WILSHIRE ASSOCIATES

Wilshire Consulting

Retirement Board of Allegheny County

Executive Summary of Investment Performance

Quarter Ending June 30, 2017

CAPITAL MARKET UPDATE

Wilshire Consulting

ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 6/2017
2012	2013	2014	2015	2016	YTD 2017	
Emrg Mrkts 18.6%	U.S. Equity 33.1%	REITs 31.8%	REITs 4.2%	MLPs 18.3%	Emrg Mrkts 18.6%	U.S. Equity 14.6%
Developed 17.9%	MLPs 27.6%	U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 14.2%	REITs 9.3%
REITs 17.6%	Developed 23.3%	Core Bond 6.0%	Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 8.7%	Developed 9.2%
U.S. Equity 16.1%	High Yield 7.4%	MLPs 4.8%	T-Bills 0.1%	Commodities 11.8%	High Yield 4.9%	High Yield 6.9%
High Yield 15.8%	REITs 1.9%	U.S. TIPS 3.6%	Developed -0.4%	Emrg Mrkts 11.6%	Core Bond 2.3%	Emrg Mrkts 4.3%
U.S. TIPS 7.0%	T-Bills 0.1%	High Yield 2.5%	U.S. TIPS -1.4%	REITs 7.2%	REITs 1.8%	Core Bond 2.2%
MLPs 4.8%	Core Bond -2.0%	T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 0.9%	MLPs 1.8%
Core Bond 4.2%	Emrg Mrkts -2.3%	Emrg Mrkts -1.8%	Emrg Mrkts -14.6%	Core Bond 2.6%	T-Bills 0.3%	U.S. TIPS 0.3%
T-Bills 0.1%	U.S. TIPS -8.6%	Developed -4.5%	Commodities -24.7%	Developed 1.5%	MLPs -2.7%	T-Bills 0.2%
Commodities -1.0%	Commodities -9.5%	Commodities -17.0%	MLPs -32.6%	T-Bills 0.3%	Commodities -5.3%	Commodities -9.2%

Data sources: Wilshire Compass

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

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MARKET COMMENTARY

U.S. Equity

The U.S. stock market was up 3.0% for the second quarter of 2017. Economic releases during the second quarter were solid with growth in both the economy and labor market. Corporate earnings reports during the quarter were stronger than many expected with Financials leading the way but weakness in the Energy sector. The Federal Open Market Committee raised the Fed Funds rate in June by 0.25%, the second such increase this year.

The U.S. equity market has produced an outstanding 14.6% annualized return during the past five years by producing very few (one) negative quarters. The five-year risk (standard deviation) of 7.8% as-of June 30 is approaching a historic low. What makes the current five-year window so intriguing is that it encompasses the period after the market completely recovered from the global debt crisis sell-off.

Non-U.S. Equity

Equity markets outside of the U.S. produced very strong returns during the second quarter, in both developed and emerging markets. While economic releases out of Europe continue to improve, Britain is showing signs of struggling with Brexit. Emerging markets are outpacing developed markets in 2017. Returns have been broad based with 21 of the 24 countries in the index (representing more than 95% of the market value) producing positive gains.

Fixed Income

The U.S. Treasury yield curve continued to flatten during the quarter with the one-year yield up 21 basis points and the thirty-year down 18 basis points. The bellwether 10-year Treasury yield ended the quarter at 2.31%, down slightly. Credit spreads continued lower during the quarter in both investment grade and high yield bonds.

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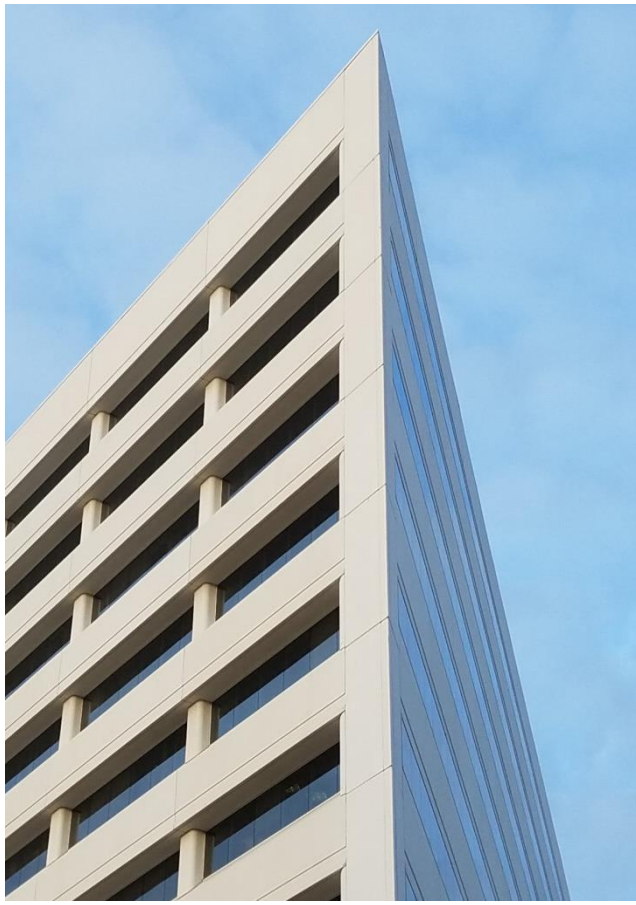
CLIMATE CHANGE REGULATORY UPDATE

- On June 1, President Trump announced U.S. withdrawal from the UN's 2015 Paris Agreement, which targeted "the increase in the global average temperature to well below 2°C above pre-industrial levels"
  - Timing and mechanism for withdrawal is unclear
  - Following the announcement, a dozen states and more than 300 U.S. cities pledged to reduce greenhouse-gas emissions in line with the Paris targets
- In 2016 Wilshire published an in-depth study of how climate change could impact asset owners' portfolios, developing a four part investment solution product called ClimateLens
  - Goal is to help investors understand and, if appropriate, respond to climate change risks as well as other ESG-related subjects
  - Daniel Ingram recently joined Wilshire Associates as Vice President for Responsible Investment Research and Consulting to help our clients navigate this often challenging space



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JUNE 2017 ASSET CLASS ASSUMPTIONS

	EQUITY						FIXED INCOME						REAL ASSETS					
													REAL ESTATE					
	US STOCK	DEV EX-US STOCK	EMG MRKT STOCK	GLOBAL EX-US STOCK	GLOBAL STOCK	PRIVATE EQUITY	CASH	CORE BOND	LT CORE BOND	US TIPS	HIGH YIELD	NON-US BOND (HDG)	US RES	GLOBAL RES	PRIVATE RE	CMDTY	REAL ASSETS	US CPI
EXPECTED COMPOUND RETURN (%)	6.50	6.50	6.50	6.70	6.70	9.05	1.45	3.50	3.80	2.75	4.90	1.40	5.15	5.35	5.70	3.20	6.05	1.75
EXPECTED ARITHMETIC RETURN (%)	7.80	7.95	9.45	8.30	8.05	12.25	1.45	3.65	4.25	2.90	5.35	1.45	6.50	6.50	6.60	4.25	6.40	1.75
EXPECTED RISK (%)	17.00	18.00	26.00	18.75	17.15	27.50	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.40	1.75
CASH YIELD (%)	2.00	3.00	2.25	2.85	2.40	0.00	1.45	3.55	4.75	3.05	8.10	1.80	3.85	3.85	2.70	1.45	2.75	0.00
CORRELATIONS																		
US STOCK	1.00																	
DEV EX-US STOCK (USD)	0.83	1.00																
EMERGING MARKET STOCK	0.75	0.75	1.00															
GLOBAL EX-US STOCK	0.85	0.96	0.87	1.00														
GLOBAL STOCK	0.96	0.94	0.84	0.96	1.00													
PRIVATE EQUITY	0.75	0.65	0.63	0.68	0.74	1.00												
CASH EQUIVALENTS	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
CORE BOND	0.29	0.13	0.00	0.10	0.20	0.32	0.19	1.00										
LT CORE BOND	0.32	0.16	0.01	0.12	0.23	0.33	0.11	0.95	1.00									
US TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.61	0.48	1.00								
HIGH YIELD BOND	0.55	0.40	0.50	0.45	0.52	0.34	-0.10	0.25	0.33	0.05	1.00							
NON-US BOND (HDG)	0.16	0.26	-0.01	0.19	0.18	0.27	0.10	0.68	0.65	0.40	0.27	1.00						
US RE SECURITIES	0.60	0.48	0.45	0.50	0.57	0.51	-0.05	0.17	0.23	0.10	0.57	0.05	1.00					
GLOBAL RE SECURITIES	0.66	0.60	0.57	0.63	0.67	0.58	-0.05	0.16	0.22	0.11	0.63	0.04	0.96	1.00				
PRIVATE REAL ESTATE	0.55	0.45	0.45	0.48	0.53	0.51	-0.05	0.19	0.26	0.09	0.58	0.05	0.79	0.77	1.00			
COMMODITIES	0.15	0.25	0.30	0.28	0.22	0.15	0.00	-0.04	-0.05	0.20	0.20	-0.05	0.26	0.29	0.25	1.00		
REAL ASSET BASKET	0.40	0.41	0.48	0.46	0.45	0.38	0.02	0.24	0.26	0.41	0.51	0.08	0.66	0.70	0.70	0.56	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	0.04	0.05	0.40	0.25	1.00

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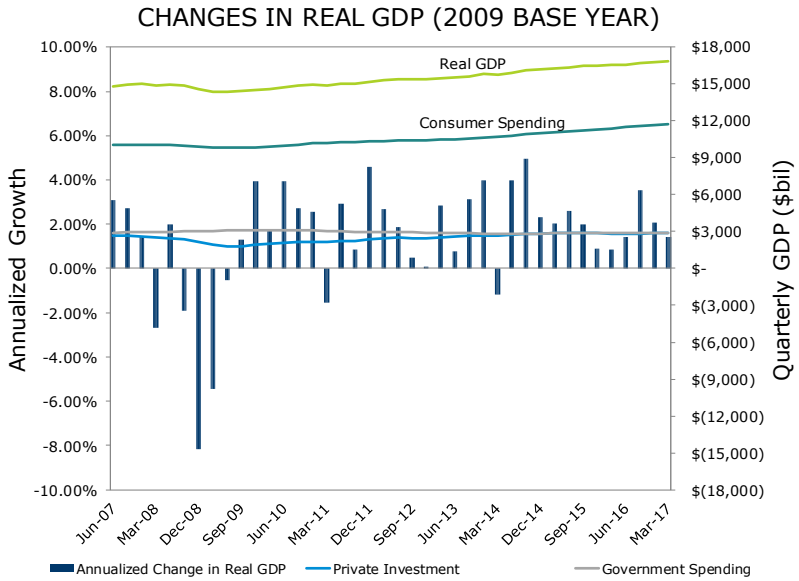
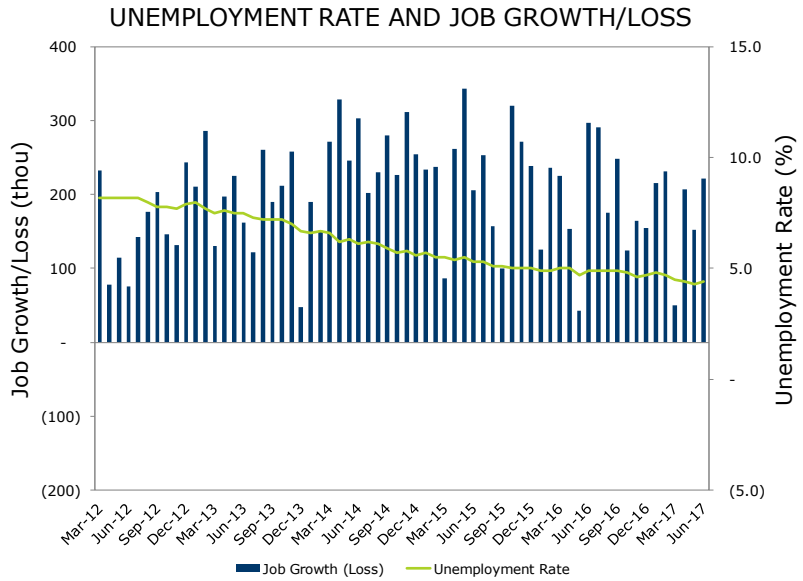
ECONOMIC REVIEW

AS OF JUNE 30, 2017	KEY ECONOMIC INDICATORS			
CPI (ALL ITEMS)	MONTHLY CHANGE		CUMULATIVE CHANGE	
SEASONALLY ADJUSTED	Jun-17	0.0	3-Mo.	0.0
	May-17	-0.1	12-Mo.	1.6
	Apr-17	0.2	10-Yr. (Annual)	1.6
BREAKEVEN INFLATION	10-Yr.	1.7		
CONSUMER SENTIMENT	Jun-17	95.1		
U. OF MICHIGAN SURVEY	May-17	97.1		
	1-Yr. Ago	93.5	10-Yr. Avg	78.3
MANUFACTURING	Jun-17	57.8	CHANGE IN SECTOR	
INST. FOR SUPPLY MGMT	May-17	54.9	>50	Expansion
PURCHASING MNGRS' IDX	1-Yr. Avg.	54.3	<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

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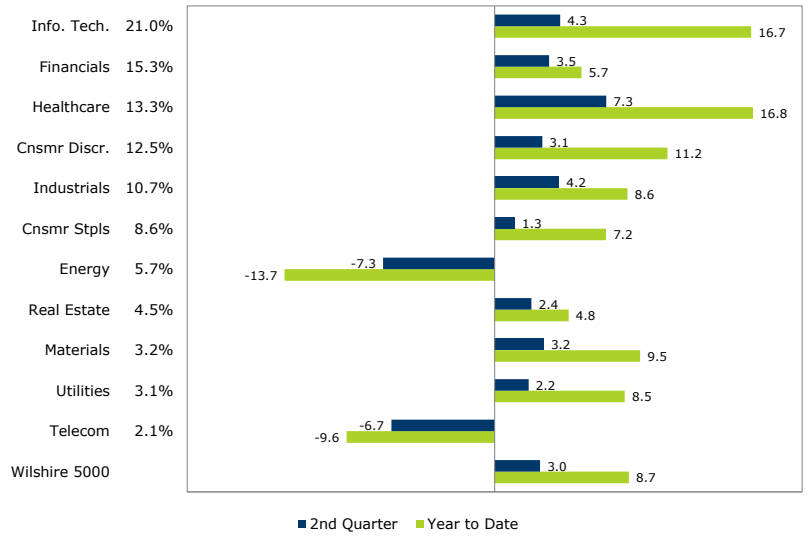
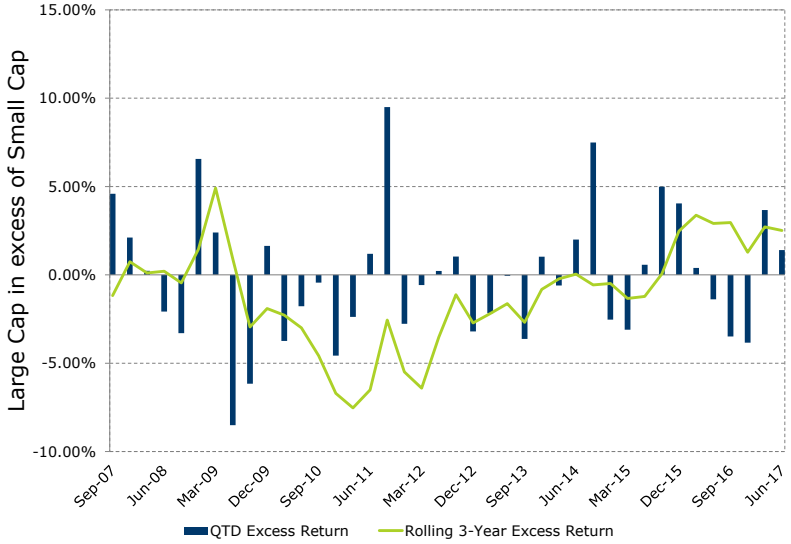
U.S. EQUITY MARKET

AS OF JUNE 30, 2017	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	3.0	8.7	18.5	9.3	14.6	7.3
WILSHIRE U.S. LARGE CAP	3.1	9.3	18.3	9.6	14.7	7.2
WILSHIRE U.S. SMALL CAP	1.7	3.9	21.2	6.9	14.3	8.1
WILSHIRE U.S. LARGE GROWTH	4.8	13.3	25.1	10.9	15.7	8.7
WILSHIRE U.S. LARGE VALUE	1.4	5.4	12.0	8.3	13.6	5.7
WILSHIRE U.S. SMALL GROWTH	3.8	7.6	26.6	5.9	14.0	8.3
WILSHIRE U.S. SMALL VALUE	-0.6	0.3	15.9	7.8	14.4	7.8
WILSHIRE REIT INDEX	1.8	1.8	-1.7	8.3	9.3	5.6
MSCI USA MIN. VOL. INDEX	3.0	9.0	7.5	11.2	12.9	7.9
FTSE RAFI U.S. 1000 INDEX	1.4	4.7	16.9	7.9	14.8	7.7

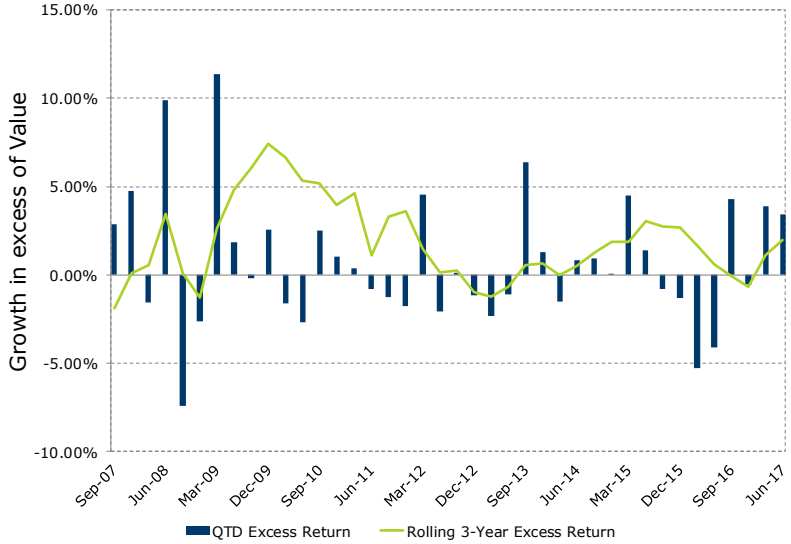
WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)



LARGE CAP VS SMALL CAP



GROWTH VS VALUE



Data sources: Wilshire Compass, Wilshire Atlas

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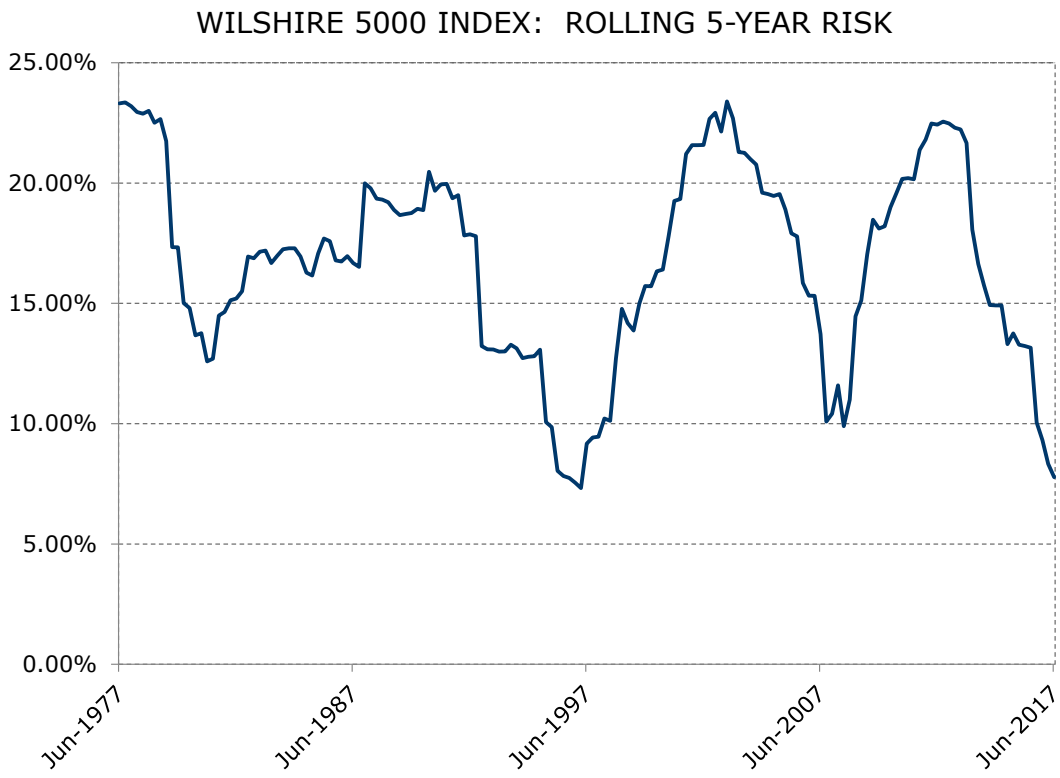
MARKET VOLATILITY

- U.S. Equity market has moved consistently higher during the past 5 years with only one negative quarter
- Latest 5-year risk number (defined as standard deviation) of 7.8% encompasses a period after the market completely recovered from the global debt crisis sell-off



Data sources: Wilshire Compass

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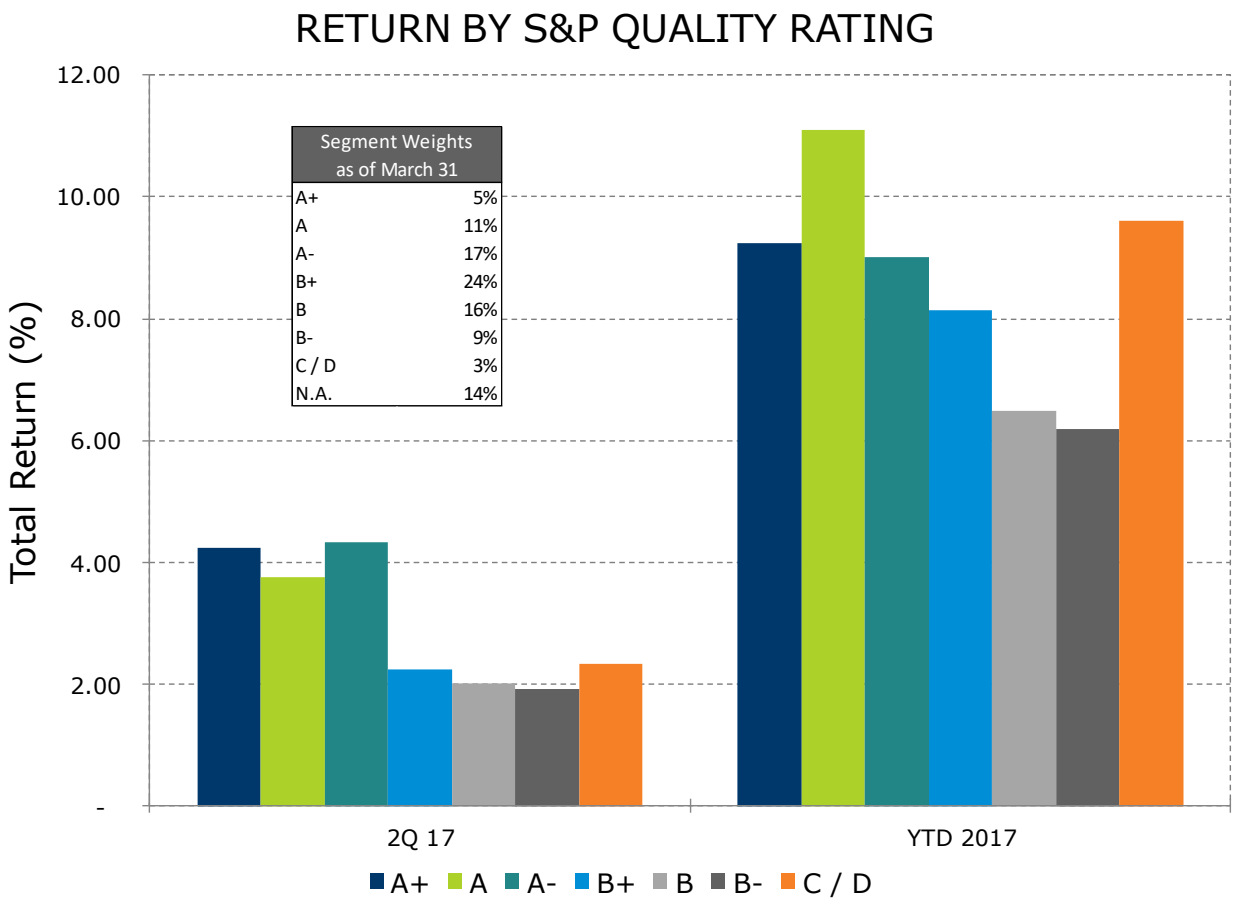
RETURNS BY QUALITY SEGMENT

In a reversal from last year, higher quality names are leading the market in 2017



Segment Weights as of March 31	
A+	5%
A	11%
A-	17%
B+	24%
B	16%
B-	9%
C / D	3%
N.A.	14%

Data sources: Wilshire Atlas

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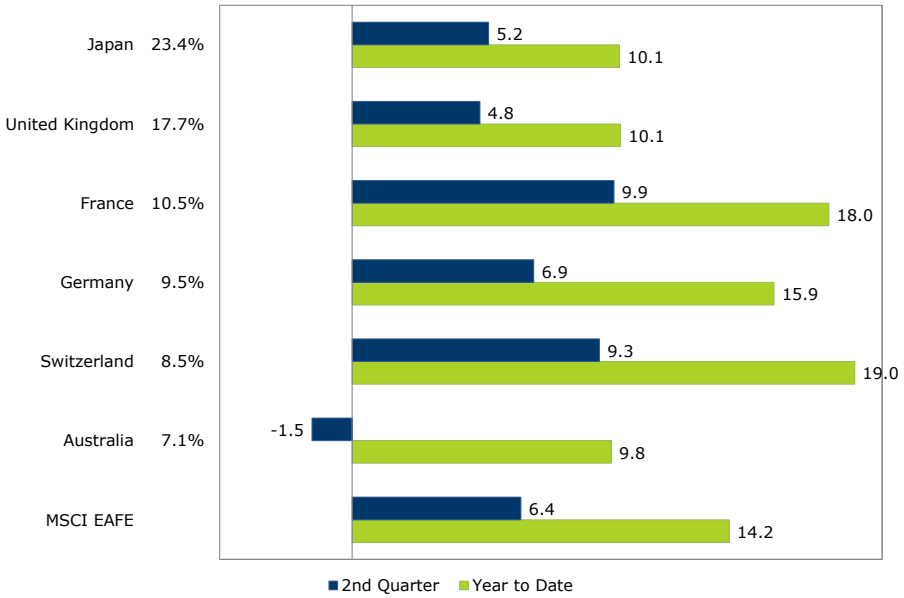
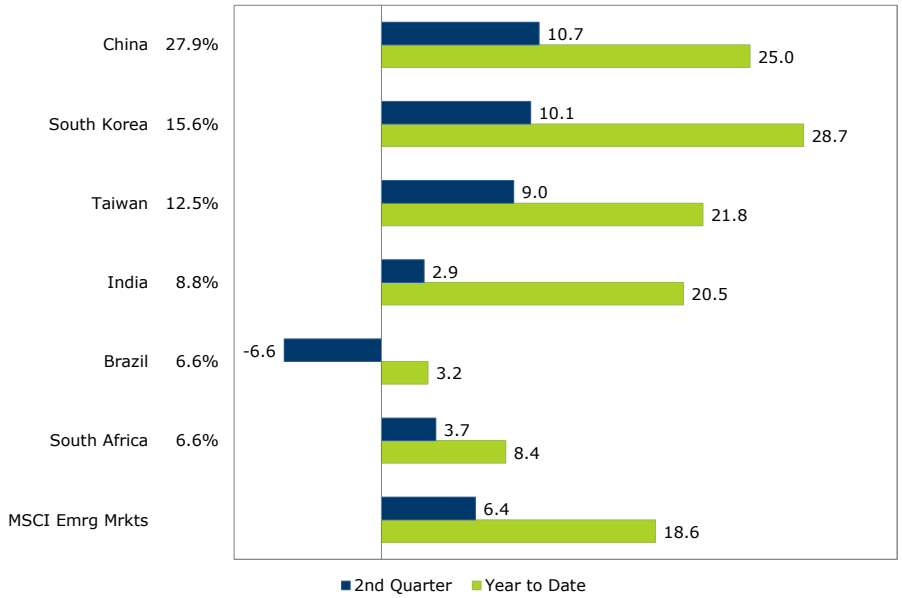
NON-U.S. EQUITY MARKET

AS OF JUNE 30, 2017	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US ($G)	6.0	14.4	21.0	1.3	7.7	1.6
MSCI EAFE ($G)	6.4	14.2	20.8	1.6	9.2	1.5
MSCI EMERGING MARKETS ($G)	6.4	18.6	24.1	1.4	4.3	2.2
MSCI FRONTIER MARKETS ($G)	6.3	15.9	19.7	-3.0	9.0	-0.9
MSCI ACWI EX-US GROWTH ($G)	7.7	17.7	17.8	2.9	8.4	2.2
MSCI ACWI EX-US VALUE ($G)	4.3	11.4	24.3	-0.4	6.9	0.9
MSCI ACWI EX-US SMALL ($G)	6.4	15.8	21.3	3.8	10.5	3.4
MSCI EAFE MINIMUM VOLATILITY	7.2	14.7	9.6	5.7	10.2	4.9
FTSE RAFI DEVELOPED EX-US	5.6	12.7	26.0	0.9	9.7	1.9
MSCI EAFE LC (G)	3.0	7.9	22.7	7.5	13.1	2.5
MSCI EMERGING MARKETS LC (G)	6.7	15.0	22.2	6.5	8.0	4.7

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



Data sources: Wilshire Compass

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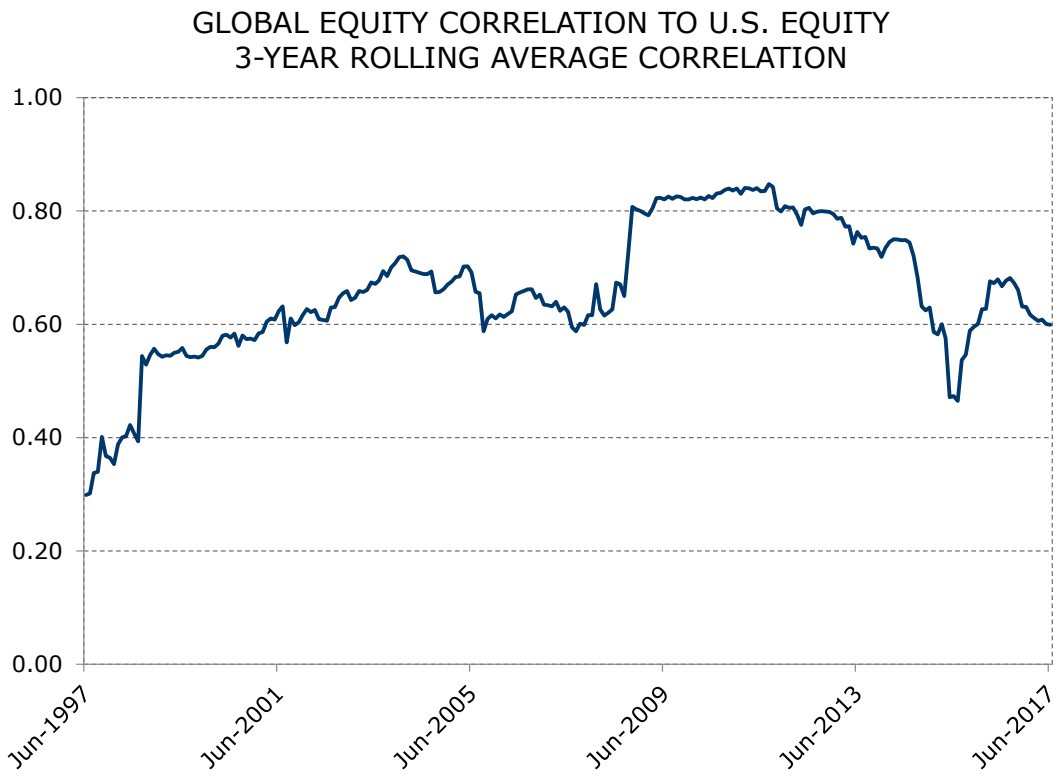
GLOBAL DIVERSIFICATION

- Exhibit below contains the average correlation among U.S. Equity and the 6 largest MSCI EAFE countries, 6 largest MSCI EM countries and Canada; represents 90% of global market cap
- Although 3 years is a relatively short timeframe, global diversification is showing signs of improving as the average correlation has been trending downward



Data sources: Wilshire Compass

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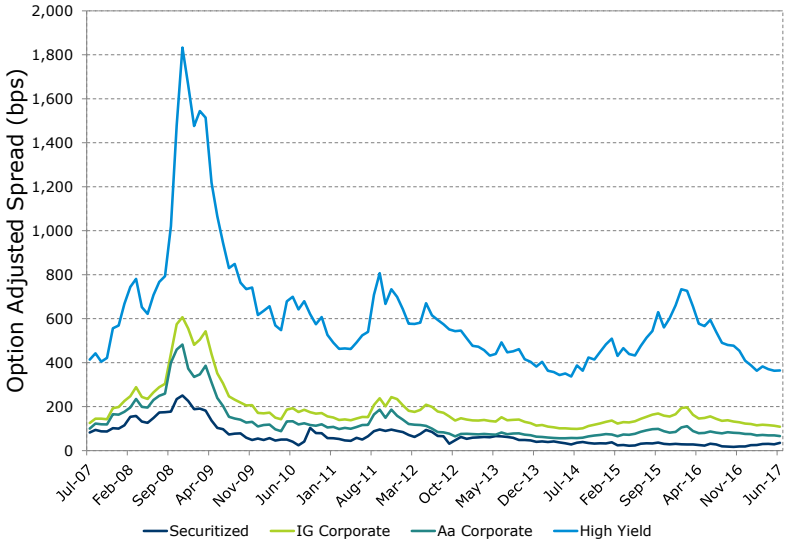
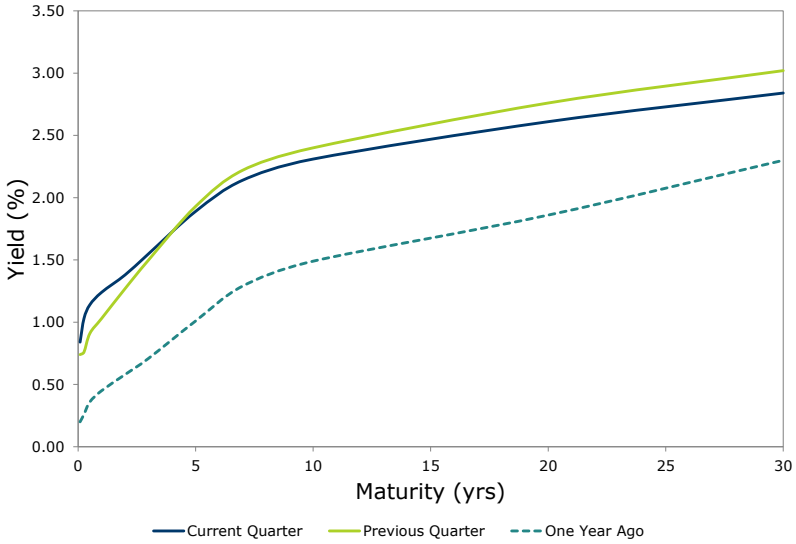
U.S. FIXED INCOME

AS OF JUNE 30, 2017	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	2.6	6.0	1.5	2.3	-0.3	2.5	2.2	4.5
BLOOMBERG BARCLAYS TREASURY	1.9	6.2	1.2	1.9	-2.3	2.0	1.3	4.1
BLOOMBERG BARCLAYS GOV'T-REL.	2.5	5.4	1.3	2.7	-0.2	2.2	2.1	4.2
BLOOMBERG BARCLAYS SECURITIZED	2.8	4.7	0.9	1.4	-0.1	2.2	2.0	4.3
BLOOMBERG BARCLAYS CORPORATE	3.2	7.5	2.5	3.8	2.3	3.6	4.0	5.8
BLOOMBERG BARCLAYS LT G/C	3.7	15.3	4.4	6.0	-1.1	5.3	4.3	7.6
BLOOMBERG BARCLAYS LT TREASURY	2.8	17.6	4.0	5.4	-7.2	5.6	2.8	7.3
BLOOMBERG BARCLAYS LT GOV't-REL.	4.1	12.5	3.3	6.6	-0.5	4.6	4.2	7.4
BLOOMBERG BARCLAYS LT CORP.	4.2	14.1	4.9	6.4	3.6	5.4	5.6	7.7
BLOOMBERG BARCLAYS U.S. TIPS	0.6	8.3	-0.4	0.9	-0.6	0.6	0.3	4.3
BLOOMBERG BARCLAYS HIGH YIELD	6.1	3.9	2.2	4.9	12.7	4.5	6.9	7.7
TREASURY BILLS	1.0	0.25	0.2	0.3	0.5	0.2	0.2	0.6

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



TREASURY YIELD CURVE



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

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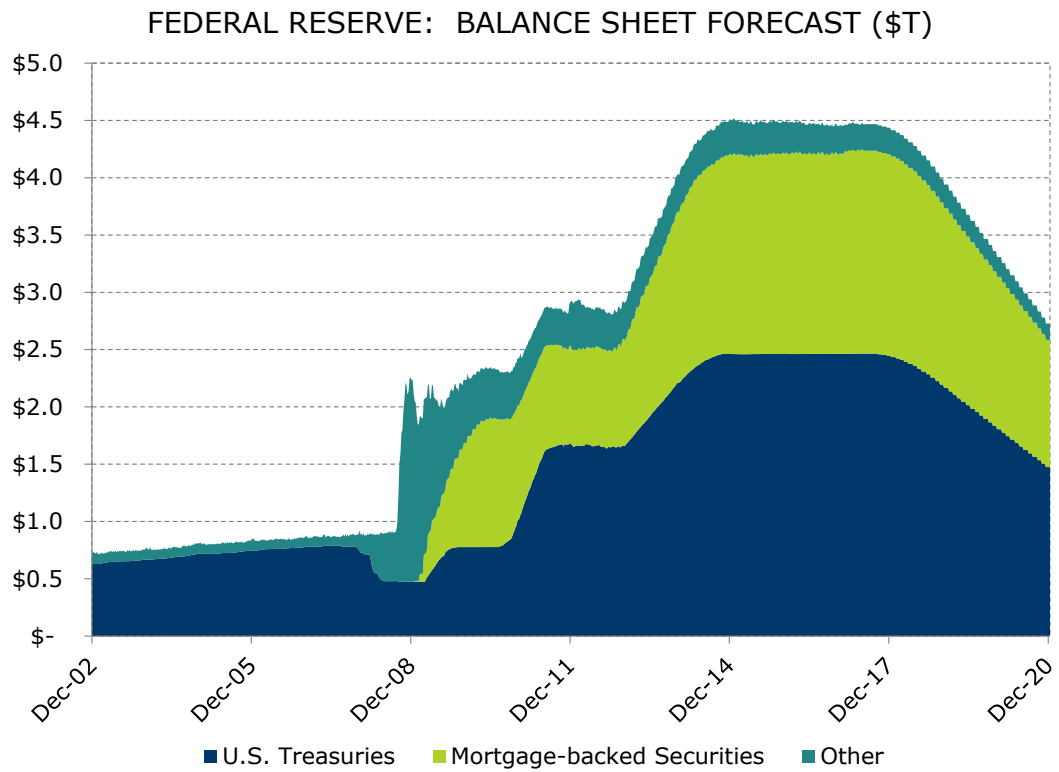
FEDERAL RESERVE

- Current plan to reduce Fed balance sheet by no longer reinvesting maturing bonds includes:
  - Treasuries: Reduce by $6B / month, increasing by $6B / quarter, until reaching $30B
  - MBS: Reduce by $4B / month, increasing by $4B / quarter, until reaching $20B
- While no commencement date was announced, following forecast assumes reductions begin during Q4-2017



Data sources: Federal Reserve

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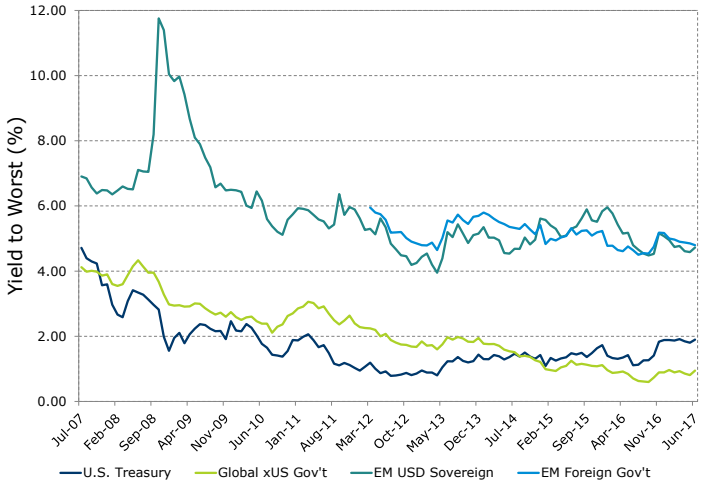
NON-U.S. FIXED INCOME

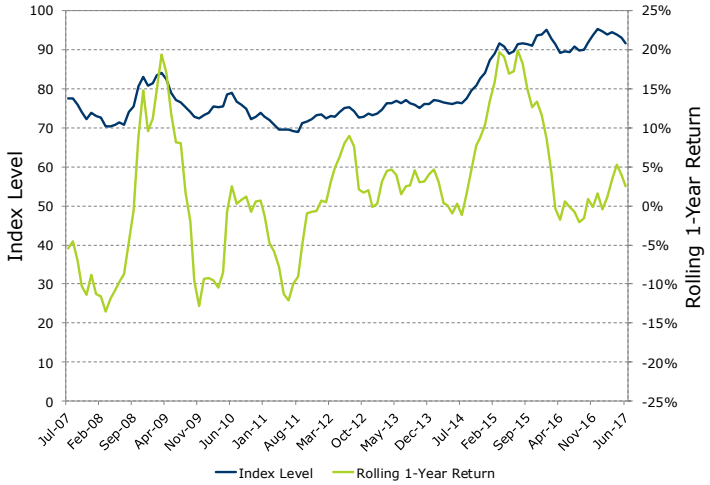
AS OF JUNE 30, 2017	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DEVELOPED MARKETS						
BLMBRG BRCLYS GLBL AGGREGATE xUS	3.6	6.1	-3.8	-2.4	-0.4	3.0
BLMBRG BRCLYS GLBL AGGREGATE xUS *	0.6	0.7	-0.7	3.8	4.0	4.5
BLMBRG BRCLYS WORLD GOV'T xUS IL	3.8	5.2	2.0	-0.6	1.9	3.5
BLMBRG BRCLYS WORLD GOV'T xUS IL *	-0.8	-0.9	2.9	7.0	5.3	6.0
EMERGING MARKETS (HARD CURRENCY)						
BLMBRG BRCLYS EM USD AGGREGATE	1.8	5.1	5.6	4.5	5.3	7.1
EMERGING MARKETS (FOREIGN CURRENCY)						
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	1.9	8.8	3.8	-1.8	1.2	n.a.
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	1.0	2.4	0.6	2.5	2.4	n.a.
EURO vs. DOLLAR	6.6	8.1	2.7	-5.9	-2.1	-1.7
YEN vs. DOLLAR	-0.8	3.8	-8.7	-3.4	-6.6	0.9
POUND vs. DOLLAR	3.9	5.1	-2.8	-8.8	-3.7	-4.3

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

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



U.S. DOLLAR INDEX: MAJOR CURRENCIES



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

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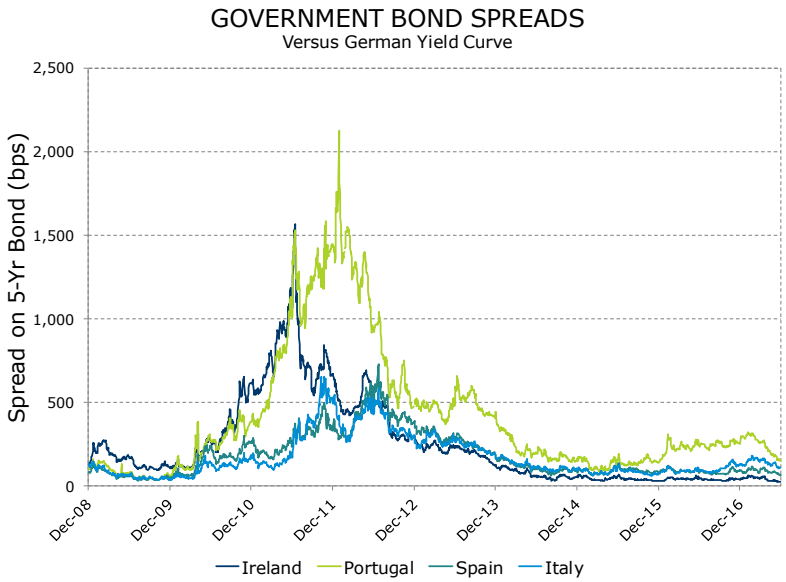
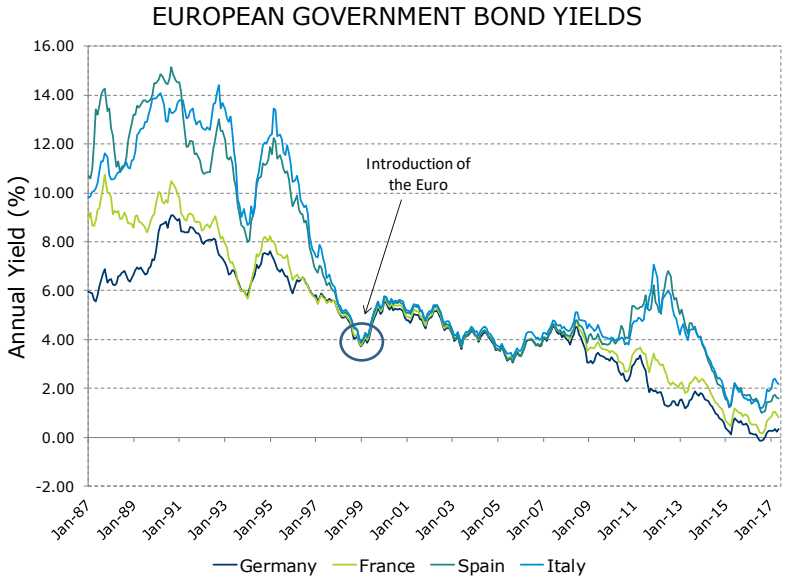
EUROPEAN DEBT

- Accelerating economic growth in Portugal has investors more optimistic on the country's future, driving down the government's yield spread



- Yields on government bonds have edged higher with German yields back above zero



Data sources: Bloomberg Barclays, International Monetary Fund

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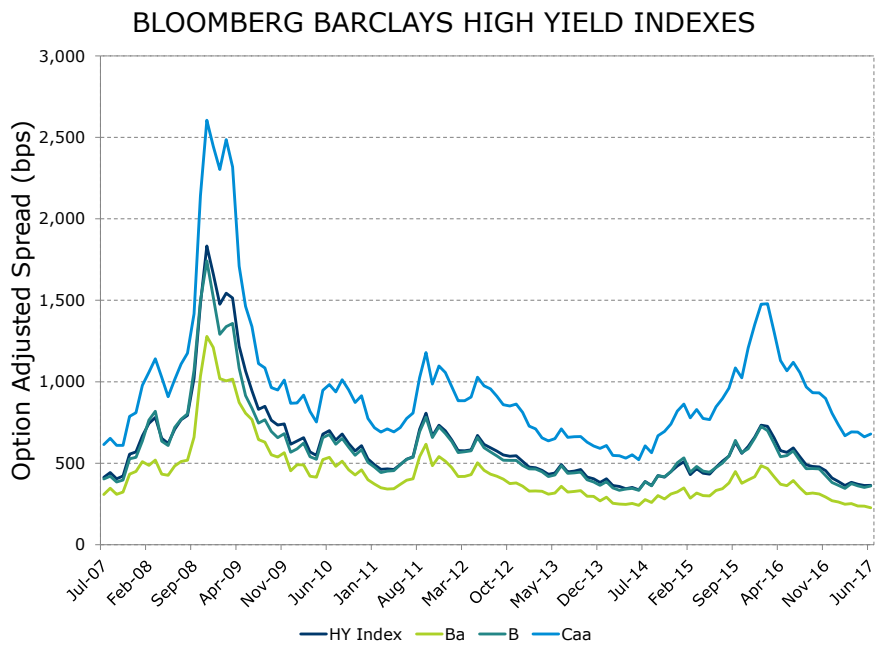
HIGH YIELD BOND MARKET

AS OF JUNE 30, 2017		QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS HIGH YIELD		2.2	4.9	12.7	4.5	6.9	7.7
CREDIT SUISSE LEVERAGED LOAN		0.8	2.0	7.5	3.5	4.8	4.2
HIGH YIELD QUALITY DISTRIBUTION	WEIGHT						
Ba U.S. HIGH YIELD	43.8%	2.7	4.8	9.8	5.2	6.8	8.2
B U.S. HIGH YIELD	40.2%	1.7	4.3	12.4	3.6	6.3	6.3
Caa U.S. HIGH YIELD	14.8%	1.9	6.6	20.8	4.8	8.5	6.9
Ca to D U.S. HIGH YIELD	0.9%	2.4	11.5	46.4	-17.3	-7.6	-2.8
Non-Rated U.S. HIGH YIELD	0.2%	2.9	8.6	7.9	-4.3	2.8	0.8



Data sources: Wilshire Compass, Bloomberg Barclays

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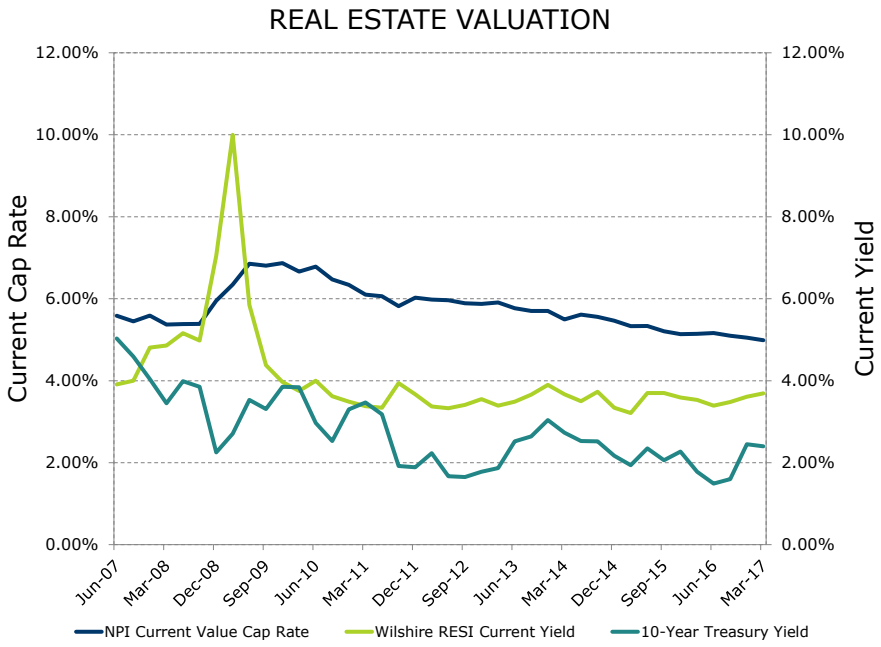
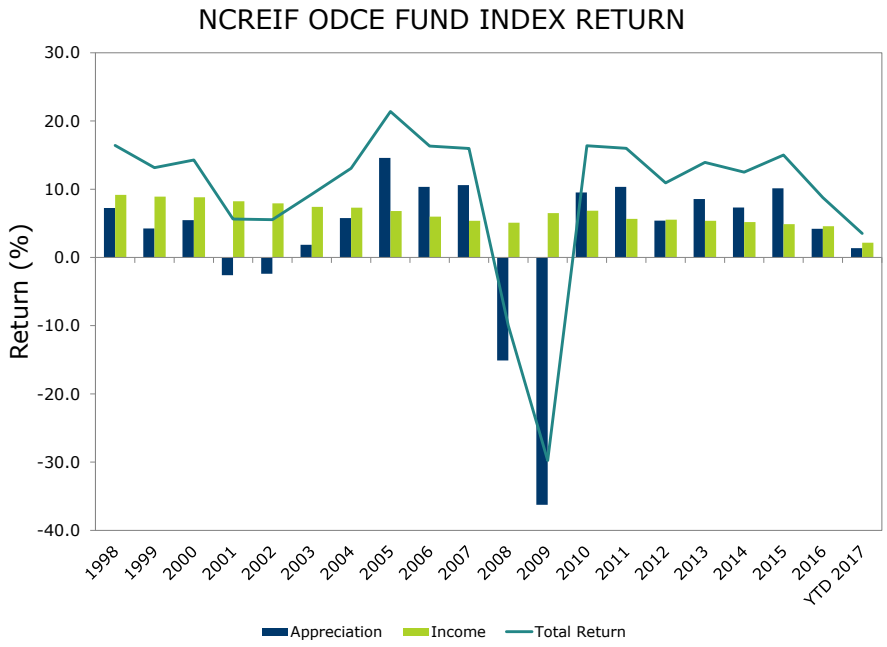
REAL ASSETS

AS OF JUNE 30, 2017	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	-0.4	0.9	-0.6	0.6	0.3	4.3
BLOOMBERG COMMODITY INDEX	-3.0	-5.3	-6.5	-14.8	-9.2	-6.5
WILSHIRE GLOBAL RESI INDEX	2.9	5.2	1.1	5.9	9.1	3.6
NCREIF ODCE FUND INDEX	1.7	3.5	7.9	11.3	11.8	5.3
NCREIF TIMBERLAND INDEX	0.7	1.5	3.4	5.5	7.2	5.5
ALERIAN MLP INDEX (OIL & GAS)	-6.4	-2.7	0.4	-11.2	1.8	5.7





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

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TOTAL FUND

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Actual Allocation vs Policy Allocation

Total Fund Composite

As of June 30, 2017

Asset Class	Market Value ($000)	Actual Allocation	Policy Target	Variance	Allowable Range	Dollar Variance ($000)
U.S. Equity	183,651	20.5%	15.0%	5.5%	12.0 - 18.0%	49,538
Non-U.S. Equity	184,052	20.6%	15.0%	5.6%	12.0 - 18.0%	49,939
Global Equity	2,897	0.3%	0.0%	0.3%		2,897
Total Public Equity[1]	**370,600**	**41.5%**	**30.0%**	**11.5%**	**24.0 36.0%**	**102,374**
Private Equity Funds	127,829	14.3%	22.5%	-8.2%	17.5 - 25.5%	(73,341)
Life Settlement Investments	32,395	3.6%	0.0%	3.6%		32,395
Total Private Equity	**160,224**	**17.9%**	**22.5%**	**-4.6%**	**18.5 - 26.5%**	**(40,946)**
Core Fixed Income[2]	83,684	9.4%	10.0%	-0.6%	8.0 - 12.0%	(5,725)
High Yield	102,818	11.5%	12.0%	-0.5%	10.0 - 14.0%	(4,473)
Total Fixed Income	**186,502**	**20.9%**	**22.0%**	**-1.1%**	**18.0 - 26.0%**	**(10,197)**
Real Estate[3]	102,951	11.5%	10.0%	1.5%	5.0 - 12.0%	13,542
Total Private Real Assets	**102,951**	**11.5%**	**10.0%**	**1.5%**	**5.0 - 12.0%**	**13,542**
TIPS	45,025	5.0%	8.0%	-3.0%	6.0 - 10.0%	(26,502)
Commodities	15,029	1.7%	2.5%	-0.8%	0.5 - 4.5%	(7,323)
MLP's	-	0.0%	5.0%	-5.0%	3.0 - 7.0%	(44,704)
Total Public Real Assets	**60,054**	**6.7%**	**15.5%**	**-8.8%**	**9.5 - 21.5%**	**(78,530)**
Hedge Funds	**5,127**	**0.6%**	**0.0%**	**0.6%**		5,127
Cash	**8,630**	**1.0%**	**0.0%**	**1.0%**	**0.0 - 2.0%**	**8,630**
Total Assets	**894,088**	**100.0%**	**100.0%**			

[1] Uninvested private equity capital will remain invested in public equity and will not be considered to be outside of allowable range

[2] Core Fixed Income includes Israel Bond investments

[3] Real Estate includes ERECT Fund investment

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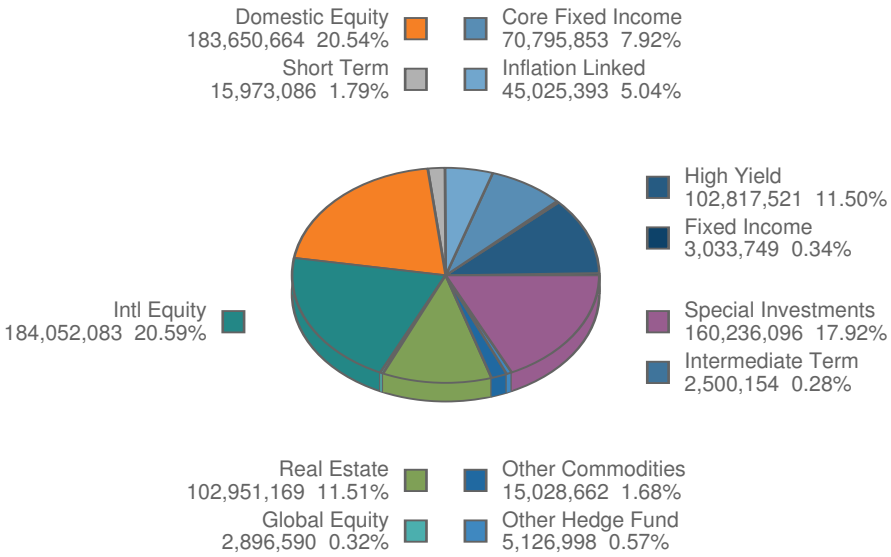
ACTUAL ALLOCATION VS POLICY ALLOCATION

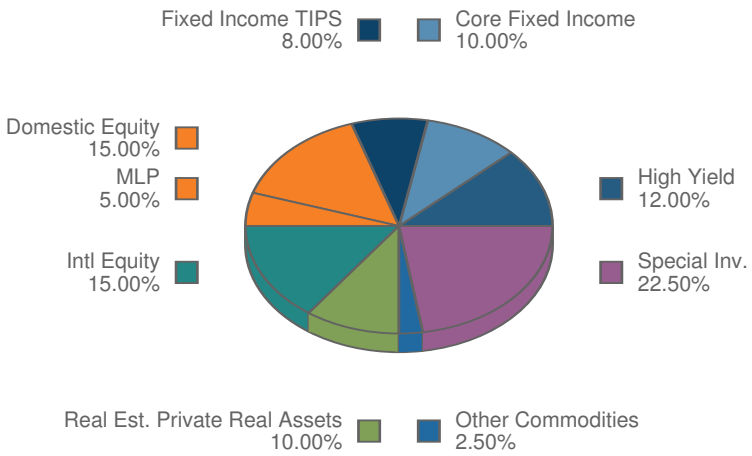
Total Fund Composite

As of June 30, 2017

Total Fund



Policy Index



$894,088,017

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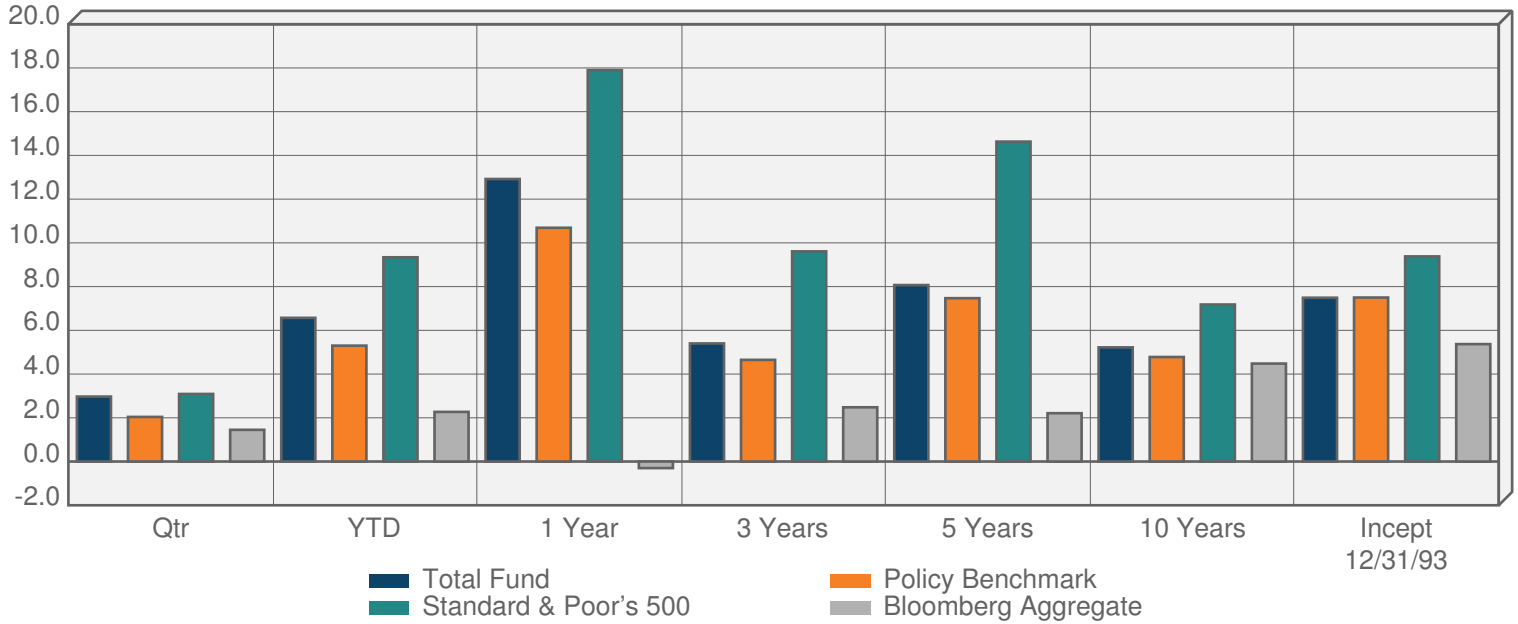
INVESTMENT PERFORMANCE

Total Fund Composite

Periods Ended June 30, 2017



Total Returns	Qtr	YTD	1 Year	3 Years	5 Years	10 Years	Incept 12/31/93
Total Fund	2.97	6.57	12.92	5.40	8.07	5.22	7.49
Policy Benchmark	2.04	5.30	10.69	4.65	7.47	4.78	7.50
Standard & Poor's 500	3.09	9.34	17.90	9.61	14.63	7.18	9.38
Bloomberg Aggregate	1.45	2.27	-0.31	2.48	2.21	4.48	5.37

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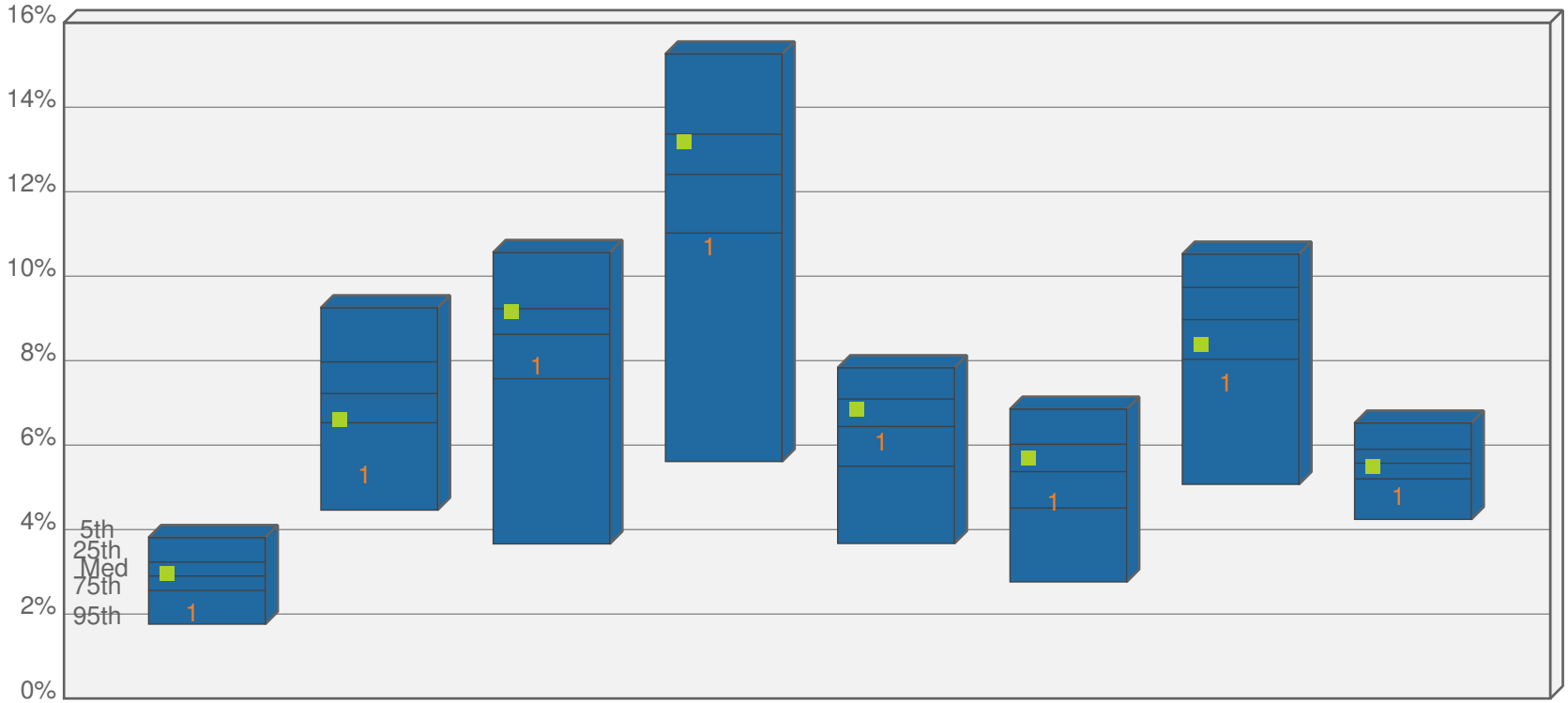
PERFORMANCE COMPARISON

Total Fund Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Total Fund	2.98 (44)	6.63 (70)	9.20 (25)	13.21 (28)	6.87 (35)	5.72 (39)	8.41 (67)	5.52 (53)
1 Policy Benchmark	2.04 (90)	5.30 (91)	7.88 (70)	10.69 (78)	6.07 (63)	4.65 (73)	7.47 (82)	4.78 (85)
5th %tile	3.81	9.25	10.56	15.26	7.83	6.85	10.52	6.52
25th %tile	3.23	7.97	9.23	13.36	7.09	6.02	9.73	5.90
Median	2.90	7.22	8.62	12.41	6.44	5.37	8.97	5.57
75th %tile	2.56	6.53	7.57	11.02	5.50	4.51	8.03	5.20
95th %tile	1.76	4.46	3.66	5.61	3.67	2.76	5.07	4.24
Number of Funds	179	179	179	178	173	169	168	139

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

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
US Equity Composite									
Net of Fee Return	**3.13**	**8.99**	**14.08**	**19.60**	**8.92**	**14.32**	**7.14**	**12/31/93**	**8.68**
Wilshire 5000	2.95	8.73	13.67	18.54	9.34	14.61	7.29	12/31/93	9.39
Value Added	0.19	0.26	0.41	1.05	-0.42	-0.28	-0.15	12/31/93	-0.71
Non US Equity Composite									
Net of Fee Return	**7.70**	**16.98**	**14.46**	**24.53**	**4.02**	**8.79**	**1.71**	**12/31/00**	**5.12**
Policy Index	5.85	14.30	12.50	20.43	1.21	7.48	0.81	12/31/00	3.95
Value Added	1.85	2.68	1.96	4.10	2.81	1.31	0.90	12/31/00	1.17
Global Equity									
Net of Fee Return	**2.76**	**9.36**	**7.89**	**14.26**				**12/31/14**	**4.58**
MSCI ACWI (N)	4.27	11.47	12.80	18.78				12/31/14	6.63
Value Added	-1.51	-2.11	-4.91	-4.51				12/31/14	-2.05
Core Fixed Composite									
Net of Fee Return	**1.25**	**2.15**	**-0.19**	**0.48**	**2.34**	**2.24**	**4.53**	**9/30/82**	**7.92**
Bloomberg Aggregate	1.45	2.27	-0.77	-0.31	2.48	2.21	4.48	9/30/82	7.49
Value Added	-0.19	-0.12	0.58	0.79	-0.14	0.02	0.05	9/30/82	0.43
High Yield Fixed Composite									
Net of Fee Return	**2.02**	**4.22**	**6.90**	**12.44**	**2.22**	**5.18**		**3/31/08**	**7.77**
Citi High Yield Market Capped	1.94	4.37	6.35	12.09	3.88	6.33		3/31/08	8.11
Value Added	0.08	-0.15	0.55	0.35	-1.66	-1.15		3/31/08	-0.34
TIPS Fixed Composite									
Net of Fee Return	**-0.41**	**0.86**	**0.20**	**1.25**	**0.46**	**0.18**		**3/31/08**	**3.07**
Bloomberg U.S. TIPS	-0.40	0.85	-1.58	-0.63	0.63	0.27		3/31/08	3.02
Value Added	-0.00	0.01	1.78	1.88	-0.18	-0.08		3/31/08	0.05

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
ERECT Composite									
Net of Fee Return	**-2.13**	**-0.82**	**-1.55**	**0.00**	**5.41**	**6.12**		**9/30/10**	**6.21**
Real Estate Composite									
Net of Fee Return	**1.78**	**3.54**	**6.28**	**8.44**	**10.34**	**11.19**	**5.20**	**3/31/03**	**8.73**
NCREIF ODCE NOF	1.47	3.03	4.97	6.89	10.32	10.76	4.28	3/31/03	7.31
Value Added	0.31	0.51	1.31	1.54	0.02	0.43	0.91	3/31/03	1.42
Hedge Fund Composite									
Net of Fee Return	**-10.19**	**-13.18**	**-8.82**	**1.76**	**-2.06**	**0.87**		**9/30/11**	**1.16**
91 Day T-Bill Index + 3%	0.94	1.80	2.63	3.49	3.23	3.17		9/30/11	3.16
Value Added	-11.14	-14.98	-11.45	-1.73	-5.29	-2.31		9/30/11	-2.00
Commodities Composite									
Net of Fee Return	**-3.17**	**-5.20**	**-0.95**	**-5.02**	**-15.15**	**-8.20**	**-5.34**	**3/31/07**	**-5.05**
Bloomberg Commodity Index	-3.00	-5.26	-2.74	-6.50	-14.81	-9.25	-6.49	3/31/07	-6.35
Value Added	-0.17	0.06	1.79	1.48	-0.35	1.05	1.15	3/31/07	1.30
Life Settlement Composite									
Net of Fee Return	**4.63**	**-2.75**	**-4.45**	**-6.08**	**-7.05**	**-0.79**		**9/30/09**	**11.34**
Israel Bonds and Cash									
Net of Fee Return	**0.46**	**0.77**	**0.99**	**1.23**	**1.15**	**1.24**	**3.05**	**3/31/99**	**3.02**
Private Equity Composite									
Net of Fee Return	**1.12**	**3.24**	**12.31**	**12.24**	**11.95**	**11.42**	**9.18**	**3/31/03**	**6.21**
RBAC Custom Private Equity Bench	**1.12**	**3.24**	**12.31**	**12.24**	**11.95**	**11.42**	**9.18**	**3/31/03**	**6.21**
Value Added	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3/31/03	0.00

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Total Fund									
Net of Fee Return	**2.97**	**6.57**	**8.98**	**12.92**	**5.40**	**8.07**	**5.22**	**12/31/93**	**7.49**
Policy Benchmark	2.04	5.30	7.88	10.69	4.65	7.47	4.78	12/31/93	7.50
Value Added	0.93	1.27	1.10	2.23	0.75	0.59	0.45	12/31/93	-0.01

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CUSTOM BENCHMARK SPECIFICATION

Total Fund

June 30, 2017

	Quarter Start	Quarter End	Percent	Description
Policy Benchmark	12/93	12/06	65.00	Russell 3000
			35.00	Bloomberg Aggregate
	3/07	6/08	5.00	RBAC Custom Private Equity Benchmark
			45.00	Wilshire 5000
			25.00	Bloomberg Aggregate
			10.00	MSCI EAFE Index (N)
			5.00	Bloomberg Commodity Index
			5.00	91-Day T-Bill + 3.0% Ann (Monthly)
			5.00	NCREIF ODCE NOF
	9/08	9/08	5.00	RBAC Custom Private Equity Benchmark
			5.00	NCREIF ODCE NOF
			5.00	91-Day T-Bill + 3.0% Ann (Monthly)
			5.00	Bloomberg Commodity Index
			10.00	MSCI ACWI X US (N)
			25.00	Bloomberg Aggregate
			45.00	Wilshire 5000
	12/08	6/09	5.00	RBAC Custom Private Equity Benchmark
			2.50	91-Day T-Bill + 3.0% Ann (Monthly)
			5.00	Citi High Yield Market Capped
			5.00	Bloomberg U.S. TIPS
			5.00	Bloomberg Commodity Index
			7.50	NCREIF ODCE NOF
			15.00	MSCI ACWI X US (N)
			20.00	Bloomberg Aggregate
			35.00	Wilshire 5000
	9/09	3/10	5.00	RBAC Custom Private Equity Benchmark
			30.00	Wilshire 5000
			20.00	MSCI ACWI X US (N)
			15.00	Bloomberg Aggregate

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CUSTOM BENCHMARK SPECIFICATION

Total Fund

June 30, 2017

	Quarter Start	Quarter End	Percent	Description
Policy Benchmark (cont.)			10.00	Citi High Yield Market Capped
			10.00	NCREIF ODCE NOF
			7.50	Bloomberg U.S. TIPS
			2.50	Bloomberg Commodity Index
	6/10	12/12	10.00	RBAC Custom Private Equity Benchmark
			5.00	Bloomberg Commodity Index
			6.00	Bloomberg U.S. TIPS
			10.00	NCREIF ODCE NOF
			10.00	Citi High Yield Market Capped
			14.00	Bloomberg Aggregate
			20.00	Wilshire 5000
			25.00	MSCI ACWI X US (N)
	3/13	6/17	20.00	RBAC Custom Private Equity Benchmark
			18.90	MSCI ACWI X US (N)
			16.10	Wilshire 5000
			12.00	Citi High Yield Market Capped
			10.00	Bloomberg Aggregate
			10.00	NCREIF ODCE NOF
			8.00	Bloomberg Commodity Index
			5.00	Bloomberg U.S. TIPS

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US EQUITY

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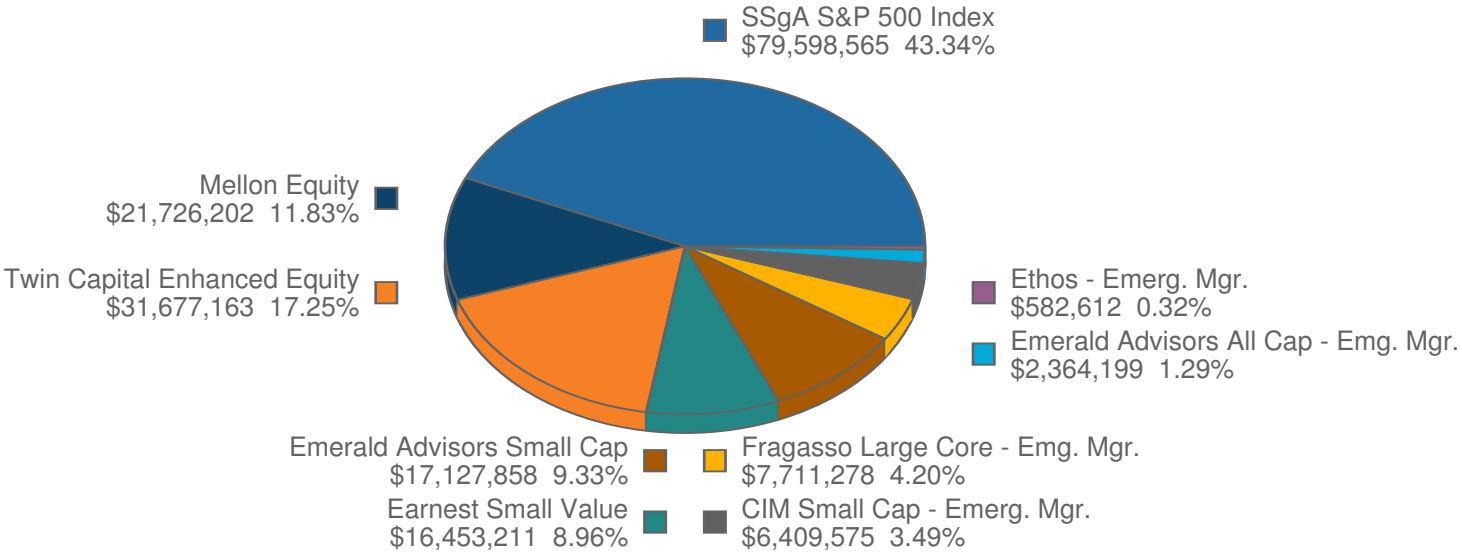
MANAGER ALLOCATION

US Equity Composite

As of June 30, 2017



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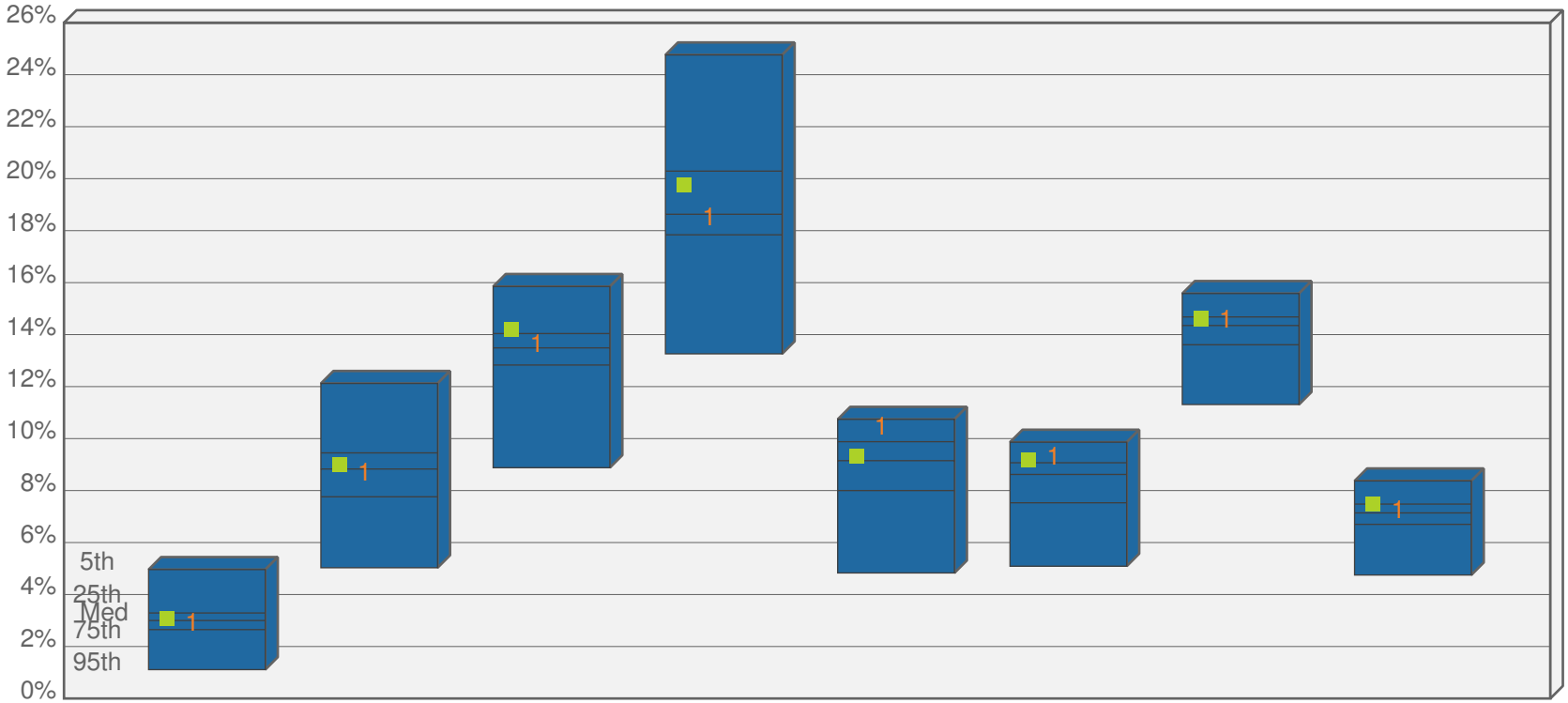
PERFORMANCE COMPARISON

US Equity Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
US Equity Composite	3.13 (32)	9.05 (40)	14.23 (22)	19.82 (31)	9.36 (38)	9.22 (20)	14.67 (26)	7.52 (22)
1 Wilshire 5000	2.95 (56)	8.73 (54)	13.67 (38)	18.54 (53)	10.48 (11)	9.34 (18)	14.61 (35)	7.29 (39)
5th %tile	4.96	12.12	15.85	24.76	10.74	9.86	15.58	8.37
25th %tile	3.29	9.45	14.04	20.29	9.88	9.07	14.68	7.48
Median	3.00	8.83	13.49	18.63	9.15	8.62	14.35	7.14
75th %tile	2.65	7.76	12.83	17.84	8.00	7.53	13.61	6.70
95th %tile	1.11	5.03	8.88	13.26	4.83	5.09	11.31	4.75
Number of Funds	167	162	161	155	140	136	113	84

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

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
SSgA S&P 500 Index									
Net of Fee Return	**3.08**	**9.34**	**13.55**	**17.95**	**9.65**	**14.64**		**12/31/07**	**7.77**
Standard & Poor's 500	3.09	9.34	13.52	17.90	9.61	14.63		12/31/07	7.73
Value Added	-0.01	-0.01	0.02	0.05	0.04	0.01		12/31/07	0.05
Mellon Equity									
Net of Fee Return	**2.14**	**9.55**	**13.88**	**17.76**	**7.42**	**13.29**	**7.26**	**3/31/94**	**9.55**
Standard & Poor's 500	3.09	9.34	13.52	17.90	9.61	14.63	7.18	3/31/94	9.67
Value Added	-0.95	0.21	0.36	-0.13	-2.19	-1.34	0.08	3/31/94	-0.12
Twin Capital Enhanced Equity									
Net of Fee Return	**2.54**	**7.92**	**13.14**	**17.43**	**9.39**	**14.41**	**7.29**	**12/31/05**	**8.31**
Standard & Poor's 500	3.09	9.34	13.52	17.90	9.61	14.63	7.18	12/31/05	8.21
Value Added	-0.55	-1.42	-0.39	-0.47	-0.22	-0.22	0.11	12/31/05	0.10
Earnest Small Value									
Net of Fee Return	**2.03**	**7.36**	**17.32**	**25.12**	**9.76**	**15.68**		**6/30/09**	**15.69**
Russell 2000 Value	0.67	0.54	14.69	24.86	7.02	13.38		6/30/09	14.88
Value Added	1.36	6.82	2.63	0.26	2.74	2.30		6/30/09	0.81
Emerald Advisors Small Cap									
Net of Fee Return	**6.81**	**11.78**	**16.08**	**27.67**	**10.43**	**16.60**	**9.22**	**9/30/04**	**10.69**
Russell 2000 Growth	4.39	9.97	13.90	24.40	7.64	13.98	7.82	9/30/04	9.42
Value Added	2.42	1.81	2.18	3.27	2.79	2.62	1.40	9/30/04	1.27
Fragasso Large Core - Emg. Mgr.									
Net of Fee Return	**2.77**	**6.70**	**10.25**	**15.51**	**7.22**			**9/30/12**	**12.24**
Standard & Poor's 500	3.09	9.34	13.52	17.90	9.61			9/30/12	13.97
Value Added	-0.31	-2.65	-3.28	-2.38	-2.40			9/30/12	-1.74

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Ethos - Emerg. Mgr.									
Net of Fee Return	**4.10**	**11.14**	**14.80**					**9/30/16**	**14.80**
Standard & Poor's 500	3.09	9.34	13.52					9/30/16	13.52
Value Added	1.01	1.80	1.28					9/30/16	1.28
CIM Small Cap - Emerg. Mgr.									
Net of Fee Return	**1.42**	**4.61**	**15.07**	**23.48**	**5.17**			**12/31/13**	**6.01**
Russell 2000	2.46	4.99	14.26	24.60	7.36			12/31/13	7.23
Value Added	-1.04	-0.38	0.81	-1.12	-2.19			12/31/13	-1.23
Emerald Advisors All Cap - Emg. Mgr.									
Net of Fee Return	**4.80**	**13.95**	**15.05**	**26.67**				**9/30/15**	**9.58**
Russell 3000 Growth	4.65	13.69	15.05	20.72				9/30/15	16.56
Value Added	0.15	0.26	-0.01	5.96				9/30/15	-6.97
US Equity Composite									
Net of Fee Return	**3.13**	**8.99**	**14.08**	**19.60**	**8.92**	**14.32**	**7.14**	**12/31/93**	**8.68**
Wilshire 5000	2.95	8.73	13.67	18.54	9.34	14.61	7.29	12/31/93	9.39
Value Added	0.19	0.26	0.41	1.05	-0.42	-0.28	-0.15	12/31/93	-0.71

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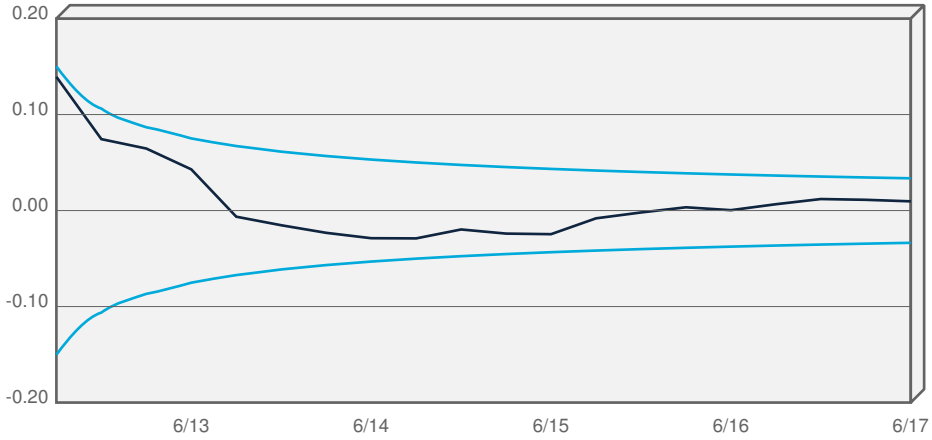
INVESTMENT MANAGER ANALYSIS

SSgA S&P 500 Index

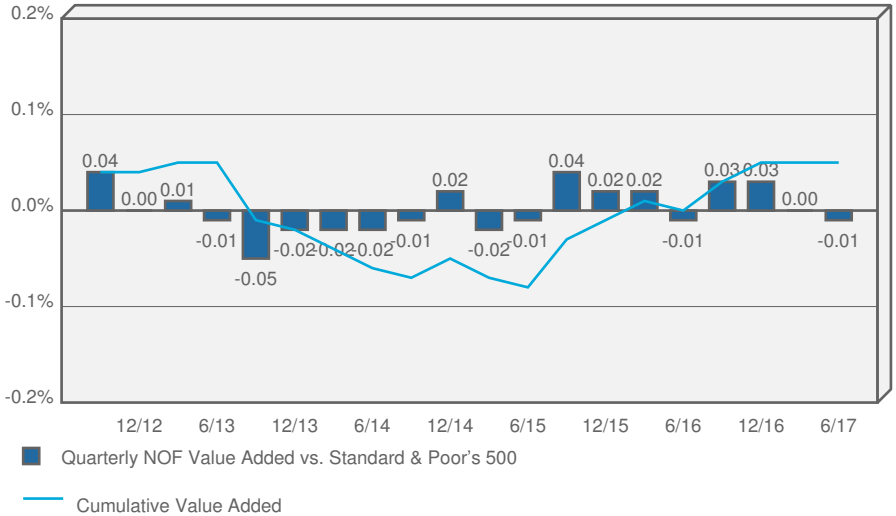
June 30, 2017

Cumulative Skill Analysis vs Benchmark

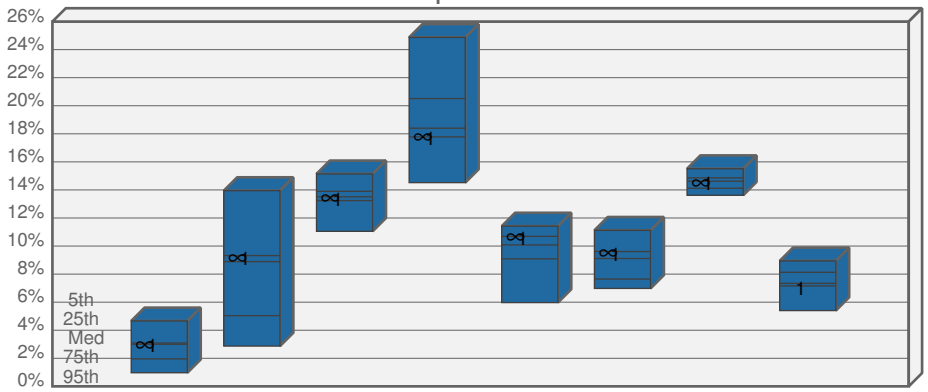


Excess Return:	0.01	Information Ratio:	0.21
Excess Risk:	0.05	T-Stat:	0.47

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
∞ SSgA S&P 500 I	3.09 (27)	9.35 (21)	13.56 (41)	17.96 (61)	10.81 (11)	9.68 (13)	14.66 (38)	
1 Standard & Poo	3.09 (27)	9.34 (24)	13.52 (49)	17.90 (66)	10.73 (19)	9.61 (25)	14.63 (49)	7.18 (74)
Median	3.00	8.89	13.51	18.40	10.08	9.11	14.62	7.34
Number of Funds	133	133	132	132	129	123	116	98

*Compass Total Returns of Passive U.S. Equity Portfolios Universe - Gross of Fees

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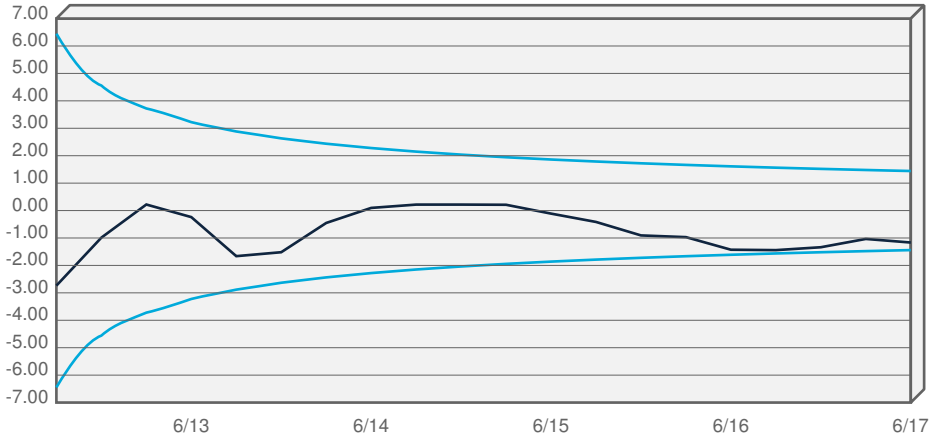
INVESTMENT MANAGER ANALYSIS

Mellon Equity

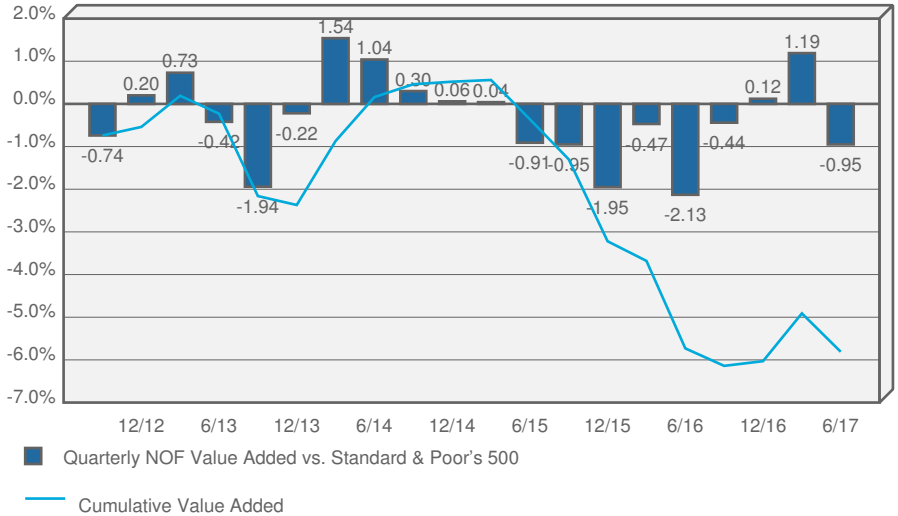
June 30, 2017

Cumulative Skill Analysis vs Benchmark

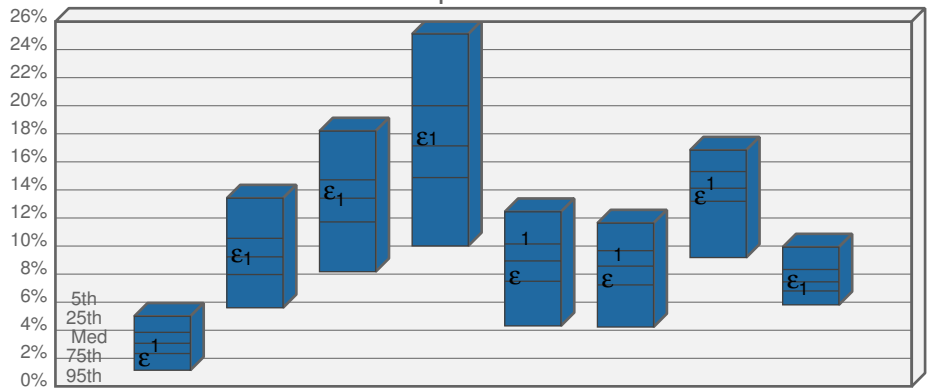


Excess Return:	-1.17	Information Ratio:	-0.59
Excess Risk:	1.96	T-Stat:	-1.33

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
ε Mellon Equity	2.14 (84)	9.55 (46)	14.00 (39)	17.89 (45)	7.94 (66)	7.73 (69)	13.65 (66)	7.66 (44)
1 Standard & Poo	3.09 (49)	9.34 (49)	13.52 (49)	17.90 (45)	10.73 (16)	9.61 (26)	14.63 (39)	7.18 (59)
Median	3.07	9.23	13.41	17.14	8.94	8.57	14.12	7.45
Number of Funds	160	160	158	158	157	154	150	127

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

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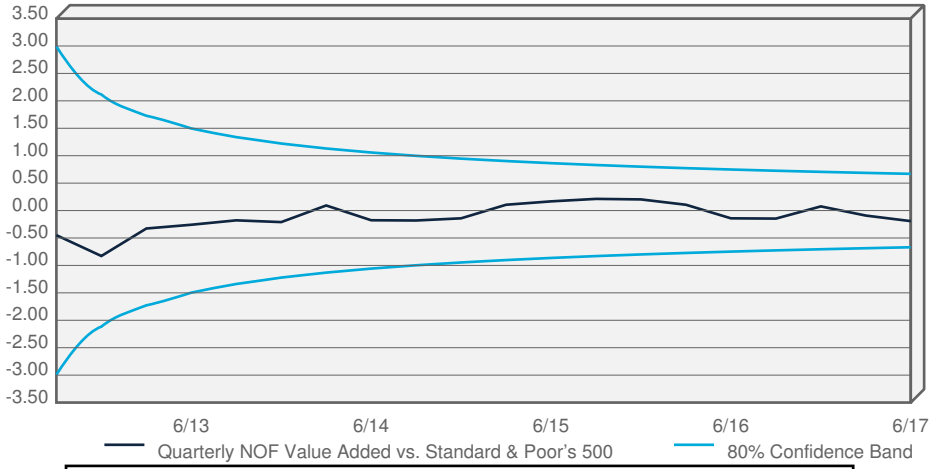
INVESTMENT MANAGER ANALYSIS

Twin Capital Enhanced Equity

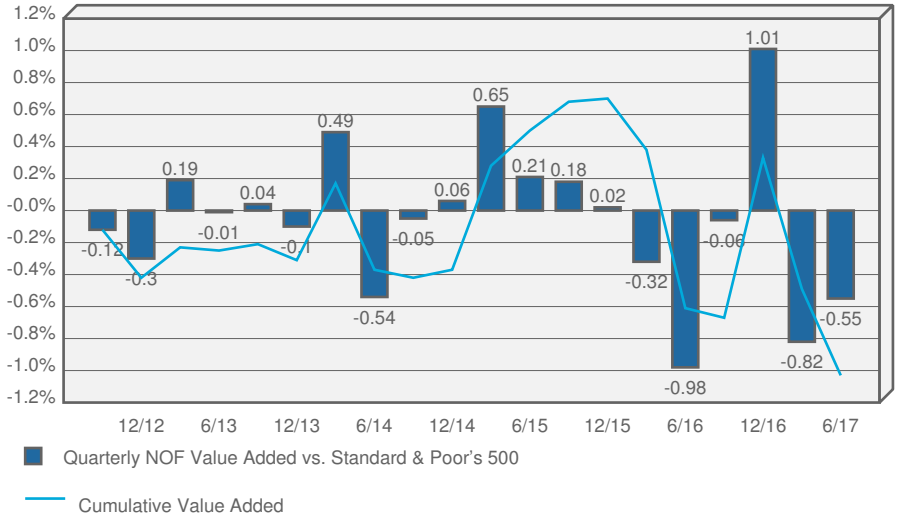
June 30, 2017

Cumulative Skill Analysis vs Benchmark

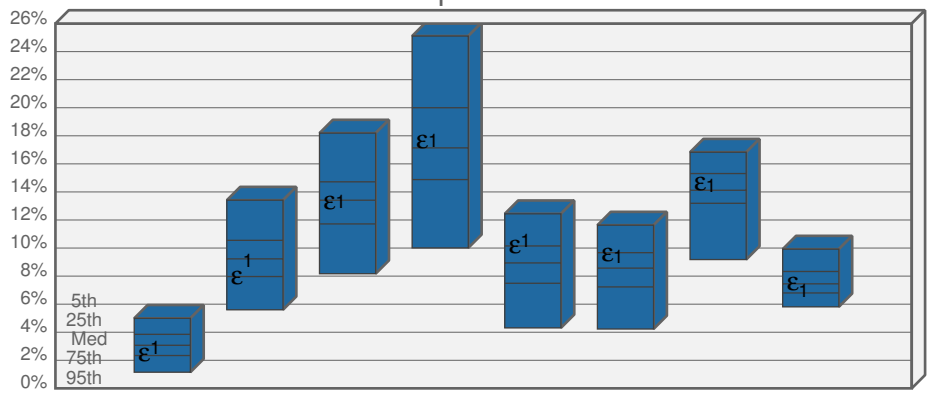


Excess Return:	-0.19	Information Ratio:	-0.21
Excess Risk:	0.91	T-Stat:	-0.47

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
ε Twin Capital E	2.63 (65)	8.10 (71)	13.42 (49)	17.83 (45)	10.30 (23)	9.74 (24)	14.78 (37)	7.65 (44)
1 Standard & Poo	3.09 (49)	9.34 (49)	13.52 (49)	17.90 (45)	10.73 (16)	9.61 (26)	14.63 (39)	7.18 (59)
Median	3.07	9.23	13.41	17.14	8.94	8.57	14.12	7.45
Number of Funds	160	160	158	158	157	154	150	127

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

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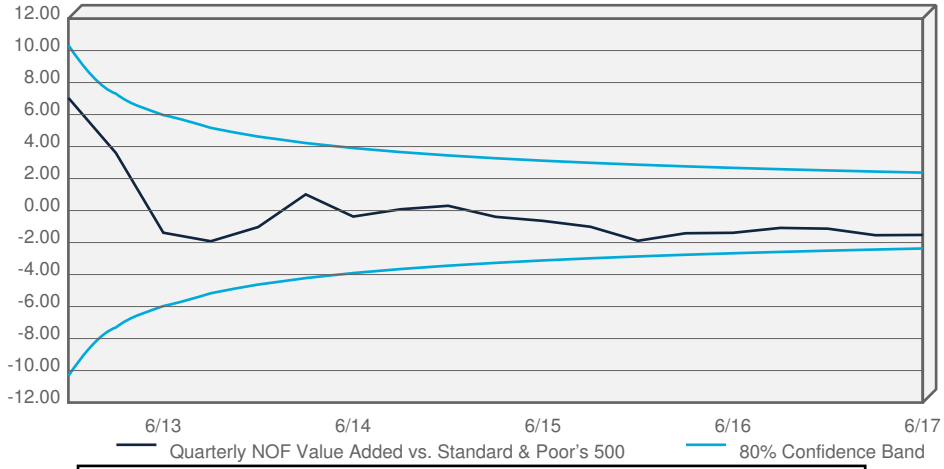
INVESTMENT MANAGER ANALYSIS

Fragasso Large Core - Emg. Mgr.

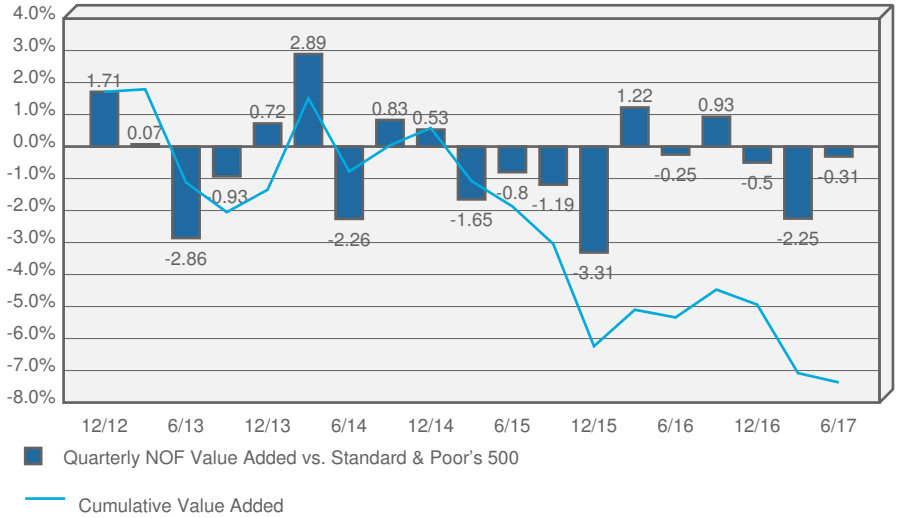
June 30, 2017

Cumulative Skill Analysis vs Benchmark

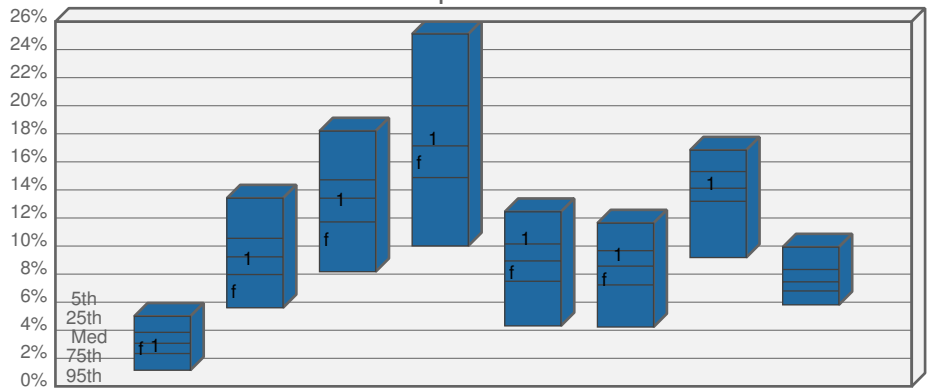


Excess Return:	-1.52	Information Ratio:	-0.48
Excess Risk:	3.14	T-Stat:	-0.97

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
f Fragasso Large	2.91 (58)	6.98 (86)	10.69 (86)	16.13 (65)	8.30 (59)	7.84 (67)		
1 Standard & Poo	3.09 (49)	9.34 (49)	13.52 (49)	17.90 (45)	10.73 (16)	9.61 (26)	14.63 (39)	
Median	3.07	9.23	13.41	17.14	8.94	8.57	14.12	7.45
Number of Funds	160	160	158	158	157	154	150	127

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

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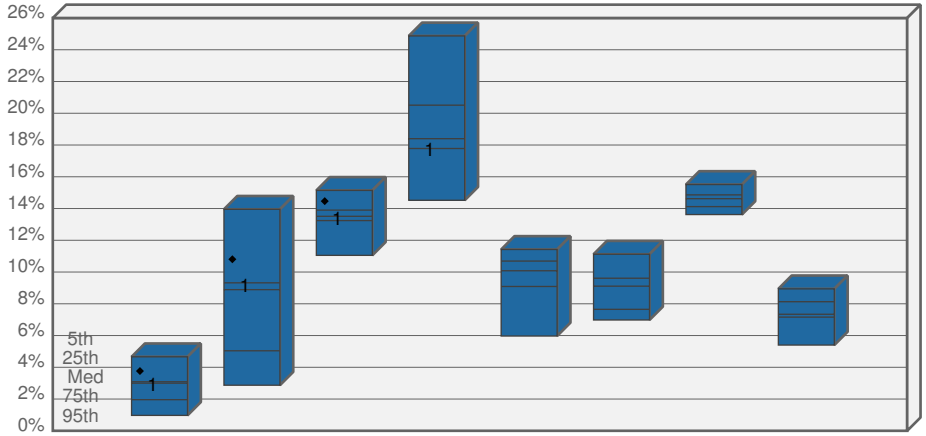
INVESTMENT MANAGER ANALYSIS

Ethos - Emerg. Mgr.

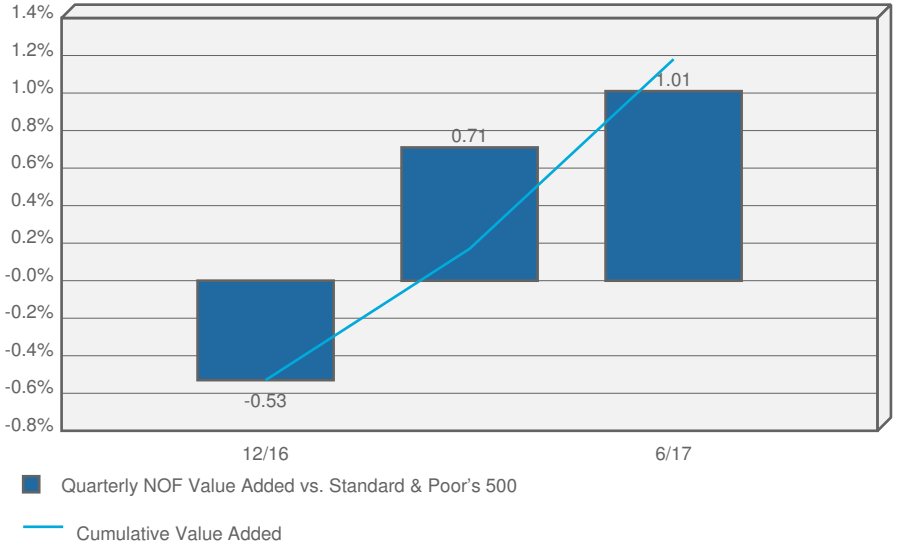
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
◆ Ethos - Emerg.	4.10 (13)	11.14 (9)	14.80 (8)					
1 Standard & Poo	3.09 (27)	9.34 (24)	13.52 (49)	17.90 (66)				
Median	3.00	8.89	13.51	18.40	10.08	9.11	14.62	7.34
Number of Funds	133	133	132	132	129	123	116	98

Value-Added Analysis vs Benchmark



*Compass Total Returns of Passive U.S. Equity Portfolios Universe - Gross of Fees

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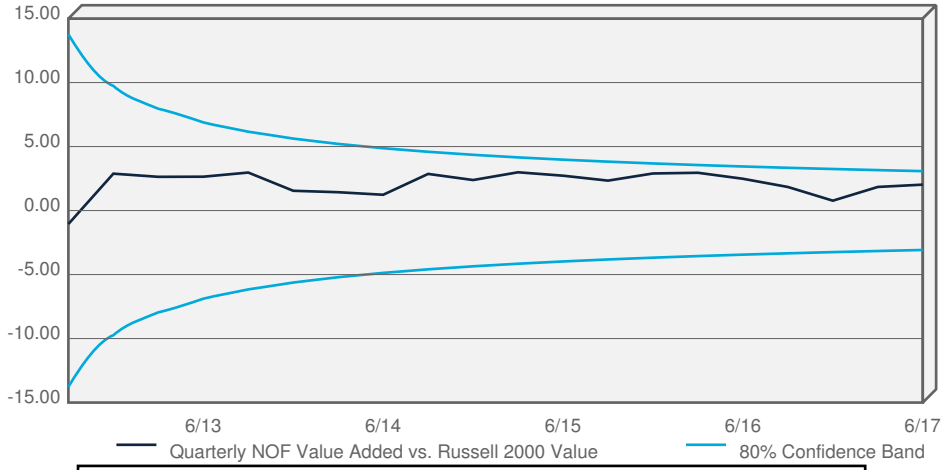
INVESTMENT MANAGER ANALYSIS

Earnest Small Value

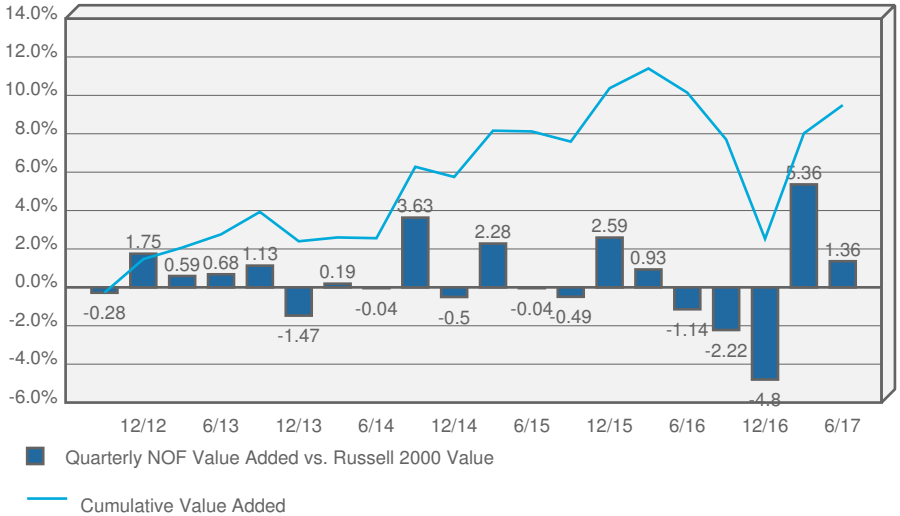
June 30, 2017

Cumulative Skill Analysis vs Benchmark

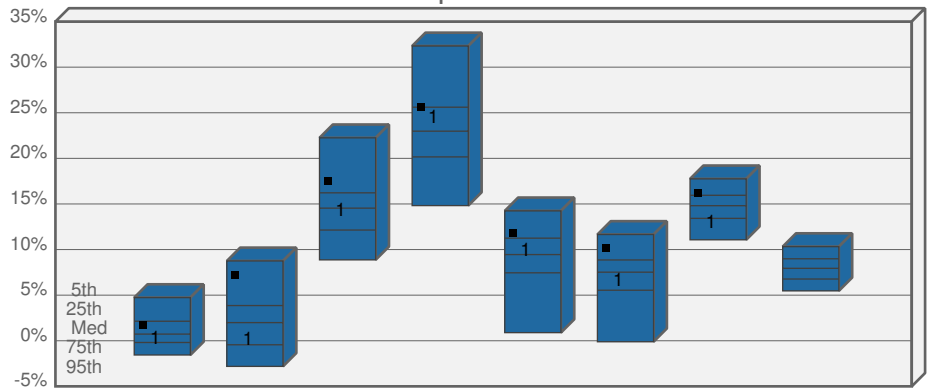


Excess Return:	2.03	Information Ratio:	0.48
Excess Risk:	4.19	T-Stat:	1.08

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
■ Earnest Small	2.26 (22)	7.83 (7)	18.10 (12)	26.23 (20)	12.41 (14)	10.77 (10)	16.77 (14)	
1 Russell 2000 V	0.67 (53)	0.54 (61)	14.69 (46)	24.86 (31)	10.29 (37)	7.02 (62)	13.38 (75)	
Median	0.73	1.99	14.54	22.98	9.45	7.52	14.81	7.94
Number of Funds	188	188	188	187	184	179	172	146

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

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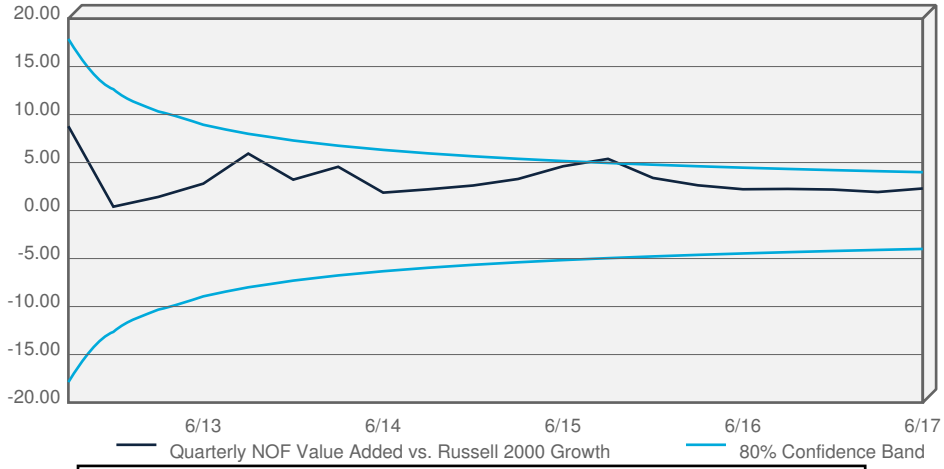
INVESTMENT MANAGER ANALYSIS

Emerald Advisors Small Cap

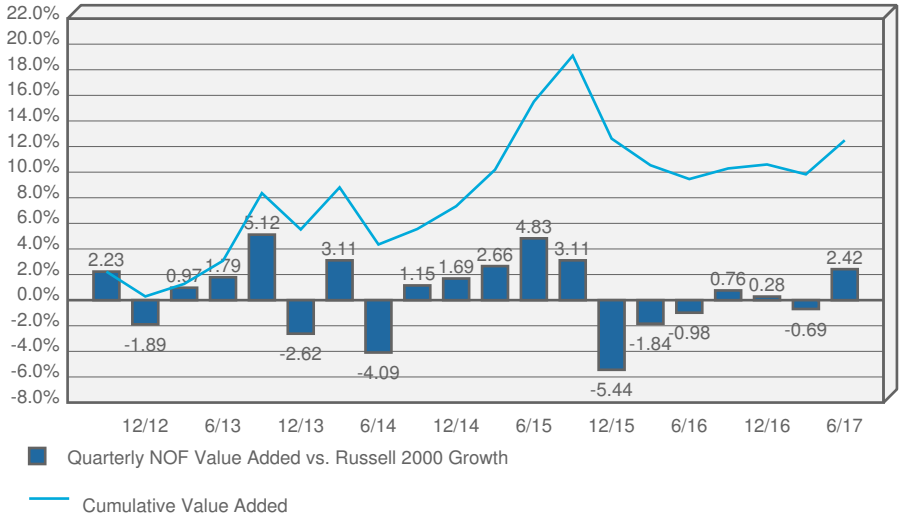
June 30, 2017

Cumulative Skill Analysis vs Benchmark

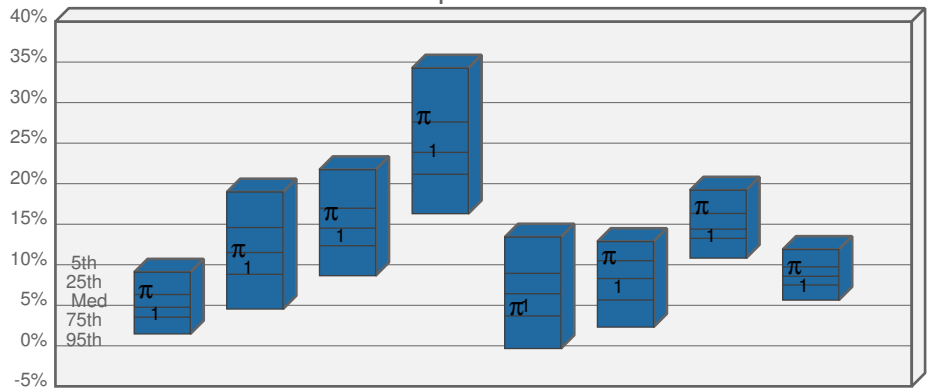


Excess Return:	2.30	Information Ratio:	0.42
Excess Risk:	5.43	T-Stat:	0.95

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
π Emerald Adviso	7.00 (19)	12.13 (43)	16.66 (26)	28.53 (21)	4.99 (63)	11.23 (18)	17.43 (9)	10.02 (17)
1 Russell 2000 G	4.39 (57)	9.97 (64)	13.90 (57)	24.40 (45)	5.37 (58)	7.64 (59)	13.98 (63)	7.82 (66)
Median	4.76	11.51	14.51	23.86	6.43	8.30	14.40	8.58
Number of Funds	142	142	141	141	141	137	134	116

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

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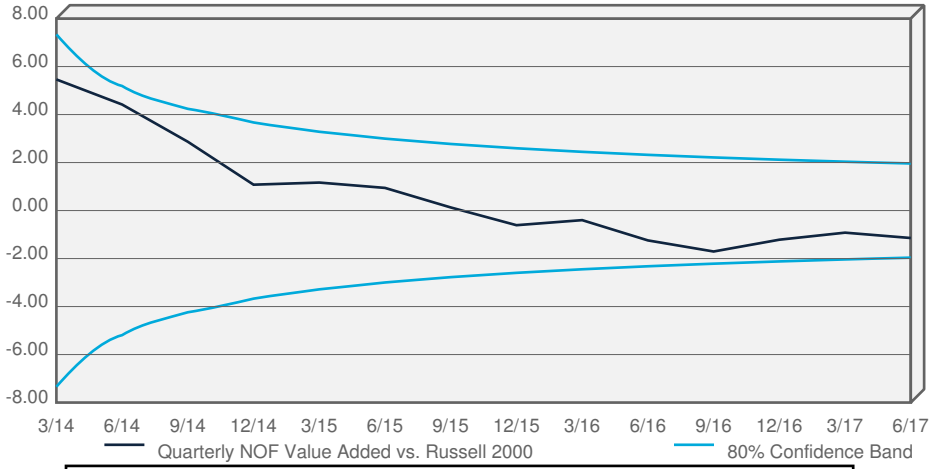
INVESTMENT MANAGER ANALYSIS

CIM Small Cap - Emerg. Mgr.

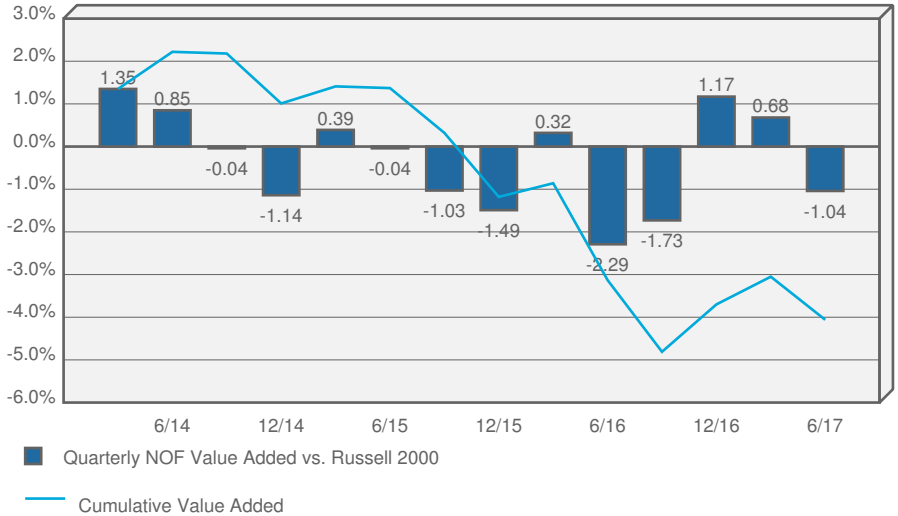
June 30, 2017

Cumulative Skill Analysis vs Benchmark

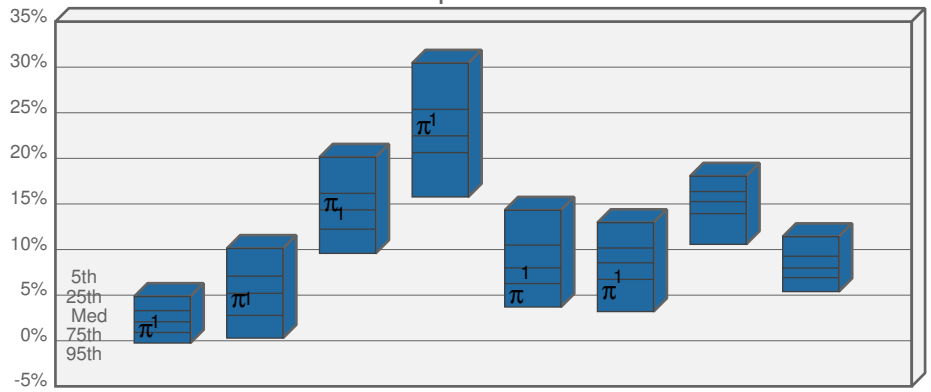


Excess Return:	-1.14	Information Ratio:	-0.51
Excess Risk:	2.23	T-Stat:	-0.89

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
π CIM Small Cap	1.42 (67)	4.78 (56)	15.26 (38)	23.68 (37)	5.20 (85)	5.57 (82)		
1 Russell 2000	2.46 (45)	4.99 (54)	14.26 (51)	24.60 (29)	7.80 (53)	7.36 (63)		
Median	2.08	5.20	14.35	22.47	8.00	8.55	15.26	7.98
Number of Funds	124	124	122	122	121	118	116	96

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

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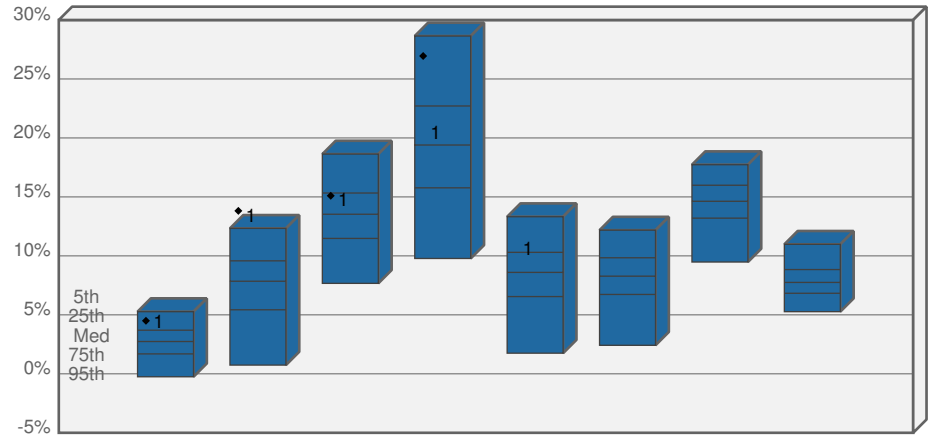
INVESTMENT MANAGER ANALYSIS

Emerald Advisors All Cap - Emg. Mgr.

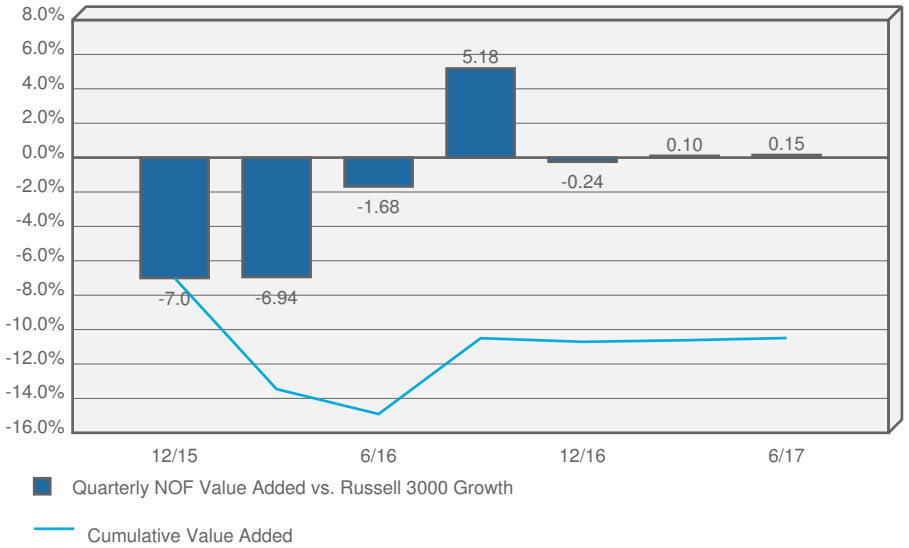
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
◆ Emerald Adviso	4.95 (6)	14.27 (1)	15.55 (21)	27.40 (7)				
1 Russell 3000 G	4.65 (9)	13.69 (1)	15.05 (27)	20.72 (38)	10.90 (18)			
Median	2.74	7.85	13.53	19.40	8.60	8.28	14.63	7.75
Number of Funds	453	452	447	447	443	435	419	344

Value-Added Analysis vs Benchmark



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

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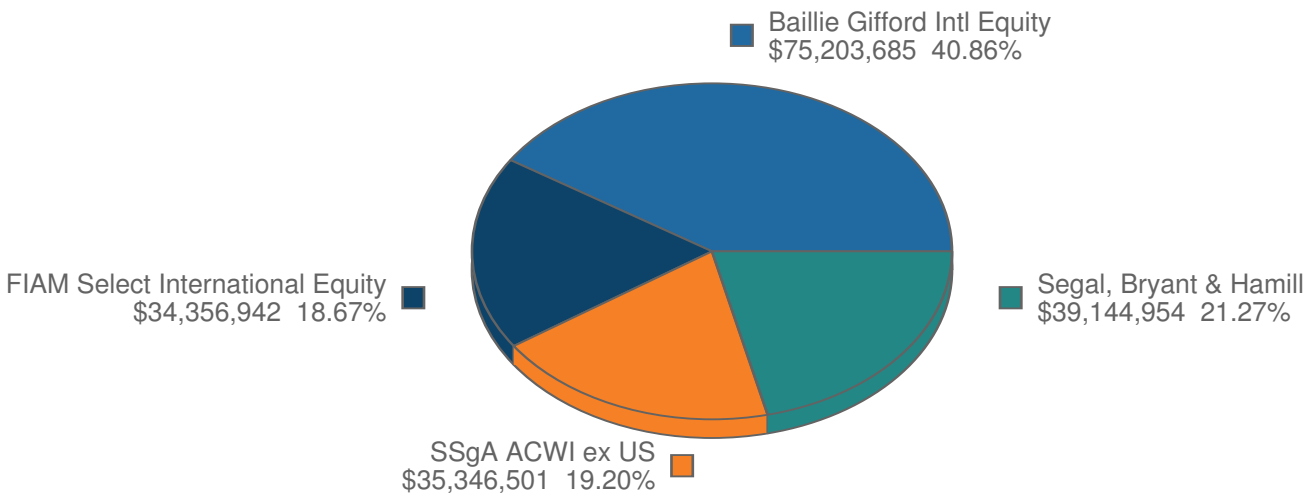
NON US EQUITY

Wilshire Consulting

MANAGER ALLOCATION

Non US Equity Composite

As of June 30, 2017



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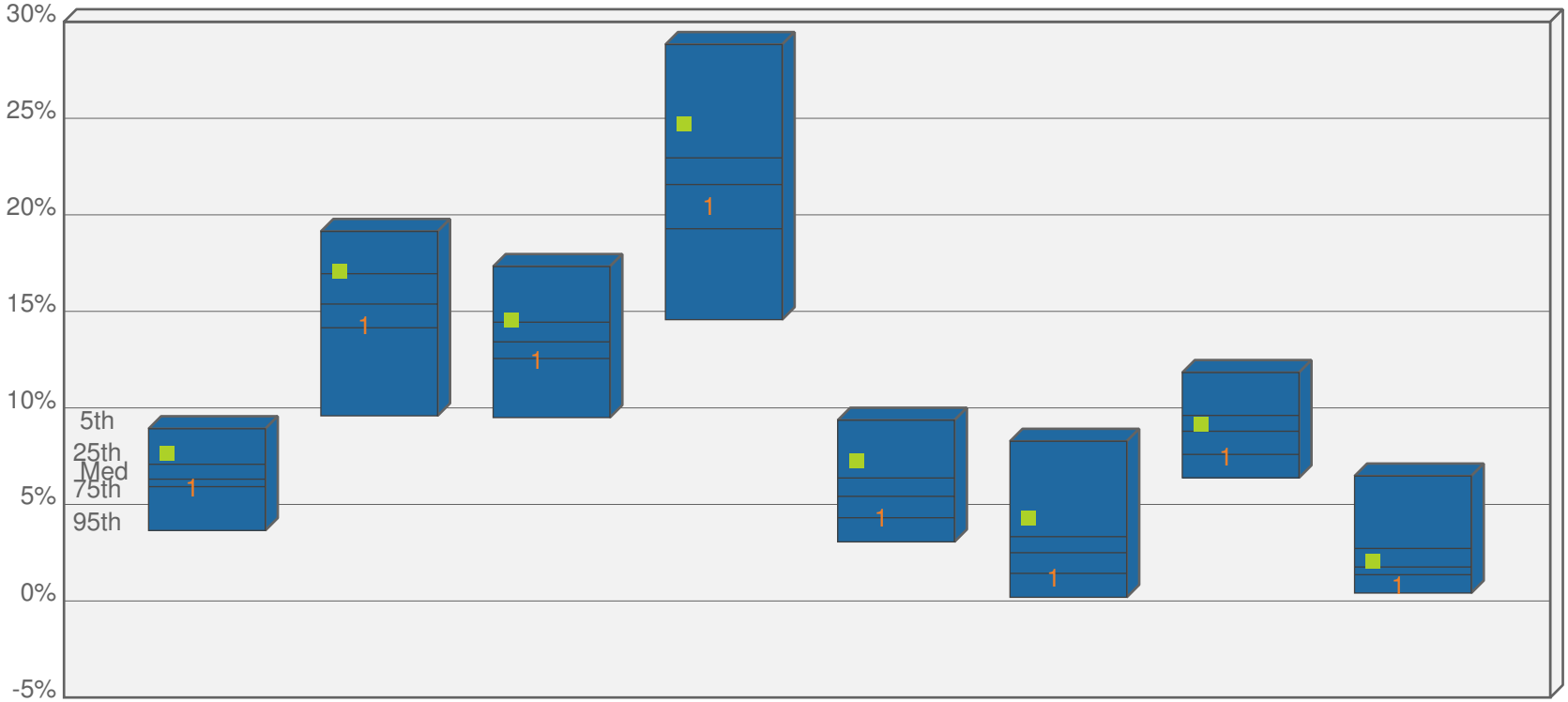
PERFORMANCE COMPARISON

Non US Equity Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ Non US Equity Composite	7.73 (12)	17.14 (22)	14.62 (17)	24.80 (8)	7.31 (13)	4.34 (11)	9.20 (30)	2.11 (35)
1 Policy Index	5.85 (80)	14.30 (74)	12.50 (77)	20.43 (66)	4.33 (74)	1.21 (80)	7.48 (82)	0.81 (93)
5th %tile	8.92	19.14	17.32	28.82	9.36	8.27	11.83	6.47
25th %tile	7.08	16.95	14.44	22.95	6.37	3.33	9.61	2.72
Median	6.31	15.38	13.42	21.57	5.42	2.50	8.79	1.76
75th %tile	5.92	14.15	12.56	19.28	4.31	1.43	7.59	1.36
95th %tile	3.65	9.59	9.50	14.57	3.06	0.19	6.38	0.41
Number of Funds	136	133	131	128	118	110	97	70

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

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Baillie Gifford Intl Equity									
Net of Fee Return	**9.44**	**20.00**	**15.31**	**27.62**	**5.96**	**10.52**		**9/30/09**	**8.63**
MSCI ACWI X US (N)	5.78	14.10	12.67	20.45	0.80	7.22		9/30/09	4.90
Value Added	3.65	5.90	2.64	7.17	5.16	3.30		9/30/09	3.73
FIAM Select International Equity									
Net of Fee Return	**6.17**	**15.09**	**12.02**	**18.80**	**0.87**	**7.04**	**0.62**	**12/31/00**	**4.43**
Policy Benchmark	5.78	14.10	12.67	20.45	0.80	7.22	0.69	12/31/00	3.87
Value Added	0.38	0.99	-0.65	-1.65	0.06	-0.18	-0.07	12/31/00	0.56
SSgA ACWI ex US									
Net of Fee Return	**5.82**	**13.12**	**12.71**	**19.83**				**6/30/15**	**4.06**
MSCI World X-US (N)	5.63	12.82	12.41	19.48				6/30/15	3.79
Value Added	0.19	0.30	0.30	0.35				6/30/15	0.27
Segal, Bryant & Hamill									
Net of Fee Return	**7.21**	**16.23**	**16.34**	**28.24**				**6/30/15**	**10.28**
MSCI EAFE Small Cap (N)	8.10	16.72	13.38	23.18				6/30/15	8.93
Value Added	-0.90	-0.48	2.96	5.06				6/30/15	1.35
Non US Equity Composite									
Net of Fee Return	**7.70**	**16.98**	**14.46**	**24.53**	**4.02**	**8.79**	**1.71**	**12/31/00**	**5.12**
Policy Index	5.85	14.30	12.50	20.43	1.21	7.48	0.81	12/31/00	3.95
Value Added	1.85	2.68	1.96	4.10	2.81	1.31	0.90	12/31/00	1.17

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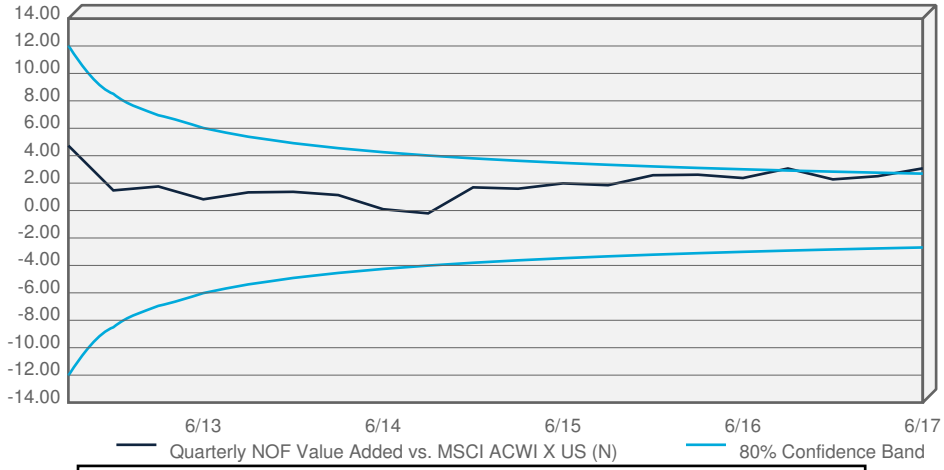
INVESTMENT MANAGER ANALYSIS

Baillie Gifford Intl Equity

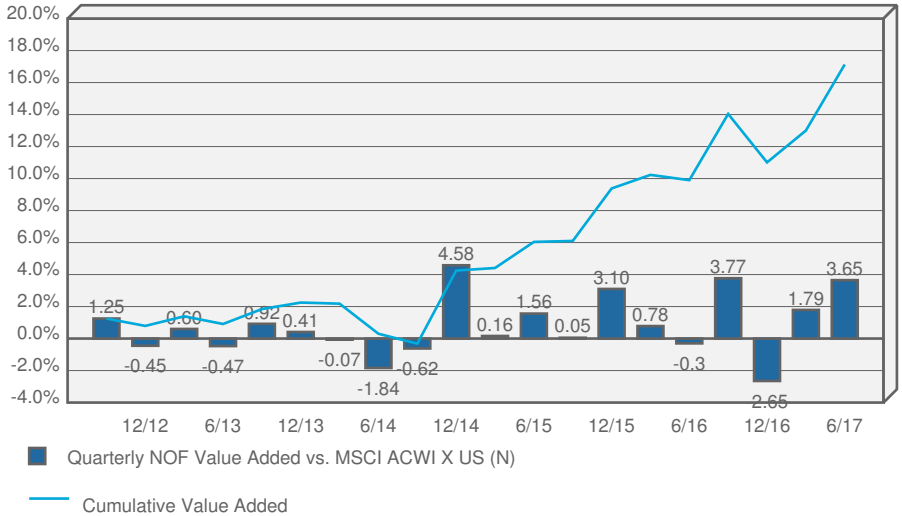
June 30, 2017

Cumulative Skill Analysis vs Benchmark

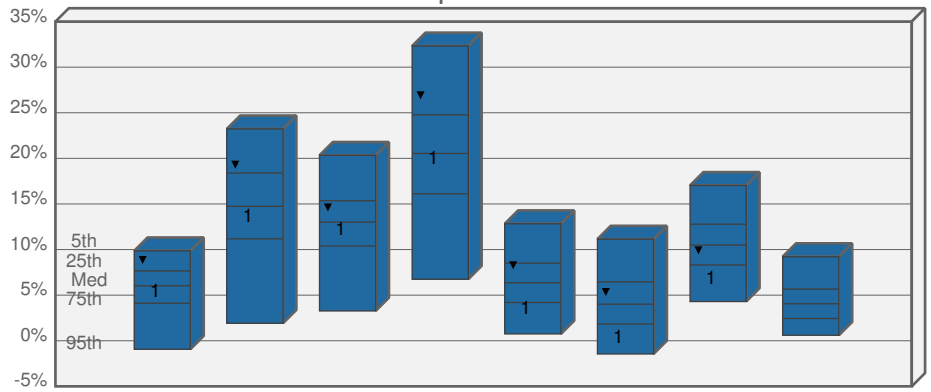


Excess Return:	3.08	Information Ratio:	0.84
Excess Risk:	3.66	T-Stat:	1.88

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
▼ Baillie Giffor	9.44 (8)	19.89 (16)	15.20 (27)	27.50 (13)	8.86 (21)	5.93 (28)	10.50 (49)	
1 MSCI ACWI X US	5.78 (54)	14.10 (55)	12.67 (54)	20.45 (50)	3.98 (77)	0.80 (85)	7.22 (82)	
Median	6.03	14.74	13.01	20.54	6.35	4.01	10.49	4.06
Number of Funds	1567	1562	1554	1548	1505	1434	1267	806

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

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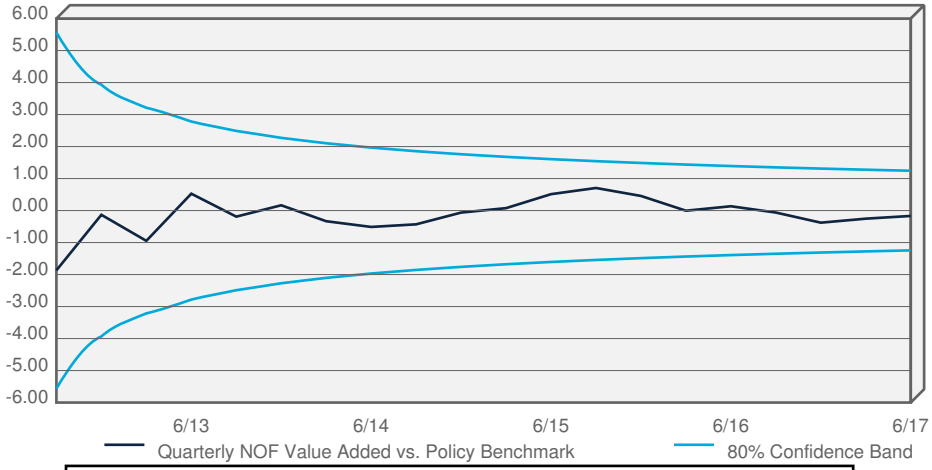
INVESTMENT MANAGER ANALYSIS

FIAM Select International Equity

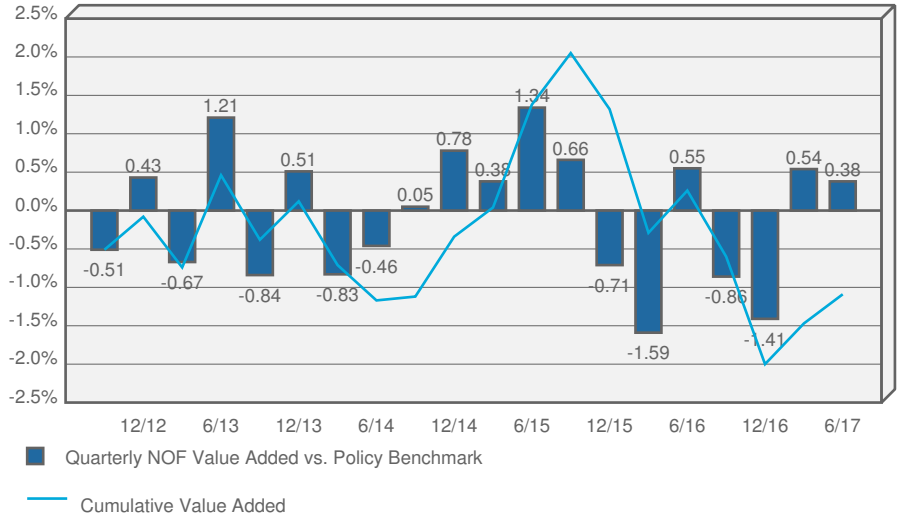
June 30, 2017

Cumulative Skill Analysis vs Benchmark

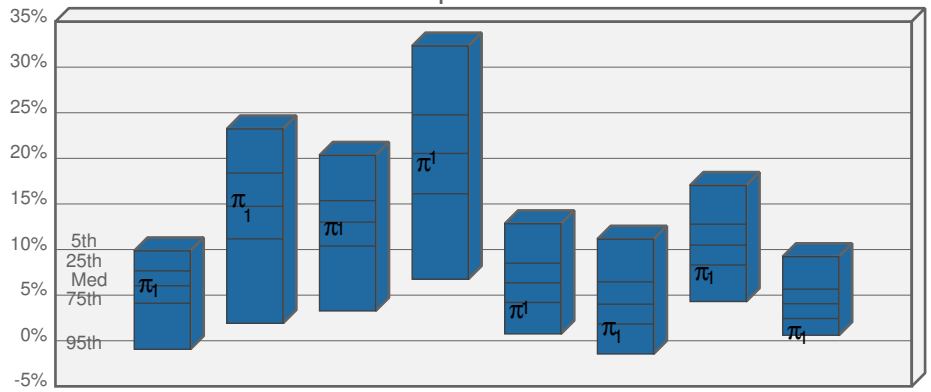


Excess Return:	-0.17	Information Ratio:	-0.10
Excess Risk:	1.69	T-Stat:	-0.22

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
π FIAM Select In	6.34 (44)	15.66 (43)	12.58 (55)	19.59 (57)	3.49 (82)	1.61 (77)	7.73 (78)	1.25 (91)
1 Policy Benchma	5.78 (54)	14.10 (55)	12.67 (54)	20.45 (50)	3.98 (77)	0.80 (85)	7.22 (82)	0.69 (94)
Median	6.03	14.74	13.01	20.54	6.35	4.01	10.49	4.06
Number of Funds	1567	1562	1554	1548	1505	1434	1267	806

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

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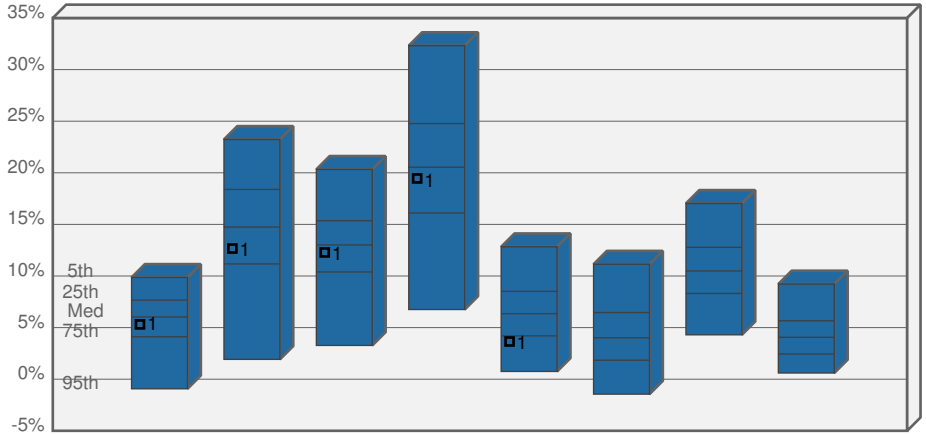
INVESTMENT MANAGER ANALYSIS

SSgA ACWI ex US

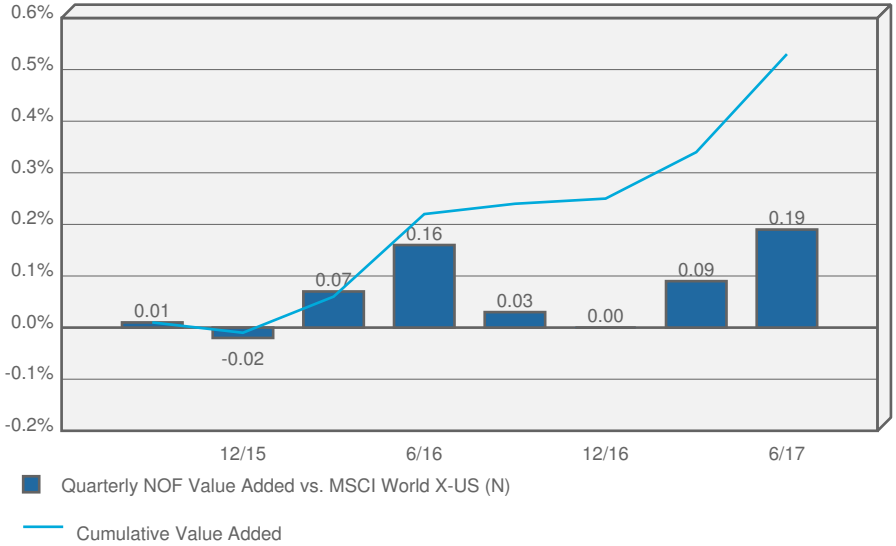
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
SSgA ACWI ex U	5.83 (54)	13.18 (63)	12.80 (52)	19.97 (53)	4.17 (75)			
1 MSCI World X-U	5.63 (57)	12.82 (66)	12.41 (58)	19.48 (57)	3.79 (79)			
Median	6.03	14.74	13.01	20.54	6.35	4.01	10.49	4.06
Number of Funds	1567	1562	1554	1548	1505	1434	1267	806

Value-Added Analysis vs Benchmark



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

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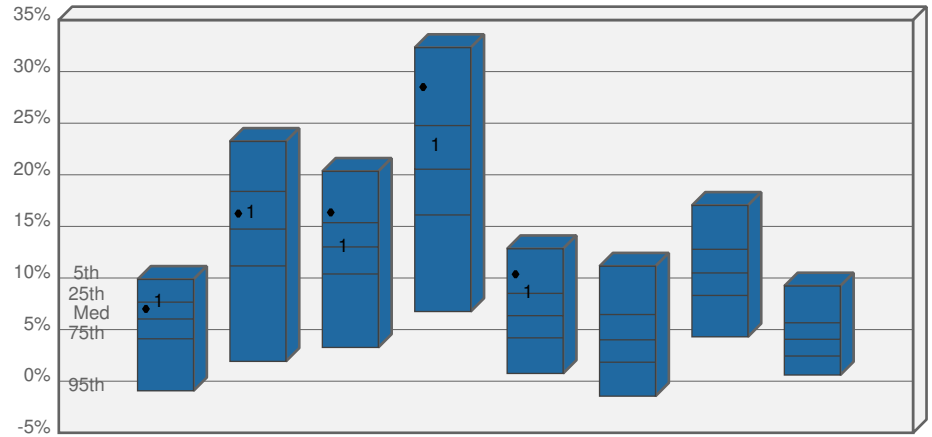
INVESTMENT MANAGER ANALYSIS

Segal, Bryant & Hamill

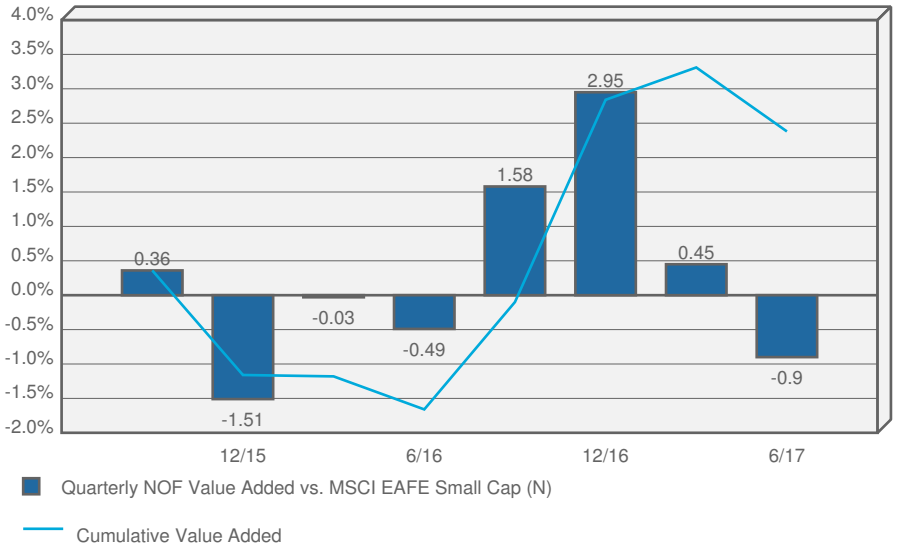
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
♦ Segal, Bryant	7.52 (26)	16.76 (34)	16.87 (14)	29.02 (9)	10.88 (9)			
1 MSCI EAFE Smal	8.10 (19)	16.72 (35)	13.38 (46)	23.18 (34)	8.93 (20)			
Median	6.03	14.74	13.01	20.54	6.35	4.01	10.49	4.06
Number of Funds	1567	1562	1554	1548	1505	1434	1267	806

Value-Added Analysis vs Benchmark



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

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CUSTOM BENCHMARK SPECIFICATION

Non US Equity Composite

June 30, 2017

	Quarter Start	Quarter End	Percent	Description
Policy Index	12/00	6/08	100.00	MSCI EAFE Index (N)
	9/08	12/14	100.00	MSCI ACWI X US (N)
	3/15	6/17	100.00	MSCI ACWI X US IMI Index (N)

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GLOBAL EQUITY

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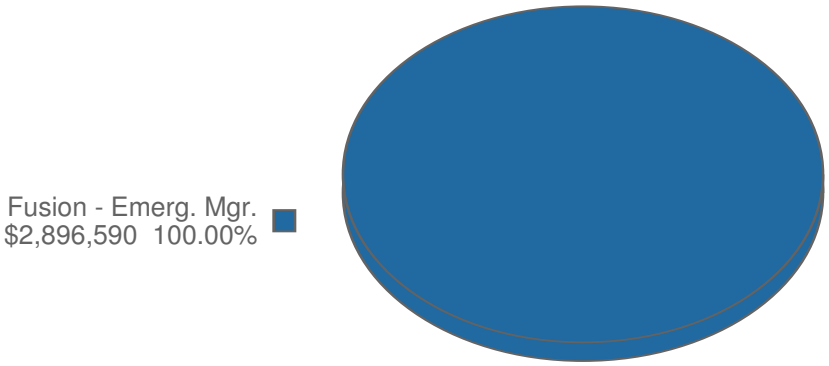
MANAGER ALLOCATION

Global Equity Composite

As of June 30, 2017



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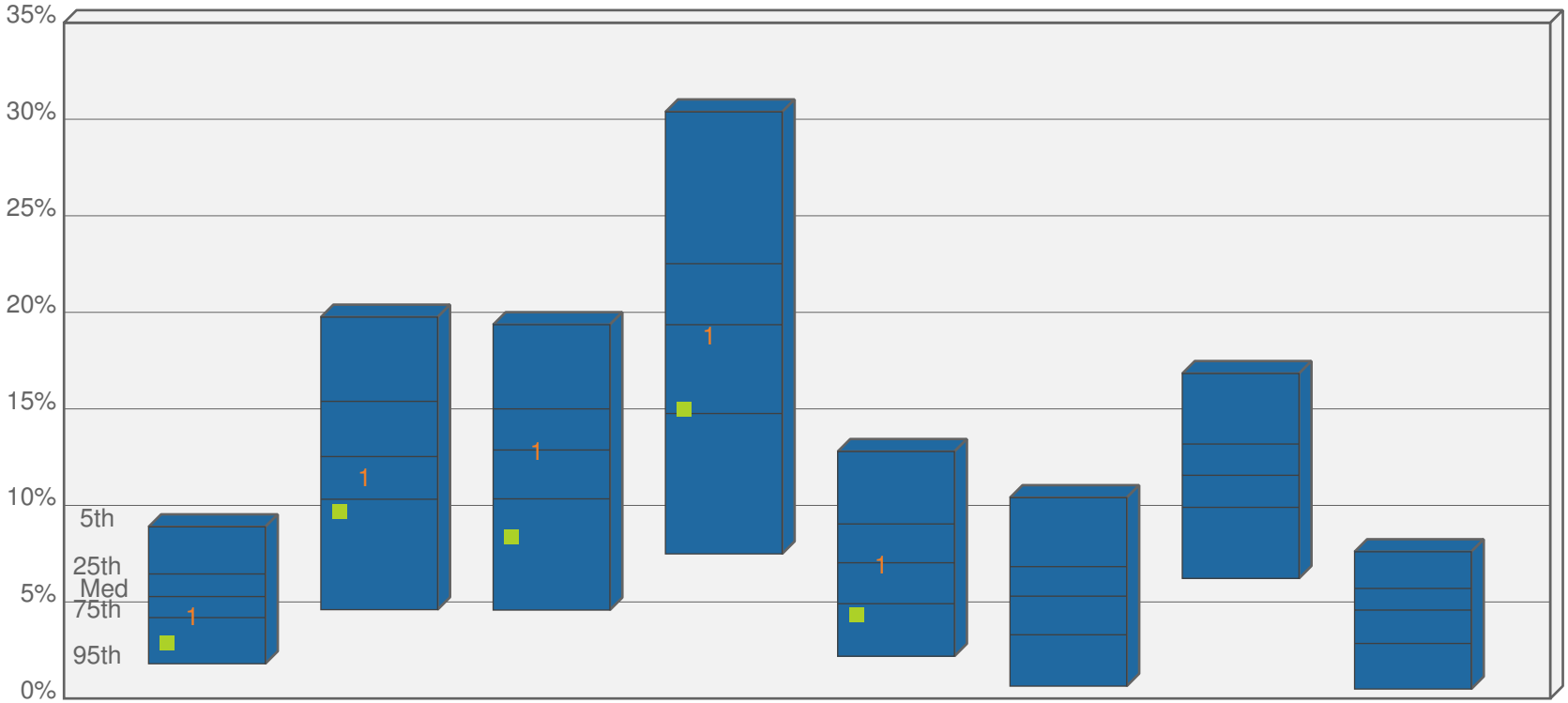
PERFORMANCE COMPARISON

Global Equity Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Global Equity	2.93 (89)	9.73 (80)	8.44 (84)	15.04 (73)	4.39 (81)			
1 MSCI ACWI (N)	4.27 (73)	11.47 (61)	12.80 (50)	18.78 (55)	6.94 (51)			
5th %tile	8.89	19.75	19.36	30.38	12.79	10.40	16.83	7.60
25th %tile	6.45	15.39	15.00	22.52	9.04	6.83	13.18	5.70
Median	5.28	12.53	12.87	19.36	7.03	5.30	11.56	4.58
75th %tile	4.19	10.32	10.34	14.76	4.91	3.30	9.90	2.85
95th %tile	1.80	4.60	4.58	7.49	2.19	0.64	6.22	0.49
Number of Funds	334	329	329	328	317	296	254	135

*TUCS Total Ret of Global Equity Portfolios Universe - Gross of Fees

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Fusion - Emerg. Mgr.									
Net of Fee Return	**2.76**	**9.36**	**7.89**	**14.26**				**12/31/14**	**4.58**
MSCI ACWI (N)	4.27	11.47	12.80	18.78				12/31/14	6.63
Value Added	-1.51	-2.11	-4.91	-4.51				12/31/14	-2.05
Global Equity									
Net of Fee Return	**2.76**	**9.36**	**7.89**	**14.26**				**12/31/14**	**4.58**
MSCI ACWI (N)	4.27	11.47	12.80	18.78				12/31/14	6.63
Value Added	-1.51	-2.11	-4.91	-4.51				12/31/14	-2.05

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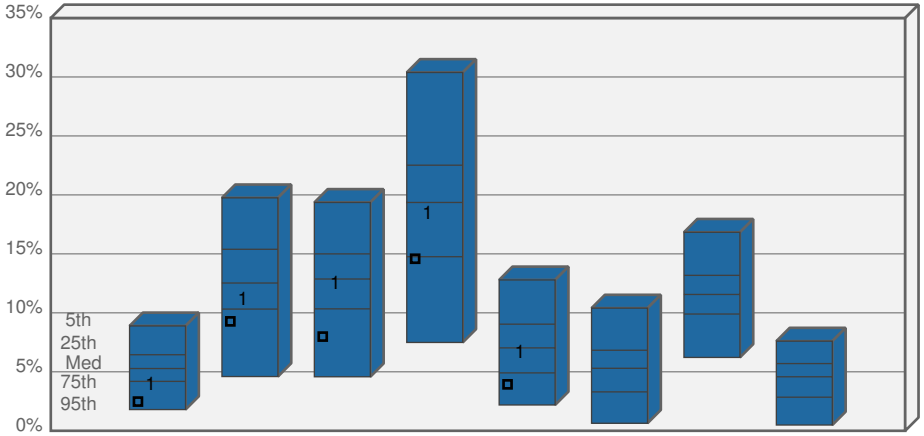
INVESTMENT MANAGER ANALYSIS

Fusion - Emerg. Mgr.

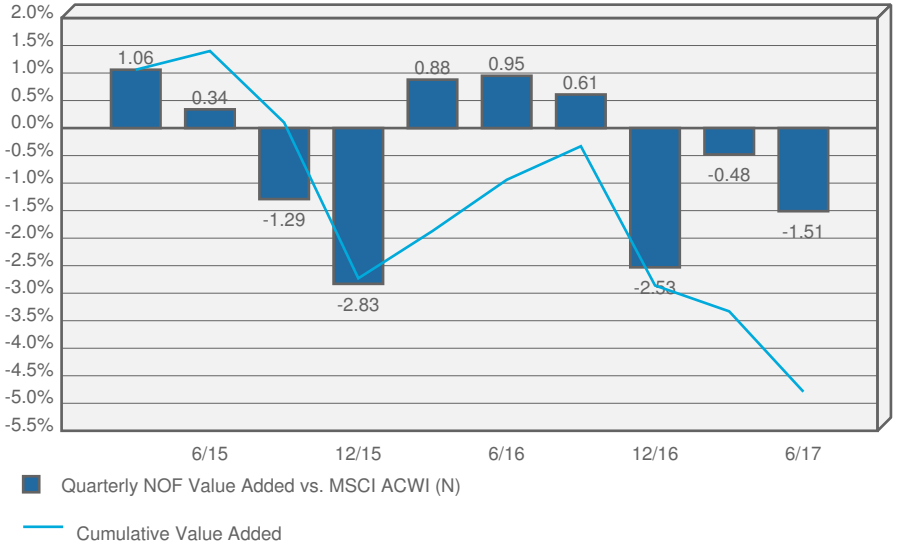
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
◘ Fusion - Emerg	2.93 (89)	9.73 (80)	8.44 (84)	15.04 (73)	4.39 (81)			
1 MSCI ACWI (N)	4.27 (73)	11.47 (61)	12.80 (50)	18.78 (55)	6.94 (51)			
Median	5.28	12.53	12.87	19.36	7.03	5.30	11.56	4.58
Number of Funds	334	329	329	328	317	296	254	135

Value-Added Analysis vs Benchmark



*TUCS Total Returns of Global Equity Portfolios Universe - Gross of Fees

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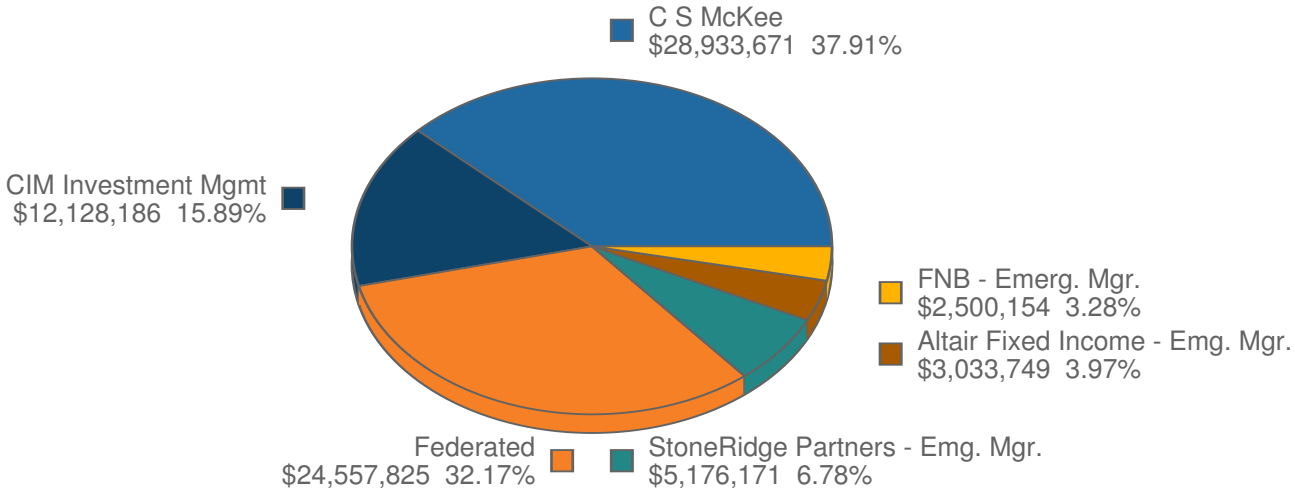
CORE FIXED INCOME

Wilshire Consulting

MANAGER ALLOCATION

Core Fixed Composite

As of June 30, 2017



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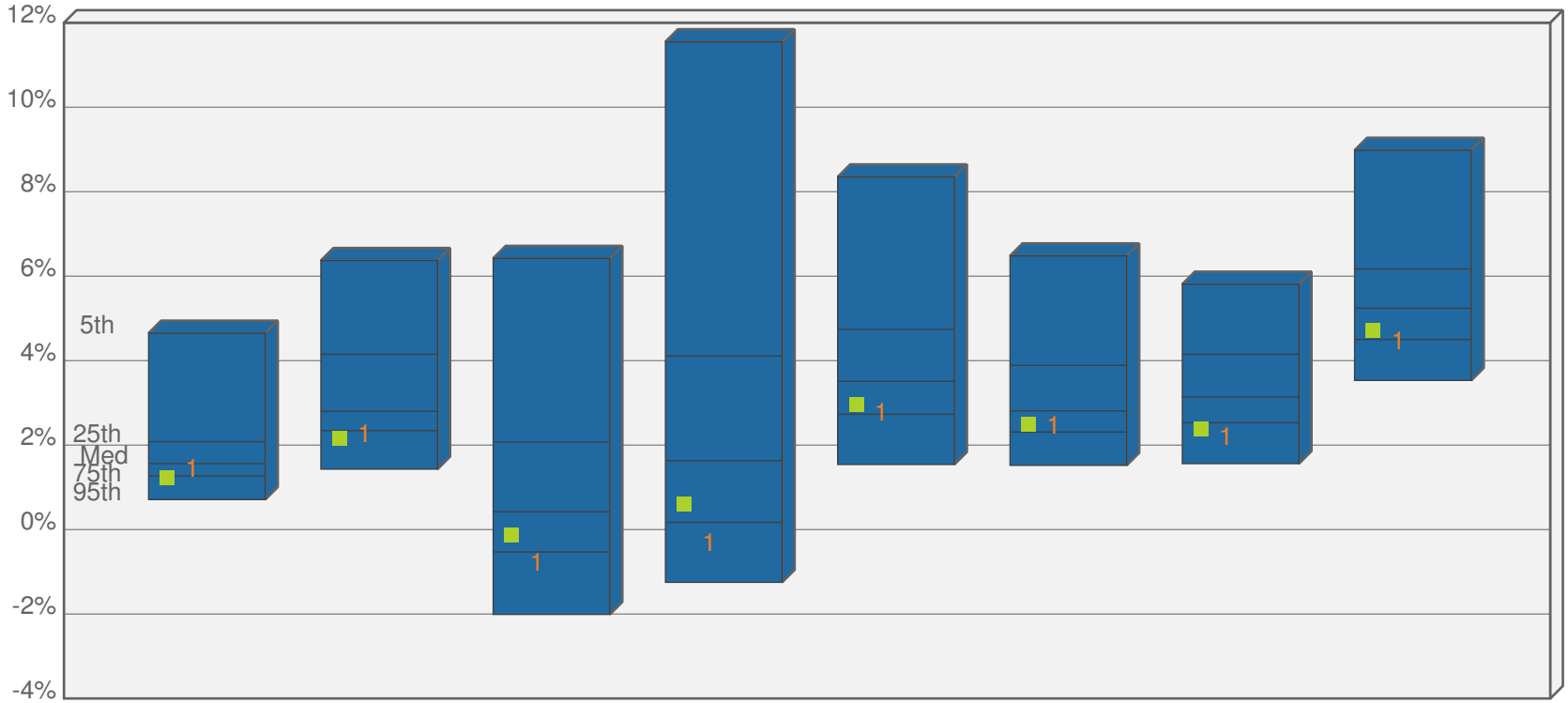
PERFORMANCE COMPARISON

Core Fixed Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Core Fixed Composite	1.25 (77)	2.18 (81)	-0.10 (65)	0.64 (67)	2.99 (72)	2.53 (59)	2.42 (80)	4.75 (68)
1 Bloomberg Aggreg	1.45 (62)	2.27 (78)	-0.77 (83)	-0.31 (85)	2.79 (74)	2.48 (59)	2.21 (83)	4.48 (75)
5th %tile	4.65	6.37	6.42	11.55	8.35	6.48	5.81	8.98
25th %tile	2.08	4.15	2.07	4.11	4.74	3.89	4.15	6.17
Median	1.56	2.80	0.42	1.63	3.51	2.81	3.14	5.24
75th %tile	1.27	2.34	-0.53	0.17	2.73	2.31	2.53	4.50
95th %tile	0.71	1.43	-2.01	-1.25	1.54	1.52	1.56	3.53
Number of Funds	159	149	145	139	130	123	105	62

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

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Altair Fixed Income - Emg. Mgr.									
Net of Fee Return	**1.04**							**3/31/17**	**1.04**
Bloomberg Aggregate	1.45							3/31/17	1.45
Value Added	-0.40							3/31/17	-0.40
C S McKee									
Net of Fee Return	**1.32**	**2.16**	**-0.70**	**-0.30**	**2.76**	**2.55**	**5.09**	**12/31/82**	**7.66**
Bloomberg Aggregate	1.45	2.27	-0.77	-0.31	2.48	2.21	4.48	12/31/82	7.30
Value Added	-0.12	-0.11	0.07	0.01	0.28	0.34	0.61	12/31/82	0.36
CIM Investment Mgmt									
Net of Fee Return	**0.59**	**1.16**	**-0.52**	**-0.35**	**1.01**	**1.27**	**3.45**	**12/31/05**	**3.41**
Bloomberg Int Govt/Credit Index	0.94	1.73	-0.37	-0.21	1.92	1.77	3.87	12/31/05	3.85
Value Added	-0.35	-0.57	-0.15	-0.14	-0.91	-0.51	-0.42	12/31/05	-0.44
Federated									
Net of Fee Return	**1.42**	**2.63**	**0.34**	**1.59**	**2.58**	**2.57**	**5.18**	**9/30/06**	**5.01**
Bloomberg Aggregate	1.45	2.27	-0.77	-0.31	2.48	2.21	4.48	9/30/06	4.37
Value Added	-0.03	0.36	1.11	1.91	0.10	0.36	0.70	9/30/06	0.64
StoneRidge Partners - Emg. Mgr.									
Net of Fee Return	**0.85**	**1.59**	**0.27**	**0.88**				**9/30/15**	**2.17**
Policy Index	1.09	2.00	-0.05	0.31				9/30/15	2.29
Value Added	-0.24	-0.41	0.33	0.56				9/30/15	-0.12
Core Fixed Composite									
Net of Fee Return	**1.25**	**2.15**	**-0.19**	**0.48**	**2.34**	**2.24**	**4.53**	**9/30/82**	**7.92**
Bloomberg Aggregate	1.45	2.27	-0.77	-0.31	2.48	2.21	4.48	9/30/82	7.49
Value Added	-0.19	-0.12	0.58	0.79	-0.14	0.02	0.05	9/30/82	0.43

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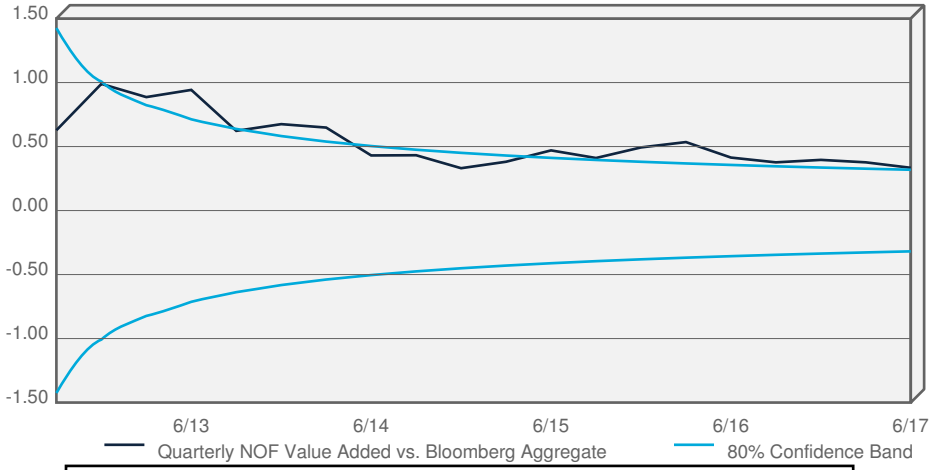
INVESTMENT MANAGER ANALYSIS

C S McKee

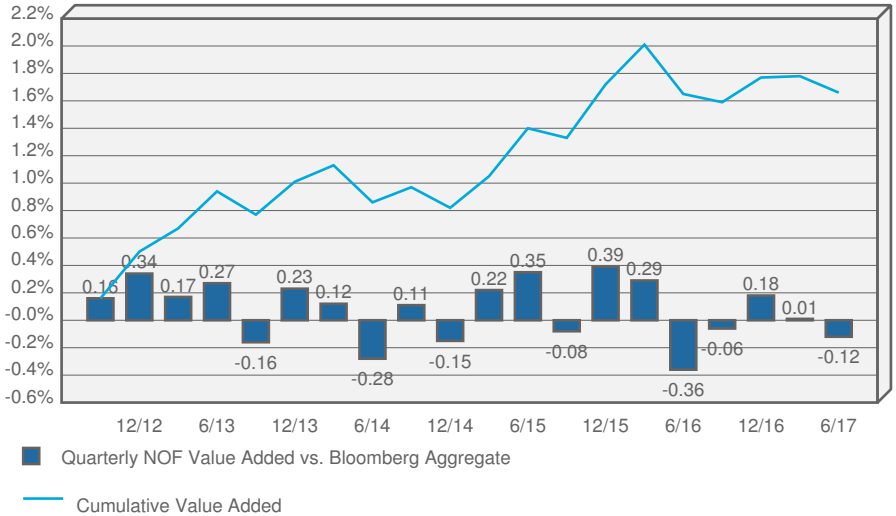
June 30, 2017

Cumulative Skill Analysis vs Benchmark

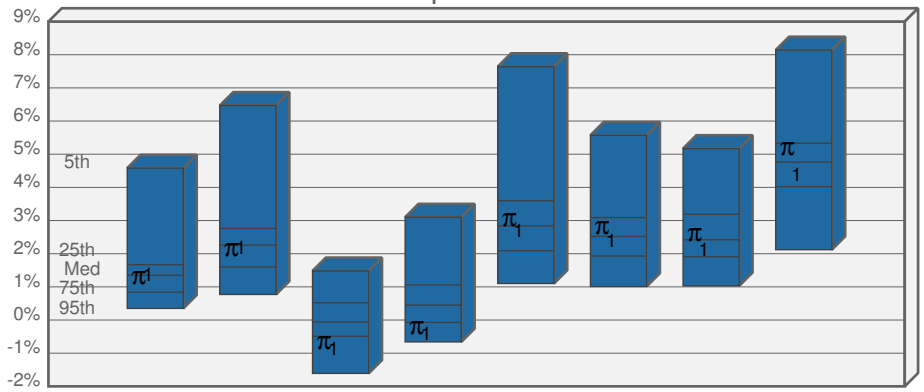


Excess Return:	0.33	Information Ratio:	0.77
Excess Risk:	0.43	T-Stat:	1.72

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
π C S McKee	1.38 (48)	2.22 (52)	-0.58 (77)	-0.13 (78)	3.11 (40)	2.88 (33)	2.65 (41)	5.26 (27)
1 Bloomberg Aggr	1.45 (44)	2.27 (49)	-0.77 (84)	-0.31 (86)	2.79 (53)	2.48 (52)	2.21 (62)	4.48 (60)
Median	1.35	2.26	-0.06	0.45	2.84	2.52	2.42	4.76
Number of Funds	447	446	445	439	428	420	402	349

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

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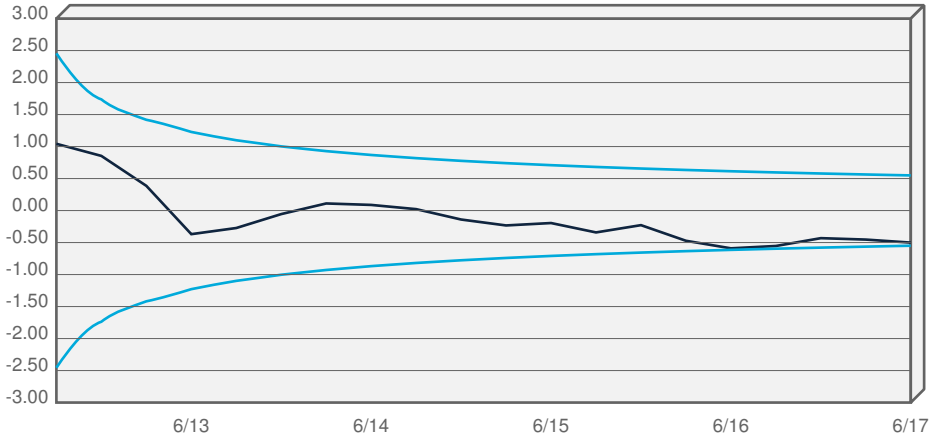
INVESTMENT MANAGER ANALYSIS

CIM Investment Mgmt

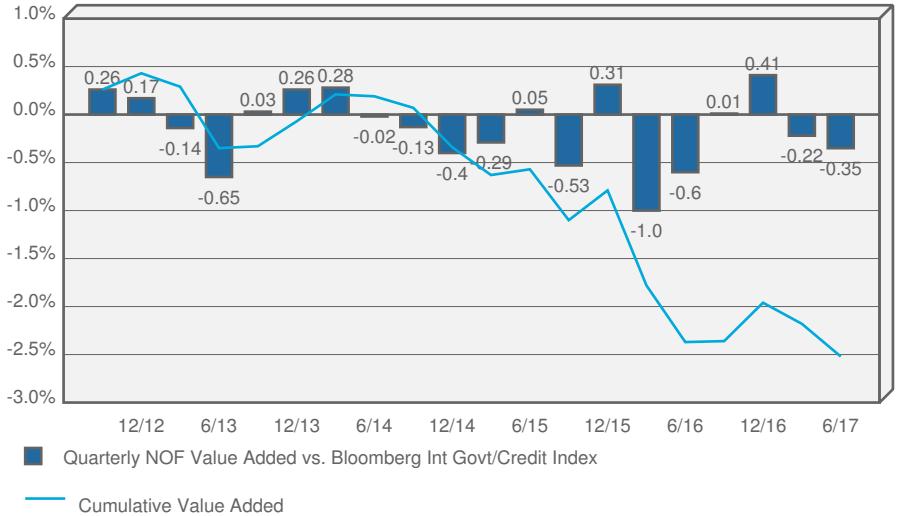
June 30, 2017

Cumulative Skill Analysis vs Benchmark

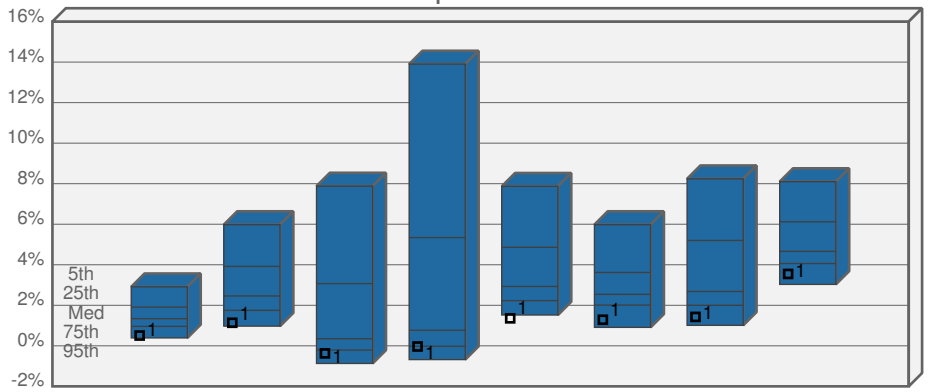


Excess Return:	-0.50	Information Ratio:	-0.67
Excess Risk:	0.75	T-Stat:	-1.50

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
◻ CIM Investment	0.77 (86)	1.40 (87)	-0.11 (70)	0.23 (67)	1.62 (93)	1.55 (89)	1.69 (85)	3.81 (83)
1 Bloomberg Int	0.94 (77)	1.73 (76)	-0.37 (82)	-0.21 (82)	2.03 (82)	1.92 (81)	1.77 (82)	3.87 (81)
Median	1.34	2.46	0.35	0.77	2.93	2.54	2.68	4.66
Number of Funds	476	476	475	474	458	447	427	353

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

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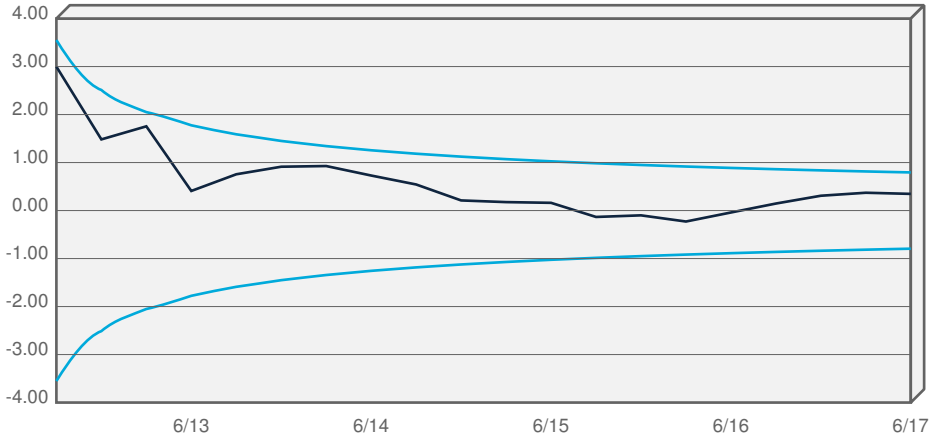
INVESTMENT MANAGER ANALYSIS

Federated

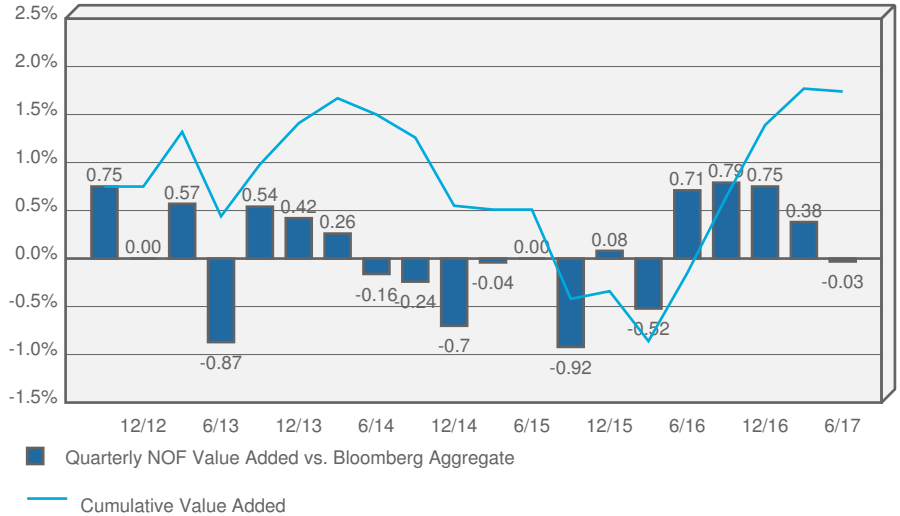
June 30, 2017

Cumulative Skill Analysis vs Benchmark

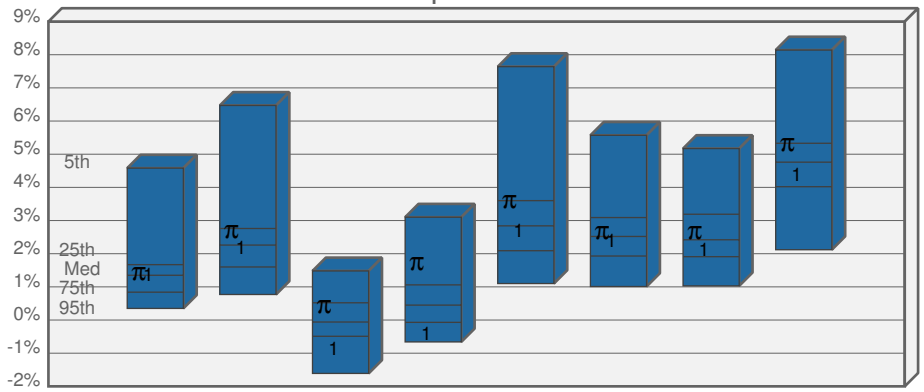


Excess Return:	0.35	Information Ratio:	0.32
Excess Risk:	1.08	T-Stat:	0.72

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
π Federated	1.49 (41)	2.77 (24)	0.48 (26)	1.80 (13)	3.67 (22)	2.73 (40)	2.73 (37)	5.39 (22)
1 Bloomberg Aggr	1.45 (44)	2.27 (49)	-0.77 (84)	-0.31 (86)	2.79 (53)	2.48 (52)	2.21 (62)	4.48 (60)
Median	1.35	2.26	-0.06	0.45	2.84	2.52	2.42	4.76
Number of Funds	447	446	445	439	428	420	402	349

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

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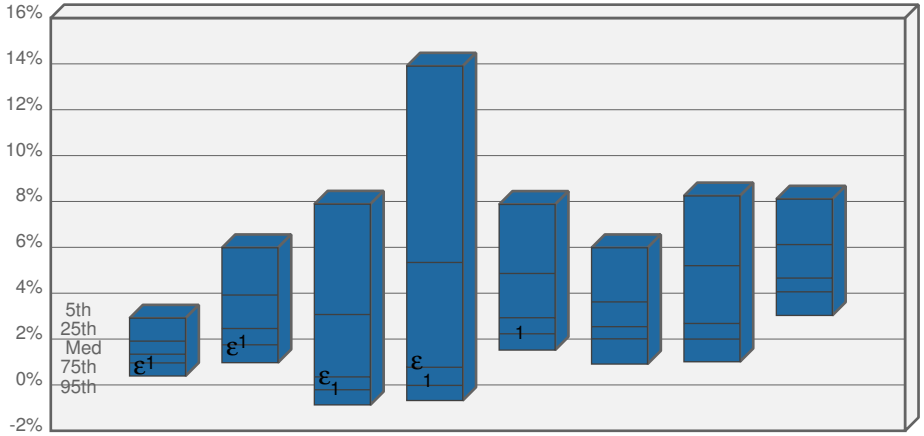
INVESTMENT MANAGER ANALYSIS

StoneRidge Partners - Emg. Mgr.

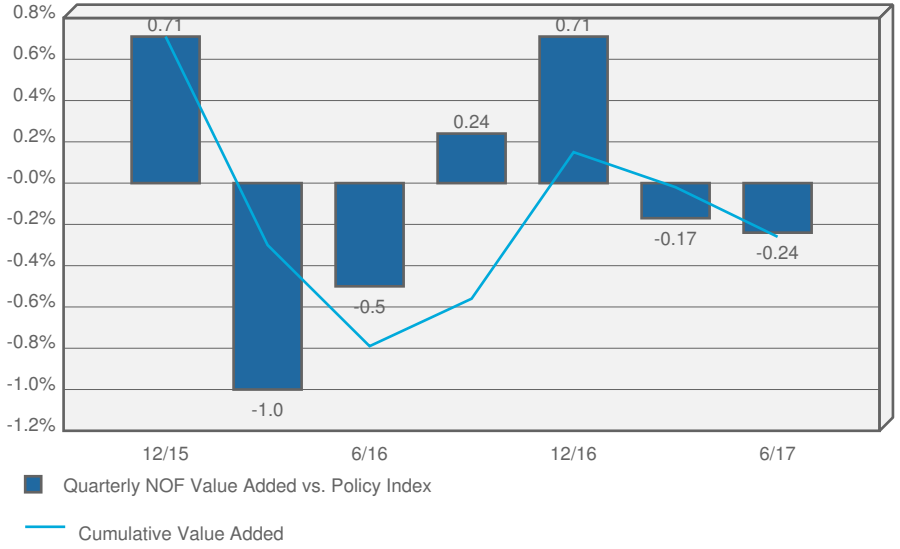
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
ε StoneRidge Par	0.90 (79)	1.70 (77)	0.43 (47)	1.09 (45)				
1 Policy Index	1.09 (63)	2.00 (61)	-0.05 (66)	0.31 (64)	2.41 (67)			
Median	1.34	2.46	0.35	0.77	2.93	2.54	2.68	4.66
Number of Funds	476	476	475	474	458	447	427	353

Value-Added Analysis vs Benchmark



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

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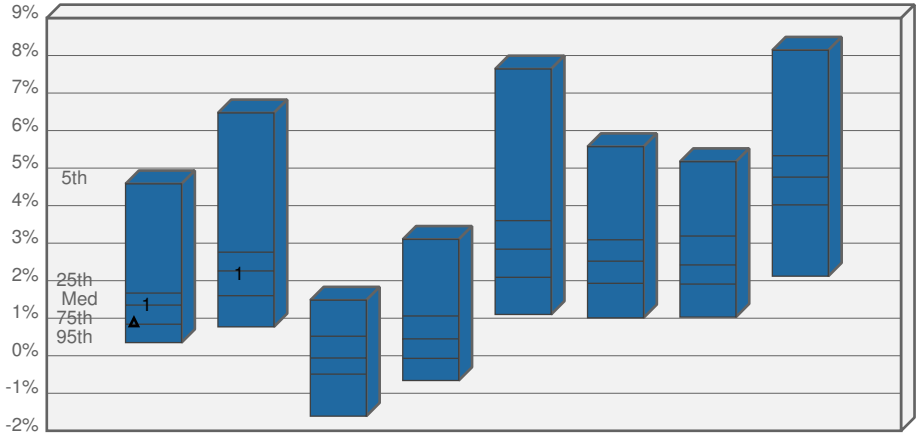
INVESTMENT MANAGER ANALYSIS

Altair Fixed Income - Emg. Mgr.

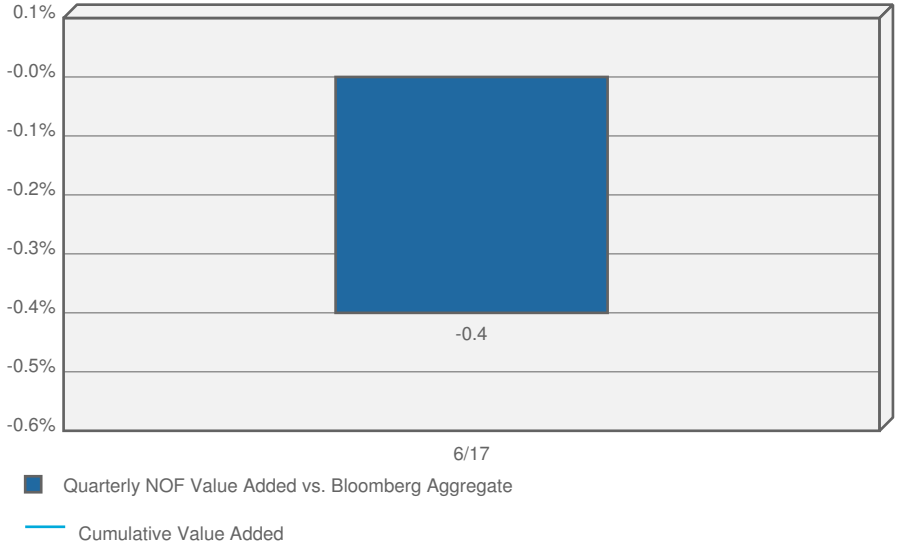
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
▲ Altair Fixed I	1.04 (63)							
1 Bloomberg Aggr	1.45 (44)	2.27 (49)						
Median	1.35	2.26	-0.06	0.45	2.84	2.52	2.42	4.76
Number of Funds	447	446	445	439	428	420	402	349

Value-Added Analysis vs Benchmark



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

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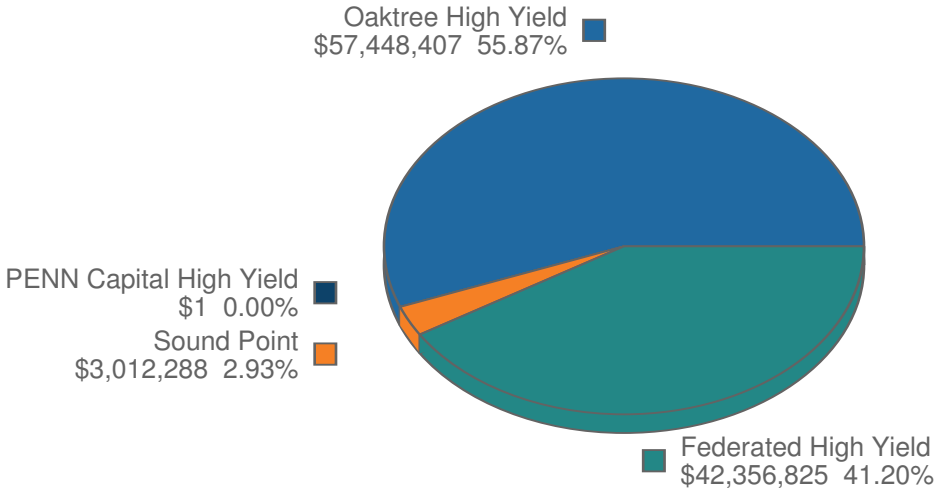
HIGH YIELD

Wilshire Consulting

MANAGER ALLOCATION

High Yield Fixed Composite

As of June 30, 2017



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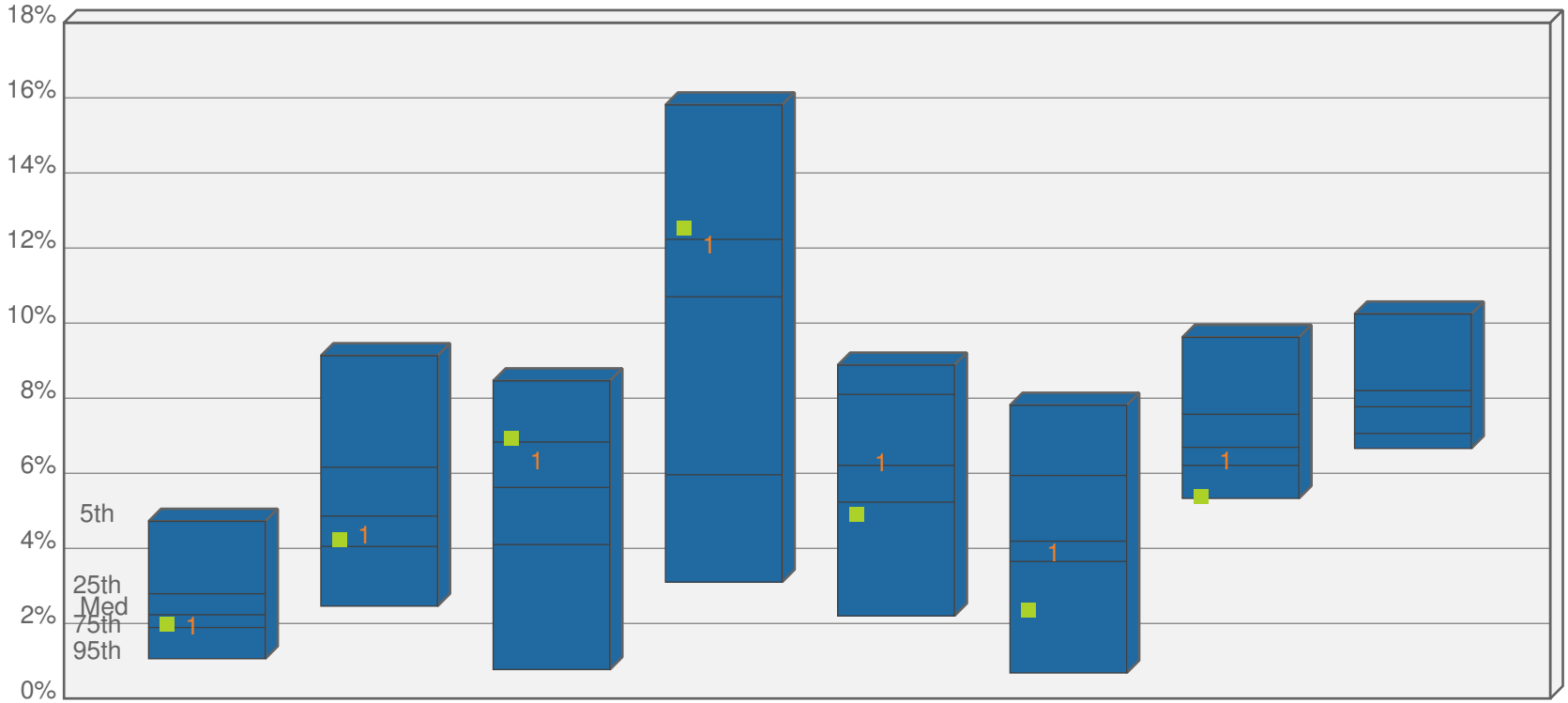
PERFORMANCE COMPARISON

High Yield Fixed Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
High Yield Fixed Composi	2.02 (68)	4.27 (64)	6.96 (20)	12.56 (17)	4.93 (81)	2.40 (92)	5.41 (93)	
1 Citi High Yield	1.94 (74)	4.37 (61)	6.35 (35)	12.09 (28)	6.30 (45)	3.88 (64)	6.33 (69)	
5th %tile	4.72	9.13	8.46	15.81	8.88	7.81	9.62	10.24
25th %tile	2.79	6.16	6.83	12.23	8.10	5.94	7.57	8.20
Median	2.23	4.86	5.62	10.70	6.21	4.19	6.69	7.77
75th %tile	1.89	4.05	4.10	5.96	5.23	3.65	6.21	7.06
95th %tile	1.06	2.46	0.77	3.10	2.20	0.68	5.33	6.66
Number of Funds	146	146	146	144	129	120	93	30

*TUCS Total Ret of Fixed Income Portfolios - High Yield Universe - Gross of Fees

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Oaktree High Yield									
Net of Fee Return	**2.35**	**4.06**	**5.97**	**11.22**	**3.13**	**5.48**		**3/31/08**	**7.92**
Citigroup HY Cash Pay Capped	1.95	4.35	6.27	11.97	3.86	6.28		3/31/08	8.04
Value Added	0.40	-0.29	-0.31	-0.75	-0.73	-0.80		3/31/08	-0.12
PENN Capital High Yield									
Net of Fee Return	**1.55**	**4.51**	**8.51**	**14.78**	**0.73**	**4.67**		**6/30/08**	**7.44**
ML High Yield Master II	2.14	4.91	6.89	12.75	4.48	6.91		6/30/08	8.66
Value Added	-0.60	-0.40	1.62	2.02	-3.75	-2.24		6/30/08	-1.22
Sound Point									
Net of Fee Return	**1.44**	**3.00**	**5.05**	**7.35**	**4.18**			**9/30/13**	**4.93**
CSFB Leveraged Loan	0.75	1.96	4.26	7.49	3.49			9/30/13	4.03
Value Added	0.68	1.04	0.79	-0.14	0.70			9/30/13	0.89
High Yield Fixed Composite									
Net of Fee Return	**2.02**	**4.22**	**6.90**	**12.44**	**2.22**	**5.18**		**3/31/08**	**7.77**
Citi High Yield Market Capped	1.94	4.37	6.35	12.09	3.88	6.33		3/31/08	8.11
Value Added	0.08	-0.15	0.55	0.35	-1.66	-1.15		3/31/08	-0.34

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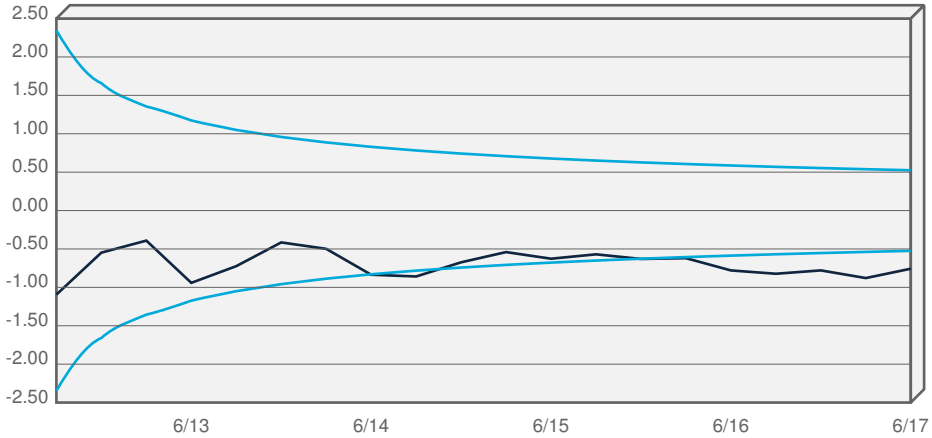
INVESTMENT MANAGER ANALYSIS

Oaktree High Yield

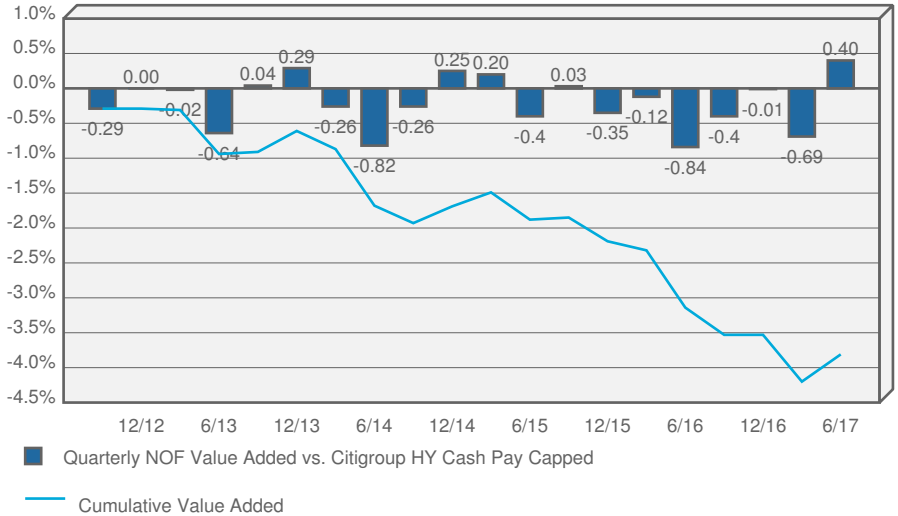
June 30, 2017

Cumulative Skill Analysis vs Benchmark

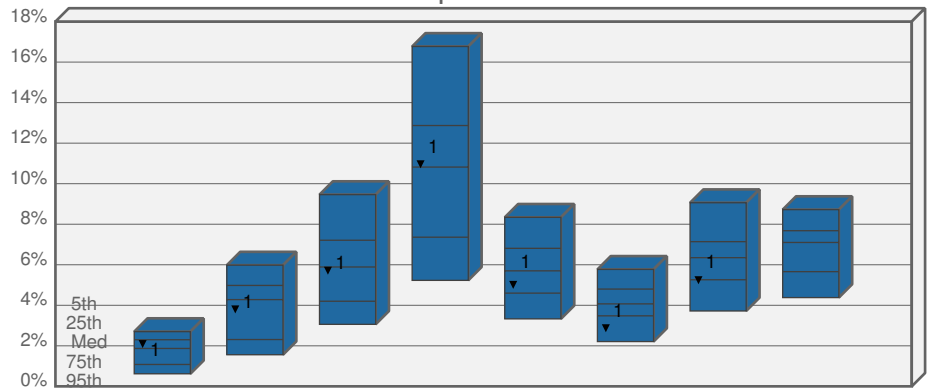


Excess Return:	-0.76	Information Ratio:	-1.06
Excess Risk:	0.71	T-Stat:	-2.37

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
▼ Oaktree High Y	2.35 (19)	4.06 (56)	5.97 (49)	11.22 (44)	5.27 (62)	3.13 (84)	5.50 (67)	
1 Citigroup HY C	1.95 (43)	4.35 (48)	6.27 (44)	11.97 (33)	6.28 (36)	3.86 (59)	6.28 (51)	
Median	1.87	4.28	5.89	10.82	5.70	4.07	6.35	7.10
Number of Funds	223	223	221	220	216	206	188	127

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

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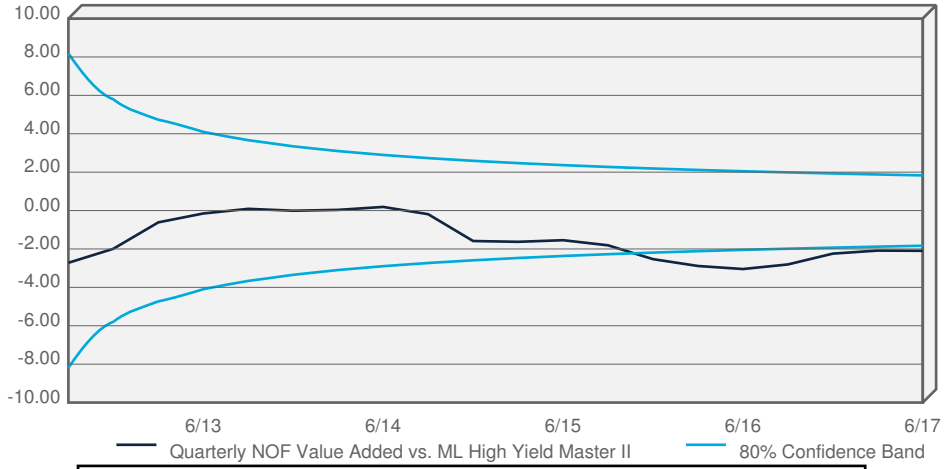
INVESTMENT MANAGER ANALYSIS

PENN Capital High Yield

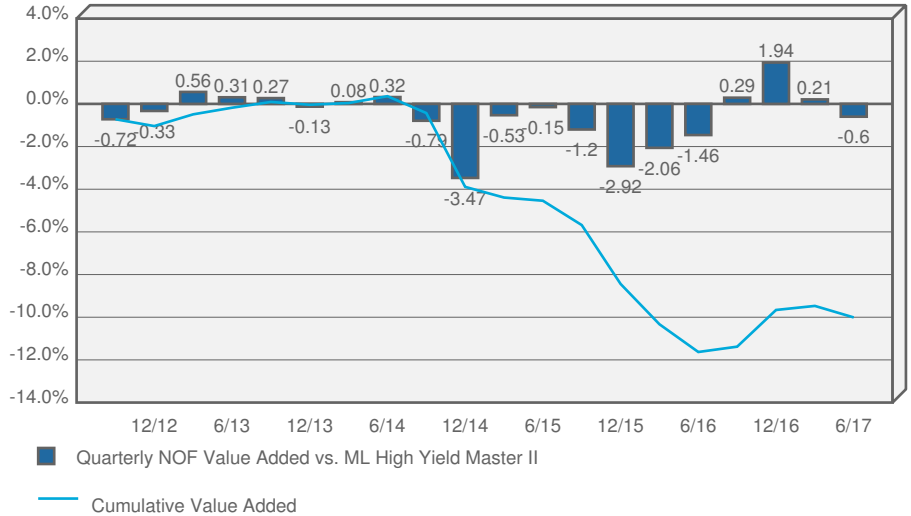
June 30, 2017

Cumulative Skill Analysis vs Benchmark

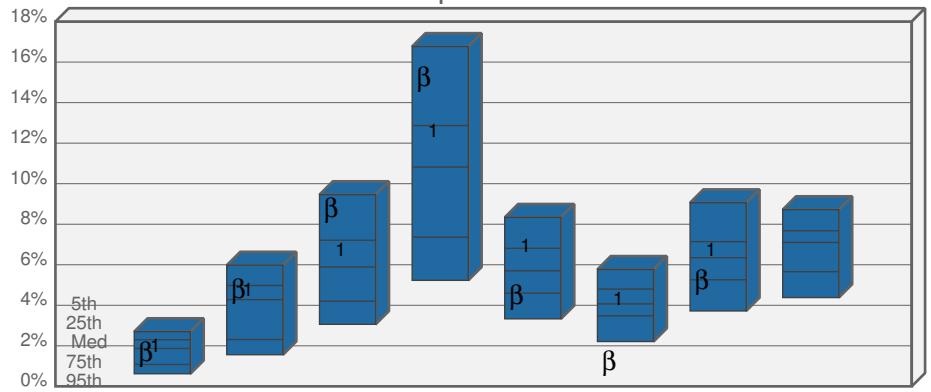


Excess Return:	-2.10	Information Ratio:	-0.84
Excess Risk:	2.49	T-Stat:	-1.88

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
β PENN Capital H	1.70 (55)	4.82 (31)	8.83 (7)	15.28 (8)	4.51 (77)	1.25 (97)	5.26 (75)	
1 ML High Yield	2.14 (33)	4.91 (28)	6.89 (28)	12.75 (25)	7.09 (19)	4.48 (33)	6.91 (32)	
Median	1.87	4.28	5.89	10.82	5.70	4.07	6.35	7.10
Number of Funds	223	223	221	220	216	206	188	127

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

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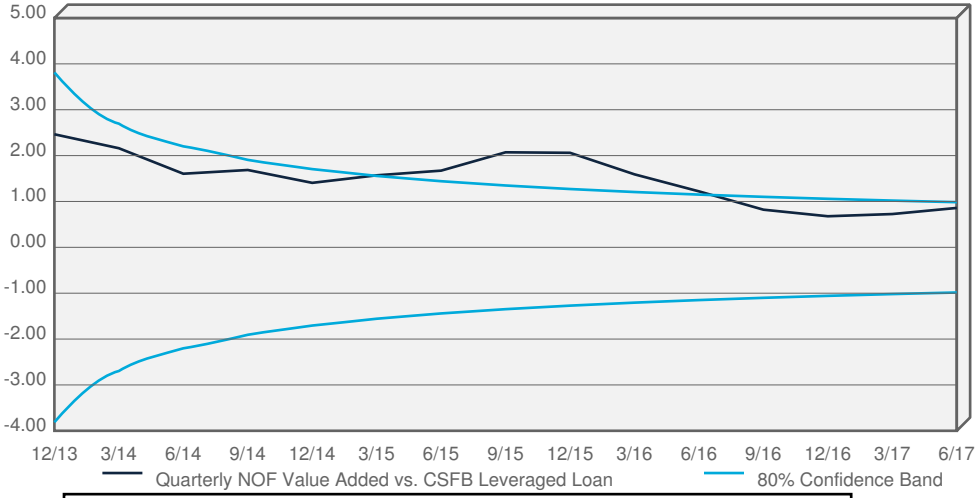
INVESTMENT MANAGER ANALYSIS

Sound Point

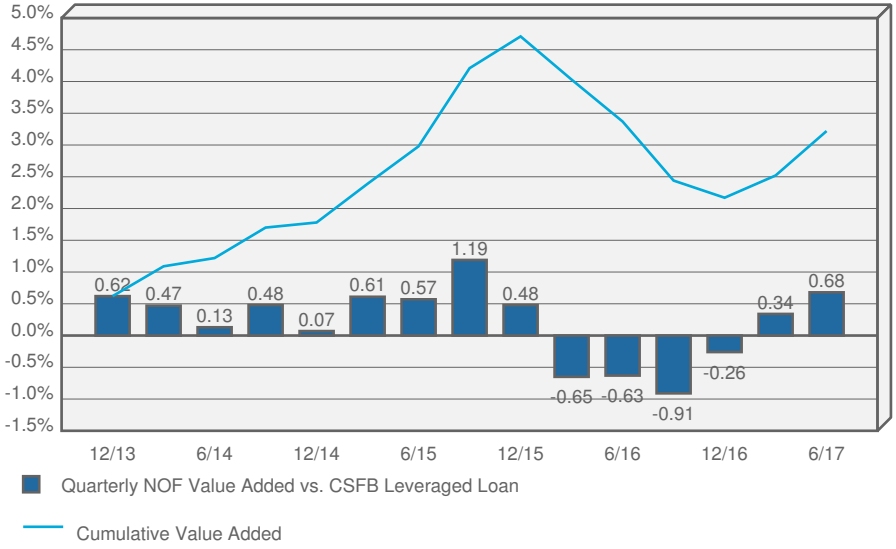
June 30, 2017

Cumulative Skill Analysis vs Benchmark



Excess Return:	0.86	Information Ratio:	0.74
Excess Risk:	1.16	T-Stat:	1.28

Value-Added Analysis vs Benchmark



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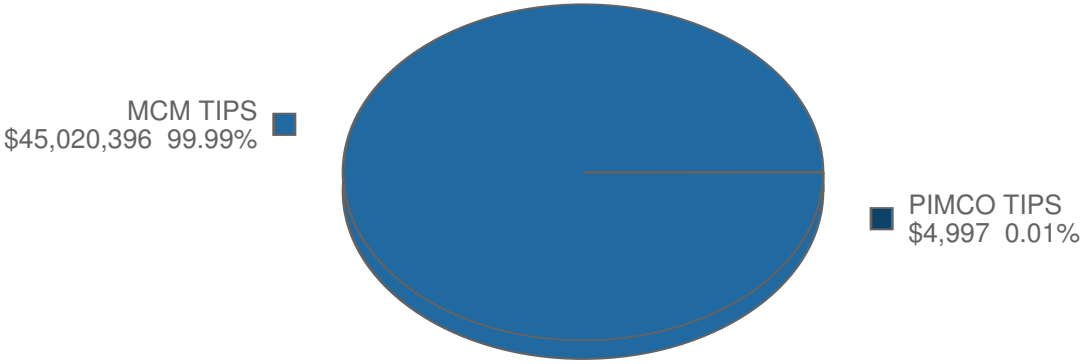
TIPS

Wilshire Consulting

MANAGER ALLOCATION

TIPS Fixed Composite

As of June 30, 2017



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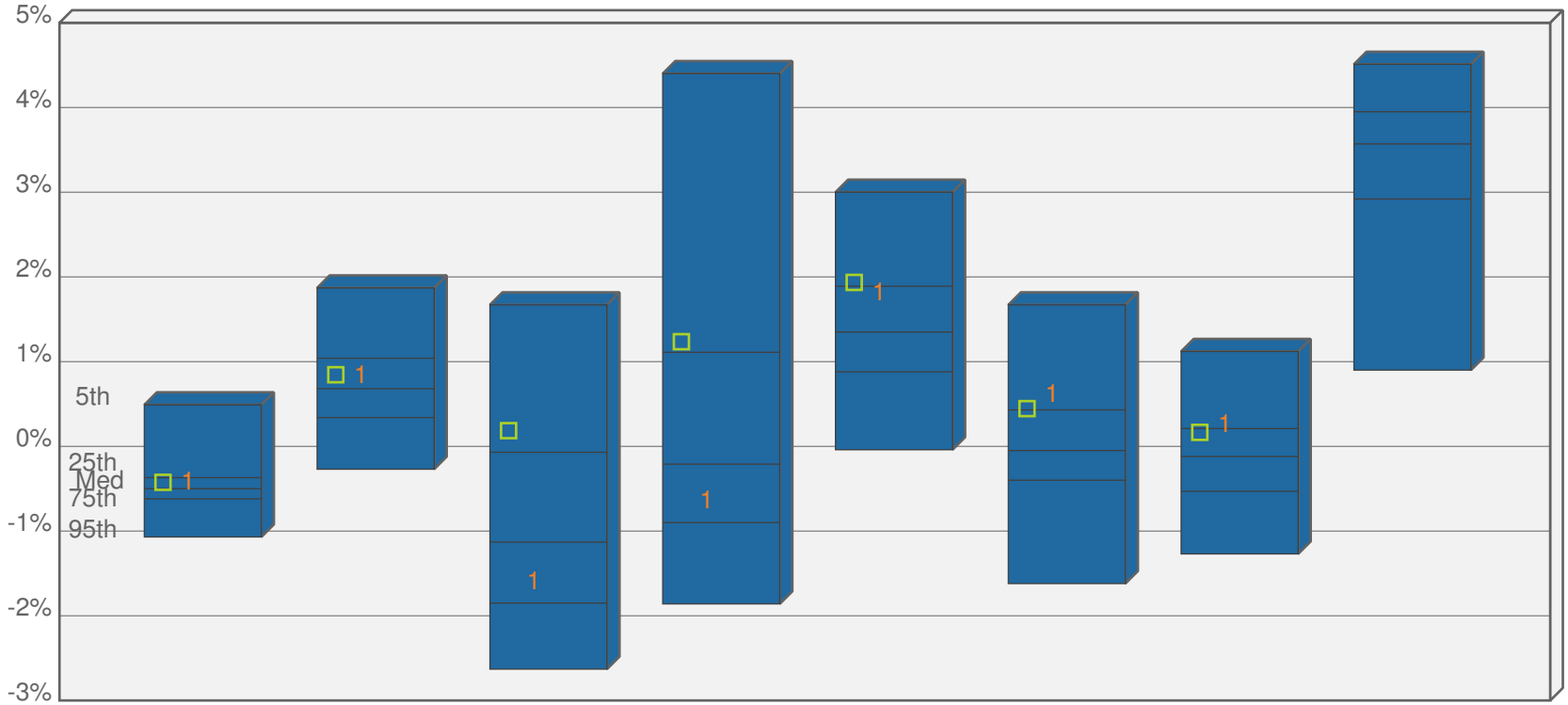
PERFORMANCE COMPARISON

TIPS Fixed Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
□ TIPS Fixed Composite	-0.41 (32)	0.86 (34)	0.20 (16)	1.25 (21)	1.95 (21)	0.46 (24)	0.18 (29)	
1 Bloomberg U.S. T	-0.40 (28)	0.85 (35)	-1.58 (62)	-0.63 (62)	1.83 (26)	0.63 (16)	0.27 (19)	
5th %tile	0.49	1.87	1.67	4.40	3.00	1.67	1.12	4.51
25th %tile	-0.37	1.04	-0.07	1.11	1.89	0.43	0.21	3.95
Median	-0.50	0.68	-1.13	-0.21	1.35	-0.05	-0.12	3.57
75th %tile	-0.62	0.34	-1.85	-0.90	0.88	-0.40	-0.53	2.92
95th %tile	-1.07	-0.27	-2.63	-1.86	-0.04	-1.62	-1.27	0.90
Number of Funds	255	247	240	239	229	208	170	105

*Total Returns of TIPS Mutual Funds Universe - Net of Fees

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
MCM TIPS									
Net of Fee Return	**-0.41**	**0.86**						**12/31/16**	**0.86**
Bloomberg U.S. TIPS	-0.40	0.85						12/31/16	0.85
Value Added	-0.00	0.01						12/31/16	0.01
TIPS Fixed Composite									
Net of Fee Return	**-0.41**	**0.86**	**0.20**	**1.25**	**0.46**	**0.18**		**3/31/08**	**3.07**
Bloomberg U.S. TIPS	-0.40	0.85	-1.58	-0.63	0.63	0.27		3/31/08	3.02
Value Added	-0.00	0.01	1.78	1.88	-0.18	-0.08		3/31/08	0.05

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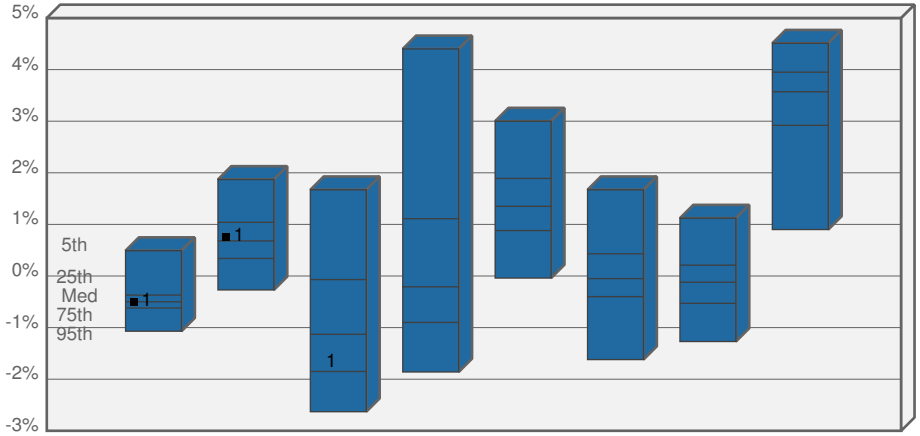
INVESTMENT MANAGER ANALYSIS

MCM TIPS

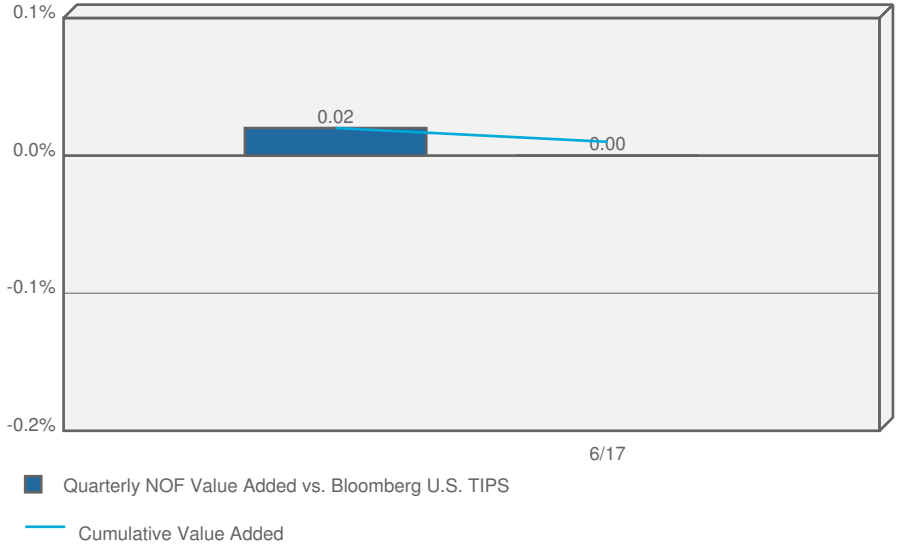
June 30, 2017

Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ MCM TIPS	-0.41 (32)	0.86 (34)						
1 Bloomberg U.S.	-0.40 (28)	0.85 (35)	-1.58 (62)					
Median	-0.50	0.68	-1.13	-0.21	1.35	-0.05	-0.12	3.57
Number of Funds	255	247	240	239	229	208	170	105

Value-Added Analysis vs Benchmark



*Lipper Total Returns of TIPS Mutual Funds Universe - Net of Fees

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COMMODITIES

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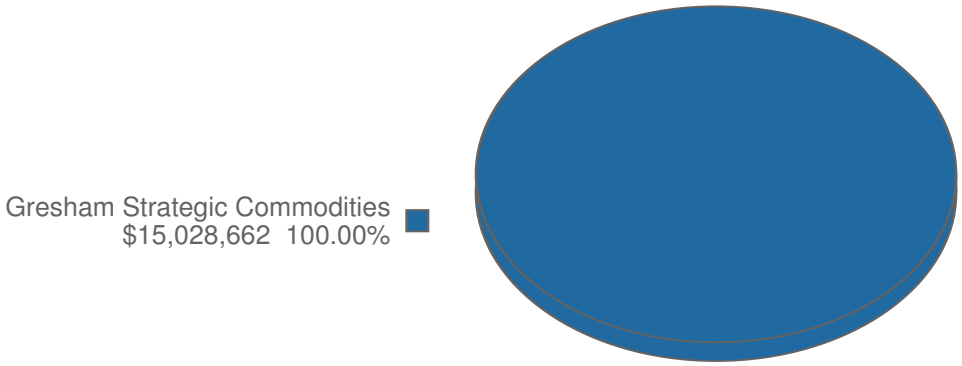
MANAGER ALLOCATION

Commodities Composite

As of June 30, 2017



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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Gresham Strategic Commodities									
Net of Fee Return	**-3.17**	**-5.20**	**-0.95**	**-5.02**	**-15.36**	**-9.04**	**-5.78**	**3/31/07**	**-5.48**
Bloomberg Commodity Index	-3.00	-5.26	-2.74	-6.50	-14.81	-9.25	-6.49	3/31/07	-6.35
Value Added	-0.17	0.06	1.79	1.48	-0.55	0.21	0.72	3/31/07	0.87
Commodities Composite									
Net of Fee Return	**-3.17**	**-5.20**	**-0.95**	**-5.02**	**-15.15**	**-8.20**	**-5.34**	**3/31/07**	**-5.05**
Bloomberg Commodity Index	-3.00	-5.26	-2.74	-6.50	-14.81	-9.25	-6.49	3/31/07	-6.35
Value Added	-0.17	0.06	1.79	1.48	-0.35	1.05	1.15	3/31/07	1.30

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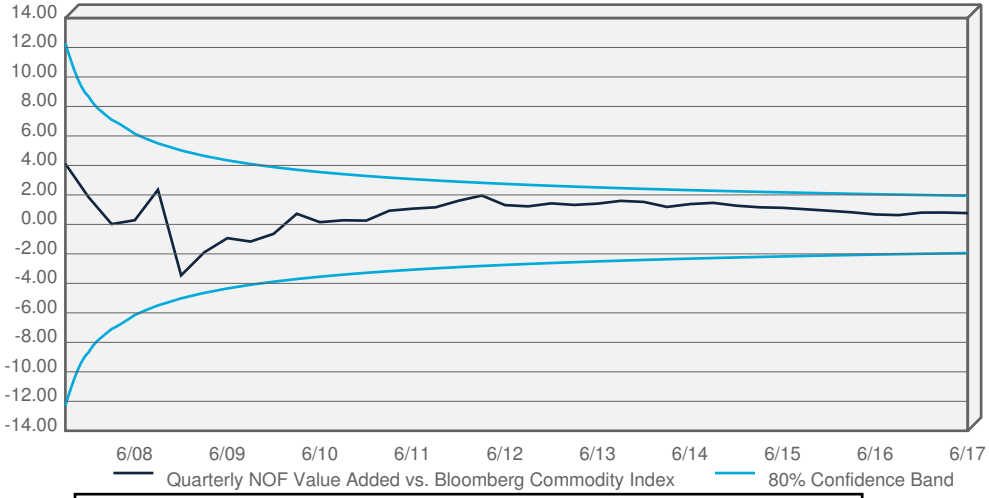
INVESTMENT MANAGER ANALYSIS

Gresham Strategic Commodities

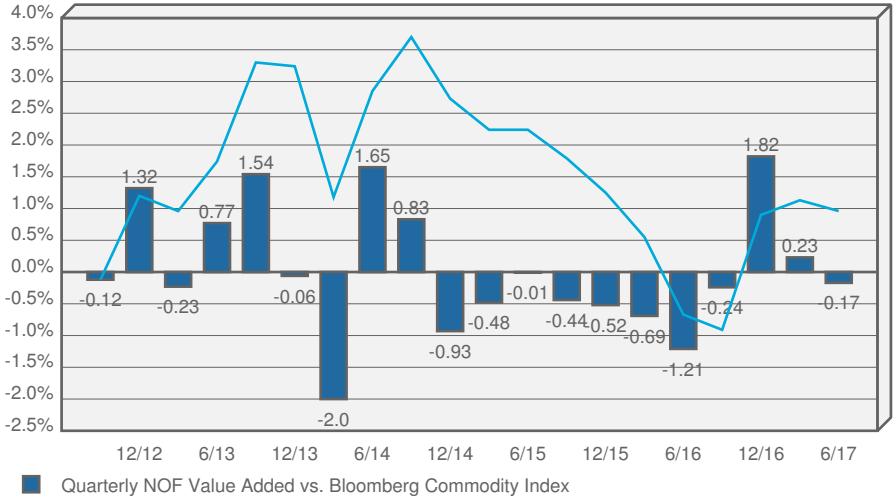
June 30, 2017

Cumulative Skill Analysis vs Benchmark



Excess Return:	0.77	Information Ratio:	0.20
Excess Risk:	3.74	T-Stat:	0.65

Value-Added Analysis vs Benchmark



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REAL ESTATE

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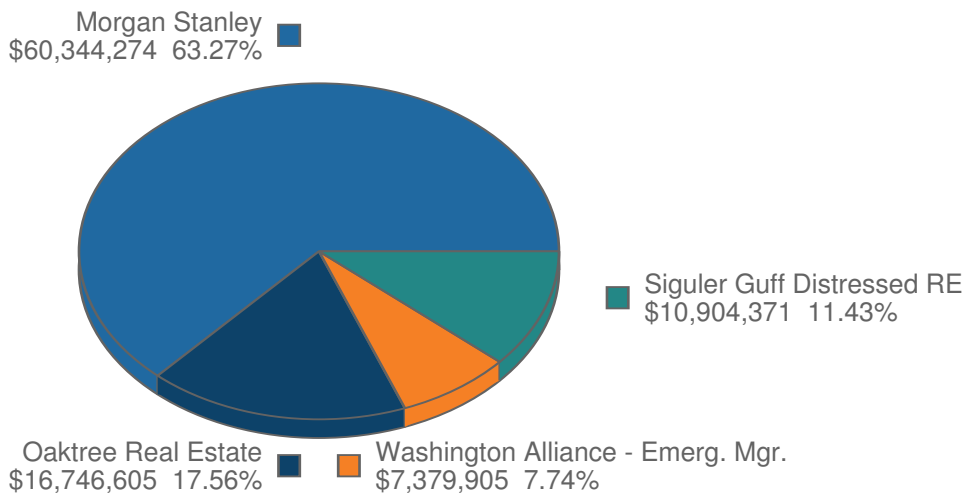
MANAGER ALLOCATION

Real Estate Composite

As of June 30, 2017



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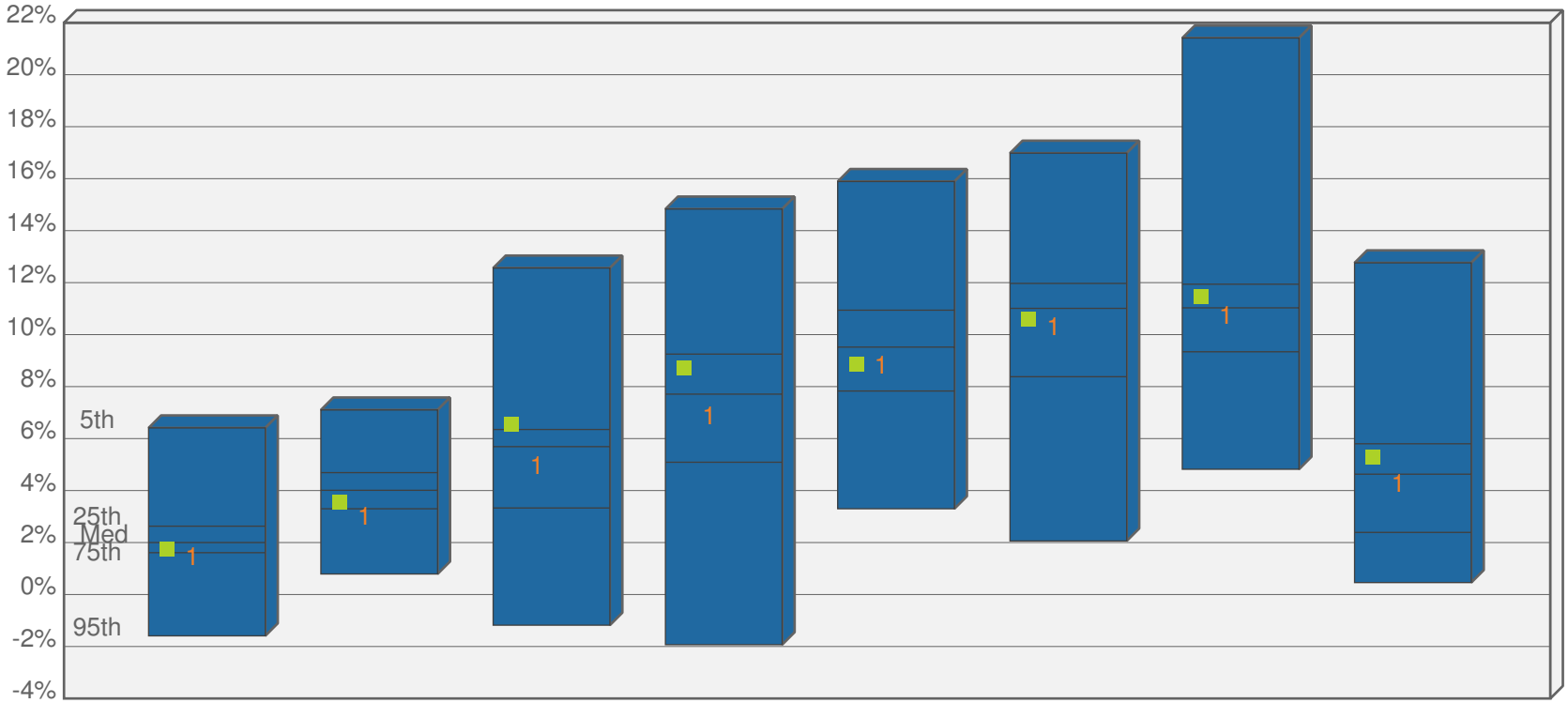
PERFORMANCE COMPARISON

Real Estate Composite

Periods Ended June 30, 2017



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ Real Estate Composite	1.78 (69)	3.61 (65)	6.60 (20)	8.76 (29)	8.92 (58)	10.64 (55)	11.51 (37)	5.35 (28)
1 NCREIF ODCE NOF	1.47 (77)	3.03 (81)	4.97 (67)	6.89 (67)	8.83 (60)	10.32 (60)	10.76 (56)	4.28 (53)
5th %tile	6.41	7.10	12.56	14.83	15.89	16.98	21.41	12.76
25th %tile	2.63	4.69	6.35	9.25	10.94	11.97	11.94	5.80
Median	2.00	4.01	5.69	7.71	9.52	11.01	11.03	4.63
75th %tile	1.61	3.30	3.33	5.09	7.83	8.38	9.34	2.39
95th %tile	-1.59	0.79	-1.18	-1.93	3.30	2.06	4.82	0.46
Number of Funds	70	67	66	65	60	57	49	30

*TUCS Total Ret of Real Estate Investment Pools Universe - Gross of Fees

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PERFORMANCE COMPARISON

Trailing Returns

Periods Ended June 30, 2017

	Quarter	2 Quarters	3 Quarters	1 Year	3 Years	5 Years	10 Years	Incept Date	Incept Ret
Morgan Stanley									
Net of Fee Return	**2.23**	**4.20**	**6.70**	**9.12**	**12.13**	**12.88**	**5.50**	**3/31/03**	**8.95**
NCREIF ODCE NOF	1.47	3.03	4.97	6.89	10.32	10.76	4.28	3/31/03	7.31
Value Added	0.76	1.17	1.73	2.23	1.81	2.12	1.22	3/31/03	1.64
Oaktree Real Estate									
Net of Fee Return	**0.00**	**-0.42**	**1.12**	**1.12**	**8.46**			**9/30/13**	**6.04**
Siguler Guff Distressed RE									
Net of Fee Return	**0.00**	**4.15**	**4.15**	**10.61**	**3.69**			**3/31/14**	**3.40**
Washington Alliance - Emerg. Mgr.									
Net of Fee Return	**5.18**	**5.18**	**18.61**	**18.61**	**16.64**			**9/30/13**	**11.41**
Real Estate Composite									
Net of Fee Return	**1.78**	**3.54**	**6.28**	**8.44**	**10.34**	**11.19**	**5.20**	**3/31/03**	**8.73**
NCREIF ODCE NOF	1.47	3.03	4.97	6.89	10.32	10.76	4.28	3/31/03	7.31
Value Added	0.31	0.51	1.31	1.54	0.02	0.43	0.91	3/31/03	1.42
ERECT Fund II									
Net of Fee Return	**-2.13**	**-0.82**	**-1.55**	**0.00**	**5.41**	**7.42**	**5.69**	**6/30/05**	**6.53**
Consumer Price Index	0.47	1.46	1.46	1.63	0.92	1.31	1.63	6/30/05	1.94
Value Added	-2.60	-2.28	-3.02	-1.63	4.49	6.11	4.06	6/30/05	4.59
ERECT Composite									
Net of Fee Return	**-2.13**	**-0.82**	**-1.55**	**0.00**	**5.41**	**6.12**		**9/30/10**	**6.21**

Real Estate Composites returns do not include ERECT Funds

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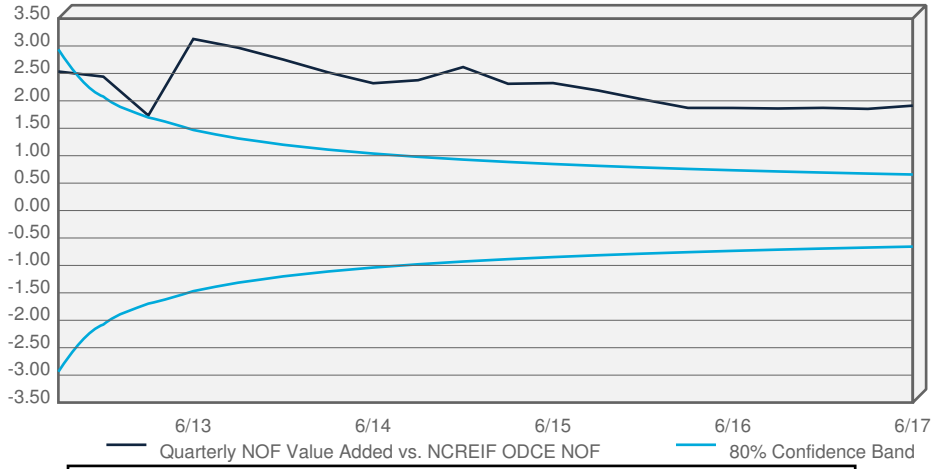
INVESTMENT MANAGER ANALYSIS

Morgan Stanley

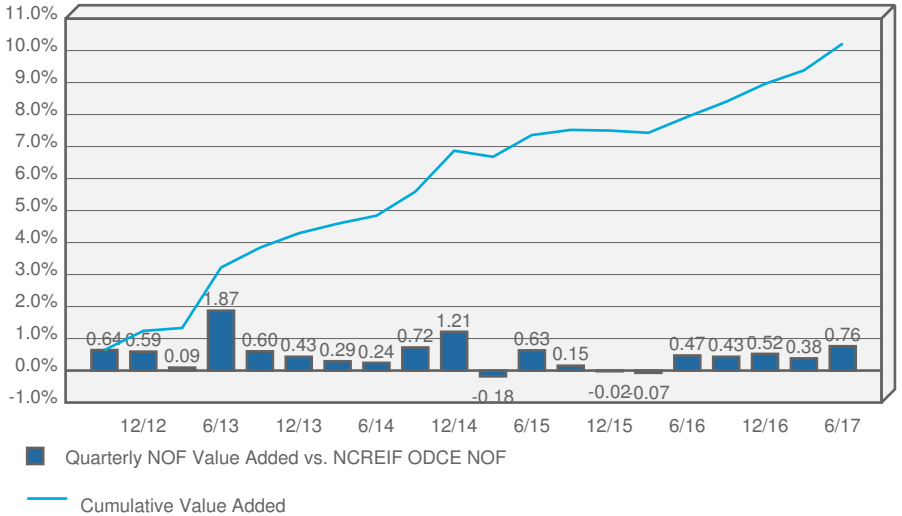
June 30, 2017

Cumulative Skill Analysis vs Benchmark

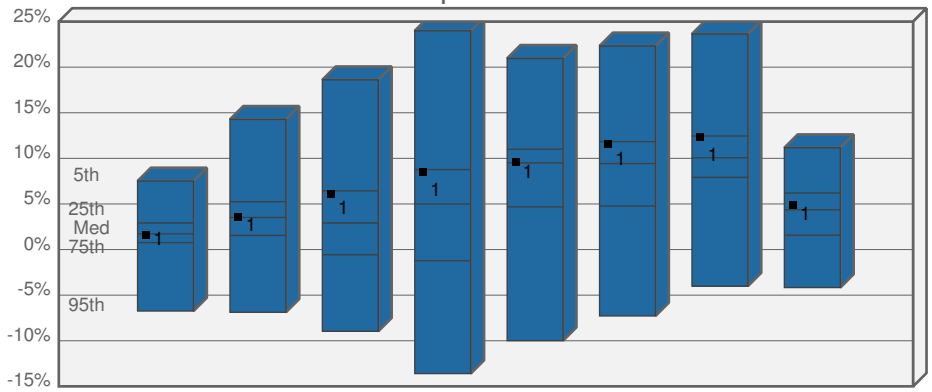


Excess Return:	1.91	Information Ratio:	2.14
Excess Risk:	0.89	T-Stat:	4.79

Value-Added Analysis vs Benchmark

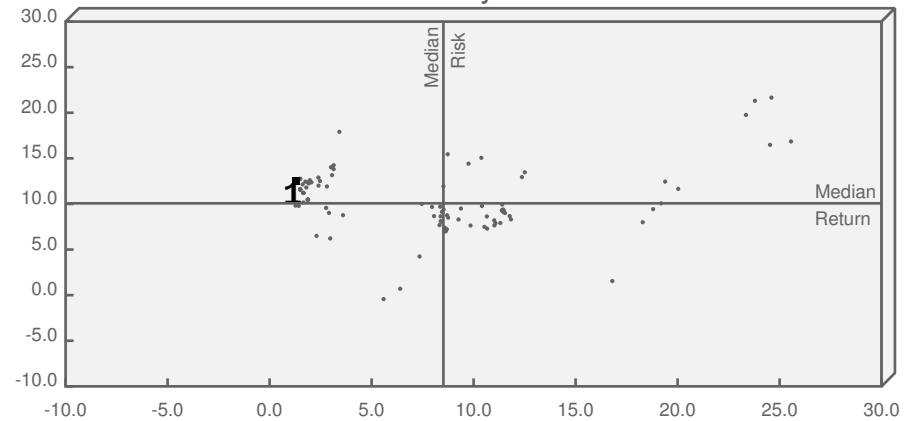


Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ Morgan Stanley	2.23 (37)	4.20 (39)	6.70 (21)	9.12 (23)	10.24 (38)	12.13 (23)	12.88 (22)	5.50 (33)
1 NCREIF ODCE NO	0.47 (62)	3.03 (54)	4.97 (37)	6.89 (41)	8.83 (58)	10.32 (41)	10.76 (42)	4.29 (51)
Median	1.72	3.52	2.91	4.99	9.51	9.43	10.07	4.36
Number of Funds	502	487	481	476	450	413	324	123

Five Year Risk/Return Analysis vs Peer Universe*



Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
Morgan Stanley	■	12.88	22	1.82	90
NCREIF ODCE NOF	1	10.76	42	1.38	99
Median		10.07		8.52	

*Wilcop Total Returns of Real Estate Portfolios Universe - Gross of Fees

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PORTFOLIO RATE OF RETURN

Oaktree Real Estate*

As of June 30, 2017

Quarter	Commitment Value $	Beginning Capital Account	Contribution	Distribution	Appreciation	Expenses	Investment Fees	Ending Capital Account	Internal Rate of Return	Annualized IRR
09/13	20,000	0	9,400	0	0	0	0	9,400	0.00	NA
12/13		9,400	309	1,410	-19	0	309	7,971	-3.76	NA
03/14		7,971	4,000	0	-64	0	0	11,907	-4.16	NA
06/14		11,907	2,074	0	316	0	74	14,223	-1.39	NA
09/14		14,223	74	0	552	0	74	14,775	2.81	2.72
12/14		14,775	1,275	0	925	0	75	16,900	9.56	7.36
03/15		16,900	1,875	0	944	0	75	19,643	15.85	10.08
06/15		19,643	1,075	0	946	0	75	21,590	21.58	11.60
09/15		21,590	2,075	0	771	0	75	24,361	25.63	11.88
12/15		24,361	75	2,490	493	0	75	22,364	27.44	11.20
03/16		22,364	385	600	105	310	75	21,869	27.02	9.90
06/16		21,869	0	913	0	287	0	20,669	26.64	8.85
09/16		20,669	0	0	0	0	0	20,669	26.43	8.03
12/16		20,669	214	2,821	513	0	214	18,362	28.46	7.91
03/17		18,362	200	400	-15	139	61	17,947	28.08	7.25
06/17		17,947	0	964	0	236	0	16,747	28.27	6.80
Total	**20,000**		**23,032**	**9,597**	**5,467**	**973**	**1,182**	**16,747**	**28.27**	**6.80**

*Dollar values are shown in thousands

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PORTFOLIO RATE OF RETURN

Washington Alliance - Emerg. Mgr.*

As of June 30, 2017

Quarter	Commitment Value $	Beginning Capital Account	Contribution	Distribution	Appreciation	Expenses	Investment Fees	Ending Capital Account	Internal Rate of Return	Annualized IRR
09/13	5,000	0	1,376	0	0	0	0	1,376	0.00	NA
12/13		1,376	203	0	0	0	0	1,579	0.00	NA
03/14		1,579	819	0	0	0	0	2,397	0.00	NA
06/14		2,397	7	27	-124	0	7	2,246	-6.89	NA
09/14		2,246	1,810	90	200	0	0	4,166	3.25	3.21
12/14		4,166	0	152	95	0	0	4,109	6.55	5.14
03/15		4,109	0	0	0	0	0	4,109	6.00	3.93
06/15		4,109	803	0	462	0	11	5,363	20.84	11.34
09/15		5,363	0	200	355	0	0	5,519	31.06	14.38
12/15		5,519	0	214	160	0	0	5,465	34.65	14.03
03/16		5,465	0	0	0	0	0	5,465	33.58	12.20
06/16		5,465	829	0	0	0	0	6,294	32.68	10.77
09/16		6,294	0	200	0	0	0	6,094	31.56	9.52
12/16		6,094	0	0	778	0	0	6,872	52.51	13.78
03/17		6,872	371	227	0	0	0	7,016	51.32	12.51
06/17		7,016	0	0	364	0	0	7,380	60.03	13.30
Total	**5,000**		**6,218**	**1,110**	**2,290**	**0**	**18**	**7,380**	**60.03**	**13.30**

*Dollar values are shown in thousands

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PORTFOLIO RATE OF RETURN

Siguler Guff Distressed RE*

As of June 30, 2017

Quarter	Commitment Value $	Beginning Capital Account	Contribution	Distribution	Appreciation	Expenses	Investment Fees	Ending Capital Account	Internal Rate of Return	Annualized IRR
03/14	15,000	0	4,200	0	0	0	0	4,200	0.00	NA
06/14		4,200	0	900	0	0	0	3,300	0.00	NA
09/14		3,300	900	0	141	0	0	4,341	3.60	NA
12/14		4,341	900	0	-8	0	0	5,233	3.28	NA
03/15		5,233	0	462	0	0	0	4,771	3.13	2.83
06/15		4,771	690	2	-61	0	0	5,398	1.67	1.23
09/15		5,398	2,250	2	-182	0	0	7,465	-2.36	-1.48
12/15		7,465	375	2	108	0	0	7,946	-0.03	-0.02
03/16		7,946	465	2	0	0	0	8,409	-0.03	-0.01
06/16		8,409	1,163	2	0	0	0	9,570	-0.03	-0.01
09/16		9,570	264	2	609	0	0	10,441	9.88	3.67
12/16		10,441	570	186	0	0	0	10,826	9.37	3.18
03/17		10,826	0	2	450	0	0	11,273	15.70	4.80
06/17		11,273	0	369	0	0	0	10,904	15.15	4.29
Total	**15,000**		**11,776**	**1,930**	**1,058**	**0**	**0**	**10,904**	**15.15**	**4.29**

*Dollar values are shown in thousands

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ALTERNATIVE INVESTMENTS

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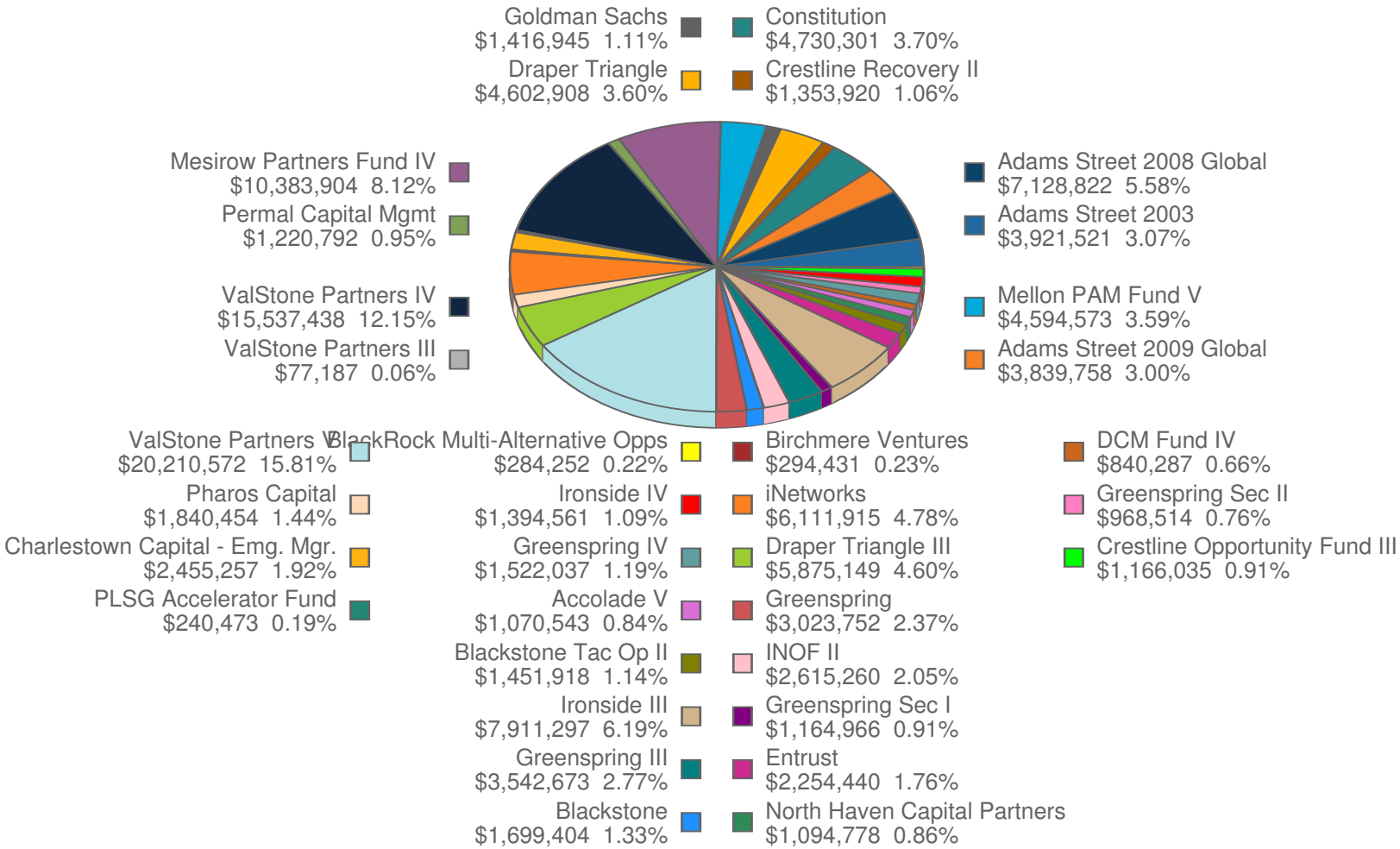
MANAGER ALLOCATION

Private Equity Composite

As of June 30, 2017



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