

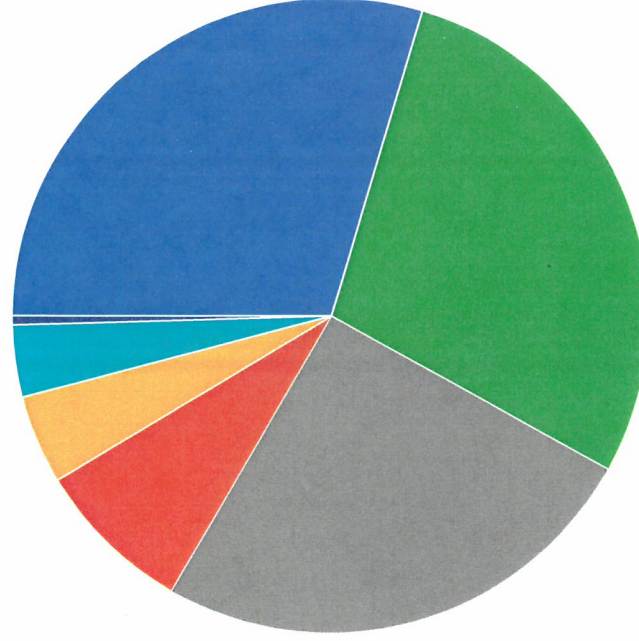
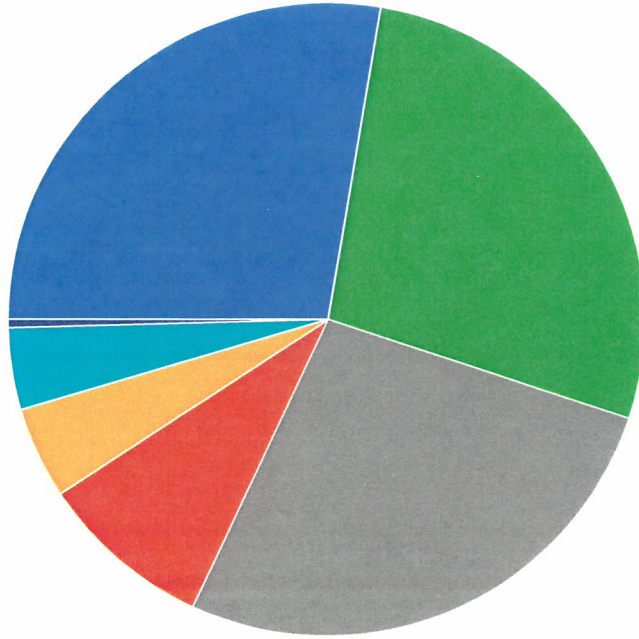
City of Memphis Retirement System

Asset Allocation Chart

As of December 31, 2020

September 30, 2020 : \$2,362,156,829

December 31, 2020 : \$2,618,766,151



Asset Class	Market Value (\$)	Allocation (%)
International Equity Composite	652,253,404	27.6
Domestic Equity Composite	648,265,547	27.4
Fixed Income Composite	633,403,772	26.8
Total Real Estate Composite	208,724,937	8.8
Hedge Fund Composite	110,429,856	4.7
Private Equity Composite	98,973,015	4.2
In House Cash	10,106,298	0.4

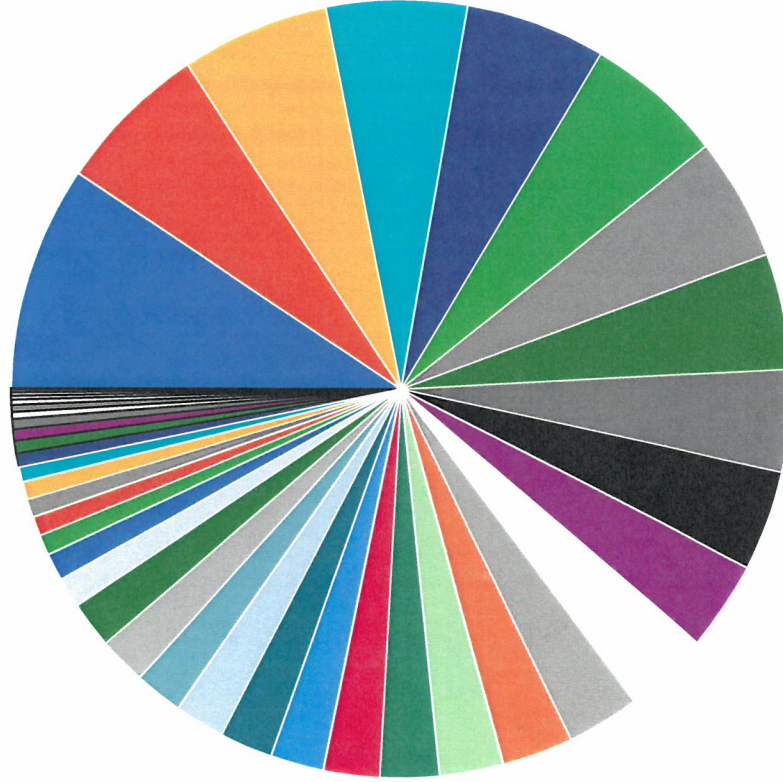
Asset Class	Market Value (\$)	Allocation (%)
International Equity Composite	773,758,819	29.5
Domestic Equity Composite	745,439,747	28.5
Fixed Income Composite	661,601,576	25.3
Total Real Estate Composite	210,998,738	8.1
Hedge Fund Composite	118,333,215	4.5
Private Equity Composite	96,102,914	3.7
In House Cash	12,531,142	0.5

City of Memphis Retirement System
Asset Allocation Chart

As of December 31, 2020

December 31, 2020 : \$2,618,766,151

Asset	Market Value (\$)	Allocation (%)
Brandywine	243,966,606	9.3
1607 Capital Partners	165,306,108	6.3
J.P. Morgan Global Emerging Markets Discovery Fund	162,276,768	6.2
Marathon Asset Mgmt	152,685,087	5.8
Barrow, Hanley	151,502,671	5.8
Mackay Shields	150,861,524	5.8
Rhumbline S&P 500	133,296,432	5.1
Acadian EM Equity II	126,378,369	4.8
Winstow Capital Management	111,229,154	4.2
Principal Global Investors	108,844,632	4.2
Prudential Core Conserv Bond	96,966,199	3.7
Smith Graham	93,132,469	3.6
Rhumbline Russell 1000 Growth	78,901,051	3.0
PIMCO	76,674,779	2.9
NTGI S&P 400	69,555,707	2.7
Conestoga Capital Advisors	63,444,579	2.4
BlackRock US Core Property Fund	60,684,072	2.3
Strategic Global Advisors	58,267,854	2.2
Capital Prospects SMID	57,443,611	2.2
Grosvenor Institutional Partners, L.P.	55,540,282	2.1
NB Crossroads Fund XXI	52,543,729	2.0
Aetos	51,655,475	2.0
Nicholas Investment Partners	50,820,115	1.9
Pantheon Global Secondary Fund V	33,241,210	1.3
Capital Prospects Small Cap Value	29,246,426	1.1
TA Realty Core Property Fund	22,472,072	0.9
Gerding Edlen Green Cities III, L.P.	21,111,867	0.8
TA Realty Fund XI	19,994,315	0.8
Mesriow Real Estate Value Fund III, L.P.	19,169,318	0.7
RREEF REIT II	16,265,573	0.6
Long Wharf RE Partners V, L.P.	14,565,805	0.6
Vanguard REIT Index Inv	13,640,975	0.5
In House Cash	12,531,142	0.5
Preserver, L.P.	11,137,458	0.4
Dune Real Estate Fund IV	7,741,059	0.3
SSM Partners Growth Equity II L.P.	7,336,779	0.3
Comerstone (Barings) Real Estate Advisers Fund X	6,063,015	0.2
Long Wharf RE Partners VI, L.P.	4,053,551	0.2
Gerding Edlen Green Cities IV, L.P.	3,653,149	0.1
SSM Partners Growth Equity III, LP	2,981,196	0.1
Long Wharf Real Estate Partners IV, L.P.	1,583,968	0.1

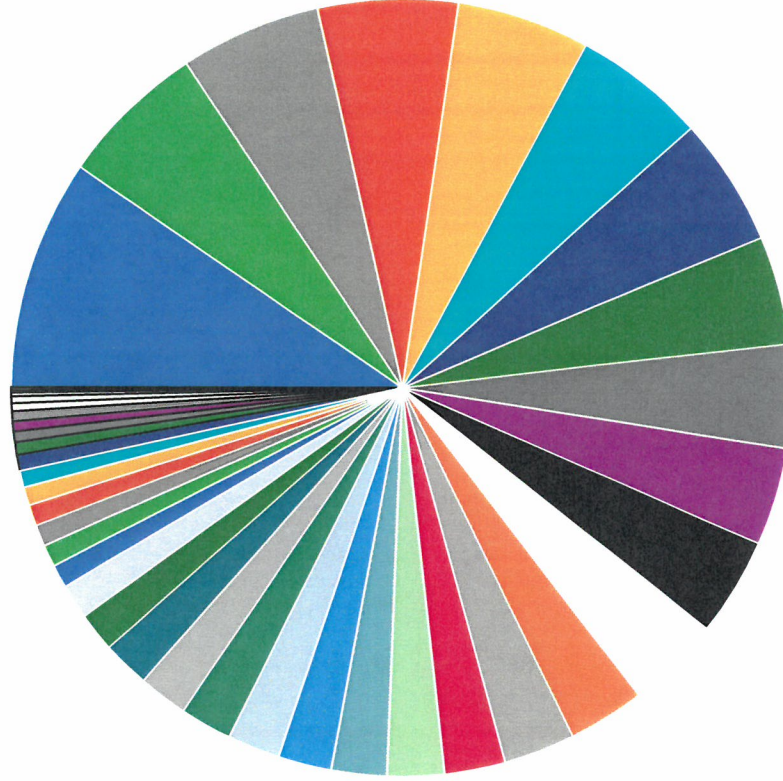


City of Memphis Retirement System
Asset Allocation Chart

As of December 31, 2020

September 30, 2020 : \$2,362,156,829

	Market Value (\$)	Allocation (%)
Brandywine	226,017,714	9.6
Mackay Shields	143,354,401	6.1
Rhumbline S&P 500	137,019,088	5.8
1607 Capital Partners	136,887,413	5.8
J.P. Morgan Global Emerging Markets Discovery Fund	132,194,544	5.6
Marathon Asset Mgmt	129,410,063	5.5
Barrow, Hanley	126,008,128	5.3
Acadian EM Equity II	106,368,813	4.5
Winslow Capital Management	101,107,715	4.3
Prudential Core Consery Bond	96,181,061	4.1
Principal Global Investors	95,968,815	4.1
Smith Graham	92,152,407	3.9
PIMCO	75,698,188	3.2
Rhumbline Russell 1000 Growth	70,832,184	3.0
BlackRock US Core Property Fund	60,099,955	2.5
NTGI S&P 400	55,927,111	2.4
NB Crossroads Fund XXI	53,844,830	2.3
Strategic Global Advisors	51,423,757	2.2
Grosvenor Institutional Partners, L.P.	51,418,625	2.2
Conestoga Capital Advisors	50,652,847	2.1
Aetos	48,625,131	2.1
Capital Prospects SMD	45,542,692	1.9
Nicholas Investment Partners	38,522,894	1.6
Pantheon Global Secondary Fund V	34,541,210	1.5
Capital Prospects Small Cap Value	22,653,089	1.0
TA Realty Core Property Fund	21,707,851	0.9
TA Realty Fund XI	21,132,768	0.9
Gerding Edlen Green Cities III, L.P.	21,111,867	0.9
Mesrow Real Estate Value Fund III, L.P.	17,585,039	0.7
RREEF REIT II	16,268,020	0.7
Long Wharf RE Partners V, L.P.	15,516,871	0.7
Vanguard REIT Index Inv	12,487,592	0.5
Preserver, L.P.	10,386,099	0.4
In House Cash	10,106,298	0.4
SSM Partners Growth Equity II L.P.	9,761,389	0.4
Dune Real Estate Fund IV	7,741,059	0.3
Comerstone (Barings) Real Estate Advisers Fund X	6,821,575	0.3
Gerding Edlen Green Cities IV, L.P.	3,630,180	0.2
Long Wharf RE Partners VI, L.P.	2,335,673	0.1
Long Wharf Real Estate Partners IV, L.P.	2,286,487	0.1
SSM Partners Growth Equity III, LP	825,586	0.0



City of Memphis Asset Allocation Comparison

Portfolio Value 12/31/20

\$2,618,766,151

<u>Target Allocations</u>		<u>Current Managers & Allocations</u>		<u>Difference</u>	<u>Range</u>
<u>Equity</u>					
Large Cap Equity	20.00%	(000) \$523,753	Barrow, Hanley (large cap value) Rhumbline Russell 1000 Growth (large cap growth) Winslow (large cap growth) Rhumbline S&P 500 (large cap core)	5.79% 3.01% 4.25% 5.09%	15%-25%
Mid/SMID Cap Equity	4.00%	\$104,751	Northern Trust (mid cap core) Capital Prospects SMID Cap*	2.66% 2.19%	0%-7%
Small Cap Equity	4.00%	\$104,751	Capital Prospects Small Cap Value* Conestoga (small cap growth) Nicholas (small cap growth)	1.12% 2.42% 1.94%	0%-7%
Domestic Equity	28.00%	\$733,255	Domestic Equity	28.47%	18%-38%
Developed International	15.00%	\$392,815	1607 Capital Partners Principal Global Investors Marathon Asset Mgmt Strategic Global Advisors	6.31% 4.16% 5.83% 2.23%	10%-20%
Emerging Markets	7.00%	\$183,314	Acadian JPMorgan	4.83% 6.20%	5%-12%
International	22.00%	\$576,129	International	29.55%	15%-30%
Equity Total	50.00%	\$1,309,383	Equity Total	58.01%	8.01%
<u>Fixed Income</u>					
Core Fixed Income	13.00%	\$340,440	PIMCO Prudential Core Conserv Bond Smith Graham	2.93% 3.70% 3.56%	8%-18%
Global Fixed Income	8.00%	\$209,501	Brandywine	9.32%	3%-13%
Global High Yield	5.00%	\$130,938	Mackay Shields	5.76%	2%-10%
Fixed Income Total	26.00%	\$680,879	Fixed Income Total	25.26%	-0.74%

Real Estate									
Core/Value Add/REITs	10.00%	\$261,877	BlackRock US Core Property Fund	0.22%	\$60,684				
			RREEF REIT II	0.62%	\$16,266				
			Vanguard REIT Index	0.52%	\$13,641				
			TA Realty Core Property Fund	0.86%	\$22,472				
			Long Wharf Real Estate Partners IV	0.06%	\$1,584	(Total Commitment \$20M, Total Drawn \$21.5M, Total Distributed \$29.2M)			
			Long Wharf Real Estate Partners Fund V	0.56%	\$14,566	(Total Commitment \$20M, Total Drawn \$20.0M, Total Distributed \$10.2M)			
			Long Wharf Real Estate Partners Fund VI	0.15%	\$4,054	(Total Commitment \$20M, Total Drawn \$4.7M, Total Distributed \$1.0M)			
			Cornerstone (Barings) Real Estate Fund X ¹	0.23%	\$6,063	(Total Commitment \$10M, Total Drawn \$8.2M, Total Distributed \$4.7M)			
			Gerding Edlen Green Cities III	0.81%	\$21,112	(Total Commitment \$20M, Total Drawn \$23.6M, Total Distributed \$6.6M)			
			Gerding Edlen Green Cities IV	0.14%	\$3,653	(Total Commitment \$20M, Total Drawn \$4.4, Total Distributed \$0.5M)			
			TA Realty Fund XI	0.76%	\$19,994	(Total Commitment \$20M, Total Drawn \$20.0M, Total Distributed \$5.8M)			
			Mesrow Financial Real Estate Value Fund III	0.73%	\$19,169	(Total Commitment \$20M, Total Drawn \$19.8M, Total Distributed \$1.7M)			
			Dune Real Estate Partners Fund IV	0.30%	\$7,741	(Total Commitment \$30M, Total Drawn \$9.1M, Total Distributed \$0.0M)			
			Real Estate Total	8.06%	\$210,999	-1.94%			5%-10%
Private Equity									
Secondary	2.50%		Pantheon Global Secondary Fund V	1.27%	\$33,241	(Total Commitment \$50M, Total Drawn \$35.7M, Total Distributed \$15.9M)			
Direct Private Equity			SSM Growth Equity Fund II*	0.28%	\$7,337	(Total Commitment \$10M, Total Drawn \$8.9, Total Distributed \$3.2M)			
			SSM Growth Equity Fund III*	0.11%	\$2,981	(Total Commitment \$10M, Total Drawn \$3.2, Total Distributed \$0.0M)			
Diversified FoF	2.50%		Neuberger Berman Crossroads XXI	2.01%	\$52,544	(Total Commitment \$50M, Total Drawn \$36.5M, Total Distributed \$1.3M)			
			Private Equity Total	3.67%	\$96,103	-1.33%			3%-7%
Private Credit									
	5.00%	\$130,938	TBD	0.00%	\$0				
	5.00%	\$130,938		0.00%	\$0				
Hedge Fund of Funds									
	4.00%		Aetos	1.97%	\$51,655				
			Grosvenor	2.12%	\$55,540				
			Preserver, LP*	0.43%	\$11,137				
			Hedge Fund of Funds Total	4.52%	\$118,333	0.52%			2%-6%
Internal Account	0.00%	\$0	Internal Account	0.48%	\$12,531				
			Cash	0.48%	\$12,531	0.48%			0%-5%
Total	100%	\$2,618,766	Total	100%	\$2,618,766				

¹ Cornerstone Real Estate Advisers now operates under the investment adviser name "Barings Real Estate Advisers," however; all predecessor funds retain the name Cornerstone. All new products open to new investors will operate under the name "Barings Real Estate Advisers" moving forward.

	Performance (%)									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Fund Composite	18.86	-5.39	18.36	6.76	0.24	5.49	17.71	13.75	0.72	14.05
Policy Index	18.76	-4.45	16.72	8.00	-0.19	5.86	15.19	12.79	0.77	12.11
In House Cash	2.12	1.93	0.67	0.35	0.18	0.11	0.11	0.20	0.54	0.36
90 Day U.S. Treasury Bill	2.28	1.87	0.86	0.25	0.03	0.04	0.05	0.08	0.08	0.13
Domestic Equity Composite	30.07	-5.88	22.62	10.04	-1.26	8.80	35.55	16.30	0.65	18.23
Russell 3000 Index	31.02	-5.24	21.13	12.74	0.48	12.56	33.55	16.42	1.03	16.93
Domestic Equity Index	29.94	-6.47	20.20	13.76	0.19	11.60	34.04	16.47	0.73	17.34
Fixed Income Composite	9.88	-0.98	6.94	5.14	-0.23	4.70	0.13	8.15	6.69	8.81
Fixed Income Index	9.24	-0.91	5.50	4.83	-0.86	4.89	0.39	6.87	6.39	6.54
International Equity Composite	24.67	-15.52	33.29	3.30	-0.50	-1.08	20.79	20.28	-12.77	13.91
International Equity Index	20.95	-13.99	28.77	3.16	-4.06	-4.13	16.58	17.70	-13.18	11.60
Hedge Fund Composite	7.95	-1.55	6.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90-Day T-Bill+ 5%	7.39	6.97	5.90	5.27	5.03	5.04	5.05	5.08	5.09	5.14
HFR1 FOF: Conservative Index	6.30	-0.87	4.12	1.89	0.37	3.14	7.70	4.22	-3.55	5.07
Core Private Real Estate Composite	10.16	4.91	7.75	8.50	11.92	20.06	7.12	14.60	13.01	22.87
NCREIF Property Index	6.42	6.72	6.96	7.97	13.33	11.82	10.98	10.54	14.26	13.11

Gross of Fees.

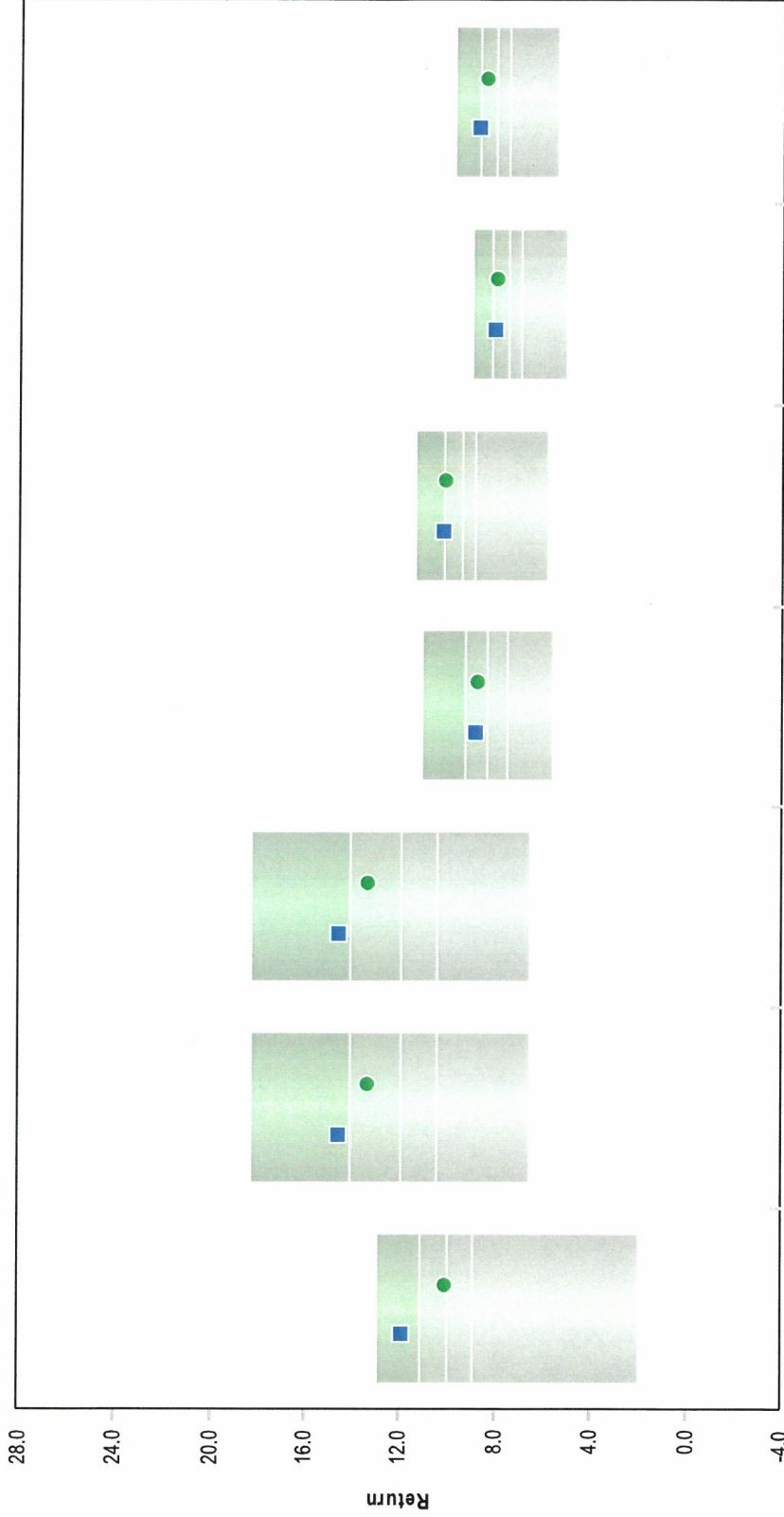
City of Memphis

Comparative Performance

As of December 31, 2020

	<u>1</u> <u>Quarter</u>	<u>Year To</u> <u>Date</u>	<u>Performance (%)</u>							<u>Inception</u> <u>Date</u>
			<u>1</u> <u>Year</u>	<u>3</u> <u>Years</u>	<u>5</u> <u>Years</u>	<u>7</u> <u>Years</u>	<u>10</u> <u>Years</u>	<u>Since</u> <u>Inception</u>		
Total Fund Composite	11.87	14.57	14.57	8.81	10.24	8.07	8.79	9.65	10/01/1982	
<i>Policy Index</i>	10.07	13.33	13.33	8.75	10.14	7.99	8.41	10.04		
In House Cash	-0.02	0.26	0.26	1.44	1.07	0.80	0.65	4.01	10/01/1982	
90 Day U.S. Treasury Bill	0.03	0.67	0.67	1.61	1.18	0.85	0.62	3.77		
Domestic Equity Composite	18.15	22.41	22.41	14.44	15.12	11.72	13.17	12.23	10/01/1982	
<i>Russell 3000 Index</i>	14.68	20.89	20.89	14.49	15.43	12.76	13.79	12.03		
<i>Domestic Equity Index</i>	17.82	20.08	20.08	13.43	14.82	12.15	13.38	N/A		
Fixed Income Composite	4.45	9.51	9.51	6.02	6.02	4.92	4.92	7.53	10/01/1982	
<i>Fixed Income Index</i>	2.78	7.78	7.78	5.27	5.23	4.29	4.35	7.39		
International Equity Composite	18.66	17.83	17.83	7.46	11.31	7.71	7.86	5.84	01/01/1990	
<i>International Equity Index</i>	17.26	11.18	11.18	4.97	8.97	5.07	5.35	5.44		
Hedge Fund Composite	7.16	10.42	10.42	5.48	N/A	N/A	N/A	6.20	04/01/2016	
<i>90-Day T-Bill+ 5%</i>	1.26	5.70	5.70	6.69	6.24	5.90	5.65	6.30		
<i>HFR1 FOF: Conservative Index</i>	5.10	5.71	5.71	3.66	3.40	2.92	2.85	4.04		
Core Private Real Estate Composite	2.53	2.52	2.52	5.81	6.73	9.28	9.95	8.09	09/01/1999	
<i>NCREIF Property Index</i>	1.15	1.60	1.60	4.89	5.91	7.77	9.00	8.53		

Gross of Fees.



	1 Qtr	YTD	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
Total Fund Composite	11.87 (15)	14.57 (22)	14.57 (22)	8.81 (38)	10.24 (25)	8.07 (29)	8.79 (23)
Policy Index	10.07 (49)	13.33 (33)	13.33 (33)	8.75 (40)	10.14 (30)	7.99 (32)	8.41 (38)
5th Percentile	12.99	18.31	18.31	11.11	11.39	9.04	9.82
1st Quartile	11.15	14.13	14.13	9.32	10.21	8.22	8.75
Median	9.97	11.95	11.95	8.40	9.46	7.54	8.05
3rd Quartile	8.88	10.42	10.42	7.51	8.88	6.98	7.54
95th Percentile	1.93	6.57	6.57	5.65	5.85	5.08	5.43

Parentheses contain percentile rankings.
Calculation based on quarterly periodicity.