



# Public Fund Universe Analysis

## Mendocino County Employees' Retirement Association

Period Ending December 31, 2018  
Fund Number: 49



## OVERVIEW

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. In May 2018, RVK received a Greenwich *Quality Leader Award*, demonstrating our high level of client service.

## MISSION STATEMENT

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

## STRATEGIC INVESTMENT ADVICE WITH NO CONFLICTS OF INTEREST

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 are in control of our business policy, providing firm stability for 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



### **RVK BY THE NUMBERS**

- **30+** years of business
- **3** offices - Portland, Chicago, New York
- **\$1+** trillion Full-Retainer AUA
- **80+** 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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- Real Estate Consulting Services
- Custody, Record keeper, Third-Party Administrator Searches
- Asset/Liability Studies
- Endowment Spending Policy Studies
- Securities Lending Reviews
- Pacing Studies
- Strategic Planning Reviews
- 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  
Chicago Teachers' Pension Fund  
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  
District of Columbia Retirement Board  
Employees' Retirement System of Rhode Island  
Fort Worth Employees' Retirement Fund  
Gila River Indian Community Retirement Plan  
Imperial County Employees' Retirement System  
Kansas City, Missouri Employees' Retirement System  
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  
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  
San Bernardino County Employees' Retirement Association  
San Diego County Employees Retirement Association  
San Mateo County Employees' Retirement Association  
Sonoma County Employees' Retirement Association

Anchorage Police & Fire Retirement System  
California State Teachers' Retirement System  
City of Austin Employees' Retirement System  
City of Milwaukee Employees' Retirement System  
City of Plano Retirement Security Plan  
Colorado Public Employees' Retirement Association  
  
County Employees' Annuity & Benefit Fund of Cook County  
Employees Retirement System of Texas  
Fire and Police Pension Association of Colorado  
Fresno County Employees' Retirement Association  
Illinois Municipal Retirement Fund  
Iowa Public Employees' Retirement System  
Kansas Public Employees' 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 (Fund No. 49)**  
Montana Public Employees' Retirement System  
Municipality of Anchorage Pre-Funding Program  
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  
San Diego City Employees' Retirement System  
San Diego Transit Corporation Employees Retirement  
Santa Barbara County Employees' Retirement System

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Stanislaus County Employees' Retirement Association  
State of New Jersey Pension Fund  
State Universities Retirement System of Illinois  
Teachers' Retirement System of the State of Illinois  
Texas Municipal Retirement System  
Tulare County Employees' Retirement Association  
Virginia Retirement System  
Wyoming Retirement System

South Dakota Retirement System  
State of Michigan Retirement Systems  
State Teachers Retirement System of Ohio  
Teachers' Retirement System of Louisiana  
Teachers' Retirement System of Kentucky  
The Navajo Nation Retirement Plan  
Ventura County Employees' Retirement Association  
West Virginia Investment Management Board

## Fourth Quarter Economic Environment

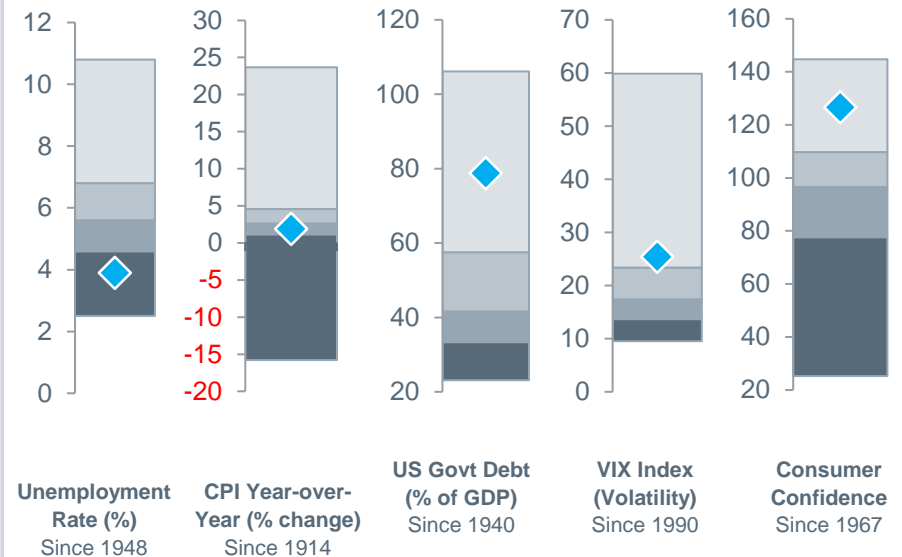
## Key Economic Indicators

The fourth quarter of 2018 was characterized by a heightened level of volatility and negative returns for the majority of risk assets. Though equity markets experienced an initial decline in October, the strongest risk-off environment emerged in December as global growth forecasts, inflation expectations, and corporate earnings expectations began to roll over in unison. During the quarter, the Federal Reserve, European Central Bank, and International Monetary Fund lowered 2019 GDP growth forecasts across regions, and the 5Y/5Y inflation expectation rate fell from nearly 2.3% at the start of the quarter to 1.9% at quarter-end. In a move that proved to be more controversial than many anticipated, the FOMC raised the target range for the federal funds rate by 0.25% for the fourth time in 2018 during its December meeting, resulting in a target range of 2.25% to 2.5%. US Economic data remained strong, with non-farm payrolls up 312,000 in December on a 3.9% unemployment rate. While the odds of a recession occurring in 2019 remain low, leading indicators such as falling oil prices, a flattening yield curve, declining consumer confidence and a subdued housing market contributed to negative investor sentiment at year-end.

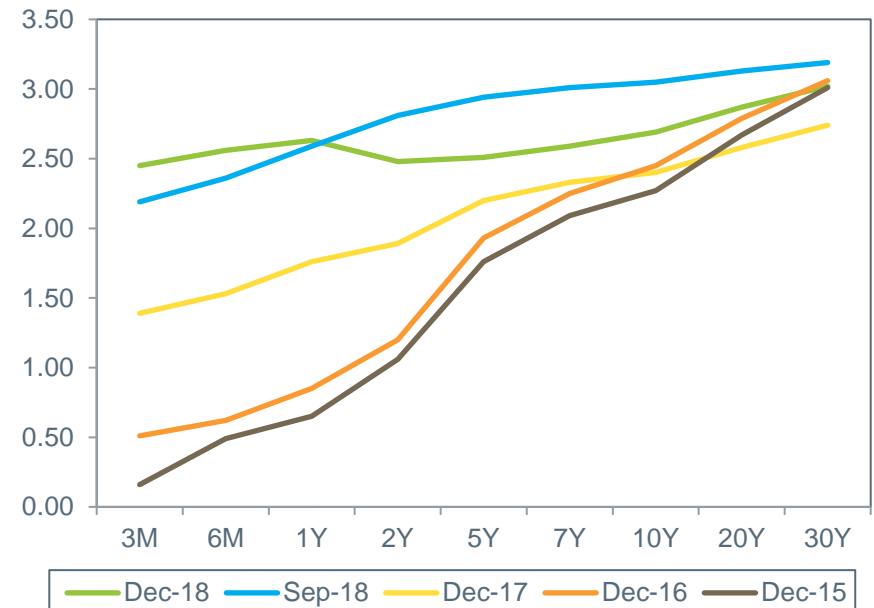
Economic Indicators	Dec-18	Sep-18	Dec-17	Dec-15	20 Yr
Federal Funds Rate (%)	2.40 ▲	2.18	1.33	0.20	1.94
Breakeven Infl. - 1 Yr (%)	-2.84 ▼	1.18	0.85	0.85	N/A
Breakeven Infl. - 10 Yr (%)	1.71 ▼	2.14	1.98	1.58	N/A
CPI YoY (Headline) (%)	1.9 ▼	2.3	2.1	0.7	2.2
Unemployment Rate (%)	3.9 ▲	3.7	4.1	5.0	5.9
Real GDP YoY (%)	3.1 ▲	3.0	2.5	2.0	2.2
PMI - Manufacturing	54.3 ▼	59.5	59.4	48.4	52.8
USD Total Wtd Idx	91.79 ▲	90.11	87.47	94.25	86.32
WTI Crude Oil per Barrel (\$)	45.4 ▼	73.3	60.4	37.0	60.1
Gold Spot per Oz (\$)	1,282 ▲	1,193	1,303	1,061	879

Market Performance (%)	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	-13.52	-4.38	-4.38	8.49	13.12
Russell 2000	-20.20	-11.01	-11.01	4.41	11.97
MSCI EAFE (Net)	-12.54	-13.79	-13.79	0.53	6.32
MSCI EAFE SC (Net)	-16.05	-17.89	-17.89	3.06	10.51
MSCI Emg Mkts (Net)	-7.47	-14.58	-14.58	1.65	8.02
Bloomberg US Agg Bond	1.64	0.01	0.01	2.52	3.48
ICE BofAML 3 Mo US T-Bill	0.56	1.87	1.87	0.63	0.37
NCREIF ODCE (Gross)	1.76	8.35	8.35	10.41	7.00
FTSE NAREIT Eq REIT (TR)	-6.73	-4.62	-4.62	7.90	12.12
HFRI FOF Comp	-4.95	-4.03	-4.03	1.40	3.12
Bloomberg Cmtty (TR)	-9.41	-11.25	-11.25	-8.80	-3.78

## Key Economic Indicators



## Treasury Yield Curve (%)



### Fourth Quarter Review

#### Broad Market

Amid broadening macroeconomic concerns, US equity markets faltered during the fourth quarter as the S&P 500 Index posted returns of -13.5%. Despite a year-to-date return of 10.6% through September, fourth quarter losses drove total S&P 500 Index returns to -4.4% for the year, marking the first negative calendar year result for the index since 2008.

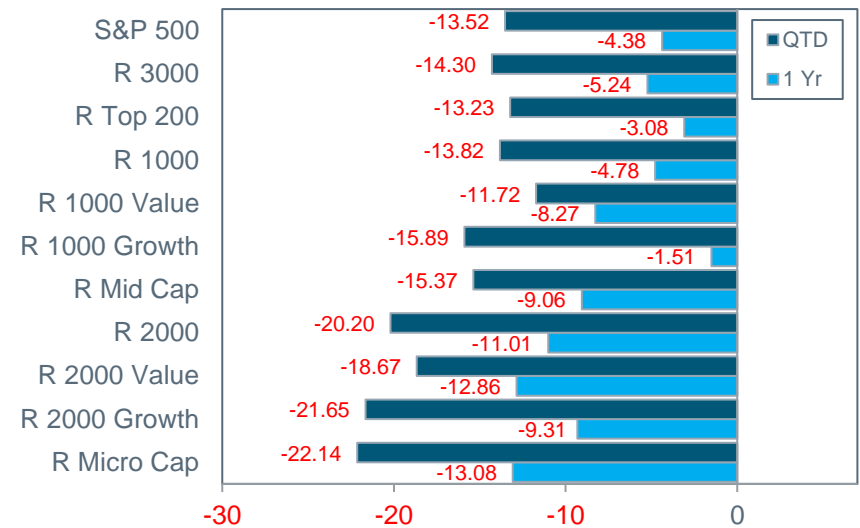
#### Market Cap

Generally, large cap managers weathered the volatility that characterized the fourth quarter better than small- and mid-cap managers.

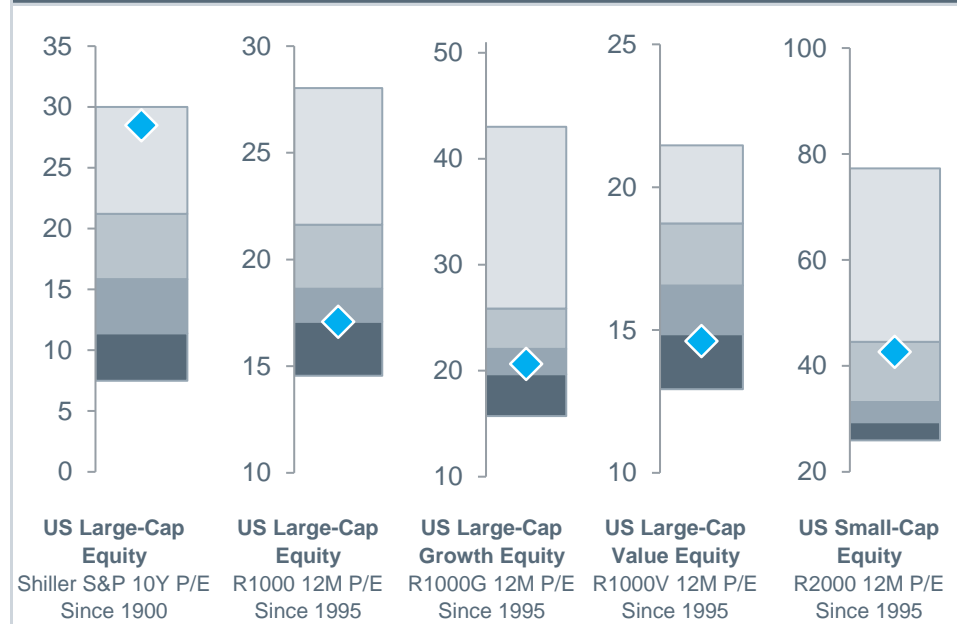
#### Style and Sector

Value indices outperformed growth indices during the fourth quarter. Active management results were mixed during the quarter, with growth managers performing relatively better across styles and market capitalizations as value generally struggled due to persistent underweights in defensive, income-oriented sectors.

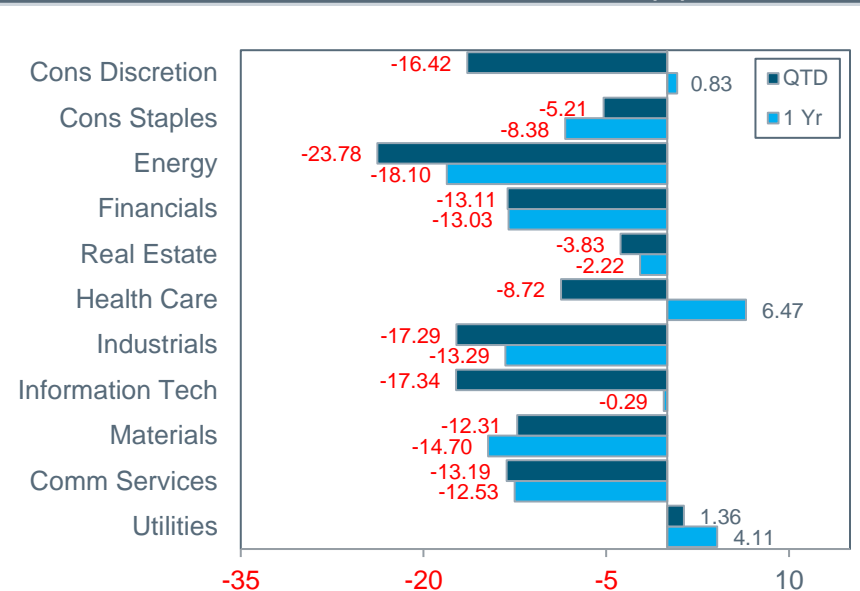
### Style and Capitalization Market Performance (%)



### Valuations



### S&P 500 Index Sector Performance (%)



## Fourth Quarter Review

## Developed Markets

Developed international markets outperformed domestic markets, but also ended with negative double-digit returns in the fourth quarter. The sell-off was partially induced by volatility in the US market, but also driven by international economic tensions.

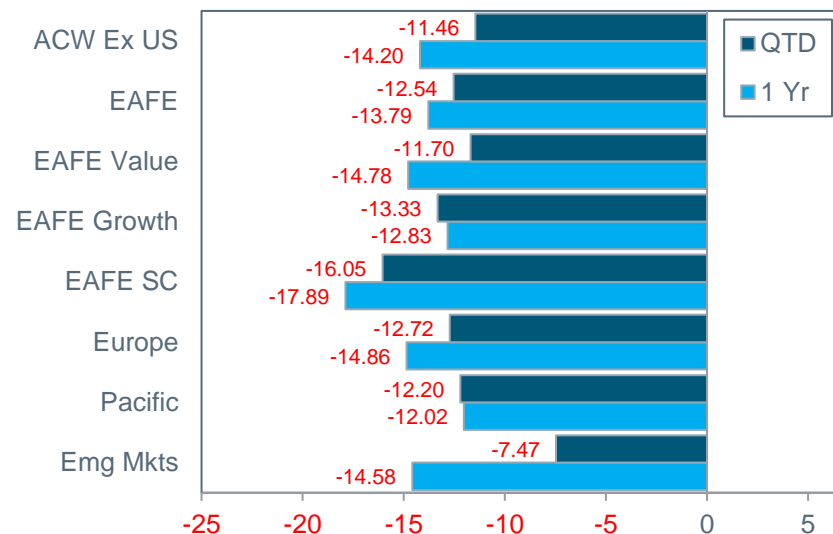
## Emerging Markets

The emerging markets were the best performing equity region in the fourth quarter, but still finished the quarter and year in negative territory. Additionally, overall investor sentiment weakened due to continued fears of growth moderation in China.

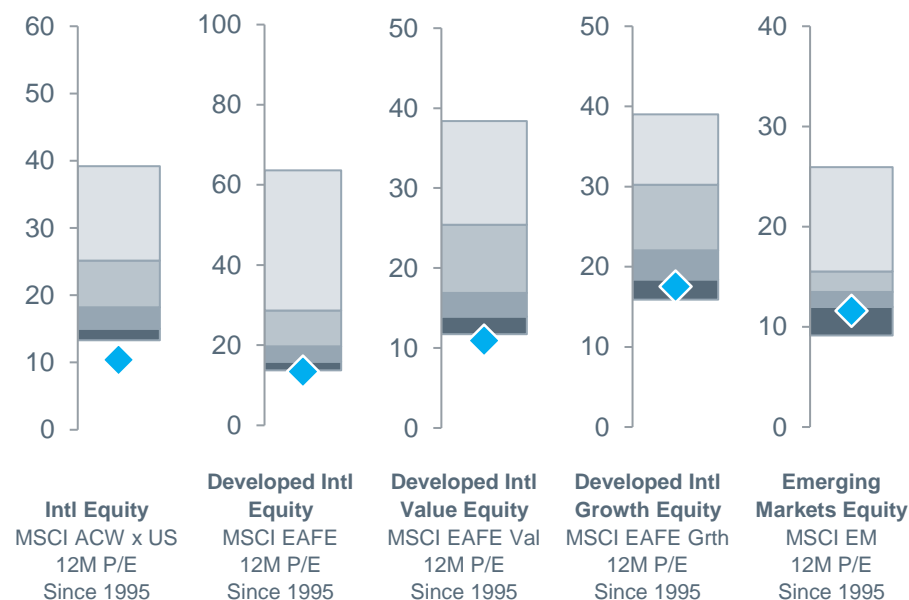
## Market Cap &amp; Style

While international stocks were negative in the quarter, value broadly outperformed growth, bucking a long-term trend of growth stock leadership. Large cap outperformed small cap in developed international markets, but in a notable trend difference, emerging markets small cap stocks broadly outperformed the stocks of larger companies.

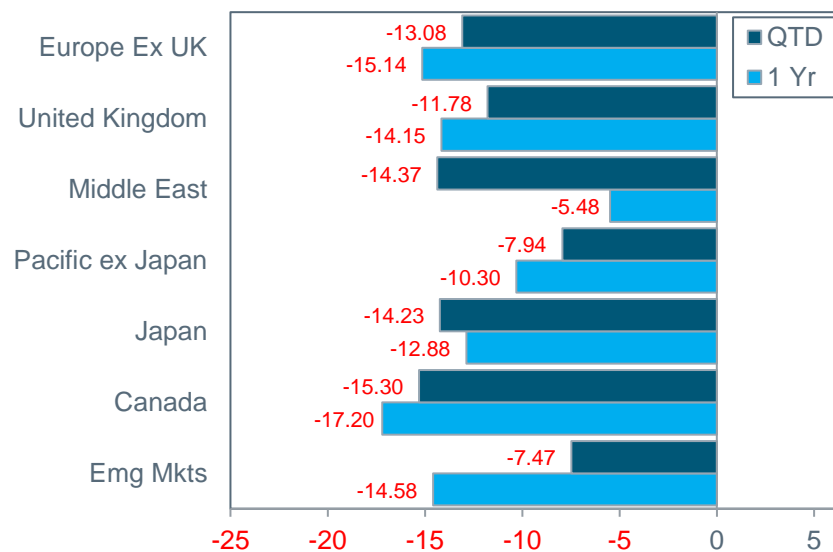
## MSCI Style and Capitalization Market Performance (%)



## 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.



## Fourth Quarter Review

## Broad Market

The Federal Open Market Committee raised the target range for the federal funds rate by 0.25% for the fourth time in 2018 to 2.25% - 2.5%. The Bloomberg US Agg Bond returned 1.6% during the quarter to end the year roughly flat. The yield spread between 2-year and 10-year maturities, a popular range often cited as a recession indicator, narrowed to 0.21%, the lowest quarter-end value since the second quarter of 2007.

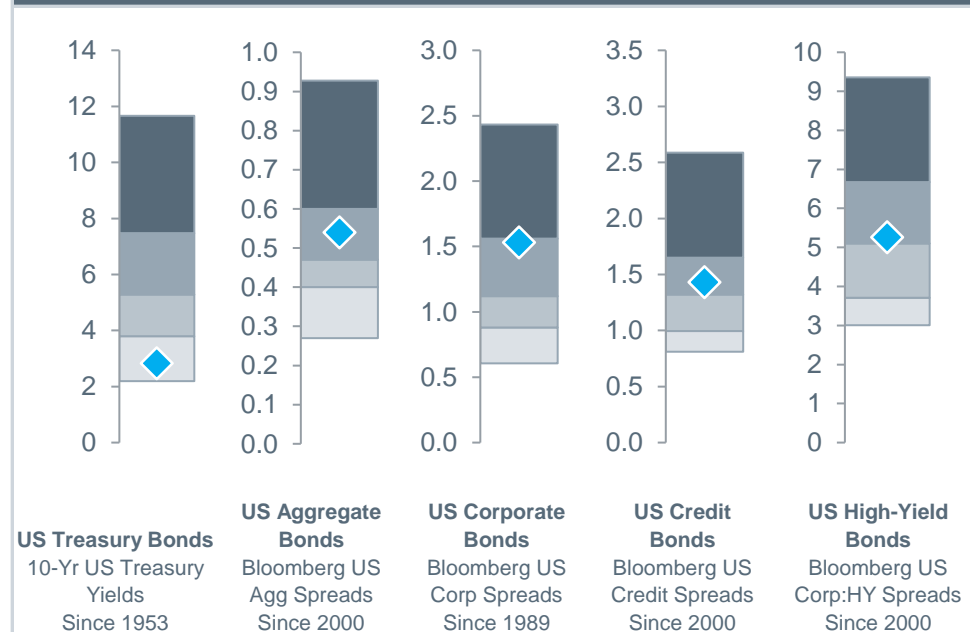
## Credit Market

Credit spreads widened over the quarter, as investors sought the safety of Treasuries during the volatile market conditions. Securities rated below investment grade were hit hard during the quarter, with the Bloomberg US High Yield Index returning -4.5%.

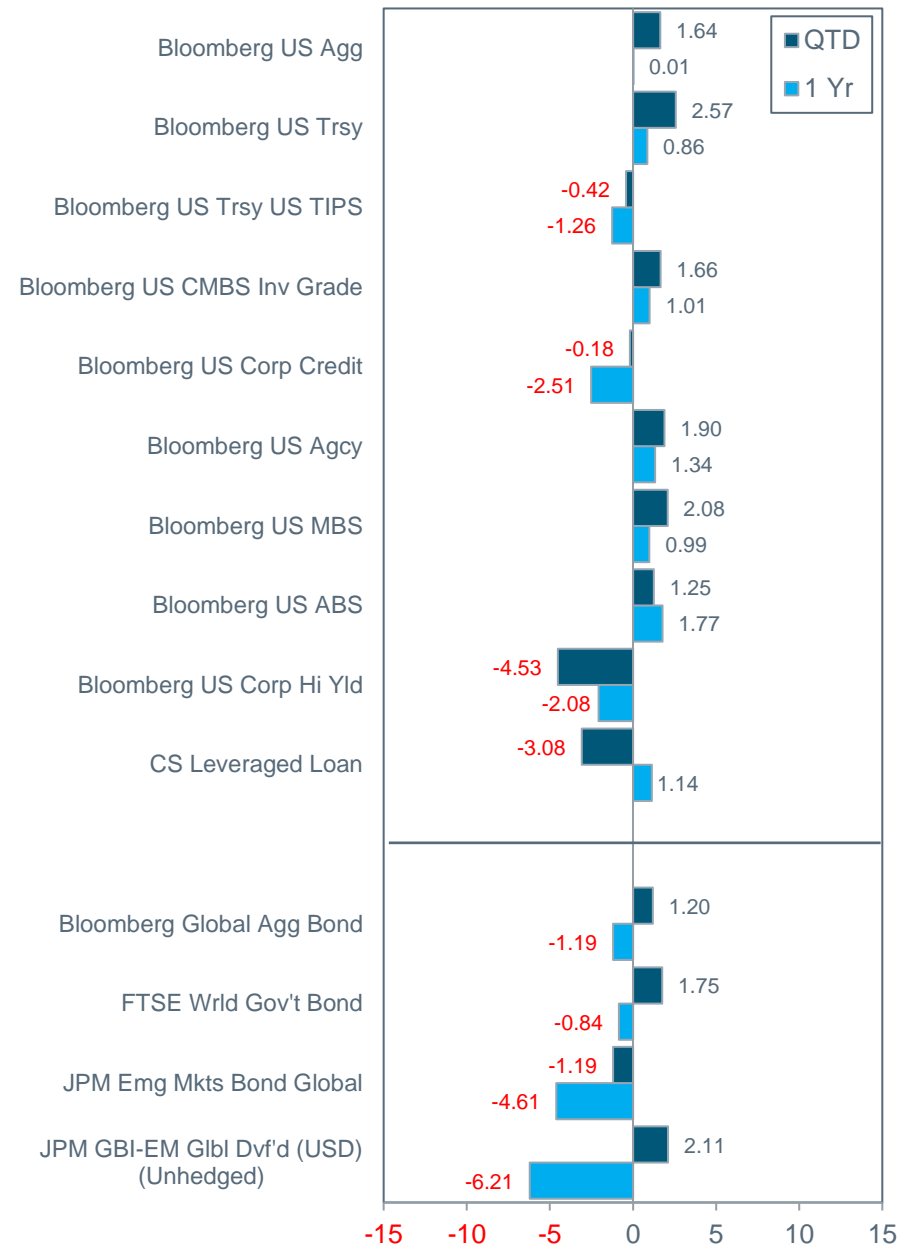
## Emerging Market Debt

Non-dollar denominated emerging market debt posted positive returns during the quarter, with the JPM GBI-EM Global Diversified Index returning 2.1%.

## 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.

#### Fourth Quarter Review - Absolute Return

##### General Market - Hedge Funds

The hedge fund industry experienced its worst quarter since the third quarter of 2011 as measured by HFRI's Fund Weighted Composite Index, capping off a difficult year for the majority of hedge fund strategies with a return of -4.6%. Equity Long/Short funds in particular were a source of poor relative returns. Specifically, the HFRI Equity Hedge Index fell -8.4% for the quarter and finished the year with a return of -7.1%.

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

Most GTAA managers underperformed a less diversified blend of 60% US equity and 40% US fixed income in 2018, despite outperforming this benchmark in the fourth quarter. In general, the GTAA managers that achieved the strongest 2018 performance held significant short exposures and fixed income allocations compared to those of their less successful counterparts. The GTAA managers that lagged their peers by the largest margins in 2018 generally held heavier weights in global equities.

#### Fourth Quarter Review - Real Assets

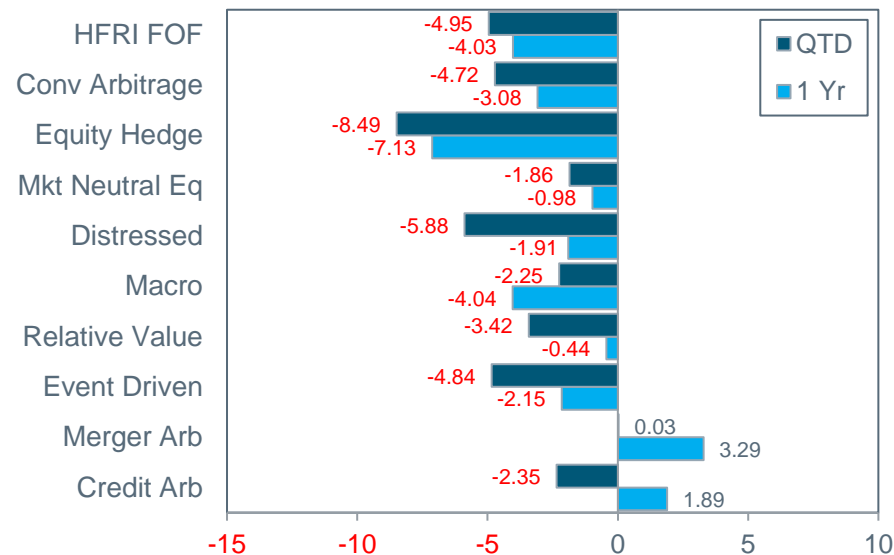
##### General Market - Diversified Inflation Strategies (DIS)

Performance of DIS managers ranged widely in the fourth quarter, though virtually all managers provided losses in 2018. Poor DIS manager performance during the fourth quarter coincided with both declines in measured inflation and market-based expectations of future inflation levels. Managers with larger allocations to TIPS experienced significantly less downside participation. Among managers with lower levels of TIPS exposure, those with larger natural resource equity and commodity exposure lagged peers by the largest margins.

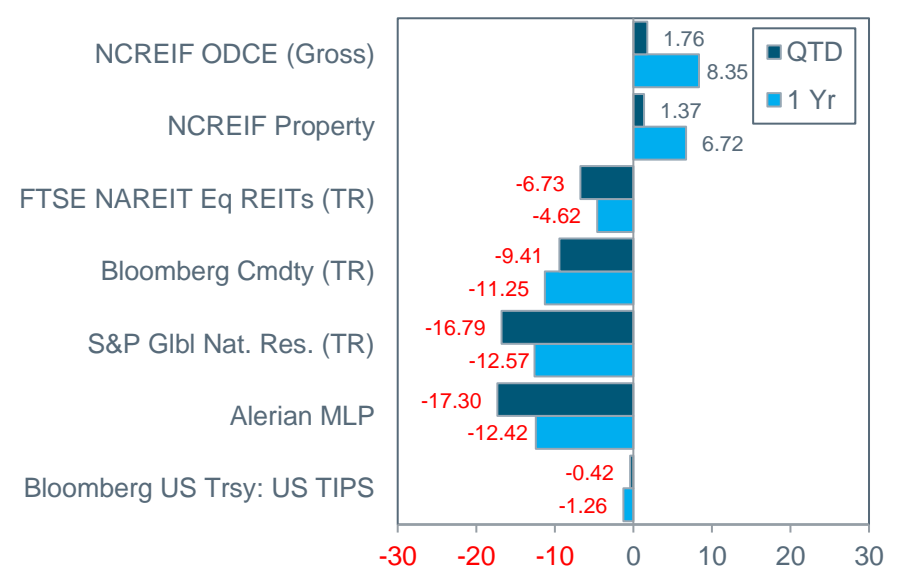
##### General Market - Real Estate

Core private real estate returned 1.8% during the fourth quarter, as tracked by the NCREIF-ODCE Index, with the total return comprised of 1.0% income and 0.7% price appreciation. Investors in publicly traded real estate significantly underperformed their private market counterparts during the fourth quarter. Publicly traded real estate experienced heightened price volatility over the quarter, ending the year with a negative return, measured by FTSE/NAREIT All REITs Index, of -6.1%.

#### HFRI Hedge Fund Performance (%)



#### Real Asset Performance (%)

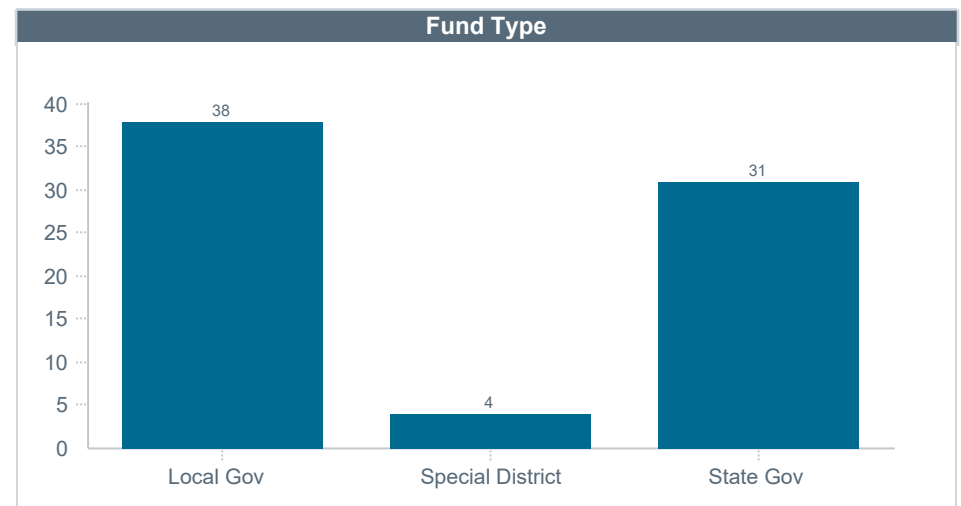
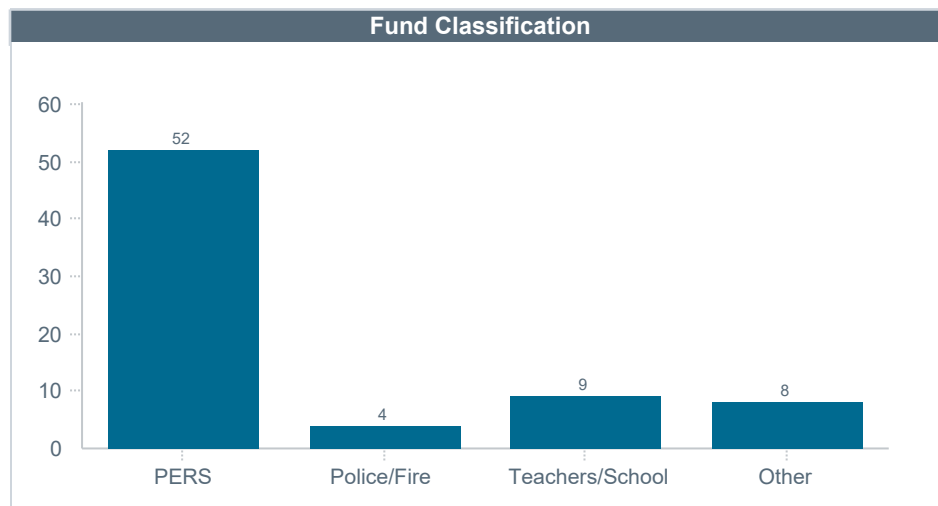
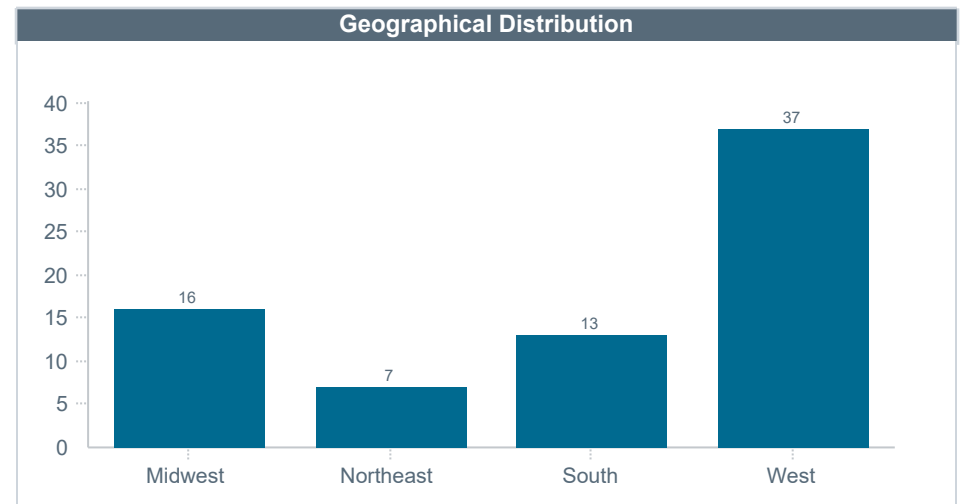
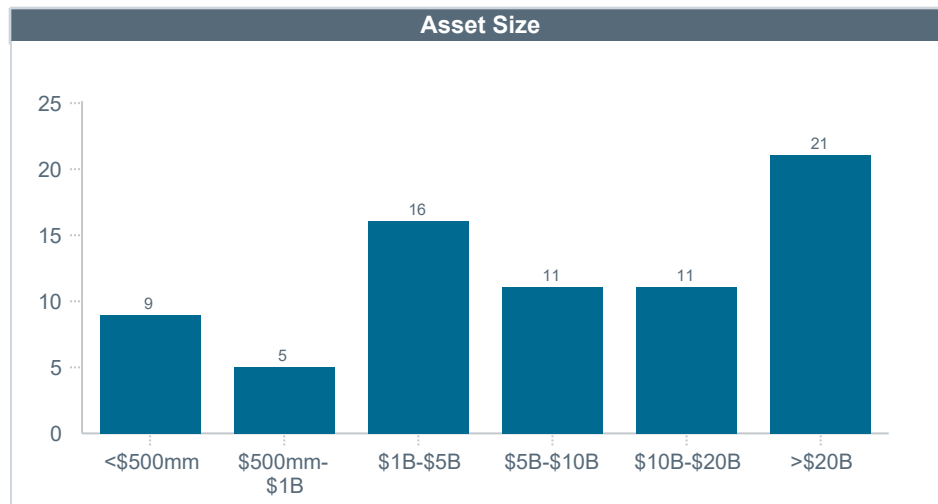


## Annual Asset Class Performance

As of December 31, 2018

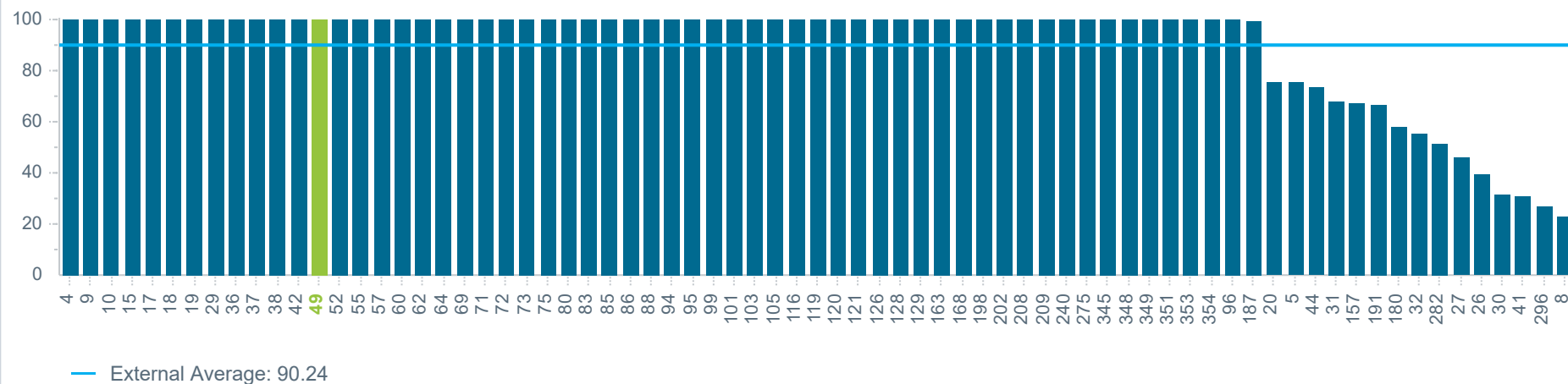
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Best ↑   <															

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

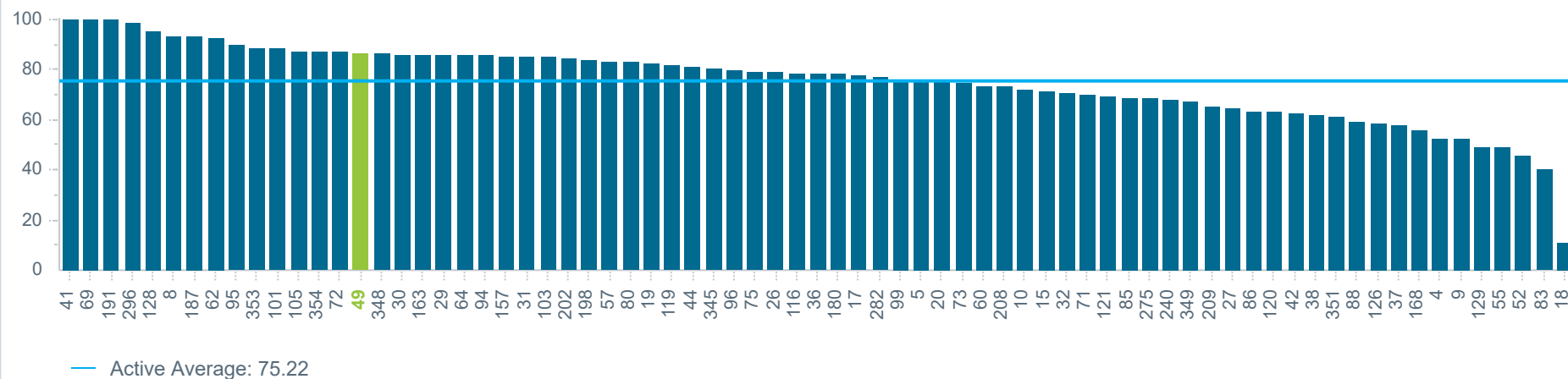


■ Universe: 73 funds

### External Management (%)



### Active Management (%)



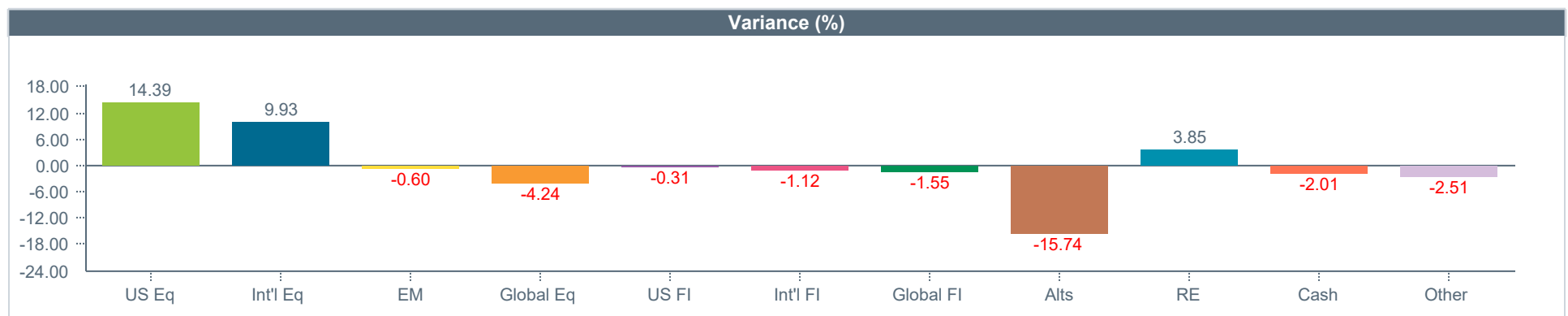
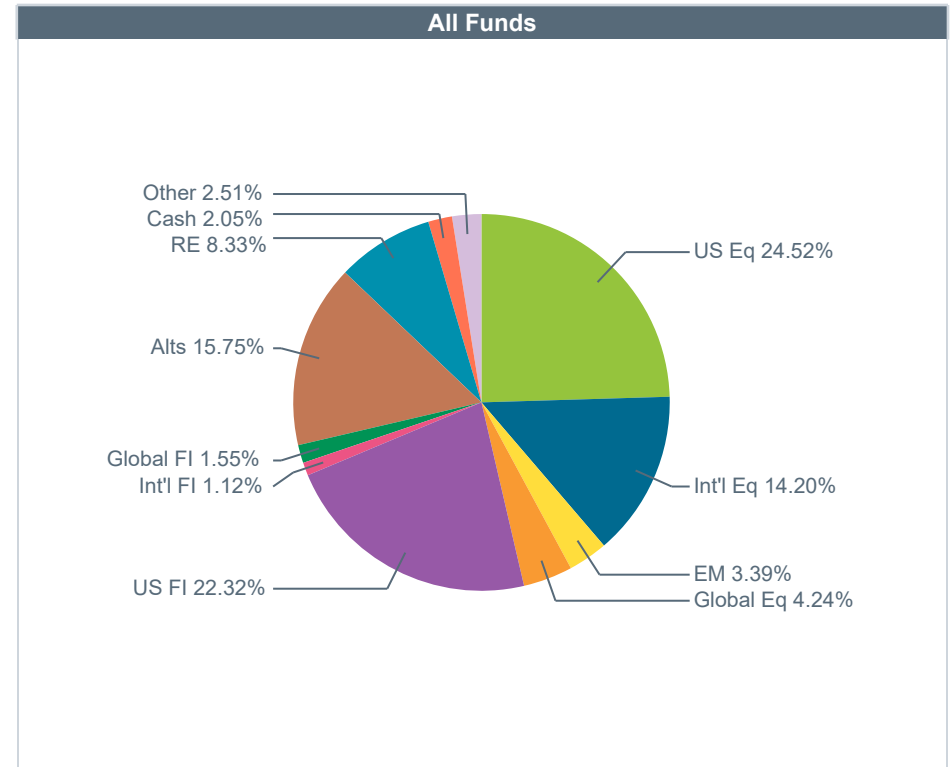
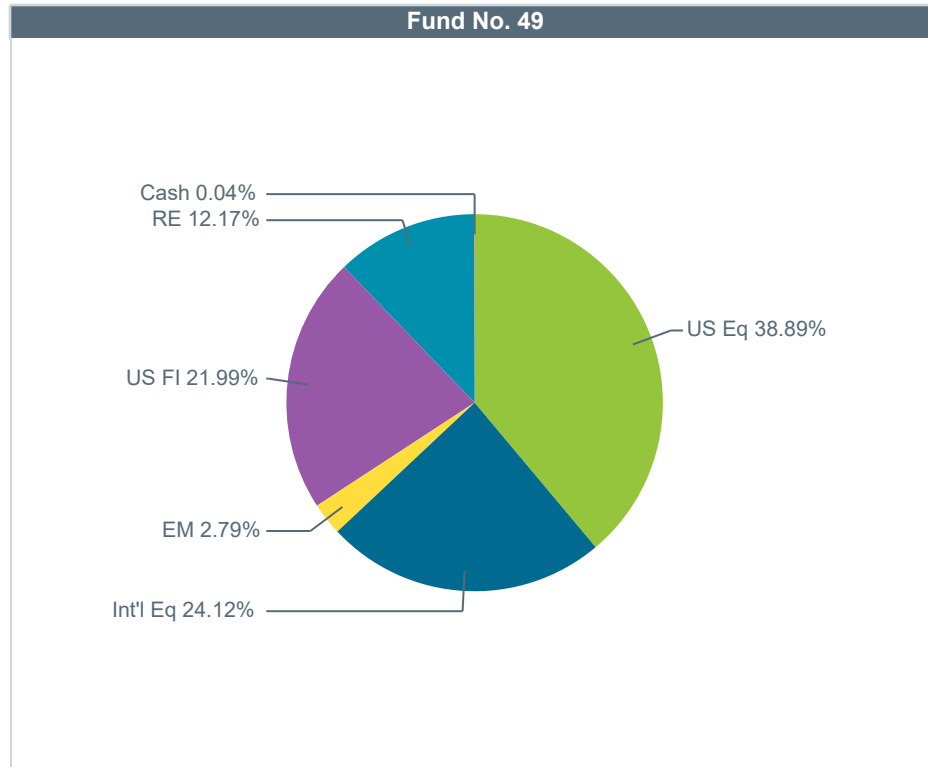
Fund No. 49



Asset Range	Actively Managed (%)	Passively Managed (%)	Externally Managed (%)	Internally Managed (%)
Over \$20B	74.93	25.07	73.17	26.83
\$10B-\$20B	73.50	26.50	90.87	9.13
\$5B-\$10B	67.28	32.72	97.78	2.22
\$1B-\$5B	80.19	19.81	98.47	1.53
\$500mm-\$1B	72.06	27.94	100.00	0.00
Under \$500mm	80.65	19.35	100.00	0.00
<b>Fund No. 49</b>	<b>86.44</b>	<b>13.56</b>	<b>100.00</b>	<b>0.00</b>

Percentages shown for asset ranges are representative of the average allocation.

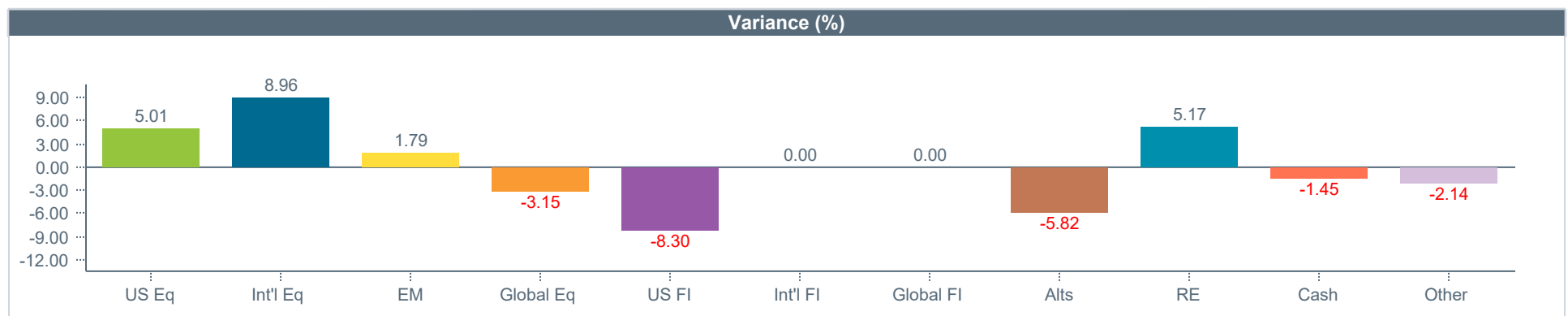
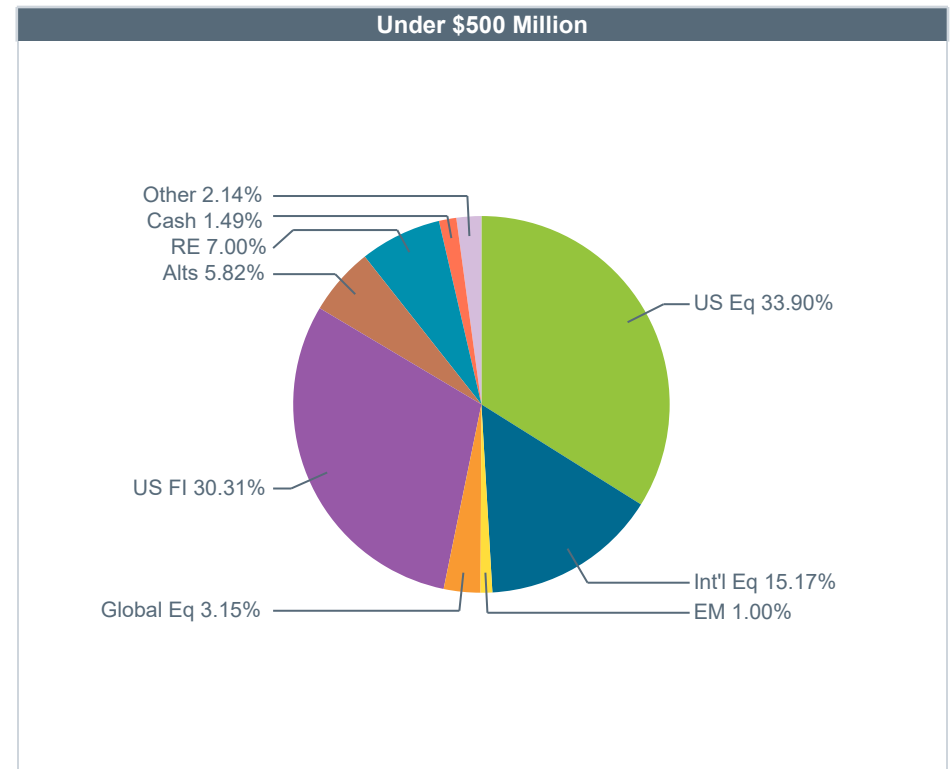
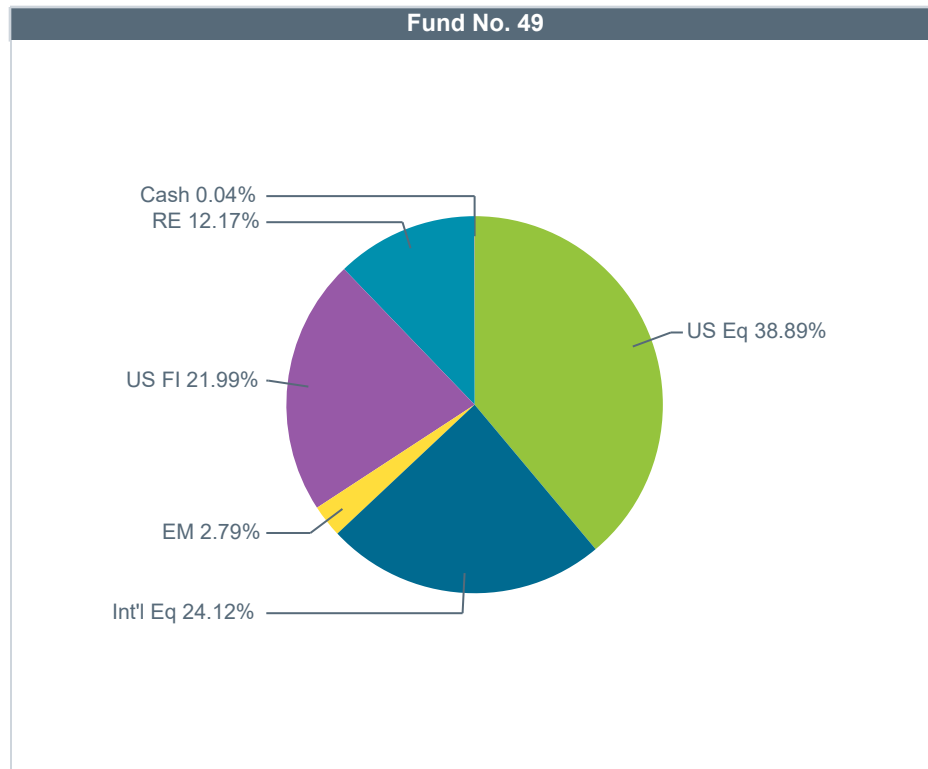
Portfolio (%)	Active Management		External Management	
	Public Fund Universe	Fund No. 49	Public Fund Universe	Fund No. 49
90 to 100	8	0	58	1
50 to 89	60	1	9	0
10 to 49	5	0	6	0
Less than 10	0	0	0	0
<b>Total Funds Reporting</b>	<b>73</b>	<b>1</b>	<b>73</b>	<b>1</b>



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

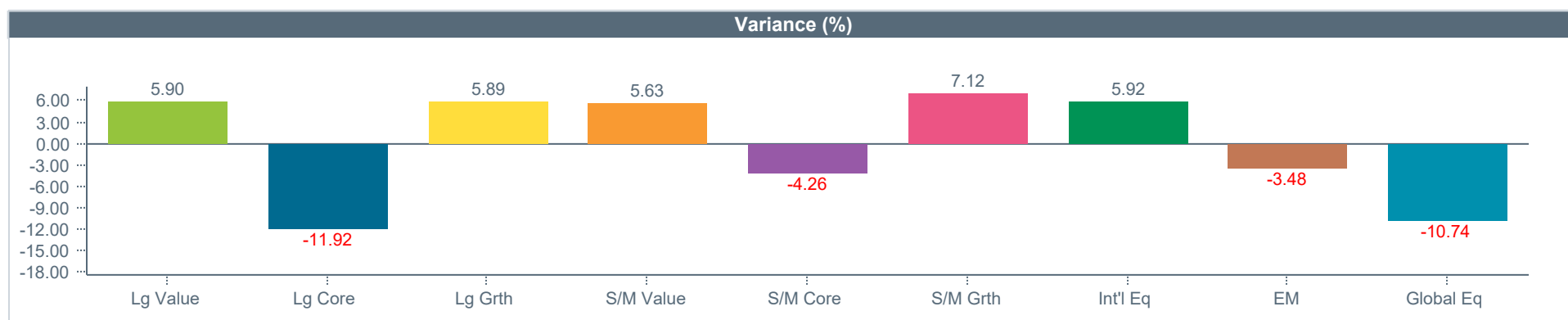
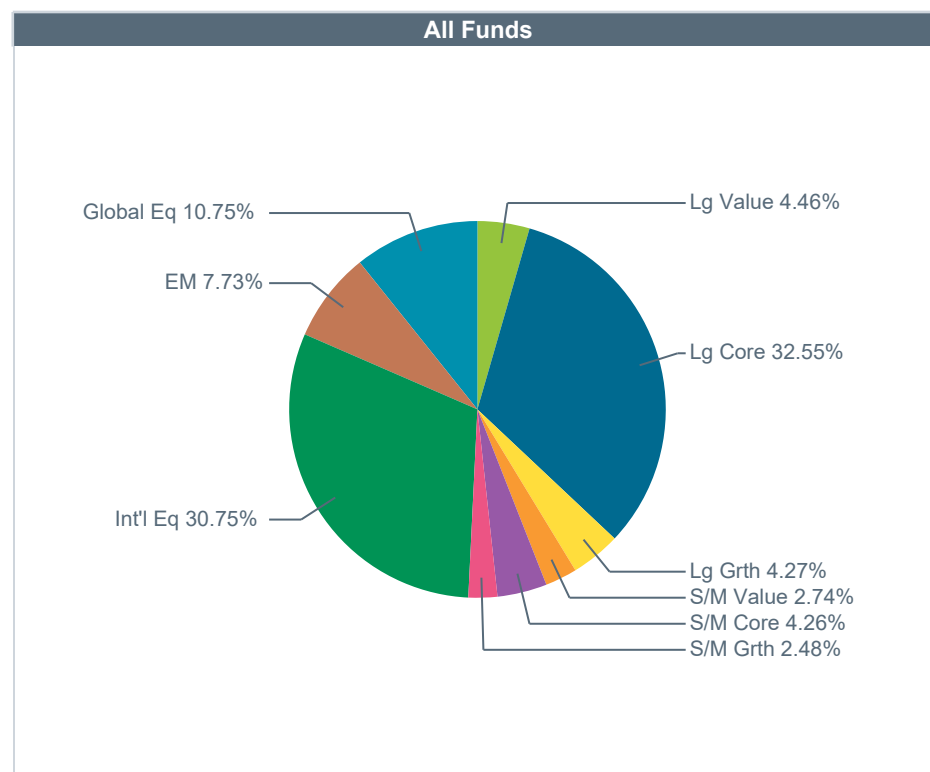
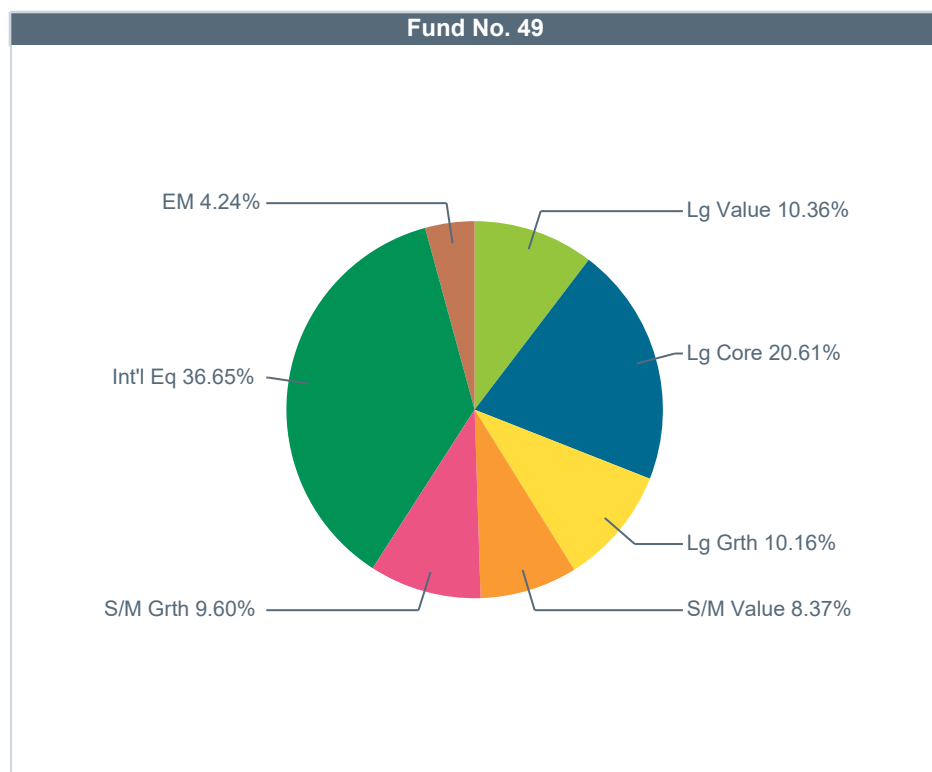
**Asset Allocation**  
**Fund No. 49 vs. Average of Similar Size Funds**

As of December 31, 2018



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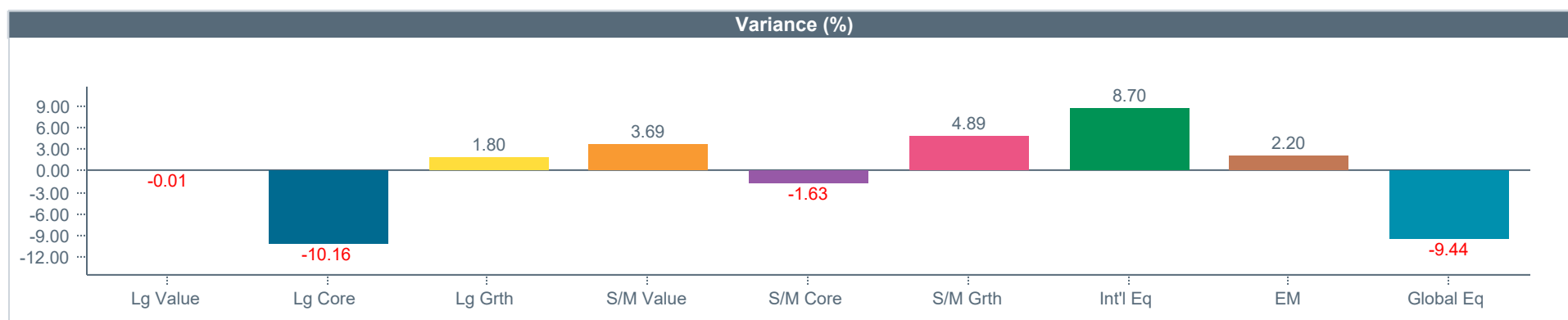
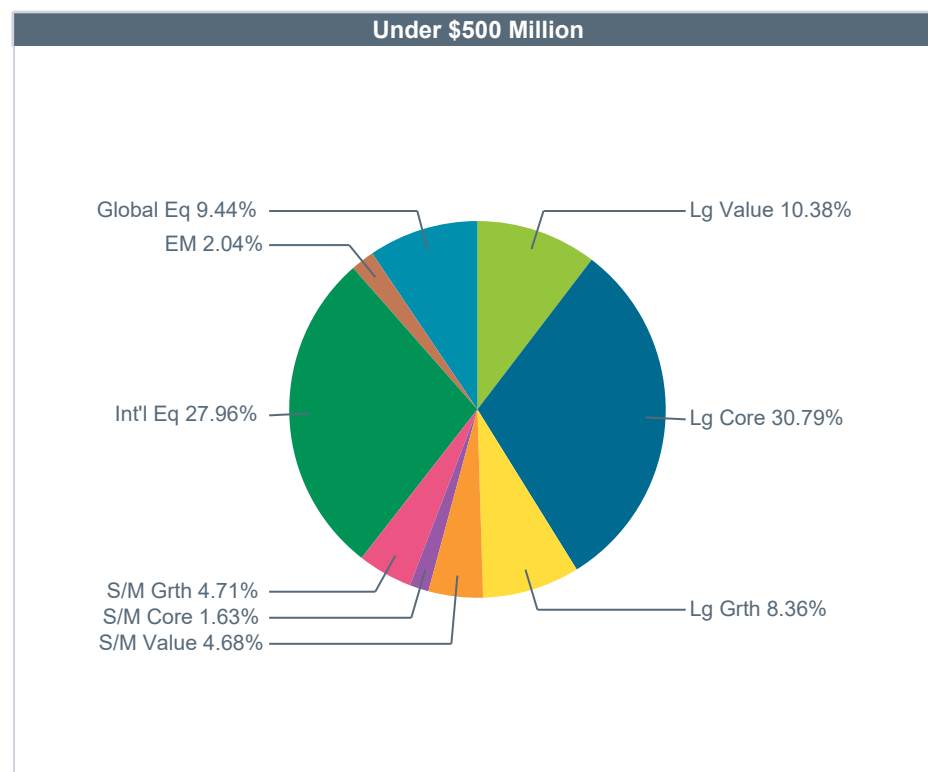
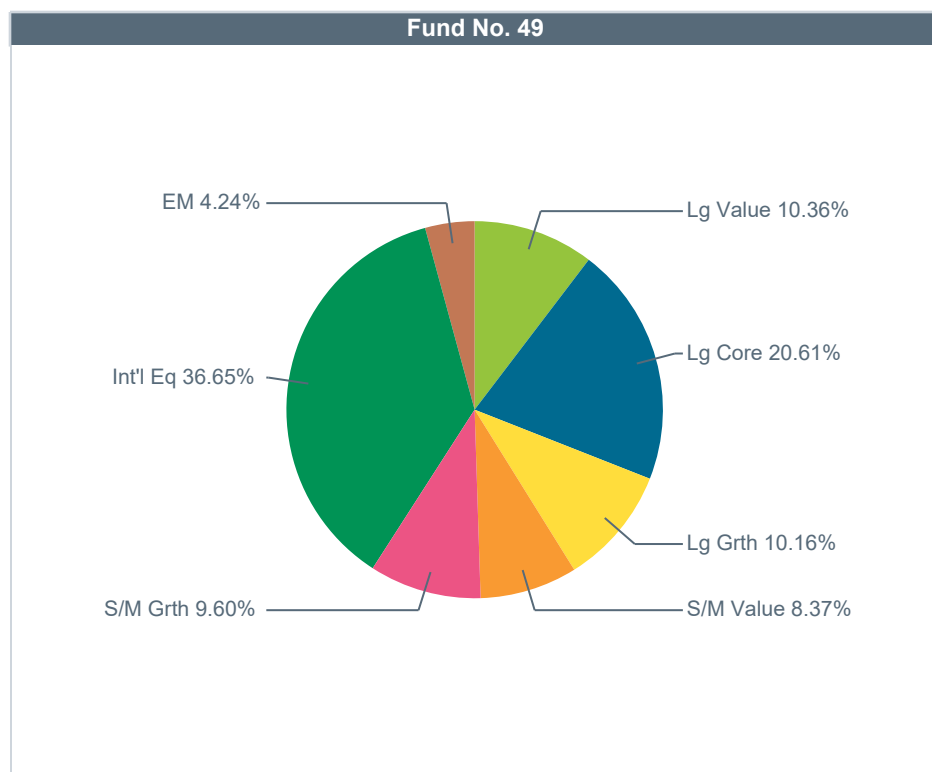


Allocations shown may not sum up to 100% exactly due to rounding.



Equity Style Allocation  
Fund No. 49 vs. Average of Similar Size Funds

As of December 31, 2018



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

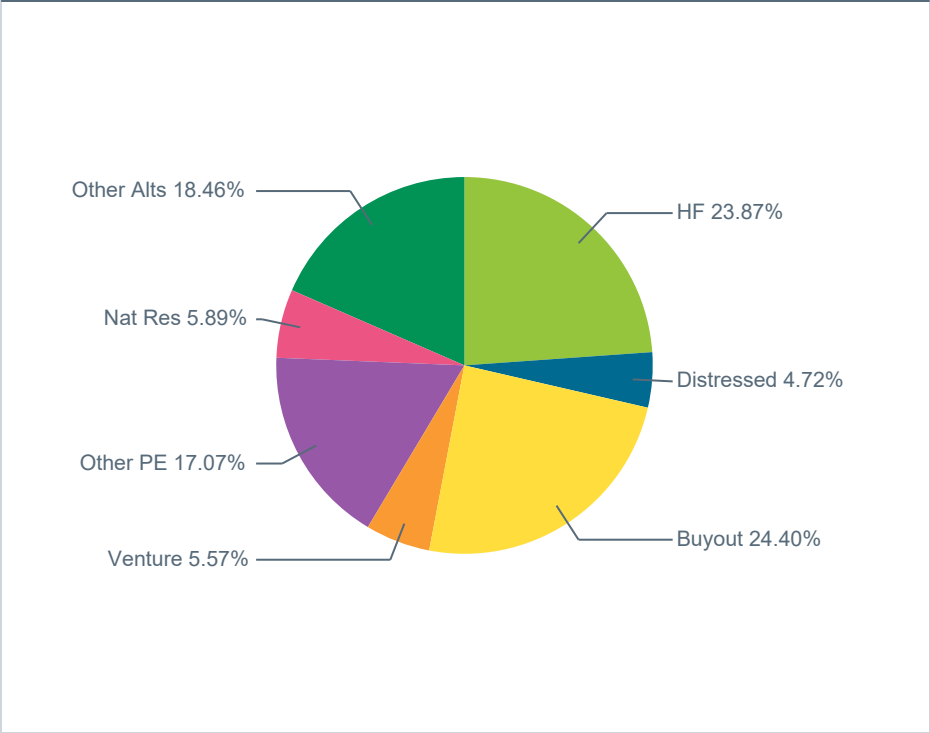




Fund No. 49

Fund No. 49 does not have data for Alternatives Style Allocation

All Funds



Variance (%)

Fund No. 49 does not have data for Alternatives Style Allocation

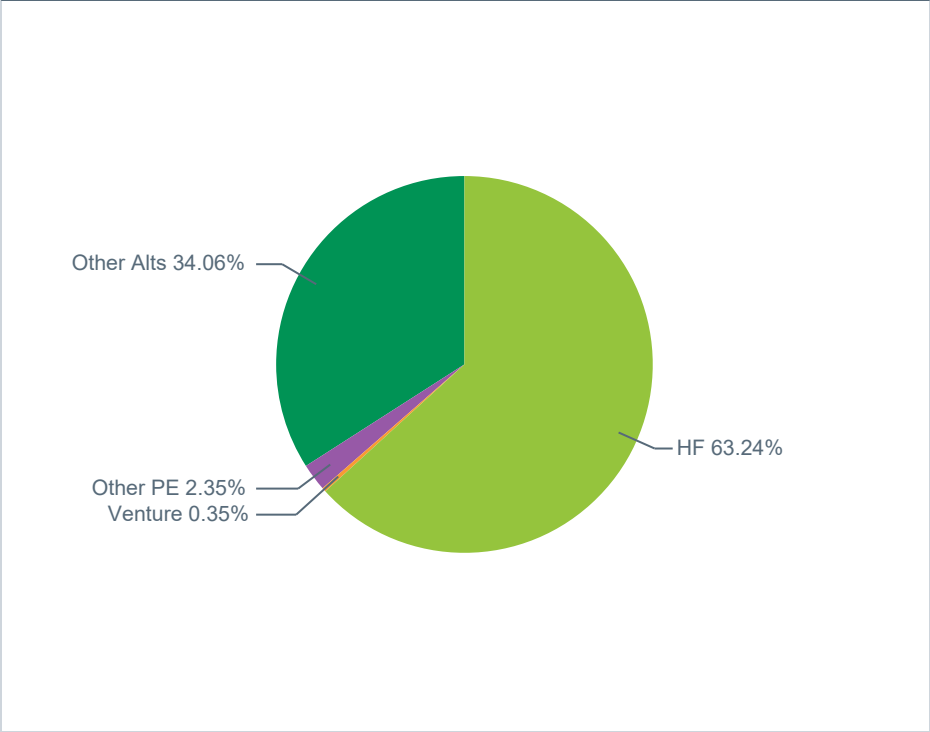
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Fund No. 49

Fund No. 49 does not have data for Alternatives Style Allocation

Under \$500 Million

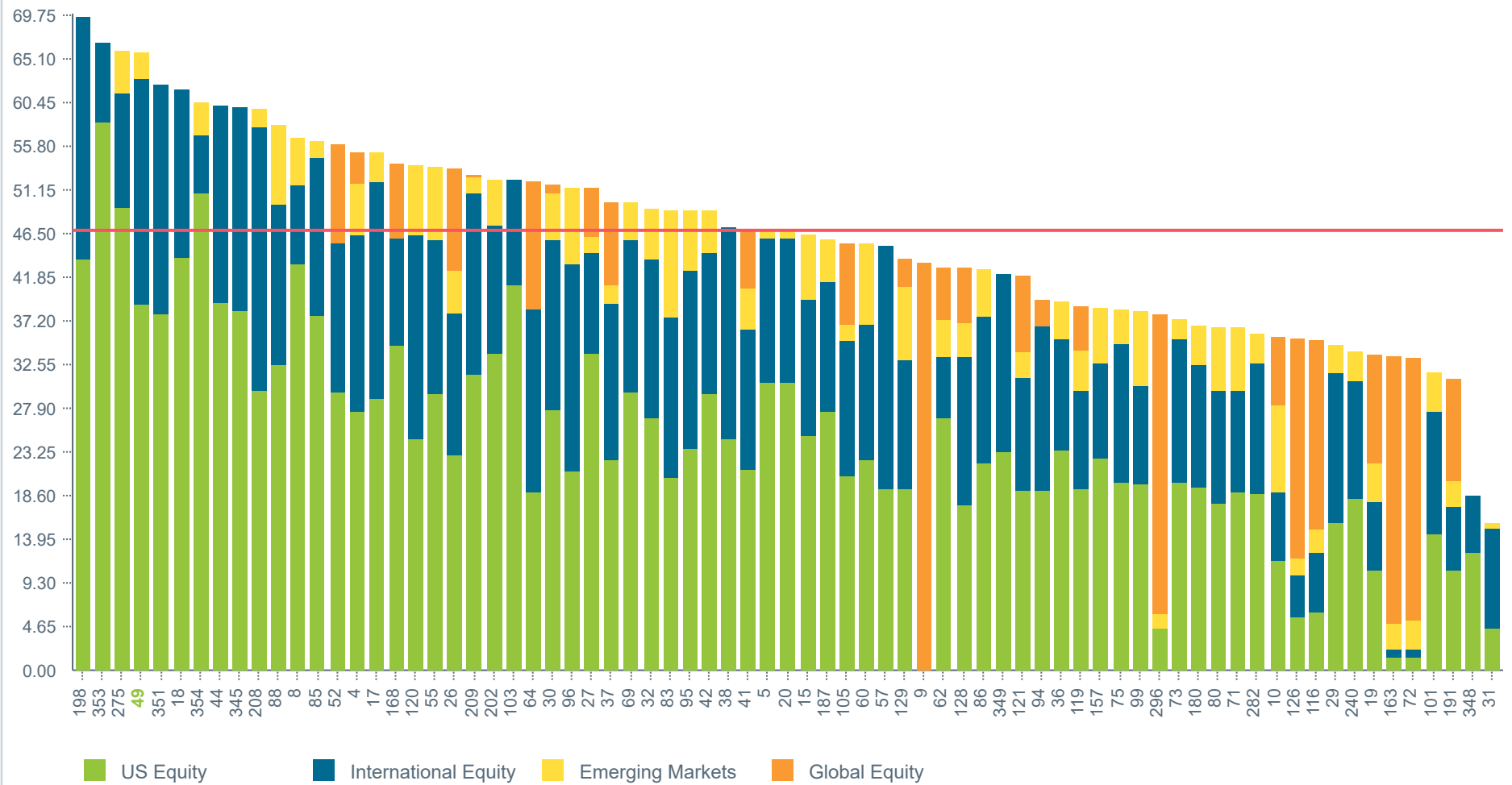


Variance (%)

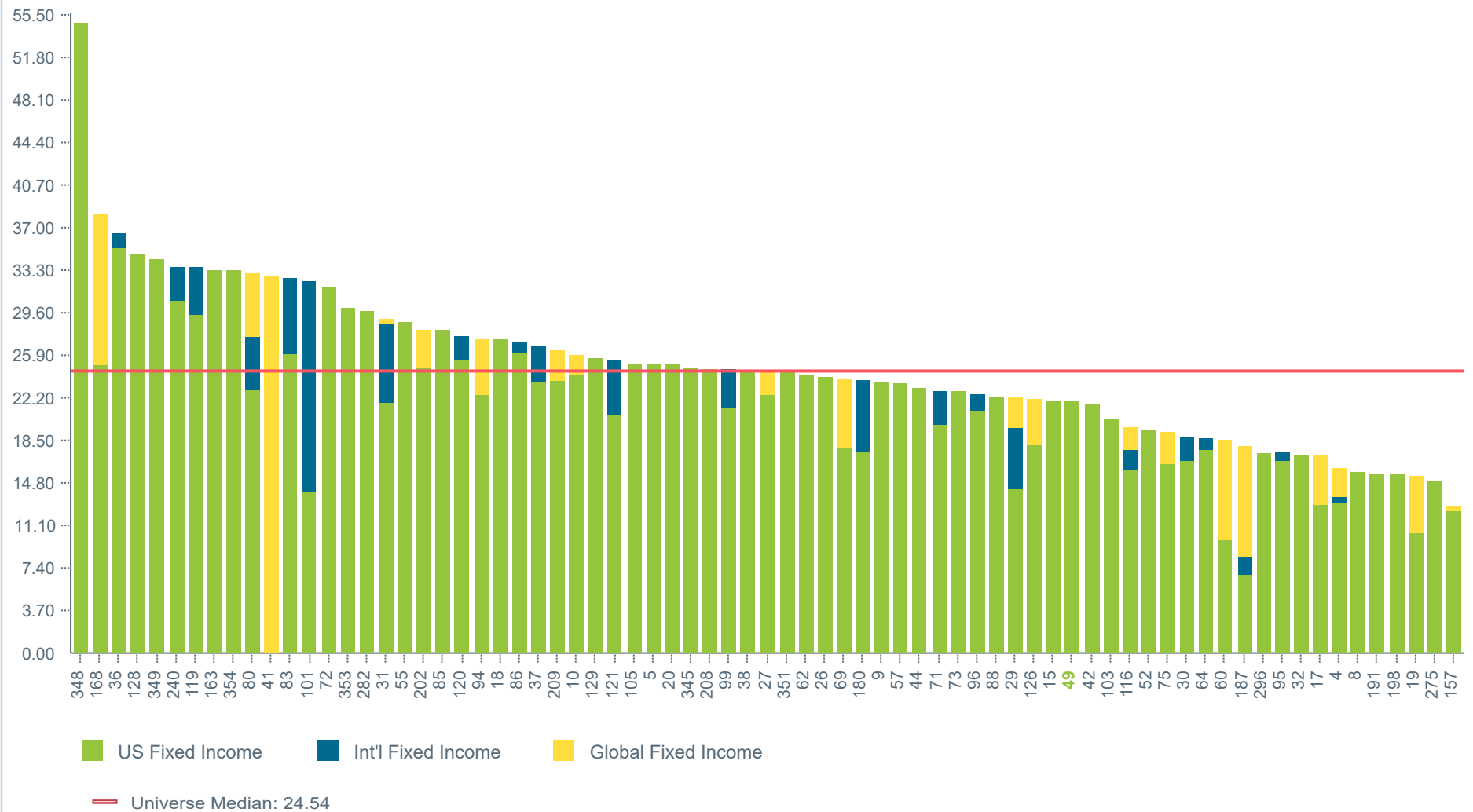
Fund No. 49 does not have data for Alternatives Style Allocation

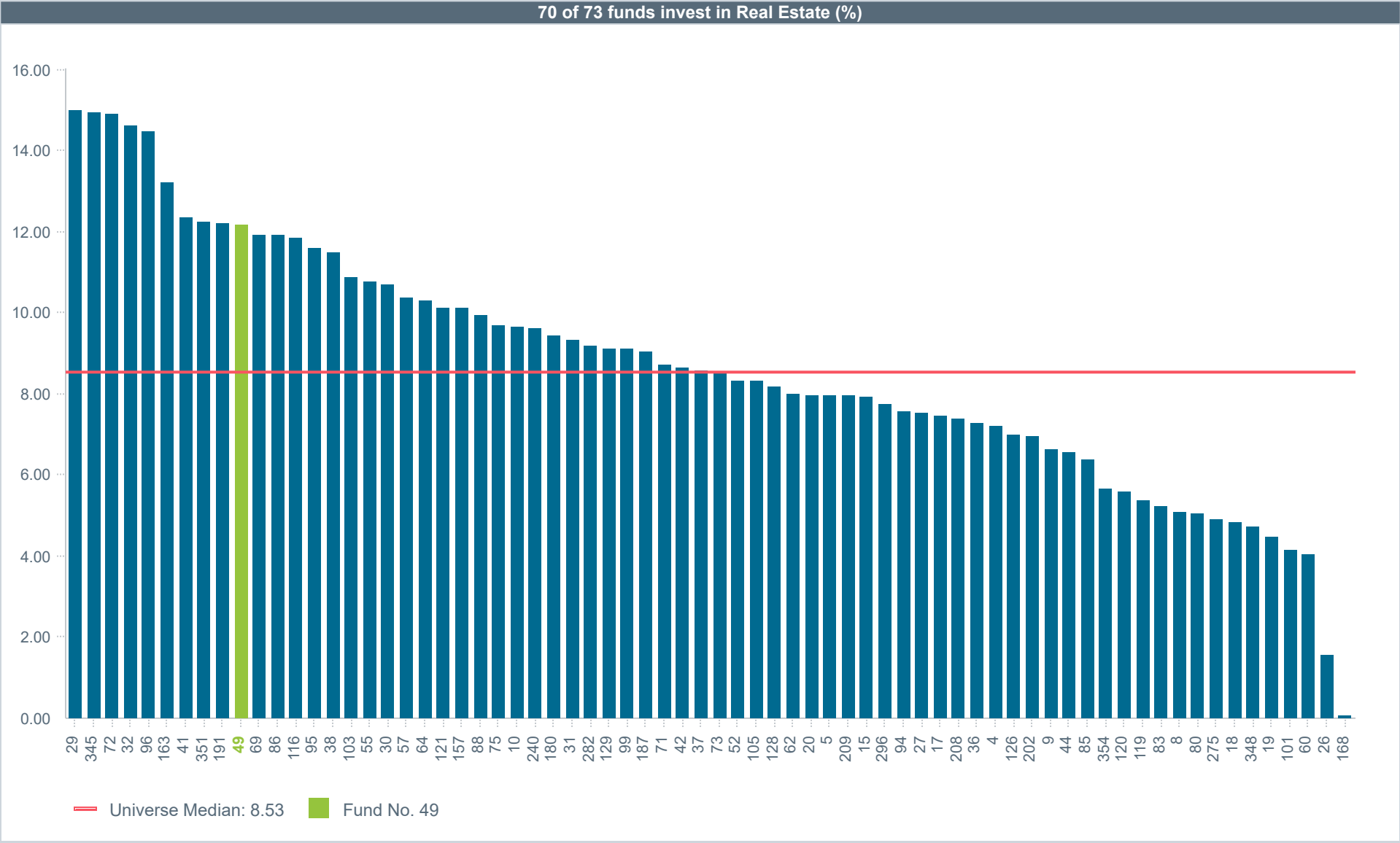
Allocations shown may not sum up to 100% exactly due to rounding.

73 of 73 funds invest in Equity (%)

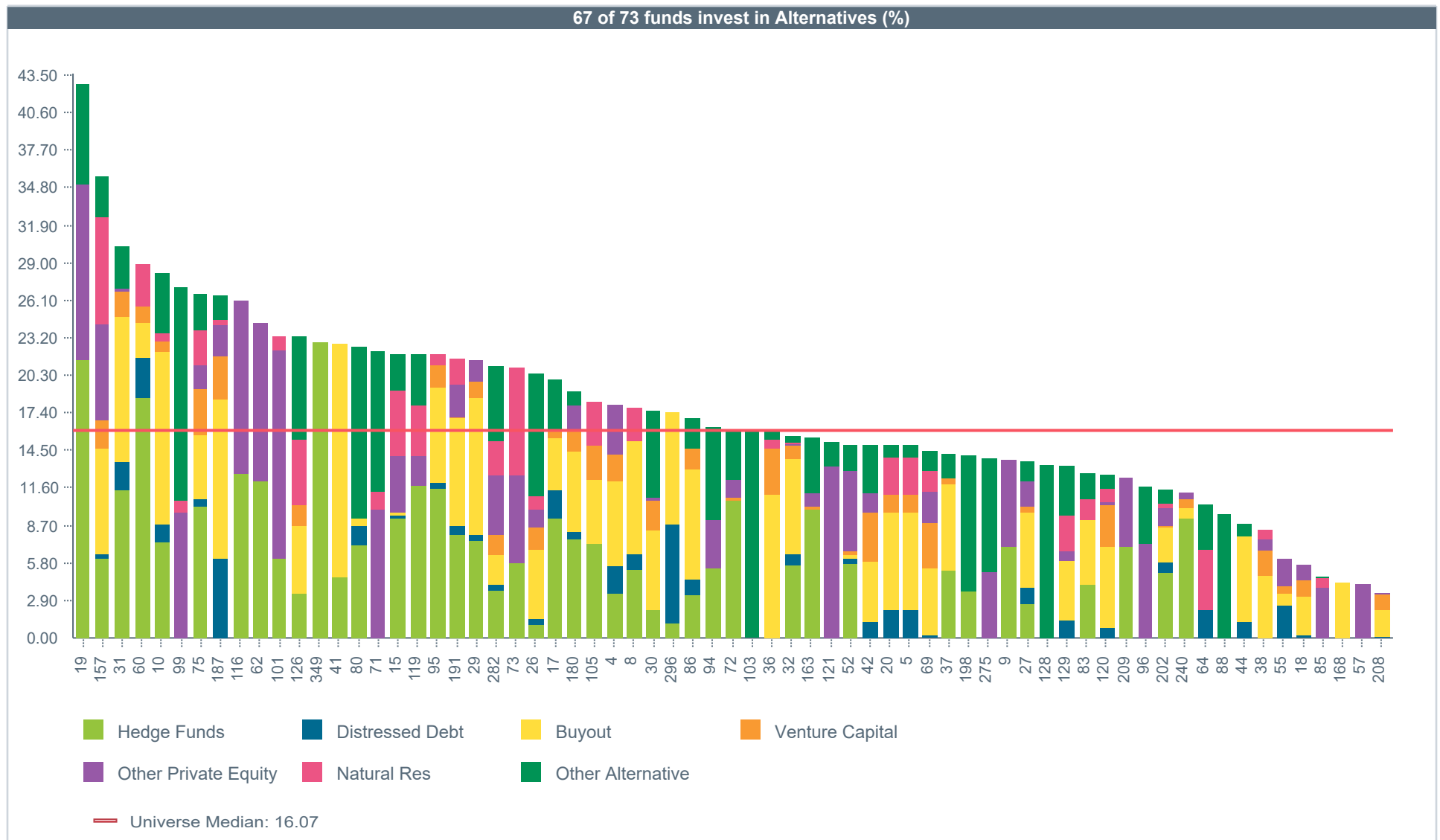


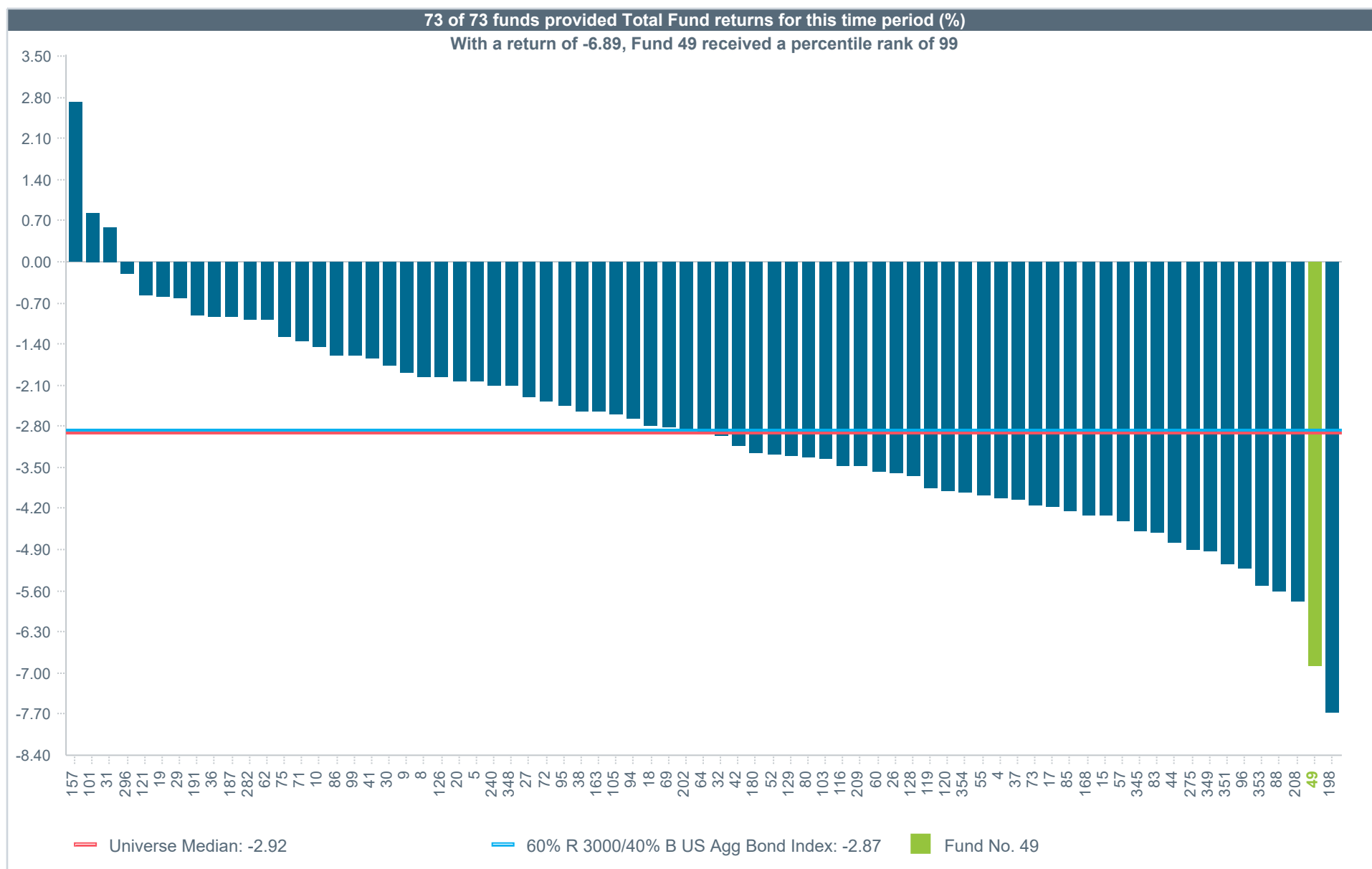
## 73 of 73 funds invest in Fixed Income (%)





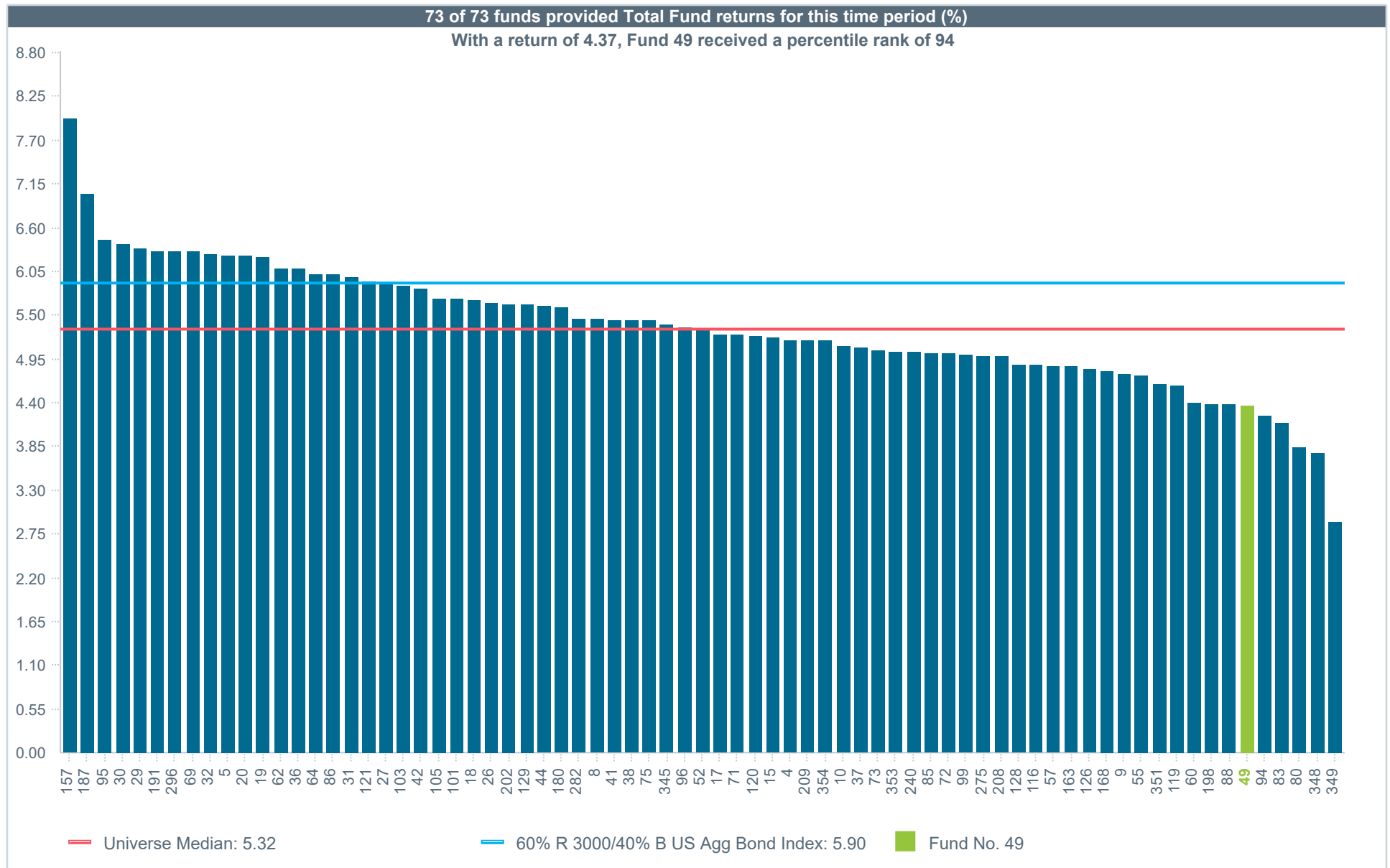




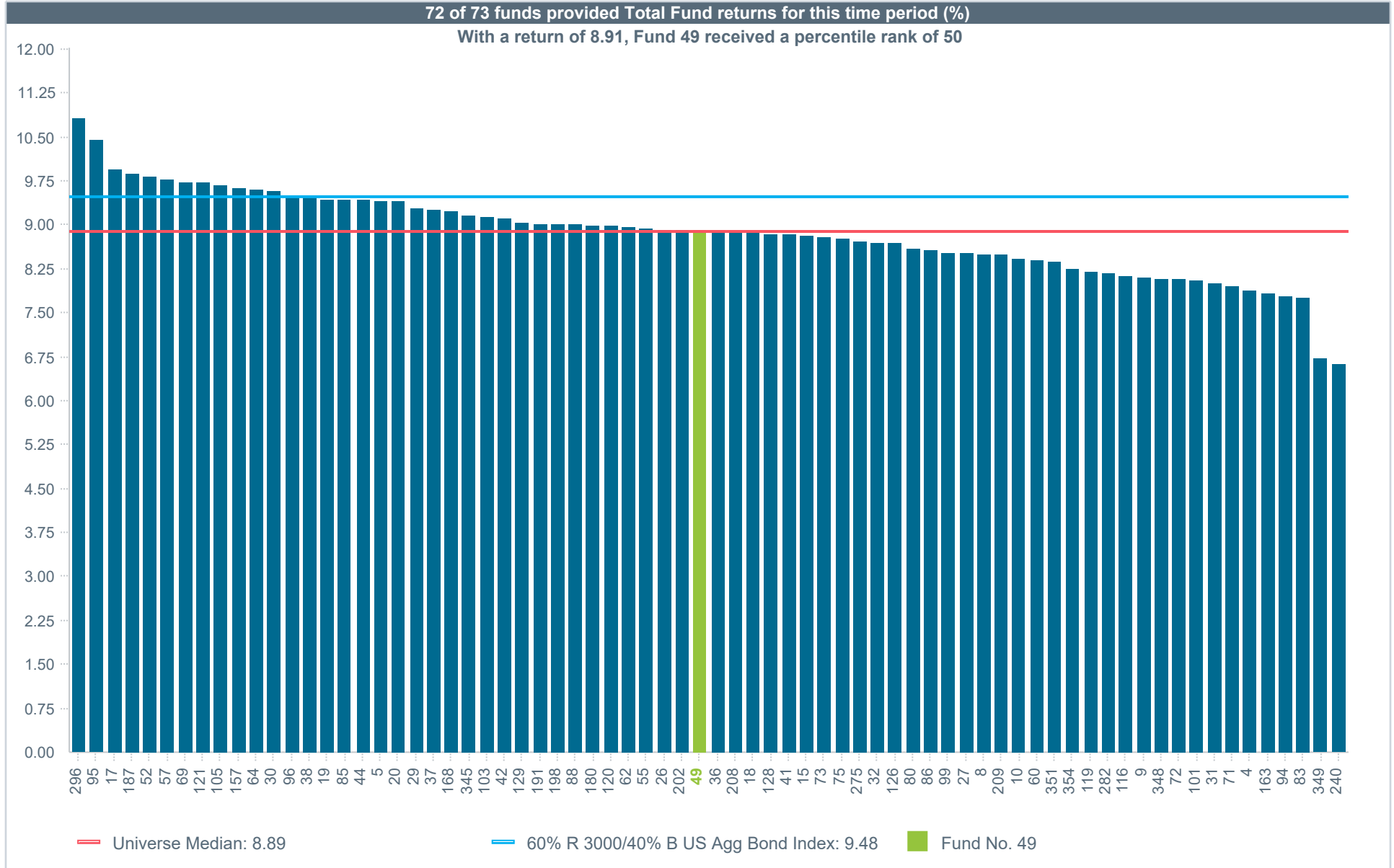


Funds with less history than the specified time period will not appear in the chart.





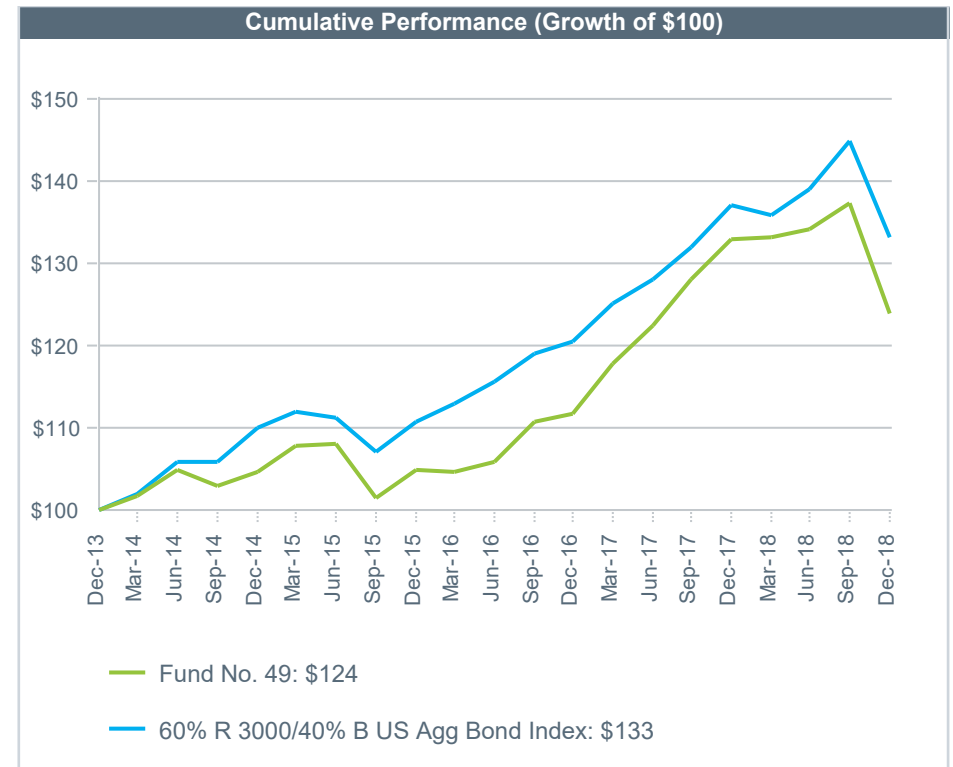
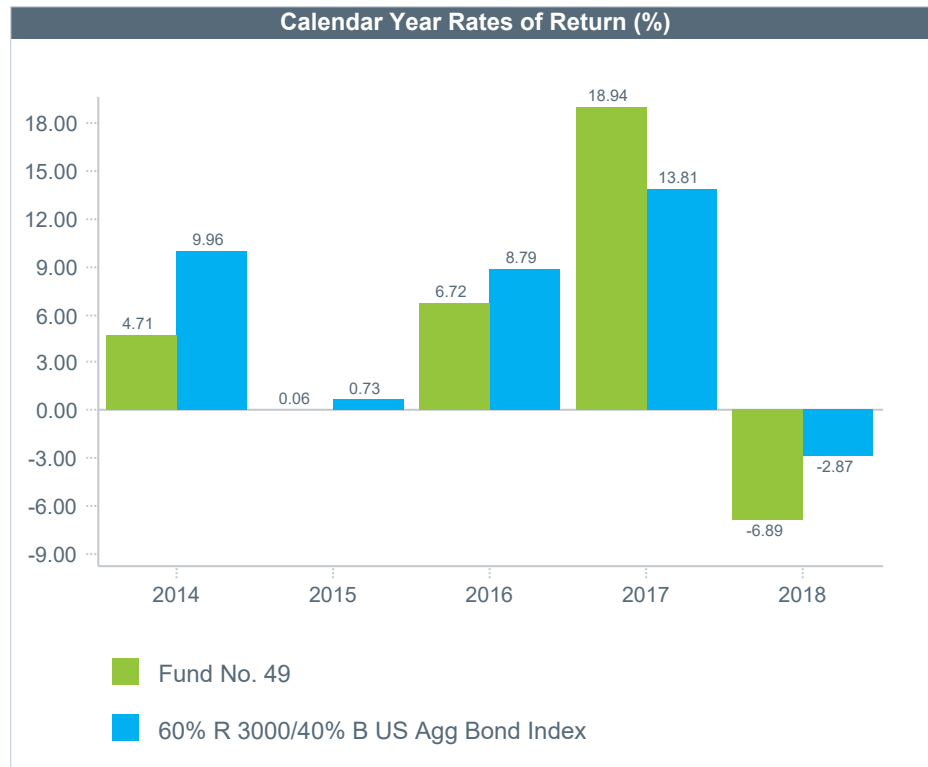
Funds with less history than the specified time period will not appear in the chart.



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**Total Return - Total Fund**  
**Fund No. 49 vs. 60% R 3000/40% B US Agg Bond Index**

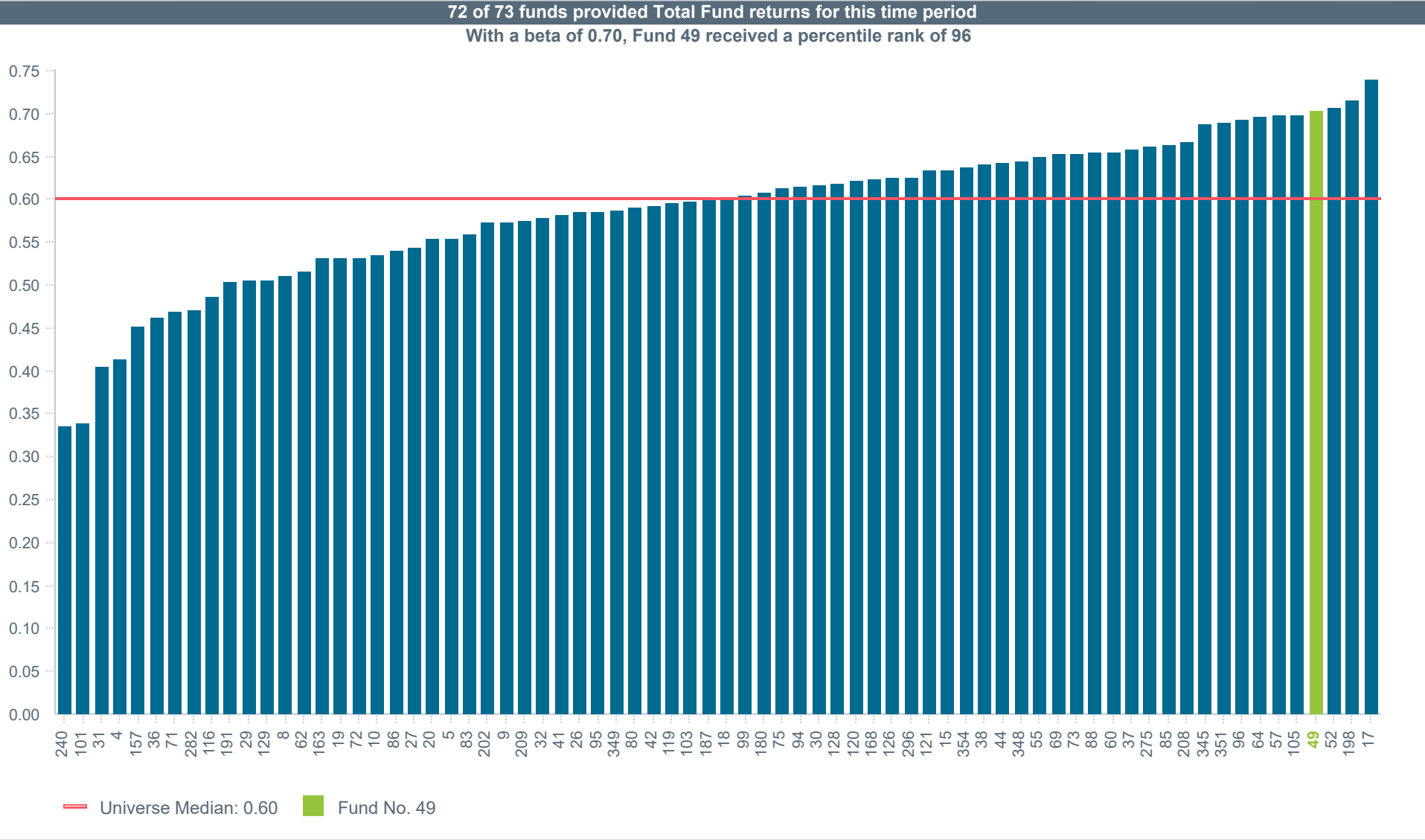
As of December 31, 2018



Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	-6.89	5.73	4.37
60% R 3000/40% B US Agg Bond Index	-2.87	6.34	5.90
Variance	-4.02	-0.61	-1.53

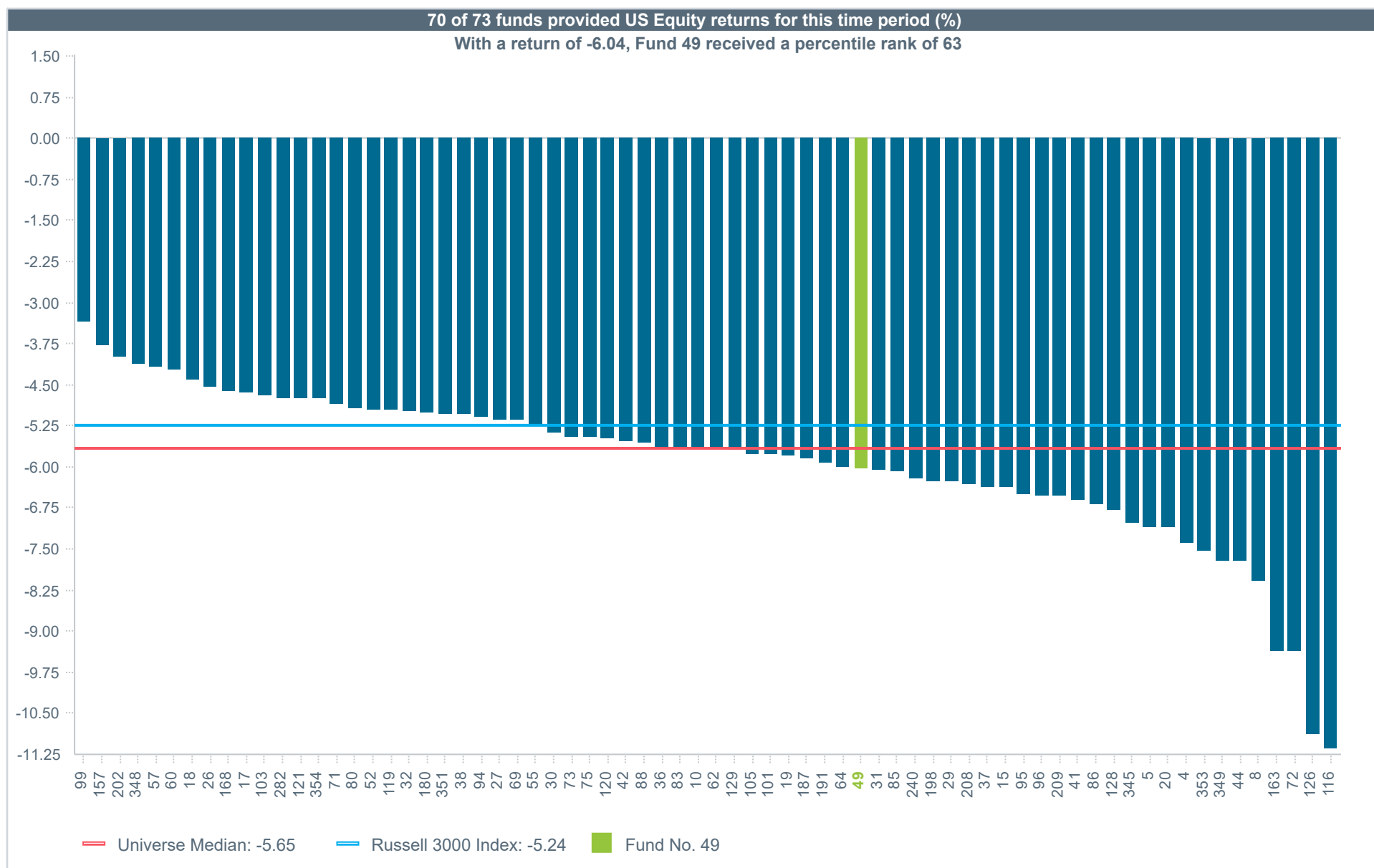




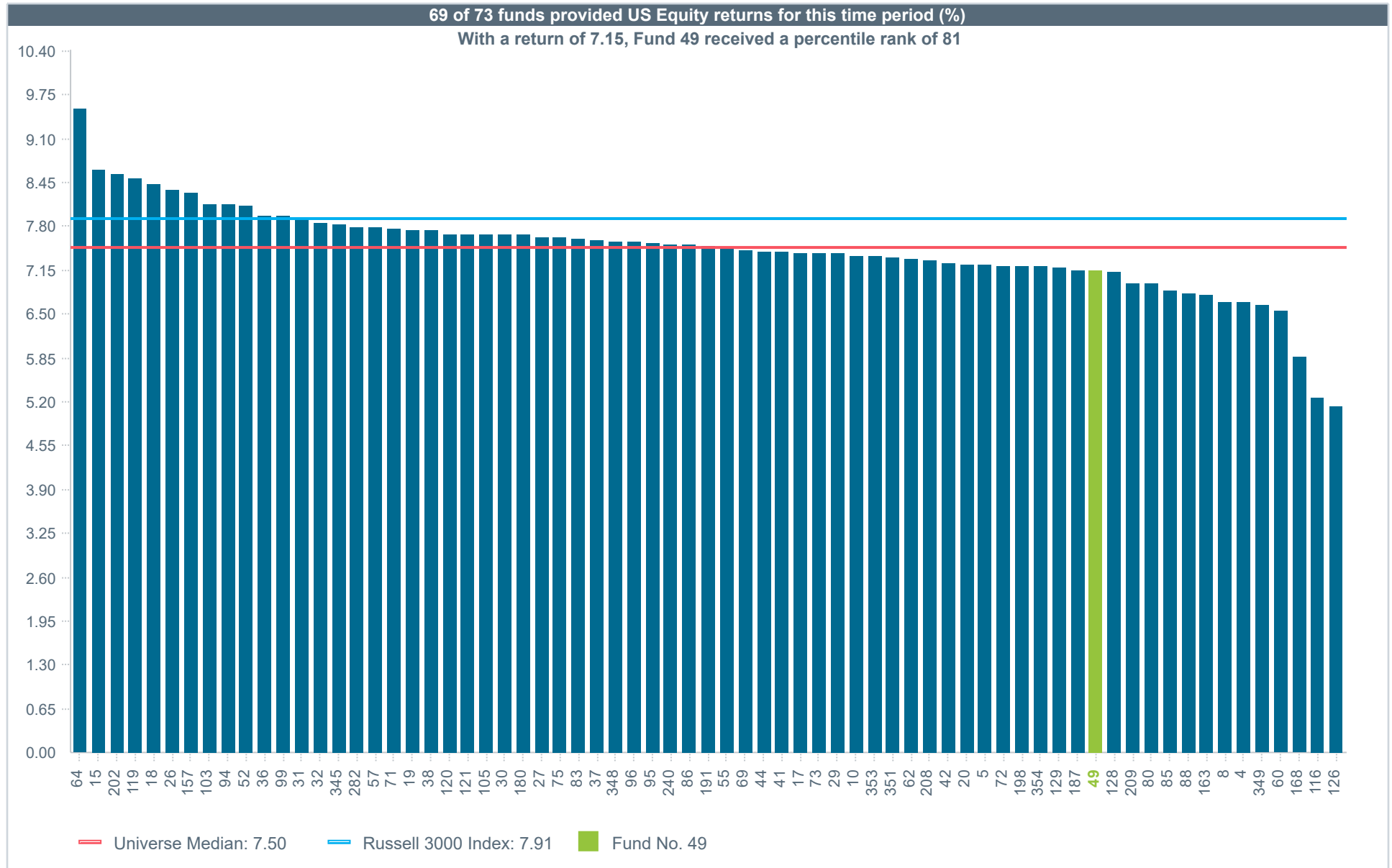


Funds with less history than the specified time period will not appear in the chart. Benchmark used is the S&P 500 Index (Cap Wtd).

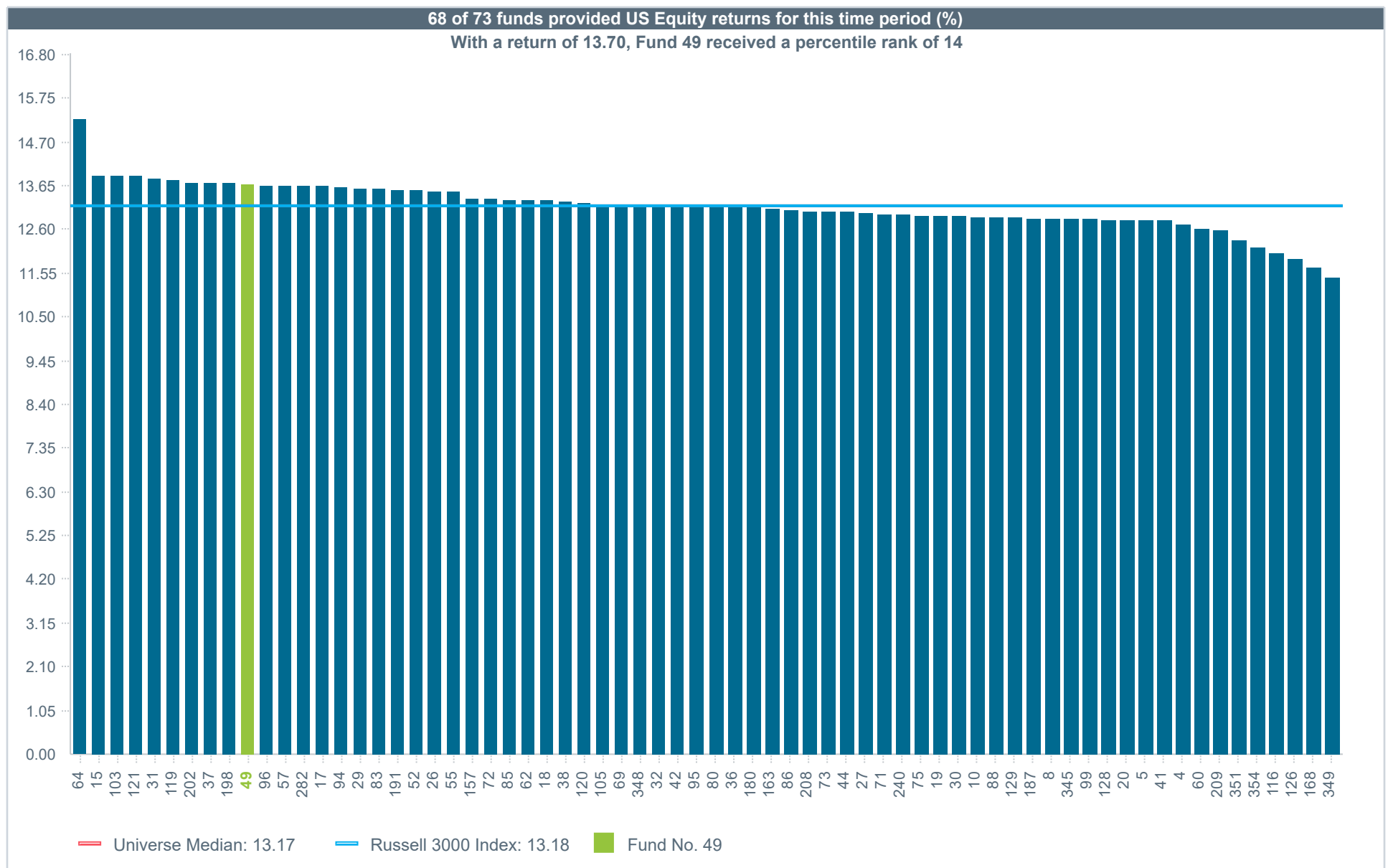




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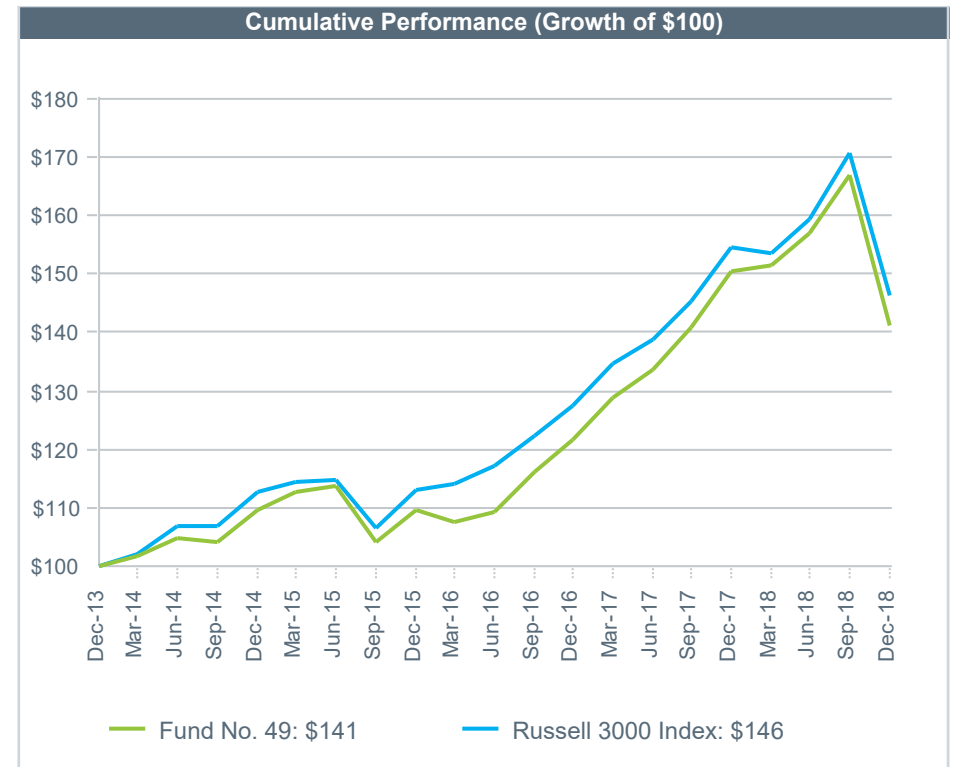
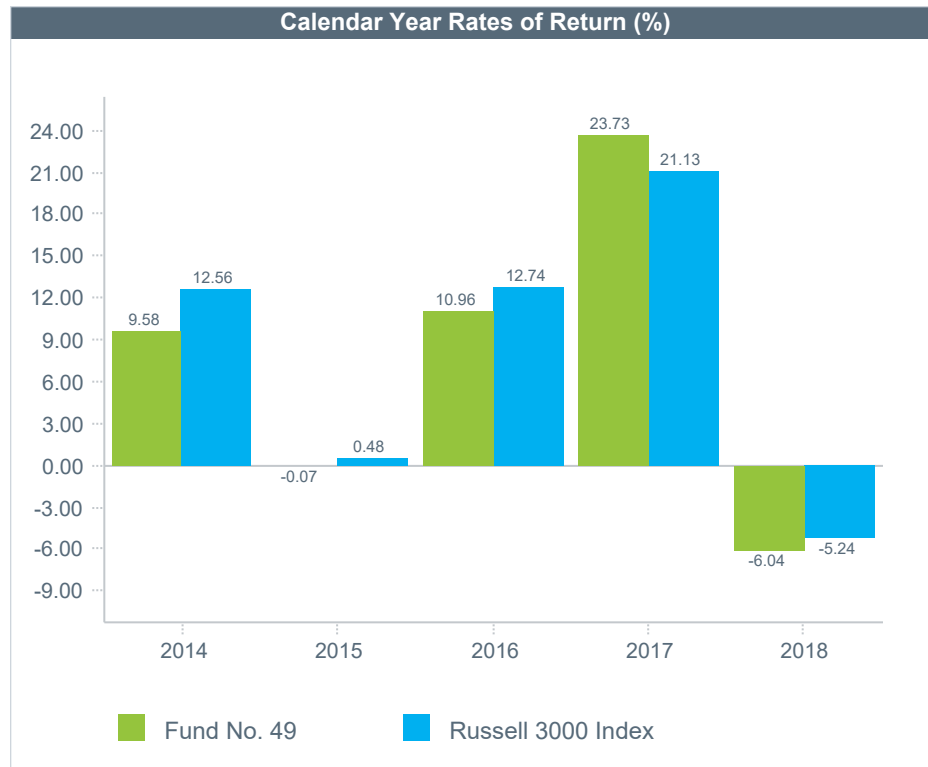
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Funds with less history than the specified time period will not appear in the chart.

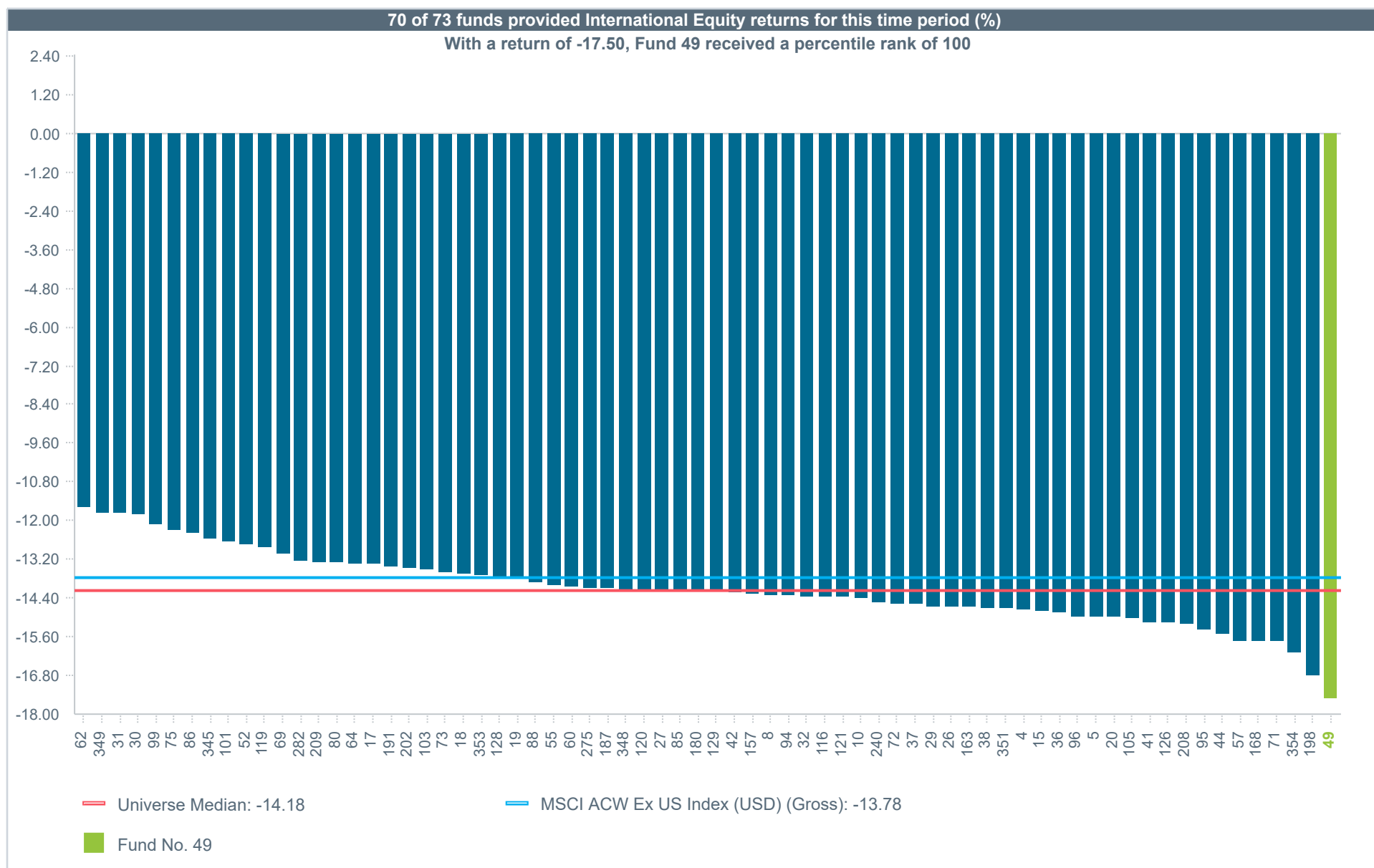
**Total Return - US Equity**  
**Fund No. 49 vs. Russell 3000 Index**

As of December 31, 2018



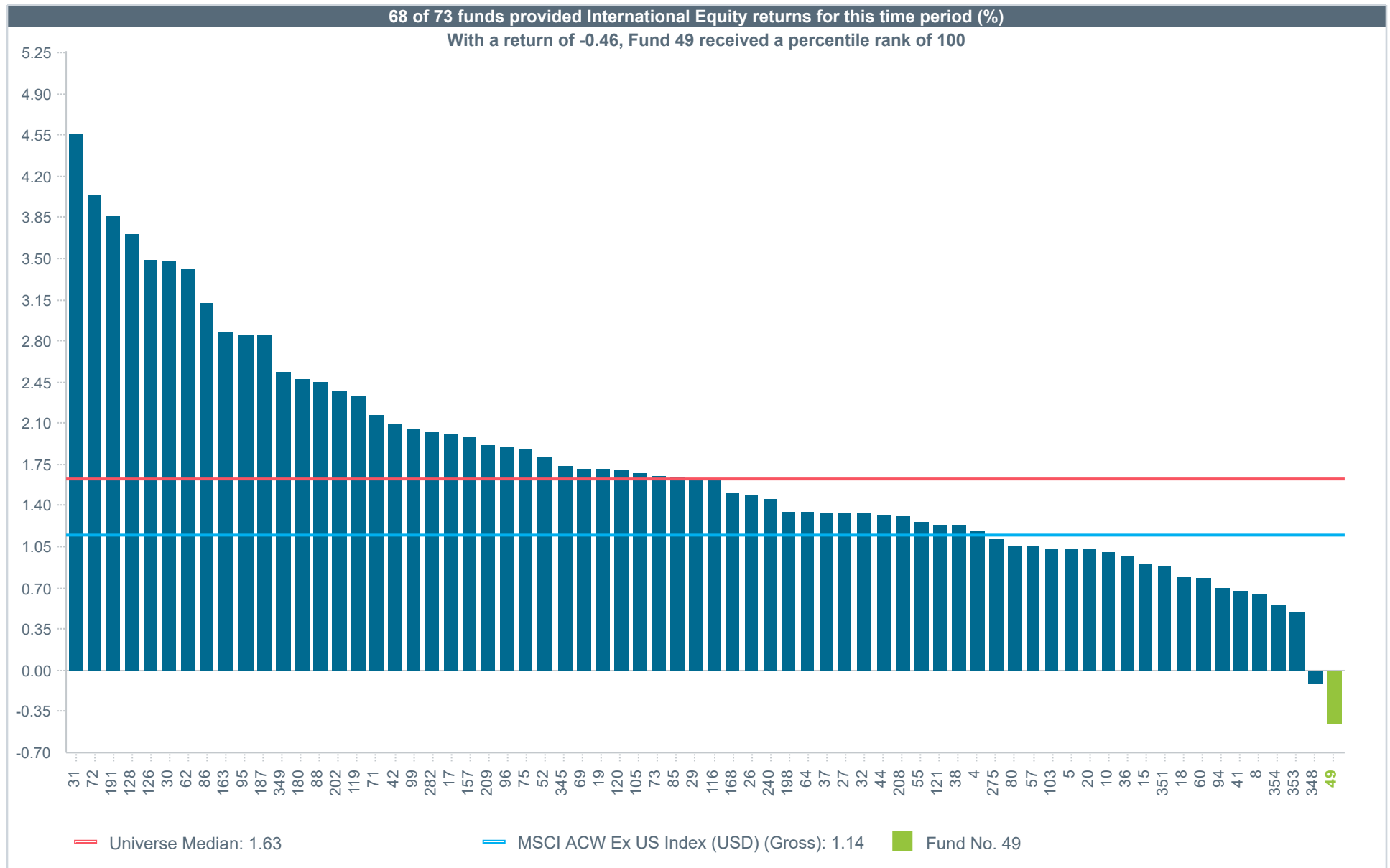
Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	-6.04	8.86	7.15
Russell 3000 Index	-5.24	8.97	7.91
Variance	-0.80	-0.11	-0.76



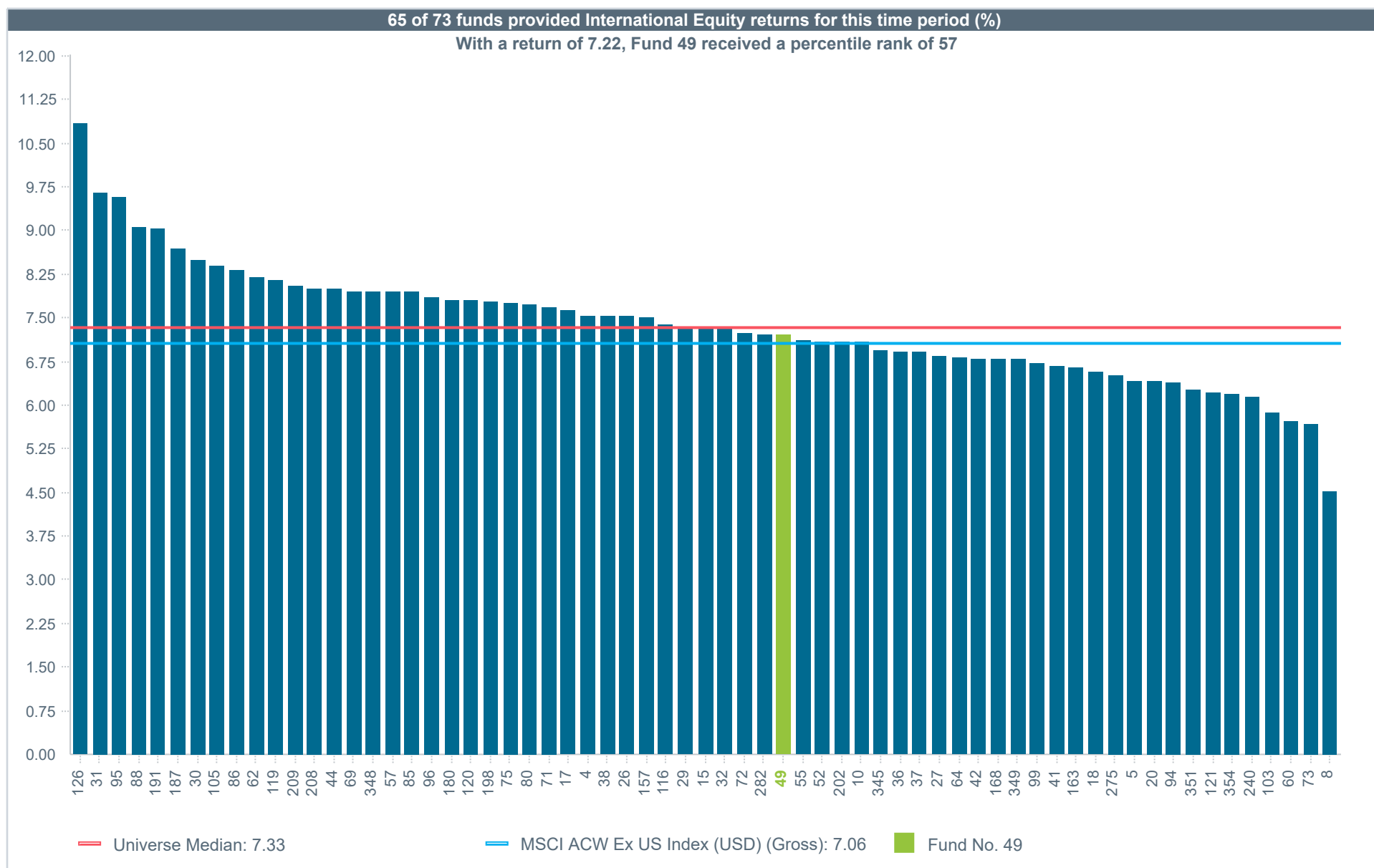


Funds with less history than the specified time period will not appear in the chart.





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

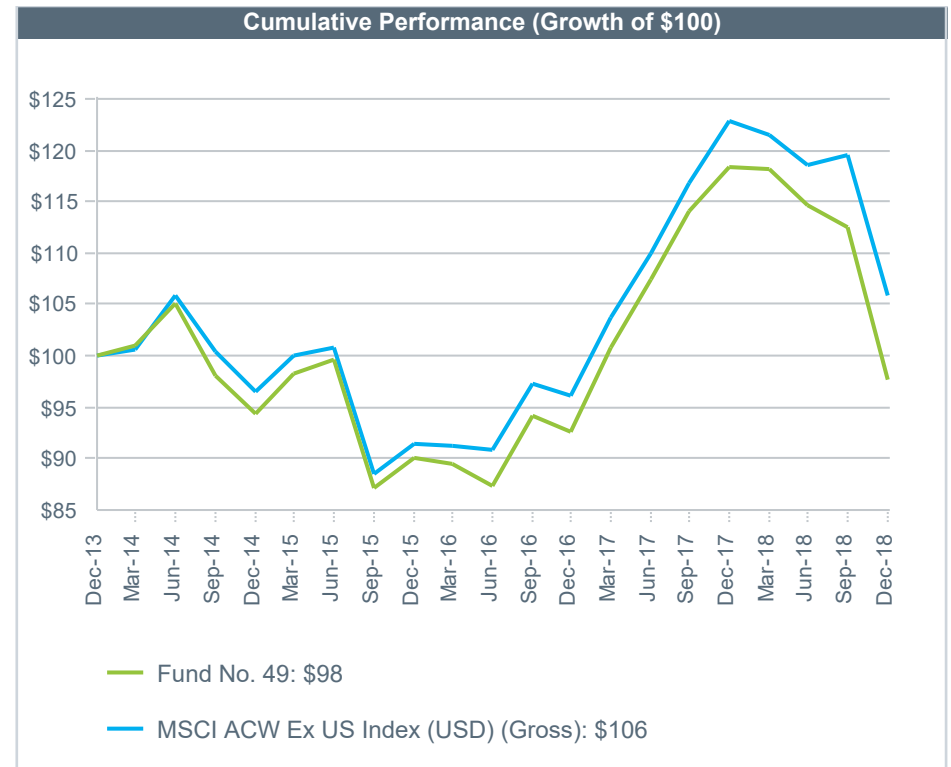
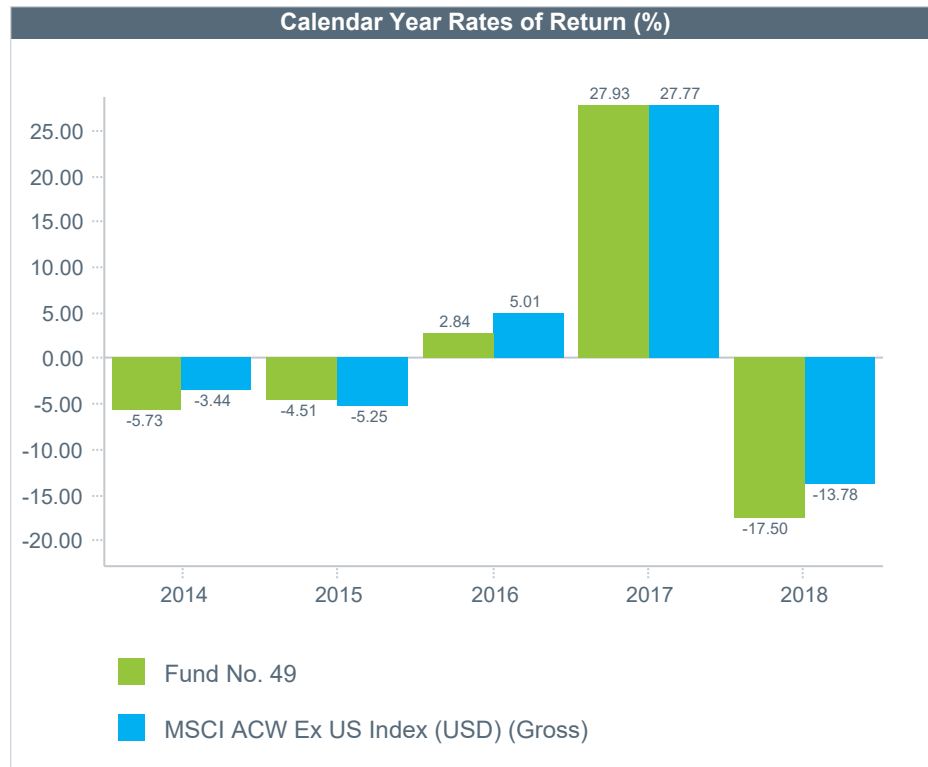


Funds with less history than the specified time period will not appear in the chart.



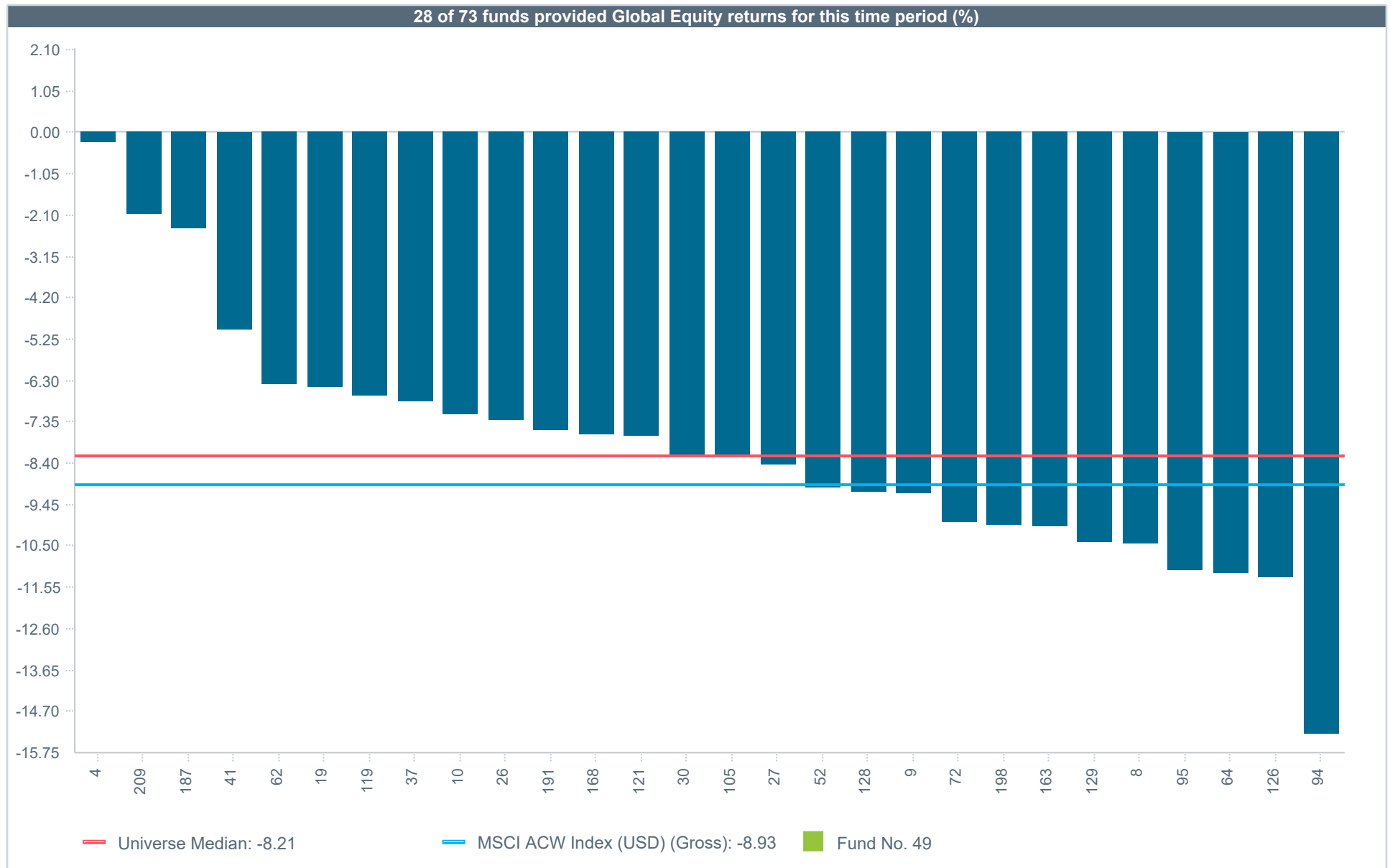
**Total Return - International Equity**  
**Fund No. 49 vs. MSCI ACW Ex US Index (USD) (Gross)**

As of December 31, 2018

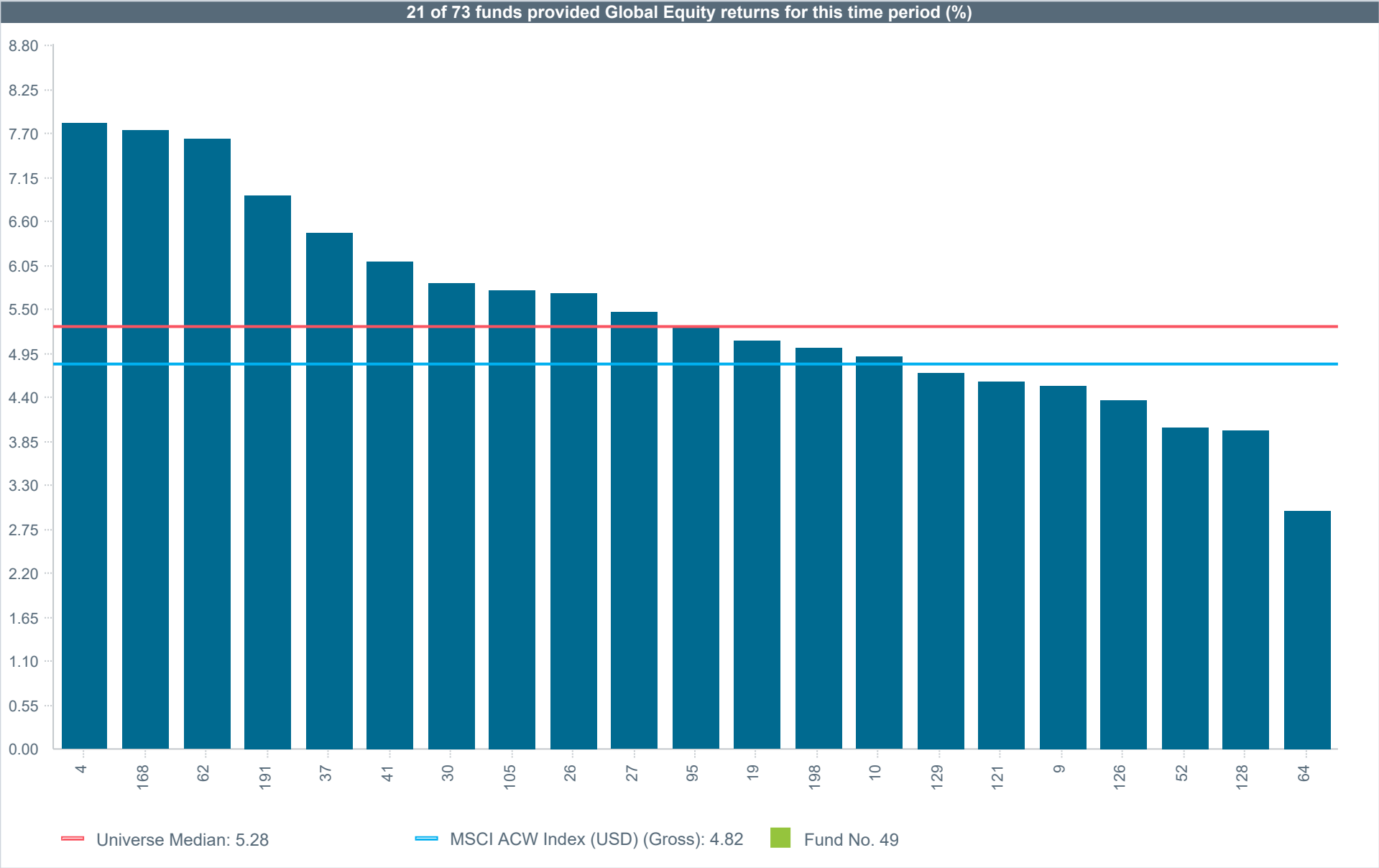


Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	-17.50	2.77	-0.46
MSCI ACW Ex US Index (USD) (Gross)	-13.78	4.98	1.14
Variance	-3.72	-2.21	-1.60



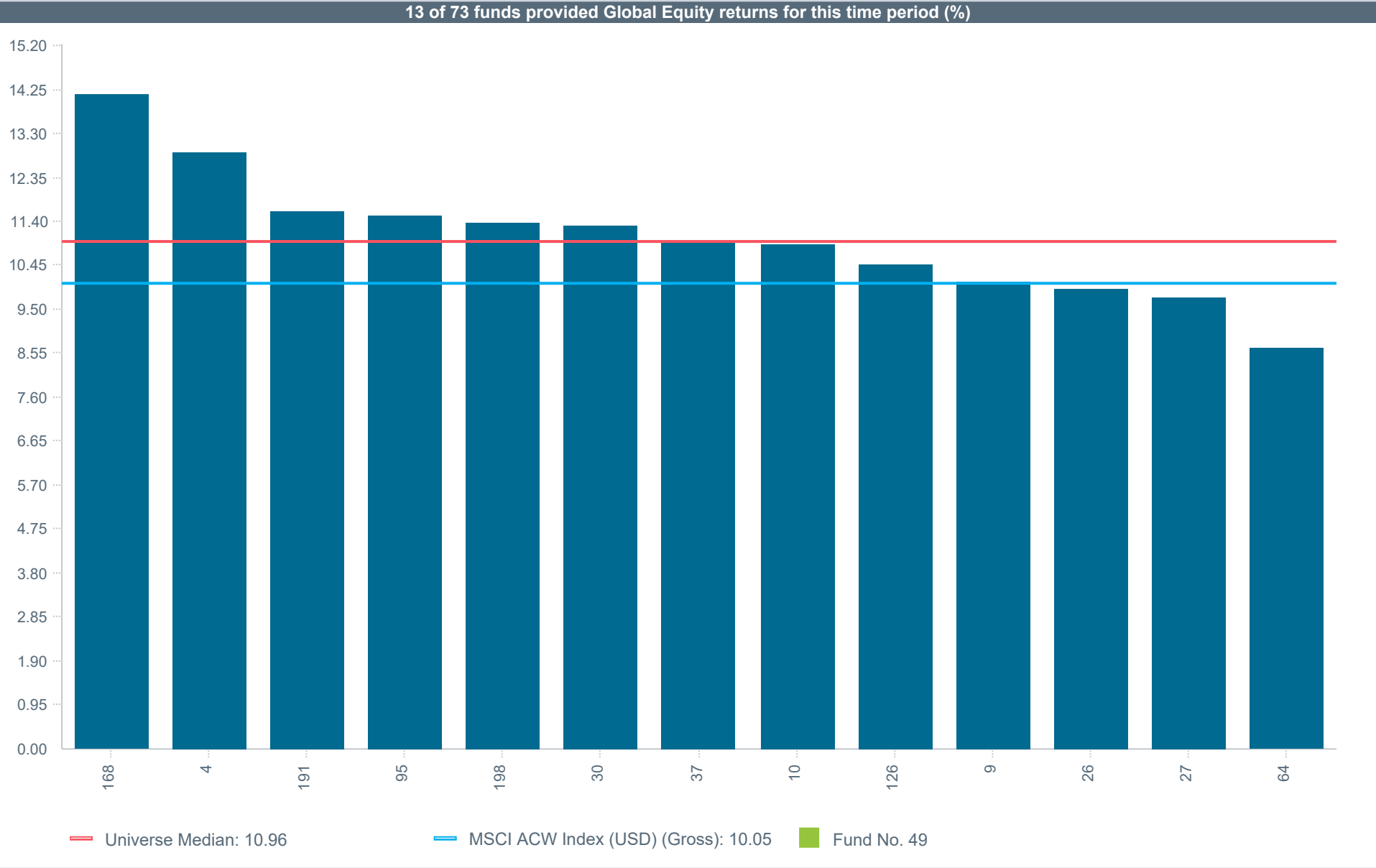


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Funds with less history than the specified time period will not appear in the chart.

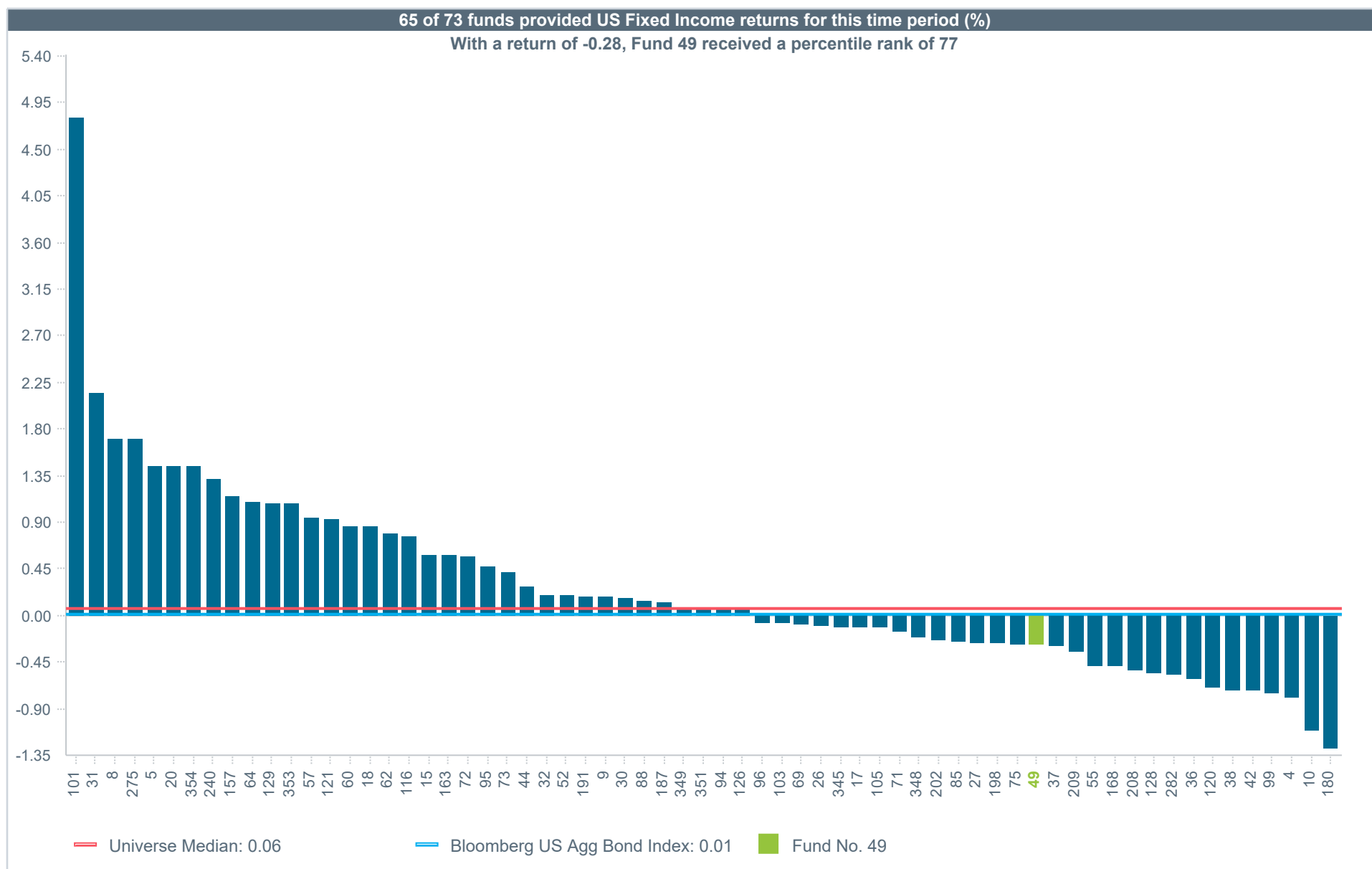




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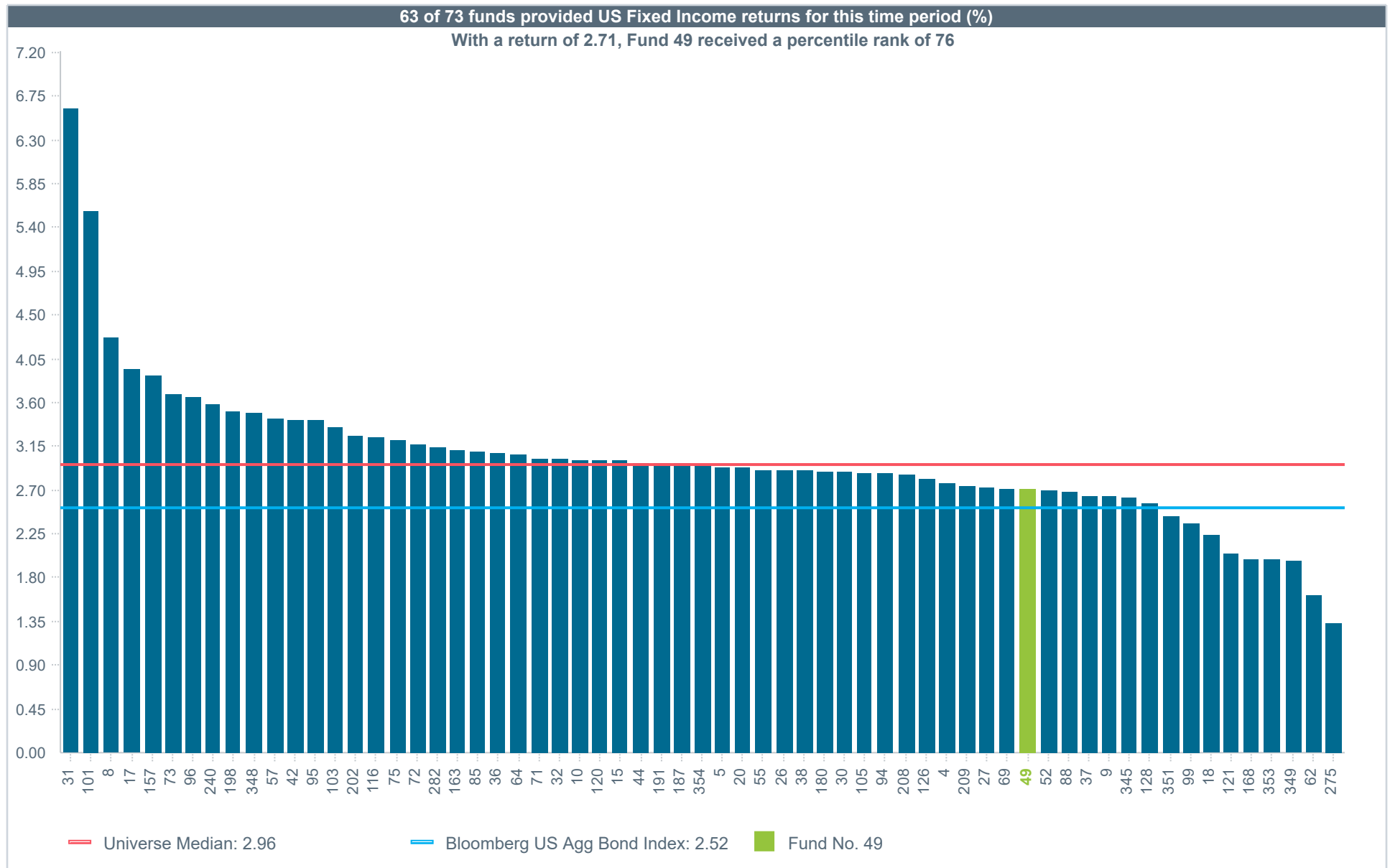
Calendar Year Rates of Return (%)	Cumulative Performance (Growth of \$100)
Fund No. 49 does not have return data for Global Equity	

Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	N/A	N/A	N/A
MSCI ACW Index (USD) (Gross)	N/A	N/A	N/A
Variance	N/A	N/A	N/A

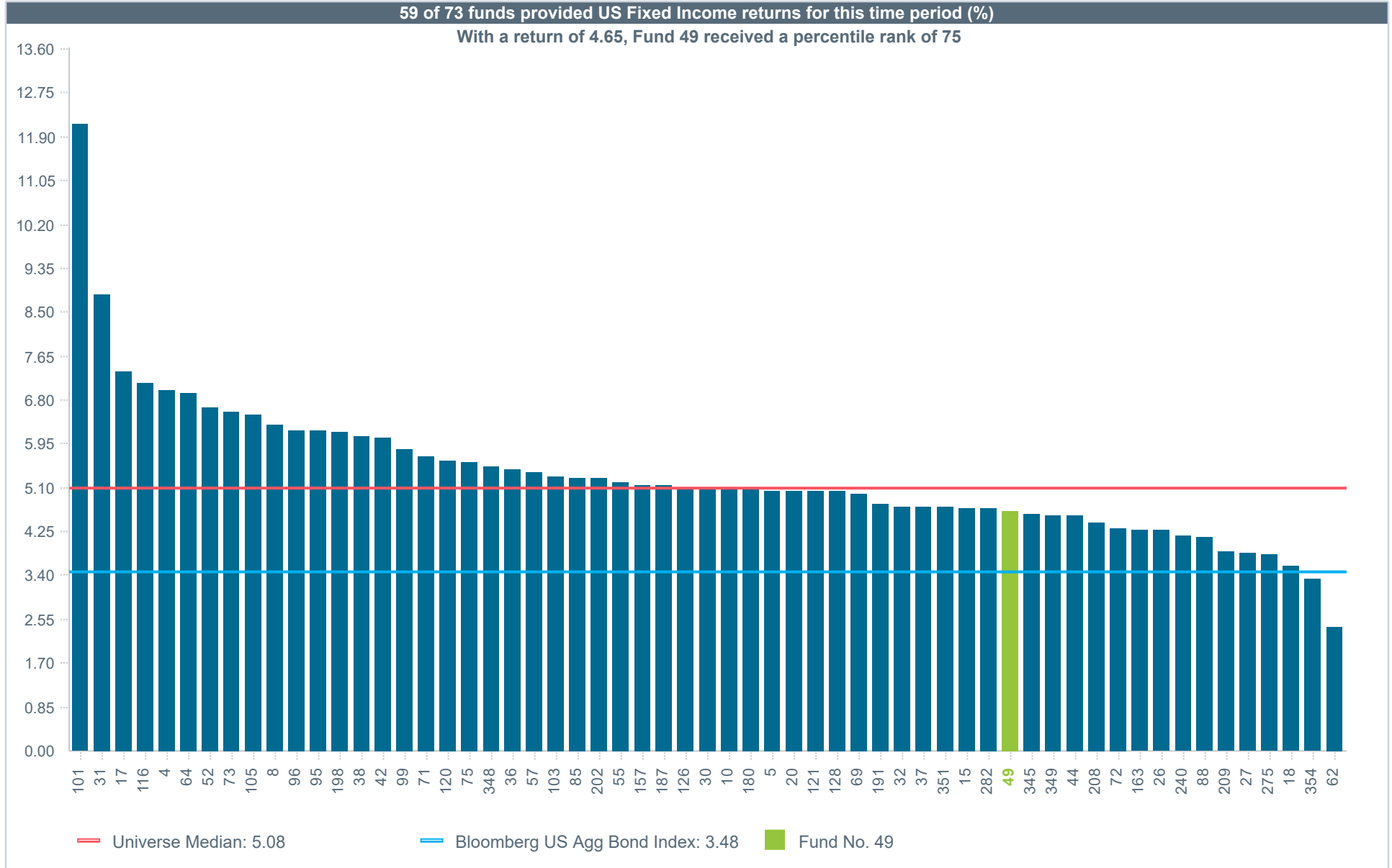


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Funds with less history than the specified time period will not appear in the chart.

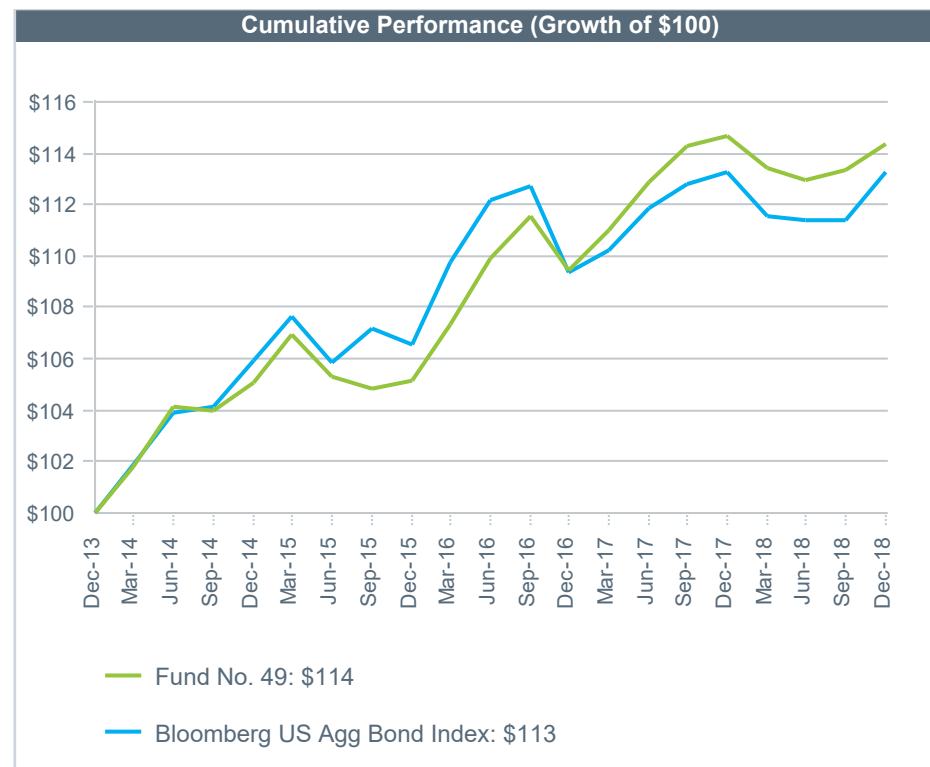
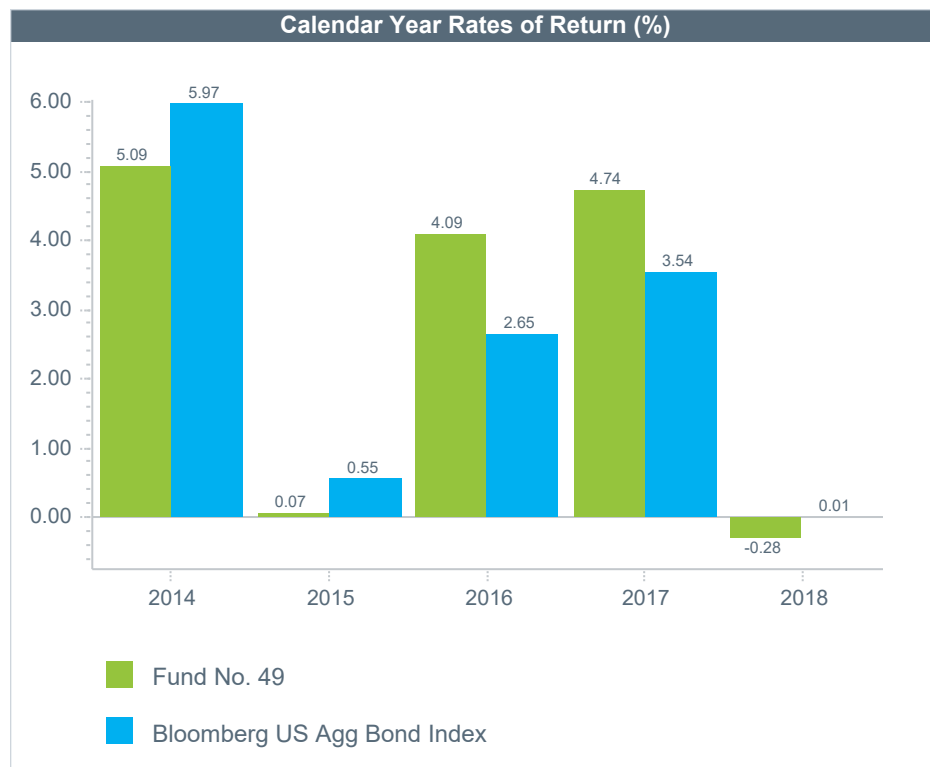


Funds with less history than the specified time period will not appear in the chart.



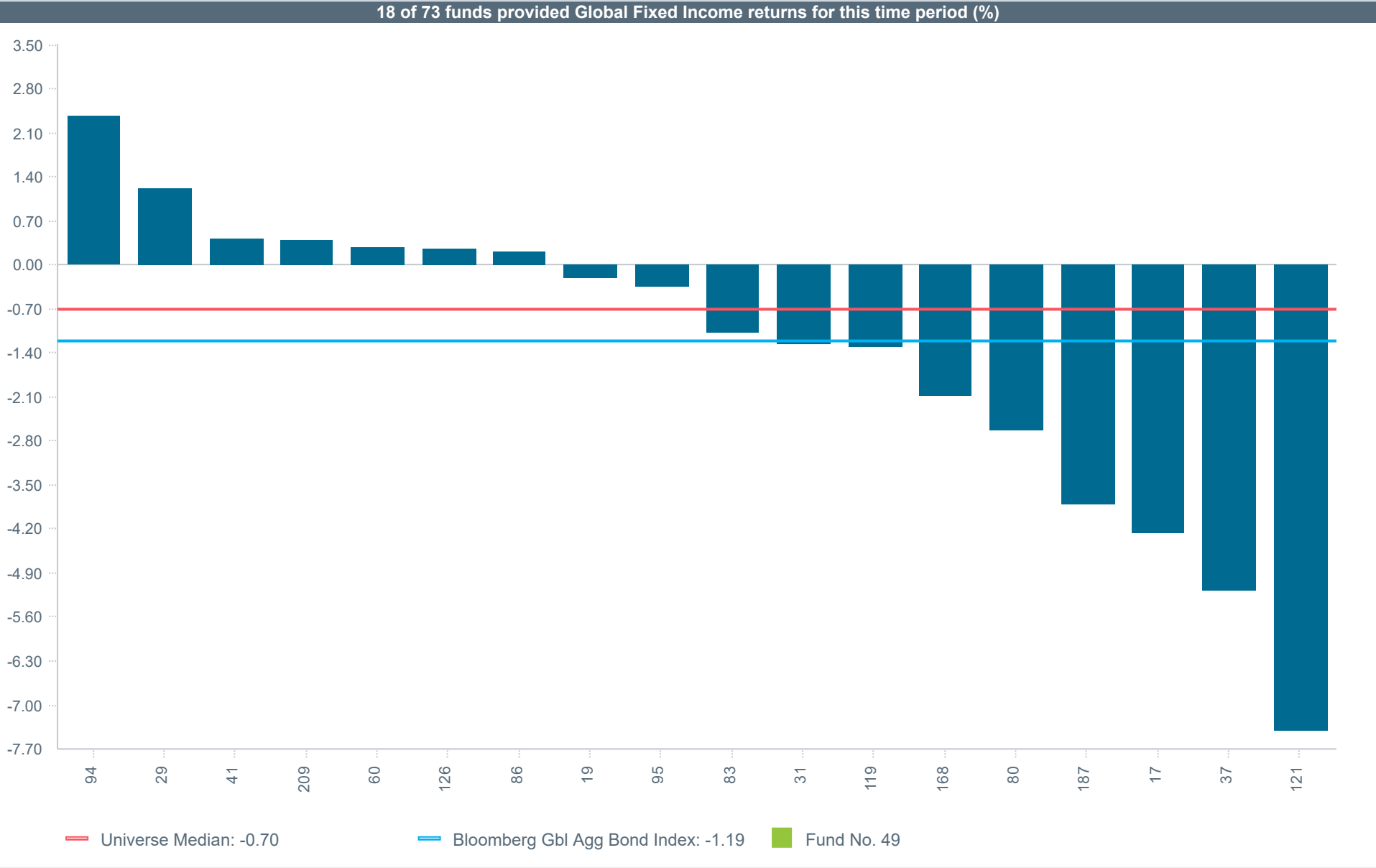
**Total Return - US Fixed Income**  
**Fund No. 49 vs. Bloomberg US Agg Bond Index**

As of December 31, 2018



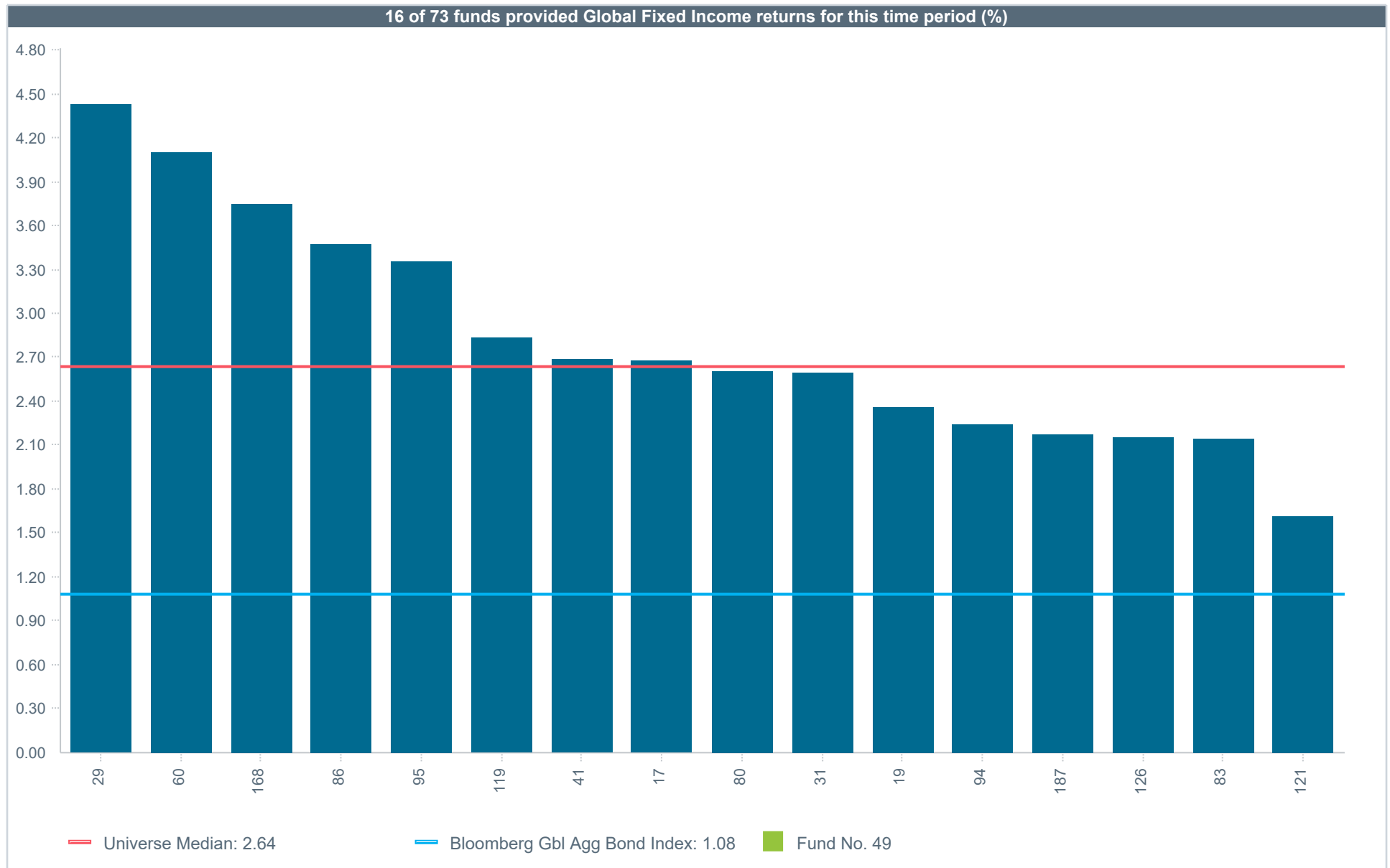
Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	-0.28	2.83	2.71
Bloomberg US Agg Bond Index	0.01	2.06	2.52
Variance	-0.29	0.77	0.19



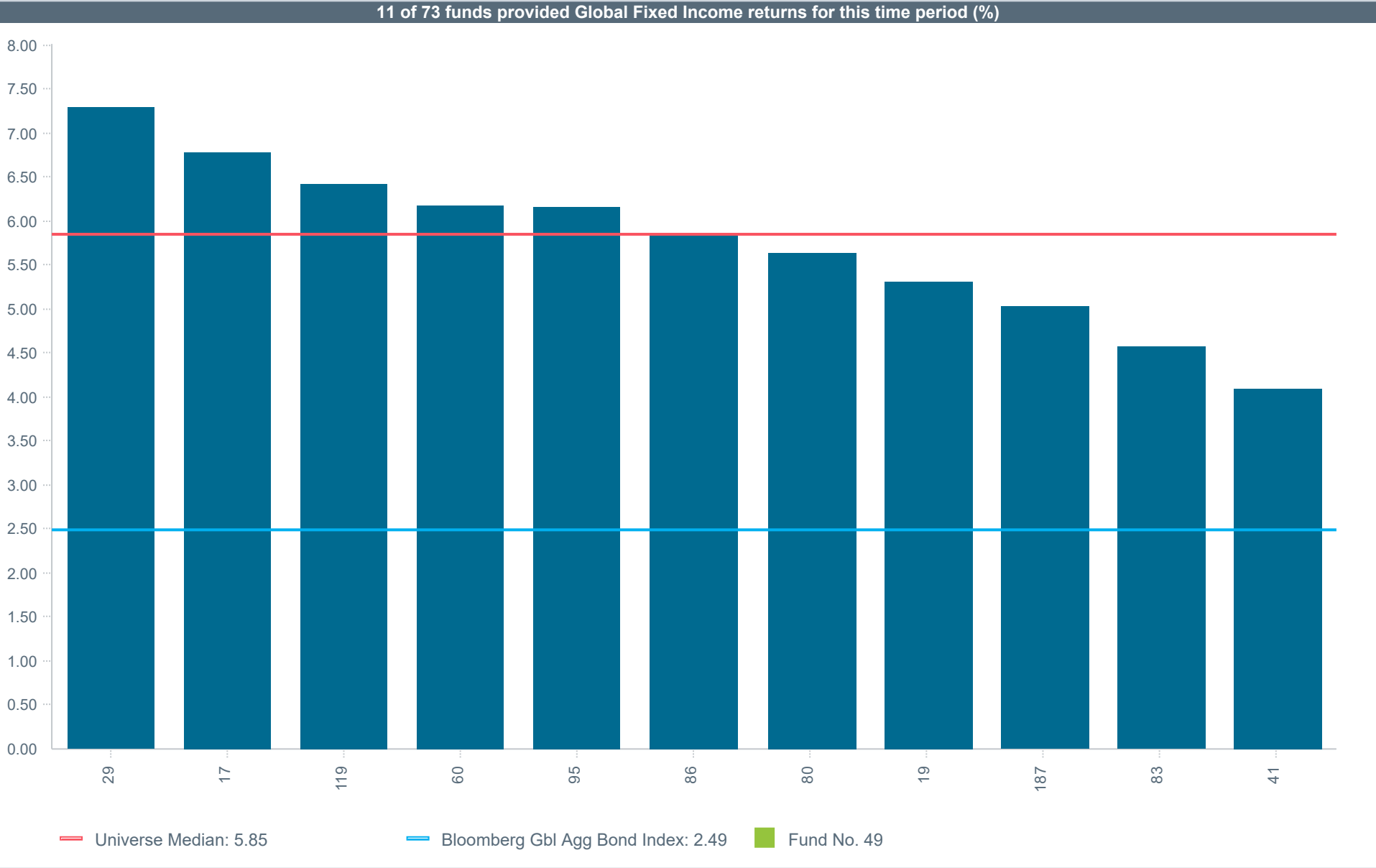


Funds with less history than the specified time period will not appear in the chart.





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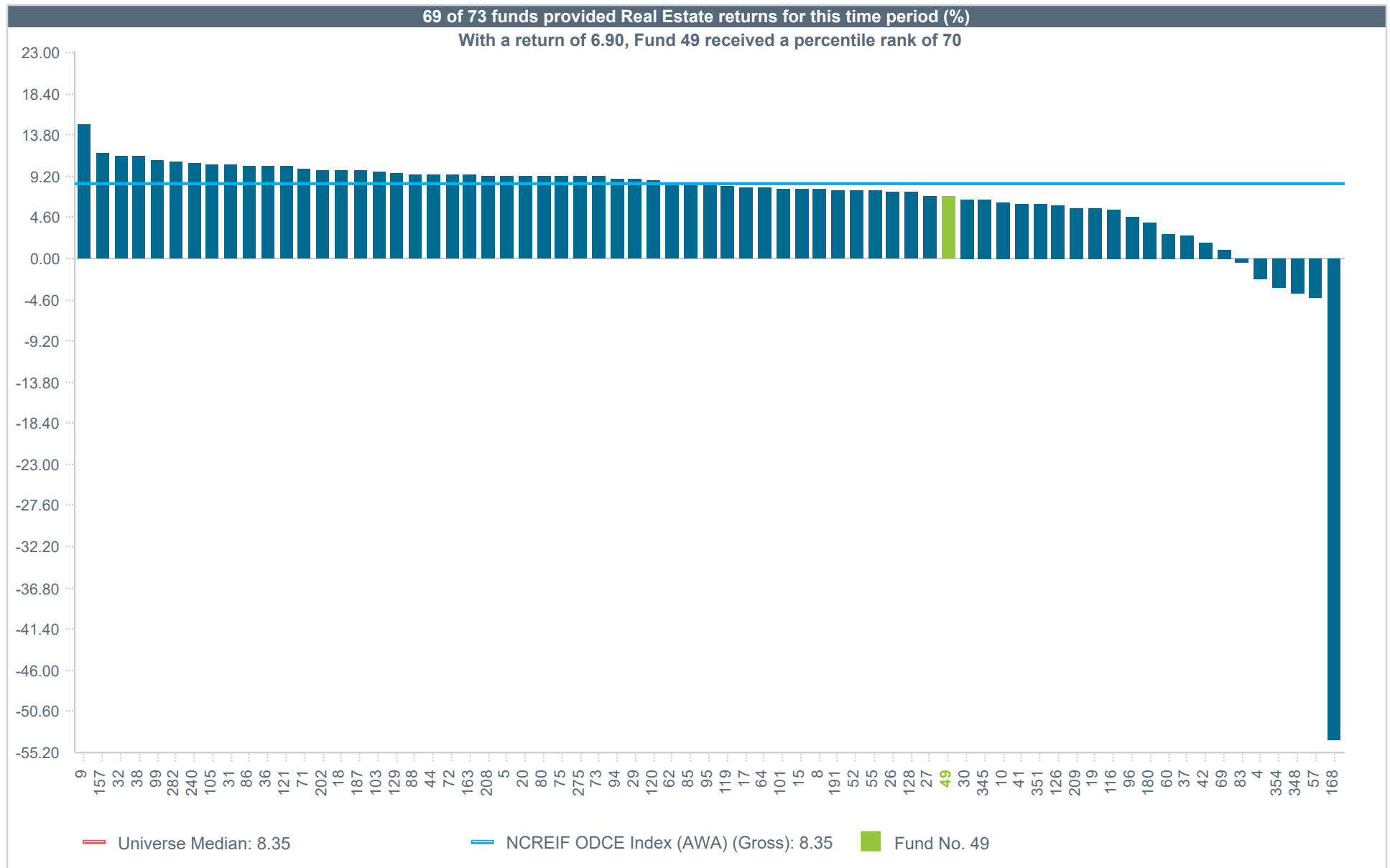


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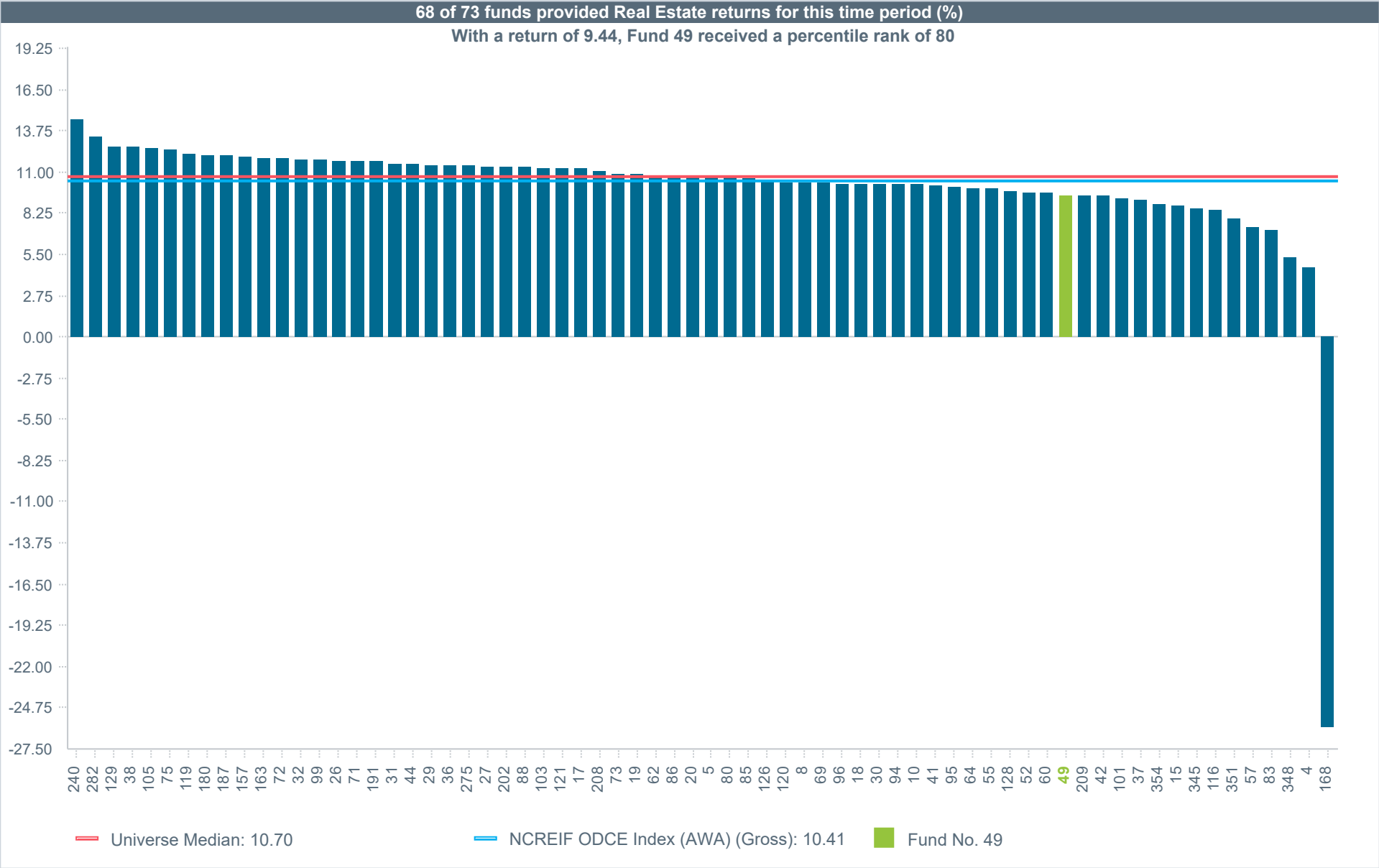
Calendar Year Rates of Return (%)	Cumulative Performance (Growth of \$100)
Fund No. 49 does not have return data for Global Fixed Income	

Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	N/A	N/A	N/A
Bloomberg Gbl Agg Bond Index	N/A	N/A	N/A
Variance	N/A	N/A	N/A



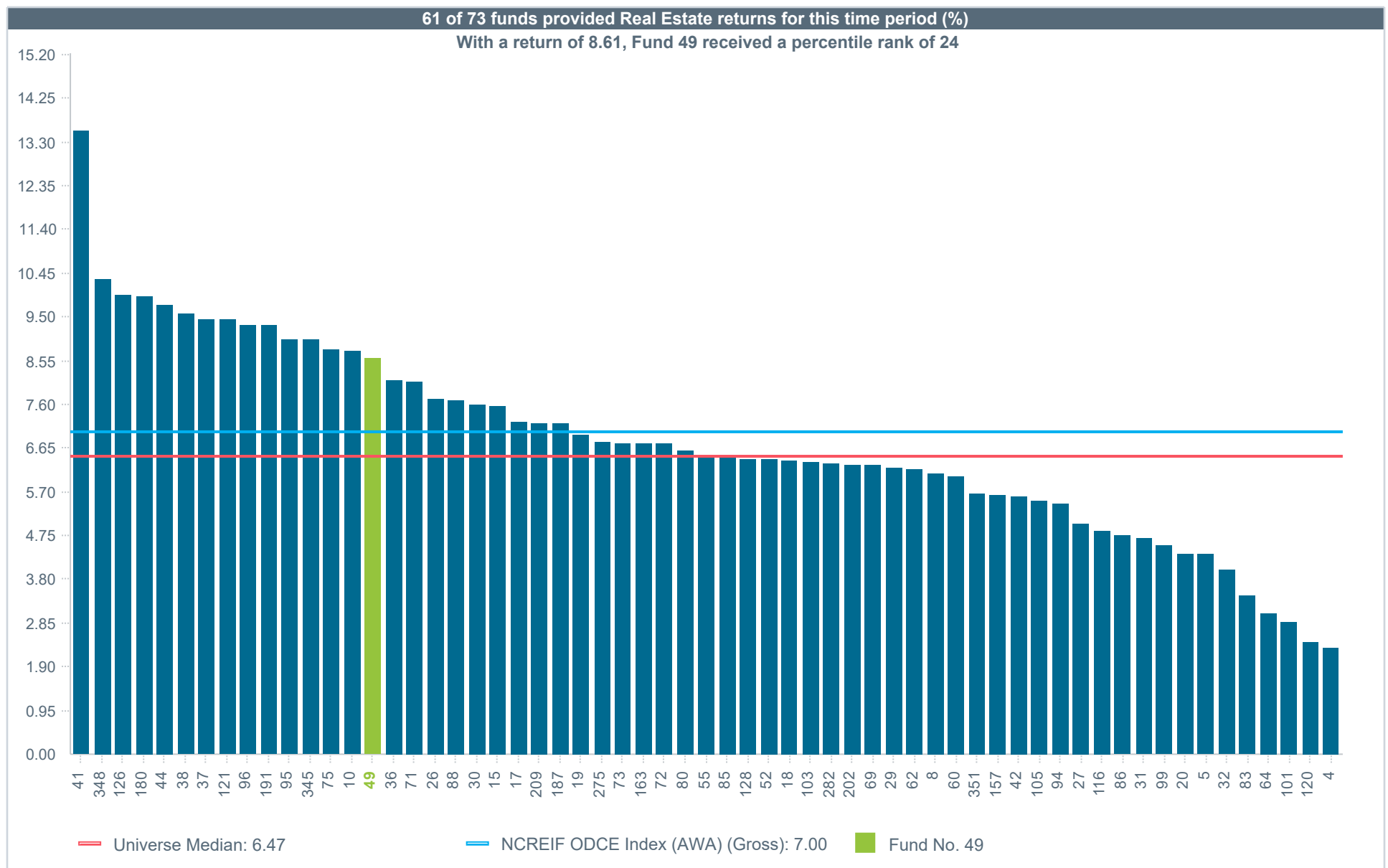
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Funds with less history than the specified time period will not appear in the chart.





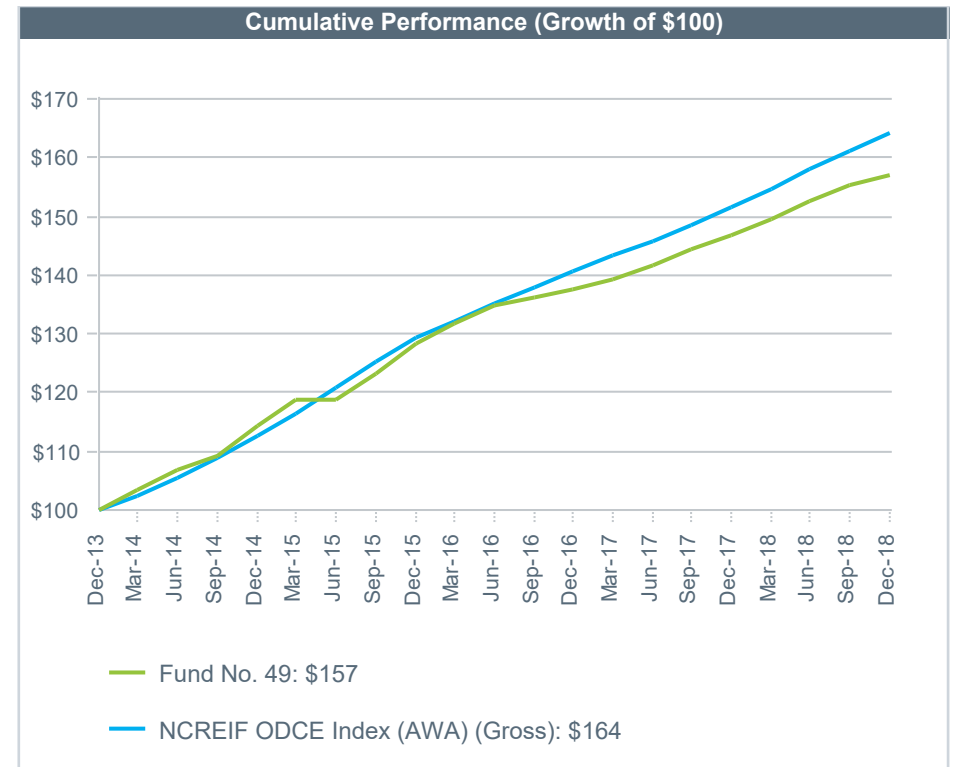
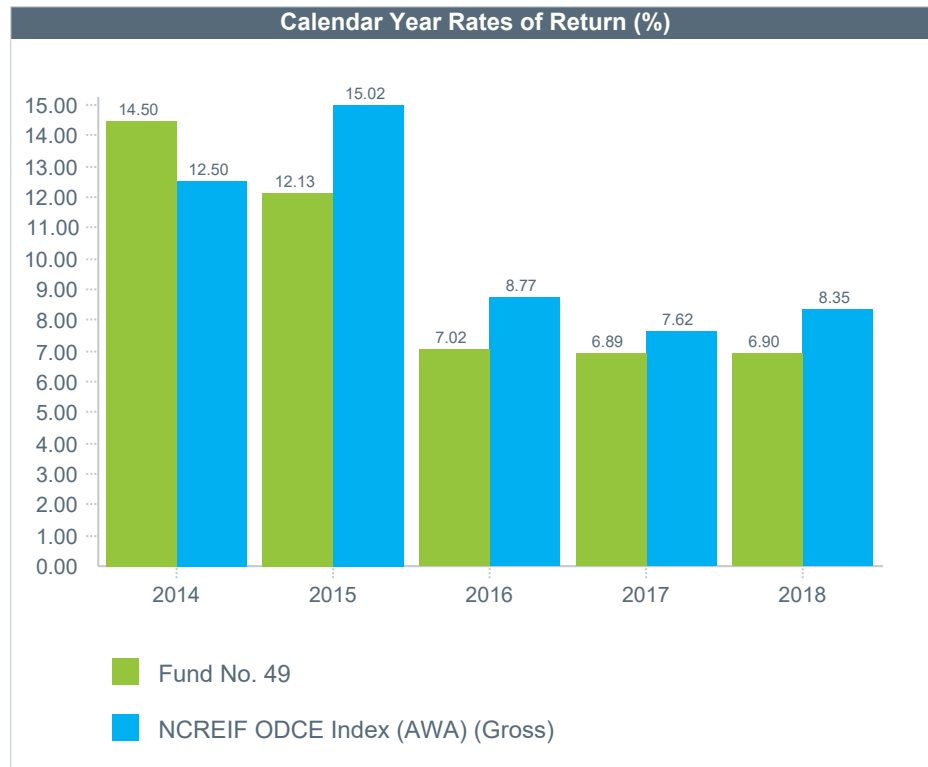
Funds with less history than the specified time period will not appear in the chart.





**Total Return - Real Estate**  
**Fund No. 49 vs. NCREIF ODCE Index (AWA) (Gross)**

As of December 31, 2018

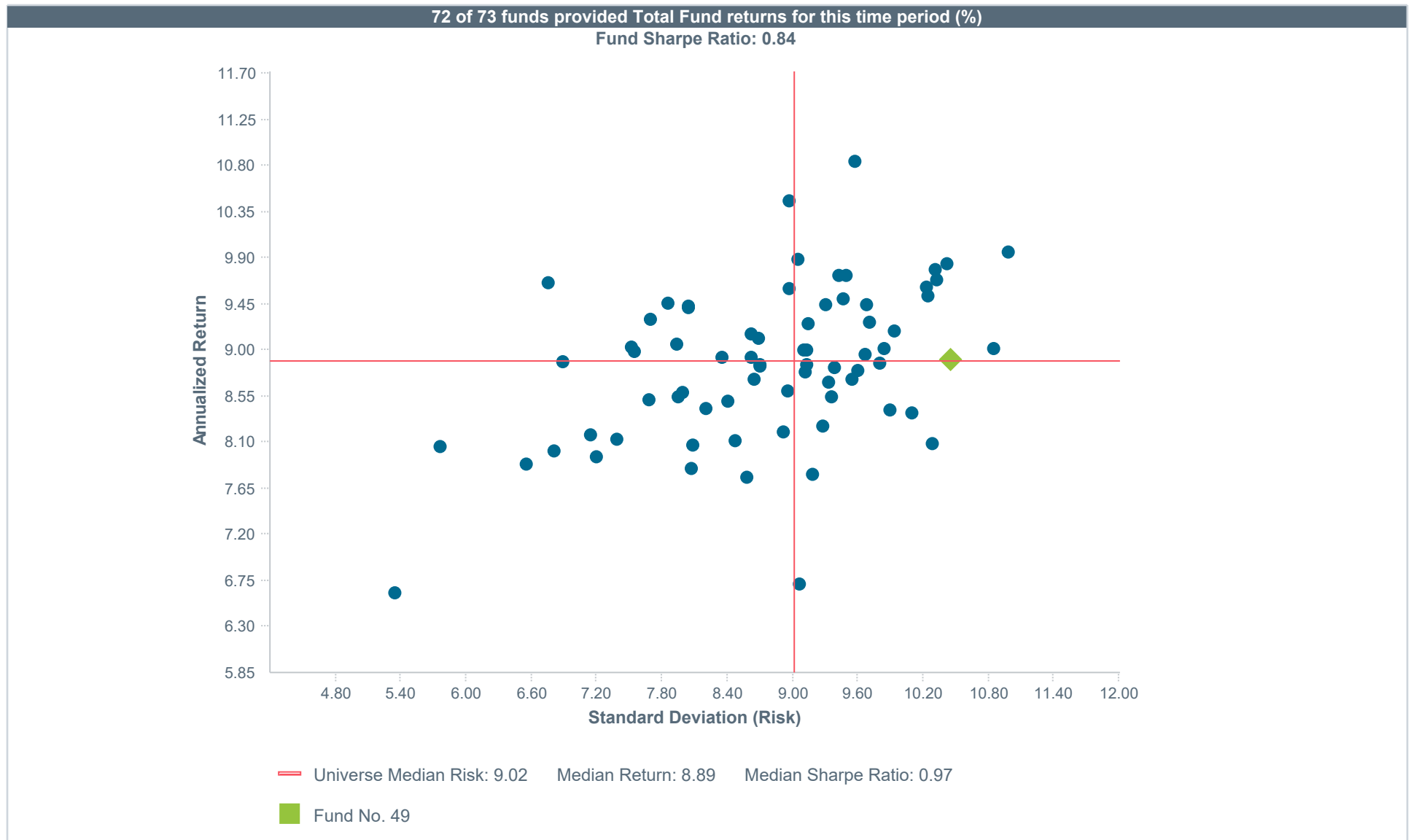


Annualized Returns (%)			
	1 Year	3 Years	5 Years
Fund No. 49	6.90	6.94	9.44
NCREIF ODCE Index (AWA) (Gross)	8.35	8.24	10.41
Variance	-1.45	-1.30	-0.97

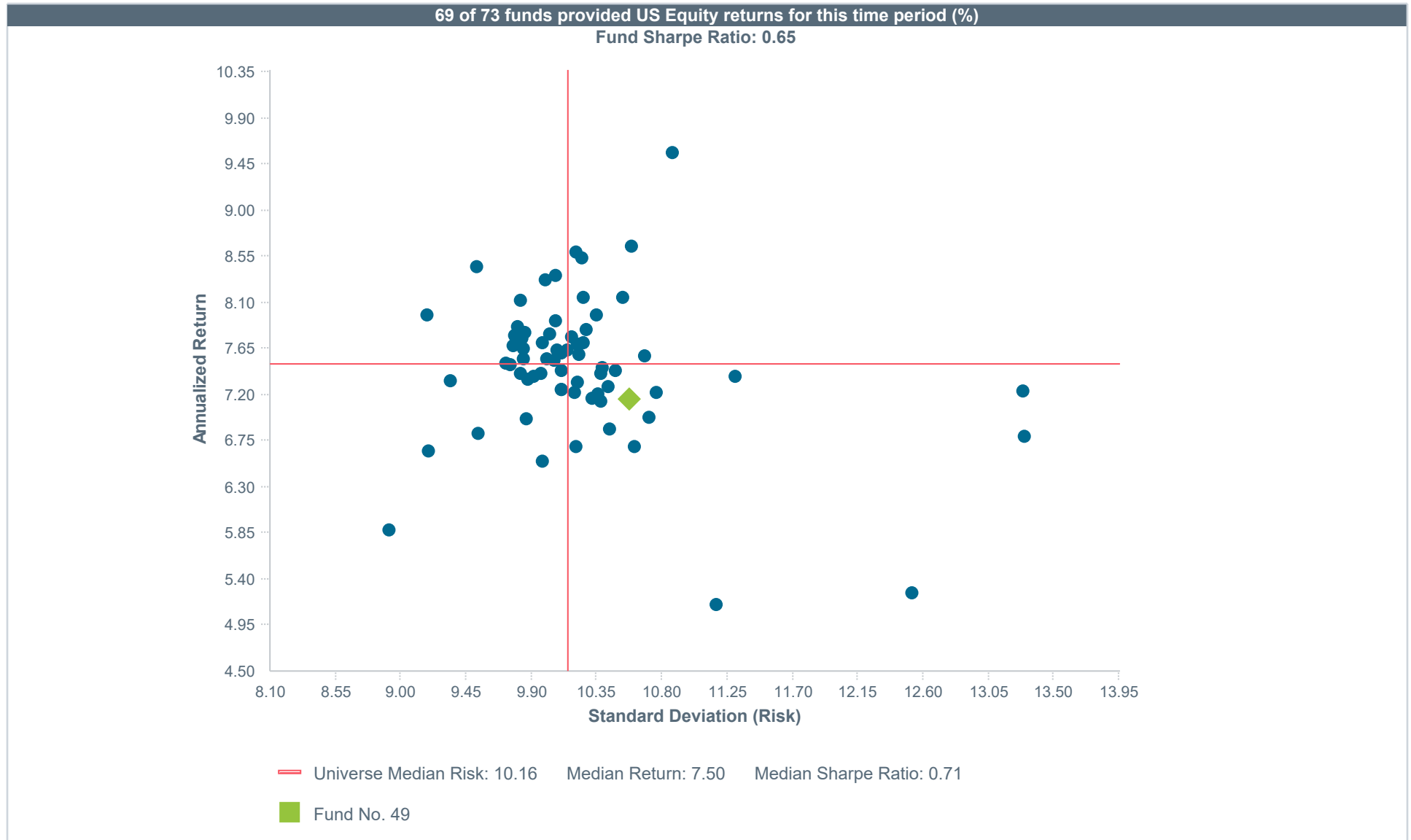




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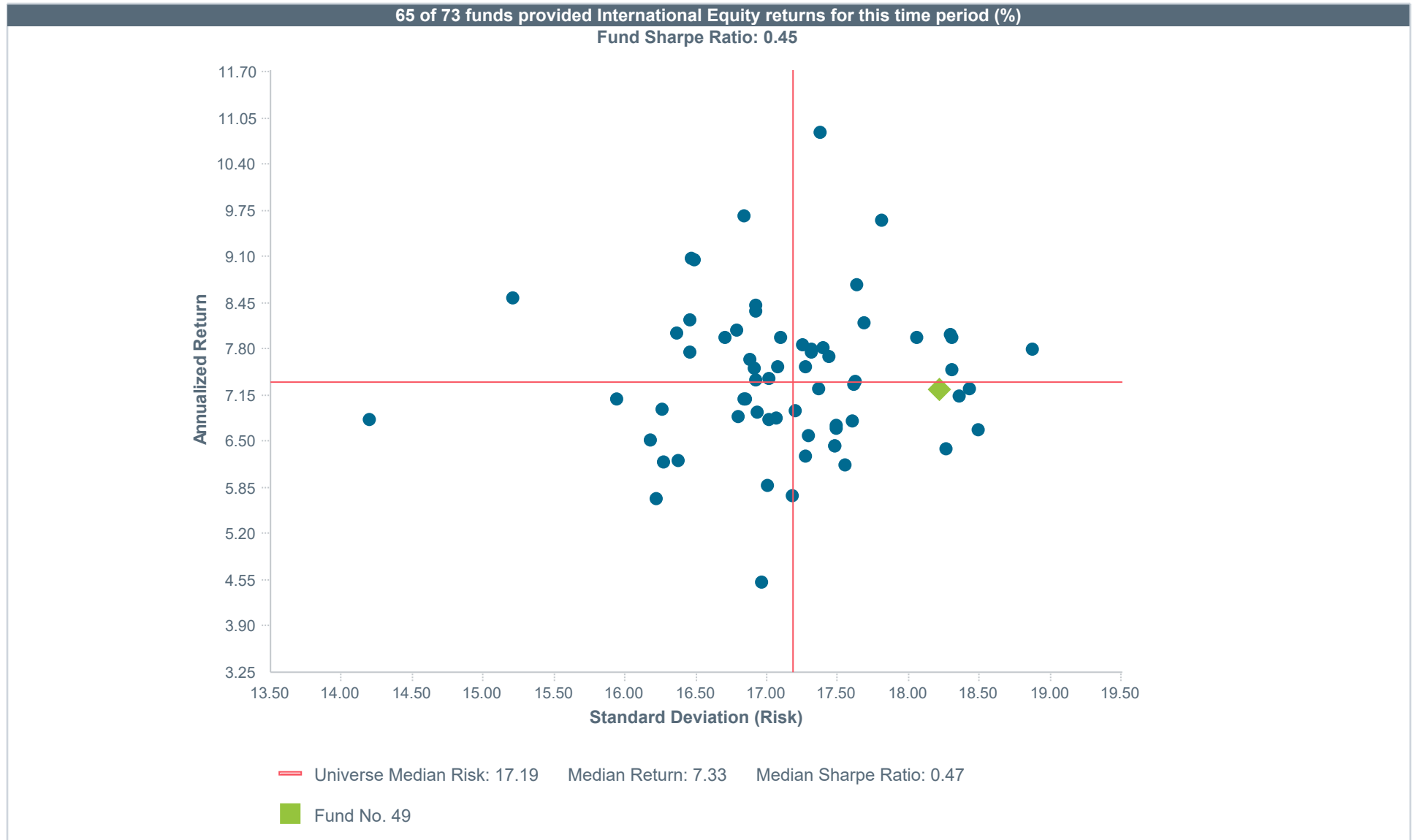
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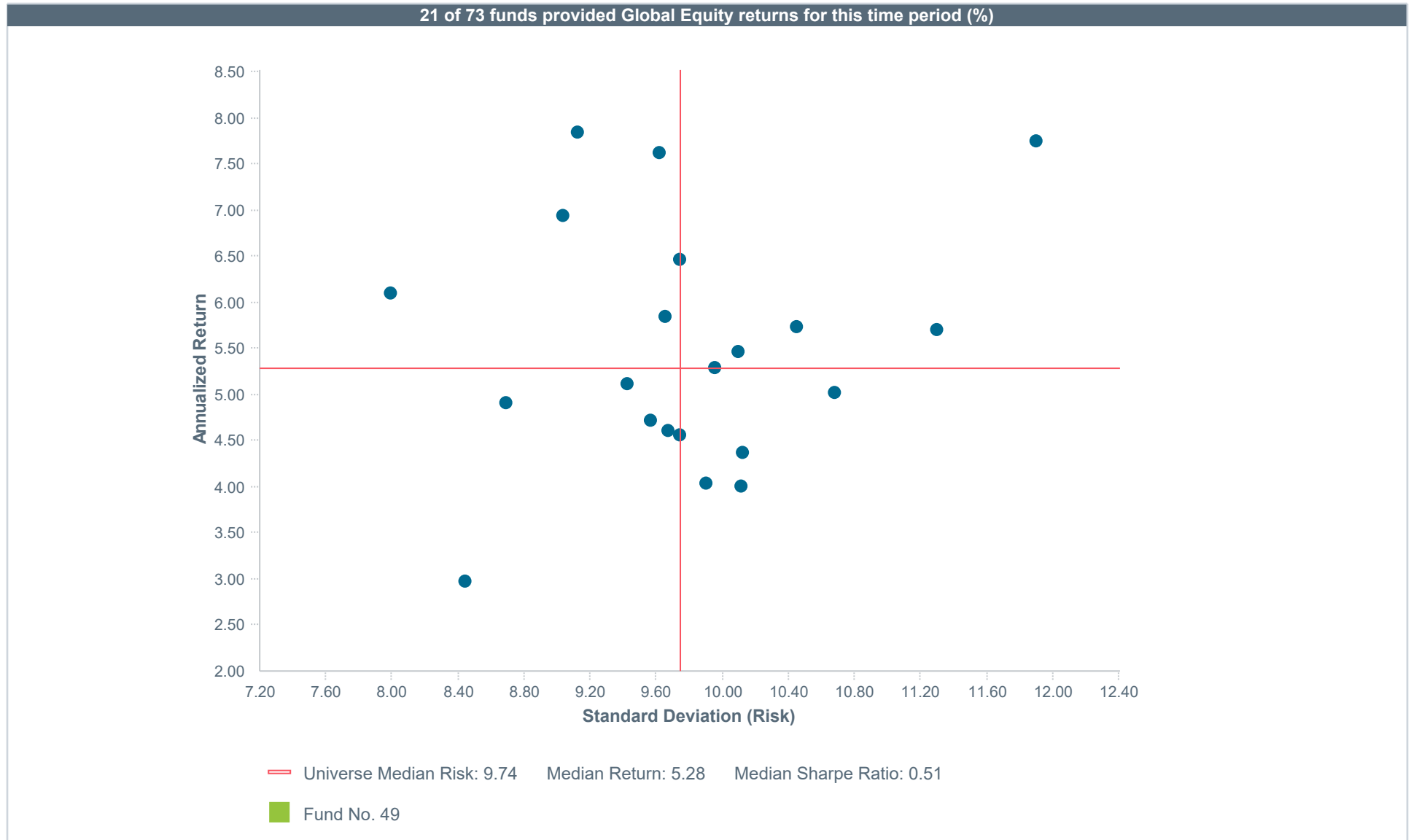
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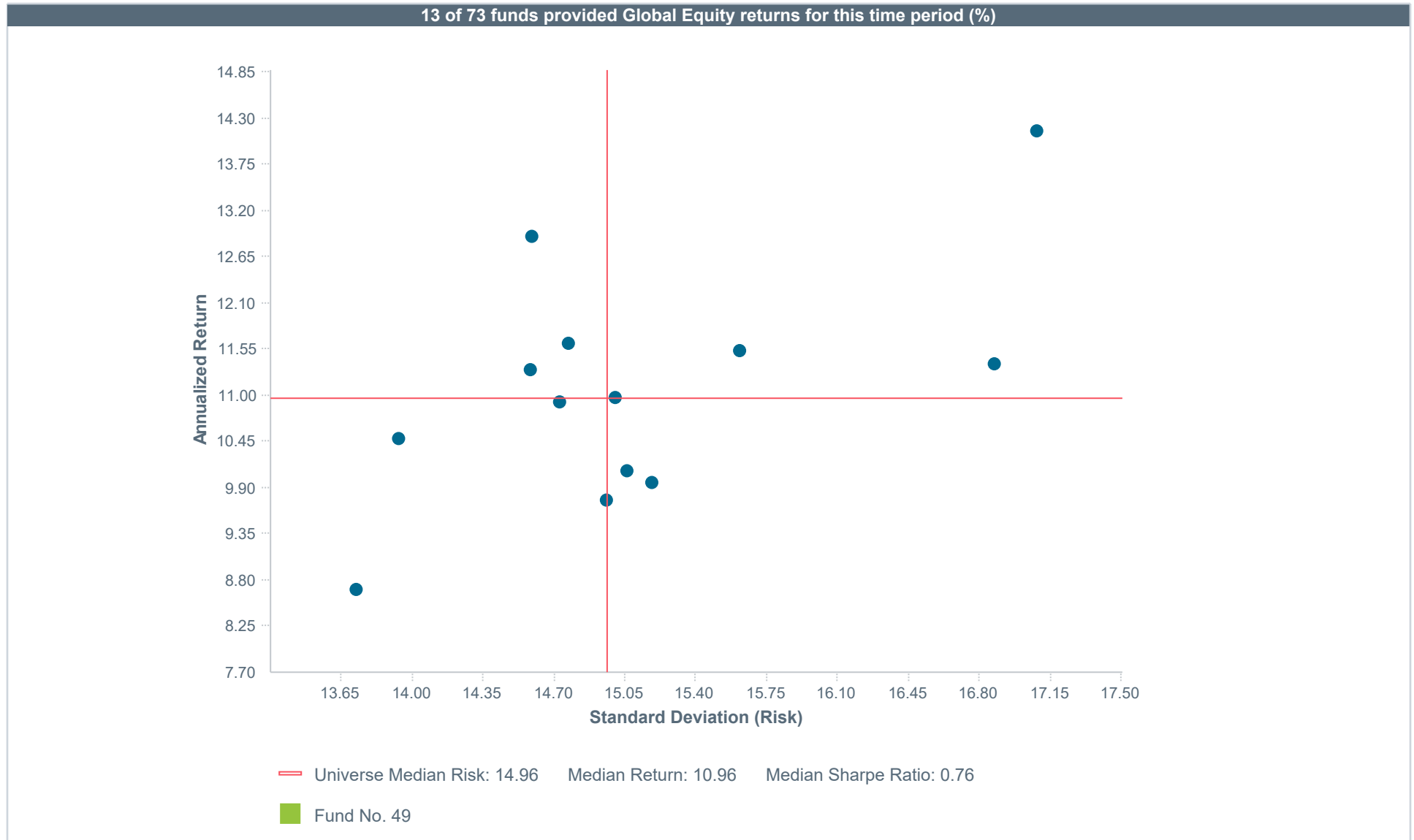


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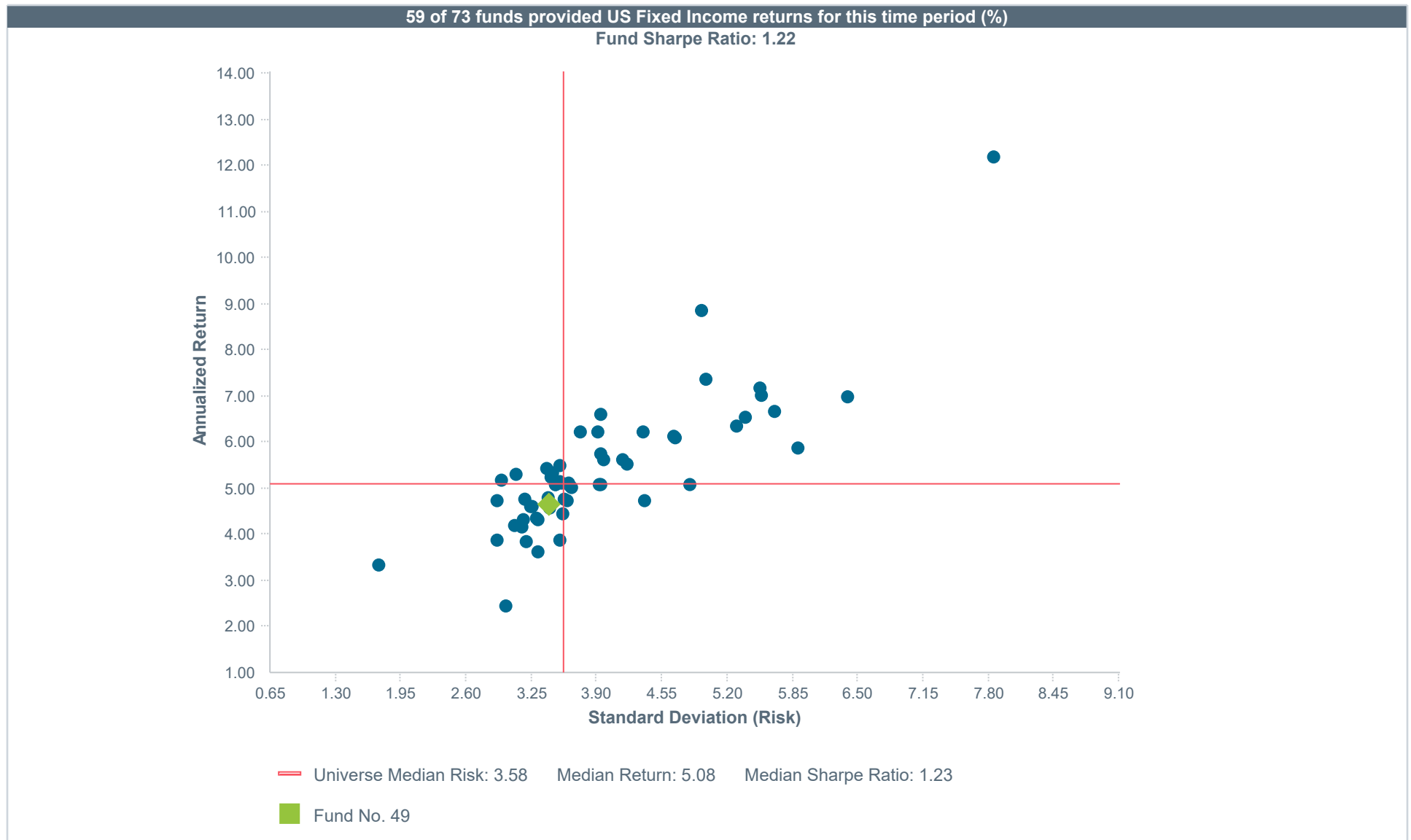




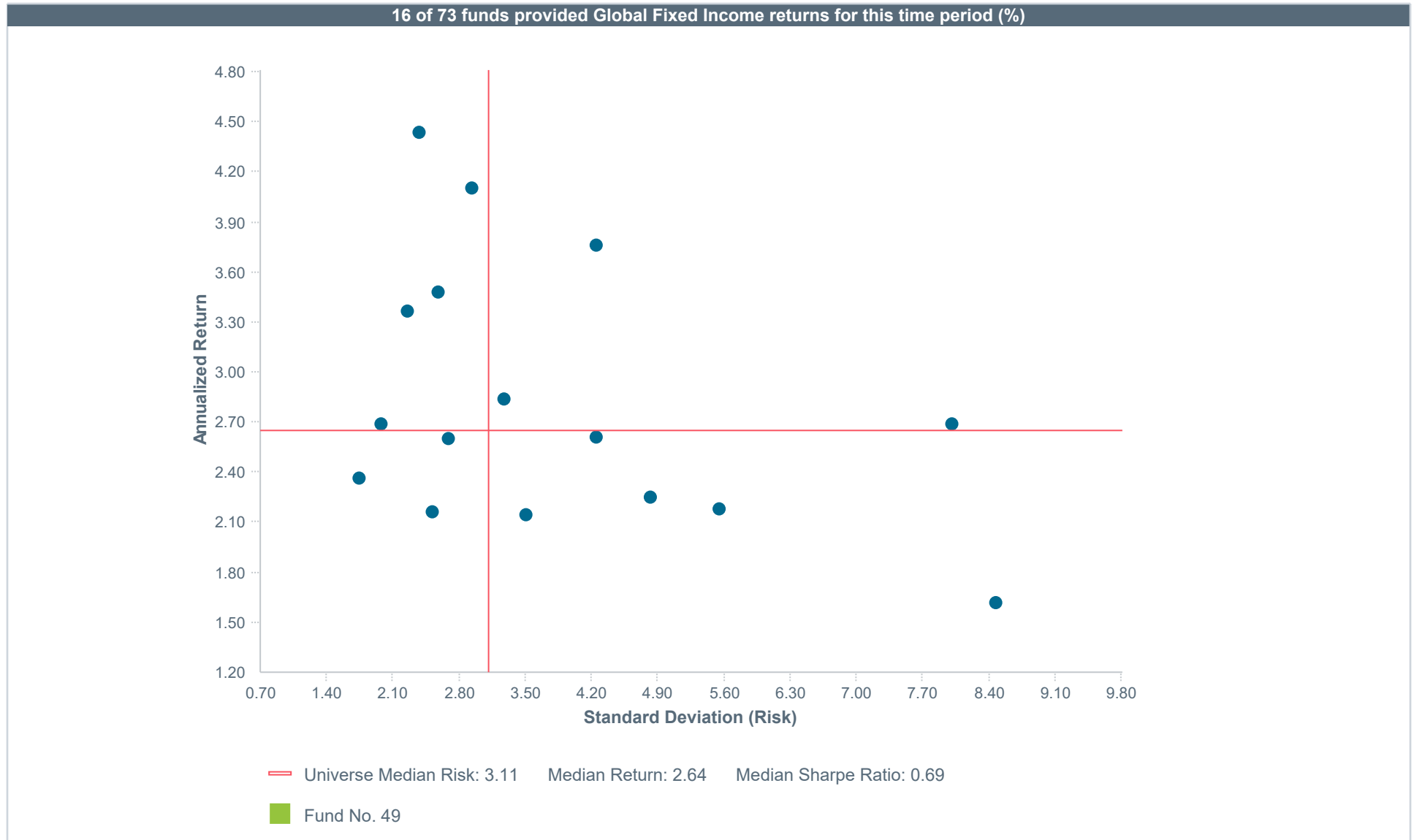
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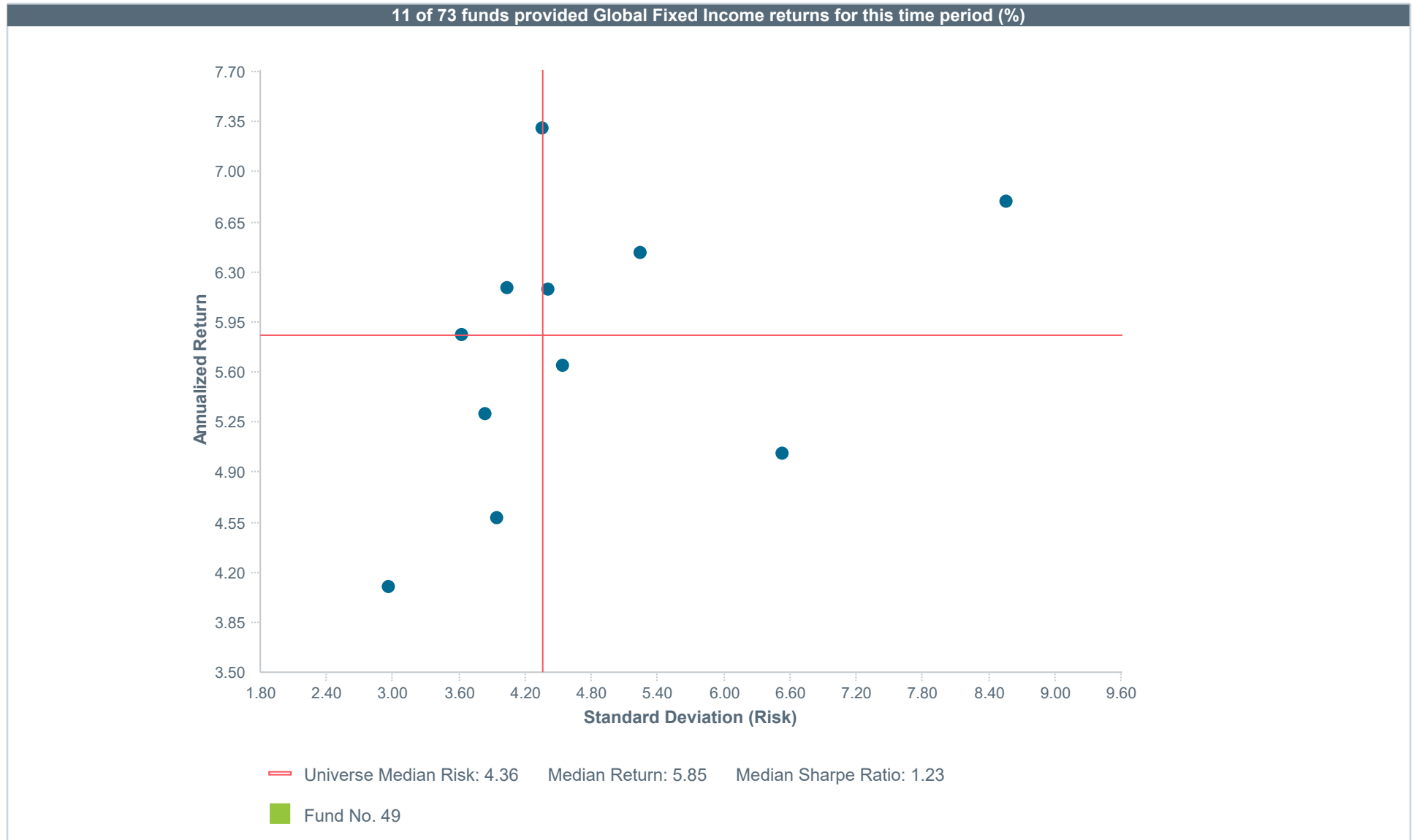
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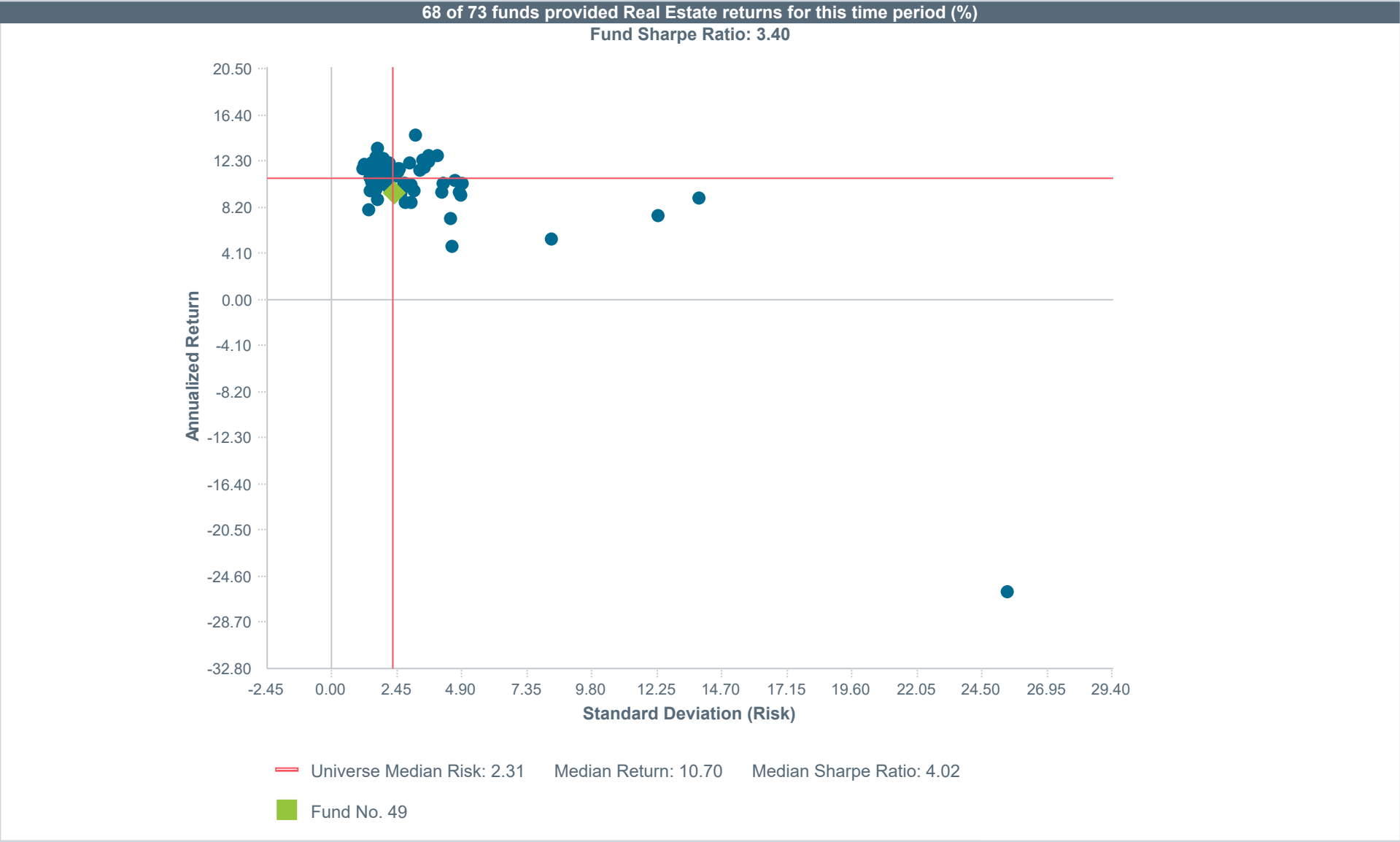
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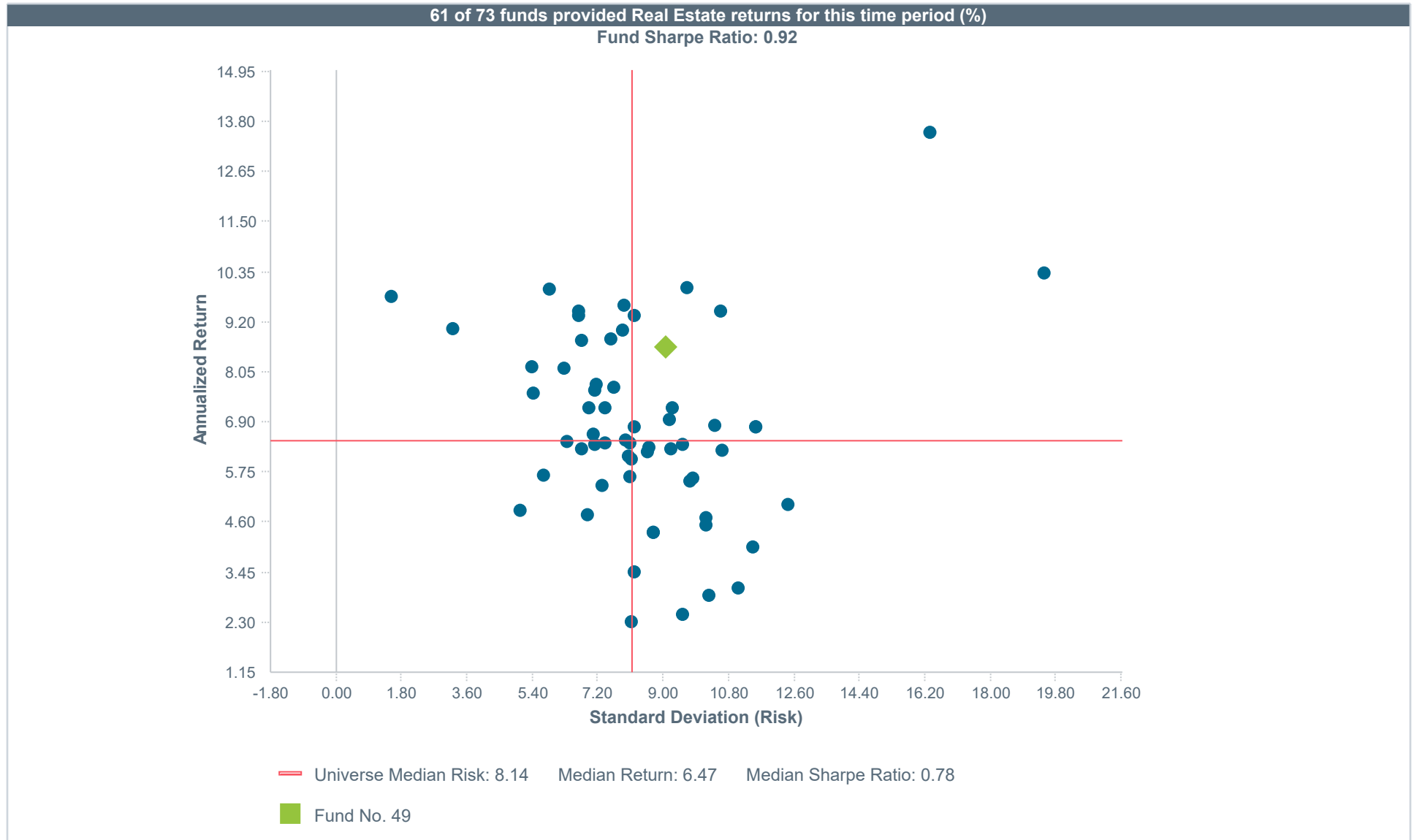
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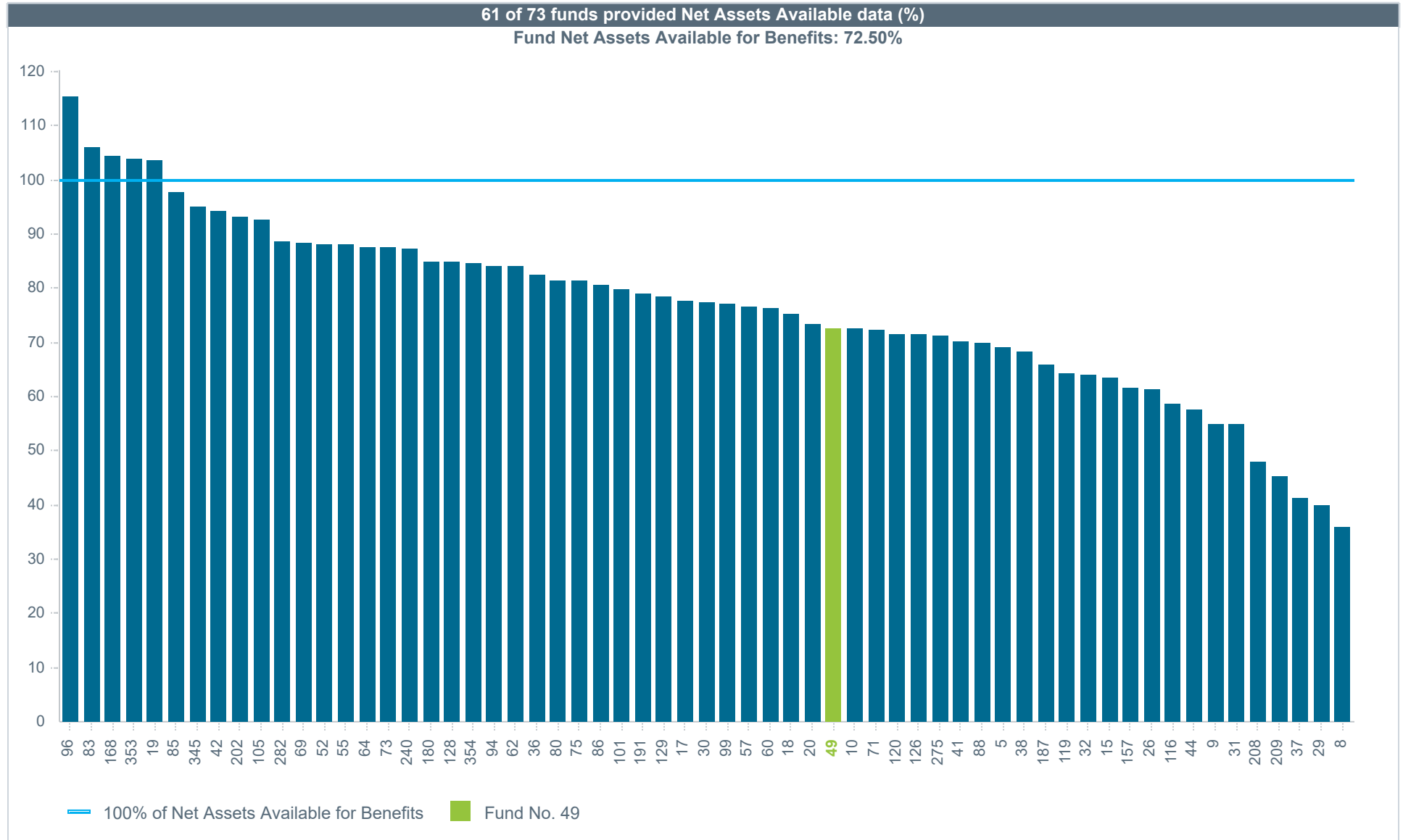
Funds with less history than the specified time period will not appear in the chart.



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

**Net Assets Available For Benefits**  
**Expressed as a Percentage of the Pension Benefit Obligation**

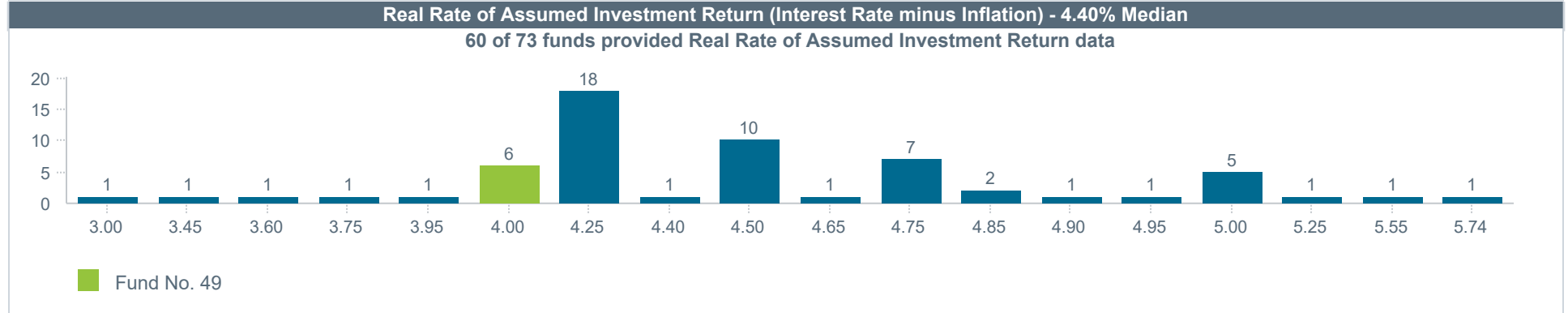
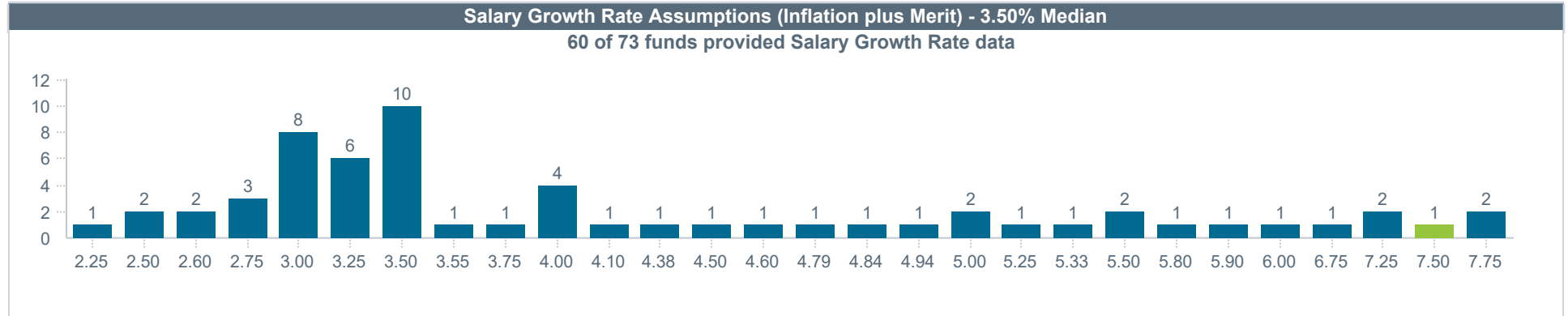
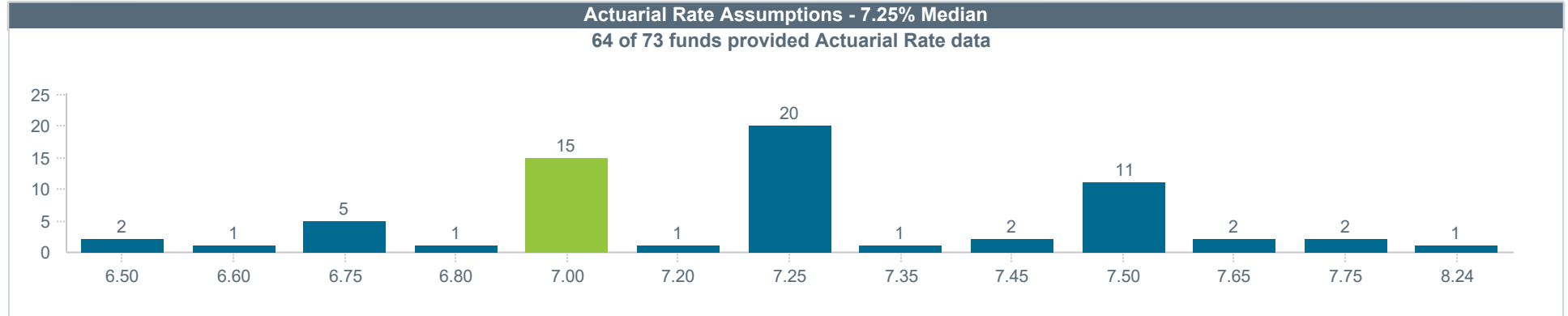
As of December 31, 2018



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







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

### Overlay Survey Summary

Q1. Of the 73 participants in the 2018 Q4 Public Fund Report, 54 participants provided a response to the Overlay Survey. Of those participants, 27 are currently using a form of overlay, 2 are considering evaluating a form of overlay, and 25 are not currently using or considering evaluating any form of overlay.

Q2. Of the 26 participants that provided a response to the Overlay Survey and have exposure to an overlay manager or managers, the purposes of the overlay programs are distributed as follows:

42.31 %	Manage foreign currency risk
30.77 %	Generate alpha
0.00 %	Match Plan liabilities more closely (either as part of an explicit or conceptual framework)
3.85 %	Express a view on US Dollar
0.00 %	Manage market risk within an LDI construct
23.08 %	Tactical asset allocation
53.85 %	Cash equitization
73.08 %	Rebalancing management
34.62 %	Transition management
0.00 %	Other

Q3. Of the 12 participants that provided a response to the Overlay Survey and have exposure to a currency manager or managers, the program structures are distributed as follows:

58.33 %	Static hedge ratio
33.33 %	Dynamic hedging program where manager varies the hedge ratio
16.67 %	Alpha generating currency manager focused on absolute return

Q4. Of the 7 participants that provided a response to the Overlay Survey and indicated use of a hedge ratio on a currency program, the responses are distributed as follows:

1 response indicated	25.00 % hedge on All Equities
4 responses indicated	50.00 % hedge on Developed Equity exposure
1 response indicated	75.00 % hedge on Developed Equity exposure
1 response indicated	50.00 % hedge on International Equity exposure

## Supplemental Questions

Q1. Of the 54 respondents, the methods of Private Equity reporting are distributed as follows:

- 37.04 % Valuations and cash flows are updated and reflected as received by custodian
- 9.26 % Reported on a 1 month lag to account for additional valuations and cash flow activity
- 53.70 % Reported on a 1 quarter lag to account for most all valuations and cash flow activity

Q2. Of the 57 respondents, the methods of Private Real Estate reporting are distributed as follows:

- 45.61 % Valuations and cash flows are updated and reflected as received by custodian
- 5.26 % Reported on a 1 month lag to account for additional valuations and cash flow activity
- 49.12 % Reported on a 1 quarter lag to account for most all valuations and cash flow activity

Q3. Of the 55 respondents, the responses to whether or not Private Equity and/or Private Real Estate valuations are restated once final valuations are received from the managers are distributed as follows:

- 20.00 % Answered 'Yes' - valuations are restated
- 80.00 % Answered 'No' - valuations are not restated

**Miscellaneous Comments**

- Performance shown is gross of fees, with the exception of the following:
  - **Funds 8, 31, 49, 350, and 351:** Performance shown is net of fees.
  - **Funds 5 and 20:** Performance shown is net of fees, except for Total Fund performance.
  - **Funds 55, 75, and 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 Benefits includes funding percentage valuation as of dates between December 2017 and December 2018.
  - **Fund 96:** Net Assets Available for Benefits shown is the higher funded ratio for one of two commingled systems reported by the fund.
- Allocations shown reflect dedicated managers/mandates rather than actual exposure, with the exception of the following:
  - **Funds 29, 86, and 119:** Performance shown for Global Fixed Income includes US and Non-US Fixed Income funds.
  - **Fund 121:** Performance shown for Global Fixed Income includes Non-US Fixed Income funds.
  - **Funds 4, 42, 64, 99, 202, and 240:** Performance shown for US Fixed Income includes US and Non-US Fixed Income funds.

**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., ICE BofAML 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.

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