

Investment Stewardship Guidance



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Milwaukee County Pension Fund (ERS)

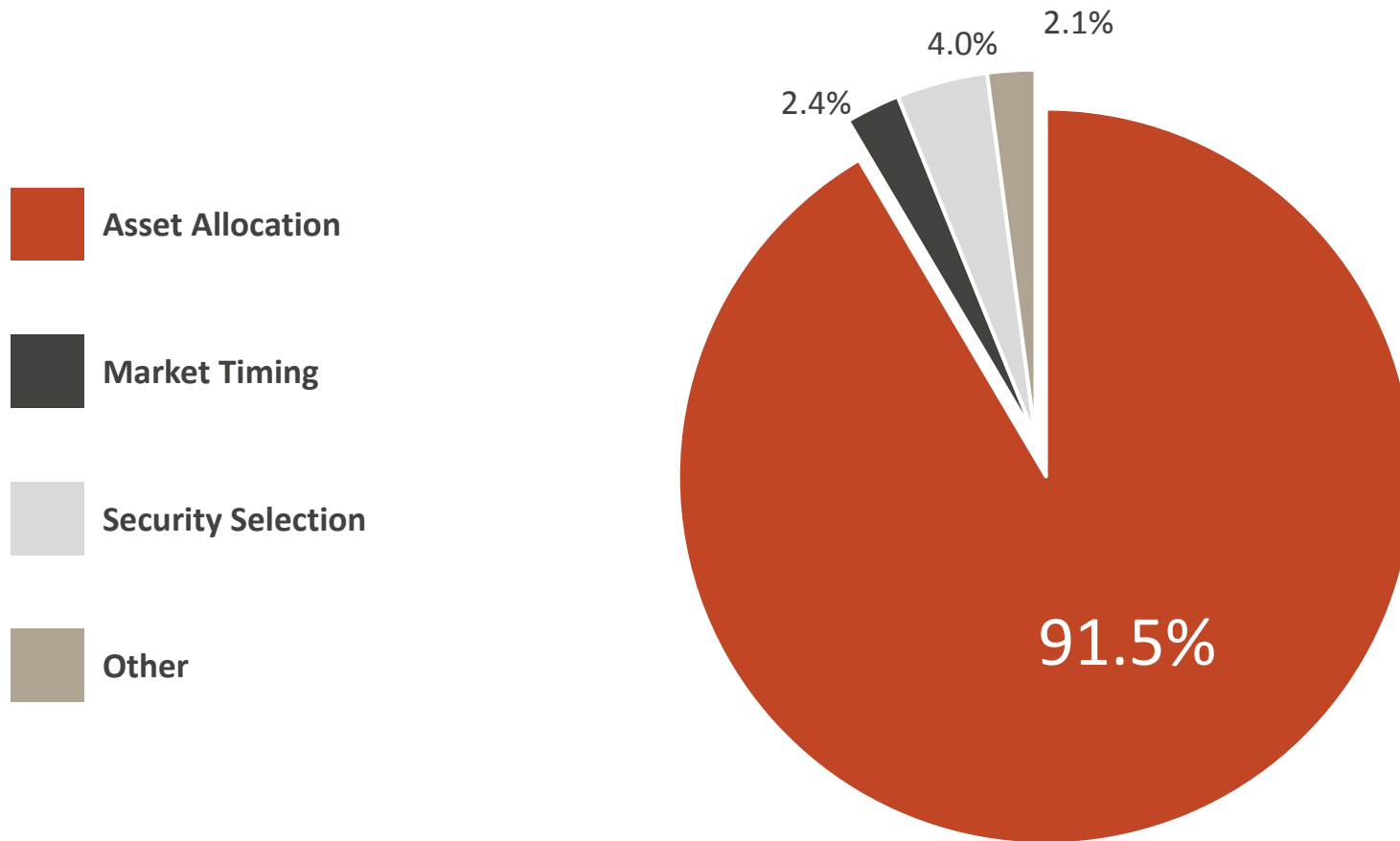
- Risk Profile
- Investment Return Assumptions
- Actual Investment Returns

Risk Profile

- Many forms of risk related to investments in a Pension system (peer risk, liquidity risk, manager risk, transfer risk, variation in returns)
- Variation in returns - standard deviation – volatility around target rate of return
- Milwaukee County actuarial rate of return goal is currently 8% (reduced to 7.75% Jan. 1st 2018, reduced to 7.5% Jan. 1st 2020)
- How do we get to a 7.5% return with the least amount of risk, or standard deviation?

Asset Allocation Controls Portfolio Risk

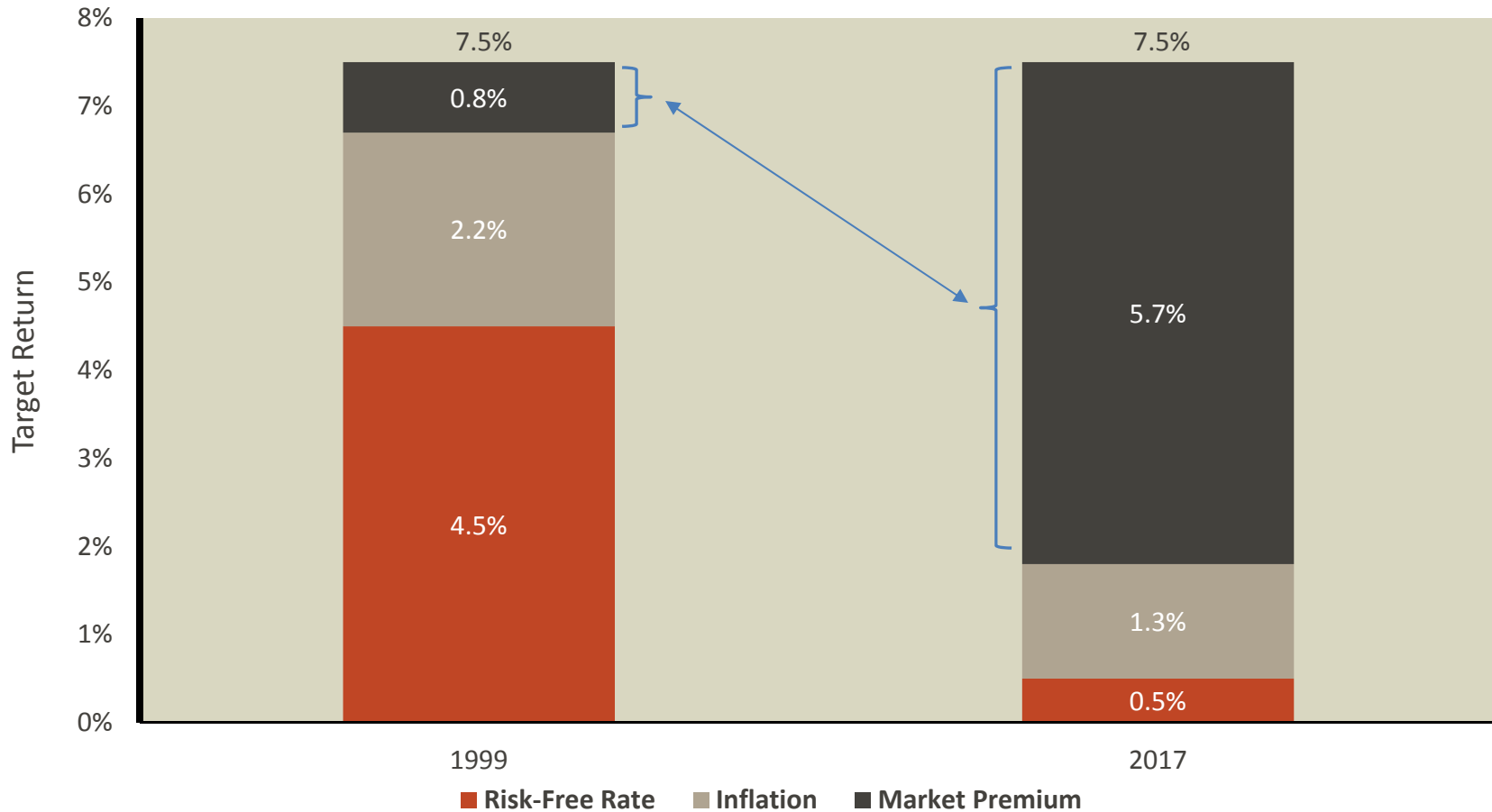
Portfolio return variability (%)



Source: Gary P. Brinson, L. Randolph Hood, and Gilbert L. Beebower, "Determinants of Portfolio Performance," Financial Analysts Journal, July/August 1986. Gary P. Brinson, Brian D. Singer, and Gilbert L. Beebower, "Determinants of Portfolio Performance II: An Update," Financial Analysts Journal, May/June 1991.

The “Real” Target Rate of Return

Significantly larger market premium now required to satisfy average return assumption



Source: Bloomberg

Restrictions/Considerations - ERS

- Restricted to a maximum 75% limit on common stock, currently interpreted as all asset classes except for fixed income and real estate
- Approximately \$145M required in annual liquidity, or roughly 8.3% of plan assets (\$1.748B as of 9/30/17)

Return Assumptions – Asset Classes

Asset Class	Average 10 Year		10 Year Annualized Returns				
	Annualized Return	Annualized Volatility	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Broad Fixed Income	3.0%	5.4%	1.6%	2.4%	2.8%	3.5%	4.9%
US Large-Cap Core	7.1%	17.9%	-2.8%	3.0%	7.4%	11.3%	16.5%
US Large-Cap Value	7.3%	24.5%	-5.7%	2.1%	7.2%	12.8%	20.2%
US Mid-Cap Core	7.4%	18.5%	-3.1%	3.0%	7.8%	11.6%	16.7%
US Mid-Cap Growth	7.5%	20.2%	-3.9%	3.3%	7.6%	11.8%	18.4%
US Small-Cap Value	8.2%	22.6%	-4.2%	3.2%	8.8%	13.2%	19.7%
Broad Non-US Equity	7.5%	24.2%	-5.0%	2.3%	7.4%	12.4%	19.3%
Non-US Small-Cap	8.1%	29.2%	-6.4%	1.5%	7.5%	14.4%	24.0%
Emerging Market	8.2%	31.8%	-8.7%	0.3%	7.6%	15.0%	26.9%
Emerging Market Small-Cap	8.2%	35.7%	-10.0%	-0.6%	7.7%	15.8%	29.3%
Defensive Equity	7.0%	11.2%	0.4%	3.8%	6.6%	9.4%	15.4%
Hedge Fund - Hedged Equity	5.3%	9.8%	-1.6%	0.6%	2.9%	7.8%	19.6%
Real Estate - Core	7.7%	5.4%	4.0%	6.3%	7.5%	9.2%	11.4%
Global Infrastructure	7.5%	8.8%	2.8%	5.5%	7.5%	9.5%	12.4%
Private Equity - Fund of Funds	11.1%	11.4%	4.9%	8.7%	11.2%	13.5%	16.7%

Source: Marquette Associates Inc. Milwaukee County 2017 Asset Allocation Study

Return Assumptions – ERS Portfolio Options

Asset Class	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
Broad Fixed Income	18.0%	18.0%	18.0%	18.0%	18.0%
Total Fixed Income	18.0%	18.0%	18.0%	18.0%	18.0%
US Large-Cap Core	6.0%	6.0%	6.0%	6.0%	6.0%
US Large-Cap Value	8.0%	7.0%	7.0%	7.0%	7.0%
US Mid-Cap Core	2.5%	3.5%	3.5%	3.5%	4.0%
US Mid-Cap Growth	2.5%	2.5%	2.5%	2.5%	2.5%
US Small-Cap Value	6.0%	6.0%	6.0%	6.0%	5.5%
Total U.S. Equity	25.0%	25.0%	25.0%	25.0%	25.0%
Broad Non-US Equity	10.0%	10.0%	10.0%	10.0%	10.0%
Non-US Small-Cap	4.0%	4.0%	4.0%	4.0%	4.0%
Emerging Market	6.0%	6.0%	4.0%	4.0%	4.0%
Emerging Market Small-Cap	0.0%	0.0%	2.0%	2.0%	2.0%
Total Non-U.S. Equity	20.0%	20.0%	20.0%	20.0%	20.0%
Defensive Equity	5.0%	5.0%	5.0%	8.5%	8.5%
Hedge Fund - Hedged Equity	3.5%	3.5%	3.5%	0.0%	0.0%
Total Hedge Funds	8.5%	8.5%	8.5%	8.5%	8.5%
Real Estate - Core	10.0%	10.0%	10.0%	10.0%	10.0%
Total Real Assets	10.0%	10.0%	10.0%	10.0%	10.0%
Global Infrastructure	8.5%	8.5%	8.5%	8.5%	8.5%
Private Equity - Fund of Funds	10.0%	10.0%	10.0%	10.0%	10.0%
Total Illiquid Assets	18.5%	18.5%	18.5%	18.5%	18.5%

	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
Avg. Annualized 10 Yr. Return	7.28%	7.28%	7.34%	7.41%	7.41%
Avg. Annualized 10 Yr. Volatility	10.88%	10.84%	10.84%	10.77%	10.76%
Avg. Return/Avg. Volatility	0.67	0.67	0.68	0.69	0.69

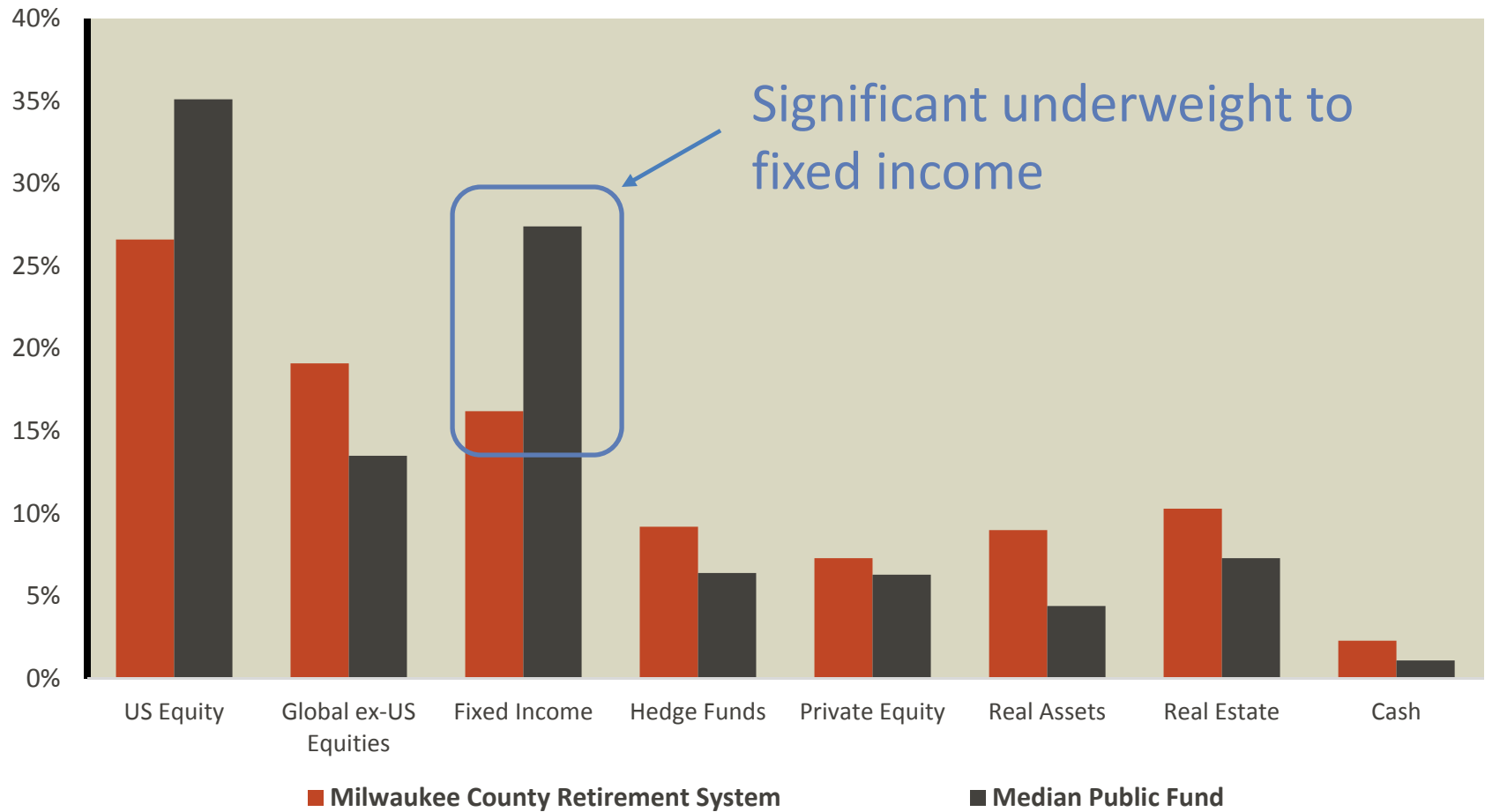
Source: Marquette Associates Inc. Milwaukee County 2017 Asset Allocation Study

ERS Market Values as of 9-30-17

Asset Class	Market Values	Allocation	Target
Fixed Income	\$268,677,287	15.4%	18.0%
U.S. Equity	\$425,831,056	24.4%	25.0%
International Equity	\$367,696,885	21.0%	20.0%
Hedged/Def. Equity	\$162,313,281	9.3%	8.5%
Real Estate	\$176,480,770	10.1%	10.0%
Infrastructure	\$159,942,724	9.2%	8.5%
Private Equity	\$149,267,114	8.5%	10.0%
Cash Equivalents	\$37,662,352	2.2%	0.0%
TOTAL PORTFOLIO	<u>\$1,747,871,470</u>	<u>100.0%</u>	<u>100.0%</u>

Source: Marquette Associates Inc. Milwaukee County 3Q 2017 Executive Summary

Investment Return Assumptions



Source: Marquette Associates Inc. Milwaukee County 4Q17 Executive Summary, InvestorForce Median Public Fund Universe

ERS Net Returns as of 9-30-17

<u>Asset Class</u>	<u>YTD Return</u>	<u>7 Yr Return</u>
U.S. Equity	12.3%	13.2%
Real Estate	5.4%	12.0%
Private Equity (as of 6/30/17)	6.3%	10.4%
International Equity	23.8%	6.6%
Infrastructure	10.1%	6.3%
Hedged/Defensive Equity	9.3%	6.2%
Fixed Income	2.4%	3.0%
Total Pension Fund Return	11.3%	8.2%

Source: Marquette Associates Inc. Milwaukee County 3Q 2017 Executive Summary

ERS Annualized Net Returns as of 9-30-17

	1 Mo	3 Mo	YTD	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	7 Yrs	10 Yrs
Total Fund Composite	1.6%	3.4%	11.3%	12.5%	10.6%	7.5%	7.7%	8.6%	8.2%	5.4%
<i>Total Fund Benchmark</i>	1.4%	3.1%	9.5%	10.9%	9.9%	6.6%	7.0%	8.1%	7.9%	5.0%
<i>InvestorForce Public DB Net Rank</i>	21	40	30	25	49	11	20	27	37	41
Fixed Income Composite	-0.3%	1.0%	2.4%	-0.5%	2.1%	2.6%	2.9%	2.1%	3.0%	4.4%
<i>BBgBarc US Aggregate TR</i>	-0.5%	0.8%	3.1%	0.1%	2.6%	2.7%	3.0%	2.1%	3.0%	4.3%
<i>InvestorForce Public DB Total Fix Inc Net Rank</i>	66	58	72	99	72	59	62	58	78	65
U.S. Equity Composite	3.5%	4.2%	12.3%	18.9%	15.0%	10.2%	10.8%	13.3%	13.2%	7.4%
<i>Wilshire 5000 Total Market</i>	2.4%	4.6%	13.7%	18.9%	17.1%	11.0%	12.7%	14.4%	14.4%	7.7%
<i>InvestorForce Public DB US Eq Net Rank</i>	13	75	76	28	84	62	76	69	68	40
International Equity Composite	1.9%	7.1%	23.8%	20.8%	16.0%	7.0%	6.6%	8.6%	6.6%	1.6%
<i>MSCI ACWI ex USA</i>	1.9%	6.2%	21.1%	19.6%	14.3%	4.7%	4.7%	7.0%	5.2%	1.3%
<i>InvestorForce Public DB ex-US Eq Net Rank</i>	39	12	33	27	24	25	19	33	41	58
Hedged Equity Composite	0.9%	3.1%	9.3%	10.8%	6.2%	5.5%	6.2%	7.7%	6.2%	--
<i>HFRX Equity Hedge Index</i>	1.8%	3.2%	7.1%	7.9%	3.9%	1.6%	2.5%	3.6%	1.0%	-1.0%
<i>Russell 3000</i>	2.4%	4.6%	13.9%	18.7%	16.8%	10.7%	12.5%	14.2%	14.3%	7.6%
<i>MSCI ACWI</i>	1.9%	5.2%	17.3%	18.6%	15.3%	7.4%	8.4%	10.2%	9.2%	3.9%
<i>InvestorForce Public DB Hedge Funds Net Rank</i>	24	5	5	15	8	8	3	3	5	--
Real Estate Composite	1.9%	1.8%	5.4%	7.3%	8.2%	10.4%	10.9%	11.4%	12.0%	5.7%
<i>Custom Real Estate Benchmark</i>	0.5%	1.6%	4.7%	6.7%	7.9%	9.8%	10.2%	10.6%	11.5%	4.3%
<i>NFI</i>	0.5%	1.6%	4.7%	6.7%	7.9%	9.8%	10.2%	10.6%	11.5%	4.1%
<i>InvestorForce All DB Real Estate Priv Net Rank</i>	10	26	27	33	39	29	25	23	20	5
Infrastructure Composite	1.6%	1.8%	11.0%	10.1%	7.3%	5.1%	4.6%	5.3%	6.3%	--
<i>CPI +4%</i>	0.3%	1.2%	4.7%	5.8%	5.6%	5.1%	5.2%	5.2%	5.7%	5.7%
Private Equity Composite	0.0%	0.0%	6.3%	10.3%	8.8%	8.6%	10.6%	9.4%	10.4%	7.2%
<i>Cambridge Associates All PE</i>	0.0%	0.0%	3.9%	6.7%	7.7%	7.8%	10.1%	11.3%	12.0%	8.1%


Source: Marquette Associates Inc. Milwaukee County 3Q 2017 Executive Summary

ERS Calendar Net Returns

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Fund Composite	7.0%	2.3%	5.4%	15.4%	11.2%	0.3%	12.2%	18.4%	-22.5%	6.0%	13.9%
<i>Total Fund Benchmark</i>	7.6%	1.2%	5.3%	15.0%	10.8%	1.0%	12.5%	20.0%	-24.8%	6.6%	14.0%
<i>InvestorForce Public DB Net Rank</i>	63	2	53	45	61	57	50	54	42	86	29
Fixed Income Composite	2.5%	1.1%	5.6%	-1.4%	4.7%	7.3%	6.8%	15.3%	-1.5%	6.1%	6.2%
<i>BBgBarc US Aggregate TR</i>	2.6%	0.6%	6.0%	-2.0%	4.2%	7.8%	6.5%	5.9%	5.2%	7.0%	4.3%
<i>InvestorForce Public DB Total Fix Inc Net Rank</i>	70	20	17	51	61	27	67	35	53	63	20
U.S. Equity Composite	12.9%	-0.7%	9.5%	34.4%	16.2%	-1.4%	19.2%	32.0%	-36.9%	5.5%	14.1%
<i>Wilshire 5000 Total Market</i>	13.4%	0.7%	12.7%	33.5%	16.4%	1.2%	17.2%	28.3%	-37.2%	5.6%	15.8%
<i>InvestorForce Public DB US Eq Net Rank</i>	45	64	73	44	40	82	31	22	41	41	50
International Equity Composite	4.1%	-2.0%	-2.2%	16.0%	16.5%	-13.0%	12.5%	29.1%	-43.9%	6.3%	14.1%
<i>MSCI ACWI ex USA</i>	4.5%	-5.7%	-3.9%	15.3%	16.8%	-13.7%	11.2%	41.4%	-45.5%	16.7%	26.6%
<i>InvestorForce Public DB ex-US Eq Net Rank</i>	54	27	24	58	84	39	41	84	58	94	95
Hedged Equity Composite	1.7%	2.1%	5.2%	19.1%	6.9%	-4.3%	--	--	--	--	--
<i>HFRX Equity Hedge Index</i>	0.1%	-2.3%	1.4%	11.1%	4.8%	-19.1%	8.9%	13.1%	-25.5%	3.2%	9.2%
<i>Russell 3000</i>	12.7%	0.5%	12.6%	33.6%	16.4%	1.0%	16.9%	28.3%	-37.3%	5.1%	15.7%
<i>MSCI ACWI</i>	7.9%	-2.4%	4.2%	22.8%	16.1%	-7.3%	12.7%	34.6%	-42.2%	11.7%	21.0%
<i>InvestorForce Public DB Hedge Funds Net Rank</i>	55	22	28	1	56	90	--	--	--	--	--
Real Estate Composite	7.8%	14.2%	13.0%	14.2%	11.0%	13.0%	14.4%	34.9%	-38.6%	-16.2%	36.2%
<i>Custom Real Estate Benchmark</i>	7.8%	13.9%	11.5%	12.9%	9.8%	15.0%	15.1%	33.7%	-45.0%	-11.1%	38.8%
<i>NFI</i>	7.8%	13.9%	11.5%	12.9%	9.8%	15.0%	15.3%	-30.4%	-10.7%	14.8%	15.3%
<i>InvestorForce All DB Real Estate Priv Net Rank</i>	50	36	19	22	30	60	43	2	99	99	1
Infrastructure Composite	3.5%	3.6%	-0.4%	6.6%	10.9%	7.6%	--	--	--	--	--
<i>CPI +4%</i>	6.2%	4.8%	4.8%	5.6%	5.8%	7.1%	5.6%	6.8%	4.1%	8.2%	6.6%
Private Equity Composite	10.8%	6.6%	11.2%	9.8%	11.6%	8.6%	18.0%	12.1%	-21.5%	18.9%	33.1%
<i>Cambridge Associates All PE</i>	9.7%	7.3%	11.3%	21.0%	12.8%	8.4%	20.2%	14.4%	-24.5%	24.2%	34.5%

Source: Marquette Associates Inc. Milwaukee County 3Q 2017 Executive Summary

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