WILSHIRE ASSOCIATES

Wilshire Consulting

Employees' Retirement Fund of the City of Dallas

Executive Summary of Performance

Fourth Quarter 2018

Wilshire Associates Incorporated
1299 Ocean Avenue, Suite 700
Santa Monica, CA 90401
Phone: 310-451-3051
contactconsulting@wilshire.com

Capital Market Overview

U.S. Equity Market

The U.S. stock market, represented by the Wilshire 5000 Total Market Index, was down -14.29% for the fourth quarter of 2018 and -5.27% for the year. This marks the worst quarter for U.S. equities since 2011 and the first down year since the credit crisis sell-off of 2008. The index had been down by double-digits for the year in late-December before gaining nearly 7% during the final few trading days. 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. Ongoing trade negotiations between China and the U.S. continued to be a factor affecting market activity during the quarter with the eventual resolutions standing as a major unknown entering the new year.

Large capitalization stocks far outperformed small caps for the quarter as the Wilshire Large-Cap Index was down -13.69% versus a loss of -19.67% for the Wilshire US Small-Cap Index. The large-cap segment of the market leads small-caps for the past twelve months, as well. The Wilshire US Micro-Cap Index was down -23.50% for the quarter and -15.58% for the one-year. Growth stocks trailed value, generally, during the fourth quarter but outperformed during the past twelve months.

Nearly all of the eleven major sectors were in negative territory during the fourth quarter. The only positive sector was Utilities (+0.8%) with Energy (-25.6%), Industrials (-18.2%) and Information Technology (-17.5%) down the most.

Fixed Income Market

The U.S. Treasury yield curve fell across most maturities during the quarter with the biggest decreases occurring in the intermediate to longer segment of the curve. The bellwether 10-year Treasury yield ended the quarter at 2.69%, down 37 basis points from September. The Federal Open Market Committee decided to increase its overnight rate by 25 basis points in December to a range of 2.25% to 2.50%. The committee adjusted their forecast for future rates, communicated through their "dot plot," from three rate increases in 2019 to only two. Credit spreads widened during the quarter within both the investment grade and high yield markets.

Non-U.S. Markets

Equity markets outside of the U.S. also suffered during the fourth quarter of 2018, although they generally outperformed the U.S. equity market. For all of 2018, however, foreign equities significantly underperformed, falling by double digits. While the European Union began the year in sound condition, economically, growth declined steadily during the year while gains in unemployment stalled and industrial production reversed course. News out of Japan was grim with a report showing a serious economic contraction during the third quarter that threatens to end Japan's longest expansion since the 1980's. Emerging markets actually led global equity for the quarter but still exhibited a meaningful loss. While there were some positive signals on the U.S.-China trade front, investors will likely wait until after a scheduled meeting in January between the two countries before fully evaluating the current global trade environment.

Real Assets Markets

Real estate securities outperformed broader equities during the quarter but were still down in absolute terms. The same is true for 2018 although Real Estate maintained only a slight margin. Commodity results were down for the quarter as crude oil fell -38.0% to $45.41 per barrel. Natural gas prices were down -2.3%, ending the quarter at $2.94 per million BTUs. MLP returns were in negative territory for the quarter (-17.30%) and are down double-digits for the year. Finally, gold prices were up and finished at approximately $1,281 per troy ounce, up +7.1% from last quarter.

Summary of Index Returns

For Periods Ended December 31, 2018

	Quarter	One Year	Three Years	Five Years	Ten Years
Domestic Equity					
Standard & Poor's 500	-13.52%	-4.38%	9.26%	8.50%	13.12%
Wilshire 5000	-14.29	-5.27	9.12	8.07	13.20
Wilshire 4500	-17.96	-9.53	8.11	5.84	13.85
Wilshire Large Cap	-13.69	-4.64	9.33	8.47	13.11
Wilshire Small Cap	-19.67	-10.84	7.38	4.70	13.88
Wilshire Micro Cap	-23.50	-15.58	4.79	2.54	13.00
Domestic Equity					
Wilshire Large Value	-10.75%	-5.94%	8.09%	7.20%	11.57%
Wilshire Large Growth	-16.82	-3.58	10.30	9.63	14.60
Wilshire Mid Value	-14.16	-8.47	7.65	6.63	13.35
Wilshire Mid Growth	-18.55	-10.47	7.60	5.01	14.73
Wilshire Small Value	-18.73	-12.04	6.45	4.71	12.93
Wilshire Small Growth	-20.59	-9.71	8.08	4.51	14.72
International Equity					
MSCI All World ex U.S.	-11.46%	-14.20%	4.48%	0.68%	6.57%
MSCI All World ex U.S. (LC)	-10.89	-10.65	4.17	4.08	7.82
MSCI EAFE	-12.54	-13.79	2.87	0.53	6.32
MSCI Europe	-12.72	-14.86	2.09	-0.61	6.15
MSCI Pacific	-12.20	-12.02	4.53	2.73	6.76
MSCI Emerging Markets Index	-7.47	-14.58	9.25	1.65	8.02
Domestic Fixed Income					
Bloomberg Aggregate Bond	1.64%	0.01%	2.06%	2.52%	3.48%
Bloomberg Credit	0.01	-2.11	3.16	3.22	5.52
Bloomberg Mortgage Back Sec.	2.08	0.99	1.71	2.53	3.11
Bloomberg Treasury	2.57	0.86	1.40	2.01	2.08
Citigroup High Yield Cash Pay	-4.69	-2.16	7.17	3.46	10.44
Bloomberg US TIPS	-0.42	-1.26	2.11	1.69	3.64
91-Day Treasury Bill	0.57	1.88	1.02	0.63	0.37
International Fixed Income					
Citigroup Non-U.S. Gov. Bond	1.31%	-1.82%	3.32%	0.28%	1.27%
Citigroup World Gov. Bond	1.75	-0.84	2.69	0.77	1.52
Currency*					
Euro vs. $	-1.58%	-4.80%	1.72%	-3.67%	-1.96%
Yen vs. $	3.53	2.67	3.12	-0.85	-1.89
Pound vs. $	-2.34	-5.85	-4.75	-5.12	-1.20
Real Estate					
Wilshire REIT Index	-6.93%	-4.84%	2.06%	7.87%	12.19%
Wilshire RESI	-6.98	-4.80	2.41	8.17	12.41

*Positive values indicate dollar depreciation.

Total Fund Overview

Asset Class Performance

	Assets ($Mil)	Assets (%)	Performance (%) QTR	YTD	1-year	3-year	5-year	10-year
U.S. Equity	420.1	12.8	-16.09	-8.67	-8.67	7.96	7.07	12.59
International Equity	437.9	13.4	-13.46	-17.33	-17.33	4.00	1.11	8.07
Global Equity	220.4	6.7	-13.88	-9.28	-9.28	6.02	3.79	-.-
Global Low Volatility	337.1	10.3	-7.67	-3.38	-3.38	7.74	-.-	-.-
Real Estate	394.1	12.0	-2.36	1.09	1.09	4.18	8.14	12.88
Global Fixed Income	480.3	14.7	0.92	-0.38	-0.38	2.56	2.92	4.71
High Yield	332.3	10.1	-4.98	-3.09	-3.09	5.62	3.14	9.22
Credit Opportunities	168.8	5.2	-3.14	-2.12	-2.12	-.-	-.-	-.-
MLPs	211.1	6.4	-19.21	-11.01	-11.01	0.79	-3.86	-.-
Private Equity	236.8	7.2	5.83	15.11	15.11	11.73	12.50	-.-
Cash Equivalents	35.3	1.1	0.57	1.88	1.88	1.01	0.62	0.38
Total Fund	**3,274.3**	**100.0**	**-7.66**	**-4.43**	**-4.43**	**5.75**	**4.36**	**9.72**
Asset Allocation Policy			**-7.65**	**-4.49**	**-4.49**	**5.71**	**4.04**	**9.41**
Value Added vs Policy			*-0.01*	*0.06*	*0.06*	*0.04*	*0.32*	*0.31*
Actuarial Rate			1.94	8.00	8.00	8.00	8.05	8.15
Wilshire 5000 Index			-14.29	-5.27	-5.27	9.12	8.07	13.20
S&P 500 Index			-13.52	-4.38	-4.38	9.26	8.50	13.12
MSCI ACWI x-U.S. IMI Index			-11.88	-14.76	-14.76	4.39	0.84	6.97
MSCI EAFE Index			-12.54	-13.79	-13.79	2.87	0.53	6.32
Bloomberg Aggregate Bond Index			1.64	0.01	0.01	2.06	2.52	3.48
Citigroup High Yield Cash Pay			-4.69	-2.16	-2.16	7.17	3.46	10.44
Wilshire RE Securities Index			-6.98	-4.80	-4.80	2.41	8.17	12.41
91-Day Treasury Bill			0.57	1.88	1.88	1.02	0.63	0.37

Total Fund Asset Growth

($Millions)	Beg. Mkt Value	Net Contrib.	Net Distrib.	Investment Fees	Investment Gain/Loss	End Mkt Value	Total Return
1Q15	3,402.5	36.1	73.5	3.5	85.2	3,446.8	2.40%
2Q15	3,446.8	44.4	83.3	3.7	6.5	3,410.6	0.08%
3Q15	3,410.6	29.6	69.6	3.4	(202.7)	3,164.5	-6.08%
4Q15	3,164.5	49.4	82.5	3.2	71.0	3,199.2	2.12%
1Q16	3,199.2	89.0	127.7	3.0	40.9	3,198.3	1.28%
2Q16	3,198.3	70.8	105.2	2.8	116.2	3,277.3	3.54%
3Q16	3,277.3	32.9	67.4	2.9	117.3	3,357.2	3.48%
4Q16	3,357.2	28.1	66.0	3.0	21.4	3,337.8	0.62%
1Q17	3,337.8	36.2	74.6	2.6	140.0	3,436.7	4.15%
2Q17	3,436.7	24.9	68.7	3.2	86.6	3,476.4	2.46%
3Q17	3,476.4	47.8	84.0	3.5	110.0	3,546.6	3.10%
4Q17	3,546.6	31.1	74.1	3.3	107.5	3,607.8	3.02%
1Q18	3,607.8	31.9	74.7	3.1	(37.9)	3,524.0	-1.09%
2Q18	3,524.0	27.2	71.0	3.6	68.0	3,544.4	1.85%
3Q18	3,544.4	31.6	75.1	3.3	101.0	3,598.8	2.74%
4Q18	3,598.8	27.5	73.9	3.5	(274.6)	3,274.3	-7.66%

- At the end of the fourth quarter of 2018, the Fund's market value was $3,274.3 million, which represented a decrease of $324.5 million in total net asset value over the previous quarter. The change in the Fund's value was driven by $73.9 million in net distributions and a $274.6 million loss on investments. Meanwhile, $27.5 million in net contributions flowed into the fund and $3.5 million in investment management fees flowed out of the Fund during the period.

Quarterly Total Fund Attribution vs. Policy

Asset Class	Assets (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
U.S. Equity	14.2	-16.09	15.0	-14.29	-0.79	-1.80	0.07	0.01	-0.28	-0.20
International Equity	13.7	-13.46	15.0	-11.88	-1.34	-1.58	0.04	0.02	-0.24	-0.18
Global Equity	7.0	-13.88	7.5	-12.75	-0.52	-1.13	0.02	0.01	-0.09	-0.06
Global Low Volatility	10.4	-7.67	10.0	-6.64	0.38	-1.03	0.00	0.00	-0.10	-0.10
Public REITs	4.9	-6.80	5.0	-6.98	-0.08	0.19	-0.01	0.00	0.01	0.00
Direct Core Real Estate	6.7	0.94	5.0	1.19	1.67	-0.25	0.14	0.00	-0.01	0.12
Global Fixed Income	13.6	0.92	15.0	1.64	-1.40	-0.72	-0.13	0.01	-0.10	-0.22
High Yield	10.1	-4.98	10.0	-4.69	0.15	-0.28	-0.01	0.00	-0.03	-0.04
Credit Opportunities	5.1	-3.14	5.0	-3.11	0.14	-0.03	0.00	0.00	0.00	-0.01
MLPs	7.0	-19.21	7.5	-17.30	-0.47	-1.91	0.05	0.01	-0.16	-0.10
Private Equity	6.4	5.83	5.0	-1.39	1.41	7.22	0.08	0.10	0.34	0.52
Cash Equivalents	0.9	0.57	0.0	0.57	0.85	0.00	0.10	0.00	0.00	0.10
Monthly Linked Return	**100.0**	**-7.82**	**100.0**	**-7.65**		**-0.17**	**0.35**	**0.15**	**-0.67**	**-0.17**
Trading/Hedging		*0.16*		*0.00*		*0.16*				***0.16***
Total		**-7.66**		**-7.65**		**-0.01**				**-0.01**

-7.65	**Asset Allocation Policy**
0.35	Actual/Tactical Asset Allocation
-0.67	Active Management
0.15	Interaction
0.16	Trading
-7.66	**Total Fund Return**

**Note: factors may not sum exactly to total return due to rounding.*

The Total Fund attribution table, shown above, displays the return contribution of each asset class to the Total Fund's overall return. The attribution provides some insights as to whether tactical allocation and active management within asset classes helped or hurt performance during the quarter.

- ***Strategic Policy:*** The contribution to total return from each asset class, calculated as the percentage allocated to each asset class multiplied by the benchmark for that asset class.
- ***Actual Allocation:*** The return contribution during the quarter due to differences in the actual allocation from the policy allocation (i.e.: the actual allocation to U.S. equity was higher than the policy allocation). A positive number would indicate an overweight allocation benefited performance, and vice versa.
- ***Active Management:*** The return contribution from active management. This number would be positive if the asset class outperformed the designated policy index and vice versa (i.e.: the U.S. equity segment outperformed the policy index, the Wilshire 5000 Index, during the quarter and contributed positively to active management).
- ***Interaction:*** Captures the interaction of managers' performance and asset class weighting differences.
- ***Actual Return:*** The actual return of the asset classes if allocations to them were static during the quarter. These returns will not match exactly with the actual segment returns since asset class allocations change during the quarter due to market movement, cash flows, etc.

One-Year Total Fund Attribution vs. Policy

Asset Class	Assets (%)		Policy (%)		Difference (%)		Total Fund Return Contribution (%)			
	Weight	Return	Weight	Return	Weight	Return	Actual Allocation	Interaction	Active Management	Total
U.S. Equity	14.9	-8.67	15.0	-5.27	-0.1	-3.40	0.07	0.01	-0.51	-0.43
International Equity	14.7	-17.33	15.0	-14.76	-0.3	-2.57	0.07	0.03	-0.43	-0.33
Global Equity	5.9	-9.28	6.3	-9.42	-0.3	0.14	0.00	0.01	-0.02	-0.01
Global Low Volatility	10.3	-3.38	10.0	-1.56	0.3	-1.81	0.01	-0.01	-0.18	-0.18
Public REITs	4.7	-4.94	5.0	-4.80	-0.3	-0.14	-0.03	0.00	-0.01	-0.04
Direct Core Real Estate	6.5	5.62	5.0	5.72	1.5	-0.10	0.15	0.00	0.00	0.15
Global Fixed Income	13.4	-0.38	15.0	0.01	-1.6	-0.39	-0.07	0.00	-0.06	-0.13
High Yield	11.2	-3.09	11.3	-2.16	0.0	-0.93	-0.01	0.00	-0.10	-0.12
Credit Opportunities	3.8	-2.12	3.8	-2.00	0.1	-0.12	-0.01	0.00	-0.01	-0.02
MLPs	7.4	-11.01	8.8	-12.42	-1.4	1.41	0.02	-0.10	0.23	0.15
Private Equity	6.2	15.11	5.0	8.76	1.2	6.35	0.13	0.11	0.28	0.53
Cash	0.9	1.88	0.0	1.88	0.9	0.00	0.08	0.00	0.00	0.08
Monthly Linked Return	**100.0**	**-4.83**	**100.0**	**-4.49**		**-0.34**	**0.41**	**0.06**	**-0.82**	**-0.34**
Trading		0.39		0.00		0.39				**0.43**
Total		***-4.43***		***-4.49***		***0.06***				***0.06***

-4.49	**Strategic Policy Allocation**
0.41	Actual/Tactical Asset Allocation
-0.82	Active Management
0.06	Interaction
0.43	Trading
-4.43	Total Return

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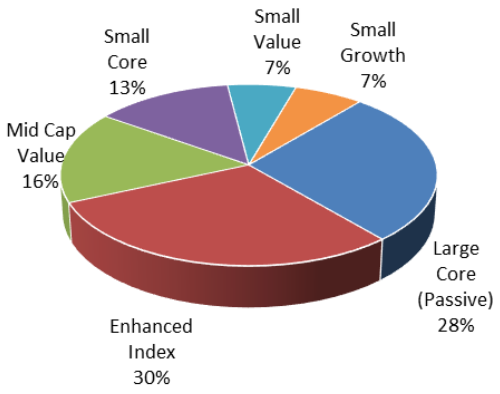
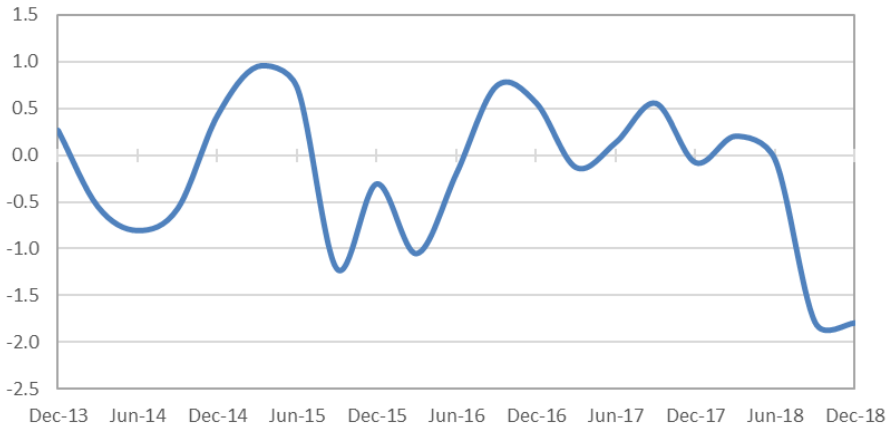
- ***Interaction:*** Captures the interaction of managers' performance and asset class weighting differences.
- ***Actual Return:*** The actual return of the asset classes if allocations to them were static during the quarter. These returns will not match exactly with the actual segment returns since asset class allocations change during the quarter due to market movement, cash flows, etc.

U.S. Equity Overview

U.S. Equity Structure



U.S. Equity Composite
Quarterly Excess Return



Composite

	Assets (Millions)	Performance QTR	YTD	1-year	3-year	5-year	10-year
Total U.S. Equity (Gross)	**$ 420.1**	**-16.00**	**-8.30**	**-8.30**	**8.35**	**7.45**	**12.97**
Total U.S. Equity (Net)		**-16.09**	**-8.67**	**-8.67**	**7.96**	**7.07**	**12.59**
Custom Benchmark [1]		-14.29	-5.27	-5.27	9.12	8.07	13.20
Net of Fee Value Added vs Benchmark		*-1.80*	*-3.40*	*-3.40*	*-1.16*	*-1.00*	*-0.61*
Small Cap Composite	**$ 113.8**	-20.06	-14.90	-14.90	6.61	4.75	12.77
Wilshire 5000 Index		-14.29	-5.27	-5.27	9.12	8.07	13.20
S&P 500 Index		-13.52	-4.38	-4.38	9.26	8.50	13.12
Russell 2000 Index		-20.20	-11.01	-11.01	7.36	4.41	11.97

U.S. Equity Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Large Core - Passive								
Northern Trust S&P 500 (Gross)	**$ 119.6**	**-13.52**	**-4.37**	**-4.37**	**9.27**	**8.54**	**9.48**	**Dec-94**
Northern Trust S&P 500 (Net)		**-13.52**	**-4.37**	**-4.37**	**9.27**	**8.53**	**9.45**	**Dec-94**
S&P 500 Index		-13.52	-4.38	-4.38	9.26	8.50	9.41	Dec-94
Net of Fee Value Added vs Benchmark		*0.00*	*0.01*	*0.01*	*0.01*	*0.03*	*0.04*	
Enhanced Index								
T. Rowe Price (Gross)	**$ 128.4**	**-13.59**	**-3.95**	**-3.95**	**9.86**	**9.16**	**8.40**	**Mar-06**
T. Rowe Price (Net)		**-13.66**	**-4.24**	**-4.24**	**9.52**	**8.81**	**8.08**	**Mar-06**
S&P 500 Index + 1%		-13.27	-3.38	-3.38	10.26	9.50	8.57	Mar-06
Net of Fee Value Added vs Objective		*-0.39*	*-0.86*	*-0.86*	*-0.74*	*-0.69*	*-0.49*	
S&P 500 Index		-13.52	-4.38	-4.38	9.26	8.50	7.57	Mar-06
Net of Fee Value Added vs Benchmark		*-0.14*	*0.14*	*0.14*	*0.26*	*0.31*	*0.51*	
Information Ratio				**0.20**	**0.19**	**0.26**		
Sharpe Ratio				**-0.39**	**0.75**	**0.73**		

[1] Domestic Equity Custom Benchmark: Wilshire 5000 Index (3q99 – Present); S&P 500 Index (1q90 – 2q99).

U.S. Equity Overview (Continued)

U.S. Equity Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Small Core - Active								
Systematic Financial (Gross)	**$ 57.0**	**-18.58**	**-14.06**	**-14.06**	**10.02**	**7.72**	**10.89**	**Jun-03**
Systematic Financial (Net)		**-18.77**	**-14.79**	**-14.79**	**9.09**	**6.81**	**10.10**	**Jun-03**
Russell 2000 Index + 1.25%		-19.89	-9.76	-9.76	8.61	5.66	9.67	Jun-03
Net of Fee Value Added vs Objective		*1.12*	*-5.03*	*-5.03*	*0.48*	*1.15*	*0.43*	
Russell 2000 Index		-20.20	-11.01	-11.01	7.36	4.41	8.42	Jun-03
Net of Fee Value Added vs Benchmark		*1.43*	*-3.78*	*-3.78*	*1.73*	*2.40*	*1.68*	
Information Ratio				**-1.17**	**0.41**	**0.59**		
Sharpe Ratio				**-0.95**	**0.53**	**0.43**		
Small Value - Active								
Channing Capital Management (Gross) *	**$ 28.2**	**-21.85**	**-16.60**	**-16.60**	**5.10**	**3.20**	**3.58**	**Oct-13**
Channing Capital Management (Net) *		**-22.06**	**-17.40**	**-17.40**	**4.10**	**2.24**	**2.64**	**Oct-13**
Russell 2000 Value Index + 1.25%		-18.36	-11.61	-11.61	8.62	4.86	5.18	Oct-13
Net of Fee Value Added vs Objective		*-3.70*	*-5.79*	*-5.79*	*-4.52*	*-2.62*	*-2.54*	
Russell 2000 Value Index		-18.67	-12.86	-12.86	7.37	3.61	3.93	Oct-13
Net of Fee Value Added vs Benchmark		*-3.39*	*-4.54*	*-4.54*	*-3.27*	*-1.37*	*-1.29*	
Information Ratio				**-0.84**	**-0.66**	**-0.30**		
Sharpe Ratio				**-0.94**	**0.18**	**0.10**		
Small Growth - Active								
Redwood Investments (Gross) *	**$ 28.6**	**-20.39**	**-11.99**	**-11.99**	**-.-**	**-.-**	**2.42**	**Sep-16**
Redwood Investments (Net) *		**-20.56**	**-12.63**	**-12.63**	**-.-**	**-.-**	**1.86**	**Sep-16**
Russell 2000 Growth Index + 1.50%		-21.28	-7.81	-7.81	-.-	-.-	7.81	Sep-16
Net of Fee Value Added vs Objective		*0.72*	*-4.82*	*-4.82*			*-5.95*	
Russell 2000 Growth Index		-21.65	-9.31	-9.31	-.-	-.-	6.31	
Net of Fee Value Added vs Benchmark		*1.09*	*-3.32*	*-3.32*			*-4.45*	
Information Ratio				**-0.66**	**-.-**	**-.-**		
Sharpe Ratio				**-0.67**	**-.-**	**-.-**		
Mid Cap Value - Active								
Smith Graham Mid Cap Value (Gross) *	**$ 58.3**	**-18.67**	**-14.19**	**-14.19**	**-.-**	**-.-**	**-14.19**	**Dec-17**
Smith Graham Mid Cap Value (Net) *		**-18.83**	**-14.73**	**-14.73**	**-.-**	**-.-**	**-14.73**	**Dec-17**
Russell Midcap Index + 2%		-14.88	-7.06	-7.06	-.-	-.-	-7.06	**Dec-17**
Net of Fee Value Added vs Objective		*-3.95*	*-7.67*	*-7.67*			*-7.67*	
Russell Midcap Index		-15.37	-9.06	-9.06	-.-	-.-	-9.06	
Net of Fee Value Added vs Benchmark		*-3.46*	*-5.67*	*-5.67*			*-5.67*	
Information Ratio				**-1.48**	**-.-**	**-.-**		
Sharpe Ratio				**-0.95**	**-.-**	**-.-**		

- The Fund's domestic equity composite generated a return of -16.09% (net of fees) during the fourth quarter of 2018, trailing the Wilshire 5000 Total Market Index, which returned -14.29%. Relative performance was mixed during the quarter with outperformance from the Fund's small cap core and small cap growth exposures and material underperformance from the Fund's mid-cap and small value exposures. Following this quarter's results, the domestic equity composite is currently trailing its custom benchmark over the one-, three-, five- and ten-year periods.

U.S. Equity Overview (Continued)

Northern Trust (Passive)

- Northern Trust manages a passive large-cap core equity portfolio for the Fund, which is designed to track the S&P 500 Index and replicate the performance of overall market. To date, the passive large-cap core portfolio is performing in line with expectations, mirroring the risk and return profile of the benchmark index and exhibiting very low tracking error over all time periods.

T. Rowe Price (Enhanced)

- T. Rowe Price manages the Fund's enhanced equity index portfolio. The T. Rowe Price portfolio returned -13.66% (net of fees) during the fourth quarter, slightly trailing its benchmark index (S&P 500) which returned -13.52%. During the period stock selection was modestly positive while sector positioning relative to the benchmark was slightly negative, the effect of trading and timing slightly detracted from the portfolio's return during the period as well. During the period stock selection was strongest within the portfolio's technology and consumer discretionary sectors, both of which posted returns above that of their respective benchmark holdings, albeit negative in absolute terms. Meanwhile, stock selection was weakest within consumer staples and communication services. Historically, the portfolio's overall sector allocation does not deviate too broadly from the Standard & Poor's 500 (approximately +/- 1%) which means the bulk of the value-added will come from stock selection. The T. Rowe portfolio remains concentrated in large-capitalization stocks (with an average market cap of $228,688 million). The portfolio is currently outperforming against its benchmark over the one-, three-, and five-year periods as well as since inception (3/06).

Systematic Financial (Small-Cap Core)

- Systematic Financial manages the Fund's small-cap core portfolio. The Systematic portfolio returned -18.77% (net of fees) during the fourth quarter, outperforming its benchmark (Russell 2000) which returned -20.20%. During the period small cap stocks as represented by the Russell 2000 Index posted weaker returns relative to their larger capitalization counterparts. Against this backdrop, the Systematic portfolio outpaced its benchmark as a result of favorable stock selection and sector positioning relative to the benchmark. Stock selection was positive in 7 of the 11 GICS sectors during the quarter. Most notably, the portfolio's health care and energy holdings significantly outperformed those of the respective benchmark holdings. Strategic sector positioning also aided performance during the period led by an underweight (5% portfolio weight vs. 16% benchmark weight) to the health care sector, which delivered sluggish returns during the period. The Systematic portfolio continues to hold relatively cheaper (or undervalued) stocks when compared to benchmark, with a current average P/E ratio of 16 (Russell 2000 P/E ratio is 32). The portfolio also continues to exhibit a large historical overweight allocation to financials, albeit smaller in the most recent period, which accounts for around 23% of the portfolio's total net asset value compared to approximately 18% for the benchmark. The Systematic portfolio is currently outperforming against its benchmark over the three-, five- and ten-year periods as well as since inception.

Channing Capital Management (Small-Cap Value)

- Channing Capital manages the Fund's small-cap value portfolio. The Channing portfolio returned -22.06% (net of fees) during the fourth quarter, trailing its benchmark (Russell 2000 Value) which returned -18.67%. Both stock selection and sector positioning weighed on performance during the period. Particularly large losses were incurred within the financials and industrials sectors. Here, the portfolio's holdings returned -24.51% and -23.28% versus -15.74% and -19.73% for the respective benchmark holdings. Sector weighting decisions were also detractive for the period providing an additional drag on the portfolio's return relative to the benchmark. To date, the Channing portfolio is consistently positioned with an underweight allocation to consumer discretionary (3% portfolio weight vs. 10% benchmark weight)

U.S. Equity Overview (Continued)

with significant overweight allocation to industrials (21% portfolio weight vs 12% benchmark weight). The Channing portfolio is currently underperforming against its benchmark over all extended time periods including since inception (12/13).

Redwood Investments (Small-Cap Growth)

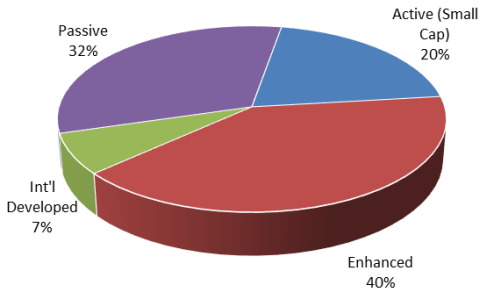
- Redwood Investments manages the Fund's small-cap growth portfolio, which was funded in late 2016. The Redwood portfolio returned -20.56% during the fourth quarter, outpacing its benchmark (Russell 2000 Growth) which returned -21.65%. The portfolio currently holds 54 securities which is considerably more concentrated than the benchmark, as such, individual stock selection typically emerges as the predominant driver of relative performance in any given period. During the quarter, several stocks within the portfolio delivered strong returns relative to the benchmark (albeit negative in absolute terms). Of note, from a stock selection perspective the portfolio was aided by contributions from its health care and industrials positions. These two sectors are the largest weighted sectors in the portfolio, as such, success within these segments accrued positively to performance as a whole. During the period management increased its exposure to consumer companies focused on lifestyle, health and experiences with less volatile earnings while maintaining underweight exposures to macro-driven sectors like real estate, materials and energy. The largest individual contributors to performance during the period were WD-40 Company (+6.8%) and Vocera Communications (+7.6%). The Redwood portfolio is currently underperforming against its benchmark since inception (09/16).

Smith, Graham & Co. (Mid-Cap Value)

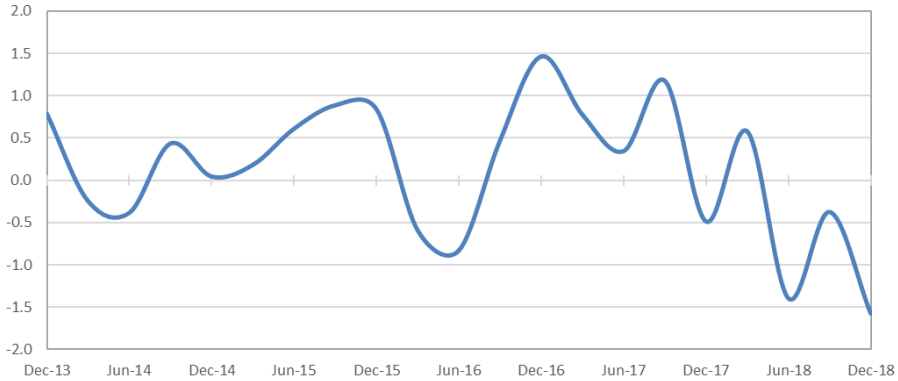
- Smith, Graham & Co. manages the Fund's mid-cap value portfolio, which was funded in December of 2017. The mid-cap portfolio returned -18.83% (net of fees) during the fourth quarter, underperforming its benchmark (Russell Mid Cap Index) which returned -15.37%. During the quarter, the portfolio's strongest sector performance relative to the Russell Midcap Index sectors was in: Energy, Health Care and Utilities. The portfolio sectors with the weakest performance compared to the Russell Midcap Index sectors were: Consumer Staples, Materials & Processing and Financial Services. The stocks that contributed the most to absolute performance during the quarter were: Arcosa and Ameren. The stocks that detracted the most from absolute performance were: United States Steel, Stericycle, Western Digital, Southwest Airlines and Valero Energy. During the quarter, one new position was established: Lumentum Holdings and one position was eliminated: Trinity Industries . Additionally, prior to eliminating Trinity Industries, it spun-off Arcosa Inc., which was also sold. At the end of December, the portfolio was diversified among 68 securities, none exceeding a 2.7% position. The 10 largest holdings represented approximately 21% of the total portfolio. Sector weightings were within plus/minus five percentage points of the Russell Midcap Index while cash represented approximately 0.5% of the portfolio on December 31st. After completing its first full year of performance within the Fund the Smith Graham portfolio trails its benchmark since inception (12/17).

International Equity Overview

International Equity Structure



International Equity Composite
Quarterly Excess Return



International Equity Composite

	Assets (Millions)	Performance QTR	YTD	1-year	3-year	5-year	10-year
Total International Equity (Gross)	**$ 437.9**	**-13.37**	**-16.95**	**-16.95**	**4.48**	**1.55**	**8.54**
Total International Equity (Net)		**-13.46**	**-17.33**	**-17.33**	**4.00**	**1.11**	**8.07**
Custom Benchmark [1]		-11.88	-14.76	-14.76	4.39	0.84	6.76
Net of Fee Value Added vs Benchmark		*-1.58*	*-2.57*	*-2.57*	*-0.39*	*0.27*	*1.31*
MSCI ACWI x-US IMI (Net)		-11.88	-14.76	-14.76	4.39	0.84	6.97
MSCI ACWI x-US (Net)		-11.46	-14.20	-14.20	4.48	0.68	6.57
MSCI EAFE (Net)		-12.54	-13.79	-13.79	2.87	0.53	6.32
MSCI Emerging Markets		-7.47	-14.58	-14.58	9.25	1.65	8.02

International Equity Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Int'l Small Cap - Active								
Acadian International (Gross)	**$ 89.3**	**-16.32**	**-19.79**	**-19.79**	**6.77**	**3.79**	**8.41**	**Mar-89**
Acadian International (Net)		**-16.44**	**-20.35**	**-20.35**	**6.18**	**3.25**	**7.96**	**Mar-89**
Custom Benchmark + 2%		-13.93	-16.20	-16.20	5.82	3.96	7.48	Mar-89
Net of Fee Value Added vs Objective		*-2.51*	*-4.15*	*-4.15*	*0.36*	*-0.71*	*0.48*	
Custom Benchmark		-14.43	-18.20	-18.20	3.82	1.96	5.48	Mar-89
Net of Fee Value Added vs Benchmark		*-2.01*	*-2.15*	*-2.15*	*2.36*	*1.29*	*2.48*	
Information Ratio				**-0.59**	**0.58**	**0.36**		
Sharpe Ratio				**-1.42**	**0.37**	**0.20**		

[2] International Equity Custom Benchmark: MSCI ACWI x-US IMI (2q10 – Present); MSCI ACWI x-US (1q99 – 1q10); Wilshire Non-US/Non-SA (2q96 – 4q98); MSCI EAFE (4q89 – 1q96)

[3] Acadian Custom Benchmark: MSCI ACWI x-US Small Cap (3q09 – Present); MSCI EAFE Small Cap (4q99 – 2q09); S&P/Citigroup Eur/Pac EMI Index (2q96 – 3q99); MSCI EAFE (2q89 – 1q96). Performance Objective: Custom Benchmark +2% (1q05 – Present); +1% (2q89 – 4q04).

International Equity Overview (Continued)

International Equity Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Int'l Enhanced Index								
AQR Capital Management (Gross)	**$ 176.2**	**-13.44**	**-17.98**	**-17.98**	**4.03**	**1.25**	**2.81**	**Mar-06**
AQR Capital Management (Net)		**-13.57**	**-18.46**	**-18.46**	**3.43**	**0.64**	**2.29**	**Mar-06**
Custom Benchmark + 1.5%		-11.09	-12.70	-12.70	5.98	2.18	3.40	Mar-06
Net of Fee Value Added vs Objective		*-2.48*	*-5.76*	*-5.76*	*-2.55*	*-1.54*	*-1.11*	
Custom Benchmark		-11.46	-14.20	-14.20	4.48	0.68	1.90	Mar-06
Net of Fee Value Added vs Benchmark		*-2.11*	*-4.26*	*-4.26*	*-1.05*	*-0.04*	*0.39*	
Information Ratio				**-1.81**	**-0.43**	**-0.02**		
Sharpe Ratio				**-1.41**	**0.19**	**0.00**		
Int'l Developed								
Ativo International Developed (Gross) *	**$ 31.0**	**-12.78**	**-12.05**	**-12.05**	**-.-**	**-.-**	**-12.05**	**Dec-17**
Ativo International Developed (Net) *		**-12.93**	**-12.44**	**-12.44**	**-.-**	**-.-**	**-12.44**	**Dec-17**
MSCI EAFE Index + 2%		-12.04	-11.79	-11.79	-.-	-.-	-11.79	
Net of Fee Value Added vs Objective		*-0.89*	*-0.65*	*-0.65*			*-0.65*	
MSCI EAFE Index		-12.54	-13.79	-13.79	-.-	-.-	-13.79	
Net of Fee Value Added vs Benchmark		*-0.39*	*1.35*	*1.35*			*1.35*	
Information Ratio				**0.49**	**-.-**	**-.-**		
Sharpe Ratio				**-1.11**	**-.-**	**-.-**		
Passive International Equity								
BlackRock ACWI Ex-U.S. (Gross)	**$ 141.4**	**-11.44**	**-.-**	**-.-**	**-.-**	**-.-**	**-12.45**	**May-18**
BlackRock ACWI Ex-U.S. (Net)		**-11.45**	**-.-**	**-.-**	**-.-**	**-.-**	**-12.46**	**May-18**
MSCI ACWI x-US (Net)		-11.46	-.-	-.-	-.-	-.-	-12.52	
Net of Fee Value Added vs Benchmark		*0.01*					*0.06*	

- The Fund's international equity composite returned -13.46% (net of fees) during the fourth quarter of 2018, trailing the MSCI ACWI x-US Investable Market Index (IMI) which returned -11.88%. Active management was weak across the board for the Fund's international equity program with AQR and Acadian trailing their respective benchmarks by a sizeable margin. The program's newly funded International Developed exposure managed by Ativo also lagged its benchmark but has performed well relative to its benchmark since its inclusion in the fund. Meanwhile, the composite's passive exposure managed by BlackRock continues to perform in-line with expectations closely tracking the risk/return profile of the benchmark. The international equity composite is currently outperforming against its benchmark for the five- and ten-periods periods, as well as since inception (12/89).

[5] AQR Custom Benchmark: MSCI ACWI x-US (2q10 – Present); MSCI EAFE (1q06 – 1q10); Performance Objective: Custom Benchmark + 1.5%.

Acadian (International Small-Cap)

- Acadian International manages the Fund's active small-cap international equity portfolio. During the fourth quarter the Acadian portfolio returned -16.44% (net of fees), underperforming against its benchmark (MSCI ACWI x-U.S. Small Cap) which returned -14.43% for the period. For the fourth quarter, the portfolio underperformed its benchmark as losses realized from stock selection were partially offset by value added from country allocations. Key sources of negative active return included stock selection in Japan, a lack of exposure to India, and a combination of stock selection and an overweight position in Canada. More successful investments included a combination of stock selection and overweight positions in Korea and South Africa, as well as a combination of stock selection and an underweight position in the U.K. Noteable decliners during the period included BRP, Leopalace21, Siltronic and Sobi. As of quarter-end, the Acadian portfolio is outperforming against its benchmark for the three- and five-year periods as well as since inception (3/89).

AQR Capital Management (International-ACWI X-US)

- AQR Capital manages the Fund's international equity portfolio. The AQR portfolio returned -13.57% (net of fees) during the fourth quarter, underperforming its benchmark (MSCI ACWI x-US) which returned -11.46%. Losses during the period were driven by stock selection, although country and currency selection also detracted from performance. Within stock selection, the momentum theme was the main driver of underperformance for the quarter. Quality and sentiment also detracted over the period. Value contributed to performance over the quarter; however, gains were not enough to offset losses. Within stock selection, the team's ability to pick stocks within sectors was the main detractor from performance. Losses were largely driven by overweight positions in materials and information technology. Overweight positions in industrials and real estate contributed positively to performance, but did not offset losses. Sector selection also detracted from performance led by an overweight position in Energy. Following this quarter's results, the AQR portfolio is underperforming against its benchmark for one-, three-, five-, and ten-year periods but continues to lead its benchmark since inception (03/06).

Ativo (International Developed)

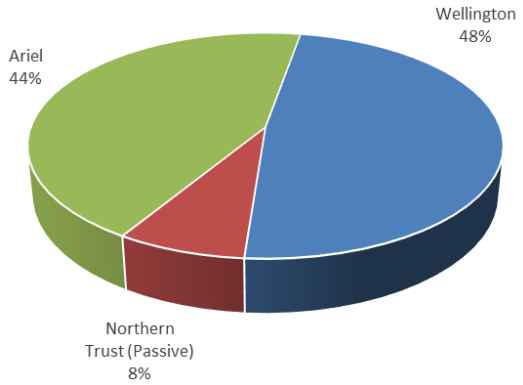
- Ativo manages the Fund's international developed equity portfolio. During the fourth quarter the Ativo portfolio returned -12.93% underperforming the MSCI EAFE Index, which returned -12.54%. Modest underperformance during the period was due to stock selection, as regional and sector exposures contributed to relative returns. From a geographic standpoint, negative stock selection in Japan and Canada offset positive stock selection in other regions, mainly Pacific ex Japan. Stock selection was weakest in health care, energy, and communication Services. However, stock selection in the Consumer Staples sector was strong and relative results also benefited from overweights in Real Estate, Utilities, and Pacific ex Japan. There were no major changes to the portfolio's regional allocations during the quarter. There were a few notable changes to sector allocations; specifically, adding exposure in financials and communication services and reducing exposure to industrials and technology. The biggest overweights at year end were Pacific ex Japan and the real estate and industrial sectors. Meanwhile, the biggest underweights were Developed Europe/Middle East ex UK, materials and health Care. After completing its first full year of performance within the Fund the Ativo portfolio currently leads its benchmark comfortably since inception (12/17).

BlackRock (ACWI Ex-U.S. Passive)

- BlackRock manages the Fund's passive international equity exposure. The BlackRock MSCI ACWI Ex-U.S. Fund is an index fund designed to track the performance of the MSCI All-Country World Ex-U.S. Index. This fund will provide broad equity exposure and diversification benefits as it holds large-, mid-, and small-capitalization stocks across the world's developed and emerging market regions.

Global Equity Overview

Global Equity Structure



Global Equity Composite

	Assets (Millions)	QTR	YTD	1-year	3-year	5-year	10-year
		Performance					
Total Global Equity (Gross)	**$ 220.4**	**-13.76**	**-8.82**	**-8.82**	**6.44**	**4.33**	**-.-**
Total Global Equity (Net)		**-13.88**	**-9.28**	**-9.28**	**6.02**	**3.79**	**-.-**
MSCI ACWI (Net)		-12.75	-9.42	-9.42	6.60	4.26	-.-
Net of Fee Value Added vs Index		*-1.13*	*0.14*	*0.14*	*-0.58*	*-0.47*	
MSCI ACWI IMI (Net)		-13.28	-10.08	-10.08	6.49	4.17	9.74
MSCI ACWI (Net)		-12.75	-9.42	-9.42	6.60	4.26	9.46
MSCI World (Net)		-13.42	-8.71	-8.71	6.30	4.56	9.66

Global Equity Managers

	Assets (Millions)	QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
		Performance (%)						
Global Equity - Active								
Wellington (Gross)	**$ 106.7**	**-15.92**	**-11.74**	**-11.74**	**4.51**	**4.85**	**10.18**	**Jan-00**
Wellington (Net)		**-16.05**	**-12.24**	**-12.24**	**3.89**	**4.26**	**9.58**	**Aug-12**
MSCI ACWI (Net) + 2%		-12.26	-7.42	-7.42	8.60	6.26	9.76	Aug-12
Net of Fee Value Added vs Objective		*-3.79*	*-4.82*	*-4.82*	*-4.71*	*-2.00*	*-0.18*	
MSCI ACWI (Net)		-12.75	-9.42	-9.42	6.60	4.26	7.76	Aug-12
Net of Fee Value Added vs Benchmark		*-3.30*	*-2.82*	*-2.82*	*-2.71*	*0.00*	*1.82*	
Information Ratio				**-0.76**	**-0.75**	**0.00**		
Sharpe Ratio				**-0.89**	**0.23**	**0.30**		
Global Equity - Active								
Ariel (Gross) *	**$ 97.0**	**-11.36**	**-5.10**	**-5.10**	**-.-**	**-.-**	**-5.10**	**Dec-17**
Ariel (Net) *		**-11.49**	**-5.58**	**-5.58**	**-.-**	**-.-**	**-5.58**	**Dec-17**
MSCI ACWI (Net) + 1.5%		-12.38	-7.92	-7.92	-.-	-.-	-7.92	
Net of Fee Value Added vs Objective		*0.89*	*2.34*	*2.34*			*2.34*	
MSCI ACWI (Net)		-12.75	-9.42	-9.42	-.-	-.-	-9.42	
Net of Fee Value Added vs Benchmark		*1.26*	*3.84*	*3.84*			*3.84*	
Information Ratio				**1.21**	**-.-**	**-.-**		
Sharpe Ratio				**-0.56**	**-.-**	**-.-**		
Global Equity - Passive								
Northern Trust (Gross)	**$ 16.7**	**-13.17**	**-9.65**	**-9.65**	**6.97**	**-.-**	**8.04**	**Oct-15**
Northern Trust (Net)		**-13.17**	**-9.68**	**-9.68**	**6.92**	**-.-**	**7.98**	**Oct-15**
MSCI ACWI IMI (Net)		-13.28	-10.08	-10.08	6.49	-.-	7.55	Oct-15
Net of Fee Value Added vs Benchmark		*0.11*	*0.40*	*0.40*	*0.43*		*0.43*	

Global Equity Overview (Continued)

- The global equity composite is comprised of an actively-managed strategy (with a U.S. bias relative to the benchmark) managed by Wellington. This strategy is complemented by a passively-managed strategy provided by Northern Trust. The composite also recently added an exposure to the Ariel Global Product strategy which has recently completed its first full year of performance. The new structure favors active management (currently 92% active/8% passive) versus the previous 50%/50% allocation between active and passively managed funds within the composite. During the fourth quarter the newly funded Ariel strategy outperformed the benchmark while the Wellington strategy struggled to keep pace with the benchmark. The global equity composite is currently outperforming over the one-year period but continues to trail its benchmark over longer time periods including since inception (9/12).

Wellington (Active)

- Wellington manages one of the Fund's active global equity portfolio. During the fourth quarter, the Wellington portfolio returned -16.05% (net of fees), underperforming its benchmark (MSCI ACWI Index) which returned -12.75%. The Global Opportunities portfolio underperformed the benchmark during the fourth quarter driven by negative stock selection in consumer discretionary and industrials. Sector allocations also modestly detracted from relative performance due to the portfolio's underweight to utilities. In consumer discretionary, Tapestry was a leading detractor. The stock price fell over the quarter due to investors' concerns of a potential slowdown in the Chinese economy, in addition to negative sentiment surrounding the ongoing trade war between China and the US. The portfolio's underperformance was partially offset by positive stock selection within financials and real estate. During the quarter, the biggest changes in portfolio sector positioning were found in information technology and health care. Sales in a few information technology positions decreased the overweight in the sector. Meanwhile the team added to positions in health care increasing their overweight to this sector. The Wellington portfolio is currently underperforming over the one- and three-year periods but continues to outperform the benchmark since inception (09/12).

Ariel (Active)

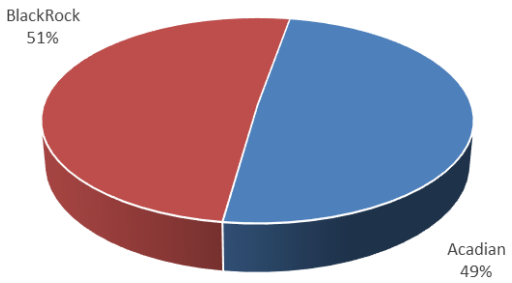
- Ariel manages the Fund's second active global equity portfolio. During the period the Ariel portfolio returned -11.49% (net of fees), outperforming its benchmark (MSCI ACWI Index) which returned -12.75%. The portfolio's overweight to health care was a notable contributor to relative performance during the period. Within that sector, Roche Holding AG, was a top contributor benefitting as investor concerns about biosimilar threats for its three largest drugs retreated in the face of patent litigation and settlements. Furthermore, its shares were boosted by growing appreciation for the company's longer term outlook and well diversified product pipeline. China Mobile was another notable contributor during the fourth quarter. Despite the fourth quarter market swings, China Mobile's stable business model as well as that of other wireless providers boosted relative performance. Overall, stock picking decisions were strongest with the technology, financials and health care segments and weakest within the energy and consumer staples sectors. Lastly, a cash position sitting around 4.7% as of quarter end also provided a boost to relative returns in what was a challenging environment for global stocks across the board. After completing its first full year of performance within the Fund the Ariel portfolio leads its benchmark since inception (12/17).

Northern Trust (Passive)

- In late 2015 the Fund added a new global equity manager to the segment. Managed by Northern Trust, this strategy gives the Fund broadly diversified exposure to global stocks via a passively managed investment vehicle, which will result in lower turnover and costs incurred. At quarter-end the strategy represented approximately 8% of the segment's total value. After its third full year of performance, the Northern Trust portfolio continues to closely track the risk profile while modestly outperforming its benchmark index MSCI ACWI (+43) basis points since inception.

Global Low Volatility Equity Overview

Global Low Volatility Structure



Global Low Volatility Composite

	Assets (Millions)	Performance QTR	YTD	1-year	3-year	5-year	10-year
Total Global Low Volatility (Gross)	**$ 337.1**	**-7.63**	**-3.23**	**-3.23**	**7.92**	**-.-**	**-.-**
Total Global Low Volatility (Net)		**-7.67**	**-3.38**	**-3.38**	**7.74**	**-.-**	**-.-**
MSCI ACWI Minimum Volatility (Net)		-6.64	-1.56	-1.56	7.64	-.-	-.-
Net of Fee Value Added vs Index		*-1.03*	*-1.82*	*-1.82*	*0.10*		
MSCI ACWI Minimum Volatility (Net)		-6.64	-1.56	-1.56	7.64	7.30	9.95
MSCI World x-US Minimum Volatility (Net)		-7.61	-6.23	-6.23	4.76	4.89	7.68
MSCI ACWI (Net)		-12.75	-9.42	-9.42	6.60	4.26	9.46

Global Equity Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Global Low Volatility - Active								
Acadian Global Low Vol (Gross)	**$ 166.7**	**-8.70**	**-5.36**	**-5.36**	**7.63**	**-.-**	**6.40**	**Jun-15**
Acadian Global Low Vol (Net)		**-8.78**	**-5.61**	**-5.61**	**7.29**	**-.-**	**6.08**	**Jun-15**
MSCI ACWI (Net) + 2%		-12.26	-7.42	-7.42	8.60	-.-	6.12	Jun-15
Net of Fee Value Added vs Objective		*3.48*	*1.81*	*1.81*	*-1.31*		*-0.04*	
MSCI ACWI (Net)		-12.75	-9.42	-9.42	6.60	-.-	4.12	Jun-15
Net of Fee Value Added vs MSCI ACWI		*3.97*	*3.81*	*3.81*	*0.69*		*1.96*	
MSCI ACWI Min Vol (Net)		-6.64	-1.56	-1.56	7.64	-.-	6.67	Jun-15
Net of Fee Value Added vs MSCI ACWI Min Vol		*-2.14*	*-4.05*	*-4.05*	*-0.35*		*-0.59*	
Information Ratio				**-2.14**	**-0.12**	**-.-**		
Sharpe Ratio				**-0.67**	**0.69**	**-.-**		
Global Low Volatility - Passive								
BlackRock Global Low Vol (Gross)	**$ 170.4**	**-6.58**	**-1.11**	**-1.11**	**8.19**	**-.-**	**7.22**	**Jun-15**
BlackRock Global Low Vol (Net)		**-6.58**	**-1.15**	**-1.15**	**8.17**	**-.-**	**7.20**	**Jun-15**
MSCI ACWI Min Vol (Net)		-6.64	-1.56	-1.56	7.64	-.-	6.67	Jun-15
Net of Fee Value Added vs Benchmark		*0.06*	*0.41*	*0.41*	*0.53*		*0.53*	

***Acadian Info Ratio/Sharpe Ratio statistics based on MSCI ACWI Min Vol benchmark.**

Global Low Volatility Equity Overview (Continued)

- In 2015, the Board elected to transfer assets from existing strategies elsewhere in the Fund into two new global low volatility equity portfolios. The first portfolio is actively-managed and run by Acadian. Its primary mandate is to provide the Fund with a better risk/return profile relative to the broad MSCI ACWI, its primary benchmark (the Acadian portfolio's performance is also measured against the MSCI ACWI Minimum Volatility as a secondary benchmark). The second portfolio is a passively-managed index fund provided through BlackRock. Taken together, both funds will add diversification benefits to the existing suite of public equity managers. Since its inception within the Fund, the global low volatility equity composite is performing in-line with the MSCI ACWI Minimum Volatility Index.

Acadian (Global Low Volatility – Active)

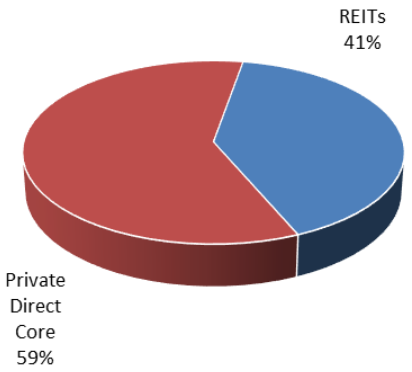
- Acadian manages the Fund's active global low volatility equity portfolio. The strategy recently completed its third year of performance within the Fund. During the fourth quarter, the Acadian portfolio returned -8.78% (net of fees). The portfolio's primary benchmark is the traditional cap-weighted MSCI All-Country World Index (ACWI). In addition, the portfolio is viewed in comparison to its secondary benchmark, the MSCI ACWI Minimum Volatility. The Acadian portfolio has wide dispersion in its economic sector allocations as compared to the cap-weighted index, potentially leading to a higher degree of tracking error (this difference is reduced when comparing against the secondary minimum volatility benchmark). During the quarter, the Acadian portfolio outperformed the MSCI ACWI but trailed the MSCI ACWI Minimum Volatility index. From a sector perspective the portfolio benefitted from stock selection in communication services and an emphasis on consumer staples. Procter & Gamble was a key source of positive return. Shares rallied after the U.S. consumer goods maker posted better-than-expected fiscal Q1 earnings. From a country perspective the portfolio benefitted from stock selection in the U.S. A lack of exposure to Apple was a key source of positive return. Shares slumped after the tech giant issued a disappointing outlook for the holiday period. The Acadian portfolio is currently outperforming its primary benchmark since inception (+196 bps) (07/15). Following this quarter's results the portfolio now trails its secondary minimum volatility benchmark since inception (-59 bps).

BlackRock (Global Low Volatility – Passive)

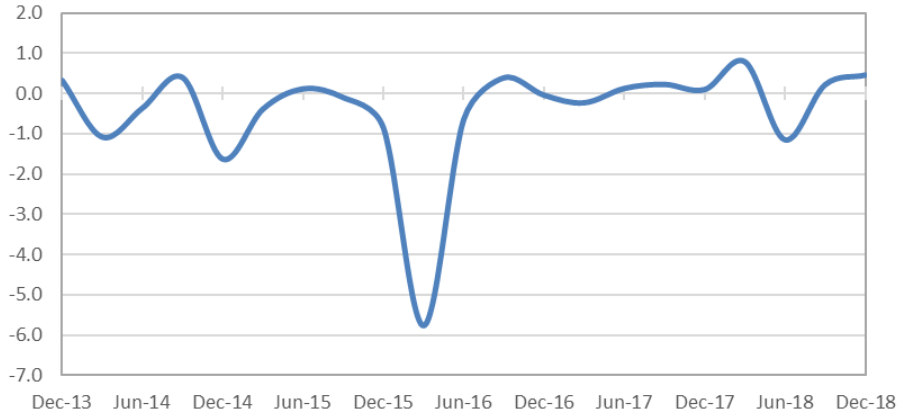
- BlackRock manages the Fund's passive global volatility equity strategy. The BlackRock portfolio is intended to provide a low-cost, highly diversified global equity investment strategy focused on minimizing volatility. The BlackRock portfolio is benchmark against the MSCI ACWI Minimum Volatility. To date, the portfolio continues to perform in line with expectations, closely tracking the risk profile of the benchmark index while outperforming the benchmark (+53 bps) since inception.

Real Estate Overview

Real Estate Structure



Total Real Estate Composite
Quarterly Excess Return



Real Estate Composite

	Assets (Millions)	Performance QTR	YTD	1-year	3-year	5-year	10-year
Total Real Estate (Gross)	**$ 394.1**	**-2.21**	**1.63**	**1.63**	**4.82**	**8.85**	**13.65**
Total Real Estate (Net)		**-2.36**	**1.09**	**1.09**	**4.18**	**8.14**	**12.88**
Custom Benchmark [1]		-2.83	0.64	0.64	4.21	8.02	12.92
Net of Fee Value Added vs Benchmark		*0.47*	*0.45*	*0.45*	*-0.03*	*0.12*	*-0.04*
REIT Strategies	$ 160.4	-6.80	-4.94	-4.94	1.54	7.68	12.01
Private Core Real Estate	$ 233.7	0.94	5.62	5.62	5.90	8.32	-.-
Wilshire Real Estate Securities Index		-6.98	-4.80	-4.80	2.41	8.17	12.41
NCREIF Open Diversified Core Equity (Net)		1.52	7.36	7.36	7.27	9.41	-.-

Real Estate Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Real Estate Securities - Public								
Adelante Capital Management (Gross)	**$ 81.3**	**-6.26**	**-5.02**	**-5.02**	**2.18**	**8.38**	**9.83**	**Sep-01**
Adelante Capital Management (Net)		**-6.40**	**-5.56**	**-5.56**	**1.60**	**7.76**	**9.25**	**Sep-01**
Wilshire Real Estate Securities + 1%		-6.73	-3.80	-3.80	3.41	9.17	10.69	Sep-01
Net of Fee Value Added vs Objective		*0.33*	*-1.76*	*-1.76*	*-1.81*	*-1.41*	*-1.44*	
Wilshire Real Estate Securities		-6.98	-4.80	-4.80	2.41	8.17	9.69	Sep-01
Net of Fee Value Added vs Index		*0.58*	*-0.76*	*-0.76*	*-0.81*	*-0.41*	*-0.44*	
Information Ratio				**-0.41**	**-0.43**	**-0.22**		
Sharpe Ratio				**-0.48**	**0.04**	**0.53**		
CenterSquare (Gross)	**$ 79.1**	**-7.09**	**-.-**	**-.-**	**-.-**	**-.-**	**-1.50**	**May-18**
CenterSquare (Net)		**-7.20**	**-.-**	**-.-**	**-.-**	**-.-**	**-1.68**	**May-18**
Wilshire Real Estate Securities + 1%		-6.73	-.-	-.-	-.-	-.-	-1.57	May-18
Net of Fee Value Added vs Objective		*-0.47*					*-0.11*	
Wilshire Real Estate Securities		-6.98	-.-	-.-	-.-	-.-	-2.16	May-18
Net of Fee Value Added vs Index		*-0.22*					*0.48*	

[6] Real Estate Custom Benchmark: 50% Wilshire RESI / 39% NCREIF ODCE NOF/11% Invesco Custom Benchmark (4q13 – Present); Wilshire RESI (4q89 – 4q10).

Real Estate Overview (Continued)

Real Estate Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Direct Core Real Estate - Private								
Heitman America Real Estate Trust (Gross)	**$ 93.3**	**0.77**	**7.50**	**7.50**	**8.13**	**10.27**	**12.49**	**Aug-10**
Heitman America Real Estate Trust (Net)		**0.55**	**6.55**	**6.55**	**7.17**	**9.31**	**11.44**	**Aug-10**
NCREIF Open-End Diversified Core (Net)		1.52	7.36	7.36	7.27	9.41	11.08	Aug-10
Net of Fee Value Added vs Index		*-0.97*	*-0.81*	*-0.81*	*-0.10*	*-0.10*	*0.36*	
Invesco Core Real Estate USA (Gross)	**$ 77.6**	**2.40**	**10.32**	**10.32**	**9.95**	**11.64**	**12.60**	**Aug-10**
Invesco Core Real Estate USA (Net)		**2.18**	**9.41**	**9.41**	**9.02**	**10.68**	**11.62**	**Aug-10**
NCREIF Open-End Diversified Core (Net)		1.52	7.36	7.36	7.27	9.41	11.08	Aug-10
Net of Fee Value Added vs Index		*0.66*	*2.05*	*2.05*	*1.75*	*1.27*	*0.54*	
Invesco II	**$ 62.7**	**0.00**	**0.02**	**0.02**	**-0.39**	**-0.08**	**-0.27**	**Oct-13**

- The Fund's total real estate composite is comprised of both public market real estate securities (REITs) and private investment in direct core real estate. The total segment returned -2.36% (net of fees) during the fourth quarter, outperforming its benchmark (split 50% Wilshire Real Estate Securities Index, 39% NCREIF Open-End Diversified Core Index and 11% Invesco II Custom Benchmark) which returned -2.83%. On the public side, the Adelante portfolio outperformed the Wilshire Real Estate Securities Index mostly as a result of favorable stock selection decisions. Meanwhile CenterSquare which was funded in May has performed well in its first few months of performance but modestly trailed the benchmark during the period. On the private side, Invesco led the benchmark during the period while Heitman was unable to keep pace with the NCREIF ODCE Index. Currently, the Fund's total real estate composite is outperforming its benchmark over the one- and five-year periods but continues to trail the benchmark since inception (12/89).

Adelante Capital Management (REIT)

- Adelante Capital manages one of the Fund's real estate securities (REIT) portfolios. During the fourth quarter, the Adelante portfolio returned -6.40% (net of fees), outperforming its benchmark index (Wilshire Real Estate Securities) which returned -6.98%. In a reversal from the previous two quarters, security selection was the main driver of this period's outperformance relative to the benchmark. Stock selection was most additive within the retail (both regional and local) and health care segments of the market. Here the portfolio holdings delivered returns ahead of the respective benchmark holdings. Similarly, albeit on a lesser scale the portfolio's apartment and industrial holdings posted returns above that of their respective benchmark holdings. From a sector positioning standpoint, the portfolio benefitted from an overweight to the triple-net lease sector as well as a small cash position. During the period the portfolio purchased four new issues (Boston Properties, Camden Property Trust, The Macerich Company & CoreSite Realty Corp.) and sold four securities (Vornado Realty Trust, Mid-America Apartment Communities, Inc., Public Storage & Sunstone Hotel Investors, Inc.). Despite this quarter's outperformance the portfolio is underperforming its benchmark over the one-, three-, five- and ten-year periods as well as since inception (09/01).

CenterSquare (REIT)

- CenterSquare manages the Fund's recently hired real estate securities (REIT) portfolio. For the quarter stock selection contributed to alpha while sector selection detracted. Cash contributed 9 bp, and the combined effect of intraday trading, rounding and other factors contributed 1 bp over the period. Stock selection was particularly strong in hotels, with an out of benchmark position in Hilton Hotels and overweight to Sunstone Hotels contributing significant alpha. In the Specialty sector, an overweight to Iron Mountain was a strong contributor, and in suburban office an overweight to Mack-Cali and underweight to

Corporate Office Properties served the portfolio well. This stock selection alpha, however was offset by sector selection in the quarter, primarily due to the rally in traditionally defensive net lease and health care stocks, to which the portfolio was broadly underweight. In addition, stock picks within the data center sector underperformed, particularly an underweight to Digital Realty Trust. From a positioning perspective, suburban office and alternative housing continue to be the largest overweights. Over the quarter management reduced their underweight the net lease sector given the risk off environment via purchases of WP Carey and Store Capital, and also reduced an underweight to health care via HCP. Furthermore, the team reduced an overweight to office by trimming exposure to Boston Properties and selling out of a position in Hudson Pacific Properties. Lastly, CenterSquare also moved from overweight to neutral in the industrial sector due to concerns about the impact of tariffs on the sector by selling Duke Realty and Prologis.

Heitman (Direct Core Real Estate)

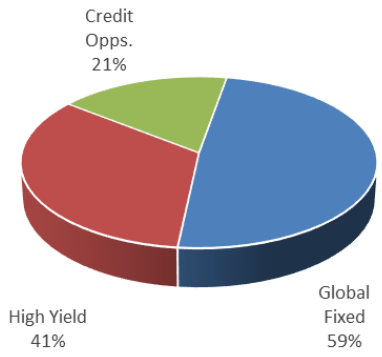
- Heitman manages one of the Fund's three direct core real estate portfolios. The Heitman portfolio returned 0.55% (net of fees) during the fourth quarter, underperforming its benchmark (NCREIF Open End Diversified Core Index) which returned 1.52%. Heitman achieved a gross return of 0.77% in the fourth quarter of 2018, comprised of 1.12% in income and -0.35% in depreciation. The depreciation return was comprised of -2 basis points related to property valuation and -33 basis points related to the valuation of the Fund's debt. The industrial and self-storage assets experienced healthy valuation increases, which were offset by a decrease in valuation for the retail portfolio. The Fund anticipates paying a dividend in January of around $13.33 per share, providing investors with additional yield. At quarter end the portfolio's allocation is well diversified across the apartment (22% allocation), office (27%), retail (21%), self-storage (20%) and industrial (10%) segments of the market. The portfolio is also well diversified across the U.S. geographical landscape allocating 37% of the portfolio to the Western region of the U.S., 21% to the Southern region, 18% to the Midwest region and 24% to the Eastern region of the country. Four acquisitions were completed during the quarter at a total equity cost of $678.7 million at HART's share. The new investments included an apartment asset in Charlotte, North Carolina; a retail asset in Walnut Creek California; an office asset in Los Angeles, California; and a student housing asset in Tampa, Florida. Following this quarter's results, the Heitman portfolio is currently trailing its benchmark over the one-, three- and five-year periods but continues to lead its benchmark since inception (08/10).

Invesco Core Real Estate-USA (Direct Core Real Estate)

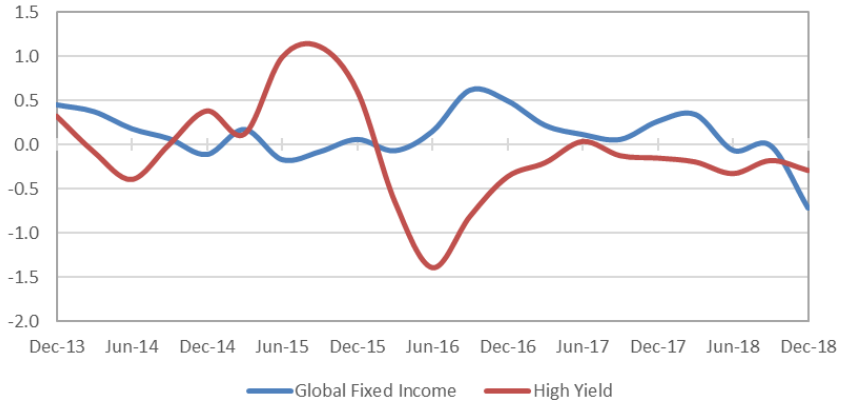
- Invesco manages two of the Fund's three direct core real estate portfolios. The Invesco Core Real Estate-USA portfolio returned 2.18% (net of fees) during the fourth quarter, leading its benchmark (NCREIF Open End Diversified Core Index) which returned 1.52%. The total gross return comprised of 0.91% income and 1.25% appreciation. The Fund produced gross unlevered property appreciation of 127 bps on the total portfolio for the quarter, driven primarily by the office and industrial sectors. Total Portfolio percentage leased decreased 170 bps from the prior quarter to 91.6% as a result of expected tenant vacancies, which have a meaningful amount of leasing activity. The Core Portfolio delivered robust net operating income growth of 10% in 2018, which was roughly in-line with expectations when excluding assets sold during the fourth quarter. During the quarter, the Fund closed on five acquisitions (total gross purchase price $265.2M: Houston industrial, Denver office, Austin multi-family and self-storage in Austin and Portland). Further, the Fund purchased the minority interest partner equity on three joint ventures for total equity proceeds of $87.6M. In addition, the Fund closed on two dispositions (total gross sales price $409.8M: Chicago multi-family and Washington DC office). The Invesco portfolio is currently outperforming its benchmark over all measured periods including since inception (08/10).

Fixed Income Overview

Fixed Income Structure



Global Fixed Income and High Yield Quarterly Excess Return



Fixed Income Composites

	Assets (Millions)	QTR	YTD	1-year	3-year	5-year	10-year
		Performance					
Global Fixed Income (Gross)	**$ 480.3**	**0.97**	**-0.17**	**-0.17**	**2.78**	**3.12**	**4.90**
Global Fixed Income (Net)		**0.92**	**-0.38**	**-0.38**	**2.56**	**2.92**	**4.71**
Bloomberg Aggregate Bond Index		1.64	0.01	0.01	2.06	2.52	3.48
Net of Fee Value Added vs Benchmark		*-0.72*	*-0.39*	*-0.39*	*0.50*	*0.40*	*1.23*
High Yield (Gross)	**$ 332.3**	**-4.86**	**-2.62**	**-2.62**	**6.13**	**3.63**	**9.73**
High Yield (Net)		**-4.98**	**-3.09**	**-3.09**	**5.62**	**3.14**	**9.22**
Custom Benchmark [1]		-4.69	-2.16	-2.16	7.17	3.46	10.44
Net of Fee Value Added vs Benchmark		*-0.29*	*-0.93*	*-0.93*	*-1.55*	*-0.32*	*-1.22*
Bloomberg Aggregate		1.64	0.01	0.01	2.06	2.52	3.48
Citigroup High Yield Cash Pay		-4.69	-2.16	-2.16	7.17	3.46	10.44
BofA ML High Yield Master II		-4.63	-2.25	-2.25	7.27	3.82	10.99

Global Fixed Income Managers

	Assets (Millions)	QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
		Performance (%)						
Global Fixed Income								
Securian Asset Mgmt. (Gross)	**$ 206.0**	**0.79**	**0.05**	**0.05**	**3.21**	**3.53**	**4.55**	**May-07**
Securian Asset Mgmt. (Net)		**0.74**	**-0.12**	**-0.12**	**3.02**	**3.35**	**4.37**	**May-07**
Bloomberg Aggregate + 0.5%		1.76	0.51	0.51	2.56	3.02	4.50	**May-07**
Net of Fee Value Added vs Objective		*-1.02*	*-0.63*	*-0.63*	*0.46*	*0.33*	*-0.13*	
Bloomberg Aggregate		1.64	0.01	0.01	2.06	2.52	4.00	**May-07**
Net of Fee Value Added vs Benchmark		*-0.90*	*-0.13*	*-0.13*	*0.96*	*0.83*	*0.37*	
Information Ratio				**-0.15**	**1.41**	**1.43**		
Sharpe Ratio				**-0.79**	**0.78**	**1.04**		
Aberdeen (Gross)	**$ 205.2**	**1.14**	**-0.75**	**-0.75**	**2.40**	**2.63**	**4.58**	**Apr-07**
Aberdeen (Net)		**1.08**	**-0.99**	**-0.99**	**2.16**	**2.43**	**4.37**	**Apr-07**
Bloomberg Aggregate + 0.5%		1.76	0.51	0.51	2.56	3.02	4.34	Apr-07
Net of Fee Value Added vs Objective		*-0.68*	*-1.50*	*-1.50*	*-0.40*	*-0.59*	*0.03*	
Bloomberg Aggregate		1.64	0.01	0.01	2.06	2.52	3.84	Apr-07
Net of Fee Value Added vs Benchmark		*-0.56*	*-1.00*	*-1.00*	*0.10*	*-0.09*	*0.53*	
Information Ratio				**-0.78**	**0.10**	**-0.10**		
Sharpe Ratio				**-1.00**	**0.40**	**0.66**		

[7] High Yield Custom Benchmark: Citigroup High Yield Cash Pay (4q99 – Present); Citigroup High Yield Composite Index (1q97 – 3q99).

Fixed Income Overview (Continued)

Global Fixed Income Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
Global Fixed Income								
Garcia Hamilton (Gross)	**$ 69.0**	**1.01**	**0.92**	**0.92**	**2.66**	**3.34**	**3.17**	**Oct-13**
Garcia Hamilton (Net)		**0.95**	**0.66**	**0.66**	**2.39**	**3.08**	**2.92**	**Oct-13**
Bloomberg Aggregate + 0.5%		1.76	0.51	0.51	2.56	3.02	2.75	Oct-13
Net of Fee Value Added vs Objective		*-0.81*	*0.15*	*0.15*	*-0.17*	*0.06*	*0.17*	
Bloomberg Aggregate		1.64	0.01	0.01	2.06	2.52	2.25	Oct-13
Net of Fee Value Added vs Benchmark		*-0.69*	*0.65*	*0.65*	*0.33*	*0.56*	*0.67*	
Information Ratio				**0.55**	**0.31**	**0.53**		
Sharpe Ratio				**-0.56**	**0.55**	**0.87**		

- The Fund's global fixed income segment returned 0.92% (net of fees) during the fourth quarter of 2018, underperforming with the Bloomberg Aggregate Bond Index, which returned 1.64%. The segment is comprised of three actively managed strategies: (1) Securian Asset Management (previously Advantus Capital Management), (2) Aberdeen Asset Management, and (3) Garcia Hamilton. During the period, all three portfolios trailed the Bloomberg Aggregate Index. Securian and Aberdeen (both with early 2007 inception dates) manage roughly the same level of assets for the Fund while the Garcia Hamilton portfolio has a smaller mandate. Therefore, quarter to quarter performance is largely driven by the results of the Securian and Aberdeen accounts while the Garcia Hamilton account does not have the ability to move the needle as much, so to speak, on account of its smaller size. Following this periods results the global fixed income composite continues to outperform against the Bloomberg Aggregate over the three-, five- and ten-year periods.

Securian Asset Management (Core Fixed Income)

- Securian Asset Management (*formerly Advantus*) manages one of the Fund's three global fixed income portfolios. During the fourth quarter, the Securian portfolio returned 0.74% (net of fees), underperforming its benchmark (Bloomberg Aggregate) which returned 1.64% for the quarter. Poor results from security selection decisions were the largest contributor to the portfolio's relative underperformance during the quarter. The overall increase in volatility during the quarter put pressure on many of the securities held in the portfolio, particularly out-of-index positions in both the corporate and securitized sectors. Additionally, the slide in oil prices weighed heavily on the energy positions held in the portfolio. The portfolio's overweight allocations to financials, utilities, CMBS and ABS also contributed to much of the underperformance, while the portfolio's underweight positions in Agency MBS contributed positively to performance during the quarter. The portfolio's duration was slightly less than that of the benchmark throughout the quarter and this produced slightly negative results as rates fell. Overall exposure to corporate bonds fell during the quarter, most notably in financials and utilities; management added to exposures in industrials. The Fund remains overweight financials, utilities and to a lesser extent, industrials as of year end. The Securian portfolio is currently outperforming against its benchmark over the three- and five-year periods as well as since inception (06/07).

Fixed Income Overview (Continued)

Aberdeen (Core Fixed Income)

- Aberdeen manages another of the Fund's global fixed income portfolios. During the fourth quarter the Aberdeen portfolio returned 1.08% (net of fees), underperforming its benchmark the Bloomberg Aggregate Index which returned 1.64% during the period. Overall security selection was a major detractor from Fund performance attributable primarily to holdings in Treasury Inflation-Protected Securities (TIPs) and high-beta corporate issues. The performance of the Fund's international investments were hampered over the quarter mainly by the strength of the U.S. dollar, while holdings in several foreign government bonds lagged comparable-duration U.S. Treasuries due to investors' demand for "safe-haven" assets. In the Fund's U.S. core market segment, duration management and yield-curve positioning were the strongest generators of alpha during the quarter. Sector allocation had a negative impact on Fund performance due to an underweight to U.S. Treasuries and an overweight to mortgage-backed securities (MBS). Partially offsetting the impact were positive contributions from the overweight allocations versus the benchmark to asset-backed securities (ABS), and an underweight to investment-grade corporate bonds. Despite mild underperformance in the past few periods, the Aberdeen portfolio continues to outperform against its benchmark over the three-year and since inception periods (06/07).

Garcia Hamilton (Core Fixed Income)

- Garcia Hamilton is the Fund's third global fixed income manager. During the fourth quarter, the portfolio returned 0.95% (net of fees), underperforming its benchmark index (Bloomberg Aggregate Index) which returned 1.64%. As of quarter end, the portfolio held approximately 46% in the corporate sector versus the index weighting of 24%. In the agency and agency MBS sectors, the account held approximately 23% and 10% versus the benchmark weightings of 6% and 28%, respectively. An underweight to fixed rate corporate bonds was a contributor as corporate spreads widened. Duration management was a detractor to relative performance this quarter as the portfolio maintained a shorter duration than the benchmark while rates declined. The team believes market participants have overreacted and forward rates now appear to be pricing in a recession despite solid economic data. Additionally, market implied probabilities for future Fed rate hikes are significantly lower than estimates provided by the FOMC. With the recent widening of corporate spreads, Garcia Hamilton is now seeing more value in the sector and have begun to selectively increase exposure to the sector. Management has cited that in the near term, rates have the bias to move higher and spreads have the bias to tighten as fears of an economic slowdown subside and the Fed continues to hike. The Garcia Hamilton portfolio is currently outperforming against its benchmark over the one-, three- and five-year periods as well as since inception (12/13).

Fixed Income Overview (Continued)

High Yield/Credit Opportunities Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
High Yield								
Oaktree Capital Management (Gross)	**$ 165.6**	**-5.18**	**-3.20**	**-3.20**	**6.28**	**3.10**	**6.96**	**Dec-96**
Oaktree Capital Management (Net)		**-5.30**	**-3.69**	**-3.69**	**5.74**	**2.58**	**6.45**	**Dec-96**
Performance Objective		-4.44	-1.16	-1.16	8.17	4.46	7.63	Dec-96
Net of Fee Value Added vs Objective		*-0.86*	*-2.53*	*-2.53*	*-2.43*	*-1.88*	*-1.18*	
Custom Benchmark		-4.69	-2.16	-2.16	7.17	3.46	6.63	Dec-96
Net of Fee Value Added vs Benchmark		*-0.61*	*-1.53*	*-1.53*	*-1.43*	*-0.88*	*-0.18*	
Information Ratio				**-3.75**	**-3.09**	**-2.76**		
Sharpe Ratio				**-1.42**	**1.03**	**0.38**		
BlackRock High Yield (Gross)	**$ 166.7**	**-4.55**	**-2.04**	**-2.04**	**5.98**	**3.72**	**6.36**	**Sep-06**
BlackRock High Yield (Net)		**-4.66**	**-2.49**	**-2.49**	**5.49**	**3.23**	**5.88**	**Sep-06**
Citigroup High Yield Cash Pay + 1%		-4.44	-1.16	-1.16	8.17	4.46	7.49	Sep-06
Net of Fee Value Added vs Objective		*-0.22*	*-1.33*	*-1.33*	*-2.68*	*-1.23*	*-1.61*	
Citigroup High Yield Cash Pay		-4.69	-2.16	-2.16	7.17	3.46	6.49	Sep-06
Net of Fee Value Added vs Benchmark		*0.03*	*-0.33*	*-0.33*	*-1.68*	*-0.23*	*-0.61*	
Information Ratio				**-0.94**	**-1.40**	**-0.13**		
Sharpe Ratio				**-1.19**	**1.14**	**0.57**		
Credit Opportunities								
Neuberger Berman (Gross)	**$ 168.8**	**-3.05**	**-1.80**	**-1.80**	**-.-**	**-.-**	**6.31**	**Jan-16**
Neuberger Berman (Net)		**-3.14**	**-2.12**	**-2.12**	**-.-**	**-.-**	**6.06**	**Jan-16**
Custom Benchmark + 1%		-2.86	-1.00	-1.00	-.-	-.-	7.25	Jan-16
Net of Fee Value Added vs Objective		*-0.28*	*-1.12*	*-1.12*			*-1.19*	
Custom Benchmark		-3.11	-2.00	-2.00	-.-	-.-	6.25	Jan-16
Net of Fee Value Added vs Benchmark		*-0.03*	*-0.12*	*-0.12*			*-0.19*	
Information Ratio				**-0.10**	**-.-**	**-.-**		
Sharpe Ratio				**-1.20**	**-.-**	**-.-**		

- The high yield composite returned -4.98% (net of fees) during the fourth quarter, underperforming against the Citigroup High Yield Cash Pay Index, which returned -4.69%. The composite is currently split equally between the two actively-managed strategies. During the period, Blackrock edged out the benchmark while Oaktree was unable to keep pace with the benchmark. The high yield composite is currently underperforming its benchmark over all extended time periods greater than one year including since inception (03/97).

Oaktree Capital Management (High Yield Fixed Income)

- Oaktree Capital manages one of the Fund's two high yield fixed income portfolios. The Oaktree portfolio returned -5.30% (net of fees) during the fourth quarter, underperforming its benchmark (Citigroup High Yield Cash Pay) which returned -4.69%. The fourth quarter was highlighted by volatile markets and the underperformance of risk markets. Underperformance in high yield was driven by overall market sentiment, the declines in CCC credits and equities, and lower oil prices. The portfolio's energy holdings were the worst performers during the period falling in lockstep with the price of oil. Moreover, holdings in David's

[8] Oaktree Capital Management Performance Objective: Citigroup High Yield Cash Pay + 1% (4q99 – Present); Citigroup High Yield Composite Index + 1% (2q97 – Present).

Bridal, which filed for bankruptcy in November, also negatively impacted returns. Oaktree has cited that while David's restructuring referred to above will be a detractor for the fourth quarter, they have been actively involved in the workout and are optimistic about the company's prospects now that it has revamped its balance sheet. In general, the strategy's risk-controlled approach is expected to outperform in negative periods such as the fourth quarter. However, the portfolio ended up on the wrong side of a few trades that ultimately eroded relative gains during the period. The Oaktree portfolio is currently underperforming over the one-, three- and five-year periods, as well as since inception (03/97).

BlackRock (High Yield Fixed Income)

- BlackRock manages the Fund's other high yield fixed income portfolio. During the fourth quarter, the BlackRock portfolio returned -4.66%, outperforming its benchmark (Citigroup High Yield Cash Pay) which returned -4.69%. The portfolio outperformed the benchmark during the period as a result of favorable individual sector/issue selection and positioning relative to the benchmark. In a sharp reversal from previous periods, lower quality issues (CCC-D) within the high yield space drastically underperformed higher quality rated issues. Despite exhibiting a slightly lower credit quality (B) relative to the benchmark (BB), the portfolio does not hold many CCC-D rated issues which aided performance during the quarter. The portfolio maintains a more defensive posture relative to the benchmark and should perform better in an environment where quality issues are in favor. The portfolio is exhibiting a slightly lower current yield relative to the benchmark while the effective duration of the portfolio sits moderately above that of the benchmark, pointing to increase price sensitivity to sudden changes in the prevailing interest rates. The BlackRock portfolio is currently underperforming over the one-, three- and five-year periods as well as since inception period (-61 bps) (09/06).

Neuberger Berman (Credit Opportunities)

- Neuberger Berman manages the Fund's credit opportunities portfolio. During the beginning of 2016 the Neuberger Berman Credit Opportunities portfolio was funded to further diversify the plan's fixed income basket. Now entering its third year of performance the portfolio returned -3.14% for the period, slightly trailing its custom benchmark (*33% ML High Yield Master II Index/33% S&P LSTA Leveraged Loan Index/33% JPM EMBI Global Diversified Index*) which returned -3.11%. Sector positioning within U.S. high yield credit, loans, and emerging markets were the main contributors this period's relative to the benchmark. Meanwhile, security selection was negative overall but not strong enough to tilt the portfolio performance meaningfully into the red versus the benchmark. As of quarter end, the portfolio maintained a notable overweight to Latin America with underweight positions to the U.S. and Asia Ex-Japan regions. Meanwhile, the credit quality of the portfolio (BB) matched that of the benchmark, such that this was not a meaningful source of added or detracted value. The Neuberger Berman portfolio is currently trails its benchmark over the one-year period and is slightly underperforming its custom benchmark since inception (-19 bps) (01/16).

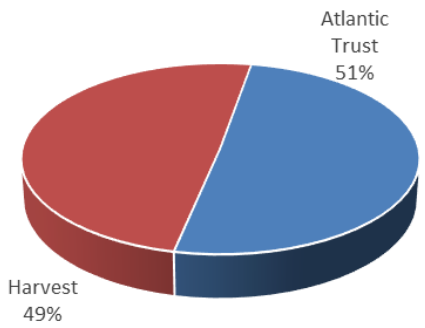
Private Equity Overview

Private Equity Composite

	Total Commitment	Cumulative Capital Called		Cumulative Distributions	Capital Balance	Multiple	Calculated IRR
Hamilton Lane Fund VII LP (Series A)	30,000,000	25,297,247	84.3%	19,544,100	18,467,923	1.50	10.0%
Hamilton Lane Fund VII LP (Series B)	20,000,000	17,695,467	88.5%	7,202,630	12,320,036	1.10	2.3%
Hamilton Lane Fund VII LP (Total)	*50,000,000*	*42,992,714*	86.0%	*26,746,730*	*30,787,959*	1.34	7.0%
Hamilton Lane Secondary Fund II LP	25,000,000	22,848,181	91.4%	26,183,409	2,292,020	1.25	8.9%
Hamilton Lane Secondary Fund III LP	30,000,000	17,762,479	59.2%	15,064,144	13,794,901	1.62	21.2%
Hamilton Lane Secondary Fund IV LP	30,000,000	10,202,242	34.0%	204,691	15,139,438	1.50	-
Hamilton Lane Fund VIII LP (Global)	30,000,000	16,412,837	54.7%	2,568,375	22,164,599	1.51	12.5%
GCM Grosvenor - Partnership, L.P.	75,000,000	80,660,373	107.5%	76,637,329	51,479,049	1.59	15.7%
GCM Grosvenor - Partnership II, L.P. (2014)	60,000,000	56,309,614	93.8%	15,686,970	48,332,452	1.14	8.7%
GCM Grosvenor - Partnership II, L.P. (2015)	20,000,000	23,376,359	116.9%	1,428,044	23,841,650	1.08	7.6%
GCM Grosvenor - Partnership II, L.P. (2017)	30,000,000	3,256,049	10.9%	-	3,220,398	0.99	-19.0%
Fairview Capital III *	40,000,000	23,576,375	58.9%	1,630,828	25,737,769	1.16	8.6%
Total Private Equity Program	**390,000,000**	**297,397,223**	**76.3%**	**166,150,520**	**236,790,235**	**1.35**	**13.3%**

- Multiple calculation = (market value + distributions) / capital called
- Internal Rate of Return shown here is calculated by Wilshire based on cumulative cash flows and annualized since inception.

MLP Overview



MLP Composite

	Assets (Millions)	Performance QTR	YTD	1-year	3-year	5-year	10-year
Total MLPs (Gross)	**$ 211.1**	**-19.06**	**-10.42**	**-10.42**	**1.45**	**-3.23**	**-.-**
Total MLPs (Net)		**-19.21**	**-11.01**	**-11.01**	**0.79**	**-3.86**	**-.-**
Alerian MLP Index		-17.30	-12.42	-12.42	-1.06	-7.31	-.-
Net of Fee Value Added vs Index		*-1.91*	*1.41*	*1.41*	*1.85*	*3.45*	
Alerian MLP Index		-17.30	-12.42	-12.42	-1.06	-7.31	9.58
S&P MLP Index		-17.80	-11.67	-11.67	0.57	-6.59	10.35
Bloomberg Commodities Index		-9.41	-11.25	-11.25	0.30	-8.80	-3.78

Managers

	Assets (Millions)	Performance (%) QTR	YTD	1-year	3-year	5-year	Since Inception	Inception Date
MLPs								
Harvest Fund Advisors (Gross)	**$ 104.3**	**-20.02**	**-10.83**	**-10.83**	**0.35**	**-3.64**	**3.50**	
Harvest Fund Advisors (Net)		**-20.18**	**-11.49**	**-11.49**	**-0.40**	**-4.31**	**2.79**	**Dec-11**
Alerian MLP Index + 1.5%		-16.92	-10.92	-10.92	0.44	-5.81	0.24	Dec-11
Net of Fee Value Added vs Objective		*-3.26*	*-0.57*	*-0.57*	*-0.84*	*1.50*	*2.55*	
Alerian MLP Index		-17.30	-12.42	-12.42	-1.06	-7.31	-1.26	Dec-11
Net of Fee Value Added vs Benchmark		*-2.88*	*0.93*	*0.93*	*0.66*	*3.00*	*4.05*	
Information Ratio				**0.29**	**0.22**	**0.74**		
Sharpe Ratio				**-0.56**	**-0.07**	**-0.25**		
Atlantic Trust CIBC (Gross)	**$ 106.8**	**-18.09**	**-10.02**	**-10.02**	**2.58**	**-3.51**	**4.58**	
Atlantic Trust CIBC (Net)		**-18.23**	**-10.54**	**-10.54**	**2.00**	**-4.05**	**4.01**	**Dec-11**
Alerian MLP Index + 1.5%		-16.92	-10.92	-10.92	0.44	-5.81	0.24	Dec-11
Net of Fee Value Added vs Objective		*-1.31*	*0.38*	*0.38*	*1.56*	*1.76*	*3.77*	
Alerian MLP Index		-17.30	-12.42	-12.42	-1.06	-7.31	-1.26	Dec-11
Net of Fee Value Added vs Benchmark		*-0.93*	*1.88*	*1.88*	*3.06*	*3.26*	*5.27*	
Information Ratio				**0.76**	**0.91**	**0.85**		
Sharpe Ratio				**-0.55**	**0.05**	**-0.24**		

MLP Overview (Continued)

- The Fund's Master Limited Partnership (MLP) program is comprised of two individual managers, Harvest Fund Advisors and Atlantic Trust (formerly Invesco), with the mandates essentially split evenly between the two. 2018 proved to be a disappointing year in the midstream space, with all of that disappointment hitting in the fourth quarter. Through September 30, 2018 the Alerian MLP Total Return Index registered a YTD net gain of 5.9%. This strong year came under heavy pressure as equity markets across virtually all subsectors unraveled in December 2018, which was the worst December for the S&P 500 since the Great Depression in 1931. Against this backdrop the MLPs (as represented by the Alerian MLP Index) dropped over 17% in the fourth quarter to close out the year, eroding all year-to-date gains.

Harvest Fund Advisors (MLPs)

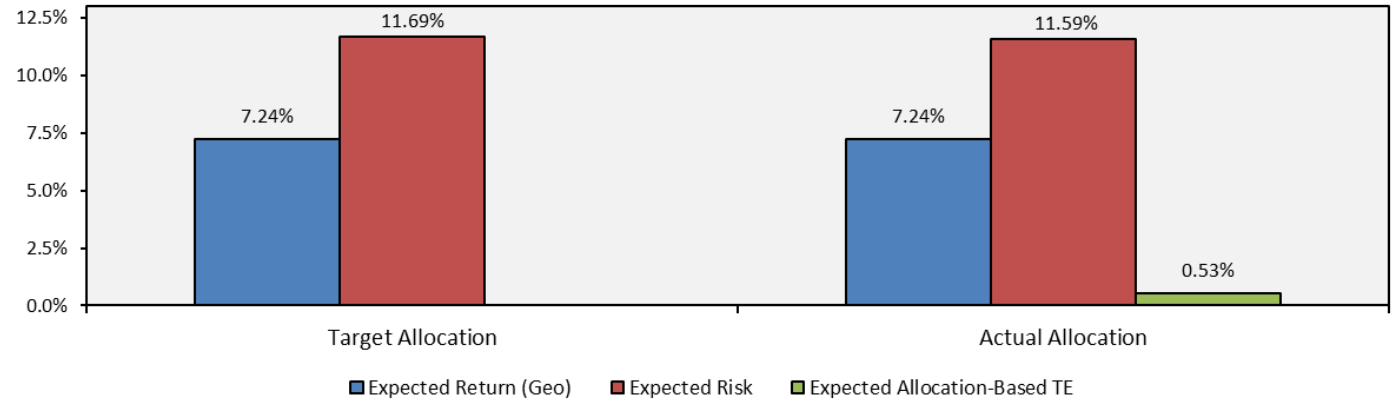
- Harvest Fund Advisors manages one of the Fund's two MLP portfolios. During the fourth quarter the Harvest portfolio returned -20.18% (net of fees), underperforming its benchmark (Alerian MLP Index) which returned -17.30%. Since the Harvest portfolio typically has approximately anywhere from 96% to 100% of its value invested in energy sector MLPs, sector weighting has not historically been a meaningful source of added or detracted value. During the period the portfolio's energy holdings delivered performance well below that of the benchmark leading to underperformance relative to the benchmark in Q4. Several heavily weighted positions in the portfolio experienced large losses during the period. Most notably, Energy Transfer Equity (-22.76%) and Targa Resources (-34.87%). Moreover, the portfolio saw underperformance from its relative positioning in Marathon Petroleum Logistics (MPLX) and Andeavor Logistics (ANDX) as their prices traded on transaction speculation. The team believes ANDX is a cheaper way to own MPLX, and will ultimately become part of MPLX in 2019. The market reacted negatively when a simplification transaction was not announced at the Marathon Petroleum (MPC) analyst day in early December, despite the company guiding that an announcement at the meeting would likely not be forthcoming. Management continues to expect this transaction to be a story of 'when' rather than 'if,' and believe they are well-positioned in the complex by owning more of the cheaper entity. Following this quarter's underperformance the Harvest Fund Advisors MLP portfolio continues to outperform against its benchmark for the one-, three- and five-year periods, as well as since inception (12/11)

Atlantic Trust (MLPs)

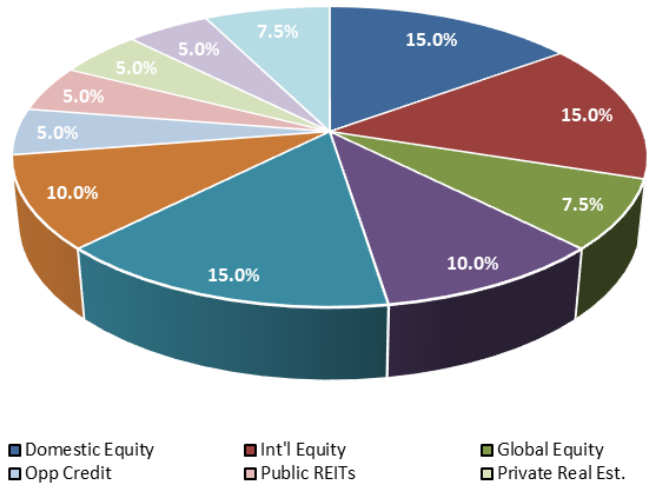
- Atlantic Trust CIBC (formerly Invesco) manages the Fund's other MLP portfolio. During the fourth quarter, the Atlantic Trust portfolio returned -18.23% (net of fees), underperforming its benchmark (Alerian MLP Index) which returned -17.30%. It is important to note that the Atlantic Trust portfolio (containing 26 stocks) is more concentrated than the Harvest portfolio (34 stocks) as well as the benchmark (58 stocks). As a result, many of its position sizes are relatively much larger and have a greater impact on the overall return. The portfolio's underperformance during the period was primarily as a result of unfavorable stock selection, which was confined to the energy segment (this is of course the dominant segment in the market space, comprising over 97% of the benchmark's total asset value). The portfolio's energy-focused MLP stocks generated a -17.80% return for the period underperforming the respective benchmark holdings which returned -17.05%. This was driven at least in part by the fact that a few of the portfolio's larger holdings were among its worst performers during the period. Most notably, Energy Transfer Equity (16.2% weight), returned -22.76% in the current period. The portfolio continues to succeed in retaining a mix of higher quality names from within this segment, which has allowed it to recoup some of the losses it experienced elsewhere in the portfolio. The portfolio has lower current yield with the expectation of slightly lower dividend growth over the five-year period relative to the benchmark. The Atlantic Trust MLP portfolio is outperforming against its benchmark for the one-, three- and five-year periods as well as since inception (12/11)

Appendix: Risk Analysis

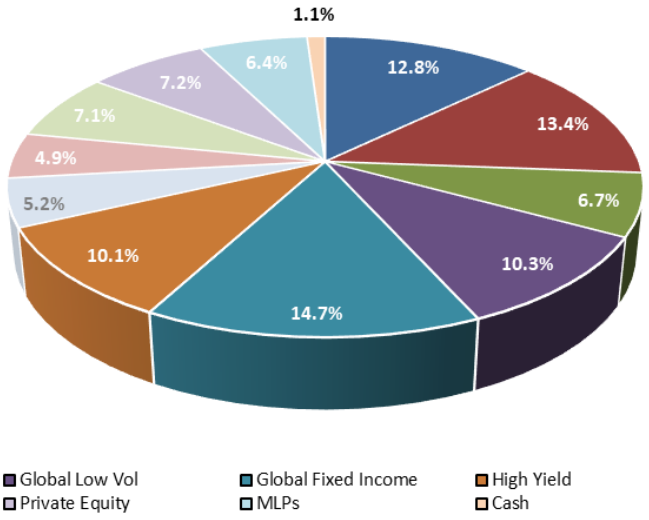
Expected Return and Risk



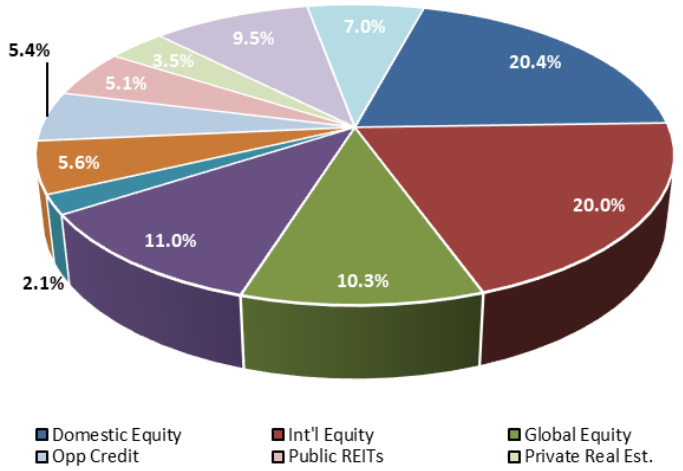
Target Asset Allocation



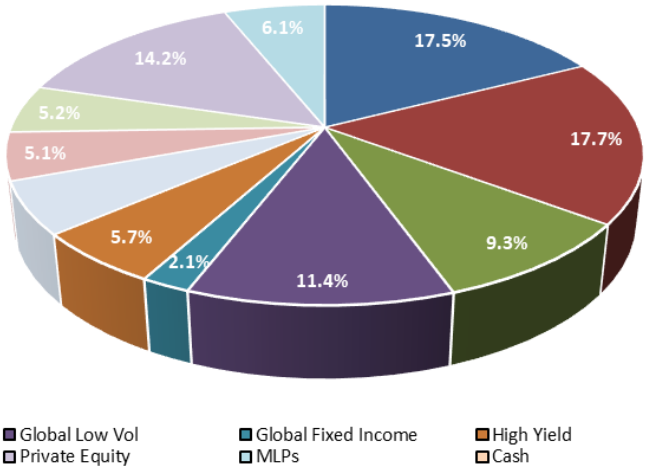
Actual Asset Allocation



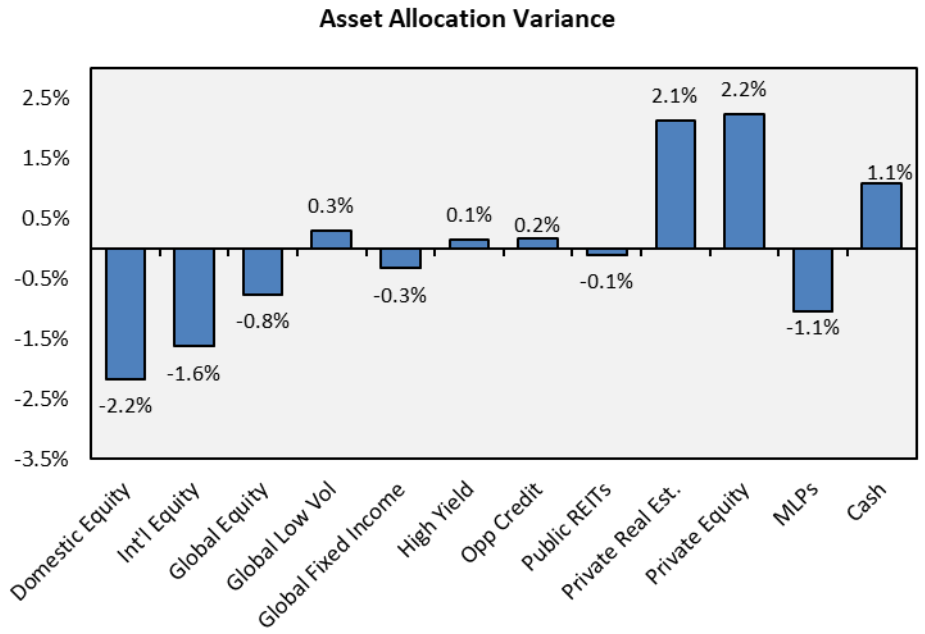
Contribution to Total Risk - Target Allocation

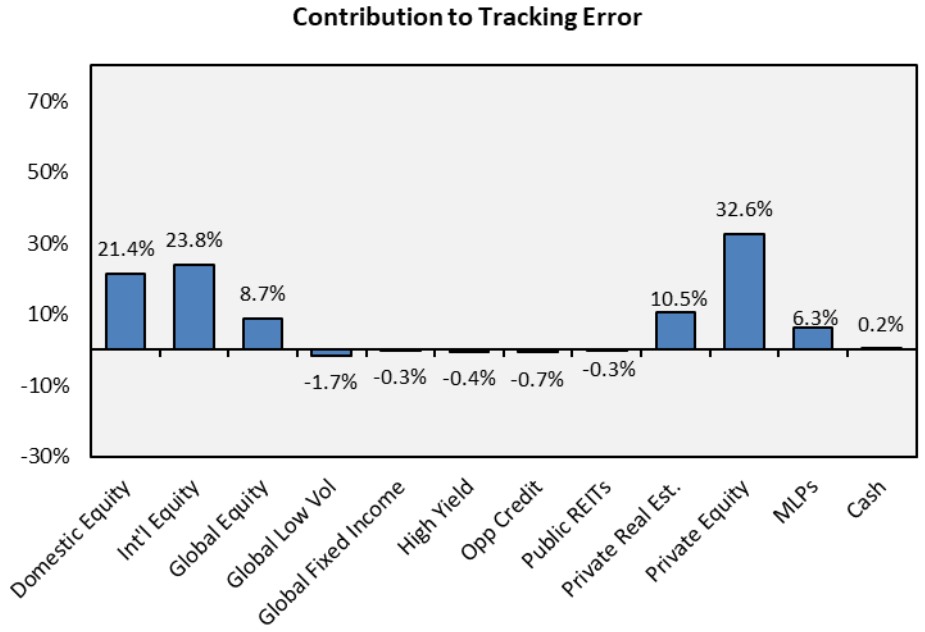


Contribution to Total Risk - Actual Allocation



Expected Return and Tracking Error based on Wilshire's Asset Assumptions





- The variance between the Fund's actual asset allocation and the target allocation is a source of tracking error for the Fund. This "asset allocation tracking error" is currently forecasted to be 0.53% (for the one-year period) at quarter-end. Underweights to public equities coupled with an overweight allocation to private equity provided the largest contributions to tracking error at the total fund level.

Manager Risk Statistics

U.S. Equity				
T. Rowe Price (Enhanced Index)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	15.42	11.16	11.10	13.66
Standard Deviation (Index)	15.33	10.95	10.94	13.60
Sharpe Ratio	-0.39	0.75	0.73	0.96
Sharpe Ratio (Index)	-0.40	0.74	0.71	0.93
Excess Risk	0.77	1.27	1.12	1.10
Information Ratio	0.20	0.19	0.26	0.33

Systematic (Small Core)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	17.22	15.08	14.36	18.78
Standard Deviation (Index)	19.33	16.01	15.43	18.44
Sharpe Ratio	-0.95	0.53	0.43	0.76
Sharpe Ratio (Index)	-0.65	0.39	0.24	0.63
Excess Risk	3.62	3.91	3.87	3.61
Information Ratio	-1.17	0.41	0.59	0.69

Channing Capital (Small Value)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	20.16	17.17	16.36	*n/a*
Standard Deviation (Index)	17.99	15.98	15.18	*n/a*
Sharpe Ratio	-0.94	0.18	0.10	*n/a*
Sharpe Ratio (Index)	-0.80	0.39	0.20	*n/a*
Excess Risk	6.24	4.61	4.33	*n/a*
Information Ratio	-0.84	-0.66	-0.30	*n/a*

Redwood (Small Growth)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	21.14	*n/a*	*n/a*	*n/a*
Standard Deviation (Index)	21.07	*n/a*	*n/a*	*n/a*
Sharpe Ratio	-0.67	*n/a*	*n/a*	*n/a*
Sharpe Ratio (Index)	-0.52	*n/a*	*n/a*	*n/a*
Excess Risk	5.57	*n/a*	*n/a*	*n/a*
Information Ratio	-0.66	*n/a*	*n/a*	*n/a*

Smith Graham (Mid-Cap)	1 Yr	*3 Yr*	*5 Yr*	*10 Yr*
Standard Deviation	17.09	*n/a*	*n/a*	*n/a*
Standard Deviation (Index)	15.52	*n/a*	*n/a*	*n/a*
Sharpe Ratio	-0.95	*n/a*	*n/a*	*n/a*
Sharpe Ratio (Index)	-0.69	*n/a*	*n/a*	*n/a*
Excess Risk	4.21	*n/a*	*n/a*	*n/a*
Information Ratio	-1.48	*n/a*	*n/a*	*n/a*

Real Estate Investment Trusts				
Adelante (REIT)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	15.10	12.93	13.30	20.27
Standard Deviation (Index)	16.16	13.54	13.92	21.43
Sharpe Ratio	-0.48	0.04	0.53	0.59
Sharpe Ratio (Index)	-0.41	0.10	0.54	0.56
Excess Risk	1.93	1.83	1.73	2.08
Information Ratio	-0.41	-0.43	-0.22	-0.02

Non-U.S. Equity				
Acadian (Int'l Small Cap)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	15.36	13.76	12.76	17.48
Standard Deviation (Index)	12.68	12.52	11.88	16.68
Sharpe Ratio	-1.42	0.37	0.20	0.70
Sharpe Ratio (Index)	-1.55	0.22	0.11	0.53
Excess Risk	4.44	3.89	3.51	3.52
Information Ratio	-0.59	0.58	0.36	0.86

AQR (Int'l Equity)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	14.17	12.28	11.83	16.94
Standard Deviation (Index)	12.72	11.54	11.91	16.16
Sharpe Ratio	-1.41	0.19	0.00	0.38
Sharpe Ratio (Index)	-1.24	0.30	0.00	0.33
Excess Risk	2.74	2.33	2.28	2.40
Information Ratio	-1.81	-0.43	-0.02	0.46

Ativo (Int'l Developed)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	12.62	*n/a*	*n/a*	*n/a*
Standard Deviation (Index)	12.43	*n/a*	*n/a*	*n/a*
Sharpe Ratio	-1.11	*n/a*	*n/a*	*n/a*
Sharpe Ratio (Index)	-1.24	*n/a*	*n/a*	*n/a*
Excess Risk	3.21	*n/a*	*n/a*	*n/a*
Information Ratio	0.49	*n/a*	*n/a*	*n/a*

Global Equity				
Wellington (Global Equity)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	15.56	12.26	11.92	*n/a*
Standard Deviation (Index)	13.47	10.62	10.86	*n/a*
Sharpe Ratio	-0.89	0.23	0.30	*n/a*
Sharpe Ratio (Index)	-0.82	0.52	0.33	*n/a*
Excess Risk	4.08	3.38	3.38	*n/a*
Information Ratio	-0.76	-0.75	0.00	*n/a*

Ariel (Global Equity)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	13.15	*n/a*	*n/a*	*n/a*
Standard Deviation (Index)	13.47	*n/a*	*n/a*	*n/a*
Sharpe Ratio	-0.56	*n/a*	*n/a*	*n/a*
Sharpe Ratio (Index)	-0.82	*n/a*	*n/a*	*n/a*
Excess Risk	3.51	*n/a*	*n/a*	*n/a*
Information Ratio	1.21	*n/a*	*n/a*	*n/a*

Global Low Volatility				
Acadian (Global Low Volatility)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	10.93	9.04	*n/a*	*n/a*
Standard Deviation (Index)	10.23	8.41	*n/a*	*n/a*
Sharpe Ratio	-0.67	0.69	*n/a*	*n/a*
Sharpe Ratio (Index)	-0.33	0.78	*n/a*	*n/a*
Excess Risk	1.92	2.60	*n/a*	*n/a*
Information Ratio	-2.14	-0.12	*n/a*	*n/a*

Manager Risk Statistics

High Yield Fixed Income				
BlackRock (High Yield)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	3.61	3.89	4.55	6.31
Standard Deviation (Index)	3.72	4.76	5.34	7.55
Sharpe Ratio	-1.19	1.14	0.57	1.41
Sharpe Ratio (Index)	-1.07	1.28	0.53	1.33
Excess Risk	0.36	1.12	1.67	2.04
Information Ratio	-0.94	-1.40	-0.13	-0.51

Oaktree (High Yield)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	3.84	4.56	5.10	6.60
Standard Deviation (Index)	3.72	4.76	5.34	7.55
Sharpe Ratio	-1.42	1.03	0.38	1.30
Sharpe Ratio (Index)	-1.07	1.28	0.53	1.33
Excess Risk	0.42	0.75	0.69	1.87
Information Ratio	-3.75	-3.09	-2.76	-2.26

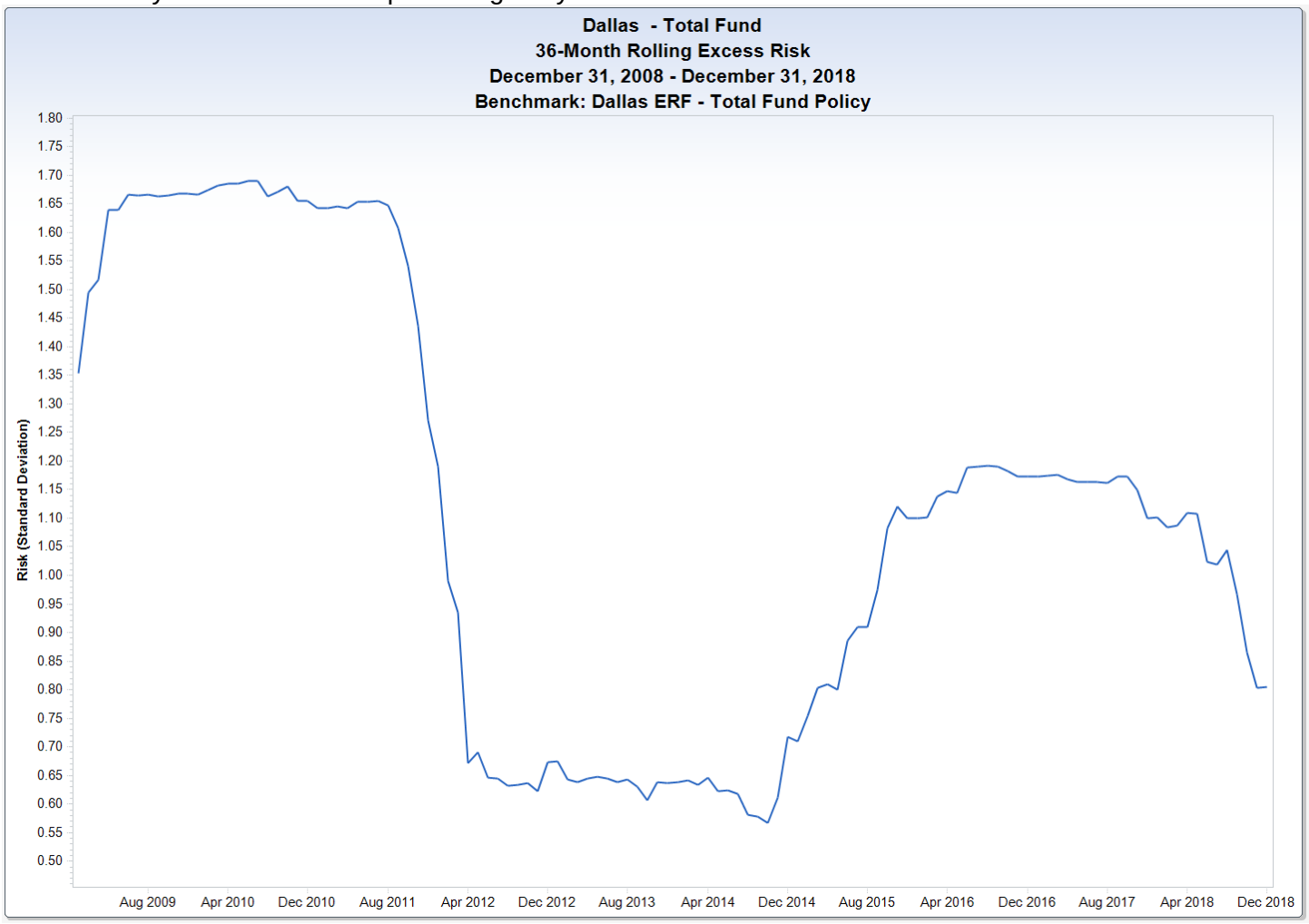
Neuberger Berman (Credit Opps)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	3.27	*n/a*	*n/a*	*n/a*
Standard Deviation (Index)	2.84	*n/a*	*n/a*	*n/a*
Sharpe Ratio	-1.20	*n/a*	*n/a*	*n/a*
Sharpe Ratio (Index)	-1.34	*n/a*	*n/a*	*n/a*
Excess Risk	1.26	*n/a*	*n/a*	*n/a*
Information Ratio	-0.10	*n/a*	*n/a*	*n/a*

Fixed Income (Core)				
Securian (Core Fixed Income)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	2.47	2.55	2.59	2.96
Standard Deviation (Index)	3.12	2.88	2.79	2.84
Sharpe Ratio	-0.79	0.78	1.04	1.61
Sharpe Ratio (Index)	-0.59	0.36	0.67	1.09
Excess Risk	0.86	0.67	0.57	0.95
Information Ratio	-0.15	1.41	1.43	1.70

Aberdeen (Core Fixed Income)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	2.83	2.84	2.74	3.14
Standard Deviation (Index)	3.12	2.88	2.79	2.84
Sharpe Ratio	-1.00	0.40	0.66	1.21
Sharpe Ratio (Index)	-0.59	0.36	0.67	1.09
Excess Risk	1.29	1.04	0.88	1.28
Information Ratio	-0.78	0.10	-0.10	0.54

Garcia Hamilton (Core Fixed Income)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	2.13	2.47	2.82	*n/a*
Standard Deviation (Index)	3.12	2.88	2.79	*n/a*
Sharpe Ratio	-0.56	0.55	0.87	*n/a*
Sharpe Ratio (Index)	-0.59	0.36	0.67	*n/a*
Excess Risk	1.18	1.08	1.04	*n/a*
Information Ratio	0.55	0.31	0.53	*n/a*

Master Limited Partnerships				
Harvest (MLP)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	23.64	19.30	19.43	*n/a*
Standard Deviation (Index)	22.38	18.36	18.97	*n/a*
Sharpe Ratio	-0.56	-0.07	-0.25	*n/a*
Sharpe Ratio (Index)	-0.63	-0.11	-0.42	*n/a*
Excess Risk	3.66	3.11	4.37	*n/a*
Information Ratio	0.29	0.22	0.74	*n/a*

Atlantic Trust CIBC (MLP)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	22.30	19.74	19.75	*n/a*
Standard Deviation (Index)	22.38	18.36	18.97	*n/a*
Sharpe Ratio	-0.55	0.05	-0.24	*n/a*
Sharpe Ratio (Index)	-0.63	-0.11	-0.42	*n/a*
Excess Risk	2.83	3.38	4.12	*n/a*
Information Ratio	0.76	0.91	0.85	*n/a*

- Below is a historical visualization of realized tracking error ("ex-post") for the Employees' Retirement Fund of the City of Dallas over the preceding ten years: