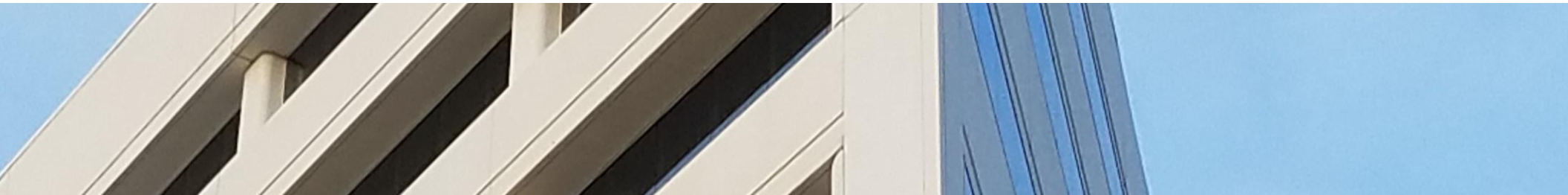




WILSHIRE ASSOCIATES

Wilshire Consulting



Police and Fire Retirement System

Executive Summary of Investment Performance

December 31, 2018

Wilshire Consulting
Contents

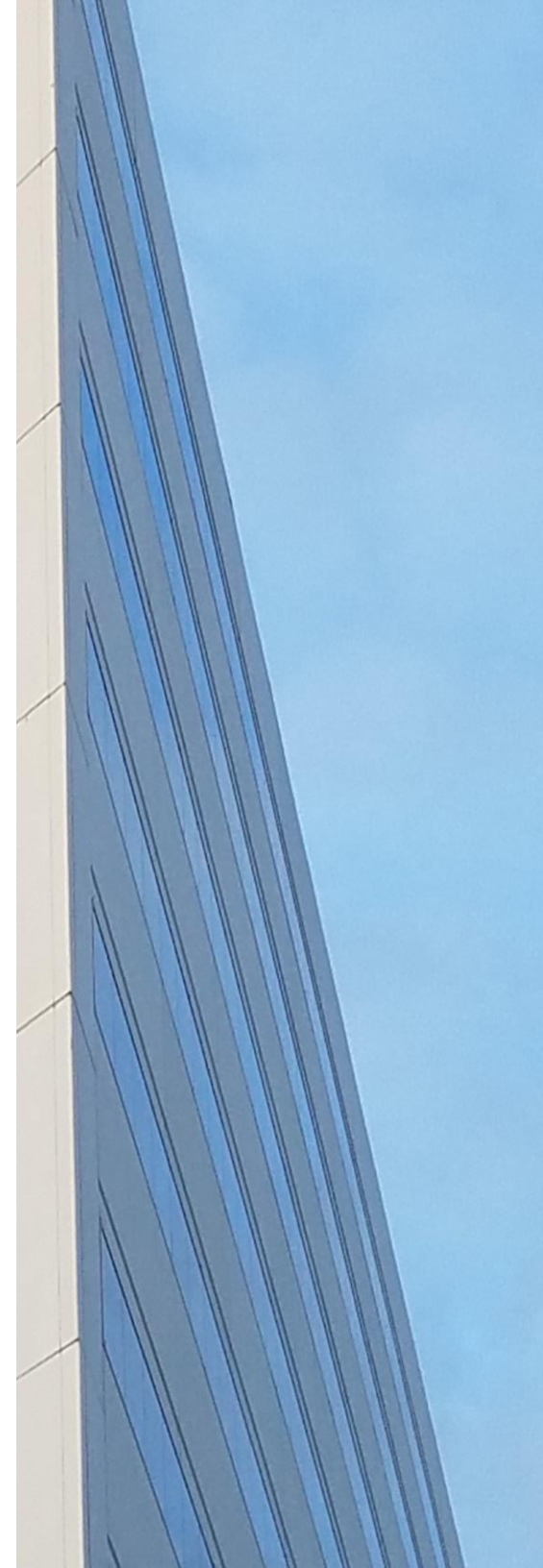
Capital Market Review

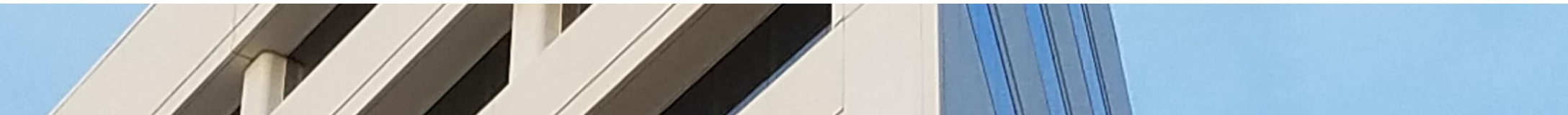
Tab 1

Investment Performance

Tab 2

Appendix





CAPITAL MARKET REVIEW

MARKET COMMENTARY

U.S. Equity

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

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

Non-U.S. Equity

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

Fixed Income

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

ASSET CLASS PERFORMANCE

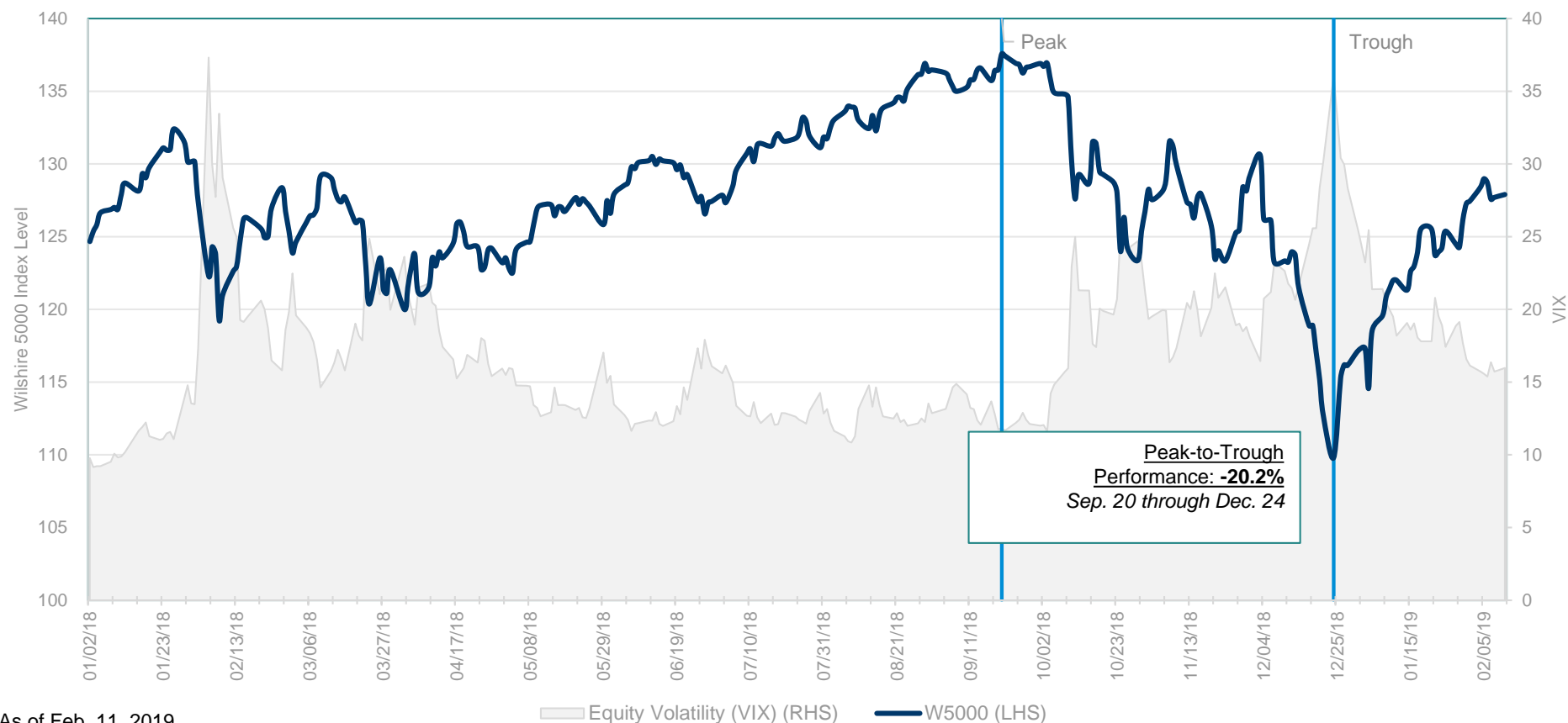
ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 12/2018
2013	2014	2015	2016	2017	2018 YTD	
U.S. Equity 33.1%	REITs 31.8%	REITs 4.2%	MLPs 18.3%	Emrg Mrkts 37.7%	T-Bills 1.9%	U.S. Equity 8.1%
MLPs 27.6%	U.S. Equity 12.7%	U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	Core Bond 0.0%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

Data sources: Wilshire Compass

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

YEAREND ENVIRONMENT

Equity Market Performance & Volatility



	1Q-18	2Q-18	3Q-18	4Q-18	2018 Calendar Year	2019 Calendar YTD	U.S. Equity Market Peak-Trough	Since U.S. Equity Market Bottom
U.S. Stocks	-0.8	3.8	7.4	-14.3	-5.3	9.2	-20.2	16.5
Non-U.S. Stocks	-1.2	-2.6	0.7	-11.5	-14.2	6.1	-12.6	7.5
Core Bonds	-1.5	-0.2	0.0	1.6	0.0	1.1	1.6	1.4

Note: U.S. Stocks (Wilshire 5000 Total market Index), Non-U.S. Stocks (MSCI ACWI x-U.S.), Core Bonds (Bloomberg Barclays Aggregate).

Wilshire Consulting

DECEMBER 2018 ASSET CLASS ASSUMPTIONS

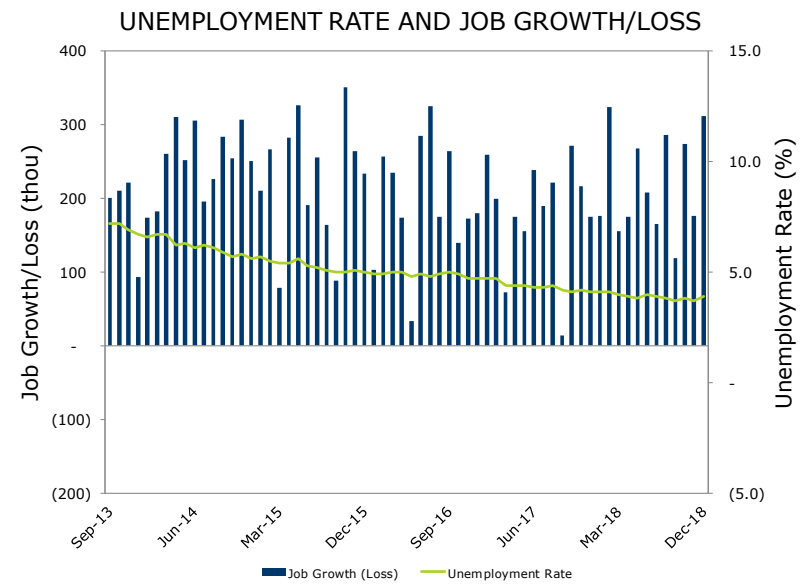
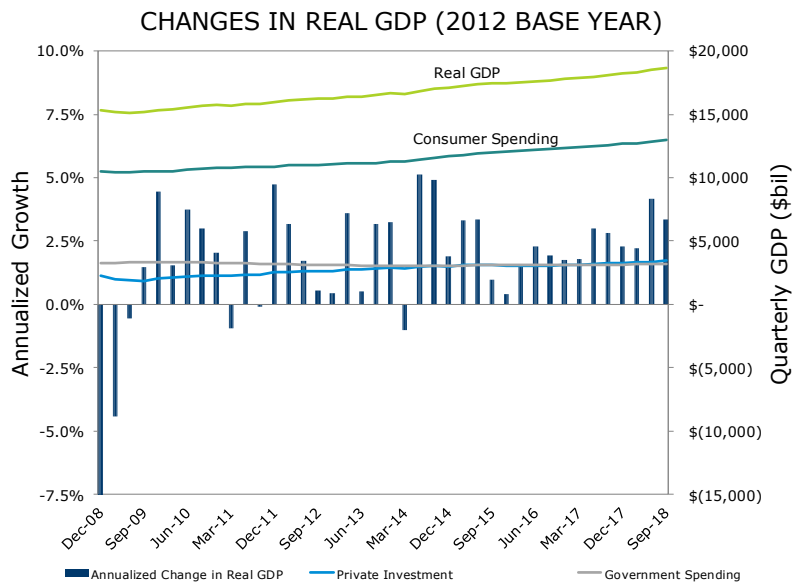
	EQUITY						FIXED INCOME						REAL ASSETS					
	US STOCK	DEV EX-US STOCK	EMG MRKT STOCK	GLOBAL		PRIVATE EQUITY	CASH	CORE BOND	LT		HIGH YIELD	NON-US BOND (HDG)	REAL ESTATE			REAL ASSETS	US CPI	
		EX-US STOCK	GLOBAL STOCK	EX-US STOCK	GLOBAL STOCK				CORE BOND	US TIPS			US RES	GLOBAL RES	PRIVATE RE			CMDTY
EXPECTED COMPOUND RETURN (%)	7.00	7.50	7.50	7.75	7.45	10.05	2.65	3.85	4.25	3.00	5.90	1.25	5.65	5.85	6.65	4.35	6.40	1.70
EXPECTED ARITHMETIC RETURN (%)	8.30	8.95	10.45	9.35	8.75	13.35	2.65	4.00	4.70	3.15	6.35	1.30	7.00	7.00	7.55	5.40	6.75	1.70
EXPECTED RISK (%)	17.00	18.00	26.00	18.80	17.05	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75
CASH YIELD (%)	2.15	3.50	2.50	3.25	2.65	0.00	2.65	4.05	5.00	3.55	8.95	1.80	4.40	4.40	2.70	2.65	3.00	0.00
CORRELATIONS																		
US STOCK	1.00																	
DEV EX-US STOCK (USD)	0.81	1.00																
EMERGING MARKET STOCK	0.74	0.74	1.00															
GLOBAL EX-US STOCK	0.83	0.96	0.86	1.00														
GLOBAL STOCK	0.94	0.92	0.82	0.94	1.00													
PRIVATE EQUITY	0.74	0.64	0.62	0.67	0.74	1.00												
CASH EQUIVALENTS	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
CORE BOND	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00										
LT CORE BOND	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.93	1.00									
US TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.60	0.47	1.00								
HIGH YIELD BOND	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00							
NON-US BOND (HDG)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.66	0.39	0.26	1.00						
US RE SECURITIES	0.59	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00					
GLOBAL RE SECURITIES	0.65	0.59	0.56	0.62	0.66	0.58	-0.05	0.17	0.22	0.11	0.62	0.03	0.94	1.00				
PRIVATE REAL ESTATE	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.77	0.76	1.00			
COMMODITIES	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00		
REAL ASSET BASKET	0.42	0.43	0.50	0.48	0.47	0.43	0.01	0.24	0.25	0.41	0.53	0.06	0.65	0.69	0.69	0.59	1.00	
INFLATION (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	-0.08	0.05	0.03	0.05	0.44	0.26	1.00

ECONOMIC REVIEW

AS OF DEC. 31, 2018 KEY ECONOMIC INDICATORS

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

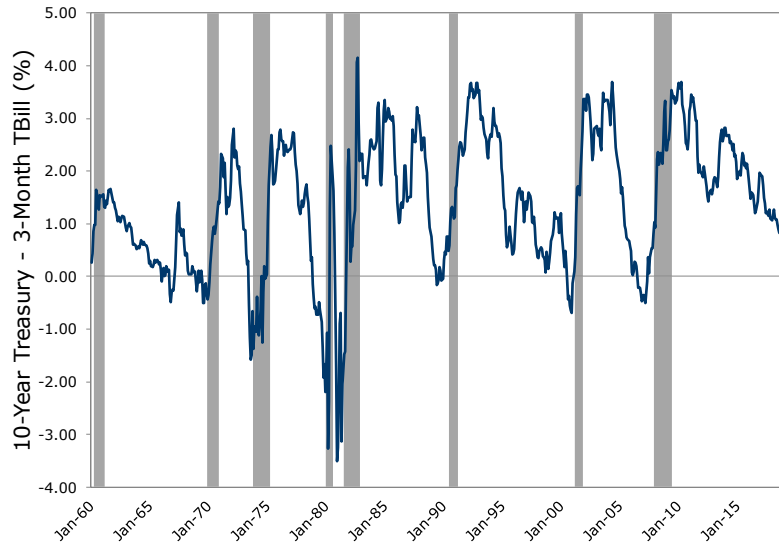
Note: Seasonally adjusted CPI data is utilized to better reflect short-term pricing activity.



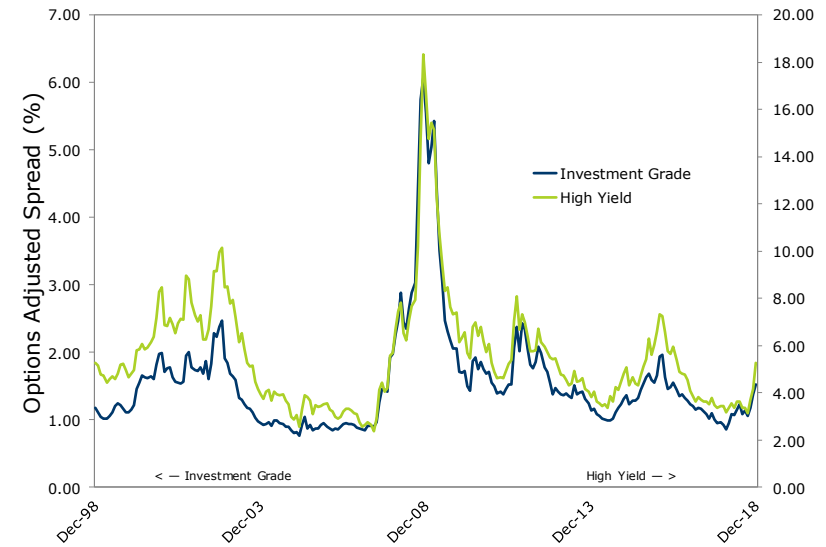
Data sources: Bureau of Labor Statistics, U.S. Treasury, University of Michigan, Institute for Supply Management, Bureau of Economic Analysis

RISK MONITOR

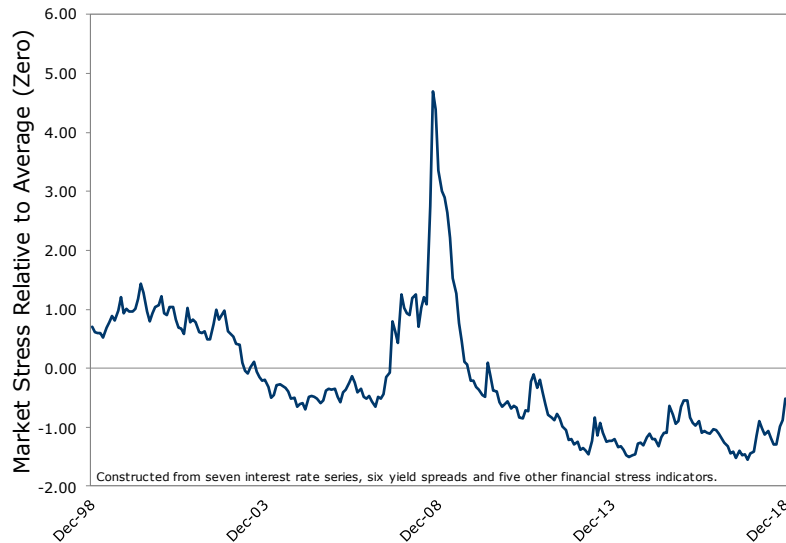
YIELD CURVE SLOPE VS RECESSIONS (IN GRAY)



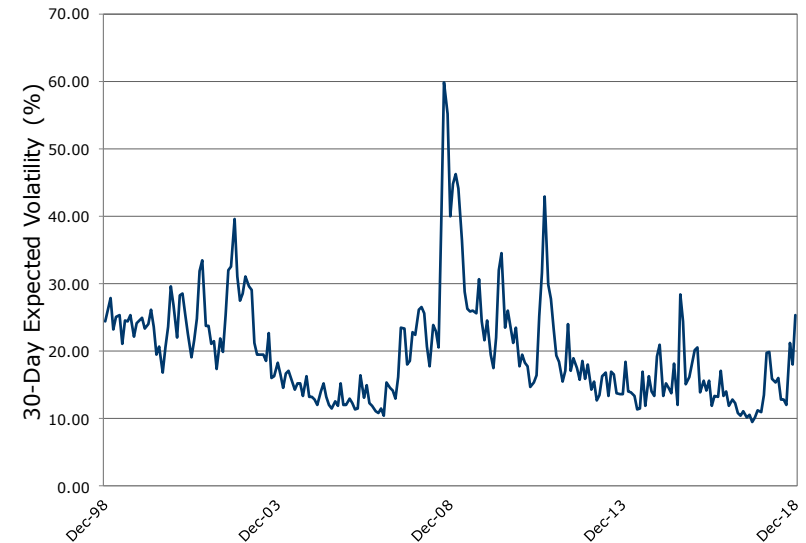
BLOOMBERG BARCLAYS CREDIT INDEXES



ST. LOUIS FED FINANCIAL STRESS INDEX



CBOE VOLATILITY INDEX



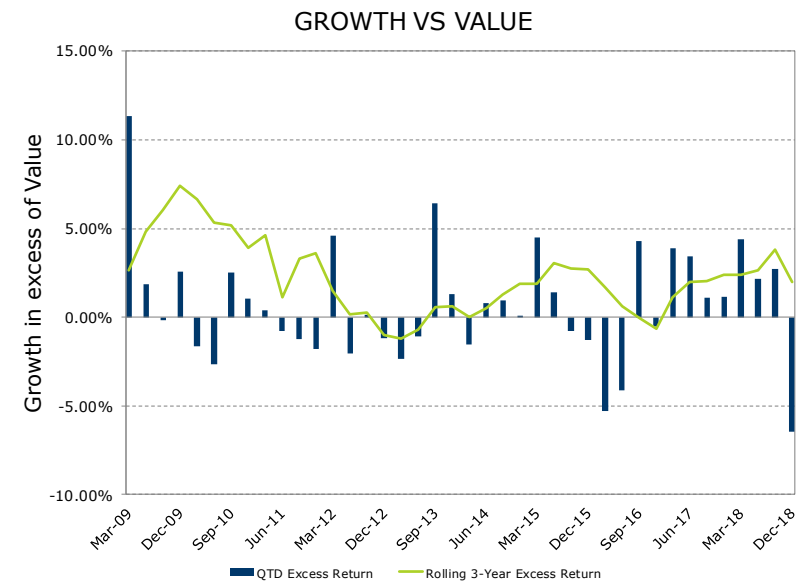
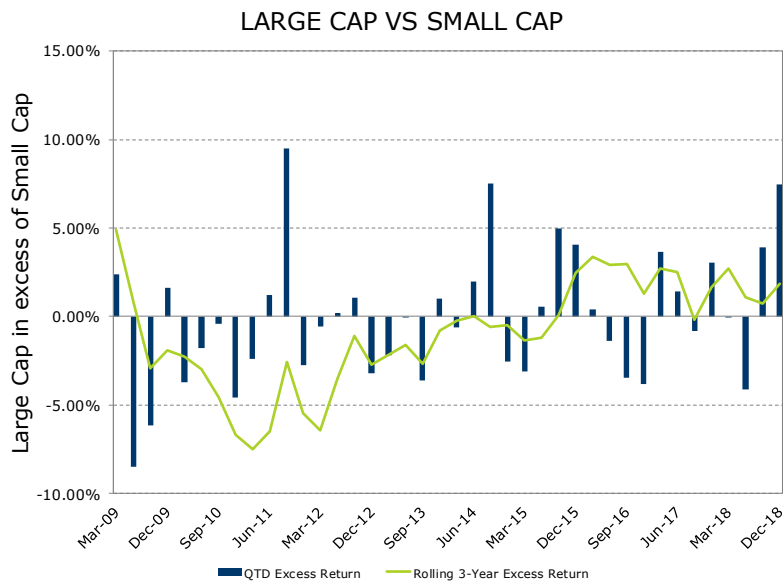
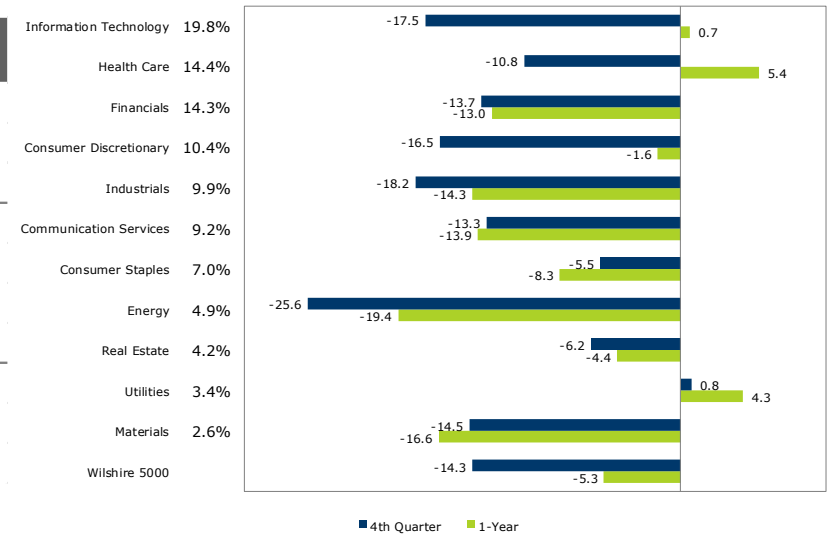
Data sources: Federal Reserve, Bloomberg Barclays

Wilshire Consulting

U.S. EQUITY MARKET

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

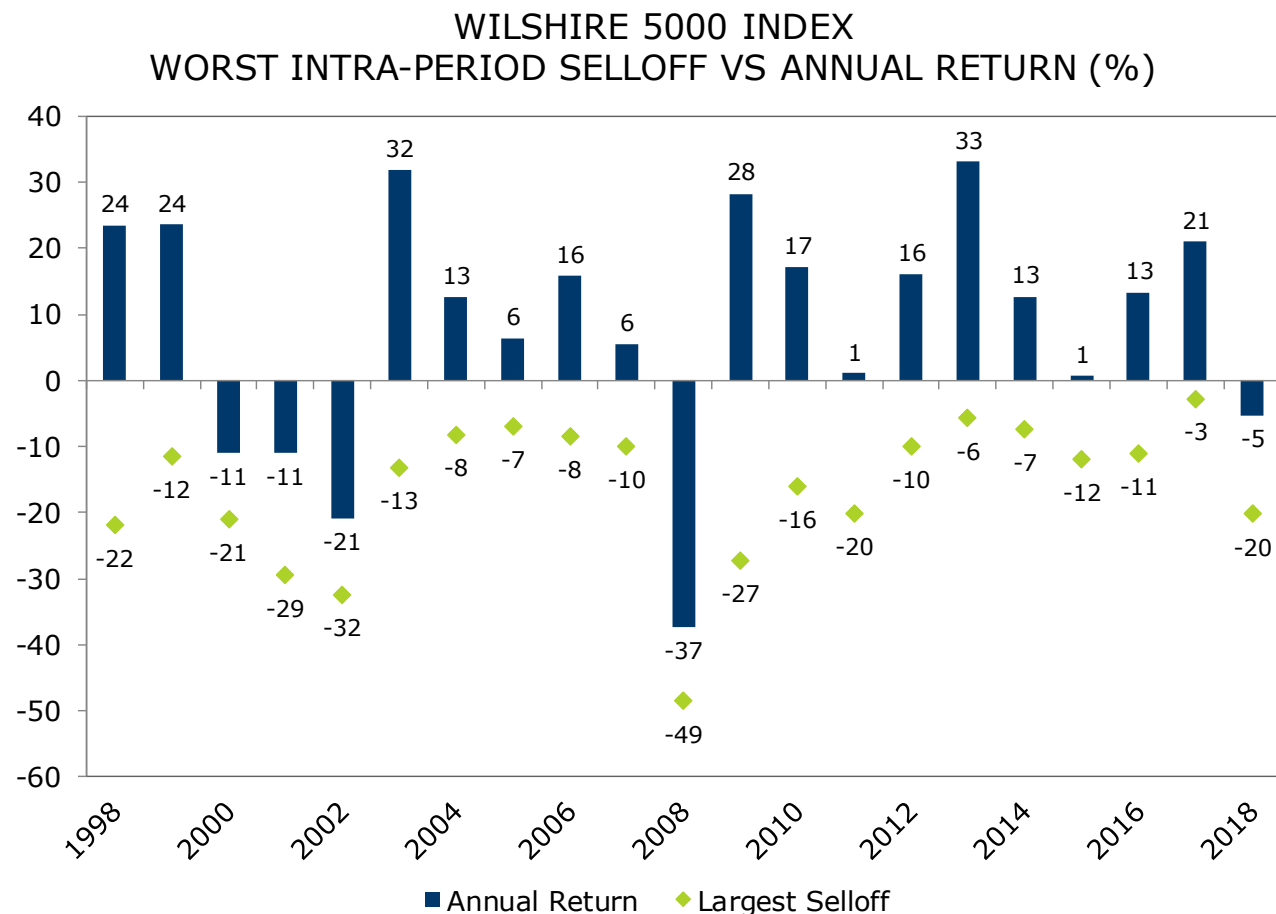
WILSHIRE 5000 SECTOR WEIGHT & RETURN (%)



Data sources: Wilshire Compass, Wilshire Atlas

ANNUAL EQUITY RETURNS

- 2018 was the first down year for the Wilshire 5000 Index since the global financial crisis
- While it was the mildest negative return in two decades, the market briefly entered a technical bear market (-20%) in late December



Wilshire Consulting

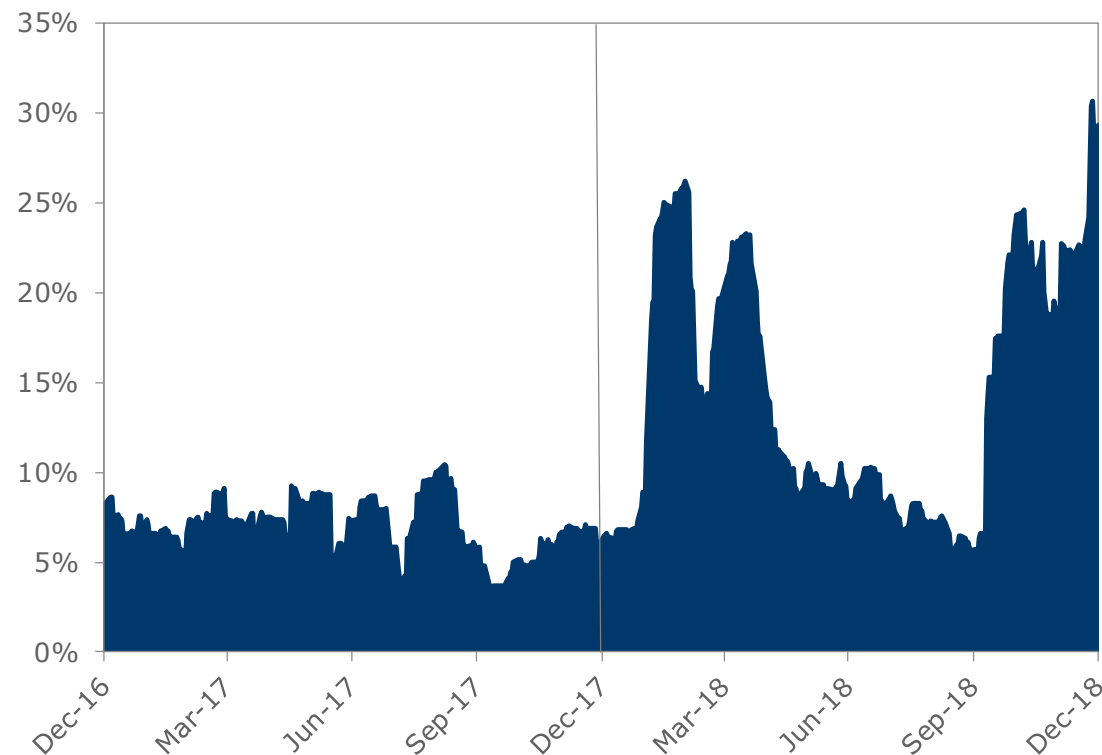
EQUITY VOLATILITY

- Volatility returned to the equity markets after a tranquil 2017
- Investor concerns included monetary tightening, global trade and future economic growth

Since 1980	Year	Annual Volatility	Largest Drawdown	Number of Days Down:				Worst Down Day
				1%	2%	3%	4%	
Universe Statistics	Max Risk	40.56%	-48.54%	71	42	24	17	-17.23%
	Avg	15.48%	-13.97%	28.2	7.7	2.3	1.0	-4.00%
	Med	13.33%	-9.95%	23.0	4.0	1.0	0.0	-3.34%
	Min Risk	6.96%	-2.74%	3	0	0	0	-1.36%
2017	Level	6.96%	-2.75%	4	0	0	0	-1.85%
	Rank	1	2	2	1	1	1	7
2018	Level	16.86%	-20.18%	32	15	5	1	-4.02%
	Rank	29	31	25	33	32	27	27

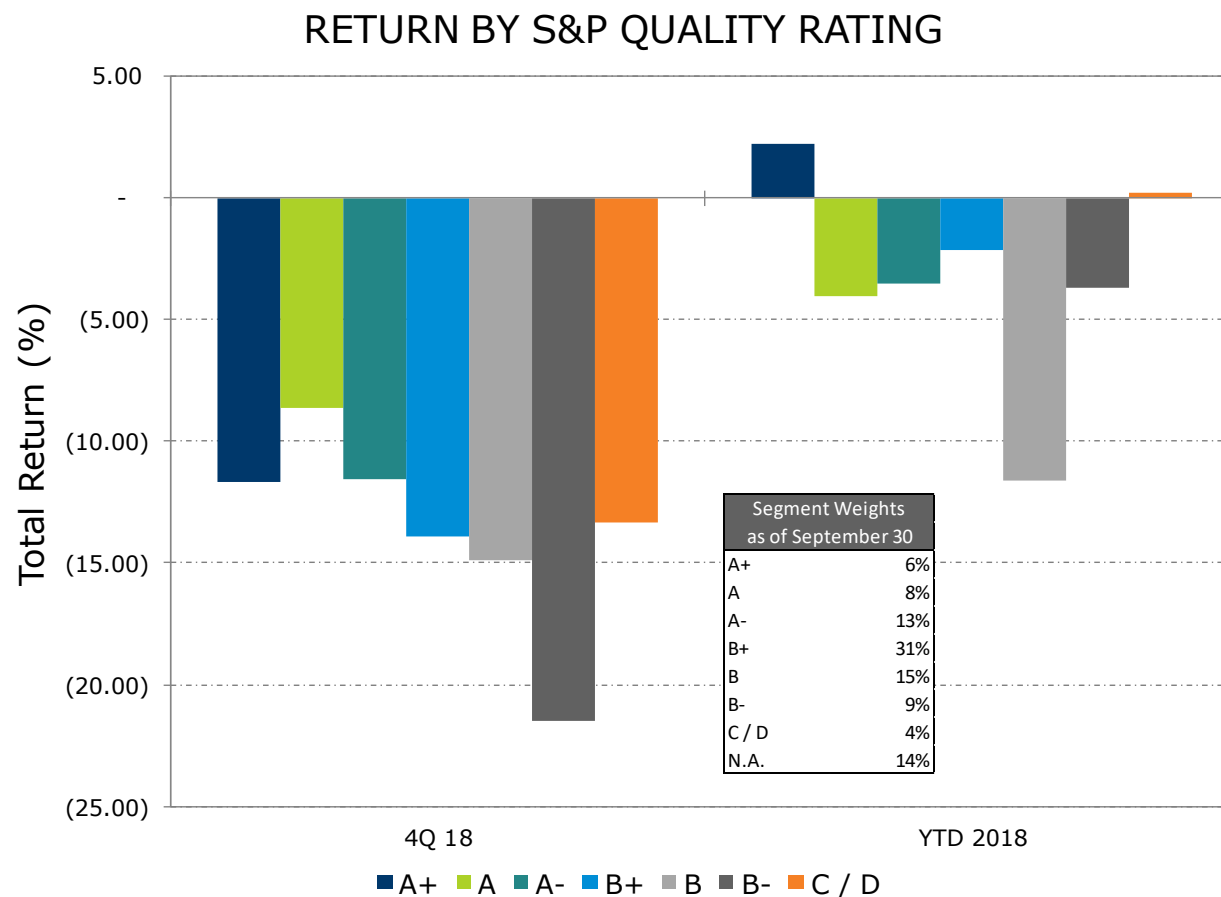
The "Rank" statistics reflect ordinal rankings among 39 annual observations (i.e. ranks shown are X of 39)

Wilshire 5000 Index: 20-Day Rolling Risk



RETURNS BY QUALITY SEGMENT

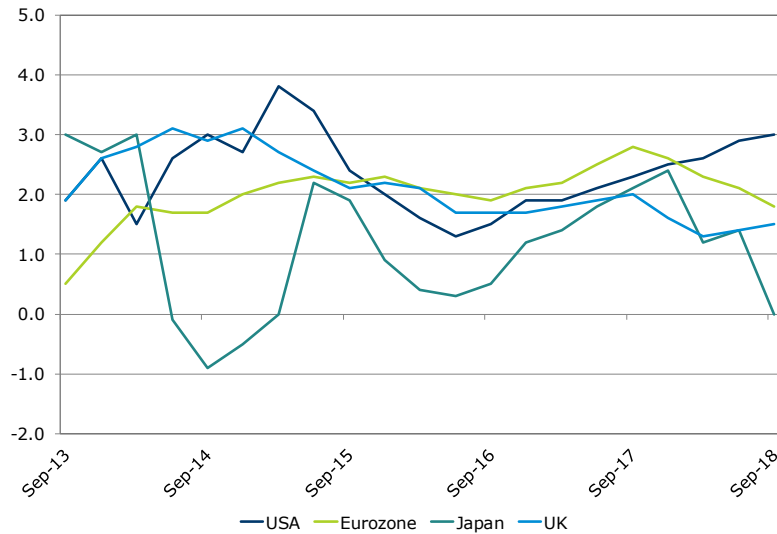
Highest quality names produced a positive return for the year but are among the lowest weight within the broad market



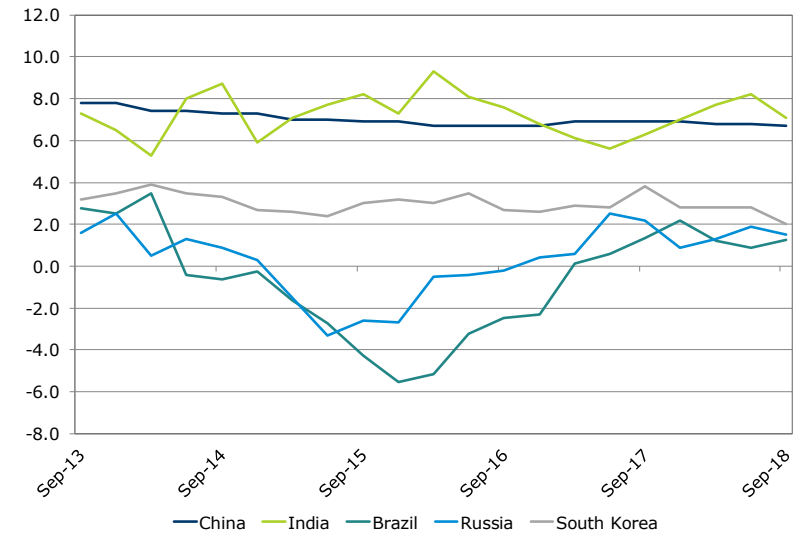
Data sources: Wilshire Atlas

NON-U.S. GROWTH AND INFLATION

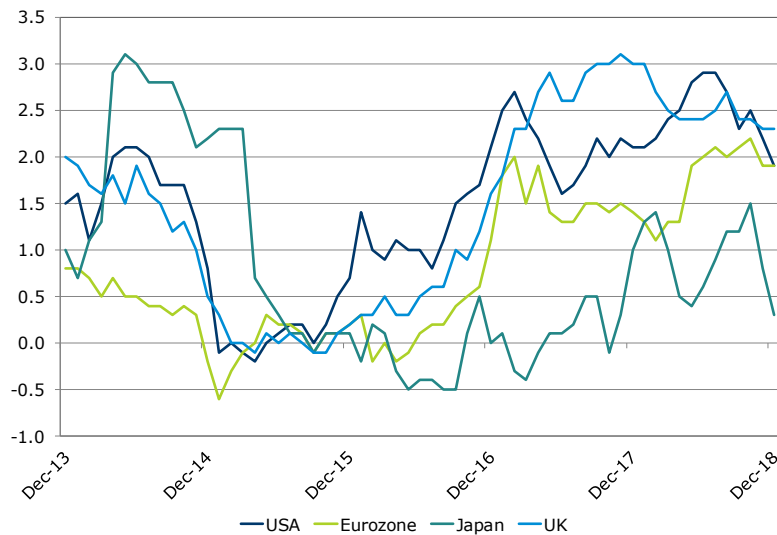
DEVELOPED MARKETS REAL GDP GROWTH YoY (%)



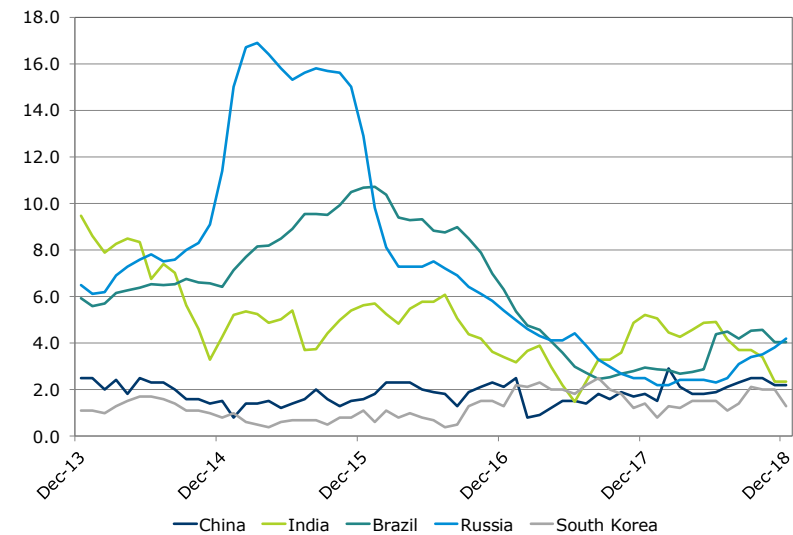
EMERGING MARKETS REAL GDP GROWTH YoY (%)



DEVELOPED MARKETS CPI GROWTH YoY (%)



EMERGING MARKETS CPI GROWTH YoY (%)

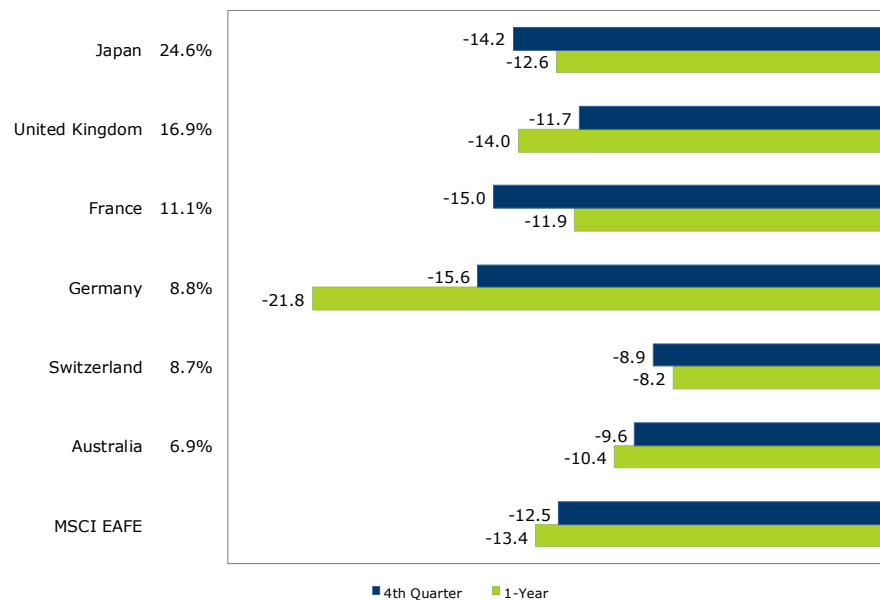


Data sources: Bloomberg

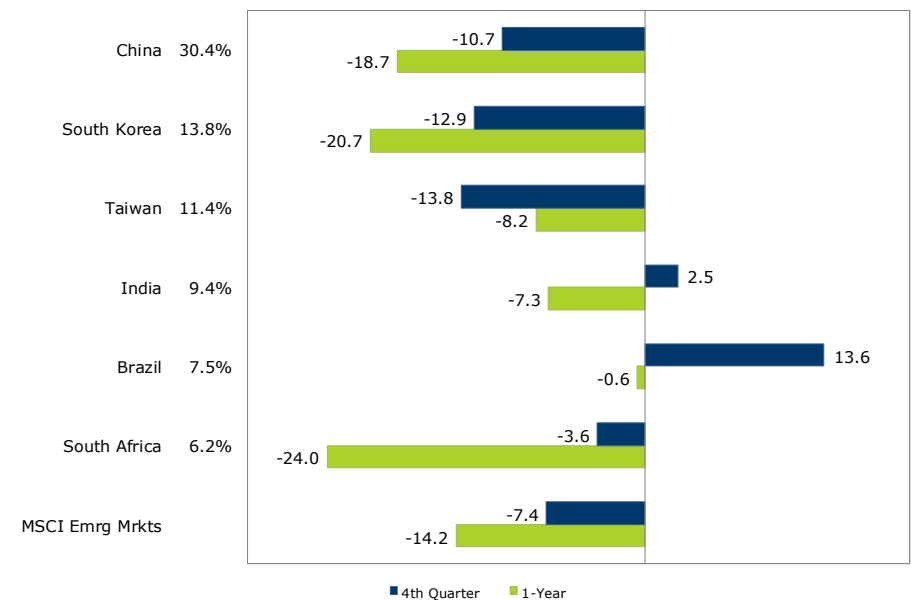
NON-U.S. EQUITY MARKET

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

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)

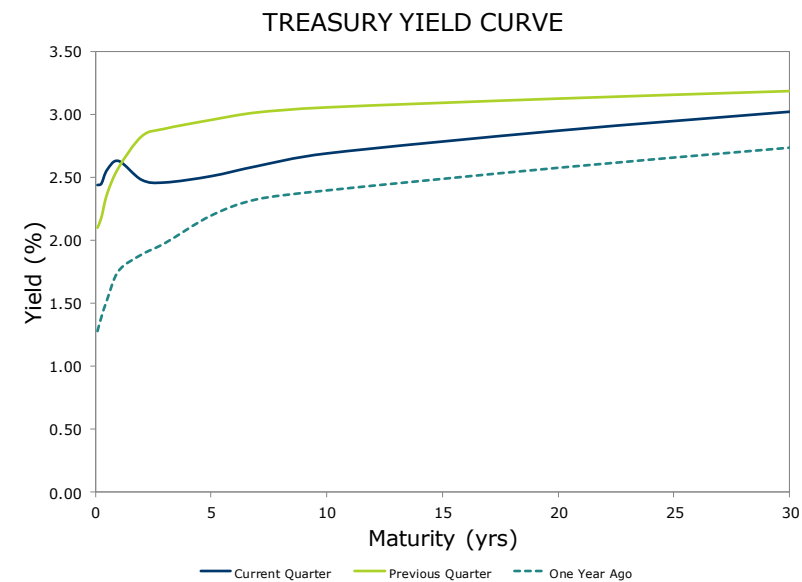
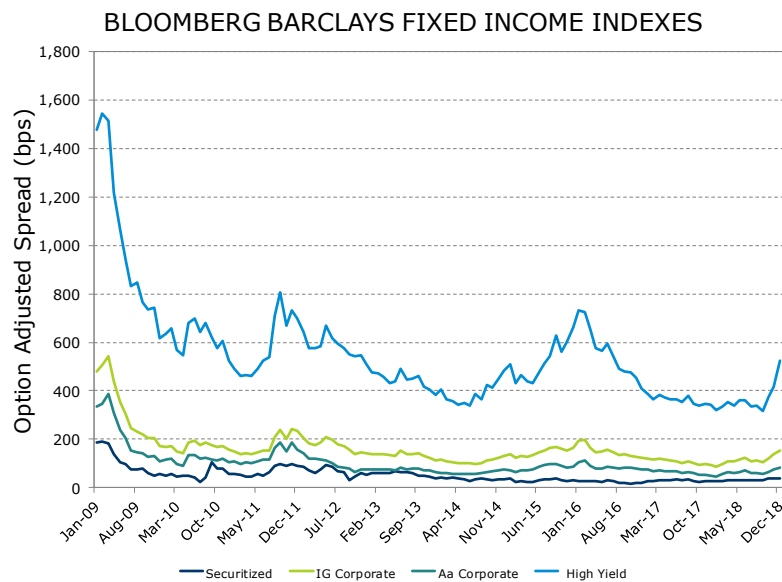


Data sources: Wilshire Compass

U.S. FIXED INCOME

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

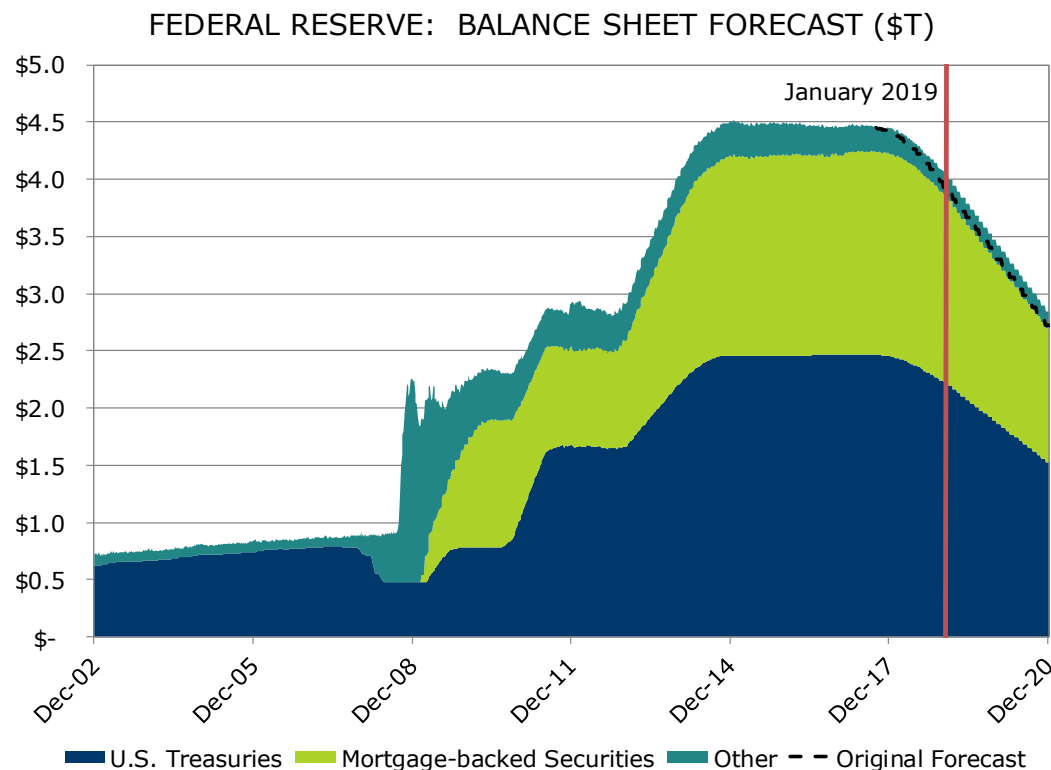
* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index



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

FEDERAL RESERVE

- Federal Reserve began their balance sheet normalization program during October 2017; targeting \$10B in reductions per month while increasing to \$50B per month in Q4 2018
- Generally on pace with their initial plan, the Federal Reserve has reduced their total assets by \$406 billion through mid-January 2019

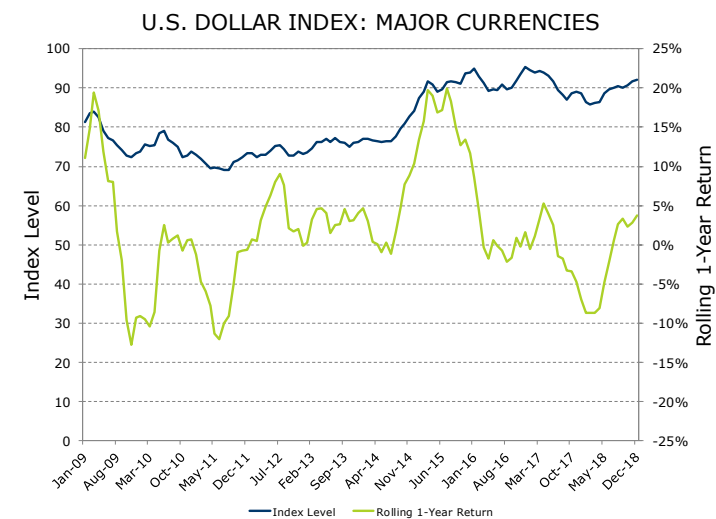
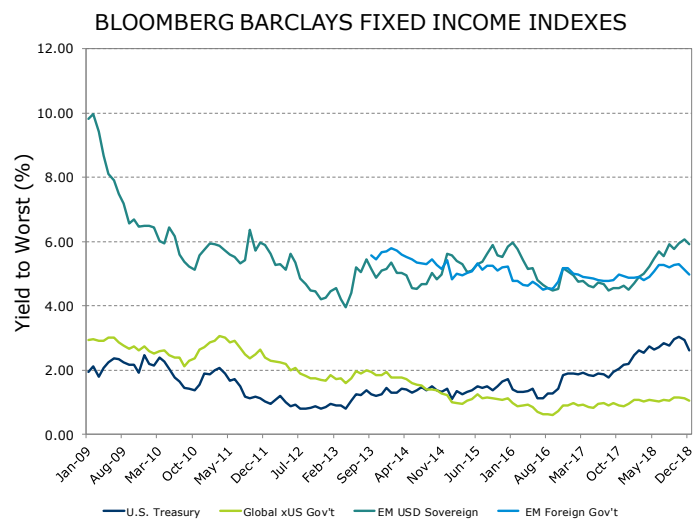


Data sources: Federal Reserve

NON-U.S. FIXED INCOME

AS OF DECEMBER 31, 2018	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DEVELOPED MARKETS						
BLMBRG BRCLYS GLBL AGGREGATE xUS	0.9	-2.1	-2.1	3.2	0.0	1.7
BLMBRG BRCLYS GLBL AGGREGATE xUS *	1.9	3.2	3.2	3.5	4.1	4.0
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-1.1	-5.9	-5.9	3.1	1.0	3.8
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	1.4	1.3	1.3	6.2	6.3	5.8
EMERGING MARKETS (HARD CURRENCY)						
BLMBRG BRCLYS EM USD AGGREGATE	-0.2	-2.5	-2.5	5.0	4.2	8.5
EMERGING MARKETS (FOREIGN CURRENCY)						
BLMBRG BRCLYS EM LOCAL CURR. GOVT	2.5	-3.4	-3.4	5.3	0.5	4.1
BLMBRG BRCLYS EM LOCAL CURR. GOVT *	2.6	2.7	2.7	3.2	2.9	3.2
CURRENCY VS. DOLLAR						
EURO vs. DOLLAR	-1.6	-4.8	-4.8	1.7	-3.7	-2.0
YEN vs. DOLLAR	3.5	2.7	2.7	3.1	-0.9	-1.9
POUND vs. DOLLAR	-2.3	-5.9	-5.9	-4.7	-5.1	-1.2

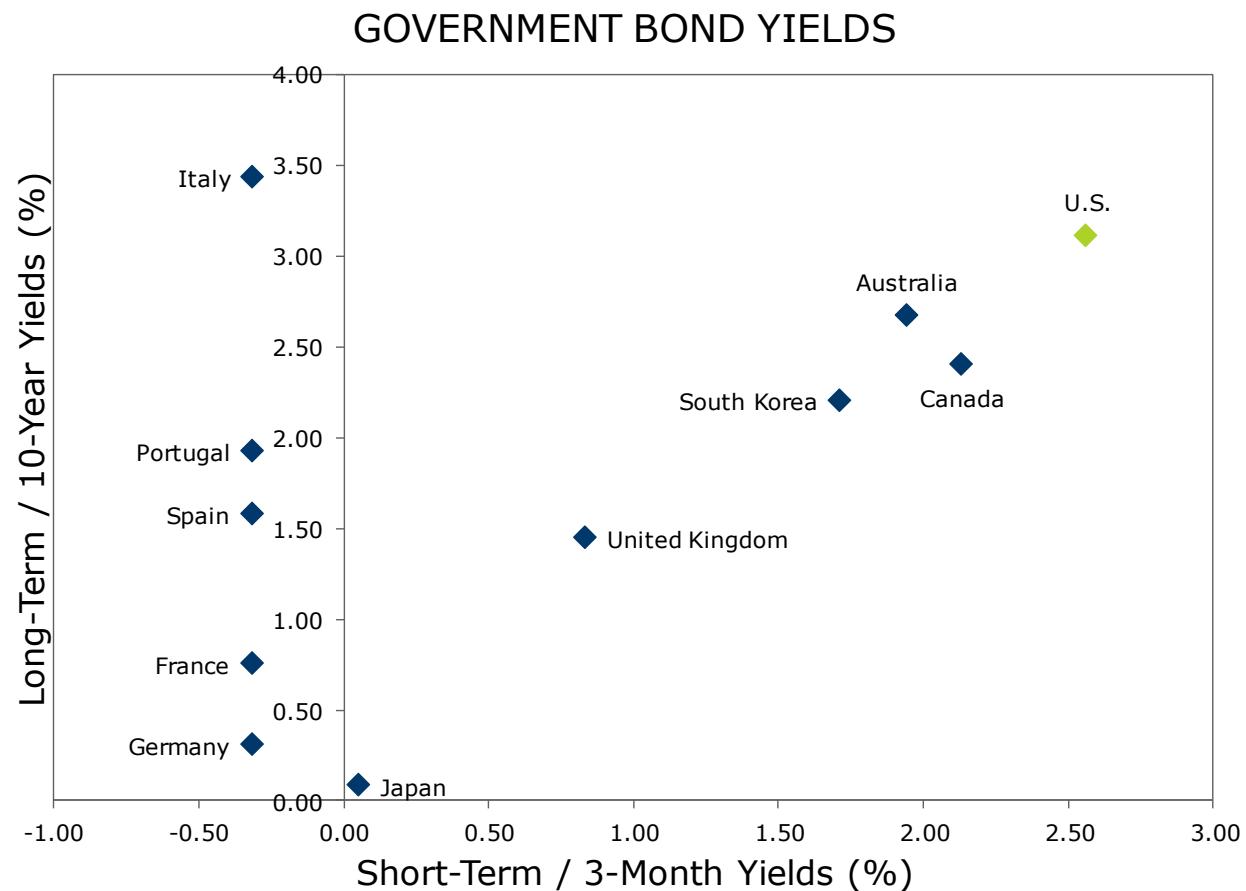
* Returns are reported in terms of local market investors, which removes currency effects.



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

GLOBAL INTEREST RATES

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

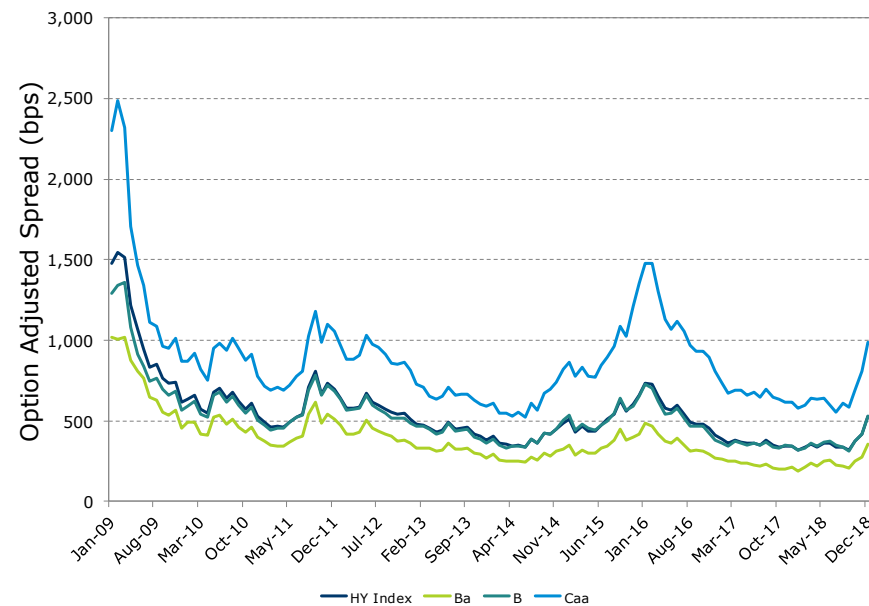


Data sources: Organization for Economic Co-operation and Development

HIGH YIELD BOND MARKET

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

BLOOMBERG BARCLAYS HIGH YIELD INDEXES

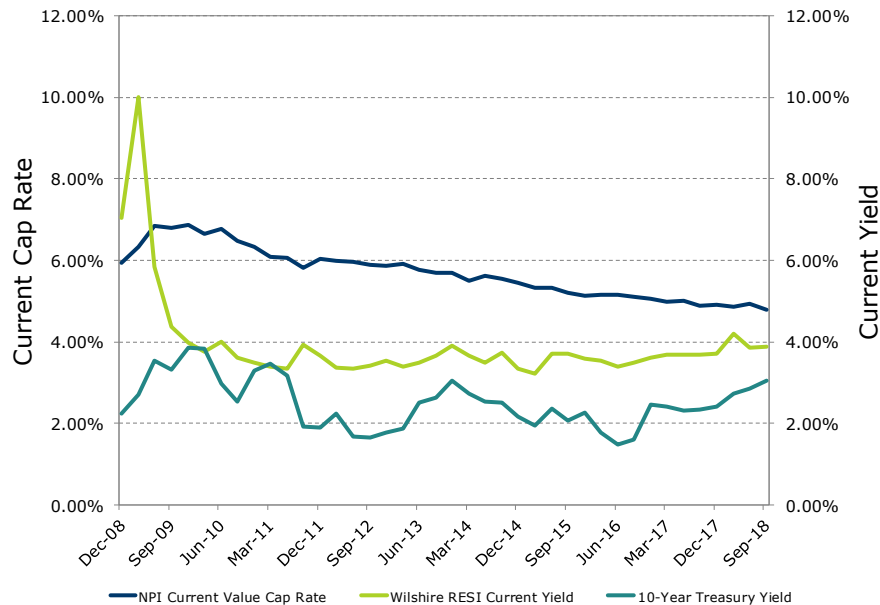


Data sources: Wilshire Compass, Bloomberg Barclays

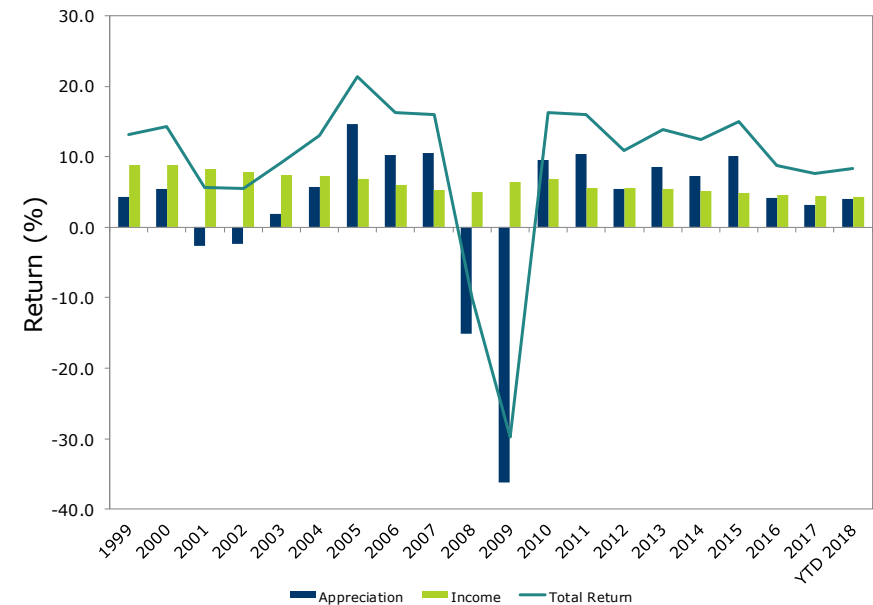
Wilshire Consulting REAL ASSETS

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

REAL ESTATE VALUATION



NCREIF ODCE FUND INDEX RETURN



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

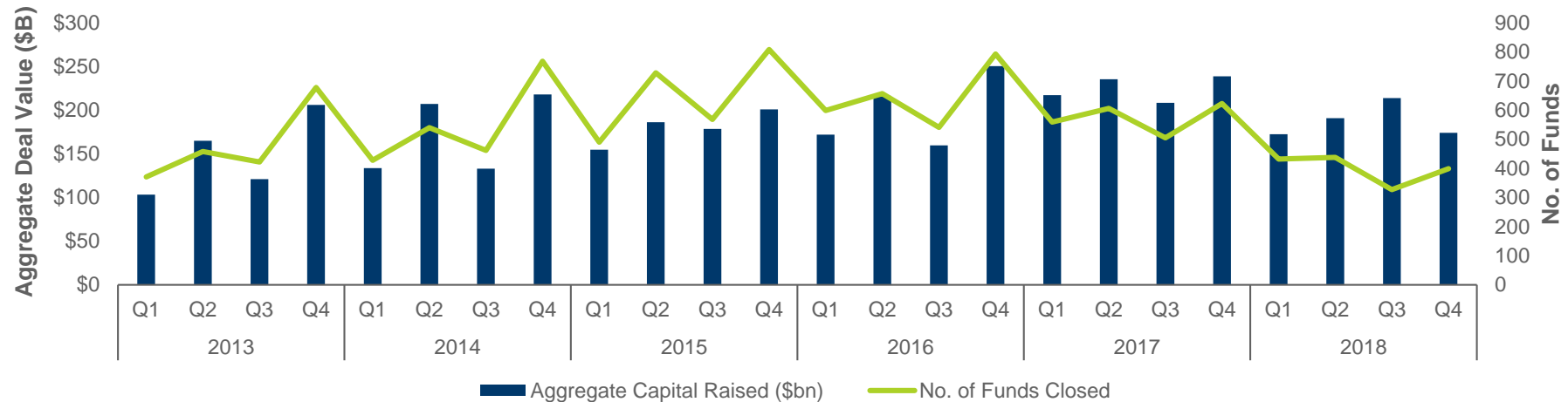


APPENDIX: PRIVATE MARKETS UPDATE

Wilshire Private Markets

PRIVATE EQUITY – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Private Capital Fundraising (Q1 2013 – Q4 2018)



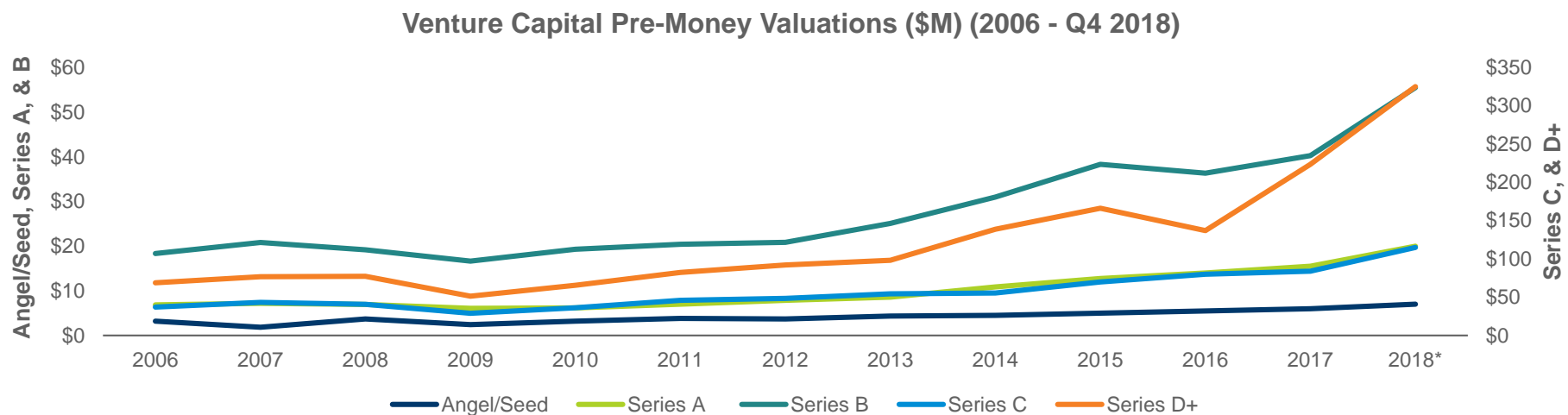
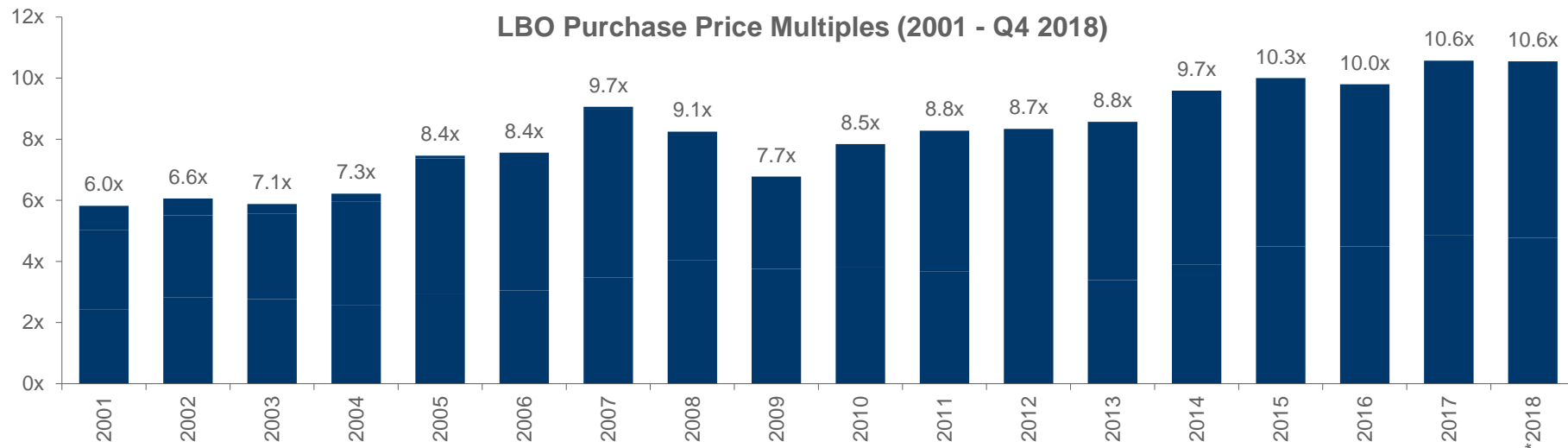
Global Annual Private Equity-Backed Buyout Activity (Q1 2013 – Q4 2018)



Source: Preqin, as of December 31, 2018.

Wilshire Private Markets

PRIVATE EQUITY – PRICING & VALUATIONS

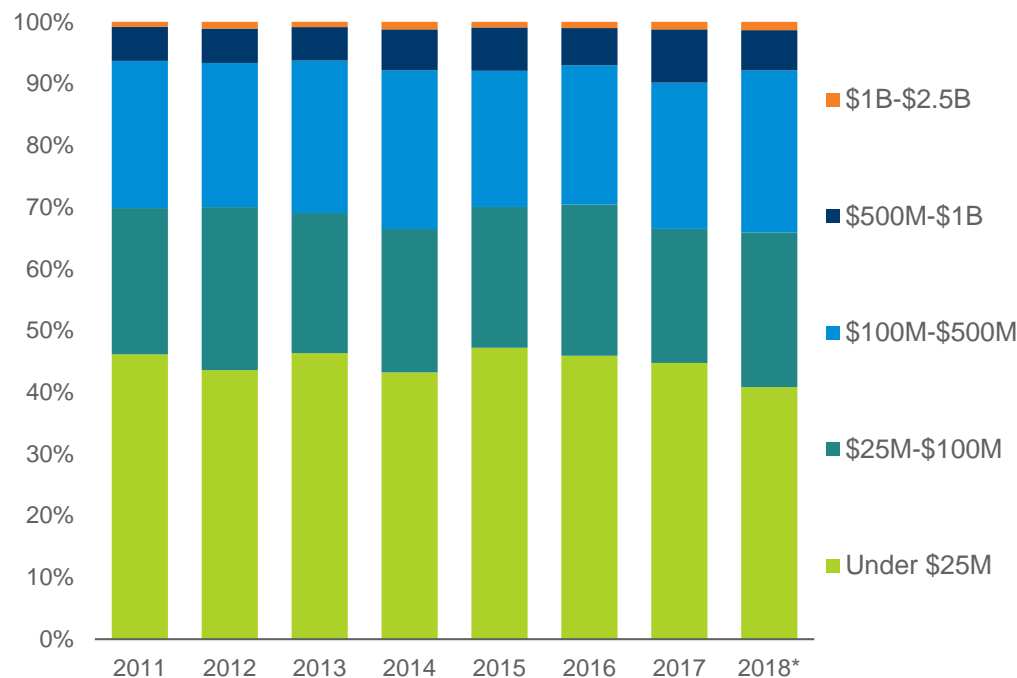


Source: S&P LBO; PitchBook, *as of December 31, 2018.

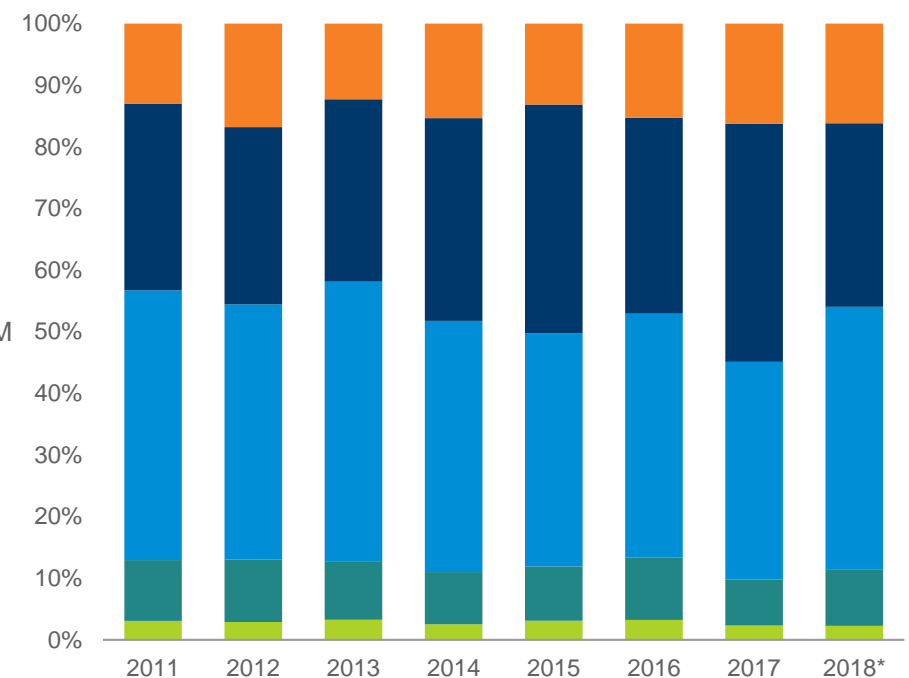
Wilshire Private Markets

U.S. INVESTMENT ACTIVITY BY DEAL SIZE

Percentage of Deal Volume by Deal Size (by Count)



Percentage of Deal Volume by Deal Size (by Dollars)



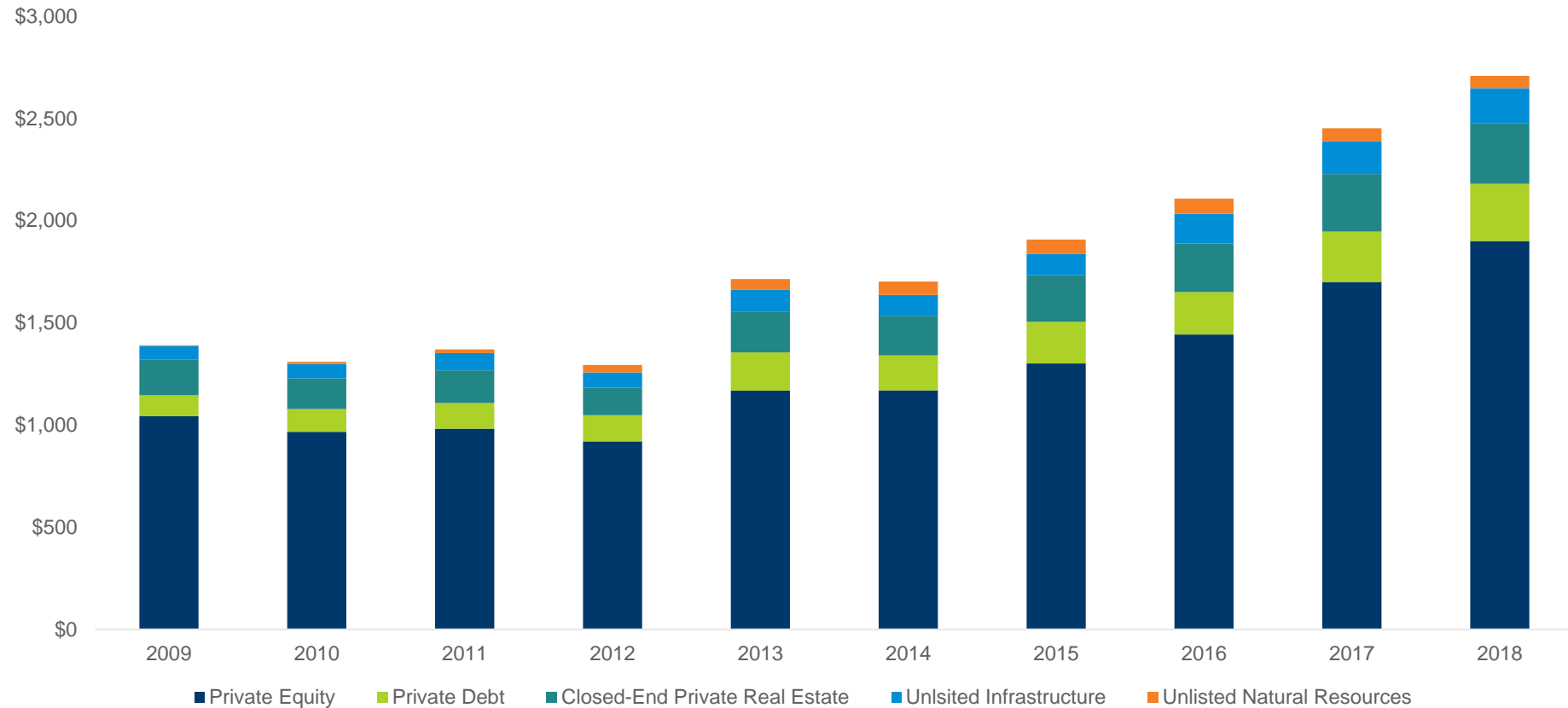
- Deal volume continues to be dominated by lower middle market deals with investment sizes below \$100 million through the fourth quarter of 2018
- However, deals with below \$100 million check sizes comprised only 7% of all deal volume by amount of capital invested in the fourth quarter of 2018

Source: PitchBook, *as of December 31, 2018.

Wilshire Private Markets

PRIVATE CAPITAL DRY POWDER

Private Capital Dry Powder by Fund Type (2009 - Q4 2018)



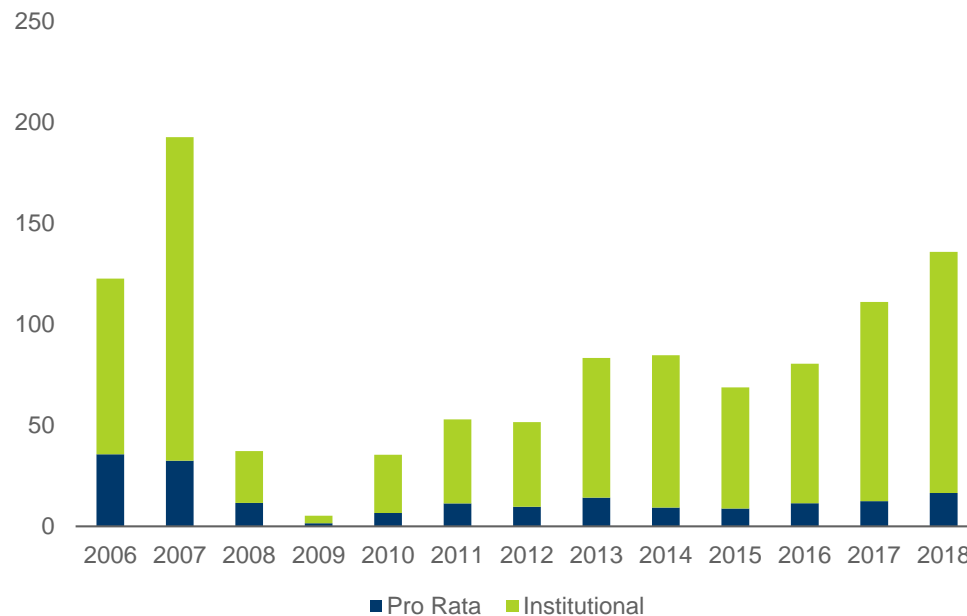
- Global private capital dry powder continues to increase, topping \$2 trillion across all fund types
- Private equity comprises just under 70% of total dry powder in the market as of Q4 2018

Source: Preqin, as of December 31, 2018.

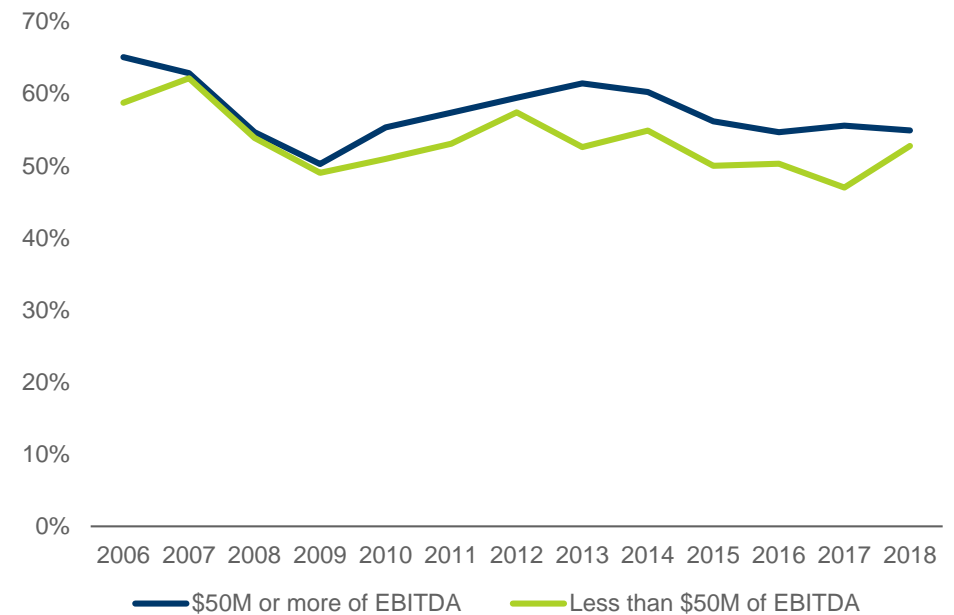
Wilshire Private Markets

PRIVATE EQUITY - U.S. DEBT MARKETS

Total U.S. LBO Loan Volume (\$B) (2006 – 2018)



Percentage of Debt Used in LBOs (2006 – 2018)

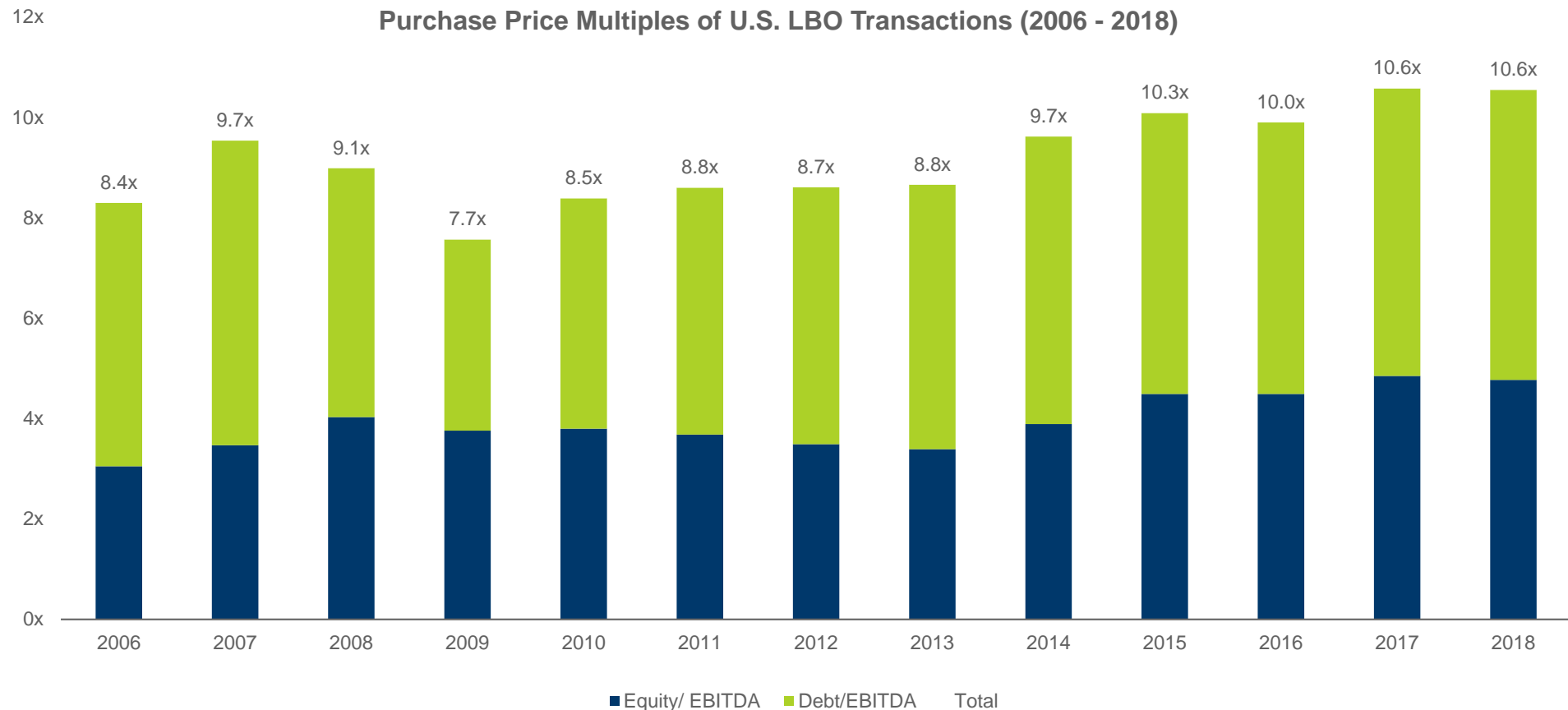


- Loan volume in 2018 increased by approximately \$25 billion from the prior year and is on pace to once again increase year-over-year through the fourth quarter of 2018
- Availability of debt capital has driven up the percentage of debt used to finance leveraged buyouts of less than \$50 million of EBITDA through the fourth quarter of 2018

Source: S&P LBO, as of December 31, 2018.

Wilshire Private Markets

PRIVATE EQUITY - U.S. LBO PURCHASE PRICE MULTIPLES



- Due to the amount of debt that is readily available, purchase price multiples for U.S. LBOs have remained consistent through Q4 2018 relative to 2017 levels

Source: S&P LBO, as of December 31, 2018.

Wilshire Consulting

37th ANNUAL CLIENT CONFERENCE

Sunday, March 24th – Tuesday, March 26th in Napa, CA

Focus on Research – Driven by client interaction and the latest thinking in the industry

Each year, Wilshire hosts an educational conference for clients on important issues and topical ideas.

Investment topics for 2019 include:

- Market & Economic Outlook
- Economic Regimes and the Late Cycle
- International Equity
- Hedge Funds
- Liquidity
- Outsourced CIO
- ESG / SRI
- Defined Contribution Plans
- Private Markets: State of the World
- Active, Passive, and Alternative Beta
- Infrastructure
- Private Credit
- Diverse Managers and New Opportunities within Private Markets

The Estate Yountville
Napa Valley California



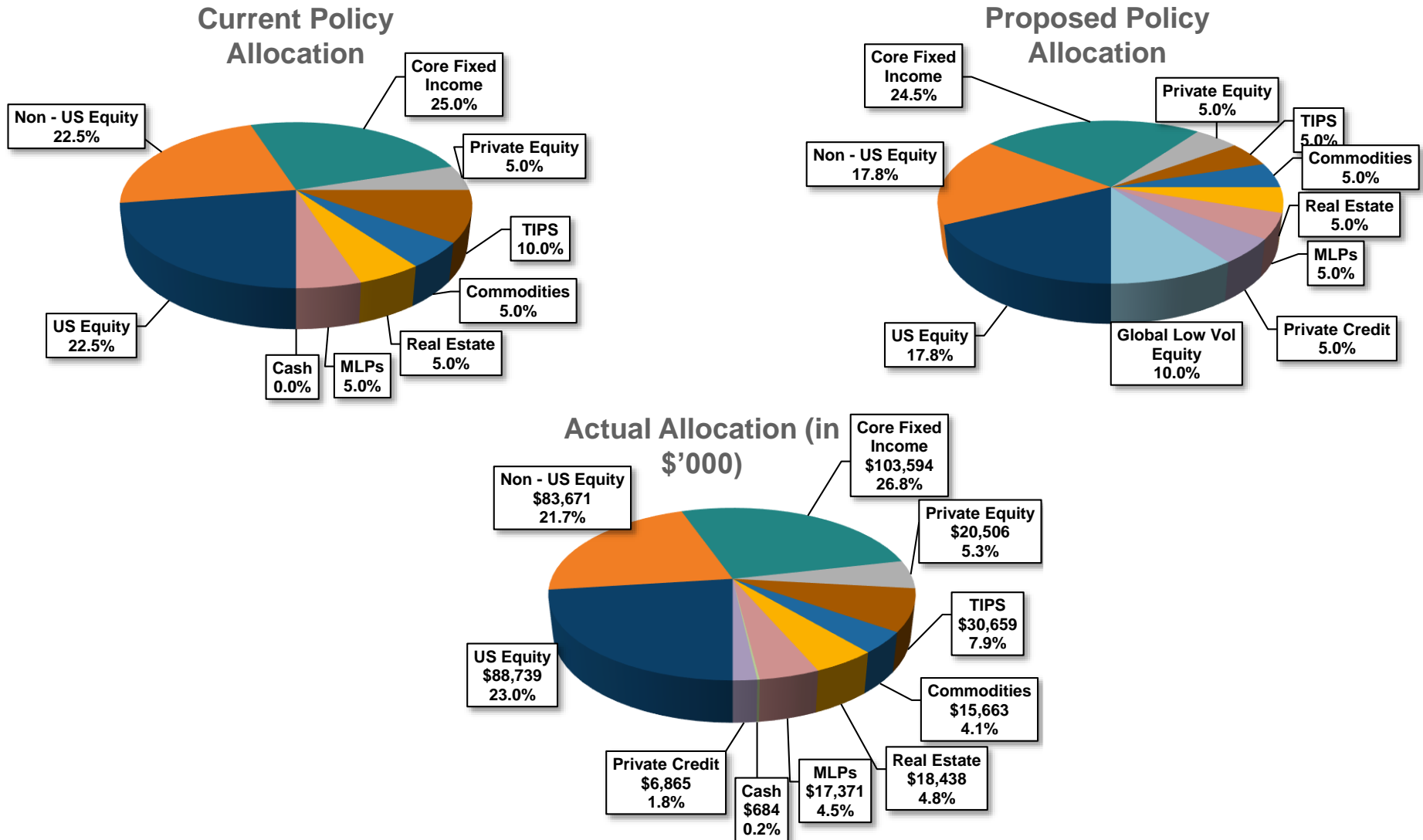


TOTAL FUND

Policy Allocation vs Actual Allocation

Total Fund Composite

As of December 31, 2018



Total Assets: \$386,190,246

Current Policy Allocation vs Actual Allocation

Total Fund Composite

As of December 31, 2018

	Market Value (in \$'000)	Asset Allocation			
		Actual	Current Policy	Proposed Policy	Variance Current
US Equity	\$88,739	22.98%	22.50%	17.75%	0.48%
Non - US Equity	\$83,671	21.67%	22.50%	17.75%	-0.83%
Global Low Volatility Equity	\$0	0.00%	0.00%	10.00%	0.00%
Private Equity	\$20,506	5.31%	5.00%	5.00%	0.31%
Private Credit	\$6,865	1.78%	0.00%	5.00%	1.78%
Total Growth Assets	\$199,781	51.73%	50.00%	55.50%	1.73%
Core Fixed Income	\$103,594	26.82%	25.00%	24.50%	1.82%
Cash	\$684	0.18%	0.00%	0.00%	0.18%
Total Diversifying Assets	\$104,278	27.00%	25.00%	24.50%	2.00%
TIPS	\$30,659	7.94%	10.00%	5.00%	-2.06%
Commodities	\$15,663	4.06%	5.00%	5.00%	-0.94%
Real Estate	\$18,438	4.77%	5.00%	5.00%	-0.23%
MLPs	\$17,371	4.50%	5.00%	5.00%	-0.50%
Total Inflation Hedging Assets	\$82,131	21.27%	25.00%	20.00%	-3.73%
Total Fund Composite	\$386,190	100.00%	100.00%	100.00%	0.00%

Proposed Policy Allocation vs Actual Allocation

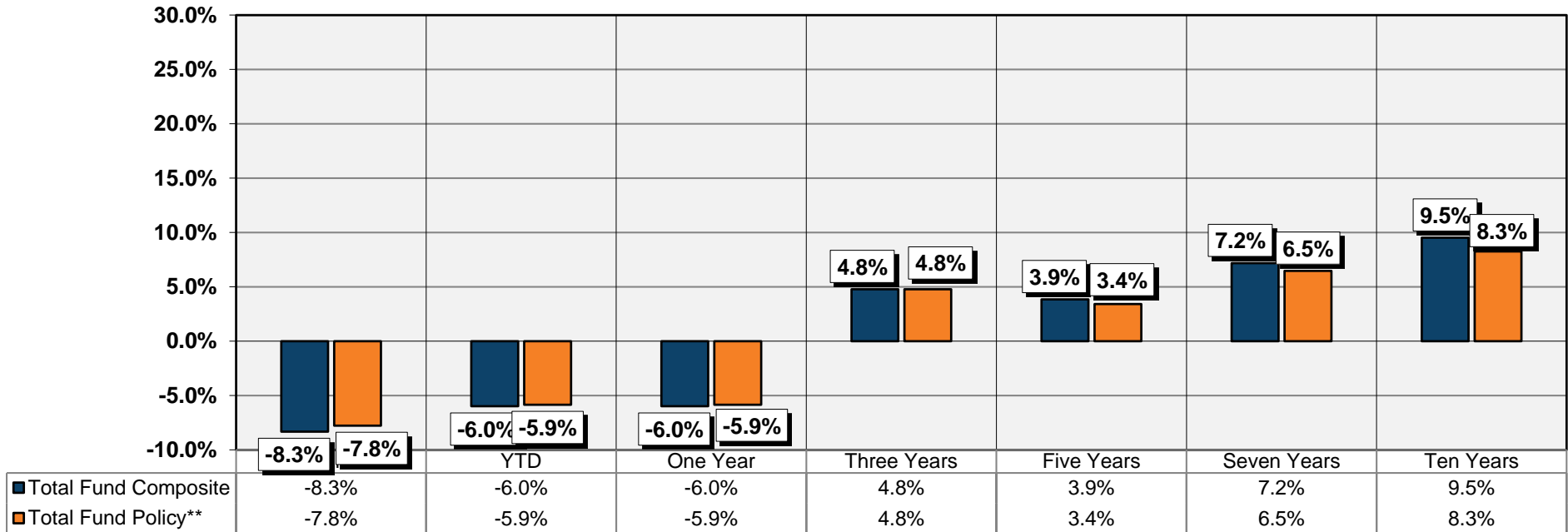
Total Fund Composite

As of December 31, 2018

	Market Value (in \$'000)	Asset Allocation			
		Actual	Proposed Policy	Current Policy	Variance Proposed
US Equity	\$88,739	22.98%	17.75%	22.50%	5.23%
Non - US Equity	\$83,671	21.67%	17.75%	22.50%	3.92%
Global Low Volatility Equity	\$0	0.00%	10.00%	0.00%	-10.00%
Private Equity	\$20,506	5.31%	5.00%	5.00%	0.31%
Private Credit	\$6,865	1.78%	5.00%	0.00%	-3.22%
Total Growth Assets	\$199,781	51.73%	55.50%	50.00%	-3.77%
Core Fixed Income	\$103,594	26.82%	24.50%	25.00%	2.32%
Cash	\$684	0.18%	0.00%	0.00%	0.18%
Total Diversifying Assets	\$104,278	27.00%	24.50%	25.00%	2.50%
TIPS	\$30,659	7.94%	5.00%	10.00%	2.94%
Commodities	\$15,663	4.06%	5.00%	5.00%	-0.94%
Real Estate	\$18,438	4.77%	5.00%	5.00%	-0.23%
MLPs	\$17,371	4.50%	5.00%	5.00%	-0.50%
Total Inflation Hedging Assets	\$82,131	21.27%	20.00%	25.00%	1.27%
Total Fund Composite	\$386,190	100.00%	100.00%	100.00%	0.00%

Investment Performance Total Fund Composite*

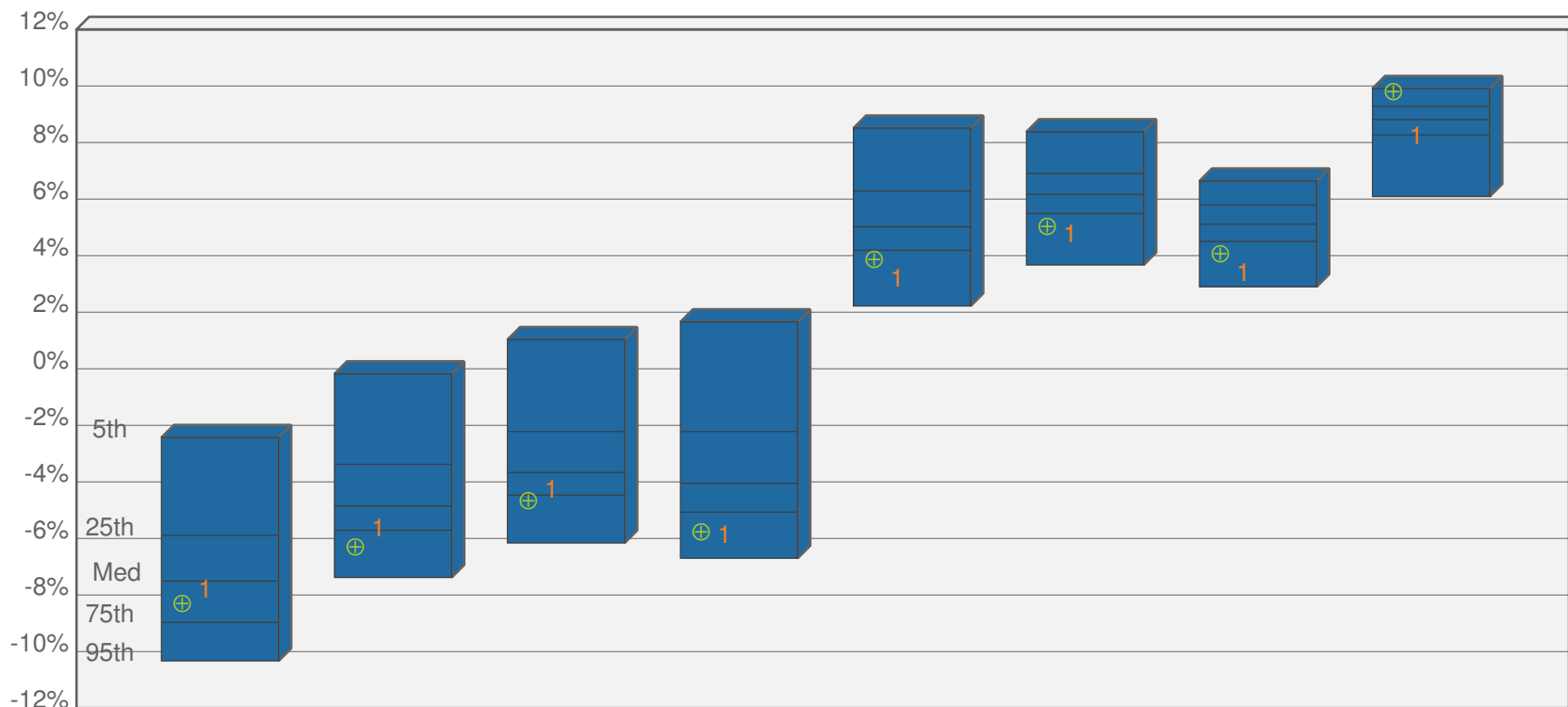
As of December 31, 2018



*Returns are net of fees.

**Policy index = Wilshire 5000 (22.50%), MSCI ACWI ex U.S. (22.50%), Bloomberg Barclays Aggregate (25.00%), Bloomberg Barclays TIPS (10.00%), FTSE EPRA NAREIT Dev RE (5.00%), Wilshire 5000 +2.5% (5.00%), Bloomberg Commodity Index (5.00%), S&P MLP Index (5.00%)

Wilshire Consulting
PERFORMANCE COMPARISON
 Total Fund Composite
 Periods Ended December 31, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊕ Total Fund	-8.27 (61)	-6.27 (84)	-4.64 (78)	-5.76 (88)	3.87 (85)	5.04 (85)	4.10 (80)	9.82 (8)
1 Policy Index	-7.77 (54)	-5.63 (71)	-4.25 (66)	-5.85 (88)	3.23 (89)	4.78 (86)	3.41 (89)	8.25 (76)
5th %tile	-2.43	-0.18	1.03	1.66	8.51	8.38	6.64	9.91
25th %tile	-5.89	-3.38	-2.22	-2.22	6.28	6.91	5.79	9.28
Median	-7.51	-4.85	-3.67	-4.05	5.02	6.17	5.11	8.81
75th %tile	-8.97	-5.71	-4.47	-5.07	4.19	5.49	4.50	8.27
95th %tile	-10.33	-7.38	-6.16	-6.70	2.22	3.67	2.90	6.09
Number of Funds	150	149	149	147	142	137	131	119

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

PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
U.S. Equity Composite									
Net of Fee Return	-14.85	-6.06	-6.06	9.19	8.12	12.80	14.16	9/30/87	9.18
Wilshire 5000	-14.29	-5.27	-5.27	9.12	8.07	12.47	13.20	9/30/87	9.17
Value Added	-0.56	-0.79	-0.79	0.06	0.05	0.33	0.95	9/30/87	0.01
Non-U.S. Equity Composite									
Net of Fee Return	-14.48	-15.07	-15.07	2.90	1.47	6.03	7.77	12/31/89	7.52
Policy Benchmark	-11.46	-14.20	-14.20	4.48	0.68	4.85	6.57	12/31/89	4.12
Value Added	-3.02	-0.87	-0.87	-1.58	0.79	1.19	1.20	12/31/89	3.40
Private Equity Composite									
Net of Fee Return	5.15	20.04	20.04	14.43	13.70	10.47		6/30/10	9.36
Wilshire 5000 +2.5%	-13.67	-2.77	-2.77	11.62	10.57	14.97		6/30/10	15.66
Value Added	18.83	22.81	22.81	2.80	3.12	-4.50		6/30/10	-6.30
Private Credit Composite									
Net of Fee Return	-0.52							9/30/18	-0.52
S&P LSTA Leverage Loan Index	-3.45							9/30/18	-3.45
Value Added	2.93							9/30/18	2.93
Core Fixed Composite									
Net of Fee Return	1.34	-0.47	-0.47	3.13	3.41	3.45	6.22	9/30/87	6.68
Bloomberg Aggregate	1.64	0.01	0.01	2.06	2.52	2.10	3.48	9/30/87	6.29
Value Added	-0.29	-0.49	-0.49	1.07	0.89	1.35	2.74	9/30/87	0.39
Real Estate Composite									
Net of Fee Return	-6.14	-8.63	-8.63	0.61	2.75	5.79		6/30/09	8.26
FTSE EPRA/NAREIT Dev (N)	-5.69	-5.63	-5.63	2.72	4.34	7.30		6/30/09	9.59
Value Added	-0.45	-2.99	-2.99	-2.11	-1.59	-1.51		6/30/09	-1.33

PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
Commodities Composite									
Net of Fee Return	-9.99	-12.50	-12.50	3.15	-7.10			3/31/13	-7.97
Bloomberg Commodity Index	-9.41	-11.25	-11.25	0.30	-8.80			3/31/13	-9.11
Value Added	-0.58	-1.26	-1.26	2.86	1.70			3/31/13	1.14
MLP Composite									
Net of Fee Return	-20.79	-13.80	-13.80	-0.84				3/31/15	-9.65
Alerian MLP Index	-17.30	-10.97	-10.97	0.83				3/31/15	-9.52
Value Added	-3.49	-2.83	-2.83	-1.67				3/31/15	-0.13
TIPS Composite									
Net of Fee Return	-0.58	-1.63	-1.63	1.99				6/30/15	1.18
Barclays U.S. TIPS	-0.42	-1.26	-1.26	2.11				6/30/15	1.29
Value Added	-0.16	-0.37	-0.37	-0.12				6/30/15	-0.11
Total Real Assets Composite									
Net of Fee Return	-8.35	-8.03	-8.03	1.20				3/31/15	-2.59
Policy Index	-6.75	-5.87	-5.87	1.91				3/31/15	-2.13
Value Added	-1.60	-2.16	-2.16	-0.71				3/31/15	-0.45
Total Fund									
Net of Fee Return	-8.32	-5.99	-5.99	4.78	3.85	7.18	9.52	9/30/87	7.86
Policy Index	-7.77	-5.85	-5.85	4.78	3.41	6.47	8.25	9/30/87	7.88
Value Added	-0.55	-0.14	-0.14	-0.00	0.44	0.71	1.27	9/30/87	-0.02

CUSTOM BENCHMARK SPECIFICATION

Total Fund

December 31, 2018

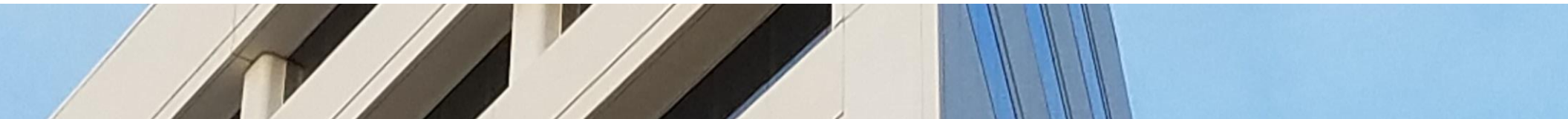
	Quarter Start	Quarter End	Percent	Description
Policy Index	12/79	6/98	55.00	Wilshire 5000
			40.00	Bloomberg Aggregate
			5.00	MSCI EAFE Index (N)
	9/98	9/02	50.00	Wilshire 5000
			40.00	Bloomberg Aggregate
			10.00	MSCI EAFE Index (N)
	12/02	3/06	50.00	Wilshire 5000
			35.00	Bloomberg Aggregate
			15.00	MSCI EAFE Index (N)
	6/06	6/06	55.00	Wilshire 5000
30.00			Bloomberg Aggregate	
15.00			MSCI EAFE Index (N)	
9/06	6/09	55.00	Wilshire 5000	
		30.00	Bloomberg Aggregate	
		15.00	MSCI ACWI ex US (N)	
9/09	3/10	5.00	FTSE EPRA/NAREIT Dev (N)	
		15.00	MSCI ACWI ex US (N)	
		30.00	Bloomberg Aggregate	
		50.00	Wilshire 5000	
6/10	12/12	5.00	FTSE EPRA/NAREIT Dev (N)	
		5.00	Wilshire 5000 + 2.5%	
		30.00	Bloomberg Aggregate	
		15.00	MSCI ACWI ex US (N)	
		45.00	Wilshire 5000	
3/13	3/15	5.00	FTSE EPRA/NAREIT Dev (N)	
		40.00	Wilshire 5000	
		15.00	MSCI ACWI ex US (N)	
		30.00	Bloomberg Aggregate	
		5.00	Wilshire 5000 + 2.5%	

CUSTOM BENCHMARK SPECIFICATION

Total Fund

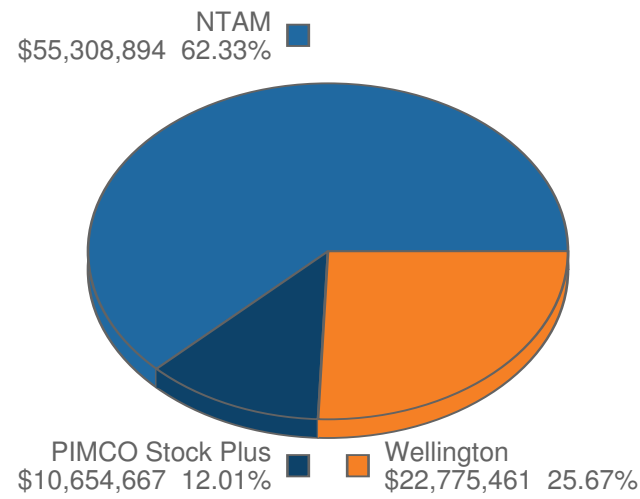
December 31, 2018

	Quarter Start	Quarter End	Percent	Description
Policy Index (cont.)			5.00	Bloomberg Commodity Index
	6/15	12/18	22.50	Wilshire 5000
			5.00	Wilshire 5000 + 2.5%
			22.50	MSCI ACWI ex US (N)
			25.00	Bloomberg Aggregate
			5.00	FTSE EPRA/NAREIT Dev (N)
			5.00	Bloomberg Commodity Index
			10.00	Bloomberg U.S. TIPS
		5.00	S&P MLP Index	



U.S. EQUITY

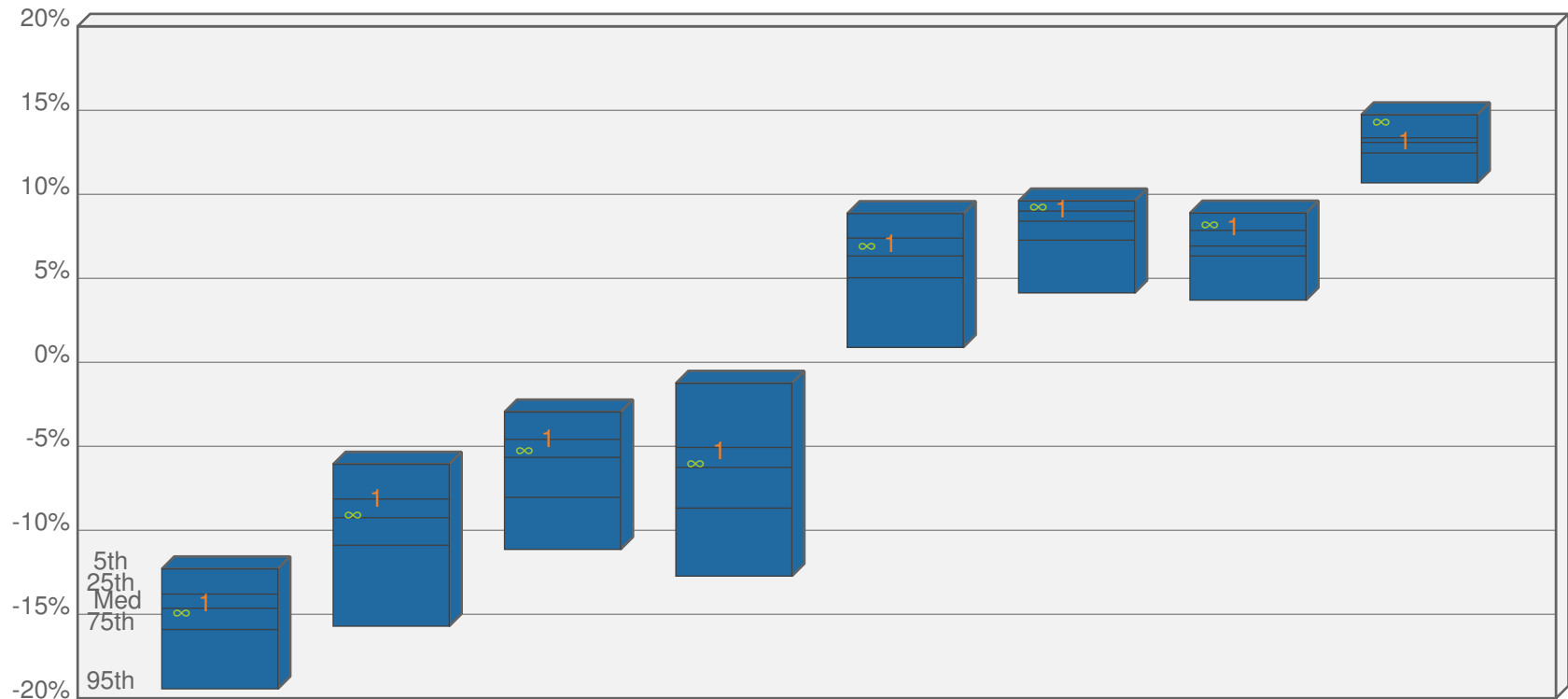
Wilshire Consulting
MANAGER ALLOCATION
U.S. Equity Composite
As of December 31, 2018



PERFORMANCE COMPARISON

U.S. Equity Composite

Periods Ended December 31, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
∞ U.S. Equity Composite	-14.81 (55)	-8.99 (43)	-5.16 (40)	-5.93 (42)	7.02 (36)	9.37 (9)	8.33 (10)	14.42 (7)
1 Wilshire 5000	-14.29 (38)	-8.06 (23)	-4.54 (24)	-5.27 (33)	7.06 (35)	9.12 (20)	8.07 (17)	13.20 (43)
5th %tile	-12.30	-6.07	-2.96	-1.25	8.85	9.60	8.88	14.73
25th %tile	-13.80	-8.14	-4.59	-5.07	7.39	9.00	7.85	13.36
Median	-14.64	-9.25	-5.66	-6.26	6.33	8.40	6.92	13.09
75th %tile	-15.91	-10.89	-8.04	-8.68	5.03	7.27	6.33	12.46
95th %tile	-19.44	-15.71	-11.14	-12.73	0.89	4.13	3.70	10.68
Number of Funds	142	141	138	134	121	117	108	80

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

PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

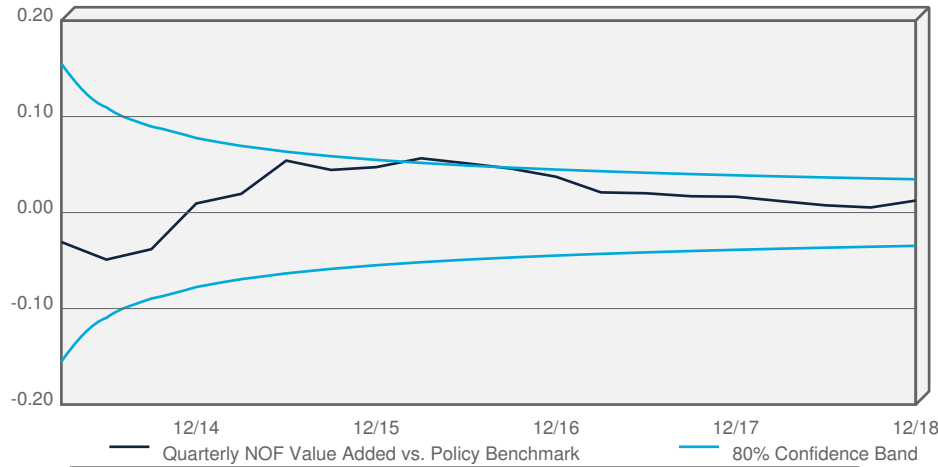
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
NTAM									
Net of Fee Return	-13.49	-4.38	-4.38	9.25	8.51	12.71	13.17	9/30/98	6.79
Policy Benchmark	-13.52	-4.38	-4.38	9.26	8.50	12.70	13.12	9/30/98	6.79
Value Added	0.03	-0.00	-0.00	-0.01	0.01	0.02	0.05	9/30/98	0.00
PIMCO Stock Plus									
Net of Fee Return	-14.22	-5.32	-5.32	9.41	8.36	13.53	15.02	9/30/00	5.65
Standard & Poor's 500	-13.52	-4.38	-4.38	9.26	8.50	12.70	13.12	9/30/00	5.15
Value Added	-0.70	-0.94	-0.94	0.15	-0.14	0.84	1.90	9/30/00	0.50
Wellington									
Net of Fee Return	-18.37	-10.35	-10.35	8.97	6.74	13.08	16.18	9/30/99	10.61
Russell 2000	-20.20	-11.01	-11.01	7.36	4.41	10.44	11.97	9/30/99	7.57
Value Added	1.83	0.67	0.67	1.61	2.33	2.64	4.21	9/30/99	3.04
U.S. Equity Composite									
Net of Fee Return	-14.85	-6.06	-6.06	9.19	8.12	12.80	14.16	9/30/87	9.18
Wilshire 5000	-14.29	-5.27	-5.27	9.12	8.07	12.47	13.20	9/30/87	9.17
Value Added	-0.56	-0.79	-0.79	0.06	0.05	0.33	0.95	9/30/87	0.01

INVESTMENT MANAGER ANALYSIS

NTAM

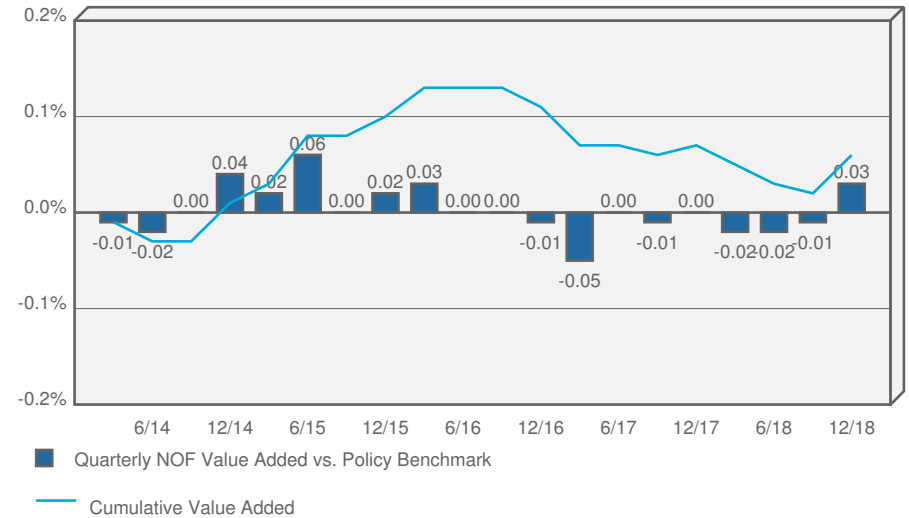
December 31, 2018

Cumulative Skill Analysis vs Benchmark

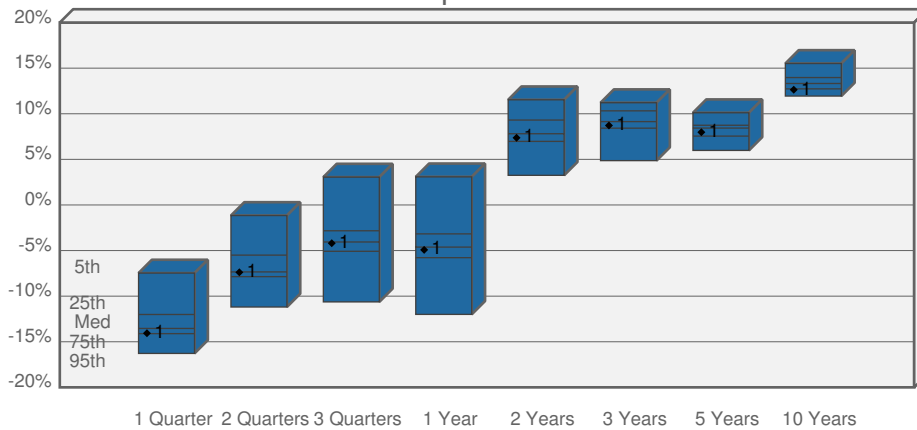


Excess Return:	0.01	Information Ratio:	0.27
Excess Risk:	0.05	T-Stat:	0.59

Value-Added Analysis vs Benchmark

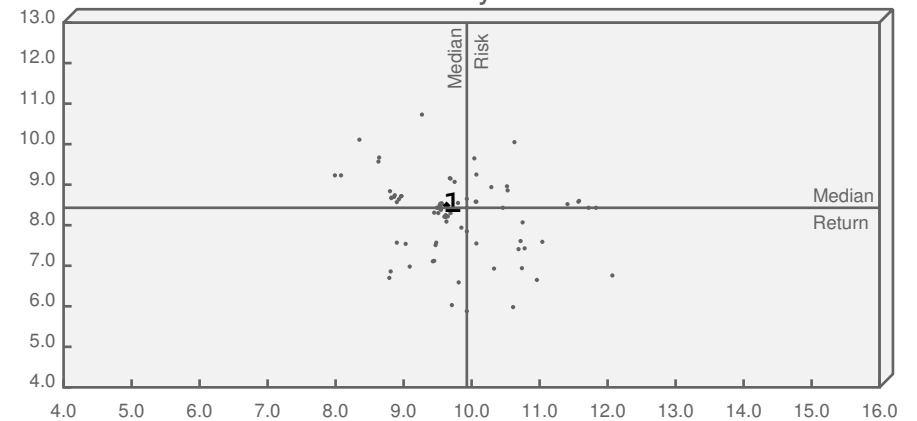


Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
◆ NTAM	-13.48 (36)	-6.80 (31)	-3.61 (29)	-4.34 (42)	7.95 (43)	9.30 (40)	8.56 (40)	13.22 (52)
■ Policy Benchmark	-13.52 (45)	-6.85 (38)	-3.65 (34)	-4.38 (43)	7.93 (43)	9.26 (42)	8.50 (46)	13.12 (56)
Median	-13.54	-7.34	-4.06	-4.62	7.81	9.14	8.43	13.32
Number of Funds	91	90	88	88	81	81	79	47

Five Year Risk/Return Analysis vs Peer Universe*



Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
NTAM	◆	8.56	40	9.79	51
Policy Benchmark	■	8.50	46	9.80	51
Median		8.43		9.93	

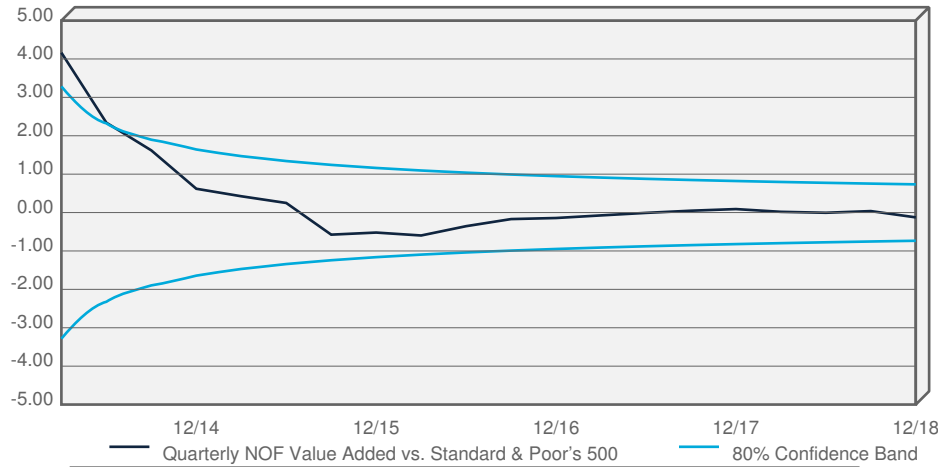
*TUCS Total Returns of Large Neutral Equity Portfolios Universe - Gross of Fees

INVESTMENT MANAGER ANALYSIS

PIMCO Stock Plus

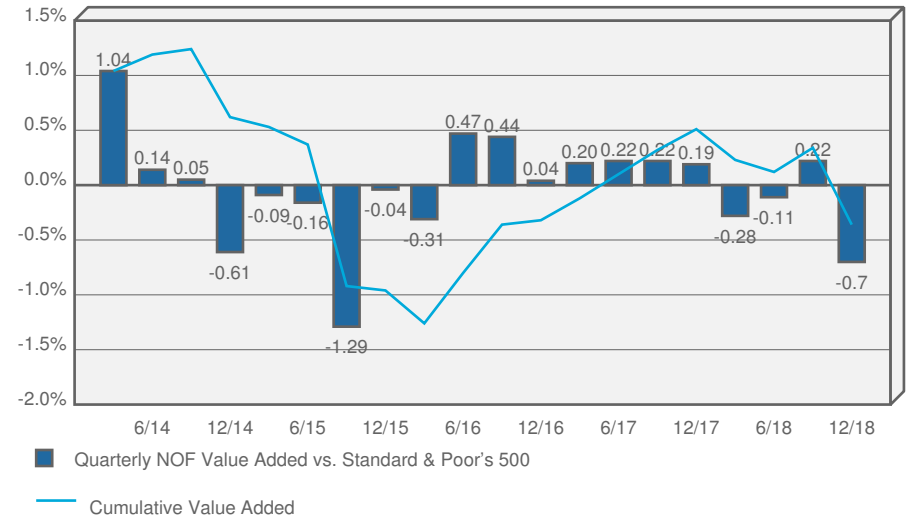
December 31, 2018

Cumulative Skill Analysis vs Benchmark

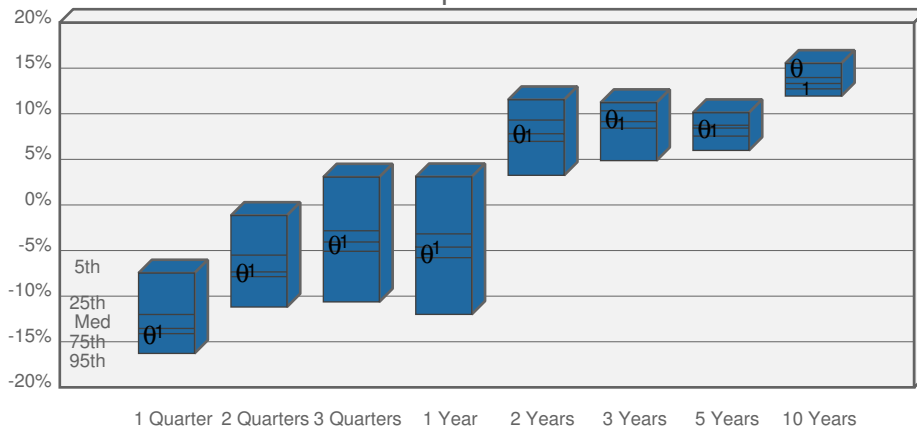


Excess Return:	-0.13	Information Ratio:	-0.13
Excess Risk:	1.00	T-Stat:	-0.28

Value-Added Analysis vs Benchmark

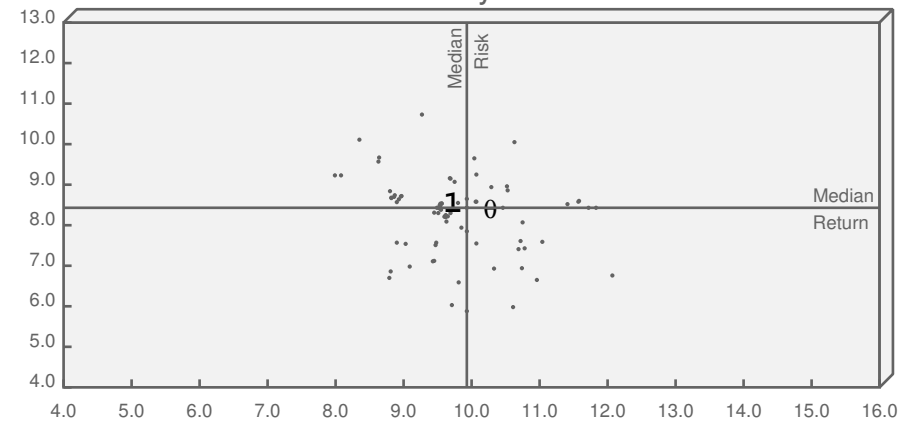


Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
θ PIMCO Stock Plus	-14.22 (76)	-7.41 (62)	-4.33 (61)	-5.32 (70)	7.82 (48)	9.41 (35)	8.36 (52)	15.02 (11)
$\mathbf{1}$ Standard & Poo	-13.52 (45)	-6.85 (38)	-3.65 (34)	-4.38 (43)	7.93 (43)	9.26 (42)	8.50 (46)	13.12 (56)
Median	-13.54	-7.34	-4.06	-4.62	7.81	9.14	8.43	13.32
Number of Funds	91	90	88	88	81	81	79	47

Five Year Risk/Return Analysis vs Peer Universe*



Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
PIMCO Stock Plus	θ	8.36	52	10.39	37
Standard & Poor's 500	$\mathbf{1}$	8.50	46	9.80	51
Median		8.43		9.93	

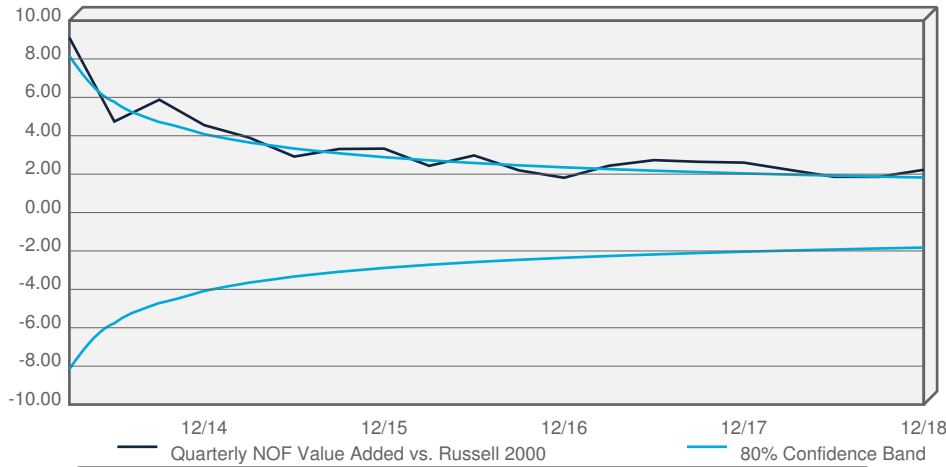
*TUCS Total Returns of Large Neutral Equity Portfolios Universe - Gross of Fees

INVESTMENT MANAGER ANALYSIS

Wellington

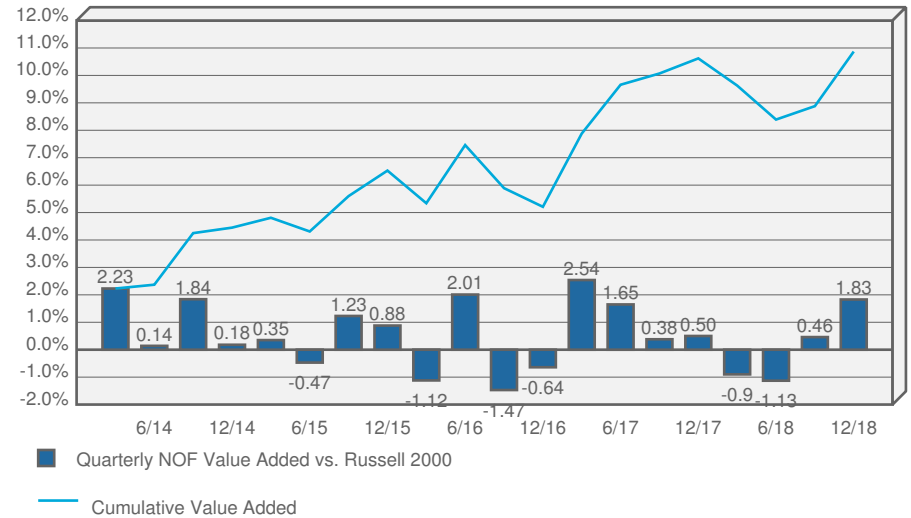
December 31, 2018

Cumulative Skill Analysis vs Benchmark

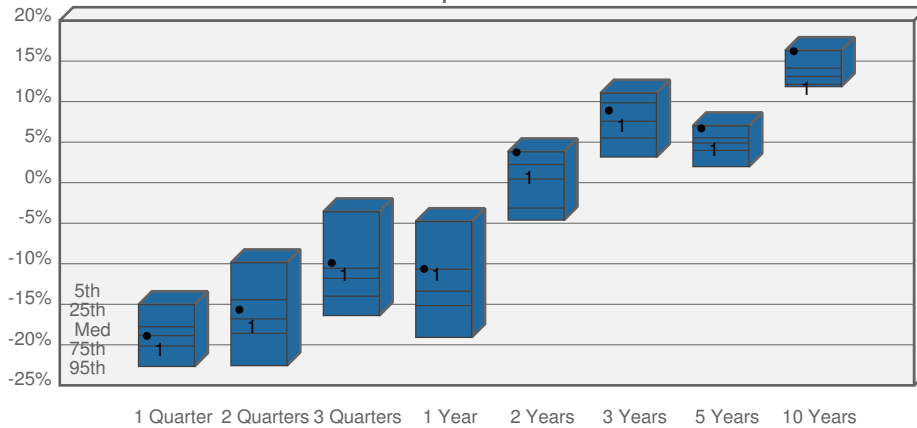


Excess Return:	2.23	Information Ratio:	0.90
Excess Risk:	2.48	T-Stat:	2.01

Value-Added Analysis vs Benchmark

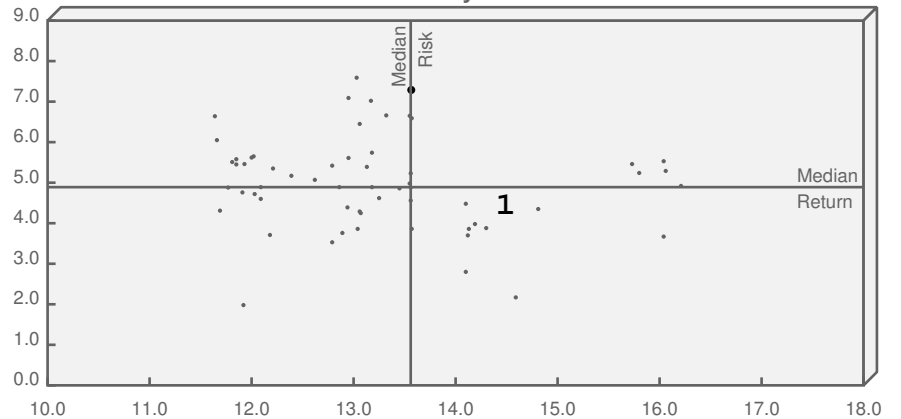


Performance Comparison vs Peer Universe*



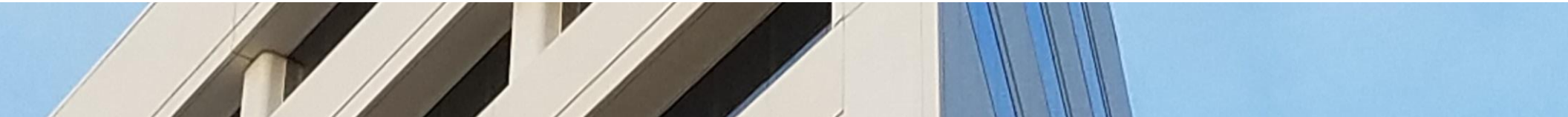
	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
● Wellington	-18.24 (32)	-15.01 (31)	-9.24 (17)	-9.98 (20)	4.40 (1)	9.56 (28)	7.36 (1)	16.87 (1)
1 Russell 2000	-20.20 (78)	-17.35 (56)	-10.94 (31)	-11.01 (28)	1.00 (43)	7.36 (53)	4.41 (65)	11.97 (85)
Median	-18.86	-16.80	-11.79	-13.38	0.46	7.58	4.89	13.10
Number of Funds	66	65	65	65	64	62	60	33

Five Year Risk/Return Analysis vs Peer Universe*



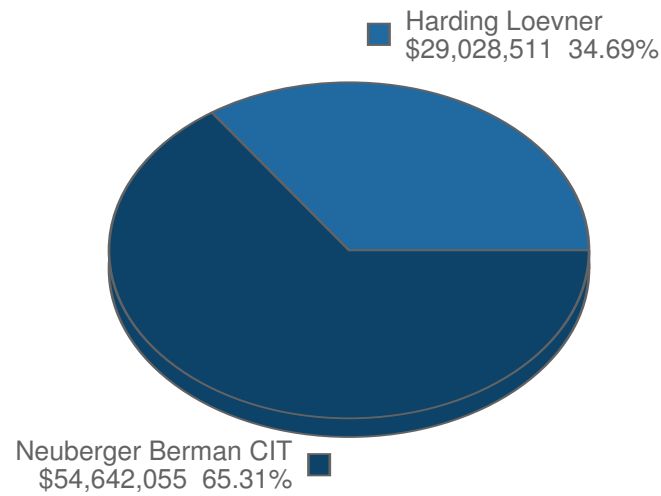
Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
Wellington	●	7.36	1	13.67	45
Russell 2000	1	4.41	65	14.54	27
Median		4.89		13.56	

*TUCS Total Returns of Small Neutral Equity Portfolios Universe - Gross of Fees



NON-U.S. EQUITY

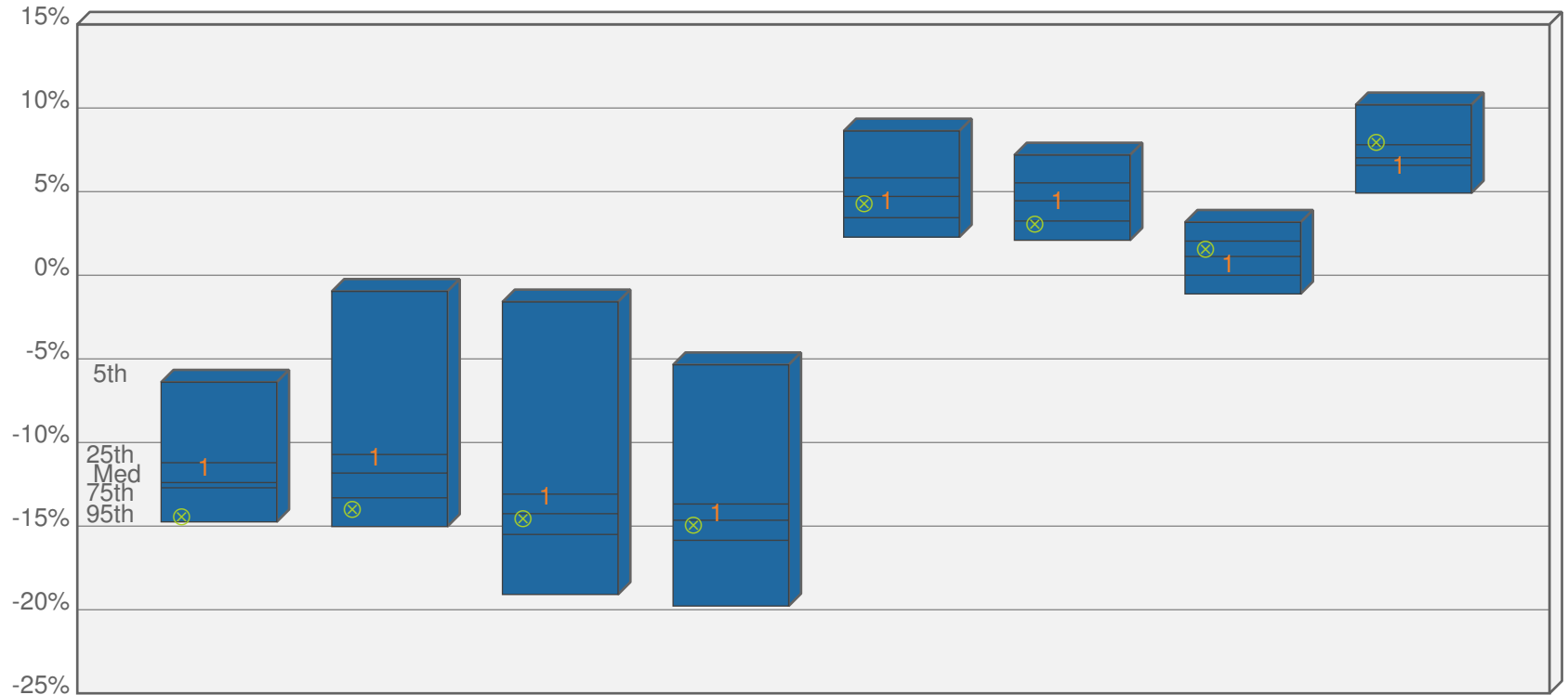
Wilshire Consulting
MANAGER ALLOCATION
Non-U.S. Equity Composite
As of December 31, 2018



PERFORMANCE COMPARISON

Non-U.S. Equity Composite

Periods Ended December 31, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊗ Non-U.S. Equity Composite	-14.44 (94)	-13.98 (86)	-14.54 (54)	-14.91 (60)	4.29 (55)	3.07 (77)	1.59 (36)	8.00 (19)
1 Policy Benchmark	-11.46 (30)	-10.84 (26)	-13.17 (26)	-14.20 (40)	4.47 (55)	4.48 (43)	0.68 (66)	6.57 (77)
5th %tile	-6.40	-0.97	-1.60	-5.36	8.62	7.18	3.16	10.18
25th %tile	-11.21	-10.72	-13.09	-13.68	5.82	5.52	2.04	7.80
Median	-12.40	-11.83	-14.26	-14.65	4.71	4.45	1.12	7.02
75th %tile	-12.71	-13.31	-15.50	-15.85	3.44	3.24	0.00	6.57
95th %tile	-14.75	-15.03	-19.09	-19.78	2.28	2.09	-1.12	4.91
Number of Funds	87	86	84	81	76	75	70	49

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

PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

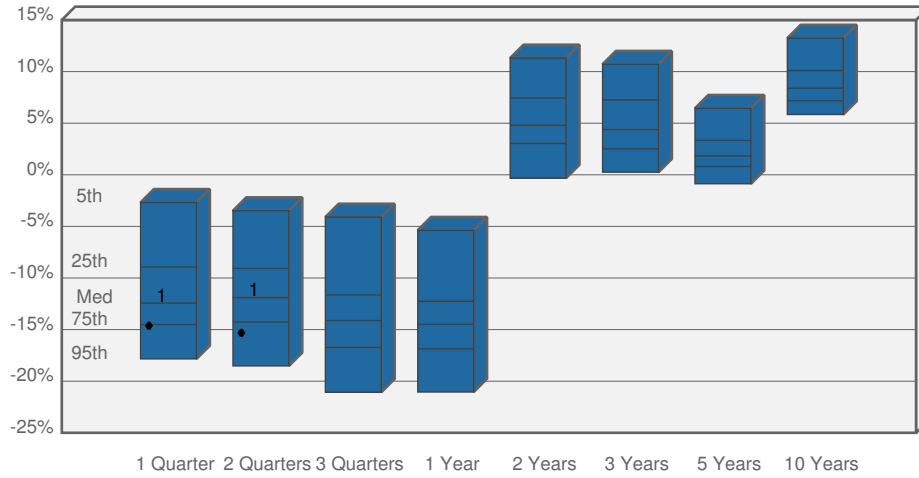
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
Neuberger Berman CIT									
Net of Fee Return	-14.11							6/30/18	-14.80
MSCI ACWI ex US (N)	-11.46							6/30/18	-10.84
Value Added	-2.65							6/30/18	-3.96
Neuberger Berman Composite									
Net of Fee Return	-14.11	-15.68	-15.68	1.98	1.22	5.82	7.62	6/30/06	2.32
MSCI ACWI ex US (N)	-11.46	-14.20	-14.20	4.48	0.68	4.85	6.57	6/30/06	2.65
Value Added	-2.65	-1.48	-1.48	-2.50	0.54	0.97	1.05	6/30/06	-0.33
Harding Loevner									
Net of Fee Return	-15.17	-13.90	-13.90	4.72				3/31/15	2.06
MSCI ACWI X US (N)	-11.46	-14.20	-14.20	4.48				3/31/15	1.04
Value Added	-3.70	0.30	0.30	0.25				3/31/15	1.02
Non-U.S. Equity Composite									
Net of Fee Return	-14.48	-15.07	-15.07	2.90	1.47	6.03	7.77	12/31/89	7.52
Policy Benchmark	-11.46	-14.20	-14.20	4.48	0.68	4.85	6.57	12/31/89	4.12
Value Added	-3.02	-0.87	-0.87	-1.58	0.79	1.19	1.20	12/31/89	3.40

INVESTMENT MANAGER ANALYSIS

Neuberger Berman CIT

December 31, 2018

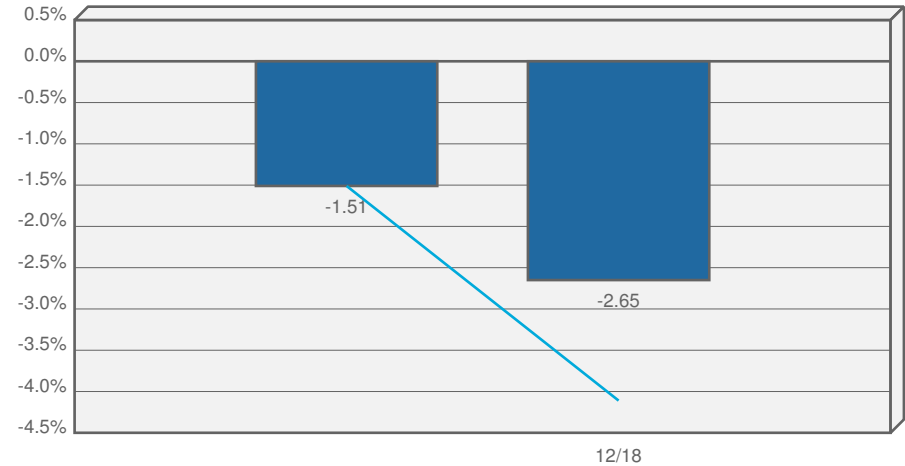
Performance Comparison vs Peer Universe*



● Neuberger Berm -14.11 (69)-14.80 (78)
 1 MSCI ACWI ex U -11.46 (42)-10.84 (39)

	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
Median	-12.43	-11.90	-14.12	-14.50	4.80	4.38	1.83	8.39
Number of Funds	873	865	850	844	818	787	737	513

Value-Added Analysis vs Benchmark



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

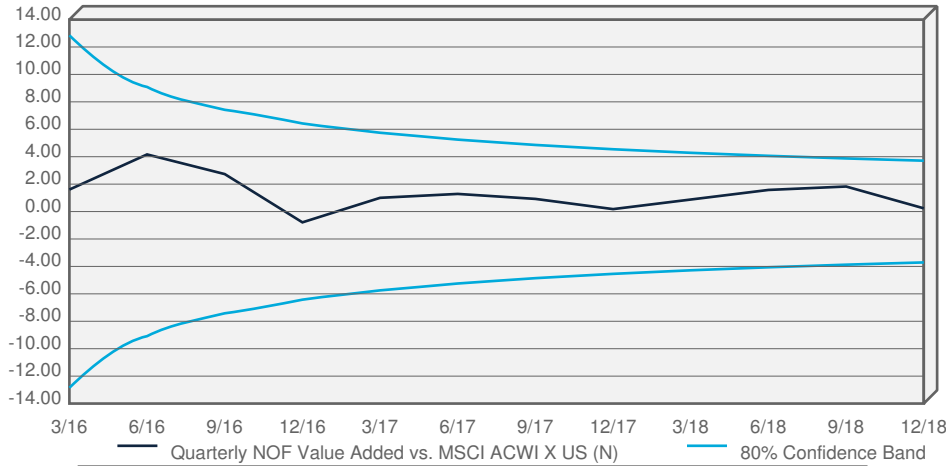
*TUCS Total Returns of International Equity Portfolios Universe - Gross of Fees

INVESTMENT MANAGER ANALYSIS

Harding Loevner

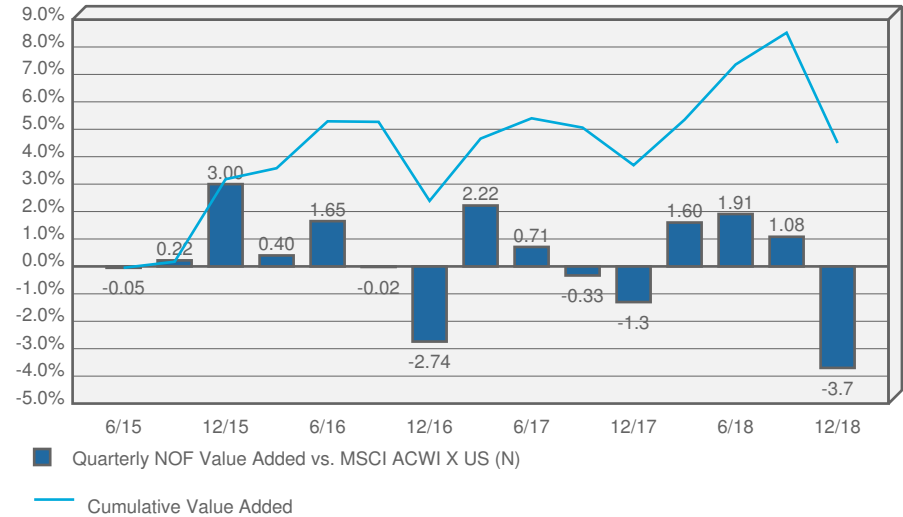
December 31, 2018

Cumulative Skill Analysis vs Benchmark

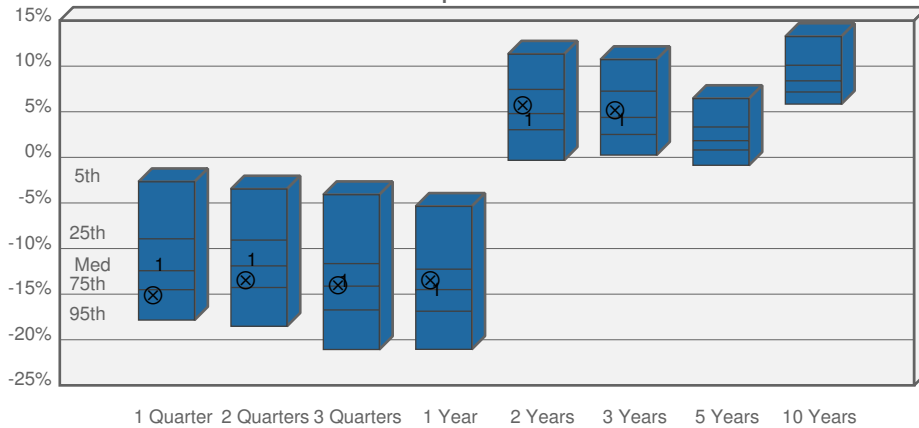


Excess Return:	0.24	Information Ratio:	0.06
Excess Risk:	3.91	T-Stat:	0.10

Value-Added Analysis vs Benchmark



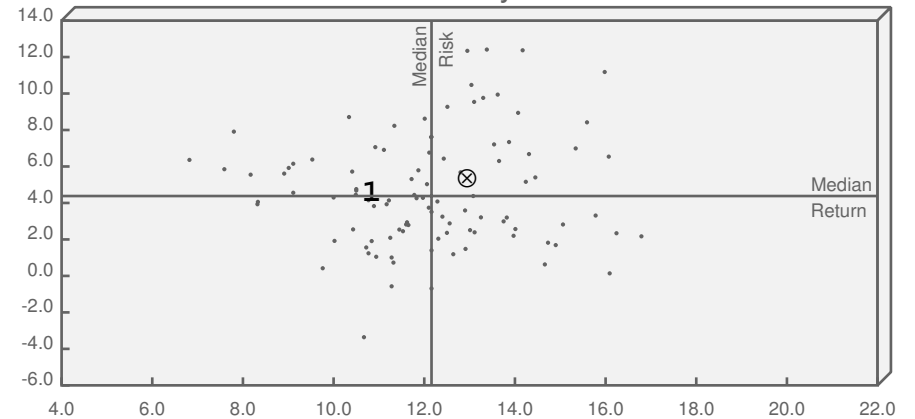
Performance Comparison vs Peer Universe*



⊗ Harding Loevne -15.04 (80)-13.42 (68)-13.91 (46)-13.43 (36) 5.80 (37) 5.28 (40)
 1 MSCI ACWI X US 11.46 (42)-10.84 (39)-13.17 (38)-14.20 (45) 4.47 (55) 4.48 (48)

Median	-12.43	-11.90	-14.12	-14.50	4.80	4.38	1.83	8.39
Number of Funds	873	865	850	844	818	787	737	513

Three Year Risk/Return Analysis vs Peer Universe*



Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
Harding Loevner	⊗	5.28	40	13.04	33
MSCI ACWI X US (N)	1	4.48	48	10.95	73
Median		4.38		12.16	

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



ALTERNATIVE INVESTMENTS

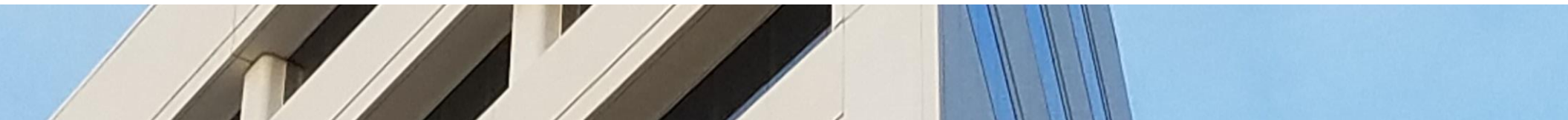
Investment Performance

Private Partnerships

As of December 31, 2018

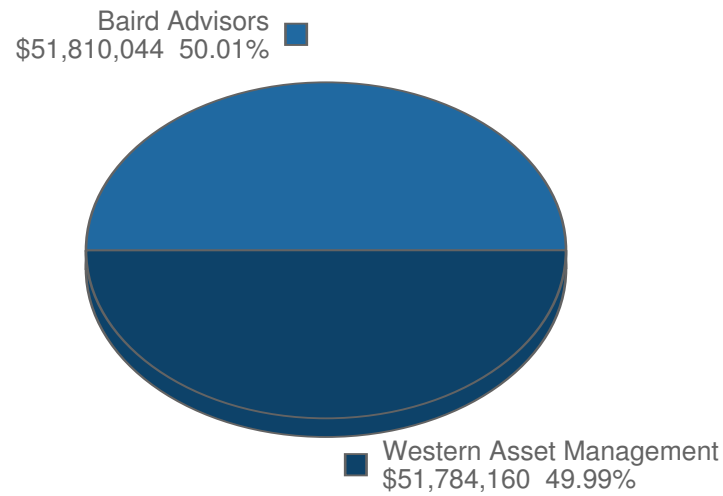
Partnership	Commitment Value	Inception Date	Capital Called		Capital Distributed		Fair Value	Total Value / Paid-In Capital ¹	Annualized IRR
			Amount	%	Amount	%			
Private Equity Program									
Adams Street Direct 2010 Fund	\$500,000	April 27, 2010	\$473,300	95%	\$533,965	107%	\$326,422	1.82	13.64%
Adams Street Non-US Dev. 2010 Fund	\$1,500,000	April 27, 2010	\$1,313,250	88%	\$915,712	61%	\$1,025,007	1.48	11.21%
Adams Street Non-US EM 2010 Fund	\$500,000	January 3, 2011	\$449,000	90%	\$118,384	24%	\$579,757	1.55	11.04%
Adams Street US 2010 Fund	\$2,500,000	April 27, 2010	\$2,202,500	88%	\$1,509,367	60%	\$2,153,501	1.66	13.83%
Adams Street 2013 Global Fund	\$5,000,000	July 3, 2013	\$3,775,000	76%	\$538,386	11%	\$4,657,388	1.38	11.23%
Aberdeen Global Partners	\$5,000,000	January 17, 2012	\$4,850,000	97%	\$1,591,013	32%	\$5,281,768	1.42	10.69%
Adams Street 2015 Global	\$6,500,000	September 30, 2015	\$4,222,868	65%	\$825,449	13%	\$4,568,924	1.28	26.62%
Adams Street 2017 Global	\$6,000,000	June 17, 2017	\$1,853,455	31%	\$0	0%	\$1,912,856	1.03	8.43%
Private Equity Composite	\$27,500,000	April 27, 2010	\$19,139,373	70%	\$6,032,276	22%	\$20,505,623	1.39	12.64%
Private Credit Managers									
Grosvenor Opportunistic Credit V	\$14,000,000	September 17, 2018	\$6,182,525	44%	\$0	\$0	\$6,165,279	1.00	-
50 South Sponsor Backed Credit	\$7,000,000	October 4, 2018	\$710,111	10%	\$0	\$0	\$700,000	0.99	-
Private Credit Composite	\$21,000,000	September 17, 2018	\$6,892,636	33%	\$0	0%	\$6,865,279	1.00	-

¹TVPI = Fair Value + Capital Distributed / Capital Called



CORE FIXED INCOME

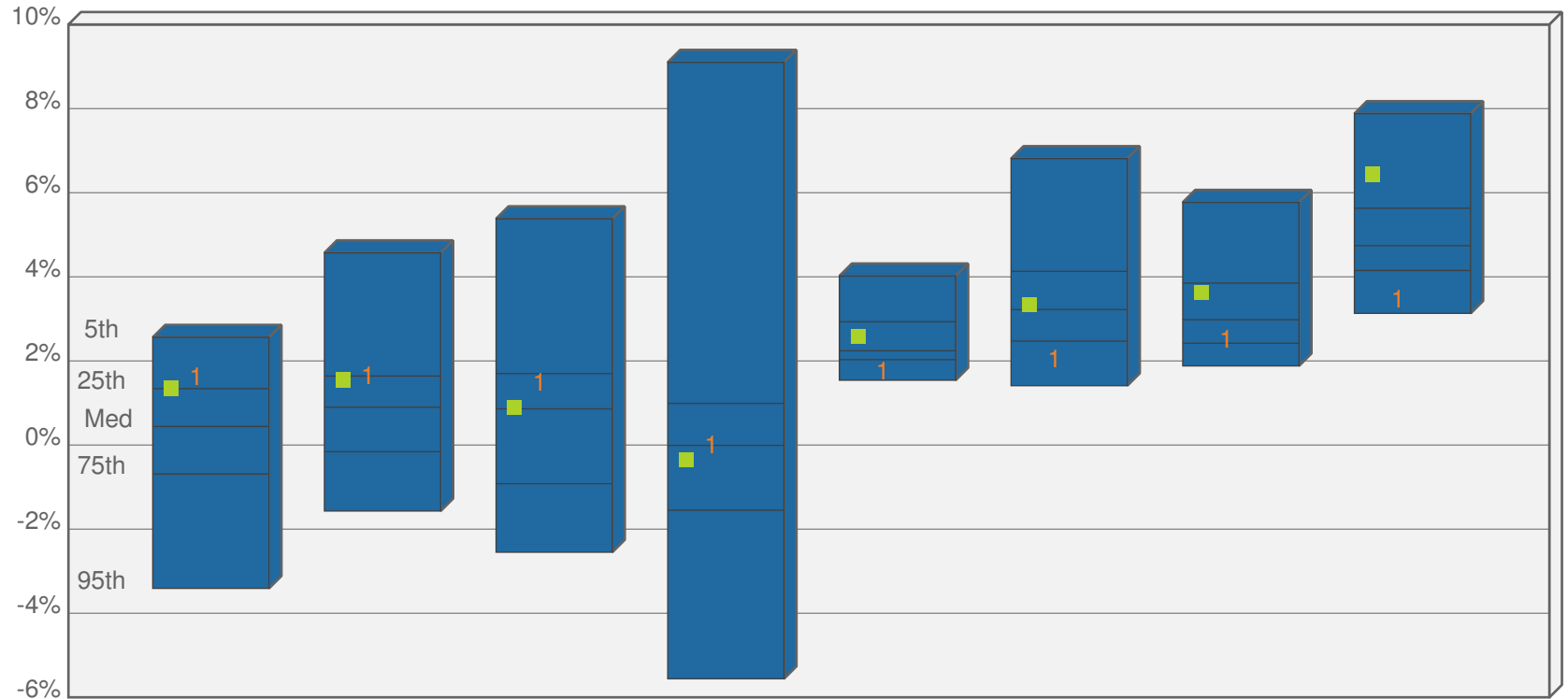
Wilshire Consulting
MANAGER ALLOCATION
Core Fixed Composite
As of December 31, 2018



PERFORMANCE COMPARISON

Core Fixed Composite

Periods Ended December 31, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
■ Core Fixed Composite	1.37 (23)	1.57 (29)	0.92 (49)	-0.32 (60)	2.62 (30)	3.36 (43)	3.65 (30)	6.46 (14)
1 Bloomberg Aggreg	1.64 (14)	1.65 (24)	1.49 (35)	0.01 (48)	1.76 (89)	2.06 (88)	2.52 (68)	3.48 (88)
5th %tile	2.56	4.57	5.38	9.10	4.02	6.81	5.77	7.88
25th %tile	1.34	1.64	1.70	0.99	2.93	4.13	3.85	5.63
Median	0.44	0.90	0.86	-0.01	2.24	3.22	2.98	4.74
75th %tile	-0.69	-0.16	-0.92	-1.55	2.03	2.47	2.42	4.15
95th %tile	-3.41	-1.57	-2.55	-5.56	1.54	1.41	1.88	3.13
Number of Funds	137	135	132	126	100	95	89	59

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

PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

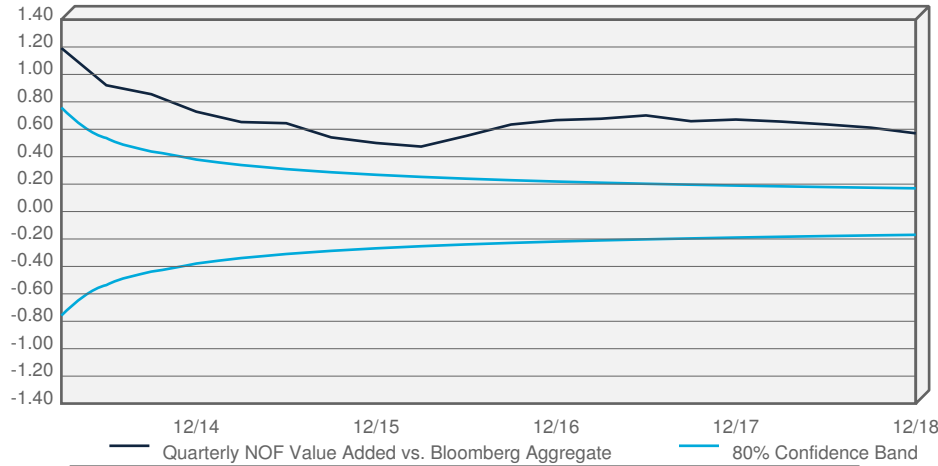
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
Baird Advisors									
Net of Fee Return	1.58	0.18	0.18	2.69	3.11	2.93	4.73	3/31/03	4.22
Bloomberg Aggregate	1.64	0.01	0.01	2.06	2.52	2.10	3.48	3/31/03	3.85
Value Added	-0.05	0.17	0.17	0.63	0.58	0.83	1.25	3/31/03	0.37
Western Asset Management									
Net of Fee Return	1.11	-1.25	-1.25	3.52	3.69	3.91	7.63	3/31/04	4.75
Bloomberg Aggregate	1.64	0.01	0.01	2.06	2.52	2.10	3.48	3/31/04	3.75
Value Added	-0.53	-1.26	-1.26	1.47	1.17	1.81	4.15	3/31/04	1.00
Core Fixed Composite									
Net of Fee Return	1.34	-0.47	-0.47	3.13	3.41	3.45	6.22	9/30/87	6.68
Bloomberg Aggregate	1.64	0.01	0.01	2.06	2.52	2.10	3.48	9/30/87	6.29
Value Added	-0.29	-0.49	-0.49	1.07	0.89	1.35	2.74	9/30/87	0.39

INVESTMENT MANAGER ANALYSIS

Baird Advisors

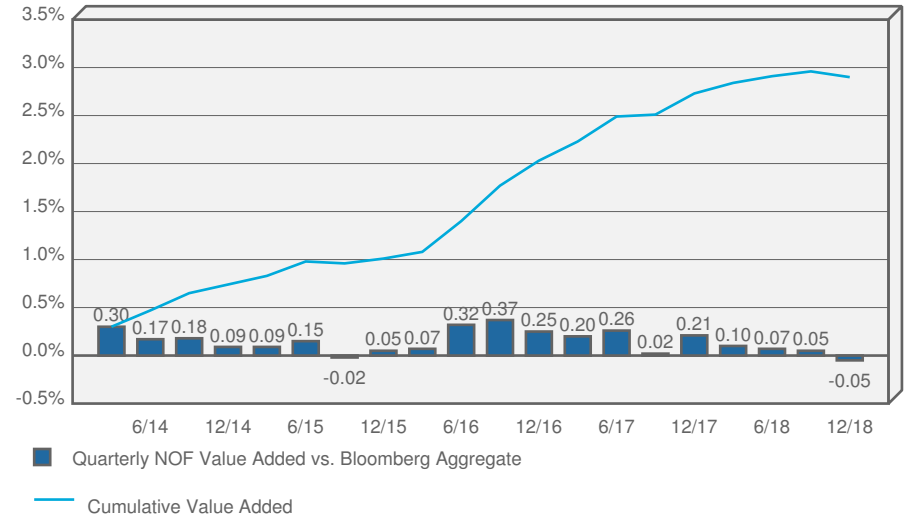
December 31, 2018

Cumulative Skill Analysis vs Benchmark

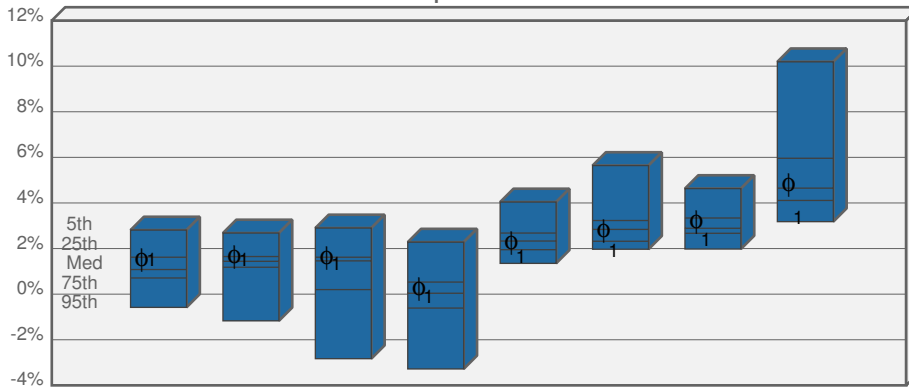


Excess Return:	0.57	Information Ratio:	2.48
Excess Risk:	0.23	T-Stat:	5.54

Value-Added Analysis vs Benchmark

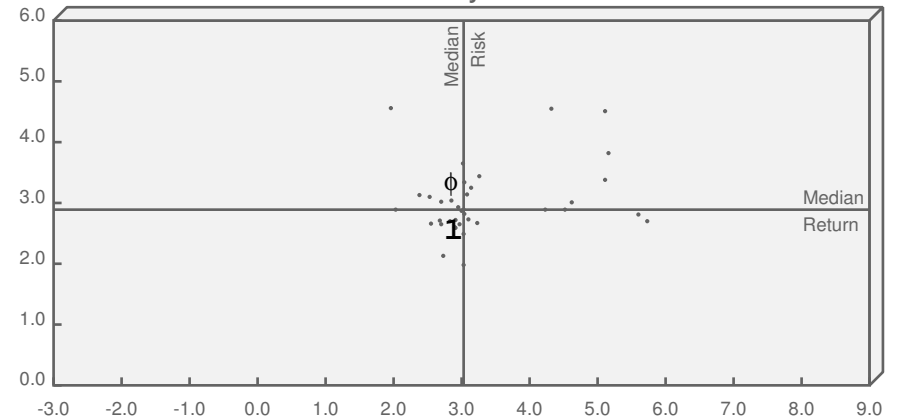


Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
ϕ Baird Advisors	1.64 (23)	1.76 (17)	1.72 (19)	0.39 (29)	2.41 (38)	2.90 (45)	3.32 (25)	4.95 (41)
1 Bloomberg Aggr	1.64 (23)	1.65 (25)	1.49 (39)	0.01 (52)	1.76 (87)	2.06 (91)	2.52 (88)	3.48 (91)
Median	1.08	1.44	1.46	0.04	2.33	2.84	2.89	4.65
Number of Funds	50	48	48	48	45	44	38	26

Five Year Risk/Return Analysis vs Peer Universe*



Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
Baird Advisors	ϕ	3.32	25	2.96	58
Bloomberg Aggregate	1	2.52	88	2.96	58
Median		2.89		3.03	

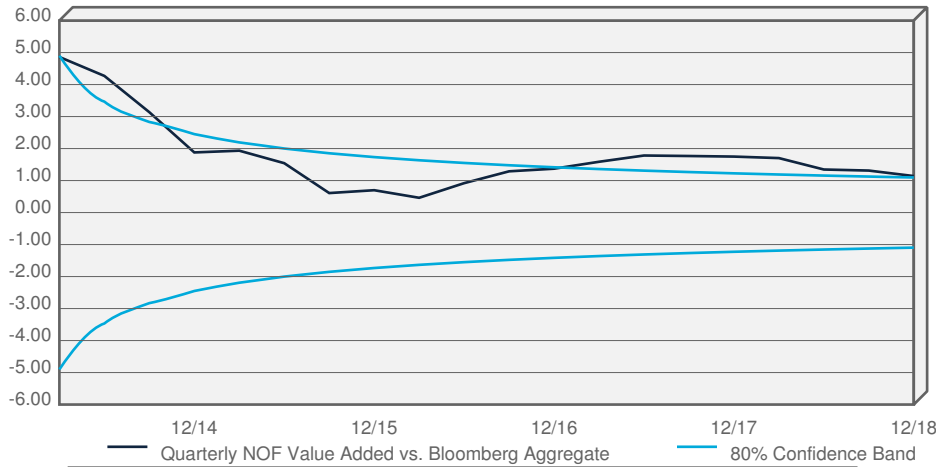
*TUCS Total Returns of Fixed Income Portfolios - Core Universe - Gross of Fees

INVESTMENT MANAGER ANALYSIS

Western Asset Management

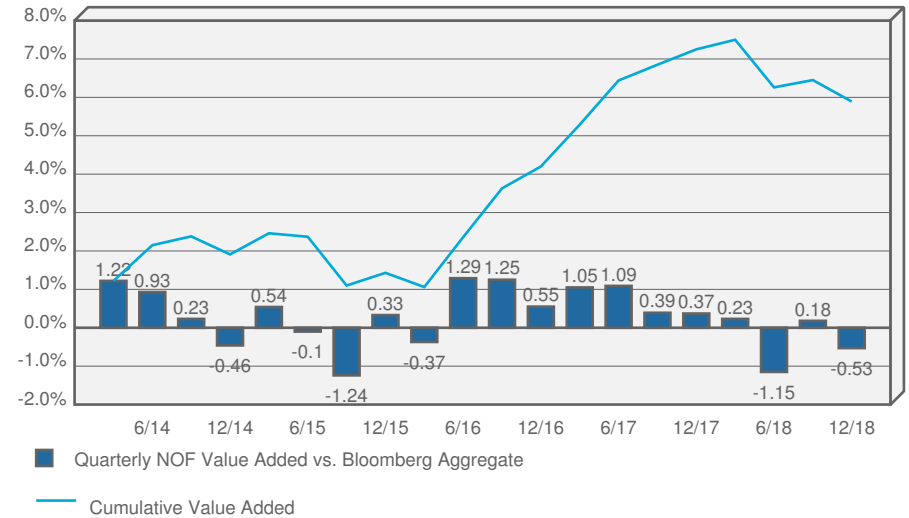
December 31, 2018

Cumulative Skill Analysis vs Benchmark

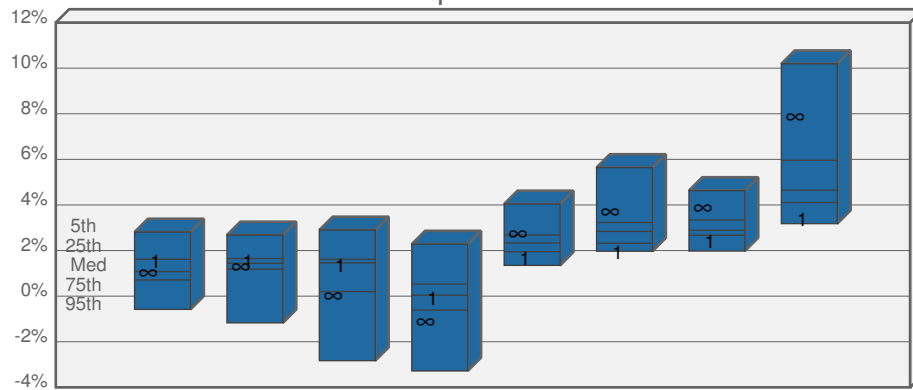


Excess Return:	1.14	Information Ratio:	0.77
Excess Risk:	1.49	T-Stat:	1.71

Value-Added Analysis vs Benchmark

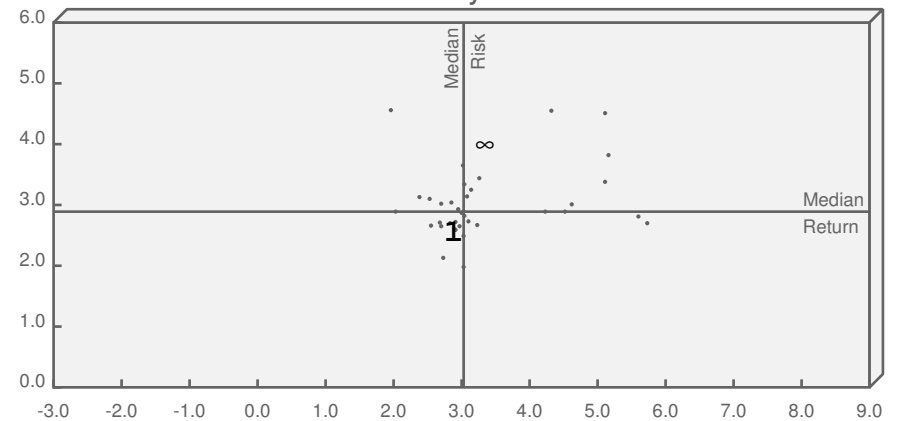


Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
∞ Western Asset	1.11 (47)	1.38 (52)	0.13 (79)	-1.03 (85)	2.84 (21)	3.81 (12)	3.98 (13)	7.94 (9)
1 Bloomberg Aggr	1.64 (23)	1.65 (25)	1.49 (39)	0.01 (52)	1.76 (87)	2.06 (91)	2.52 (88)	3.48 (91)
Median	1.08	1.44	1.46	0.04	2.33	2.84	2.89	4.65
Number of Funds	50	48	48	48	45	44	38	26

Five Year Risk/Return Analysis vs Peer Universe*



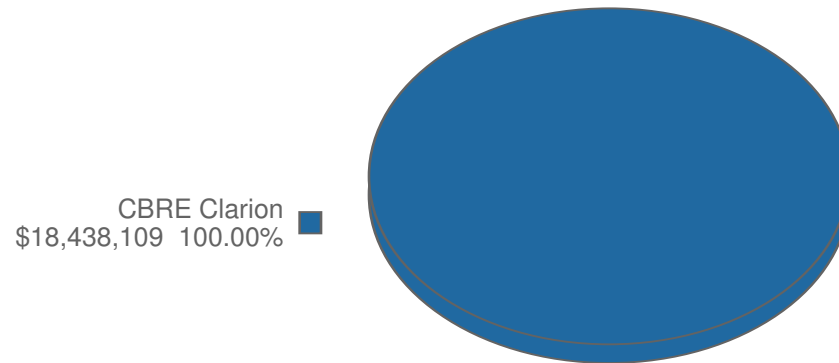
Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
Western Asset Management	∞	3.98	13	3.42	27
Bloomberg Aggregate	1	2.52	88	2.96	58
Median		2.89		3.03	

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



REAL ESTATE

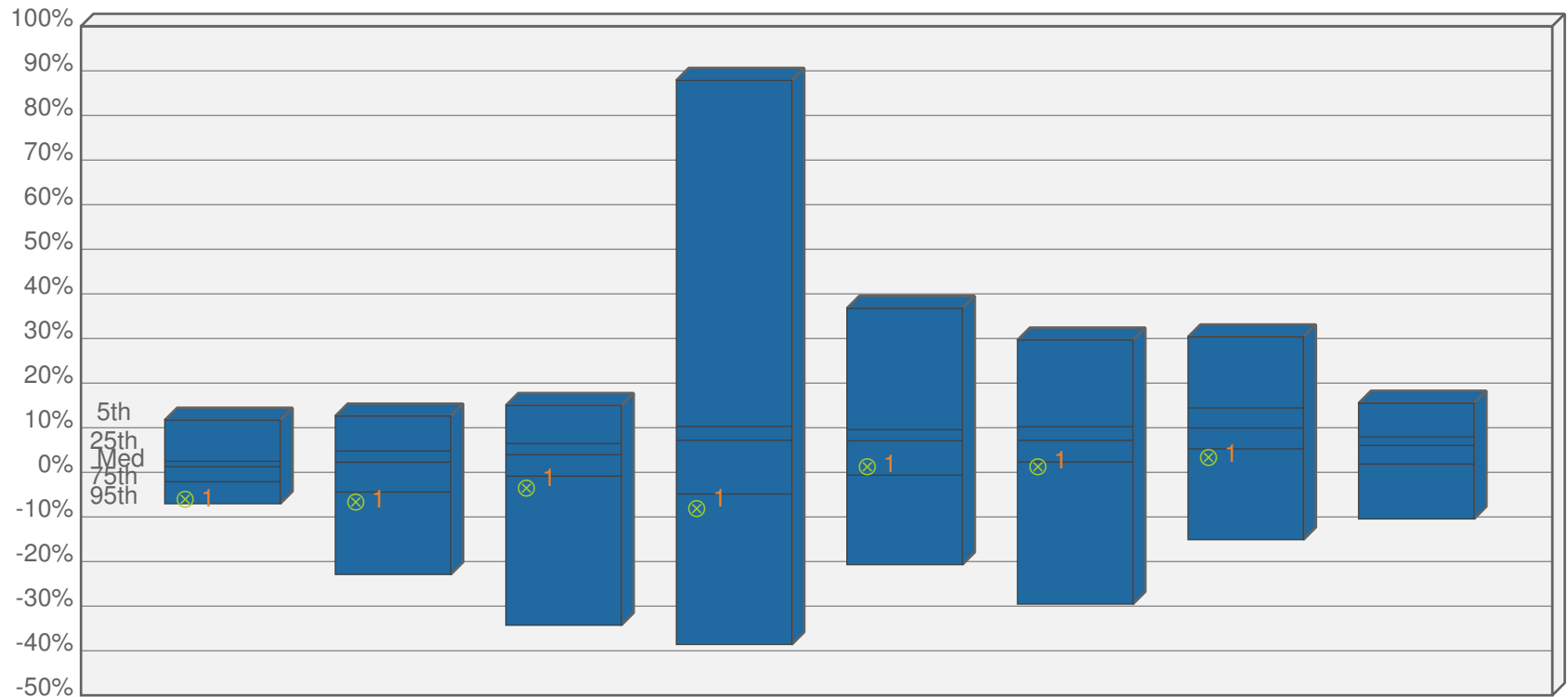
Wilshire Consulting
MANAGER ALLOCATION
Real Estate Composite
As of December 31, 2018



PERFORMANCE COMPARISON

Real Estate Composite

Periods Ended December 31, 2018



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊗ Real Estate Composite	-5.95 (85)	-6.48 (85)	-3.41 (78)	-7.93 (83)	1.32 (67)	1.37 (77)	3.53 (81)	
1 FTSE EPRA/NAREIT	-5.69 (84)	-5.97 (83)	-1.16 (75)	-5.63 (75)	2.05 (67)	2.72 (72)	4.34 (80)	
5th %tile	11.69	12.62	14.99	87.88	36.78	29.66	30.36	15.50
25th %tile	2.46	4.75	6.45	10.29	9.55	10.20	14.41	7.94
Median	1.25	2.25	3.93	7.18	7.05	7.16	9.94	6.00
75th %tile	-2.12	-4.43	-0.87	-4.86	-0.65	2.30	5.25	1.84
95th %tile	-7.05	-22.91	-34.29	-38.60	-20.71	-29.55	-15.11	-10.46
Number of Funds	113	118	116	119	111	110	105	67

*TUCS Total Ret of Real Estate Portfolios Universe - Gross of Fees

PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

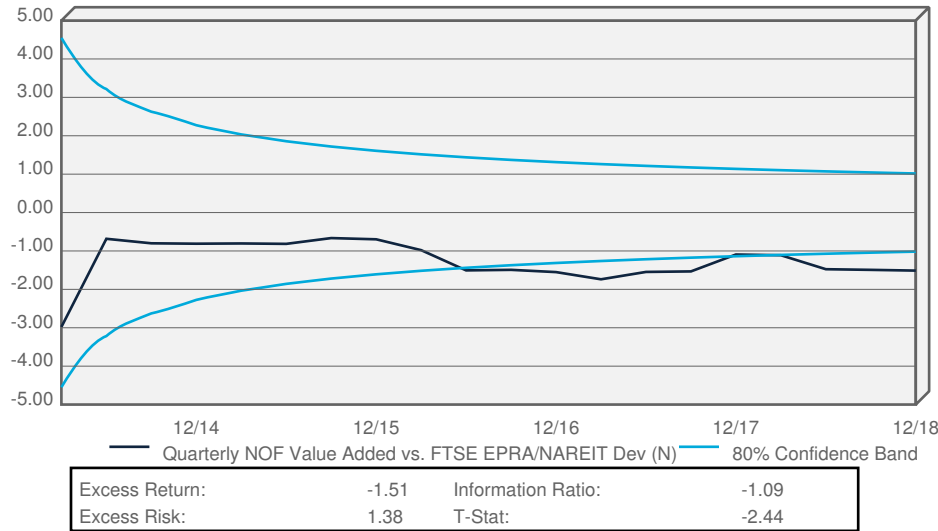
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
CBRE Clarion									
Net of Fee Return	-6.14	-8.63	-8.63	0.61	2.76	5.79		6/30/09	8.27
FTSE EPRA/NAREIT Dev (N)	-5.69	-5.63	-5.63	2.72	4.34	7.30		6/30/09	9.59
Value Added	-0.45	-2.99	-2.99	-2.11	-1.58	-1.51		6/30/09	-1.32
Real Estate Composite									
Net of Fee Return	-6.14	-8.63	-8.63	0.61	2.75	5.79		6/30/09	8.26
FTSE EPRA/NAREIT Dev (N)	-5.69	-5.63	-5.63	2.72	4.34	7.30		6/30/09	9.59
Value Added	-0.45	-2.99	-2.99	-2.11	-1.59	-1.51		6/30/09	-1.33

INVESTMENT MANAGER ANALYSIS

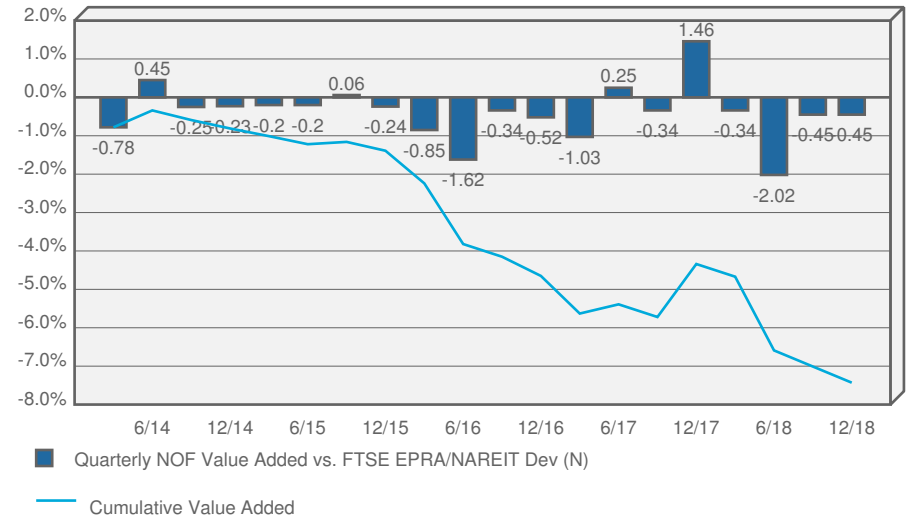
CBRE Clarion

December 31, 2018

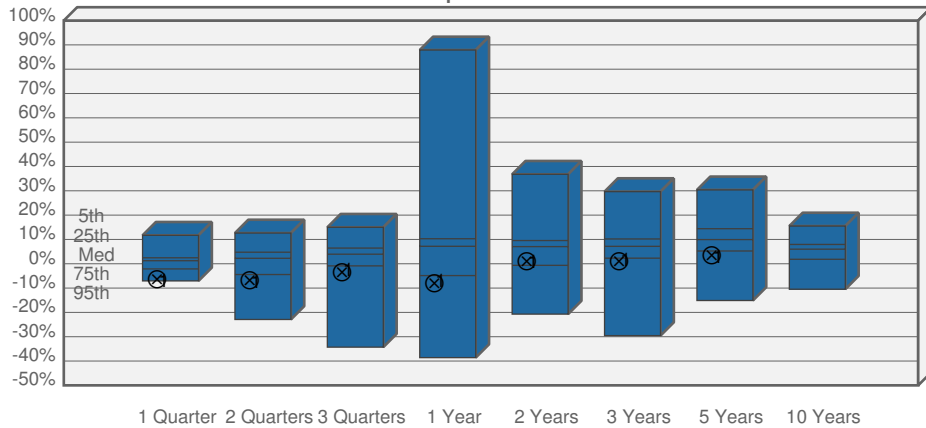
Cumulative Skill Analysis vs Benchmark



Value-Added Analysis vs Benchmark

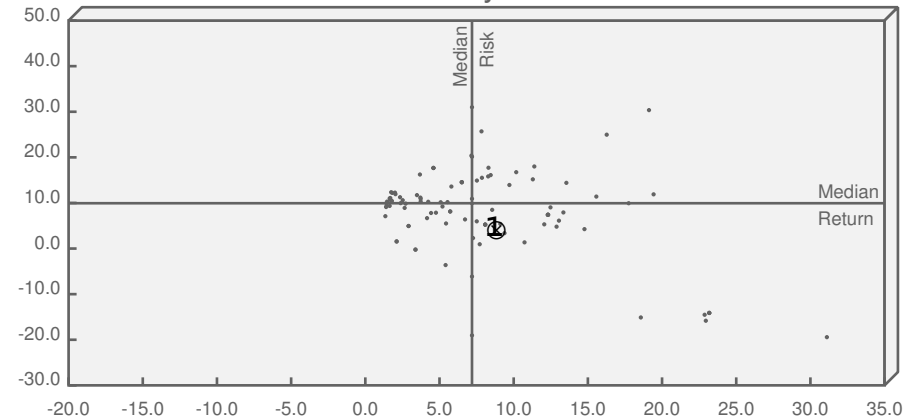


Performance Comparison vs Peer Universe*



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	5 Years	10 Years
⊗ CBRE Clarion	-5.95 (85)	-6.48 (85)	-3.41 (78)	-7.93 (83)	1.32 (67)	1.37 (77)	3.54 (81)	
1 FTSE EPRA/NAREIT Dev (N)	-5.69 (84)	-5.97 (83)	-1.16 (75)	-5.63 (75)	2.05 (67)	2.72 (72)	4.34 (80)	
Median	1.25	2.25	3.93	7.18	7.05	7.16	9.94	6.00
Number of Funds	113	118	116	119	111	110	105	67

Five Year Risk/Return Analysis vs Peer Universe*



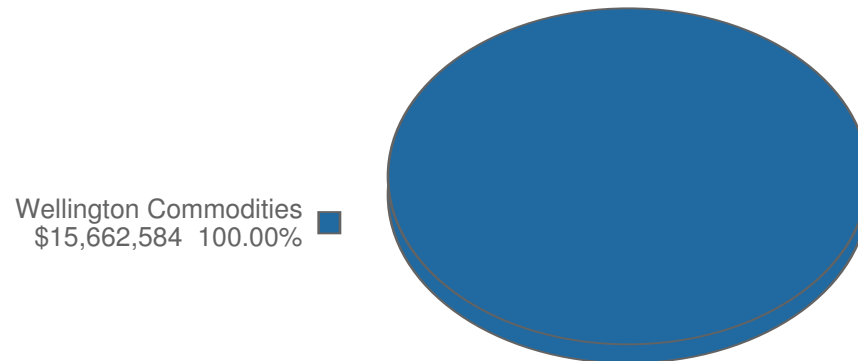
Description	Legend	Gross Fee Ret		Standard Deviation	
		Value	Rank	Value	Rank
CBRE Clarion	⊗	3.54	81	9.14	36
FTSE EPRA/NAREIT Dev (N)	1	4.34	80	9.07	37
Median		9.94		7.19	

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



COMMODITIES

Wilshire Consulting
MANAGER ALLOCATION
Commodities Composite
As of December 31, 2018



PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

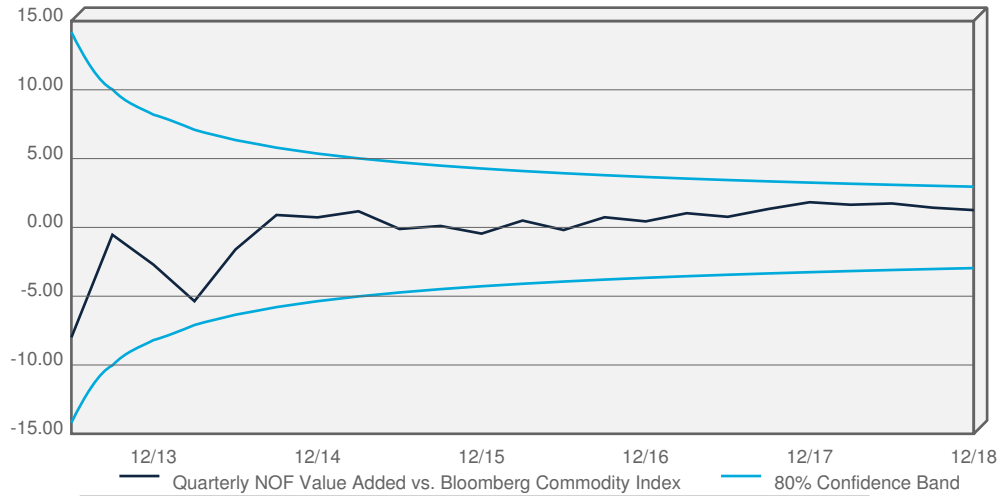
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
Wellington Commodities									
Net of Fee Return	-9.99	-12.50	-12.50	3.15	-7.10			3/31/13	-7.97
Bloomberg Commodity Index	-9.41	-11.25	-11.25	0.30	-8.80			3/31/13	-9.11
Value Added	-0.58	-1.26	-1.26	2.86	1.70			3/31/13	1.14
Commodities Composite									
Net of Fee Return	-9.99	-12.50	-12.50	3.15	-7.10			3/31/13	-7.97
Bloomberg Commodity Index	-9.41	-11.25	-11.25	0.30	-8.80			3/31/13	-9.11
Value Added	-0.58	-1.26	-1.26	2.86	1.70			3/31/13	1.14

INVESTMENT MANAGER ANALYSIS

Wellington Commodities

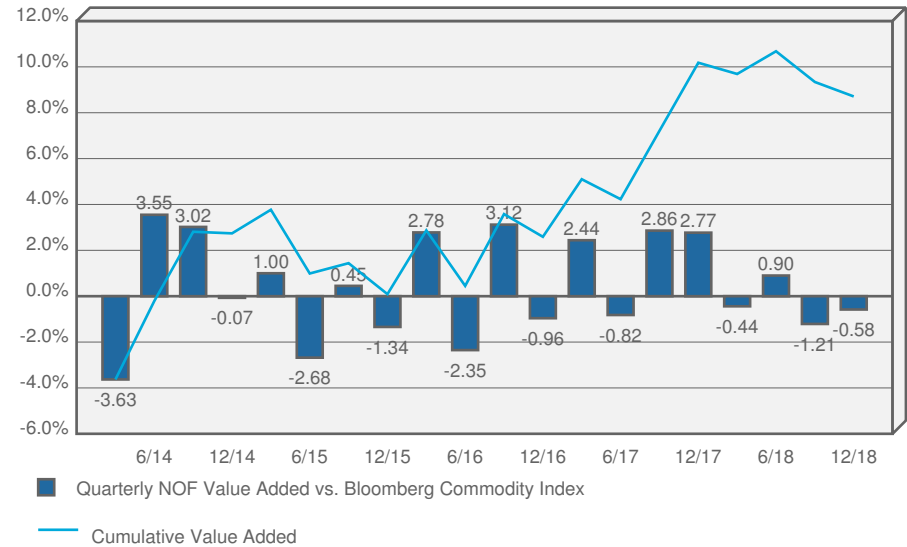
December 31, 2018

Cumulative Skill Analysis vs Benchmark



Excess Return:	1.26	Information Ratio:	0.29
Excess Risk:	4.31	T-Stat:	0.65

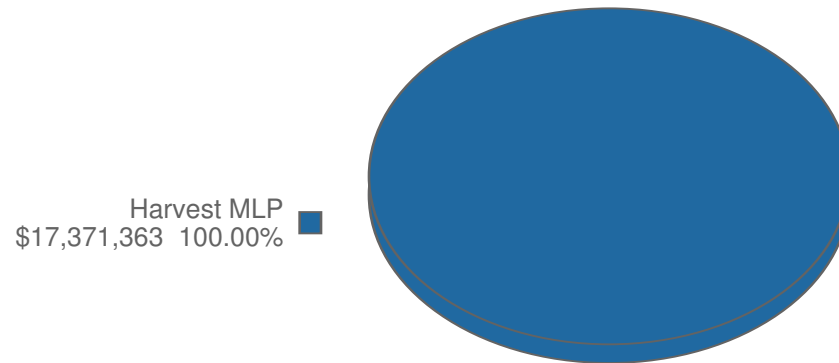
Value-Added Analysis vs Benchmark





MLP

Wilshire Consulting
MANAGER ALLOCATION
MLP Composite
As of December 31, 2018



PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

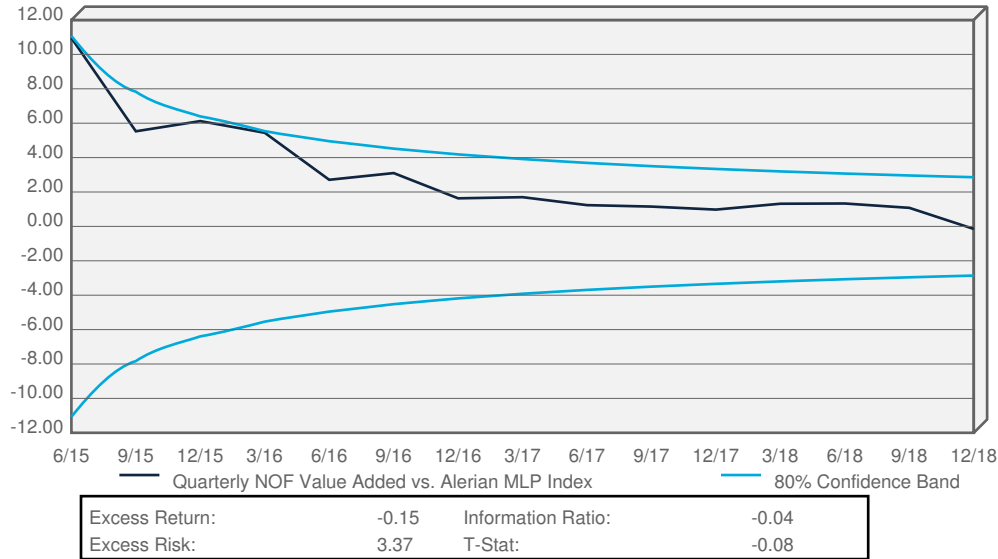
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
Harvest MLP									
Net of Fee Return	-20.79	-13.80	-13.80	-0.84				3/31/15	-9.65
Alerian MLP Index	-17.30	-10.97	-10.97	0.83				3/31/15	-9.52
Value Added	-3.49	-2.83	-2.83	-1.67				3/31/15	-0.13
MLP Composite									
Net of Fee Return	-20.79	-13.80	-13.80	-0.84				3/31/15	-9.65
Alerian MLP Index	-17.30	-10.97	-10.97	0.83				3/31/15	-9.52
Value Added	-3.49	-2.83	-2.83	-1.67				3/31/15	-0.13

INVESTMENT MANAGER ANALYSIS

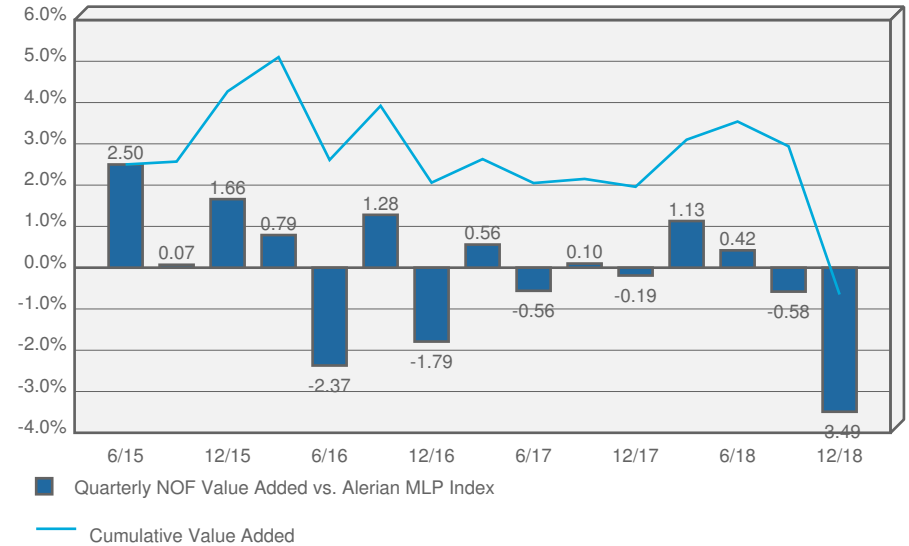
Harvest MLP

December 31, 2018

Cumulative Skill Analysis vs Benchmark



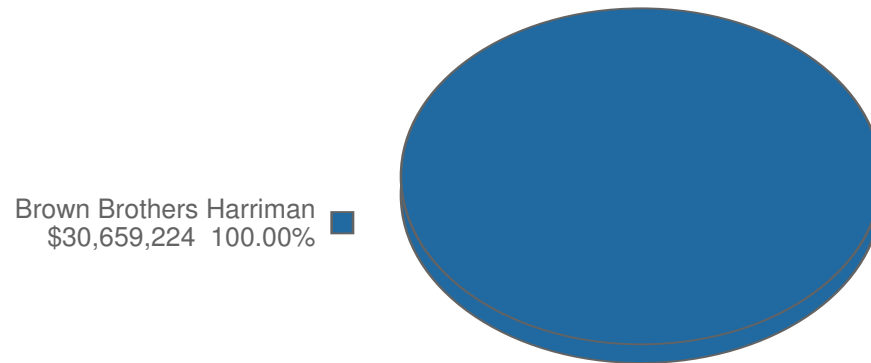
Value-Added Analysis vs Benchmark





TIPS

Wilshire Consulting
MANAGER ALLOCATION
TIPS Composite
As of December 31, 2018



PERFORMANCE COMPARISON

Trailing Returns

Periods Ended December 31, 2018

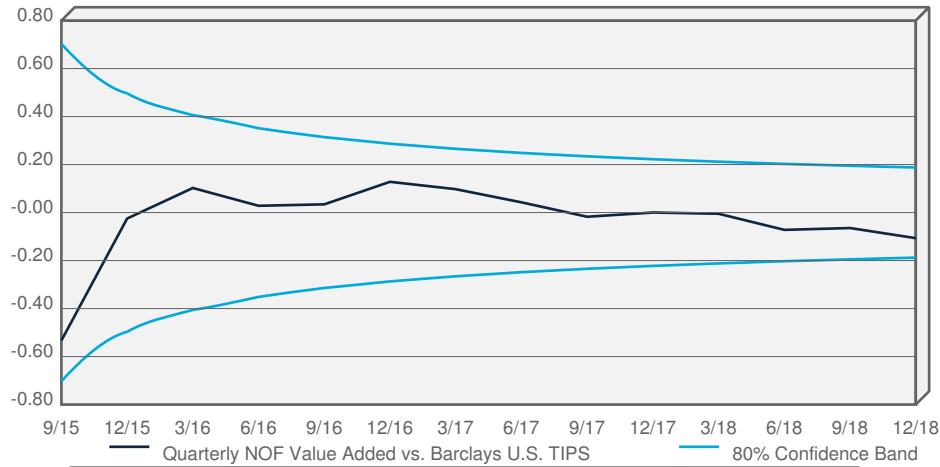
	1 Qtr	YTD	1 Year	3 Yrs	5 Yrs	7 Yrs	10 Yrs	Incept Date	Incept Ret
Brown Brothers Harriman									
Net of Fee Return	-0.58	-1.63	-1.63	1.99				6/30/15	1.18
Barclays U.S. TIPS	-0.42	-1.26	-1.26	2.11				6/30/15	1.29
Value Added	-0.16	-0.37	-0.37	-0.12				6/30/15	-0.11
TIPS Composite									
Net of Fee Return	-0.58	-1.63	-1.63	1.99				6/30/15	1.18
Barclays U.S. TIPS	-0.42	-1.26	-1.26	2.11				6/30/15	1.29
Value Added	-0.16	-0.37	-0.37	-0.12				6/30/15	-0.11

INVESTMENT MANAGER ANALYSIS

Brown Brothers Harriman

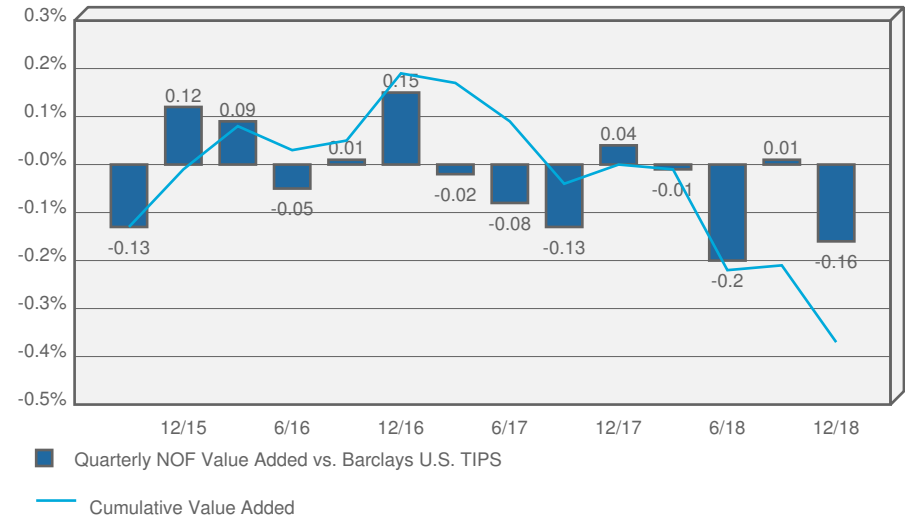
December 31, 2018

Cumulative Skill Analysis vs Benchmark

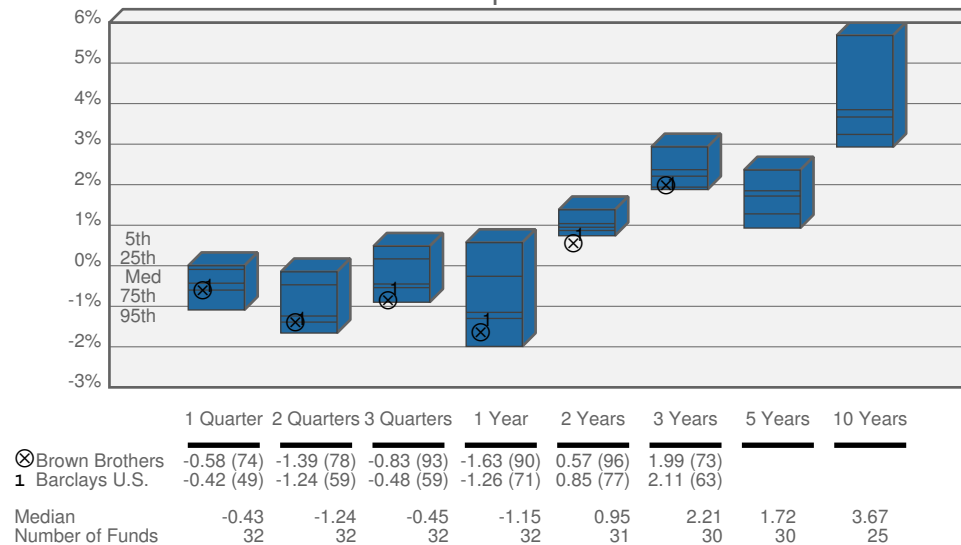


Excess Return:	-0.11	Information Ratio:	-0.50
Excess Risk:	0.21	T-Stat:	-0.87

Value-Added Analysis vs Benchmark



Performance Comparison vs Peer Universe*



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



APPENDIX

Glossary

Cumulative Skill Graph

- Graphical representation of the statistical significance of excess returns over a specified benchmark for the cumulative time period being analyzed.
- Positive cumulative excess performance is shown when the dark blue line is above the "0.00" line measured on the left Y axis.
- The light blue lines that form a channel, or the shape of a trumpet horn, represent the boundaries of the statistical significance test.
- The width of the channel is calculated based on the amount of "Excess Risk" that the manager takes over the benchmark.

