



# Public Fund Universe Analysis

City of Milwaukee Employees' Retirement System

Period Ending June 30, 2017

Fund Number: 105



## OVERVIEW

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RVK, Inc. (“RVK”) was founded in 1985 and is one of the largest independent and employee-owned investment consulting firms in the US, providing world-class investment advice to institutional investors. We serve over 400 plans, including pension plans, defined contribution plans, endowments & foundations, insurance pools, and special purpose funds.

## MISSION STATEMENT

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To provide best-in-class investment consulting services to a wide array of sophisticated investors.

## STRATEGIC INVESTMENT ADVICE WITH NO CONFLICTS OF INTEREST

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RVK built its investment consulting practice on the principles of integrity, investment knowledge, client service, and our no conflicts of interest policy. We are exclusively focused on strategic investment consulting services and solely owned by active employees, enabling us to offer advice that is not influenced by other business activities. As a privately-held firm, with no affiliates or parent company, we provide informed and unbiased investment advice to our clients. We offer an extensive slate of consulting services and produce deliverables fully customized to meet each client’s needs.

## KEY TENETS OF OUR CULTURE

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### **RVK BY THE NUMBERS**

- **30+** years of business
- **3** offices - Portland, Chicago, New York
- **\$800+** billion Full-Retainer AUA
- **90+** Investment Professionals
- **50+** Advanced Degrees and Certifications
- **100%** Employee Ownership
- **100%** Revenue Derived from Client Fees
- **100%** Non-Discretionary Services

### **GENERAL CONSULTING SERVICES**

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- Plan Evaluation
- Strategic Asset Allocation
- Investment Policy Development & Review
- Investment Manager Search & Selection
- Performance Analysis & Reporting
- Manager Structure Analysis
- Risk Monitoring and Management
- Client Education
- Special Projects

### **SPECIALTY CONSULTING SERVICES**

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- Strategic Planning Reviews
- Custody, Record keeper, Third-Party Administrator Searches
- Asset/Liability Studies
- Endowment Spending Policy Studies
- Securities Lending Reviews
- Pacing Studies
- Outsourced CIO (“OCIO”) Searches, Evaluation, and Ongoing Monitoring
- Directed Consulting Services
- Fee Reviews
- Defined Contribution Solutions Services
- Investment Operations Solutions
- Board and Investment Program Operational Reviews

**FOR MORE INFORMATION ABOUT OUR SERVICES, PLEASE CONTACT:**

**[Business.Development@RVKInc.com](mailto:Business.Development@RVKInc.com)**  
**503-221-4200**

Alameda County Employees' Retirement Association  
Arlington County Employees' Retirement System  
City of Austin Employees' Retirement System  
**City of Milwaukee Employees' Retirement System (105)**  
City of Plano Retirement Security Plan  
  
Colorado Public Employees' Retirement Association  
Contra Costa County Employees' Retirement Association  
District of Columbia Retirement Board  
Employees Retirement System of Texas  
Fire and Police Pension Association of Colorado  
Fort Worth Employees' Retirement Fund  
Georgia Division of Investment Services  
Illinois Municipal Retirement Fund  
Iowa Public Employees' Retirement System  
Kansas Public Employees' Retirement System  
Kentucky Teachers' Retirement System  
Los Angeles City Employees' Retirement System  
Los Angeles Fire and Police Pension System  
Marin County Employees' Retirement Association  
Mendocino County Employees' Retirement Association  
Montana Public Employees' Retirement System  
Municipal Employees' Annuity and Benefit Fund of Chicago  
Nebraska Investment Council  
New York State Common Retirement Fund  
North Carolina Retirement System  
Orange County Employees' Retirement System  
Pennsylvania State Employees' Retirement System  
Public Employees Retirement Association of New Mexico  
Sacramento County Employees' Retirement System

Anchorage Police & Fire Retirement System  
California State Teachers' Retirement System  
City of Fresno Retirement Systems  
City of Plano Other Post-Employment Benefits Trust  
Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri  
Confederated Tribes of the Warm Springs Tribal Council Pension Fund  
County Employees' Annuity & Benefit Fund of Cook County  
Educational Employees' Supplementary Retirement System of Fairfax County  
Fire & Police Employees' Retirement System of Baltimore  
Florida State Board of Administration  
Fresno County Employees' Retirement Association  
Gila River Indian Community Retirement Plan  
Imperial County Employees' Retirement System  
Kansas City, Missouri Employees' Retirement System  
Kentucky Retirement Systems  
Kern County Employees' Retirement Association  
Los Angeles County Employees Retirement Association  
Los Angeles Water & Power Employees Retirement Plan  
Maryland State Retirement and Pension System  
Merced County Employees' Retirement Association  
Montana Teachers' Retirement System  
Municipality of Anchorage Pre-Funding Program  
Nevada Public Employees' Retirement System  
Newport News Employees' Retirement Fund  
Ohio Public Employees' Retirement System  
Pennsylvania Public School Employees' Retirement System  
Police Retirement System of Kansas City, Missouri  
Public School and Education ERS of Missouri



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San Diego City Employees' Retirement System  
San Diego Transit Corporation Employees Retirement  
San Mateo County Employees' Retirement Association  
Sonoma County Employees' Retirement Association  
Stanislaus County Employees' Retirement Association  
State Teachers Retirement System of Ohio  
Teachers' Retirement System of Louisiana  
Texas Municipal Retirement System  
Tulare County Employees' Retirement Association  
Virginia Retirement System  
Wyoming Retirement System

San Bernardino County Employees' Retirement Association  
San Diego County Employees Retirement Association  
San Joaquin County Employees' Retirement Association  
Santa Barbara County Employees' Retirement System  
South Dakota Retirement System  
State of Michigan Retirement Systems  
State Universities Retirement System of Illinois  
Teachers' Retirement System of the State of Illinois  
The Navajo Nation Retirement Plan  
Ventura County Employees' Retirement Association  
West Virginia Investment Management Board

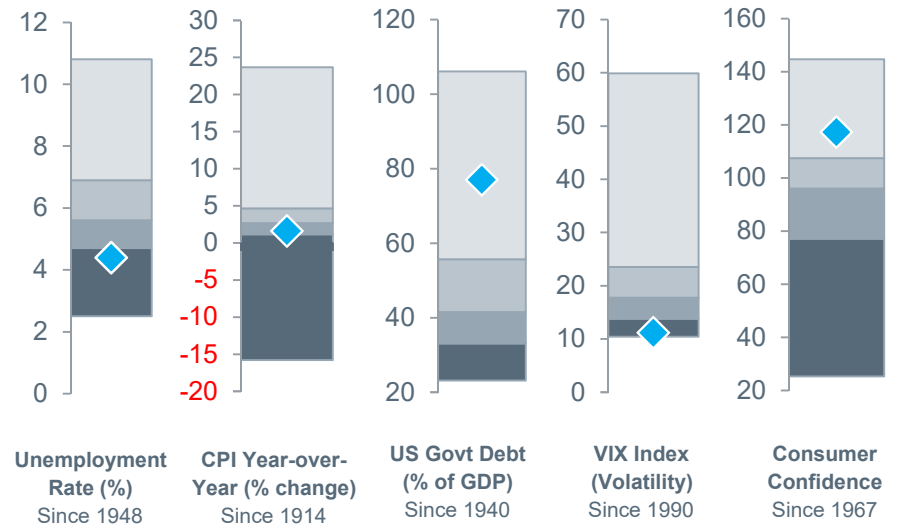
**Second Quarter Economic Environment**

**Key Economic Indicators**

Global risk assets continued to perform well during the second quarter of 2017, with gains broadly supported by strengthening economic data related to global inflation, job growth, and corporate fundamentals. In contrast to prior run-ups in risk assets, the past quarter was marked by high levels of sector and market factor dispersion. This created significant opportunities for skilled active managers and generated tailwinds for strategies with heavy growth and cyclical biases. Geographically, emerging markets outperformed developed, while international markets generally outperformed US markets.

Gains across most risk assets occurred despite persistent political divisiveness in the US, heightened geopolitical risks (most notably in North Korea), and a range of other international issues. Although positive economic fundamentals have thus far supported 2017 market gains, it is possible that unanticipated global central bank policy and US political events could have a larger influence on markets through the remainder of the year.

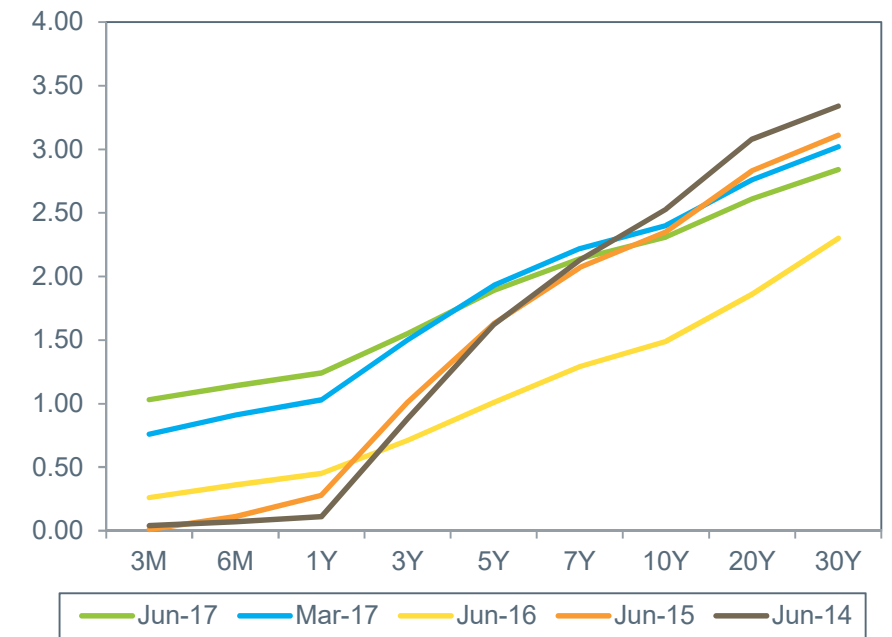
**Key Economic Indicators**



**Economic Indicators**

	Jun-17	Mar-17	Jun-16	Jun-14	20 Yr
Federal Funds Rate (%)	1.06 ▲	0.82	0.30	0.09	2.23
Breakeven Infl. - 1 Yr (%)	0.72 ▼	2.06	1.17	1.46	N/A
Breakeven Infl. - 10 Yr (%)	1.74 ▼	1.98	1.44	2.24	N/A
CPI YoY (Headline) (%)	1.6 ▼	2.4	1.0	2.1	2.1
Unemployment Rate (%)	4.4 ▼	4.5	4.9	6.1	5.9
Real GDP YoY (%)	2.1 ▲	2.0	1.2	2.7	2.3
PMI - Manufacturing	57.80 ▲	57.20	52.80	55.40	52.25
USD Total Wtd Idx	90.54 ▼	94.01	90.65	75.72	86.89
WTI Crude Oil per Barrel (\$)	46.0 ▼	50.6	48.3	105.4	56.7
Gold Spot per Oz (\$)	1,241.6 ▼	1,249.4	1,322.2	1,327.3	806.4

**Treasury Yield Curve (%)**



**Market Performance (%)**

	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	3.09	9.34	17.90	14.63	7.18
Russell 2000	2.46	4.99	24.60	13.70	6.92
MSCI EAFE (Net)	6.12	13.81	20.27	8.69	1.03
MSCI EAFE SC (Net)	8.10	16.72	23.18	12.94	3.41
MSCI Emg Mkts (Net)	6.27	18.43	23.75	3.96	1.92
Bloomberg US Agg Bond	1.45	2.27	-0.31	2.21	4.48
BofA ML 3 Mo US T-Bill	0.20	0.30	0.49	0.17	0.58
NCREIF ODCE (Gross)	1.70	3.50	7.87	11.79	5.25
Wilshire US REIT	1.78	1.82	-1.71	9.35	5.63
HFRI FOF Comp	0.70	3.10	6.37	3.85	0.86
Bloomberg Cmdty (TR)	-3.00	-5.26	-6.50	-9.25	-6.49

Treasury data courtesy of the US Department of the Treasury. Economic data courtesy of Bloomberg Professional Service. Breakeven Inflation does not have 20 years of history; therefore, its 20-year average is shown as N/A.

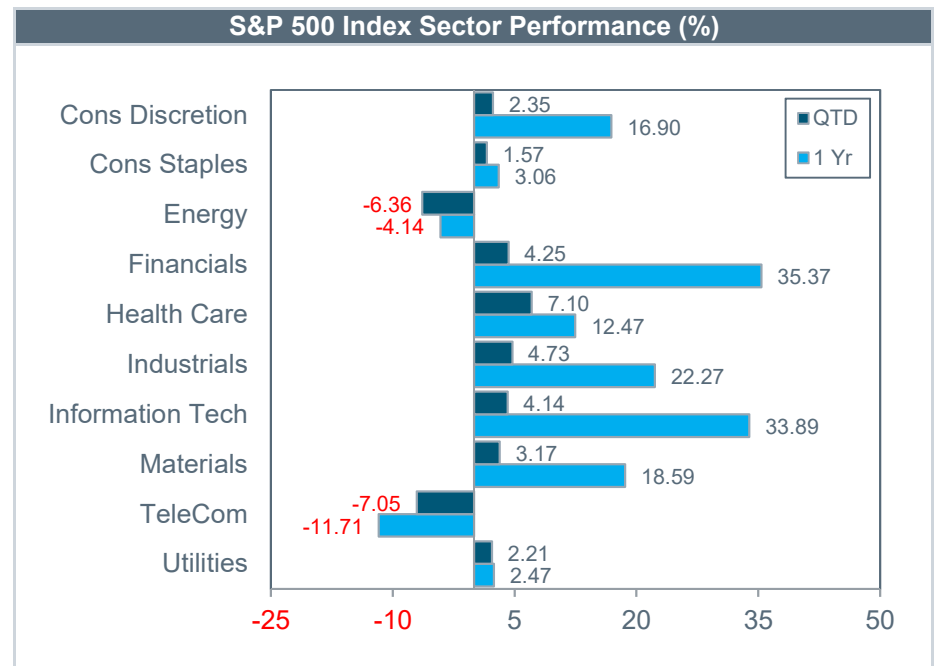
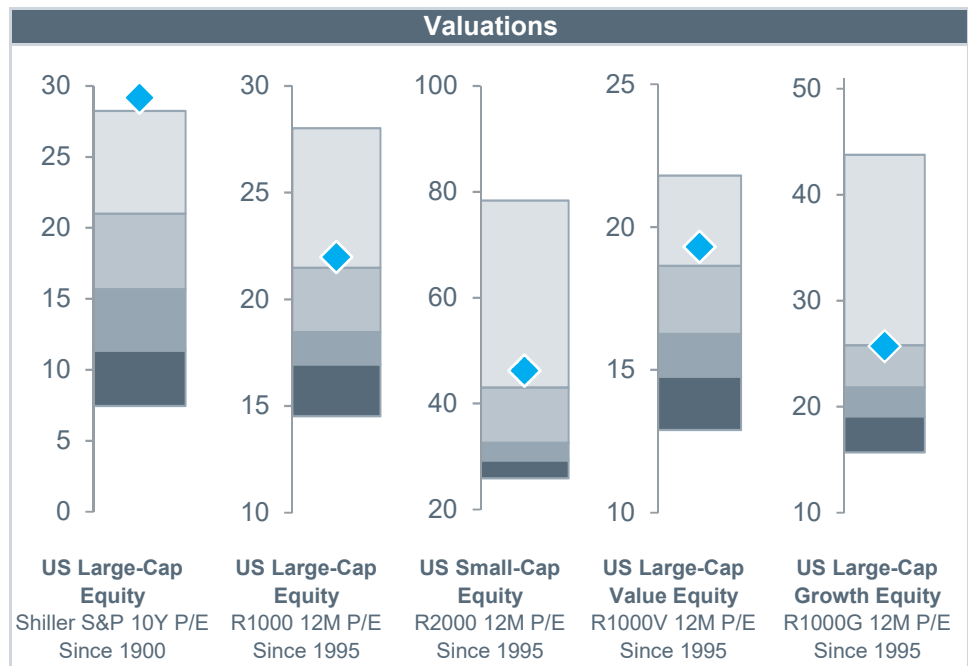
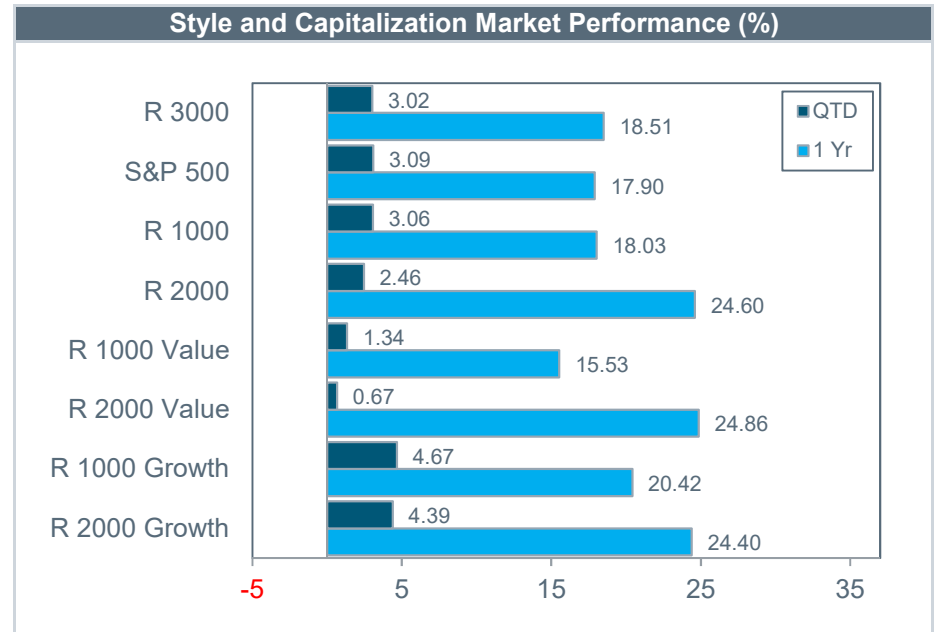


### Second Quarter Review

**Broad Market**  
 Domestic equity markets continued to rally during the second quarter, albeit at a slower rate and with less volatility. Expectations for fiscal stimulus were again supportive of markets during the quarter, as was the positive tone from the Federal Open Market Committee (“FOMC”) regarding near-term economic growth and inflation expectations. Equities provided positive returns across all market caps and styles, but with significant dispersion across sectors and market factors.

**Market Cap**  
 Large cap stocks continued to outpace small cap stocks, with the exception of micro cap.

**Style and Sector**  
 Growth continued its strong run in the second quarter of 2017, with the Russell 3000 Growth Index posting returns of 4.7% for the quarter and 13.7% year-to-date, versus 1.3% and 4.3%, respectively, for its value counterpart.



Valuation data courtesy of Bloomberg Professional Service and Robert J. Shiller, Irrational Exuberance, Second Edition. P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.



**Second Quarter Review**

**Broad Market**

International equity markets continued to react positively to signs of strengthening economic growth across both developed and emerging markets, driving equity and sovereign debt yields higher.

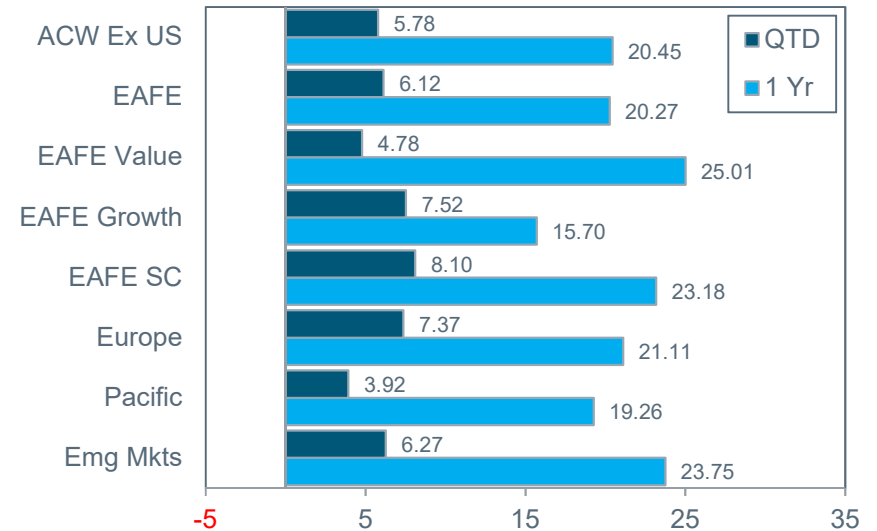
**Region**

From a country perspective, political developments drove a generally risk-on repricing of assets. France and the Netherlands withstood the anti-globalization political forces, which reduced political uncertainty and supported higher asset prices.

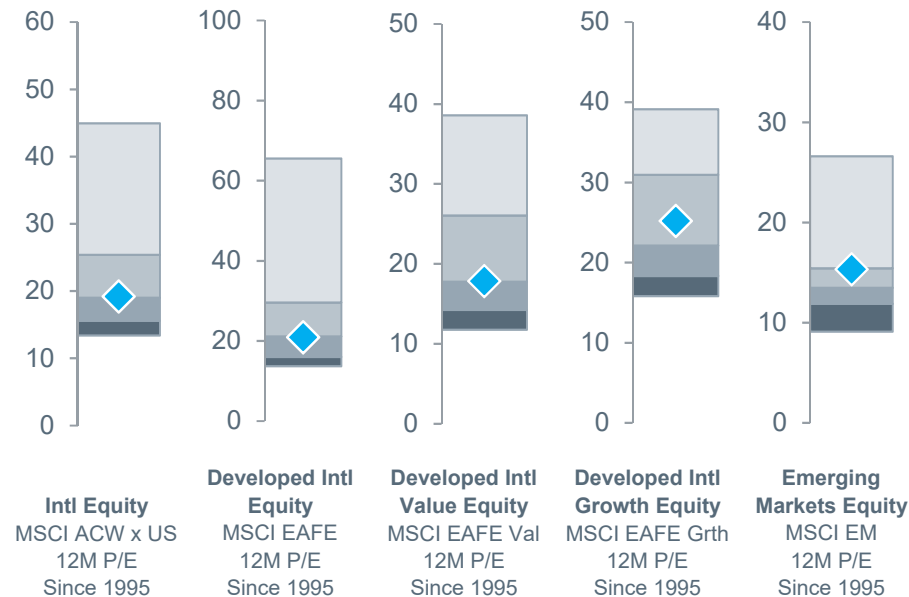
**Market Cap & Style**

Developed small-cap equities outperformed large-cap equities, while emerging markets equities narrowly edged out developed markets equities. As would be expected during periods of growth leadership, healthcare and technology led performance from a sector standpoint, with materials, energy, and telecom lagging.

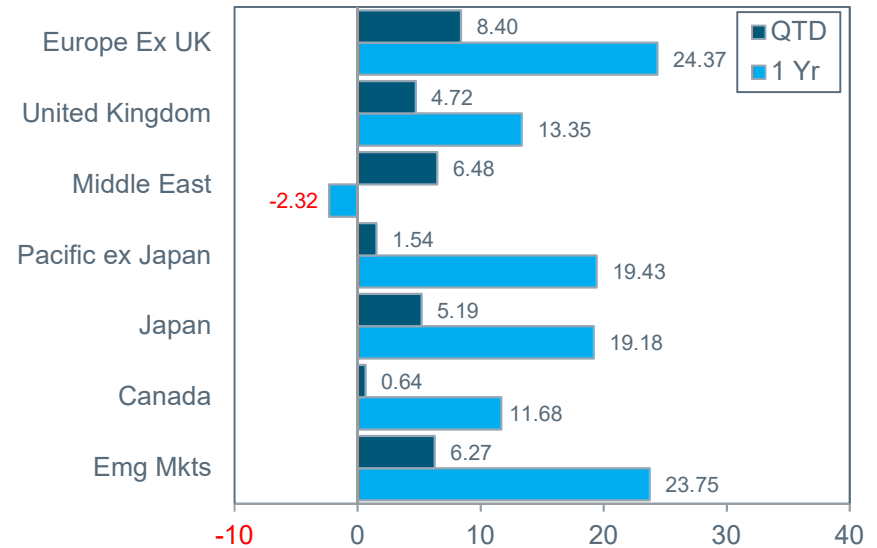
**MSCI Style and Capitalization Market Performance (%)**



**Valuations**



**MSCI Region Performance (%)**



Valuation data courtesy of Bloomberg Professional Service.

P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers. All returns are shown net of foreign taxes on dividends.



**Second Quarter Review**

**Broad Market**

The FOMC raised the Federal Funds rate by 0.25% during its June meeting, citing developments in labor markets and expectations for higher inflation over the near-term. As expected, given recent inflation data and the June increase in the targeted Federal Funds rate, the yield curve flattened considerably during the second quarter.

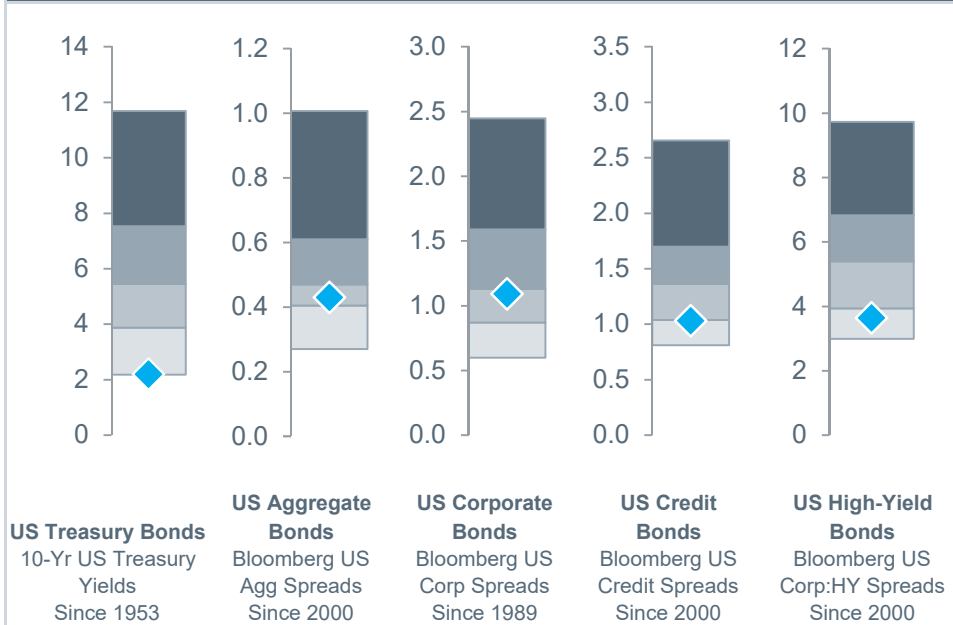
**Credit Market**

Unsurprisingly, given the general risk-on sentiment of the second quarter, credit spreads tightened for both the BofAML US Corporate Index and the BofAML US High Yield Index.

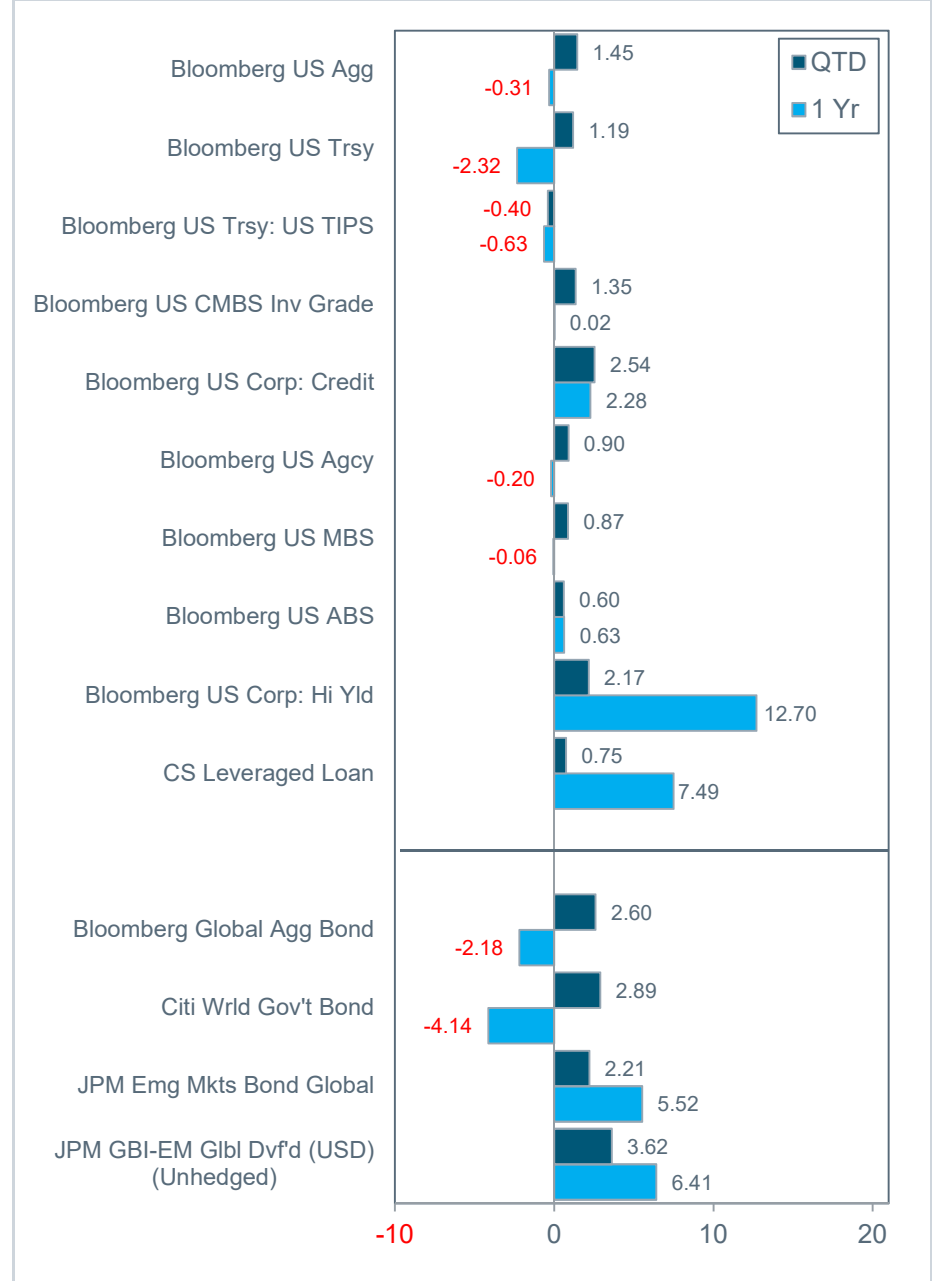
**International**

Emerging markets debt continued to be a top performer in 2017. Hard currency EMD returned 2.2% for the quarter and 6.2% for the year-to-date, as measured by the JPM EMBI Global Diversified Index.

**Valuations**



**Fixed Income Performance (%)**



Valuation data courtesy of Bloomberg Professional Service. Valuations shown represent the 5th through 95th percentiles to minimize the effect of outliers.



**Second Quarter Review - Absolute Return**

**General Market - Hedge Funds**

The hedge fund industry continued to produce positive returns for the quarter, though they cooled slightly from the pace set in the first quarter. As measured by the HFRI Fund Weighted Composite, the industry has now generated positive returns in 15 out of 16 months dating back to March 2016. Macro strategies continued to lag other sectors, however, as systematic strategies were whipsawed by interest rate movements in 2017.

**General Market - Global Tactical Asset Allocation (GTAA)**

Relative to an undiversified and static portfolio comprised of 60% US equity and 40% fixed income, performance across the GTAA manager universe was mixed in the second quarter. The stronger-performing tactical managers either avoided or de-emphasized US large cap equity exposure in favor of foreign developed equity, emerging market equity, and credit-sensitive fixed income. Managers with overweight positions in European and Japanese equity exposures fared particularly well.

**Second Quarter Review - Real Assets**

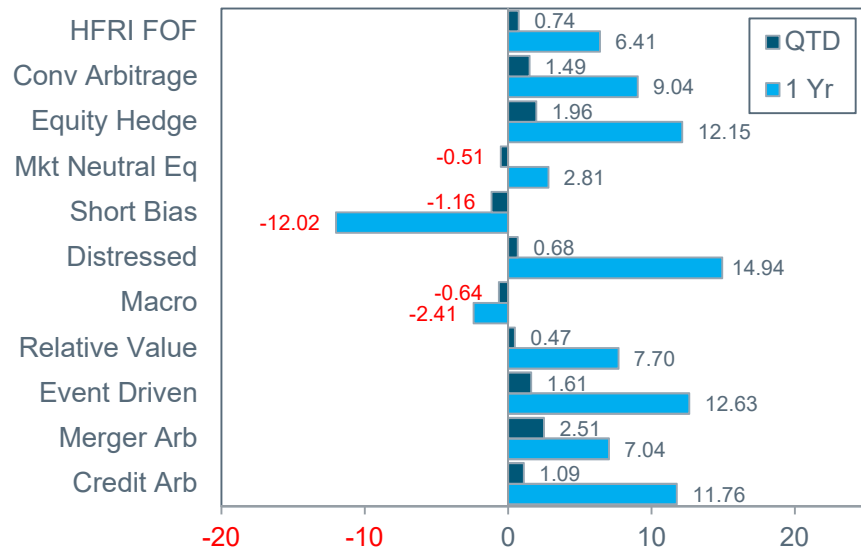
**General Market - Diversified Inflation Strategies (DIS)**

Performance for Diversified Inflation Strategies in the second quarter varied widely, as commodities exposure (or lack thereof) served as the defining characteristic that separated strong manager returns from disappointing ones.

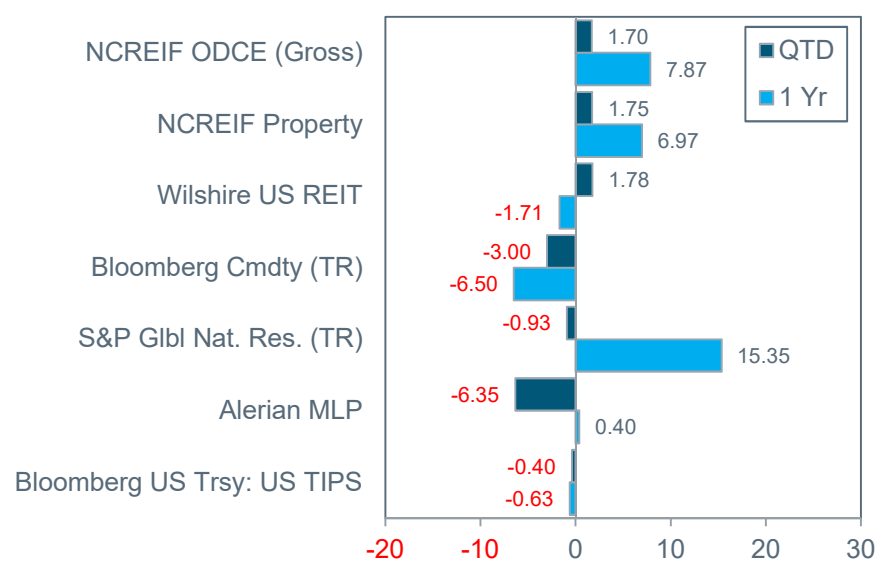
**General Market - Real Estate**

Core real estate returns mirrored those experienced in the first quarter. Gains were moderate with income comprising more than half of the quarter's total return. The core index, NCREIF-ODCE, returned 1.7% (on a preliminary basis) during the quarter, reinforcing investor expectations of lower returns going forward as we enter the later stages of the recovery. Real estate valuations remain at elevated levels. However, with the exception of a small cohort of high-end luxury properties in a few gateway cities, fundamentals remain intact.

**HFRI Hedge Fund Performance (%)**



**Real Asset Performance (%)**



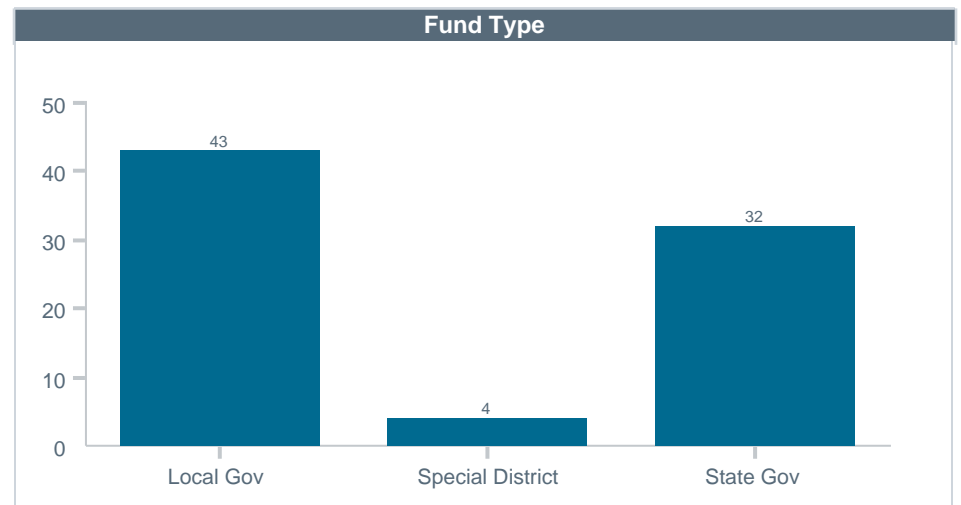
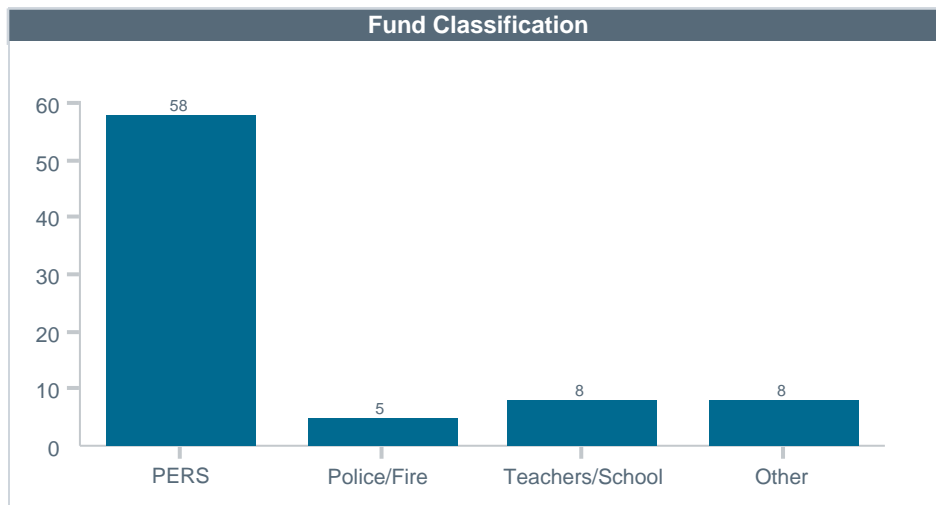
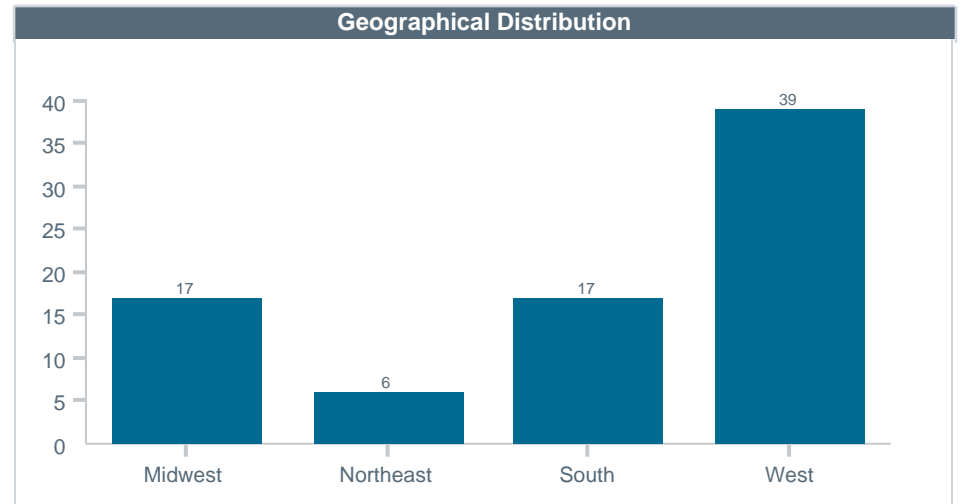
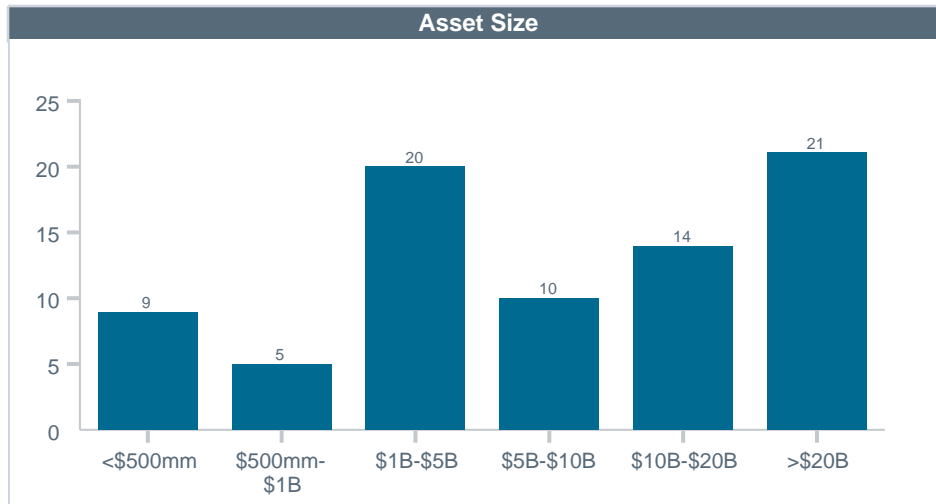
Annual Asset Class Performance

As of June 30, 2017

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	YTD
Best	61.34	33.16	34.00	35.97	39.38	8.44	78.51	28.60	22.49	20.00	38.82	31.78	15.02	21.31	18.43
	55.81	31.45	26.19	32.18	16.23	5.24	58.21	26.85	15.99	18.23	32.39	19.31	9.59	17.13	16.72
	47.25	25.55	21.39	26.34	15.97	2.06	46.78	22.04	13.56	17.59	29.30	13.69	4.23	11.96	13.81
	38.59	20.25	21.36	19.31	11.63	-2.35	31.78	18.88	9.24	17.32	22.78	12.50	1.38	11.74	9.34
	36.18	18.33	13.82	18.37	11.17	-10.01	28.60	16.83	7.84	16.35	13.94	5.97	0.55	11.19	6.03
	28.96	13.06	13.54	16.32	10.25	-21.37	27.17	16.36	4.98	16.00	8.96	4.89	0.05	8.77	4.99
	28.68	11.14	7.49	15.79	6.97	-26.16	26.46	15.12	2.11	15.81	7.44	3.64	-0.27	7.24	4.93
	23.93	10.88	5.34	11.86	6.60	-33.79	18.91	15.06	0.10	10.94	1.86	3.37	-0.81	6.67	3.50
	11.61	9.15	4.91	10.39	5.49	-35.65	11.47	10.16	-4.18	8.78	0.07	2.45	-1.44	4.68	3.10
	9.28	8.56	4.55	4.85	5.00	-37.00	11.41	7.75	-5.72	6.98	-2.02	0.04	-3.30	2.65	2.27
	8.39	8.46	3.07	4.34	1.87	-39.20	5.93	6.54	-12.14	4.79	-2.60	-2.19	-4.41	2.18	1.82
	5.88	6.86	2.84	2.72	1.45	-43.38	1.92	6.31	-13.32	4.21	-8.61	-4.90	-4.47	1.00	0.85
	4.11	4.34	2.74	2.07	-1.57	-47.01	0.21	5.70	-15.94	0.11	-8.83	-4.95	-14.92	0.51	0.30
Worst	1.15	1.33	2.43	0.49	-17.55	-53.33	-29.76	0.13	-18.42	-1.06	-9.52	-17.01	-24.66	0.33	-5.26
	S&P 500 - US Large Cap	R 2000 - US Small Cap	MSCI EAFE (Net) - Int'l Dev.	MSCI EAFE SC (Net) - Int'l SC	MSCI EM (Net) - Int'l Emg Mkts	Bloomberg US Agg Bond - FI	Bloomberg US Corp: Hi Yield - FI	Bloomberg US Trsy: US TIPS - FI	Bloomberg US Gov/Credit: Lng - FI	NCREIF ODCE (Gross) - Real Estate	Wilshire US REIT - REITs	HFRI FOF Comp Index - ARS	Bloomberg Cmdty (TR) - Commod.	BofA ML 3 Mo T-Bill - Cash Equiv	

NCREIF ODCE (Gross) performance is reported quarterly; performance is shown N/A in interim-quarter months.



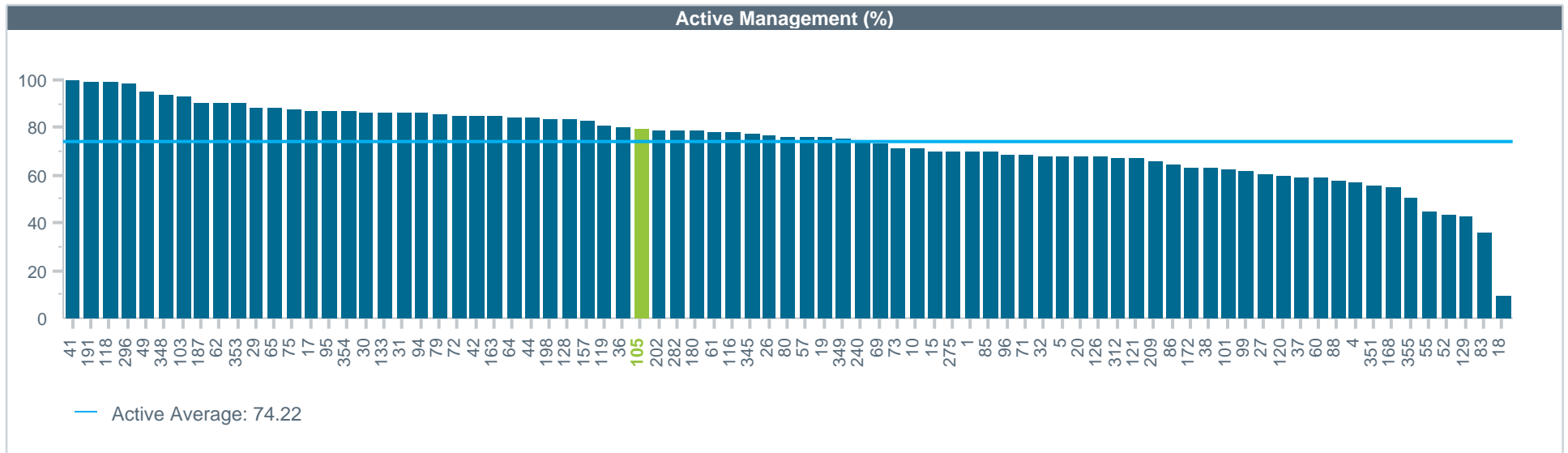
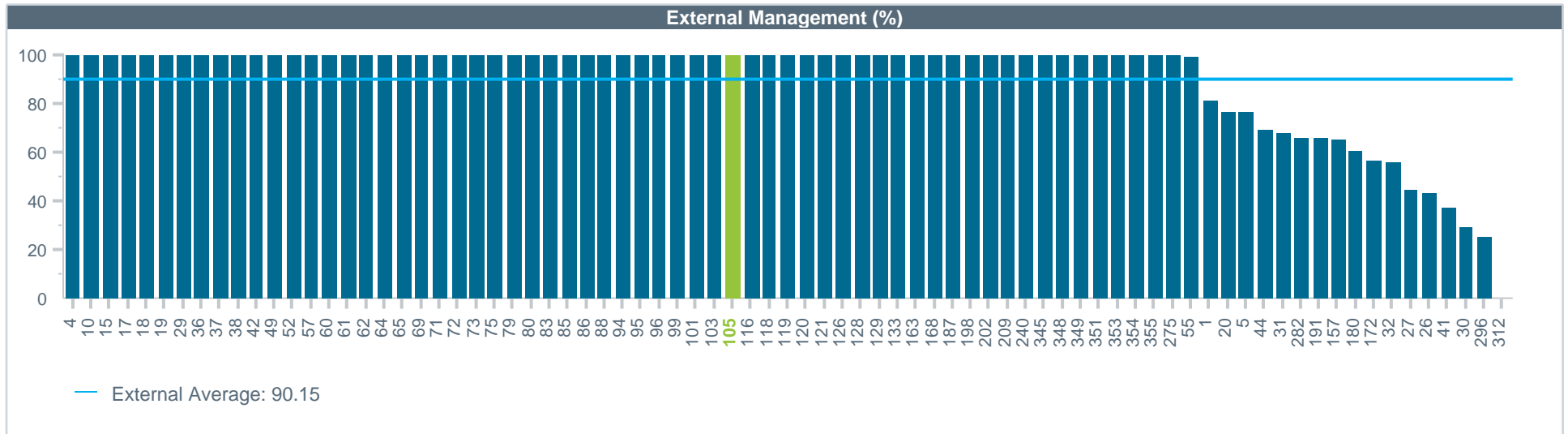


■ Universe: 79 funds



Portfolio Management

Percentage Externally Managed & Percentage Actively Managed



■ City of Milwaukee ERS



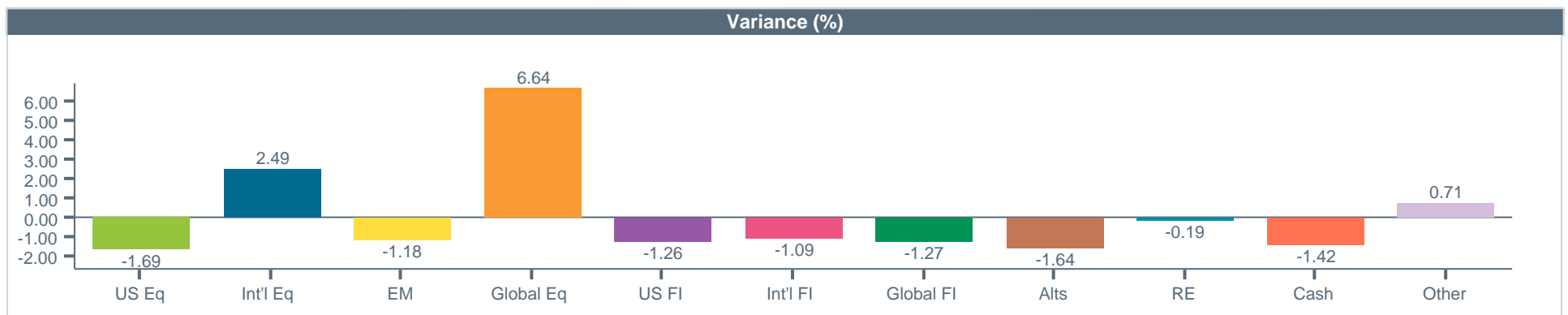
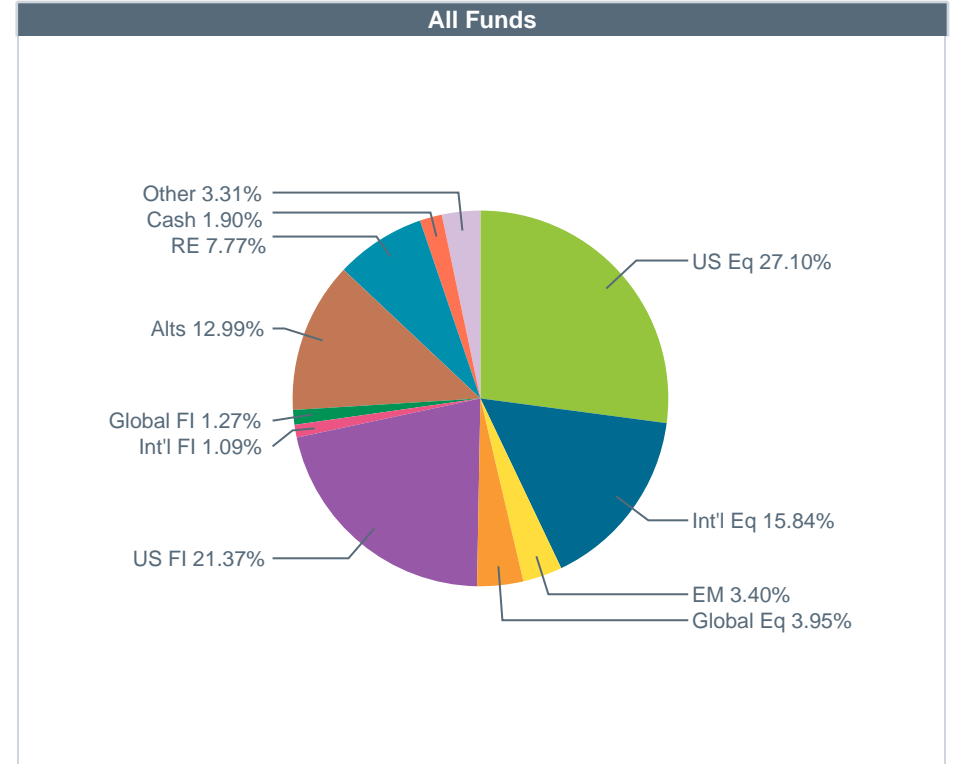
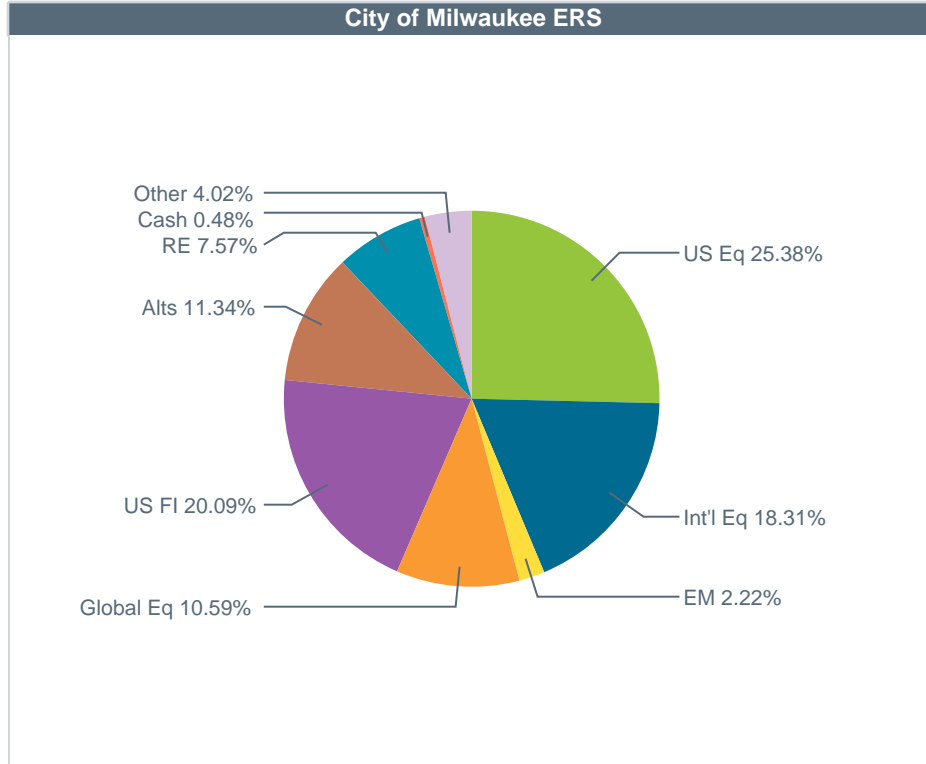
Asset Range	Actively Managed (%)	Passively Managed (%)	Externally Managed (%)	Internally Managed (%)
Over \$20B	74.88	25.12	75.88	24.12
\$10B-\$20B	70.66	29.34	84.00	16.00
\$5B-\$10B	71.13	28.87	97.67	2.33
\$1B-\$5B	74.13	25.87	98.83	1.17
\$500mm-\$1B	72.74	27.26	99.88	0.12
Under \$500mm	82.63	17.37	100.00	0.00
<b>City of Milwaukee ERS</b>	<b>79.27</b>	<b>20.73</b>	<b>100.00</b>	<b>0.00</b>

Portfolio (%)	Active Management		External Management	
	Public Fund Universe	City of Milwaukee ERS	Public Fund Universe	City of Milwaukee ERS
90 to 100	10	0	62	1
50 to 89	64	1	11	0
10 to 49	4	0	5	0
Less than 10	1	0	1	0
<b>Total Funds Reporting</b>	<b>79</b>	<b>1</b>	<b>79</b>	<b>1</b>



Asset Allocation

City of Milwaukee ERS vs. Average of All Funds

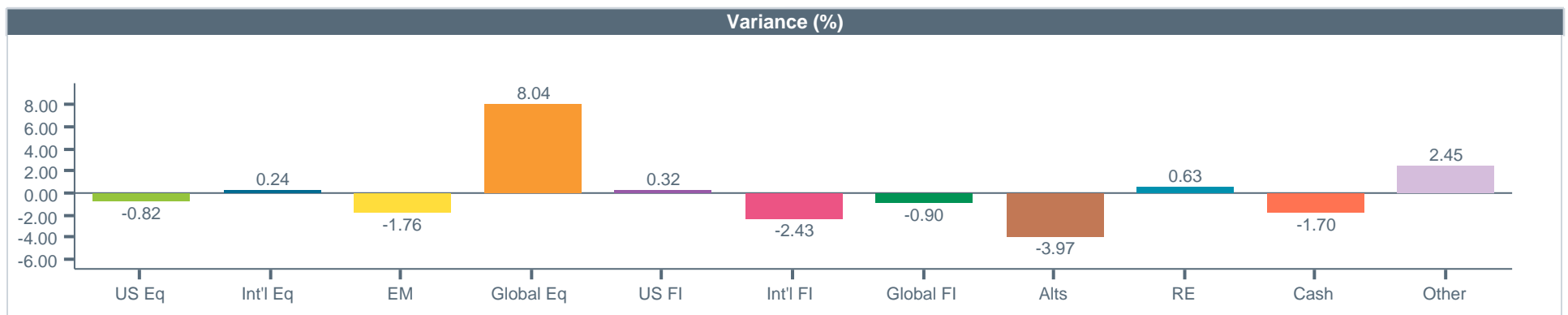
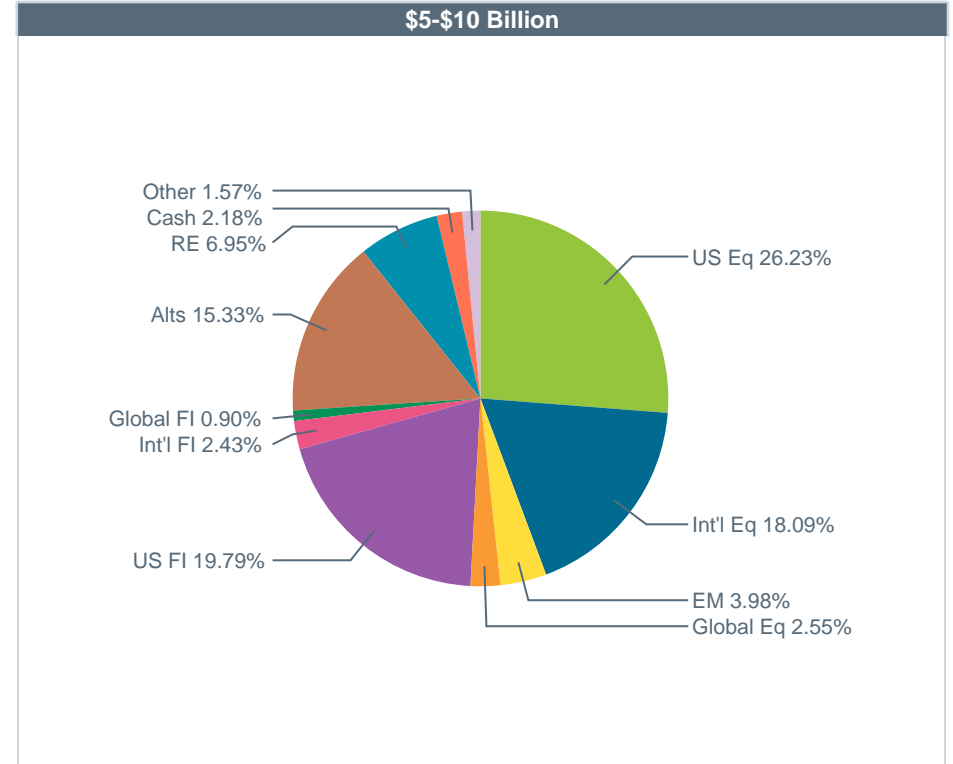
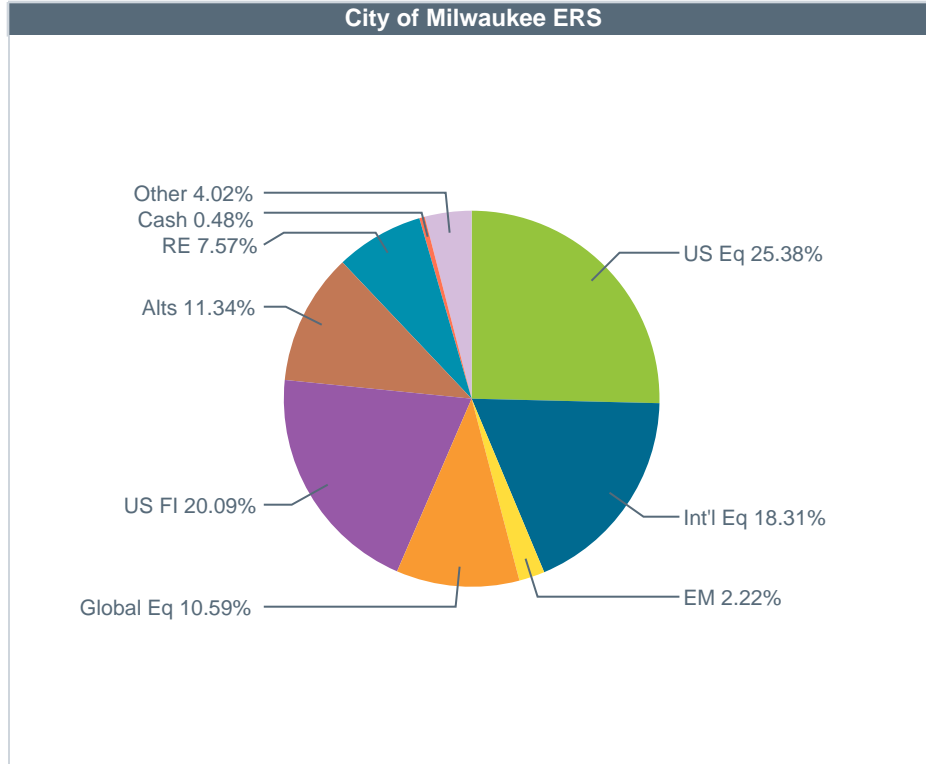


Allocations shown may not sum up to 100% exactly due to rounding.



Asset Allocation

City of Milwaukee ERS vs. Average of Similar Size Funds



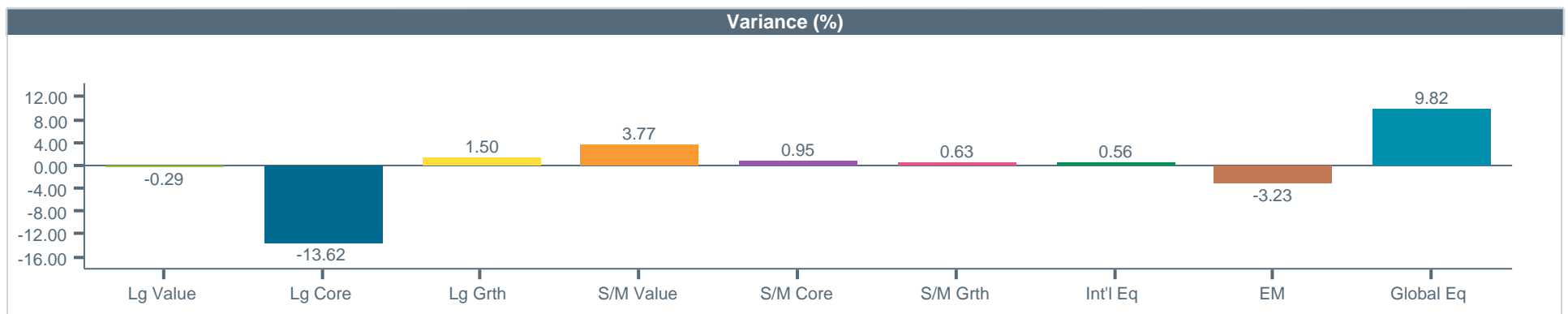
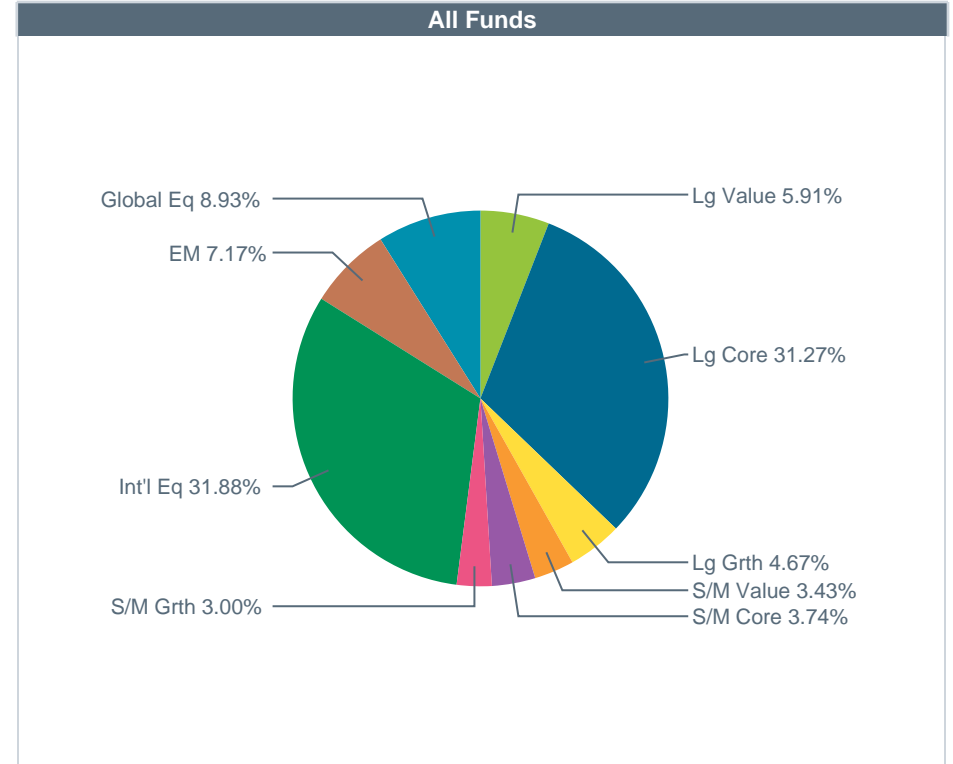
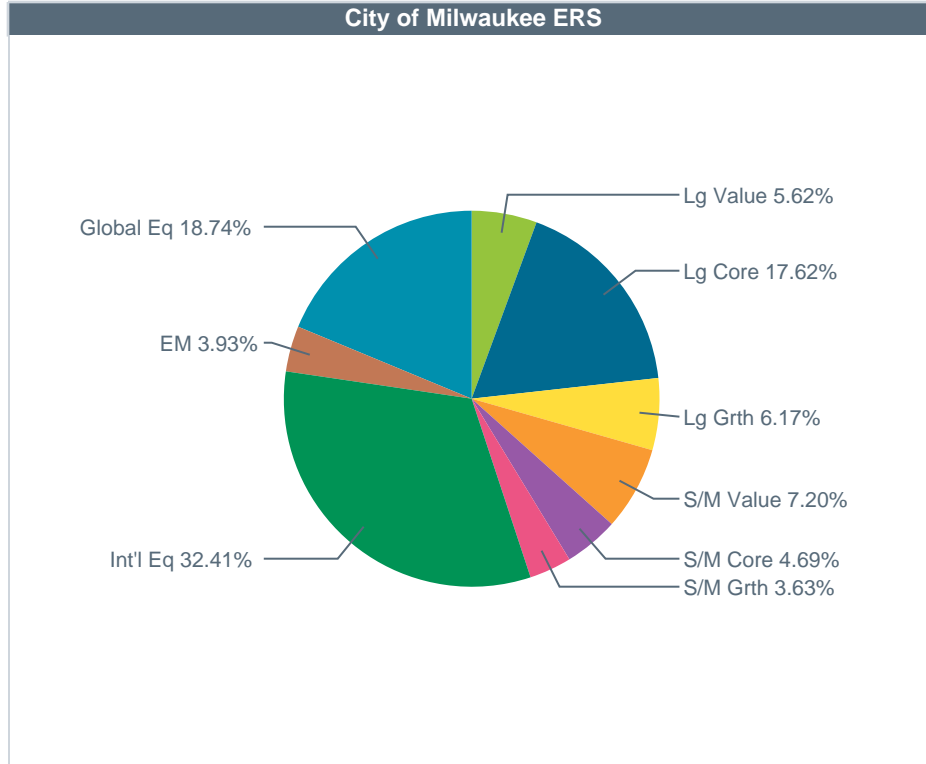
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Equity Style Allocation

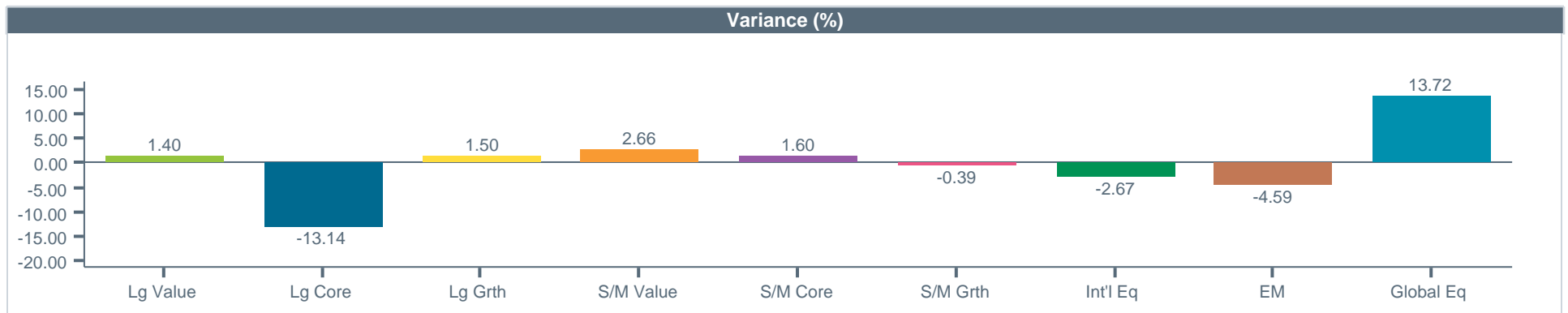
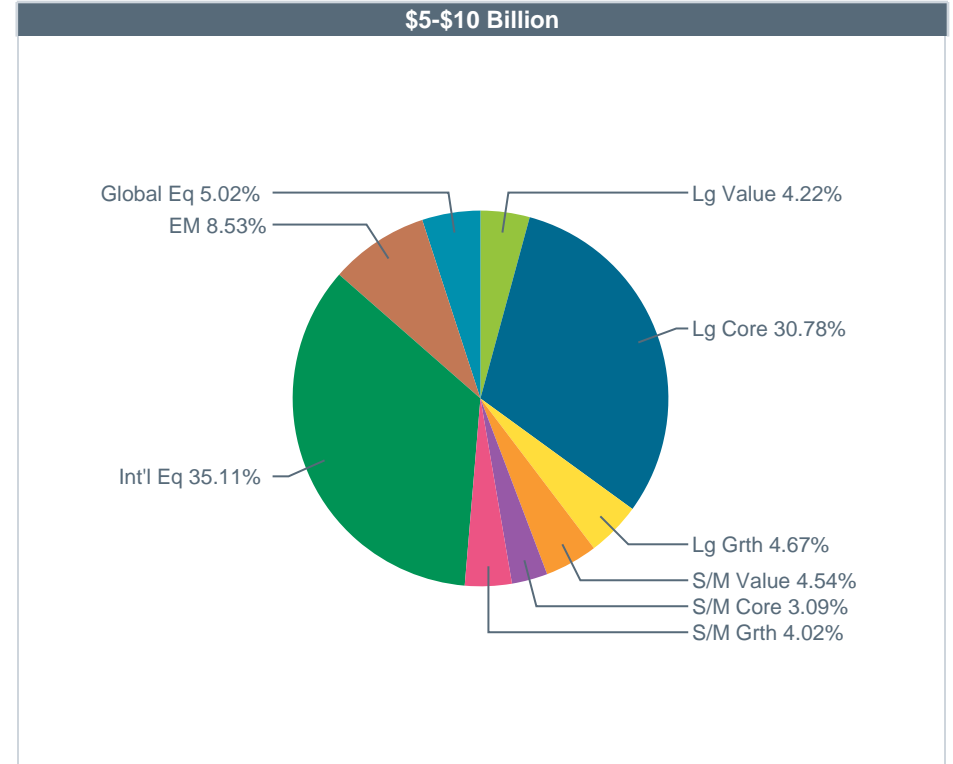
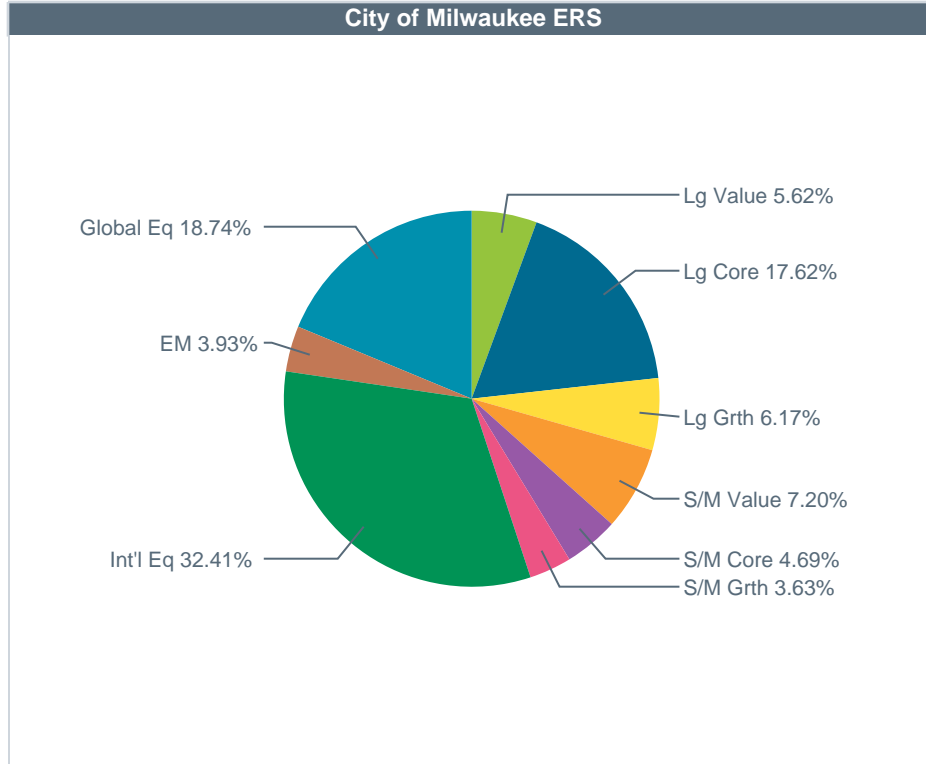
City of Milwaukee ERS vs. Average of All Funds



Allocations shown may not sum up to 100% exactly due to rounding.



City of Milwaukee ERS vs. Average of Similar Size Funds

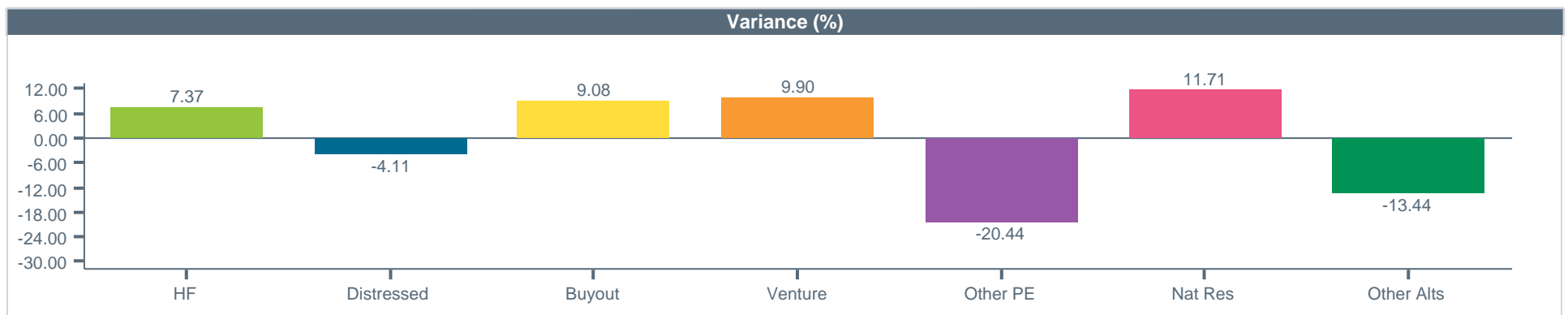
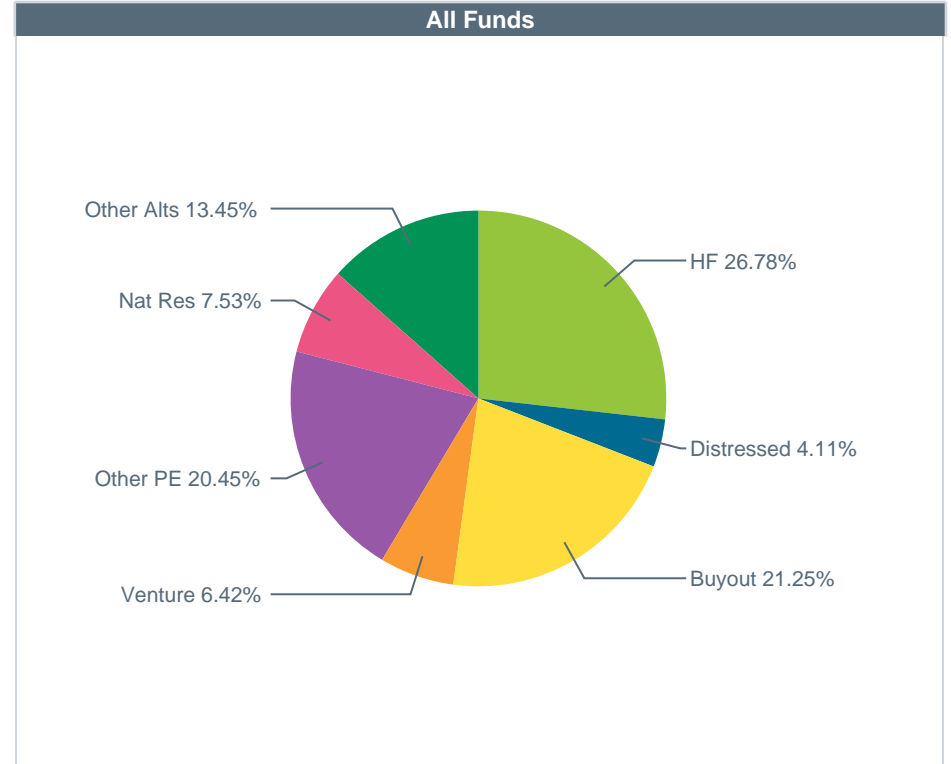
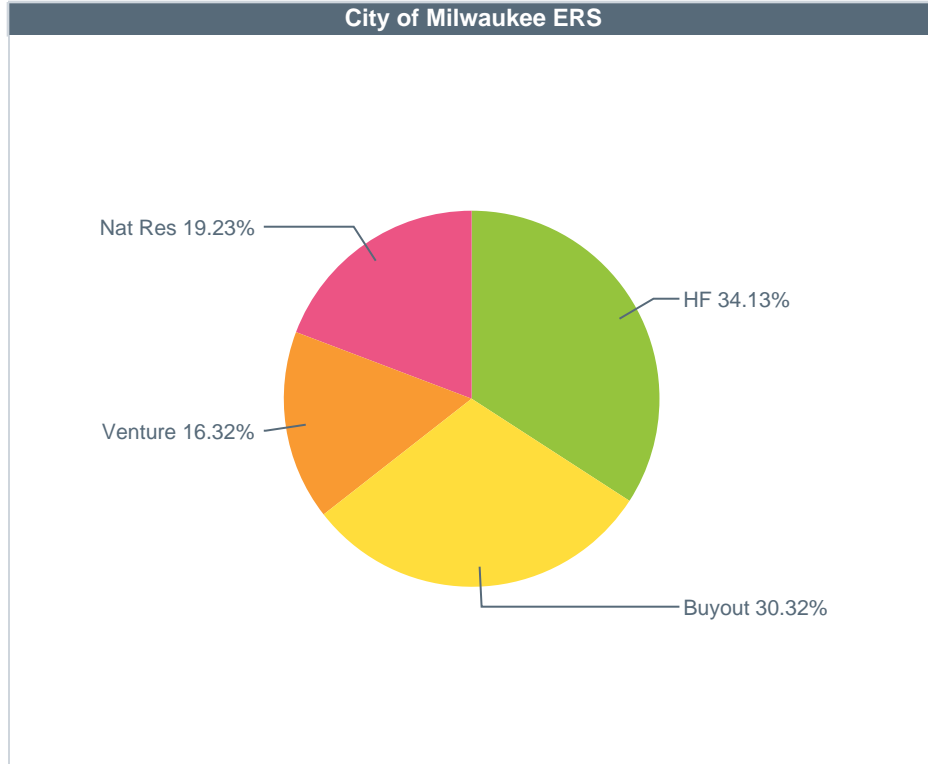


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Alternatives Style Allocation

City of Milwaukee ERS vs. Average of All Funds

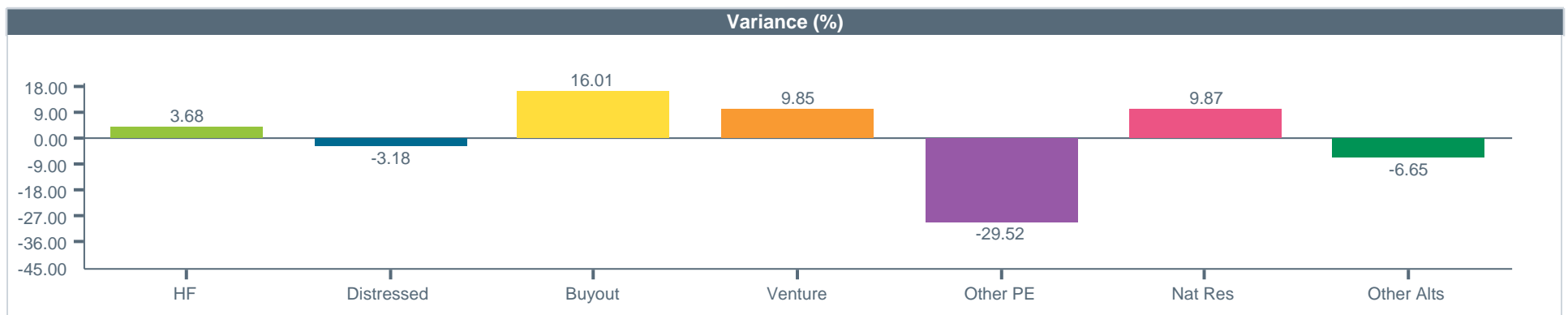
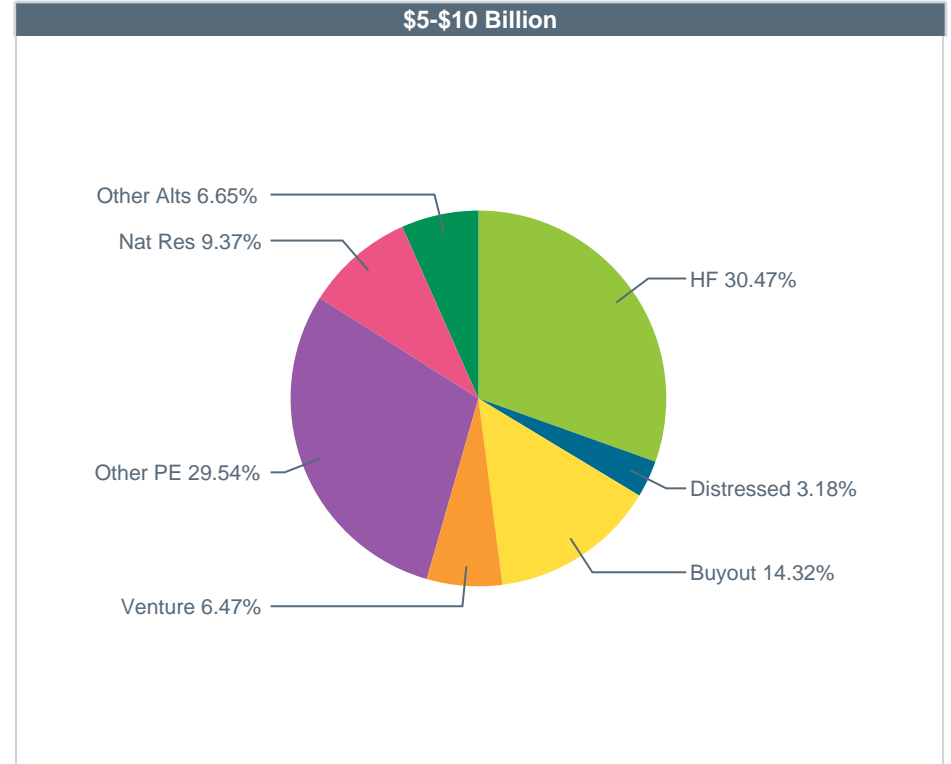
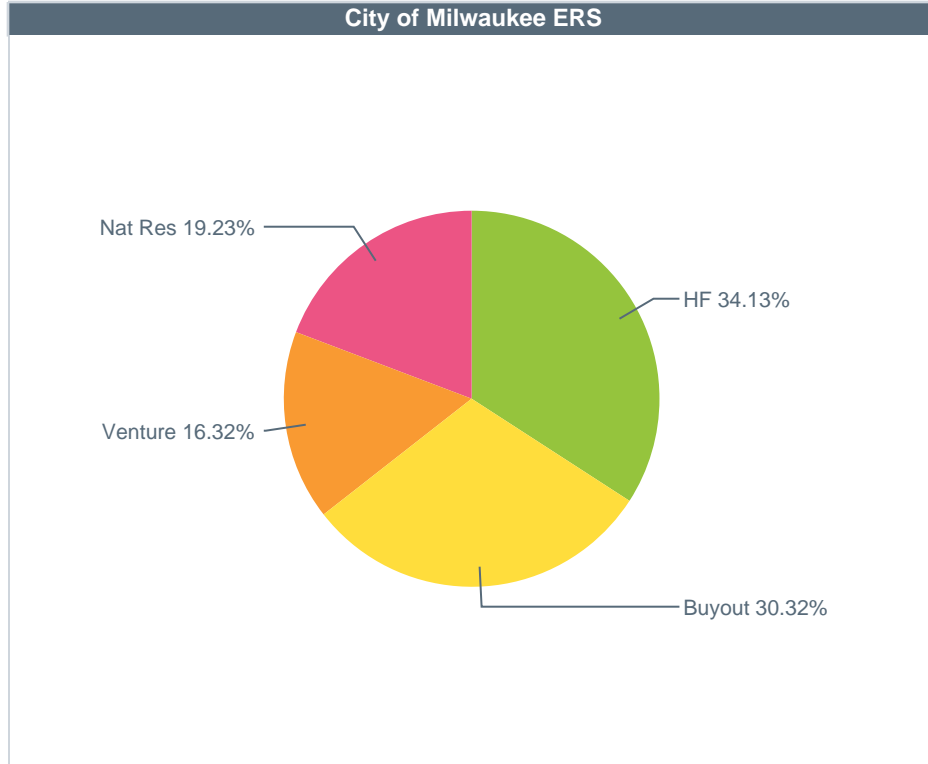


Allocations shown may not sum up to 100% exactly due to rounding.



Alternatives Style Allocation

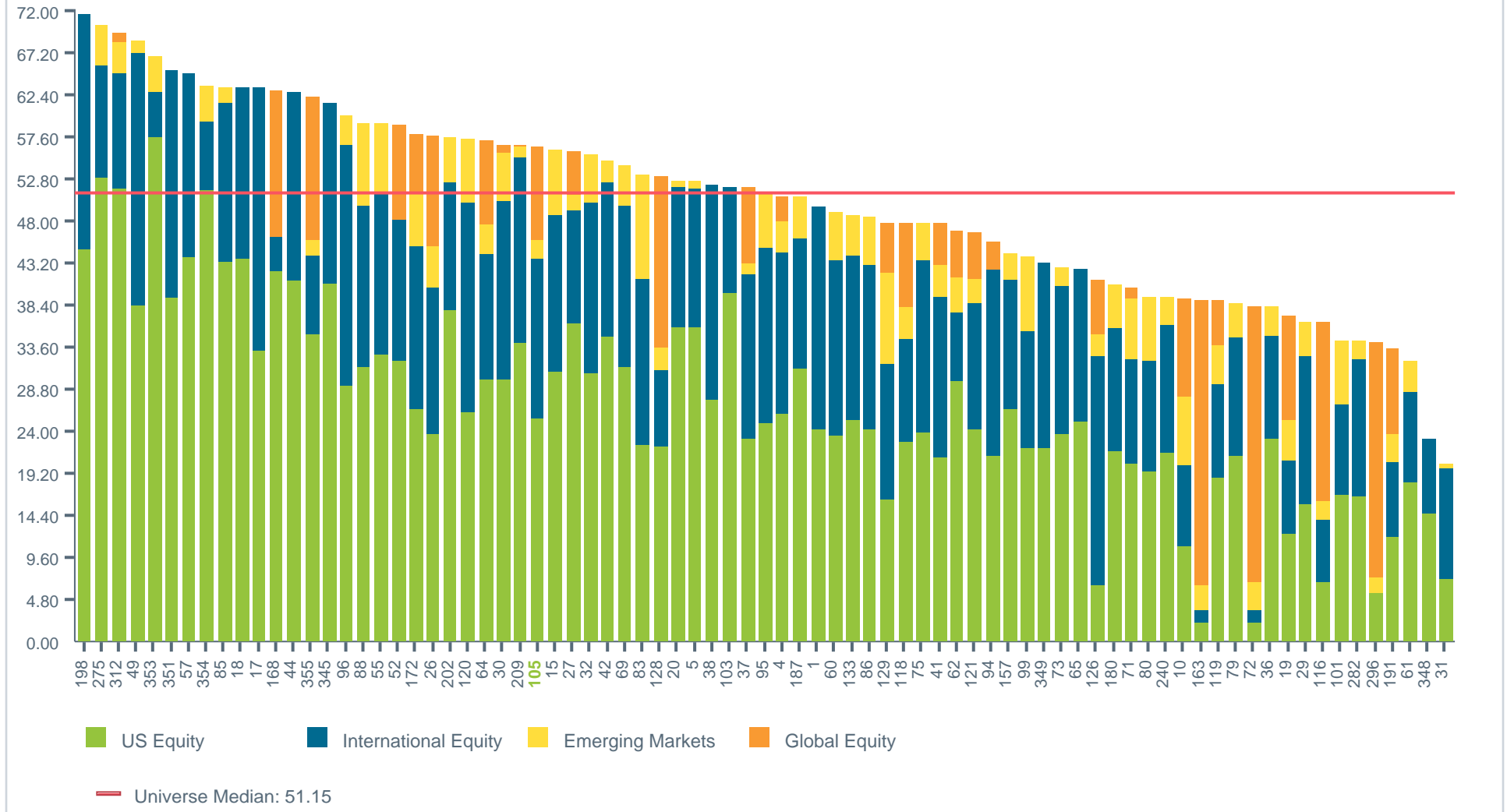
City of Milwaukee ERS vs. Average of Similar Size Funds

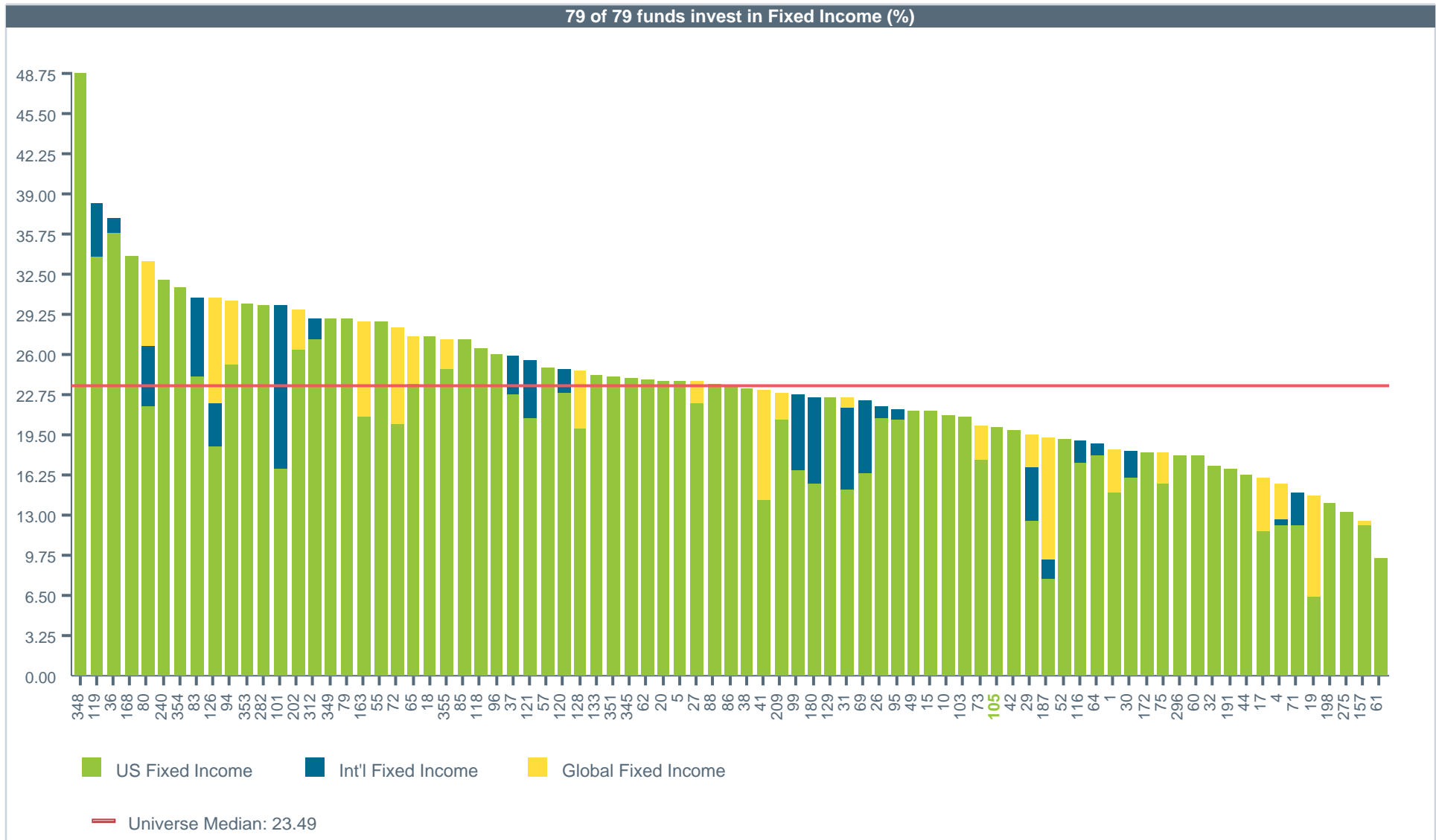


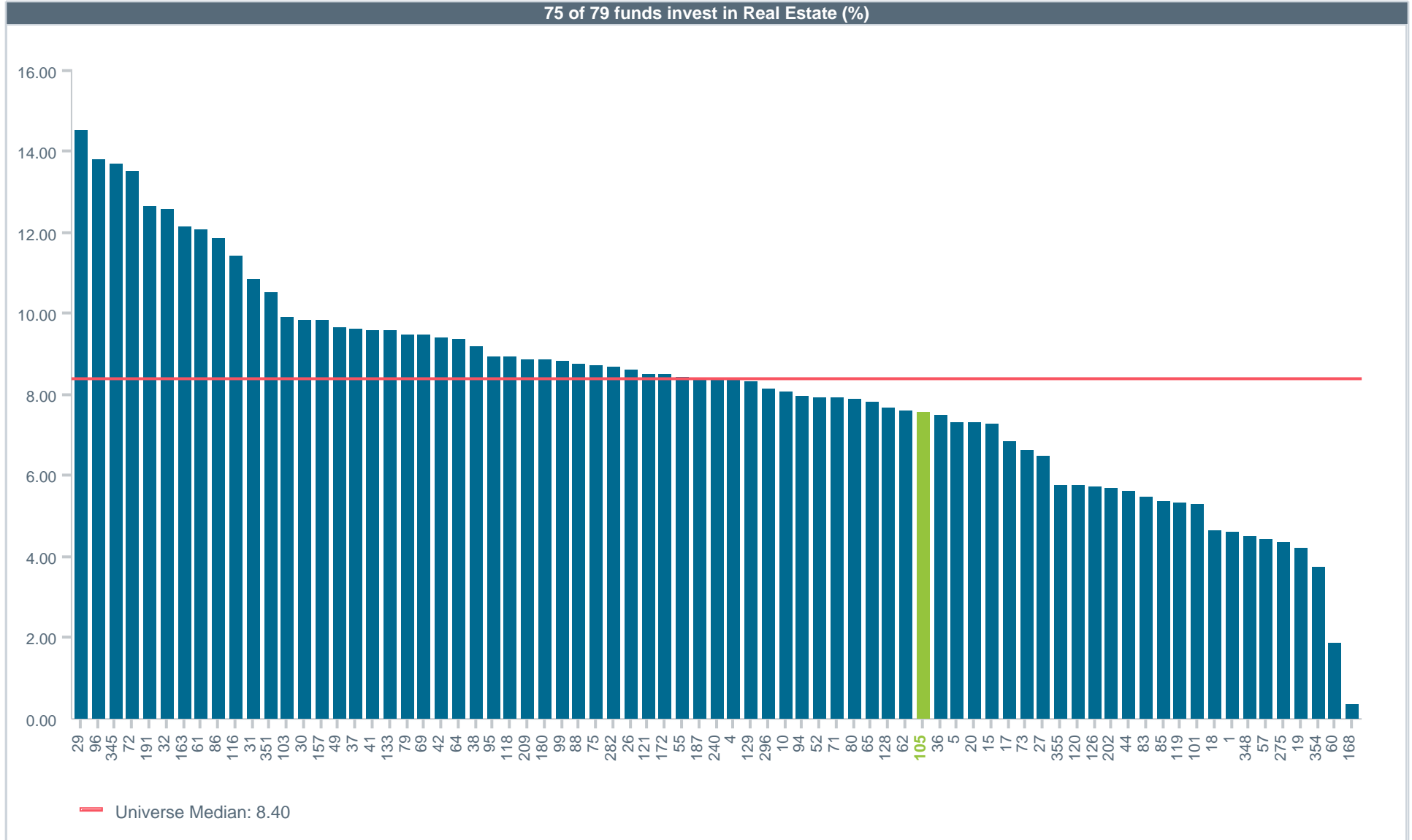
Allocations shown may not sum up to 100% exactly due to rounding.



79 of 79 funds invest in Equity (%)



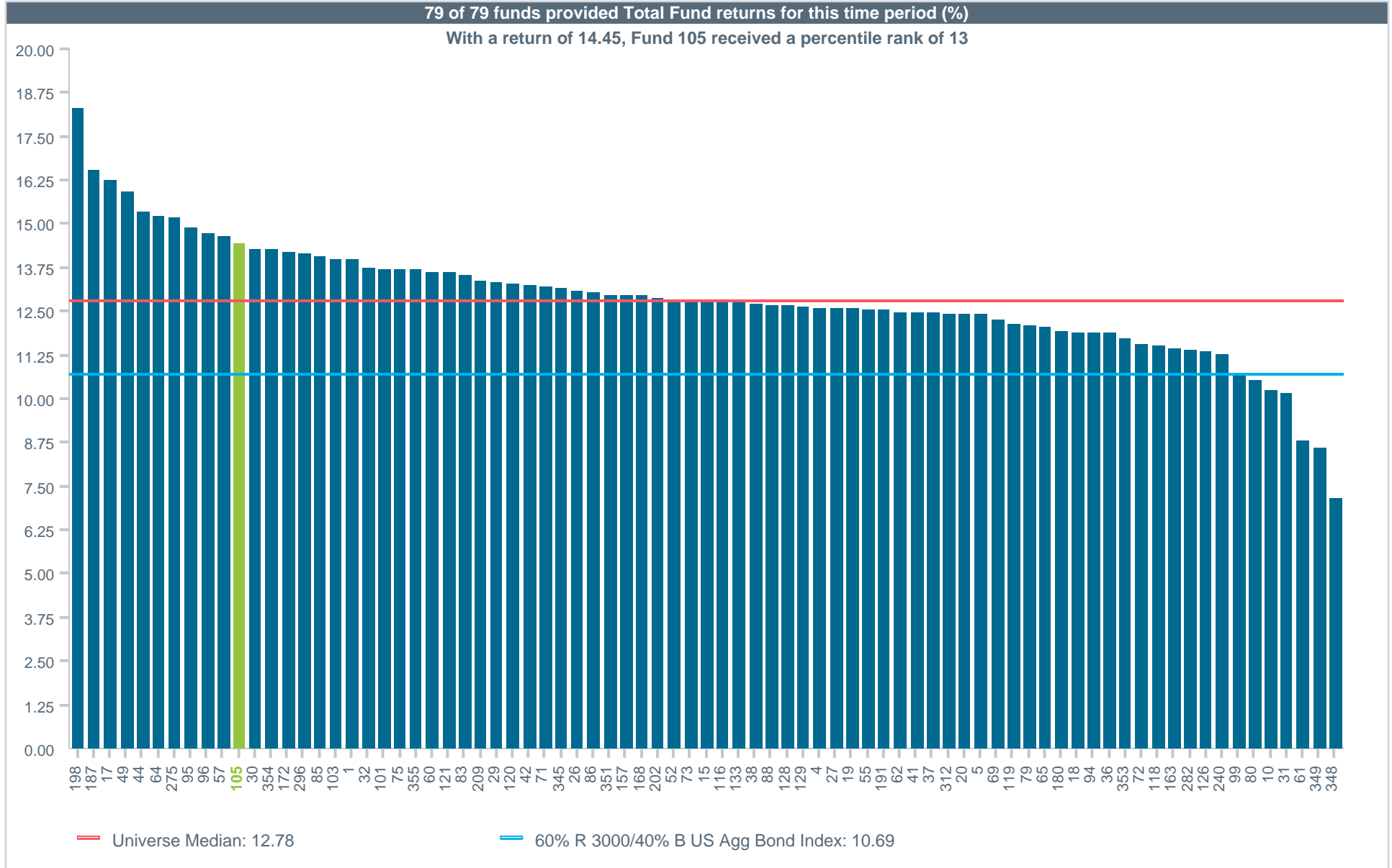




72 of 79 funds invest in Alternatives (%)

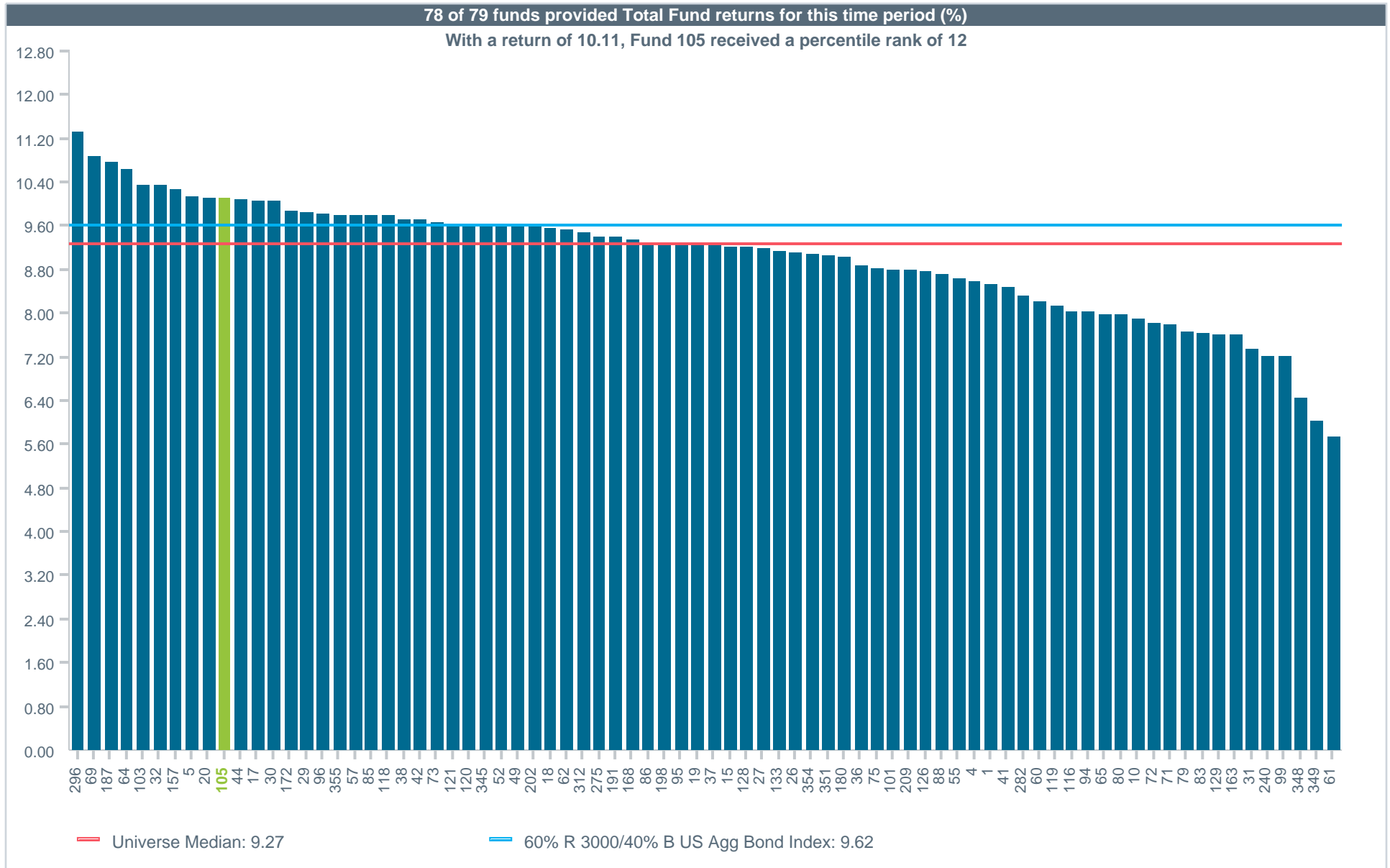






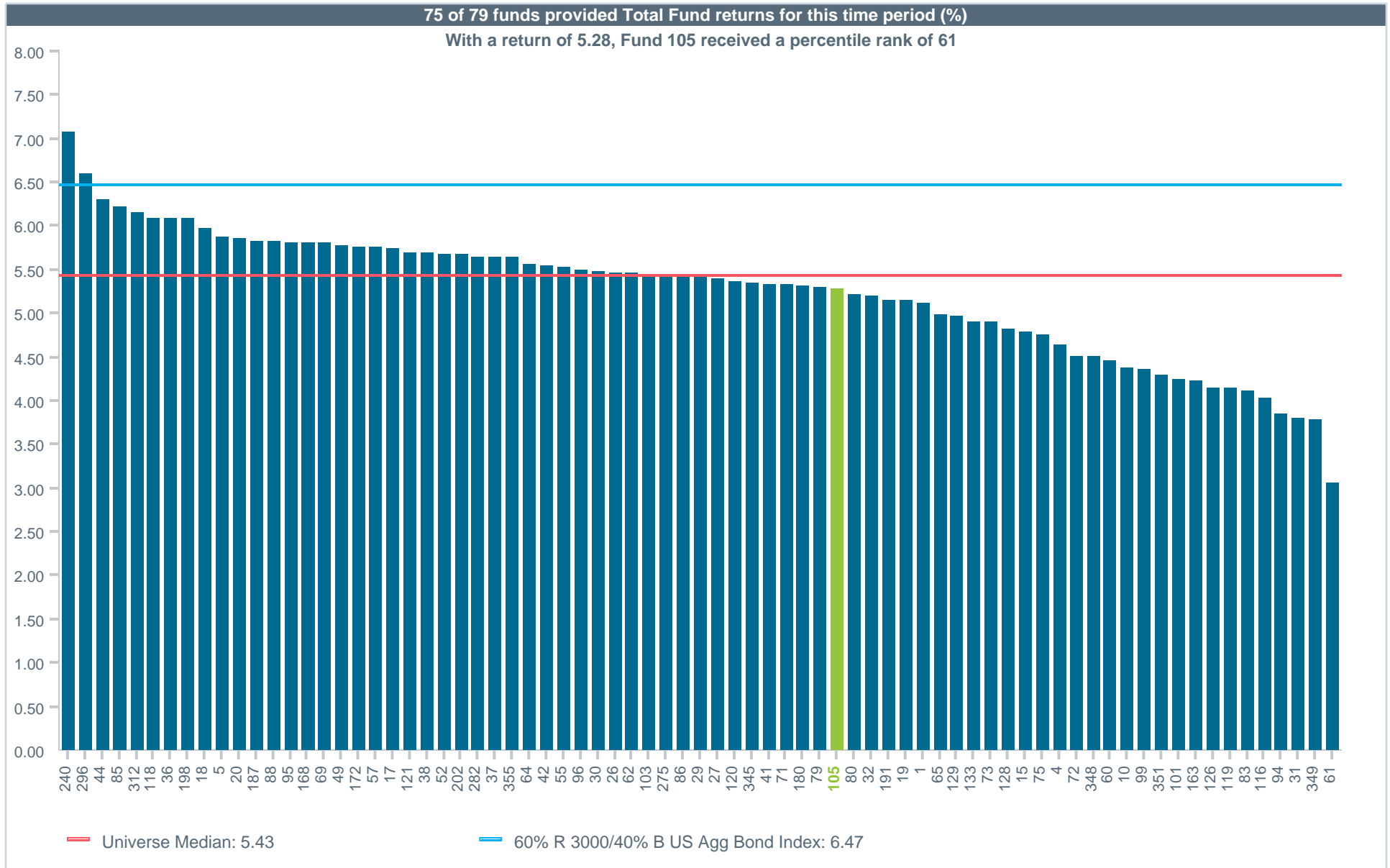
Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.



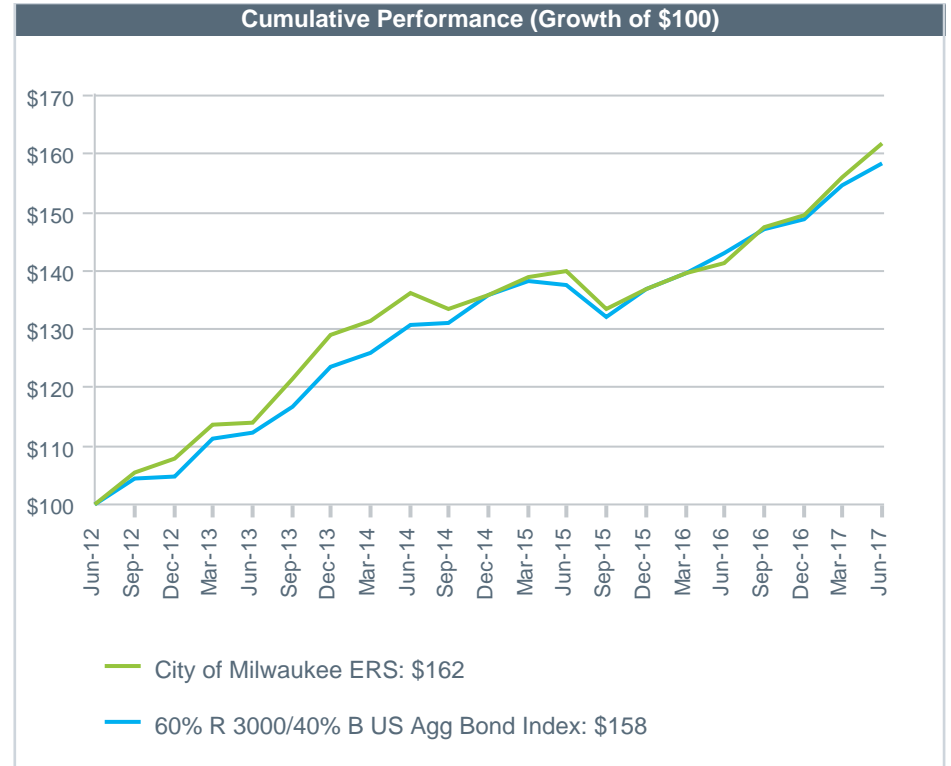
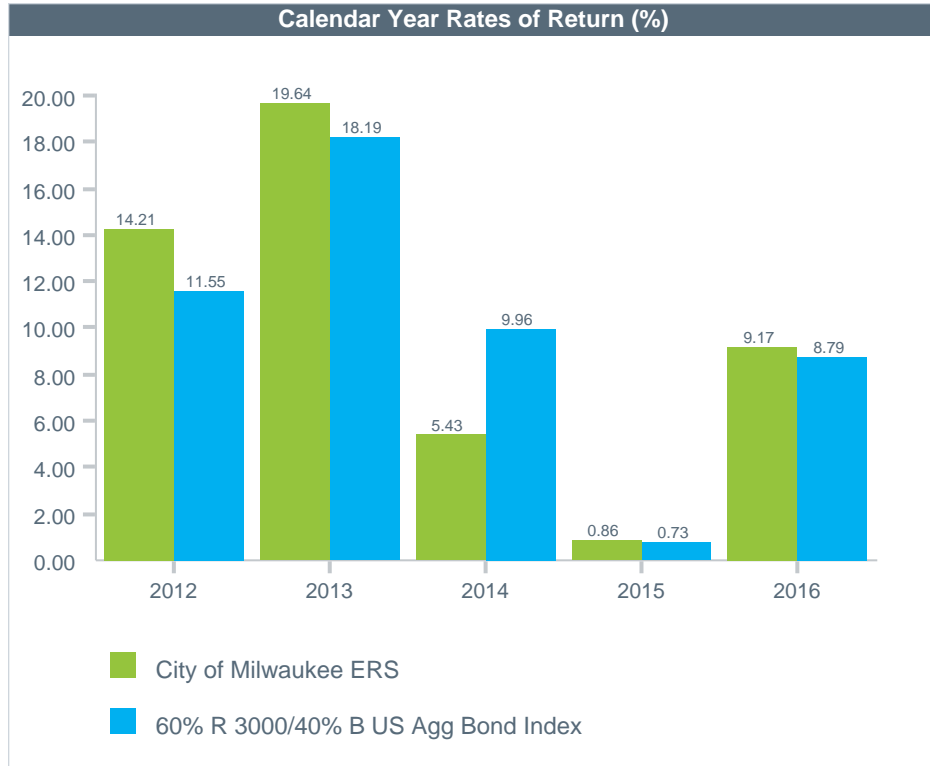


Funds with less history than the specified time period will not appear in the chart.



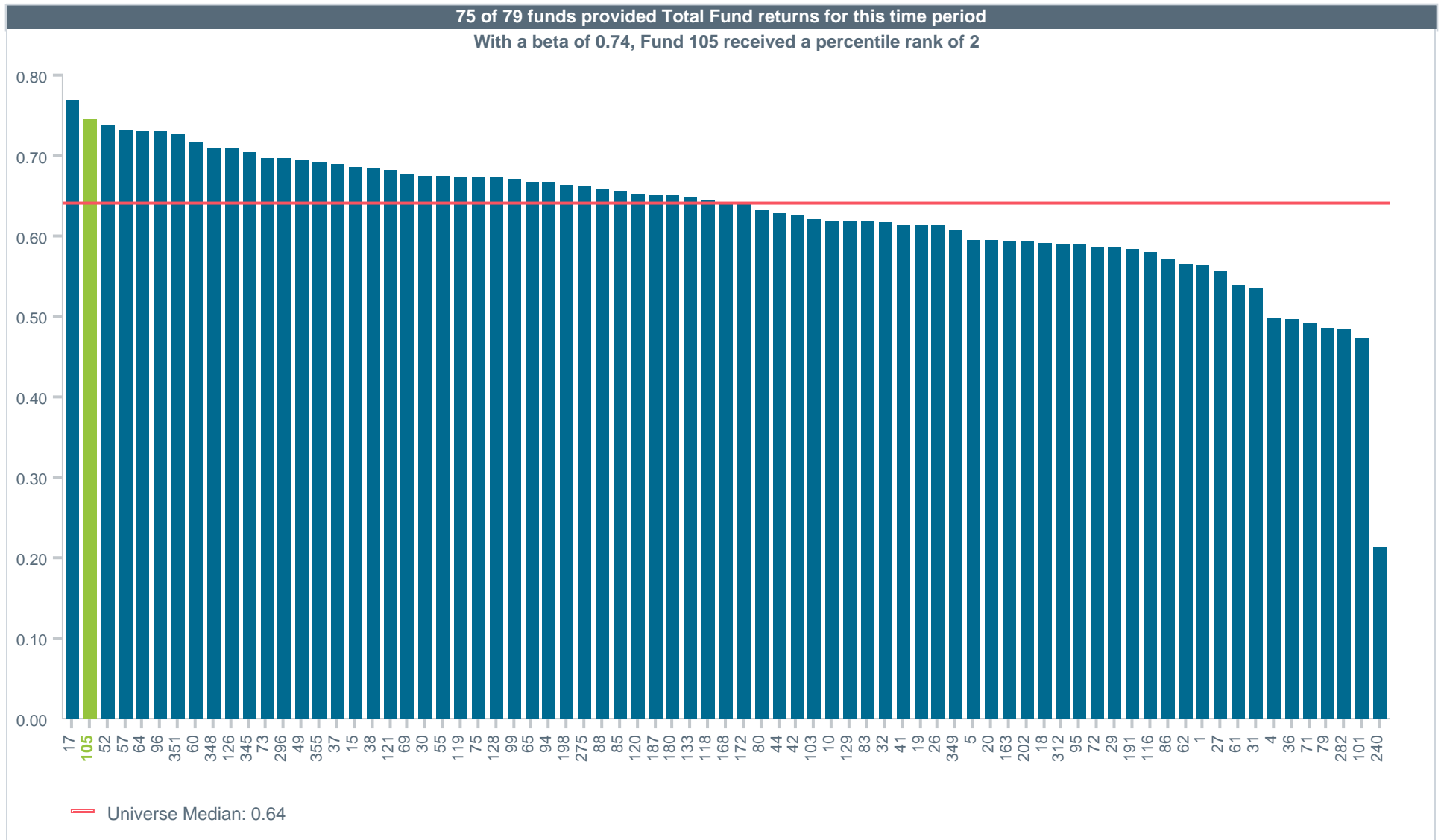
Total Return - Total Fund

City of Milwaukee ERS vs. 60% R 3000/40% B US Agg Bond Index



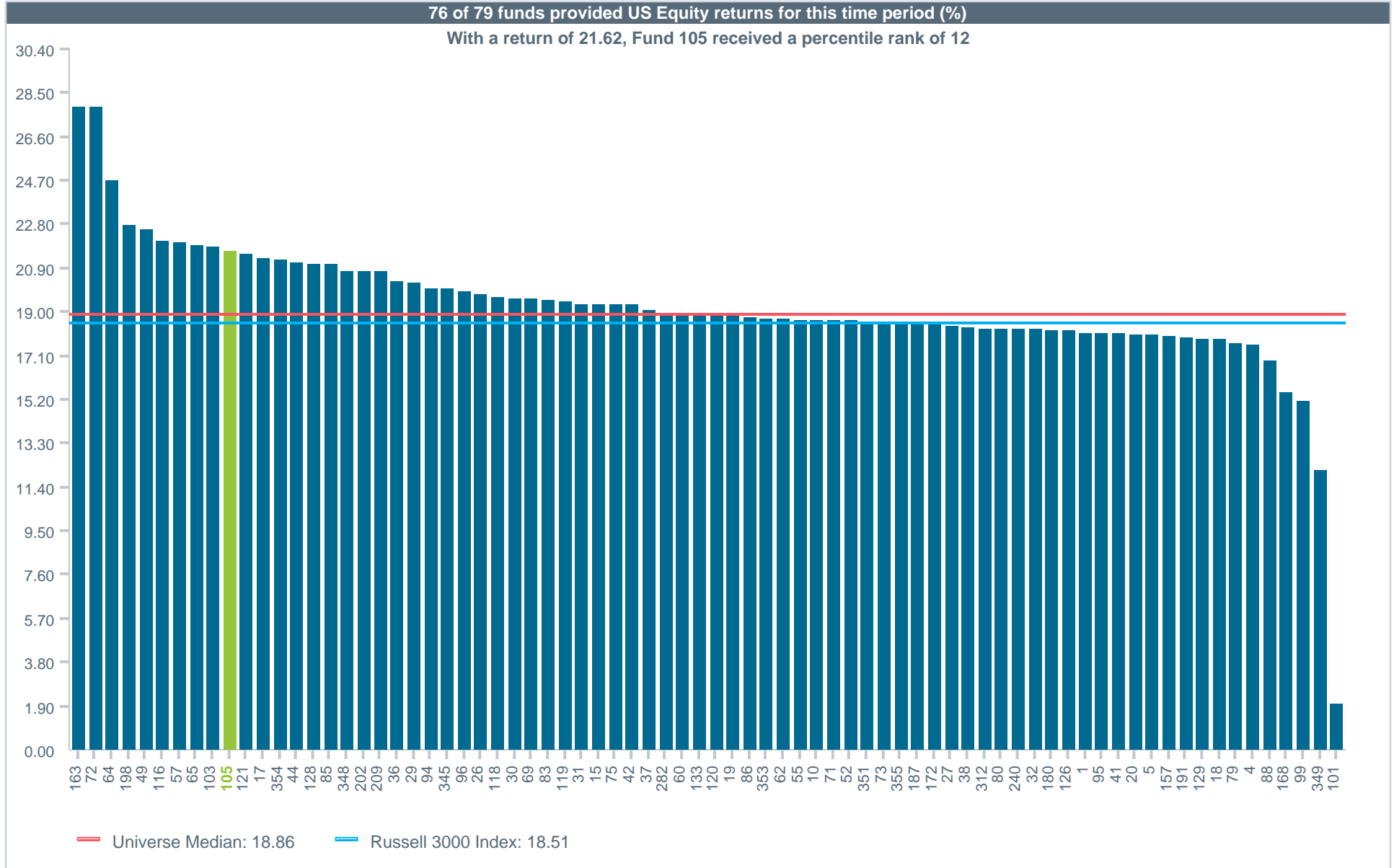
Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	14.45	5.89	10.11
60% R 3000/40% B US Agg Bond Index	10.69	6.56	9.62
Variance	3.76	-0.67	0.49





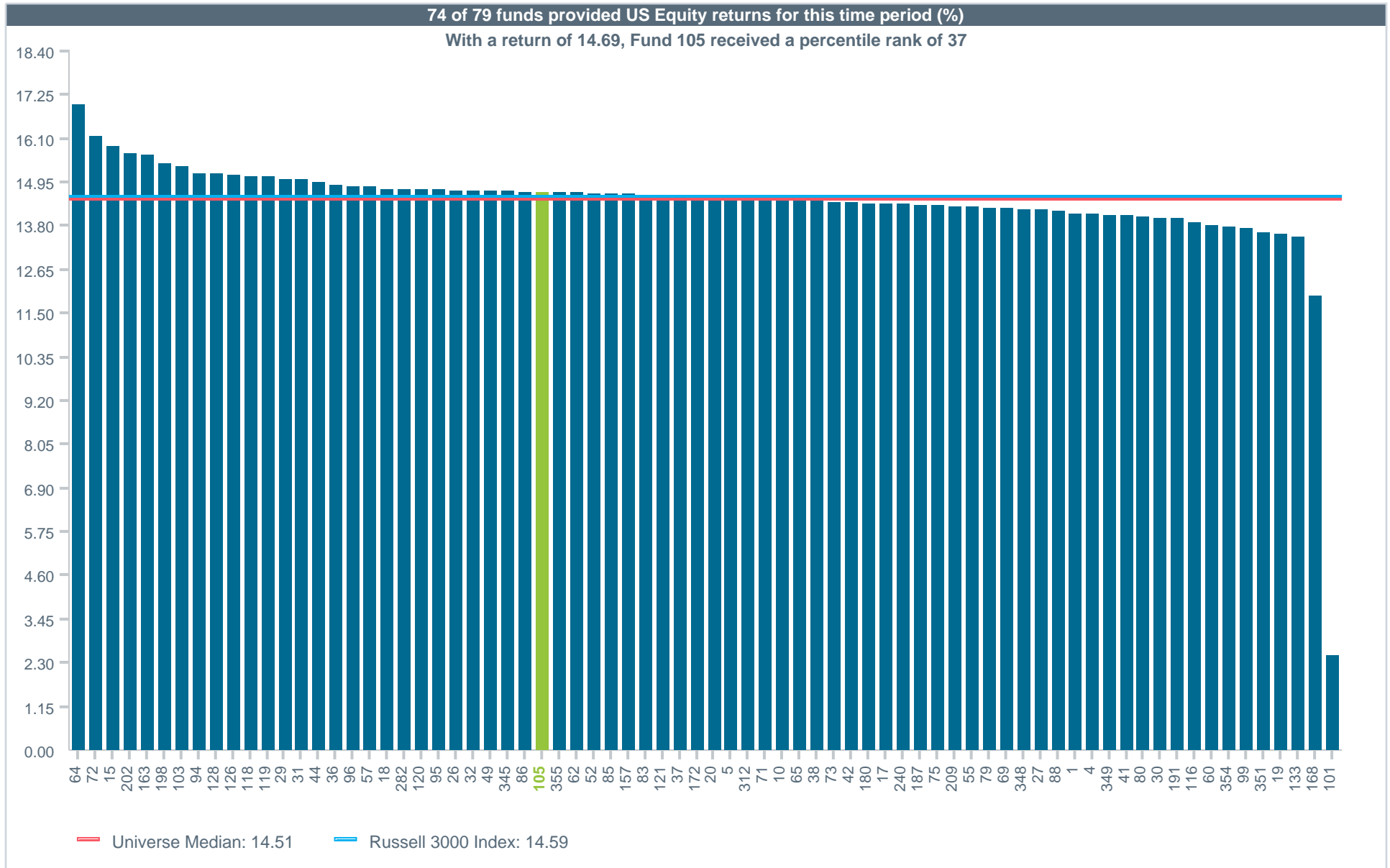
Funds with less history than the specified time period will not appear in the chart. Benchmark used is the S&P 500 Index (Cap Wtd).





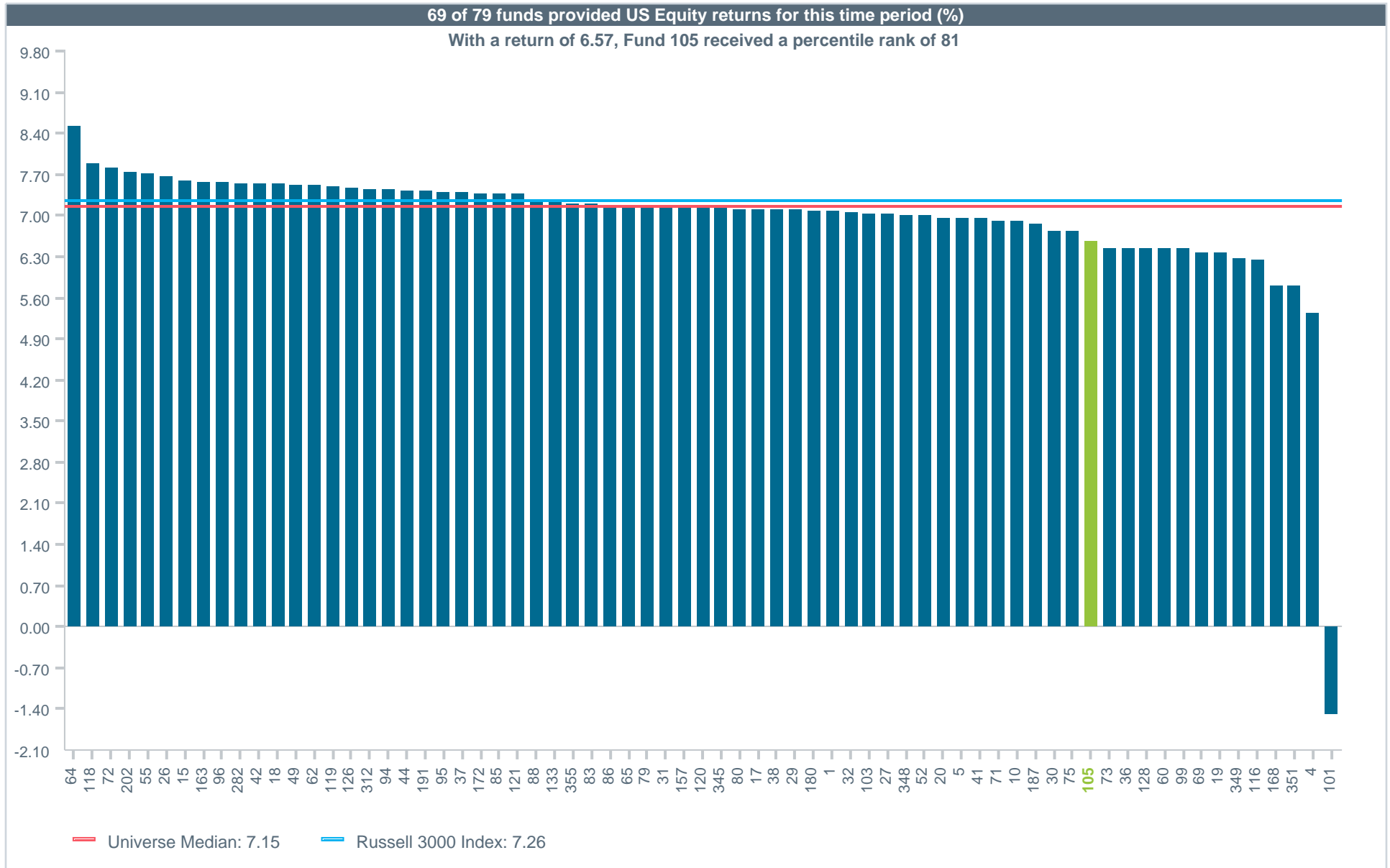
Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.





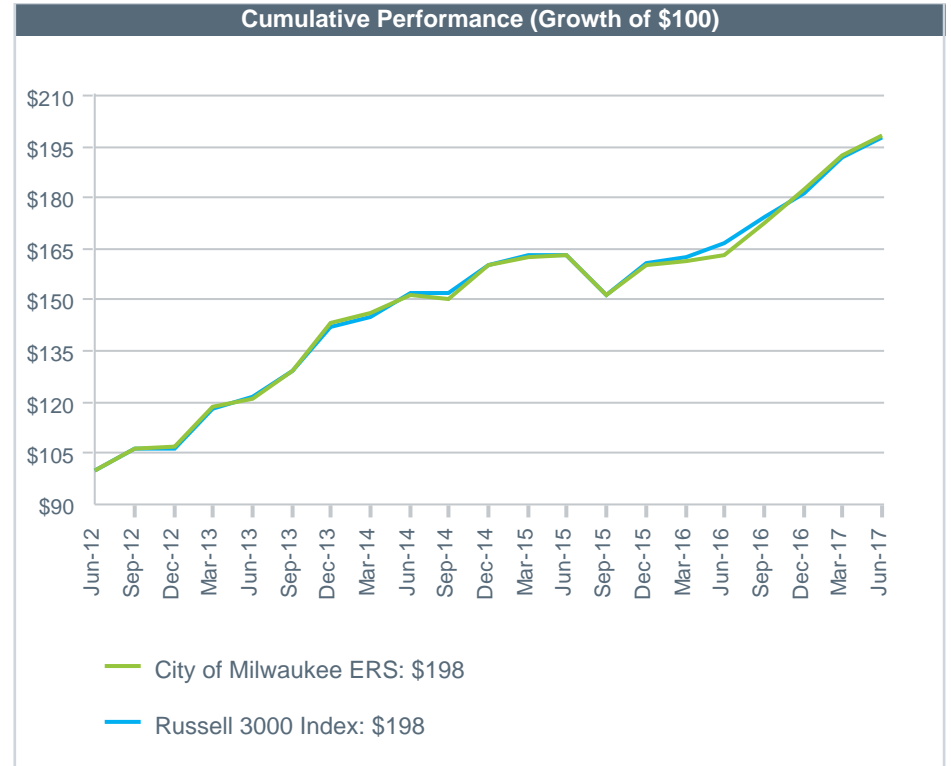
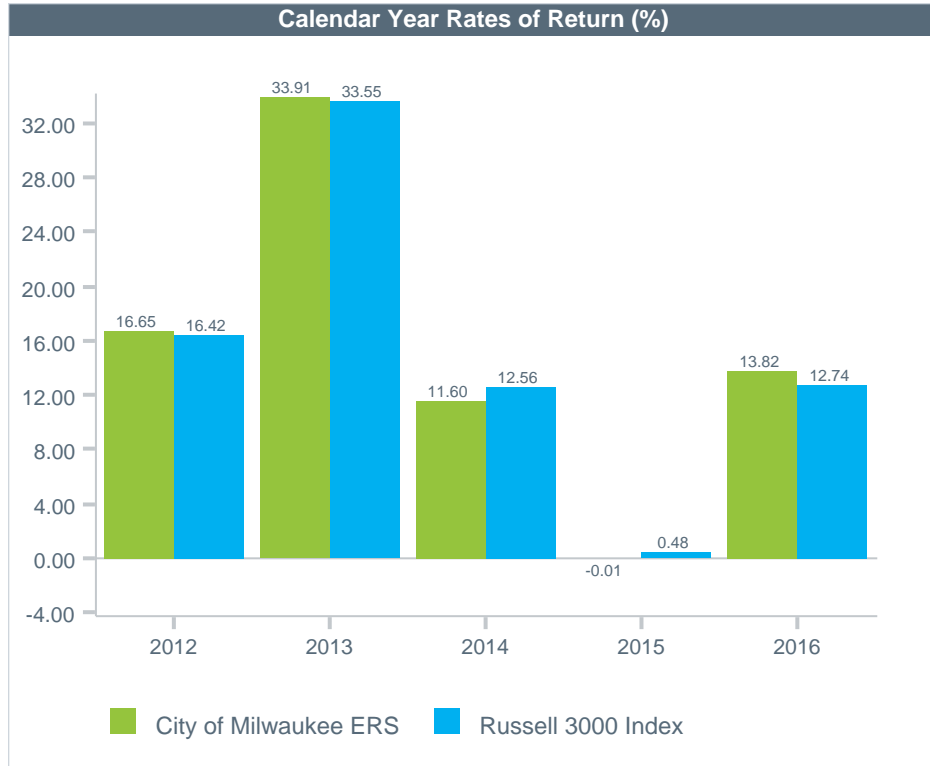
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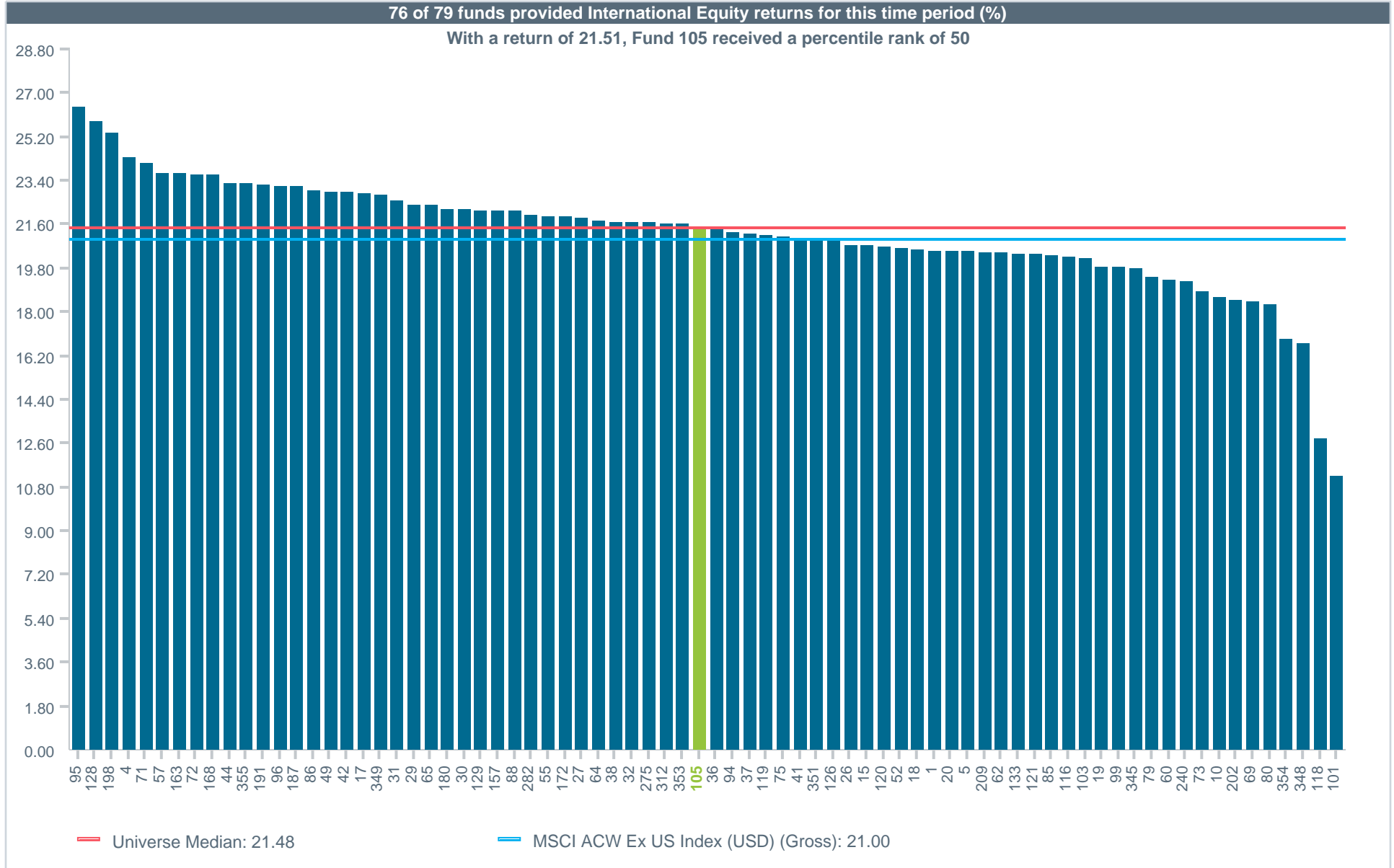
Total Return - US Equity

City of Milwaukee ERS vs. Russell 3000 Index



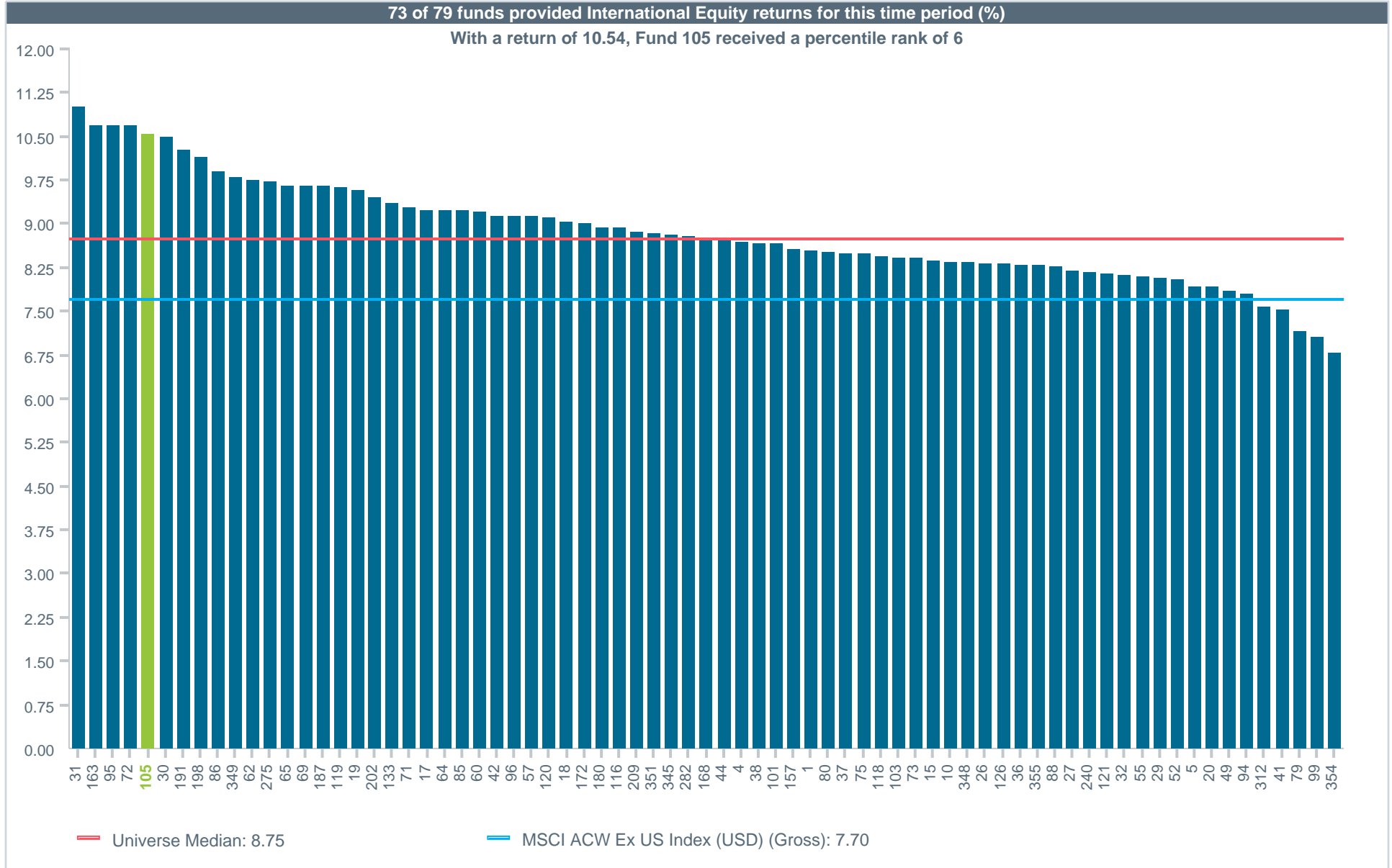
Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	21.62	9.38	14.69
Russell 3000 Index	18.51	9.10	14.58
Variance	3.11	0.28	0.11





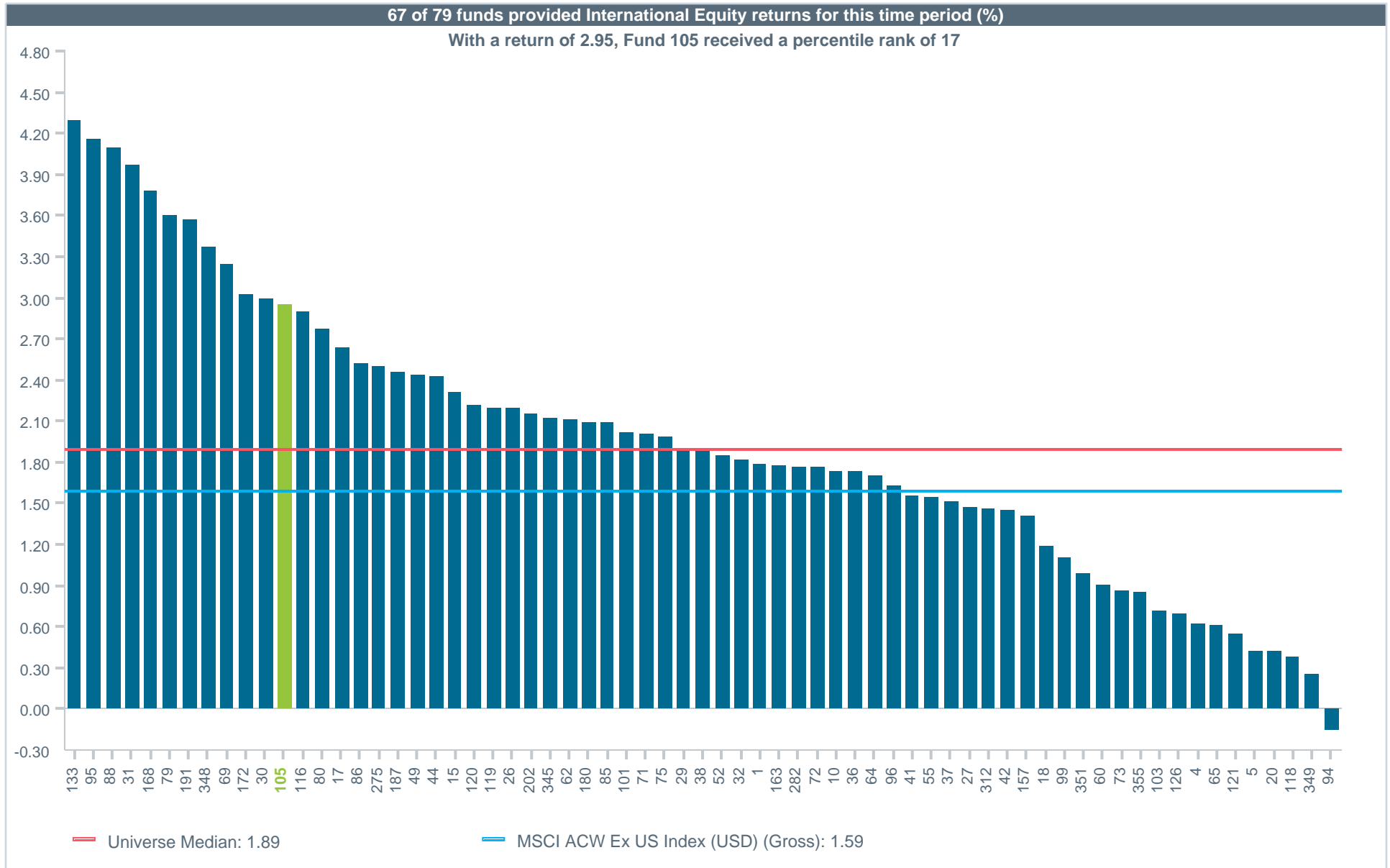
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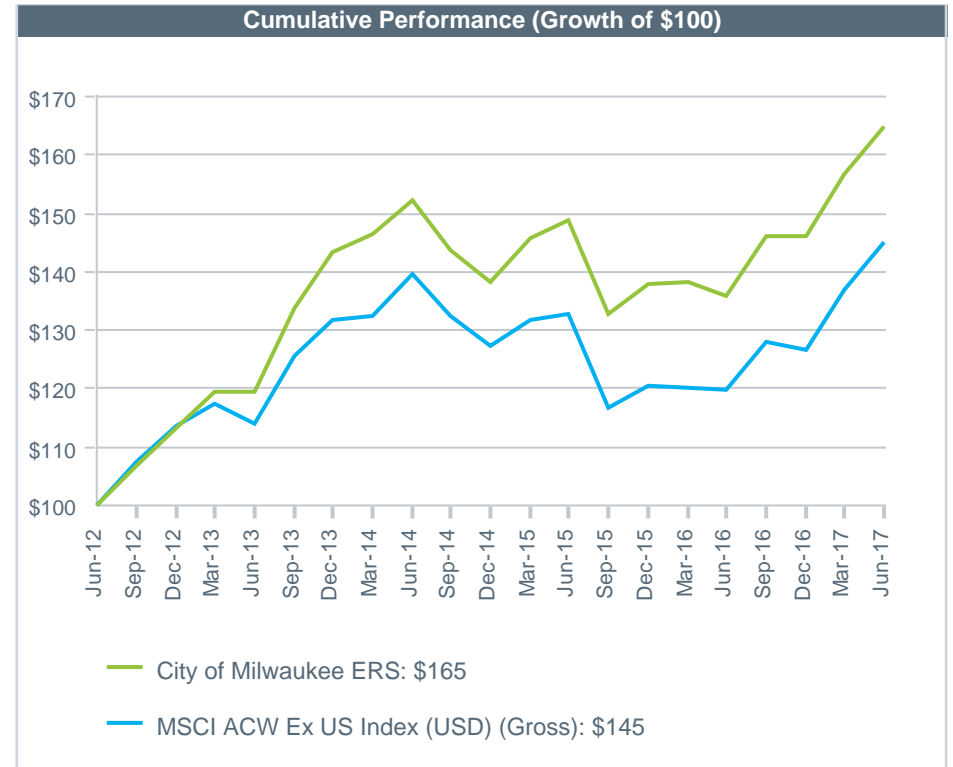
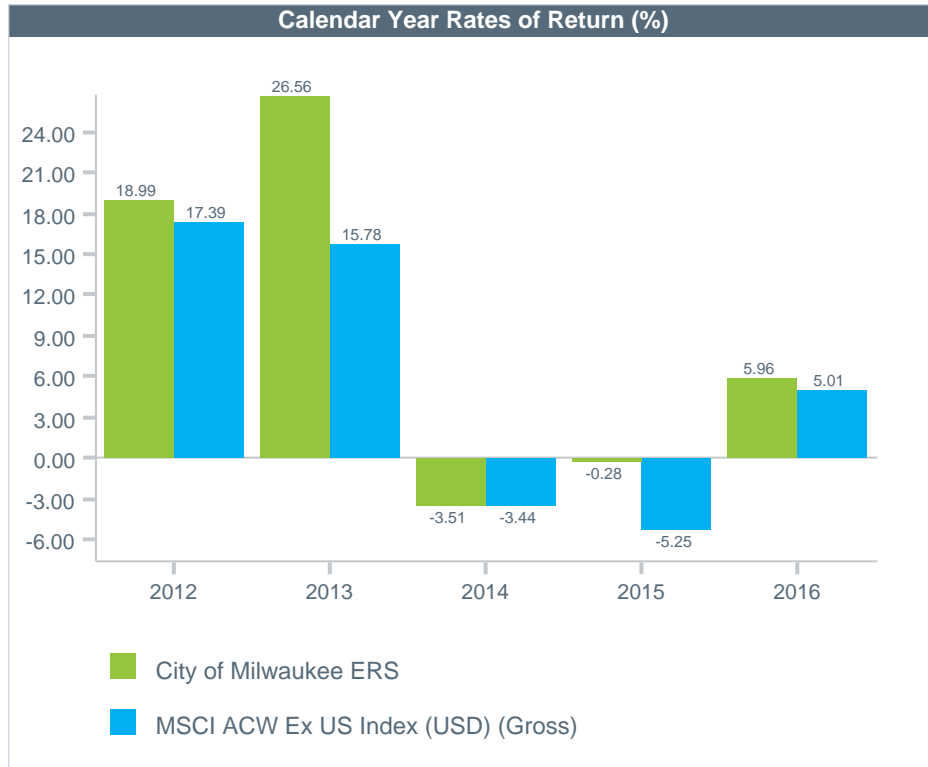


Funds with less history than the specified time period will not appear in the chart.



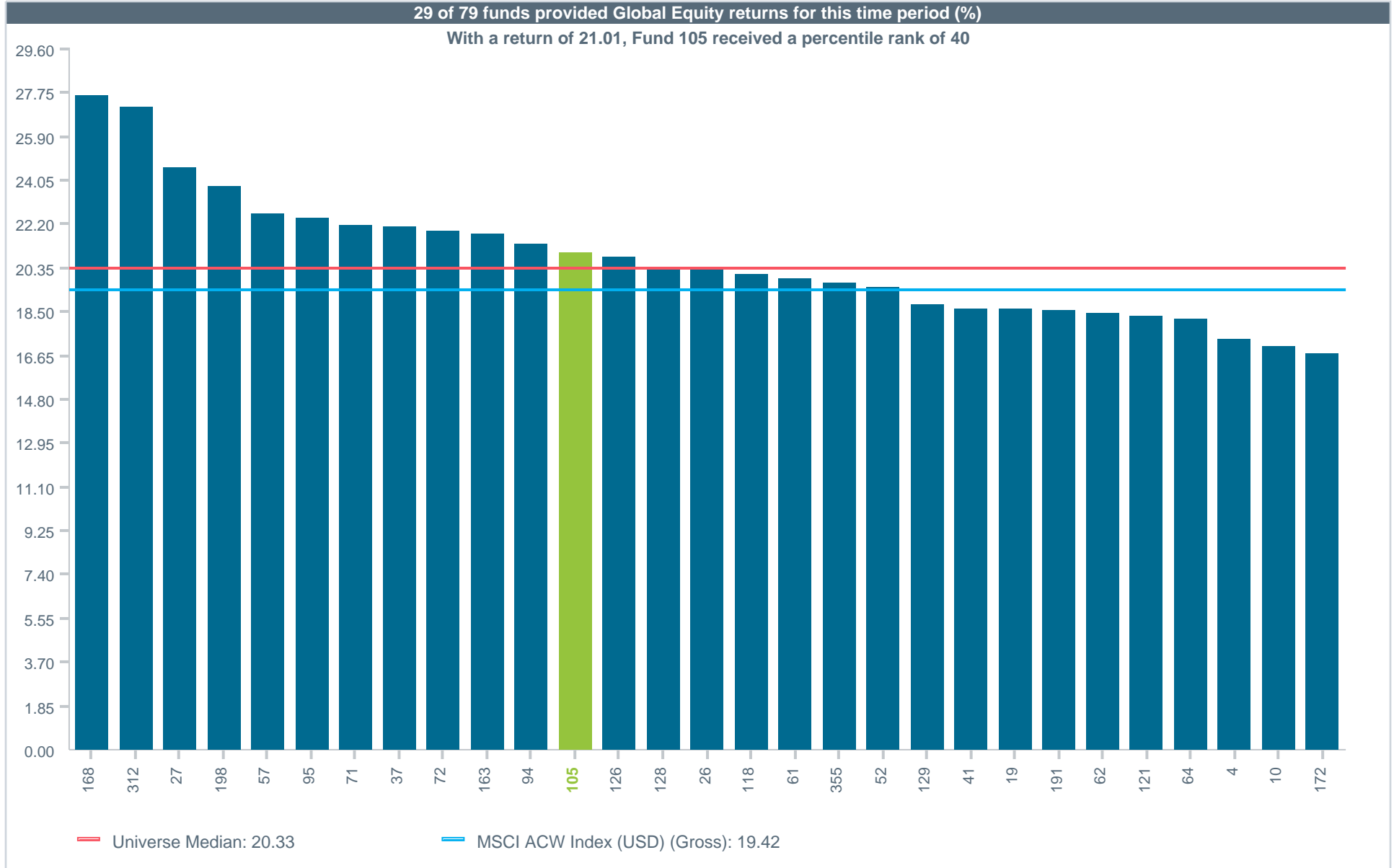
Total Return - International Equity

City of Milwaukee ERS vs. MSCI ACW Ex US Index (USD) (Gross)



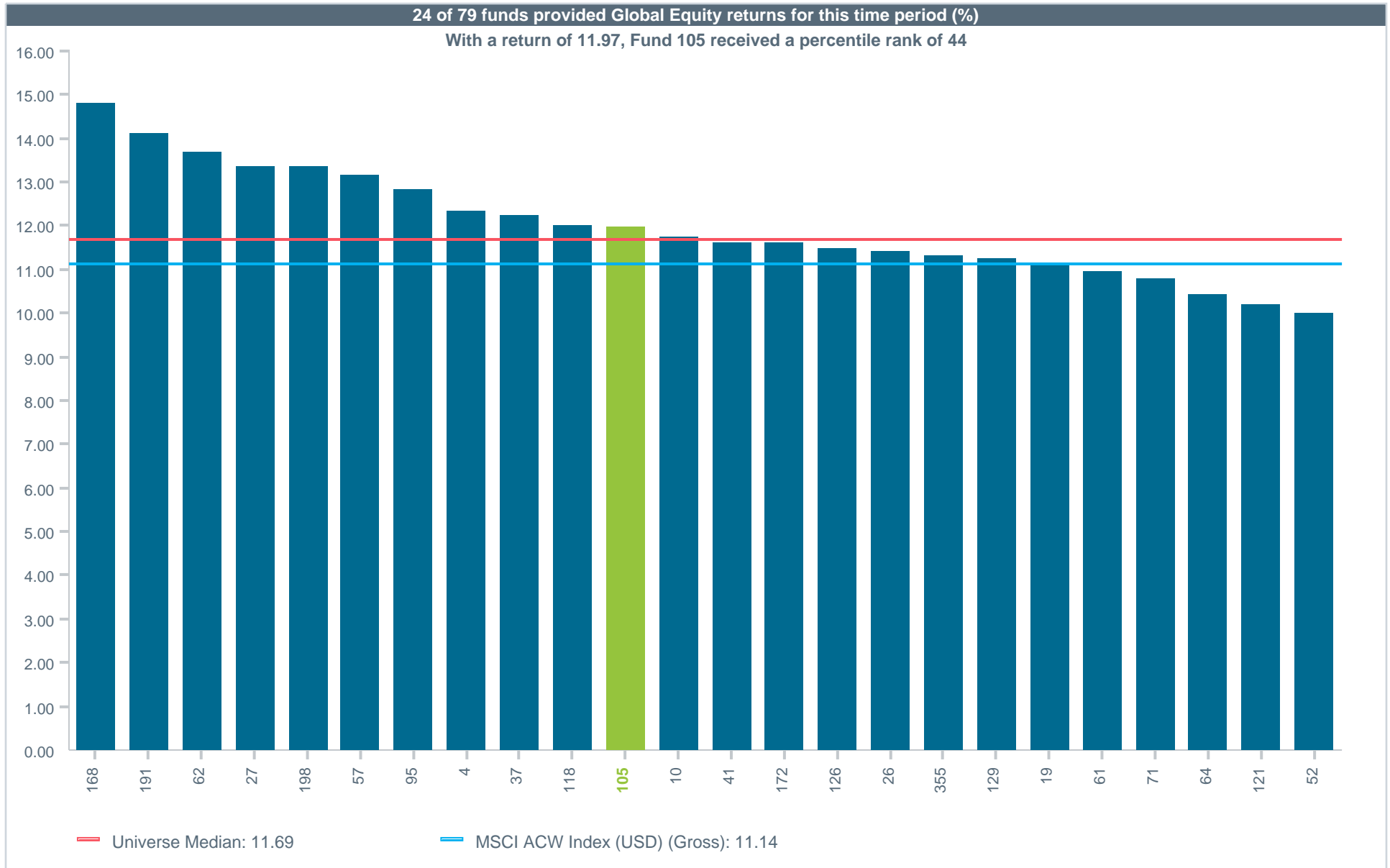
Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	21.51	2.73	10.54
MSCI ACW Ex US Index (USD) (Gross)	21.00	1.27	7.70
Variance	0.51	1.46	2.84





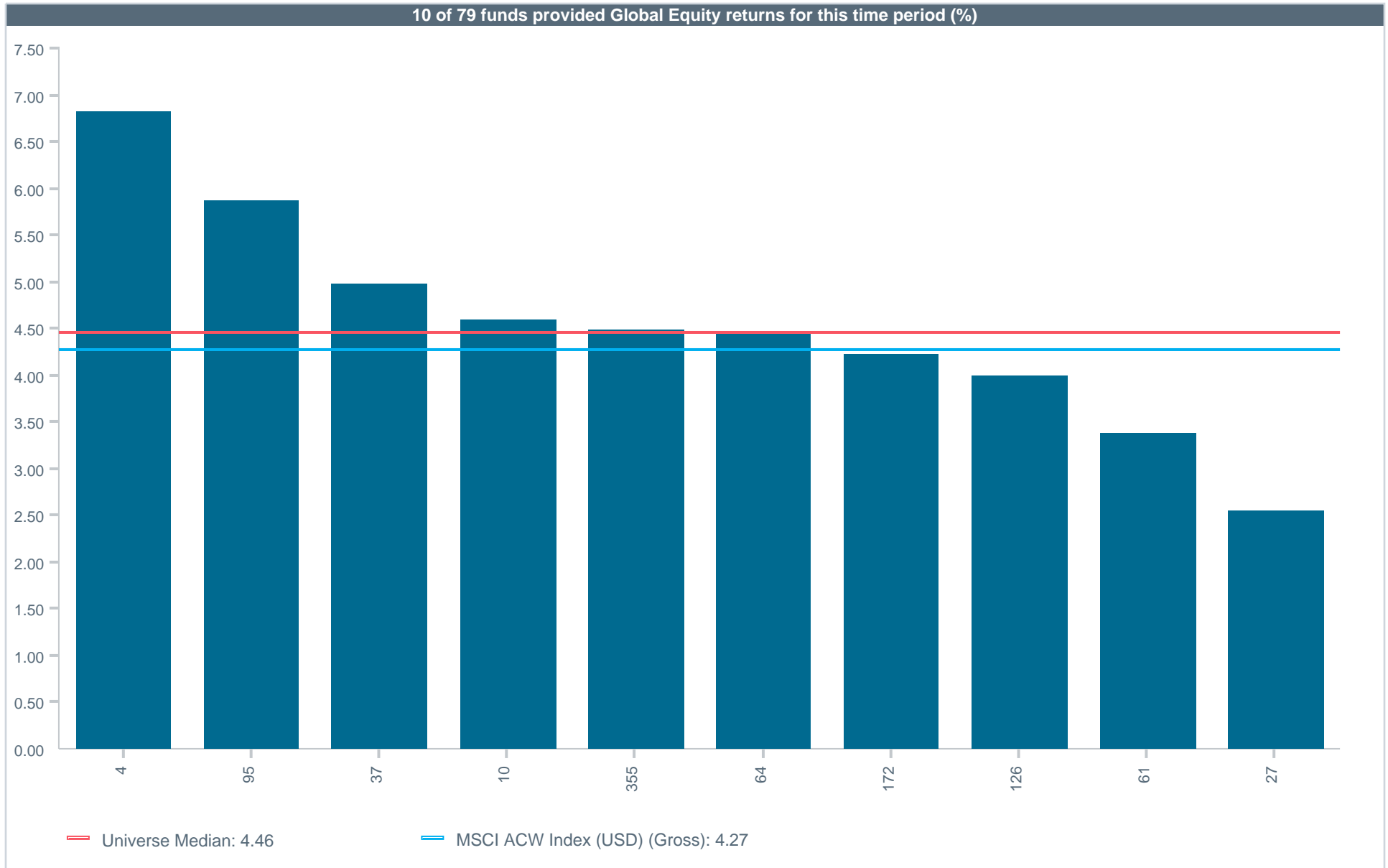
Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.





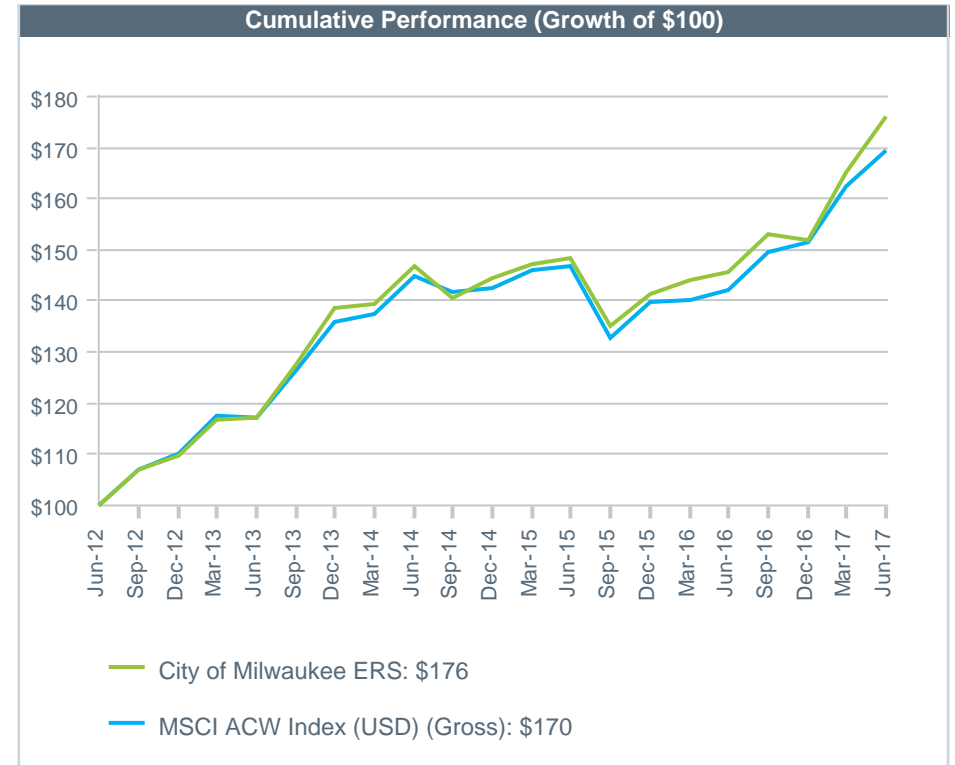
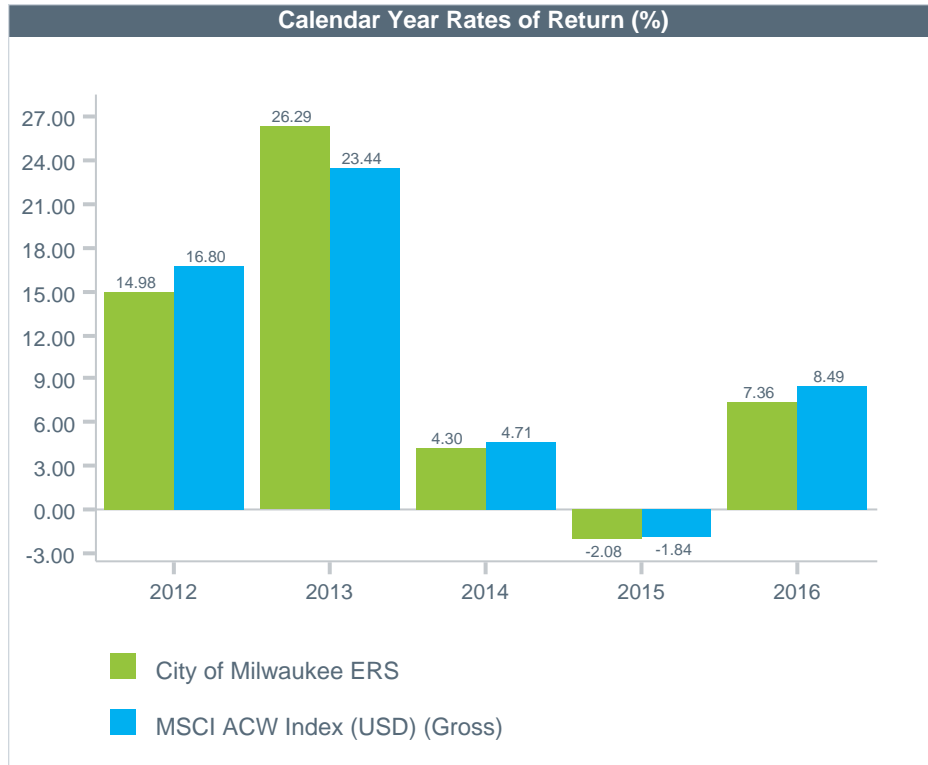
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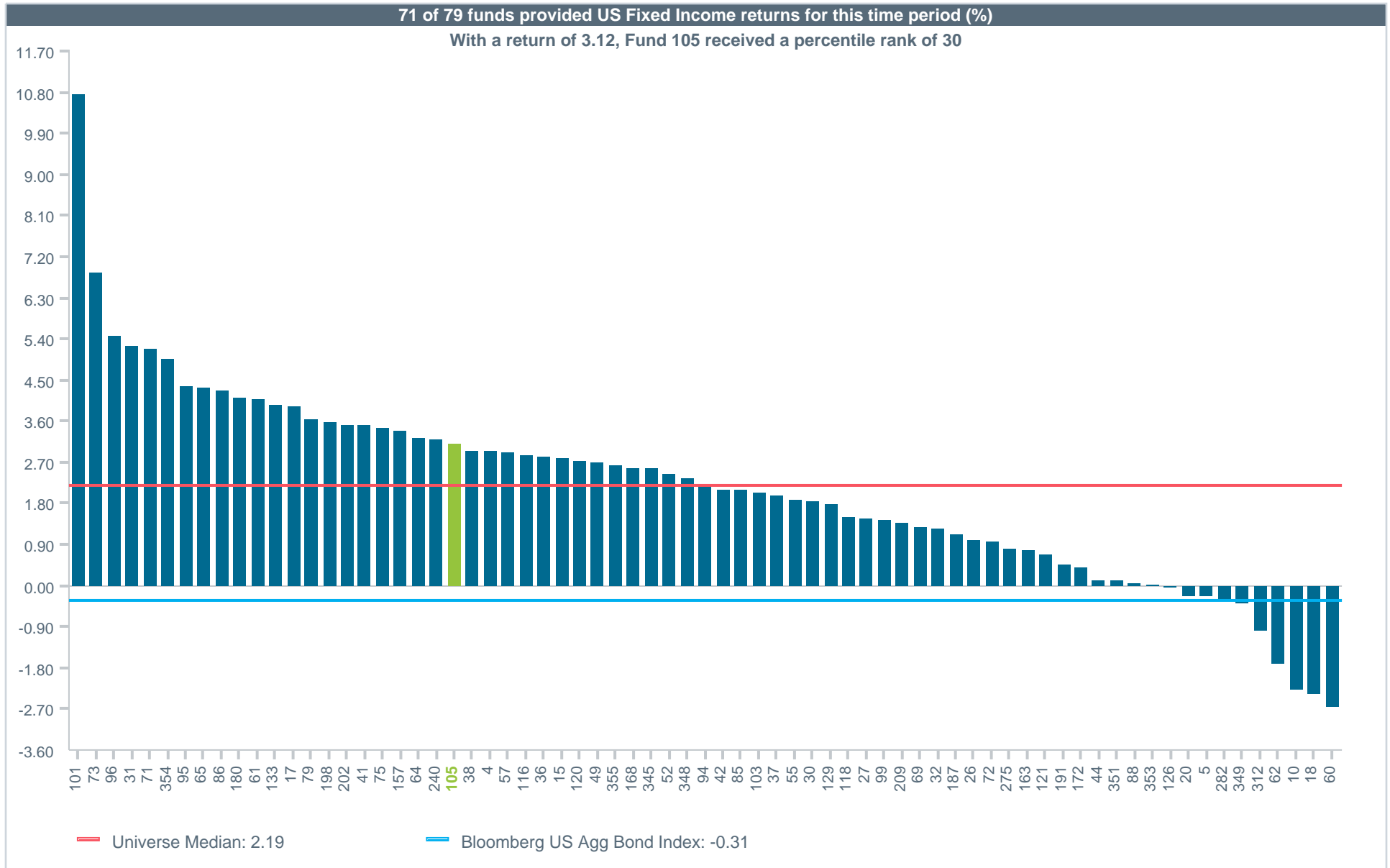
Total Return - Global Equity

City of Milwaukee ERS vs. MSCI ACW Index (USD) (Gross)



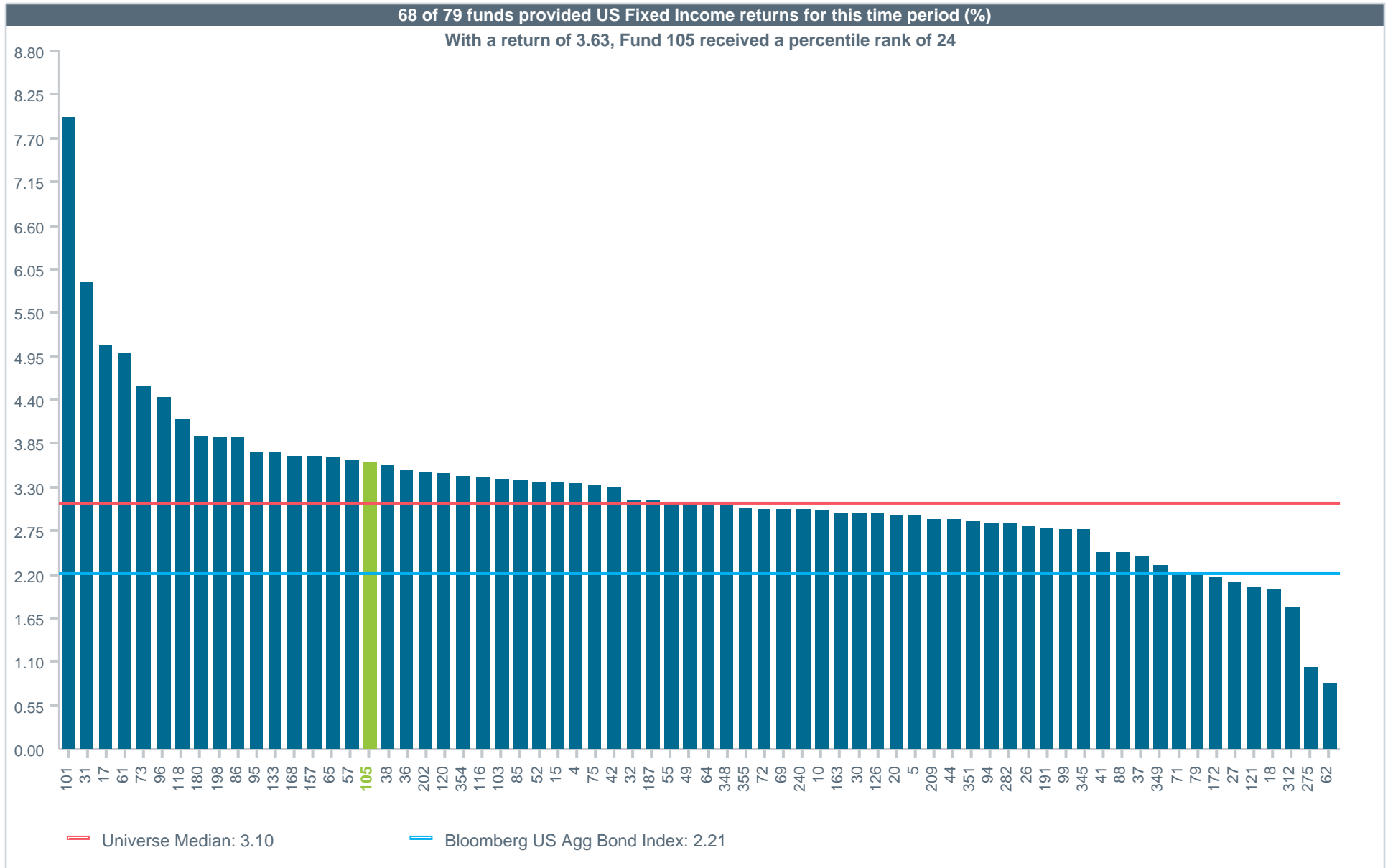
Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	21.01	6.21	11.97
MSCI ACW Index (USD) (Gross)	19.42	5.39	11.14
Variance	1.59	0.82	0.83





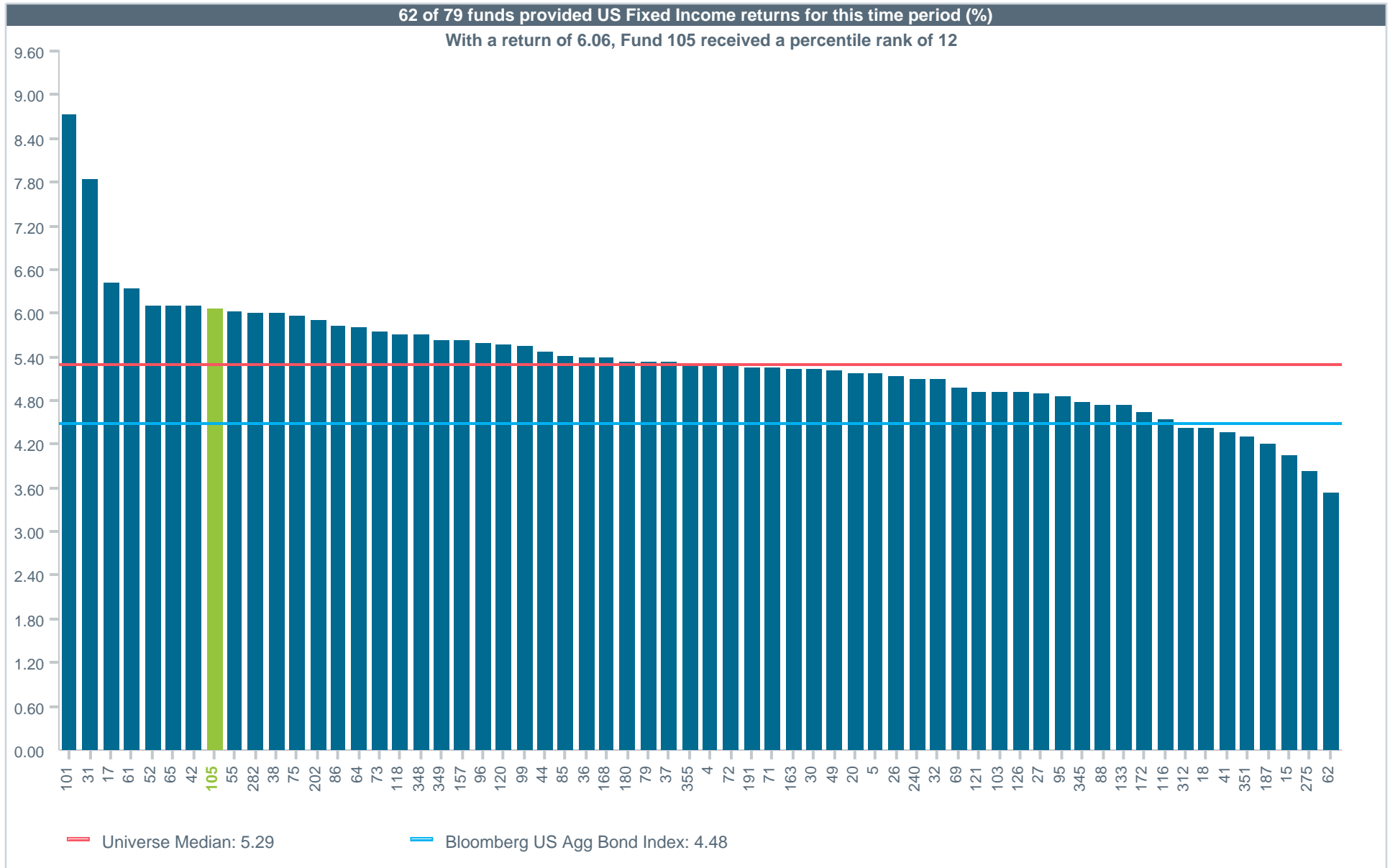
Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.



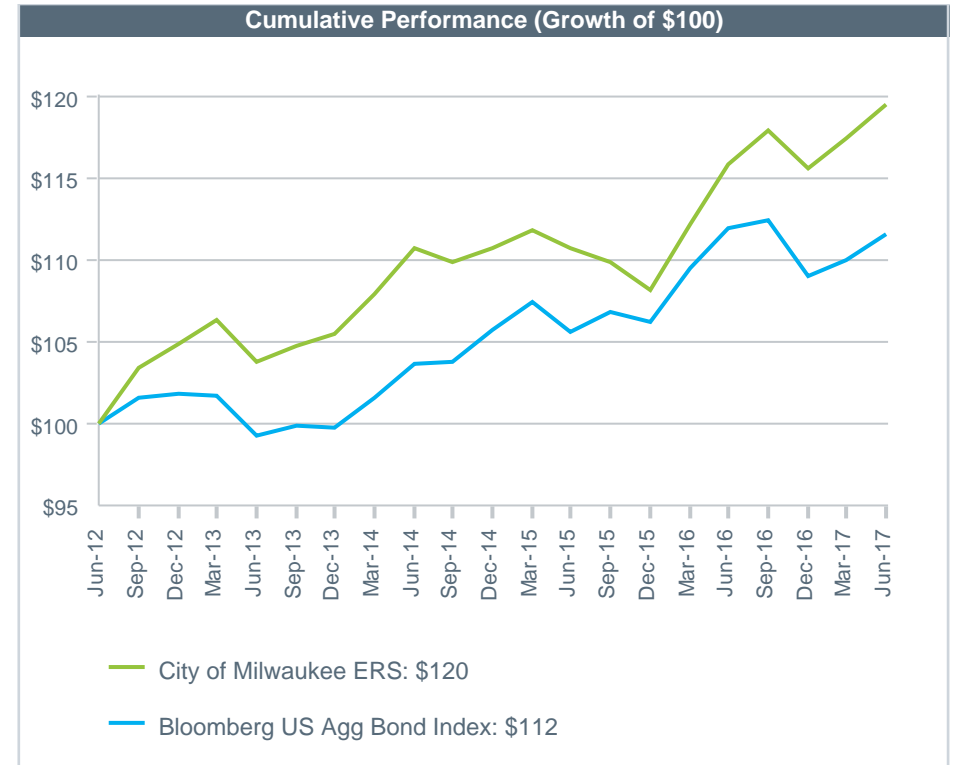
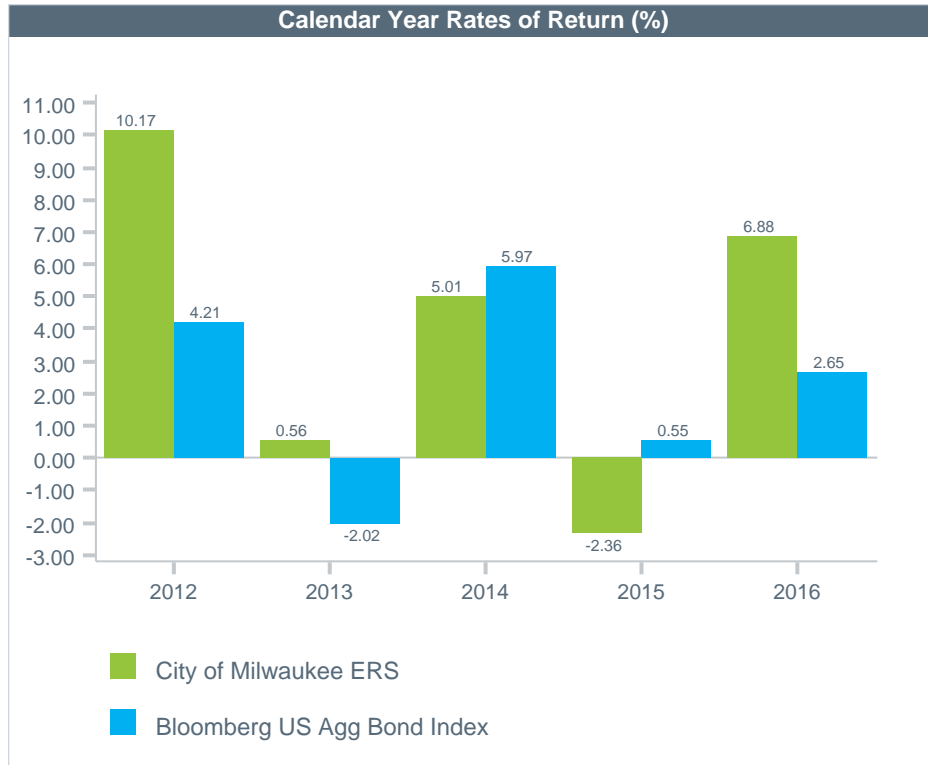


Funds with less history than the specified time period will not appear in the chart.



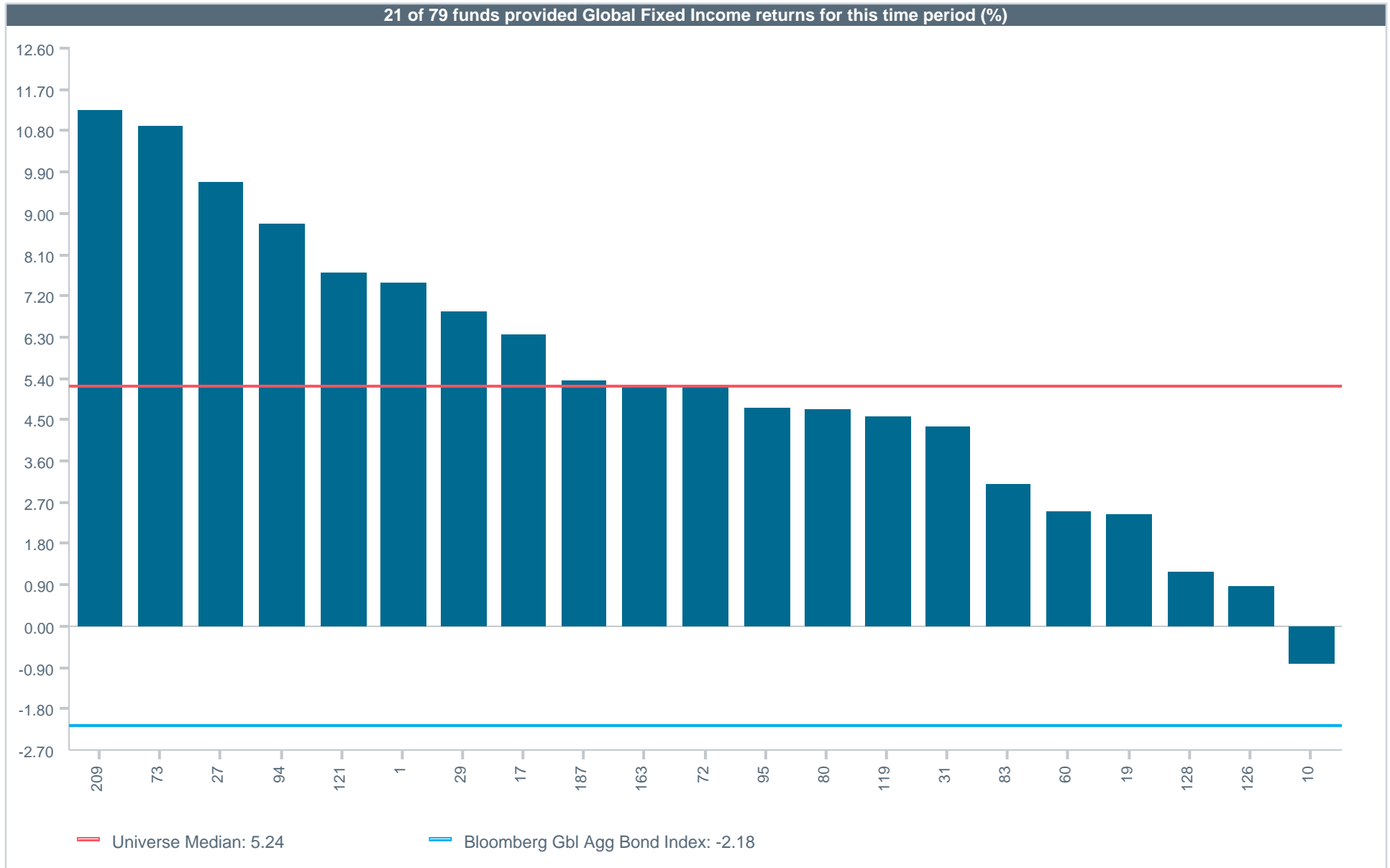
Total Return - US Fixed Income

City of Milwaukee ERS vs. Bloomberg US Agg Bond Index



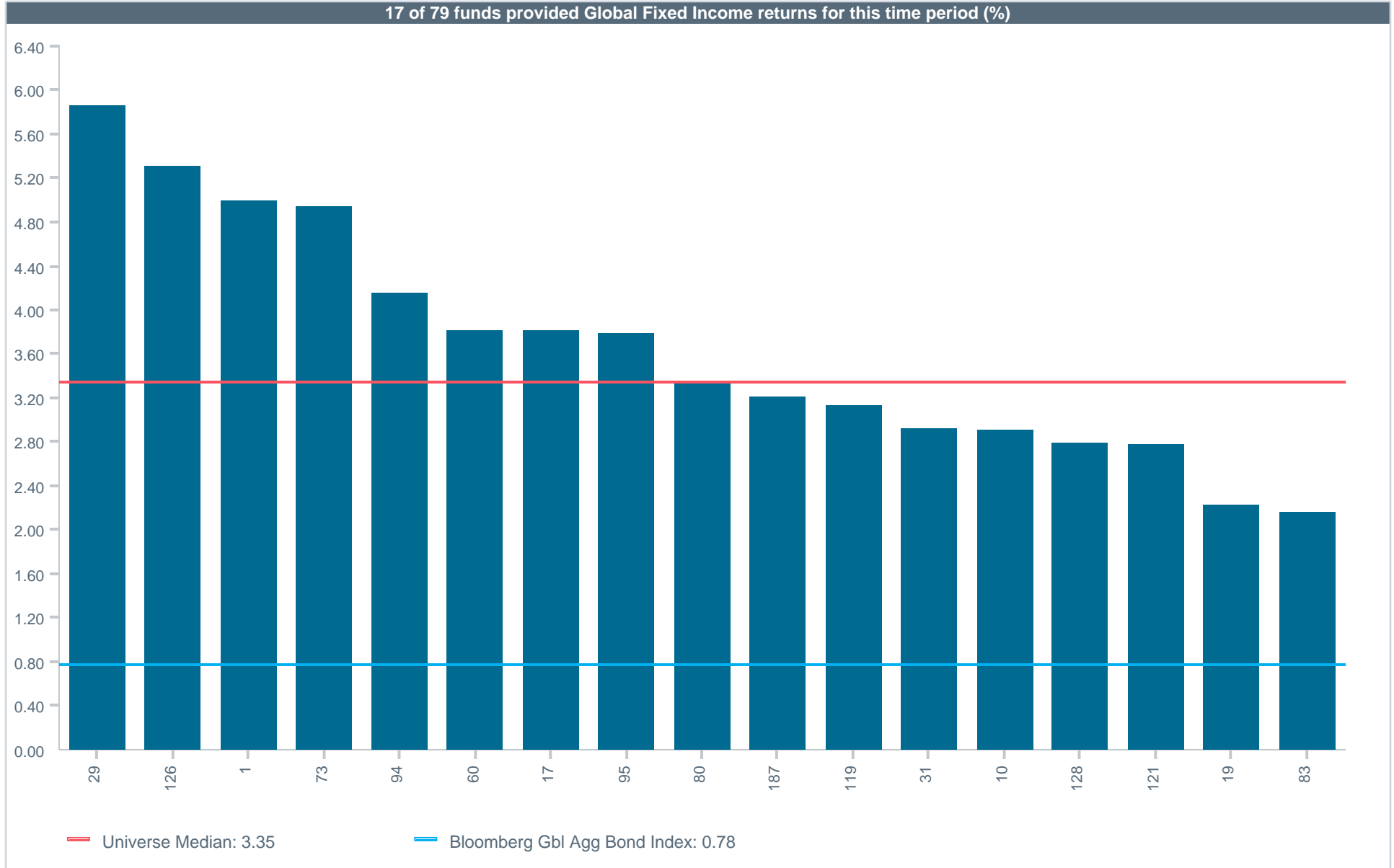
Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	3.12	2.56	3.63
Bloomberg US Agg Bond Index	-0.31	2.48	2.21
Variance	3.43	0.08	1.42





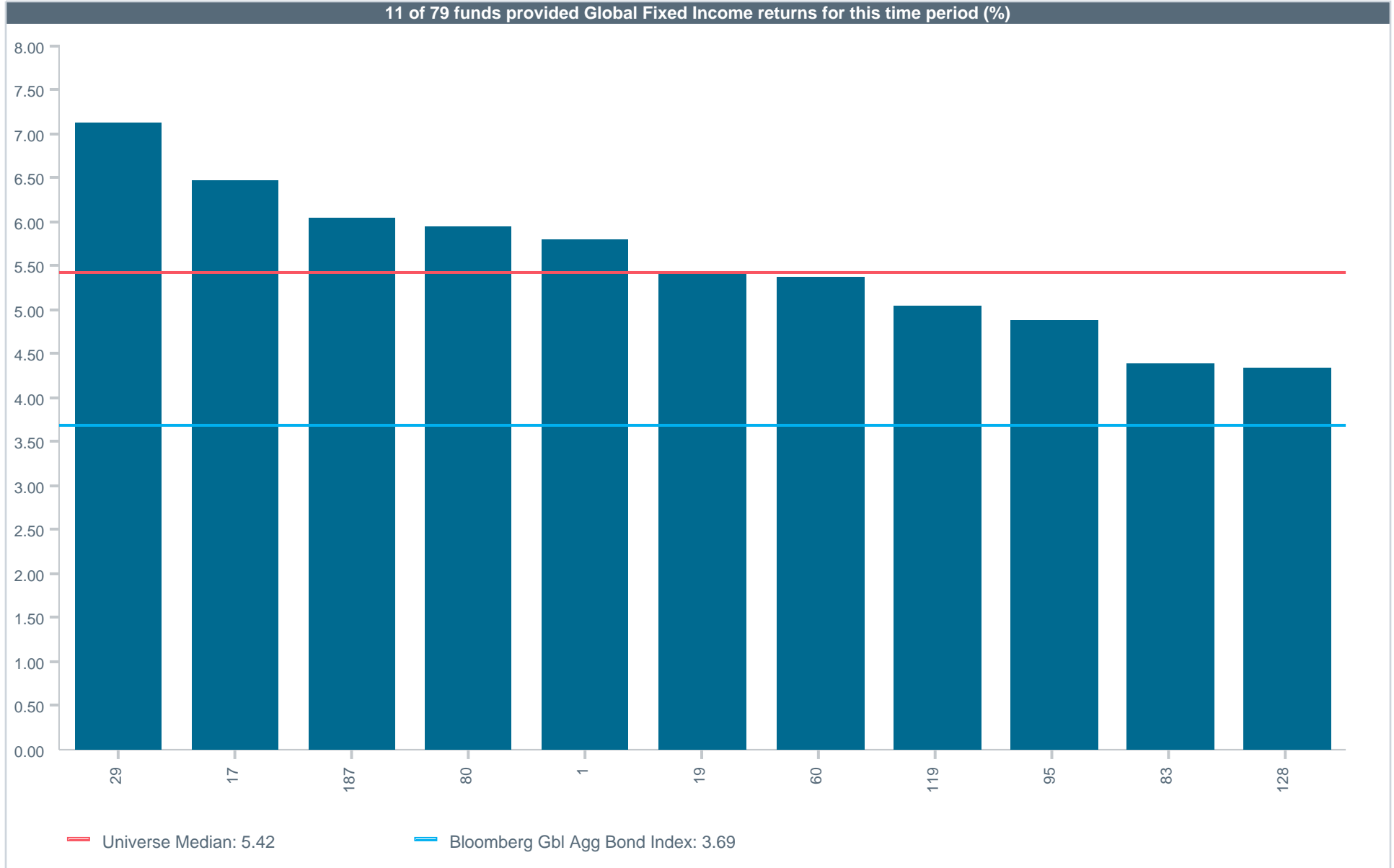
Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.





Total Return - Global Fixed Income

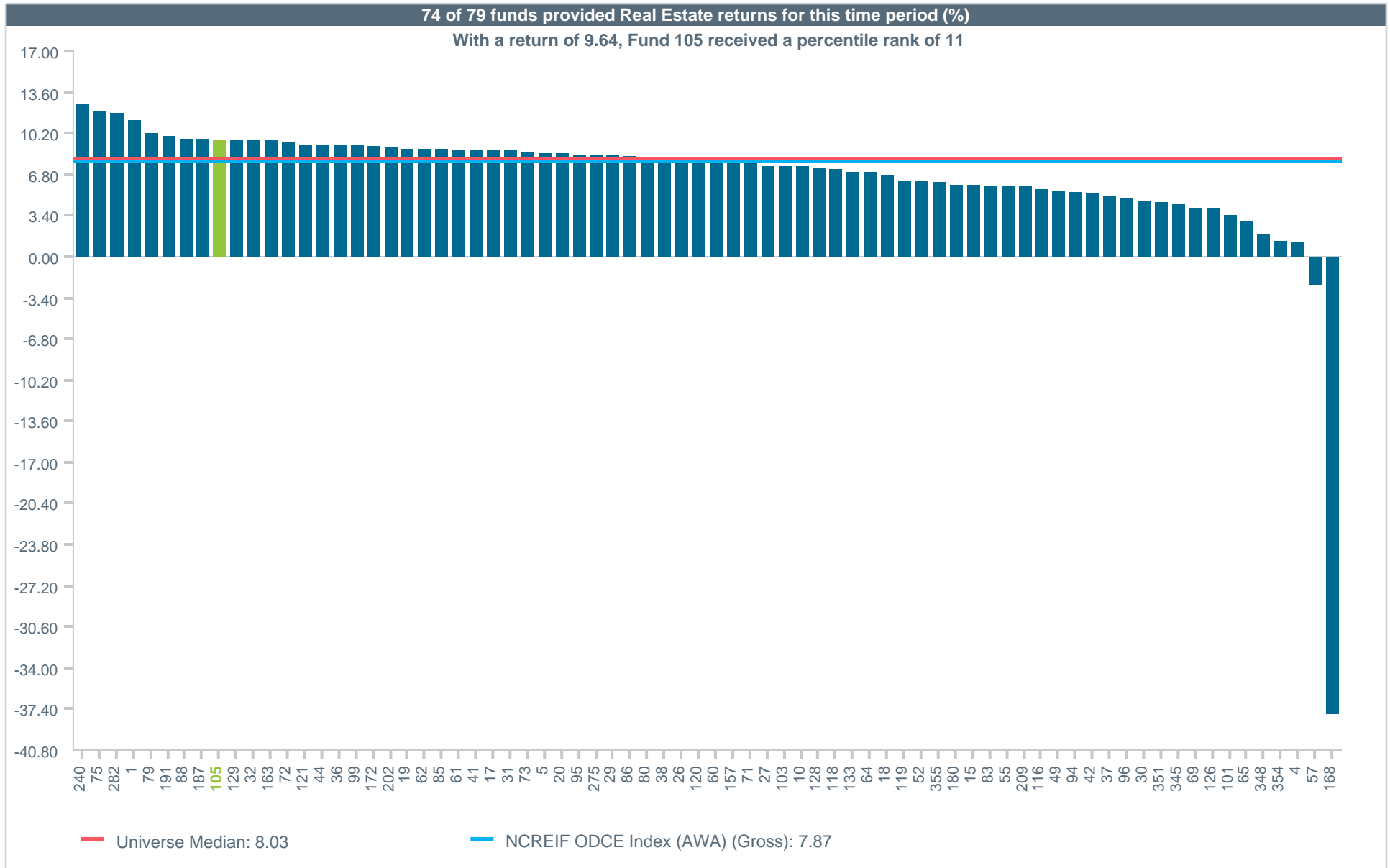
City of Milwaukee ERS vs. Bloomberg Gbl Agg Bond Index

Calendar Year Rates of Return (%)
City of Milwaukee ERS does not have return data for Global Fixed Income

Cumulative Performance (Growth of \$100)
City of Milwaukee ERS does not have return data for Global Fixed Income

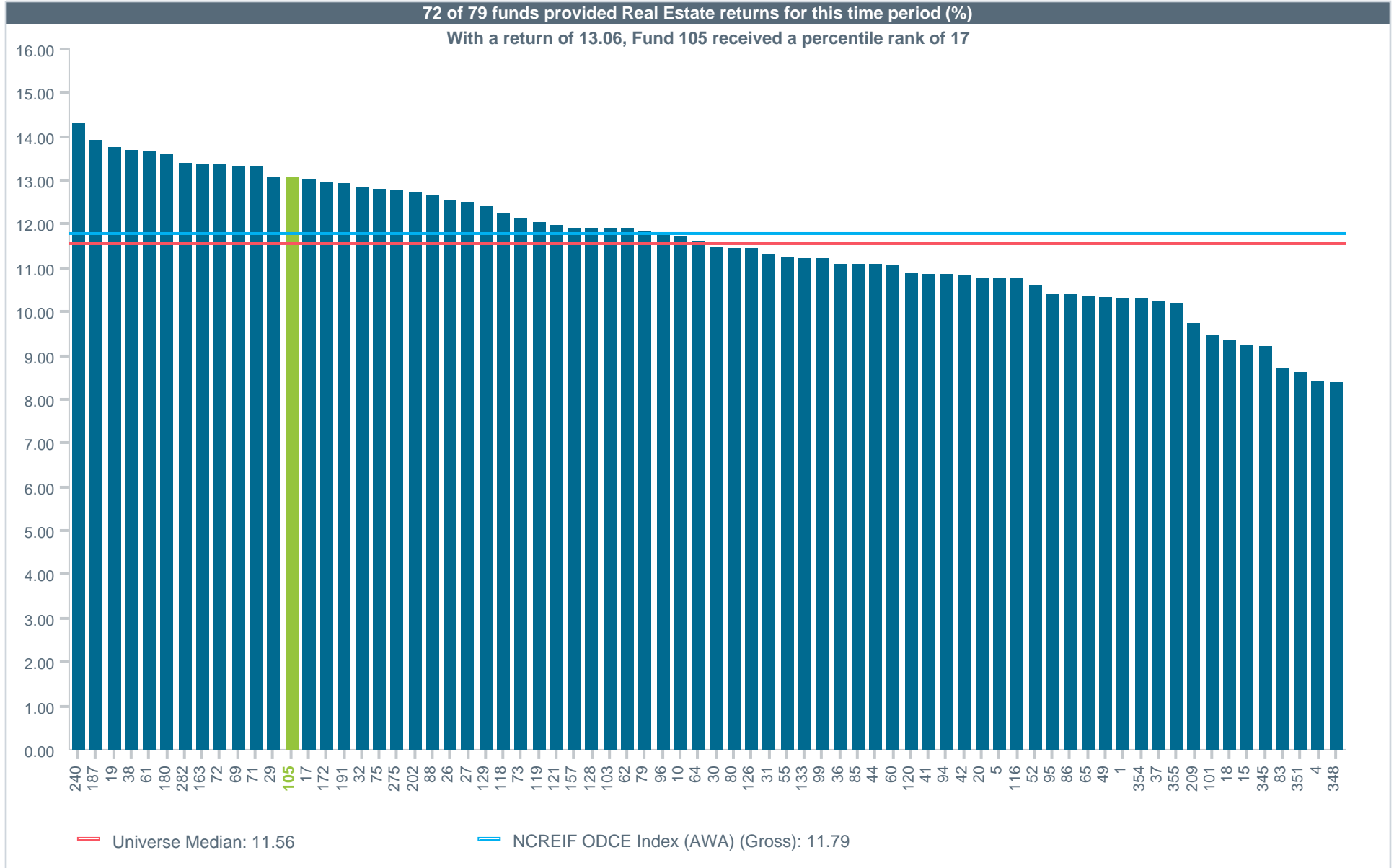
Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	N/A	N/A	N/A
Bloomberg Gbl Agg Bond Index	N/A	N/A	N/A
Variance	N/A	N/A	N/A





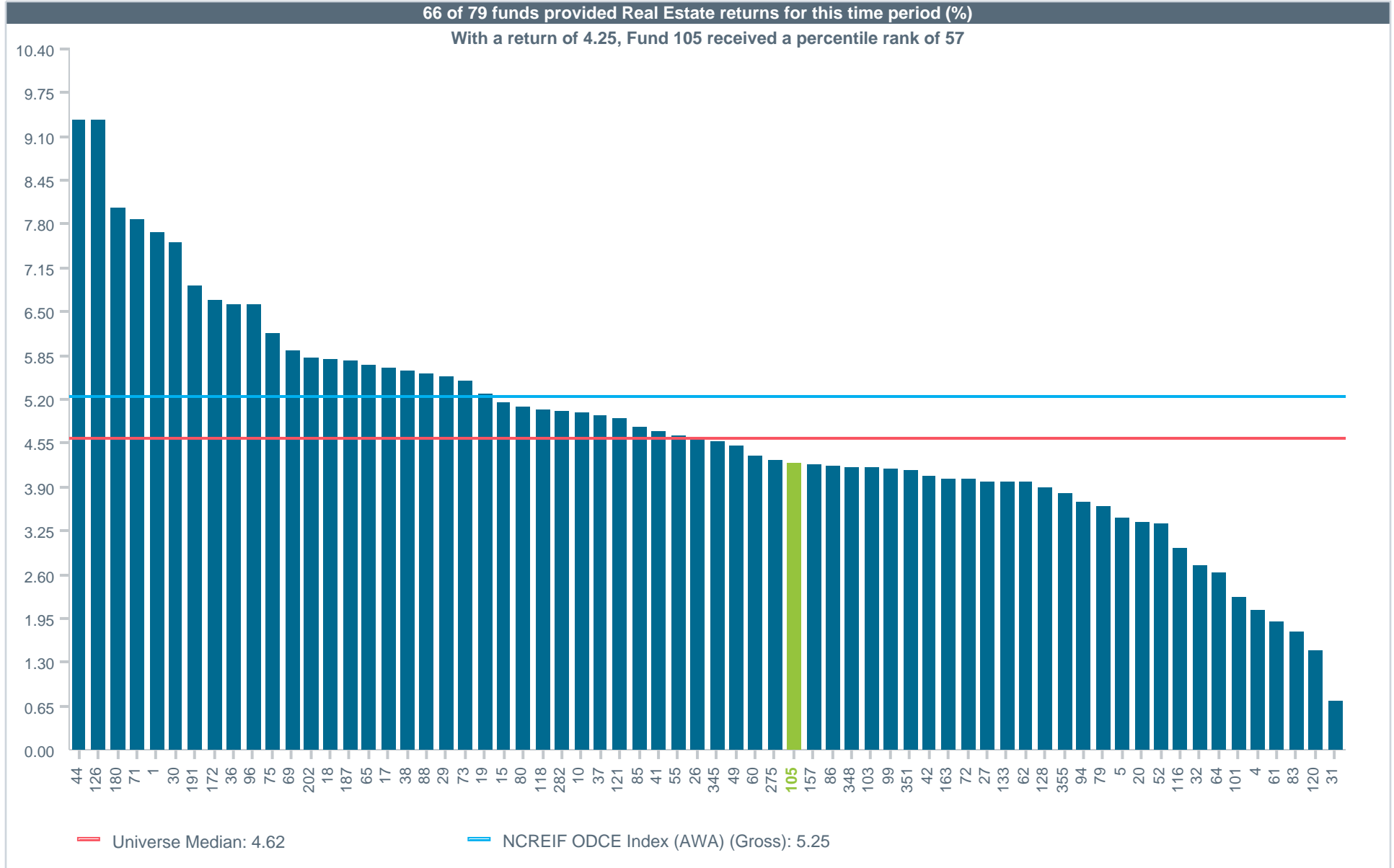
Funds with less history than the specified time period will not appear in the chart.





Funds with less history than the specified time period will not appear in the chart.



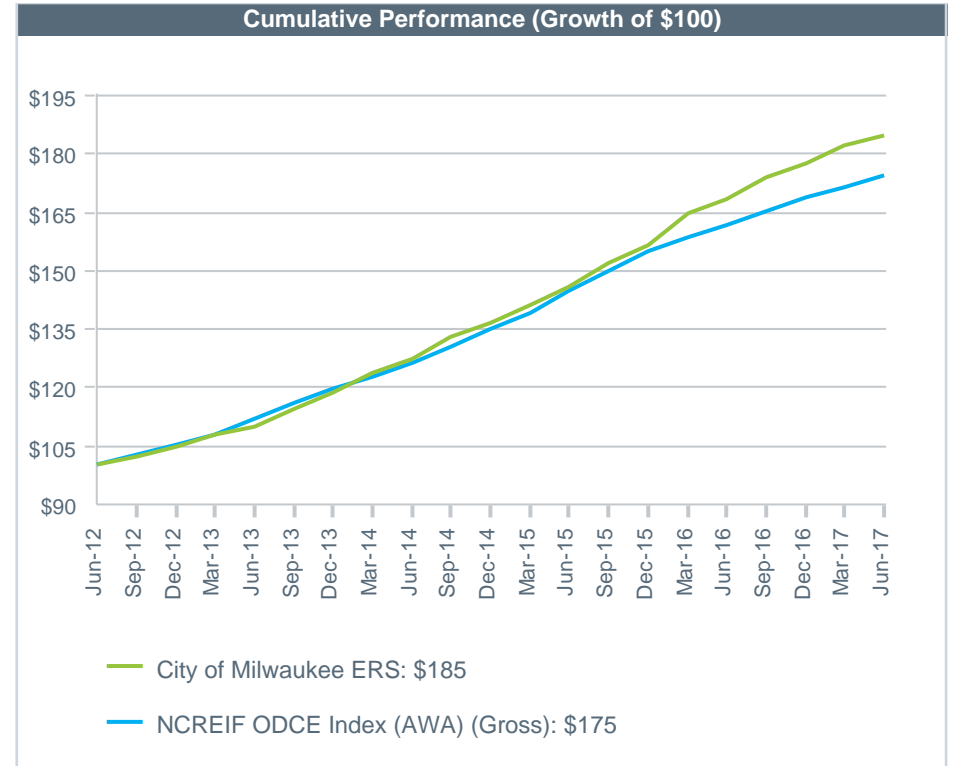
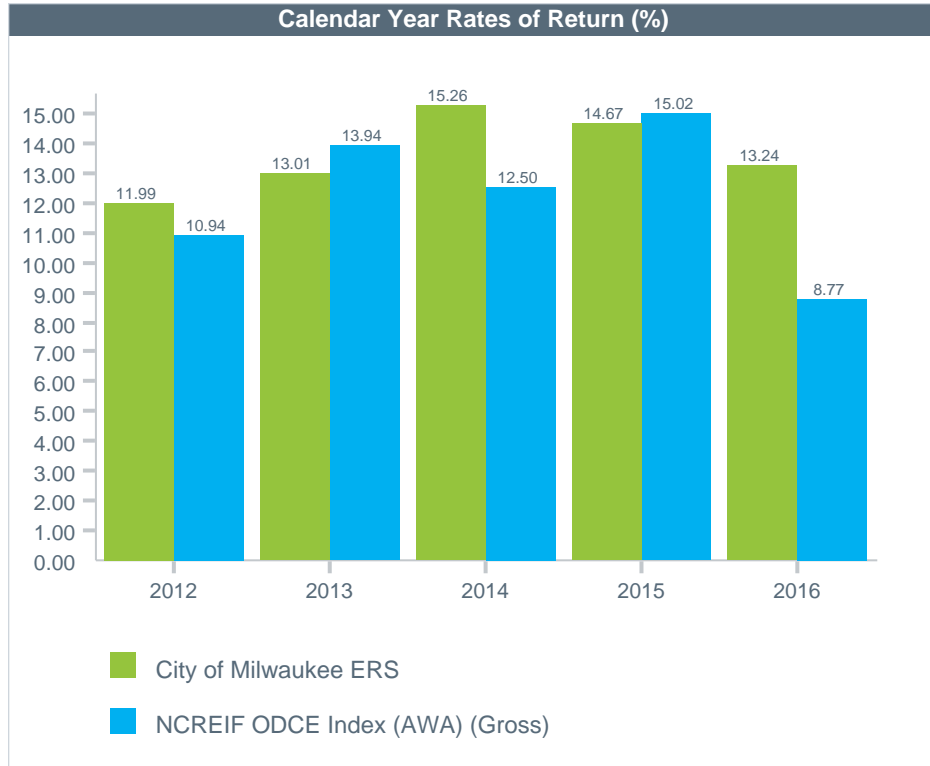


Funds with less history than the specified time period will not appear in the chart.



Total Return - Real Estate

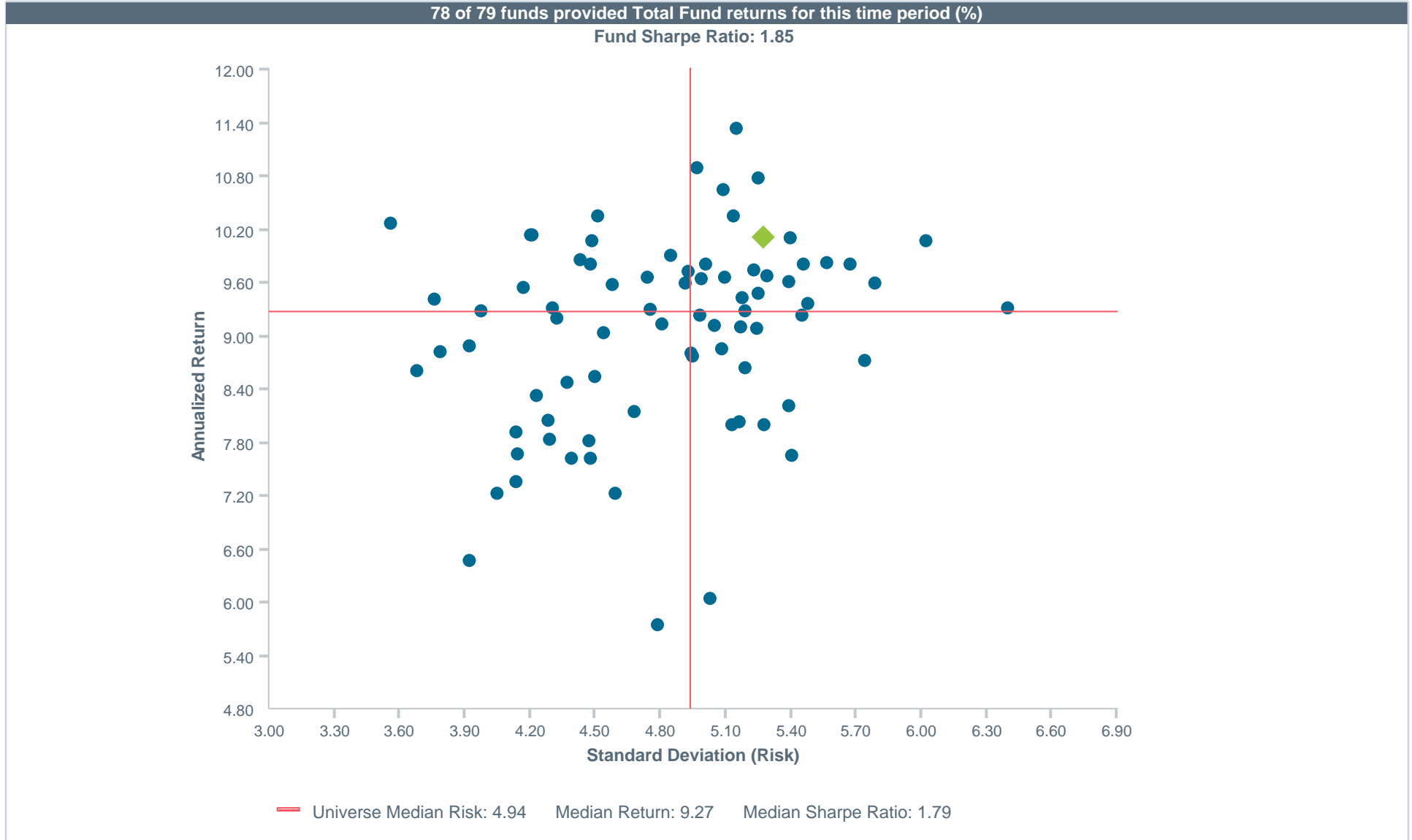
City of Milwaukee ERS vs. NCREIF ODCE Index (AWA) (Gross)



Annualized Returns (%)			
	1 Year	3 Years	5 Years
City of Milwaukee ERS	9.64	13.14	13.06
NCREIF ODCE Index (AWA) (Gross)	7.87	11.34	11.79
Variance	1.77	1.80	1.27



5 Year Annualized Total Fund Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



10 Year Annualized Total Fund Returns vs. Standard Deviation

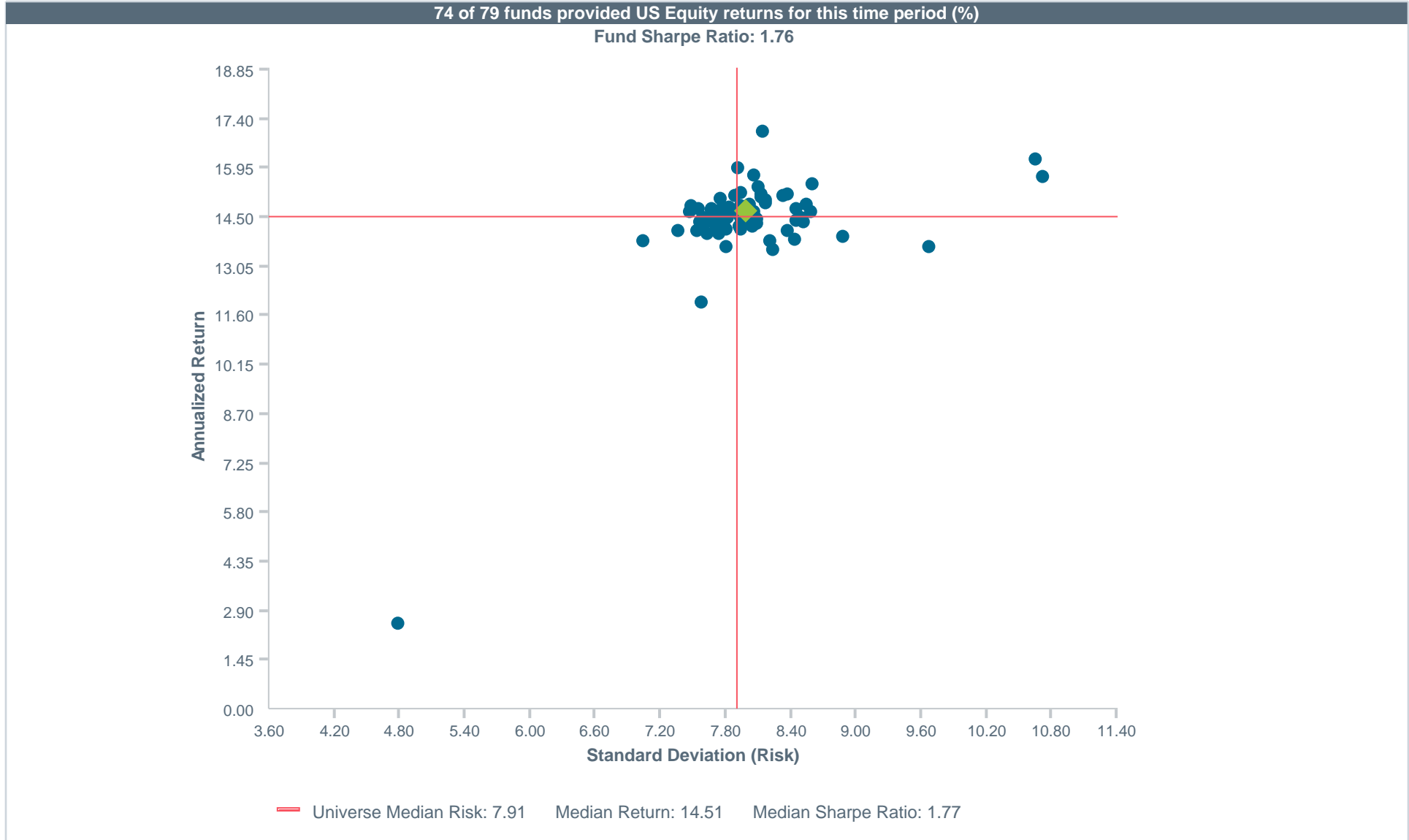


Funds with less history than the specified time period will not appear in the chart.



Risk/Return Analysis

5 Year Annualized US Equity Returns vs. Standard Deviation



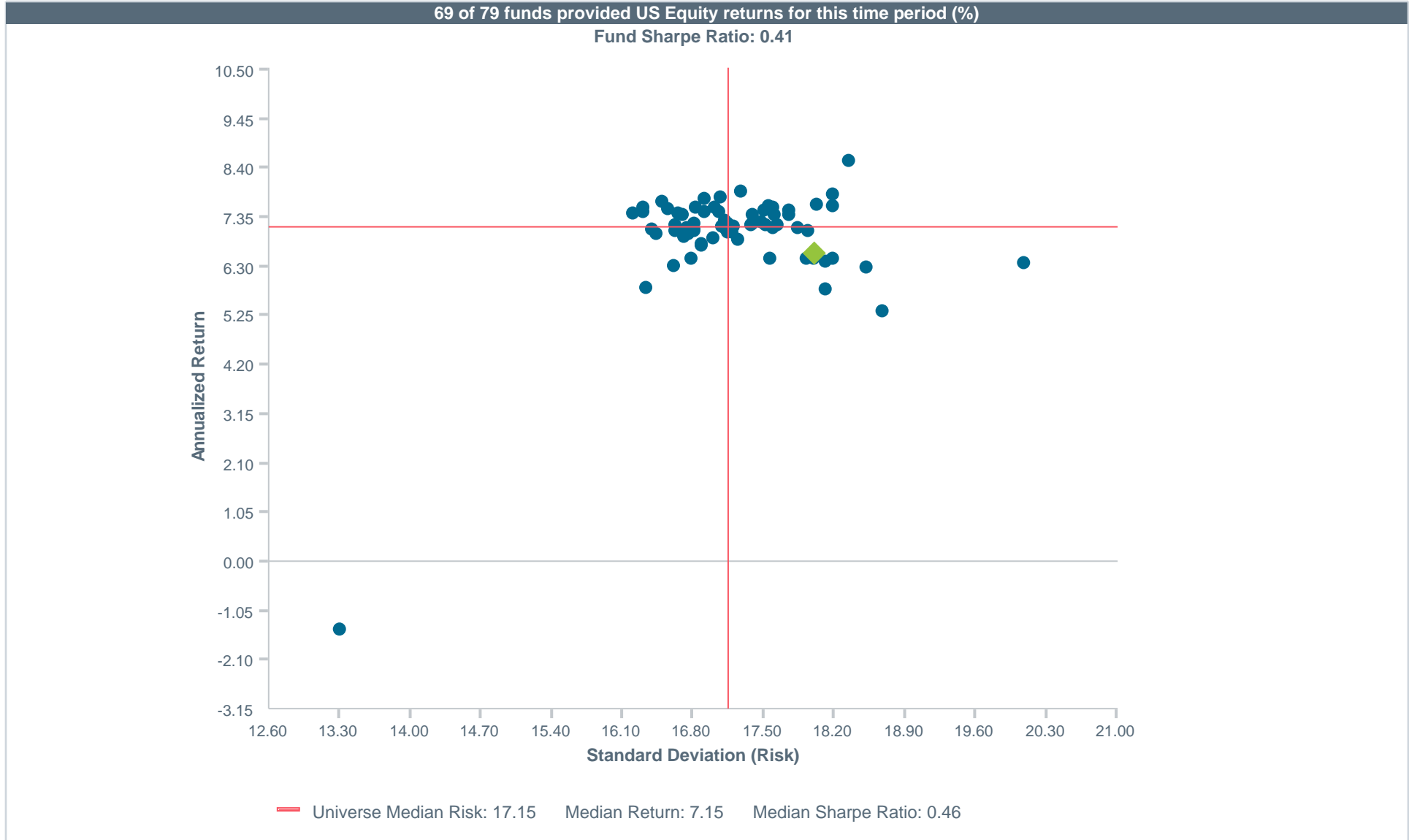
Funds with less history than the specified time period will not appear in the chart.





Risk/Return Analysis

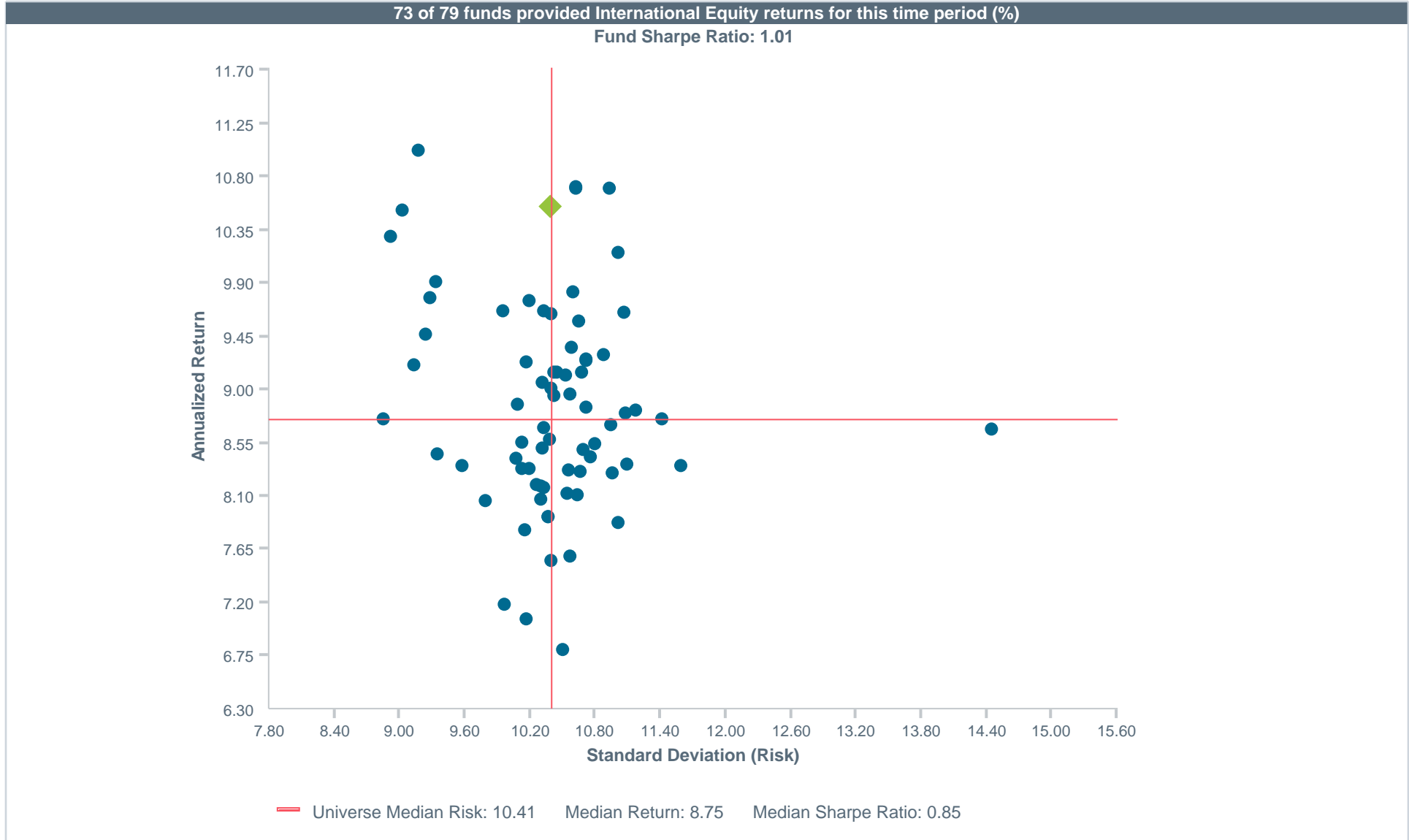
10 Year Annualized US Equity Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



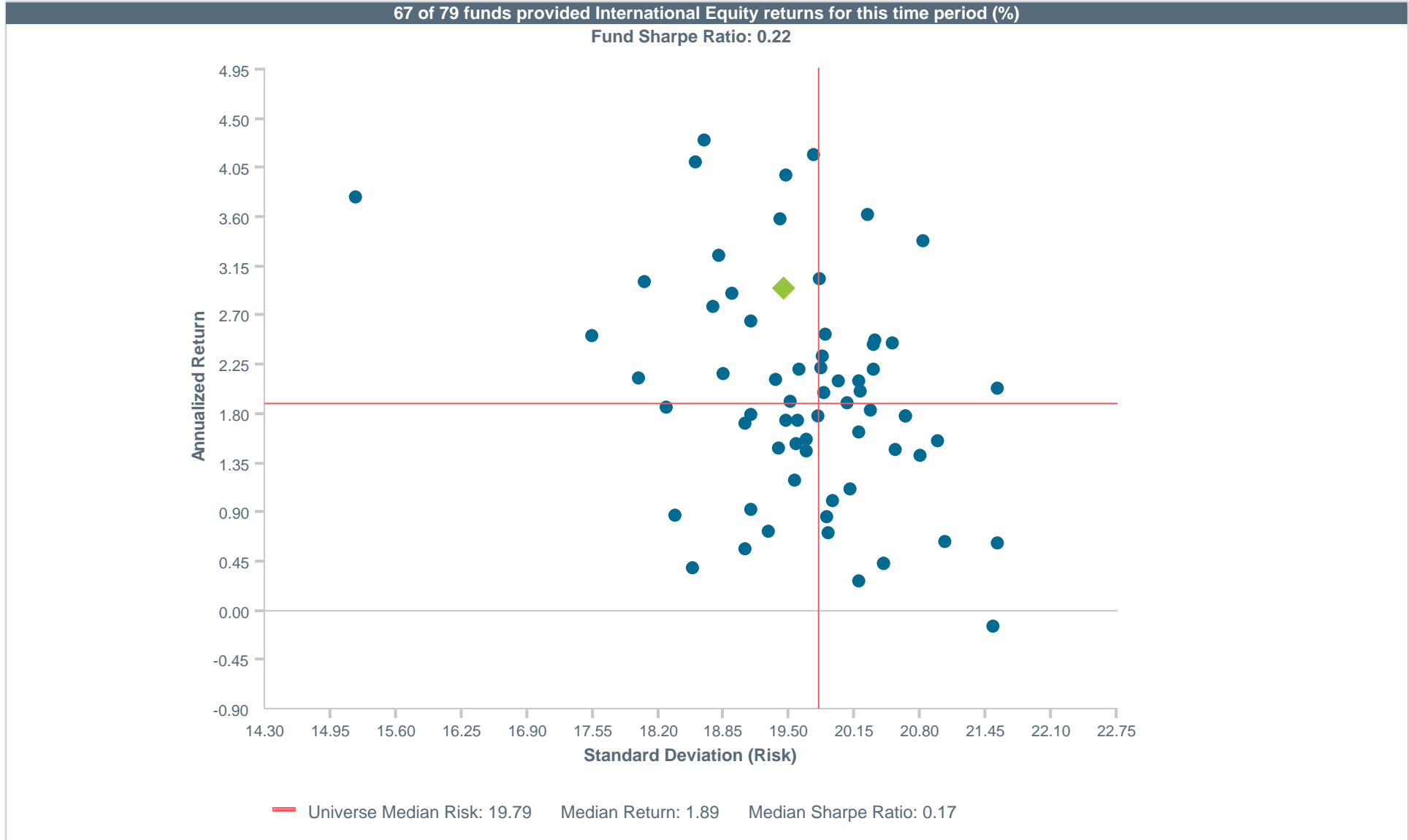
5 Year Annualized International Equity Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



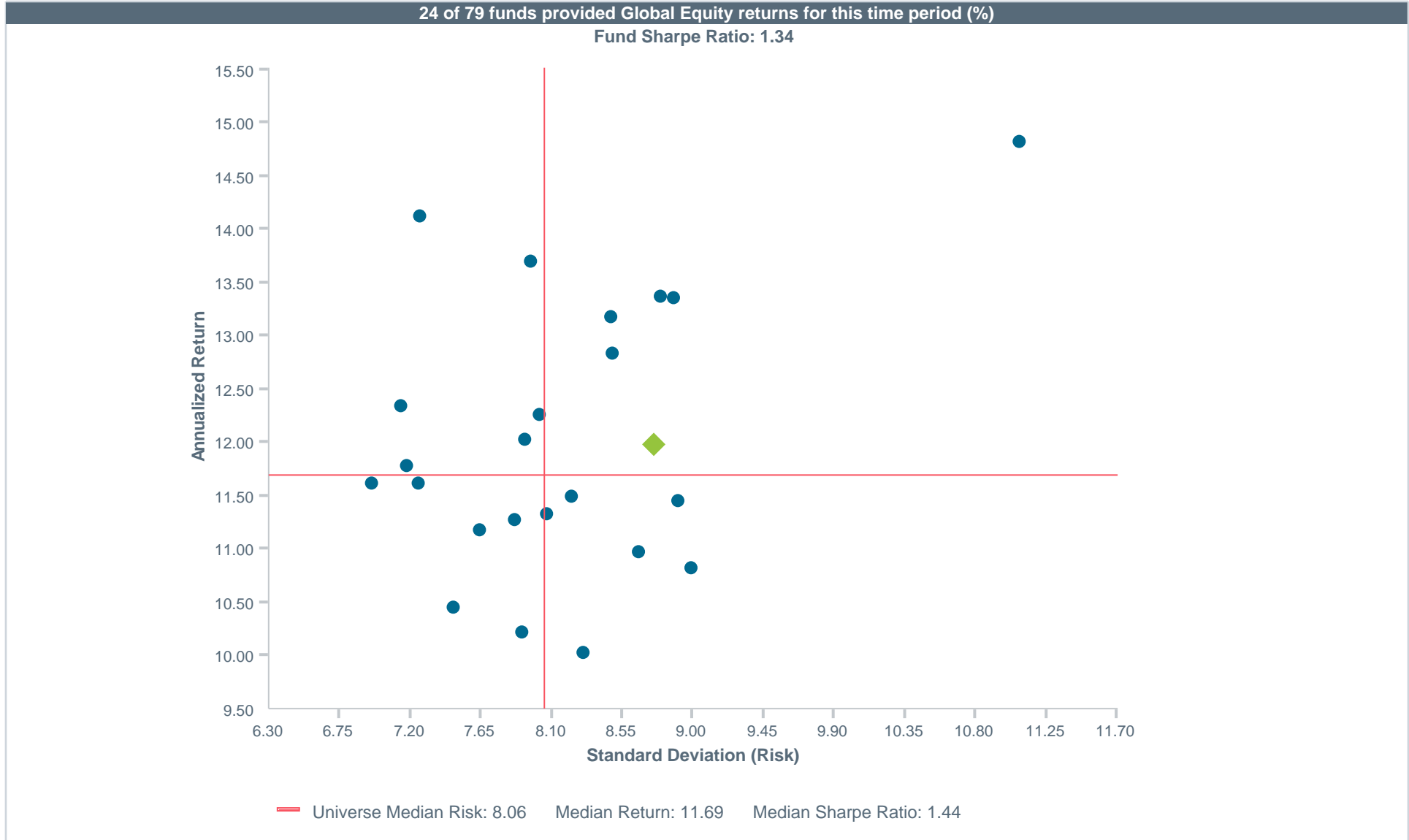
10 Year Annualized International Equity Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



5 Year Annualized Global Equity Returns vs. Standard Deviation

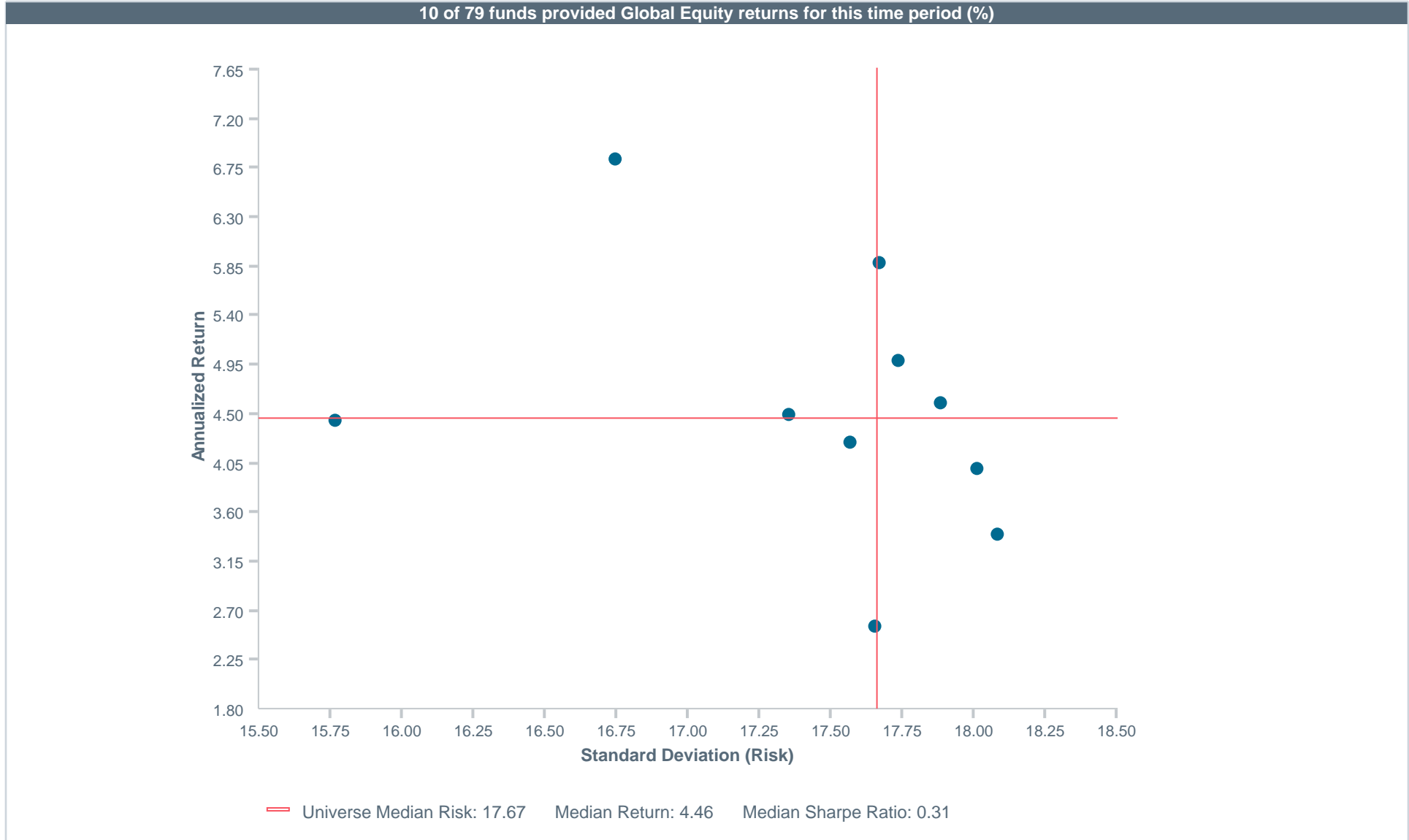


Funds with less history than the specified time period will not appear in the chart.



Risk/Return Analysis

10 Year Annualized Global Equity Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



Risk/Return Analysis

5 Year Annualized US Fixed Income Returns vs. Standard Deviation

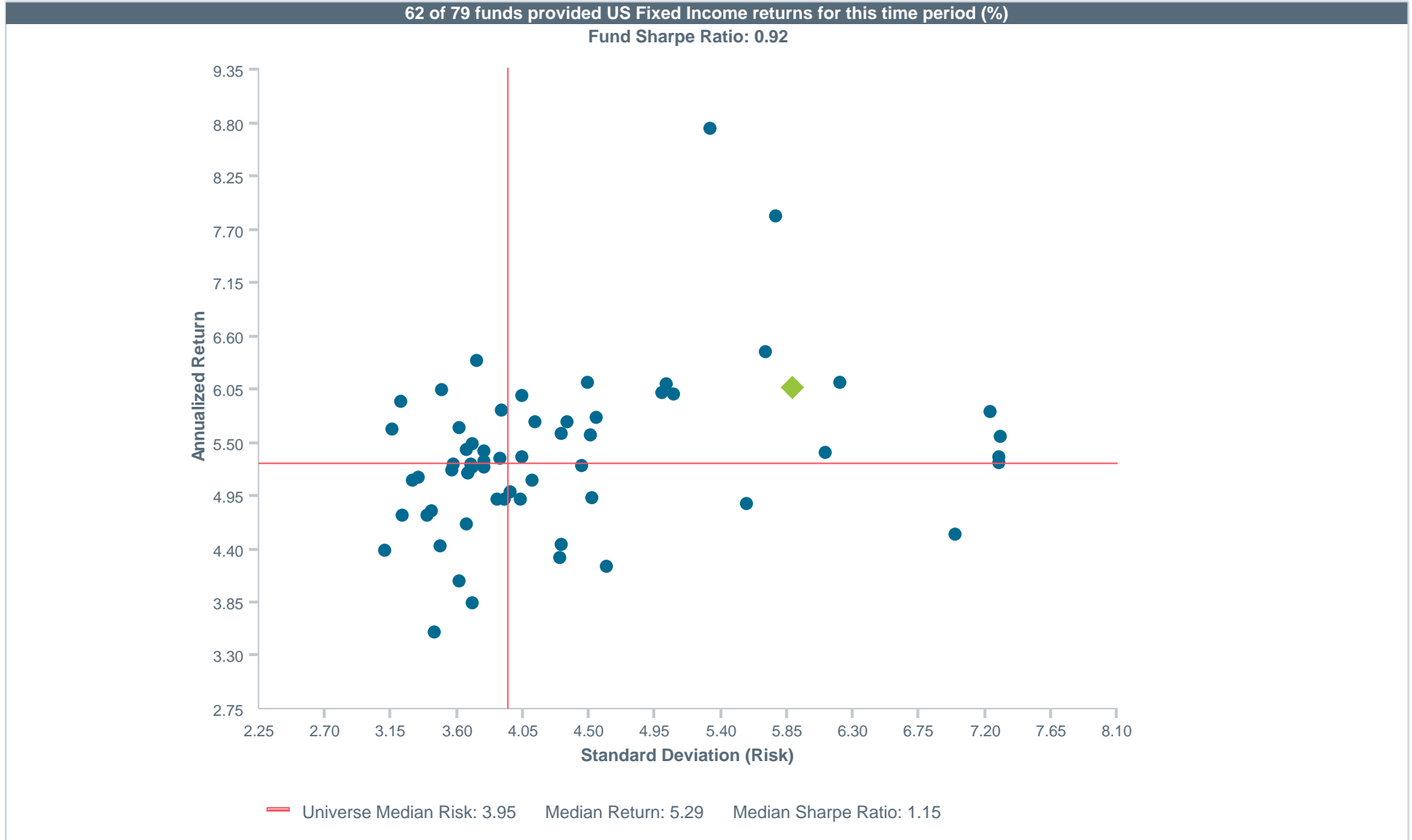


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Risk/Return Analysis

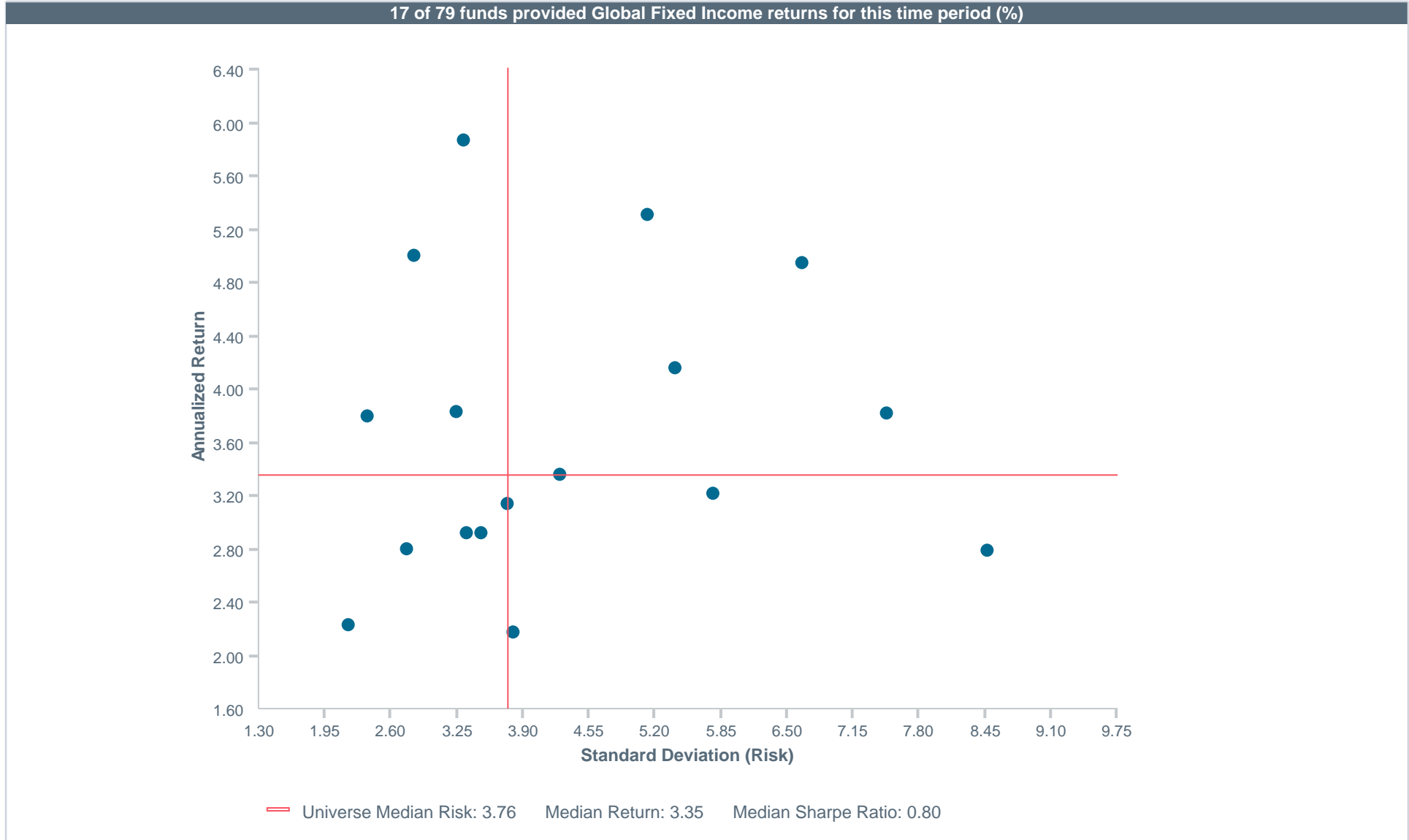
10 Year Annualized US Fixed Income Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



5 Year Annualized Global Fixed Income Returns vs. Standard Deviation



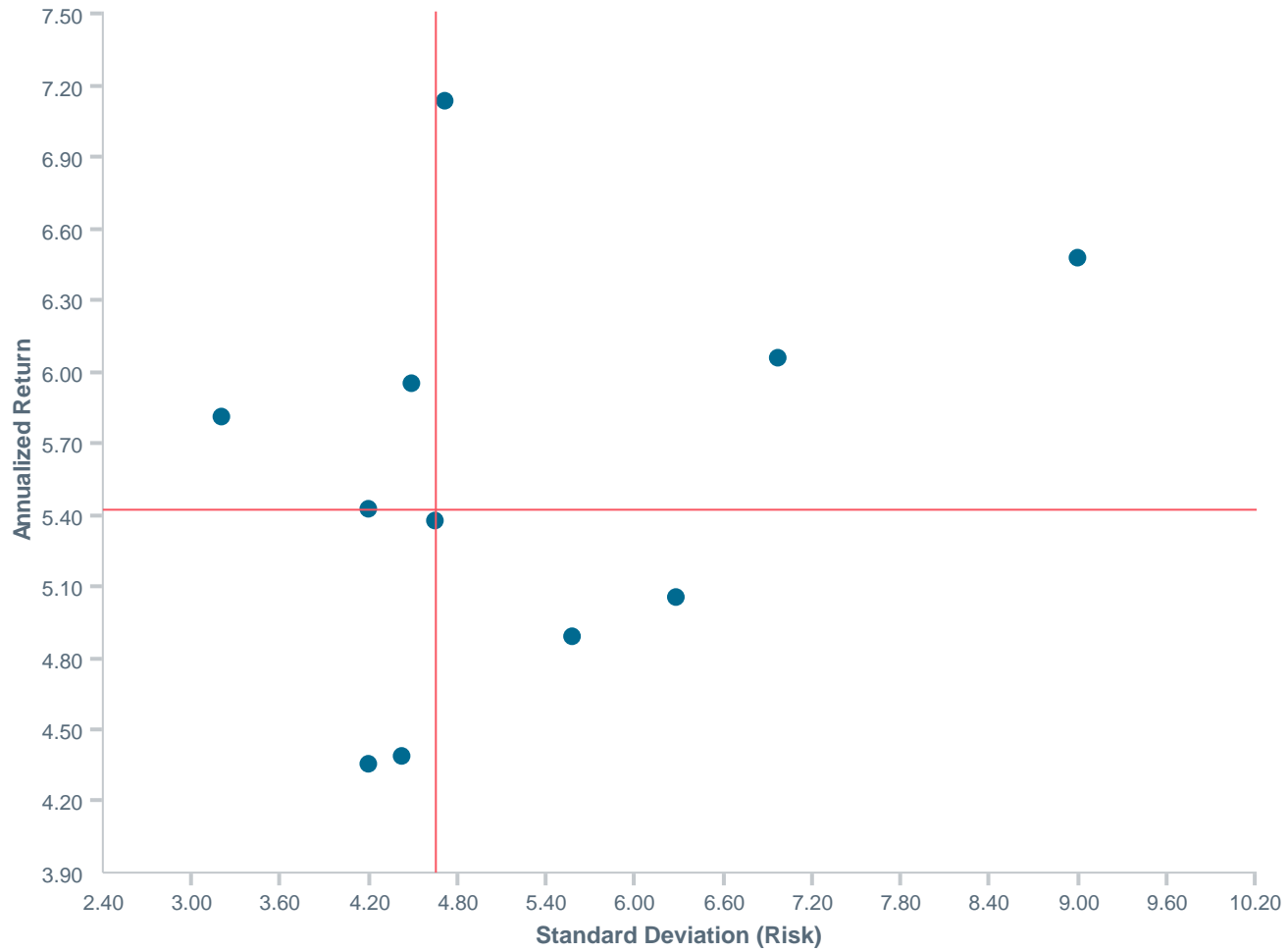
Funds with less history than the specified time period will not appear in the chart.





10 Year Annualized Global Fixed Income Returns vs. Standard Deviation

11 of 79 funds provided Global Fixed Income returns for this time period (%)

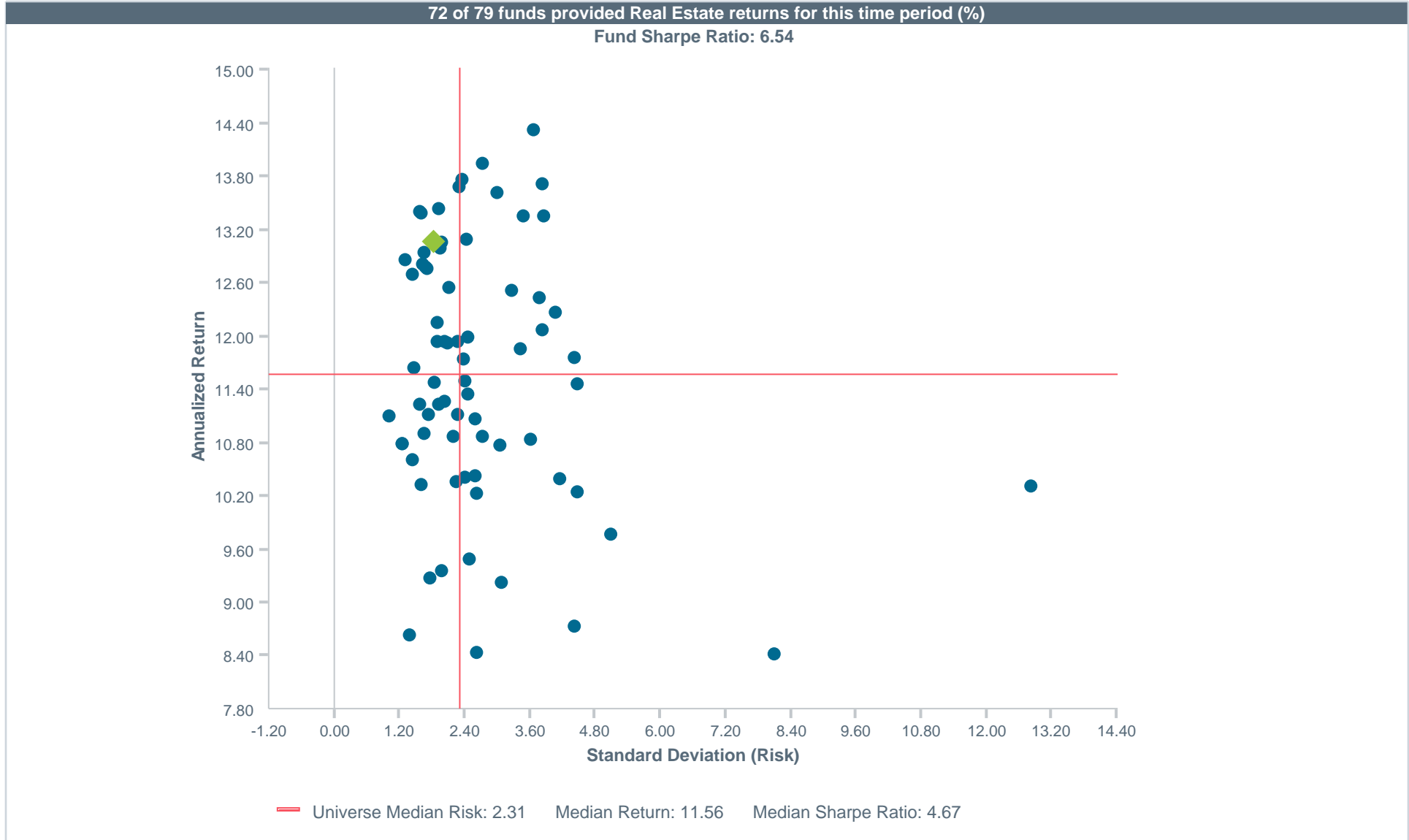


— Universe Median Risk: 4.65    Median Return: 5.42    Median Sharpe Ratio: 0.87

Funds with less history than the specified time period will not appear in the chart.



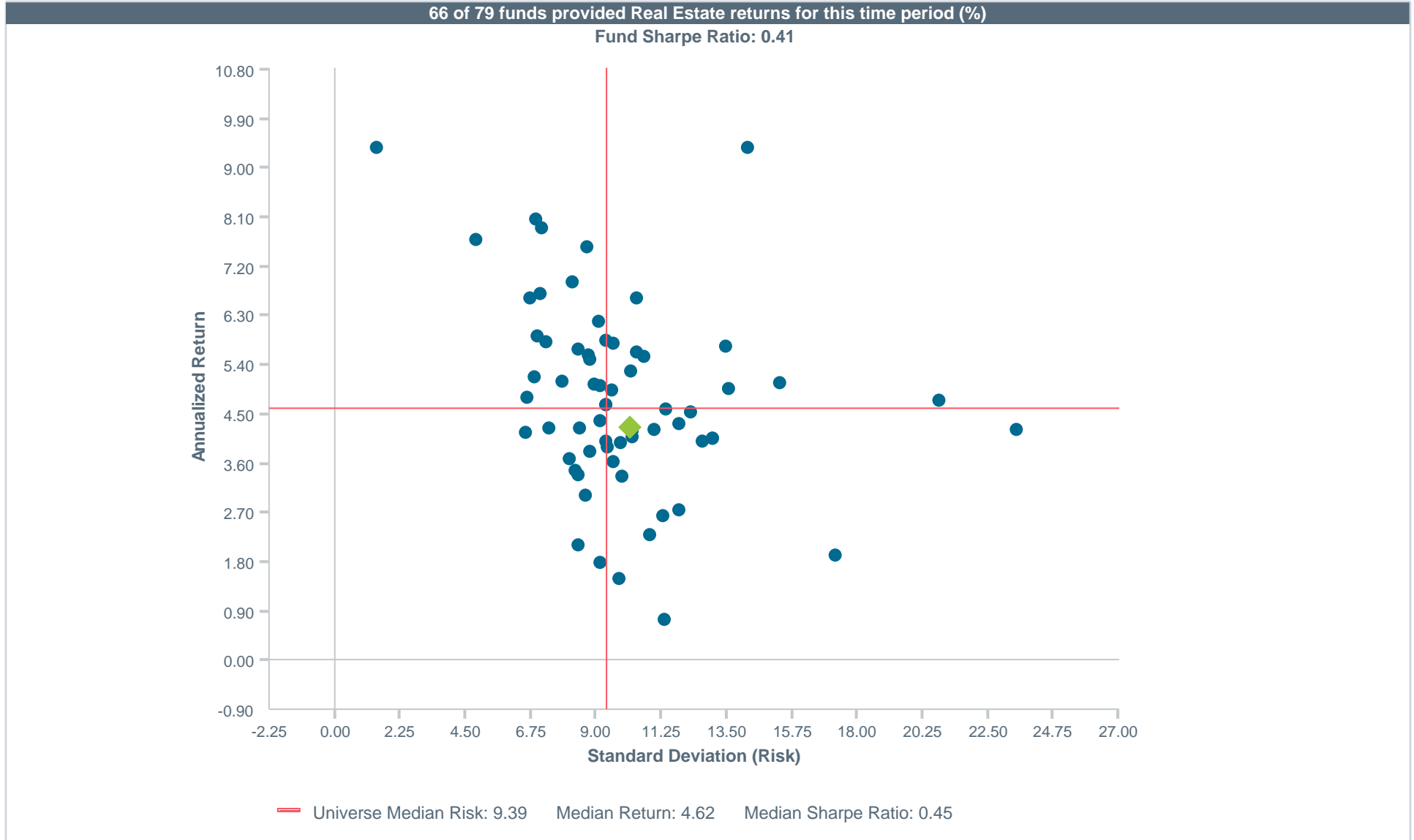
5 Year Annualized Real Estate Returns vs. Standard Deviation



Funds with less history than the specified time period will not appear in the chart.



10 Year Annualized Real Estate Returns vs. Standard Deviation

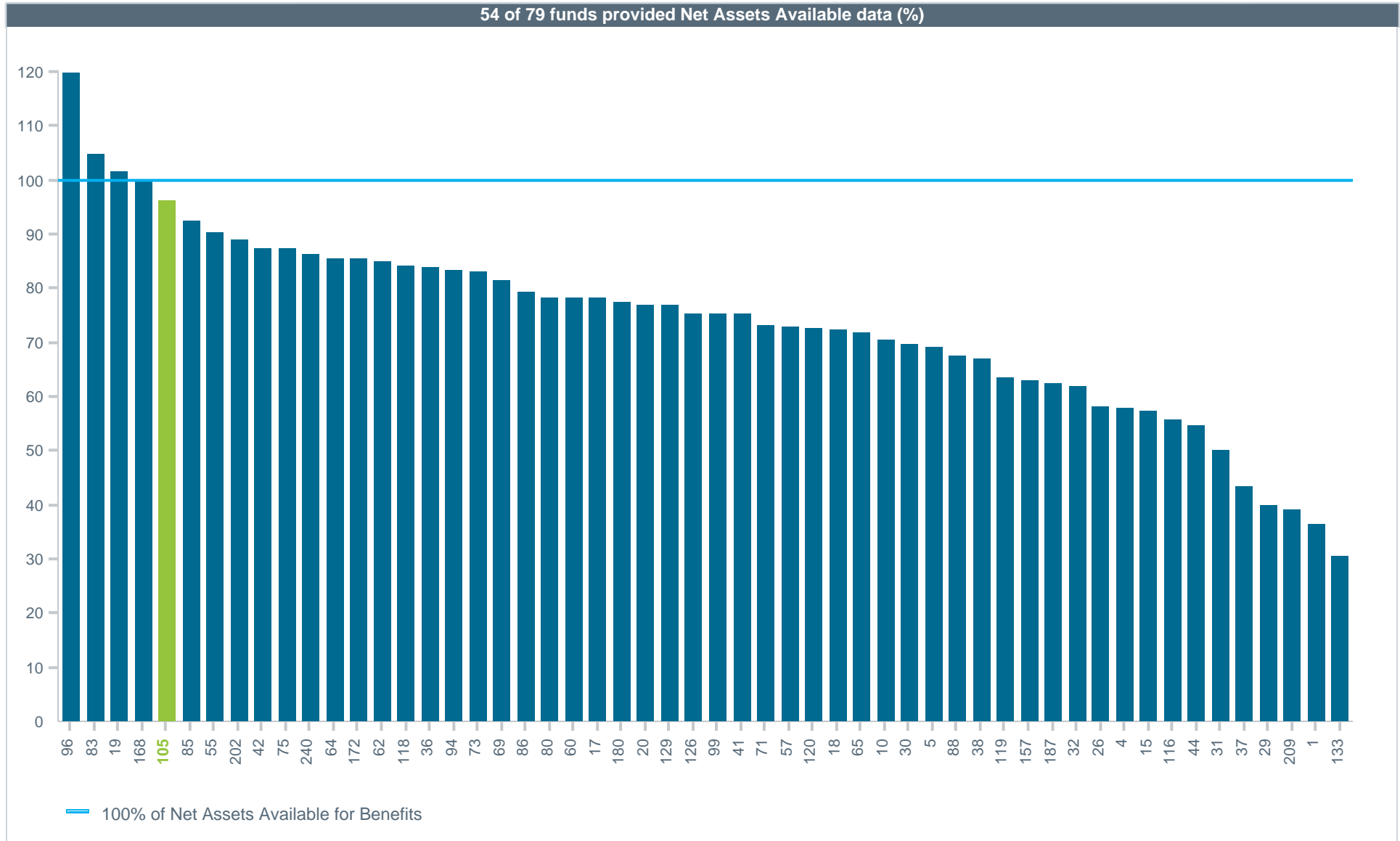


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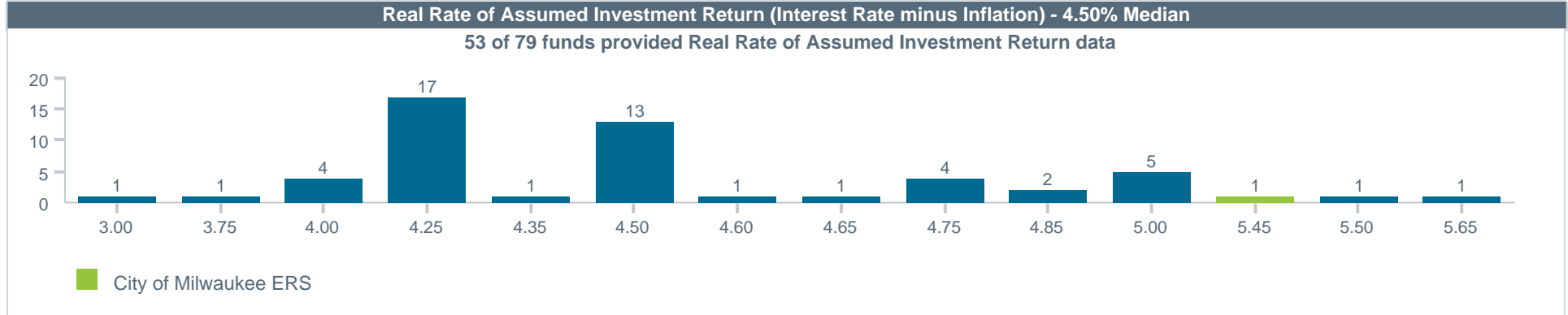
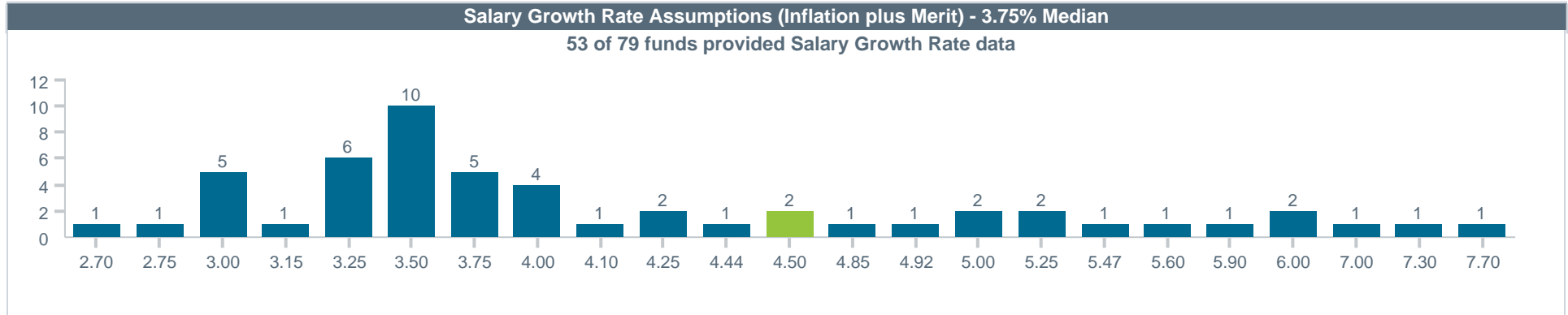
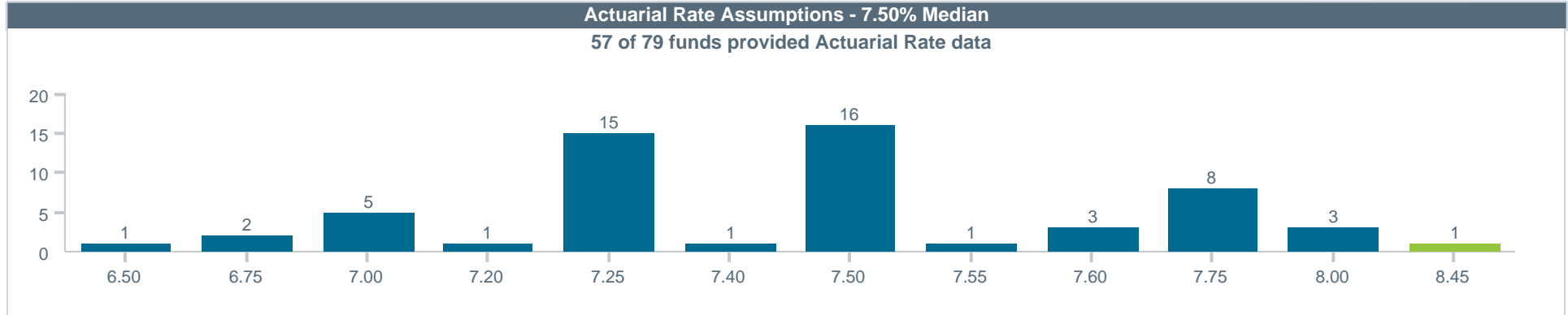
Net Assets Available For Benefits

Expressed as a Percentage of the Pension Benefit Obligation



Funds that did not provide data will not appear in the chart.

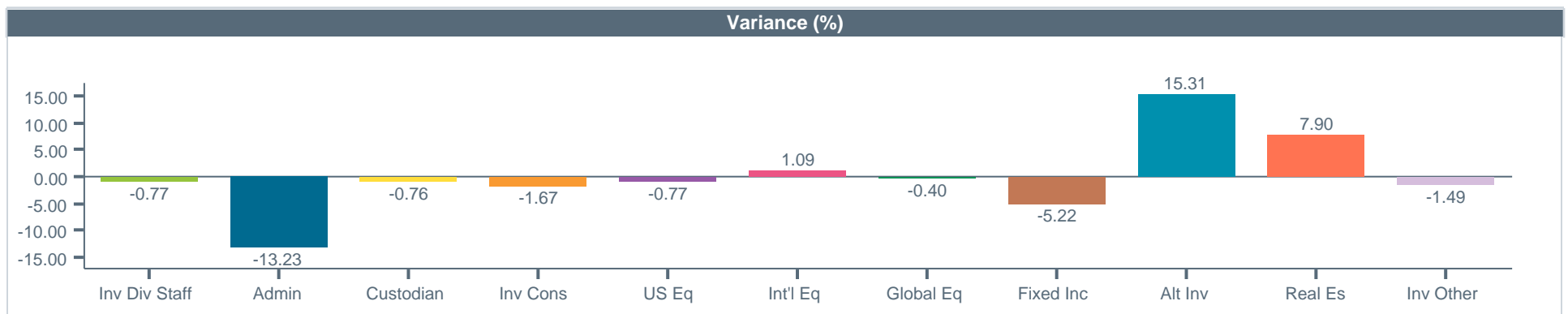
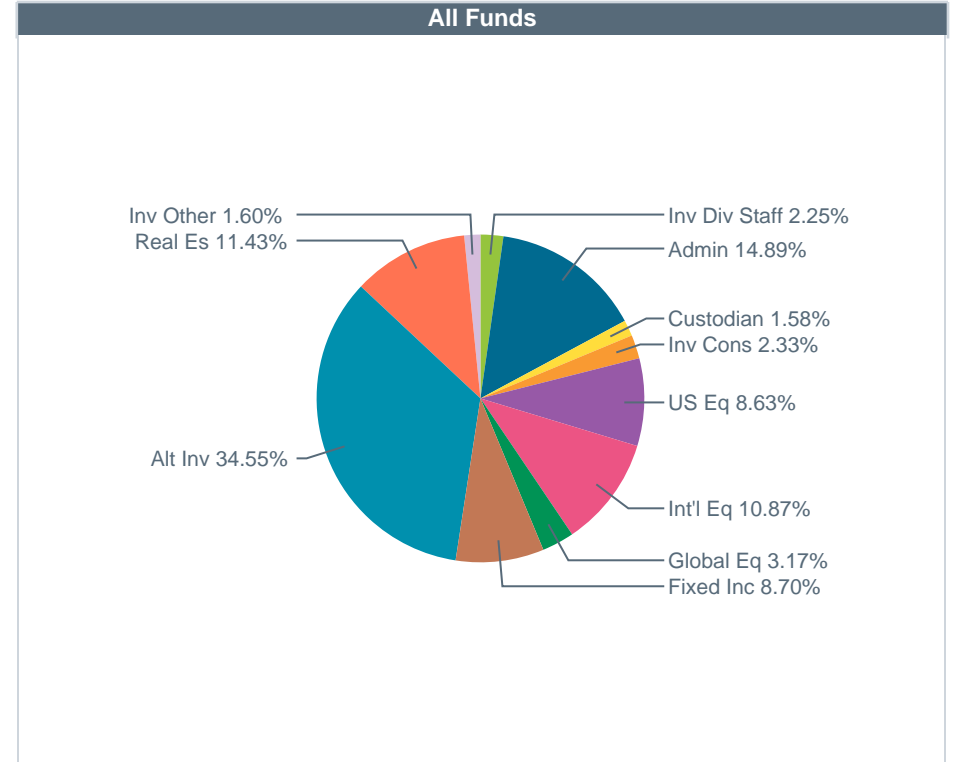
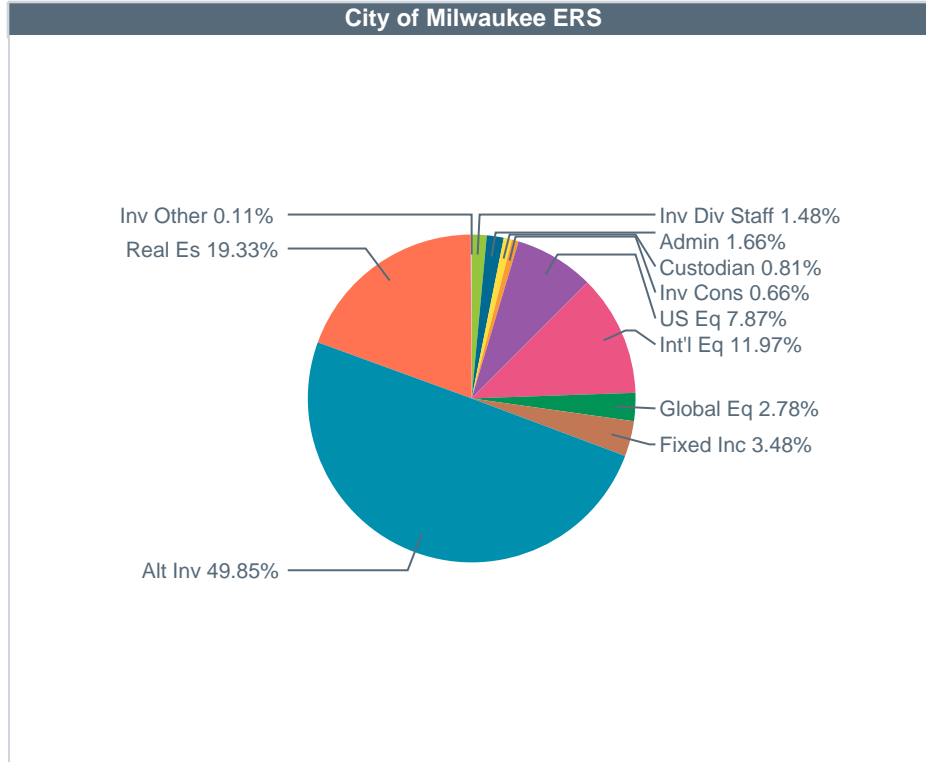




Funds that did not provide data will not appear in the chart.



Total Administrative and Investment Fees  
City of Milwaukee ERS vs. All Funds



Allocations shown may not sum up to 100% exactly due to rounding.



Fund Number: 105

As of June 30, 2017

**Total Fund Fee Summary in Basis Points**

City of Milwaukee ERS vs. Average by Asset Range

56 of 79 funds provided fee data for this time period

Administrative Expenses	City of Milwaukee ERS	Under \$500 Million	\$500mm - \$1 Billion	\$1 - \$5 Billion	\$5 - \$10 Billion	\$10 - \$20 Billion	Over \$20 Billion
Internal Inv. Div. Staff	1.06	1.96	0.00	0.91	0.63	0.85	2.04
Actuary	0.24	3.25	1.80	0.54	0.24	0.13	0.11
Legal	0.29	1.45	1.18	0.68	0.20	0.31	0.15
Consultant	0.00	0.00	0.25	0.26	0.07	0.12	0.13
Audit	0.17	0.92	0.64	0.21	0.11	0.06	0.07
Other Professional	0.13	0.00	1.73	0.27	0.60	0.43	0.77
General Administrative	0.37	21.89	13.74	7.42	6.46	4.47	3.30
<b>Total Administrative Expenses</b>	<b>2.25</b>	<b>29.48</b>	<b>19.34</b>	<b>10.28</b>	<b>8.32</b>	<b>6.37</b>	<b>6.57</b>
Investment Expenses	City of Milwaukee ERS	Under \$500 Million	\$500mm - \$1 Billion	\$1 - \$5 Billion	\$5 - \$10 Billion	\$10 - \$20 Billion	Over \$20 Billion
Custodial	0.58	1.29	3.03	1.16	0.71	0.55	0.30
Investment Consulting	0.47	3.05	2.40	2.22	0.69	0.70	0.45
US Equity	5.64	0.00	7.38	6.66	6.35	3.26	2.19
International Equity	8.58	0.00	6.71	7.62	5.29	5.68	4.20
Global Equity	1.99	4.32	1.00	2.43	2.29	1.11	0.95
Fixed Income	2.50	0.00	5.32	6.07	3.24	4.42	3.80
Real Estate	13.86	0.00	5.98	5.73	7.86	4.49	6.77
Other Investment Management	0.08	0.00	0.00	0.38	0.07	0.88	1.78
<b>Total Investment Expenses (ex. Alt Inv)</b>	<b>33.71</b>	<b>8.66</b>	<b>31.81</b>	<b>32.28</b>	<b>26.49</b>	<b>21.10</b>	<b>20.42</b>
Alternative Investments	35.75	0.00	3.98	18.11	23.98	14.10	21.73
<b>Total Investment Expenses</b>	<b>69.46</b>	<b>8.66</b>	<b>35.79</b>	<b>50.39</b>	<b>50.46</b>	<b>35.20</b>	<b>42.15</b>
<b>Total Expenses</b>	<b>71.71</b>	<b>38.14</b>	<b>55.13</b>	<b>60.67</b>	<b>58.78</b>	<b>41.57</b>	<b>48.73</b>

Expressed in basis points on total fund assets. Funds that did not provide fee data will not appear in the table.



## GIPS Compliance Survey Summary

**Q1. Are you currently claiming compliance or considering compliance with the CFA Institute's Guidance Statement on the Application of the Global Investment Performance Standards (GIPS) to Asset Owners, effective January 1, 2015?**

Of the 79 participants in the 2017Q2 Public Fund Report, 51 participants provided a reply to the GIPS Compliance Survey. Of those participants, 6 answered "Yes, Currently Comply", 4 answered "Yes, Considering", and 41 answered "Not Considering".

**Q2. According to the GIPS standards, asset owner net of fees performance must reflect internal as well as external investment costs, and such net of all fee performance is required to be calculated and presented to fund oversight committees/Boards. Please identify which, if any, of the following costs you are currently including or will consider including in net performance that is in compliance with the GIPS standards.**

	<u>Currently Include</u>	<u>Considering</u>	<u>Not Considering</u>	<u>Unsure at this Time</u>
• Internal investment department compensation/benefits	7	1	3	2
• Allocation of non-investment department expenses (human resources, communications, technology, performance measurement, and compliance to support internal management team)	7	1	3	2
• Investment research services (100% or pro-rata determination)	6	0	3	4
• Investment consulting fees (general investment consulting and project fees; 100% or pro-rata determination)	8	0	3	2
• Pro-rata data valuation fees	4	1	3	5
• Pro-rata overhead indirectly related to asset management (building and utilities fees to support internal management team)	5	0	4	3



### Miscellaneous Comments

- Performance shown is gross of fees, with the exception of the following:
  - **Funds 31, 49, 350, 351, and 355:** Performance shown is net of fees.
  - **Funds 5 and 20:** Performance shown is net of fees, except for Total Fund performance.
  - **Fund 85:** Performance shown for Real Estate is net of fees.
- Performance shown is calculated using quarterly performance provided by participating public funds.
- Performance shown may differ from a fund's actual performance due to rounding.
- Net Assets Available for Benefit includes funding percentage valuation as of dates between June 2016 and June 2017.
- Allocations shown reflect dedicated managers/mandates rather than actual exposure, with the exception of the following:
  - **Fund 61:** Performance shown for Global Equity includes US and Non-US exposure.
  - **Funds 1, 29, and 119:** Performance shown for Global Fixed Income includes US and Non-US exposure.
  - **Funds 4, 42, and 64:** Performance shown for US Fixed Income includes US and Non-US exposure.

### Glossary of Terms

**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.

**Return** - Compounded rate of return for the period.

**% Return** - The time-weighted rate of return of a portfolio for a given period.

**Sharpe Ratio** - Represents the excess rate of return over the risk-free return (i.e., BofA ML 3 Mo US T-Bill Index unless specified otherwise), divided by the standard deviation of the excess return to the risk free asset. 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. Calculation is based on quarterly periodicity.

PORTLAND

CHICAGO

NEW YORK

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