (57)	
Median	3.10	5.99	4.47	9.31	13.44	13.48	10.93	12.20
Number of Funds	85	85	85	85	85	85	84	75

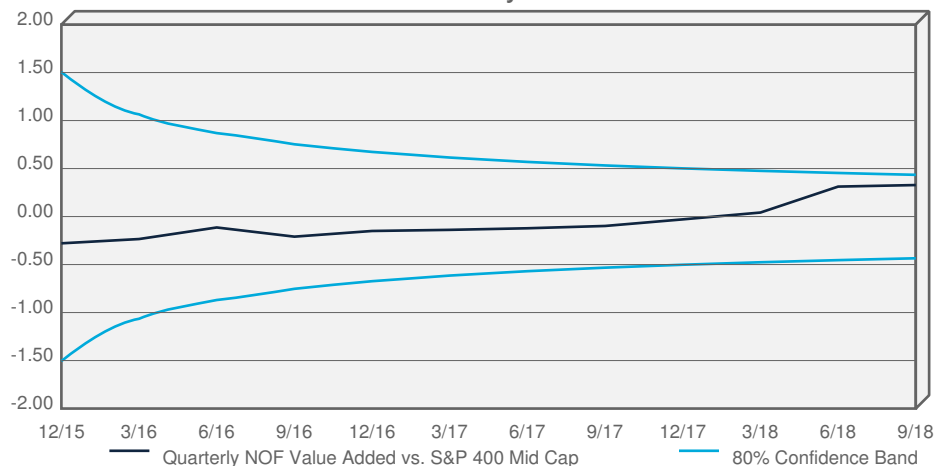
\*Compass Total Returns of Active Midcap Value Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Internal US Mid Cap

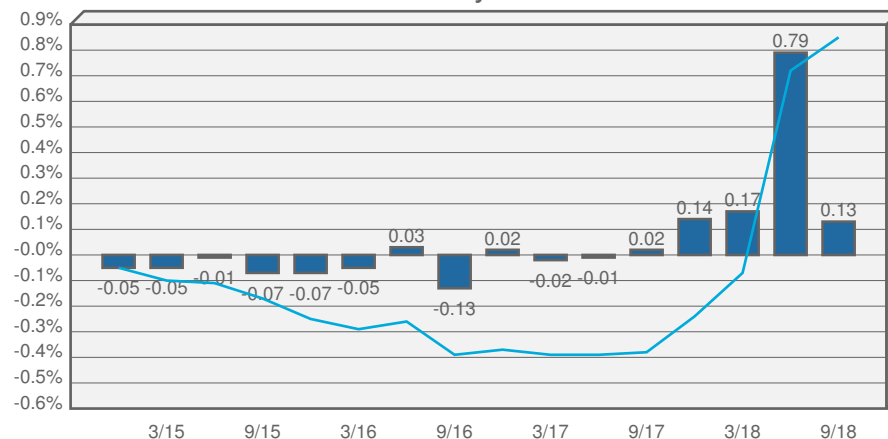
September 30, 2018

Cumulative Skill Analysis vs Benchmark



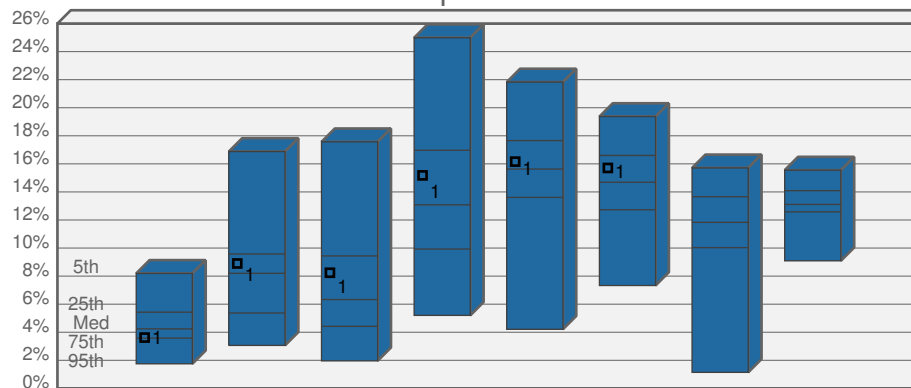
Excess Return:	0.33	Information Ratio:	0.72
Excess Risk:	0.46	T-Stat:	1.24

Value-Added Analysis vs Benchmark



■ Quarterly NOF Value Added vs. S&P 400 Mid Cap  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



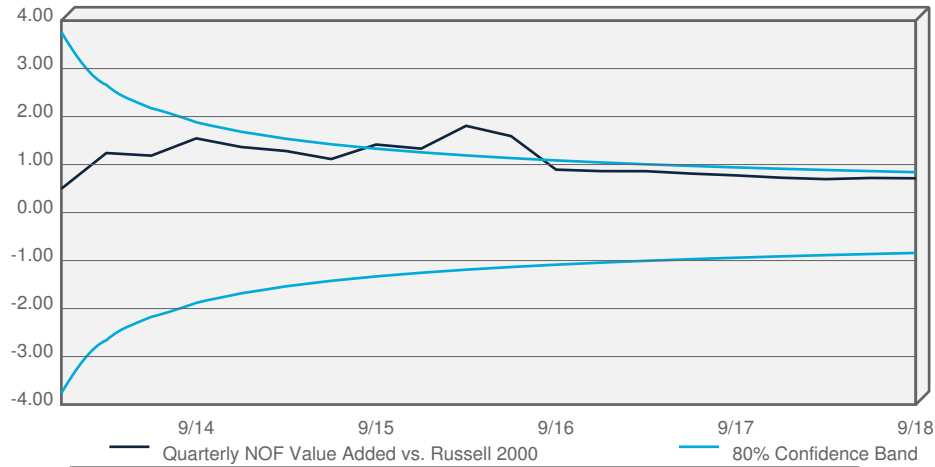
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
□ Internal US Mi	4.00 (63)	9.28 (32)	8.62 (32)	15.56 (32)	16.54 (36)	16.09 (32)		
■ S&P 400 Mid Ca	3.86 (69)	8.32 (48)	7.49 (40)	14.21 (38)	15.85 (44)	15.68 (32)		
Median	4.24	8.20	6.33	13.08	15.63	14.69	11.83	13.11
Number of Funds	49	49	49	49	49	49	47	38

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

# INVESTMENT MANAGER ANALYSIS

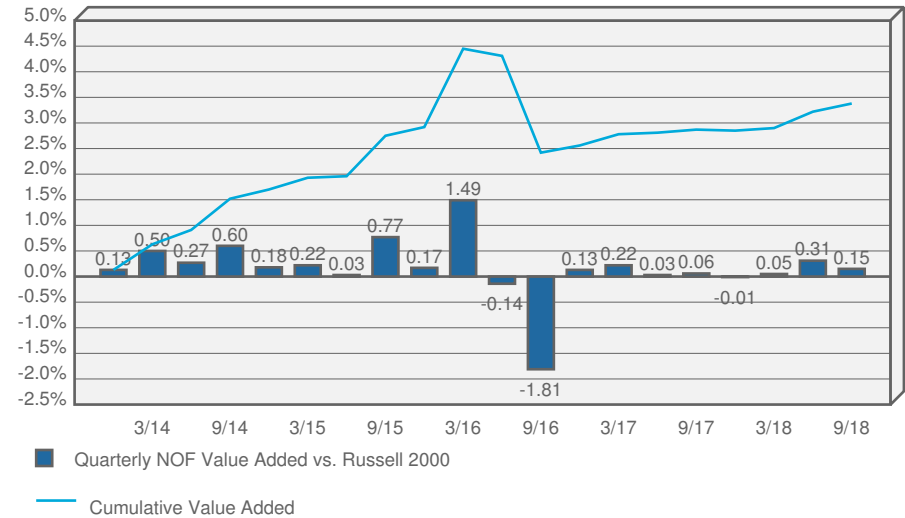
NTGI Structured  
September 30, 2018

Cumulative Skill Analysis vs Benchmark

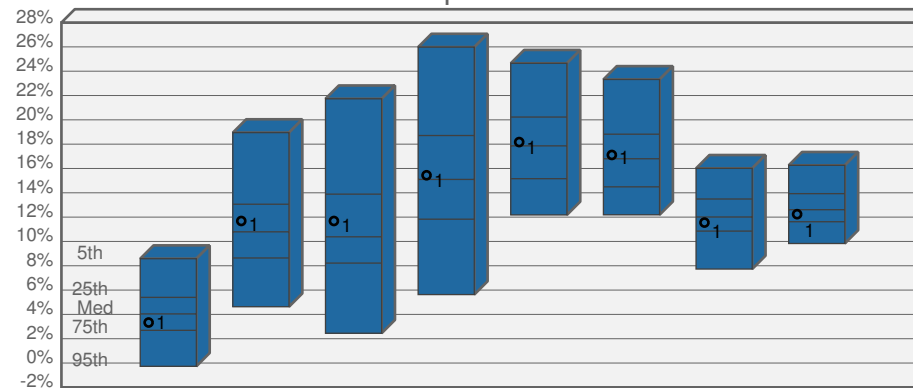


Excess Return:	0.71	Information Ratio:	0.62
Excess Risk:	1.14	T-Stat:	1.40

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
o NTGI Structure	3.77 (57)	12.12 (37)	12.12 (38)	15.88 (43)	18.61 (39)	17.55 (40)	11.99 (50)	12.68 (48)
1 Russell 2000	3.58 (57)	11.61 (42)	11.51 (43)	15.24 (49)	17.96 (49)	17.12 (47)	11.07 (71)	11.11 (85)
Median	4.04	10.79	10.38	15.10	17.86	16.80	12.01	12.61
Number of Funds	118	116	116	116	116	115	113	98

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

# CUSTOM BENCHMARK SPECIFICATION

US Equity Composite

*September 30, 2018*

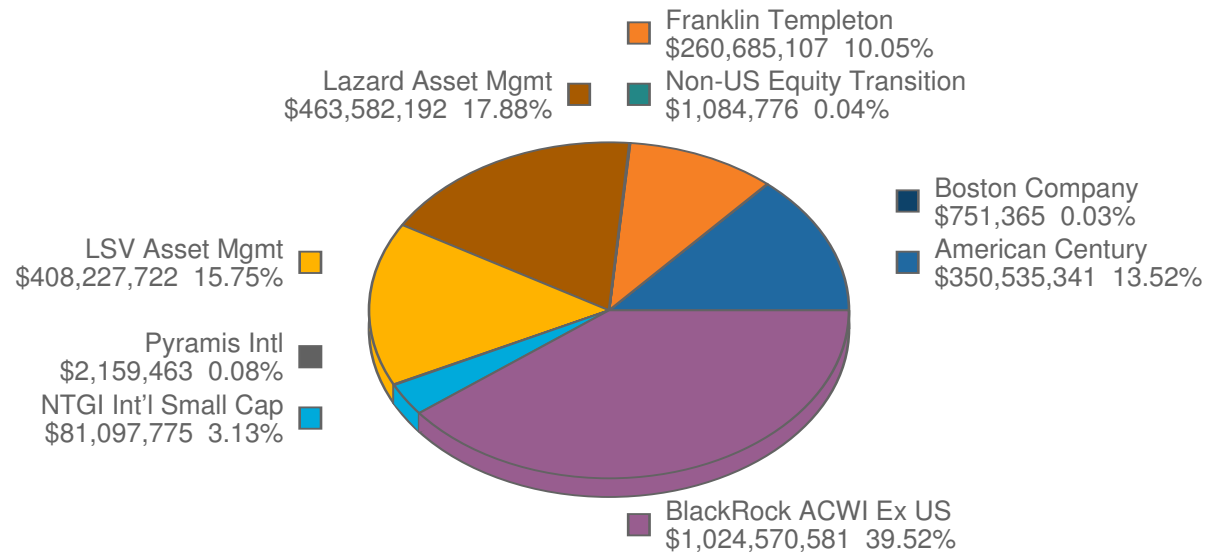
	Quarter Start	Quarter End	Percent	Description
Russell 3000	6/84	6/14	100.00	Blended US Equity Index
	9/14	9/18	100.00	Russell 3000





# NON-US EQUITY

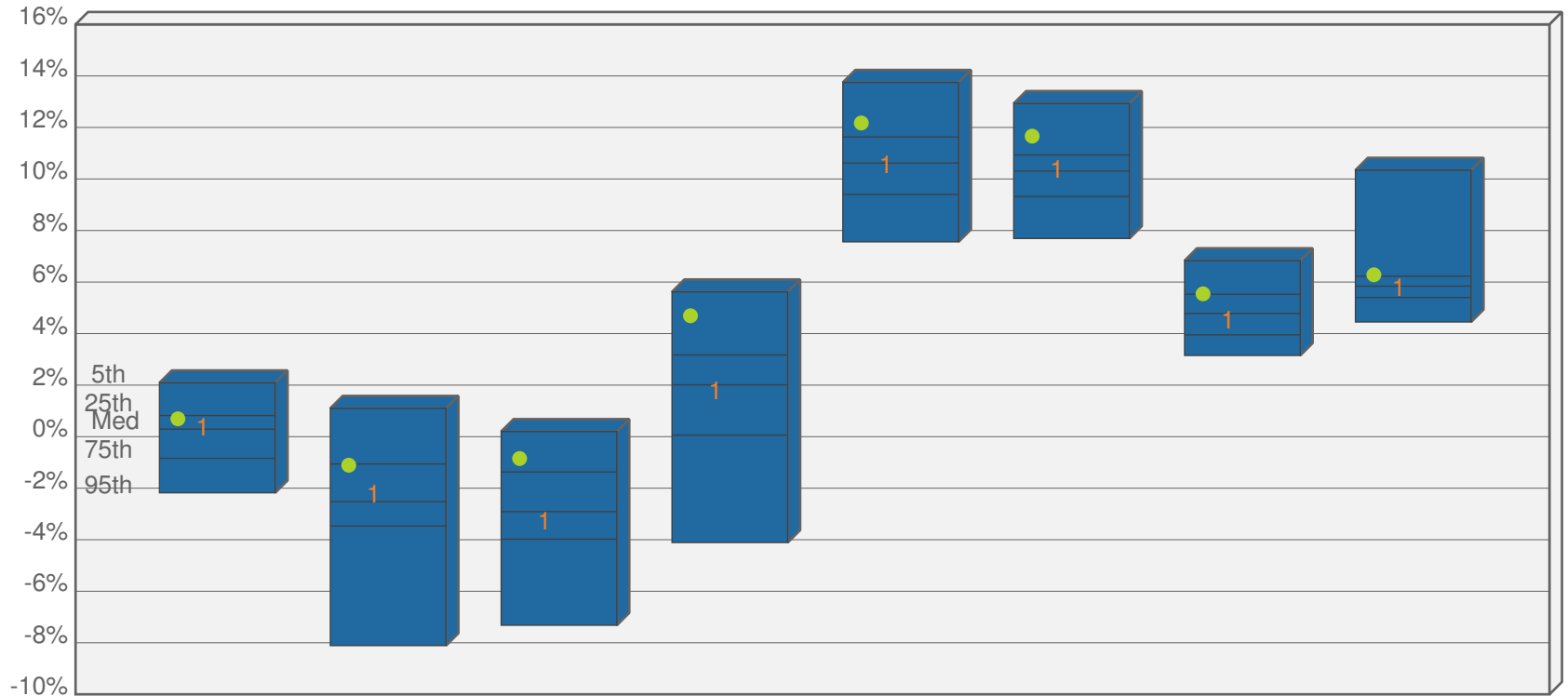
**Wilshire Consulting**  
**MANAGER ALLOCATION**  
 Non-US Equity Composite  
*As of September 30, 2018*



# PERFORMANCE COMPARISON

## Non-US Equity Composite

Periods Ended September 30, 2018



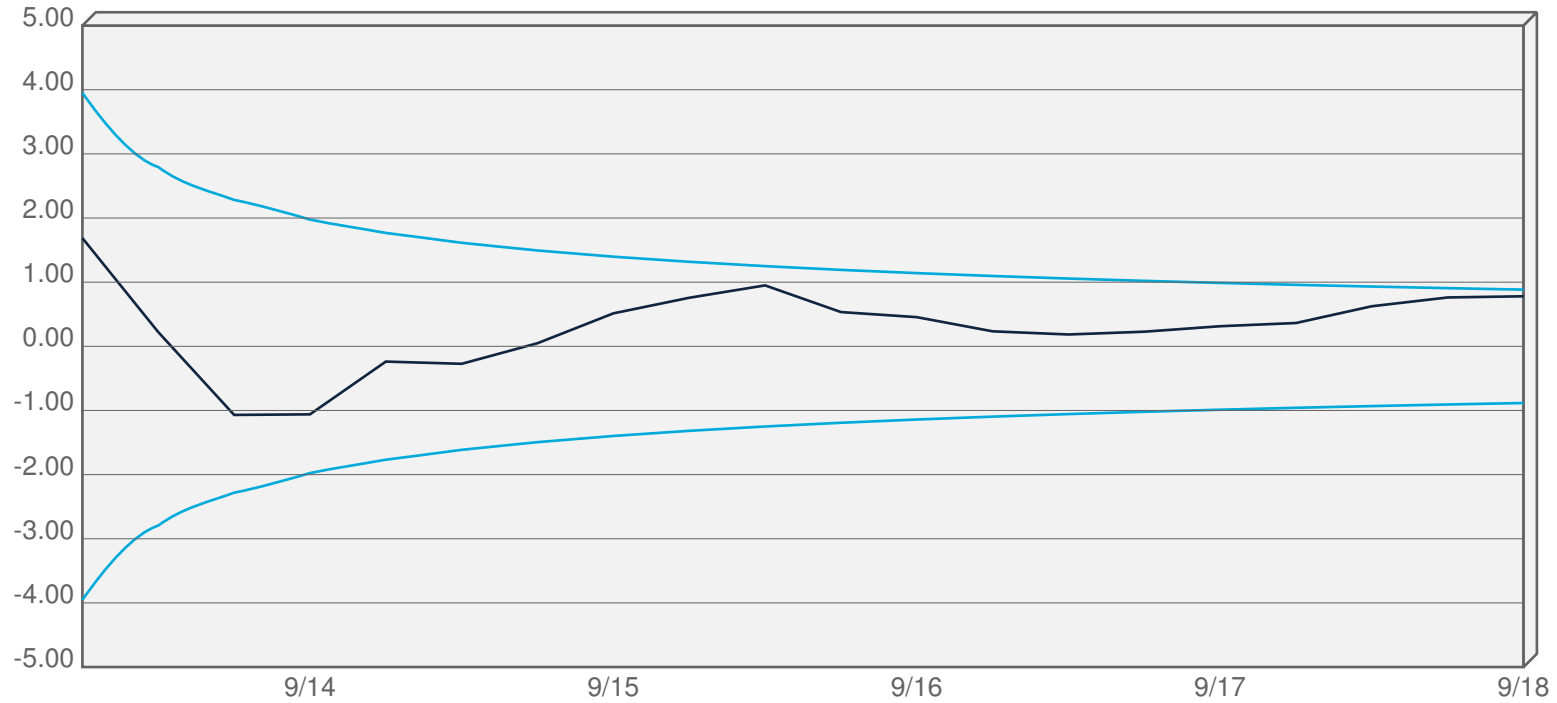
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
● Non-US Equity Composite	0.74 (30)	-1.06 (25)	-0.80 (15)	4.74 (11)	12.22 (11)	11.71 ( 8)	5.59 (16)	6.33 (21)
┆ Policy Index	0.39 (46)	-2.23 (40)	-3.27 (53)	1.78 (54)	10.55 (53)	10.38 (47)	4.54 (54)	5.79 (56)
5th %tile	2.09	1.10	0.20	5.62	13.75	12.93	6.83	10.34
25th %tile	0.82	-1.06	-1.37	3.17	11.63	10.93	5.53	6.23
Median	0.29	-2.52	-2.91	2.01	10.62	10.31	4.78	5.84
75th %tile	-0.84	-3.47	-3.98	0.06	9.40	9.32	3.95	5.40
95th %tile	-2.18	-8.11	-7.32	-4.11	7.56	7.69	3.15	4.45
Number of Funds	90	88	85	84	79	78	72	49

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

# CUMULATIVE SKILL ANALYSIS

Non-US Equity Composite

Five Years Ending September 30, 2018



— Quarterly NOF Value Added vs. Policy Index

— 80% Confidence Band

Excess Return:	0.78	Information Ratio:	0.65
Excess Risk:	1.20	T-Stat:	1.45

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 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>0.72</b>	<b>-1.60</b>	<b>-2.87</b>	<b>2.02</b>	<b>10.29</b>	<b>4.39</b>		<b>6/30/09</b>	<b>7.25</b>
MSCI ACWI X US (N)	0.71	-1.93	-3.09	1.76	9.97	4.12		6/30/09	7.02
Value Added	0.02	0.33	0.22	0.26	0.32	0.27		6/30/09	0.23
<b>American Century</b>									
<b>Net of Fee Return</b>	<b>-0.42</b>	<b>0.41</b>	<b>3.53</b>	<b>9.05</b>	<b>12.46</b>			<b>6/30/14</b>	<b>5.25</b>
Policy Index	0.39	-2.23	-3.27	1.78	10.32			6/30/14	2.77
Value Added	-0.81	2.64	6.80	7.27	2.14			6/30/14	2.48
<b>Franklin Templeton</b>									
<b>Net of Fee Return</b>	<b>-2.21</b>	<b>1.65</b>	<b>3.96</b>	<b>10.04</b>	<b>15.62</b>			<b>6/30/14</b>	<b>7.57</b>
Policy Index	0.39	-2.23	-3.27	1.78	10.32			6/30/14	2.77
Value Added	-2.60	3.88	7.23	8.26	5.30			6/30/14	4.80
<b>Lazard Asset Mgmt</b>									
<b>Net of Fee Return</b>	<b>0.73</b>	<b>-2.84</b>	<b>-1.26</b>	<b>5.27</b>	<b>9.82</b>			<b>6/30/14</b>	<b>3.98</b>
Policy Index	0.39	-2.23	-3.27	1.78	10.32			6/30/14	2.77
Value Added	0.34	-0.61	2.01	3.48	-0.51			6/30/14	1.21
<b>LSV Asset Mgmt</b>									
<b>Net of Fee Return</b>	<b>3.76</b>	<b>-0.88</b>	<b>-1.99</b>	<b>3.36</b>	<b>9.88</b>			<b>6/30/14</b>	<b>3.17</b>
Policy Index	0.39	-2.23	-3.27	1.78	10.32			6/30/14	2.77
Value Added	3.37	1.35	1.28	1.58	-0.45			6/30/14	0.40
<b>NTGI Int'l Small Cap</b>									
<b>Net of Fee Return</b>	<b>-1.51</b>	<b>-4.15</b>	<b>-3.88</b>	<b>2.22</b>	<b>11.43</b>	<b>6.37</b>		<b>12/31/08</b>	<b>11.85</b>
MSCI ACWI X US Small Cap (N)	-1.51	-4.07	-4.41	1.86	11.24	6.14		12/31/08	12.07
Value Added	-0.00	-0.08	0.53	0.36	0.19	0.23		12/31/08	-0.21

# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended September 30, 2018*

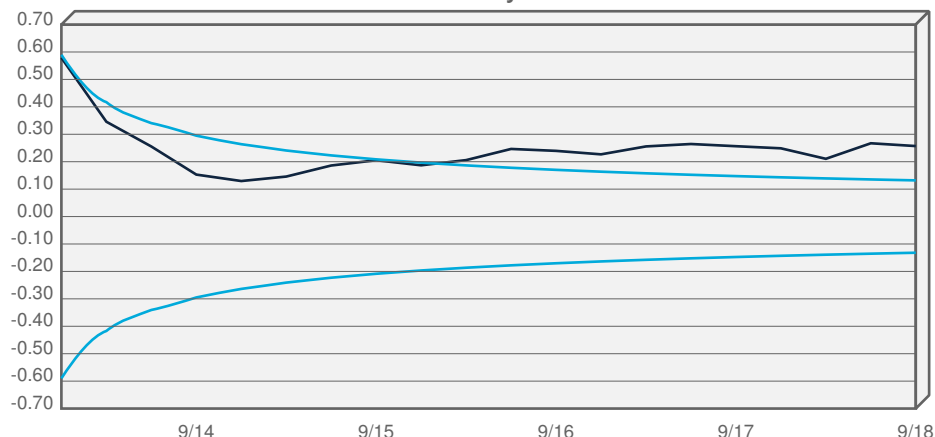
	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Non-US Equity Transition Net of Fee Return</b>								<b>6/30/14</b>	
<b>Non-US Equity Composite Net of Fee Return</b>	<b>0.67</b>	<b>-1.17</b>	<b>-0.98</b>	<b>4.50</b>	<b>11.44</b>	<b>5.35</b>	<b>6.37</b>	<b>6/30/00</b>	<b>3.41</b>
Policy Index	0.39	-2.23	-3.27	1.78	10.38	4.54	5.79	6/30/00	3.51
Value Added	0.28	1.06	2.29	2.72	1.06	0.82	0.58	6/30/00	<b>-0.10</b>

# INVESTMENT MANAGER ANALYSIS

BlackRock ACWI Ex US

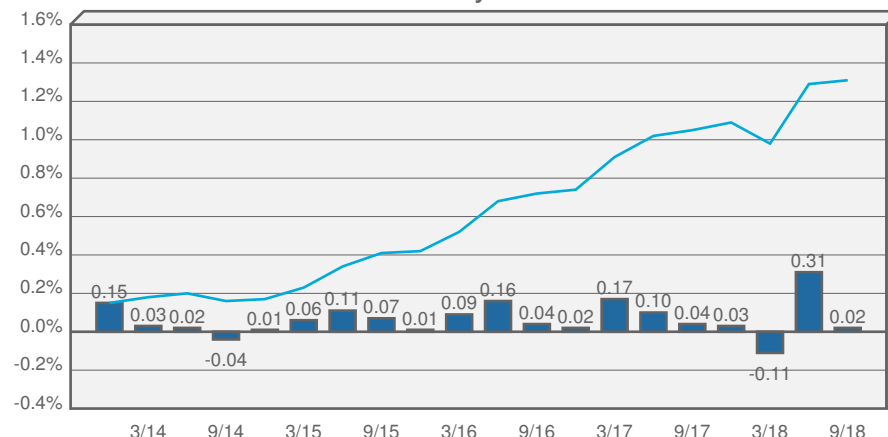
September 30, 2018

Cumulative Skill Analysis vs Benchmark



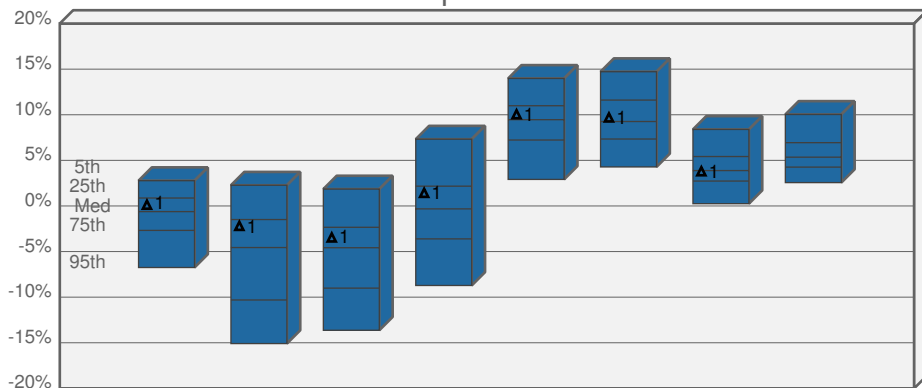
Excess Return:	0.26	Information Ratio:	1.43
Excess Risk:	0.18	T-Stat:	3.21

Value-Added Analysis vs Benchmark



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

Performance Comparison vs Peer Universe\*

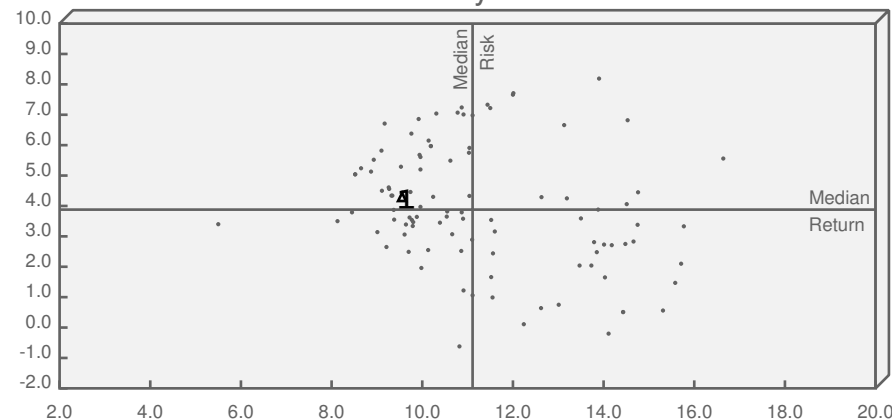


1 Quarter 2 Quarters 3 Quarters 1 Year 2 Years 3 Years 5 Years 10 Years

▲ BlackRock ACWI	0.72 (27)	-1.60 (25)	-2.87 (31)	2.02 (26)	10.64 (29)	10.29 (38)	4.39 (39)
■ MSCI ACWI X US	0.71 (27)	-1.93 (28)	-3.09 (34)	1.76 (28)	10.32 (34)	9.97 (42)	4.12 (45)

Median	-0.62	-4.56	-4.58	-0.32	9.46	9.26	3.88	5.35
Number of Funds	2554	2516	2477	2390	2175	2010	1554	922

Five Year Risk/Return Analysis vs Peer Universe\*



Description	Legend	Net Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
BlackRock ACWI Ex US	▲	4.39	39	9.79	74
MSCI ACWI X US (N)	■	4.12	45	9.77	75
Median		3.88		11.11	

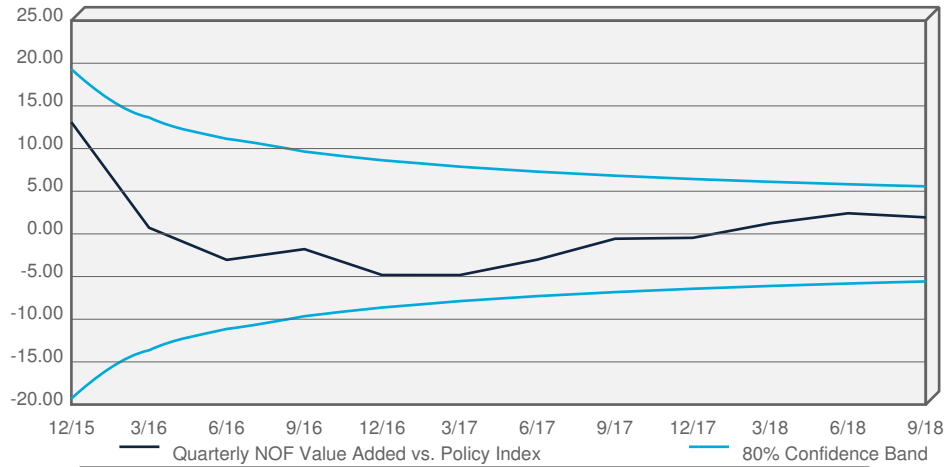
\*Lipper Total Returns of International Equity Mutual Funds Universe - Net of Fees

# INVESTMENT MANAGER ANALYSIS

American Century

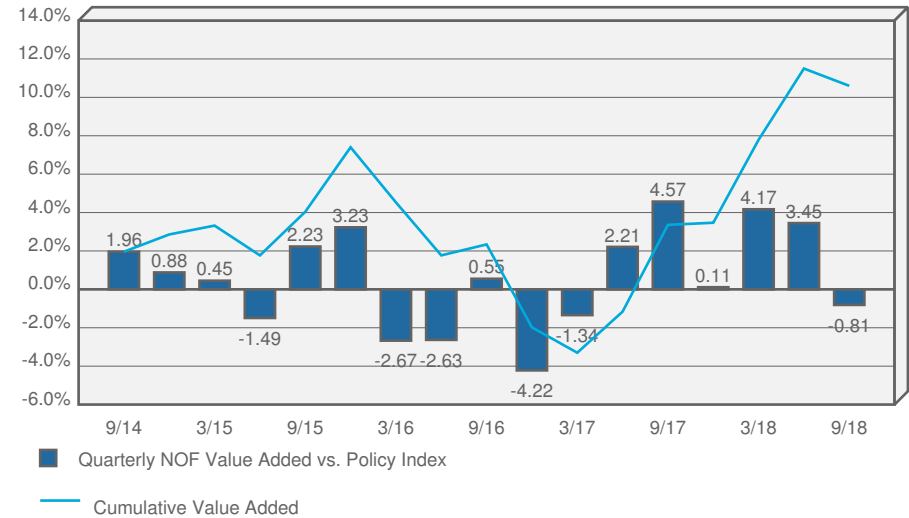
September 30, 2018

Cumulative Skill Analysis vs Benchmark

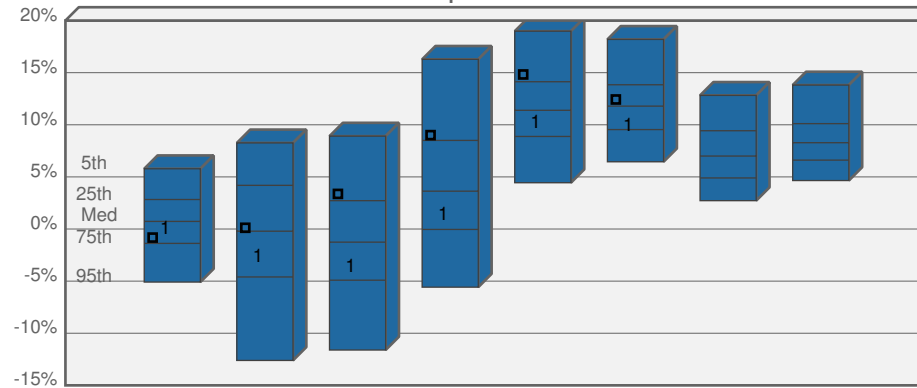


Excess Return:	1.94	Information Ratio:	0.33
Excess Risk:	5.86	T-Stat:	0.57

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
□ American Centu	-0.31 (63)	0.63 (44)	3.88 (20)	9.52 (20)	15.34 (17)	12.94 (34)		
▮ Policy Index	0.39 (54)	-2.23 (64)	-3.27 (66)	1.78 (63)	10.59 (60)	10.32 (65)		
Median	0.73	-0.21	-1.26	3.63	11.39	11.79	7.00	8.28
Number of Funds	1487	1480	1475	1472	1441	1399	1250	844

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

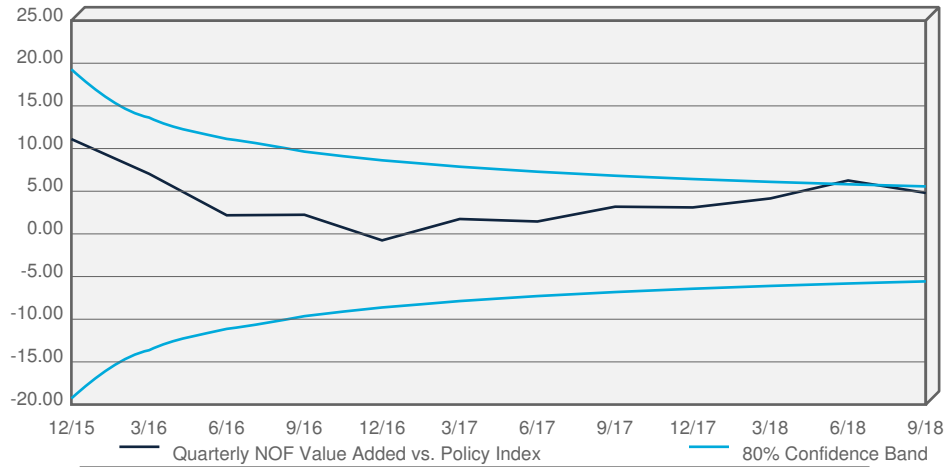


# INVESTMENT MANAGER ANALYSIS

Franklin Templeton

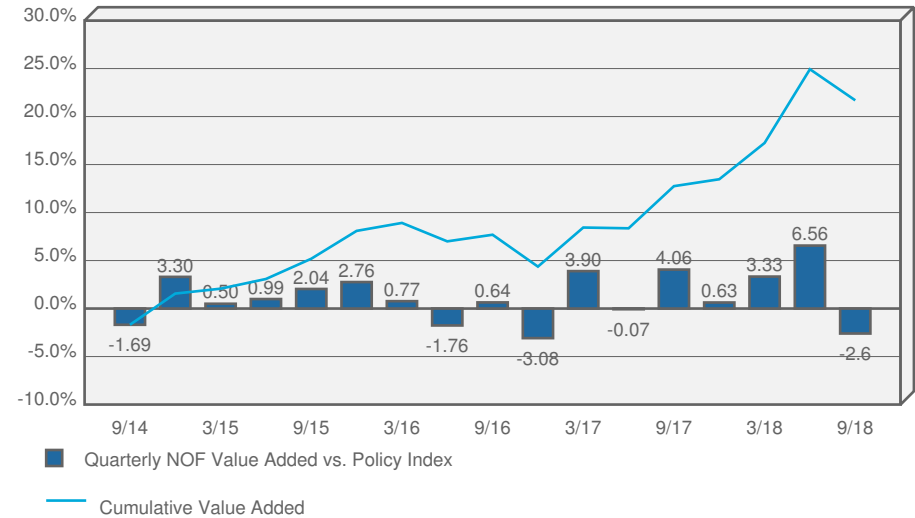
September 30, 2018

Cumulative Skill Analysis vs Benchmark

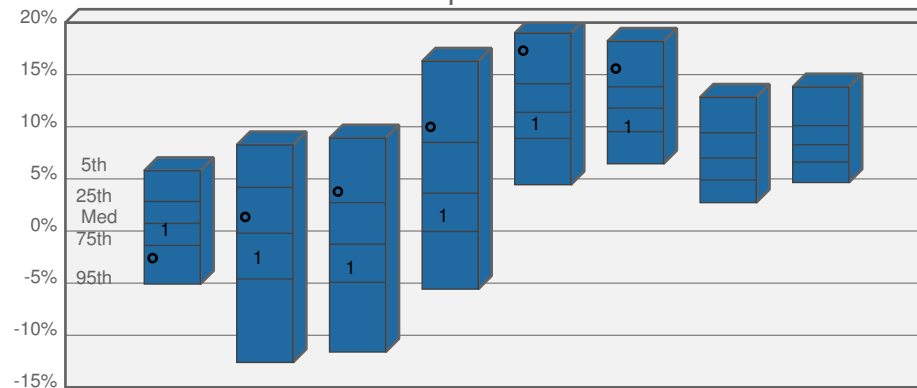


Excess Return:	4.80	Information Ratio:	0.82
Excess Risk:	5.86	T-Stat:	1.42

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
○ Franklin Templ	-2.09 (81)	1.86 (36)	4.29 (18)	10.50 (16)	17.82 ( 7)	16.10 (10)		
1 Policy Index	0.39 (54)	-2.23 (64)	-3.27 (66)	1.78 (63)	10.59 (60)	10.32 (65)		
Median	0.73	-0.21	-1.26	3.63	11.39	11.79	7.00	8.28
Number of Funds	1487	1480	1475	1472	1441	1399	1250	844

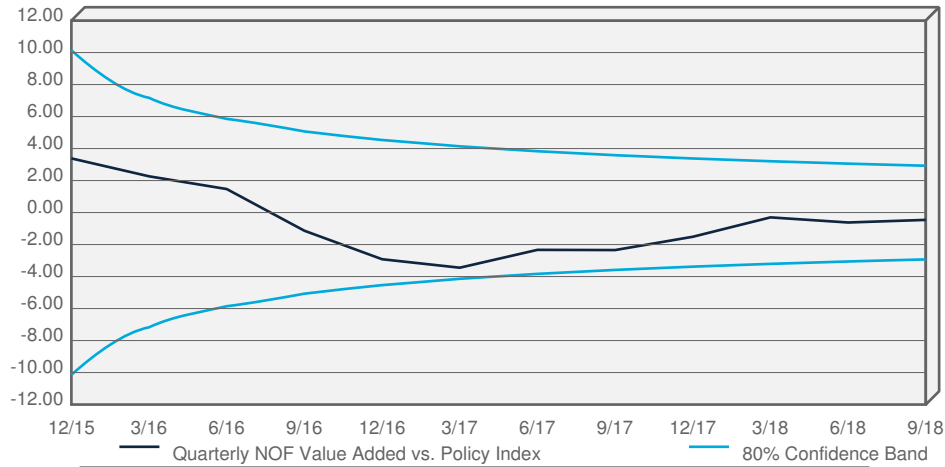
\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Lazard Asset Mgmt

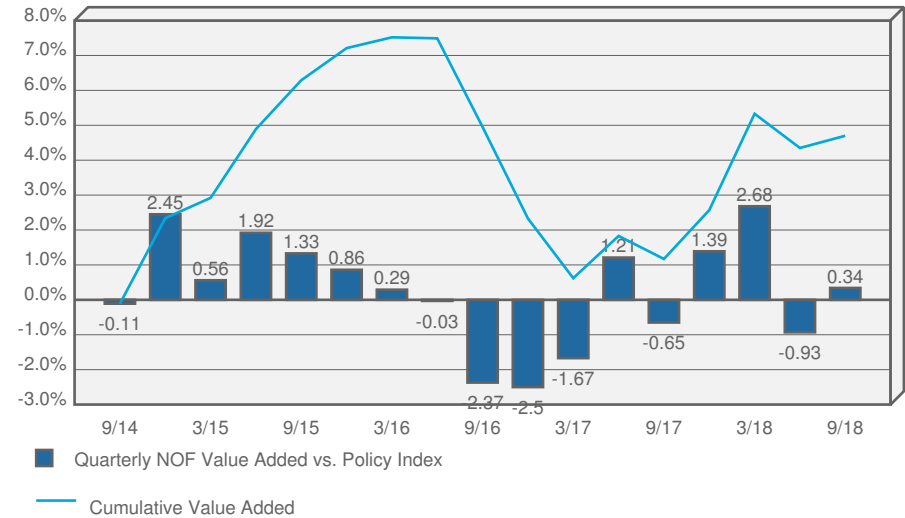
September 30, 2018

Cumulative Skill Analysis vs Benchmark

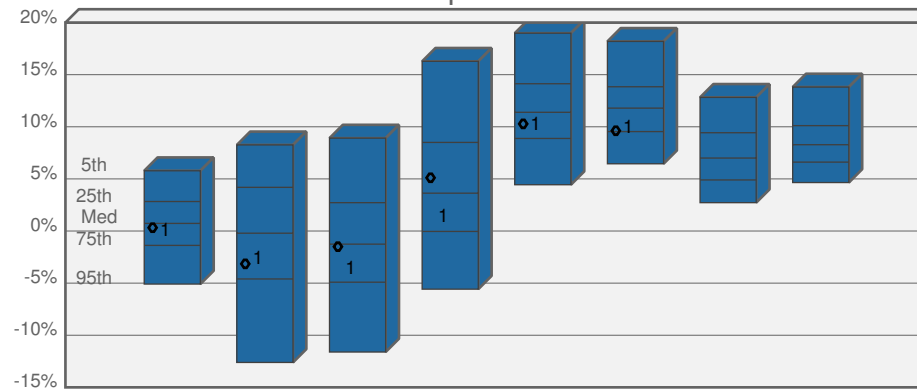


Excess Return:	-0.46	Information Ratio:	-0.15
Excess Risk:	3.08	T-Stat:	-0.26

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	0.83 (48)	-2.64 (66)	-0.99 (47)	5.62 (38)	10.79 (58)	10.13 (67)		
■ Policy Index	0.39 (54)	-2.23 (64)	-3.27 (66)	1.78 (63)	10.59 (60)	10.32 (65)		
Median	0.73	-0.21	-1.26	3.63	11.39	11.79	7.00	8.28
Number of Funds	1487	1480	1475	1472	1441	1399	1250	844

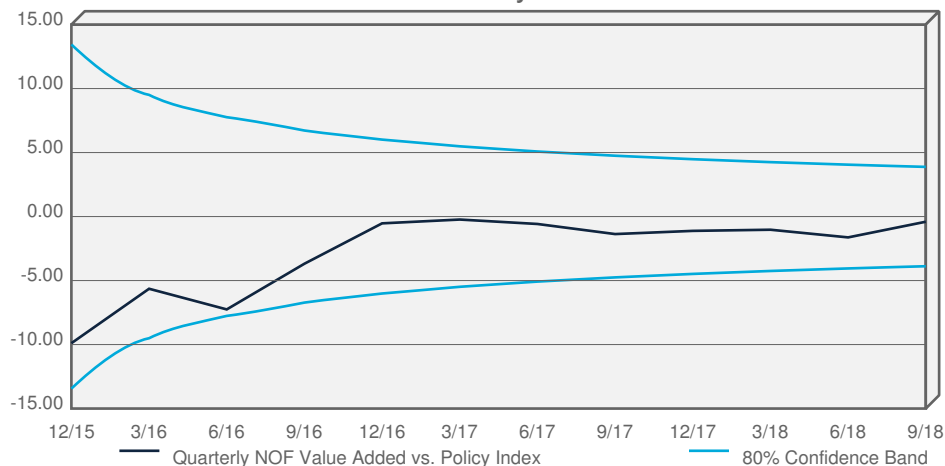
\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

LSV Asset Mgmt

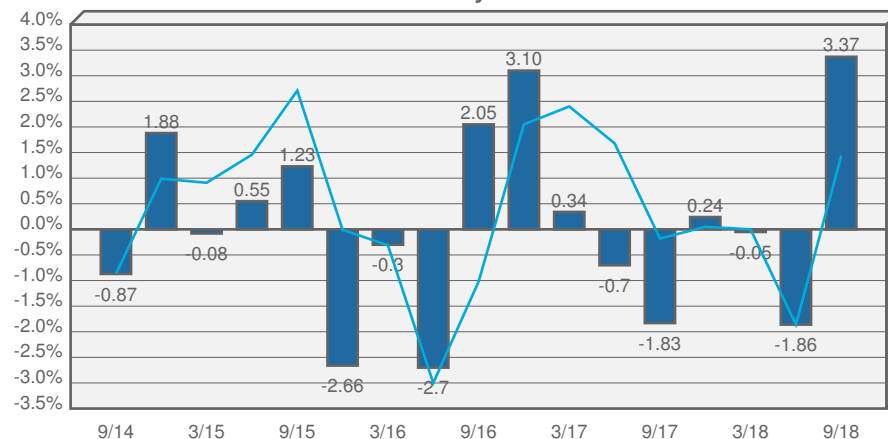
September 30, 2018

Cumulative Skill Analysis vs Benchmark



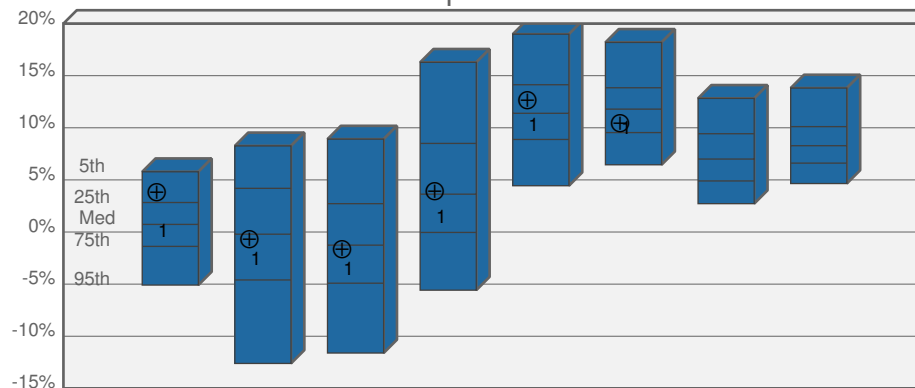
Excess Return:	-0.40	Information Ratio:	-0.10
Excess Risk:	4.09	T-Stat:	-0.17

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
⊕ LSV Asset Mgmt	3.86 (17)	-0.60 (53)	-1.56 (52)	3.97 (48)	12.68 (36)	10.49 (63)		
1 Policy Index	0.39 (54)	-2.23 (64)	-3.27 (66)	1.78 (63)	10.59 (60)	10.32 (65)		
Median	0.73	-0.21	-1.26	3.63	11.39	11.79	7.00	8.28
Number of Funds	1487	1480	1475	1472	1441	1399	1250	844

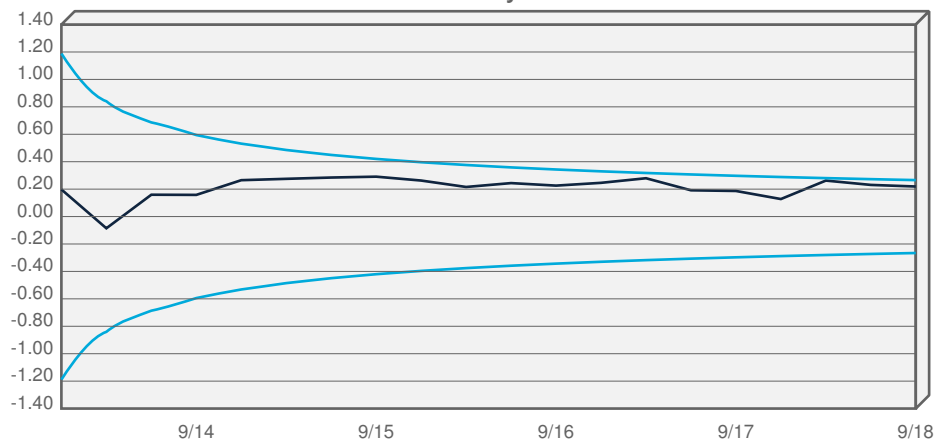
\*Compass Total Returns of International Equity Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

NTGI Int'l Small Cap

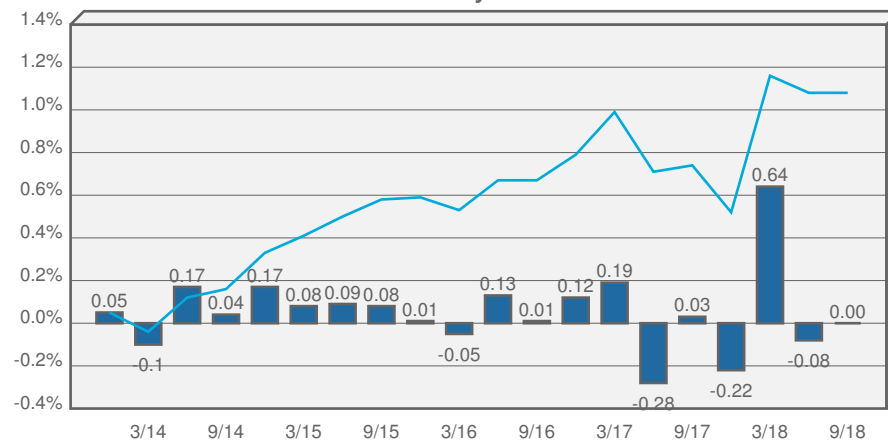
September 30, 2018

Cumulative Skill Analysis vs Benchmark



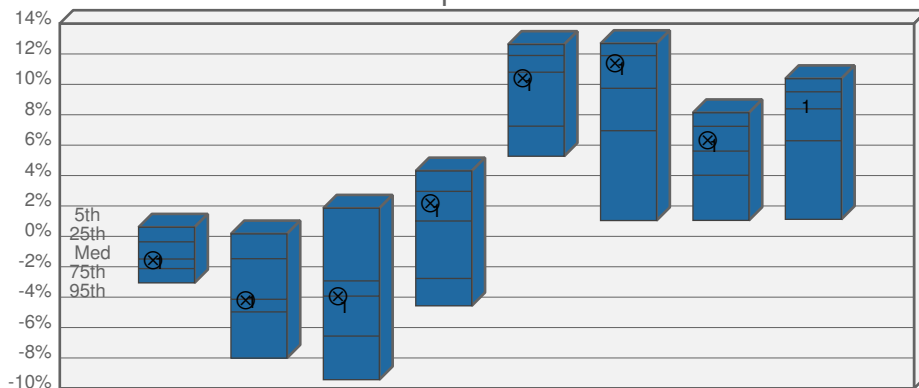
Excess Return:	0.22	Information Ratio:	0.61
Excess Risk:	0.36	T-Stat:	1.36

Value-Added Analysis vs Benchmark



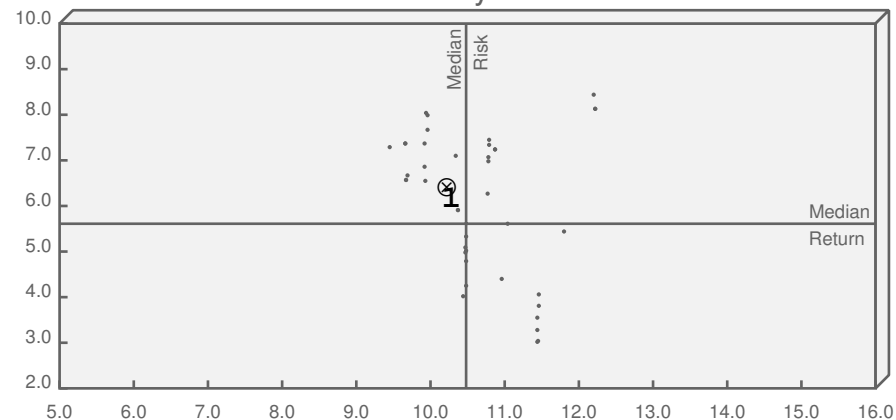
■ Quarterly NOF Value Added vs. MSCI ACWI X US Small Cap (N)  
 — Cumulative Value Added

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊗ NTGI Int'l Sma	-1.51 (51)	-4.15 (50)	-3.88 (46)	2.22 (29)	10.42 (55)	11.43 (28)	6.37 (42)	
1 MSCI ACWI X US-1.51 (51)	-4.07 (46)	-4.41 (57)		1.86 (29)	10.19 (57)	11.24 (34)	6.14 (45)	8.73 (42)
Median	-1.49	-4.14	-3.93	1.01	10.80	9.74	5.61	8.39
Number of Funds	65	64	64	63	56	52	41	27

Five Year Risk/Return Analysis vs Peer Universe\*



Description	Legend	Net Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
NTGI Int'l Small Cap	⊗	6.37	42	10.28	62
MSCI ACWI X US Small Cap (N)	1	6.14	45	10.35	60
Median		5.61		10.48	

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

# CUSTOM BENCHMARK SPECIFICATION

Non-US Equity Composite

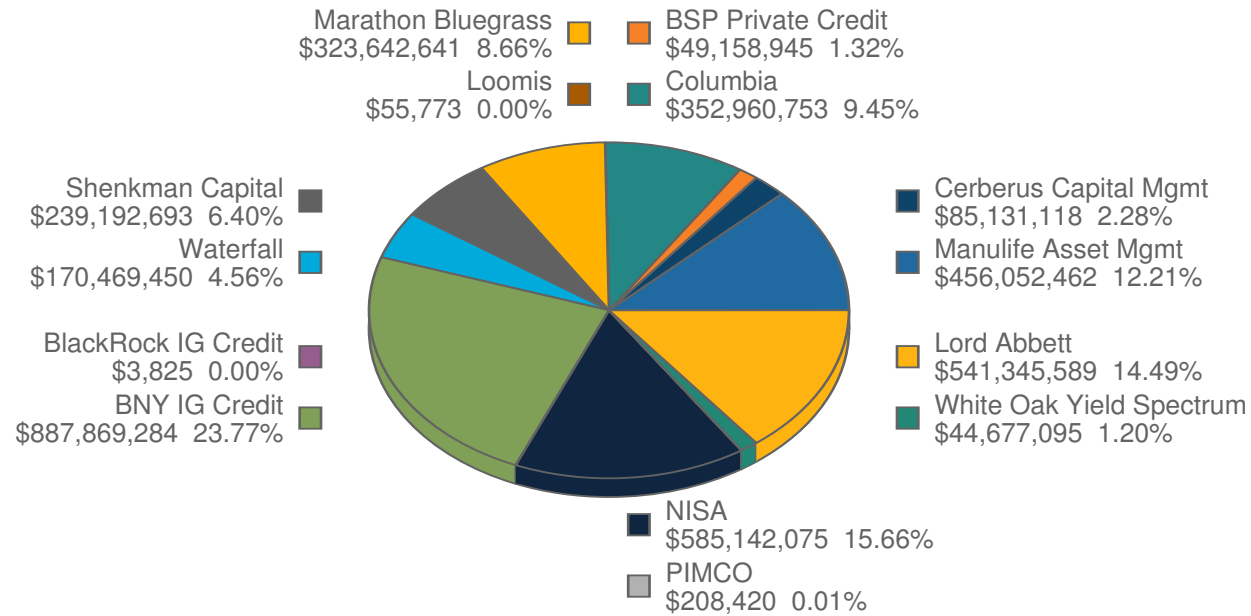
*September 30, 2018*

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



# FIXED INCOME

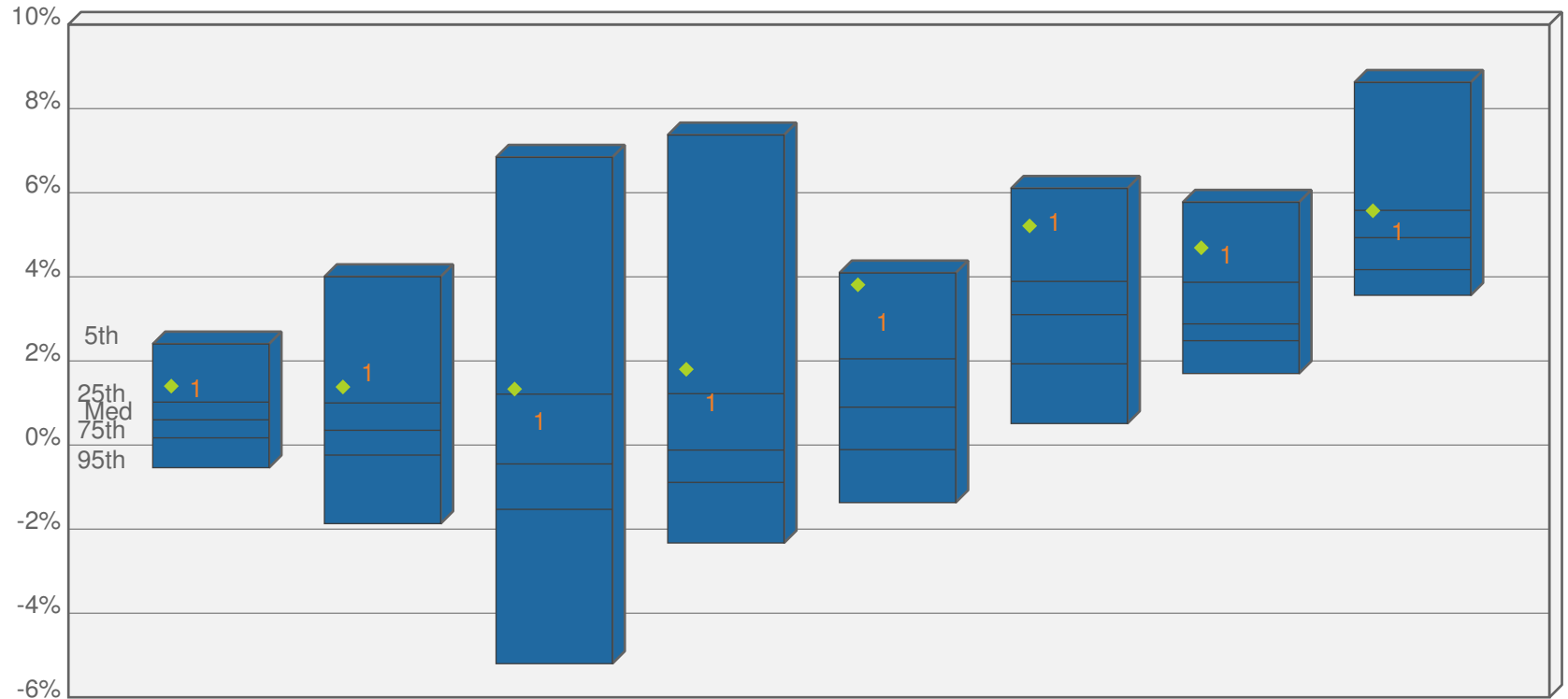
Wilshire Consulting  
**MANAGER ALLOCATION**  
 Fixed Income Composite  
*As of September 30, 2018*



# PERFORMANCE COMPARISON

## Fixed Income Composite

Periods Ended September 30, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
◆ Fixed Income Composite	1.43 (17)	1.41 (21)	1.36 (23)	1.83 (20)	3.84 ( 6)	5.24 ( 8)	4.72 (11)	5.60 (23)
1 Policy Index	1.34 (18)	1.72 (19)	0.57 (26)	1.01 (29)	2.92 (10)	5.31 ( 7)	4.53 (11)	5.08 (41)
5th %tile	2.40	4.00	6.84	7.37	4.09	6.10	5.77	8.62
25th %tile	1.02	1.00	1.21	1.22	2.05	3.89	3.87	5.58
Median	0.60	0.35	-0.45	-0.12	0.90	3.10	2.88	4.93
75th %tile	0.17	-0.24	-1.53	-0.89	-0.11	1.93	2.48	4.17
95th %tile	-0.54	-1.87	-5.20	-2.33	-1.37	0.51	1.70	3.56
Number of Funds	130	127	121	116	95	91	85	57

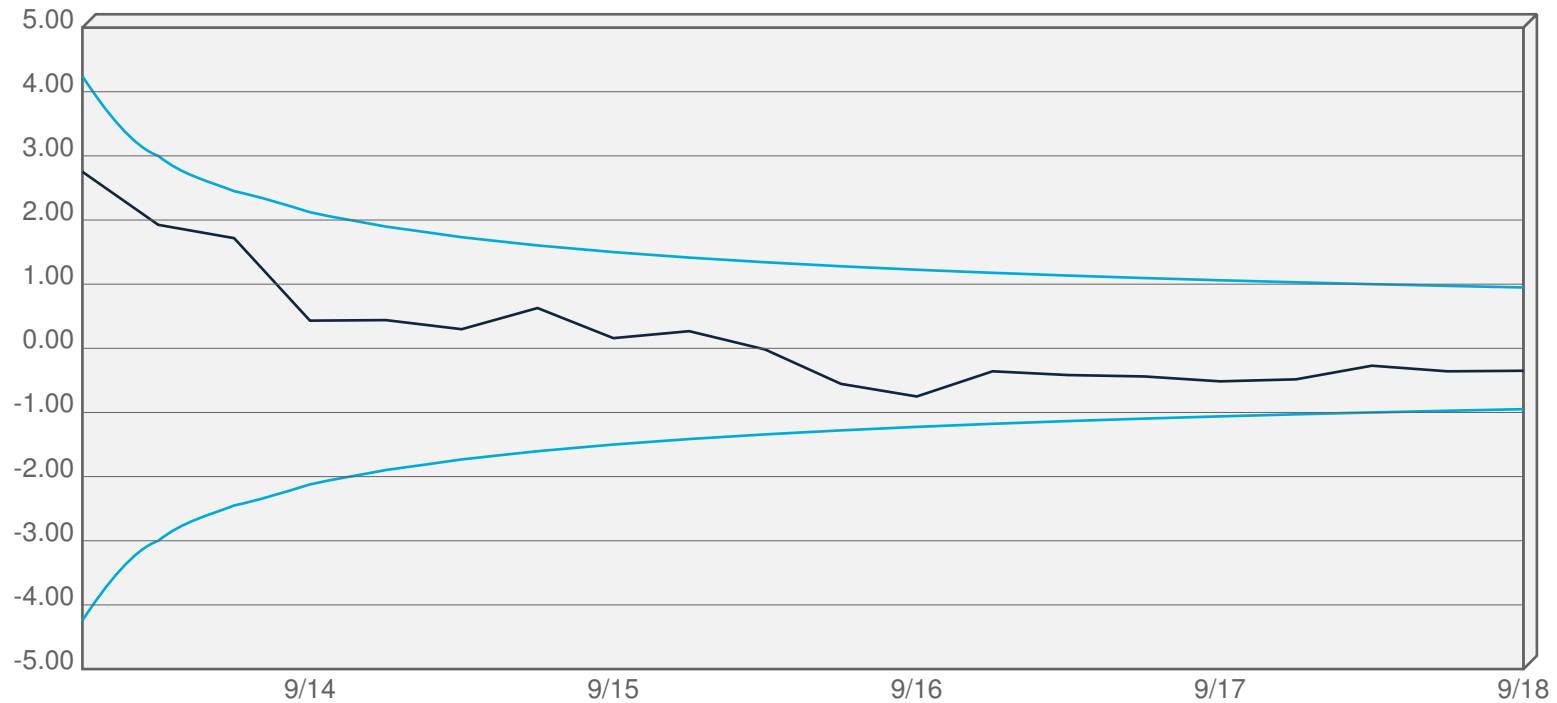
\*TUCS Total Ret of Fixed Income Investment Pools Universe - Gross of Fees



# CUMULATIVE SKILL ANALYSIS

Fixed Income Composite

Five Years Ending September 30, 2018



— Quarterly NOF Value Added vs. Policy Index

— 80% Confidence Band

Excess Return:	-0.35	Information Ratio:	-0.27
Excess Risk:	1.29	T-Stat:	-0.61

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 2018

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>NISA</b>									
<b>Net of Fee Return</b>	<b>-0.05</b>	<b>-0.20</b>	<b>-1.63</b>	<b>-1.17</b>	<b>1.60</b>	<b>2.41</b>		<b>3/31/09</b>	<b>3.64</b>
Bloomberg Aggregate	0.02	-0.14	-1.60	-1.22	1.31	2.16		3/31/09	3.47
Value Added	-0.07	-0.06	-0.03	0.05	0.29	0.25		3/31/09	0.16
<b>Manulife Asset Mgmt</b>									
<b>Net of Fee Return</b>	<b>0.84</b>	<b>-0.84</b>	<b>-1.28</b>	<b>-1.05</b>	<b>2.56</b>	<b>2.72</b>		<b>12/31/11</b>	<b>3.71</b>
Policy Index	0.27	0.00	-1.41	-1.00	1.86	0.66		12/31/11	0.90
Value Added	0.57	-0.84	0.12	-0.04	0.69	2.06		12/31/11	2.80
<b>BlackRock IG Credit</b>									
<b>Net of Fee Return</b>	<b>1.02</b>	<b>0.90</b>	<b>-0.48</b>	<b>-0.37</b>				<b>3/31/17</b>	<b>1.20</b>
Bloomberg Int Credit	0.73	0.64	-0.73	-0.62				3/31/17	1.16
Value Added	0.30	0.26	0.25	0.25				3/31/17	0.04
<b>BNY IG Credit</b>									
<b>Net of Fee Return</b>	<b>0.74</b>	<b>0.72</b>	<b>-0.71</b>					<b>12/31/17</b>	<b>-0.71</b>
Bloomberg Int Credit	0.73	0.64	-0.73					12/31/17	-0.73
Value Added	0.01	0.07	0.02					12/31/17	0.02
<b>Columbia</b>									
<b>Net of Fee Return</b>	<b>3.05</b>	<b>3.42</b>	<b>1.77</b>	<b>1.97</b>	<b>6.77</b>	<b>5.49</b>		<b>12/31/11</b>	<b>6.85</b>
Bloomberg High Yield	2.40	3.46	2.57	3.05	8.15	5.54		12/31/11	6.94
Value Added	0.65	-0.04	-0.80	-1.08	-1.38	-0.05		12/31/11	-0.09
<b>Marathon Bluegrass</b>									
<b>Net of Fee Return</b>	<b>3.31</b>	<b>3.54</b>	<b>4.93</b>	<b>5.77</b>				<b>12/31/15</b>	<b>7.95</b>
Bloomberg High Yield	2.40	3.46	2.57	3.05				12/31/15	9.75
Value Added	0.91	0.08	2.36	2.72				12/31/15	-1.80

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 2018

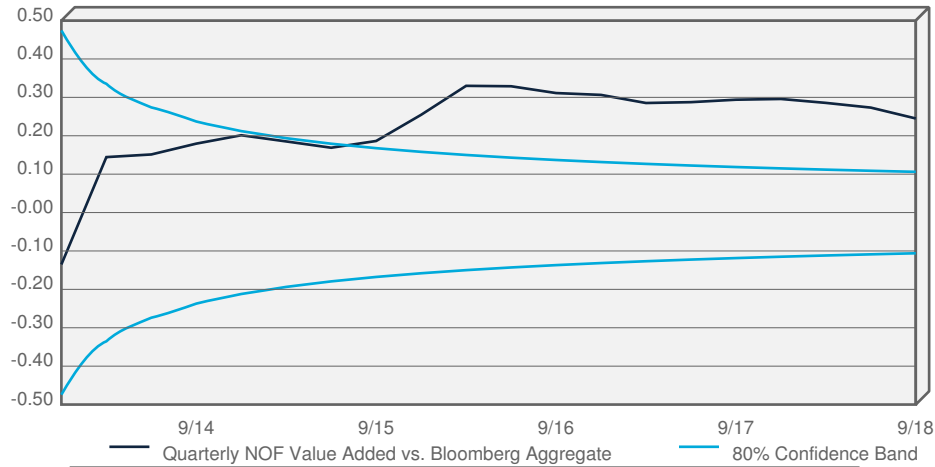
	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Waterfall</b>									
<b>Net of Fee Return</b>	<b>1.72</b>	<b>3.35</b>	<b>6.34</b>	<b>8.17</b>	<b>10.01</b>	<b>9.85</b>		<b>3/31/10</b>	<b>11.64</b>
Policy Index	1.74	2.67	2.42	3.11	6.04	4.18		3/31/10	5.10
Value Added	-0.02	0.69	3.91	5.06	3.97	5.67		3/31/10	6.54
<b>Cerberus Capital Mgmt</b>									
<b>Net of Fee Return</b>	<b>2.68</b>	<b>4.36</b>	<b>6.86</b>	<b>7.99</b>	<b>8.25</b>			<b>9/30/14</b>	<b>8.36</b>
S&P LSTA Leverage Loan	1.84	2.55	4.03	5.20	5.32			9/30/14	4.20
Value Added	0.84	1.81	2.82	2.79	2.93			9/30/14	4.16
<b>Shenkman Capital</b>									
<b>Net of Fee Return</b>	<b>2.03</b>	<b>2.70</b>	<b>4.14</b>	<b>4.88</b>	<b>4.45</b>	<b>3.96</b>		<b>9/30/10</b>	<b>4.81</b>
S&P LSTA Leverage Loan	1.84	2.55	4.03	5.20	5.32	4.61		9/30/10	5.73
Value Added	0.19	0.15	0.10	-0.32	-0.87	-0.65		9/30/10	-0.93
<b>BSP Private Credit</b>									
<b>Net of Fee Return</b>	<b>0.36</b>	<b>0.07</b>						<b>3/31/18</b>	<b>0.07</b>
S&P LSTA Leverage Loan Index	1.84	2.55						3/31/18	2.55
Value Added	-1.48	-2.48						3/31/18	-2.48
<b>White Oak Yield Spectrum</b>									
<b>Net of Fee Return</b>	<b>1.23</b>	<b>1.57</b>						<b>3/31/18</b>	<b>1.57</b>
S&P LSTA Leverage Loan Index	1.84	2.55						3/31/18	2.55
Value Added	-0.61	-0.98						3/31/18	-0.98
<b>Fixed Income Composite</b>									
<b>Net of Fee Return</b>	<b>1.29</b>	<b>1.18</b>	<b>0.88</b>	<b>1.33</b>	<b>4.59</b>	<b>4.16</b>	<b>5.30</b>	<b>3/31/84</b>	<b>7.47</b>
Policy Index	1.33	1.72	0.57	1.01	5.31	4.53	5.08	3/31/84	7.31
Value Added	-0.04	-0.54	0.31	0.31	-0.73	-0.37	0.22	3/31/84	0.16
Bloomberg Global Aggregate	-0.92	-3.68	-2.37	-1.32	1.98	0.75	2.89		

# INVESTMENT MANAGER ANALYSIS

NISA

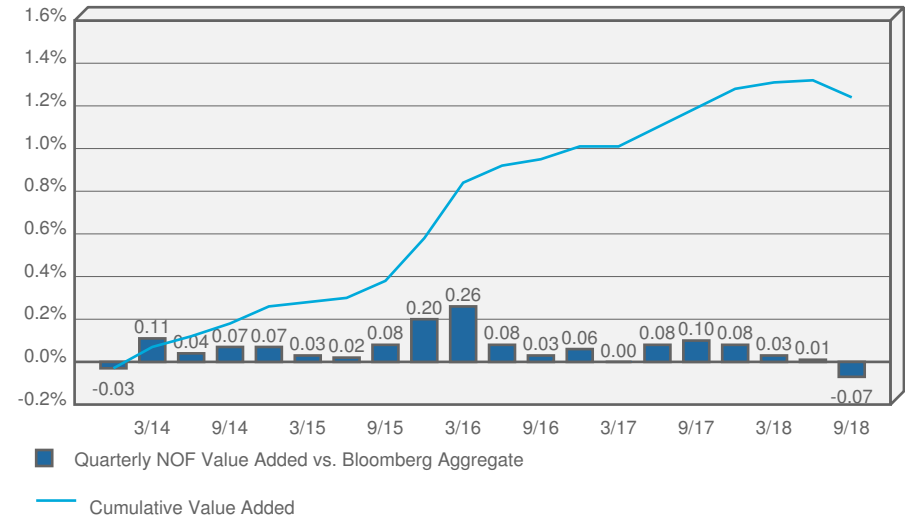
September 30, 2018

Cumulative Skill Analysis vs Benchmark

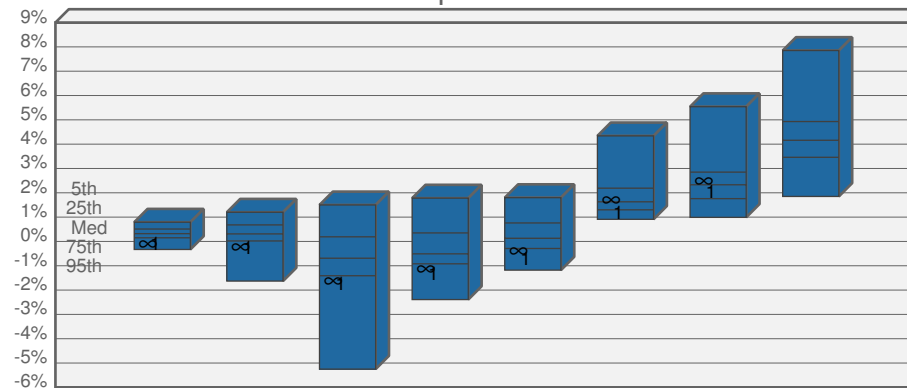


Excess Return:	0.24	Information Ratio:	1.70
Excess Risk:	0.14	T-Stat:	3.80

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
∞ NISA	-0.01 (89)	-0.13 (86)	-1.53 (79)	-1.04 (80)	-0.28 (74)	1.78 (42)	2.58 (37)	
1 Bloomberg Aggr	0.02 (88)	-0.14 (86)	-1.60 (82)	-1.22 (87)	-0.57 (88)	1.31 (73)	2.16 (57)	
Median	0.32	0.31	-0.69	-0.51	0.13	1.63	2.33	4.16
Number of Funds	432	431	431	431	423	414	401	348

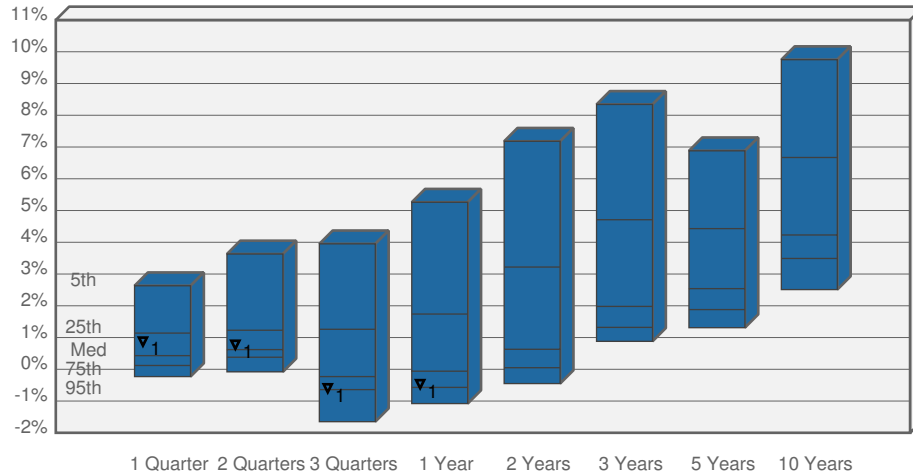
\*Compass Total Returns of Active Core Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

BlackRock IG Credit

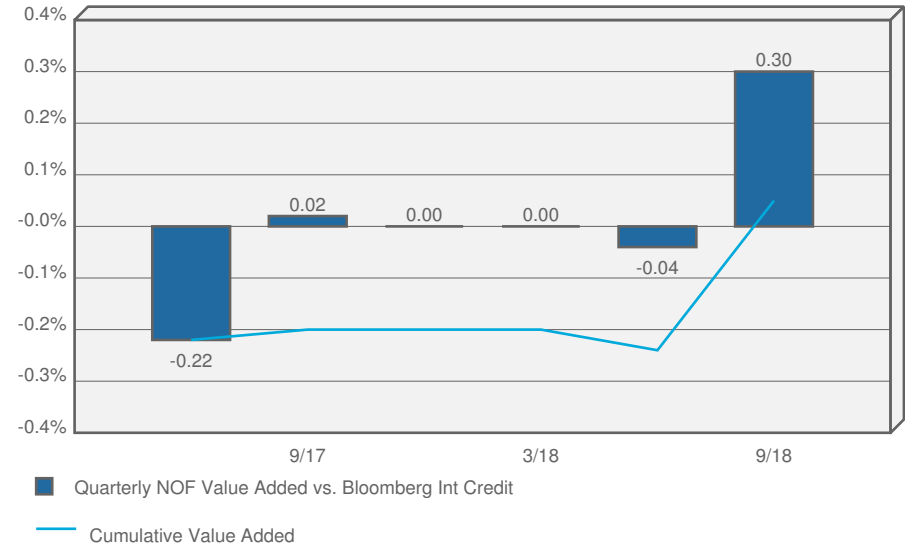
September 30, 2018

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▼ BlackRock IG C	1.04 (26)	0.94 (30)	-0.43 (60)	-0.30 (59)				
▬ Bloomberg Int	0.73 (33)	0.64 (48)	-0.73 (81)	-0.62 (79)				
Median	0.43	0.62	-0.23	-0.06	0.63	1.98	2.54	4.23
Number of Funds	455	453	453	453	450	443	417	353

Value-Added Analysis vs Benchmark



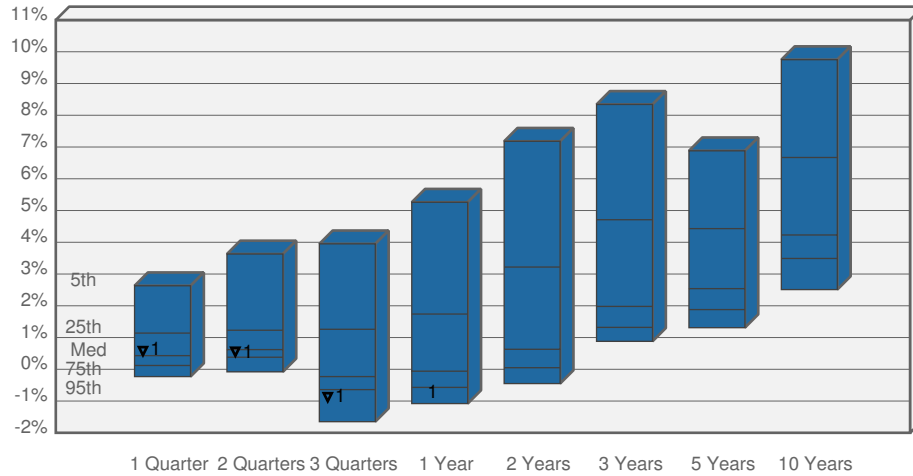
\*Compass Total Returns of Active Intermediate Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

BNY IG Credit

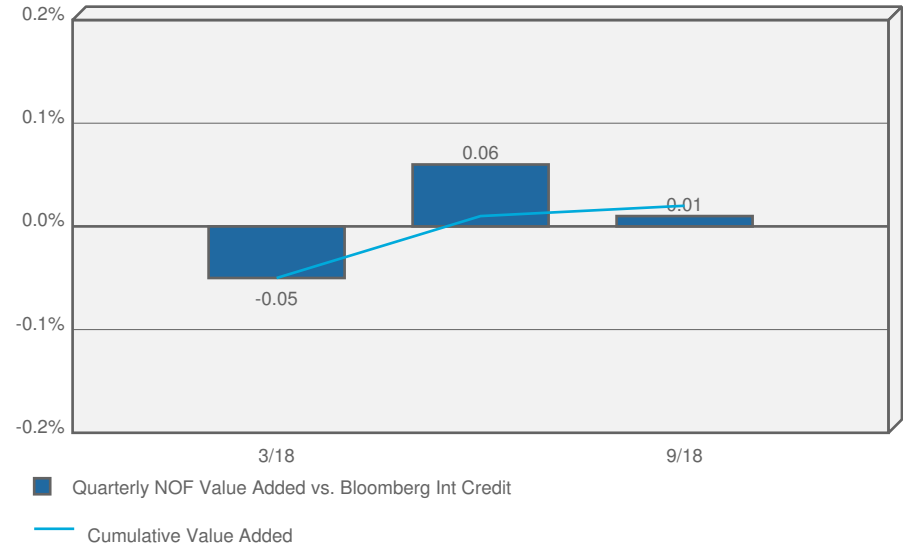
September 30, 2018

Performance Comparison vs Peer Universe\*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▼ BNY IG Credit	0.74 (32)	0.72 (41)	-0.71 (79)	-0.62 (79)	0.63	1.98	2.54	4.23
▮ Bloomberg Int	0.73 (33)	0.64 (48)	-0.73 (81)	-0.62 (79)	0.63	1.98	2.54	4.23
Median	0.43	0.62	-0.23	-0.06	0.63	1.98	2.54	4.23
Number of Funds	455	453	453	453	450	443	417	353

Value-Added Analysis vs Benchmark



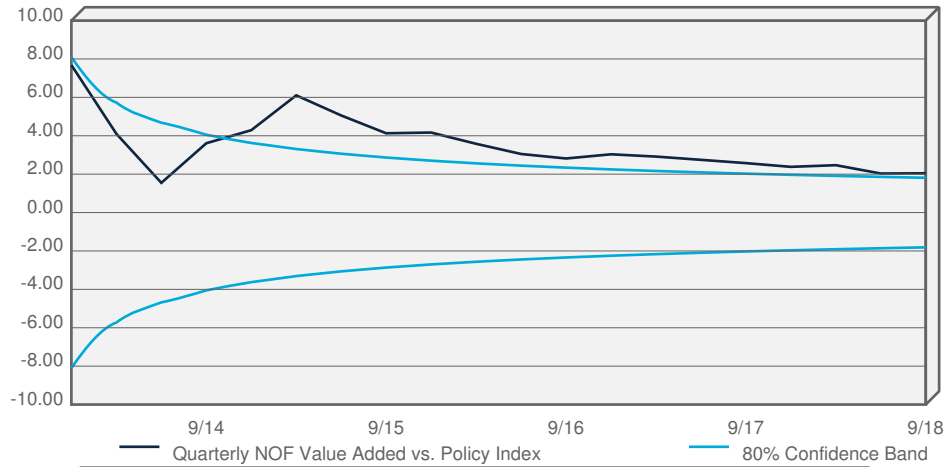
\*Compass Total Returns of Active Intermediate Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Manulife Asset Mgmt

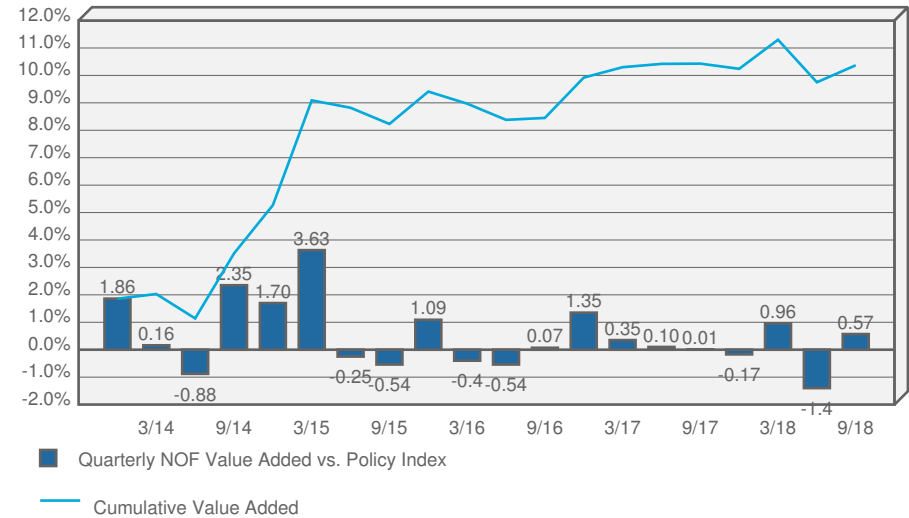
September 30, 2018

Cumulative Skill Analysis vs Benchmark

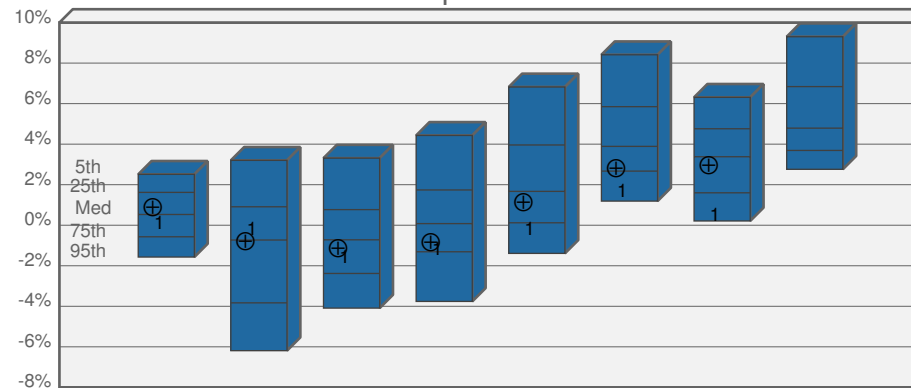


Excess Return:	2.05	Information Ratio:	0.83
Excess Risk:	2.46	T-Stat:	1.86

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
⊕ Manulife Asset	0.90 (40)	-0.74 (50)	-1.13 (55)	-0.83 (64)	1.15 (59)	2.82 (71)	3.01 (53)	
1 Policy Index	0.27 (58)	0.00 (41)	-1.41 (58)	-1.00 (67)	-0.02 (75)	1.86 (89)	0.66 (89)	
Median	0.53	-0.73	-0.72	0.08	1.67	3.89	3.38	4.79
Number of Funds	249	248	247	246	241	236	213	112

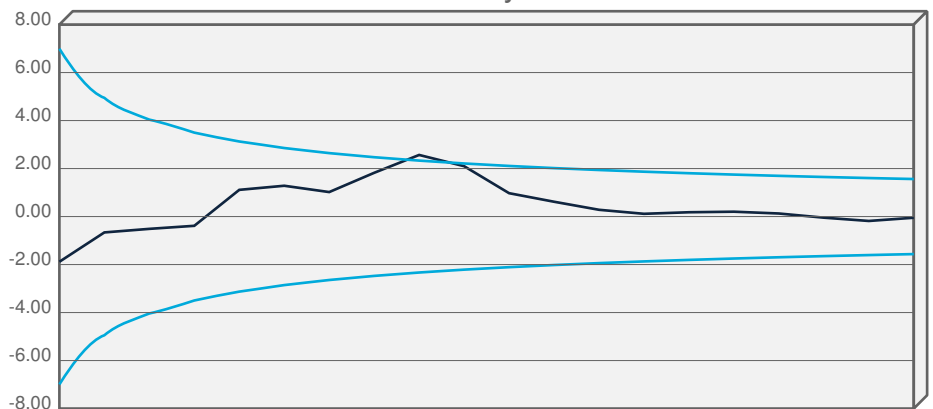
\*Compass Total Returns of Active Global Intl Fixed Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Columbia

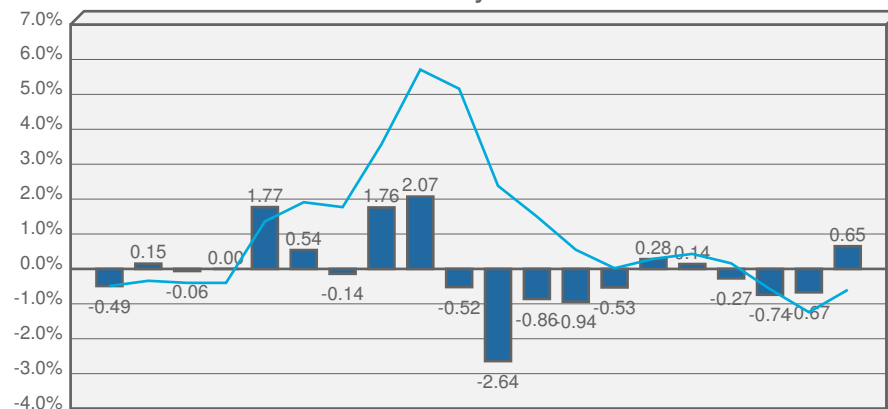
September 30, 2018

Cumulative Skill Analysis vs Benchmark



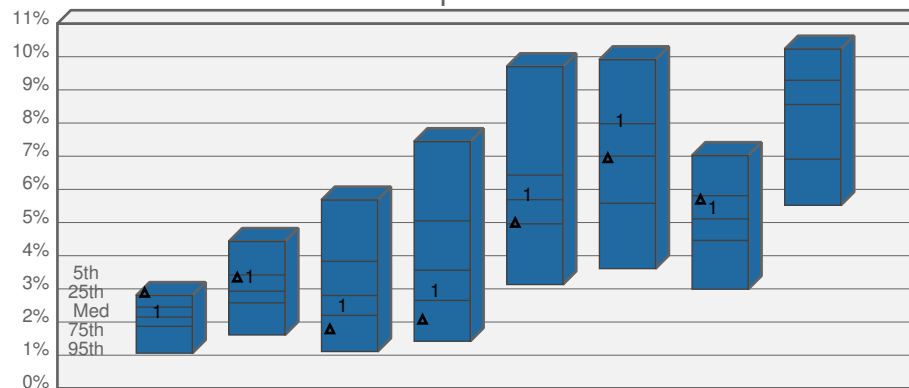
Excess Return:	-0.05	Information Ratio:	-0.02
Excess Risk:	2.13	T-Stat:	-0.05

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	3.05 ( 1)	3.51 (21)	1.95 (82)	2.24 (86)	5.16 (70)	7.11 (47)	5.86 (23)	
1 Bloomberg High	2.40 (28)	3.46 (23)	2.57 (59)	3.05 (65)	5.92 (41)	8.15 (20)	5.54 (33)	
Median	2.15	2.93	2.80	3.56	5.69	7.00	5.11	8.56
Number of Funds	218	218	218	218	211	208	194	126

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

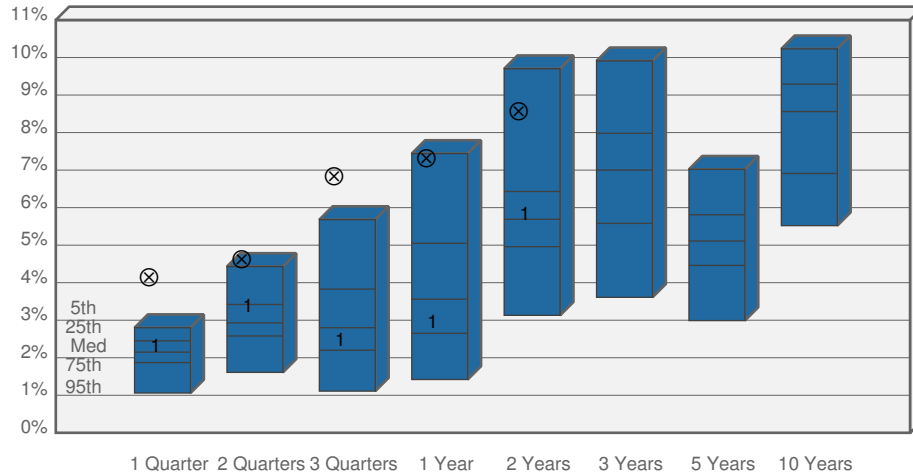


# INVESTMENT MANAGER ANALYSIS

Marathon Bluegrass

September 30, 2018

Performance Comparison vs Peer Universe\*

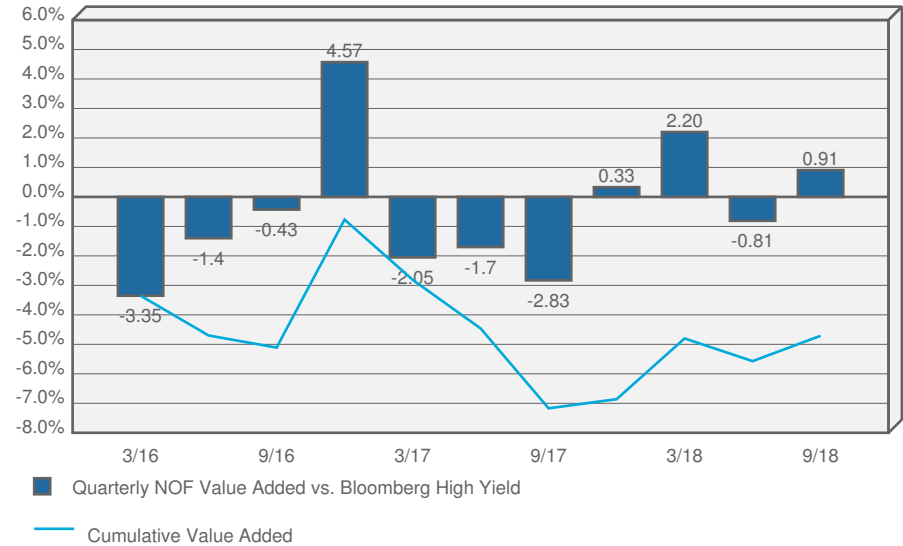


⊗ Marathon Blueg  
1 Bloomberg High

Median  
Number of Funds

	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Marathon Blueg	4.15 ( 1)	4.64 ( 2)	6.84 ( 3)	7.33 ( 5)	8.59 ( 6)	-	-	-
Bloomberg High	2.40 (28)	3.46 (23)	2.57 (59)	3.05 (65)	5.92 (41)	-	-	-
Median	2.15	2.93	2.80	3.56	5.69	7.00	5.11	8.56
Number of Funds	218	218	218	218	211	208	194	126

Value-Added Analysis vs Benchmark



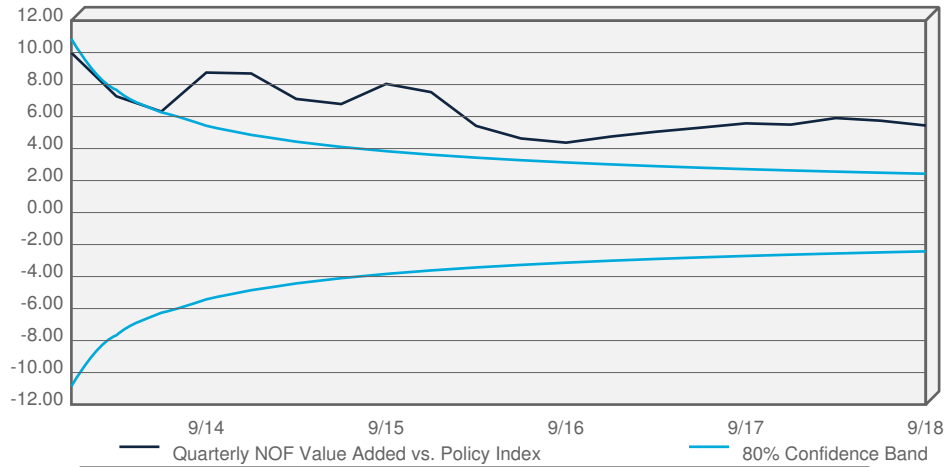
\*Compass Total Returns of Active High Yield Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

## Waterfall

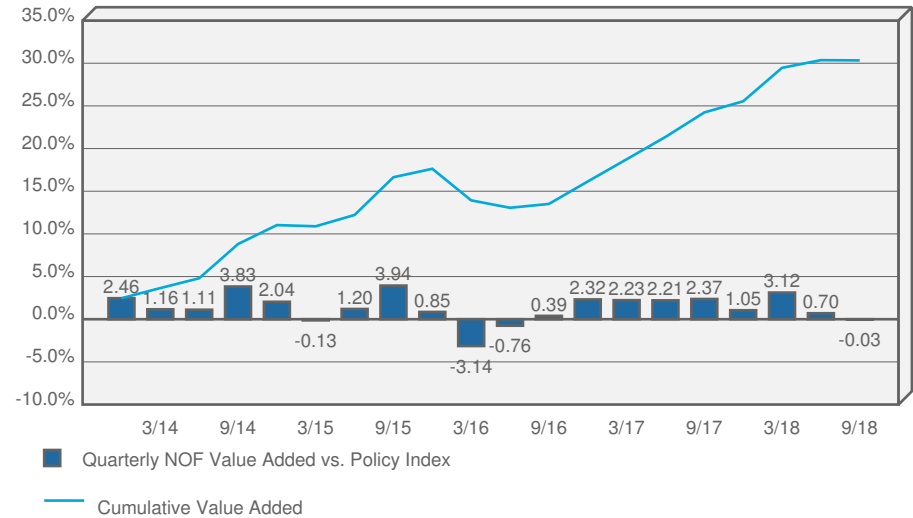
September 30, 2018

Cumulative Skill Analysis vs Benchmark

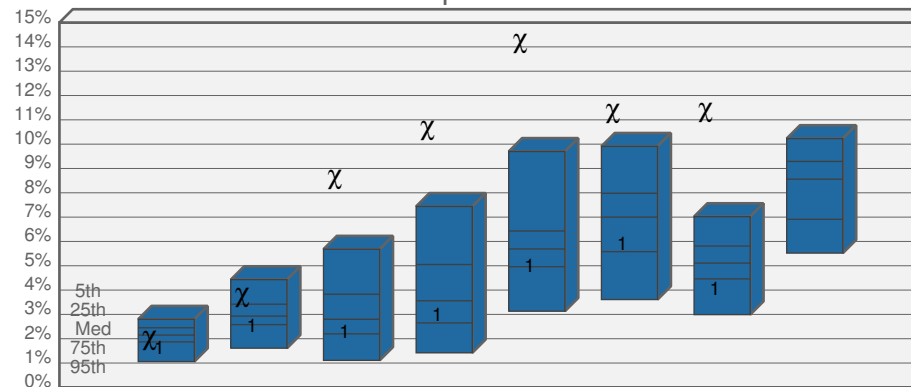


Excess Return:	5.44	Information Ratio:	1.65
Excess Risk:	3.30	T-Stat:	3.69

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
<b>X</b> Waterfall	1.85 (76)	3.60 (16)	8.45 ( 1)	10.47 ( 1)	14.05 ( 1)	11.18 ( 2)	11.22 ( 1)	
<b>1</b> Policy Index	1.74 (83)	2.67 (68)	2.43 (64)	3.11 (63)	5.13 (72)	6.04 (68)	4.18 (81)	
Median	2.15	2.93	2.80	3.56	5.69	7.00	5.11	8.56
Number of Funds	218	218	218	218	211	208	194	126

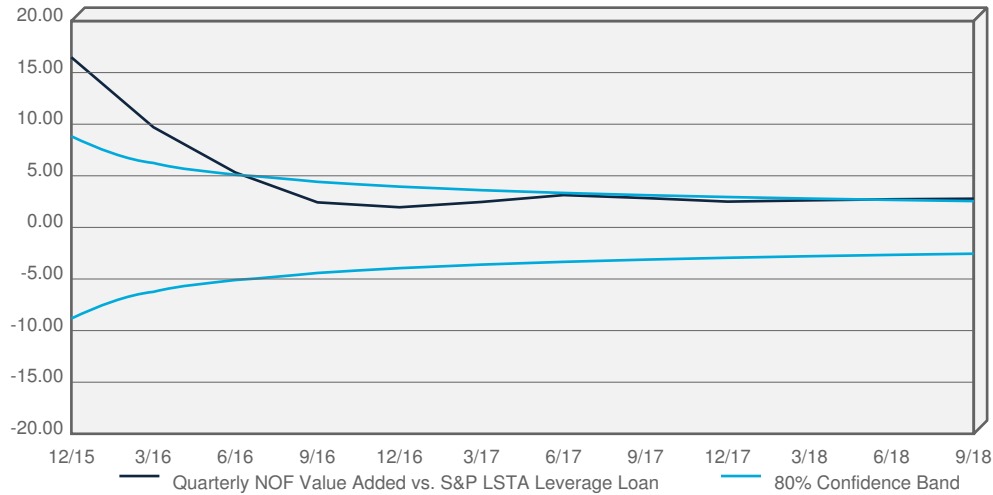
\*Compass Total Returns of Active High Yield Fixed Income Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

Cerberus Capital Mgmt

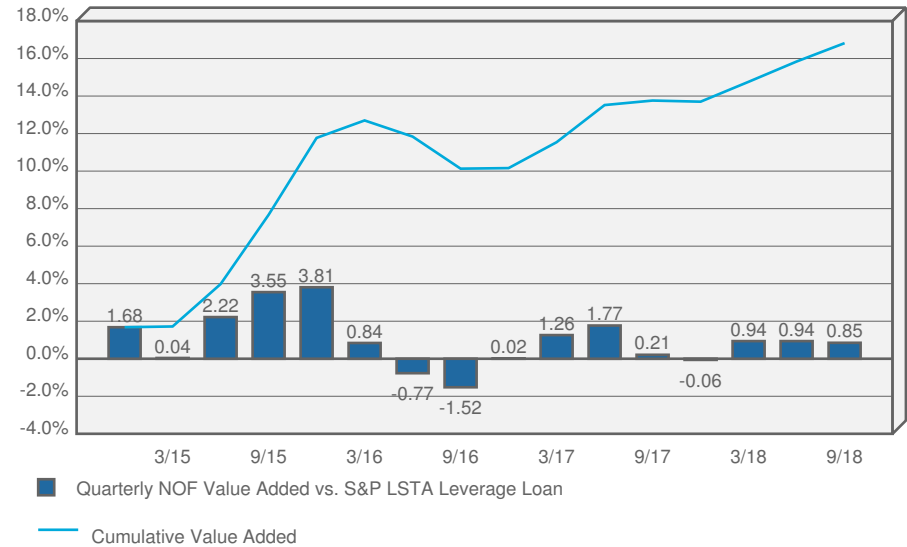
September 30, 2018

Cumulative Skill Analysis vs Benchmark



Excess Return:	2.78	Information Ratio:	1.04
Excess Risk:	2.68	T-Stat:	1.79

Value-Added Analysis vs Benchmark

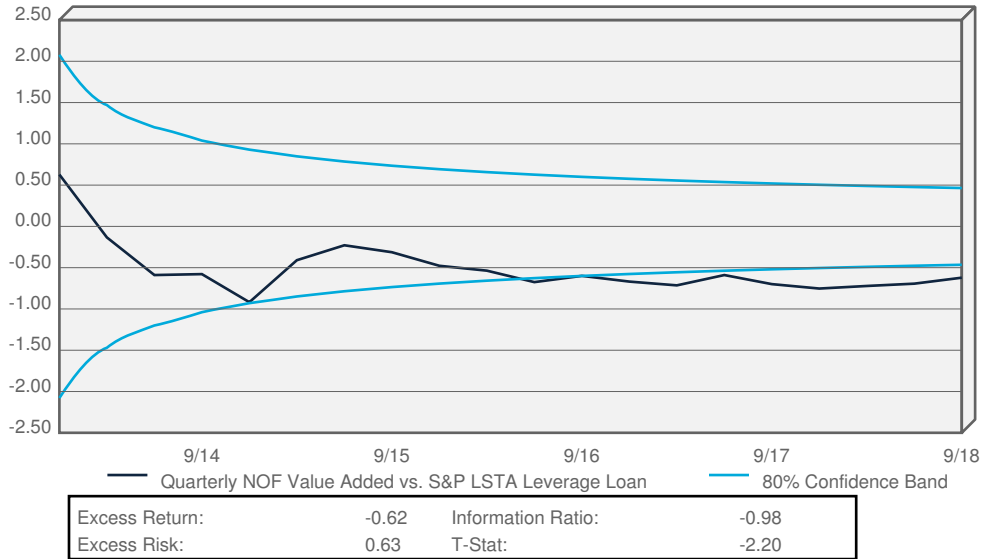


# INVESTMENT MANAGER ANALYSIS

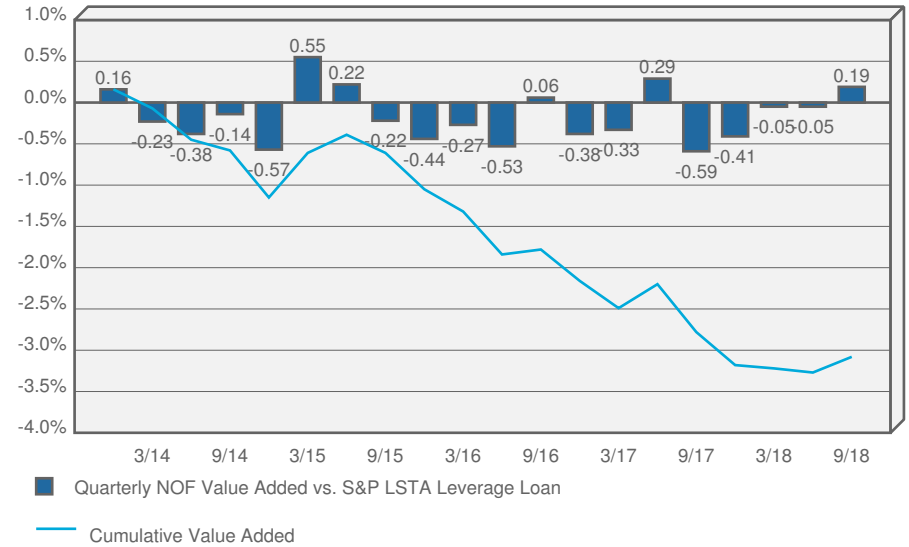
Shenkman Capital

September 30, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark



# CUSTOM BENCHMARK SPECIFICATION

Fixed Income Composite

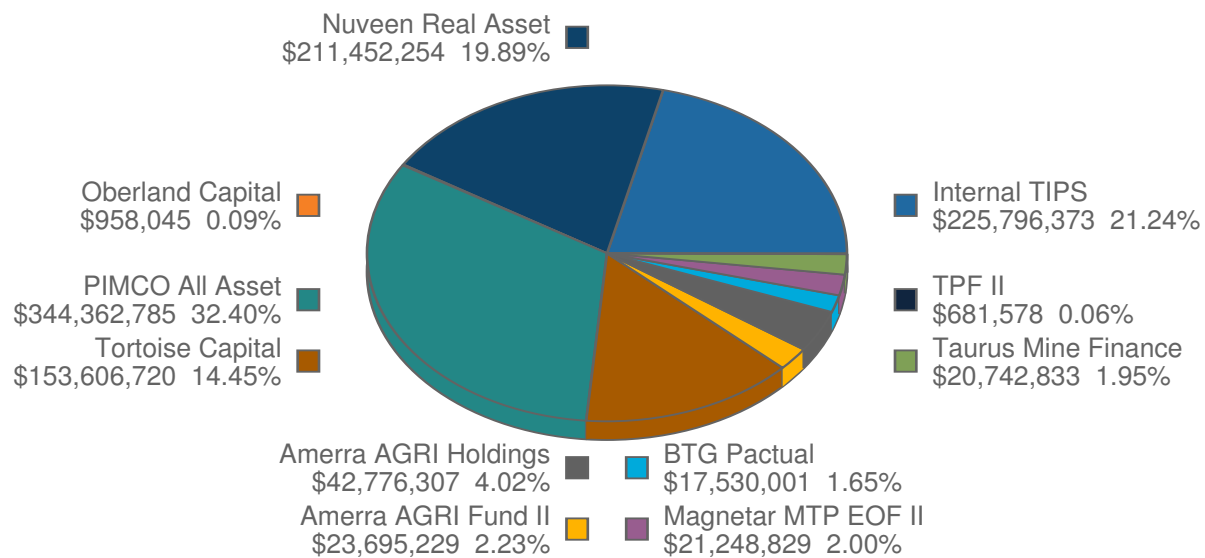
September 30, 2018

	Quarter Start	Quarter End	Percent	Description
Policy Index	6/84	6/17	100.00	Blended Fixed Benchmark
	9/17	9/18	50.00 50.00	Bloomberg Universal Bloomberg High Yield
Bloomberg Global Aggregate	6/84	9/18	100.00	Bloomberg Global Aggregate



# REAL RETURN

Wilshire Consulting  
**MANAGER ALLOCATION**  
 Real Return Composite  
 As of September 30, 2018



# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 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>-0.19</b>	<b>0.37</b>	<b>-0.00</b>	<b>0.33</b>	<b>1.88</b>	<b>1.49</b>	<b>3.37</b>	<b>6/30/02</b>	<b>4.61</b>
Bloomberg 1-10 Yrs TIPS	-0.42	0.20	-0.20	0.33	1.65	1.14	3.20	6/30/02	4.49
Value Added	0.22	0.17	0.20	0.00	0.23	0.35	0.17	6/30/02	0.13
<b>PIMCO All Asset</b>									
<b>Net of Fee Return</b>	<b>0.34</b>	<b>-2.03</b>	<b>0.34</b>	<b>1.35</b>	<b>8.25</b>	<b>3.44</b>		<b>12/31/11</b>	<b>5.25</b>
Bloomberg 1-10 Yrs TIPS	-0.42	0.20	-0.20	0.33	1.65	0.94		12/31/11	0.77
Value Added	0.76	-2.23	0.55	1.02	6.60	2.50		12/31/11	4.48
<b>Tortoise Capital</b>									
<b>Net of Fee Return</b>	<b>2.91</b>	<b>14.15</b>	<b>2.99</b>	<b>2.31</b>	<b>5.72</b>	<b>1.13</b>		<b>9/30/09</b>	<b>11.54</b>
Alerian MLP	6.57	19.14	5.90	4.89	4.43	-2.72		9/30/09	7.98
Value Added	-3.66	-4.99	-2.90	-2.58	1.29	3.85		9/30/09	3.56
<b>Nuveen Real Asset</b>									
<b>Net of Fee Return</b>	<b>1.51</b>	<b>3.18</b>	<b>0.24</b>	<b>1.62</b>	<b>8.04</b>			<b>3/31/15</b>	<b>4.90</b>
Policy Index	-0.21	2.92	-1.01	0.05	7.07			3/31/15	4.53
Value Added	1.72	0.26	1.25	1.57	0.97			3/31/15	0.37
<b>Amerra AGRI Fund II</b>									
<b>Net of Fee Return</b>	<b>-1.41</b>	<b>-3.69</b>	<b>-4.45</b>	<b>-6.38</b>	<b>0.25</b>	<b>4.65</b>		<b>12/31/12</b>	<b>3.79</b>
<b>Amerra AGRI Holdings</b>									
<b>Net of Fee Return</b>	<b>-1.82</b>	<b>-2.35</b>	<b>-3.47</b>	<b>-4.66</b>	<b>-1.74</b>			<b>9/30/15</b>	<b>-1.74</b>
<b>BTG Pactual</b>									
<b>Net of Fee Return</b>	<b>-6.99</b>	<b>-7.27</b>	<b>-11.17</b>	<b>-8.56</b>	<b>-7.71</b>			<b>12/31/14</b>	<b>-10.88</b>



# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 2018

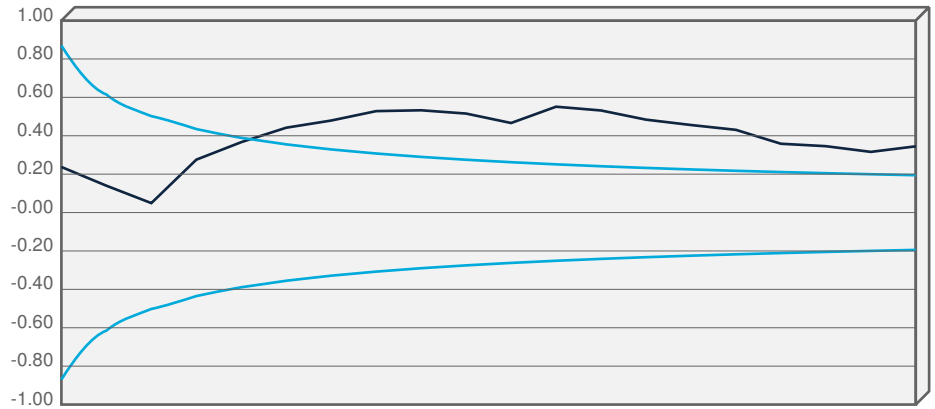
	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Magnetar MTP EOF II Net of Fee Return</b>	<b>3.34</b>	<b>3.01</b>	<b>6.56</b>	<b>11.92</b>	<b>2.65</b>			<b>9/30/15</b>	<b>2.65</b>
<b>Taurus Mine Finance Net of Fee Return</b>	<b>7.14</b>	<b>7.48</b>	<b>11.77</b>	<b>10.06</b>	<b>17.81</b>			<b>3/31/15</b>	<b>14.45</b>
<b>TPF II Net of Fee Return</b>								<b>9/30/08</b>	
<b>Real Return Composite Net of Fee Return</b>	<b>0.66</b>	<b>0.88</b>	<b>0.36</b>	<b>1.11</b>	<b>5.90</b>	<b>2.86</b>		<b>6/30/11</b>	<b>3.67</b>
Real Return Index (P)	0.62	2.25	0.37	0.92	3.38	1.62		6/30/11	2.52
Value Added	0.03	-1.37	-0.01	0.20	2.53	1.24		6/30/11	1.15

# INVESTMENT MANAGER ANALYSIS

## Internal TIPS

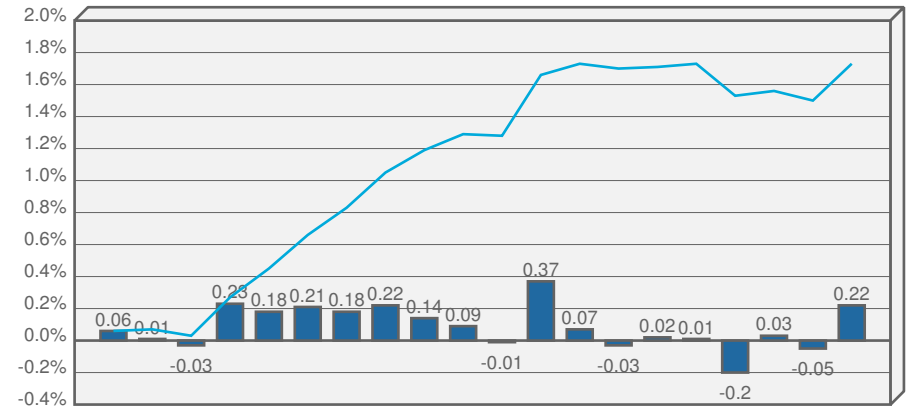
September 30, 2018

Cumulative Skill Analysis vs Benchmark



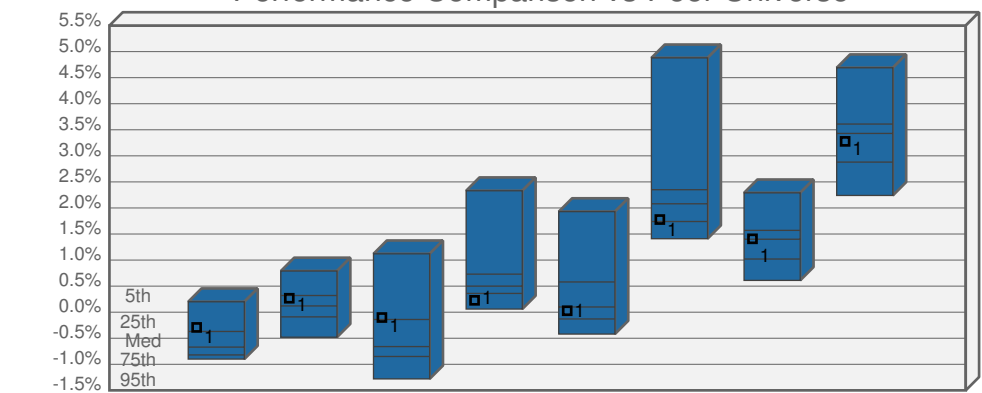
Excess Return:	0.35	Information Ratio:	1.30
Excess Risk:	0.26	T-Stat:	2.92

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	-0.19 (12)	0.37 (17)	-0.00 (17)	0.33 (84)	0.13 (41)	1.88 (71)	1.51 (34)	3.38 (62)
Bloomberg 1-10	-0.42 (35)	0.20 (41)	-0.20 (35)	0.33 (84)	0.09 (53)	1.65 (89)	1.14 (71)	3.20 (68)
Median	-0.67	0.12	-0.66	0.50	0.10	2.08	1.40	3.43
Number of Funds	39	39	39	39	39	38	38	32

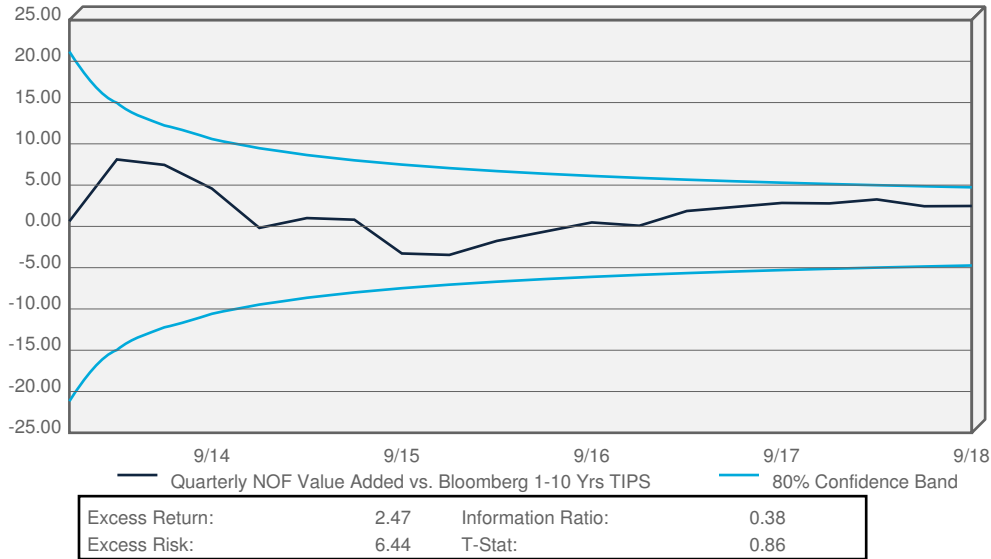
\*Compass Total Returns of Active TIPS Portfolios Universe - Gross of Fees

# INVESTMENT MANAGER ANALYSIS

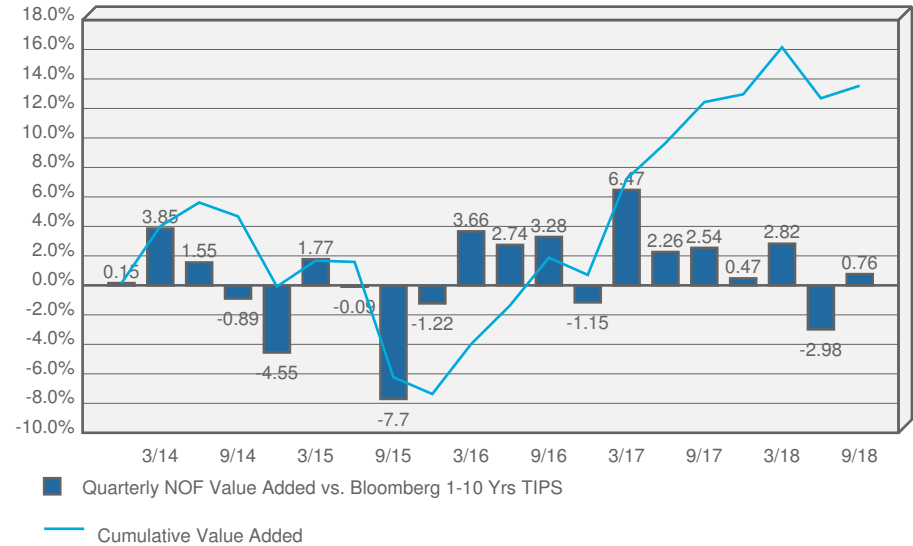
PIMCO All Asset

September 30, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark

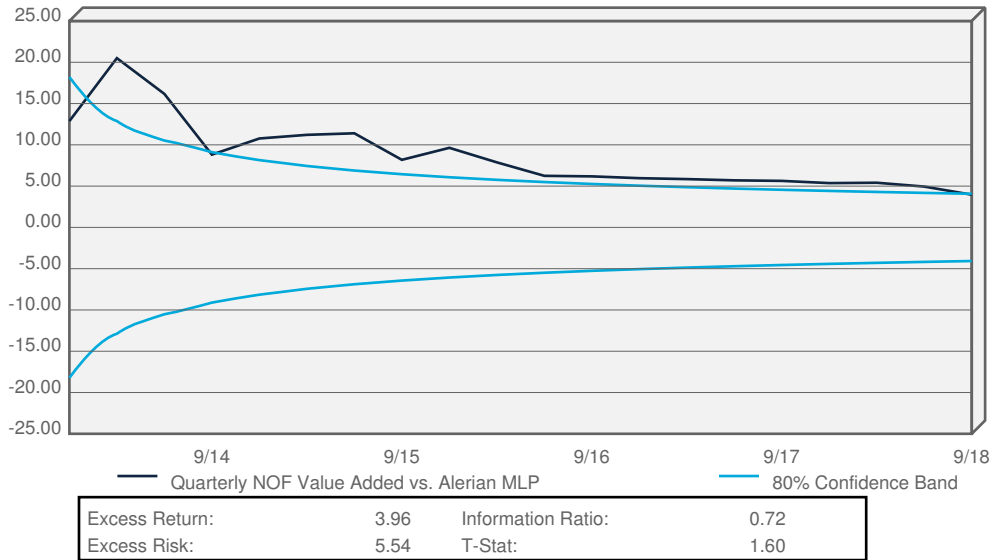


# INVESTMENT MANAGER ANALYSIS

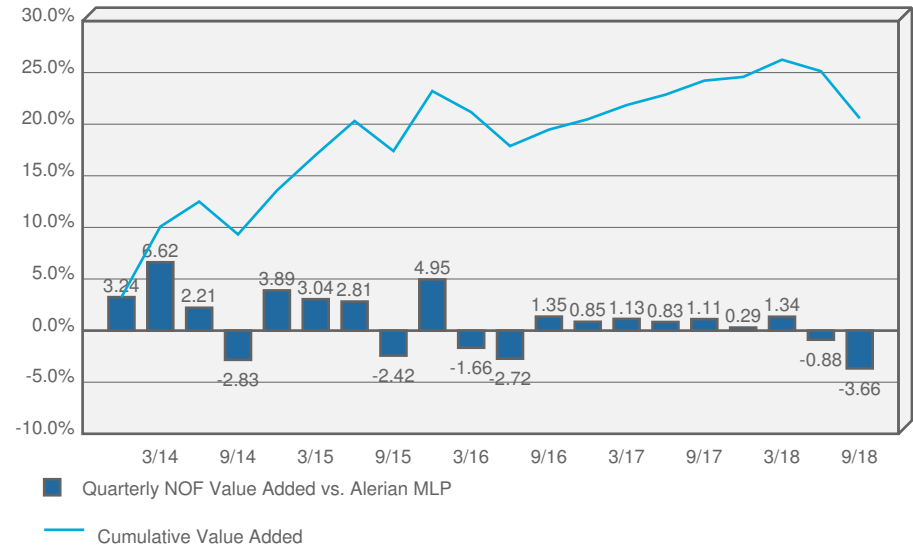
Tortoise Capital

September 30, 2018

Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark

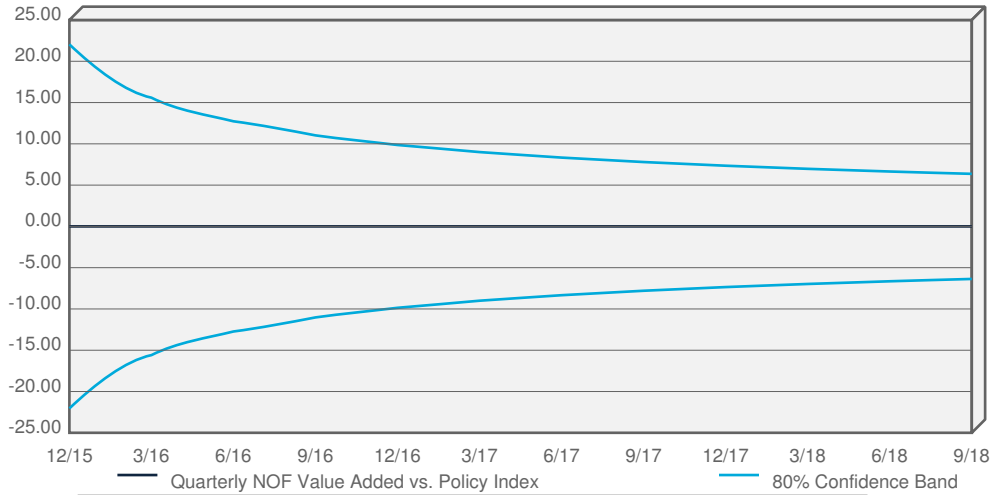


# INVESTMENT MANAGER ANALYSIS

Nuveen Real Asset

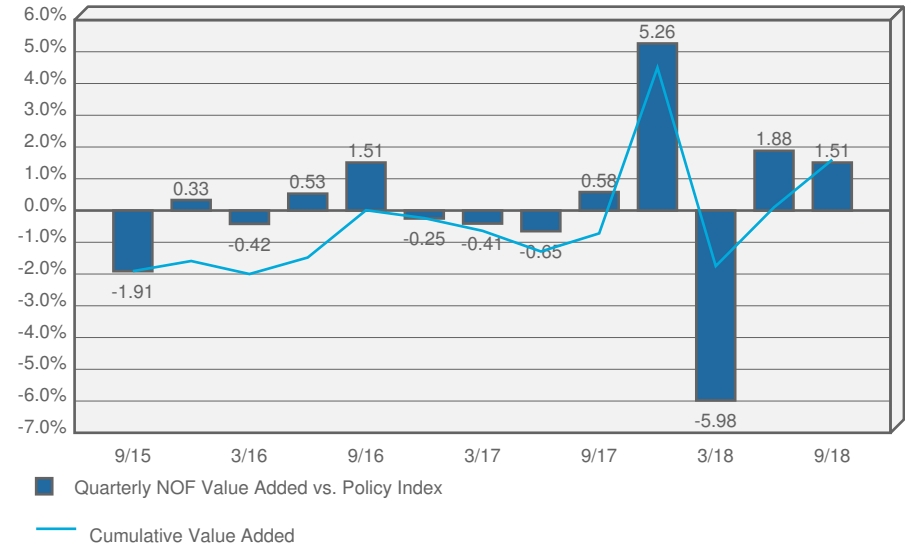
September 30, 2018

Cumulative Skill Analysis vs Benchmark



Excess Return:	0.79	Information Ratio:	0.12
Excess Risk:	6.70	T-Stat:	0.20

Value-Added Analysis vs Benchmark



# CUSTOM BENCHMARK SPECIFICATION

Real Return Composite

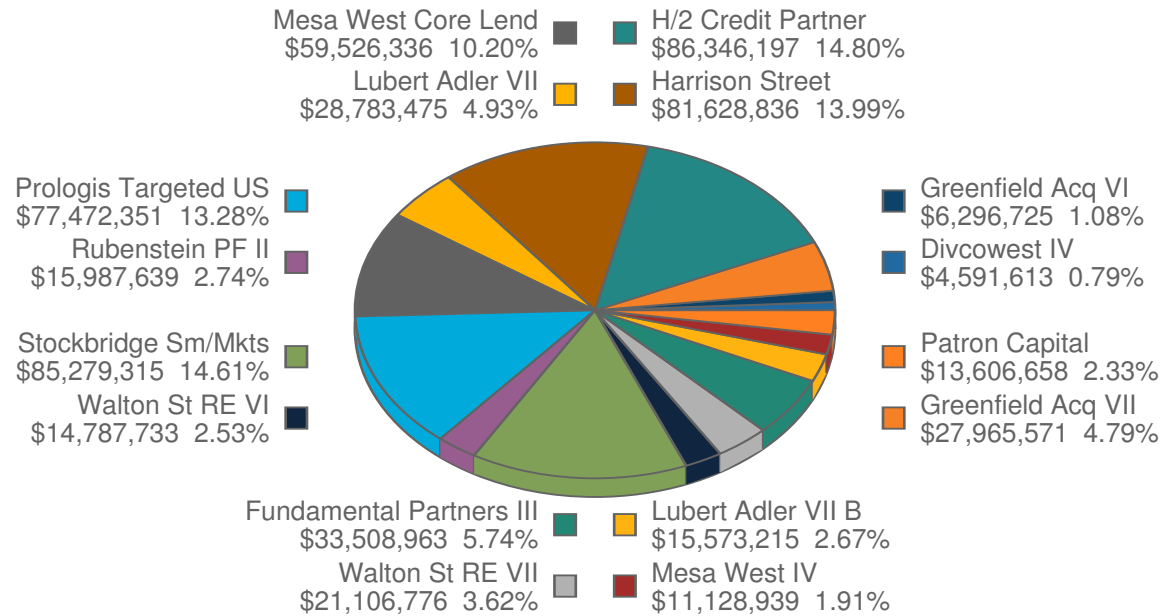
September 30, 2018

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



# REAL ESTATE

Wilshire Consulting  
**MANAGER ALLOCATION**  
 Real Estate Composite  
*As of September 30, 2018*





# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended September 30, 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>7.41</b>	<b>12.67</b>	<b>25.52</b>	<b>25.77</b>	<b>30.11</b>			<b>3/31/14</b>	<b>24.84</b>
<b>Greenfield Acq VI</b>									
<b>Net of Fee Return</b>	<b>-11.16</b>	<b>-8.13</b>	<b>-19.57</b>	<b>-18.55</b>	<b>-2.73</b>	<b>4.64</b>		<b>12/31/12</b>	<b>5.84</b>
<b>Greenfield Acq VII</b>									
<b>Net of Fee Return</b>	<b>5.21</b>	<b>5.93</b>	<b>12.43</b>	<b>13.34</b>	<b>13.79</b>			<b>6/30/14</b>	<b>12.39</b>
<b>H/2 Credit Partner</b>									
<b>Net of Fee Return</b>	<b>1.18</b>	<b>2.09</b>	<b>2.15</b>	<b>2.29</b>	<b>5.21</b>	<b>5.69</b>		<b>6/30/11</b>	<b>6.10</b>
<b>Harrison Street</b>									
<b>Net of Fee Return</b>	<b>3.45</b>	<b>5.46</b>	<b>7.96</b>	<b>10.99</b>	<b>10.24</b>	<b>10.19</b>		<b>6/30/12</b>	<b>9.31</b>
<b>Lubert Adler VII</b>									
<b>Net of Fee Return</b>	<b>2.95</b>	<b>6.47</b>	<b>8.04</b>	<b>12.69</b>	<b>7.09</b>			<b>6/30/14</b>	<b>-1.48</b>
<b>Mesa West Core Lend</b>									
<b>Net of Fee Return</b>	<b>3.35</b>	<b>5.10</b>	<b>6.97</b>	<b>8.71</b>	<b>8.16</b>	<b>7.19</b>		<b>6/30/13</b>	<b>7.18</b>
<b>Prologis Targeted US</b>									
<b>Net of Fee Return</b>	<b>5.13</b>	<b>10.42</b>	<b>14.62</b>	<b>21.77</b>	<b>17.00</b>			<b>9/30/14</b>	<b>15.81</b>
<b>Rubenstein PF II</b>									
<b>Net of Fee Return</b>	<b>4.86</b>	<b>8.37</b>	<b>11.74</b>	<b>17.82</b>	<b>9.62</b>	<b>14.80</b>		<b>6/30/13</b>	<b>14.05</b>
<b>Stockbridge Sm/Mkts</b>									
<b>Net of Fee Return</b>	<b>1.64</b>	<b>3.39</b>	<b>5.35</b>	<b>7.11</b>	<b>8.73</b>			<b>6/30/14</b>	<b>9.48</b>

# PERFORMANCE COMPARISON

## Trailing Returns

Periods Ended September 30, 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>2.23</b>	<b>4.60</b>	<b>7.05</b>	<b>9.80</b>	<b>4.12</b>	<b>8.09</b>		<b>6/30/09</b>	<b>-17.86</b>
<b>Walton St RE VII</b>									
<b>Net of Fee Return</b>	<b>0.26</b>	<b>2.05</b>	<b>4.61</b>	<b>6.82</b>	<b>10.35</b>	<b>12.67</b>		<b>6/30/13</b>	<b>12.58</b>
<b>Fundamental Partners III</b>									
<b>Net of Fee Return</b>	<b>1.71</b>	<b>1.72</b>	<b>3.31</b>	<b>5.28</b>				<b>6/30/17</b>	<b>4.17</b>
<b>Lubert Adler VII B</b>									
<b>Net of Fee Return</b>	<b>2.12</b>	<b>3.72</b>	<b>3.16</b>	<b>-1.08</b>				<b>6/30/17</b>	<b>-0.86</b>
<b>Mesa West IV</b>									
<b>Net of Fee Return</b>	<b>2.38</b>	<b>3.96</b>	<b>6.26</b>	<b>7.61</b>				<b>3/31/17</b>	<b>4.46</b>
<b>Patron Capital</b>									
<b>Net of Fee Return</b>	<b>2.29</b>	<b>1.64</b>	<b>22.48</b>	<b>21.38</b>				<b>9/30/16</b>	<b>-0.42</b>
<b>Real Estate Composite</b>									
<b>Net of Fee Return</b>	<b>2.66</b>	<b>4.76</b>	<b>7.19</b>	<b>9.65</b>	<b>9.44</b>	<b>9.12</b>	<b>8.46</b>	<b>6/30/84</b>	<b>6.09</b>
NCREIF ODCE NOF 1 Quarter Lag	1.85	3.86	5.78	7.51	8.39	10.04	4.34		
Value Added	0.81	0.91	1.41	2.14	1.05	-0.92	4.12		

# CUSTOM BENCHMARK SPECIFICATION

Real Estate Composite

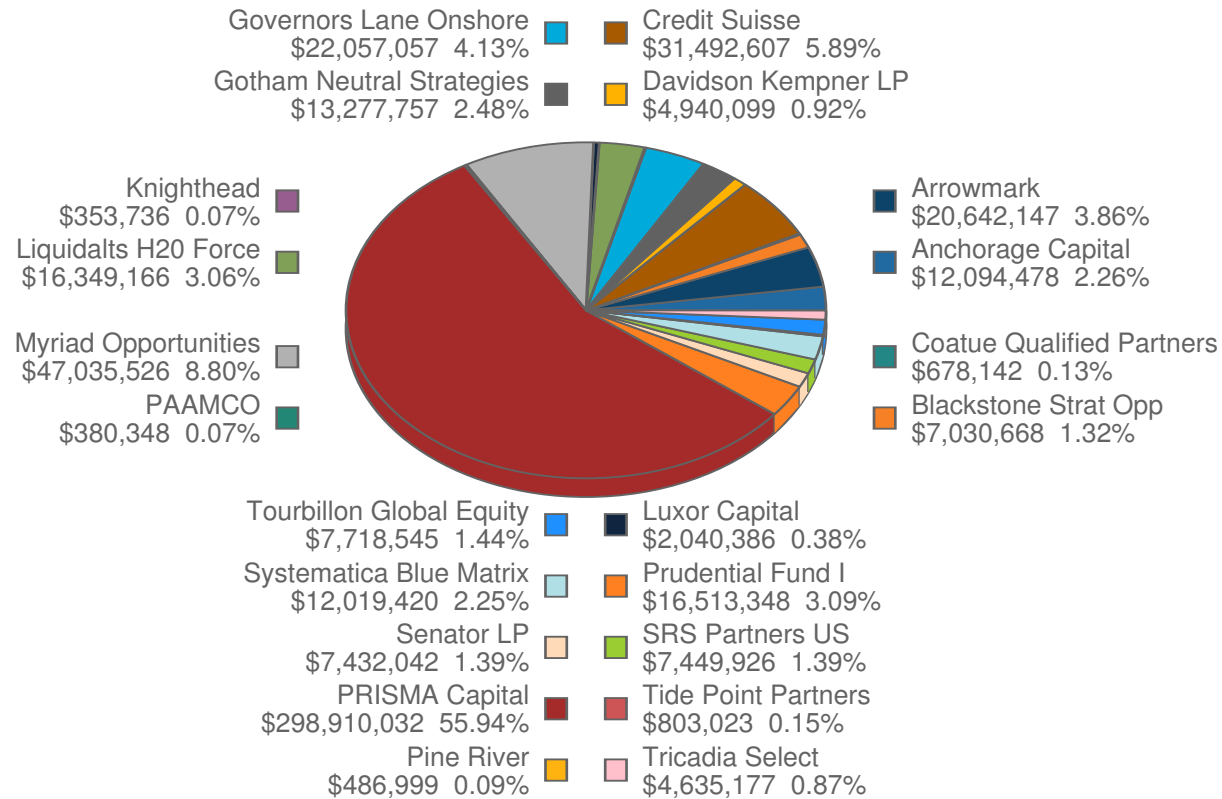
September 30, 2018

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



# ABSOLUTE RETURN

Wilshire Consulting  
**MANAGER ALLOCATION**  
 Absolute Return Composite  
*As of September 30, 2018*



# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended September 30, 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>	1.29	1.94	2.58	5.81				9/30/16	5.82
<b>Arrowmark Net of Fee Return</b>	2.58							6/30/18	2.58
<b>Blackstone Strat Opp Net of Fee Return</b>	1.25	3.04	4.35	5.72				9/30/17	5.72
<b>Coatue Qualified Partners Net of Fee Return</b>	0.00	2.63	8.58	9.26	14.64			6/30/15	13.45
<b>Credit Suisse Net of Fee Return</b>	1.54	3.45	5.03	6.64				6/30/17	6.93
<b>Davidson Kempner LP Net of Fee Return</b>	0.76	0.28	2.33	3.14				3/31/16	6.40
<b>Gotham Neutral Strategies Net of Fee Return</b>	-1.16	-1.46	1.14	1.04				3/31/17	-2.37
<b>Governors Lane Onshore Net of Fee Return</b>	1.88	0.41	0.27	-1.43				3/31/17	1.80
<b>Knighthead Net of Fee Return</b>	-0.08	0.17	1.63	2.71	4.44			12/31/13	2.14
<b>Liquidalts H20 Force Net of Fee Return</b>	1.70	-1.39	1.80	-0.03				9/30/16	5.68

# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended September 30, 2018*

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Luxor Capital</b>									
<b>Net of Fee Return</b>	<b>0.26</b>	<b>1.12</b>	<b>8.03</b>	<b>13.85</b>	<b>7.73</b>			<b>3/31/14</b>	<b>1.55</b>
<b>Myriad Opportunities</b>									
<b>Net of Fee Return</b>	<b>-3.88</b>	<b>-4.39</b>	<b>-3.13</b>	<b>0.28</b>				<b>6/30/16</b>	<b>6.50</b>
<b>PAAMCO</b>									
<b>Net of Fee Return</b>								<b>9/30/11</b>	
<b>Pine River</b>									
<b>Net of Fee Return</b>								<b>6/30/14</b>	
<b>PRISMA Capital</b>									
<b>Net of Fee Return</b>	<b>0.84</b>	<b>1.63</b>	<b>4.04</b>	<b>5.29</b>	<b>2.29</b>	<b>3.40</b>		<b>9/30/11</b>	<b>3.92</b>
<b>Prudential Fund I</b>									
<b>Net of Fee Return</b>	<b>1.36</b>	<b>2.63</b>	<b>3.35</b>	<b>3.31</b>				<b>3/31/17</b>	<b>5.10</b>
<b>SRS Partners US</b>									
<b>Net of Fee Return</b>	<b>-8.01</b>	<b>-5.20</b>	<b>-4.81</b>	<b>-1.95</b>				<b>9/30/17</b>	<b>-1.95</b>
<b>Senator LP</b>									
<b>Net of Fee Return</b>	<b>0.88</b>	<b>2.58</b>	<b>0.12</b>	<b>2.74</b>				<b>9/30/16</b>	<b>6.59</b>
<b>Systematica Blue Matrix</b>									
<b>Net of Fee Return</b>	<b>-4.44</b>	<b>-2.45</b>	<b>-3.43</b>	<b>-2.69</b>				<b>3/31/17</b>	<b>1.11</b>
<b>Tide Point Partners</b>									
<b>Net of Fee Return</b>	<b>-30.44</b>	<b>-30.44</b>	<b>-33.84</b>	<b>-28.77</b>				<b>3/31/17</b>	<b>-23.50</b>

# PERFORMANCE COMPARISON

## Trailing Returns

*Periods Ended September 30, 2018*

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
<b>Tourbillon Global Equity Net of Fee Return</b>	<b>-1.16</b>	<b>4.33</b>	<b>-1.58</b>	<b>-10.55</b>				<b>12/31/15</b>	<b>-8.78</b>
<b>Tricadia Select Net of Fee Return</b>	<b>-5.61</b>	<b>-19.00</b>	<b>-18.26</b>	<b>-21.53</b>				<b>9/30/17</b>	<b>-21.53</b>
<b>Absolute Return Composite Net of Fee Return</b>	<b>0.23</b>	<b>0.80</b>	<b>2.39</b>	<b>3.72</b>	<b>2.34</b>	<b>3.60</b>		<b>3/31/10</b>	<b>4.06</b>
HFRI FOF Div (1 Month Lag)	0.99	1.43	2.91	4.63	2.60	3.53		3/31/10	3.08
Value Added	-0.76	-0.63	-0.52	-0.91	-0.27	0.07		3/31/10	0.97



# CUSTOM BENCHMARK SPECIFICATION

Absolute Return Composite

*September 30, 2018*

	Quarter Start	Quarter End	Percent	Description
HFRI FOF Div (1 Month Lag)	6/10	9/18	100.00	HFRI FOF Div (1 Month Lag)