

# Part 2

# Exhibit 1 Redacted

As of September 30, 2018

## Trailing Period Performance

	Performance(%)										Since Inception	Inception Date	
	1 Quarter	2 Quarters	3 Quarters	YTD	FYTD	1 Year	3 Years	5 Years	10 Years	15 Years			20 Years
<b>Real Assets (unlevered/hedged)</b>	0.78	4.61	3.39	3.39	0.78	6.28	6.95	N/A	N/A	N/A	N/A	3.35	10/01/2014
Blended Policy (Real Assets) (Hedged)	0.21	3.75	2.90	2.90	0.21	5.69	5.89	N/A	N/A	N/A	N/A	2.86	
Value Added	0.57	0.86	0.49	0.49	0.57	0.59	1.06	N/A	N/A	N/A	N/A	0.49	
<b>Total Infrastructure Composite (unlevered/hedged)</b>	3.60	15.38	5.89	5.89	3.60	6.37	N/A	N/A	N/A	N/A	N/A	8.52	11/01/2015
Blended Policy (Infrastructure Hedged)	4.27	15.55	5.54	5.54	4.27	6.11	9.42	N/A	N/A	N/A	N/A	8.16	
Value Added	-0.67	-0.17	0.35	0.35	-0.67	0.26	N/A	N/A	N/A	N/A	N/A	0.36	
<b>Commodities Composite (unlevered)</b>	-3.29	-5.23	-5.01	-5.01	-3.29	-1.50	2.86	-3.52	-2.83	N/A	N/A	-1.26	11/01/2006
Blended Policy (Commodities)	-3.14	-4.92	-4.82	-4.82	-3.14	-1.34	0.72	-5.43	-5.17	N/A	N/A	-3.77	
Value Added	-0.15	-0.31	-0.19	-0.19	-0.15	-0.16	2.14	1.91	2.34	N/A	N/A	2.51	
<b>Total Real Estate (unlevered/hedged)</b>	2.00	5.77	8.38	8.38	2.00	12.20	10.31	12.07	3.12	8.16	8.47	8.23	04/01/1981
Blended Policy (Total Real Estate) (Hedged)	0.43	3.91	6.87	6.87	0.43	10.36	8.94	10.76	6.44	9.13	9.29	8.57	
Value Added	1.57	1.86	1.51	1.51	1.57	1.84	1.37	1.31	-3.32	-0.97	-0.82	-0.34	
<b>Private Real Estate Composite</b>	2.29	5.45	9.11	9.11	2.29	12.99	10.99	12.59	2.18	8.69	8.65	9.46	07/01/1986
Blended Policy (Private Real Estate)	0.46	3.35	7.59	7.59	0.46	11.04	9.43	11.07	6.58	9.23	9.37	9.79	
Value Added	1.83	2.10	1.52	1.52	1.83	1.95	1.56	1.52	-4.40	-0.54	-0.72	-0.33	
<b>PTRES Composite (unlevered/hedged)</b>	-0.15	8.67	1.87	1.87	-0.15	5.31	6.45	6.47	6.61	8.55	9.53	8.80	07/01/1998
Blended Policy (PTRES) (Hedged)	0.30	7.56	2.03	2.03	0.30	5.66	6.57	5.53	6.20	7.82	8.93	8.14	
Value Added	-0.45	1.11	-0.16	-0.16	-0.45	-0.35	-0.12	0.94	0.41	0.73	0.60	0.66	
<b>Risk Parity Composite (vol adjusted)</b>	0.34	1.54	-0.94	-0.94	0.34	3.40	7.37	5.27	N/A	N/A	N/A	3.64	10/01/2012
Blended Policy (Risk Parity)	0.07	-0.19	-1.89	-1.89	0.07	2.73	7.89	5.55	8.19	8.66	9.07	4.05	
Value Added	0.27	1.73	0.95	0.95	0.27	0.67	-0.52	-0.28	N/A	N/A	N/A	-0.41	
<b>Total Absolute Return</b>	0.93	1.31	3.45	3.45	0.93	4.88	3.83	4.01	5.98	N/A	N/A	5.20	10/01/2005
Blended Policy (3-month Libor + 3.5%)	1.46	2.93	4.32	4.32	1.46	5.61	4.80	4.94	6.35	6.90	7.17	6.73	
Value Added	-0.53	-1.62	-0.87	-0.87	-0.53	-0.73	-0.97	-0.93	-0.37	N/A	N/A	-1.53	
<b>Unallocated Cash &amp; Cash Equivalents</b>	0.56	1.07	1.44	1.44	0.56	2.06	0.96	0.72	1.00	0.64	0.41	0.50	07/01/1998
ICE BofAML 3 Month U.S. T-Bill	0.49	0.95	1.30	1.30	0.49	1.59	0.84	0.52	0.34	1.30	1.93	1.98	
Value Added	0.07	0.12	0.14	0.14	0.07	0.47	0.12	0.20	0.66	-0.66	-1.52	-1.48	

The indicated index in parenthesis of Blended Policy represents current benchmark. Description of Blended Policy is provided in Appendix of this report

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As of September 30, 2018

## Trailing Period Performance

	Performance(%)											Since Inception	Inception Date
	1 Quarter	2 Quarters	3 Quarters	YTD	FYTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years		
<b>PSERS Total Fund</b>	1.40	3.52	3.66	3.66	1.40	7.37	8.78	7.31	6.41	7.46	6.92	9.71	07/01/1982
Blended Policy (Total Plan)	1.21	2.87	2.81	2.81	1.21	6.33	8.23	6.90	6.31	6.81	6.11	N/A	
Value Added	0.19	0.65	0.85	0.85	0.19	1.04	0.55	0.41	0.10	0.65	0.81	N/A	
<b>Total Public and Private Equity Exposure (hedged)</b>	3.30	5.18	6.46	6.46	3.30	11.20	12.49	N/A	N/A	N/A	N/A	9.09	10/01/2014
Blended Policy (Total Equity Exposure)	3.10	5.10	6.39	6.39	3.10	11.59	12.27	11.14	9.59	9.58	N/A	9.70	
Value Added	0.20	0.08	0.07	0.07	0.20	-0.39	0.22	N/A	N/A	N/A	N/A	-0.61	
<b>Total Fixed Income Composite (hedged)</b>	-0.42	1.01	1.21	1.21	-0.42	4.35	6.25	5.64	7.68	6.45	6.41	6.59	07/01/1998
Blended Policy (Total FI)	0.05	0.24	-0.34	-0.34	0.05	1.20	4.33	3.17	5.76	5.07	5.38	5.57	
Value Added	-0.47	0.77	1.55	1.55	-0.47	3.15	1.92	2.47	1.92	1.38	1.03	1.02	
<b>Real Assets (unlevered/hedged)</b>	0.78	4.61	3.39	3.39	0.78	6.28	6.95	N/A	N/A	N/A	N/A	3.35	10/01/2014
Blended Policy (Real Assets) (Hedged)	0.21	3.75	2.90	2.90	0.21	5.69	5.89	N/A	N/A	N/A	N/A	2.88	
Value Added	0.57	0.86	0.49	0.49	0.57	0.59	1.06	N/A	N/A	N/A	N/A	0.49	
<b>Risk Parity Composite (vol adjusted)</b>	0.34	1.54	-0.94	-0.94	0.34	3.40	7.37	5.27	N/A	N/A	N/A	3.64	10/01/2012
Blended Policy (Risk Parity)	0.07	-0.19	-1.89	-1.89	0.07	2.73	7.89	5.55	8.19	8.66	9.07	4.05	
Value Added	0.27	1.73	0.95	0.95	0.27	0.67	-0.52	-0.28	N/A	N/A	N/A	-0.41	
<b>Total Absolute Return</b>	0.93	1.31	3.45	3.45	0.93	4.88	3.83	4.01	5.98	N/A	N/A	5.20	10/01/2005
Blended Policy (3-month Libor + 3.5%)	1.46	2.93	4.32	4.32	1.46	5.61	4.80	4.94	6.35	6.90	7.17	6.73	
Value Added	-0.53	-1.62	-0.87	-0.87	-0.53	-0.73	-0.97	-0.93	-0.37	N/A	N/A	-1.53	

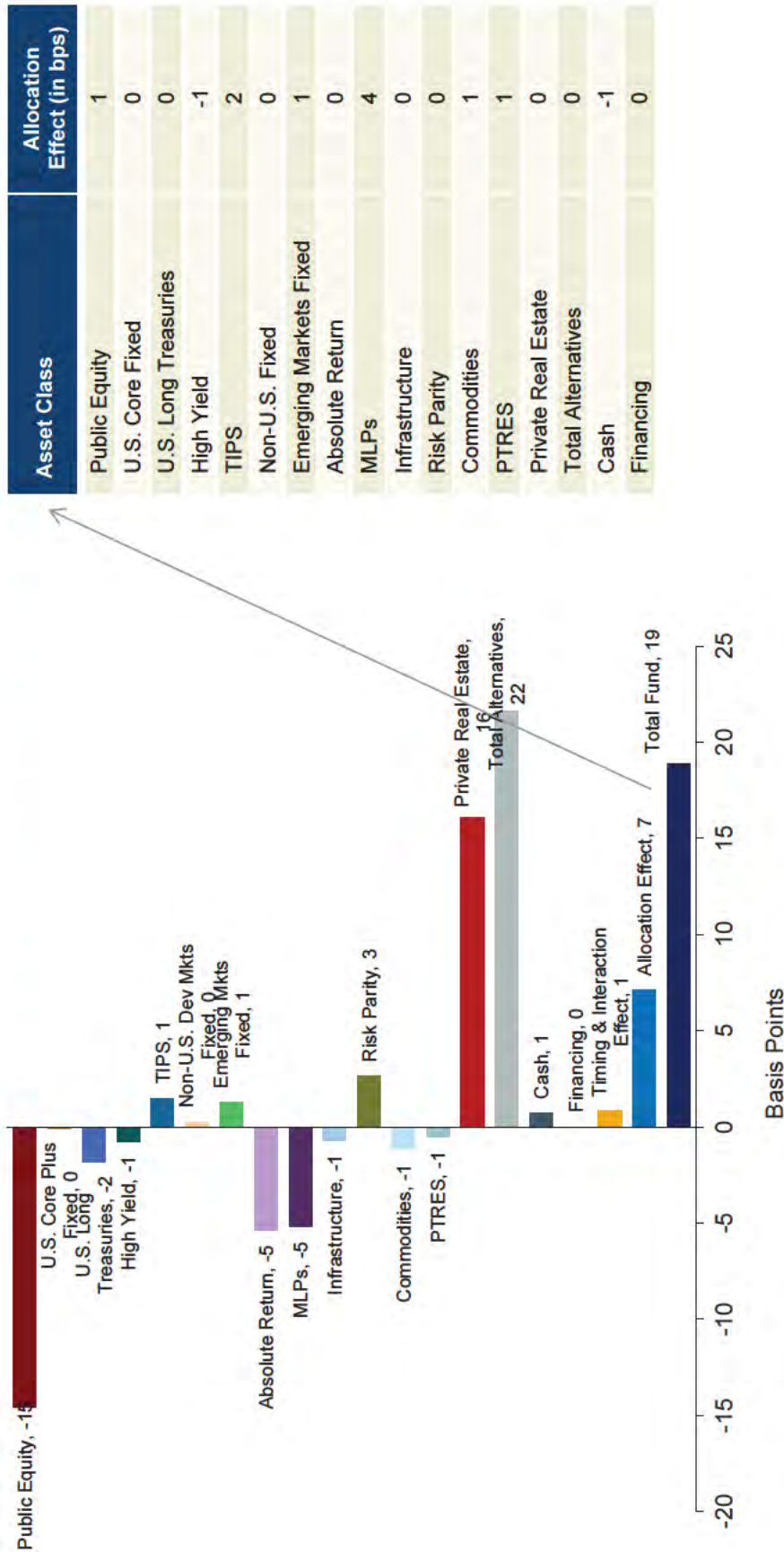
Case ID: 221102792

The indicated index in parenthesis of Blended Policy represents current benchmark. Description of Blended Policy is provided in Appendix of this report

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Performance Attribution – Total Fund



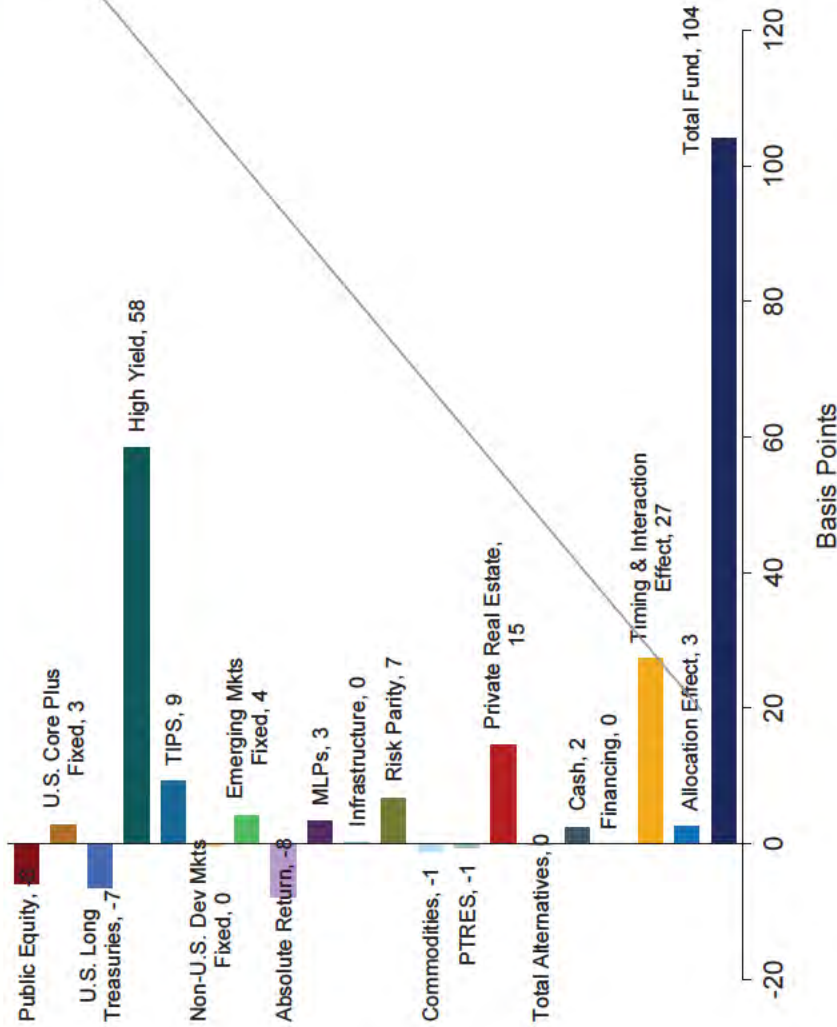
- The Selection Effect (shown by each composite bar above) represents the impact each composite had on Total Fund performance, based on its weight in the asset class and its performance relative to its blended asset class policy benchmark.
- The Allocation Effect represents the favorable or unfavorable impact of being over or under weight to each asset class relative to policy targets.
- The Timing & Interaction Effect captures the impact of intra-month cash flows on Total Fund return.

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1 Year Ending September 30, 2018

## Performance Attribution – Total Fund



Asset Class	Allocation Effect (in bps)
Public Equity	-1
U.S. Core Fixed	2
U.S. Long Treasuries	1
High Yield	5
TIPS	3
Non-U.S. Fixed	1
Emerging Markets Fixed	4
Absolute Return	1
MLPs	-6
Infrastructure	0
Risk Parity	-1
Commodities	1
PTRES	0
Private Real Estate	0
Total Alternatives	-3
Cash	-4
Financing	-1

- The Selection Effect (shown by each composite bar above) represents the impact each composite had on Total Fund performance, based on its weight in the asset class and its performance relative to its blended asset class policy benchmark.
- The Allocation Effect represents the favorable or unfavorable impact of being over or under weight to each asset class relative to policy targets.
- The Timing & Interaction Effect captures the impact of intra-month cash flows on Total Fund return.

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# Total Fund

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Case ID: 221102792

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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	Since Inception	
<b>PSERS Total Fund</b>	1.40	3.52	3.66	3.66	7.37	8.78	7.31	6.41	7.46	6.92	9.71	07/01/1982
Blended Policy (Total Plan)	1.21	2.87	2.81	2.81	6.33	8.23	6.90	6.31	6.81	6.11	N/A	
Value Added	0.19	0.65	0.85	0.19	1.04	0.55	0.41	0.10	0.65	0.81	N/A	
<b>Total Public Markets Composite</b>	0.78	2.76	1.62	0.78	5.36	8.04	5.67	6.29	6.57	N/A	6.54	06/01/2002
Blended Policy (Public Market) (Hedged)	1.00	2.30	0.75	1.00	4.13	7.54	4.72	4.96	5.64	5.24	5.27	
Value Added	-0.22	0.46	0.87	-0.22	1.23	0.50	0.95	1.33	0.93	N/A	1.27	
Blended Policy (Public Market) (Unhedged)	0.94	1.23	0.17	0.94	3.63	7.34	4.32	4.76	5.50	5.14	5.15	
Value Added	-0.16	1.53	1.45	-0.16	1.73	0.70	1.35	1.53	1.07	N/A	1.39	
<b>Total Public Markets Composite ex HY &amp; Absolute Return</b>	0.50	2.72	0.43	0.50	0.43	N/A	N/A	N/A	N/A	N/A	0.43	01/01/2018
Blended Policy (Public Market x HY & Abs Return) (Hedged)	0.68	2.04	-0.30	0.68	N/A	N/A	N/A	N/A	N/A	N/A	-0.30	
Value Added	-0.18	0.68	0.73	-0.18	0.73	N/A	N/A	N/A	N/A	N/A	0.73	
<b>Total Public Equity Composite</b>	2.66	4.39	3.36	2.66	8.95	13.46	10.23	10.01	9.11	7.90	7.06	07/01/1998
Blended Policy (Public Equity) (Hedged)	3.37	4.85	3.36	3.37	9.24	13.33	9.80	9.27	8.70	7.01	6.20	
Value Added	-0.71	-0.46	0.00	-0.71	0.00	0.13	0.43	0.74	0.41	0.89	0.86	
Blended Policy (Public Equity) (Unhedged)	3.96	4.78	3.92	3.96	9.94	13.83	9.02	8.89	8.44	6.82	6.01	
Value Added	-1.30	-0.39	-0.56	-1.30	-0.99	-0.37	1.21	1.12	0.67	1.08	1.05	
<b>Total US Equity Composite</b>	6.83	11.44	10.30	6.83	10.30	17.69	13.59	12.30	9.80	N/A	6.96	01/01/2000
Blended Policy (Tot US Eq)	7.08	11.32	10.65	7.08	10.65	17.14	13.52	11.94	9.92	N/A	6.11	
Value Added	-0.25	0.12	-0.35	-0.25	-0.35	0.55	0.07	0.36	-0.12	N/A	0.85	
<b>PSERS-S&amp;P 500 Index Composite</b>	7.71	11.52	10.03	7.71	16.97	17.57	13.99	12.30	9.89	7.65	7.00	07/01/1998
S&P 500 Index	7.71	11.41	10.56	7.71	17.91	17.31	13.95	11.97	9.65	7.42	6.77	
Value Added	-0.01	0.11	-0.53	-0.01	-0.94	0.26	0.04	0.33	0.24	0.23	0.23	
<b>Total US Small Cap Composite</b>	4.39	11.23	11.13	4.39	16.79	18.03	11.87	12.83	11.10	N/A	10.42	12/01/2001
MSCI USA Small Cap Index	4.22	11.36	10.83	4.22	16.20	17.15	11.94	13.01	10.99	N/A	10.30	
Value Added	0.17	-0.13	0.30	0.17	0.30	0.88	-0.07	-0.38	0.11	N/A	0.12	
<b>PSERS Small Cap Index Composite</b>	4.39	11.23	11.13	4.39	16.79	18.03	13.03	13.53	12.07	N/A	11.24	12/01/2001
PSERS-S&P 400 Index Composite	3.90	8.37	7.54	3.90	7.54	15.96	12.08	13.07	11.64	11.75	10.75	07/01/1998
S&P MFCap 400	3.86	8.32	7.49	3.86	7.49	15.68	11.91	12.49	11.20	11.39	10.38	
Value Added	0.04	0.05	0.05	0.04	0.05	0.28	0.18	0.58	0.44	0.36	0.37	
<b>PSERS-S&amp;P 600 Index Composite</b>	4.87	14.08	14.77	4.87	14.77	20.14	13.98	13.98	12.66	12.06	10.58	05/01/1998
S&P SmallCap 600	4.71	13.90	14.54	4.71	14.54	19.41	13.32	12.86	11.86	11.45	9.99	
Value Added	0.16	0.18	0.23	0.16	0.23	0.73	0.66	1.12	0.80	0.61	0.59	
<b>Total Non-U.S. Equity Composite (hedged)</b>	0.79	1.61	0.27	0.79	0.27	11.54	8.41	8.59	9.66	N/A	5.87	01/01/2000
Blended Policy (Total Non-US Eq) (Hedged)	1.02	0.80	-1.15	1.02	4.04	10.88	7.20	7.27	8.63	N/A	4.87	
Value Added	-0.23	0.81	1.42	-0.23	1.48	0.68	1.21	1.32	1.03	N/A	1.00	
<b>Total Non-U.S. Equity Composite (Unhedged)</b>	0.09	-2.01	-2.13	0.09	-2.13	11.00	5.61	7.17	8.71	N/A	5.13	01/01/2000
Blended Policy (Total Non-US Eq) (Unhedged)	0.33	-2.51	-3.45	0.33	-3.45	10.24	4.34	5.82	7.65	N/A	4.11	
Value Added	-0.24	0.50	1.32	-0.24	1.32	0.76	1.27	1.35	1.06	N/A	1.02	
<b>Emerging Markets Equity Composite</b>	-6.01	-11.07	-10.72	-6.01	-10.72	5.53	2.12	4.60	8.94	9.00	7.63	07/01/1998
Blended Policy (MSCIEM net)	-1.45	-9.35	-8.22	-1.45	-8.22	12.22	3.54	5.36	9.73	9.96	8.49	
Value Added	-4.56	-1.72	-2.50	-4.56	-2.50	-6.69	-1.42	-0.76	-0.79	-0.96	-0.86	
<b>MSCI Emerging Markets MI (Net)</b>	-1.45	-9.35	-8.22	-1.45	-8.22	11.72	3.51	5.65	9.74	9.18	7.58	
Value Added	-4.56	-1.72	-2.50	-4.56	-2.50	-6.19	-1.39	-1.05	-0.80	-0.18	0.05	
<b>Wasatch EM Small Cap</b>	-6.01	-11.07	-10.72	-6.01	-10.72	5.53	2.02	9.89	N/A	N/A	6.86	07/01/2008
Blended Policy (Wasatch EM)	-3.35	-11.90	-11.39	-3.35	-11.39	7.82	2.67	7.51	10.10	9.67	3.98	
Value Added	-2.66	0.83	0.67	-2.66	0.67	-2.29	-0.65	2.38	N/A	N/A	2.88	
<b>Total Non-U.S. Equity x Emerging Markets Composite (hedged)</b>	1.11	2.25	0.81	1.11	0.81	11.82	N/A	N/A	N/A	N/A	8.64	04/01/2014
Blended Policy (Non-US Equity x EM) (Hedged)	1.12	1.25	-0.85	1.12	-0.85	10.79	7.54	7.43	8.74	N/A	7.17	



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Performance (%)

	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	Since Inception	Inception Date
Value Added	-0.01	1.00	1.66	1.66	1.76	1.03	N/A	N/A	N/A	N/A	1.47	
Insight Everest - Int'l Eq (notional)	1.26	6.51	4.46	4.45	4.34	1.07	3.89	2.21	N/A	N/A	1.47	07/01/2006
Currency Hedge Benchmark - Int'l Eq	1.30	6.50	4.46	4.46	4.36	1.18	3.97	2.29	N/A	N/A	1.56	
Value Added	-0.04	0.01	-0.01	-0.04	-0.02	-0.11	-0.08	-0.08	N/A	N/A	-0.09	
Total Non-U.S. Equity x Emerging Markets Composite (unhedged)	0.38	-1.56	-1.71	-1.71	3.47	11.26	5.83	7.03	8.41	7.23	6.35	07/01/1997
Blended Policy (Non-US Equity x EM) (Unhedged)	0.39	-2.23	-3.27	-3.27	1.79	10.14	4.39	5.85	7.67	N/A	N/A	
Value Added	-0.01	0.67	1.56	1.56	1.68	1.12	1.44	1.18	0.74	N/A	N/A	
Non-US Large Cap Equity Composite	0.55	-1.44	-1.95	-1.95	3.05	11.01	5.48	6.40	8.07	7.02	6.04	07/01/1998
Blended Policy (MSCI World AC Word ex USA net)	0.71	-1.93	-3.09	-3.09	1.76	9.97	4.12	5.18	7.34	5.86	4.89	
Value Added	-0.16	0.49	1.14	1.14	1.29	1.04	1.34	1.22	0.73	1.16	1.05	
PSERS ACWI x US Index Fund	0.75	-1.58	-2.37	-2.37	2.83	10.76	4.79	5.94	7.79	6.05	5.19	07/01/1998
MSCI ACWI/EA FE Index Blend	0.71	-1.93	-3.09	-3.09	1.76	9.97	4.12	5.18	7.16	5.47	4.60	
Value Added	0.04	0.35	0.72	0.72	1.07	0.79	0.67	0.76	0.63	0.58	0.59	
BlackRock EMAX	-1.09	-8.97	-7.68	-7.68	-0.81	12.36	3.61	5.40	9.65	9.85	4.80	
MSCI Emerging Markets Index (Net)	-0.58	0.38	1.60	1.60	2.48	1.91	N/A	N/A	N/A	N/A	2.17	
Value Added	-0.80	1.74	2.38	2.38	-2.59	N/A	N/A	N/A	N/A	N/A	-2.59	10/01/2017
ACWI ex US Large Cap Swap (Notional)	-0.80	1.74	2.38	2.38	-2.59	-10.18	-5.15	-7.92	-8.37	-8.21	-2.59	
MSCI ACWI ex US Index (Short)	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	0.00	
Value Added	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Active Non-US Large Cap Composite	0.71	-1.93	-3.09	-3.09	1.76	9.97	4.12	5.18	7.20	5.85	4.82	
MSCI AC World ex USA Index (Net)	-0.37	0.57	1.49	1.49	1.63	1.37	2.14	2.28	1.49	1.68	1.61	
Value Added	0.25	-2.07	-2.74	-2.74	3.15	13.66	7.04	7.97	10.48	N/A	9.66	07/01/2002
Baillie Gifford	0.71	-1.93	-3.09	-3.09	1.76	9.97	4.12	5.18	7.20	5.85	6.86	
MSCI AC World ex USA Index (Net)	-0.46	-0.14	0.35	0.35	-0.46	0.39	3.69	2.92	3.28	N/A	2.70	
Value Added	0.78	-1.24	-1.87	-1.87	2.52	9.73	5.53	8.08	9.78	10.02	8.97	07/01/1998
Marathon Asset Mgmt	0.71	-1.93	-3.09	-3.09	1.76	9.97	4.12	5.18	7.31	5.99	5.06	
Blended Benchmark (MSCI ACWI ex USA net)	0.08	0.89	1.42	1.42	0.76	-0.24	1.41	2.90	2.47	4.03	3.91	
Value Added	1.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.54	05/01/2018
The Children's Investment Fund, LP	4.98	6.80	5.43	5.43	11.24	13.54	9.28	8.56	8.15	6.15	5.59	
MSCI World Index (Net)	-3.77	N/A	N/A	N/A	-3.77	N/A	N/A	N/A	N/A	N/A	3.95	
Value Added	-4.05	-5.84	-4.95	-4.95	-0.48	8.14	4.65	6.83	N/A	N/A	7.36	10/01/2004
BlackRock Global Composite	0.71	-1.93	-3.09	-3.09	1.76	9.97	4.12	5.18	7.20	5.85	6.17	
MSCI AC World ex USA Index (Net)	-4.76	-3.91	-1.86	-1.86	-2.24	-1.83	0.53	1.65	N/A	N/A	1.19	
Value Added	-0.72	-2.33	0.00	-0.72	0.00	13.09	8.71	11.15	N/A	N/A	9.25	07/01/2005
Non-US Small Cap Equity Composite	-1.51	-4.07	-4.41	-4.41	1.86	11.24	6.14	8.73	9.44	8.67	7.24	
MSCI AC World ex USA Small Cap (Net)	0.79	1.74	0.79	0.79	4.41	1.85	2.57	2.42	N/A	N/A	2.01	
Value Added	-1.51	-3.97	-4.22	-4.22	2.16	N/A	N/A	N/A	N/A	N/A	2.16	10/01/2017
ACWI ex US Small Cap Swap (Notional)	-1.51	-4.07	-4.41	-4.41	1.86	11.24	6.14	8.73	9.44	8.67	1.86	
MSCI AC World ex USA Small Cap (Net)	0.00	0.10	0.19	0.19	0.30	N/A	N/A	N/A	N/A	N/A	0.30	
Value Added	-1.09	-4.71	-2.93	-2.93	1.62	15.36	9.74	10.91	N/A	N/A	10.60	07/01/2005
Acadian Asset Mgmt	-1.51	-4.07	-4.41	-4.41	1.86	11.24	6.14	8.73	N/A	N/A	6.78	
Blended Benchmark (MSCI AC World ex USA Small Cap net)	0.42	-0.64	1.48	1.48	-0.24	0.42	3.60	2.18	N/A	N/A	3.82	
Value Added	1.92	3.77	8.32	8.32	13.76	13.26	7.99	14.18	N/A	N/A	9.98	10/01/2005
Wasatch Int'l Small Cap	-1.51	-4.07	-4.41	-4.41	1.86	11.24	6.14	8.73	N/A	N/A	6.26	
Blended Benchmark (MSCI AC World ex USA Small Cap net)	3.43	7.84	12.73	12.73	11.90	2.02	1.85	5.45	N/A	N/A	3.72	
Value Added	-2.69	-3.96	-2.09	-2.09	5.45	12.44	11.02	13.19	N/A	N/A	9.08	07/01/2008
Obervels Asset Mgmt	-1.51	-4.07	-4.41	-4.41	1.86	11.24	6.14	8.73	9.44	8.67	5.47	
MSCI AC World ex USA Small Cap (Net)												

Case ID: 221102792

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As of September 30, 2018

Trailing Period Performance

	Performance (%)										
	1	2	3	1	3	5	10	15	20	Since	Inception
	Quarter	Quarters	Quarters	Year	Years	Years	Years	Years	Years	Inception	Date
	Ending	Ending	Ending	YTD	FYTD	YTD	YTD	YTD	YTD	YTD	
	1	2	3	1	3	5	10	15	20	Since	Inception
	2018	2018	2018	2018	2018	2018	2018	2018	2018	Since	Inception
	1	2	3	1	3	5	10	15	20	Since	Inception
	2018	2018	2018	2018	2018	2018	2018	2018	2018	Since	Inception
Value Added	-1.18	0.11	2.32	2.32	1.20	4.88	4.46	N/A	N/A	3.61	
QS Investors	-1.33	-4.98	-1.33	-5.20	0.00	10.54	9.55	N/A	N/A	6.47	07/01/2008
MSCI AC World ex USA Small Cap (Net)	-1.51	-4.07	-4.41	-4.41	1.86	6.14	8.73	9.44	8.67	5.47	
Value Added	0.18	-0.91	-0.79	-0.79	0.18	1.34	0.82	N/A	N/A	1.00	
Total Fixed Income Composite	-0.42	1.21	-0.42	1.21	6.25	5.64	7.68	6.45	6.41	6.59	07/01/1998
Blended Policy (Total FI)	0.05	0.24	-0.34	0.05	1.20	3.17	5.76	5.07	5.38	5.57	
Value Added	-0.47	0.77	1.55	1.55	1.92	2.47	1.92	1.38	1.03	1.02	
Global Fixed Income Composite	0.13	-0.90	-1.55	-1.55	-0.34	3.48	2.59	N/A	N/A	2.57	07/01/2012
Blended Policy (Global FI)	-0.14	-1.49	-1.93	-1.93	-1.93	2.47	3.55	N/A	N/A	1.26	
Value Added	0.27	0.59	0.38	0.27	0.93	1.01	1.31	N/A	N/A	1.31	
Total US Fixed Income Composite	-0.47	1.22	1.36	-0.47	1.36	6.30	8.20	N/A	N/A	6.82	10/01/2004
Blended Policy (Total US FI)	0.08	0.55	-0.19	0.08	4.28	3.72	6.30	5.36	5.68	5.47	
Value Added	-0.55	0.67	1.55	-0.55	3.30	2.67	1.90	N/A	N/A	1.35	
Total US Fixed Income ex TIPS Composite	0.78	2.49	0.78	2.49	6.54	6.96	8.41	6.75	6.76	6.89	07/01/1998
Investment Grade Composite	-2.02	-2.65	-5.39	-2.02	-3.47	N/A	N/A	N/A	N/A	2.81	10/01/2014
Blended Policy (Investment Grade)	-0.90	-0.90	-2.70	-0.97	1.26	2.68	4.30	N/A	N/A	1.86	
Value Added	-1.05	-1.75	-2.69	-2.69	-1.88	N/A	N/A	N/A	N/A	0.95	
US Core Plus Fixed Income Composite	0.00	-0.55	-1.77	0.00	-0.69	2.80	5.56	N/A	N/A	4.79	10/01/2004
Blended Policy (Barclays Aggregate Index)	0.02	-0.14	-1.60	0.02	-1.22	1.31	3.83	3.85	4.60	3.81	
Value Added	-0.02	-0.41	-0.17	-0.02	0.53	1.49	1.73	N/A	N/A	0.98	
Pugh Capital Management	0.02	-0.19	-1.84	0.02	-1.26	1.35	4.32	N/A	N/A	4.54	07/01/2006
Bimbg. Barc. U.S. Aggregate	0.02	-0.14	-1.60	0.02	-1.22	1.31	3.77	3.78	4.48	4.11	
Value Added	0.00	-0.05	-0.24	0.00	-0.04	0.15	0.55	N/A	N/A	0.43	
PSERS Active Core Plus Fixed Income	-0.07	0.20	-0.84	-0.07	-0.84	2.26	3.06	4.96	5.56	5.70	07/01/1998
Bimbg. Barc. U.S. Aggregate	-0.09	0.34	0.76	-0.09	0.76	1.00	3.77	3.78	4.48	4.64	
Value Added	-0.01	-1.87	-3.53	-0.01	-3.53	4.23	7.40	N/A	N/A	1.08	
BlackRock Global Alpha	0.02	-0.14	-1.60	0.02	-1.22	1.31	3.83	3.85	4.60	3.85	07/01/2007
Blended Policy (Barclays Aggregate Index)	0.02	-0.14	-1.60	0.02	-1.22	1.31	3.83	3.85	4.60	3.85	
Value Added	-0.03	-1.73	-1.93	-0.03	-1.93	2.09	2.78	N/A	N/A	2.78	
SEI Investment Management	0.81	2.14	2.96	0.91	2.96	4.40	5.28	N/A	N/A	4.35	03/01/2014
ICE BofAML 1-3 Year U.S. Corporate	0.72	1.19	0.81	0.72	1.66	1.58	3.39	3.06	3.95	1.47	
Value Added	0.19	0.95	2.15	0.19	3.61	3.62	N/A	N/A	N/A	2.88	
Non-U.S. Developed Markets Fixed Income Composite	0.22	0.02	0.83	0.22	3.66	0.69	3.79	3.99	4.25	4.56	07/01/1998
Blended Policy (Barclays GlobalAgg GDP Weighted Dev xUS hedged)	-0.15	0.27	1.03	-0.15	1.03	0.07	2.82	N/A	N/A	N/A	
Value Added	0.37	-0.25	-0.20	0.37	-0.20	0.62	0.97	N/A	N/A	N/A	
Alliance Bernstein Global Fixed	0.22	0.02	0.83	0.22	3.66	0.51	N/A	N/A	N/A	1.16	01/01/2012
Spliced Barclays GlobalAgg GDPWeighted Dev xUS	-0.15	0.27	1.03	-0.15	1.03	0.07	2.81	N/A	N/A	0.82	
Value Added	0.37	-0.25	-0.20	0.37	-0.20	0.44	N/A	N/A	N/A	0.34	
U.S. Treasuries Total (levered)	-30.07	-31.53	-46.15	-30.07	-34.28	-4.87	N/A	N/A	N/A	-25.43	07/01/2012
U.S. Treasuries Total (unlevered)	-3.49	-3.72	-7.51	-3.49	-7.51	2.54	N/A	N/A	N/A	0.44	07/01/2012
Bimbg. Barc. U.S. Treasury: Long	-2.88	-2.58	-2.88	-2.88	0.72	4.41	5.45	5.56	5.80	1.71	
Value Added	-0.61	-1.14	-1.72	-0.61	-1.49	-1.87	N/A	N/A	N/A	-1.27	
PSERS U.S. Treasuries	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.04	09/01/2018
Bimbg. Barc. U.S. Treasury	-0.59	-0.49	-1.67	-0.59	0.23	1.34	2.68	3.27	4.01	-0.93	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.89	
PSERS U.S. Long Treasuries (unlevered)	-3.47	-3.71	-7.49	-3.47	-7.49	2.55	N/A	N/A	N/A	0.44	07/01/2012
Bimbg. Barc. U.S. Treasury: Long	-2.88	-2.58	-2.88	-2.88	0.72	4.41	5.45	5.56	5.80	1.71	
Value Added	-0.59	-1.13	-1.70	-0.59	-1.48	-1.86	N/A	N/A	N/A	-1.27	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)												
	1	2	3	1	YTD	1	3	5	10	15	20	Since Inception	Inception Date
	Quarter	Quarters Ending Sep-2018	Quarters Ending Sep-2018	Year	YTD	Year	Years	Years	Years	Years	Years	Inception	Date
Credit-Related	2.25	4.70	6.56	6.56	6.56	9.26	9.05	N/A	N/A	N/A	N/A	6.32	10/01/2014
Blended Policy (Credit-Related)	2.10	2.20	1.72	2.29	1.72	2.29	8.03	N/A	N/A	N/A	N/A	4.10	
Value Added	0.15	2.50	4.84	0.15	4.84	6.97	1.02	N/A	N/A	N/A	N/A	2.22	
Emerging Markets Fixed Income Composite	0.97	-3.67	-1.20	0.97	-1.20	1.00	8.20	2.36	N/A	N/A	N/A	3.93	04/01/2010
Blended Policy (Barclays Emerging Mkt 10% Country Cap)	-1.02	-9.81	-6.73	-1.02	-6.73	-5.32	4.94	-0.53	3.56	6.58	N/A	1.78	
Value Added	1.99	6.14	5.53	1.99	5.53	6.32	3.26	2.89	N/A	N/A	N/A	2.15	
Franklin Templeton Emerging Fixed Income	0.97	-3.67	-1.20	0.97	-1.20	1.00	8.26	4.10	7.27	N/A	N/A	7.27	10/01/2008
Blended Benchmark (Barclays Emerging Mkt 10% Country Cap)	-1.02	-9.81	-6.73	-1.02	-6.73	-5.32	4.94	-0.53	3.52	4.99	5.73	3.52	
Value Added	1.99	6.14	5.53	1.99	5.53	6.32	3.26	4.63	3.75	N/A	N/A	3.75	
High Yield Fixed Income Composite (hedged)	2.34	5.33	7.14	2.34	7.14	9.87	9.00	7.95	9.43	8.26	N/A	8.06	10/01/1999
Blended Policy (Barclays Corporate HY)	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.32	7.80	7.30	7.48	
Value Added	-0.06	1.87	4.57	-0.06	4.57	6.82	0.85	2.41	0.11	0.46	N/A	0.58	
High Yield Fixed Income x Internal Composite (hedged)	2.37	5.40	7.18	2.37	7.18	9.92	N/A	N/A	N/A	N/A	N/A	10.36	10/01/2016
Blended Policy (Barclays Corporate HY)	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.32	7.80	7.30	5.92	
Value Added	-0.03	1.94	4.61	-0.03	4.61	6.87	N/A	N/A	N/A	N/A	N/A	4.44	
Insight Oxygen - HY (notional)	1.19	7.31	5.38	1.19	5.38	4.32	0.41	N/A	N/A	N/A	N/A	0.36	07/01/2015
Currency Hedge Benchmark - HY	1.13	7.01	4.93	1.13	4.93	3.80	0.01	3.71	1.31	N/A	N/A	-0.02	
Value Added	0.06	0.30	0.45	0.06	0.45	0.52	0.40	N/A	N/A	N/A	N/A	0.38	
High Yield Fixed Income Composite (Unhedged)	2.24	4.69	6.66	2.24	6.66	9.49	8.90	7.89	9.39	8.24	N/A	8.04	10/01/1999
Blended Policy (Barclays Corporate HY)	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.32	7.80	7.30	7.48	
Value Added	-0.16	1.23	4.09	-0.16	4.09	6.44	0.75	2.35	0.07	0.44	N/A	0.56	
High Yield Fixed Income x Internal Composite (unhedged)	2.27	4.76	6.69	2.27	6.69	9.53	N/A	N/A	N/A	N/A	N/A	10.24	10/01/2016
Blended Policy (Barclays Corporate HY)	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.32	7.80	7.30	5.92	
Value Added	-0.13	1.30	4.12	-0.13	4.12	6.48	N/A	N/A	N/A	N/A	N/A	4.32	
Mezzanine High Yield Composite	1.41	0.13	3.42	1.41	3.42	7.90	2.49	N/A	N/A	N/A	N/A	1.87	06/01/2015
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.24	
Value Added	-0.99	-3.33	0.85	-0.99	0.85	4.85	-5.68	N/A	N/A	N/A	N/A	-3.37	
Internally Managed Private Debt Co-Investment	0.00	-1.39	3.85	0.00	3.85	5.73	-16.83	-13.71	N/A	N/A	N/A	-12.65	08/01/2013
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.43	
Value Added	-2.40	-4.85	1.28	-2.40	1.28	2.68	-24.98	-19.25	N/A	N/A	N/A	-18.08	
Mezzanine High Yield Composite x Internal	1.57	0.30	3.47	1.57	3.47	8.12	N/A	N/A	N/A	N/A	N/A	9.52	10/01/2016
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.92	
Value Added	-0.83	-3.16	0.90	-0.83	0.90	5.07	N/A	N/A	N/A	N/A	N/A	3.60	
Carlyle Energy Mezz. Opp. Fund	-1.02	-1.80	-1.36	-1.02	-1.36	2.34	-20.62	-10.28	N/A	N/A	N/A	-6.08	10/01/2012
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.80	
Value Added	-3.41	-5.28	-3.93	-3.41	-3.93	-0.71	-28.77	-15.82	N/A	N/A	N/A	-11.88	
Carlyle Energy Mezz. Opp. Fund II	0.66	4.74	5.70	0.66	5.70	6.14	N/A	N/A	N/A	N/A	N/A	-6.46	11/01/2015
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	7.39	
Value Added	-1.74	1.28	3.13	-1.74	3.13	3.09	N/A	N/A	N/A	N/A	N/A	-13.85	
ICG Europe Fund V	4.56	1.68	6.36	4.56	6.36	11.14	12.83	13.96	N/A	N/A	N/A	9.63	01/01/2013
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.47	
Value Added	-1.78	3.79	2.16	-1.78	3.79	8.09	4.68	8.42	N/A	N/A	N/A	4.16	
ICG Europe Fund VI	2.37	-4.76	1.89	2.37	1.89	10.94	N/A	N/A	N/A	N/A	N/A	56.38	02/01/2016
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	10.74	
Value Added	-0.03	-8.22	-0.68	-0.03	-0.68	7.89	N/A	N/A	N/A	N/A	N/A	45.64	
ICG Europe Fund VII	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	08/01/2018
Bimbg. Barc. U.S. Corp. High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	1.30	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.30	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	Since Inception	
Bain Capital Middle Market Credit 2010, L.P.	-1.79	-4.51	-5.92	-5.92	-1.75	-1.74	1.58	N/A	N/A	N/A	5.45	06/01/2010
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	7.60	
Bain Capital Middle Market Credit 2014, L.P.	-4.19	-7.97	-8.49	-8.49	-4.80	-9.89	-3.96	N/A	N/A	N/A	-2.15	
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	5.10	11/01/2013
Opportunistic High Yield Composite	-1.40	-7.63	-7.96	-7.63	-1.63	0.29	4.65	N/A	N/A	N/A	1.36	
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	5.24	05/01/2015
Apollo European Principal Fund II	0.54	4.76	7.08	7.08	9.91	3.50	N/A	N/A	N/A	N/A	4.55	
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	5.80	10/01/2012
Apollo European Principal Fund III	1.40	0.85	-24.13	1.40	-24.13	N/A	N/A	N/A	N/A	N/A	-24.13	01/01/2018
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	2.57	
Bain Capital Credit Opp. Fund IV	-1.00	-2.61	-26.70	-1.00	N/A	N/A	N/A	N/A	N/A	N/A	-26.70	10/01/2008
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	9.46	
Bain Capital Distressed and Special Situations 2013	-12.47	24.53	33.11	-12.47	42.85	17.68	10.24	11.02	N/A	N/A	11.02	10/01/2008
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	1.56	10/01/2012
Bain Capital Distressed and Special Situations 2016 (A), L.P.	3.81	9.80	11.21	3.81	17.83	9.58	8.40	N/A	N/A	N/A	7.85	10/01/2015
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	5.80	
TPG Opportunities Partners II, LP	0.91	16.51	18.68	0.91	18.91	11.47	15.39	N/A	N/A	N/A	10.17	04/01/2012
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	6.36	
TPG Opportunities Partners III, LP	-1.49	13.05	16.11	-1.49	15.86	3.32	9.85	N/A	N/A	N/A	6.96	02/01/2014
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	4.99	
TOP NPL (A)	-2.69	-1.37	-3.42	-2.69	-3.42	0.59	9.70	N/A	N/A	N/A	2.07	04/01/2012
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	6.36	
TPG TAO	2.22	5.70	10.68	2.22	11.58	9.20	N/A	N/A	N/A	N/A	10.01	01/01/2015
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	5.76	
Brigade Distressed Value	-0.18	2.24	8.11	-0.18	8.53	1.05	N/A	N/A	N/A	N/A	4.25	10/01/2011
1-Month Libor + 5%	1.77	3.52	5.22	1.77	6.87	6.09	5.72	5.55	6.59	7.21	5.58	
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	3.03	
Brigade Structured Credit Offshore Fund	6.30	8.47	9.15	6.30	10.82	14.62	N/A	N/A	N/A	N/A	9.29	11/01/2014
Barclays Corporate High Yield + 0.25%	2.47	3.58	2.76	2.47	3.31	8.42	5.80	9.74	8.01	7.18	5.19	
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	5.71	
Avenue Energy Opportunities Fund	3.83	4.89	6.39	3.83	7.51	6.20	N/A	N/A	N/A	N/A	4.10	02/01/2015
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	1.05	
Avenue Energy Opportunities Fund II	1.59	6.95	4.23	1.59	7.46	1.97	N/A	N/A	N/A	N/A	-1.05	09/01/2017
Bimbg. Barc. U.S. Corp. High Yield Value Added	2.40	3.46	2.57	2.40	3.05	8.15	5.54	9.46	7.74	6.92	3.66	
	4.90	13.96	8.03	4.90	9.27	N/A	N/A	N/A	N/A	N/A	8.00	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	Since Inception	
Avenue Europe SS III	2.73	5.76	6.52	9.92	N/A	N/A	N/A	N/A	N/A	N/A	8.39	01/01/2016
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	9.75	
Real Asset High Yield Composite	1.76	3.31	4.03	1.76	4.03	5.32	6.56	N/A	N/A	N/A	6.07	06/01/2015
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	5.24	
Mariner/Galton RMBS	1.08	1.68	1.16	1.08	1.16	1.59	4.25	N/A	N/A	N/A	7.66	05/01/2010
Blended Benchmark (Barclays US MBS) Value Added	-0.12	0.12	-1.07	-0.12	-1.07	-0.92	0.98	N/A	N/A	N/A	4.52	
Galton Onshore Mortgage Recovery Fund III, LP	1.20	1.58	2.23	1.20	2.23	2.51	3.27	N/A	N/A	N/A	3.14	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-0.32	1.14	2.62	-0.32	2.62	6.55	8.15	9.46	7.74	6.92	5.10	11/01/2013
Galton Onshore Mortgage Recovery Fund IV, L.P.	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	-2.35	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-2.72	-2.32	0.05	-2.72	0.05	0.70	-1.60	N/A	N/A	N/A	-10.90	11/01/2017
Mariner International Infrastructure	-0.13	-1.71	-7.04	-0.13	-7.04	N/A	N/A	N/A	N/A	N/A	2.62	
P MCO BRAVO Fund III Onshore Feeder, L.P.	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	2.88	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-2.53	-5.17	-9.61	-2.53	-9.61	N/A	N/A	N/A	N/A	N/A	-13.52	12/01/2013
The Vardie Scratch and Dent Fund, LP	4.50	5.60	7.46	4.50	7.46	8.84	8.72	N/A	N/A	N/A	4.44	
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	5.09	
The Vardie Scratch and Dent Fund Feed I-A	2.10	2.14	4.89	2.10	4.89	3.79	0.57	N/A	N/A	N/A	-0.65	
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.28	8.71	11.51	2.28	11.51	N/A	N/A	N/A	N/A	N/A	21.93	12/01/2017
The Vardie Scratch and Dent Fund Feed I-A	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	2.88	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-0.12	5.25	8.94	-0.12	8.94	N/A	N/A	N/A	N/A	N/A	19.05	12/01/2014
Latitude Management Real Estate Capital IV	1.98	3.28	4.59	1.98	4.59	7.04	7.07	N/A	N/A	N/A	8.05	
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	5.23	
Senior Loans High Yield Composite	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	2.82	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-0.42	-0.18	2.02	-0.42	2.02	3.99	-1.08	N/A	N/A	N/A	2.82	
Latitude Management Real Estate Capital IV	2.31	4.18	6.13	2.31	6.13	7.70	7.70	N/A	N/A	N/A	N/A	08/01/2016
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	6.80	
Senior Loans High Yield Composite	-0.09	0.72	3.56	-0.09	3.56	N/A	N/A	N/A	N/A	N/A	N/A	
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.15	3.60	4.63	2.15	4.63	3.85	N/A	N/A	N/A	N/A	2.29	05/01/2017
Latitude Management Real Estate Capital IV	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	4.30	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-0.25	0.14	2.06	-0.25	2.06	0.80	N/A	N/A	N/A	N/A	-2.01	
Senior Loans High Yield Composite	1.85	2.90	5.27	1.85	5.27	7.34	9.17	N/A	N/A	N/A	8.34	06/01/2015
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	5.24	
Cerberus Levered Loan Fund I	-0.55	-0.66	2.70	-0.55	2.70	4.29	1.02	N/A	N/A	N/A	3.10	
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.25	3.38	4.82	2.25	4.82	6.83	5.47	N/A	N/A	N/A	6.02	01/01/2012
Cerberus Levered Loan Fund II	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	6.94	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-0.15	-0.08	2.25	-0.15	2.25	3.58	-2.68	N/A	N/A	N/A	-0.82	
Cerberus Levered Loan Fund II	1.37	2.20	3.01	1.37	3.01	2.40	2.91	N/A	N/A	N/A	7.19	01/01/2013
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	5.47	
Cerberus PSERS Levered Loan Opportunities Fund	-1.03	-1.26	0.44	-1.03	0.44	-0.65	-5.24	N/A	N/A	N/A	1.72	
Bimbg. Barc. U.S. Corp: High Yield Value Added	1.04	4.06	7.83	1.04	7.83	10.43	26.73	N/A	N/A	N/A	26.73	10/01/2015
Cerberus PSERS Levered Loan Opportunities Fund	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	8.15	
Bimbg. Barc. U.S. Corp: High Yield Value Added	-1.36	0.60	5.26	-1.36	5.26	7.38	18.58	N/A	N/A	N/A	18.58	
LBC Credit Partners II	0.62	5.81	16.88	0.62	16.88	20.07	18.82	N/A	N/A	N/A	13.19	01/01/2009
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	11.96	
HBC Credit Partners III	-1.78	2.35	14.31	-1.78	14.31	17.02	10.67	N/A	N/A	N/A	1.23	
Bimbg. Barc. U.S. Corp: High Yield Value Added	2.71	0.76	3.82	2.71	3.82	3.85	7.13	N/A	N/A	N/A	11.56	04/01/2013
HBC Credit Partners III	2.40	3.46	2.57	2.40	2.57	3.05	8.15	9.46	7.74	6.92	5.18	
Bimbg. Barc. U.S. Corp: High Yield Value Added	0.31	-2.70	1.25	0.31	1.25	0.80	-1.02	N/A	N/A	N/A	6.38	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)												
	1	2	3	1	YTD	1	3	5	10	15	20	Since Inception	Inception Date
	Quarter	Quarters Ending Sep-2018	Quarters Ending Sep-2018	Year	YTD	Year	Years	Years	Years	Years	Years	Inception	Date
LBC-P Credit Fund LP	3.07	5.04	7.91	11.62	7.91	11.62	N/A	N/A	N/A	N/A	N/A	17.34	10/01/2016
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.92	9.46
Value Added	0.67	1.58	5.34	8.57	5.34	8.57	N/A	N/A	N/A	N/A	N/A	11.42	N/A
Summit Partners Credit Fund II LP	1.66	4.05	4.83	1.86	4.83	8.17	10.47	N/A	N/A	N/A	N/A	6.81	11/01/2014
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	4.92	9.46
Value Added	-0.54	0.59	2.26	-0.54	2.26	5.12	2.32	N/A	N/A	N/A	N/A	1.89	N/A
Oaktree Loan Fund 2X, LP	0.33	0.40	2.03	0.33	2.03	1.27	-0.78	-3.17	3.60	N/A	N/A	2.74	01/01/2008
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	7.70	9.46
Value Added	-2.07	-3.06	-0.54	-2.07	-0.54	-1.78	-8.93	-8.71	-5.86	N/A	N/A	-4.96	N/A
Bain Capital Credit Managed Account (PSERS), L.P.	1.75	2.95	4.82	1.75	4.82	7.39	7.98	5.62	N/A	N/A	N/A	7.73	07/01/2009
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	9.45	9.46
Value Added	-0.65	-0.51	2.25	-0.65	2.25	4.34	-0.17	0.08	N/A	N/A	N/A	-1.72	N/A
Park Square Credit Opportunities	0.00	-0.98	0.99	0.00	0.99	1.29	N/A	N/A	N/A	N/A	N/A	9.35	11/01/2015
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	7.39	9.46
Value Added	-2.40	-4.44	-1.58	-2.40	-1.58	-1.76	N/A	N/A	N/A	N/A	N/A	1.96	N/A
Hayfin Special Opportunities Credit LP	5.77	3.43	6.74	5.77	6.74	10.62	11.49	5.88	N/A	N/A	N/A	6.92	03/01/2013
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	5.29	9.46
Value Added	3.37	-0.03	4.17	3.37	4.17	7.57	3.34	0.34	N/A	N/A	N/A	1.63	N/A
Hayfin SOF II USD Co-Invest	1.20	1.81	3.97	1.20	3.97	6.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	6.80	9.46
Value Added	-1.20	-1.65	1.40	-1.20	1.40	3.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hayfin SOF II USD LP	1.73	3.22	4.86	1.73	4.86	5.75	N/A	N/A	N/A	N/A	N/A	N/A	09/01/2016
Bimbg. Barc. U.S. Corp: High Yield	2.40	3.46	2.57	2.40	2.57	3.05	8.15	5.54	9.46	7.74	6.92	6.02	9.46
Value Added	-0.67	-0.24	2.29	-0.67	2.29	2.70	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inflation Protected (levered)	-2.77	-1.13	-0.73	-2.77	-0.73	4.11	6.02	N/A	N/A	N/A	N/A	5.09	10/01/2014
Inflation Protected (unlevered)	-0.74	0.11	0.31	-0.74	0.31	2.71	3.44	N/A	N/A	N/A	N/A	4.03	10/01/2014
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	-0.84	-0.52	-0.44	-0.84	-0.44	2.06	3.93	2.50	3.89	4.32	5.50	2.72	3.89
Value Added	0.10	0.63	0.75	0.10	0.75	0.65	-0.49	N/A	N/A	N/A	N/A	1.31	N/A
TIPS Composite (levered)	-2.77	-1.13	-0.73	-2.77	-0.73	4.11	6.02	5.42	8.17	N/A	N/A	7.00	04/01/2004
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	-0.84	-0.52	-0.44	-0.84	-0.44	2.06	3.93	2.50	3.89	4.32	5.50	3.99	3.89
Value Added	-1.93	-0.61	-0.29	-1.93	-0.29	2.05	2.09	2.92	4.28	N/A	N/A	3.01	N/A
Blended Policy (Net Levered TIPS)	-2.27	-2.20	-2.56	-2.27	-2.56	2.00	6.50	3.94	6.76	N/A	N/A	N/A	N/A
Value Added	-0.50	1.07	1.83	-0.50	1.83	2.11	-0.48	1.48	1.41	N/A	N/A	N/A	N/A
TIPS Composite (unlevered)	-0.74	0.11	0.31	-0.74	0.31	2.71	3.44	4.68	6.03	N/A	N/A	6.95	04/01/2004
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	-0.84	-0.52	-0.44	-0.84	-0.44	2.06	3.93	2.50	3.89	4.32	5.50	3.99	3.89
Value Added	0.10	0.63	0.75	0.10	0.75	0.65	-0.49	2.18	4.14	N/A	N/A	2.96	N/A
Bridgewater TIPS (unlevered)	-0.51	0.69	1.63	-0.51	1.63	4.94	N/A	N/A	N/A	N/A	N/A	2.40	02/01/2015
BGI Custom IL Bond Index (unlevered)	-1.14	-0.04	0.26	-1.14	0.26	3.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	0.63	0.73	1.37	0.63	1.37	1.83	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bridgewater TIPS (levered)	-3.21	-1.00	0.80	-3.21	0.80	7.40	7.74	7.71	11.71	N/A	N/A	9.89	07/01/2004
BGI Custom IL Bond Index (levered)	-2.13	-0.05	0.52	-2.13	0.52	6.22	7.54	6.95	N/A	N/A	N/A	N/A	N/A
Value Added	-1.08	-0.96	0.28	-1.08	0.28	1.18	0.20	0.76	N/A	N/A	N/A	N/A	N/A
Garda Inflation Opportunity Composite (levered)	-3.97	-3.40	-6.11	-3.97	-6.11	-2.91	5.12	N/A	N/A	N/A	N/A	1.47	08/01/2014
Blended Benchmark (Garda)	-3.52	-2.09	-7.51	-3.52	-7.51	-3.31	5.45	1.67	N/A	N/A	N/A	-0.98	N/A
Value Added	-0.45	-1.31	1.40	-0.45	1.40	0.40	-0.33	N/A	N/A	N/A	N/A	2.45	N/A
Garda Inflation Opportunity Composite (unlevered)	-1.21	-1.03	-1.91	-1.21	-1.91	-0.90	1.49	N/A	N/A	N/A	N/A	0.55	08/01/2014
Bimbg. Barc. Global Inflation-Linked: U.S. TIPS	-0.82	-0.05	-0.84	-0.82	-0.84	0.41	2.04	1.37	3.32	3.93	5.20	0.75	N/A
Value Added	-0.39	-0.98	-1.07	-0.39	-1.07	-1.31	-0.55	N/A	N/A	N/A	N/A	-0.20	N/A



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											
	1	2	3	1	3	5	10	15	20	Since	Inception	
	Quarter	Quarters Ending Sep-2018	Quarters Ending Sep-2018	Year	Years	Years	Years	Years	Years	Inception	Date	
				YTD	FYTD	YTD	YTD	YTD	YTD	YTD		
Garda Inflation Opp. Fund CI B (levered)	-6.48	-4.92	-10.07	-6.48	-10.07	-6.48	-6.01	4.07	3.20	N/A	N/A	-2.35
Blended Benchmark (Garda)	-3.52	-2.09	-7.51	-3.52	-7.51	-3.52	-3.31	5.45	1.67	N/A	N/A	-3.94
Value Added	<b>-2.96</b>	<b>-2.83</b>	<b>-2.56</b>	<b>-2.96</b>	<b>-2.56</b>	<b>-2.96</b>	<b>-2.70</b>	<b>-1.38</b>	1.53	N/A	N/A	1.59
Garda Inflation Opp. Fund CI B (unlevered)	-1.32	-0.99	-2.14	-1.32	-2.14	-1.32	-1.24	1.27	N/A	N/A	N/A	0.49
Bimbg. Barc. Global Inflation-Linked: U.S. T PS	-0.82	-0.05	-0.84	-0.82	-0.84	-0.82	0.41	2.04	1.37	3.32	3.93	5.20
Value Added	<b>-0.50</b>	<b>-0.94</b>	<b>-1.30</b>	<b>-0.50</b>	<b>-1.30</b>	<b>-0.50</b>	<b>-1.65</b>	<b>-0.77</b>	N/A	N/A	N/A	<b>-0.10</b>
Garda Fixed Income Relative Value Opportunity Fund Ltd. (TIPS)	1.13	-0.42	2.36	1.13	2.36	1.13	3.50	5.53	N/A	N/A	N/A	4.46
PSERS Total TIPS (levered)	-1.47	-0.52	-1.56	-1.47	-1.56	-1.47	0.78	2.77	2.06	5.15	N/A	4.92
PSERS Total TIPS (unlevered)	-0.92	-0.33	-0.97	-0.92	-0.97	-0.92	0.49	2.61	1.96	3.93	N/A	4.07
Bimbg. Barc. Global Inflation-Linked: U.S. T PS	-0.82	-0.05	-0.84	-0.82	-0.84	-0.82	0.41	2.04	1.37	3.32	3.93	5.20
Value Added	<b>-0.10</b>	<b>-0.28</b>	<b>-0.13</b>	<b>-0.10</b>	<b>-0.13</b>	<b>-0.10</b>	0.08	0.57	0.59	0.61	N/A	0.47
PSERS TIPS	-0.67	0.14	-0.64	-0.67	-0.64	-0.67	1.17	2.71	2.02	5.13	N/A	4.90
PSERS TIPS (unlevered)	-0.67	0.14	-0.64	-0.67	-0.64	-0.67	1.17	2.71	2.02	3.96	N/A	4.10
Bimbg. Barc. Global Inflation-Linked: U.S. T PS	-0.82	-0.05	-0.84	-0.82	-0.84	-0.82	0.41	2.04	1.37	3.32	3.93	5.20
Value Added	0.15	0.19	0.20	0.15	0.20	0.15	0.76	0.67	0.65	0.64	N/A	0.50
P MCO Multi-Sector Strategy	-0.42	-0.26	-0.89	-0.42	-0.89	-0.42	-0.11	3.61	2.62	N/A	N/A	2.75
Blended Policy (PIMCO Multi-Sector)	-0.49	-0.32	-1.05	-0.49	-1.05	-0.49	-0.01	3.08	2.62	4.39	4.19	2.67
Value Added	0.07	0.06	0.16	0.07	0.16	0.07	<b>-0.10</b>	0.53	0.00	N/A	N/A	0.08
Real Assets (levered/hedged)	1.01	6.02	4.37	1.01	4.37	1.01	8.18	9.10	N/A	N/A	N/A	4.91
Real Assets (unlevered/hedged)	4.61	3.39	0.78	4.61	3.39	4.61	6.28	6.95	N/A	N/A	N/A	3.35
Blended Policy (Real Assets) (Hedged)	0.21	3.75	2.90	0.21	2.90	0.21	5.69	5.89	N/A	N/A	N/A	2.86
Value Added	0.57	0.86	0.49	0.57	0.49	0.57	1.06	1.06	N/A	N/A	N/A	0.49
Real Assets (levered/unhedged)	0.95	5.66	4.08	0.95	4.08	0.95	7.89	9.09	N/A	N/A	N/A	4.90
Real Assets (unlevered/unhedged)	0.73	4.34	3.17	0.73	3.17	0.73	6.06	6.94	N/A	N/A	N/A	3.35
Blended Policy (Real Assets) (Unhedged)	0.14	3.37	2.58	0.14	2.58	0.14	5.37	5.86	N/A	N/A	N/A	2.83
Value Added	0.59	0.97	0.59	0.59	0.59	0.59	1.08	1.08	N/A	N/A	N/A	0.52
Real Assets x Private (levered/hedged)	-0.04	6.75	0.04	-0.04	0.04	-0.04	3.82	7.27	N/A	N/A	N/A	-4.08
Real Assets x Private (unlevered/hedged)	-0.03	4.20	0.03	-0.03	0.03	-0.03	2.35	4.08	N/A	N/A	N/A	-6.23
Blended Policy (Real Assets x Private RE) (Hedged)	0.06	3.78	-0.13	0.06	-0.13	0.06	2.26	3.56	N/A	N/A	N/A	-5.39
Value Added	<b>-0.09</b>	0.42	0.16	<b>-0.09</b>	0.16	<b>-0.09</b>	0.09	0.52	N/A	N/A	N/A	<b>-0.84</b>
Real Assets x Private (levered/unhedged)	-0.17	6.06	-0.48	-0.17	-0.48	-0.17	3.29	7.25	N/A	N/A	N/A	-4.09
Real Assets x Private (unlevered/unhedged)	-0.11	3.77	-0.31	-0.11	-0.31	-0.11	2.02	4.07	N/A	N/A	N/A	-6.23
Blended Policy (Real Assets x Private RE) (Unhedged)	-0.03	3.27	-0.56	-0.03	-0.56	-0.03	1.84	3.51	N/A	N/A	N/A	-5.43
Value Added	<b>-0.08</b>	0.50	0.25	<b>-0.08</b>	0.25	<b>-0.08</b>	0.18	0.56	N/A	N/A	N/A	<b>-0.80</b>
Total Infrastructure Composite (levered/hedged)	4.17	18.09	6.78	4.17	6.78	4.17	7.35	N/A	N/A	N/A	N/A	14.39
Total Infrastructure Composite (unlevered/hedged)	3.60	15.38	5.89	3.60	5.89	3.60	6.37	N/A	N/A	N/A	N/A	8.82
Blended Policy (Infrastructure Hedged)	4.27	15.55	5.54	4.27	5.54	4.27	6.11	9.42	9.77	N/A	N/A	8.16
Value Added	<b>-0.67</b>	<b>-0.17</b>	0.35	<b>-0.67</b>	0.35	<b>-0.67</b>	0.26	N/A	N/A	N/A	N/A	0.36
Insight Nevada - Infra (notional)	0.85	5.38	4.85	0.85	4.85	0.85	4.70	N/A	N/A	N/A	N/A	-0.41
Currency Hedge Benchmark - Infra	0.85	5.43	4.92	0.85	4.92	0.85	4.70	N/A	N/A	N/A	N/A	-0.30
Value Added	0.00	<b>-0.05</b>	<b>-0.07</b>	0.00	<b>-0.07</b>	0.00	0.00	N/A	N/A	N/A	N/A	<b>-0.11</b>
Total Infrastructure Composite (levered/unhedged)	4.07	17.25	6.16	4.07	6.16	4.07	6.76	N/A	N/A	N/A	N/A	14.64
Total Infrastructure Composite (unlevered/unhedged)	3.51	14.66	5.35	3.51	5.35	3.51	5.86	N/A	N/A	N/A	N/A	8.10
Blended Policy (Infrastructure Unhedged)	4.15	14.64	4.75	4.15	4.75	4.15	5.34	9.38	7.84	N/A	N/A	8.01
Value Added	<b>-0.64</b>	0.02	0.60	<b>-0.64</b>	0.60	<b>-0.64</b>	0.52	N/A	N/A	N/A	N/A	0.09
Private Infrastructure Composite	-1.13	5.57	10.40	-1.13	10.40	-1.13	12.28	N/A	N/A	N/A	N/A	9.81



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date	
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	FYTD	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years		Since Inception
PSERS Infrastructure Private	-1.13	5.57	10.40	-1.13	10.40	12.28	N/A	N/A	N/A	N/A	N/A	9.81	05/01/2017
Publicly-Traded Infrastructure Composite (levered)	-1.00	6.45	-3.49	-1.00	-3.49	0.10	N/A	N/A	N/A	N/A	N/A	13.73	11/01/2015
Publicly-Traded Infrastructure Composite (unlevered)	-0.50	3.13	-1.77	-0.50	-1.77	0.04	N/A	N/A	N/A	N/A	N/A	7.03	11/01/2015
FTSE Developed Core Infracap 50/50 Index (Net Value Added)	-0.22	3.57	-1.24	-0.22	-1.24	-0.70	8.76	7.47	N/A	N/A	N/A	7.38	
PSERS Infrastructure Index (levered)	-1.00	6.45	-3.49	-1.00	-3.49	0.10	N/A	N/A	N/A	N/A	N/A	13.73	11/01/2015
PSERS Infrastructure Index (unlevered)	-0.50	3.13	-1.77	-0.50	-1.77	0.04	N/A	N/A	N/A	N/A	N/A	7.03	11/01/2015
FTSE Developed Core Infracap 50/50 Index (Net Value Added)	-0.22	3.57	-1.24	-0.22	-1.24	0.74	8.76	7.47	N/A	N/A	N/A	7.38	
MLP Composite	5.31	19.98	8.23	5.31	8.23	8.06	6.34	1.56	13.61	N/A	N/A	13.61	10/01/2008
S&P MLP Index	6.39	20.38	7.46	6.39	7.46	7.15	4.90	-1.73	9.97	9.12	N/A	9.97	
Value Added	-1.08	-0.40	0.77	-1.08	0.77	0.91	1.44	3.29	3.64	N/A	N/A	3.64	
PSERS MLP	5.29	19.92	8.15	5.29	8.15	7.98	5.19	-1.57	10.06	9.18	N/A	-2.52	
MLP Internal Blended Benchmark	0.08	0.24	0.33	0.08	0.33	0.30	1.12	N/A	N/A	N/A	N/A	1.41	
External MLP Composite	5.29	19.92	8.15	5.29	8.15	7.98	N/A	N/A	N/A	N/A	N/A	3.82	06/01/2017
S&P MLP Index	6.39	20.38	7.46	6.39	7.46	7.15	4.90	-1.73	9.97	9.12	N/A	3.18	
Value Added	-1.10	-0.46	0.69	-1.10	0.69	0.83	N/A	N/A	N/A	N/A	N/A	0.64	
Atlantic Trust	5.62	21.05	9.58	5.62	9.58	9.39	6.69	1.60	N/A	N/A	N/A	5.87	09/01/2012
S&P MLP Index	6.39	20.38	7.46	6.39	7.46	7.15	4.90	-1.73	9.97	9.12	N/A	1.67	
Value Added	-0.77	0.67	2.12	-0.77	2.12	2.24	1.79	3.33	N/A	N/A	N/A	4.20	
PSERS Harvest Funds MLP	6.12	20.66	9.33	6.12	9.33	8.99	6.11	1.83	13.73	N/A	N/A	13.73	10/01/2008
S&P MLP Index	6.39	20.38	7.46	6.39	7.46	7.15	4.90	-1.73	9.97	9.12	N/A	9.97	
Value Added	-0.27	0.28	1.87	-0.27	1.87	1.84	1.21	3.56	3.76	N/A	N/A	3.76	
Sallent	3.91	17.90	5.32	3.91	5.32	5.39	6.44	0.93	N/A	N/A	N/A	5.40	08/01/2012
S&P MLP Index	6.39	20.38	7.46	6.39	7.46	7.15	4.90	-1.73	9.97	9.12	N/A	1.92	
Value Added	-2.48	-2.48	-2.14	-2.48	-2.14	-1.76	1.54	2.66	N/A	N/A	N/A	3.48	
Commodities Composite (levered)	-7.87	-12.09	-11.68	-7.87	-11.68	-4.40	5.54	-5.75	-4.22	N/A	N/A	-2.44	11/01/2006
Commodities Composite (unlevered)	-3.29	-5.23	-5.01	-3.29	-5.01	-1.50	2.86	-3.52	-2.83	N/A	N/A	-1.26	11/01/2006
Blended Policy (Commodities)	-3.14	-4.92	-4.82	-3.14	-4.82	-1.34	0.72	-5.43	-5.17	N/A	N/A	-3.77	
Value Added	-0.15	-0.31	-0.19	-0.15	-0.19	-0.16	2.14	1.91	2.34	N/A	N/A	2.51	
PSERS Commodity Beta + PCAF Composite	-2.23	-2.14	-2.03	-2.23	-2.03	2.51	3.33	N/A	N/A	N/A	N/A	-5.93	05/01/2014
Bloomberg Commodity Index Total Return	-2.02	-1.63	-2.03	-2.02	-2.03	2.59	-0.11	-7.18	-6.24	-1.07	1.55	-9.76	
Value Added	-0.21	-0.51	0.00	-0.21	0.00	-0.08	3.44	N/A	N/A	N/A	N/A	2.78	
PSERS Commodity Beta (levered)	-8.72	-9.08	-10.57	-8.72	-10.57	-0.92	1.67	N/A	N/A	N/A	N/A	-9.76	05/01/2014
PSERS Commodity Beta (unlevered)	-2.91	-3.03	-3.46	-2.91	-3.46	-0.61	0.96	N/A	N/A	N/A	N/A	-8.47	05/01/2014
Bloomberg Commodity Index Total Return	-2.02	-1.63	-2.03	-2.02	-2.03	2.59	-0.11	-7.18	-6.24	-1.07	1.55	-9.76	
Value Added	-0.89	-1.40	-1.43	-0.89	-1.43	-1.43	1.07	N/A	N/A	N/A	N/A	1.29	
P MCO Commodity Alpha Fund	3.95	5.31	8.81	3.95	8.81	11.48	17.30	N/A	N/A	N/A	N/A	13.63	03/01/2015
ICE Libor (3 month)	0.99	1.18	1.66	0.99	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.10	
Value Added	3.36	4.13	7.15	3.36	7.15	9.44	16.04	N/A	N/A	N/A	N/A	12.53	
resham	-0.40	1.55	1.72	-0.40	1.72	8.27	2.80	-5.34	-3.90	N/A	N/A	-3.56	10/01/2007
Bloomberg Commodity Index Total Return	-2.02	-1.63	-2.03	-2.02	-2.03	2.59	-0.11	-7.18	-6.24	-1.07	1.55	-9.76	
Value Added	1.62	3.18	3.75	1.62	3.75	5.68	2.91	1.84	2.34	N/A	N/A	2.45	
Wellington Management Company	-1.23	0.16	-0.42	-1.23	-0.42	5.81	7.44	-2.72	-1.27	N/A	N/A	-0.63	01/01/2007
Blended Benchmark (Wellington)	-0.23	4.27	2.70	-0.23	2.70	9.55	9.29	-2.04	-0.19	N/A	N/A	0.65	
Value Added	-1.00	-4.11	-3.12	-1.00	-3.12	-3.74	-1.85	-0.68	-1.08	N/A	N/A	-1.28	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date	
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	FYTD	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years		Since Inception
PSERS Gold Fund (unlevered)	-5.48	-11.05	-10.52	-5.48	-10.52	-9.11	0.68	-2.73	N/A	N/A	N/A	-4.71	06/01/2012
Bloomberg Gold Subindex Total Return	-5.00	-10.22	-9.36	-5.00	-9.36	-7.66	1.53	-2.68	2.41	7.00	6.65	-4.76	
Value Added	-0.48	-0.83	-1.16	-0.48	-1.16	-1.45	-0.85	-0.05	N/A	N/A	N/A	0.05	
PTRES Composite (levered/hedged)	-0.24	13.60	2.57	-0.24	2.57	8.56	9.24	8.13	7.44	9.11	9.95	9.22	07/01/1998
PTRES Composite (unlevered/hedged)	-0.15	8.67	1.87	-0.15	1.87	5.31	6.45	6.47	6.61	8.55	8.53	8.80	07/01/1998
Blended Policy (PTRES) (Hedged)		7.56	2.03		2.03	5.66	6.57	5.53	6.20	7.82	7.83	8.14	
Value Added	-0.45	1.11	-0.16	-0.45	-0.16	-0.35	-0.12	0.94	0.41	0.73	0.60	0.66	
Insight Sierra - REIT (notional)	1.29	5.61	4.05	1.29	4.05	3.93	N/A	N/A	N/A	N/A	N/A	0.05	12/01/2015
Currency Hedge Benchmark - REIT	1.30	5.66	4.12	1.30	4.12	4.02	N/A	N/A	N/A	N/A	N/A	0.16	
Value Added	-0.01	-0.05	-0.07	-0.01	-0.07	-0.09	N/A	N/A	N/A	N/A	N/A	-0.11	
PTRES Composite (levered/unhedged)	-0.85	10.55	0.71	-0.85	0.71	6.73	9.09	8.04	7.40	9.08	9.93	9.20	07/01/1998
PTRES Composite (unlevered/unhedged)	-0.56	6.73	0.60	-0.56	0.60	4.09	6.35	6.40	6.58	8.52	8.51	8.78	07/01/1998
Blended Policy (PTRES) (Unhedged)		4.81	0.06		0.06	3.66	6.19	5.30	6.08	7.74	8.87	8.08	
Value Added	-0.26	1.92	0.54	-0.26	0.54	0.16	1.10	0.50	0.78	0.64	0.70	0.70	
PSERS REIT Index (levered)	-0.94	8.88	-0.79	-0.94	-0.79	7.19	N/A	N/A	N/A	N/A	N/A	8.19	11/01/2015
PSERS REIT Index (unlevered)	-0.49	4.42	-0.41	-0.49	-0.41	3.08	N/A	N/A	N/A	N/A	N/A	4.18	11/01/2015
FTSE EPRA/NAREIT Developed Index (Net)	-0.30	4.81	0.06	-0.30	0.06	3.66	6.19	5.43	6.04	N/A	N/A	4.37	
Value Added	-0.19	-0.39	-0.47	-0.19	-0.47	-0.58	N/A	N/A	N/A	N/A	N/A	-0.19	
Security Capital Preferred Growth	-0.73	12.69	2.65	-0.73	2.65	5.59	8.18	7.50	8.47	N/A	N/A	7.39	07/01/2008
Wilshire US Real Estate Securities Index	0.73	10.55	2.35	0.73	2.35	4.11	7.52	9.58	7.51	9.50	10.18	7.79	
Value Added	-1.46	2.14	0.30	-1.46	0.30	1.48	0.66	-2.08	0.96	N/A	N/A	-0.40	
Risk Parity Composite (vol adjusted)	0.34	1.54	-0.94	0.34	-0.94	3.40	7.37	5.27	N/A	N/A	N/A	3.64	10/01/2012
Blended Policy (Risk Parity)	0.07	-0.19	-1.89	0.07	-1.89	2.73	7.89	5.55	8.19	8.66	9.07	4.05	
Value Added	0.27	1.73	0.95	0.27	0.95	0.67	-0.52	-0.28	N/A	N/A	N/A	-0.41	
PSERS Risk Parity Composite (vol adjusted to 12%)	-0.47	0.25	-1.64	-0.47	-1.64	2.71	8.29	5.98	N/A	N/A	N/A	3.78	02/01/2013
Bridgewater All Weather @15% (vol adjusted)	-0.41	0.81	-0.88	-0.41	-0.88	4.06	7.62	5.09	N/A	N/A	N/A	3.54	10/01/2012
DE Shaw Orientier HV (vol adjusted)	3.61	5.04	3.61	3.61	4.48	4.51	N/A	N/A	N/A	N/A	N/A	8.63	02/01/2016
BlackRock Market Advantage II (vol adjusted)	0.85	2.67	1.23	0.85	1.23	6.92	9.34	N/A	N/A	N/A	N/A	5.19	04/01/2015
Bridgewater Optimal (vol adjusted)	0.14	2.83	-1.90	0.14	-1.90	0.56	N/A	N/A	N/A	N/A	N/A	2.42	11/01/2015
Total Absolute Return	0.93	1.31	3.45	0.93	3.45	4.88	3.83	4.01	5.98	N/A	N/A	5.20	10/01/2005
Blended Policy (3-month Libor + 3.5%)	1.46	2.93	4.32	1.46	4.32	5.61	4.80	4.94	6.35	6.90	7.17	6.73	
Value Added	-0.53	-1.62	-0.87	-0.53	-0.87	-0.73	-0.97	-0.93	-0.37	N/A	N/A	-1.53	
Aeolus Property Catastrophe Keystone PF Fund, LP	5.32	4.50	5.03	5.32	5.03	-0.87	-0.75	6.30	N/A	N/A	N/A	9.50	06/01/2012
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	1.51	2.10	0.59	
Value Added	4.79	3.47	3.59	4.79	3.59	-2.65	-1.79	5.61	N/A	N/A	N/A	8.91	
Apollo Aviation/SASOF III LP	6.96	24.38	18.62	6.96	18.62	22.90	12.55	N/A	N/A	N/A	N/A	0.53	02/01/2015
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	1.51	2.10	0.88	
Value Added	6.43	23.35	17.18	6.43	17.18	21.12	11.51	N/A	N/A	N/A	N/A	-0.35	
Apollo Aviation/SASOF IV LP	2.04	6.96	N/A	2.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.96	04/01/2018
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	1.51	2.10	1.03	
Value Added	1.51	5.93	N/A	1.51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.93	
Bridgewater Pure Alpha Fund II, Ltd.	-3.44	-2.09	3.08	-3.44	3.08	6.81	2.89	4.55	12.59	N/A	N/A	11.21	01/01/2006
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.53	
Value Added	-4.03	-3.27	1.42	-4.03	1.42	4.77	1.63	3.69	11.89	N/A	N/A	9.68	
Bridgeway Leveraged Capital Structures Offshore Fund, Ltd.	5.04	7.06	9.78	5.04	9.78	9.79	10.55	5.75	7.18	N/A	N/A	6.13	10/01/2007
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	1.51	2.10	0.78	
Value Added	4.51	6.03	8.34	4.51	8.34	8.01	9.51	5.06	6.66	N/A	N/A	5.35	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date	
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	FYTD	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years		Since Inception
Capital Structure Investments Offshore Fund, Ltd.	-0.63	-11.05	-8.66	-0.63	-8.66	-5.51	2.90	2.14	N/A	N/A	N/A	1.70	03/01/2009
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.48	
Value Added	-1.16	-12.08	-10.10	-1.16	-10.10	-7.29	1.86	1.45	N/A	N/A	N/A	1.22	
Capula Global Relative Value Fund Limited	1.61	2.42	4.22	1.61	4.22	4.54	6.27	7.01	N/A	N/A	N/A	6.51	04/01/2011
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.53	
Value Added	1.08	1.39	2.78	1.08	2.78	2.76	5.23	6.32	N/A	N/A	N/A	5.98	
Capula Tail Risk Fund Limited	-0.70	-2.73	-2.28	-0.70	-2.28	-3.47	-4.35	-2.55	N/A	N/A	N/A	-2.02	07/01/2011
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.54	
Value Added	-1.23	-3.76	-3.72	-1.23	-3.72	-5.25	-5.39	-3.24	N/A	N/A	N/A	-2.56	
Caspian Keystone Focused Fund, Ltd.	0.00	0.00	-0.66	0.00	-0.66	1.46	N/A	N/A	N/A	N/A	N/A	7.56	06/01/2016
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	1.23	
Value Added	-0.53	-1.03	-2.10	-0.53	-2.10	-0.32	N/A	N/A	N/A	N/A	N/A	6.33	
Caspian Select Credit International, Ltd.	1.97	2.60	3.24	1.97	3.24	4.74	4.22	2.71	N/A	N/A	N/A	3.51	04/01/2011
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.53	
Value Added	1.44	1.57	1.80	1.44	1.80	2.96	3.18	2.02	N/A	N/A	N/A	2.98	
Garda Fixed Income Relative Value Opportunity Fund Ltd.	1.13	-0.42	2.36	1.13	2.36	3.50	5.53	5.14	N/A	N/A	N/A	5.41	01/01/2012
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.57	
Value Added	0.60	-1.45	0.92	0.60	0.92	1.72	4.49	4.45	N/A	N/A	N/A	4.84	
HS Group Sponsor Fund II, Ltd.	-3.11	N/A	N/A	-3.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-4.54	06/01/2018
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	0.70	2.23	0.78	
Value Added	-3.70	N/A	N/A	-3.70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-5.32	
Independence Reinsurance Partners Composite	2.86	5.97	7.79	2.86	7.79	1.73	N/A	N/A	N/A	N/A	N/A	-0.56	02/01/2016
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	1.13	
Value Added	2.33	4.94	6.35	2.33	6.35	-0.05	N/A	N/A	N/A	N/A	N/A	-1.89	
DaVinci Reinsurance Ltd.	0.37	5.25	7.38	0.37	7.38	6.18	N/A	N/A	N/A	N/A	N/A	-0.86	02/01/2016
RenaissanceRe Medici Fund Ltd.	1.38	3.50	5.22	1.38	5.22	8.81	N/A	N/A	N/A	N/A	N/A	4.81	02/01/2016
Upsilon Diversified Fund Ltd.	5.33	8.43	10.14	5.33	10.14	-38.20	N/A	N/A	N/A	N/A	N/A	-35.90	01/01/2017
Nephila/Nimbus Weather Fund	4.22	6.09	4.07	4.22	4.07	N/A	N/A	N/A	N/A	N/A	N/A	4.07	01/01/2018
3-Month TBills+ 5.00%	1.73	3.43	5.07	1.73	5.07	6.65	5.84	5.51	5.33	5.33	6.93	5.07	
Value Added	2.49	2.66	-1.00	2.49	-1.00	N/A	N/A	N/A	N/A	N/A	N/A	-1.00	
Nephila/Palmetto Fund Ltd.	1.16	2.12	1.22	1.16	1.22	-0.50	-0.38	2.37	N/A	N/A	N/A	4.16	07/01/2011
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.54	
Value Added	0.63	1.09	-0.22	0.63	-0.22	-2.28	-1.42	1.68	N/A	N/A	N/A	3.62	
Oceanwood Investments SPC Co-Invest	N/A	N/A	N/A	N/A	N/A	8.67	7.84	7.41	N/A	N/A	N/A	N/A	10/01/2018
3-Month Libor+ 6.50%	2.19	4.41	6.58	2.19	6.58	8.67	7.84	7.41	7.24	7.24	8.27	8.87	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oceanwood Opportunities Fund	2.10	4.56	1.92	2.10	1.92	4.89	5.82	N/A	N/A	N/A	N/A	5.31	09/01/2014
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.81	
Value Added	1.57	3.53	0.48	1.57	0.48	3.11	4.78	N/A	N/A	N/A	N/A	4.50	
OWS Credit Opportunity Offshore Fund III, Ltd.	2.49	4.88	9.48	2.49	9.48	12.81	N/A	N/A	N/A	N/A	N/A	12.02	12/01/2015
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	0.70	2.23	1.31	
Value Added	1.90	3.70	7.82	1.90	7.82	10.77	N/A	N/A	N/A	N/A	N/A	10.71	
Perry Partners LP	-9.11	-9.13	-18.23	-9.11	-18.23	-13.96	-5.47	N/A	N/A	N/A	N/A	-5.73	12/01/2013
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.71	
Value Added	-9.64	-10.16	-19.67	-9.64	-19.67	-15.74	-6.51	N/A	N/A	N/A	N/A	-6.44	
P MCO PARS/GCOF/MAV Composite	0.51	0.86	0.28	0.51	0.28	0.34	1.16	3.15	8.16	8.16	N/A	6.03	03/01/2008
ICE Libor (1 month)	0.53	1.03	1.44	0.53	1.44	1.78	1.04	0.69	0.52	0.52	2.10	0.64	



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As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	FYTD	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	
Value Added	-0.02	-0.17	-1.16	-0.02	-1.16	-1.44	0.12	2.46	7.64	N/A	N/A	5.39
P MCO Absolute Return Strategy V Offshore Fund, Ltd.	1.70	1.50	-1.30	1.70	-1.30	-0.81	1.81	5.40	N/A	N/A	N/A	5.04
P MCO Global Credit Opportunity Offshore Fund, Ltd.	-1.34	-1.41	3.68	-1.34	3.68	2.95	3.98	6.19	N/A	N/A	N/A	7.47
P MCO Multi-Asset Volatility Onshore Fund, LLC	1.50	3.06	-1.89	1.50	-1.89	-1.45	1.41	3.28	N/A	N/A	N/A	1.72
Two Sigma Risk Premia Enhanced Fund, LP	2.54	4.74	5.68	2.54	5.68	8.27	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.78
Value Added	1.95	3.56	4.02	1.95	4.02	6.23	N/A	N/A	N/A	N/A	N/A	N/A
Venor Capital Offshore, Ltd.	2.73	7.23	8.65	2.73	8.65	15.24	N/A	N/A	N/A	N/A	N/A	8.66
FTSE 1 Month T-Bill	0.48	0.90	1.25	0.48	1.25	1.51	0.76	0.46	0.26	1.17	1.73	1.03
Value Added	2.25	6.33	7.40	2.25	7.40	13.73	N/A	N/A	N/A	N/A	N/A	7.63
Unallocated Cash & Cash Equivalents	0.56	1.07	1.44	0.56	1.44	2.06	0.96	0.72	1.00	0.64	0.41	0.50
ICE BofAML 3 Month U.S. T-Bill	0.49	0.95	1.30	0.49	1.30	1.59	0.84	0.52	0.34	1.30	1.93	1.98
Value Added	0.07	0.12	0.14	0.07	0.14	0.47	0.12	0.20	0.66	-0.66	-1.52	-1.48
PSERS Cash Management	0.56	1.09	1.49	0.56	1.49	2.11	0.94	0.63	0.34	0.18	0.04	2.42
RE Conversions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Derivatives Collateral	1.13	1.59	1.79	1.13	1.79	N/A	N/A	N/A	N/A	N/A	N/A	1.79
PSERS Ultra Short Duration	0.57	1.09	1.50	0.57	1.50	1.81	1.06	0.72	N/A	N/A	N/A	0.59
ICE BofAML US Treasury Bills 0-3M	0.49	0.93	1.27	0.49	1.27	1.54	0.78	0.48	0.30	1.23	1.84	0.29
Value Added	0.08	0.16	0.23	0.08	0.23	0.27	0.28	0.24	N/A	N/A	N/A	0.30
LIBOR Composite	0.71	1.28	1.77	0.71	1.77	2.12	1.81	1.39	1.48	N/A	N/A	1.93
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.22
Value Added	0.12	0.10	0.11	0.12	0.11	0.08	0.55	0.53	0.78	N/A	N/A	0.71
PSERS LIBOR Plus	0.88	1.31	1.79	0.88	1.79	2.20	1.66	1.21	1.30	N/A	N/A	1.78
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.22
Value Added	0.09	0.13	0.13	0.09	0.13	0.16	0.40	0.35	0.60	N/A	N/A	0.57
Capula L BOR Tail Risk	-0.70	-2.73	-2.28	-0.70	-2.28	-3.46	-3.59	N/A	N/A	N/A	N/A	-3.59
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.26
Value Added	-1.29	-3.91	-3.94	-1.29	-3.94	-5.50	-4.85	N/A	N/A	N/A	N/A	-4.85
Radcliffe Ultra Short Duration	1.00	1.71	2.27	1.00	2.27	2.81	3.32	2.68	N/A	N/A	N/A	2.76
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	0.74
Value Added	0.41	0.53	0.61	0.41	0.61	0.57	2.06	1.82	N/A	N/A	N/A	2.02
Penn Mutual Asset Management	0.92	1.67	2.16	0.92	2.16	2.75	N/A	N/A	N/A	N/A	N/A	2.75
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	1.85
Value Added	0.33	0.49	0.50	0.33	0.50	0.71	N/A	N/A	N/A	N/A	N/A	0.90
PSERS Healthcare & HOP	0.62	1.22	1.59	0.62	1.59	1.93	1.25	0.87	1.12	2.04	2.72	2.84
PSERS Healthcare - Premium Assist	0.49	0.95	1.30	0.49	1.30	1.59	0.84	0.52	0.34	1.30	1.93	2.06
ICE BofAML 3 Month U.S. T-Bill	0.13	0.27	0.29	0.13	0.29	0.34	0.41	0.35	0.78	0.74	0.79	0.78
Value Added	0.57	1.12	1.53	0.57	1.53	1.86	1.07	0.73	0.62	1.78	N/A	1.64
PSERS Healthcare - HOP	0.49	0.95	1.30	0.49	1.30	1.59	0.84	0.52	0.34	1.30	1.93	1.32
ICE BofAML 3 Month U.S. T-Bill	0.08	0.17	0.23	0.08	0.23	0.27	0.23	0.21	0.28	0.48	N/A	0.32
Value Added	0.58	1.08	1.36	0.58	1.36	N/A	N/A	N/A	N/A	N/A	N/A	1.36
Defined Contribution												
PSERS Defined Contribution												

Case ID: 221102792

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As of September 30, 2018

## Trailing Period Performance

	Performance (%)											Inception Date	
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	FYTD	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years		Since Inception
E/M Total Program Composite	0.98	1.36	1.37	0.98	1.37	2.05	3.16	3.29	5.48	5.47	N/A	3.25	01/01/2000
E/M US Core Plus FI Composite	0.02	-0.19	-1.85	0.02	-1.85	-1.26	1.35	2.22	0.60	N/A	N/A	1.39	11/01/2004
Pugh Capital Management	0.02	-0.19	-1.84	0.02	-1.84	-1.26	1.35	2.31	4.32	N/A	N/A	4.54	07/01/2006
Bimbg. Barc. U.S. Aggregate	0.02	-0.14	-1.60	0.02	-1.60	-1.22	1.31	2.16	3.77	3.78	4.48	4.11	
Value Added	0.00	-0.05	-0.24	0.00	-0.24	-0.04	0.04	0.15	0.55	N/A	N/A	0.43	
E/M Short Duration Cash	1.14	1.62	1.90	1.14	1.90	2.55	3.87	N/A	N/A	N/A	N/A	3.67	10/01/2014
Radcliffe Ultra Short Duration	1.00	1.71	2.27	1.00	2.27	2.61	3.32	2.68	N/A	N/A	N/A	2.76	06/01/2012
ICE Libor (3 month)	0.59	1.18	1.66	0.59	1.66	2.04	1.26	0.86	0.70	1.66	2.23	0.74	
Value Added	0.41	0.53	0.61	0.41	0.61	0.57	2.06	1.82	N/A	N/A	N/A	2.02	
Radcliffe Specialty Finance Debt	1.25	1.54	1.62	1.25	1.62	2.50	4.31	N/A	N/A	N/A	N/A	4.12	10/01/2014
3-Month Libor + 0.60%	0.74	1.48	2.12	0.74	2.12	2.65	1.87	1.46	1.30	2.27	2.84	1.62	
Value Added	0.51	0.06	-0.50	0.51	-0.50	-0.15	2.44	N/A	N/A	N/A	N/A	2.50	

As of September 30, 2018

Trailing Period Performance

	Performance (%)											Inception Date	
	1 Quarter	2 Quarters Ending Sep-2018	3 Quarters Ending Sep-2018	FYTD	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years		Since Inception
Total Private Market Composites (hedged)	3.43	5.97	10.49	3.43	10.49	14.15	11.32	11.47	6.10	11.24	9.60	10.18	10/01/1992
Blended Policy (Private Market)	1.81	4.62	9.34	1.81	9.34	13.29	10.43	12.07	8.68	9.43	7.97	N/A	
Value Added	1.62	1.35	1.15	1.62	1.15	0.86	0.89	-0.60	-2.58	1.81	1.63	N/A	
Total Private Market Composites (unhedged)	3.42	5.98	10.49	3.42	10.49	14.12	11.30	11.46	6.10	11.24	9.59	10.18	10/01/1992
Blended Policy (Private Market)	1.81	4.62	9.34	1.81	9.34	13.29	10.43	12.07	8.68	9.43	7.97	N/A	
Value Added	1.61	1.36	1.15	1.61	1.15	0.83	0.87	-0.61	-2.58	1.81	1.62	N/A	
Total Alternative Investments (hedged)	4.20	6.26	11.36	4.20	11.36	14.90	11.51	10.64	7.86	12.84	10.51	10.40	07/01/1998
Burgiss All Private Markets ex Real Estate (1Q Lag)	2.70	5.46	10.50	2.70	10.50	14.80	11.06	12.61	9.11	9.04	6.31	6.27	
Value Added	1.50	0.80	0.86	1.50	0.86	0.10	0.45	-1.97	-1.25	3.80	4.20	4.13	
Total Alternative Investments (unhedged)	4.19	6.29	11.38	4.19	11.38	14.84	11.49	10.62	7.85	12.83	10.51	10.39	07/01/1998
Burgiss All Private Markets ex Real Estate (1Q Lag)	2.70	5.46	10.50	2.70	10.50	14.80	11.06	12.61	9.11	9.04	6.31	6.27	
Value Added	1.49	0.83	0.88	1.49	0.88	0.04	0.43	-1.99	-1.26	3.79	4.20	4.12	
Priv. Eq Venture Cap/ Priv. Debt/Co-Invest	4.19	6.29	11.38	4.19	11.38	14.85	11.51	10.64	N/A	N/A	N/A	10.92	04/01/2012
Insight Wilson - PE (notional)	6.33	4.09	3.15	6.33	3.15	0.20	1.45	N/A	N/A	N/A	N/A	1.45	10/01/2015
Currency Hedge Benchmark - PE (1Q Lag)	6.26	4.06	3.10	6.26	3.10	0.15	1.53	N/A	N/A	N/A	N/A	1.53	
Value Added	0.07	0.03	0.05	0.07	0.05	0.05	-0.08	N/A	N/A	N/A	N/A	-0.08	
Private Equity Co-Investment Composite	2.86	6.80	4.85	2.86	4.85	8.88	19.80	25.27	N/A	N/A	N/A	29.13	04/01/2012
PA Penn Investment Fund - PE Composite	5.08	14.72	13.15	5.08	13.15	28.25	N/A	N/A	N/A	N/A	N/A	23.41	12/01/2015
PA Penn Investment Fund - PE Internal	-16.11	-22.14	-36.08	-16.11	-36.08	-36.08	N/A	N/A	N/A	N/A	N/A	-12.18	12/01/2015
PA Penn Investment Fund - PE External	6.14	17.15	17.15	6.14	17.15	34.28	N/A	N/A	N/A	N/A	N/A	26.26	12/01/2015
Woodstream	29.97	52.45	52.45	29.97	52.45	60.56	N/A	N/A	N/A	N/A	N/A	43.94	12/01/2015
ERT	5.88	6.65	6.65	5.88	6.65	34.70	N/A	N/A	N/A	N/A	N/A	34.67	07/01/2016
Lasko	3.62	20.74	20.74	3.62	20.74	18.04	N/A	N/A	N/A	N/A	N/A	31.94	01/01/2017
Evans Network	-7.77	6.31	6.31	-7.77	6.31	32.02	N/A	N/A	N/A	N/A	N/A	21.43	05/01/2017
Redzone Robotics	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.06	08/01/2018
Internally Managed PE Composite	2.31	5.76	3.76	2.31	3.76	6.63	19.00	24.77	N/A	N/A	N/A	28.73	04/01/2012
Private Eq/Venture Cap/Priv. Debt	4.31	6.27	11.86	4.31	11.86	15.29	11.16	10.27	7.69	12.71	10.49	10.32	07/01/1998
Private Debt Composite	1.98	0.69	7.04	1.98	7.04	12.79	4.85	6.23	6.95	9.27	N/A	7.59	04/01/2001
Private Equity/Venture Capital Composite	4.72	7.29	12.72	4.72	12.72	15.74	12.29	10.99	7.54	13.32	10.48	10.31	07/01/1998
Private Equity	4.61	6.64	12.14	4.61	12.14	14.85	12.61	10.93	7.66	13.89	N/A	11.19	04/01/2001
Private Equity x Tobacco Composite	4.61	6.64	12.14	4.61	12.14	14.85	12.68	11.03	7.71	13.92	N/A	11.22	04/01/2001
Venture Capital	5.28	10.73	15.78	5.28	15.78	20.54	10.46	11.71	6.54	8.83	N/A	4.62	04/01/2001
Total Real Estate (levered/hedged)	2.09	6.02	8.65	2.09	8.65	12.70	10.80	12.38	3.26	8.25	8.54	8.27	04/01/1981
Total Real Estate (unlevered/hedged)	2.00	5.77	8.38	2.00	8.38	12.20	10.31	12.07	3.12	8.16	8.47	8.23	04/01/1981
Blended Policy (Total Real Estate) (Hedged)	0.43	3.91	6.87	0.43	6.87	10.36	8.94	10.76	6.44	9.13	9.29	8.57	
Value Added	1.57	1.88	1.51	1.57	1.51	1.84	1.37	1.31	-3.32	-0.97	-0.82	-0.34	
Total Real Estate (levered/unhedged)	2.03	5.79	8.48	2.03	8.48	12.51	10.78	12.36	3.26	8.25	8.54	8.27	04/01/1981
Total Real Estate (unlevered/unhedged)	2.00	5.77	8.38	2.00	8.38	12.20	10.31	12.07	3.12	8.16	8.47	8.23	04/01/1981
Blended Policy (Total Real Estate) (Unhedged)	0.32	3.51	6.54	0.32	6.54	10.03	8.89	10.74	6.42	9.12	9.29	8.57	
Value Added	1.68	2.26	1.84	1.68	1.84	2.17	1.42	1.33	-3.30	-0.96	-0.82	-0.34	
Private Real Estate Composite	2.29	5.45	9.11	2.29	9.11	12.99	10.99	12.59	2.18	8.69	8.65	9.46	07/01/1996
Blended Policy (Private Real Estate)	0.46	3.35	7.59	0.46	7.59	11.04	9.43	11.07	6.58	9.23	9.37	8.79	
Value Added	1.83	2.10	1.52	1.83	1.52	1.95	1.56	1.52	-4.40	-0.54	-0.72	-0.33	
Private Real Estate x Internal	2.22	5.37	8.97	2.22	8.97	12.87	10.91	12.50	2.13	7.99	8.16	9.01	07/01/1996
Internally Managed Private Real Estate	5.08	8.50	14.67	5.08	14.67	18.25	15.01	19.39	N/A	N/A	N/A	22.79	07/01/2013



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As of September 30, 2018

Calendar Year Performance

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
<b>PSERS Total Fund</b>	<b>12.19</b>	<b>10.81</b>	<b>-1.80</b>	<b>8.75</b>	<b>8.66</b>	<b>11.35</b>	<b>4.31</b>	<b>14.22</b>	<b>12.06</b>	<b>-29.70</b>
Blended Policy (Total Plan)	11.98	10.29	-1.59	8.81	7.70	10.19	3.70	11.98	14.34	-25.96
Value Added	0.21	0.52	-0.21	-0.06	0.96	1.16	0.61	2.24	-2.28	-3.74
<b>Total Public Markets Composite</b>	<b>11.40</b>	<b>11.18</b>	<b>-4.70</b>	<b>6.58</b>	<b>6.64</b>	<b>10.38</b>	<b>1.01</b>	<b>15.33</b>	<b>28.30</b>	<b>-34.67</b>
Blended Policy (Public Market) (Hedged)	11.27	11.05	-5.66	5.19	4.76	9.81	-0.36	11.76	24.17	-32.01
Value Added	0.13	0.13	0.96	1.39	1.88	1.17	1.37	3.57	4.13	-2.66
Blended Policy (Public Market) (Unhedged)	13.08	9.70	-6.28	4.16	4.69	9.81	-0.36	11.76	24.17	-32.01
Value Added	-1.68	1.48	1.58	2.42	1.95	1.17	1.37	3.57	4.13	-2.66
<b>Total Public Markets Composite ex HY &amp; Absolute Return</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Blended Policy (Public Market x HY & Abs Return) (Hedged)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Total Public Equity Composite</b>	<b>22.26</b>	<b>9.23</b>	<b>0.92</b>	<b>8.15</b>	<b>24.43</b>	<b>17.07</b>	<b>-6.96</b>	<b>16.95</b>	<b>41.00</b>	<b>-42.75</b>
Blended Policy (Public Equity) (Hedged)	22.74	8.89	-0.51	7.93	24.18	16.73	-7.83	14.34	37.59	-41.03
Value Added	-0.48	0.34	1.43	0.22	0.25	0.34	0.87	2.61	3.41	-1.72
Blended Policy (Public Equity) (Unhedged)	24.32	8.72	-1.88	4.14	23.89	16.73	-7.83	14.34	37.59	-41.03
Value Added	-2.06	0.51	2.80	4.01	0.54	0.34	0.87	2.61	3.41	-1.72
<b>Total US Equity Composite</b>	<b>19.21</b>	<b>16.49</b>	<b>0.40</b>	<b>11.71</b>	<b>34.04</b>	<b>15.65</b>	<b>1.65</b>	<b>18.37</b>	<b>33.94</b>	<b>-41.49</b>
Blended Policy (Tot US Eq)	21.28	12.66	0.64	12.51	33.39	16.42	0.80	16.52	28.22	-37.23
Value Added	-2.07	3.83	-0.24	-0.80	0.65	-0.77	0.85	1.85	5.72	-4.26
<b>PSERS-S&amp;P 500 Index Composite</b>	<b>20.69</b>	<b>13.90</b>	<b>1.43</b>	<b>13.66</b>	<b>32.85</b>	<b>16.09</b>	<b>2.03</b>	<b>16.03</b>	<b>28.52</b>	<b>-37.07</b>
S&P 500 Index	21.83	11.96	1.38	13.69	32.39	16.00	2.11	15.06	26.46	-37.00
Value Added	-1.14	1.94	0.05	-0.03	0.46	0.09	-0.08	0.97	2.06	-0.07
<b>Total US Small Cap Composite</b>	<b>15.00</b>	<b>24.56</b>	<b>-2.31</b>	<b>3.57</b>	<b>37.99</b>	<b>15.08</b>	<b>-1.14</b>	<b>26.20</b>	<b>38.03</b>	<b>-35.83</b>
MSCI USA Small Cap Index	17.00	19.80	-3.65	7.55	38.26	18.22	-3.03	27.96	39.74	-35.88
Value Added	-2.30	4.76	1.34	-3.98	-0.27	-3.14	1.89	-1.76	-1.71	0.05
<b>PSERS Small Cap Index Composite</b>	<b>15.00</b>	<b>24.56</b>	<b>-1.79</b>	<b>8.00</b>	<b>38.32</b>	<b>18.36</b>	<b>-0.14</b>	<b>27.43</b>	<b>35.33</b>	<b>-33.93</b>
PSERS-S&P 400 Index Composite	16.49	21.34	-2.20	9.87	33.45	18.78	-1.60	27.42	41.12	-35.91
S&P MidCap 400	16.24	20.74	-2.18	9.77	33.50	17.88	-1.73	26.64	37.38	-36.23
Value Added	0.25	0.60	-0.02	0.10	-0.05	0.90	0.13	0.78	3.74	0.32
<b>PSERS-S&amp;P 600 Index Composite</b>	<b>13.53</b>	<b>28.05</b>	<b>-1.47</b>	<b>6.23</b>	<b>43.13</b>	<b>17.70</b>	<b>1.64</b>	<b>27.47</b>	<b>29.62</b>	<b>-30.67</b>
S&P SmallCap 600	13.23	26.56	-1.97	5.76	41.31	16.33	1.02	26.31	25.57	-31.07
Value Added	0.30	1.49	0.50	0.47	1.82	1.37	0.62	1.16	4.05	0.40
<b>Total Non-U.S. Equity Composite (hedged)</b>	<b>24.79</b>	<b>5.15</b>	<b>2.68</b>	<b>5.09</b>	<b>15.95</b>	<b>18.39</b>	<b>-13.34</b>	<b>16.00</b>	<b>45.88</b>	<b>-43.80</b>
Blended Policy (Total Non-US Eq) (Hedged)	23.62	6.43	-0.50	3.97	16.36	17.03	-14.30	12.73	45.38	-44.31
Value Added	1.17	-1.28	3.18	1.12	-0.41	1.36	0.96	3.27	0.50	0.51
<b>Total Non-U.S. Equity Composite (unhedged)</b>	<b>30.36</b>	<b>2.96</b>	<b>-1.98</b>	<b>-3.27</b>	<b>15.95</b>	<b>18.39</b>	<b>-13.34</b>	<b>16.00</b>	<b>45.88</b>	<b>-43.80</b>
Blended Policy (Total Non-US Eq) (Unhedged)	28.21	4.67	-5.11	-3.99	15.82	17.03	-14.30	12.73	45.38	-44.31
Value Added	2.15	-1.71	3.13	0.72	0.13	1.36	0.96	3.27	0.50	0.51
<b>Emerging Markets Equity Composite</b>	<b>35.73</b>	<b>-3.95</b>	<b>-8.21</b>	<b>1.48</b>	<b>-0.24</b>	<b>21.03</b>	<b>-17.81</b>	<b>17.04</b>	<b>71.83</b>	<b>-52.69</b>

Case ID: Z21102792

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As of September 30, 2018

Calendar Year Performance

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Blended Policy (MSCI EM net)	37.58	11.19	-14.92	-2.19	-2.60	18.23	-18.42	18.87	78.48	-53.27
Value Added	-1.85	-15.14	6.71	3.67	2.36	2.80	0.61	-1.83	-6.65	0.58
MSCI Emerging Markets IMI (Net)	36.83	9.90	-13.86	-1.79	-2.20	18.69	-19.49	19.90	82.36	-53.78
Value Added	-1.10	-13.85	5.65	3.27	1.96	2.34	1.68	-2.86	-10.53	1.09
Wasatch EM Small Cap	35.73	-3.95	-10.36	2.13	1.87	28.06	-12.98	42.87	119.09	N/A
Blended Policy (Wasatch EM)	33.33	4.03	-9.81	1.49	1.01	22.60	-26.96	27.47	114.32	-58.10
Value Added	2.40	-7.98	-0.55	0.64	0.86	5.46	13.98	15.40	4.77	N/A
Total Non-U.S. Equity x Emerging Markets Composite (hedged)	24.31	5.60	3.70	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Non-US Equity x EM) (Hedged)	23.03	6.25	0.66	4.75	16.36	17.03	-14.30	12.73	45.38	-44.31
Value Added	1.28	-0.65	3.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Insight Everest - Int'l Eq (notional)	-6.57	4.02	7.13	10.98	-0.37	-1.46	0.00	1.39	1.84	3.15
Currency Hedge Benchmark - Int'l Eq	-6.46	4.18	7.24	11.05	-1.39	0.00	0.00	0.00	3.39	3.81
Value Added	-0.11	-0.16	-0.11	-0.07	1.02	-1.46	0.00	1.39	-1.55	-0.66
Total Non-U.S. Equity x Emerging Markets Composite (unhedged)	30.12	3.29	-1.46	-3.43	19.23	18.82	-12.39	14.77	42.06	-45.82
Blended Policy (Non-US Equity x EM) (Unhedged)	27.81	4.41	-4.60	-3.89	15.82	17.03	-14.30	12.73	45.38	-44.31
Value Added	2.31	-1.12	3.14	0.46	3.41	1.79	1.91	2.04	-3.32	-1.51
Non-US Large Cap Equity Composite	29.19	3.99	-2.76	-3.41	17.33	17.78	-11.96	12.69	40.38	-44.76
Blended Policy (MSCI World AC Word ex USA net)	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.33
Value Added	2.00	-0.51	2.90	0.46	2.04	0.95	1.75	1.54	-1.07	0.57
PSERS ACWI x US Index Fund	28.03	5.35	-5.24	-3.41	16.07	17.57	-13.06	11.85	42.86	-44.91
MSCI ACWI/EAFE Index Blend	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.53
Value Added	0.84	0.85	0.42	0.46	0.78	0.74	0.65	0.70	1.41	0.62
BlackRock EMEA	40.71	13.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MSCI Emerging Markets Index (Net)	37.28	11.19	-14.92	-2.19	-2.60	18.23	-18.42	18.88	78.51	-53.33
Value Added	3.43	2.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Active Non-US Large Cap Composite	30.80	2.28	0.72	-3.88	19.34	18.60	-8.26	15.23	37.57	-44.60
MSCI AC World ex USA Index (Net)	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.53
Value Added	3.61	-2.22	6.38	-0.01	4.05	1.77	5.45	4.08	-3.88	0.93
Baillie Gifford	35.09	5.65	-1.91	-2.19	17.46	21.25	-11.41	15.75	49.51	-46.12
MSCI AC World ex USA Index (Net)	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.53
Value Added	7.90	1.15	3.75	1.68	2.17	4.42	2.30	4.60	8.06	-0.59
Marathon Asset Mgmt	26.05	1.25	3.53	-5.35	25.79	18.82	-9.23	17.59	35.96	-40.50
Blended Benchmark (MSCI ACWI ex USA net)	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.53
Value Added	-1.14	-3.25	9.19	-1.48	10.50	1.99	4.48	6.44	-5.49	5.03
The Children's Investment Fund, LP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MSCI World Index (Net)	22.40	7.51	-0.87	4.94	26.68	15.83	-5.54	11.76	29.99	-40.71
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BlackRock Global Composite	31.84	-1.59	-0.93	-3.52	13.89	18.71	-4.14	21.12	35.38	-45.67
MSCI AC World ex USA Index (Net)	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71	11.15	41.45	-45.53

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As of September 30, 2018

## Calendar Year Performance

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Value Added	4.65	-6.09	4.73	0.35	-1.40	1.88	9.57	9.97	-6.07	-0.14
<b>Non-US Small Cap Equity Composite</b>	<b>36.26</b>	<b>-0.91</b>	<b>9.41</b>	<b>-3.47</b>	<b>30.37</b>	<b>25.17</b>	<b>-15.55</b>	<b>29.62</b>	<b>52.97</b>	<b>-52.32</b>
MSCI AC World ex USA Small Cap (Net)	31.65	3.91	2.60	-4.03	19.73	18.52	-18.50	25.21	62.91	-50.23
Value Added	4.61	-4.82	6.81	0.56	10.64	6.65	2.95	4.41	-9.94	-2.09
<b>Acadian Asset Mgmt</b>	<b>37.99</b>	<b>8.76</b>	<b>3.08</b>	<b>-0.19</b>	<b>24.86</b>	<b>25.11</b>	<b>-16.94</b>	<b>26.02</b>	<b>59.84</b>	<b>-55.59</b>
Blended Benchmark (MSCI AC World ex USA Small Cap net)	31.65	3.91	2.60	-4.03	19.73	18.52	-18.50	25.21	62.91	-48.38
Value Added	6.34	4.85	0.48	3.84	5.13	6.59	1.56	0.81	-3.07	-7.21
<b>Wasatch Int'l Small Cap</b>	<b>33.33</b>	<b>-7.75</b>	<b>14.73</b>	<b>-7.31</b>	<b>28.25</b>	<b>33.41</b>	<b>-13.75</b>	<b>34.70</b>	<b>69.89</b>	<b>-52.34</b>
Blended Benchmark (MSCI AC World ex USA Small Cap net)	31.65	3.91	2.60	-4.03	19.73	18.52	-18.50	25.21	62.91	-48.38
Value Added	1.68	-11.66	12.13	-3.28	8.52	14.89	4.75	9.49	6.98	-3.96
<b>Oberweis Asset Mgmt</b>	<b>41.55</b>	<b>-4.84</b>	<b>16.17</b>	<b>-2.82</b>	<b>59.12</b>	<b>31.95</b>	<b>-14.60</b>	<b>31.03</b>	<b>62.42</b>	<b>N/A</b>
MSCI AC World ex USA Small Cap (Net)	31.65	3.91	2.60	-4.03	19.73	18.52	-18.50	25.21	62.91	-50.23
Value Added	9.90	-8.75	13.57	1.21	39.39	13.43	3.90	5.82	-0.49	N/A
<b>QS Investors</b>	<b>31.70</b>	<b>3.28</b>	<b>4.60</b>	<b>-0.18</b>	<b>26.34</b>	<b>21.71</b>	<b>-12.22</b>	<b>26.52</b>	<b>41.36</b>	<b>N/A</b>
MSCI AC World ex USA Small Cap (Net)	31.65	3.91	2.60	-4.03	19.73	18.52	-18.50	25.21	62.91	-50.23
Value Added	0.05	-0.63	2.00	3.85	6.61	3.19	6.28	1.31	-21.55	N/A
<b>Total Fixed Income Composite</b>	<b>7.94</b>	<b>10.94</b>	<b>-1.40</b>	<b>10.29</b>	<b>-2.52</b>	<b>11.76</b>	<b>9.54</b>	<b>14.11</b>	<b>22.14</b>	<b>-7.24</b>
Blended Policy (Total FI)	5.10	9.49	-2.62	5.19	-4.69	9.86	7.27	10.27	24.80	-4.55
Value Added	2.84	1.45	1.22	5.10	2.17	1.90	2.27	3.84	-2.46	-2.69
<b>Global Fixed Income Composite</b>	<b>7.11</b>	<b>4.64</b>	<b>-0.92</b>	<b>3.69</b>	<b>-1.89</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Blended Policy (Global FI)	5.01	4.55	-3.35	2.65	-2.76	7.49	5.36	8.07	9.49	N/A
Value Added	2.10	0.09	2.43	1.04	0.87	N/A	N/A	N/A	N/A	N/A
<b>Total US Fixed Income Composite</b>	<b>7.90</b>	<b>11.27</b>	<b>-0.54</b>	<b>12.94</b>	<b>-2.35</b>	<b>11.42</b>	<b>10.83</b>	<b>14.58</b>	<b>22.49</b>	<b>-7.78</b>
Blended Policy (Total US FI)	4.87	9.61	-1.72	5.60	-2.92	9.48	8.46	10.45	27.91	-6.09
Value Added	3.03	1.66	1.18	7.34	0.57	1.94	2.37	4.13	-5.42	-1.69
<b>Total US Fixed Income ex TIPS Composite</b>	<b>10.00</b>	<b>8.21</b>	<b>-0.14</b>	<b>13.46</b>	<b>3.53</b>	<b>13.15</b>	<b>4.98</b>	<b>13.50</b>	<b>24.35</b>	<b>-10.83</b>
Investment Grade Composite	9.46	2.62	-0.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Investment Grade)	5.11	2.23	-0.58	11.06	-5.59	4.39	14.57	7.30	-0.22	11.04
Value Added	4.35	0.39	0.36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>US Core Plus Fixed Income Composite</b>	<b>6.25</b>	<b>3.95</b>	<b>1.70</b>	<b>7.12</b>	<b>-0.86</b>	<b>8.06</b>	<b>9.31</b>	<b>10.25</b>	<b>14.84</b>	<b>-5.70</b>
Blended Policy (Barclays Aggregate Index)	3.54	2.65	0.55	5.97	-2.02	4.21	7.06	7.16	8.60	2.38
Value Added	2.71	1.30	1.15	1.15	1.16	3.85	2.25	3.09	6.24	-8.08
<b>Pugh Capital Management</b>	<b>3.98</b>	<b>2.63</b>	<b>0.56</b>	<b>6.22</b>	<b>-1.89</b>	<b>5.52</b>	<b>8.02</b>	<b>7.24</b>	<b>8.65</b>	<b>5.43</b>
Blmbg. Barc. U.S. Aggregate	3.54	2.65	0.55	5.97	-2.02	4.21	7.84	6.54	5.93	5.24
Value Added	0.44	-0.02	0.01	0.25	0.13	1.31	0.18	0.70	2.72	0.19
<b>PSERS Active Core Plus Fixed Income</b>	<b>4.26</b>	<b>3.50</b>	<b>1.59</b>	<b>7.27</b>	<b>-2.01</b>	<b>5.78</b>	<b>9.34</b>	<b>8.54</b>	<b>15.38</b>	<b>1.57</b>
Blmbg. Barc. U.S. Aggregate	3.54	2.65	0.55	5.97	-2.02	4.21	7.84	6.54	5.93	5.24
Value Added	0.72	0.85	1.04	1.30	0.01	1.57	1.50	2.00	9.45	-3.67
<b>BlackRock Global Alpha</b>	<b>8.99</b>	<b>4.31</b>	<b>2.25</b>	<b>7.79</b>	<b>1.52</b>	<b>12.05</b>	<b>11.18</b>	<b>13.67</b>	<b>19.95</b>	<b>-5.12</b>

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Empower Results®

As of September 30, 2018

Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
Blended Policy (Barclays Aggregate Index)	3.54	2.65	0.55	5.97	-2.02	4.21	7.06	7.16	8.60	2.38	
Value Added	5.45	1.66	1.70	1.82	3.54	7.84	4.12	6.51	11.35	-7.50	
SEI Investment Management	7.83	7.34	0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ICE BofAML 1-3 Year U.S. Corporate	1.91	2.39	1.01	1.19	1.78	4.49	1.76	4.86	14.69	-2.68	
Value Added	5.92	4.95	-0.97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Non-U.S. Developed Markets Fixed Income Composite	3.43	6.23	-5.57	-1.09	-2.49	7.16	3.79	8.63	19.43	-3.08	
Blended Policy (Barclays GlobalAgg GDP Weighted Dev xUS hedged)	2.79	4.90	-5.56	-2.28	-1.49	6.70	4.48	5.84	8.04	3.76	
Value Added	0.64	1.33	-0.01	1.19	-1.00	0.46	-0.69	2.79	11.39	-6.84	
Alliance Bernstein Global Fixed	3.43	6.23	-5.71	-1.80	-1.82	7.30	N/A	N/A	N/A	N/A	
Spliced Barclays GlobalAgg GDPWeighted Dev xUS	2.79	4.90	-5.56	-2.28	-1.49	6.70	3.95	3.47	9.49	2.77	
Value Added	0.64	1.33	-0.15	0.48	-0.33	0.60	N/A	N/A	N/A	N/A	
U.S. Treasuries Total (unlevered)	7.12	-0.04	-1.84	19.66	-12.10	N/A	N/A	N/A	N/A	N/A	
Bimbg. Barc. U.S. Treasury: Long	8.53	1.33	-1.21	25.07	-12.66	3.56	29.93	9.38	-12.92	24.03	
Value Added	-1.41	-1.37	-0.63	-5.41	0.56	N/A	N/A	N/A	N/A	N/A	
PSERS U.S. Long Treasuries (unlevered)	7.12	-0.04	-1.84	19.66	-12.10	N/A	N/A	N/A	N/A	N/A	
Bimbg. Barc. U.S. Treasury: Long	8.53	1.33	-1.21	25.07	-12.66	3.56	29.93	9.38	-12.92	24.03	
Value Added	-1.41	-1.37	-0.63	-5.41	0.56	N/A	N/A	N/A	N/A	N/A	
Credit-Related	10.42	11.05	-1.46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blended Policy (Credit-Related)	8.30	15.99	-6.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Value Added	2.12	-4.94	4.84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Emerging Markets Fixed Income Composite	15.68	9.28	-6.50	-3.52	-4.08	16.81	0.82	N/A	N/A	N/A	
Blended Policy (Barclays Emerging Mkt 10% Country Cap)	14.94	6.85	-11.72	-3.14	-5.39	16.00	-1.49	15.68	21.98	-5.22	
Value Added	0.74	2.43	5.22	-0.38	1.31	0.81	2.31	N/A	N/A	N/A	
Franklin Templeton Emerging Fixed Income	15.68	9.04	-1.75	-1.66	0.87	18.99	1.96	14.19	56.43	N/A	
Blended Benchmark (Barclays Emerging Mkt 10% Country Cap)	14.94	6.85	-11.72	-3.14	-5.39	19.47	4.47	10.95	8.00	8.00	
Value Added	0.74	2.19	9.97	1.48	6.26	-0.48	-2.51	3.24	48.43	N/A	
High Yield Fixed Income Composite (hedged)	10.04	11.11	-0.29	8.54	10.17	17.31	1.64	15.95	34.90	-20.97	
Blended Policy (Barclays Corporate HY)	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	57.95	-26.17	
Value Added	2.54	-6.02	4.18	6.09	2.73	1.50	-3.34	0.83	-23.05	5.20	
High Yield Fixed Income x Internal Composite (hedged)	10.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blended Policy (Barclays Corporate HY)	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	57.95	-26.17	
Value Added	2.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Insight Oxygen - HY (notional)	-10.54	4.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Currency Hedge Benchmark - HY	-10.74	4.01	10.55	13.41	-4.63	-2.06	1.12	4.49	-4.83	1.53	
Value Added	0.20	0.28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
High Yield Fixed Income Composite (Unhedged)	11.07	10.71	-0.69	8.54	10.17	17.31	1.64	15.95	34.90	-20.97	
Blended Policy (Barclays Corporate HY)	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	57.95	-26.17	
Value Added	3.57	-6.42	3.78	6.09	2.73	1.50	-3.34	0.83	-23.05	5.20	
High Yield Fixed Income x Internal Composite (unhedged)	11.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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As of September 30, 2018

Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
Blended Policy (Barclays Corporate HY) Value Added	7.50 3.69	17.13 N/A	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	57.95 N/A	-26.17 N/A	
Mezzanine High Yield Composite	14.73	-7.51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 7.23	17.13 -24.64	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Internally Managed Private Debt Co-Investment	-13.32	-32.79	-33.14	15.79	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 -20.82	17.13 -49.92	-4.47 -28.67	2.45 13.34	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Mezzanine High Yield Composite x Internal	15.96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 8.46	17.13 N/A	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Carlyle Energy Mezz. Opp. Fund	-11.38	-41.34	-9.01	19.08	20.66	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 -18.88	17.13 -58.47	-4.47 -4.54	2.45 16.63	7.44 13.22	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Carlyle Energy Mezz. Opp. Fund II	-1.36	-10.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 -8.86	17.13 -28.00	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
ICG Europe Fund V	27.83	6.38	-2.00	4.03	15.07	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 20.33	17.13 -10.75	-4.47 2.47	2.45 1.58	7.44 7.63	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
ICG Europe Fund VI	63.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 56.12	17.13 N/A	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
ICG Europe Fund VII	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 N/A	17.13 N/A	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Bain Capital Middle Market Credit 2010, L.P.	7.34	-6.05	4.81	6.37	11.04	19.37	8.64	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 -0.16	17.13 -23.18	-4.47 9.28	2.45 3.92	7.44 3.60	15.81 3.56	4.98 3.66	15.12 N/A	58.21 N/A	-26.16 N/A	
Bain Capital Middle Market Credit 2014, L.P.	10.41	5.91	0.81	7.00	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 2.91	17.13 -11.22	-4.47 5.28	2.45 4.55	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Opportunistic High Yield Composite	9.77	18.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 2.27	17.13 0.88	-4.47 N/A	2.45 N/A	7.44 N/A	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Apollo European Principal Fund II	12.25	14.56	6.31	8.80	-0.83	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50 4.75	17.13 -2.57	-4.47 10.78	2.45 6.35	7.44 -8.27	15.81 N/A	4.98 N/A	15.12 N/A	58.21 N/A	-26.16 N/A	
Apollo European Principal Fund III	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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As of September 30, 2018

Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Bain Capital Credit Opp. Fund IV	25.20	2.05	-7.15	1.69	9.20	6.47	0.81	13.76	39.72	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Bain Capital Distressed and Special Situations 2013	17.70	-15.08	-2.68	-0.76	1.76	-9.34	-4.17	-1.36	-18.49	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	12.88	7.00	-3.02	10.46	10.06	N/A	N/A	N/A	N/A	N/A	
Bain Capital Distressed and Special Situations 2016 (A), L.P.	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Blmbg. Barc. U.S. Corp: High Yield Value Added	5.38	-10.13	1.45	8.01	2.62	N/A	N/A	N/A	N/A	N/A	
TPG Opportunities Partners II, LP	12.41	29.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
TPG Opportunities Partners III, LP	4.91	12.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	4.07	6.52	21.82	25.75	13.76	N/A	N/A	N/A	N/A	N/A	
TOP NPL (A)	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Blmbg. Barc. U.S. Corp: High Yield Value Added	-3.43	-10.61	26.29	23.30	6.32	N/A	N/A	N/A	N/A	N/A	
TPG Opportunities Partners II, LP	13.79	17.10	3.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
TOP NPL (A)	6.29	-0.03	7.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	2.02	-3.30	27.19	30.38	12.18	N/A	N/A	N/A	N/A	N/A	
TPG TAO	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Blmbg. Barc. U.S. Corp: High Yield Value Added	-5.48	-20.43	31.66	27.93	4.74	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	6.56	10.10	10.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Brigade Distressed Value	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
1-Month Libor + 5%	-0.94	-7.03	14.60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Value Added	11.34	34.96	-17.17	3.66	11.12	10.71	N/A	N/A	N/A	N/A	
Brigade Structured Credit Offshore Fund	6.18	5.52	5.21	5.16	5.20	5.25	5.24	5.29	5.35	7.80	
Value Added	5.16	29.44	-22.38	-1.50	5.92	5.46	N/A	N/A	N/A	N/A	
Barclays Corporate High Yield + 0.25%	8.52	26.20	-5.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Value Added	7.77	17.42	-4.23	2.71	7.71	16.10	5.24	15.41	58.60	-25.97	
Avenue Energy Opportunities Fund	0.75	8.78	-1.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	4.50	41.63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Avenue Energy Opportunities Fund II	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	-3.00	24.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Avenue Europe SS III	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield Value Added	10.73	5.81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Real Asset High Yield Composite	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	3.23	-11.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Value Added	9.91	4.99	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	



As of September 30, 2018

## Calendar Year Performance

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	2.41	-12.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mariner/Galton RMBS	7.78	3.87	4.38	8.61	8.55	21.64	1.67	N/A	N/A	N/A
Blended Benchmark (Barclays US MBS)	2.47	1.67	1.51	6.33	7.50	7.50	7.50	N/A	N/A	N/A
Value Added	5.31	2.20	2.87	2.28	1.05	14.14	-5.83	N/A	N/A	N/A
Galton Onshore Mortgage Recovery Fund III, LP	15.62	1.83	-1.33	-4.44	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	8.12	-15.30	3.14	-6.89	N/A	N/A	N/A	N/A	N/A	N/A
Galton Onshore Mortgage Recovery Fund IV, L.P.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mariner International Infrastructure	8.44	8.67	5.82	-5.53	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	0.94	-8.46	10.29	-7.98	N/A	N/A	N/A	N/A	N/A	N/A
PIMCO BRAVO Fund III Onshore Feeder, L.P.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
The Varde Scratch and Dent Fund, LP	8.25	6.67	7.48	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	0.75	-10.46	11.95	N/A	N/A	N/A	N/A	N/A	N/A	N/A
The Varde Scratch and Dent Fund Feed I-A	6.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	-1.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Latitude Management Real Estate Capital IV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Senior Loans High Yield Composite	11.64	12.60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	4.14	-4.53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cerberus Levered Loan Fund I	6.89	6.04	-1.29	3.38	9.09	12.20	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	-0.61	-11.09	3.18	0.93	1.65	-3.61	N/A	N/A	N/A	N/A
Cerberus Levered Loan Fund II	1.52	3.25	8.03	13.92	12.21	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	-5.98	-13.88	12.50	11.47	4.77	N/A	N/A	N/A	N/A	N/A
Cerberus PSERS Levered Loan Opportunities Fund	18.25	36.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16
Value Added	10.75	19.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ABC Credit Partners II	30.45	14.28	12.35	17.02	19.02	29.31	21.09	-15.87	-6.79	N/A

Case ID: 221102792

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As of September 30, 2018

## Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	22.95	-2.85	16.82	14.57	11.58	13.50	16.11	-30.99	-65.00	N/A	
LBC Credit Partners III	2.33	13.28	14.46	11.66	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	-5.17	-3.85	18.93	9.21	N/A	N/A	N/A	N/A	N/A	N/A	
LBC-P Credit Fund LP	25.65	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	18.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Summit Partners Credit Fund II LP	12.18	13.37	-0.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	4.68	-3.76	4.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oaktree Loan Fund 2X, LP	0.04	5.35	-23.74	-0.78	6.26	12.69	7.08	12.94	39.95	-18.94	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	-7.46	-11.78	-19.27	-3.23	-1.18	-3.12	2.10	-2.18	-18.26	7.22	
Bain Capital Credit Managed Account (PSERS), L.P.	9.28	17.80	-8.51	4.28	7.79	10.67	2.10	14.16	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	1.78	0.67	-4.04	1.83	0.35	-5.14	-2.88	-0.96	N/A	N/A	
Park Square Credit Opportunities	4.29	20.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	-3.21	3.53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hayfin Special Opportunities Credit LP	25.60	5.14	-2.76	-6.95	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	18.10	-11.99	1.71	-9.40	N/A	N/A	N/A	N/A	N/A	N/A	
Hayfin SOF II USD Co-Invest	6.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	-0.78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hayfin SOF II USD LP	20.95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Blmbg. Barc. U.S. Corp: High Yield	7.50	17.13	-4.47	2.45	7.44	15.81	4.98	15.12	58.21	-26.16	
Value Added	13.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inflation Protected (levered)	4.18	17.80	-2.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inflation Protected (unlevered)	2.11	9.25	2.47	12.49	-10.76	9.15	23.56	18.13	18.74	0.47	
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	3.32	10.22	-1.76	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35	
Value Added	-1.21	-0.97	4.23	8.85	-2.15	2.17	10.00	11.82	7.33	2.82	
TIPS Composite (levered)	4.18	17.80	-2.00	12.06	-11.23	8.59	23.01	17.55	18.42	0.20	
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	3.32	10.22	-1.76	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35	
Value Added	0.86	7.58	-0.24	8.42	-2.62	1.61	9.45	11.24	7.01	2.55	
Blended Policy (Net Levered TIPS)	5.40	20.11	-3.97	6.76	-17.07	13.75	28.18	12.34	22.50	-8.81	
Value Added	-1.22	-2.31	1.97	5.30	5.84	-5.16	-5.17	5.21	-4.08	9.01	
TIPS Composite (unlevered)	2.11	9.25	2.47	12.49	-10.76	9.15	23.56	18.13	18.74	0.47	

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Empower Results®

As of September 30, 2018

Calendar Year Performance

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	3.32	10.22	-1.76	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35
Value Added	-1.21	-0.97	4.23	8.85	-2.15	2.17	10.00	11.82	7.33	2.82
Bridgewater TIPS (unlevered)	1.55	11.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BGI Custom IL Bond Index (unlevered)	1.67	11.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.12	0.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bridgewater TIPS (levered)	2.96	23.93	-2.06	18.34	-11.80	10.04	29.14	27.46	20.64	5.45
BGI Custom IL Bond Index (levered)	2.94	23.14	-3.03	16.76	-12.92	N/A	N/A	N/A	N/A	N/A
Value Added	0.02	0.79	0.97	1.58	1.12	N/A	N/A	N/A	N/A	N/A
Garda Inflation Opportunity Composite (levered)	8.81	18.39	-0.97	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Benchmark (Garda)	9.17	19.85	-1.74	2.07	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.36	-1.46	0.77	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Garda Inflation Opportunity Composite (unlevered)	2.53	5.13	-0.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS	3.01	4.68	-1.44	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35
Value Added	-0.48	0.45	0.59	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Garda Inflation Opp. Fund CI B (levered)	8.78	21.35	-1.47	10.60	N/A	N/A	N/A	N/A	N/A	N/A
Blended Benchmark (Garda)	9.17	19.85	-1.74	2.07	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.39	1.50	0.27	8.53	N/A	N/A	N/A	N/A	N/A	N/A
Garda Inflation Opp. Fund CI B (unlevered)	2.11	5.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS	3.01	4.68	-1.44	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35
Value Added	-0.90	0.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Garda Fixed Income Relative Value Opportunity Fund Ltd. (TIPS)	7.09	6.82	2.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Total TIPS (levered)	4.35	5.98	-1.46	5.03	-7.97	7.10	18.25	11.31	17.12	-2.23
PSERS Total TIPS (unlevered)	3.03	6.20	-1.46	5.03	-7.97	7.03	13.96	7.12	12.95	-2.23
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS	3.01	4.68	-1.44	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35
Value Added	0.02	1.52	-0.02	1.39	0.64	0.05	0.40	0.81	1.54	0.12
PSERS TIPS	3.94	5.23	-1.46	5.03	-7.97	7.10	18.25	11.31	17.12	-2.23
PSERS TIPS (unlevered)	3.94	5.23	-1.46	5.03	-7.97	7.03	13.96	7.12	12.95	-2.23
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS	3.01	4.68	-1.44	3.64	-8.61	6.98	13.56	6.31	11.41	-2.35
Value Added	0.93	0.55	-0.02	1.39	0.64	0.05	0.40	0.81	1.54	0.12
PIMCO Multi-Sector Strategy	4.78	7.11	-3.32	5.22	-1.24	N/A	N/A	N/A	N/A	N/A
Blended Policy (PIMCO Multi-Sector)	3.95	6.36	-2.70	6.32	-0.73	7.46	7.84	6.54	5.93	5.24
Value Added	0.83	0.75	-0.62	-1.10	-0.51	N/A	N/A	N/A	N/A	N/A
Real Assets (levered/hedged)	9.44	17.88	-8.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Assets (unlevered/hedged)	7.25	14.01	-8.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Real Assets) (Hedged)	7.09	11.24	-6.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	0.16	2.77	-1.42	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Assets (levered/unhedged)	9.98	17.58	-8.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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As of September 30, 2018

## Calendar Year Performance

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Real Assets (unlevered/unhedged)	7.66	13.79	-8.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Real Assets) (Unhedged)	7.60	10.98	-6.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	0.06	2.81	-1.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Assets x Private (levered/hedged)	6.54	27.77	-30.79	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Assets x Private (unlevered/hedged)	4.06	17.17	-29.41	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Real Assets x Private RE) (Hedged)	4.12	14.10	-24.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.06	3.07	-4.54	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Assets x Private (levered/unhedged)	7.58	27.12	-30.79	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Real Assets x Private (unlevered/unhedged)	4.72	16.81	-29.41	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Real Assets x Private RE) (Unhedged)	4.91	13.64	-24.92	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.19	3.17	-4.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Infrastructure Composite (levered/hedged)	23.11	24.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Infrastructure Composite (unlevered/hedged)	10.63	11.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Infrastructure Hedged)	10.85	11.81	-3.56	21.17	18.21	10.80	7.40	8.22	N/A	N/A
Value Added	-0.22	-0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Insight Nevada - Infra (notional)	-7.14	1.84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Currency Hedge Benchmark - Infra	-7.04	1.99	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.10	-0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Infrastructure Composite (levered/unhedged)	27.85	21.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Infrastructure Composite (unlevered/unhedged)	13.07	10.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Infrastructure Unhedged)	13.36	10.63	-7.56	16.02	15.48	11.49	8.00	10.34	N/A	N/A
Value Added	-0.29	-0.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Private Infrastructure Composite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Infrastructure Private	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Publicly-Traded Infrastructure Composite (levered)	37.41	21.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Publicly-Traded Infrastructure Composite (unlevered)	17.79	10.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTSE Developed Core Infracast 50/50 Index (Net)	18.18	10.63	-7.56	16.02	15.48	11.49	8.00	10.34	N/A	N/A
Value Added	-0.39	-0.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Infrastructure Index (levered)	37.41	21.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Infrastructure Index (unlevered)	17.79	10.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTSE Developed Core Infracast 50/50 Index (Net)	18.18	10.63	-7.56	16.02	15.48	11.49	8.00	10.34	N/A	N/A
Value Added	-0.39	-0.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MLP Composite	-5.68	24.62	-32.63	16.30	37.44	12.77	18.88	39.82	72.22	N/A
S&P MLP Index	-5.58	21.95	-35.07	7.66	29.75	4.95	14.47	35.17	78.79	-37.46
Value Added	-0.10	2.67	2.44	8.64	7.69	7.82	4.41	4.65	-6.57	N/A
PSERS MLP	-4.92	22.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MLP Internal Blended Benchmark	-5.41	21.95	-35.07	7.66	29.75	4.95	14.47	35.17	78.79	-37.46
Value Added	0.49	0.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Case ID: 221102792

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As of September 30, 2018

## Calendar Year Performance

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
External MLP Composite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S&P MLP Index	-5.58	21.95	-35.07	7.66	29.75	4.95	14.47	35.17	78.79	-37.46
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Atlantic Trust	-7.28	28.14	-33.34	15.38	38.77	N/A	N/A	N/A	N/A	N/A
S&P MLP Index	-5.58	21.95	-35.07	7.66	29.75	4.95	14.47	35.17	78.79	-37.46
Value Added	-1.70	6.19	1.73	7.72	9.02	N/A	N/A	N/A	N/A	N/A
PSERS Harvest Funds MLP	-5.34	19.96	-30.25	17.87	35.60	12.80	18.88	39.82	72.22	N/A
S&P MLP Index	-5.58	21.95	-35.07	7.66	29.75	4.95	14.47	35.17	78.79	-37.46
Value Added	0.24	-1.99	4.82	10.21	5.85	7.85	4.41	4.65	-6.57	N/A
Salient	-5.19	29.46	-36.06	15.15	38.62	N/A	N/A	N/A	N/A	N/A
S&P MLP Index	-5.58	21.95	-35.07	7.66	29.75	4.95	14.47	35.17	78.79	-37.46
Value Added	0.39	7.51	-0.99	7.49	8.87	N/A	N/A	N/A	N/A	N/A
Commodities Composite (levered)	17.10	35.48	-33.05	-18.05	-14.29	2.41	-10.00	18.13	33.40	-42.37
Commodities Composite (unlevered)	7.48	14.75	-18.59	-10.18	-11.16	2.41	-10.00	18.13	33.40	-42.37
Blended Policy (Commodities)	5.83	10.81	-19.85	-12.05	-10.34	-1.05	-13.32	16.82	18.90	-35.65
Value Added	1.65	3.94	1.26	1.87	-0.82	3.46	3.32	1.31	14.50	-6.72
PSERS Commodity Beta + PCAF Composite	4.95	17.31	-22.60	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bloomberg Commodity Index Total Return	1.70	11.77	-24.66	-17.01	-9.52	-1.06	-13.32	16.83	18.91	-35.65
Value Added	3.25	5.54	2.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Commodity Beta (levered)	7.55	45.52	-41.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Commodity Beta (unlevered)	2.99	14.25	-23.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bloomberg Commodity Index Total Return	1.70	11.77	-24.66	-17.01	-9.52	-1.06	-13.32	16.83	18.91	-35.65
Value Added	1.29	2.48	1.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PIMCO Commodity Alpha Fund	12.44	20.81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92
Value Added	11.17	20.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gresham	6.13	12.90	-24.91	-16.31	-7.06	0.66	-6.15	20.92	25.47	-37.17
Bloomberg Commodity Index Total Return	1.70	11.77	-24.66	-17.01	-9.52	-1.06	-13.32	16.83	18.91	-35.65
Value Added	4.43	1.13	-0.25	0.70	2.46	1.72	7.17	4.09	6.56	-1.52
Wellington Management Company	6.28	25.32	-24.58	-15.09	-5.05	2.92	-11.05	19.62	50.65	-46.97
Blended Benchmark (Wellington)	8.43	23.33	-24.75	-14.23	-2.79	4.39	-7.71	19.25	33.80	-36.65
Value Added	-2.15	1.99	0.17	-0.86	-2.26	-1.47	-3.34	0.37	16.85	-10.32
PSERS Gold Fund (unlevered)	11.82	7.38	-10.78	0.40	-28.17	N/A	N/A	N/A	N/A	N/A
Bloomberg Gold Subindex Total Return	12.79	7.73	-10.88	-1.75	-28.66	6.08	9.63	28.72	22.86	3.91
Value Added	-0.97	-0.35	0.10	2.15	0.49	N/A	N/A	N/A	N/A	N/A
PTRES Composite (levered/hedged)	10.55	11.66	-2.15	20.09	4.10	13.75	4.71	16.82	45.64	-49.52
PTRES Composite (unlevered/hedged)	6.31	7.91	-1.89	20.09	4.10	13.75	4.71	16.82	45.64	-49.52
Blended Policy (PTRES) (Hedged)	7.64	5.36	-0.32	14.73	2.24	29.65	-8.13	20.03	39.30	-47.73
Value Added	-1.33	2.55	-1.57	5.36	1.86	-16.10	12.84	-3.21	6.34	-1.79

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As of September 30, 2018

## Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
Insight Sierra - REIT (notional)	-5.51	2.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Currency Hedge Benchmark - REIT	-5.40	2.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	-0.11	-0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PTRES Composite (levered/unhedged)	14.20	9.65	-2.16	20.09	4.10	13.75	4.71	16.82	45.64	-49.52	
PTRES Composite (unlevered/unhedged)	8.49	6.75	-1.89	20.09	4.10	13.75	4.71	16.82	45.64	-49.52	
Blended Policy (PTRES) (Unhedged)	10.36	4.06	-0.72	14.73	2.24	29.85	-8.13	20.03	39.30	-47.73	
Value Added	-1.87	2.69	-1.17	5.36	1.86	-16.10	12.84	-3.21	6.34	-1.79	
PSERS REIT Index (levered)	21.70	7.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS REIT Index (unlevered)	10.19	4.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTSE EPRA/NAREIT Developed Index (Net)	10.36	4.06	-0.79	15.02	3.67	27.73	-6.46	19.63	37.13	-48.16	
Value Added	-0.17	0.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Security Capital Preferred Growth	2.25	12.23	2.15	20.09	4.10	13.75	4.71	24.71	64.34	N/A	N/A
Wilshire US Real Estate Securities Index	4.84	7.62	4.81	31.53	2.15	17.55	8.56	29.12	29.20	-39.83	
Value Added	-2.59	4.61	-2.66	-11.44	1.95	-3.80	-3.85	-4.41	35.14	N/A	N/A
Risk Parity Composite (vol adjusted)	12.94	11.14	-6.54	10.17	-4.74	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Risk Parity)	14.91	12.20	-5.66	10.41	-5.28	14.00	16.70	20.34	22.70	-17.74	
Value Added	-1.97	-1.06	-0.88	-0.24	0.54	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Risk Parity Composite (vol adjusted to 12%)	13.75	14.17	-6.14	10.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bridgewater All Weather @15% (vol adjusted)	14.19	11.60	-8.35	9.49	-4.57	N/A	N/A	N/A	N/A	N/A	N/A
DE Shaw Orienteer HV (vol adjusted)	13.90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BlackRock Market Advantage II (vol adjusted)	16.06	11.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bridgewater Optimal (vol adjusted)	3.00	7.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Total Absolute Return</b>	<b>4.15</b>	<b>3.98</b>	<b>3.70</b>	<b>3.06</b>	<b>4.77</b>	<b>3.54</b>	<b>7.72</b>	<b>17.25</b>	<b>15.25</b>	<b>-8.71</b>	
Blended Policy (3-month Libor + 3.5%)	4.82	4.27	3.83	5.61	7.50	7.50	7.75	8.00	8.00	8.00	
Value Added	-0.67	-0.29	-0.13	-2.55	-2.73	-3.96	-0.03	9.25	7.25	-16.71	
Aeolus Property Catastrophe Keystone PF Fund, LP	-18.14	10.24	14.72	19.41	22.65	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	-19.26	9.75	14.52	19.25	22.46	N/A	N/A	N/A	N/A	N/A	N/A
Apollo Aviation/SASOF III LP	10.10	15.42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	8.98	14.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Apollo Aviation/SASOF IV LP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bridgewater Pure Alpha Fund II, Ltd.	1.78	2.94	7.58	5.93	6.99	1.56	32.86	56.55	2.44	14.31	
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92	
Value Added	0.51	2.20	7.26	5.70	6.72	1.14	32.52	56.21	1.75	11.39	
Brigade Leveraged Capital Structures Offshore Fund, Ltd.	7.10	22.88	-11.10	0.51	6.12	7.05	2.90	7.84	39.90	-16.69	

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As of September 30, 2018

Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	5.98	22.39	-11.30	0.35	5.93	6.81	2.67	7.57	39.57	-19.36	
Capital Structure Investments Offshore Fund, Ltd.	22.47	-10.67	12.60	-5.14	7.52	4.07	23.18	0.61	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	21.35	-11.16	12.40	-5.30	7.33	3.83	22.95	0.34	N/A	N/A	
Capula Global Relative Value Fund Limited	4.30	9.01	8.09	8.62	8.18	8.83	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	3.18	8.52	7.89	8.46	7.99	0.59	N/A	N/A	N/A	N/A	
Capula Tail Risk Fund Limited	-7.90	-0.57	3.32	-1.04	-3.41	-14.28	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	-9.02	-1.06	3.12	-1.20	-3.60	-14.52	N/A	N/A	N/A	N/A	
Caspian Select Credit International, Ltd.	6.71	8.92	-10.40	3.11	9.82	11.83	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	5.59	8.43	-10.60	2.95	9.63	11.59	N/A	N/A	N/A	N/A	
Caspian Keystone Focused Fund, Ltd.	9.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	8.81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Garda Fixed Income Relative Value Opportunity Fund Ltd.	7.09	6.83	2.18	6.39	5.06	6.70	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	5.97	6.34	1.98	6.23	4.87	6.46	N/A	N/A	N/A	N/A	
HS Group Sponsor Fund II, Ltd.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Independence Reinsurance Partners Composite	-15.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	-16.64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
DaVinci Reinsurance Ltd.	-17.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
RenaissanceRe Medici Fund Ltd.	1.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Upsilon Diversified Fund Ltd.	-58.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Nephila/Nimbus Weather Fund	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3-Month TBills+ 5.00%	5.88	5.28	5.03	5.02	5.06	5.09	5.06	5.11	5.17	6.89	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Nephila/Palmetto Fund Ltd.	-5.84	2.83	5.37	6.92	6.96	10.04	N/A	N/A	N/A	N/A	
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67	
Value Added	-6.96	2.34	5.17	6.76	6.77	9.80	N/A	N/A	N/A	N/A	
Oceanwood Investments SPC Co-Invest	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3-Month Libor+ 6.50%	7.85	7.29	6.84	6.75	6.79	6.95	6.86	6.87	7.23	9.61	
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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Empower Results®

As of September 30, 2018

## Calendar Year Performance

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Oceanwood Opportunities Fund	17.40	-5.12	9.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67
Value Added	16.28	-5.61	8.90	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OWS Credit Opportunity Offshore Fund III, Ltd.	15.28	10.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92
Value Added	14.01	9.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Perry Partners LP	0.98	8.03	-13.32	-4.25	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67
Value Added	-0.14	7.54	-13.52	-4.41	N/A	N/A	N/A	N/A	N/A	N/A
PIMCO PARS/GCOF/MAV Composite	2.68	0.54	7.08	4.70	2.16	14.21	5.85	2.03	60.77	N/A
ICE Libor (1 month)	1.12	0.49	0.20	0.16	0.19	0.24	0.23	0.27	0.33	2.67
Value Added	1.56	0.05	6.88	4.54	1.97	13.97	5.62	1.76	60.44	N/A
PIMCO Absolute Return Strategy V Offshore Fund, Ltd.	5.77	-0.14	8.20	14.38	0.90	N/A	N/A	N/A	N/A	N/A
PIMCO Global Credit Opportunity Offshore Fund, Ltd.	0.42	10.19	10.03	7.34	11.11	N/A	N/A	N/A	N/A	N/A
PIMCO Multi-Asset Volatility Onshore Fund, LLC	1.97	1.88	10.07	2.97	-4.71	N/A	N/A	N/A	N/A	N/A
Two Sigma Risk Premia Enhanced Fund, LP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Venor Capital Offshore, Ltd.	3.60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTSE 1 Month T-Bill	0.80	0.21	0.02	0.02	0.01	0.04	0.04	0.10	0.10	1.35
Value Added	2.80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unallocated Cash & Cash Equivalents	1.03	0.40	0.33	0.29	0.28	3.84	3.06	0.47	0.06	-8.91
ICE BofAML 3 Month U.S. T-Bill	0.86	0.33	0.05	0.04	0.07	0.11	0.10	0.13	0.21	2.06
Value Added	0.17	0.07	0.28	0.25	0.21	3.73	2.96	0.34	-0.15	-10.97
PSERS Cash Management	0.93	0.40	-0.05	0.30	0.29	0.55	0.77	0.46	0.25	-9.42
RE Conversions	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Derivatives Collateral	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PSERS Ultra Short Duration	1.09	0.56	0.20	0.19	0.24	0.29	0.22	0.31	1.14	N/A
ICE BofAML US Treasury Bills 0-3M	0.82	0.25	0.02	0.03	0.05	0.08	0.07	0.13	0.14	1.75
Value Added	0.27	0.31	0.18	0.16	0.19	0.21	0.15	0.18	1.00	N/A
LIBOR Composite	1.48	1.90	0.76	0.76	1.39	1.35	0.62	0.97	3.35	N/A
PSERS LIBOR Plus	1.58	1.43	0.46	0.59	0.86	0.76	0.63	1.04	3.42	3.01
US Cash Indices LIBOR Total Return 3 Month	1.18	0.71	0.28	0.24	0.28	0.46	0.32	0.34	0.80	3.48
Value Added	0.40	0.72	0.18	0.35	0.58	0.30	0.31	0.70	2.62	-0.47
Capula LIBOR Tail Risk	-7.88	-0.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92

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Empower Results®

As of September 30, 2018

## Calendar Year Performance

	Performance (%)									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Value Added	-9.15	-1.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Radcliffe Ultra Short Duration	2.66	4.26	2.19	1.38	3.25	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92
Value Added	1.39	3.52	1.87	1.15	2.98	N/A	N/A	N/A	N/A	N/A
Penn Mutual Asset Management	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>PSERS Healthcare &amp; HOP</b>										
PSERS Healthcare - Premium Assist	1.12	0.97	0.31	0.19	0.50	0.79	0.83	1.28	2.67	3.76
ICE BofAML 3 Month U.S. T-Bill	0.86	0.33	0.05	0.04	0.07	0.11	0.10	0.13	0.21	2.06
Value Added	0.26	0.64	0.26	0.15	0.43	0.68	0.73	1.15	2.46	1.70
PSERS Healthcare - HOP	1.08	0.53	0.24	0.20	0.24	0.29	0.24	0.47	0.95	2.80
ICE BofAML 3 Month U.S. T-Bill	0.86	0.33	0.05	0.04	0.07	0.11	0.10	0.13	0.21	2.06
Value Added	0.22	0.20	0.19	0.16	0.17	0.18	0.14	0.34	0.74	0.74
<b>Defined Contribution</b>										
PSERS Defined Contribution	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>E/M Total Program Composite</b>										
E/M US Core Plus FI Composite	4.20	4.09	2.07	-0.74	19.28	8.37	-5.72	16.52	29.46	-34.32
Pugh Capital Management	3.98	2.63	0.38	5.92	-1.85	5.72	7.63	1.26	-17.81	2.87
Blmbg. Barc. U.S. Aggregate	3.54	2.65	0.55	5.97	-2.02	4.21	8.02	7.24	8.65	5.43
Value Added	0.44	-0.02	0.01	0.25	0.13	1.31	0.18	0.70	2.72	0.19
<b>E/M Short Duration Cash</b>										
Radcliffe Ultra Short Duration	4.22	5.20	2.74	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICE Libor (3 month)	2.66	4.26	2.19	1.38	3.25	N/A	N/A	N/A	N/A	N/A
Value Added	1.27	0.74	0.32	0.23	0.27	0.42	0.34	0.34	0.69	2.92
Radcliffe Specialty Finance Debt	1.39	3.52	1.87	1.15	2.98	N/A	N/A	N/A	N/A	N/A
3-Month Libor + 0.60%	5.47	5.97	3.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Value Added	1.88	1.35	0.92	0.84	0.87	1.03	0.94	0.95	1.29	3.54
	3.59	4.62	2.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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As of September 30, 2018

## Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
<b>Total Private Market Composites (hedged)</b>	14.64	9.85	5.39	12.85	12.52	12.00	11.14	11.59	-23.40	-9.29	
Blended Policy (Private Market)	14.14	8.22	8.71	15.79	13.30	10.94	13.82	12.80	-13.64	-0.23	
Value Added	0.50	1.63	-3.32	-2.94	-0.78	1.06	-2.68	-1.21	-9.76	-9.06	
<b>Total Private Market Composites (unhedged)</b>	14.60	9.82	5.39	12.85	12.52	12.00	11.14	11.59	-23.40	-9.29	
Blended Policy (Private Market)	14.14	8.22	8.71	15.79	13.30	10.94	13.82	12.80	-13.64	-0.23	
Value Added	0.46	1.60	-3.32	-2.94	-0.78	1.06	-2.68	-1.21	-9.76	-9.06	
<b>Total Alternative Investments (hedged)</b>	16.09	9.63	2.39	10.03	12.73	13.27	9.96	15.58	-9.82	-3.23	
Burgiss All Private Markets ex Real Estate (1Q Lag)	15.65	8.43	6.93	16.26	15.05	12.02	12.77	16.00	-9.84	-7.73	
Value Added	0.44	1.20	-4.54	-6.23	-2.32	1.25	-2.81	-0.42	0.22	4.50	
<b>Total Alternative Investments (unhedged)</b>	16.03	9.59	2.39	10.03	12.73	13.27	9.96	15.58	-9.82	-3.23	
Burgiss All Private Markets ex Real Estate (1Q Lag)	15.65	8.43	6.93	16.26	15.05	12.02	12.77	16.00	-9.84	-7.73	
Value Added	0.38	1.16	-4.54	-6.23	-2.32	1.25	-2.81	-0.42	0.22	4.50	
Priv. Eq Venture Cap/ Priv. Debt/Co-Invest	16.11	9.59	2.39	10.03	12.72	N/A	N/A	N/A	N/A	N/A	
Insight Wilson - PE (notional)	-2.90	3.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Currency Hedge Benchmark - PE (1Q Lag)	-2.78	3.51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Value Added	-0.12	-0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Private Equity Co-Investment Composite	23.34	27.85	26.47	37.82	39.75	N/A	N/A	N/A	N/A	N/A	
PA Penn Investment Fund - PE Composite	43.44	12.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PA Penn Investment Fund - PE Internal	0.00	8.27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PA Penn Investment Fund - PE External	49.01	11.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Woodstream	42.48	27.89	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ERT	85.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Lasko	33.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Evans Network	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Redzone Robotics	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Internally Managed PE Composite	21.35	28.67	26.48	37.82	39.75	N/A	N/A	N/A	N/A	N/A	
Private Eq/ Venture Cap/ Priv. Debt	15.59	8.81	1.76	9.71	12.55	13.23	10.29	15.57	-9.63	-3.22	
Private Debt Composite	8.28	1.58	0.50	12.79	12.21	13.49	2.43	19.36	3.32	-9.96	
Private Equity/ Venture Capital Composite	16.92	10.08	1.97	9.30	12.53	13.20	12.00	14.24	-13.60	-1.67	
Private Equity	18.02	10.41	1.29	8.82	13.12	12.89	13.13	15.04	-14.11	-2.74	
Private Equity x Tobacco Composite	18.02	10.41	1.75	8.82	13.12	12.89	13.13	15.04	-14.11	-2.74	
Venture Capital	11.23	8.19	6.92	13.50	7.10	15.97	2.26	7.84	-9.66	6.36	
<b>Total Real Estate (levered/hedged)</b>	12.28	10.20	9.17	17.23	11.70	9.16	13.21	3.52	-35.90	-23.17	
<b>Total Real Estate (unlevered/hedged)</b>	11.59	9.83	9.01	17.23	11.70	9.16	13.21	3.52	-35.90	-23.17	
Blended Policy (Total Real Estate) (Hedged)	11.18	7.37	11.19	14.95	10.56	9.05	15.56	5.63	-22.11	5.27	
Value Added	0.41	2.46	-2.18	2.28	1.14	0.11	-2.35	-2.11	-13.79	-28.44	
<b>Total Real Estate (levered/unhedged)</b>	12.60	10.01	9.17	17.23	11.70	9.16	13.21	3.52	-35.90	-23.17	

Case ID: 221102792

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As of September 30, 2018

## Calendar Year Performance

	Performance (%)										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	
<b>Total Real Estate (unlevered/unhedged)</b>	<b>11.59</b>	<b>9.83</b>	<b>9.01</b>	<b>17.23</b>	<b>11.70</b>	<b>9.16</b>	<b>13.21</b>	<b>3.52</b>	<b>-35.90</b>	<b>-23.17</b>	
Blended Policy (Total Real Estate) (Unhedged)	11.64	7.15	11.15	14.95	10.56	9.05	15.56	5.63	-22.11	5.27	
Value Added	-0.05	2.68	-2.14	2.28	1.14	0.11	-2.35	-2.11	-13.79	-28.44	
<b>Private Real Estate Composite</b>	<b>12.53</b>	<b>10.10</b>	<b>9.54</b>	<b>17.15</b>	<b>11.92</b>	<b>9.79</b>	<b>13.48</b>	<b>1.04</b>	<b>-44.59</b>	<b>-16.12</b>	
Blended Policy (Private Real Estate)	11.90	7.76	10.86	14.95	10.56	9.05	15.56	5.63	-22.11	5.27	
Value Added	0.63	2.34	-1.32	2.20	1.36	0.74	-2.08	-4.59	-22.48	-21.39	
Private Real Estate x Internal	12.51	9.97	9.46	17.07	11.85	9.79	13.48	1.04	-44.61	-17.15	
Internally Managed Private Real Estate	13.70	18.13	18.51	28.93	N/A	N/A	N/A	N/A	N/A	N/A	

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As of September 30, 2018

Trailing Period Performance - Currency Hedge

	Performance (%)										Allocation Market Value (\$000)
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	Since Inception	Inception Date		
Currency Hedge Aggregate Portfolio (notional)	0.51	0.51	1.22	1.22	4.57	4.36	0.98	3.53	10/01/2014	4,487,022	
Currency Hedge Benchmark - Aggregate Value Added	0.52	0.52	1.25	1.25	4.57	4.37	1.08	3.48			
	-0.01	-0.01	-0.03	-0.03	0.00	-0.01	-0.10	0.05			
Insight Everest - Int'l Eq (notional)	0.57	0.43	1.26	1.26	4.45	4.34	1.07	1.47	07/01/2006	3,254,262	
Currency Hedge Benchmark - Int'l Eq Value Added	0.59	0.44	1.30	1.30	4.46	4.36	1.18	1.56			
	-0.02	-0.01	-0.04	-0.04	-0.01	-0.02	-0.11	-0.09			
Insight Oxygen - HY (notional)	0.38	0.80	1.19	1.19	5.38	4.32	0.41	0.36	07/01/2015	418,140	
Currency Hedge Benchmark - HY Value Added	0.33	0.79	1.13	1.13	4.93	3.80	0.01	-0.02			
	0.05	0.01	0.06	0.06	0.45	0.52	0.40	0.38			
Insight Nevada - Infra (notional)	0.22	0.75	0.85	0.85	4.85	4.70	N/A	-0.41	12/01/2015	446,647	
Currency Hedge Benchmark - Infra Value Added	0.21	0.73	0.85	0.85	4.92	4.70	N/A	-0.30			
	0.01	0.02	0.00	0.00	-0.07	0.00	N/A	-0.11			
Insight Sierra - REIT (notional)	0.48	0.58	1.29	1.29	4.05	3.93	N/A	0.05	12/01/2015	214,597	
Currency Hedge Benchmark - REIT Value Added	0.48	0.58	1.30	1.30	4.12	4.02	N/A	0.16			
	0.00	0.00	-0.01	-0.01	-0.07	-0.09	N/A	-0.11			
Insight Wilson - PE (notional) Unlagged	0.21	0.87	1.32	1.32	5.47	4.51	N/A	2.18	04/01/2016	153,376	
PE Currency Hedge Benchmark (unlagged) Value Added	0.21	0.88	1.34	1.34	5.46	4.48	1.68	2.23			
	0.00	-0.01	-0.02	-0.02	0.01	0.03	N/A	-0.05			

As of September 30, 2018

Supplemental Reporting - Notional Internal Portfolios

	Performance (%)										Allocation
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$000)		
PSERS U.S. Long Treasuries (unlevered)	-3.25	1.51	-3.47	-3.47	-7.49	-5.66	-0.76	2.55	1,565,610		
Bloomberg Barclays Long Treasury Index (Adjusted) <sup>1</sup>	-3.11	1.43	-3.31	-3.31	-6.89	-4.94	-0.11	N/A			
Value Added	-0.14	0.08	-0.16	-0.16	-0.60	-0.72	-0.65	N/A			
PSERS Total TIPS (unlevered)	-1.05	0.63	-0.92	-0.92	-1.05	0.49	2.61	1.96	1,924,781		
Bloomberg Barclays Global Inflation-Linked: U.S. TIPS (Adjusted) <sup>2</sup>	-1.13	0.64	-1.05	-1.05	-1.52	-0.42	1.52	1.02			
Value Added	0.08	-0.01	0.13	0.13	0.55	0.91	1.09	0.94			
PSERS Infrastructure Index (unlevered)	-0.75	-1.47	-0.50	-0.50	-1.77	0.04	N/A	N/A	1,040,115		
FTSE Developed Core Infrastructure 50/50 Net Tax Index (Adjusted) <sup>3</sup>	-0.79	-1.49	-0.57	-0.57	-2.04	-0.26	8.08	7.01			
Value Added	0.04	0.02	0.07	0.07	0.27	0.30	N/A	N/A			
PSERS Commodity Beta (unlevered)	1.23	-2.16	-2.91	-2.91	-3.46	0.61	0.96	N/A	1,703,240		
Bloomberg Commodity Index Total Return (Adjusted) <sup>3</sup>	1.82	-1.87	-2.31	-2.31	-2.83	1.56	-0.74	-7.58			
Value Added	-0.59	-0.29	-0.60	-0.60	-0.63	-0.95	1.70	N/A			
PSERS Gold Fund (unlevered)	-0.86	-2.18	-5.48	-5.48	-10.52	-9.11	0.68	-2.73	1,700,000		
Bloomberg Gold Subindex Total Return (Adjusted) <sup>4</sup>	-0.85	-2.16	-5.42	-5.42	-10.39	-8.92	0.84	-3.08			
Value Added	-0.01	-0.02	-0.06	-0.06	-0.13	-0.19	-0.16	0.35			
PSERS REIT Index (unlevered)	-2.13	0.89	-0.49	-0.49	-0.41	3.08	N/A	N/A	459,196		
FTSE EPRA/NAREIT Developed Index (Net) (Adjusted) <sup>5</sup>	-2.16	0.85	-0.59	-0.59	-0.76	2.62	5.53	4.99			
Value Added	0.03	0.04	0.10	0.10	0.35	0.46	N/A	N/A			

<sup>1</sup> Long Treasury: benchmark adjusted to estimate cost of financing using DTCC GCF O/N Repo Index and target leverage ratio of 8:1  
<sup>2</sup> TIPS: benchmark adjusted to estimate cost of financing using 3-month LIBOR and target leverage ratio of 1.65:1  
<sup>3</sup> Infrastructure, Commodities & REITS: benchmark adjusted to estimate cost of financing using 3-month LIBOR and target leverage ratio of 2:1  
<sup>4</sup> Gold: benchmark adjusted to estimate cost of financing using 3-month LIBOR and target leverage ratio of 2:1  
<sup>5</sup> REIT: benchmark adjusted to estimate cost of financing using 3-month LIBOR and target leverage ratio of 2:1

Performance related to the performance calculation methodology within this report. Performance is based on the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.



Asset Allocation

	(\$)	Total Fund	%
<b>PSERS Total Fund Composite</b>	<b>55,485,899</b>		<b>100.0</b>
Total Public Market Composite	42,287,949		76.2
Total Private Market Composites	13,197,950		23.8
<b>Total Public Equity Composite</b>	<b>10,017,583</b>		<b>18.1</b>
Equity Rebalance Account	9,126		0.0
Total US Equity Composite	3,587,947		6.5
Total US Large Cap Composite	2,695,951		4.9
PSERS-S&P 500 Index Composite	2,695,951		4.9
Radcliffe Specialty Finance Debt	351,422		0.6
Total US Small Cap Composite	890,662		1.6
PSERS-S&P 600 Index Composite	444,200		0.8
PSERS-S&P 400 Index Composite	446,463		0.8
PSERS Misc. Equity	1,333		0.0
<b>Total Non-U.S. Equity Composite (hedged)</b>	<b>6,420,511</b>		<b>11.6</b>
Emerging Markets Equity Composite	303,324		0.5
Wasatch EM Small Cap	303,324		0.5
<b>Total Non-U.S. Equity x Emerging Markets Composite</b>	<b>6,117,187</b>		<b>11.0</b>
Insight Everest - Int'l Eq	38,136		0.1
<b>Non-US Large Cap Equity Composite</b>	<b>5,189,927</b>		<b>9.4</b>
PSERS ACWI x US Index Fund	2,477,724		4.5
BlackRock EMAX	462,623		0.8
Baillie Gifford	1,170,292		2.1
Marathon Asset Mgmt	1,125,654		2.0
The Children's Investment Fund, LP	260,765		0.5
BlackRock Global Composite	155,492		0.3
<b>Non-US Small Cap Equity Composite</b>	<b>889,124</b>		<b>1.6</b>
Acadian Asset Mgmt	267,192		0.5
Wasatch Int'l Small Cap	311,464		0.6
Oberweis Asset Mgmt	213,370		0.4
QS Investors	96,939		0.2
Fidelity Institutional Int'l Small Cap	159		0.0
<b>Total Alternative Investments (hedged)</b>	<b>8,145,057</b>		<b>14.7</b>

Alternative investment and real estate investments are valued on a quarter lag.

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Asset Allocation

	(\$)	Total Fund	%
Private Equity	5,378,566		9.7
Insight Wilson - PE	1,448		0.0
Managed Stock Distribution	10,189		0.0
PA Penn Investment Fund - PE Composite	75,870		0.1
PA Penn Investment Fund - PE Internal	2,941		0.0
PA Penn Investment Fund - PE External	72,929		0.1
Woodstream	15,238		0.0
ERT	20,795		0.0
Lasko	9,727		0.0
Evans Network	13,184		0.0
Redzone Robotics	13,985		0.0
Private Debt Composite	1,109,349		2.0
Venture Capital	1,058,030		1.9
Internally Managed PE Composite	511,604		0.9
<b>Total Fixed Income Composite</b>	<b>13,270,144</b>		<b>23.9</b>
Investment Grade Composite	3,513,909		6.3
US Core Plus Fixed Income Composite	2,400,408		4.3
Pugh Capital Management	100,455		0.2
PSERS Active Core Plus Fixed Income	1,242,991		2.2
BlackRock Global Alpha	938,737		1.7
SEI Investment Management	118,225		0.2
Non-U.S. Developed Markets Fixed Income Composite	182,016		0.3
Alliance Bernstein Global Fixed	182,016		0.3
U.S. Treasuries Total Composite	931,484		1.7
PSERS U.S. Treasuries	799,688		1.4
PSERS U.S. Long Treasuries	131,797		0.2
<b>Credit-Related</b>	<b>5,376,784</b>		<b>9.7</b>
Emerging Markets Fixed Income Composite	352,097		0.6
Franklin Templeton Emerging Fixed Income	352,097		0.6
High Yield Fixed Income Composite (hedged)	5,024,687		9.1
Insight Oxygen - HY	-777		0.0

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Asset Allocation

	(\$)	Total Fund	%
<b>Mezzanine High Yield Composite</b>	<b>665,441</b>		<b>1.2</b>
Internally Managed Private Debt Co-Investment	66,854		0.1
<b>Mezzanine High Yield Composite x Internal</b>	<b>598,587</b>		<b>1.1</b>
Carlyle Energy Mezz. Opp. Fund	89,640		0.2
Carlyle Energy Mezz. Opp. Fund II	89,836		0.2
ICG Europe Fund V	81,709		0.1
ICG Europe Fund VI	175,596		0.3
ICG Europe Fund VII	11,548		0.0
Bain Capital Middle Market Credit 2010, L.P.	30,653		0.1
Bain Capital Middle Market Credit 2014, L.P.	119,605		0.2
<b>Opportunistic High Yield Composite</b>	<b>2,177,238</b>		<b>3.9</b>
Apollo European Principal Fund II	75,443		0.1
Apollo European Principal Fund III	37,503		0.1
Bain Capital Credit Opp. Fund IV	58,121		0.1
Bain Capital Distressed and Special Situations 2013	264,286		0.5
Bain Capital Distressed and Special Situations 2016 (A), L.P.	253,951		0.5
TPG Opportunities Partners II, LP	15,843		0.0
TPG Opportunities Partners III, LP	88,941		0.2
TOP NPL (A)	8,975		0.0
TPG TAO	349,813		0.6
Brigade Distressed Value	178,284		0.3
Brigade Structured Credit Offshore Fund	283,186		0.5
Avenue Energy Opportunities Fund	269,329		0.5
Avenue Energy Opportunities Fund II	69,091		0.1
Avenue Europe SS III	224,473		0.4
<b>Real Asset High Yield Composite</b>	<b>650,006</b>		<b>1.2</b>
Mariner/Galton RMBS	189,968		0.3
Galton Onshore Mortgage Recovery Fund III, LP	53,389		0.1
Galton Onshore Mortgage Recovery Fund IV, L.P.	50,061		0.1
Mariner International Infrastructure	86,034		0.2
PIMCO BRAVO Fund III Onshore Feeder, L.P.	92,052		0.2
The Varde Scratch and Dent Fund, LP	86,317		0.2
The Varde Scratch and Dent Fund Feed I-A	62,400		0.1

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## Asset Allocation

	Total Fund	%
	(\$)	
Latitude Management Real Estate Capital IV	29,786	0.1
Senior Loans High Yield Composite	1,532,780	2.8
Cerberus Levered Loan Fund I	5,095	0.0
Cerberus Levered Loan Fund II	117,647	0.2
Cerberus PSERS Levered Loan Opportunities Fund	228,963	0.4
LBC Credit Partners II	12,223	0.0
LBC Credit Partners III	91,005	0.2
LBC-P Credit Fund LP	191,530	0.3
Summit Partners Credit Fund II LP	123,342	0.2
Oaktree Loan Fund 2X, LP	11,441	0.0
Bain Capital Credit Managed Account (PSERS), L.P.	394,672	0.7
Park Square Credit Opportunities	174,442	0.3
Hayfin Special Opportunities Credit LP	99,546	0.2
Hayfin SOF II USD Co-Invest	14,516	0.0
Hayfin SOF II USD LP	68,357	0.1
<b>Inflation Protected</b>	<b>3,963,885</b>	<b>7.1</b>
<b>TIPS Composite (levered)</b>	<b>3,963,885</b>	<b>7.1</b>
Garda Inflation Opportunity Composite (levered)	437,869	0.8
Garda Inflation Opp. Fund CI B (levered)	285,724	0.5
Garda FIRVO Fund Ltd. (TIPS)	152,145	0.3
Bridgewater TIPS (levered)	2,326,235	4.2
PSERS Total TIPS (levered)	1,199,781	2.2
PIMCO Multi-Sector Strategy	413,648	0.7
PSERS Fixed Liquidation	1,918	0.0
<b>Real Assets (levered/hedged)</b>	<b>10,598,578</b>	<b>19.1</b>
<b>Total Infrastructure Composite (levered/hedged)</b>	<b>3,414,580</b>	<b>6.2</b>
Insight Nevada - Infra	-466	0.0
Private Infrastructure Composite	117,031	0.2
PSERS Infrastructure Private	117,031	0.2
Publicly-Traded Infrastructure Composite (levered)	518,631	0.9

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## Asset Allocation

	(\$)	Total Fund	%
PSERS Infrastructure Index (levered)	518,631		0.9
MLP Composite	2,779,384		5.0
PSERS MLP	757,095		1.4
External MLP Composite	2,022,288		3.6
Atlantic Trust	602,134		1.1
Harvest MLP Alpha	801,705		1.4
Salient	618,449		1.1
<b>Commodities Composite (levered)</b>	<b>1,821,082</b>		<b>3.3</b>
PSERS Commodities Composite	846,322		1.5
PSERS Commodity Beta (levered)	532,967		1.0
PIMCO Commodity Alpha Fund	313,355		0.6
Gresham	354,885		0.6
Wellington Management Company	463,524		0.8
Gold Composite	156,350		0.3
PSERS Gold Fund (levered)	156,350		0.3
<b>Total Real Estate (levered/hedged)</b>	<b>5,362,916</b>		<b>9.7</b>
PTRES Composite (levered/hedged)	427,054		0.8
Insight Sierra - REIT	299		0.0
PSERS REIT Index (levered)	237,384		0.4
Security Capital Preferred Growth	189,372		0.3
Private Real Estate	4,935,862		8.9
Private Real Estate x Internal	4,813,441		8.7
Internally Managed Private Real Estate	122,421		0.2
<b>Risk Parity Composite</b>	<b>4,501,309</b>		<b>8.1</b>
PSERS Risk Parity Composite	1,987,714		3.6
PSERS Risk Parity	1,690,088		3.0
PSERS Risk Parity LIBOR	297,626		0.5
Bridgewater All Weather @15%	689,891		1.2
DE Shaw Orienteer HV	684,420		1.2
BlackRock Market Advantage II	500,156		0.9
Bridgewater Optimal	639,128		1.2

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## Asset Allocation

	Total Fund	%
	(\$)	
<b>Total Absolute Return</b>	<b>5,740,133</b>	<b>10.3</b>
Aeolus Property Catastrophe Keystone PF Fund, LP	348,263	0.6
Apollo Aviation/SASOF II LP	6,494	0.0
Apollo Aviation/SASOF III LP	63,844	0.1
Apollo Aviation/SASOF IV LP	43,459	0.1
Bridgewater Pure Alpha Fund II, Ltd.	928,290	1.7
Brigade Leveraged Capital Structures Offshore Fund, Ltd.	330,488	0.6
Capital Structure Investments Offshore Fund, Ltd.	298,065	0.5
Capula Global Relative Value Fund Limited	445,549	0.8
Capula Tail Risk Fund Limited	311,912	0.6
Caspian Keystone Focused Fund, Ltd.	108	0.0
Caspian Select Credit International, Ltd.	258,908	0.5
Garda Fixed Income Relative Value Opportunity Fund Ltd.	417,376	0.8
HS Group Sponsor Fund II, Ltd.	29,066	0.1
Independence Reinsurance Partners Composite	170,586	0.3
Independence Reinsurance Partners Cash	-88	0.0
DaVinci Reinsurance Ltd.	33,883	0.1
Renaissance Medici Fund Ltd.	62,041	0.1
Upsilon Diversified Fund	74,749	0.1
Nephila/Nimbus Weather Fund	109,024	0.2
Nephila/Palmetto Fund Ltd.	215,816	0.4
Oceanwood Investments SPC Co-Invest	24,969	0.0
Oceanwood Opportunities Fund	247,071	0.4
OWS Credit Opportunity Offshore Fund III, Ltd.	275,870	0.5
Perry Partners LP	21,419	0.0
PIMCO PARS/GCOF/MAV Composite	797,033	1.4
PIMCO PARS	270,217	0.5
PIMCO GCOF	291,551	0.5
PIMCO MAV	235,264	0.4
Two Sigma Risk Premia Enhanced Fund, LP	218,203	0.4
Venor Capital Offshore, Ltd.	178,319	0.3
<b>Unallocated Cash &amp; Cash Equivalents</b>	<b>3,212,983</b>	<b>5.8</b>

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Asset Allocation

	(\$)	Total Fund	%
PSERS Cash Management	2,603,010		4.7
PSERS Derivatives Collateral	609,973		1.1
RE Conversions	-		0.0

Schedule of Investable Assets

PSERS Total Fund Composite vs. Blended Policy (Total Plan)

Periods Ending	Beginning Market Value (\$'000)	Contributions (\$'000)	Withdrawals (\$'000)	Net Cash Flow (\$'000)	Gain/Loss (\$'000)	Ending Market Value (\$'000)	%Return
Jun-2013	-	-	-	-	-	49,016,578.10	-
Sep-2013	49,016,578.10	4,636,922.82	6,172,104.01	-1,535,181.19	1,389,685.21	48,871,082.12	2.9
Dec-2013	48,871,082.12	5,867,242.37	6,252,435.21	-385,192.84	1,653,594.99	50,139,484.27	3.4
Mar-2014	50,139,484.27	4,406,958.92	5,416,004.58	-1,009,045.66	1,795,946.40	50,926,385.02	3.6
Jun-2014	50,926,385.02	7,554,255.99	8,049,348.85	-495,092.86	2,129,620.59	52,560,912.74	4.2
Sep-2014	52,560,912.74	5,613,796.98	6,298,432.85	-684,635.87	305,731.96	52,182,008.83	0.6
Dec-2014	52,182,008.83	9,486,756.02	10,202,396.23	-715,640.21	73,636.67	51,540,005.29	0.1
Mar-2015	51,540,005.29	10,008,587.78	10,707,898.63	-699,310.86	1,458,105.84	52,298,800.27	2.8
Jun-2015	52,298,800.27	5,787,431.23	6,620,947.13	-833,515.90	-71,189.47	51,394,094.90	-0.5
Sep-2015	51,394,094.90	8,230,771.92	9,673,052.94	-1,442,281.03	-1,975,325.66	47,976,488.21	-3.9
Dec-2015	47,976,488.21	7,625,267.24	8,688,588.51	-1,063,321.26	-34,282.61	46,878,884.34	-0.1
Mar-2016	46,878,884.34	5,942,062.19	6,052,023.77	-109,961.58	686,046.88	47,454,969.63	1.5
Jun-2016	47,454,969.63	5,626,818.39	6,000,209.13	-373,390.75	1,890,250.48	48,971,829.36	4.0
Sep-2016	48,971,829.36	5,501,625.43	6,080,823.79	-579,198.36	1,805,042.28	50,197,673.28	3.7
Dec-2016	50,197,673.28	6,462,818.85	6,783,275.18	-320,456.32	613,829.27	50,491,046.22	1.3
Mar-2017	50,491,046.22	4,304,959.51	4,961,133.73	-656,174.21	1,624,051.18	51,458,923.19	3.3
Jun-2017	51,458,923.19	4,192,658.62	4,236,025.27	-43,366.65	848,662.44	52,264,218.98	1.7
Sep-2017	52,264,218.98	4,525,861.55	5,015,428.95	-489,567.40	1,650,241.65	53,424,893.24	3.2
Dec-2017	53,424,893.24	5,197,997.67	5,324,115.82	-126,118.15	1,904,946.52	55,203,721.61	3.6
Mar-2018	55,203,721.61	5,951,560.62	7,081,966.94	-1,130,406.32	77,227.31	54,150,542.60	0.1
Jun-2018	54,150,542.60	4,621,763.51	4,487,735.72	134,027.79	1,126,934.56	55,411,504.95	2.1
Sep-2018	55,411,504.95	6,963,615.22	7,659,714.49	-696,099.27	770,493.30	55,485,898.98	1.4
	49,016,578.10	128,509,732.85	141,763,661.75	-13,253,928.90	19,723,249.78	55,485,898.98	7.5



## Total Public Markets

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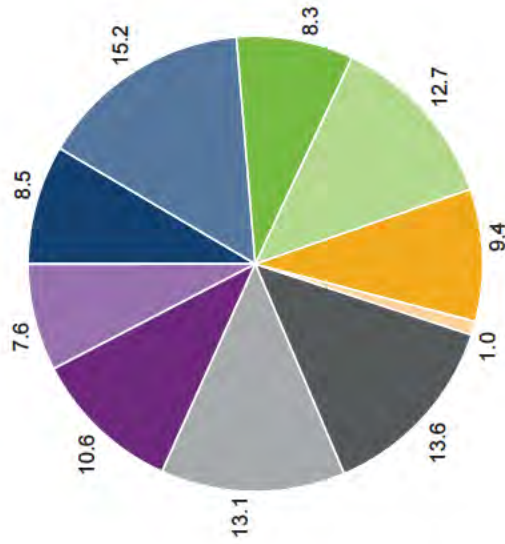
Case ID: 221102792

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Asset Allocation by Asset Class

September 30, 2018 : \$42,287,949



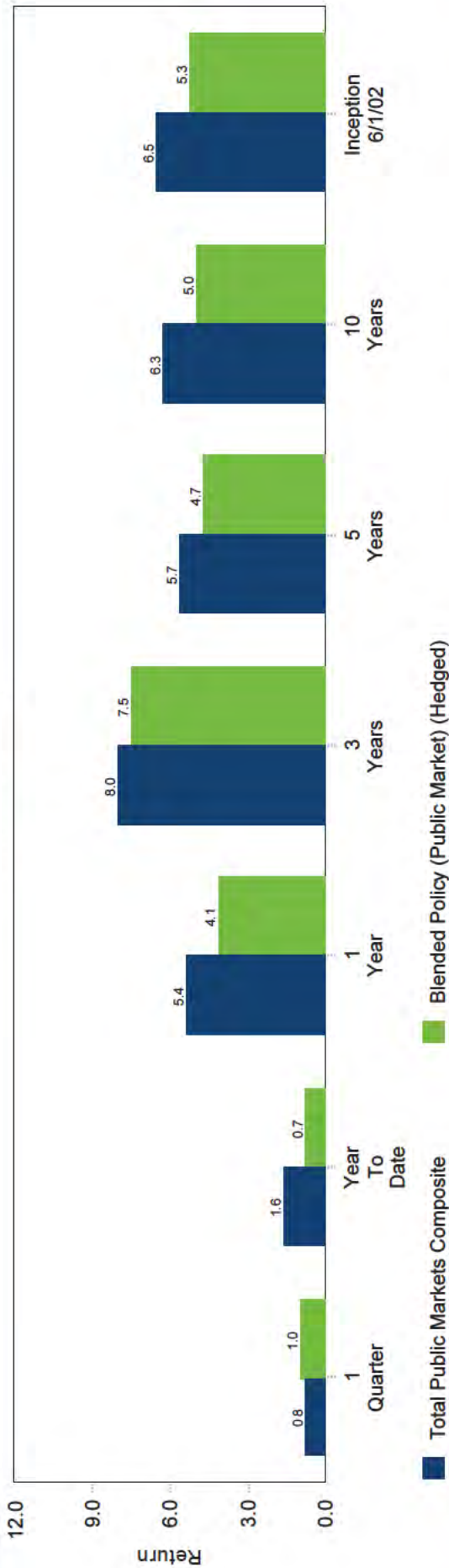
Asset Class	Market Value (\$000)	Allocation (%)
US Equity	3,587,946.7	8.5
Non-US Equity	6,420,511.1	15.2
Investment Grade	3,513,908.5	8.3
Credit-Related	5,376,783.8	12.7
Inflation Protected	3,963,885.2	9.4
PIMCO Multi-Sector Strategy	413,648.3	1.0
Absolute Return	5,740,132.8	13.6
Real Assets x Private Real Estate	5,545,684.6	13.1
Risk Parity	4,501,309.3	10.6
Unallocated Cash & Cash Equivalents	3,212,982.7	7.6
Equity Rebalance Account	9,125.7	0.0
PSERS Fixed Liquidation	1,917.8	0.0
Global Tax Reclaim	82.3	0.0
Income Receivable-Term Managers	-	0.0
PSERS - Misc. Collections	30.4	0.0

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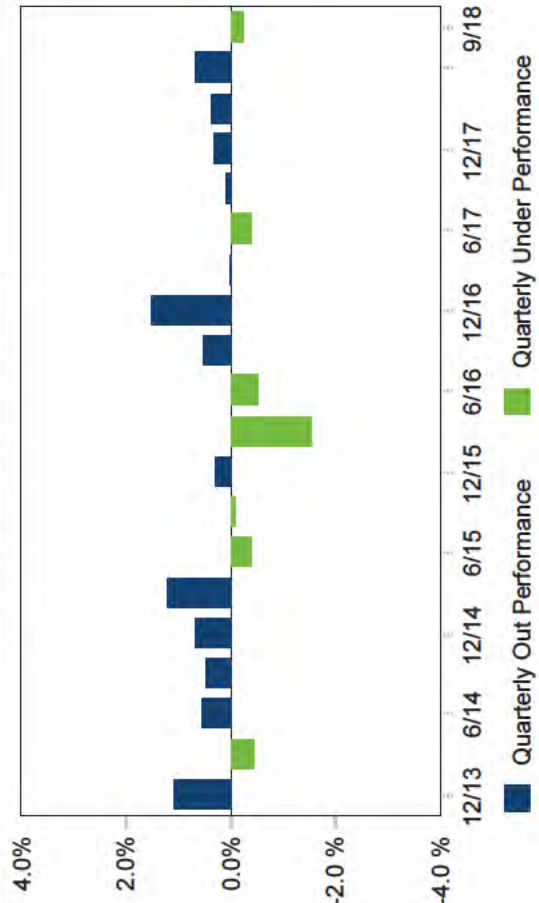


Performance Summary

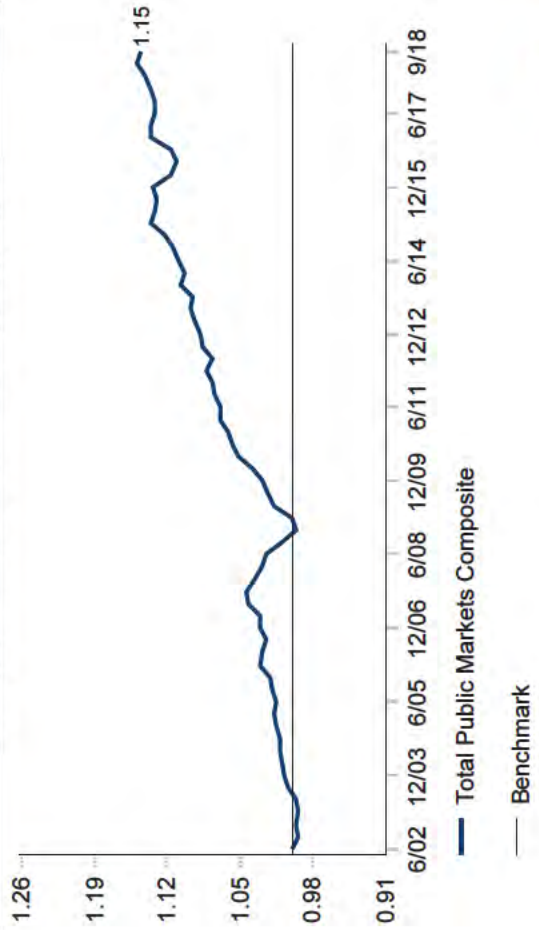
Return Summary



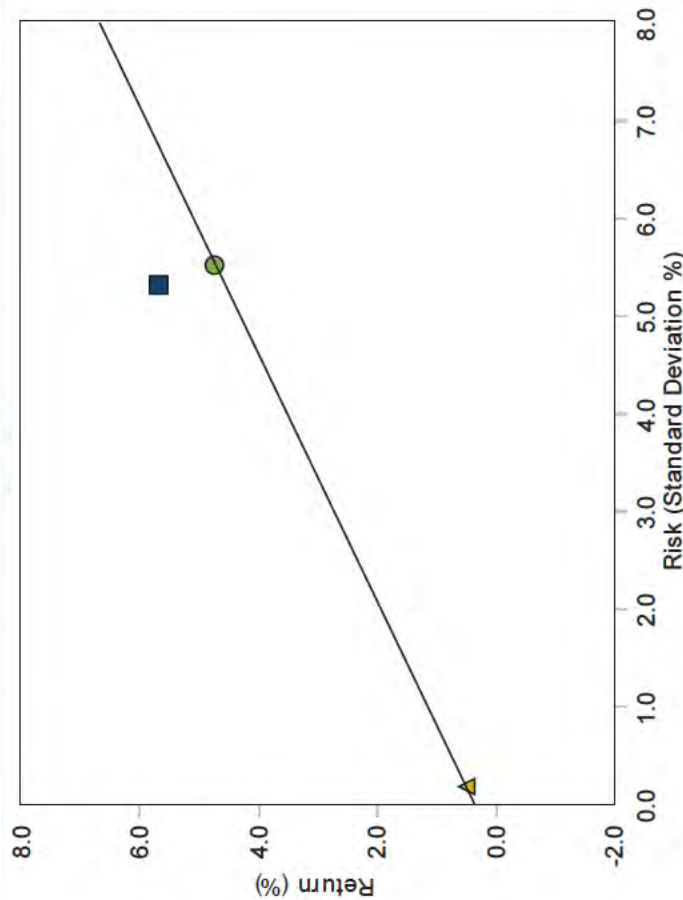
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

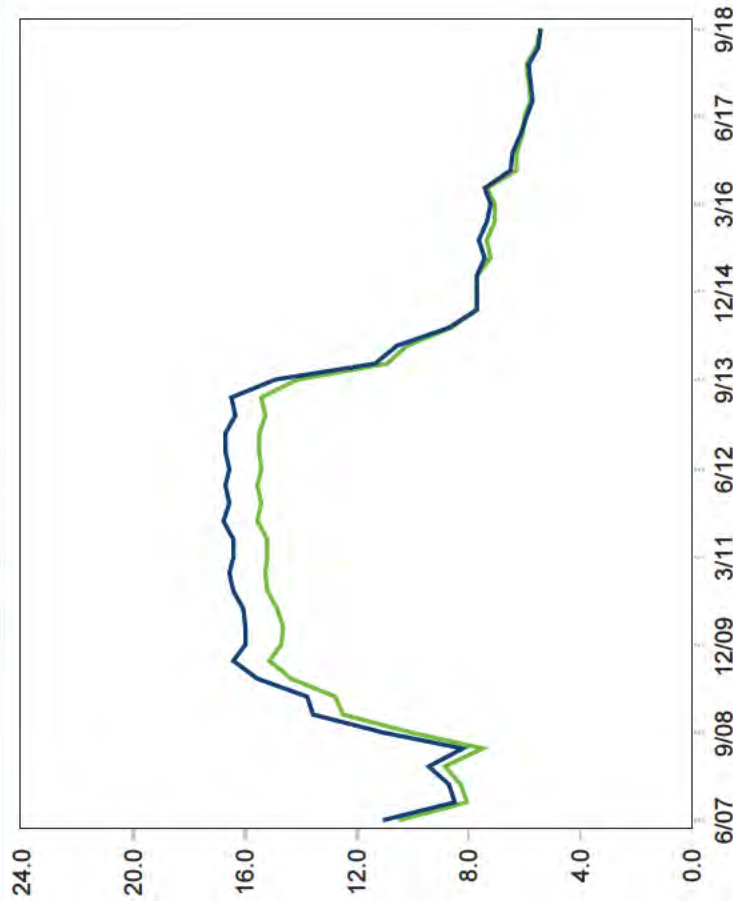


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Total Public Markets Composite
- Blended Policy (Public Market) (Hedged)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Total Public Markets Composite
- Blended Policy (Public Market) (Hedged)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Public Markets Composite	0.89	1.21	0.74	0.95	0.97	1.19	0.94	5.67	5.32	0.98
Blended Policy (Public Market) (Hedged)	0.00	0.00	N/A	1.00	0.78	0.00	1.00	4.72	5.53	1.00
FTSE 3 Month T-Bill	-4.28	5.52	-0.78	0.00	N/A	0.48	0.00	0.49	0.18	0.04

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Empower Results®

## Risk Statistics

## Total Public Markets Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.36	8.04	5.67	6.29	6.58	07/01/2002
Standard Deviation	4.04	3.61	5.40	11.08	11.60	
Downside Risk	1.28	0.67	3.17	7.15	7.43	
Downside Semi Deviation	N/A	N/A	7.98	14.89	14.01	
Max Drawdown Recovery Period	2.00	2.00	6.00	3.00	18.00	
Maximum Drawdown	-1.11	-1.11	-7.86	-23.22	-39.18	
Maximum Loss Exposure	N/A	N/A	N/A	-23.22	-11.76	
Upside Semi Deviation	3.01	5.70	5.92	10.59	11.45	
Blended Policy (Public Market) (Hedged)						
Return	4.13	7.54	4.72	4.96	5.69	
Standard Deviation	3.99	4.08	5.43	10.57	10.97	
Downside Risk	1.75	1.08	3.23	7.02	7.10	
Downside Semi Deviation	N/A	1.27	5.75	12.66	12.40	
Max Drawdown Recovery Period	3.00	3.00	8.00	4.00	20.00	
Maximum Drawdown	-1.51	-1.51	-7.63	-22.45	-36.57	
Maximum Loss Exposure	N/A	-0.09	N/A	-22.45	-11.23	
Upside Semi Deviation	2.64	6.47	6.30	10.24	11.02	

## vs. Blended Policy (Public Market) (Hedged)

Active Return	1.19	0.45	0.91	1.33	0.92	
Tracking Error	0.75	1.48	1.39	1.31	1.25	
Actual Correlation	0.98	0.93	0.97	0.99	1.00	
Beta	0.99	0.83	0.96	1.04	1.05	
Consistency	75.00	66.67	65.00	75.00	70.77	
Down Market Capture	73.56	13.28	75.89	92.62	99.73	
Down Market Outperformance	0.40	2.20	1.58	0.98	-0.03	
Information Ratio	1.58	0.31	0.66	1.02	0.74	
Jensen Alpha	1.20	1.58	1.08	1.12	0.66	
Up Market Capture	114.00	96.53	104.50	108.80	107.83	
Up Market Outperformance	0.82	-0.42	0.54	1.54	1.54	
vs. FTSE 3 Month T-Bill						
Excess Return	3.76	7.06	5.20	6.45	5.86	
Excess Risk	4.10	3.71	5.39	11.13	11.62	
Sharpe Ratio	0.91	1.90	0.96	0.58	0.50	

Calculation based on quarterly periodicity.

Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.

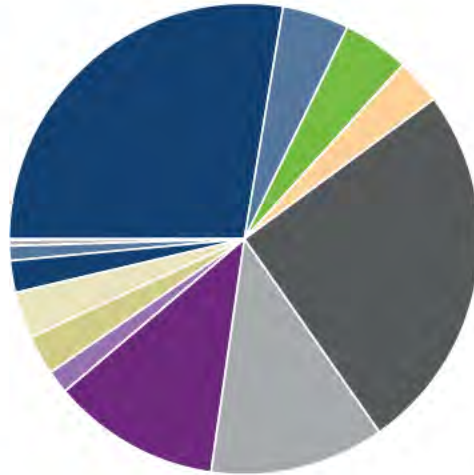


## Total Public Equity

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Asset Allocation by Manager

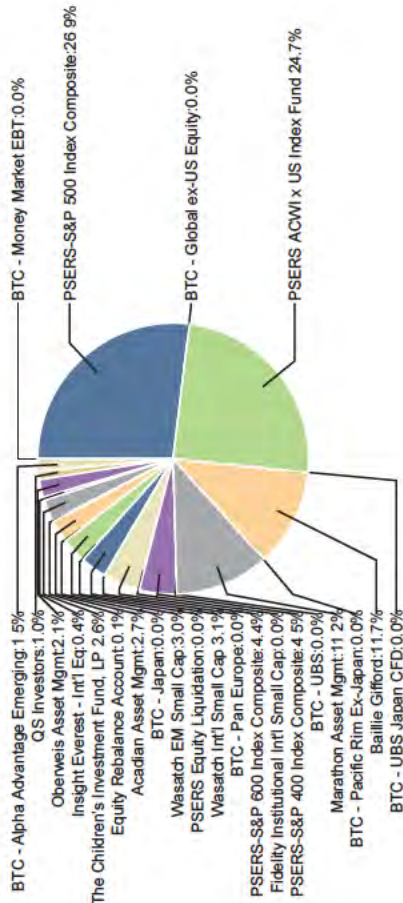
September 30, 2018 : \$9,756,818



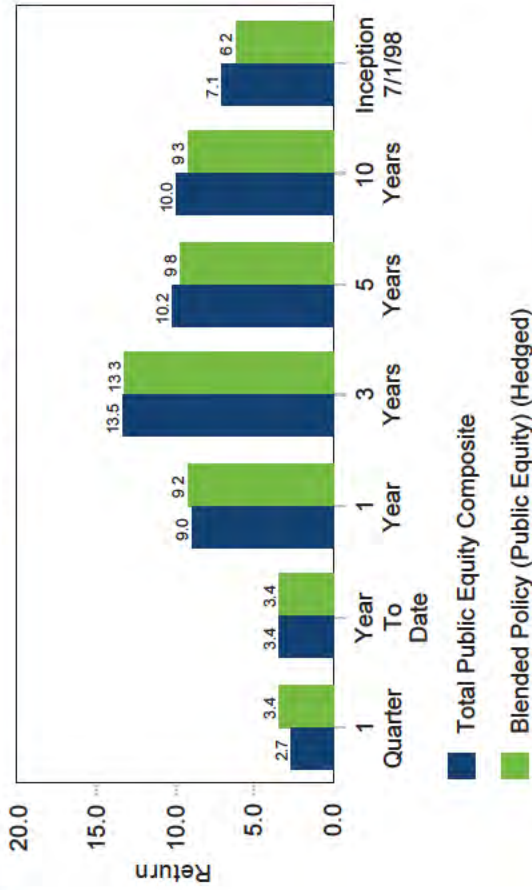
	Market Value (\$000)	Allocation (%)
PSERS-S&P 500 Index Composite	2,695,951.3	27.6
PSERS-S&P 400 Index Composite	446,462.9	4.6
PSERS-S&P 600 Index Composite	444,199.5	4.6
PSERS Equity Liquidation	1,333.0	0.0
PSERS - Trading Error	-	0.0
Wasatch EM Small Cap	303,324.3	3.1
PSERS ACWI x US Index Fund	2,477,724.1	25.4
Baillie Gifford	1,170,291.7	12.0
Marathon Asset Mgmt	1,125,654.2	11.5
BlackRock Global Composite	155,491.8	1.6
Acadian Asset Mgmt	267,192.1	2.7
Wasatch Int'l Small Cap	311,463.9	3.2
Oberweis Asset Mgmt	213,370.0	2.2
QS Investors	96,939.2	1.0
Fidelity Institutional Int'l Small Cap	158.9	0.0
Insight Everest - Int'l Eq	38,136.0	0.4
Equity Rebalance Account	9,125.7	0.1

Current Allocation

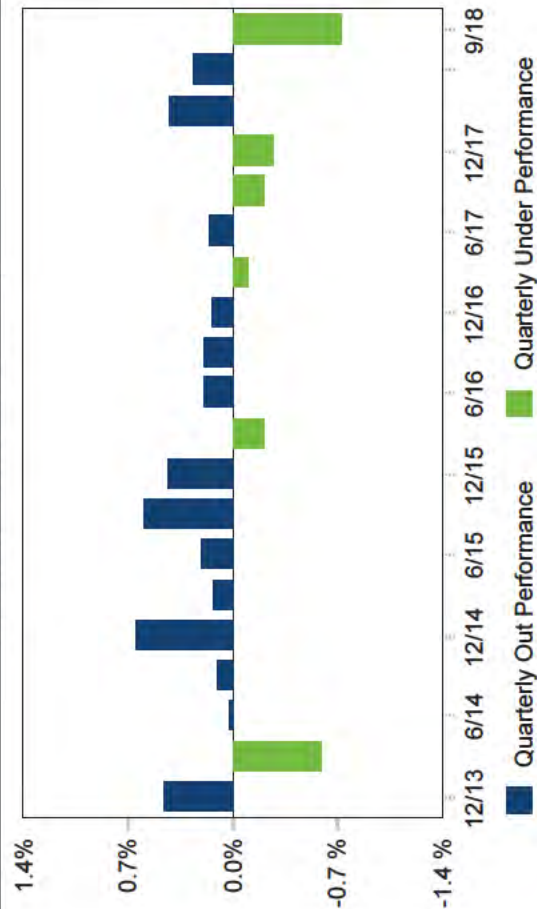
September 30, 2018 : \$10,018M



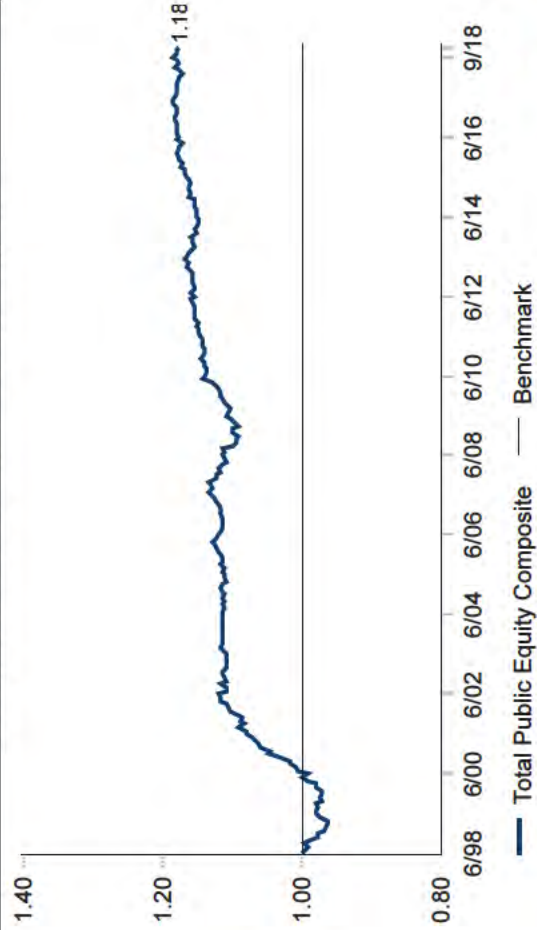
Return Summary



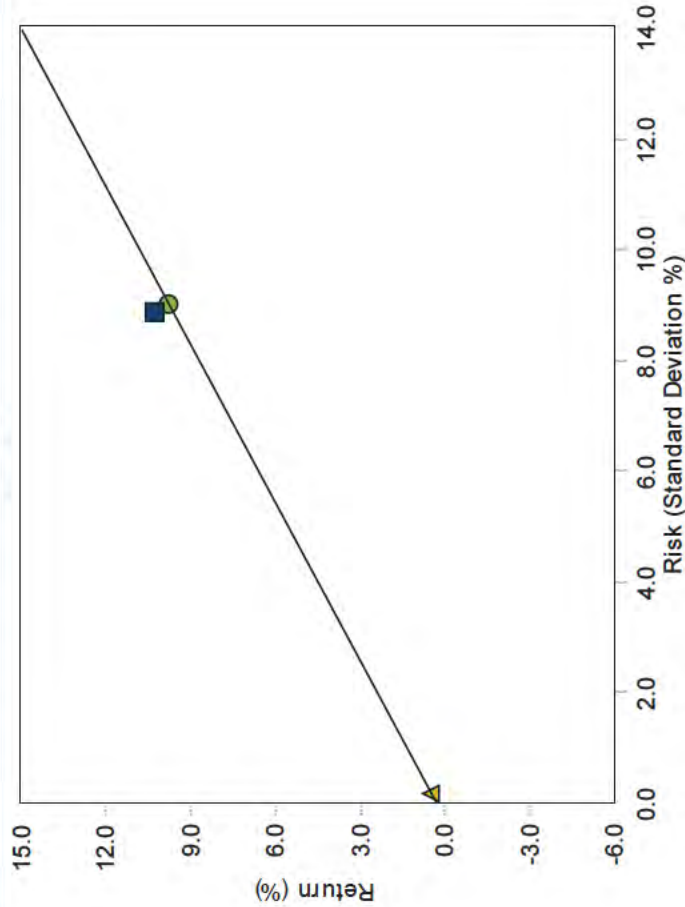
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

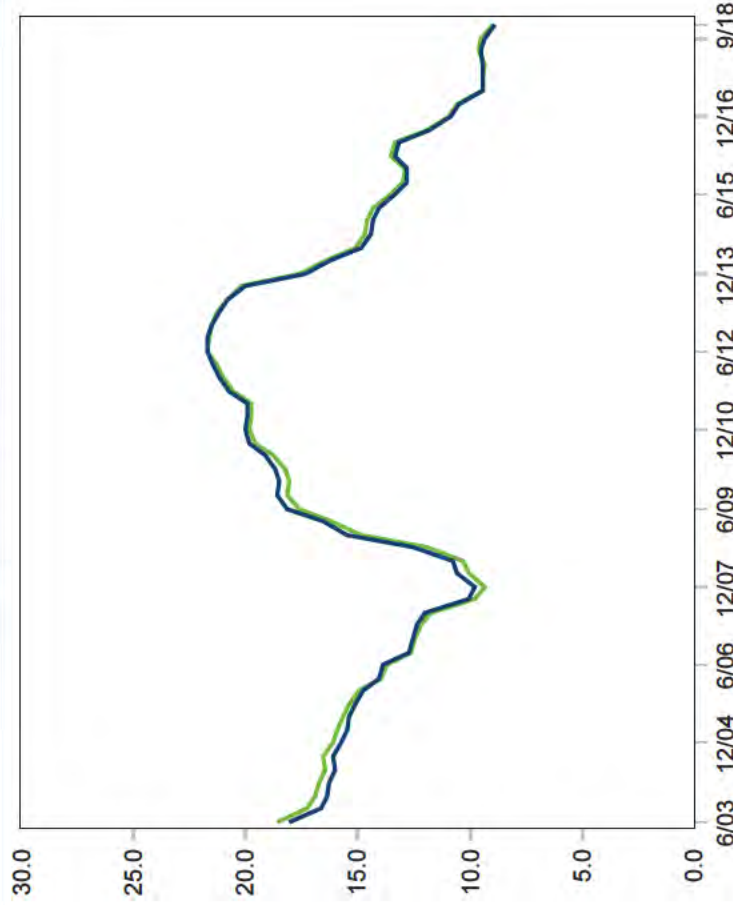


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Total Public Equity Composite
- Blended Policy (Public Equity) (Hedged)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Total Public Equity Composite
- Blended Policy (Public Equity) (Hedged)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Public Equity Composite	0.39	0.91	0.42	0.99	1.09	0.58	0.98	10.23	8.90	0.99
Blended Policy (Public Equity) (Hedged)	0.00	0.00	N/A	1.00	1.03	0.00	1.00	9.80	9.03	1.00
FTSE 3 Month T-Bill	-9.29	9.02	-1.03	0.00	N/A	0.48	0.00	0.49	0.18	0.04

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## Risk Statistics

Total Public Equity Composite	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.95	13.46	10.23	10.01	7.06	07/01/1998
Standard Deviation	6.54	8.29	8.90	15.44	15.40	
Downside Risk	3.80	4.28	5.34	10.45	10.83	
Downside Semi Deviation	2.57	2.59	9.94	18.26	17.67	
Max Drawdown Recovery Period	N/A	8.00	19.00	11.00	63.00	
Maximum Drawdown	-4.64	-9.12	-13.14	-34.96	-54.73	
Maximum Loss Exposure	N/A	-1.84	N/A	-34.96	-16.79	
Upside Semi Deviation	2.01	9.35	9.25	14.46	14.21	
Blended Policy (Public Equity) (Hedged)						
Return	9.24	13.33	9.80	9.27	6.20	
Standard Deviation	7.48	8.59	9.03	15.59	15.51	
Downside Risk	4.39	4.49	5.46	10.60	10.95	
Downside Semi Deviation	2.97	2.90	10.48	18.28	17.66	
Max Drawdown Recovery Period	N/A	8.00	19.00	11.00	65.00	
Maximum Drawdown	-5.50	-9.17	-14.06	-34.90	-53.33	
Maximum Loss Exposure	N/A	-2.12	N/A	-34.90	-23.94	
Upside Semi Deviation	2.25	9.38	9.17	14.57	14.29	
vs. Blended Policy (Public Equity) (Hedged)						
Active Return	-0.32	0.09	0.39	0.66	0.80	
Tracking Error	1.25	0.96	0.91	1.07	1.46	
Actual Correlation	0.99	0.99	0.99	1.00	1.00	
Beta	0.87	0.96	0.98	0.99	0.99	
Consistency	41.67	50.00	56.67	60.83	58.85	
Down Market Capture	80.10	93.22	95.24	95.82	96.26	
Down Market Outperformance	1.19	1.01	1.01	1.19	1.07	
Information Ratio	-0.26	0.10	0.42	0.62	0.55	
Jensen Alpha	0.68	0.57	0.57	0.78	0.86	
Up Market Capture	89.84	98.40	100.10	100.16	100.67	
Up Market Outperformance	-1.75	-0.47	0.03	0.09	0.39	
vs. FTSE 3 Month T-Bill						
Excess Return	7.24	12.22	9.68	10.47	6.18	
Excess Risk	6.55	8.31	8.89	15.45	15.44	
Sharpe Ratio	1.10	1.47	1.09	0.68	0.40	

Calculation based on monthly periodicity.

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## US Equity

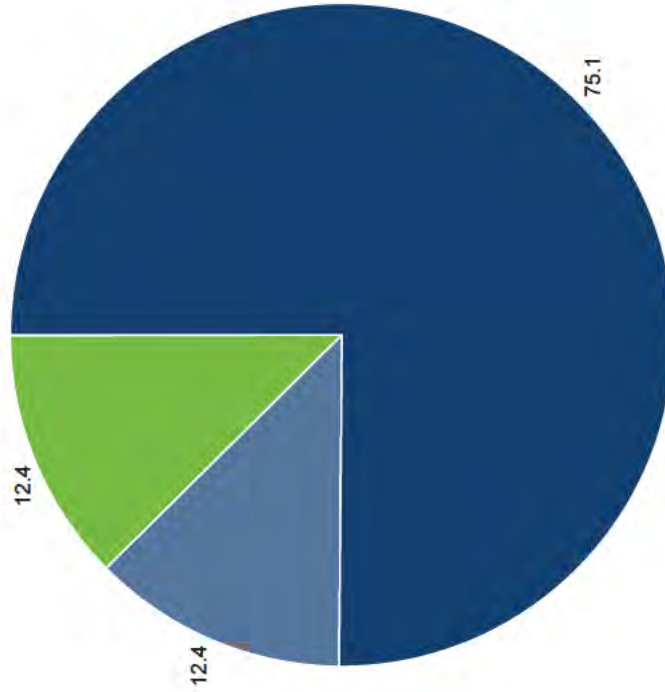
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Case ID: 221102792

Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.

Asset Allocation by Manager

September 30, 2018 : \$3,587,947



Market Value (\$000)	Allocation (%)
2,695,951.3	75.1
446,462.9	12.4
444,199.5	12.4
1,333.0	0.0
-	0.0

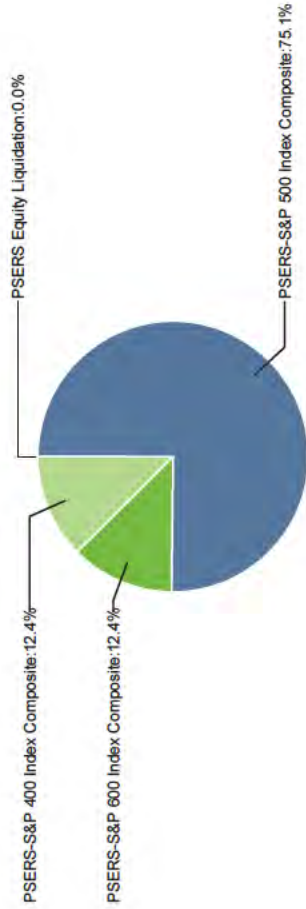
- PSERS-S&P 500 Index Composite
- PSERS-S&P 400 Index Composite
- PSERS-S&P 600 Index Composite
- PSERS Equity Liquidation
- PSERS - Trading Error

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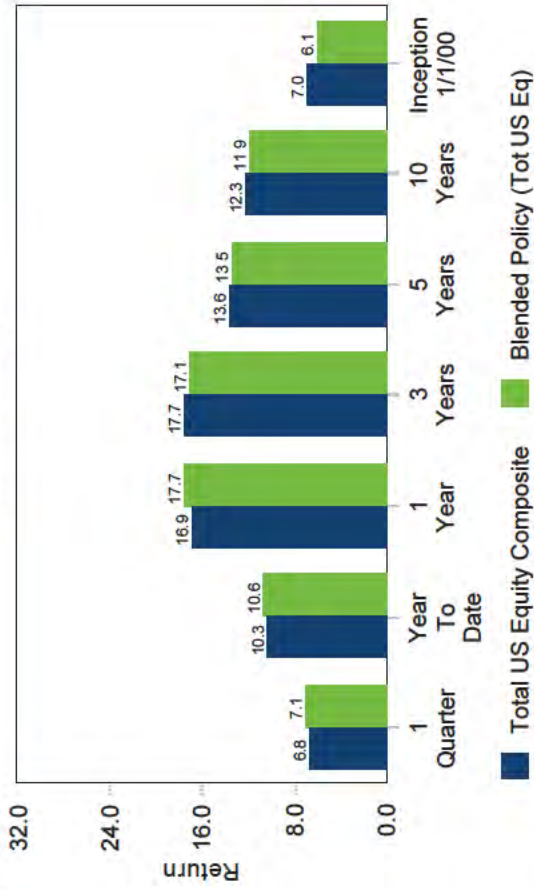


Current Allocation

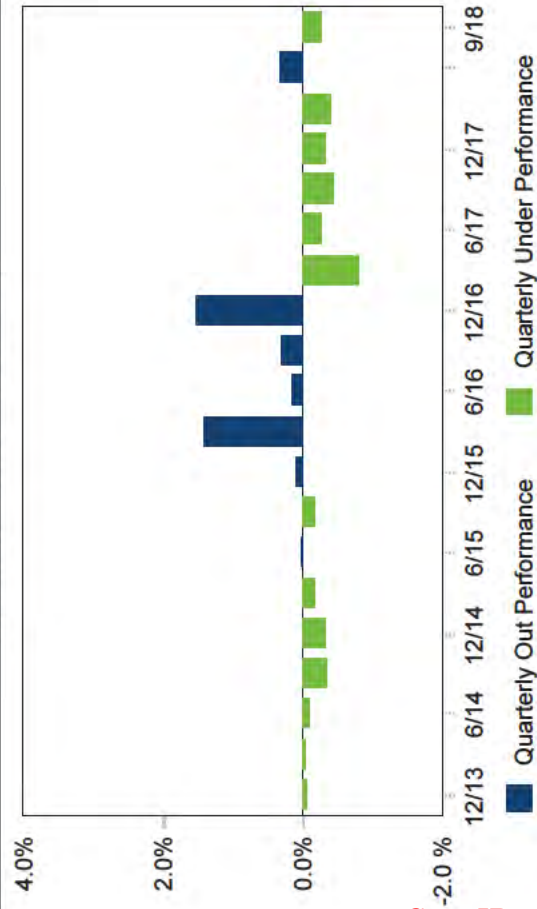
September 30, 2018 : \$3,588M



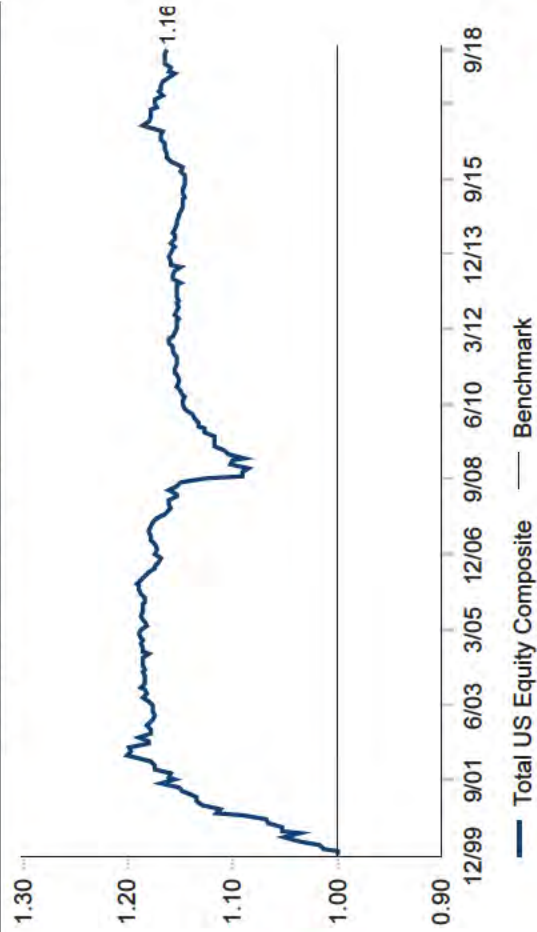
Return Summary



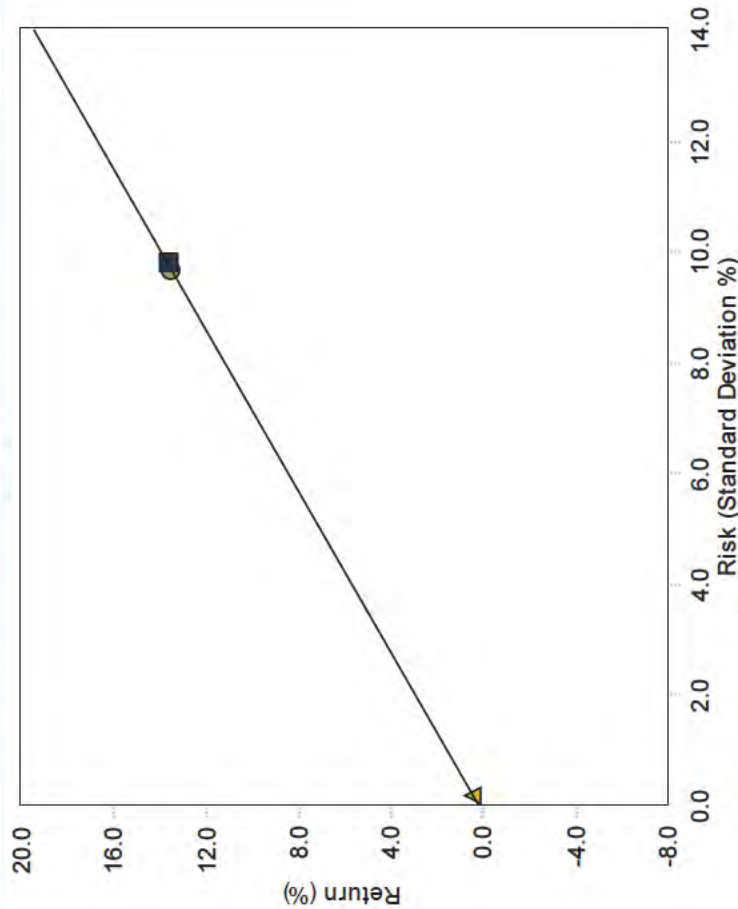
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

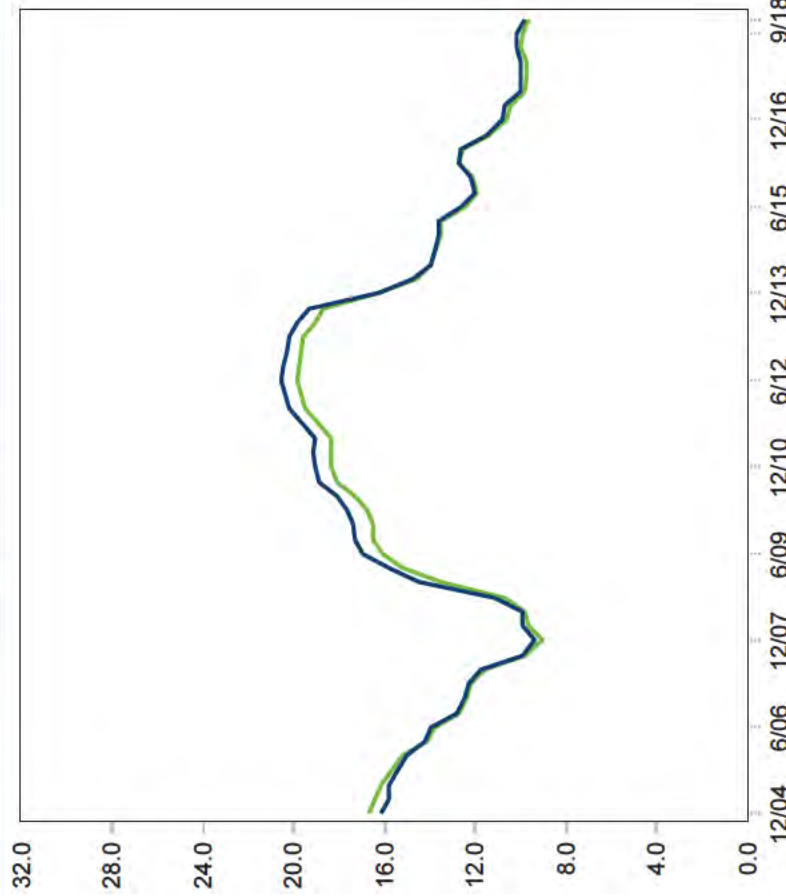


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Total US Equity Composite
- Blended Policy (Tot US Eq)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Total US Equity Composite
- Blended Policy (Tot US Eq)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total US Equity Composite	0.07	1.02	0.07	0.99	1.30	-0.05	1.01	13.59	9.81	0.99
Blended Policy (Tot US Eq)	0.00	0.00	N/A	1.00	1.32	0.00	1.00	13.52	9.67	1.00
FTSE 3 Month T-Bill	-12.71	9.66	-1.32	0.01	N/A	0.47	0.00	0.49	0.18	0.08

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Total US Equity Composite	16.92	17.69	13.59	12.30	6.96	01/01/2000
Return	16.92	17.69	13.59	12.30	6.96	01/01/2000
Standard Deviation	8.71	9.46	9.81	15.26	14.87	
Downside Risk	4.57	4.33	5.19	10.29	10.39	
Downside Semi Deviation	3.09	3.02	9.98	18.98	17.17	
Max Drawdown Recovery Period	6.00	4.00	12.00	17.00	59.00	
Maximum Drawdown	-5.58	-7.06	-8.96	-38.00	-54.02	
Maximum Loss Exposure	N/A	N/A	N/A	-38.00	-31.32	
Upside Semi Deviation	3.00	10.90	10.88	14.20	13.72	
Blended Policy (Tot US Eq)						
Return	17.65	17.14	13.52	11.94	6.11	
Standard Deviation	8.73	9.31	9.67	14.86	14.75	
Downside Risk	4.41	4.49	5.21	9.93	10.34	
Downside Semi Deviation	4.23	3.43	10.70	18.59	17.30	
Max Drawdown Recovery Period	6.00	6.00	12.00	17.00	53.00	
Maximum Drawdown	-5.65	-7.64	-8.87	-36.52	-50.95	
Maximum Loss Exposure	N/A	N/A	N/A	-36.52	-22.86	
Upside Semi Deviation	2.89	10.39	10.43	13.84	13.40	
vs. Blended Policy (Tot US Eq)						
Active Return	-0.63	0.49	0.07	0.39	0.83	
Tracking Error	1.00	1.26	1.02	1.52	1.90	
Actual Correlation	0.99	0.99	0.99	1.00	0.99	
Beta	0.99	1.01	1.01	1.02	1.00	
Consistency	33.33	47.22	41.67	50.00	52.00	
Down Market Capture	98.63	95.26	99.41	99.94	97.58	
Down Market Outperformance	0.07	0.65	0.14	-0.08	0.68	
Information Ratio	-0.63	0.39	0.07	0.26	0.44	
Jensen Alpha	-0.49	0.36	-0.05	0.13	0.84	
Up Market Capture	96.85	101.11	100.15	101.46	101.84	
Up Market Outperformance	-0.86	0.33	0.03	0.73	0.93	
vs. FTSE 3 Month T-Bill						
Excess Return	14.52	16.03	12.79	12.52	6.23	
Excess Risk	8.70	9.47	9.80	15.27	14.94	
Sharpe Ratio	1.67	1.69	1.30	0.82	0.42	

Calculation based on monthly periodicity.

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## Asset Allocation &amp; Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)	%	
<b>Total US Equity Composite</b>	6.83 (32)	10.30 (37)	6.83 (32)	16.92 (35)	17.69 (21)	13.59 (23)	12.30 (27)	6.96 (72)	01/01/2000	3,587,947	100.0	
Blended Policy (Tot US Eq)	7.08 (30)	10.65 (35)	7.08 (30)	17.65 (34)	17.14 (27)	13.52 (24)	11.94 (38)	6.11 (85)				
Value Added	-0.25	-0.35	-0.25	-0.73	0.55	0.07	0.36	0.85				
IM U.S. All Cap Equity (SA+CF) Median	5.74	7.70	5.74	14.54	14.50	11.47	11.25	7.92				
<b>PSERS-S&amp;P 500 Index Composite</b>	7.70 (30)	10.03 (44)	7.70 (30)	16.97 (44)	17.57 (23)	13.99 (27)	12.30 (28)	7.00 (57)	07/01/1998	2,695,951	75.1	
S&P 500 Index	7.71 (30)	10.56 (36)	7.71 (30)	17.91 (34)	17.31 (26)	13.95 (28)	11.97 (34)	6.77 (64)				
Value Added	-0.01	-0.53	-0.01	-0.94	0.26	0.04	0.33	0.23				
IM U.S. Large Cap Equity (SA+CF) Median	6.96	9.32	6.96	16.42	15.67	12.79	11.39	7.16				
<b>PSERS-S&amp;P 400 Index Composite</b>	3.90 (62)	7.54 (52)	3.90 (62)	14.29 (50)	15.96 (26)	12.09 (35)	13.07 (24)	10.75 (16)	07/01/1998	446,463	12.4	
S&P MidCap 400	3.86 (62)	7.49 (52)	3.86 (62)	14.21 (50)	15.68 (29)	11.91 (39)	12.49 (37)	10.38 (23)				
Value Added	0.04	0.05	0.04	0.08	0.28	0.18	0.58	0.37				
IM U.S. Mid Cap Equity (SA+CF) Median	4.76	7.84	4.76	14.19	14.45	11.29	12.04	9.62				
<b>PSERS-S&amp;P 600 Index Composite</b>	4.87 (36)	14.77 (29)	4.87 (36)	19.27 (31)	20.14 (15)	13.98 (11)	13.98 (17)	10.54 (23)	05/01/1998	444,200	12.4	
S&P SmallCap 600	4.71 (37)	14.54 (30)	4.71 (37)	19.08 (31)	19.41 (19)	13.32 (15)	12.86 (29)	9.65 (39)				
Value Added	0.16	0.23	0.16	0.19	0.73	0.66	1.12	0.89				
IM U.S. Small Cap Equity (SA+CF) Median	3.63	9.49	3.63	13.46	16.07	10.79	11.63	9.09				

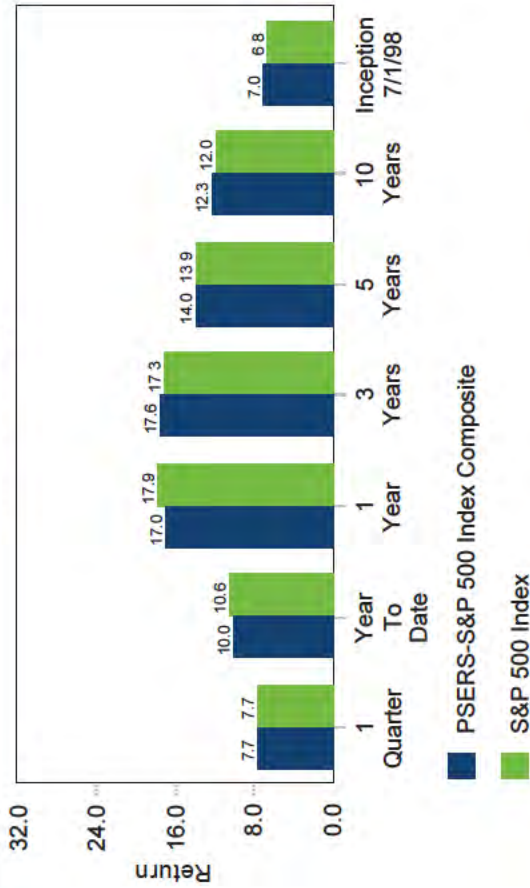
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Performance Summary

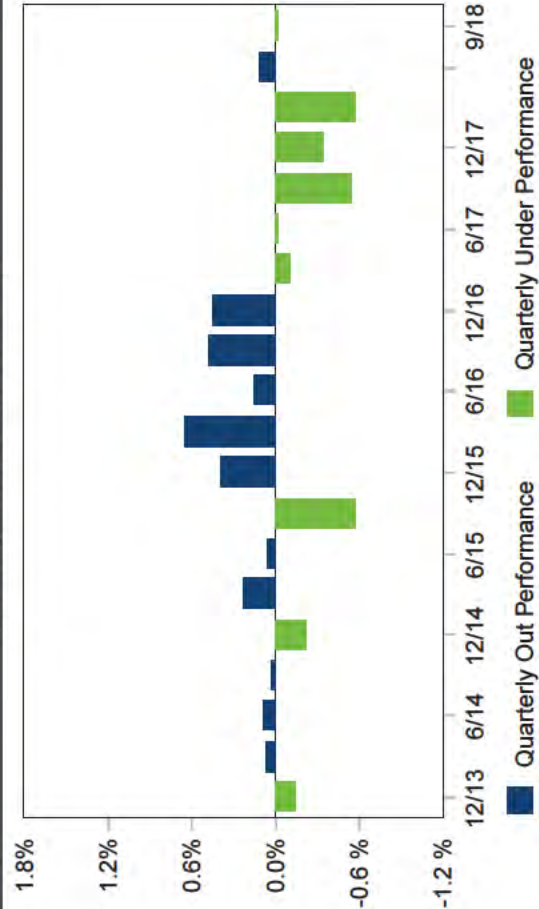
Account Information

Account Name: PSERS-S&P 500 Index Composite  
 Inception Date: 06/01/1998  
 Account Structure: Separate Account  
 Asset Class: US Equity  
 Benchmark: S&P 500 Index  
 Peer Group: IM U.S. Large Cap Equity (SA+CF)

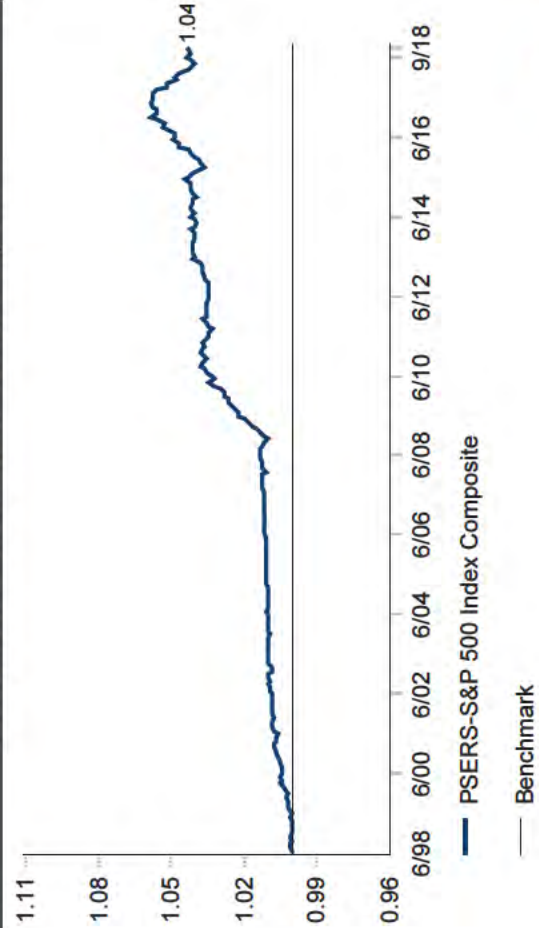
Return Summary



Quarterly Excess Performance

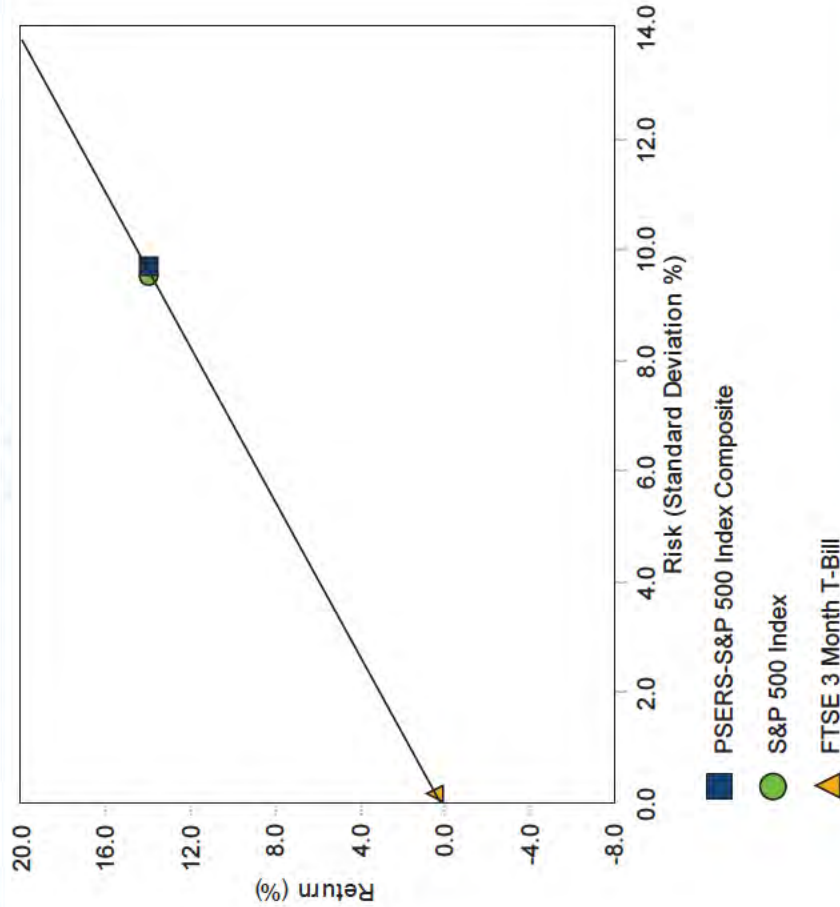


Ratio of Cumulative Wealth - Since Inception

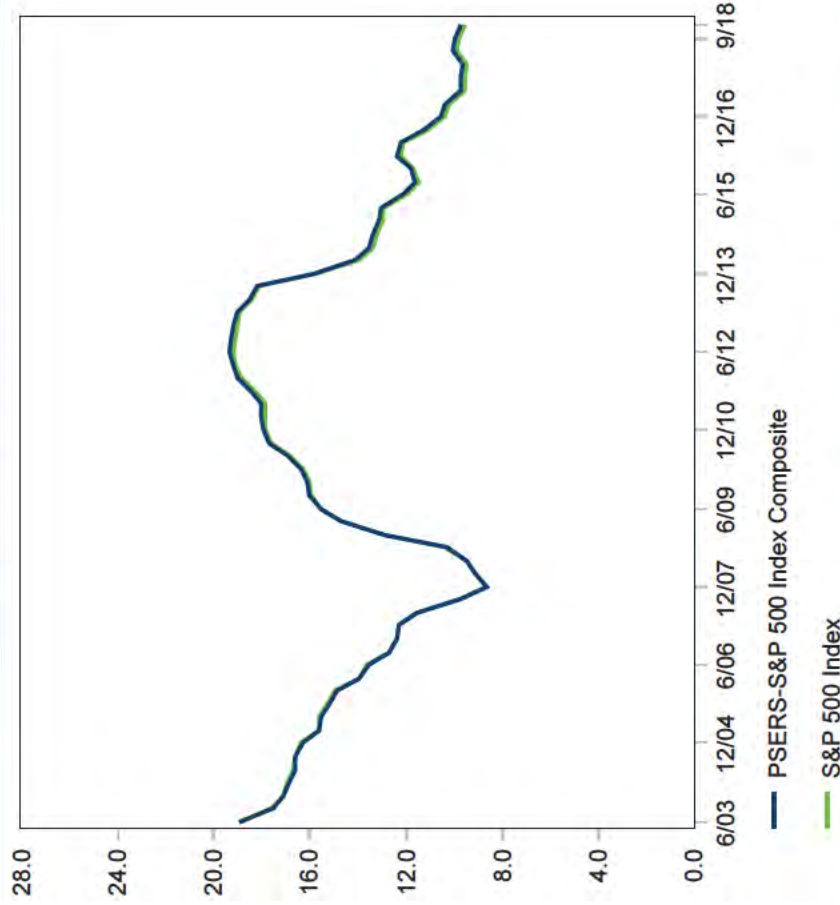




Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS-S&P 500 Index Composite	0.05	0.59	0.09	1.00	1.35	-0.16	1.02	13.99	9.72	1.00
S&P 500 Index	0.00	0.00	N/A	1.00	1.37	0.00	1.00	13.95	9.55	1.00
FTSE 3 Month T-Bill	-13.08	9.54	-1.37	0.01	N/A	0.47	0.00	0.49	0.18	0.08

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Risk Statistics

PSERS-S&P 500 Index Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	16.97	17.57	13.99	12.30	7.00	07/01/1998
Standard Deviation	9.22	9.30	9.72	14.54	14.82	
Downside Risk	5.02	4.21	5.14	9.59	10.22	
Downside Semi Deviation	4.81	3.21	10.54	17.69	17.04	
Max Drawdown Recovery Period	6.00	6.00	11.00	14.00	53.00	
Maximum Drawdown	-6.53	-6.53	-8.93	-36.00	-50.84	
Maximum Loss Exposure	N/A	N/A	N/A	-36.00	-23.19	
Upside Semi Deviation	2.92	10.58	10.60	13.80	13.76	
S&P 500 Index						
Return	17.91	17.31	13.95	11.97	6.77	
Standard Deviation	9.11	9.18	9.55	14.40	14.77	
Downside Risk	4.68	4.16	5.03	9.57	10.23	
Downside Semi Deviation	4.48	3.18	10.32	17.90	17.16	
Max Drawdown Recovery Period	6.00	5.00	10.00	17.00	53.00	
Maximum Drawdown	-6.13	-6.59	-8.36	-36.13	-50.95	
Maximum Loss Exposure	N/A	N/A	N/A	-36.13	-23.93	
Upside Semi Deviation	2.98	10.44	10.46	13.51	13.60	
vs. S&P 500 Index						
Active Return	-0.80	0.24	0.05	0.32	0.22	
Tracking Error	0.61	0.67	0.59	0.50	0.38	
Actual Correlation	1.00	1.00	1.00	1.00	1.00	
Beta	1.01	1.01	1.02	1.01	1.00	
Consistency	41.67	58.33	51.67	59.17	60.91	
Down Market Capture	106.54	100.70	102.31	100.55	99.91	
Down Market Outperformance	-0.40	-0.09	-0.51	-0.16	0.03	
Information Ratio	-1.30	0.36	0.09	0.64	0.58	
Jensen Alpha	-0.95	0.07	-0.16	0.22	0.20	
Up Market Capture	98.32	101.28	101.06	101.54	100.86	
Up Market Outperformance	-0.47	0.41	0.37	0.76	0.44	
vs. FTSE 3 Month T-Bill						
Excess Return	14.61	15.91	13.14	12.41	6.03	
Excess Risk	9.22	9.31	9.71	14.55	14.88	
Sharpe Ratio	1.59	1.71	1.35	0.85	0.41	

Calculation based on monthly periodicity.

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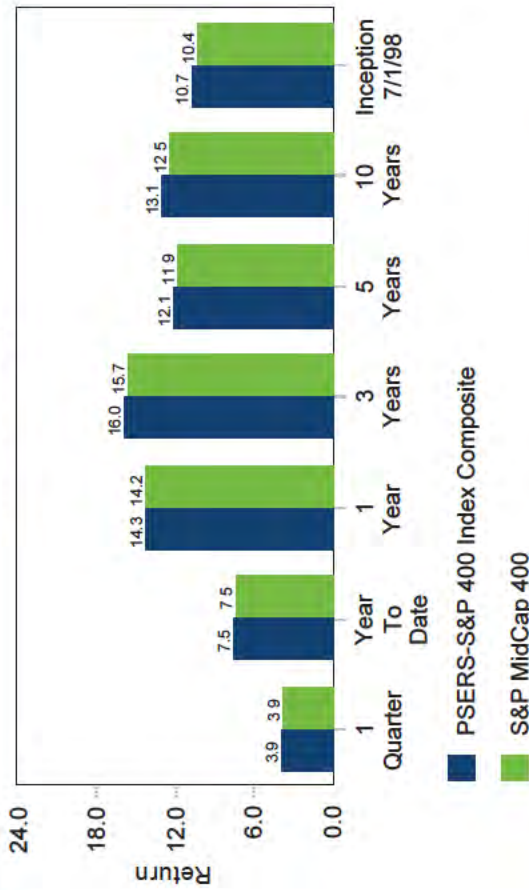


Performance Summary

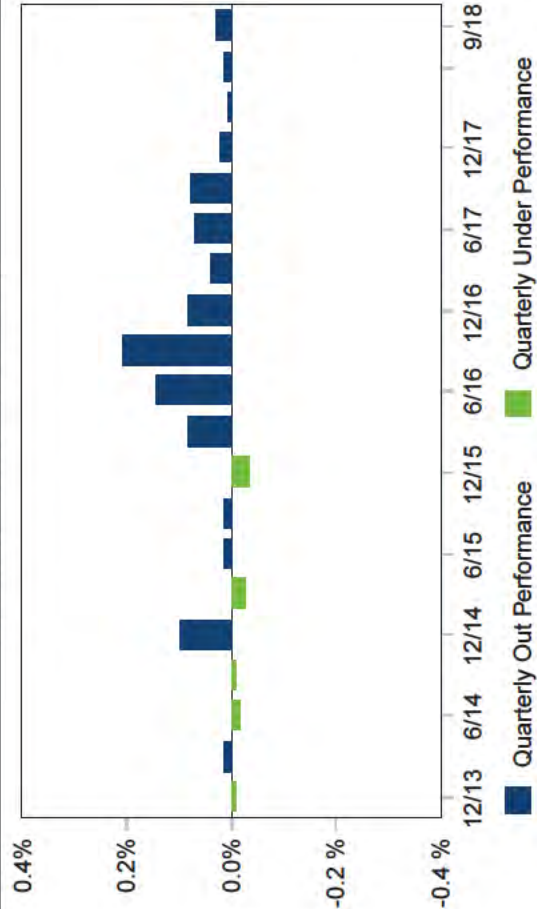
Account Information

Account Name: PSERS-S&P 400 Index Composite  
 Inception Date: 06/01/1998  
 Account Structure: Separate Account  
 Asset Class: US Equity  
 Benchmark: S&P MidCap 400  
 Peer Group: IM U.S. Mid Cap Core Equity (SA+CF)

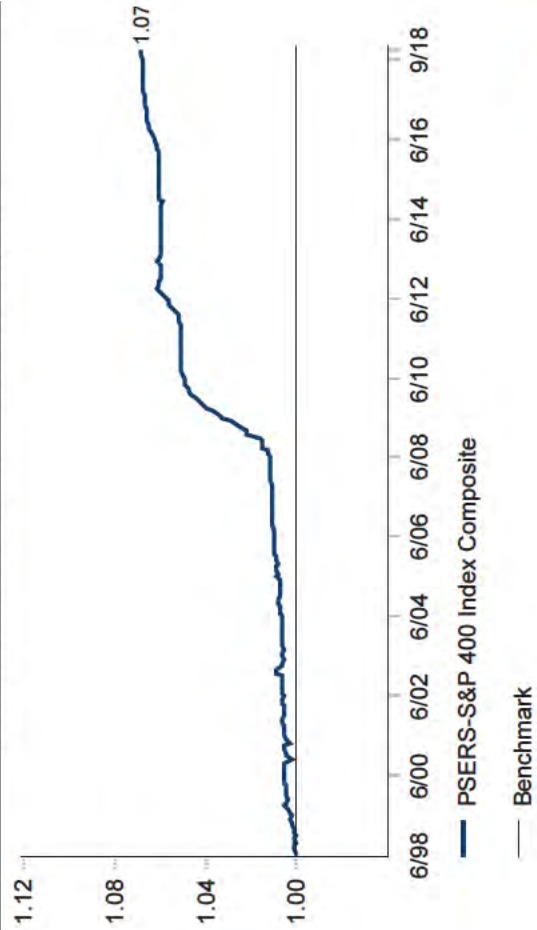
Return Summary



Quarterly Excess Performance

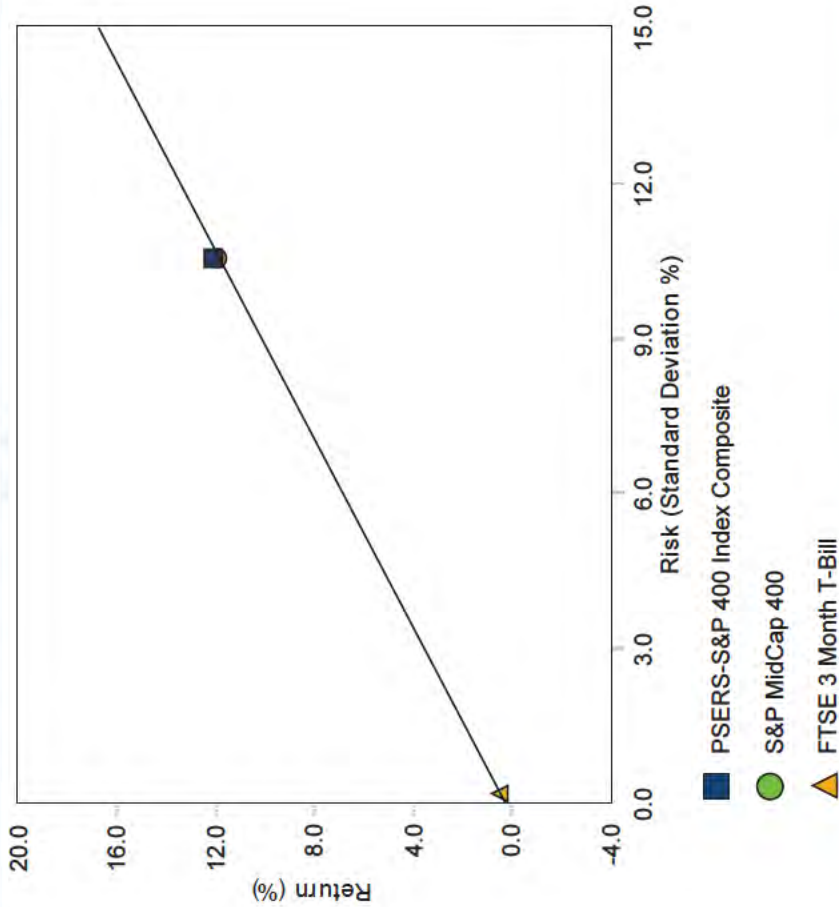


Ratio of Cumulative Wealth - Since Inception

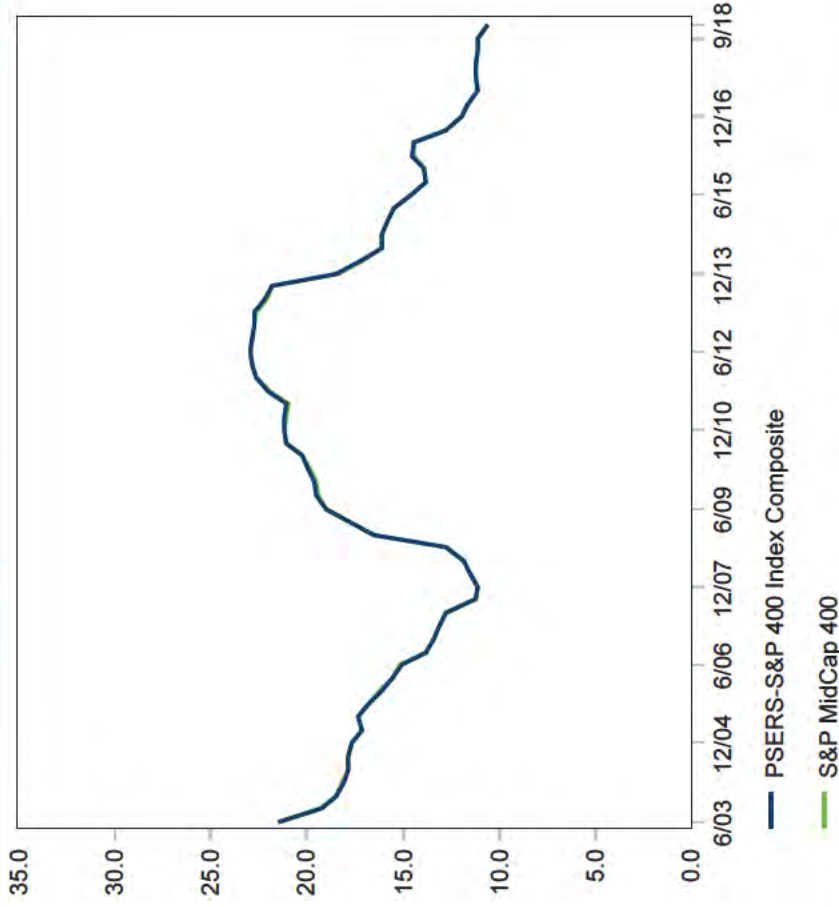


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS-S&P 400 Index Composite	0.17	0.10	1.68	1.00	1.09	0.16	1.00	12.09	10.57	1.00
S&P MidCap 400	0.00	0.00	N/A	1.00	1.08	0.00	1.00	11.91	10.56	1.00
FTSE 3 Month T-Bill	-11.36	10.55	-1.08	0.00	N/A	0.48	0.00	0.49	0.18	0.05

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Risk Statistics

PSERS-S&P 400 Index Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	14.29	15.96	12.09	13.07	10.75	07/01/1998
Standard Deviation	8.34	10.39	10.57	17.09	17.25	
Downside Risk	4.77	5.26	5.93	11.26	11.40	
Downside Semi Deviation	3.23	2.99	10.73	19.67	18.59	
Max Drawdown Recovery Period	4.00	5.00	13.00	14.00	42.00	
Maximum Drawdown	-4.43	-9.61	-12.62	-37.22	-49.07	
Maximum Loss Exposure	N/A	-3.25	N/A	-37.22	-21.65	
Upside Semi Deviation	2.71	11.87	11.44	16.52	17.00	
S&P MidCap 400						
Return	14.21	15.68	11.91	12.49	10.38	
Standard Deviation	8.33	10.37	10.56	17.05	17.25	
Downside Risk	4.78	5.27	5.94	11.32	11.45	
Downside Semi Deviation	3.23	3.00	10.76	19.52	18.68	
Max Drawdown Recovery Period	4.00	5.00	14.00	14.00	43.00	
Maximum Drawdown	-4.43	-9.62	-12.62	-37.64	-49.62	
Maximum Loss Exposure	N/A	-3.24	N/A	-37.64	-21.77	
Upside Semi Deviation	2.70	11.80	11.40	16.45	16.91	
vs. S&P MidCap 400						
Active Return	0.08	0.25	0.17	0.52	0.33	
Tracking Error	0.03	0.10	0.10	0.32	0.30	
Actual Correlation	1.00	1.00	1.00	1.00	1.00	
Beta	1.00	1.00	1.00	1.00	1.00	
Consistency	83.33	75.00	61.67	68.33	63.79	
Down Market Capture	99.69	99.55	99.68	99.19	99.30	
Down Market Outperformance	0.02	0.08	0.07	0.24	0.21	
Information Ratio	2.43	2.52	1.68	1.64	1.11	
Jensen Alpha	0.07	0.22	0.16	0.50	0.33	
Up Market Capture	100.30	100.97	100.64	101.35	100.71	
Up Market Outperformance	0.07	0.39	0.26	0.89	0.50	
vs. FTSE 3 Month T-Bill						
Excess Return	12.19	14.61	11.52	13.51	9.89	
Excess Risk	8.33	10.39	10.56	17.10	17.28	
Sharpe Ratio	1.46	1.41	1.09	0.79	0.57	

Calculation based on monthly periodicity.

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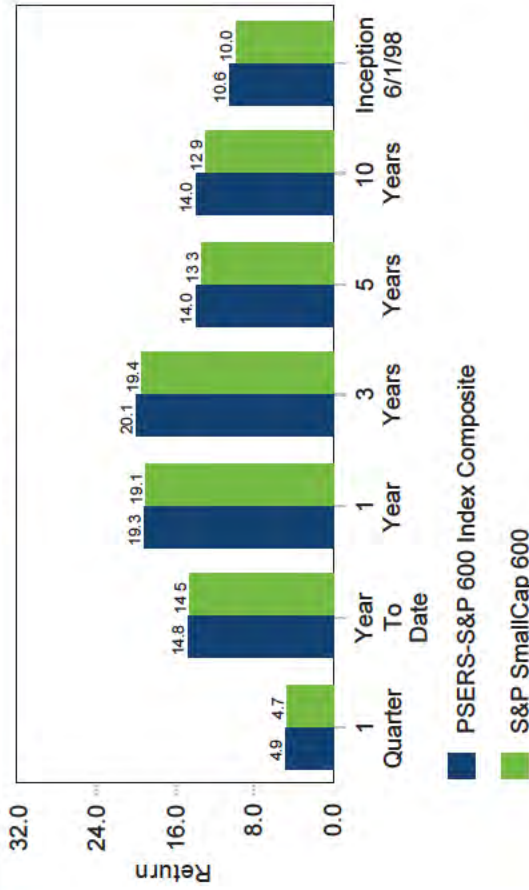


Performance Summary

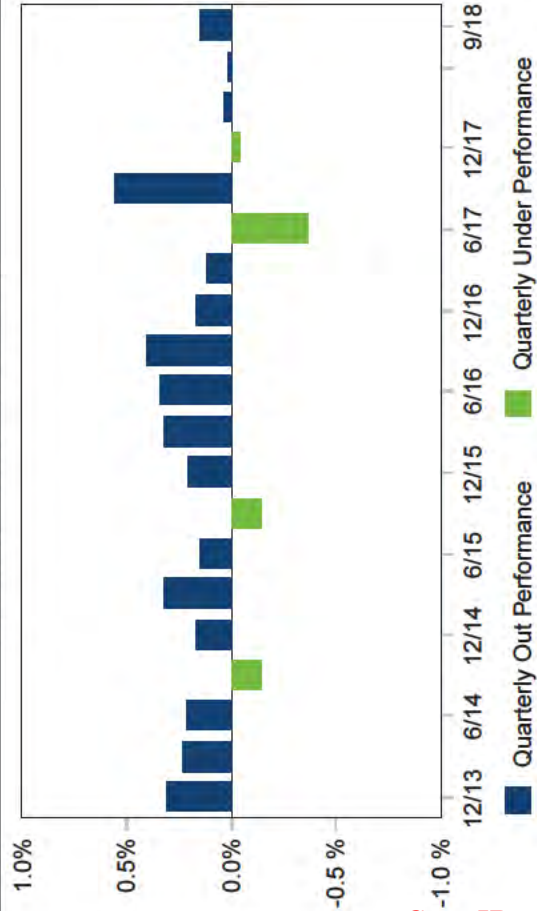
Account Information

Account Name: PSERS-S&P 600 Index Composite  
 Inception Date: 06/30/1998  
 Account Structure: Separate Account  
 Asset Class: US Equity  
 Benchmark: S&P SmallCap 600  
 Peer Group: IM U.S. Small Cap Equity (SA+CF)

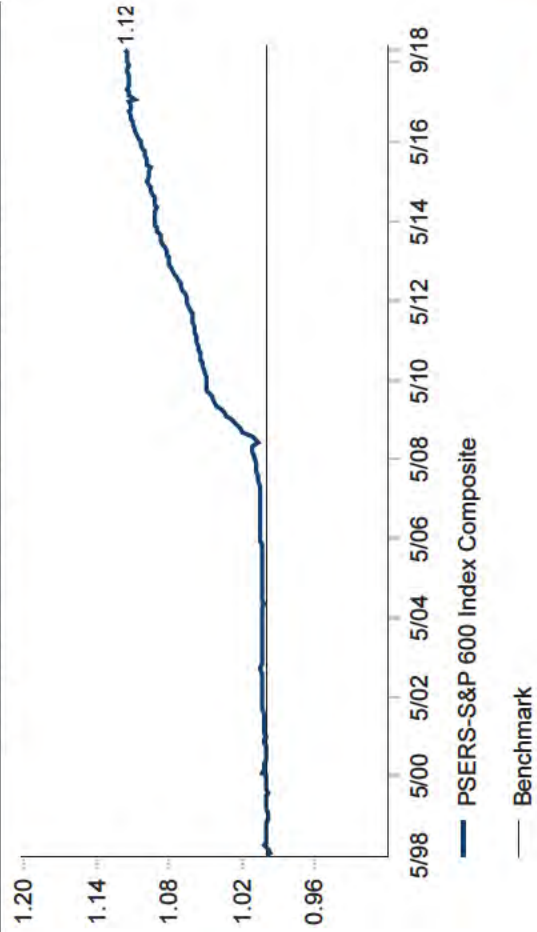
Return Summary



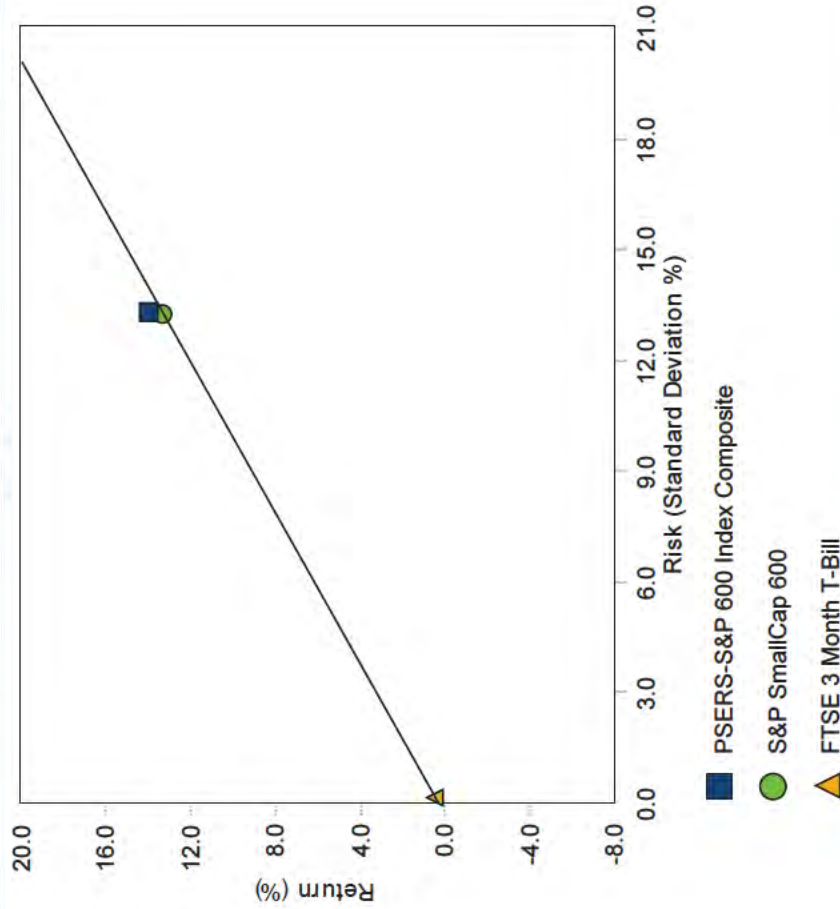
Quarterly Excess Performance



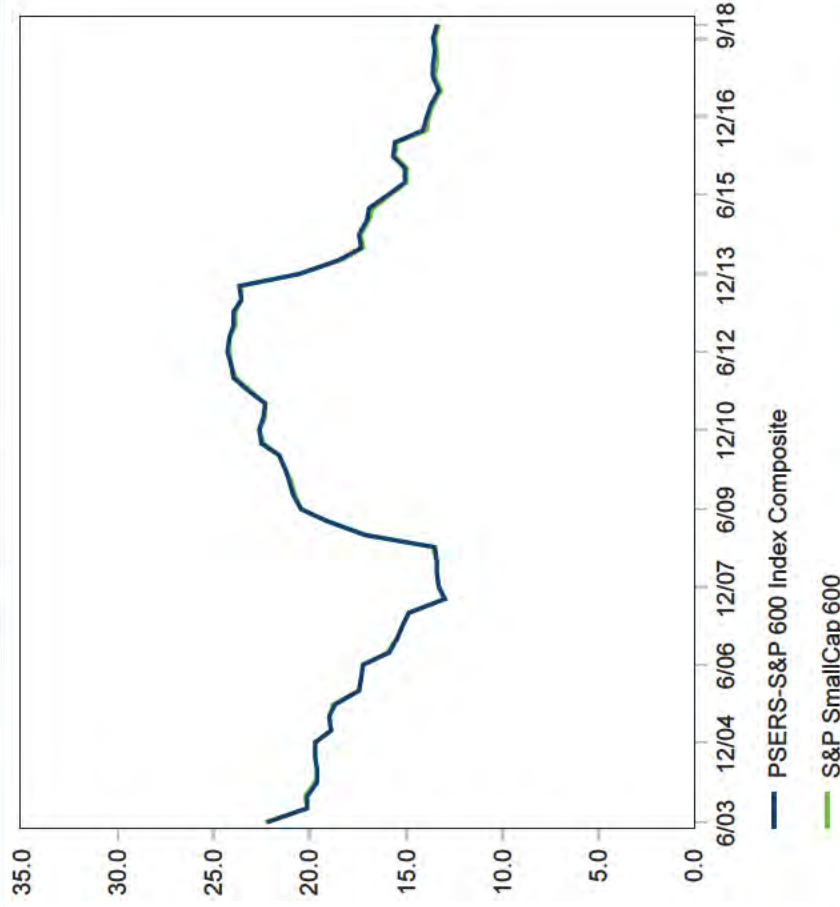
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS-S&P 600 Index Composite	0.59	0.37	1.59	1.00	1.01	0.52	1.01	13.98	13.35	1.00
S&P SmallCap 600	0.00	0.00	N/A	1.00	0.98	0.00	1.00	13.32	13.28	1.00
FTSE 3 Month T-Bill	-12.94	13.26	-0.98	0.01	N/A	0.47	0.00	0.49	0.18	0.10

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Risk Statistics

PSERS-S&P 600 Index Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	19.27	20.14	13.98	13.98	10.58	06/01/1998
Standard Deviation	10.41	13.34	13.35	19.11	18.63	
Downside Risk	5.18	6.25	7.18	12.37	12.40	
Downside Semi Deviation	3.51	3.56	12.66	21.33	20.37	
Max Drawdown Recovery Period	4.00	6.00	12.00	17.00	43.00	
Maximum Drawdown	-3.80	-10.47	-11.46	-41.95	-51.37	
Maximum Loss Exposure	N/A	-2.26	N/A	-41.95	-25.14	
Upside Semi Deviation	3.58	15.47	14.72	18.79	18.12	
S&P SmallCap 600						
Return	19.08	19.41	13.32	12.86	9.99	
Standard Deviation	10.41	13.33	13.28	19.03	18.62	
Downside Risk	5.26	6.35	7.23	12.45	12.48	
Downside Semi Deviation	3.56	3.61	12.73	21.47	20.39	
Max Drawdown Recovery Period	4.00	6.00	13.00	17.00	45.00	
Maximum Drawdown	-3.87	-10.66	-11.70	-42.50	-52.15	
Maximum Loss Exposure	N/A	-2.67	N/A	-42.50	-25.26	
Upside Semi Deviation	3.56	15.31	14.52	18.47	18.01	
vs. S&P SmallCap 600						
Active Return	0.16	0.62	0.59	1.01	0.55	
Tracking Error	0.13	0.42	0.37	0.44	0.38	
Actual Correlation	1.00	1.00	1.00	1.00	1.00	
Beta	1.00	1.00	1.01	1.00	1.00	
Consistency	66.67	77.78	71.67	79.17	66.80	
Down Market Capture	98.70	98.63	99.27	98.91	99.12	
Down Market Outperformance	0.09	0.31	0.19	0.35	0.28	
Information Ratio	1.26	1.49	1.59	2.27	1.42	
Jensen Alpha	0.17	0.62	0.53	0.95	0.54	
Up Market Capture	100.25	101.75	101.95	102.48	101.20	
Up Market Outperformance	0.08	0.97	1.06	1.90	0.93	
vs. FTSE 3 Month T-Bill						
Excess Return	16.68	18.53	13.53	14.67	9.98	
Excess Risk	10.39	13.34	13.34	19.13	18.68	
Sharpe Ratio	1.61	1.39	1.01	0.77	0.53	

Calculation based on monthly periodicity.

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## Non-US Equity

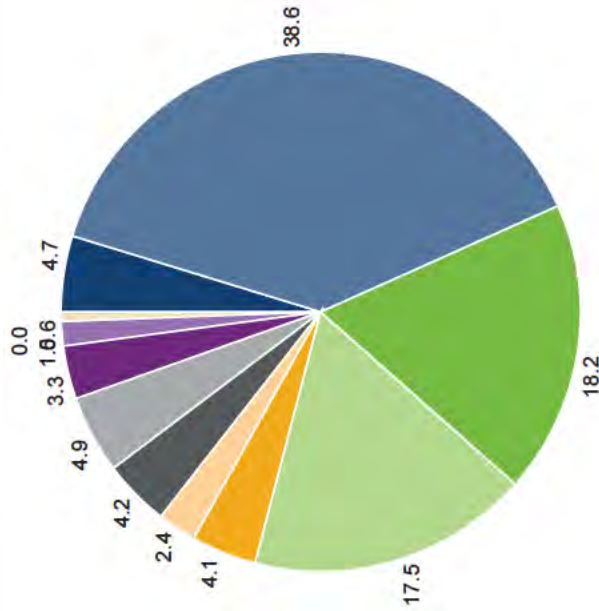
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Case ID: 221102792

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Asset Allocation by Manager

September 30, 2018 : \$6,420,511



Market Value (\$000)	Allocation (%)
303,324.3	4.7
2,477,724.1	38.6
1,170,291.7	18.2
1,125,654.2	17.5
260,765.0	4.1
155,491.8	2.4
267,192.1	4.2
311,463.9	4.9
213,370.0	3.3
96,939.2	1.5
158.9	0.0
38,136.0	0.6

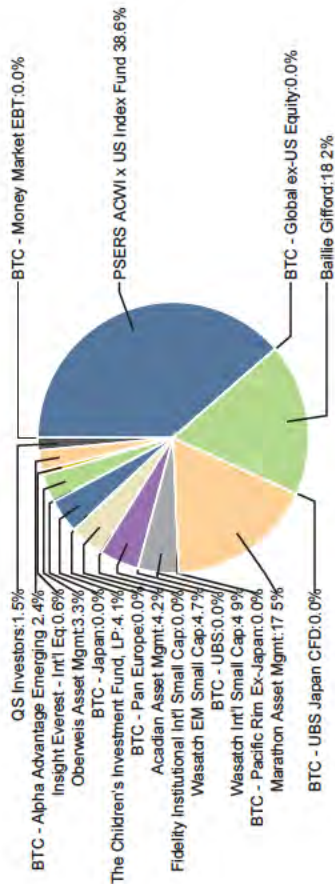
- Wasatch EM Small Cap
- PSERS ACWI x US Index Fund
- Baillie Gifford
- Marathon Asset Mgmt
- The Children's Investment Fund, LP
- BlackRock Global Composite
- Acadian Asset Mgmt
- Wasatch Int'l Small Cap
- Oberweis Asset Mgmt
- QS Investors
- Fidelity Institutional Int'l Small Cap
- Insight Everest - Int'l Eq

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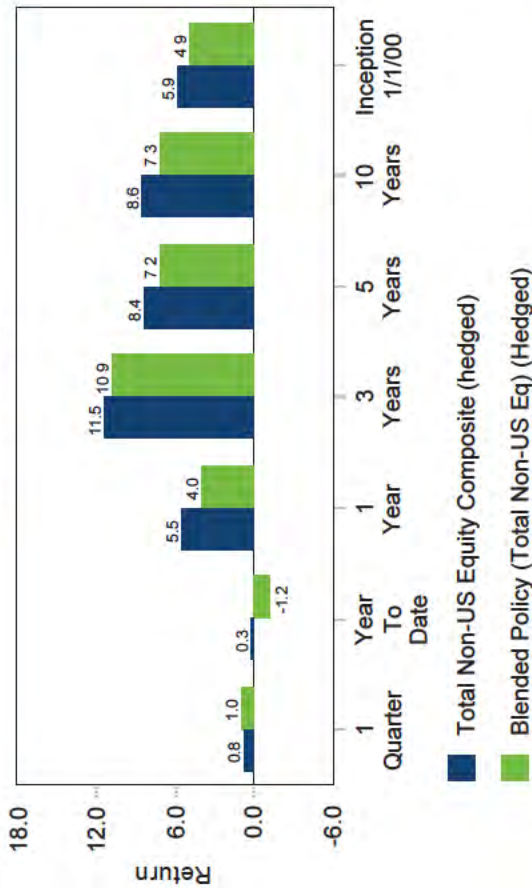


Current Allocation

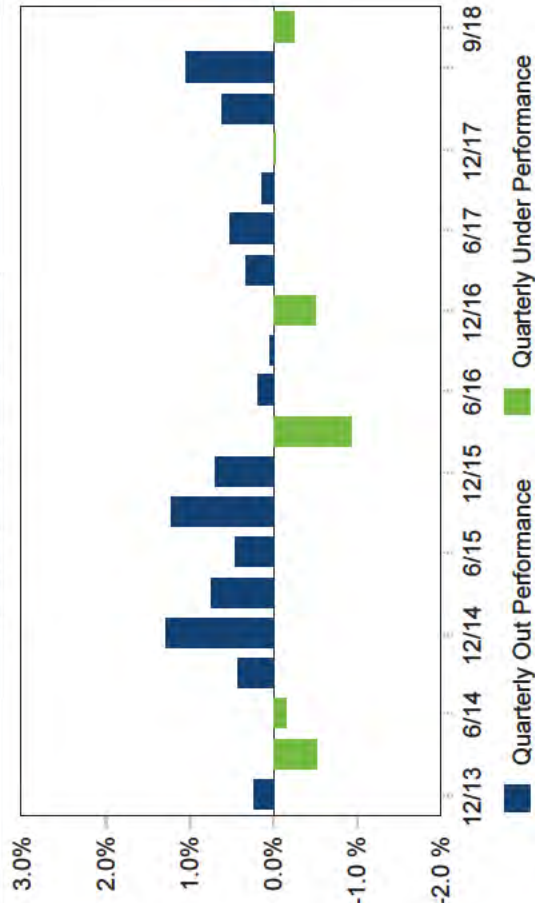
September 30, 2018 : \$6,421M



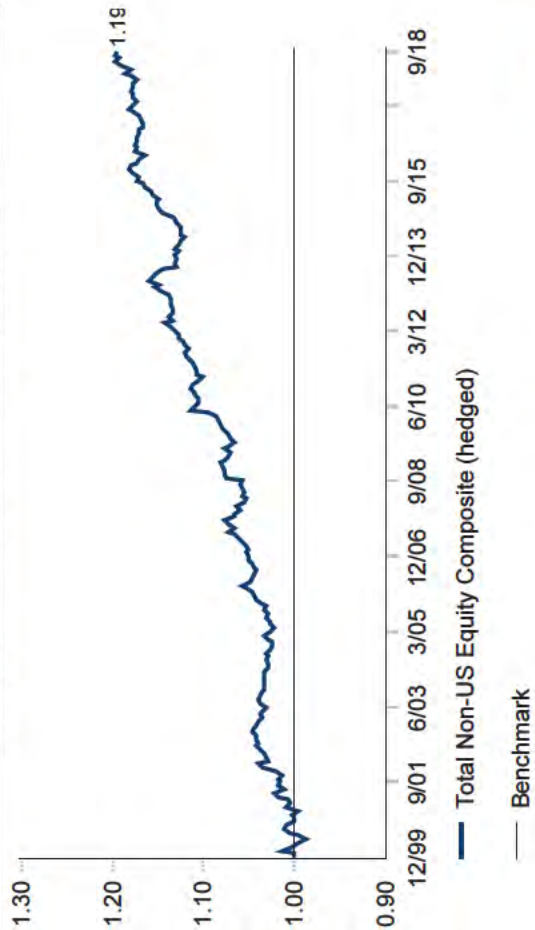
Return Summary



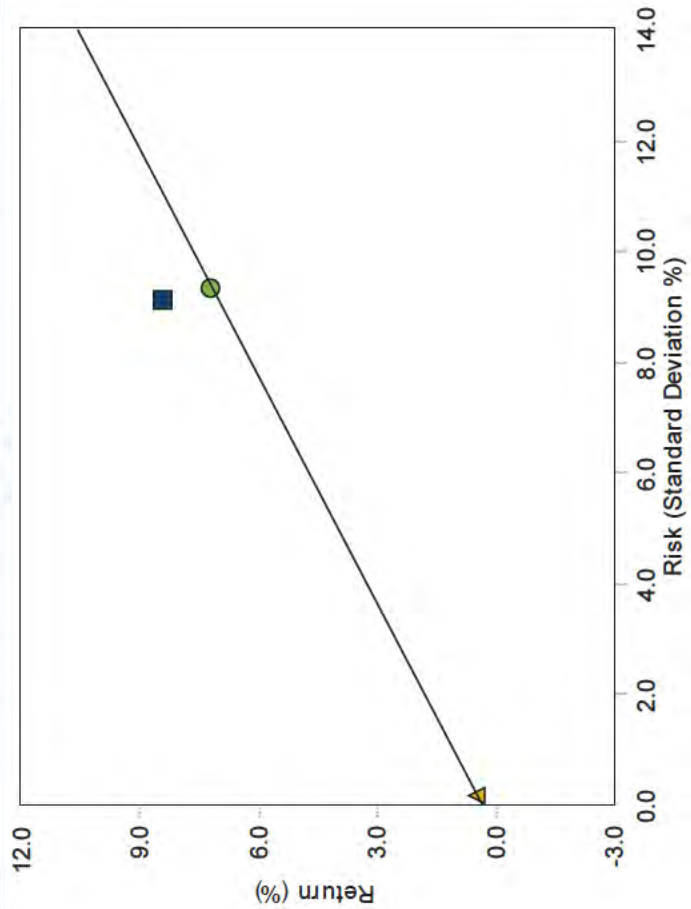
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

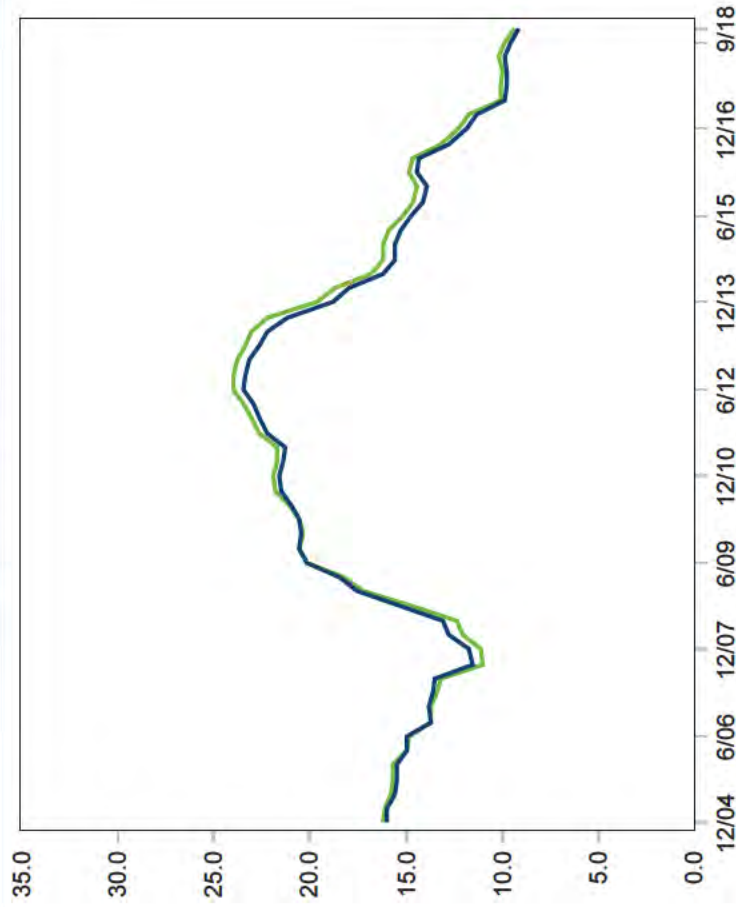


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Total Non-U.S. Equity Composite (hedged)
- Blended Policy (Total Non-US Eq) (Hedged)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Total Non-U.S. Equity Composite (hedged)
- Blended Policy (Total Non-US Eq) (Hedged)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Non-U.S. Equity Composite (hedged)	1.11	1.29	0.86	0.98	0.88	1.36	0.97	8.41	9.15	0.99
Blended Policy (Total Non-US Eq) (Hedged)	0.00	0.00	N/A	1.00	0.74	0.00	1.00	7.20	9.37	1.00
FTSE 3 Month T-Bill	-6.92	9.37	-0.74	0.00	N/A	0.49	0.00	0.49	0.18	0.01

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Empower Results®

## Risk Statistics

## Total Non-U.S. Equity Composite (hedged)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.52	11.54	8.41	8.59	5.87	01/01/2000
Standard Deviation	7.02	8.78	9.15	16.28	16.15	
Downside Risk	4.06	4.81	5.83	10.96	11.35	
Downside Semi Deviation	1.94	2.60	10.86	18.45	18.42	
Max Drawdown Recovery Period	N/A	9.00	21.00	9.00	71.00	
Maximum Drawdown	-4.50	-10.40	-16.05	-32.08	-55.34	
Maximum Loss Exposure	N/A	-3.60	N/A	-32.08	-17.59	
Upside Semi Deviation	2.34	9.73	8.96	15.46	14.87	

## Blended Policy (Total Non-US Eq) (Hedged)

Return	4.04	10.86	7.20	7.27	4.87	
Standard Deviation	8.13	9.06	9.37	16.96	16.37	
Downside Risk	5.08	4.97	6.06	11.59	11.61	
Downside Semi Deviation	2.43	2.68	11.28	18.85	18.73	
Max Drawdown Recovery Period	N/A	9.00	22.00	9.00	74.00	
Maximum Drawdown	-5.62	-10.15	-17.38	-33.63	-55.52	
Maximum Loss Exposure	N/A	-3.62	N/A	-33.63	-18.53	
Upside Semi Deviation	2.53	9.90	8.96	16.11	14.93	

## vs. Blended Policy (Total Non-US Eq) (Hedged)

Active Return	1.34	0.59	1.11	1.11	0.92	
Tracking Error	1.46	1.34	1.29	1.54	1.61	
Actual Correlation	0.99	0.99	0.99	1.00	1.00	
Beta	0.86	0.96	0.97	0.96	0.98	
Consistency	58.33	52.78	60.00	62.50	59.11	
Down Market Capture	73.19	92.45	92.05	92.02	96.79	
Down Market Outperformance	2.48	1.41	1.84	2.39	1.00	
Information Ratio	0.92	0.44	0.86	0.72	0.57	
Jensen Alpha	1.74	1.01	1.34	1.48	1.00	
Up Market Capture	90.67	100.03	102.28	99.09	101.30	
Up Market Outperformance	-1.48	0.03	0.68	-0.48	0.77	

## vs. FTSE 3 Month T-Bill

Excess Return	4.05	10.54	8.03	9.29	5.40	
Excess Risk	7.05	8.80	9.15	16.29	16.21	
Sharpe Ratio	0.57	1.20	0.88	0.57	0.33	

Calculation based on monthly periodicity.

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Asset Allocation & Peer Rankings

	Performance(%)										Allocation Market Value (\$000)
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	%	
<b>Total Non-US Equity Composite (hedged)</b>	0.79 (33)	0.27 (16)	0.79 (33)	5.52 (17)	11.54 (37)	8.41 (13)	8.59 (22)	5.87 (44)	01/01/2000	6,420,511	100.0
Blended Policy (Total Non-US Eq) (Hedged)	1.02 (29)	-1.15 (24)	1.02 (29)	4.04 (25)	10.86 (43)	7.20 (21)	7.27 (37)	4.87 (59)			
Value Added	-0.23	1.42	-0.23	1.48	0.68	1.21	1.32	1.00			
M International Equity (SA+CF) Median	-0.06	-3.63	-0.06	0.68	10.19	4.80	6.46	5.53			
<b>Emerging Markets Equity Composite</b>	-6.01 (87)	-10.72 (67)	-6.01 (87)	-4.46 (62)	5.53 (94)	2.12 (81)	4.60 (71)	7.63 (88)	07/01/1998	303,324	4.7
Blended Policy (MSCI EM net)	-1.45 (40)	-8.22 (30)	-1.45 (40)	-1.18 (23)	12.22 (32)	3.54 (44)	5.36 (55)	8.49 (69)			
Value Added	-4.56	-2.50	-4.56	-3.28	-6.69	-1.42	-0.76	-0.86			
M Emerging Markets Equity (SA+CF) Median	-2.46	-9.23	-2.46	-3.50	10.93	3.30	5.67	8.71			
<b>Wasatch EM Small Cap</b>	-6.01 (87)	-10.72 (67)	-6.01 (87)	-4.46 (62)	5.53 (94)	2.02 (82)	9.89 (5)	6.86 (4)	07/01/2008	303,324	4.7
Blended Policy (Wasatch EM)	-3.35 (61)	-11.39 (76)	-3.35 (61)	-4.01 (58)	7.82 (82)	2.67 (66)	7.51 (17)	3.98 (22)			
Value Added	-2.66	0.67	-2.66	-0.45	-2.29	-0.65	2.38	2.88			
M Emerging Markets Equity (SA+CF) Median	-2.46	-9.23	-2.46	-3.50	10.93	3.30	5.67	2.23			
<b>Total Non-U.S. Equity x Emerging Markets Composite (hedged)</b>	1.11 (28)	0.81 (14)	1.11 (28)	6.01 (15)	11.82 (33)	N/A	N/A	8.64 (9)	04/01/2014	6,117,187	95.3
Blended Policy (Non-US Equity x EM) (Hedged)	1.12 (28)	-0.85 (22)	1.12 (28)	4.25 (24)	10.79 (44)	N/A	N/A	7.17 (16)			
Value Added	-0.01	1.66	-0.01	1.76	1.03	N/A	N/A	1.47			
M International Equity (SA+CF) Median	-0.06	-3.63	-0.06	0.68	10.19	N/A	N/A	3.99			
<b>PSERS ACWI x US Index Fund</b>	0.75 (34)	-2.37 (37)	0.75 (34)	2.83 (32)	10.76 (44)	4.79 (51)	5.94 (62)	5.19 (74)	07/01/1998	2,477,724	38.6
MSCI ACWI/EAFE Index Blend	0.71 (35)	-3.09 (44)	0.71 (35)	1.76 (41)	9.97 (53)	4.12 (61)	5.18 (73)	4.60 (88)			
Value Added	0.04	0.72	0.04	1.07	0.79	0.67	0.76	0.59			
M International Equity (SA+CF) Median	-0.06	-3.63	-0.06	0.68	10.19	4.80	6.46	6.74			
<b>Baillie Gifford</b>	0.25 (45)	-2.74 (41)	0.25 (45)	3.15 (30)	13.66 (15)	7.04 (22)	7.97 (28)	9.56 (36)	07/01/2002	1,170,292	18.2
MSCI AC World ex USA Index (Net)	0.71 (35)	-3.09 (44)	0.71 (35)	1.76 (41)	9.97 (53)	4.12 (61)	5.18 (73)	6.86 (72)			
Value Added	-0.46	0.35	-0.46	1.39	3.69	2.92	2.79	2.70			
M International Equity (SA+CF) Median	-0.06	-3.63	-0.06	0.68	10.19	4.80	6.46	8.10			
<b>Marathon Asset Mgmt</b>	0.79 (33)	-1.67 (29)	0.79 (33)	2.52 (34)	9.73 (56)	5.53 (39)	8.08 (26)	8.97 (22)	07/01/1998	1,125,654	17.5
Blended Benchmark (MSCI ACWI ex USA net)	0.71 (35)	-3.09 (44)	0.71 (35)	1.76 (41)	9.97 (53)	4.12 (61)	5.18 (73)	5.06 (79)			
Value Added	0.08	1.42	0.08	0.76	-0.24	1.41	2.90	3.91			
M International Equity (SA+CF) Median	-0.06	-3.63	-0.06	0.68	10.19	4.80	6.46	6.74			
<b>The Children's Investment Fund, LP</b>	1.21 (25)	N/A	1.21 (25)	N/A	N/A	N/A	N/A	9.54 (1)	05/01/2018	260,765	4.1
MSCI World Index (Net)	4.98 (3)	N/A	4.98 (3)	N/A	N/A	N/A	N/A	5.59 (2)			
Value Added	-3.77	N/A	-3.77	N/A	N/A	N/A	N/A	3.95			
M International Equity (SA+CF) Median	-0.06	N/A	-0.06	N/A	N/A	N/A	N/A	-4.12			

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Asset Allocation & Peer Rankings

	Performance(%)										Allocation Market Value (\$000)
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	%	
BlackRock Global Composite	-4.05 (89)	-4.95 (62)	-4.05 (89)	-0.48 (61)	8.14 (76)	4.65 (52)	6.83 (44)	7.36 (51)	10/01/2004	155,492	2.4
MSCI AC World ex USA Index (Net)	0.71 (35)	-3.09 (44)	0.71 (35)	1.76 (41)	9.97 (53)	4.12 (61)	5.18 (73)	6.17 (71)			
Value Added	-1.76	-1.86	-4.76	-2.24	-1.83	0.53	1.65	1.19			
M International Equity (SA+CF) Median	-0.06	-3.63	-0.06	0.68	10.19	4.80	6.46	7.37			
Acadian Asset Mgmt	-1.09 (41)	-2.93 (50)	-1.09 (41)	1.62 (54)	15.36 (10)	9.74 (18)	10.91 (23)	10.60 (5)	07/01/2005	267,192	4.2
Blended Benchmark (MSCI AC World ex USA Small Cap net)	-1.51 (49)	-4.41 (59)	-1.51 (49)	1.86 (53)	11.24 (57)	6.14 (73)	8.73 (77)	6.78 (84)			
Value Added	0.42	1.48	0.42	-0.24	4.12	3.60	2.18	3.82			
M International Small Cap Equity (SA+CF) Median	-1.58	-3.11	-1.58	2.67	11.99	7.37	9.88	8.25			
Wasatch Int'l Small Cap	1.92 (5)	8.32 (3)	1.92 (5)	13.76 (3)	13.26 (21)	7.99 (36)	14.18 (2)	9.98 (5)	10/01/2005	311,464	4.9
Blended Benchmark (MSCI AC World ex USA Small Cap net)	-1.51 (49)	-4.41 (59)	-1.51 (49)	1.86 (53)	11.24 (57)	6.14 (73)	8.73 (77)	6.26 (83)			
Value Added	3.43	12.73	3.43	11.90	2.02	1.85	5.45	3.72			
M International Small Cap Equity (SA+CF) Median	-1.58	-3.11	-1.58	2.67	11.99	7.37	9.88	6.94			
Oberweis Asset Mgmt	-2.69 (80)	-2.09 (41)	-2.69 (80)	5.45 (31)	12.44 (34)	11.02 (7)	13.19 (6)	9.08 (11)	07/01/2008	213,370	3.3
Blended Benchmark (MSCI AC World ex USA Small Cap (Net))	-1.51 (49)	-4.41 (59)	-1.51 (49)	1.86 (53)	11.24 (57)	6.14 (73)	8.73 (77)	5.47 (83)			
Value Added	-1.18	2.32	-1.18	3.59	1.20	4.88	4.46	3.61			
M International Small Cap Equity (SA+CF) Median	-1.58	-3.11	-1.58	2.67	11.99	7.37	9.88	6.92			
QS Investors	-1.33 (44)	-5.20 (67)	-1.33 (44)	0.00 (68)	10.54 (63)	7.48 (49)	9.55 (61)	6.47 (62)	07/01/2008	96,939	1.5
Blended Benchmark (MSCI AC World ex USA Small Cap (Net))	-1.51 (49)	-4.41 (59)	-1.51 (49)	1.86 (53)	11.24 (57)	6.14 (73)	8.73 (77)	5.47 (83)			
Value Added	0.18	-0.79	0.18	-1.86	-0.70	1.34	0.82	1.00			
M International Small Cap Equity (SA+CF) Median	-1.58	-3.11	-1.58	2.67	11.99	7.37	9.88	6.92			
Insight Everest - Int'l Eq										38,136	0.6



## Emerging Markets Equity

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Case ID: 221102792

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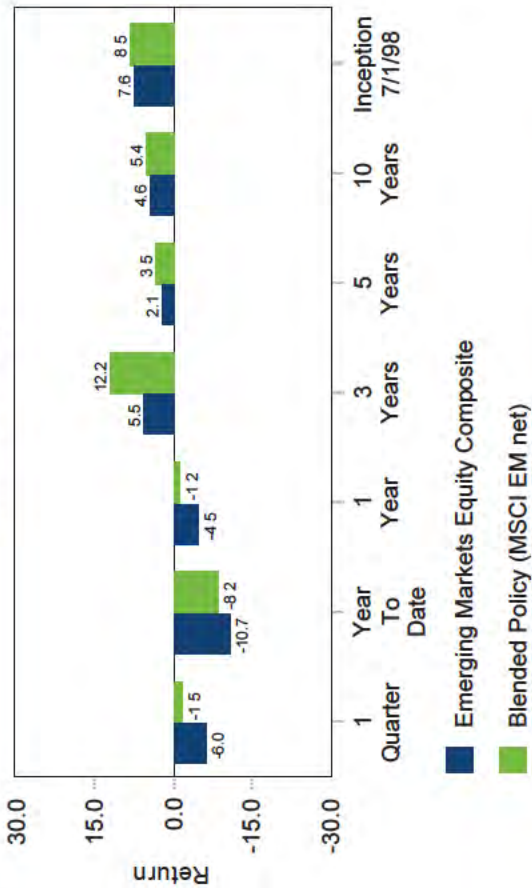


Current Allocation

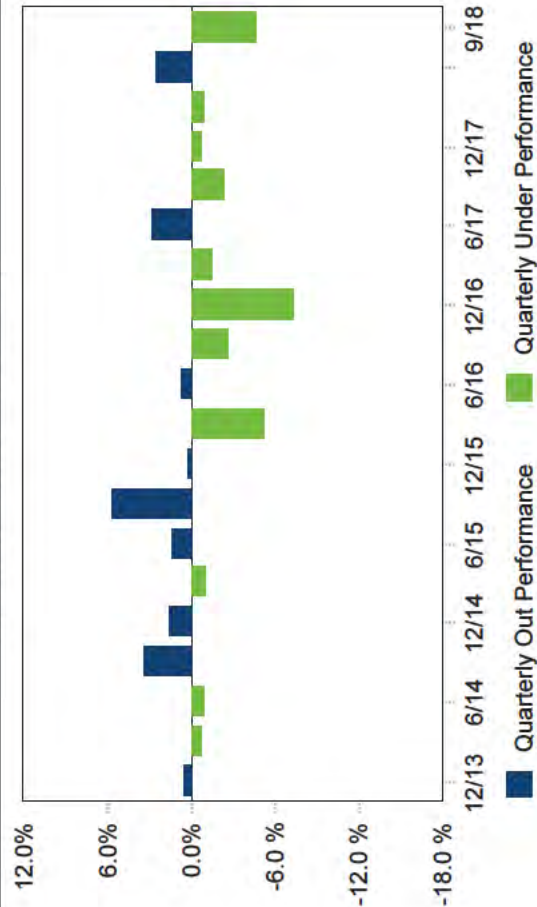
September 30, 2018 : \$303M



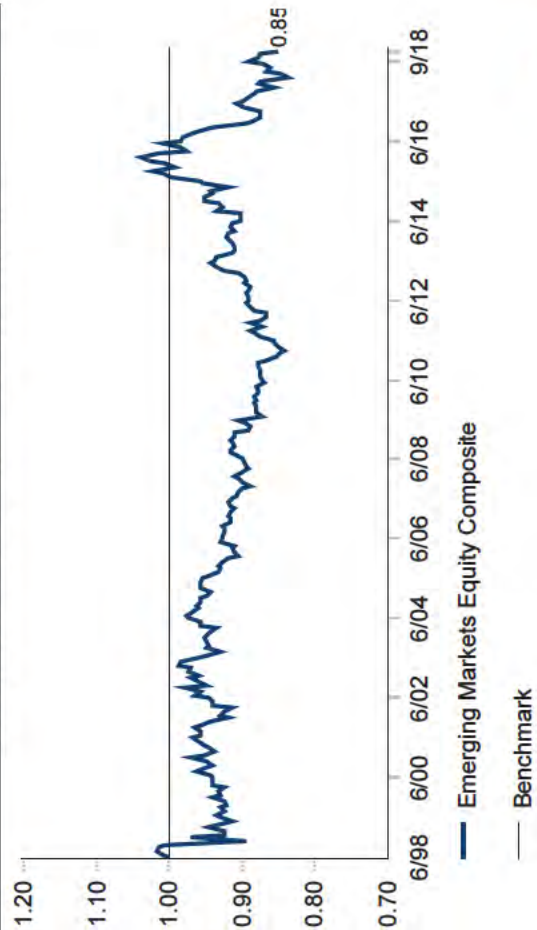
Return Summary



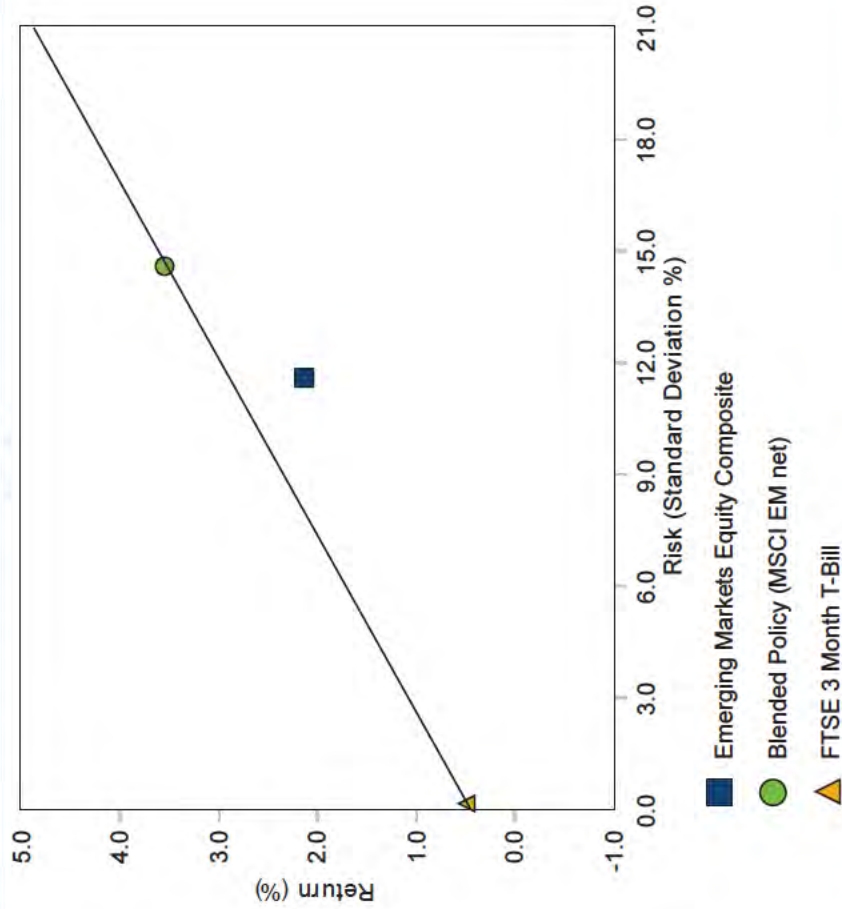
Quarterly Excess Performance



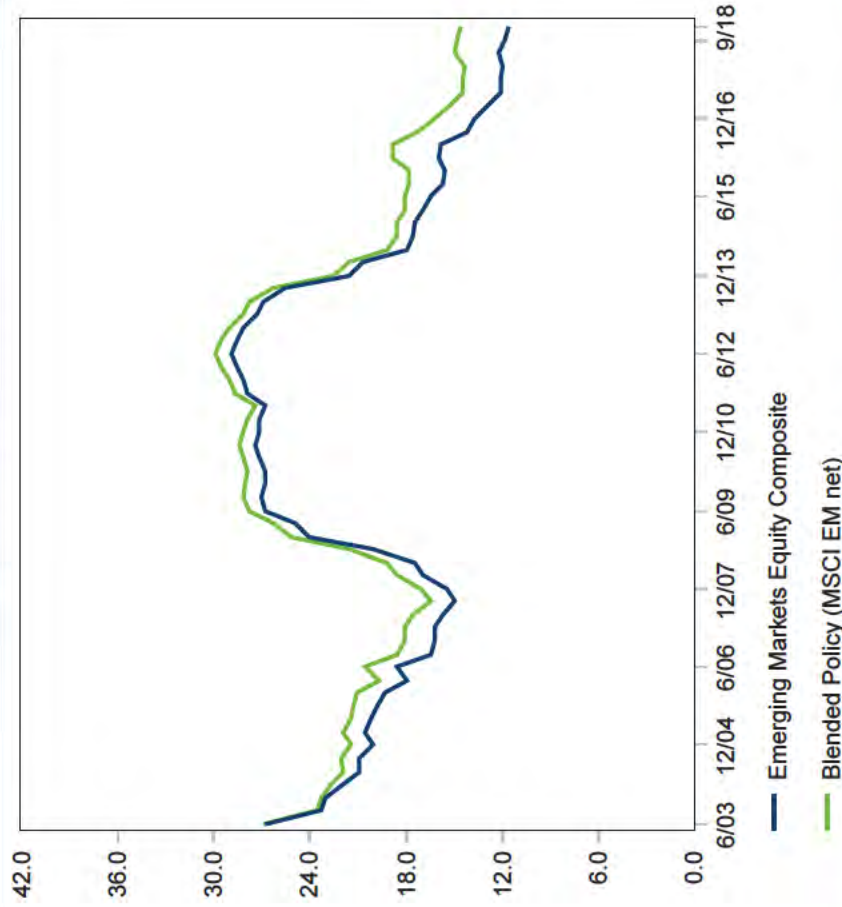
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Emerging Markets Equity Composite	-1.76	6.59	-0.27	0.81	0.20	-0.46	0.71	2.12	11.61	0.90
Blended Policy (MSCI EM net)	0.00	0.00	N/A	1.00	0.28	0.00	1.00	3.54	14.63	1.00
FTSE 3 Month T-Bill	-4.04	14.62	-0.28	0.00	N/A	0.49	0.00	0.49	0.18	0.02

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## Risk Statistics

## Emerging Markets Equity Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-4.46	5.53	2.12	4.60	7.63	07/01/1998
Standard Deviation	9.11	12.03	11.61	19.78	21.66	
Downside Risk	7.05	7.79	8.10	13.72	15.07	
Downside Semi Deviation	3.02	12.31	12.21	20.55	23.21	
Max Drawdown Recovery Period	N/A	N/A	35.00	9.00	117.00	
Maximum Drawdown	-13.70	-13.70	-20.99	-36.33	-60.52	
Maximum Loss Exposure	-4.46	-6.80	-11.92	-36.33	-25.47	
Upside Semi Deviation	2.52	12.35	11.35	19.46	20.86	
Blended Policy (MSCI EM net)						
Return	-1.18	12.22	3.54	5.36	8.49	
Standard Deviation	13.06	14.23	14.63	21.24	22.74	
Downside Risk	8.27	7.41	9.54	14.19	15.58	
Downside Semi Deviation	3.23	12.16	14.66	20.88	24.24	
Max Drawdown Recovery Period	N/A	N/A	35.00	9.00	117.00	
Maximum Drawdown	-15.02	-15.02	-29.77	-36.10	-61.54	
Maximum Loss Exposure	-1.18	-6.02	-20.88	-36.10	-26.66	
Upside Semi Deviation	4.84	16.39	14.93	21.91	22.09	
vs. Blended Policy (MSCI EM net)						
Active Return	-3.76	-6.45	-1.76	-1.01	-1.04	
Tracking Error	7.92	7.06	6.59	5.35	5.83	
Actual Correlation	0.80	0.87	0.90	0.97	0.97	
Beta	0.56	0.73	0.71	0.90	0.92	
Consistency	41.67	36.11	45.00	49.17	48.15	
Down Market Capture	83.59	93.14	77.65	87.95	90.92	
Down Market Outperformance	2.57	1.61	6.53	3.72	3.05	
Information Ratio	-0.48	-0.91	-0.27	-0.19	-0.18	
Jensen Alpha	-4.53	-3.28	-0.60	-0.30	-0.33	
Up Market Capture	61.82	71.42	74.31	87.62	90.76	
Up Market Outperformance	-7.39	-16.34	-13.55	-11.04	-9.22	
vs. FTSE 3 Month T-Bill						
Excess Return	-5.74	5.30	2.28	6.20	7.93	
Excess Risk	9.17	12.06	11.62	19.80	21.67	
Sharpe Ratio	-0.63	0.44	0.20	0.31	0.37	

Calculation based on monthly periodicity.

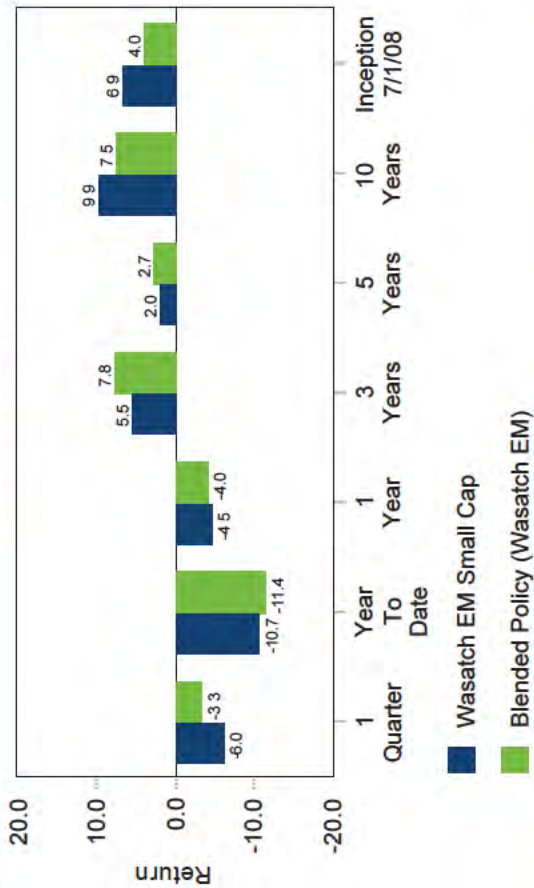
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Performance Summary

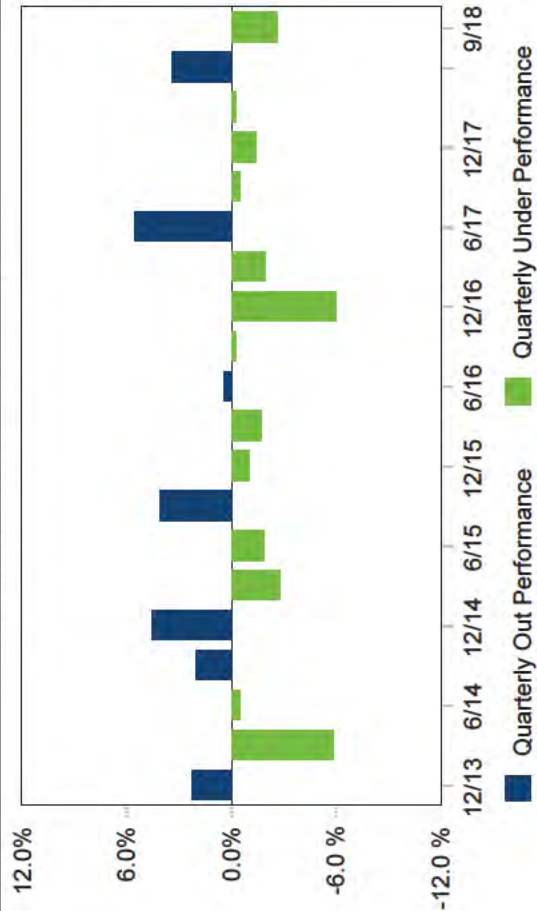
Account Information

Account Name: Wasatch EM Small Cap  
 Inception Date: 06/30/2008  
 Account Structure: Separate Account  
 Asset Class: International-Emerging Equity  
 Benchmark: Blended Policy (Wasatch EM)  
 Peer Group: IM Emerging Markets Equity (SA+CF)

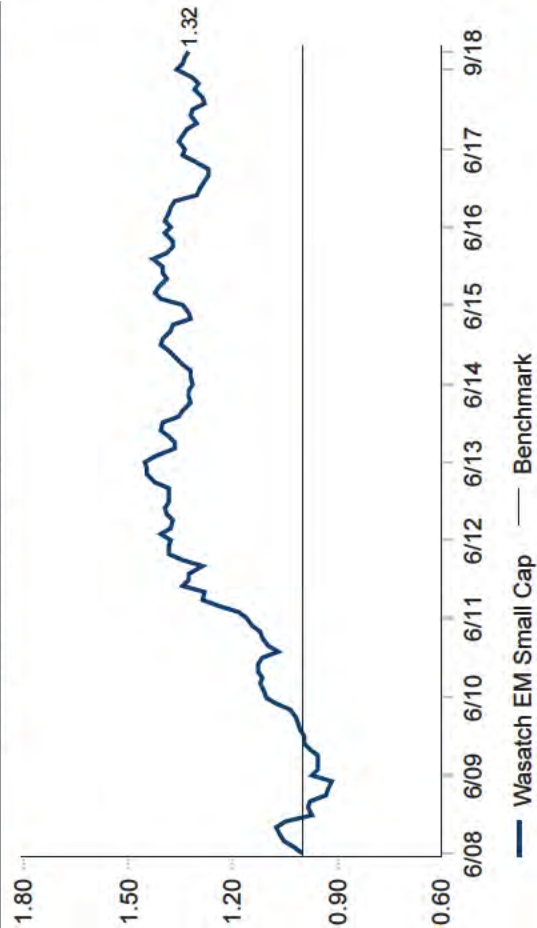
Return Summary



Quarterly Excess Performance

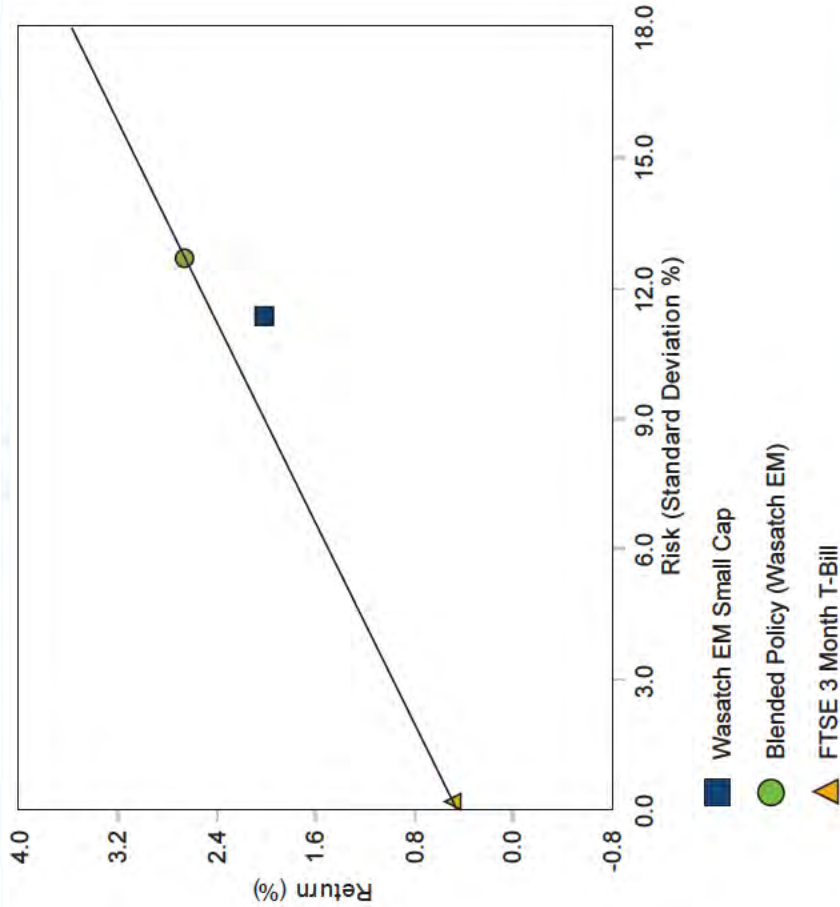


Ratio of Cumulative Wealth - Since Inception

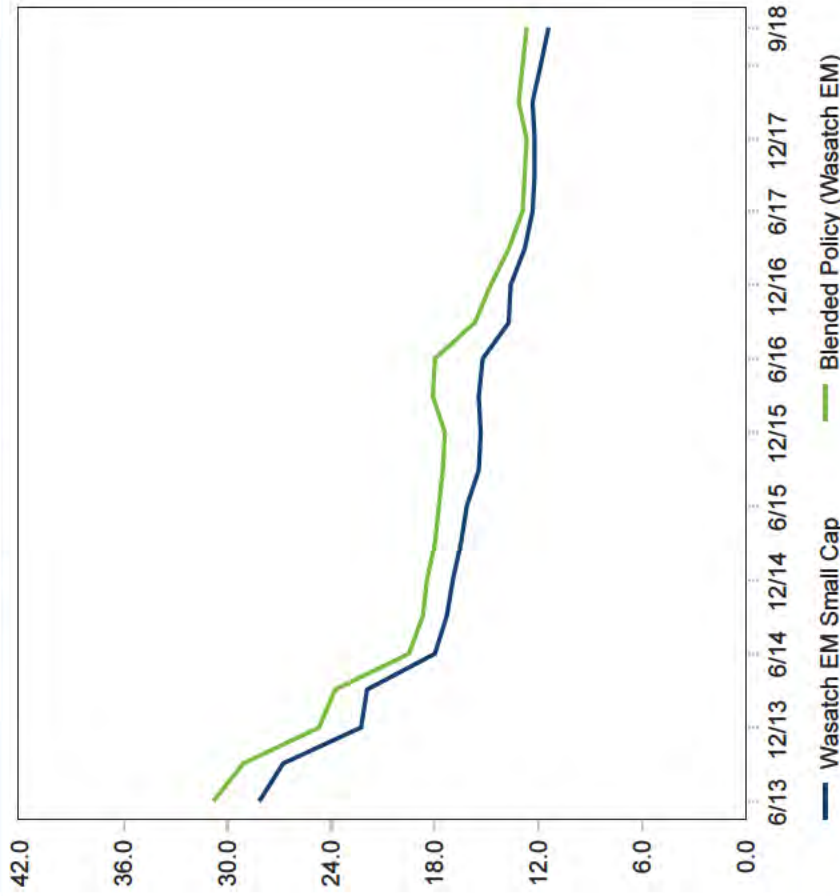


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Wasatch EM Small Cap	-0.79	5.83	-0.14	0.79	0.19	-0.08	0.79	2.02	11.37	0.89
Blended Policy (Wasatch EM)	0.00	0.00	N/A	1.00	0.23	0.00	1.00	2.67	12.71	1.00
FTSE 3 Month T-Bill	-2.94	12.72	-0.23	0.00	N/A	0.49	0.00	0.49	0.18	-0.04

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Wasatch EM Small Cap						07/01/2008
Return	-4.46	5.53	2.02	9.89	6.86	
Standard Deviation	9.11	12.03	11.37	20.63	21.43	
Downside Risk	7.05	7.79	7.91	13.59	14.83	
Downside Semi Deviation	3.02	12.31	11.70	21.39	23.16	
Max Drawdown Recovery Period	N/A	N/A	35.00	8.00	15.00	
Maximum Drawdown	-13.70	-13.70	-21.18	-38.39	-52.85	
Maximum Loss Exposure	-4.46	-6.80	-12.36	-38.39	-52.66	
Upside Semi Deviation	2.52	12.35	11.32	20.71	20.56	
Blended Policy (Wasatch EM)						
Return	-4.01	7.82	2.67	7.51	3.98	
Standard Deviation	12.13	12.48	12.71	22.46	23.30	
Downside Risk	8.87	7.66	8.68	14.74	16.08	
Downside Semi Deviation	3.47	13.08	13.33	22.73	24.39	
Max Drawdown Recovery Period	N/A	N/A	35.00	7.00	14.00	
Maximum Drawdown	-16.41	-16.41	-25.28	-34.26	-52.45	
Maximum Loss Exposure	-4.01	-5.50	-14.01	-34.26	-52.45	
Upside Semi Deviation	3.99	12.80	12.49	22.73	22.73	
vs. Blended Policy (Wasatch EM)						
Active Return	-0.76	-2.20	-0.79	1.83	2.33	
Tracking Error	6.01	5.83	5.83	7.15	7.13	
Actual Correlation	0.88	0.89	0.89	0.95	0.95	
Beta	0.66	0.86	0.79	0.87	0.88	
Consistency	41.67	36.11	45.00	49.17	50.41	
Down Market Capture	78.19	90.35	82.62	79.30	79.50	
Down Market Outperformance	3.64	2.45	4.58	6.75	6.93	
Information Ratio	-0.13	-0.38	-0.14	0.26	0.33	
Jensen Alpha	-2.42	-1.11	-0.19	3.09	3.16	
Up Market Capture	68.69	83.79	81.61	91.55	91.55	
Up Market Outperformance	-5.48	-7.20	-8.11	-7.07	-7.07	
vs. FTSE 3 Month T-Bill						
Excess Return	-5.74	5.30	2.15	11.33	8.67	
Excess Risk	9.17	12.06	11.38	20.65	21.47	
Sharpe Ratio	-0.63	0.44	0.19	0.55	0.40	

Calculation based on monthly periodicity.

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## Non-US Equity ex Emerging Markets

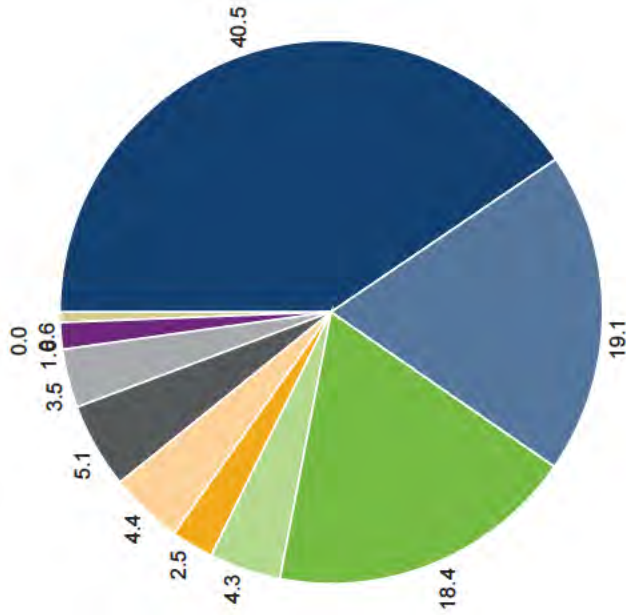
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Case ID: 221102792

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Asset Allocation by Manager

September 30, 2018 : \$6,117,187



Market Value (\$000)	Allocation (%)
2,477,724.1	40.5
1,170,291.7	19.1
1,125,654.2	18.4
260,765.0	4.3
155,491.8	2.5
267,192.1	4.4
311,463.9	5.1
213,370.0	3.5
96,939.2	1.6
158.9	0.0
38,136.0	0.6

Market Value (\$000)	Allocation (%)
2,477,724.1	40.5
1,170,291.7	19.1
1,125,654.2	18.4
260,765.0	4.3
155,491.8	2.5
267,192.1	4.4
311,463.9	5.1
213,370.0	3.5
96,939.2	1.6
158.9	0.0
38,136.0	0.6

- PSERS ACWI x US Index Fund
- Baillie Gifford
- Marathon Asset Mgmt
- The Children's Investment Fund, LP
- BlackRock Global Composite
- Acadian Asset Mgmt
- Wasatch Int'l Small Cap
- Oberweis Asset Mgmt
- QS Investors
- Fidelity Institutional Int'l Small Cap
- Insight Everest - Int'l Eq

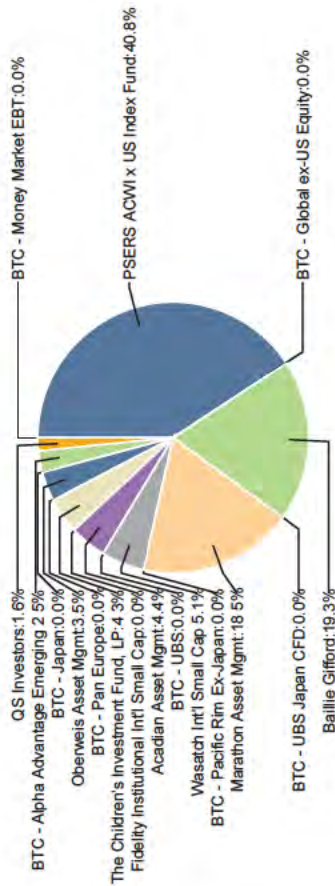
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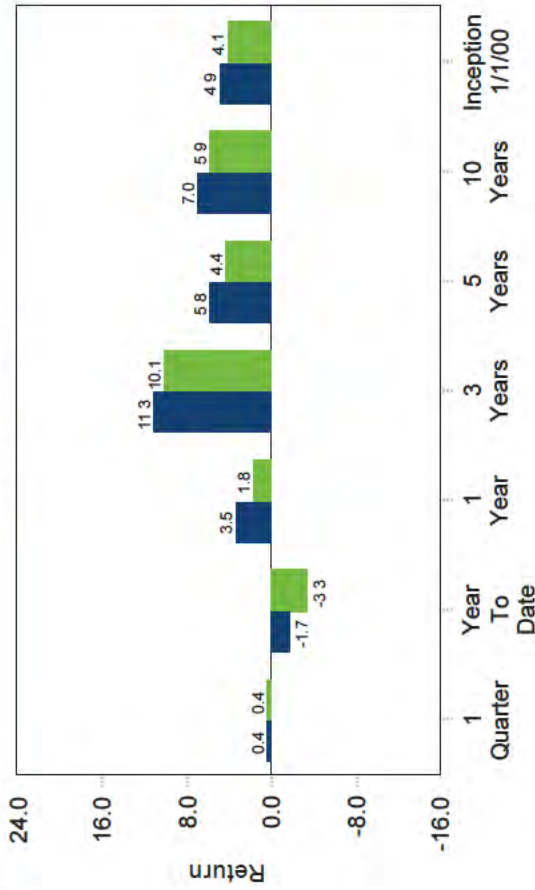


Current Allocation

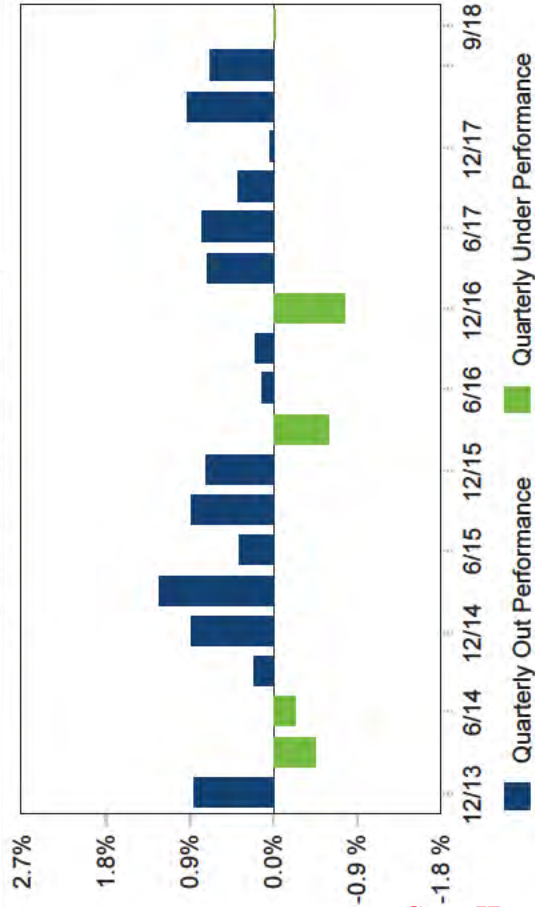
September 30, 2018 : \$6,079M



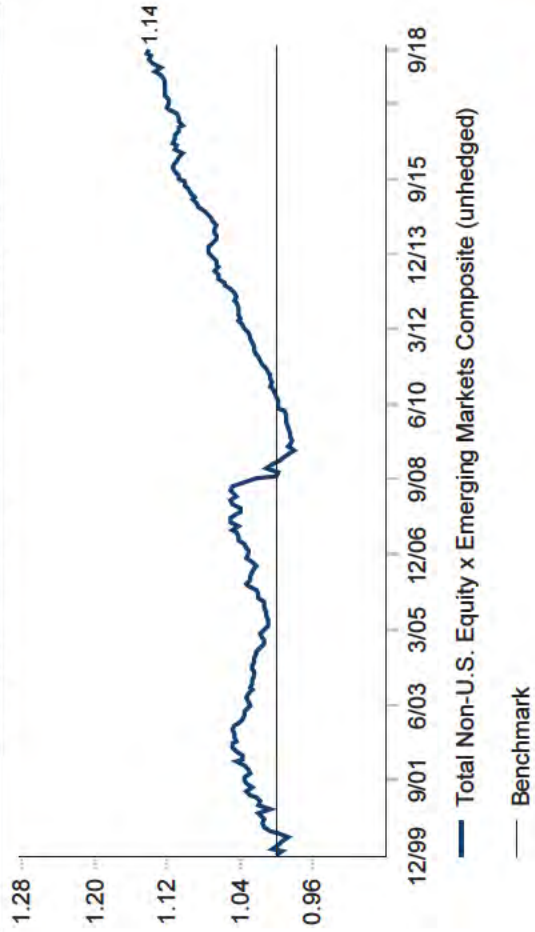
Return Summary



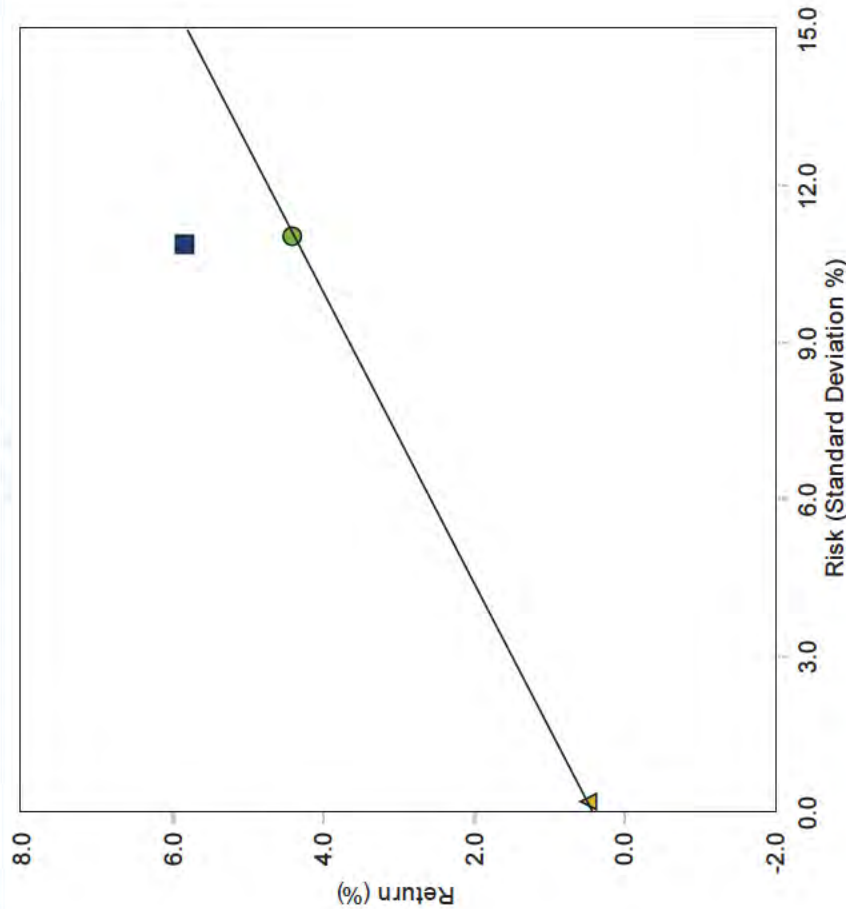
Quarterly Excess Performance



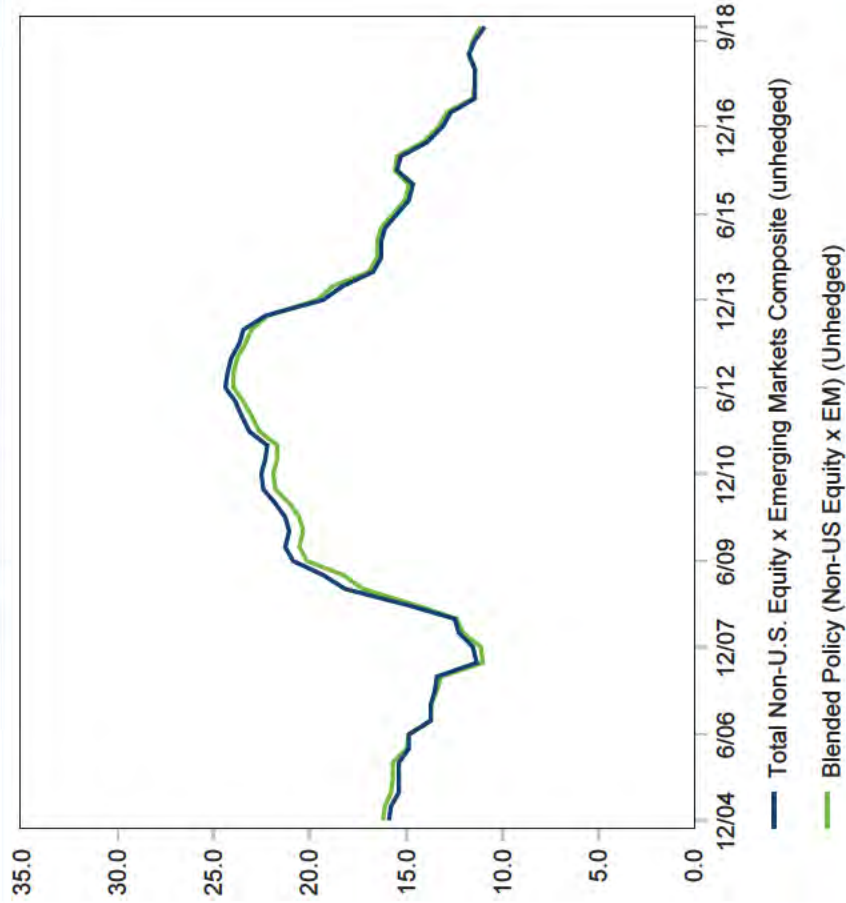
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Non-U.S. Equity x Emerging Markets Composite (unhedged)	1.35	1.08	1.25	0.99	0.53	1.46	0.98	5.83	10.90	1.00
Blended Policy (Non-US Equity x EM) (Unhedged)	0.00	0.00	N/A	1.00	0.40	0.00	1.00	4.39	11.06	1.00
FTSE 3 Month T-Bill	-4.42	11.06	-0.40	0.00	N/A	0.49	0.00	0.49	0.18	0.04

## Risk Statistics

## Total Non-U.S. Equity x Emerging Markets Composite (unhedged)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.47	11.26	5.83	7.03	6.35	07/01/1997
Standard Deviation	8.82	10.72	10.90	17.52	16.36	
Downside Risk	5.34	5.75	6.74	12.02	11.39	
Downside Semi Deviation	2.55	9.82	10.56	18.36	18.25	
Max Drawdown Recovery Period	N/A	9.00	23.00	10.00	72.00	
Maximum Drawdown	-7.29	-10.87	-17.79	-35.33	-57.82	
Maximum Loss Exposure	N/A	-4.38	-7.83	-35.33	-15.09	
Upside Semi Deviation	2.78	12.15	11.53	17.29	15.33	

## Blended Policy (Non-US Equity x EM) (Unhedged)

Return	1.79	10.14	4.39	5.85	N/A	
Standard Deviation	9.50	10.81	11.06	17.47	N/A	
Downside Risk	6.29	6.00	7.08	11.87	N/A	
Downside Semi Deviation	3.01	10.24	11.09	17.96	N/A	
Max Drawdown Recovery Period	N/A	9.00	35.00	9.00	N/A	
Maximum Drawdown	-8.65	-11.00	-20.07	-33.63	N/A	
Maximum Loss Exposure	N/A	-4.55	-11.44	-33.63	N/A	
Upside Semi Deviation	2.80	11.96	11.36	17.43	N/A	

## vs. Blended Policy (Non-US Equity x EM) (Unhedged)

Active Return	1.59	1.01	1.35	1.13	N/A	
Tracking Error	1.24	1.17	1.08	1.26	N/A	
Actual Correlation	0.99	0.99	1.00	1.00	N/A	
Beta	0.92	0.99	0.98	1.00	N/A	
Consistency	66.67	58.33	65.00	69.17	N/A	
Down Market Capture	81.53	91.33	90.20	95.41	N/A	
Down Market Outperformance	2.08	1.91	2.27	1.22	N/A	
Information Ratio	1.28	0.86	1.25	0.90	N/A	
Jensen Alpha	1.65	1.14	1.45	1.13	N/A	
Up Market Capture	95.24	100.54	100.60	101.07	N/A	
Up Market Outperformance	-0.79	0.21	0.22	0.77	N/A	

## vs. FTSE 3 Month T-Bill

Excess Return	2.21	10.47	5.77	8.06	5.51	
Excess Risk	8.85	10.74	10.89	17.54	16.39	
Sharpe Ratio	0.25	0.97	0.53	0.46	0.34	

Calculation based on monthly periodicity.

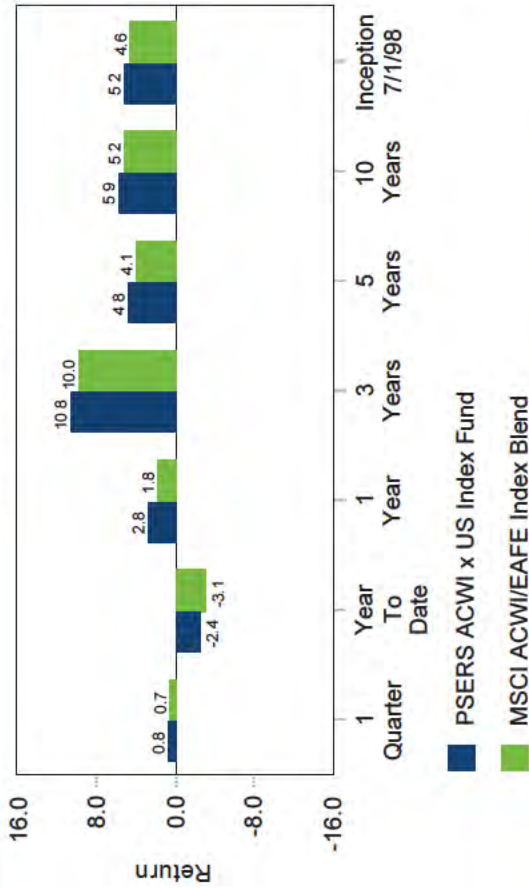
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Performance Summary

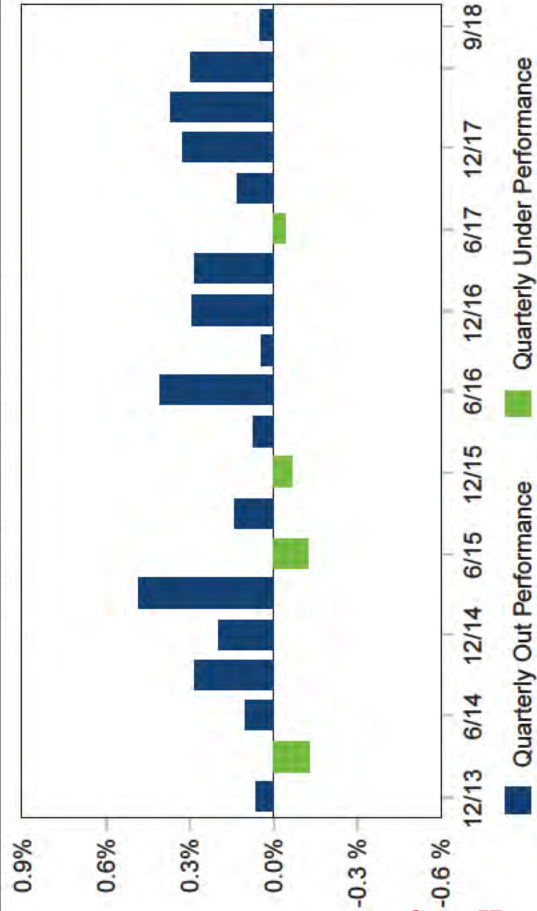
Account Information

Account Name: PSERS ACWI x US Index Fund  
 Inception Date: 06/30/1998  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: MSCI ACWI/EAFE Index Blend  
 Peer Group: IM International Equity (SA+CF)

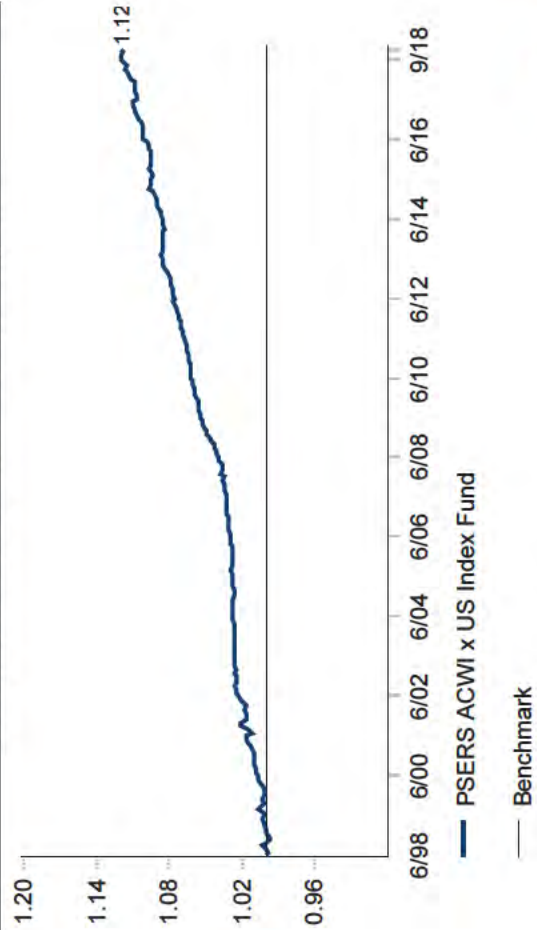
Return Summary



Quarterly Excess Performance

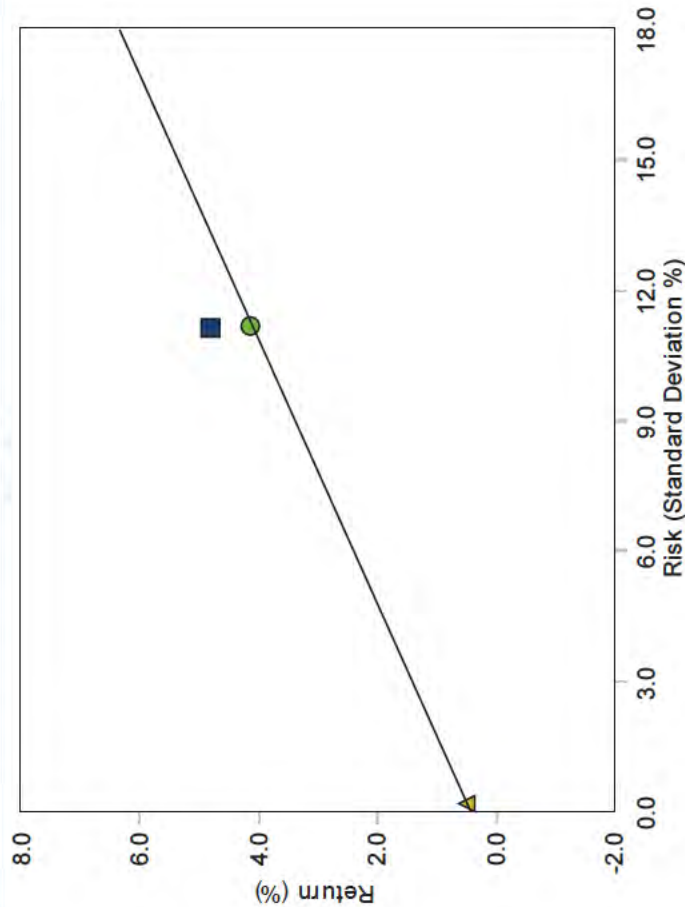


Ratio of Cumulative Wealth - Since Inception

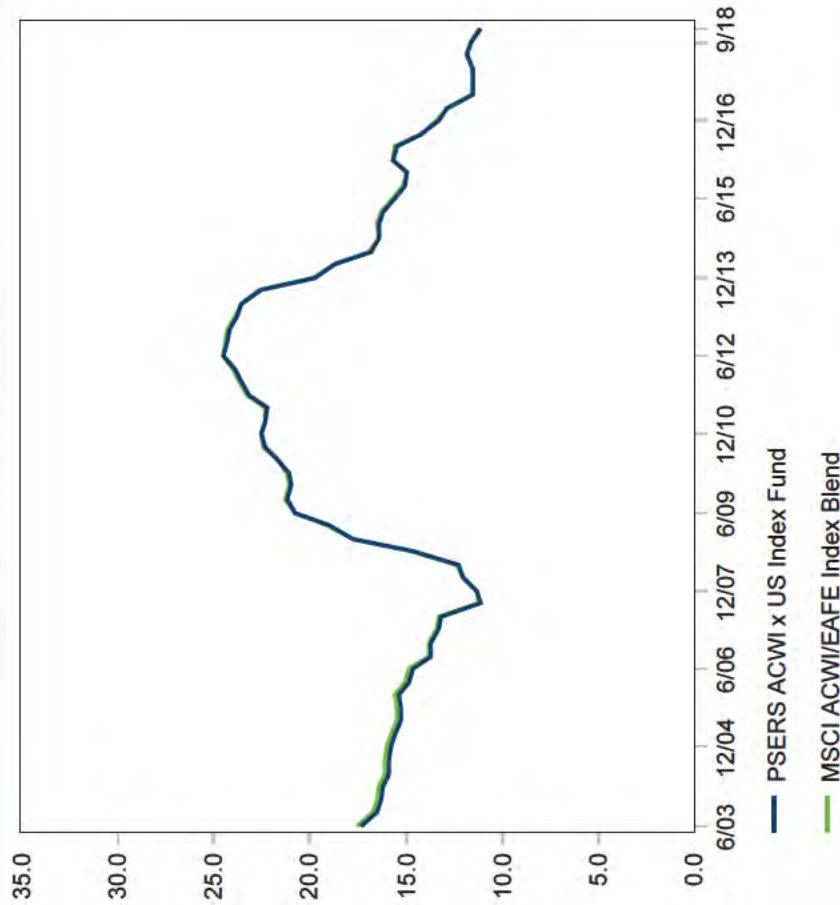


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS ACWI x US Index Fund	0.64	0.39	1.63	1.00	0.43	0.66	1.00	4.79	11.16	1.00
MSCI ACWI/EAFE Index Blend	0.00	0.00	N/A	1.00	0.37	0.00	1.00	4.12	11.20	1.00
FTSE 3 Month T-Bill	-4.17	11.19	-0.37	0.00	N/A	0.49	0.00	0.49	0.18	0.04

Risk Statistics

PSERS ACWI x US Index Fund

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.83	10.76	4.79	5.94	5.19	07/01/1998
Standard Deviation	9.66	10.86	11.16	17.74	16.82	
Downside Risk	6.25	5.94	7.14	12.19	11.81	
Downside Semi Deviation	2.99	10.14	11.20	18.63	18.56	
Max Drawdown Recovery Period	N/A	9.00	34.00	10.00	79.00	
Maximum Drawdown	-8.26	-11.48	-20.17	-35.39	-57.01	
Maximum Loss Exposure	N/A	-5.03	-11.68	-35.39	-17.59	
Upside Semi Deviation	2.90	12.14	11.48	17.41	15.77	

MSCI ACWI/EAFE Index Blend

Return	1.76	9.97	4.12	5.18	4.60	
Standard Deviation	9.74	10.88	11.20	17.78	16.92	
Downside Risk	6.49	6.05	7.25	12.31	11.97	
Downside Semi Deviation	3.11	10.32	11.37	18.80	18.71	
Max Drawdown Recovery Period	N/A	10.00	35.00	10.00	115.00	
Maximum Drawdown	-8.84	-11.47	-20.85	-35.81	-57.63	
Maximum Loss Exposure	N/A	-4.88	-12.46	-35.81	-18.73	
Upside Semi Deviation	2.85	12.00	11.38	17.29	15.78	

vs. MSCI ACWI/EAFE Index Blend

Active Return	1.04	0.72	0.64	0.71	0.54	
Tracking Error	0.51	0.44	0.39	0.32	0.40	
Actual Correlation	1.00	1.00	1.00	1.00	1.00	
Beta	0.99	1.00	1.00	1.00	0.99	
Consistency	75.00	63.89	63.33	76.67	71.60	
Down Market Capture	95.82	96.71	97.10	97.93	98.07	
Down Market Outperformance	0.48	0.73	0.68	0.60	0.59	
Information Ratio	2.02	1.63	1.63	2.21	1.37	
Jensen Alpha	1.05	0.75	0.66	0.73	0.57	
Up Market Capture	103.37	101.80	101.47	101.21	100.65	
Up Market Outperformance	0.58	0.78	0.59	0.84	0.42	

vs. FTSE 3 Month T-Bill

Excess Return	1.66	10.03	4.81	7.07	4.64	
Excess Risk	9.69	10.88	11.15	17.76	16.85	
Sharpe Ratio	0.17	0.92	0.43	0.40	0.28	

Calculation based on monthly periodicity.

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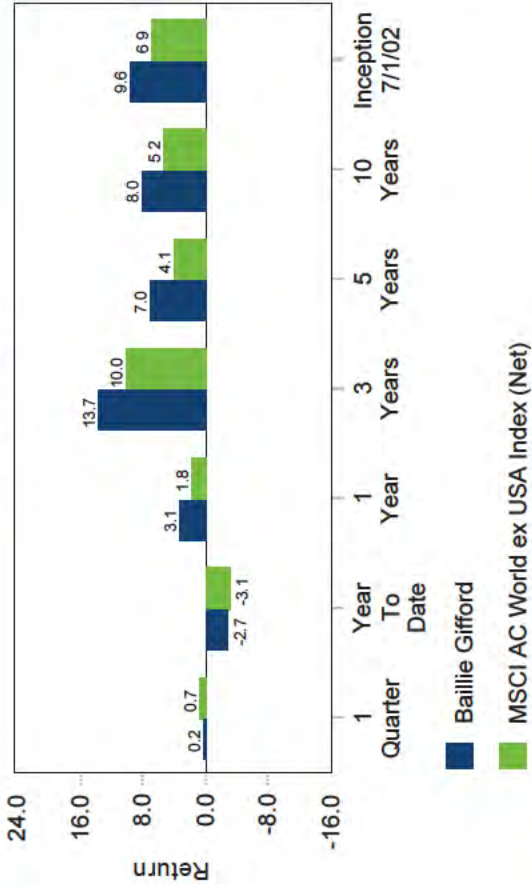


Performance Summary

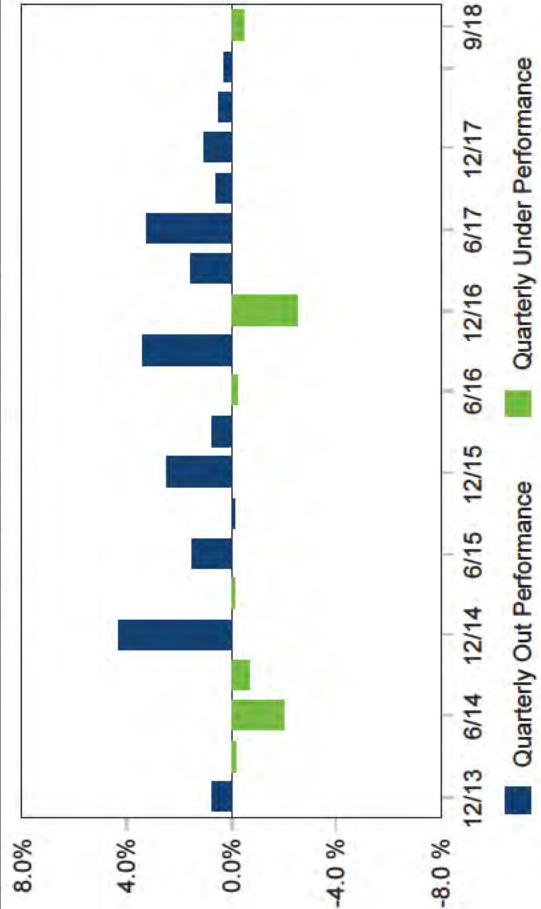
Account Information

Account Name: Baillie Gifford  
 Inception Date: 06/01/2002  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: MSCI AC World ex USA Index (Net)  
 Peer Group: IM International Equity (SA+CF)

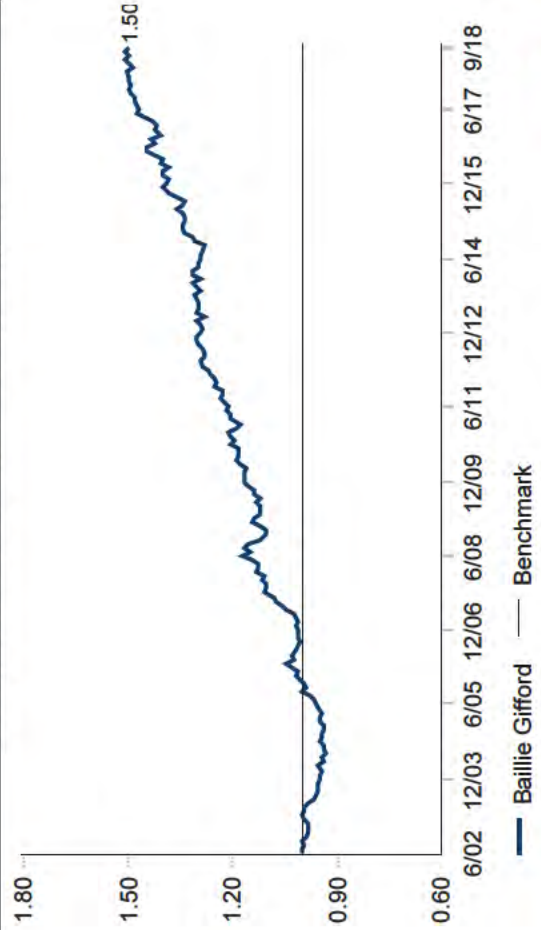
Return Summary



Quarterly Excess Performance

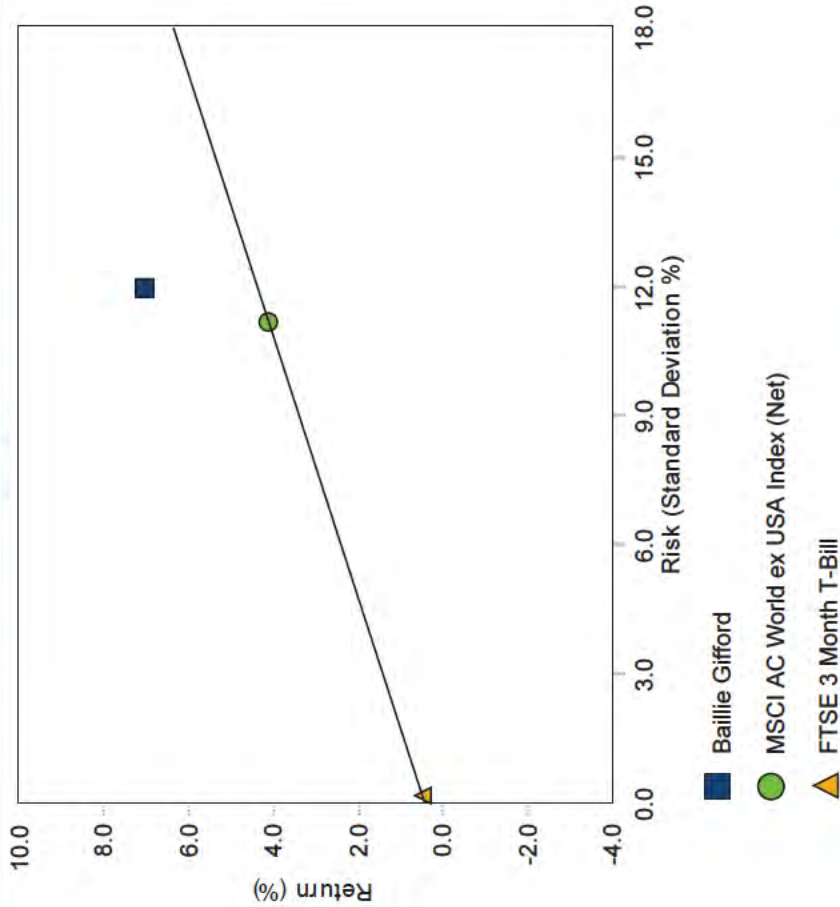


Ratio of Cumulative Wealth - Since Inception

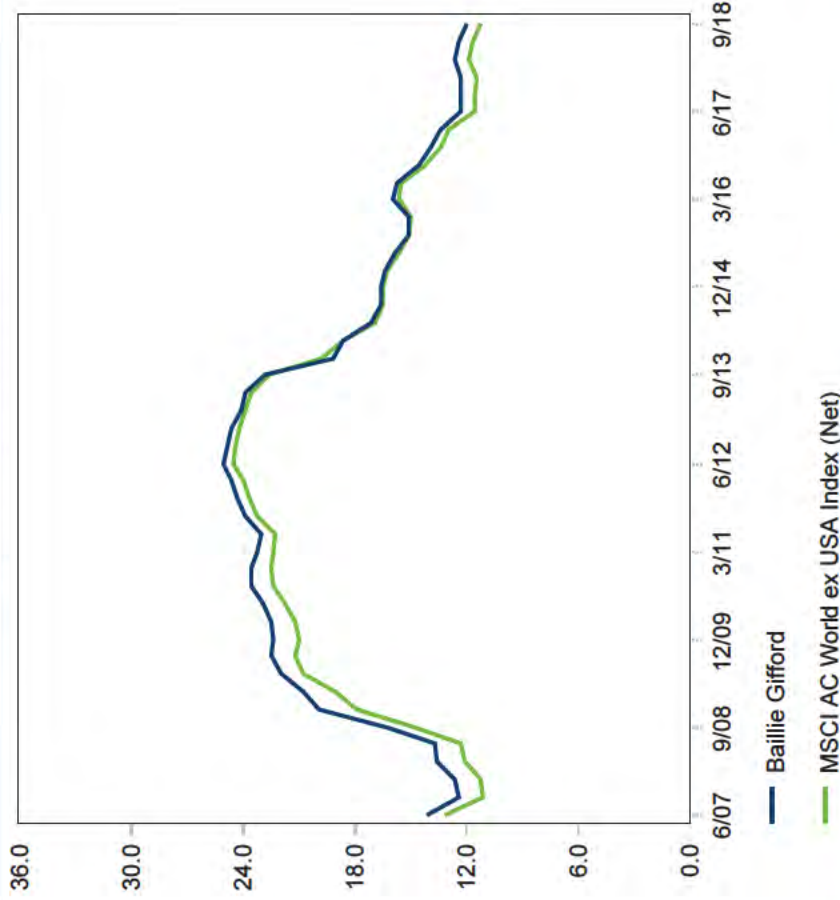


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Baillie Gifford	2.87	3.38	0.85	0.92	0.59	2.76	1.03	7.04	12.00	0.96
MSCI AC World ex USA Index (Net)	0.00	0.00	N/A	1.00	0.37	0.00	1.00	4.12	11.20	1.00
FTSE 3 Month T-Bill	-4.17	11.19	-0.37	0.00	N/A	0.49	0.00	0.49	0.18	0.04

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## Risk Statistics

## Baillie Gifford

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.15	13.66	7.04	7.97	9.56	07/01/2002
Standard Deviation	9.09	11.86	12.00	18.14	17.56	
Downside Risk	5.56	6.03	7.32	12.37	11.99	
Downside Semi Deviation	2.38	10.76	12.27	19.68	19.55	
Max Drawdown Recovery Period	N/A	9.00	22.00	11.00	66.00	
Maximum Drawdown	-8.26	-10.45	-16.63	-36.48	-56.18	
Maximum Loss Exposure	N/A	-2.13	-6.33	-36.48	-20.25	
Upside Semi Deviation	3.11	13.51	12.33	17.53	16.78	
MSCI AC World ex USA Index (Net)						
Return	1.76	9.97	4.12	5.18	6.86	
Standard Deviation	9.74	10.88	11.20	17.78	16.98	
Downside Risk	6.49	6.05	7.25	12.31	11.83	
Downside Semi Deviation	3.11	10.32	11.37	18.80	18.78	
Max Drawdown Recovery Period	N/A	10.00	35.00	10.00	115.00	
Maximum Drawdown	-8.84	-11.47	-20.85	-35.81	-57.63	
Maximum Loss Exposure	N/A	-4.88	-12.46	-35.81	-20.22	
Upside Semi Deviation	2.85	12.00	11.38	17.29	16.04	

## vs. MSCI AC World ex USA Index (Net)

Active Return	1.30	3.43	2.87	2.70	2.62	
Tracking Error	2.49	3.39	3.38	3.48	3.56	
Actual Correlation	0.97	0.96	0.96	0.98	0.98	
Beta	0.90	1.05	1.03	1.00	1.01	
Consistency	66.67	66.67	65.00	63.33	59.49	
Down Market Capture	77.96	86.08	88.72	90.01	93.74	
Down Market Outperformance	2.55	3.08	2.60	2.83	1.76	
Information Ratio	0.52	1.01	0.85	0.78	0.73	
Jensen Alpha	1.37	3.04	2.78	2.72	2.56	
Up Market Capture	89.87	109.52	107.87	102.97	105.56	
Up Market Outperformance	-1.74	3.99	3.03	1.95	3.56	
vs. FTSE 3 Month T-Bill						
Excess Return	1.92	12.74	7.04	9.05	9.50	
Excess Risk	9.13	11.89	12.00	18.16	17.54	
Sharpe Ratio	0.21	1.07	0.59	0.50	0.54	

Calculation based on monthly periodicity.

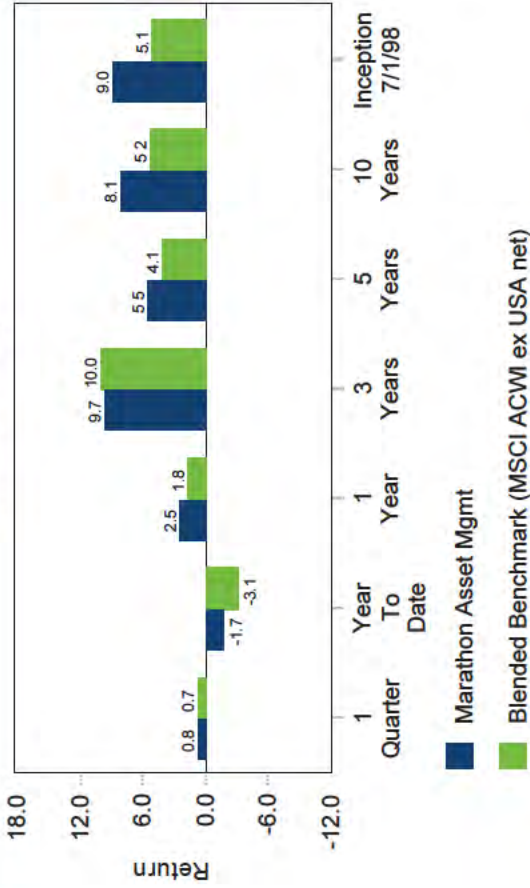
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Performance Summary

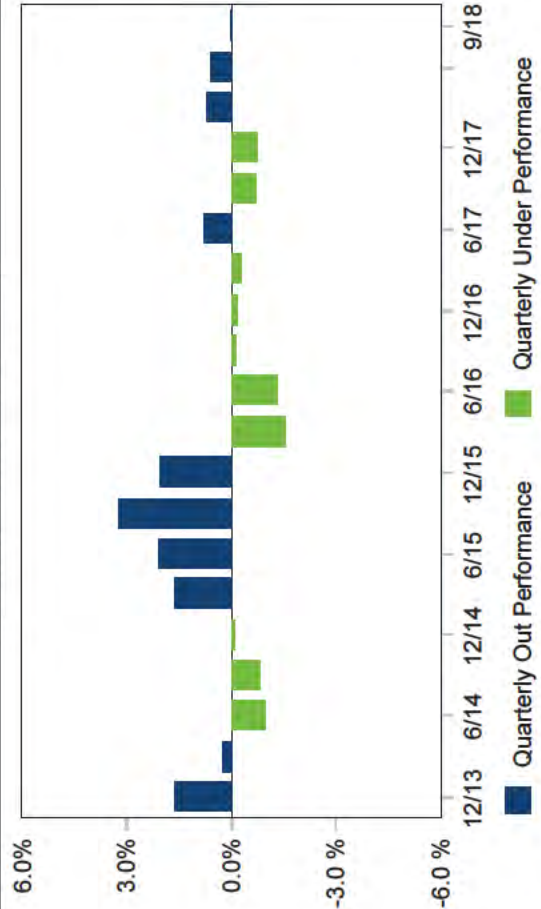
Account Information

Account Name: Marathon Asset Mgmt  
 Inception Date: 06/30/1998  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: Blended Benchmark (MSCI ACWI ex USA net)  
 Peer Group: IM International Equity (SA+CF)

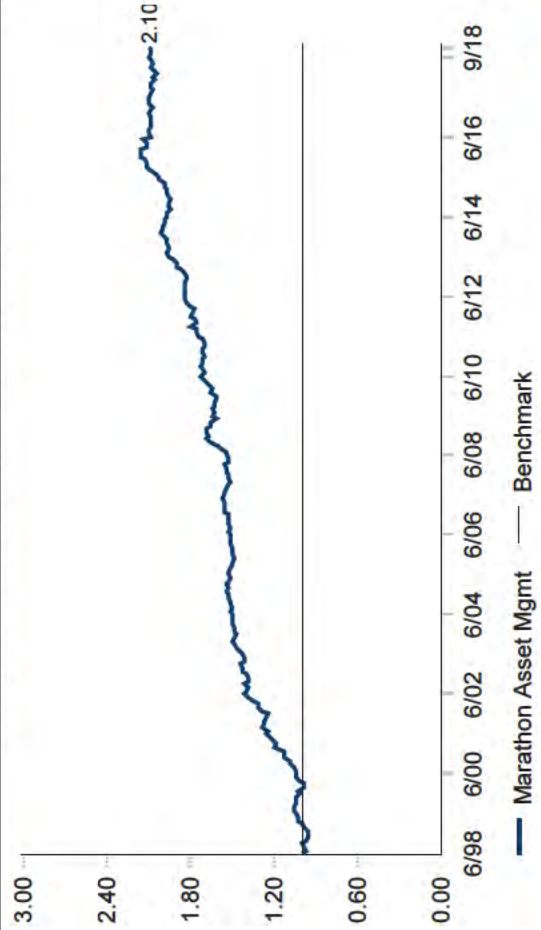
Return Summary



Quarterly Excess Performance

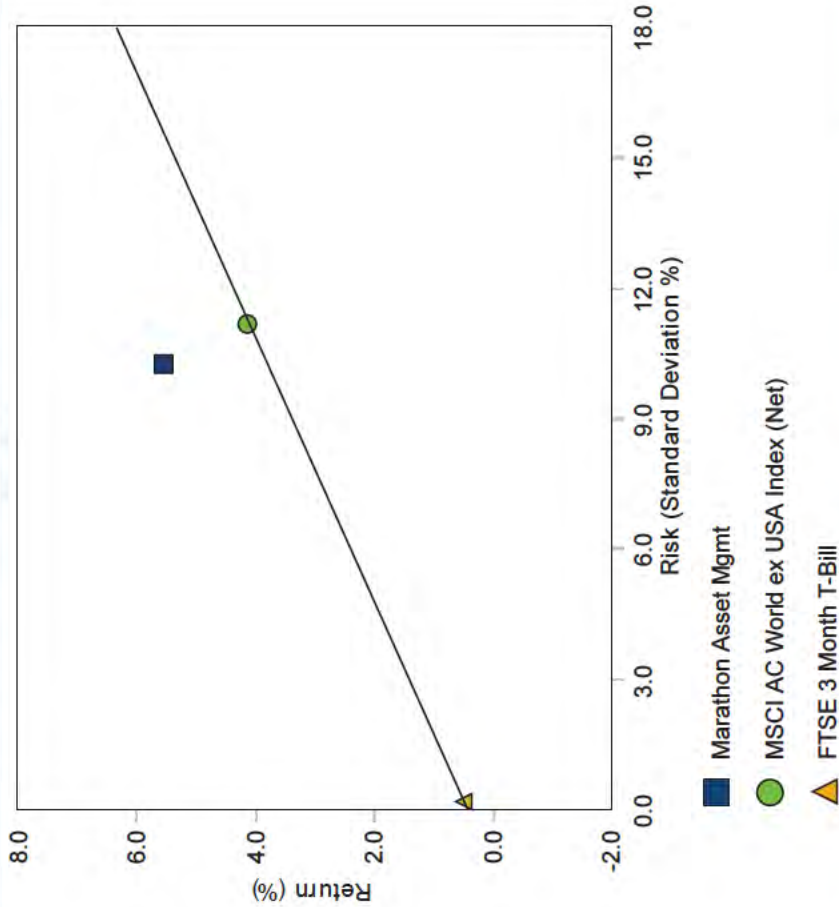


Ratio of Cumulative Wealth - Since Inception

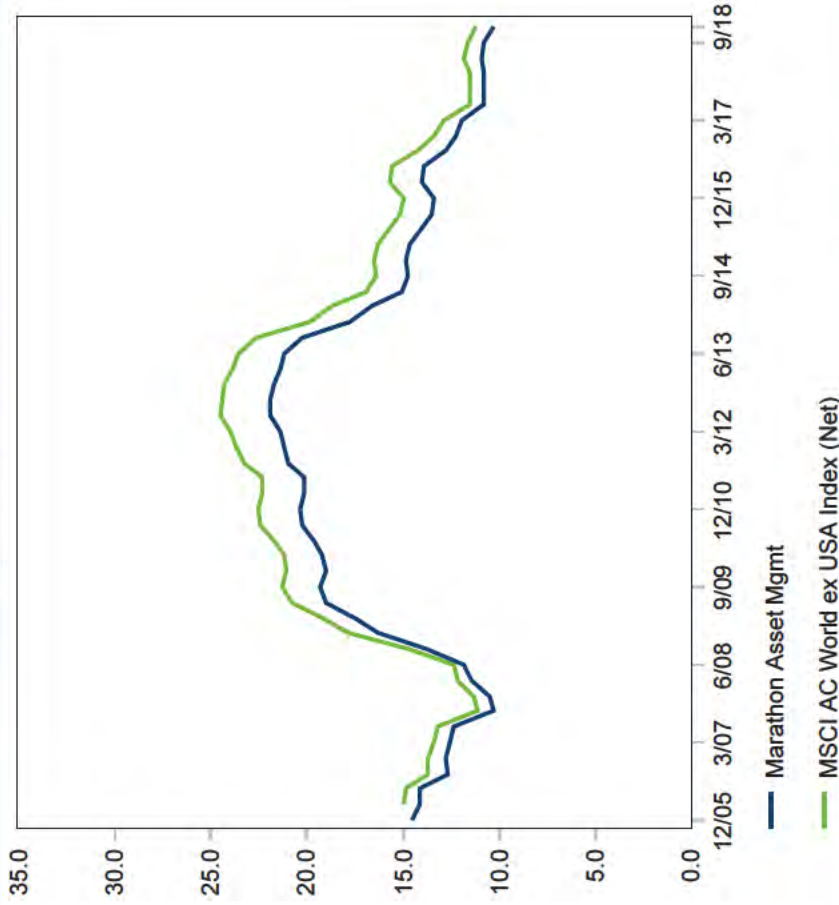


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Marathon Asset Mgmt	1.25	2.74	0.46	0.94	0.53	1.77	0.89	5.53	10.27	0.97
MSCI AC World ex USA Index (Net)	0.00	0.00	N/A	1.00	0.37	0.00	1.00	4.12	11.20	1.00
FTSE 3 Month T-Bill	-4.17	11.19	-0.37	0.00	N/A	0.49	0.00	0.49	0.18	0.04

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## Risk Statistics

## Marathon Asset Mgmt

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.52	9.73	5.53	8.08	8.97	07/01/1998
Standard Deviation	8.09	10.21	10.27	15.98	15.49	
Downside Risk	4.97	5.60	6.24	10.72	10.58	
Downside Semi Deviation	2.13	8.86	9.58	16.88	16.71	
Max Drawdown Recovery Period	N/A	11.00	33.00	10.00	63.00	
Maximum Drawdown	-6.65	-9.76	-13.87	-32.10	-52.72	
Maximum Loss Exposure	N/A	-2.95	-3.89	-32.10	-15.61	
Upside Semi Deviation	2.76	11.91	11.15	15.84	15.12	
Blended Benchmark (MSCI ACWI ex USA net)						
Return	1.76	9.97	4.12	5.18	5.06	
Standard Deviation	9.74	10.88	11.20	17.78	17.06	
Downside Risk	6.49	6.05	7.25	12.31	12.05	
Downside Semi Deviation	3.11	10.32	11.37	18.80	19.04	
Max Drawdown Recovery Period	N/A	10.00	35.00	10.00	115.00	
Maximum Drawdown	-8.84	-11.47	-20.85	-35.81	-57.62	
Maximum Loss Exposure	N/A	-4.88	-12.46	-35.81	-16.17	
Upside Semi Deviation	2.85	12.00	11.38	17.29	15.83	
vs. Blended Benchmark (MSCI ACWI ex USA net)						
Active Return	0.61	-0.28	1.25	2.42	3.41	
Tracking Error	2.59	2.66	2.74	3.34	4.14	
Actual Correlation	0.97	0.97	0.97	0.99	0.97	
Beta	0.81	0.91	0.89	0.89	0.88	
Consistency	66.67	52.78	56.67	55.83	59.26	
Down Market Capture	76.04	89.11	81.39	79.01	77.99	
Down Market Outperformance	2.80	2.46	4.49	6.48	7.11	
Information Ratio	0.23	-0.11	0.46	0.73	0.82	
Jensen Alpha	0.73	0.55	1.71	3.19	4.02	
Up Market Capture	83.62	93.07	93.31	93.72	96.55	
Up Market Outperformance	-2.75	-2.95	-2.65	-4.17	-2.13	
vs. FTSE 3 Month T-Bill						
Excess Return	1.23	9.02	5.42	8.77	7.97	
Excess Risk	8.11	10.23	10.27	16.00	15.51	
Sharpe Ratio	0.15	0.88	0.53	0.55	0.51	

Calculation based on monthly periodicity.

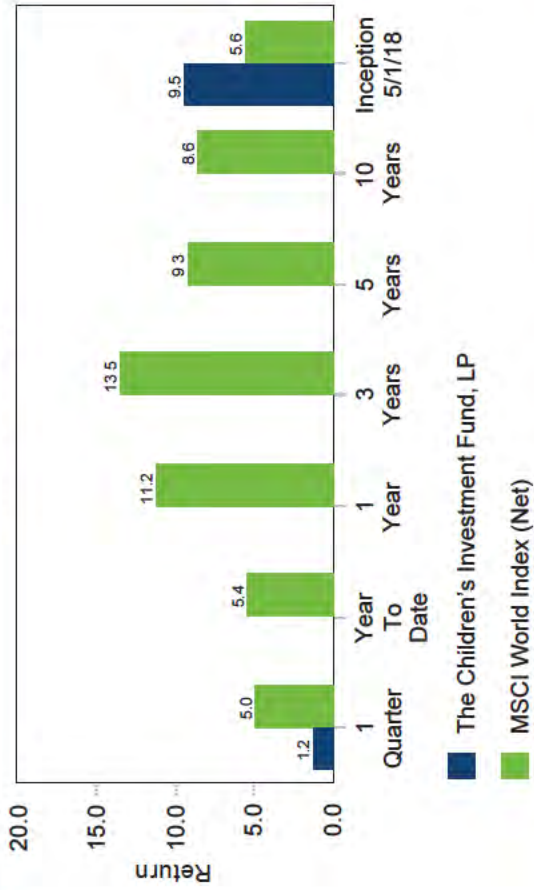
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Performance Summary

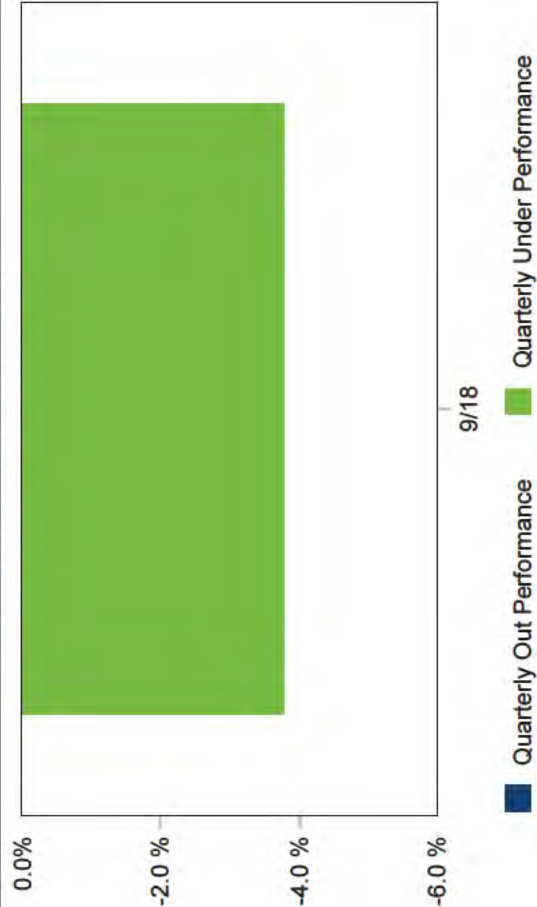
Account Information

Account Name: The Children's Investment Fund, LP  
 Inception Date: 05/01/2018  
 Account Structure: Commingled Fund  
 Asset Class: International Equity  
 Benchmark: MSCI World Index (Net)  
 Peer Group:

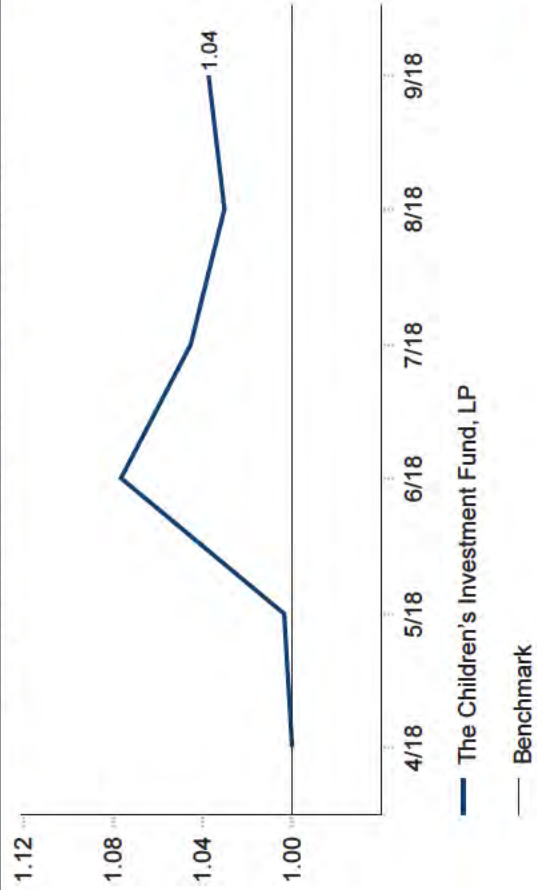
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

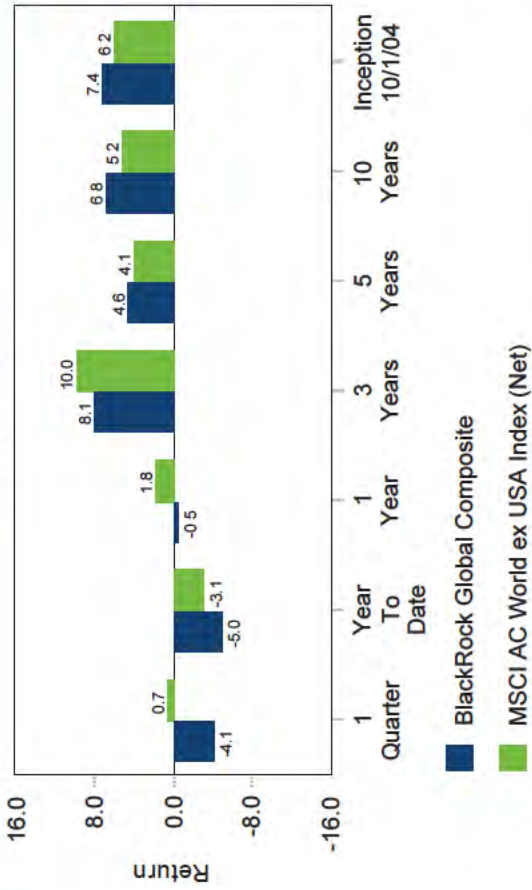


Performance Summary

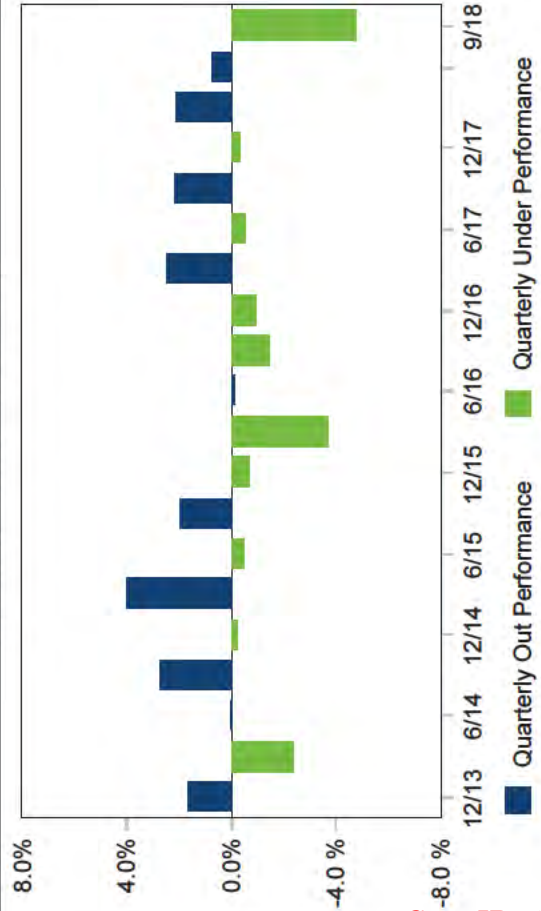
Account Information

Account Name: BlackRock Global Composite  
 Inception Date: 10/01/2004  
 Account Structure: Equity  
 Asset Class: MSCI AC World ex USA Index (Net)  
 Benchmark: IM International Equity (SA+CF)  
 Peer Group:

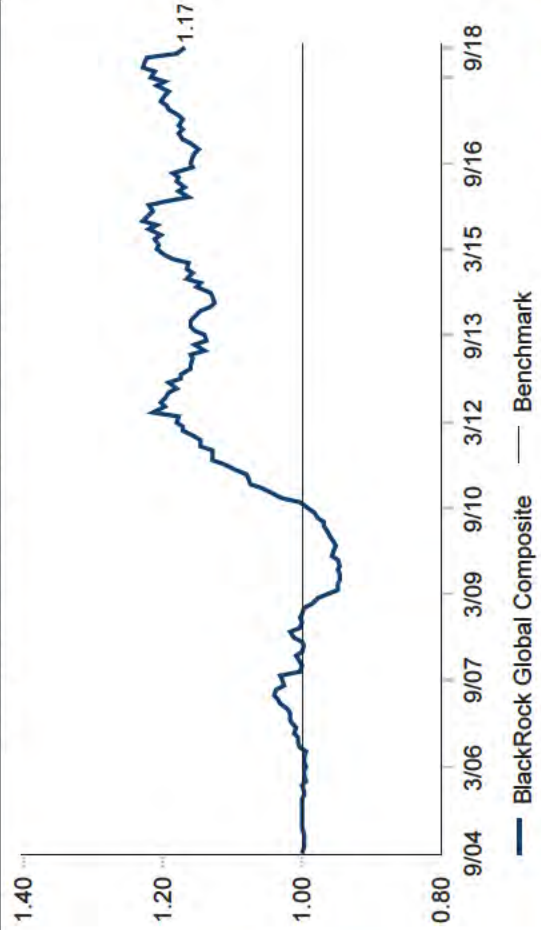
Return Summary



Quarterly Excess Performance

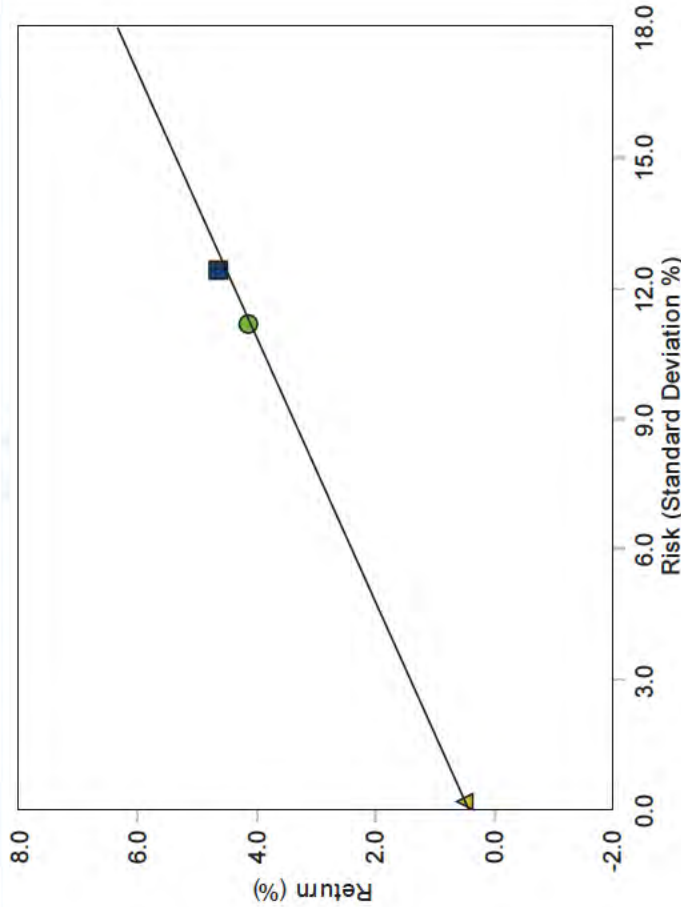


Ratio of Cumulative Wealth - Since Inception



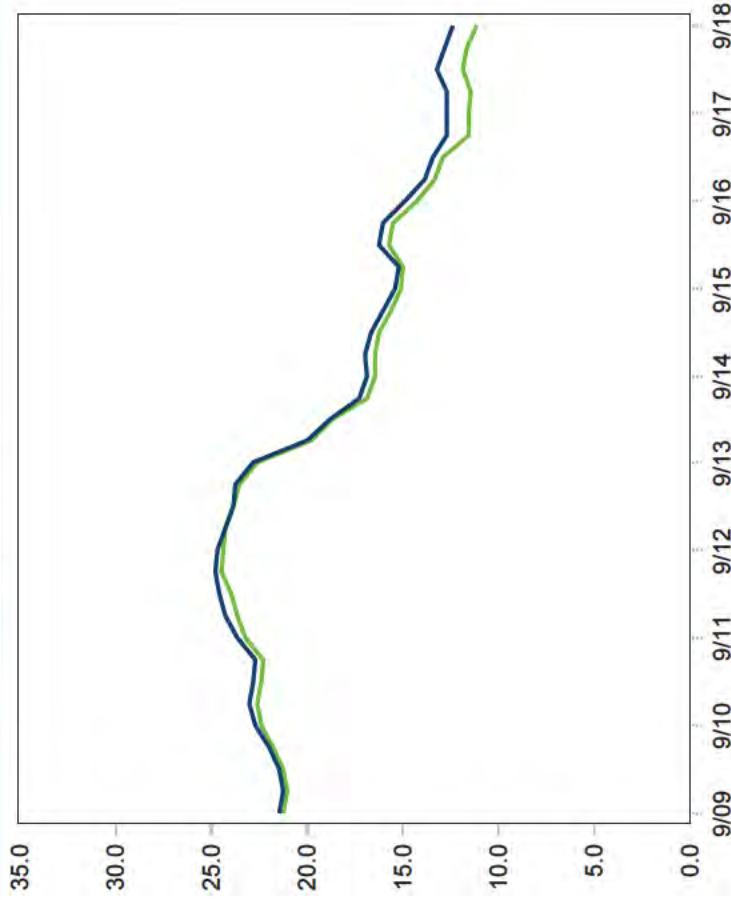
Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



- BlackRock Global Composite
- MSCI AC World ex USA Index (Net)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- BlackRock Global Composite
- MSCI AC World ex USA Index (Net)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
BlackRock Global Composite	0.65	3.78	0.17	0.91	0.39	0.38	1.06	4.65	12.42	0.95
MSCI AC World ex USA Index (Net)	0.00	0.00	N/A	1.00	0.37	0.00	1.00	4.12	11.20	1.00
FTSE 3 Month T-Bill	-4.17	11.19	-0.37	0.00	N/A	0.49	0.00	0.49	0.18	0.04

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
BlackRock Global Composite						10/01/2004
Return	-0.48	8.14	4.65	6.83	7.36	
Standard Deviation	11.93	12.88	12.42	18.30	17.67	
Downside Risk	8.56	7.95	8.20	12.49	12.25	
Downside Semi Deviation	3.67	12.14	12.35	18.90	19.06	
Max Drawdown Recovery Period	N/A	16.00	25.00	13.00	72.00	
Maximum Drawdown	-11.13	-15.62	-22.97	-37.37	-59.94	
Maximum Loss Exposure	-0.48	-10.11	-10.81	-37.37	-12.62	
Upside Semi Deviation	3.56	14.17	12.85	18.24	17.02	
MSCI AC World ex USA Index (Net)						
Return	1.76	9.97	4.12	5.18	6.17	
Standard Deviation	9.74	10.88	11.20	17.78	17.13	
Downside Risk	6.49	6.05	7.25	12.31	12.01	
Downside Semi Deviation	3.11	10.32	11.37	18.80	18.82	
Max Drawdown Recovery Period	N/A	10.00	35.00	10.00	115.00	
Maximum Drawdown	-8.84	-11.47	-20.85	-35.81	-57.63	
Maximum Loss Exposure	N/A	-4.88	-12.46	-35.81	-10.50	
Upside Semi Deviation	2.85	12.00	11.38	17.29	16.21	
vs. MSCI AC World ex USA Index (Net)						
Active Return	-2.01	-1.45	0.65	1.65	1.21	
Tracking Error	4.77	4.00	3.78	3.63	3.28	
Actual Correlation	0.92	0.96	0.95	0.98	0.98	
Beta	1.13	1.13	1.06	1.01	1.01	
Consistency	33.33	44.44	48.33	54.17	55.36	
Down Market Capture	112.30	119.57	98.74	96.53	99.46	
Down Market Outperformance	-1.50	-4.38	0.15	0.94	0.10	
Information Ratio	-0.42	-0.36	0.17	0.46	0.37	
Jensen Alpha	-2.07	-2.65	0.40	1.61	1.13	
Up Market Capture	97.03	102.96	102.74	103.79	104.27	
Up Market Outperformance	-0.59	1.13	0.97	2.52	2.76	
vs. FTSE 3 Month T-Bill						
Excess Return	-1.39	7.86	4.82	8.01	7.47	
Excess Risk	11.97	12.89	12.42	18.31	17.66	
Sharpe Ratio	-0.12	0.61	0.39	0.44	0.42	

Calculation based on monthly periodicity.

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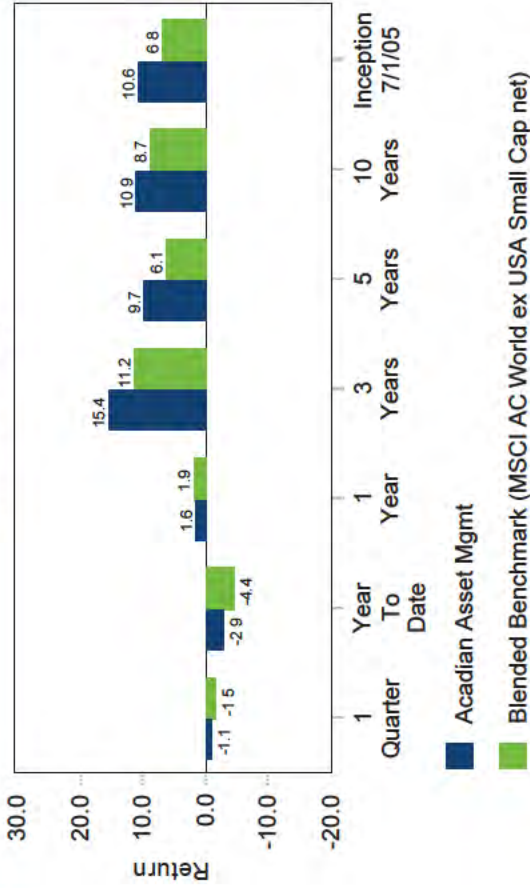


Performance Summary

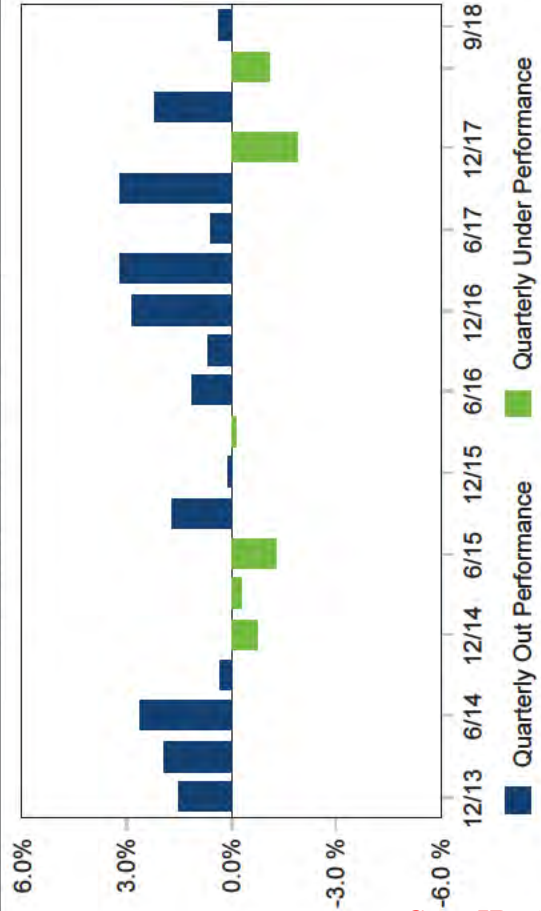
Account Information

Account Name: Acadian Asset Mgmt  
 Inception Date: 06/01/2005  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: Blended Benchmark (MSCI AC World ex USA Small Cap net)  
 Peer Group: IM International Small Cap Equity (SA+CF)

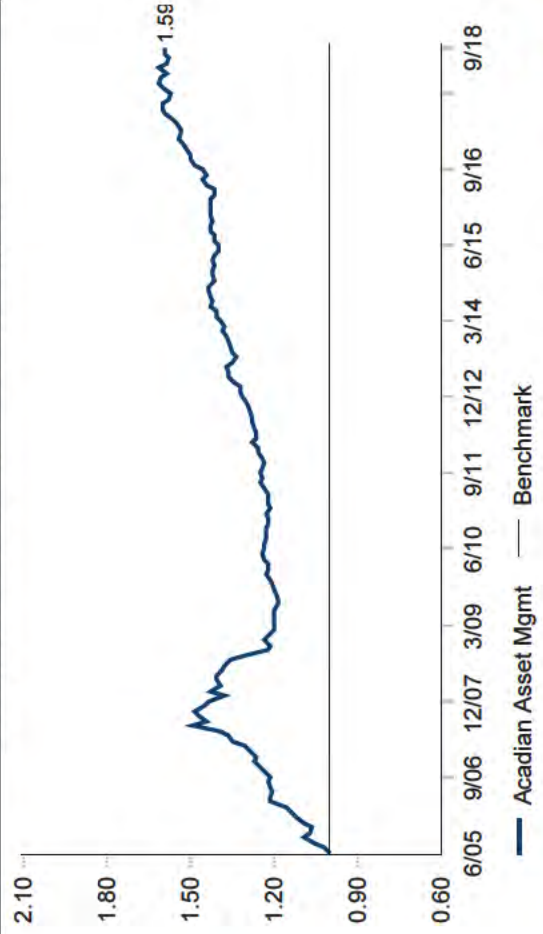
Return Summary



Quarterly Excess Performance

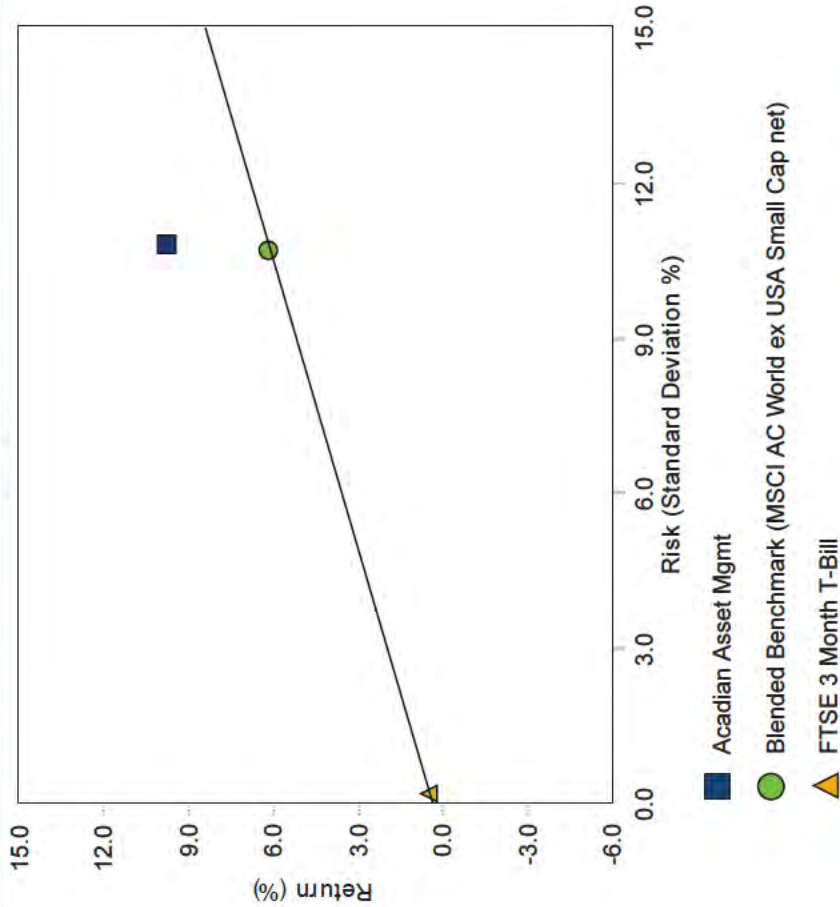


Ratio of Cumulative Wealth - Since Inception

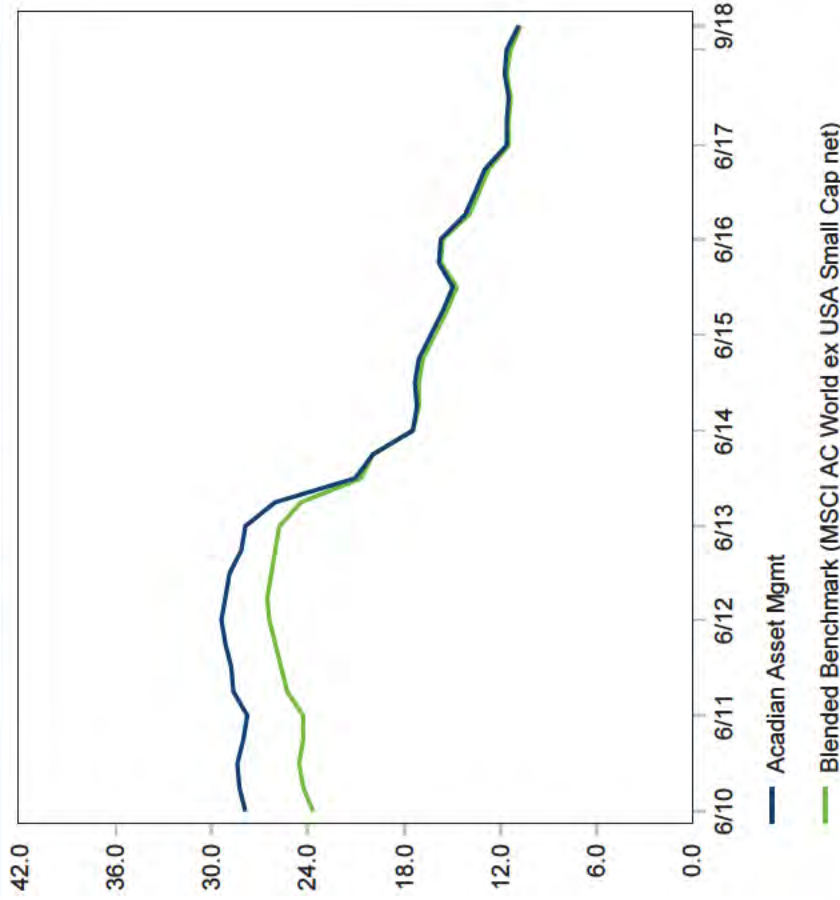


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Acadian Asset Mgmt	3.36	3.12	1.08	0.92	0.87	3.64	0.97	9.74	10.84	0.96
Blended Benchmark (MSCI AC World ex USA Small Cap net)	0.00	0.00	N/A	1.00	0.56	0.00	1.00	6.14	10.74	1.00
FTSE 3 Month T-Bill	-6.05	10.74	-0.56	0.00	N/A	0.49	0.00	0.49	0.18	0.00

## Risk Statistics

## Acadian Asset Mgmt

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.62	15.36	9.74	10.91	10.60	07/01/2005
Standard Deviation	9.68	11.20	10.84	19.89	20.56	
Downside Risk	5.85	5.80	6.11	13.74	14.63	
Downside Semi Deviation	2.80	10.34	9.58	21.86	23.74	
Max Drawdown Recovery Period	N/A	N/A	27.00	10.00	72.00	
Maximum Drawdown	-8.95	-8.95	-15.15	-39.72	-67.05	
Maximum Loss Exposure	N/A	-2.65	N/A	-39.72	-18.61	
Upside Semi Deviation	3.03	13.00	12.39	19.20	18.99	
Blended Benchmark (MSCI AC World ex USA Small Cap net)						
Return	1.86	11.24	6.14	8.73	6.78	
Standard Deviation	8.64	10.83	10.74	18.81	18.34	
Downside Risk	5.50	6.19	6.50	12.64	12.89	
Downside Semi Deviation	2.35	10.57	9.79	19.50	19.94	
Max Drawdown Recovery Period	N/A	N/A	32.00	9.00	42.00	
Maximum Drawdown	-8.89	-8.89	-15.22	-34.25	-59.06	
Maximum Loss Exposure	N/A	-2.80	-4.88	-34.25	-32.08	
Upside Semi Deviation	2.87	11.95	11.89	18.84	17.49	
vs. Blended Benchmark (MSCI AC World ex USA Small Cap net)						
Active Return	-0.16	3.71	3.36	2.26	4.03	
Tracking Error	4.11	3.41	3.12	3.42	5.03	
Actual Correlation	0.91	0.95	0.96	0.99	0.97	
Beta	1.02	0.99	0.97	1.04	1.09	
Consistency	41.67	61.11	63.33	61.67	61.01	
Down Market Capture	83.98	81.33	82.87	98.05	102.94	
Down Market Outperformance	1.57	3.93	3.46	0.22	-1.27	
Information Ratio	-0.04	1.09	1.08	0.66	0.80	
Jensen Alpha	-0.17	3.93	3.62	1.86	3.45	
Up Market Capture	85.43	109.18	107.94	106.89	117.06	
Up Market Outperformance	-2.24	3.98	3.46	5.19	12.30	
vs. FTSE 3 Month T-Bill						
Excess Return	0.47	14.18	9.41	12.15	11.15	
Excess Risk	9.72	11.23	10.84	19.91	20.54	
Sharpe Ratio	0.05	1.26	0.87	0.61	0.54	

Calculation based on monthly periodicity.

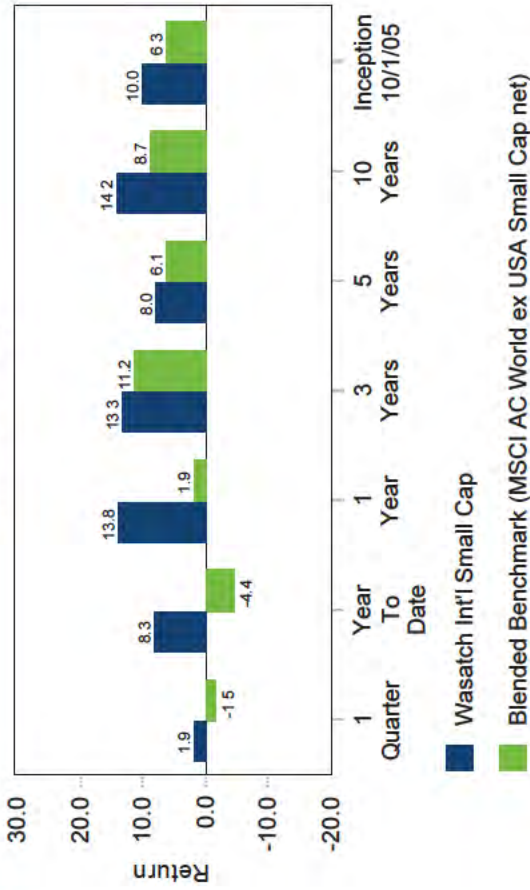
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Performance Summary

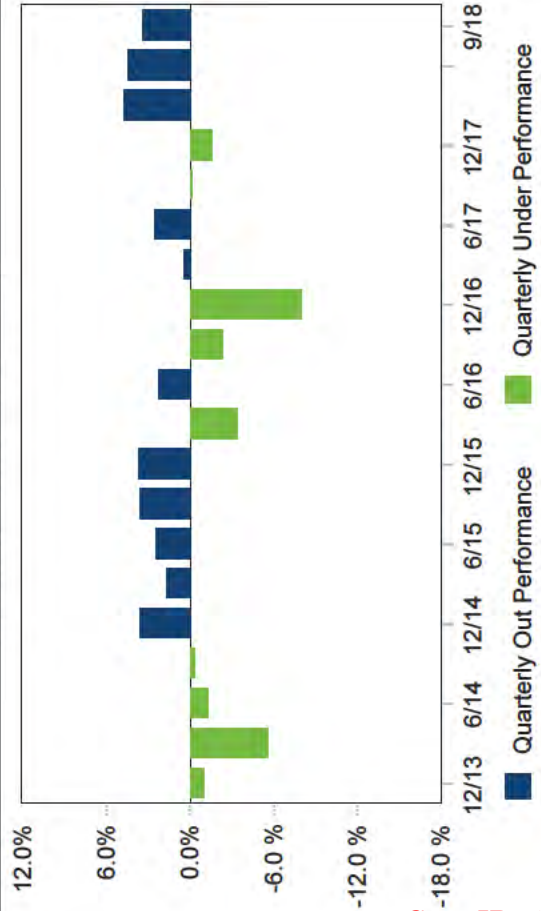
Account Information

Account Name: Wasatch Int'l Small Cap  
 Inception Date: 09/01/2005  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: Blended Benchmark (MSCI AC World ex USA Small Cap net)  
 Peer Group: IM International Small Cap Equity (SA+CF)

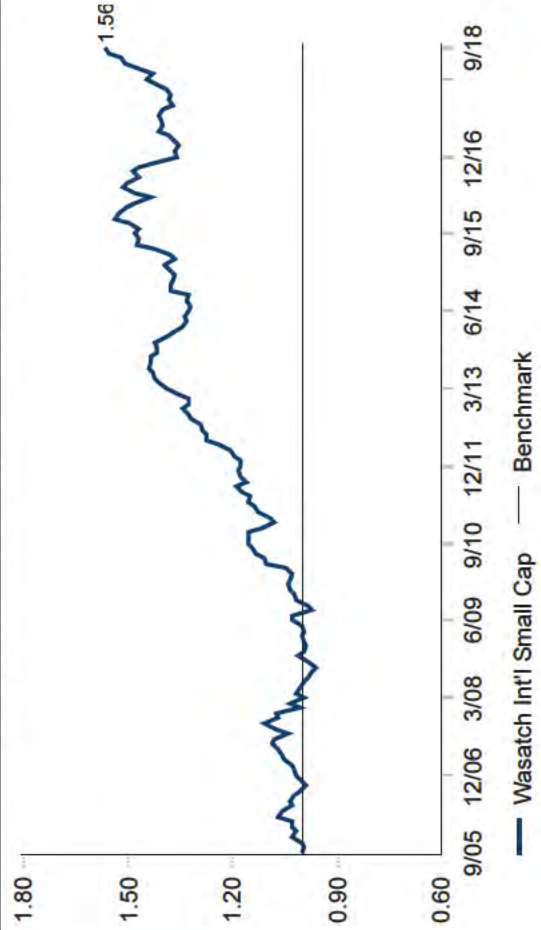
Return Summary



Quarterly Excess Performance

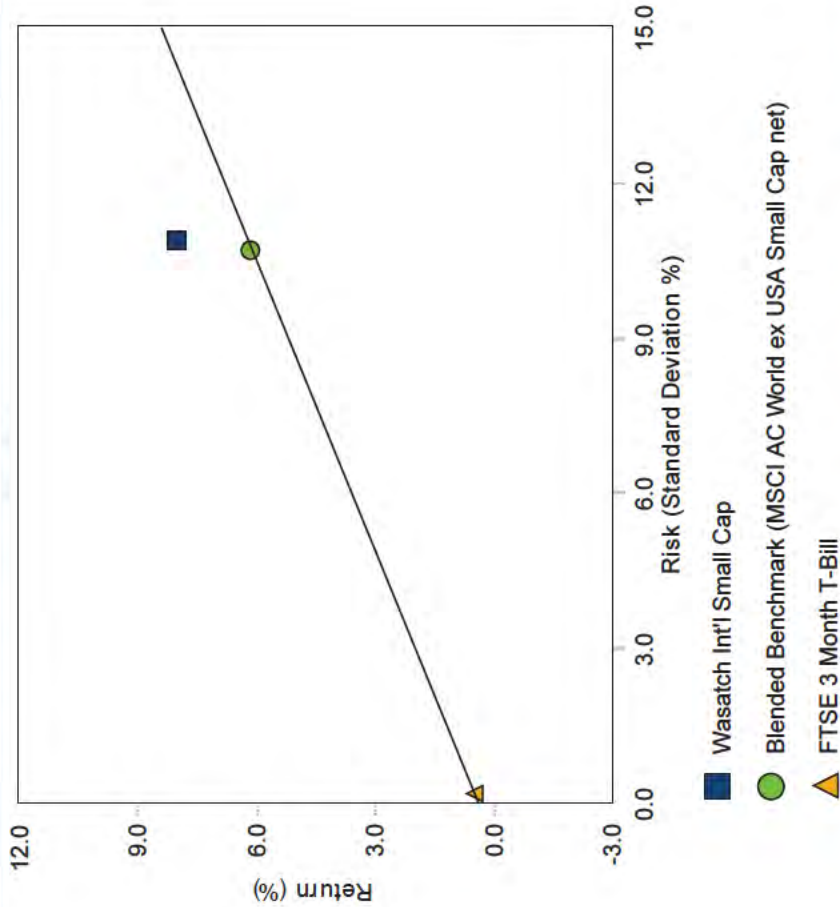


Ratio of Cumulative Wealth - Since Inception

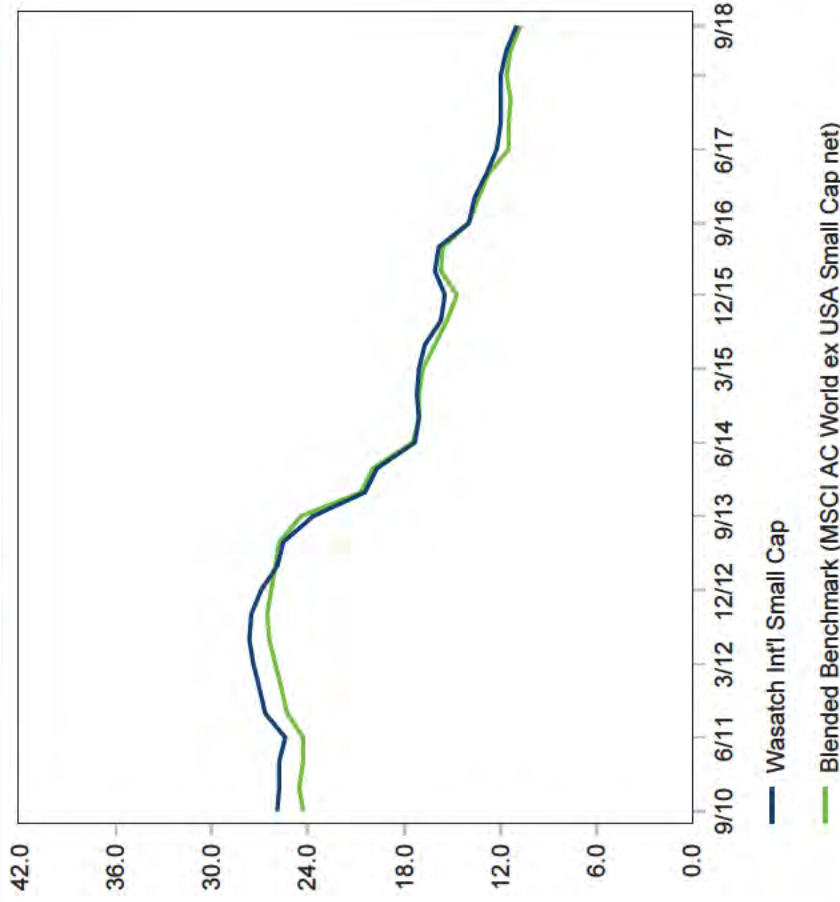


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Wasatch Int'l Small Cap	1.77	6.13	0.29	0.71	0.72	2.75	0.85	7.99	10.92	0.84
Blended Benchmark (MSCI AC World ex USA Small Cap net)	0.00	0.00	N/A	1.00	0.56	0.00	1.00	6.14	10.74	1.00
FTSE 3 Month T-Bill	-6.05	10.74	-0.56	0.00	N/A	0.49	0.00	0.49	0.18	0.00



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## Risk Statistics

## Wasatch Int'l Small Cap

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	13.76	13.26	7.99	14.18	9.98	10/01/2005
Standard Deviation	6.45	11.19	10.92	18.45	19.41	
Downside Risk	1.83	7.10	7.21	11.92	13.53	
Downside Semi Deviation	1.01	12.12	11.30	19.38	21.75	
Max Drawdown Recovery Period	4.00	7.00	7.00	7.00	41.00	
Maximum Drawdown	-1.57	-11.48	-11.48	-31.85	-63.25	
Maximum Loss Exposure	-0.30	-0.90	-4.55	-31.85	-37.68	
Upside Semi Deviation	2.66	11.94	11.26	18.84	18.37	
Blended Benchmark (MSCI AC World ex USA Small Cap net)						
Return	1.86	11.24	6.14	8.73	6.26	
Standard Deviation	8.64	10.83	10.74	18.81	18.48	
Downside Risk	5.50	6.19	6.50	12.64	13.01	
Downside Semi Deviation	2.35	10.57	9.79	19.50	19.94	
Max Drawdown Recovery Period	N/A	N/A	32.00	9.00	42.00	
Maximum Drawdown	-8.89	-8.89	-15.22	-34.25	-59.06	
Maximum Loss Exposure	N/A	-2.80	-4.88	-34.25	-37.29	
Upside Semi Deviation	2.87	11.95	11.89	18.84	17.67	
vs. Blended Benchmark (MSCI AC World ex USA Small Cap net)						
Active Return	10.96	1.86	1.77	4.85	3.64	
Tracking Error	5.50	6.49	6.13	6.05	6.48	
Actual Correlation	0.77	0.83	0.84	0.95	0.94	
Beta	0.58	0.85	0.85	0.93	0.99	
Consistency	75.00	55.56	53.33	63.33	60.26	
Down Market Capture	-13.04	60.33	67.27	78.66	93.55	
Down Market Outperformance	11.96	8.30	6.54	6.15	1.69	
Information Ratio	1.99	0.29	0.29	0.80	0.56	
Jensen Alpha	11.82	3.47	2.69	5.69	3.76	
Up Market Capture	88.74	90.67	89.10	103.90	109.06	
Up Market Outperformance	-1.70	-4.11	-4.73	2.88	6.47	
vs. FTSE 3 Month T-Bill						
Excess Return	11.59	12.33	7.81	14.74	10.33	
Excess Risk	6.47	11.18	10.90	18.47	19.43	
Sharpe Ratio	1.79	1.10	0.72	0.80	0.53	

Calculation based on monthly periodicity.

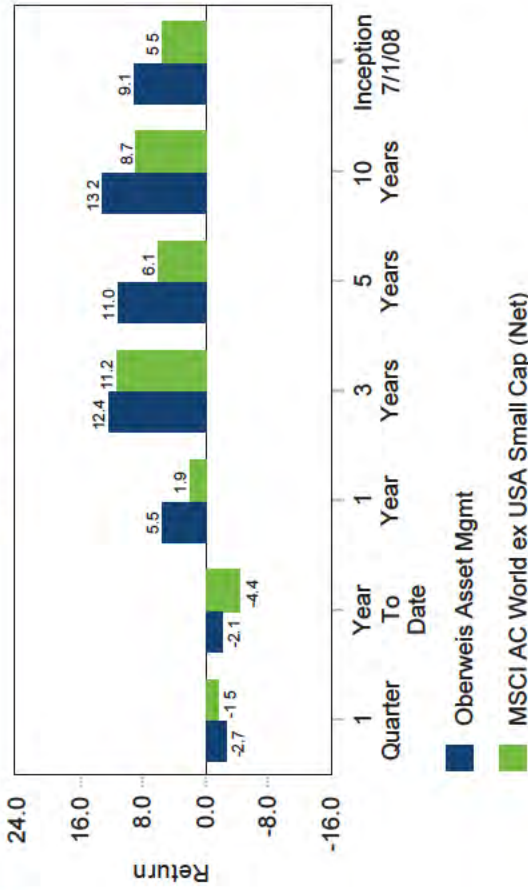
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Performance Summary

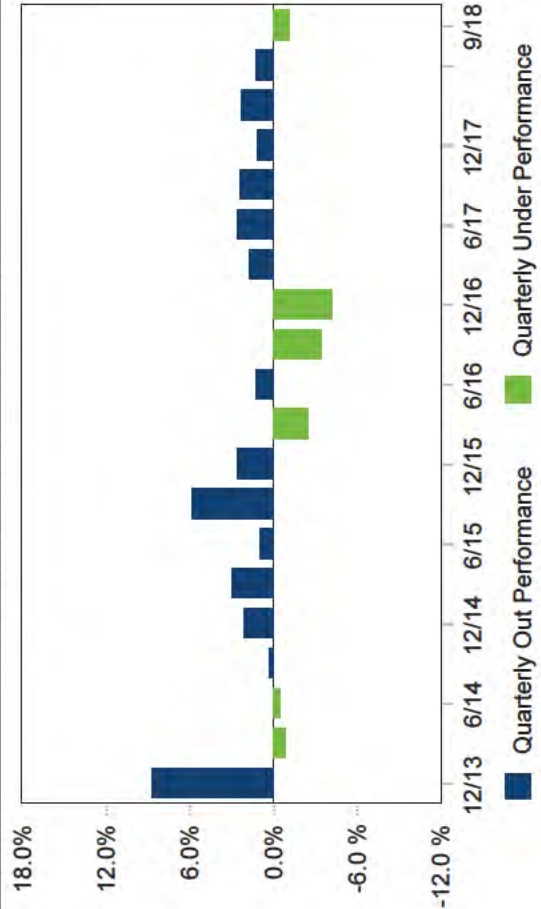
Account Information

Account Name: Oberweis Asset Mgmt  
 Inception Date: 06/30/2008  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: MSCI AC World ex USA Small Cap (Net)  
 Peer Group: IM International Small Cap Equity (SA+CF)

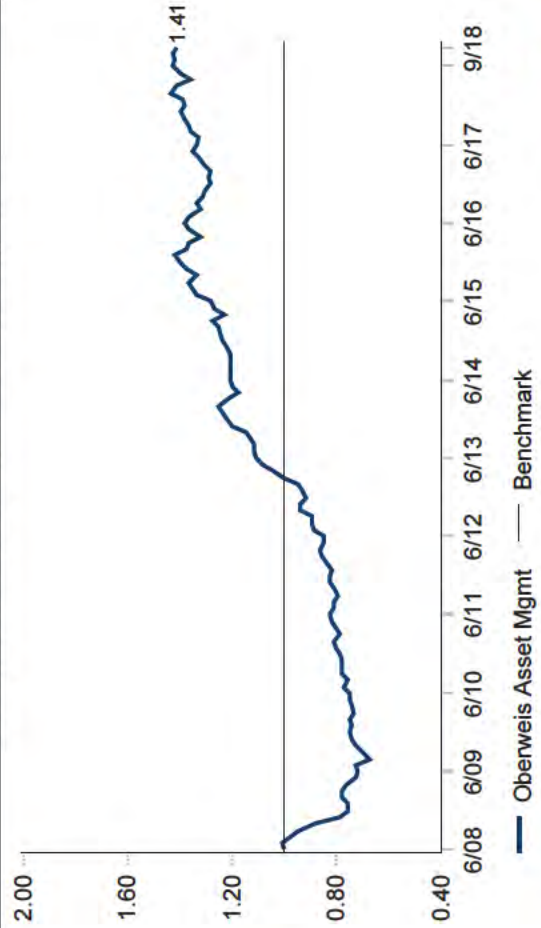
Return Summary



Quarterly Excess Performance

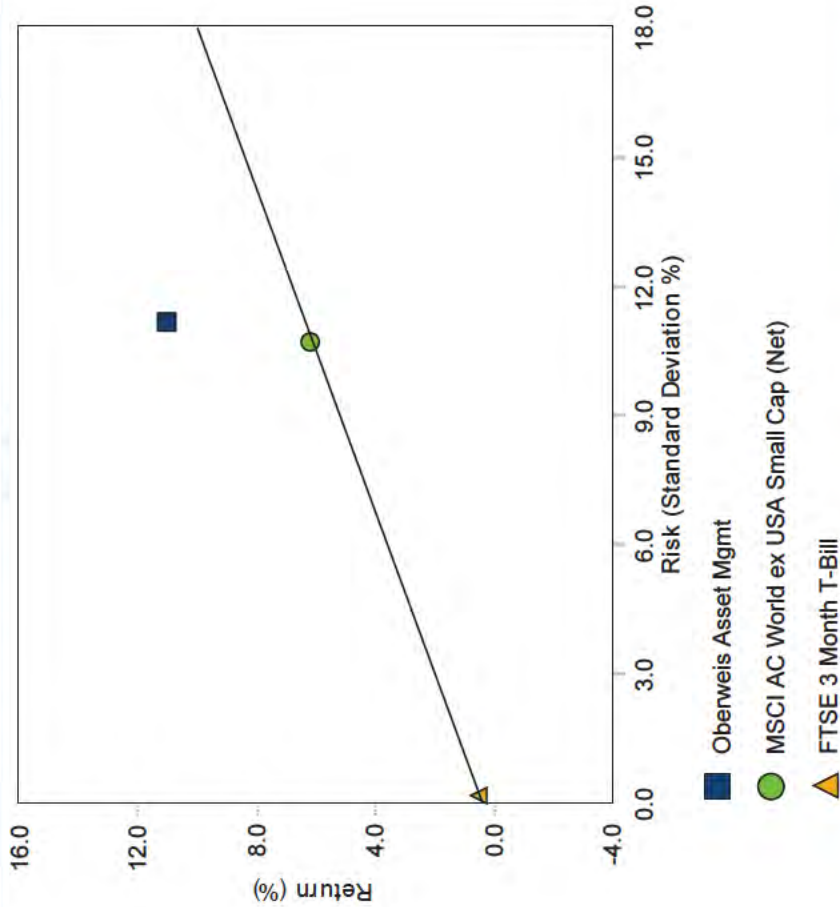


Ratio of Cumulative Wealth - Since Inception

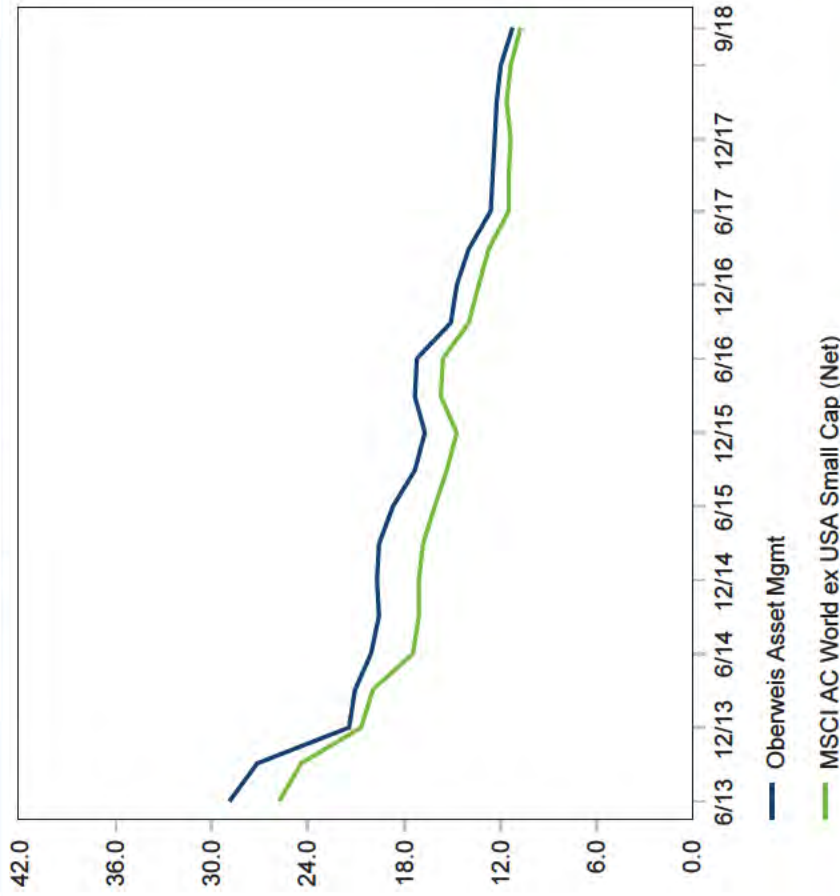


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Oberweis Asset Mgmt	4.57	6.88	0.66	0.65	0.95	5.79	0.84	11.02	11.18	0.80
MSCI AC World ex USA Small Cap (Net)	0.00	0.00	N/A	1.00	0.56	0.00	1.00	6.14	10.74	1.00
FTSE 3 Month T-Bill	-6.05	10.74	-0.56	0.00	N/A	0.49	0.00	0.49	0.18	0.00

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## Risk Statistics

## Oberweis Asset Mgmt

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.45	12.44	11.02	13.19	9.08	07/01/2008
Standard Deviation	9.13	11.24	11.18	20.68	21.77	
Downside Risk	4.86	6.29	6.30	14.37	15.85	
Downside Semi Deviation	1.90	9.95	10.09	23.12	25.02	
Max Drawdown Recovery Period	N/A	5.00	5.00	17.00	51.00	
Maximum Drawdown	-7.37	-8.90	-8.90	-45.53	-61.54	
Maximum Loss Exposure	N/A	-1.80	N/A	-45.53	-61.54	
Upside Semi Deviation	3.79	13.22	12.71	19.89	19.89	
MSCI AC World ex USA Small Cap (Net)						
Return	1.86	11.24	6.14	8.73	5.47	
Standard Deviation	8.64	10.83	10.74	18.81	19.63	
Downside Risk	5.50	6.19	6.50	12.64	13.86	
Downside Semi Deviation	2.35	10.57	9.79	19.50	21.03	
Max Drawdown Recovery Period	N/A	N/A	32.00	9.00	26.00	
Maximum Drawdown	-8.89	-8.89	-15.22	-34.25	-50.87	
Maximum Loss Exposure	N/A	-2.80	-4.88	-34.25	-50.87	
Upside Semi Deviation	2.87	11.95	11.89	18.84	18.84	
vs. MSCI AC World ex USA Small Cap (Net)						
Active Return	3.51	1.13	4.57	4.50	3.92	
Tracking Error	7.37	6.97	6.88	8.56	8.57	
Actual Correlation	0.66	0.80	0.80	0.91	0.92	
Beta	0.69	0.83	0.84	1.00	1.02	
Consistency	58.33	52.78	63.33	62.50	61.79	
Down Market Capture	43.03	67.08	56.17	85.39	89.70	
Down Market Outperformance	5.84	6.98	9.05	3.55	2.40	
Information Ratio	0.48	0.16	0.66	0.53	0.46	
Jensen Alpha	3.76	2.93	5.70	4.58	3.84	
Up Market Capture	79.07	90.24	97.74	106.89	106.89	
Up Market Outperformance	-3.21	-4.44	-1.21	4.93	4.93	
vs. FTSE 3 Month T-Bill						
Excess Return	4.14	11.59	10.62	14.38	10.88	
Excess Risk	9.18	11.26	11.19	20.71	21.82	
Sharpe Ratio	0.45	1.03	0.95	0.69	0.50	

Calculation based on monthly periodicity.

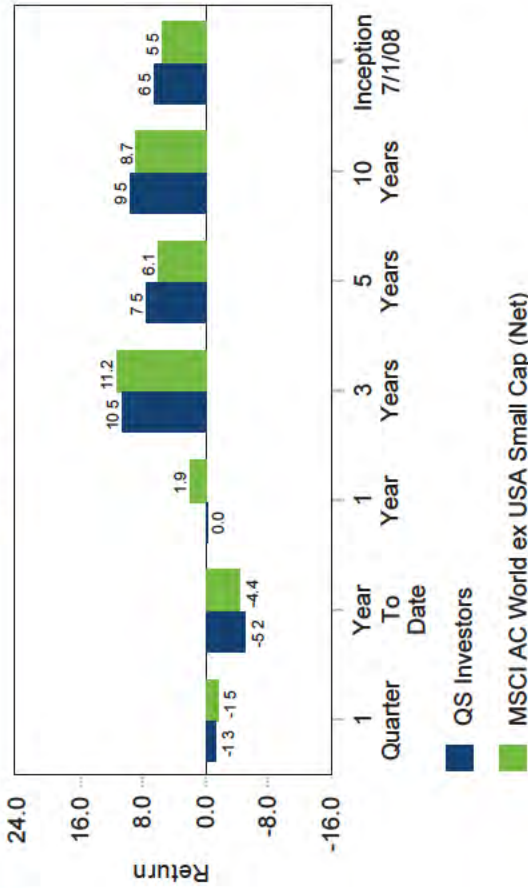
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Performance Summary

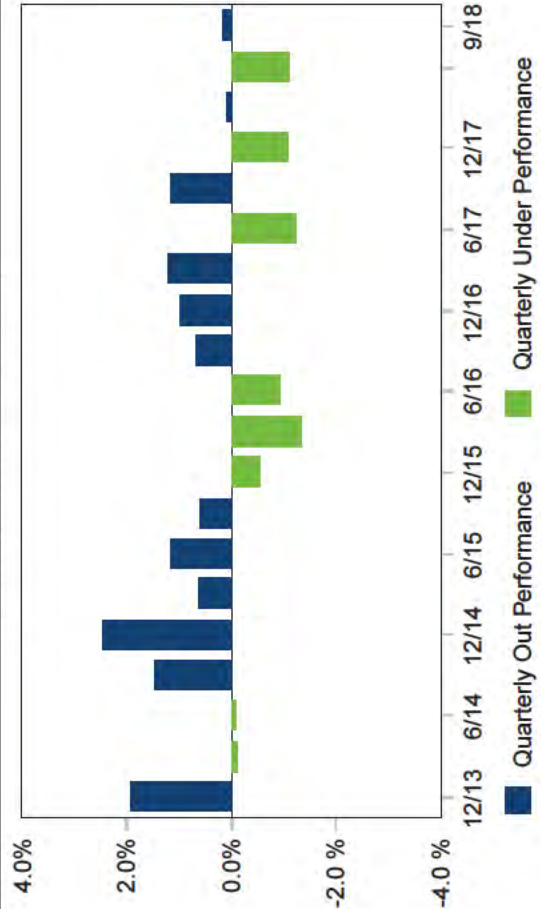
Account Information

Account Name: QS Investors  
 Inception Date: 06/30/2008  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: MSCI AC World ex USA Small Cap (Net)  
 Peer Group: IM International Small Cap Equity (SA+CF)

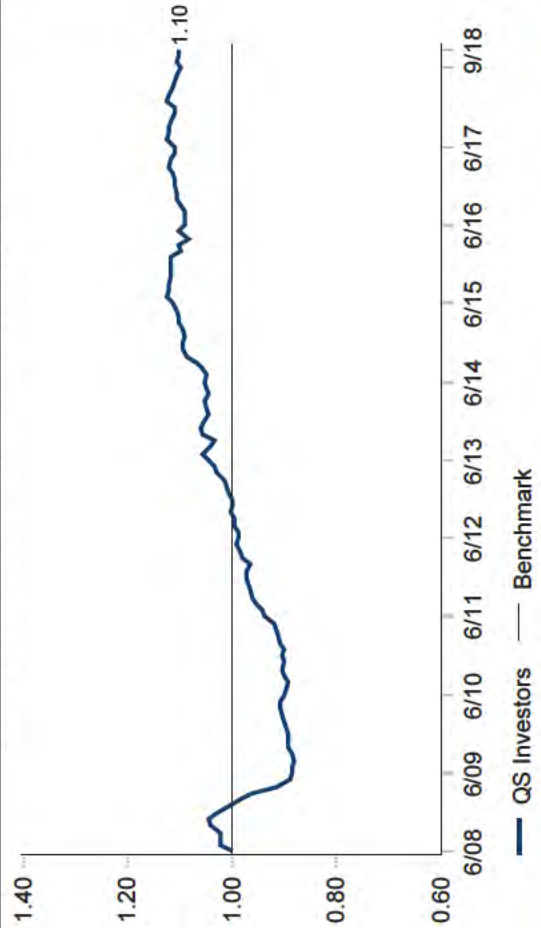
Return Summary



Quarterly Excess Performance

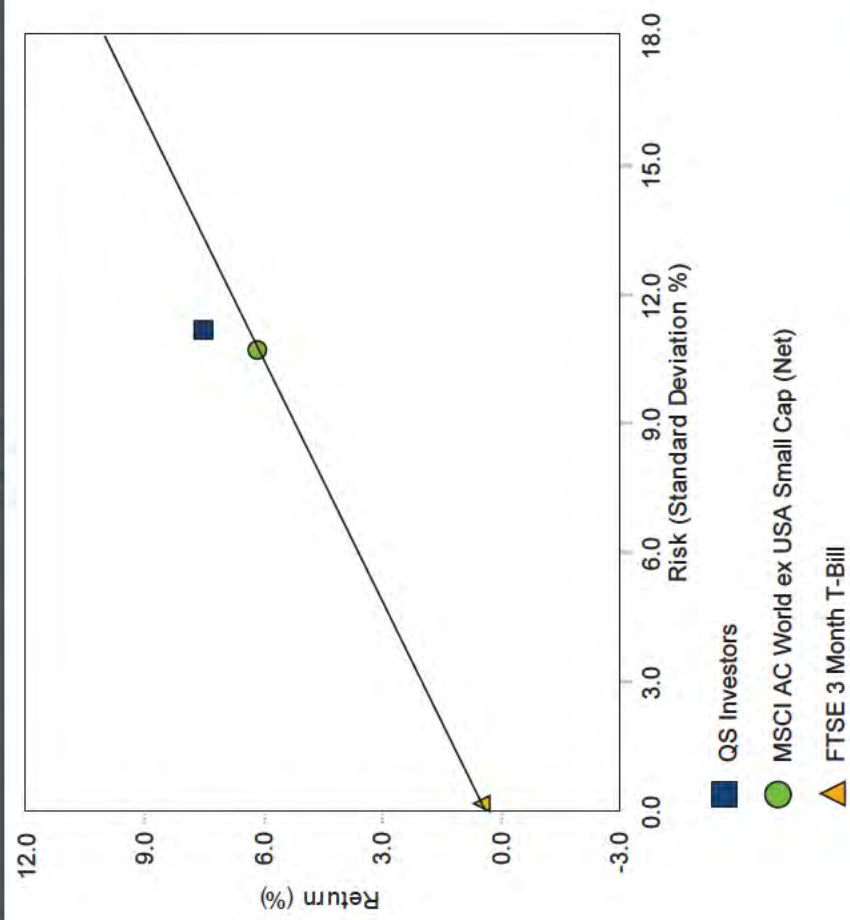


Ratio of Cumulative Wealth - Since Inception

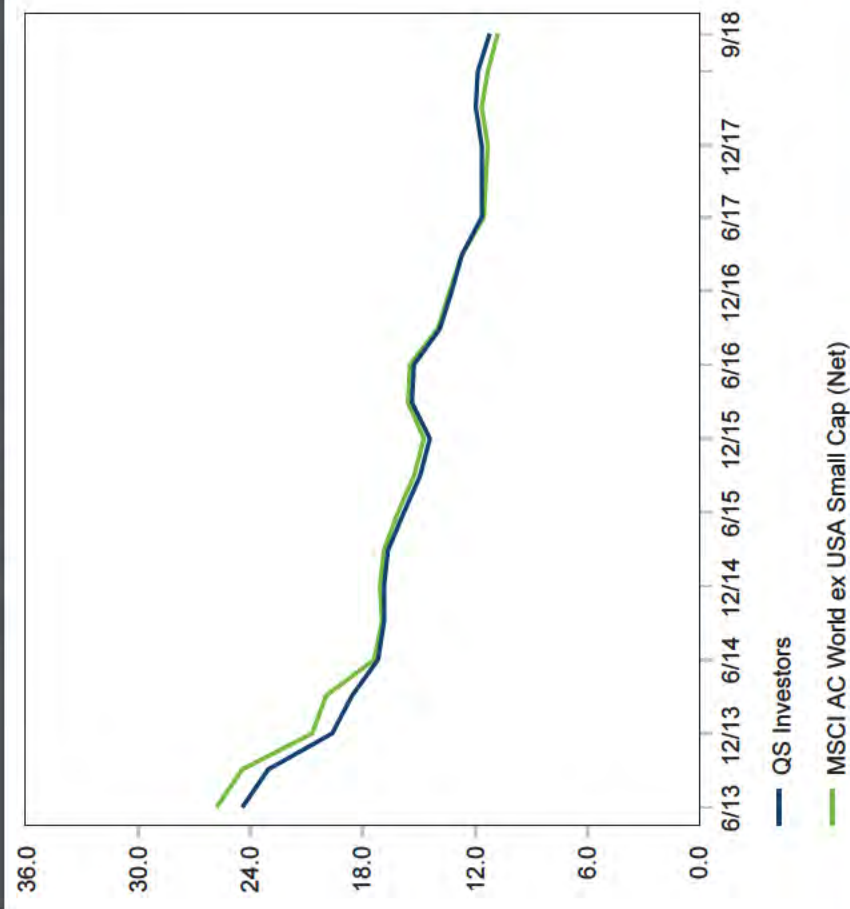


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
QS Investors	1.31	2.51	0.52	0.95	0.66	1.22	1.02	7.48	11.19	0.97
MSCI AC World ex USA Small Cap (Net)	0.00	0.00	N/A	1.00	0.56	0.00	1.00	6.14	10.74	1.00
FTSE 3 Month T-Bill	-6.05	10.74	-0.56	0.00	N/A	0.49	0.00	0.49	0.18	0.00

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Risk Statistics

QS Investors

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	0.00	10.54	7.48	9.55	6.47	07/01/2008
Standard Deviation	10.21	11.56	11.19	18.07	18.92	
Downside Risk	6.60	6.68	6.55	12.33	13.55	
Downside Semi Deviation	2.82	11.40	10.27	19.63	21.17	
Max Drawdown Recovery Period	N/A	N/A	20.00	11.00	29.00	
Maximum Drawdown	-10.82	-10.82	-14.75	-36.70	-51.66	
Maximum Loss Exposure	0.00	-4.65	N/A	-36.70	-51.66	
Upside Semi Deviation	3.34	12.55	12.32	17.58	17.58	
MSCI AC World ex USA Small Cap (Net)						
Return	1.86	11.24	6.14	8.73	5.47	
Standard Deviation	8.64	10.83	10.74	18.81	19.63	
Downside Risk	5.50	6.19	6.50	12.64	13.86	
Downside Semi Deviation	2.35	10.57	9.79	19.50	21.03	
Max Drawdown Recovery Period	N/A	N/A	32.00	9.00	26.00	
Maximum Drawdown	-8.89	-8.89	-15.22	-34.25	-50.87	
Maximum Loss Exposure	N/A	-2.80	-4.88	-34.25	-50.87	
Upside Semi Deviation	2.87	11.95	11.89	18.84	18.84	
vs. MSCI AC World ex USA Small Cap (Net)						
Active Return	-1.72	-0.56	1.31	0.63	0.82	
Tracking Error	2.20	2.45	2.51	3.43	3.46	
Actual Correlation	0.99	0.98	0.97	0.98	0.98	
Beta	1.17	1.04	1.02	0.94	0.95	
Consistency	33.33	38.89	53.33	60.00	60.16	
Down Market Capture	124.25	104.80	94.11	95.59	95.13	
Down Market Outperformance	-2.41	-1.03	1.15	1.27	1.46	
Information Ratio	-0.78	-0.23	0.52	0.18	0.24	
Jensen Alpha	-1.80	-1.02	1.22	1.17	1.18	
Up Market Capture	107.23	99.54	103.60	99.46	99.46	
Up Market Outperformance	1.01	-0.30	1.49	-0.21	-0.21	
vs. FTSE 3 Month T-Bill						
Excess Return	-1.09	9.91	7.36	10.51	7.78	
Excess Risk	10.25	11.59	11.20	18.09	18.96	
Sharpe Ratio	-0.11	0.85	0.66	0.58	0.41	

Calculation based on monthly periodicity.

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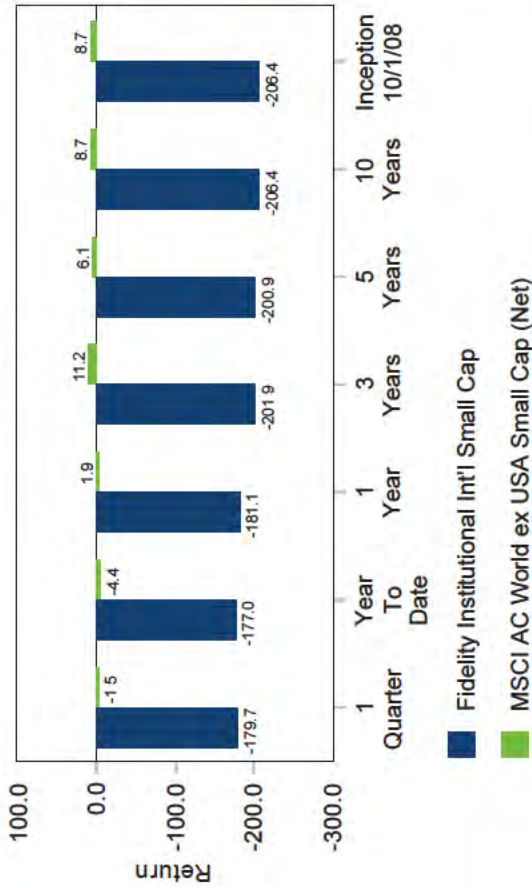


Performance Summary

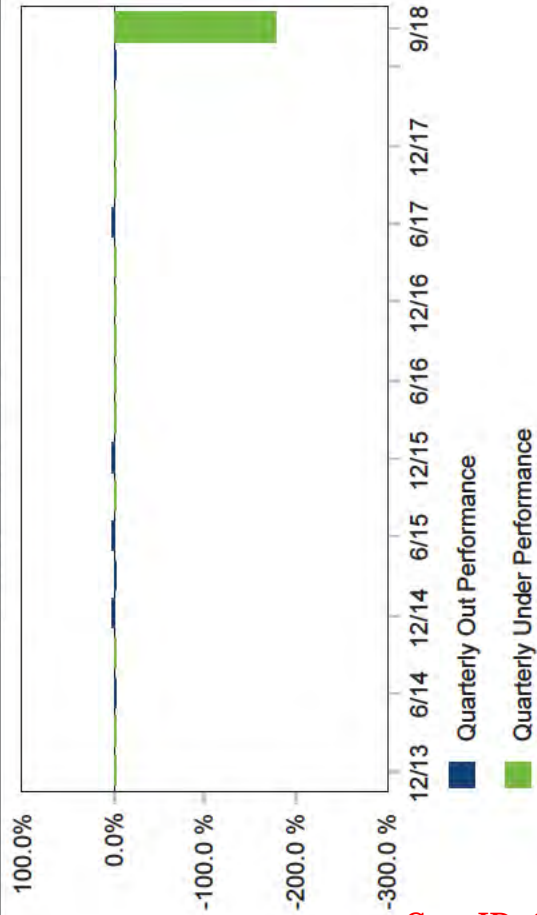
Account Information

Account Name: Fidelity Institutional Int'l Small Cap  
 Inception Date: 09/01/2008  
 Account Structure: Separate Account  
 Asset Class: International Equity  
 Benchmark: MSCI AC World ex USA Small Cap (Net)  
 Peer Group: IM International Small Cap Equity (SA+CF)

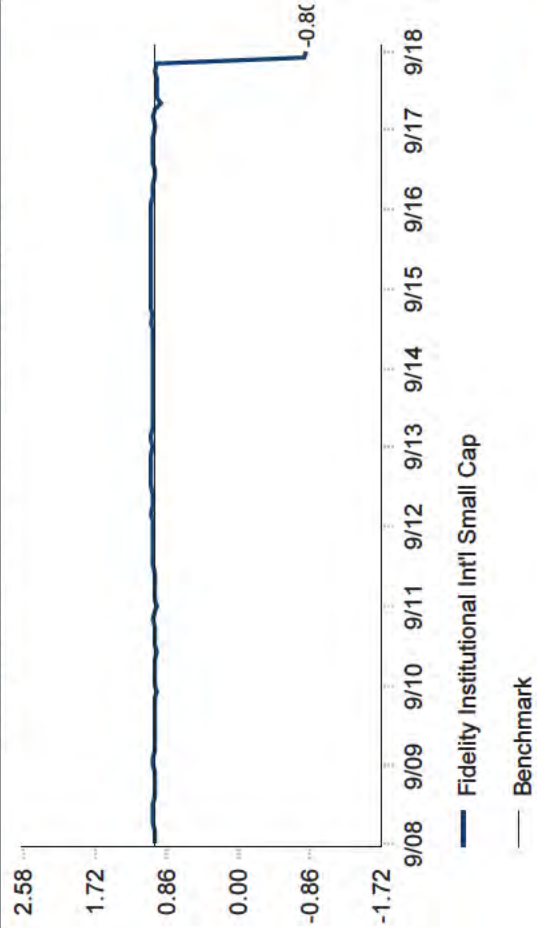
Return Summary



Quarterly Excess Performance

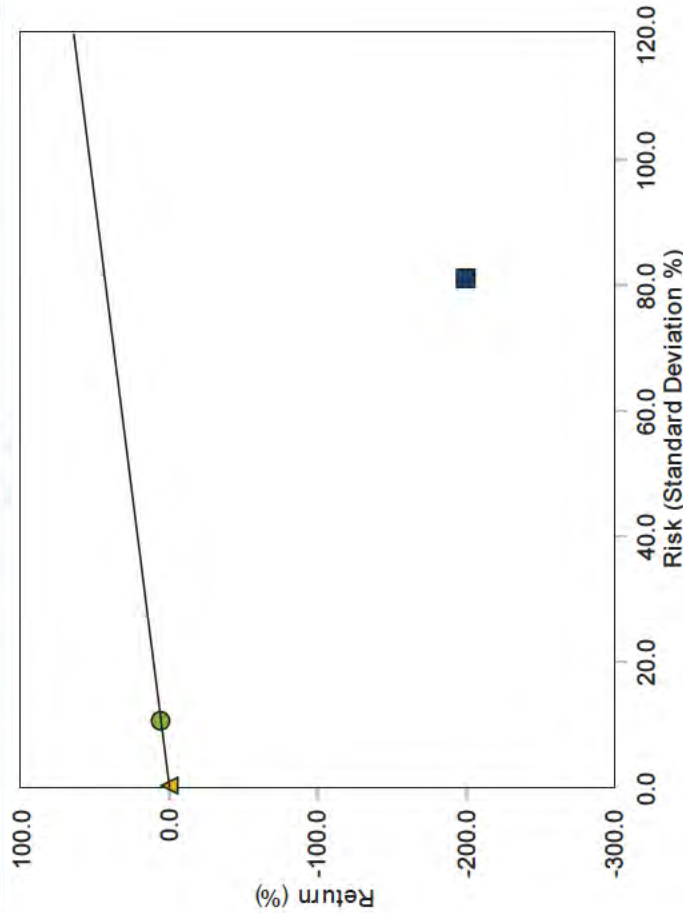


Ratio of Cumulative Wealth - Since Inception

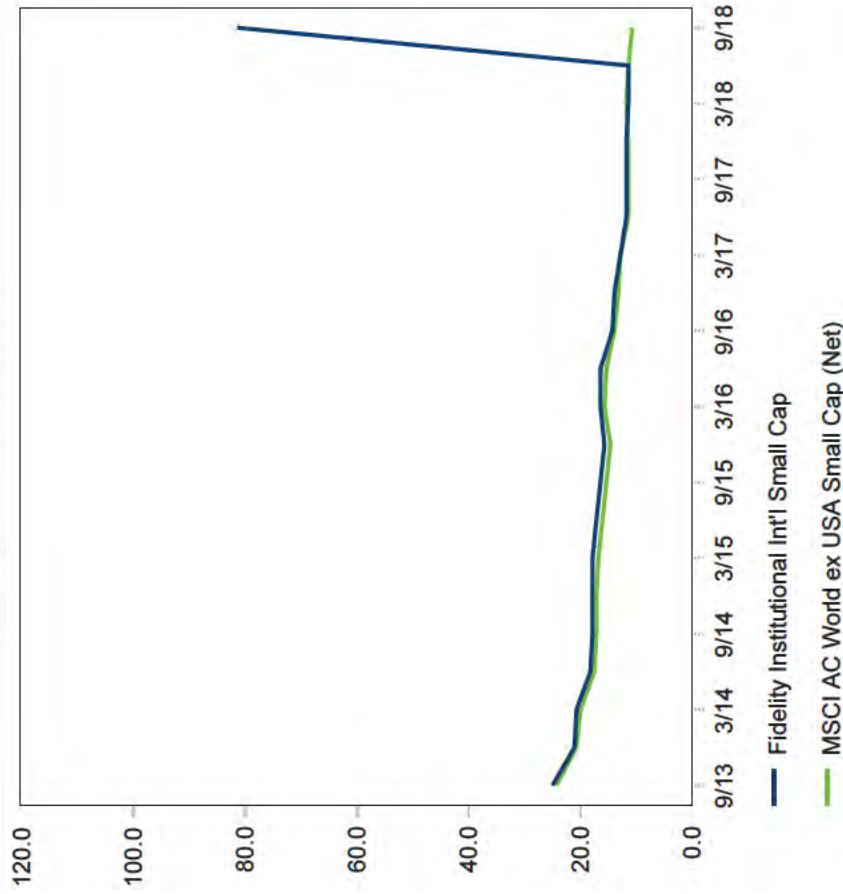


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Fidelity Institutional Int'l Small Cap	-36.56	80.06	-0.46	0.03	-0.37	-32.79	1.39	-200.86	81.32	0.18
MSCI AC World ex USA Small Cap (Net)	0.00	0.00	N/A	1.00	0.56	0.00	1.00	6.14	10.74	1.00
FTSE 3 Month T-Bill	-6.05	10.74	-0.56	0.00	N/A	0.49	0.00	0.49	0.18	0.00

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## Risk Statistics

## Fidelity Institutional Int'l Small Cap

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-181.12	-201.85	-200.86	-206.36	-206.36	10/01/2008
Standard Deviation	180.02	104.79	81.32	60.23	60.23	
Downside Risk	187.78	105.43	81.33	58.52	58.52	
Downside Semi Deviation	67.95	172.99	120.23	91.19	91.19	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-177.27	-177.27	-177.27	-177.27	-177.27	
Maximum Loss Exposure	-181.39	-206.01	-204.70	-285.86	-285.86	
Upside Semi Deviation	2.68	11.58	11.94	18.96	18.96	

## MSCI AC World ex USA Small Cap (Net)

Return	1.86	11.24	6.14	8.73	8.73	
Standard Deviation	8.64	10.83	10.74	18.81	18.81	
Downside Risk	5.50	6.19	6.50	12.64	12.64	
Downside Semi Deviation	2.35	10.57	9.79	19.50	19.50	
Max Drawdown Recovery Period	N/A	N/A	32.00	9.00	9.00	
Maximum Drawdown	-8.89	-8.89	-15.22	-34.25	-34.25	
Maximum Loss Exposure	N/A	-2.80	-4.88	-34.25	-34.25	
Upside Semi Deviation	2.87	11.95	11.89	18.84	18.84	

## vs. MSCI AC World ex USA Small Cap (Net)

Active Return	-180.18	-61.28	-36.56	-17.86	-17.86	
Tracking Error	178.91	103.29	80.06	56.67	56.67	
Actual Correlation	0.15	0.19	0.18	0.34	0.34	
Beta	3.15	1.83	1.39	1.09	1.09	
Consistency	41.67	36.11	38.33	46.67	46.67	
Down Market Capture	1,654.97	698.79	403.25	198.33	198.33	
Down Market Outperformance	-167.27	-142.38	-149.70	-126.84	-126.84	
Information Ratio	-1.01	-0.59	-0.46	-0.32	-0.32	
Jensen Alpha	-86.04	-51.62	-32.83	-17.27	-17.27	
Up Market Capture	32.24	82.06	88.09	98.15	98.15	
Up Market Outperformance	-9.65	-7.76	-5.21	-1.50	-1.50	

## vs. FTSE 3 Month T-Bill

Excess Return	-179.55	-50.82	-30.51	-7.97	-7.97	
Excess Risk	180.06	104.85	81.38	60.28	60.28	
Sharpe Ratio	-1.00	-0.48	-0.37	-0.13	-0.13	

Calculation based on monthly periodicity.

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## Total Alternatives

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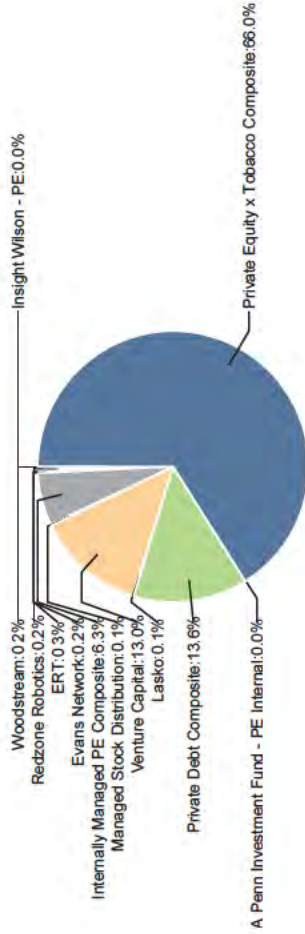
Case ID: 221102792

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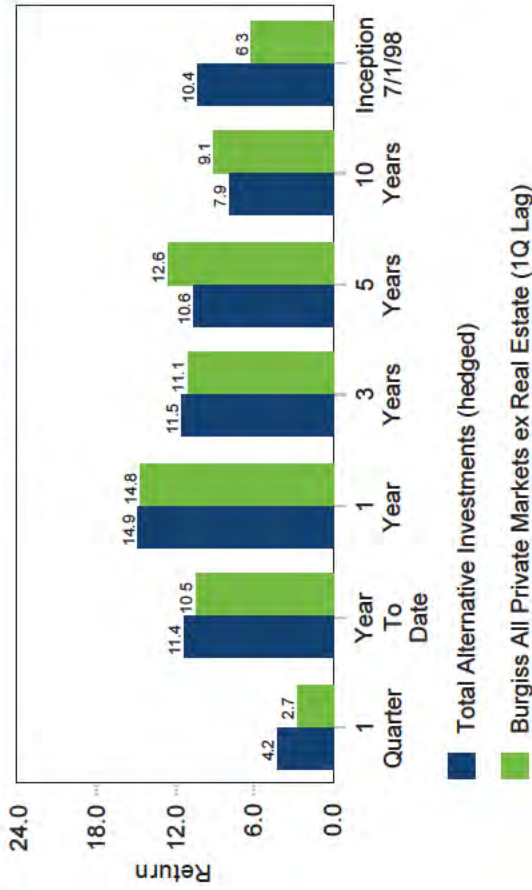


Current Allocation

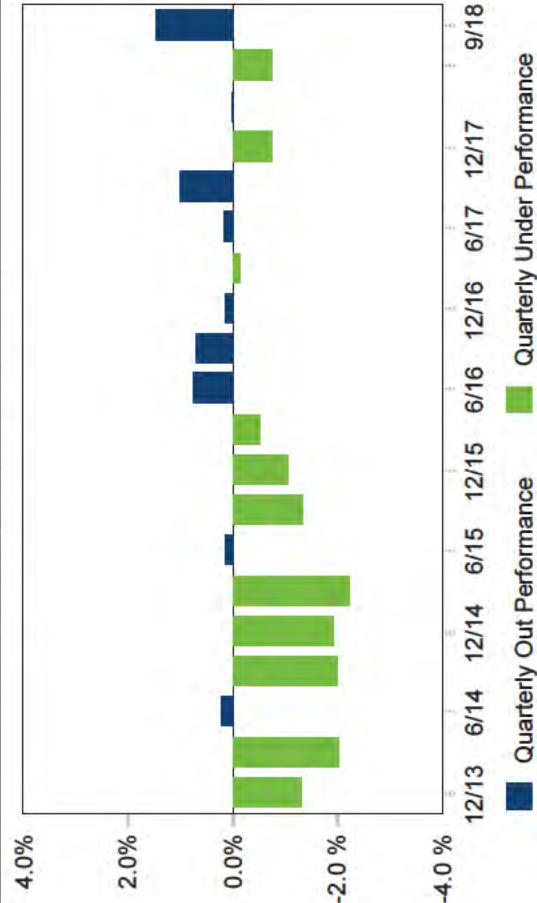
September 30, 2018 : \$8,145M



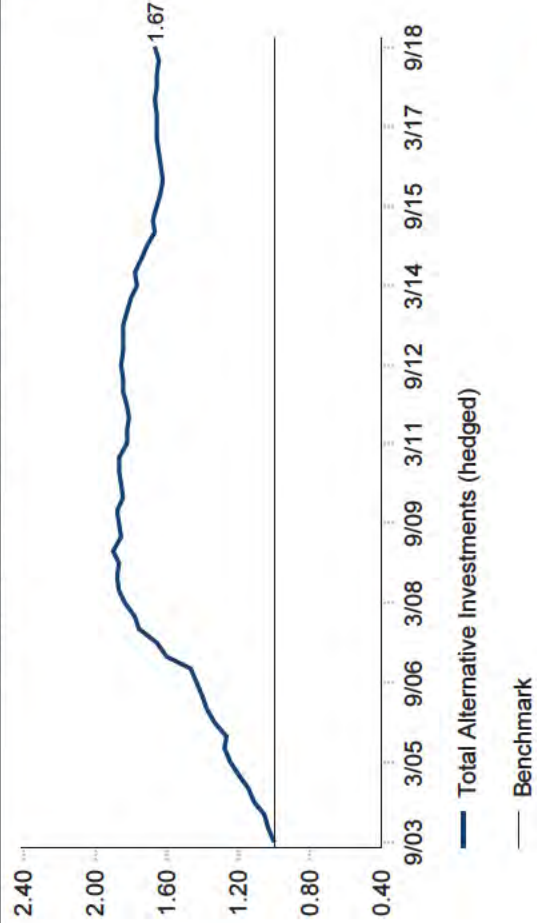
Return Summary



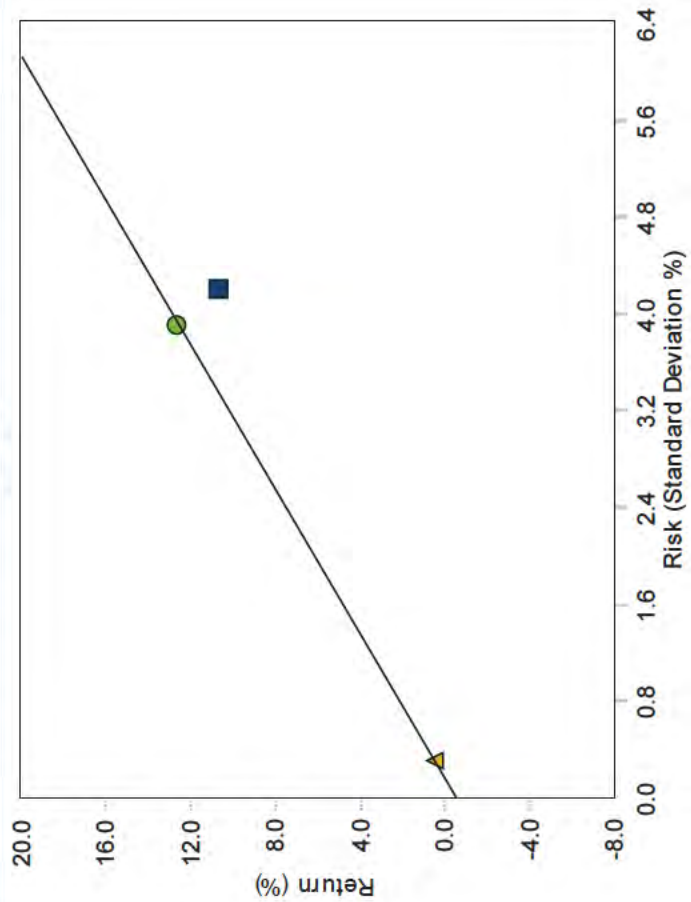
Quarterly Excess Performance



Ratio of Cumulative Wealth - 15 Years

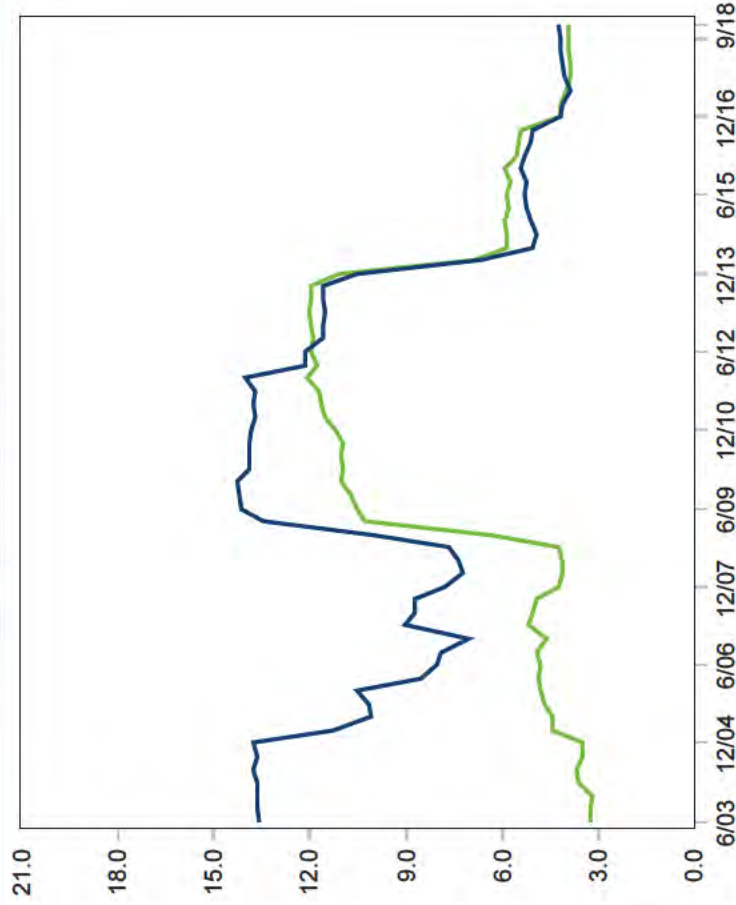


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Total Alternative Investments (hedged)
- Burgiss All Private Markets ex Real Estate (1Q Lag)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Total Alternative Investments (hedged)
- Burgiss All Private Markets ex Real Estate (1Q Lag)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Alternative Investments (hedged)	-1.80	2.19	-0.82	0.74	2.40	-0.84	0.92	10.64	4.21	0.86
Burgiss All Private Markets ex Real Estate (1Q Lag)	0.00	0.00	N/A	1.00	2.99	0.00	1.00	12.61	3.92	1.00
FTSE 3 Month T-Bill	-11.64	3.90	-2.99	0.01	N/A	0.37	0.01	0.49	0.32	0.12

Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.



## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Total Alternative Investments (hedged)						
Return	14.90	11.51	10.64	7.86	10.40	07/01/1998
Standard Deviation	2.48	4.13	4.21	8.68	10.31	
Downside Risk	0.00	1.30	1.27	6.24	5.50	
Downside Semi Deviation	N/A	N/A	1.96	15.91	12.31	
Max Drawdown Recovery Period	N/A	2.00	3.00	10.00	18.00	
Maximum Drawdown	0.00	-2.16	-2.16	-27.66	-28.00	
Maximum Loss Exposure	N/A	-2.16	N/A	-27.66	-0.37	
Upside Semi Deviation	8.54	7.35	7.24	8.03	11.50	
vs. Burgiss All Private Markets ex Real Estate (1Q Lag)						
Active Return	0.10	0.45	-1.80	-1.20	4.15	
Tracking Error	2.09	1.55	2.19	2.15	6.78	
Actual Correlation	0.59	0.93	0.86	0.97	0.76	
Beta	0.72	1.13	0.92	0.94	1.10	
Consistency	50.00	58.33	45.00	50.00	61.73	
Down Market Capture	N/A	187.91	187.91	102.27	120.35	
Down Market Outperformance	N/A	-1.01	-1.01	-0.37	-2.04	
Information Ratio	0.05	0.29	-0.82	-0.56	0.61	
Jensen Alpha	3.97	-0.90	-0.59	-0.69	4.00	
Up Market Capture	100.68	107.09	87.05	91.19	152.24	
Up Market Outperformance	0.10	0.93	-1.85	-1.47	6.73	
vs. FTSE 3 Month T-Bill						
Excess Return	12.59	10.32	9.83	7.71	8.66	
Excess Risk	2.49	3.97	4.10	8.68	10.19	
Sharpe Ratio	5.06	2.60	2.40	0.89	0.85	

calculation based on quarterly periodicity.

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## Total Fixed Income

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# Investment Grade Fixed Income

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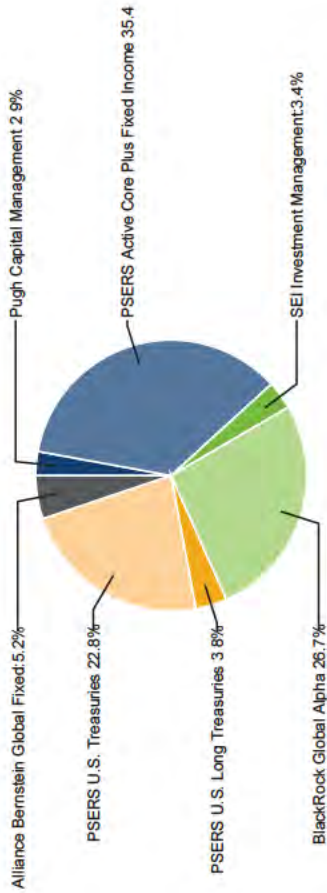
Case ID: 221102792

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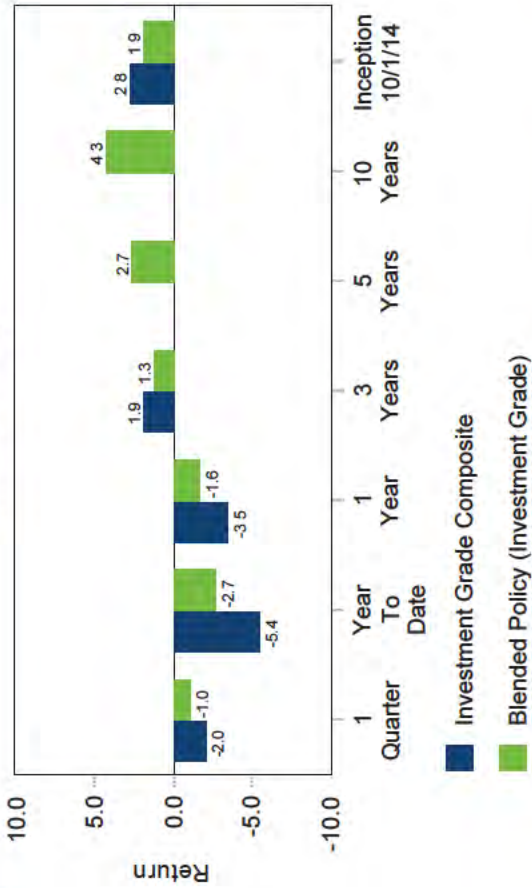
Portfolio Overview

Current Allocation

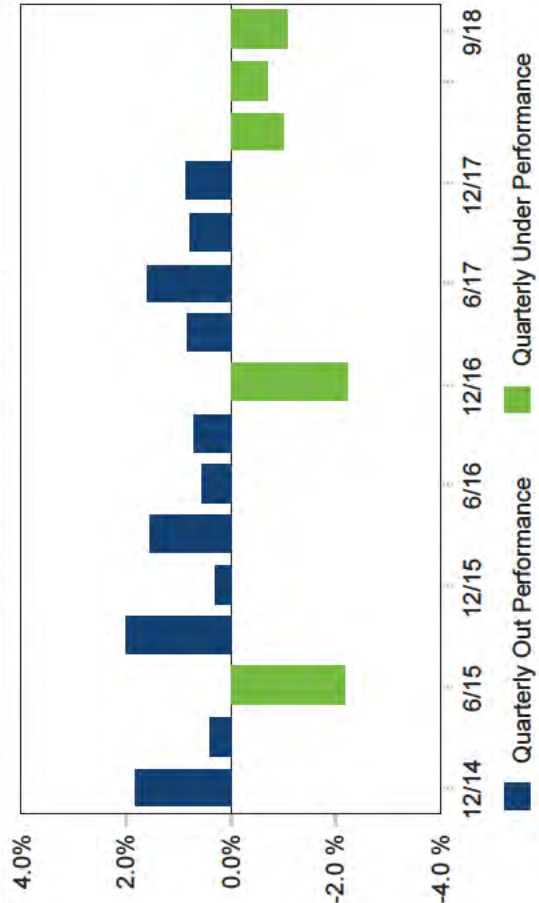
September 30, 2018 : \$3,514M



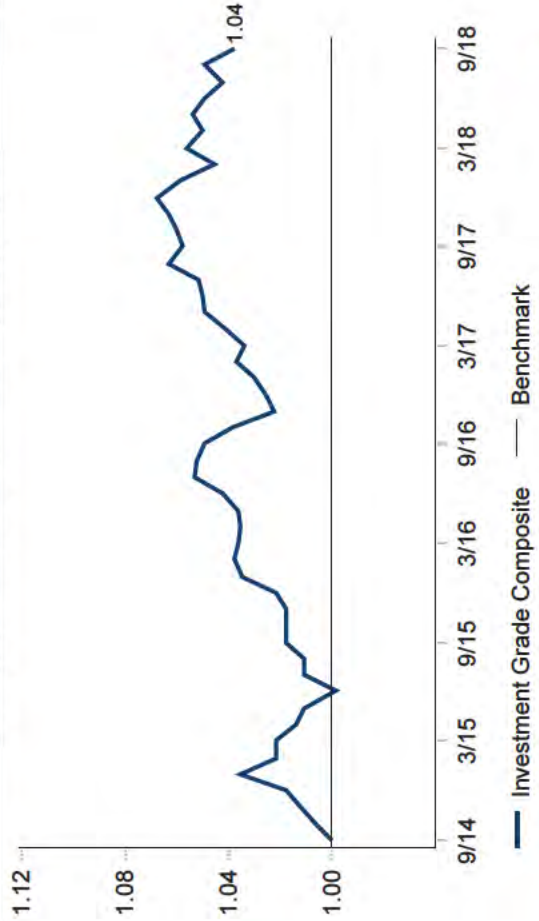
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





## US Core Plus Fixed Income

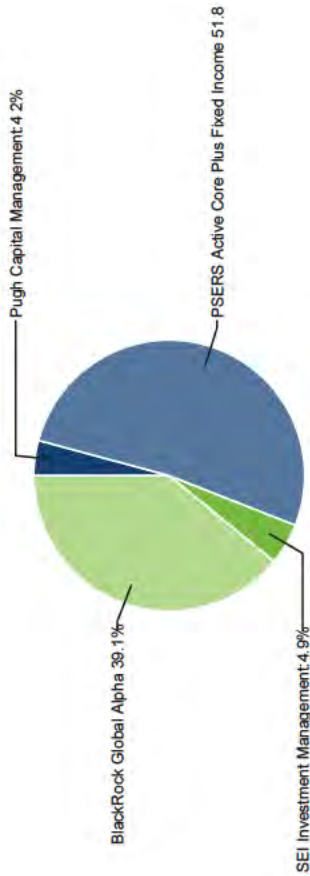
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Case ID: 221102792

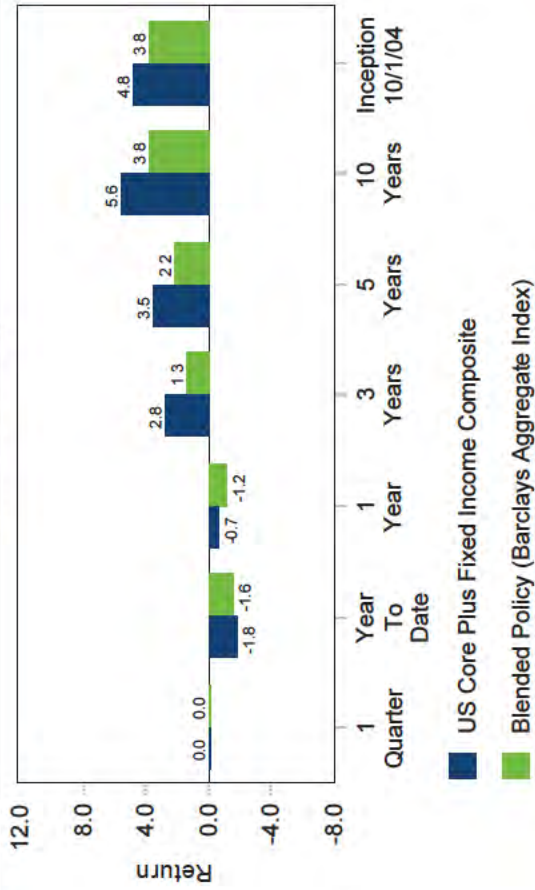
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Current Allocation

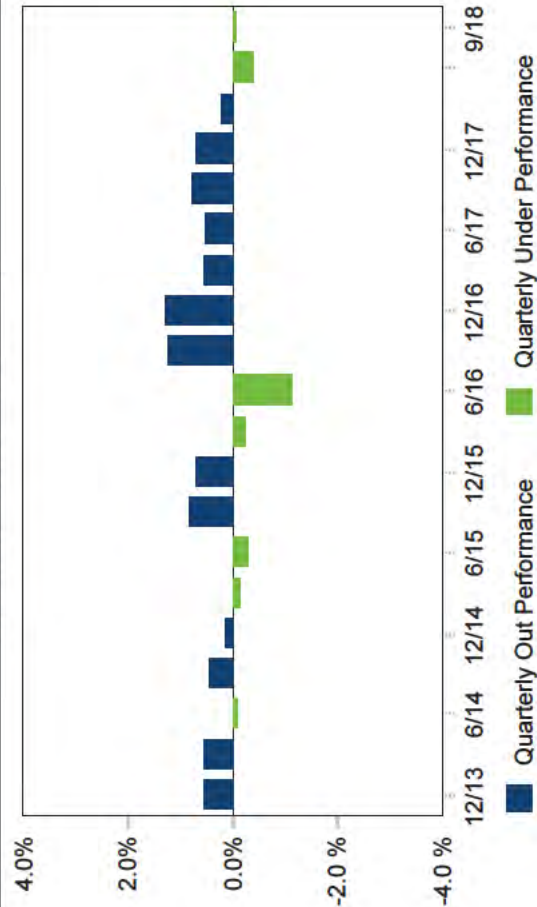
September 30, 2018 : \$2,400M



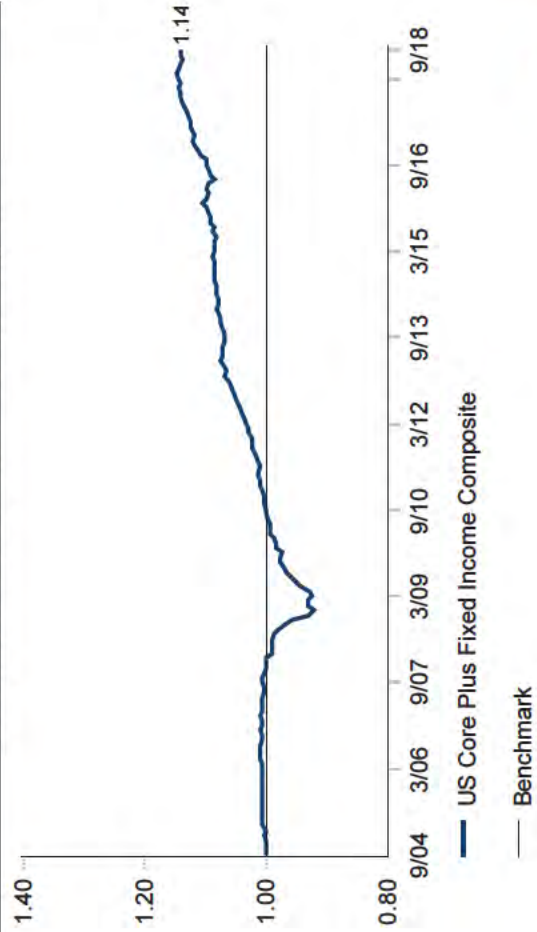
Return Summary



Quarterly Excess Performance



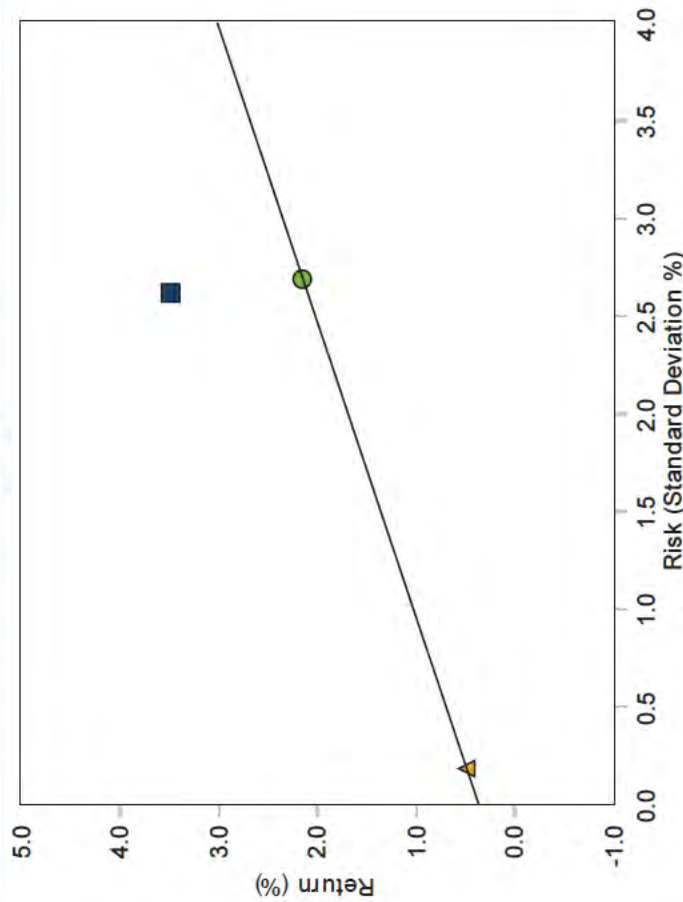
Ratio of Cumulative Wealth - Since Inception





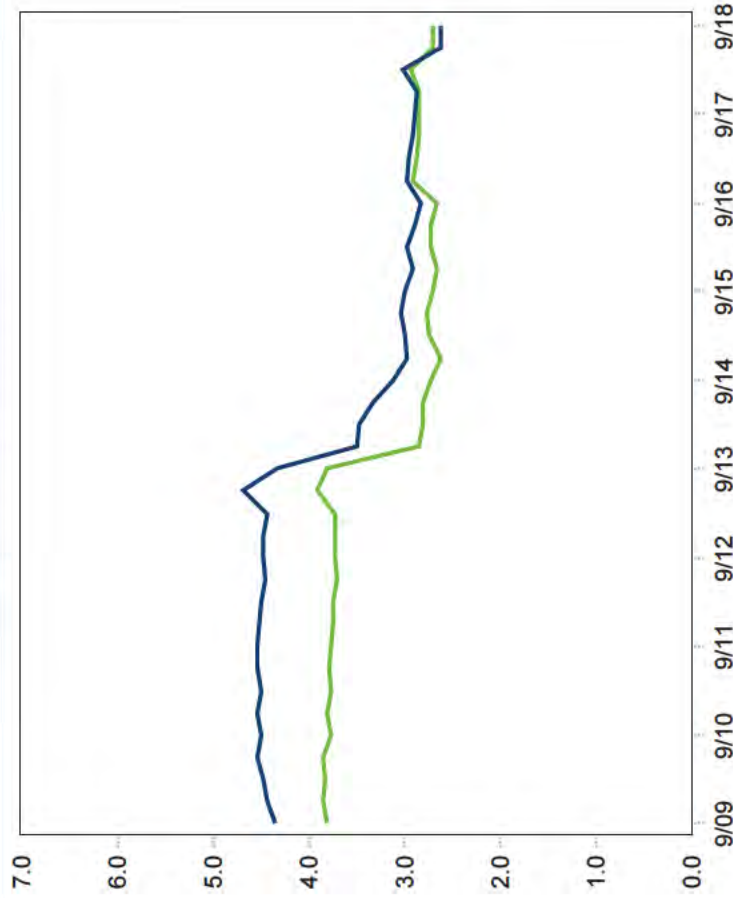
Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



- US Core Plus Fixed Income Composite
- Blended Policy (Barclays Aggregate Index)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- US Core Plus Fixed Income Composite
- Blended Policy (Barclays Aggregate Index)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
US Core Plus Fixed Income Composite	1.29	1.00	1.29	0.86	1.12	1.51	0.90	3.49	2.62	0.93
Blended Policy (Barclays Aggregate Index)	0.00	0.00	N/A	1.00	0.62	0.00	1.00	2.16	2.70	1.00
FTSE 3 Month T-Bill	-1.69	2.73	-0.62	0.02	N/A	0.51	-0.01	0.49	0.18	-0.14

Risk Statistics

US Core Plus Fixed Income Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.69	2.80	3.49	5.56	4.79	10/01/2004
Standard Deviation	2.35	2.51	2.62	3.62	3.52	
Downside Risk	1.85	1.45	1.38	2.08	2.08	
Downside Semi Deviation	0.79	2.48	2.31	3.95	3.73	
Max Drawdown Recovery Period	N/A	7.00	12.00	6.00	18.00	
Maximum Drawdown	-2.11	-2.22	-2.46	-4.83	-9.76	
Maximum Loss Exposure	-1.03	-0.02	N/A	-4.83	N/A	
Upside Semi Deviation	0.62	2.79	3.09	3.97	3.82	

Blended Policy (Barclays Aggregate Index)

Return	-1.22	1.31	2.16	3.83	3.81	
Standard Deviation	2.25	2.66	2.70	3.32	3.17	
Downside Risk	1.88	1.84	1.63	1.91	1.80	
Downside Semi Deviation	0.80	2.90	2.56	3.34	3.10	
Max Drawdown Recovery Period	N/A	13.00	13.00	13.00	8.00	
Maximum Drawdown	-2.19	-3.28	-3.28	-3.67	-5.58	
Maximum Loss Exposure	-1.81	-0.57	-0.14	-3.59	N/A	
Upside Semi Deviation	0.56	2.60	2.95	3.59	3.49	

vs. Blended Policy (Barclays Aggregate Index)

Active Return	0.53	1.46	1.29	1.67	0.95	
Tracking Error	0.97	1.19	1.00	1.56	1.45	
Actual Correlation	0.91	0.90	0.93	0.90	0.91	
Beta	0.95	0.85	0.90	0.98	1.01	
Consistency	66.67	72.22	70.00	71.67	63.69	
Down Market Capture	91.41	69.06	73.75	85.46	94.45	
Down Market Outperformance	0.31	1.95	1.57	1.05	0.38	
Information Ratio	0.55	1.23	1.29	1.07	0.65	
Jensen Alpha	0.41	1.55	1.46	1.72	0.89	
Up Market Capture	108.38	114.85	112.64	119.96	112.69	
Up Market Outperformance	0.22	1.11	1.12	2.12	1.34	

vs. FTSE 3 Month T-Bill

Excess Return	-2.23	2.00	2.98	5.17	3.50	
Excess Risk	2.35	2.56	2.66	3.65	3.59	
Sharpe Ratio	-0.95	0.78	1.12	1.42	0.98	

Calculation based on monthly periodicity.

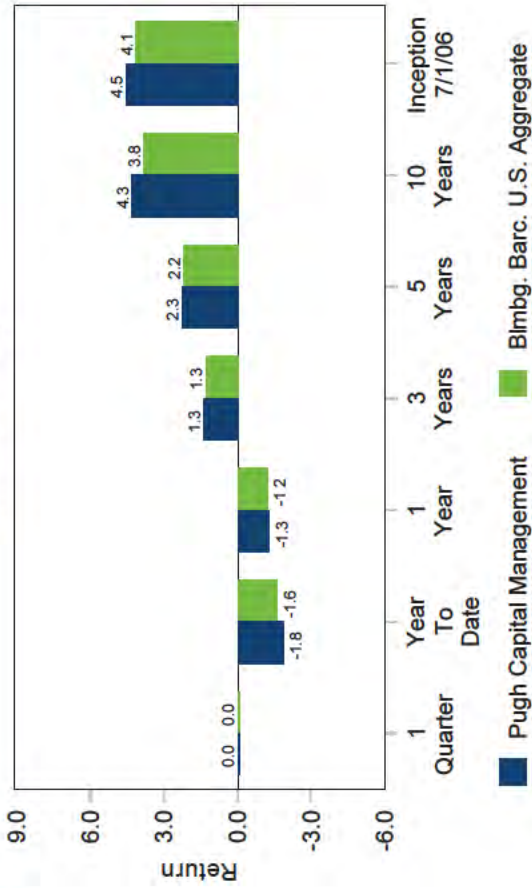
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Performance Summary

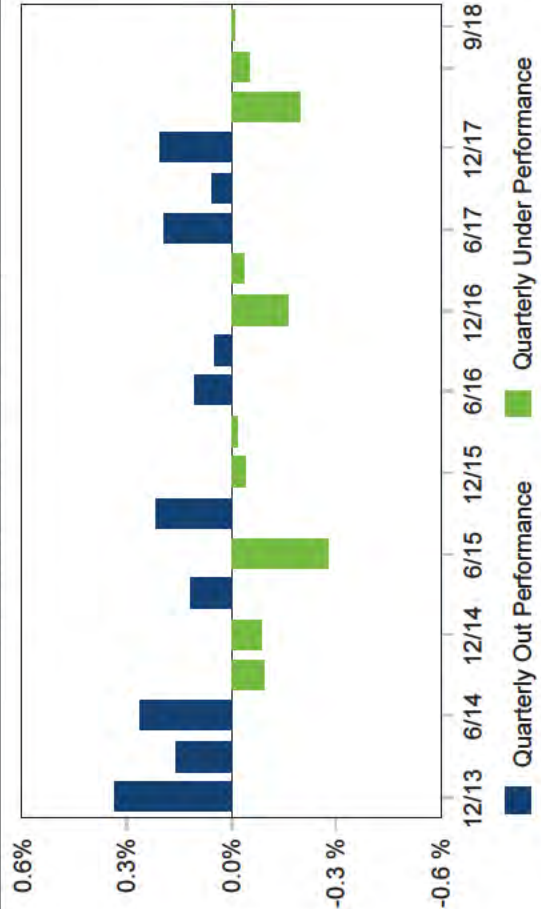
Account Information

Account Name: Pugh Capital Management  
 Inception Date: 06/30/2006  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Aggregate  
 Peer Group: IM U.S. Broad Market Core+ Fixed Income (SA+CF)

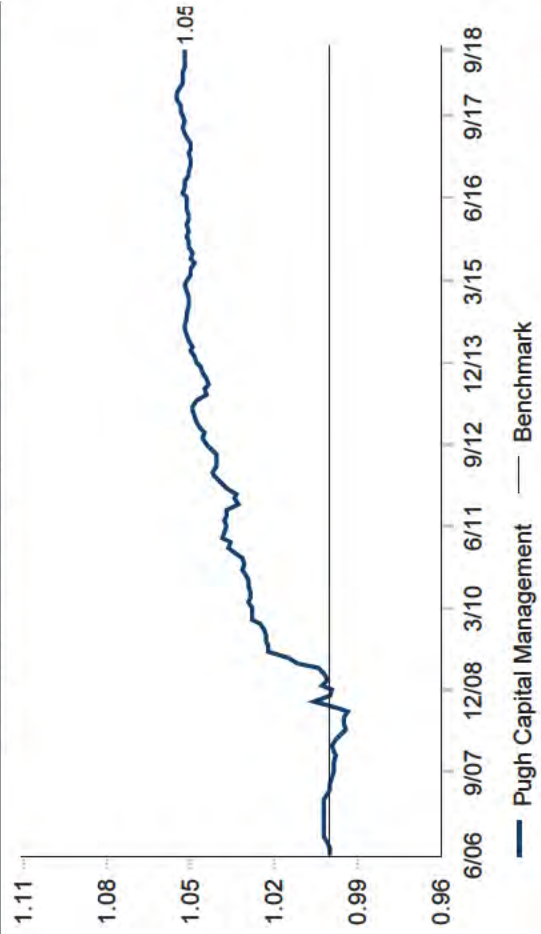
Return Summary



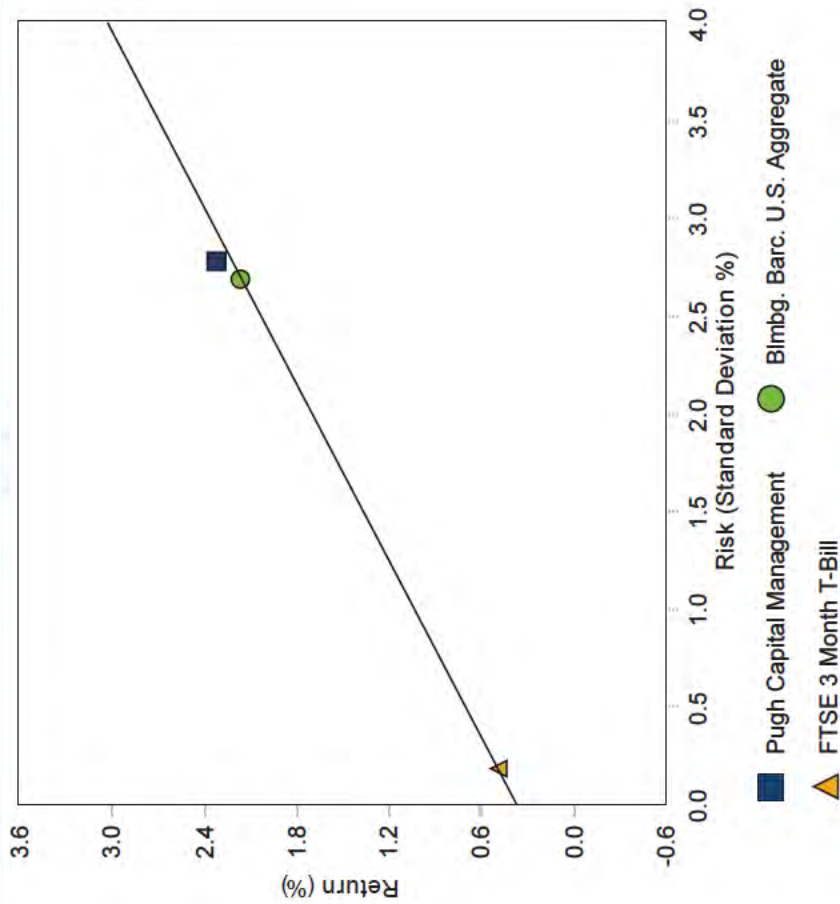
Quarterly Excess Performance



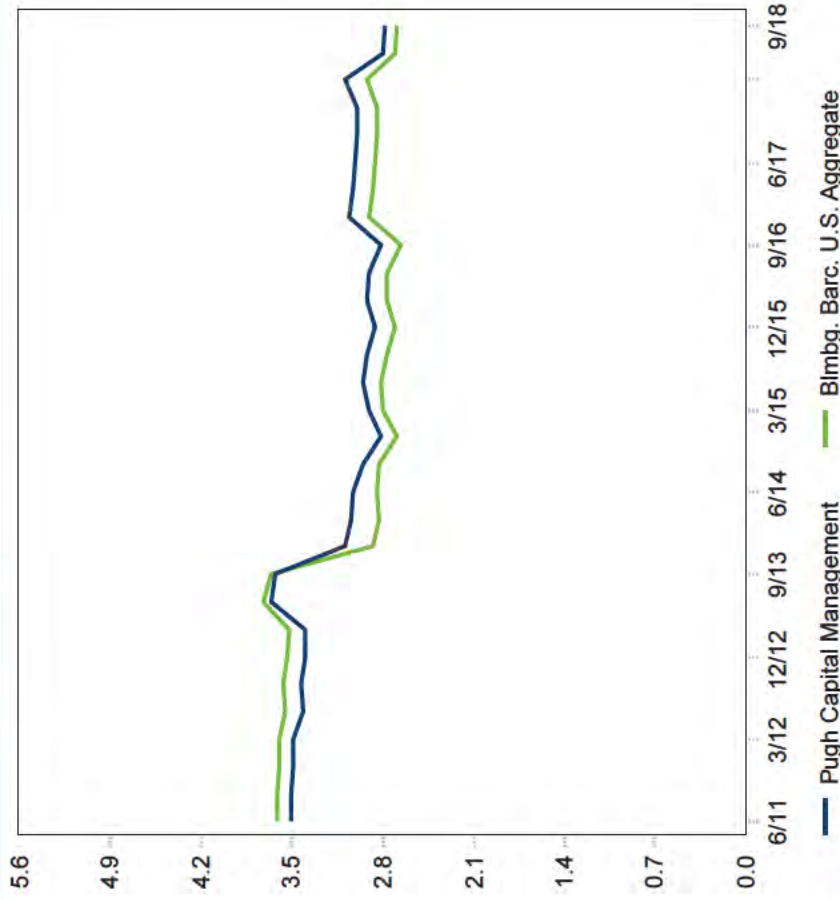
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Pugh Capital Management	0.15	0.26	0.57	0.99	0.65	0.09	1.03	2.31	2.79	1.00
Blmbg. Barc. U.S. Aggregate	0.00	0.00	N/A	1.00	0.62	0.00	1.00	2.16	2.70	1.00
FTSE 3 Month T-Bill	-1.69	2.73	-0.62	0.02	N/A	0.51	-0.01	0.49	0.18	-0.14

## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Pugh Capital Management						07/01/2006
Return	-1.26	1.35	2.31	4.32	4.54	
Standard Deviation	2.27	2.71	2.79	3.28	3.19	
Downside Risk	1.90	1.87	1.67	1.71	1.62	
Downside Semi Deviation	0.82	2.96	2.62	2.98	2.79	
Max Drawdown Recovery Period	N/A	13.00	13.00	13.00	13.00	
Maximum Drawdown	-2.38	-3.45	-3.45	-4.16	-4.16	
Maximum Loss Exposure	-1.80	-0.61	N/A	-1.62	N/A	
Upside Semi Deviation	0.55	2.66	3.07	3.76	3.76	
Blmbg. Barc. U.S. Aggregate						
Return	-1.22	1.31	2.16	3.77	4.11	
Standard Deviation	2.25	2.66	2.70	3.24	3.17	
Downside Risk	1.88	1.84	1.63	1.75	1.66	
Downside Semi Deviation	0.80	2.90	2.56	3.02	2.87	
Max Drawdown Recovery Period	N/A	13.00	13.00	13.00	9.00	
Maximum Drawdown	-2.19	-3.28	-3.28	-3.67	-3.83	
Maximum Loss Exposure	-1.81	-0.57	-0.14	-2.36	N/A	
Upside Semi Deviation	0.56	2.60	2.95	3.62	3.63	
vs. Blmbg. Barc. U.S. Aggregate						
Active Return	-0.04	0.04	0.15	0.53	0.42	
Tracking Error	0.26	0.23	0.26	0.60	0.57	
Actual Correlation	0.99	1.00	1.00	0.98	0.98	
Beta	1.00	1.02	1.03	1.00	0.99	
Consistency	50.00	47.22	51.67	58.33	55.10	
Down Market Capture	103.31	103.46	103.43	97.40	97.63	
Down Market Outperformance	-0.12	-0.21	-0.20	0.18	0.16	
Information Ratio	-0.17	0.17	0.57	0.89	0.73	
Jensen Alpha	-0.04	0.03	0.10	0.55	0.43	
Up Market Capture	103.12	103.25	104.98	107.32	105.51	
Up Market Outperformance	0.08	0.24	0.44	0.77	0.60	
vs. FTSE 3 Month T-Bill						
Excess Return	-2.81	0.58	1.84	3.98	3.54	
Excess Risk	2.25	2.74	2.82	3.30	3.20	
Sharpe Ratio	-1.25	0.21	0.65	1.21	1.11	

Calculation based on monthly periodicity.

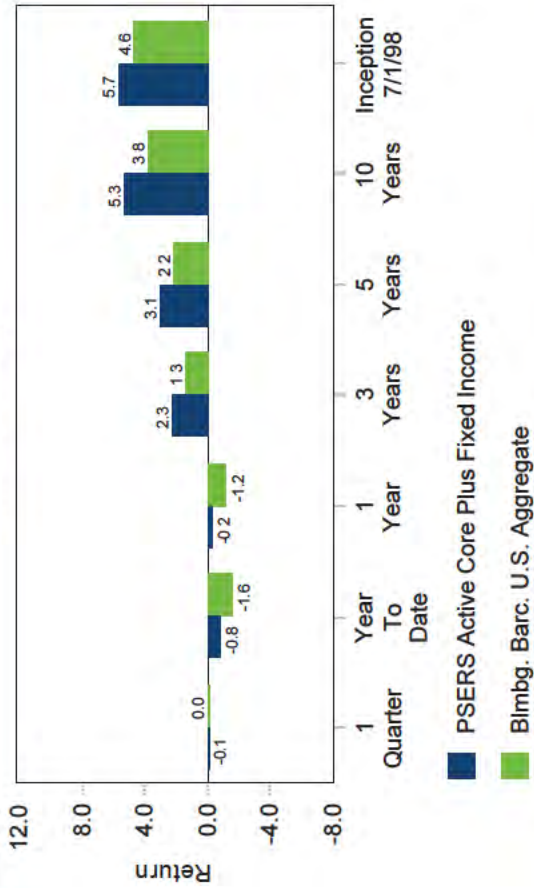
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Performance Summary

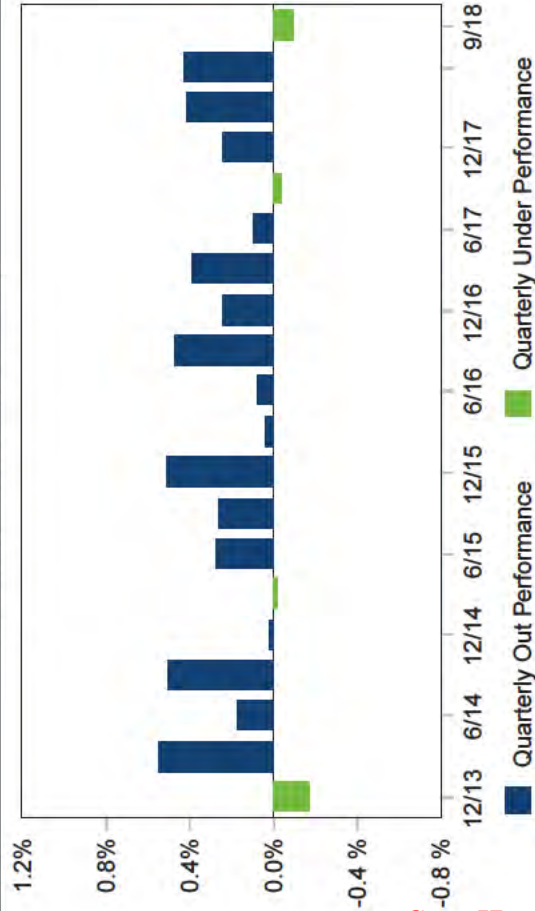
Account Information

Account Name: PSERS Active Core Plus Fixed Income  
 Inception Date: 06/30/1998  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Aggregate  
 Peer Group: IM U.S. Broad Market Core+ Fixed Income (SA+CF)

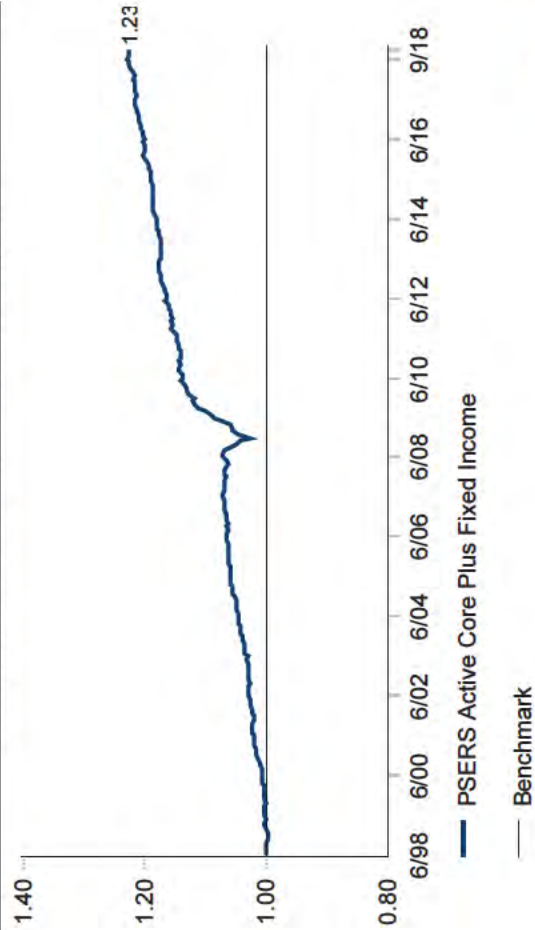
Return Summary



Quarterly Excess Performance

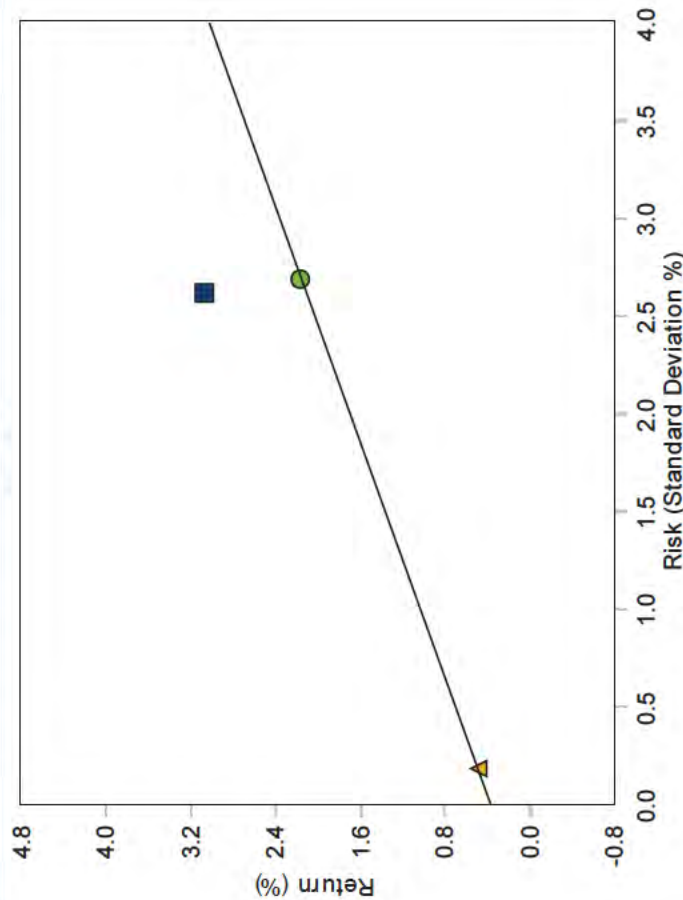


Ratio of Cumulative Wealth - Since Inception

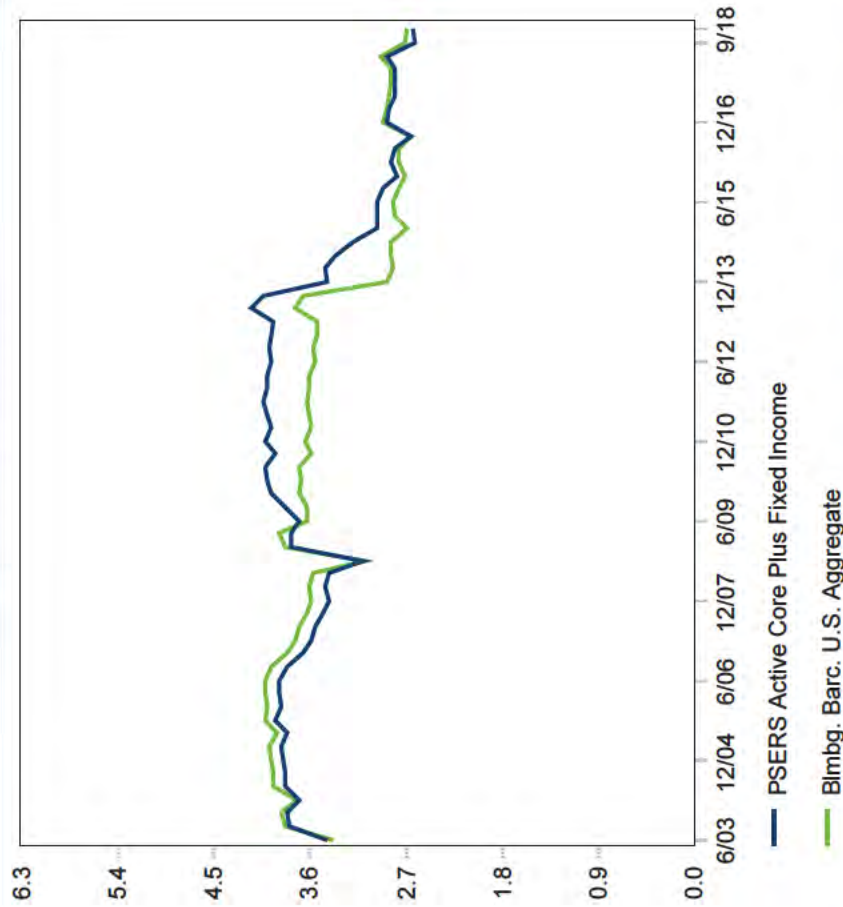


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Active Core Plus Fixed Income	0.87	0.44	1.97	0.97	0.96	0.96	0.96	3.06	2.63	0.99
Blimg. Barc. U.S. Aggregate	0.00	0.00	N/A	1.00	0.62	0.00	1.00	2.16	2.70	1.00
FTSE 3 Month T-Bill	-1.69	2.73	-0.62	0.02	N/A	0.51	-0.01	0.49	0.18	-0.14

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Risk Statistics

PSERS Active Core Plus Fixed Income

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.22	2.26	3.06	5.27	5.70	07/01/1998
Standard Deviation	2.41	2.59	2.63	3.45	3.47	
Downside Risk	1.76	1.69	1.50	1.92	1.86	
Downside Semi Deviation	0.84	0.91	2.64	3.65	3.43	
Max Drawdown Recovery Period	N/A	8.00	8.00	13.00	6.00	
Maximum Drawdown	-1.91	-2.85	-2.85	-3.91	-5.48	
Maximum Loss Exposure	-1.29	-0.05	-0.30	-3.65	N/A	
Upside Semi Deviation	0.65	2.51	2.87	3.83	3.99	
Blmbg. Barc. U.S. Aggregate						
Return	-1.22	1.31	2.16	3.77	4.64	
Standard Deviation	2.25	2.66	2.70	3.24	3.38	
Downside Risk	1.88	1.84	1.63	1.75	1.83	
Downside Semi Deviation	0.80	2.90	2.56	3.02	3.17	
Max Drawdown Recovery Period	N/A	13.00	13.00	13.00	9.00	
Maximum Drawdown	-2.19	-3.28	-3.28	-3.67	-3.83	
Maximum Loss Exposure	-1.81	-0.57	-0.14	-2.36	N/A	
Upside Semi Deviation	0.56	2.60	2.95	3.62	3.86	
vs. Blmbg. Barc. U.S. Aggregate						
Active Return	1.01	0.93	0.87	1.44	1.02	
Tracking Error	0.50	0.45	0.44	1.31	1.01	
Actual Correlation	0.98	0.99	0.99	0.93	0.96	
Beta	1.05	0.96	0.96	0.99	0.98	
Consistency	66.67	66.67	68.33	70.00	68.72	
Down Market Capture	83.38	76.65	77.76	83.28	85.85	
Down Market Outperformance	0.60	1.46	1.32	1.16	1.02	
Information Ratio	2.02	2.07	1.97	1.10	1.01	
Jensen Alpha	1.16	0.96	0.94	1.49	1.06	
Up Market Capture	115.32	107.07	106.09	116.03	109.00	
Up Market Outperformance	0.39	0.53	0.54	1.69	1.09	
vs. FTSE 3 Month T-Bill						
Excess Return	-1.75	1.47	2.56	4.89	3.75	
Excess Risk	2.40	2.63	2.66	3.48	3.48	
Sharpe Ratio	-0.73	0.56	0.96	1.41	1.08	

Calculation based on monthly periodicity.

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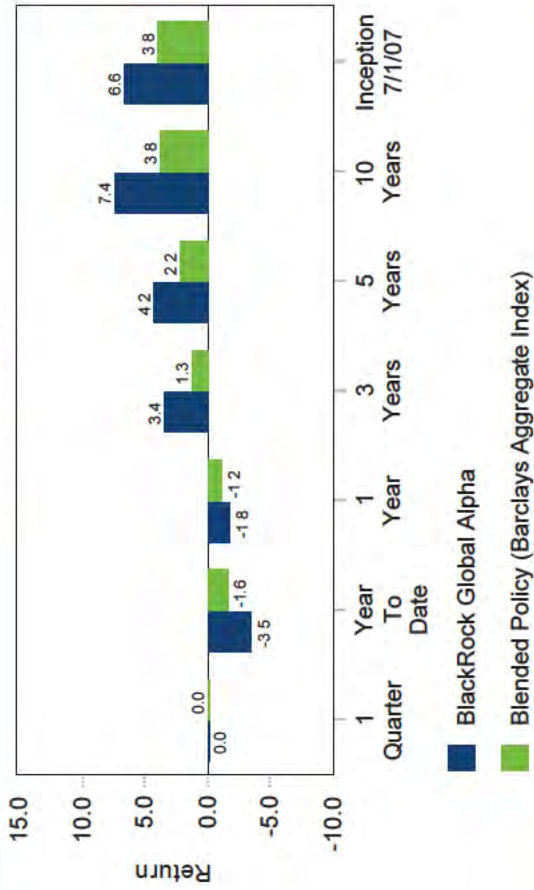


Performance Summary

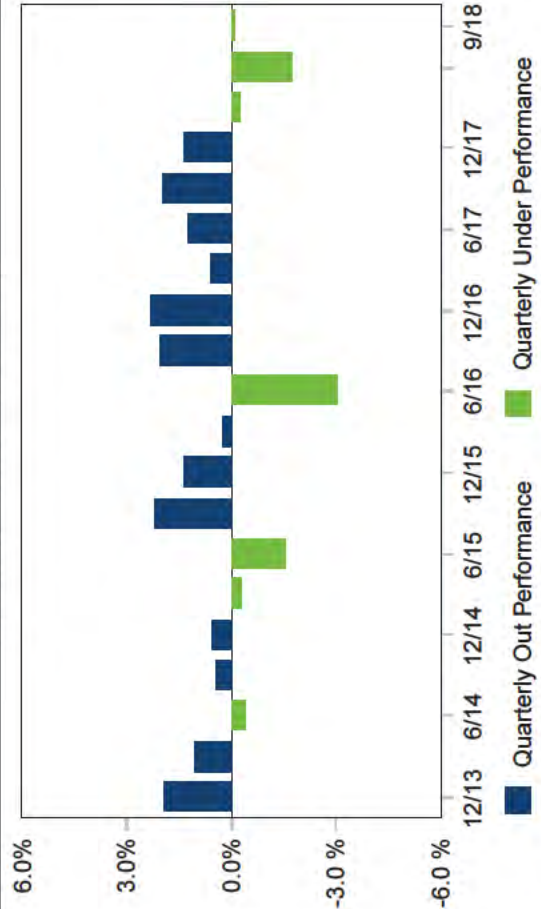
Account Information

Account Name: BlackRock Global Alpha  
 Inception Date: 06/30/2007  
 Account Structure: Hedge Fund  
 Asset Class: Global Fixed Income  
 Benchmark: Blended Policy (Barclays Aggregate Index)  
 Peer Group: IM Global Fixed Income (SA+CF)

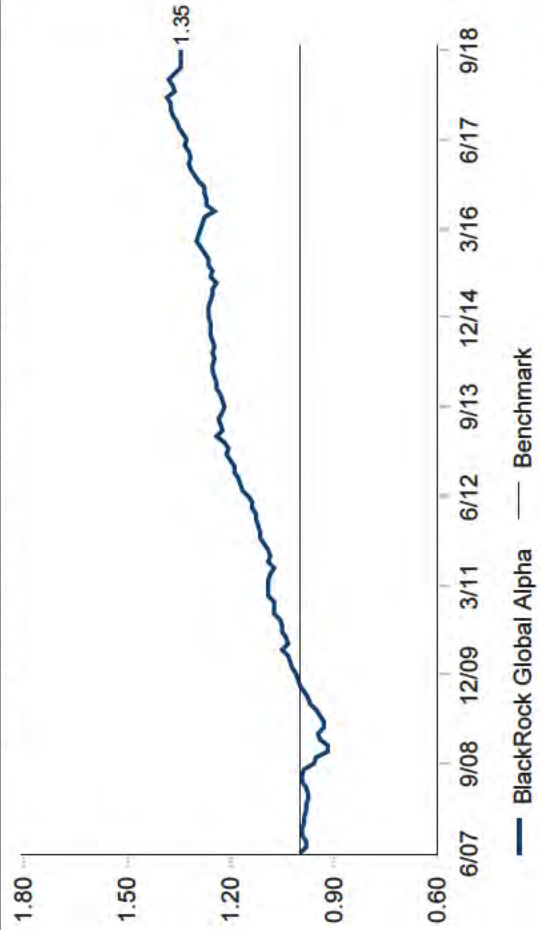
Return Summary



Quarterly Excess Performance

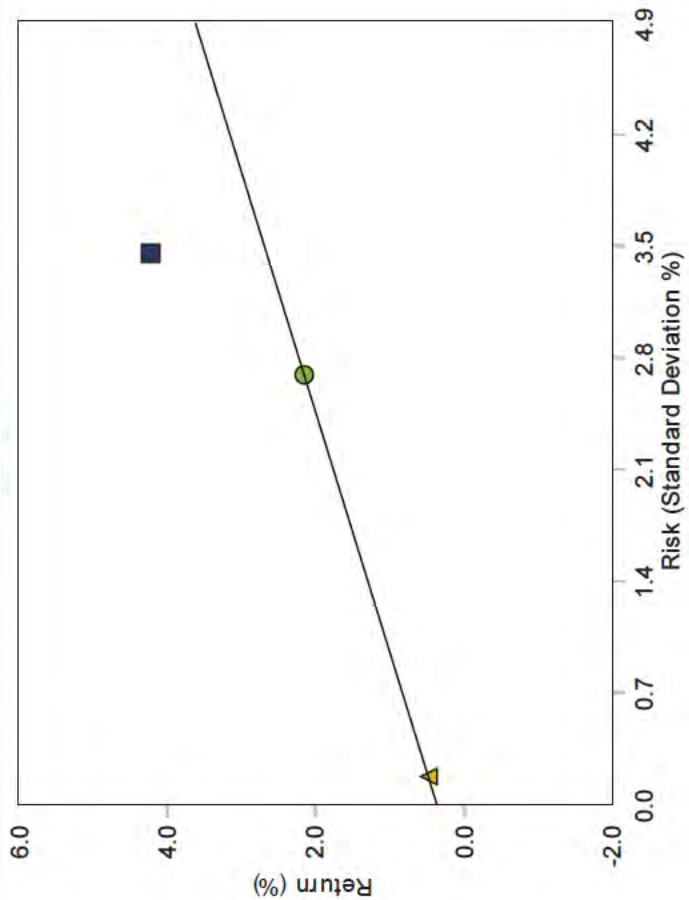


Ratio of Cumulative Wealth - Since Inception

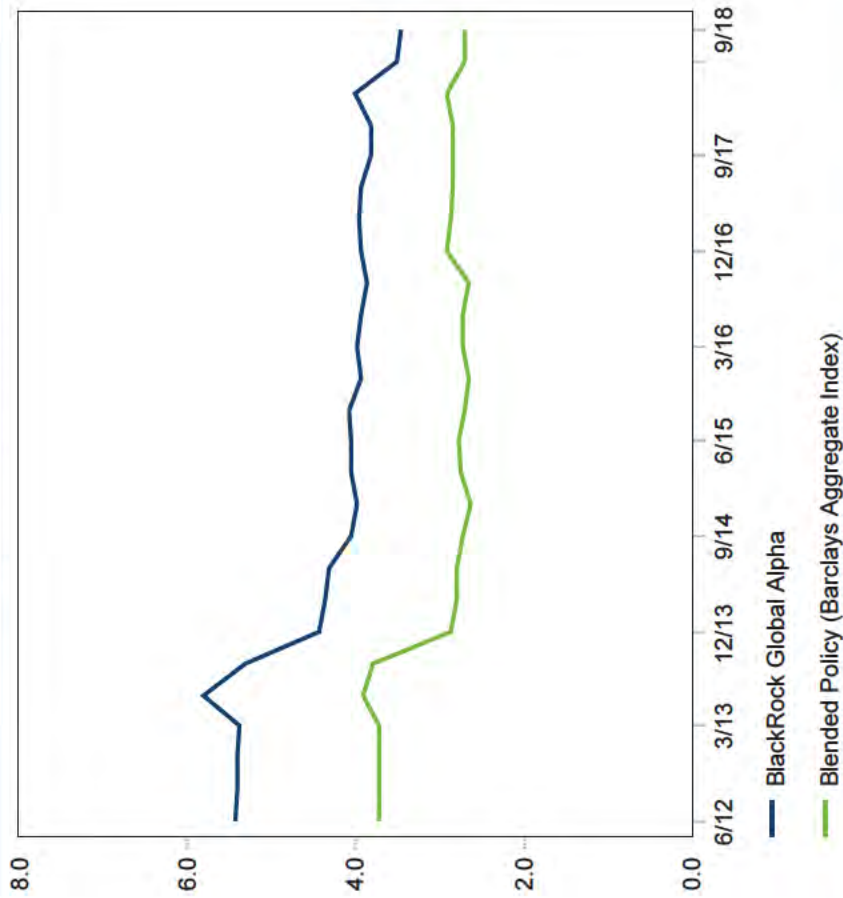


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
BlackRock Global Alpha	2.04	2.41	0.85	0.52	1.06	2.21	0.93	4.23	3.47	0.72
Blended Policy (Barclays Aggregate Index)	0.00	0.00	N/A	1.00	0.62	0.00	1.00	2.16	2.70	1.00
FTSE 3 Month T-Bill	-1.69	2.73	-0.62	0.02	N/A	0.51	-0.01	0.49	0.18	-0.14



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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
BlackRock Global Alpha						07/01/2007
Return	-1.85	3.40	4.23	7.40	6.63	
Standard Deviation	3.25	3.42	3.47	4.55	4.67	
Downside Risk	2.82	1.85	1.83	2.39	2.70	
Downside Semi Deviation	1.10	2.83	2.93	4.34	4.82	
Max Drawdown Recovery Period	N/A	N/A	12.00	3.00	10.00	
Maximum Drawdown	-3.64	-3.64	-4.14	-5.63	-10.07	
Maximum Loss Exposure	-1.96	-0.03	N/A	-5.63	-4.91	
Upside Semi Deviation	0.82	4.13	4.14	5.32	5.17	
Blended Policy (Barclays Aggregate Index)						
Return	-1.22	1.31	2.16	3.83	3.85	
Standard Deviation	2.25	2.66	2.70	3.32	3.28	
Downside Risk	1.88	1.84	1.63	1.91	1.90	
Downside Semi Deviation	0.80	2.90	2.56	3.34	3.31	
Max Drawdown Recovery Period	N/A	13.00	13.00	13.00	8.00	
Maximum Drawdown	-2.19	-3.28	-3.28	-3.67	-5.58	
Maximum Loss Exposure	-1.81	-0.57	-0.14	-3.59	N/A	
Upside Semi Deviation	0.56	2.60	2.95	3.59	3.55	
vs. Blended Policy (Barclays Aggregate Index)						
Active Return	-0.61	2.07	2.04	3.45	2.71	
Tracking Error	2.52	2.73	2.41	3.08	3.19	
Actual Correlation	0.63	0.62	0.72	0.74	0.73	
Beta	0.92	0.80	0.93	1.01	1.04	
Consistency	58.33	61.11	61.67	69.17	66.67	
Down Market Capture	116.74	72.20	78.60	70.87	78.19	
Down Market Outperformance	-0.62	1.73	1.26	2.11	1.53	
Information Ratio	-0.24	0.76	0.85	1.12	0.85	
Jensen Alpha	-0.80	2.19	2.16	3.44	2.53	
Up Market Capture	100.46	131.85	130.83	141.66	133.36	
Up Market Outperformance	0.01	2.37	2.73	4.43	3.52	
vs. FTSE 3 Month T-Bill						
Excess Return	-3.38	2.61	3.72	6.95	5.93	
Excess Risk	3.26	3.47	3.51	4.59	4.73	
Sharpe Ratio	-1.04	0.75	1.06	1.51	1.25	

Calculation based on monthly periodicity.

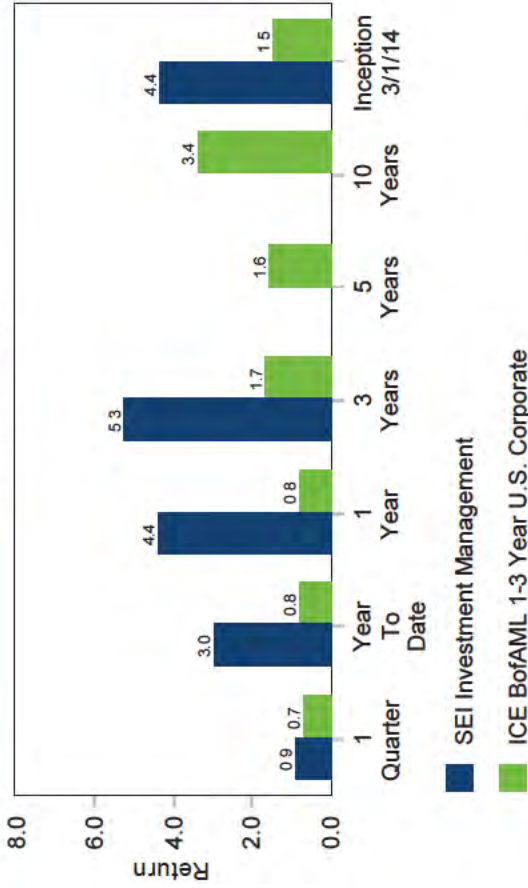
Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.

Performance Summary

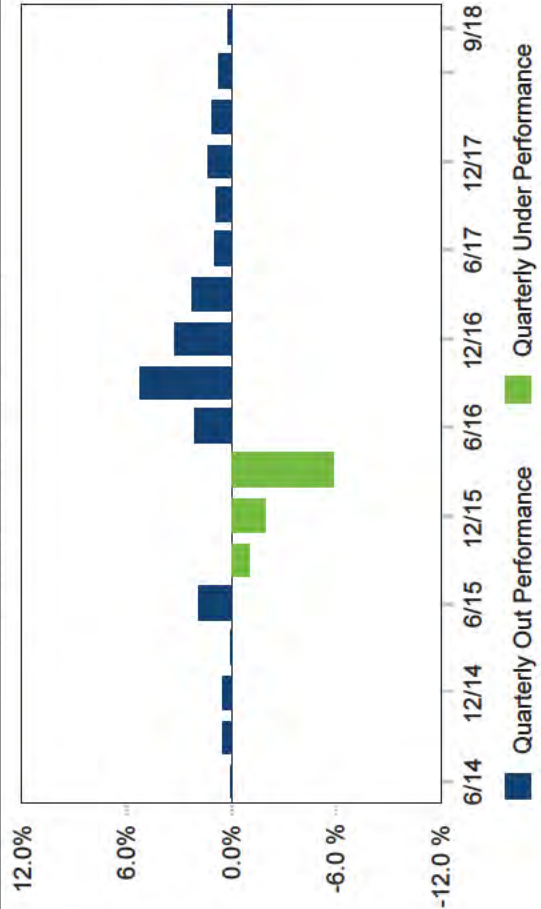
Account Information

Account Name: SEI Investment Management  
 Inception Date: 03/01/2014  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: ICE BofAML 1-3 Year U.S. Corporate  
 Peer Group: IM U.S. Corporate Bonds (SA+CF)

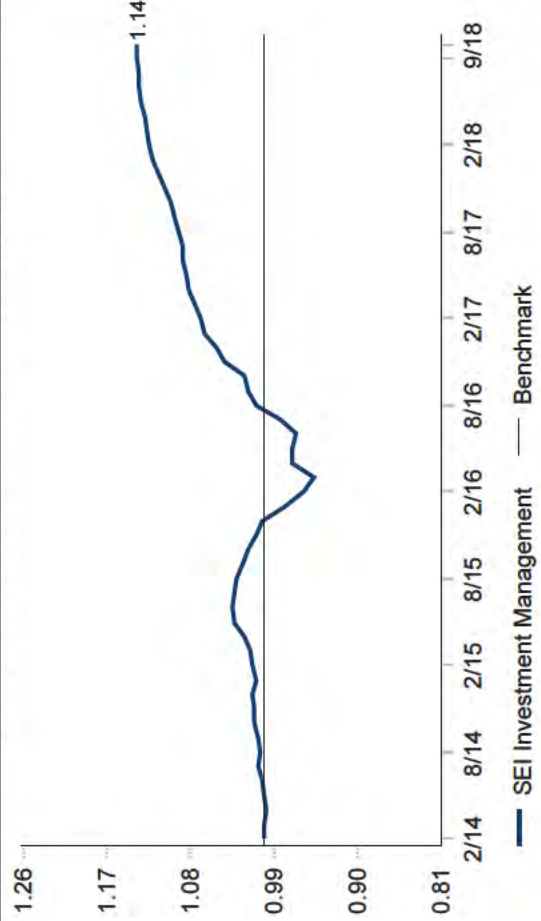
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## SEI Investment Management

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.40	5.28	N/A	N/A	4.35	03/01/2014
Standard Deviation	0.74	3.50	N/A	N/A	2.96	
Downside Risk	0.00	1.93	N/A	N/A	1.57	
Downside Semi Deviation	N/A	1.47	N/A	N/A	3.49	
Max Drawdown Recovery Period	N/A	10.00	N/A	N/A	14.00	
Maximum Drawdown	0.00	-6.56	N/A	N/A	-7.35	
Maximum Loss Exposure	N/A	-6.56	N/A	N/A	-2.65	
Upside Semi Deviation	1.50	3.62	N/A	N/A	3.17	
ICE BofAML 1-3 Year U.S. Corporate						
Return	0.79	1.66	1.58	3.39	1.47	
Standard Deviation	0.72	0.85	0.79	2.26	0.81	
Downside Risk	0.37	0.36	0.35	1.14	0.36	
Downside Semi Deviation	0.21	0.25	0.74	2.40	0.77	
Max Drawdown Recovery Period	9.00	9.00	9.00	3.00	9.00	
Maximum Drawdown	-0.51	-0.51	-0.51	-3.24	-0.51	
Maximum Loss Exposure	-0.42	-0.13	N/A	-3.24	-0.03	
Upside Semi Deviation	0.24	1.02	0.97	2.50	0.96	
vs. ICE BofAML 1-3 Year U.S. Corporate						
Active Return	3.53	3.57	N/A	N/A	2.85	
Tracking Error	0.78	3.57	N/A	N/A	3.01	
Actual Correlation	0.43	0.04	N/A	N/A	0.07	
Beta	0.44	0.18	N/A	N/A	0.27	
Consistency	91.67	77.78	N/A	N/A	72.73	
Down Market Capture	-185.37	-64.27	N/A	N/A	-48.60	
Down Market Outperformance	1.77	2.21	N/A	N/A	3.10	
Information Ratio	4.54	1.00	N/A	N/A	0.95	
Jensen Alpha	3.17	4.33	N/A	N/A	3.63	
Up Market Capture	225.79	234.27	N/A	N/A	207.69	
Up Market Outperformance	1.80	3.58	N/A	N/A	2.82	
vs. FTSE 3 Month T-Bill						
Excess Return	2.76	4.41	N/A	N/A	3.78	
Excess Risk	0.76	3.50	N/A	N/A	2.94	
Sharpe Ratio	3.61	1.26	N/A	N/A	1.28	

Calculation based on monthly periodicity.

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# Non-US Developed Markets Fixed Income

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Case ID: 221102792

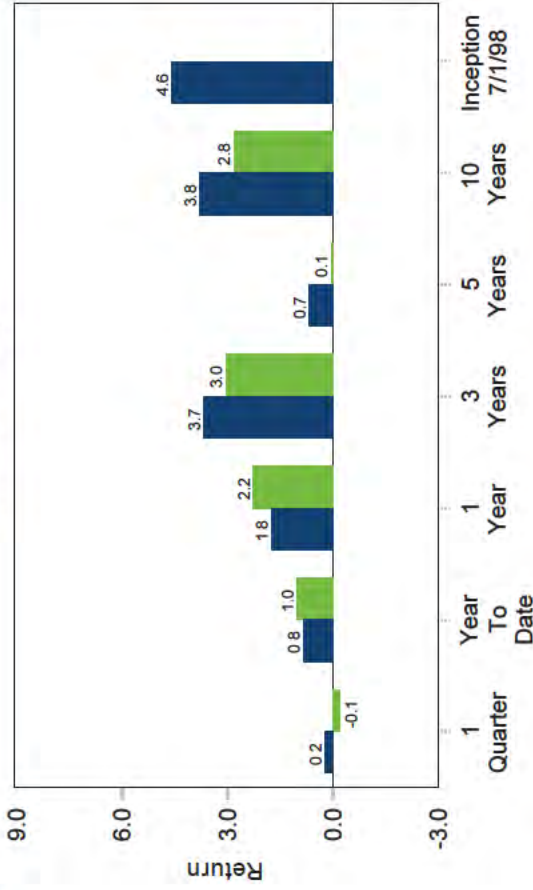
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Current Allocation

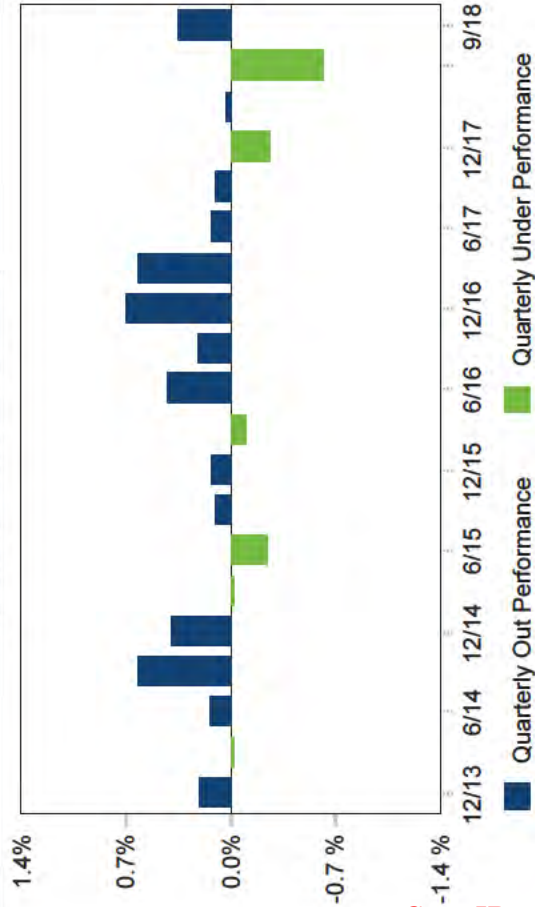
September 30, 2018 : \$182M



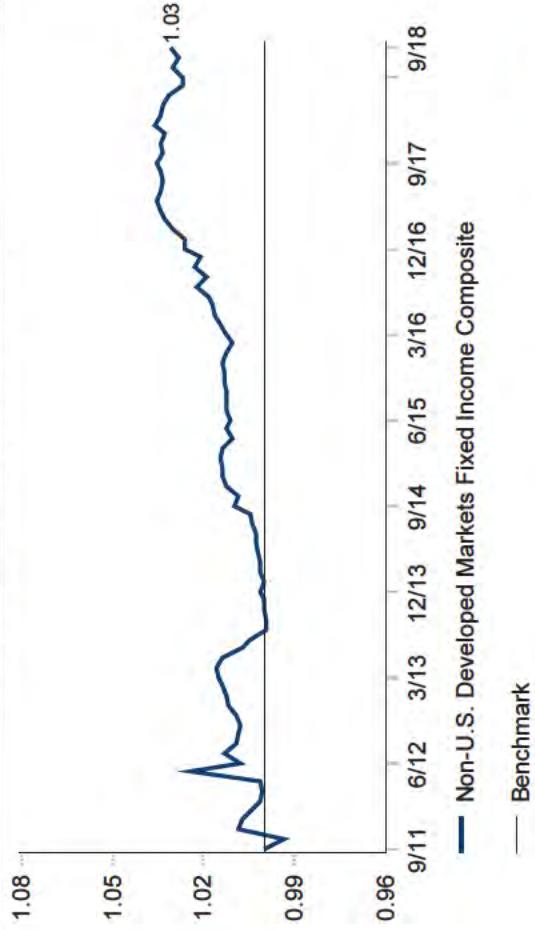
Return Summary



Quarterly Excess Performance



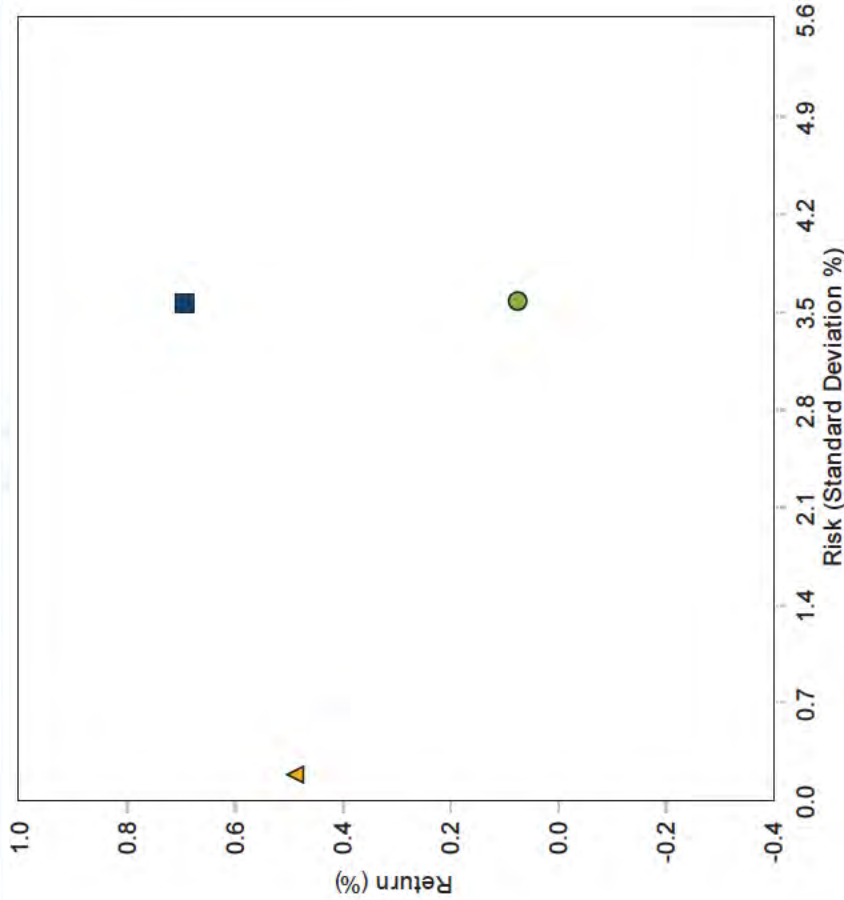
Ratio of Cumulative Wealth - 7 Years



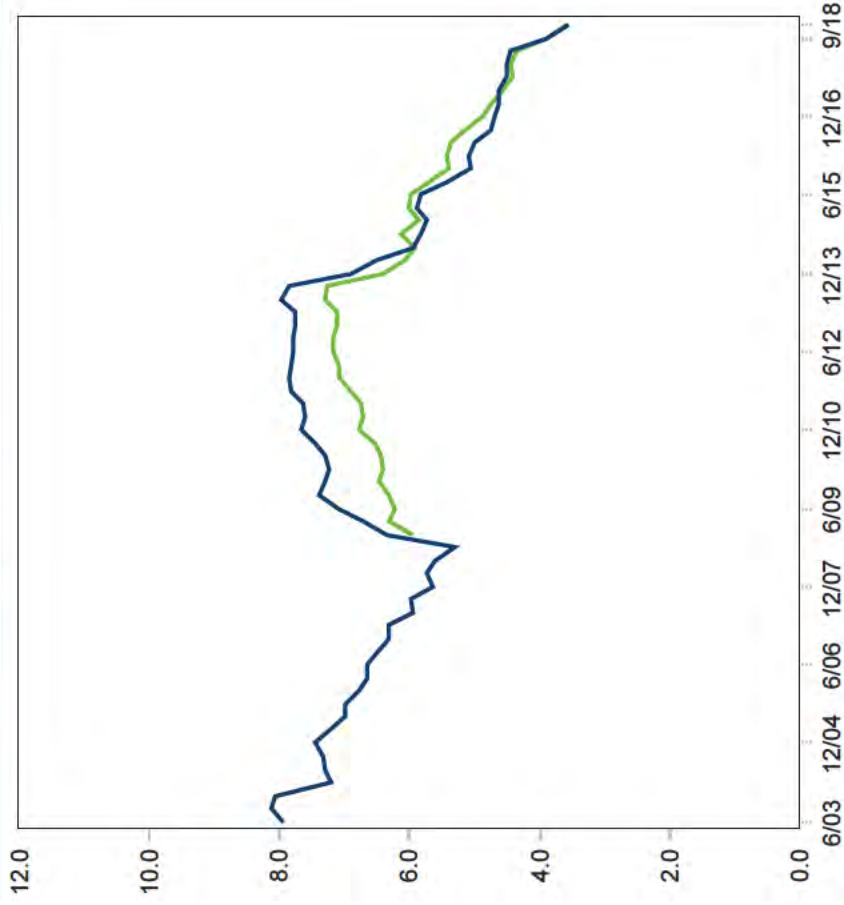
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Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Ac Corr
Non-U.S. Developed Markets Fixed Income Composite	0.61	0.67	0.91	0.96	0.07	0.62	0.98	0.69	3.57	0
Blended Policy (Barclays GlobalAgg GDP Weighted Dev xUS hedged)	0.00	0.00	N/A	1.00	-0.10	0.00	1.00	0.07	3.58	1
FTSE 3 Month T-Bill	0.35	3.56	0.10	0.02	N/A	0.49	0.01	0.49	0.18	0



Risk Statistics

Non-U.S. Developed Markets Fixed Income Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.77	3.66	0.69	3.79	4.56	07/01/1998
Standard Deviation	1.36	2.53	3.57	6.15	6.53	
Downside Risk	0.51	1.22	2.61	3.90	3.92	
Downside Semi Deviation	0.22	2.09	3.93	6.35	6.19	
Max Drawdown Recovery Period	4.00	9.00	N/A	N/A	16.00	
Maximum Drawdown	-0.59	-2.54	-13.37	-13.37	-13.89	
Maximum Loss Exposure	N/A	N/A	-8.49	-6.21	-1.03	
Upside Semi Deviation	0.59	3.10	3.32	6.23	6.99	

Blended Policy (Barclays GlobalAgg GDP Weighted Dev xUS hedged)

Return	2.24	3.04	0.07	2.82	N/A	
Standard Deviation	1.51	2.43	3.58	5.76	N/A	
Downside Risk	0.60	1.27	2.76	3.81	N/A	
Downside Semi Deviation	0.33	2.17	4.16	6.26	N/A	
Max Drawdown Recovery Period	3.00	12.00	N/A	N/A	N/A	
Maximum Drawdown	-0.48	-2.79	-14.08	-14.08	N/A	
Maximum Loss Exposure	N/A	N/A	-9.55	-4.11	N/A	
Upside Semi Deviation	0.56	2.84	3.09	5.59	N/A	

vs. Blended Policy (Barclays GlobalAgg GDP Weighted Dev xUS hedged)

Active Return	-0.46	0.61	0.61	0.96	N/A	
Tracking Error	0.79	0.75	0.67	2.21	N/A	
Actual Correlation	0.85	0.96	0.98	0.93	N/A	
Beta	0.77	0.99	0.98	1.00	N/A	
Consistency	33.33	58.33	65.00	58.33	N/A	
Down Market Capture	25.50	83.09	91.69	94.19	N/A	
Down Market Outperformance	0.69	0.87	0.77	0.78	N/A	
Information Ratio	-0.59	0.81	0.91	0.44	N/A	
Jensen Alpha	-0.31	0.61	0.61	0.98	N/A	
Up Market Capture	63.39	105.55	105.02	106.96	N/A	
Up Market Outperformance	-1.19	0.46	0.46	1.11	N/A	

vs. FTSE 3 Month T-Bill

Excess Return	0.20	2.83	0.26	3.60	2.81	
Excess Risk	1.39	2.57	3.56	6.16	6.56	
Sharpe Ratio	0.15	1.10	0.07	0.58	0.43	

Calculation based on monthly periodicity.

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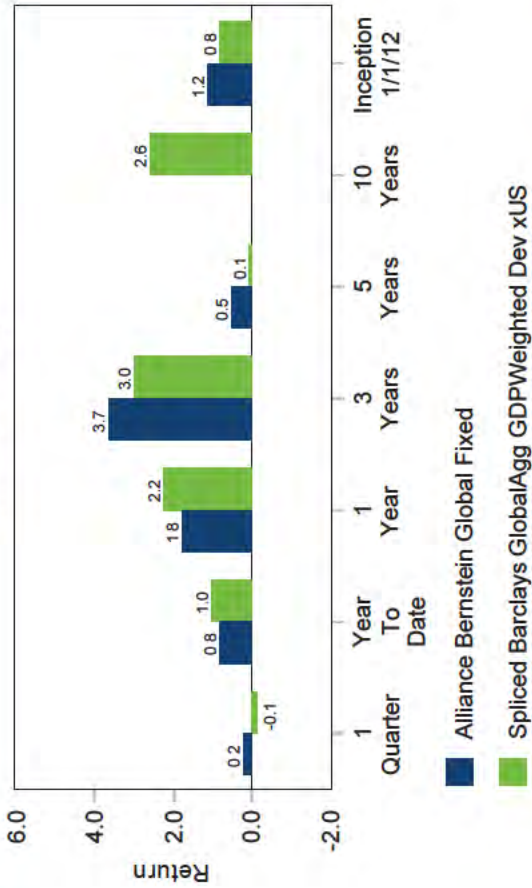


Performance Summary

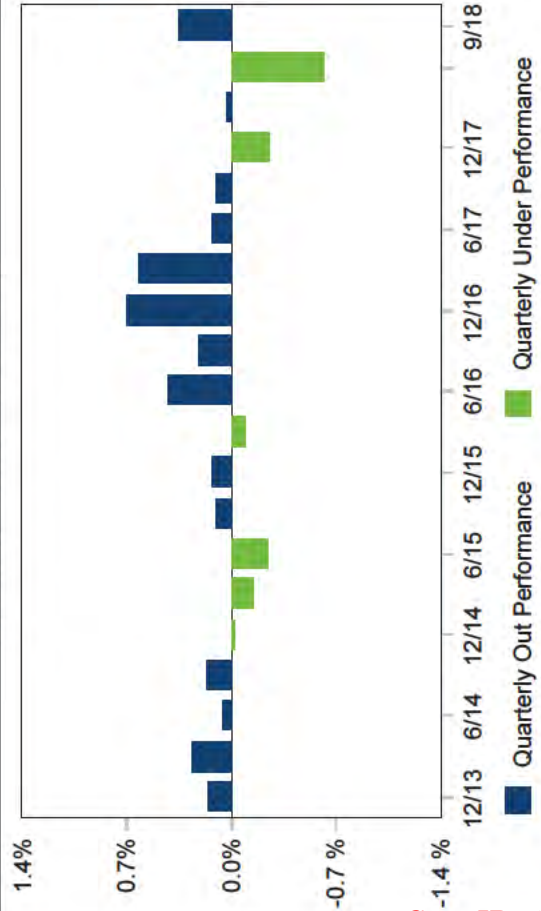
Account Information

Account Name: Alliance Bernstein Global Fixed  
 Inception Date: 12/31/2011  
 Account Structure: Separate Account  
 Asset Class: Global Fixed Income  
 Benchmark: Spliced Barclays GlobalAgg GDPWeighted Dev xUS  
 Peer Group: IM Global Fixed Income (SA+CF)

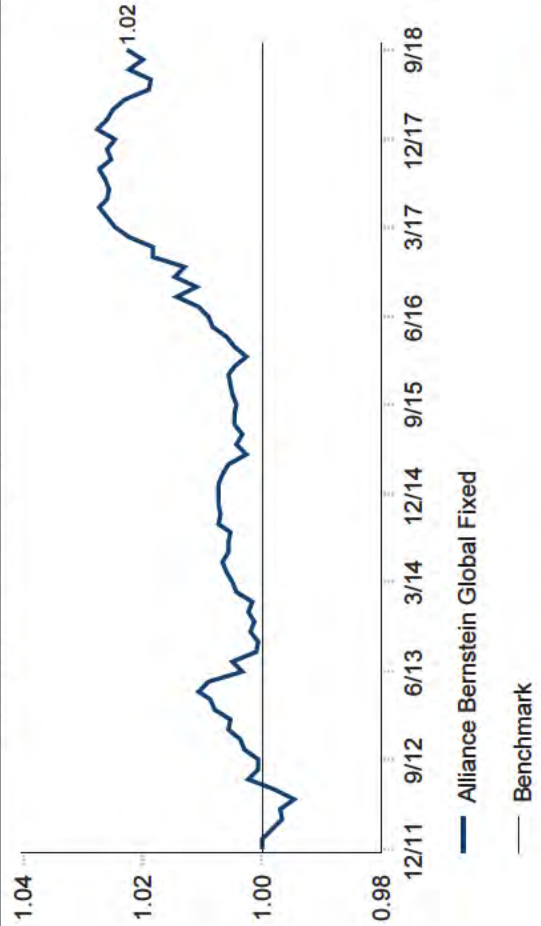
Return Summary



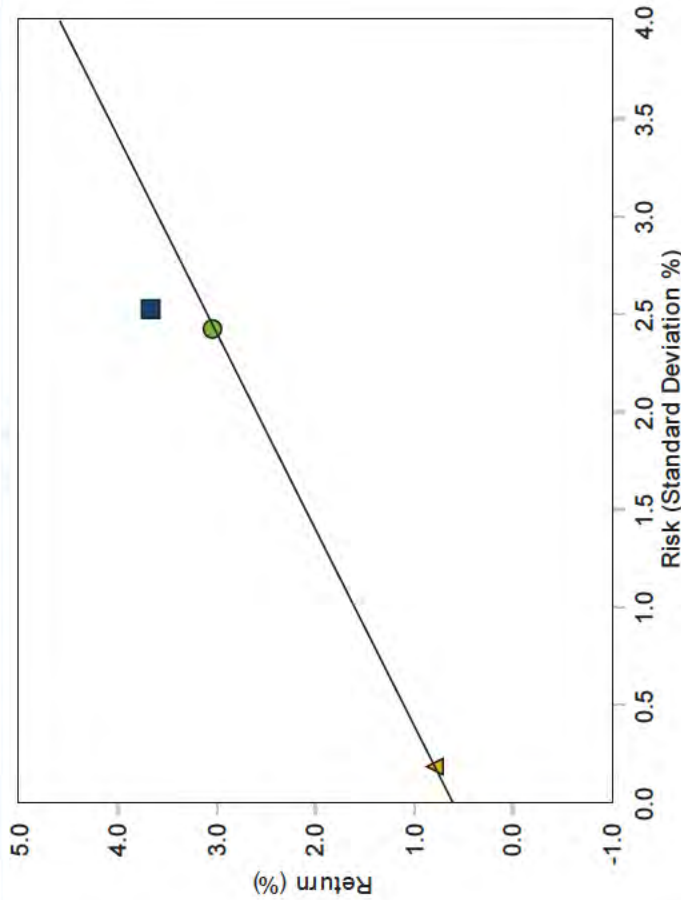
Quarterly Excess Performance



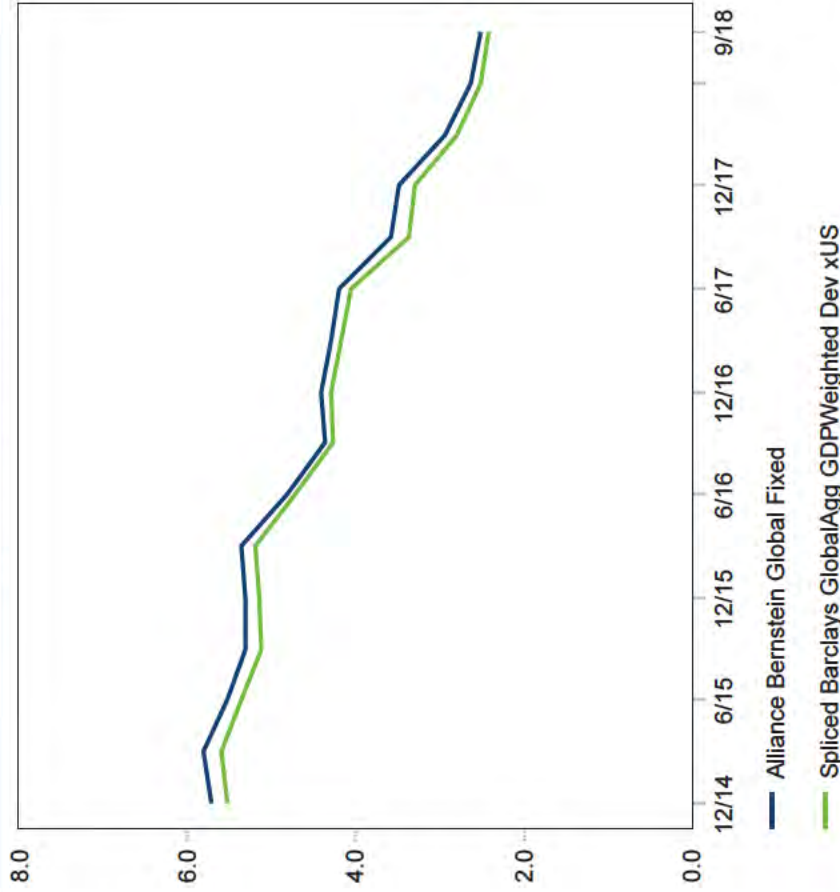
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Alliance Bernstein Global Fixed	0.61	0.75	0.81	0.91	1.10	0.63	0.99	3.66	2.53	0.96
Spliced Barclays GlobalAgg GDPWeighted Dev xUS	0.00	0.00	N/A	1.00	0.90	0.00	1.00	3.04	2.43	1.00
FTSE 3 Month T-Bill	-2.22	2.46	-0.90	0.02	N/A	0.83	-0.01	0.80	0.18	-0.13

## Risk Statistics

## Alliance Bernstein Global Fixed

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.77	3.66	0.51	N/A	1.16	01/01/2012
Standard Deviation	1.36	2.53	3.68	N/A	4.46	
Downside Risk	0.51	1.22	2.74	N/A	3.20	
Downside Semi Deviation	0.22	2.09	4.12	N/A	4.91	
Max Drawdown Recovery Period	4.00	9.00	N/A	N/A	N/A	
Maximum Drawdown	-0.59	-2.54	-14.28	N/A	-14.28	
Maximum Loss Exposure	N/A	N/A	-9.32	N/A	-4.46	
Upside Semi Deviation	0.59	3.10	3.35	N/A	4.17	
Spliced Barclays GlobalAgg GDPWeighted Dev xUS						
Return	2.24	3.04	0.07	2.61	0.82	
Standard Deviation	1.51	2.43	3.58	7.16	4.29	
Downside Risk	0.60	1.27	2.76	4.82	3.12	
Downside Semi Deviation	0.33	2.17	4.16	7.68	4.79	
Max Drawdown Recovery Period	3.00	12.00	N/A	N/A	N/A	
Maximum Drawdown	-0.48	-2.79	-14.08	-14.08	-14.08	
Maximum Loss Exposure	N/A	N/A	-9.55	-5.50	-4.77	
Upside Semi Deviation	0.56	2.84	3.09	6.93	3.94	
vs. Spliced Barclays GlobalAgg GDPWeighted Dev xUS						
Active Return	-0.46	0.61	0.44	N/A	0.34	
Tracking Error	0.79	0.75	0.64	N/A	0.69	
Actual Correlation	0.85	0.96	0.99	N/A	0.99	
Beta	0.77	0.99	1.01	N/A	1.03	
Consistency	33.33	58.33	56.67	N/A	56.79	
Down Market Capture	25.50	83.09	96.39	N/A	101.07	
Down Market Outperformance	0.69	0.87	0.33	N/A	-0.12	
Information Ratio	-0.59	0.81	0.69	N/A	0.49	
Jensen Alpha	-0.31	0.61	0.44	N/A	0.32	
Up Market Capture	63.39	105.55	105.79	N/A	106.50	
Up Market Outperformance	-1.19	0.46	0.53	N/A	0.76	
vs. FTSE 3 Month T-Bill						
Excess Return	0.20	2.83	0.09	N/A	0.86	
Excess Risk	1.39	2.57	3.67	N/A	4.46	
Sharpe Ratio	0.15	1.10	0.02	N/A	0.19	

Calculation based on monthly periodicity.

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# US Treasuries

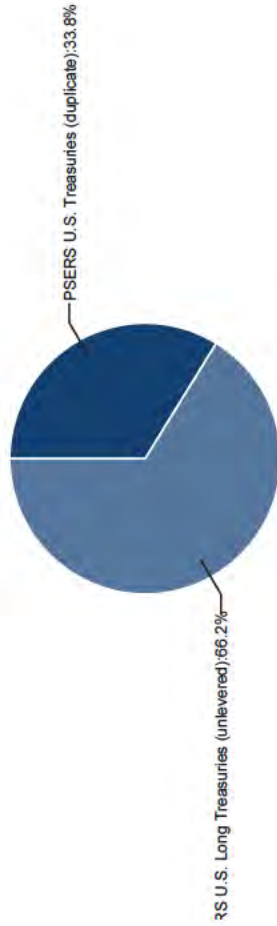
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Case ID: 221102792

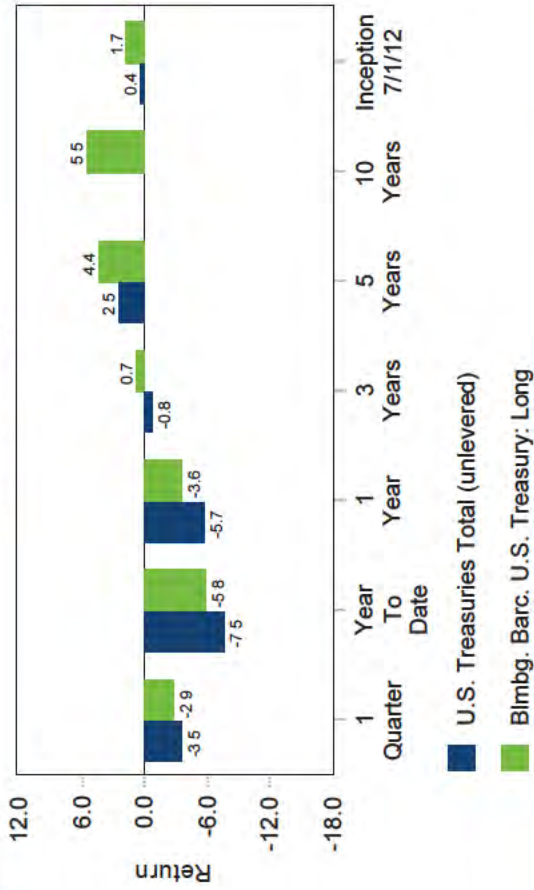
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Current Allocation

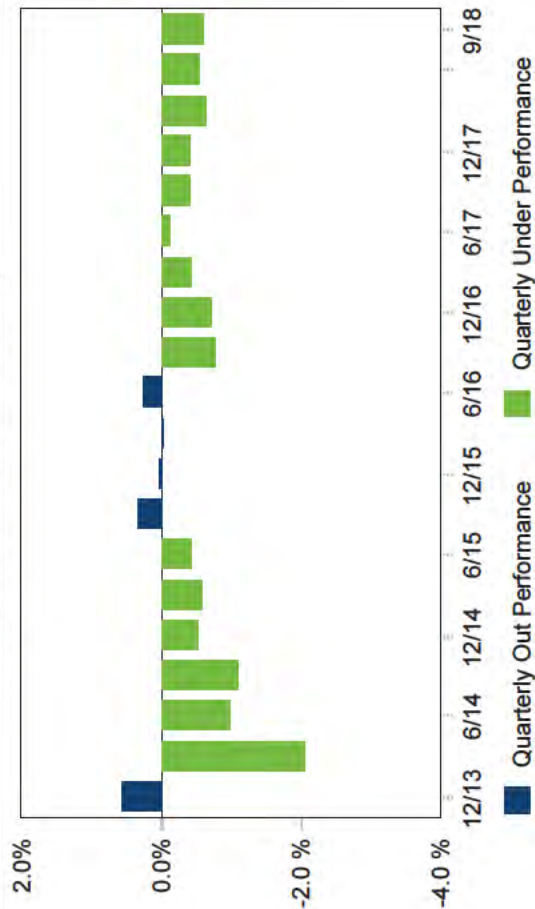
September 30, 2018 : \$2,365M



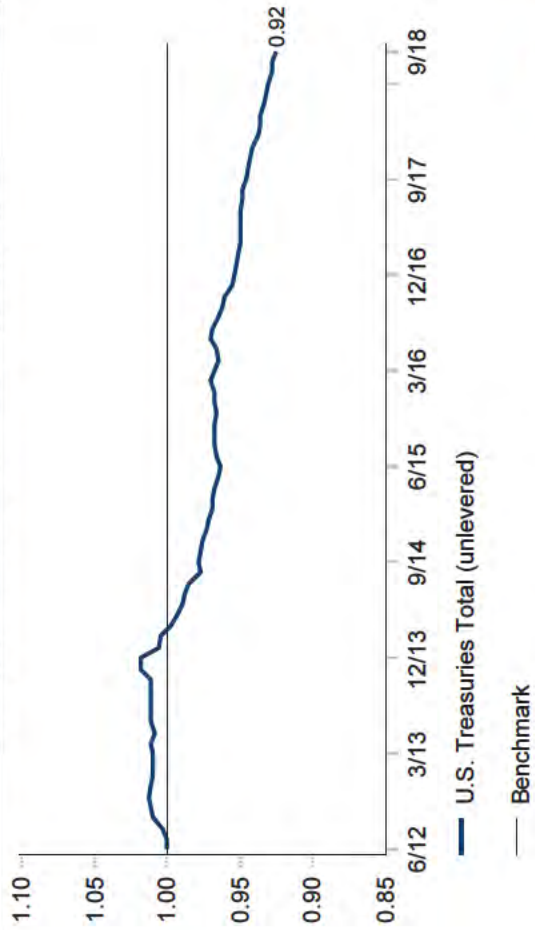
Return Summary



Quarterly Excess Performance



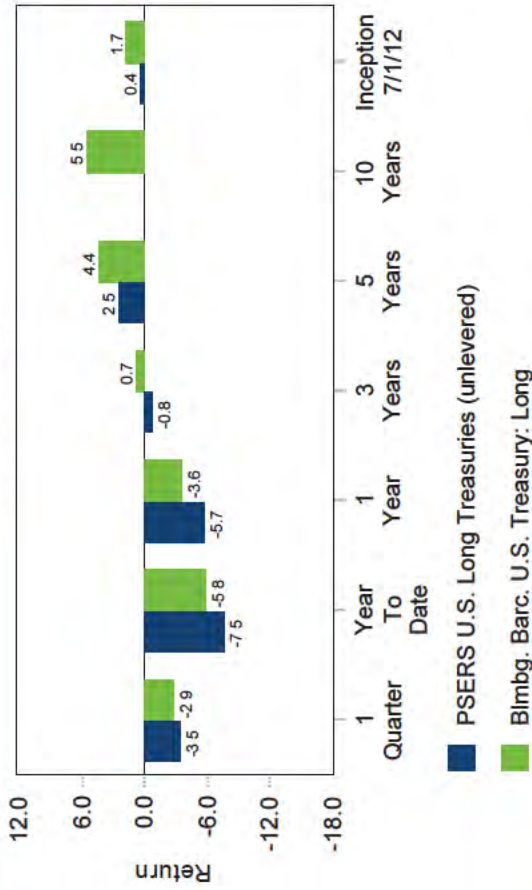
Ratio of Cumulative Wealth - Since Inception



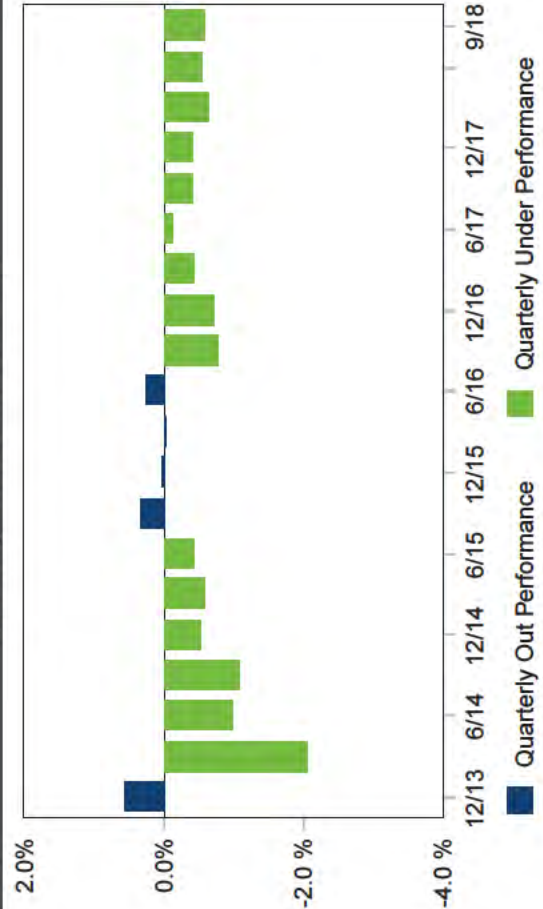
Account Information

Account Name: PSERS U.S. Long Treasuries (unlevered)  
 Inception Date: 06/30/2012  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Treasury: Long  
 Peer Group: IM U.S. Long Term Treasury/Govt Bond (MF)

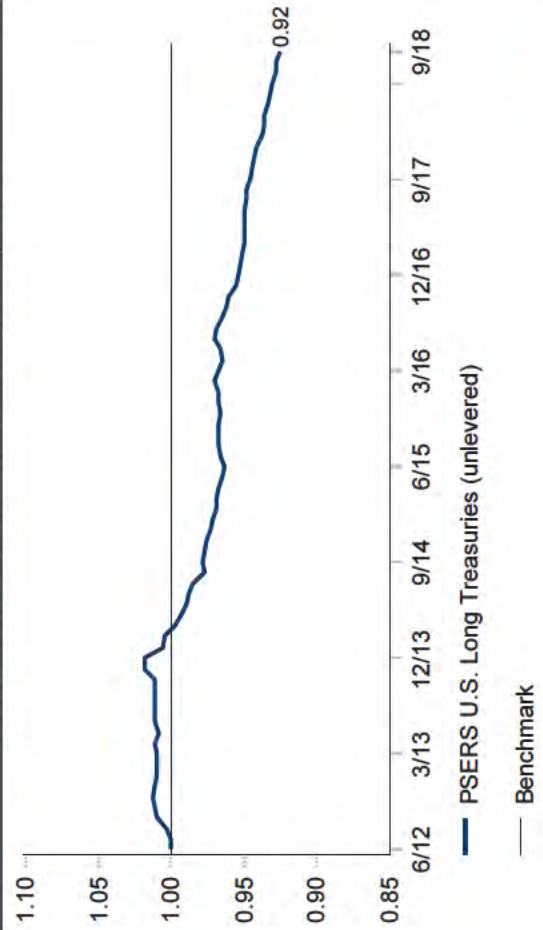
Return Summary



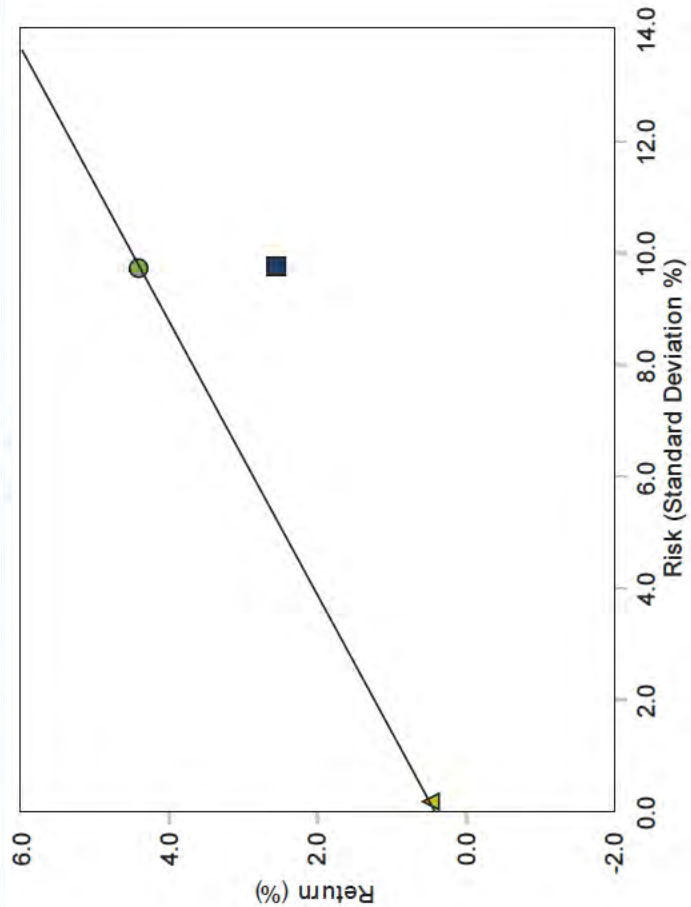
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

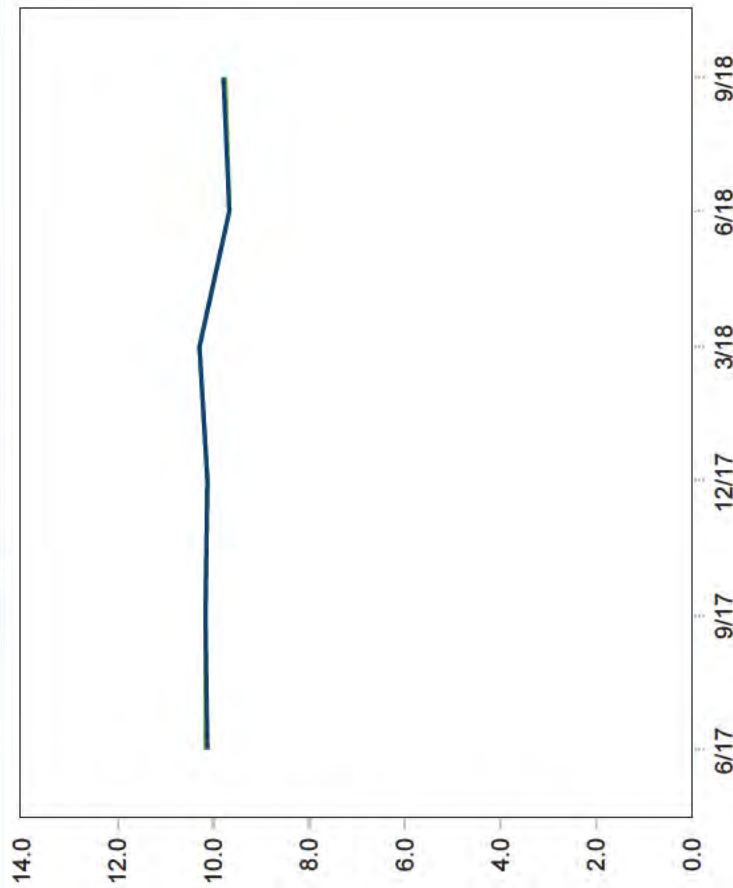


Annualized Return vs. Annualized Standard Deviation  
5 Years



- PSERS U.S. Long Treasuries (unlevered)
- Blmbg. Barc. U.S. Treasury: Long
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- PSERS U.S. Long Treasuries (unlevered)
- Blmbg. Barc. U.S. Treasury: Long

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS U.S. Long Treasuries (unlevered)	-1.80	0.95	-1.89	0.99	0.25	-1.78	1.00	2.55	9.80	1.00
Blmbg. Barc. U.S. Treasury: Long	0.00	0.00	N/A	1.00	0.44	0.00	1.00	4.41	9.76	1.00
FTSE 3 Month T-Bill	-4.30	9.79	-0.44	0.02	N/A	0.50	0.00	0.49	0.18	-0.13



Risk Statistics

PSERS U.S. Long Treasuries (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-5.66	-0.76	2.55	N/A	0.44	07/01/2012
Standard Deviation	7.90	9.40	9.80	N/A	9.72	
Downside Risk	6.75	6.84	6.49	N/A	6.77	
Downside Semi Deviation	2.89	9.81	9.97	N/A	9.85	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-7.49	-15.96	-15.96	N/A	-15.96	
Maximum Loss Exposure	-5.66	-2.27	-2.52	N/A	-11.64	
Upside Semi Deviation	1.90	9.27	9.88	N/A	9.74	

Blmbg. Barc. U.S. Treasury: Long

Return	-3.56	0.72	4.41	5.45	1.71	
Standard Deviation	7.59	8.95	9.76	12.11	9.70	
Downside Risk	6.11	6.31	6.13	7.03	6.48	
Downside Semi Deviation	2.61	8.80	9.07	10.24	9.17	
Max Drawdown Recovery Period	N/A	N/A	N/A	28.00	28.00	
Maximum Drawdown	-6.14	-13.92	-13.92	-15.94	-15.94	
Maximum Loss Exposure	-3.91	-1.38	-3.08	-3.26	-13.16	
Upside Semi Deviation	1.98	9.40	10.65	13.88	10.38	

vs. Blmbg. Barc. U.S. Treasury: Long

Active Return	-2.17	-1.44	-1.80	N/A	-1.25	
Tracking Error	0.35	0.60	0.95	N/A	0.97	
Actual Correlation	1.00	1.00	1.00	N/A	0.99	
Beta	1.04	1.05	1.00	N/A	1.00	
Consistency	0.00	19.44	18.33	N/A	28.00	
Down Market Capture	111.77	112.24	107.18	N/A	104.07	
Down Market Outperformance	-1.34	-2.07	-1.32	N/A	-0.77	
Information Ratio	-6.15	-2.40	-1.89	N/A	-1.28	
Jensen Alpha	-1.96	-1.45	-1.78	N/A	-1.24	
Up Market Capture	92.71	99.02	93.25	N/A	94.48	
Up Market Outperformance	-0.73	-0.33	-2.50	N/A	-2.00	

vs. FTSE 3 Month T-Bill

Excess Return	-7.09	-1.13	2.50	N/A	0.50	
Excess Risk	7.90	9.42	9.82	N/A	9.74	
Sharpe Ratio	-0.90	-0.12	0.25	N/A	0.05	

Calculation based on monthly periodicity.

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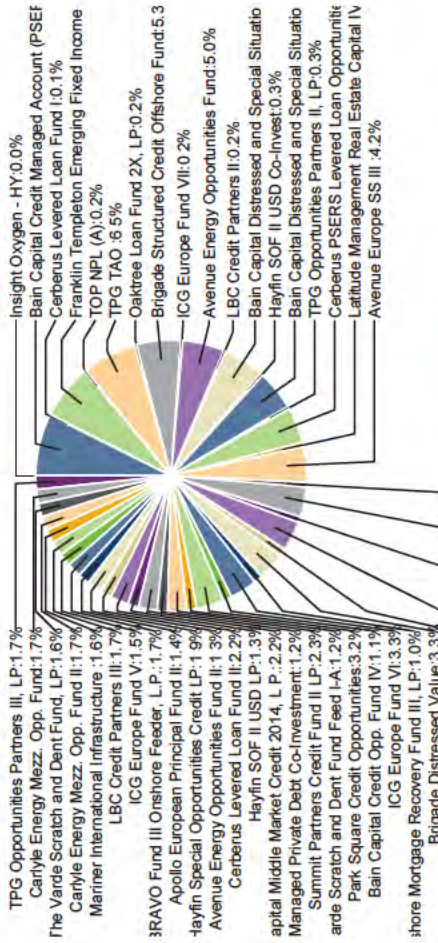


## Credit-Related Fixed Income

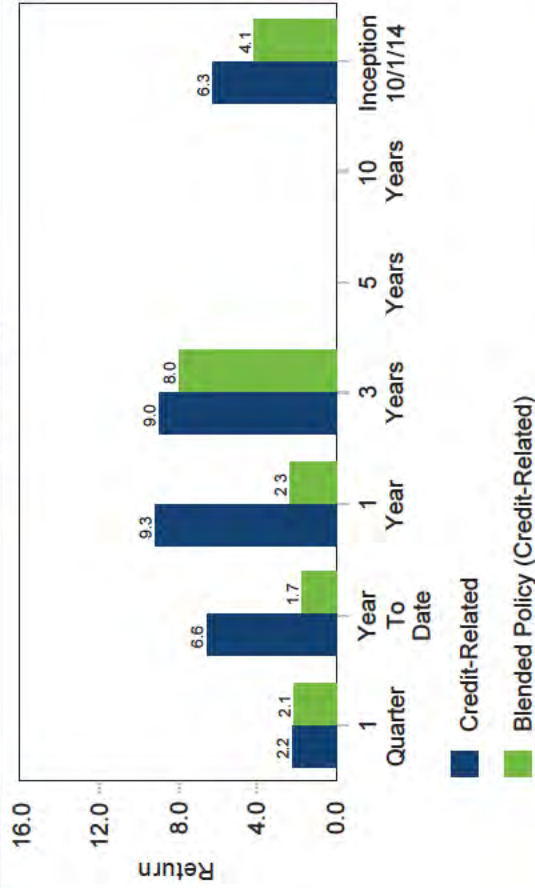
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Current Allocation

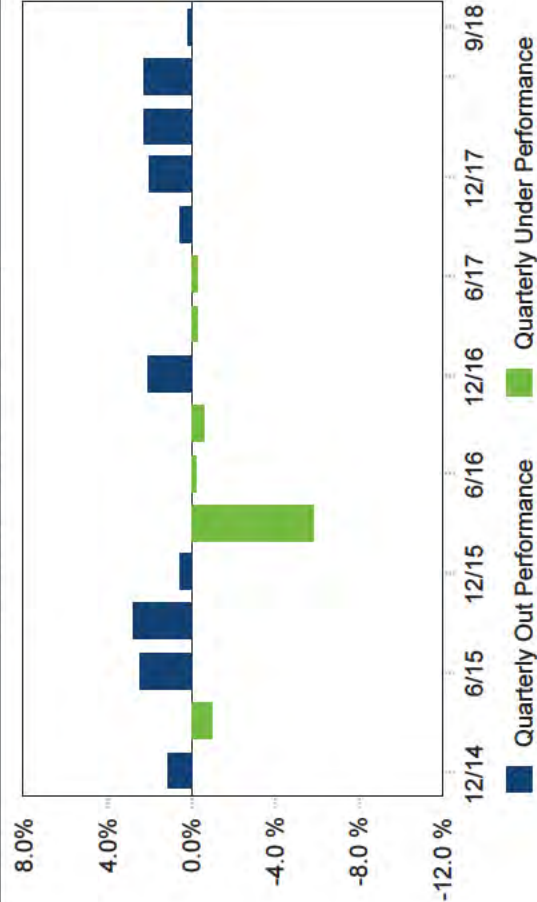
September 30, 2018 : \$5,377M



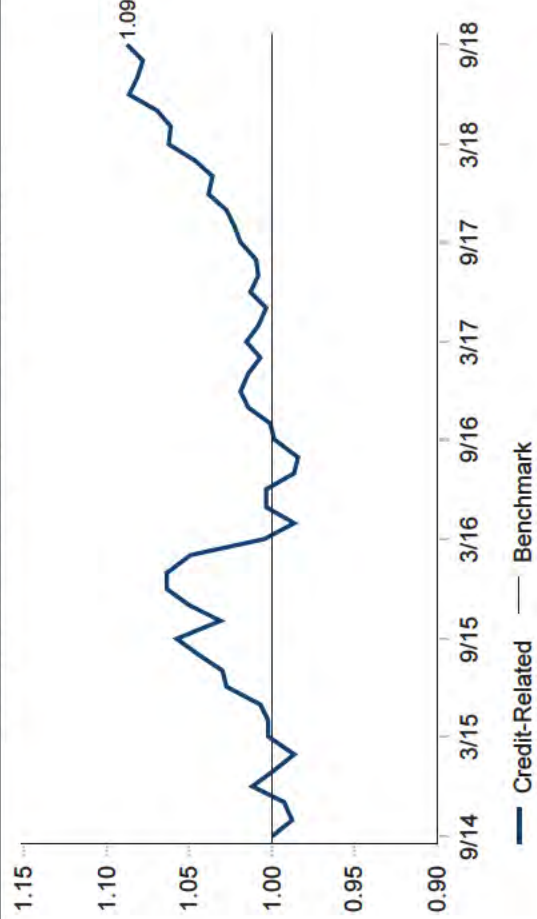
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





## Emerging Markets Fixed Income

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Case ID: 221102792

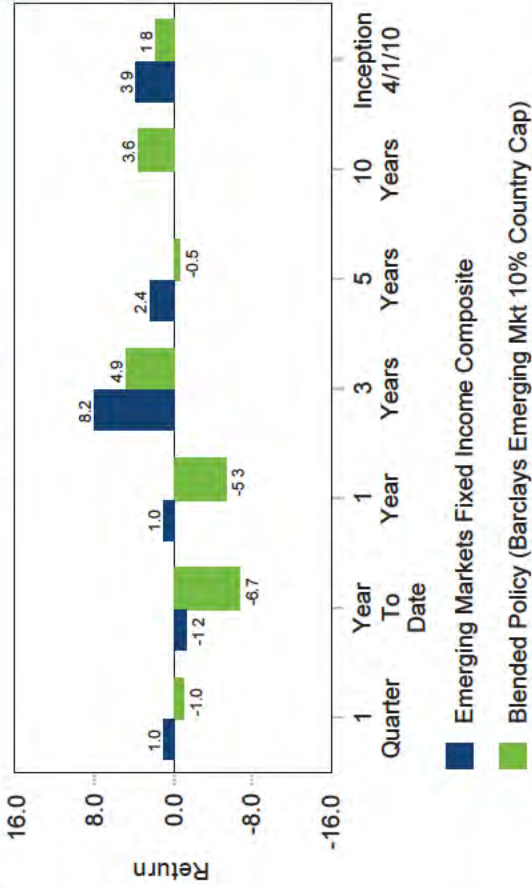
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Current Allocation

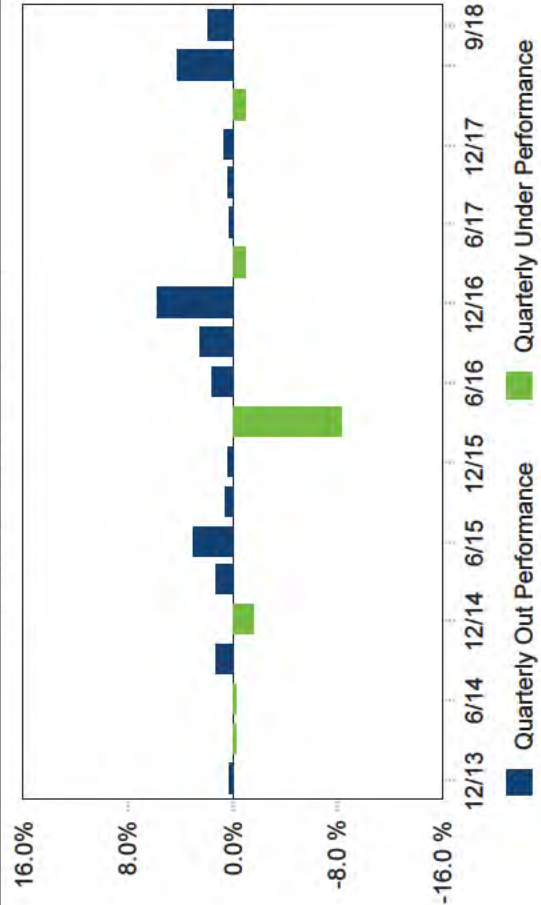
September 30, 2018 : \$352M



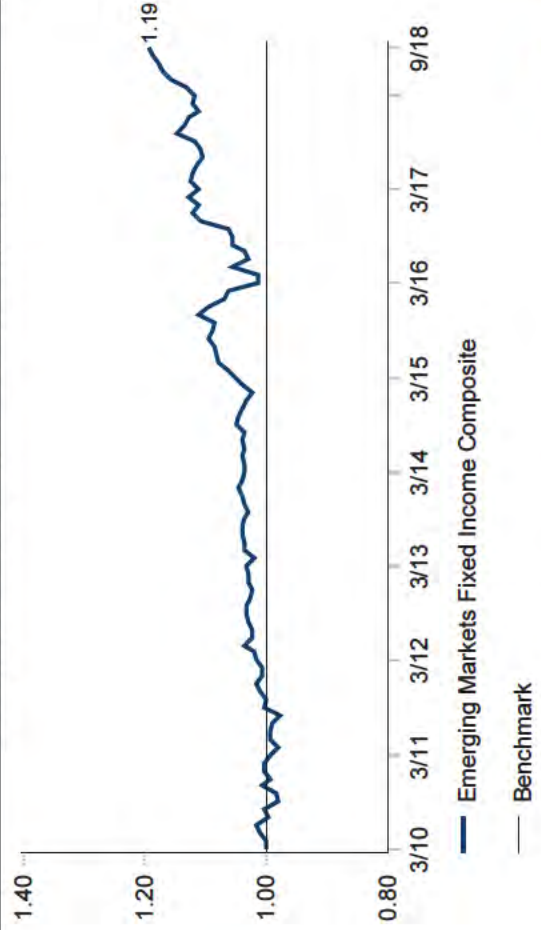
Return Summary



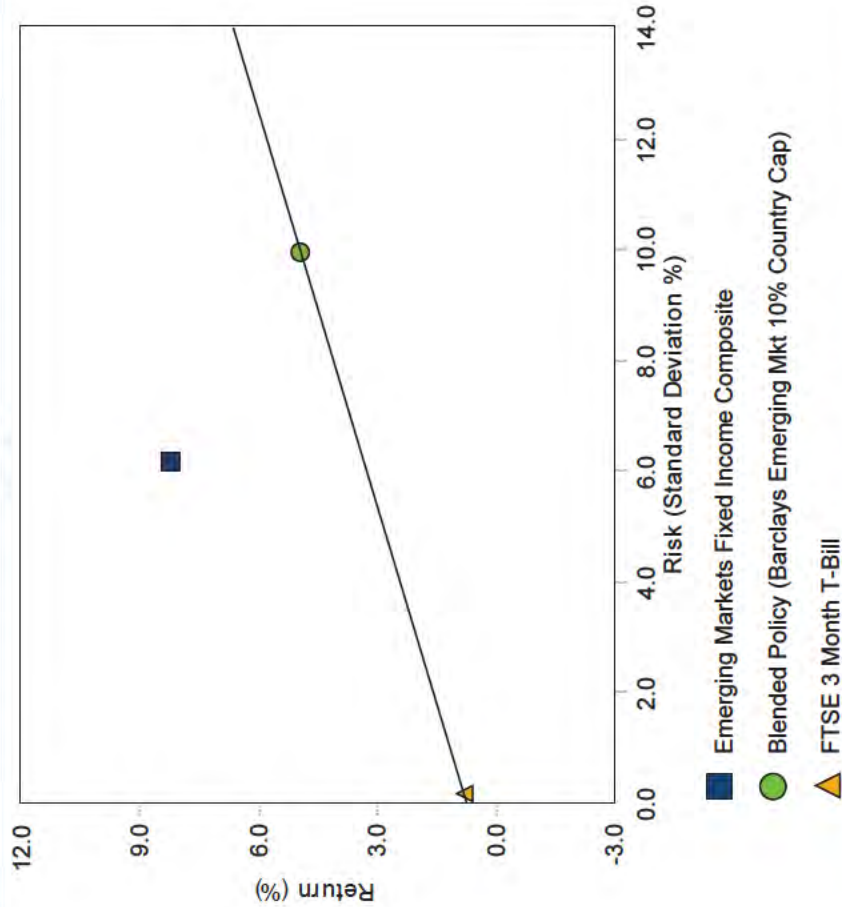
Quarterly Excess Performance



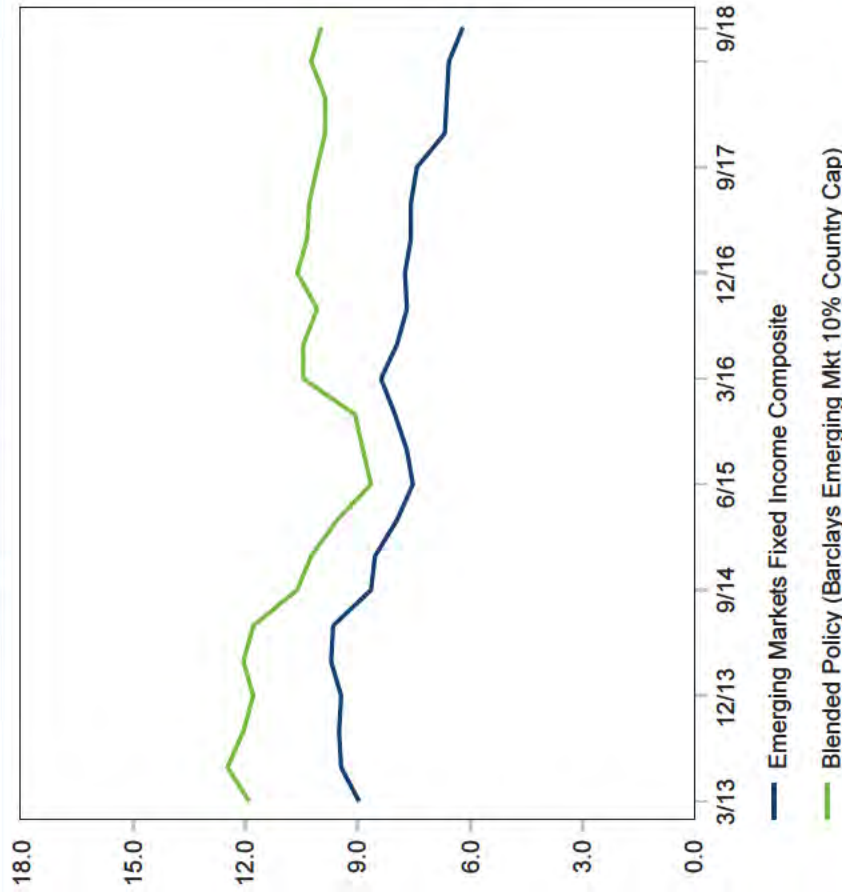
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Emerging Markets Fixed Income Composite	2.78	6.17	0.45	0.65	1.17	5.57	0.50	8.20	6.18	0.81
Blended Policy (Barclays Emerging Mkt 10% Country Cap)	0.00	0.00	N/A	1.00	0.45	0.00	1.00	4.94	9.98	1.00
FTSE 3 Month T-Bill	-4.52	10.02	-0.45	0.05	N/A	0.83	0.00	0.80	0.18	-0.22

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## Risk Statistics

## Emerging Markets Fixed Income Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.00	8.20	2.36	N/A	3.93	04/01/2010
Standard Deviation	6.19	6.18	7.01	N/A	8.03	
Downside Risk	4.52	3.67	4.87	N/A	5.58	
Downside Semi Deviation	2.17	2.09	7.97	N/A	9.62	
Max Drawdown Recovery Period	N/A	N/A	35.00	N/A	49.00	
Maximum Drawdown	-5.71	-5.71	-17.19	N/A	-18.10	
Maximum Loss Exposure	-1.14	-1.01	-10.53	N/A	-1.85	
Upside Semi Deviation	1.66	6.52	6.53	N/A	7.29	
Blended Policy (Barclays Emerging Mkt 10% Country Cap)						
Return	-5.32	4.94	-0.53	3.56	1.78	
Standard Deviation	9.06	9.98	9.53	12.29	10.67	
Downside Risk	7.50	6.58	6.92	8.70	7.62	
Downside Semi Deviation	3.21	11.73	10.62	14.48	12.27	
Max Drawdown Recovery Period	N/A	N/A	43.00	N/A	N/A	
Maximum Drawdown	-11.33	-11.33	-20.41	-22.54	-22.54	
Maximum Loss Exposure	-6.76	N/A	-15.75	-15.45	-2.84	
Upside Semi Deviation	2.27	9.45	8.77	11.05	9.64	
vs. Blended Policy (Barclays Emerging Mkt 10% Country Cap)						
Active Return	6.25	2.78	2.67	N/A	1.85	
Tracking Error	4.30	6.17	5.04	N/A	4.52	
Actual Correlation	0.91	0.81	0.86	N/A	0.92	
Beta	0.62	0.50	0.63	N/A	0.69	
Consistency	66.67	55.56	55.00	N/A	56.86	
Down Market Capture	48.07	40.61	59.89	N/A	63.80	
Down Market Outperformance	7.72	15.70	9.87	N/A	9.57	
Information Ratio	1.45	0.45	0.53	N/A	0.41	
Jensen Alpha	3.80	5.14	2.48	N/A	2.49	
Up Market Capture	79.65	77.35	79.71	N/A	80.92	
Up Market Outperformance	-2.53	-6.55	-5.69	N/A	-6.01	
vs. FTSE 3 Month T-Bill						
Excess Return	-0.39	7.29	2.09	N/A	3.86	
Excess Risk	6.22	6.22	7.00	N/A	8.03	
Sharpe Ratio	-0.06	1.17	0.30	N/A	0.48	

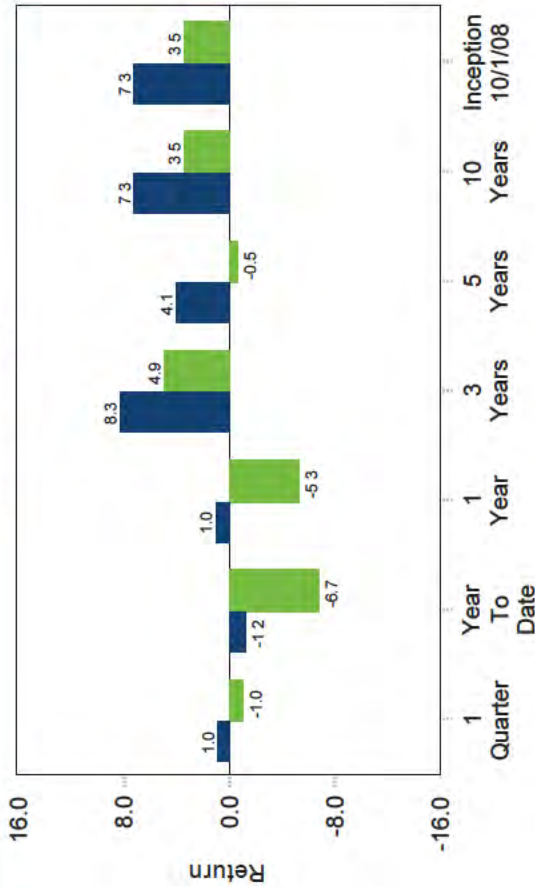
Calculation based on monthly periodicity.

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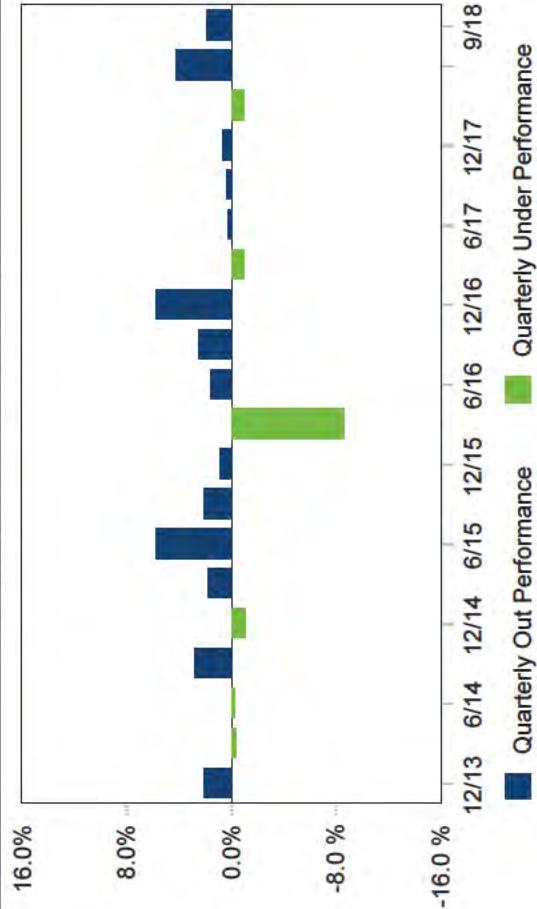
Account Information

Account Name: Franklin Templeton Emerging Fixed Income  
 Inception Date: 09/30/2008  
 Account Structure: Separate Account  
 Asset Class: International-Emerging Fixed Income  
 Benchmark: Blended Benchmark (Barclays Emerging Mkt 10% Country Cap)  
 Peer Group: IM Emerging Markets Debt (SA+CF)

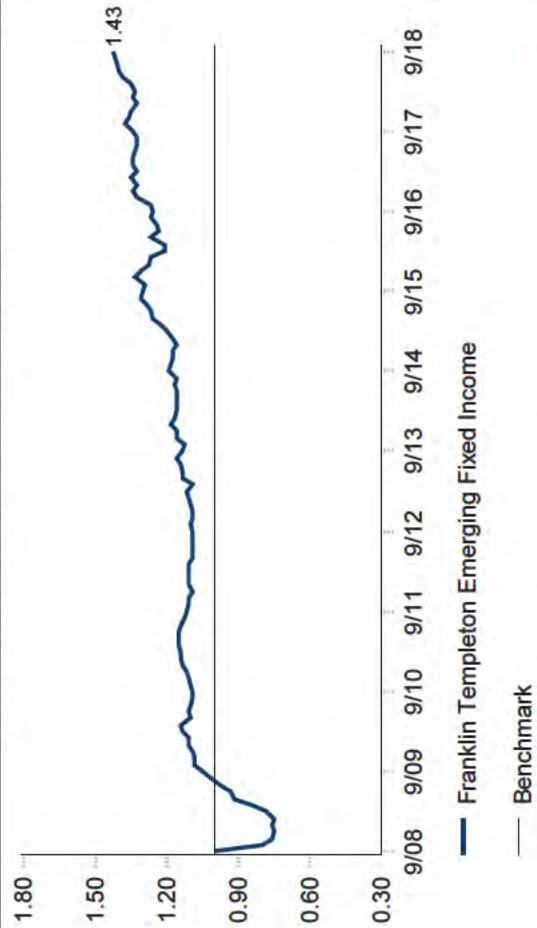
Return Summary



Quarterly Excess Performance

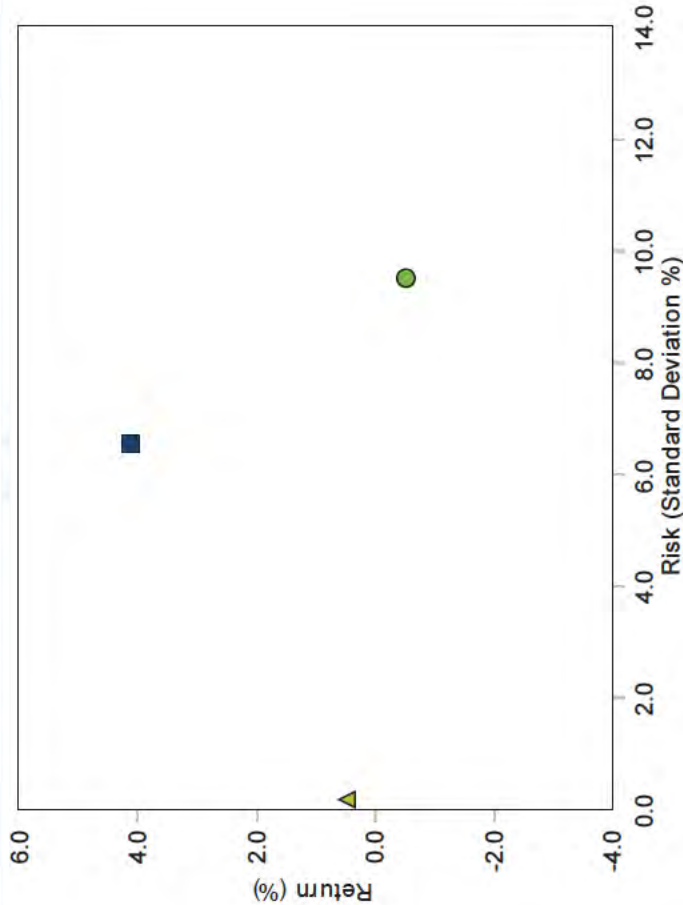


Ratio of Cumulative Wealth - Since Inception

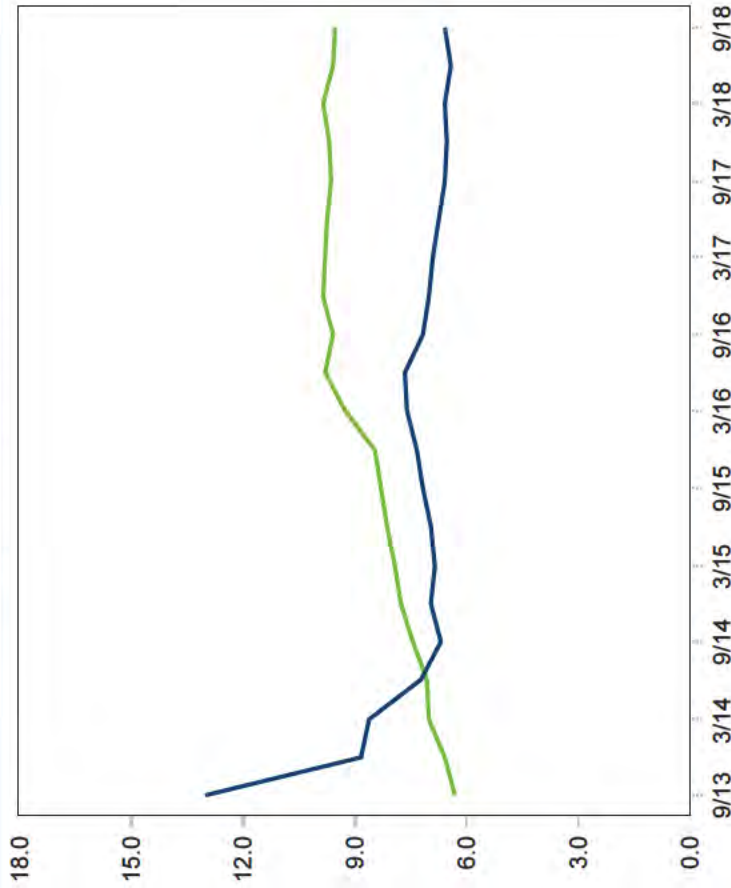




Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Franklin Templeton Emerging Fixed Income	4.32	5.69	0.76	0.66	0.57	4.37	0.56	4.10	6.59	0.81
Blended Benchmark (Barclays Emerging Mkt 10% Country Cap)	0.00	0.00	N/A	1.00	-0.06	0.00	1.00	-0.53	9.53	1.00
FTSE 3 Month T-Bill	0.57	9.54	0.06	0.00	N/A	0.49	0.00	0.49	0.18	-0.01



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## Risk Statistics

## Franklin Templeton Emerging Fixed Income

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.00	8.26	4.10	7.27	7.27	10/01/2008
Standard Deviation	6.19	6.32	6.59	10.31	10.31	
Downside Risk	4.52	3.80	4.26	7.55	7.55	
Downside Semi Deviation	2.17	2.16	6.97	13.91	13.91	
Max Drawdown Recovery Period	N/A	N/A	27.00	9.00	9.00	
Maximum Drawdown	-5.71	-5.71	-11.43	-23.37	-23.37	
Maximum Loss Exposure	-1.14	-1.04	-4.66	-23.37	-23.37	
Upside Semi Deviation	1.66	6.61	6.63	8.81	8.81	
Blended Benchmark (Barclays Emerging Mkt 10% Country Cap)						
Return	-5.32	4.94	-0.53	3.52	3.52	
Standard Deviation	9.06	9.98	9.53	8.13	8.13	
Downside Risk	7.50	6.58	6.92	5.72	5.72	
Downside Semi Deviation	3.21	11.73	10.62	10.26	10.26	
Max Drawdown Recovery Period	N/A	N/A	43.00	N/A	N/A	
Maximum Drawdown	-11.33	-11.33	-20.41	-22.54	-22.54	
Maximum Loss Exposure	-6.76	N/A	-15.75	N/A	N/A	
Upside Semi Deviation	2.27	9.45	8.77	7.13	7.13	
vs. Blended Benchmark (Barclays Emerging Mkt 10% Country Cap)						
Active Return	6.25	2.84	4.32	3.80	3.80	
Tracking Error	4.30	6.28	5.69	9.33	9.33	
Actual Correlation	0.91	0.79	0.81	0.51	0.51	
Beta	0.62	0.50	0.56	0.64	0.64	
Consistency	66.67	55.56	56.67	57.50	57.50	
Down Market Capture	48.07	39.20	44.52	53.33	53.33	
Down Market Outperformance	7.72	16.09	13.95	10.94	10.94	
Information Ratio	1.45	0.45	0.76	0.41	0.41	
Jensen Alpha	3.80	5.20	4.15	5.14	5.14	
Up Market Capture	79.65	76.82	76.72	96.52	96.52	
Up Market Outperformance	-2.53	-6.72	-6.55	-1.35	-1.35	
vs. FTSE 3 Month T-Bill						
Excess Return	-0.39	7.36	3.75	7.27	7.27	
Excess Risk	6.22	6.36	6.59	10.34	10.34	
Sharpe Ratio	-0.06	1.16	0.57	0.70	0.70	

Calculation based on monthly periodicity.

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## High Yield

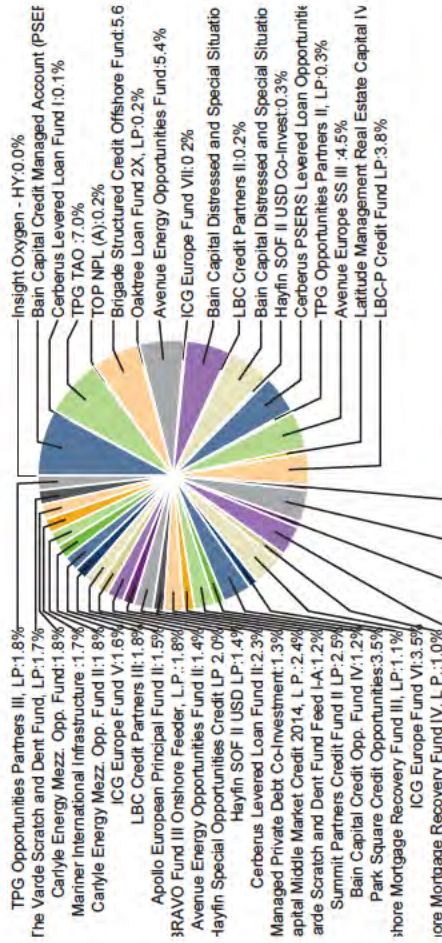
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Case ID: 221102792

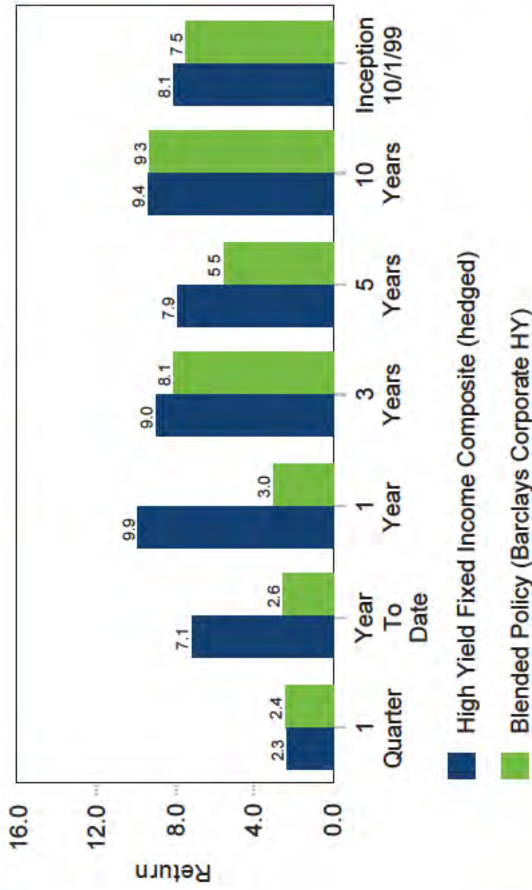
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Current Allocation

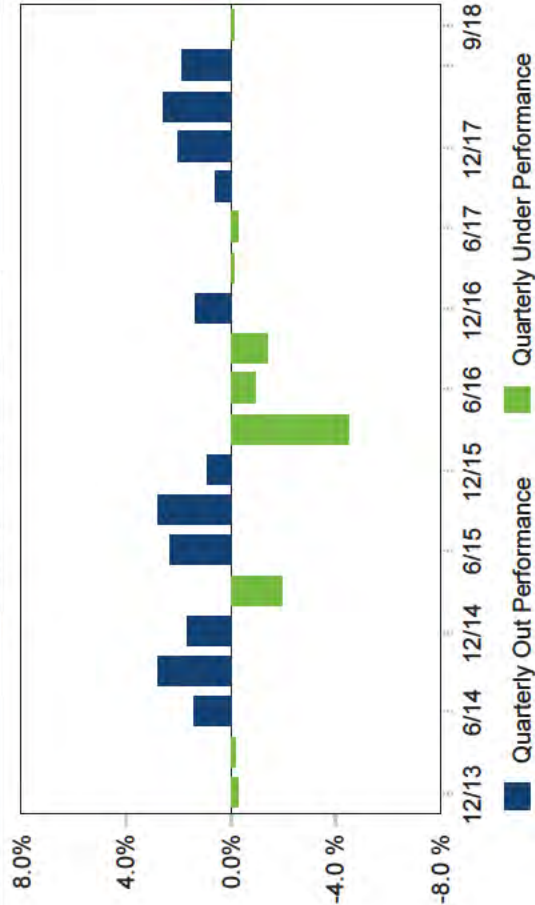
September 30, 2018 : \$5,025M



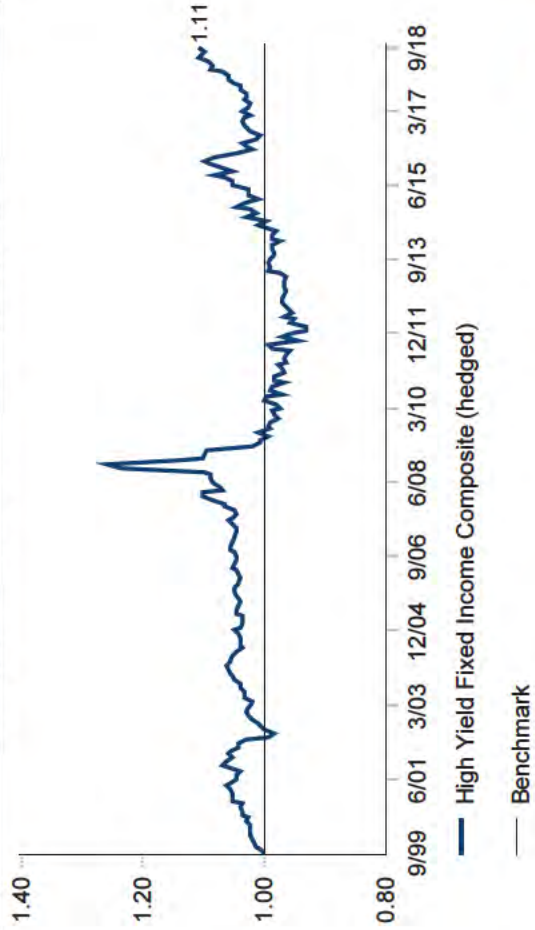
Return Summary



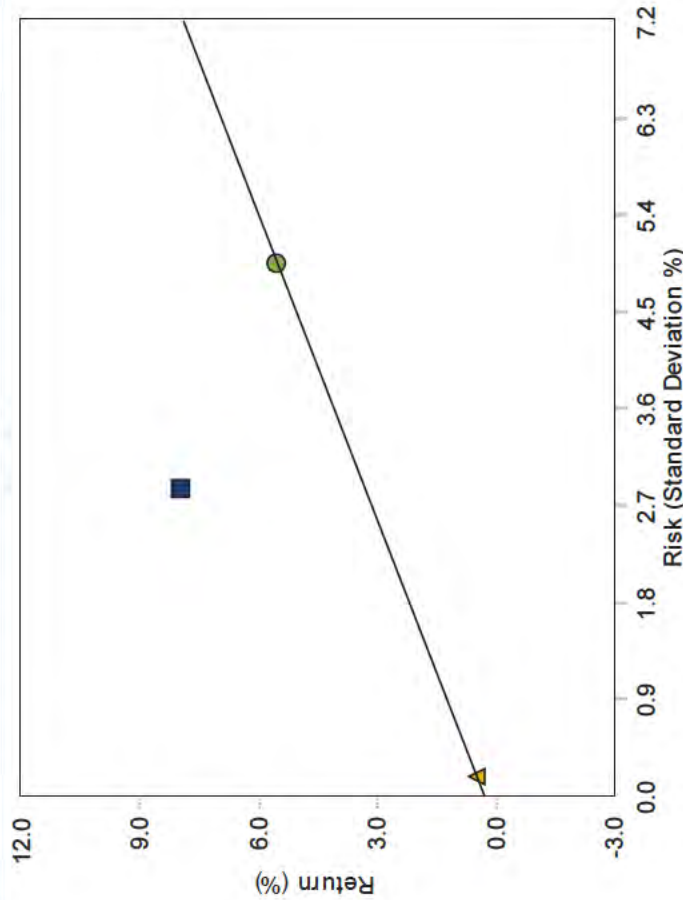
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

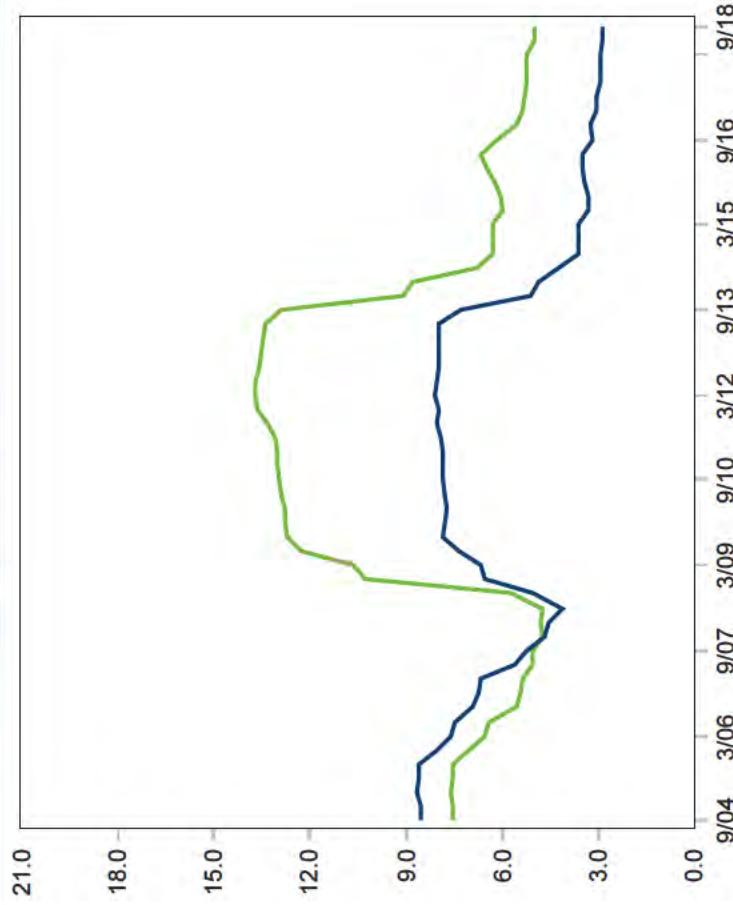


Annualized Return vs. Annualized Standard Deviation  
5 Years



- High Yield Fixed Income Composite (hedged)
- Blended Policy (Barclays Corporate HY)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- High Yield Fixed Income Composite (hedged)
- Blended Policy (Barclays Corporate HY)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
High Yield Fixed Income Composite (hedged)	2.19	4.66	0.47	0.15	2.54	6.66	0.23	7.95	2.87	0.39
Blended Policy (Barclays Corporate HY)	0.00	0.00	N/A	1.00	1.02	0.00	1.00	5.54	4.95	1.00
FTSE 3 Month T-Bill	-5.03	4.95	-1.02	0.00	N/A	0.48	0.00	0.49	0.18	0.03

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
High Yield Fixed Income Composite (hedged)						
Return	9.87	9.00	7.95	9.43	8.06	10/01/1999
Standard Deviation	1.96	2.79	2.87	5.52	6.36	
Downside Risk	0.00	0.94	1.02	3.41	4.06	
Downside Semi Deviation	N/A	0.93	0.75	8.54	8.32	
Max Drawdown Recovery Period	N/A	7.00	12.00	9.00	17.00	
Maximum Drawdown	0.00	-3.01	-4.99	-15.59	-22.67	
Maximum Loss Exposure	N/A	-3.01	N/A	-15.59	-2.11	
Upside Semi Deviation	3.46	3.88	3.84	5.59	6.21	
Blended Policy (Barclays Corporate HY)						
Return	3.05	8.15	5.54	9.32	7.48	
Standard Deviation	2.00	4.93	4.95	9.78	8.54	
Downside Risk	1.12	2.29	2.73	6.53	5.69	
Downside Semi Deviation	0.62	1.30	4.95	12.58	10.39	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	27.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.10	-31.84	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.10	-5.14	
Upside Semi Deviation	0.68	5.86	5.38	9.15	8.08	
vs. Blended Policy (Barclays Corporate HY)						
Active Return	6.45	0.71	2.19	-0.24	0.38	
Tracking Error	2.62	4.55	4.66	7.16	5.51	
Actual Correlation	0.12	0.42	0.39	0.69	0.76	
Beta	0.12	0.24	0.23	0.39	0.57	
Consistency	66.67	58.33	58.33	50.83	54.82	
Down Market Capture	-125.32	-13.80	-13.46	20.30	53.45	
Down Market Outperformance	3.92	9.72	14.54	17.53	9.01	
Information Ratio	2.46	0.16	0.47	-0.03	0.07	
Jensen Alpha	8.06	6.37	6.28	5.42	2.93	
Up Market Capture	153.18	75.84	72.80	65.05	80.63	
Up Market Outperformance	2.66	-4.08	-4.34	-9.14	-4.68	
vs. FTSE 3 Month T-Bill						
Excess Return	7.91	7.88	7.22	8.88	6.29	
Excess Risk	1.94	2.77	2.85	5.54	6.43	
Sharpe Ratio	4.08	2.85	2.54	1.60	0.98	

Calculation based on monthly periodicity.

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Asset Allocation & Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$'000)	%	
<b>High Yield Fixed Income Composite (hedged)</b>	2.34 (31)	7.14 (3)	2.34 (31)	9.87 (1)	9.00 (8)	7.95 (1)	9.43 (10)	8.06 (13)	10/01/1999	5,024,687	100.0	
Blended Policy (Barclays Corporate HY)	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	9.32 (11)	7.48 (25)				
Value Added	-0.06	4.57	-0.06	6.82	0.85	2.41	0.11	0.58				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	8.22	6.88				
<b>Internally Managed Private Debt Co-Investment</b>	0.00 (99)	3.85 (11)	0.00 (99)	5.73 (7)	-16.83 (100)	-13.71 (100)	N/A	-12.65 (100)	08/01/2013	66,854	1.3	
Blimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.43 (16)				
Value Added	-2.40	1.28	-2.40	2.68	-24.98	-19.25	N/A	-18.08				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	4.75				
<b>Carlyle Energy Mezz. Opp. Fund</b>	-1.02 (100)	-1.36 (100)	-1.02 (100)	2.34 (58)	-20.62 (100)	-10.28 (100)	N/A	-6.08 (100)	10/01/2012	89,640	1.8	
Blimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.80 (18)				
Value Added	-3.41	-3.93	-3.41	-0.71	-28.77	-15.82	N/A	-11.88				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	5.14				
<b>Carlyle Energy Mezz. Opp. Fund II</b>	0.66 (99)	5.70 (5)	0.66 (99)	6.14 (6)	N/A	N/A	N/A	-6.46 (100)	11/01/2015	89,836	1.8	
Blimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	7.39 (16)				
Value Added	-1.74	3.13	-1.74	3.09	N/A	N/A	N/A	-13.85				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	6.00				
<b>ICG Europe Fund V</b>	4.56 (1)	6.36 (4)	4.56 (1)	11.14 (1)	12.83 (1)	13.96 (1)	N/A	9.63 (1)	01/01/2013	81,709	1.6	
Blimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.47 (16)				
Value Added	2.16	3.79	2.16	8.09	4.68	8.42	N/A	4.16				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	4.84				
<b>ICG Europe Fund VI</b>	2.37 (26)	1.89 (59)	2.37 (26)	10.94 (1)	N/A	N/A	N/A	56.38 (1)	02/01/2016	175,596	3.5	
Blimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	10.74 (17)				
Value Added	-0.03	-0.68	-0.03	7.89	N/A	N/A	N/A	45.64				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	8.91				
<b>ICG Europe Fund VII</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00 (99)	08/01/2018	11,548	0.2	
Blimbg. Barc. U.S. Corp. High Yield	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.30 (27)				
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.30				
M U.S. High Yield Bonds (SA+CF) Median	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.16				
<b>Bain Capital Middle Market Credit 2010, L.P.</b>	-1.79 (100)	-5.92 (100)	-1.79 (100)	-1.75 (100)	-1.74 (100)	1.58 (99)	N/A	5.45 (90)	06/01/2010	30,653	0.6	
Blimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	7.60 (14)				
Value Added	-4.19	-8.49	-4.19	-4.80	-9.89	-3.96	N/A	-2.15				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	6.86				

Asset Allocation & Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)	%	
Bain Capital Middle Market Credit 2014, L.P.	2.24 (42)	7.85 (2)	2.24 (42)	10.99 (1)	6.66 (54)	N/A	N/A	6.46 (2)	11/01/2013	119,605	2.4	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	5.10 (18)				
Value Added	-0.16	5.28	-0.16	7.94	-1.49	N/A	N/A	1.36				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.42				
Apollo European Principal Fund II	-5.23 (100)	-2.29 (100)	-5.23 (100)	1.42 (89)	8.44 (11)	10.19 (1)	N/A	6.62 (7)	10/01/2012	75,443	1.5	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.80 (18)				
Value Added	-7.63	-4.86	-7.63	-1.63	0.29	4.65	N/A	0.82				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	5.14				
Apollo European Principal Fund III	1.40 (95)	-24.13 (100)	1.40 (95)	N/A	N/A	N/A	N/A	-24.13 (100)	01/01/2018	37,503	0.7	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	N/A	N/A	N/A	N/A	2.57 (29)				
Value Added	-1.00	-26.70	-1.00	N/A	N/A	N/A	N/A	-26.70				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	N/A	N/A	N/A	N/A	2.03				
Bain Capital Credit Opp. Fund IV	-12.47 (100)	33.11 (1)	-12.47 (100)	42.85 (1)	17.68 (1)	10.24 (1)	11.02 (1)	11.02 (1)	10/01/2008	58,121	1.2	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	9.46 (10)	9.46 (10)				
Value Added	-14.87	30.54	-14.87	39.80	9.53	4.70	1.56	1.56				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	8.22	8.22				
Bain Capital Distressed and Special Situations 2013	3.81 (1)	11.21 (1)	3.81 (1)	17.83 (1)	9.58 (5)	8.40 (1)	N/A	7.85 (2)	10/01/2012	264,286	5.3	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.80 (18)				
Value Added	1.41	8.64	1.41	14.78	1.43	2.86	N/A	2.05				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	5.14				
Bain Capital Distressed and Special Situations 2016 (A), L.P.	3.58 (1)	10.44 (1)	3.58 (1)	14.49 (1)	N/A	N/A	N/A	17.56 (1)	11/01/2015	253,951	5.1	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	7.39 (16)				
Value Added	1.18	7.87	1.18	11.44	N/A	N/A	N/A	10.17				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	6.00				
TPG Opportunities Partners II, LP	0.91 (99)	18.68 (1)	0.91 (99)	18.91 (1)	11.47 (1)	15.39 (1)	N/A	13.32 (1)	04/01/2012	15,843	0.3	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	6.36 (16)				
Value Added	-1.49	16.11	-1.49	15.86	3.32	9.85	N/A	6.96				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	5.64				
TPG Opportunities Partners III, LP	3.81 (1)	14.52 (1)	3.81 (1)	20.15 (1)	14.89 (1)	N/A	N/A	7.06 (1)	02/01/2014	88,941	1.8	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	4.99 (19)				
Value Added	1.41	11.95	1.41	17.10	6.74	N/A	N/A	2.07				
IM U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.30				



Asset Allocation & Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)	%	
<b>TOP NPL (A)</b>												
Bimbg. Barc. U.S. Corp. High Yield	-2.69 (100)	-3.42 (100)	-2.89 (100)	-3.49 (100)	0.59 (100)	9.70 (1)	N/A	10.89 (1)	04/01/2012	8,975	0.2	
Value Added	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	6.36 (16)				
M U.S. High Yield Bonds (SA+CF) Median	-5.09	-5.99	-5.09	-6.54	-7.56	4.16	N/A	4.53				
	2.12	2.03	2.12	2.59	6.72	4.82	N/A	5.64				
<b>TPG TAO</b>												
Bimbg. Barc. U.S. Corp. High Yield	2.22 (45)	10.68 (1)	2.22 (45)	11.58 (1)	9.20 (7)	N/A	N/A	10.01 (1)	01/01/2015	349,813	7.0	
Value Added	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	5.76 (17)				
M U.S. High Yield Bonds (SA+CF) Median	-0.18	8.11	-0.18	8.53	1.05	N/A	N/A	4.25				
	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.88				
<b>Brigade Distressed Value</b>												
1-Month Libor + 5%	4.50 (1)	11.85 (1)	4.50 (1)	13.71 (1)	14.97 (1)	8.37 (1)	N/A	8.61 (5)	10/01/2011	178,284	3.5	
Value Added	1.77 (83)	5.22 (5)	1.77 (83)	6.87 (5)	6.09 (74)	5.72 (14)	N/A	5.58 (88)				
IM U.S. High Yield Bonds (SA+CF) Median	2.73	6.63	2.73	6.84	8.88	2.65	N/A	3.03				
	2.12	2.03	2.12	2.59	6.72	4.82	N/A	6.86				
<b>Brigade Structured Credit Offshore Fund</b>												
Barclays Corporate High Yield + 0.25%	6.30 (1)	9.15 (1)	6.30 (1)	10.82 (1)	14.62 (1)	N/A	N/A	9.29 (1)	11/01/2014	283,186	5.6	
Value Added	2.47 (18)	2.76 (26)	2.47 (18)	3.31 (28)	8.42 (11)	N/A	N/A	5.19 (14)				
M U.S. High Yield Bonds (SA+CF) Median	3.83	6.39	3.83	7.51	6.20	N/A	N/A	4.10				
	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.12				
<b>Avenue Energy Opportunities Fund</b>												
Bimbg. Barc. U.S. Corp. High Yield	3.99 (1)	6.80 (3)	3.99 (1)	10.51 (1)	10.12 (3)	N/A	N/A	4.66 (60)	02/01/2015	269,329	5.4	
Value Added	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	5.71 (16)				
M U.S. High Yield Bonds (SA+CF) Median	1.59	4.23	1.59	7.46	1.97	N/A	N/A	-1.05				
	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.86				
<b>Avenue Energy Opportunities Fund II</b>												
Bimbg. Barc. U.S. Corp. High Yield	7.30 (1)	10.60 (1)	7.30 (1)	12.32 (1)	N/A	N/A	N/A	11.66 (1)	09/01/2017	69,091	1.4	
Value Added	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	3.66 (30)				
M U.S. High Yield Bonds (SA+CF) Median	4.90	8.03	4.90	9.27	N/A	N/A	N/A	8.00				
	2.12	2.03	2.12	2.59	N/A	N/A	N/A	3.16				
<b>Avenue Europe SS III</b>												
Bimbg. Barc. U.S. Corp. High Yield	2.73 (4)	6.52 (4)	2.73 (4)	9.92 (1)	N/A	N/A	N/A	8.39 (42)	01/01/2016	224,473	4.5	
Value Added	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	9.75 (14)				
M U.S. High Yield Bonds (SA+CF) Median	0.33	3.95	0.33	6.87	N/A	N/A	N/A	-1.36				
	2.12	2.03	2.12	2.59	N/A	N/A	N/A	8.05				
<b>Latitude Management Real Estate Capital IV</b>												
Bimbg. Barc. U.S. Corp. High Yield	2.15 (49)	4.63 (7)	2.15 (49)	3.85 (19)	N/A	N/A	N/A	2.29 (95)	05/01/2017	29,786	0.6	
Value Added	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	4.30 (28)				
M U.S. High Yield Bonds (SA+CF) Median	-0.25	2.06	-0.25	0.80	N/A	N/A	N/A	-2.01				
	2.12	2.03	2.12	2.59	N/A	N/A	N/A	3.76				

## Asset Allocation &amp; Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$'000)	Market Value (\$'000)	%
Mariner/Galton RMBS	1.08 (N/A)	1.16 (N/A)	1.08 (N/A)	1.59 (N/A)	4.25 (N/A)	5.74 (N/A)	N/A	7.66 (20)	05/01/2010	189,968	3.8	
Blended Benchmark (Barclays US MBS)	-0.12 (N/A)	-1.07 (N/A)	-0.12 (N/A)	-0.92 (N/A)	0.98 (N/A)	2.53 (N/A)	N/A	4.52 (42)				
Value Added	1.20	2.23	1.20	2.51	3.27	3.21	N/A	3.14				
M U.S. Mortgage Backed Bonds (SA+CF) Median	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.62				
Galton Onshore Mortgage Recovery Fund III, LP	-0.32 (100)	2.62 (29)	-0.32 (100)	3.75 (21)	6.55 (66)	N/A	N/A	2.75 (91)	11/01/2013	53,389	1.1	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	5.10 (18)				
Value Added	-2.72	0.05	-2.72	0.70	-1.60	N/A	N/A	-2.35				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.42				
Galton Onshore Mortgage Recovery Fund IV, L.P.	-0.13 (99)	-7.04 (100)	-0.13 (99)	N/A	N/A	N/A	N/A	-10.90 (100)	11/01/2017	50,061	1.0	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	N/A	N/A	N/A	N/A	2.62 (35)				
Value Added	-2.53	-9.61	-2.53	N/A	N/A	N/A	N/A	-13.52				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	N/A	N/A	N/A	N/A	2.14				
Mariner International Infrastructure	4.50 (1)	7.46 (2)	4.50 (1)	6.84 (5)	8.72 (10)	N/A	N/A	4.44 (48)	12/01/2013	86,034	1.7	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	5.09 (18)				
Value Added	2.10	4.89	2.10	3.79	0.57	N/A	N/A	-0.65				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.41				
PIMCO BRAVO Fund III Onshore Feeder, L.P.	2.28 (36)	11.51 (1)	2.28 (36)	N/A	N/A	N/A	N/A	21.93 (1)	12/01/2017	92,052	1.8	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	N/A	N/A	N/A	N/A	2.88 (31)				
Value Added	-0.12	8.94	-0.12	N/A	N/A	N/A	N/A	19.05				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	N/A	N/A	N/A	N/A	2.35				
The Varde Scratch and Dent Fund, LP	1.98 (67)	4.59 (7)	1.98 (67)	7.04 (5)	7.07 (40)	N/A	N/A	8.05 (1)	12/01/2014	86,317	1.7	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	5.23 (18)				
Value Added	-0.42	2.02	-0.42	3.99	-1.08	N/A	N/A	2.82				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.34				
The Varde Scratch and Dent Fund Feed I-A	2.31 (33)	6.13 (4)	2.31 (33)	7.70 (3)	N/A	N/A	N/A	N/A	08/01/2016	62,400	1.2	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	6.80 (25)				
Value Added	-0.09	3.56	-0.09	4.65	N/A	N/A	N/A	N/A				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	5.94				
Cerberus Levered Loan Fund I	2.25 (40)	4.82 (7)	2.25 (40)	6.63 (5)	5.47 (84)	4.15 (79)	N/A	6.02 (62)	01/01/2012	5,095	0.1	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	6.94 (21)				
Value Added	-0.15	2.25	-0.15	3.58	-2.68	-1.39	N/A	-0.92				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	6.20				

Asset Allocation & Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)	%	
<b>Carabus Levered Loan Fund II</b>	1.37 (96)	3.01 (21)	1.37 (96)	2.40 (55)	2.91 (99)	6.55 (3)	N/A	7.19 (2)	01/01/2013	117,647	2.3	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.47 (16)				
Value Added	-1.03	0.44	-1.03	-0.65	-5.24	1.01	N/A	1.72				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	4.84				
<b>Carabus PSERS Levered Loan Opportunities Fund</b>	1.04 (99)	7.83 (2)	1.04 (99)	10.43 (1)	26.73 (1)	N/A	N/A	26.73 (1)	10/01/2015	228,963	4.6	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	8.15 (13)				
Value Added	-1.36	5.26	-1.36	7.38	18.58	N/A	N/A	18.58				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	6.72				
<b>LBC Credit Partners II</b>	0.62 (99)	16.88 (1)	0.62 (99)	20.07 (1)	18.82 (1)	19.60 (1)	N/A	13.19 (2)	01/01/2009	12,223	0.2	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	11.96 (10)				
Value Added	-1.78	14.31	-1.78	17.02	10.67	14.06	N/A	1.23				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	10.48				
<b>LBC Credit Partners III</b>	2.71 (4)	3.82 (11)	2.71 (4)	3.85 (19)	7.13 (37)	9.63 (1)	N/A	11.56 (1)	04/01/2013	91,005	1.8	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.18 (16)				
Value Added	0.31	1.25	0.31	0.80	-1.02	4.09	N/A	6.38				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	4.50				
<b>LBC-P Credit Fund LP</b>	3.07 (2)	7.91 (1)	3.07 (2)	11.62 (1)	N/A	N/A	N/A	17.34 (1)	10/01/2016	191,530	3.8	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	5.92 (26)				
Value Added	0.67	5.34	0.67	8.57	N/A	N/A	N/A	11.42				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	5.20				
<b>Summit Partners Credit Fund II LP</b>	1.86 (78)	4.83 (7)	1.86 (78)	8.17 (3)	10.47 (2)	N/A	N/A	6.81 (2)	11/01/2014	123,342	2.5	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	N/A	N/A	4.92 (19)				
Value Added	-0.54	2.26	-0.54	5.12	2.32	N/A	N/A	1.89				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	N/A	N/A	4.12				
<b>Oaktree Loan Fund 2X, LP</b>	0.33 (99)	2.03 (51)	0.33 (99)	1.27 (91)	-0.78 (100)	-3.17 (100)	3.60 (100)	2.74 (100)	01/01/2008	11,441	0.2	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	9.46 (10)	7.70 (13)				
Value Added	-2.07	-0.54	-2.07	-1.78	-8.93	-8.71	-5.86	-4.96				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	8.22	6.81				
<b>Bain Capital Credit Managed Account (PSERS), L.P.</b>	1.75 (54)	4.82 (4)	1.75 (54)	7.39 (3)	7.98 (1)	5.62 (1)	N/A	7.73 (3)	07/01/2009	394,672	7.9	
Bimbg. Barc. U.S. Corp. High Yield	2.40 (3)	2.57 (99)	2.40 (3)	3.05 (100)	8.15 (1)	5.54 (1)	N/A	9.45 (1)				
Value Added	-0.65	2.25	-0.65	4.34	-0.17	0.08	N/A	-1.72				
M U.S. Bank Loans (SA+CF) Median	1.76	3.75	1.76	4.89	4.93	3.96	N/A	6.15				

Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.



Asset Allocation & Peer Rankings

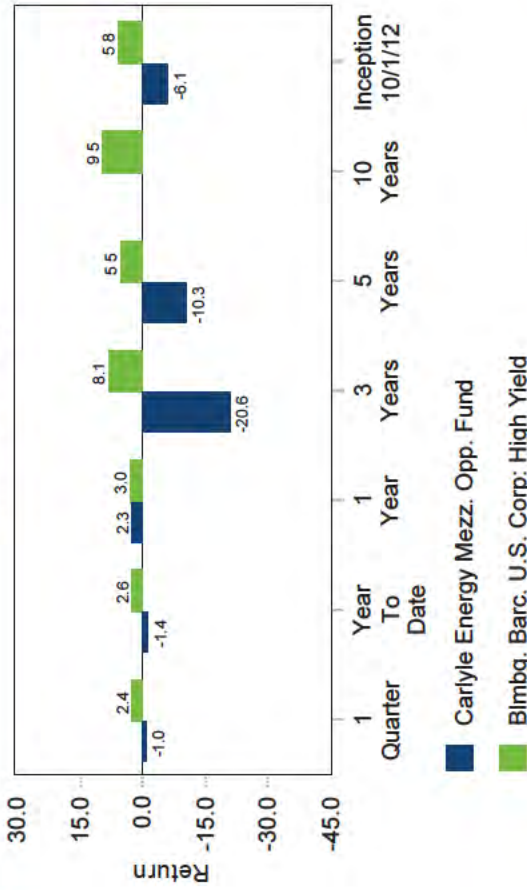
	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)	%	
Park Square Credit Opportunities	0.00 (99)	0.99 (91)	0.00 (99)	1.29 (91)	N/A	N/A	N/A	9.35 (5)	11/01/2015	174,442	3.5	
Bimbg. Barc. U.S. Corp: High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	7.39 (16)				
Value Added	-2.40	-1.58	-2.40	-1.76	N/A	N/A	N/A	1.96				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	6.00				
Hayfin Special Opportunities Credit LP	5.77 (1)	6.74 (4)	5.77 (1)	10.62 (1)	11.49 (1)	5.88 (11)	N/A	6.92 (2)	03/01/2013	99,546	2.0	
Bimbg. Barc. U.S. Corp: High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	8.15 (13)	5.54 (17)	N/A	5.29 (16)				
Value Added	3.37	4.17	3.37	7.57	3.34	0.34	N/A	1.63				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	6.72	4.82	N/A	4.63				
Hayfin SOF II USD Co-Invest	1.20 (98)	3.97 (11)	1.20 (98)	6.18 (6)	N/A	N/A	N/A	N/A	08/01/2016	14,516	0.3	
Bimbg. Barc. U.S. Corp: High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	6.80 (25)				
Value Added	-1.20	1.40	-1.20	3.13	N/A	N/A	N/A	N/A				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	5.94				
Hayfin SOF II USD LP	1.73 (84)	4.86 (7)	1.73 (84)	5.75 (7)	N/A	N/A	N/A	N/A	09/01/2016	68,357	1.4	
Bimbg. Barc. U.S. Corp: High Yield	2.40 (24)	2.57 (29)	2.40 (24)	3.05 (33)	N/A	N/A	N/A	6.02 (25)				
Value Added	-0.67	2.29	-0.67	2.70	N/A	N/A	N/A	N/A				
M U.S. High Yield Bonds (SA+CF) Median	2.12	2.03	2.12	2.59	N/A	N/A	N/A	5.23				

Performance Summary

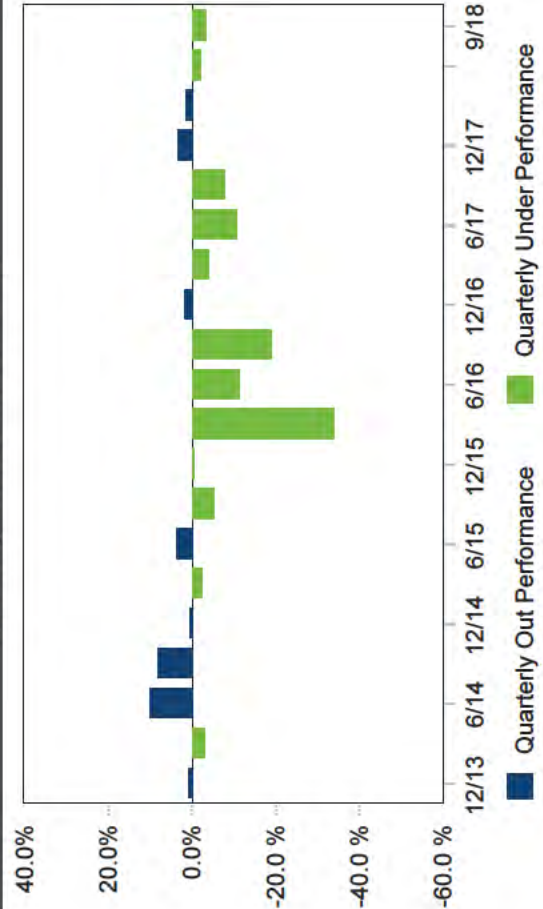
Account Information

Account Name: Carlyle Energy Mezz. Opp. Fund  
 Inception Date: 09/30/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

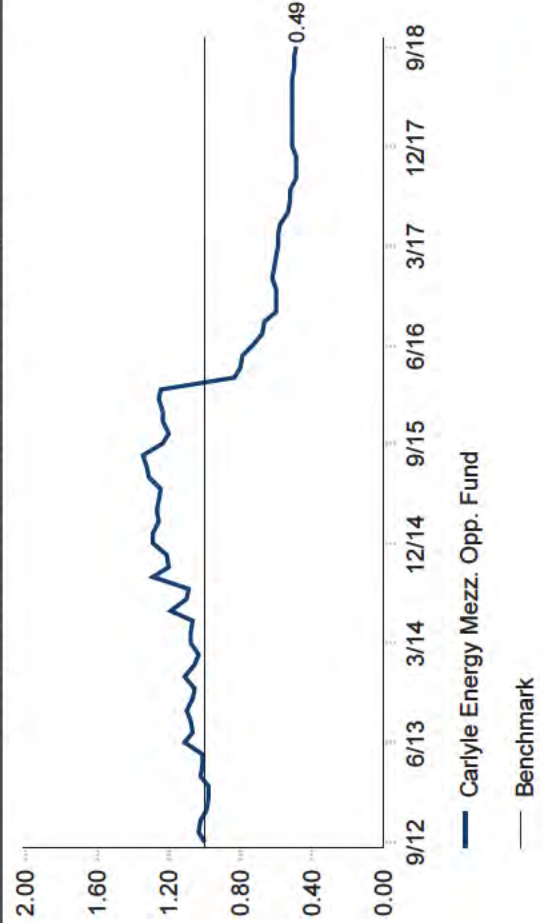
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Carlyle Energy Mezz. Opp. Fund

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.34	-20.62	-10.28	N/A	-6.08	10/01/2012
Standard Deviation	4.11	19.43	19.87	N/A	18.78	
Downside Risk	1.35	20.10	16.96	N/A	15.49	
Downside Semi Deviation	1.29	11.44	34.82	N/A	32.64	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-1.80	-51.12	-56.13	N/A	-56.13	
Maximum Loss Exposure	N/A	-32.32	-30.02	N/A	-22.29	
Upside Semi Deviation	1.26	3.73	12.33	N/A	12.25	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.80	
Standard Deviation	2.00	4.93	4.95	10.05	4.85	
Downside Risk	1.12	2.29	2.73	6.68	2.74	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.22	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	-0.64	-28.62	-14.17	N/A	-10.11	
Tracking Error	4.71	21.89	21.83	N/A	20.74	
Actual Correlation	-0.08	-0.40	-0.29	N/A	-0.30	
Beta	-0.17	-1.59	-1.17	N/A	-1.14	
Consistency	41.67	30.56	35.00	N/A	37.50	
Down Market Capture	-25.80	35.40	-16.59	N/A	-41.76	
Down Market Outperformance	2.18	5.40	13.45	N/A	17.33	
Information Ratio	-0.14	-1.31	-0.65	N/A	-0.49	
Jensen Alpha	1.06	-9.58	-3.22	N/A	1.33	
Up Market Capture	40.76	-179.64	-95.42	N/A	-61.09	
Up Market Outperformance	-2.98	-42.42	-30.21	N/A	-25.63	
vs. FTSE 3 Month T-Bill						
Excess Return	0.83	-21.45	-9.13	N/A	-4.76	
Excess Risk	4.15	19.39	19.87	N/A	18.79	
Sharpe Ratio	0.20	-1.11	-0.46	N/A	-0.25	

Calculation based on monthly periodicity.

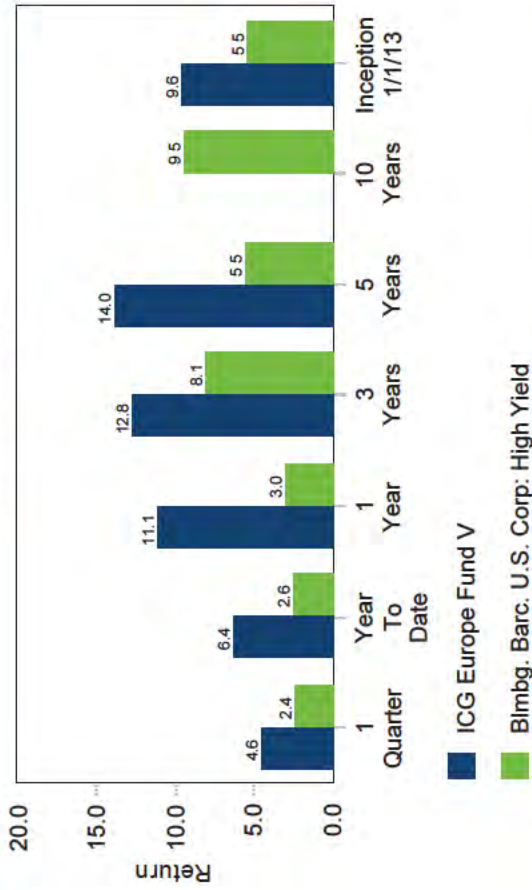
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Performance Summary

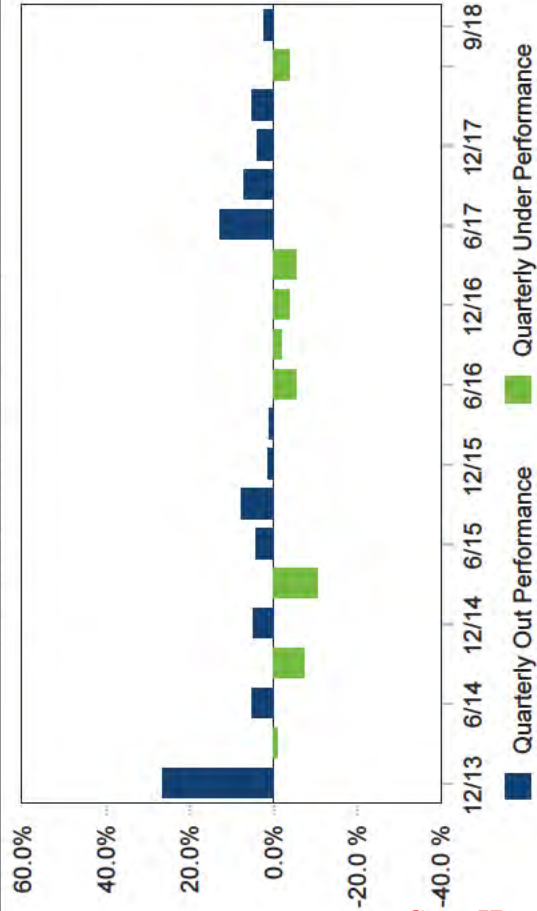
Account Information

Account Name: ICG Europe Fund V  
 Inception Date: 12/31/2012  
 Account Structure: Commingled Fund  
 Asset Class: International Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

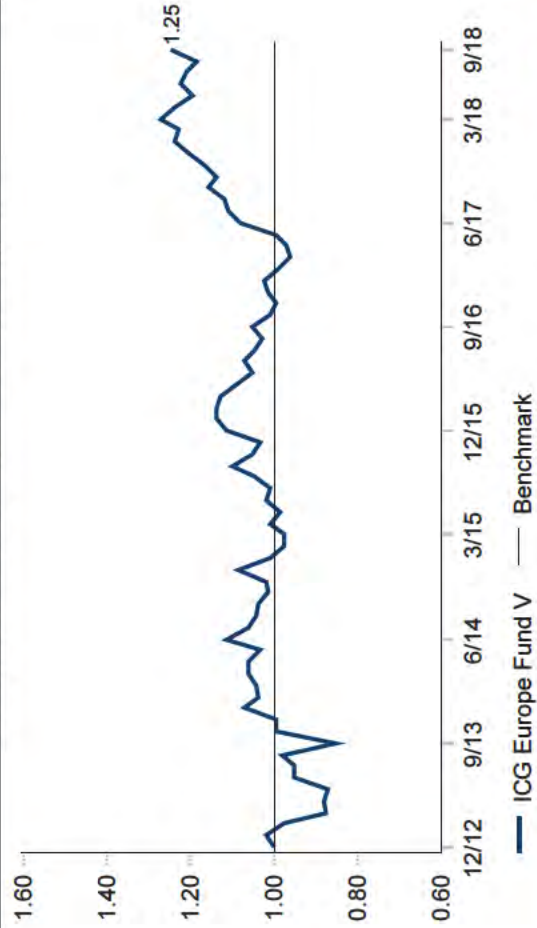
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



Risk Statistics

ICG Europe Fund V

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	11.14	12.83	13.96	N/A	9.63	01/01/2013
Standard Deviation	9.98	10.68	14.40	N/A	15.56	
Downside Risk	4.91	5.31	6.19	N/A	8.87	
Downside Semi Deviation	2.35	9.07	9.92	N/A	14.08	
Max Drawdown Recovery Period	6.00	4.00	27.00	N/A	9.00	
Maximum Drawdown	-5.31	-5.75	-12.70	N/A	-14.52	
Maximum Loss Exposure	-1.45	-5.48	N/A	N/A	-11.73	
Upside Semi Deviation	3.64	12.59	17.70	N/A	17.13	

Blmbg. Barc. U.S. Corp: High Yield

Return	3.05	8.15	5.54	9.46	5.47	
Standard Deviation	2.00	4.93	4.95	10.05	4.93	
Downside Risk	1.12	2.29	2.73	6.68	2.80	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.30	

vs. Blmbg. Barc. U.S. Corp: High Yield

Active Return	8.03	4.70	8.59	N/A	4.94	
Tracking Error	10.06	11.27	14.28	N/A	15.80	
Actual Correlation	0.06	0.11	0.20	N/A	0.11	
Beta	0.31	0.23	0.57	N/A	0.34	
Consistency	50.00	50.00	51.67	N/A	52.17	
Down Market Capture	-9.02	34.62	15.16	N/A	-12.83	
Down Market Outperformance	1.74	5.09	10.18	N/A	14.13	
Information Ratio	0.80	0.42	0.60	N/A	0.31	
Jensen Alpha	9.44	10.72	11.32	N/A	8.59	
Up Market Capture	228.92	125.47	150.59	N/A	99.96	
Up Market Outperformance	6.26	3.98	7.28	N/A	-1.56	

vs. FTSE 3 Month T-Bill

Excess Return	9.50	11.88	13.62	N/A	9.96	
Excess Risk	9.99	10.66	14.39	N/A	15.55	
Sharpe Ratio	0.95	1.11	0.95	N/A	0.64	

Calculation based on monthly periodicity.

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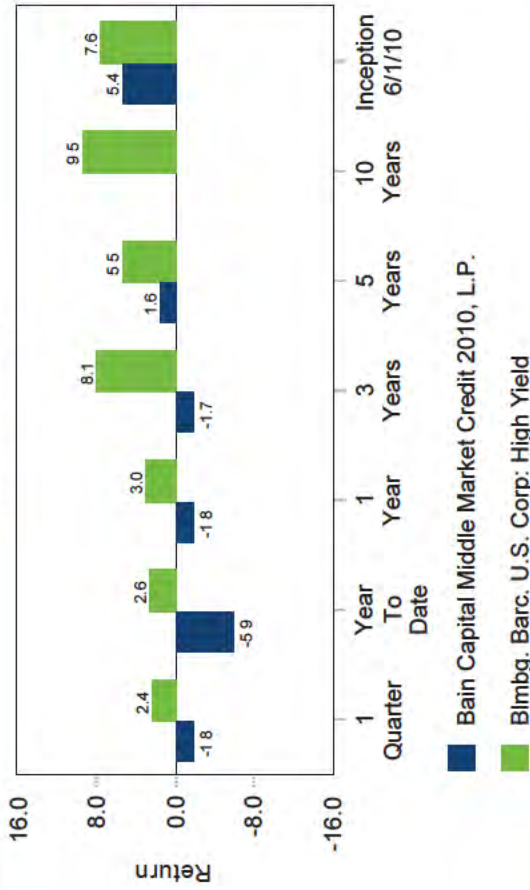


Performance Summary

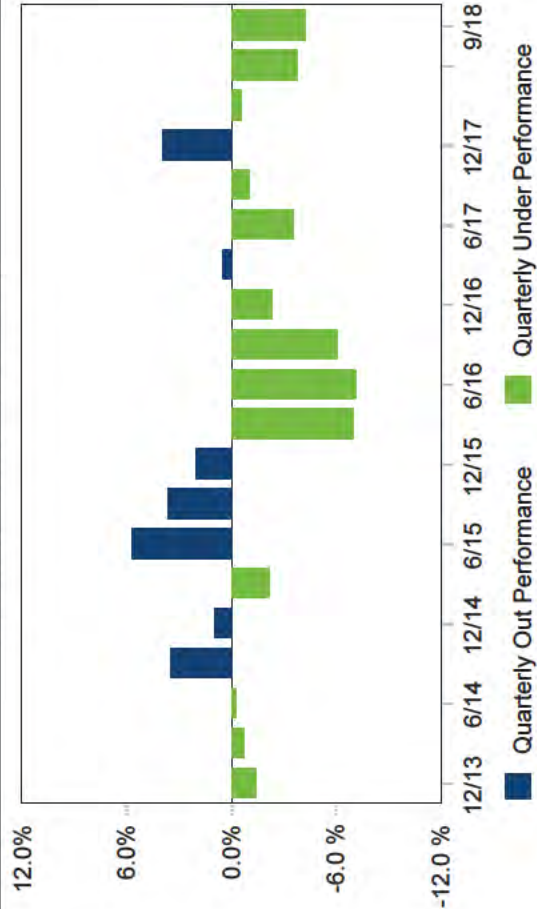
Account Information

Account Name: Bain Capital Middle Market Credit 2010, L.P.  
 Inception Date: 05/31/2010  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

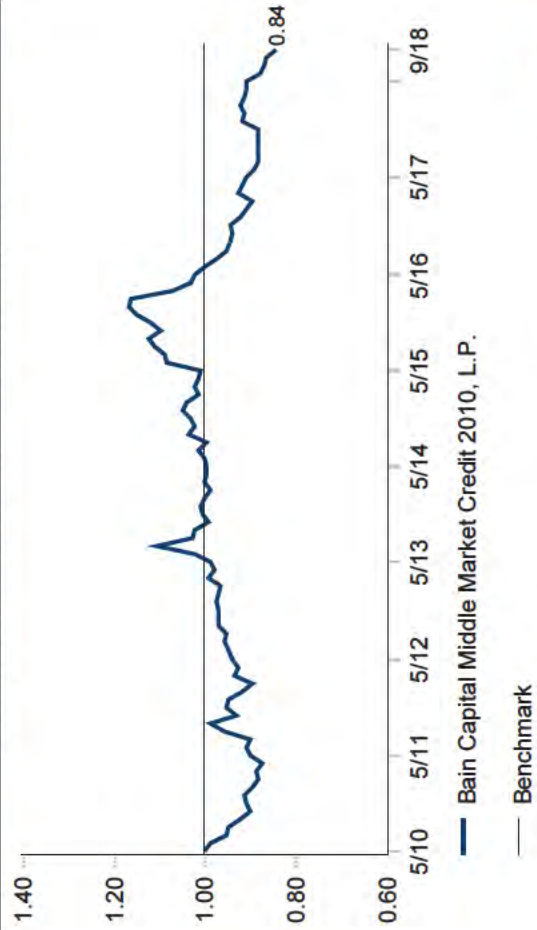
Return Summary



Quarterly Excess Performance

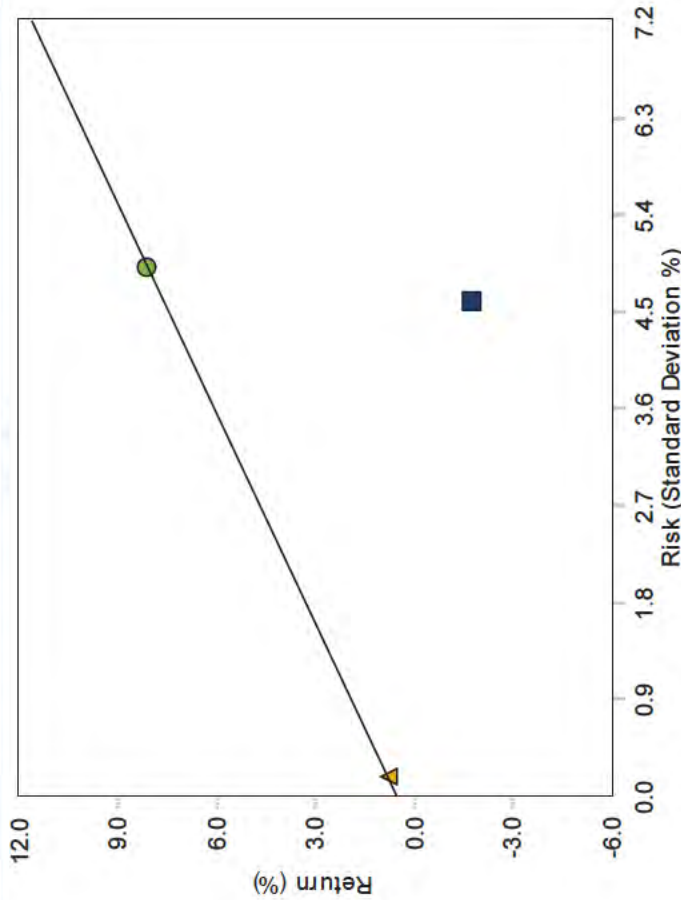


Ratio of Cumulative Wealth - Since Inception



Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



- Bain Capital Middle Market Credit 2010, L.P.
- Blmbg. Barc. U.S. Corp: High Yield
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



- Bain Capital Middle Market Credit 2010, L.P.
- Blmbg. Barc. U.S. Corp: High Yield

3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bain Capital Middle Market Credit 2010, L.P.	-9.63	7.49	-1.29	0.05	-0.53	0.09	-0.22	-1.74	4.60	-0.23
Blmbg. Barc. U.S. Corp: High Yield	0.00	0.00	N/A	1.00	1.45	0.00	1.00	8.15	4.93	1.00
FTSE 3 Month T-Bill	-7.17	4.96	-1.45	0.02	N/A	0.84	0.00	0.80	0.18	-0.13

## Risk Statistics

## Bain Capital Middle Market Credit 2010, L.P.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-1.75	-1.74	1.58	N/A	5.50	07/01/2010
Standard Deviation	5.95	4.60	4.68	N/A	6.51	
Downside Risk	3.77	3.27	2.58	N/A	3.40	
Downside Semi Deviation	2.55	1.86	5.72	N/A	8.99	
Max Drawdown Recovery Period	N/A	25.00	N/A	N/A	14.00	
Maximum Drawdown	-5.92	-6.07	-7.15	N/A	-7.85	
Maximum Loss Exposure	-1.75	-4.88	-0.43	N/A	-0.24	
Upside Semi Deviation	1.56	3.88	4.45	N/A	6.28	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	7.52	
Standard Deviation	2.00	4.93	4.95	10.05	5.71	
Downside Risk	1.12	2.29	2.73	6.68	3.12	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.85	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	6.24	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	-4.63	-9.63	-3.85	N/A	-1.86	
Tracking Error	6.18	7.49	7.59	N/A	8.66	
Actual Correlation	0.05	-0.23	-0.24	N/A	0.00	
Beta	0.14	-0.22	-0.23	N/A	0.00	
Consistency	33.33	30.56	41.67	N/A	45.45	
Down Market Capture	84.50	-20.53	-39.42	N/A	-21.45	
Down Market Outperformance	0.26	10.28	18.05	N/A	17.93	
Information Ratio	-0.75	-1.29	-0.51	N/A	-0.21	
Jensen Alpha	-3.41	-0.96	2.32	N/A	5.33	
Up Market Capture	-2.91	-20.67	-0.10	N/A	37.99	
Up Market Outperformance	-5.15	-19.31	-15.36	N/A	-11.89	
vs. FTSE 3 Month T-Bill						
Excess Return	-3.17	-2.45	1.19	N/A	5.25	
Excess Risk	6.00	4.62	4.71	N/A	6.54	
Sharpe Ratio	-0.53	-0.53	0.25	N/A	0.80	

Calculation based on monthly periodicity.

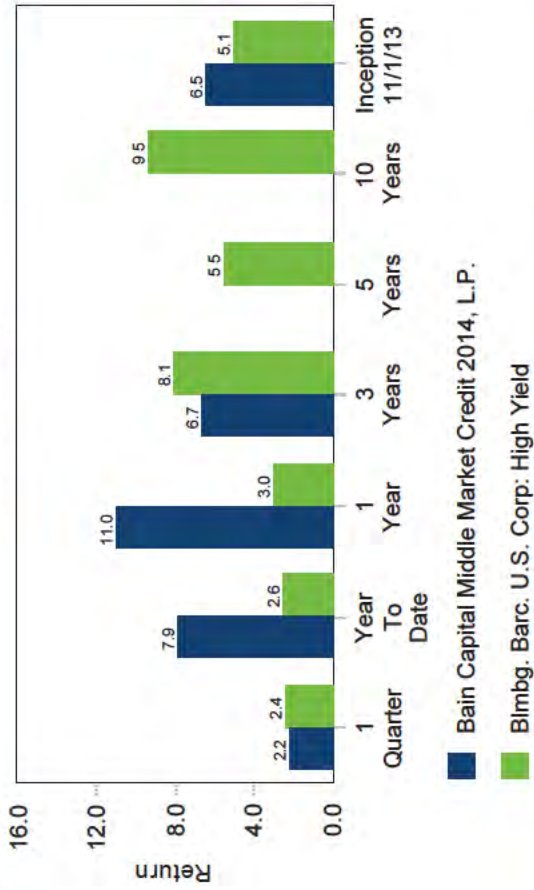
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Performance Summary

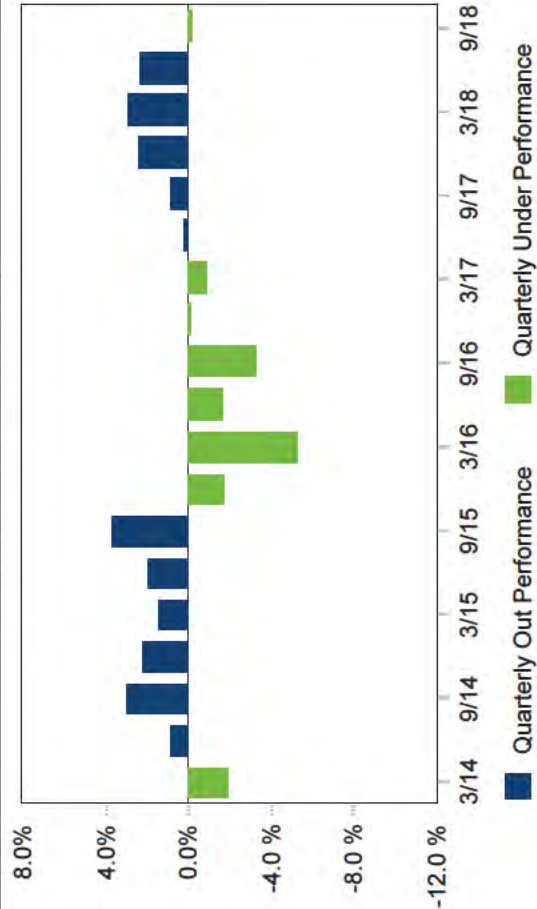
Account Information

Account Name: Bain Capital Middle Market Credit 2014, L.P.  
 Inception Date: 11/01/2013  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

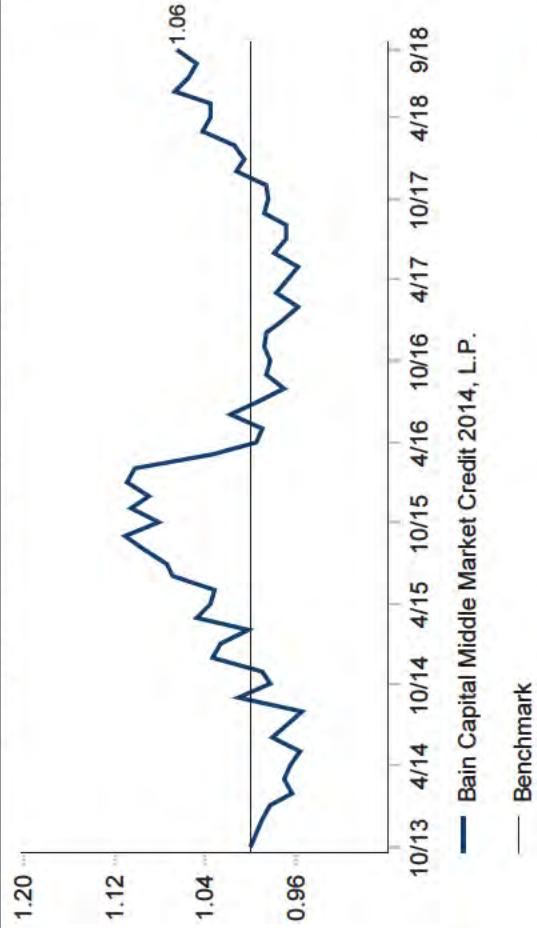
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Bain Capital Middle Market Credit 2014, L.P.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	10.99	6.66	N/A	N/A	6.46	11/01/2013
Standard Deviation	4.64	5.14	N/A	N/A	5.26	
Downside Risk	0.00	2.50	N/A	N/A	2.40	
Downside Semi Deviation	N/A	3.02	N/A	N/A	2.36	
Max Drawdown Recovery Period	N/A	10.00	N/A	N/A	16.00	
Maximum Drawdown	0.00	-5.68	N/A	N/A	-6.77	
Maximum Loss Exposure	N/A	-5.68	N/A	N/A	N/A	
Upside Semi Deviation	5.63	5.11	N/A	N/A	5.32	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.10	
Standard Deviation	2.00	4.93	4.95	10.05	4.91	
Downside Risk	1.12	2.29	2.73	6.68	2.76	
Downside Semi Deviation	0.62	1.30	4.95	12.88	4.95	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-2.69	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.27	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	7.55	-1.39	N/A	N/A	1.30	
Tracking Error	5.14	7.09	N/A	N/A	7.45	
Actual Correlation	-0.05	0.01	N/A	N/A	-0.07	
Beta	-0.11	0.01	N/A	N/A	-0.08	
Consistency	58.33	44.44	N/A	N/A	44.07	
Down Market Capture	-117.43	-1.46	N/A	N/A	-41.87	
Down Market Outperformance	3.77	8.53	N/A	N/A	18.33	
Information Ratio	1.47	-0.20	N/A	N/A	0.17	
Jensen Alpha	9.64	5.91	N/A	N/A	6.49	
Up Market Capture	179.14	59.96	N/A	N/A	48.52	
Up Market Outperformance	3.91	-6.81	N/A	N/A	-7.94	
vs. FTSE 3 Month T-Bill						
Excess Return	9.01	5.79	N/A	N/A	5.91	
Excess Risk	4.63	5.09	N/A	N/A	5.23	
Sharpe Ratio	1.95	1.14	N/A	N/A	1.13	

Calculation based on monthly periodicity.

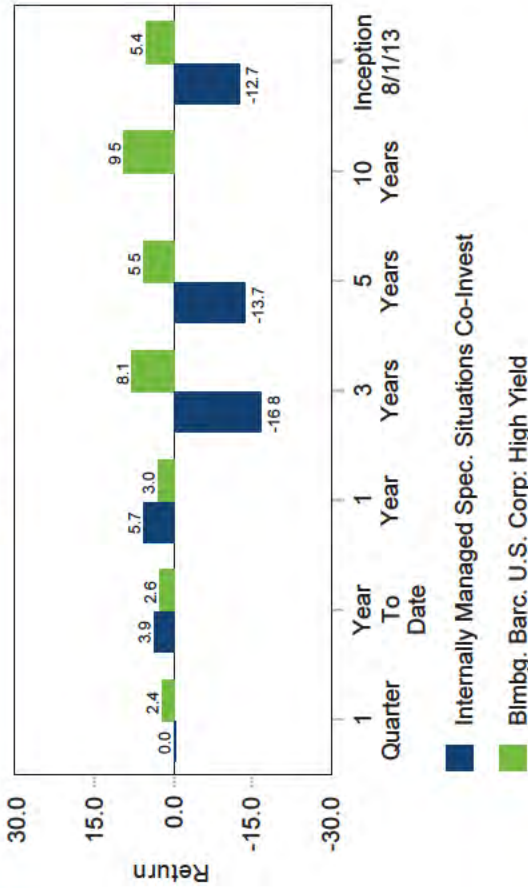
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Performance Summary

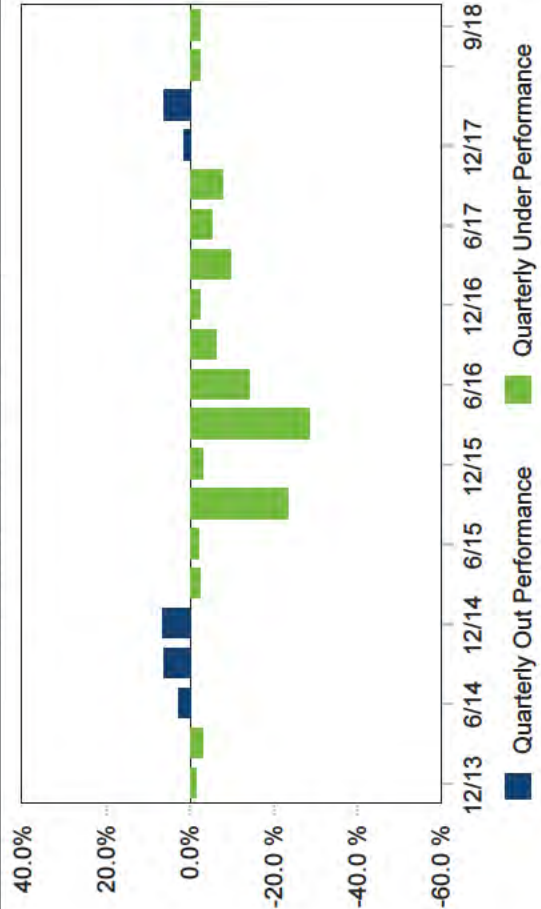
Account Information

Account Name: Internally Managed Private Debt Co-Investment  
 Inception Date: 08/01/2013  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

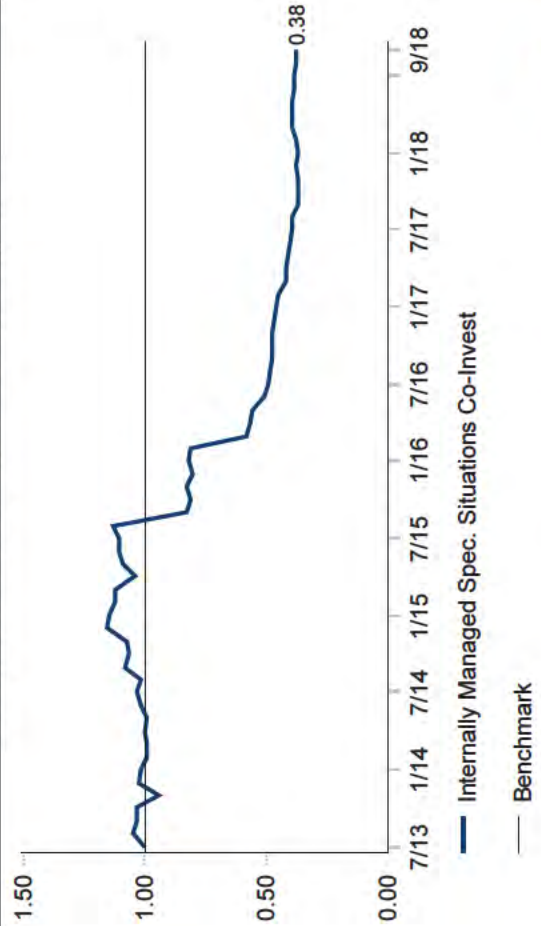
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Internally Managed Spec. Situations Co-Invest

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.73	-16.83	-13.71	N/A	-12.65	08/01/2013
Standard Deviation	5.79	16.30	19.52	N/A	19.33	
Downside Risk	1.45	16.70	18.76	N/A	18.45	
Downside Semi Deviation	1.39	9.02	36.02	N/A	36.02	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-1.39	-45.60	-61.74	N/A	-61.74	
Maximum Loss Exposure	N/A	-28.25	-31.66	N/A	-30.39	
Upside Semi Deviation	1.87	3.97	7.73	N/A	7.82	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.43	
Standard Deviation	2.00	4.93	4.95	10.05	4.90	
Downside Risk	1.12	2.29	2.73	6.68	2.70	
Downside Semi Deviation	0.62	1.30	4.95	12.88	4.84	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-0.61	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.35	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	2.71	-24.77	-18.00	N/A	-16.74	
Tracking Error	6.91	18.61	20.41	N/A	20.24	
Actual Correlation	-0.44	-0.35	-0.06	N/A	-0.06	
Beta	-1.28	-1.16	-0.22	N/A	-0.25	
Consistency	41.67	25.00	35.00	N/A	35.48	
Down Market Capture	-306.20	73.47	115.65	N/A	94.77	
Down Market Outperformance	7.05	1.76	-4.77	N/A	-2.32	
Information Ratio	0.39	-1.33	-0.88	N/A	-0.83	
Jensen Alpha	6.31	-8.82	-11.19	N/A	-10.00	
Up Market Capture	8.82	-134.09	-76.83	N/A	-75.31	
Up Market Outperformance	-4.47	-36.11	-27.15	N/A	-26.82	
vs. FTSE 3 Month T-Bill						
Excess Return	4.18	-17.60	-12.97	N/A	-11.80	
Excess Risk	5.81	16.25	19.51	N/A	19.32	
Sharpe Ratio	0.72	-1.08	-0.66	N/A	-0.61	

Calculation based on monthly periodicity.

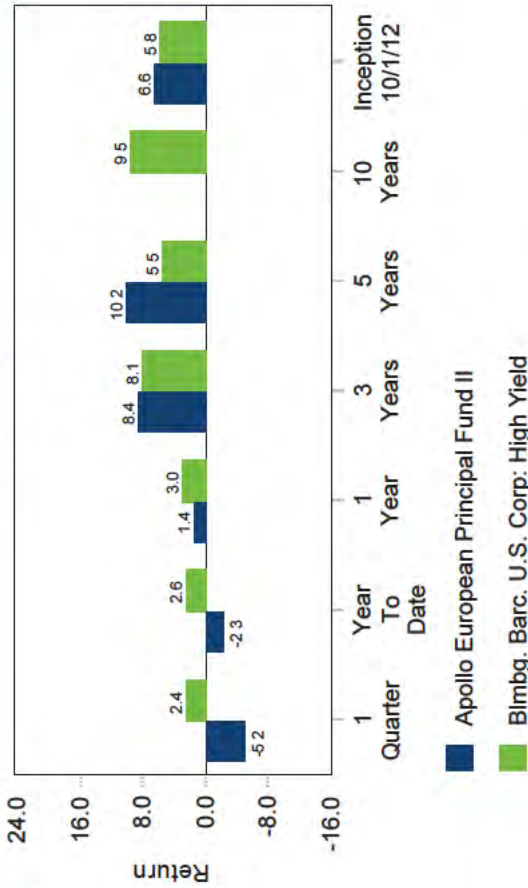
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Performance Summary

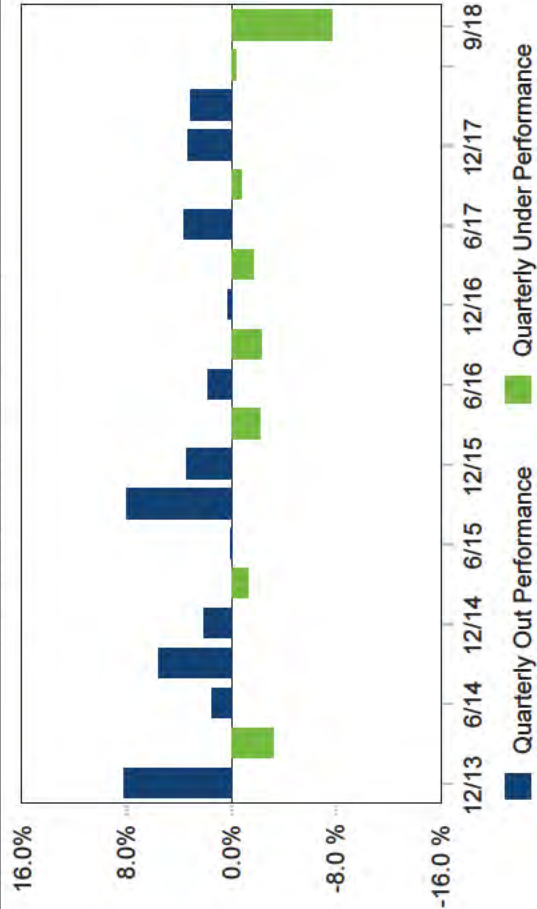
Account Information

Account Name: Apollo European Principal Fund II  
 Inception Date: 09/30/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

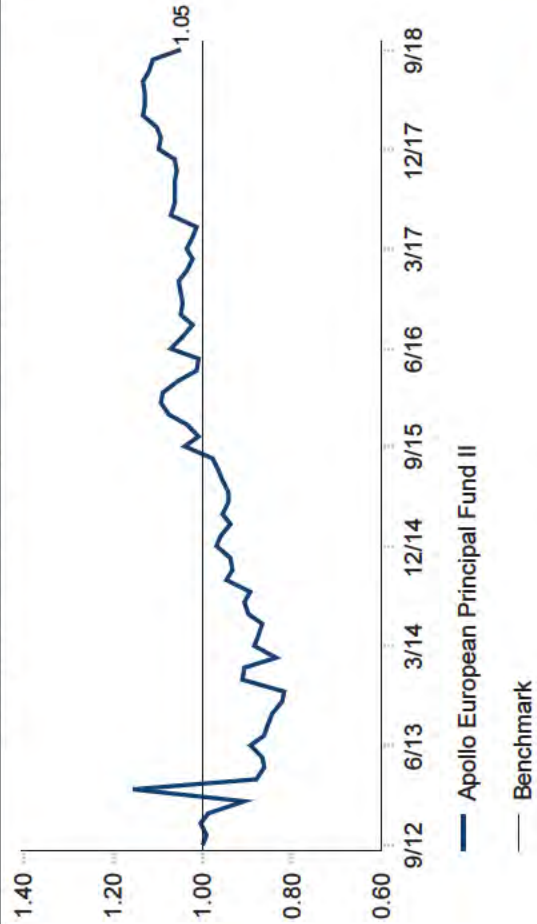
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





## Risk Statistics

## Apollo European Principal Fund II

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.42	8.44	10.19	N/A	6.62	10/01/2012
Standard Deviation	7.20	6.94	8.64	N/A	17.20	
Downside Risk	5.46	3.06	3.55	N/A	10.48	
Downside Semi Deviation	N/A	N/A	4.54	N/A	9.63	
Max Drawdown Recovery Period	N/A	N/A	5.00	N/A	40.00	
Maximum Drawdown	-5.23	-5.23	-5.86	N/A	-25.55	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	-9.58	
Upside Semi Deviation	1.43	6.78	8.71	N/A	14.69	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.80	
Standard Deviation	2.00	4.93	4.95	10.05	4.85	
Downside Risk	1.12	2.29	2.73	6.68	2.74	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.22	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	-1.37	0.39	4.58	N/A	2.10	
Tracking Error	7.94	8.64	10.55	N/A	18.33	
Actual Correlation	-0.25	-0.03	-0.14	N/A	-0.10	
Beta	-0.90	-0.05	-0.25	N/A	-0.36	
Consistency	50.00	47.22	48.33	N/A	45.83	
Down Market Capture	-133.40	-53.87	-67.83	N/A	-51.45	
Down Market Outperformance	4.04	13.34	22.21	N/A	20.16	
Information Ratio	-0.17	0.04	0.43	N/A	0.11	
Jensen Alpha	1.38	8.04	11.37	N/A	9.71	
Up Market Capture	-13.88	62.08	73.46	N/A	57.23	
Up Market Outperformance	-5.73	-6.66	-4.73	N/A	-8.93	
vs. FTSE 3 Month T-Bill						
Excess Return	0.09	7.56	9.61	N/A	7.45	
Excess Risk	7.25	6.98	8.67	N/A	17.21	
Sharpe Ratio	0.01	1.08	1.11	N/A	0.43	

Calculation based on monthly periodicity.

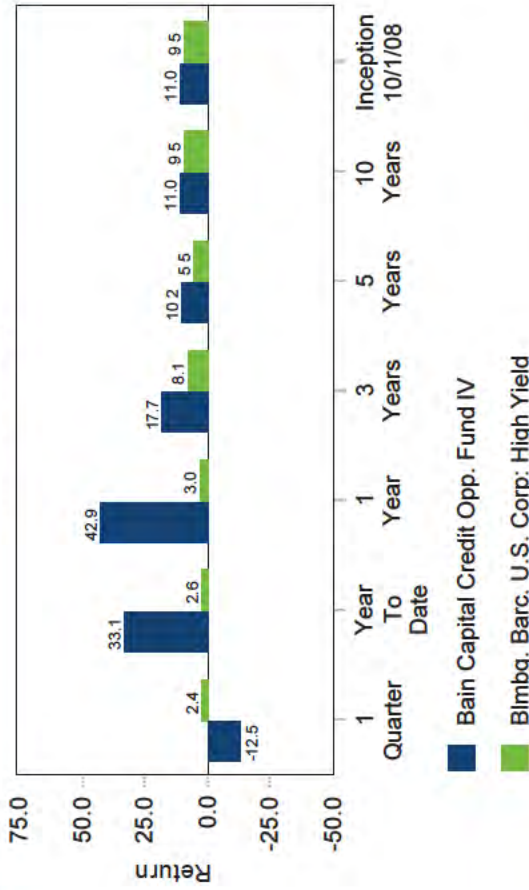
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Performance Summary

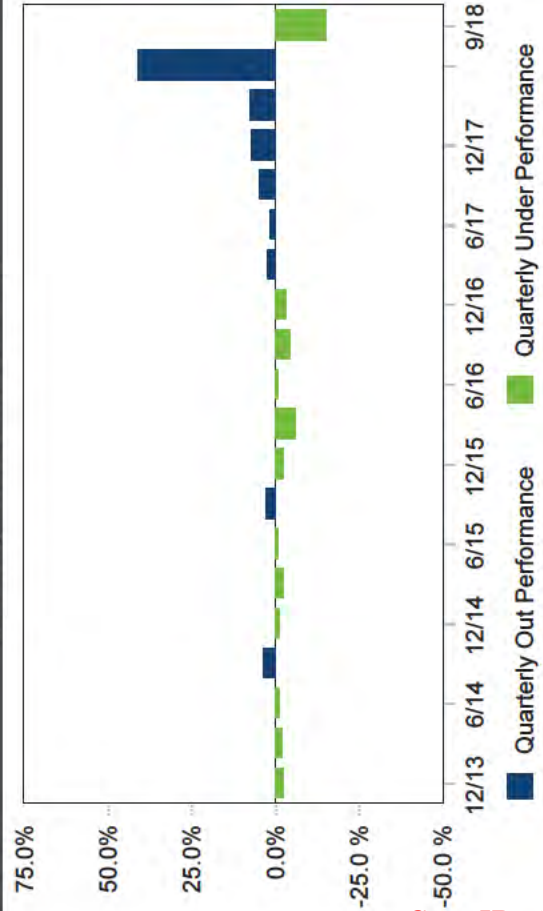
Account Information

Account Name: Bain Capital Credit Opp. Fund IV  
 Inception Date: 09/30/2008  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

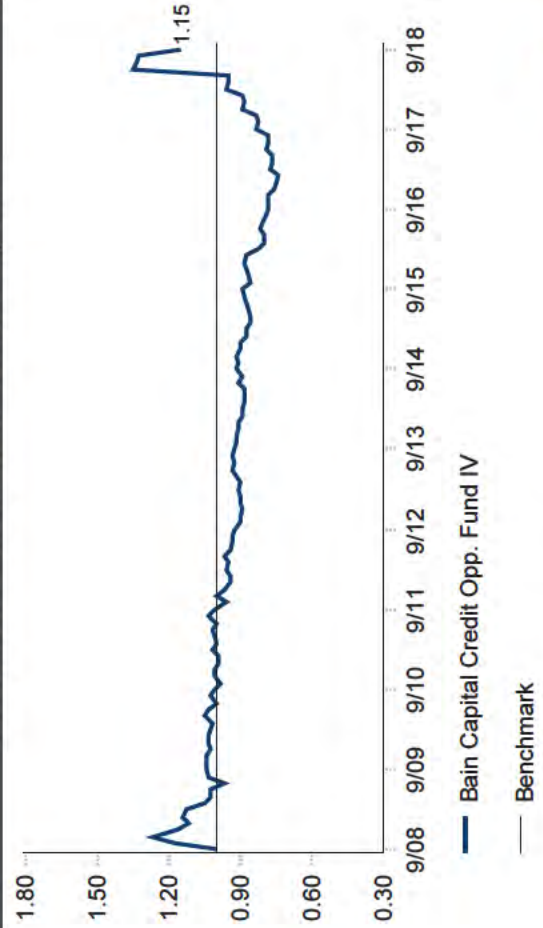
Return Summary



Quarterly Excess Performance

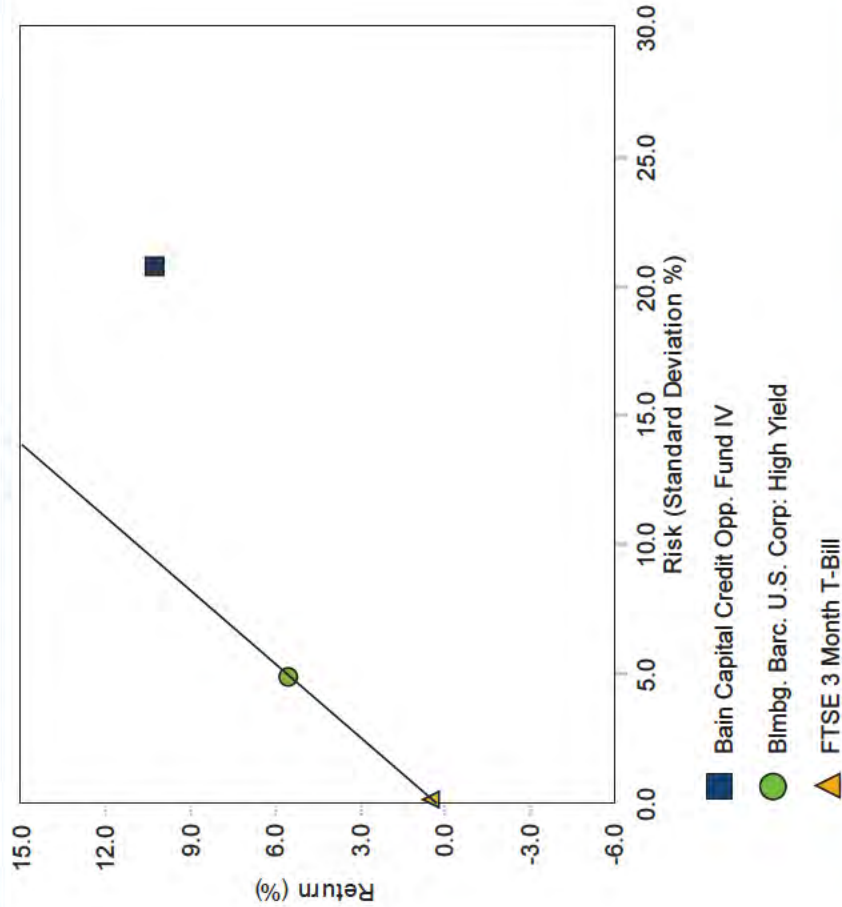


Ratio of Cumulative Wealth - Since Inception

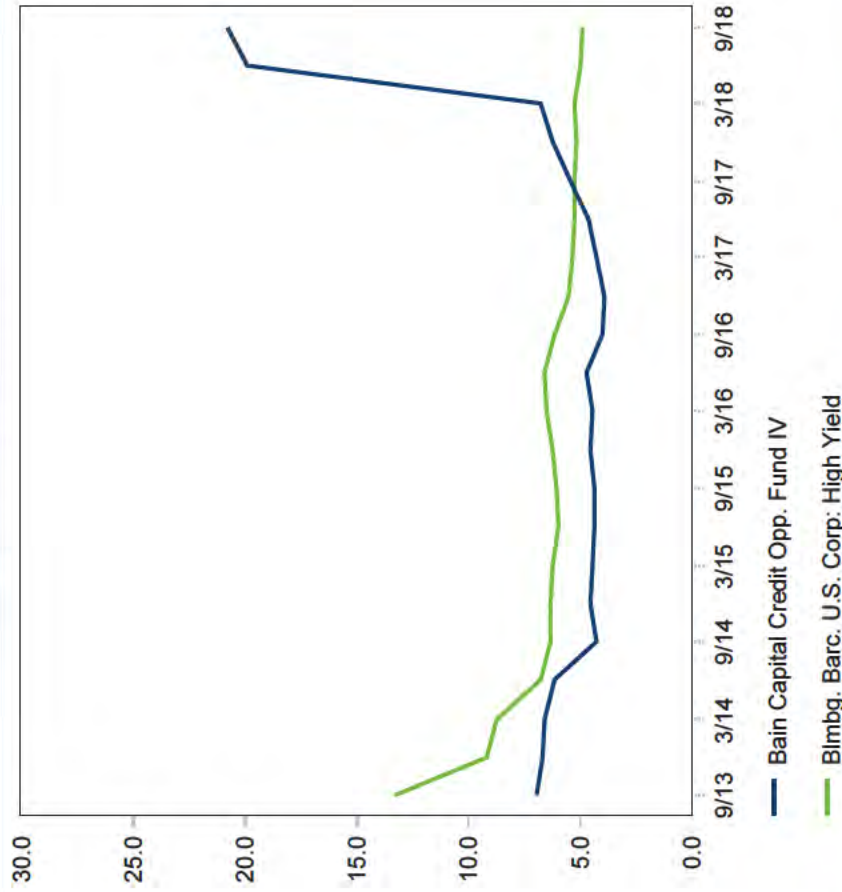


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bain Capital Credit Opp. Fund IV	6.03	21.33	0.28	0.00	0.53	11.95	0.04	10.24	20.79	0.01
Blmbg. Barc. U.S. Corp: High Yield	0.00	0.00	N/A	1.00	1.02	0.00	1.00	5.54	4.95	1.00
FTSE 3 Month T-Bill	-5.03	4.95	-1.02	0.00	N/A	0.48	0.00	0.49	0.18	0.03

## Risk Statistics

## Bain Capital Credit Opp. Fund IV

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	42.85	17.68	10.24	11.02	11.02	10/01/2008
Standard Deviation	45.31	26.62	20.79	15.44	15.44	
Downside Risk	13.02	7.61	6.09	4.78	4.78	
Downside Semi Deviation	N/A	4.92	11.03	9.51	9.51	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-12.47	-12.47	-12.47	-12.47	-12.47	
Maximum Loss Exposure	N/A	-6.85	-6.93	-4.92	-4.92	
Upside Semi Deviation	13.74	29.75	24.48	17.51	17.51	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	9.46	
Standard Deviation	2.00	4.93	4.95	10.05	10.05	
Downside Risk	1.12	2.29	2.73	6.68	6.68	
Downside Semi Deviation	0.62	1.30	4.95	12.88	12.88	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	7.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-23.74	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-23.74	
Upside Semi Deviation	0.68	5.86	5.38	9.42	9.42	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	40.98	11.28	6.03	1.91	1.91	
Tracking Error	45.42	27.35	21.33	17.25	17.25	
Actual Correlation	-0.04	-0.06	0.01	0.13	0.13	
Beta	-0.83	-0.31	0.04	0.21	0.21	
Consistency	50.00	41.67	41.67	45.00	45.00	
Down Market Capture	-396.55	-99.30	-20.70	2.94	2.94	
Down Market Outperformance	8.62	17.27	15.28	22.19	22.19	
Information Ratio	0.90	0.41	0.28	0.11	0.11	
Jensen Alpha	53.80	23.03	11.65	9.70	9.70	
Up Market Capture	779.52	149.63	108.85	70.51	70.51	
Up Market Outperformance	28.79	4.40	-1.26	-9.25	-9.25	
vs. FTSE 3 Month T-Bill						
Excess Return	42.45	18.45	11.07	11.18	11.18	
Excess Risk	45.30	26.58	20.74	15.41	15.41	
Sharpe Ratio	0.94	0.69	0.53	0.73	0.73	

Calculation based on monthly periodicity.

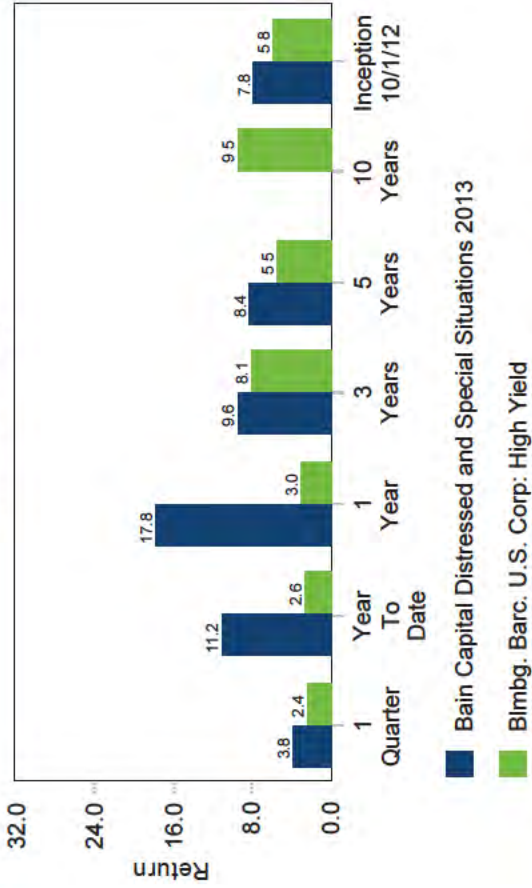
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Performance Summary

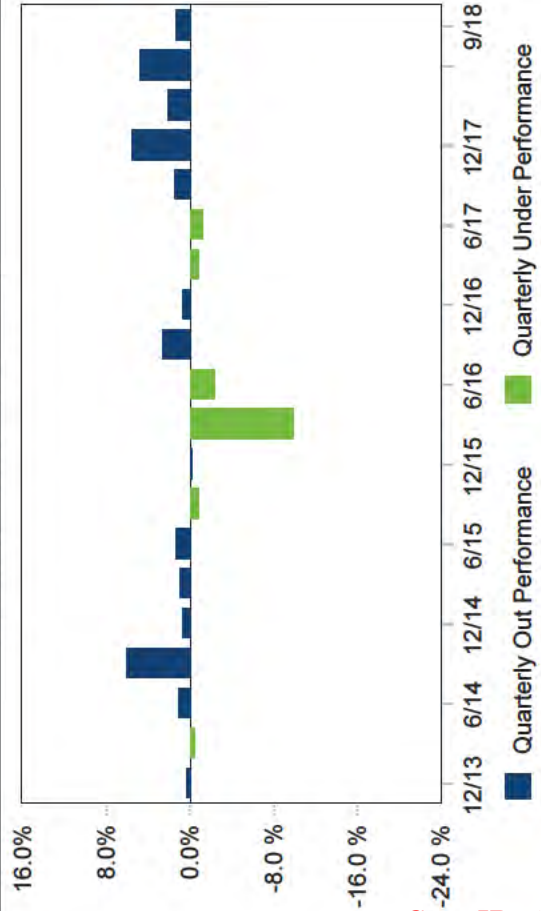
Account Information

Account Name: Bain Capital Distressed and Special Situations 2013  
 Inception Date: 09/30/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

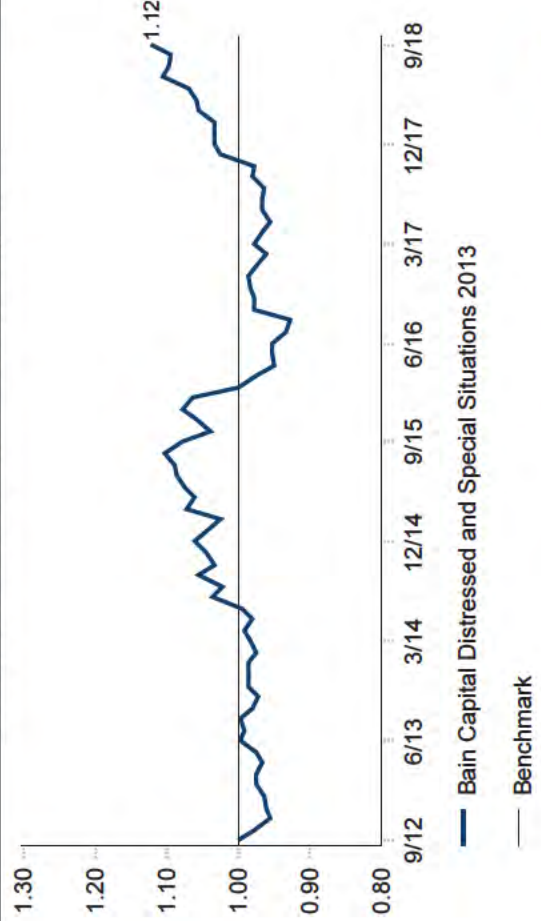
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Bain Capital Distressed and Special Situations 2013

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	17.83	9.58	8.40	N/A	7.85	10/01/2012
Standard Deviation	5.65	6.71	6.30	N/A	5.99	
Downside Risk	0.70	3.69	3.63	N/A	3.42	
Downside Semi Deviation	N/A	2.10	6.97	N/A	6.30	
Max Drawdown Recovery Period	2.00	11.00	22.00	N/A	22.00	
Maximum Drawdown	-0.67	-10.04	-15.33	N/A	-15.33	
Maximum Loss Exposure	N/A	-10.04	N/A	N/A	-2.84	
Upside Semi Deviation	2.28	7.39	6.74	N/A	6.51	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.80	
Standard Deviation	2.00	4.93	4.95	10.05	4.85	
Downside Risk	1.12	2.29	2.73	6.68	2.74	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.22	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	13.64	1.42	2.76	N/A	1.99	
Tracking Error	6.14	7.62	7.16	N/A	6.82	
Actual Correlation	-0.08	0.17	0.21	N/A	0.22	
Beta	-0.22	0.23	0.26	N/A	0.27	
Consistency	66.67	52.78	55.00	N/A	55.56	
Down Market Capture	-378.42	-44.10	-30.45	N/A	-24.91	
Down Market Outperformance	8.39	12.29	16.65	N/A	16.19	
Information Ratio	2.22	0.19	0.39	N/A	0.29	
Jensen Alpha	16.62	7.24	6.72	N/A	6.08	
Up Market Capture	211.87	74.22	71.26	N/A	67.30	
Up Market Outperformance	5.61	-4.55	-4.72	N/A	-5.35	
vs. FTSE 3 Month T-Bill						
Excess Return	15.10	8.60	7.80	N/A	7.34	
Excess Risk	5.65	6.66	6.26	N/A	5.96	
Sharpe Ratio	2.67	1.29	1.24	N/A	1.23	

Calculation based on monthly periodicity.

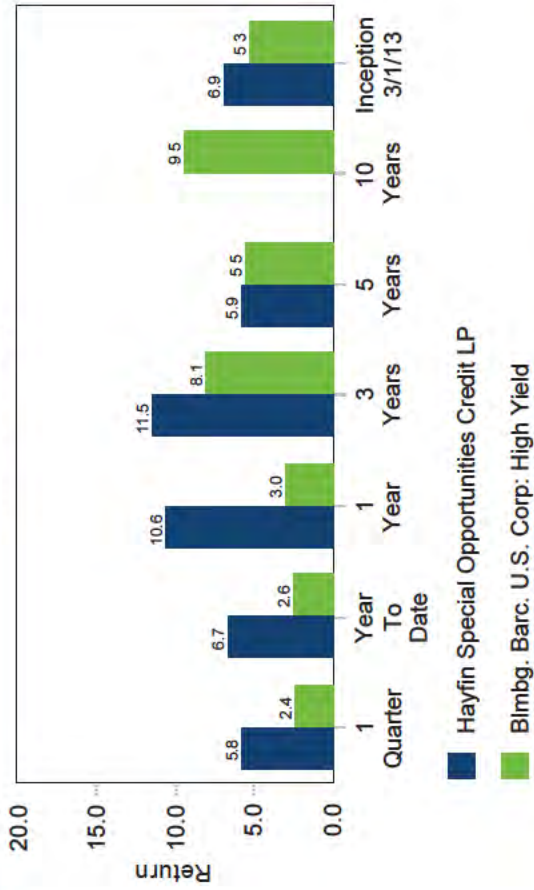
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Performance Summary

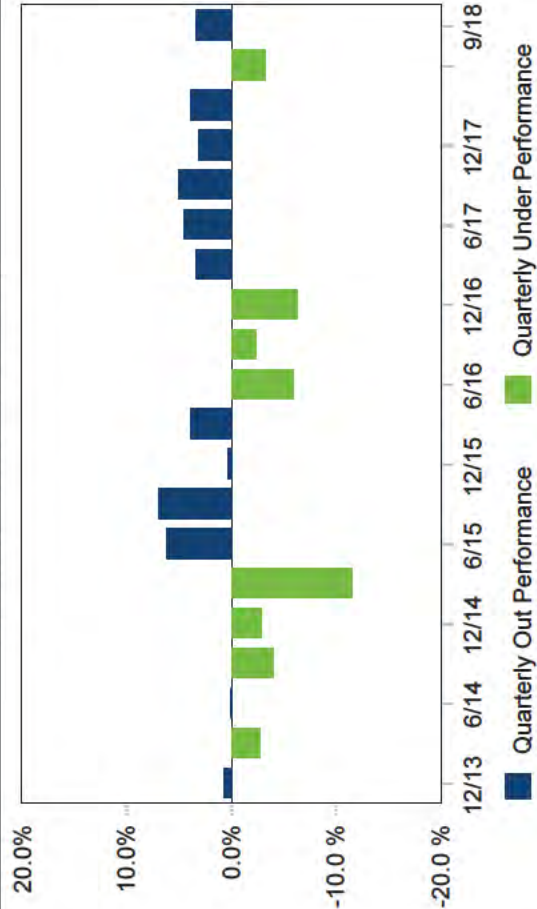
Account Information

Account Name: Hayfin Special Opportunities Credit LP  
 Inception Date: 02/28/2013  
 Account Structure: Commingled Fund  
 Asset Class: International Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

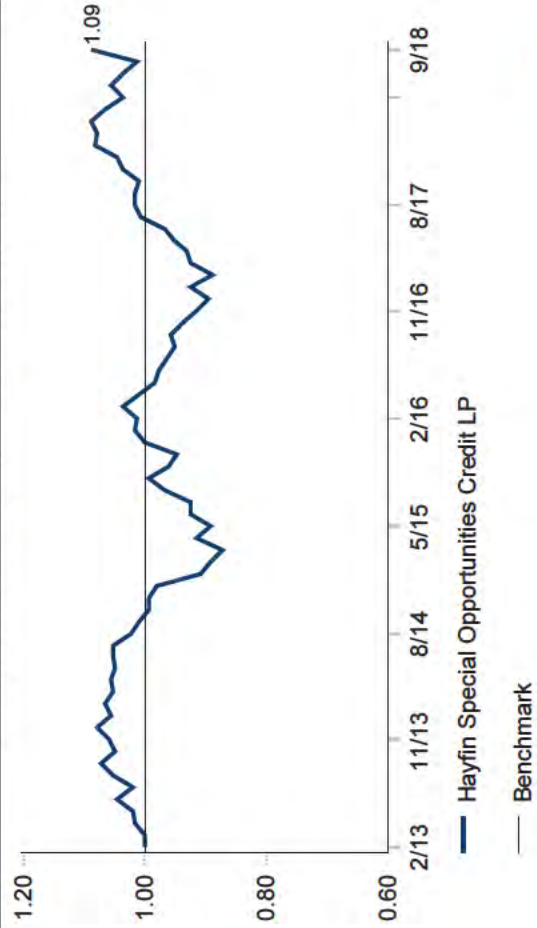
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Hayfin Special Opportunities Credit LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	10.62	11.49	5.88	N/A	6.92	03/01/2013
Standard Deviation	10.32	9.29	9.28	N/A	8.99	
Downside Risk	4.03	4.12	5.21	N/A	4.94	
Downside Semi Deviation	1.93	7.35	8.35	N/A	7.87	
Max Drawdown Recovery Period	8.00	8.00	35.00	N/A	35.00	
Maximum Drawdown	-5.03	-5.03	-17.56	N/A	-17.56	
Maximum Loss Exposure	N/A	-4.29	-11.54	N/A	-3.40	
Upside Semi Deviation	3.92	11.06	10.23	N/A	10.13	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.29	
Standard Deviation	2.00	4.93	4.95	10.05	4.99	
Downside Risk	1.12	2.29	2.73	6.68	2.84	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-0.43	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.36	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	7.59	3.36	0.62	N/A	1.82	
Tracking Error	10.19	9.24	9.23	N/A	9.01	
Actual Correlation	0.16	0.28	0.28	N/A	0.27	
Beta	0.83	0.52	0.52	N/A	0.49	
Consistency	50.00	47.22	45.00	N/A	49.25	
Down Market Capture	86.06	3.51	32.66	N/A	18.42	
Down Market Outperformance	0.17	7.91	8.12	N/A	10.16	
Information Ratio	0.74	0.36	0.07	N/A	0.20	
Jensen Alpha	8.10	7.07	3.15	N/A	4.42	
Up Market Capture	254.20	104.77	76.98	N/A	81.00	
Up Market Outperformance	7.51	0.44	-4.13	N/A	-3.53	
vs. FTSE 3 Month T-Bill						
Excess Return	9.05	10.53	5.66	N/A	6.66	
Excess Risk	10.31	9.28	9.25	N/A	8.96	
Sharpe Ratio	0.88	1.14	0.61	N/A	0.74	

Calculation based on monthly periodicity.

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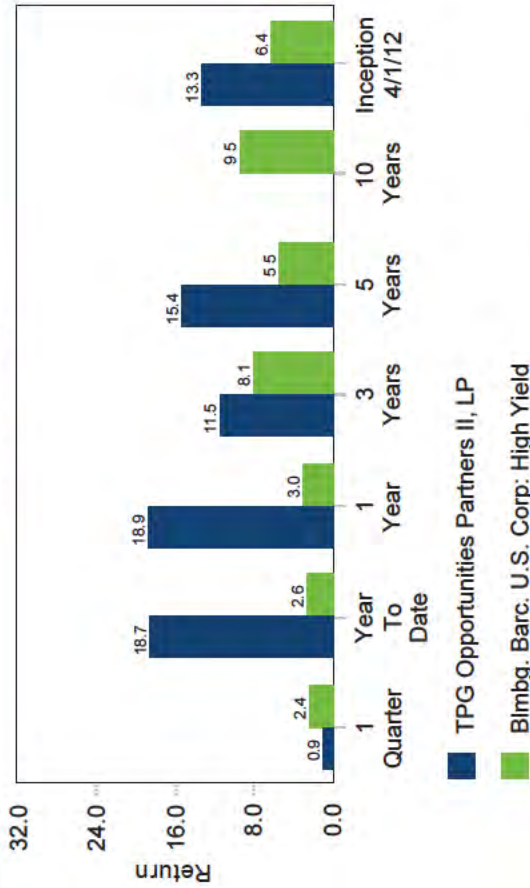


Performance Summary

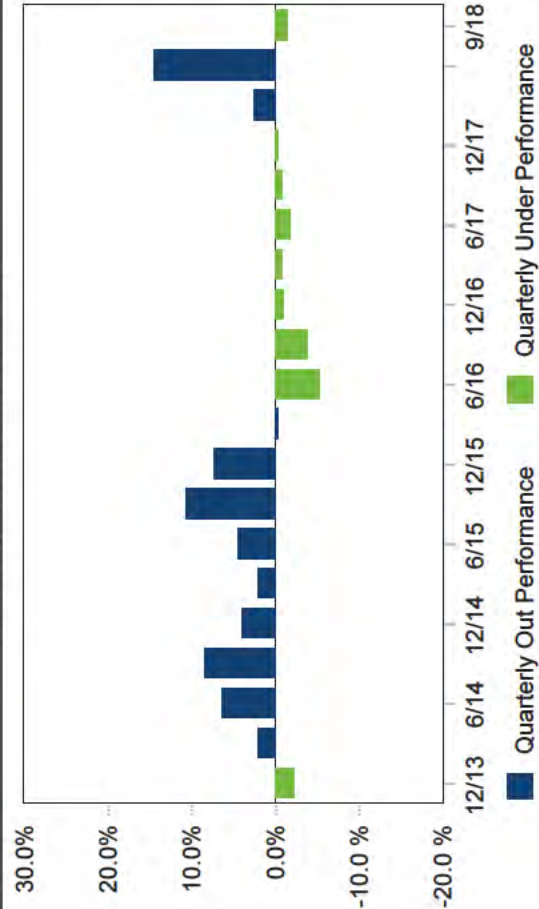
Account Information

Account Name: TPG Opportunities Partners II, LP  
 Inception Date: 03/31/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

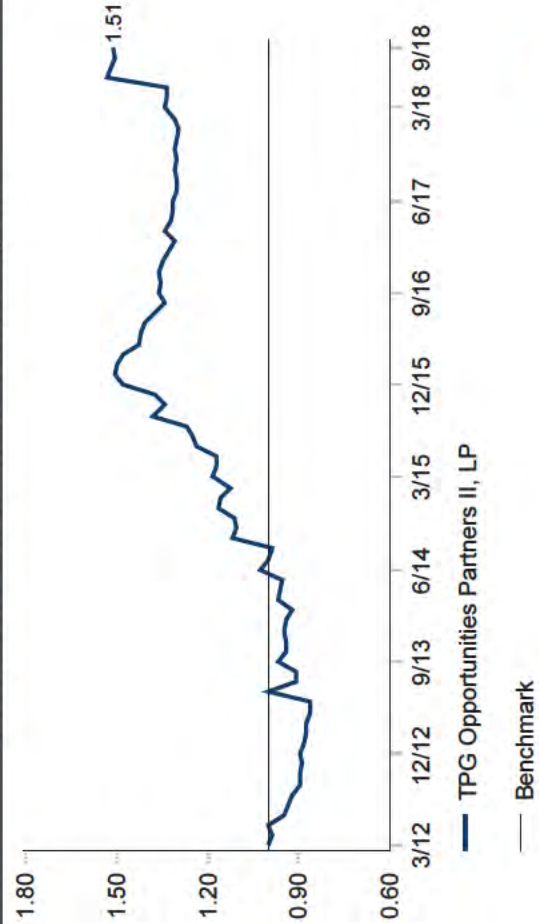
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



Risk Statistics

TPG Opportunities Partners II, LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	18.91	11.47	15.39	N/A	13.32	04/01/2012
Standard Deviation	15.32	9.46	10.27	N/A	11.16	
Downside Risk	0.00	0.00	1.63	N/A	3.63	
Downside Semi Deviation	N/A	N/A	N/A	N/A	5.31	
Max Drawdown Recovery Period	N/A	N/A	3.00	N/A	6.00	
Maximum Drawdown	0.00	0.00	-3.61	N/A	-7.62	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	-4.90	
Upside Semi Deviation	16.29	10.02	11.12	N/A	11.53	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	6.36	
Standard Deviation	2.00	4.93	4.95	10.05	4.81	
Downside Risk	1.12	2.29	2.73	6.68	2.68	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.01	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-0.27	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.25	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	15.40	3.33	9.36	N/A	6.86	
Tracking Error	15.37	11.02	12.43	N/A	13.55	
Actual Correlation	0.04	-0.08	-0.24	N/A	-0.33	
Beta	0.28	-0.16	-0.50	N/A	-0.77	
Consistency	50.00	41.67	43.33	N/A	42.31	
Down Market Capture	-106.86	-103.72	-160.74	N/A	-176.41	
Down Market Outperformance	3.58	17.91	36.06	N/A	39.39	
Information Ratio	1.00	0.30	0.75	N/A	0.51	
Jensen Alpha	17.95	12.33	18.30	N/A	18.77	
Up Market Capture	347.97	75.63	81.74	N/A	57.46	
Up Market Outperformance	11.88	-4.62	-3.37	N/A	-7.43	
vs. FTSE 3 Month T-Bill						
Excess Return	16.86	10.50	14.40	N/A	12.76	
Excess Risk	15.29	9.42	10.27	N/A	11.16	
Sharpe Ratio	1.10	1.11	1.40	N/A	1.14	

Calculation based on monthly periodicity.

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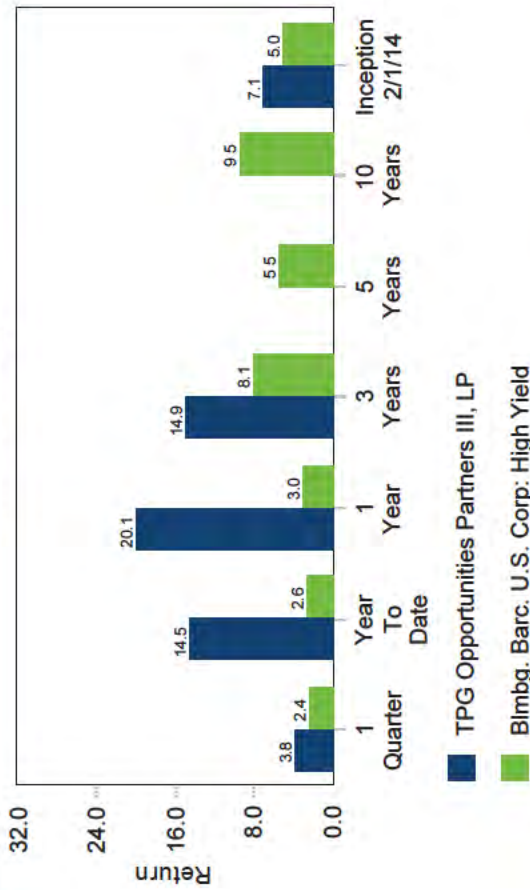


Performance Summary

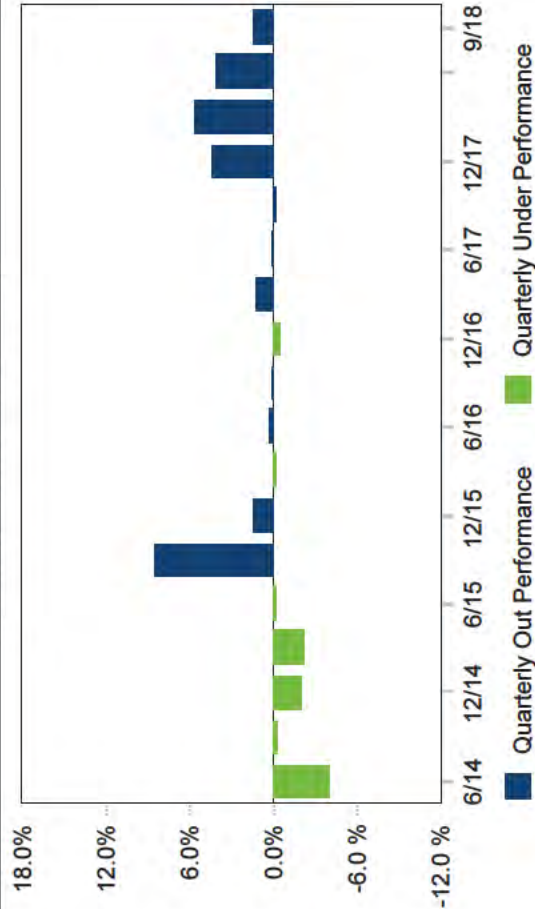
Account Information

Account Name: TPG Opportunities Partners III, LP  
 Inception Date: 02/01/2014  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

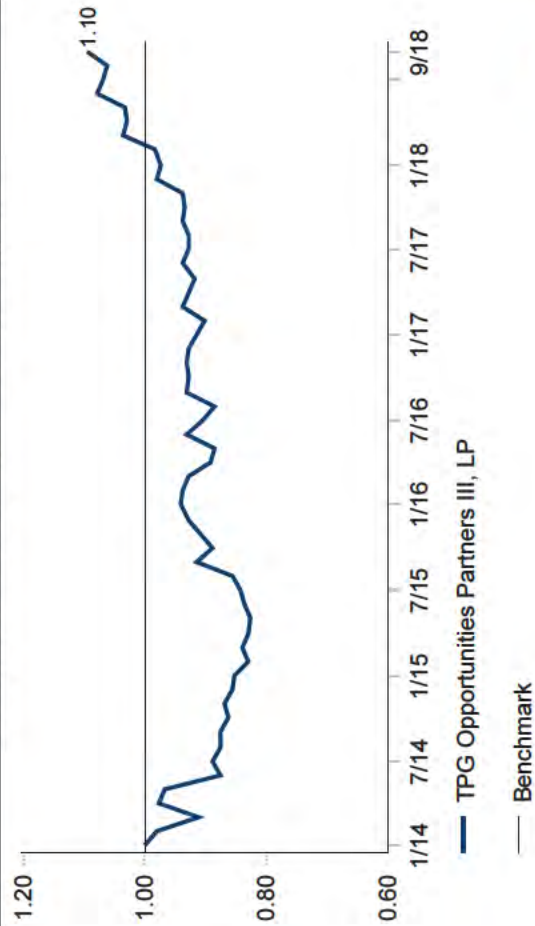
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



Risk Statistics

TPG Opportunities Partners III, LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	20.15	14.89	N/A	N/A	7.06	02/01/2014
Standard Deviation	8.09	7.01	N/A	N/A	9.14	
Downside Risk	0.00	0.36	N/A	N/A	5.44	
Downside Semi Deviation	N/A	N/A	N/A	N/A	5.20	
Max Drawdown Recovery Period	N/A	4.00	N/A	N/A	28.00	
Maximum Drawdown	0.00	-0.62	N/A	N/A	-13.37	
Maximum Loss Exposure	N/A	-0.62	N/A	N/A	-12.86	
Upside Semi Deviation	9.87	8.26	N/A	N/A	8.10	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	4.99	
Standard Deviation	2.00	4.93	4.95	10.05	5.04	
Downside Risk	1.12	2.29	2.73	6.68	2.83	
Downside Semi Deviation	0.62	1.30	4.95	12.88	4.95	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-4.37	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.46	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	15.76	6.22	N/A	N/A	2.24	
Tracking Error	8.59	8.43	N/A	N/A	10.16	
Actual Correlation	-0.14	0.04	N/A	N/A	0.06	
Beta	-0.55	0.05	N/A	N/A	0.11	
Consistency	58.33	47.22	N/A	N/A	44.64	
Down Market Capture	-281.04	-93.17	N/A	N/A	-32.62	
Down Market Outperformance	6.61	16.87	N/A	N/A	17.02	
Information Ratio	1.84	0.74	N/A	N/A	0.22	
Jensen Alpha	19.73	13.85	N/A	N/A	6.48	
Up Market Capture	292.06	104.91	N/A	N/A	60.00	
Up Market Outperformance	9.70	0.65	N/A	N/A	-6.95	
vs. FTSE 3 Month T-Bill						
Excess Return	17.23	13.39	N/A	N/A	6.73	
Excess Risk	8.07	6.99	N/A	N/A	9.10	
Sharpe Ratio	2.13	1.92	N/A	N/A	0.74	

Calculation based on monthly periodicity.

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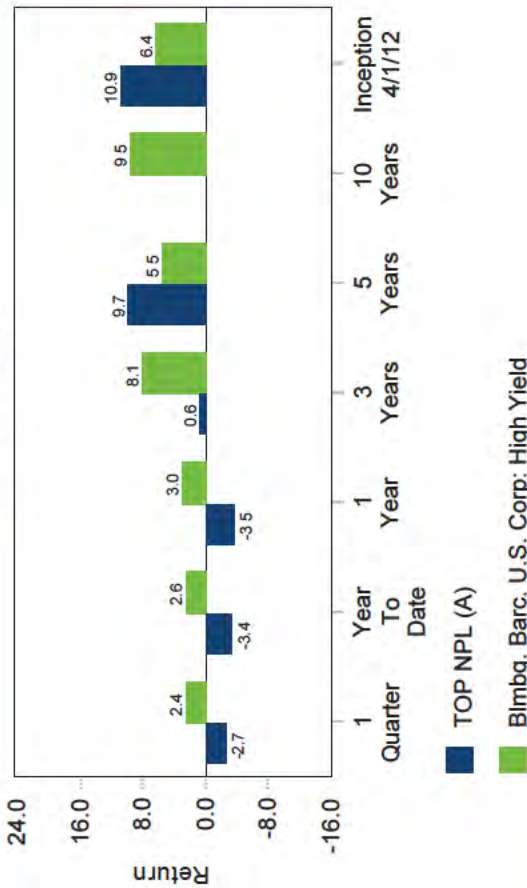


Performance Summary

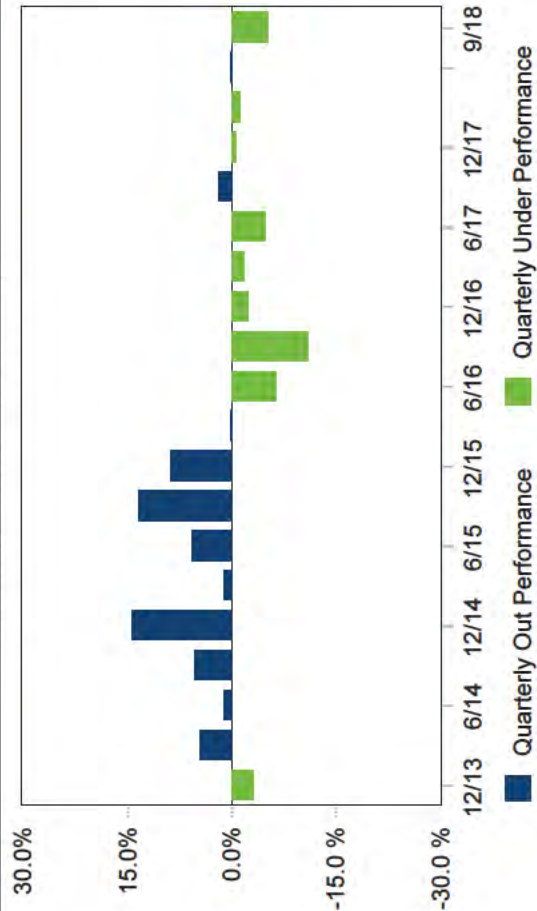
Account Information

Account Name: TOP NPL (A)  
 Inception Date: 03/31/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

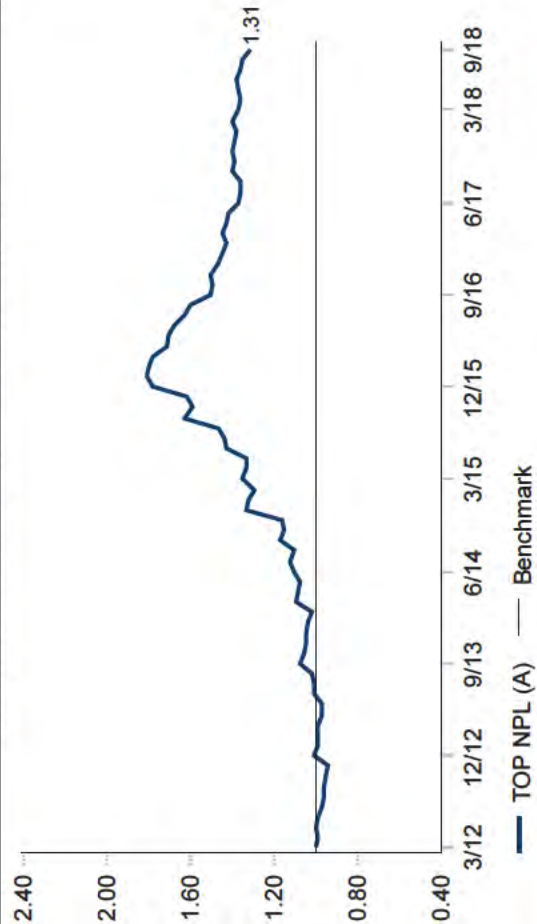
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## TOP NPL (A)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-3.49	0.59	9.70	N/A	10.89	04/01/2012
Standard Deviation	3.68	6.58	9.70	N/A	9.39	
Downside Risk	3.55	4.10	3.16	N/A	2.77	
Downside Semi Deviation	2.40	2.86	2.86	N/A	2.86	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-3.49	-8.20	-8.20	N/A	-8.20	
Maximum Loss Exposure	-3.49	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.48	5.76	10.22	N/A	9.97	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	6.36	
Standard Deviation	2.00	4.93	4.95	10.05	4.81	
Downside Risk	1.12	2.29	2.73	6.68	2.68	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.01	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-0.27	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.25	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	-6.51	-7.17	4.21	N/A	4.50	
Tracking Error	3.87	8.44	12.30	N/A	11.49	
Actual Correlation	0.17	-0.06	-0.34	N/A	-0.23	
Beta	0.32	-0.08	-0.67	N/A	-0.45	
Consistency	33.33	30.56	38.33	N/A	38.46	
Down Market Capture	119.98	-66.24	-189.53	N/A	-154.96	
Down Market Outperformance	-0.36	14.27	40.55	N/A	35.83	
Information Ratio	-1.68	-0.85	0.34	N/A	0.39	
Jensen Alpha	-5.40	0.45	13.25	N/A	13.73	
Up Market Capture	-29.44	-10.50	16.60	N/A	43.19	
Up Market Outperformance	-6.30	-17.87	-13.06	N/A	-9.44	
vs. FTSE 3 Month T-Bill						
Excess Return	-5.05	0.00	9.25	N/A	10.40	
Excess Risk	3.70	6.61	9.75	N/A	9.43	
Sharpe Ratio	-1.36	0.00	0.95	N/A	1.10	

Calculation based on monthly periodicity.

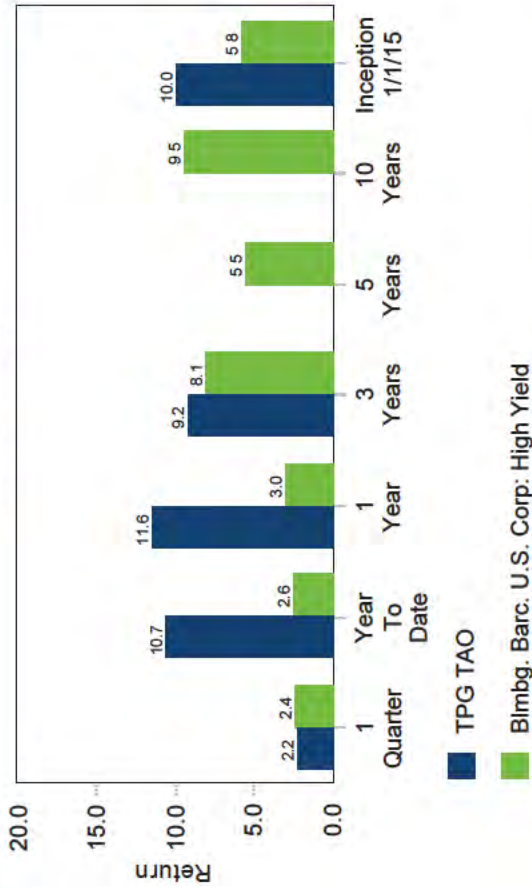
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Performance Summary

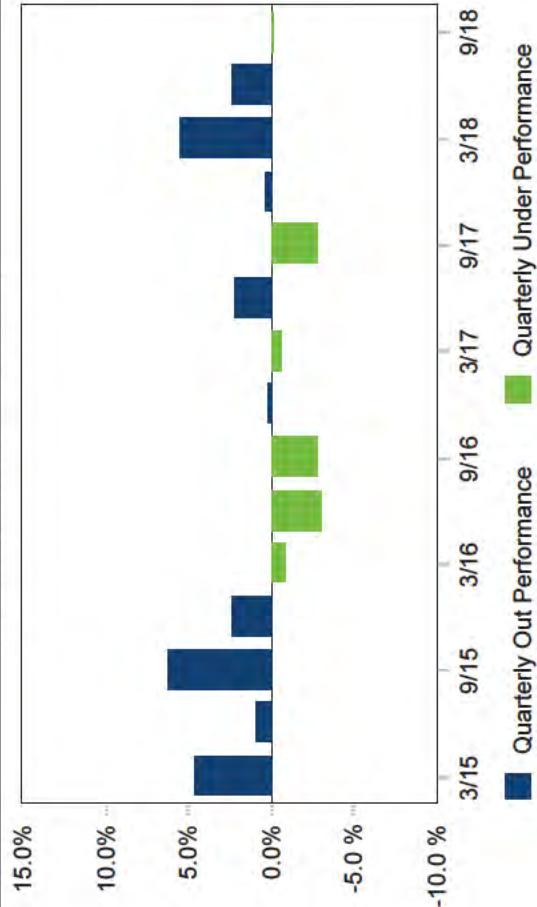
Account Information

Account Name: TPG TAO  
 Inception Date: 01/01/2015  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

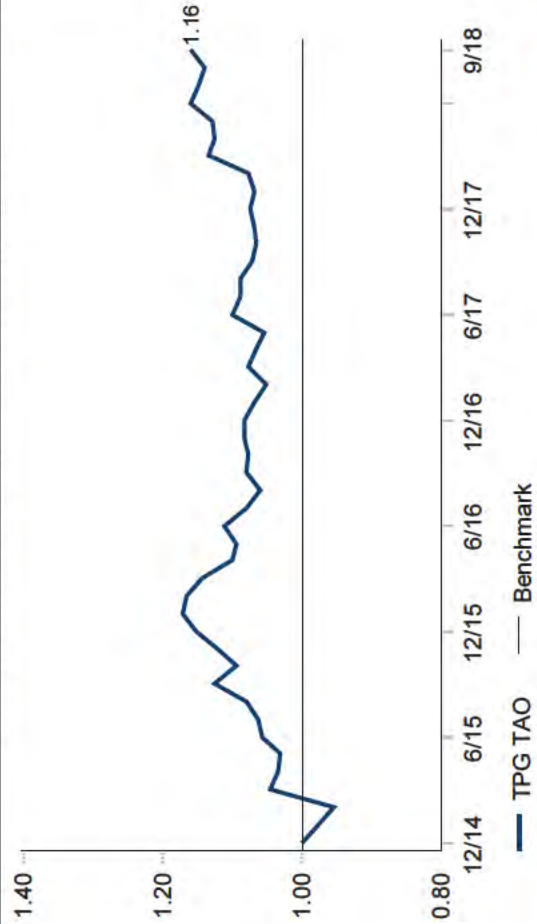
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

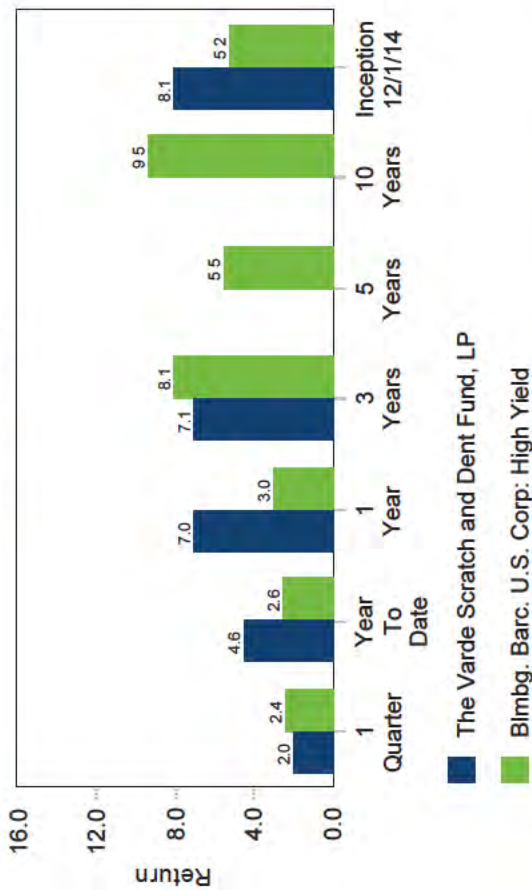


Performance Summary

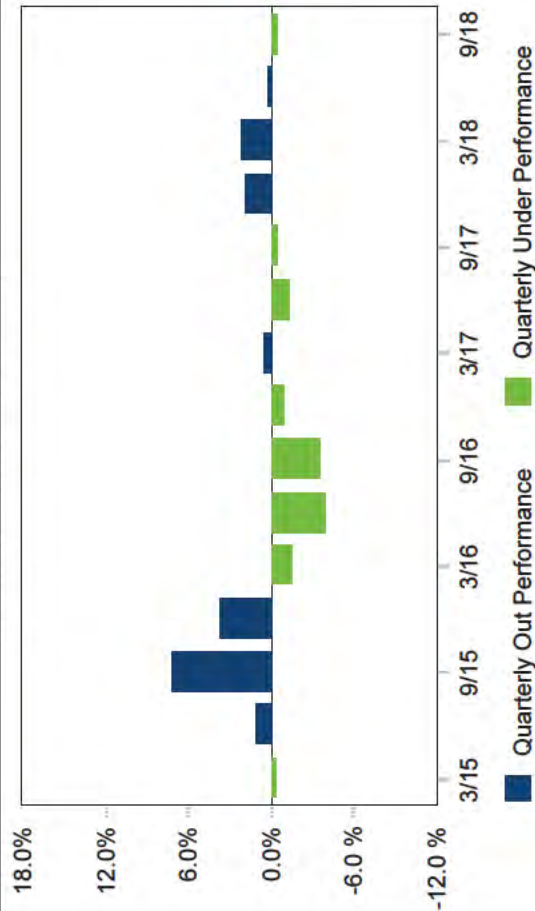
Account Information

Account Name: The Varde Scratch and Dent Fund, LP  
 Inception Date: 12/01/2014  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

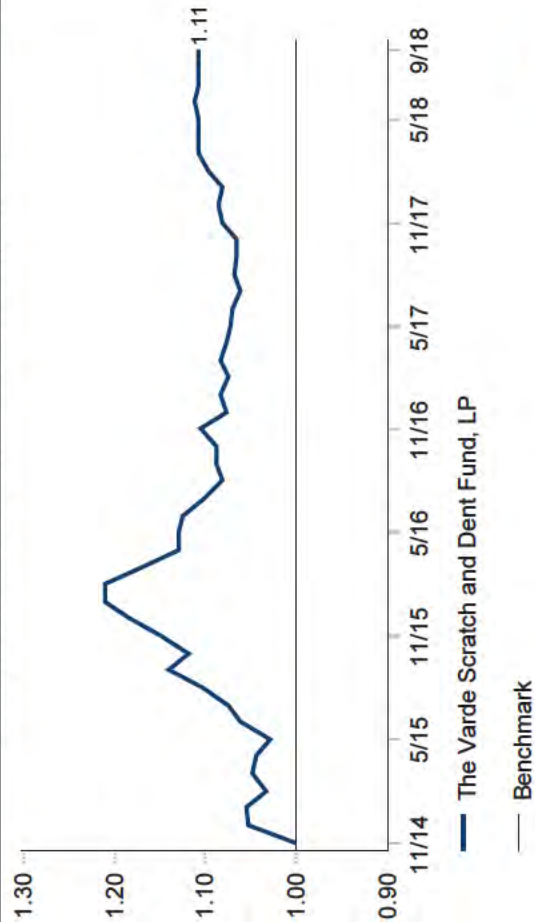
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



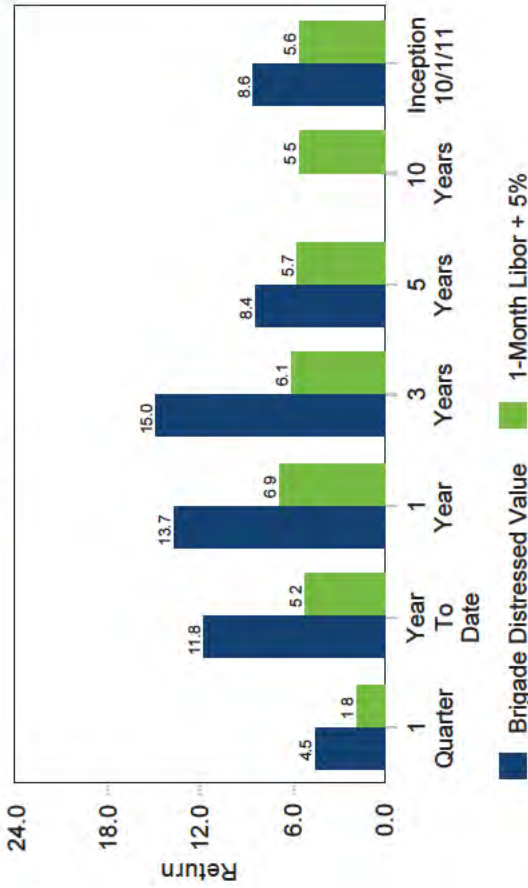


Performance Summary

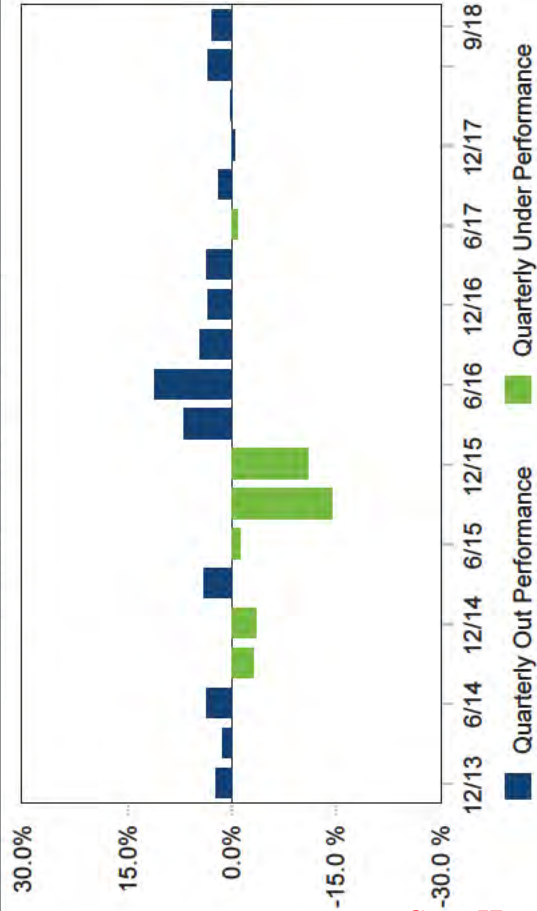
Account Information

Account Name: Brigade Distressed Value  
 Inception Date: 10/01/2011  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: 1-Month Libor + 5%  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

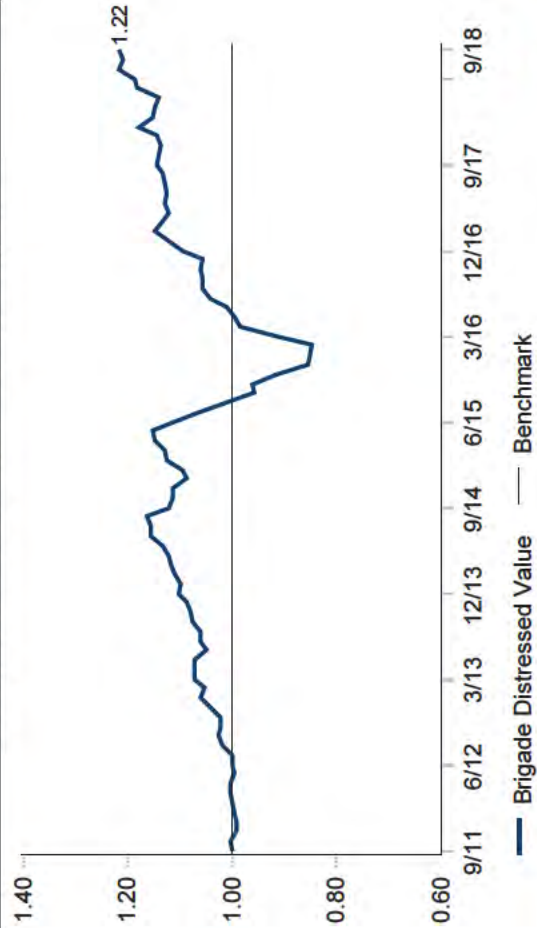
Return Summary



Quarterly Excess Performance

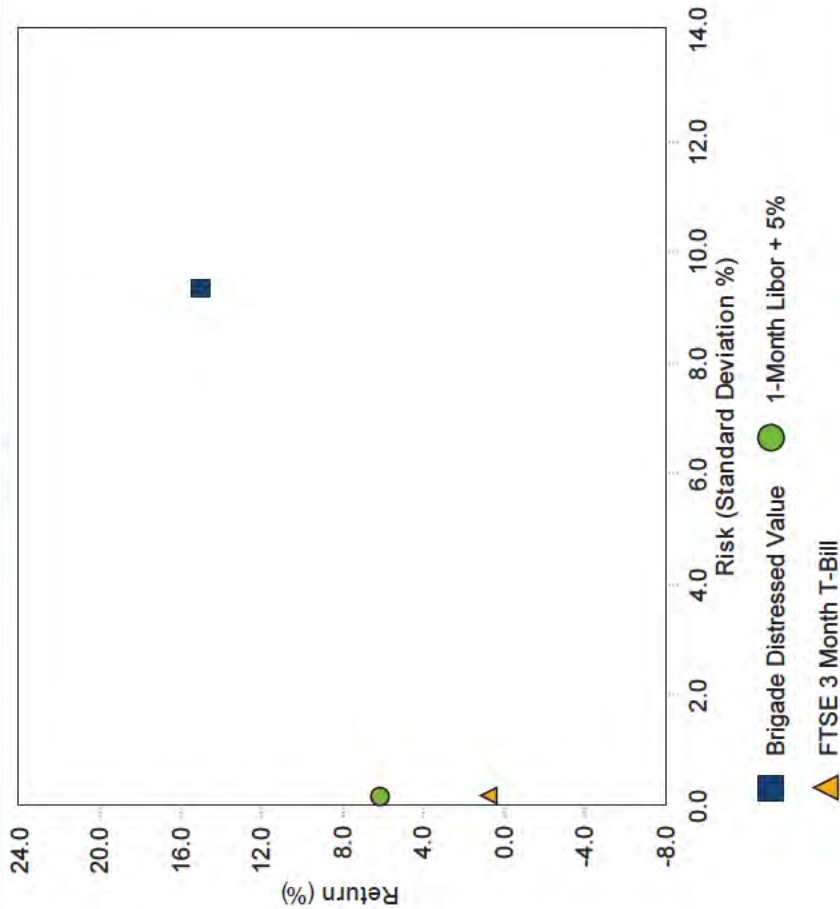


Ratio of Cumulative Wealth - Since Inception

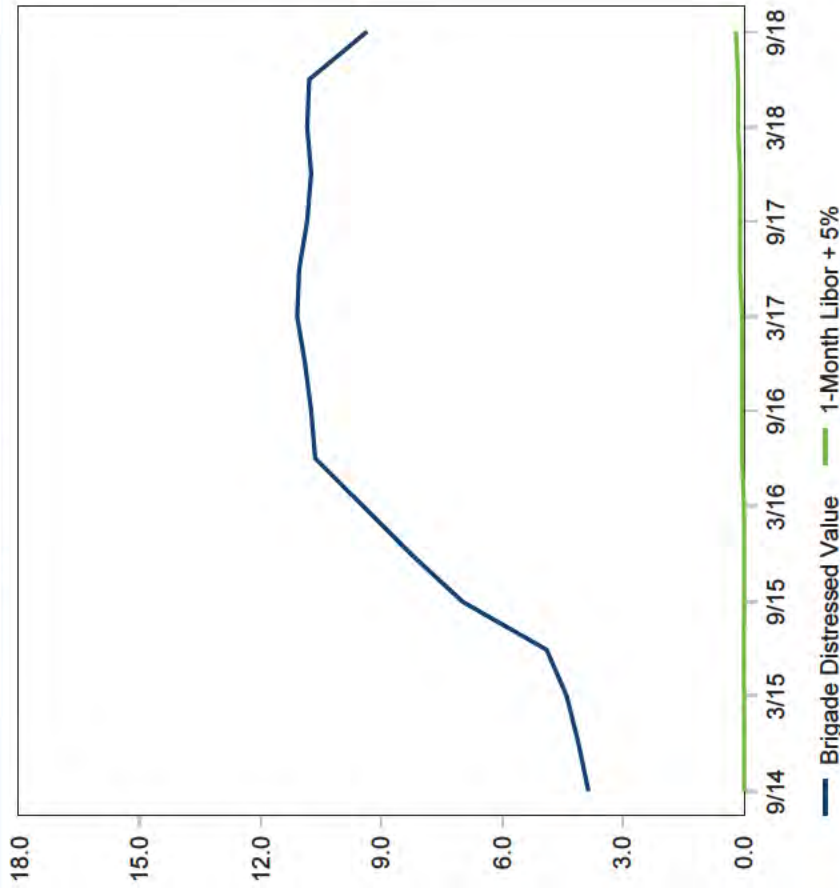


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Brigade Distressed Value	8.52	9.36	0.91	0.00	1.46	8.44	1.07	14.97	9.36	0.02
1-Month Libor + 5%	0.00	0.00	N/A	1.00	254.07	0.00	1.00	6.09	0.18	1.00
FTSE 3 Month T-Bill	-5.13	0.02	-254.07	0.99	N/A	-5.07	1.01	0.80	0.18	0.99

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Risk Statistics

Brigade Distressed Value

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	13.71	14.97	8.37	N/A	8.61	10/01/2011
Standard Deviation	5.91	9.36	9.00	N/A	7.81	
Downside Risk	1.87	4.69	5.49	N/A	4.68	
Downside Semi Deviation	1.79	3.03	11.26	N/A	10.06	
Max Drawdown Recovery Period	4.00	6.00	19.00	N/A	19.00	
Maximum Drawdown	-1.79	-10.59	-23.66	N/A	-23.66	
Maximum Loss Exposure	-0.04	-9.68	-11.15	N/A	-0.02	
Upside Semi Deviation	2.19	10.40	8.75	N/A	7.66	
1-Month Libor + 5%						
Return	6.87	6.09	5.72	5.55	5.58	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	2.01	1.74	1.63	1.58	1.59	
vs. 1-Month Libor + 5%						
Active Return	6.41	8.52	2.88	N/A	3.14	
Tracking Error	5.87	9.36	8.98	N/A	7.79	
Actual Correlation	0.36	0.02	0.17	N/A	0.15	
Beta	22.04	1.07	8.01	N/A	6.82	
Consistency	50.00	61.11	60.00	N/A	61.90	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	1.09	0.91	0.32	N/A	0.40	
Jensen Alpha	-96.18	2,507.03	-3.96	N/A	70.24	
Up Market Capture	196.17	243.74	151.70	N/A	157.70	
Up Market Outperformance	6.84	8.87	2.65	N/A	3.03	
vs. FTSE 3 Month T-Bill						
Excess Return	11.51	13.65	7.98	N/A	8.22	
Excess Risk	5.88	9.35	8.98	N/A	7.79	
Sharpe Ratio	1.96	1.46	0.89	N/A	1.06	

Calculation based on monthly periodicity.

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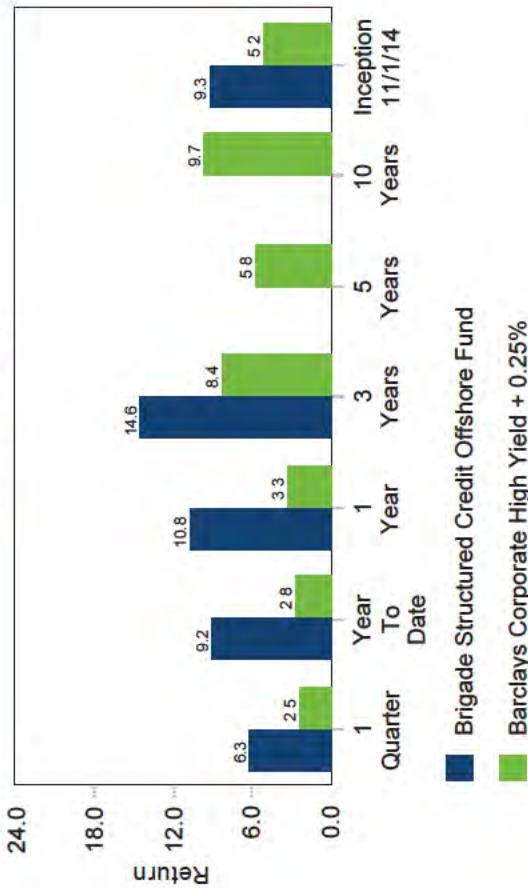


Performance Summary

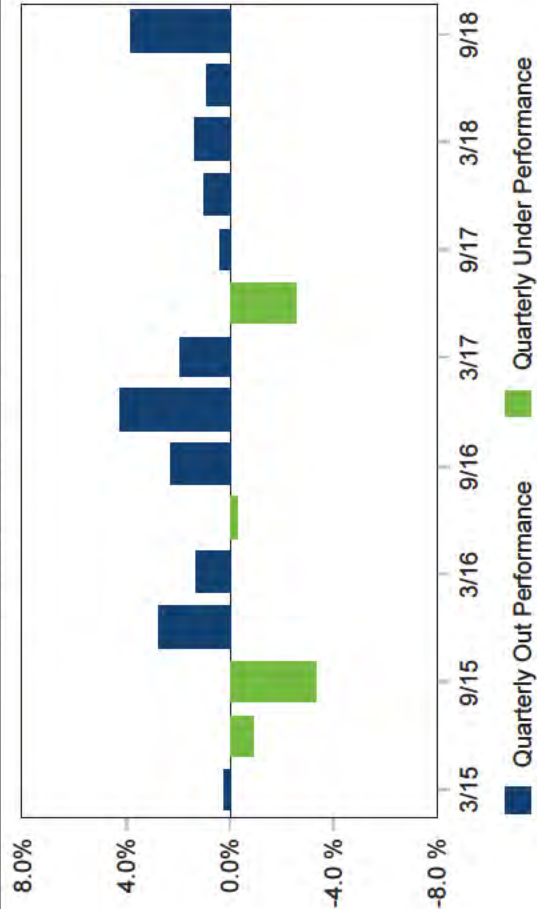
Account Information

Account Name: Brigade Structured Credit Offshore Fund  
 Inception Date: 11/01/2014  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Barclays Corporate High Yield + 0.25%  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

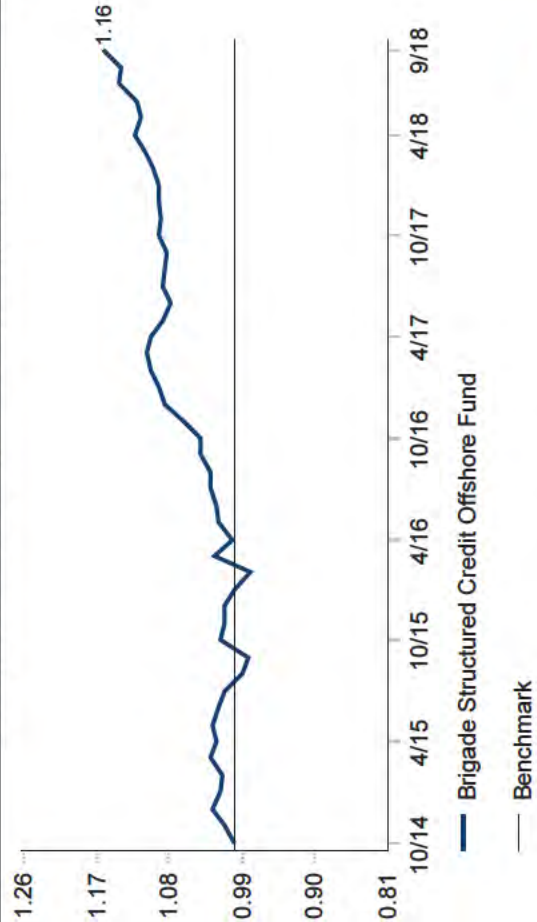
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

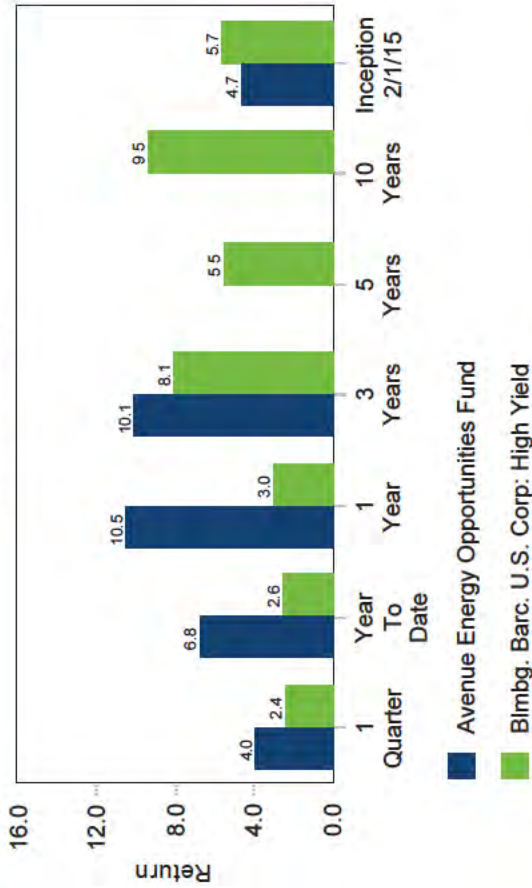


Performance Summary

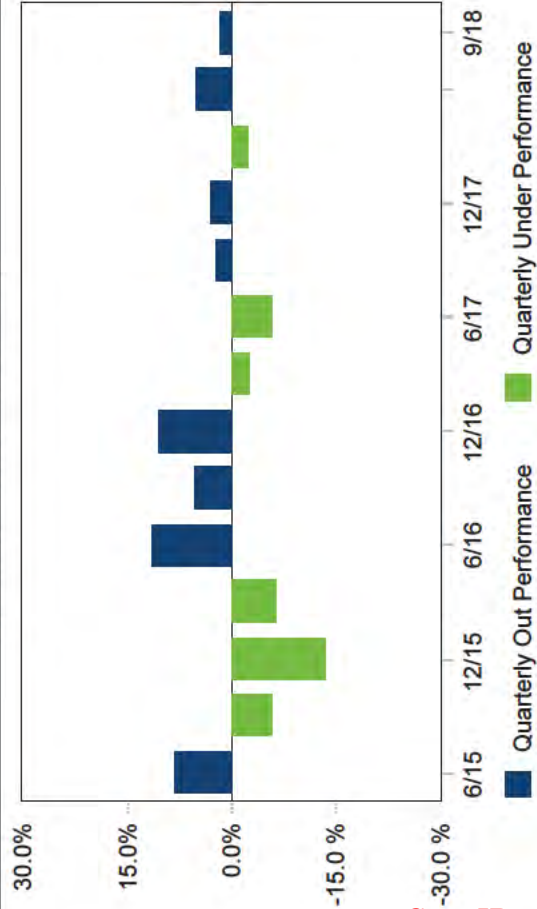
Account Information

Account Name: Avenue Energy Opportunities Fund  
 Inception Date: 02/01/2015  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

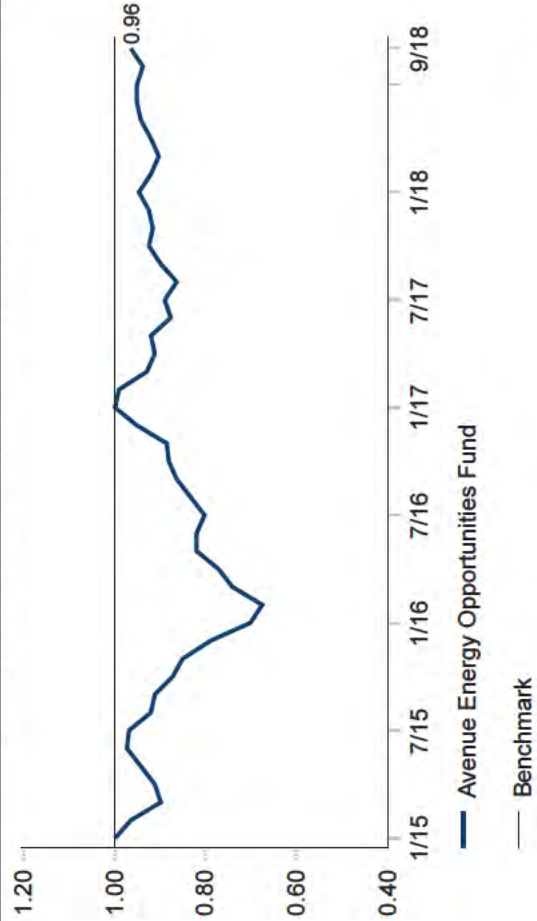
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

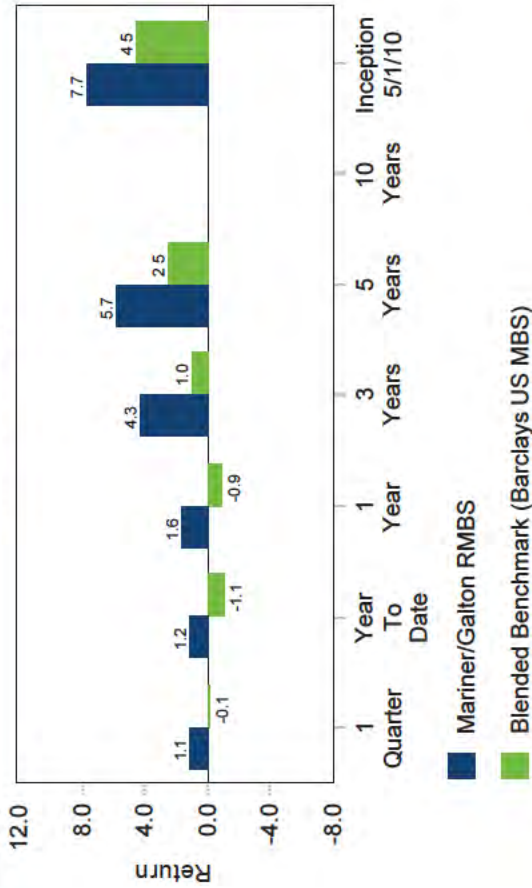


Performance Summary

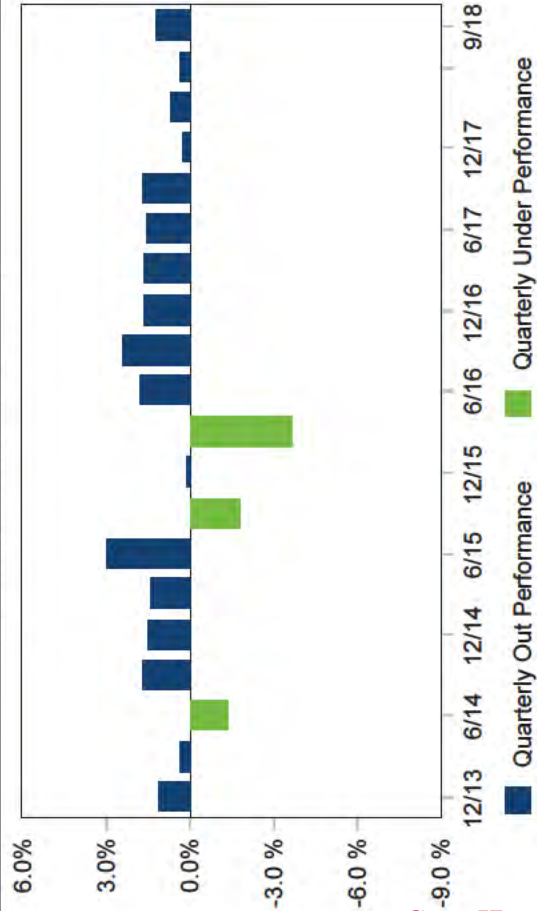
Account Information

Account Name: Mariner/Galton RMBS  
 Inception Date: 04/30/2010  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blended Benchmark (Barclays US MBS)  
 Peer Group: IM U.S. Mortgage Backed Bonds (SA+CF)

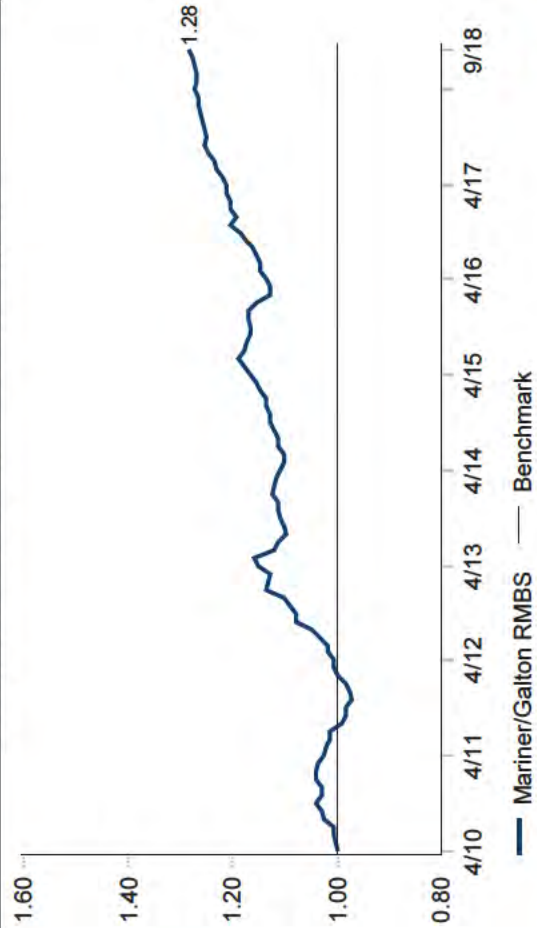
Return Summary



Quarterly Excess Performance

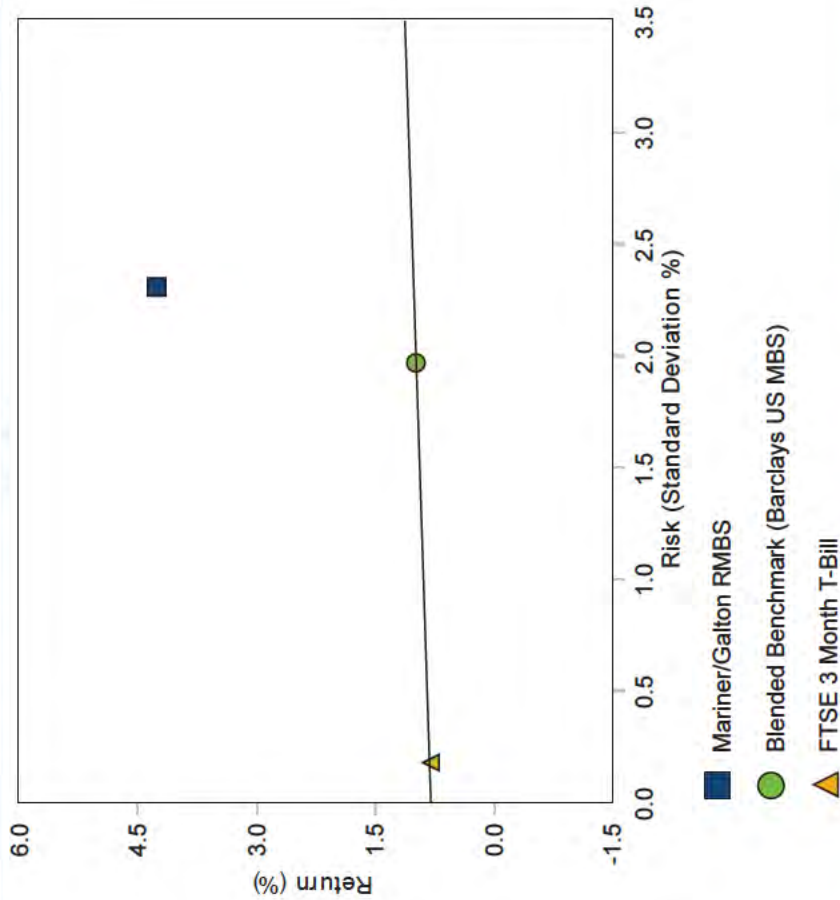


Ratio of Cumulative Wealth - Since Inception

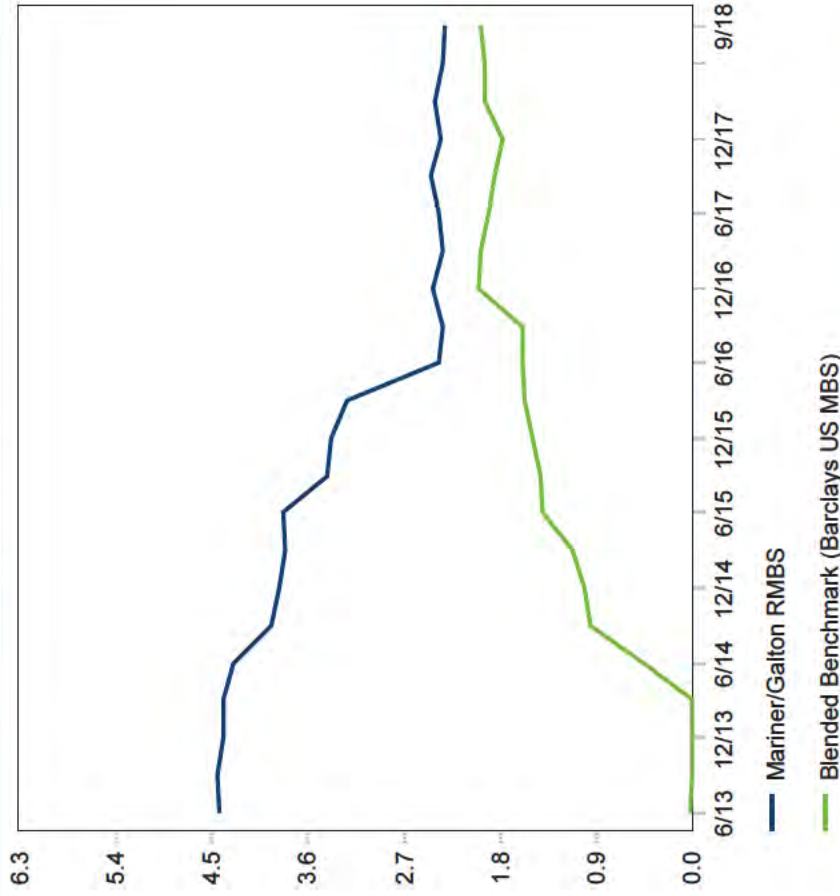


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Mariner/Galton RMBS	3.20	2.48	1.29	0.11	1.46	3.87	0.39	4.25	2.31	0.34
Blended Benchmark (Barclays US MBS)	0.00	0.00	N/A	1.00	0.10	0.00	1.00	0.98	1.97	1.00
FTSE 3 Month T-Bill	-0.19	2.00	-0.10	0.01	N/A	0.81	-0.01	0.80	0.18	-0.11



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## Risk Statistics

## Mariner/Galton RMBS

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.59	4.25	5.74	N/A	7.66	05/01/2010
Standard Deviation	1.38	2.31	2.19	N/A	3.24	
Downside Risk	0.79	1.31	1.02	N/A	1.42	
Downside Semi Deviation	0.44	0.75	2.27	N/A	3.09	
Max Drawdown Recovery Period	5.00	7.00	11.00	N/A	7.00	
Maximum Drawdown	-0.95	-2.07	-2.38	N/A	-3.40	
Maximum Loss Exposure	-0.53	-1.94	N/A	N/A	N/A	
Upside Semi Deviation	0.45	2.68	2.87	N/A	4.11	
Blended Benchmark (Barclays US MBS)						
Return	-0.92	0.98	2.53	N/A	4.52	
Standard Deviation	2.03	1.97	1.93	N/A	1.63	
Downside Risk	1.64	1.40	1.17	N/A	0.90	
Downside Semi Deviation	0.64	2.21	2.05	N/A	2.05	
Max Drawdown Recovery Period	N/A	11.00	11.00	N/A	11.00	
Maximum Drawdown	-1.82	-2.01	-2.01	N/A	-2.01	
Maximum Loss Exposure	-1.67	-0.10	N/A	N/A	N/A	
Upside Semi Deviation	0.59	1.88	2.10	N/A	2.10	
vs. Blended Benchmark (Barclays US MBS)						
Active Return	2.49	3.20	3.10	N/A	3.02	
Tracking Error	0.99	2.48	2.42	N/A	3.28	
Actual Correlation	0.90	0.34	0.31	N/A	0.23	
Beta	0.61	0.39	0.35	N/A	0.46	
Consistency	66.67	69.44	63.33	N/A	62.38	
Down Market Capture	18.08	-11.88	-51.28	N/A	-51.28	
Down Market Outperformance	2.60	5.30	6.94	N/A	6.94	
Information Ratio	2.51	1.29	1.28	N/A	0.92	
Jensen Alpha	1.52	3.37	4.44	N/A	5.25	
Up Market Capture	93.55	131.74	118.79	N/A	130.44	
Up Market Outperformance	-0.15	1.70	1.20	N/A	2.12	
vs. FTSE 3 Month T-Bill						
Excess Return	0.02	3.40	5.13	N/A	7.13	
Excess Risk	1.34	2.32	2.22	N/A	3.27	
Sharpe Ratio	0.02	1.46	2.31	N/A	2.18	

Calculation based on monthly periodicity.

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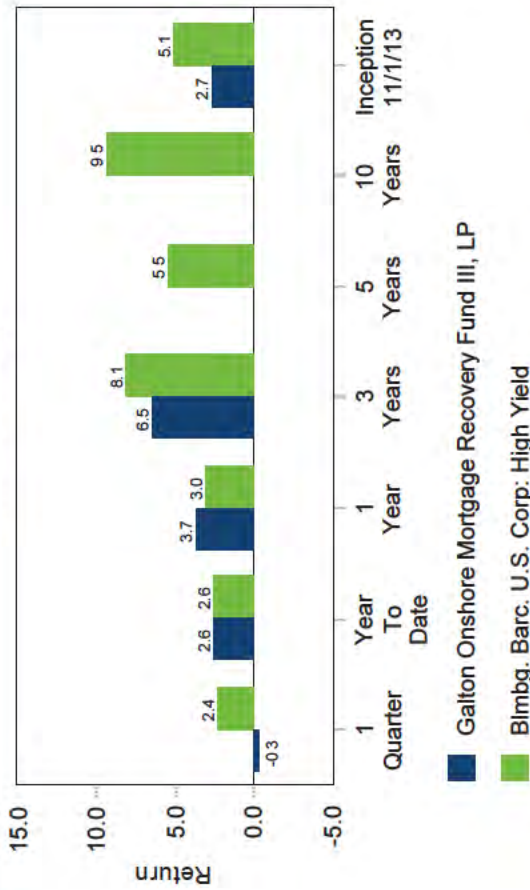


Performance Summary

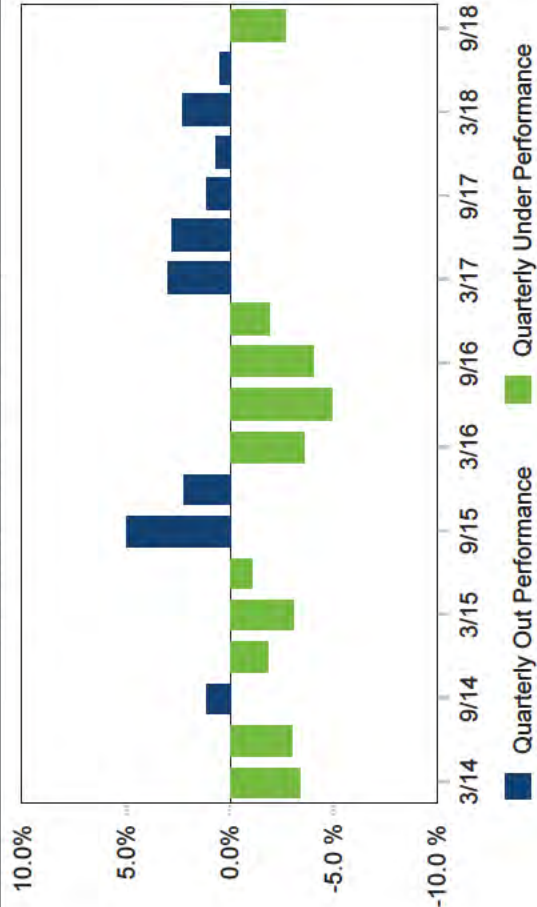
Account Information

Account Name: Galton Onshore Mortgage Recovery Fund III, LP  
 Inception Date: 11/01/2013  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group:

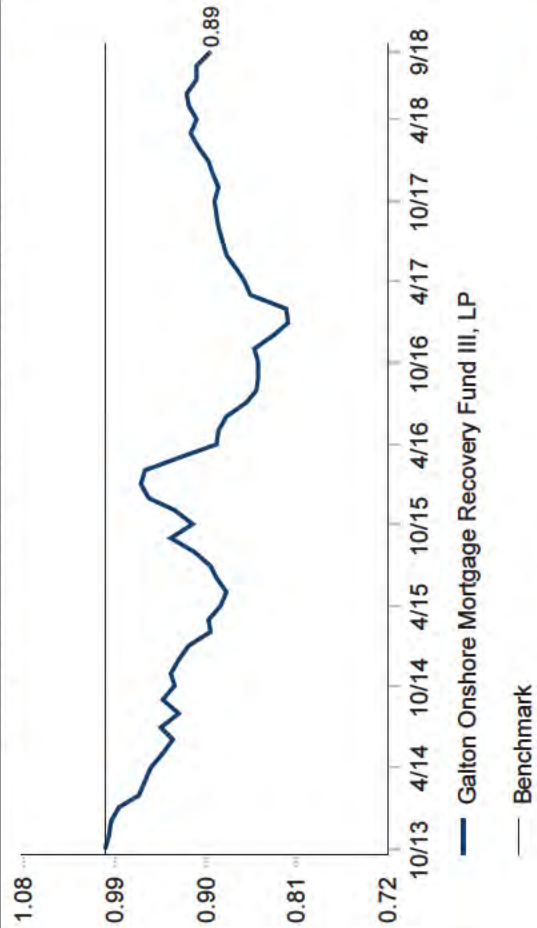
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Galton Onshore Mortgage Recovery Fund III, LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.75	6.55	N/A	N/A	2.75	11/01/2013
Standard Deviation	2.23	3.16	N/A	N/A	2.99	
Downside Risk	1.28	0.99	N/A	N/A	1.42	
Downside Semi Deviation	1.23	0.69	N/A	N/A	2.35	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	37.00	
Maximum Drawdown	-1.01	-1.01	N/A	N/A	-6.55	
Maximum Loss Exposure	N/A	-0.79	N/A	N/A	-3.33	
Upside Semi Deviation	0.68	3.96	N/A	N/A	3.50	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.10	
Standard Deviation	2.00	4.93	4.95	10.05	4.91	
Downside Risk	1.12	2.29	2.73	6.68	2.76	
Downside Semi Deviation	0.62	1.30	4.95	12.88	4.95	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-2.69	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.27	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	0.68	-1.57	N/A	N/A	-2.35	
Tracking Error	2.89	5.69	N/A	N/A	5.25	
Actual Correlation	0.07	0.06	N/A	N/A	0.19	
Beta	0.07	0.04	N/A	N/A	0.11	
Consistency	58.33	55.56	N/A	N/A	47.46	
Down Market Capture	-35.06	-48.61	N/A	N/A	-3.39	
Down Market Outperformance	2.33	12.80	N/A	N/A	13.12	
Information Ratio	0.24	-0.28	N/A	N/A	-0.45	
Jensen Alpha	2.07	5.41	N/A	N/A	1.78	
Up Market Capture	65.10	45.59	N/A	N/A	27.60	
Up Market Outperformance	-1.73	-9.05	N/A	N/A	-10.92	
vs. FTSE 3 Month T-Bill						
Excess Return	2.15	5.61	N/A	N/A	2.26	
Excess Risk	2.25	3.17	N/A	N/A	2.95	
Sharpe Ratio	0.95	1.77	N/A	N/A	0.77	

Calculation based on monthly periodicity.

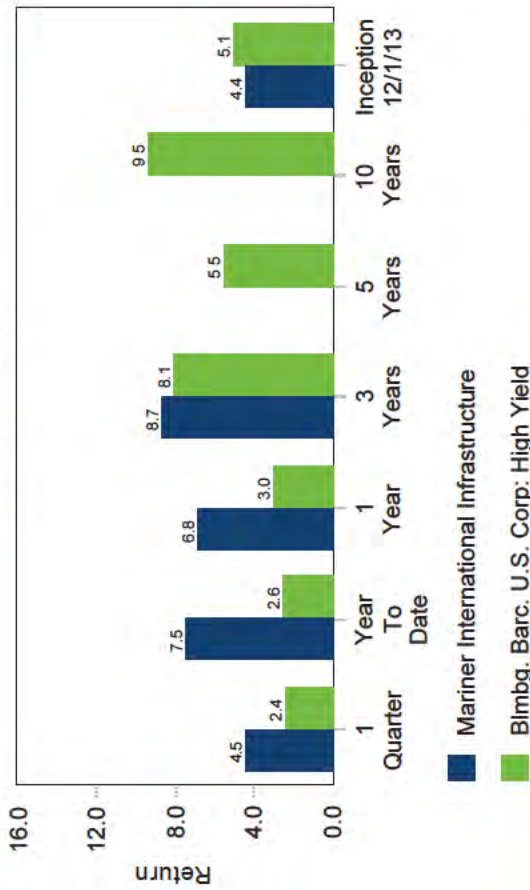
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Performance Summary

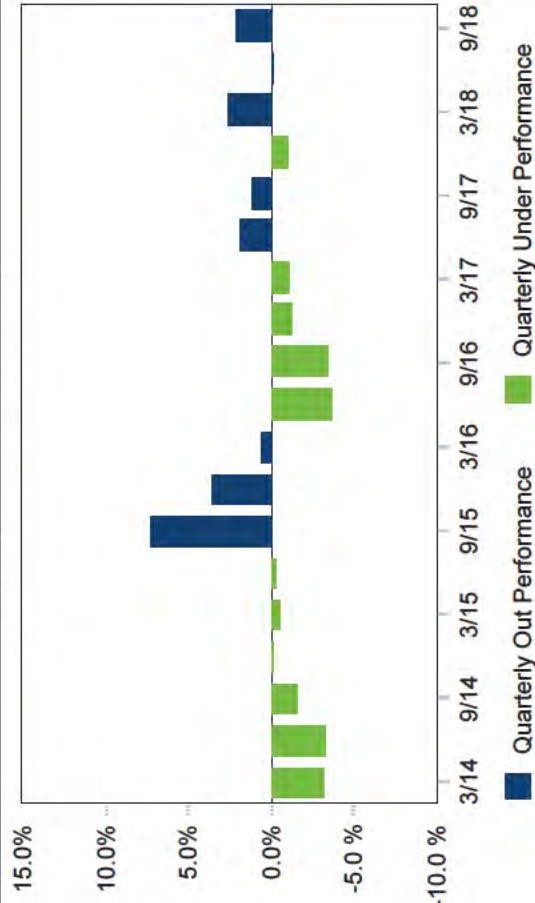
Account Information

Account Name: Mariner International Infrastructure  
 Inception Date: 12/01/2013  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

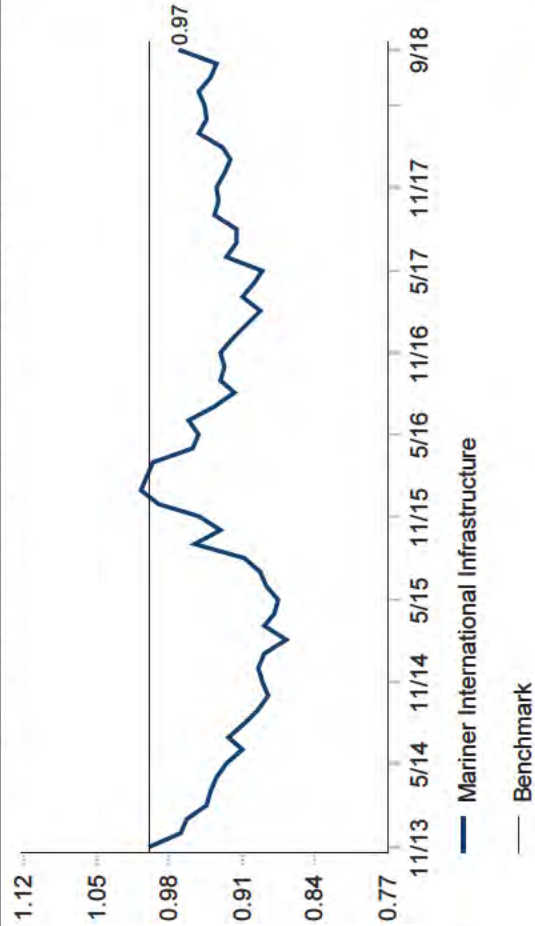
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Mariner International Infrastructure

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	6.84	8.72	N/A	N/A	4.44	12/01/2013
Standard Deviation	4.79	4.60	N/A	N/A	4.64	
Downside Risk	0.60	0.34	N/A	N/A	2.10	
Downside Semi Deviation	N/A	N/A	N/A	N/A	1.87	
Max Drawdown Recovery Period	4.00	4.00	N/A	N/A	27.00	
Maximum Drawdown	-0.58	-0.58	N/A	N/A	-7.93	
Maximum Loss Exposure	-0.58	N/A	N/A	N/A	-7.34	
Upside Semi Deviation	1.56	5.29	N/A	N/A	4.63	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.09	
Standard Deviation	2.00	4.93	4.95	10.05	4.95	
Downside Risk	1.12	2.29	2.73	6.68	2.78	
Downside Semi Deviation	0.62	1.30	4.95	12.88	4.95	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-3.18	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.33	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	3.71	0.51	N/A	N/A	-0.63	
Tracking Error	5.19	6.45	N/A	N/A	6.37	
Actual Correlation	0.00	0.09	N/A	N/A	0.12	
Beta	0.00	0.08	N/A	N/A	0.11	
Consistency	50.00	44.44	N/A	N/A	41.38	
Down Market Capture	-101.46	-54.98	N/A	N/A	-20.93	
Down Market Outperformance	3.49	13.45	N/A	N/A	15.50	
Information Ratio	0.72	0.08	N/A	N/A	-0.10	
Jensen Alpha	5.43	7.34	N/A	N/A	3.53	
Up Market Capture	104.53	62.94	N/A	N/A	37.12	
Up Market Outperformance	0.13	-6.32	N/A	N/A	-9.78	
vs. FTSE 3 Month T-Bill						
Excess Return	5.18	7.69	N/A	N/A	3.95	
Excess Risk	4.74	4.58	N/A	N/A	4.60	
Sharpe Ratio	1.09	1.68	N/A	N/A	0.86	

Calculation based on monthly periodicity.

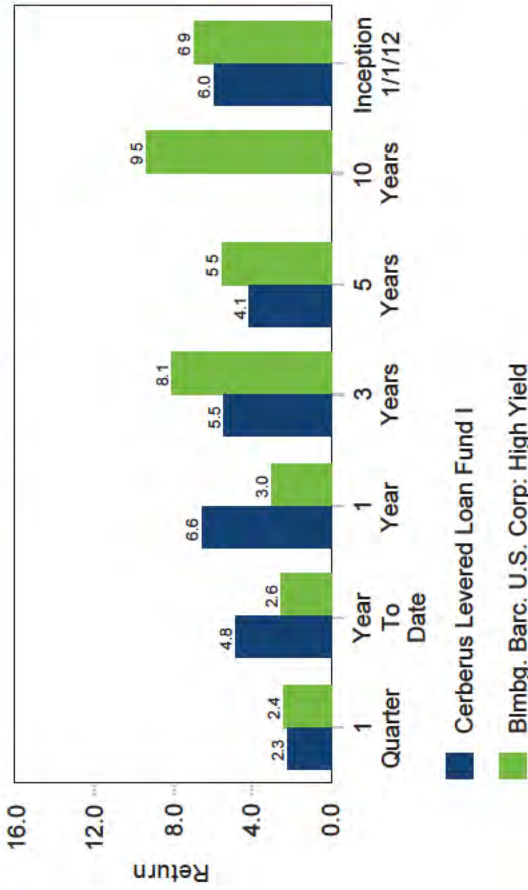
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Performance Summary

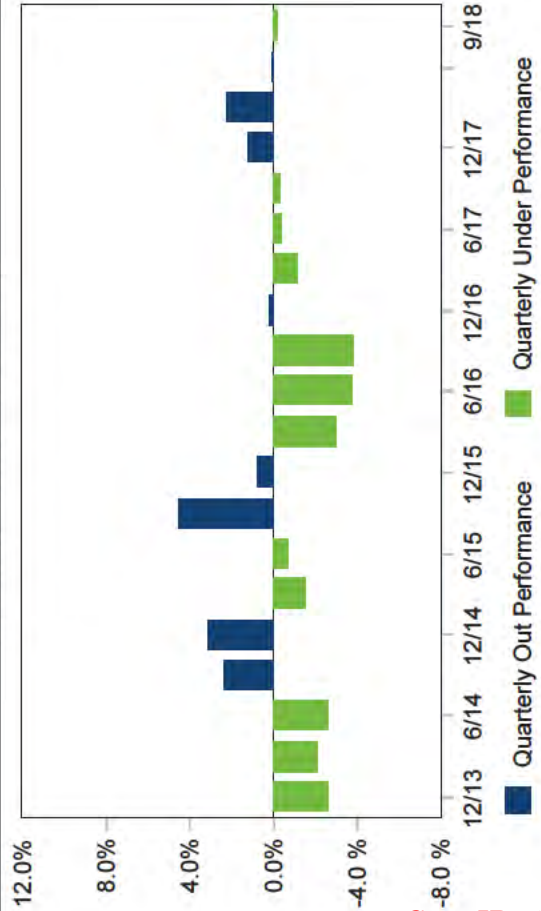
Account Information

Account Name: Cerberus Levered Loan Fund I  
 Inception Date: 12/31/2011  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

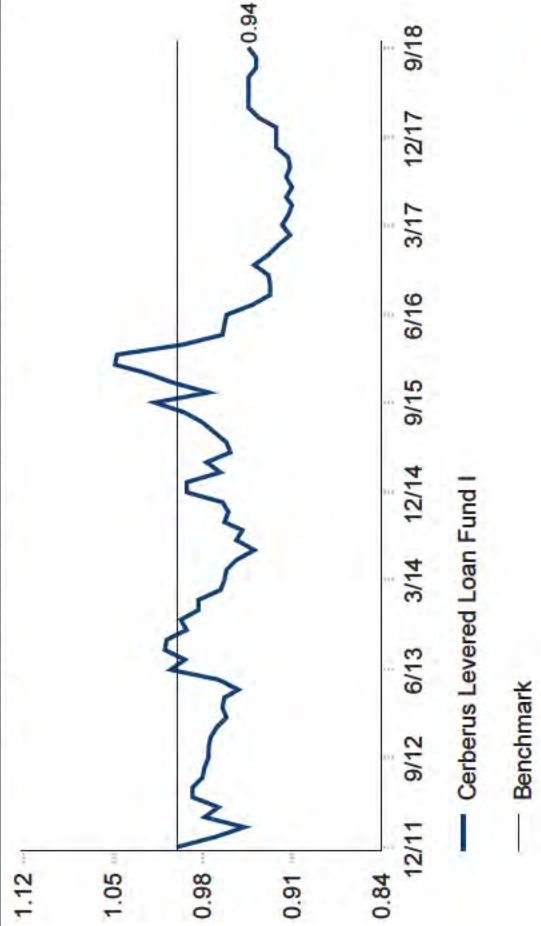
Return Summary



Quarterly Excess Performance

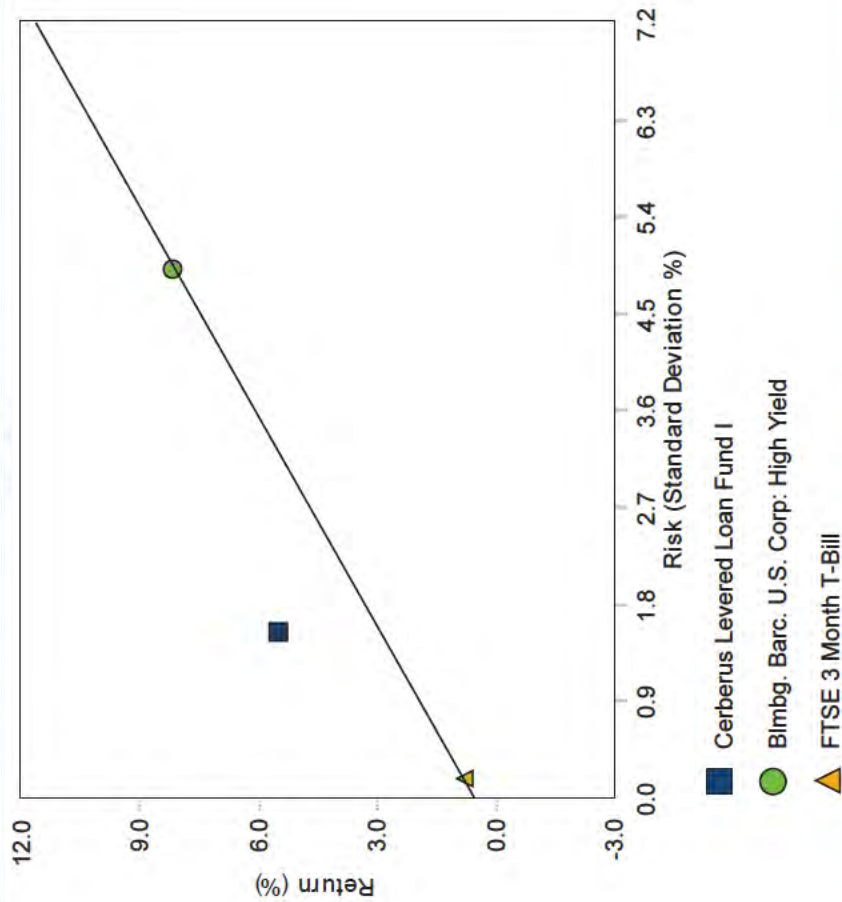


Ratio of Cumulative Wealth - Since Inception

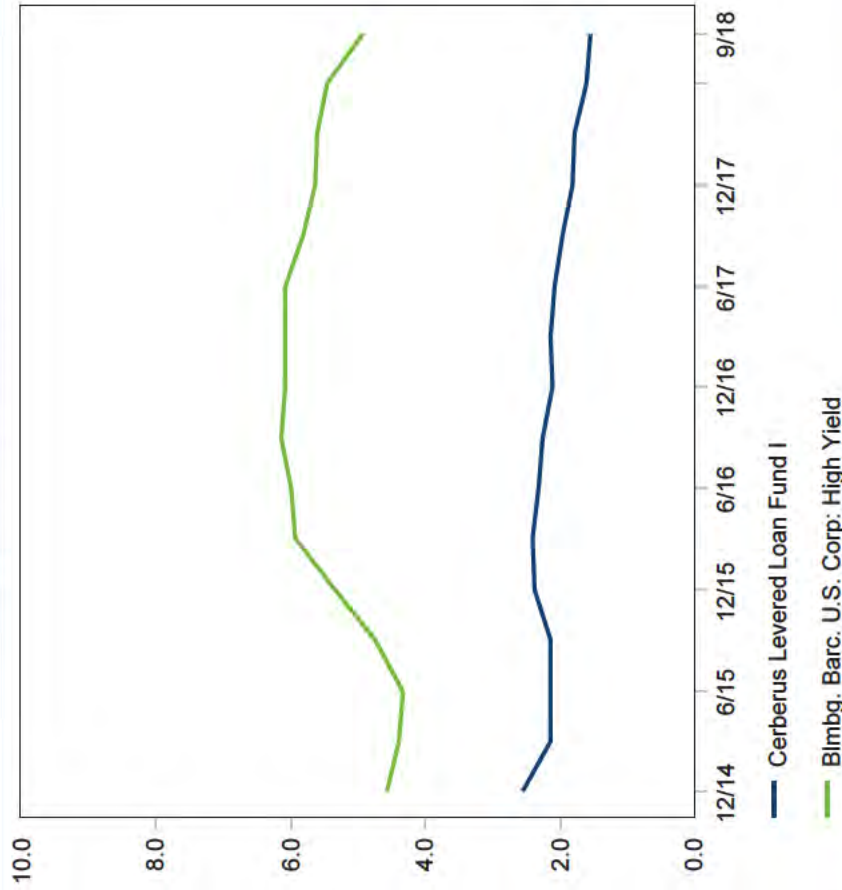


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Cerberus Levered Loan Fund I	-2.63	5.48	-0.48	0.05	3.01	6.06	-0.07	5.47	1.55	-0.22
Blmbg. Barc. U.S. Corp: High Yield	0.00	0.00	N/A	1.00	1.45	0.00	1.00	8.15	4.93	1.00
FTSE 3 Month T-Bill	-7.17	4.96	-1.45	0.02	N/A	0.84	0.00	0.80	0.18	-0.13

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## Risk Statistics

## Cerberus Levered Loan Fund I

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	6.63	5.47	4.15	N/A	6.02	01/01/2012
Standard Deviation	0.95	1.55	1.88	N/A	2.18	
Downside Risk	0.00	0.96	1.05	N/A	0.90	
Downside Semi Deviation	N/A	1.17	2.32	N/A	2.32	
Max Drawdown Recovery Period	N/A	7.00	16.00	N/A	16.00	
Maximum Drawdown	0.00	-1.47	-2.44	N/A	-2.44	
Maximum Loss Exposure	N/A	-1.47	N/A	N/A	N/A	
Upside Semi Deviation	2.16	2.07	2.23	N/A	2.86	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	6.94	
Standard Deviation	2.00	4.93	4.95	10.05	4.88	
Downside Risk	1.12	2.29	2.73	6.68	2.63	
Downside Semi Deviation	0.62	1.30	4.95	12.88	4.90	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.45	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	3.42	-2.63	-1.44	N/A	-0.96	
Tracking Error	2.11	5.48	5.21	N/A	5.30	
Actual Correlation	0.12	-0.22	0.05	N/A	0.02	
Beta	0.06	-0.07	0.02	N/A	0.01	
Consistency	66.67	44.44	45.00	N/A	43.21	
Down Market Capture	-104.60	-47.09	-21.47	N/A	-42.78	
Down Market Outperformance	3.55	12.74	15.66	N/A	18.39	
Information Ratio	1.62	-0.48	-0.28	N/A	-0.18	
Jensen Alpha	4.93	5.13	3.58	N/A	5.57	
Up Market Capture	97.10	36.31	32.32	N/A	38.89	
Up Market Outperformance	-0.14	-10.51	-10.54	N/A	-10.30	
vs. FTSE 3 Month T-Bill						
Excess Return	4.88	4.55	3.60	N/A	5.50	
Excess Risk	0.95	1.51	1.84	N/A	2.18	
Sharpe Ratio	5.11	3.01	1.95	N/A	2.53	

Calculation based on monthly periodicity.

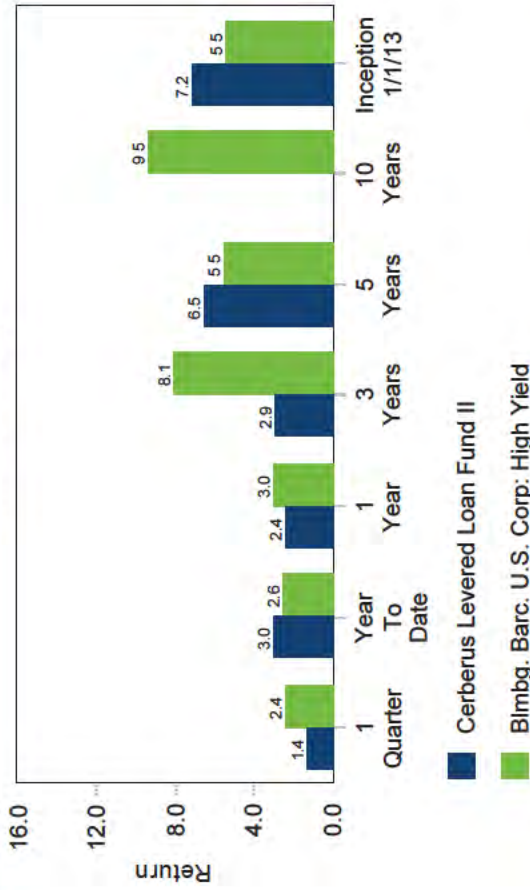
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Performance Summary

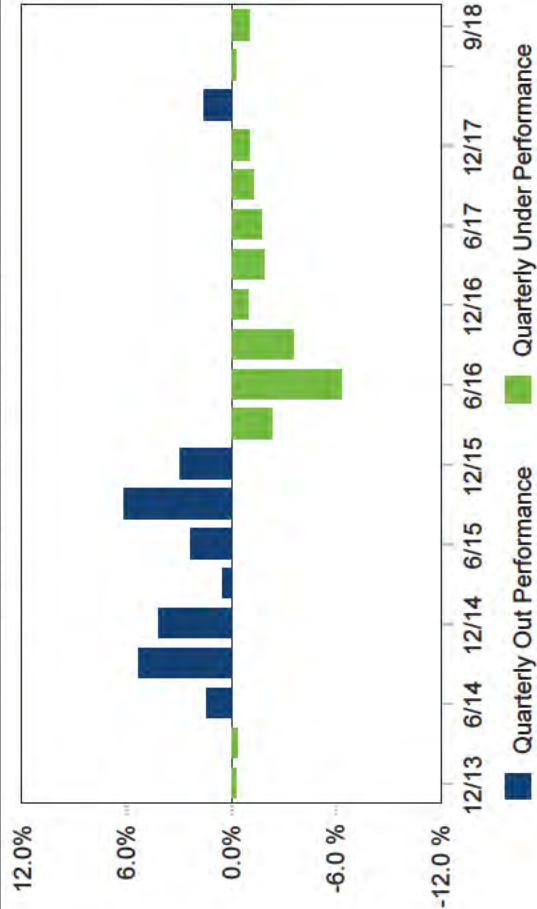
Account Information

Account Name: Cerberus Levered Loan Fund II  
 Inception Date: 12/31/2012  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

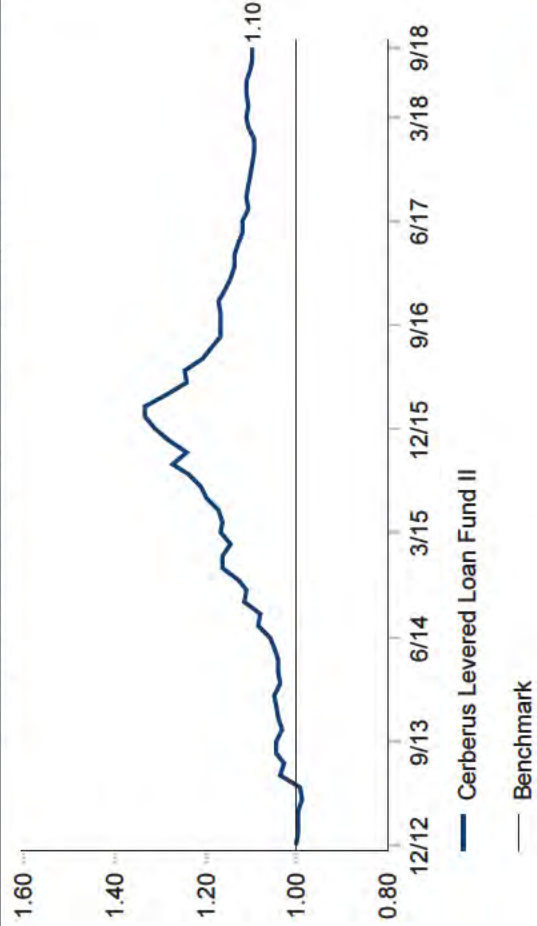
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





## Risk Statistics

## Cerberus Levered Loan Fund II

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.40	2.91	6.55	N/A	7.19	01/01/2013
Standard Deviation	1.15	1.84	2.02	N/A	1.99	
Downside Risk	0.60	1.37	1.06	N/A	0.98	
Downside Semi Deviation	0.41	1.05	1.05	N/A	1.05	
Max Drawdown Recovery Period	4.00	6.00	6.00	N/A	6.00	
Maximum Drawdown	-0.74	-2.27	-2.27	N/A	-2.27	
Maximum Loss Exposure	-0.60	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.41	1.64	2.67	N/A	2.79	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.47	
Standard Deviation	2.00	4.93	4.95	10.05	4.93	
Downside Risk	1.12	2.29	2.73	6.68	2.80	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.30	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	-0.65	-5.09	0.86	N/A	1.53	
Tracking Error	1.90	4.96	5.27	N/A	5.26	
Actual Correlation	0.37	0.17	0.04	N/A	0.03	
Beta	0.21	0.06	0.02	N/A	0.01	
Consistency	25.00	30.56	48.33	N/A	49.28	
Down Market Capture	-6.53	-13.20	-42.50	N/A	-46.43	
Down Market Outperformance	1.84	9.68	18.62	N/A	19.50	
Information Ratio	-0.34	-1.03	0.16	N/A	0.29	
Jensen Alpha	0.55	1.60	5.93	N/A	6.66	
Up Market Capture	47.51	22.89	46.54	N/A	50.32	
Up Market Outperformance	-2.58	-12.63	-8.40	N/A	-7.89	
vs. FTSE 3 Month T-Bill						
Excess Return	0.81	2.09	5.89	N/A	6.55	
Excess Risk	1.10	1.85	2.09	N/A	2.06	
Sharpe Ratio	0.74	1.13	2.82	N/A	3.18	

Calculation based on monthly periodicity.

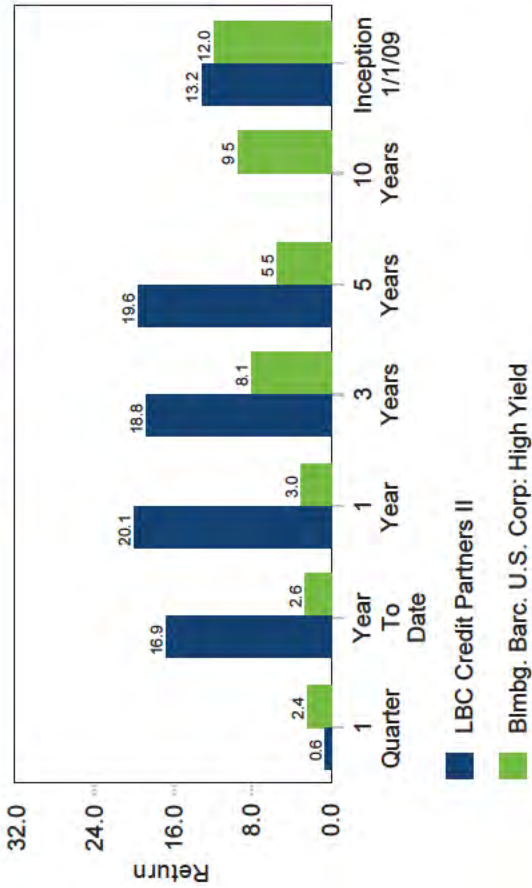
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Performance Summary

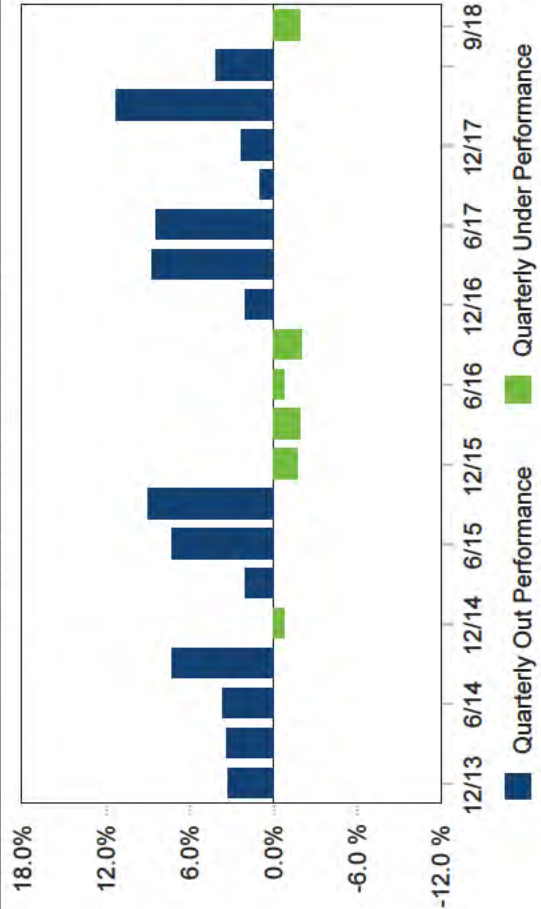
Account Information

Account Name: LBC Credit Partners II  
 Inception Date: 12/31/2008  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

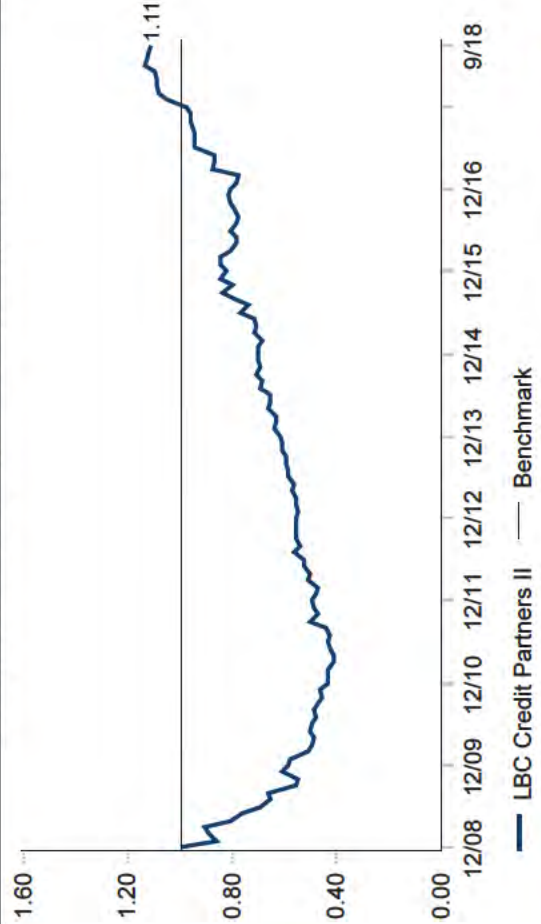
Return Summary



Quarterly Excess Performance

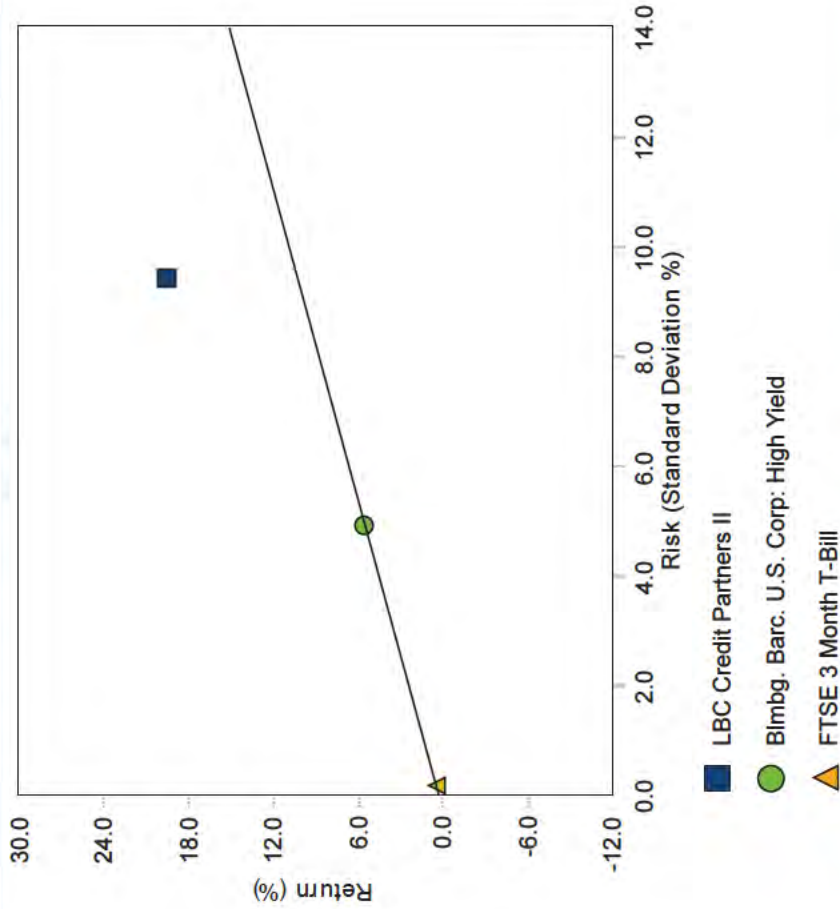


Ratio of Cumulative Wealth - Since Inception

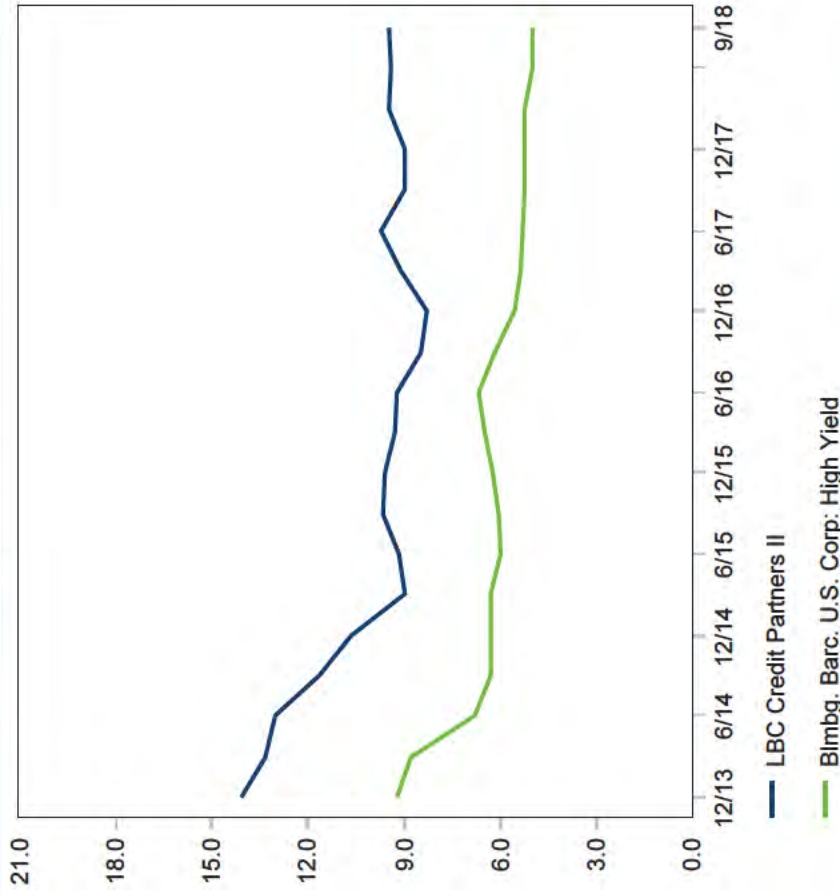


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
LBC Credit Partners II	12.93	11.18	1.16	0.01	1.90	21.61	-0.23	19.60	9.44	-0.12
Blmbg. Barc. U.S. Corp: High Yield	0.00	0.00	N/A	1.00	1.02	0.00	1.00	5.54	4.95	1.00
FTSE 3 Month T-Bill	-5.03	4.95	-1.02	0.00	N/A	0.48	0.00	0.49	0.18	0.03

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## Risk Statistics

## LBC Credit Partners II

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	20.07	18.82	19.60	N/A	13.19	01/01/2009
Standard Deviation	7.94	10.33	9.44	N/A	12.13	
Downside Risk	0.40	2.95	3.08	N/A	7.05	
Downside Semi Deviation	N/A	2.91	2.79	N/A	18.99	
Max Drawdown Recovery Period	N/A	7.00	7.00	N/A	38.00	
Maximum Drawdown	-0.38	-4.53	-4.53	N/A	-21.58	
Maximum Loss Exposure	N/A	-3.74	N/A	N/A	-11.45	
Upside Semi Deviation	2.95	11.89	11.10	N/A	11.46	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	11.96	
Standard Deviation	2.00	4.93	4.95	10.05	7.67	
Downside Risk	1.12	2.29	2.73	6.68	3.25	
Downside Semi Deviation	0.62	1.30	4.95	12.88	6.40	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	9.02	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	15.68	9.88	12.93	N/A	1.55	
Tracking Error	7.95	11.95	11.18	N/A	15.69	
Actual Correlation	0.12	-0.12	-0.12	N/A	-0.22	
Beta	0.47	-0.24	-0.23	N/A	-0.34	
Consistency	75.00	55.56	58.33	N/A	49.57	
Down Market Capture	-179.04	-174.19	-148.27	N/A	-118.67	
Down Market Outperformance	4.86	24.12	33.79	N/A	37.96	
Information Ratio	1.97	0.83	1.16	N/A	0.10	
Jensen Alpha	17.66	20.47	20.91	N/A	18.10	
Up Market Capture	327.52	116.67	123.58	N/A	47.53	
Up Market Outperformance	11.56	2.61	3.67	N/A	-14.01	
vs. FTSE 3 Month T-Bill						
Excess Return	17.14	17.06	17.97	N/A	12.89	
Excess Risk	7.96	10.31	9.44	N/A	12.12	
Sharpe Ratio	2.15	1.65	1.90	N/A	1.06	

Calculation based on monthly periodicity.

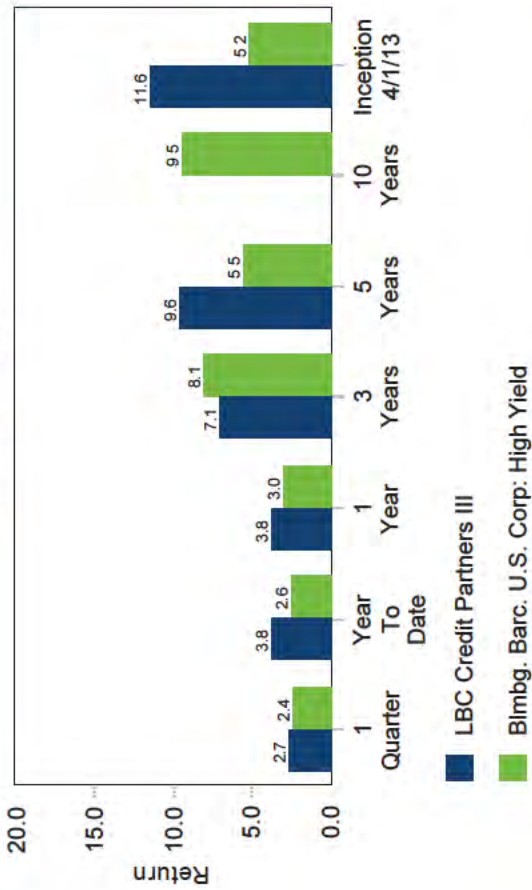
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Performance Summary

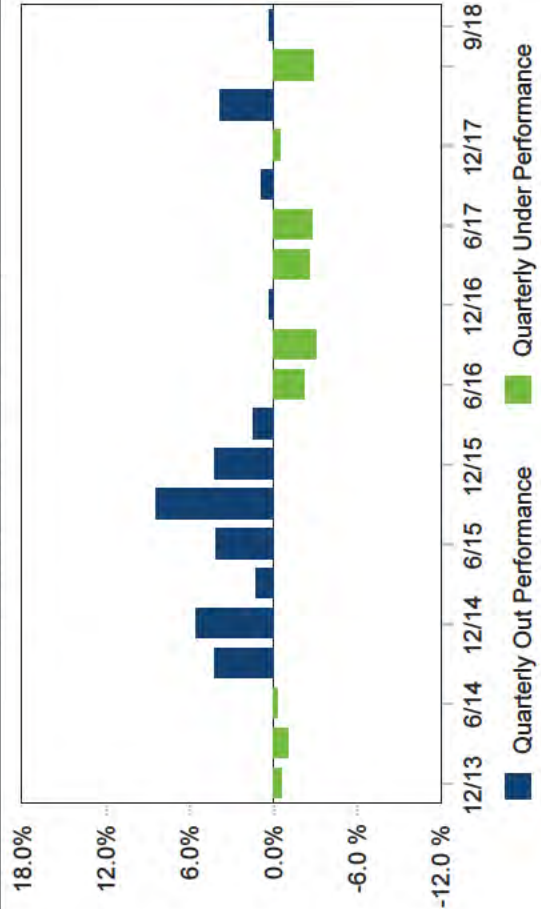
Account Information

Account Name: LBC Credit Partners III  
 Inception Date: 03/31/2013  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

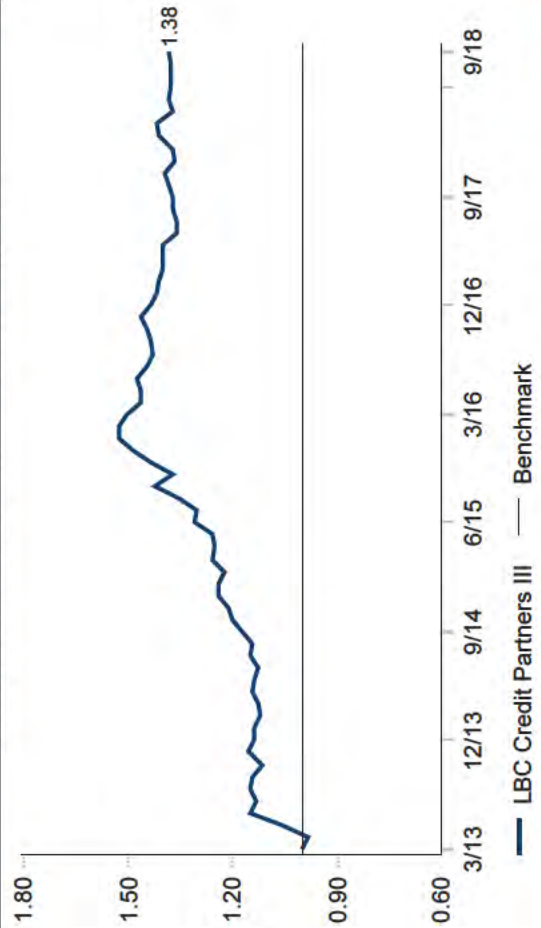
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## LBC Credit Partners III

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.85	7.13	9.63	N/A	11.56	04/01/2013
Standard Deviation	4.60	4.07	4.18	N/A	5.20	
Downside Risk	3.47	2.56	2.08	N/A	1.98	
Downside Semi Deviation	3.32	2.19	1.74	N/A	1.74	
Max Drawdown Recovery Period	6.00	6.00	6.00	N/A	6.00	
Maximum Drawdown	-2.89	-2.89	-2.89	N/A	-2.89	
Maximum Loss Exposure	N/A	-1.00	N/A	N/A	N/A	
Upside Semi Deviation	1.03	4.07	4.87	N/A	6.19	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	5.18	
Standard Deviation	2.00	4.93	4.95	10.05	5.02	
Downside Risk	1.12	2.29	2.73	6.68	2.86	
Downside Semi Deviation	0.62	1.30	4.95	12.88	5.03	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-1.44	
Upside Semi Deviation	0.68	5.86	5.38	9.42	5.40	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	0.85	-0.98	3.79	N/A	5.94	
Tracking Error	5.46	6.25	6.73	N/A	7.97	
Actual Correlation	-0.26	0.04	-0.08	N/A	-0.22	
Beta	-0.59	0.04	-0.07	N/A	-0.23	
Consistency	66.67	50.00	53.33	N/A	53.03	
Down Market Capture	-204.74	-96.89	-90.68	N/A	-129.55	
Down Market Outperformance	5.32	17.35	25.64	N/A	32.07	
Information Ratio	0.16	-0.16	0.56	N/A	0.74	
Jensen Alpha	3.31	6.00	9.52	N/A	12.34	
Up Market Capture	6.78	37.95	55.48	N/A	53.09	
Up Market Outperformance	-4.61	-10.33	-7.11	N/A	-7.65	
vs. FTSE 3 Month T-Bill						
Excess Return	2.32	6.19	8.83	N/A	10.67	
Excess Risk	4.59	4.11	4.22	N/A	5.24	
Sharpe Ratio	0.50	1.51	2.09	N/A	2.04	

Calculation based on monthly periodicity.

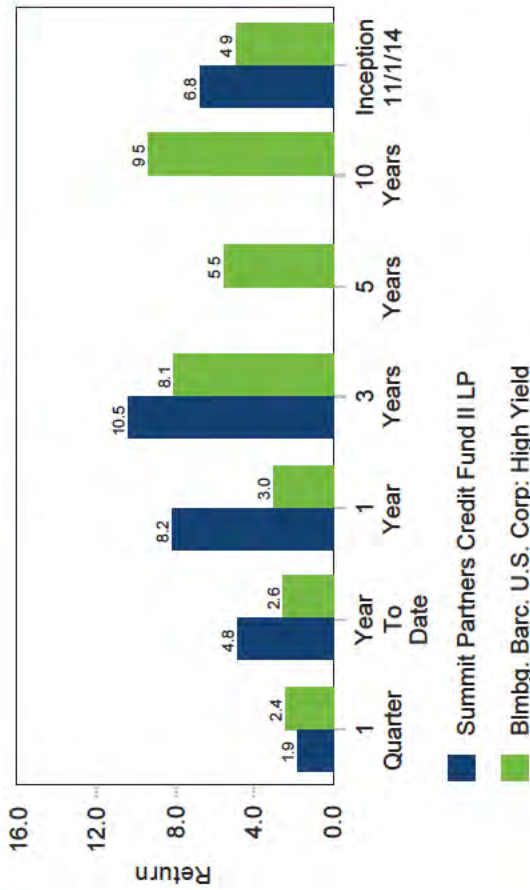
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Performance Summary

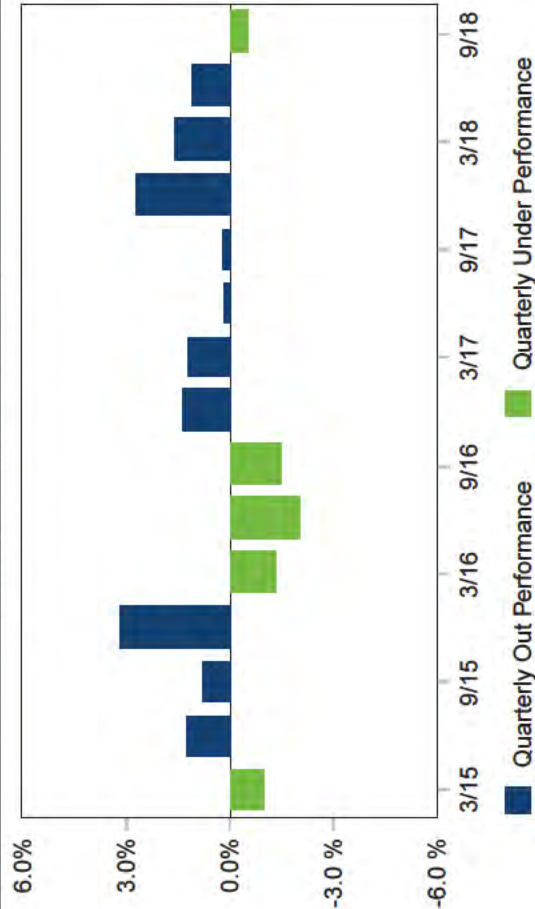
Account Information

Account Name: Summit Partners Credit Fund II LP  
 Inception Date: 11/01/2014  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

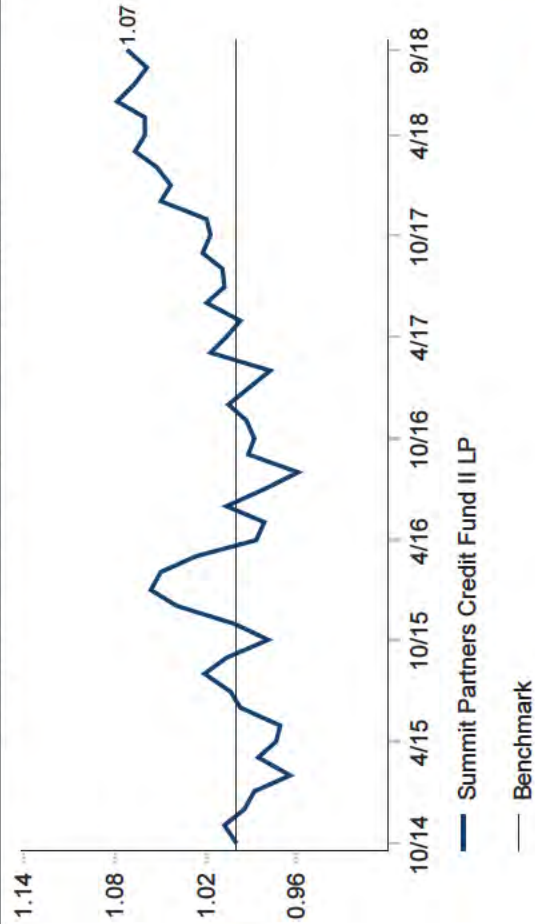
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

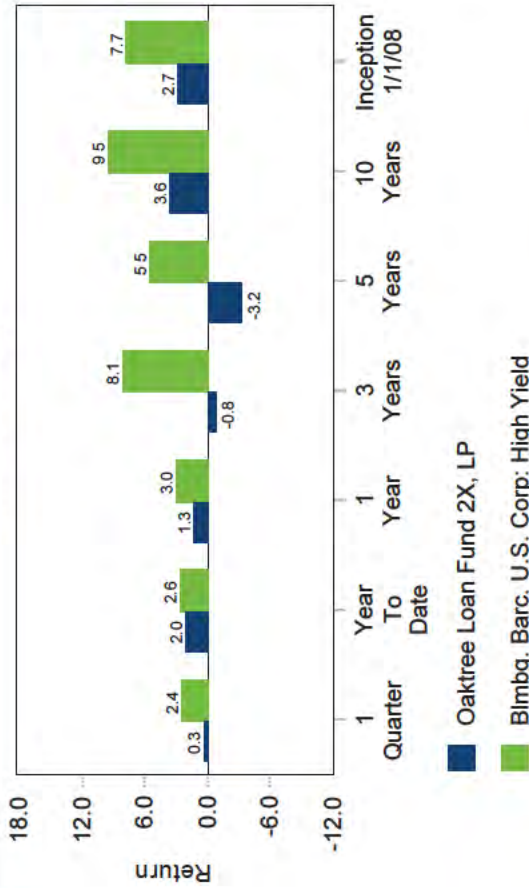


Performance Summary

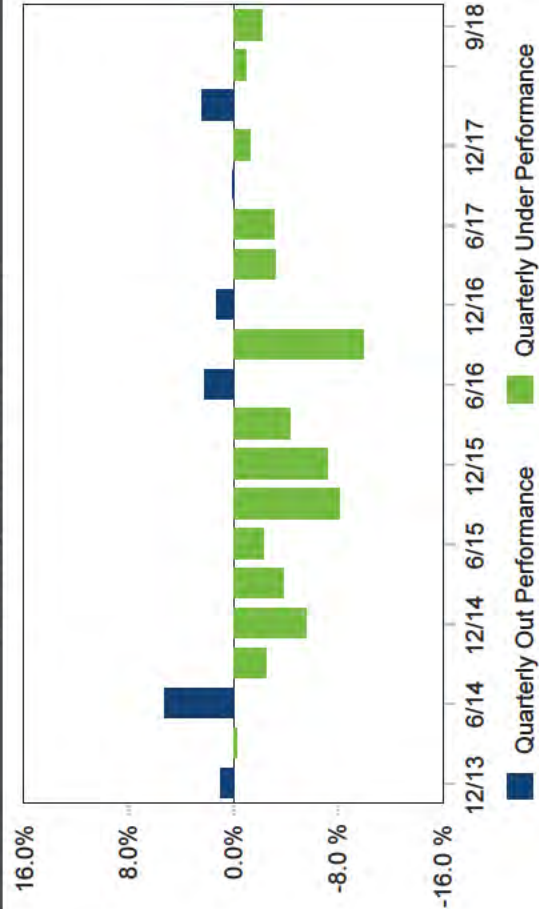
Account Information

Account Name: Oaktree Loan Fund 2X, LP  
 Inception Date: 12/31/2007  
 Account Structure: Commingled Fund  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. U.S. Corp: High Yield  
 Peer Group: IM U.S. High Yield Bonds (SA+CF)

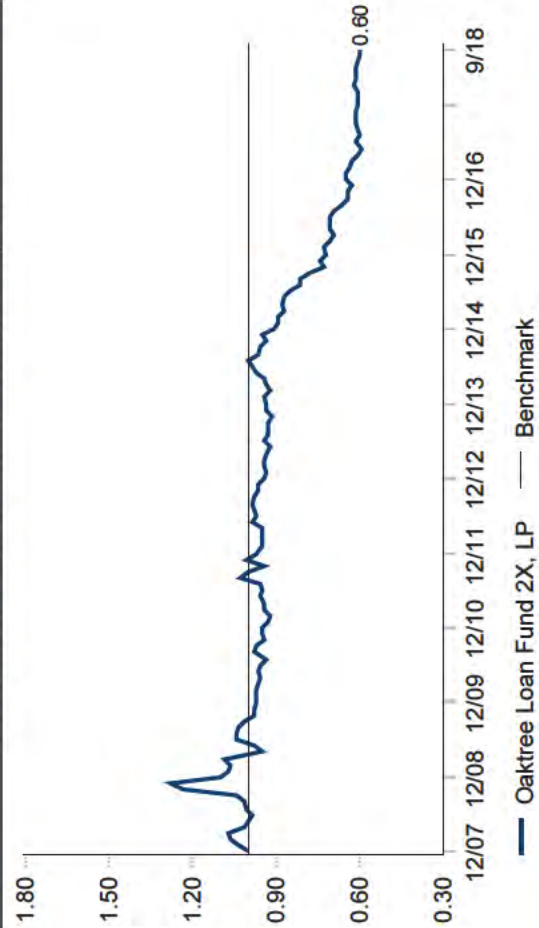
Return Summary



Quarterly Excess Performance



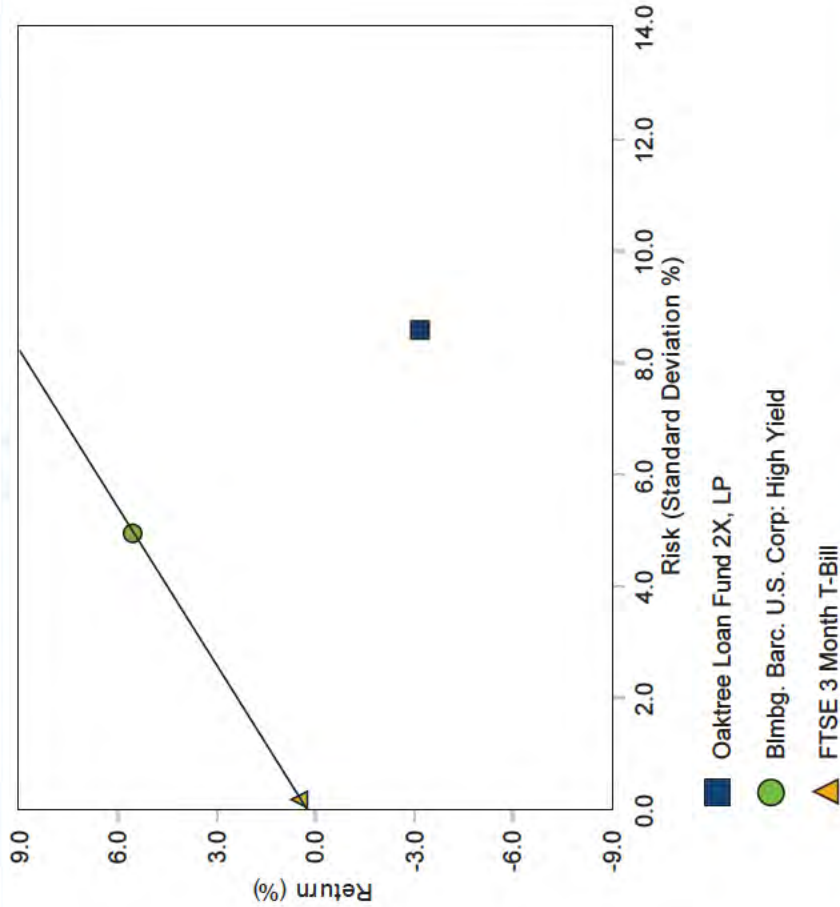
Ratio of Cumulative Wealth - Since Inception



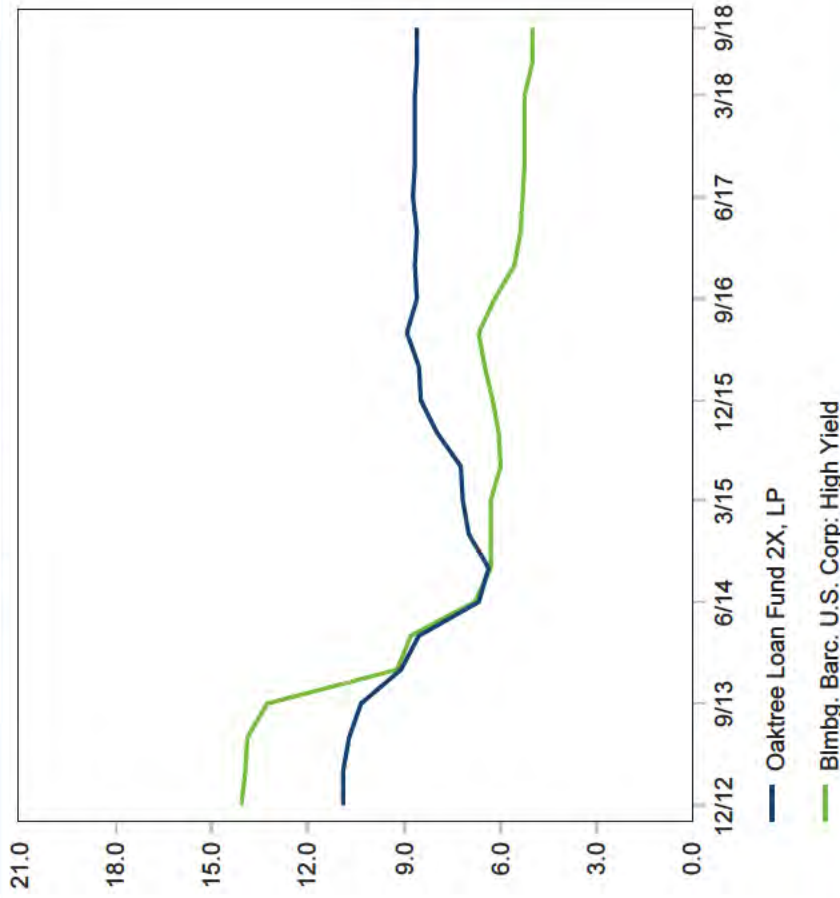


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Oaktree Loan Fund 2X, LP	-8.37	7.25	-1.15	0.29	-0.39	-7.77	0.94	-3.17	8.62	0.54
Blimbg. Barc. U.S. Corp: High Yield	0.00	0.00	N/A	1.00	1.02	0.00	1.00	5.54	4.95	1.00
FTSE 3 Month T-Bill	-5.03	4.95	-1.02	0.00	N/A	0.48	0.00	0.49	0.18	0.03

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## Risk Statistics

## Oaktree Loan Fund 2X, LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.27	-0.78	-3.17	3.60	2.74	01/01/2008
Standard Deviation	2.98	7.79	8.62	9.70	9.64	
Downside Risk	1.82	5.27	6.81	6.27	6.38	
Downside Semi Deviation	1.01	7.56	9.88	9.76	9.91	
Max Drawdown Recovery Period	6.00	N/A	N/A	N/A	N/A	
Maximum Drawdown	-1.77	-12.37	-34.18	-34.18	-34.18	
Maximum Loss Exposure	-0.74	-12.37	-23.64	-14.10	-19.34	
Upside Semi Deviation	0.86	8.24	7.51	9.85	9.58	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	7.70	
Standard Deviation	2.00	4.93	4.95	10.05	10.23	
Downside Risk	1.12	2.29	2.73	6.68	6.98	
Downside Semi Deviation	0.62	1.30	4.95	12.88	12.80	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	14.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-32.46	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	-31.42	
Upside Semi Deviation	0.68	5.86	5.38	9.42	9.39	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	-1.72	-8.46	-8.37	-5.58	-4.81	
Tracking Error	3.11	7.25	7.25	11.28	11.18	
Actual Correlation	0.27	0.42	0.54	0.35	0.37	
Beta	0.40	0.67	0.94	0.34	0.35	
Consistency	25.00	33.33	40.00	40.83	42.64	
Down Market Capture	49.58	107.70	176.35	74.08	66.69	
Down Market Outperformance	0.85	-0.74	-8.93	5.48	7.20	
Information Ratio	-0.55	-1.17	-1.15	-0.49	-0.43	
Jensen Alpha	-0.83	-5.84	-7.76	0.56	0.09	
Up Market Capture	45.45	24.53	47.88	55.41	53.13	
Up Market Outperformance	-2.69	-12.67	-8.44	-12.15	-12.67	
vs. FTSE 3 Month T-Bill						
Excess Return	-0.26	-1.29	-3.34	3.69	2.73	
Excess Risk	2.97	7.77	8.60	9.71	9.65	
Sharpe Ratio	-0.09	-0.17	-0.39	0.38	0.28	

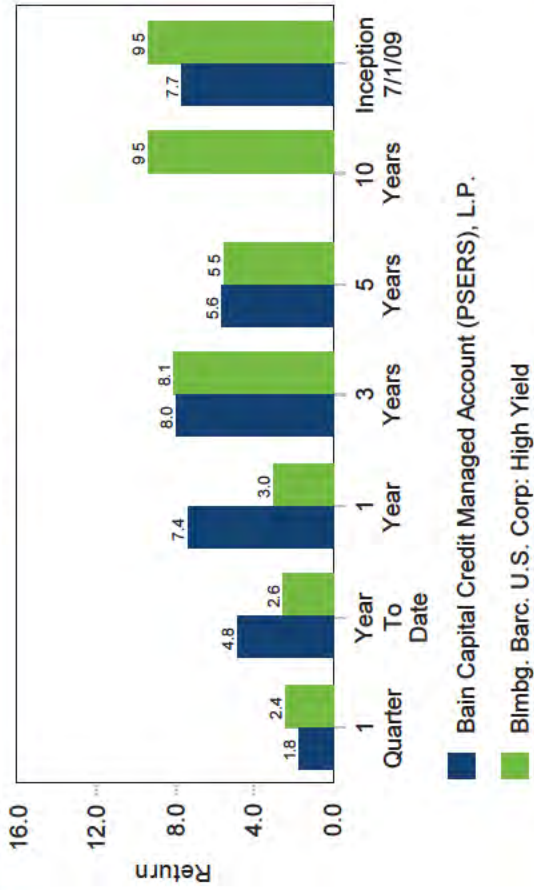
Calculation based on monthly periodicity.

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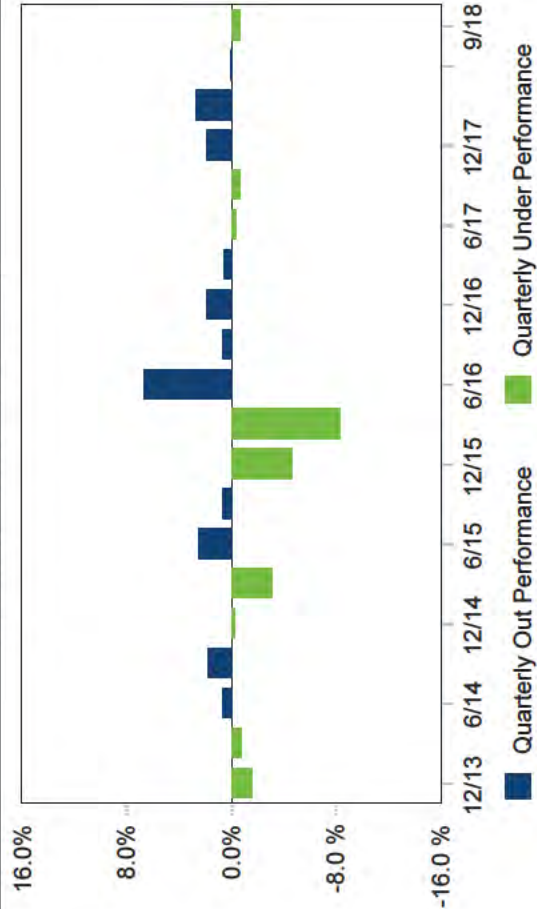
**Account Information**

**Account Name:** Bain Capital Credit Managed Account (PSERS), L.P.  
**Inception Date:** 06/30/2009  
**Account Structure:** Commingled Fund  
**Asset Class:** US Fixed Income  
**Benchmark:** Blmbg. Barc. U.S. Corp: High Yield  
**Peer Group:** IM U.S. Bank Loans (SA+CF)

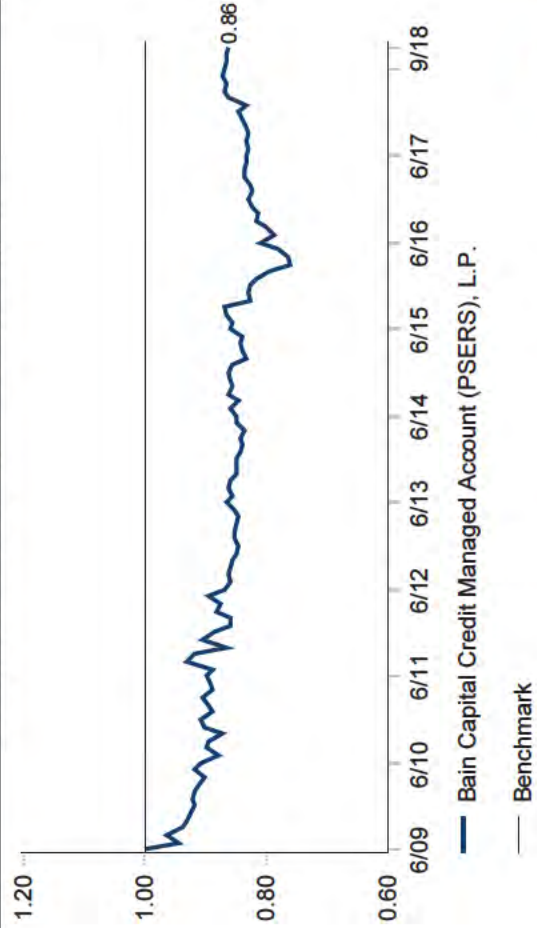
**Return Summary**



**Quarterly Excess Performance**

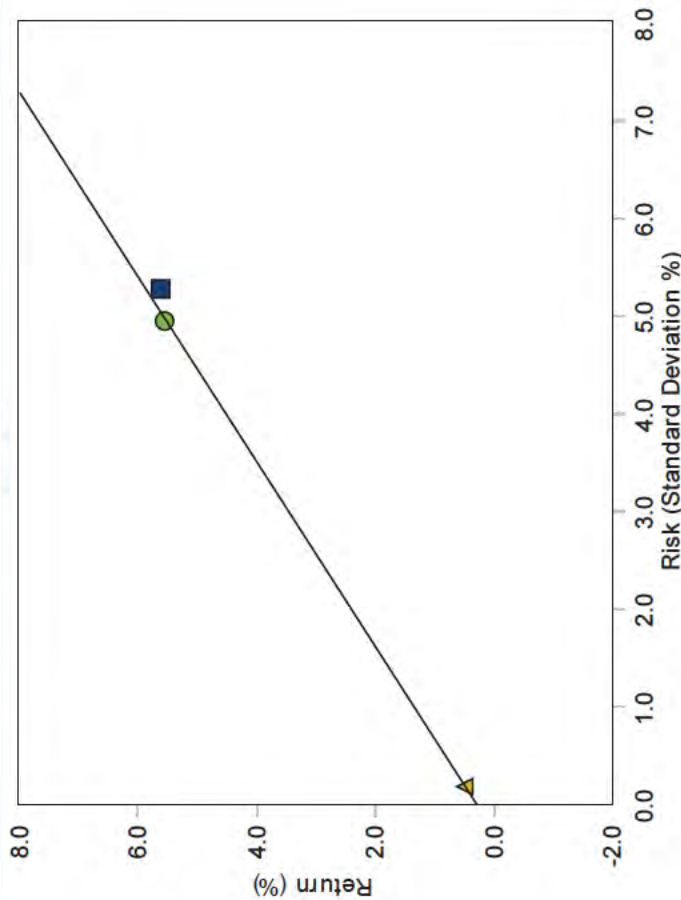


**Ratio of Cumulative Wealth - Since Inception**



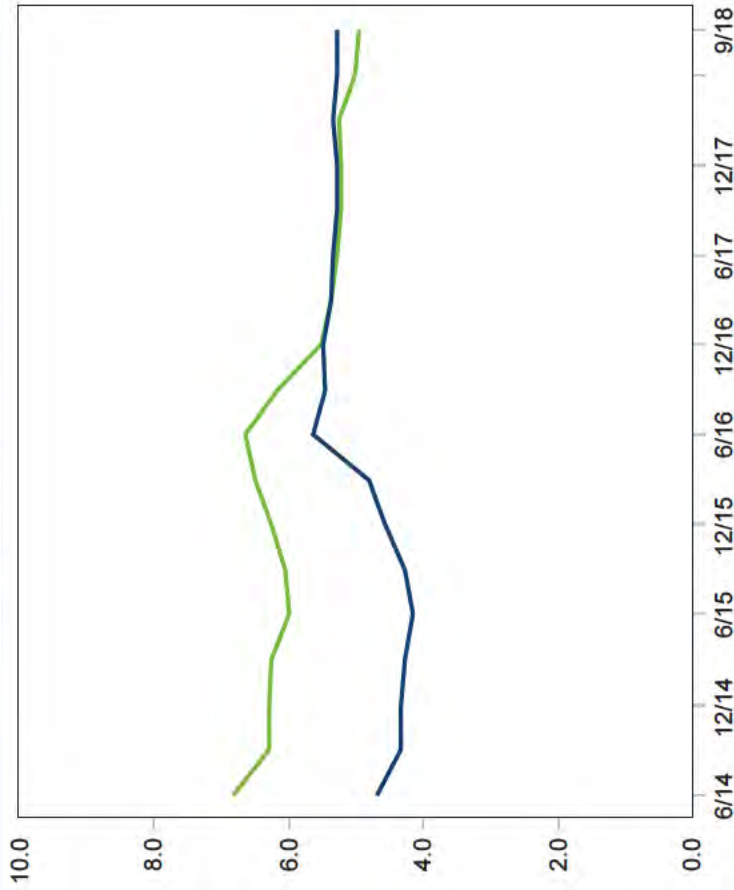
Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



- Bain Capital Credit Managed Account (PSERS), L.P.
- Blmbg. Barc. U.S. Corp: High Yield
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Bain Capital Credit Managed Account (PSERS), L.P.
- Blmbg. Barc. U.S. Corp: High Yield

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bain Capital Credit Managed Account (PSERS), L.P.	0.10	5.36	0.02	0.21	0.97	2.98	0.48	5.62	5.29	0.45
Blmbg. Barc. U.S. Corp: High Yield	0.00	0.00	N/A	1.00	1.02	0.00	1.00	5.54	4.95	1.00
FTSE 3 Month T-Bill	-5.03	4.95	-1.02	0.00	N/A	0.48	0.00	0.49	0.18	0.03

## Risk Statistics

## Bain Capital Credit Managed Account (PSERS), L.P.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	7.39	7.98	5.62	N/A	7.73	07/01/2009
Standard Deviation	2.62	6.13	5.29	N/A	5.14	
Downside Risk	0.80	3.19	2.81	N/A	2.70	
Downside Semi Deviation	N/A	2.44	6.50	N/A	7.08	
Max Drawdown Recovery Period	2.00	10.00	15.00	N/A	15.00	
Maximum Drawdown	-0.76	-11.29	-14.88	N/A	-14.88	
Maximum Loss Exposure	N/A	-11.29	-7.37	N/A	N/A	
Upside Semi Deviation	1.00	6.29	5.34	N/A	5.33	
Blmbg. Barc. U.S. Corp: High Yield						
Return	3.05	8.15	5.54	9.46	9.45	
Standard Deviation	2.00	4.93	4.95	10.05	6.24	
Downside Risk	1.12	2.29	2.73	6.68	3.18	
Downside Semi Deviation	0.62	1.30	4.95	12.88	6.19	
Max Drawdown Recovery Period	6.00	6.00	13.00	7.00	13.00	
Maximum Drawdown	-1.45	-6.22	-9.68	-23.74	-9.68	
Maximum Loss Exposure	-0.39	-3.64	-0.25	-23.74	N/A	
Upside Semi Deviation	0.68	5.86	5.38	9.42	7.04	
vs. Blmbg. Barc. U.S. Corp: High Yield						
Active Return	4.16	-0.09	0.10	N/A	-1.66	
Tracking Error	3.95	6.03	5.36	N/A	6.37	
Actual Correlation	-0.46	0.42	0.45	N/A	0.39	
Beta	-0.60	0.53	0.48	N/A	0.32	
Consistency	58.33	52.78	51.67	N/A	46.85	
Down Market Capture	-226.35	19.88	26.82	N/A	10.68	
Down Market Outperformance	5.70	6.64	9.06	N/A	13.62	
Information Ratio	1.05	-0.02	0.02	N/A	-0.26	
Jensen Alpha	6.74	3.36	2.74	N/A	4.53	
Up Market Capture	68.23	77.57	69.03	N/A	58.64	
Up Market Outperformance	-1.58	-3.94	-5.03	N/A	-8.95	
vs. FTSE 3 Month T-Bill						
Excess Return	5.62	7.08	5.13	N/A	7.29	
Excess Risk	2.64	6.13	5.27	N/A	5.14	
Sharpe Ratio	2.13	1.16	0.97	N/A	1.42	

Calculation based on monthly periodicity.

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## Inflation Protected

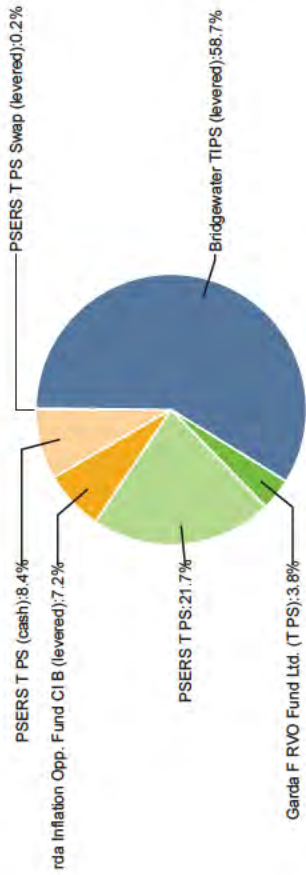
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Case ID: 221102792

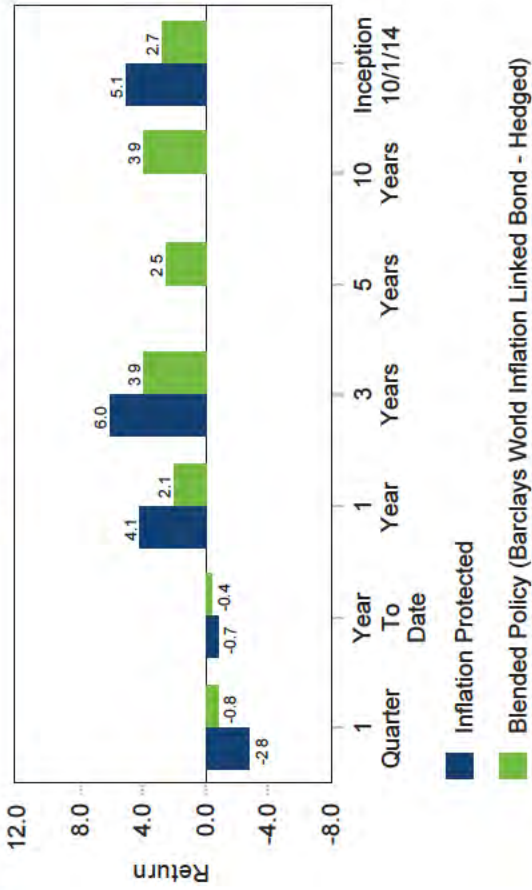
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Current Allocation

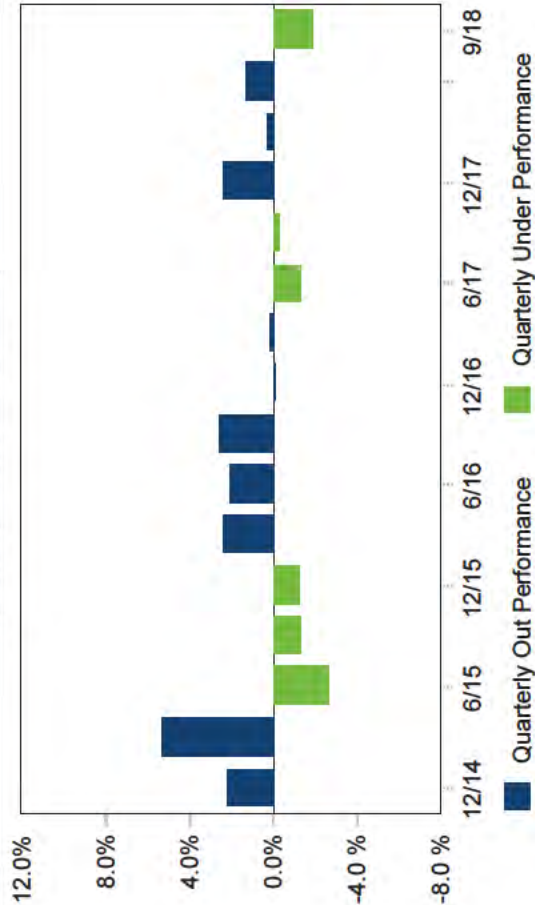
September 30, 2018 : \$3,964M



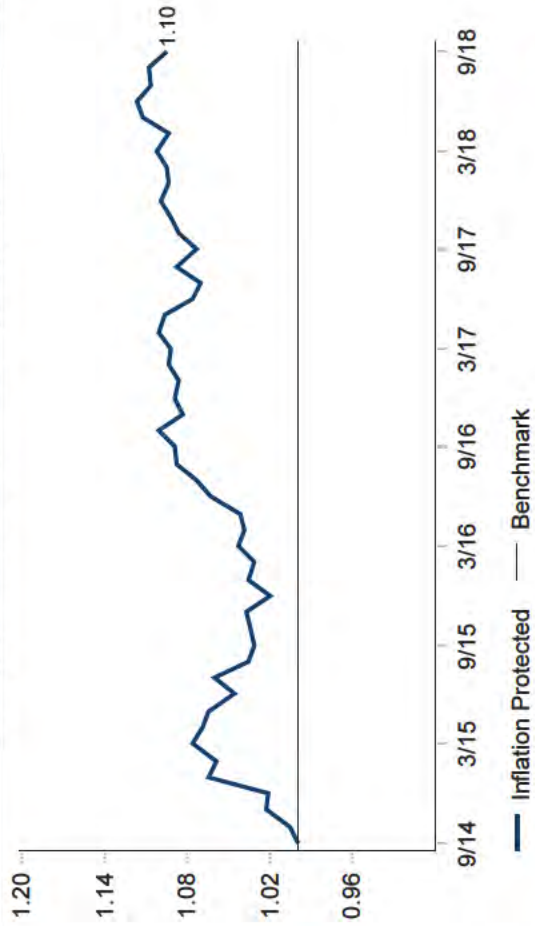
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





# TIPS

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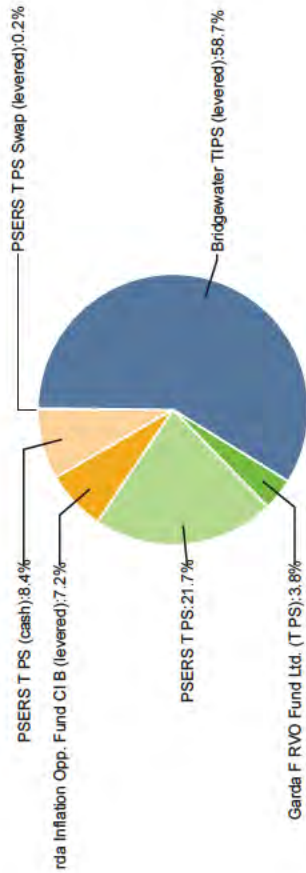
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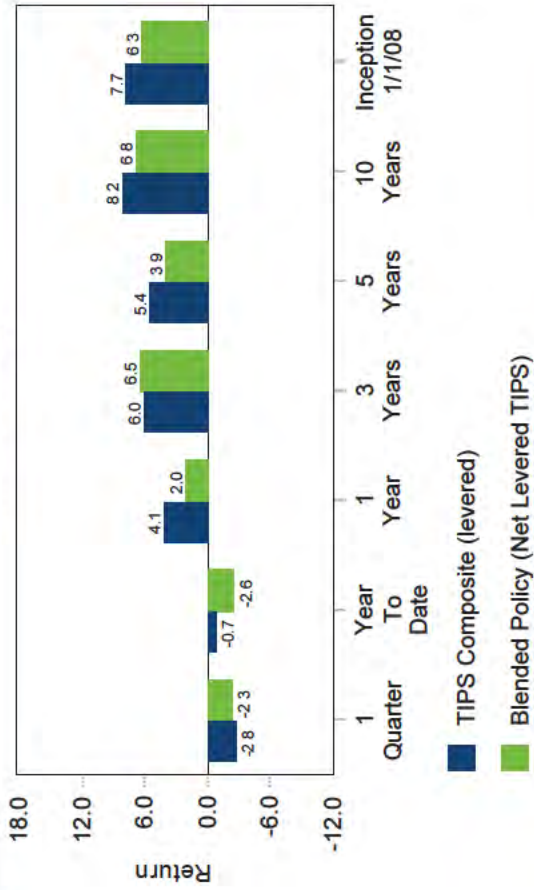


Current Allocation

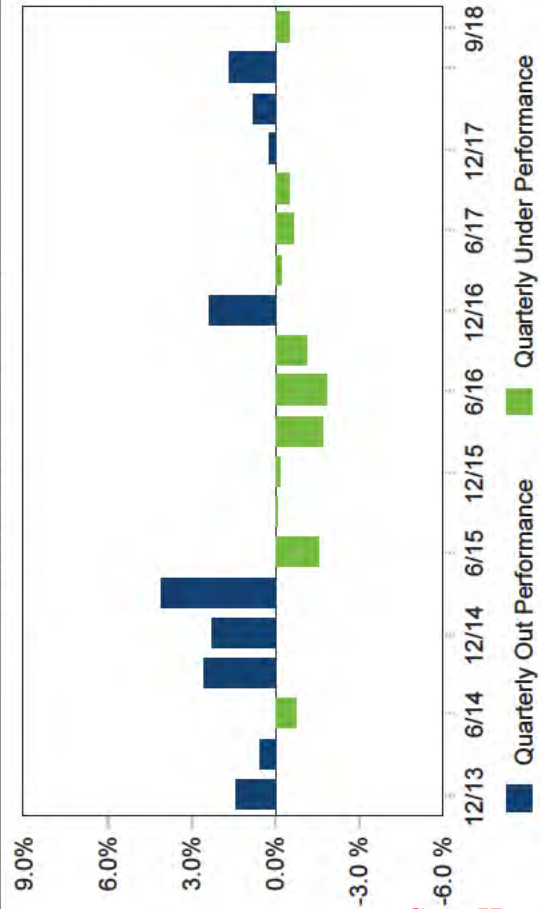
September 30, 2018 : \$3,964M



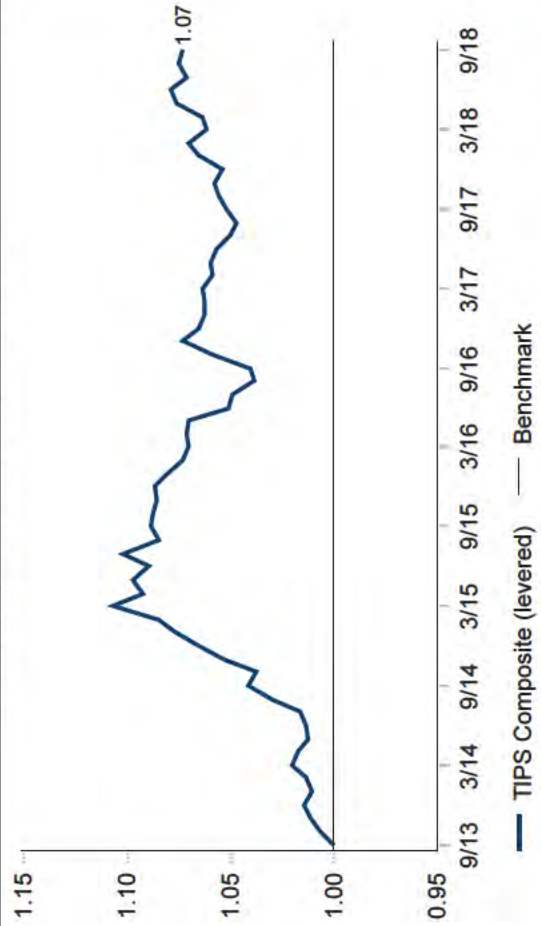
Return Summary



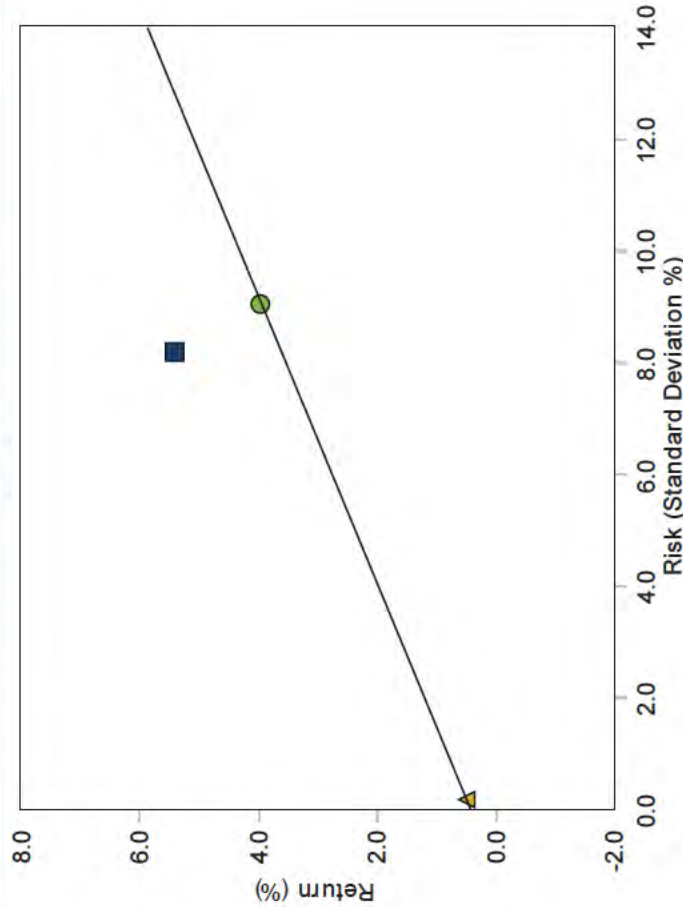
Quarterly Excess Performance



Ratio of Cumulative Wealth - 5 Years

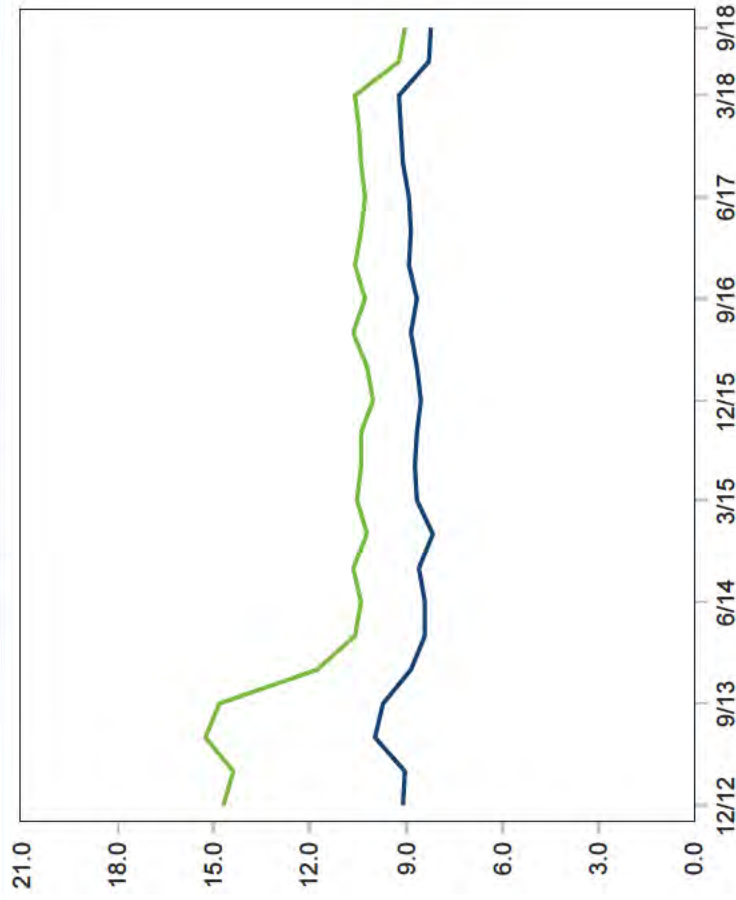


Annualized Return vs. Annualized Standard Deviation  
5 Years



- TIPS Composite (levered)
- Blended Policy (Net Levered TIPS)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- TIPS Composite (levered)
- Blended Policy (Net Levered TIPS)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
TIPS Composite (levered)	1.35	2.72	0.50	0.91	0.62	1.94	0.87	5.42	8.22	0.96
Blended Policy (Net Levered TIPS)	0.00	0.00	N/A	1.00	0.42	0.00	1.00	3.94	9.06	1.00
FTSE 3 Month T-Bill	-3.79	9.07	-0.42	0.00	N/A	0.49	0.00	0.49	0.18	-0.05

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## Risk Statistics

TIPS Composite (levered)	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.11	6.02	5.42	8.17	7.00	04/01/2004
Standard Deviation	5.52	7.79	8.22	9.00	8.07	
Downside Risk	3.31	4.52	4.75	5.39	4.94	
Downside Semi Deviation	1.58	7.15	7.45	9.07	8.76	
Max Drawdown Recovery Period	N/A	8.00	17.00	21.00	21.00	
Maximum Drawdown	-2.77	-4.55	-8.84	-12.98	-12.98	
Maximum Loss Exposure	N/A	-2.17	-2.66	-7.56	-4.54	
Upside Semi Deviation	1.80	8.72	9.09	9.51	8.15	
Blended Policy (Net Levered TIPS)						
Return	2.00	6.50	3.94	6.76	N/A	
Standard Deviation	5.97	9.22	9.06	12.29	N/A	
Downside Risk	3.95	5.23	5.41	8.29	N/A	
Downside Semi Deviation	1.69	8.28	8.31	13.80	N/A	
Max Drawdown Recovery Period	N/A	15.00	17.00	44.00	N/A	
Maximum Drawdown	-3.38	-6.88	-9.64	-18.17	N/A	
Maximum Loss Exposure	N/A	-2.06	-4.06	-17.72	N/A	
Upside Semi Deviation	1.94	10.38	9.86	11.73	N/A	
vs. Blended Policy (Net Levered TIPS)						
Active Return	2.03	-0.57	1.35	0.95	N/A	
Tracking Error	2.11	2.37	2.72	5.01	N/A	
Actual Correlation	0.94	0.98	0.96	0.94	N/A	
Beta	0.86	0.82	0.87	0.69	N/A	
Consistency	66.67	47.22	56.67	54.17	N/A	
Down Market Capture	83.73	84.24	82.27	67.70	N/A	
Down Market Outperformance	1.13	2.78	3.34	8.20	N/A	
Information Ratio	0.96	-0.24	0.50	0.19	N/A	
Jensen Alpha	2.13	0.47	1.87	3.20	N/A	
Up Market Capture	108.93	87.40	97.14	85.33	N/A	
Up Market Outperformance	0.93	-4.07	-0.84	-5.44	N/A	
vs. FTSE 3 Month T-Bill						
Excess Return	2.61	5.35	5.13	7.96	5.87	
Excess Risk	5.56	7.82	8.23	9.02	8.11	
Sharpe Ratio	0.47	0.68	0.62	0.88	0.72	

Calculation based on monthly periodicity.

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## Asset Allocation &amp; Peer Rankings

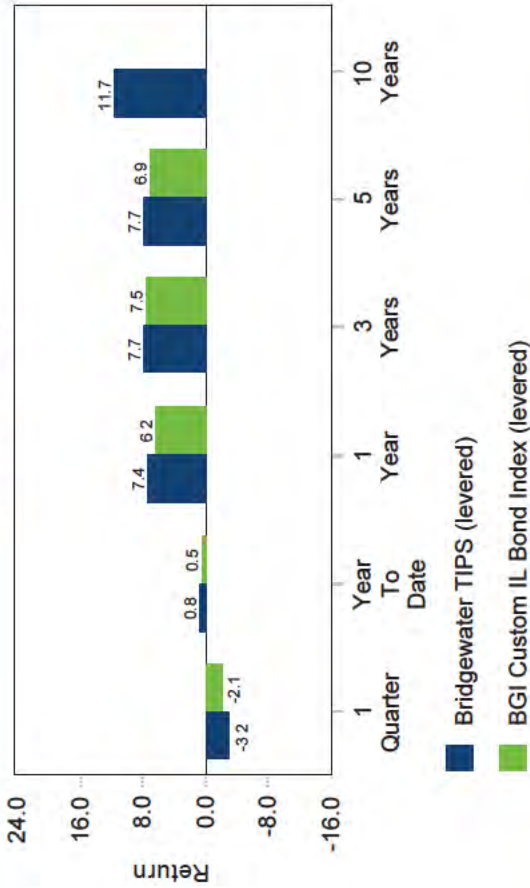
	Performance(%)										Allocation Market Value (\$000)	%
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)		
<b>TIPS Composite (levered)</b>	-2.77 (100)	-0.73 (99)	-2.77 (100)	4.11 (1)	6.02 (1)	5.42 (1)	8.17 (1)	7.00 (1)	04/01/2004	3,963,885	100.0	
Blended Policy (Net Levered TIPS)	-2.27 (100)	-2.56 (99)	-2.27 (100)	2.00 (4)	6.50 (1)	3.94 (1)	6.76 (1)	N/A				
Value Added	-0.50	1.83	-0.50	2.11	-0.48	1.48	1.41	N/A				
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	-0.84 (55)	-0.44 (30)	-0.84 (55)	2.06 (4)	3.93 (1)	2.50 (1)	3.89 (2)	3.99 (2)				
Value Added	-1.93	-0.29	-1.93	2.05	2.09	2.92	4.28	3.01				
IM U.S. TIPS (SA+CF) Median	-0.80	-0.91	-0.80	0.20	1.87	1.15	3.19	3.45				
<b>Bridgewater TIPS (levered)</b>	-3.21 (100)	0.80 (3)	-3.21 (100)	7.40 (1)	7.74 (1)	7.71 (1)	11.71 (1)	9.89 (1)	07/01/2004	2,326,235	58.7	
BGI Custom IL Bond Index (levered)	-2.13 (100)	0.52 (6)	-2.13 (100)	6.22 (1)	7.54 (1)	6.95 (1)	N/A	N/A				
Value Added	-1.08	0.28	-1.08	1.18	0.20	0.76	N/A	N/A				
M U.S. TIPS (SA+CF) Median	-0.80	-0.91	-0.80	0.20	1.87	1.15	3.19	3.72				
<b>Garda Inflation Opportunity Composite (levered)</b>	-3.97 (100)	-6.11 (100)	-3.97 (100)	-2.91 (100)	5.12 (1)	N/A	N/A	1.47 (1)	08/01/2014	437,869	11.0	
Blended Benchmark (Garda)	-3.52 (100)	-7.51 (100)	-3.52 (100)	-3.31 (100)	5.45 (1)	N/A	N/A	-0.98 (100)				
Value Added	-0.45	1.40	-0.45	0.40	-0.33	N/A	N/A	2.45				
M U.S. TIPS (SA+CF) Median	-0.80	-0.91	-0.80	0.20	1.87	N/A	N/A	0.56				
<b>Garda Inflation Opp. Fund CI B (levered)</b>	-6.48 (100)	-10.07 (100)	-6.48 (100)	-6.01 (100)	4.07 (1)	3.20 (1)	N/A	-2.35 (100)	03/01/2013	285,724	7.2	
Blended Benchmark (Garda)	-3.52 (100)	-7.51 (100)	-3.52 (100)	-3.31 (100)	5.45 (1)	1.67 (3)	N/A	-3.94 (100)				
Value Added	-2.96	-2.56	-2.96	-2.70	-1.38	1.53	N/A	1.59				
M U.S. TIPS (SA+CF) Median	-0.80	-0.91	-0.80	0.20	1.87	1.15	N/A	-0.08				
Garda Fixed Income Relative Value Opportunity Fund Ltd. (TIPS)	1.13	2.36	1.13	3.50	5.53	N/A	N/A	4.46	08/01/2014	152,145	3.8	
<b>PSERS Total TIPS (levered)</b>	-1.47 (100)	-1.56 (97)	-1.47 (100)	0.78 (11)	2.77 (5)	2.06 (1)	5.15 (1)	4.92 (1)	04/01/2004	1,199,781	30.3	
Bimbg. Barc. Global Inflation-Linked: U.S. TIPS	-0.82 (53)	-0.84 (45)	-0.82 (53)	0.41 (29)	2.04 (23)	1.37 (13)	3.32 (24)	3.60 (20)				
Value Added	-0.65	-0.72	-0.65	0.37	0.73	0.69	1.83	1.32				
M U.S. TIPS (SA+CF) Median	-0.80	-0.91	-0.80	0.20	1.87	1.15	3.19	3.45				

Performance Summary

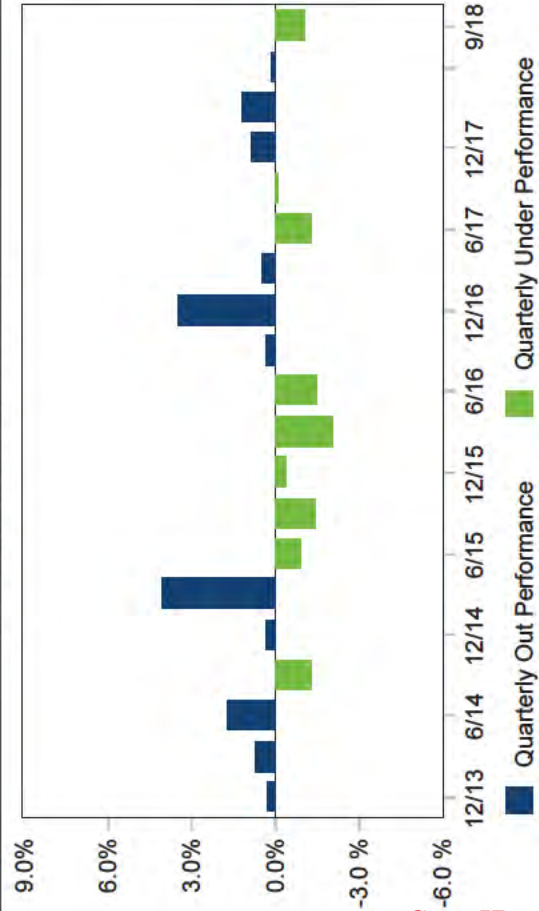
Account Information

Account Name	Bridgewater TIPS (levered)
Account Structure	Separate Account
Asset Class	Global Fixed Income
Benchmark	BGI Custom IL Bond Index (levered)
Peer Group	IM U.S. TIPS (SA+CF)

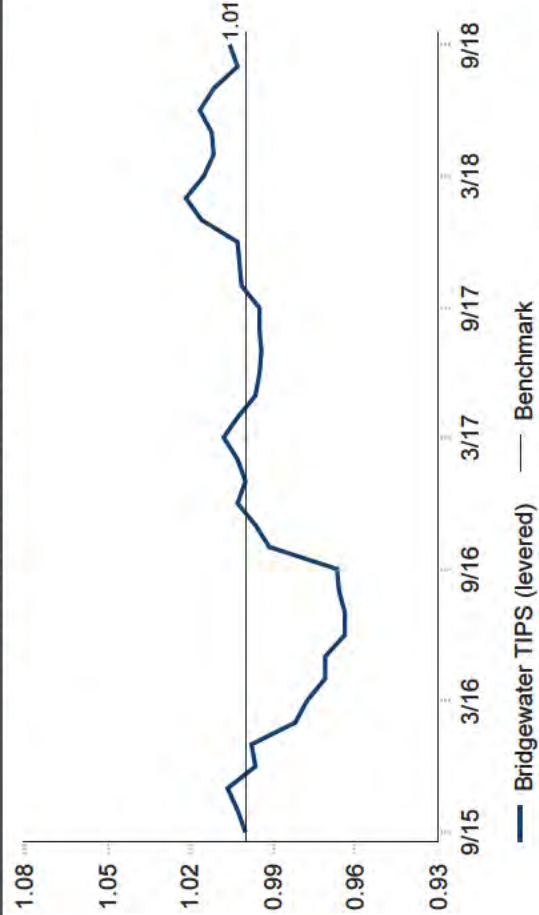
Return Summary



Quarterly Excess Performance

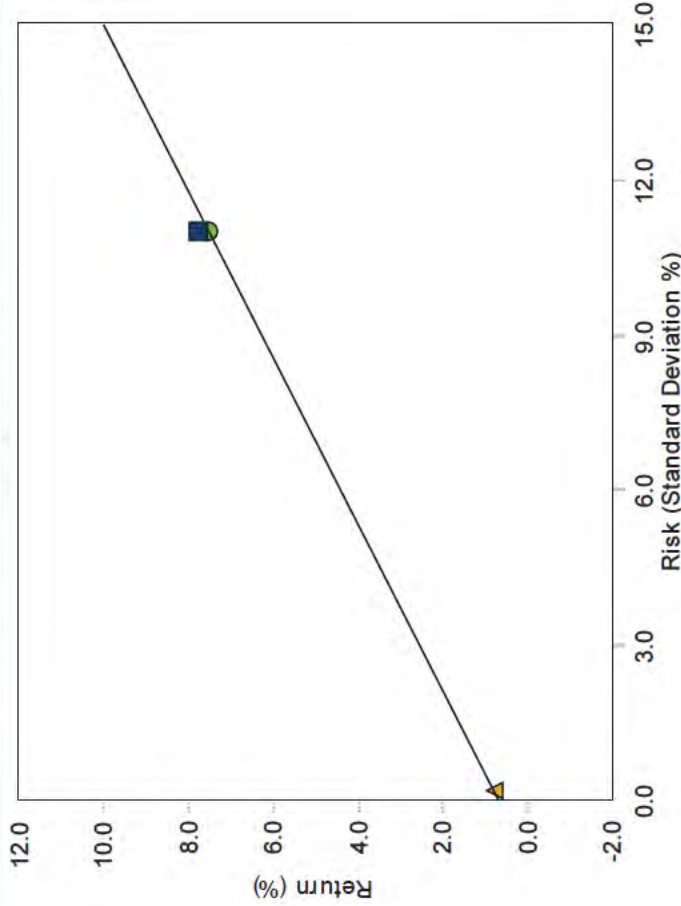


Ratio of Cumulative Wealth - 3 Years



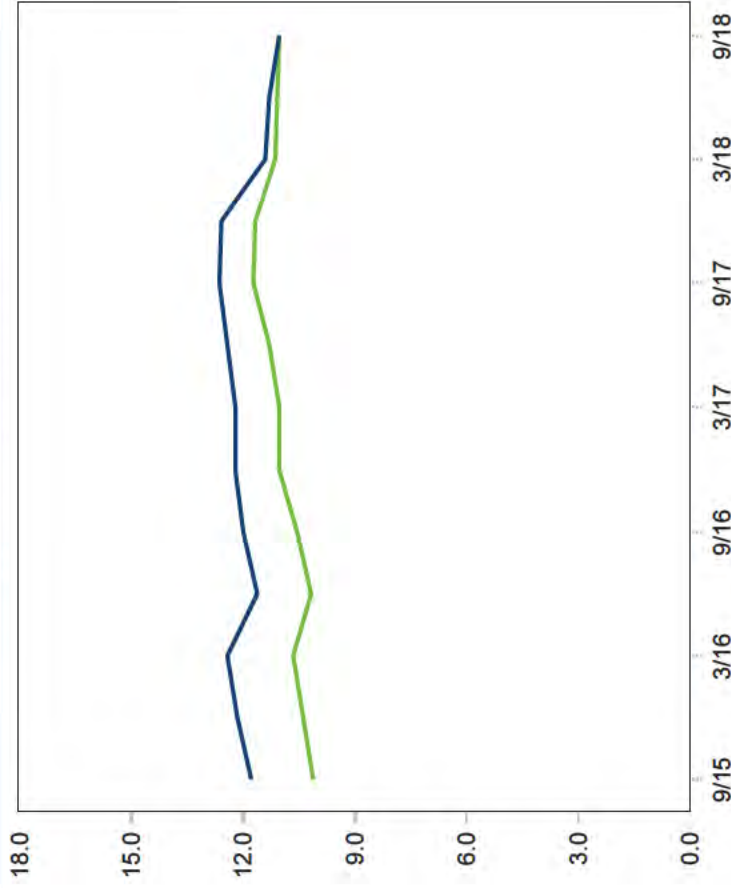
Bridgewater TIPS (levered) Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



- Bridgewater TIPS (levered)
- BGI Custom IL Bond Index (levered)
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation



- Bridgewater TIPS (levered)
- BGI Custom IL Bond Index (levered)

3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bridgewater TIPS (levered)	0.19	2.43	0.08	0.95	0.66	0.38	0.98	7.74	11.02	0.98
BGI Custom IL Bond Index (levered)	0.00	0.00	-0.58	1.00	0.64	0.00	1.00	7.54	11.02	1.00
FTSE 3 Month T-Bill	-7.07	11.04	-0.64	0.01	N/A	0.82	0.00	0.80	0.18	-0.12

## Risk Statistics

## Bridgewater TIPS (levered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	7.40	7.74	7.71	11.71	9.89	07/01/2004
Standard Deviation	7.10	11.02	11.09	11.30	9.94	
Downside Risk	3.82	6.24	6.23	6.29	5.67	
Downside Semi Deviation	1.83	9.53	9.57	10.99	10.16	
Max Drawdown Recovery Period	N/A	8.00	15.00	16.00	16.00	
Maximum Drawdown	-3.21	-6.96	-10.97	-14.92	-14.92	
Maximum Loss Exposure	N/A	-2.76	-2.74	-4.86	N/A	
Upside Semi Deviation	2.50	12.73	12.67	12.25	10.48	
BGI Custom IL Bond Index (levered)						
Return	6.22	7.54	6.95	N/A	N/A	
Standard Deviation	7.37	11.02	10.28	N/A	N/A	
Downside Risk	4.44	6.12	5.72	N/A	N/A	
Downside Semi Deviation	2.45	9.67	8.97	N/A	N/A	
Max Drawdown Recovery Period	3.00	21.00	17.00	N/A	N/A	
Maximum Drawdown	-3.15	-7.79	-9.59	N/A	N/A	
Maximum Loss Exposure	N/A	-2.40	-3.01	N/A	N/A	
Upside Semi Deviation	2.24	12.50	11.58	N/A	N/A	

## vs. BGI Custom IL Bond Index (levered)

Active Return	1.09	0.19	0.80	N/A	N/A	
Tracking Error	2.13	2.43	2.63	N/A	N/A	
Actual Correlation	0.96	0.98	0.97	N/A	N/A	
Beta	0.92	0.98	1.05	N/A	N/A	
Consistency	66.67	55.56	56.67	N/A	N/A	
Down Market Capture	91.08	95.41	103.47	N/A	N/A	
Down Market Outperformance	0.66	0.92	-0.74	N/A	N/A	
Information Ratio	0.51	0.08	0.30	N/A	N/A	
Jensen Alpha	1.45	0.36	0.46	N/A	N/A	
Up Market Capture	102.82	98.32	106.53	N/A	N/A	
Up Market Outperformance	0.44	-0.74	2.59	N/A	N/A	
vs. FTSE 3 Month T-Bill						
Excess Return	5.83	7.26	7.56	11.43	8.71	
Excess Risk	7.15	11.04	11.11	11.31	9.99	
Sharpe Ratio	0.82	0.66	0.68	1.01	0.87	

Calculation based on monthly periodicity.

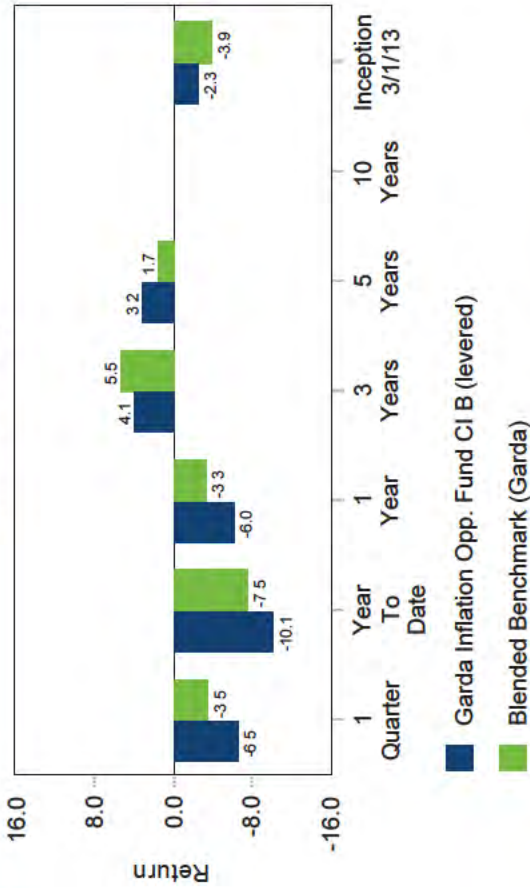
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Performance Summary

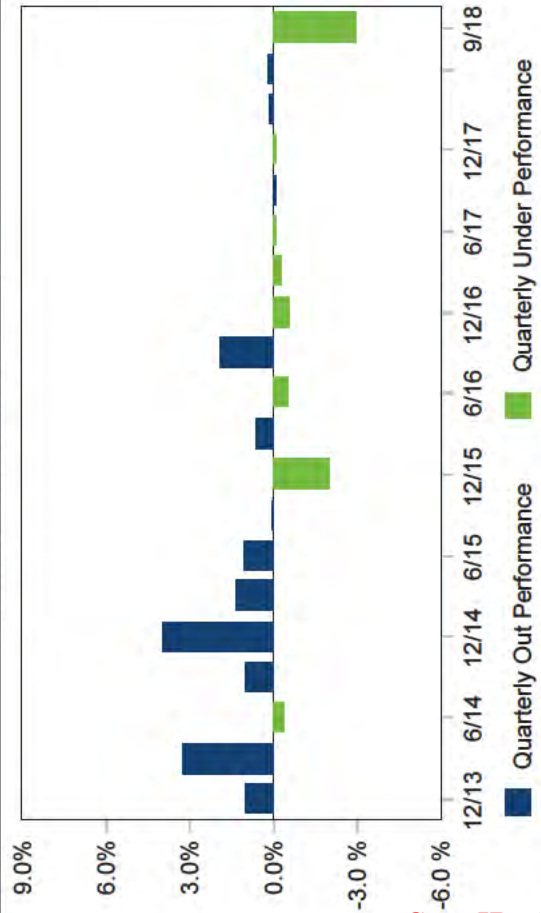
Account Information

Account Name: Garda Inflation Opp. Fund CI B (levered)  
 Inception Date: 01/01/2013  
 Account Structure: Separate Account  
 Asset Class: Global Fixed Income  
 Benchmark: Blended Benchmark (Garda)  
 Peer Group: IM U.S. TIPS (SA+CF)

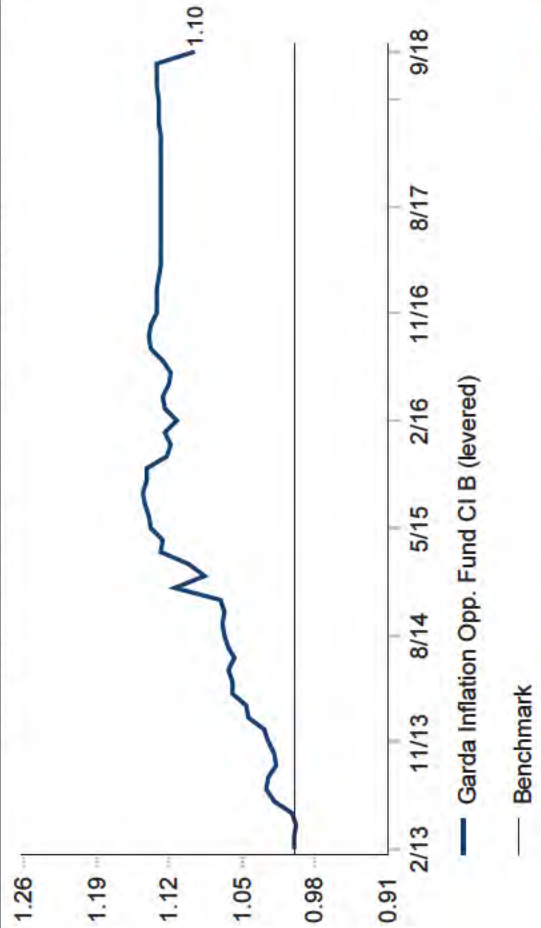
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception





## Risk Statistics

## Garda Inflation Opp. Fund CI B (levered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-6.01	4.07	3.20	N/A	-2.35	03/01/2013
Standard Deviation	12.66	14.52	17.93	N/A	21.09	
Downside Risk	10.37	9.40	11.42	N/A	15.55	
Downside Semi Deviation	4.96	14.36	16.88	N/A	22.69	
Max Drawdown Recovery Period	N/A	N/A	21.00	N/A	N/A	
Maximum Drawdown	-10.07	-13.50	-17.17	N/A	-33.67	
Maximum Loss Exposure	-6.01	-5.07	-9.50	N/A	-32.29	
Upside Semi Deviation	2.91	15.14	19.17	N/A	19.85	
Blended Benchmark (Garda)						
Return	-3.31	5.45	1.67	N/A	-3.94	
Standard Deviation	11.41	13.70	18.59	N/A	21.82	
Downside Risk	8.81	8.58	12.10	N/A	16.32	
Downside Semi Deviation	4.22	13.11	17.88	N/A	23.81	
Max Drawdown Recovery Period	N/A	N/A	24.00	N/A	N/A	
Maximum Drawdown	-9.82	-12.46	-21.70	N/A	-35.51	
Maximum Loss Exposure	-5.72	-3.10	-10.48	N/A	-34.17	
Upside Semi Deviation	2.85	14.71	19.51	N/A	20.18	
vs. Blended Benchmark (Garda)						
Active Return	-2.68	-1.22	1.38	N/A	1.48	
Tracking Error	3.12	2.38	3.27	N/A	3.17	
Actual Correlation	0.97	0.99	0.98	N/A	0.99	
Beta	1.08	1.05	0.95	N/A	0.96	
Consistency	66.67	52.78	61.67	N/A	61.19	
Down Market Capture	117.72	111.17	94.79	N/A	95.44	
Down Market Outperformance	-2.64	-2.83	1.67	N/A	1.64	
Information Ratio	-0.86	-0.51	0.42	N/A	0.47	
Jensen Alpha	-2.32	-1.46	1.53	N/A	1.40	
Up Market Capture	102.58	102.55	100.76	N/A	100.67	
Up Market Outperformance	0.42	1.42	0.68	N/A	0.65	
vs. FTSE 3 Month T-Bill						
Excess Return	-7.00	4.21	4.23	N/A	-0.58	
Excess Risk	12.67	14.55	17.95	N/A	21.09	
Sharpe Ratio	-0.55	0.29	0.24	N/A	-0.03	

Calculation based on monthly periodicity.

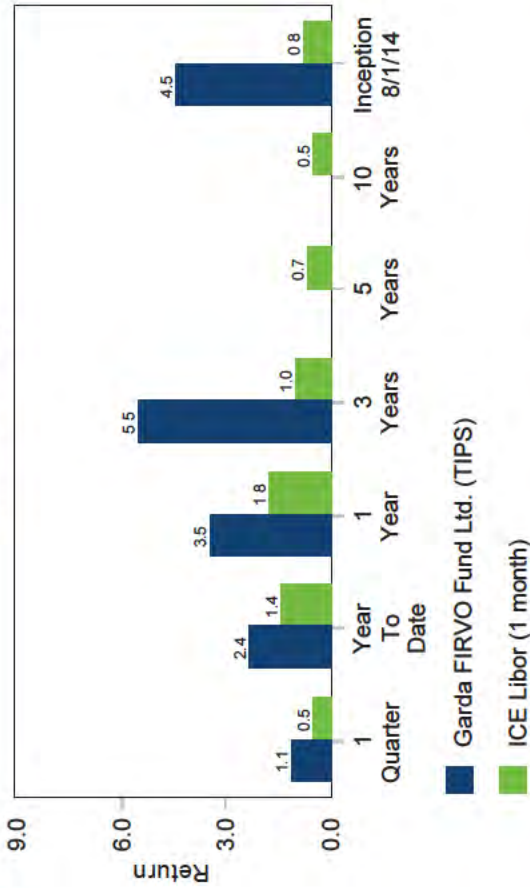
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Performance Summary

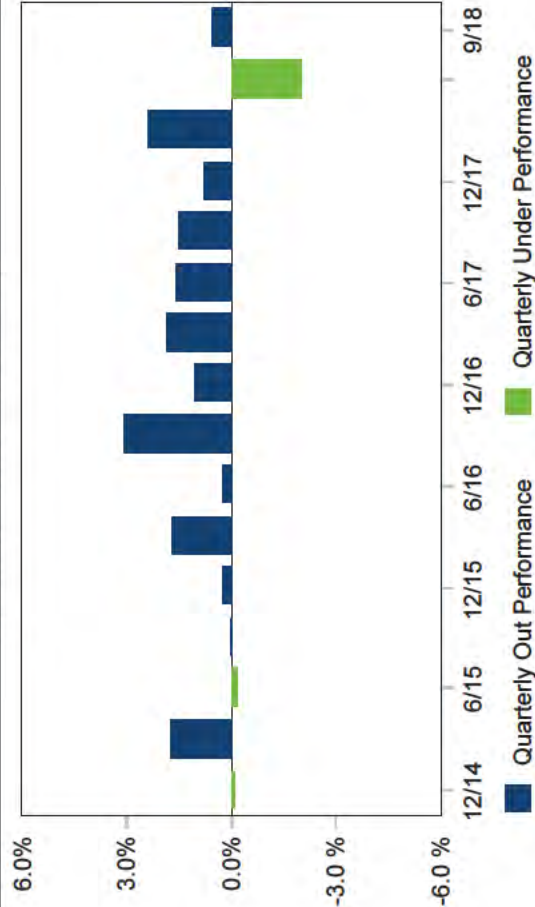
Account Information

Account Name: Garda FIRVO Fund Ltd. (TIPS)  
 Inception Date: 08/01/2014  
 Account Structure: Separate Account  
 Asset Class: Global Fixed Income  
 Benchmark: ICE Libor (1 month)  
 Peer Group: IM U.S. TIPS (SA+CF)

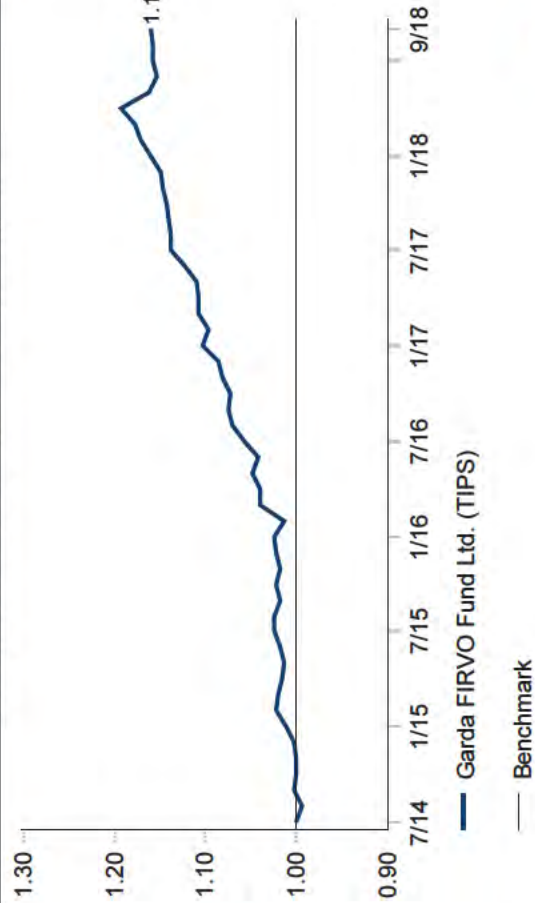
Return Summary



Quarterly Excess Performance



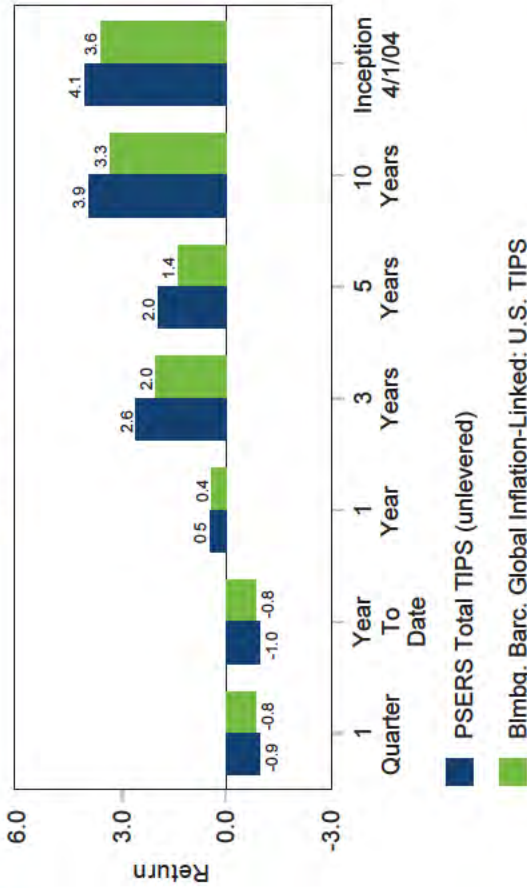
Ratio of Cumulative Wealth - Since Inception



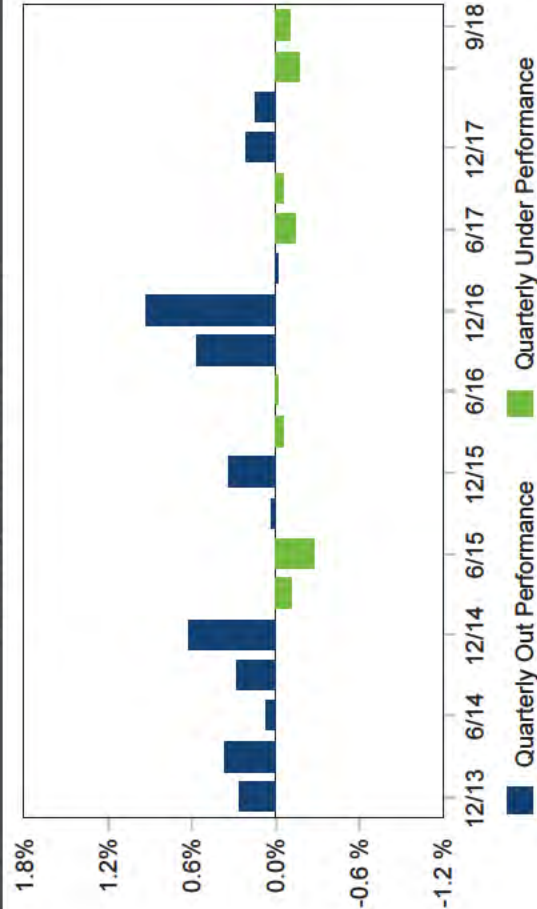
Account Information

Account Name: PSERS Total TIPS (unlevered)  
 Inception Date: 03/01/2004  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. Global Inflation-Linked: U.S. TIPS  
 Peer Group: IM U.S. TIPS (SA+CF)

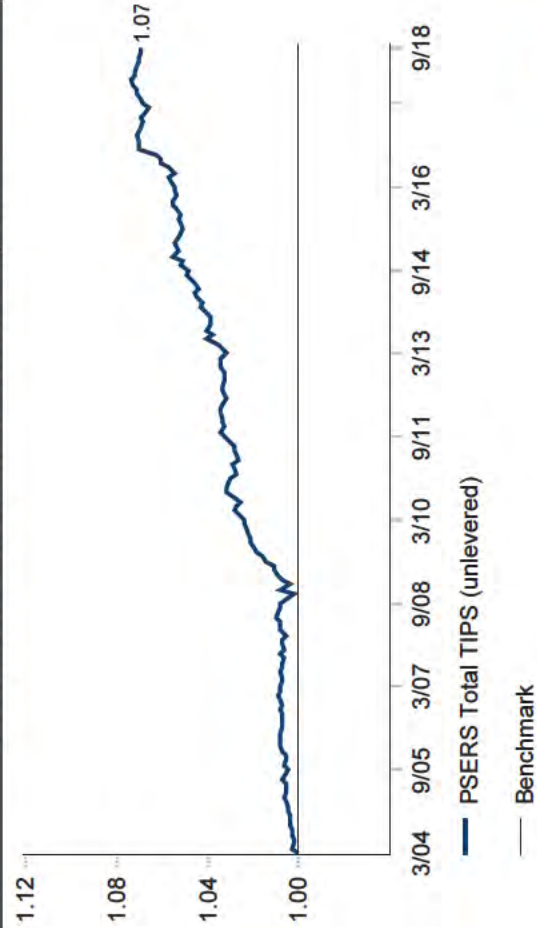
Return Summary



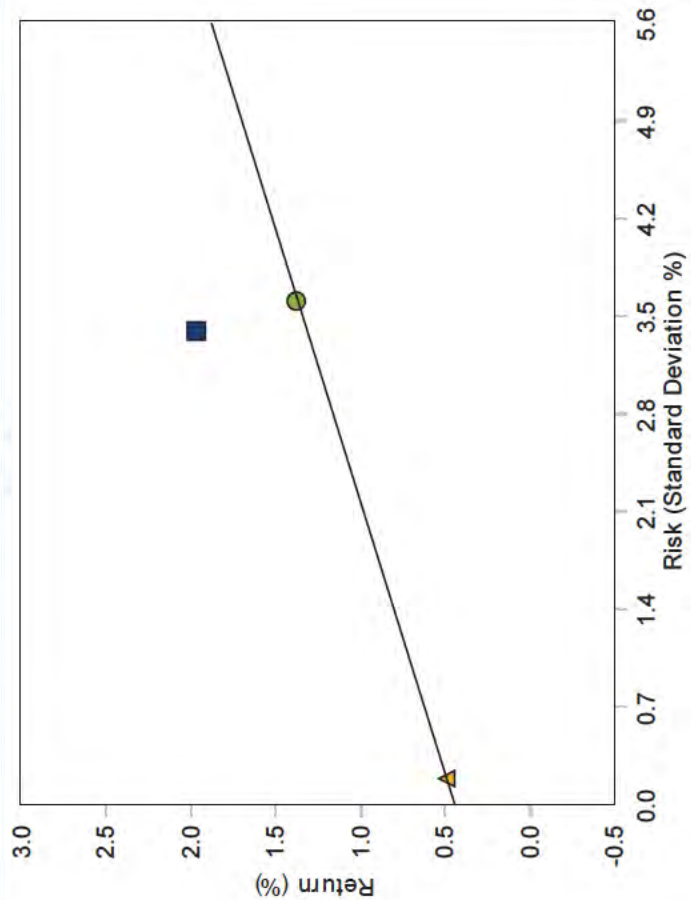
Quarterly Excess Performance



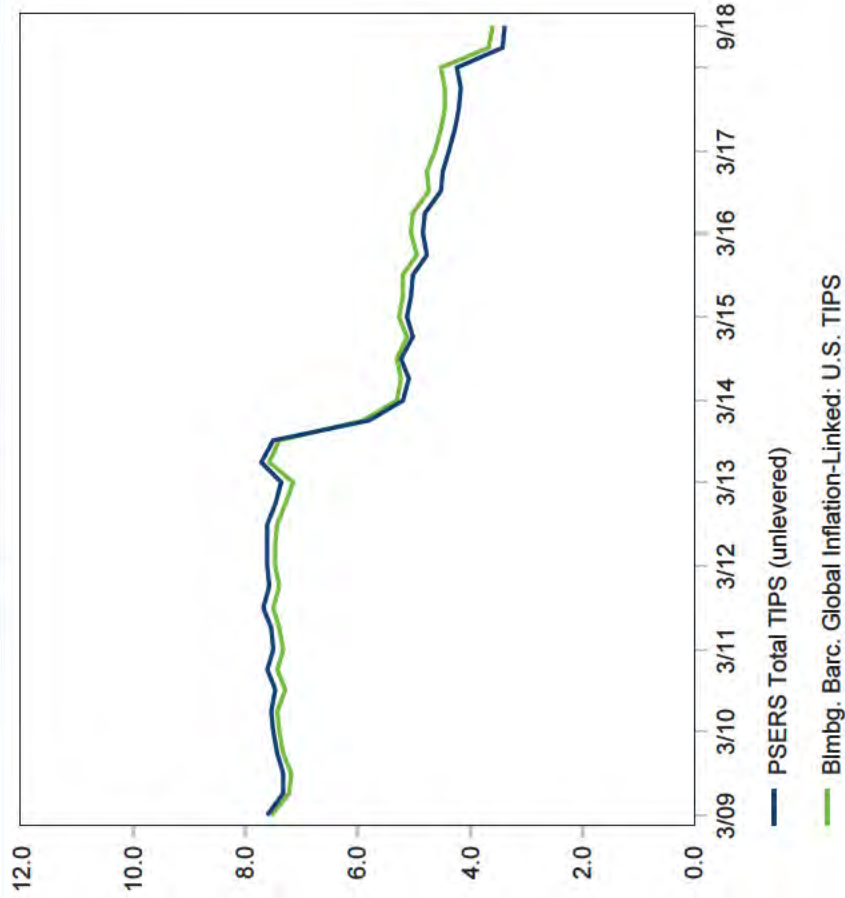
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Total TIPS (unlevered)	0.57	0.57	1.00	0.98	0.44	0.67	0.93	1.96	3.40	0.99
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS	0.00	0.00	N/A	1.00	0.26	0.00	1.00	1.37	3.61	1.00
FTSE 3 Month T-Bill	-0.94	3.62	-0.26	0.00	N/A	0.49	0.00	0.49	0.18	-0.03

Risk Statistics

PSERS Total TIPS (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	0.49	2.61	1.96	3.93	4.07	04/01/2004
Standard Deviation	2.33	2.67	3.40	5.83	5.70	
Downside Risk	1.68	1.44	2.03	3.88	3.78	
Downside Semi Deviation	0.80	2.28	3.12	6.37	6.37	
Max Drawdown Recovery Period	8.00	8.00	15.00	5.00	12.00	
Maximum Drawdown	-1.54	-1.54	-4.24	-9.00	-12.47	
Maximum Loss Exposure	-0.09	-0.30	-1.75	-9.00	-4.59	
Upside Semi Deviation	0.64	3.13	3.72	5.71	5.54	
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS						
Return	0.41	2.04	1.37	3.32	3.60	
Standard Deviation	2.53	3.00	3.61	5.83	5.74	
Downside Risk	1.82	1.81	2.25	3.96	3.88	
Downside Semi Deviation	0.87	2.76	3.39	6.52	6.43	
Max Drawdown Recovery Period	8.00	15.00	15.00	61.00	19.00	
Maximum Drawdown	-1.82	-2.41	-4.45	-9.20	-12.22	
Maximum Loss Exposure	-0.58	-0.64	-2.00	-8.69	-4.85	
Upside Semi Deviation	0.69	3.34	3.87	5.57	5.50	

vs. Blmbg. Barc. Global Inflation-Linked: U.S. TIPS

Active Return	0.07	0.55	0.57	0.59	0.46	
Tracking Error	0.35	0.60	0.57	0.63	0.55	
Actual Correlation	0.99	0.98	0.99	0.99	1.00	
Beta	0.91	0.88	0.93	0.99	0.99	
Consistency	50.00	58.33	58.33	60.83	58.62	
Down Market Capture	92.01	79.73	87.45	91.80	92.62	
Down Market Outperformance	0.27	1.38	1.08	1.02	0.92	
Information Ratio	0.21	0.91	1.00	0.94	0.83	
Jensen Alpha	N/A	N/A	N/A	N/A	N/A	
Up Market Capture	94.83	98.12	100.80	101.71	100.87	
Up Market Outperformance	-0.20	-0.19	0.09	0.27	0.14	
Excess Return	0.07	0.55	0.57	0.59	0.46	
Excess Risk	0.35	0.60	0.57	0.63	0.55	
Sharpe Ratio	0.21	0.91	1.00	0.94	0.83	

Calculation based on monthly periodicity.

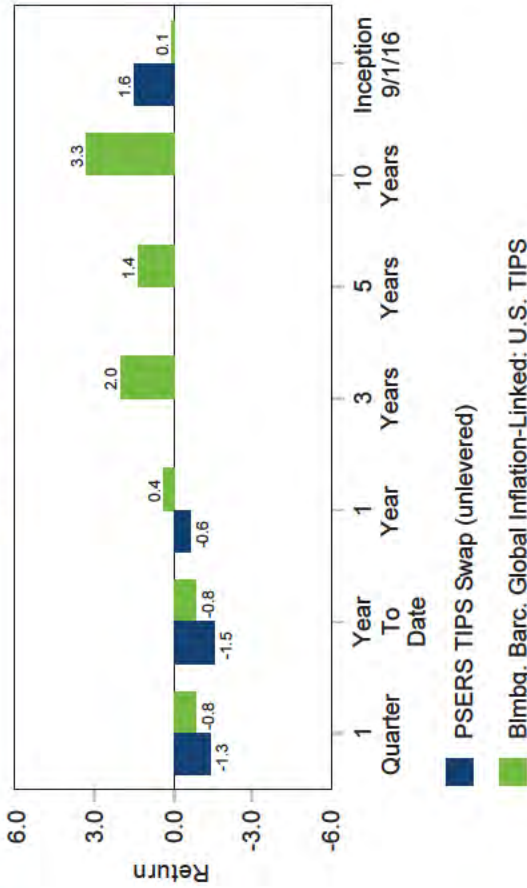
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Performance Summary

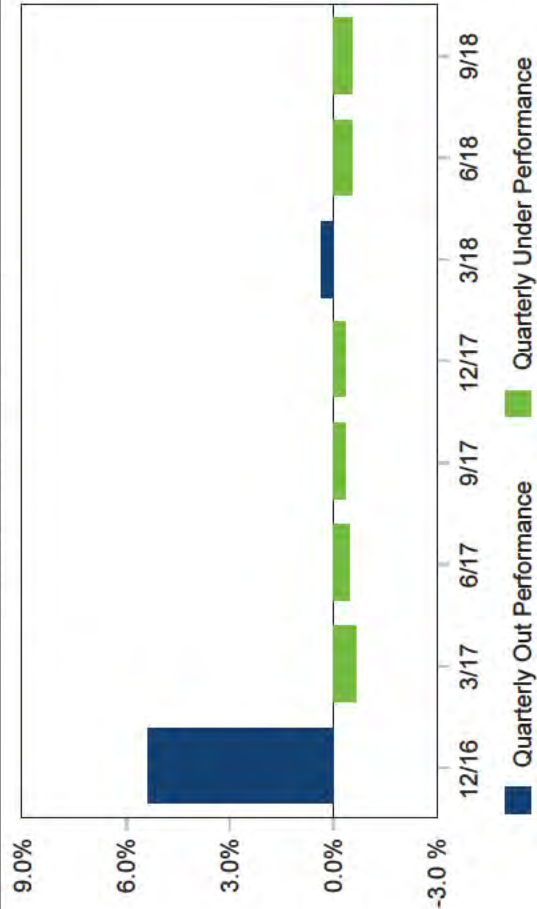
Account Information

Account Name: PSERS TIPS Swap (unlevered)  
 Inception Date: 09/01/2016  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blmbg. Barc. Global Inflation-Linked: U.S. TIPS  
 Peer Group: IM U.S. TIPS (SA+CF)

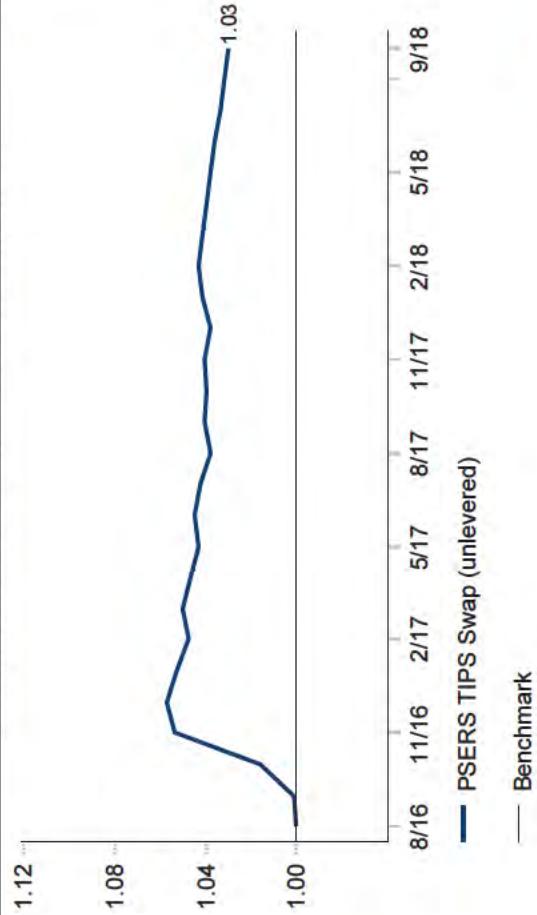
Return Summary



Quarterly Excess Performance

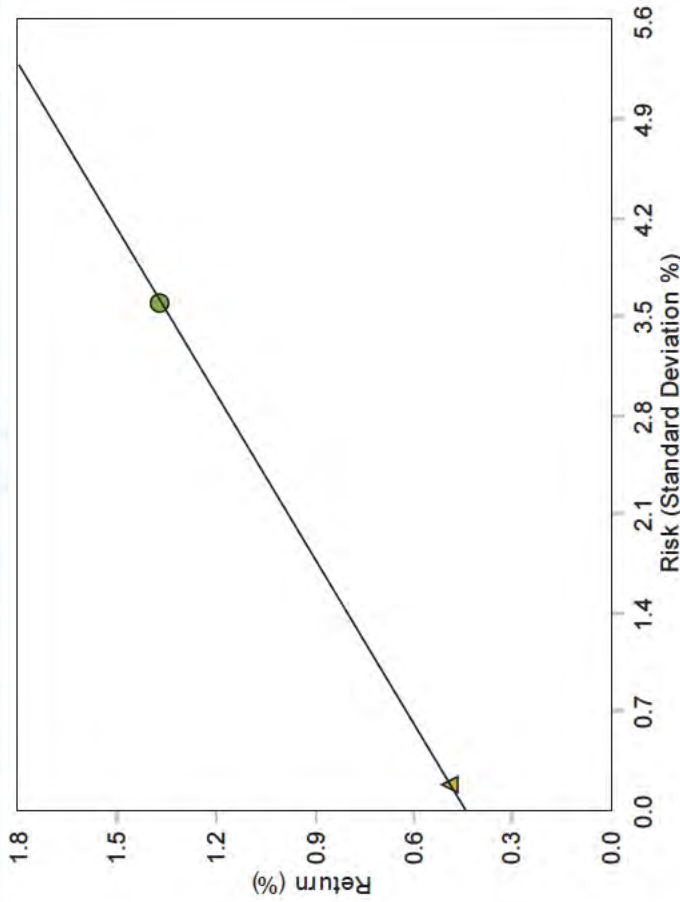


Ratio of Cumulative Wealth - Since Inception



Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



- PSERS TIPS Swap (unlevered)
- Bimbg. Barc. Global Inflation-Linked: U.S. TIPS
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation

No data found.

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS TIPS Swap (unlevered)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bimbg. Barc. Global Inflation-Linked: U.S. TIPS	0.00	0.00	N/A	1.00	0.26	0.00	1.00	1.37	3.61	1.00
FTSE 3 Month T-Bill	-0.94	3.62	-0.26	0.00	N/A	0.49	0.00	0.49	0.18	-0.03

Risk Statistics

PSERS TIPS Swap (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.61	N/A	N/A	N/A	1.55	09/01/2016
Standard Deviation	2.20	N/A	N/A	N/A	2.25	
Downside Risk	1.77	N/A	N/A	N/A	1.37	
Downside Semi Deviation	0.84	N/A	N/A	N/A	0.68	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-1.52	N/A	N/A	N/A	-1.52	
Maximum Loss Exposure	-0.61	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.52	N/A	N/A	N/A	2.34	

Blmbg. Barc. Global Inflation-Linked: U.S. TIPS

Return	0.41	2.04	1.37	3.32	0.11
Standard Deviation	2.53	3.00	3.61	5.83	2.64
Downside Risk	1.82	1.81	2.25	3.96	2.02
Downside Semi Deviation	0.87	2.76	3.39	6.52	2.99
Max Drawdown Recovery Period	8.00	15.00	15.00	61.00	15.00
Maximum Drawdown	-1.82	-2.41	-4.45	-9.20	-2.41
Maximum Loss Exposure	-0.58	-0.64	-2.00	-8.69	-1.87
Upside Semi Deviation	0.69	3.34	3.87	5.57	2.40

vs. Blmbg. Barc. Global Inflation-Linked: U.S. TIPS

Active Return	-1.03	N/A	N/A	N/A	1.42
Tracking Error	0.63	N/A	N/A	N/A	2.86
Actual Correlation	0.97	N/A	N/A	N/A	0.33
Beta	0.85	N/A	N/A	N/A	0.28
Consistency	25.00	N/A	N/A	N/A	40.00
Down Market Capture	99.16	N/A	N/A	N/A	23.62
Down Market Outperformance	0.03	N/A	N/A	N/A	5.49
Information Ratio	-1.63	N/A	N/A	N/A	0.50
Jensen Alpha	N/A	N/A	N/A	N/A	N/A
Up Market Capture	72.65	N/A	N/A	N/A	64.45
Up Market Outperformance	-1.08	N/A	N/A	N/A	-2.71
Excess Return	-1.03	N/A	N/A	N/A	1.42
Excess Risk	0.63	N/A	N/A	N/A	2.86
Sharpe Ratio	-1.63	N/A	N/A	N/A	0.50

Calculation based on monthly periodicity.

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## PIMCO Multi-Sector

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Case ID: 221102792

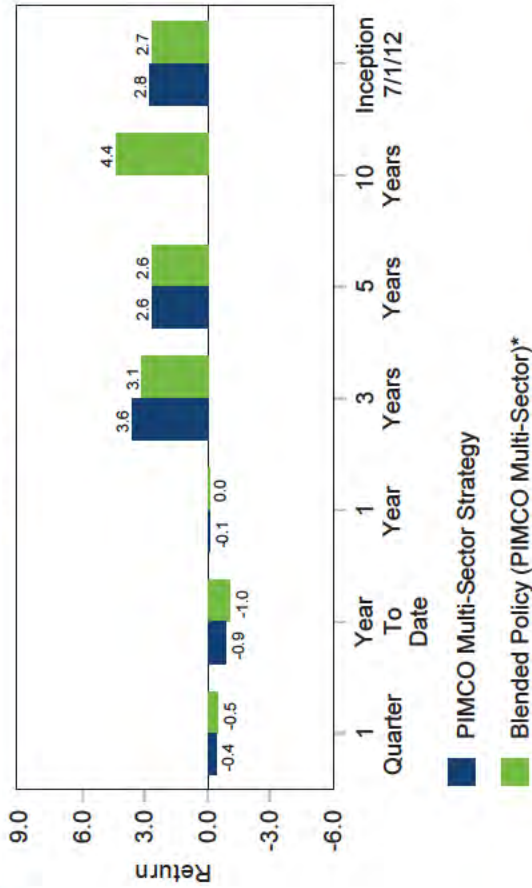
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Performance Summary

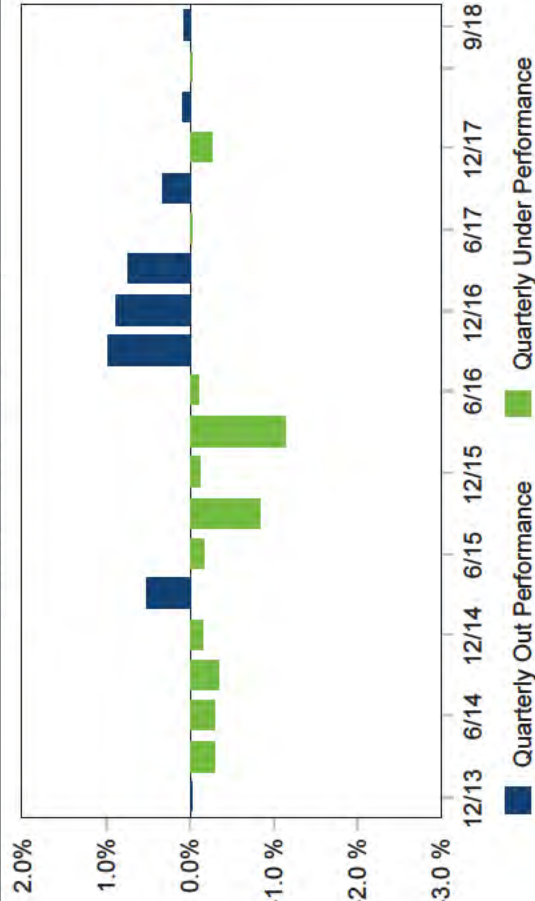
Account Information

Account Name: PIMCO Multi-Sector Strategy  
 Inception Date: 06/30/2012  
 Account Structure: Separate Account  
 Asset Class: US Fixed Income  
 Benchmark: Blended Policy (PIMCO Multi-Sector)  
 Peer Group: IM U.S. Fixed Income (SA+CF)

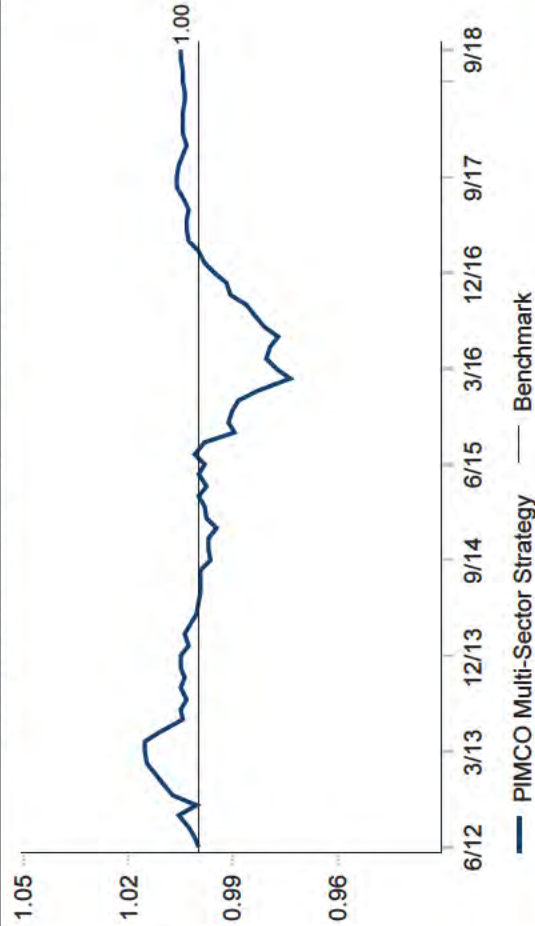
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## PIMCO Multi-Sector Strategy

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.11	3.61	2.62	N/A	2.75	07/01/2012
Standard Deviation	2.46	3.86	4.06	N/A	4.33	
Downside Risk	1.80	2.06	2.41	N/A	2.79	
Downside Semi Deviation	0.86	3.67	3.95	N/A	4.71	
Max Drawdown Recovery Period	N/A	9.00	16.00	N/A	13.00	
Maximum Drawdown	-1.80	-3.56	-5.81	N/A	-6.39	
Maximum Loss Exposure	-1.03	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.65	4.23	4.30	N/A	4.27	
Blended Policy (PIMCO Multi-Sector)						
Return	-0.01	3.08	2.62	4.39	2.67	
Standard Deviation	2.48	3.84	3.92	3.96	4.04	
Downside Risk	1.83	2.16	2.30	2.25	2.53	
Downside Semi Deviation	0.88	3.42	3.54	3.88	4.04	
Max Drawdown Recovery Period	N/A	N/A	14.00	12.00	12.00	
Maximum Drawdown	-1.89	-4.47	-5.06	-5.27	-5.27	
Maximum Loss Exposure	-0.86	N/A	N/A	-2.36	N/A	
Upside Semi Deviation	0.66	4.36	4.37	4.32	4.21	
vs. Blended Policy (PIMCO Multi-Sector)						
Active Return	-0.11	0.52	0.00	N/A	0.09	
Tracking Error	0.24	0.94	0.92	N/A	0.97	
Actual Correlation	1.00	0.97	0.97	N/A	0.98	
Beta	0.98	0.97	1.01	N/A	1.05	
Consistency	50.00	63.89	53.33	N/A	57.33	
Down Market Capture	99.33	87.90	100.03	N/A	103.78	
Down Market Outperformance	0.02	0.96	-0.01	N/A	-0.38	
Information Ratio	-0.45	0.55	0.00	N/A	0.09	
Jensen Alpha	-0.13	0.57	-0.01	N/A	-0.01	
Up Market Capture	96.37	101.23	100.05	N/A	103.58	
Up Market Outperformance	-0.14	0.15	0.00	N/A	0.46	
vs. FTSE 3 Month T-Bill						
Excess Return	-1.65	2.83	2.18	N/A	2.40	
Excess Risk	2.46	3.89	4.07	N/A	4.34	
Sharpe Ratio	-0.67	0.73	0.54	N/A	0.55	

Calculation based on monthly periodicity.

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## Supplemental Trailing Period Performance

	Performance(%)						Allocation Market Value (\$000)	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	Since Inception		Inception Date
<b>PIMCO Multi-Sector Strategy<sup>1</sup></b>	<b>-0.42</b>	<b>-0.89</b>	<b>-0.42</b>	<b>-0.11</b>	<b>3.61</b>	<b>2.75</b>	<b>07/01/2012</b>	<b>413,648.28</b>
Blended Policy (PIMCO Multi-Sector)	-0.49	-1.05	-0.49	-0.01	3.08	2.67		
Value Added	0.07	0.16	0.07	<b>-0.10</b>	0.53	0.08		
<b>PIMCO (Blended)</b>	<b>-0.42</b>	<b>-0.89</b>	<b>-0.42</b>	<b>-0.11</b>	<b>3.61</b>	<b>7.27</b>	<b>05/01/1987</b>	
Blended Policy (PIMCO Blended)	-0.49	-1.05	-0.49	-0.01	3.08	6.34		
Value Added	0.07	0.16	0.07	<b>-0.10</b>	0.53	0.93		
<b>PIMCO U.S. Core Plus</b>	<b>-0.08 (93)</b>	<b>-0.99 (31)</b>	<b>-0.08 (93)</b>	<b>-0.62 (40)</b>	<b>2.73 (34)</b>	<b>2.30 (68)</b>	<b>07/01/2012</b>	<b>166,041.52</b>
Bimbg. Barc. U.S. Aggregate	0.02 (85)	-1.60 (76)	0.02 (85)	-1.22 (80)	1.31 (93)	1.70 (93)		
Value Added	<b>-0.10</b>	0.61	<b>-0.10</b>	0.60	1.42	0.60		
IM U.S. Broad Market Core+ Fixed Income (SA+CF) Median	0.33	-1.31	0.33	-0.78	2.27	2.53		
<b>PIMCO Global</b>	<b>1.88 (19)</b>	<b>3.45 (4)</b>	<b>1.88 (19)</b>	<b>4.50 (5)</b>	<b>4.94 (29)</b>	<b>1.81 (59)</b>	<b>07/01/2012</b>	<b>181,115.88</b>
Spliced Barclays GlobalAgg GDPWeighted Dev xUS	-0.15 (62)	1.03 (22)	-0.15 (62)	2.24 (18)	3.04 (58)	0.64 (76)		
Value Added	2.03	2.42	2.03	2.26	1.90	1.17		
IM Global Fixed Income (SA+CF) Median	0.40	-0.82	0.40	-0.07	3.53	2.78		
<b>PIMCO Overlay</b>	<b>-2.18</b>	<b>-4.85</b>	<b>-2.18</b>	<b>-6.56</b>	<b>2.24</b>	<b>3.82</b>	<b>07/01/2012</b>	<b>11,556.23</b>
<b>PIMCO Long Treasuries</b>	<b>-5.43 (100)</b>	<b>-8.44 (98)</b>	<b>-5.43 (100)</b>	<b>-6.37 (96)</b>	<b>0.04 (67)</b>	<b>1.47 (17)</b>	<b>07/01/2012</b>	<b>55,234.28</b>
Bimbg. Barc. U.S. Treasury: Long	-2.88 (89)	-5.79 (78)	-2.88 (89)	-3.56 (74)	0.72 (15)	1.71 (2)		
Value Added	<b>-2.55</b>	<b>-2.65</b>	<b>-2.55</b>	<b>-2.81</b>	<b>-0.68</b>	<b>-0.24</b>		
IM U.S. Long Term Treasury/Govt Bond (MF) Median	-0.54	-1.78	-0.54	-1.96	0.20	0.84		

<sup>1</sup>Performance calculated by Aon Hewitt based on market values provided by State Street and cash flows provided by BNY Mellon. Underlying sleeve market values may not sum to total strategy market value because of net income, cash, and other items.

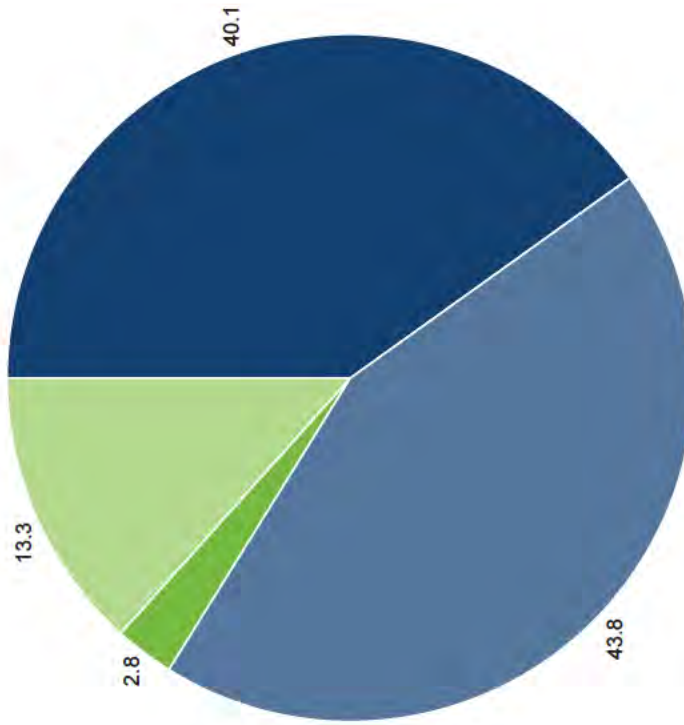
Performance for each of the underlying portfolios is provided by PIMCO.

PIMCO (Blended) consists of PIMCO PSERS CorePLUS prior to July 2012, and PIMCO Multi-Sector Strategy thereafter. Blended Policy (PIMCO Blended) consists of Barclays Aggregate Index prior to July 2012, and Blended Policy (PIMCO Multi-Sector) thereafter.

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Asset Allocation by Manager

September 30, 2018 : \$413,948



	Market Value (\$000)	Allocation (%)
PIMCO U.S. Core Plus	166,042	40.1
PIMCO Global	181,116	43.8
PIMCO Overlay	11,556	2.8
PIMCO Long Treasuries	55,234	13.3

All market values are provided by State Street. Total may not match to previous pages because of items such as cash and net income.

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
PIMCO (Blended)						05/01/1987
Return	-0.11	3.61	2.62	5.74	7.27	
Standard Deviation	2.46	3.86	4.06	4.37	4.31	
Downside Risk	1.80	2.06	2.41	2.41	2.13	
Downside Semi Deviation	0.86	3.67	3.95	4.33	3.98	
Max Drawdown Recovery Period	N/A	9.00	16.00	13.00	17.00	
Maximum Drawdown	-1.80	-3.56	-5.81	-6.39	-7.31	
Maximum Loss Exposure	-1.03	N/A	N/A	-2.31	-1.78	
Upside Semi Deviation	0.65	4.23	4.30	4.85	5.07	
Blended Policy (PIMCO Blended)						
Return	-0.01	3.08	2.62	4.39	6.34	
Standard Deviation	2.48	3.84	3.92	3.96	3.97	
Downside Risk	1.83	2.16	2.30	2.25	2.01	
Downside Semi Deviation	0.88	3.42	3.54	3.88	3.59	
Max Drawdown Recovery Period	N/A	N/A	14.00	12.00	12.00	
Maximum Drawdown	-1.89	-4.47	-5.06	-5.27	-5.27	
Maximum Loss Exposure	-0.86	N/A	N/A	-2.36	-1.77	
Upside Semi Deviation	0.66	4.36	4.37	4.32	4.68	
vs. Blended Policy (PIMCO Blended)						
Active Return	-0.11	0.52	0.00	1.30	0.88	
Tracking Error	0.24	0.94	0.92	1.93	1.39	
Actual Correlation	1.00	0.97	0.97	0.90	0.95	
Beta	0.98	0.97	1.01	0.99	1.03	
Consistency	50.00	63.89	53.33	64.17	58.89	
Down Market Capture	99.33	87.90	100.03	97.73	98.80	
Down Market Outperformance	0.02	0.96	-0.01	0.20	0.09	
Information Ratio	-0.45	0.55	0.00	0.68	0.63	
Jensen Alpha	-0.13	0.57	-0.01	1.34	0.78	
Up Market Capture	96.37	101.23	100.05	115.64	109.21	
Up Market Outperformance	-0.14	0.15	0.00	2.08	1.39	
vs. FTSE 3 Month T-Bill						
Excess Return	-1.65	2.83	2.18	5.37	3.98	
Excess Risk	2.46	3.89	4.07	4.40	4.28	
Sharpe Ratio	-0.67	0.73	0.54	1.22	0.93	

Calculation based on monthly periodicity. PIMCO (Blended) consists of PIMCO PSERS CorePLUS prior to July 2012, and PIMCO Multi-Sector Strategy thereafter. Blended Policy (PIMCO Blended) consists of Barclays Aggregate Index prior to July 2012, and Blended Policy (PIMCO Multi-Sector) thereafter.

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## Risk Statistics

## PIMCO U.S. Core Plus

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.62	2.73	2.76	N/A	2.30	07/01/2012
Standard Deviation	2.56	2.77	2.94	N/A	3.19	
Downside Risk	1.94	1.79	1.69	N/A	2.07	
Downside Semi Deviation	0.83	3.20	2.65	N/A	3.31	
Max Drawdown Recovery Period	N/A	7.00	7.00	N/A	19.00	
Maximum Drawdown	-1.98	-2.45	-2.45	N/A	-5.84	
Maximum Loss Exposure	-1.61	N/A	-0.36	N/A	-0.83	
Upside Semi Deviation	0.72	2.78	3.34	N/A	3.26	
Blmbg. Barc. U.S. Aggregate						
Return	-1.22	1.31	2.16	3.77	1.70	
Standard Deviation	2.25	2.66	2.70	3.24	2.75	
Downside Risk	1.88	1.84	1.63	1.75	1.78	
Downside Semi Deviation	0.80	2.90	2.56	3.02	2.84	
Max Drawdown Recovery Period	N/A	13.00	13.00	13.00	13.00	
Maximum Drawdown	-2.19	-3.28	-3.28	-3.67	-3.67	
Maximum Loss Exposure	-1.81	-0.57	-0.14	-2.36	-1.06	
Upside Semi Deviation	0.56	2.60	2.95	3.62	2.80	
vs. Blmbg. Barc. U.S. Aggregate						
Active Return	0.61	1.39	0.59	N/A	0.60	
Tracking Error	0.50	1.34	1.27	N/A	1.31	
Actual Correlation	0.99	0.88	0.90	N/A	0.91	
Beta	1.12	0.91	0.98	N/A	1.06	
Consistency	58.33	72.22	63.33	N/A	64.00	
Down Market Capture	99.77	77.49	92.57	N/A	101.09	
Down Market Outperformance	0.01	1.40	0.44	N/A	-0.08	
Information Ratio	1.21	1.04	0.47	N/A	0.46	
Jensen Alpha	0.95	1.44	0.63	N/A	0.53	
Up Market Capture	123.66	118.86	108.31	N/A	113.82	
Up Market Outperformance	0.61	1.42	0.73	N/A	1.13	
vs. FTSE 3 Month T-Bill						
Excess Return	-2.15	1.93	2.28	N/A	1.92	
Excess Risk	2.54	2.80	2.96	N/A	3.20	
Sharpe Ratio	-0.85	0.69	0.77	N/A	0.60	

Calculation based on monthly periodicity.

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
PIMCO Global						07/01/2012
Return	4.50	4.94	1.59	N/A	1.81	
Standard Deviation	1.90	2.51	3.75	N/A	4.61	
Downside Risk	0.23	1.09	2.67	N/A	3.32	
Downside Semi Deviation	0.22	0.70	4.58	N/A	5.71	
Max Drawdown Recovery Period	3.00	7.00	48.00	N/A	48.00	
Maximum Drawdown	-0.19	-2.06	-12.92	N/A	-12.92	
Maximum Loss Exposure	N/A	N/A	-7.58	N/A	-4.45	
Upside Semi Deviation	0.74	3.04	3.34	N/A	4.04	
Spliced Barclays GlobalAgg GDPWeighted Dev xUS						
Return	2.24	3.04	0.07	2.61	0.64	
Standard Deviation	1.51	2.43	3.58	7.16	4.15	
Downside Risk	0.60	1.27	2.76	4.82	3.02	
Downside Semi Deviation	0.33	2.17	4.16	7.68	4.59	
Max Drawdown Recovery Period	3.00	12.00	N/A	N/A	N/A	
Maximum Drawdown	-0.48	-2.79	-14.08	-14.08	-14.08	
Maximum Loss Exposure	N/A	N/A	-9.55	-5.50	-6.19	
Upside Semi Deviation	0.56	2.84	3.09	6.93	3.83	
vs. Spliced Barclays GlobalAgg GDPWeighted Dev xUS						
Active Return	2.20	1.84	1.51	N/A	1.18	
Tracking Error	2.02	1.47	1.42	N/A	1.56	
Actual Correlation	0.31	0.82	0.93	N/A	0.94	
Beta	0.39	0.85	0.97	N/A	1.05	
Consistency	41.67	63.89	58.33	N/A	56.00	
Down Market Capture	-186.80	35.41	76.24	N/A	88.67	
Down Market Outperformance	2.67	3.35	2.20	N/A	1.12	
Information Ratio	1.09	1.25	1.07	N/A	0.75	
Jensen Alpha	2.64	2.20	1.51	N/A	1.17	
Up Market Capture	85.08	111.60	109.14	N/A	110.81	
Up Market Outperformance	-0.49	0.97	0.84	N/A	1.20	
vs. FTSE 3 Month T-Bill						
Excess Return	2.87	4.06	1.16	N/A	1.49	
Excess Risk	1.88	2.52	3.72	N/A	4.59	
Sharpe Ratio	1.52	1.61	0.31	N/A	0.33	

Calculation based on monthly periodicity.

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## Risk Statistics

## PIMCO Overlay

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-6.56	2.24	3.07	N/A	3.82	07/01/2012
Standard Deviation	6.21	6.70	5.57	N/A	5.63	
Downside Risk	5.62	4.71	3.86	N/A	3.85	
Downside Semi Deviation	2.03	7.20	6.63	N/A	6.91	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-6.56	-8.25	-8.25	N/A	-8.25	
Maximum Loss Exposure	-6.56	-1.36	N/A	N/A	N/A	
Upside Semi Deviation	1.83	6.55	5.14	N/A	5.19	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.59	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.24	
vs. ICE Libor (1 month)						
Active Return	-8.36	1.41	2.49	N/A	3.32	
Tracking Error	6.19	6.74	5.61	N/A	5.66	
Actual Correlation	0.21	-0.20	-0.17	N/A	-0.16	
Beta	13.72	-7.35	-5.08	N/A	-5.23	
Consistency	25.00	52.78	63.33	N/A	66.67	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-1.35	0.21	0.44	N/A	0.59	
Jensen Alpha	-4.71	-0.32	5.37	N/A	7.92	
Up Market Capture	-372.72	235.90	462.81	N/A	661.06	
Up Market Outperformance	-8.34	1.20	2.38	N/A	3.22	
vs. FTSE 3 Month T-Bill						
Excess Return	-8.15	1.64	2.69	N/A	3.50	
Excess Risk	6.19	6.74	5.61	N/A	5.66	
Sharpe Ratio	-1.32	0.24	0.48	N/A	0.62	

Calculation based on monthly periodicity.

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## Risk Statistics

## PIMCO Long Treasuries

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-6.37	0.04	4.03	N/A	1.47	07/01/2012
Standard Deviation	9.02	9.13	9.81	N/A	9.74	
Downside Risk	8.00	6.73	6.32	N/A	6.65	
Downside Semi Deviation	3.83	9.95	9.71	N/A	9.67	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	28.00	
Maximum Drawdown	-8.44	-13.09	-13.09	N/A	-15.41	
Maximum Loss Exposure	-6.37	-1.38	-2.78	N/A	-12.58	
Upside Semi Deviation	1.79	8.61	10.18	N/A	9.97	
Blmbg. Barc. U.S. Treasury: Long						
Return	-3.56	0.72	4.41	5.45	1.71	
Standard Deviation	7.59	8.95	9.76	12.11	9.70	
Downside Risk	6.11	6.31	6.13	7.03	6.48	
Downside Semi Deviation	2.61	8.80	9.07	10.24	9.17	
Max Drawdown Recovery Period	N/A	N/A	N/A	28.00	28.00	
Maximum Drawdown	-6.14	-13.92	-13.92	-15.94	-15.94	
Maximum Loss Exposure	-3.91	-1.38	-3.08	-3.26	-13.16	
Upside Semi Deviation	1.98	9.40	10.65	13.88	10.38	
vs. Blmbg. Barc. U.S. Treasury: Long						
Active Return	-2.84	-0.66	-0.35	N/A	-0.23	
Tracking Error	2.81	1.73	1.41	N/A	1.30	
Actual Correlation	0.96	0.98	0.99	N/A	0.99	
Beta	1.14	1.00	0.99	N/A	1.00	
Consistency	33.33	47.22	45.00	N/A	48.00	
Down Market Capture	121.79	103.24	100.54	N/A	100.22	
Down Market Outperformance	-2.51	-0.58	-0.12	N/A	-0.06	
Information Ratio	-1.01	-0.38	-0.25	N/A	-0.17	
Jensen Alpha	-2.13	-0.66	-0.33	N/A	-0.22	
Up Market Capture	99.24	97.39	98.06	N/A	98.57	
Up Market Outperformance	-0.08	-0.81	-0.72	N/A	-0.52	
vs. FTSE 3 Month T-Bill						
Excess Return	-7.75	-0.35	3.94	N/A	1.52	
Excess Risk	9.03	9.16	9.84	N/A	9.76	
Sharpe Ratio	-0.86	-0.04	0.40	N/A	0.16	

Calculation based on monthly periodicity.

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## Real Assets

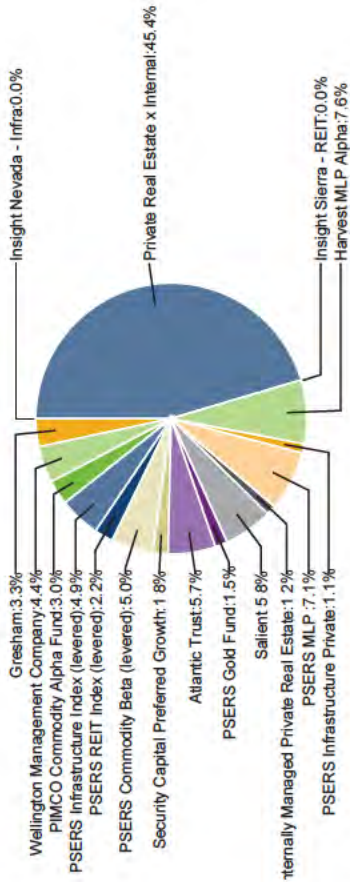
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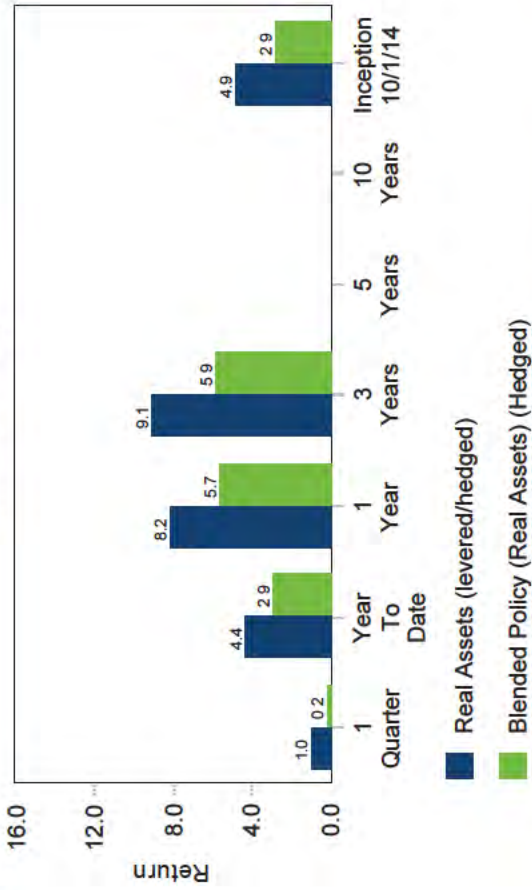
Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.

Current Allocation

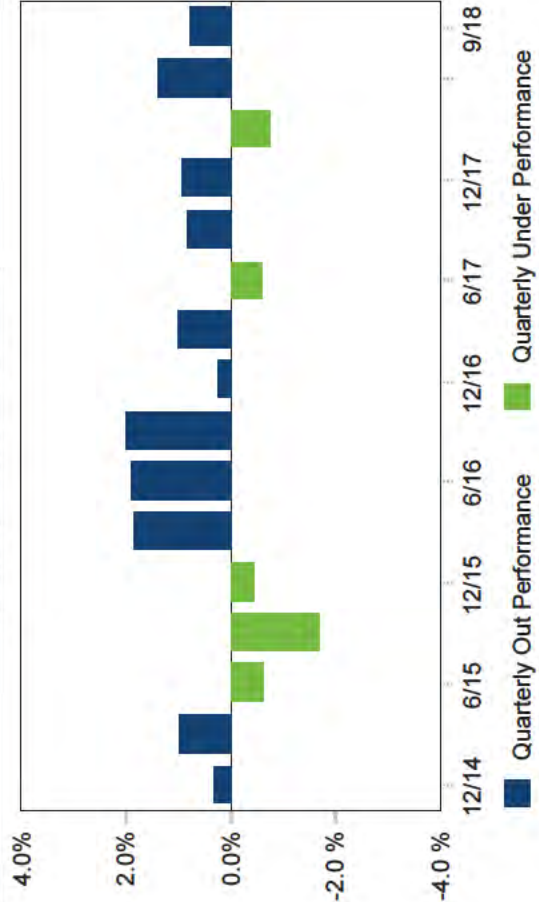
September 30, 2018 : \$10,599M



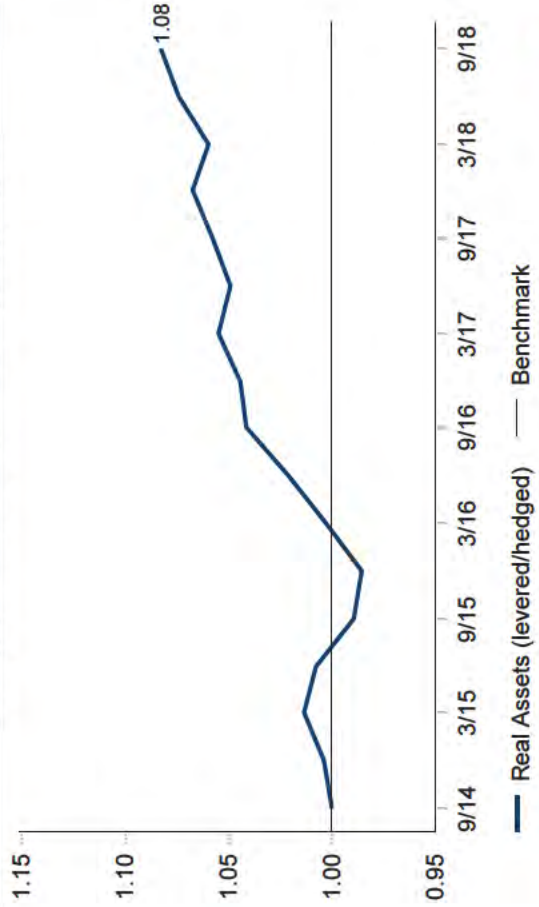
Return Summary



Quarterly Excess Performance



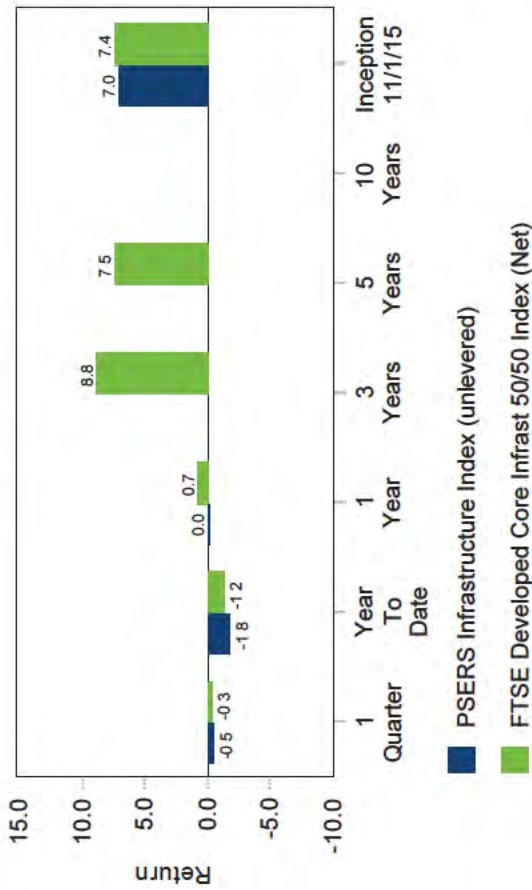
Ratio of Cumulative Wealth - Since Inception



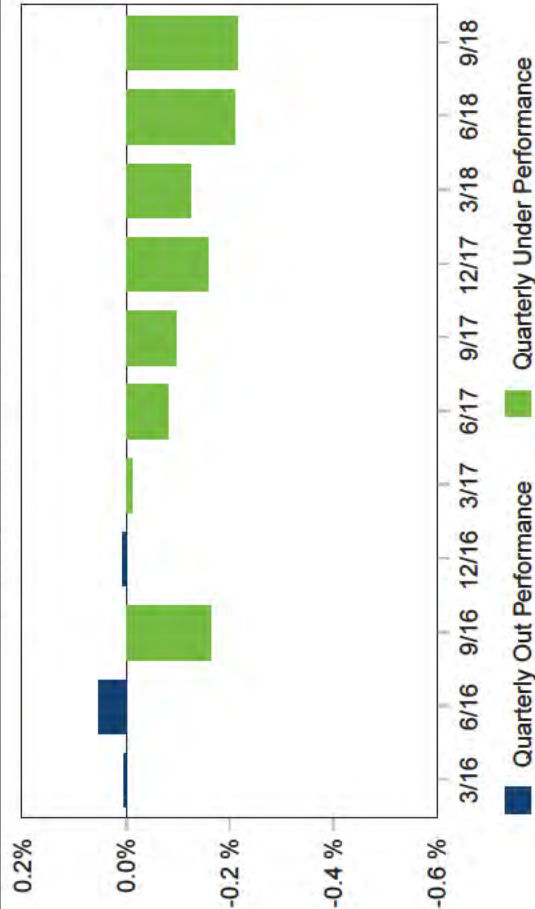
Account Information

Account Name: PSERS Infrastructure Index (unlevered)  
 Inception Date: 11/01/2015  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: FTSE Developed Core Infrac 50/50 Index (Net)  
 Peer Group:

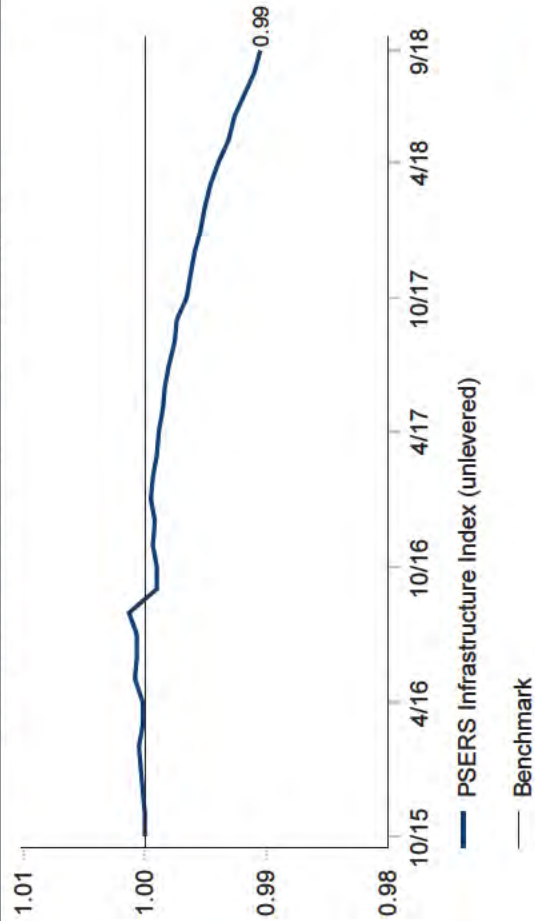
Return Summary



Quarterly Excess Performance

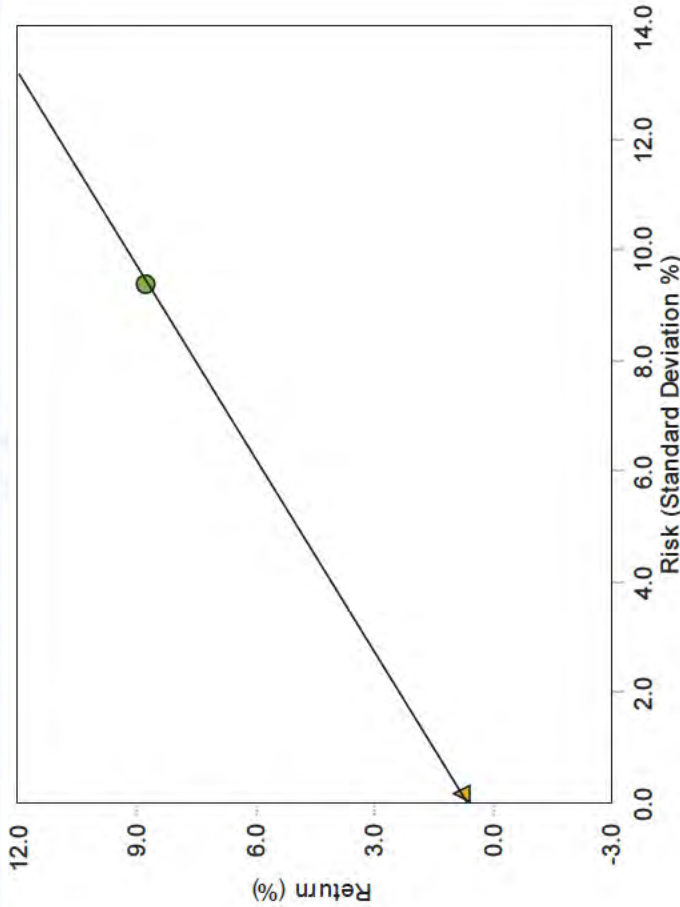


Ratio of Cumulative Wealth - Since Inception



PSERS Infrastructure Index (unlevered) Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



- PSERS Infrastructure Index (unlevered)
- FTSE Developed Core Infracast 50/50 Index (Net)
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation

No data found.

3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Infrastructure Index (unlevered)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTSE Developed Core Infracast 50/50 Index (Net)	0.00	0.00	N/A	1.00	0.85	0.00	1.00	8.76	9.41	1.00
FTSE 3 Month T-Bill	-8.05	9.43	-0.85	0.01	N/A	0.82	0.00	0.80	0.18	-0.11

Risk Statistics

PSERS Infrastructure Index (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	0.04	N/A	N/A	N/A	7.03	11/01/2015
Standard Deviation	8.08	N/A	N/A	N/A	9.23	
Downside Risk	6.55	N/A	N/A	N/A	5.65	
Downside Semi Deviation	2.80	N/A	N/A	N/A	9.14	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	8.00	
Maximum Drawdown	-7.50	N/A	N/A	N/A	-7.80	
Maximum Loss Exposure	-4.08	N/A	N/A	N/A	-4.66	
Upside Semi Deviation	2.03	N/A	N/A	N/A	9.90	

FTSE Developed Core Infracst 50/50 Index (Net)

Return	0.74	8.76	7.47	N/A	7.38	
Standard Deviation	8.10	9.41	9.24	N/A	9.27	
Downside Risk	6.47	5.56	5.64	N/A	5.64	
Downside Semi Deviation	2.77	9.13	9.04	N/A	9.13	
Max Drawdown Recovery Period	N/A	8.00	14.00	N/A	8.00	
Maximum Drawdown	-7.39	-7.69	-8.34	N/A	-7.69	
Maximum Loss Exposure	-3.86	-0.37	N/A	N/A	-4.68	
Upside Semi Deviation	2.09	10.35	9.93	N/A	10.01	

vs. FTSE Developed Core Infracst 50/50 Index (Net)

Active Return	-0.70	N/A	N/A	N/A	-0.34	
Tracking Error	0.06	N/A	N/A	N/A	0.18	
Actual Correlation	1.00	N/A	N/A	N/A	1.00	
Beta	1.00	N/A	N/A	N/A	1.00	
Consistency	0.00	N/A	N/A	N/A	20.00	
Down Market Capture	103.28	N/A	N/A	N/A	100.77	
Down Market Outperformance	-0.30	N/A	N/A	N/A	-0.15	
Information Ratio	-11.07	N/A	N/A	N/A	-1.91	
Jensen Alpha	-0.70	N/A	N/A	N/A	-0.31	
Up Market Capture	96.70	N/A	N/A	N/A	98.48	
Up Market Outperformance	-0.40	N/A	N/A	N/A	-0.56	

vs. FTSE 3 Month T-Bill

Excess Return	-1.22	N/A	N/A	N/A	6.40	
Excess Risk	8.07	N/A	N/A	N/A	9.25	
Sharpe Ratio	-0.15	N/A	N/A	N/A	0.69	

Calculation based on monthly periodicity.

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## MLPs

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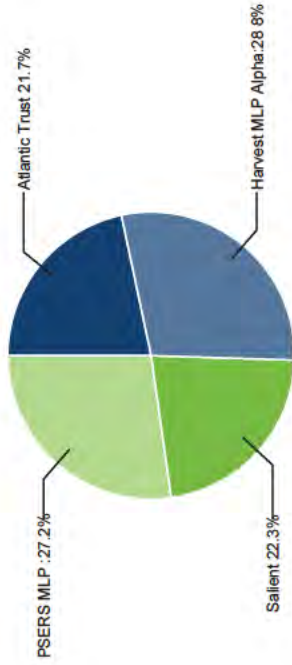
Case ID: 221102792

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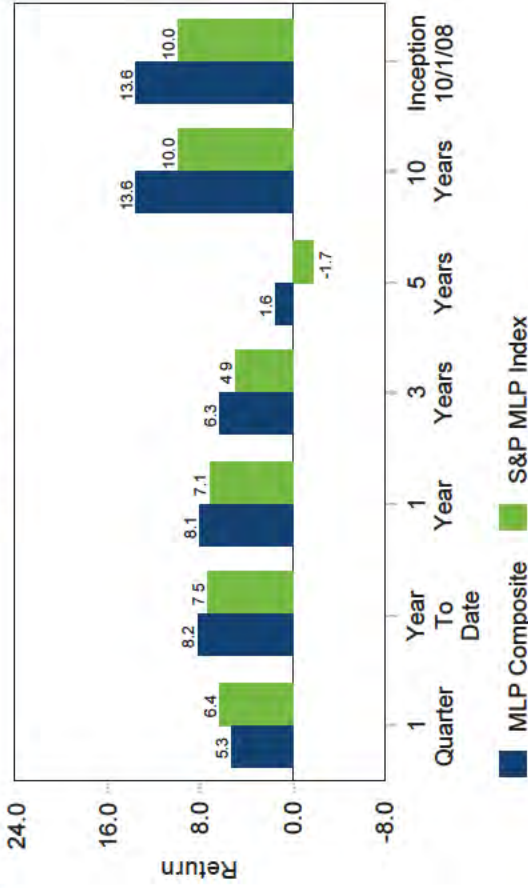


Current Allocation

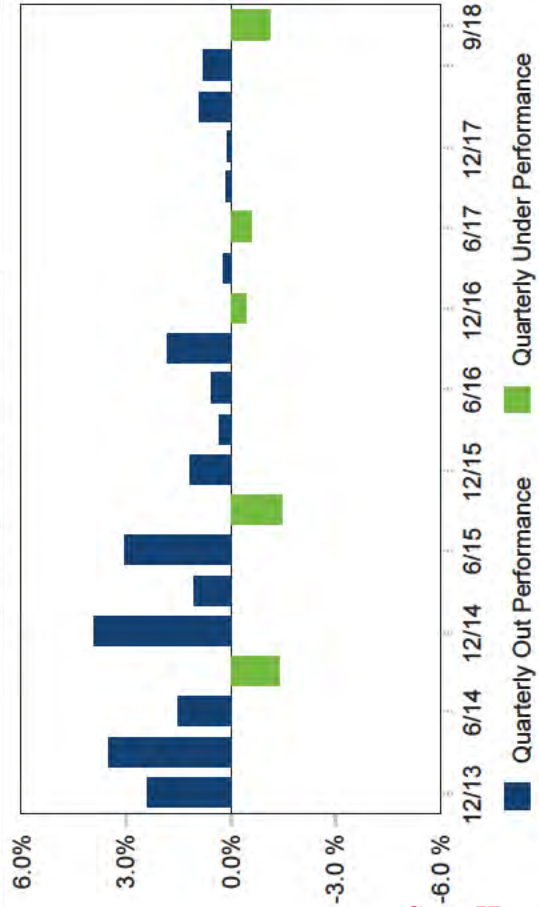
September 30, 2018 : \$2,779M



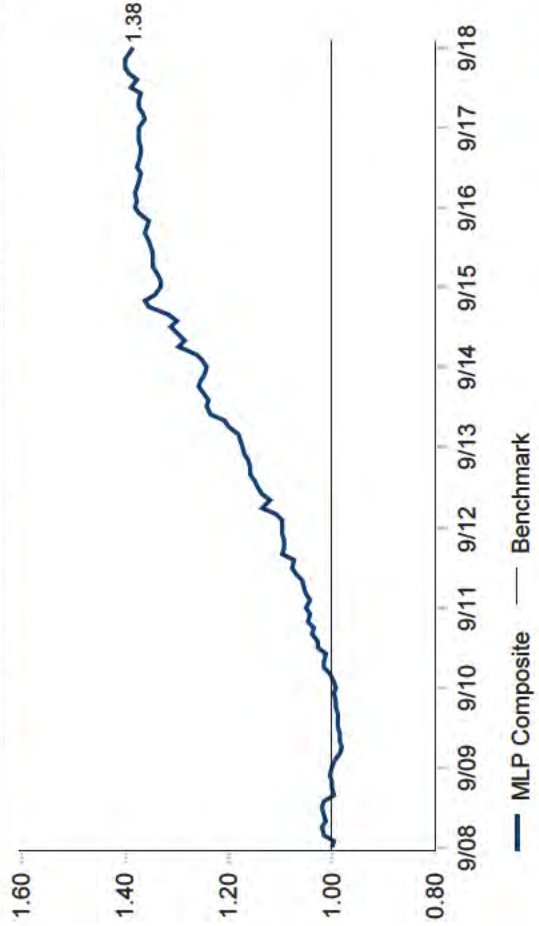
Return Summary



Quarterly Excess Performance

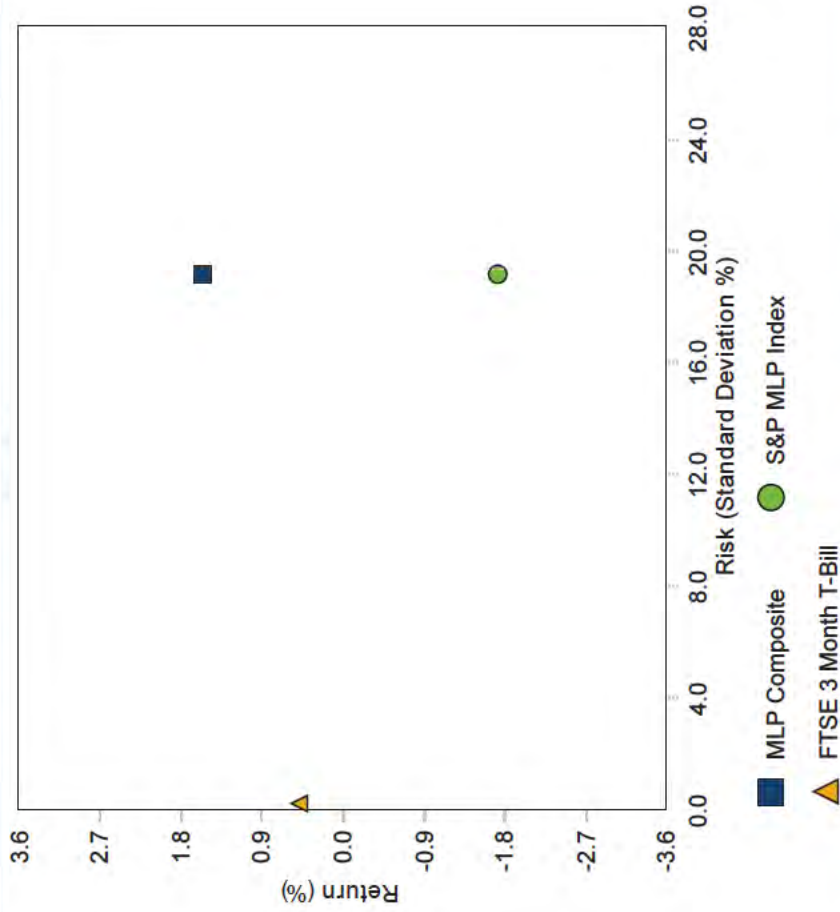


Ratio of Cumulative Wealth - Since Inception

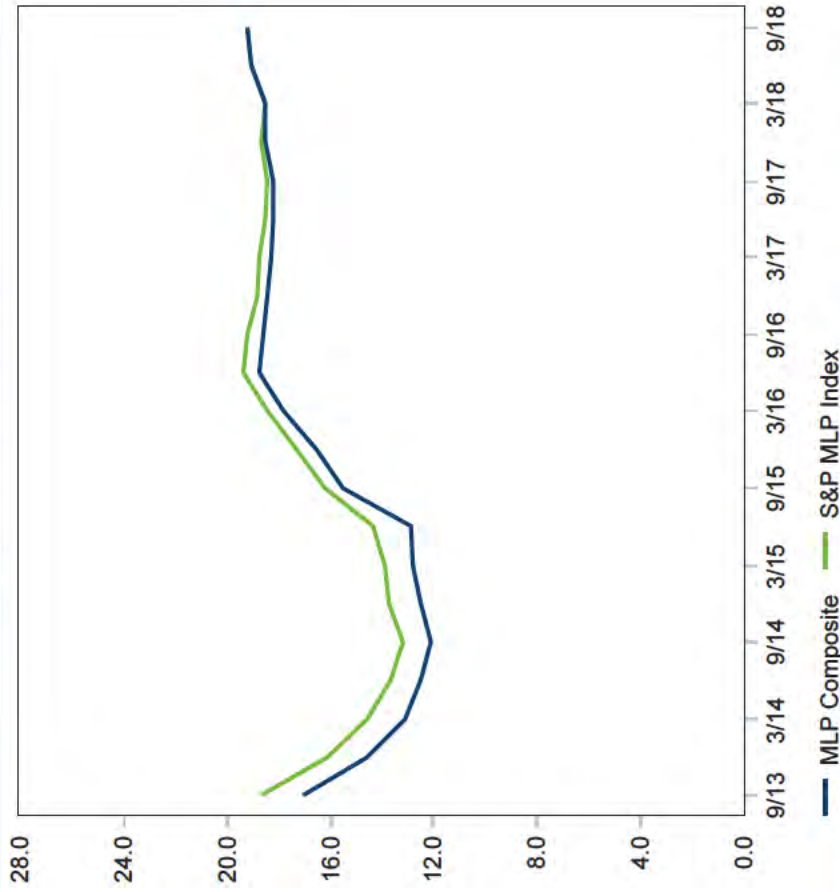


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
MLP Composite	3.28	2.90	1.13	0.98	0.15	3.34	0.99	1.56	19.19	0.99
S&P MLP Index	0.00	0.00	N/A	1.00	-0.02	0.00	1.00	-1.73	19.23	1.00
FTSE 3 Month T-Bill	0.39	19.21	0.02	0.01	N/A	0.49	0.00	0.49	0.18	0.10

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## Risk Statistics

MLP Composite	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.06	6.34	1.56	13.61	13.61	10/01/2008
Standard Deviation	19.75	19.53	19.19	18.35	18.35	
Downside Risk	12.87	12.80	13.70	11.58	11.58	
Downside Semi Deviation	5.51	19.55	20.25	19.26	19.26	
Max Drawdown Recovery Period	6.00	8.00	N/A	N/A	N/A	
Maximum Drawdown	-14.57	-25.02	-47.29	-47.29	-47.29	
Maximum Loss Exposure	-9.94	-18.23	-26.55	-19.01	-19.01	
Upside Semi Deviation	6.53	20.27	18.58	18.70	18.70	
S&P MLP Index						
Return	7.15	4.90	-1.73	9.97	9.97	
Standard Deviation	19.82	19.50	19.23	19.13	19.13	
Downside Risk	13.08	12.98	14.07	12.30	12.30	
Downside Semi Deviation	5.60	19.20	20.42	19.57	19.57	
Max Drawdown Recovery Period	6.00	11.00	N/A	N/A	N/A	
Maximum Drawdown	-15.56	-25.82	-51.27	-51.27	-51.27	
Maximum Loss Exposure	-10.99	-19.32	-35.96	-20.60	-20.60	
Upside Semi Deviation	6.48	20.46	18.39	19.45	19.45	
vs. S&P MLP Index						
Active Return	0.84	1.37	3.28	3.14	3.14	
Tracking Error	2.48	1.88	2.90	2.76	2.76	
Actual Correlation	0.99	1.00	0.99	0.99	0.99	
Beta	0.99	1.00	0.99	0.95	0.95	
Consistency	50.00	58.33	61.67	63.33	63.33	
Down Market Capture	97.76	96.08	93.38	88.04	88.04	
Down Market Outperformance	0.45	1.20	2.13	3.81	3.81	
Information Ratio	0.34	0.73	1.13	1.14	1.14	
Jensen Alpha	0.93	1.40	3.33	3.76	3.76	
Up Market Capture	100.88	101.55	105.96	102.38	102.38	
Up Market Outperformance	0.38	1.41	4.86	2.14	2.14	
vs. FTSE 3 Month T-Bill						
Excess Return	8.01	7.22	2.90	14.20	14.20	
Excess Risk	19.72	19.52	19.18	18.36	18.36	
Sharpe Ratio	0.41	0.37	0.15	0.77	0.77	

Calculation based on monthly periodicity.

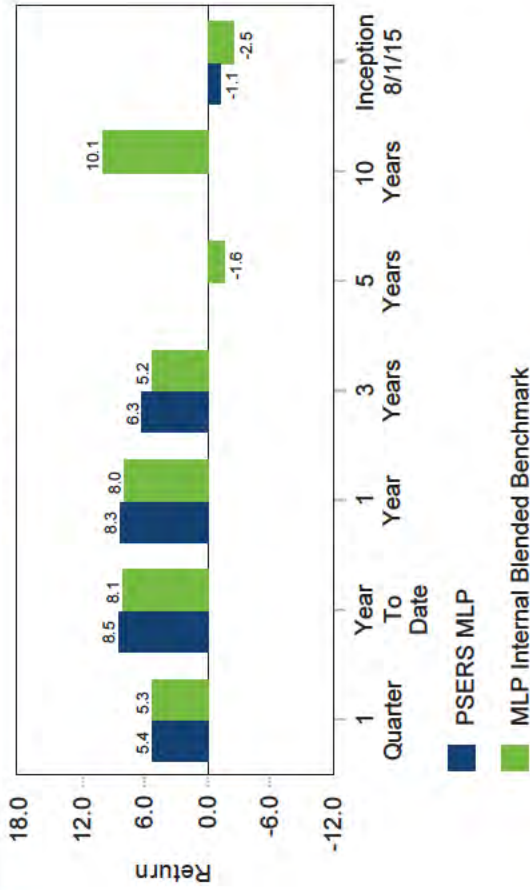
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Performance Summary

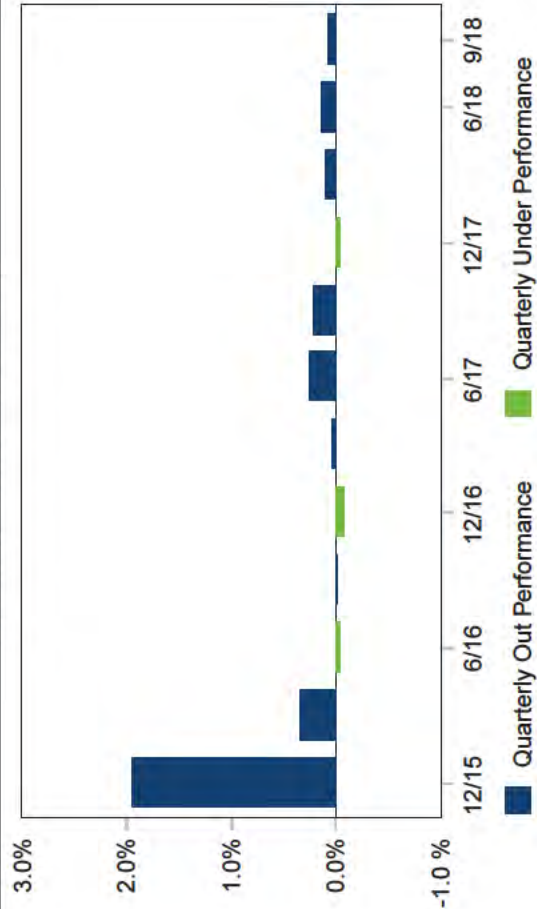
Account Information

Account Name: PSERS MLP  
 Inception Date: 07/30/2015  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: MLP Internal Blended Benchmark  
 Peer Group:

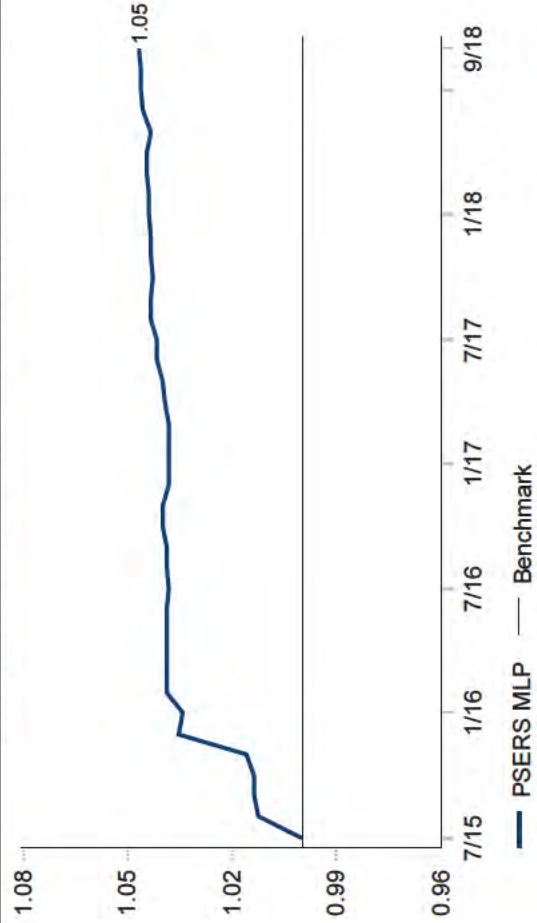
Return Summary



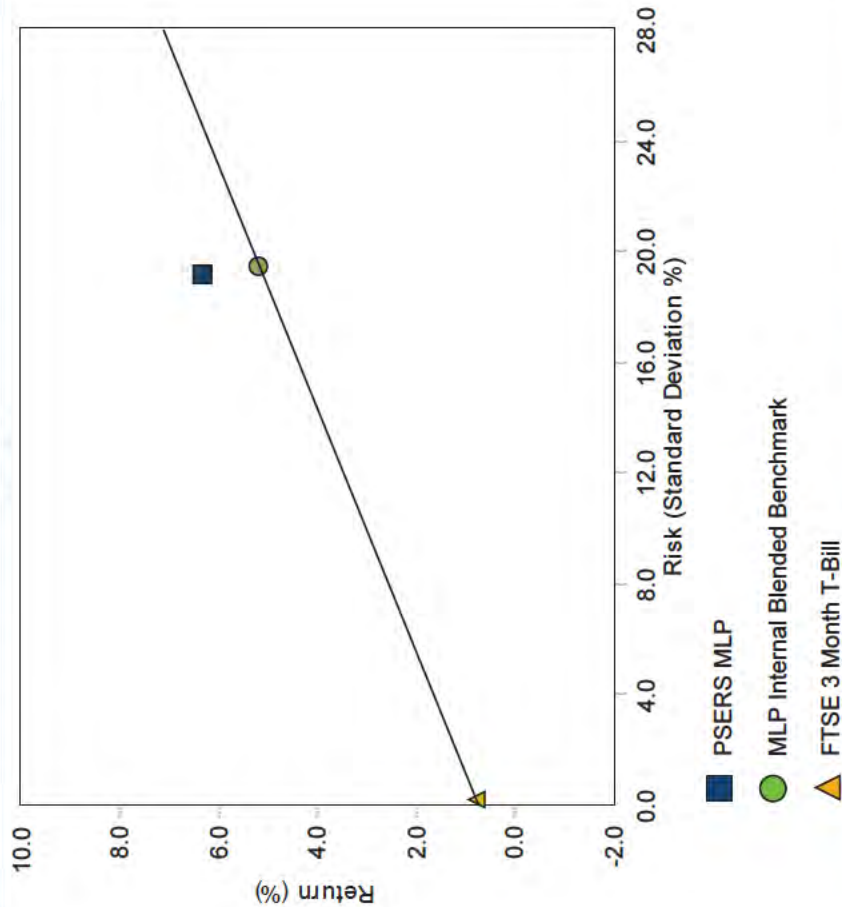
Quarterly Excess Performance



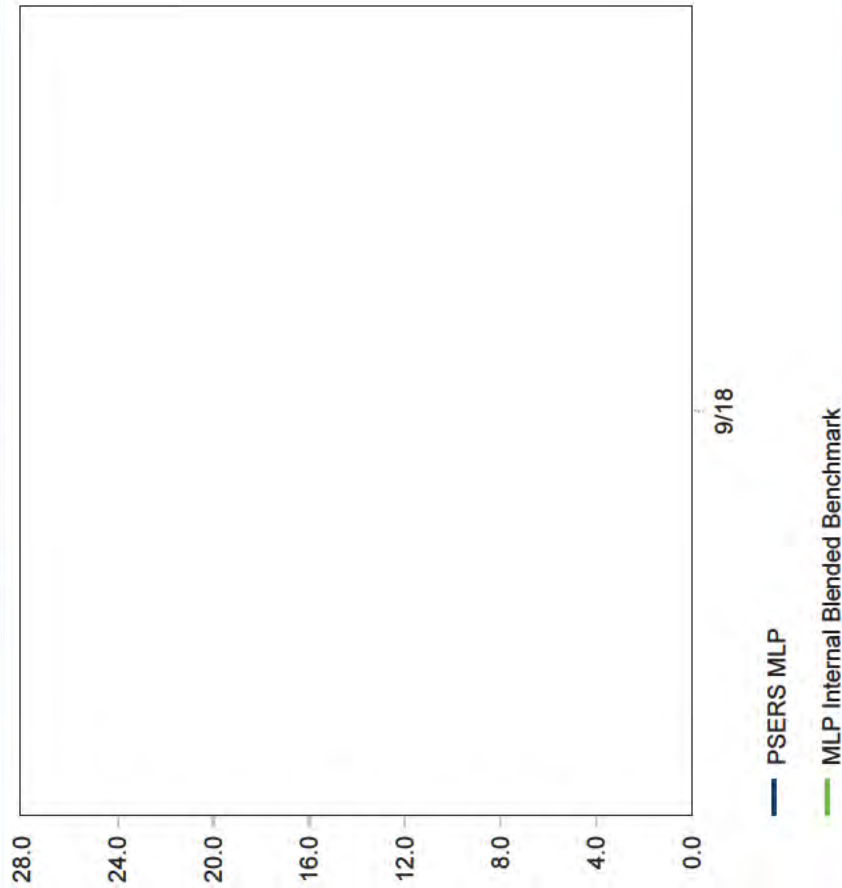
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS MLP	1.01	1.05	0.96	1.00	0.37	1.13	0.98	6.31	19.19	1.00
MLP Internal Blended Benchmark	0.00	0.00	N/A	1.00	0.31	0.00	1.00	5.19	19.48	1.00
FTSE 3 Month T-Bill	-6.12	19.47	-0.31	0.00	N/A	0.80	0.00	0.80	0.18	0.05

Risk Statistics

PSERS MLP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.28	6.31	N/A	N/A	-1.11	08/01/2015
Standard Deviation	19.71	19.19	N/A	N/A	21.07	
Downside Risk	12.83	12.56	N/A	N/A	15.49	
Downside Semi Deviation	5.49	18.58	N/A	N/A	22.20	
Max Drawdown Recovery Period	6.00	8.00	N/A	N/A	N/A	
Maximum Drawdown	-14.53	-23.97	N/A	N/A	-33.60	
Maximum Loss Exposure	-9.89	-17.35	N/A	N/A	-33.60	
Upside Semi Deviation	6.53	20.48	N/A	N/A	20.48	
MLP Internal Blended Benchmark						
Return	7.98	5.19	-1.57	10.06	-2.52	
Standard Deviation	19.76	19.48	19.23	19.13	21.41	
Downside Risk	12.88	12.92	14.03	12.28	15.92	
Downside Semi Deviation	5.52	19.11	20.37	19.54	22.82	
Max Drawdown Recovery Period	6.00	11.00	N/A	N/A	N/A	
Maximum Drawdown	-14.59	-25.82	-51.27	-51.27	-36.07	
Maximum Loss Exposure	-9.96	-19.32	-35.96	-20.60	-36.07	
Upside Semi Deviation	6.53	20.53	18.43	19.47	20.53	

vs. MLP Internal Blended Benchmark

Active Return	0.27	1.01	N/A	N/A	1.36	
Tracking Error	0.26	1.05	N/A	N/A	1.19	
Actual Correlation	1.00	1.00	N/A	N/A	1.00	
Beta	1.00	0.98	N/A	N/A	0.98	
Consistency	83.33	72.22	N/A	N/A	73.68	
Down Market Capture	98.86	95.38	N/A	N/A	95.05	
Down Market Outperformance	0.22	1.44	N/A	N/A	1.66	
Information Ratio	1.04	0.96	N/A	N/A	1.15	
Jensen Alpha	0.30	1.11	N/A	N/A	1.36	
Up Market Capture	100.00	99.80	N/A	N/A	99.80	
Up Market Outperformance	0.00	-0.18	N/A	N/A	-0.18	
vs. FTSE 3 Month T-Bill						
Excess Return	8.21	7.12	N/A	N/A	0.33	
Excess Risk	19.68	19.18	N/A	N/A	21.04	
Sharpe Ratio	0.42	0.37	N/A	N/A	0.02	

Calculation based on monthly periodicity.

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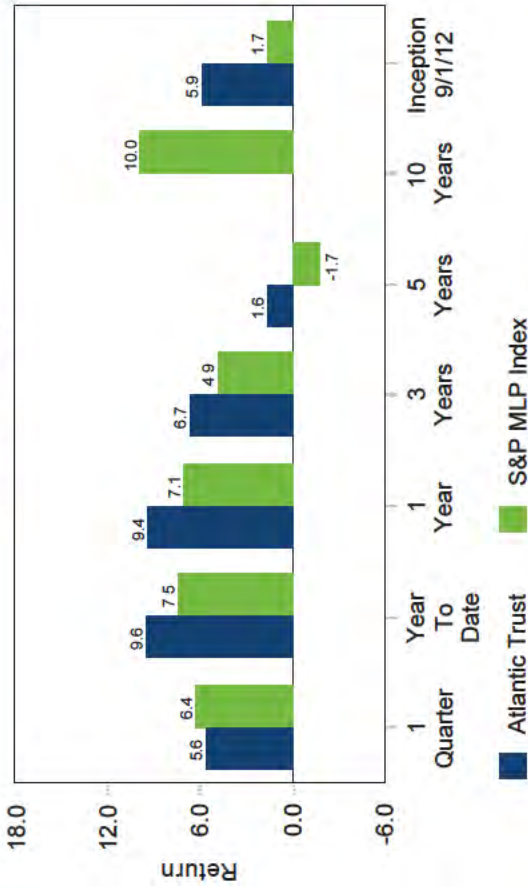


Performance Summary

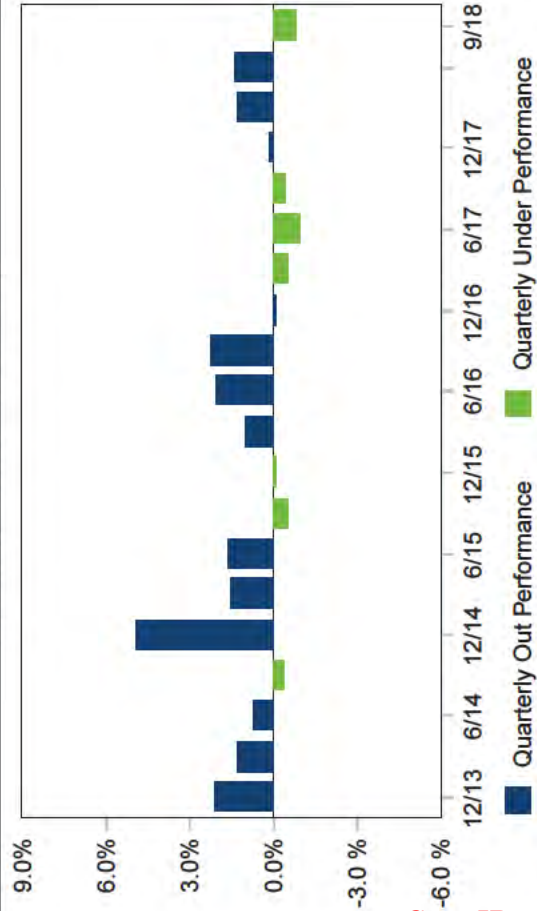
Account Information

Account Name: Atlantic Trust  
 Inception Date: 09/30/2012  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: S&P MLP Total Return Index  
 Peer Group:

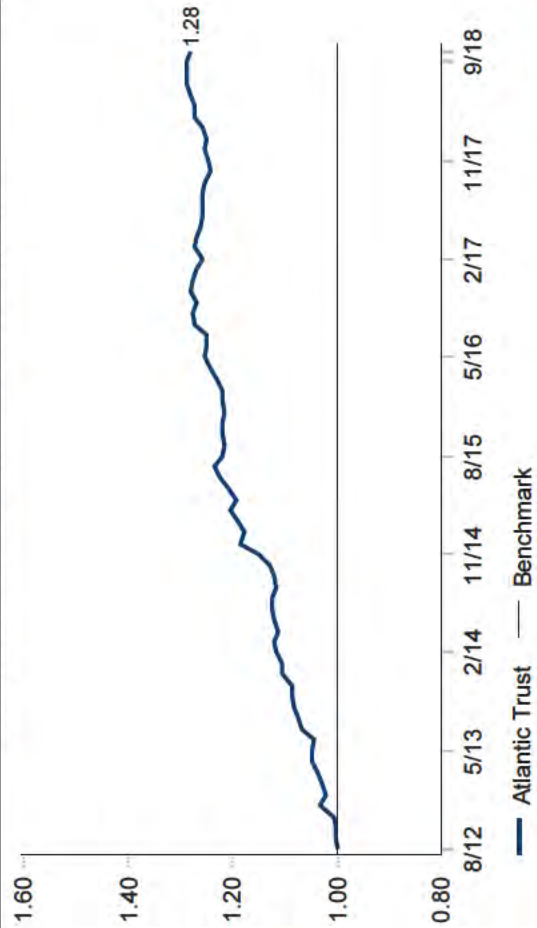
Return Summary



Quarterly Excess Performance

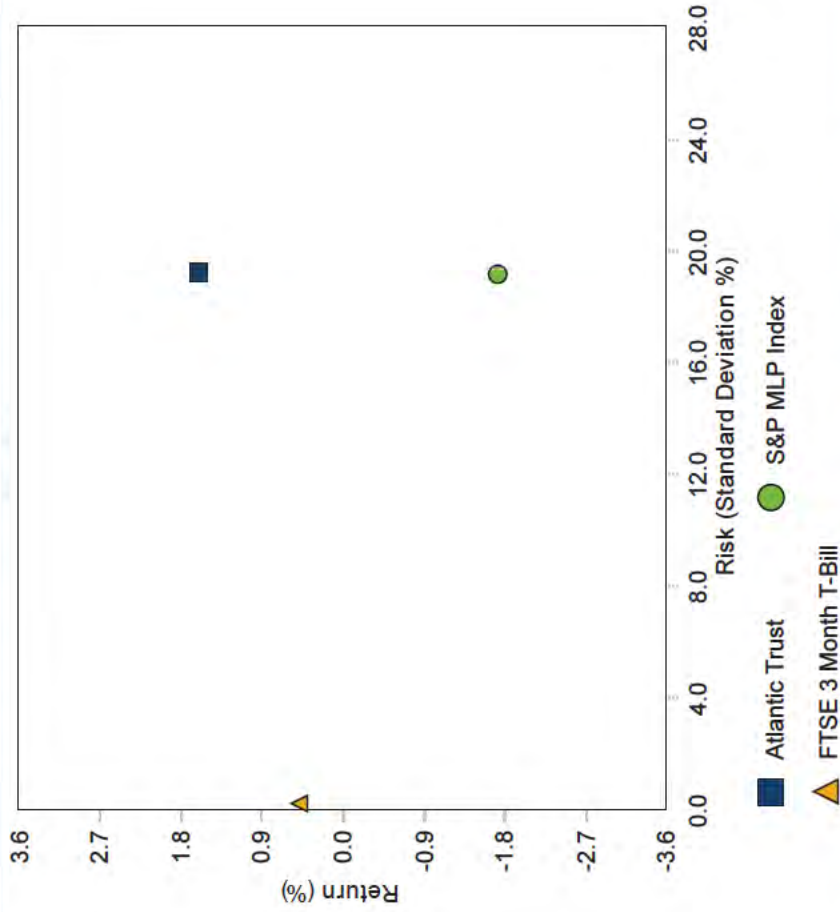


Ratio of Cumulative Wealth - Since Inception

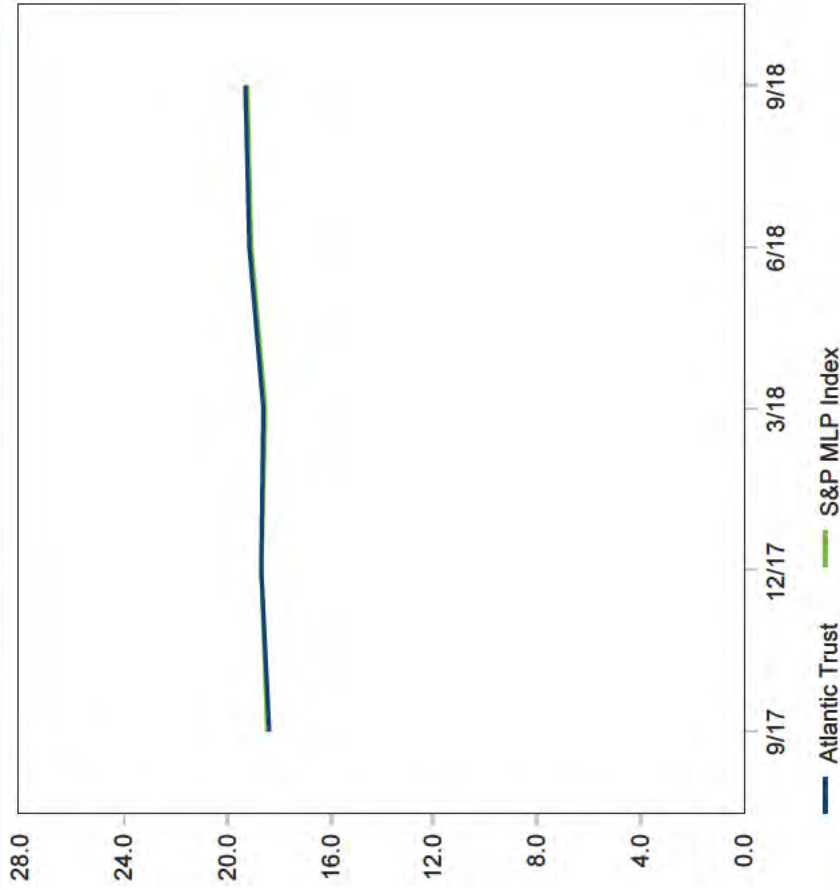


Atlantic Trust Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Atlantic Trust	3.34	2.74	1.22	0.98	0.15	3.39	0.99	1.60	19.27	0.99
S&P MLP Index	0.00	0.00	N/A	1.00	-0.02	0.00	1.00	-1.73	19.23	1.00
FTSE 3 Month T-Bill	0.39	19.21	0.02	0.01	N/A	0.49	0.00	0.49	0.18	0.10



## Risk Statistics

## Atlantic Trust

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	9.39	6.69	1.60	N/A	5.87	09/01/2012
Standard Deviation	19.52	19.93	19.27	N/A	18.30	
Downside Risk	12.36	12.91	13.66	N/A	12.41	
Downside Semi Deviation	5.29	20.41	20.57	N/A	19.22	
Max Drawdown Recovery Period	6.00	8.00	N/A	N/A	N/A	
Maximum Drawdown	-14.06	-25.67	-46.77	N/A	-46.77	
Maximum Loss Exposure	-9.64	-19.07	-27.85	N/A	-5.72	
Upside Semi Deviation	6.62	20.36	18.52	N/A	18.05	
S&P MLP Index						
Return	7.15	4.90	-1.73	9.97	1.67	
Standard Deviation	19.82	19.50	19.23	19.13	18.46	
Downside Risk	13.08	12.98	14.07	12.30	12.87	
Downside Semi Deviation	5.60	19.20	20.42	19.57	19.30	
Max Drawdown Recovery Period	6.00	11.00	N/A	N/A	N/A	
Maximum Drawdown	-15.56	-25.82	-51.27	-51.27	-51.27	
Maximum Loss Exposure	-10.99	-19.32	-35.96	-20.60	-22.71	
Upside Semi Deviation	6.48	20.46	18.39	19.45	18.03	
vs. S&P MLP Index						
Active Return	2.02	1.78	3.34	N/A	4.04	
Tracking Error	2.09	2.24	2.74	N/A	2.91	
Actual Correlation	0.99	0.99	0.99	N/A	0.99	
Beta	0.98	1.02	0.99	N/A	0.98	
Consistency	50.00	47.22	56.67	N/A	60.27	
Down Market Capture	94.91	96.28	91.73	N/A	89.30	
Down Market Outperformance	1.04	1.12	2.67	N/A	3.36	
Information Ratio	0.96	0.79	1.22	N/A	1.38	
Jensen Alpha	2.19	1.69	3.39	N/A	4.18	
Up Market Capture	102.33	103.06	104.53	N/A	106.11	
Up Market Outperformance	1.01	2.71	3.59	N/A	4.57	
vs. FTSE 3 Month T-Bill						
Excess Return	9.19	7.62	2.95	N/A	6.97	
Excess Risk	19.50	19.93	19.26	N/A	18.29	
Sharpe Ratio	0.47	0.38	0.15	N/A	0.38	

Calculation based on monthly periodicity.

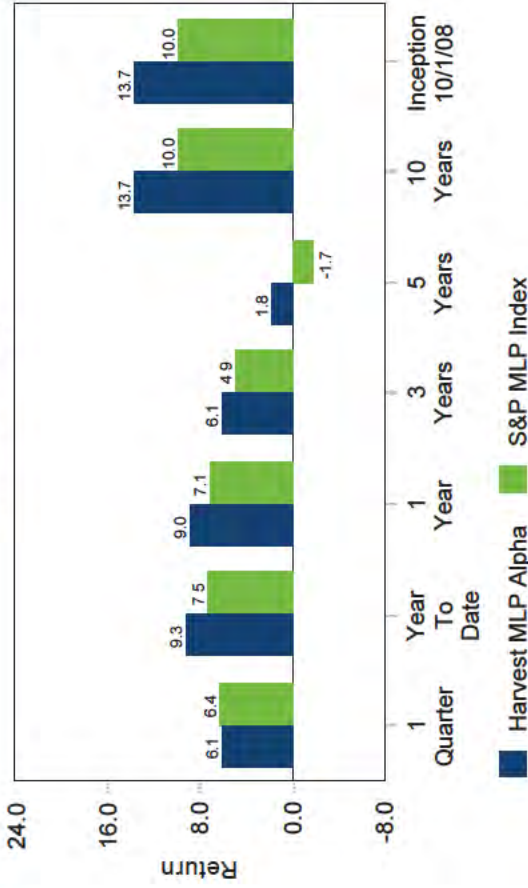
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Performance Summary

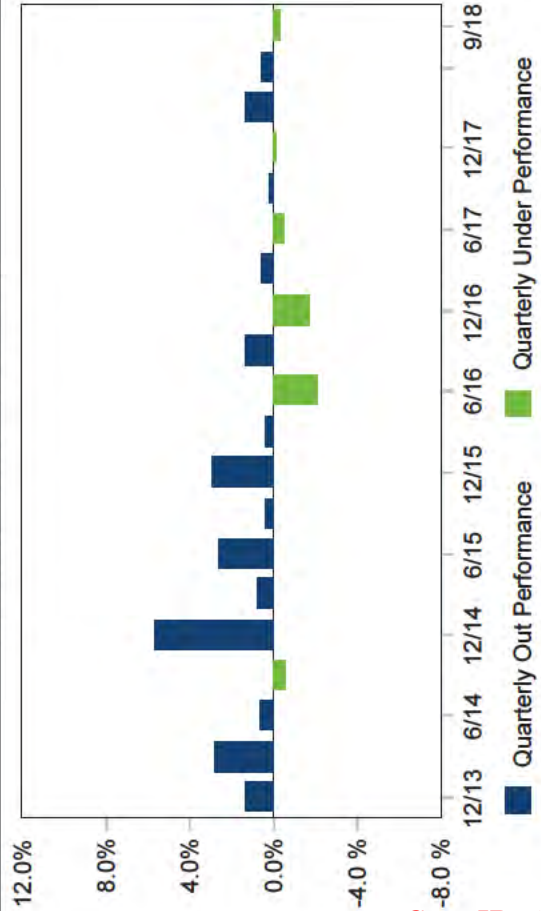
Account Information

Account Name: Harvest MLP Alpha  
 Inception Date: 09/30/2008  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: S&P MLP Total Return Index  
 Peer Group:

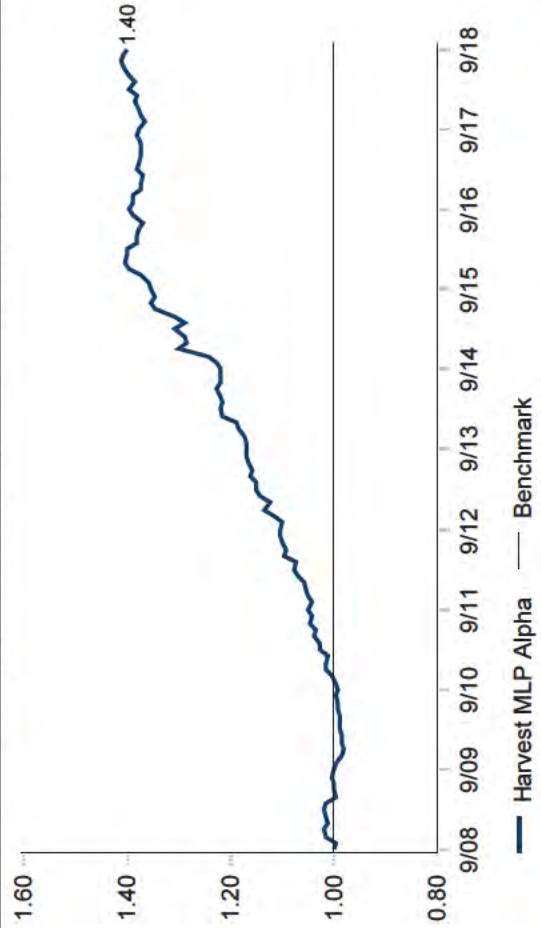
Return Summary



Quarterly Excess Performance

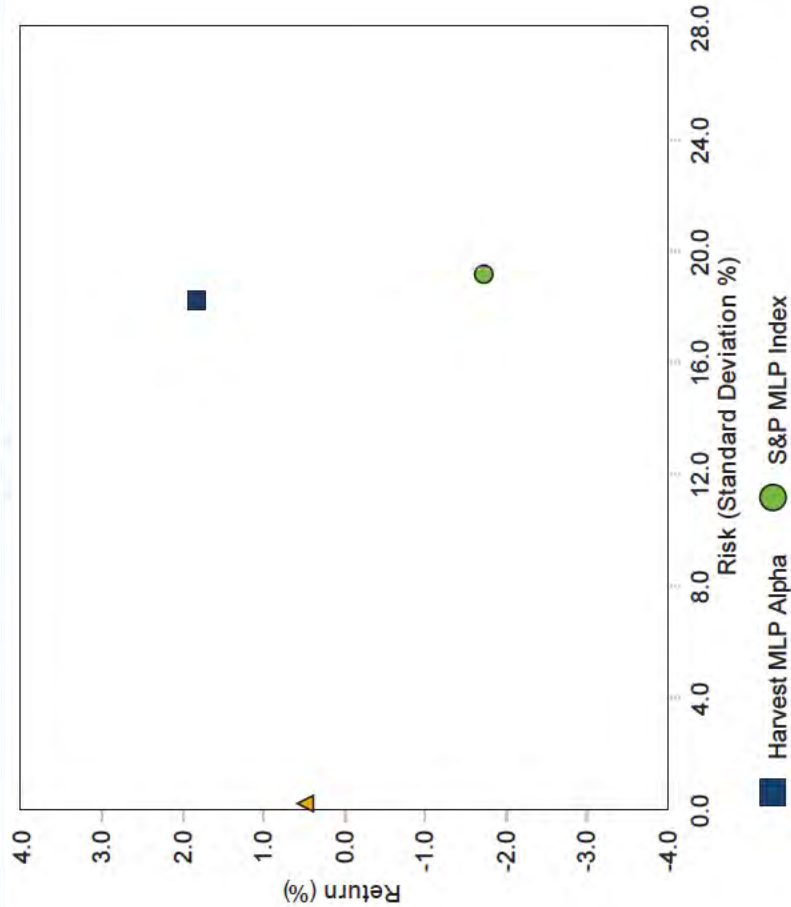


Ratio of Cumulative Wealth - Since Inception

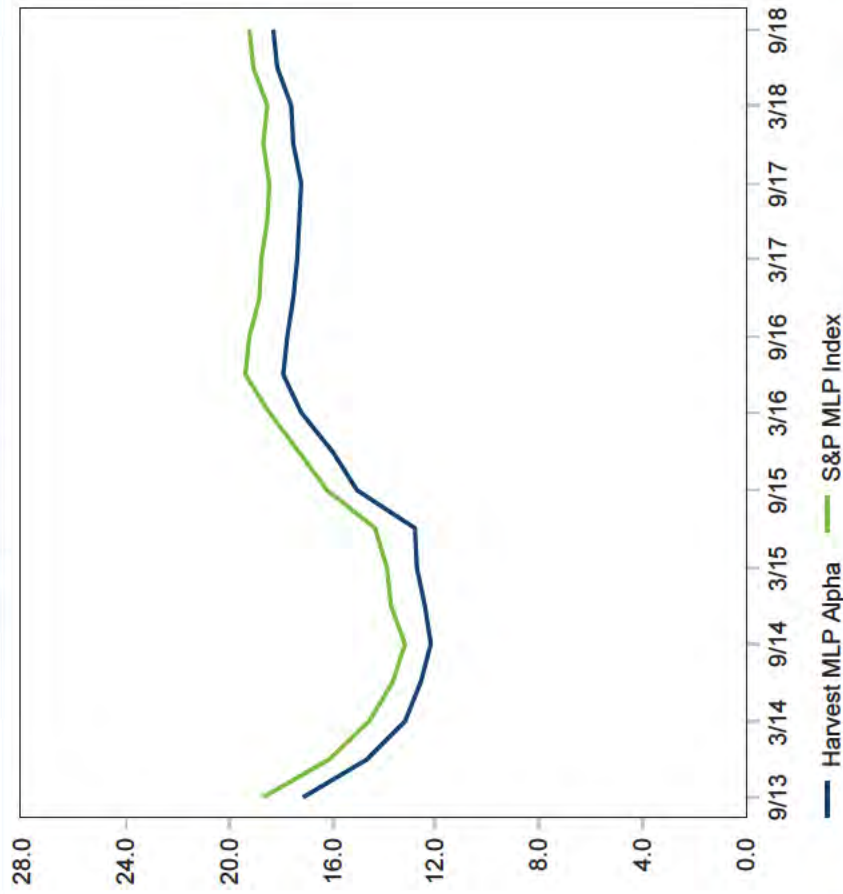


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Harvest MLP Alpha	3.39	3.35	1.01	0.97	0.16	3.45	0.94	1.83	18.29	0.99
S&P MLP Index	0.00	0.00	N/A	1.00	-0.02	0.00	1.00	-1.73	19.23	1.00
FTSE 3 Month T-Bill	0.39	19.21	0.02	0.01	N/A	0.49	0.00	0.49	0.18	0.10

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## Risk Statistics

## Harvest MLP Alpha

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.99	6.11	1.83	13.73	13.73	10/01/2008
Standard Deviation	20.08	18.78	18.29	17.93	17.93	
Downside Risk	12.95	12.37	13.02	11.19	11.19	
Downside Semi Deviation	5.55	18.89	19.24	18.62	18.62	
Max Drawdown Recovery Period	6.00	9.00	N/A	N/A	N/A	
Maximum Drawdown	-14.79	-23.54	-44.04	-44.04	-44.04	
Maximum Loss Exposure	-9.67	-16.55	-23.50	-19.01	-19.01	
Upside Semi Deviation	6.71	19.42	17.79	18.42	18.42	
S&P MLP Index						
Return	7.15	4.90	-1.73	9.97	9.97	
Standard Deviation	19.82	19.50	19.23	19.13	19.13	
Downside Risk	13.08	12.98	14.07	12.30	12.30	
Downside Semi Deviation	5.60	19.20	20.42	19.57	19.57	
Max Drawdown Recovery Period	6.00	11.00	N/A	N/A	N/A	
Maximum Drawdown	-15.56	-25.82	-51.27	-51.27	-51.27	
Maximum Loss Exposure	-10.99	-19.32	-35.96	-20.60	-20.60	
Upside Semi Deviation	6.48	20.46	18.39	19.45	19.45	
vs. S&P MLP Index						
Active Return	1.76	1.01	3.39	3.17	3.17	
Tracking Error	2.37	2.46	3.35	3.00	3.00	
Actual Correlation	0.99	0.99	0.99	0.99	0.99	
Beta	1.01	0.96	0.94	0.93	0.93	
Consistency	58.33	52.78	60.00	62.50	62.50	
Down Market Capture	98.08	92.85	88.00	84.80	84.80	
Down Market Outperformance	0.38	2.25	4.00	4.92	4.92	
Information Ratio	0.74	0.41	1.01	1.06	1.06	
Jensen Alpha	1.73	1.28	3.42	4.05	4.05	
Up Market Capture	103.89	97.83	101.00	100.41	100.41	
Up Market Outperformance	1.69	-1.95	0.91	0.50	0.50	
vs. FTSE 3 Month T-Bill						
Excess Return	8.94	6.86	3.00	14.22	14.22	
Excess Risk	20.06	18.77	18.28	17.94	17.94	
Sharpe Ratio	0.45	0.37	0.16	0.79	0.79	

Calculation based on monthly periodicity.

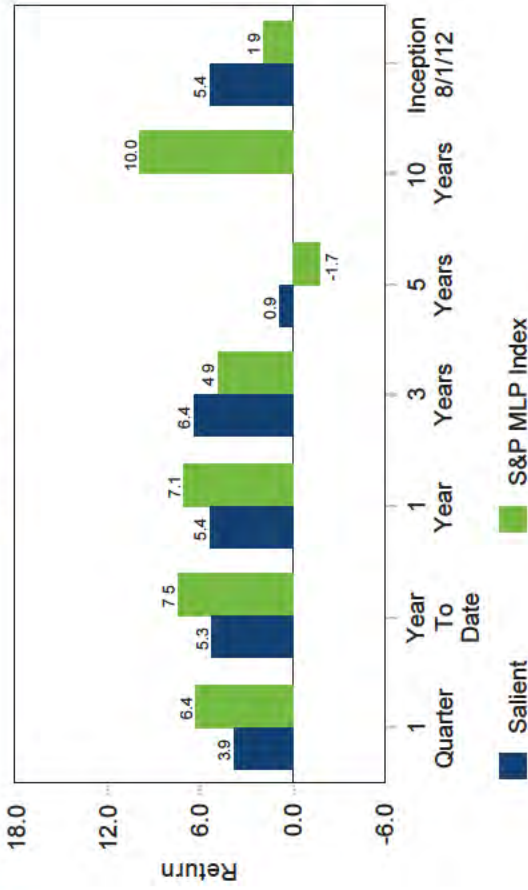
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Performance Summary

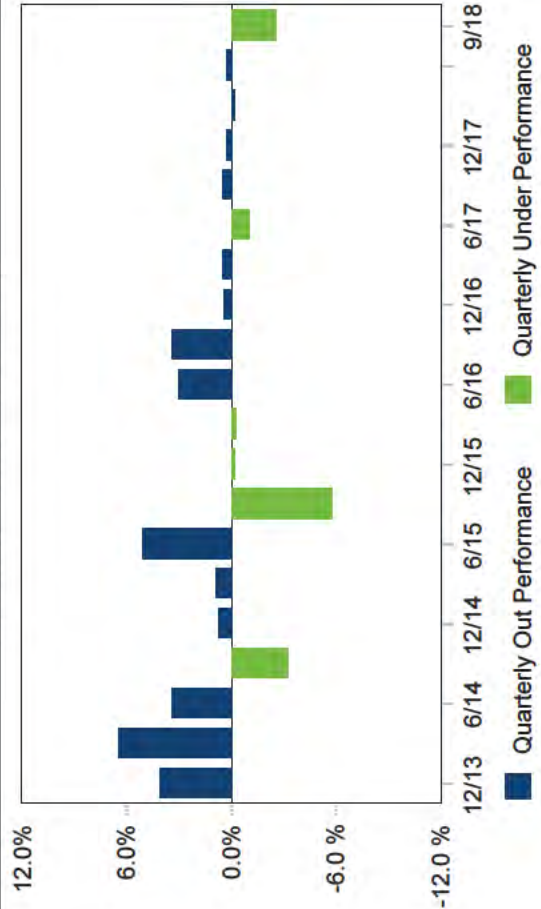
Account Information

Account Name: Salient  
 Inception Date: 09/30/2012  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: S&P MLP Total Return Index  
 Peer Group:

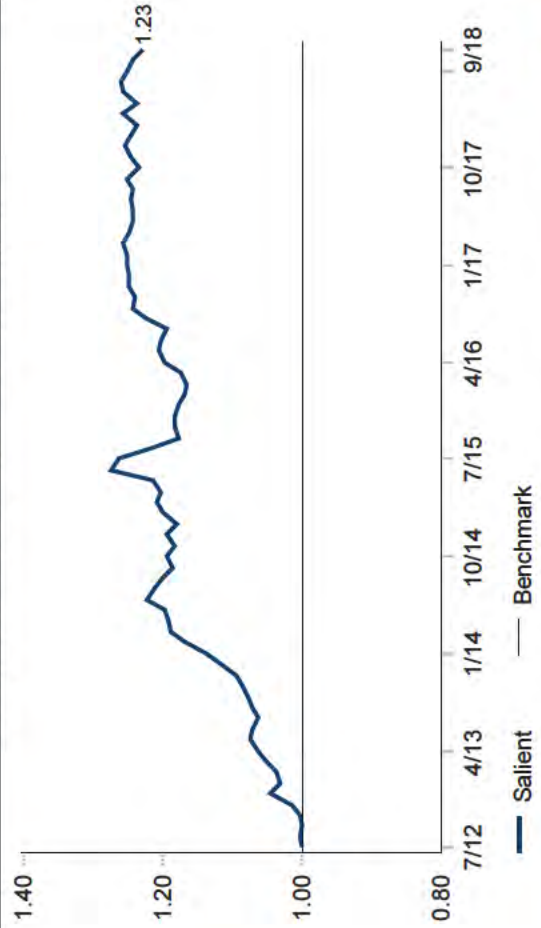
Return Summary



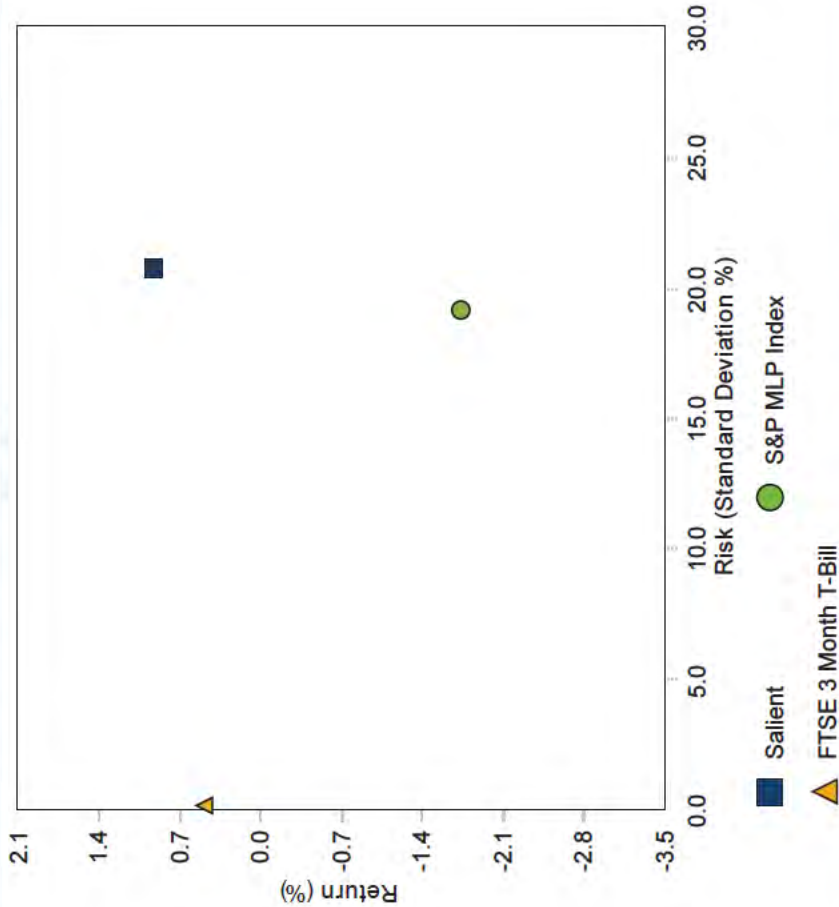
Quarterly Excess Performance



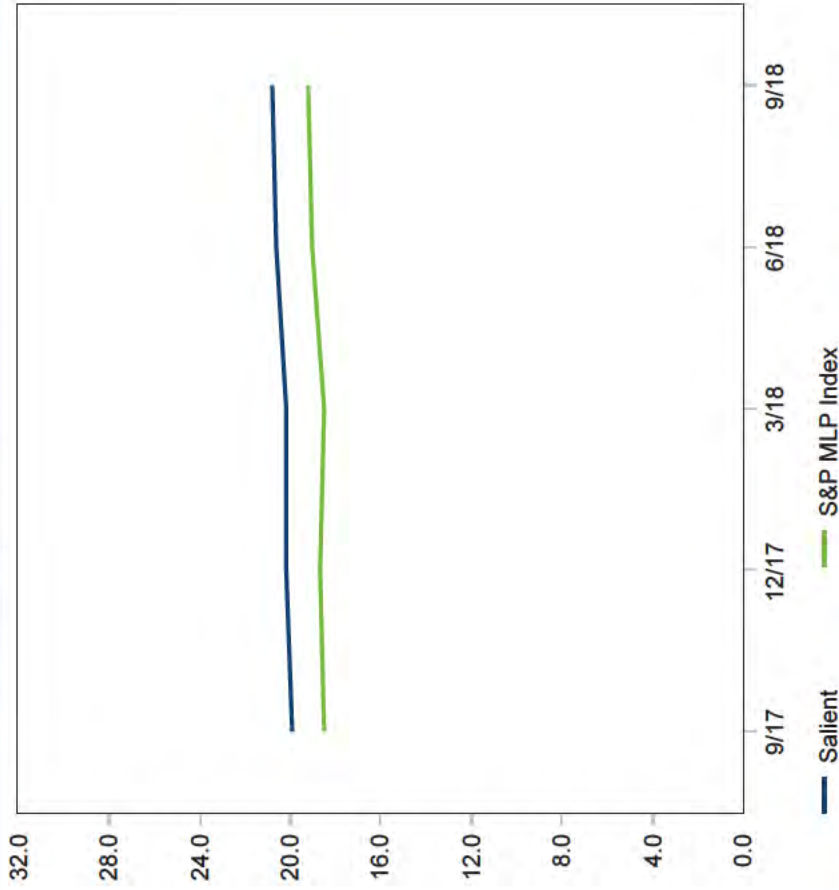
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Salient	3.00	4.62	0.65	0.95	0.13	3.03	1.06	0.93	20.79	0.98
S&P MLP Index	0.00	0.00	N/A	1.00	-0.02	0.00	1.00	-1.73	19.23	1.00
FTSE 3 Month T-Bill	0.39	19.21	0.02	0.01	N/A	0.49	0.00	0.49	0.18	0.10

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## Risk Statistics

## Saliient

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.39	6.44	0.93	N/A	5.40	08/01/2012
Standard Deviation	19.72	20.57	20.79	N/A	19.46	
Downside Risk	13.32	13.49	15.02	N/A	13.54	
Downside Semi Deviation	5.70	20.60	22.21	N/A	21.11	
Max Drawdown Recovery Period	6.00	8.00	N/A	N/A	N/A	
Maximum Drawdown	-14.83	-26.76	-52.60	N/A	-52.60	
Maximum Loss Exposure	-10.61	-20.04	-30.53	N/A	-8.30	
Upside Semi Deviation	6.29	21.34	19.86	N/A	18.64	
S&P MLP Index						
Return	7.15	4.90	-1.73	9.97	1.92	
Standard Deviation	19.82	19.50	19.23	19.13	18.34	
Downside Risk	13.08	12.98	14.07	12.30	12.78	
Downside Semi Deviation	5.60	19.20	20.42	19.57	19.30	
Max Drawdown Recovery Period	6.00	11.00	N/A	N/A	N/A	
Maximum Drawdown	-15.56	-25.82	-51.27	-51.27	-51.27	
Maximum Loss Exposure	-10.99	-19.32	-35.96	-20.60	-21.42	
Upside Semi Deviation	6.48	20.46	18.39	19.45	17.83	
vs. S&P MLP Index						
Active Return	-1.67	1.66	3.00	N/A	3.59	
Tracking Error	3.73	3.22	4.62	N/A	4.47	
Actual Correlation	0.98	0.99	0.98	N/A	0.97	
Beta	0.98	1.04	1.06	N/A	1.03	
Consistency	41.67	50.00	55.00	N/A	58.11	
Down Market Capture	101.09	100.38	102.94	N/A	98.47	
Down Market Outperformance	-0.23	-0.21	-1.09	N/A	0.29	
Information Ratio	-0.45	0.52	0.65	N/A	0.80	
Jensen Alpha	-1.50	1.42	3.06	N/A	3.54	
Up Market Capture	95.75	105.86	114.39	N/A	112.47	
Up Market Outperformance	-1.86	5.38	11.81	N/A	9.18	
vs. FTSE 3 Month T-Bill						
Excess Return	5.50	7.51	2.61	N/A	6.76	
Excess Risk	19.69	20.57	20.78	N/A	19.46	
Sharpe Ratio	0.28	0.37	0.13	N/A	0.35	

Calculation based on monthly periodicity.

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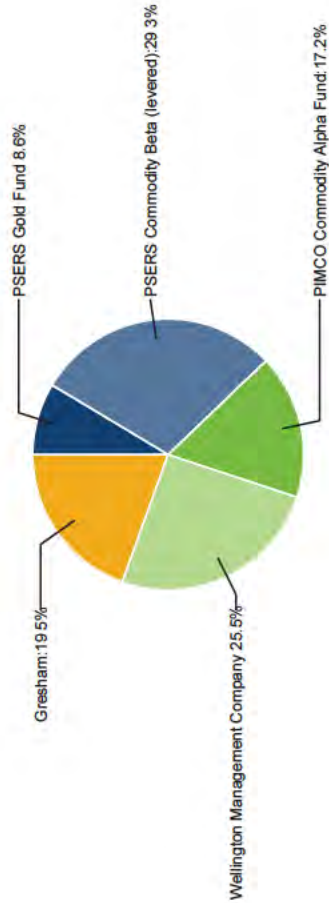
# Commodities

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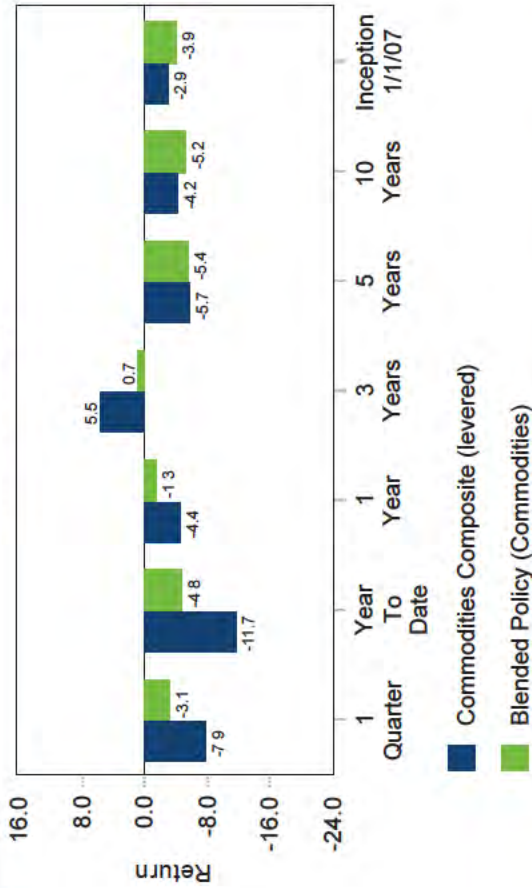


Current Allocation

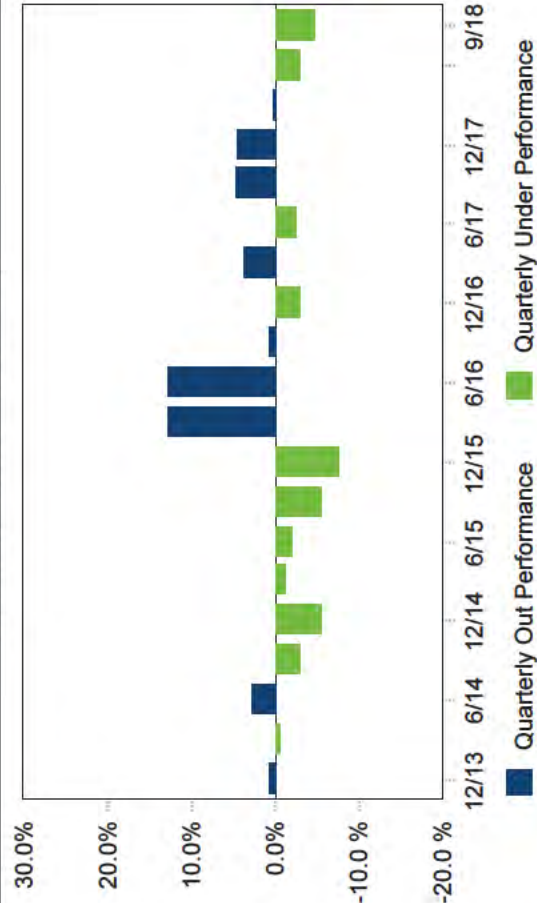
September 30, 2018 : \$1,821M



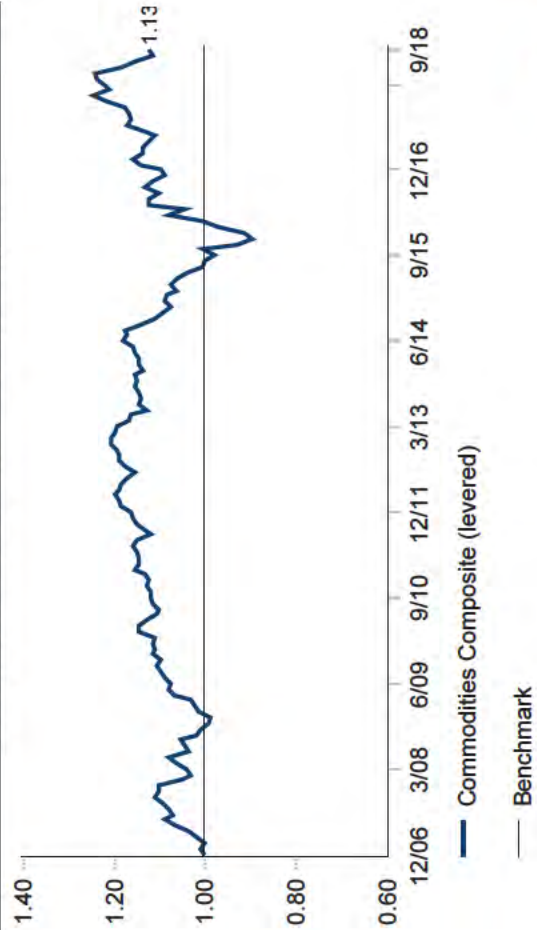
Return Summary



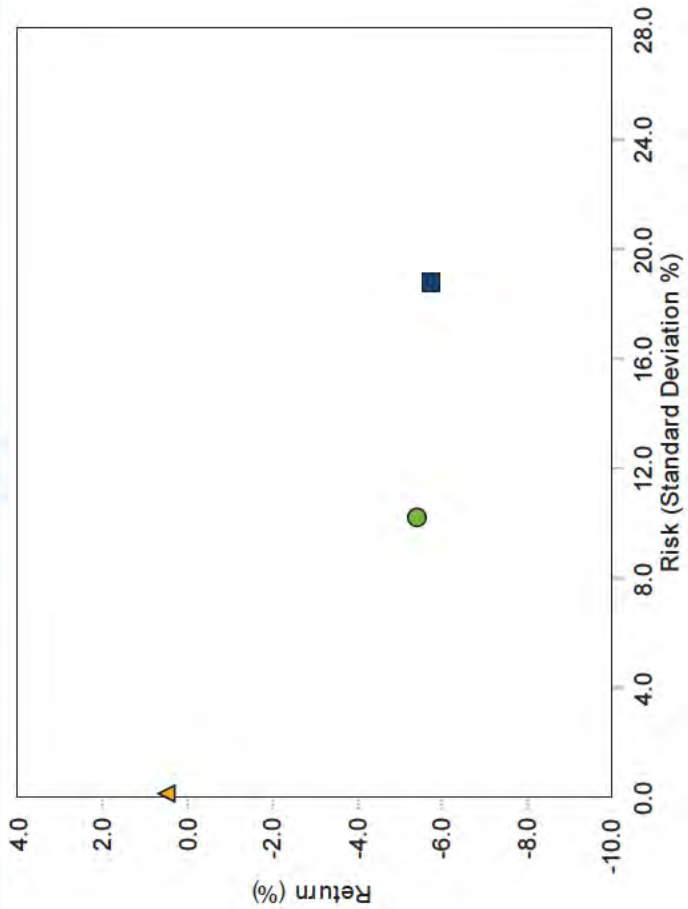
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

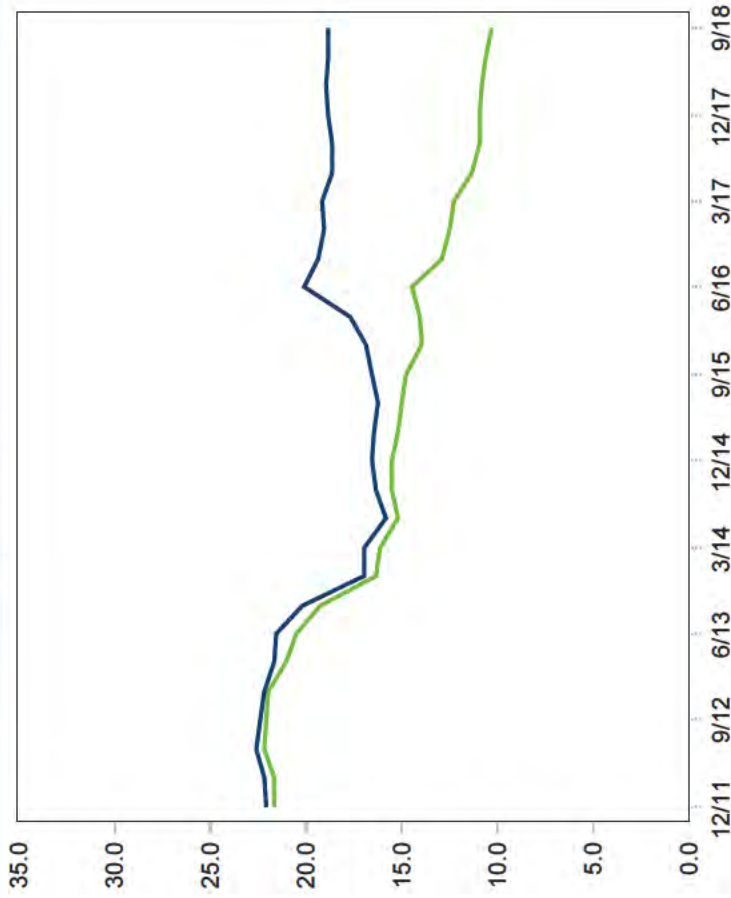


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Commodities Composite (levered)
- Blended Policy (Commodities)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Commodities Composite (levered)
- Blended Policy (Commodities)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Commodities Composite (levered)	0.89	9.53	0.09	0.91	-0.25	4.79	1.75	-5.75	18.87	0.96
Blended Policy (Commodities)	0.00	0.00	N/A	1.00	-0.54	0.00	1.00	-5.43	10.29	1.00
FTSE 3 Month T-Bill	5.54	10.27	0.54	0.01	N/A	0.50	0.00	0.49	0.18	0.09

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## Risk Statistics

## Commodities Composite (levered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-4.40	5.54	-5.75	-4.22	-2.44	11/01/2006
Standard Deviation	15.14	20.32	18.87	19.45	19.65	
Downside Risk	12.03	12.67	13.50	14.59	14.64	
Downside Semi Deviation	6.65	19.35	18.05	20.72	21.31	
Max Drawdown Recovery Period	N/A	6.00	N/A	N/A	N/A	
Maximum Drawdown	-17.28	-18.82	-50.43	-60.66	-66.98	
Maximum Loss Exposure	-6.11	-16.11	-37.81	-23.17	-37.75	
Upside Semi Deviation	3.35	21.76	20.34	18.30	18.16	
Blended Policy (Commodities)						
Return	-1.34	0.72	-5.43	-5.17	-3.77	
Standard Deviation	6.68	9.09	10.29	15.39	16.41	
Downside Risk	5.15	6.10	8.21	12.24	12.67	
Downside Semi Deviation	2.20	8.75	10.98	17.24	18.31	
Max Drawdown Recovery Period	N/A	6.00	N/A	N/A	N/A	
Maximum Drawdown	-7.65	-9.01	-35.33	-49.83	-61.91	
Maximum Loss Exposure	-2.26	-8.46	-22.86	-12.83	-12.29	
Upside Semi Deviation	1.83	9.68	9.79	13.46	14.57	
vs. Blended Policy (Commodities)						
Active Return	-2.29	6.27	0.89	1.69	1.95	
Tracking Error	8.55	11.42	9.53	7.40	7.43	
Actual Correlation	0.99	0.99	0.96	0.94	0.93	
Beta	2.25	2.21	1.75	1.18	1.11	
Consistency	66.67	58.33	51.67	54.17	56.64	
Down Market Capture	221.39	203.54	165.85	123.57	117.13	
Down Market Outperformance	-10.63	-17.68	-13.45	-6.46	-5.02	
Information Ratio	-0.27	0.55	0.09	0.23	0.26	
Jensen Alpha	1.09	6.04	5.19	2.53	2.36	
Up Market Capture	211.07	243.67	203.79	139.05	129.30	
Up Market Outperformance	10.67	53.22	36.84	19.33	15.97	
vs. FTSE 3 Month T-Bill						
Excess Return	-4.99	6.59	-4.65	-2.71	-1.36	
Excess Risk	15.19	20.34	18.86	19.46	19.62	
Sharpe Ratio	-0.33	0.32	-0.25	-0.14	-0.07	

Calculation based on monthly periodicity.

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## Risk Statistics

## Commodities Composite (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-1.50	2.86	-3.52	-2.83	-1.26	11/01/2006
Standard Deviation	6.73	9.07	9.73	15.57	16.49	
Downside Risk	5.29	5.68	7.33	12.02	12.53	
Downside Semi Deviation	2.92	8.67	9.80	17.07	18.24	
Max Drawdown Recovery Period	N/A	6.00	N/A	N/A	N/A	
Maximum Drawdown	-7.75	-8.44	-32.31	-45.66	-54.79	
Maximum Loss Exposure	-2.24	-7.11	-22.35	-36.53	-27.22	
Upside Semi Deviation	1.51	9.68	9.94	14.07	14.86	
Blended Policy (Commodities)						
Return	-1.34	0.72	-5.43	-5.17	-3.77	
Standard Deviation	6.68	9.09	10.29	15.39	16.41	
Downside Risk	5.15	6.10	8.21	12.24	12.67	
Downside Semi Deviation	2.20	8.75	10.98	17.24	18.31	
Max Drawdown Recovery Period	N/A	6.00	N/A	N/A	N/A	
Maximum Drawdown	-7.65	-9.01	-35.33	-49.83	-61.91	
Maximum Loss Exposure	-2.26	-8.46	-22.86	-12.83	-12.29	
Upside Semi Deviation	1.83	9.68	9.79	13.46	14.57	
vs. Blended Policy (Commodities)						
Active Return	-0.16	2.10	1.94	2.46	2.59	
Tracking Error	0.78	1.32	1.93	3.23	4.24	
Actual Correlation	0.99	0.99	0.98	0.98	0.97	
Beta	1.00	0.99	0.93	0.99	0.97	
Consistency	33.33	61.11	60.00	59.17	60.84	
Down Market Capture	96.76	91.62	88.76	92.00	91.56	
Down Market Outperformance	0.28	1.59	2.53	2.24	2.46	
Information Ratio	-0.20	1.59	1.01	0.76	0.61	
Jensen Alpha	-0.16	2.12	1.57	2.44	2.53	
Up Market Capture	94.52	108.83	101.12	104.42	103.78	
Up Market Outperformance	-0.51	2.85	0.35	2.04	1.99	
vs. FTSE 3 Month T-Bill						
Excess Return	-2.87	2.42	-3.60	-1.94	-0.72	
Excess Risk	6.77	9.09	9.72	15.58	16.46	
Sharpe Ratio	-0.42	0.27	-0.37	-0.12	-0.04	

Calculation based on monthly periodicity.

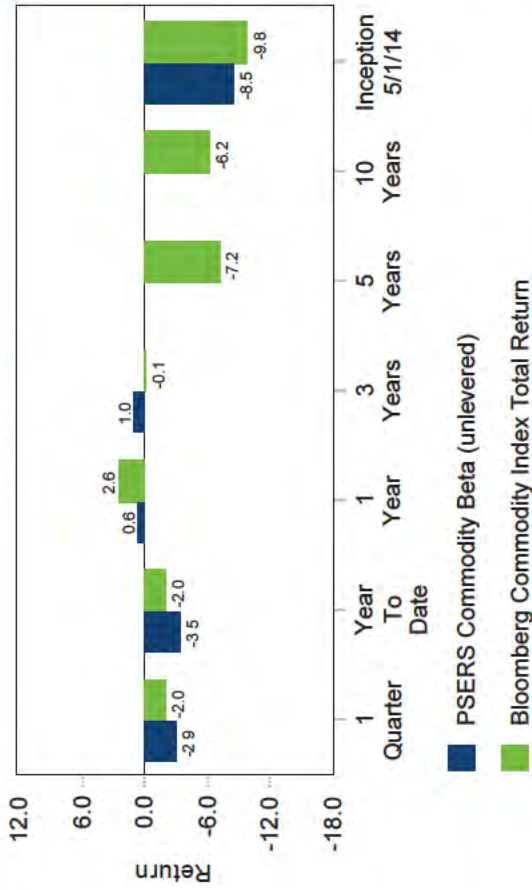
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PSERS Commodity Beta (unlevered) Performance Summary

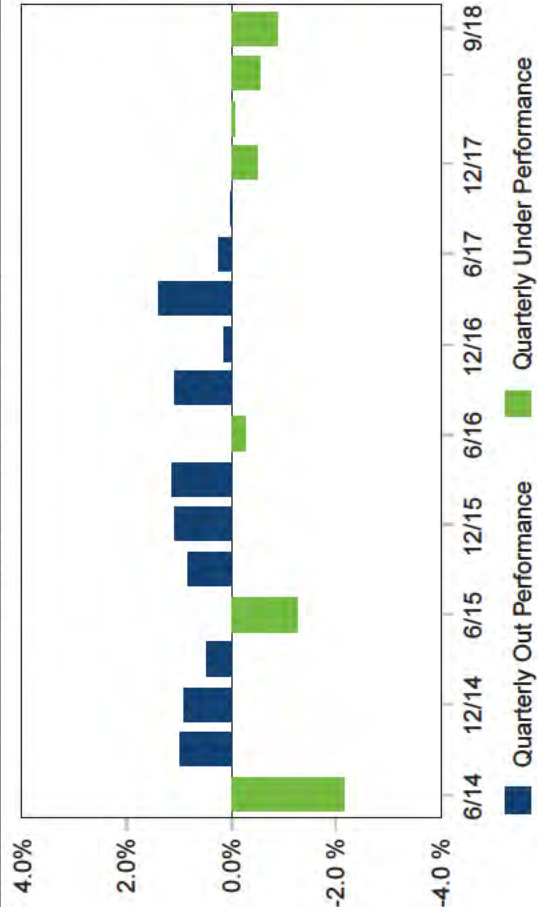
Account Information

Account Name: PSERS Commodity Beta (unlevered)  
 Inception Date: 04/29/2014  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: Bloomberg Commodity Index Total Return  
 Peer Group:

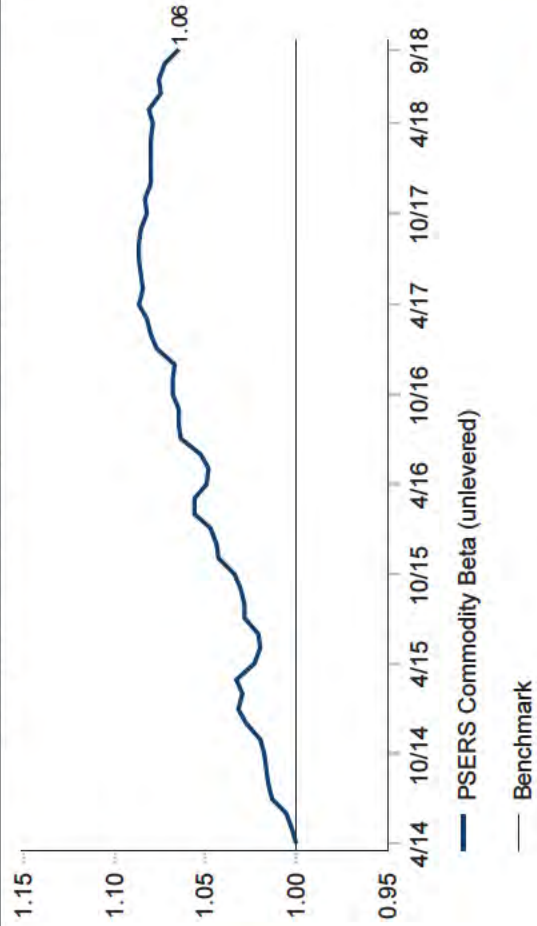
Return Summary



Quarterly Excess Performance

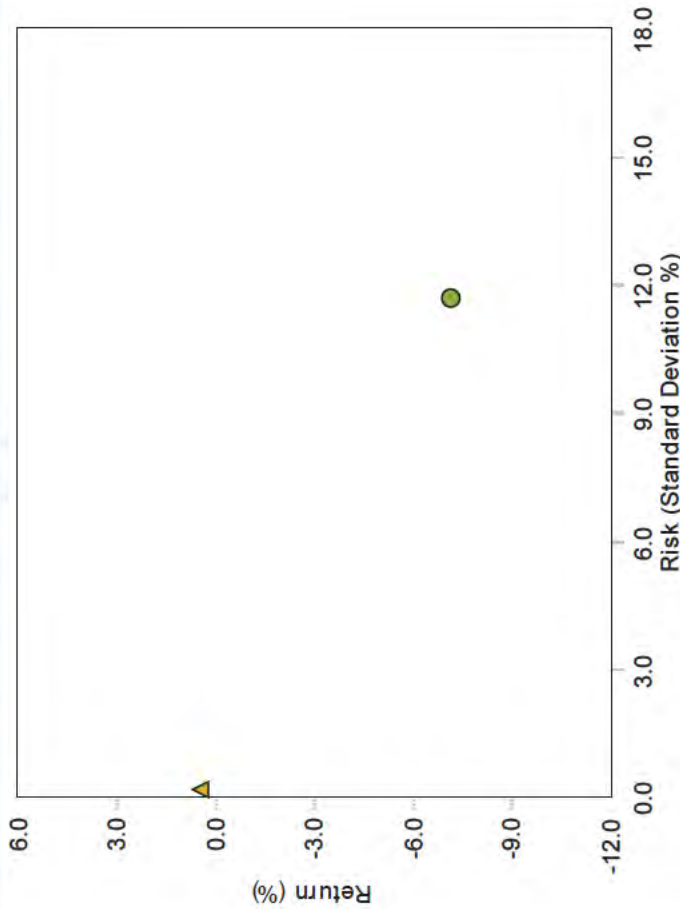


Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years

Rolling 5 Years Standard Deviation



No data found.

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Commodity Beta (unlevered)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bloomberg Commodity Index Total Return	0.00	0.00	N/A	1.00	-0.62	0.00	1.00	-7.18	11.74	1.00
FTSE 3 Month T-Bill	7.23	11.72	0.62	0.02	N/A	0.51	0.00	0.49	0.18	0.16

Risk Statistics

PSERS Commodity Beta (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	0.61	0.96	N/A	N/A	-8.38	04/01/2014
Standard Deviation	7.65	9.37	N/A	N/A	11.07	
Downside Risk	5.61	6.21	N/A	N/A	9.40	
Downside Semi Deviation	2.40	8.43	N/A	N/A	11.91	
Max Drawdown Recovery Period	N/A	8.00	N/A	N/A	N/A	
Maximum Drawdown	-8.03	-11.39	N/A	N/A	-41.93	
Maximum Loss Exposure	-0.62	-11.39	N/A	N/A	-24.69	
Upside Semi Deviation	2.23	10.74	N/A	N/A	10.55	
Bloomberg Commodity Index Total Return						
Return	2.59	-0.11	-7.18	-6.24	-9.10	
Standard Deviation	7.58	9.90	11.74	15.83	11.89	
Downside Risk	5.06	6.73	9.60	12.72	10.10	
Downside Semi Deviation	2.17	9.13	12.65	17.76	13.00	
Max Drawdown Recovery Period	N/A	8.00	N/A	N/A	N/A	
Maximum Drawdown	-7.23	-13.45	-44.82	-56.57	-44.82	
Maximum Loss Exposure	N/A	-13.45	-27.70	-14.99	-28.99	
Upside Semi Deviation	2.44	11.10	11.04	13.79	11.03	

vs. Bloomberg Commodity Index Total Return

Active Return	-1.95	1.02	N/A	N/A	0.69
Tracking Error	1.03	1.35	N/A	N/A	1.91
Actual Correlation	0.99	0.99	N/A	N/A	0.99
Beta	1.00	0.94	N/A	N/A	0.92
Consistency	33.33	58.33	N/A	N/A	64.81
Down Market Capture	107.37	91.75	N/A	N/A	92.70
Down Market Outperformance	-0.70	1.55	N/A	N/A	1.83
Information Ratio	-1.90	0.75	N/A	N/A	0.36
Jensen Alpha	-1.93	1.00	N/A	N/A	-0.05
Up Market Capture	90.85	99.85	N/A	N/A	93.11
Up Market Outperformance	-1.32	-0.01	N/A	N/A	-2.61
vs. FTSE 3 Month T-Bill					
Excess Return	-0.69	0.58	N/A	N/A	-8.66
Excess Risk	7.69	9.38	N/A	N/A	11.04
Sharpe Ratio	-0.09	0.06	N/A	N/A	-0.78

Calculation based on monthly periodicity.

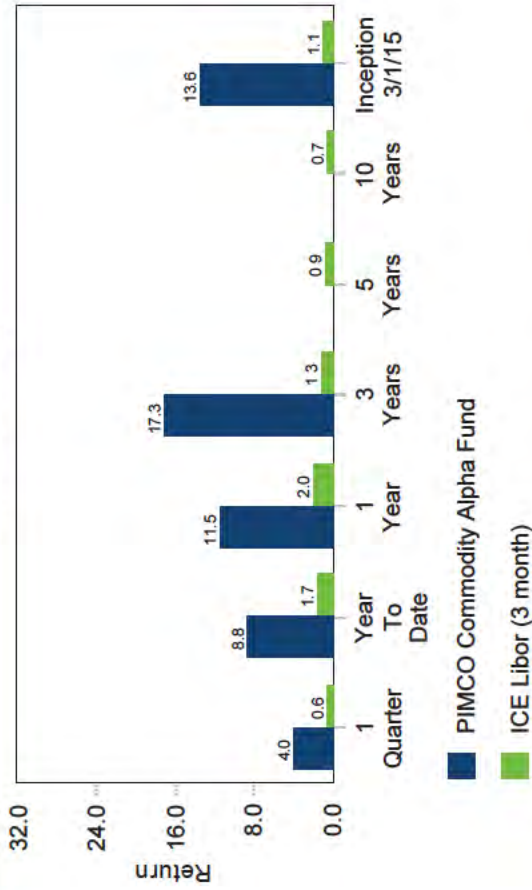
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PIMCO Commodity Alpha Fund Performance Summary

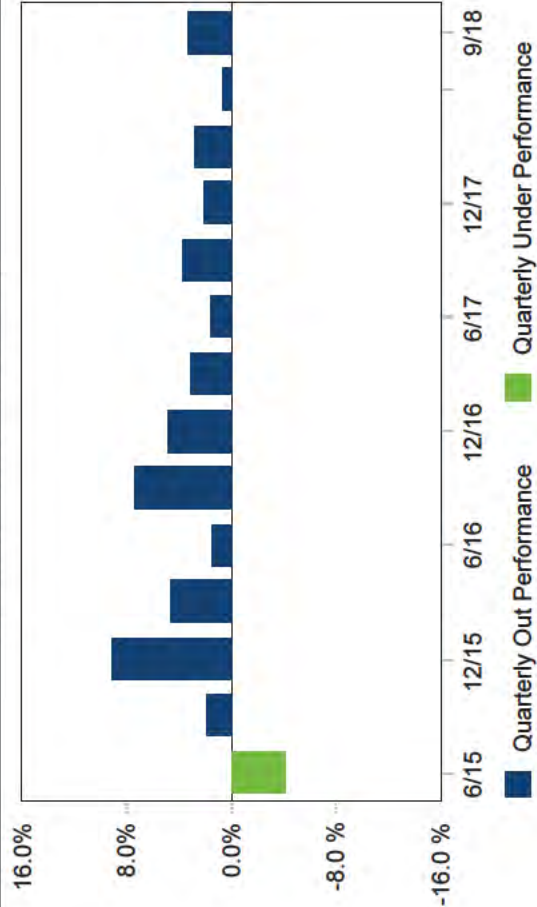
Account Information

Account Name: PIMCO Commodity Alpha Fund  
 Inception Date: 03/01/2015  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: ICE Libor (3 month)  
 Peer Group:

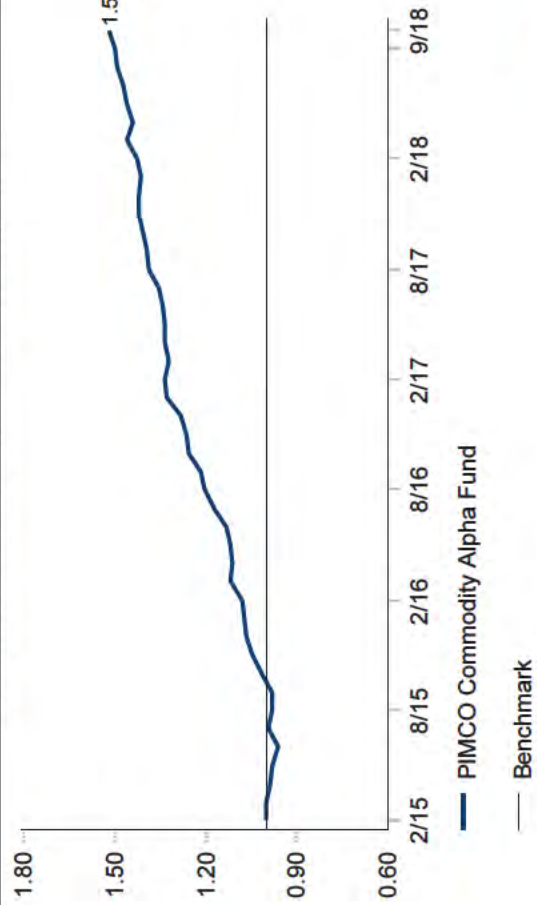
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



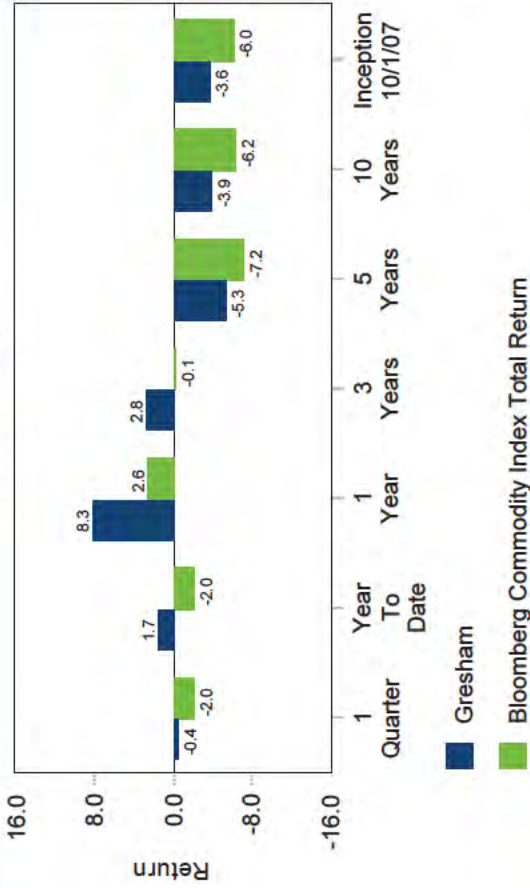


Performance Summary

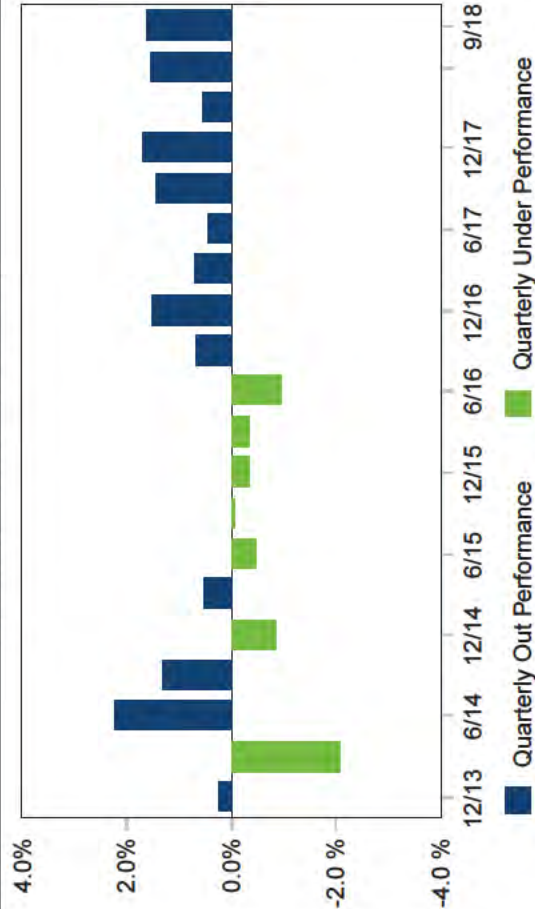
Account Information

Account Name: Gresham  
 Inception Date: 09/30/2007  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: Bloomberg Commodity Index Total Return  
 Peer Group:

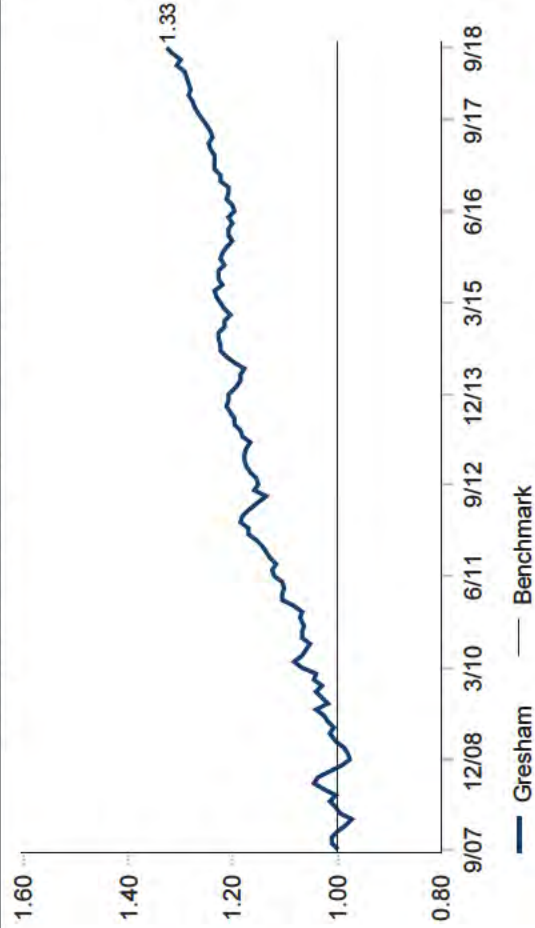
Return Summary



Quarterly Excess Performance

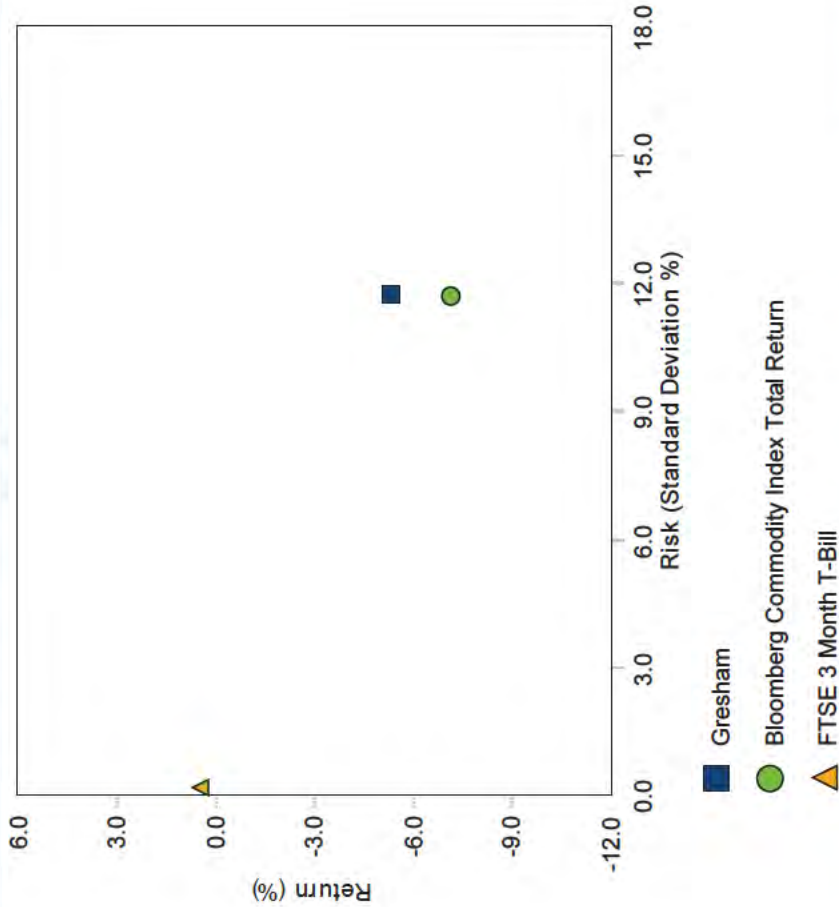


Ratio of Cumulative Wealth - Since Inception

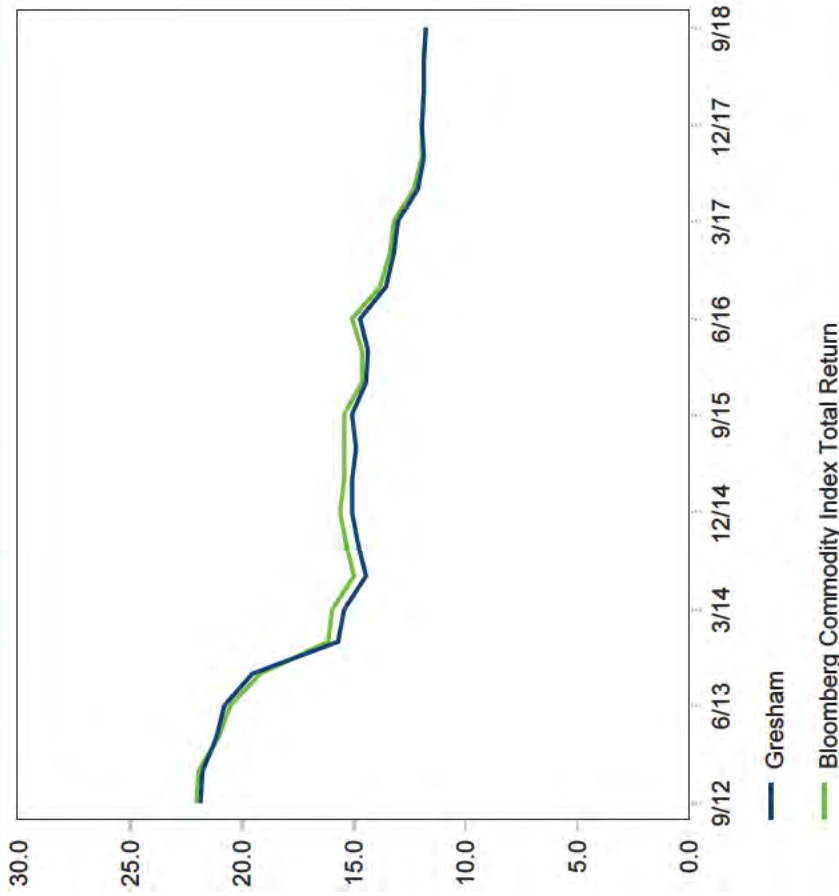


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Gresham	1.96	2.25	0.87	0.96	-0.45	1.87	0.98	-5.34	11.78	0.98
Bloomberg Commodity Index Total Return	0.00	0.00	N/A	1.00	-0.62	0.00	1.00	-7.18	11.74	1.00
FTSE 3 Month T-Bill	7.23	11.72	0.62	0.02	N/A	0.51	0.00	0.49	0.18	0.16

## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Gresham						10/01/2007
Return	8.27	2.80	-5.34	-3.90	-3.56	
Standard Deviation	7.74	9.95	11.78	16.10	16.94	
Downside Risk	4.29	6.69	9.42	12.88	13.36	
Downside Semi Deviation	2.05	10.23	12.99	18.61	19.41	
Max Drawdown Recovery Period	N/A	14.00	N/A	N/A	N/A	
Maximum Drawdown	-5.53	-14.30	-43.65	-52.47	-60.30	
Maximum Loss Exposure	N/A	-14.18	-28.83	-14.65	-14.67	
Upside Semi Deviation	2.70	10.07	10.65	13.54	14.48	
Bloomberg Commodity Index Total Return						
Return	2.59	-0.11	-7.18	-6.24	-6.01	
Standard Deviation	7.58	9.90	11.74	15.83	17.04	
Downside Risk	5.06	6.73	9.60	12.72	13.47	
Downside Semi Deviation	2.17	9.13	12.65	17.76	18.98	
Max Drawdown Recovery Period	N/A	8.00	N/A	N/A	N/A	
Maximum Drawdown	-7.23	-13.45	-44.82	-56.57	-67.03	
Maximum Loss Exposure	N/A	-13.45	-27.70	-14.99	-15.65	
Upside Semi Deviation	2.44	11.10	11.04	13.79	15.05	
vs. Bloomberg Commodity Index Total Return						
Active Return	5.42	2.89	1.96	2.51	2.56	
Tracking Error	1.70	1.93	2.25	3.02	3.20	
Actual Correlation	0.98	0.98	0.98	0.98	0.98	
Beta	1.00	0.99	0.98	1.00	0.98	
Consistency	83.33	72.22	63.33	64.17	62.88	
Down Market Capture	74.40	88.10	93.06	92.96	92.07	
Down Market Outperformance	2.42	2.17	1.65	1.94	2.35	
Information Ratio	3.19	1.49	0.87	0.83	0.80	
Jensen Alpha	5.57	2.92	1.85	2.53	2.46	
Up Market Capture	121.56	110.75	105.45	105.36	103.35	
Up Market Outperformance	3.16	4.19	2.06	2.70	1.96	
vs. FTSE 3 Month T-Bill						
Excess Return	6.68	2.44	-5.27	-2.95	-2.66	
Excess Risk	7.77	9.93	11.74	16.11	16.93	
Sharpe Ratio	0.86	0.25	-0.45	-0.18	-0.16	

Calculation based on monthly periodicity.

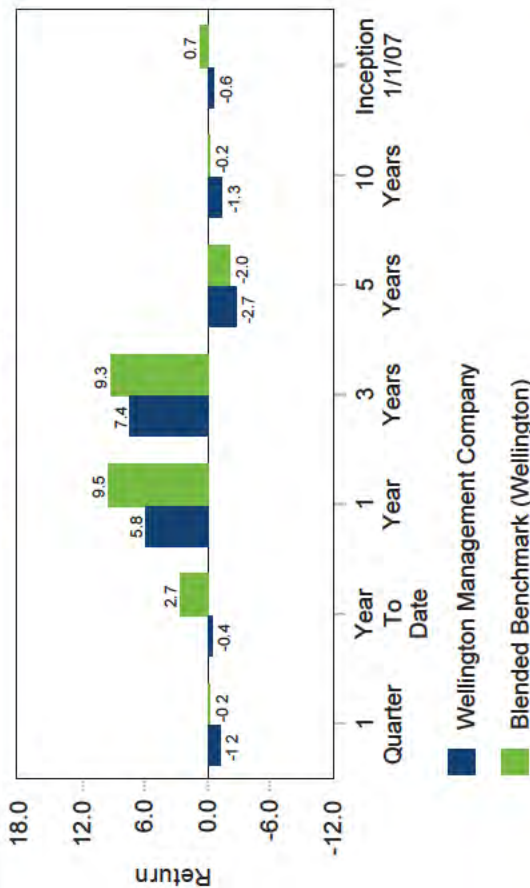
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Performance Summary

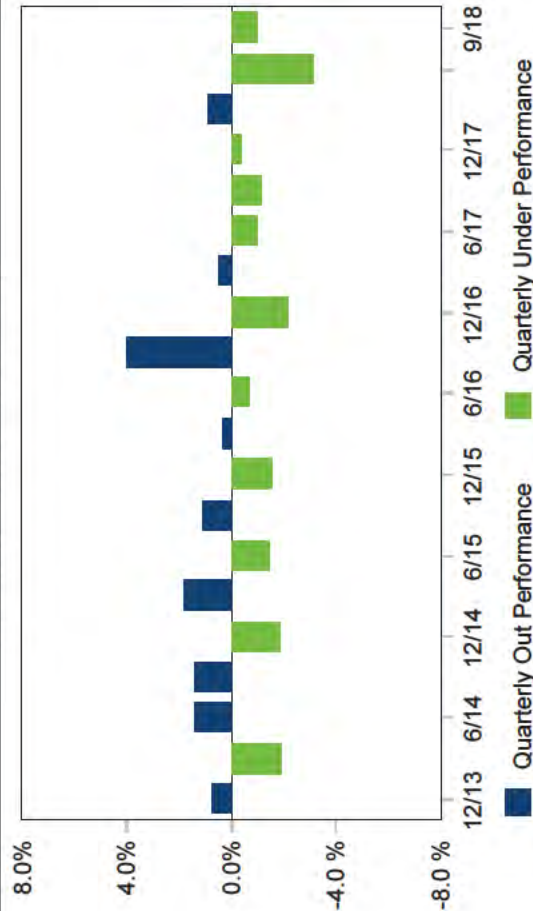
Account Information

Account Name: Wellington Management Company  
 Inception Date: 12/31/2006  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: Blended Benchmark (WMC)  
 Peer Group:

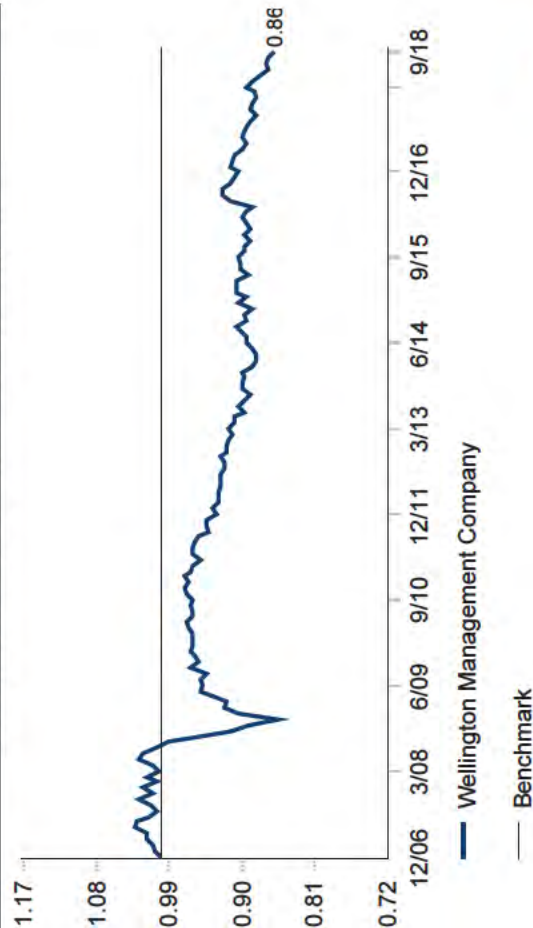
Return Summary



Quarterly Excess Performance

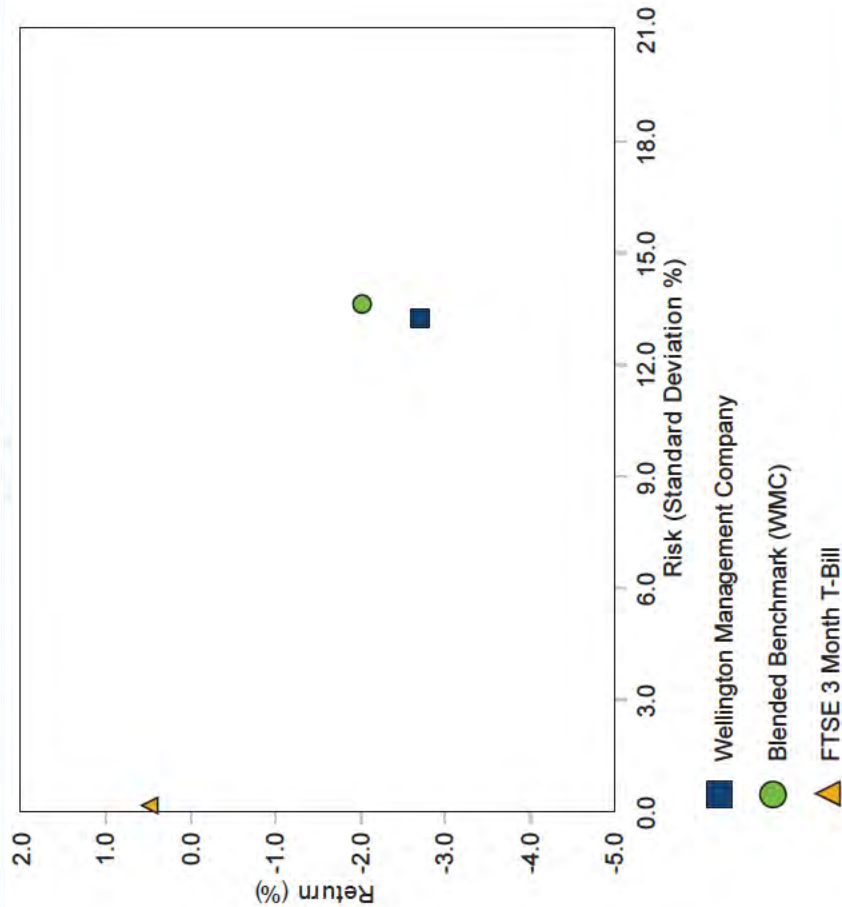


Ratio of Cumulative Wealth - Since Inception

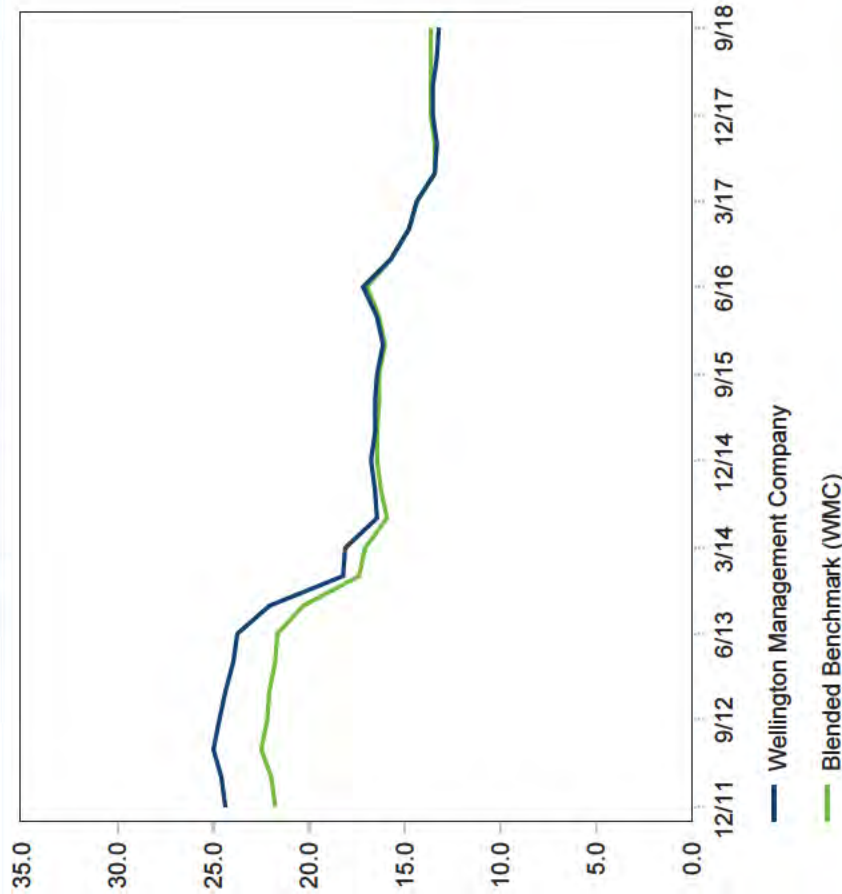


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Wellington Management Company	-0.75	2.99	-0.25	0.95	-0.18	-0.81	0.95	-2.72	13.28	0.98
Blended Benchmark (WMC)	0.00	0.00	N/A	1.00	-0.12	0.00	1.00	-2.04	13.68	1.00
FTSE 3 Month T-Bill	1.63	13.65	0.12	0.03	N/A	0.49	0.00	0.49	0.18	0.17

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Empower Results®

## Risk Statistics

## Wellington Management Company

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.81	7.44	-2.72	-1.27	-0.63	01/01/2007
Standard Deviation	9.61	12.03	13.28	18.13	18.82	
Downside Risk	6.34	6.75	9.42	13.60	14.13	
Downside Semi Deviation	3.51	10.30	13.21	19.82	21.07	
Max Drawdown Recovery Period	N/A	6.00	N/A	N/A	N/A	
Maximum Drawdown	-6.06	-13.15	-43.03	-50.31	-54.99	
Maximum Loss Exposure	N/A	-8.89	-28.45	-35.70	-32.16	
Upside Semi Deviation	2.70	13.87	13.61	16.61	16.88	
Blended Benchmark (WMC)						
Return	9.55	9.29	-2.04	-0.19	0.65	
Standard Deviation	10.35	12.05	13.68	17.26	17.47	
Downside Risk	6.03	6.35	9.59	12.67	12.82	
Downside Semi Deviation	2.89	9.39	13.02	18.14	18.67	
Max Drawdown Recovery Period	N/A	6.00	N/A	N/A	N/A	
Maximum Drawdown	-5.11	-13.12	-43.26	-47.25	-50.05	
Maximum Loss Exposure	N/A	-8.07	-28.84	-33.10	-26.37	
Upside Semi Deviation	3.48	14.82	14.72	16.52	16.46	
vs. Blended Benchmark (WMC)						
Active Return	-3.56	-1.72	-0.75	-0.91	-1.01	
Tracking Error	2.63	3.00	2.99	3.76	3.87	
Actual Correlation	0.97	0.97	0.98	0.98	0.98	
Beta	0.90	0.97	0.95	1.03	1.06	
Consistency	33.33	30.56	43.33	43.33	44.68	
Down Market Capture	96.02	96.28	95.90	101.55	105.34	
Down Market Outperformance	0.35	0.68	1.05	-0.63	-1.77	
Information Ratio	-1.35	-0.57	-0.25	-0.24	-0.26	
Jensen Alpha	-2.71	-1.43	-0.83	-0.93	-1.09	
Up Market Capture	80.00	89.96	91.59	97.53	100.64	
Up Market Outperformance	-4.59	-5.86	-4.97	-1.81	0.28	
vs. FTSE 3 Month T-Bill						
Excess Return	4.52	7.09	-2.38	0.10	0.40	
Excess Risk	9.64	12.04	13.26	18.14	18.80	
Sharpe Ratio	0.47	0.59	-0.18	0.01	0.02	

Calculation based on monthly periodicity.

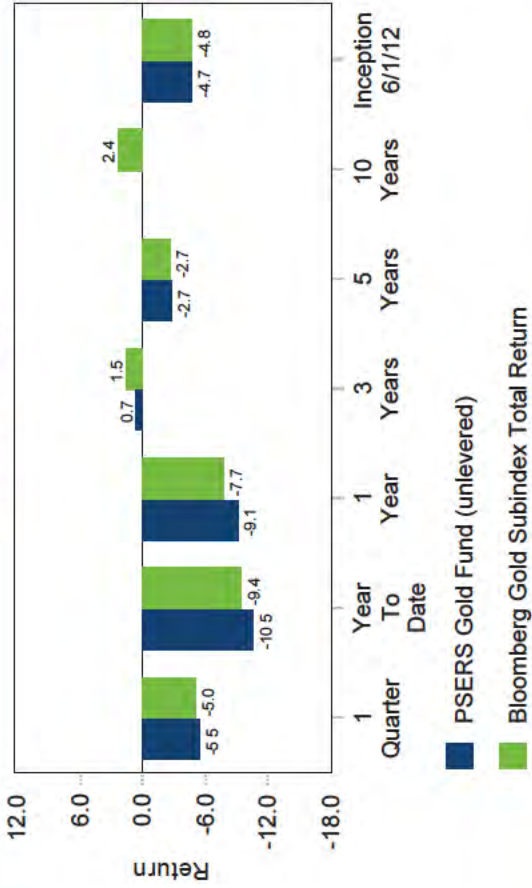
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Performance Summary

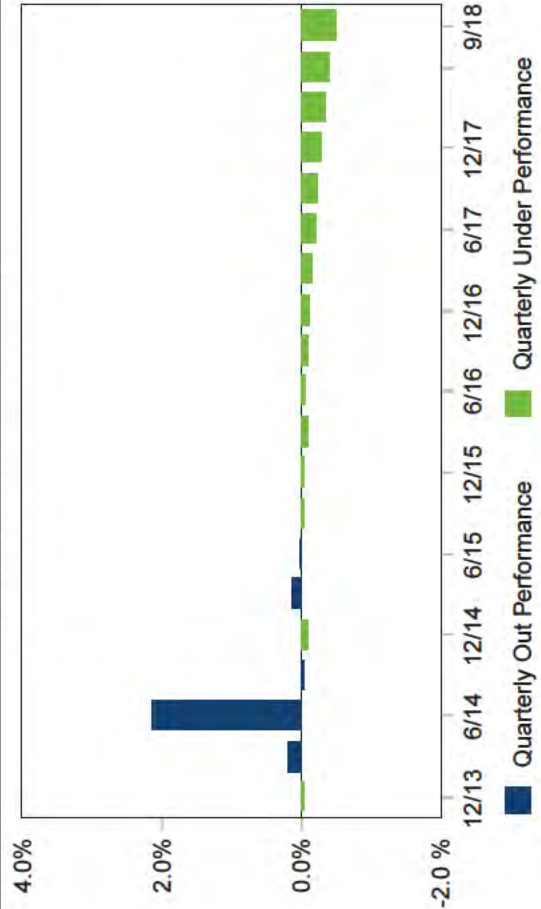
Account Information

Account Name: PSERS Gold Fund (unlevered)  
 Inception Date: 06/01/2012  
 Account Structure: Separate Account  
 Asset Class: US Real Assets  
 Benchmark: Bloomberg Gold Subindex Total Return  
 Peer Group: IM Commodities General (MF)

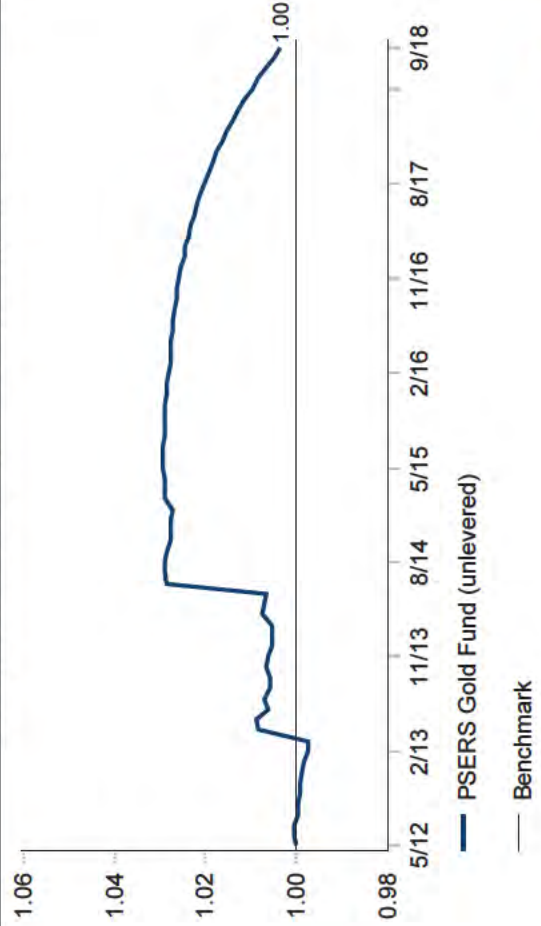
Return Summary



Quarterly Excess Performance

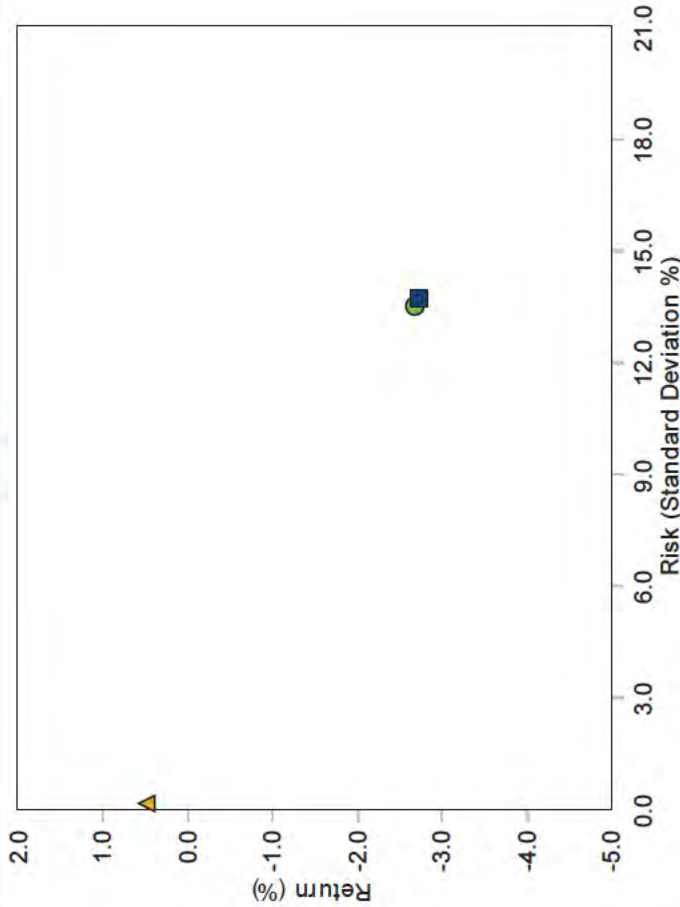


Ratio of Cumulative Wealth - Since Inception

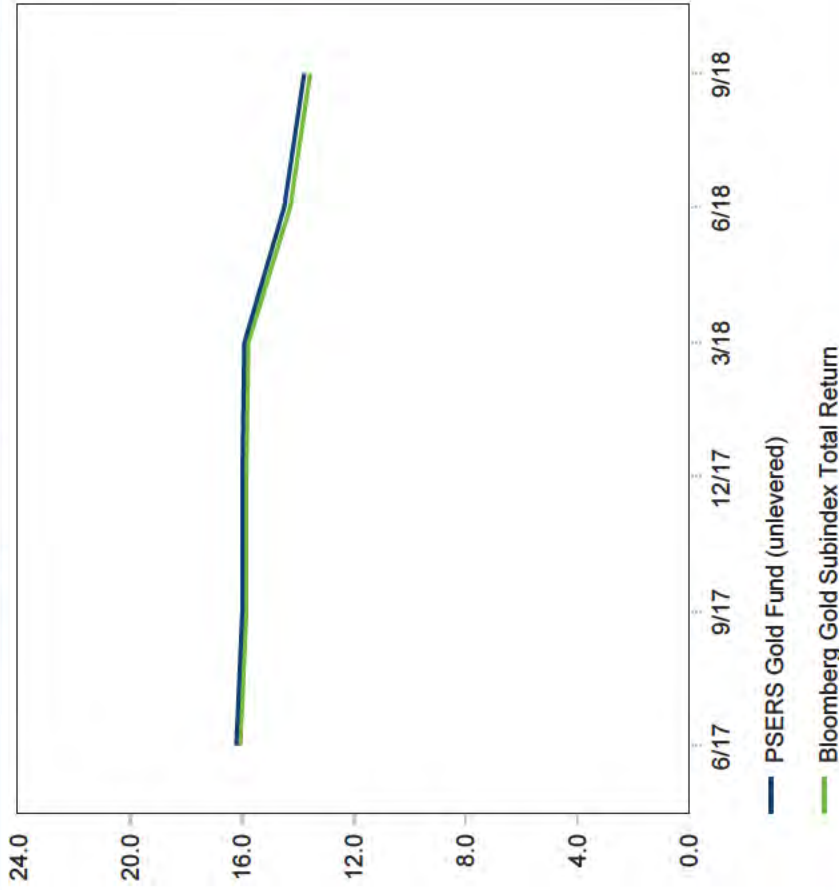


PSERS Gold Fund (unlevered) Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Gold Fund (unlevered)	-0.02	1.07	-0.02	0.99	-0.17	0.01	1.02	-2.73	13.79	1.00
Bloomberg Gold Subindex Total Return	0.00	0.00	N/A	1.00	-0.17	0.00	1.00	-2.68	13.54	1.00
FTSE 3 Month T-Bill	2.31	13.55	0.17	0.00	N/A	0.49	0.00	0.49	0.18	-0.04

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Risk Statistics

PSERS Gold Fund (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-9.11	0.68	-2.73	N/A	-4.71	06/01/2012
Standard Deviation	6.48	13.47	13.79	N/A	14.79	
Downside Risk	6.10	8.68	9.31	N/A	10.74	
Downside Semi Deviation	2.21	12.46	12.85	N/A	14.70	
Max Drawdown Recovery Period	N/A	N/A	25.00	N/A	N/A	
Maximum Drawdown	-12.47	-15.41	-20.29	N/A	-39.34	
Maximum Loss Exposure	-9.11	-5.01	-13.06	N/A	-12.82	
Upside Semi Deviation	1.97	14.80	15.05	N/A	15.19	
Bloomberg Gold Subindex Total Return						
Return	-7.66	1.53	-2.68	2.41	-4.76	
Standard Deviation	6.43	13.44	13.54	18.43	14.66	
Downside Risk	5.73	8.55	9.25	12.40	10.76	
Downside Semi Deviation	2.08	12.27	12.77	17.76	14.73	
Max Drawdown Recovery Period	N/A	N/A	33.00	N/A	N/A	
Maximum Drawdown	-11.44	-15.26	-20.72	-43.39	-41.05	
Maximum Loss Exposure	-7.66	-4.97	-9.81	-18.40	-13.70	
Upside Semi Deviation	2.07	14.90	14.64	19.28	14.88	
vs. Bloomberg Gold Subindex Total Return						
Active Return	-1.56	-0.83	-0.02	N/A	0.07	
Tracking Error	0.09	0.17	1.07	N/A	1.04	
Actual Correlation	1.00	1.00	1.00	N/A	1.00	
Beta	1.01	1.00	1.02	N/A	1.01	
Consistency	0.00	2.78	15.00	N/A	19.74	
Down Market Capture	108.30	103.13	101.35	N/A	100.48	
Down Market Outperformance	-0.98	-0.74	-0.34	N/A	-0.12	
Information Ratio	-16.67	-4.83	-0.02	N/A	0.07	
Jensen Alpha	-1.49	-0.83	0.02	N/A	0.10	
Up Market Capture	92.14	98.25	101.39	N/A	100.98	
Up Market Outperformance	-0.46	-0.91	0.66	N/A	0.49	
vs. FTSE 3 Month T-Bill						
Excess Return	-10.88	0.75	-2.32	N/A	-4.14	
Excess Risk	6.54	13.51	13.80	N/A	14.80	
Sharpe Ratio	-1.66	0.06	-0.17	N/A	-0.28	

Calculation based on monthly periodicity.

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## Real Estate

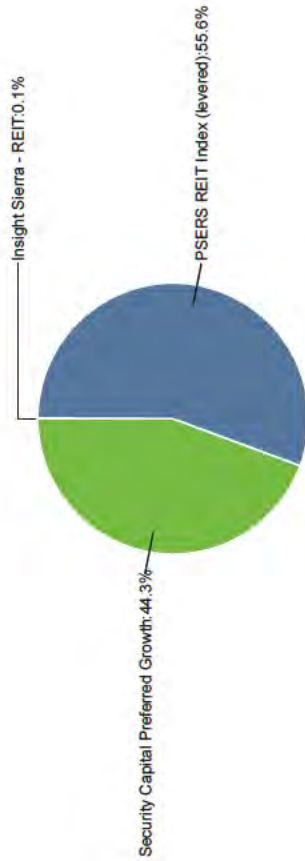
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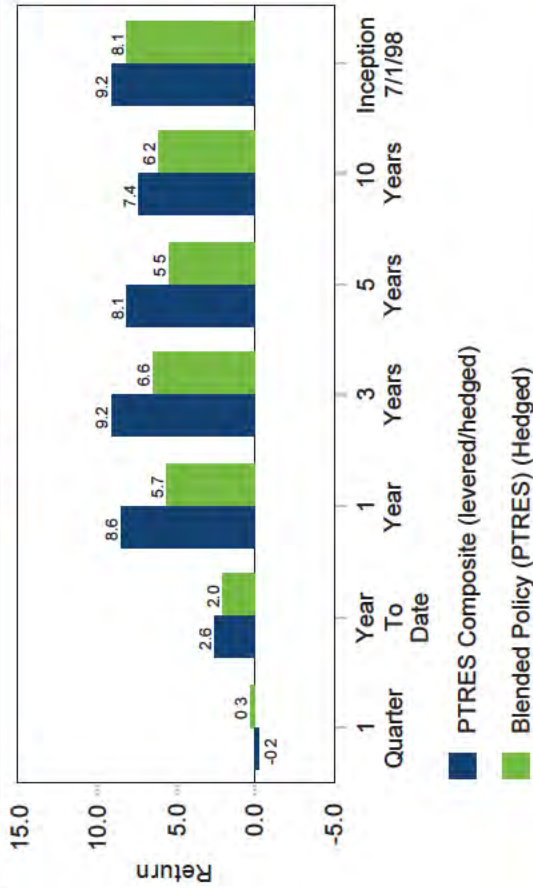
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Current Allocation

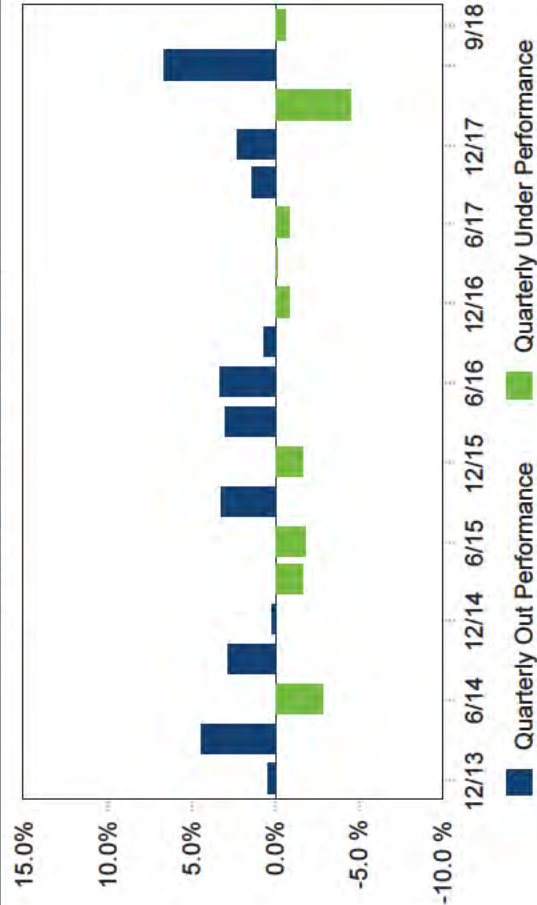
September 30, 2018 : \$427M



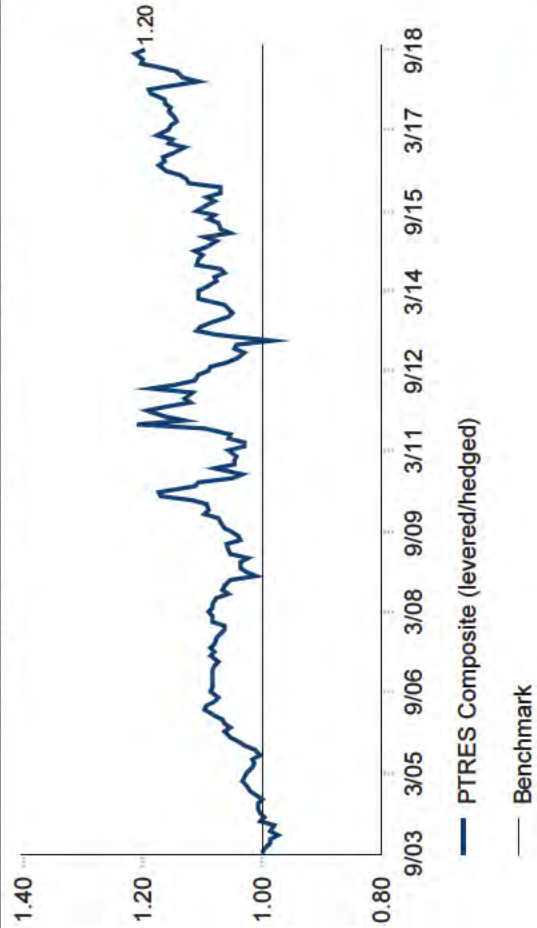
Return Summary



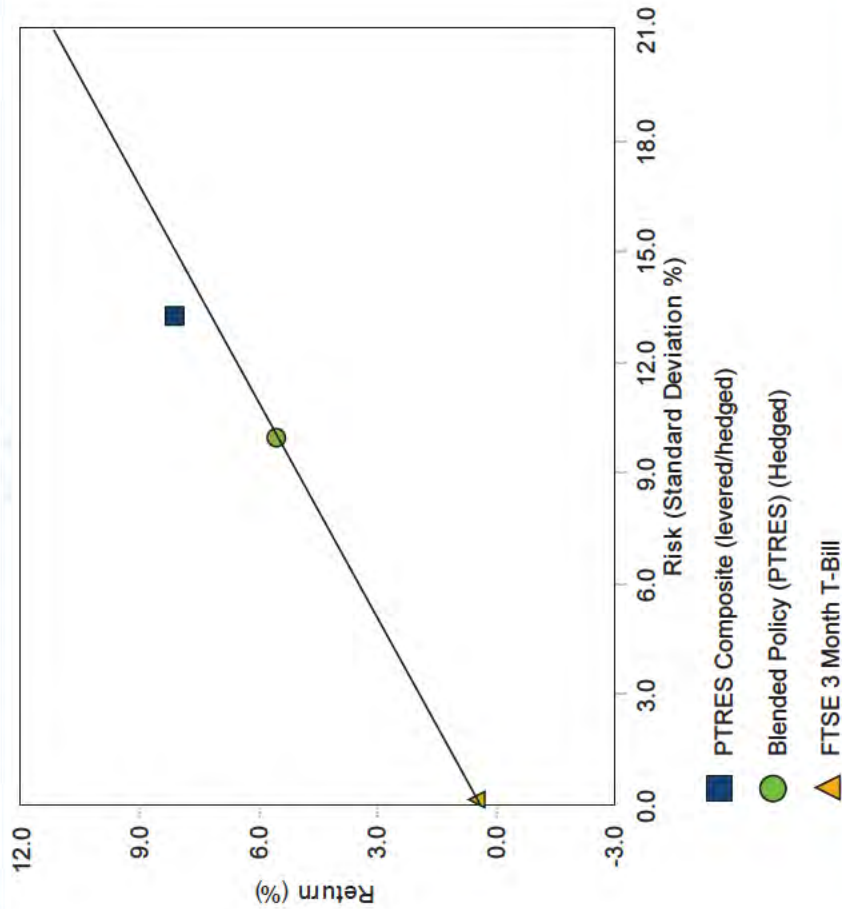
Quarterly Excess Performance



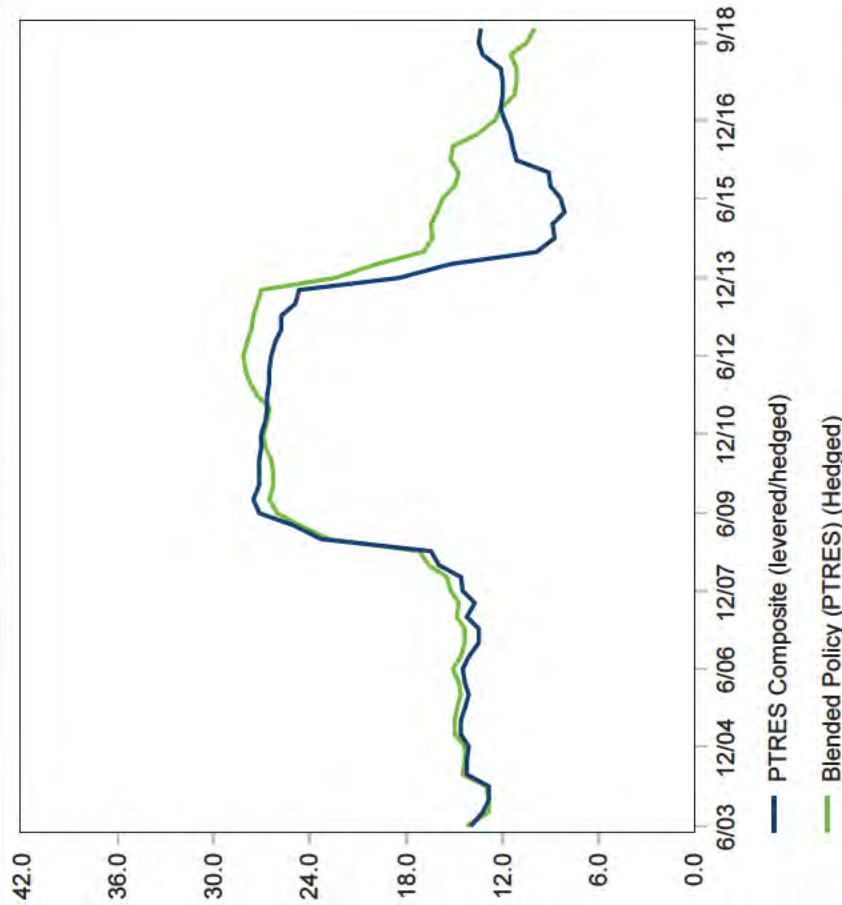
Ratio of Cumulative Wealth - 15 Years



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PTRES Composite (levered/hedged)	2.82	6.17	0.46	0.81	0.62	1.70	1.19	8.13	13.30	0.90
Blended Policy (PTRES) (Hedged)	0.00	0.00	N/A	1.00	0.54	0.00	1.00	5.53	10.01	1.00
FTSE 3 Month T-Bill	-5.40	10.01	-0.54	0.00	N/A	0.49	0.00	0.49	0.18	0.02

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## Risk Statistics

## PTRES Composite (levered/hedged)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.56	9.24	8.13	7.44	9.22	07/01/1998
Standard Deviation	15.66	14.91	13.30	19.77	17.56	
Downside Risk	11.55	8.80	8.19	14.19	12.23	
Downside Semi Deviation	6.39	13.45	13.41	24.47	20.52	
Max Drawdown Recovery Period	6.00	6.00	6.00	17.00	84.00	
Maximum Drawdown	-13.60	-13.60	-13.60	-52.12	-68.70	
Maximum Loss Exposure	-8.56	-3.36	-1.08	-52.12	-16.73	
Upside Semi Deviation	3.96	16.80	13.80	17.32	16.19	

## Blended Policy (PTRES) (Hedged)

Return	5.66	6.57	5.53	6.20	8.14	
Standard Deviation	8.83	9.54	10.01	20.34	18.08	
Downside Risk	6.74	5.56	6.37	14.65	12.72	
Downside Semi Deviation	3.73	8.79	9.78	24.10	21.21	
Max Drawdown Recovery Period	6.00	16.00	17.00	23.00	71.00	
Maximum Drawdown	-7.31	-9.20	-9.79	-50.79	-67.20	
Maximum Loss Exposure	-4.02	N/A	-1.77	-50.79	-13.55	
Upside Semi Deviation	2.16	10.59	10.58	18.15	16.48	

## vs. Blended Policy (PTRES) (Hedged)

Active Return	3.52	3.11	2.82	1.05	0.91	
Tracking Error	7.27	6.27	6.17	8.79	7.04	
Actual Correlation	0.98	0.96	0.90	0.90	0.92	
Beta	1.73	1.50	1.19	0.88	0.90	
Consistency	58.33	52.78	53.33	50.00	48.97	
Down Market Capture	187.06	157.84	115.63	81.70	86.49	
Down Market Outperformance	-7.46	-9.98	-3.15	5.84	4.25	
Information Ratio	0.48	0.50	0.46	0.12	0.13	
Jensen Alpha	0.35	0.08	1.79	2.02	1.72	
Up Market Capture	176.56	152.64	127.28	90.88	94.38	
Up Market Outperformance	13.87	19.31	10.25	-5.97	-3.62	

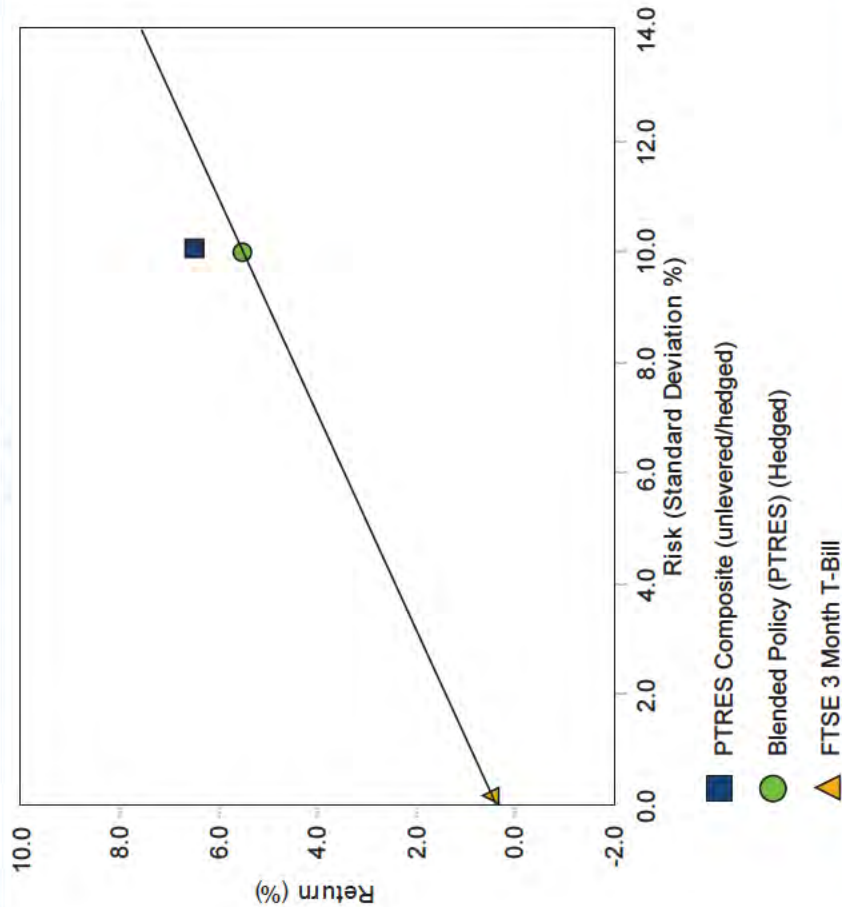
## vs. FTSE 3 Month T-Bill

Excess Return	7.84	9.14	8.22	8.91	8.57	
Excess Risk	15.64	14.90	13.30	19.79	17.58	
Sharpe Ratio	0.50	0.61	0.62	0.45	0.49	

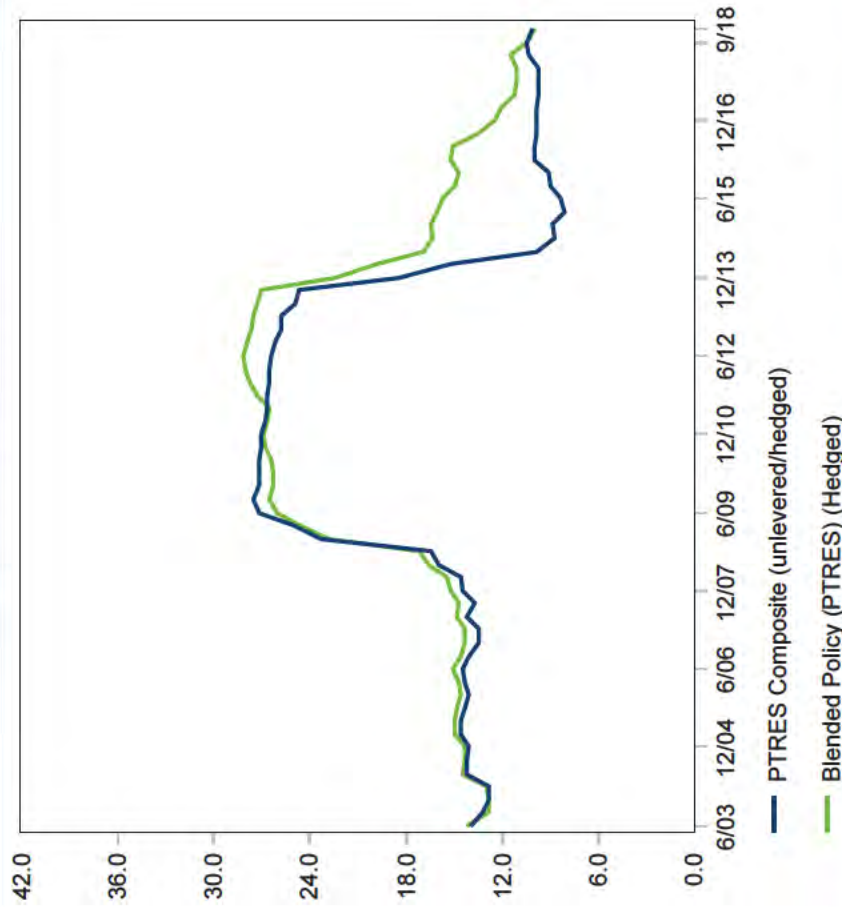
Calculation based on monthly periodicity.

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Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PTRES Composite (unlevered/hedged)	0.90	4.18	0.21	0.83	0.62	1.38	0.92	6.47	10.07	0.91
Blended Policy (PTRES) (Hedged)	0.00	0.00	N/A	1.00	0.54	0.00	1.00	5.53	10.01	1.00
FTSE 3 Month T-Bill	-5.40	10.01	-0.54	0.00	N/A	0.49	0.00	0.49	0.18	0.02

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
PTRES Composite (unlevered/hedged)						07/01/1998
Return	5.31	6.45	6.47	6.61	8.80	
Standard Deviation	10.11	9.76	10.07	18.80	17.03	
Downside Risk	7.44	5.69	6.34	13.71	11.96	
Downside Semi Deviation	4.11	8.69	10.39	23.65	20.07	
Max Drawdown Recovery Period	6.00	6.00	16.00	17.00	84.00	
Maximum Drawdown	-8.84	-8.84	-10.90	-52.12	-68.70	
Maximum Loss Exposure	-5.77	-0.92	-1.08	-52.12	-16.73	
Upside Semi Deviation	2.55	11.09	10.32	16.16	15.57	
Blended Policy (PTRES) (Hedged)						
Return	5.66	6.57	5.53	6.20	8.14	
Standard Deviation	8.83	9.54	10.01	20.34	18.08	
Downside Risk	6.74	5.56	6.37	14.65	12.72	
Downside Semi Deviation	3.73	8.79	9.78	24.10	21.21	
Max Drawdown Recovery Period	6.00	16.00	17.00	23.00	71.00	
Maximum Drawdown	-7.31	-9.20	-9.79	-50.79	-67.20	
Maximum Loss Exposure	-4.02	N/A	-1.77	-50.79	-13.55	
Upside Semi Deviation	2.16	10.59	10.58	18.15	16.48	
vs. Blended Policy (PTRES) (Hedged)						
Active Return	-0.22	-0.09	0.90	0.09	0.43	
Tracking Error	2.44	2.11	4.18	8.17	6.67	
Actual Correlation	0.98	0.98	0.91	0.92	0.93	
Beta	1.12	1.00	0.92	0.85	0.88	
Consistency	41.67	55.56	55.00	50.83	49.38	
Down Market Capture	125.15	103.44	86.85	74.05	82.43	
Down Market Outperformance	-2.15	-0.62	2.49	8.55	5.62	
Information Ratio	-0.09	-0.04	0.21	0.01	0.06	
Jensen Alpha	-0.72	-0.09	1.34	1.30	1.39	
Up Market Capture	114.01	101.39	97.09	82.02	90.01	
Up Market Outperformance	2.43	0.47	-1.10	-11.40	-6.30	
vs. FTSE 3 Month T-Bill						
Excess Return	4.10	5.93	6.29	7.95	8.10	
Excess Risk	10.09	9.76	10.07	18.82	17.05	
Sharpe Ratio	0.41	0.61	0.62	0.42	0.47	

Calculation based on monthly periodicity.

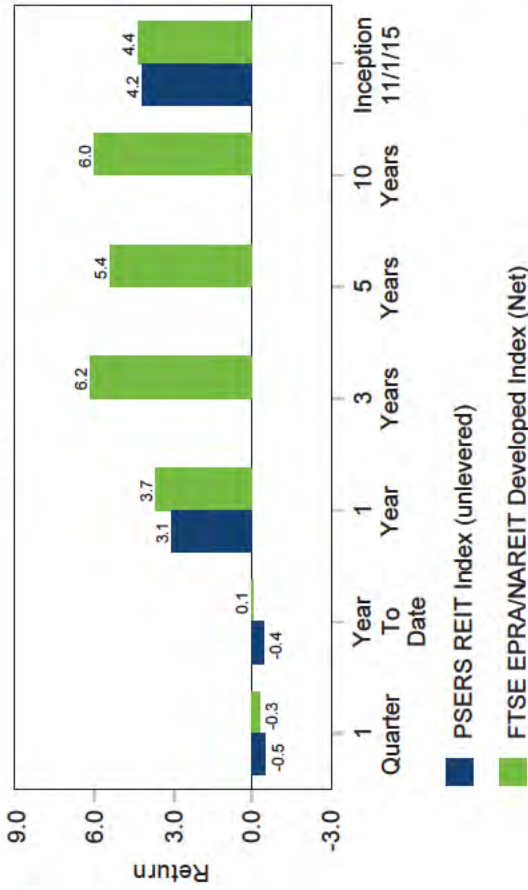
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Performance Summary

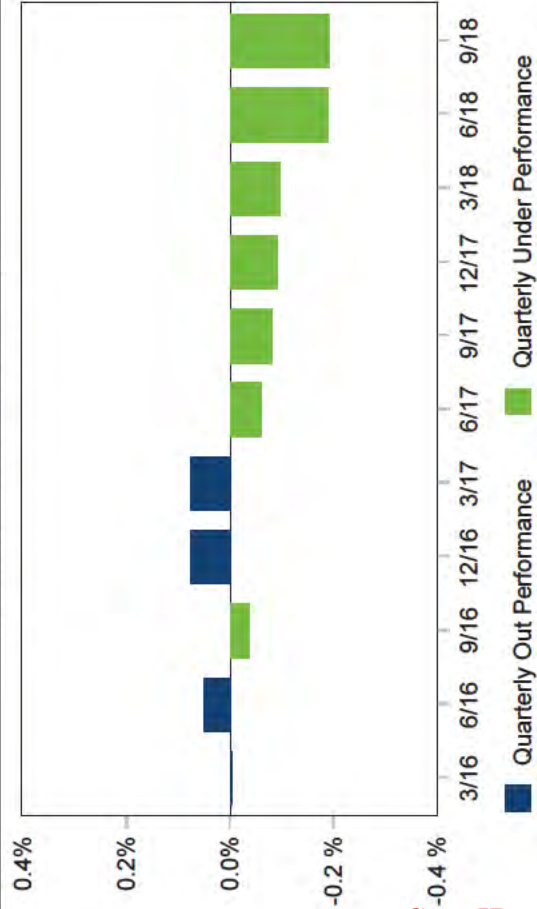
Account Information

Account Name: PSERS REIT Index (unlevered)  
 Inception Date: 11/01/2015  
 Account Structure: Separate Account  
 Asset Class: US REIT (Real-Estate Funds)  
 Benchmark: FTSE EPRA/NAREIT Developed Index (Net)  
 Peer Group: IM U.S. REIT (SA+CF)

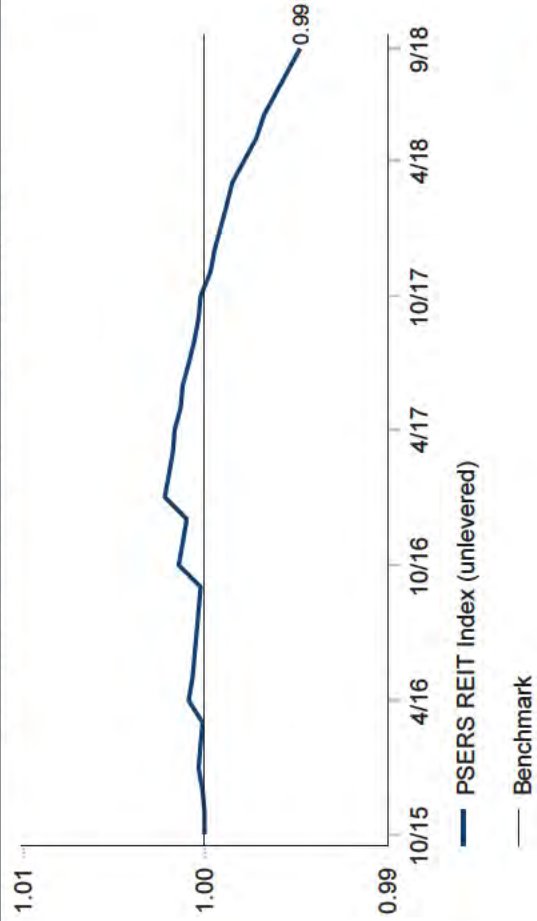
Return Summary



Quarterly Excess Performance



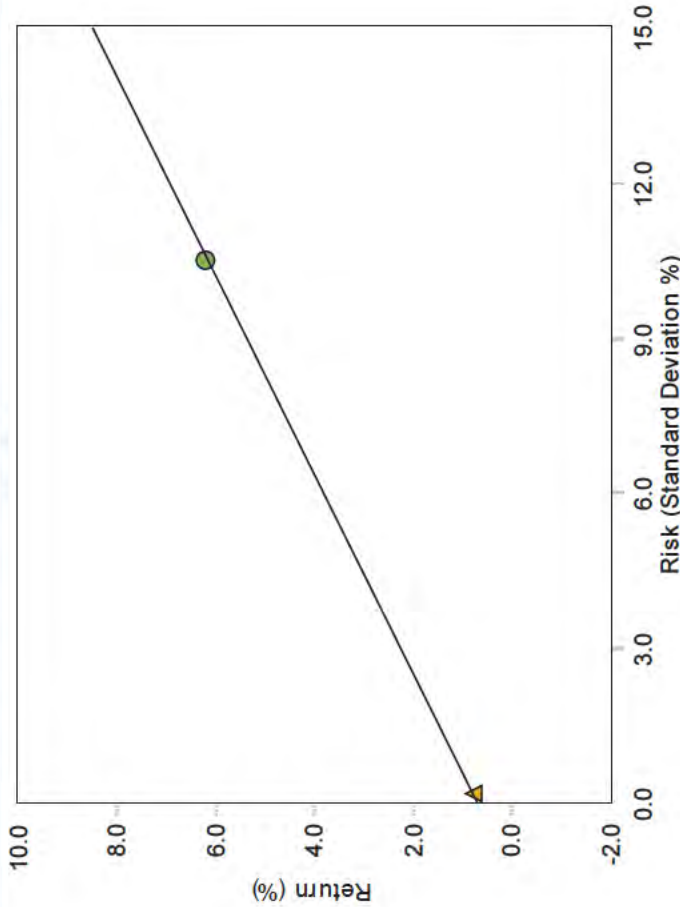
Ratio of Cumulative Wealth - Since Inception





PSERS REIT Index (unlevered) Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



- PSERS REIT Index (unlevered)
- FTSE EPRA/NAREIT Developed Index (Net)
- ▲ FTSE 3 Month T-Bill

Rolling 3 Years Standard Deviation

No data found.

3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS REIT Index (unlevered)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTSE EPRA/NAREIT Developed Index (Net)	0.00	0.00	N/A	1.00	0.55	0.00	1.00	6.19	10.52	1.00
FTSE 3 Month T-Bill	-5.75	10.53	-0.55	0.00	N/A	0.81	0.00	0.80	0.18	-0.04

Risk Statistics

PSERS REIT Index (unlevered)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.08	N/A	N/A	N/A	4.18	11/01/2015
Standard Deviation	8.92	N/A	N/A	N/A	10.17	
Downside Risk	7.40	N/A	N/A	N/A	6.57	
Downside Semi Deviation	4.09	N/A	N/A	N/A	10.63	
Max Drawdown Recovery Period	6.00	N/A	N/A	N/A	17.00	
Maximum Drawdown	-6.78	N/A	N/A	N/A	-11.48	
Maximum Loss Exposure	-3.51	N/A	N/A	N/A	-5.61	
Upside Semi Deviation	1.84	N/A	N/A	N/A	10.27	

FTSE EPRA/NAREIT Developed Index (Net)

Return	3.66	6.19	5.43	6.04	4.37
Standard Deviation	8.93	10.52	10.64	20.32	10.21
Downside Risk	7.34	6.49	6.85	14.74	6.59
Downside Semi Deviation	4.06	10.65	11.22	24.81	10.65
Max Drawdown Recovery Period	6.00	17.00	17.00	23.00	17.00
Maximum Drawdown	-6.71	-11.55	-11.55	-50.99	-11.55
Maximum Loss Exposure	-3.36	-0.28	-0.93	-50.99	-5.65
Upside Semi Deviation	1.89	10.97	10.64	17.74	10.34

vs. FTSE EPRA/NAREIT Developed Index (Net)

Active Return	-0.56	N/A	N/A	N/A	-0.18
Tracking Error	0.07	N/A	N/A	N/A	0.15
Actual Correlation	1.00	N/A	N/A	N/A	1.00
Beta	1.00	N/A	N/A	N/A	1.00
Consistency	0.00	N/A	N/A	N/A	17.14
Down Market Capture	101.67	N/A	N/A	N/A	100.08
Down Market Outperformance	-0.14	N/A	N/A	N/A	-0.01
Information Ratio	-8.42	N/A	N/A	N/A	-1.23
Jensen Alpha	-0.56	N/A	N/A	N/A	-0.17
Up Market Capture	96.91	N/A	N/A	N/A	98.84
Up Market Outperformance	-0.46	N/A	N/A	N/A	-0.36

vs. FTSE 3 Month T-Bill

Excess Return	1.85	N/A	N/A	N/A	3.78
Excess Risk	8.92	N/A	N/A	N/A	10.17
Sharpe Ratio	0.21	N/A	N/A	N/A	0.37

Calculation based on monthly periodicity.

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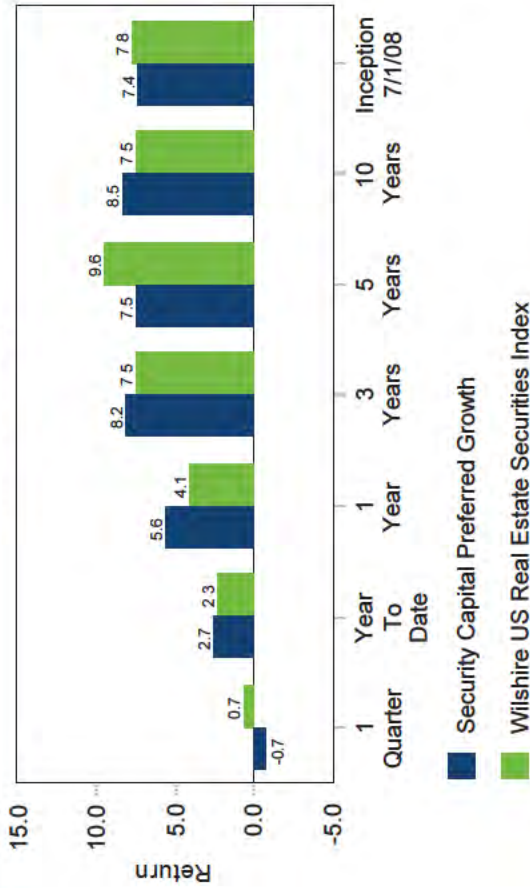


Performance Summary

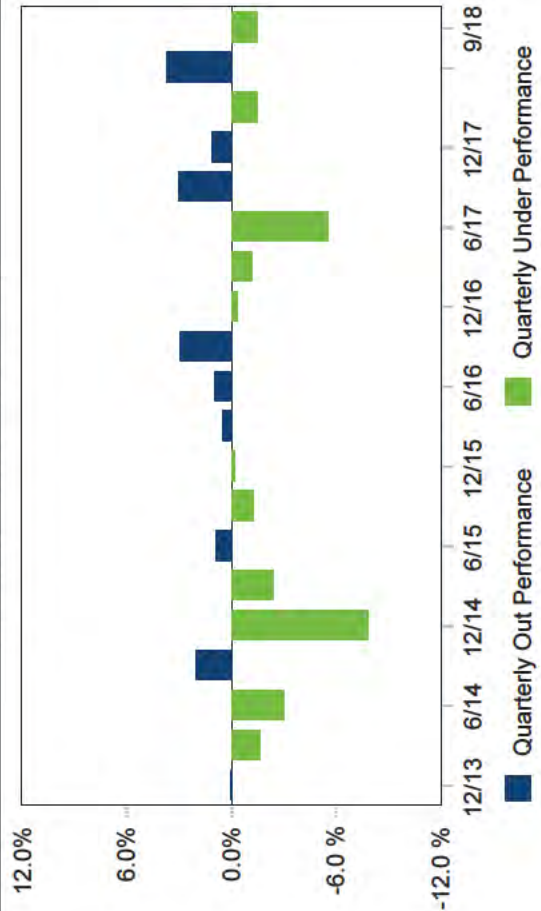
Account Information

Account Name: Security Capital Preferred Growth  
 Inception Date: 06/30/2008  
 Account Structure: Commingled Fund  
 Asset Class: Global REIT (Real-Estate Funds)  
 Benchmark: Wilshire US Real Estate Securities Index  
 Peer Group:

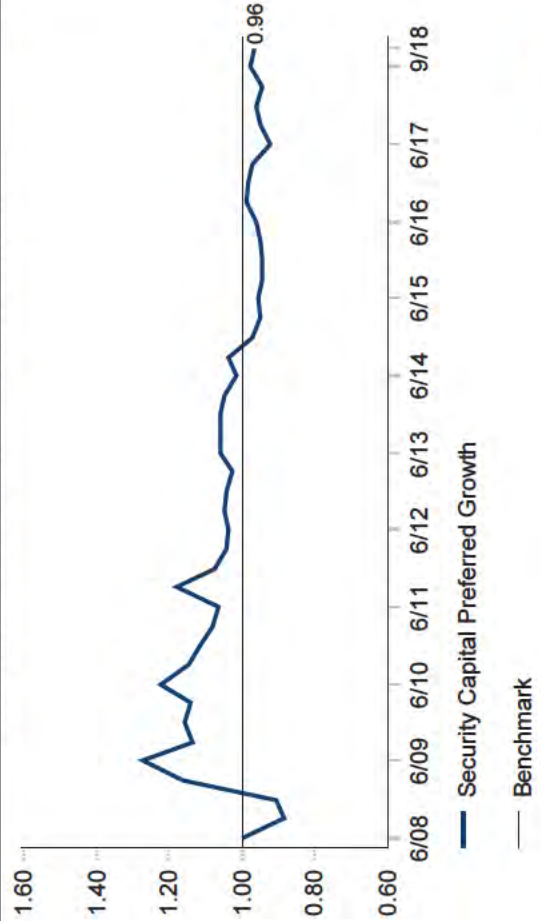
Return Summary



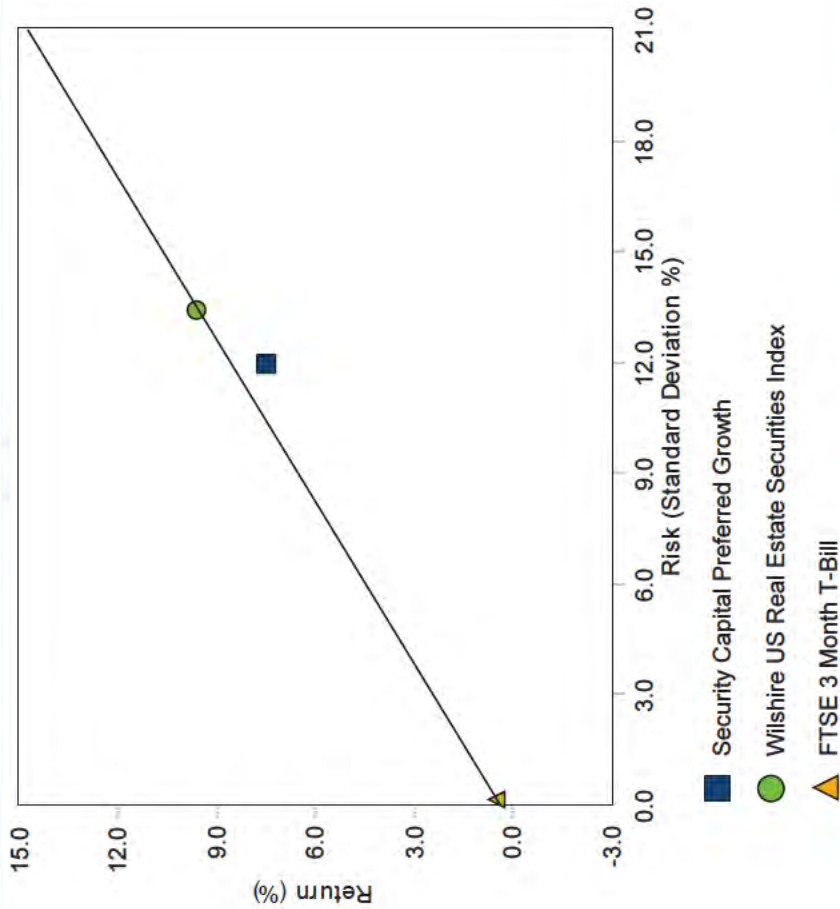
Quarterly Excess Performance



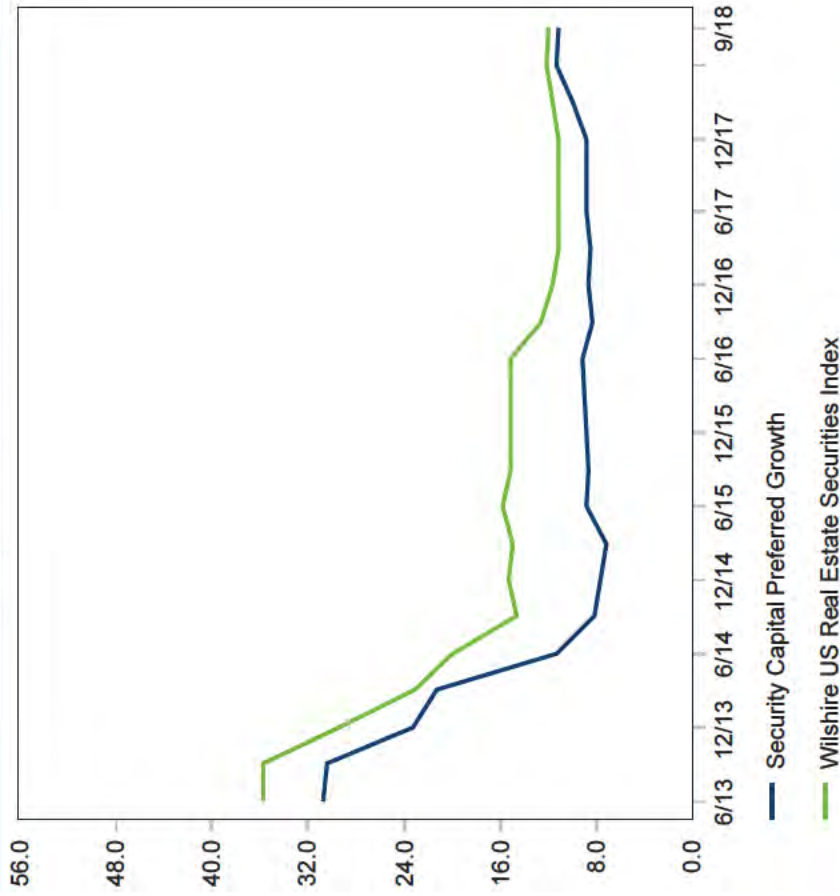
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Security Capital Preferred Growth	-2.10	5.75	-0.37	0.82	0.62	-0.16	0.81	7.50	11.98	0.90
Wilshire US Real Estate Securities Index	0.00	0.00	N/A	1.00	0.71	0.00	1.00	9.58	13.42	1.00
FTSE 3 Month T-Bill	-9.57	13.43	-0.71	0.00	N/A	0.50	0.00	0.49	0.18	-0.05

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## Risk Statistics

## Security Capital Preferred Growth

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.59	8.18	7.50	8.47	7.39	07/01/2008
Standard Deviation	18.59	11.92	11.19	22.70	22.66	
Downside Risk	10.32	6.01	6.08	14.12	14.16	
Downside Semi Deviation	8.93	9.96	10.02	26.59	25.86	
Max Drawdown Recovery Period	2.00	7.00	7.00	4.00	6.00	
Maximum Drawdown	-8.90	-9.18	-9.18	-48.10	-52.19	
Maximum Loss Exposure	-6.29	N/A	-0.64	-48.10	-52.19	
Upside Semi Deviation	13.82	15.20	13.44	22.35	22.35	

## Wilshire US Real Estate Securities Index

Return	4.11	7.52	9.58	7.51	7.79	
Standard Deviation	14.04	9.39	11.92	26.32	25.99	
Downside Risk	8.57	4.74	5.88	18.11	17.88	
Downside Semi Deviation	N/A	5.56	11.46	32.65	32.65	
Max Drawdown Recovery Period	2.00	2.00	3.00	9.00	10.00	
Maximum Drawdown	-7.42	-7.42	-9.61	-60.57	-60.57	
Maximum Loss Exposure	-5.83	N/A	-0.75	-60.57	-58.80	
Upside Semi Deviation	7.02	10.61	13.96	24.37	23.97	

## vs. Wilshire US Real Estate Securities Index

Active Return	1.97	0.86	-2.02	-0.22	-1.42	
Tracking Error	5.02	5.06	5.60	11.10	11.62	
Actual Correlation	0.99	0.91	0.88	0.91	0.89	
Beta	1.31	1.16	0.83	0.78	0.78	
Consistency	50.00	50.00	45.00	45.00	43.90	
Down Market Capture	119.99	88.98	82.29	63.47	63.47	
Down Market Outperformance	-1.48	0.96	2.47	11.44	11.44	
Information Ratio	0.39	0.17	-0.36	-0.02	-0.12	
Jensen Alpha	0.96	-0.23	-0.41	2.12	0.96	
Up Market Capture	128.31	104.04	80.48	79.85	75.01	
Up Market Outperformance	3.46	0.40	-4.76	-8.76	-10.71	

## vs. FTSE 3 Month T-Bill

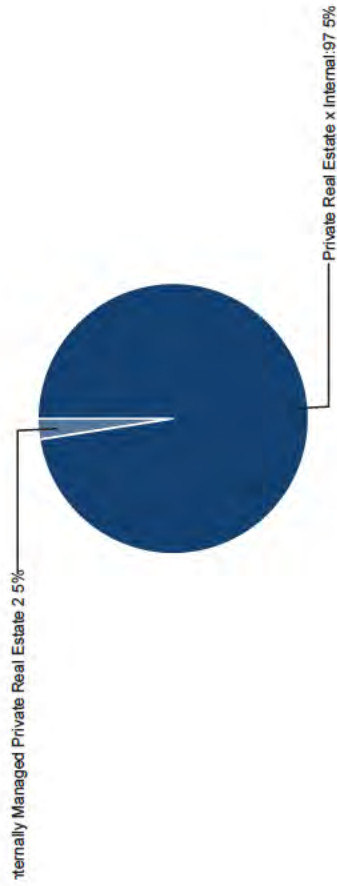
Excess Return	5.18	7.78	7.40	10.49	9.42	
Excess Risk	18.55	11.95	11.21	22.75	22.72	
Sharpe Ratio	0.28	0.65	0.66	0.46	0.41	

Calculation based on quarterly periodicity.

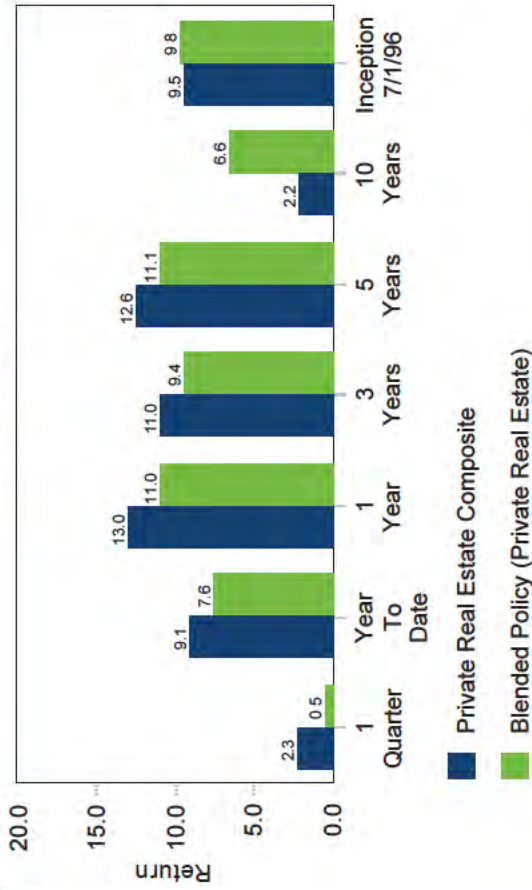
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Current Allocation

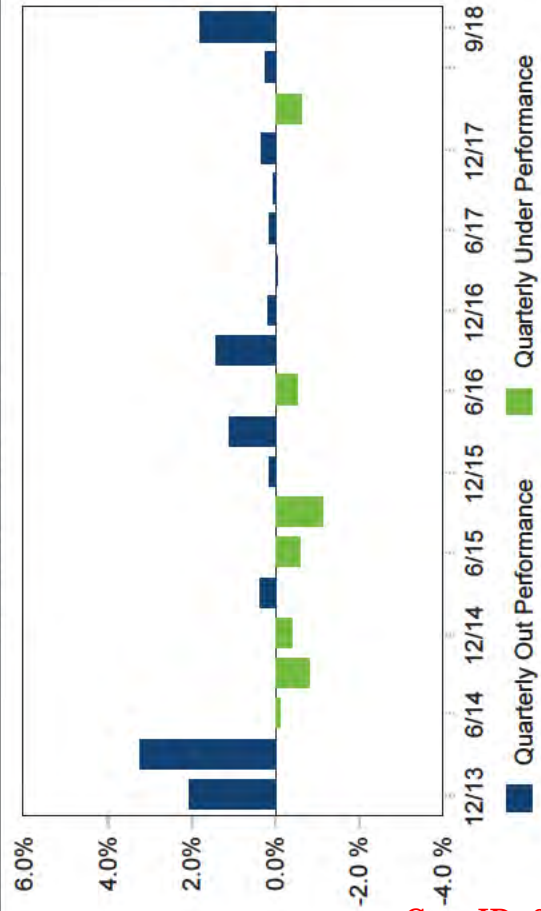
September 30, 2018 : \$4,936M



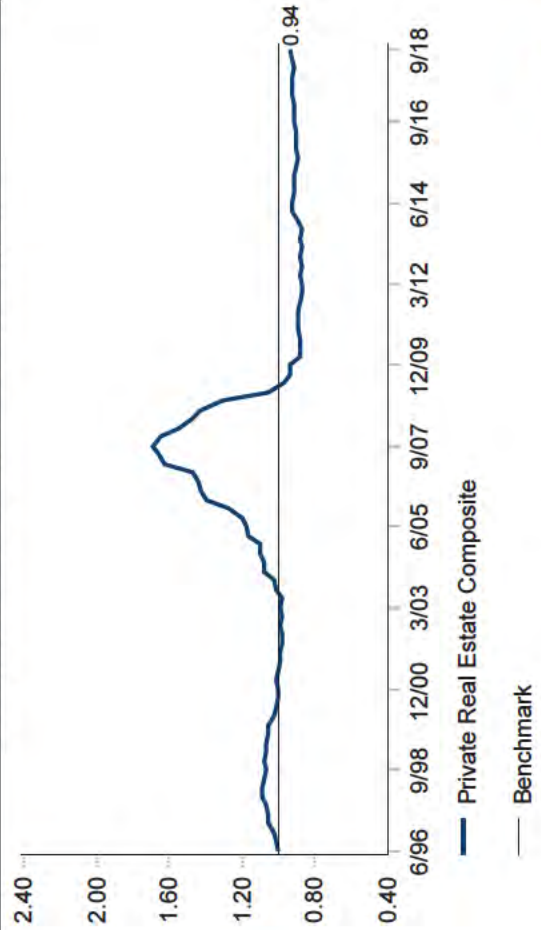
Return Summary



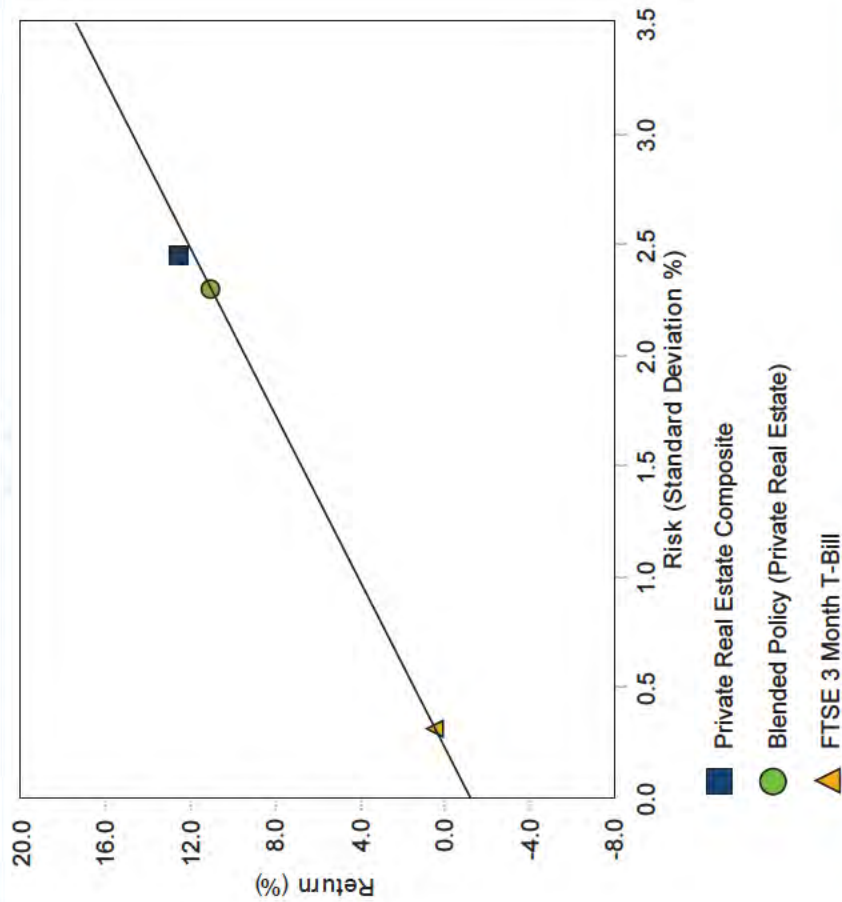
Quarterly Excess Performance



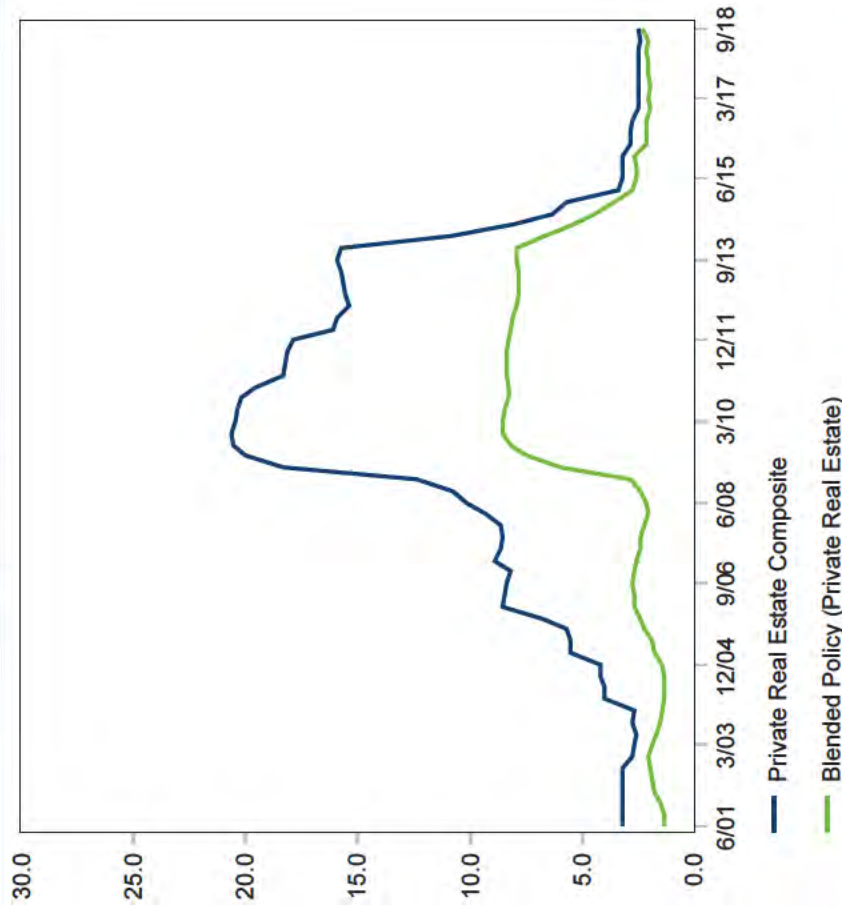
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Private Real Estate Composite	1.40	2.17	0.65	0.34	4.65	5.50	0.63	12.59	2.45	0.59
Blended Policy (Private Real Estate)	0.00	0.00	N/A	1.00	4.31	0.00	1.00	11.07	2.30	1.00
FTSE 3 Month T-Bill	-10.17	2.36	-4.31	0.01	N/A	0.67	-0.02	0.49	0.32	-0.12

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## Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Private Real Estate Composite						
Return	12.99	10.99	12.59	2.18	9.46	07/01/1996
Standard Deviation	1.16	1.67	2.45	12.14	10.35	
Downside Risk	0.00	0.00	0.00	10.64	7.17	
Downside Semi Deviation	N/A	N/A	N/A	27.14	20.29	
Max Drawdown Recovery Period	N/A	N/A	N/A	32.00	39.00	
Maximum Drawdown	0.00	0.00	0.00	-52.91	-56.90	
Maximum Loss Exposure	N/A	N/A	N/A	-39.47	N/A	
Upside Semi Deviation	7.26	5.77	6.66	6.65	9.60	
Blended Policy (Private Real Estate)						
Return	11.04	9.43	11.07	6.58	9.79	
Standard Deviation	3.11	2.20	2.30	6.09	4.57	
Downside Risk	0.00	0.00	0.00	4.11	2.74	
Downside Semi Deviation	N/A	N/A	N/A	11.49	11.49	
Max Drawdown Recovery Period	N/A	N/A	N/A	15.00	16.00	
Maximum Drawdown	0.00	0.00	0.00	-23.88	-23.88	
Maximum Loss Exposure	N/A	N/A	N/A	-16.63	N/A	
Upside Semi Deviation	6.89	5.26	5.93	6.09	6.26	
vs. Blended Policy (Private Real Estate)						
Active Return	1.76	1.44	1.40	-3.64	0.15	
Tracking Error	2.04	1.47	2.17	6.96	6.84	
Actual Correlation	0.95	0.74	0.59	0.92	0.86	
Beta	0.35	0.56	0.63	1.83	1.94	
Consistency	75.00	83.33	65.00	47.50	53.93	
Down Market Capture	N/A	N/A	N/A	260.71	260.71	
Down Market Outperformance	N/A	N/A	N/A	-22.84	-22.84	
Information Ratio	0.86	0.98	0.65	-0.52	0.02	
Jensen Alpha	7.52	5.52	5.20	-8.58	-6.79	
Up Market Capture	116.57	115.74	113.15	106.60	119.21	
Up Market Outperformance	1.95	1.56	1.52	0.77	2.26	
vs. FTSE 3 Month T-Bill						
Excess Return	10.84	9.78	11.57	2.66	7.54	
Excess Risk	1.34	1.55	2.49	12.13	10.10	
Sharpe Ratio	8.10	6.33	4.65	0.22	0.75	

Calculation based on quarterly periodicity.

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## Risk Parity

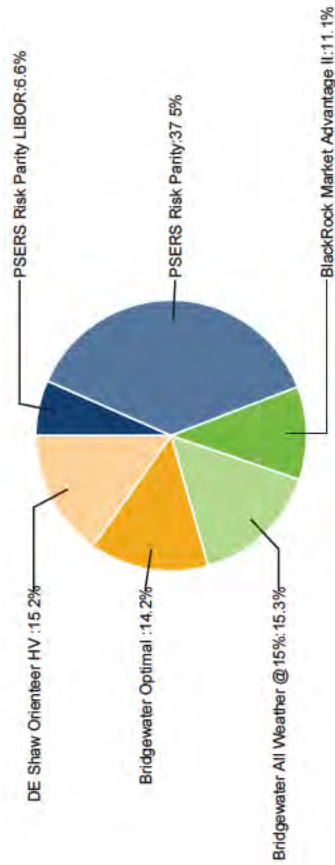
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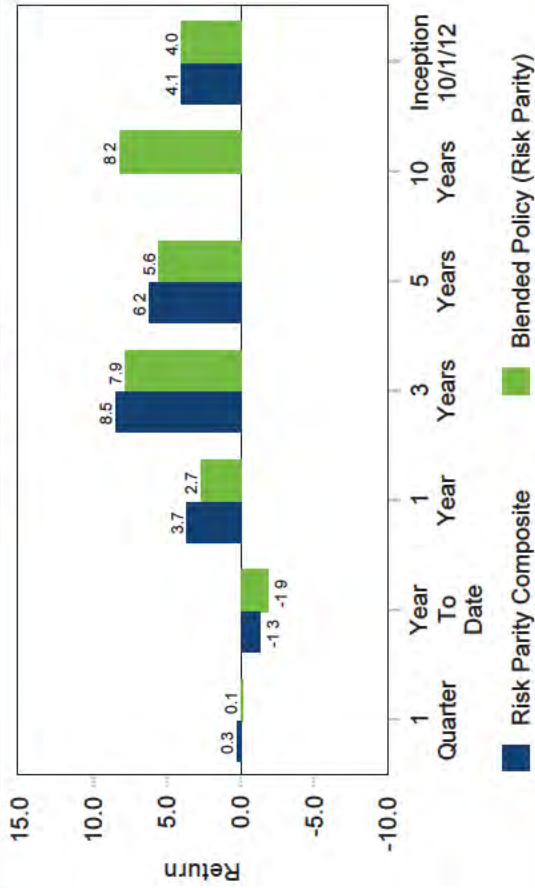
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Current Allocation

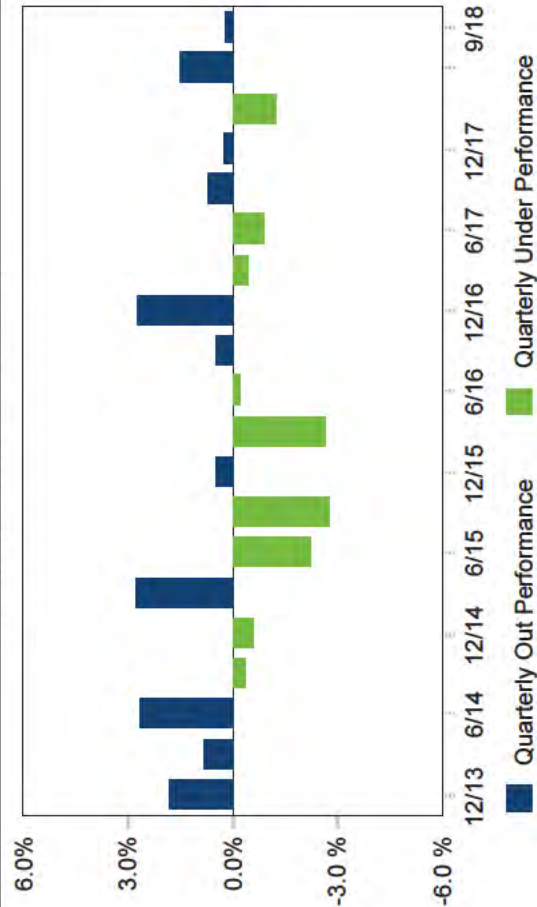
September 30, 2018 : \$4,501M



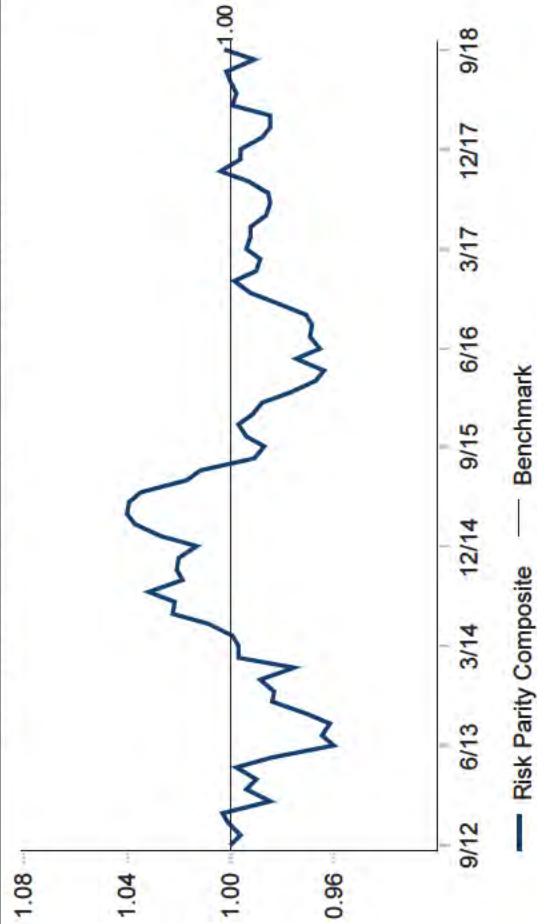
Return Summary



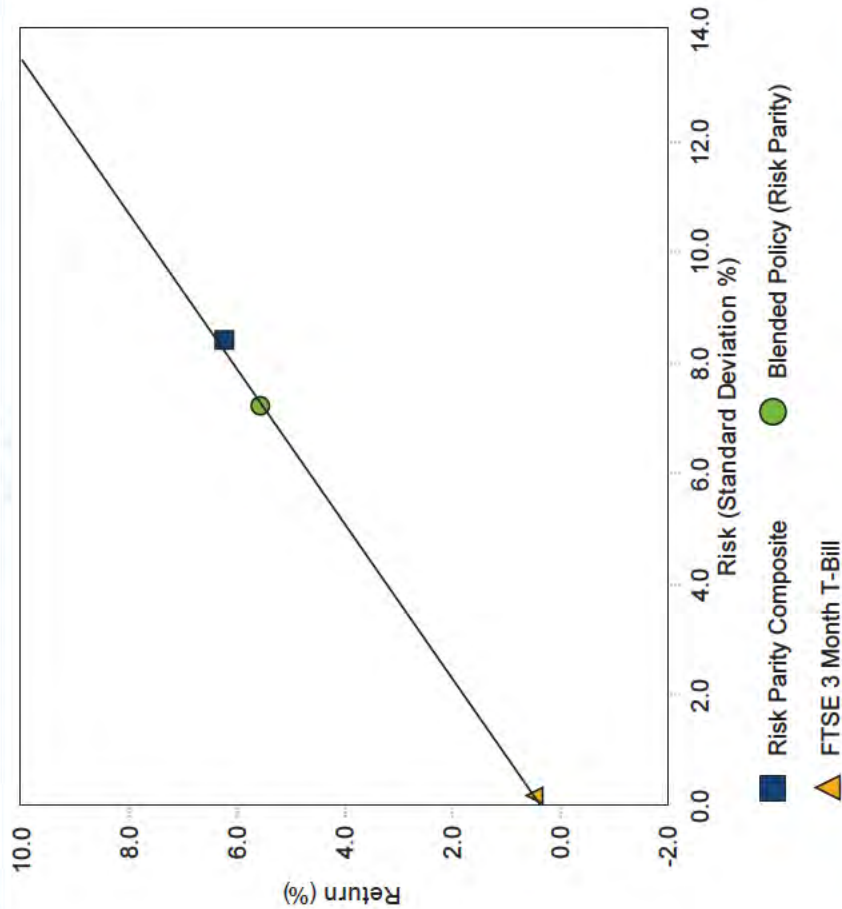
Quarterly Excess Performance



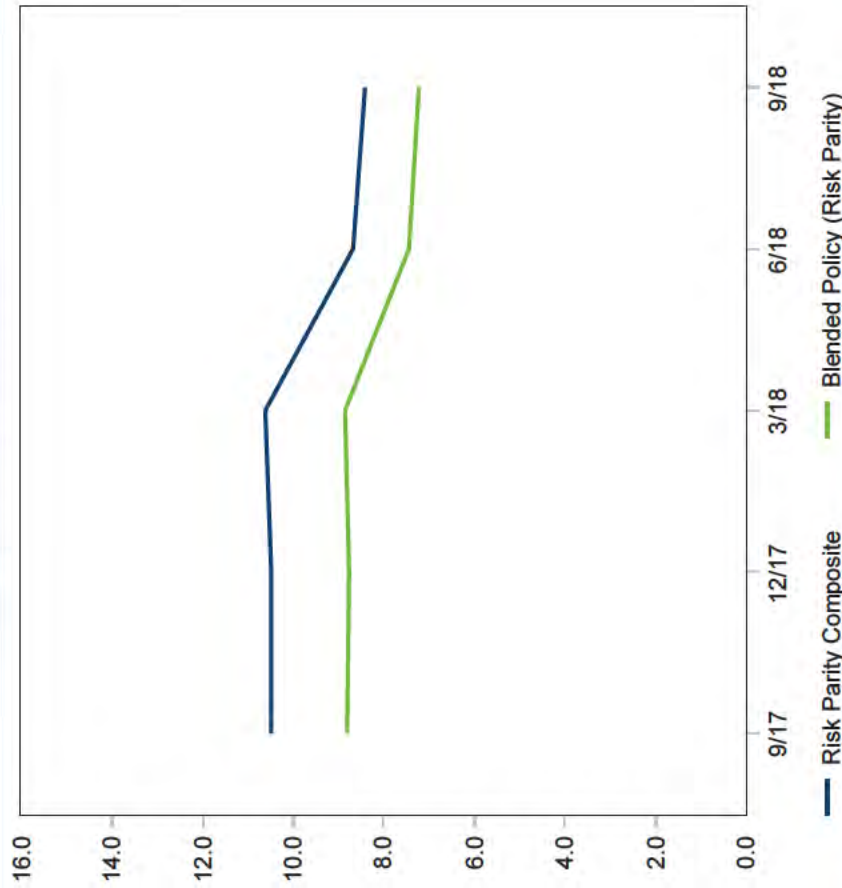
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Risk Parity Composite	0.73	2.99	0.24	0.88	0.70	0.22	1.09	6.23	8.42	0.94
Blended Policy (Risk Parity)	0.00	0.00	N/A	1.00	0.72	0.00	1.00	5.55	7.24	1.00
FTSE 3 Month T-Bill	-5.19	7.25	-0.72	0.00	N/A	0.49	0.00	0.49	0.18	-0.02

## Risk Statistics

Risk Parity Composite	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.67	8.45	6.23	N/A	4.09	10/01/2012
Standard Deviation	5.45	6.45	8.42	N/A	9.80	
Downside Risk	3.92	3.53	5.36	N/A	7.19	
Downside Semi Deviation	2.65	1.90	8.98	N/A	11.89	
Max Drawdown Recovery Period	N/A	7.00	23.00	N/A	13.00	
Maximum Drawdown	-3.62	-5.55	-15.02	N/A	-16.94	
Maximum Loss Exposure	N/A	-1.23	N/A	N/A	-10.71	
Upside Semi Deviation	1.34	7.16	8.53	N/A	8.62	
Blended Policy (Risk Parity)						
Return	2.73	7.89	5.55	8.19	4.05	
Standard Deviation	4.99	6.81	7.24	12.04	8.26	
Downside Risk	3.68	3.75	4.47	8.56	5.86	
Downside Semi Deviation	2.03	6.69	7.32	14.76	9.33	
Max Drawdown Recovery Period	N/A	6.00	14.00	10.00	14.00	
Maximum Drawdown	-3.33	-5.68	-10.23	-21.94	-13.68	
Maximum Loss Exposure	N/A	-0.95	-0.55	-21.94	-7.01	
Upside Semi Deviation	1.26	7.56	7.60	10.92	7.74	
vs. Blended Policy (Risk Parity)						
Active Return	0.93	0.50	0.73	N/A	0.18	
Tracking Error	2.83	2.51	2.99	N/A	3.12	
Actual Correlation	0.86	0.93	0.94	N/A	0.95	
Beta	0.93	0.88	1.09	N/A	1.13	
Consistency	41.67	47.22	46.67	N/A	47.22	
Down Market Capture	53.61	69.57	102.02	N/A	106.98	
Down Market Outperformance	2.39	4.62	-0.43	N/A	-1.45	
Information Ratio	0.33	0.20	0.24	N/A	0.06	
Jensen Alpha	1.02	1.34	0.26	N/A	-0.33	
Up Market Capture	80.78	90.62	106.60	N/A	106.09	
Up Market Outperformance	-1.71	-2.32	1.70	N/A	1.65	
vs. FTSE 3 Month T-Bill						
Excess Return	2.18	7.54	5.91	N/A	4.07	
Excess Risk	5.46	6.48	8.42	N/A	9.80	
Sharpe Ratio	0.40	1.16	0.70	N/A	0.42	

Calculation based on monthly periodicity.

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## Risk Statistics

## Risk Parity Composite (vol adjusted)

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.40	7.37	5.27	N/A	3.64	10/01/2012
Standard Deviation	4.71	5.62	6.96	N/A	7.83	
Downside Risk	3.37	3.11	4.46	N/A	5.67	
Downside Semi Deviation	2.28	1.68	7.47	N/A	9.37	
Max Drawdown Recovery Period	N/A	7.00	22.00	N/A	22.00	
Maximum Drawdown	-3.12	-4.99	-12.87	N/A	-12.87	
Maximum Loss Exposure	N/A	-1.37	N/A	N/A	-7.79	
Upside Semi Deviation	1.17	6.21	7.04	N/A	7.01	
Blended Policy (Risk Parity)						
Return	2.73	7.89	5.55	8.19	4.05	
Standard Deviation	4.99	6.81	7.24	12.04	8.26	
Downside Risk	3.68	3.75	4.47	8.56	5.86	
Downside Semi Deviation	2.03	6.69	7.32	14.76	9.33	
Max Drawdown Recovery Period	N/A	6.00	14.00	10.00	14.00	
Maximum Drawdown	-3.33	-5.68	-10.23	-21.94	-13.68	
Maximum Loss Exposure	N/A	-0.95	-0.55	-21.94	-7.01	
Upside Semi Deviation	1.26	7.56	7.60	10.92	7.74	
vs. Blended Policy (Risk Parity)						
Active Return	0.64	-0.56	-0.29	N/A	-0.43	
Tracking Error	2.61	2.59	2.40	N/A	2.38	
Actual Correlation	0.86	0.93	0.94	N/A	0.96	
Beta	0.81	0.77	0.91	N/A	0.91	
Consistency	50.00	38.89	41.67	N/A	44.44	
Down Market Capture	45.10	61.21	84.83	N/A	85.88	
Down Market Outperformance	2.86	5.97	2.54	N/A	2.64	
Information Ratio	0.24	-0.22	-0.12	N/A	-0.18	
Jensen Alpha	0.88	1.07	0.19	N/A	-0.06	
Up Market Capture	71.64	79.32	89.07	N/A	87.22	
Up Market Outperformance	-2.50	-5.01	-2.87	N/A	-3.54	
vs. FTSE 3 Month T-Bill						
Excess Return	1.89	6.48	4.89	N/A	3.47	
Excess Risk	4.73	5.64	6.96	N/A	7.82	
Sharpe Ratio	0.40	1.15	0.70	N/A	0.44	

Calculation based on monthly periodicity.

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As of September 30, 2018

Trailing Period Performance - Risk Parity

	Performance (%)										Allocation Market Value (\$000)
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Since Inception	Inception Date	
<b>Risk Parity Composite<sup>o</sup></b>	0.30	-0.61	0.31	0.31	-1.29	3.67	8.45	6.23	4.09	10/01/2012	4,501,309
Blended Policy (Risk Parity) <sup>1</sup>	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	4.05		
Value Added	1.15	-1.05	0.24	0.24	0.60	0.94	0.56	0.68	0.04		
<b>PSERS Risk Parity Composite (14% Targeted Vol)<sup>2</sup></b>	-0.40	-0.39	-0.63	-0.63	-2.14	2.88	9.56	6.87	4.27	02/01/2013	1,987,714
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	3.67		
Value Added	0.45	-0.83	-0.70	-0.70	-0.25	0.15	1.67	1.32	0.60		
<b>PSERS Risk Parity</b>	-0.54	-0.53	-0.91	-0.91	-2.71	2.28	9.35	6.75	4.16	02/01/2013	1,690,088
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	3.67		
Value Added	0.31	-0.97	-0.98	-0.98	-0.82	-0.45	1.46	1.20	0.49		
<b>PSERS Risk Parity LIBOR</b>	0.22	0.24	0.71	0.71	N/A	N/A	N/A	N/A	1.40	03/01/2018	297,626
ICE Libor (3 month)	0.19	0.20	0.59	0.59	1.66	2.04	1.26	0.86	1.36		
Value Added	0.03	0.04	0.12	0.12	N/A	N/A	N/A	N/A	0.04		
<b>Risk Parity - External<sup>3</sup></b>	0.97	-0.81	1.22	1.22	-0.45	4.46	7.76	N/A	3.18	06/01/2014	2,513,595
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	3.94		
Value Added	1.82	-1.25	1.15	1.15	1.44	1.73	-0.13	N/A	-0.76		
<b>Bridgewater All Weather (15% Targeted Vol)<sup>4</sup></b>	0.11	-0.61	-0.63	-0.63	-1.42	4.67	9.32	6.18	4.22	10/01/2012	689,891
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	4.05		
Value Added	0.96	-1.05	-0.70	-0.70	0.47	1.94	1.43	0.63	0.17		
<b>DE Shaw Orienteer HV (15% Targeted Vol)<sup>5</sup></b>	3.12	-1.15	4.39	4.39	0.21	5.17	N/A	N/A	10.59	02/01/2016	684,420
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	9.31		
Value Added	3.97	-1.59	4.32	4.32	2.10	2.44	N/A	N/A	1.28		
<b>BlackRock Market Advantage II (15% Targeted Vol)<sup>6</sup></b>	-0.30	0.15	0.94	0.94	1.20	8.27	11.51	N/A	6.28	04/01/2015	500,156
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	4.32		
Value Added	0.55	-0.29	0.87	0.87	3.09	5.54	3.62	N/A	1.96		
<b>Bridgewater Optimal (10% Targeted Vol)<sup>7</sup></b>	0.65	-1.43	0.20	0.20	-1.36	0.75	N/A	N/A	2.19	11/01/2015	639,128
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	6.74		
Value Added	1.50	-1.87	0.13	0.13	0.53	-1.98	N/A	N/A	-4.55		

Case ID: 221102792

<sup>1</sup>SI volatility is 10.67% <sup>2</sup>SI volatility is 8.26%  
<sup>3</sup>SI volatility is 9.90% <sup>4</sup>SI volatility is 12.33%  
<sup>5</sup>SI volatility is 10.22% <sup>6</sup>SI volatility is 8.54% <sup>7</sup>SI volatility is 6.29%.

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As of September 30, 2018

Trailing Period Performance - Risk Parity (Vol Adjusted)

	Performance (%)										Allocation Market Value (\$000)
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Since Inception	Inception Date	
<b>Risk Parity Composite (Vol adjusted)</b>	0.28	-0.50	0.34	0.34	-0.94	3.40	7.37	5.27	3.64	10/01/2012	5,194,690
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	4.05		
Value Added	1.13	-0.94	0.27	0.27	0.95	0.67	-0.52	-0.28	-0.41		
<b>PSERS Risk Parity Composite (Vol adjusted to 12%)</b>	-0.32	-0.31	-0.47	-0.47	-1.64	2.71	8.29	5.98	3.78	02/01/2013	2,319,000
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	3.67		
Value Added	0.53	-0.75	-0.54	-0.54	0.25	-0.02	0.40	0.43	0.11		
<b>Risk Parity - External (Vol adjusted)</b>	0.86	-0.69	1.13	1.13	-0.22	4.12	6.93	N/A	3.06	06/01/2014	2,875,690
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	3.94		
Value Added	1.71	-1.13	1.06	1.06	1.67	1.39	-0.96	N/A	-0.88		
<b>Bridgewater All Weather (Vol adjusted to 12%)</b>	0.12	-0.45	-0.41	-0.41	-0.88	4.06	7.62	5.09	3.54	10/01/2012	862,363
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	4.05		
Value Added	0.97	-0.89	-0.48	-0.48	1.01	1.33	-0.27	-0.46	-0.51		
<b>DE Shaw Orienteer HV (Vol adjusted to 12%)</b>	2.53	-0.88	3.61	3.61	0.48	4.51	N/A	N/A	8.63	02/01/2016	855,525
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	9.31		
Value Added	3.38	-1.32	3.54	3.54	2.37	1.78	N/A	N/A	-0.68		
<b>BlackRock Market Advantage II (Vol adjusted to 12%)</b>	-0.21	0.15	0.85	0.85	1.23	6.92	9.34	N/A	5.19	04/01/2015	625,196
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	4.32		
Value Added	0.64	-0.29	0.78	0.78	3.12	4.19	1.45	N/A	0.87		
<b>Bridgewater Optimal (Vol adjusted to 12%)</b>	0.75	-1.76	0.14	0.14	-1.90	0.56	N/A	N/A	2.42	11/01/2015	532,607
Blended Policy (Risk Parity)	-0.85	0.44	0.07	0.07	-1.89	2.73	7.89	5.55	6.74		
Value Added	1.60	-2.20	0.07	0.07	-0.01	-2.17	N/A	N/A	-4.32		

Supplemental reporting.

All volatility adjustments are made based on ex-ante volatility expectations.

Risk Parity Composite (Vol adjusted) is an asset-weighted composite of volatility adjusted performance of underlying portfolios.

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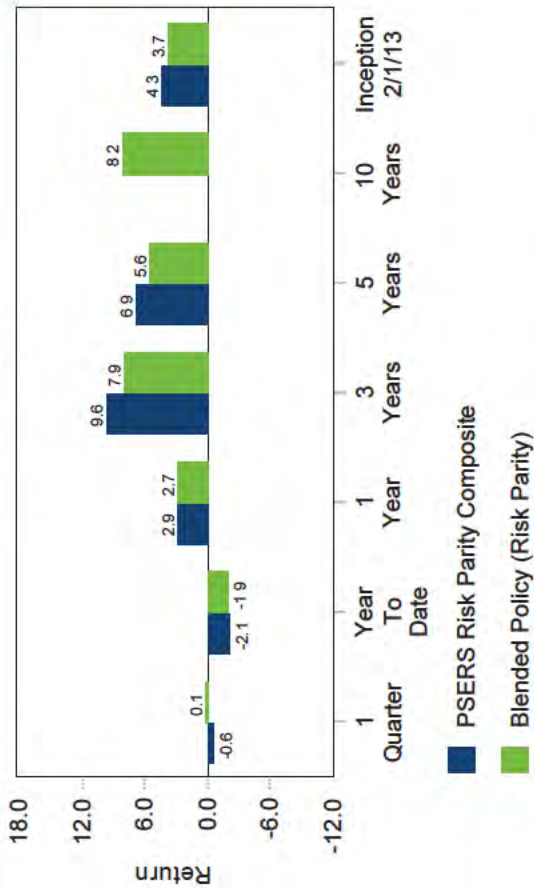


Performance Summary

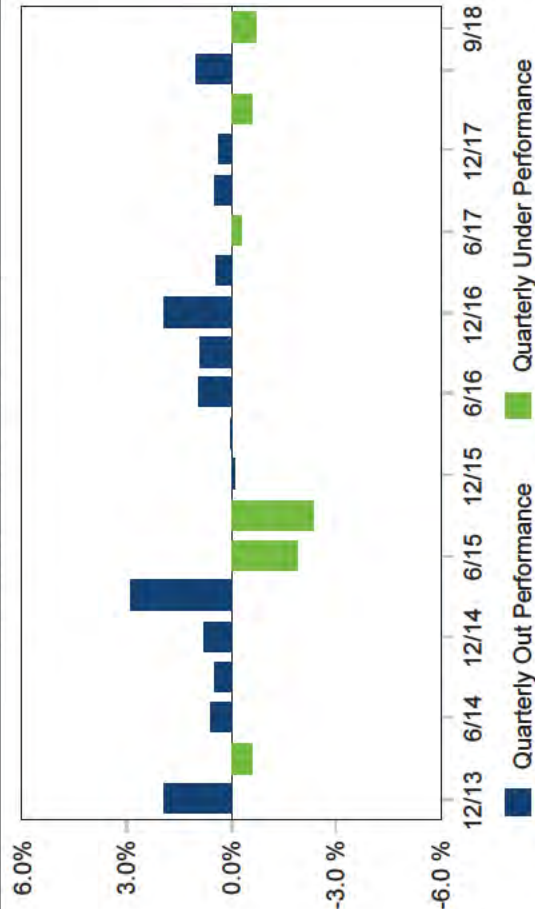
Account Information

Account Name: PSERS Risk Parity Composite  
 Inception Date: 02/01/2013  
 Account Structure: Separate Account  
 Asset Class: Hedge Fund  
 Benchmark: Blended Policy (Risk Parity)  
 Peer Group:

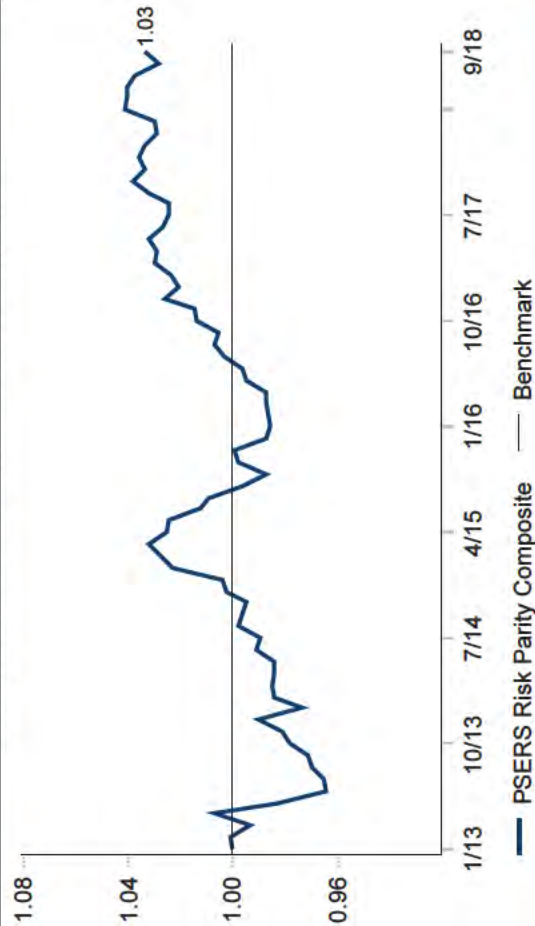
Return Summary



Quarterly Excess Performance



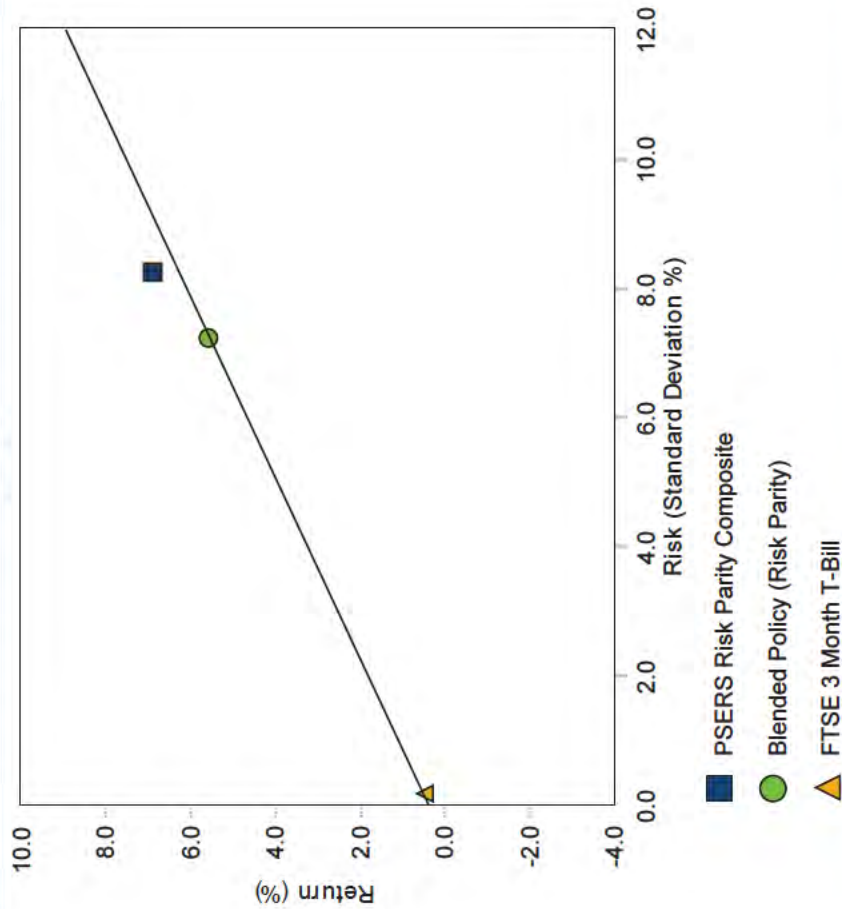
Ratio of Cumulative Wealth - Since Inception



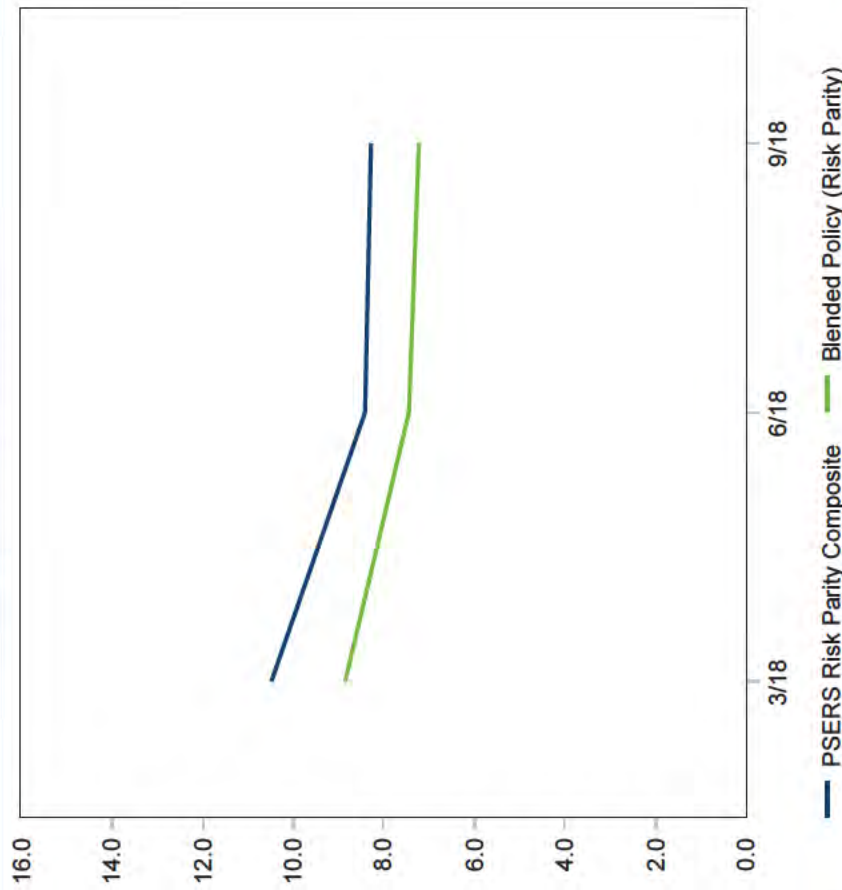


PSERS Risk Parity Composite Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Risk Parity Composite	1.33	2.30	0.58	0.93	0.79	0.75	1.10	6.87	8.28	0.96
Blended Policy (Risk Parity)	0.00	0.00	N/A	1.00	0.72	0.00	1.00	5.55	7.24	1.00
FTSE 3 Month T-Bill	-5.19	7.25	-0.72	0.00	N/A	0.49	0.00	0.49	0.18	-0.02

Risk Statistics

PSERS Risk Parity Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.88	9.56	6.87	N/A	4.27	02/01/2013
Standard Deviation	5.45	7.36	8.28	N/A	9.90	
Downside Risk	4.00	4.00	5.04	N/A	7.23	
Downside Semi Deviation	2.21	2.16	8.45	N/A	11.83	
Max Drawdown Recovery Period	N/A	5.00	15.00	N/A	16.00	
Maximum Drawdown	-3.67	-5.78	-13.74	N/A	-17.30	
Maximum Loss Exposure	N/A	-1.11	N/A	N/A	-13.29	
Upside Semi Deviation	1.38	8.18	8.68	N/A	8.82	
vs. Blended Policy (Risk Parity)						
Active Return	0.17	1.58	1.33	N/A	0.72	
Tracking Error	1.85	1.85	2.30	N/A	2.58	
Actual Correlation	0.94	0.97	0.96	N/A	0.97	
Beta	1.03	1.05	1.10	N/A	1.14	
Consistency	50.00	58.33	56.67	N/A	57.35	
Down Market Capture	78.70	89.34	100.90	N/A	106.90	
Down Market Outperformance	1.08	1.56	-0.21	N/A	-1.47	
Information Ratio	0.09	0.85	0.58	N/A	0.28	
Jensen Alpha	0.13	1.24	0.80	N/A	0.21	
Up Market Capture	88.02	106.97	110.40	N/A	110.13	
Up Market Outperformance	-1.07	1.70	2.73	N/A	2.80	
vs. FTSE 3 Month T-Bill						
Excess Return	1.42	8.63	6.51	N/A	4.24	
Excess Risk	5.48	7.40	8.28	N/A	9.90	
Sharpe Ratio	0.26	1.17	0.79	N/A	0.43	

calculation based on monthly periodicity.

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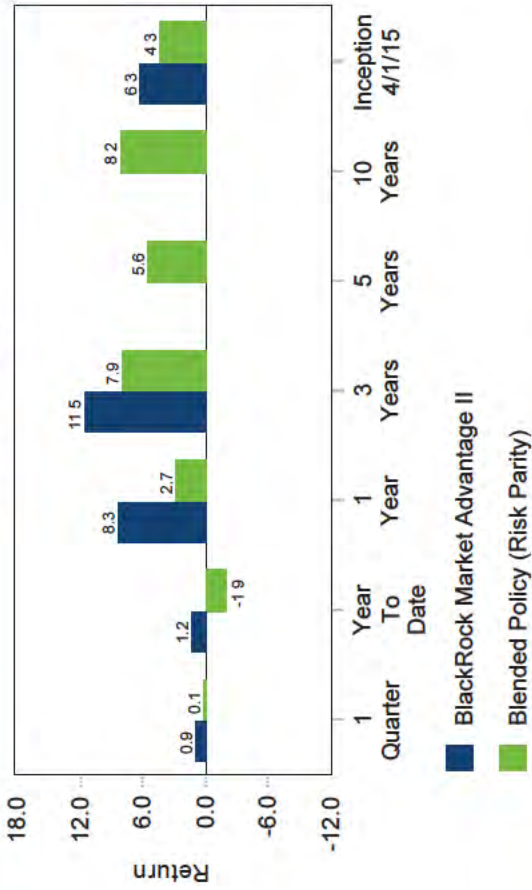


Performance Summary

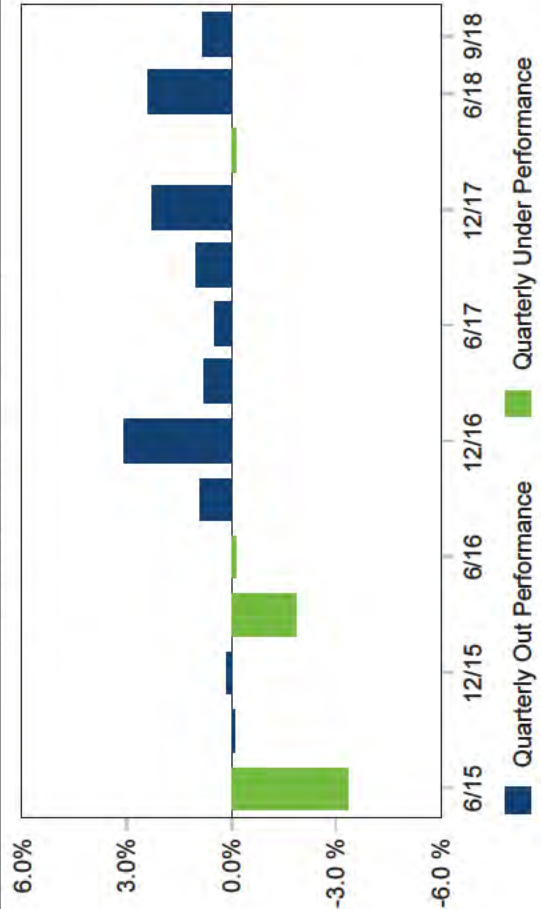
Account Information

Account Name: BlackRock Market Advantage II  
 Inception Date: 04/01/2015  
 Account Structure: Commingled Fund  
 Asset Class: Hedge Fund  
 Benchmark: Blended Policy (Risk Parity)  
 Peer Group:

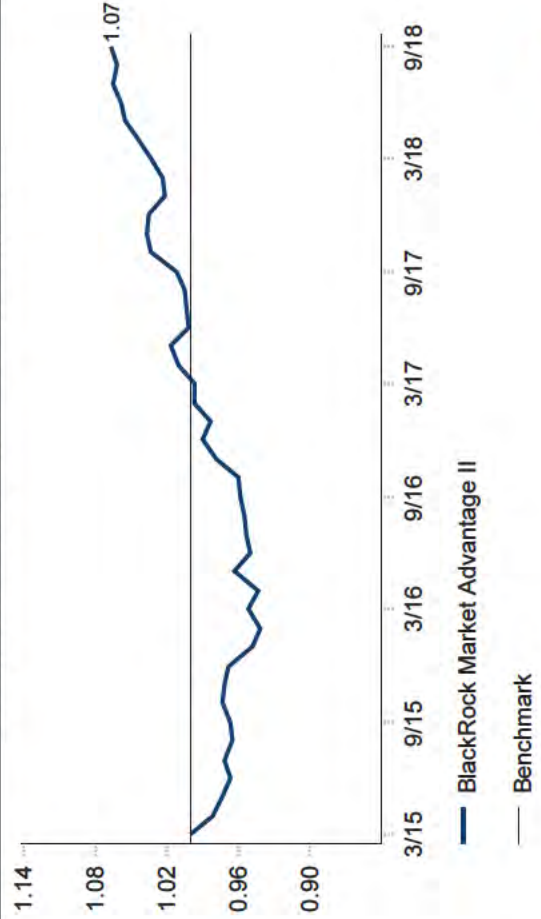
Return Summary



Quarterly Excess Performance

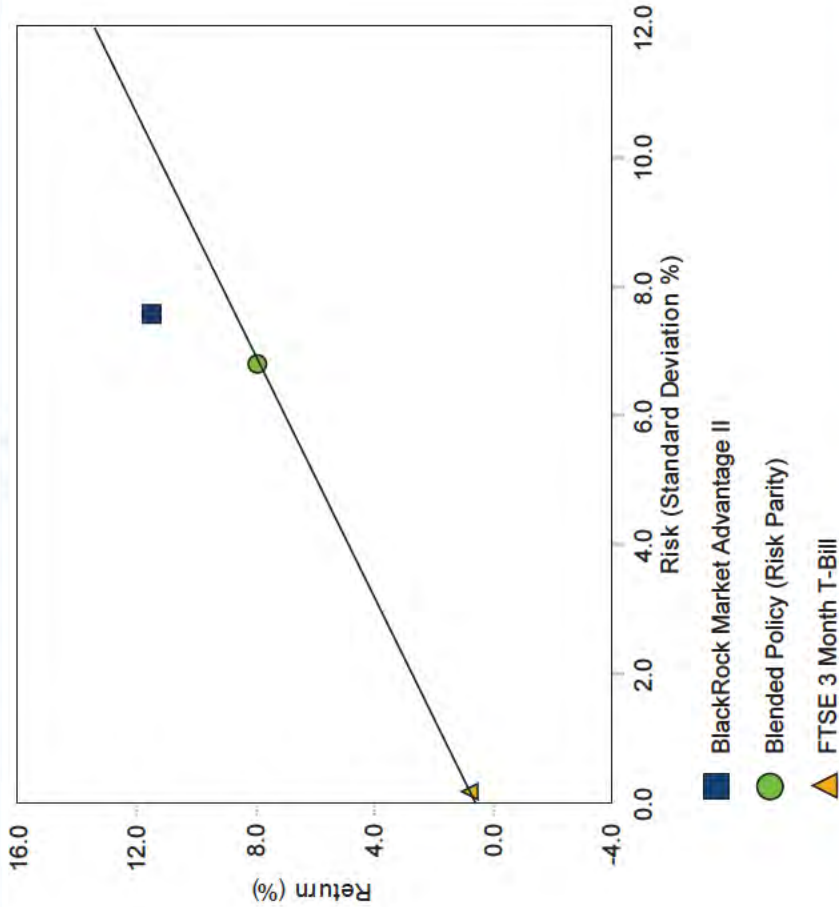


Ratio of Cumulative Wealth - Since Inception

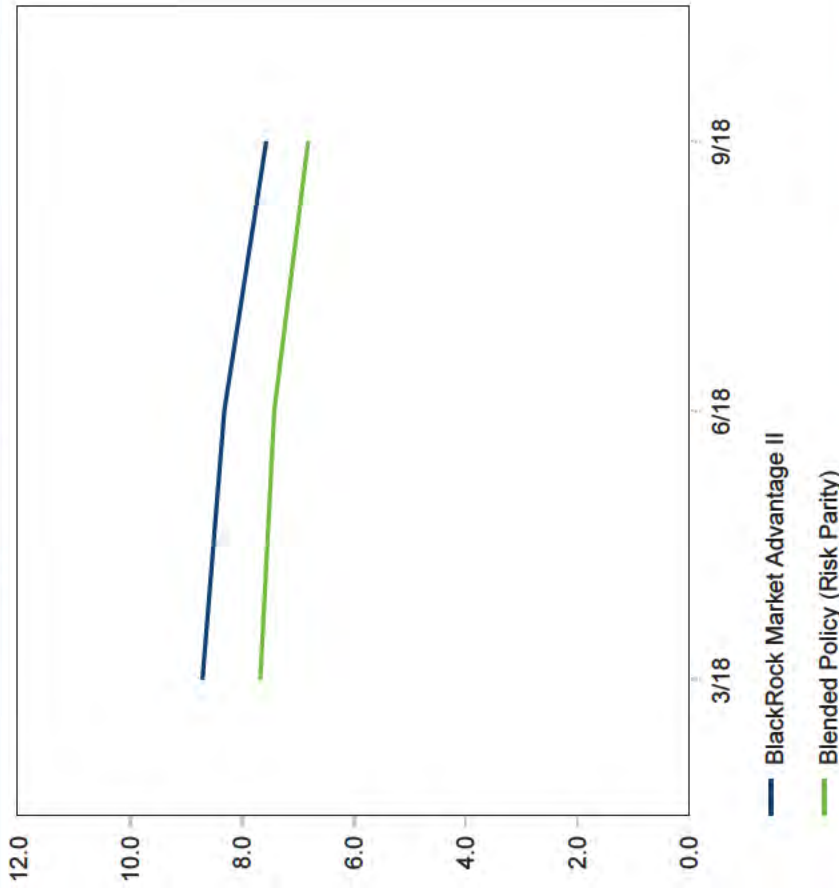


BlackRock Market Advantage II Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
BlackRock Market Advantage II	3.38	3.32	1.02	0.81	1.37	3.42	1.00	11.51	7.58	0.90
Blended Policy (Risk Parity)	0.00	0.00	N/A	1.00	1.03	0.00	1.00	7.89	6.81	1.00
FTSE 3 Month T-Bill	-7.04	6.84	-1.03	0.02	N/A	0.84	0.00	0.80	0.18	-0.15

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## Risk Statistics

## BlackRock Market Advantage II

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.27	11.51	N/A	N/A	6.28	04/01/2015
Standard Deviation	5.93	7.58	N/A	N/A	8.14	
Downside Risk	3.48	3.75	N/A	N/A	4.84	
Downside Semi Deviation	2.35	2.03	N/A	N/A	8.28	
Max Drawdown Recovery Period	4.00	7.00	N/A	N/A	15.00	
Maximum Drawdown	-3.24	-6.97	N/A	N/A	-13.26	
Maximum Loss Exposure	N/A	-2.80	N/A	N/A	-13.26	
Upside Semi Deviation	1.83	8.89	N/A	N/A	8.55	
Blended Policy (Risk Parity)						
Return	2.73	7.89	5.55	8.19	4.32	
Standard Deviation	4.99	6.81	7.24	12.04	7.17	
Downside Risk	3.68	3.75	4.47	8.56	4.48	
Downside Semi Deviation	2.03	6.69	7.32	14.76	7.17	
Max Drawdown Recovery Period	N/A	6.00	14.00	10.00	14.00	
Maximum Drawdown	-3.33	-5.68	-10.23	-21.94	-10.23	
Maximum Loss Exposure	N/A	-0.95	-0.55	-21.94	-8.55	
Upside Semi Deviation	1.26	7.56	7.60	10.92	7.52	
vs. Blended Policy (Risk Parity)						
Active Return	5.32	3.38	N/A	N/A	1.93	
Tracking Error	2.89	3.32	N/A	N/A	3.39	
Actual Correlation	0.87	0.90	N/A	N/A	0.91	
Beta	1.04	1.00	N/A	N/A	1.03	
Consistency	75.00	69.44	N/A	N/A	64.29	
Down Market Capture	66.66	84.49	N/A	N/A	95.47	
Down Market Outperformance	1.73	2.30	N/A	N/A	0.67	
Information Ratio	1.84	1.02	N/A	N/A	0.57	
Jensen Alpha	5.41	3.43	N/A	N/A	1.84	
Up Market Capture	142.81	118.00	N/A	N/A	112.87	
Up Market Outperformance	3.80	4.49	N/A	N/A	3.18	
vs. FTSE 3 Month T-Bill						
Excess Return	6.58	10.42	N/A	N/A	5.74	
Excess Risk	5.96	7.60	N/A	N/A	8.12	
Sharpe Ratio	1.10	1.37	N/A	N/A	0.71	

Calculation based on monthly periodicity.

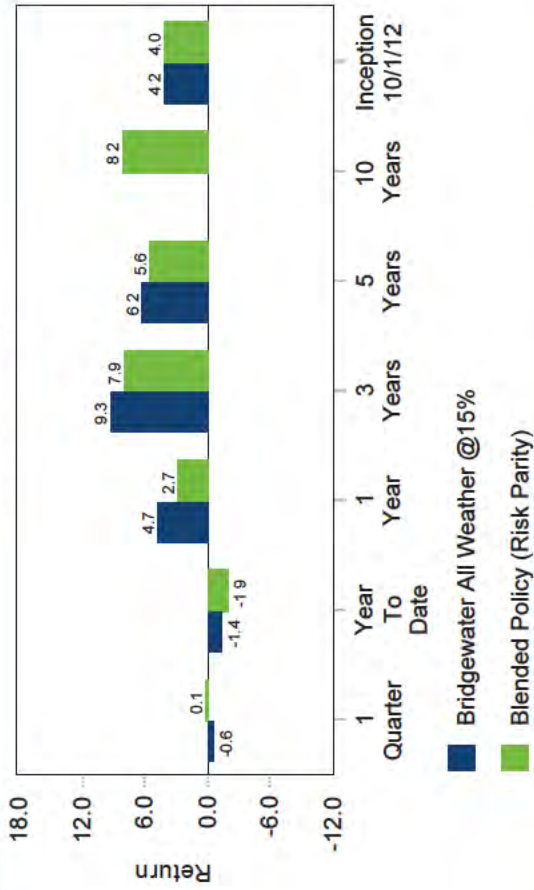
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Performance Summary

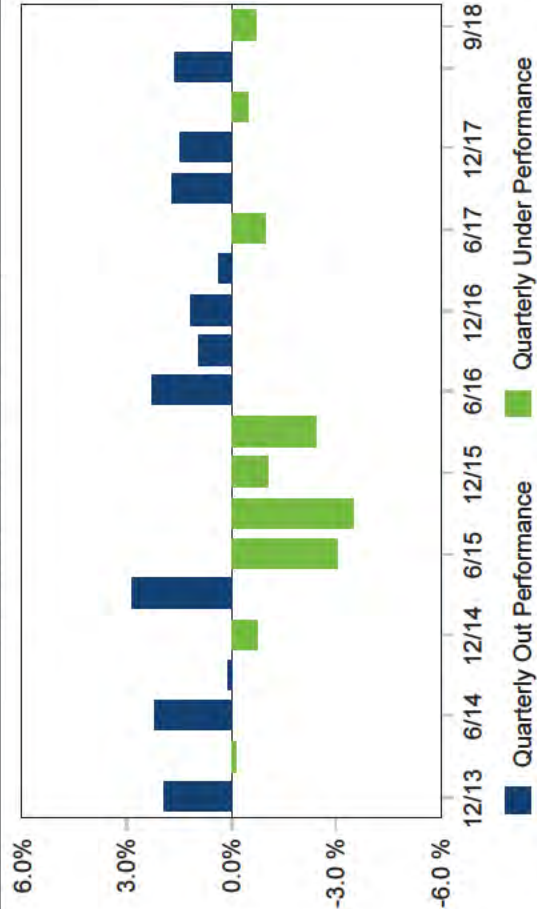
Account Information

Account Name: Bridgewater All Weather @15%  
 Inception Date: 09/30/2012  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: Blended Policy (Risk Parity)  
 Peer Group:

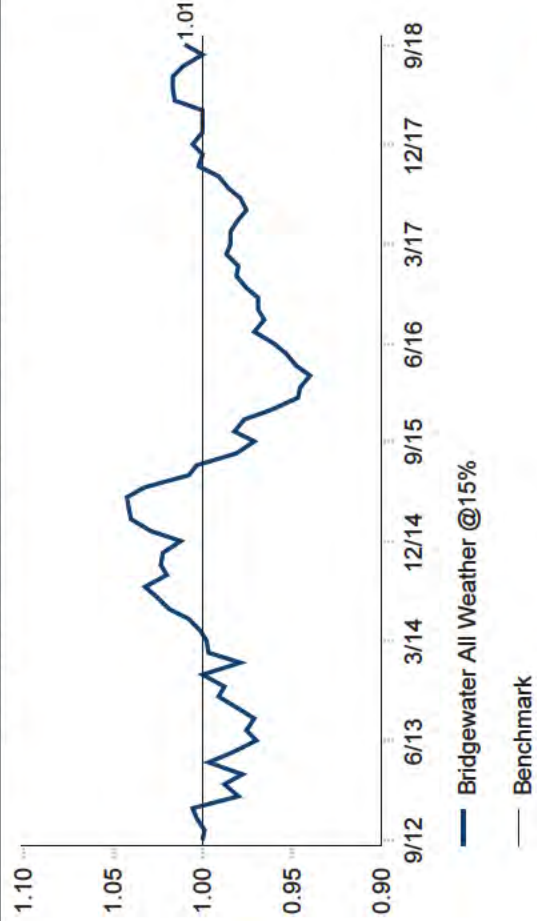
Return Summary



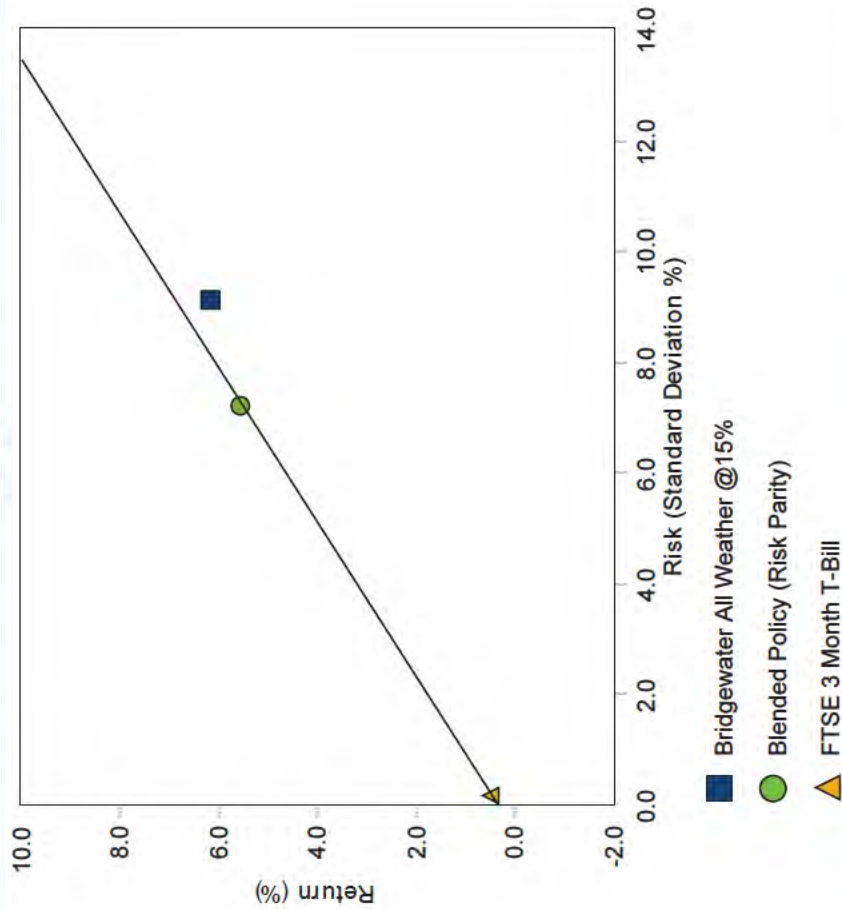
Quarterly Excess Performance



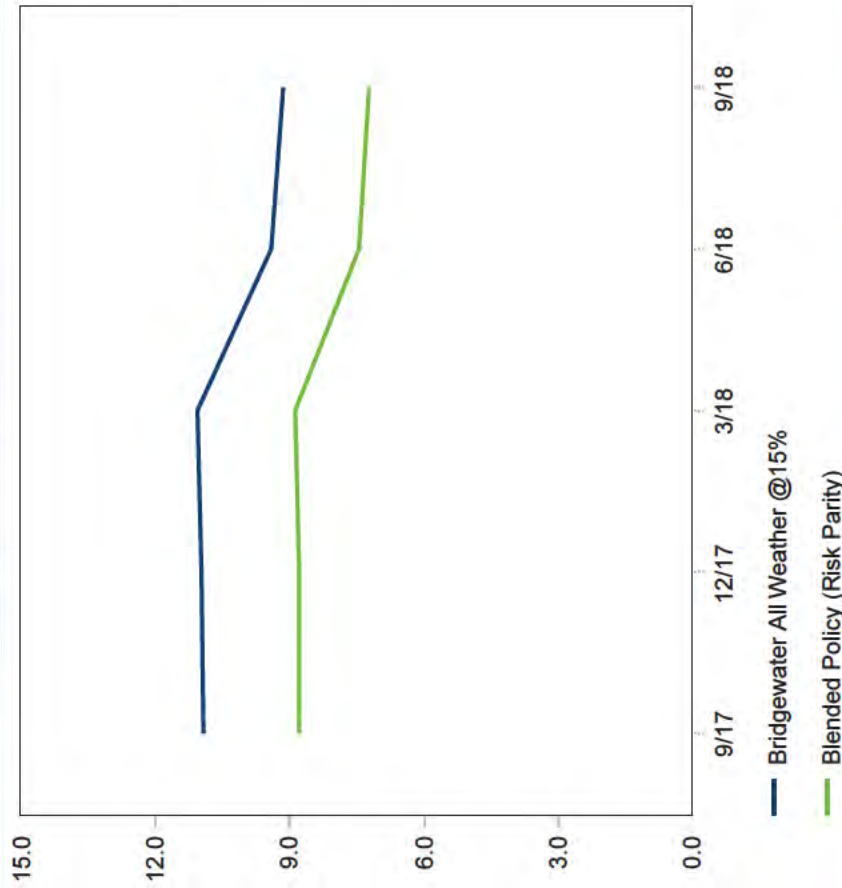
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bridgewater All Weather @15%	0.75	3.18	0.24	0.90	0.65	-0.39	1.20	6.18	9.15	0.95
Blended Policy (Risk Parity)	0.00	0.00	N/A	1.00	0.72	0.00	1.00	5.55	7.24	1.00
FTSE 3 Month T-Bill	-5.19	7.25	-0.72	0.00	N/A	0.49	0.00	0.49	0.18	-0.02

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## Risk Statistics

## Bridgewater All Weather @15%

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.67	9.32	6.18	N/A	4.22	10/01/2012
Standard Deviation	5.54	7.87	9.15	N/A	10.22	
Downside Risk	3.62	4.25	5.83	N/A	7.28	
Downside Semi Deviation	2.00	7.25	9.14	N/A	11.39	
Max Drawdown Recovery Period	N/A	8.00	24.00	N/A	24.00	
Maximum Drawdown	-3.29	-8.00	-18.42	N/A	-18.42	
Maximum Loss Exposure	N/A	-3.43	-0.22	N/A	-9.82	
Upside Semi Deviation	1.60	9.02	9.61	N/A	9.61	
Blended Policy (Risk Parity)						
Return	2.73	7.89	5.55	8.19	4.05	
Standard Deviation	4.99	6.81	7.24	12.04	8.26	
Downside Risk	3.68	3.75	4.47	8.56	5.86	
Downside Semi Deviation	2.03	6.69	7.32	14.76	9.33	
Max Drawdown Recovery Period	N/A	6.00	14.00	10.00	14.00	
Maximum Drawdown	-3.33	-5.68	-10.23	-21.94	-13.68	
Maximum Loss Exposure	N/A	-0.95	-0.55	-21.94	-7.01	
Upside Semi Deviation	1.26	7.56	7.60	10.92	7.74	
vs. Blended Policy (Risk Parity)						
Active Return	1.90	1.39	0.75	N/A	0.35	
Tracking Error	2.64	2.57	3.18	N/A	3.37	
Actual Correlation	0.88	0.95	0.95	N/A	0.96	
Beta	0.98	1.10	1.20	N/A	1.18	
Consistency	58.33	52.78	55.00	N/A	54.17	
Down Market Capture	52.83	98.92	118.16	N/A	116.08	
Down Market Outperformance	2.44	0.10	-3.09	N/A	-3.07	
Information Ratio	0.72	0.54	0.24	N/A	0.10	
Jensen Alpha	1.95	0.73	-0.29	N/A	-0.36	
Up Market Capture	92.12	109.70	116.07	N/A	113.54	
Up Market Outperformance	-0.73	2.35	4.24	N/A	3.74	
vs. FTSE 3 Month T-Bill						
Excess Return	3.15	8.44	5.94	N/A	4.24	
Excess Risk	5.58	7.89	9.15	N/A	10.22	
Sharpe Ratio	0.57	1.07	0.65	N/A	0.42	

Calculation based on monthly periodicity.

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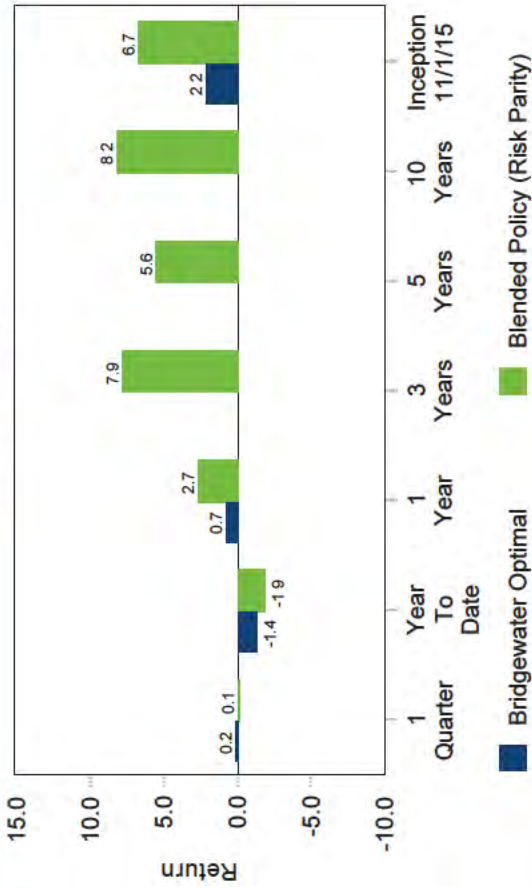


Performance Summary

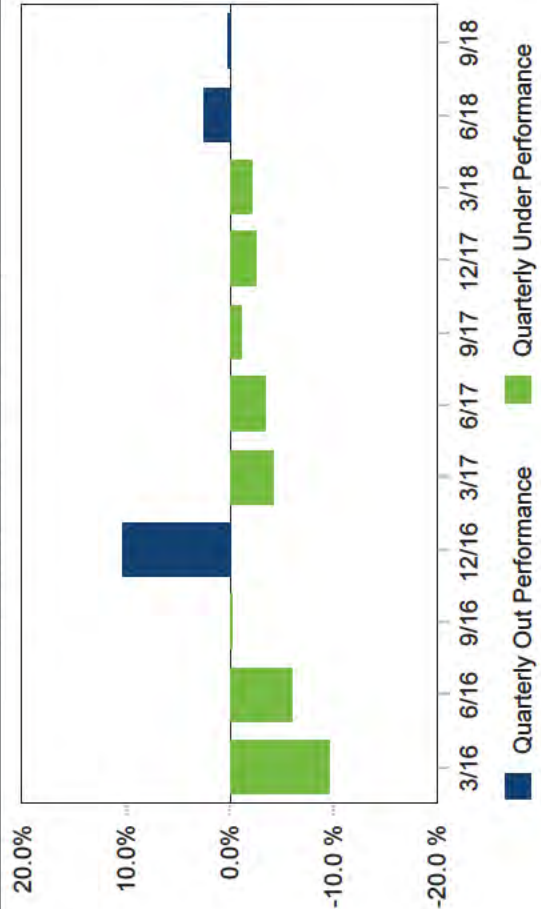
Account Information

Account Name: Bridgewater Optimal  
 Inception Date: 11/01/2015  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: Blended Policy (Risk Parity)  
 Peer Group:

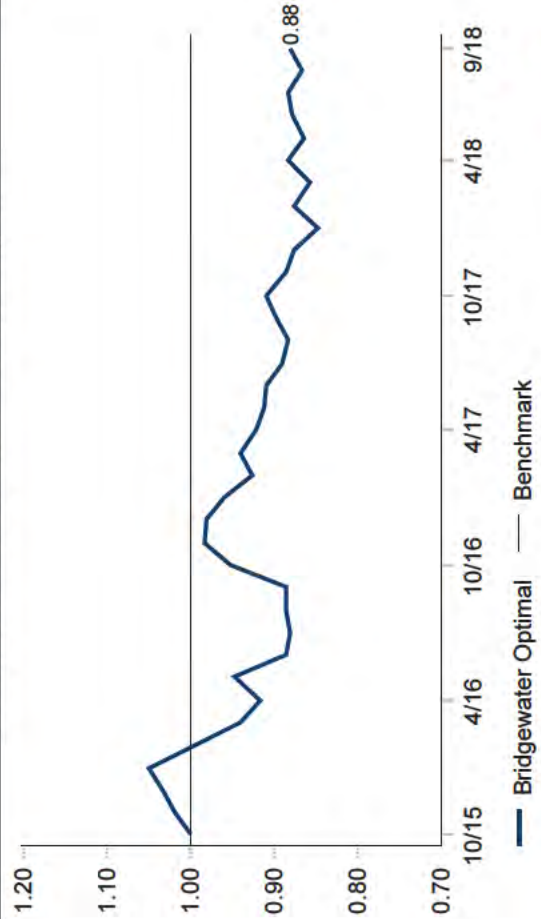
Return Summary



Quarterly Excess Performance

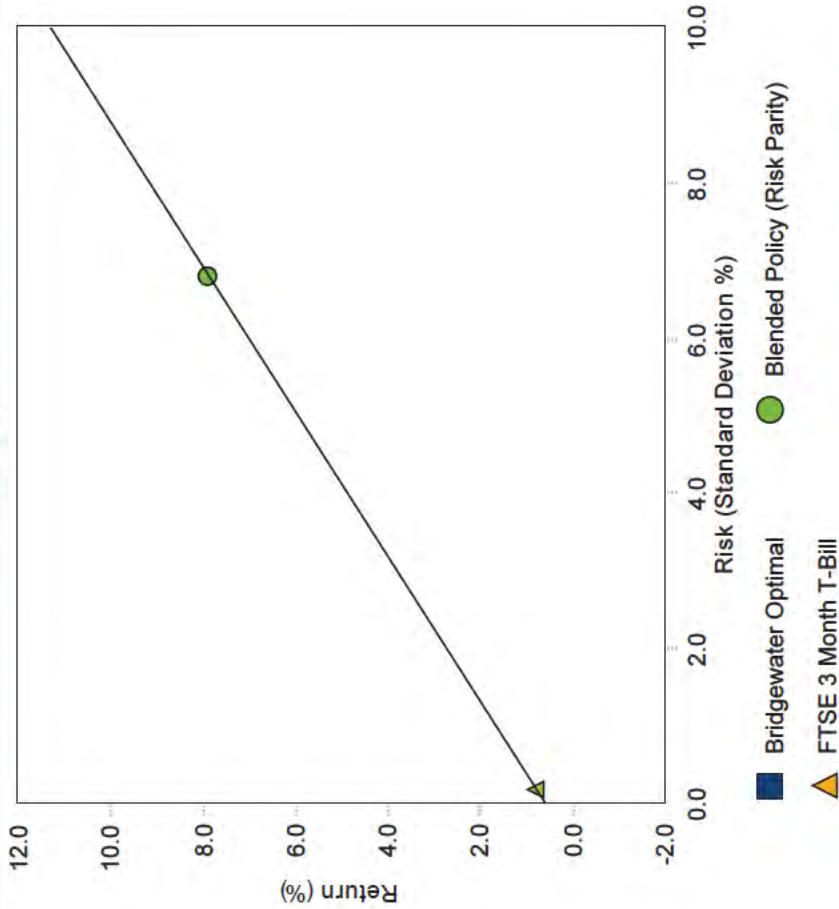


Ratio of Cumulative Wealth - Since Inception



Bridgewater Optimal Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation

No data found.

3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bridgewater Optimal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Risk Parity)	0.00	0.00	N/A	1.00	1.03	0.00	1.00	7.89	6.81	1.00
FTSE 3 Month T-Bill	-7.04	6.84	-1.03	0.02	N/A	0.84	0.00	0.80	0.18	-0.15

Risk Statistics

Bridgewater Optimal

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	0.75	N/A	N/A	N/A	2.19	11/01/2015
Standard Deviation	5.68	N/A	N/A	N/A	6.29	
Downside Risk	3.60	N/A	N/A	N/A	3.92	
Downside Semi Deviation	1.54	N/A	N/A	N/A	5.39	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	9.00	
Maximum Drawdown	-4.44	N/A	N/A	N/A	-5.77	
Maximum Loss Exposure	-1.73	N/A	N/A	N/A	-5.62	
Upside Semi Deviation	1.89	N/A	N/A	N/A	7.47	
Blended Policy (Risk Parity)						
Return	2.73	7.89	5.55	8.19	6.74	
Standard Deviation	4.99	6.81	7.24	12.04	6.63	
Downside Risk	3.68	3.75	4.47	8.56	3.80	
Downside Semi Deviation	2.03	6.69	7.32	14.76	6.69	
Max Drawdown Recovery Period	N/A	6.00	14.00	10.00	6.00	
Maximum Drawdown	-3.33	-5.68	-10.23	-21.94	-5.68	
Maximum Loss Exposure	N/A	-0.95	-0.55	-21.94	-4.61	
Upside Semi Deviation	1.26	7.56	7.60	10.92	7.19	
vs. Blended Policy (Risk Parity)						
Active Return	-1.92	N/A	N/A	N/A	-4.40	
Tracking Error	7.71	N/A	N/A	N/A	9.95	
Actual Correlation	-0.04	N/A	N/A	N/A	-0.19	
Beta	-0.04	N/A	N/A	N/A	-0.18	
Consistency	50.00	N/A	N/A	N/A	42.86	
Down Market Capture	-69.58	N/A	N/A	N/A	-66.16	
Down Market Outperformance	9.12	N/A	N/A	N/A	28.39	
Information Ratio	-0.25	N/A	N/A	N/A	-0.44	
Jensen Alpha	-0.62	N/A	N/A	N/A	2.57	
Up Market Capture	-34.90	N/A	N/A	N/A	-12.77	
Up Market Outperformance	-11.44	N/A	N/A	N/A	-23.81	
vs. FTSE 3 Month T-Bill						
Excess Return	-0.67	N/A	N/A	N/A	1.54	
Excess Risk	5.68	N/A	N/A	N/A	6.29	
Sharpe Ratio	-0.12	N/A	N/A	N/A	0.24	

Calculation based on monthly periodicity.

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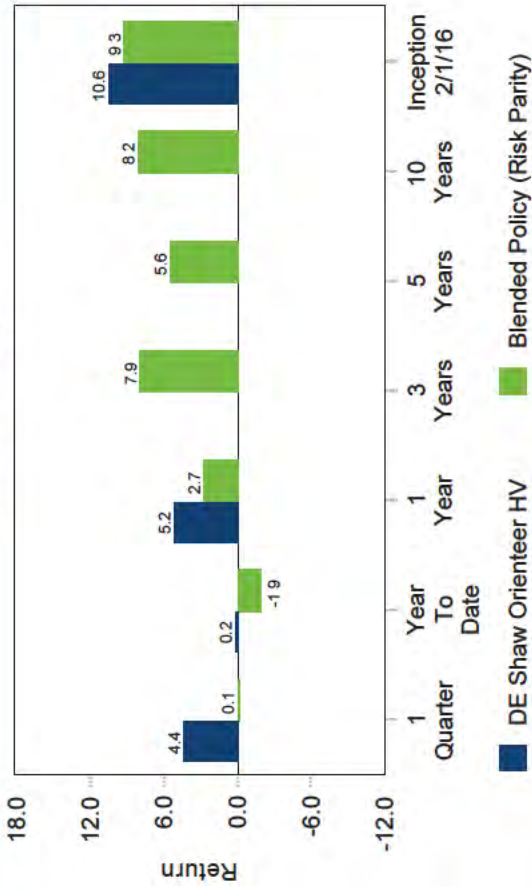


Performance Summary

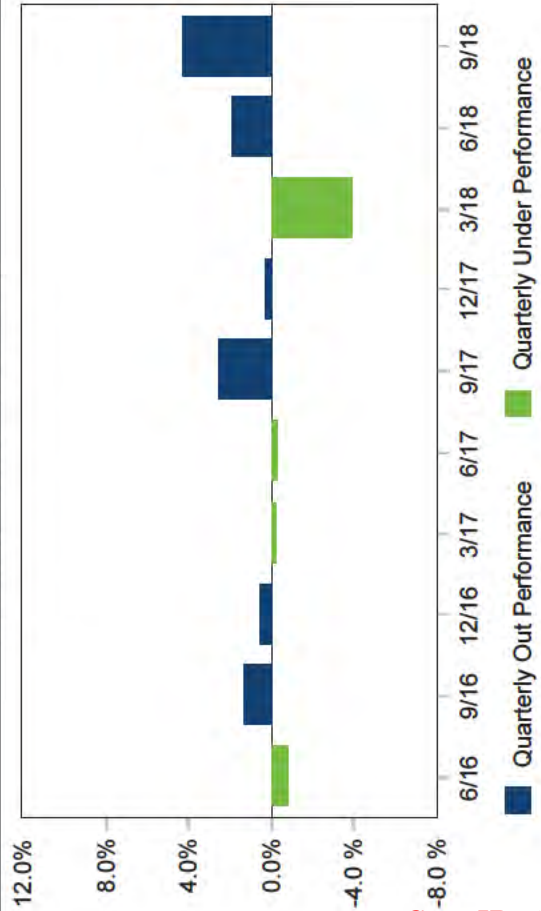
Account Information

Account Name: DE Shaw Orienteer HV  
 Inception Date: 01/01/2016  
 Account Structure: US Hedge Fund  
 Asset Class: Blended Policy (Risk Parity)  
 Benchmark: Blended Policy (Risk Parity)  
 Peer Group:

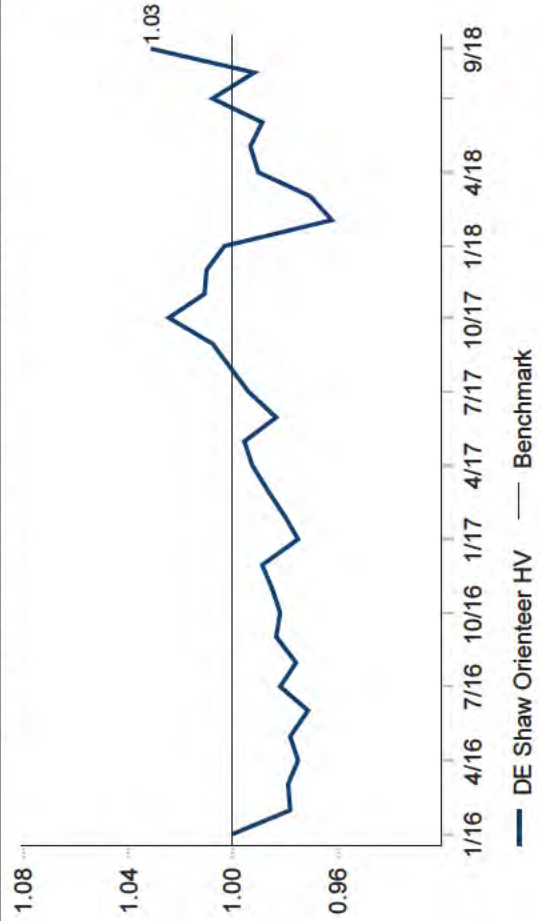
Return Summary



Quarterly Excess Performance

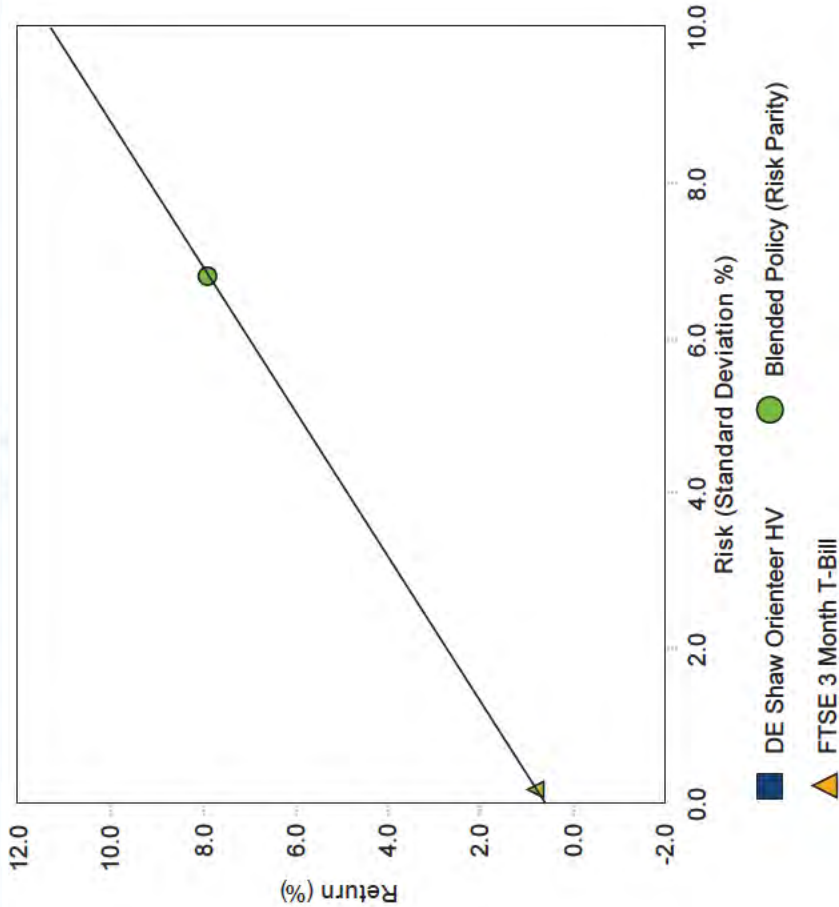


Ratio of Cumulative Wealth - Since Inception



DE Shaw Orienteer HV Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation

No data found.

3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
DE Shaw Orienteer HV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Blended Policy (Risk Parity)	0.00	0.00	N/A	1.00	1.03	0.00	1.00	7.89	6.81	1.00
FTSE 3 Month T-Bill	-7.04	6.84	-1.03	0.02	N/A	0.84	0.00	0.80	0.18	-0.15

## Risk Statistics

## DE Shaw Orienteer HV

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	5.17	N/A	N/A	N/A	10.59	02/01/2016
Standard Deviation	9.86	N/A	N/A	N/A	8.54	
Downside Risk	7.76	N/A	N/A	N/A	5.48	
Downside Semi Deviation	4.29	N/A	N/A	N/A	2.94	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-7.20	N/A	N/A	N/A	-7.20	
Maximum Loss Exposure	-2.00	N/A	N/A	N/A	-1.43	
Upside Semi Deviation	2.28	N/A	N/A	N/A	8.78	
Blended Policy (Risk Parity)						
Return	2.73	7.89	5.55	8.19	9.31	
Standard Deviation	4.99	6.81	7.24	12.04	6.44	
Downside Risk	3.68	3.75	4.47	8.56	3.47	
Downside Semi Deviation	2.03	6.69	7.32	14.76	1.97	
Max Drawdown Recovery Period	N/A	6.00	14.00	10.00	6.00	
Maximum Drawdown	-3.33	-5.68	-10.23	-21.94	-5.68	
Maximum Loss Exposure	N/A	-0.95	-0.55	-21.94	N/A	
Upside Semi Deviation	1.26	7.56	7.60	10.92	7.19	
vs. Blended Policy (Risk Parity)						
Active Return	2.69	N/A	N/A	N/A	1.33	
Tracking Error	7.19	N/A	N/A	N/A	4.92	
Actual Correlation	0.72	N/A	N/A	N/A	0.82	
Beta	1.41	N/A	N/A	N/A	1.09	
Consistency	50.00	N/A	N/A	N/A	59.38	
Down Market Capture	69.64	N/A	N/A	N/A	88.08	
Down Market Outperformance	1.30	N/A	N/A	N/A	1.11	
Information Ratio	0.37	N/A	N/A	N/A	0.27	
Jensen Alpha	2.22	N/A	N/A	N/A	0.67	
Up Market Capture	112.75	N/A	N/A	N/A	105.34	
Up Market Outperformance	1.07	N/A	N/A	N/A	1.17	
vs. FTSE 3 Month T-Bill						
Excess Return	3.94	N/A	N/A	N/A	9.57	
Excess Risk	9.85	N/A	N/A	N/A	8.55	
Sharpe Ratio	0.40	N/A	N/A	N/A	1.12	

Calculation based on monthly periodicity.

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# Absolute Return

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Case ID: 221102792

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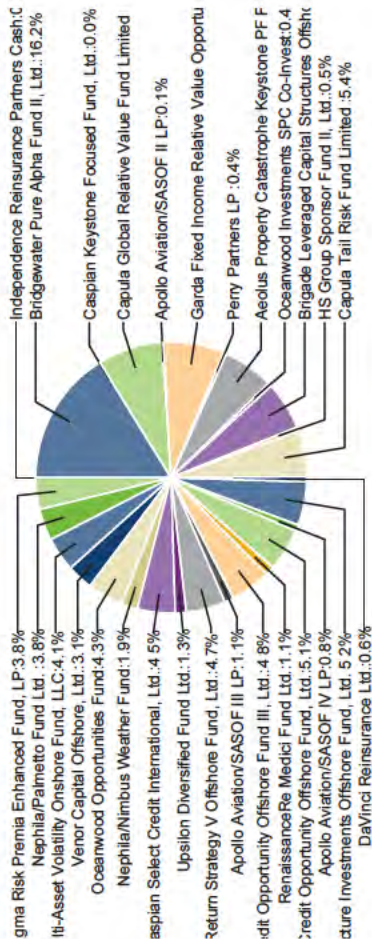
Total Absolute Return

As of September 30, 2018

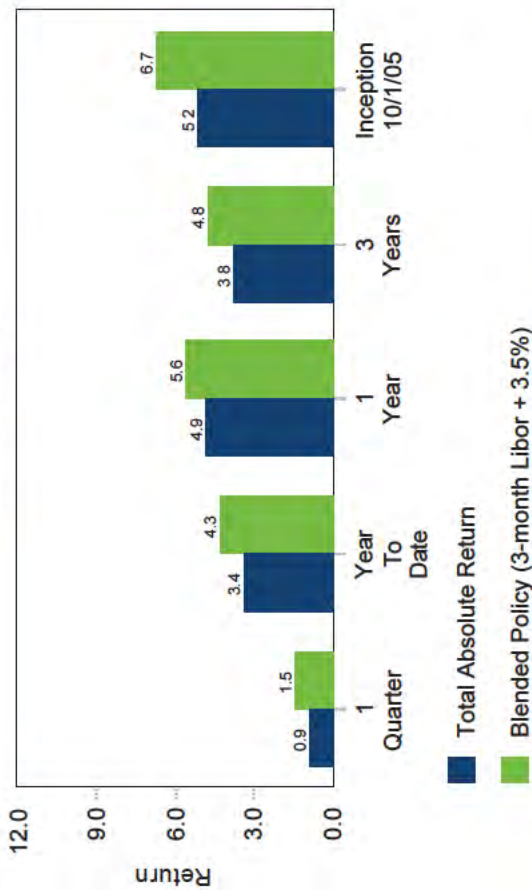
Portfolio Overview

Current Allocation

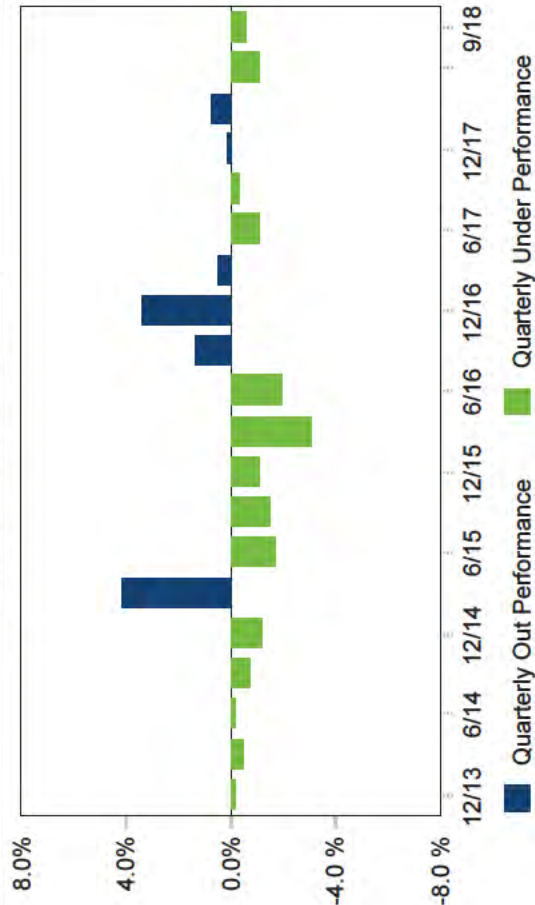
September 30, 2018 : \$5,740M



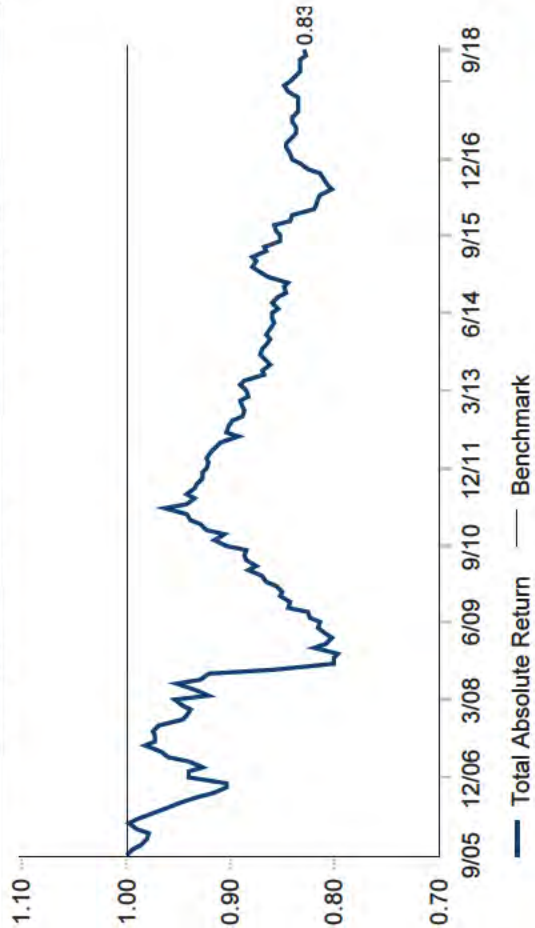
Return Summary



Quarterly Excess Performance



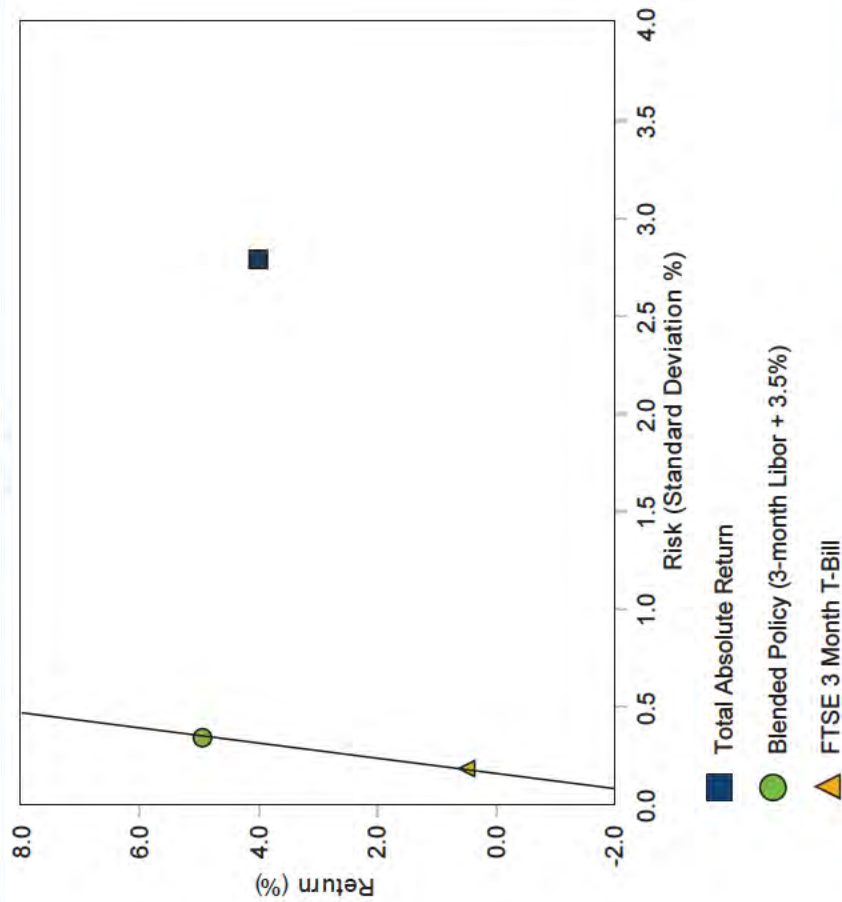
Ratio of Cumulative Wealth - Since Inception



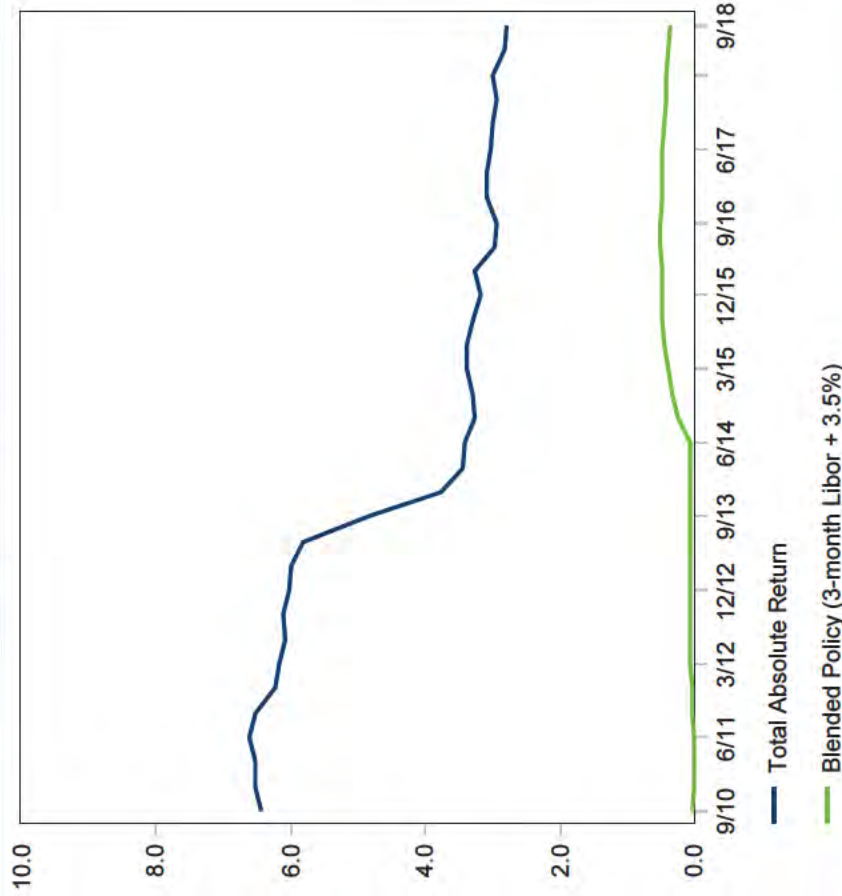


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Absolute Return	-0.86	2.78	-0.31	0.01	1.24	-0.57	0.94	4.01	2.80	0.12
Blended Policy (3-month Libor + 3.5%)	0.00	0.00	N/A	1.00	12.22	0.00	1.00	4.94	0.35	1.00
FTSE 3 Month T-Bill	-4.35	0.36	-12.22	0.05	N/A	-0.07	0.12	0.49	0.18	0.23

## Risk Statistics

Total Absolute Return	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.88	3.83	4.01	5.98	5.20	10/01/2005
Standard Deviation	1.73	2.65	2.80	3.98	4.65	
Downside Risk	0.39	1.63	1.60	2.41	3.00	
Downside Semi Deviation	0.26	0.98	3.18	4.88	5.62	
Max Drawdown Recovery Period	4.00	11.00	18.00	7.00	17.00	
Maximum Drawdown	-0.44	-4.10	-4.67	-6.07	-13.55	
Maximum Loss Exposure	N/A	-2.97	N/A	-6.07	-1.72	
Upside Semi Deviation	0.75	2.74	3.01	4.17	4.58	
Blended Policy (3-month Libor + 3.5%)						
Return	5.61	4.80	4.94	6.35	6.73	
Standard Deviation	0.12	0.19	0.35	0.46	0.45	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	1.65	1.39	1.45	1.85	1.94	
vs. Blended Policy (3-month Libor + 3.5%)						
Active Return	-0.68	-0.90	-0.86	-0.27	-1.34	
Tracking Error	1.79	2.64	2.78	3.93	4.64	
Actual Correlation	-0.46	0.09	0.12	0.17	0.08	
Beta	-6.89	1.22	0.94	1.44	0.83	
Consistency	41.67	52.78	50.00	50.00	46.15	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-0.38	-0.34	-0.31	-0.07	-0.29	
Jensen Alpha	128.09	-38.95	-0.78	-4.19	-3.90	
Up Market Capture	87.53	80.77	82.19	95.63	79.46	
Up Market Outperformance	-0.73	-0.97	-0.94	-0.37	-1.53	
vs. FTSE 3 Month T-Bill						
Excess Return	3.22	2.99	3.49	5.59	4.04	
Excess Risk	1.77	2.64	2.80	4.01	4.70	
Sharpe Ratio	1.82	1.13	1.24	1.39	0.86	

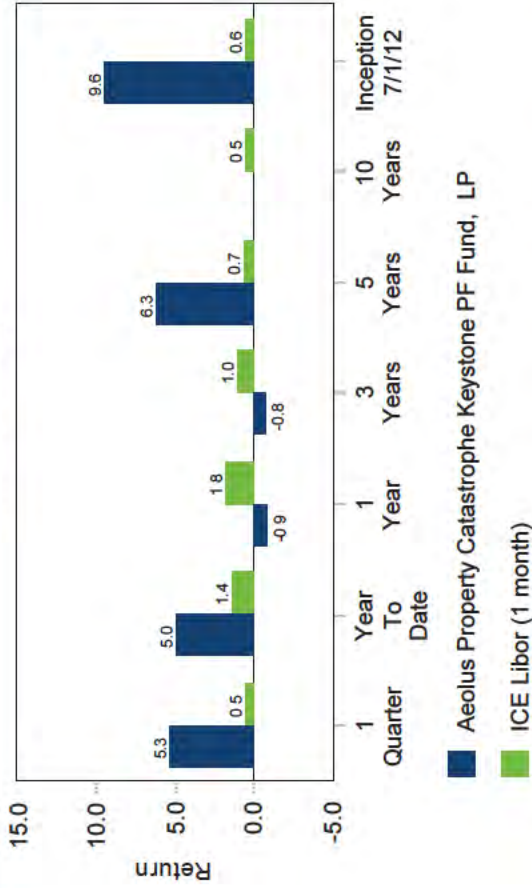
Calculation based on monthly periodicity.

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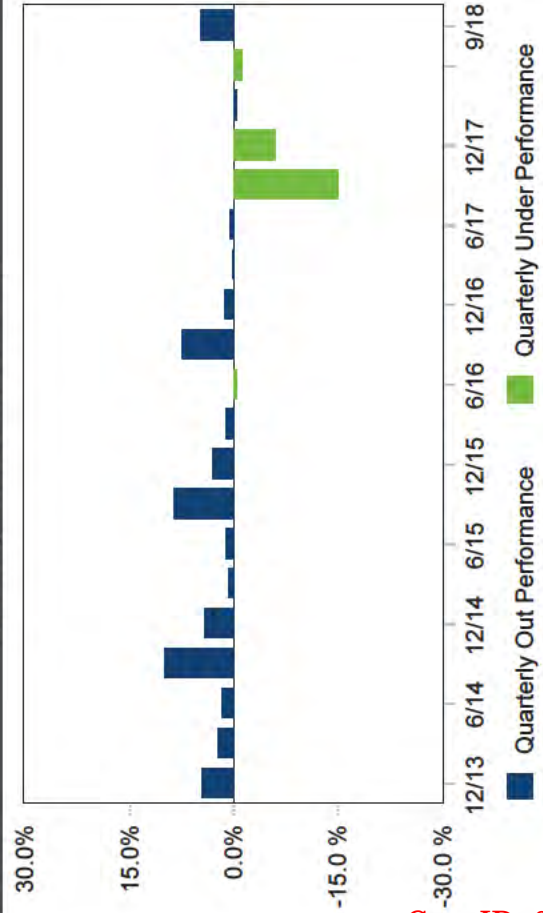
**Account Information**

Account Name: Aeolus Property Catastrophe Keystone PF Fund, LP  
 Inception Date: 06/30/2012  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

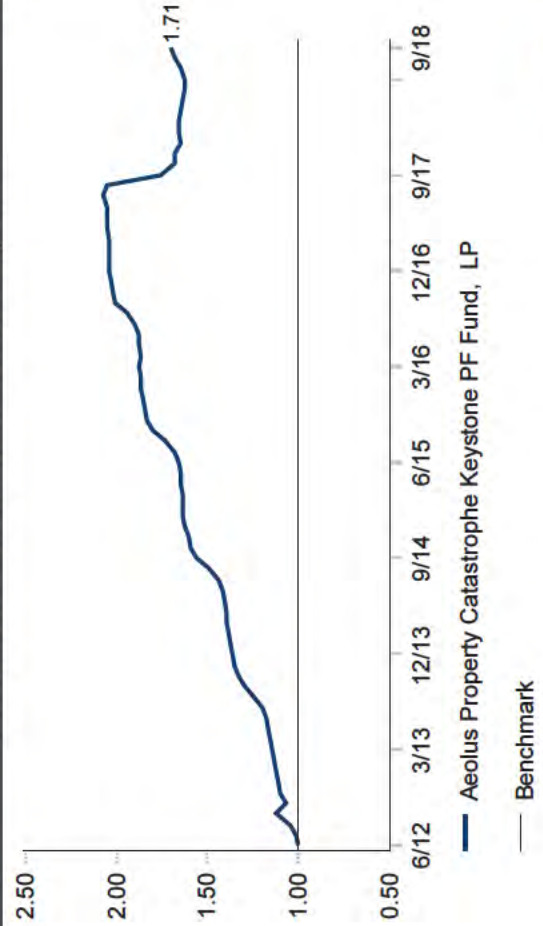
**Return Summary**



**Quarterly Excess Performance**

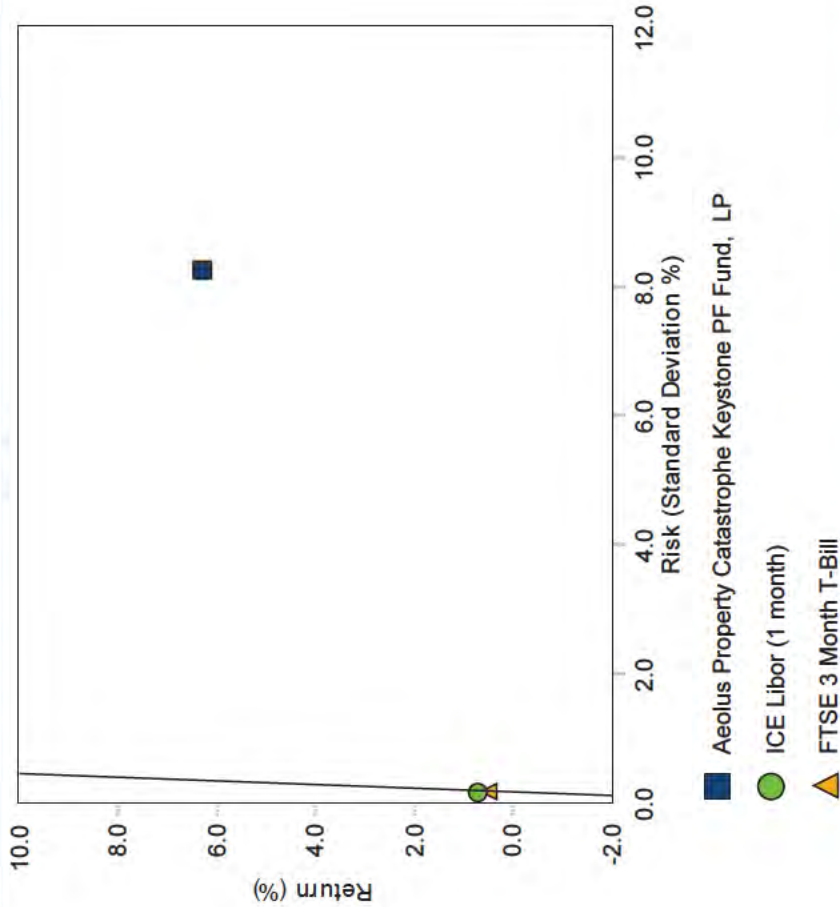


**Ratio of Cumulative Wealth - Since Inception**

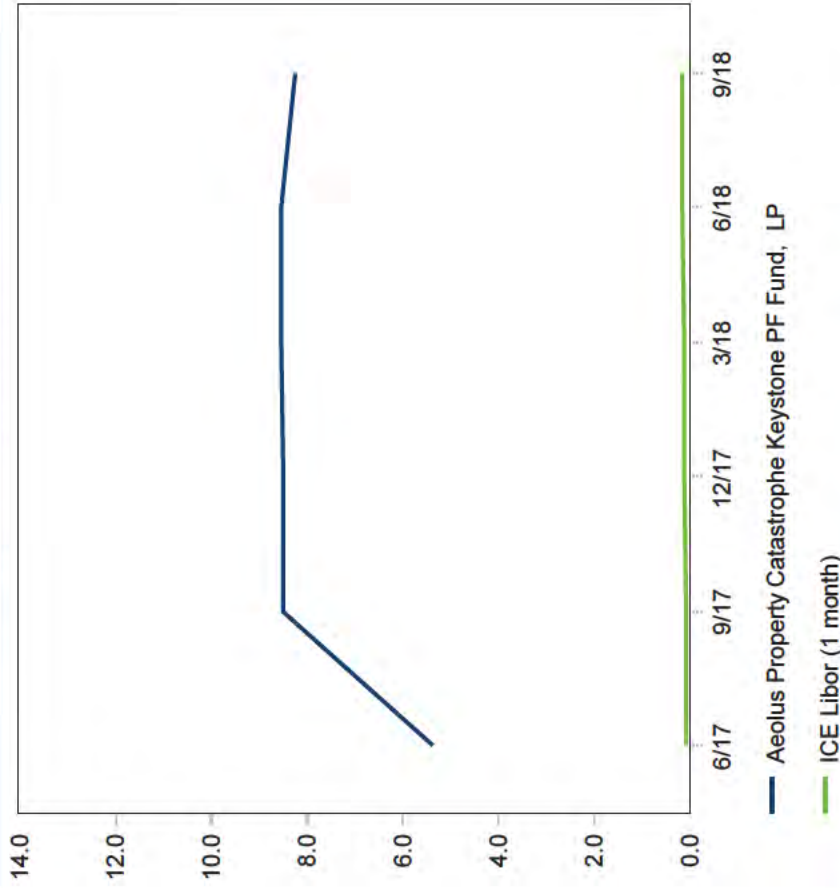


**Aeolus Property Catastrophe Keystone PF Fund, LP Risk Profile**

**Annualized Return vs. Annualized Standard Deviation  
5 Years**



**Rolling 5 Years Standard Deviation**



**5 Years Historical Statistics**

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Aeolus Property Catastrophe Keystone PF Fund, LP	5.79	8.31	0.70	0.07	0.72	15.83	-12.07	6.30	8.26	-0.27
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99

Risk Statistics

As of September 30, 2018

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.87	-0.75	6.30	N/A	9.50	06/01/2012
Standard Deviation	5.78	9.64	8.26	N/A	8.33	
Downside Risk	4.65	8.94	6.89	N/A	6.32	
Downside Semi Deviation	1.99	5.09	4.83	N/A	16.51	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-6.25	-20.59	-20.59	N/A	-20.59	
Maximum Loss Exposure	-6.25	-7.55	N/A	N/A	N/A	
Upside Semi Deviation	1.47	4.26	5.46	N/A	6.64	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.59	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.24	
vs. ICE Libor (1 month)						
Active Return	-2.49	-1.30	5.79	N/A	8.89	
Tracking Error	5.72	9.67	8.31	N/A	8.38	
Actual Correlation	0.66	-0.11	-0.27	N/A	-0.29	
Beta	39.94	-6.20	-12.07	N/A	-13.99	
Consistency	50.00	66.67	78.33	N/A	81.58	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-0.44	-0.13	0.70	N/A	1.06	
Jensen Alpha	32.23	-4.92	21.13	N/A	26.97	
Up Market Capture	-40.85	-25.80	942.75	N/A	1,614.35	
Up Market Outperformance	-2.66	-1.79	5.61	N/A	8.91	
vs. FTSE 3 Month T-Bill						
Excess Return	-2.28	-1.07	5.99	N/A	9.07	
Excess Risk	5.71	9.67	8.31	N/A	8.38	
Sharpe Ratio	-0.40	-0.11	0.72	N/A	1.08	

calculation based on monthly periodicity.

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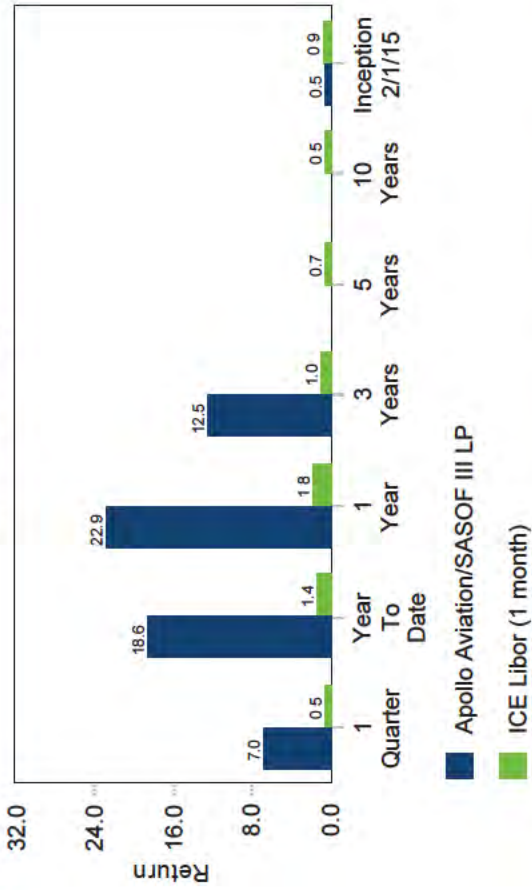


Apollo Aviation/SASOF III LP Performance Summary

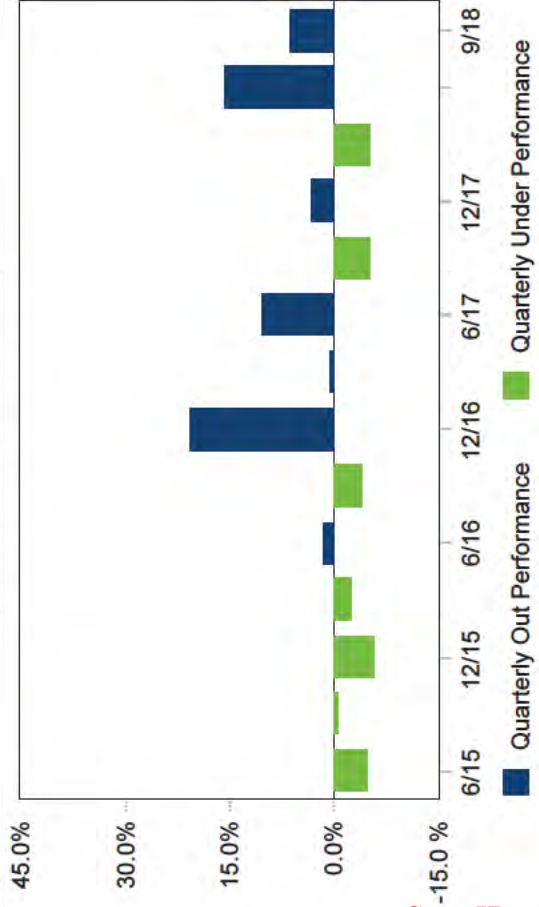
Account Information

Account Name: Apollo Aviation/SASOF III LP  
 Inception Date: 02/01/2015  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

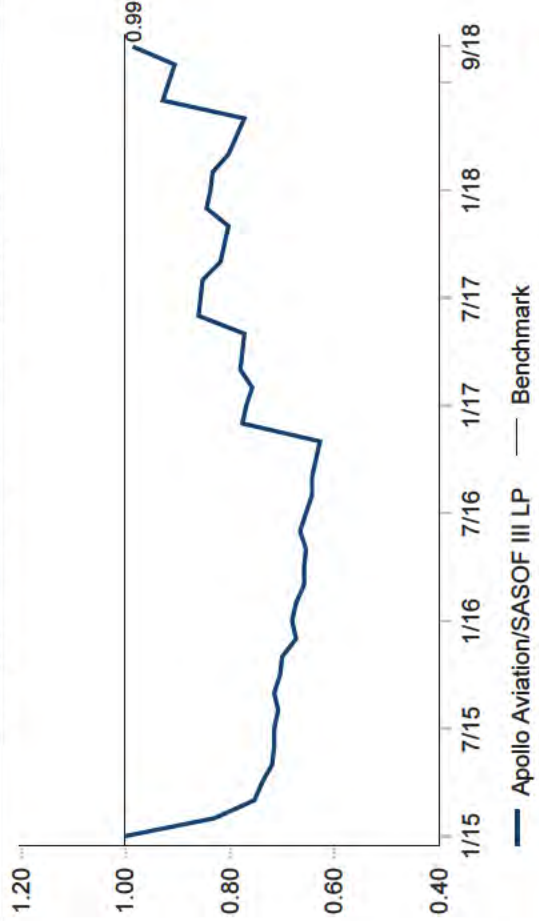
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Apollo Aviation/SASOF III LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	22.90	12.55	N/A	N/A	0.53	02/01/2015
Standard Deviation	23.44	20.67	N/A	N/A	21.62	
Downside Risk	4.92	5.00	N/A	N/A	11.29	
Downside Semi Deviation	1.66	5.80	N/A	N/A	12.89	
Max Drawdown Recovery Period	6.00	14.00	N/A	N/A	43.00	
Maximum Drawdown	-7.85	-11.58	N/A	N/A	-36.75	
Maximum Loss Exposure	-4.52	-10.01	N/A	N/A	-22.11	
Upside Semi Deviation	16.21	12.35	N/A	N/A	11.65	
vs. ICE Libor (1 month)						
Active Return	21.32	12.71	N/A	N/A	1.81	
Tracking Error	23.41	20.64	N/A	N/A	21.57	
Actual Correlation	0.29	0.19	N/A	N/A	0.31	
Beta	71.41	22.54	N/A	N/A	35.63	
Consistency	25.00	25.00	N/A	N/A	22.73	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	0.91	0.62	N/A	N/A	0.08	
Jensen Alpha	19.61	-39.32	N/A	N/A	-57.65	
Up Market Capture	1,305.89	1,329.26	N/A	N/A	305.95	
Up Market Outperformance	21.12	11.51	N/A	N/A	-0.35	
vs. FTSE 3 Month T-Bill						
Excess Return	21.53	12.95	N/A	N/A	2.03	
Excess Risk	23.41	20.64	N/A	N/A	21.57	
Sharpe Ratio	0.92	0.63	N/A	N/A	0.09	

Calculation based on monthly periodicity.

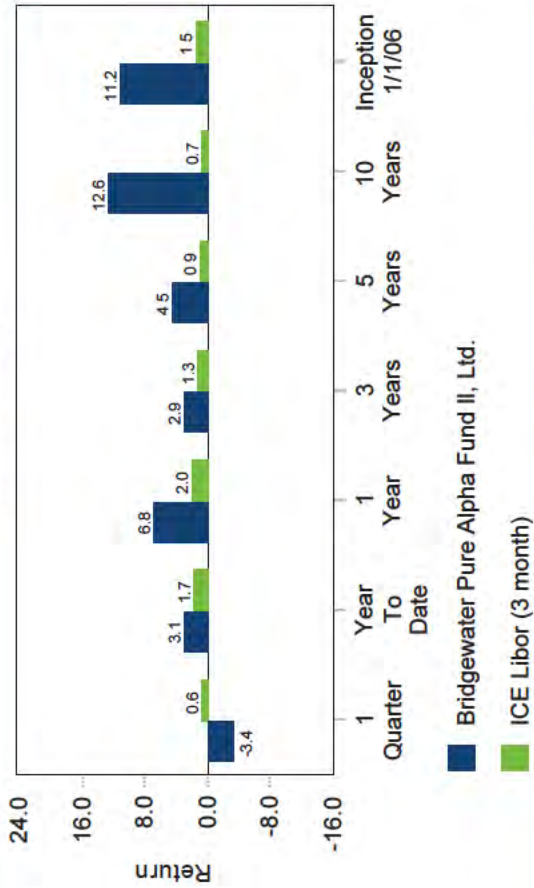
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Performance Summary

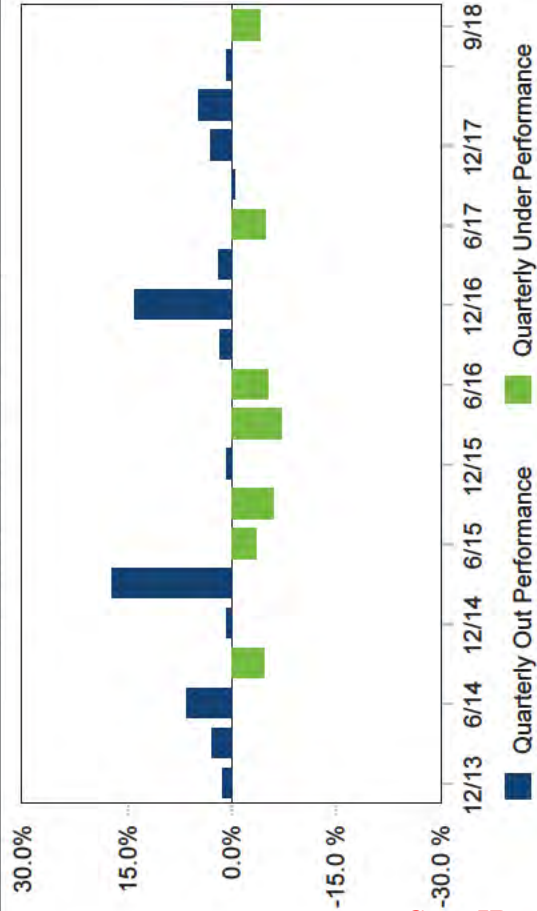
Account Information

Account Name: Bridgewater Pure Alpha Fund II, Ltd.  
 Inception Date: 12/31/2005  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (3 month)  
 Peer Group:

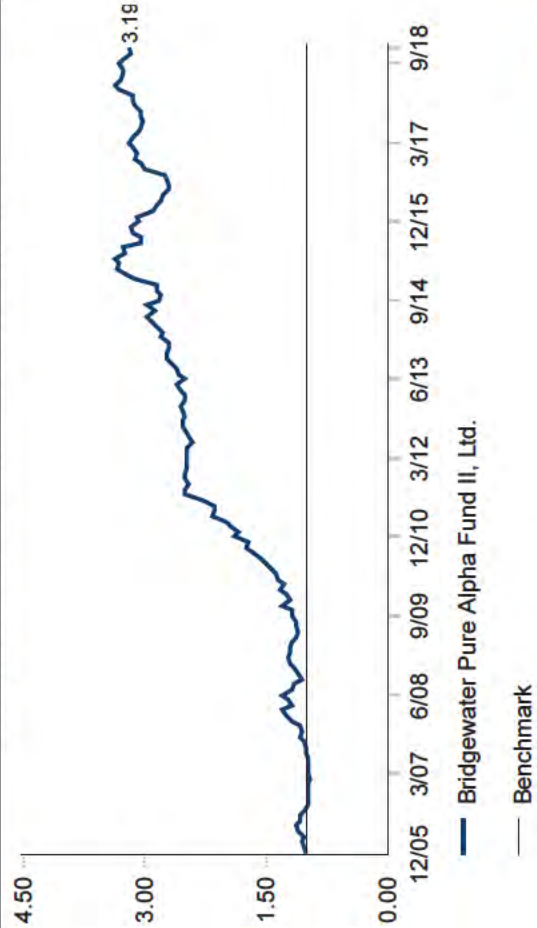
Return Summary



Quarterly Excess Performance



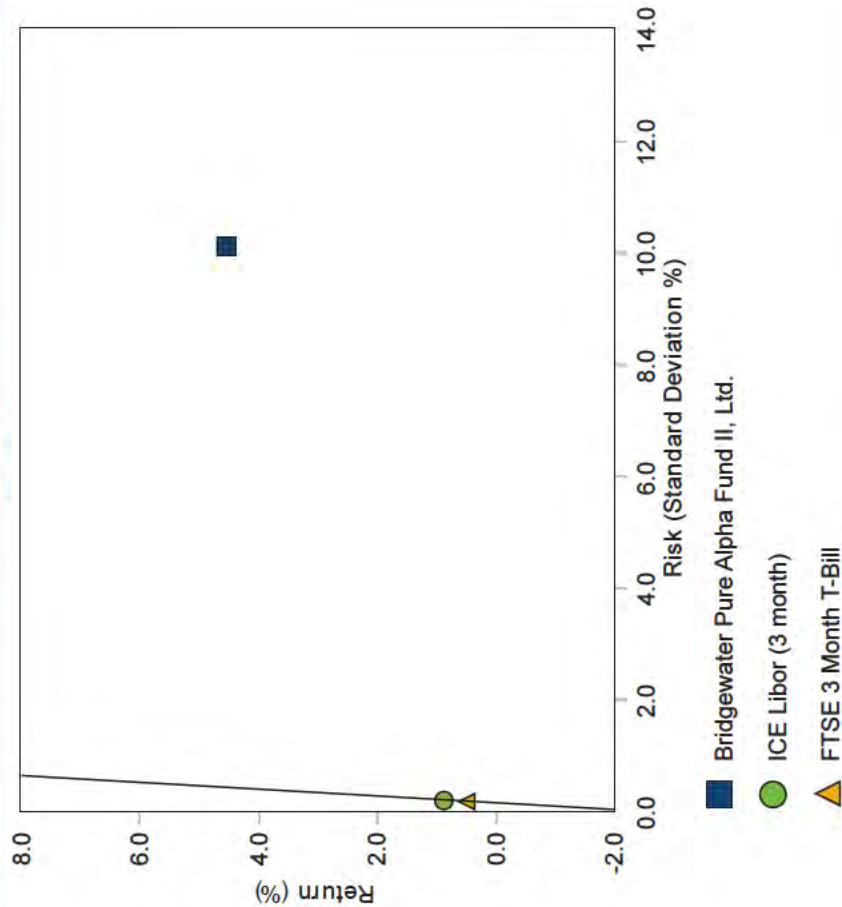
Ratio of Cumulative Wealth - Since Inception



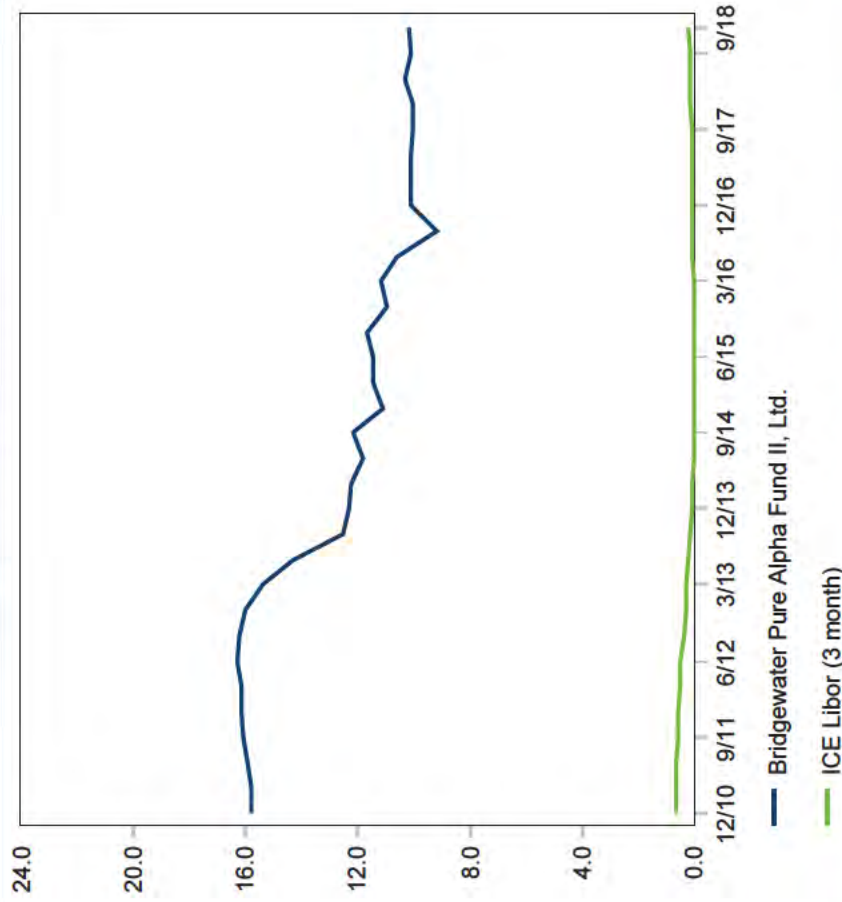


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Bridgewater Pure Alpha Fund II, Ltd.	4.10	10.16	0.40	0.00	0.44	7.09	-2.24	4.55	10.15	-0.04
ICE Libor (3 month)	0.00	0.00	N/A	1.00	9.00	0.00	1.00	0.86	0.20	1.00
FTSE 3 Month T-Bill	-0.36	0.04	-9.00	0.97	N/A	-0.26	0.88	0.49	0.18	0.98

## Risk Statistics

## Bridgewater Pure Alpha Fund II, Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	6.81	2.89	4.55	12.59	11.21	01/01/2006
Standard Deviation	8.06	9.33	10.15	11.57	12.79	
Downside Risk	4.37	5.63	6.18	5.50	7.16	
Downside Semi Deviation	2.41	8.90	9.69	8.85	11.60	
Max Drawdown Recovery Period	N/A	16.00	32.00	32.00	17.00	
Maximum Drawdown	-5.34	-14.81	-19.45	-19.45	-19.57	
Maximum Loss Exposure	N/A	-10.85	N/A	N/A	N/A	
Upside Semi Deviation	2.56	9.93	10.78	13.90	14.20	
ICE Libor (3 month)						
Return	2.04	1.26	0.86	0.70	1.53	
Standard Deviation	0.11	0.19	0.20	0.19	0.51	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.62	0.41	0.32	0.28	0.67	
vs. ICE Libor (3 month)						
Active Return	4.89	2.02	4.10	11.88	9.96	
Tracking Error	8.12	9.33	10.16	11.58	12.82	
Actual Correlation	-0.53	0.01	-0.04	-0.02	-0.04	
Beta	-36.94	0.29	-2.24	-1.20	-0.89	
Consistency	66.67	58.33	58.33	60.83	58.17	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	0.60	0.22	0.40	1.03	0.78	
Jensen Alpha	37.63	-13.78	6.58	11.16	15.42	
Up Market Capture	342.18	261.27	581.65	1,811.34	754.81	
Up Market Outperformance	4.78	1.63	3.69	11.90	9.68	
vs. FTSE 3 Month T-Bill						
Excess Return	5.34	2.47	4.47	12.26	10.38	
Excess Risk	8.11	9.34	10.16	11.58	12.81	
Sharpe Ratio	0.66	0.26	0.44	1.06	0.81	

Calculation based on monthly periodicity.

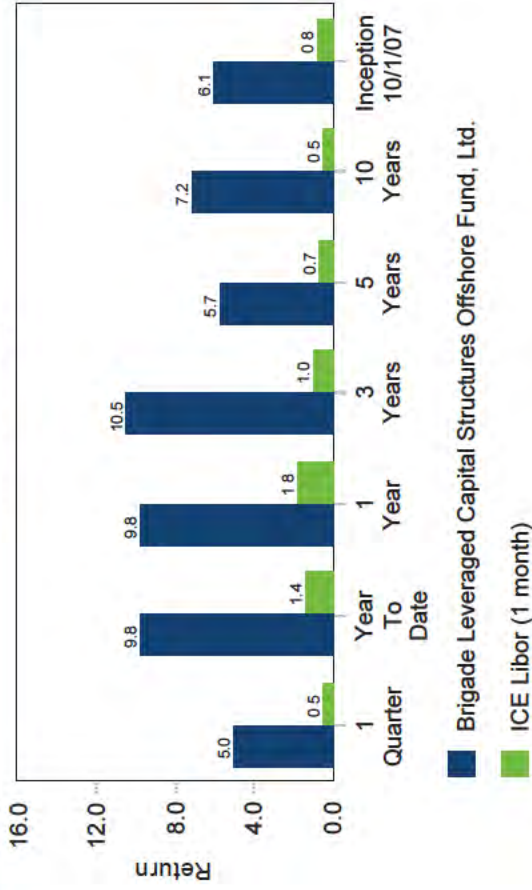
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Brigade Leveraged Capital Structures Offshore Fund, Ltd. As of September 30, 2018  
**Performance Summary**

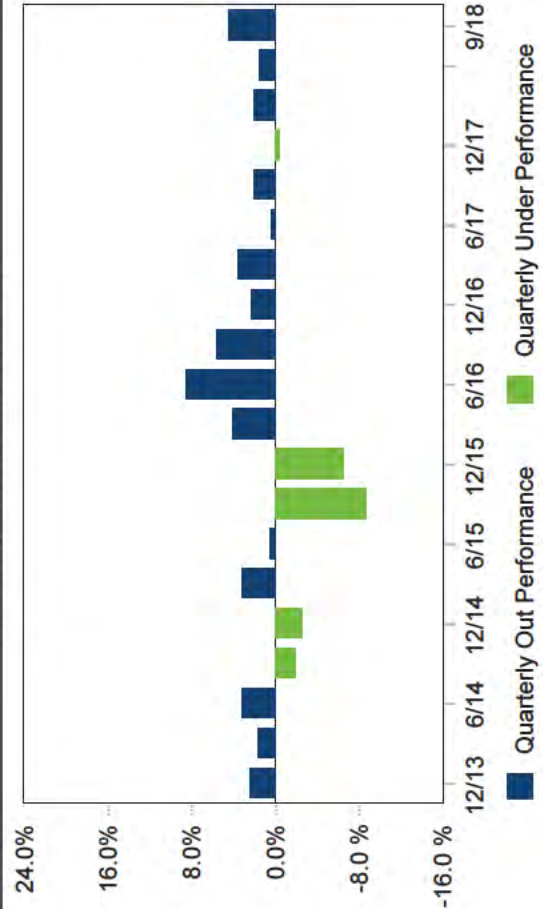
**Account Information**

Account Name: Brigade Leveraged Capital Structures Offshore Fund, Ltd.  
 Inception Date: 09/30/2007  
 Account Structure: Limited Partnership  
 Asset Class: Private Equity  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

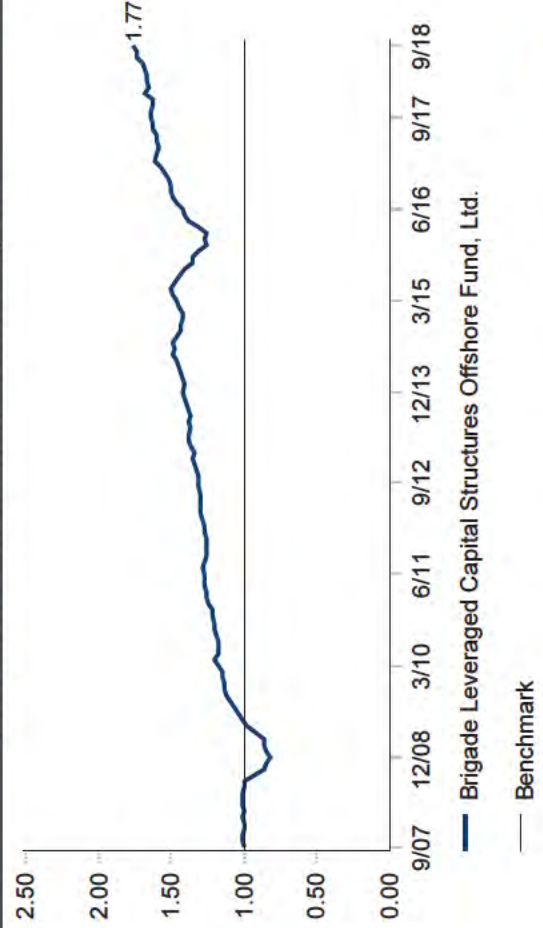
**Return Summary**



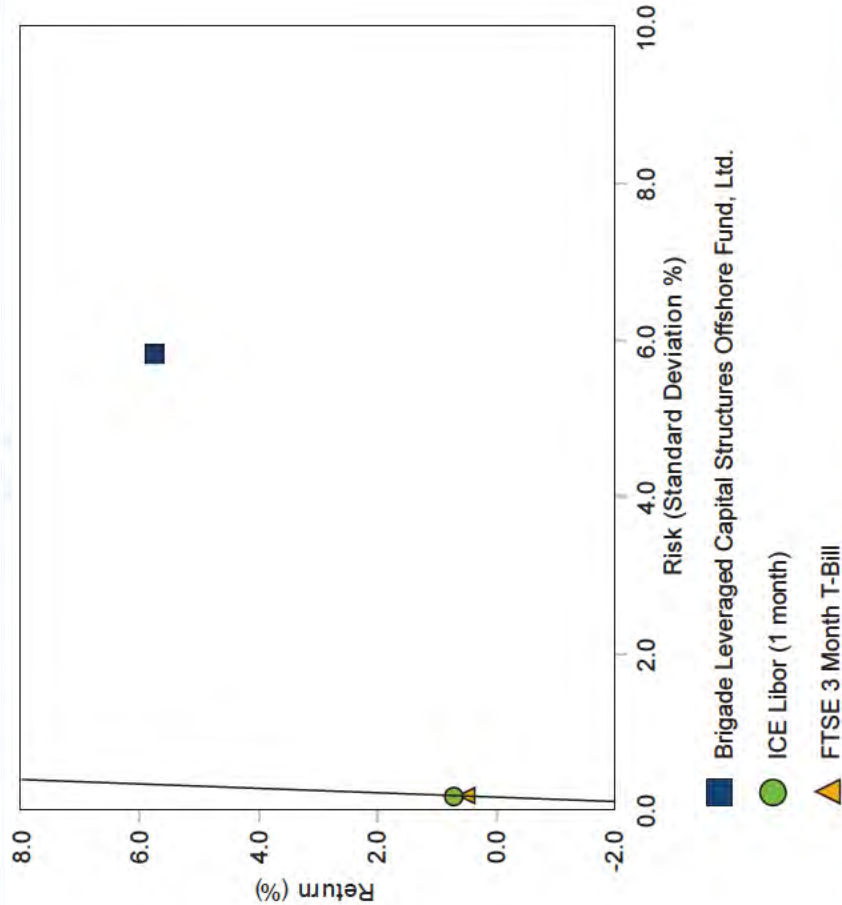
**Quarterly Excess Performance**



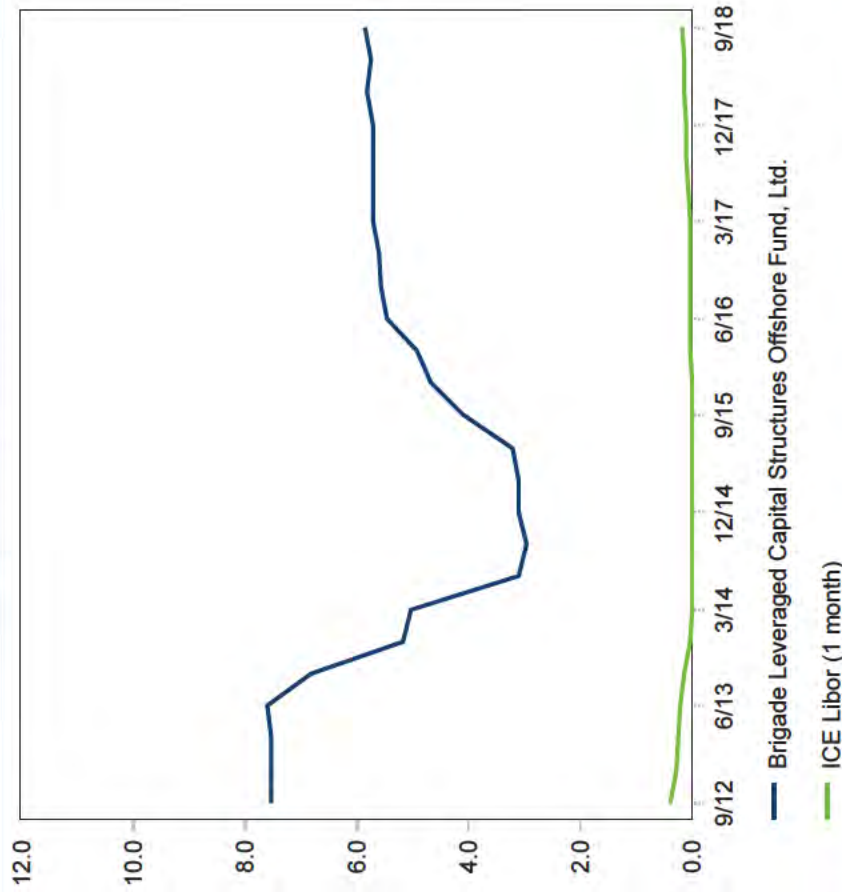
**Ratio of Cumulative Wealth - Since Inception**



Annualized Return vs. Annualized Standard Deviation  
 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Brigade Leveraged Capital Structures Offshore Fund, Ltd.	5.08	5.81	0.88	0.04	0.91	1.30	6.52	5.75	5.84	0.21
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99

## Risk Statistics

## Brigade Leveraged Capital Structures Offshore Fund, Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	9.79	10.55	5.75	7.18	6.13	10/01/2007
Standard Deviation	4.12	5.78	5.84	6.34	6.47	
Downside Risk	1.13	2.93	3.64	3.86	4.21	
Downside Semi Deviation	0.76	1.89	7.00	7.95	8.52	
Max Drawdown Recovery Period	4.00	6.00	16.00	16.00	12.00	
Maximum Drawdown	-0.99	-6.63	-16.30	-16.30	-19.12	
Maximum Loss Exposure	-0.49	-6.50	-8.47	-12.15	-15.53	
Upside Semi Deviation	1.65	6.62	5.77	6.26	6.04	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.78	
Standard Deviation	0.10	0.18	0.19	0.17	0.30	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.37	
vs. ICE Libor (1 month)						
Active Return	7.68	9.20	5.08	6.63	5.40	
Tracking Error	4.07	5.78	5.81	6.38	6.53	
Actual Correlation	0.50	0.05	0.21	-0.18	-0.18	
Beta	21.60	1.67	6.52	-6.59	-3.99	
Consistency	75.00	77.78	71.67	75.83	72.73	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	1.89	1.59	0.88	1.04	0.83	
Jensen Alpha	5.65	20.59	3.29	17.73	16.18	
Up Market Capture	534.43	989.00	839.31	1,374.91	797.15	
Up Market Outperformance	8.00	9.51	5.06	6.66	5.35	
vs. FTSE 3 Month T-Bill						
Excess Return	7.89	9.43	5.28	6.84	5.65	
Excess Risk	4.07	5.78	5.81	6.35	6.49	
Sharpe Ratio	1.94	1.63	0.91	1.08	0.87	

Calculation based on monthly periodicity.

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Performance Summary

Account Information

Account Name: Capital Structure Investments Offshore Fund, Ltd.

Inception Date: 06/30/2009

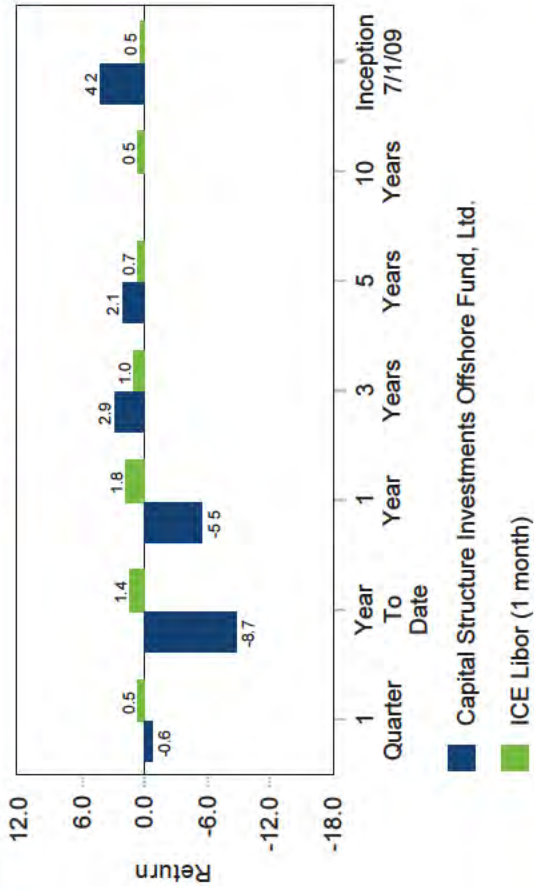
Account Structure: Hedge Fund

Asset Class: Hedge Fund

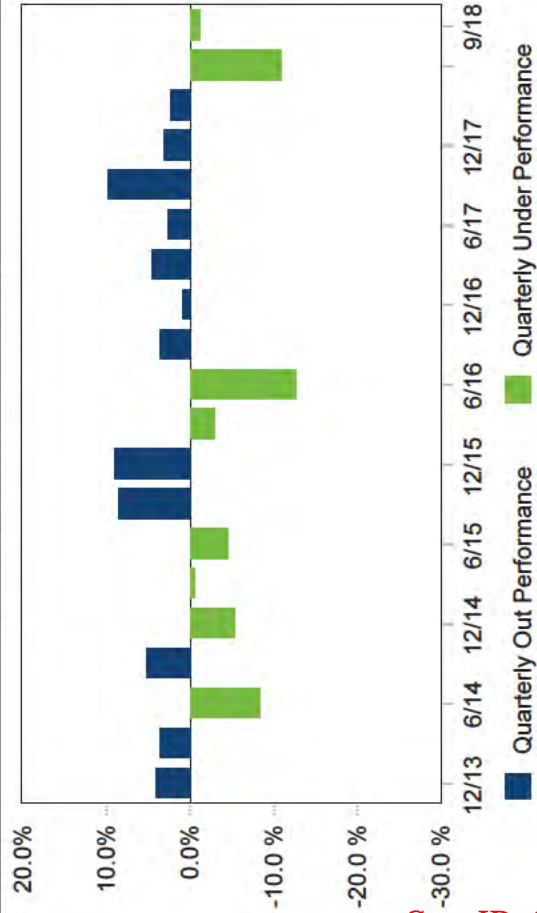
Benchmark: ICE Libor (1 month)

Peer Group:

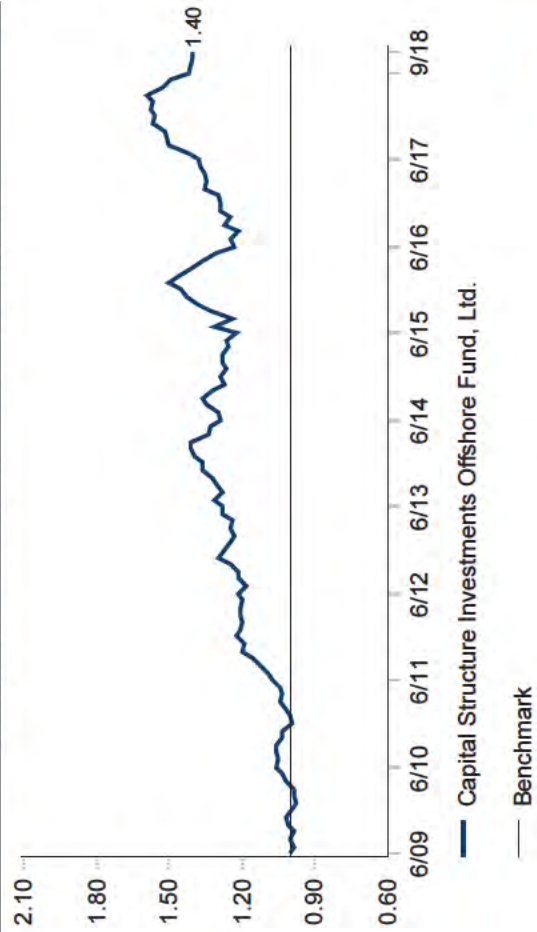
Return Summary



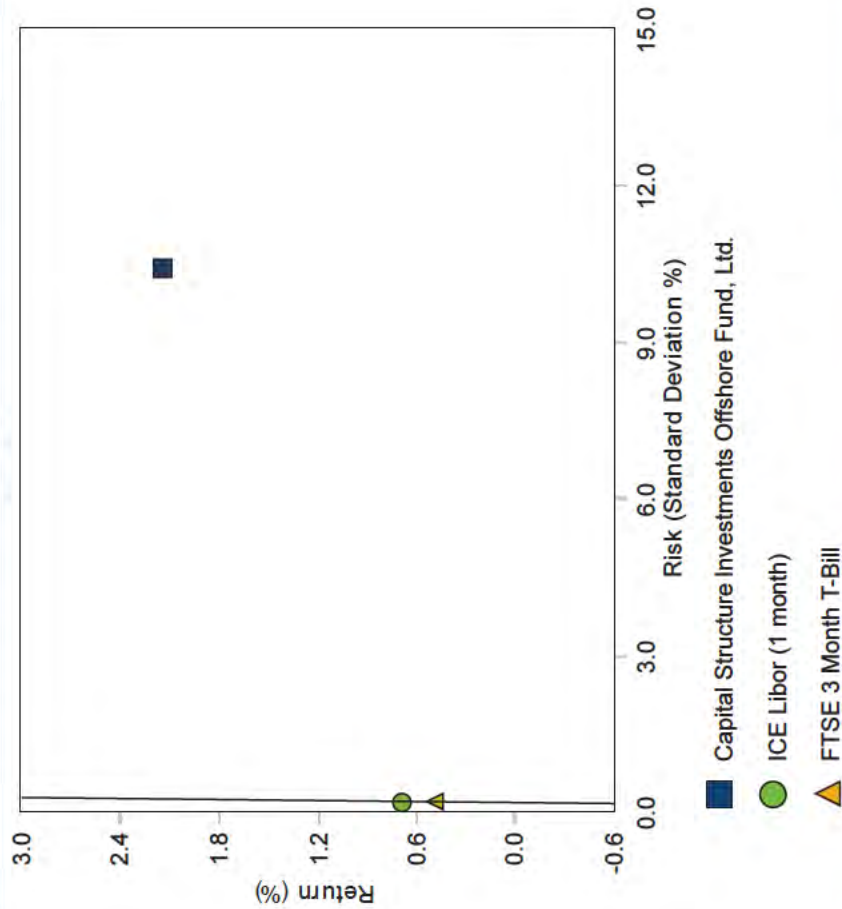
Quarterly Excess Performance



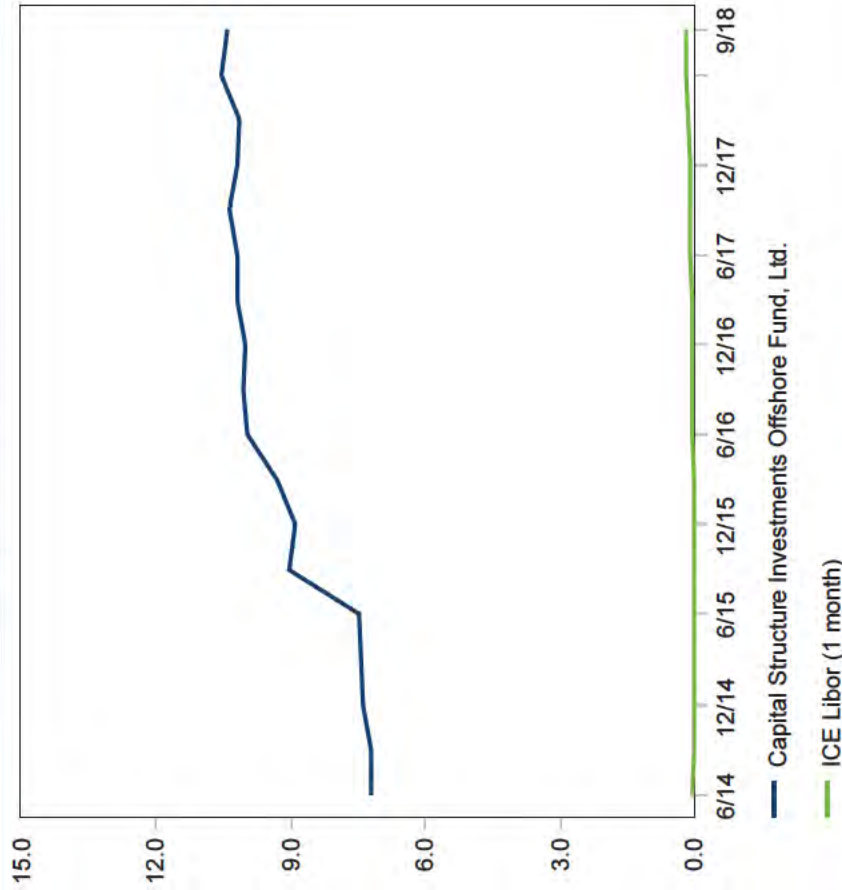
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Capital Structure Investments Offshore Fund, Ltd.	1.96	10.44	0.19	0.00	0.21	4.68	-2.80	2.14	10.43	-0.05
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99

## Risk Statistics

## Capital Structure Investments Offshore Fund, Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-5.51	2.90	2.14	N/A	1.70	03/01/2009
Standard Deviation	7.96	10.03	10.43	N/A	11.31	
Downside Risk	6.96	6.80	6.92	N/A	8.93	
Downside Semi Deviation	2.72	10.75	10.84	N/A	13.90	
Max Drawdown Recovery Period	N/A	19.00	19.00	N/A	43.00	
Maximum Drawdown	-11.38	-18.99	-18.99	N/A	-21.55	
Maximum Loss Exposure	-5.86	-8.20	-6.33	N/A	-21.55	
Upside Semi Deviation	2.00	9.84	10.34	N/A	9.17	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.48	
Standard Deviation	0.10	0.18	0.19	0.17	0.15	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.20	
vs. ICE Libor (1 month)						
Active Return	-7.13	2.31	1.96	N/A	1.88	
Tracking Error	8.00	10.05	10.44	N/A	11.32	
Actual Correlation	-0.50	-0.12	-0.05	N/A	-0.05	
Beta	-41.42	-6.94	-2.80	N/A	-3.90	
Consistency	41.67	58.33	58.33	N/A	57.39	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-0.89	0.23	0.19	N/A	0.17	
Jensen Alpha	-4.64	-14.54	-11.54	N/A	-1.09	
Up Market Capture	-303.11	323.67	385.61	N/A	493.31	
Up Market Outperformance	-7.29	1.86	1.45	N/A	1.22	
vs. FTSE 3 Month T-Bill						
Excess Return	-6.92	2.55	2.16	N/A	2.06	
Excess Risk	8.00	10.05	10.45	N/A	11.32	
Sharpe Ratio	-0.86	0.25	0.21	N/A	0.18	

Calculation based on monthly periodicity.

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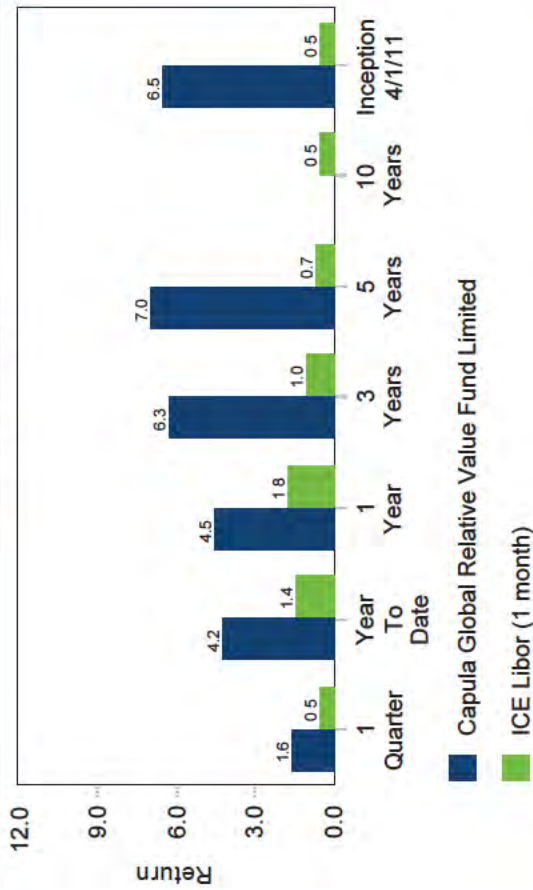


Performance Summary

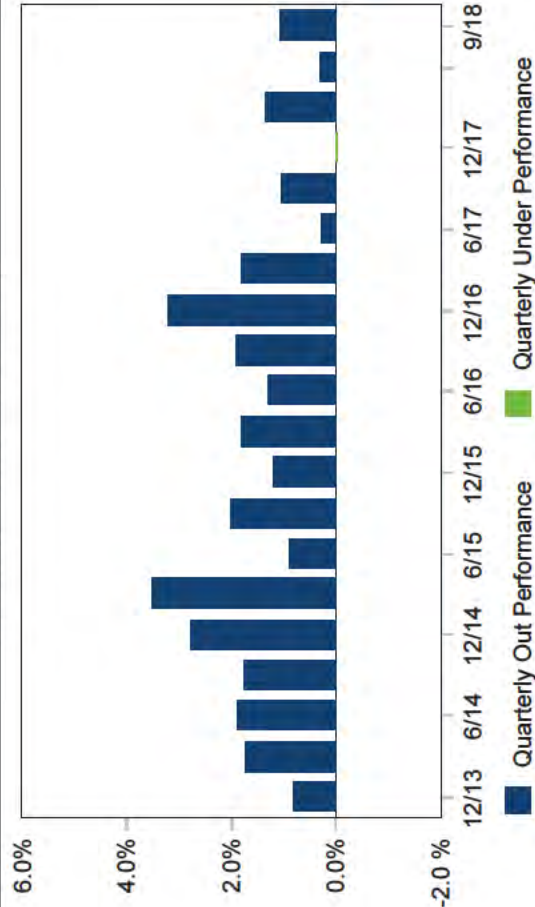
Account Information

Account Name: Capula Global Relative Value Fund Limited  
 Inception Date: 03/31/2011  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

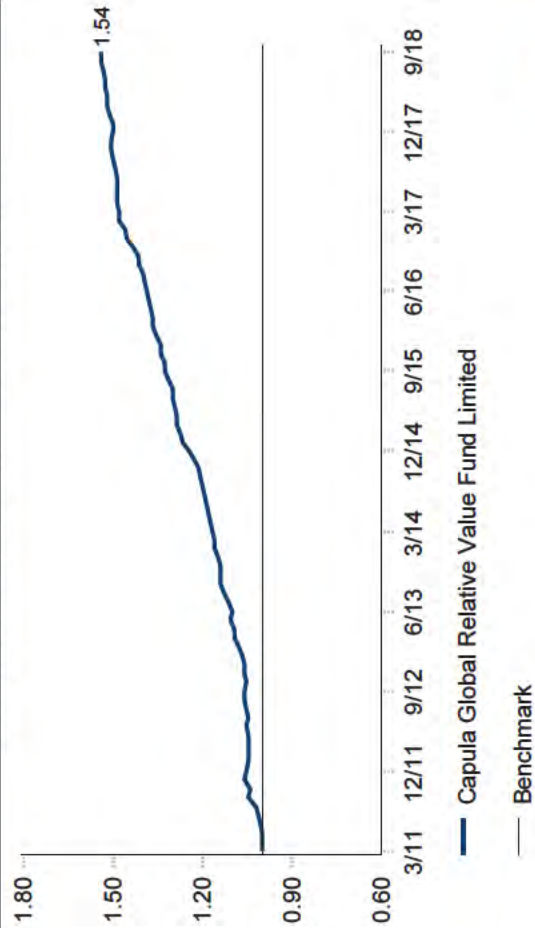
Return Summary



Quarterly Excess Performance

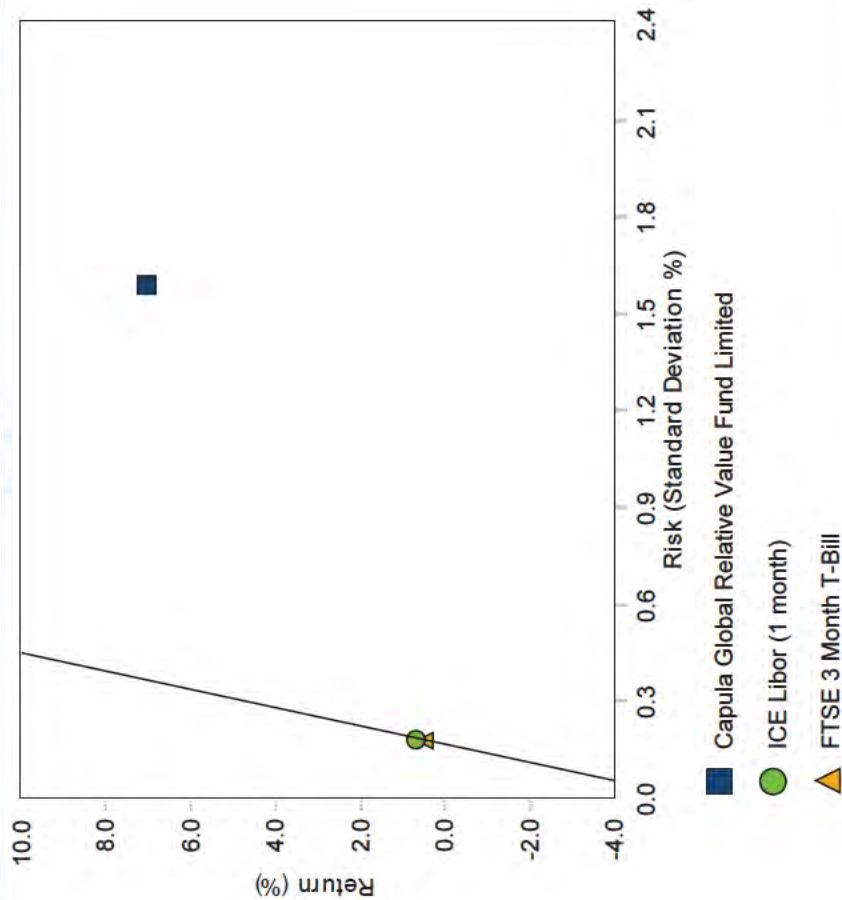


Ratio of Cumulative Wealth - Since Inception

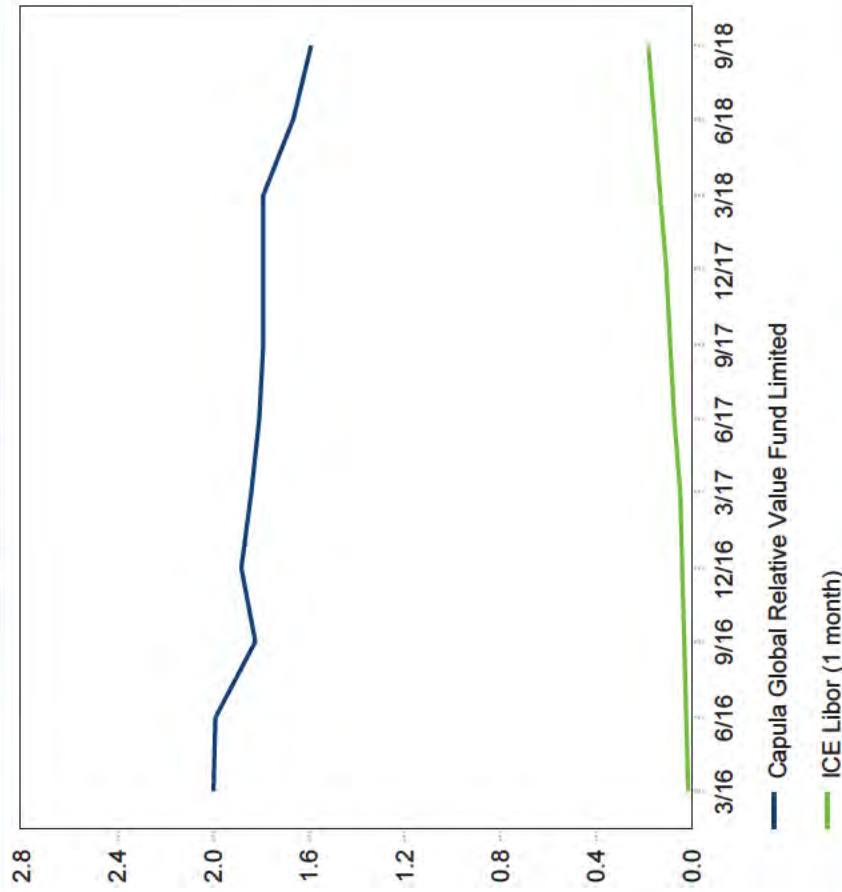


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Capula Global Relative Value Fund Limited	6.12	1.65	3.71	0.06	3.84	8.51	-2.02	7.01	1.59	-0.23
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99

Risk Statistics

Capula Global Relative Value Fund Limited

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.54	6.27	7.01	N/A	6.51	04/01/2011
Standard Deviation	1.24	1.60	1.59	N/A	1.89	
Downside Risk	0.10	0.09	0.08	N/A	0.40	
Downside Semi Deviation	0.09	0.11	0.10	N/A	1.15	
Max Drawdown Recovery Period	4.00	2.00	2.00	N/A	9.00	
Maximum Drawdown	-0.11	-0.13	-0.13	N/A	-1.06	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.58	2.51	2.63	N/A	2.80	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.53	
Standard Deviation	0.10	0.18	0.19	0.17	0.16	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.23	
vs. ICE Libor (1 month)						
Active Return	2.69	5.07	6.12	N/A	5.81	
Tracking Error	1.22	1.65	1.65	N/A	1.92	
Actual Correlation	0.18	-0.23	-0.23	N/A	-0.12	
Beta	2.26	-2.04	-2.02	N/A	-1.36	
Consistency	66.67	83.33	88.33	N/A	82.22	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	2.20	3.08	3.71	N/A	3.03	
Jensen Alpha	10.14	6.41	9.47	N/A	7.69	
Up Market Capture	251.86	590.53	989.66	N/A	1,191.51	
Up Market Outperformance	2.76	5.23	6.32	N/A	5.98	
vs. FTSE 3 Month T-Bill						
Excess Return	2.89	5.31	6.32	N/A	5.99	
Excess Risk	1.21	1.65	1.64	N/A	1.91	
Sharpe Ratio	2.38	3.22	3.84	N/A	3.13	

Calculation based on monthly periodicity.

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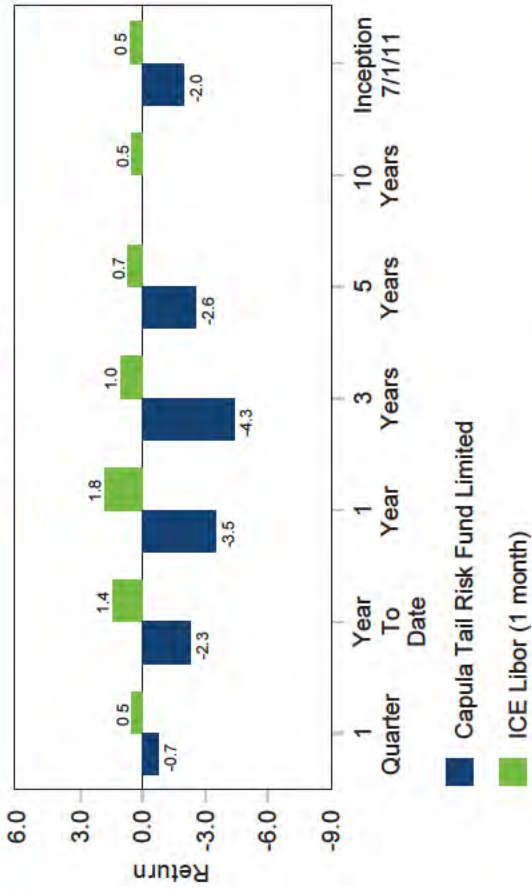


Performance Summary

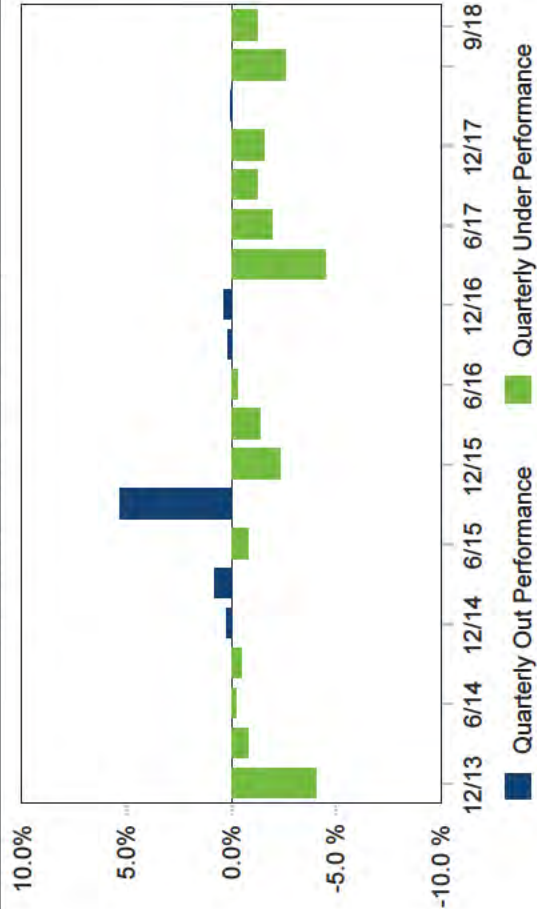
Account Information

Account Name: Capula Tail Risk Fund Limited  
 Inception Date: 06/30/2011  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

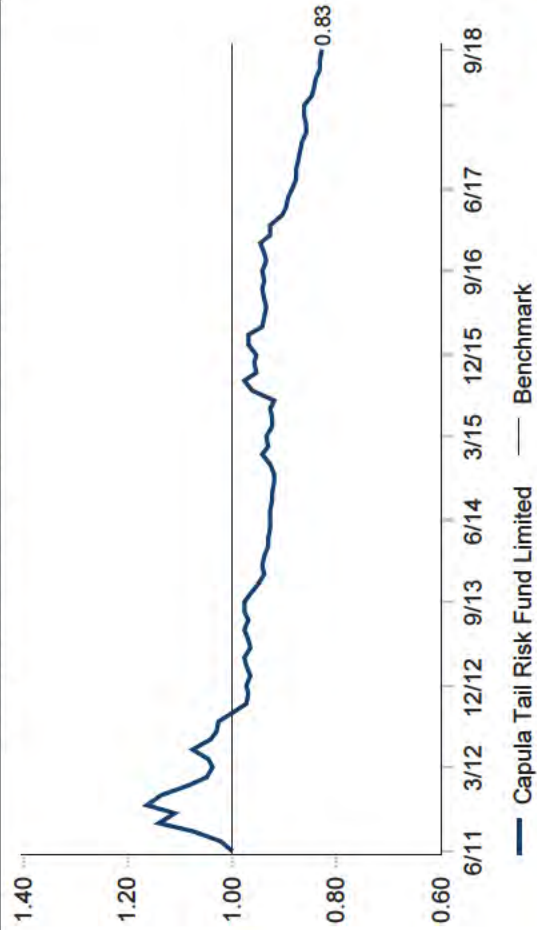
Return Summary



Quarterly Excess Performance

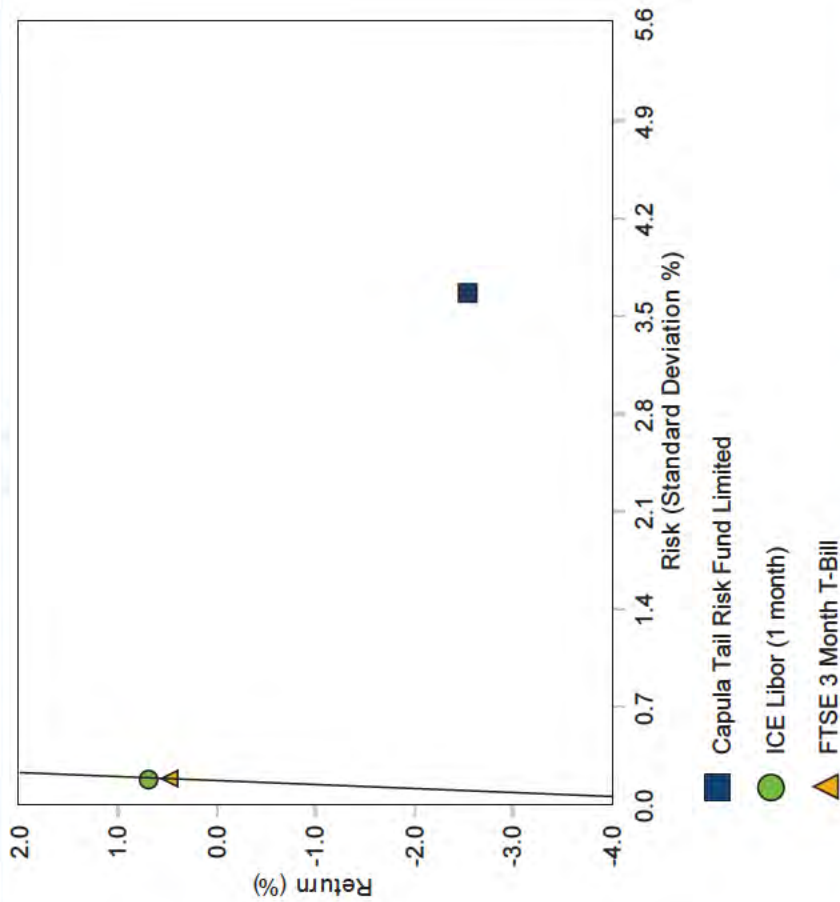


Ratio of Cumulative Wealth - Since Inception

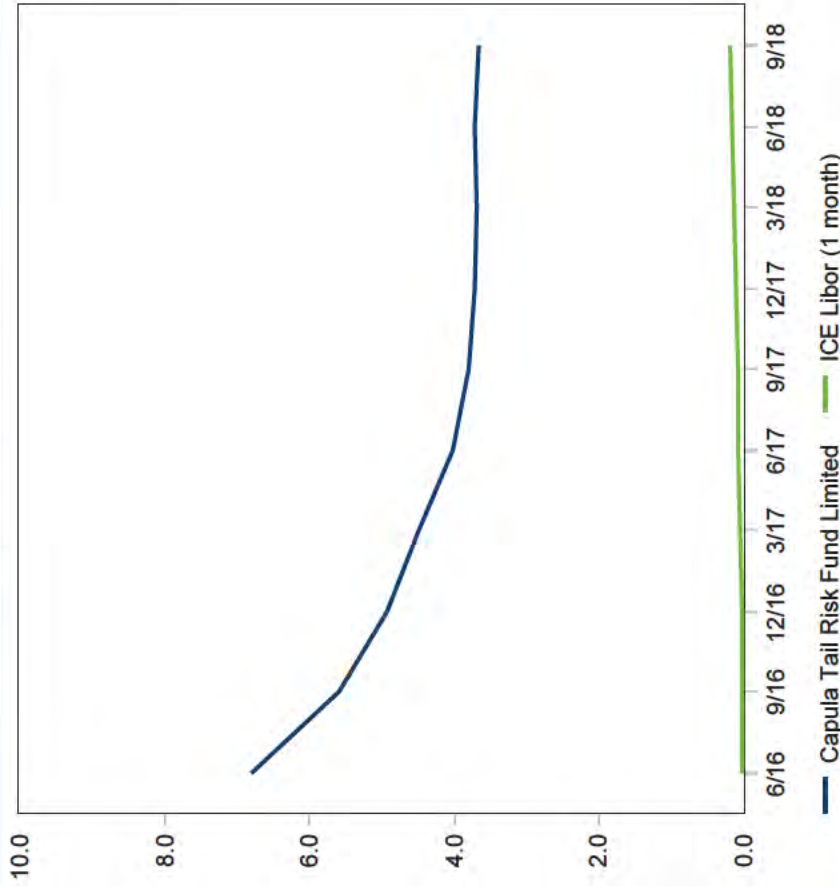


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Capula Tail Risk Fund Limited	-3.20	3.70	-0.86	0.01	-0.81	-0.92	-2.31	-2.55	3.68	-0.12
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99

Risk Statistics

Capula Tail Risk Fund Limited

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-3.47	-4.35	-2.55	N/A	-2.02	07/01/2011
Standard Deviation	1.80	3.05	3.68	N/A	5.83	
Downside Risk	2.00	3.12	2.81	N/A	3.93	
Downside Semi Deviation	0.64	3.77	3.60	N/A	5.10	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-3.47	-12.48	-12.48	N/A	-25.97	
Maximum Loss Exposure	-3.47	-4.35	-4.22	N/A	-2.40	
Upside Semi Deviation	0.57	0.59	4.07	N/A	6.90	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.54	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.23	
vs. ICE Libor (1 month)						
Active Return	-5.28	-5.42	-3.20	N/A	-2.41	
Tracking Error	1.81	3.05	3.70	N/A	5.84	
Actual Correlation	-0.08	0.00	-0.12	N/A	-0.08	
Beta	-1.50	-0.02	-2.31	N/A	-2.94	
Consistency	8.33	22.22	33.33	N/A	36.78	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-2.92	-1.78	-0.86	N/A	-0.41	
Jensen Alpha	-0.02	0.30	3.69	N/A	2.70	
Up Market Capture	-198.46	-424.40	-365.80	N/A	-344.15	
Up Market Outperformance	-5.25	-5.39	-3.24	N/A	-2.56	
vs. FTSE 3 Month T-Bill						
Excess Return	-5.07	-5.19	-3.00	N/A	-2.23	
Excess Risk	1.80	3.05	3.70	N/A	5.84	
Sharpe Ratio	-2.81	-1.70	-0.81	N/A	-0.38	

Calculation based on monthly periodicity.

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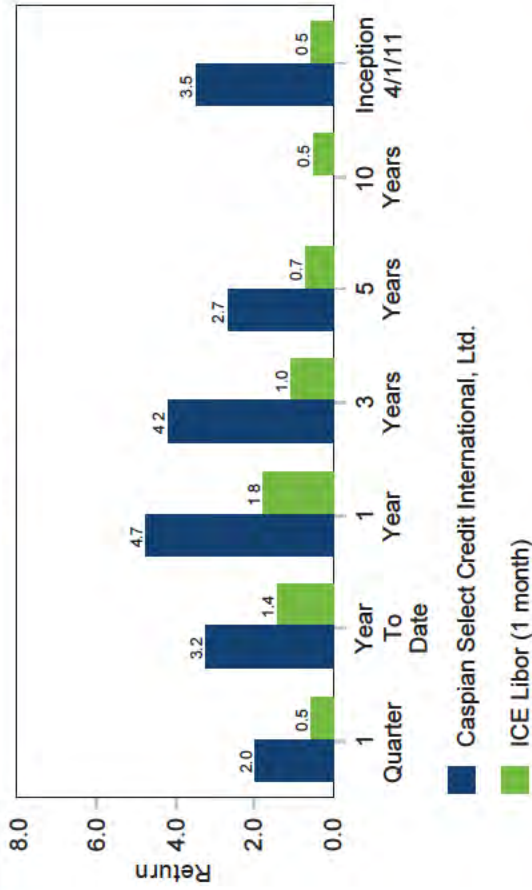


Performance Summary

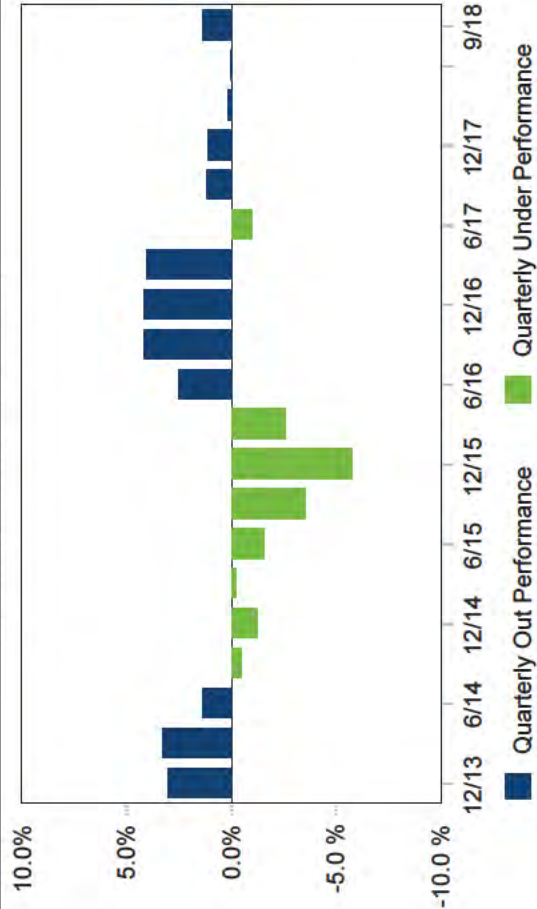
Account Information

Account Name: Caspian Select Credit International, Ltd.  
 Inception Date: 03/31/2011  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

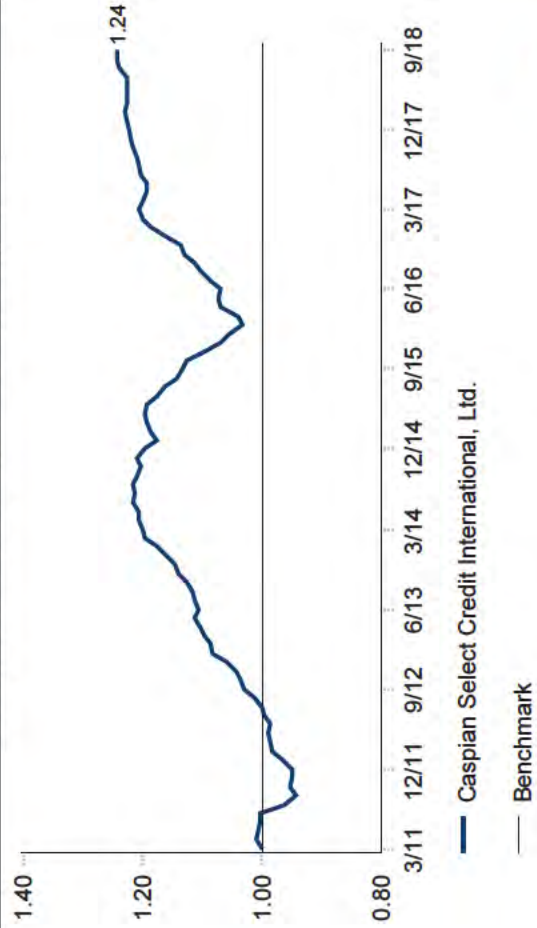
Return Summary



Quarterly Excess Performance

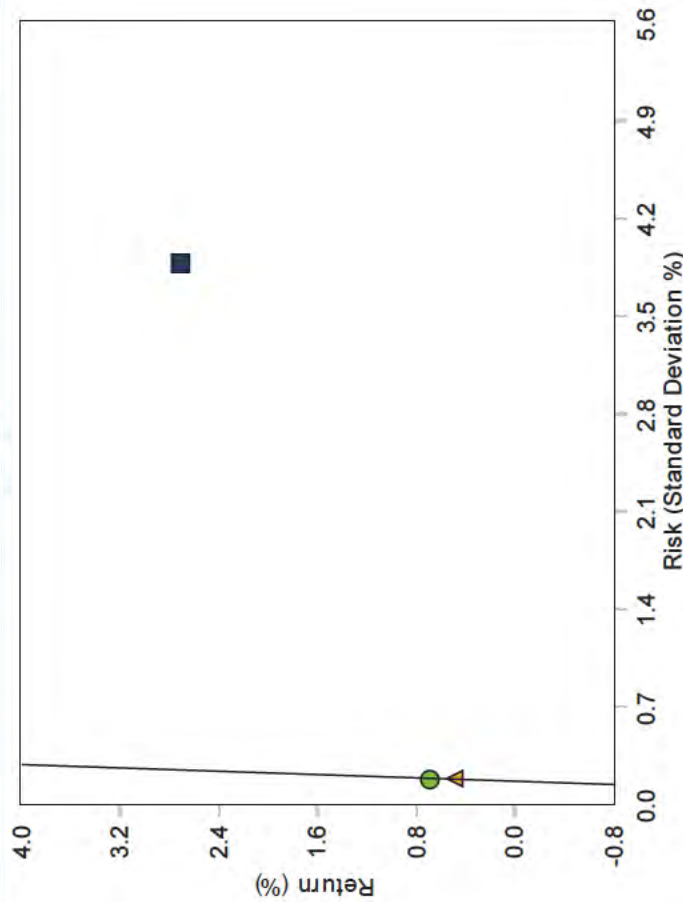


Ratio of Cumulative Wealth - Since Inception



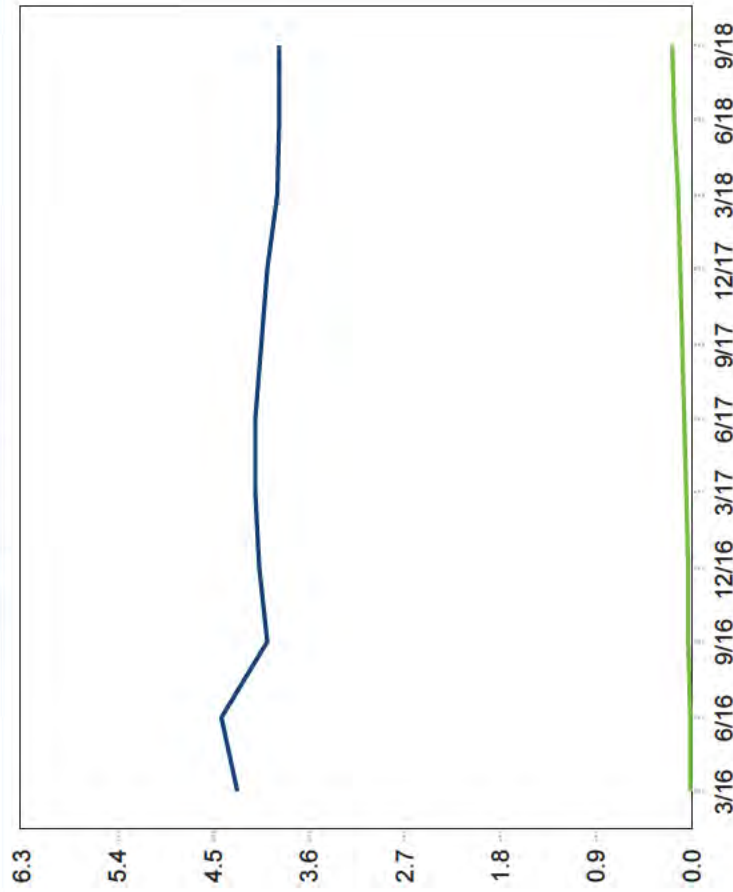
Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



- Caspian Select Credit International, Ltd.
- ICE Libor (1 month)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Caspian Select Credit International, Ltd.
- ICE Libor (1 month)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Caspian Select Credit International, Ltd.	2.06	3.86	0.53	0.02	0.59	0.50	3.28	2.71	3.89	0.16
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99



## Risk Statistics

## Caspian Select Credit International, Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.74	4.22	2.71	N/A	3.51	04/01/2011
Standard Deviation	1.32	4.13	3.89	N/A	3.96	
Downside Risk	0.25	2.65	2.59	N/A	2.68	
Downside Semi Deviation	N/A	1.60	4.69	N/A	4.97	
Max Drawdown Recovery Period	3.00	12.00	36.00	N/A	36.00	
Maximum Drawdown	-0.24	-8.80	-14.92	N/A	-14.92	
Maximum Loss Exposure	N/A	-8.80	-7.92	N/A	-5.54	
Upside Semi Deviation	0.58	3.94	3.65	N/A	3.70	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.53	
Standard Deviation	0.10	0.18	0.19	0.17	0.16	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.23	
vs. ICE Libor (1 month)						
Active Return	2.88	3.19	2.06	N/A	3.00	
Tracking Error	1.33	4.11	3.86	N/A	3.95	
Actual Correlation	-0.03	0.12	0.16	N/A	0.09	
Beta	-0.39	2.67	3.28	N/A	2.08	
Consistency	75.00	69.44	65.00	N/A	67.78	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	2.17	0.78	0.53	N/A	0.76	
Jensen Alpha	7.16	1.35	-0.32	N/A	4.90	
Up Market Capture	262.98	408.45	399.92	N/A	664.10	
Up Market Outperformance	2.96	3.18	2.02	N/A	2.98	
vs. FTSE 3 Month T-Bill						
Excess Return	3.09	3.42	2.26	N/A	3.18	
Excess Risk	1.33	4.11	3.86	N/A	3.95	
Sharpe Ratio	2.33	0.83	0.59	N/A	0.81	

Calculation based on monthly periodicity.

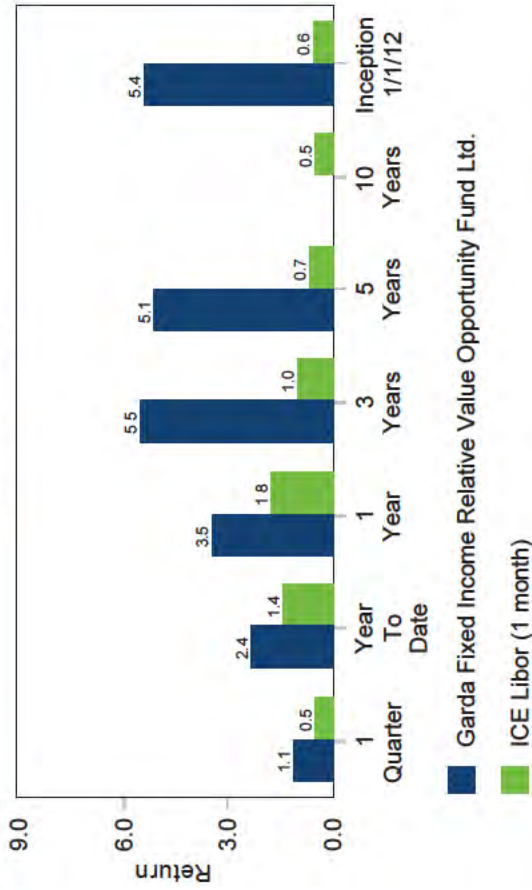
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Garda Fixed Income Relative Value Opportunity Fund Ltd. As of September 30, 2018  
**Performance Summary**

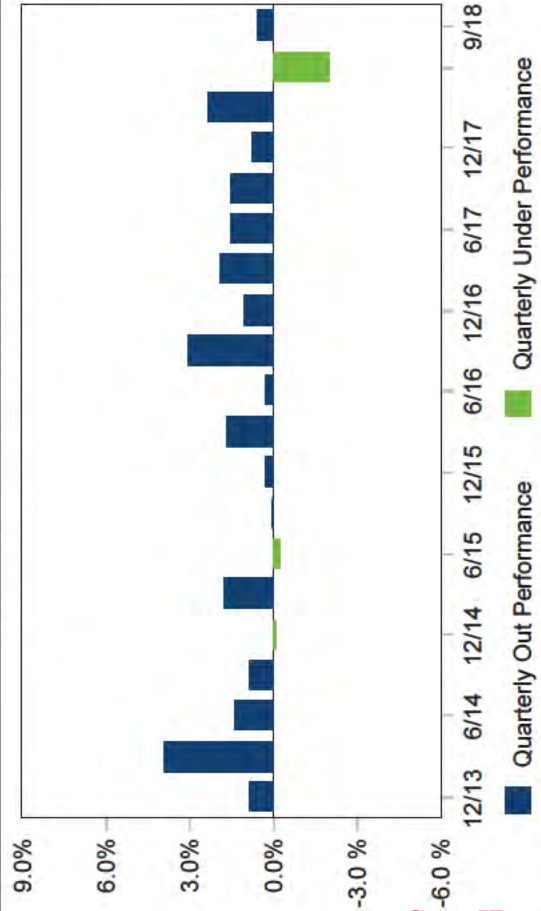
**Account Information**

Account Name: Garda Fixed Income Relative Value Opportunity Fund Ltd.  
 Inception Date: 12/31/2011  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

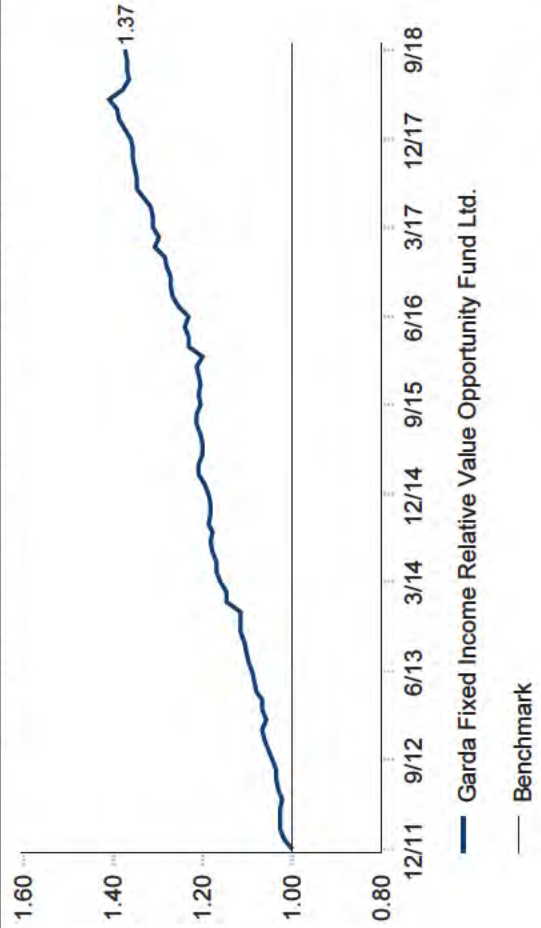
**Return Summary**



**Quarterly Excess Performance**

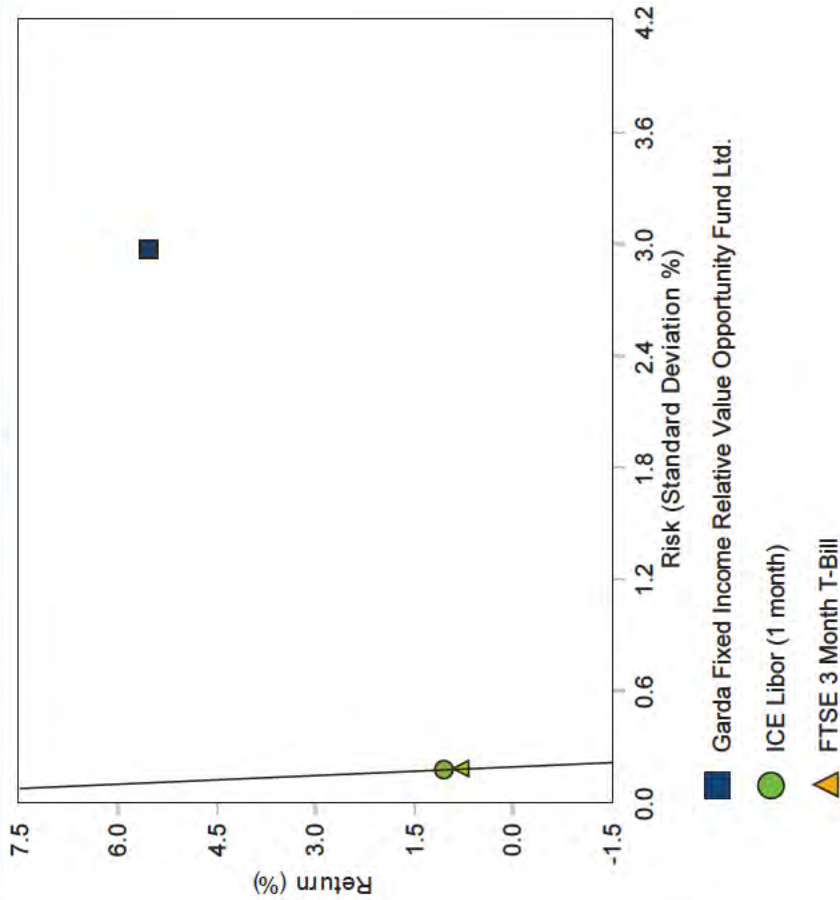


**Ratio of Cumulative Wealth - Since Inception**

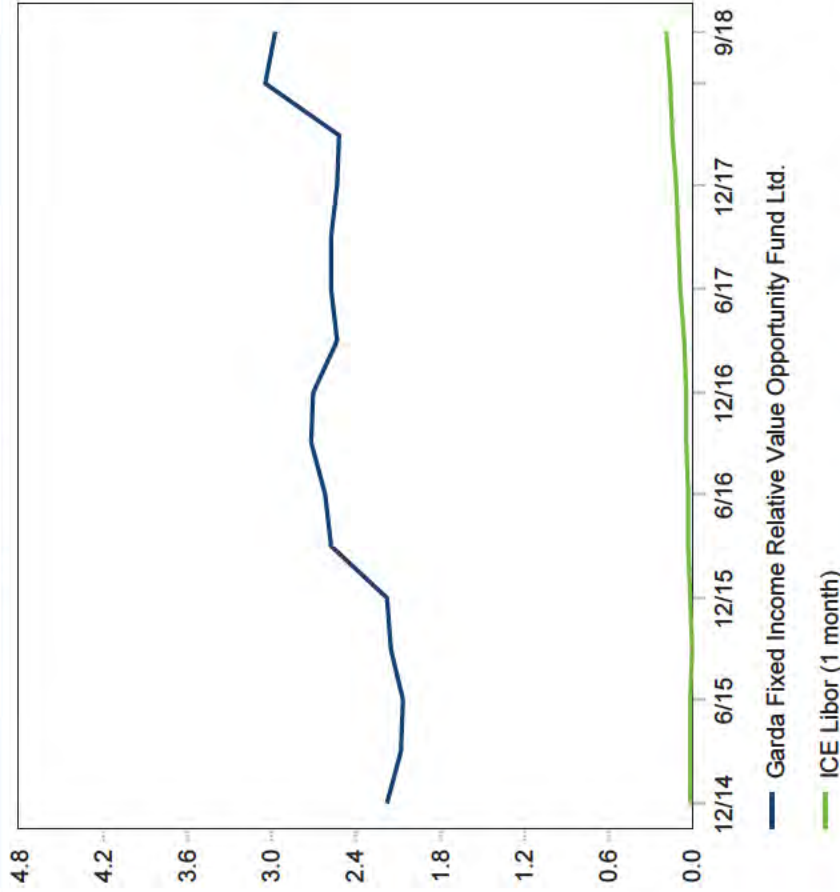


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Garda Fixed Income Relative Value Opportunity Fund Ltd.	4.40	3.01	1.46	0.01	1.54	7.54	-1.79	5.53	2.98	-0.11
ICE Libor (1 month)	0.00	0.00	N/A	1.00	11.50	0.00	1.00	1.04	0.18	1.00
FTSE 3 Month T-Bill	-0.23	0.02	-11.50	0.99	N/A	-0.25	1.01	0.80	0.18	0.99

## Risk Statistics

## Garda Fixed Income Relative Value Opportunity Fund Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	3.50	5.53	5.14	N/A	5.41	01/01/2012
Standard Deviation	3.33	2.98	2.73	N/A	2.54	
Downside Risk	2.46	1.61	1.30	N/A	1.14	
Downside Semi Deviation	2.36	1.12	2.68	N/A	2.41	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-2.91	-2.91	-2.91	N/A	-2.91	
Maximum Loss Exposure	N/A	-0.41	N/A	N/A	N/A	
Upside Semi Deviation	0.79	3.33	3.26	N/A	3.14	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.57	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.24	
vs. ICE Libor (1 month)						
Active Return	1.73	4.40	4.37	N/A	4.74	
Tracking Error	3.36	3.01	2.74	N/A	2.56	
Actual Correlation	-0.29	-0.11	-0.04	N/A	-0.05	
Beta	-9.96	-1.79	-0.53	N/A	-0.69	
Consistency	75.00	77.78	73.33	N/A	75.31	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	0.52	1.46	1.59	N/A	1.85	
Jensen Alpha	-6.47	-3.06	0.51	N/A	1.47	
Up Market Capture	197.82	525.65	735.34	N/A	937.49	
Up Market Outperformance	1.72	4.49	4.45	N/A	4.84	
vs. FTSE 3 Month T-Bill						
Excess Return	1.94	4.64	4.57	N/A	4.93	
Excess Risk	3.36	3.01	2.74	N/A	2.56	
Sharpe Ratio	0.58	1.54	1.66	N/A	1.92	

Calculation based on monthly periodicity.

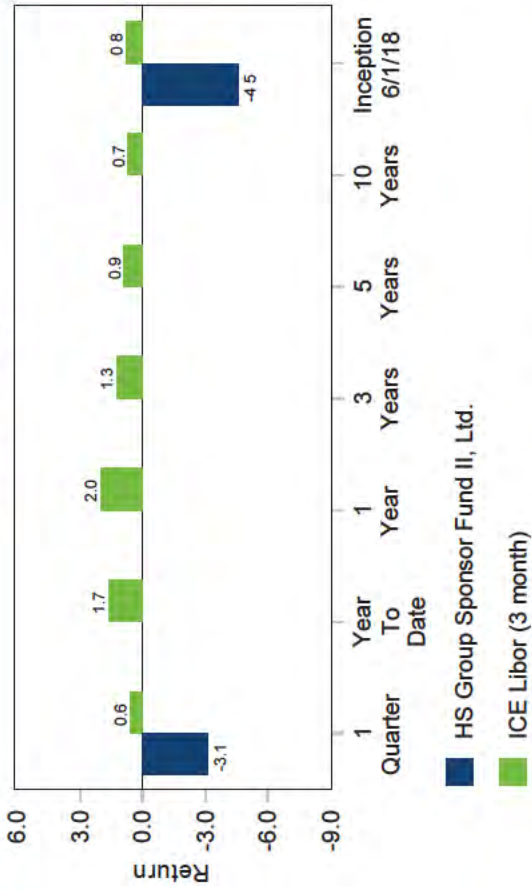
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Performance Summary

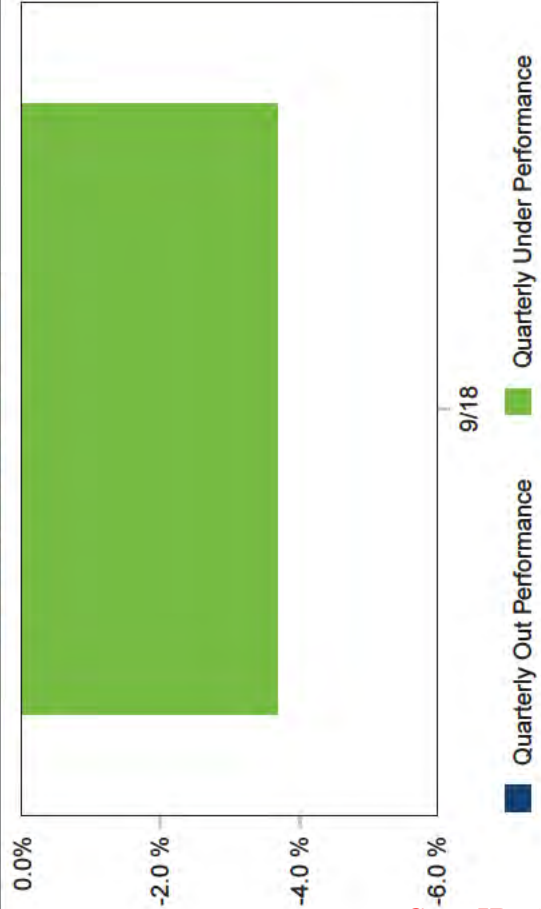
Account Information

Account Name: HS Group Sponsor Fund II, Ltd.  
 Inception Date: 05/01/2018  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: ICE Libor (3 month)  
 Peer Group:

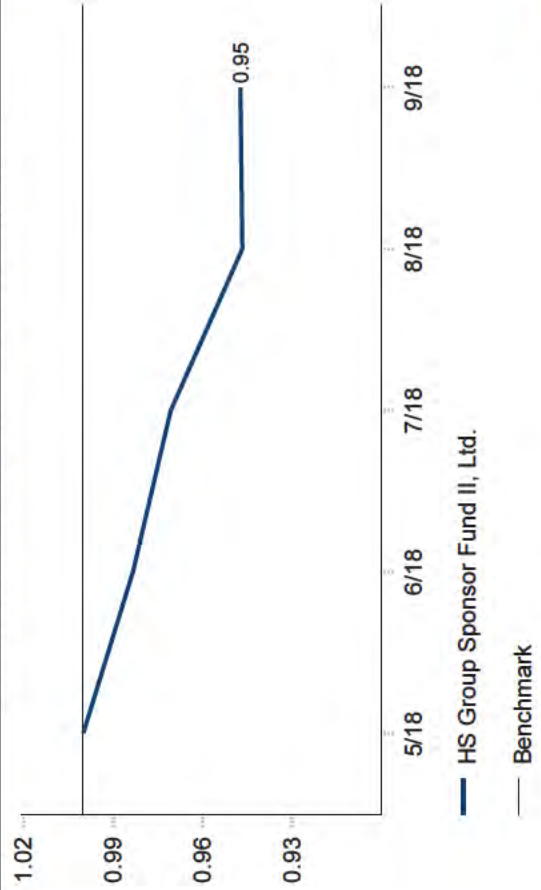
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



Performance Summary

Account Information

Account Name: Independence Reinsurance Partners Composite

Inception Date: 01/01/2016

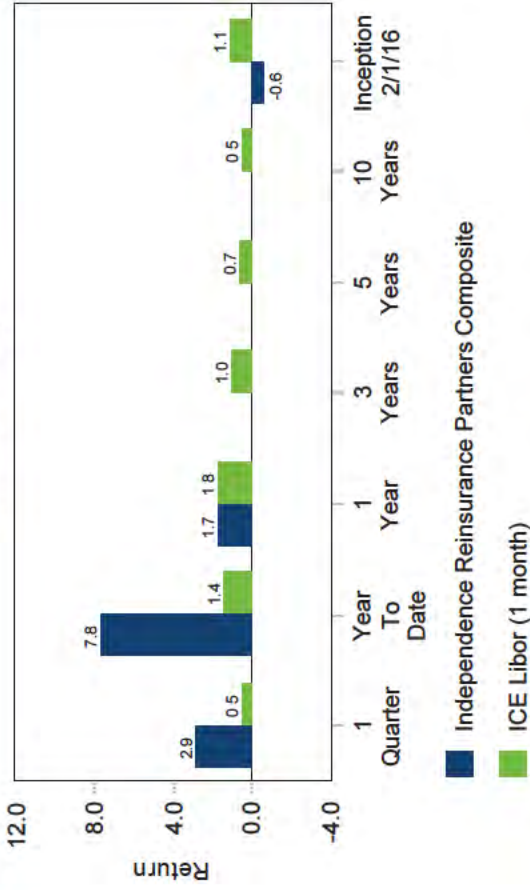
Account Structure: Hedge Fund

Asset Class: ICE Libor (1 month)

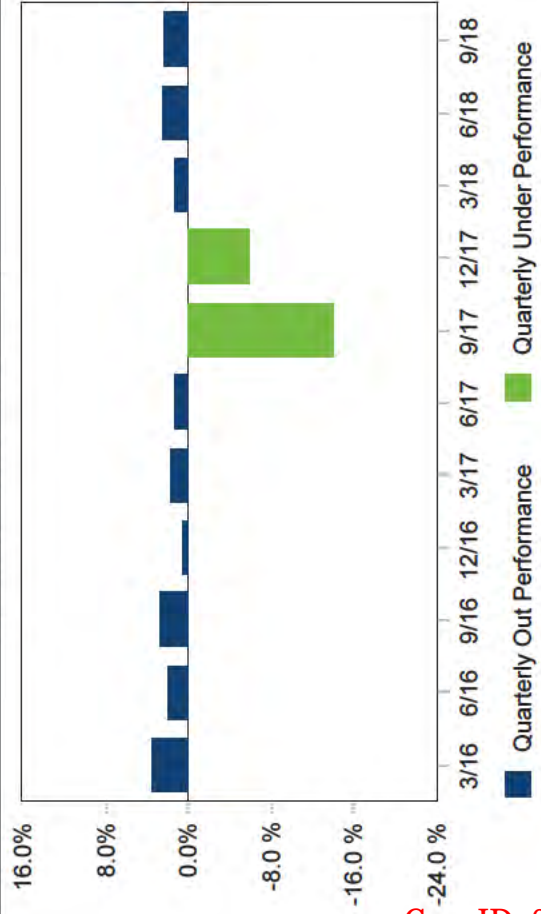
Benchmark: ICE Libor (1 month)

Peer Group:

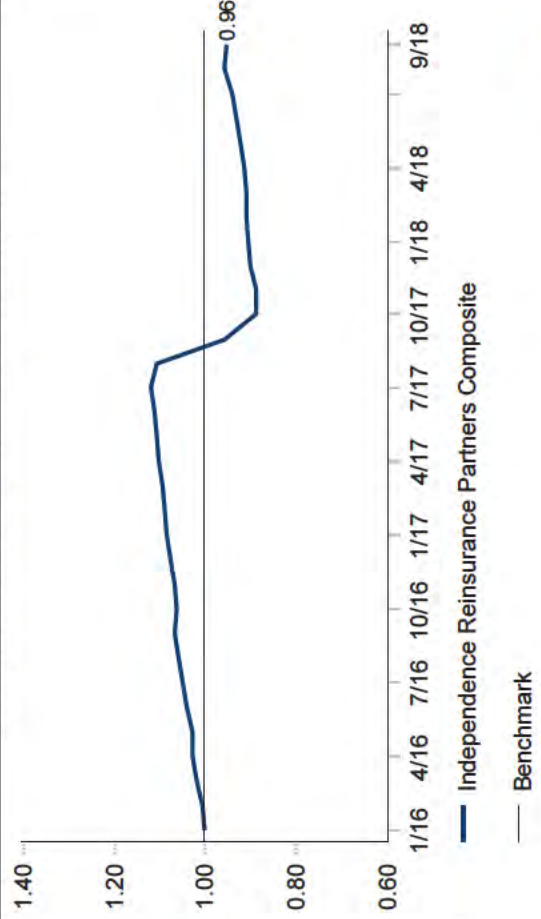
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



Risk Statistics

Independence Reinsurance Partners Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.73	N/A	N/A	N/A	0.02	01/01/2016
Standard Deviation	8.20	N/A	N/A	N/A	9.90	
Downside Risk	7.46	N/A	N/A	N/A	9.43	
Downside Semi Deviation	N/A	N/A	N/A	N/A	8.89	
Max Drawdown Recovery Period	10.00	N/A	N/A	N/A	N/A	
Maximum Drawdown	-7.14	N/A	N/A	N/A	-20.51	
Maximum Loss Exposure	-7.14	N/A	N/A	N/A	-8.69	
Upside Semi Deviation	1.05	N/A	N/A	N/A	3.23	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	1.11	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.37	
vs. ICE Libor (1 month)						
Active Return	0.27	N/A	N/A	N/A	-0.57	
Tracking Error	8.15	N/A	N/A	N/A	9.91	
Actual Correlation	0.52	N/A	N/A	N/A	-0.04	
Beta	45.02	N/A	N/A	N/A	-2.37	
Consistency	83.33	N/A	N/A	N/A	84.85	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	0.03	N/A	N/A	N/A	-0.06	
Jensen Alpha	-10.83	N/A	N/A	N/A	-19.34	
Up Market Capture	115.46	N/A	N/A	N/A	47.98	
Up Market Outperformance	-0.05	N/A	N/A	N/A	-1.09	
vs. FTSE 3 Month T-Bill						
Excess Return	0.48	N/A	N/A	N/A	-0.34	
Excess Risk	8.16	N/A	N/A	N/A	9.92	
Sharpe Ratio	0.06	N/A	N/A	N/A	-0.03	

Calculation based on monthly periodicity.

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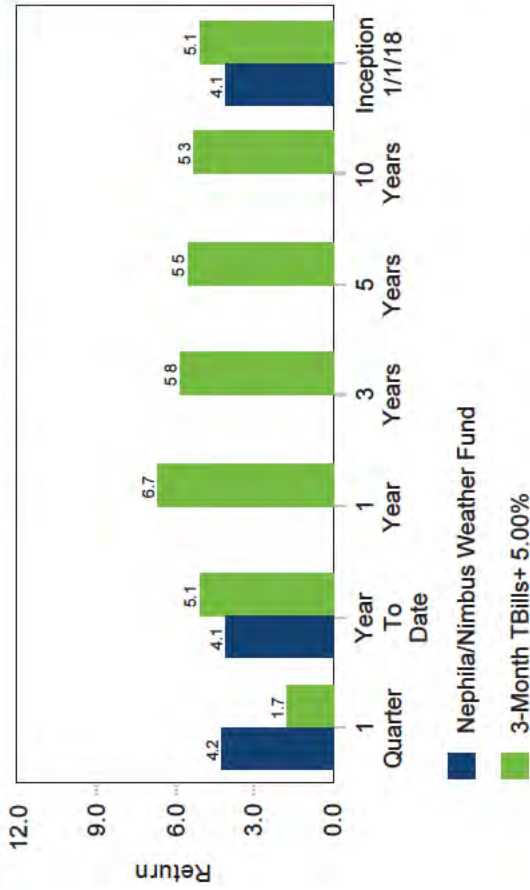


Performance Summary

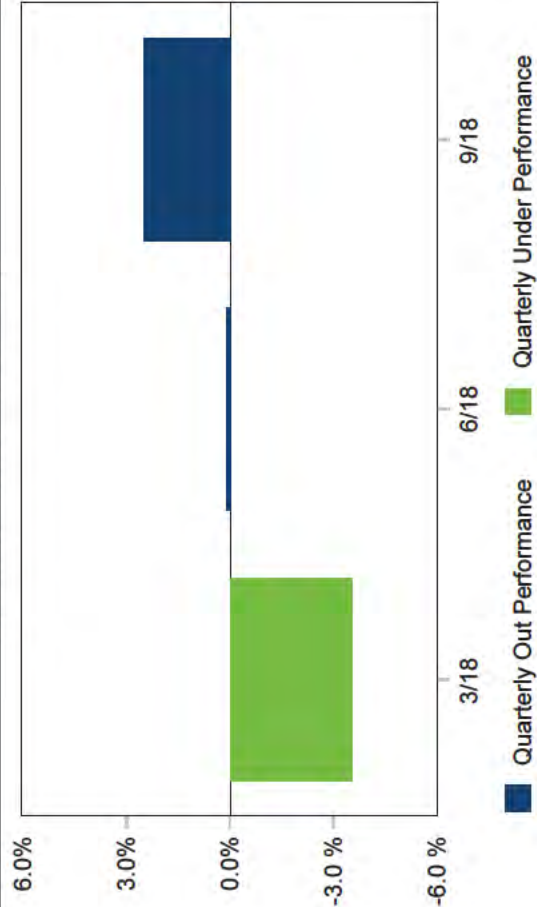
Account Information

Account Name: Nephila/Nimbus Weather Fund  
 Inception Date: 09/01/2017  
 Account Structure: Commingled Fund  
 Asset Class: Hedge Fund  
 Benchmark: 3-Month TBills+ 5.00%  
 Peer Group:

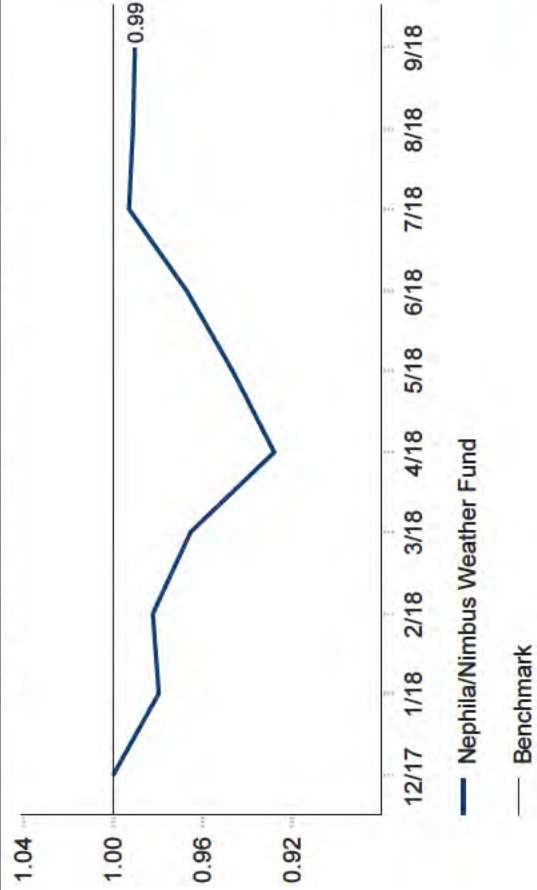
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



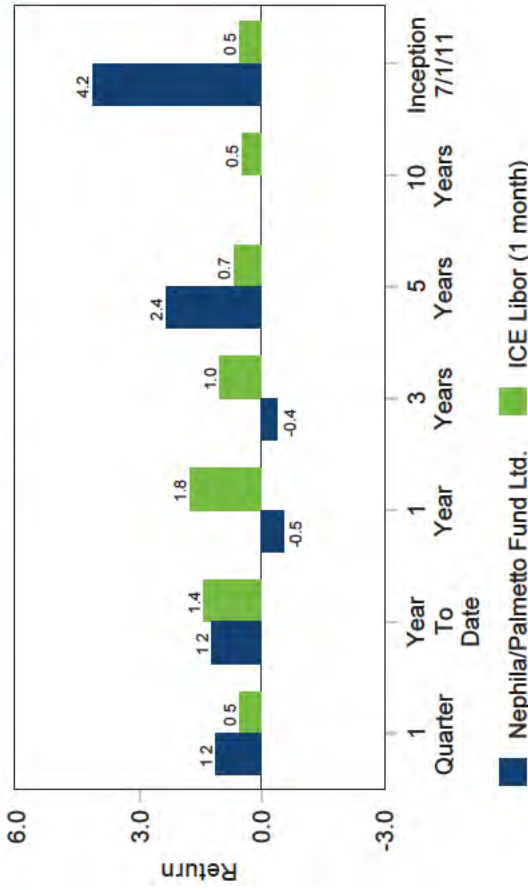


Performance Summary

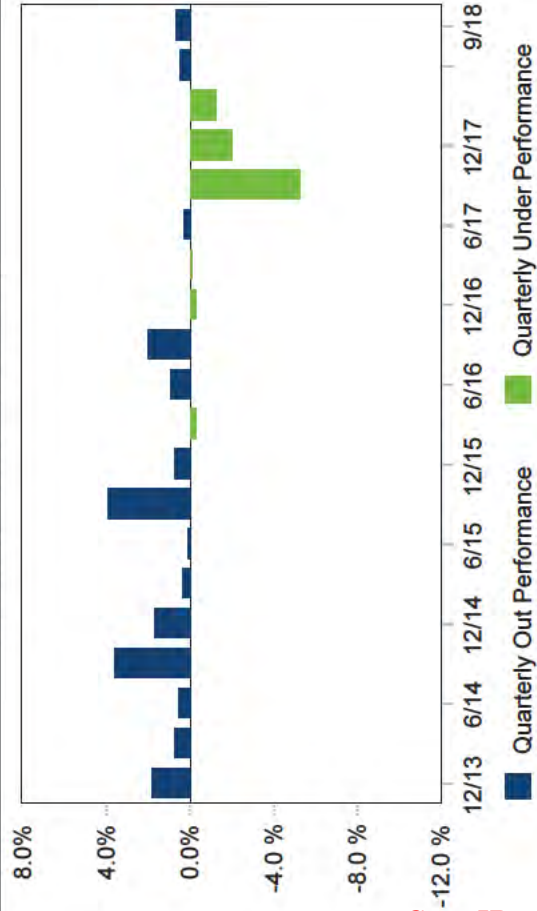
Account Information

Account Name: Nephila/Palmetto Fund Ltd.  
 Inception Date: 06/30/2011  
 Account Structure: Hedge Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

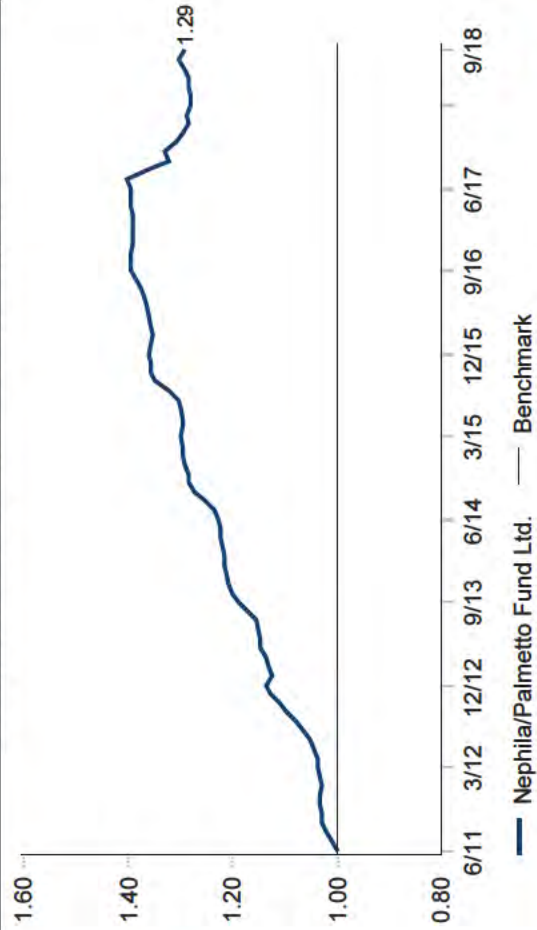
Return Summary



Quarterly Excess Performance

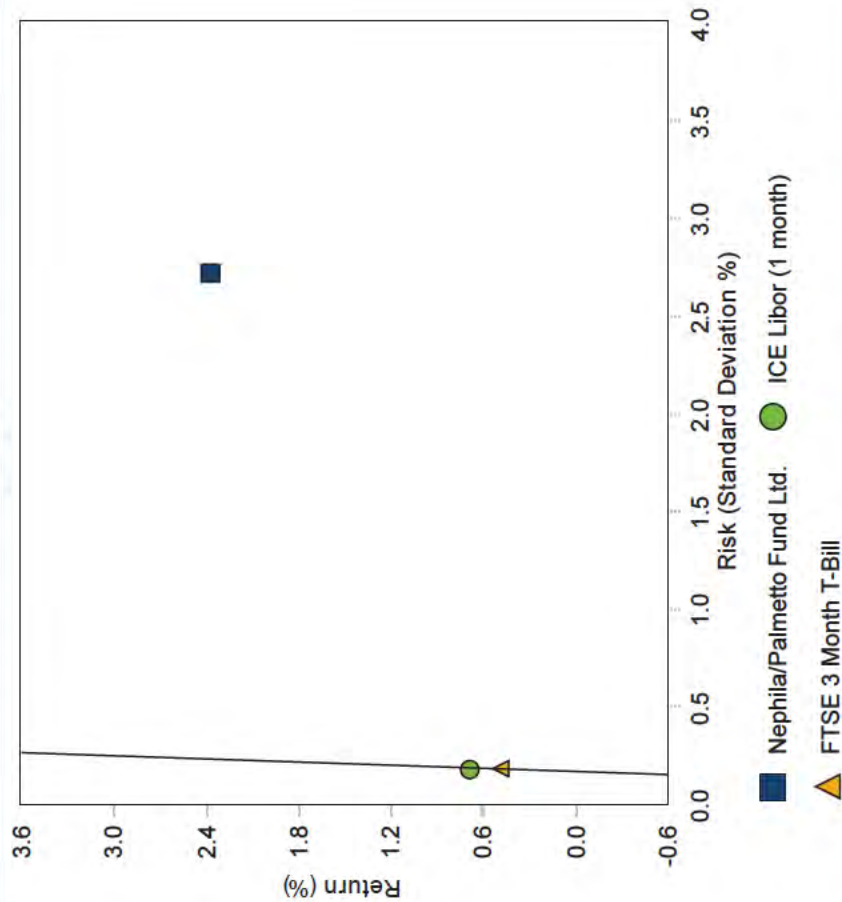


Ratio of Cumulative Wealth - Since Inception

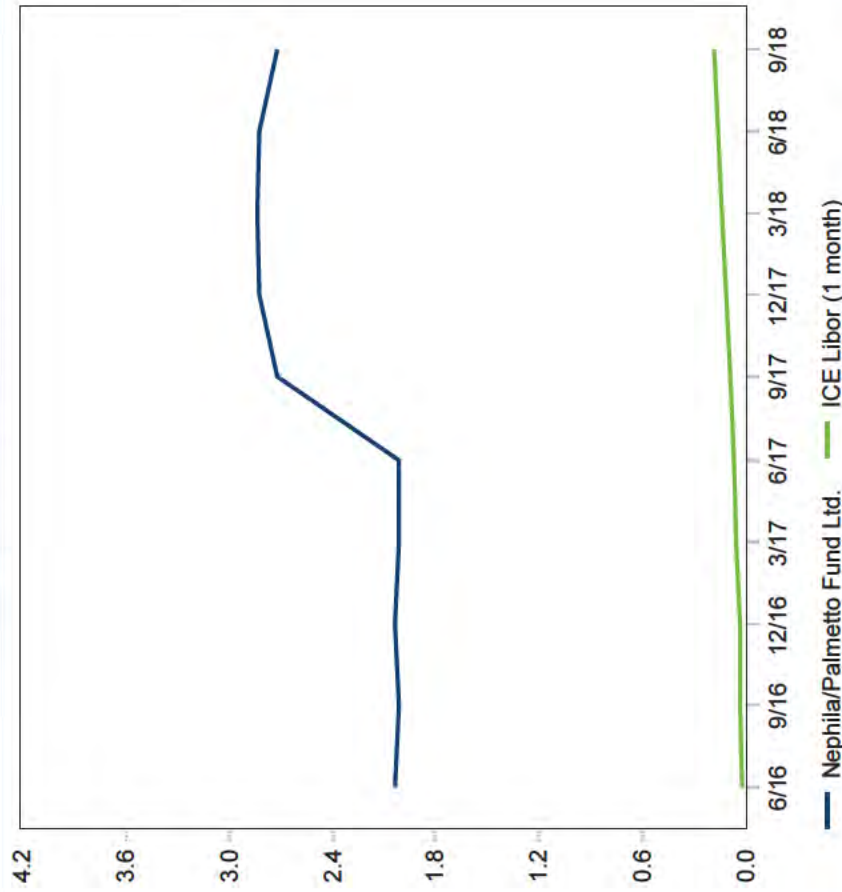


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Nephila/Palmetto Fund Ltd.	1.70	2.79	0.61	0.10	0.68	5.76	-4.70	2.37	2.72	-0.32
ICE Libor (1 month)	0.00	0.00	N/A	1.00	9.92	0.00	1.00	0.69	0.19	1.00
FTSE 3 Month T-Bill	-0.20	0.02	-9.92	0.99	N/A	-0.17	0.96	0.49	0.18	0.99

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Empower Results®

## Risk Statistics

## Nephila/Palmetto Fund Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-0.50	-0.38	2.37	N/A	4.16	07/01/2011
Standard Deviation	2.67	2.91	2.72	N/A	2.68	
Downside Risk	2.16	2.59	1.99	N/A	1.69	
Downside Semi Deviation	1.03	1.40	4.42	N/A	4.04	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-3.21	-7.84	-7.84	N/A	-7.84	
Maximum Loss Exposure	-2.56	-3.19	N/A	N/A	N/A	
Upside Semi Deviation	0.62	1.61	2.24	N/A	2.67	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.54	
Standard Deviation	0.10	0.18	0.19	0.17	0.17	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.23	
vs. ICE Libor (1 month)						
Active Return	-2.23	-1.37	1.70	N/A	3.58	
Tracking Error	2.63	2.94	2.79	N/A	2.75	
Actual Correlation	0.43	-0.14	-0.32	N/A	-0.36	
Beta	11.97	-2.20	-4.70	N/A	-5.81	
Consistency	50.00	63.89	75.00	N/A	78.16	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-0.85	-0.47	0.61	N/A	1.30	
Jensen Alpha	10.56	-1.04	8.79	N/A	12.14	
Up Market Capture	-26.23	-32.84	346.65	N/A	758.37	
Up Market Outperformance	-2.28	-1.42	1.68	N/A	3.62	
vs. FTSE 3 Month T-Bill						
Excess Return	-2.03	-1.14	1.89	N/A	3.76	
Excess Risk	2.62	2.94	2.78	N/A	2.74	
Sharpe Ratio	-0.77	-0.39	0.68	N/A	1.37	

Calculation based on monthly periodicity.

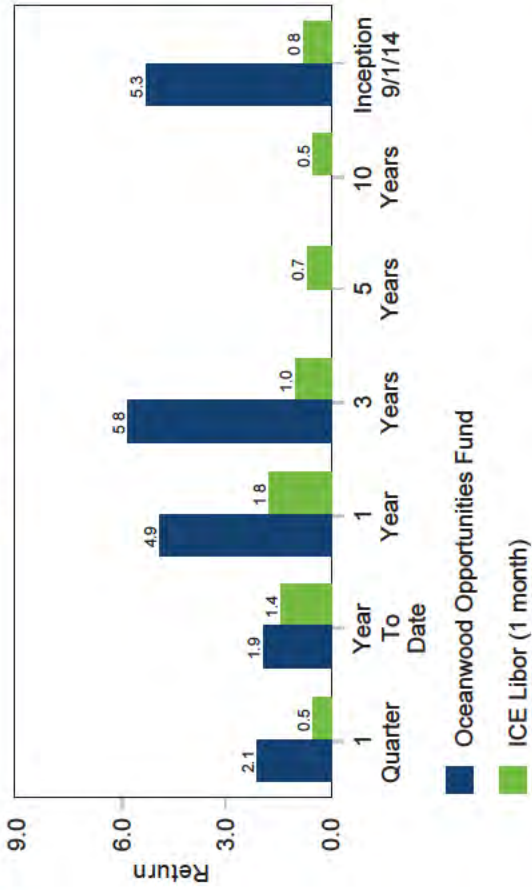
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Performance Summary

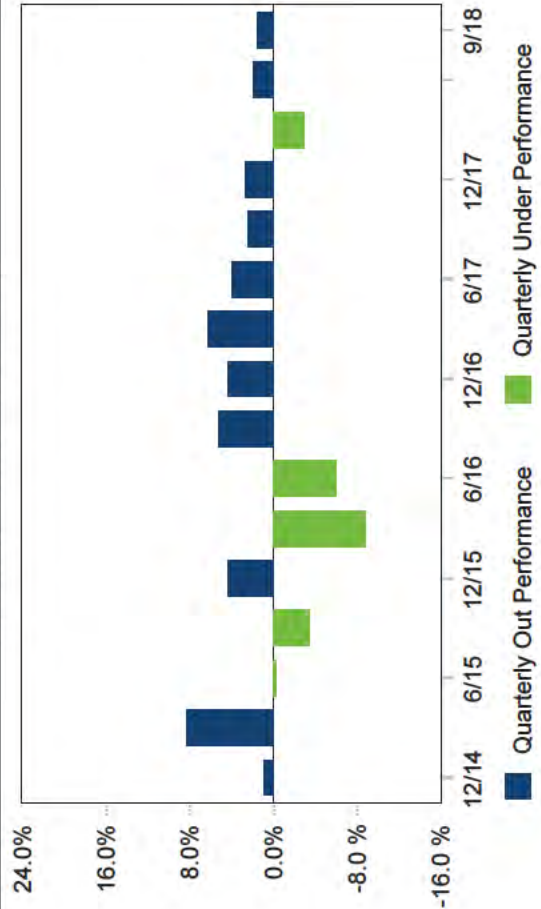
Account Information

Account Name: Oceanwood Opportunities Fund  
 Inception Date: 09/01/2014  
 Account Structure: Commingled Fund  
 Asset Class: Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

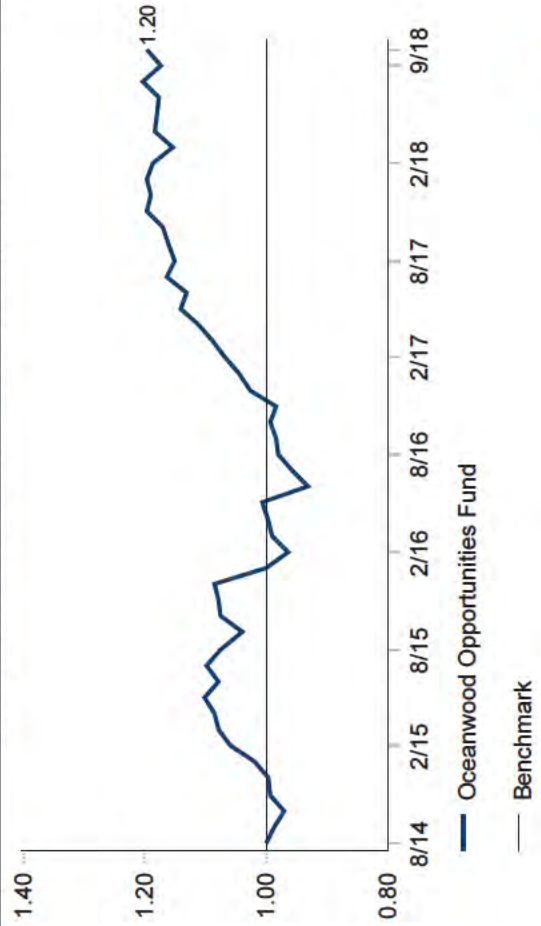
Return Summary



Quarterly Excess Performance

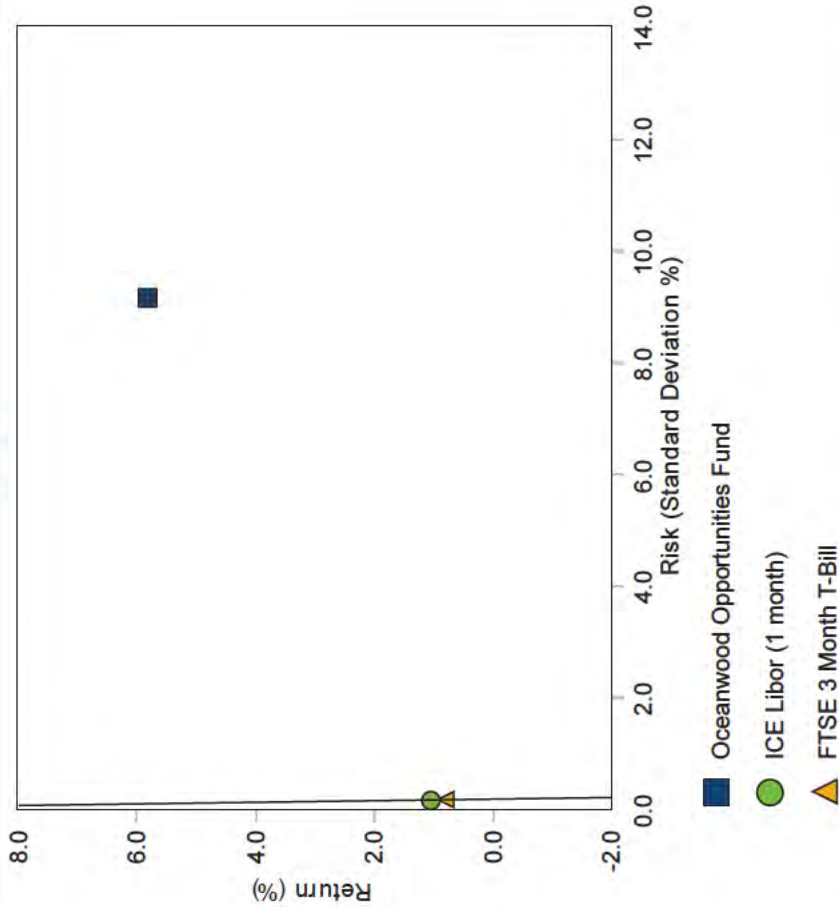


Ratio of Cumulative Wealth - Since Inception

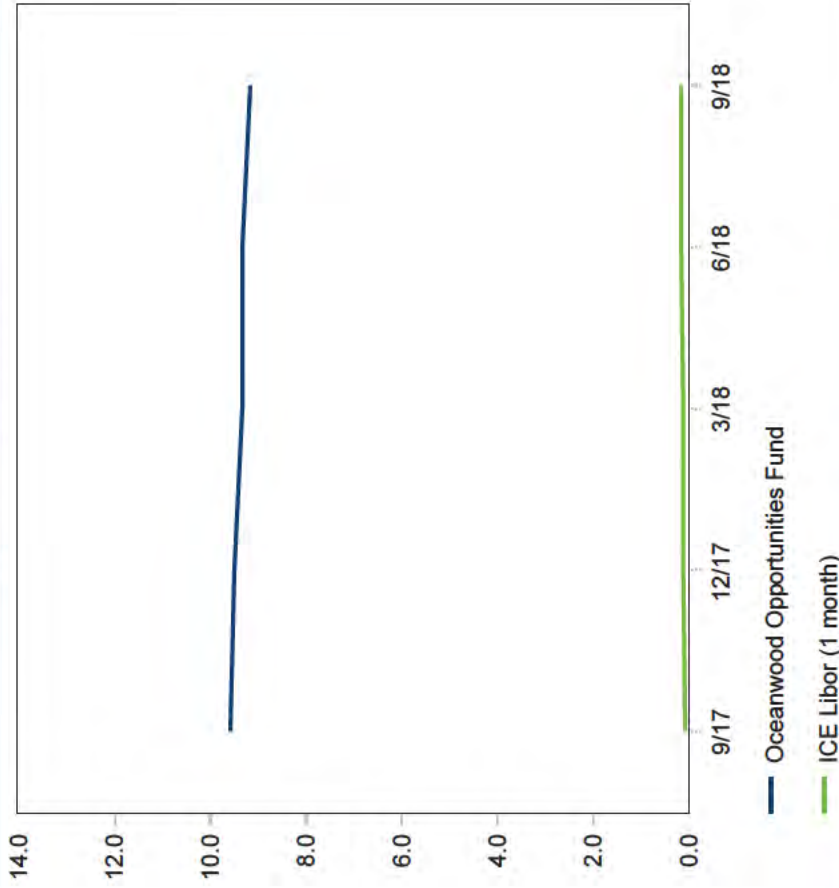


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
3 Years



Rolling 3 Years Standard Deviation



3 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Oceanwood Opportunities Fund	5.05	9.17	0.55	0.00	0.58	3.60	2.46	5.82	9.18	0.05
ICE Libor (1 month)	0.00	0.00	N/A	1.00	11.50	0.00	1.00	1.04	0.18	1.00
FTSE 3 Month T-Bill	-0.23	0.02	-11.50	0.99	N/A	-0.25	1.01	0.80	0.18	0.99

## Risk Statistics

## Oceanwood Opportunities Fund

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	4.89	5.82	N/A	N/A	5.31	09/01/2014
Standard Deviation	6.03	9.18	N/A	N/A	8.72	
Downside Risk	3.61	6.99	N/A	N/A	6.43	
Downside Semi Deviation	1.55	12.47	N/A	N/A	11.14	
Max Drawdown Recovery Period	6.00	15.00	N/A	N/A	23.00	
Maximum Drawdown	-3.31	-13.94	N/A	N/A	-15.14	
Maximum Loss Exposure	N/A	-10.17	N/A	N/A	-6.35	
Upside Semi Deviation	2.17	7.66	N/A	N/A	7.59	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.81	
Standard Deviation	0.10	0.18	0.19	0.17	0.19	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.30	
vs. ICE Libor (1 month)						
Active Return	3.19	5.05	N/A	N/A	4.76	
Tracking Error	6.04	9.17	N/A	N/A	8.71	
Actual Correlation	-0.09	0.05	N/A	N/A	0.05	
Beta	-5.71	2.46	N/A	N/A	2.31	
Consistency	50.00	66.67	N/A	N/A	65.31	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	0.53	0.55	N/A	N/A	0.55	
Jensen Alpha	4.77	-9.49	N/A	N/A	-4.98	
Up Market Capture	280.21	588.68	N/A	N/A	690.37	
Up Market Outperformance	3.11	4.78	N/A	N/A	4.50	
vs. FTSE 3 Month T-Bill						
Excess Return	3.39	5.29	N/A	N/A	4.97	
Excess Risk	6.04	9.17	N/A	N/A	8.71	
Sharpe Ratio	0.56	0.58	N/A	N/A	0.57	

Calculation based on monthly periodicity.

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Performance Summary

Account Information

Account Name: OWS Credit Opportunity Offshore Fund III, Ltd.

Inception Date: 12/01/2015

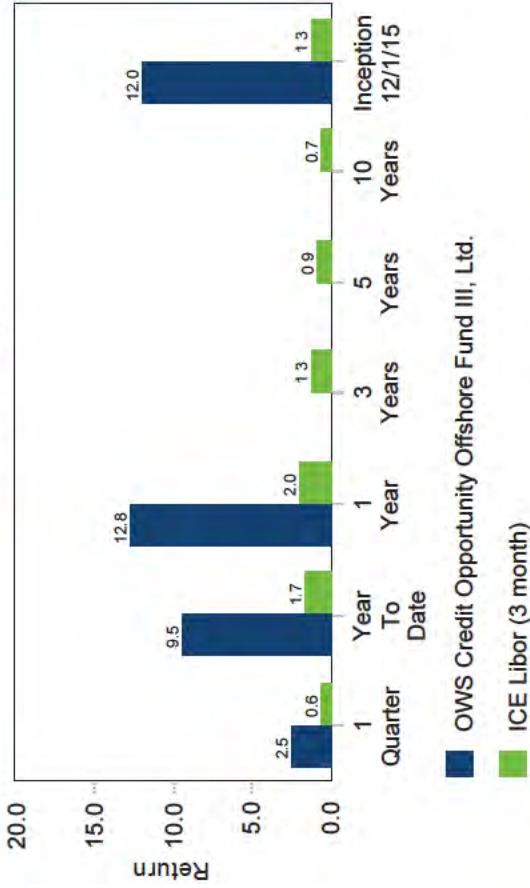
Account Structure: Hedge Fund

Asset Class: Hedge Fund

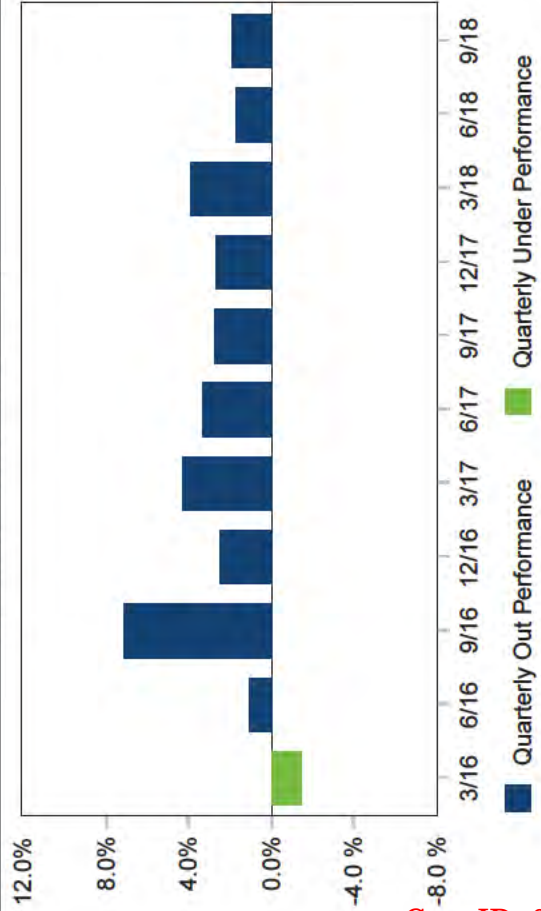
Benchmark: ICE Libor (3 month)

Peer Group:

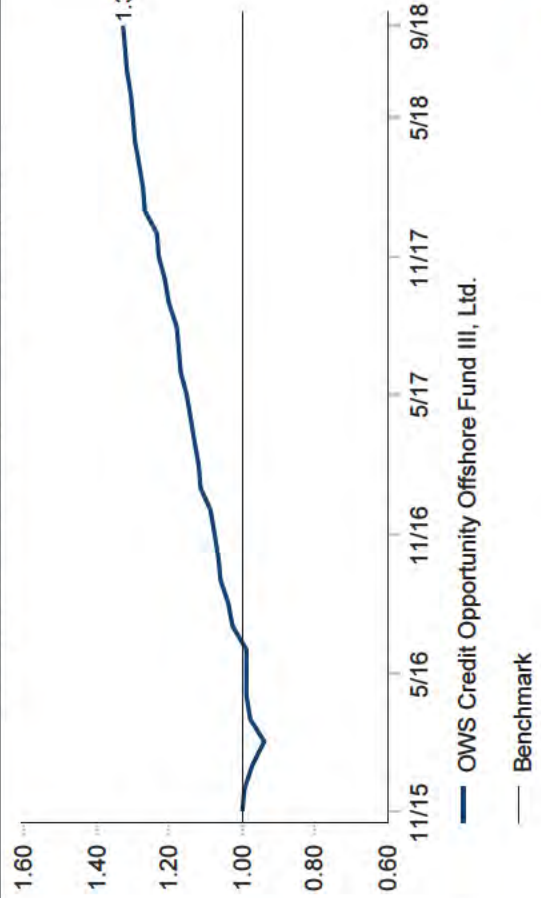
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## OWS Credit Opportunity Offshore Fund III, Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	12.81	N/A	N/A	N/A	12.02	12/01/2015
Standard Deviation	1.93	N/A	N/A	N/A	4.68	
Downside Risk	0.00	N/A	N/A	N/A	2.36	
Downside Semi Deviation	N/A	N/A	N/A	N/A	2.26	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	7.00	
Maximum Drawdown	0.00	N/A	N/A	N/A	-5.94	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	-5.94	
Upside Semi Deviation	4.13	N/A	N/A	N/A	5.61	
vs. ICE Libor (3 month)						
Active Return	10.11	N/A	N/A	N/A	10.21	
Tracking Error	1.97	N/A	N/A	N/A	4.67	
Actual Correlation	-0.35	N/A	N/A	N/A	0.07	
Beta	-5.88	N/A	N/A	N/A	1.93	
Consistency	100.00	N/A	N/A	N/A	88.24	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	5.14	N/A	N/A	N/A	2.19	
Jensen Alpha	13.57	N/A	N/A	N/A	9.20	
Up Market Capture	601.22	N/A	N/A	N/A	882.48	
Up Market Outperformance	10.77	N/A	N/A	N/A	10.71	
vs. FTSE 3 Month T-Bill						
Excess Return	10.56	N/A	N/A	N/A	10.66	
Excess Risk	1.96	N/A	N/A	N/A	4.67	
Sharpe Ratio	5.38	N/A	N/A	N/A	2.28	

calculation based on monthly periodicity.

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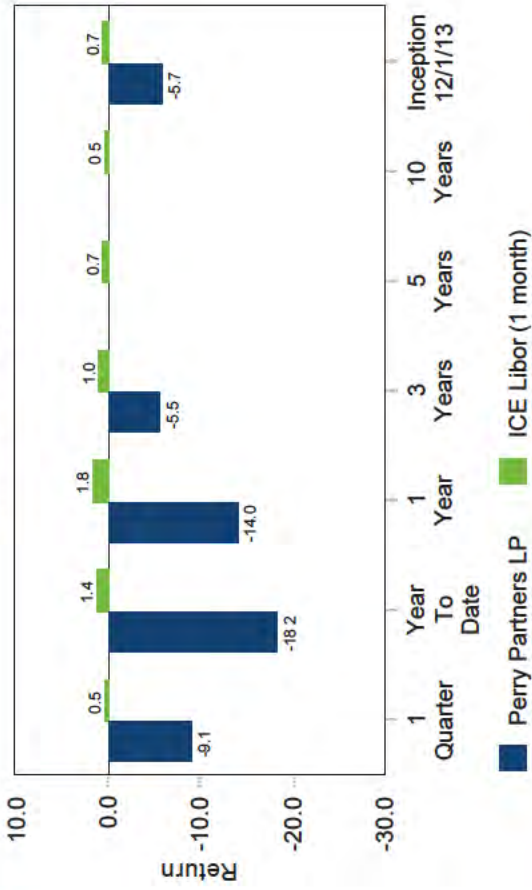


Performance Summary

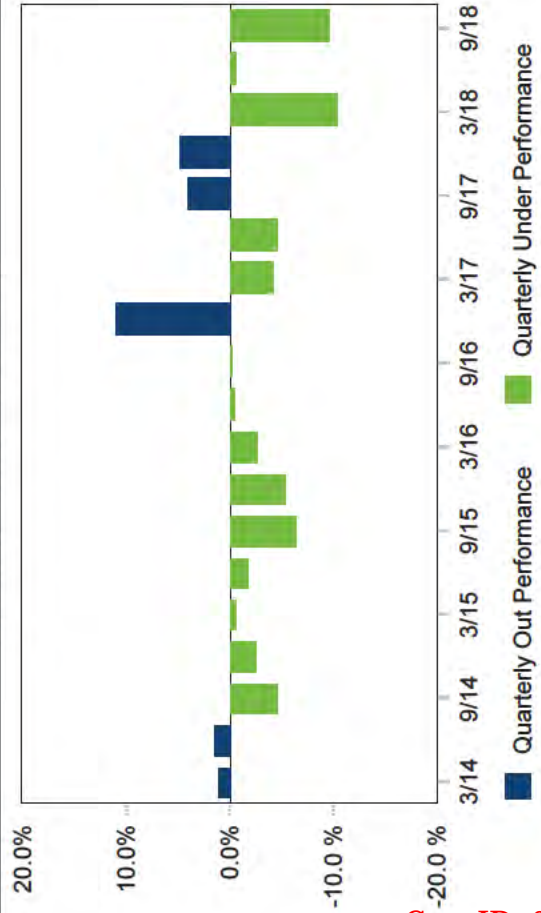
Account Information

Account Name: Perry Partners LP  
 Inception Date: 12/01/2013  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: ICE Libor (1 month)  
 Peer Group:

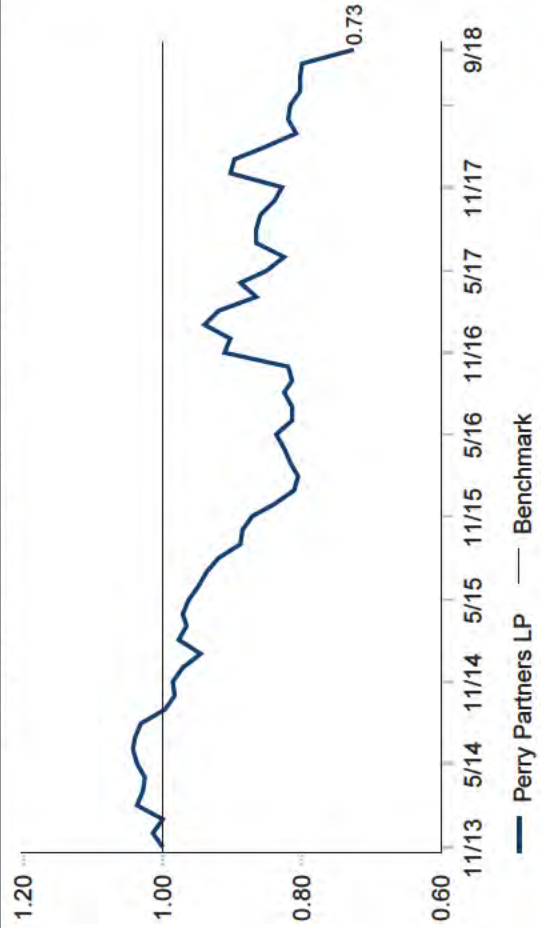
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Perry Partners LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	-13.96	-5.47	N/A	N/A	-5.73	12/01/2013
Standard Deviation	15.07	13.10	N/A	N/A	10.97	
Downside Risk	12.37	9.09	N/A	N/A	7.79	
Downside Semi Deviation	4.48	12.03	N/A	N/A	9.94	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	-18.23	-20.68	N/A	N/A	-28.04	
Maximum Loss Exposure	-13.96	-15.53	N/A	N/A	-6.74	
Upside Semi Deviation	5.28	15.07	N/A	N/A	12.97	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.71	
Standard Deviation	0.10	0.18	0.19	0.17	0.19	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.28	
vs. ICE Libor (1 month)						
Active Return	-15.67	-5.82	N/A	N/A	-6.00	
Tracking Error	15.09	13.13	N/A	N/A	10.99	
Actual Correlation	-0.20	-0.16	N/A	N/A	-0.10	
Beta	-31.82	-11.41	N/A	N/A	-5.95	
Consistency	16.67	36.11	N/A	N/A	34.48	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-1.04	-0.44	N/A	N/A	-0.55	
Jensen Alpha	-66.00	-22.26	N/A	N/A	-13.81	
Up Market Capture	-786.00	-463.11	N/A	N/A	-751.10	
Up Market Outperformance	-15.74	-6.51	N/A	N/A	-6.43	
vs. FTSE 3 Month T-Bill						
Excess Return	-15.46	-5.59	N/A	N/A	-5.80	
Excess Risk	15.10	13.13	N/A	N/A	10.99	
Sharpe Ratio	-1.02	-0.43	N/A	N/A	-0.53	

Calculation based on monthly periodicity.

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Performance Summary

Account Information

Account Name: PIMCO PARS/GCOF/MAV Composite

Inception Date: 03/01/2008

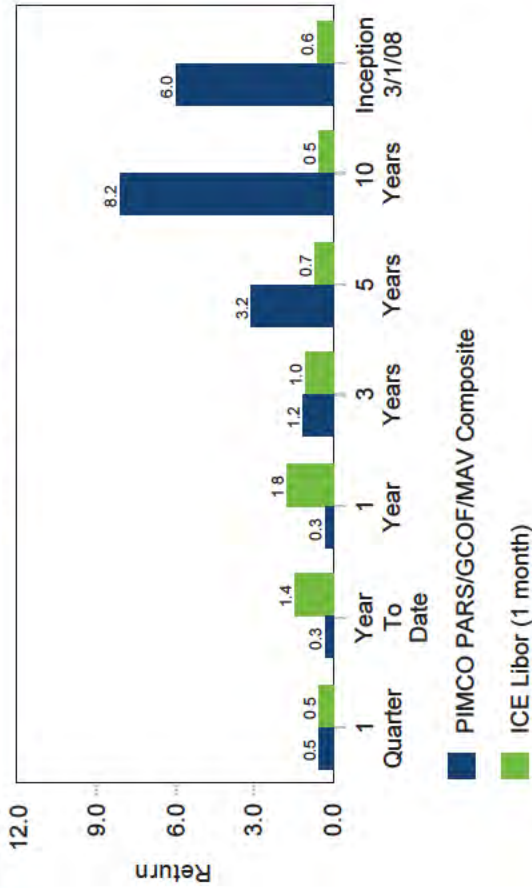
Account Structure: Hedge Fund

Asset Class: ICE Libor (1 month)

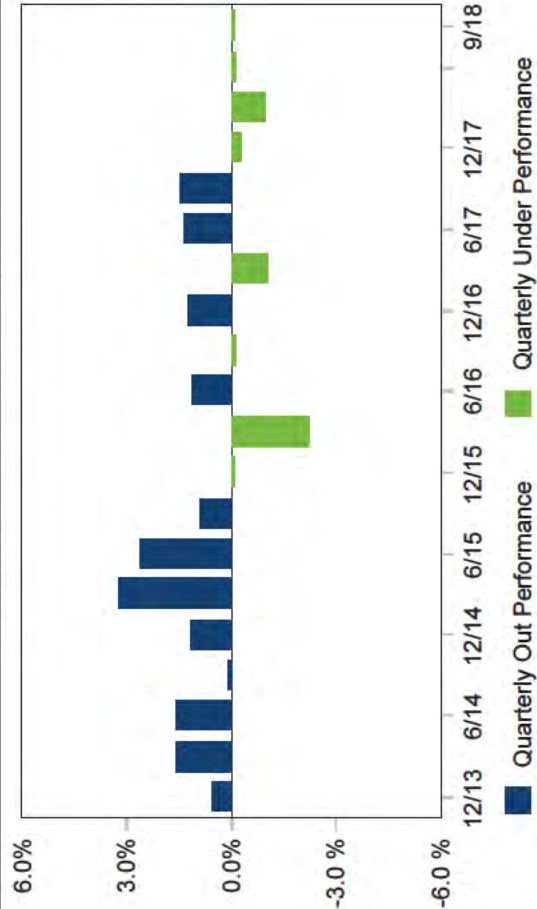
Benchmark: ICE Libor (1 month)

Peer Group:

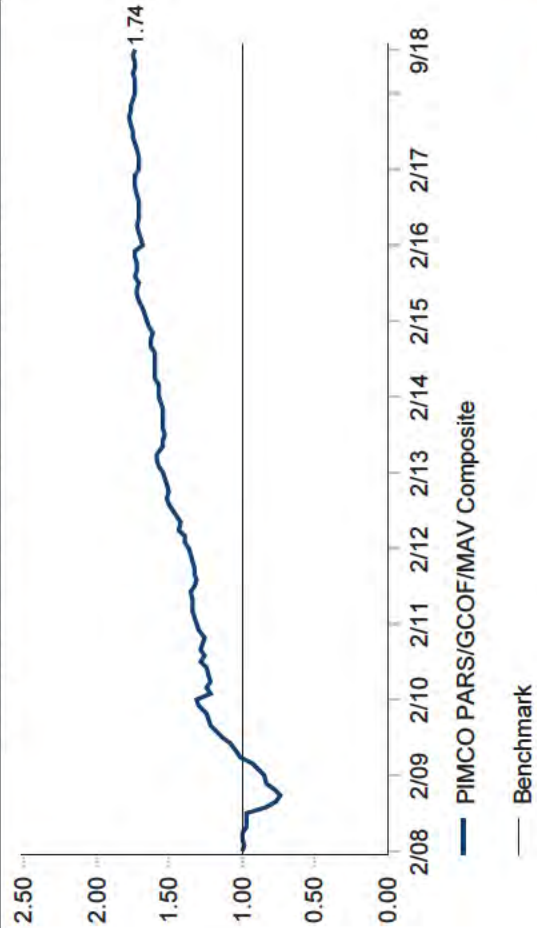
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## PIMCO PARS/GCOF/MAV Composite

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	0.34	1.16	3.15	8.16	6.03	03/01/2008
Standard Deviation	1.98	2.62	2.52	7.13	8.39	
Downside Risk	1.41	2.06	1.64	4.03	5.94	
Downside Semi Deviation	0.68	1.11	3.26	8.03	11.44	
Max Drawdown Recovery Period	N/A	9.00	9.00	3.00	12.00	
Maximum Drawdown	-1.60	-2.95	-2.95	-11.88	-25.72	
Maximum Loss Exposure	-1.06	-2.74	N/A	-11.88	-25.30	
Upside Semi Deviation	0.55	2.01	2.47	7.37	7.28	
ICE Libor (1 month)						
Return	1.78	1.04	0.69	0.52	0.64	
Standard Deviation	0.10	0.18	0.19	0.17	0.22	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.54	0.35	0.27	0.23	0.29	
vs. ICE Libor (1 month)						
Active Return	-1.41	0.15	2.45	7.60	5.59	
Tracking Error	1.96	2.61	2.55	7.18	8.47	
Actual Correlation	0.24	0.09	-0.13	-0.30	-0.37	
Beta	4.90	1.35	-1.77	-12.23	-14.44	
Consistency	41.67	61.11	68.33	71.67	70.08	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	-0.72	0.06	0.96	1.06	0.66	
Jensen Alpha	0.03	-2.27	6.38	17.70	19.25	
Up Market Capture	20.17	114.45	456.44	1,561.88	979.56	
Up Market Outperformance	-1.44	0.12	2.46	7.64	5.39	
vs. FTSE 3 Month T-Bill						
Excess Return	-1.21	0.38	2.65	7.81	5.83	
Excess Risk	1.96	2.61	2.54	7.16	8.44	
Sharpe Ratio	-0.61	0.15	1.04	1.09	0.69	

Calculation based on monthly periodicity.

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Performance Summary

Account Information

Account Name: Two Sigma Risk Premia Enhanced Fund, LP

Inception Date: 05/01/2017

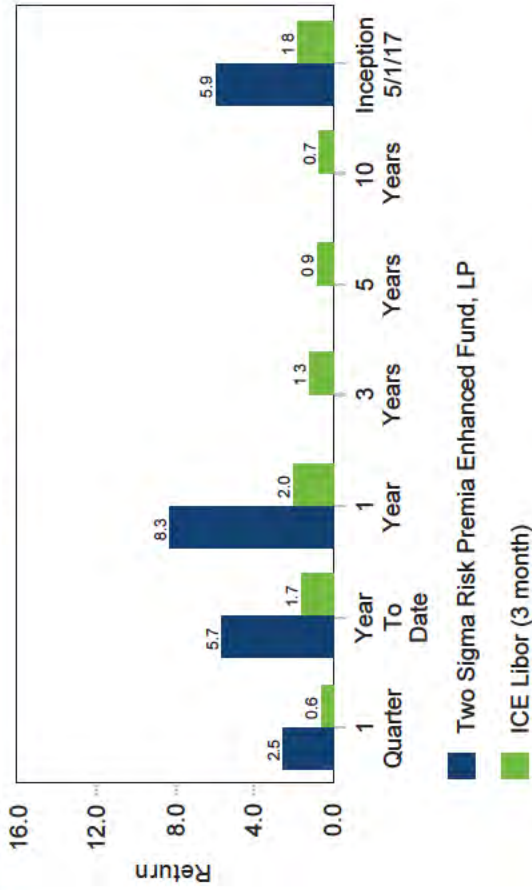
Account Structure: Hedge Fund

Asset Class: ICE Libor (3 month)

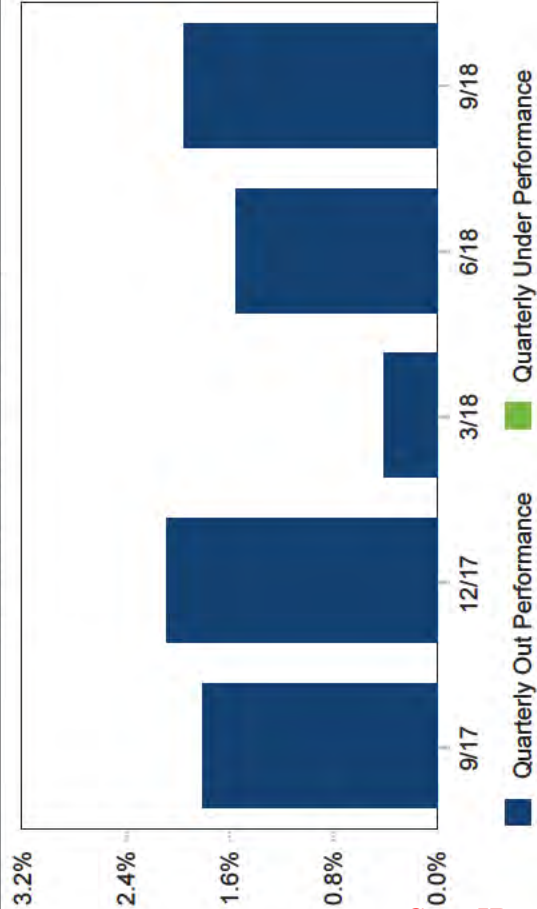
Benchmark: ICE Libor (3 month)

Peer Group:

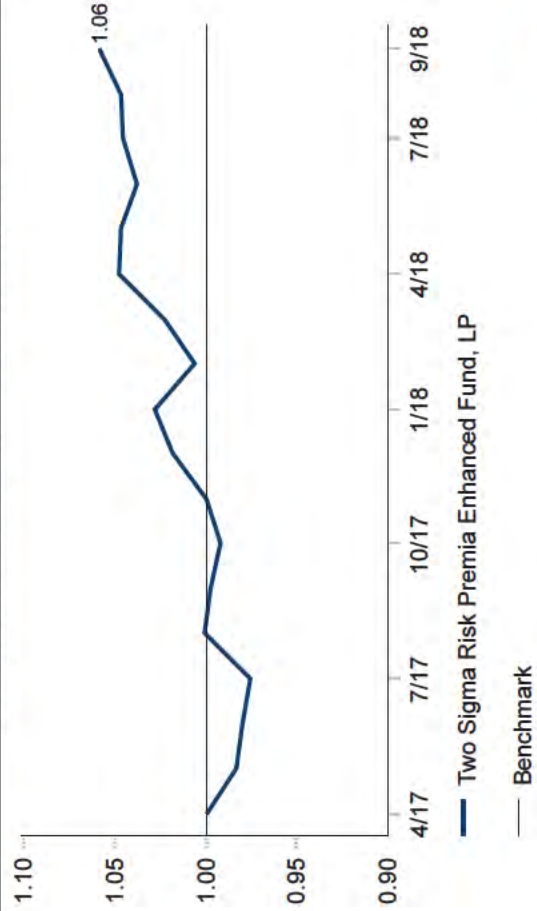
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Two Sigma Risk Premia Enhanced Fund, LP

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	8.27	N/A	N/A	N/A	5.95	05/01/2017
Standard Deviation	4.51	N/A	N/A	N/A	4.71	
Downside Risk	2.25	N/A	N/A	N/A	2.35	
Downside Semi Deviation	1.53	N/A	N/A	N/A	1.11	
Max Drawdown Recovery Period	3.00	N/A	N/A	N/A	3.00	
Maximum Drawdown	-2.02	N/A	N/A	N/A	-2.14	
Maximum Loss Exposure	-0.44	N/A	N/A	N/A	-2.14	
Upside Semi Deviation	1.56	N/A	N/A	N/A	1.71	
ICE Libor (3 month)						
Return	2.04	1.26	0.86	0.70	1.82	
Standard Deviation	0.11	0.19	0.20	0.19	0.14	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.62	0.41	0.32	0.28	0.55	
vs. ICE Libor (3 month)						
Active Return	6.05	N/A	N/A	N/A	4.09	
Tracking Error	4.49	N/A	N/A	N/A	4.67	
Actual Correlation	0.20	N/A	N/A	N/A	0.28	
Beta	7.67	N/A	N/A	N/A	9.74	
Consistency	66.67	N/A	N/A	N/A	52.94	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	1.35	N/A	N/A	N/A	0.88	
Jensen Alpha	-12.60	N/A	N/A	N/A	-5.19	
Up Market Capture	399.87	N/A	N/A	N/A	327.23	
Up Market Outperformance	6.24	N/A	N/A	N/A	4.13	
vs. FTSE 3 Month T-Bill						
Excess Return	6.50	N/A	N/A	N/A	4.52	
Excess Risk	4.50	N/A	N/A	N/A	4.68	
Sharpe Ratio	1.45	N/A	N/A	N/A	0.97	

Calculation based on monthly periodicity.

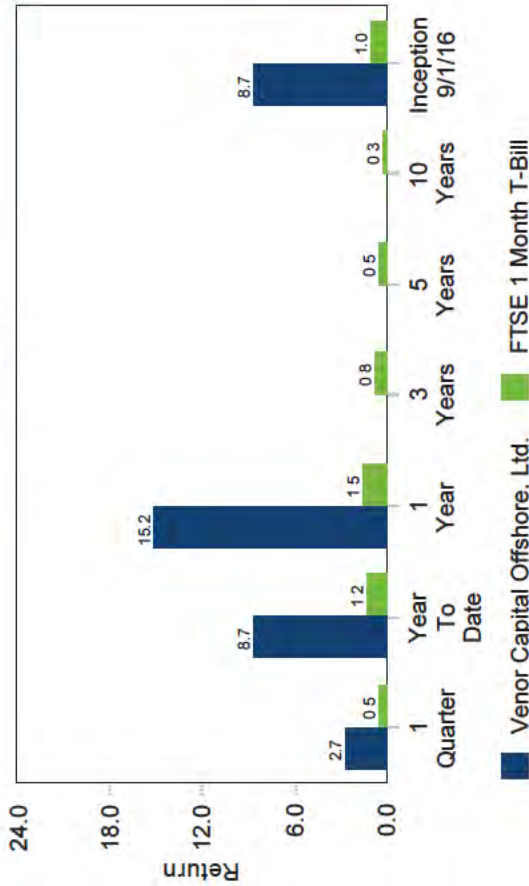
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Performance Summary

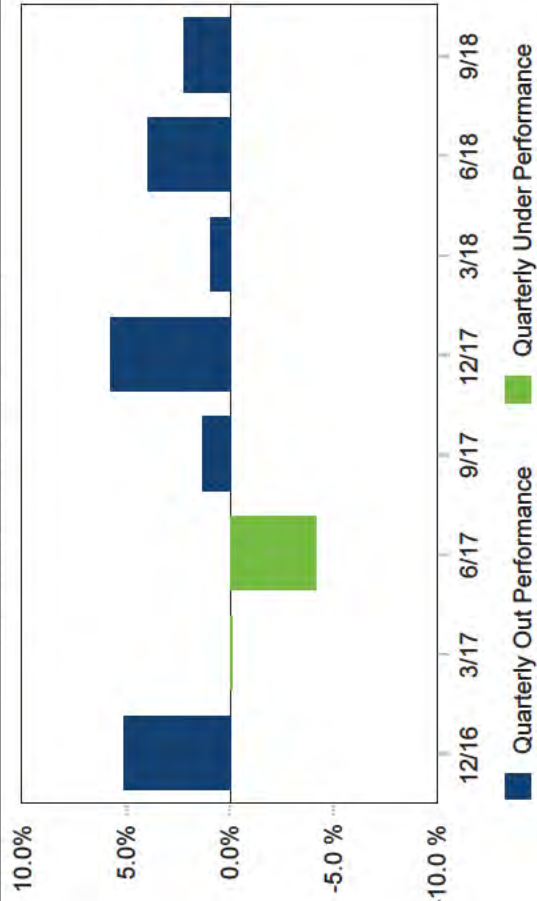
Account Information

Account Name: Venor Capital Offshore, Ltd.  
 Inception Date: 09/01/2016  
 Account Structure: Hedge Fund  
 Asset Class: US Hedge Fund  
 Benchmark: FTSE 1 Month T-Bill  
 Peer Group:

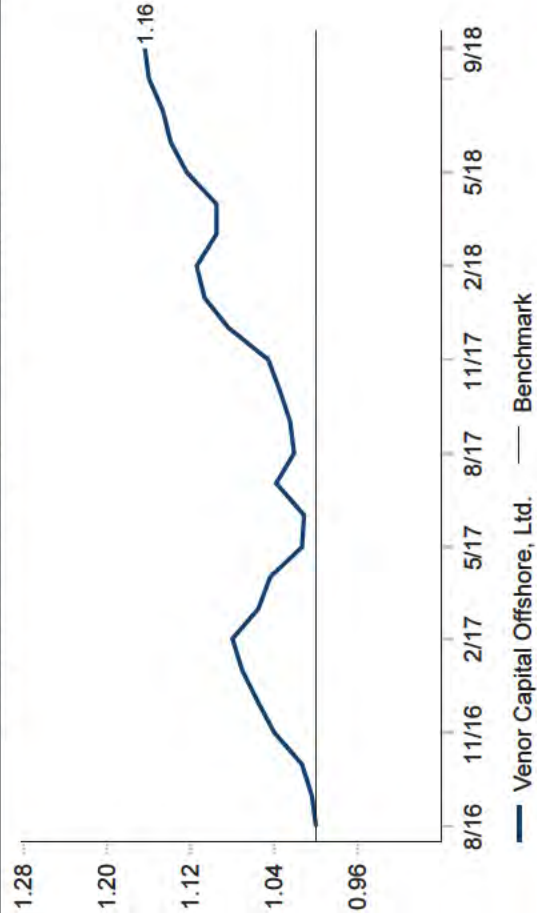
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



## Risk Statistics

## Venor Capital Offshore, Ltd.

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	15.24	N/A	N/A	N/A	8.66	09/01/2016
Standard Deviation	4.67	N/A	N/A	N/A	5.59	
Downside Risk	1.70	N/A	N/A	N/A	3.14	
Downside Semi Deviation	N/A	N/A	N/A	N/A	1.99	
Max Drawdown Recovery Period	3.00	N/A	N/A	N/A	10.00	
Maximum Drawdown	-1.63	N/A	N/A	N/A	-6.13	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	1.86	N/A	N/A	N/A	6.07	
FTSE 1 Month T-Bill						
Return	1.51	0.76	0.46	0.26	1.03	
Standard Deviation	0.10	0.18	0.17	0.14	0.16	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	2.00	3.00	3.00	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	0.00	N/A	N/A	N/A	
Upside Semi Deviation	0.46	0.29	0.22	0.16	0.34	
vs. FTSE 1 Month T-Bill						
Active Return	12.87	N/A	N/A	N/A	7.46	
Tracking Error	4.69	N/A	N/A	N/A	5.57	
Actual Correlation	-0.23	N/A	N/A	N/A	0.10	
Beta	-10.82	N/A	N/A	N/A	3.49	
Consistency	91.67	N/A	N/A	N/A	76.00	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	2.74	N/A	N/A	N/A	1.34	
Jensen Alpha	8.22	N/A	N/A	N/A	3.62	
Up Market Capture	955.57	N/A	N/A	N/A	829.82	
Up Market Outperformance	13.73	N/A	N/A	N/A	7.63	
vs. FTSE 3 Month T-Bill						
Excess Return	12.81	N/A	N/A	N/A	7.41	
Excess Risk	4.69	N/A	N/A	N/A	5.57	
Sharpe Ratio	2.73	N/A	N/A	N/A	1.33	

Calculation based on monthly periodicity.

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## Supplemental Reporting - STIF

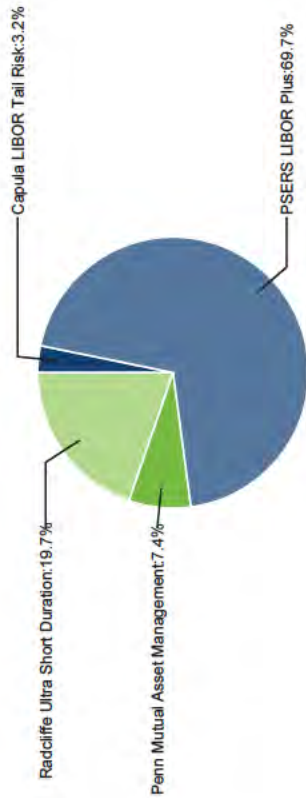
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Case ID: 221102792

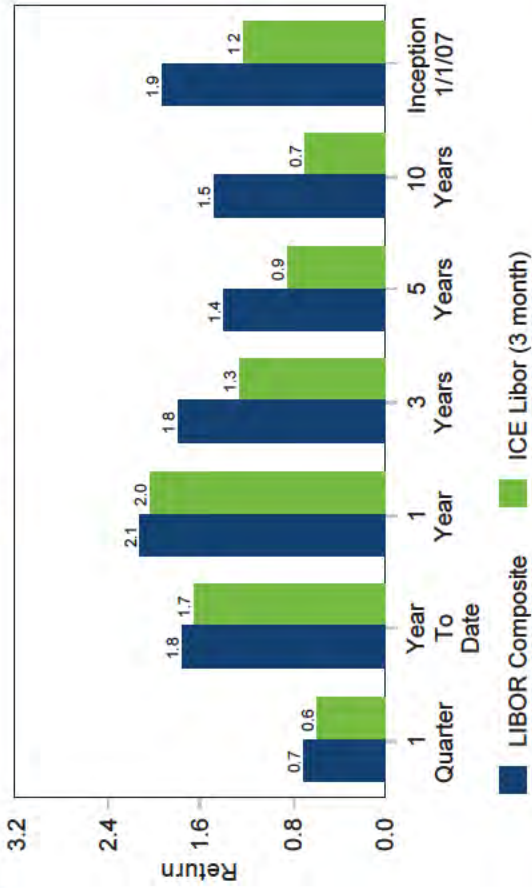
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Current Allocation

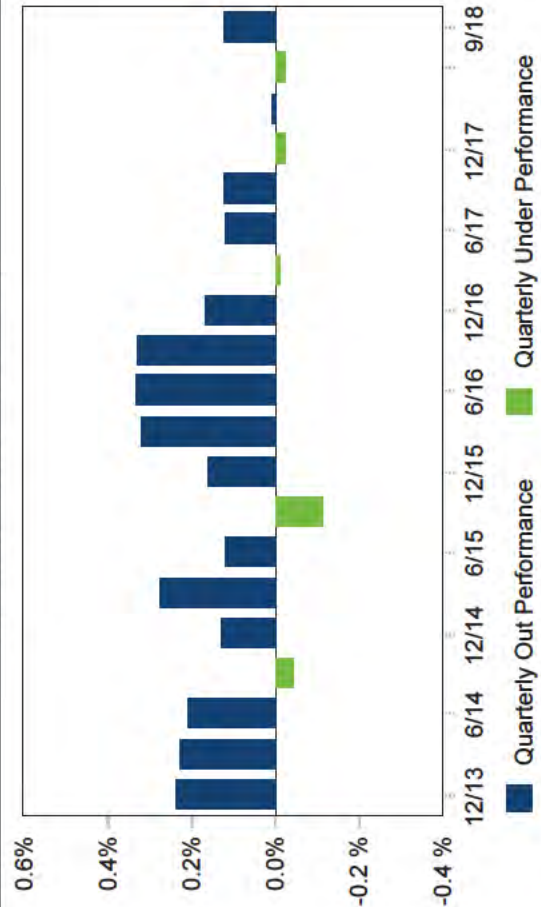
September 30, 2018 : \$1,405M



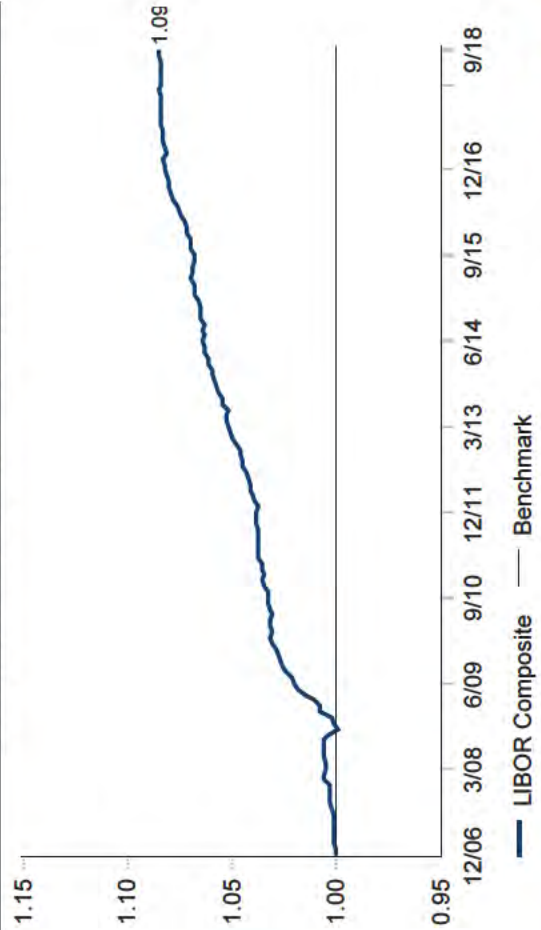
Return Summary



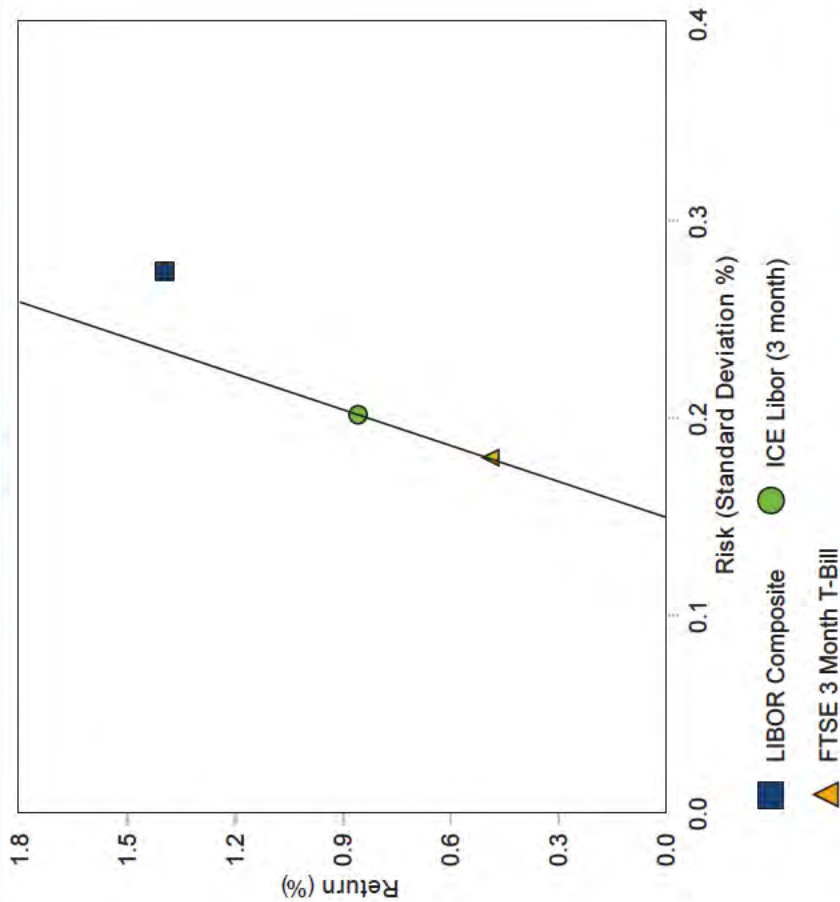
Quarterly Excess Performance



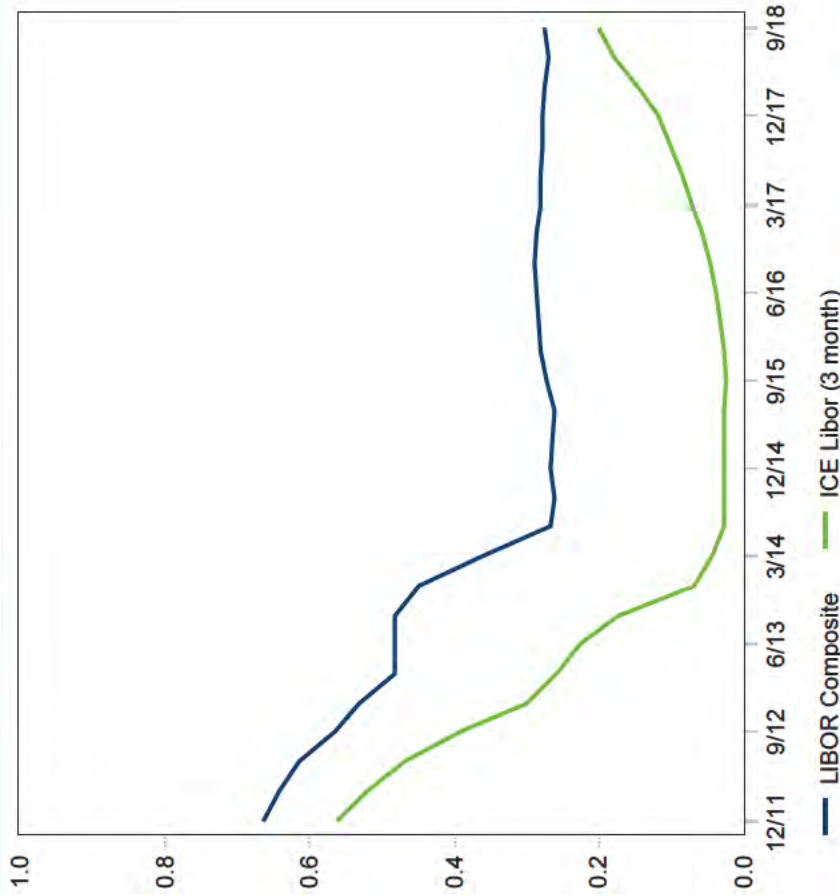
Ratio of Cumulative Wealth - Since Inception



Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
LIBOR Composite	0.53	0.24	2.20	0.27	3.74	0.79	0.71	1.39	0.28	0.52
ICE Libor (3 month)	0.00	0.00	N/A	1.00	9.00	0.00	1.00	0.86	0.20	1.00
FTSE 3 Month T-Bill	-0.36	0.04	-9.00	0.97	N/A	-0.26	0.88	0.49	0.18	0.98

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## Risk Statistics

LIBOR Composite	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.12	1.81	1.39	1.48	1.93	01/01/2007
Standard Deviation	0.19	0.21	0.28	0.39	0.51	
Downside Risk	0.00	0.00	0.04	0.06	0.06	
Downside Semi Deviation	N/A	N/A	0.04	0.18	0.18	
Max Drawdown Recovery Period	N/A	2.00	2.00	1.00	2.00	
Maximum Drawdown	0.00	0.00	-0.08	-0.15	-0.15	
Maximum Loss Exposure	N/A	N/A	N/A	-0.15	N/A	
Upside Semi Deviation	0.66	0.57	0.52	0.61	0.79	
ICE Libor (3 month)						
Return	2.04	1.26	0.86	0.70	1.22	
Standard Deviation	0.11	0.19	0.20	0.19	0.42	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.62	0.41	0.32	0.28	0.55	
vs. ICE Libor (3 month)						
Active Return	0.08	0.54	0.53	0.78	0.70	
Tracking Error	0.13	0.22	0.24	0.39	0.38	
Actual Correlation	0.71	0.36	0.52	0.25	0.68	
Beta	1.16	0.41	0.71	0.51	0.82	
Consistency	50.00	75.00	70.00	74.17	73.76	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	0.62	2.42	2.20	1.99	1.82	
Jensen Alpha	0.79	1.47	0.90	1.05	1.06	
Up Market Capture	104.06	143.27	162.59	212.05	157.35	
Up Market Outperformance	0.08	0.55	0.54	0.78	0.71	
vs. FTSE 3 Month T-Bill						
Excess Return	0.54	0.99	0.90	1.16	1.12	
Excess Risk	0.12	0.22	0.24	0.39	0.38	
Sharpe Ratio	4.45	4.58	3.74	2.99	2.99	

Calculation based on monthly periodicity.

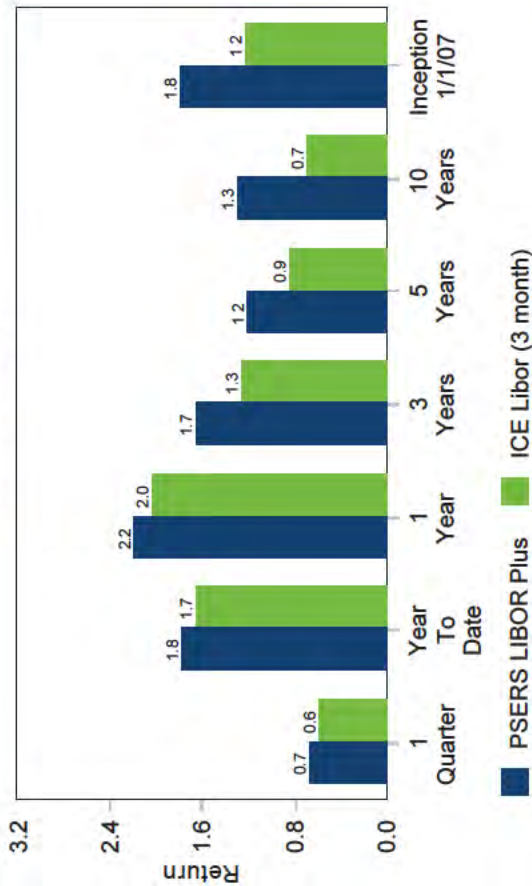
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Performance Summary

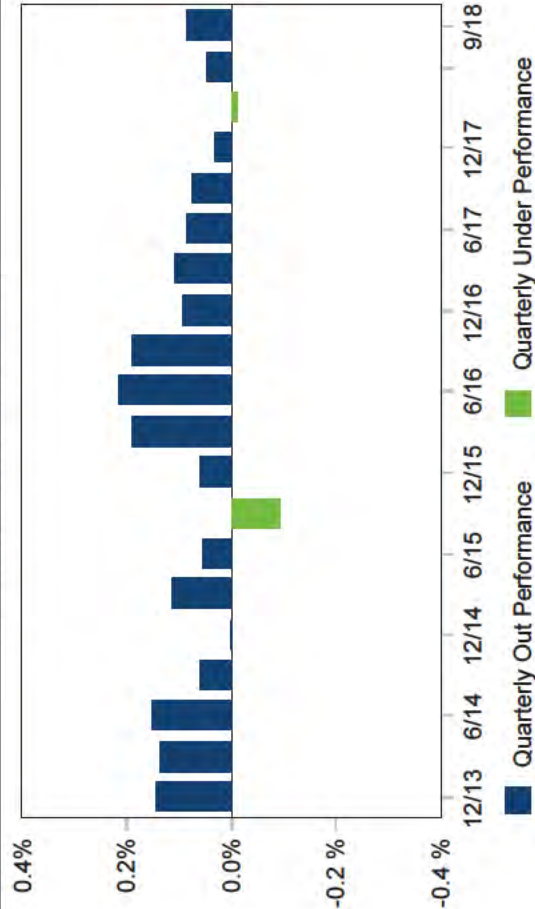
Account Information

Account Name: PSERS LIBOR Plus  
 Inception Date: 01/01/2007  
 Account Structure: Separate Account  
 Asset Class: US Cash  
 Benchmark: ICE Libor (3 month)  
 Peer Group:

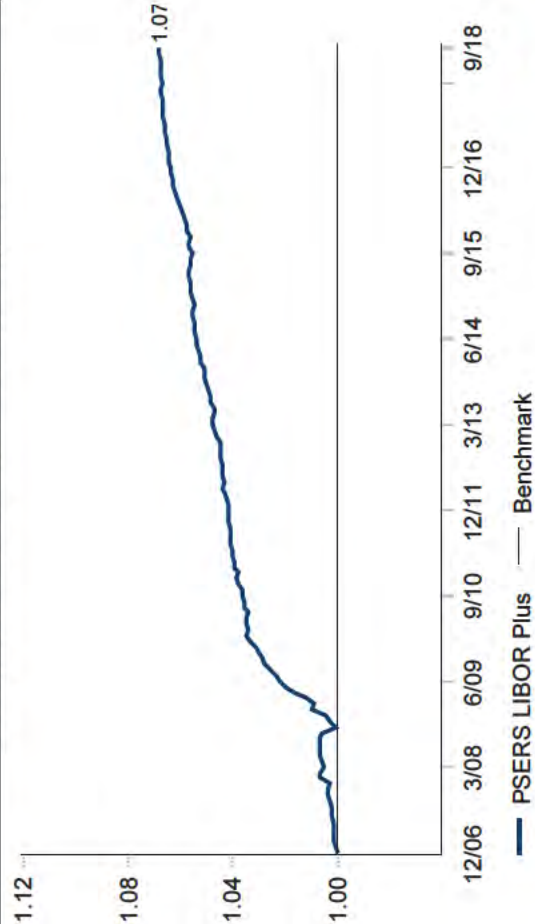
Return Summary



Quarterly Excess Performance

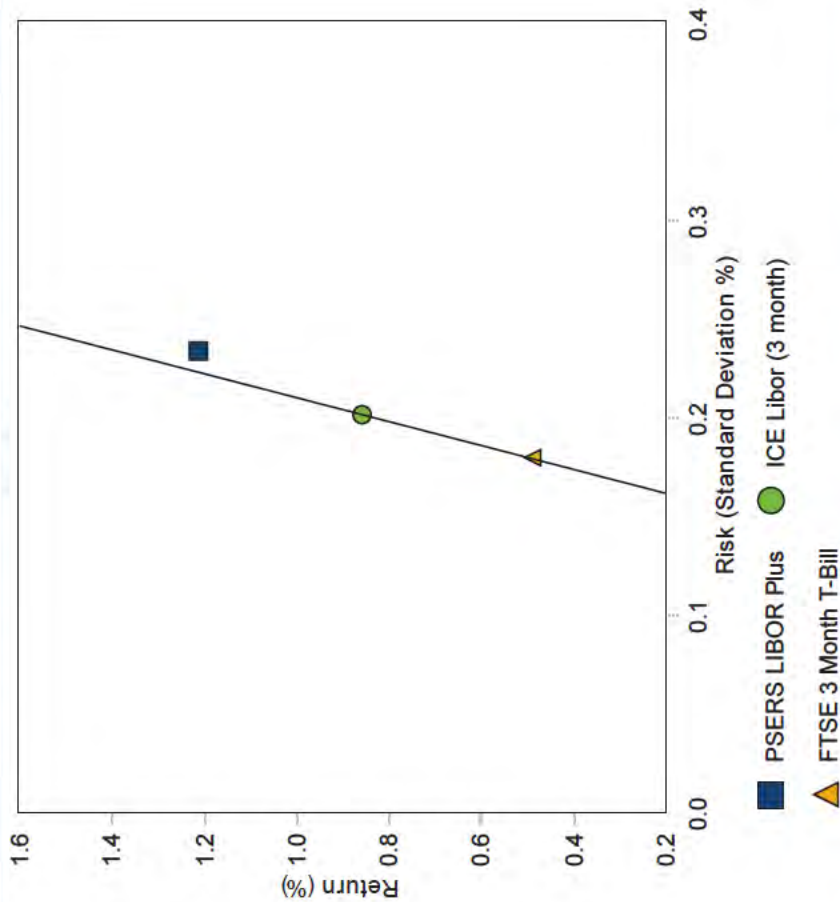


Ratio of Cumulative Wealth - Since Inception

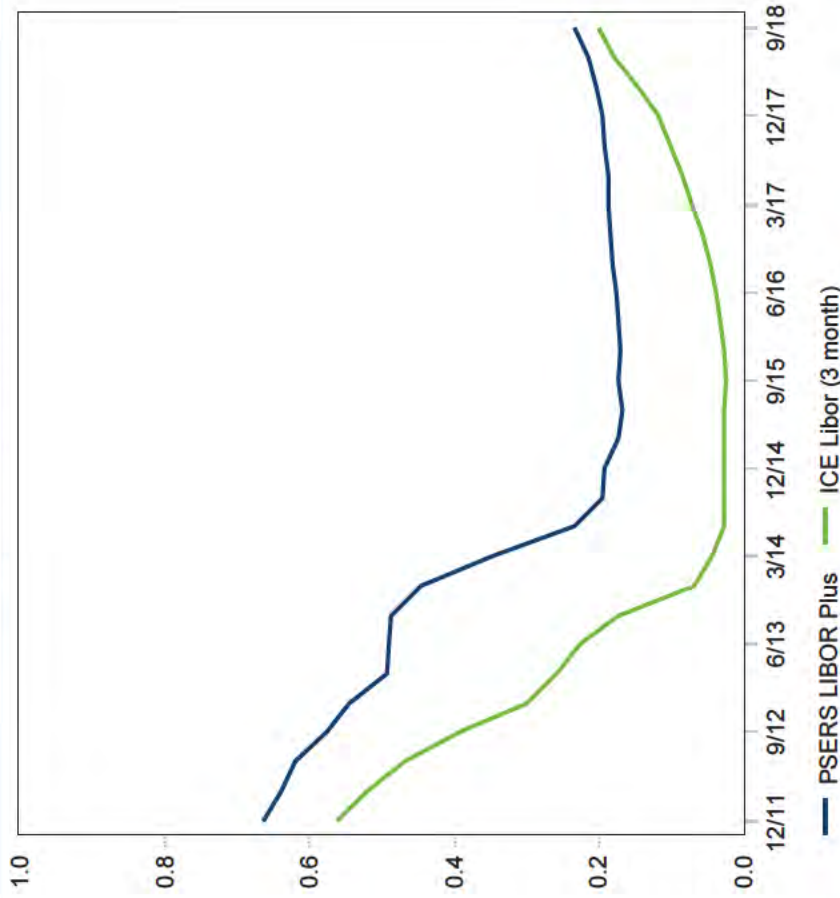


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS LIBOR Plus	0.35	0.15	2.40	0.61	4.74	0.43	0.91	1.21	0.23	0.78
ICE Libor (3 month)	0.00	0.00	N/A	1.00	9.00	0.00	1.00	0.86	0.20	1.00
FTSE 3 Month T-Bill	-0.36	0.04	-9.00	0.97	N/A	-0.26	0.88	0.49	0.18	0.98

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Empower Results®

Risk Statistics

PSERS LIBOR Plus

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	2.20	1.66	1.21	1.30	1.79	01/01/2007
Standard Deviation	0.15	0.17	0.23	0.38	0.52	
Downside Risk	0.00	0.00	0.03	0.06	0.06	
Downside Semi Deviation	N/A	N/A	0.04	0.06	0.06	
Max Drawdown Recovery Period	N/A	N/A	5.00	1.00	2.00	
Maximum Drawdown	0.00	0.00	-0.07	-0.17	-0.17	
Maximum Loss Exposure	N/A	N/A	N/A	-0.17	N/A	
Upside Semi Deviation	0.67	0.51	0.44	0.56	0.75	
ICE Libor (3 month)						
Return	2.04	1.26	0.86	0.70	1.22	
Standard Deviation	0.11	0.19	0.20	0.19	0.42	
Downside Risk	0.00	0.00	0.00	0.00	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	N/A	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	N/A	
Maximum Drawdown	0.00	0.00	0.00	0.00	0.00	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.62	0.41	0.32	0.28	0.55	
vs. ICE Libor (3 month)						
Active Return	0.16	0.39	0.35	0.60	0.56	
Tracking Error	0.08	0.12	0.15	0.37	0.35	
Actual Correlation	0.84	0.79	0.78	0.33	0.73	
Beta	1.07	0.73	0.91	0.64	0.89	
Consistency	75.00	86.11	78.33	78.33	78.01	
Down Market Capture	N/A	N/A	N/A	N/A	N/A	
Down Market Outperformance	N/A	N/A	N/A	N/A	N/A	
Information Ratio	1.96	3.36	2.40	1.65	1.58	
Jensen Alpha	0.43	0.64	0.40	0.82	0.81	
Up Market Capture	107.83	131.44	141.42	186.96	146.14	
Up Market Outperformance	0.16	0.40	0.36	0.61	0.57	
vs. FTSE 3 Month T-Bill						
Excess Return	0.61	0.84	0.72	0.98	0.99	
Excess Risk	0.08	0.12	0.15	0.37	0.35	
Sharpe Ratio	7.74	7.22	4.74	2.69	2.79	

Calculation based on monthly periodicity.

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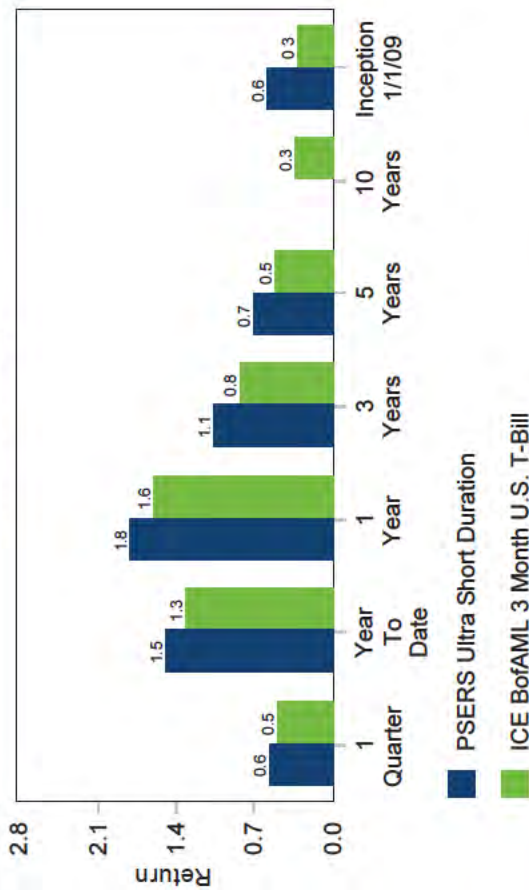


Performance Summary

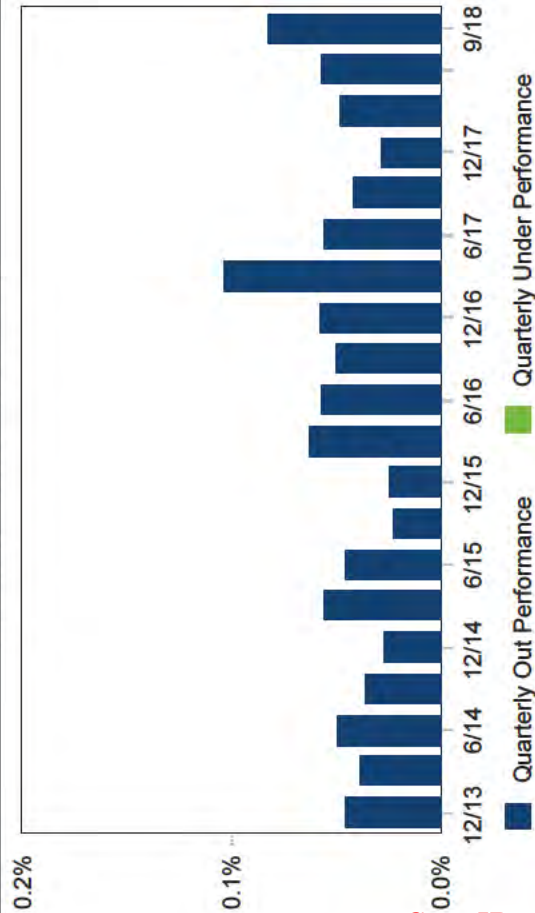
Account Information

Account Name: PSERS Ultra Short Duration  
 Inception Date: 01/01/2009  
 Account Structure: Separate Account  
 Asset Class: Cash  
 Benchmark: ICE BofAML 3 Month U.S. T-Bill  
 Peer Group:

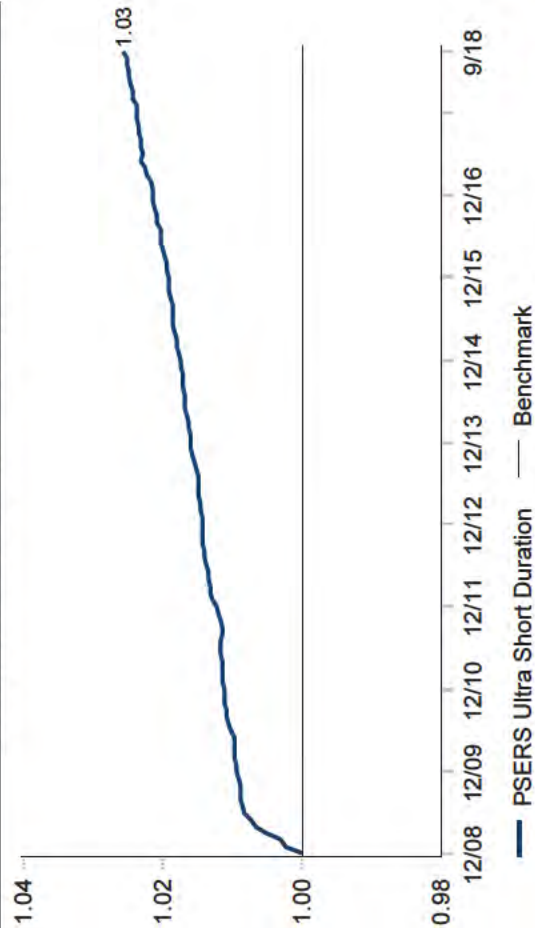
Return Summary



Quarterly Excess Performance



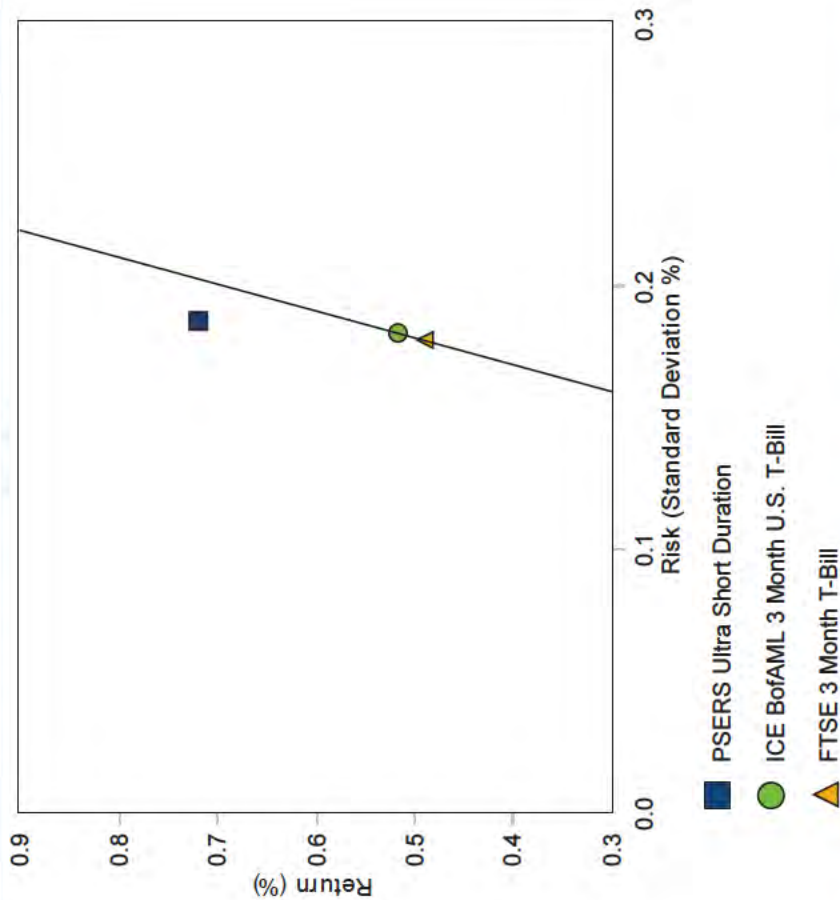
Ratio of Cumulative Wealth - Since Inception



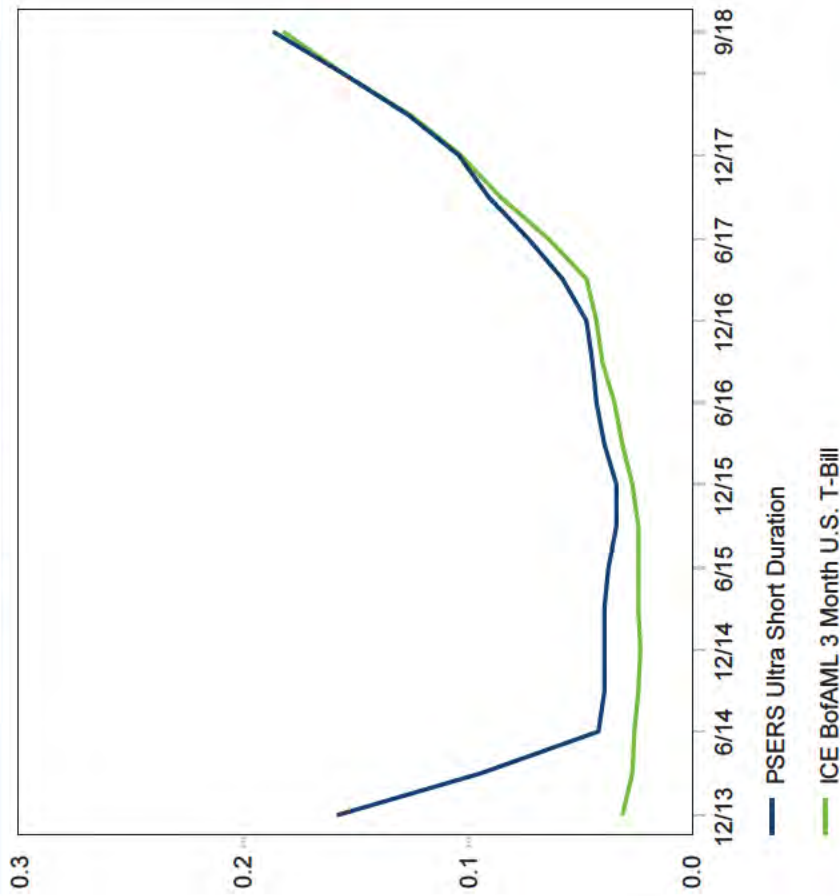


Risk Profile

Annualized Return vs. Annualized Standard Deviation  
5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
PSERS Ultra Short Duration	0.20	0.04	4.70	0.95	8.71	0.20	1.00	0.72	0.19	0.97
ICE BofAML 3 Month U.S. T-Bill	0.00	0.00	N/A	1.00	0.80	0.00	1.00	0.52	0.18	1.00
FTSE 3 Month T-Bill	-0.03	0.03	-0.80	0.97	N/A	-0.01	0.97	0.49	0.18	0.98

Risk Statistics

PSERS Ultra Short Duration

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Return	1.81	1.06	0.72	N/A	0.59	01/01/2009
Standard Deviation	0.12	0.18	0.19	N/A	0.18	
Downside Risk	0.00	0.00	0.00	N/A	0.00	
Downside Semi Deviation	N/A	N/A	N/A	N/A	0.01	
Max Drawdown Recovery Period	N/A	N/A	N/A	N/A	3.00	
Maximum Drawdown	0.00	0.00	0.00	N/A	-0.01	
Maximum Loss Exposure	N/A	N/A	N/A	N/A	N/A	
Upside Semi Deviation	0.56	0.36	0.28	N/A	0.25	

ICE BofAML 3 Month U.S. T-Bill

Return	1.59	0.84	0.52	0.34	0.33	
Standard Deviation	0.11	0.18	0.18	0.15	0.14	
Downside Risk	0.00	0.00	0.00	0.01	0.01	
Downside Semi Deviation	N/A	N/A	0.01	0.01	0.01	
Max Drawdown Recovery Period	N/A	2.00	3.00	2.00	1.00	
Maximum Drawdown	0.00	-0.01	-0.01	-0.01	-0.01	
Maximum Loss Exposure	N/A	-0.01	0.00	N/A	-0.01	
Upside Semi Deviation	0.49	0.31	0.24	0.18	0.18	

vs. ICE BofAML 3 Month U.S. T-Bill

Active Return	0.22	0.22	0.20	N/A	0.26	
Tracking Error	0.05	0.05	0.04	N/A	0.11	
Actual Correlation	0.92	0.96	0.97	N/A	0.77	
Beta	1.01	0.95	1.00	N/A	0.96	
Consistency	91.67	91.67	93.33	N/A	90.60	
Down Market Capture	N/A	-238.57	-313.75	N/A	-946.15	
Down Market Outperformance	N/A	0.02	0.07	N/A	0.41	
Information Ratio	4.49	4.46	4.70	N/A	2.26	
Jensen Alpha	0.24	0.26	0.23	N/A	0.30	
Up Market Capture	113.75	125.80	135.88	N/A	166.00	
Up Market Outperformance	0.22	0.22	0.20	N/A	0.24	

vs. FTSE 3 Month T-Bill

Excess Return	0.23	0.26	0.23	N/A	0.29	
Excess Risk	0.03	0.03	0.03	N/A	0.11	
Sharpe Ratio	8.21	9.74	8.71	N/A	2.65	

Calculation based on monthly periodicity.

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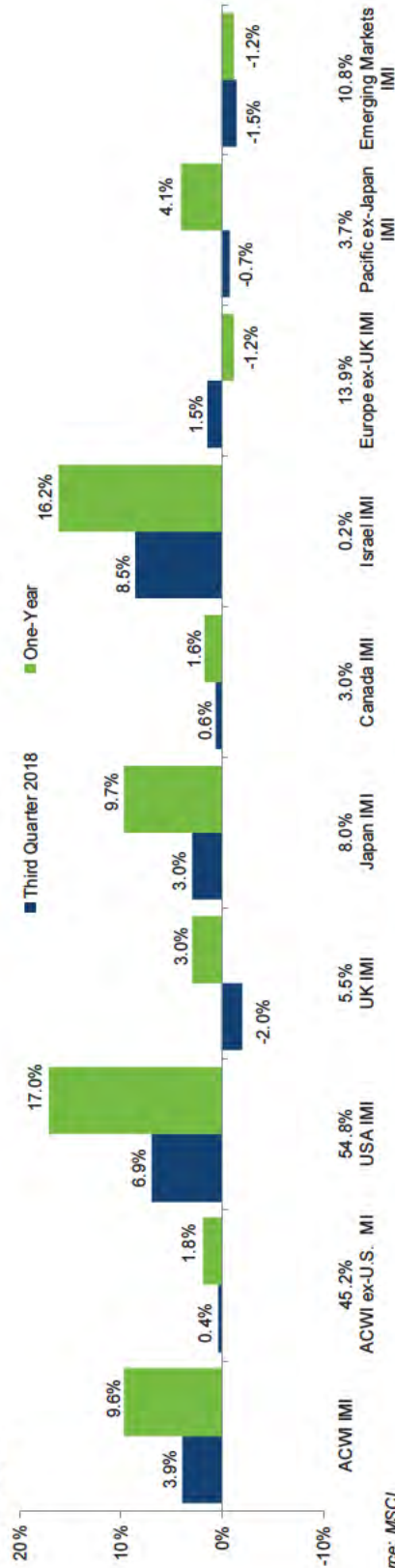


# Market Environment

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## Global Equity Markets

GLOBAL MSCI IMI INDEX RETURNS  
AS OF 09/30/2018



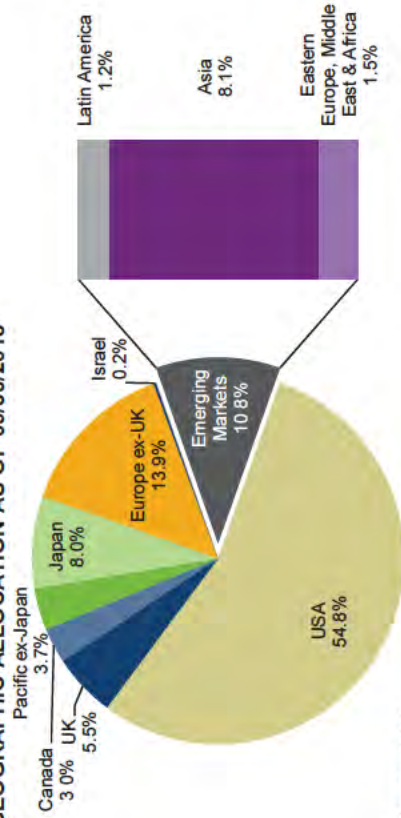
- Trade negotiation developments were keenly watched in Q3 2018. A last-minute compromise in the U.S.-Canada trade negotiations late in the quarter looks set to pave the way for the U.S.-Mexico-Canada (USMCA) agreement to be ratified by all three member governments towards the end of this year. However, U.S.-China trade relations continued to deteriorate. Despite this, global equities returned 3.9% in Q3 2018.
- U.S. equities continued to perform well in Q3 2018. This was supported by encouraging earnings and upbeat US economic data, with real GDP growth hitting 4.2% (year-on-year) and the Institute of Supply Management's (ISM) manufacturing index topping 60 once more in September. The combination of strong U.S. economic performance and robust corporate earnings growth elevated U.S. equity markets to new heights with the S&P 500 index hitting record levels.
- UK equities fell the most over the quarter as U.S. Dollar terms in a quarter where Brexit negotiations became increasingly anxious after several key elements of the UK Government's so-called "Chequers" plan for Brexit negotiations were rejected by the European Union (EU). European equities only modestly increased with concerns over the Italian budget and European banks' exposure to Turkey, which was exposed to a currency and debt crisis, weighing on the market.
- Trade war escalations, a strengthening U.S. dollar and concerns over the Chinese economy—all prominent features from the second quarter—were mainstays over Q3 for Emerging Markets (EM) equities. Consequently, EM equities fell 1.5% in U.S. dollar terms over the quarter.

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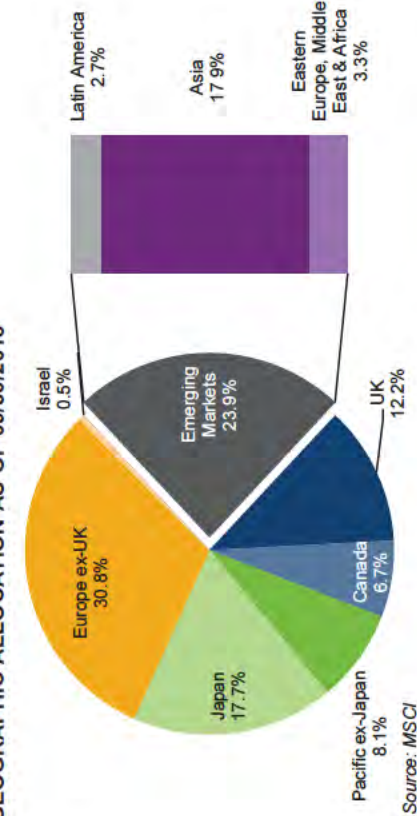
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# Global Equity Markets

MSCI ALL COUNTRY WORLD IMI INDEX  
GEOGRAPHIC ALLOCATION AS OF 09/30/2018



MSCI ALL COUNTRY WORLD EX-U.S. IMI INDEX  
GEOGRAPHIC ALLOCATION AS OF 09/30/2018

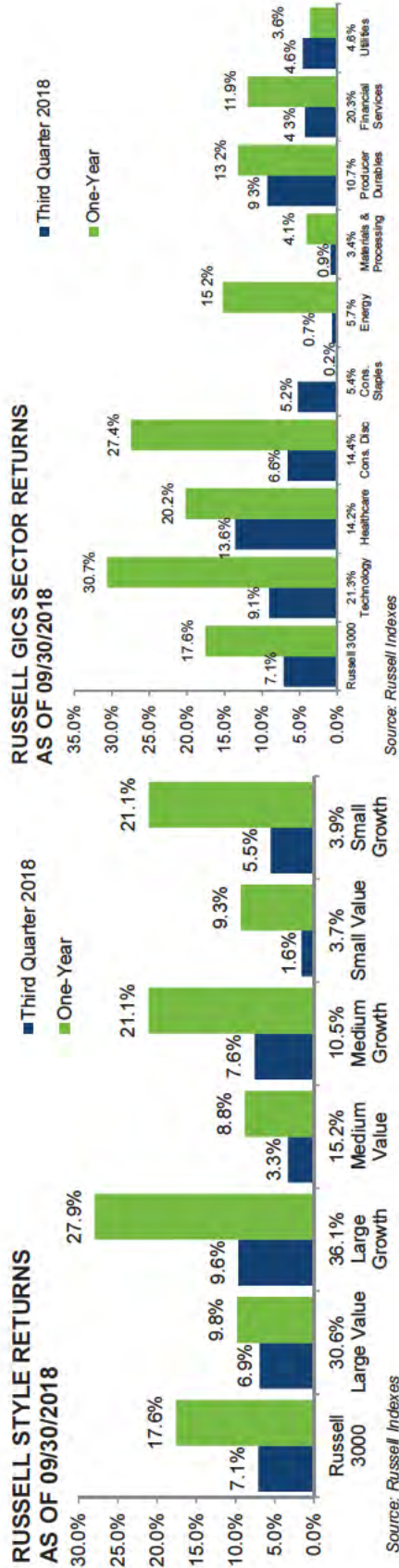


- The two exhibits on this slide illustrate the percentage that each country/region represents of the global and international equity markets as measured by the MSCI All Country World IMI Index and the MSCI All Country World ex-U.S. IMI Index, respectively.

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## U.S. Equity Markets



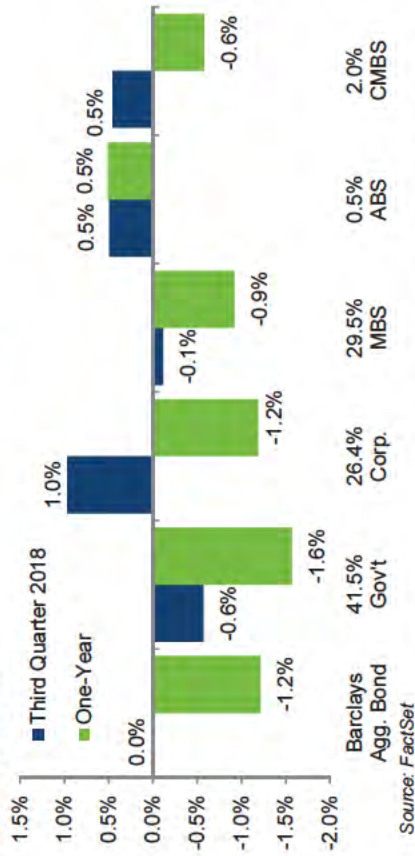
- The Russell 3000 Index returned 7.1% during the third quarter and 17.6% over the one-year period.
- All sectors generated positive returns over the quarter. In particular, Healthcare (13.6%) and Producer Durables (9.3%) were the strongest performing sectors in Q3 2018. The Technology sector continued to perform strongly (9.1%) over the quarter supported by very strong earnings for mega-cap technology stocks, such as Amazon, Apple and Microsoft.
- Performance was positive across the market capitalization spectrum over the quarter. In general, large cap stocks outperformed both medium and small cap stocks over the quarter. Small cap stocks were led lower by poor performance of Financial and Healthcare stocks.
- Growth stocks outperformed their Value counterparts in Q3 2018. Over the last 12 months, Value stocks continued to lag their Growth stock equivalents significantly. The underperformance of Value stocks can be partly attributed to the lower exposure to Technology stocks, which have performed strongly over the last year.

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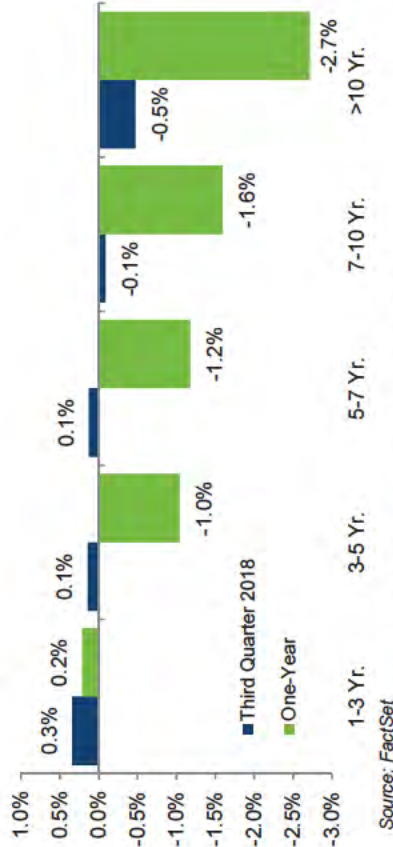
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## U.S. Fixed Income Markets

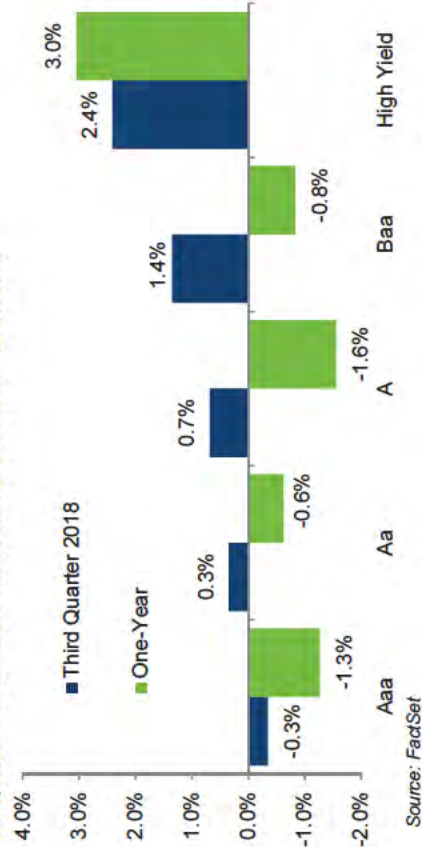
**BLOOMBERG BARCLAYS AGGREGATE RETURNS BY SECTOR AS OF 09/30/2018**



**BLOOMBERG BARCLAYS AGGREGATE RETURNS BY MATURITY AS OF 09/30/2018**



**BLOOMBERG BARCLAYS U.S. AGGREGATE RETURNS BY QUALITY AND HIGH YIELD RETURNS AS OF 09/30/2018**

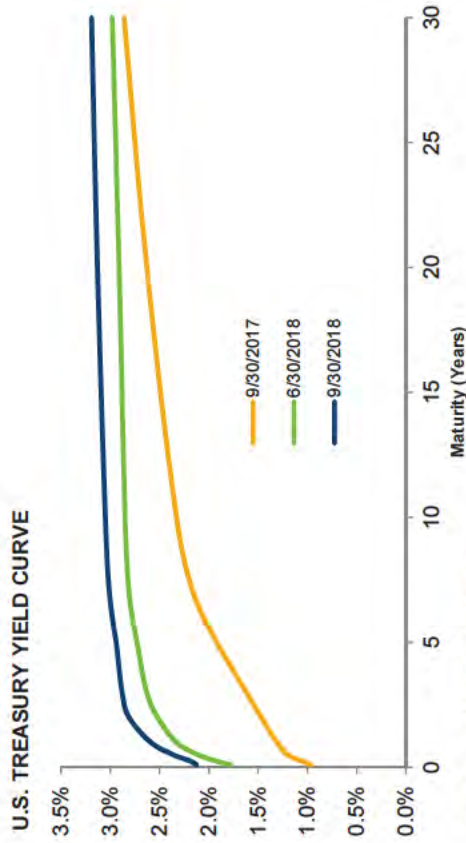


- The Bloomberg Barclays U.S. Aggregate Bond Index remained flat in the third quarter. Investment grade corporate bonds was the best performer over the quarter at 1.0% whilst government bonds was the worst performer at -0.6%.
- Performance was positive across all credit qualities, with the exception of AAA bonds which fell 0.3%, as spreads tightened over the quarter. High yield bonds returned the most at 2.4%. In investment grade bonds, Baa bonds were the major outperformer with a return of 1.4%.
- Short maturity bonds outperformed intermediate and long maturity bonds over the quarter. Short maturity bonds returned 0.3% while long maturity bonds fell 0.5% in Q3 2018.

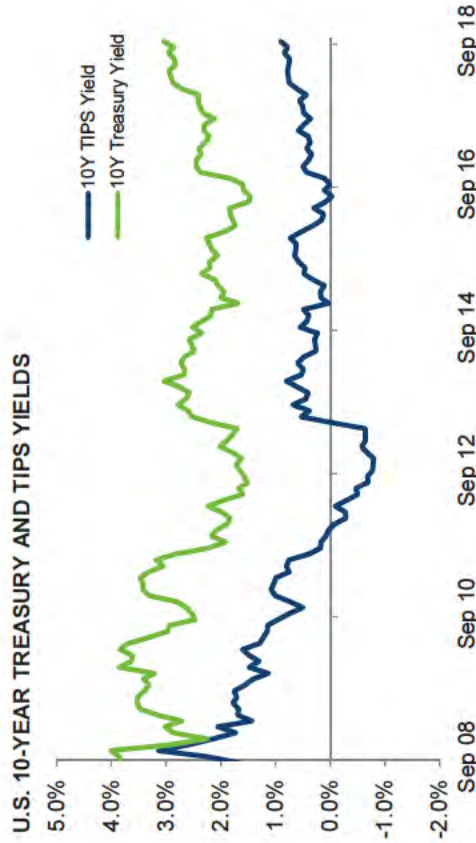
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## U.S. Fixed Income Markets



Source: U.S. Department of Treasury



Source: U.S. Department of Treasury

- The yield curve flattened over the quarter with yields rising across maturities. The spread between the 10-year and 2-year U.S. Treasury yield narrowed to 24bps from 33bps. This flattening is very likely signalling bond market caution on economic growth prospects once the U.S. tax stimulus has flowed through.
- The US Federal Reserve (Fed) continued to tighten monetary policy, increasing the federal funds rate by 25bps to a range of 2.0-2.25%. While this rate hike now puts U.S. monetary policy above the Fed's preferred measure of inflation, the core Personal Consumption Expenditure price index, for the first time since the financial crisis, the real Fed funds rate (see chart below) is still very low historically and still broadly accommodative.
- The recent move in U.S. nominal government bond yields has primarily been driven by real yields, rather than market-implied expectations of future inflation. The 10-year U.S. treasury yield rose by 20bps to 3.05% with 18bps attributable to the increase in the duration-equivalent TIPS yield.

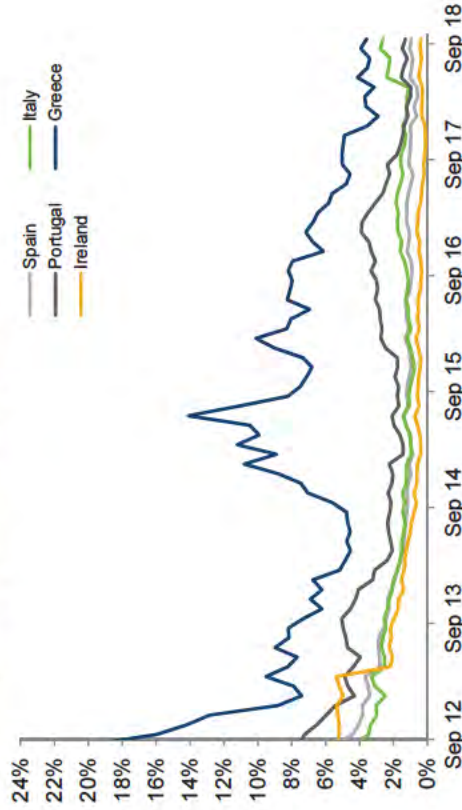
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## European Fixed Income Markets

EUROZONE PERIPHERAL BOND SPREADS  
(10-YEAR SPREADS OVER GERMAN BONDS)



Source: Factset

- Changes in bond spreads over 10-year German bunds were mixed across the eurozone. The European Central Bank (ECB) reiterated its expectations that any tightening to conventional monetary policy would only take place in the second half of 2019. We are, however, drawing nearer to the end of quantitative easing in the Eurozone which could ease downward pressure on bond yields that has prevailed for several years and potentially remove support for risk assets.
- Italian bond yields rose by 49bps to 3.18%, as the country's populist coalition agreed a budget with a fiscal deficit of 2.4%, significantly higher than finance minister Giovanni Tria's preferred target of a 1.6% deficit. The spread between Italian 10-year government bonds and German bunds widened by 32bps. Spanish government bond yields rose by 19bps to 1.51% over the quarter.
- Greek government bond yields rose by 20bps to 4.14% as the ECB confirmed it would stop providing liquidity to Greek banks, by accepting Greek government bonds as collateral, after Greece's bail-out deal. Over the quarter, the S&P improved its credit rating for Greece to positive from stable.

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## Credit Spreads

Spread (bps)	09/30/2018	06/30/2018	09/30/2017	Quarterly Change (bps)	1-Year Change (bps)
U.S. Aggregate	39	44	38	-5	1
Long Govt	2	1	2	1	0
Long Credit	153	174	149	-21	4
Long Govt/Credit	90	101	90	-11	0
MBS	28	28	22	0	6
CMBS	60	70	71	-10	-11
ABS	38	47	44	-9	-6
Corporate	106	123	101	-17	5
High Yield	316	363	347	-47	-31
Global Emerging Markets	273	288	235	-15	38

Source: FactSet

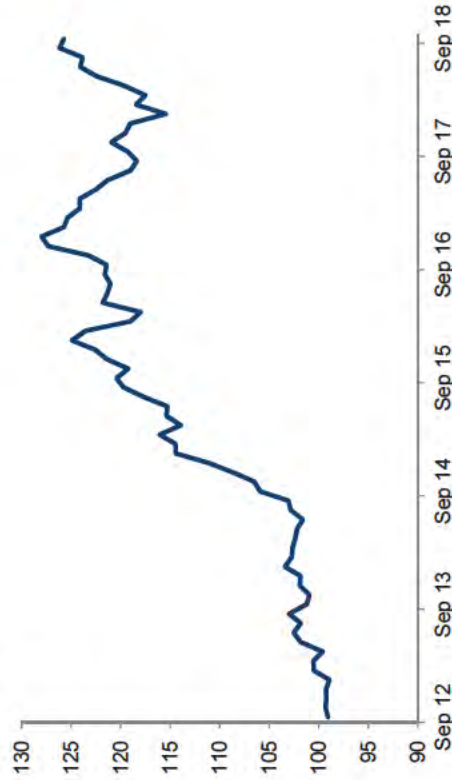
- Credit spreads whipsawed over the third quarter, as initial narrowing over July was offset by spreads blowing out in August, before contracting again in September. Overall, spreads were down over the three months supporting credit market outperformance over government bonds.
- U.S. Corporate bond spreads and Long Government/Credit bond spreads narrowed by 17bps and 11bps, respectively. Of the longer maturity indexes, Long Credit narrowed the most at 21bps.
- The strong relative performance of high yield bonds persisted; spreads on the Bloomberg Barclays US High Yield Index dropped by 47bps to 316bps, and primarily drove the 2.4% quarterly return. High yield also benefitted from lower interest rate sensitivity relative to the broader credit index.
- Long Government bonds spreads widened by 1bp whilst MBS bonds spreads remained unchanged.

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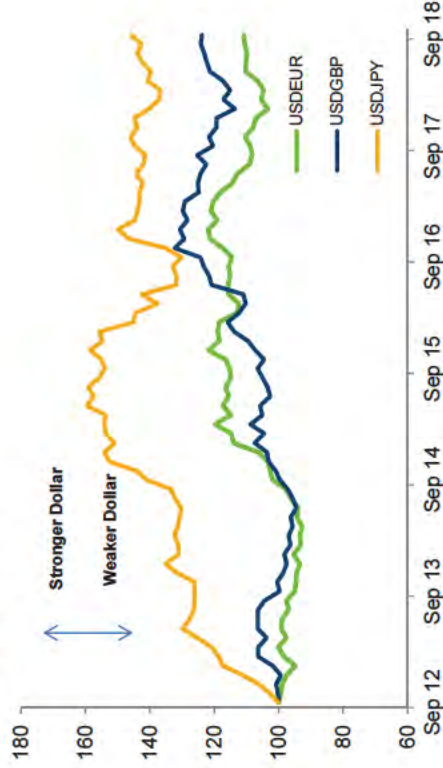
## Currency

TRADE WEIGHTED U.S. DOLLAR INDEX  
(1997 = 100)



Source: Federal Reserve

U.S. DOLLAR RELATIVE TO EUR, GBP AND JPY  
REBASED TO 100 AT 09/28/2012



Source: Factset

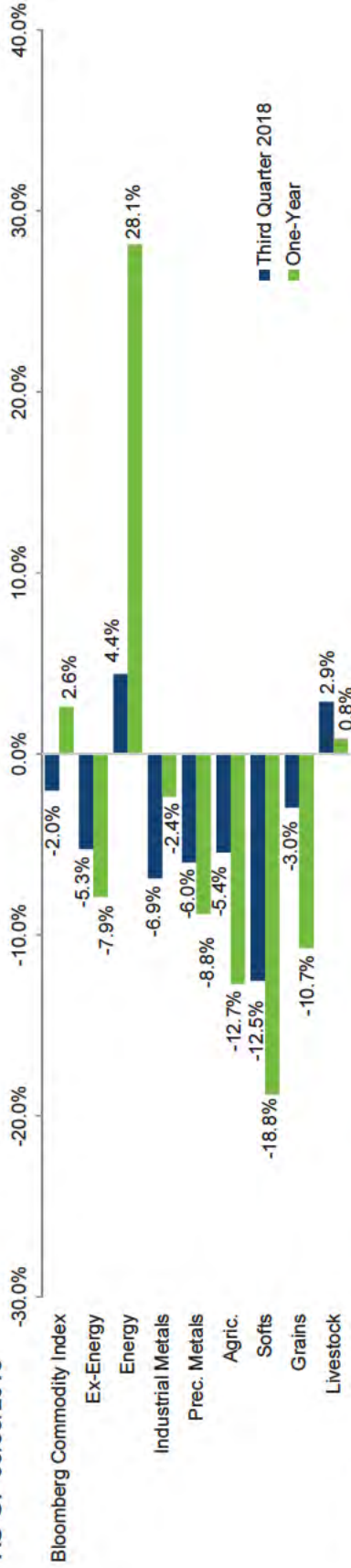
- The U.S. dollar continued on an upward trend albeit to a lesser extent compared to the previous two quarters as it rose 1.3% on a trade-weighted basis over the quarter. Tightening U.S. monetary policy and strong economic fundamentals led the U.S. dollar higher.
- The U.S. dollar appreciated against all the major currencies. Brexit uncertainty in the UK, Italian budget uncertainty in the Eurozone and widening interest rate differentials with the Bank of Japan (BoJ) contributed to the strong U.S. dollar performance. During the quarter, the BoJ loosened its yield curve control policy; the yield on 10-year Japanese government bonds will now be able to fluctuate by 0.2% around zero, up from the previous range of 0.1%.
- The Canadian dollar performed strongly against a wide range of currencies, most notably against the Japanese yen (an appreciation of 4.4% in Q3 2018). Uncertainty surrounding the future of the Canadian economy was allayed late in the quarter as concessions were made with the late save in the form of the USMCA agreement.

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## Commodities

### COMMODITY RETURNS AS OF 09/30/2018



Source: Bloomberg

Note: Softs and Grains are part of the wider Agriculture sector

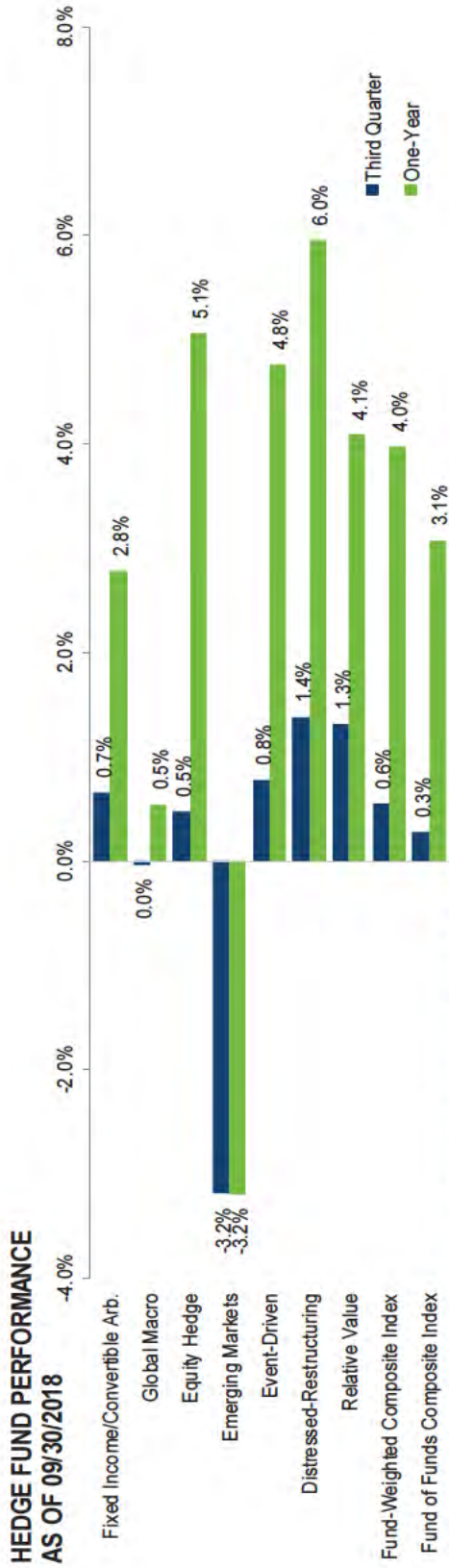
- The Bloomberg Commodity Index returned -2.0% during a weak quarter for commodities.
- Energy was the best performing sector over the quarter with a return of 4.4%. The uncertainty of the impact on U.S. sanctions against Iran and OPEC's response, helped send Brent crude oil prices higher. However, the glut of U.S. crude oil supplies dragged down the price of WTI crude oil to US\$73.16/bbl – the price spread relative to Brent crude oil widened to just under US\$10/bbl.
- Other than Energy, the other notable increase was Livestock, which rose by 2.9% in Q3 2018.
- Meanwhile, agriculture and industrial metal commodities, which are more impacted by global trade uncertainty, detracted from the overall index return. Industrial metals (-6.9%) were particularly affected with the price of copper dropping by 7.0% over the quarter to US\$6,180/bbl.
- The detrimental impact of a stronger U.S. dollar on commodities was noticeable in other markets with declines in Softs, Grains, and Precious Metals.

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## Hedge Fund Markets Overview



Note: Latest 5 months of HFR data are estimated by HFR and may change in the future.  
Source: HFR

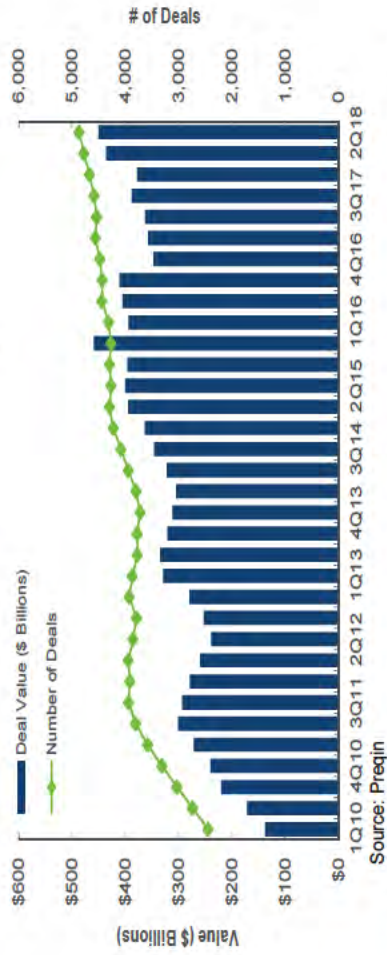
- Hedge fund performance was positive across all strategies (except for Emerging Markets) in the third quarter. Distressed-Restructuring and Relative Value were the best performers with a return of 1.4% and 1.3% respectively whilst Emerging Market hedge funds continued to be the worst performer with a return of -3.2%.
- July performance was positive across most strategies with Relative Value and Equity Hedge leading the way. August performance was led by Macro hedge funds, snapping a 3-month decline. Driven by currency exposure, Macro sub-strategy performance was led by quantitative, trend-following CTA strategies. September strategy performance was led by Relative Value funds mainly due to Sovereign bond and Asset Backed exposures.
- HFRI Fund-Weighted Composite Index and the HFR I Fund of Funds Composite Index produced returns of 0.6% and 0.3% respectively.

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## Private Equity Market Overview – Q2 2018 – Slide 1 of 2

### LTM Global Private Equity-Backed Buyout Deal Volume



- Fundraising:** In Q2 2018, \$147.8 billion was raised by 285 funds, an increase of 17.1% on a capital basis and 3.9% by number of deals from the prior quarter. However, this marks a decline of 29.3% and 20.2% by number of funds and by capital raised, respectively, over Q2 2017. Dry powder stood at \$1.72 trillion at the end of the quarter, an increase of 7.2% and 26.8% compared to Q4 2017 and the five-year average, respectively.<sup>1</sup>
- Buyout:** Global private equity-backed buyout deals totaled \$129.3 billion in Q2 2018, up 5.8% and 33.2% from the prior quarter and five-year average, respectively.<sup>1</sup> At the end of 2Q 2018, the average purchase price multiple for all U.S. LBOs was 9.8x EBITDA, down from 10.6x as of the end of 2017.<sup>2</sup> Large cap purchase price multiples stood at 9.8x, down compared to the full-year 2017 level of 10.4x.<sup>2</sup> The weighted average purchase price multiple across all European transaction sizes averaged 10.8x EBITDA in 2Q 2018, up slightly from the 10.7x seen at year-end 2017. Purchase prices for transactions of €1.0 billion or more increased from 11.3x at Q1 2018 to 11.6x in 2Q 2018. Transactions between €500.0 million and €1.0 billion were up 0.4x from the end of 1Q 2018, and stood at 10.8x at Q2 2018.<sup>2</sup> Globally, exit value totaled \$17.4 billion during the quarter, significantly higher than the \$64.1 billion in exits during 1Q 2018. This was primarily driven by trade sales (\$58.7 billion) and through sales to GPs (\$33.7 billion).
- Venture:** During the second quarter, 1,416 venture backed transactions totaling \$23.0 billion were completed, which was an increase on a capital basis over the prior quarter's total of \$22.4 billion across 1,297 deals. This was 42.0% higher than the five-year quarterly average of \$16.2 billion.<sup>1</sup> Total U.S. venture backed exit activity totaled approximately \$12.9 billion across 201 completed transactions in 2Q 2018, down from \$15.7 billion across 218 exits in 1Q 2018.<sup>3</sup>
- Mezzanine:** Eight funds closed on \$15.3 billion during the quarter, up from 1Q 2018's total of \$5.8 billion raised by eighteen funds and the five year quarterly average of \$4.9 billion.<sup>1</sup> Estimated dry powder was \$45.5 billion at the end of 2Q 2018, down by \$4.9 billion from 4Q 2017 and lower than the \$53.1 billion high seen at year-end 2016.<sup>1</sup> Fundraising remains robust with an estimated 76 funds in market targeting \$30.6 billion of commitments.<sup>1</sup>

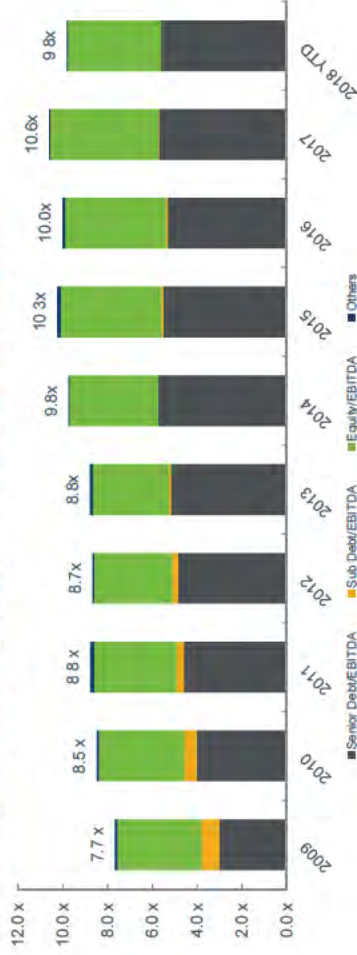
Sources: <sup>1</sup> Preqin <sup>2</sup> Standard & Poor's <sup>3</sup> PwC/IB Insights Money Tree Report <sup>4</sup> PitchBook/NVCA Venture Monitor <sup>5</sup> Fitch Ratings <sup>6</sup> Thomson Reuters <sup>7</sup> UBS  
 Notes: FY=Fiscal year ended 12/31; YTD=Year to date; LTM=Last 12 months (aka trailing 12 months); PPM=Purchase Price Multiples; Total Purchase Price ÷ EBITDA.

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## Private Equity Market Overview – Q2 2018 – Slide 2 of 2

### Purchase Price Multiples – All Transactions Sizes



Source: Standard & Poor's

- Distressed Debt:** The LTM U.S. high-yield default rate was 2.5% as of June 2018, which was up from December 2017's LTM rate of 1.8%.<sup>4</sup> During the quarter, \$17.9 billion was raised by 12 funds, significantly higher than the \$8.4 billion raised during Q1 2018. This was the largest amount raised since Q4 2016.<sup>1</sup> Dry powder was estimated at \$117.9 billion at the end of Q2 2018, which was up 12.2% from 4Q 2017. This remained above the five-year annual average level of \$97.5 billion.<sup>1</sup>
- Secondaries:** Twelve funds raised \$3.1 billion during the second quarter, down from \$6.7 billion raised by ten funds in Q1 2018 and lower than the \$6.6 billion raised in Q2 2017.<sup>1</sup> At the end of Q2 2018, there were an estimated 41 secondary and direct secondary funds in market, targeting approximately \$49.2 billion.<sup>1</sup> Dry powder stood at \$64.0 billion for 2Q 2018, down from Q4 2017's total of \$77.0 billion.<sup>5</sup>
- Infrastructure:** \$24.7 billion of capital was raised by 17 funds in Q2 2018 compared to \$10.3 billion of capital raised by 22 partnerships in Q2 2017. At the end of the quarter, dry powder stood at an estimated \$161.0 billion, up from the prior quarter's total of \$160.0 billion. Infrastructure managers completed 569 deals with an estimated aggregate deal value of \$209.4 billion in 2Q 2018 compared to 630 deals totaling \$249.8 billion a quarter ago.<sup>1</sup>
- Natural Resources:** During Q2 2018, six funds closed on \$2.3 billion compared to 11 funds totaling \$7.9 billion in Q1 2018. Energy and utilities industry managers completed approximately 35 deals totaling an estimated \$12.0 billion through Q2 2018. Dry powder is estimated at \$62.9 billion for Q2 2018, down 2.2% from Q1 2018's level.<sup>1</sup>

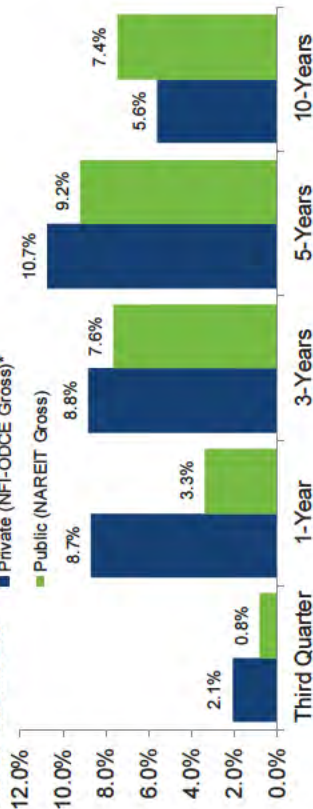
Sources: <sup>1</sup> Preqin <sup>2</sup> Standard & Poor's <sup>3</sup> PwC/CB Insights MoneyTree Report <sup>4</sup> PitchBook/NVCA Venture Monitor <sup>5</sup> Fitch Ratings <sup>6</sup> Thomson Reuters <sup>7</sup> UBS  
 Notes: FY=Fiscal year ended 12/31; YTD=Year to date; LTM=Last 12 months (aka trailing 12 months); PPM=Purchase Price Multiples; Total Purchase Price ÷ EBITDA.

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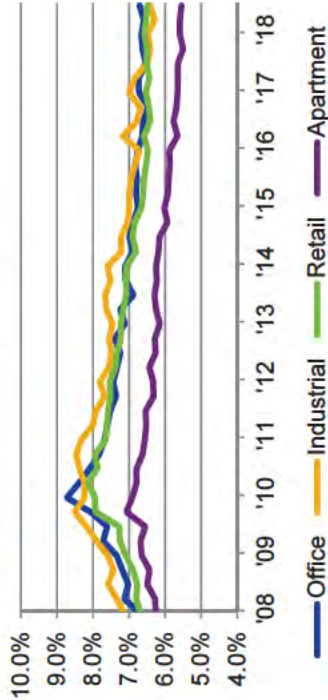
# U.S. Commercial Real Estate Markets

**PRIVATE VS. PUBLIC REAL ESTATE RETURNS AS OF 09/30/2018**



\*Second quarter returns are preliminary  
Sources: NCREIF, Factset

**CAP RATES BY SECTOR**  
SOURCE: RCA, AON HEWITT 6/30/2018



- U.S. Core real estate returned 2.09%\* over the third quarter, equating to 8.7% total gross return year-over-year, with 4.3% made up of income. Net income growth is expected to be the larger driver of the total return going forward given the current point of the real estate cycle.
- After posting positive gains early in the quarter, global property stocks (FTSE EPRA/NAREIT Developed Index) ended Q3 with a slight loss (-0.2%) and are up 4.6% for the trailing year. U.S. REITs led the way with a marginal gain of 0.8%, as both the Europe and Asia/Pacific regions fell during the quarter. Although positive for the quarter, the U.S. REIT market (FTSE NAREIT Equity REITs Index) suffered the biggest loss in September among the major asset classes, down 2.5% compared with a 7.6% return for S&P 500. The Federal Reserve lifted short-term interest rates during the month which sparked investor concerns over the future performance of REITs. This marked the first monthly setback for US securitized real estate since February. The 10-year U.S. Treasury bond yield stood at 3.1% as of quarter end, compared to the U.S. REIT dividend yield of 4.2%. Transaction market volume and pricing remains healthy across property types.

- According to RCA, through August 2018, the U.S. property market has experienced price growth of 7.7% year-over-year across major sectors. Further, transaction volume is up 46% over the same period, primarily driven by large portfolio deals and foreign capital sources.
- Real Estate fundamentals remain healthy, but valuations across real estate and other asset classes are rich. Return expectations have normalized, with go forward expectations in line with historical norms. Rising interest rates have led to asset value correction fears across various asset classes; within real estate, investors can mitigate these risks by shifting preference to investments that can participate and benefit from economic growth, with downside protection offered by current income. Aon prefers investments that offer relatively strong rental income growth, or value-add potential with near-term income generation potential.
- It is critical to identify sub-sector and sub-market driven themes in the current environment; Unlike the last 6-7 year period, as assets are no longer trading at deep discounts to replacement value. Real estate investments should seek levers of NOI growth that are not predicated on continued market uplift. For example, an investment thesis can focus towards sectors benefiting from secular changes (e.g. Industrial and e-commerce), acquiring in-place rents below current market terms, and improving operational efficiency.

\*Indicates preliminary NFI-ODCE data gross of fees

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## Notes and Disclaimers

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## Disclosures

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- The rates of return contained in this report are shown on an after-fees (based on fees actually paid out of the fund) basis unless otherwise noted. They are geometric and time weighted. Returns for periods longer than one year are annualized.
- Historical returns and market values for Total Fund, asset class composites, individual accounts, and asset class policy benchmarks for periods prior to June 30, 2013 are provided by prior consultant and Pennsylvania Public School Employees' Retirement System (PSERS).
- Historical returns for the private equity and inputs for the real estate policy benchmarks are provided on a quarterly basis by PSERS which in turn are provided by PSERS' specialty consultants.
- Private real estate and alternatives market values and cash flows are reflected on a quarter lag.
- Performance of blended policy benchmark for Total Fund and Private Markets are based on quarterly periodicity.
- Historical returns for the Public Markets policy benchmark were provided on a quarterly basis prior to July 2013. As of July 1, 2013, Public Markets policy benchmark is based on monthly periodicity.
- Performance for composites reflects the returns and market values of the levered/hedged accounts, unless otherwise noted.
  - The unlevered versions of the TIPS, Real Assets, Commodities, Infrastructure, Real Estate, and PTRES composites are included as supplemental reporting and the calculation reflects unlevered returns based on the notional value and cash flows for those sub-accounts that are employing leverage, in addition to the performance of the remainder accounts within the composite.
  - The unhedged versions of the Non-US Equity, High Yield, Real Assets, Infrastructure, Real Estate, and PTRES composites are included as supplemental reporting and the calculation excludes the Insight currency hedge accounts.
  - The vol-adjusted version of the Risk Parity composites are included as supplemental reporting and the calculation reflects adjusting the volatility of the underlying risk parity accounts to 12%.
- The TIPS Composite Blended Policy (Net Levered TIPS) represents the monthly return of the index multiplied by a leverage factor of 2 and reduced by the cost of financing as represented by the 3-month LIBOR.
- Effective April 1, 2015, the past 20 quarters of returns for all Thomson One Median (Quarter Lagged) were replaced with the Burgiss (Quarter Lagged).
- Effective July 1, 2015, HY Currency Hedge Benchmark represents the arithmetic difference between the monthly returns of the MSCI EMU Index (hedged) and MSCI EMU Index (unhedged).

# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	9/82	12/00	45.0	Wilshire 5000
			20.0	MSCI ACWI X US (G)
			20.0	Barclays Aggregate
			5.0	JP Morgan Global Gov't Index
			5.0	PSERS NCREIF Lagged
			5.0	Venture Econ Index(Lagged)-PE/PD/MC
Blended Policy (Total Plan)	1/01	6/01	44.0	Wilshire 5000
			20.0	MSCI ACWI X US (G)
			20.0	Barclays Aggregate
			5.0	JP Morgan Global Gov't Index
			5.0	PSERS NCREIF Lagged
			6.0	Venture Econ Index(Lagged)-PE/PD/MC
Blended Policy (Total Plan)	7/01	12/01	44.0	Wilshire 5000
			20.0	MSCI ACWI ex US (G)
			20.0	Barclays Aggregate
			5.0	JP Morgan Global Gov't Index
			5.0	PSERS NCREIF Lagged
			6.0	Venture Econ Index(Lagged)-PE/PD/MC
Blended Policy (Total Plan)	1/02	12/02	42.0	Wilshire 5000
			20.0	MSCI ACWI ex US (G)
			20.0	Barclays Aggregate
			5.0	JP Morgan Global Gov't Index
			1.1	Wilshire REIT Index
			5.9	PSERS NCREIF Lagged
6.0	Venture Econ Index(Lagged)-PE/PD/MC			
Blended Policy (Total Plan)	1/03	6/04	42.0	Wilshire 5000
			17.6	Barclays Aggregate
			4.4	Barclays Global Aggregate
			1.1	Wilshire REIT Index
			5.9	PSERS NCREIF Lagged
			11.0	Venture Econ Index(Lagged)-PE/PD/MC
Blended Policy (Total Plan)	7/04	6/05	18.0	MSCI ACWI X US (G)
			42.0	Wilshire 5000
			13.7	Barclays Aggregate

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			11.0	Venture Econ Index(Lagged)-PE/PD/MC
			5.0	Barclays U.S. TIPS
			3.3	Barclays Global Aggregate
			1.4	Wilshire Real Estate Securities
			5.6	PSERS NCREIF Lagged
			18.0	MSCIACWIX US (G)
Blended Policy (Total Plan)	7/05	6/06	40.0	Wilshire 5000
			13.7	Barclays Aggregate
			11.0	Venture Econ Index(Lagged)-PE/PD/MC
			5.0	Barclays U.S. TIPS
			3.3	Barclays Global Aggregate
			1.4	Wilshire Real Estate Securities
			5.6	PSERS NCREIF Lagged
			20.0	MSCIACWIX US (G)
Blended Policy (Total Plan)	7/06	9/06	30.0	Wilshire 5000
			13.7	Barclays Aggregate
			5.0	Barclays U.S. TIPS
			3.3	Barclays Global Aggregate
			1.4	Wilshire Real Estate Securities
			5.6	PSERS NCREIF Lagged
			11.0	Venture Econ Index(Lagged)-PE/PD/MC
			9.0	MSCIACWI Ex-US (LC Gross)
			21.0	MSCIACWIX US (G)
Blended Policy (Total Plan)	10/06	12/06	3.3	Barclays Global Aggregate
			1.75	FTSE EPRA/NAREIT Developed RE
			5.25	PSERS NCREIF Lagged
			11.0	Venture Econ Index(Lagged)-PE/PD/MC
			9.0	MSCIACWI Ex-US (LC Gross)
			21.0	MSCIACWIX US (G)
			30.0	Wilshire 5000
			13.7	Barclays Aggregate
			5.0	Barclays U.S. TIPS
Blended Policy (Total Plan)	1/07	3/07	3.3	Barclays Global Aggregate
			1.75	FTSE EPRA/NAREIT Developed RE

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			5.25 11.0 8.85 20.65 29.5 13.7 1.0 5.0	PSERS NCREIF Lagged Venture Econ Index(Lagged)-PE/PD/VC MSCI ACWI Ex-US (LC Gross) MSCI ACWI X US (G) Wilshire 5000 Barclays Aggregate DJ UBS Commodity Index Barclays U.S. TIPS
Blended Policy (Total Plan)	4/07	6/07	8.63 20.12 6.0 28.75 13.7 3.3 11.0 2.0 1.5 5.0	MSCI ACWI Ex-US (LC Gross) MSCI ACWI X US (G) PSERS NCREIF Lagged Wilshire 5000 Barclays Universal Barclays Multiverse Index Venture Econ Index(Lagged)-PE/PD/VC FTSE EPRA/NAREIT Developed RE DJ UBS Commodity Index Barclays U.S. TIPS
Blended Policy (Total Plan)	7/07	10/07	8.78 6.0 29.25 13.7 3.3 5.0 9.0 2.0 20.47 2.5	MSCI ACWI Ex-US (LC Gross) PSERS NCREIF Lagged Wilshire 5000 Barclays Universal Barclays Multiverse Index Barclays U.S. TIPS Venture Econ Index(Lagged)-PE/PD/VC FTSE EPRA/NAREIT Developed RE MSCI ACWI X US (G) DJ UBS Commodity Index
Blended Policy (Total Plan)	10/07	3/08	28.5 19.95 8.55 13.7 5.0 3.3	Wilshire 5000 MSCI ACWI X US (G) MSCI ACWI Ex-US (LC Gross) Barclays Universal Barclays U.S. TIPS Barclays Multiverse Index

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	4/08	6/08	2.0	FTSE EPRA/NAREIT Developed RE
			3.0	DJ UBS Commodity Index
			6.0	PSERS NCREIF Lagged
			10.0	Venture Econ Index(Lagged)-PE/PD/MC
			26.0	Wilshire 5000
			19.25	MSCI ACWI X US (G)
			8.25	MSCI ACWI Ex-US (LC Gross)
			8.0	Barclays Universal
			5.0	Barclays U.S. TIPS
			5.0	CS High Yield
Blended Policy (Total Plan)	7/08	9/08	4.0	Barclays Multiverse Index
			1.5	FTSE EPRA/NAREIT Developed RE
			4.0	DJ UBS Commodity Index
			7.5	PSERS NCREIF Lagged
			11.5	Venture Econ Index(Lagged)-PE/PD/MC
			23.5	Wilshire 5000
			19.25	MSCI ACWI X US IMI Index (N)
			8.25	MSCI-AC World Ex US IMI Index (LC Net)
			8.0	Barclays Universal
			5.0	Barclays U.S. TIPS
Blended Policy (Total Plan)	10/08	12/08	5.0	CS High Yield
			4.0	Barclays Multiverse Index
			1.5	FTSE EPRA/NAREIT Developed RE
			5.0	DJ UBS Commodity Index
			8.0	PSERS NCREIF Lagged
			12.5	Venture Econ Index(Lagged)-PE/PD/MC
			21.0	Wilshire 5000
			18.2	MSCI ACWI X US IMI Index (N)
			7.8	MSCI-AC World Ex US IMI Index (LC Net)
			8.0	Barclays Universal
5.0	Barclays U.S. TIPS			
5.0	CS High Yield			
4.0	Barclays Multiverse Index			
1.5	FTSE EPRA/NAREIT Developed RE			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description			
Blended Policy (Total Plan)	1/09	3/09	5.0	DJ UBS Commodity Index			
			9.5	PSERS NCREIF Lagged			
			15.0	Venture Econ Index(Lagged)-PE/PD/MC			
			18.75	Wilshire 5000			
			16.62	MSCI ACWI X US IMI Index (N)			
			7.13	MSCI-AC World Ex US IMI Index (LC Net)			
			8.0	Barclays Universal			
			5.0	Barclays U.S. TIPS			
			5.0	CS High Yield			
			4.0	Barclays Multiverse Index			
			1.5	FTSE EPRA/NAREIT Developed RE			
			5.0	DJ UBS Commodity Index			
			11.0	PSERS NCREIF Lagged			
18.0	Venture Econ Index(Lagged)-PE/PD/MC						
Blended Policy (Total Plan)	4/09	6/09	29.5	MSCI AC World IMI Index (\$N)			
			7.5	Barclays Universal			
			5.0	Barclays U.S. TIPS			
			9.0	Barclays High Yield			
			3.0	Barclays Multiverse Index			
			1.5	FTSE EPRA/NAREIT Global RE Index			
			5.0	ML US T-Bill 0-3 Months			
			4.0	DJ UBS Commodity Index			
			7.5	8% Annualized Return			
			10.0	PSERS NCREIF Lagged			
			18.0	Venture Econ Index(Lagged)-PE/PD/MC			
			Blended Policy (Total Plan)	7/09	9/09	31.0	MSCI AC World IMI Index (\$N)
						7.5	Barclays Universal
5.0	Barclays U.S. TIPS						
9.0	Barclays High Yield						
3.0	Barclays Multiverse Index						
1.5	FTSE EPRA/NAREIT Global RE Index						
4.0	DJ UBS Commodity Index						
7.5	8% Annualized Return						
9.5	PSERS NCREIF Lagged						

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	10/09	12/09	17.0	Venture Econ Index(Lagged)-PE/PD/MC
			5.0	ML US T-Bill 0-3 Months
	32.5	MSCI AC World IMI Index (\$N)		
	7.5	Barclays Universal		
	5.0	Barclays U.S. TIPS		
	9.0	Barclays High Yield		
	3.0	Barclays Multiverse Index		
	1.5	FTSE EPRA/NAREIT Global RE Index		
	4.0	DJ UBS Commodity Index		
	7.5	8% Annualized Return		
8.0	PSERS NCREIF Lagged			
17.0	Venture Econ Index(Lagged)-PE/PD/MC			
5.0	ML US T-Bill 0-3 Months			
Blended Policy (Total Plan)	1/10	3/10	31.5	MSCI AC World IMI Index (\$N)
			7.5	Barclays Universal
	5.0	Barclays U.S. TIPS		
	9.0	Barclays High Yield		
	3.0	Barclays Multiverse Index		
	1.5	FTSE EPRA/NAREIT Global RE Index		
	4.0	DJ UBS Commodity Index		
	7.5	8% Annualized Return		
	8.0	PSERS NCREIF Lagged		
	18.0	Venture Econ Index(Lagged)-PE/PD/MC		
5.0	ML US T-Bill 0-3 Months			
Blended Policy (Total Plan)	4/10	6/10	30.6	MSCI AC World IMI Index (\$N)
			5.0	Barclays Universal
	5.0	Barclays U.S. TIPS		
	8.0	Barclays High Yield		
	5.0	DJ UBS Commodity Index		
	10.0	8% Annualized Return		
	7.5	PSERS NCREIF Lagged		
	19.0	Venture Econ Index(Lagged)-PE/PD/MC		
	5.0	ML US T-Bill 0-3 Months		
	2.0	Barclays Multiverse Index		

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description			
Blended Policy (Total Plan)	4/10	9/10	2.90	JP Morgan GBI EM Global Diversified			
			28.6	MSCI AC World IMI Index (\$N)			
			5.0	Barclays Universal			
			5.0	Barclays U.S. TIPS			
			8.0	Barclays High Yield			
			5.0	DJ UBS Commodity Index			
			10.0	8% Annualized Return			
			1.86	NTFI Value Added Closed-End (ValueW-L)			
			4.99	NTFI Opportunistic (ValueW-Lagged)			
			20.5	Venture Econ Index(Lagged)-PE/PD/MC			
			5.0	ML US T-Bill 0-3 Months			
			2.0	Barclays Multiverse Index			
			2.9	JP Morgan GBI EM Global Diversified			
			1.15	NCREIF ODCE NOF 1 Quarter Lag			
			Blended Policy (Total Plan)	10/10	12/10	28.6	MSCI AC World IMI Index (\$N)
5.0	Barclays Universal						
5.0	Barclays U.S. TIPS						
8.0	Barclays High Yield						
5.0	DJ UBS Commodity Index						
10.0	8% Annualized Return						
5.0	ML US T-Bill 0-3 Months						
2.0	Barclays Multiverse Index						
2.9	JP Morgan GBI EM Global Diversified						
20.0	Venture Econ Index(Lagged)-PE/PD/MC						
1.93	NTFI Value Added Closed-End (ValueW-L)						
5.43	NTFI Opportunistic (ValueW-Lagged)						
1.14	NCREIF ODCE NOF 1 Quarter Lag						
Blended Policy (Total Plan)	1/11	3/11				5.0	Barclays Universal
						5.0	Barclays U.S. TIPS
			8.0	Barclays High Yield			
			5.0	DJ UBS Commodity Index			
			10.0	8% Annualized Return			
			5.0	ML US T-Bill 0-3 Months			
			2.0	Barclays Multiverse Index			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	4/11	6/11	2.9	JP Morgan GBI EM Global Diversified
			27.6	MSCI AC World IMI Index (\$N)
			2.08	NTFI Value Added Closed-End (ValueW-L)
			5.81	NTFI Opportunistic (ValueW-Lagged)
			20.5	Venture Econ Index(Lagged)-PE/PD/MVC
			1.11	NCREIF ODCE NOF 1 Quarter Lag
			5.0	Barclays Universal
			5.0	Barclays U.S. TIPS
			8.0	Barclays High Yield
			5.0	DJ UBS Commodity Index
			10.0	8% Annualized Return
Blended Policy (Total Plan)	7/11	9/11	5.0	ML US T-Bill 0-3 Months
			2.0	Barclays Multiverse Index
			2.9	JP Morgan GBI EM Global Diversified
			27.1	MSCI AC World IMI Index (\$N)
			6.09	NTFI Opportunistic (ValueW-Lagged)
			2.23	NTFI Value Added Closed-End (ValueW-L)
			20.5	Venture Econ Index(Lagged)-PE/PD/MVC
			1.18	NCREIF ODCE NOF 1 Quarter Lag
			5.25	Barclays Universal
			5.0	Barclays U.S. TIPS
			6.0	Barclays High Yield
Blended Policy (Total Plan)	10/11	12/11	6.0	DJ UBS Commodity Index
			12.0	7.5% Annualized Return
			3.0	Barclays Multiverse Index
			5.0	ML US T-Bill 0-3 Months
			2.0	JP Morgan GBI EM Global Diversified
			25.5	MSCI AC World IMI Index (\$N)
			6.25	NTFI Opportunistic (ValueW-Lagged)
			2.33	NTFI Value Added Closed-End (ValueW-L)
			20.5	Venture Econ Index(Lagged)-PE/PD/MVC
			1.17	NCREIF ODCE NOF 1 Quarter Lag
			5.0	Barclays U.S. TIPS Barclays
6.0	High Yield			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	1/12	3/12	6.0	DJ UBS Commodity Index
			12.0	7.5% Annualized Return
Blended Policy (Total Plan)	1/12	3/12	5.0	ML US T-Bill 0-3 Months
			22.5	Venture Econ Index(Lagged)-PE/PD/VC/INT
Blended Policy (Total Plan)	1/12	3/12	7.1	NTFI Opportunistic (ValueW-Lagged)
			2.84	NTFI Value Added Closed-End (ValueW-L)
Blended Policy (Total Plan)	1/12	3/12	22.0	MSCI ACWI with USA Gross IMI Index (N)
			5.25	Barclays Aggregate
Blended Policy (Total Plan)	1/12	3/12	3.0	Barclays GlobalAgg GDPWeighted Dev xU
			2.0	Barclays Emerging Mkt 10% Country Cap
Blended Policy (Total Plan)	1/12	3/12	1.31	NCREIF ODCE NOF 1 Quarter Lag
			5.0	Barclays U.S. TIPS
Blended Policy (Total Plan)	1/12	3/12	6.0	Barclays High Yield
			6.0	DJ UBS Commodity Index
Blended Policy (Total Plan)	1/12	3/12	12.0	7.5% Annualized Return
			5.0	ML US T-Bill 0-3 Months
Blended Policy (Total Plan)	1/12	3/12	3.0	Barclays GlobalAgg GDPWeighted Dev xU
			2.0	Barclays Emerging Mkt 10% Country Cap
Blended Policy (Total Plan)	1/12	3/12	5.25	Barclays Aggregate
			21.0	Venture Econ Index(Lagged)-PE/PD/VC/INT
Blended Policy (Total Plan)	1/12	3/12	3.02	NTFI Value Added Closed-End (ValueW-L)
			7.46	NTFI Opportunistic (ValueW-Lagged)
Blended Policy (Total Plan)	1/12	3/12	23.0	MSCI ACWI with USA Gross IMI Index (N)
			1.27	NCREIF ODCE NOF 1 Quarter Lag
Blended Policy (Total Plan)	4/12	6/12	5.0	Barclays U.S. TIPS
			6.0	Barclays High Yield
Blended Policy (Total Plan)	4/12	6/12	6.0	DJ UBS Commodity Index
			12.0	7.5% Annualized Return
Blended Policy (Total Plan)	4/12	6/12	5.0	ML US T-Bill 0-3 Months
			3.0	Barclays GlobalAgg GDPWeighted Dev xU
Blended Policy (Total Plan)	4/12	6/12	2.0	Barclays Emerging Mkt 10% Country Cap
			5.25	Barclays Aggregate
Blended Policy (Total Plan)	4/12	6/12	20.5	Venture Econ Index(Lagged)-PE/PD/VC/INT
			3.04	NTFI Value Added Closed-End (ValueW-L)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	7/12	9/12	7.62	NTFI Opportunistic (ValueW-Lagged)
			23.5	MSCI ACWI with USA Gross IMI Index (N)
			1.09	NCREIF ODCE NOF 1 Quarter Lag
			5.0	Barclays U.S. TIPS
			6.0	Barclays High Yield
			6.0	DJ UBS Commodity Index
			12.0	7.5% Annualized Return
			5.0	ML US T-Bill 0-3 Months
			3.0	Barclays GlobalAgg GDPWeighted Dev xU
			2.0	Barclays Emerging Mkt 10% Country Cap
			5.25	Barclays Aggregate
			22.0	Venture Econ Index(Lagged)-PE/PD/VC/INT
			3.24	NTFI Value Added Closed-End (ValueW-L)
7.89	NTFI Opportunistic (ValueW-Lagged)			
21.5	MSCI ACWI with USA Gross IMI Index (N)			
1.12	NCREIF ODCE NOF 1 Quarter Lag			
Blended Policy (Total Plan)	10/12	12/12	15.0	MSCI ACWI with USA Gross IMI Index (N)
			12.0	7.5% Annualized Return
			6.0	DJ UBS Commodity Index
			3.0	ML US T-Bill 0-3 Months
			2.0	Barclays Emerging Mkt 10% Country Cap
			1.0	Barclays GlobalAgg GDPWeighted Dev xU
			8.0	Barclays High Yield
			12.0	Barclays U.S. TIPS
			5.0	Barclays Aggregate
			2.0	S&P MLP Index
			-9.0	LIBOR 3 MONTH
			3.0	Barclays Long Treasury
			5.0	PSERS Blended Policy (Risk Parity)
8.24	NTFI Opportunistic (ValueW-Lagged)			
3.16	NTFI Value Added Closed-End (ValueW-L)			
22.0	Venture Econ Index(Lagged)-PE/PD/VC/INT			
1.1	NCREIF ODCE NOF 1 Quarter Lag			
Blended Policy (Total Plan)	1/13	3/13	15.0	MSCI ACWI with USA Gross IMI Index (N)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			12.0	7.5% Annualized Return
			6.0	DJ UBS Commodity Index
			3.0	ML US T-Bill 0-3 Months
			2.0	Barclays Emerging Mkt 10% Country Cap
			1.0	Barclays GlobalAgg GDPWeighted Dev xU
			8.0	Barclays High Yield
			12.0	Barclays U.S. TIPS
			5.0	Barclays Aggregate
			2.0	S&P MLP Index
			-9.0	LIBOR 3 MONTH
			3.0	Barclays Long Treasury
			5.0	PSERS Blended Policy (Risk Parity)
			8.54	NTFI Opportunistic (ValueW-Lagged)
			3.29	NTFI Value Added Closed-End (ValueW-L)
			22.0	Venture Econ Index(Lagged)-PE/PD/VC/INT
			1.17	NCREIF ODCE NOF 1 Quarter Lag
Blended Policy (Total Plan)	4/13	6/13	15.5	MSCI ACWI with USA Gross IMI Index (N)
			5.0	Barclays Aggregate
			1.0	Barclays GlobalAgg GDPWeighted Dev xU
			2.0	Barclays Emerging Mkt 10% Country Cap
			3.0	Barclays Long Treasury
			8.0	Barclays High Yield
			12.0	Barclays U.S. TIPS
			3.0	ML US T-Bill 0-3 Months
			12.0	7.5% Annualized Return
			2.0	S&P MLP Index
			6.0	DJ UBS Commodity Index
			-9.0	LIBOR 3 MONTH
			21.5	Venture Econ Index(Lagged)-PE/PD/VC/INT
			8.55	NTFI Opportunistic (ValueW-Lagged)
			3.28	NTFI Value Added Closed-End (ValueW-L)
			5.0	PSERS Blended Policy (Risk Parity)
			1.17	NCREIF ODCE NOF 1 Quarter Lag
Blended Policy (Total Plan)	7/13	9/13	17.5	MSCI ACWI with USA Gross IMI Index (N)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	10/13	12/13	5.0	Barclays Aggregate
			1.0	Barclays GlobalAgg GDPWeighted Dev xU
			2.0	Barclays Emerging Mkt 10% Country Cap
			3.0	Barclays Long Treasury
			6.0	Barclays High Yield
			12.0	Barclays U.S. TIPS
			3.0	ML US T-Bill 0-3 Months
			10.0	7.5% Annualized Return
			3.0	S&P MLP Index
			4.0	DJ UBS Commodity Index
			-9.0	LIBOR 3 MONTH
			22.0	Venture Econ Index(Lagged)-PE/PD/VC/INT
			8.86	NTFI Opportunistic (ValueW-Lagged)
			3.45	NTFI Value Added Closed-End (ValueW-L)
			5.0	PSERS Blended Policy (Risk Parity)
			1.2	NCREIF ODCE NOF 1 Quarter Lag
			2.0	DJ UBS Commodity Gold SubIndex
			17.5	MSCI ACWI with USA Gross IMI Index (N)
			5.0	Barclays Aggregate
			1.0	Barclays GlobalAgg GDPWeighted Dev xU
2.0	Barclays Emerging Mkt 10% Country Cap			
3.0	Barclays Long Treasury			
6.0	Barclays High Yield			
12.0	Barclays U.S. TIPS			
3.0	ML US T-Bill 0-3 Months			
10.0	7.5% Annualized Return			
3.0	S&P MLP Index			
4.0	DJ UBS Commodity Index			
-9.0	LIBOR 3 MONTH			
21.5	Venture Econ Index(Lagged)-PE/PD/VC/INT			
9.34	NTFI Opportunistic (ValueW-Lagged)			
3.45	NTFI Value Added Closed-End (ValueW-L)			
5.0	PSERS Blended Policy (Risk Parity)			
1.2	NCREIF ODCE NOF 1 Quarter Lag			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			2.0	DJ UBS Commodity Gold Subindex Foreign Currency Hedge Overlay: (MSCI EAFE Hedged Index (Price) – MSCI EAFE Index (Price)) 8.00%*
Blended Policy (Total Plan)	1/14	6/14	65.0 21.0 14.0	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	7/14	9/14	65.5 21.0 13.5	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	10/14	12/14	65.0 21.0 14.0	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	1/15	3/15	69.5 17.0 13.5	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	4/15	6/15	70.5 16.0 13.5	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	7/15	9/15	71.0 16.0 13.0	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	10/15	12/15	72.0 17.0 11.0	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	1/16	3/16	72.5 16.5 11.0	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	4/16	6/16	73.0 16.0 11.0	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	7/16	12/16	73.5 16.0 10.5	Blended Policy (Public Market) (Hedged) Burgiss (Lagged) Blended Policy (Private Real Estate)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Total Plan)	1/17	3/17	74.0	Blended Policy (Public Market) (Hedged)
			16.0	Burgiss (Lagged)
			10.0	Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	4/17	12/17	75.0	Blended Policy (Public Market) (Hedged)
			15.0	Burgiss All Private Markets ex Real Estate (Lagged)
			10.0	Blended Policy (Private Real Estate)
Blended Policy (Total Plan)	1/18		76.0	Blended Policy (Public Market) (Hedged)
			15.5	Burgiss All Private Markets ex Real Estate (Lagged)
			8.50	Blended Policy (Private Real Estate)
Blended Policy (Public Markets) (Hedged)	4/14	6/14	27.69	Blended Policy (Total Eq) (Hedged)
			7.69	Barclays Aggregate
			1.54	Barclays GlobalAgg GDP Weighted Dev xU
			3.08	Barclays Emerging Mkt 10% Country Cap
			4.62	Barclays Long Treasury
			9.23	Barclays Corporate High Yield
			18.46	Barclays U.S. TIPS
			4.62	ML US T-Bill 0-3 Months
			15.38	7.5% Annualized Return
			4.62	S&P MLP Index
			6.15	Bloomberg Commodity Index
			-13.85	LIBOR 3 MONTH
			7.69	PSERS Blended Policy (Risk Parity)
			3.08	DJ UBS Commodity Gold Subindex
			Blended Policy (Public Markets) (Hedged)	7/14
7.63	Barclays Aggregate			
1.53	Barclays GlobalAgg GDP Weighted Dev xU			
3.05	Barclays Emerging Mkt 10% Country Cap			
4.58	Barclays Long Treasury			
9.16	Barclays Corporate High Yield			
18.32	Barclays U.S. TIPS			
4.58	ML US T-Bill 0-3 Months			
15.27	Blended Policy (Absolute Return)			
4.58	S&P MLP Index			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			6.11 -13.74 7.63 3.05	Bloomberg Commodity Index LIBOR 3 MONTH PSERS Blended Policy (Risk Parity) DJ UBS Commodity Gold SubIndex
Blended Policy (Public Markets) (Hedged)	10/14	12/14	26.15 7.69 1.54 3.08 4.62 9.23 18.46 4.62 15.38 6.15 6.15 -18.46 12.31 3.08	Blended Policy (Total Equity) (Hedged) Barclays Aggregate Barclays GlobalAgg GDP Weighted Dev xU Barclays Emerging Mkt 10% Country Cap Barclays Long Treasury Barclays Corporate High Yield Barclays U.S. TIPS ML US T-Bill 0-3 Months 7.5% Annualized Return S&P MLP Index Bloomberg Commodity Index LIBOR 3 MONTH PSERS Blended Policy (Risk Parity) DJ UBS Commodity Gold SubIndex
Blended Policy (Public Markets) (Hedged)	1/15	3/15	30.94 7.19 1.44 2.88 4.32 8.63 17.27 4.32 14.39 5.76 5.76 -17.27 11.51 2.88	Blended Policy (Total Equity) (Hedged) Barclays Aggregate Barclays GlobalAgg GDP Weighted Dev xU Barclays Emerging Mkt 10% Country Cap Barclays Long Treasury Barclays Corporate High Yield Barclays U.S. TIPS ML US T-Bill 0-3 Months 7.5% Annualized Return S&P MLP Index Bloomberg Commodity Index LIBOR 3 MONTH PSERS Blended Policy (Risk Parity) DJ UBS Commodity Gold SubIndex
Blended Policy (Public Markets) (Hedged)	4/15	6/15	31.91 7.09	Blended Policy (Total Equity) (Hedged) Barclays Aggregate

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			1.42	Barclays GlobalAgg GDP Weighted Dev xUSA
			2.84	Barclays Emerging Mkt 10% Country Cap
			4.26	Barclays Long Treasury
			8.51	Barclays Corporate High Yield
			17.02	Barclays U.S. TIPS
			4.26	ML US T-Bill 0-3 Months
			14.18	Libor + 3.5%
			5.67	S&P MLP Index
			5.67	Bloomberg Commodity Index
			-17.02	LIBOR 3 MONTH
			11.35	Blended Policy (Risk Parity)
			2.84	Bloomberg Commodity Gold SubIndex
Blended Policy (Public Markets) (Hedged)	7/15	9/15	32.39	Blended Policy (Total Equity) (Hedged)
			7.04	Barclays Aggregate
			1.41	Barclays GlobalAgg GDP Weighted Dev xUSA
			2.82	Barclays Emerging Mkt 10% Country Cap
			4.23	Barclays Long Treasury
			8.45	Barclays Corporate High Yield
			16.90	Barclays U.S. TIPS
			4.23	ML US T-Bill 0-3 Months
			14.08	Libor + 3.5%
			5.63	S&P MLP Index
			5.63	Bloomberg Commodity Index
			-16.9	LIBOR 3 MONTH
			11.27	Blended Policy (Risk Parity)
			2.82	Bloomberg Commodity Gold SubIndex
Blended Policy (Public Markets) (Hedged)	10/15	12/15	28.47	Blended Policy (Total Equity) (Hedged)
			6.94	Barclays Aggregate
			1.39	Barclays GlobalAgg GDP Weighted Dev xUSA
			2.78	Barclays Emerging Mkt 10% Country Cap
			3.47	Barclays Long Treasury
			8.33	Barclays Corporate High Yield
			16.67	Barclays World Inflation Linked Bonds (H\$)
			4.17	BofA ML US T-Bill 0-3 Months

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			13.89	LIBOR + 3.5%
			5.56	S&P MLP Index
			6.94	Bloomberg Commodity Index
			-19.44	LIBOR 3-Month
			13.89	Blended Policy (Risk Parity)
			4.17	Bloomberg Commodity Gold SubIndex
			1.39	FTSE Dev Core Infrastructure 50/50 Net (hedged)
			1.39	FTSE EPRA/NAREIT Developed Index Net (hedged)
Blended Policy (Public Markets) (Hedged)	1/16	3/16	28.97	Blended Policy (Total Equity) (Hedged)
			6.90	Barclays Aggregate
			1.38	Barclays GlobalAgg GDP Weighted Dev xUSA
			2.76	Barclays Emerging Mkt 10% Country Cap
			3.45	Barclays Long Treasury
			8.28	Barclays Corporate High Yield
			16.55	Barclays World Inflation Linked Bonds (H\$)
			4.14	BofA ML US T-Bill 0-3 Months
			13.79	LIBOR + 3.5%
			5.51	S&P MLP Index
			6.90	Bloomberg Commodity Index
			-19.31	LIBOR 3-Month
			13.79	Blended Policy (Risk Parity)
			4.14	Bloomberg Commodity Gold SubIndex
			1.38	FTSE Dev Core Infrastructure 50/50 Net (hedged)
			1.38	FTSE EPRA/NAREIT Developed Index Net (hedged)
Blended Policy (Public Markets) (Hedged)	4/16	6/16	29.45	Blended Policy (Total Equity) (Hedged)
			6.85	Barclays Aggregate
			1.37	Barclays GlobalAgg GDP Weighted Dev xUSA
			2.74	Barclays Emerging Mkt 10% Country Cap
			3.42	Barclays Long Treasury
			8.22	Barclays Corporate High Yield
			16.44	Barclays World Inflation Linked Bonds (H\$)
			4.11	BofA ML US T-Bill 0-3 Months
			13.70	LIBOR + 3.5%
			5.48	S&P MLP Index

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			6.85 -19.18 13.70 4.11 1.37 1.37	Bloomberg Commodity Index LIBOR 3-Month Blended Policy (Risk Parity) Bloomberg Commodity Gold SubIndex FTSE Dev Core Infrastructure 50/50 Net (hedged) FTSE EPRA/NAREIT Developed Index Net (hedged)
Blended Policy (Public Markets) (Hedged)	7/16	9/16	29.25 6.80 1.36 2.72 3.40 8.16 16.33 4.08 13.61 5.44 6.80 -19.05 13.61 6.80 1.36 2.04	Blended Policy (Total Equity) (Hedged) Barclays Aggregate Barclays GlobalAgg GDP Weighted Dev xUSA Barclays Emerging Mkt 10% Country Cap Barclays Long Treasury Barclays Corporate High Yield Barclays World Inflation Linked Bonds (H\$) BofA ML US T-Bill 0-3 Months LIBOR + 3.5% S&P MLP Index Bloomberg Commodity Index LIBOR 3-Month Blended Policy (Risk Parity) Bloomberg Commodity Gold SubIndex FTSE Dev Core Infrastructure 50/50 Net (hedged) FTSE EPRA/NAREIT Developed Index Net (hedged)
Blended Policy (Public Markets) (Hedged)	10/16	12/16	25.85 6.80 1.36 1.36 4.08 10.88 20.41 4.08 13.61 5.44 6.80 -23.13	Blended Policy (Total Equity) (Hedged) Bloomberg Barclays Aggregate Bloomberg Barclays GlobalAgg GDP Weighted Dev xUSA Bloomberg Barclays Emerging Mkt 10% Country Cap Bloomberg Barclays Long Treasury Bloomberg Barclays Corporate High Yield Bloomberg Barclays World Inflation Linked Bonds (H\$) BofA ML US T-Bill 0-3 Months LIBOR + 3.5% S&P MLP Index Bloomberg Commodity Index LIBOR 3-Month

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Public Markets) (Hedged)	1/17	3/17	13.61	Blended Policy (Risk Parity)
			4.08	Bloomberg Commodity Gold SubIndex
			2.72	FTSE Dev Core Infrastructure 50/50 Net (hedged)
			2.04	FTSE EPRA/NAREIT Developed Index Net (hedged)
Blended Policy (Public Markets) (Hedged)	1/17	3/17	25.68	Blended Policy (Total Equity) (Hedged)
			6.76	Bloomberg Barclays Aggregate
			1.35	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUSA
			1.35	Bloomberg Barclays Emerging Mkt 10% Country Cap
			4.05	Bloomberg Barclays Long Treasury
			10.81	Bloomberg Barclays Corporate High Yield
			20.27	Bloomberg Barclays World Inflation Linked Bonds (H\$)
			4.05	BofA ML US T-Bill 0-3 Months
			13.51	LIBOR + 3.5%
			5.41	S&P MLP Index
			6.76	Bloomberg Commodity Index
			-22.97	LIBOR 3-Month
			13.51	Blended Policy (Risk Parity)
			4.05	Bloomberg Commodity Gold SubIndex
			2.70	FTSE Dev Core Infrastructure 50/50 Net (hedged)
			2.70	FTSE EPRA/NAREIT Developed Index Net (hedged)
			Blended Policy (Public Markets) (Hedged)	4/17
6.67	Bloomberg Barclays Aggregate			
1.33	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUSA			
1.33	Bloomberg Barclays Emerging Mkt 10% Country Cap			
4.00	Bloomberg Barclays Long Treasury			
10.67	Bloomberg Barclays Corporate High Yield			
20.00	Bloomberg Barclays World Inflation Linked Bonds (H\$)			
4.00	BofA ML US T-Bill 0-3 Months			
13.33	LIBOR + 3.5%			
5.33	S&P MLP Index			
6.76	Bloomberg Commodity Index			
-22.67	LIBOR 3-Month			
13.33	Blended Policy (Risk Parity)			
4.00	Bloomberg Commodity Gold SubIndex			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			2.67 2.67	FTSE Dev Core Infrastructure 50/50 Net (hedged) FTSE EPRA/NAREIT Developed Index Net (hedged)
Blended Policy (Public Markets) (Hedged)	10/17	12/17	25.33 6.67 1.33 1.33 4.00 13.33 20.00 4.00 5.33 6.67 -22.67 13.34 4.00 2.67 1.33 13.33	Blended Policy (Total Equity) (Hedged) Bloomberg Barclays Aggregate Bloomberg Barclays GlobalAgg GDP Weighted Dev xUSA Bloomberg Barclays Emerging Mkt 10% Country Cap Bloomberg Barclays Long Treasury Bloomberg Barclays Corporate High Yield Bloomberg Barclays World Inflation Linked Bonds (H\$) BofA ML US T-Bill 0-3 Months S&P MLP Index Bloomberg Commodity Index LIBOR 3-Month Blended Policy (Risk Parity) Bloomberg Commodity Gold SubIndex FTSE Dev Core Infrastructure 50/50 Net (hedged) FTSE EPRA/NAREIT Developed Index Net (hedged) Blended Policy (Abs Ret)
Blended Policy (Public Markets) (Hedged)	1/18	3/18	25.66 6.58 1.32 3.95 1.32 13.16 19.74 5.26 2.63 6.58 3.95 1.97 13.16	Blended Policy (Total Equity) (Hedged) Bloomberg Barclays Aggregate Bloomberg Barclays Global Agg GDP Weighted Dev x USA Bloomberg Barclays Long Treasury Bloomberg Barclays Emerging Mkt 10% Country Cap Bloomberg Barclays Corporate High Yield Bloomberg Barclays World Inflation Linked Bonds (H\$) S&P MLP Index FTSE Dev Core Infrastructure 50/50 Net (hedged) Bloomberg Index Total Return Bloomberg Gold Subindex Total Return FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net) Blended Policy (Risk Parity)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			13.16 3.95 -22.37	Blended Policy (Absolute Return) BofA Merrill Lynch US Treasury Bill 0-3M LIBOR (3 month)
Blended Policy (Public Markets) (Hedged)	4/18	6/18	26.14 6.54 1.31 3.92 1.31 13.01 19.61 5.23 2.61 6.54 3.92 1.96 13.07 13.07 3.92 -22.22	Blended Policy (Total Equity) (Hedged) Bloomberg Barclays Aggregate Bloomberg Barclays Global Agg GDP Weighted Dev x USA Bloomberg Barclays Long Treasury Bloomberg Barclays Emerging Mkt 10% Country Cap Bloomberg Barclays Corporate High Yield Bloomberg Barclays World Inflation Linked Bonds (H\$) S&P MLP Index FTSE Dev Core Infrastructure 50/50 Net (hedged) Bloomberg Index Total Return Bloomberg Gold Subindex Total Return FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net) Blended Policy (Risk Parity) Blended Policy (Absolute Return) BofA Merrill Lynch US Treasury Bill 0-3M LIBOR (3 month)
Blended Policy (Public Markets) (Hedged)	7/18		25.97 6.49 1.30 3.90 1.30 12.99 19.48 5.19 2.60 6.49 3.90 2.60 12.99	Blended Policy (Total Equity) (Hedged) Bloomberg Barclays Aggregate Bloomberg Barclays Global Agg GDP Weighted Dev x USA Bloomberg Barclays Long Treasury Bloomberg Barclays Emerging Mkt 10% Country Cap Bloomberg Barclays Corporate High Yield Bloomberg Barclays World Inflation Linked Bonds (H\$) S&P MLP Index FTSE Dev Core Infrastructure 50/50 Net (hedged) Bloomberg Commodity Index Total Return Bloomberg Gold Subindex Total Return FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net) Blended Policy (Risk Parity)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			12.99 3.90 -22.08	Blended Policy (Absolute Return) BofA Merrill Lynch US Treasury Bill 0-3M LIBOR (3 month)
Blended Policy (Public Markets) (Unhedged)	4/14	6/14	27.69 7.69 1.54 3.08 4.62 9.23 18.46 4.62 15.38 4.62 6.15 -13.85 7.69 3.08	MSCI ACWI with USA Gross IMI Index (N) Barclays Aggregate Barclays GlobalAgg GDP Weighted Dev xU Barclays Emerging Mkt 10% Country Cap Barclays Long Treasury Barclays Corporate High Yield Barclays U.S. TIPS ML US T-Bill 0-3 Months 7.5% Annualized Return S&P MLP Index Bloomberg Commodity Index LIBOR 3 MONTH PSERS Blended Policy (Risk Parity) DJ UBS Commodity Gold SubIndex
Blended Policy (Public Markets) (Unhedged)	7/14	9/14	28.24 7.63 1.53 3.05 4.58 9.16 18.32 4.58 15.27 4.58 6.11 -13.74 7.63 3.05	MSCI ACWI with USA Gross IMI Index (N) Barclays Aggregate Barclays GlobalAgg GDP Weighted Dev xU Barclays Emerging Mkt 10% Country Cap Barclays Long Treasury Barclays Corporate High Yield Barclays U.S. TIPS ML US T-Bill 0-3 Months Blended Policy (Absolute Return) S&P MLP Index Bloomberg Commodity Index LIBOR 3 MONTH PSERS Blended Policy (Risk Parity) DJ UBS Commodity Gold SubIndex
Blended Policy (Public Markets) (Unhedged)	10/14	12/14	26.15 7.69	MSCI ACWI with USA Gross IMI Index (N) Barclays Aggregate

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			1.54	Barclays GlobalAgg GDP Weighted Dev xU
			3.08	Barclays Emerging Mkt 10% Country Cap
			4.62	Barclays Long Treasury
			9.23	Barclays Corporate High Yield
			18.46	Barclays U.S. TIPS
			4.62	ML US T-Bill 0-3 Months
			15.38	Libor + 3.5%
			6.15	S&P MLP Index
			6.15	Bloomberg Commodity Index
			-18.46	LIBOR 3 MONTH
			12.31	PSERS Blended Policy (Risk Parity)
			3.08	Bloomberg Commodity Gold SubIndex
Blended Policy (Public Markets) (Unhedged)	1/15	3/15	30.94	MSCI ACWI with USA Gross IMI Index (Net)
			7.19	Barclays Aggregate
			1.44	Barclays GlobalAgg GDP Weighted Dev xUS
			2.88	Barclays Emerging Mkt 10% Country Cap
			4.32	Barclays Long Treasury
			8.63	Barclays Corporate High Yield
			17.27	Barclays U.S. TIPS
			4.32	ML US T-Bill 0-3 Months
			14.39	Libor + 3.5%
			5.76	S&P MLP Index
			5.76	Bloomberg Commodity Index
			-17.27	LIBOR 3 MONTH
			11.51	Blended Policy (Risk Parity)
			2.88	Bloomberg Commodity Gold SubIndex
Blended Policy (Public Markets) (Unhedged)	4/15	6/15	31.91	MSCI ACWI with USA Gross IMI Index (Net)
			7.09	Barclays Aggregate
			1.42	Barclays GlobalAgg GDP Weighted Dev xUS
			2.84	Barclays Emerging Mkt 10% Country Cap
			4.26	Barclays Long Treasury
			8.51	Barclays Corporate High Yield
			17.02	Barclays U.S. TIPS
			4.26	ML US T-Bill 0-3 Months

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			14.18	Libor + 3.5%
			5.67	S&P MLP Index
			5.67	Bloomberg Commodity Index
			-17.02	LIBOR 3 MONTH
			11.35	Blended Policy (Risk Parity)
			2.84	Bloomberg Commodity Gold SubIndex
Blended Policy (Public Markets) (Unhedged)	7/15	9/15	32.39	MSCI ACWI with USA Gross IMI Index (Net)
			7.04	Barclays Aggregate
			1.41	Barclays GlobalAgg GDP Weighted Dev xUS
			2.82	Barclays Emerging Mkt 10% Country Cap
			4.23	Barclays Long Treasury
			8.45	Barclays Corporate High Yield
			16.90	Barclays U.S. TIPS
			4.23	ML US T-Bill 0-3 Months
			14.08	Libor + 3.5%
			5.63	S&P MLP Index
			5.63	Bloomberg Commodity Index
			-16.9	LIBOR 3 MONTH
			11.27	Blended Policy (Risk Parity)
			2.82	Bloomberg Commodity Gold SubIndex
Blended Policy (Public Markets) (Unhedged)	10/15	12/15	28.47	MSCI ACWI with USA Gross IMI Index (Net)
			6.94	Barclays Aggregate
			1.39	Barclays GlobalAgg GDP Weighted Dev xUS
			2.78	Barclays Emerging Mkt 10% Country Cap
			3.47	Barclays Long Treasury
			8.33	Barclays Corporate High Yield
			16.67	Barclays World Inflation Linked Bonds (Unhedged)
			4.17	BofA ML US T-Bill 0-3 Months
			13.89	Libor + 3.5%
			5.56	S&P MLP Index
			6.94	Bloomberg Commodity Index
			-19.44	LIBOR 3 MONTH
			13.89	Blended Policy (Risk Parity)
			4.17	Bloomberg Commodity Gold SubIndex

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			1.39	FTSE Dev Core Infrastructure 50/50 Net
			1.39	FTSE EPRA/NAREIT Developed Index Net
Blended Policy (Public Markets) (Unhedged)	1/16	3/16	28.97	MSCI ACWI with USA Gross IMI Index (Net)
			6.90	Barclays Aggregate
			1.38	Barclays GlobalAgg GDP Weighted Dev xUS
			2.76	Barclays Emerging Mkt 10% Country Cap
			3.45	Barclays Long Treasury
			8.28	Barclays Corporate High Yield
			16.55	Barclays World Inflation Linked Bonds (Unhedged)
			4.14	BofA ML US T-Bill 0-3 Months
			13.79	Libor + 3.5%
			5.51	S&P MLP Index
			6.90	Bloomberg Commodity Index
			-19.31	LIBOR 3 MONTH
			13.79	Blended Policy (Risk Parity)
			4.14	Bloomberg Commodity Gold SubIndex
			1.38	FTSE Dev Core Infrastructure 50/50 Net
1.38	FTSE EPRA/NAREIT Developed Index Net			
Blended Policy (Public Markets) (Unhedged)	4/16	6/16	29.45	MSCI ACWI with USA Gross IMI Index (Net)
			6.85	Barclays Aggregate
			1.37	Barclays GlobalAgg GDP Weighted Dev xUS
			2.74	Barclays Emerging Mkt 10% Country Cap
			3.42	Barclays Long Treasury
			8.22	Barclays Corporate High Yield
			16.44	Barclays World Inflation Linked Bonds (Unhedged)
			4.11	BofA ML US T-Bill 0-3 Months
			13.70	Libor + 3.5%
			5.48	S&P MLP Index
			6.85	Bloomberg Commodity Index
			-19.18	LIBOR 3 MONTH
			13.70	Blended Policy (Risk Parity)
			4.11	Bloomberg Commodity Gold SubIndex
			1.37	FTSE Dev Core Infrastructure 50/50 Net
1.37	FTSE EPRA/NAREIT Developed Index Net			

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Public Markets) (Unhedged)	7/16	9/16	29.25	MSCI ACWI with USA Gross IMI Index (Net)
			6.80	Barclays Aggregate
			1.36	Barclays GlobalAgg GDP Weighted Dev xUS
			2.72	Barclays Emerging Mkt 10% Country Cap
			3.40	Barclays Long Treasury
			8.16	Barclays Corporate High Yield
			16.33	Barclays World Inflation Linked Bonds (Unhedged)
			4.08	BofA ML US T-Bill 0-3 Months
			13.61	Libor + 3.5%
			5.44	S&P MLP Index
			6.80	Bloomberg Commodity Index
			-19.04	LIBOR 3 MONTH
			13.61	Blended Policy (Risk Parity)
			4.08	Bloomberg Commodity Gold SubIndex
1.36	FTSE Dev Core Infrastructure 50/50 Net			
2.04	FTSE EPRA/NAREIT Developed Index Net			
Blended Policy (Public Markets) (Unhedged)	10/16	12/16	25.85	MSCI ACWI with USA Gross IMI Index (Net)
			6.80	Bloomberg Barclays Aggregate
			1.36	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			1.36	Bloomberg Barclays Emerging Mkt 10% Country Cap
			4.08	Bloomberg Barclays Long Treasury
			10.88	Bloomberg Barclays Corporate High Yield
			20.41	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			4.08	BofA ML US T-Bill 0-3 Months
			13.61	Libor + 3.5%
			5.44	S&P MLP Index
			6.80	Bloomberg Commodity Index
			-23.13	LIBOR 3 MONTH
			13.61	Blended Policy (Risk Parity)
			4.08	Bloomberg Commodity Gold SubIndex
2.72	FTSE Dev Core Infrastructure 50/50 Net			
2.04	FTSE EPRA/NAREIT Developed Index Net			
Blended Policy (Public Markets) (Unhedged)	1/17	3/17	25.68	MSCI ACWI with USA Gross IMI Index (Net)
			6.76	Bloomberg Barclays Aggregate

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			1.35	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			1.35	Bloomberg Barclays Emerging Mkt 10% Country Cap
			4.05	Bloomberg Barclays Long Treasury
			10.81	Bloomberg Barclays Corporate High Yield
			20.27	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			4.05	BofA ML US T-Bill 0-3 Months
			13.51	Libor + 3.5%
			5.41	S&P MLP Index
			6.76	Bloomberg Commodity Index
			-22.97	LIBOR 3 MONTH
			13.51	Blended Policy (Risk Parity)
			4.05	Bloomberg Commodity Gold SubIndex
			2.70	FTSE Dev Core Infrastructure 50/50 Net
			2.70	FTSE EPRA/NAREIT Developed Index Net
Blended Policy (Public Markets) (Unhedged)	4/17	9/17	26.67	MSCI ACWI with USA Gross IMI Index (Net)
			6.67	Bloomberg Barclays Aggregate
			1.33	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			1.33	Bloomberg Barclays Emerging Mkt 10% Country Cap
			4.00	Bloomberg Barclays Long Treasury
			10.67	Bloomberg Barclays Corporate High Yield
			20.00	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			4.00	BofA ML US T-Bill 0-3 Months
			13.33	Libor + 3.5%
			5.33	S&P MLP Index
			6.76	Bloomberg Commodity Index
			-22.67	LIBOR 3 MONTH
			13.33	Blended Policy (Risk Parity)
			4.00	Bloomberg Commodity Gold SubIndex
			2.67	FTSE Dev Core Infrastructure 50/50 Net
			2.67	FTSE EPRA/NAREIT Developed Index Net
Blended Policy (Public Markets) (Unhedged)	10/17	12/17	25.33	Blended Policy (Public Equity) (Unhedged)
			6.67	Bloomberg Barclays Aggregate
			1.33	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			4.00	Bloomberg Barclays Long Treasury

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# PA Public School Employees' Retirement System

## Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			1.33	Bloomberg Barclays Emerging Markets 10% Country Cap
			13.33	Bloomberg Barclays Corporate High Yield
			20.00	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			5.33	S&P MLP Total Return
			2.67	FTSE Developed Core Infrastructure 50/50 Net
			6.67	Bloomberg Commodity Index Total Return
			4.00	Bloomberg Gold Subindex Total Return
			1.33	FTSE EPRA/NAREIT Developed Index (Net)
			13.33	Blended Policy (Risk Parity)
			13.33	Blended Policy (Abs Ret)
			4.00	BofA Merrill Lynch US Treasury Bills 0-3M
			-22.67	Libor (3 months)
Blended Policy (Public Markets) (Unhedged)	1/18	3/18	25.66	Blended Policy (Public Equity) (Unhedged)
			6.58	Bloomberg Barclays U.S. Aggregate
			1.32	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			3.95	Bloomberg Barclays Long Treasury
			1.32	Bloomberg Barclays Emerging Markets 10% Country Cap
			13.16	Bloomberg Barclays Corporate High Yield
			19.74	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			5.26	S&P MLP Total Return Index
			2.63	FTSE Developed Core Infrastructure 50/50 Net Tax Index
			6.58	Bloomberg Commodity Index Total Return
			3.95	Bloomberg Gold Subindex Total Return
			1.97	FTSE EPRA/NAREIT Developed Index (Net)
			13.16	Blended Policy (Risk Parity)
			13.16	Blended Policy (Abs Ret)
			3.95	BofA Merrill Lynch US Treasury Bills 0-3M
			-22.37	Libor (3 month)
Blended Policy (Public Markets) (Unhedged)	4/18	6/18	26.14	Blended Policy (Public Equity) (Unhedged)
			6.54	Bloomberg Barclays Aggregate
			1.31	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			3.92	Bloomberg Barclays Long Treasury
			1.31	Bloomberg Barclays Emerging Markets 10% Country Cap
			13.01	Bloomberg Barclays Corporate High Yield

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			19.61	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			5.23	S&P MLP Total Return
			2.61	FTSE Developed Core Infrastructure 50/50 Net
			6.54	Bloomberg Commodity Index Total Return
			3.92	Bloomberg Gold Subindex Total Return
			1.96	FTSE EPRA/NAREIT Developed Index (Net)
			13.07	Blended Policy (Risk Parity)
			13.307	Blended Policy (Abs Ret)
			3.92	BofA Merrill Lynch US Treasury Bills 0-3M
			-22.22	Libor (3 months)
Blended Policy (Public Markets) (Unhedged)	7/18		25.97	Blended Policy (Public Equity) (Unhedged)
			6.49	Bloomberg Barclays Aggregate
			1.30	Bloomberg Barclays GlobalAgg GDP Weighted Dev xUS
			3.90	Bloomberg Barclays Long Treasury
			1.30	Bloomberg Barclays Emerging Markets 10% Country Cap
			12.99	Bloomberg Barclays Corporate High Yield
			19.48	Bloomberg Barclays World Inflation Linked Bonds (Unhedged)
			5.19	S&P MLP Total Return
			2.60	FTSE Developed Core Infrastructure 50/50 Net
			6.49	Bloomberg Commodity Index Total Return
			3.90	Bloomberg Gold Subindex Total Return
			2.60	FTSE EPRA/NAREIT Developed Index (Net)
			12.99	Blended Policy (Risk Parity)
			12.99	Blended Policy (Abs Ret)
			3.90	BofA Merrill Lynch US Treasury Bills 0-3M
			-22.08	Libor (3 months)
Blended Policy (Public Equity) (Hedged)	10/13	12/14	100.0	MSCI ACWI w USA Gross IMI Index (Net) + [Hedging Program as a % of Global Equity x (MSCI EAFE Hedged – MSCI EAFE Price)]
Blended Policy (Public Equity) (Hedged)	1/15	3/15	91.2	MSCI AC World IMI w USA DM 100% Hedged
			8.8	MSCI Emerging Markets (Net)
		4/15	39.11	MSCI USA IMI (Gross)
			58.67	MSCI AC World IMI w USA DM 100% Hedged
			2.22	MSCI Emerging Markets (Net)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
	7/15	9/15	39.13	MSCI USA IMI (Gross)
			58.7	MSCI ACWI ex USA DM 100% Hedged
			2.17	MSCI Emerging Markets (Net)
	10/15	12/15	39.02	MSCI USA IMI (Gross)
			58.54	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			2.44	MSCI Emerging Markets (Net)
	1/16	3/16	39.05	MSCI USA IMI (Gross)
			58.57	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			2.38	MSCI Emerging Markets (Net)
	4/16	6/16	39.07	MSCI USA IMI (Gross)
			58.60	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>
			2.33	MSCI Emerging Markets (Net)
	7/16	9/16	39.07	MSCI USA IMI (Gross)
		58.60	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>	
		2.33	MSCI Emerging Markets (Net)	
10/16	12/16	38.95	MSCI USA IMI (Gross)	
		58.42	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>	
		2.63	MSCI Emerging Markets (Net)	
1/17	3/17	38.95	MSCI USA IMI (Gross)	
		58.42	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>	
		2.63	MSCI Emerging Markets (Net)	
4/17	9/17	39.00	MSCI USA IMI (Gross)	
		58.50	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>	
		2.50	MSCI Emerging Markets (Net)	
10/17	12/17	38.95	MSCI USA IMI (Gross)	
		58.42	Blended Policy (Non-US Equity x EM) (Hedged)	
		2.63	MSCI Emerging Markets IMI (Net)	
1/18	3/18	38.97	MSCI USA IMI (Gross)	
		58.46	Blended Policy (Non-US Equity x EM) (Hedged)	

Source: MSCI. The MSCI data is comprised of a custom index calculated by MSCI for, and as requested by, Aon Service Corporation. The MSCI data is for internal use only and may not be redistributed or used in connection with selling or offering any securities, financial products, or indices. Neither MSCI nor any other third party involved in or related to compiling, computing or creating the MSCI data ("the MSCI Parties") makes any express or implied warranties or representations with respect to such data (or the results to be obtained by the use thereof), and the MSCI Parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to such data. Without limiting any of the foregoing, in no event shall any of the MSCI Parties have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Public Equity) (Hedged)	4/18		2.57	MSCI Emerging Markets IMI (Net)
			39.00	MSCI USA IMI (Gross)
			58.50	Blended Policy (Non-US Equity x EM) (Hedged)
			2.50	MSCI Emerging Markets IMI (Net)
Blended Policy (Public Equity) (Unhedged)	7/13		100.0	MSCI ACWI w/USA Gross IMI (Net)
Blended Policy (Total US Eq)	10/11		100.0	MSCI USA IMI (Gross)
Blended Policy (Total Non-US Eq) (Hedged)	10/13	9/14	100.0	MSCI ACWI ex US IMI Index (net) + [Hedging Program as a % of Non-US Equity x (MSCI EAFE Hedged – MSCI EAFE Price)]
	10/14	12/14	83.5	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			16.5	MSCI Emerging Markets Index (Net)
	1/15	3/15	86.4	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			13.6	MSCI Emerging Markets Index (Net)
	4/15	9/15	96.4	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			3.6	MSCI Emerging Markets Index (Net)
	10/15	12/15	96.0	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			4.0	MSCI Emerging Markets Index (Net)
	1/16	3/16	96.1	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
			3.9	MSCI Emerging Markets Index (Net)
	4/16	6/16	96.2	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>
			3.8	MSCI Emerging Markets Index (Net)
	10/16	12/16	95.7	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>
			4.3	MSCI Emerging Markets Index (Net)
	1/17	3/17	95.7	Blended Policy (Non-US Equity x EM) (Hedged)
			4.3	MSCI Emerging Markets (Net)
Blended Policy (Total Non-US Eq) (Hedged)	4/17	9/17	95.90	Blended Policy (Non-US Equity x EM) (Hedged)
			4.10	MSCI Emerging Markets (Net)
Blended Policy (Total Non-US Eq) (Hedged)	10/17	12/17	95.69	Blended Policy (Non-US Equity x EM) (Hedged)
			4.31	MSCI Emerging Markets IMI (Net)
Blended Policy (Total Non-US Eq) (Hedged)	1/18	3/18	95.80	Blended Policy (Non-US Equity x EM) (Hedged)
			4.20	MSCI Emerging Markets IMI (Net)
Blended Policy (Total Non-US Eq) (Hedged)	4/18		95.90	Blended Policy (Non-US Equity x EM) (Hedged)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			4.10	MSCI Emerging Markets IMI (Net)
Blended Policy (Total Non-US Eq) (Unhedged)	7/13	9/14	100.0	MSCI AC World ex USA IMI (Net)
	10/14	12/14	83.5	MSCI AC World ex USA IMI (Net)
			16.5	MSCI Emerging Markets Index (Net)
	1/15	3/15	86.4	MSCI AC World ex USA IMI (Net)
			13.6	MSCI Emerging Markets Index (Net)
	4/15	9/15	96.4	MSCI AC World ex USA IMI (Net)
			3.6	MSCI Emerging Markets Index (Net)
	10/15	12/15	96.0	MSCI AC World ex USA IMI (Net)
			4.0	MSCI Emerging Markets Index (Net)
	1/16	3/16	96.1	MSCI AC World ex USA IMI (Net)
			3.9	MSCI Emerging Markets Index (Net)
	4/16	6/16	96.2	MSCI AC World ex USA IMI (Net)
			3.8	MSCI Emerging Markets Index (Net)
Blended Policy (Total Non-US Eq) (Unhedged)	10/16	12/16	95.7	MSCI AC World ex USA IMI (Net)
			4.3	MSCI Emerging Markets Index (Net)
	1/17	3/17	95.7	MSCI AC World ex USA IMI (Net)
			4.3	MSCI Emerging Markets (Net)
	4/17	9/17	95.9	MSCI AC World ex USA IMI (Net)
Blended Policy (Total Non-US Eq) (Unhedged)			4.1	MSCI Emerging Markets (Net)
	10/17	3/18	95.69	MSCI AC World ex USA IMI (Net)
			4.31	MSCI Emerging Markets (Net)
Blended Policy (Total Non-US Eq) (Unhedged)	4/18		95.90	MSCI AC World ex USA IMI (Net)
			4.10	MSCI Emerging Markets (Net)
Blended Policy (Total Non-US Equity x EM) (Hedged)	10/13	3/16	100.0	MSCI ACWI ex USA IMI with DM 100% Hedged to USD (Net) <sup>1</sup>
	4/16		100.0	MSCI ACWI ex USA IMI with DM 75% Hedged to USD (Net) <sup>1</sup>
Blended Policy (Total Non-US Equity x EM) (Unhedged)	10/13		100.0	MSCI AC World ex USA IMI (Net)
Int'l Equity Currency Hedge Benchmark	10/14		100.0	MSCI World ex USA IMI FX Hedge w/DM 100% Hedged to USD (Net)
Blended Policy (Non-US Large)		Prior to	100.0	MSCI EAFE Index (Net)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
	7/99			
	7/99	6/13	100.0	MSCI AC World ex U.S. Index
	7/13		100.0	MSCI AC World ex U.S. Index (Net)
Blended Benchmark (Marathon)		Prior to 1/08	100.0	MSCI AC World ex U.S. Index
	1/08		100.0	MSCI AC World ex U.S. Index (Net)
Blended Benchmark (Acadian)	7/13		100.0	MSCI AC World ex USA Small Cap (Net)
Blended Benchmark (Wasatch Int'l SC)	7/13		100.0	MSCI AC World ex USA Small Cap (Net)
Blended Benchmark (Wasatch EM)		Prior to 1/13	100.0	MSCI Emerging Markets Small Cap (Net)
	1/13		15.0	MSCI Emerging Markets (Net)
			70.0	MSCI Emerging Markets Small Cap (Net)
			15.0	MSCI Frontier Emerging Markets Index (Net)
Blended Policy (EM)	7/13	9/17	100.0	MSCI Emerging Markets (Net)
Blended Policy (EM)	10/17		100.0	MSCI Emerging Markets IMI (Net)
Blended Policy (Total FI)		Prior to 7/13	24.71	Barclays Universal Index
			9.41	JP Morgan GBI EM Global Diversified
			28.23	Barclays High Yield Index
			14.12	Barclays Multiverse Index
			23.53	Blended Policy (Net Levered TIPS)
Blended Policy (Total FI)	7/13	3/15	17.24	Barclays Aggregate Index
			3.45	Barclays Global Agg GDP Weighted Dev x US
			6.9	Barclays Emerging Mkt 10 County Cap
			10.34	Barclays Long Treasury Index
			20.69	Barclays High Yield Index
			41.38	Barclays U.S. TIPS Index
	4/15	9/15	17.24	Barclays Aggregate Index
			3.45	Barclays Global AggGDPWeighted Dev xUS Hedged

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			6.9	Barclays Emerging Mkt 10% County Cap
			10.34	Barclays Long Treasury Index
			20.69	Barclays High Yield Index
			41.38	Barclays U.S. TIPS Index
	10/15	9/16	17.54	Barclays Aggregate Index
			3.51	Barclays Global AggGDPWeighted Dev xUS Hedged
			7.01	Barclays Emerging Mkt 10% County Cap
			8.77	Barclays Long Treasury Index
			21.05	Barclays High Yield Index
			42.1	Barclays World Inflation Linked Bonds (H\$)
	10/16	12/16	15.15	Bloomberg Barclays Aggregate Index
			3.03	Bloomberg Barclays Global AggGDPWeighted Dev xUS Hedged
			3.03	Bloomberg Barclays Emerging Mkt 10% County Cap
			9.09	Bloomberg Barclays Long Treasury Index
			24.24	Bloomberg Barclays High Yield Index
			45.45	Bloomberg Barclays World Inflation Linked Bonds (H\$)
	1/17	9/17	15.15	Bloomberg Barclays Aggregate Index
			3.03	Bloomberg Barclays Global AggGDPWeighted Dev xUS Hedged
			3.03	Bloomberg Barclays Emerging Mkt 10% County Cap
			9.09	Bloomberg Barclays Long Treasury Index
			24.24	Bloomberg Barclays High Yield Index
			45.45	Bloomberg Barclays World Inflation Linked Bonds (H\$)
Blended Policy (Total FI)	10/17	12/17	14.29	Bloomberg Barclays Aggregate
			2.88	Bloomberg Barclays Global Agg GDP Weighted Dev x US Hedged
			2.88	Bloomberg Barclays Emerging Markets 10% Country Cap
			8.58	Bloomberg Barclays Long Treasury
			28.58	Bloomberg Barclays Corporate High Yield
			42.86	Bloomberg Barclays World Inflation Linked Bonds (H\$)
Blended Policy (Total FI)	1/18		14.29	Bloomberg Barclays Aggregate
			2.86	Bloomberg Barclays Global Agg GDP Weighted Dev x US Hedged
			2.86	Bloomberg Barclays Emerging Markets 10% Country Cap
			8.58	Bloomberg Barclays Long Treasury
			28.58	Bloomberg Barclays Corporate High Yield
			42.86	Bloomberg Barclays World Inflation Linked Bonds (H\$)

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# PA Public School Employees' Retirement System

## Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Global FI)	7/12	3/15	12.5	Barclays Global Agg GDPWeighted Dev xU
			25.0	Barclays Emerging Mkt 10% Country Cap
			62.5	Barclays Aggregate Index
	4/15	9/16	12.5	Barclays GlbAgg GDPWeighted DevxUS Hedged
			25.0	Barclays Emerging Mkt 10% Country Cap
			62.5	Barclays Aggregate Index
	10/16		14.29	Bloomberg Barclays GlbAgg GDPWeighted DevxUS Hedged
			14.29	Bloomberg Barclays Emerging Mkt 10% Country Cap
			71.43	Bloomberg Barclays Aggregate Index
Blended Policy (Total US FI)	7/13	9/15	36.92	Barclays Corporate High Yield Index
			32.31	Barclays Aggregate Index
			30.77	Barclays U.S. TIPS
	10/15	9/16	23.53	Barclays Corporate High Yield Index
			19.61	Barclays Aggregate Index
			47.06	Barclays World Inflation Linked Bonds (H\$)
	10/16	12/16	9.80	Barclays Long Treasury
			25.81	Bloomberg Barclays Corporate High Yield Index
			16.13	Bloomberg Barclays Aggregate Index
	1/17	9/17	48.39	Bloomberg Barclays World Inflation Linked Bonds (H\$)
			9.68	Bloomberg Barclays Long Treasury Index
			25.81	Bloomberg Barclays Corporate High Yield Index
	10/17		16.13	Bloomberg Barclays Aggregate Index
			48.39	Bloomberg Barclays World Inflation Linked Bonds (H\$)
			9.68	Bloomberg Barclays Long Treasury Index
Blended Policy (Total US FI)	10/17	30.30	Bloomberg Barclays Corporate High Yield Index	
		15.15	Bloomberg Barclays Aggregate Index	
		45.45	Bloomberg Barclays World Inflation Linked Bonds (H\$)	
Blended Policy (Investment Grade)	10/14	3/15	11.11	Barclays Global Agg GDP Weighted Dev exUS
			55.56	Barclays Aggregate Index
			33.33	Barclays Long Treasury Index

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
	4/15	9/15	11.76	Barclays Global Agg GDP Weighted Dev exUS Hedg
			58.82	Barclays Aggregate Index
			29.41	Barclays Long Treasury Index
	10/15	9/16	11.76	Barclays Global Agg GDP Weighted Dev exUS Hedg
			58.82	Barclays Aggregate Index
			29.41	Barclays Long Treasury Index
	10/16		11.11	Bloomberg Barclays Global Agg GDP Weighted Dev xUS Hedged
			55.56	Bloomberg Barclays Aggregate Index
			33.33	Bloomberg Barclays Long Treasury Index
Blended Policy (US Core+ FI)		Prior to 10/11	100.0	Barclays Universal
	10/11		100.0	Bloomberg Barclays Aggregate Index
Blended Policy (Non-US FI)		Prior to 10/11	100.0	Barclays Multiverse Index
	10/11	3/15	100.0	Barclays Global Agg GDPWeighted Dev xUS
	4/15	9/16	100.0	Bloomberg Barclays Global Agg GDPWeighted Dev xUS Hedged
	10/17		50.0	Bloomberg Barclays Global Agg GDPWeighted Dev xUS Hedged
			50.0	Bloomberg Barclays Emerging Market 10% Country Cap Index
Blended Policy (Credit-Related)	10/14	9/16	75.0	Barclays Corporate High Yield Index
			25.0	Barclays Emerging Mkt 10% Country Cap
	10/16	12/16	88.89	Bloomberg Barclays Corporate High Yield Index
			11.11	Bloomberg Barclays Emerging Mkt 10% Country Cap
	1/17	9/17	88.89	Bloomberg Barclays Corporate High Yield Index
			11.11	Bloomberg Barclays Emerging Mkt 10% Country Cap
Blended Policy (EM FI)	10/17		90.90	Bloomberg Barclays Corporate High Yield Index
			9.09	Bloomberg Barclays Emerging Market 10% Country Cap
		Prior to 10/11	100.0	JPM GBI-EM Global Diversified
	10/11		100.0	Bloomberg Barclays Emerging Mkt 10% Country Cap

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (High Yield)		Prior to 4/09	100.0	Credit Suisse High Yield Index
	4/09		100.0	Bloomberg Barclays Corporate High Yield Index
Blended Benchmark (Mariner RMBS)				
	5/10	3/14	100.0	7.5% Annualized Return
Blended Policy (TIPS)				
	4/14		100.0	Bloomberg Barclays U.S. Mortgage Backed Securities
Blended Policy (TIPS)				
		Prior to 10/15	100.0	Barclays U.S. TIPS Index
Blended Policy (PIMCO Multi-Sector)				
	10/15		100.0	Bloomberg Barclays World Inflation Linked Bonds (H\$)
Blended Policy (PIMCO Multi-Sector)				
		Prior to 7/13	26.0	Barclays Aggregate Index
			16.0	Barclays Long Treasury Index
			5.0	Barclays Global Agg GDPWeighted Dev xU
			42.0	Barclays Corporate High Yield Index
			11.0	Barclays Emerging Mkt 10% Country Cap
		7/13	29.0	Barclays Aggregate Index
			18.0	Barclays Long Treasury Index
			6.0	Barclays Global Agg GDPWeighted Dev xU
			35.0	Barclays Corporate High Yield Index
			12.0	Barclays Emerging Mkt 10% Country Cap
		4/15	30.0	Barclays Aggregate Index
			10.0	Barclays Long Treasury Index
		25.0	Barclays Global Agg GDPWeight Dev xUS Hedged	
		35.0	Barclays Emerging Mkt 10% Country Cap	
Blended Policy (Absolute Return)				
		5/16	40.0	Bloomberg Barclays Aggregate Index
			15.0	Bloomberg Barclays Long Treasury Index
		45.0	Bloomberg Barclays Global Agg GDPWeighted Dev xUS Hedged	
Blended Policy (Absolute Return)				
		Prior to 7/11	100.0	8% Annualized Return
	7/11	6/14	100.0	7.5% Annualized Return
	7/14		100.0	3-Month LIBOR + 3.5%

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
Blended Policy (Risk Parity)	10/12	6/14	35.0	MSCI ACWI (Net)
			75.0	Barclays U.S. Treasury Index
			120.0	Barclays World Inflation Linked Bond Index (Hedged)
			15.0	Bloomberg Commodity Index
			5.0	Bloomberg Commodity Gold SubIndex
			-150.0	LIBOR 3 Month
	7/14		50.0	MSCI ACWI (Net)
			75.0	Bloomberg Barclays U.S. Treasury Index
			55.0	Bloomberg Barclays World Inflation Linked Bond Index (Hedged)
			15.0	Bloomberg Commodity Index
		5.0	Bloomberg Commodity Gold SubIndex	
		-100.0	LIBOR 3-Month	
Blended Policy (Real Assets) (Hedged)	10/14	9/15	16.67	Bloomberg Commodity Index
			16.67	S&P MLP Index
			8.33	Bloomberg Commodity Gold SubIndex
			58.33	Policy Index (Total Real Estate)
	10/15	9/16	20.0	Bloomberg Commodity Index
			16.0	S&P MLP Index
			12.0	Bloomberg Commodity Gold SubIndex
			48.0	Blended Policy (Total Real Estate)
			4.0	FTSE Dev Core Infrastructure 50/50 100% Hedged
	10/16	12/16	19.23	Bloomberg Commodity Index
15.38			S&P MLP Index	
11.54			Bloomberg Commodity Gold SubIndex	
		46.15	Blended Policy (Total Real Estate)	
		7.69	FTSE Dev Core Infrastructure 50/50 100% Hedged	
1/17	9/17	19.23	Bloomberg Commodity Index	
		15.38	S&P MLP Index	
		11.54	Bloomberg Commodity Gold SubIndex	
		46.15	Blended Policy (Total Real Estate)	
		7.69	FTSE Dev Core Infrastructure 50/50 100% Hedged	
10/17		20.00	Bloomberg Commodity Index	
		16.00	S&P MLP Total Return Index	

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			12.00	Bloomberg Gold Subindex Total Return
			44.00	Blended Policy (Total Real Estate) (Hedged)
			8.00	FTSE Developed Core Infrastructure 50/50 100% Hedged Index (Net)
Blended Policy (Real Assets x Private Real Estate) (Hedged)	10/14	9/15	40.0	Bloomberg Commodity Index
			40.0	S&P MLP Index
			20.0	Bloomberg Gold Subindex
	10/15	9/16	35.71	Bloomberg Commodity Index
			28.57	S&P MLP Index
			21.43	Bloomberg Gold Subindex
			7.14	FTSE EPRA NAREIT Custom Dev 100% Hedged
			7.14	FTSE Dev Core Infrastructure 50/50 100% Hedged
	10/16	12/16	32.26	Bloomberg Commodity Index
			25.81	S&P MLP Index
		19.35	Bloomberg Gold Subindex	
		9.68	FTSE EPRA NAREIT Custom Dev 100% Hedged	
		12.90	FTSE Dev Core Infrastructure 50/50 100% Hedged	
Blended Policy (Real Assets x Private Real Estate) (Hedged)	1/17	9/17	32.25	Bloomberg Commodity Index
			25.00	S&P MLP Index
			18.75	Bloomberg Gold Subindex
			12.50	FTSE EPRA NAREIT Custom Dev 100% Hedged
			12.50	FTSE Dev Core Infrastructure 50/50 100% Hedged
	10/17		33.33	Bloomberg Commodity Index
			26.67	S&P MLP Total Return
			20.00	Bloomberg Gold Subindex Total Return
			6.67	FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net)
			13.33	FTSE Developed Core Infrastructure 50/50 100% Hedged Index (Net)
Blended Policy (Commodities)	10/13	9/15	66.67	Bloomberg Commodity Index
			33.33	Bloomberg Gold Subindex
	10/15		62.5	Bloomberg Commodity Index
			37.5	Bloomberg Gold Subindex
Blended Benchmark (Wellington)	7/14	9/17	45.00	DJUBS Commodity Index Total Return

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
	10/17		55.00	MSCI ACWI Commodity Producers Index
			45.00	Bloomberg Roll Select Commodity Index Total Return
			55.00	MSCI ACW Commodity Producers Index
Blended Policy (PTRES) (Hedged)	7/13	3/15	100.0	FTSE EPRA/NAREIT Global Index
	4/15	9/15	100.0	FTSE EPRA/NAREIT Developed Index (Net)
	10/15		100.0	FTSE EPRA/NAREIT Custom Dev 100% Hedged USD (Net)
Blended Policy (Total Real Estate) (Hedged)	10/15	12/15	23.54	Burgiss (Lagged) - Value Added
			58.67	Burgiss (Lagged) – Opportunistic
			9.45	NCREIF ODCE NOF 1 Quarter Lag
			8.33	FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net)
	1/16	6/16	91.67	Blended Policy (Private Real Estate)
			8.33	FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net)
	7/16	12/16	87.5	Blended Policy (Private Real Estate)
			12.5	FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net)
	1/17	12/147	83.33	Blended Policy (Private Real Estate)
			16.67	FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net)
Blended Policy (Total Real Estate) (Hedged)	1/18		9.09	FTSE EPRA NAREIT Custom Dev 100% Hedged USD (Net)
			90.90	Blended Policy (Private Real Estate)
Blended Policy (Private Real Estate)	6/10	9/10	23.26	NTFI Value Added Closed-End (ValueW-L)
			62.38	NTFI Opportunistic (ValueW Lagged)
			14.36	NCREIF ODCE NOF (Quarter Lagged)
	10/10	3/11	22.66	NTFI Value Added Closed-End (ValueW-L)
			63.95	NTFI Opportunistic (ValueW Lagged)
			13.39	NCREIF ODCE NOF (Quarter Lagged)
	4/11	6/11	23.46	NTFI Value Added Closed-End (ValueW-L)
			64.14	NTFI Opportunistic (ValueW Lagged)
			12.40	NCREIF ODCE NOF (Quarter Lagged)
	7/11	9/11	23.86	NTFI Value Added Closed-End (ValueW-L)
			64.11	NTFI Opportunistic (ValueW Lagged)
			12.03	NCREIF ODCE NOF (Quarter Lagged)
	10/11	12/11	25.23	NTFI Value Added Closed-End (ValueW-L)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			63.14	NTFI Opportunistic (ValueW Lagged)
			11.63	NCREIF ODCE NOF (Quarter Lagged)
	1/12	3/12	25.66	NTFI Value Added Closed-End (ValueW-L)
			63.50	NTFI Opportunistic (ValueW Lagged)
			10.84	NCREIF ODCE NOF (Quarter Lagged)
	4/12	6/12	25.89	NTFI Value Added Closed-End (ValueW-L)
			64.81	NTFI Opportunistic (ValueW Lagged)
			9.30	NCREIF ODCE NOF (Quarter Lagged)
	7/12	9/12	26.46	NTFI Value Added Closed-End (ValueW-L)
			64.39	NTFI Opportunistic (ValueW Lagged)
			9.15	NCREIF ODCE NOF (Quarter Lagged)
	10/12	12/12	25.34	NTFI Value Added Closed-End (ValueW-L)
			65.9	NTFI Opportunistic (ValueW Lagged)
			8.76	NCREIF ODCE NOF (Quarter Lagged)
	1/13	3/13	25.28	NTFI Value Added Closed-End (ValueW-L)
			65.72	NTFI Opportunistic (ValueW Lagged)
			9.0	NCREIF ODCE NOF (Quarter Lagged)
	3/13	6/13	25.21	NTFI Value Added Closed-End (ValueW-L)
			65.79	NTFI Opportunistic (ValueW Lagged)
			9.0	NCREIF ODCE NOF (Quarter Lagged)
	6/13	9/13	25.63	NTFI Value Added Closed-End (ValueW-L)
			65.51	NTFI Opportunistic (ValueW Lagged)
			8.86	NCREIF ODCE NOF (Quarter Lagged)
	9/13	3/15	24.73	NTFI Value Added Closed-End (ValueW-L)
			66.73	NTFI Opportunistic (ValueW Lagged)
			8.54	NCREIF ODCE NOF (Quarter Lagged)
	4/15	6/15	23.18	Burgiss Value Added (Quarter Lagged)
			69.03	Burgiss Opportunistic (Quarter Lagged)
			7.79	NCREIF ODCE NOF (Quarter Lagged)
	7/15	9/15	24.22	Burgiss Value Added (Quarter Lagged)
			67.56	Burgiss Opportunistic (Quarter Lagged)
			8.22	NCREIF ODCE NOF (Quarter Lagged)
	10/15	12/15	25.68	Burgiss Value Added (Quarter Lagged)
			64.00	Burgiss Opportunistic (Quarter Lagged)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
			10.31	NCREIF ODCE NOF (Quarter Lagged)
	1/16	3/16	25.96	Burgiss Value Added (Quarter Lagged)
			63.04	Burgiss Opportunistic (Quarter Lagged)
			11.00	NCREIF ODCE NOF (Quarter Lagged)
	4/16	6/16	26.98	Burgiss Value Added (Quarter Lagged)
			62.21	Burgiss Opportunistic (Quarter Lagged)
			10.81	NCREIF ODCE NOF (Quarter Lagged)
	7/16	9/16	27.46	Burgiss Value Added (Quarter Lagged)
			61.14	Burgiss Opportunistic (Quarter Lagged)
			11.39	NCREIF ODCE NOF (Quarter Lagged)
	10/16	12/16	28.67	Burgiss Value Added (Quarter Lagged)
			58.46	Burgiss Opportunistic (Quarter Lagged)
			12.88	NCREIF ODCE NOF (Quarter Lagged)
	1/17	3/17	29.66	Burgiss Value Added (Quarter Lagged)
			56.68	Burgiss Opportunistic (Quarter Lagged)
			13.67	NCREIF ODCE NOF (Quarter Lagged)
	4/17	6/17	35.53	Burgiss Value Added (Quarter Lagged)
			52.27	Burgiss Opportunistic (Quarter Lagged)
			14.20	NCREIF ODCE NOF (Quarter Lagged)
	7/17	9/17	32.87	Burgiss Value Added (Quarter Lagged)
			52.48	Burgiss Opportunistic (Quarter Lagged)
			14.65	NCREIF ODCE NOF (Quarter Lagged)
	10/17		31.55	Burgiss Value Added (Quarter Lagged)
			53.14	Burgiss Opportunistic (Quarter Lagged)
			15.31	NCREIF ODCE NOF (Quarter Lagged)
Blended Policy (Private Real Estate)				
Blended Policy (Private Markets)	1/09	3/09	62.1	Thomson One Median (Quarter Lagged)
			37.9	NCREIF Property (Quarter Lagged)
Blended Policy (Private Markets)	4/09	6/09	64.3	Thomson One Median (Quarter Lagged)
			35.7	NCREIF Property (Quarter Lagged)
	7/09	9/09	64.2	Thomson One Median (Quarter Lagged)
			35.9	NCREIF Property (Quarter Lagged)
	10/09	12/09	68.0	Thomson One Median (Quarter Lagged)
			32.0	NCREIF Property (Quarter Lagged)

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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
	1/10	3/10	69.2	Thomson One Median (Quarter Lagged)
			30.8	NCREIF Property (Quarter Lagged)
	4/10	6/10	71.7	Burgiss (Lagged)
			28.3	Blended Policy (Private Real Estate)
	7/10	9/10	71.9	Burgiss (Lagged)
			28.1	Blended Policy (Private Real Estate)
	10/10	12/10	70.2	Burgiss (Lagged)
			29.8	Blended Policy (Private Real Estate)
	1/11	3/11	69.5	Burgiss (Lagged)
			30.5	Blended Policy (Private Real Estate)
	4/11	6/11	68.3	Burgiss (Lagged)
			31.7	Blended Policy (Private Real Estate)
	7/11	9/11	67.8	Burgiss (Lagged)
			32.2	Blended Policy (Private Real Estate)
	10/11	12/11	66.7	Burgiss (Lagged)
			33.3	Blended Policy (Private Real Estate)
	1/12	3/12	64.1	Burgiss (Lagged)
			35.9	Blended Policy (Private Real Estate)
	4/12	6/12	63.6	Burgiss (Lagged)
			36.4	Blended Policy (Private Real Estate)
	7/12	9/12	64.2	Burgiss (Lagged)
			35.8	Blended Policy (Private Real Estate)
	10/12	12/12	63.8	Burgiss (Lagged)
			36.2	Blended Policy (Private Real Estate)
	1/13	3/13	62.9	Burgiss (Lagged)
			37.1	Blended Policy (Private Real Estate)
	4/13	6/13	62.3	Burgiss (Lagged)
			37.7	Blended Policy (Private Real Estate)
	7/13	9/13	62.0	Burgiss (Lagged)
			38.0	Blended Policy (Private Real Estate)
	10/13	12/13	60.6	Burgiss (Lagged)
			39.4	Blended Policy (Private Real Estate)
	1/14	9/14	60.0	Burgiss (Lagged)
			40.0	Blended Policy (Private Real Estate)

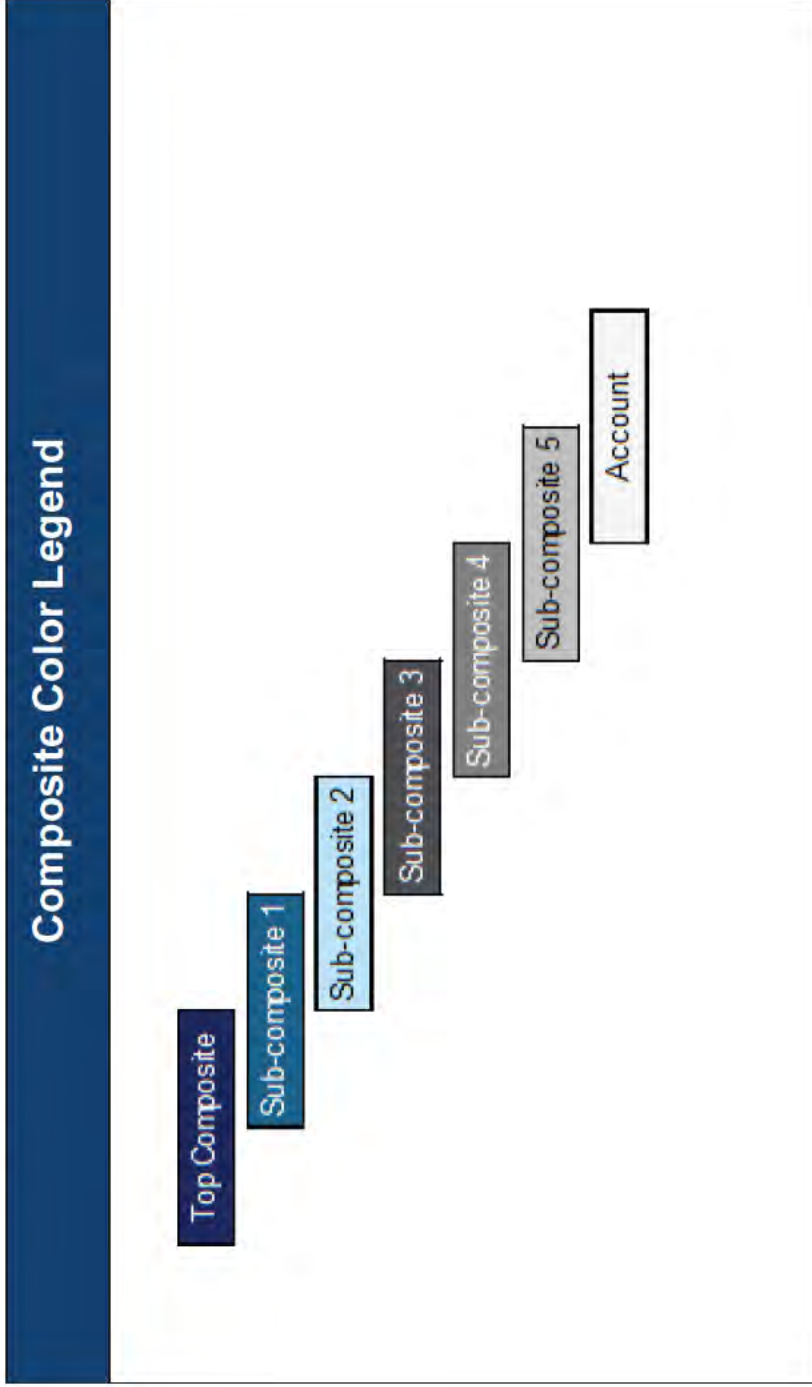
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# PA Public School Employees' Retirement System Policy Benchmark Descriptions

Policy Benchmark	Start Date	End Date	Percent	Description
	10/14	12/14	54.14	Burgiss (Lagged)
			45.86	Blended Policy (Private Real Estate)
	1/15	3/15	54.11	Burgiss (Lagged)
			45.89	Blended Policy (Private Real Estate)
	4/15	6/15	54.51	Burgiss (Lagged)
			45.49	Blended Policy (Private Real Estate)
	7/15	9/15	61.02	Burgiss (Lagged)
			38.98	Blended Policy (Private Real Estate)
	10/15	12/15	59.79	Burgiss (Lagged)
			40.21	Blended Policy (Private Real Estate)
	1/16	3/16	59.96	Burgiss (Lagged)
			40.04	Blended Policy (Private Real Estate)
	4/16	6/16	59.26	Burgiss (Lagged)
			40.74	Blended Policy (Private Real Estate)
	7/16	12/16	60.38	Burgiss (Lagged)
			39.62	Blended Policy (Private Real Estate)
	1/17		60.08	Burgiss (Lagged)
			39.92	Blended Policy (Private Real Estate)

# PA Public School Employees' Retirement System Policy Benchmark Descriptions



## Statistics Definitions

Statistics	Definition
Active Return	- Arithmetic difference between the managers return and the benchmark return over a specified time period.
Actual Correlation	- It is a measure of the correlation (linear dependence) between two variables X and Y, giving a value between +1 and -1 inclusive. It is widely used in the statistics as a measure of the strength of linear dependence between two variables. Also called coefficient of correlation.
Alpha	- A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market, or a portfolio's non-systematic return.
Beta	- A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of a portfolio's non-diversifiable or systematic risk
Consistency	- The percentage of quarters that a product achieved a rate of return higher than that of its benchmark. The higher the consistency figure, the more value a manager has contributed to the product's performance.
Down Market Capture	- The ratio of average portfolio return over the benchmark during periods of negative benchmark return. Lower values indicate better product performance.
Down Market Outperformance	- A statistical measure of an investment manager's overall performance in down-markets. The down-market capture ratio is used to evaluate how well or poorly an investment manager performed relative to an index during periods when that index has dropped. The ratio is calculated by dividing the manager's returns by the returns of the index during the down-market and multiplying that factor by 100.
Downside Risk	- A measure similar to standard deviation, but focuses only on the negative movements of the return series. It is calculated by taking the standard deviation of the negative set of returns. The higher the factor, the riskier the product.
Downside Semi Deviation	- A measure of dispersion the portfolio returns set falling below hurdle rate.
Excess Return	- Arithmetic difference between the managers return and the risk-free return over a specified time period.
Excess Risk	- A measure of the standard deviation of a portfolio's performance relative to the risk free return.
Information Ratio	- Measured by dividing the active rate of return by the tracking error. The higher the Information Ratio, the more value-added contribution by the manager.
Jensen Alpha	- A risk-adjusted performance measure that represents the average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return. This is the portfolio's alpha.
Max Drawdown Recovery Period	- Recovery Periods is the number of periods it takes to recover (from valley to previous peak) from the maximum drawdown that occurred.
Maximum Drawdown	- The drawdown is defined as the percent retrenchment from a fund's peak value to the fund's valley value. It is in effect from the time the fund's retrenchment begins until a new fund high is reached. The maximum drawdown encompasses both the period from the fund's peak to the fund's valley (length), and the time from the fund's valley to a new fund high (recovery). It measures the largest percentage drawdown that has occurred in any fund's data record.
Maximum Loss Exposure	- The maximum cumulative loss.
Return	- Compounded rate of return for the period.
R-Squared	- The percentage of a portfolio's performance explained by the behavior of the appropriate benchmark. High R-Square means a higher correlation of the portfolio's performance to the appropriate benchmark.
Sharpe Ratio	- Represents the excess rate of return over the risk free return divided by the standard deviation of the excess return. The result is the absolute rate of return per unit of risk. The higher the value, the better the product's historical risk-adjusted performance.
Standard Deviation	- A statistical measure of the range of a portfolio's performance, the variability of a return around its average return over a specified time period.
Tracking Error	- A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.
Up Market Capture	- The ratio of average portfolio return over the benchmark during periods of positive benchmark return. Higher values indicate better product performance.



## Statistics Definitions

Statistics	Definition
Up Market Outperformance	- A statistical measure of an investment manager's overall performance in up-markets. The up-market capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen. The ratio is calculated by dividing the manager's returns by the returns of the index during the up-market, and multiplying that factor by 100.
Upside Semi Deviation	- A measure of dispersion the portfolio returns set falling above hurdle rate.

## Disclaimer

Past performance is not necessarily indicative of future results.

Unless otherwise noted, performance returns presented reflect the respective fund's performance as indicated. Returns may be presented on a before-fees basis (gross) or after-fees basis (net). After-fee performance is net of each respective sub-advisor's investment management fees and include the reinvestment of dividends and interest as indicated on the notes page within this report or on the asset allocation and performance summary pages. Actual returns may be reduced by AHIC's investment advisory fees or other trust payable expenses you may incur as a client. AHIC's advisory fees are described in Form ADV Part 2A. Portfolio performance, characteristics and volatility also may differ from the benchmark(s) shown.

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200 East Randolph Street  
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# M. Sample Monthly Flash Report



PA Public School Employees' Retirement System | November 30, 2018

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## Monthly Investment Review

All information presented in this report should be considered preliminary.  
Finalized data will be available on the next Quarterly Investment Report after the close of the quarter.

Case ID: 221102792



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As of November 30, 2018

Market Highlights

	Performance (%)							
	1 Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	10 Years
<b>Equity</b>								
MSCI ACWI IMI with USA Gross Index (Net)	1.45	-6.47	-2.77	-2.80	-1.20	8.85	6.44	11.33
Dow Jones U.S. Total Stock Market Index	2.00	-5.55	1.16	4.44	5.50	11.77	10.56	14.54
S&P 500 Index	2.04	-4.94	2.39	5.11	6.27	12.16	11.12	14.32
MSCI USA Large Cap Index	1.92	-4.82	2.80	5.74	6.90	12.41	11.34	14.15
MSCI USA Small Cap Index	1.87	-8.48	-4.62	1.43	1.87	10.90	8.63	16.03
MSCI AC World ex USA IMI (Net)	0.85	-7.58	-7.22	-10.60	-8.49	5.49	2.01	8.10
MSCI AC World ex USA Index (Net)	0.95	-7.26	-6.61	-10.13	-8.12	5.43	1.79	7.66
MSCI EAFE Index (Net)	-0.13	-8.08	-6.83	-9.39	-7.94	4.12	1.84	7.47
MSCI EAFE Small Cap (Net)	-0.70	-10.26	-11.05	-12.23	-9.89	6.31	4.92	11.98
MSCI Emerging Markets Index (Net)	4.12	-4.95	-5.99	-12.24	-9.09	9.41	1.90	9.13
MSCI EAFE (Hedged)	-0.20	-6.49	-4.32	-6.00	-4.79	2.36	3.33	5.83
MSCI EAFE (Price)	-0.31	-8.31	-7.61	-11.76	-10.42	1.30	-0.85	4.47
<b>Fixed Income</b>								
Bimbg. Barc. U.S. Aggregate	0.60	-0.20	-0.18	-1.79	-1.34	1.33	2.03	3.67
Barclays Universal	0.45	-0.39	-0.12	-1.79	-1.36	1.86	2.31	4.29
Bimbg. Barc. U.S. Corp: High Yield	-0.86	-2.45	-0.10	0.06	0.36	7.09	4.39	12.19
Bimbg. Barc. Global Inflation-Linked: U.S. TIPS	0.48	-0.96	-1.77	-1.80	-0.90	1.66	1.28	4.09
Bimbg. Barc. U.S. Treasury: Long	1.89	-1.21	-4.06	-6.93	-5.34	0.77	4.40	4.45
Bimbg. Barc. World Inflation Linked Bonds (H\$)	-0.67	-0.60	-1.44	-1.05	0.02	3.46	3.66	5.02
Bimbg. Barc. World ILB (Unhedged) Index	-0.80	-1.97	-3.59	-5.19	-4.04	1.68	1.00	4.21
Bimbg. Barc. Global Agg GDP Wght'd Dev x U.S.	0.13	-1.37	-2.83	-4.49	-4.11	2.76	-0.38	2.74
Bimbg. Barc. Global Agg GDP Wght'd Dev x U.S. (\$H)	0.38	0.62	0.47	1.66	1.69	2.98	3.72	4.20
Bimbg. Barc. Emerging Market 10% Country Cap Index	2.54	0.75	-0.28	-6.03	-4.61	4.43	-0.30	4.58
ICE Libor (3 month)	0.22	0.43	1.02	2.09	2.23	1.38	0.93	0.69
ICE BofAML US Treasury Bills 0-3M	0.19	0.37	0.86	1.64	1.74	0.91	0.55	0.32
Bimbg. Barc. U.S. Treasury	0.89	0.41	-0.19	-1.27	-0.96	0.63	1.39	2.20
<b>Infrastructure</b>								
FTSE Dev. Core Infrast 50/50 100% Hdg Index (Net)	2.84	1.58	1.68	2.56	0.18	8.76	9.23	N/A
FTSE Developed Core Infrast 50/50 Index (Net)	2.98	0.85	0.57	-0.40	-2.14	8.75	7.27	N/A
<b>MLP</b>								
S&P MLP Index	-1.42	-9.63	-3.86	-2.89	2.20	1.59	-4.44	10.94
<b>Commodities</b>								
Bloomberg Commodity Index Total Return	-0.56	-2.71	-4.68	-4.68	-1.83	1.64	-7.26	-3.54
Bloomberg Gold Subindex Total Return	0.61	2.40	-2.73	-7.19	-4.72	3.93	-1.03	3.41
<b>REIT</b>								
FTSE EPRA/NAREIT Custom Dev 100% Hedged USD (Net)	3.72	0.51	0.81	2.55	3.61	5.34	7.34	N/A
FTSE EPRA/NAREIT Developed Index (Net)	3.72	-0.13	-0.43	-0.07	1.21	4.98	5.57	11.29
<b>Risk Parity</b>								
Blended Policy (Risk Parity)	0.76	-3.79	-3.73	-5.61	-3.65	5.87	4.46	10.01

Case ID: 221102792

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As of November 30, 2018

## Trailing Period Performance

	Performance(%)							
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years
<b>Total Public Market Composite</b>	<b>-0.19</b>	<b>-3.06</b>	<b>-3.24</b>	<b>-2.48</b>	<b>-1.67</b>	<b>0.08</b>	<b>6.04</b>	<b>4.44</b>
Blended Policy (Public Market) (Hedged)	0.41	-3.01	-2.62	-1.65	-1.89	-0.27	5.88	3.79
Value Added	-0.60	-0.05	-0.62	-0.83	0.22	0.35	0.16	0.65
Blended Policy (Public Market) (Unhedged)	0.40	-3.37	-2.98	-2.07	-2.82	-1.18	5.73	3.33
Value Added	-0.59	0.31	-0.26	-0.41	1.15	1.26	0.31	1.11
<b>Total Public Equity Composite</b>	<b>1.16</b>	<b>-7.77</b>	<b>-6.89</b>	<b>-4.21</b>	<b>-3.56</b>	<b>-1.94</b>	<b>8.05</b>	<b>7.44</b>
Blended Policy (Public Equity) (Hedged)	1.39	-7.41	-6.13	-2.96	-2.97	-1.31	8.24	7.21
Value Added	-0.23	-0.36	-0.56	-1.25	-0.59	-0.63	-0.19	0.23
Blended Policy (Public Equity) (Unhedged)	1.45	-7.81	-6.47	-2.77	-2.80	-1.20	8.85	6.44
Value Added	-0.29	0.04	-0.22	-1.44	-0.76	-0.74	-0.80	1.00
<b>Total US Equity Composite</b>	<b>2.19</b>	<b>-7.69</b>	<b>-5.66</b>	<b>0.78</b>	<b>4.05</b>	<b>4.90</b>	<b>12.24</b>	<b>10.67</b>
Blended Policy (Tot US Eq)	1.94	-7.35	-5.56	1.13	4.50	5.55	11.84	10.66
Value Added	0.25	-0.34	-0.10	-0.35	-0.45	-0.65	0.40	0.01
<b>Total Non-U.S. Equity Composite (hedged)</b>	<b>1.00</b>	<b>-8.10</b>	<b>-7.18</b>	<b>-6.45</b>	<b>-6.93</b>	<b>-4.90</b>	<b>6.18</b>	<b>5.92</b>
Blended Policy (Total Non-US Eq) (Hedged)	1.13	-7.46	-6.42	-5.46	-7.49	-5.49	5.93	4.90
Value Added	-0.13	-0.64	-0.76	-0.99	0.56	0.59	0.25	1.02
<b>Total Non-U.S. Equity Composite (unhedged)</b>	<b>0.92</b>	<b>-8.94</b>	<b>-8.11</b>	<b>-8.02</b>	<b>-10.06</b>	<b>-7.85</b>	<b>6.01</b>	<b>2.97</b>
Blended Policy (Total Non-US Eq) (Unhedged)	1.01	-8.37	-7.45	-7.15	-10.64	-8.49	5.66	1.99
Value Added	-0.09	-0.57	-0.66	-0.87	0.58	0.64	0.35	0.98
<b>Total Fixed Income Composite</b>	<b>-0.24</b>	<b>-0.47</b>	<b>-0.72</b>	<b>-1.12</b>	<b>0.49</b>	<b>1.94</b>	<b>5.87</b>	<b>5.34</b>
Blended Policy (Total FI)	-0.07	-1.06	-1.13	-1.08	-1.46	-0.66	3.79	2.87
Value Added	-0.17	0.59	0.41	-0.04	1.95	2.60	2.08	2.47
<b>Investment Grade Composite</b>	<b>1.08</b>	<b>-2.07</b>	<b>-1.01</b>	<b>-3.01</b>	<b>-6.35</b>	<b>-5.18</b>	<b>1.74</b>	<b>N/A</b>
Blended Policy (Investment Grade)	1.37	-2.14	-0.80	-1.76	-3.48	-2.67	1.14	2.54
Value Added	-0.29	0.07	-0.21	-1.25	-2.87	-2.51	0.60	N/A
<b>US Core Plus Fixed Income Composite</b>	<b>0.09</b>	<b>-0.91</b>	<b>-0.82</b>	<b>-0.81</b>	<b>-2.58</b>	<b>-2.10</b>	<b>2.51</b>	<b>3.16</b>
Blended Policy (Barclays Aggregate Index)	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03
Value Added	-0.51	-0.12	-0.62	-0.63	-0.79	-0.76	1.18	1.13
<b>Non-U.S. Developed Markets Fixed Income</b>	<b>-2.22</b>	<b>-0.01</b>	<b>-2.23</b>	<b>-2.01</b>	<b>-1.42</b>	<b>-1.51</b>	<b>2.58</b>	<b>0.16</b>
Blended Policy (Barclays Global Agg GDP)	0.38	0.24	0.62	0.47	1.66	1.69	2.98	0.14
Value Added	-2.60	-0.25	-2.85	-2.48	-3.08	-3.20	-0.40	0.02

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As of November 30, 2018

## Trailing Period Performance

	Performance(%)						
	1 Month	Prior Month	Quarter To Date	Year To Date	1 Year	3 Years	5 Years
U.S. Long Treasury Composite (levered)	32.79	-35.45	-14.28	-53.73	-48.81	-35.59	-5.53
U.S. Long Treasury Composite (unlevered)	1.84	-2.98	-1.20	-4.63	-7.13	-0.68	2.40
Bllmg. Barc. U.S. Treasury: Long Value Added	1.89 <b>-0.05</b>	-3.05 0.07	-1.21 0.01	-6.93 <b>-1.67</b>	-5.34 <b>-1.79</b>	0.77 <b>-1.45</b>	4.40 <b>-2.00</b>
Credit-Related	-0.28	-0.11	-0.39	6.17	7.72	8.82	N/A
Blended Policy (Credit-Related) Value Added	-0.55 0.27	-1.61 1.50	-2.15 1.76	-0.48 1.97	-0.06 7.78	6.92 1.90	N/A N/A
Emerging Markets Fixed Income	0.25	-0.75	-0.50	-1.70	-0.79	6.54	2.33
Blended Policy (Barclays Emerging Mkt 10% Country Cap) Value Added	2.54 <b>-2.29</b>	-1.75 1.00	0.75 <b>-1.25</b>	-0.28 0.75	-4.61 3.82	4.43 2.11	-0.30 2.63
High Yield Fixed Income Composite (hedged)	-0.32	-0.07	-0.39	6.75	8.36	9.00	7.39
Blended Policy (Barclays Corporate HY) Value Added	-0.86 0.54	-1.60 1.53	-2.45 2.06	0.06 2.07	0.36 8.00	7.09 1.91	4.39 3.00
High Yield Fixed Income Composite (unhedged)	-0.35	-0.29	-0.64	6.01	7.65	9.07	7.28
Blended Policy (Barclays Corporate HY) Value Added	-0.86 0.51	-1.60 1.31	-2.45 1.81	0.06 1.71	0.36 7.29	7.09 1.98	4.39 2.89
Inflation Protected (levered)	-1.60	0.47	-1.13	-1.85	-0.23	5.19	N/A
Blended Policy (Net Levered TIPS) Value Added	-1.56 <b>-0.04</b>	-0.08 0.55	-1.64 0.51	-4.16 2.31	-2.22 1.99	5.41 <b>-0.22</b>	3.84 N/A
Inflation Protected (unlevered)	-0.82	0.24	-0.58	-0.27	0.56	3.01	N/A
Blended Policy (Barclays World Inflation Linked Bond - Hedged) Value Added	-0.67 <b>-0.15</b>	0.07 0.17	-0.60 0.02	-1.05 0.78	0.02 0.54	3.46 <b>-0.45</b>	2.48 N/A
TIPS Composite (levered)	-1.60	0.47	-1.13	-1.85	-0.23	5.19	5.19
Blended Policy (Net Levered TIPS) Value Added	-1.56 <b>-0.04</b>	-0.08 0.55	-1.64 0.51	-4.16 2.31	-2.22 1.99	5.41 <b>-0.22</b>	3.84 1.35
TIPS Composite (unlevered)	-0.82	0.24	-0.58	-0.27	0.56	3.01	4.54
Blended Policy (Barclays World Inflation Linked Bond - Hedged) Value Added	-0.67 <b>-0.15</b>	0.07 0.17	-0.60 0.02	-1.05 0.78	0.02 0.54	3.46 <b>-0.45</b>	2.48 2.06
Real Assets x Private (levered/hedged)	-1.18	-5.70	-6.81	-6.78	-2.63	6.51	N/A
Real Assets x Private (unlevered/hedged)	-0.73	-3.63	-4.34	-4.32	-1.65	4.25	N/A
Blended Policy (Real Assets x Private RE) (Hedged) Value Added	0.18 <b>-0.91</b>	-2.96 <b>-0.67</b>	-2.78 <b>-1.56</b>	-2.91 <b>-1.41</b>	-0.30 <b>-1.35</b>	3.79 0.46	N/A N/A

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As of November 30, 2018

## Trailing Period Performance

	Performance(%)						
	1 Month	Prior Month	Quarter To Date	Year To Date	1 Year	3 Years	5 Years
Real Assets x Private (levered/unhedged)	-1.16	-5.90	-6.99	-7.44	-3.18	6.43	N/A
Real Assets x Private (unlevered/unhedged)	-0.72	-3.76	-4.45	-4.75	-2.01	4.21	N/A
Blended Policy (Real Assets x Private RE) (Unhedged)	0.20	-3.11	-2.92	-3.46	-0.78	3.73	N/A
Value Added	-0.92	-0.65	-1.53	-1.29	-1.23	0.48	N/A
Infrastructure Composite ex Private (levered/hedged)	-0.62	-7.37	-7.94	-1.72	1.93	13.62	N/A
Infrastructure Composite ex Private (unlevered/hedged)	-0.52	-6.36	-6.85	-1.43	1.65	6.31	N/A
Blended Policy (Infrastructure Hedged)	0.00	-5.97	-5.96	-0.75	1.95	6.59	7.92
Value Added	-0.52	-0.39	-0.89	-1.41	-0.30	-0.28	N/A
Commodities Composite ex Private (levered)	-3.57	-3.09	-6.54	-17.46	-12.30	7.35	-6.44
Commodities Composite ex Private (unlevered)	-1.51	-1.34	-2.83	-7.69	-5.07	3.62	-3.63
Blended Policy (Commodities)	-0.13	-0.68	-0.81	-5.58	-2.88	2.72	-4.92
Value Added	-1.38	-0.66	-2.02	-2.11	-2.19	0.90	1.29
PTRES Composite (levered/hedged)	4.90	-3.94	0.77	3.36	4.57	9.01	8.53
PTRES Composite (unlevered/hedged)	3.17	-2.59	0.50	2.39	3.17	5.86	6.81
Blended Policy (PTRES) (Hedged)	3.72	-3.09	0.51	2.55	3.61	5.34	5.81
Value Added	-0.55	0.50	-0.01	-0.16	-0.44	0.52	1.00
PTRES Composite (levered/unhedged)	4.94	-4.61	0.10	0.82	2.27	8.62	8.30
PTRES Composite (unlevered/unhedged)	3.19	-3.03	0.07	0.67	1.62	5.60	6.65
Blended Policy (PTRES) (Unhedged)	3.72	-3.71	-0.13	-0.43	1.21	4.98	5.44
Value Added	-0.52	0.68	0.20	-0.06	0.41	0.62	1.21
Risk Parity Composite	-0.05	-4.68	-4.73	-5.96	-4.02	5.70	4.66
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-5.61	-3.65	5.87	4.46
Value Added	-0.81	-0.17	-0.94	-0.35	-0.37	-0.17	0.20
Risk Parity Composite (vol adjusted)	-0.02	-4.04	-4.05	-4.96	-3.24	5.08	3.99
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-5.61	-3.65	5.87	4.46
Value Added	-0.78	0.47	-0.26	0.00	0.41	-0.79	-0.47
Total Absolute Return	-1.43	0.73	-0.71	2.71	3.17	3.18	3.53
Blended Policy (3-month Libor + 3.5%)	0.51	0.50	1.00	5.36	5.81	4.93	4.90
Value Added	-1.94	0.23	-1.71	-2.65	-2.64	-1.75	-1.37
Unallocated Cash & Cash Equivalents	0.16	0.71	0.87	1.44	2.72	1.24	0.89
ICE BofAML 3 Month U.S. T-Bill	0.21	0.17	0.38	1.69	1.80	0.97	0.59
Value Added	-0.05	0.54	0.49	0.57	0.92	0.27	0.30

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As of November 30, 2018

## Trailing Period Performance

	Performance (%)						Allocation		
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year		3 Years	5 Years
<b>Total Public Market Composite</b>	-0.19	-3.06	-3.24	-2.48	-1.67	0.08	6.04	4.44	40,124,113
Blended Policy (Public Market) (Hedged)	0.41	-3.01	-2.62	-1.65	-1.89	-0.27	5.88	3.79	
Value Added	-0.60	-0.05	-0.62	-0.83	0.22	0.35	0.16	0.65	
Blended Policy (Public Market) (Unhedged)	0.40	-3.37	-2.98	-2.07	-2.82	-1.18	5.73	3.33	
Value Added	-0.59	0.31	-0.26	-0.41	1.15	1.26	0.31	1.11	
<b>Total Public Markets Composite ex HY &amp; Absolute Return</b>	0.07	-4.82	-4.75	-4.27	-4.34	N/A	N/A	N/A	27,029,127
Blended Policy (Public Market x HY & Abs Return) (Hedged)	0.66	-4.36	-3.73	-3.08	-4.02	N/A	N/A	N/A	
Value Added	-0.59	-0.46	-1.02	-1.19	-0.32	N/A	N/A	N/A	
<b>Total Public Equity Composite</b>	1.16	-7.77	-6.69	-4.21	-3.56	-1.94	8.05	7.44	8,636,883
Blended Policy (Public Equity) (Hedged)	1.39	-7.41	-6.13	-2.96	-2.97	-1.31	8.24	7.21	
Value Added	-0.23	-0.36	-0.56	-1.25	-0.59	-0.63	-0.19	0.23	
Blended Policy (Public Equity) (Unhedged)	1.45	-7.81	-6.47	-2.77	-2.80	-1.20	8.85	6.44	
Value Added	-0.29	0.04	-0.22	-1.44	-0.76	-0.74	-0.80	1.00	
<b>Total US Equity Composite</b>	2.19	-7.69	-5.66	0.78	4.05	4.90	12.24	10.67	2,473,316
Blended Policy (Tot US Eq)	1.94	-7.35	-5.56	1.13	4.50	5.55	11.84	10.66	
Value Added	0.25	-0.34	-0.10	-0.35	-0.45	-0.65	0.40	0.01	
<b>PSERS-S&amp;P 500 Index Composite</b>	2.07	-6.88	-4.95	2.37	4.59	5.78	12.34	11.18	1,877,348
S&P 500 Index	2.04	-6.84	-4.94	2.39	5.11	6.27	12.16	11.12	
Value Added	0.03	-0.04	-0.01	-0.02	-0.52	-0.49	0.18	0.06	
<b>Radcliffe Specialty Finance Debt</b>	0.02	-0.07	-0.05	1.20	1.57	2.12	4.04	N/A	351,250
3-Month Libor + 0.60%	0.27	0.26	0.53	1.27	2.66	2.85	1.99	1.54	
Value Added	-0.25	-0.33	-0.58	-0.07	-1.09	-0.73	2.05	N/A	
<b>Total US Small Cap Composite</b>	2.34	-10.00	-7.90	-3.85	2.35	2.21	11.88	8.70	594,554
MSCI USA Small Cap Index	1.87	-10.16	-8.48	-4.62	1.43	1.87	10.90	8.63	
Value Added	0.47	0.16	0.58	0.77	0.92	0.34	0.98	0.07	
<b>PSERS Small Cap Index Composite</b>	2.34	-10.00	-7.90	-3.85	2.35	2.21	11.88	9.72	594,554
PSERS-S&P 400 Index Composite	3.14	-9.53	-6.69	-3.06	0.35	0.59	10.77	9.46	303,070
S&P MidCap 400	3.12	-9.55	-6.72	-3.12	0.26	0.48	10.48	9.27	
Value Added	0.02	0.02	0.03	0.06	0.09	0.11	0.29	0.19	
<b>PSERS-S&amp;P 600 Index Composite</b>	1.51	-10.47	-9.12	-4.70	4.31	3.76	13.02	10.01	291,484
S&P SmallCap 600	1.50	-10.48	-9.13	-4.85	4.08	3.54	12.40	9.42	
Value Added	0.01	0.01	0.01	0.15	0.23	0.22	0.62	0.59	
<b>PSERS Misc. Equity</b>									1,414
Equity Rebalance Account									12,403
<b>Total Non-U.S. Equity Composite (hedged)</b>	1.00	-8.10	-7.18	-6.45	-6.93	-4.90	6.18	5.92	6,151,164
Blended Policy (Total Non-US Eq) (Hedged)	1.13	-7.46	-6.42	-5.46	-7.49	-5.49	5.93	4.90	
Value Added	-0.13	-0.64	-0.76	-0.99	0.56	0.59	0.25	1.02	

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Empower Results®

As of November 30, 2018

Trailing Period Performance

	Performance (%)						Allocation			
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year		3 Years	5 Years	Market Value (\$'000)
<b>Total Non-U.S. Equity Composite (unhedged)</b>	0.92	-8.94	-8.11	-8.02	-10.06	-7.85	6.01	2.97	6,144,419	15.31
Blended Policy (Total Non-US Eq) (Unhedged)	1.01	-8.37	-7.45	-7.15	-10.64	-8.49	5.66	1.99		
Value Added	-0.09	-0.57	-0.66	-0.87	0.58	0.64	0.35	0.98		
<b>Emerging Markets Equity Composite</b>	7.41	-11.84	-5.30	-10.99	-15.45	-12.76	3.17	0.31	420,236	1.05
Blended Policy (MSCI EM net)	4.27	-8.91	-5.03	-6.41	-12.83	-9.69	9.24	1.81		
Value Added	3.14	-2.93	-0.27	-4.58	-2.62	-3.07	-6.07	-1.50		
MSCI Emerging Markets IMI (Net)	4.27	-8.91	-5.03	-6.41	-12.83	-9.69	8.74	1.81		
Value Added	3.14	-2.93	-0.27	-4.58	-2.62	-3.07	-5.57	-1.50		
Wasatch EM Small Cap	7.41	-11.84	-5.30	-10.99	-15.45	-12.76	3.17	-0.04	287,236	0.72
Blended Benchmark (Wasatch EM)	4.68	-9.29	-5.04	-8.22	-15.86	-12.76	5.19	1.22		
Value Added	2.73	-2.55	-0.26	-2.77	0.41	0.00	-2.02	-1.26		
Steadview Capital Partners LP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	133,000	0.33
Nifty 50 Index	4.82	-4.87	-0.29	2.15	4.79	7.91	12.62	13.58		
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
<b>Total Non-U.S. Equity x Emerging Markets Composite (hedged)</b>	0.70	-7.92	-7.27	-6.24	-6.52	-4.53	6.32	N/A	5,730,928	14.28
Blended Policy (Non-US Equity x EM) (Hedged)	0.97	-7.39	-6.49	-5.44	-7.28	-5.33	5.78	5.21		
Value Added	-0.27	-0.53	-0.78	-0.80	0.76	0.80	0.54	N/A		
Insight Everest - Int'l Eq	0.19	1.74	1.93	3.21	6.47	6.00	0.83	4.27	6,744	0.02
Insight Everest - Int'l Eq (notional)	0.22	1.75	1.97	3.30	6.52	6.05	0.95	4.31	2,752,722	6.86
Currency Hedge Benchmark - Int'l Eq	-0.03	-0.01	-0.04	-0.09	-0.05	-0.05	-0.12	-0.04		
Value Added	0.61	-8.80	-8.24	-7.89	-9.81	-7.63	6.15	3.16	5,724,184	14.27
<b>Total Non-U.S. Equity x Emerging Markets Composite (unhedged)</b>	0.85	-8.36	-7.58	-7.22	-10.60	-8.49	5.49	2.01		
Blended Policy (Non-US Equity x EM) (Unhedged)	-0.24	-0.44	-0.66	-0.67	0.79	0.86	0.66	1.15		
Value Added	0.83	-8.24	-7.48	-6.97	-9.29	-7.14	6.20	2.97	4,948,310	12.33
<b>Non-US Large Cap Equity Composite</b>	0.95	-8.13	-7.26	-6.61	-10.13	-8.12	5.43	1.79		
Blended Policy (MSCI World AC Word ex USA net)	-0.12	-0.11	-0.22	-0.36	0.84	0.98	0.77	1.18		
Value Added	0.94	-8.31	-7.45	-6.76	-9.65	-7.37	6.16	2.39	2,293,084	5.71
PSERS ACWI x US Index Fund	0.95	-8.13	-7.26	-6.61	-10.13	-8.12	5.43	1.79		
MSCI ACWI/EAFE Index Blend	-0.01	-0.18	-0.19	-0.15	0.48	0.75	0.73	0.60		
Value Added	4.35	-9.35	-5.40	-6.98	-11.15	-7.16	11.66	N/A	437,882	1.09
BlackRock EMAX	4.12	-8.71	-4.95	-5.99	-12.24	-9.09	9.41	1.90		
MSCI Emerging Markets Index (Net)	0.23	-0.64	-0.45	-0.99	1.09	1.93	2.25	N/A		
Value Added	0.74	-8.18	-7.51	-7.19	-8.99	-6.91	6.23	3.65	2,655,226	6.62
<b>Active Non-US Large Cap Composite</b>	0.95	-8.13	-7.26	-6.61	-10.13	-8.12	5.43	1.79		
MSCI AC World ex USA Index (Net)	-0.21	-0.05	-0.25	-0.58	1.14	1.21	0.80	1.86		
Value Added										

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As of November 30, 2018

Trailing Period Performance

	Performance (%)										Allocation	
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$000)	%		
Baillie Gifford	0.05	-8.95	-8.91	-8.68	-11.40	-9.66	7.26	4.29	1,065,927	2.66		
MSCI AC World ex USA Index (Net)	0.95	-8.13	-7.26	-6.61	-10.13	-8.12	5.43	1.79				
Value Added	-0.90	-0.82	-1.65	-2.07	-1.27	-1.54	1.83	2.50				
Marathon Asset Mgmt	-0.09	-8.00	-8.08	-7.35	-9.62	-6.98	4.57	2.82	1,034,677	2.58		
Blended Benchmark (MSCI AC World ex USA net)	0.95	-8.13	-7.26	-6.61	-10.13	-8.12	5.43	1.79				
Value Added	-1.04	0.13	-0.82	-0.74	0.51	1.14	-0.86	1.03				
The Children's Investment Fund, LP	3.88	-5.37	-1.70	-0.51	N/A	N/A	N/A	N/A	357,450	0.89		
MSCI World Index (Net)	1.14	-7.34	-6.29	-1.62	-1.20	0.14	8.50	6.67				
Value Added	2.74	1.97	4.59	1.11	N/A	N/A	N/A	N/A				
BlackRock Global Composite	4.32	-9.27	-5.35	-9.18	-10.04	-8.47	4.83	2.38	147,172	0.37		
MSCI AC World ex USA Index (Net)	0.95	-8.13	-7.26	-6.61	-10.13	-8.12	5.43	1.79				
Value Added	3.37	-1.14	1.91	-2.57	0.09	-0.35	-0.60	0.59				
Effisimo Capital Partners Feeder Fund 2 LP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	50,000	0.12		
MSCI Japan in LC (Net)	1.01	-9.04	-8.12	-2.32	-5.90	-4.61	3.07	6.86				
Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Non-US Small Cap Equity Composite	-0.75	-12.08	-12.74	-13.36	-12.73	-10.25	6.16	4.92	775,874	1.93		
MSCI AC World ex USA Small Cap (Net)	0.25	-9.73	-9.50	-10.87	-13.49	-10.83	5.81	3.46				
Value Added	-1.00	-2.35	-3.24	-2.49	0.76	0.58	0.35	1.46				
Active Non-US Small Cap Composite	-0.75	-12.08	-12.74	-13.18	-12.18	-10.06	6.07	4.87	775,874	1.93		
MSCI AC World ex USA Small Cap (Net)	0.25	-9.73	-9.50	-10.87	-13.49	-10.83	5.81	3.46				
Value Added	-1.00	-2.35	-3.24	-2.31	1.31	0.77	0.26	1.41				
Acadian Asset Mgmt	-0.29	-10.49	-10.75	-11.72	-13.36	-11.32	9.43	6.47	238,478	0.59		
Blended Benchmark (MSCI AC World ex USA Small Cap net)	0.25	-9.73	-9.50	-10.87	-13.49	-10.83	5.81	3.46				
Value Added	-0.53	-0.76	-1.25	-0.85	0.13	-0.49	3.62	3.01				
Wasatch Int'l Small Cap	-0.17	-13.87	-14.02	-12.36	-6.87	-4.17	5.51	4.45	267,811	0.67		
Blended Benchmark (MSCI AC World ex USA Small Cap net)	0.25	-9.73	-9.50	-10.87	-13.49	-10.83	5.81	3.46				
Value Added	-0.42	-4.14	-4.52	-1.49	6.62	6.66	-0.30	0.99				
Oberweis Asset Mgmt	-2.28	-12.24	-14.23	-16.54	-16.03	-14.78	4.91	5.80	182,998	0.46		
MSCI AC World ex USA Small Cap (Net)	0.25	-9.73	-9.50	-10.87	-13.49	-10.83	5.81	3.46				
Value Added	-2.53	-2.51	-4.73	-5.67	-2.54	-3.95	-0.90	2.34				
QS Investors	-0.56	-10.33	-10.84	-12.02	-15.48	-12.76	4.78	3.93	86,433	0.22		
MSCI AC World ex USA Small Cap (Net)	0.25	-9.73	-9.50	-10.87	-13.49	-10.83	5.81	3.46				
Value Added	-0.81	-0.60	-1.34	-1.15	-1.99	-1.93	-1.03	0.47				

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As of November 30, 2018

## Trailing Period Performance

	Performance (%)						Allocation			
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$000)	%
<b>Total Fixed Income Composite</b>	<b>-0.24</b>	<b>-0.47</b>	<b>-0.72</b>	<b>-1.12</b>	<b>0.49</b>	<b>1.94</b>	<b>5.87</b>	<b>5.34</b>	<b>14,356,906</b>	<b>35.78</b>
Blended Policy (Total FI)	-0.07	-1.06	-1.13	-1.08	-1.46	-0.66	3.79	2.87		
Value Added	-0.17	0.59	0.41	-0.04	1.95	2.60	2.08	2.47		
<b>Global Fixed Income Composite</b>	<b>0.11</b>	<b>-0.88</b>	<b>-0.77</b>	<b>-0.64</b>	<b>-2.31</b>	<b>-1.81</b>	<b>2.95</b>	<b>2.33</b>	<b>2,737,997</b>	<b>6.82</b>
Blended Policy (Global FI)	0.99	-0.98	-0.01	-0.14	-1.93	-1.39	2.29	1.24		
Value Added	-0.88	0.10	-0.76	-0.50	-0.38	-0.42	0.66	1.09		
<b>Total US Fixed Income Composite</b>	<b>-0.27</b>	<b>-0.46</b>	<b>-0.74</b>	<b>-1.19</b>	<b>0.63</b>	<b>2.16</b>	<b>6.01</b>	<b>6.06</b>	<b>13,763,711</b>	<b>34.30</b>
Blended Policy (Total US FI)	-0.14	-1.04	-1.18	-1.10	-1.37	-0.57	3.76	3.22		
Value Added	-0.13	0.58	0.44	-0.09	2.00	2.73	2.25	2.84		
<b>Total US Fixed Income ex TIPS Composite</b>	<b>0.31</b>	<b>-0.90</b>	<b>-0.59</b>	<b>0.20</b>	<b>1.90</b>	<b>3.38</b>	<b>6.51</b>	<b>6.54</b>	<b>9,825,039</b>	<b>24.49</b>
<b>Investment Grade Composite</b>	<b>1.08</b>	<b>-2.07</b>	<b>-1.01</b>	<b>-3.01</b>	<b>-6.35</b>	<b>-5.18</b>	<b>1.74</b>	<b>N/A</b>	<b>4,859,463</b>	<b>12.11</b>
Blended Policy (Investment Grade)	1.37	-2.14	-0.80	-1.76	-3.48	-2.67	1.14	2.54		
Value Added	-0.29	0.07	-0.21	-1.25	-2.87	-2.51	0.60	N/A		
<b>US Core Plus Fixed Income Composite</b>	<b>0.09</b>	<b>-0.91</b>	<b>-0.82</b>	<b>-0.81</b>	<b>-2.58</b>	<b>-2.10</b>	<b>2.51</b>	<b>3.16</b>	<b>2,380,796</b>	<b>5.93</b>
Blended Policy (Barclays Aggregate Index)	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03		
Value Added	-0.51	-0.12	-0.62	-0.63	-0.79	-0.76	1.18	1.13		
<b>Pugh Capital Management</b>	<b>0.53</b>	<b>-0.80</b>	<b>-0.28</b>	<b>-0.26</b>	<b>-2.12</b>	<b>-1.55</b>	<b>1.33</b>	<b>2.13</b>	<b>100,177</b>	<b>0.25</b>
Blmng. Barc. U.S. Aggregate	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03		
Value Added	-0.07	-0.01	-0.08	-0.08	-0.33	-0.21	0.00	0.10		
<b>PSERS Active Core Plus Fixed Income</b>	<b>0.82</b>	<b>-0.44</b>	<b>0.37</b>	<b>0.30</b>	<b>-0.47</b>	<b>0.03</b>	<b>2.39</b>	<b>3.06</b>	<b>1,247,625</b>	<b>3.11</b>
Blmng. Barc. U.S. Aggregate	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03		
Value Added	0.22	0.35	0.57	0.48	1.32	1.37	1.06	1.03		
<b>BlackRock Global Alpha</b>	<b>-0.92</b>	<b>-1.72</b>	<b>-2.63</b>	<b>-2.63</b>	<b>-6.06</b>	<b>-5.64</b>	<b>2.38</b>	<b>3.35</b>	<b>914,096</b>	<b>2.28</b>
Blended Policy (Barclays Aggregate Index)	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03		
Value Added	-1.52	-0.93	-2.43	-2.45	-4.27	-4.30	1.05	1.32		
<b>SEI Investment Management</b>	<b>0.02</b>	<b>0.55</b>	<b>0.57</b>	<b>1.48</b>	<b>3.55</b>	<b>4.18</b>	<b>5.93</b>	<b>N/A</b>	<b>118,898</b>	<b>0.30</b>
ICE BofAML 1-3 Year U.S. Corporate	0.09	0.02	0.11	0.83	0.92	1.03	1.65	1.47		
Value Added	-0.07	0.53	0.46	0.65	2.63	3.15	4.28	N/A		
<b>Non-U.S. Developed Markets Fixed Income Composite</b>	<b>-2.22</b>	<b>-0.01</b>	<b>-2.23</b>	<b>-2.01</b>	<b>-1.42</b>	<b>-1.51</b>	<b>2.58</b>	<b>0.16</b>	<b>6,858</b>	<b>0.02</b>
Blended Policy (Barclays Global Agg GDP Weighted Dev ex US)	0.38	0.24	0.62	0.47	1.66	1.69	2.98	0.14		
Value Added	-2.60	-0.25	-2.85	-2.48	-3.08	-3.20	-0.40	0.02		
<b>Alliance Bernstein Global Fixed</b>	<b>-2.22</b>	<b>-0.01</b>	<b>-2.23</b>	<b>-2.01</b>	<b>-1.42</b>	<b>-1.51</b>	<b>2.58</b>	<b>-0.01</b>	<b>6,858</b>	<b>0.02</b>
Spliced Barclays GlobalAgg GDPWeighted Dev xUS	0.38	0.24	0.62	0.47	1.66	1.69	2.98	0.14		
Value Added	-2.60	-0.25	-2.85	-2.48	-3.08	-3.20	-0.40	-0.15		
<b>U.S. Treasuries Total (unlevered)</b>	<b>1.34</b>	<b>-2.02</b>	<b>-0.71</b>	<b>-4.17</b>	<b>-8.16</b>	<b>-6.68</b>	<b>-0.52</b>	<b>2.50</b>	<b>3,905,622</b>	<b>9.73</b>
Blmng. Barc. U.S. Treasury: Long	1.89	-3.05	-1.21	-4.06	-6.93	-5.34	0.77	4.40		
Value Added	-0.55	1.03	0.50	-0.11	-1.23	-1.34	-1.29	-1.90		

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As of November 30, 2018

Trailing Period Performance

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	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$000)	%	
<b>PSERS U.S. Treasuries</b>	0.87	-0.48	0.38	N/A	N/A	N/A	N/A	N/A	1,608,834	4.01	
Blmbg. Barc. U.S. Treasury Value Added	0.89	-0.48	0.41	-0.19	-1.27	-0.96	0.63	1.39			
<b>PSERS U.S. Long Treasuries (levered)</b>	-0.02	0.00	-0.03	N/A	N/A	N/A	N/A	N/A			
PSERS U.S. Long Treasuries (unlevered)	32.79	-35.45	-14.28	-39.92	-53.73	-48.81	-35.59	-5.53	112,975	0.28	
Blmbg. Barc. U.S. Treasury: Long Value Added	1.84	-2.98	-1.20	-4.63	-8.60	-7.13	-0.68	2.40	1,546,788	3.86	
Blmbg. Barc. U.S. Treasury: Long Value Added	1.89	-3.05	-1.21	-4.06	-6.93	-5.34	0.77	4.40			
Blmbg. Barc. U.S. Treasury: Long Value Added	-0.05	0.07	0.01	-0.57	-1.67	-1.79	-1.45	-2.00			
<b>PSERS U.S. Funded Long Treasuries</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	750,000	1.87	
Blmbg. Barc. U.S. Treasury: Long Value Added	1.89	-3.05	-1.21	-4.06	-6.93	-5.34	0.77	4.40			
Blmbg. Barc. U.S. Treasury: Long Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
<b>Credit-Related</b>	-0.28	-0.11	-0.39	1.87	6.17	7.72	8.82	N/A	5,320,661	13.26	
Blended Policy (Credit-Related) Value Added	-0.55	-1.61	-2.15	-0.10	-0.48	-0.06	6.92	N/A			
Blended Policy (Credit-Related) Value Added	0.27	1.50	1.76	1.97	6.65	7.78	1.90	N/A			
<b>Emerging Markets Fixed Income Composite</b>	0.25	-0.75	-0.50	0.47	-1.70	-0.79	6.54	2.33	350,343	0.87	
Blended Policy (Barclays Emerging Mkt 10% Country Cap) Value Added	2.54	-1.75	0.75	-0.28	-6.03	-4.61	4.43	-0.30			
Blended Policy (Barclays Emerging Mkt 10% Country Cap) Value Added	-2.29	1.00	-1.25	0.75	4.33	3.82	2.11	2.63			
<b>Franklin Templeton Emerging Fixed Income</b>	0.25	-0.75	-0.50	0.47	-1.70	-0.79	6.42	3.77	350,343	0.87	
Blended Policy (Barclays Emerging Mkt 10% Country Cap) Value Added	2.54	-1.75	0.75	-0.28	-6.03	-4.61	4.43	-0.30			
Blended Policy (Barclays Emerging Mkt 10% Country Cap) Value Added	-2.29	1.00	-1.25	0.75	4.33	3.82	1.99	4.07			
<b>High Yield Fixed Income Composite (hedged)</b>	-0.32	-0.07	-0.39	1.97	6.75	8.36	9.00	7.39	4,970,318	12.39	
Blended Policy (Barclays Corporate HY) Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39			
Blended Policy (Barclays Corporate HY) Value Added	0.54	1.53	2.06	2.07	6.69	8.00	1.91	3.00			
<b>High Yield Fixed Income x Internal Composite (hedged)</b>	-0.32	-0.07	-0.39	2.00	6.79	8.40	N/A	N/A	4,903,719	12.22	
Blended Policy (Barclays Corporate HY) Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39			
Blended Policy (Barclays Corporate HY) Value Added	0.54	1.53	2.06	2.10	6.73	8.04	N/A	N/A			
<b>Insight Oxygen - HY</b>	0.34	2.77	3.12	4.34	8.66	8.14	-0.44	N/A	1,052	0.00	
Insight Oxygen - HY (notional)	0.23	2.53	2.77	3.94	7.84	7.32	-0.87	4.40	407,610	1.02	
Currency Hedge Benchmark - HY Value Added	0.11	0.24	0.35	0.40	0.82	0.82	0.43	N/A			
<b>High Yield Fixed Income Composite (unhedged)</b>	-0.35	-0.29	-0.64	1.61	6.01	7.65	9.07	7.28	4,969,266	12.38	
Blended Policy (Barclays Corporate HY) Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39			
Blended Policy (Barclays Corporate HY) Value Added	0.51	1.31	1.81	1.71	5.95	7.29	1.98	2.89			
<b>High Yield Fixed Income x Internal Composite (unhedged)</b>	-0.35	-0.30	-0.65	1.64	6.04	7.68	N/A	N/A	4,902,568	12.22	
Blended Policy (Barclays Corporate HY) Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39			
Blended Policy (Barclays Corporate HY) Value Added	0.51	1.30	1.80	1.74	5.98	7.32	N/A	N/A			
<b>Mezzanine High Yield Composite</b>	0.05	-0.60	-0.55	0.74	2.74	6.83	3.04	N/A	642,800	1.60	
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39			
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.91	1.00	1.90	0.84	2.68	6.47	-4.05	N/A			

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	Performance (%)										Allocation	
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$'000)	%		
Internally Managed Private Debt Co-Investment	0.00	0.00	0.00	-0.54	3.30	5.17	-16.98	-12.64	66,599	0.17		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Mezzanine High Yield Composite x Internal	0.86	1.60	2.45	-0.44	3.24	4.81	-24.07	-17.03				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.06	-0.67	-0.61	0.88	2.77	7.01	N/A	N/A	576,202	1.44		
Carlyle Energy Mezz. Opp. Fund	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.92	0.93	1.84	0.98	2.71	6.65	N/A	N/A				
ICG Europe Fund V	0.00	0.00	0.00	-1.02	-1.36	2.34	-20.62	-10.10	89,640	0.22		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Carlyle Energy Mezz. Opp. Fund II	0.86	1.60	2.45	-0.91	-1.42	1.98	-27.71	-14.49				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	0.66	5.70	6.14	-6.28	N/A	89,836	0.22		
ICG Europe Fund VI	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.86	1.60	2.45	0.76	5.64	5.78	-13.37	N/A				
ICG Europe Fund VII	0.15	-1.63	-1.48	3.01	4.78	8.58	14.39	9.45	73,719	0.18		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Bain Capital Middle Market Credit 2010, L.P.	1.01	-0.03	0.97	3.11	4.72	8.22	7.30	5.06				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.14	-1.56	-1.42	0.91	0.44	8.65	N/A	N/A	165,958	0.41		
ICG Europe Fund VIII	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Blmbg. Barc. U.S. Corp: High Yield Value Added	1.00	0.04	1.03	1.01	0.38	8.29	N/A	N/A				
Bain Capital Middle Market Credit 2014, L.P.	0.13	-1.53	-1.40	N/A	N/A	N/A	N/A	N/A	11,149	0.03		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Opportunistic High Yield Composite	0.99	0.07	1.05	N/A	N/A	N/A	N/A	N/A				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	-1.79	-5.92	-1.75	-1.74	1.33	30,653	0.08		
Bain Capital Middle Market Credit 2010, L.P.	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.86	1.60	2.45	-1.69	-5.98	-2.11	-8.83	-3.06				
Bain Capital Middle Market Credit 2014, L.P.	0.00	0.00	0.00	2.24	7.85	10.99	6.66	6.35	115,247	0.29		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Opportunistic High Yield Composite	0.86	1.60	2.45	2.34	7.79	10.63	-0.43	1.96				
Blmbg. Barc. U.S. Corp: High Yield Value Added	-1.09	-0.66	-1.74	1.15	7.75	9.45	11.47	N/A	2,137,899	5.33		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Apollo European Principal Fund II	-0.23	0.94	0.71	1.25	7.69	9.09	4.38	N/A				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	-5.23	-2.29	1.42	8.44	10.19	71,319	0.18		
Apollo European Principal Fund III	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.86	1.60	2.45	-5.13	-2.35	1.06	1.35	5.80				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	1.43	-24.12	N/A	N/A	N/A	66,113	0.16		
Bain Capital Credit Opp. Fund IV	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.86	1.60	2.45	1.53	-24.18	N/A	N/A	N/A				
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	-12.47	33.11	42.85	18.55	9.87	45,287	0.11		

Case ID: 221102792

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Empower results®

As of November 30, 2018

Trailing Period Performance

	Performance (%)							Allocation		
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$'000)	%
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Bain Capital Distressed and Special Situations 2013	-3.43	0.01	-3.42	-12.37	33.05	42.49	11.46	5.48		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39	224,243	0.56
Bain Capital Distressed and Special Situations 2016 (A), L.P.	-2.57	1.61	-0.97	0.36	7.34	8.40	1.78	2.49		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.66	0.45	-0.21	3.36	10.20	11.16	16.96	N/A	265,832	0.66
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
TPG Opportunities Partners II, LP	0.20	2.05	2.24	3.46	10.14	10.80	9.87	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	0.91	18.68	18.91	11.47	15.39	15,843	0.04
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
TPG Opportunities Partners III, LP	0.86	1.60	2.45	1.01	18.62	18.55	4.38	11.00		
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	3.81	14.52	20.15	14.89	N/A	88,941	0.22
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
TOP NPL (A)	0.86	1.60	2.45	3.91	14.46	19.79	7.80	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	-2.69	-3.42	-3.49	0.59	9.70	8,975	0.02
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
TPG TAO	0.86	1.60	2.45	-2.59	-3.48	-3.85	-6.50	5.31		
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	2.22	10.68	11.58	9.20	N/A	336,356	0.84
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Brigade Distressed Value	0.86	1.60	2.45	2.32	10.62	11.22	2.11	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.96	-3.58	-4.50	-0.21	6.81	8.37	14.53	6.95	170,253	0.42
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Brigade Structured Credit Offshore Fund	-0.10	-1.98	-2.05	-0.11	6.75	8.01	7.44	2.56		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-1.55	-0.59	-2.13	4.03	6.83	7.54	12.49	N/A	277,154	0.69
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Avenue Energy Opportunities Fund	-0.69	1.01	0.32	4.13	6.77	7.18	5.40	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-2.27	-1.78	-4.01	-0.17	2.52	3.74	10.98	N/A	258,534	0.64
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Avenue Energy Opportunities Fund II	-1.41	-0.18	-1.56	-0.07	2.46	3.38	3.89	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-3.72	-0.42	-4.13	2.87	6.03	5.63	N/A	N/A	85,543	0.21
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Avenue Europe SS III	-2.86	1.18	-1.68	2.97	5.97	5.27	N/A	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.63	-1.06	-0.43	2.29	6.06	8.05	N/A	N/A	223,506	0.56
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Real Asset High Yield Composite	1.49	0.54	2.02	2.39	6.00	7.69	N/A	N/A	659,980	1.64
Blmbg. Barc. U.S. Corp: High Yield Value Added	0.24	-0.45	-0.22	1.54	3.80	4.64	6.35	N/A		
Blmbg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Blmbg. Barc. U.S. Corp: High Yield Value Added	1.10	1.15	2.23	1.64	3.74	4.28	-0.74	N/A		

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As of November 30, 2018

Trailing Period Performance

	Performance (%)							Allocation		
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$000)	%
Latitude Management Real Estate Capital IV	0.00	0.00	0.00	2.15	4.63	3.85	N/A	N/A	36,664	0.09
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Mariner/Galton RMBS	0.50	-0.18	0.32	1.40	1.48	1.96	4.32	5.35	190,572	0.47
Blended Benchmark (Barclays US MBS) Value Added	0.90	-0.63	0.26	0.15	-0.81	-0.49	1.09	2.33		
Galton Onshore Mortgage Recovery Fund III, LP	-0.40	0.45	0.06	1.25	2.29	2.45	3.23	3.02		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.00	-0.65	-0.65	-0.97	1.96	3.06	6.33	2.57	41,794	0.10
Galton Onshore Mortgage Recovery Fund IV, L.P.	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.86	0.95	1.80	-0.87	1.90	2.70	-0.76	-1.82		
Mariner International Infrastructure	0.00	-6.23	-6.23	-6.35	-12.83	-16.35	N/A	N/A	61,914	0.15
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
PIMCO BRAVO Fund III Onshore Feeder, L.P.	0.86	-4.63	-3.78	-6.25	-12.89	-16.71	N/A	N/A		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.00	0.00	0.00	4.50	7.46	6.84	8.72	4.29	79,974	0.20
PIMCO BRAVO Fund III Onshore Feeder, L.P.	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.86	1.60	2.45	4.60	7.40	6.48	1.63	-0.10		
The Varde Scratch and Dent Fund, LP	0.00	0.00	0.00	2.28	11.51	21.93	N/A	N/A	104,552	0.26
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
The Varde Scratch and Dent Fund Feed I-A	0.38	0.29	0.67	2.67	5.30	6.06	6.85	N/A	81,167	0.20
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
The Varde Scratch and Dent Fund Feed I-A	1.24	1.89	3.12	2.77	5.24	5.70	-0.24	N/A		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.50	1.01	1.51	3.86	7.73	8.06	N/A	N/A	63,344	0.16
Senior Loans High Yield Composite	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Blmfg. Barc. U.S. Corp: High Yield Value Added	1.14	2.03	3.16	2.81	6.10	6.54	2.64	N/A		
Cerberus Levered Loan Fund I	0.44	1.42	1.87	4.16	6.78	7.24	6.44	4.14	5,190	0.01
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Cerberus Levered Loan Fund II	1.30	3.02	4.32	4.26	6.72	6.88	-0.65	-0.25		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.05	0.33	0.38	1.75	3.40	3.15	2.73	6.12	102,291	0.25
Cerberus PSERS Levered Loan Opportunities Fund	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Blmfg. Barc. U.S. Corp: High Yield Value Added	0.91	1.93	2.83	1.85	3.34	2.79	-4.36	1.73		
LBC Credit Partners II	0.58	2.50	3.09	4.16	11.16	11.46	23.10	N/A	236,036	0.59
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
LBC Credit Partners II	1.44	4.10	5.54	4.26	11.10	11.10	16.01	N/A		
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.04	0.00	-0.04	8.22	25.72	27.87	21.40	20.12	1,226	0.00
Blmfg. Barc. U.S. Corp: High Yield Value Added	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		

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As of November 30, 2018

Trailing Period Performance

	Performance (%)						Allocation			
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year		3 Years	5 Years	Market Value (\$'000)
Value Added	0.82	1.60	2.41	8.32	25.66	27.51	14.31	15.73		
LBC Credit Partners III	0.82	0.92	1.75	5.64	6.79	5.04	7.60	9.35	90,418	0.23
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	1.68	2.52	4.20	5.74	6.73	4.68	0.51	4.96		
LBC-P Credit Fund LP	1.15	1.00	2.16	4.62	9.53	10.68	N/A	N/A	189,006	0.47
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	2.01	2.60	4.61	4.72	9.47	10.32	N/A	N/A		
Summit Partners Credit Fund II LP	0.00	0.00	0.00	1.86	4.83	8.17	10.47	N/A	133,516	0.33
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	0.86	1.60	2.45	1.96	4.77	7.81	3.38	N/A		
Oaktree Loan Fund 2X, LP	0.00	0.00	0.00	0.33	2.03	1.04	0.66	-3.93	11,441	0.03
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	0.86	1.60	2.45	0.43	1.97	0.68	-6.43	-8.32		
Bain Capital Credit Managed Account (PSERS), L.P.	-0.37	-0.18	-0.55	1.19	4.24	5.03	9.17	5.10	392,492	0.98
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	0.49	1.42	1.90	1.29	4.18	4.67	2.08	0.71		
Park Square Credit Opportunities	0.00	0.00	0.00	2.52	3.54	3.85	9.99	N/A	175,847	0.44
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	0.86	1.60	2.45	2.62	3.48	3.49	2.90	N/A		
Hayfin Special Opportunities Credit LP	1.56	-1.68	-0.15	5.61	6.58	8.13	13.07	5.45	85,418	0.21
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	2.42	-0.08	2.30	5.71	6.52	7.77	5.98	1.06		
Hayfin SOF II USD Co-Invest	0.00	0.00	0.00	1.20	3.97	6.18	N/A	N/A	22,915	0.06
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	0.86	1.60	2.45	1.30	3.91	5.82	N/A	N/A		
Hayfin SOF II USD LP	0.00	0.00	0.00	1.73	4.86	5.75	N/A	N/A	82,790	0.21
Blmbg. Barc. U.S. Corp: High Yield	-0.86	-1.60	-2.45	-0.10	0.06	0.36	7.09	4.39		
Value Added	0.86	1.60	2.45	1.83	4.80	5.39	N/A	N/A		
Inflation Protected (levered)	-1.60	0.47	-1.13	-3.87	-1.85	-0.23	5.19	N/A	3,938,672	9.82
Blended Policy (Net Levered TIPS)	-1.56	-0.08	-1.64	-3.87	-4.16	-2.22	5.41	3.84		
Value Added	-0.04	0.55	0.51	0.00	2.31	1.99	-0.22	N/A		
Inflation Protected (unlevered)	-0.82	0.24	-0.58	-1.32	-0.27	0.56	3.01	N/A	7,824,267	19.50
Blended Policy (Barclays World Inflation Linked Bond - Hedged)	-0.67	0.07	-0.60	-1.44	-1.05	0.02	3.46	2.48		
Value Added	-0.15	0.17	0.02	0.12	0.78	0.54	-0.45	N/A		
TIPS Composite (levered)	-1.60	0.47	-1.13	-3.87	-1.85	-0.23	5.19	5.19	3,938,672	9.82
Blended Policy (Net Levered TIPS)	-1.56	-0.08	-1.64	-3.87	-4.16	-2.22	5.41	3.84		
Value Added	-0.04	0.55	0.51	0.00	2.31	1.99	-0.22	1.35		

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As of November 30, 2018

Trailing Period Performance

	Performance (%)							Allocation		
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$'000)	%
TIPS Composite (unlevered)	-0.82	0.24	-0.58	-1.32	-0.27	0.56	3.01	4.54	7,824,267	19.50
Blended Policy (Barclays World Inflation Linked Bond - Hedged) Value Added	-0.67	0.07	-0.60	-1.44	-1.05	0.02	3.46	2.48		
	-0.15	0.17	0.02	0.12	0.78	0.54	-0.45	2.06		
Bridgewater TIPS (unlevered)	-1.73	1.61	-0.15	-0.66	1.47	2.28	3.97	N/A	4,400,000	10.97
BGI Custom IL Bond Index (unlevered) Value Added	-1.46	0.83	-0.64	-1.77	-0.38	0.37	N/A	N/A		
	-0.27	0.78	0.49	1.11	1.85	1.91	N/A	N/A		
Bridgewater TIPS (levered)	-3.18	3.04	-0.24	-3.44	0.55	2.10	6.90	7.57	2,320,666	5.78
BGI Custom IL Bond Index (levered) Value Added	-2.67	1.54	-1.17	-3.28	-0.66	0.78	6.60	6.71		
	-0.51	1.50	0.93	-0.16	1.21	1.32	0.30	0.86		
Garda Inflation Opportunity Composite (unlevered)	0.30	-1.57	-1.28	-2.47	-3.16	-2.35	1.12	N/A	1,500,000	3.74
Garda Inflation Opportunity Composite (levered) Value Added	1.08	-5.39	-4.37	-8.16	-10.21	-7.73	3.82	N/A	418,739	1.04
	1.61	-8.55	-7.08	-10.34	-14.05	-10.69	2.63	0.34		
Blended Benchmark (Garda) Value Added	-0.53	3.16	2.71	2.18	3.84	2.96	1.19	N/A		
Garda Inflation Opp. Fund CI B (unlevered)	0.31	-1.61	-1.31	-2.61	-3.42	-2.65	0.90	N/A	1,500,000	3.74
Garda Inflation Opp. Fund CI B (levered) Value Added	1.77	-8.45	-6.83	-12.87	-16.22	-12.94	1.94	1.75	266,207	0.66
	1.61	-8.55	-7.08	-10.34	-14.05	-10.69	2.63	0.34		
Blended Benchmark (Garda) Value Added	0.16	0.10	0.25	-2.53	-2.17	-2.25	-0.69	1.41		
Garda Fixed Income Relative Value Opportunity Fund (TIPS)	-0.11	0.37	0.25	1.39	2.62	3.03	5.65	N/A	152,532	0.38
PSERS Total TIPS (levered)	0.66	-2.36	-1.72	-3.17	-3.25	-1.84	2.01	1.81	1,199,267	2.99
PSERS Total TIPS (unlevered) Value Added	0.41	-1.47	-1.07	-1.98	-2.03	-1.14	2.07	1.85	1,924,267	4.80
	0.48	-1.43	-0.96	-1.77	-1.80	-0.90	1.66	1.28		
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS Value Added	-0.07	-0.04	-0.11	-0.21	-0.23	-0.24	0.41	0.57		
PSERS TIPS	0.49	-1.39	-0.91	-1.57	-1.54	-0.49	2.23	1.95	1,182,041	2.95
Blmbg. Barc. Global Inflation-Linked: U.S. TIPS Value Added	0.48	-1.43	-0.96	-1.77	-1.80	-0.90	1.66	1.28		
	0.01	0.04	0.05	0.20	0.26	0.41	0.57	0.67		
PIMCO Multi-Sector Strategy	0.78	-0.61	0.16	-0.26	-0.73	-0.41	3.39	2.46	235,994	0.59
Blended Policy (PIMCO Multi-Sector) Value Added	0.96	-0.66	0.29	-0.20	-0.76	-0.31	2.91	2.49		
	-0.18	0.05	-0.13	-0.06	0.03	-0.10	0.48	-0.03		
PSERS Fixed Liquidation									2,117	0.01
Risk Parity Composite (vol adjusted)	-0.02	-4.04	-4.05	-3.73	-4.96	-3.24	5.08	3.99	4,394,668	10.95
Blended Policy (Risk Parity) Value Added	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46		
	-0.78	0.47	-0.26	0.00	0.65	0.41	-0.79	-0.47		
PSERS Risk Parity Composite (vol adjusted)	-0.07	-3.33	-3.40	-3.85	-4.99	-3.09	6.11	4.82	2,225,660	5.55
Bridgewater All Weather (vol adjusted)	-0.05	-3.37	-3.42	-3.82	-4.27	-2.25	5.70	4.00	724,829	1.81
JE Shaw Orienteer HV (vol adjusted)	0.64	-6.73	-6.13	-2.73	-5.67	-4.15	N/A	N/A	436,504	1.09

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Empower Results®

As of November 30, 2018

## Trailing Period Performance

	Performance (%)										Allocation
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$000)	%	
BlackRock Market Advantage II (vol adjusted)	0.03	-4.05	-4.02	-3.21	-2.84	-1.36	7.15	N/A	493,225	1.23	
Bridgewater Optimal (vol adjusted)	-0.34	-3.83	-4.16	-4.03	-5.98	-5.05	0.95	N/A	514,450	1.28	
Real Assets x Private (levered/hedged)	-1.18	-5.70	-6.81	-6.86	-6.78	-2.63	6.51	N/A	5,156,880	12.85	
Real Assets x Private (unlevered/hedged)	-0.73	-3.63	-4.34	-4.37	-4.32	-1.65	4.25	N/A	8,280,723	20.64	
Blended Policy (Real Assets x Private RE) (Hedged)	0.18	-2.96	-2.78	-2.72	-2.91	-0.30	3.79	N/A			
Value Added	-0.91	-0.67	-1.56	-1.65	-1.41	-1.35	0.46	N/A			
Real Assets x Private (levered/unhedged)	-1.16	-5.90	-6.99	-7.15	-7.44	-3.18	6.43	N/A	5,156,228	12.85	
Real Assets x Private (unlevered/unhedged)	-0.72	-3.76	-4.45	-4.56	-4.75	-2.01	4.21	N/A	8,280,071	20.64	
Blended Policy (Real Assets x Private RE) (Unhedged)	0.20	-3.11	-2.92	-2.95	-3.46	-0.78	3.73	N/A			
Value Added	-0.92	-0.65	-1.53	-1.61	-1.29	-1.23	0.48	N/A			
Infrastructure Composite ex Private (levered/hedged)	-0.62	-7.37	-7.94	-3.92	-1.72	1.93	13.62	N/A	3,029,265	7.55	
Infrastructure Composite ex Private (unlevered/hedged)	-0.52	-6.36	-6.85	-3.35	-1.43	1.65	6.31	N/A	3,551,920	8.85	
Blended Policy (Infrastructure Hedged)	0.00	-5.97	-5.96	-1.94	-0.75	1.95	6.59	7.92			
Value Added	-0.52	-0.39	-0.89	-1.41	-0.68	-0.30	-0.28	N/A			
Insight Nevada - Infra	-0.30	1.77	1.46	2.32	6.38	5.09	0.09	N/A	191	0.00	
Insight Nevada - Infra (notional)	-0.30	1.80	1.49	2.36	6.49	5.21	0.21	N/A	465,985	1.16	
Currency Hedge Benchmark - Infra	0.00	-0.03	-0.03	-0.04	-0.11	-0.12	-0.12	N/A			
Value Added	-0.57	-7.62	-8.15	-4.24	-2.53	1.31	N/A	N/A	3,029,074	7.55	
Infrastructure Composite ex Private (levered/unhedged)	-0.48	-6.58	-7.03	-3.62	-2.14	1.10	N/A	N/A	3,551,729	8.85	
Infrastructure Composite ex Private (unlevered/unhedged)	0.05	-6.25	-6.20	-2.31	-1.75	1.11	6.76	6.08			
Blended Policy (Infrastructure Unhedged)	-0.53	-0.33	-0.83	-1.31	-0.39	-0.01	N/A	N/A			
Value Added	6.00	-4.34	1.41	0.40	-2.14	-5.49	16.71	N/A	525,925	1.31	
Publicly-Traded Infrastructure Composite (levered)	2.95	-2.14	0.74	0.24	-1.05	-2.81	8.36	N/A	1,048,579	2.61	
Publicly-Traded Infrastructure Composite (unlevered)	2.98	-2.07	0.85	0.57	-0.40	-2.14	8.75	7.27			
FTSE Developed Core Infracast 50/50 Index (Net)	-0.03	-0.07	-0.11	-0.33	-0.65	-0.67	-0.39	N/A			
Value Added	6.00	-4.34	1.41	0.40	-2.14	-5.49	16.71	N/A	525,925	1.31	
PSERS Infrastructure Index (levered)	2.95	-2.14	0.74	0.24	-1.05	-2.81	8.36	N/A	1,048,579	2.61	
PSERS Infrastructure Index (unlevered)	2.98	-2.07	0.85	0.57	-0.40	-2.14	8.75	7.27			
FTSE Developed Core Infracast 50/50 Index (Net)	-0.03	-0.07	-0.11	-0.33	-0.65	-0.67	-0.39	N/A			
Value Added	-1.85	-8.24	-9.94	-5.16	-2.52	3.13	2.60	-1.45	2,503,150	6.24	
MLP Composite	-1.42	-8.34	-9.63	-3.86	-2.89	2.20	1.59	-4.44			
S&P MLP Index	-0.43	0.10	-0.31	-1.30	0.37	0.93	1.01	2.99			
Value Added	-1.85	-8.20	-9.90	-5.07	-2.26	3.41	2.77	N/A	682,114	1.70	
PSERS MLP	-1.85	-8.25	-9.95	-5.19	-2.62	3.03	1.75	-4.36			
MLP Internal Blended Benchmark	0.00	0.05	0.05	0.12	0.36	0.38	1.02	N/A			
Value Added	-1.85	-8.25	-9.95	-5.19	-2.62	3.03	N/A	N/A	1,821,036	4.54	
External MLP Composite											

Case ID: 221102792

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As of November 30, 2018

## Trailing Period Performance

	Performance (%)						Allocation			
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$'000)	%
S&P MLP Total Return Index	-1.42	-8.34	-9.63	-3.86	-2.89	2.20	1.59	-4.44		
Value Added	-0.43	0.09	-0.32	-1.33	0.27	0.83	N/A	N/A		
Atlantic Trust	-1.46	-8.14	-9.48	-4.40	-0.81	5.19	3.32	-1.24	545,044	1.36
S&P MLP Index	-1.42	-8.34	-9.63	-3.86	-2.89	2.20	1.59	-4.44		
Value Added	-0.04	0.20	0.15	-0.54	2.08	2.99	1.73	3.20		
Salient	-1.79	-7.16	-8.83	-5.27	-3.98	1.71	3.23	-1.99	563,852	1.41
S&P MLP Index	-1.42	-8.34	-9.63	-3.86	-2.89	2.20	1.59	-4.44		
Value Added	-0.37	1.18	0.80	-1.41	-1.09	-0.49	1.64	2.45		
PSERS Harvest Funds MLP	-2.20	-9.18	-11.17	-5.74	-2.88	2.47	1.65	-1.37	712,140	1.77
S&P MLP Index	-1.42	-8.34	-9.63	-3.86	-2.89	2.20	1.59	-4.44		
Value Added	-0.78	-0.84	-1.54	-1.88	0.01	0.27	0.06	3.07		
Commodities Composite ex Private (levered)	-3.57	-3.09	-6.54	-13.90	-17.46	-12.30	7.35	-6.44	1,701,923	4.24
Commodities Composite ex Private (unlevered)	-1.51	-1.34	-2.83	-6.02	-7.69	-5.07	3.62	-3.63	4,081,344	10.17
Blended Policy (Commodities)	-0.13	-0.68	-0.81	-3.92	-5.58	-2.88	2.72	-4.92		
Value Added	-1.38	-0.66	-2.02	-2.10	-2.11	-2.19	0.90	1.29		
Gresham	-4.54	-2.94	-7.35	-7.72	-5.76	-2.64	2.85	-6.42	328,805	0.82
Bloomberg Commodity Index Total Return	-0.56	-2.16	-2.71	-4.68	-4.68	-1.83	1.64	-7.26		
Value Added	-3.98	-0.78	-4.64	-3.04	-1.08	-0.81	1.21	0.84		
Wellington Management Company	-1.46	-5.10	-6.49	-7.64	-6.88	-3.14	5.20	-4.25	433,439	1.08
Blended Benchmark (Wellington)	-2.55	-5.78	-8.18	-8.40	-5.71	-1.62	6.05	-3.74		
Value Added	1.09	0.68	1.69	0.76	-1.17	-1.52	-0.85	-0.51		
PSERS Commodity Beta + PCAF Composite	-2.88	-2.89	-5.69	-7.80	-7.61	-5.10	3.41	N/A	1,619,100	4.04
Bloomberg Commodity Index Total Return	-0.56	-2.16	-2.71	-4.68	-4.68	-1.83	1.64	-7.26		
Value Added	-2.32	-0.73	-2.98	-3.12	-2.93	-3.27	1.77	N/A		
PSERS Commodity Beta (levered)	-6.53	-7.69	-13.72	-21.24	-22.84	-17.57	3.17	N/A	459,859	1.15
PSERS Commodity Beta (unlevered)	-1.93	-2.41	-4.29	-7.08	-7.60	-5.08	1.78	N/A	1,634,791	4.07
Bloomberg Commodity Index Total Return	-0.56	-2.16	-2.71	-4.68	-4.68	-1.83	1.64	-7.26		
Value Added	-1.37	-0.25	-1.58	-2.40	-2.92	-3.25	0.14	N/A		
PIMCO Commodity Alpha Fund	-5.24	-2.63	-7.73	-4.08	0.40	0.36	11.55	N/A	289,135	0.72
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93		
Value Added	-5.46	-2.84	-8.16	-5.10	-1.69	-1.87	10.17	N/A		
Gold Composite									190,685	0.48
PSERS Gold Fund (levered)									190,685	0.48
PSERS Gold Fund (unlevered)	0.43	1.59	2.03	-3.56	-8.71	-6.37	2.94	-1.16	1,700,000	4.24
Bloomberg Gold Subindex Total Return	0.61	1.78	2.40	-2.73	-7.19	-4.72	3.93	-1.03		
Value Added	-0.18	-0.19	-0.37	-0.83	-1.52	-1.65	-0.99	-0.13		
PTRES Composite (levered/hedged)	4.90	-3.94	0.77	0.52	3.36	4.57	9.01	8.53	425,691	1.06

Case ID: 221102792

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Empower Results®

As of November 30, 2018

## Trailing Period Performance

	Performance (%)										Allocation
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$'000)	%	
PTRES Composite (unlevered/hedged)	3.17	-2.59	0.50	0.35	2.39	3.17	5.96	6.81	647,459	1.61	
Blended Policy (PTRES) (Hedged)	3.72	-3.09	0.51	0.81	2.55	3.61	5.34	5.81			
Value Added	-0.55	0.50	-0.01	-0.46	-0.16	-0.44	0.52	1.00			
Insight Sierra - REIT									460	0.00	
Insight Sierra - REIT (notional)	0.00	1.35	1.35	2.65	5.45	4.88	0.49	N/A	202,323	0.50	
Currency Hedge Benchmark - REIT	0.01	1.37	1.38	2.70	5.56	5.00	0.61	N/A			
Value Added	-0.01	-0.02	-0.03	-0.05	-0.11	-0.12	-0.12	N/A			
PTRES Composite (levered/unhedged)	4.94	-4.61	0.10	-0.74	0.82	2.27	8.62	8.30	425,231	1.06	
PTRES Composite (unlevered/unhedged)	3.19	-3.03	0.07	-0.49	0.67	1.62	5.60	6.65	646,998	1.61	
Blended Policy (PTRES) (Unhedged)	3.72	-3.71	-0.13	-0.43	-0.07	1.21	4.98	5.44			
Value Added	-0.52	0.68	0.20	-0.06	0.74	0.41	0.62	1.21			
PSERS REIT Index (levered)	7.35	-7.30	-0.49	-1.42	-1.27	1.15	9.43	N/A	236,222	0.59	
PSERS REIT Index (unlevered)	3.65	-3.77	-0.26	-0.74	-0.67	0.59	4.75	N/A	457,989	1.14	
FTSE EPRA/NAREIT Developed Index (Net)	3.72	-3.71	-0.13	-0.43	-0.07	1.21	4.98	5.57			
Value Added	-0.06	-0.06	-0.13	-0.31	-0.60	-0.62	-0.23	N/A			
Security Capital Preferred Growth	2.07	-1.20	0.85	0.11	3.53	3.73	6.38	7.92	189,009	0.47	
Wishire US Real Estate Securities Index	4.68	-3.04	1.49	2.24	3.87	3.71	6.11	10.20			
Value Added	-2.61	1.84	-0.64	-2.13	-0.34	0.02	0.27	-2.28			
<b>Total Absolute Return</b>	<b>-1.43</b>	<b>0.73</b>	<b>-0.71</b>	<b>0.22</b>	<b>2.71</b>	<b>3.17</b>	<b>3.18</b>	<b>3.53</b>	<b>5,753,521</b>	<b>14.34</b>	
Blended Policy (3-month Libor + 3.5%)	0.51	0.50	1.00	2.48	5.36	5.81	4.93	4.90			
Value Added	-1.94	0.23	-1.71	-2.26	-2.65	-2.64	-1.75	-1.37			
Aeolus Property Catastrophe Keystone PF Fund, LP	-5.70	-0.37	-6.05	-1.05	-1.32	-2.99	-3.66	4.24	318,778	0.79	
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76			
Value Added	-5.89	-0.56	-6.44	-1.97	-3.15	-4.95	-4.82	3.48			
Apollo Aviation/SASOF II LP	-0.96	-0.85	-1.80	5.04	16.49	22.45	12.57	N/A	7,249	0.02	
Apollo Aviation/SASOF III LP	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	61,358	0.15	
ICE Libor (1 month)	-1.15	-1.04	-2.19	4.12	14.66	20.49	11.41	N/A			
Value Added	-0.74	0.68	-0.07	1.97	N/A	N/A	N/A	N/A	54,429	0.14	
Apollo Aviation/SASOF IV LP	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76			
ICE Libor (1 month)	-0.93	0.49	-0.46	1.05	N/A	N/A	N/A	N/A			
Value Added	-1.28	5.95	4.59	0.99	7.81	8.42	2.87	4.97	970,882	2.42	
Bridgewater Pure Alpha Fund II, Ltd.	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93			
ICE Libor (3 month)	-1.50	5.74	4.16	-0.03	5.72	6.19	1.49	4.04			
Value Added	-1.35	-1.64	-2.97	1.92	6.52	7.05	10.52	4.76	320,675	0.80	
Brigade Leveraged Capital Structures Offshore Fund, Ltd.	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76			
ICE Libor (1 month)	-1.54	-1.83	-3.36	1.00	4.69	5.09	9.36	4.00			
Value Added	-5.05	-7.02	-11.72	-12.28	-19.36	-19.56	-3.55	-1.16	263,140	0.66	
Capital Structure Investments Offshore Fund, Ltd.											

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Empower results®

As of November 30, 2018

Trailing Period Performance

	Performance (%)							Allocation Market Value (\$'000)	
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years		5 Years
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-5.24	-7.21	-12.11	-13.20	-21.19	-21.52	-4.71	-1.92	
Capula Global Relative Value Fund Limited	0.11	0.59	0.70	2.32	4.95	4.86	6.19	7.05	448,664
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-0.08	0.40	0.31	1.40	3.12	2.90	5.03	6.29	
Capula Tail Risk Fund Limited	-0.68	0.93	0.24	-0.46	-2.05	-2.46	-3.59	-1.99	312,667
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-0.87	0.74	-0.15	-1.38	-3.88	-4.42	-4.75	-2.75	
Caspian Keystone Focused Fund, Ltd.	0.00	0.00	0.00	0.00	-0.66	0.75	N/A	N/A	108
1-Month Libor + 7%	0.76	0.76	1.52	3.81	8.35	9.10	8.24	7.81	
Value Added	-0.76	-0.76	-1.52	-3.81	-9.01	-8.35	N/A	N/A	
Caspian Select Credit International, Ltd.	-0.58	-0.35	-0.93	1.02	2.29	2.62	4.95	2.13	256,506
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-0.77	-0.54	-1.32	0.10	0.46	0.66	3.79	1.37	
Garda Fixed Income Relative Value Opportunity Fund Ltd.	-0.11	0.37	0.25	1.39	2.62	3.03	5.65	4.97	418,439
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-0.30	0.18	-0.14	0.47	0.79	1.07	4.49	4.21	
HS Group Sponsor Fund II, Ltd.	1.31	-3.83	-2.57	-5.60	N/A	N/A	N/A	N/A	38,419
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93	
Value Added	1.09	-4.04	-3.00	-6.62	N/A	N/A	N/A	N/A	
Independence Reinsurance Partners Composite	-4.75	-0.55	-5.27	-2.56	2.11	3.61	N/A	N/A	161,573
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-4.94	-0.74	-5.66	-3.48	0.28	1.65	N/A	N/A	
Independence Reinsurance Partners Cash									-97
DaVinci Reinsurance Ltd.	-3.75	-2.59	-6.24	-5.90	0.67	4.72	N/A	N/A	31,762
Renaissance Re Medici Fund Ltd.	-0.34	0.55	0.21	1.59	5.44	6.40	N/A	N/A	62,169
Upsilon Diversified Fund Ltd.	-8.89	-0.53	-9.38	-4.55	-0.19	-4.94	N/A	N/A	67,739
Nephilar/Nimbus Weather Fund									154,336
3-Month TBills+ 5.00%	-0.08	0.28	0.20	4.43	4.28	N/A	N/A	N/A	
Value Added	0.59	0.59	1.19	2.94	6.31	6.85	5.97	5.59	
Nephilar/Palmetto Fund Ltd.	-0.67	-0.31	-0.99	1.49	-2.03	N/A	N/A	N/A	
ICE Libor (1 month)	-3.27	-2.82	-6.00	-4.91	-4.85	-5.49	-2.66	0.80	202,865
Value Added	-3.46	-3.01	-6.39	-5.83	-6.68	-7.45	-3.82	0.04	
Oceanwood Investments SPC Co-Invest	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	24,969
3-Month Libor+ 6.50%	0.75	0.74	1.49	3.71	8.16	8.88	7.97	7.49	
Value Added	-0.75	-0.74	-1.49	N/A	N/A	N/A	N/A	N/A	
Oceanwood Opportunities Fund	-1.18	-2.73	-3.88	-1.86	-2.03	-2.42	3.17	N/A	237,487

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Empower Results®

As of November 30, 2018

Trailing Period Performance

	Performance (%)							Allocation Market Value (\$'000)	
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years		5 Years
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-1.37	-2.92	-4.27	-2.78	-3.86	-4.38	2.01	N/A	
OWS Credit Opportunity Offshore Fund III, Ltd.	-0.26	0.38	0.12	2.61	9.61	10.53	11.36	N/A	276,201
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93	
Value Added	-0.48	0.17	-0.31	1.59	7.52	8.30	9.98	N/A	
Perry Partners LP	0.00	0.00	0.00	-9.11	-18.23	-10.88	-4.86	-5.54	20,295
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-0.19	-0.19	-0.39	-10.03	-20.06	-12.84	-6.02	-6.30	
PIMCO PARS/GCOF/MAV Composite	-1.16	2.56	1.37	1.89	1.66	1.43	1.77	3.39	807,960
ICE Libor (1 month)	0.19	0.19	0.39	0.92	1.83	1.96	1.16	0.76	
Value Added	-1.35	2.37	0.98	0.97	-0.17	-0.53	0.61	2.63	
PIMCO Absolute Return Strategy V Offshore Fund, Ltd.	-2.76	3.13	0.28	1.98	-1.03	-1.25	1.43	5.30	270,970
PIMCO Global Credit Opportunity Offshore Fund, Ltd.	-0.51	3.41	2.89	1.51	6.68	6.39	6.00	6.88	299,969
PIMCO Multi-Asset Volatility Onshore Fund, LLC	-0.12	0.86	0.75	2.26	-1.16	-1.34	1.18	3.39	237,020
Two Sigma Risk Premia Enhanced Fund, LP	1.17	0.73	1.91	4.49	7.69	9.82	N/A	N/A	222,366
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93	
Value Added	0.95	0.52	1.48	3.47	5.60	7.59	N/A	N/A	
Venor Capital Offshore, Ltd.	-2.04	-0.30	-2.34	0.33	6.11	10.07	N/A	N/A	174,154
FTSE 1 Month T-Bill	0.18	0.18	0.36	0.84	1.62	1.72	0.88	0.53	
Value Added	-2.22	-0.48	-2.70	-0.51	4.49	8.35	N/A	N/A	
Unallocated Cash & Cash Equivalents	0.16	0.71	0.87	1.44	2.33	2.72	1.24	0.89	2,371,148
ICE BofAML 3 Month U.S. T-Bill	0.21	0.17	0.38	0.87	1.69	1.80	0.97	0.59	
Value Added	-0.05	0.54	0.49	0.57	0.64	0.92	0.27	0.30	
PSERS Cash Management	0.19	0.20	0.39	0.95	1.88	2.28	1.06	0.71	1,753,031
RE Conversions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
PSERS Derivatives Collateral	-0.02	3.15	3.13	4.29	4.98	N/A	N/A	N/A	618,116
PSERS Ultra Short Duration	0.20	0.20	0.40	0.98	1.90	2.02	1.19	0.79	5,442,922
ICE BofAML US Treasury Bills 0-3M	0.19	0.17	0.37	0.86	1.64	1.74	0.91	0.55	
Value Added	0.01	0.03	0.03	0.12	0.26	0.28	0.28	0.24	
LIBOR Composite	0.13	0.18	0.31	1.02	2.08	2.21	1.82	1.41	1,023,706
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93	
Value Added	-0.09	-0.03	-0.12	0.00	-0.01	-0.02	0.44	0.48	
PSERS LIBOR Plus	0.13	0.18	0.31	0.99	2.10	2.24	1.71	1.24	597,154
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93	

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As of November 30, 2018

Trailing Period Performance

	Performance (%)						Allocation			
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Market Value (\$'000)	%
Value Added	-0.09	-0.03	-0.12	-0.03	0.01	0.01	0.33	0.31		
Capula LIBOR Tail Risk	-0.68	0.93	0.24	-0.46	-2.04	-2.46	-3.58	N/A	44,912	0.11
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93		
Value Added	-0.90	0.72	-0.19	-1.48	-4.13	-4.69	-4.96	N/A		
Radcliffe Ultra Short Duration	0.36	0.01	0.37	1.37	2.64	2.83	3.19	2.67	277,765	0.69
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93		
Value Added	0.14	-0.20	-0.06	0.35	0.55	0.60	1.81	1.74		
Penn Mutual Asset Management	-0.11	0.26	0.16	1.08	2.32	2.51	N/A	N/A	103,875	0.26
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93		
Value Added	-0.33	0.05	-0.27	0.06	0.23	0.28	N/A	N/A		
<b>PSERS Healthcare &amp; HOP</b>									<b>184,856</b>	<b>0.46</b>
PSERS Healthcare - Premium Assist	0.20	0.18	0.39	1.01	1.99	2.09	1.38	0.91	92,708	0.23
ICE BofAML 3 Month U.S. T-Bill	0.21	0.17	0.38	0.87	1.69	1.80	0.97	0.59		
Value Added	-0.01	0.01	0.01	0.14	0.30	0.29	0.41	0.32		
PSERS Healthcare - HOP	0.20	0.21	0.41	0.98	1.94	2.06	1.20	0.80	92,148	0.23
ICE BofAML 3 Month U.S. T-Bill	0.21	0.17	0.38	0.87	1.69	1.80	0.97	0.59		
Value Added	-0.01	0.04	0.03	0.11	0.25	0.26	0.23	0.21		
<b>Defined Contribution</b>									<b>11,707</b>	<b>0.03</b>
PSERS Defined Contribution	0.20	0.21	0.41	0.99	1.78	N/A	N/A	N/A		
<b>E/M Total Program Composite</b>									<b>729,192</b>	<b>1.82</b>
E/M US Core Plus FI Composite	0.22	-0.14	0.08	1.06	1.45	1.91	3.07	2.43		
Pugh Capital Management	0.53	-0.80	-0.28	-0.26	-2.12	-1.55	1.33	2.03	100,177	0.25
Blmbg. Barc. U.S. Aggregate	0.53	-0.80	-0.28	-0.26	-2.12	-1.55	1.33	2.13	100,177	0.25
Value Added	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03		
E/M Short Duration Cash	-0.07	-0.01	-0.08	-0.08	-0.33	-0.21	0.00	0.10		
Radcliffe Ultra Short Duration	0.17	-0.04	0.14	1.28	2.04	2.43	3.66	N/A	629,015	1.57
ICE Libor (3 month)	0.36	0.01	0.37	1.37	2.64	2.83	3.19	2.67	277,765	0.69
Value Added	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93		
Radcliffe Specialty Finance Debt	0.14	-0.20	-0.06	0.35	0.55	0.60	1.81	1.74		
3-Month Libor + 0.60%	0.02	-0.07	-0.05	1.20	1.57	2.12	4.04	N/A	351,250	0.88
Value Added	0.27	0.26	0.53	1.27	2.66	2.85	1.99	1.54		
Securities Lending	-0.25	-0.33	-0.58	-0.07	-1.09	-0.73	2.05	N/A		
Deutsche Bank Securities Lending Account									4,600,806	11.47
									4,600,806	11.47

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Empower Results®



As of November 30, 2018

## Trailing Period Performance - Risk Parity

	Performance (%)										Allocation Market Value (\$000)
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Since Inception	Inception Date	
<b>Risk Parity Composite<sup>o</sup></b>	-0.05	-4.68	-4.73	-4.43	-5.96	-4.02	5.70	4.66	3.16	10/01/2012	3,848,695
Blended Policy (Risk Parity) <sup>1</sup>	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.29		
Value Added	-0.81	-0.17	-0.94	-0.70	-0.35	-0.37	-0.17	0.20	-0.13		
<b>PSERS Risk Parity Composite (14% Targeted Vol)<sup>2</sup></b>	-0.11	-3.92	-4.03	-4.63	-6.08	-3.90	6.97	5.49	3.42	02/01/2013	1,907,709
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	2.88		
Value Added	-0.87	0.59	-0.24	-0.90	-0.47	-0.25	1.10	1.03	0.54		
<b>PSERS Risk Parity</b>	-0.16	-4.64	-4.79	-5.66	-7.37	-5.22	6.48	5.20	3.17	02/01/2013	1,609,171
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	2.88		
Value Added	-0.92	-0.13	-1.00	-1.93	-1.76	-1.57	0.61	0.74	0.29		
<b>PSERS Risk Parity LIBOR</b>	0.13	0.18	0.31	1.02	N/A	N/A	N/A	N/A	1.71	03/01/2018	298,537
ICE Libor (3 month)	0.22	0.21	0.43	1.02	2.09	2.23	1.38	0.93	1.80		
Value Added	-0.09	-0.03	-0.12	0.00	N/A	N/A	N/A	N/A	-0.09		
<b>Risk Parity - External<sup>3</sup></b>	0.02	-5.29	-5.27	-4.12	-5.70	-3.96	4.85	N/A	1.83	06/01/2014	1,940,987
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	2.91		
Value Added	-0.74	-0.78	-1.48	-0.39	-0.09	-0.31	-1.02	N/A	-1.08		
<b>Bridgewater All Weather (15% Targeted Vol)<sup>4</sup></b>	-0.11	-4.26	-4.36	-4.97	-5.72	-3.27	6.86	4.79	3.35	10/01/2012	579,863
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.29		
Value Added	-0.87	0.25	-0.57	-1.24	-0.11	0.38	0.99	0.33	0.06		
<b>DE Shaw Orienteer HV (15% Targeted Vol)<sup>5</sup></b>	0.75	-8.45	-7.76	-3.71	-7.57	-5.72	N/A	N/A	6.85	02/01/2016	349,203
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	7.27		
Value Added	-0.01	-3.94	-3.97	0.02	-1.96	-2.07	N/A	N/A	-0.42		
<b>BlackRock Market Advantage II (15% Targeted Vol)<sup>6</sup></b>	-0.01	-5.11	-5.11	-4.23	-3.97	-2.16	8.70	N/A	4.48	04/01/2015	394,580
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.03		
Value Added	-0.77	-0.60	-1.32	-0.50	1.64	1.49	2.83	N/A	1.45		
<b>Bridgewater Optimal (10% Targeted Vol)<sup>7</sup></b>	-0.25	-3.16	-3.41	-3.22	-4.72	-3.92	0.99	N/A	0.93	11/01/2015	617,340
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	5.04		
Value Added	-1.01	1.35	0.38	0.51	0.89	-0.27	-4.88	N/A	-4.11		

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<sup>1</sup>SI volatility is 9.95% <sup>2</sup>SI volatility is 8.44%  
<sup>3</sup>SI volatility is 9.99% <sup>4</sup>SI volatility is 8.43%  
<sup>5</sup>SI volatility is 10.32% <sup>6</sup>SI volatility is 10.11% <sup>7</sup>SI volatility is 6.49%

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As of November 30, 2018

Trailing Period Performance - Risk Parity (Vol Adjusted)

	Performance (%)										Allocation Market Value (\$000)
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Since Inception	Inception Date	
<b>Risk Parity Composite (Vol adjusted)</b>	<b>-0.02</b>	<b>-4.04</b>	<b>-4.05</b>	<b>-3.73</b>	<b>-4.96</b>	<b>-3.24</b>	<b>5.08</b>	<b>3.99</b>	<b>2.85</b>	<b>10/01/2012</b>	<b>4,394,668</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.29		
Value Added	<b>-0.78</b>	0.47	<b>-0.26</b>	0.00	0.65	0.41	<b>-0.79</b>	<b>-0.47</b>	<b>-0.44</b>		
<b>PSERS Risk Parity Composite (Vol adjusted to 12%)</b>	<b>-0.07</b>	<b>-3.33</b>	<b>-3.40</b>	<b>-3.85</b>	<b>-4.99</b>	<b>-3.09</b>	<b>6.11</b>	<b>4.82</b>	<b>3.05</b>	<b>02/01/2013</b>	<b>2,225,660</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	2.88		
Value Added	<b>-0.83</b>	1.18	0.39	<b>-0.12</b>	0.62	0.56	0.24	0.36	0.17		
<b>Risk Parity - External (Vol adjusted)</b>	<b>0.03</b>	<b>-4.60</b>	<b>-4.57</b>	<b>-3.49</b>	<b>-4.78</b>	<b>-3.23</b>	<b>4.50</b>	<b>N/A</b>	<b>1.88</b>	<b>06/01/2014</b>	<b>2,169,008</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	2.91		
Value Added	<b>-0.73</b>	<b>-0.09</b>	<b>-0.78</b>	0.24	0.83	0.42	<b>-1.37</b>	N/A	<b>-1.03</b>		
<b>Bridgewater All Weather (Vol adjusted to 12%)</b>	<b>-0.05</b>	<b>-3.37</b>	<b>-3.42</b>	<b>-3.82</b>	<b>-4.27</b>	<b>-2.25</b>	<b>5.70</b>	<b>4.00</b>	<b>2.86</b>	<b>10/01/2012</b>	<b>724,829</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.29		
Value Added	<b>-0.81</b>	1.14	0.37	<b>-0.09</b>	1.34	1.40	<b>-0.17</b>	<b>-0.46</b>	<b>-0.43</b>		
<b>DE Shaw Orienteer HV (Vol adjusted to 12%)</b>	<b>0.64</b>	<b>-6.73</b>	<b>-6.13</b>	<b>-2.73</b>	<b>-5.67</b>	<b>-4.15</b>	<b>N/A</b>	<b>N/A</b>	<b>5.72</b>	<b>02/01/2016</b>	<b>436,504</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	7.27		
Value Added	<b>-0.12</b>	<b>-2.22</b>	<b>-2.34</b>	1.00	<b>-0.06</b>	<b>-0.50</b>	N/A	N/A	<b>-1.55</b>		
<b>BlackRock Market Advantage II (Vol adjusted to 12%)</b>	<b>0.03</b>	<b>-4.05</b>	<b>-4.02</b>	<b>-3.21</b>	<b>-2.84</b>	<b>-1.36</b>	<b>7.15</b>	<b>N/A</b>	<b>3.78</b>	<b>04/01/2015</b>	<b>493,225</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.03		
Value Added	<b>-0.73</b>	0.46	<b>-0.23</b>	0.52	2.77	2.29	1.28	N/A	0.75		
<b>Bridgewater Optimal (Vol adjusted to 12%)</b>	<b>-0.34</b>	<b>-3.83</b>	<b>-4.16</b>	<b>-4.03</b>	<b>-5.98</b>	<b>-5.05</b>	<b>0.95</b>	<b>N/A</b>	<b>0.89</b>	<b>11/01/2015</b>	<b>514,450</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	5.04		
Value Added	<b>-1.10</b>	0.68	<b>-0.37</b>	<b>-0.30</b>	<b>-0.37</b>	<b>-1.40</b>	<b>-4.92</b>	N/A	<b>-4.15</b>		

Supplemental reporting.  
All volatility adjustments are made based on ex-ante volatility expectations.  
Risk Parity Composite (Vol adjusted) is an asset-weighted composite of volatility adjusted performance of underlying portfolios.

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As of November 30, 2018

## Supplemental Trailing Period Performance - Risk Parity

		Performance (%)										
1	1	1	1	1	1	1	1	1	3	5	Since	Inception
Month	Prior Month	Quarter To Date	FYTD	Year To Date	Year	Year	Year	Year	Years	Years	Inception	Date
Risk Parity Composite	-0.05	-4.68	-4.73	-4.43	-5.96	-4.02	-4.02	-4.02	5.70	4.66	3.16	10/01/2012
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	-3.65	-3.65	5.87	4.46	3.29	
Value Added	-0.81	-0.17	-0.94	-0.70	-0.35	-0.37	-0.37	-0.37	-0.17	0.20	-0.13	
90 Day TBill + 600bps	0.69	0.66	1.36	3.35	7.27	7.91	7.91	7.91	7.00	6.61	6.51	
Value Added	-0.74	-5.34	-6.09	-7.78	-13.23	-11.93	-11.93	-11.93	-1.30	-1.95	-3.35	
HFR Risk Parity Vol 10 Institutional Index	0.57	-4.19	-3.64	-3.64	-4.48	-3.04	-3.04	-3.04	5.57	4.34	3.77	
Value Added	-0.62	-0.49	-1.09	-0.79	-1.48	-0.98	-0.98	-0.98	0.13	0.32	-0.61	
HFR Risk Parity Vol 12 Institutional Index	-0.40	-5.55	-5.93	-6.39	-7.11	-5.24	-5.24	-5.24	5.72	3.84	3.26	
Value Added	0.35	0.87	1.20	1.96	1.15	1.22	1.22	1.22	-0.02	0.82	-0.10	
Risk Parity - External	0.02	-5.29	-5.27	-4.12	-5.70	-3.96	-3.96	-3.96	4.85	N/A	1.83	06/01/2014
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	-3.65	-3.65	5.87	4.46	2.91	
Value Added	-0.74	-0.78	-1.48	-0.39	-0.09	-0.31	-0.31	-0.31	-1.02	N/A	-1.08	
90 Day TBill + 600bps	0.69	0.66	1.36	3.35	7.27	7.91	7.91	7.91	7.00	6.61	6.67	
Value Added	-0.67	-5.95	-6.63	-7.47	-12.97	-11.87	-11.87	-11.87	-2.15	N/A	-4.84	
HFR Risk Parity Vol 10 Institutional Index	0.57	-4.19	-3.64	-3.64	-4.48	-3.04	-3.04	-3.04	5.57	4.34	3.07	
Value Added	-0.55	-1.10	-1.63	-0.48	-1.22	-0.92	-0.92	-0.92	-0.72	N/A	-1.24	
HFR Risk Parity Vol 12 Institutional Index	-0.40	-5.55	-5.93	-6.39	-7.11	-5.24	-5.24	-5.24	5.72	3.84	2.21	
Value Added	0.42	0.26	0.66	2.27	1.41	1.28	1.28	1.28	-0.87	N/A	-0.38	

As of November 30, 2018

Supplemental Trailing Period Performance - Risk Parity (Vol Adjusted)

	Performance (%)									
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Since Inception	Inception Date
<b>Risk Parity Composite (Vol adjusted)</b>	<b>-0.02</b>	<b>-4.04</b>	<b>-4.05</b>	<b>-3.73</b>	<b>-4.96</b>	<b>-3.24</b>	<b>5.08</b>	<b>3.99</b>	<b>2.85</b>	<b>10/01/2012</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	3.29	
Value Added	-0.78	0.47	-0.26	0.00	0.65	0.41	-0.79	-0.47	-0.44	
90 Day TBill + 600bps	0.69	0.66	1.36	3.35	7.27	7.91	7.00	6.61	6.51	
Value Added	-0.71	-4.70	-5.41	-7.08	-12.23	-11.15	-1.92	-2.62	-3.66	
HFR Risk Parity Vol 10 Institutional Index	0.57	-4.19	-3.64	-3.64	-4.48	-3.04	5.57	4.34	3.77	
Value Added	-0.59	0.15	-0.41	-0.09	-0.48	-0.20	-0.49	-0.35	-0.92	
HFR Risk Parity Vol 12 Institutional Index	-0.40	-5.55	-5.93	-6.39	-7.11	-5.24	5.72	3.84	3.26	
Value Added	0.38	1.51	1.88	2.66	2.15	2.00	-0.64	0.15	-0.41	
<b>Risk Parity - External (Vol adjusted)</b>	<b>0.03</b>	<b>-4.60</b>	<b>-4.57</b>	<b>-3.49</b>	<b>-4.78</b>	<b>-3.23</b>	<b>4.50</b>	<b>N/A</b>	<b>1.88</b>	<b>06/01/2014</b>
Blended Policy (Risk Parity)	0.76	-4.51	-3.79	-3.73	-5.61	-3.65	5.87	4.46	2.91	
Value Added	-0.73	-0.09	-0.78	0.24	0.83	0.42	-1.37	N/A	-1.03	
90 Day TBill + 600bps	0.69	0.66	1.36	3.35	7.27	7.91	7.00	6.61	6.67	
Value Added	-0.66	-5.26	-5.93	-6.84	-12.05	-11.14	-2.50	N/A	-4.79	
HFR Risk Parity Vol 10 Institutional Index	0.57	-4.19	-3.64	-3.64	-4.48	-3.04	5.57	4.34	3.07	
Value Added	-0.54	-0.41	-0.93	0.15	-0.30	-0.19	-1.07	N/A	-1.19	
HFR Risk Parity Vol 12 Institutional Index	-0.40	-5.55	-5.93	-6.39	-7.11	-5.24	5.72	3.84	2.21	
Value Added	0.43	0.95	1.36	2.90	2.33	2.01	-1.22	N/A	-0.33	

All volatility adjustments are made based on ex-ante volatility expectations. Risk Parity Composite (Vol adjusted) is an asset-weighted composite of volatility adjusted performance of underlying portfolios.

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As of November 30, 2018

## Trailing Period Performance - Currency Hedge

	Performance (%)										Allocation Market Value (\$000)
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	Since Inception	Inception Date		
<b>Currency Hedge Aggregate Portfolio (notional)</b>	0.14	1.85	1.99	3.24	6.66	6.11	0.70	3.87	10/01/2014	4,007,333	
Currency Hedge Benchmark - Aggregate Value Added	0.16 -0.02	1.87 -0.02	2.03 -0.04	3.31 -0.07	6.70 -0.04	6.15 -0.04	0.80 -0.10	3.84 0.03			
<b>Insight Everest - Int'l Eq (notional)</b>	0.19	1.74	1.93	3.21	6.47	6.00	0.83	1.61	07/01/2006	2,752,722	
Currency Hedge Benchmark - Int'l Eq Value Added	0.22 -0.03	1.75 -0.01	1.97 -0.04	3.30 -0.09	6.52 -0.05	6.05 -0.05	0.95 -0.12	1.70 -0.09			
<b>Insight Oxygen - HY (notional)</b>	0.34	2.77	3.12	4.34	8.66	8.14	-0.44	1.25	07/01/2015	407,610	
Currency Hedge Benchmark - HY Value Added	0.23 0.11	2.53 0.24	2.77 0.35	3.94 0.40	7.84 0.82	7.32 0.82	-0.87 0.43	0.79 0.46			
<b>Insight Nevada - Infra (notional)</b>	-0.30	1.77	1.46	2.32	6.38	5.09	0.09	0.09	12/01/2015	465,985	
Currency Hedge Benchmark - Infra Value Added	-0.30 0.00	1.80 -0.03	1.49 -0.03	2.36 -0.04	6.49 -0.11	5.21 -0.12	0.21 -0.12	0.21 -0.12			
<b>Insight Sierra - REIT (notional)</b>	0.00	1.35	1.35	2.65	5.45	4.88	0.49	0.49	12/01/2015	202,323	
Currency Hedge Benchmark - REIT Value Added	0.01 -0.01	1.37 -0.02	1.38 -0.03	2.70 -0.05	5.56 -0.11	5.00 -0.12	0.61 -0.12	0.61 -0.12			
<b>Insight Wilson - PE (notional) Unlagged</b>	0.34	2.61	2.96	4.31	8.58	8.23	N/A	3.16	04/01/2016	178,693	
PE Currency Hedge Benchmark (unlagged) Value Added	0.29 0.05	2.62 -0.01	2.92 0.04	4.30 0.01	8.53 0.05	8.14 0.09	1.22 N/A	3.19 -0.03			

Case ID: 221102792

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As of November 30, 2018

Trailing Period Supplemental Performance - PIMCO Multi-Sector

	Performance (%)										Allocation	
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value (\$000)	%
PIMCO Multi-Sector Strategy <sup>1</sup>	0.78	-0.61	0.16	-0.26	-0.73	-0.41	3.39	2.46	2.71	07/01/2012	235,994	100
Blended Policy (PIMCO Multi-Sector) Value Added	0.96	-0.66	0.29	-0.20	-0.76	-0.31	2.91	2.49	2.65			
	-0.18	0.05	-0.13	-0.06	0.03	-0.10	0.48	-0.03	0.06			
PIMCO (Blended)	0.78	-0.61	0.16	-0.26	-0.73	-0.41	3.39	2.46	7.23	05/01/1987		
Blended Policy (PIMCO Blended) Value Added	0.96	-0.66	0.29	-0.20	-0.76	-0.31	2.91	2.49	6.32			
	-0.18	0.05	-0.13	-0.06	0.03	-0.10	0.48	-0.03	0.91			
PIMCO U.S. Core Plus	0.51	-1.61	-1.11	-1.19	-2.09	-1.63	2.15	2.44	2.07	07/01/2012	165,598	70
Bimbg. Barc. U.S. Aggregate Value Added	0.60	-0.79	-0.20	-0.18	-1.79	-1.34	1.33	2.03	1.63			
	-0.09	-0.82	-0.91	-1.01	-0.30	-0.29	0.82	0.41	0.44			
PIMCO Overlay	1.12	-3.84	-2.76	-4.88	-7.48	-7.43	1.11	2.35	3.26	07/01/2012	15,506	7
PIMCO Long Treasuries	1.86	-8.22	-6.51	-11.59	-14.41	-13.02	-1.81	2.78	0.38	07/01/2012	54,743	23
Bimbg. Barc. U.S. Treasury: Long Value Added	1.89	-3.05	-1.21	-4.06	-6.93	-5.34	0.77	4.40	1.47			
	-0.03	-5.17	-5.30	-7.53	-7.48	-7.68	-2.58	-1.62	-1.09			

<sup>1</sup>Performance calculated by Aon Hewitt based on market values provided by State Street and cash flows provided by BNY Mellon. Underlying sleeve market values may not sum to total strategy market value because of net income, cash, and other items.

<sup>2</sup>Returns for each of the underlying portfolios are provided by PIMCO. PIMCO (Blended) consists of PIMCO PSERS CorePLUS prior to July 2012, and PIMCO Multi-Sector Strategy thereafter. Blended Policy (PIMCO Blended) consists of Barclays Aggregate Index prior to July 2012, and Blended Policy (PIMCO Multi-Sector) thereafter.

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As of November 30, 2018

Supplemental Reporting - Notional Internal Portfolios

	Performance (%)							Allocation Market Value (\$000)	
	1 Month	Prior Month	Quarter To Date	FYTD	Year To Date	1 Year	3 Years		5 Years
PSERS U.S. Long Treasuries (unlevered)	1.84	-2.98	-1.20	-4.63	-8.60	-7.13	-0.68	2.40	1,546,788
Bloomberg Barclays Long Treasury Index (Adjusted) <sup>1</sup> Value Added	1.73	-3.21	-1.54	-4.80	-8.33	-6.84	-0.16	N/A	
	0.11	0.23	0.34	0.17	-0.27	-0.29	-0.52	N/A	
PSERS Total TIPS (unlevered)	0.41	-1.47	-1.07	-1.98	-2.03	-1.14	2.07	1.85	1,924,267
Bloomberg Barclays Global Inflation-Linked: U.S. TIPS (Adjusted) <sup>2</sup> Value Added	0.39	-1.52	-1.13	-2.17	-2.63	-1.80	1.10	0.91	
	0.02	0.05	0.06	0.19	0.60	0.66	0.97	0.94	
PSERS Infrastructure Index (unlevered)	2.95	-2.14	0.74	0.24	-1.05	-2.81	8.36	N/A	1,048,579
FTSE Developed Core Infrastructure 50/50 Net Tax Index (Adjusted) <sup>3</sup> Value Added	2.88	-2.18	0.63	0.06	-1.42	-3.21	8.01	6.77	
	0.07	0.04	0.11	0.18	0.37	0.40	0.35	N/A	
PSERS Commodity Beta (unlevered)	-1.93	-2.41	-4.29	-7.08	-7.60	-5.08	1.78	N/A	1,634,791
Bloomberg Commodity Index Total Return (Adjusted) <sup>3</sup> Value Added	-0.67	-2.26	-2.92	-5.17	-5.67	-2.91	0.94	-7.70	
	-1.26	-0.15	-1.37	-1.91	-1.93	-2.17	0.84	N/A	
PSERS Gold Fund (unlevered)	0.43	1.59	2.03	-3.56	-8.71	-6.37	2.94	-1.16	1,700,000
Bloomberg Gold Subindex Total Return (Adjusted) <sup>4</sup> Value Added	0.44	1.62	2.07	-3.46	-8.53	-6.18	3.11	-1.50	
	-0.01	-0.03	-0.04	-0.10	-0.18	-0.19	-0.17	0.34	
PSERS REIT Index (unlevered)	3.65	-3.77	-0.26	-0.74	-0.67	0.59	4.75	N/A	457,989
FTSE EPRA/NAREIT Developed Index (Net) (Adjusted) <sup>3</sup> Value Added	3.61	-3.82	-0.35	-0.93	-1.10	0.10	4.26	5.08	
	0.04	0.05	0.09	0.19	0.43	0.49	0.49	N/A	

<sup>1</sup>Long Treasury: benchmark adjusted to estimate cost of financing using DTCC GCF O/N Repo Index and target leverage ratio of 8:1

<sup>2</sup>TIPS: benchmark adjusted to estimate cost of financing using 3-month LIBOR and target leverage ratio of 1.65:1

<sup>3</sup>Infrastructure, Commodities & REITS: benchmark adjusted to estimate cost of financing using 3-month LIBOR and target leverage ratio of 2:1

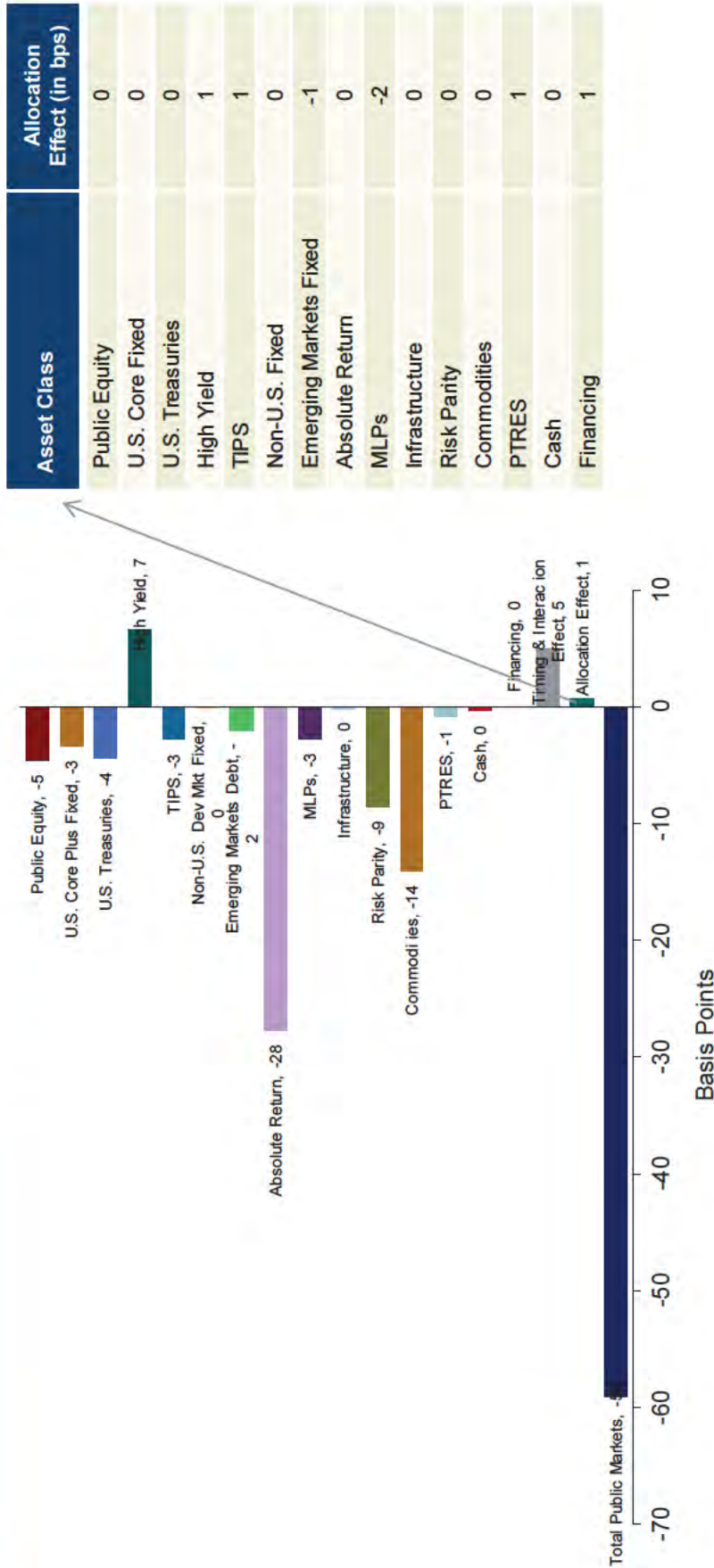
<sup>4</sup>Gold: benchmark adjusted to estimate cost of financing using FTSE 1 Month T-Bill and target leverage ratio of 10:1

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1 Month Ending November 30, 2018

## Performance Attribution – Total Public Markets



- The Selection Effect (shown by each composite bar above) represents the impact each composite had on Total Public Market performance, based on its weight in the asset class and its performance relative to its blended asset class policy benchmark.
- The Allocation Effect represents the favorable or unfavorable impact of being over or under weight to each asset class relative to policy targets.
- The Timing & Interaction Effect captures the impact of intra-month cash flows on Total Public Market returns.

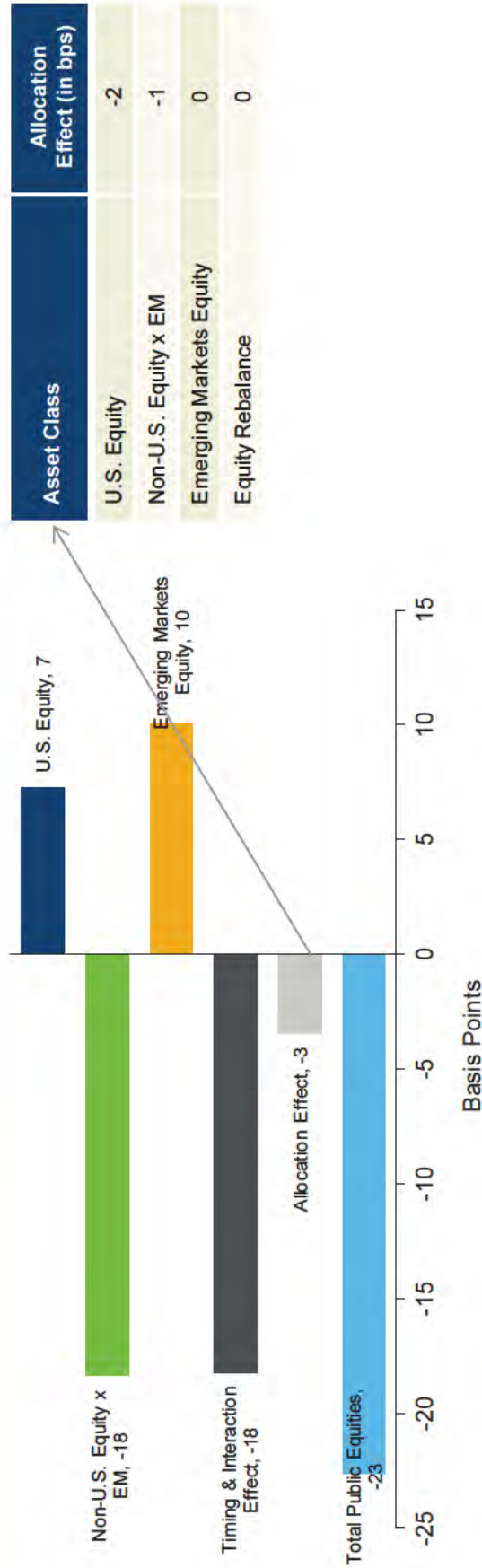
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1 Month Ending November 30, 2018

## Performance Attribution – Total Public Equities



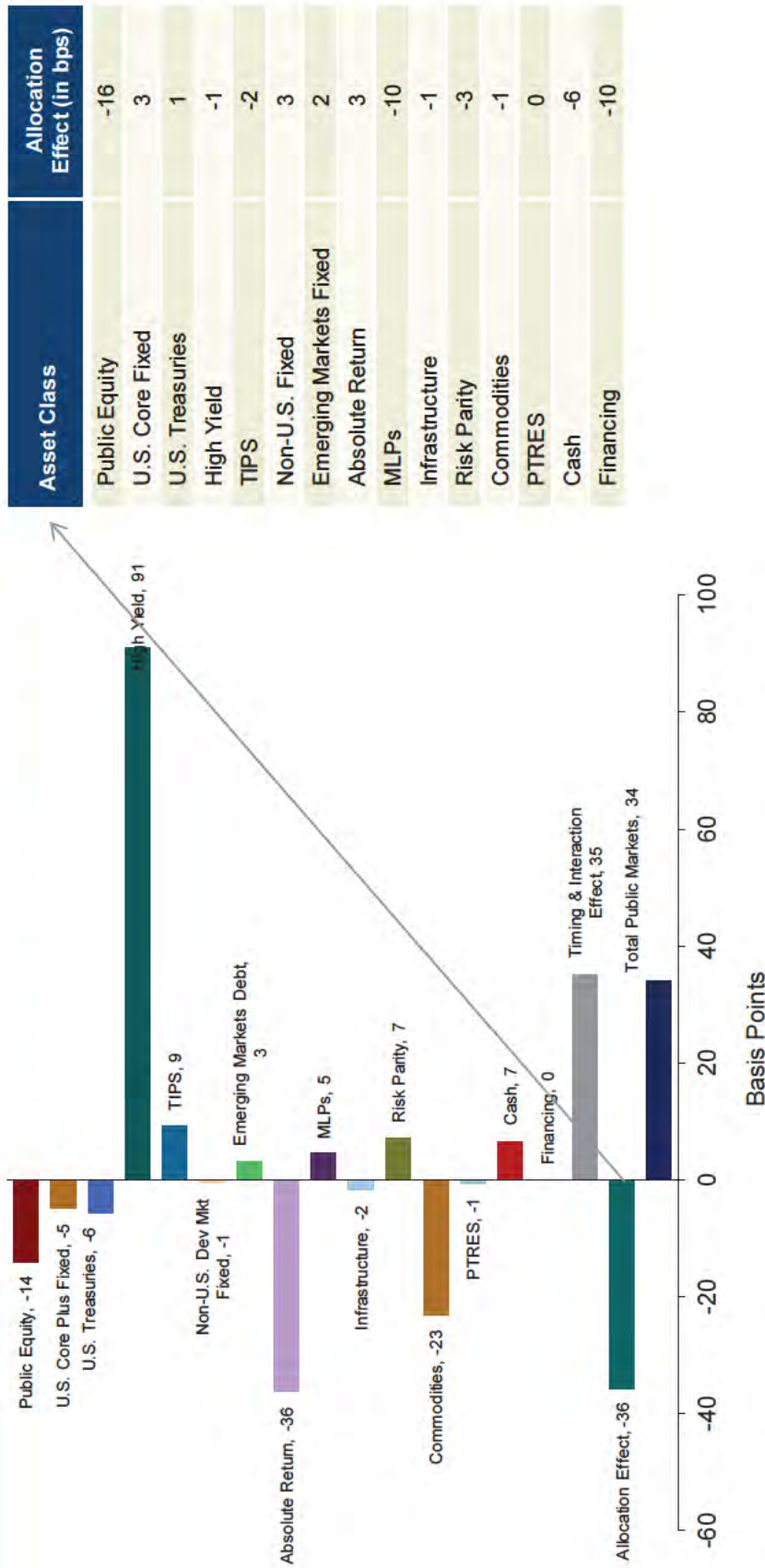
- The Selection Effect (shown by each composite bar above – U.S., Non-U.S. x EM, and Emerging Markets Equity) represents the impact each composite had on Total Public Equity performance, based on its weight in the asset class and its performance relative to its specific asset class policy benchmark.
- The Allocation Effect represents the favorable or unfavorable impact of being over or under weight to each asset class relative to policy targets.
- The Timing & Interaction Effect captures the impact of intra-month cash flows on Total Public Equity returns.



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1 Year Ending November 30, 2018

## Performance Attribution – Total Public Markets



- The Selection Effect (shown by each composite bar above) represents the impact each composite had on Total Public Market performance, based on its weight in the asset class and its performance relative to its blended asset class policy benchmark.
- The Allocation Effect represents the favorable or unfavorable impact of being over or under weight to each asset class relative to policy targets.
- The Timing & Interaction Effect captures the impact of intra-month cash flows on Total Public Market returns.

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## Performance Policies and Disclosures

- Please review this report and notify Aon Hewitt Investment Consulting (AHIC) with any issues or questions you may have with respect to investment performance or any other matter set forth herein.
- The rates of return contained in this report are shown on an after-fees basis unless otherwise noted. They are geometric and time weighted. Returns for periods longer than one year are annualized. Please note, all returns and market values in the monthly reports are preliminary and subject to change.
- Historical returns and market values for Total Fund, asset class composites, individual accounts, and asset class policy benchmarks for periods prior to June 30, 2013 are provided by the prior consultant and Pennsylvania Public School Employees' Retirement System.
- Performance for composites reflects the returns and market values of the levered/hedged accounts, unless otherwise noted.
  - The unlevered versions of the TIPS, Commodities, PTRES, Infrastructure, and Real Assets ex Private Real Estate composites are included as supplemental reporting and the calculation reflects unlevered returns based on the notional value and cash flows for those sub-accounts that are employing leverage, in addition to the performance of the remainder accounts within the composite.
  - The unhedged versions of the Non-US Equity, High Yield, PTRES, Infrastructure, and Real Assets ex Private Real Estate composites are included as supplemental reporting and the calculation excludes the Insight currency hedge accounts.
  - The vol adjusted version of the Risk Parity composites are included as supplemental reporting and the calculation reflects adjusting the volatility of the underlying risk parity accounts to 12%.
- Blended Policy (Net Levered TIPS) represents the monthly return of the index multiplied by a leverage factor of 2 and reduced by the cost of financing as represented by the 3-month LIBOR.
- Effective June 1, 2017, MLP Internal Blended Benchmark is 100% External MLP Composite. Prior to June 1, 2017, 100% S&P MLP Total Return Index.
- Effective July 1, 2015, HY Currency Hedge Benchmark represents the arithmetic difference between the monthly returns of the MSCI EMU Index (hedged) and MSCI EMU Index (unhedged).
- Effective April 1, 2016, Blended Policy (Non-US Equity x EM) (Hedged) is the MSCI ACWI ex USA IMI with DM 75% Hedged to USD Index (net)<sup>1</sup>
- Effective April 1, 2016, Blended Policy (Public Equity) (Hedged) is calculated as:
  - MSCI USA IMI Index (gross) + MSCI ACWI ex USA IMI with DM 75% Hedged to USD Index (net)<sup>1</sup> + MSCI Emerging Markets Index (net)

<sup>1</sup>Source: MSCI. The MSCI data is comprised of a custom index calculated by MSCI for, and as requested by, Aon Service Corporation. The MSCI data is for internal use only and may not be redistributed or used in connection with creating or offering any securities, financial products, or indices. Neither MSCI nor any other third party involved in or related to compiling, computing or creating the MSCI data ("the MSCI Parties") makes any express or implied warranties or representations with respect to such data (or the results to be obtained by the use thereof), and the MSCI Parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to such data. Without limiting any of the foregoing, in no event shall any of the MSCI Parties have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

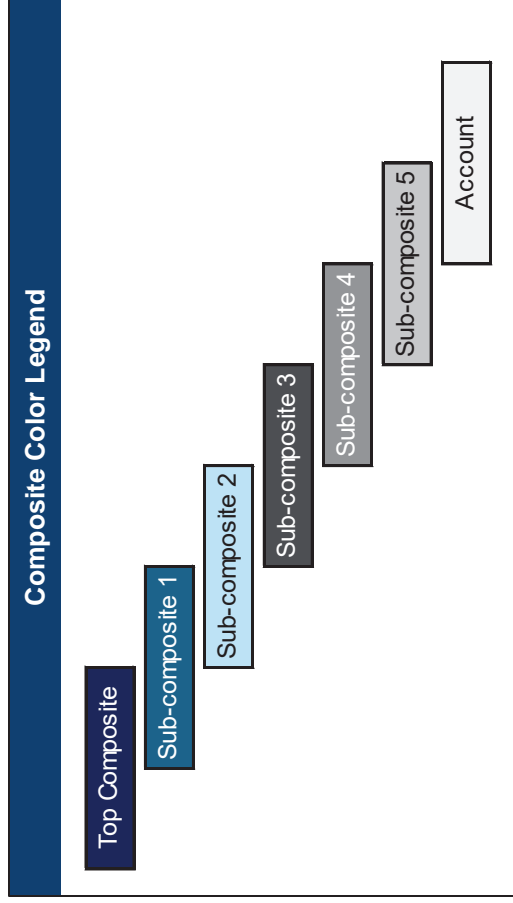
## Performance Policies and Disclosures

PSERS Total Public Markets Benchmark (Hedged)	
Index Component	Index Weight
Blended Policy (Public Equity) (hedged)	20.26%
Bloomberg Barclays Aggregate Index	5.23%
Bloomberg Barclays Global Agg GDP Weighted Dev ex US (hedged)	0.00%
Bloomberg Barclays Long Treasury Index	7.84%
Bloomberg Barclays Emerging Market 10% Country Cap	1.31%
Bloomberg Barclays Corporate High Yield Index	13.07%
Bloomberg Barclays World Inflation Linked Bonds (hedged)	19.61%
S&P MLP Index	5.23%
FTSE Developed Core Infrastructure 50/50 Index (hedged)	2.61%
Bloomberg Commodity Index Total Return	6.54%
Bloomberg Gold Subindex Total Return	3.92%
FTSE EPRA/NAREIT Developed Index Net (hedged)	1.31%
Blended Policy (Risk Parity)	10.46%
Blended Policy (Abs Return)	13.07%
ICE BofA ML US T-Bill 0-3 Months	7.84%
ICE 3-Month LIBOR	-18.30%

Blended Policy (Risk Parity)	
Index Component	Index Weight
MSCI AC World Index (Net)	50%
Bloomberg Barclays US Treasury Index	75%
Bloomberg Barclays World Inflation Linked Bonds (hedged)	55%
Bloomberg Commodity Index Total Return	15%
Bloomberg Gold Subindex Total Return	5%
ICE 3-Month LIBOR	-100%

Blended Policy (PIMCO Multi-Sector)	
Index Component	Index Weight
Bloomberg Barclays Aggregate Index	72%
Bloomberg Barclays Long Treasury Index	28%

PSERS Total Public Markets Benchmark (Unhedged)	
Index Component	Index Weight
Blended Policy (Public Equity) (unhedged)	20.26%
Bloomberg Barclays Aggregate Index	5.23%
Bloomberg Barclays Global Agg GDP Weighted Dev ex US (unhedged)	0.00%
Bloomberg Barclays Long Treasury Index	7.84%
Bloomberg Barclays Emerging Market 10% Country Cap	1.31%
Bloomberg Barclays Corporate High Yield Index	13.07%
Bloomberg Barclays World Inflation Linked Bonds (unhedged)	19.61%
S&P MLP Index	5.23%
FTSE Developed Core Infrastructure 50/50 Index (unhedged)	2.61%
Bloomberg Commodity Index Total Return	6.54%
Bloomberg Gold Subindex Total Return	3.92%
FTSE EPRA/NAREIT Developed Index Net (unhedged)	1.31%
Blended Policy (Risk Parity)	10.46%
Blended Policy (Abs Return)	13.07%
ICE BofA ML US T-Bill 0-3 Months	7.84%
ICE 3-Month LIBOR	-18.30%



Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.

## Disclaimer

Past performance is not necessarily indicative of future results.

Unless otherwise noted, performance returns presented reflect the respective fund's performance as indicated. Returns may be presented on a before-fees basis (gross) or after-fees basis (net). After-fee performance is net of each respective sub-advisor's investment management fees and include the reinvestment of dividends and interest as indicated on the notes page within this report or on the asset allocation and performance summary pages. Actual returns may be reduced by AHIC's investment advisory fees or other trust payable expenses you may incur as a client. AHIC's advisory fees are described in Form ADV Part 2A. Portfolio performance, characteristics and volatility also may differ from the benchmark(s) shown.

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Refer to Hedge Fund Research, Inc. [www.hedgefundresearch.com](http://www.hedgefundresearch.com) for information on HFR indices.

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Aon Hewitt Investment Consulting, Inc.  
200 East Randolph Street  
Suite 1500  
Chicago, IL 60601  
ATTN: AHIC Compliance Officer

Case ID: 221102792

Past performance is not necessarily indicative of future results. Please refer to the Notes section for disclosures related to the performance calculation methodology within this performance report. Additionally, please refer to the Appendix for referenced benchmark index definitions. Indices cannot be invested in directly. Unmanaged index returns assume reinvestment of any and all distributions and do not reflect fees or expenses.

# N. PSERS' Client Portal Presentation



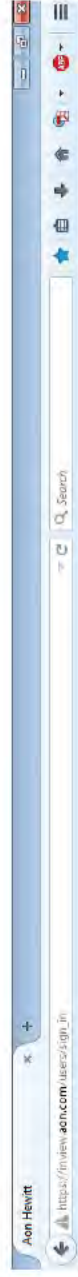
# PSERS Client Portal

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.



# PSERS Client Portal Introduction

- AHIC has designed a secure internet portal to allow PSERS staff to directly access our investment manager research, market updates, and white papers.
- Portal website: [https://inview.aon.com/users/sign\\_in](https://inview.aon.com/users/sign_in)



## Secure Portal

Email Address

PASSWORD

I accept the [website Terms of Use](#)

[Forgot your Password?](#)



- Please also note that many of our thought leadership pieces are published via Aon Hewitt's Retirement and Investment Blog. To subscribe, visit <https://retirementandinvestmentblog.aon.com/>



# PSERS Client Portal Home Page

- The home page for the portal is not client-specific, and includes Aon's latest manager research and thought leadership content.
- The screen shot below shows some of the latest flash reports published from our manager research team. The "Recent Correspondence" drop down menu also includes filters for InBriefs, InForms, InTotals, Manager Meetings, ODD Reports, White Papers, Capital Market Assumptions, and Market Research.
- On the top right of the screen is the link to access plan-specific info for PSERS.

Welcome, Amanda Janusz | Log Out

My Plans  AUA

Pennsylvania Public School Employees' Retirement System - IC, Pennsylvania Public School Employees' Retirement System \$50,178,469,041.01

Retirement System View 1 of 1

Flash performance is not a guide to future returns. [View More](#)  
Source: Manager/Customer/Performance Measures/Aon Hewitt

Portfolio RA Thought Leadership Documents Research

### Welcome to InView for Clients

Aon Hewitt is excited to bring you access to our manager research database – InView. You are now able to view Aon Hewitt's research views on the products in which you invest. Click to view ratings, manager news, our written assessments, and on the ground insights on your managers via our research teams' meetings notes.\* Also view your Plan(s) details, including assets under management, asset mix and performance at the plan, asset class, and holding level. \*Your Plan specific correspondence, as well as Aon Hewitt thought leadership, is available to view and download. [Welcome!](#)

*\*Ratings and assessments available for managers included in our monitoring efforts. Access to research meeting notes as determined by client specific permission levels. Speak to your Aon Hewitt consultant for more information.*

### Recent Correspondence

Show/Advanced

Date	Title	Associated With	Type
2016-12-06	Flash Report - Harris-Portfolio Management Additions_2016_12.docx	Harris Associates L.P. Global All Cap Equity (HedgeFund) Harris Associates L.P. International Value Equity (HedgeFund)	Document
2016-12-05	Flash_Keeley_Acquired by Teton Advisors_2016_11	Keeley AM Small Cap Value (HedgeFund) Keeley AM Small Mid Value (HedgeFund)	Document
2016-12-01	T. Rowe Price_Flash Report_SCC-InReview to Buy_December2016.docx	T. Rowe Price Associates, Inc. Small Cap Stock (HedgeFund)	Document



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# PSERS Client Portal

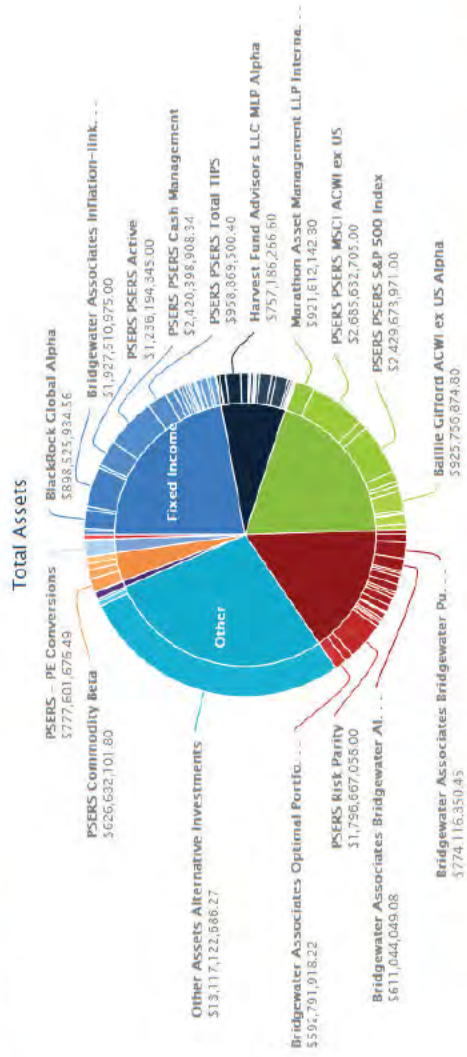
## Portfolio

- The portfolio page draws asset and return data from our performance reporting system, PARis, and is refreshed quarterly.
- Each product is also linked to the product record in our manager research database, InView, so our ratings flow through to the portal, and by clicking the product links (highlighted in blue below), the user can access product details and research content.

[Overview](#)
[Portfolio](#)
[RA](#)
[Thought Leadership](#)
[Documents](#)
[Research](#)

### Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System

Total Value: \$50,178,469,041.01



Client Assets	Asset Class	Product	Rating	IFA Rating	IFA Status	As Of	Curly	12 Mtrtr	3 Yr (p.a)
<a href="#">AB_Global Plus Fixed Income</a>	Fixed Income	<a href="#">AB_Global Plus Fixed Income</a>	Buy	---	DRAFT	9/30/2016	1.12%	8.17%	-0.13%
<a href="#">Acadian Asset Management, Inc. International Small Cap</a>	Equities	<a href="#">Acadian International Small Cap</a>	IFA Only	Qualified	DRAFT	9/30/2016	8.60%	15.41%	6.18%


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## PSERS Client Portal Portfolio (continued)

- Due to manager NDA requirements, ODD reports for the PSERS managers may be found on the PSERS' portfolio page so staff will have access to the latest reviews for funds in the PSERS plan.
- Additionally, any other PSERS-specific manager memos can be found on the PSERS portfolio page as well.
- These reports can be found by scrolling to the bottom of the "Portfolio" page on the portal in a section called "PSERS Correspondence."

### Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System Correspondence

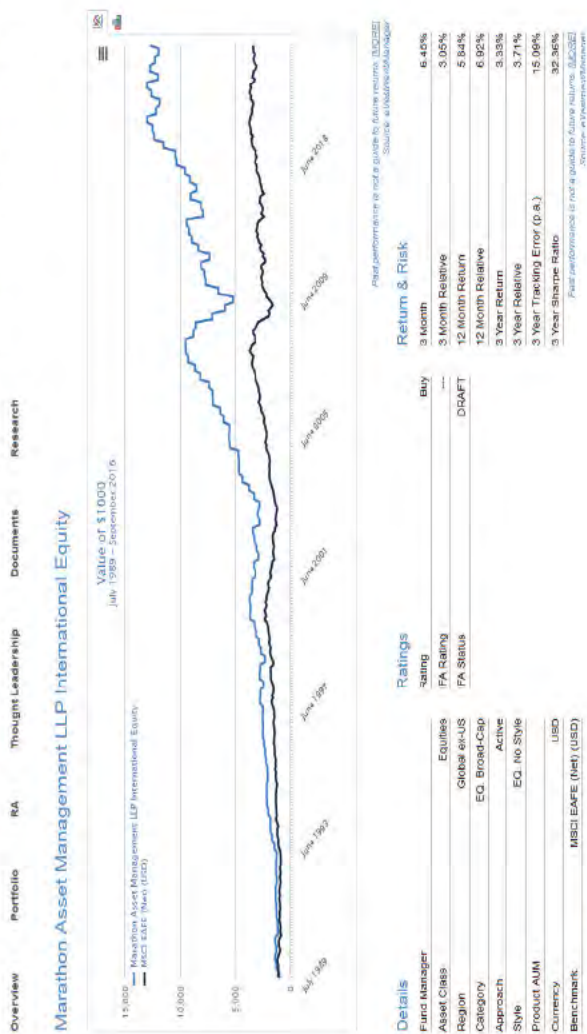
Show Advanced 

Date	Title	Associated With	Type
2016-09-24	2014_09_PSERS_BlackRock Market Advantage Memo.pdf	Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System (Product)	Document
2016-09-24	2014_09_PSERS_Deutsche Bank ASI_Public/Version Updated.pdf	Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System (Product)	Document
2016-09-24	2014_09_PSERS_Radcliffe BDC Debt_Confidential.pdf	Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System (Product)	Document
2016-08-30	AH ODD Summary Assessment - Radcliffe.pdf	Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System (Product)	Document
2016-08-30	AH-ODD-Summary Assessment - Wasatch.pdf	Pennsylvania Public School Employees' Retirement System - IC Pennsylvania Public School Employees' Retirement System (Product)	Document

# PSERS Client Portal

## Linking to InView

- By clicking on a product link, users can see our latest research content for a given manager or fund, including ratings, researcher's visit notes, InBriefs, flash reports, etc. Content is available to view or download in pdf format.



### Correspondence

Show Advanced

View All Correspondence Types

Date	Title
2016-11-14	ODD call with David Shubotham re Marathon
2016-11-11	Call with State Street re Marathon
2016-02-03	Marathon-London Aon InBrief(IFA) International Equity US EAFE Large and All Cap 2015 09 102498.docx
2015-03-12	Flash Report - Marathon EAFE Upgrade FINAL_US 2013 June
2015-03-12	Flash Report - Marathon Jeremy Hosking retirement 2012 July UK
2015-02-17	Marathon-London_Int'l Intl International Equity_US_EAFE Large and All Cap_2014_09_100_05

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## PSERS Client Portal Linking to InView (Continued)

- The screen shot below is an example of a visit note from an ODD research meeting. AHIC's visit notes are posted to InView, and can be viewed through the client portal.

The screenshot displays a document titled "ODD call with David Shuboham re Marathon - Call". The document header includes a "Print Version" link. Below the title, there are fields for "Type: Phone - Outbound", "Date: 2016-11-14", "Attendees: Chris Goodeve-Ballard, David Shuboham", and "Associated With: Attachments:". The main content of the document is a detailed visit note. It begins with a paragraph stating that the call was part of an overall ODD exercise and identifies David Shuboham as an independent Director on four Marathon funds. The note then describes his background as an ex-stockbroker and his role on the Management Committee. It details his involvement in the "shareholder issues" at Marathon, his role as a referee between the parties, and his efforts to stretch his capacity on the Goldmans Sachs Boards. The note also mentions that he has been involved in the "shareholder issues" at Marathon and acted as a referee between the parties as he knows and gets on with all involved. It notes that the issue aside he gives the a "100% clean bill of health from top to bottom". The note then lists four EMs pa, all in Dublin, and states that board packs are made available on a portal for the Directors to access. It mentions that they are following CR88 even though it has not been fully enacted, and that there is a declaration process at the start of each meeting re conflicts and time commitments. The note then lists several bullet points: "The minutes of previous meetings tend to be accurate and well reviewed. (Marathon management are good at taking any issues and dealing with them quickly). Action points are covered.", "Admin and Depository reports are reviewed.", "The investment manager part of the pack normally extends to 30-40 pages.", "The Compliance Calendar is checked and reviews of different policies are carried out in different EMs.", "Risk reports from the manager are reviewed.", "Compliance issues are few. One recent one was a management fee issue on an Australian pension fund - sorted.", "Legal and Regulatory reviews", and "Business overview". The note then states that DS has no holdings in Marathon funds, that he visits the Marathon offices in London at least once annually, and sometimes more frequently. It identifies Carl O'Sullivan as the other independent lawyer and used to be an adviser to Marathon. He is now retired and property independent. The note then states that there is no Audit Committee but PwC come in at least twice pa. It mentions that they discussed the potential risk of too few traders and he agreed that it is currently "just adequate" not "super adequate". It notes that he charges fees of €20K in total for the UCITS with total for Marathon being €35-40K. He has a PA to assist. The note concludes with "Overall, very happy with the culture at Marathon". A "Conclusion:" section follows, stating "As ever this is only a telephone call, but DS has a good CV (verified online). I am comfortable that the Marathon Funds have suitable governance for our purposes." The document footer includes the text "Viewed by: Amanda Janusz - amanda.janusz@aonhewitt.com".

# PSERS Client Portal Linking to InView (Continued)

- The "Research" page is not client-specific and allows users to access our latest product ratings investment manager research on all products covered by Aon Hewitt's Global Investment Manager Research Team.



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[RA](#)
[Thought Leadership](#)
[Documents](#)
[Research](#)

## Research

Products	Manager	Rating	IFA Rating	Asset Class	Region	Approach	Category	Style
<a href="#">Marathon Asset Management LLP Equities - Global (Hard closed - both seq. and pooled)</a>	<a href="#">Marathon Asset Management LLP</a>	IFA Only Rating	Qualified	Equities	Global	Unconstrained	EQ. Broad-Cap	EQ. Value
<a href="#">Marathon Asset Management LLP Equities - New Global Fund</a>	<a href="#">Marathon Asset Management LLP</a>	IFA Only Rating	Qualified	Equities	Global	Unconstrained	EQ. Broad-Cap	EQ. Value
<a href="#">Marathon Asset Management LLP Equities - Pacific Basin</a>	<a href="#">Marathon Asset Management LLP</a>	Buy	---	Equities	Pacific Basin	Unconstrained	EQ. Broad-Cap	EQ. Value
<a href="#">Marathon Asset Management LLP Europe</a>	<a href="#">Marathon Asset Management LLP</a>	Buy	---	Equities	Europe	Active	EQ. Broad-Cap	EQ. Ex-Multination
<a href="#">Marathon Asset Management LLP International Equity</a>	<a href="#">Marathon Asset Management LLP</a>	Buy	---	Equities	Global ex-US	Active	EQ. Broad-Cap	EQ. No Style
<a href="#">Marathon Asset Management LLP Japan</a>	<a href="#">Marathon Asset Management LLP</a>	Buy	---	Equities	Japan	Active	EQ. Broad-Cap	EQ. Ex-Multination
<a href="#">Marathon Asset Management LLP UK Equity</a>	<a href="#">Marathon Asset Management LLP</a>	Qualified	---	Equities	United Kingdom	Active	EQ. Broad-Cap	EQ. Value



# PSERS Client Portal

## Thought Leadership

- Users can access Aon Hewitt's latest market and investment research content through the "Thought Leadership" section of the portal. Filters include Capital Market Assumptions, Themes, Market Updates and White Papers. Content is available for download in pdf format.
- Users can also find a link to Aon Hewitt's blog through the Thought Leadership page.

Overview Portfolio RA **Thought Leadership** Documents Research

### Capital Market Assumptions

Show Advanced

Date	Title
2016-06-30	Capital Market Assumptions as at 30 June 2016.pdf
2016-03-31	Capital Market Assumptions as at 31 March 2016.pdf
2015-12-31	Capital Market Assumptions as at 31 December 2015.pdf

## O. Asset Allocation by Manager Report

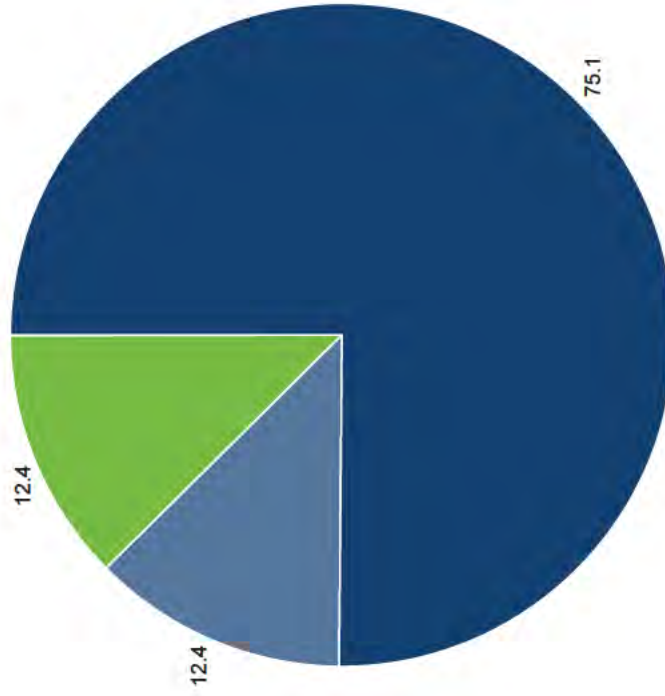


Total US Equity Composite

As of September 30, 2018

Asset Allocation by Manager

September 30, 2018 : \$3,587,947



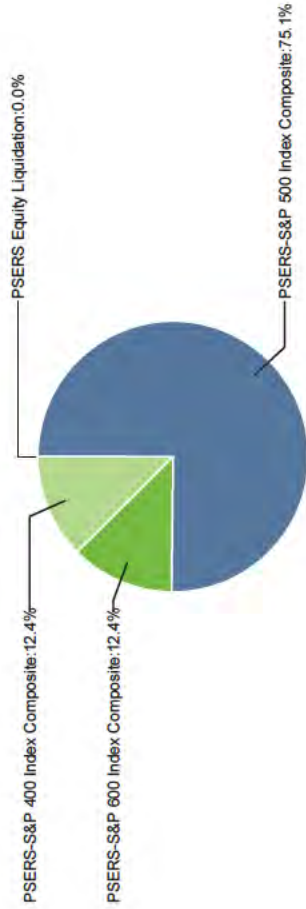
Allocation (%)

Market Value (\$000)

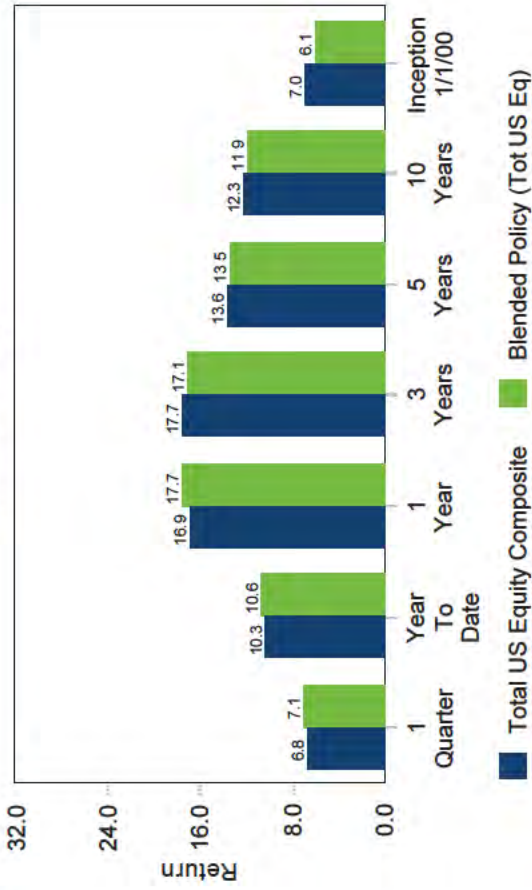
- PSERS-S&P 500 Index Composite
- PSERS-S&P 400 Index Composite
- PSERS-S&P 600 Index Composite
- PSERS Equity Liquidation
- PSERS - Trading Error

Current Allocation

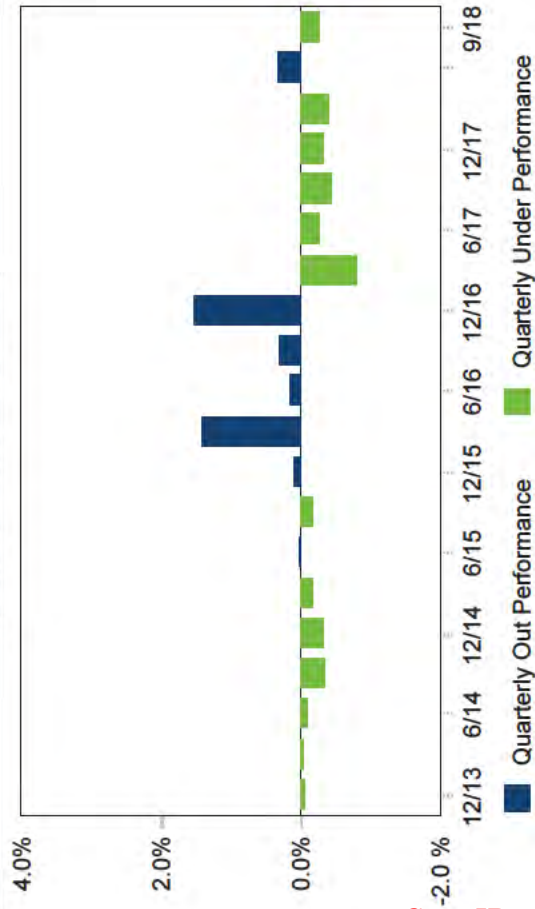
September 30, 2018 : \$3,588M



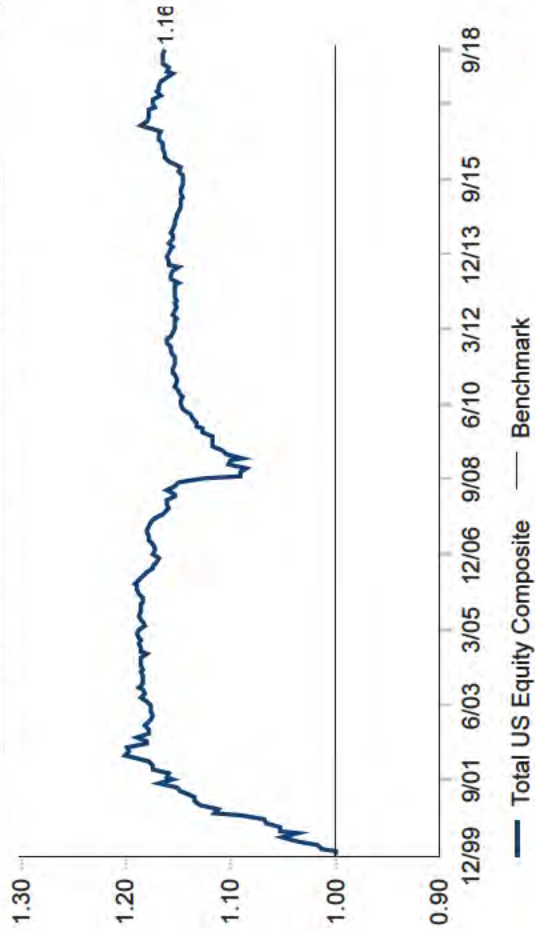
Return Summary



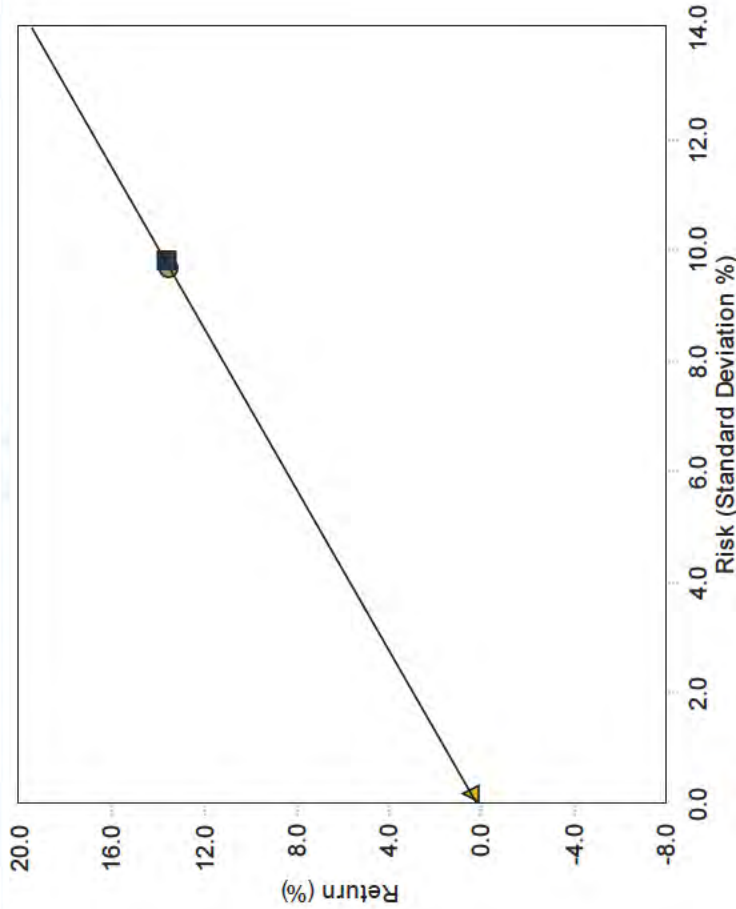
Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

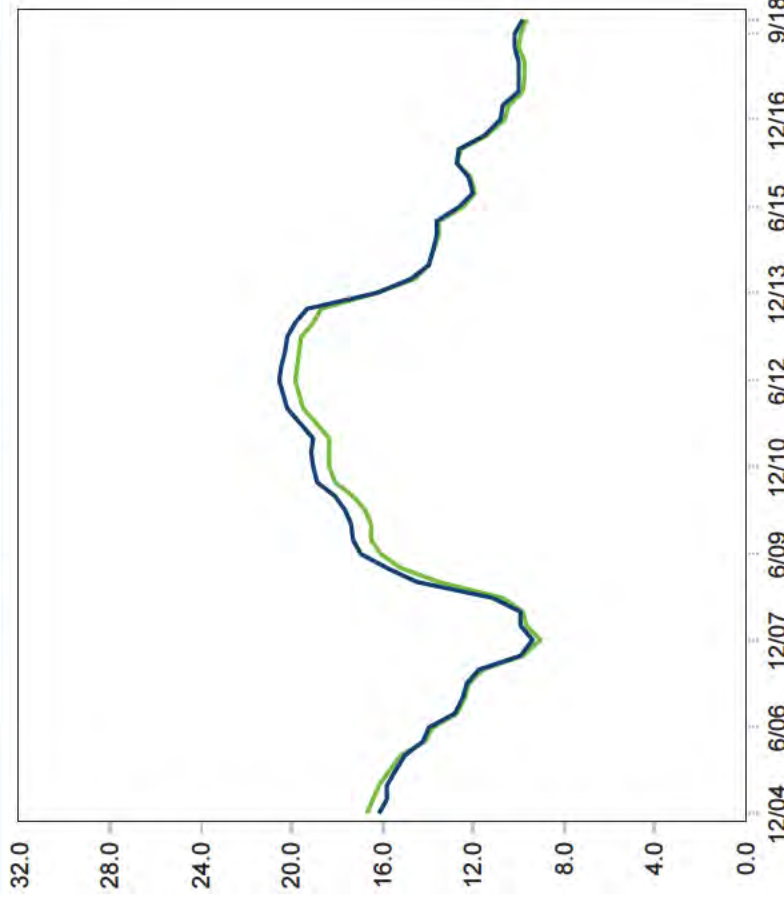


Annualized Return vs. Annualized Standard Deviation  
5 Years



- Total US Equity Composite
- Blended Policy (Tot US Eq)
- ▲ FTSE 3 Month T-Bill

Rolling 5 Years Standard Deviation



- Total US Equity Composite
- Blended Policy (Tot US Eq)

5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total US Equity Composite	0.07	1.02	0.07	0.99	1.30	-0.05	1.01	13.59	9.81	0.99
Blended Policy (Tot US Eq)	0.00	0.00	N/A	1.00	1.32	0.00	1.00	13.52	9.67	1.00
FTSE 3 Month T-Bill	-12.71	9.66	-1.32	0.01	N/A	0.47	0.00	0.49	0.18	0.08

Risk Statistics

	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
<b>Total US Equity Composite</b>						01/01/2000
Return	16.92	17.69	13.59	12.30	6.96	
Standard Deviation	8.71	9.46	9.81	15.26	14.87	
Downside Risk	4.57	4.33	5.19	10.29	10.39	
Downside Semi Deviation	3.09	3.02	9.98	18.98	17.17	
Max Drawdown Recovery Period	6.00	4.00	12.00	17.00	59.00	
Maximum Drawdown	-5.58	-7.06	-8.96	-38.00	-54.02	
Maximum Loss Exposure	N/A	N/A	N/A	-38.00	-31.32	
Upside Semi Deviation	3.00	10.90	10.88	14.20	13.72	
<b>Blended Policy (Tot US Eq)</b>						
Return	17.65	17.14	13.52	11.94	6.11	
Standard Deviation	8.73	9.31	9.67	14.86	14.75	
Downside Risk	4.41	4.49	5.21	9.93	10.34	
Downside Semi Deviation	4.23	3.43	10.70	18.59	17.30	
Max Drawdown Recovery Period	6.00	6.00	12.00	17.00	53.00	
Maximum Drawdown	-5.65	-7.64	-8.87	-36.52	-50.95	
Maximum Loss Exposure	N/A	N/A	N/A	-36.52	-22.86	
Upside Semi Deviation	2.89	10.39	10.43	13.84	13.40	
<b>vs. Blended Policy (Tot US Eq)</b>						
Active Return	-0.63	0.49	0.07	0.39	0.83	
Tracking Error	1.00	1.26	1.02	1.52	1.90	
Actual Correlation	0.99	0.99	0.99	1.00	0.99	
Beta	0.99	1.01	1.01	1.02	1.00	
Consistency	33.33	47.22	41.67	50.00	52.00	
Down Market Capture	98.63	95.26	99.41	99.94	97.58	
Down Market Outperformance	0.07	0.65	0.14	-0.08	0.68	
Information Ratio	-0.63	0.39	0.07	0.26	0.44	
Jensen Alpha	-0.49	0.36	-0.05	0.13	0.84	
Up Market Capture	96.85	101.11	100.15	101.46	101.84	
Up Market Outperformance	-0.86	0.33	0.03	0.73	0.93	
<b>vs. FTSE 3 Month T-Bill</b>						
Excess Return	14.52	16.03	12.79	12.52	6.23	
Excess Risk	8.70	9.47	9.80	15.27	14.94	
Sharpe Ratio	1.67	1.69	1.30	0.82	0.42	

Calculation based on monthly periodicity.



As of September 30, 2018

Asset Allocation & Peer Rankings

	Performance(%)										Allocation	
	1 Quarter	Year To Date	FYTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	Market Value (\$000)	%	
<b>Total US Equity Composite</b>	6.83 (32)	10.30 (37)	6.83 (32)	16.92 (35)	17.69 (21)	13.59 (23)	12.30 (27)	6.96 (72)	01/01/2000	3,587,947	100.0	
<i>Blended Policy (Tot US Eq)</i>	7.08 (30)	10.65 (35)	7.08 (30)	17.65 (34)	17.14 (27)	13.52 (24)	11.94 (38)	6.11 (85)				
Value Added	-0.25	-0.35	-0.25	-0.73	0.55	0.07	0.36	0.85				
<i>IM U.S. All Cap Equity (SA+CF) Median</i>	5.74	7.70	5.74	14.54	14.50	11.47	11.25	7.92				
<b>PSERS-S&amp;P 500 Index Composite</b>	7.70 (30)	10.03 (44)	7.70 (30)	16.97 (44)	17.57 (23)	13.99 (27)	12.30 (28)	7.00 (57)	07/01/1998	2,695,951	75.1	
<i>S&amp;P 500 Index</i>	7.71 (30)	10.56 (36)	7.71 (30)	17.91 (34)	17.31 (26)	13.95 (28)	11.97 (34)	6.77 (64)				
Value Added	-0.01	-0.53	-0.01	-0.94	0.26	0.04	0.33	0.23				
<i>IM U.S. Large Cap Equity (SA+CF) Median</i>	6.96	9.32	6.96	16.42	15.67	12.79	11.39	7.16				
<b>PSERS-S&amp;P 400 Index Composite</b>	3.90 (62)	7.54 (52)	3.90 (62)	14.29 (50)	15.96 (26)	12.09 (35)	13.07 (24)	10.75 (16)	07/01/1998	446,463	12.4	
<i>S&amp;P MidCap 400</i>	3.86 (62)	7.49 (52)	3.86 (62)	14.21 (50)	15.68 (29)	11.91 (39)	12.49 (37)	10.38 (23)				
Value Added	0.04	0.05	0.04	0.08	0.28	0.18	0.58	0.37				
<i>IM U.S. Mid Cap Equity (SA+CF) Median</i>	4.76	7.84	4.76	14.19	14.45	11.29	12.04	9.62				
<b>PSERS-S&amp;P 600 Index Composite</b>	4.87 (36)	14.77 (29)	4.87 (36)	19.27 (31)	20.14 (15)	13.98 (11)	13.98 (17)	10.54 (23)	05/01/1998	444,200	12.4	
<i>S&amp;P SmallCap 600</i>	4.71 (37)	14.54 (30)	4.71 (37)	19.08 (31)	19.41 (19)	13.32 (15)	12.86 (29)	9.65 (39)				
Value Added	0.16	0.23	0.16	0.19	0.73	0.66	1.12	0.89				
<i>IM U.S. Small Cap Equity (SA+CF) Median</i>	3.63	9.49	3.63	13.46	16.07	10.79	11.63	9.09				

**Past Performance is no guarantee of future results.** Returns are net of sub-advisor fees and expenses, but do not reflect the deduction of AHIC advisory fees. Your actual returns will be reduced by your advisory fees and other expenses you may incur as a client. AHIC's advisory fees are described in Part 2A of AHIC's Form ADV. Please refer below for Index Definitions and other General Disclosures.

Indices cannot be invested in directly. Unmanaged index returns do not reflect our fees or expenses.

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**S&P Mid-Cap 400 Index** - A market-capitalization-weighted index of stocks in all major industries in the mid-range of the U.S. stock market.  
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PO - STANDARD TERMS and CONDITIONS

**1.1 CONTRACT-001.1c Contract Terms and Conditions – Stand-Alone (Jan 24 2007)**

The Contractor and the Commonwealth agree that the following terms and conditions are part of the Contract:

**1.2 CONTRACT-002.1B Term of Contract – Stand-Alone PO (July 2015)**

The term of the Contract created by the issuance of the Purchase Order shall commence on the Original PO Effective Date, which will be printed on the Purchase Order output form after the Solicitation Response or Purchase Order has been signed and returned by the contractor, electronically signed by the Commonwealth and approved as required by Commonwealth contracting procedures. If the Purchase Order output form does not have "Fully Executed" at the top of the first page and does not have the name of the Purchasing Agent printed in the appropriate box, the Purchase Order has not been fully executed. Subject to the other provisions of the Contract, the Contract shall end on the later of: a) complete delivery and acceptance of the awarded item(s); b) the expiration of any specified warranty and maintenance period; c) payment by the Commonwealth for the item or items received; or d) any Expiration Date identified in the Purchase Order.

**1.3 CONTRACT-002.3 Extension of Contract Term (Nov 30 2006)**

The Commonwealth reserves the right, upon notice to the Contractor, to extend any single term of the Contract for up to three (3) months upon the same terms and conditions.

**1.4 CONTRACT-003.1D Signatures – Stand-Alone Purchase Order (July 2015)**

The Contract shall not be a legally binding contract until the fully-executed Purchase Order has been sent to the Contractor. No Commonwealth employee has the authority to verbally direct the commencement of any work or delivery of any supply under this Purchase Order prior to the Original PO Effective Date. The Contractor hereby waives any claim or cause of action for any service or work performed prior to the Original PO Effective Date.

The Purchase Order may be signed in counterparts. The Contractor shall sign the Solicitation Response or Purchase Order and return it to the Commonwealth. After the Solicitation Response or Purchase Order is signed by the Contractor and returned to the Commonwealth, it will be processed for Commonwealth signatures and approvals. When the Purchase Order has been electronically signed and approved by the Commonwealth as required by Commonwealth contracting procedures, it shall: 1) clearly indicate "Fully executed" at the top of the form; 2) include a printed Original PO Effective Date and 3) include the printed name of the Purchasing Agent indicating that the document has been electronically signed and approved by the Commonwealth. Until the Contractor receives the Purchase Order output form with this information on the Purchase Order output form, there is no legally binding contract between the parties.

The fully-executed Purchase Order may be sent to the Contractor electronically or through facsimile equipment. The electronic transmission of a Purchase Order shall require acknowledgement of receipt of the transmission by the Contractor. Receipt of the electronic or facsimile transmission of the Purchase Order shall constitute receipt of the fully-executed Purchase Order.

The Commonwealth and the Contractor specifically agree as follows:

- a. No handwritten signature shall be required in order for the Purchase Order to be legally enforceable.
- b. The parties agree that no writing shall be required in order to make the Purchase Order legally binding, notwithstanding contrary requirements in any law. The parties hereby agree not to contest the validity or enforceability of a genuine Purchase Order or acknowledgement issued electronically under the provisions of a statute of frauds or any other applicable law relating to whether certain agreements be in writing and signed by the party bound thereby. Any genuine Purchase Order or acknowledgement issued electronically, if introduced as



evidence on paper in any judicial, arbitration, mediation, or administrative proceedings, will be admissible as between the parties to the same extent and under the same conditions as other business records originated and maintained in documentary form. Neither party shall contest the admissibility of copies of a genuine Purchase Order or acknowledgements under either the business records exception to the hearsay rule or the best evidence rule on the basis that the Purchase Order or acknowledgement were not in writing or signed by the parties. A Purchase Order or acknowledgement shall be deemed to be genuine for all purposes if it is transmitted to the location designated for such documents.

c. Each party will immediately take steps to verify any document that appears to be obviously garbled in transmission or improperly formatted to include re-transmission of any such document if necessary.

### **1.5 CONTRACT-004.1a Definitions (Oct 2013)**

As used in this Contract, these words shall have the following meanings:

- a. Agency: The department, board, commission or other agency of the Commonwealth of Pennsylvania listed as the Purchasing Agency. If a COSTARS entity or external procurement activity has issued an order against this contract, that entity shall also be identified as "Agency".
- b. Contracting Officer: The person authorized to administer this Contract for the Commonwealth and to make written determinations with respect to the Contract.
- c. Days: Unless specifically indicated otherwise, days mean calendar days.
- d. Developed Works or Developed Materials: All documents, sketches, drawings, designs, works, papers, files, reports, computer programs, computer documentation, data, records, software, samples or any other tangible material without limitation authored or prepared by Contractor as the work product covered in the scope of work for the Project.
- e. Documentation: All materials required to support and convey information about the services required by this Contract. It includes, but is not necessarily restricted to, written reports and analyses, diagrams, maps, logical and physical designs, system designs, computer programs, flow charts, disks, and/or other machine-readable storage media.
- f. Services: All Contractor activity necessary to satisfy the Contract.

### **1.6 CONTRACT-006.1 Independent Prime Contractor (Oct 2006)**

In performing its obligations under the Contract, the Contractor will act as an independent contractor and not as an employee or agent of the Commonwealth. The Contractor will be responsible for all services in this Contract whether or not Contractor provides them directly. Further, the Contractor is the sole point of contact with regard to all contractual matters, including payment of any and all charges resulting from the Contract.

### **1.7 CONTRACT-007.01b Delivery of Services (Nov 30 2006)**

The Contractor shall proceed with all due diligence in the performance of the services with qualified personnel, in accordance with the completion criteria set forth in the Contract.

### **1.8 CONTRACT-008.1a Warranty (Oct 2006)**

The Contractor warrants that all items furnished and all services performed by the Contractor, its agents and subcontractors shall be free and clear of any defects in workmanship or materials. Unless otherwise stated in the Contract, all items are warranted for a period of one year following delivery by the Contractor and acceptance by the Commonwealth. The Contractor shall repair, replace or otherwise correct any problem with the delivered item. When an item is replaced, it shall be replaced with an item of equivalent or superior quality without any additional cost to the Commonwealth.

### **1.9 CONTRACT-009.1c Patent, Copyright, and Trademark Indemnity (Oct 2013)**

The Contractor warrants that it is the sole owner or author of, or has entered into a suitable legal agreement

concerning either: a) the design of any product or process provided or used in the performance of the Contract which is covered by a patent, copyright, or trademark registration or other right duly authorized by state or federal law or b) any copyrighted matter in any report, document or other material provided to the Commonwealth under the contract.

The Contractor shall defend any suit or proceeding brought against the Commonwealth on account of any alleged patent, copyright or trademark infringement in the United States of any of the products provided or used in the performance of the Contract.

This is upon condition that the Commonwealth shall provide prompt notification in writing of such suit or proceeding; full right, authorization and opportunity to conduct the defense thereof; and full information and all reasonable cooperation for the defense of same.

As principles of governmental or public law are involved, the Commonwealth may participate in or choose to conduct, in its sole discretion, the defense of any such action.

If information and assistance are furnished by the Commonwealth at the Contractor's written request, it shall be at the Contractor's expense, but the responsibility for such expense shall be only that within the Contractor's written authorization.

The Contractor shall indemnify and hold the Commonwealth harmless from all damages, costs, and expenses, including attorney's fees that the Contractor or the Commonwealth may pay or incur by reason of any infringement or violation of the rights occurring to any holder of copyright, trademark, or patent interests and rights in any products provided or used in the performance of the Contract.

If any of the products provided by the Contractor in such suit or proceeding are held to constitute infringement and the use is enjoined, the Contractor shall, at its own expense and at its option, either procure the right to continue use of such infringement products, replace them with non-infringement equal performance products or modify them so that they are no longer infringing.

If the Contractor is unable to do any of the preceding, the Contractor agrees to remove all the equipment or software which are obtained contemporaneously with the infringing product, or, at the option of the Commonwealth, only those items of equipment or software which are held to be infringing, and to pay the Commonwealth: 1) any amounts paid by the Commonwealth towards the purchase of the product, less straight line depreciation; 2) any license fee paid by the Commonwealth for the use of any software, less an amount for the period of usage; and 3) the pro rata portion of any maintenance fee representing the time remaining in any period of maintenance paid for. The obligations of the Contractor under this paragraph continue without time limit. No costs or expenses shall be incurred for the account of the Contractor without its written consent.

#### **1.10 CONTRACT-009.1d Ownership Rights (Oct 2006)**

The Commonwealth shall have unrestricted authority to reproduce, distribute, and use any submitted report, data, or material, and any software or modifications and any associated documentation that is designed or developed and delivered to the Commonwealth as part of the performance of the Contract.

#### **1.11 CONTRACT-010.1a Acceptance (Oct 2006)**

No item(s) received by the Commonwealth shall be deemed accepted until the Commonwealth has had a reasonable opportunity to inspect the item(s). Any item(s) which is discovered to be defective or fails to conform to the specifications may be rejected upon initial inspection or at any later time if the defects contained in the item(s) or the noncompliance with the specifications were not reasonably ascertainable upon the initial inspection. It shall thereupon become the duty of the Contractor to remove rejected item(s) from the premises without expense to the Commonwealth within fifteen (15) days after notification. Rejected item(s) left longer than fifteen (15) days will be regarded as abandoned, and the Commonwealth shall have the right to dispose of them as its own property and shall retain that portion of the proceeds of any sale which represents the Commonwealth's costs and expenses in regard to the storage and sale of the item(s). Upon notice of rejection, the Contractor shall immediately replace all such rejected item(s) with others conforming to the specifications and which are not defective. If the Contractor fails, neglects or refuses to do so, the Commonwealth shall then have the right to procure a corresponding quantity of such

item(s), and deduct from any monies due or that may thereafter become due to the Contractor, the difference between the price stated in the Contract and the cost thereof to the Commonwealth.

#### **1.12 CONTRACT-011.1a Compliance With Law (Oct 2006)**

The Contractor shall comply with all applicable federal and state laws and regulations and local ordinances in the performance of the Contract.

#### **1.13 CONTRACT-013.1 Environmental Provisions (Oct 2006)**

In the performance of the Contract, the Contractor shall minimize pollution and shall strictly comply with all applicable environmental laws and regulations, including, but not limited to: the Clean Streams Law Act of June 22, 1937 (P.L. 1987, No. 394), as amended 35 P.S. Section 691.601 et seq.; the Pennsylvania Solid Waste Management Act, Act of July 7, 1980 (P.L. 380, No. 97), as amended, 35 P.S. Section 6018.101 et seq.; and the Dam Safety and Encroachment Act, Act of November 26, 1978 (P.L. 1375, No. 325), as amended, 32 P.S. Section 693.1.

#### **1.14 CONTRACT-014.1 Post-Consumer Recycled Content (June 2016)**

Except as specifically waived by the Department of General Services in writing, any products which are provided to the Commonwealth as a part of the performance of the Contract must meet the minimum percentage levels for total recycled content as specified by the Environmental Protection Agency in its Comprehensive Procurement Guidelines, which can be found at <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

#### **1.15 CONTRACT-014.3 Recycled Content Enforcement (Feb 2009)**

The Contractor may be required, after delivery of the Contract item(s), to provide the Commonwealth with documentary evidence that the item(s) was in fact produced with the required minimum percentage of post-consumer and recovered material content.

#### **1.16 CONTRACT-015.1A Compensation/Expenses (May 2008)**

The Contractor shall be required to perform the specified services at the price(s) quoted in the Contract. All services shall be performed within the time period(s) specified in the Contract. The Contractor shall be compensated only for work performed to the satisfaction of the Commonwealth. The Contractor shall not be allowed or paid travel or per diem expenses except as specifically set forth in the Contract.

#### **1.17 CONTRACT-015.2 Billing Requirements (February 2012)**

Unless the Contractor has been authorized by the Commonwealth for Evaluated Receipt Settlement or Vendor Self-Invoicing, the Contractor shall include in all of its invoices the following minimum information:

- Vendor name and "Remit to" address, including SAP Vendor number;
- Bank routing information, if ACH;
- SAP Purchase Order number;
- Delivery Address, including name of Commonwealth agency;
- Description of the supplies/services delivered in accordance with SAP Purchase Order (include purchase order line number if possible);
- Quantity provided;
- Unit price;
- Price extension;
- Total price; and
- Delivery date of supplies or services.

If an invoice does not contain the minimum information set forth in this paragraph, the Commonwealth may return the invoice as improper. If the Commonwealth returns an invoice as improper, the time for processing a payment will be suspended until the Commonwealth receives a correct invoice. The Contractor may not receive payment until the Commonwealth has received a correct invoice.

Contractors are required to establish separate billing accounts with each using agency and invoice them directly. Each invoice shall be itemized with adequate detail and match the line item on the Purchase Order. In no instance shall any payment be made for services to the Contractor that are not in accordance with the prices on the Purchase Order, the Contract, updated price lists or any discounts negotiated by the purchasing agency.

#### **1.18 CONTRACT-016.1 Payment (Oct 2006)**

- a. The Commonwealth shall put forth reasonable efforts to make payment by the required payment date. The required payment date is: (a) the date on which payment is due under the terms of the Contract; (b) thirty (30) days after a proper invoice actually is received at the "Bill To" address if a date on which payment is due is not specified in the Contract (a "proper" invoice is not received until the Commonwealth accepts the service as satisfactorily performed); or (c) the payment date specified on the invoice if later than the dates established by (a) and (b) above. Payment may be delayed if the payment amount on an invoice is not based upon the price(s) as stated in the Contract. If any payment is not made within fifteen (15) days after the required payment date, the Commonwealth may pay interest as determined by the Secretary of Budget in accordance with Act No. 266 of 1982 and regulations promulgated pursuant thereto. Payment should not be construed by the Contractor as acceptance of the service performed by the Contractor. The Commonwealth reserves the right to conduct further testing and inspection after payment, but within a reasonable time after performance, and to reject the service if such post payment testing or inspection discloses a defect or a failure to meet specifications. The Contractor agrees that the Commonwealth may set off the amount of any state tax liability or other obligation of the Contractor or its subsidiaries to the Commonwealth against any payments due the Contractor under any contract with the Commonwealth.
- b. The Commonwealth shall have the option of using the Commonwealth purchasing card to make purchases under the Contract or Purchase Order. The Commonwealth's purchasing card is similar to a credit card in that there will be a small fee which the Contractor will be required to pay and the Contractor will receive payment directly from the card issuer rather than the Commonwealth. Any and all fees related to this type of payment are the responsibility of the Contractor. In no case will the Commonwealth allow increases in prices to offset credit card fees paid by the Contractor or any other charges incurred by the Contractor, unless specifically stated in the terms of the Contract or Purchase Order.

#### **1.19 CONTRACT-017.1 Taxes (Dec 5 2006)**

The Commonwealth is exempt from all excise taxes imposed by the Internal Revenue Service and has accordingly registered with the Internal Revenue Service to make tax free purchases under Registration No. 23-23740001-K. With the exception of purchases of the following items, no exemption certificates are required and none will be issued: undyed diesel fuel, tires, trucks, gas guzzler emergency vehicles, and sports fishing equipment. The Commonwealth is also exempt from Pennsylvania state sales tax, local sales tax, public transportation assistance taxes and fees and vehicle rental tax. The Department of Revenue regulations provide that exemption certificates are not required for sales made to governmental entities and none will be issued. Nothing in this paragraph is meant to exempt a construction contractor from the payment of any of these taxes or fees which are required to be paid with respect to the purchase, use, rental, or lease of tangible personal property or taxable services used or transferred in connection with the performance of a construction contract.

#### **1.20 CONTRACT-018.1 Assignment of Antitrust Claims (Oct 2006)**

The Contractor and the Commonwealth recognize that in actual economic practice, overcharges by the Contractor's suppliers resulting from violations of state or federal antitrust laws are in fact borne by the Commonwealth. As part of the consideration for the award of the Contract, and intending to be legally bound, the Contractor assigns to the

Commonwealth all right, title and interest in and to any claims the Contractor now has, or may acquire, under state or federal antitrust laws relating to the products and services which are the subject of this Contract.

#### **1.21 CONTRACT-019.1 Hold Harmless Provision (Nov 30 2006)**

- a. The Contractor shall hold the Commonwealth harmless from and indemnify the Commonwealth against any and all third party claims, demands and actions based upon or arising out of any activities performed by the Contractor and its employees and agents under this Contract, provided the Commonwealth gives Contractor prompt notice of any such claim of which it learns. Pursuant to the Commonwealth Attorneys Act (71 P.S. Section 732-101, et seq.), the Office of Attorney General (OAG) has the sole authority to represent the Commonwealth in actions brought against the Commonwealth. The OAG may, however, in its sole discretion and under such terms as it deems appropriate, delegate its right of defense. If OAG delegates the defense to the Contractor, the Commonwealth will cooperate with all reasonable requests of Contractor made in the defense of such suits.
- b. Notwithstanding the above, neither party shall enter into any settlement without the other party's written consent, which shall not be unreasonably withheld. The Commonwealth may, in its sole discretion, allow the Contractor to control the defense and any related settlement negotiations.

#### **1.22 CONTRACT-020.1 Audit Provisions (Oct 2006)**

The Commonwealth shall have the right, at reasonable times and at a site designated by the Commonwealth, to audit the books, documents and records of the Contractor to the extent that the books, documents and records relate to costs or pricing data for the Contract. The Contractor agrees to maintain records which will support the prices charged and costs incurred for the Contract. The Contractor shall preserve books, documents and records that relate to costs or pricing data for the Contract for a period of three (3) years from the date of final payment. The Contractor shall give full and free access to all records to the Commonwealth and/or their authorized representatives.

#### **1.23 CONTRACT-021.1 Default (Oct 2013)**

- a. The Commonwealth may, subject to the Force Majeure provisions of this Contract, and in addition to its other rights under the Contract, declare the Contractor in default by written notice thereof to the Contractor, and terminate (as provided in the Termination Provisions of this Contract) the whole or any part of this Contract or any Purchase Order for any of the following reasons:
  - 1) Failure to begin work within the time specified in the Contract or Purchase Order or as otherwise specified;
  - 2) Failure to perform the work with sufficient labor, equipment, or material to ensure the completion of the specified work in accordance with the Contract or Purchase Order terms;
  - 3) Unsatisfactory performance of the work;
  - 4) Failure to deliver the awarded item(s) within the time specified in the Contract or Purchase Order or as otherwise specified;
  - 5) Improper delivery;
  - 6) Failure to provide an item(s) which is in conformance with the specifications referenced in the Contract or Purchase Order;
  - 7) Delivery of a defective item;
  - 8) Failure or refusal to remove material, or remove and replace any work rejected as defective or unsatisfactory;
  - 9) Discontinuance of work without approval;

- 10) Failure to resume work, which has been discontinued, within a reasonable time after notice to do so;
- 11) Insolvency or bankruptcy;
- 12) Assignment made for the benefit of creditors;
- 13) Failure or refusal within 10 days after written notice by the Contracting Officer, to make payment or show cause why payment should not be made, of any amounts due for materials furnished, labor supplied or performed, for equipment rentals, or for utility services rendered;
- 14) Failure to protect, to repair, or to make good any damage or injury to property;
- 15) Breach of any provision of the Contract;
- 16) Failure to comply with representations made in the Contractor's bid/proposal; or
- 17) Failure to comply with applicable industry standards, customs, and practice.

b. In the event that the Commonwealth terminates this Contract or any Purchase Order in whole or in part as provided in Subparagraph a. above, the Commonwealth may procure, upon such terms and in such manner as it determines, items similar or identical to those so terminated, and the Contractor shall be liable to the Commonwealth for any reasonable excess costs for such similar or identical items included within the terminated part of the Contract or Purchase Order.

c. If the Contract or a Purchase Order is terminated as provided in Subparagraph a. above, the Commonwealth, in addition to any other rights provided in this paragraph, may require the Contractor to transfer title and deliver immediately to the Commonwealth in the manner and to the extent directed by the Contracting Officer, such partially completed items, including, where applicable, reports, working papers and other documentation, as the Contractor has specifically produced or specifically acquired for the performance of such part of the Contract or Purchase Order as has been terminated. Except as provided below, payment for completed work accepted by the Commonwealth shall be at the Contract price. Except as provided below, payment for partially completed items including, where applicable, reports and working papers, delivered to and accepted by the Commonwealth shall be in an amount agreed upon by the Contractor and Contracting Officer. The Commonwealth may withhold from amounts otherwise due the Contractor for such completed or partially completed works, such sum as the Contracting Officer determines to be necessary to protect the Commonwealth against loss.

d. The rights and remedies of the Commonwealth provided in this paragraph shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract.

e. The Commonwealth's failure to exercise any rights or remedies provided in this paragraph shall not be construed to be a waiver by the Commonwealth of its rights and remedies in regard to the event of default or any succeeding event of default.

f. Following exhaustion of the Contractor's administrative remedies as set forth in the Contract Controversies Provision of the Contract, the Contractor's exclusive remedy shall be to seek damages in the Board of Claims.

#### **1.24 CONTRACT-022.1 Force Majeure (Oct 2006)**

Neither party will incur any liability to the other if its performance of any obligation under this Contract is prevented or delayed by causes beyond its control and without the fault or negligence of either party. Causes beyond a party's control may include, but aren't limited to, acts of God or war, changes in controlling law, regulations, orders or the requirements of any governmental entity, severe weather conditions, civil disorders, natural disasters, fire, epidemics and quarantines, general strikes throughout the trade, and freight embargoes.

The Contractor shall notify the Commonwealth orally within five (5) days and in writing within ten (10) days of the date on which the Contractor becomes aware, or should have reasonably become aware, that such cause would

prevent or delay its performance. Such notification shall (i) describe fully such cause(s) and its effect on performance, (ii) state whether performance under the contract is prevented or delayed and (iii) if performance is delayed, state a reasonable estimate of the duration of the delay. The Contractor shall have the burden of proving that such cause(s) delayed or prevented its performance despite its diligent efforts to perform and shall produce such supporting documentation as the Commonwealth may reasonably request. After receipt of such notification, the Commonwealth may elect to cancel the Contract, cancel the Purchase Order, or to extend the time for performance as reasonably necessary to compensate for the Contractor's delay.

In the event of a declared emergency by competent governmental authorities, the Commonwealth by notice to the Contractor, may suspend all or a portion of the Contract or Purchase Order.

### **1.25 CONTRACT-023.1a Termination Provisions (Oct 2013)**

The Commonwealth has the right to terminate this Contract or any Purchase Order for any of the following reasons. Termination shall be effective upon written notice to the Contractor.

a. **TERMINATION FOR CONVENIENCE:** The Commonwealth shall have the right to terminate the Contract or a Purchase Order for its convenience if the Commonwealth determines termination to be in its best interest. The Contractor shall be paid for work satisfactorily completed prior to the effective date of the termination, but in no event shall the Contractor be entitled to recover loss of profits.

b. **NON-APPROPRIATION:** The Commonwealth's obligation to make payments during any Commonwealth fiscal year succeeding the current fiscal year shall be subject to availability and appropriation of funds. When funds (state and/or federal) are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal year period, the Commonwealth shall have the right to terminate the Contract or a Purchase Order. The Contractor shall be reimbursed for the reasonable value of any nonrecurring costs incurred but not amortized in the price of the supplies or services delivered under the Contract. Such reimbursement shall not include loss of profit, loss of use of money, or administrative or overhead costs. The reimbursement amount may be paid from any appropriations available for that purpose.

c. **TERMINATION FOR CAUSE:** The Commonwealth shall have the right to terminate the Contract or a Purchase Order for Contractor default under the Default Clause upon written notice to the Contractor. The Commonwealth shall also have the right, upon written notice to the Contractor, to terminate the Contract or a Purchase Order for other cause as specified in the Contract or by law. If it is later determined that the Commonwealth erred in terminating the Contract or a Purchase Order for cause, then, at the Commonwealth's discretion, the Contract or Purchase Order shall be deemed to have been terminated for convenience under the Subparagraph a.

### **1.26 CONTRACT-024.1 Contract Controversies (Oct 2011)**

a. In the event of a controversy or claim arising from the Contract, the Contractor must, within six months after the cause of action accrues, file a written claim with the contracting officer for a determination. The claim shall state all grounds upon which the Contractor asserts a controversy exists. If the Contractor fails to file a claim or files an untimely claim, the Contractor is deemed to have waived its right to assert a claim in any forum. At the time the claim is filed, or within sixty (60) days thereafter, either party may request mediation through the Commonwealth Office of General Counsel Dispute Resolution Program.

b. If the Contractor or the contracting officer requests mediation and the other party agrees, the contracting officer shall promptly make arrangements for mediation. Mediation shall be scheduled so as to not delay the issuance of the final determination beyond the required 120 days after receipt of the claim if mediation is unsuccessful. If mediation is not agreed to or if resolution is not reached through mediation, the contracting officer shall review timely-filed claims and issue a final determination, in writing, regarding the claim. The final determination shall be issued within 120 days of the receipt of the claim, unless extended by consent of the contracting officer and the Contractor. The contracting officer shall send his/her written determination to the

Contractor. If the contracting officer fails to issue a final determination within the 120 days (unless extended by consent of the parties), the claim shall be deemed denied. The contracting officer's determination shall be the final order of the purchasing agency.

c. Within fifteen (15) days of the mailing date of the determination denying a claim or within 135 days of filing a claim if, no extension is agreed to by the parties, whichever occurs first, the Contractor may file a statement of claim with the Commonwealth Board of Claims. Pending a final judicial resolution of a controversy or claim, the Contractor shall proceed diligently with the performance of the Contract in a manner consistent with the determination of the contracting officer and the Commonwealth shall compensate the Contractor pursuant to the terms of the Contract.

#### **1.27 CONTRACT-025.1 Assignability and Subcontracting (Oct 2013)**

a. Subject to the terms and conditions of this paragraph, this Contract shall be binding upon the parties and their respective successors and assigns.

b. The Contractor shall not subcontract with any person or entity to perform all or any part of the work to be performed under this Contract without the prior written consent of the Contracting Officer, which consent may be withheld at the sole and absolute discretion of the Contracting Officer.

c. The Contractor may not assign, in whole or in part, this Contract or its rights, duties, obligations, or responsibilities hereunder without the prior written consent of the Contracting Officer, which consent may be withheld at the sole and absolute discretion of the Contracting Officer.

d. Notwithstanding the foregoing, the Contractor may, without the consent of the Contracting Officer, assign its rights to payment to be received under the Contract, provided that the Contractor provides written notice of such assignment to the Contracting Officer together with a written acknowledgement from the assignee that any such payments are subject to all of the terms and conditions of this Contract.

e. For the purposes of this Contract, the term "assign" shall include, but shall not be limited to, the sale, gift, assignment, pledge, or other transfer of any ownership interest in the Contractor provided, however, that the term shall not apply to the sale or other transfer of stock of a publicly traded company.

f. Any assignment consented to by the Contracting Officer shall be evidenced by a written assignment agreement executed by the Contractor and its assignee in which the assignee agrees to be legally bound by all of the terms and conditions of the Contract and to assume the duties, obligations, and responsibilities being assigned.

g. A change of name by the Contractor, following which the Contractor's federal identification number remains unchanged, shall not be considered to be an assignment hereunder. The Contractor shall give the Contracting Officer written notice of any such change of name.

#### **1.28 CONTRACT-026.1 Other Contractors (Oct 2006)**

The Commonwealth may undertake or award other contracts for additional or related work, and the Contractor shall fully cooperate with other contractors and Commonwealth employees, and coordinate its work with such additional work as may be required. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Commonwealth employees. This paragraph shall be included in the Contracts of all contractors with which this Contractor will be required to cooperate. The Commonwealth shall equitably enforce this paragraph as to all contractors to prevent the imposition of unreasonable burdens on any contractor.

#### **1.29 CONTRACT-027.1 Nondiscrimination/Sexual Harassment Clause (August 2018)**

The Contractor agrees:



1. In the hiring of any employee(s) for the manufacture of supplies, performance of work, or any other activity required under the contract or any subcontract, the Contractor, each subcontractor, or any person acting on behalf of the Contractor or subcontractor shall not discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of the *Pennsylvania Human Relations Act* (PHRA) and applicable federal laws, against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
2. Neither the Contractor nor any subcontractor nor any person on their behalf shall in any manner discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of the PHRA and applicable federal laws, against or intimidate any employee involved in the manufacture of supplies, the performance of work, or any other activity required under the contract.
3. Neither the Contractor nor any subcontractor nor any person on their behalf shall in any manner discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of the PHRA and applicable federal laws, in the provision of services under the contract.
4. Neither the Contractor nor any subcontractor nor any person on their behalf shall in any manner discriminate against employees by reason of participation in or decision to refrain from participating in labor activities protected under the *Public Employee Relations Act*, *Pennsylvania Labor Relations Act* or *National Labor Relations Act*, as applicable and to the extent determined by entities charged with such Acts' enforcement, and shall comply with any provision of law establishing organizations as employees' exclusive representatives.
5. The Contractor and each subcontractor shall establish and maintain a written nondiscrimination and sexual harassment policy and shall inform their employees in writing of the policy. The policy must contain a provision that sexual harassment will not be tolerated and employees who practice it will be disciplined. Posting this Nondiscrimination/Sexual Harassment Clause conspicuously in easily-accessible and well-lighted places customarily frequented by employees and at or near where the contracted services are performed shall satisfy this requirement for employees with an established work site.
6. The Contractor and each subcontractor shall not discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of PHRA and applicable federal laws, against any subcontractor or supplier who is qualified to perform the work to which the contract relates.
7. The Contractor and each subcontractor represents that it is presently in compliance with and will maintain compliance with all applicable federal, state, and local laws, regulations and policies relating to nondiscrimination and sexual harassment. The Contractor and each subcontractor further represents that it has filed a Standard Form 100 Employer Information Report ("EEO-1") with the U.S. Equal Employment Opportunity Commission ("EEOC") and shall file an annual EEO-1 report with the EEOC as required for employers' subject to *Title VII of the Civil Rights Act of 1964*, as amended, that have 100 or more employees and employers that have federal government contracts or first-tier subcontracts and have 50 or more employees. The Contractor and each subcontractor shall, upon request and within the time periods requested by the Commonwealth, furnish all necessary employment documents and records, including EEO-1 reports, and permit access to their books, records, and accounts by the contracting agency and the Bureau of Diversity, Inclusion and Small Business Opportunities for purpose of ascertaining compliance with provisions of this Nondiscrimination/Sexual Harassment Clause.
8. The Contractor shall include the provisions of this Nondiscrimination/Sexual Harassment Clause in every subcontract so that those provisions applicable to subcontractors will be binding upon each subcontractor.
9. The Contractor's and each subcontractor's obligations pursuant to these provisions are ongoing from and after the effective date of the contract through the termination date thereof. Accordingly, the Contractor and each subcontractor shall have an obligation to inform the Commonwealth if, at any time during the term of the contract, it becomes aware of any actions or occurrences that would result in violation of these provisions.
10. The Commonwealth may cancel or terminate the contract and all money due or to become due under

the contract may be forfeited for a violation of the terms and conditions of this Nondiscrimination/Sexual Harassment Clause. In addition, the agency may proceed with debarment or suspension and may place the Contractor in the Contractor Responsibility File.

### **1.30 CONTRACT-028.1 Contractor Integrity Provisions (Jan 2015)**

It is essential that those who seek to contract with the Commonwealth of Pennsylvania ("Commonwealth") observe high standards of honesty and integrity. They must conduct themselves in a manner that fosters public confidence in the integrity of the Commonwealth contracting and procurement process.

**1. DEFINITIONS.** For purposes of these Contractor Integrity Provisions, the following terms shall have the meanings found in this Section:

**a. "Affiliate"** means two or more entities where (a) a parent entity owns more than fifty percent of the voting stock of each of the entities; or (b) a common shareholder or group of shareholders owns more than fifty percent of the voting stock of each of the entities; or (c) the entities have a common proprietor or general partner.

**b. "Consent"** means written permission signed by a duly authorized officer or employee of the Commonwealth, provided that where the material facts have been disclosed, in writing, by prequalification, bid, proposal, or contractual terms, the Commonwealth shall be deemed to have consented by virtue of the execution of this contract.

**c. "Contractor"** means the individual or entity, that has entered into this contract with the Commonwealth.

**d. "Contractor Related Parties"** means any affiliates of the Contractor and the Contractor's executive officers, Pennsylvania officers and directors, or owners of 5 percent or more interest in the Contractor.

**e. "Financial Interest"** means either:

(1) Ownership of more than a five percent interest in any business; or

(2) Holding a position as an officer, director, trustee, partner, employee, or holding any position of management.

**f. "Gratuity"** means tendering, giving, or providing anything of more than nominal monetary value including, but not limited to, cash, travel, entertainment, gifts, meals, lodging, loans, subscriptions, advances, deposits of money, services, employment, or contracts of any kind. The exceptions set forth in the *Governor's Code of Conduct, Executive Order 1980-18, the 4 Pa. Code §7.153(b)*, shall apply.

**g. "Non-bid Basis"** means a contract awarded or executed by the Commonwealth with Contractor without seeking bids or proposals from any other potential bidder or offeror.

**2.** In furtherance of this policy, Contractor agrees to the following:

**a.** Contractor shall maintain the highest standards of honesty and integrity during the performance of this contract and shall take no action in violation of state or federal laws or regulations or any other applicable laws or regulations, or other requirements applicable to Contractor or that govern contracting or procurement with the Commonwealth.

**b.** Contractor shall establish and implement a written business integrity policy, which includes, at a minimum, the requirements of these provisions as they relate to the Contractor activity with the Commonwealth and Commonwealth employees and which is made known to all Contractor employees. Posting these Contractor Integrity Provisions conspicuously in easily-accessible and well-lighted places customarily frequented by employees and at or near where the contract services are performed shall satisfy this requirement.

**c.** Contractor, its affiliates, agents, employees and anyone in privity with Contractor shall not accept, agree to give, offer, confer or agree to confer or promise to confer, directly or indirectly, any gratuity or pecuniary benefit to any person, or to influence or attempt to influence any person in violation of any federal or state law, regulation, executive order of the Governor of Pennsylvania, statement of policy, management directive or any other published standard of the Commonwealth in connection with performance of work under this contract, except as provided in

this contract.

**d.** Contractor shall not have a financial interest in any other contractor, subcontractor, or supplier providing services, labor or material under this contract, unless the financial interest is disclosed to the Commonwealth in writing and the Commonwealth consents to Contractor's financial interest prior to Commonwealth execution of the contract. Contractor shall disclose the financial interest to the Commonwealth at the time of bid or proposal submission, or if no bids or proposals are solicited, no later than the Contractor's submission of the contract signed by Contractor.

**e.** Contractor certifies to the best of its knowledge and belief that within the last five (5) years Contractor or Contractor Related Parties have not:

**(1)** been indicted or convicted of a crime involving moral turpitude or business honesty or integrity in any jurisdiction;

**(2)** been suspended, debarred or otherwise disqualified from entering into any contract with any governmental agency;

**(3)** had any business license or professional license suspended or revoked;

**(4)** had any sanction or finding of fact imposed as a result of a judicial or administrative proceeding related to fraud, extortion, bribery, bid rigging, embezzlement, misrepresentation or anti-trust; and

**(5)** been, and is not currently, the subject of a criminal investigation by any federal, state or local prosecuting or investigative agency and/or civil anti-trust investigation by any federal, state or local prosecuting or investigative agency.

If Contractor cannot so certify to the above, then it must submit along with its bid, proposal or contract a written explanation of why such certification cannot be made and the Commonwealth will determine whether a contract may be entered into with the Contractor. The Contractor's obligation pursuant to this certification is ongoing from and after the effective date of the contract through the termination date thereof. Accordingly, the Contractor shall have an obligation to immediately notify the Commonwealth in writing if at any time during the term of the contract it becomes aware of any event which would cause the Contractor's certification or explanation to change. Contractor acknowledges that the Commonwealth may, in its sole discretion, terminate the contract for cause if it learns that any of the certifications made herein are currently false due to intervening factual circumstances or were false or should have been known to be false when entering into the contract.

**f.** Contractor shall comply with the requirements of the *Lobbying Disclosure Act (65 Pa.C.S. §13A01 et seq.)* regardless of the method of award. If this contract was awarded on a Non-bid Basis, Contractor must also comply with the requirements of the *Section 1641 of the Pennsylvania Election Code (25 P.S. §3260a)*.

**g.** When contractor has reason to believe that any breach of ethical standards as set forth in law, the Governor's Code of Conduct, or these Contractor Integrity Provisions has occurred or may occur, including but not limited to contact by a Commonwealth officer or employee which, if acted upon, would violate such ethical standards, Contractor shall immediately notify the Commonwealth contracting officer or the Office of the State Inspector General in writing.

**h.** Contractor, by submission of its bid or proposal and/or execution of this contract and by the submission of any bills, invoices or requests for payment pursuant to the contract, certifies and represents that is has not violated any of these Contractor Integrity Provisions in connection with the submission of the bid or proposal, during any contract negotiations or during the term of the contract, to include any extensions thereof. Contractor shall immediately notify the Commonwealth in writing of any actions for occurrences that would result in a violation of these Contractor Integrity Provisions. Contractor agrees to reimburse the Commonwealth for the reasonable costs of investigation incurred by the Office of the State Inspector General for investigations of the Contractor's compliance with the terms of this or any other agreement between the Contractor and the Commonwealth that results in the suspension or debarment of the Contractor. Contractor shall not be responsible for investigative costs for investigations that do not result in the Contractor's suspension or debarment.

**i.** Contractor shall cooperate with the Office of the State Inspector General in its investigation of any alleged Commonwealth agency or employee breach of ethical standards and any alleged Contractor non-compliance with

these Contractor Integrity Provisions. Contractor agrees to make identified Contractor employees available for interviews at reasonable times and places. Contractor, upon the inquiry or request of an Inspector General, shall provide, or if appropriate, make promptly available for inspection or copying, any information of any type or form deemed relevant by the Office of the State Inspector General to Contractor's integrity and compliance with these provisions. Such information may include, but shall not be limited to, Contractor's business or financial records, documents or files of any type or form that refer to or concern this contract. Contractor shall incorporate this paragraph in any agreement, contract or subcontract it enters into in the course of the performance of this contract/agreement solely for the purpose of obtaining subcontractor compliance with this provision. The incorporation of this provision in a subcontract shall not create privity of contract between the Commonwealth and any such subcontractor, and no third party beneficiaries shall be created thereby.

j. For violation of any of these Contractor Integrity Provisions, the Commonwealth may terminate this and any other contract with Contractor, claim liquidated damages in an amount equal to the value of anything received in breach of these Provisions, claim damages for all additional costs and expenses incurred in obtaining another contractor to complete performance under this contract, and debar and suspend Contractor from doing business with the Commonwealth. These rights and remedies are cumulative, and the use or non-use of any one shall not preclude the use of all or any other. These rights and remedies are in addition to those the Commonwealth may have under law, statute, regulation or otherwise.

### **1.31 CONTRACT-029.1 Contractor Responsibility Provisions (Nov 2010)**

For the purpose of these provisions, the term contractor is defined as any person, including, but not limited to, a bidder, offeror, loan recipient, grantee or lessor, who has furnished or performed or seeks to furnish or perform, goods, supplies, services, leased space, construction or other activity, under a contract, grant, lease, purchase order or reimbursement agreement with the Commonwealth of Pennsylvania (Commonwealth). The term contractor includes a permittee, licensee, or any agency, political subdivision, instrumentality, public authority, or other public entity in the Commonwealth.

1. The Contractor certifies, in writing, for itself and its subcontractors required to be disclosed or approved by the Commonwealth, that as of the date of its execution of this Bid/Contract, that neither the Contractor, nor any such subcontractors, are under suspension or debarment by the Commonwealth or any governmental entity, instrumentality, or authority and, if the Contractor cannot so certify, then it agrees to submit, along with its Bid/Contract, a written explanation of why such certification cannot be made.

2. The Contractor also certifies, in writing, that as of the date of its execution of this Bid/Contract it has no tax liabilities or other Commonwealth obligations, or has filed a timely administrative or judicial appeal if such liabilities or obligations exist, or is subject to a duly approved deferred payment plan if such liabilities exist.

3. The Contractor's obligations pursuant to these provisions are ongoing from and after the effective date of the Contract through the termination date thereof. Accordingly, the Contractor shall have an obligation to inform the Commonwealth if, at any time during the term of the Contract, it becomes delinquent in the payment of taxes, or other Commonwealth obligations, or if it or, to the best knowledge of the Contractor, any of its subcontractors are suspended or debarred by the Commonwealth, the federal government, or any other state or governmental entity. Such notification shall be made within 15 days of the date of suspension or debarment.

4. The failure of the Contractor to notify the Commonwealth of its suspension or debarment by the Commonwealth, any other state, or the federal government shall constitute an event of default of the Contract with the Commonwealth.

5. The Contractor agrees to reimburse the Commonwealth for the reasonable costs of investigation incurred by the Office of State Inspector General for investigations of the Contractor's compliance with the terms of this or any other agreement between the Contractor and the Commonwealth that results in the suspension or debarment of the contractor. Such costs shall include, but shall not be limited to, salaries of investigators, including overtime; travel and lodging expenses; and expert witness and documentary fees. The Contractor shall not be responsible for investigative costs for investigations that do not result in the Contractor's suspension or debarment.

6. The Contractor may obtain a current list of suspended and debarred Commonwealth contractors by either searching the Internet at <http://www.dgs.state.pa.us/> or contacting the:

Department of General Services  
Office of Chief Counsel  
603 North Office Building  
Harrisburg, PA 17125  
Telephone No: (717) 783-6472  
FAX No: (717) 787-9138

**1.32 CONTRACT-030.1 Americans with Disabilities Act (Oct 2006)**

- a. Pursuant to federal regulations promulgated under the authority of The Americans With Disabilities Act, 28 C.F.R. Section 35.101 et seq., the Contractor understands and agrees that it shall not cause any individual with a disability to be excluded from participation in this Contract or from activities provided for under this Contract on the basis of the disability. As a condition of accepting this contract, the Contractor agrees to comply with the "General Prohibitions Against Discrimination," 28 C.F.R. Section 35.130, and all other regulations promulgated under Title II of The Americans With Disabilities Act which are applicable to all benefits, services, programs, and activities provided by the Commonwealth of Pennsylvania through contracts with outside contractors.
- b. The Contractor shall be responsible for and agrees to indemnify and hold harmless the Commonwealth of Pennsylvania from all losses, damages, expenses, claims, demands, suits, and actions brought by any party against the Commonwealth of Pennsylvania as a result of the Contractor's failure to comply with the provisions of Subparagraph a. above.

**1.33 CONTRACT-032.1 Covenant Against Contingent Fees (Oct 2006)**

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure the Contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty, the Commonwealth shall have the right to terminate the Contract without liability or in its discretion to deduct from the Contract price or consideration, or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.

**1.34 CONTRACT-033.1 Applicable Law (Oct 2006)**

This Contract shall be governed by and interpreted and enforced in accordance with the laws of the Commonwealth of Pennsylvania (without regard to any conflict of laws provisions) and the decisions of the Pennsylvania courts. The Contractor consents to the jurisdiction of any court of the Commonwealth of Pennsylvania and any federal courts in Pennsylvania, waiving any claim or defense that such forum is not convenient or proper. The Contractor agrees that any such court shall have in personam jurisdiction over it, and consents to service of process in any manner authorized by Pennsylvania law.

**1.35 CONTRACT-034.1d Integration – Stand Alone Purchase Order (Nov 30 2006)**

This Purchase Order, including all referenced documents, constitutes the entire agreement between the parties. No agent, representative, employee or officer of either the Commonwealth or the Contractor has authority to make, or has made, any statement, agreement or representation, oral or written, in connection with the Contract, which in any way can be deemed to modify, add to or detract from, or otherwise change or alter its terms and conditions. No negotiations between the parties, nor any custom or usage, shall be permitted to modify or contradict any of the terms and conditions of the Contract. No modifications, alterations, changes, or waiver to the Contract or any of its terms shall be valid or binding unless accomplished by a written amendment signed by both parties.

**1.36 CONTRACT-034.3 Controlling Terms and Conditions (Aug 2011)**

The terms and conditions of this Contract shall be the exclusive terms of agreement between the Contractor and the Commonwealth. All quotations requested and received from the Contractor are for obtaining firm pricing only. Other terms and conditions or additional terms and conditions included or referenced in the Contractor's quotations, invoices, business forms, or other documentation shall not become part of the parties' agreement and shall be disregarded by the parties, unenforceable by the Contractor and not binding on the Commonwealth.

### **1.37 CONTRACT-035.1a Changes (Oct 2006)**

The Commonwealth reserves the right to make changes at any time during the term of the Contract or any renewals or extensions thereof: 1) to increase or decrease the quantities resulting from variations between any estimated quantities in the Contract and actual quantities; 2) to make changes to the services within the scope of the Contract; 3) to notify the Contractor that the Commonwealth is exercising any Contract renewal or extension option; or 4) to modify the time of performance that does not alter the scope of the Contract to extend the completion date beyond the Expiration Date of the Contract or any renewals or extensions thereof. Any such change shall be made by the Contracting Officer by notifying the Contractor in writing. The change shall be effective as of the date of the change, unless the notification of change specifies a later effective date. Such increases, decreases, changes, or modifications will not invalidate the Contract, nor, if performance security is being furnished in conjunction with the Contract, release the security obligation. The Contractor agrees to provide the service in accordance with the change order. Any dispute by the Contractor in regard to the performance required by any notification of change shall be handled through Contract Controversies Provision.

### **1.38 CONTRACT-036.1 Background Checks (February 2016)**

a. The Contractor must, at its expense, arrange for a background check for each of its employees, as well as the employees of any of its subcontractors, who will have access to Commonwealth facilities, either through on-site access or through remote access. Background checks are to be conducted via the Request for Criminal Record Check form and procedure found at <http://www.psp.state.pa.us/psp/lib/psp/sp4-164.pdf>. The background check must be conducted prior to initial access and on an annual basis thereafter.

b. Before the Commonwealth will permit access to the Contractor, the Contractor must provide written confirmation that the background checks have been conducted. If, at any time, it is discovered that a Contractor employee has a criminal record that includes a felony or misdemeanor involving terroristic behavior, violence, use of a lethal weapon, or breach of trust/fiduciary responsibility or which raises concerns about building, system or personal security or is otherwise job-related, the Contractor shall not assign that employee to any Commonwealth facilities, shall remove any access privileges already given to the employee and shall not permit that employee remote access unless the Commonwealth consents to the access, in writing, prior to the access. The Commonwealth may withhold its consent in its sole discretion. Failure of the Contractor to comply with the terms of this Section on more than one occasion or Contractor's failure to appropriately address any single failure to the satisfaction of the Commonwealth may result in the Contractor being deemed in default of its Contract.

c. The Commonwealth specifically reserves the right of the Commonwealth to conduct background checks over and above that described herein.

d. Access to certain Capitol Complex buildings and other state office buildings is controlled by means of card readers and secured visitors' entrances. Commonwealth contracted personnel who have regular and routine business in Commonwealth worksites may be issued a photo identification or access badge subject to the requirements of the contracting agency and DGS set forth in [Enclosure 3 of Commonwealth Management Directive 625.10 \(Amended\) Card Reader and Emergency Response Access to Certain Capitol Complex Buildings and Other State Office Buildings](#). The requirements, policy and procedures include a processing fee payable by the Contractor for contracted personnel photo identification or access badges.

### **1.39 CONTRACT-037.1a Confidentiality (Oct 2013)**

a) The Contractor agrees to protect the confidentiality of the Commonwealth's confidential information. The Commonwealth agrees to protect the confidentiality of Contractor's confidential information. In order for information to be deemed confidential, the party claiming confidentiality must designate the information as "confidential" in such a way as to give notice to the other party (notice may be communicated by describing the information, and the specifications around its use or disclosure, in the SOW). Neither party may assert that information owned by the other party is such party's confidential information. The parties agree that such confidential information shall not be copied, in whole or in part, or used or disclosed except when essential for authorized activities under this Contract and, in the case of disclosure, where the recipient of the confidential information has agreed to be bound by confidentiality requirements no less restrictive than those set forth herein. Each copy of such confidential information shall be marked by the party making the copy with any notices appearing in the original. Upon termination or cancellation of this Contract or any license granted hereunder, the receiving party will return to the disclosing party all copies of the confidential information in the receiving party's possession, other than one copy, which may be maintained for archival purposes only, and which will remain subject to this Contract's security, privacy, data retention/destruction and confidentiality provisions (all of which shall survive the expiration of this Contract). Both parties agree that a material breach of these requirements may, after failure to cure within the time frame specified in this Contract, and at the discretion of the non-breaching party, result in termination for default pursuant to the DEFAULT provision of this Contract, in addition to other remedies available to the non-breaching party.

(b) Insofar as information is not otherwise protected by law or regulation, the obligations stated in this Section do not apply to information:

- (1) already known to the recipient at the time of disclosure other than through the contractual relationship;
- (2) independently generated by the recipient and not derived by the information supplied by the disclosing party.
- (3) known or available to the public, except where such knowledge or availability is the result of unauthorized disclosure by the recipient of the proprietary information;
- (4) disclosed to the recipient without a similar restriction by a third party who has the right to make such disclosure; or
- (5) required to be disclosed by law, regulation, court order, or other legal process.

There shall be no restriction with respect to the use or disclosure of any ideas, concepts, know-how, or data processing techniques developed alone or jointly with the Commonwealth in connection with services provided to the Commonwealth under this Contract.

(c) The Contractor shall use the following process when submitting information to the Commonwealth it believes to be confidential and/or proprietary information or trade secrets:

- (1) Prepare an un-redacted version of the appropriate document, and
- (2) Prepare a redacted version of the document that redacts the information that is asserted to be confidential or proprietary information or a trade secret, and
- (3) Prepare a signed written statement that states:
  - (i) the attached document contains confidential or proprietary information or trade secrets;
  - (ii) the Contractor is submitting the document in both redacted and un-redacted format in accordance with 65 P.S. § 67.707(b); and
  - (iii) the Contractor is requesting that the document be considered exempt under 65 P.S. § 67.708(b)(11) from public records requests.
- (4) Submit the two documents along with the signed written statement to the Commonwealth.

#### **1.40 CONTRACT-051.1 Notice (Dec 2006)**

Any written notice to any party under this Contract shall be deemed sufficient if delivered personally, or by facsimile, teletype, electronic or digital transmission (provided such delivery is confirmed), or by a recognized overnight courier service (e.g., DHL, Federal Express, etc.) with confirmed receipt, or by certified or registered United States mail, postage prepaid, return receipt requested, and sent to following:

- a. If to the Contractor: the Contractor's address as recorded in the Commonwealth's Supplier Registration system.
- b. If to the Commonwealth: the address of the Issuing Office as set forth on the Contract.

#### **1.41 CONTRACT-052.1 Right to Know Law (Feb 2010)**

a. The Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101-3104, ("RTKL") applies to this Contract. For the purpose of these provisions, the term "the Commonwealth" shall refer to the contracting Commonwealth agency.

b. If the Commonwealth needs the Contractor's assistance in any matter arising out of the RTKL related to this Contract, it shall notify the Contractor using the legal contact information provided in this Contract. The Contractor, at any time, may designate a different contact for such purpose upon reasonable prior written notice to the Commonwealth.

c. Upon written notification from the Commonwealth that it requires the Contractor's assistance in responding to a request under the RTKL for information related to this Contract that may be in the Contractor's possession, constituting, or alleged to constitute, a public record in accordance with the RTKL ("Requested Information"), the Contractor shall:

1. Provide the Commonwealth, within ten (10) calendar days after receipt of written notification, access to, and copies of, any document or information in the Contractor's possession arising out of this Contract that the Commonwealth reasonably believes is Requested Information and may be a public record under the RTKL; and
2. Provide such other assistance as the Commonwealth may reasonably request, in order to comply with the RTKL with respect to this Contract.

d. If the Contractor considers the Requested Information to include a request for a Trade Secret or Confidential Proprietary Information, as those terms are defined by the RTKL, or other information that the Contractor considers exempt from production under the RTKL, the Contractor must notify the Commonwealth and provide, within seven (7) calendar days of receiving the written notification, a written statement signed by a representative of the Contractor explaining why the requested material is exempt from public disclosure under the RTKL.

e. The Commonwealth will rely upon the written statement from the Contractor in denying a RTKL request for the Requested Information unless the Commonwealth determines that the Requested Information is clearly not protected from disclosure under the RTKL. Should the Commonwealth determine that the Requested Information is clearly not exempt from disclosure, the Contractor shall provide the Requested Information within five (5) business days of receipt of written notification of the Commonwealth's determination.

f. If the Contractor fails to provide the Requested Information within the time period required by these provisions, the Contractor shall indemnify and hold the Commonwealth harmless for any damages, penalties, costs, detriment or harm that the Commonwealth may incur as a result of the Contractor's failure, including any statutory damages assessed against the Commonwealth.

g. The Commonwealth will reimburse the Contractor for any costs associated with complying with these provisions only to the extent allowed under the fee schedule established by the Office of Open Records or as otherwise provided by the RTKL if the fee schedule is inapplicable.

h. The Contractor may file a legal challenge to any Commonwealth decision to release a record to the public with the Office of Open Records, or in the Pennsylvania Courts, however, the Contractor shall indemnify the Commonwealth for any legal expenses incurred by the Commonwealth as a result of such a challenge and shall hold the Commonwealth harmless for any damages, penalties, costs, detriment or harm that the Commonwealth may



incur as a result of the Contractor's failure, including any statutory damages assessed against the Commonwealth, regardless of the outcome of such legal challenge. As between the parties, the Contractor agrees to waive all rights or remedies that may be available to it as a result of the Commonwealth's disclosure of Requested Information pursuant to the RTKL.

i. The Contractor's duties relating to the RTKL are continuing duties that survive the expiration of this Contract and shall continue as long as the Contractor has Requested Information in its possession.

#### **1.42 CONTRACT-053.1 Enhanced Minimum Wage Provisions (July 2018)**

1. **Enhanced Minimum Wage.** Contractor/Lessor agrees to pay no less than \$12.00 per hour to its employees for all hours worked directly performing the services called for in this Contract/Lease, and for an employee's hours performing ancillary services necessary for the performance of the contracted services or lease when such employee spends at least twenty per cent (20%) of their time performing ancillary services in a given work week.
2. **Adjustment.** Beginning July 1, 2019, and annually thereafter, the minimum wage rate shall be increased by \$0.50 until July 1, 2024, when the minimum wage reaches \$15.00. Thereafter, the minimum wage rate would be increased by an annual cost-of-living adjustment using the percentage change in the Consumer Price Index for All Urban Consumers (CPI-U) for Pennsylvania, New Jersey, Delaware, and Maryland. The applicable adjusted amount shall be published in the Pennsylvania Bulletin by March 1 of each year to be effective the following July 1.
3. **Exceptions.** These Enhanced Minimum Wage Provisions shall not apply to employees:
  - a. exempt from the minimum wage under the Minimum Wage Act of 1968;
  - b. covered by a collective bargaining agreement;
  - c. required to be paid a higher wage under another state or federal law governing the services, including the Prevailing Wage Act and Davis-Bacon Act; or
  - d. required to be paid a higher wage under any state or local policy or ordinance.
4. **Notice.** Contractor/Lessor shall post these Enhanced Minimum Wage Provisions for the entire period of the contract conspicuously in easily-accessible and well-lighted places customarily frequented by employees at or near where the contracted services are performed.
5. **Records.** Contractor/Lessor must maintain and, upon request and within the time periods requested by the Commonwealth, furnish all employment and wage records necessary to document compliance with these Enhanced Minimum Wage Provisions.
6. **Sanctions.** Failure to comply with these Enhanced Minimum Wage Provisions may result in the imposition of sanctions, which may include, but shall not be limited to, termination of the contract or lease, nonpayment, debarment or referral to the Office of General Counsel for appropriate civil or criminal referral.
7. **Subcontractors.** Contractor/Lessor shall include the provisions of these Enhanced Minimum Wage Provisions in every subcontract so that these provisions will be binding upon each subcontractor.

## **RIDER 5**

### **License Agreement for Manager Database**

This License Agreement (this “License Agreement”) sets forth the understanding between Public School Employees’ Retirement System (“PSERS”) and Aon Hewitt Investment Consulting, Inc. (“CONSULTANT”) relating to the license of CONSULTANT’s online manager database (the “Database”). This License Agreement is entered into pursuant to, and shall be appended to, Purchase Order No: 4300636463, concurrently entered into between PSERS and CONSULTANT (the “Agreement”), and shall be effective as of the date of the Agreement (the “Effective Date”).

Capitalized terms used herein but not otherwise defined shall have the respective meanings ascribed to such terms in the Agreement.

The parties hereto agree as follows:

#### **1. License**

- (a) Subject to the terms of this License Agreement, CONSULTANT hereby grants PSERS a worldwide, non-transferable, and non-exclusive right and license to use Database and access the Database Website (as defined herein) only in accordance with this License Agreement for the limited purpose provided under the Agreement and this License Agreement. The Database and the Database Website shall constitute Software under the Agreement.
- (b) Subject to paragraph l(c), PSERS is permitted to view and print extracts from the Website as follows: (a) without modification to any documents or related graphics on the Website; (b) without use of graphics separately from accompanying text; and (c) and with acknowledgement that the Website contains copyrighted materials as well as trademarks and service marks that are owned by CONSULTANT, its related entities and affiliates, and/or third parties.
- (c) Subject to paragraphs l(a) and l(b), no part of the Website may be reproduced or stored in any other website, included in any public or private electronic retrieval system or service.
- (d) Any rights not expressly granted in these terms are reserved.

#### **2. Term and Termination**

- (a) This License Agreement is effective on the Effective Date and its initial term will terminate on the earlier of the expiration or termination of the Agreement.
- (b) This License Agreement may be terminated at any time upon written notice by either party to the other party if the other party commits a material breach of any of the material terms contained in this License Agreement.

- (c) This License Agreement may be terminated at any time upon thirty (30) days written notice to the other party.
- (d) Upon termination or expiration of this License Agreement for any reason, PSERS' right and license to use Database will terminate immediately, as will PSERS' access and use of Database and the Website.

### **3. Access and Usage**

- (a) Database is currently located at the following URL address: <https://inview.aon.com> ("Website"). This URL address is subject to change at CONSULTANT's sole discretion and PSERS will be given notice of any such change. Accessing Website subjects PSERS to all Terms and Conditions of this License Agreement.
- (b) PSERS will be provided with usernames and passwords for access to, and use of, Database by certain PSERS' employees, officers, and other individuals authorized by PSERS ("Authorized Users"). Each Authorized User will be assigned a unique username and password. PSERS will provide CONSULTANT with a list of Authorized Users so that CONSULTANT may generate such passwords. Upon PSERS' request, CONSULTANT will disable the password of any current Authorized User and issue a new password for a replacement Authorized User.
- (c) PSERS will not provide access to, or use of, Database to any individuals or third parties not employed by or directly controlled by PSERS without the prior written consent of CONSULTANT. In the event PSERS requests that a third party be included as an Authorized User under this License Agreement, such request may be granted only at the sole discretion of CONSULTANT and may be conditioned on such third party executing a confidentiality and/or license agreement acceptable to CONSULTANT, or amendment of this License Agreement, including the Annual Fee, as described herein. PSERS shall promptly notify CONSULTANT in the event an Authorized User is no longer employed or engaged by PSERS so that CONSULTANT may deactivate such Authorized User's access. PSERS will not disclose any information obtained from the Database to any third party, except PSERS may disclose such information pursuant to Rider 4 of the Agreement.
- (d) Database will be available to Authorized Users 24 hours per day, 7 days per week, except during periods of scheduled or emergency maintenance or as otherwise limited in a manner described in this License Agreement.
- (e) PSERS agrees that it will not download the software executable code in Database to any hard drive or remove, alter, cover, or obfuscate any copyright or trademark notice appearing in Database.
- (f) Any analysis or information included in the Database is not intended to be for, and should not be used for, implementation of any investment strategy and is not

intended to be investment advice. Decisions regarding the implementation of any strategy require additional information, more precise analysis and review of PSERS data and strategy, along with the consideration of other factors not included in the Database.

- (g) PSERS understands that the Database includes information that is highly technical and sophisticated in nature, and that CONSULTANT recommends PSERS consult with a qualified professional when reviewing any information obtained from Database.
- (h) PSERS agrees that it will not make references to CONSULTANT with respect to information obtained from Database in communications with third parties.
- (i) PSERS acknowledges that information included in Database includes historical information and data, which may not be accurate as of the date accessed by PSERS. PSERS acknowledges that CONSULTANT has no responsibility to inform PSERS of any updates, changes, corrections or supplementation to information included in Database.
- (j) PSERS' failure to comply with Sections 3(c), (e) or (h) shall constitute a material breach of this License Agreement for which CONSULTANT may immediately suspend access to the Database and/or terminate this License Agreement.
- (k) Appendix A to this License Agreement provides CONSULTANT's privacy policy pertaining to PSERS' usage and access to the Website and Database. Appendix A is subject to change from time to time, and CONSULTANT shall provide PSERS with timely written notice of any such change.

#### **4. Fees and Payment**

PSERS will be responsible for an annual fee ("Annual Fee") to access and use Database, which is included in the fee that PSERS pays under the Agreement.

#### **5. Limited Liability**

The terms of this Section 5 shall only apply to PSERS' access to, use of or reliance upon any manager meeting notes, manager diligence and other raw data related to manager research that is made available to PSERS through the Database or Website (the "Internal Notes"). With respect to all other services provided pursuant to the Agreement by CONSULTANT, the liability terms of the Agreement shall apply.

- (a) CONSULTANT, any CONSULTANT affiliates, any other party (whether or not involved in affiliates creating, producing, maintaining or delivering the Website), and any of CONSULTANT's and the officers, directors, employees, shareholders or agents of any of them, are excluded from all liability and responsibility for any loss or damage that may result in connection with PSERS' use of Database and the

use of the Website in any way, or in connection with the use, inability to use or the results of use of the Website, except for liability arising out of the intentional misconduct on the part of said party.

- (b) Nothing in this License Agreement, nor PSERS' use of Database or the Website shall constitute investment advice, legal advice, or any other professional advice. PSERS assumes all risks in acting upon any of the information obtained by PSERS from Database or the Website and neither CONSULTANT or any of its affiliates or third parties shall have any liability to PSERS, its employees, officers, directors, affiliates, plan participants, or any related third parties under this License Agreement, except for liability arising out of the intentional misconduct of CONSULTANT or any of its affiliates.
- (c) In no event will CONSULTANT or third party suppliers providing portions of Database be liable for any indirect, consequential, incidental, special or punitive damages in connection with this License Agreement.
- (d) Client agrees that CONSULTANT's sole responsibility is to Client as set forth herein.
- (e) Without regard to the limitation of Section 5(a), CONSULTANT agrees to indemnify, defend, and hold PSERS harmless from and against any and all claims, actions, damages, losses, and expenses of any nature (including reasonable attorneys' fees and expenses) pertaining to patent, trademark, or copyright infringement or to a violation of trade secret, license, or proprietary rights arising from PSERS' use of Database in accordance with this License Agreement.
- (f) CONSULTANT shall not be liable, if, for any reason the Website is unavailable at any time or for any period. Access to the Website may be suspended temporarily and without notice in the case of system failure, maintenance, and repair or for reasons beyond CONSULTANT's control. The Website may not perform as intended at all times. PSERS agrees that CONSULTANT is not responsible for any error, omission, interruption or delay in operation of or transmission through the Website, communication line failure, system failure, or other circumstance beyond their control.
- (g) CONSULTANT does not warrant the security of any information transmitted over the internet. Any document or information transmitted, is transmitted at PSERS' own risk.
- (h) Notwithstanding anything to the contrary in the Agreement, CONSULTANT's liability to PSERS with respect to the Internal Notes shall not exceed \$500,000. CONSULTANT's liability to PSERS with respect to all other aspects of this License Agreement shall not exceed the actual damages incurred by PSERS.

- (i) EXCEPT AS EXPRESSLY SET FORTH IN THIS LICENSE AGREEMENT, CONSULTANT MAKES NO REPRESENTATION OR WARRANTY TO PSERS OR ANY OTHER PERSON OR ENTITY REGARDING DATABASE OR RELATED SERVICES OR MATERIALS PROVIDED BY CONSULTANT UNDER THIS LICENSE AGREEMENT AND EXPRESSLY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

**6. Assignment**

Neither party may assign its rights or obligations hereunder without the prior written consent of the other party.


**7. Miscellaneous**

- (a) This License Agreement and the Agreement sets forth the entire agreement of the parties regarding Database and supersedes all prior written and oral communications, negotiations, and agreements regarding Database.
- (b) It is expressly understood and agreed that the obligations of Sections 2(c), 3(e) -(i), 5 and 7, as well as all payment obligations arising on or before the date of termination or expiration of the term of this License Agreement, will survive the termination of this License Agreement.
- (c) CONSULTANT shall comply with the Standard Contract Terms and Conditions attached to the Agreement as Rider 4 and incorporated therein by reference, which provisions may be modified from time to time with written notice to CONSULTANT.


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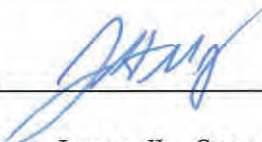
Authorized representatives of the parties have executed this Database License Agreement as of the Effective Date.

**Aon Hewitt Investment Consulting, Inc.**

By:   
Name: Michael T. Novy  
Title: VP-Legal  
Date: August 21, 2019

**Commonwealth of Pennsylvania,  
Public School Employees' Retirement  
System**

By:   
Name: Glen R. Grell  
Title: Executive Director  
Date: 8/26/2019

By:   
Name: James H. Grossman, Jr.  
Title: Chief Investment Officer  
Date: 8/26/2019

## Appendix -A

### CONSULTANT Privacy Statement

This Privacy Statement describes how CONSULTANT collects, uses, and protects personal information it receives in the course of providing its services. At CONSULTANT, your privacy is very important. We strive to protect the personal information under our control and to maintain the security and integrity of that information.

#### How CONSULTANT Receives Personal Information

Generally, “personal information” is information that can be used to identify you. Most of the personal information we receive relates to your participation in the compensation and benefits programs offered by your employer. There are several ways that we could receive personal information:

- You might provide the information directly as a benefit plan participant by methods such as visiting our Web sites, telephoning our call center, or sending mail to our offices.
- Your employer might provide the information to us.
- Another service provider engaged by your employer (such as payroll processors, health plans, or mutual funds) that have a part in administering your employer’s plans or programs might provide the information to us.

The types of personal information we receive may include:

- Contact information, such as name, address, phone number, email address;
- Other personal information, such as a Social Security number or other government-assigned identifier, date of birth, gender, and marital status;
- Employment information, such as date of hire, employment status, pay history, tax withholding information, performance records, and date of termination; and
- Benefit program participation and coverage information, such as benefit elections, beneficiary information, claims information, benefit plan account numbers and balances, and date of retirement.

#### CONSULTANT’s Commitment to Protecting Personal Information

We understand the responsibility that comes with being trusted with your personal information. We have implemented various security measures to protect the confidentiality of all the personal information we process, in both electronic and paper formats. We have policies, procedures, and controls to reduce the risk of unauthorized or accidental use, disclosure, or destruction of your



personal information, and we train our employees on data security. Employees who have a job-related need to access your personal information are authorized to do so. In addition to these employees, CONSULTANT limits access to your personal information to your employer and authorized service providers. We also require that our service providers enter into confidentiality agreements intended to protect your personal information

Our commitment to protecting personally identifiable information also means that:

- We won't sell your personal information to any third party; and
- We won't use, transfer, or disclose your personal information to anyone outside of CONSULTANT, unless authorized by you or your employer, except in connection with your employer's plans and programs, as required by law or legal process, in response to law enforcement requests, and as necessary to protect the property, interests, and rights of CONSULTANT and/or your employer.
- If we process your "protected health information" as a business associate to your employer's health plan, we will also comply with the requirements of the HIPAA Privacy and Security Rules.

## Access and Corrections

CONSULTANT is committed to respecting your rights to access your personal information. In many cases, you can access and update your personal information via our self-service Web sites or by telephoning our call center. CONSULTANT is also committed to maintaining the accuracy of your personal information. In most cases, we rely on you and your employer to keep your personal information updated. If you need to update or correct your personal information, contact [dataprivacy\(@\)hewitt.com](mailto:dataprivacy(@)hewitt.com). Please understand that, in some circumstances, only your employer, and not CONSULTANT, may have the authority to update or correct your personal information. If this information is the type that only your employer can update or correct, we'll forward your request to your employer.

## Cookies

CONSULTANT tracks content usage and traffic on its Web sites by using "cookies" a feature of your browser. A cookie is a text file that is placed on your hard disk by a Web server. CONSULTANT uses cookies to help it compile aggregate statistics about usage of its Web sites, such as how many users visit the Web site, how long users spend viewing the Web site, what pages are viewed most often, and to secure your session. This information is used to improve our Web sites, for transaction auditing, and for other everyday business purposes; it is not shared with any other party for any commercial purposes. You can set your browser to notify you when you are sent a cookie. This gives you the chance to decide whether or not to accept it. If you disable cookies, however, you may not be able to take advantage of all the features of our Web sites.

## Notification of Updates

CONSULTANT may update this Privacy Statement. If the changes are not material or do not affect previously-provided information, we will simply post the revised Privacy Statement on our Web

sites. If the changes are material in the way we treat your personal information, we will provide notice on this Web site before we make such a change. We encourage you to periodically review our Privacy Statement so that you'll always know how we protect your personal information.

## Contact Information

If you have any questions or concerns about CONSULTANT's use of your personal information or about this Privacy Statement, please send an email to : [dataprivacy@hewitt.com](mailto:dataprivacy@hewitt.com).

## RIDER 6

### Information Security Addendum

This Information Security Addendum (“Addendum”) made as of the Effective Date, by and between the Commonwealth of Pennsylvania, Public School Employees’ Retirement System (“PSERS”) and Aon Hewitt Investment Consulting, Inc. (“Contractor”) sets forth additional terms and conditions with respect to information security applicable to Purchase Order No: 4300636463 (the “Agreement”). The terms and conditions agreed to in this Addendum are the minimum required for the Agreement and shall take precedence over any term of the Agreement which attempts to reduce, waive or remove these terms and conditions.

WHEREAS, PSERS wishes to disclose certain information to Contractor, and Contractor is authorized to collect and/or use certain information, pursuant to the terms of the Agreement; and

WHEREAS, PSERS and Contractor intend to protect the privacy and provide for the confidentiality of such information.

NOW THEREFORE, in consideration of the foregoing recitals, which are incorporated herein, and the mutual promises and undertakings hereinafter set forth, and the exchange of information pursuant to the Agreement and this Addendum, the parties agree as follows:

#### I. Definitions

- A. Authorized Persons. Authorized Persons include Contractor’s employees and contractors who have appropriate PSERS’ clearance and a specific need for such access in order to perform Contractor’s services for PSERS.
- B. Industry Standards. Industry Standards include National Institute of Standards and Technology (NIST) 800 Series, NIST Cybersecurity Framework and ISO 27001/2, or their generally recognized equivalents.
- C. PSERS’ Data. PSERS’ Data is any data or information that Contractor creates, obtains, accesses, receives (from PSERS or on behalf of PSERS), hosts or uses in the course of its performance of the Agreement;
- D. Public Data. Public Data means any specific information or data, regardless of form or format, that PSERS has actively and intentionally disclosed, disseminated, or made available to the public.
- E. Multi-Factor Authentication: The use of two or more of the Authentication Methods listed below. Two-factor would employ two of the methods; three-factor would employ one each of all three methods.
  - i. Something you know (e.g. PIN, password, shared information)
  - ii. Something you possess (e.g. token, smart card, digital certificate)

iii. Something you are (biometrics – e.g. fingerprint, voice, iris, face).

- F. Services. The services pursuant to the Agreement and any Statement of Work (“SOW”).
- G. Documentation. All documentation related to the Services, including but not limited to the SOW.
- H. PSERS’ Confidential Information. PSERS’ Data that is not Public Data, including but not limited to information containing personally identifiable information (“PII”), protected health information (“PHI”), and electronic protected health information (“ePHI”) as defined in HIPPA regulations, investment portfolio information and trade secrets. (For the avoidance of doubt, trade secrets include but are not limited to limited partnership agreements, side letters, private placement memoranda and similar information.)

## II. Data Security.

- A. Compliance. Contractor shall comply with the Information Technology (“IT”) standards and policies issued by the Governor’s Office of Administration, Office for Information Technology (OA/OIT) (located at: <http://www.oa.pa.gov/Policies/Pages/itp.aspx>), including the accessibility standards set out in IT Bulletin ACC001, IT Accessibility Policy. The Contractor shall ensure that Services procured under this Contract comply with the applicable standards. In the event such standards change during Contractor’s performance, and the Commonwealth requests that Contractor comply with the changed standard, then any incremental costs incurred by Contractor to comply with such changes shall be paid for pursuant to a change order to the Contract.
- B. Data Protection. To the extent that Contractor is charged with creating, accessing, transmitting, maintaining, hosting or using PSERS’ Data under the Agreement, Contractor shall preserve the confidentiality, integrity and availability of PSERS’ Data by implementing and maintaining administrative, technical and physical controls that conform to Commonwealth of Pennsylvania IT Policies and Industry Standards. Implemented security controls shall provide a level of security which is commensurate with the sensitivity of the data to be protected.
- C. Data Use and Access. Contractor shall use PSERS’ Data only and exclusively to support the performance of services for PSERS under the Agreement and not for any other purpose. With the exception of Public Data, absent PSERS’ prior written consent, Contractor shall not at any time during or after the term of the Agreement disclose PSERS’ Data to any person, other than Authorized Persons and PSERS personnel in connection with the performance of the services (except as required by law). If such disclosure is required by law, Contractor shall notify PSERS prior to such disclosure, unless such notification is prohibited by law.

- D. Data Backup. Where appropriate to protect the integrity and availability of PSERS' Data, Contractor shall maintain (and cause any third-party hosting company that it uses to maintain) a means to backup and recover PSERS' Data in the event that PSERS' Data is lost, corrupted or improperly destroyed. PSERS shall have the right to establish backup security for PSERS' Data and to keep backup PSERS' Data and PSERS' Data files in its possession if it chooses.
- E. Return of PSERS' Data. Contractor shall ensure that, upon request, PSERS can retrieve PSERS' Data in the event the Contractor is unable to continue providing the services under the Agreement due to termination of the Agreement or otherwise. In the event of a termination and upon PSERS' request, the Contractor will provide PSERS' Data in a mutually acceptable format.
- F. Destruction of PSERS' Data. Contractor shall erase, destroy, and/or render unrecoverable all PSERS' Data in Contractor's possession that is no longer required for the performance of its duties under the Agreement. Upon request, Contractor shall certify in writing that these actions have been completed within seven (7) days of PSERS' request.
- G. Effect of Termination. Unless directed otherwise by PSERS, upon termination of the Agreement for any reason, Contractor shall maintain PSERS' Data and continue to extend the protections of the Agreement and this Addendum to such information for a period of six months at which point it shall return and destroy all PSERS' Data received from PSERS (or created or received by Contractor on behalf of PSERS) regardless of form, and shall retain no copies of PSERS' Data. If return or destruction of PSERS' Data is not feasible, Contractor shall continue to extend the protections of the Agreement and this Addendum to such information and limit further use of PSERS' Data to those purposes that make the return or destruction of PSERS' Data infeasible. Notwithstanding the foregoing, Contractor reserves the right to maintain an archival copy per its record retention policies.

### III. Contractor Security.

- A. Information Security Program. For the term of the Agreement, Contractor agrees that it has and will maintain a formal information security program which is appropriate for the types of services that it provides. Such program is and will be consistent with Industry Standards.
- B. Contractor Personnel. Contractor agrees that it shall only use highly qualified personnel and contractors in performing the Agreement and, to the extent not prohibited by applicable law, shall require each to pass a background check.
- C. Acceptance of Acceptable Use Policy. Contractor shall ensure that all Contractor personnel, including employees and contractors, who access PSERS' network as a part of performing the Agreement, will agree to PSERS' Acceptable Use Policy as found in Management Directive 205.34, as it may be amended from time to time.

- D. Multi-Factor Authentication. For services exposed to the Internet, where sensitive information is stored, processed or transmitted, Contractor will provide Multi-Factor Authentication for user authentication to the web application via workstation and mobile browsers. If the service is provided via mobile application as well, that application must also be protected by Multi-Factor Authentication.
- E. Security Awareness Training. Contractor shall ensure its personnel and partners are provided cybersecurity awareness education and are adequately trained to perform their information security-related duties and responsibilities consistent with Commonwealth of Pennsylvania IT Policies.

#### IV. Security Incident and Breach Notification.

- A. Contractor agrees to notify PSERS upon learning of: (i) unauthorized access, loss, alteration, theft or corruption of PSERS' Confidential Information; (ii) any event that creates a substantial risk to the confidentiality, integrity or availability of PSERS' Data; (iii) a breach of any of Contractor's security obligations under this Addendum; or (iv) any other event requiring notification under applicable law. In such an instance, Contractor agrees to:
  - i. Take such action as may be necessary to preserve forensic evidence and eliminate the cause of the risk or breach within Contractor's reasonable control. As soon as practicable after discovery, Contractor shall undertake a thorough forensic investigation of any compromise or improper use and provide PSERS all information necessary to enable PSERS to fully understand the nature and extent of the compromise or improper use to the extent known.
  - ii. And, notify PSERS by telephone at (717) 720-4699 and (717) 720-4678 and by e-mail at [RA-PSISO@pa.gov](mailto:RA-PSISO@pa.gov) regarding such an event without undue delay and in any event within 24 hours of discovery, and
  - iii. To the extent that the breach or incident was the fault of Contractor:
    - a) assume the cost of informing all such affected individuals in accordance with applicable law, and
    - b) indemnify, hold harmless and defend PSERS and its trustees, officers, and employees from and against any claims, damages, or other harm related to such incident or breach.

#### B. Security Incident Investigations.

Contractor agrees to cooperate with PSERS in investigating a security incident, as declared by PSERS, and provide the name and contact information, of at least two (2) security contacts who will respond to PSERS in a timely manner, dependent on criticality, in the event that PSERS must investigate a security incident. The current security contacts are as follows:

Contact Names: Claire Shaughnessy; Amanda Janusz  
Phone Numbers: 203-523-8163; 203-523-8039  
Email Addresses: [Claire.shaughnessy@aon.com](mailto:Claire.shaughnessy@aon.com); [Amanda.janusz@aon.com](mailto:Amanda.janusz@aon.com)

V. Maintenance of Safeguards.

- A. Contractor shall maintain and follow Industry Standards with respect to any of PSERS' Confidential Information in Contractor's possession or control and protect such information against any loss, alteration, theft or corruption.
- B. At PSERS' request, Contractor shall provide PSERS with copies of its information security policies, processes, and procedures. Contractor will notify PSERS of any changes to its policies, processes or procedures that relate to the security of PSERS' Confidential Information in Contractor's possession.

VI. Information Security Audit.

- A. PSERS shall have the right to review Contractor's information security program prior to the commencement of Services and from time to time during the Term of the Agreement. During the performance of the Services, on an ongoing basis annually and immediately in the event of a security incident, PSERS, including its professional advisors and auditors, at its own expense, shall be entitled to perform, or to have performed, an on-site assessment of Contractor's information security program.
- B. PSERS shall have the right to review Contractor's information security program through Contractor's annual submission to PSERS of its current SOC2 report. The report must document an assessment conducted by a qualified, independent third party. Assessment scope must address the services provided to PSERS, including but not limited to related people, process and technology.
- C. Upon PSERS' request, Contractor agrees to complete, within forty-five (45 days) of receipt of PSERS' request, an assessment questionnaire provided by PSERS regarding Contractor's information security program, including artifacts for a subset of controls.

VII. Application Security.

In the event the Contractor conducts application software development for PSERS, Contractor will either make source codes available for review by PSERS or will conduct source code scanning using a commercial security tool. Scans must be conducted annually and at any time significant code changes are made. Scan reports will be made available to PSERS within two weeks of execution. Contractor must disclose remediation timelines for high, medium and low risk security code defects.

Scans must occur before code is implemented in production. High risk security code defects may not be implemented in production without written approval from either PSERS' Executive Director, Deputy Executive Director or Assistant Executive Director.

VIII. Compliance with Applicable State and Federal Law.

Contractor shall comply with all applicable federal, state, and local laws concerning data protection and privacy when handling PSERS' Data.

IX. Enforcing Compliance.

Contractor shall enforce and be responsible for compliance by all its personnel and contractors with the provisions of this Information Security Addendum and all other confidentiality obligations owed to PSERS.

X. Accommodation of Additional Protections.

Contractor agrees to comply with such additional protections as PSERS shall reasonably request.

XI. Termination.

A breach by Contractor of any provision of this Addendum, as reasonably determined by PSERS, shall constitute a material breach of the Agreement and shall provide grounds for immediate termination of the Agreement by PSERS pursuant to the Agreement.

XII. Indemnification.

Contractor shall indemnify, hold harmless and defend PSERS from and against all claims, losses, liabilities, damages, judgments, costs and other expenses, including PSERS' costs and attorney fees, incurred as a result of, or arising directly or indirectly out of or in connection with Contractor's failure to meet any of its security obligations under this Addendum; and (ii) any claims, demands, awards, judgments, actions and proceedings made by any person or organization arising out of or in any way connected with Contractor's performance under this Addendum. Limitations on Contractor's liability, regardless of conflicting language elsewhere in the Agreement, shall not apply to claims related to Contractor's breach of the information security sections of this Addendum.

XIII. Intellectual Property Infringement Indemnification.

a. Contractor shall indemnify, defend and hold PSERS harmless from any and all claims brought against PSERS alleging that the Services and/or Documentation or PSERS' use of the Services and/or Documentation constitutes a misappropriation



or infringement of intellectual property (“IP”) of any Third Party. Contractor agrees to be responsible for all costs or expenses, to include reasonable attorneys’ fees awarded or resulting from any claim. PSERS shall, after receiving notice of a claim, advise Contractor of such notification. In no event will Contractor be liable to PSERS for incidental, consequential, special or punitive damages (including loss of profits, data, business or goodwill, or government fines, penalties, taxes or filing fees), regardless of whether such liability is based on breach of contract, tort, strict liability, breach of warranty, failure of essential purpose, statutory liability or otherwise, and even if advised of the likelihood of such damages.

Limitations on Contractor’s liability, regardless of conflicting language elsewhere in any Agreement, shall not apply to claims related to Contractor’s misappropriation or infringement of another’s intellectual property.

#### XIV. Contractor Liability Insurance.

Contractor shall procure, and maintain for the duration of the contract, insurance against claims and damages which may arise from or in connection with the performance of its work to include IP infringement and privacy or data breaches coverage. Coverage shall have limits of no less than \$5,000,000.00 per occurrence and \$10,000,000.00 aggregate.

#### XV. Survival; Order of Precedence.

The provisions of this Addendum shall survive expiration or termination of the Agreement.

#### XVI. Entire Agreement.

The Agreement, including any exhibits and/or schedules thereto, and this Addendum contain the entire understanding of the Parties with respect to the subject matter hereof and supersedes all prior agreements, oral or written, and all other communications between the Parties relating to such subject matter.

[Signatures on Next Page]

Aon Hewitt Investment Consulting, Inc.

By: 

Name: Michael T. Novy

Title: VP-Legal

Date: August 21, 2019


Commonwealth of Pennsylvania,  
Public School Employees' Retirement  
System

By: 

Name: Glen R. Grell

Title: Executive Director

Date: 8/26/2019

By: 

Name: James H. Grossman, Jr.

Title: Chief Investment Officer

Date: 8/26/2019



# Proposal for Investment Consulting Services

RFP Number: PSERS RFP 2018-6

Cost Submittal - **UPDATED**

Public School Employees' Retirement System

March 7, 2019

**Contact:**

Claire Shaughnessy

Partner

Merritt 7 Corporate Park, Building 201

Norwalk, CT 06851

+1.203.523.8163

[claire.shaughnessy@aon.com](mailto:claire.shaughnessy@aon.com)

[aon.com](http://aon.com)

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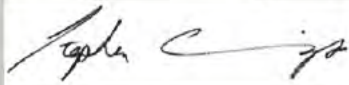
# APPENDIX B

**PROPOSAL COVER SHEET  
COMMONWEALTH OF PENNSYLVANIA  
PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM  
RFP# PSERS RFP 2018-6**

Enclosed in three separately sealed submittals is the proposal of the Offeror identified below for the above-referenced RFP:

<b>Offeror Information:</b>	
Offeror Name	Aon Hewitt Investment Consulting, Inc.
Offeror Mailing Address	200 E. Randolph St., Suite 1500 Chicago, IL 60601
Offeror Website	<a href="http://www.aon.com">www.aon.com</a>
Offeror Contact Person	Claire Shaughnessy
Contact Person's Phone Number	+1.203.523.8163
Contact Person's Facsimile Number	+1.203.523.6750
Contact Person's E-Mail Address	<a href="mailto:claire.shaughnessy@aon.com">claire.shaughnessy@aon.com</a>
Offeror Federal ID Number	36-3109431
Offeror SAP/SRM Vendor Number	383098

<b>Submittals Enclosed and Separately Sealed:</b>	
<input checked="" type="checkbox"/>	Technical Submittal <input checked="" type="checkbox"/> Domestic Workforce Utilization Certification
<input type="checkbox"/>	Small Diverse Business and Small Business Participation Submittal <input type="checkbox"/> Small Diverse Business and Small Business Participation Submittal Form <input type="checkbox"/> Small Diverse Business and Small Business Letter(s) of Intent
<input checked="" type="checkbox"/>	Cost Submittal

<b>Signature</b>	
Signature of an official authorized to bind the Offeror to the provisions contained in the Offeror's proposal:	
Printed Name	Steve Cummings
Title	NA Chief Executive Officer

**FAILURE TO COMPLETE, SIGN AND RETURN THIS FORM WITH THE OFFEROR'S PROPOSAL MAY RESULT IN THE REJECTION OF THE OFFEROR'S PROPOSAL**

## Part IV Cost Submittal

### IV-1. Cost Submittal

***The information requested in this Part IV shall constitute the Cost Submittal. The Cost Submittal shall be placed in a separate sealed envelope within the sealed proposal, separated from the technical submittal. The total proposed cost should be broken down into the components set forth in Appendix F – Cost Submittal Worksheet. The percentage of commitment to Small Diverse Businesses and Small Businesses should not be stated in the Cost Submittal. Offerors should not include any assumptions in their cost submittals. If the Offeror includes assumptions in its cost submittal, the Issuing Office may reject the proposal. Offerors should direct in writing to the Issuing Office pursuant to Part I, Section I-9 of this RFP any questions about whether a cost or other component is included or applies. All Offerors will then have the benefit of the Issuing Office’s written answer so that all proposals are submitted on the same basis.***

***The Issuing Office will reimburse the selected Offeror for work satisfactorily performed after execution of a written contract and the start of the contract term, in accordance with contract requirements, and only after the Issuing Office has issued a notice to proceed.***

## APPENDIX F: COST SUBMITTAL

Aon would like to present the revised fee proposal below which reflects a further fee discount from our cost proposal dated February, 19, 2019.

We have reduced our Year 1 fee proposal by a further 5% in addition to the initial \$100,000 fee reduction already proposed. In addition, we have reduced Years 2-5 fees by 8%. This results in a total fee savings of \$273,714 over the combined DB and DC fees over the five year fees for a total fee reduction of 7.45%.

As PSERS' strategic partner over the past five years for the DB plan, we are intimately familiar with the investment program and needs of the PSERS plan we have factored that into our pricing of the pricing of the Defined Benefit Component existing services has been kept flat for the first year. We have absorbed all of the cost of the fiduciary and governance work in the DB fee for the first year and have subtracted an additional \$100,000 in recognition of the additional cost, time and effort involved in PSERS' need to re-issue this RFP. Please note the revised Year 1 cost includes the \$80,000 cost for the operational gap analysis. In recognition of our long-standing relationship, we have absorbed the cost of the Fiduciary training sessions currently billed at an additional cost within our total consult fee below and have assumed a 2% growth per annum for the following four years.

As the Defined Contribution Plan is new, we have based our the 12 mutual fund investment options (target date fund is counted as one) being offered at the inception of the plan in July 2019 with anticipated assets in the first year of \$30 million, growing at approximately \$30 million per year in each of the following years.

We value our partnership and have provided an additional 15% bundled discount on the combined fee for the Defined Benefit and Defined Contribution Plan fee for Consulting, External Manager ODD & Performance Measurement.

Please note that our Fee for Consulting includes the cost of external Manager Operational Due Diligence on all of PSERS managers covered under this general consulting contract. Aon does not currently offer these services on a standalone basis.

### Defined Benefit Component Only

Calendar Year	Fee for Consulting, External Manager ODD & Performance Measurement	Fee for Consulting Only	Fee for External Manager Operational Due Diligence Only	Fee for Performance Measurement Only
06/01/2019 to 05/31/2020	\$ 675,925 *	\$ 491,925	Included in Consulting only fee	\$184,000
06/01/2020 to 05/31/2021	\$708,400	\$524,400	Included in Consulting only fee	\$184,000
06/01/2021 to 05/31/2022	\$722,200	\$538,200	Included in Consulting only fee	\$184,000
06/01/2022 to 05/31/2023	\$736,644	\$ 552,644	Included in Consulting only fee	\$184,000
06/01/2023 to 05/31/2024	\$751,364	\$ 567,364	Included in Consulting only fee	\$184,000
<b>Total (5 years)</b>	<b>\$ 3,594,533</b>	<b>\$ 2,674,533</b>	<b>\$0</b>	<b>\$920,000</b>

\* includes the additional cost of \$80K for operational gap analysis review in Year 1 not included in our June 7, 2018 proposal. Aon has deducted \$100K from our first year fee to reflect the inconvenience caused by the need to re-issue the RFP

**Defined Contribution Component Only**

Calendar Year	Fee for Consulting, External Manager ODD, & Performance Measurement	Fee for Consulting Only	Fee for External Manager Operational Due Diligence Only	Fee for Performance Measurement Only
06/01/2019 to 05/31/2020	\$ 80,750	\$ 57,750	included in Consulting Only fee	\$ 23,000
06/01/2020 to 05/31/2021	\$ 78,200	\$55,200	included in Consulting Only fee	\$ 23,000
06/01/2021 to 05/31/2022	\$ 78,200	\$ 55,200	included in Consulting Only fee	\$ 23,000
06/01/2022 to 05/31/2023	\$ 82,800	\$ 59,800	included in Consulting Only fee	\$ 23,000
06/01/2023 to 05/31/2024	\$ 87,400	\$ 64,400	included in Consulting Only fee	\$ 23,000
<b>Total (5 years)</b>	\$ 407,350	\$292,350	<b>NA</b>	\$ 115,000

**Defined Benefit/Defined Contribution Combined**

Calendar Year	Fee for Consulting, External Manager ODD, & Performance Measurement	Fee for Consulting Only	Fee for External Manager Operational Due Diligence Only	Fee for Performance Measurement Only
06/01/2019 to 5/31/2020	\$ 643,174	\$549,675	included in Consulting Only fee	\$ 207,000
06/01/2020 to 5/31/2021	\$ 668,610	\$ 579,600	included in Consulting Only fee	\$ 207,000
06/01/2021 to 05/31/2022	\$ 680,340	\$ 593,400	included in Consulting Only fee	\$ 207,000
06/01/2022 to 05/31/2023	\$ 696,527	\$ 612,444	included in Consulting Only fee	\$ 207,000
06/01/2023 to 05/31/2024	\$712,949	\$ 631,764	included in Consulting Only fee	\$ 207,000
<b>Total (5 years)</b>	\$ 3,401,601	\$ 2,966,883	<b>NA</b>	\$ 1,035,000

Fees should include the use of analytics software as well as attendance at up to six board meetings a year (on average, your attendance would normally only be requested quarterly).



## Disclaimer

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