

September 2024

# BUILDING THE TRUST

## Investment Management



**Teacher Retirement System of  
Texas**  
1000 Red River Street  
Austin, Texas  
78701-2698



**TEACHER RETIREMENT SYSTEM OF TEXAS MEETING  
BOARD OF TRUSTEES  
AND  
INVESTMENT MANAGEMENT COMMITTEE**

*(Committee Chair and Members: Mr. Corpus, Chair; Ms. Allred; Mr. Elliott,  
Ms. Sissney and Mr. Walls, Jr.)*

*All or part of the September 1, 2024, meeting of the TRS Investment Management Committee and Board of Trustees may be held by telephone or video conference call as authorized under Sections 551.130 and 551.127 of the Texas Government Code. The Board intends to have a quorum and the presiding officer of the meeting physically present at the following location, which will be open to the public during the open portions of the meeting: **1000 Red River, Austin, Texas 78701 in the TRS East Building, 5<sup>th</sup> Floor, Boardroom.***

*The open portions of the September 19, 2024, meeting are being broadcast over the Internet. Access to the Internet broadcast and agenda materials of the meeting is provided at [www.trs.texas.gov](http://www.trs.texas.gov). A recording of the meeting will be available at [www.trs.texas.gov](http://www.trs.texas.gov).*

**AGENDA  
September 19, 2024 – 8:00 a.m.**

1. Call roll of Committee members.
2. Consider the approval of the proposed minutes of the July 2024 committee meeting – Committee Chair.
3. CIO Update including Talent Management; Accomplishments; Notices; Awards; Key Dates and Upcoming Events, and Market Update – Jase Auby.
4. Discuss the Second Quarter 2024 Performance Review –Mike McCormick and Mike Comstock, Aon.
5. Review of the Semi-annual Risk Report – James Nield and Melissa Jerkins.

NOTE: The Board of Trustees (Board) of the Teacher Retirement System of Texas will not consider or act upon any item before the Investment Management Committee (Committee) at this meeting of the Committee. This meeting is not a regular meeting of the Board. However, because the full Committee constitutes a quorum of the Board, the meeting of the Committee is also being posted as a meeting of the Board out of an abundance of caution.



## **Minutes of the Investment Management Committee July 18, 2024**

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on Thursday, July 18, 2024, in the boardroom located on the Fifth Floor in the East Building of TRS' offices located at 1000 Red River Street, Austin, Texas, 78701.

### **Committee members present:**

Mr. David Corpus, Chair  
Ms. Brittny Allred  
Mr. John Elliott  
Mrs. Nanette Sissney  
Mr. Robert H. Walls, Jr.

### **Other TRS Board Members present:**

Mr. Mike Ball  
Mr. James D. Nance  
Mr. John Rutherford  
Mr. Elvis Williams

### **Others present:**

Brian Guthrie, TRS	Mike McCormick, Aon
Caasi Lamb, TRS	Mike Comstock, Aon
Heather Traeger, TRS	Phillip Kivarkis, Aon
Jase Auby, TRS	
Amanda Jenami, TRS	
Don Green, TRS	
Katy Hoffman, TRS	
Eric Lang, TRS	
Carolyn Hansard, TRS	
Neil Randall, TRS	
Grant Walker, TRS	
James Nield, TRS	
Mike Simmons, TRS	
Katherine Farrell, TRS	
Suzanne Dugan, Cohen Milstein	
Dr. Keith Brown, Board Advisor	

Investment Management Committee Chair, Mr. David Corpus, called the meeting to order at 2:20 p.m.

### **1. Call roll of Committee members.**

Ms. Farrell called the roll. A quorum was present.

**2. Consider the approval of the proposed minutes of the May 2024, Investment Management Committee meeting – Chair David Corpus.**

On a motion by Ms. Sissney, seconded by Mr. Walls, the committee approved the proposed minutes for the May 2024 Investment Management Committee meeting as presented.

**3. CIO Update including Fleet Strategy; Talent Management; Accomplishments; Notices; Key Dates and Upcoming Events – Jase Auby.**

Mr. Jase Auby provided a performance update reporting a one-year return of 9.4 percent that included 298 basis points of alpha, a record one-year alpha for the Trust. He said there were 44 days until the end of the fiscal year and announced the estimated fiscal year return as 9.3 percent. He said they held an SPN Summit in Austin this quarter where discussions were had on artificial intelligence, emerging markets investing as well as Europe. He reported the launch of an industry initiative with TRS and Albourne to advocate for the use of cash hurdles in the calculation of hedge fund returns. He said there are 60 signatories to the letter.

**4. Discuss the First Quarter 2024 Performance Review –Mike McCormick and Mike Comstock, Aon.**

Mr. Mike McCormick began by reporting on global equity's very positive nominal returns for the trailing one-year period, up 16.5 percent. He said risk parity was doing well but negative performance in stable value as rates have risen. He said that this is part of the diversification plan of the strategic asset allocation. He noted within the real return, comprised of real estate, infrastructure, natural resources, all of which were doing predominantly well, except for core real estate that had a negative pressure in the trailing one-year period, down 12.7 percent. He then provided a five-year period review with \$67 billion in investment earnings and almost \$20 billion in net outflows of benefit payments to teachers and participants in the plan. He provided a comparison to peers with \$1 billion funds due to the sample size of \$10 billion funds being so small. He said as to the three goals of performance identified in the Investment Policy Statement (IPS) are beating the total Fund benchmark which is a great proxy for success over time.

**5. Annual Review of External Private Markets – Eric Lang, Grant Walker Carolyn Hansard and Neil Randall.**

Mr. Eric Lang reviewed the three tenets of the private markets team: transparency, innovation and industry leadership. He said there was a total of four teams with two offices, London and Austin. He reported the portfolio is 38 percent of the Trust at almost \$80 billion with 7,100 holdings. He said ENRI and PE both had positive returns this year and real estate was negative for the first time in 14 years. Mr. Lang covered a special topic of data centers and artificial intelligence (AI). He said this touches all areas of the Trust, in real estate, infrastructure, private equity, businesses, and in special opportunities in credit or structured investments. He said there is around \$2 billion invested currently and growing.

Mr. Grant Walker provided an overview on the real estate portfolio. He said the negative one-year return was caused by the spike in interest rates last year. He noted the office sector was by far the

worst performing and has been negative for eight consecutive quarters. He said apartments at negative 11 percent were second worst performing while industrial was the best of the three at negative six percent. He said 53 percent of the portfolio was in principal investments (PIs) that have outperformed the funds across all time periods. Mr. Walker concluded with accomplishments and 2024 priorities.

Ms. Carolyn Hansard provided an overview of the Energy, Natural Resources, and Infrastructure (ENRI) portfolio noting it delivered a 9.8 percent return, a 4.3 percent above benchmark. She said on a three-year basis energy generated 20 percent returns, but since inception it is close to 4 percent due to the volatility in the space. She reviewed the demand and various generation of power specifically in Texas.

Mr. Neil Randall provided an overview of the private equity (PE) portfolio noting on a one-year basis delivered eight to nine percent. He said from a team perspective it is the most well-resourced and talented group he has worked with during his tenure at TRS. He reviewed distributions, reporting \$3.5 billion for this last year as in line with industry. He said private markets move slower than public and expects the distributions to normalize over the next year or two.

**6. Consider recommending to the Board adoption of the Strategic Asset Allocation Proposal – James Nield, Mike Simmons and Mike McCormick, Aon.**

Mr. Mike Simmons reviewed the timeline of the strategic asset allocation study with today being the final recommendation. He reviewed the proposed SAA based on four key considerations that came from IMD's research. He said for public equity it is a proposed reduction to the overweight to emerging markets and the underweight to USA. He said the belief that emerging markets will outperform developed markets is less confident than five years ago due to waning globalism and worsening geopolitical situation across emerging markets. Next, he said, private equity has seen its outperformance versus public equity decline over the last decade with the driving factor being increased competition in this space. Mr. Simmons said the other two considerations have the same effect, government bonds and risk parity, both reduce the Trust duration given their sensitivity to interest rates. He said the recommendation is to remove China from TRS' emerging market benchmark due to the political environment shifting. The recommended decrease to emerging market is offset by both increases to USA and non-US developed. Mr. Auby concluded today's recommendation was a culmination of a year's worth of work presented to the Board over the last year. There was further discussion about the removal of China from the benchmark, zero percent allocation.

On a motion by Mr. Walls, seconded by Mr. Elliott, the committee voted to recommend to the Board adoption of the proposed resolution to adopt the strategic asset allocation as presented by staff with Mr. Rutherford abstaining:

**TEACHER RETIREMENT SYSTEM OF TEXAS BOARD OF TRUSTEES  
RESOLUTION OF BOARD OF TRUSTEES RELATING TO THE  
STRATEGIC ASSET ALLOCATION**

**WHEREAS**, pursuant to Section 825.103 of the Texas Government Code, the Board of Trustees (Board) of the Teacher Retirement System of Texas (TRS), is the trustee of all assets of the retirement system;

**WHEREAS**, Pursuant to Section 825.301 of the Texas Government Code, the Board shall develop written investment objectives for the investment of the assets of the Trust to address desired rates of return, risks involved, investment time frames, and any other relevant considerations;

**WHEREAS**, Pursuant to section 1.6 of the TRS Investment Policy Statement (IPS): The Investment Management Division (IMD) assists the Board in engaging in a strategic asset allocation (SAA) Study at least once every five (5) years to review asset classes, return-risk assumptions, and the correlation of returns with applicable benchmarks and across asset classes;

**WHEREAS**, The Fund objectives, as set forth in Section 1.4 of the IPS, require that the Board control risk through diversification and long-term risk and return expectation and achieve long-term returns that exceed the actuarial assumed rate of return adopted by the Board, the rate of inflation by an annualized 5%, and exceeds the Fund Policy Benchmark;

**WHEREAS**, TRS conducted SAA Studies in 2009, 2014, and 2019. The most recent SAA Study conducted by IMD was approved by the Board in 2019 and incorporated into the current IPS;

**WHEREAS**, IMD conducted the SAA Study in consultation with TRS' investment consultant, Aon, and utilized Aon's strategic asset allocation best practices, as set forth in the Aon and IMD presentation to the Board at the December 2023 Board meeting;

**WHEREAS**, The results of the current SAA Study were presented to the Board by IMD over the last four Board meetings in coordination with TRS' investment and actuarial advisors and other strategic partners;

**WHEREAS**, The SAA Study conducted by TRS followed a prudent process designed to address applicable fiduciary obligations of the Board; and  
Now therefore, be it

**RESOLVED**, That the Board hereby approves the new strategic asset allocation set forth in Exhibit A, and hereby authorizes and directs the IMD to revise the IPS to reflect the new strategic asset allocation, and to present the revised IPS for Board consideration at the Board's next regular meeting, with a targeted effective date of September 23, 2024; and

**RESOLVED**, That the Board hereby authorizes IMD to take all actions necessary to begin the transition to implement the new strategic asset allocation plan in Exhibit A as of September 23, 2024 in accordance with the duties and responsibilities set forth in the IPS as well as in accordance with all other IMD policies and procedures.

Mr. McCormick provided the results of Aon’s asset liability study. Mr. Phillip Kivarkis reviewed the three facets of the analysis: portfolio analysis, the asset liability projection analysis and the liquidity analysis. He concluded by stating both portfolios, the recently adopted and previous one, exceeded the seven percent actuarial assumption, both get to 100 percent funding within the next 20 years, and there was sufficient liquidity for both strategies in terms of funding plan operations in the liquidity stress test.

**7. Review of proposed modifications to the Investment Policy Statement – Katy Hoffman.**

Ms. Katy Hoffman provided an overview noting there were eleven proposed changes to the Investment Policy Statement (IPS) that will be brought back to the Policy committee in September. She said 10 of the 11 related to the SAA. The 11<sup>th</sup> recommendation she said was in response to a wording clarification Aon identified when conducting their investment practices and performance review. She identified the addition of the two new asset classes, that All Country in the global equity portfolio and the Government Bonds Real in the stable value portfolio. She said the maximum and minimum ranges were updated and noted the private equity maximum was unchanged at 19 percent, but the target is going down two percent.

Ms. Hoffman reviewed the proposed new stable value hedge fund benchmark, from the HFRI fund-to-fund to SOFR plus 250 basis points. Dr. Brown raised the question as to using a benchmark that was not investible. Mr. Comstock agreed a benchmark needs to be investible but stated once one moves away from public equities and bonds it is difficult to find investible indices that make sense and is appropriate. Ms. Hoffman then reviewed the proposed change to the private equity portfolio from State Street private equity index to a customized one. She said the customization is to limit it to the things the team has control over. She said the final modification proposed is to allow the CIO to increase short exposure within internal equity portfolios from 25 to 50 percent.

There being no more business before the Investment Management Committee, the committee adjourned at 1:52 p.m.

Approved by the Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas on September\_\_, 2024.

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Katherine H. Farrell  
Secretary to the Board of Trustees  
Teacher Retirement Systems of Texas

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Date



# CIO Update

Jase Auby, Chief Investment Officer

September 2024



# CIO Update

# IMD at a Glance

## Priorities

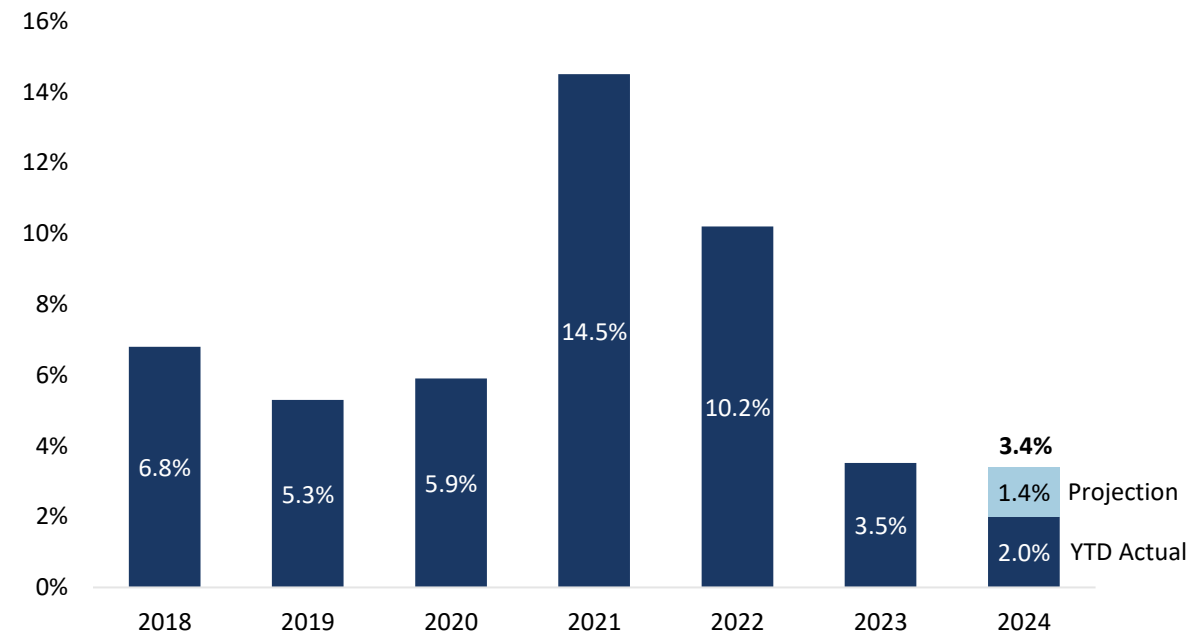
- **Performance.** The Trust ended the second quarter of 2024 with a 1-year return of 9.0% and +333 bp of excess return. The 3-year return is 3.5% with +173 bp of excess return
- **SAA Update.** Implementation is well in hand. Trust-wide team is working on planned asset and portfolio transitions
- **Annual Reviews.** Completed Management Committee (MC) Annual Offsite Talent Review
- **Performance Pay Plans.** Collaborated with Legal & Compliance (L&C) and Organizational Excellence (OE) on the annual review of Performance Pay Plans
- **IDM Program.** Executed key IDM contract with Simcorp to provide Investment Book of Record (IBOR), Shadow Accounting Book of Record (SABOR), and Master Data Management (MDM) services
- **SPN Summit.** Preparing for the SPN Summit which will be held in New York on October 17, 2024

## Our People

### Snapshot as of July 2024

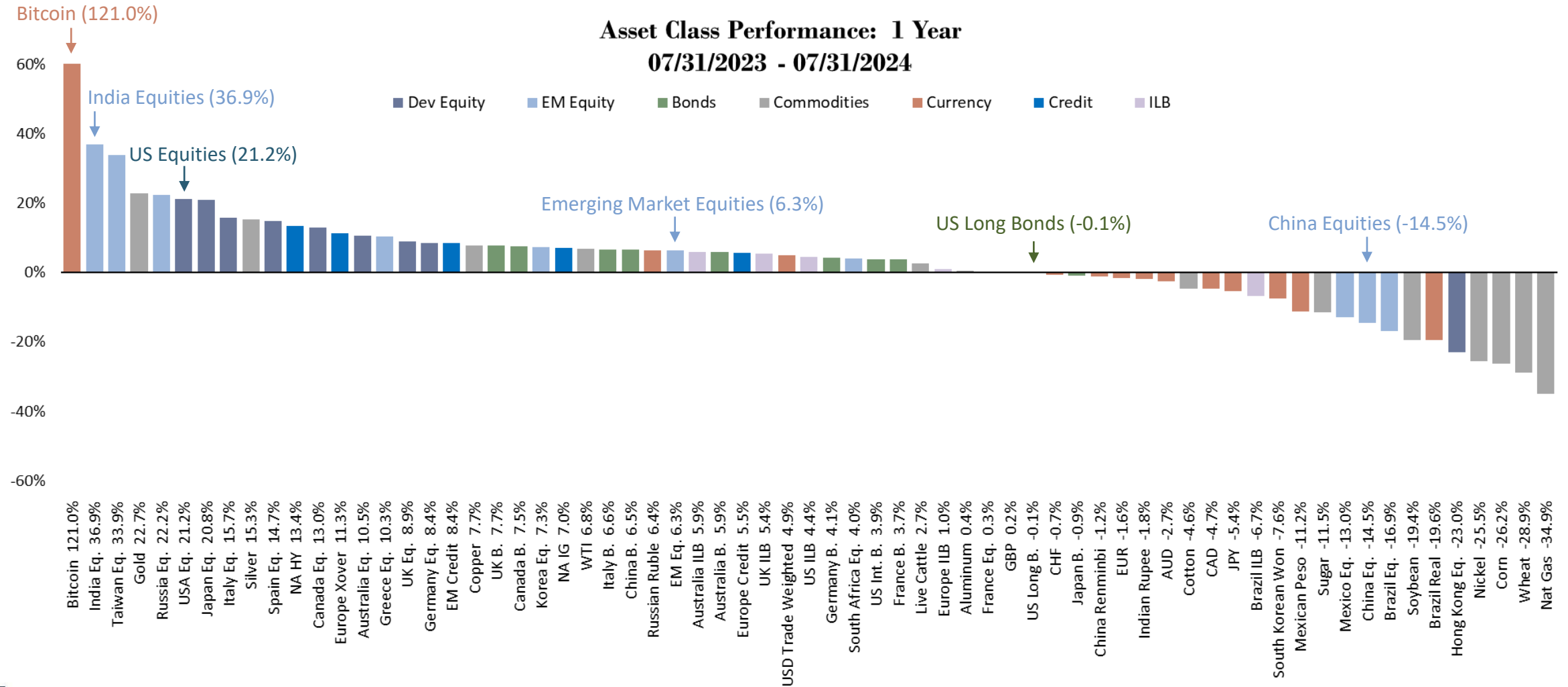
IMD FTEs	253
Contractors	8

### Attrition Trend 2018 - 2024 (As of July 2024)



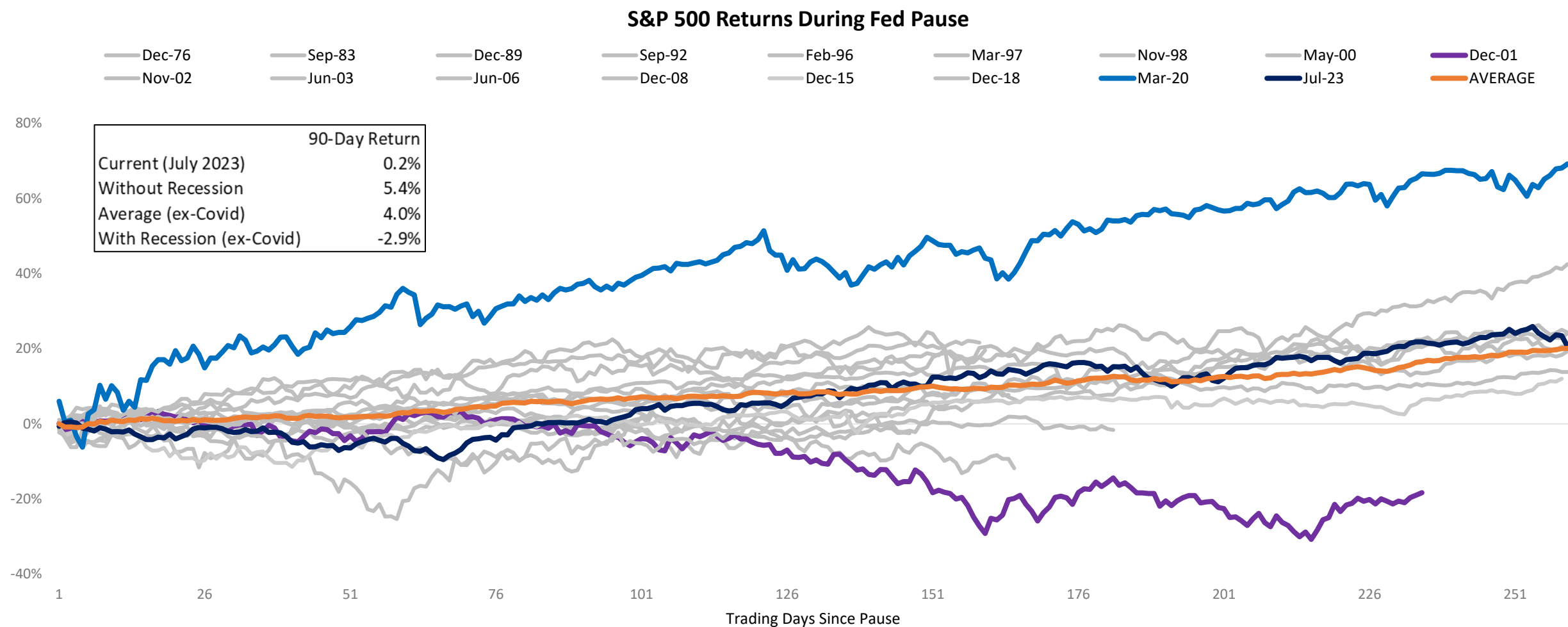
## Market Update

# Strong one-year market returns led by equities

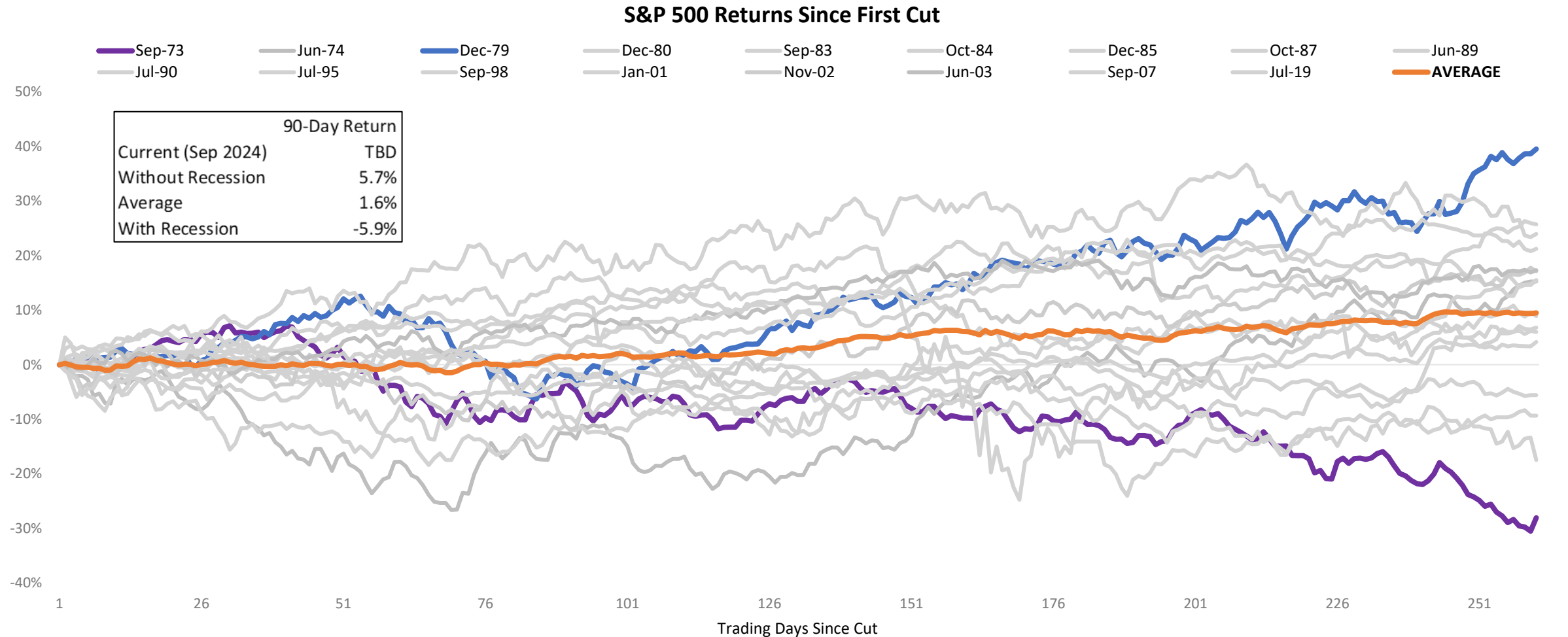


Source: Bloomberg

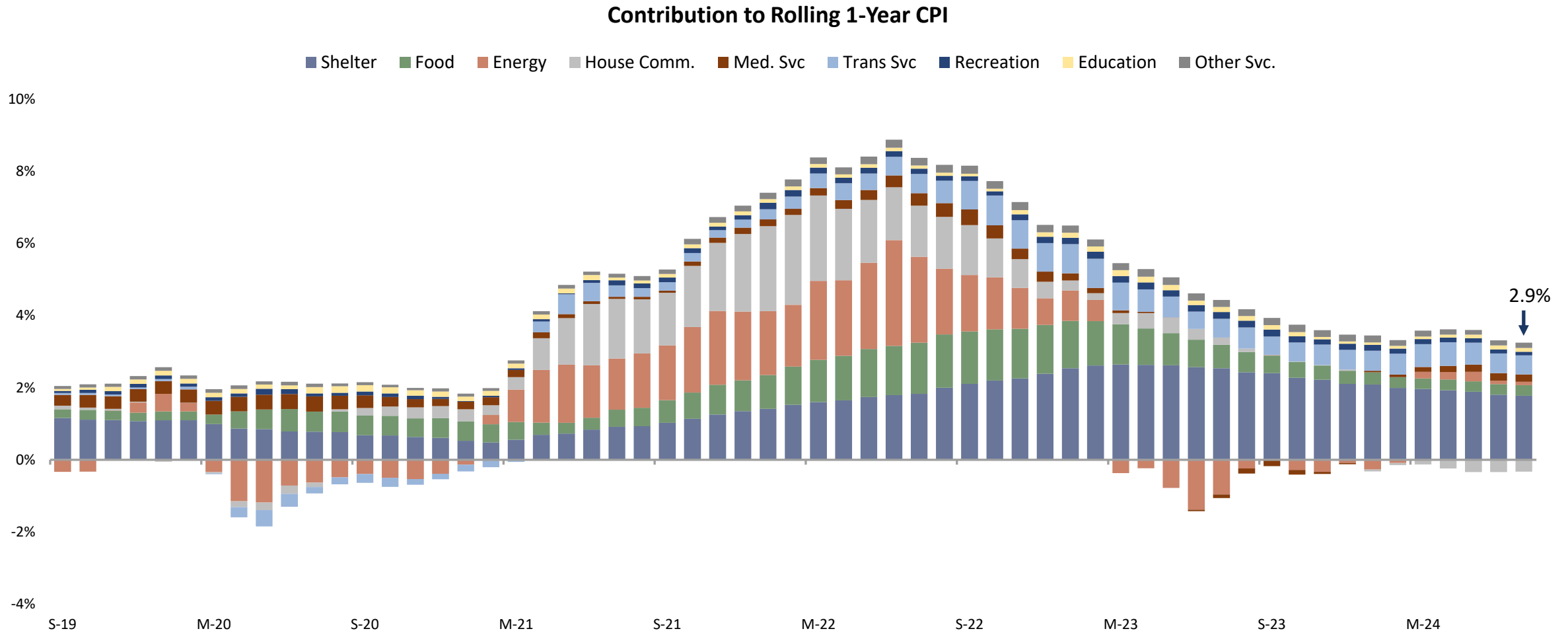
# Fed has been on pause since July 2023



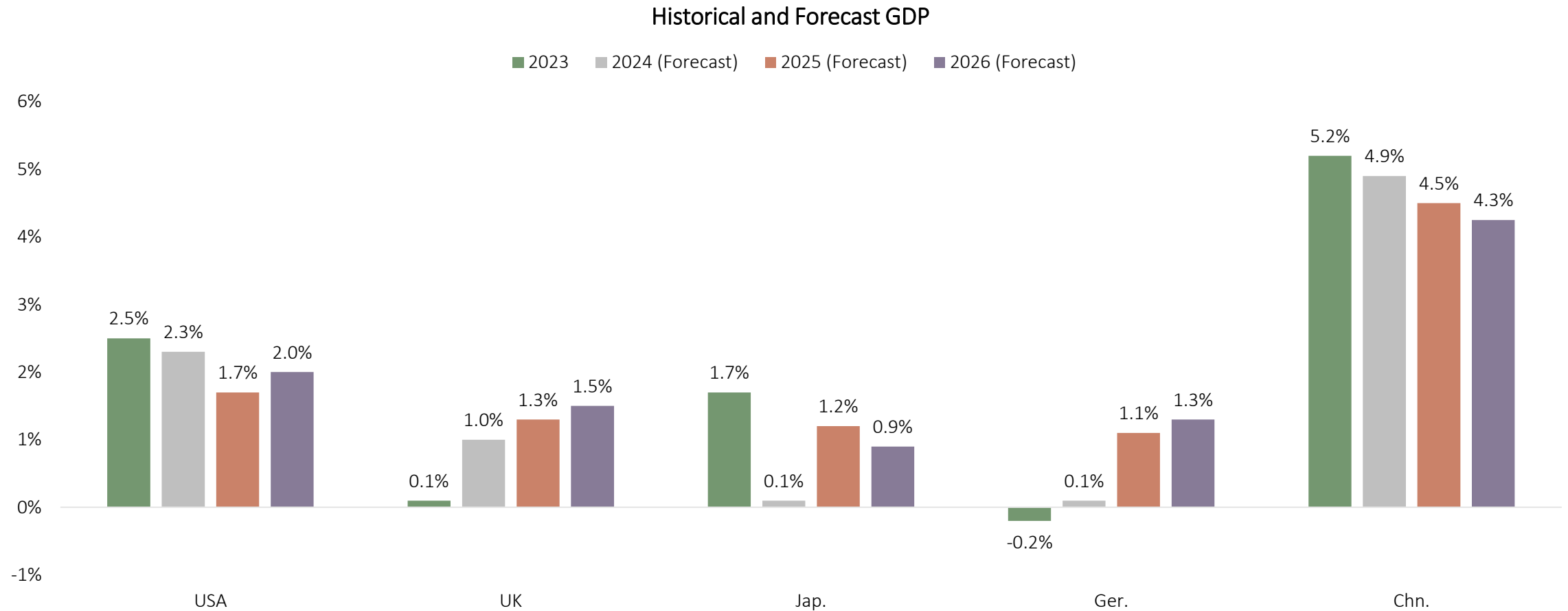
# Historically, Fed cuts lead to positive returns on average



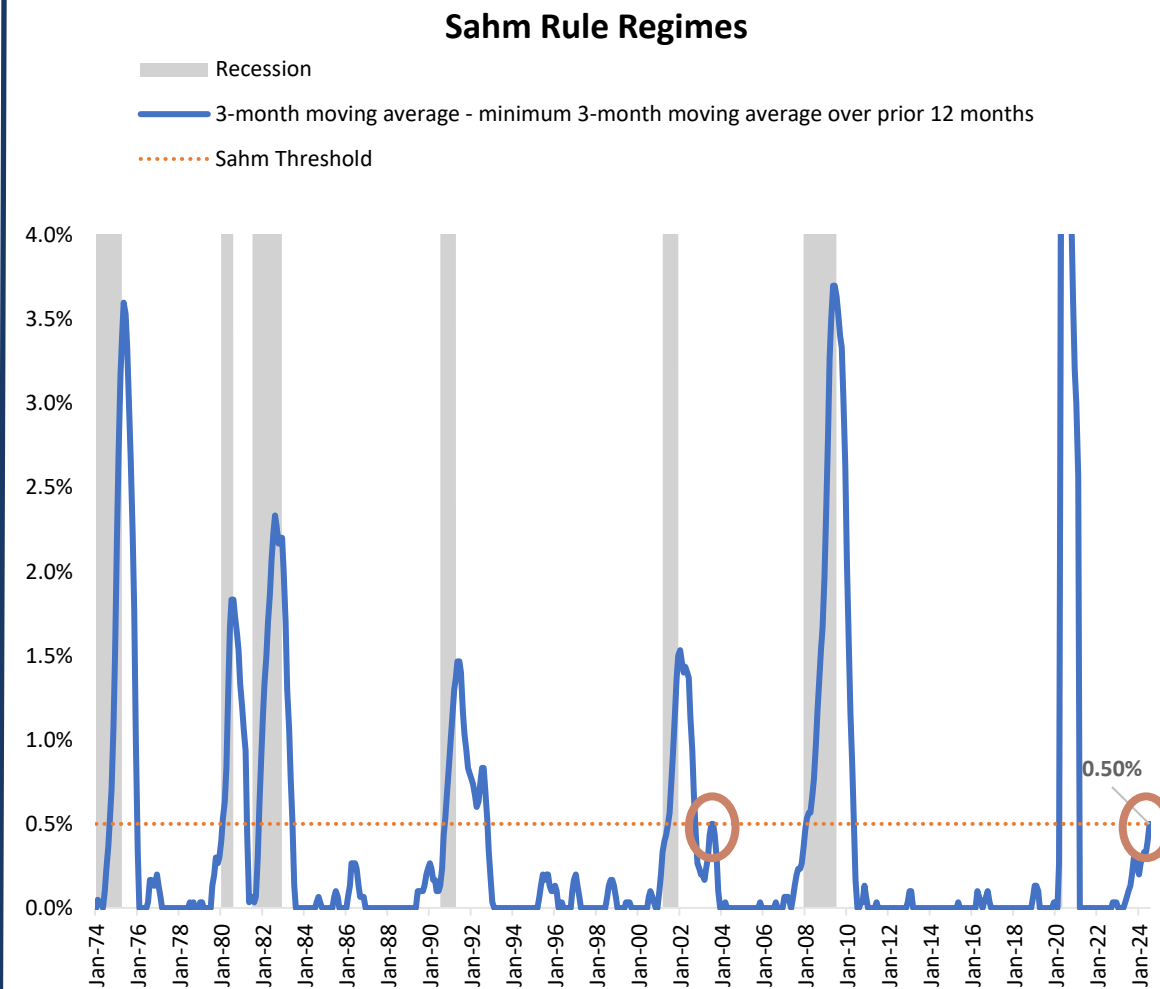
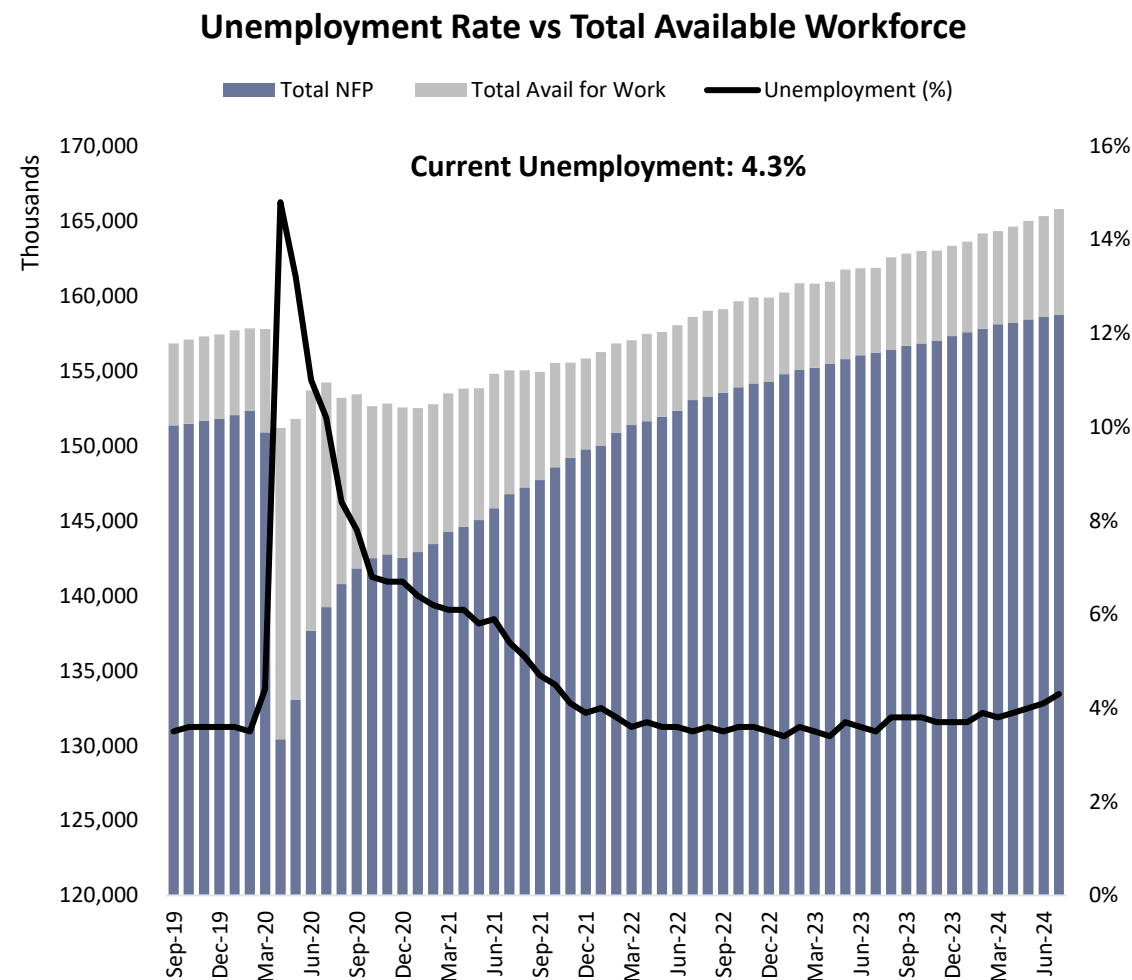
# Inflation returning to Fed target



# US growth outlook remains steady

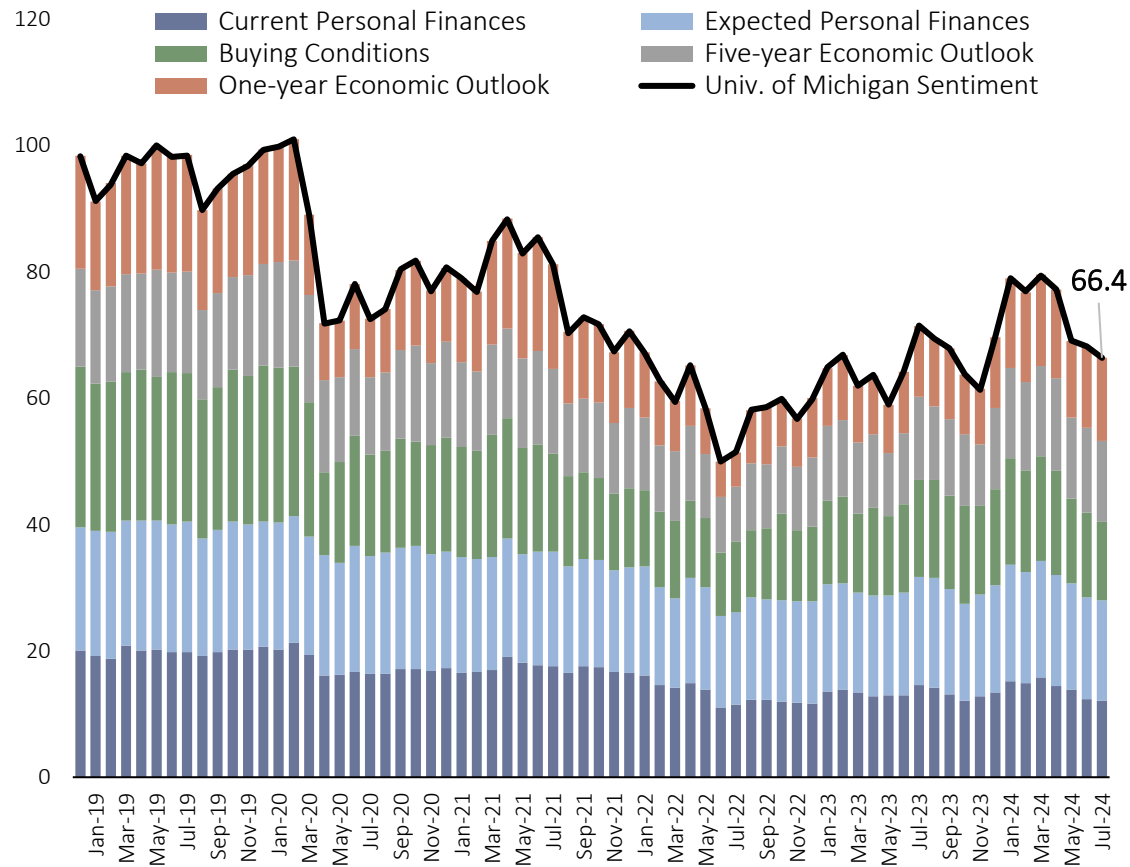


# Sahm Rule triggered as Nonfarm Payrolls released

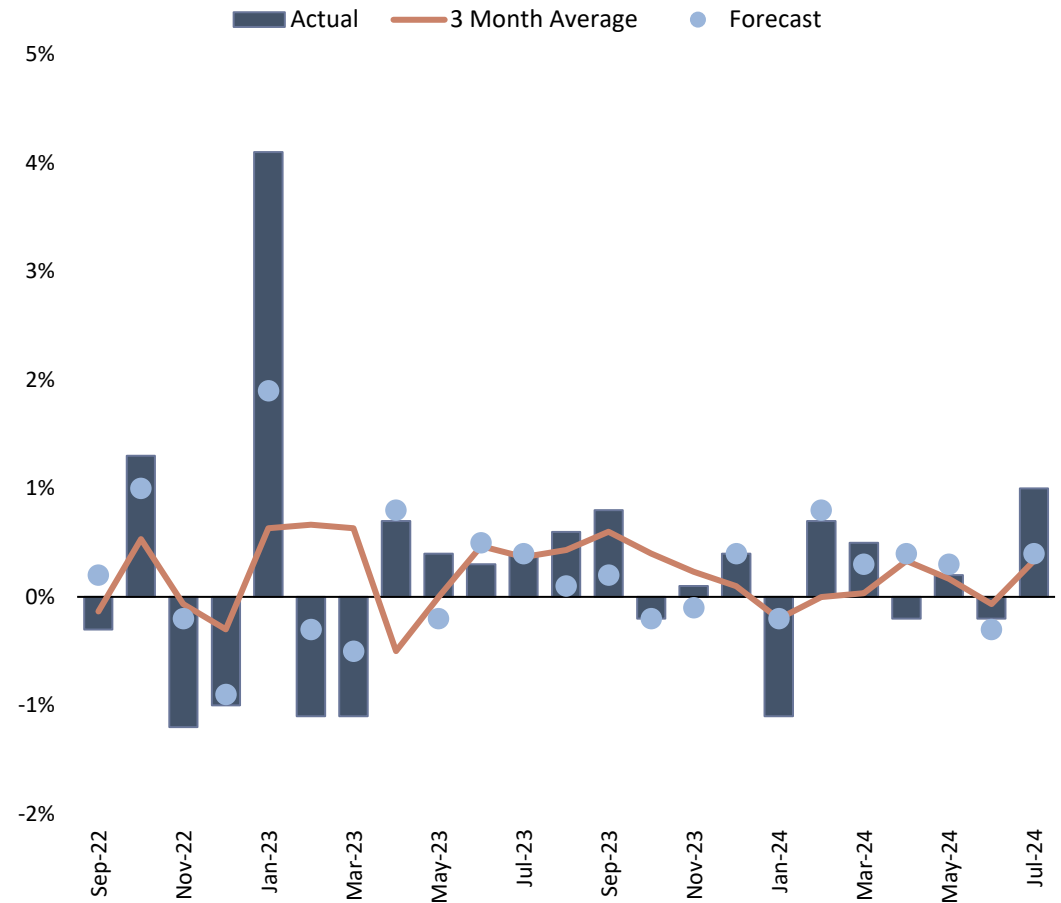


# Sentiment falling but consumer holding up, alleviating growth worries

US - Contributions to University of Michigan Consumer Sentiment



Adjusted Retail and Food Services Sales MoM

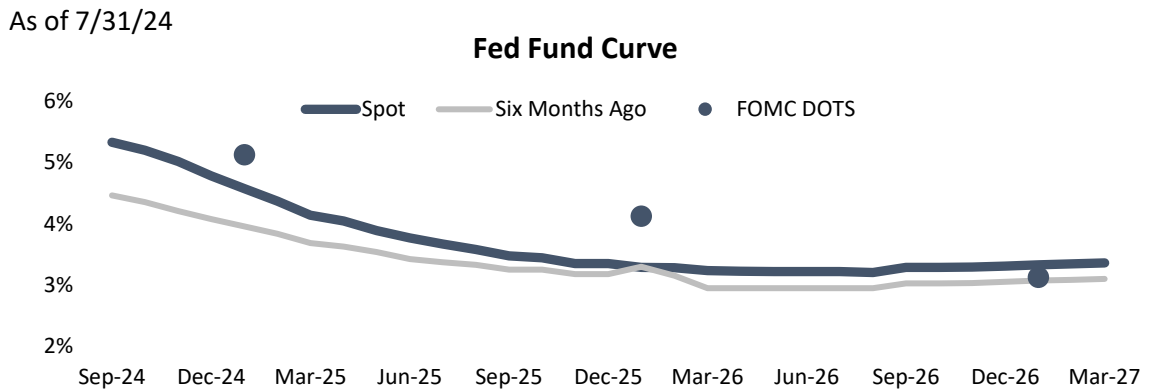


## Special Topic: Corporate Earnings

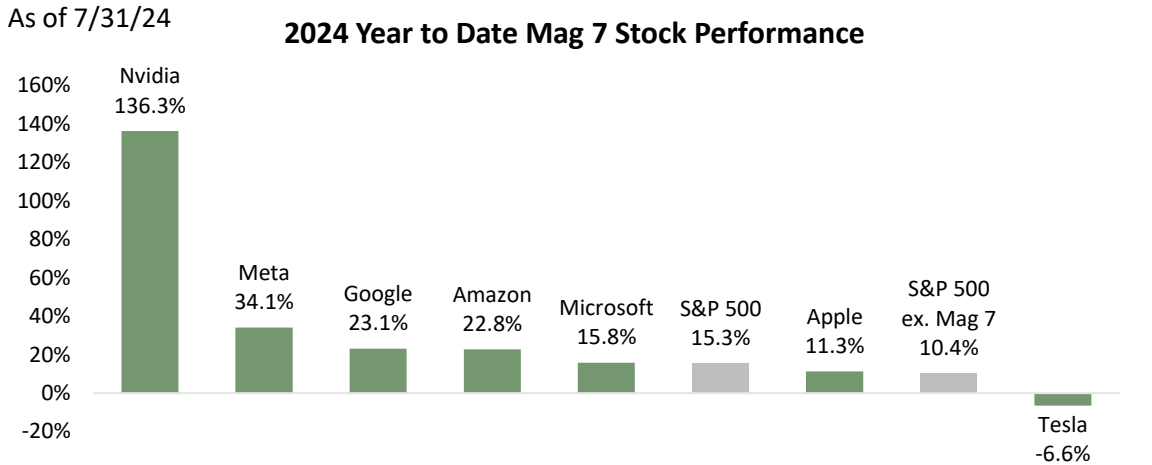
# Special Topic Overview

Special Topics			
Topic	Date	Topic	Date
1 Recession	September 2017	9 Commodities	September 2021
2 Growth	February 2018	10 China	February 2022
3 Inflation	September 2018	11 Sentiment	September 2022
4 Strategic Asset Allocation	February 2019	12 Foreign Currency	February 2023
5 Value	September 2019	13 Artificial Intelligence	September 2023
6 Diversification	February 2020	14 Strategic Asset Allocation	February 2024
7 Interest Rates	September 2020	15 Corporate Earnings	September 2024
8 Long-Term Investing	February 2021		

## Interest Rates



## Artificial Intelligence



## China



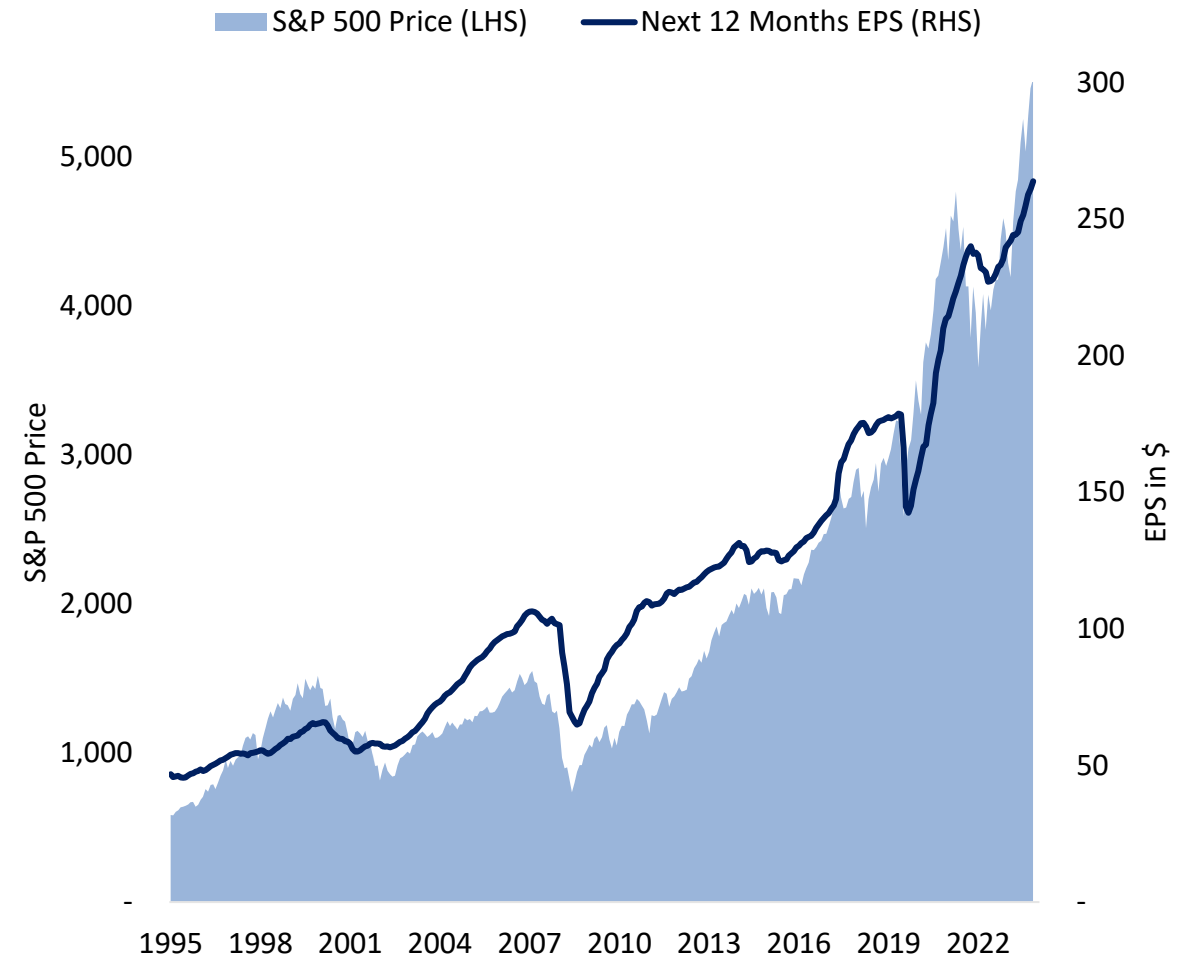
# What are corporate earnings and why are they important to markets?

- **Corporate Earnings** are a company's after-tax net income (profit or loss), often referred to as a company's "bottom-line"

## Profit and Loss Statement (P&L)

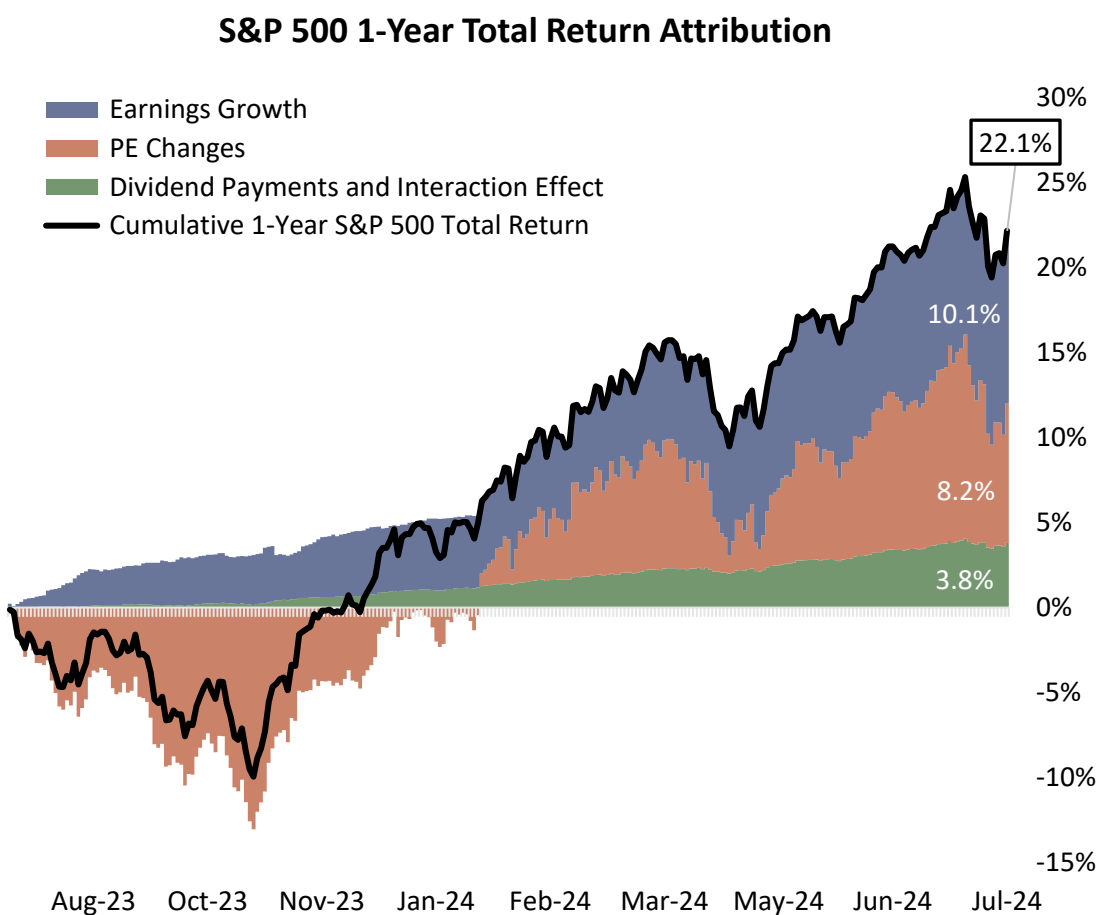
(\$ in millions)	2024 Q2	Margin
Revenue	\$ 100	a
Less: Cost of Goods Sold (COGS)	(40)	
<b>Gross Profit</b>	<b>60</b>	<b>b</b> <b>60% Gross Margin</b>
Less: Selling and General Expenses	(20)	$= b / a$
<b>EBIT (Earnings Before Interest and Taxes)</b>	<b>40</b>	
Less: Interest Expense	(5)	
Less: Taxes	(10)	
<b>Earnings</b>	<b>\$ 25</b>	<b>c</b> <b>25% Profit Margin</b>
		$= c / a$

## Earnings Per Share (EPS) Tracks S&P Price Level

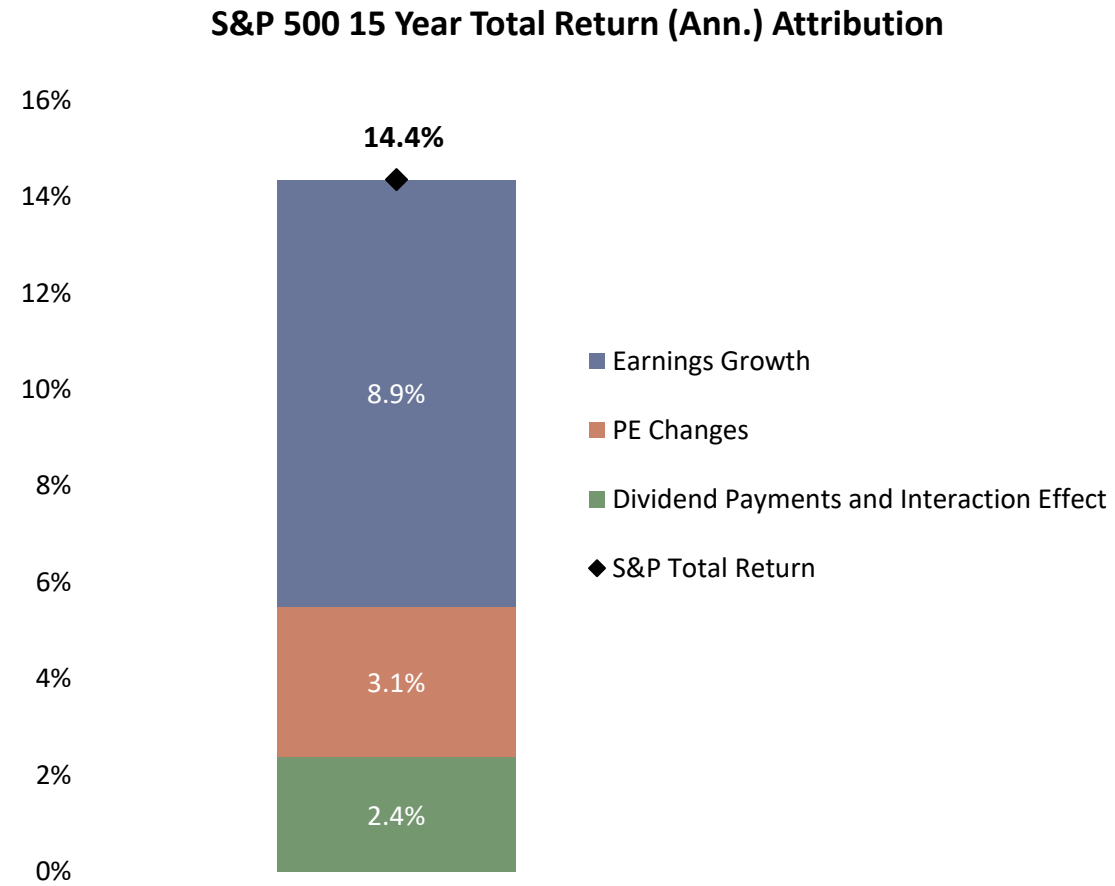


# Growth in earnings is the primary driver of shareholder returns

Earnings growth, price/earnings (P/E) expansion, and dividend income are all important drivers of total shareholder return...

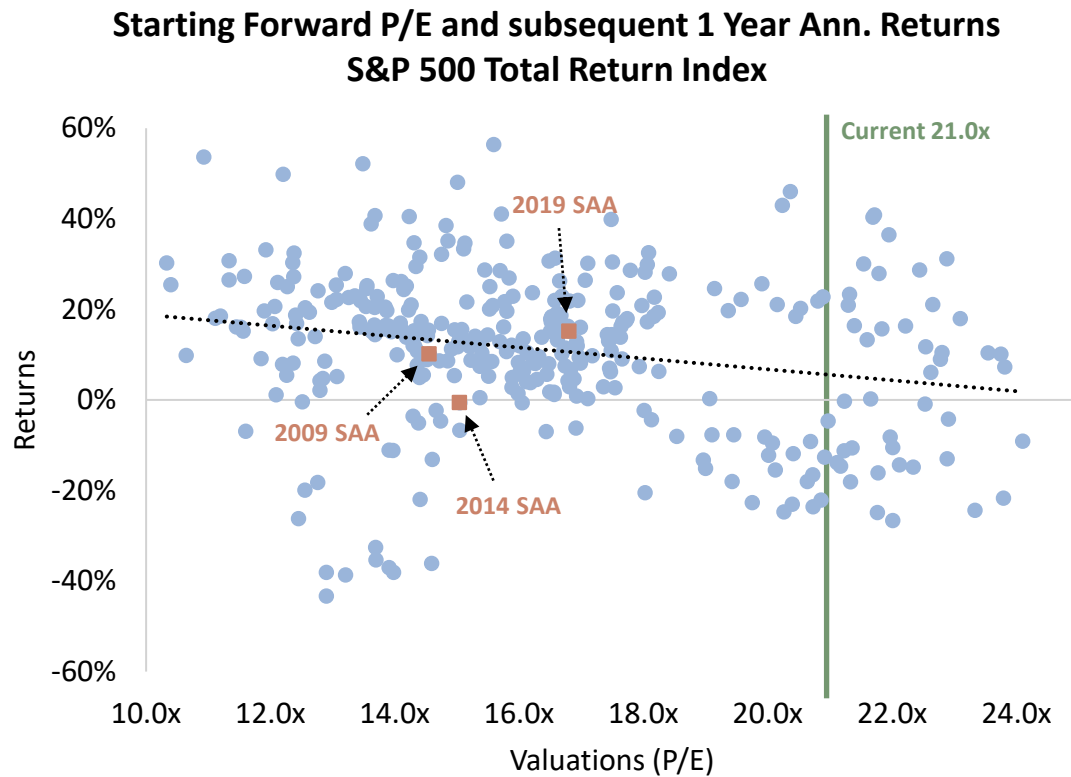


...however earnings are the most dominant driver of growth over the long-term

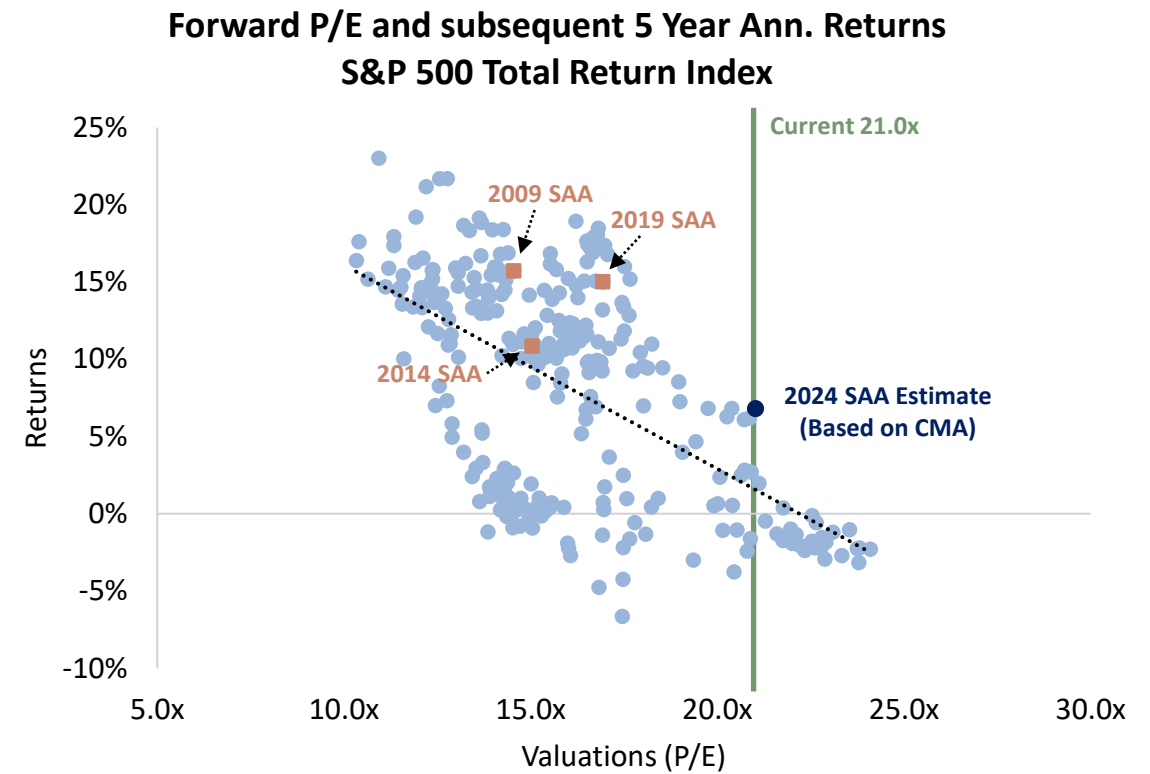


# Valuation ratios provide investors insight to future performance

Over the short-term, low and attractive valuations do not necessarily predict strong performance...

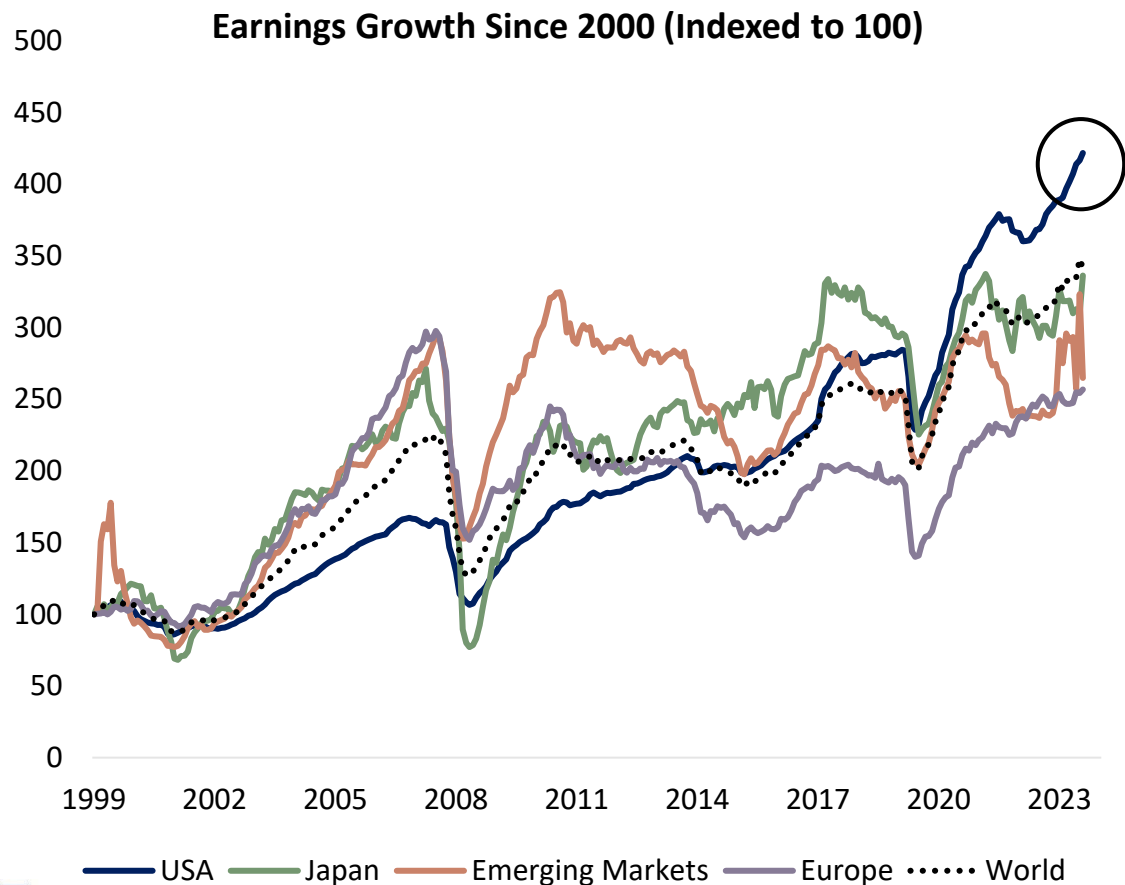


...but over the long-term forward valuation can be a very powerful indicator

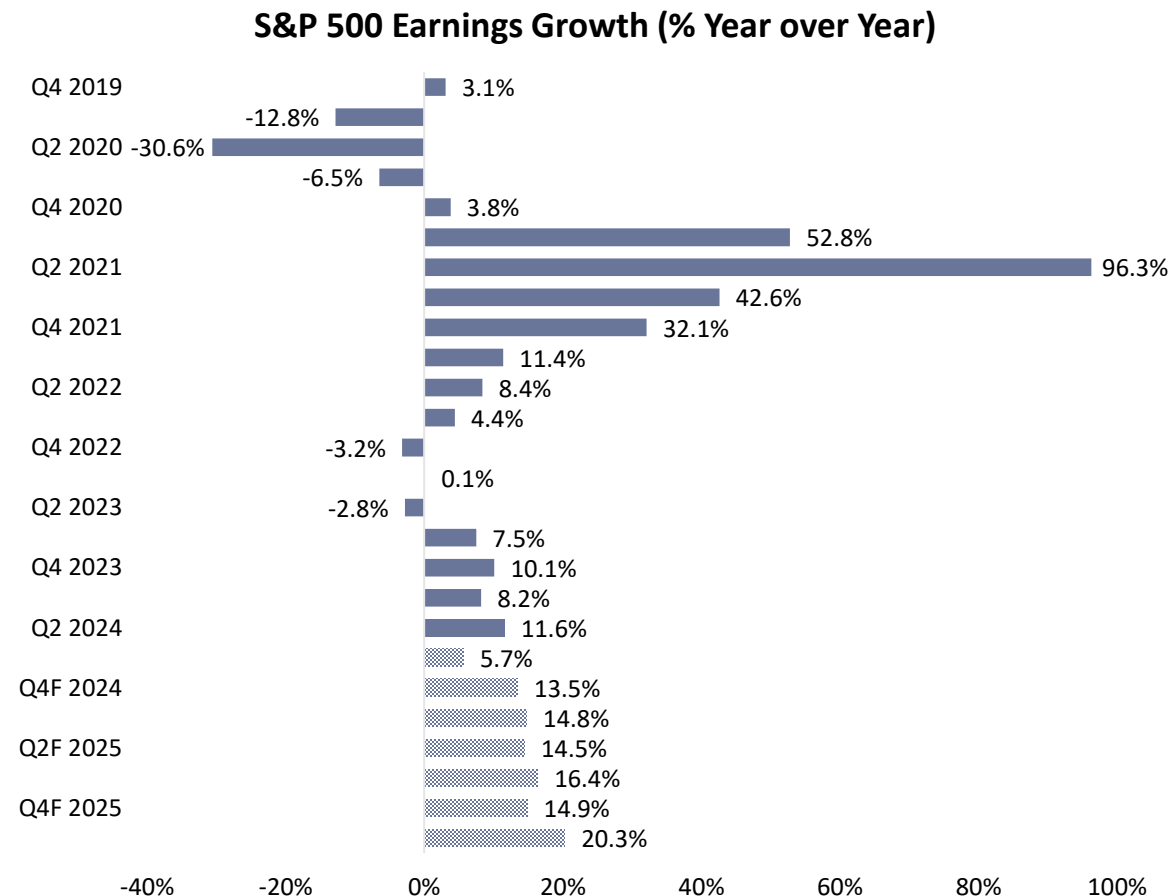


# United States earnings robust, validating higher valuation relative to world

Regional earnings leaders have shifted since 2000, with the US outperforming over the past decade...



... as corporate profits remain resilient with a strong Q2 2024 and future expectations trending higher



# At a sector level, profits driven by technology over the past decade

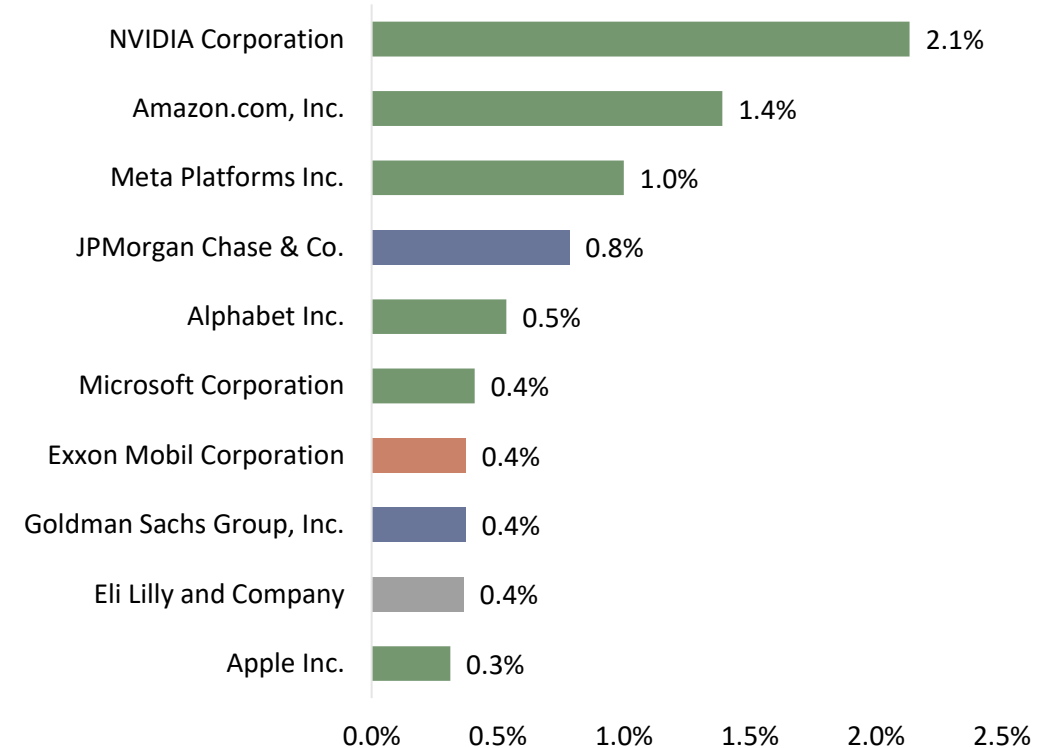
Over the past 10 years, annualized S&P earnings are strong and technology has been dominant...

**S&P 500 Sector Annualized Earnings Growth Rates**

Sector	S&P Weight	1 Year	3 Year	10 Year
Technology	31%	21%	13%	13%
Financials	13%	11%	4%	6%
Health Care	12%	18%	4%	7%
Consumer Discretionary	10%	10%	8%	9%
Communication Services	9%	9%	9%	2%
Industrials	8%	-1%	7%	6%
Consumer Staples	6%	1%	5%	4%
Energy	4%	-1%	18%	1%
Utilities	3%	16%	6%	5%
Real Estate	2%	-2%	4%	3%
Materials	2%	-8%	6%	5%
<b>S&amp;P 500</b>		<b>10%</b>	<b>8%</b>	<b>7%</b>

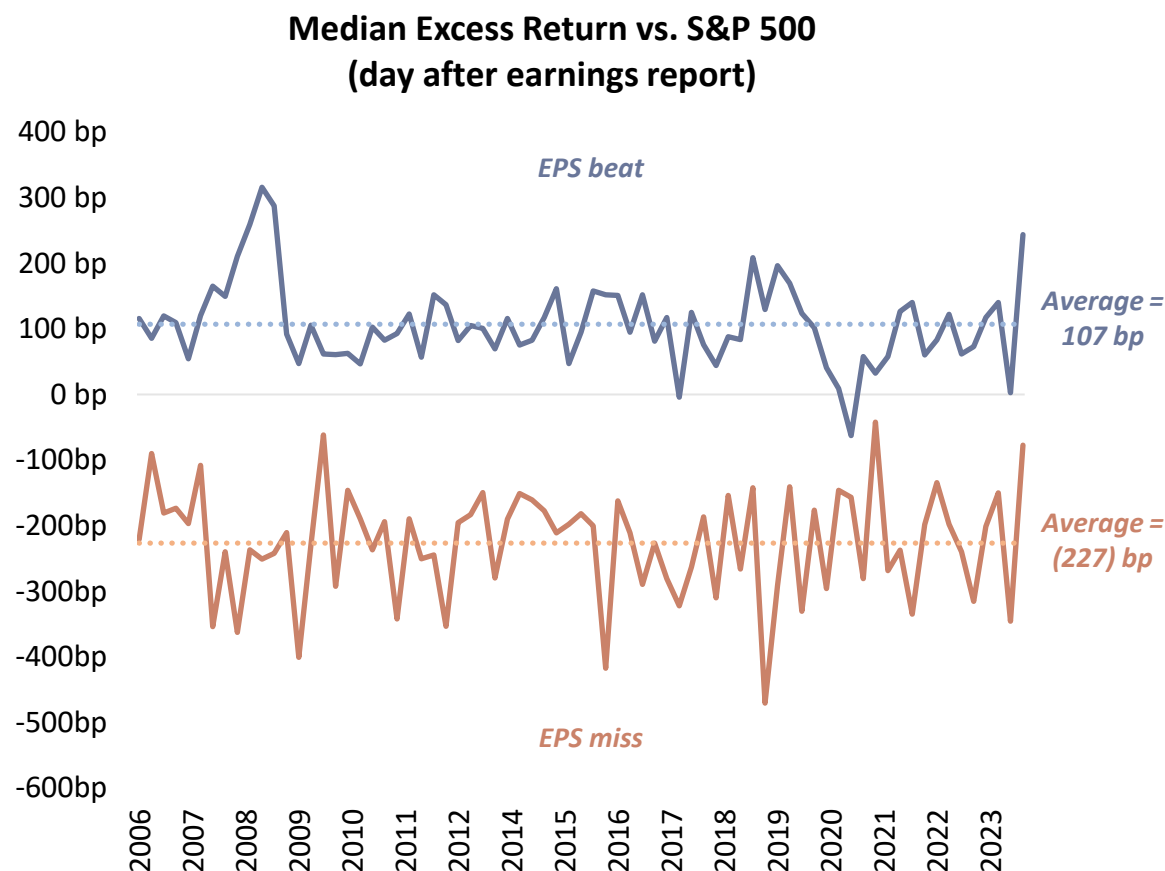
...today, the market and economy continues to be lifted by big tech spending and AI optimism

**S&P Top 10 Constituent Contribution to Y/Y Growth (Q2 2024)**

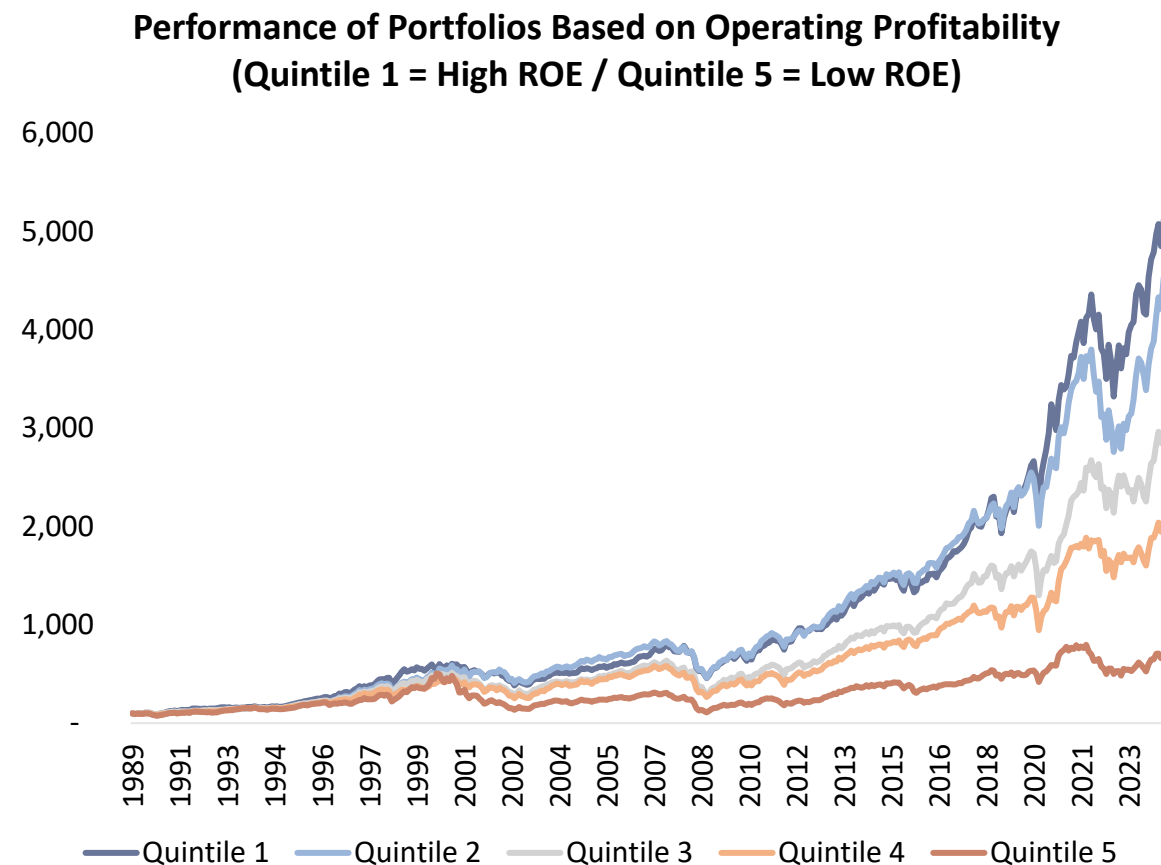


# Earnings analysis is pivotal to public market investment strategies

In depth fundamental research can lead to excess alpha by selecting companies with competitive advantages...



... and those companies with more stable earnings, stronger balance sheets, and higher margins tend to outperform



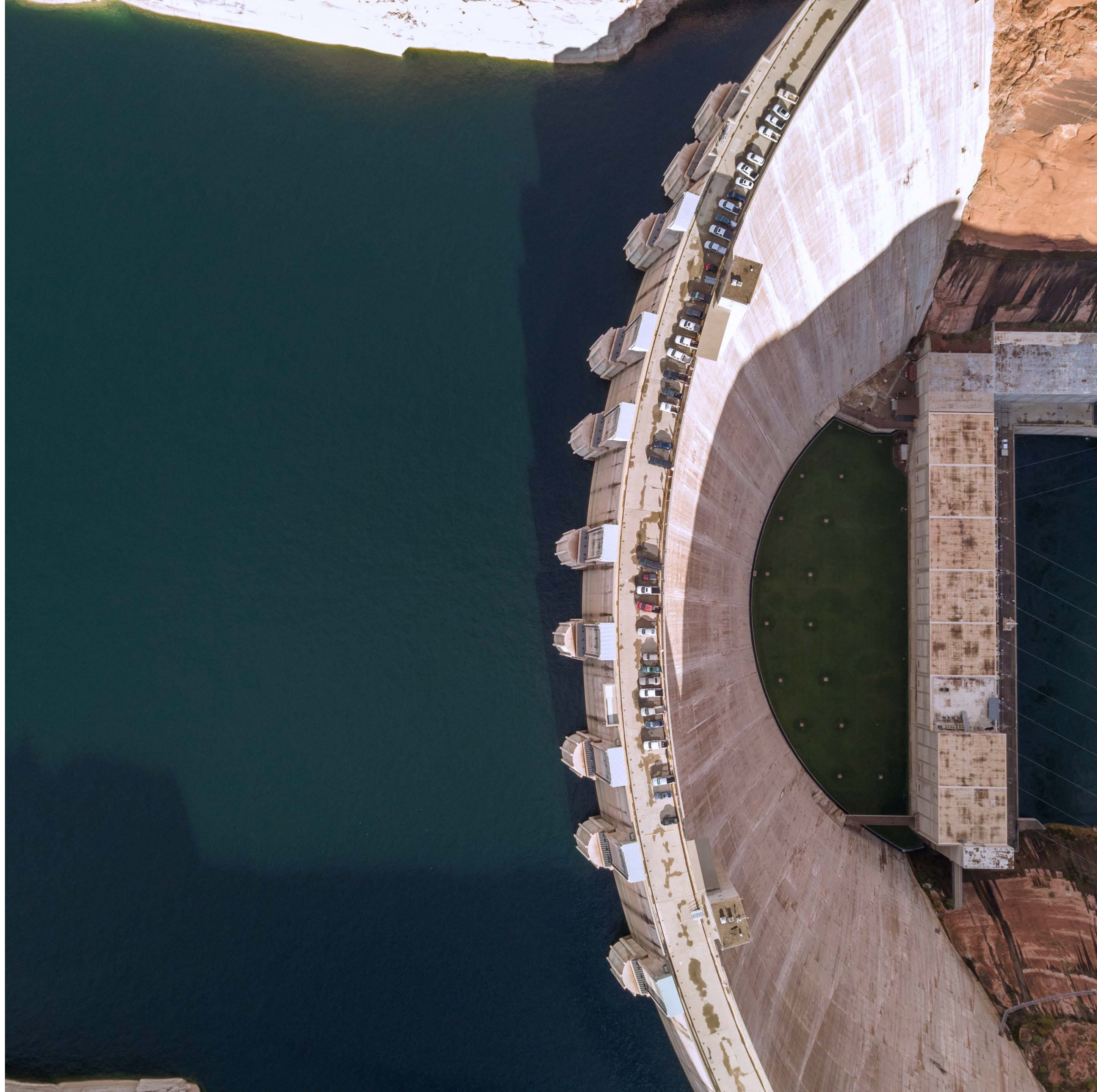




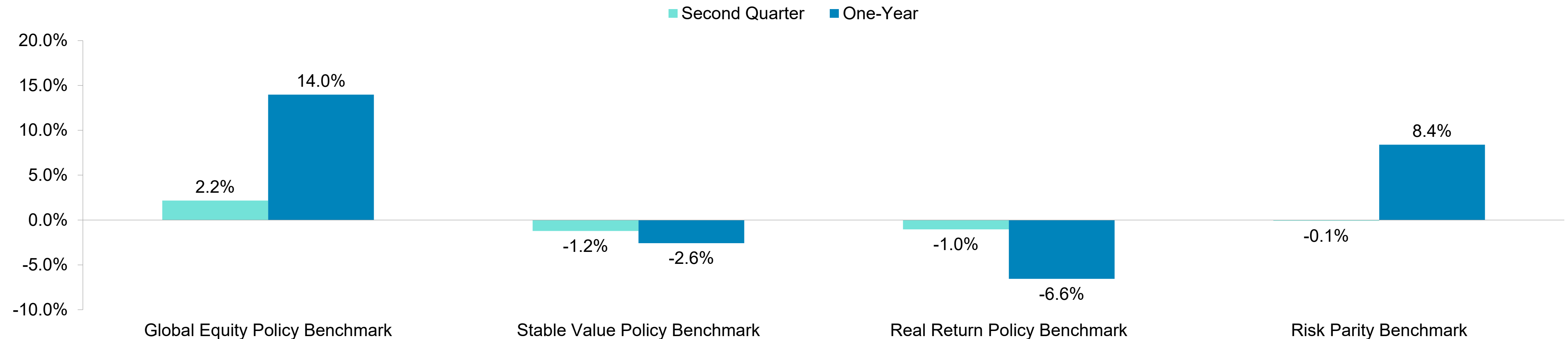
# Teacher Retirement System of Texas

Performance Review:  
Second Quarter 2024

Investment advice and consulting services provided by Aon Investments USA, Inc.  
To protect the confidential and proprietary information included in this material, it may not be disclosed or provided to any third parties without the approval of Aon.



# Summary



**In Q2 2024, the global equity markets rose. The S&P 500 Index reached an all-time high, driven by a positive outlook on a solid earnings season, easing inflation data, signs of economic resilience, and rallies from the tech giants.**

**Global equities rose 2.2% for the quarter, and they returned 14.0% over a trailing 1-year period**

**The U.S. Federal Reserve (Fed) kept its interest rate unchanged at 5.25%-5.5%. According to the latest Fed "dot plot," the median FOMC member believes only one quarter point cut this year is appropriate, compared to three rate cuts projected earlier in March. Meanwhile, the Fed plans to slow its pace of quantitative tightening starting in June, lowering the cap on the amount of treasury rolling off the balance sheet from \$60 billion to \$25 billion each month.**

**TRS returned 1.3% for the quarter which was 0.6 percentage points above its benchmark**

–Outperformance at the asset class level for Global Equity, Stable Value, Risk Parity and Real Return were the primary drivers for relative results.

**For the trailing twelve months, TRS returned 9.0% versus the benchmark return of 5.7%**

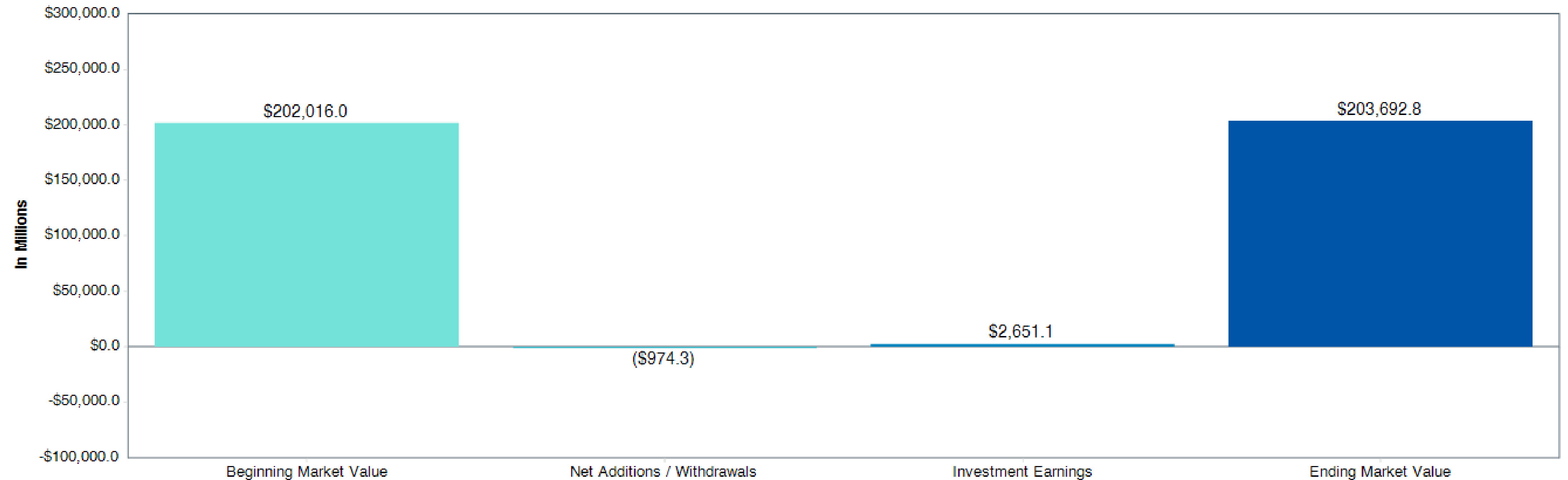
–Outperformance from the Global Equity, Stable Value, Real Return and Risk Parity asset classes were the primary drivers of relative performance

# 1. Market Summary – Second Quarter 2024

	Second Quarter	YTD	One Year	Three Years	Five Years	Ten Years
<b>Global Equity:</b>						
TF USA Benchmark	3.4%	13.7%	23.3%	8.2%	14.3%	12.3%
TRS Non-US Developed Benchmark	-0.8	4.9	11.0	2.7	6.5	4.2
TRS Emerging Markets Benchmark	4.6	8.0	15.5	-4.4	3.6	3.0
HFRI Fund of Funds Composite Index	0.6	4.8	8.7	2.1	4.8	3.5
State Street Private Equity Index (quarter lagged)	1.5	4.4	6.3	8.6	14.0	12.2
Global Equity Policy Benchmark	2.2	7.8	14.0	5.2	10.8	8.7
<b>Stable Value:</b>						
Bloomberg Barclays Long Treasury Index	-1.8%	-5.0%	-5.6%	-10.5%	-4.3%	0.6%
HFRI Fund of Funds Conservative Index	0.5	3.1	6.7	3.5	4.9	3.5
Absolute Return Benchmark	2.4	4.8	9.9	7.3	5.5	4.4
90 Day U.S. Treasury Bill	1.4	2.8	5.6	3.2	2.2	1.5
Stable Value Policy Benchmark	-1.2	-3.1	-2.6	-7.2	-2.0	1.4
<b>Real Return:</b>						
Bloomberg Barclays U.S. TIPS Index	0.8%	0.7%	2.7%	-1.3%	2.1%	1.9%
NCREIF ODCE (quarter lagged)	-2.6	-7.4	-12.0	2.5	2.6	5.8
Energy, Natural Resources & Infrastructure Benchmark	2.3	3.3	6.7	11.9	7.6	--
Goldman Sachs Commodities Index	0.7	11.1	15.0	12.7	8.3	-3.1
Real Return Policy Benchmark	-1.0	-4.1	-6.6	5.3	4.1	5.4
<b>Risk Parity:</b>						
Risk Parity Benchmark	-0.1%	3.7%	8.4%	-4.6%	1.8%	3.3%
<b>TRS Policy Benchmark</b>	<b>0.7%</b>	<b>2.8%</b>	<b>5.7%</b>	<b>1.7%</b>	<b>6.4%</b>	<b>6.4%</b>

## 2. Market Value Change

From April 1, 2024 to June 30, 2024



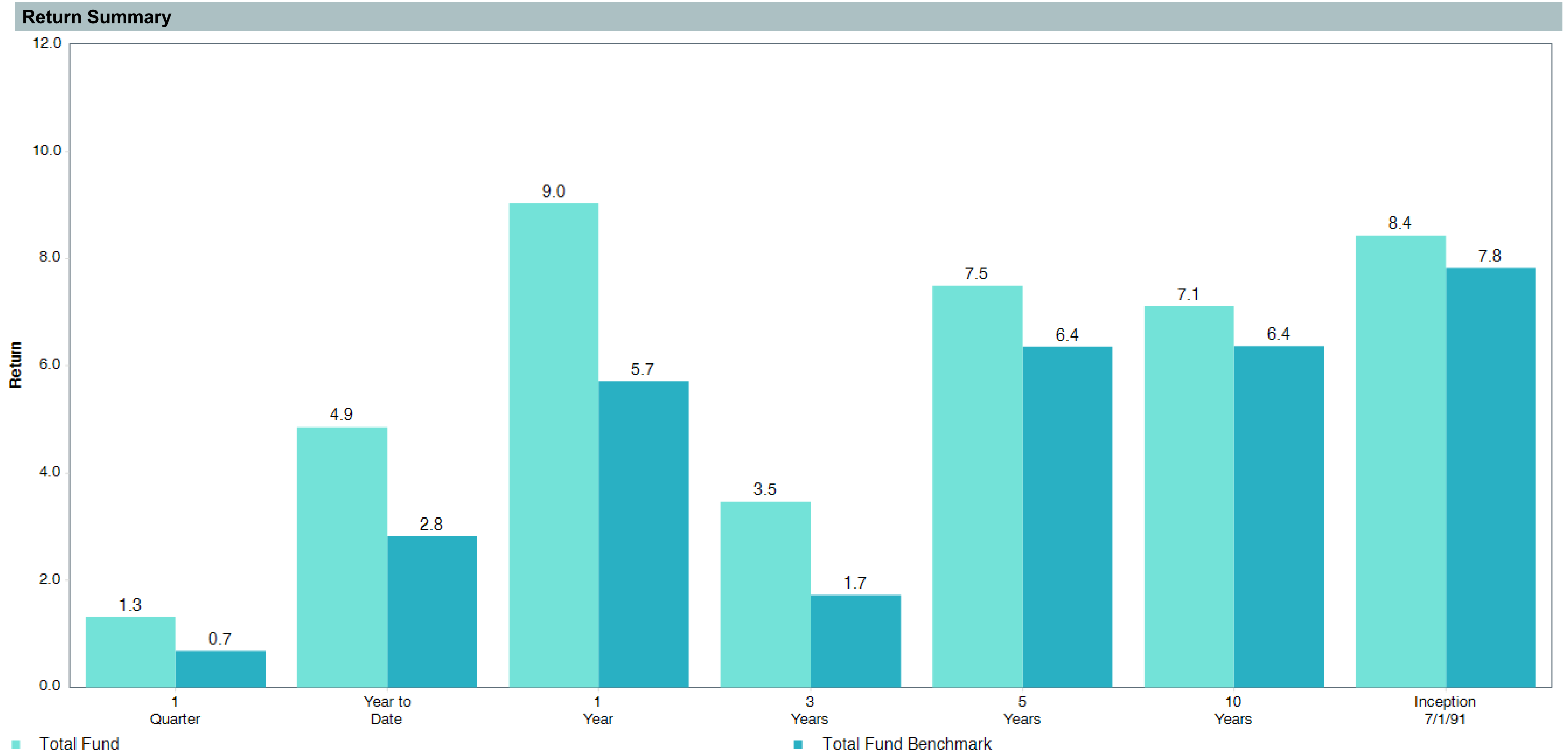
Summary of Cash Flows					
	1 Quarter	Year to Date	1 Year	3 Years	5 Years
<b>Total Fund</b>					
Beginning Market Value	202,015,981,520	192,953,353,892	187,669,161,066	193,050,542,291	156,402,995,341
+ Additions / Withdrawals	-974,339,593	1,250,970,188	-820,189,160	-9,166,208,789	-17,221,208,793
+ Investment Earnings	2,651,125,983	9,488,443,829	16,843,796,003	19,808,434,407	64,510,981,362
<b>= Ending Market Value</b>	<b>203,692,767,909</b>	<b>203,692,767,909</b>	<b>203,692,767,909</b>	<b>203,692,767,909</b>	<b>203,692,767,909</b>

### 3. Asset Allocation Detail

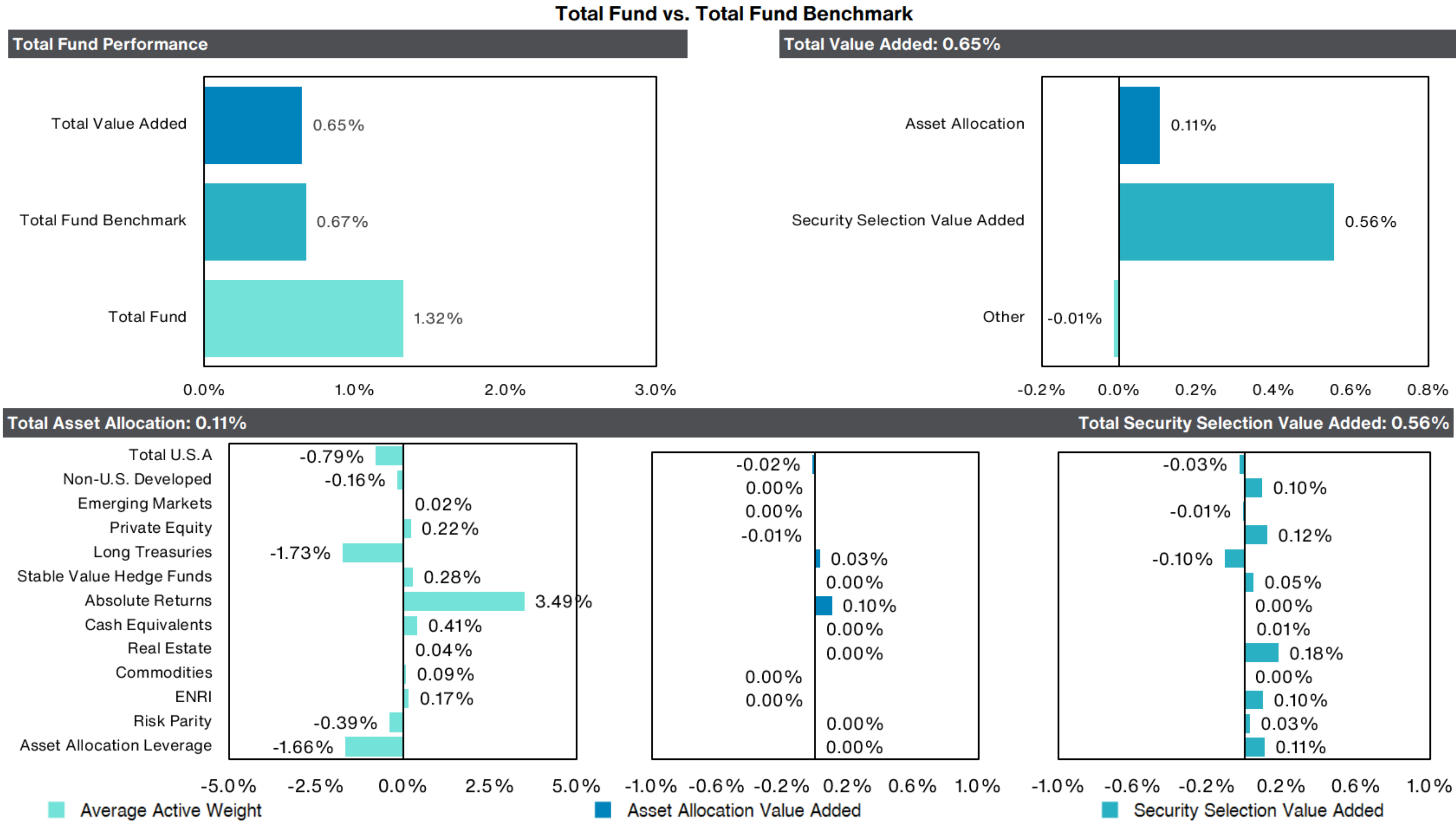
	Market Value \$ in millions) as of 6/30/2024		Interim Policy Target	Relative to Interim Policy Target	Long Term Policy Target	Long Term Policy Ranges
	(\$)	(%)				
<b>Investment Exposure</b>	--	104.7%	104.0%	+0.7%	104.0%	93-115%
Total U.S.A.	\$34,350	16.9%	17.2%	-0.3%	18.0	13-23%
Non-U.S. Developed	\$24,306	11.9%	12.4%	-0.5%	13.0	8-18%
Emerging Markets	\$17,894	8.8%	8.6%	+0.2%	9.0	4-14%
Private Equity	\$33,676	16.5%	16.7%	-0.2%	14.0	9-19%
<b>Global Equity</b>	<b>\$110,226</b>	<b>54.1%</b>	<b>54.9%</b>	<b>-0.8%</b>	<b>54.0</b>	<b>47-61%</b>
Government Bonds	\$27,643	13.6%	15.3%	-1.7%	16.0	0-21%
Stable Value Hedge Funds	\$10,017	4.9%	4.7%	+0.2%	5.0	0-10%
Absolute Return	\$7,316	3.6%	0.0%	+3.6%	0.0	0-20%
<b>Stable Value</b>	<b>\$44,976</b>	<b>22.1%</b>	<b>20.0%</b>	<b>2.1%</b>	<b>21.0</b>	<b>14-28%</b>
Real Estate	\$29,347	14.4%	14.7%	-0.3%	15.0	10-20%
Energy, Natural Resource and Inf.	\$13,836	6.8%	6.8%	0.0%	6.0	1-11%
Commodities	\$236	0.1%	0.0%	+0.1%	0.0	0-5%
<b>Real Return</b>	<b>\$43,419</b>	<b>21.3%</b>	<b>21.5%</b>	<b>-0.2%</b>	<b>21.0</b>	<b>14-28%</b>
Risk Parity	\$14,706	7.2%	7.6%	-0.4%	8.0	0-13%
<b>Risk Parity</b>	<b>\$14,706</b>	<b>7.2%</b>	<b>7.6%</b>	<b>-0.4%</b>	<b>8.0</b>	<b>0-13%</b>
Cash	\$4,728	2.3%	2.0%	+0.3%	2.0	0-7%
Asset Allocation Leverage	-\$14,362	-7.1%	-6.0%	-1.1%	-6.0	--
<b>Net Asset Allocation</b>	<b>-\$9,635</b>	<b>-4.7%</b>	<b>-4.0%</b>	<b>-0.7%</b>	<b>-4.0</b>	<b>--</b>
<b>Total Fund</b>	<b>\$203,693</b>			<b>---</b>	<b>100.0%</b>	<b>--</b>

Note: Asset allocation information shown above is based upon MOPAR reporting. The excess returns shown above may not be a perfect difference between the actual and benchmark returns due entirely to rounding.

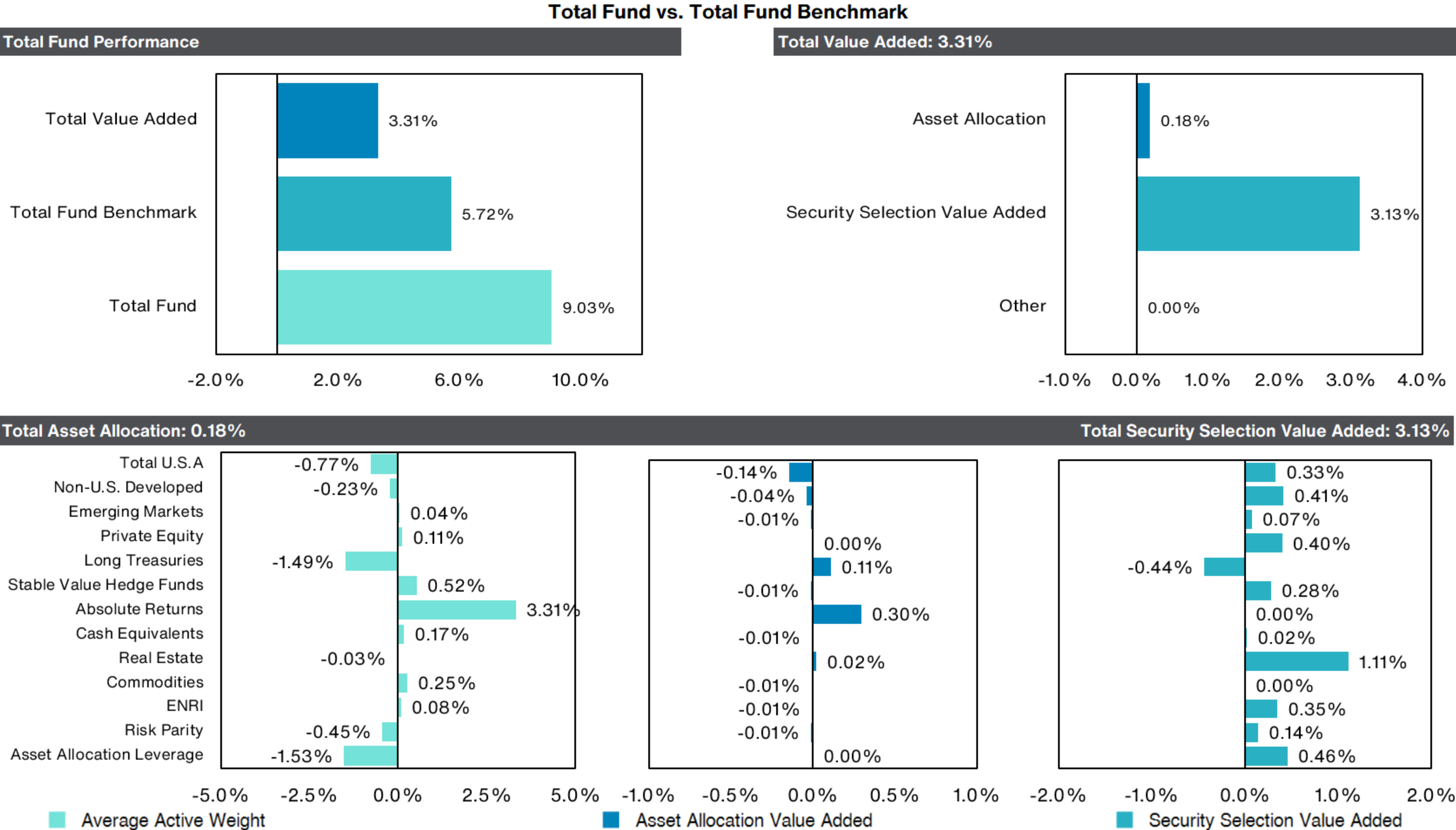
## 4. Total TRS Performance Ending 6/30/2024



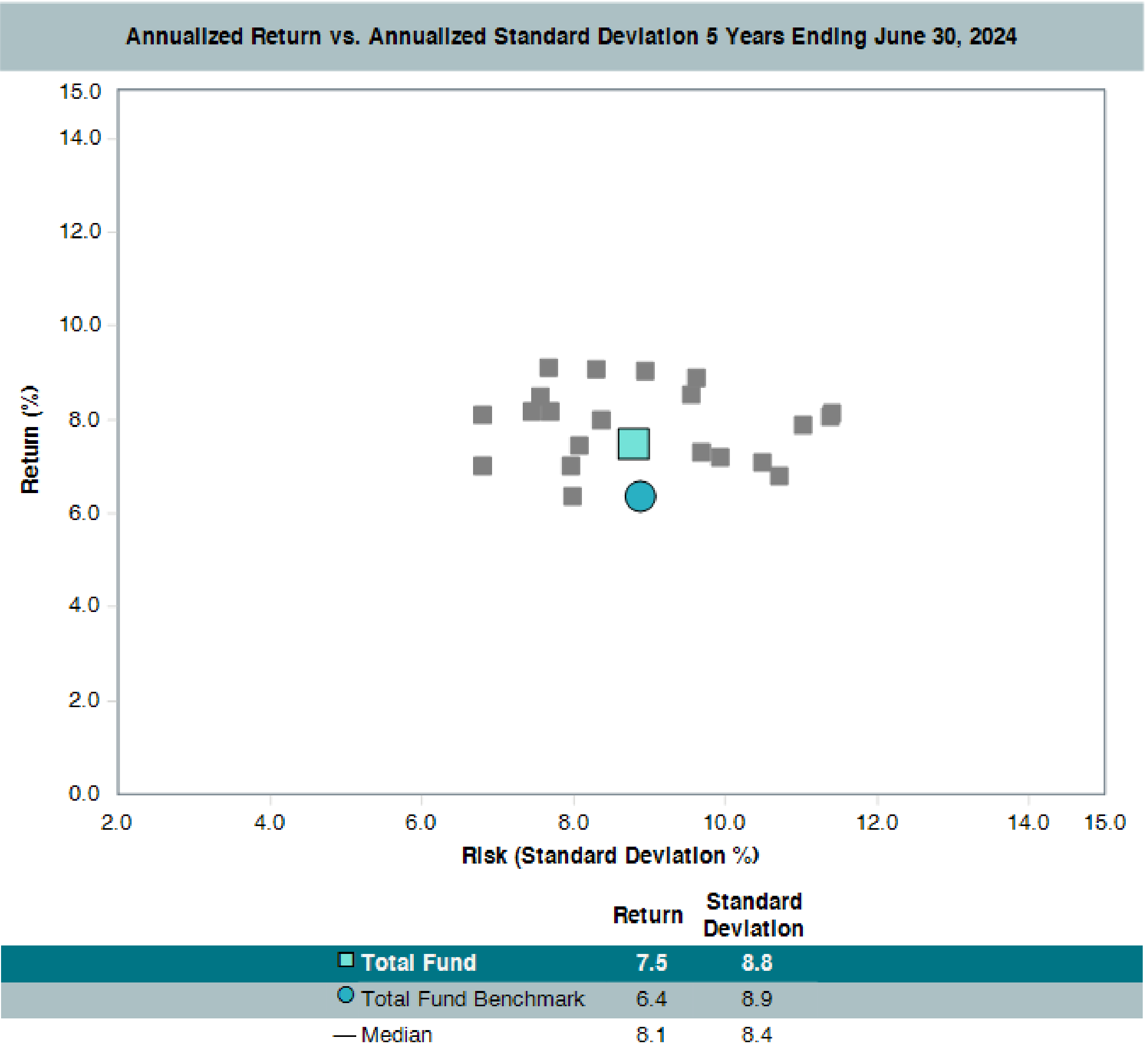
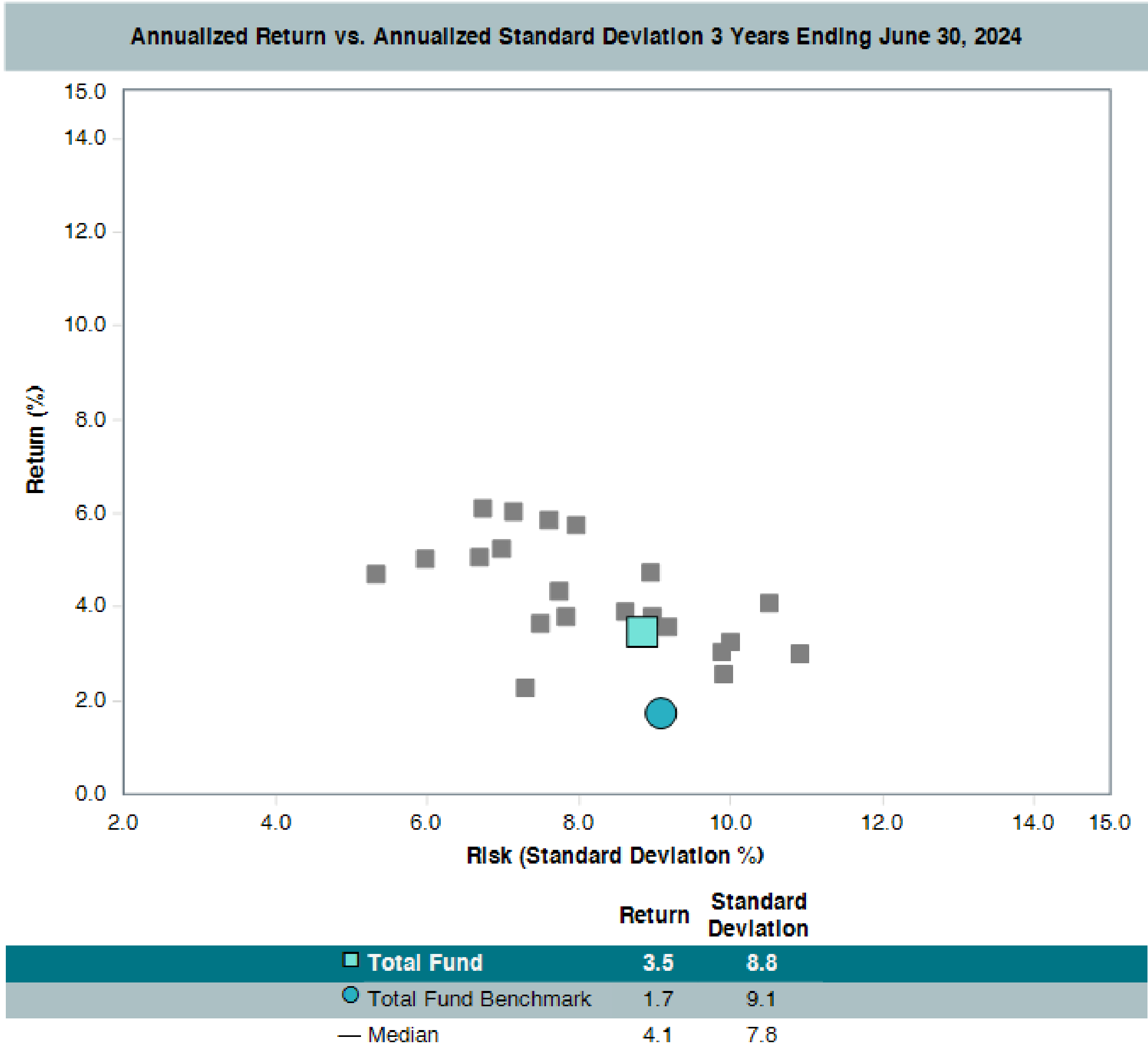
# 5. Total Fund Attribution – One Quarter Ending 6/30/2024



# 5. Total Fund Attribution – One Year Ending 6/30/2024

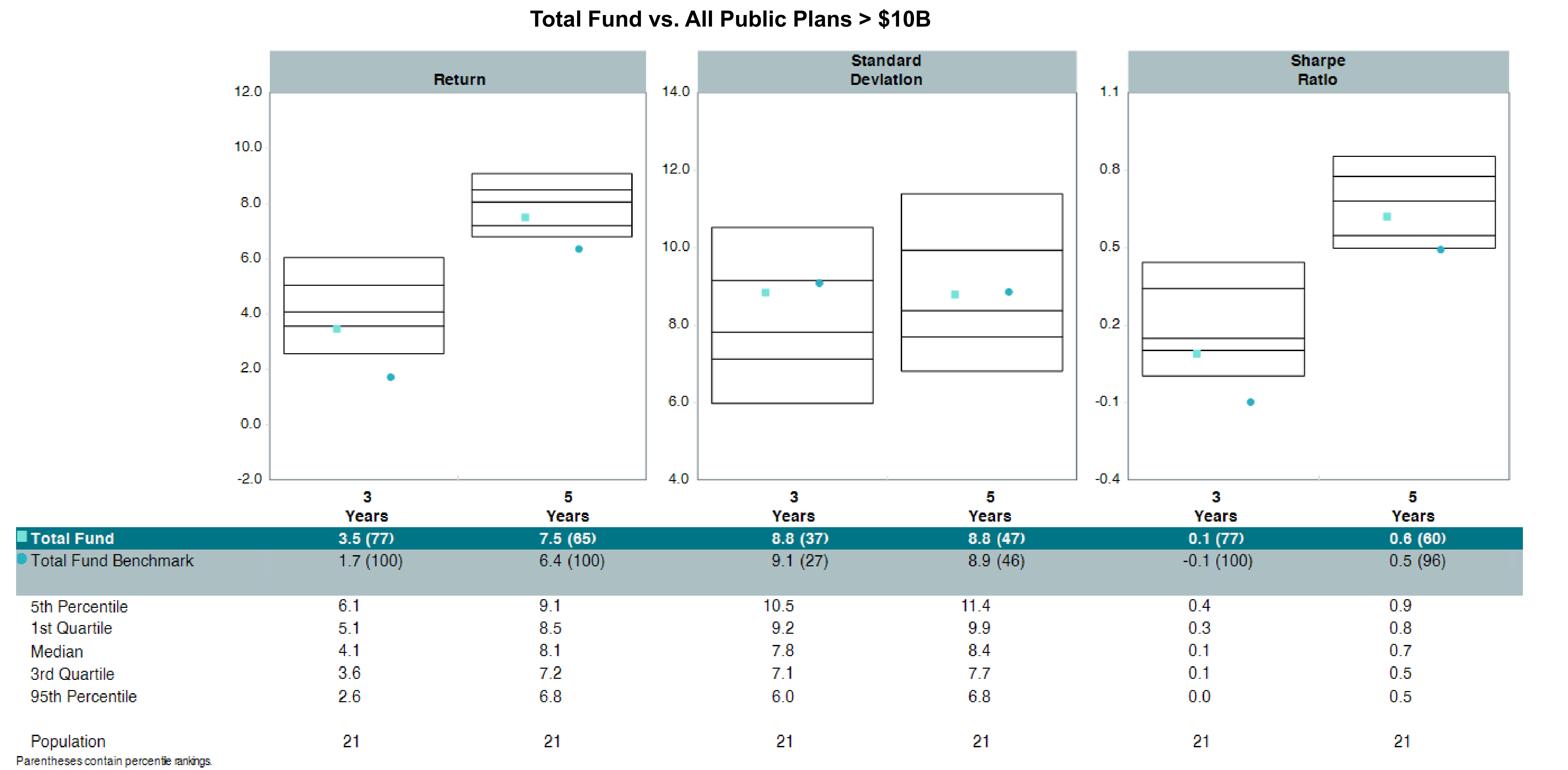


# 6. Risk Profile: Total Fund Risk-Return vs. Peers

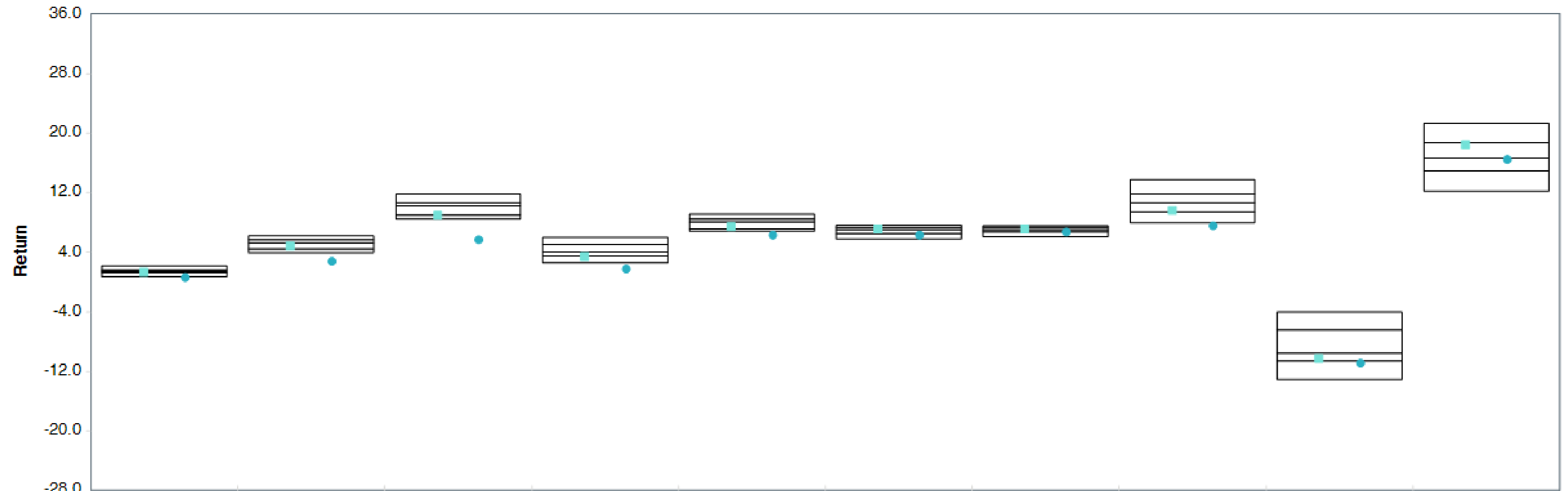


Note: Public Plan peer group composed of 21 public funds, for 3- and 5-year periods, with total assets in excess of \$10B as of 6/30/2024. An exhibit outlining the asset allocation of the peer portfolios is provided in the appendix of this report.

# 6. Risk Profile: Trailing 3-Year and 5-Year Risk Metrics Peer Comparison



## 6. TRS Performance vs. Peers (>\$10 Billion) as of 6/30/2024



	1 Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years	20 Years	2023	2022	2021
■ Total Fund	1.3 (62)	4.9 (69)	9.0 (73)	3.5 (77)	7.5 (65)	7.1 (42)	7.2 (38)	9.7 (72)	-10.3 (65)	18.5 (27)
● Total Fund Benchmark	0.7 (100)	2.8 (100)	5.7 (100)	1.7 (100)	6.4 (100)	6.4 (84)	6.7 (79)	7.6 (97)	-10.9 (78)	16.5 (58)
5th Percentile	2.2	6.2	11.9	6.1	9.1	7.7	7.6	13.8	-4.0	21.4
1st Quartile	1.7	5.7	10.7	5.1	8.5	7.3	7.4	11.9	-6.4	18.8
Median	1.5	5.3	10.3	4.1	8.1	7.0	7.0	10.7	-9.5	16.7
3rd Quartile	1.2	4.4	9.0	3.6	7.2	6.6	6.8	9.5	-10.6	14.9
95th Percentile	0.8	4.0	8.5	2.6	6.8	5.8	6.2	8.0	-13.0	12.3
Population	22	22	22	21	21	20	19	51	53	64

Parentheses contain percentile rankings.

## 7. IPS Stated Trust Return Objectives ending 6/30/2024

	Five Year	Seven Year	Ten Year	Twenty Year
Total Fund	<b>7.5</b>	<b>7.6</b>	<b>7.1</b>	<b>7.2</b>
Total Fund Benchmark	6.4	6.7	6.4	6.7
<b>Difference</b>	<b>+1.1</b>	<b>+0.9</b>	<b>+0.7</b>	<b>+0.5</b>
Total Fund	<b>7.5</b>	<b>7.6</b>	<b>7.1</b>	<b>7.2</b>
Assumed Rate of Return	7.2	7.3	7.5	7.8
<b>Difference</b>	<b>+0.3</b>	<b>+0.3</b>	<b>-0.4</b>	<b>-0.6</b>
Total Fund	<b>7.5</b>	<b>7.6</b>	<b>7.1</b>	<b>7.2</b>
CPI + 5%	9.4	8.8	7.9	7.6
<b>Difference</b>	<b>-1.9</b>	<b>-1.2</b>	<b>-0.8</b>	<b>-0.4</b>

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

## 8. Global Equity: Performance Summary Ending 6/30/2024

	Second Quarter	YTD	One Year	Three Year	Five Year	Ten Year
<b>Total Global Equity</b>	<b>2.5</b>	<b>9.4</b>	<b>16.1</b>	<b>5.5</b>	<b>10.8</b>	<b>8.6</b>
Total Global Equity Benchmark	2.2	7.8	14.0	5.2	10.8	8.7
<i>Difference</i>	<i>+0.3</i>	<i>+1.6</i>	<i>+2.1</i>	<i>+0.3</i>	<i>0.0</i>	<i>-0.1</i>
<b>Total U.S. Equity</b>	<b>3.2</b>	<b>14.7</b>	<b>25.7</b>	<b>9.4</b>	<b>13.9</b>	<b>11.2</b>
Total U.S. Equity Benchmark	3.4	13.7	23.3	8.2	14.3	12.3
<i>Difference</i>	<i>-0.2</i>	<i>+1.0</i>	<i>+2.4</i>	<i>+1.2</i>	<i>-0.4</i>	<i>-1.1</i>
<b>Non-U.S. Equity</b>	<b>1.9</b>	<b>8.5</b>	<b>15.4</b>	<b>1.0</b>	<b>6.4</b>	<b>4.7</b>
Non-U.S. Equity Benchmark	1.4	6.2	12.9	-0.1	5.5	3.9
<i>Difference</i>	<i>+0.5</i>	<i>+2.3</i>	<i>+2.5</i>	<i>+1.1</i>	<i>+0.9</i>	<i>+0.8</i>
<b>Non-U.S. Developed</b>	<b>0.0</b>	<b>7.6</b>	<b>14.6</b>	<b>3.6</b>	<b>7.3</b>	<b>5.0</b>
TRS Non-U.S. Developed Benchmark	-0.8	4.9	11.0	2.7	6.5	4.2
<i>Difference</i>	<i>+0.8</i>	<i>+2.7</i>	<i>+3.6</i>	<i>+0.9</i>	<i>+0.8</i>	<i>+0.8</i>
<b>Emerging Markets</b>	<b>4.5</b>	<b>9.7</b>	<b>16.5</b>	<b>-2.9</b>	<b>5.0</b>	<b>4.1</b>
TRS Emerging Market Benchmark	4.6	8.0	15.5	-4.4	3.6	3.0
<i>Difference</i>	<i>-0.1</i>	<i>+1.7</i>	<i>+1.0</i>	<i>+1.5</i>	<i>+1.4</i>	<i>+1.1</i>



Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.

Investment advice and consulting services provided by Aon Investments USA Inc.

## 8. Global Equity: Performance Summary Ending 6/30/2024 (cont'd)

	Second Quarter	YTD	One Year	Three Year	Five Year	Ten Year
<b>Total Public Equity</b>	<b>2.5</b>	<b>11.2</b>	<b>19.9</b>	<b>4.7</b>	<b>9.7</b>	<b>7.4</b>
Public Equity Benchmark	2.3	9.6	17.5	3.7	9.5	7.5
<i>Difference</i>	+0.2	+1.6	+2.4	+1.0	+0.2	-0.1
<b>Total Private Equity</b>	<b>2.5</b>	<b>5.5</b>	<b>8.7</b>	<b>7.4</b>	<b>13.5</b>	<b>12.6</b>
Private Equity Benchmark	1.7	3.8	6.3	8.7	14.1	12.3
<i>Difference</i>	+0.8	+1.7	+2.4	-1.3	-0.6	+0.3

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

## 9. Stable Value: Performance Summary Ending 6/30/2024

	Second Quarter	YTD	One Year	Three Year	Five Year	Ten Year
<b>Total Stable Value</b>	<b>-0.6</b>	<b>-1.5</b>	<b>-0.7</b>	<b>-4.9</b>	<b>-0.3</b>	<b>2.9</b>
Total Stable Value Benchmark	-1.2	-3.1	-2.6	-7.2	-2.0	1.4
<i>Difference</i>	<i>+0.6</i>	<i>+1.6</i>	<i>+1.9</i>	<i>+2.3</i>	<i>+1.7</i>	<i>+1.5</i>
<b>Total Government Bonds</b>	<b>-2.6</b>	<b>-6.4</b>	<b>-8.5</b>	<b>-12.2</b>	<b>-5.3</b>	<b>0.3</b>
Treasury Benchmark	-1.8	-5.0	-5.6	-10.5	-4.3	0.6
<i>Difference</i>	<i>-0.8</i>	<i>-1.4</i>	<i>-2.9</i>	<i>-1.7</i>	<i>-1.0</i>	<i>-0.3</i>
<b>Stable Value Hedge Funds</b>	<b>1.7</b>	<b>6.2</b>	<b>12.4</b>	<b>8.4</b>	<b>8.1</b>	<b>6.4</b>
Hedge Funds Benchmark	0.5	3.1	6.7	3.5	4.9	3.5
<i>Difference</i>	<i>+1.2</i>	<i>+3.1</i>	<i>+5.7</i>	<i>+4.9</i>	<i>+3.2</i>	<i>+2.9</i>
<b>Absolute Return</b>	<b>3.7</b>	<b>7.4</b>	<b>15.4</b>	<b>8.0</b>	<b>8.9</b>	<b>8.3</b>
Absolute Return Benchmark	2.4	4.8	9.9	7.3	5.5	4.4
<i>Difference</i>	<i>+1.3</i>	<i>+2.6</i>	<i>+5.5</i>	<i>+0.7</i>	<i>+3.4</i>	<i>+3.9</i>

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

## 10. Real Return: Performance Summary Ending 6/30/2024

	Second Quarter	YTD	One Year	Three Year	Five Year	Ten Year
<b>Total Real Return</b>	<b>0.3</b>	<b>-0.6</b>	<b>-0.5</b>	<b>9.0</b>	<b>7.5</b>	<b>7.8</b>
Real Return Benchmark	-1.0	-4.1	-6.6	5.3	4.1	5.4
<i>Difference</i>	<i>+1.3</i>	<i>+3.5</i>	<i>+6.1</i>	<i>+3.7</i>	<i>+3.4</i>	<i>+2.4</i>
<b>Real Estate</b>	<b>-1.3</b>	<b>-3.3</b>	<b>-5.5</b>	<b>6.9</b>	<b>7.1</b>	<b>9.2</b>
Real Estate Benchmark	-2.6	-7.4	-12.0	2.5	2.6	5.8
<i>Difference</i>	<i>+1.3</i>	<i>+4.1</i>	<i>+6.5</i>	<i>+4.4</i>	<i>+4.5</i>	<i>+3.4</i>
<b>Energy, Natural Resources, and Infrastructure</b>	<b>3.7</b>	<b>5.7</b>	<b>11.8</b>	<b>14.3</b>	<b>8.3</b>	<b>--</b>
Energy and Natural Res. Benchmark	2.3	3.3	6.7	11.9	7.6	--
<i>Difference</i>	<i>+1.4</i>	<i>+2.4</i>	<i>+5.1</i>	<i>+2.4</i>	<i>+0.7</i>	
<b>Commodities</b>	<b>-4.0</b>	<b>-5.5</b>	<b>1.1</b>	<b>1.7</b>	<b>12.3</b>	<b>-5.9</b>
Commodities Benchmark	0.7	11.1	15.0	12.7	8.3	-3.1
<i>Difference</i>	<i>-4.7</i>	<i>-16.6</i>	<i>-13.9</i>	<i>-11.0</i>	<i>+4.0</i>	<i>-2.8</i>

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

# 11. Risk Parity: Performance Summary Ending 6/30/2024

	Second Quarter	YTD	One Year	Three Year	Five Year	Ten Year
Total Risk Parity	0.3	4.0	10.5	-2.2	1.9	3.5
Risk Parity Benchmark	-0.1	3.7	8.4	-4.6	1.8	3.3
Difference	+0.4	+0.3	+2.1	+2.4	+0.1	+0.2

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

## 12. Cash Equivalents: Performance Summary Ending 6/30/2024

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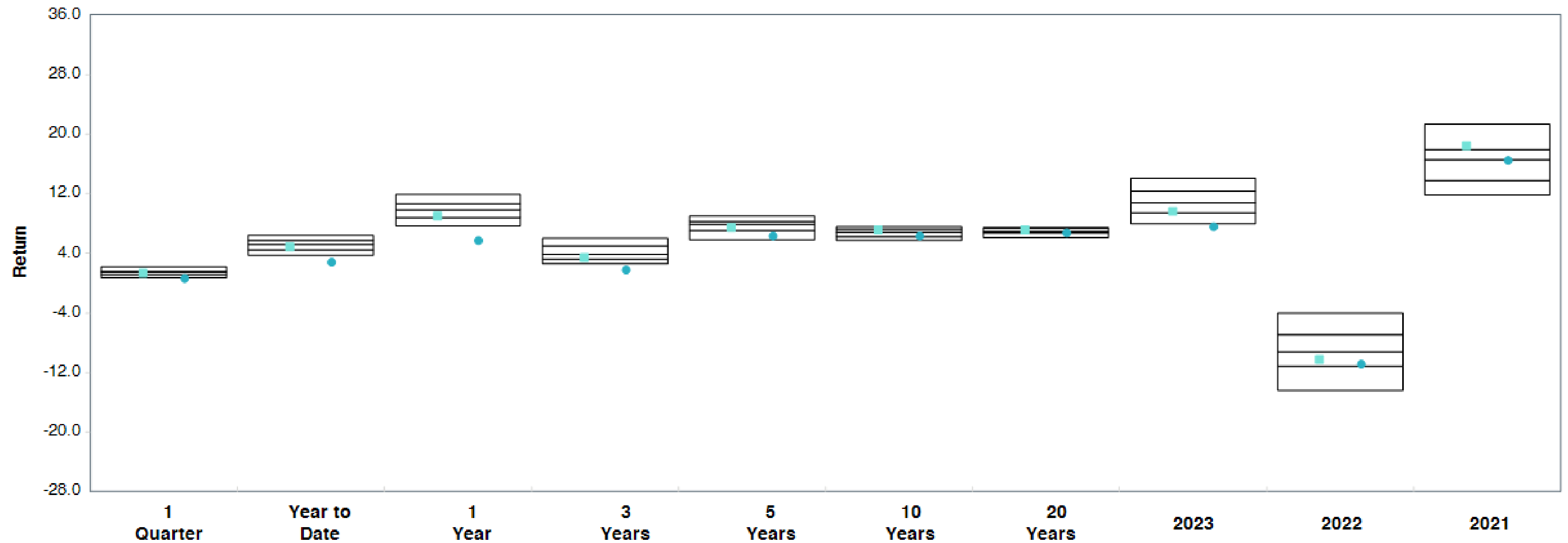
	Second Quarter	YTD	One Year	Three Year	Five Year	Ten Year
Cash Equivalents	1.6	3.1	6.6	4.1	2.8	2.6
Cash Benchmark	1.4	2.8	5.6	3.2	2.2	1.5
<i>Difference</i>	+0.2	+0.3	+1.0	+0.9	+0.6	+1.1

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

# Appendix – Supplemental Reporting



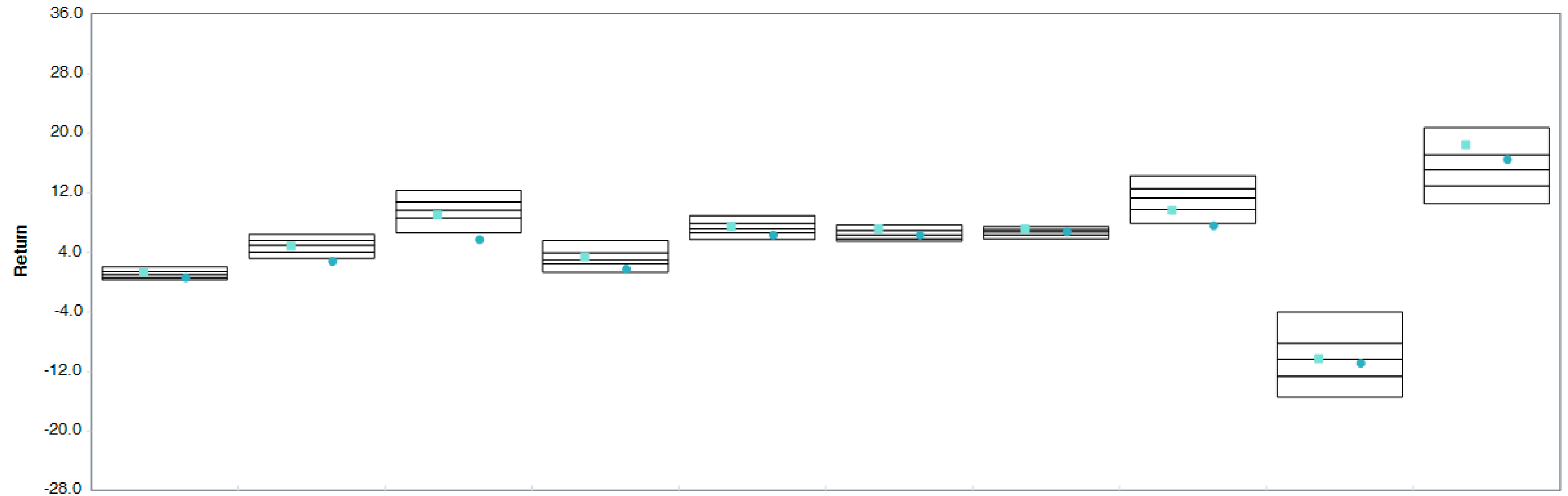
# TRS Performance vs. Peers (>\$5 Billion) as of 6/30/2024



	1 Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years	20 Years	2023	2022	2021
■ Total Fund	1.3 (54)	4.9 (60)	9.0 (71)	3.5 (72)	7.5 (54)	7.1 (36)	7.2 (37)	9.7 (71)	-10.3 (64)	18.5 (23)
● Total Fund Benchmark	0.7 (100)	2.8 (100)	5.7 (100)	1.7 (100)	6.4 (93)	6.4 (68)	6.7 (76)	7.6 (97)	-10.9 (74)	16.5 (52)
5th Percentile	2.1	6.4	11.9	6.0	9.1	7.6	7.5	14.1	-4.0	21.4
1st Quartile	1.6	5.7	10.7	5.0	8.3	7.3	7.4	12.3	-6.9	18.0
Median	1.4	5.2	9.8	3.9	7.9	6.8	7.0	10.8	-9.2	16.6
3rd Quartile	1.2	4.4	8.9	3.2	7.1	6.2	6.7	9.5	-11.2	13.8
95th Percentile	0.7	3.8	7.7	2.6	5.9	5.7	6.1	8.0	-14.4	11.9
Population	31	31	31	28	27	26	22	67	70	79

Parentheses contain percentile rankings.

# TRS Performance vs. Peers (>\$1 Billion) as of 6/30/2024

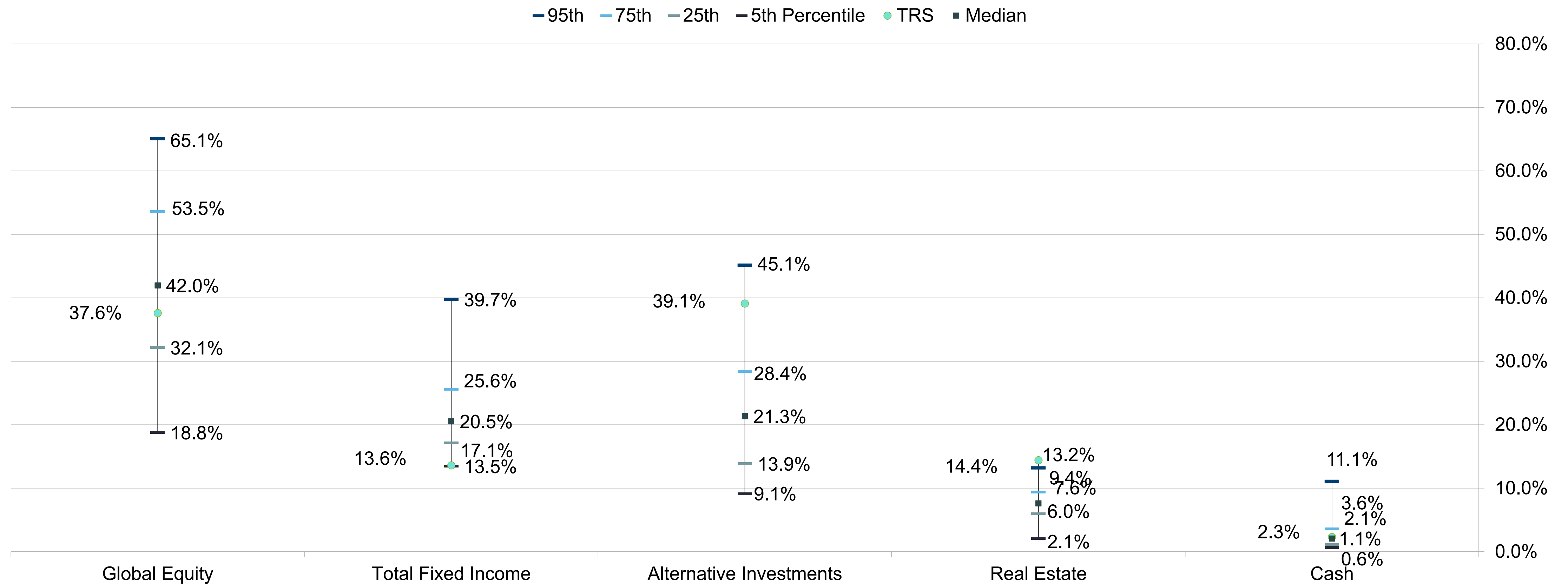


	1 Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years	20 Years	2023	2022	2021
■ Total Fund	1.3 (29)	4.9 (56)	9.0 (67)	3.5 (40)	7.5 (34)	7.1 (20)	7.2 (17)	9.7 (76)	-10.3 (48)	18.5 (14)
● Total Fund Benchmark	0.7 (75)	2.8 (98)	5.7 (100)	1.7 (91)	6.4 (83)	6.4 (46)	6.7 (50)	7.6 (97)	-10.9 (58)	16.5 (36)
5th Percentile	2.0	6.4	12.4	5.6	8.9	7.6	7.5	14.4	-4.0	20.7
1st Quartile	1.4	5.6	10.8	3.9	7.9	6.9	7.0	12.5	-8.2	17.2
Median	1.0	5.0	9.6	3.0	7.2	6.3	6.7	11.3	-10.3	15.2
3rd Quartile	0.7	4.1	8.6	2.5	6.6	5.8	6.3	9.8	-12.6	13.0
95th Percentile	0.3	3.2	6.6	1.4	5.7	5.5	5.9	7.9	-15.5	10.6
Population	95	95	95	90	88	83	61	175	173	205

Parentheses contain percentile rankings.

# TRS Commitment Levels vs. Peers (>\$10 Billion) as of 6/30/2024

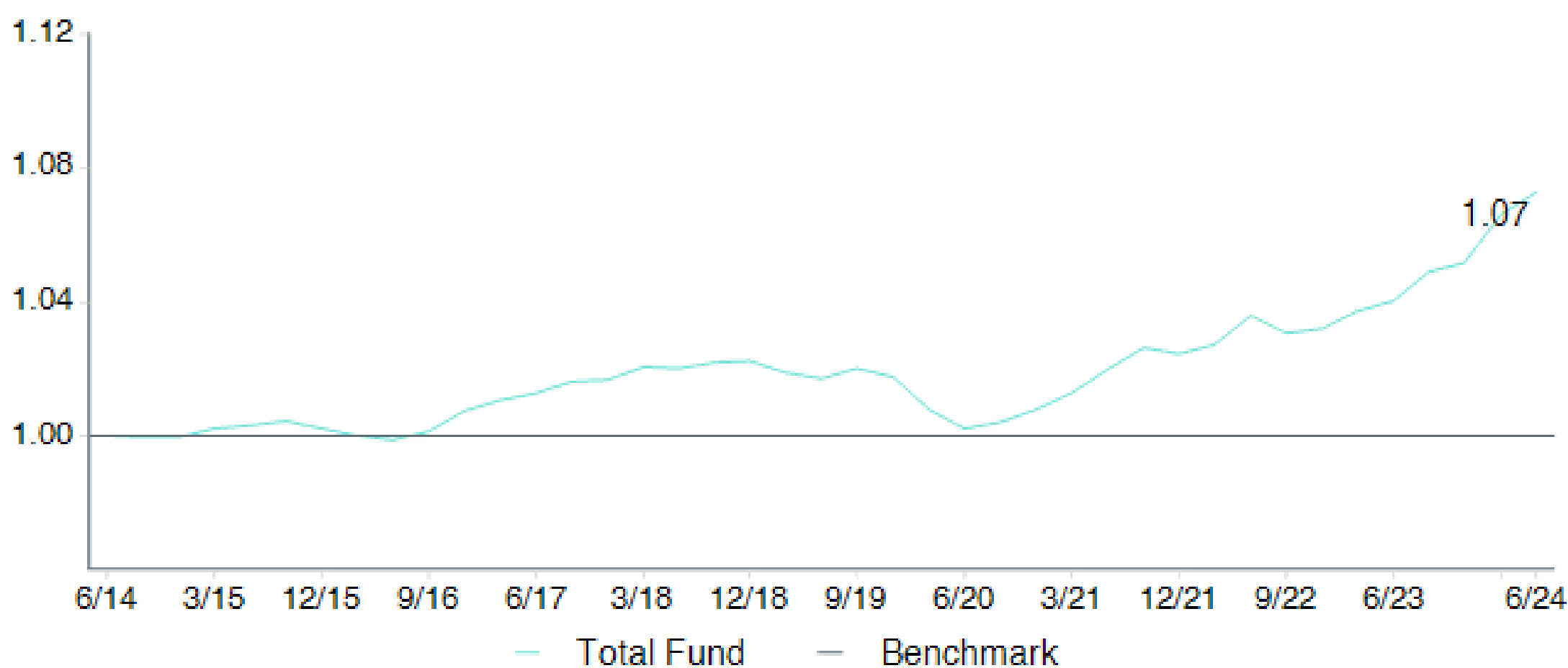
- The chart below depicts the asset allocation of peer public funds with assets greater than \$10 billion.
  - The ends of each line represent the 95<sup>th</sup> and 5<sup>th</sup> percentile of exposures, the middle light blue and grey lines represent the 25<sup>th</sup> and 75<sup>th</sup> percentile of exposures, the purple square represents the median, and the green dot represents TRS exposure.



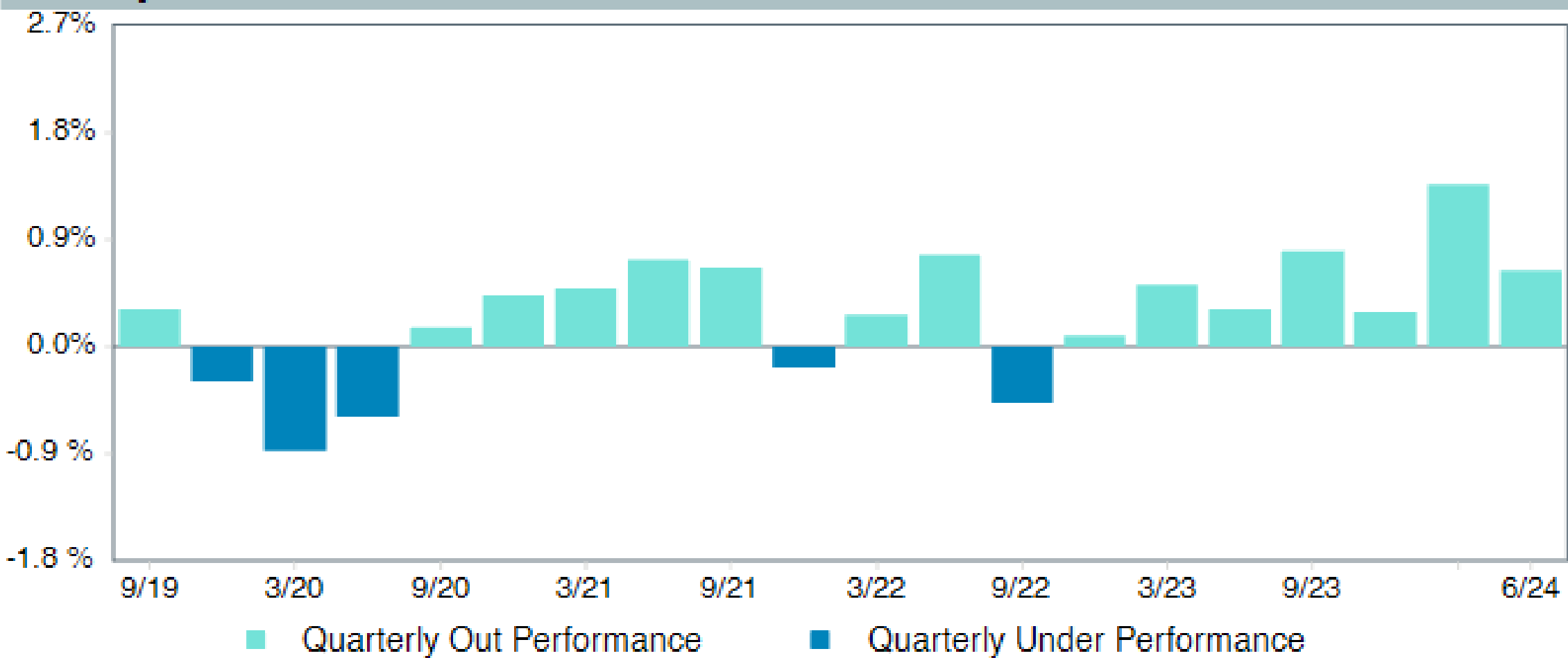
# Historical Excess Performance Ending 6/30/2024

## Total Fund vs. Total Fund Benchmark

Ratio of Cumulative Wealth - 10 Years

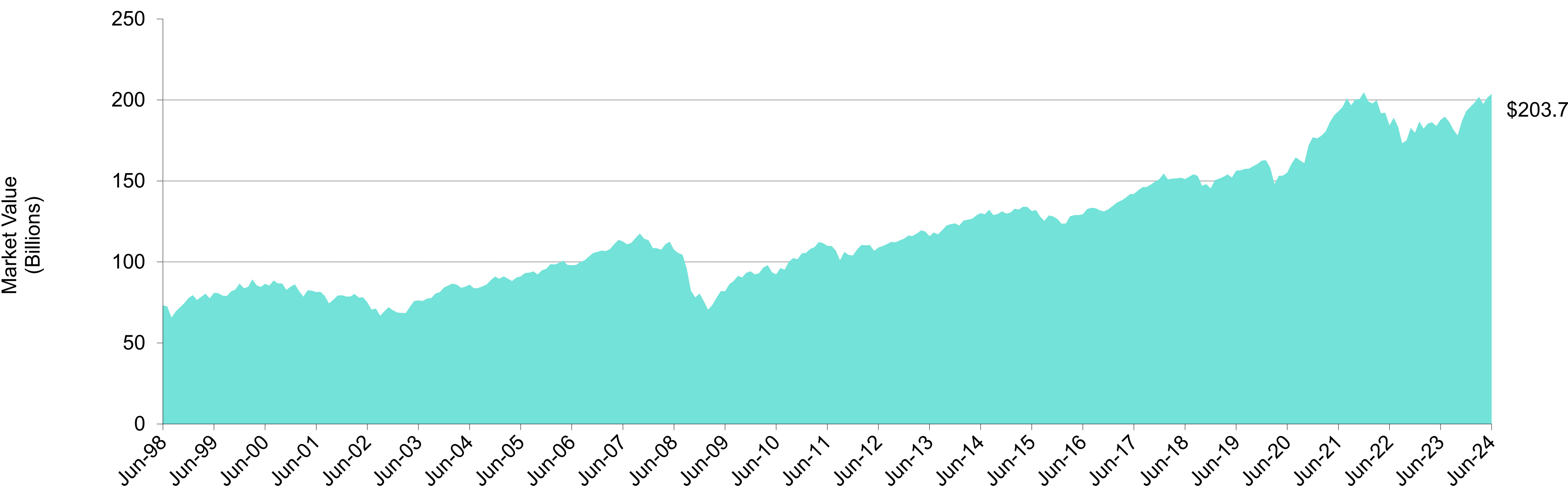


Quarterly Excess Performance



# TRS Asset Growth

Total Fund Historical Growth (September 1997 - June 2024)



# External Manager Program: Public Equity Performance as of 6/30/2024

	Allocation (\$ in billions)	Second Quarter	YTD	One Year	Three Year	Five Year
<b>EP Total Global Equity</b>	<b>\$35.5</b>	<b>2.5</b>	<b>11.7</b>	<b>20.6</b>	<b>5.2</b>	<b>11.4</b>
EP Global Equity Benchmark	--	2.5	10.0	18.2	3.9	9.9
<i>Difference</i>	--	0.0	+1.7	+2.4	+1.3	+1.5
<b>EP U.S.A.</b>	<b>\$13.3</b>	<b>2.9</b>	<b>13.1</b>	<b>24.7</b>	<b>8.4</b>	<b>14.4</b>
EP U.S.A. Benchmark	--	3.4	13.7	23.3	8.2	14.3
<i>Difference</i>	--	-0.5	-0.6	+1.4	+0.2	+0.1
<b>EP Non-U.S. Developed</b>	<b>\$7.9</b>	<b>0.0</b>	<b>7.7</b>	<b>14.4</b>	<b>3.0</b>	<b>9.4</b>
MSCI EAFE + Canada Policy Index	--	-0.8	4.9	11.0	2.7	6.5
<i>Difference</i>	--	+0.8	+2.8	+3.4	+0.3	+2.9
<b>EP Emerging Markets</b>	<b>\$6.9</b>	<b>4.3</b>	<b>9.7</b>	<b>15.0</b>	<b>-2.6</b>	<b>6.3</b>
MSCI Emerging Markets Policy Index	--	4.6	8.0	15.5	-4.4	3.6
<i>Difference</i>	--	-0.3	+1.7	-0.5	+1.8	+2.7
<b>EP World Equity</b>	<b>\$7.5</b>	<b>2.7</b>	<b>15.1</b>	<b>25.8</b>	<b>10.0</b>	<b>14.3</b>
EP World Equity Benchmark	--	2.4	10.8	19.2	5.3	11.0
<i>Difference</i>	--	+0.3	+4.3	+6.6	+4.7	+3.3



Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.

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# External Manager Program: Stable Value/Total Program Performance as of 6/30/2024

	Allocation (\$ in billions)	Second Quarter	YTD	One Year	Three Year
<b>EP Total Stable Value</b>	<b>\$10.0</b>	<b>1.7</b>	<b>6.2</b>	<b>12.4</b>	<b>8.4</b>
EP Stable Value Benchmark	--	0.5	3.1	6.7	3.5
<i>Difference</i>	--	+1.2	+3.1	+5.7	+4.9
<b>Total External Public Program</b>	<b>\$53.6</b>	<b>2.2</b>	<b>9.6</b>	<b>17.4</b>	<b>5.1</b>
EP External Public Benchmark	--	1.9	7.9	14.6	3.2
<i>Difference</i>	--	+0.3	+1.7	+2.8	+1.9

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

# Public Strategic Partnership Program (SPN): Performance as of 6/30/2024

	Allocation (\$ in billions)	Second Quarter	YTD	One Year	Three Year
<b>Public Strategic Partnership</b>	<b>\$8.0</b>	<b>1.3</b>	<b>5.3</b>	<b>11.1</b>	<b>-0.3</b>
Public SPN Benchmark	--	1.2	5.2	10.4	-0.4
<i>Difference</i>	--	<i>0.0</i>		<i>-0.1</i>	<i>0.0</i>
<b>BlackRock</b>	<b>\$2.9</b>	<b>2.3</b>	<b>7.4</b>	<b>12.8</b>	<b>1.3</b>
<b>JP Morgan</b>	<b>\$2.8</b>	<b>0.8</b>	<b>5.3</b>	<b>11.3</b>	<b>-0.7</b>
<b>Morgan Stanley</b>	<b>\$2.4</b>	<b>0.6</b>	<b>3.0</b>	<b>8.9</b>	<b>-1.7</b>

*Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.*

# Benchmarks

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**Total Fund Performance Benchmark – 17.2% MSCI U.S.A. IMI, 12.4% MSCI EAFE plus Canada Index, 8.6% MSCI Emerging Markets Index, 16.7% State Street Private Equity Index (1 quarter lagged), 15.3% Blmb. Barc. Long Term Treasury Index, 4.7% HFRI FoF Conservative Index, 2.0% Citigroup 3 Mo. T-Bill Index, 14.7% NCREIF ODCE Index (1 quarter lagged), 6.8% Energy and Natural Resources Benchmark, 7.6% Risk Parity Benchmark, and -6.0% Asset Allocation Leverage Benchmark.**

**Global Equity Benchmark – 31.3% MSCI U.S.A. IMI, 22.6% MSCI EAFE plus Canada Index, 15.6% MSCI Emerging Markets Index, and 30.4% State Street Private Equity Index (1 quarter lagged)**

- TF U.S. Equity Benchmark - MSCI U.S.A. Investable Markets Index (IMI)
- Emerging Markets Equity Benchmark – MSCI Emerging Markets Index
- Non-US Developed Equity Benchmark– MSCI EAFE + Canada Index
- Private Equity Benchmark - State Street Private Equity Index (1 quarter lagged)

# Benchmarks (cont'd)

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## **Stable Value Benchmark – 76.3% Blmb. Barc. Long Term Treasury Index and 23.7% HFRI FoF Conservative Index**

- US Treasuries Benchmark – Bloomberg Barclays Long Term Treasury Index
- Stable Value Hedge Funds – HFRI Fund of Funds (FoF) Conservative Index
- Absolute Return Benchmark - SOFR + 4%

## **Real Return Benchmark – 68.3% NCREIF ODCE Index and 31.7% Energy & Natural Resources Benchmark**

- Real Estate Benchmark – NCREIF ODCE Index (1 quarter lagged)
- Energy and Natural Resources Benchmark – 75% Cambridge Associates Natural Resources Index (reweighted) and 25% quarterly Seasonally-Adjusted Consumer Price Index (1 quarter lagged)
- Commodities Benchmark – Goldman Sachs Commodity Index

- Risk Parity Benchmark – 100% HFR Risk Parity Vol 12 Institutional Index

# Description of Performance Attribution

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- A measure of the source of the deviation of a fund's performance from that of its policy benchmark. Each bar on the attribution graph represents the contribution made by the asset class to the total difference in performance. A positive value for a component indicates a positive contribution to the aggregate relative performance. A negative value indicates a detrimental impact. The magnitude of each component's contribution is a function of (1) the performance of the component relative to its benchmark, and (2) the weight (beginning of period) of the component in the aggregate.
- The individual Asset Class effect, also called **Selection Effect**, is calculated as
$$\text{Actual Weight of Asset Class} \times (\text{Actual Asset Class Return} - \text{Asset Class Benchmark Return})$$
- The bar labeled **Allocation Effect** illustrates the effect that a Total Fund's asset allocation has on its relative performance. Allocation Effect calculation =  $(\text{Asset Class Benchmark Return} - \text{Total Benchmark Return}) \times (\text{Actual Weight of Asset Class} - \text{Target Policy Weight of Asset Class})$ .
- The bar labeled **Other** is a combination of Cash Flow Effect and Benchmark Effect:
  - **Cash Flow Effect** describes the impact of asset movements on the Total Fund results. Cash Flow Effect calculation =  $(\text{Total Fund Actual Return} - \text{Total Fund Policy Return}) - \text{Current Selection Effect} - \text{Current Allocation Effect}$
  - **Benchmark Effect** results from the weighted average return of the asset classes' benchmarks being different from the Total Funds' policy benchmark return. Benchmark Effect calculation =  $\text{Total Fund Policy Return} - (\text{Asset Class Benchmark Return} \times \text{Target Policy Weight of Asset Class})$
- **Cumulative Effect**  
Cumulative Effect calculation =  $\text{Current Effect } t \times (1 + \text{Cumulative Total Fund Actual Return } t-1) + \text{Cumulative Effect } t-1 \times (1 + \text{Total Fund Benchmark Return } t)$

# Disclaimers and Notes



# Disclaimers and Notes

## Disclaimers:

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

## Notes:

- The rates of return contained in this report are shown on an after-fees basis unless otherwise noted. They are geometric and time weighted. Returns for periods longer than one year are annualized.
- Universe percentiles are based upon an ordering system in which 1 is the best ranking and 100 is the worst ranking.
- Due to rounding throughout the report, percentage totals displayed may not sum up to 100.0%. Additionally, individual fund totals in dollar terms may not sum up to the plan totals.

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ATTN: Aon Investments Compliance Officer

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# Investment Risk Report

James Nield, Chief Risk Officer

Melissa Jerkins, Investment Manager

September 2024



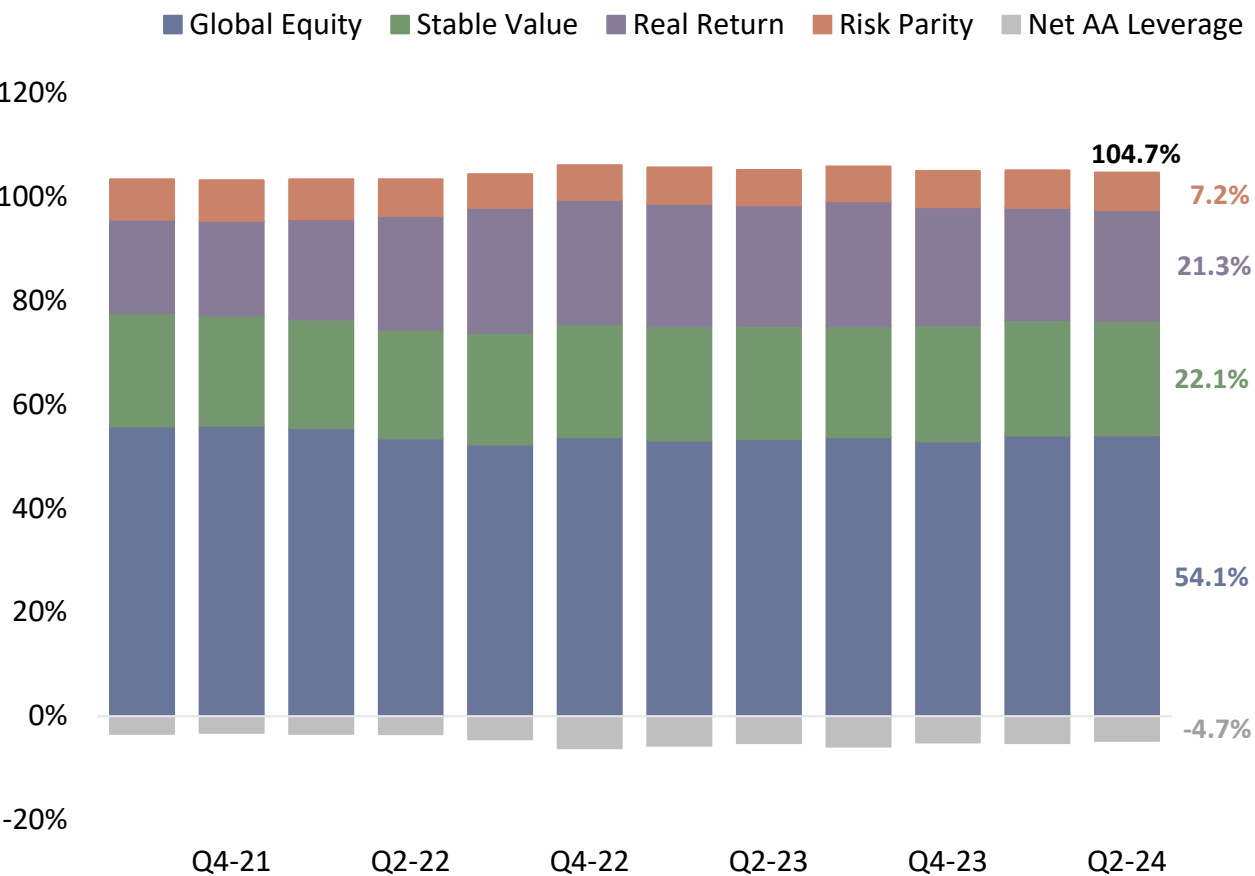
# All metrics in compliance

<b><u>Risk Metric</u></b>	<b><u>Value</u></b>	<b><u>In Compliance?</u></b>	<b><u>Page(s)</u></b>
<b>1. Asset Allocation (AA):</b> Overweight Stable Value	Overweight 2.1%	✓	3 - 4
<b>2. Drawdown Risk:</b> VaR estimate decreased	6.3% VaR	✓	5 - 6
<b>3. Tracking Error (TE):</b> Public TE range bound	155 bp Realized	✓	7
<b>4. Liquidity:</b> Remained strong	6.2x Coverage Ratio	✓	8
<b>5. Leverage:</b> Trust leverage decreased slightly	-4.7% Net	✓	9 - 10
<b>6. Derivatives:</b> Gross notional exposure stable	22.3% Gross Notional	✓	11
<b>7. Counterparty Risk:</b> Within Policy limits	Lowest Rating: A-	✓	12
<b>8. Securities Lending:</b> Earnings stable	10.1% Utilization	✓	13

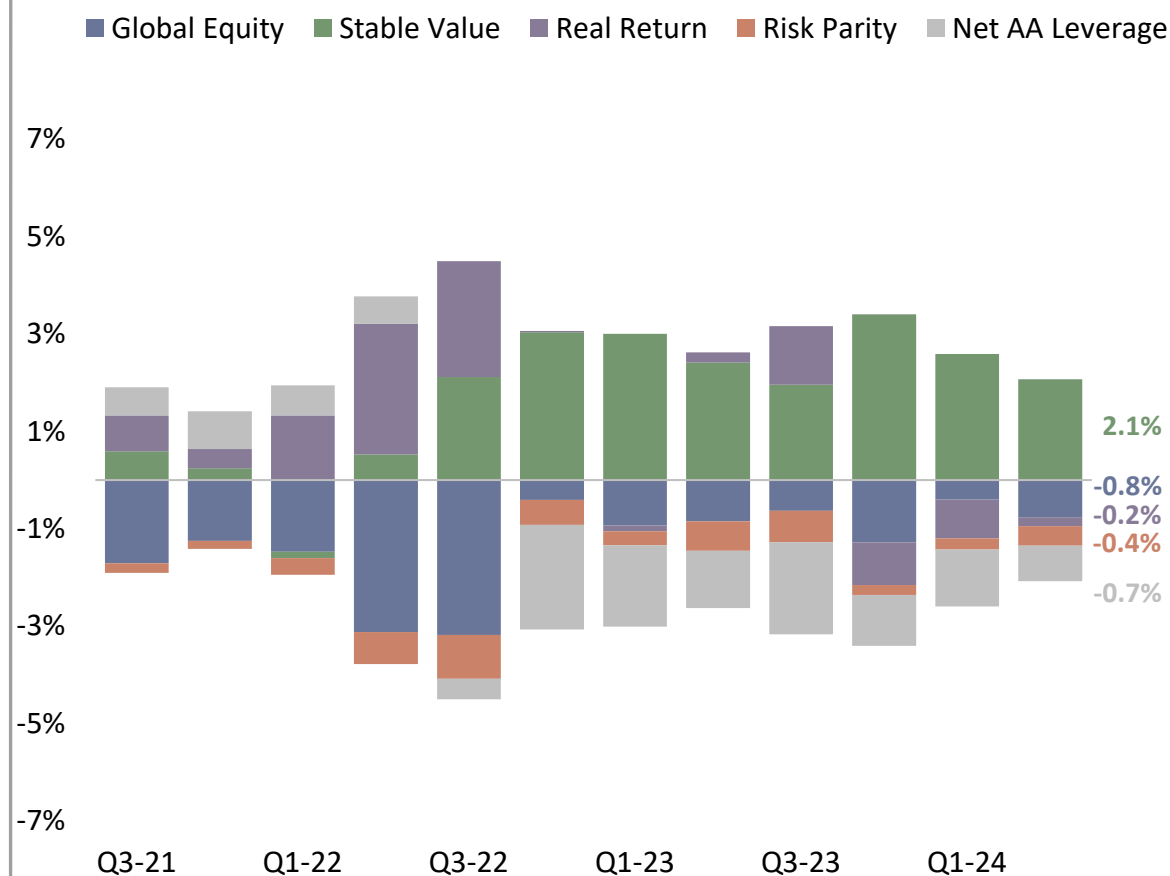
Unless otherwise noted, data presented as of June 30, 2024

# Trust overweight investment exposure primarily due to Stable Value

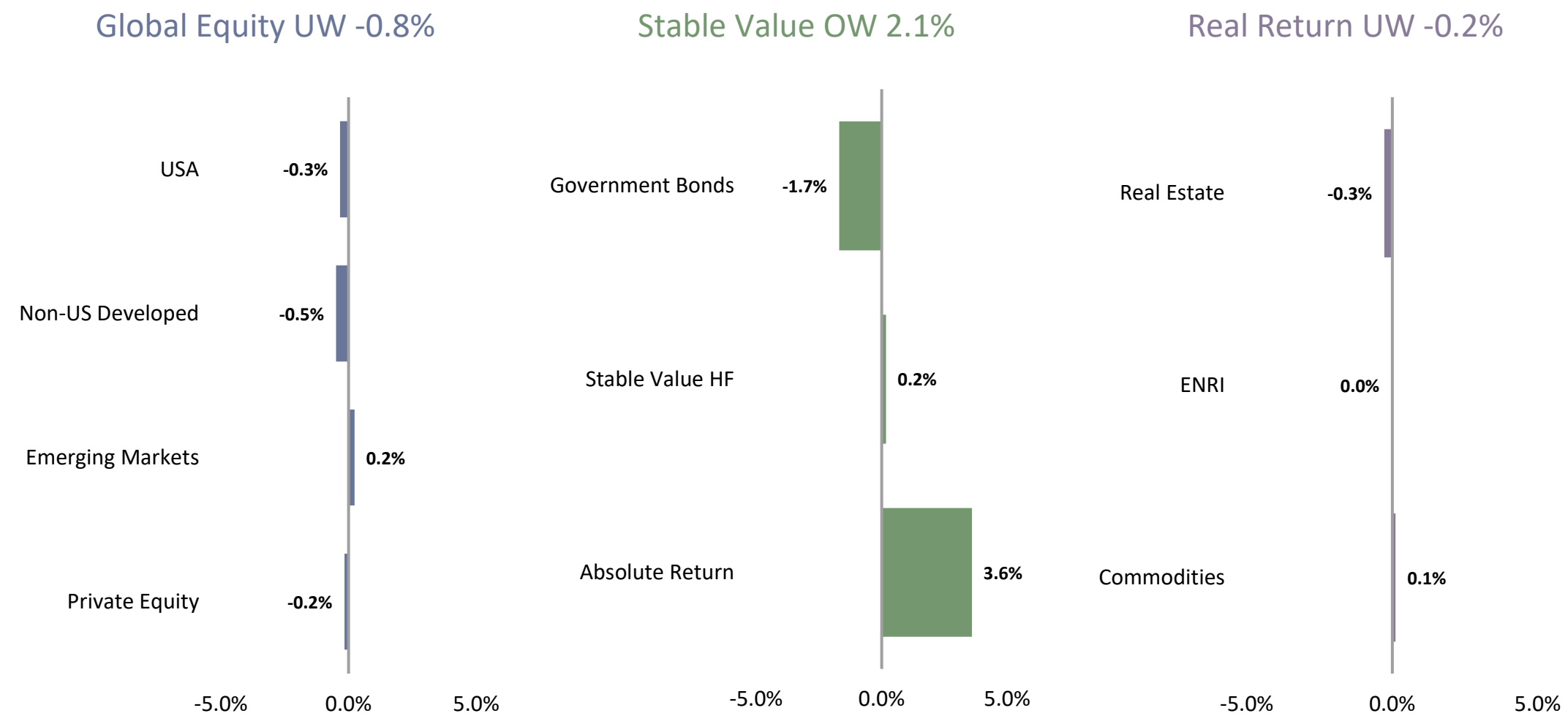
Asset Class Weights Trend



Asset Class Relative Weights

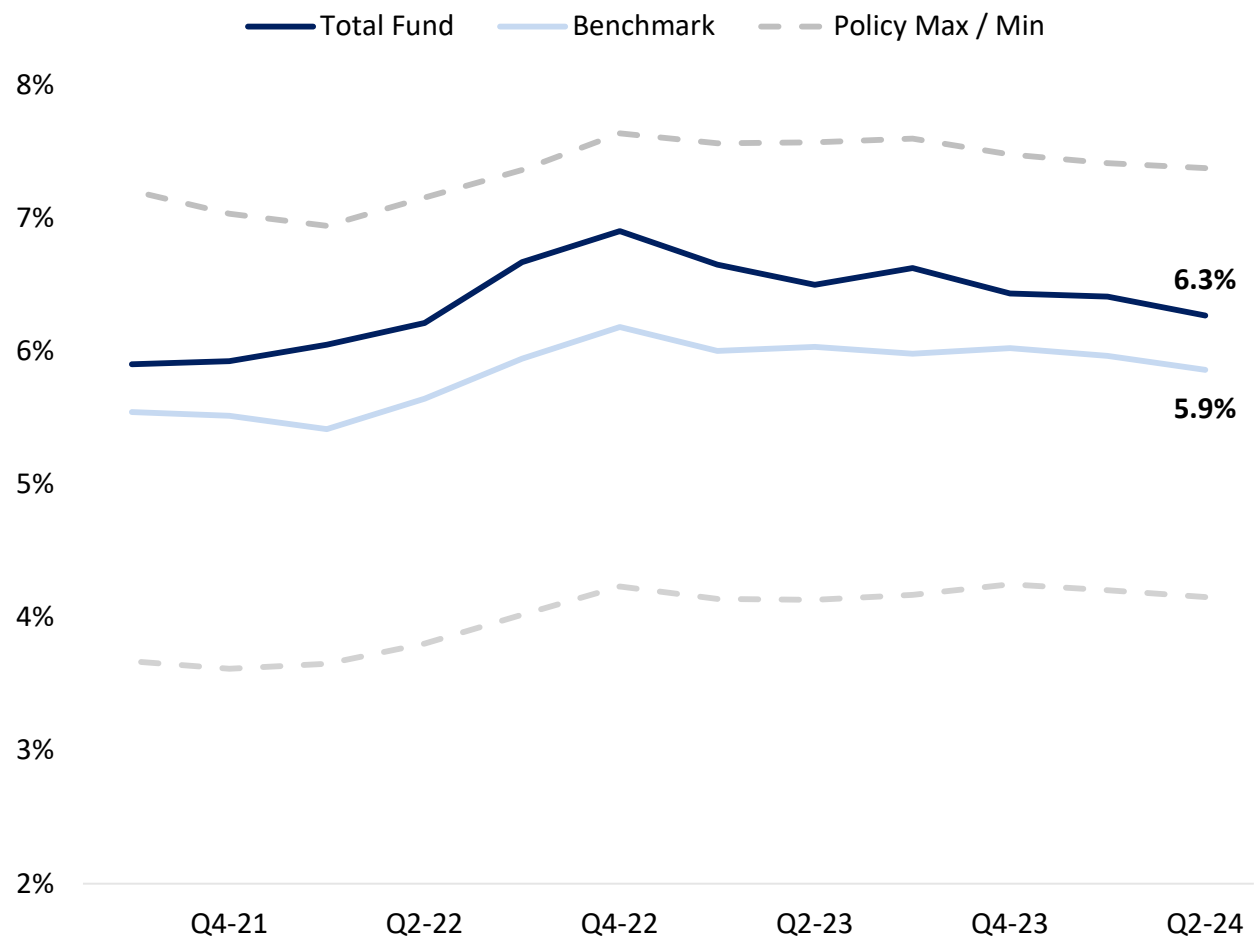


# Global Equity and Real Return allocations near target

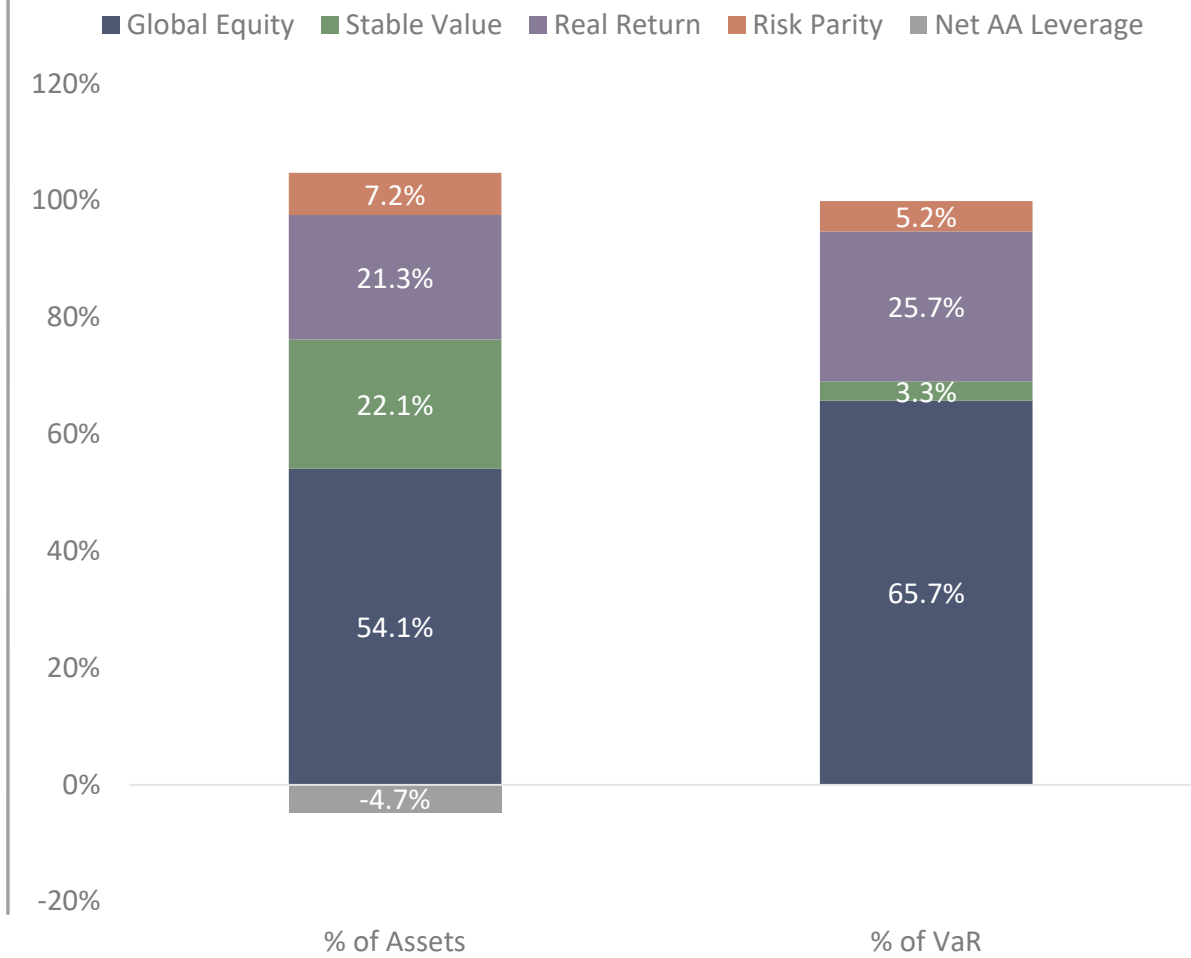


# VaR estimates decreased given strong returns in 2024

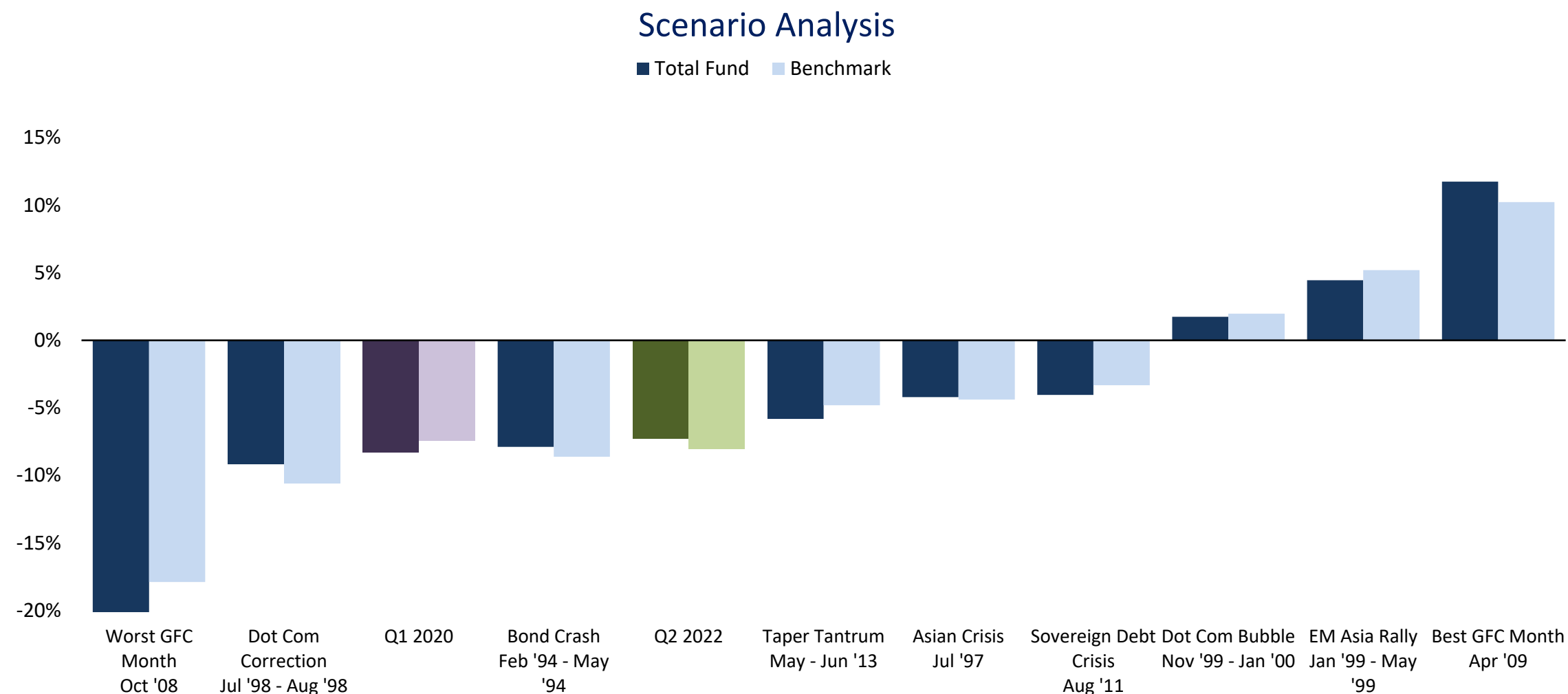
VaR History



VaR Contribution



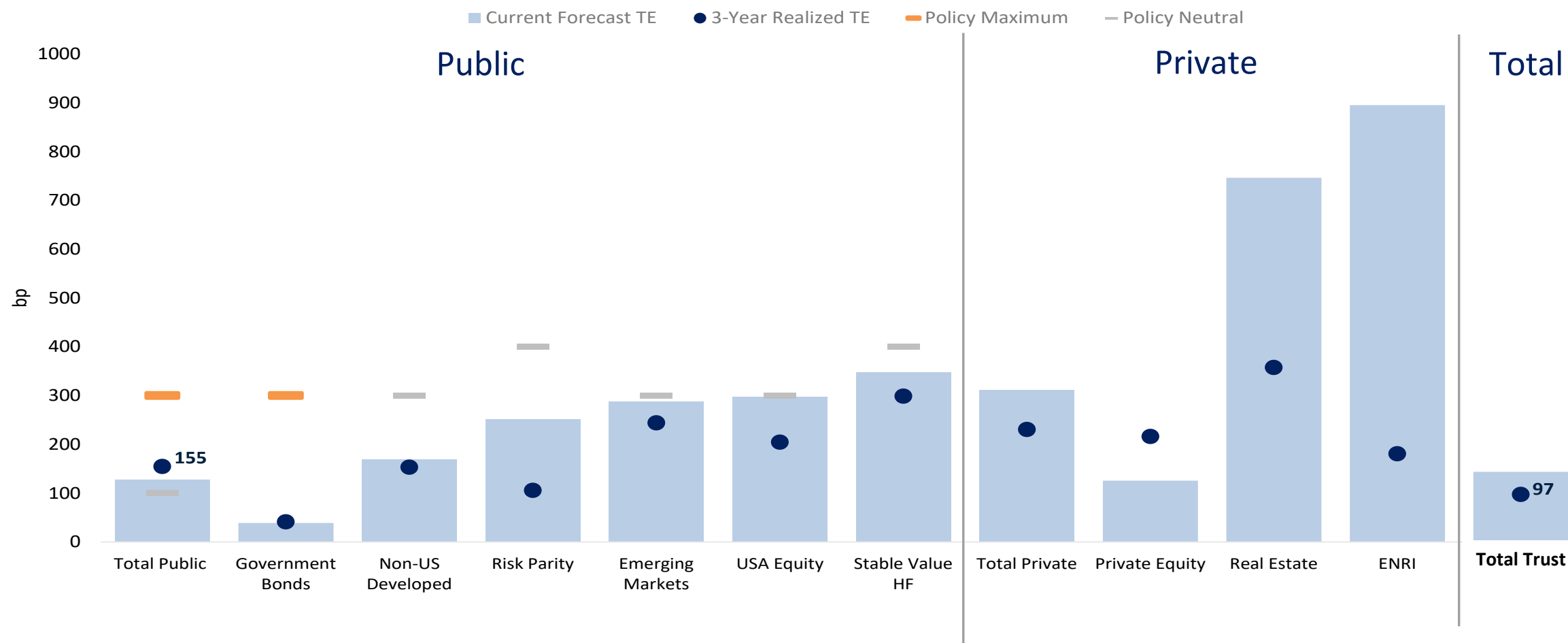
# Predicted Trust drawdowns in line with benchmark



Source: State Street Bank; note: data shown are predicted drawdowns given current allocation, except for Q1 2020 and Q2 2022, which reflect realized performance

# Realized tracking error near historical norms

Asset Class Tracking Error



Source: State Street Bank; note: current forecast tracking error uses past experiences from January 1, 2008 to June 30, 2024 and therefore includes the effects of the Global Financial Crisis; External World Equity had tracking error of 274 bp realized, 204 bp forecasted with a policy neutral of 300

# Trust liquidity remained strong

Sources of Liquidity (\$, billions)	Market Value	Stressed Value
Cash	\$ 4.7	\$ 4.5
Unencumbered Government Bonds	12.4	7.7
Risk Parity	13.9	8.6
Equities	50.0	27.4
Other Liquid Assets	0.3	0.1
<b>Total Sources of Liquidity</b>	<b>\$ 81.0</b>	<b>\$ 48.1</b>

*Note: Excluded illiquid assets, bond collateral, and Hedge Funds*

	\$ 122.5	0.0
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Uses of Liquidity (\$, billions)	Market Value	Stressed Value
Operational Uses of Liquidity		\$ (0.4)
Stressed Securities Lending		(0.9)
Stressed Derivatives		(6.1)
Stressed Private Markets		(0.5)
<b>Total Uses of Liquidity</b>	<b>\$ -</b>	<b>\$ (7.8)</b>

Liquidity Ratio	
<b>Ratio (Sources/Uses)</b>	<b>6.2</b>
Alert Threshold	2.0
<b>Test Result</b>	<b>Pass</b>

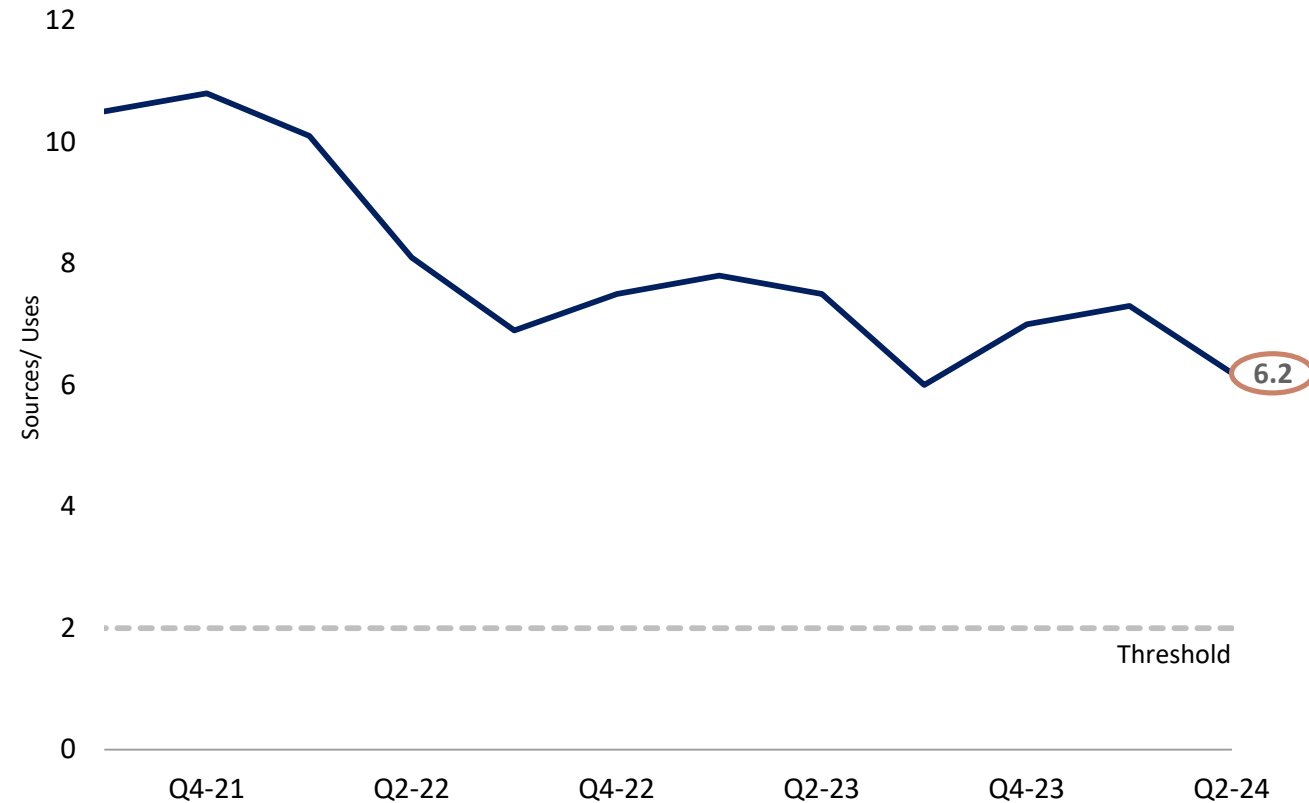
*Note: Net Stressed Liquidity (Sources less Uses)*

\$ 40.4

*Note: Past 12 Months of Benefit Payments*

\$ 4.0

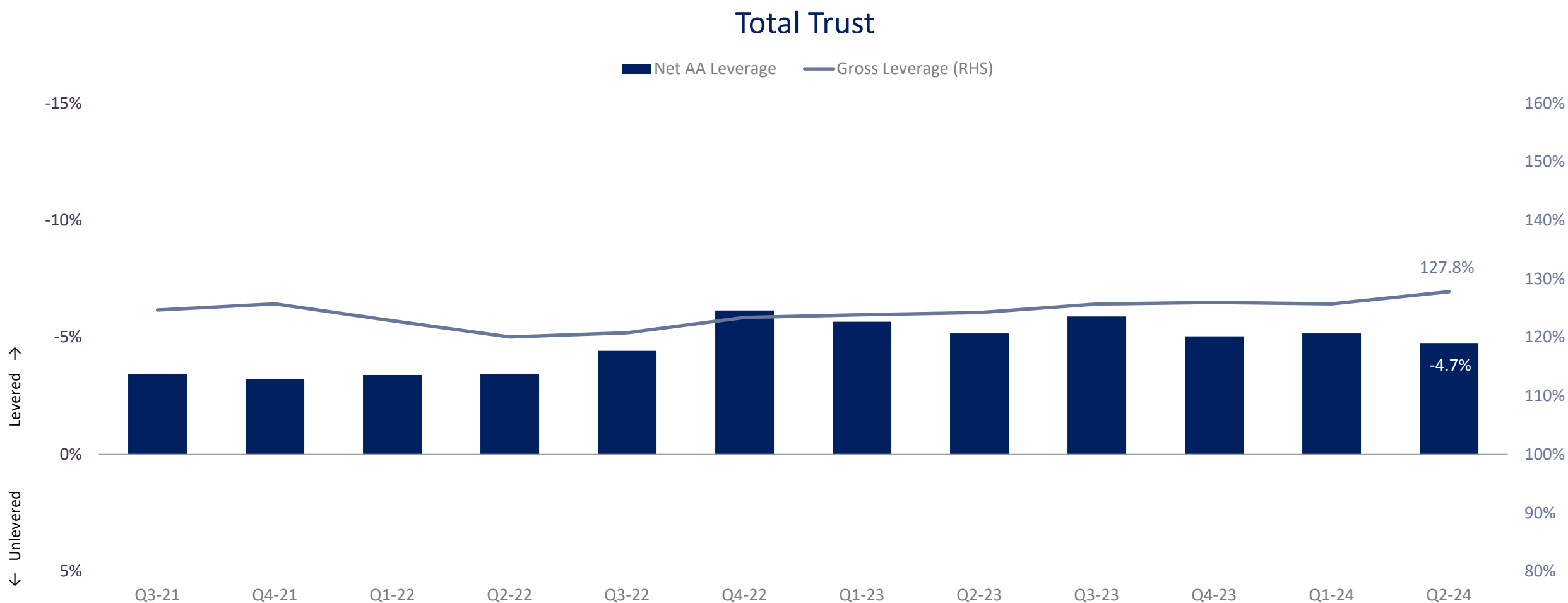
## Liquidity Ratio



Source: State Street Bank, TRS IMD

Assumptions: The stress case assumes liquid assets experience 1.5x the worst rolling monthly return since 2008 plus an additional liquidity stress. Operational uses of liquidity reflects forecasted monthly benefit payments. Stressed securities lending reflects potential costs associated with termination including a liquidity stress. Stressed non-collateralized assets and derivatives reflect margin calls based on the same market stress applied to Liquid Assets. Stressed Private Market investment estimates are informed by historical capital calls and distributions.

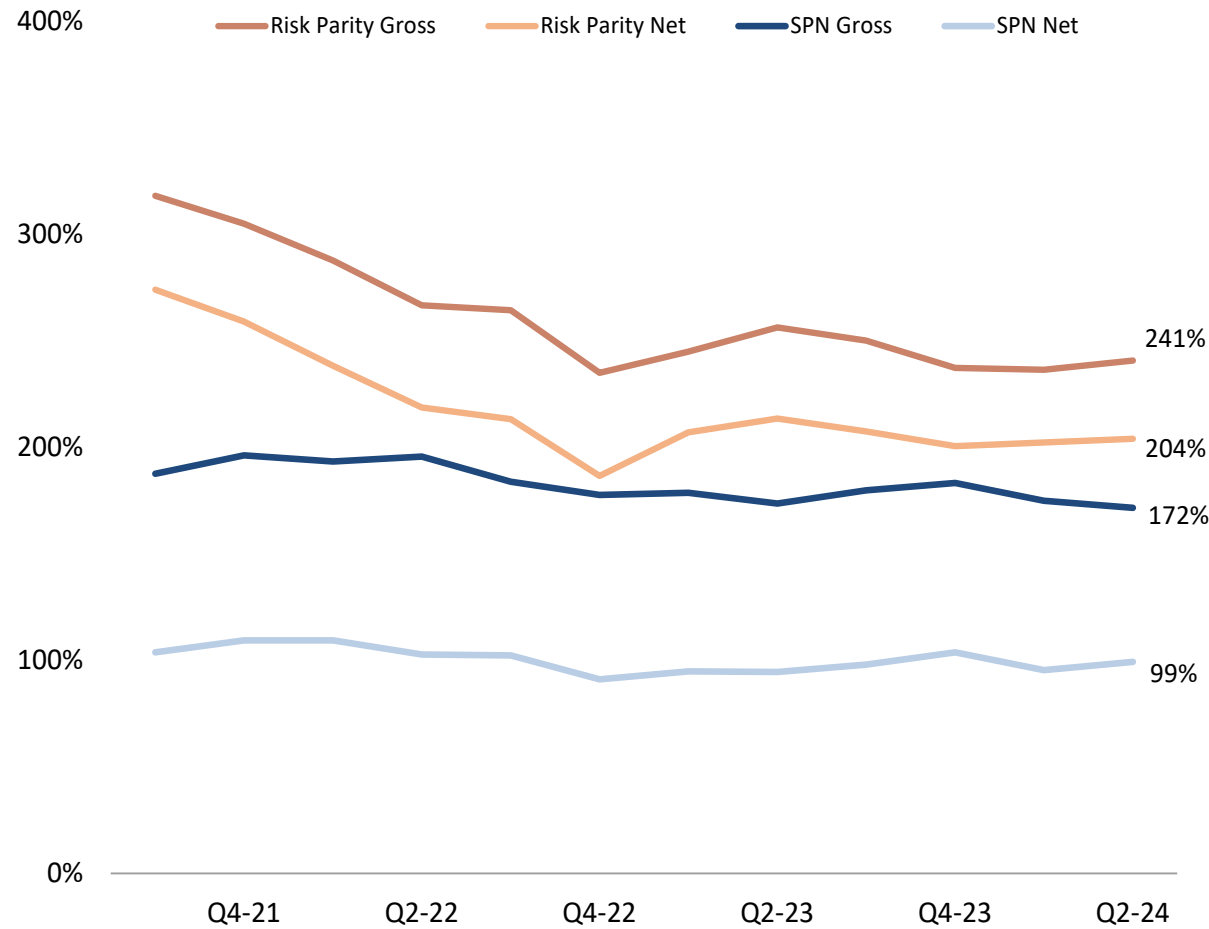
# Gross AA Leverage remained stable



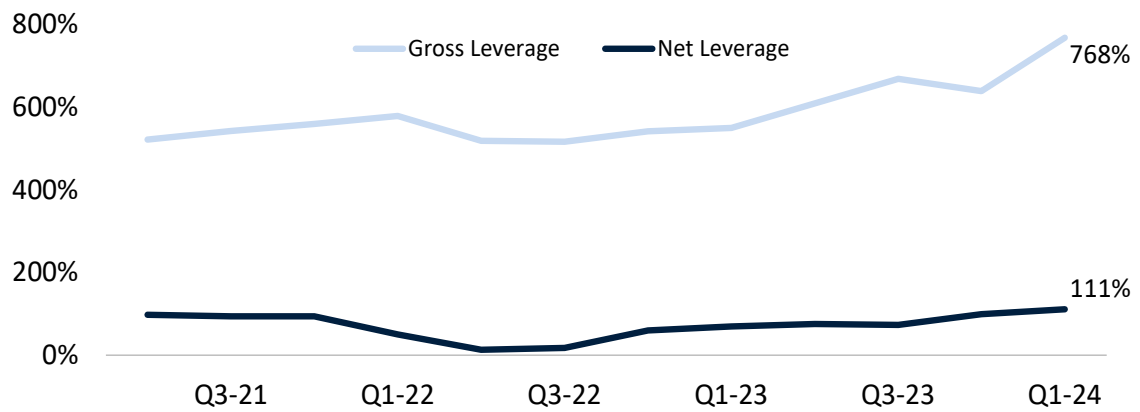
Source: State Street Bank; note: total Trust leverage excludes securities lending which is reported separately; Net AA Leverage includes adjustments for delta-notionalization of options and exclusion of FX forwards of 30 days or less

# Hedge Fund leverage increased given strong market returns

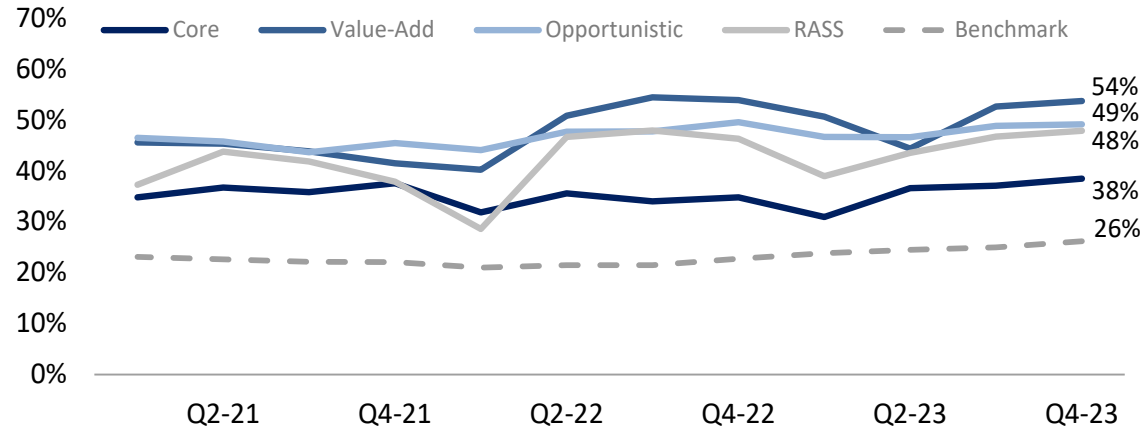
## Risk Parity and Public Strategic Partners



## Total Hedge Funds



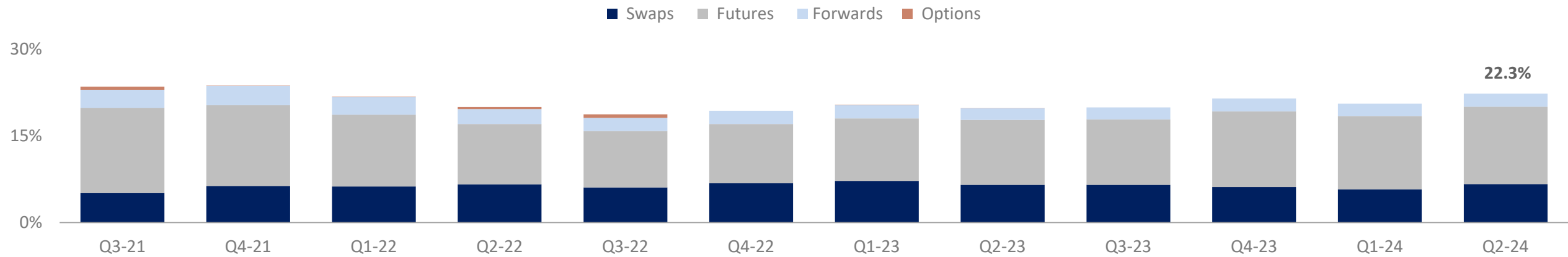
## Real Estate Loan to Value



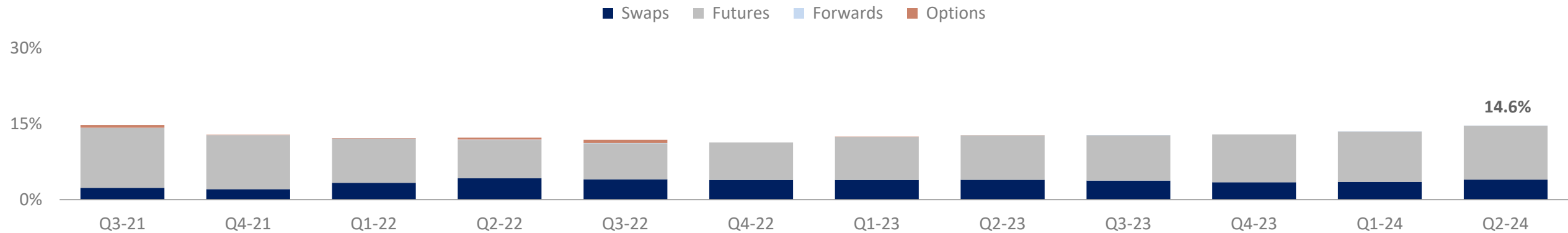
Source: State Street Bank, MSCI RiskMetrics. Hedge Fund overlay as a percentage of Total Directional Hedge Funds was 87% as of Q2 2024.

# Derivative notional increased primarily due to Hedge Fund Overlay

## Gross Notional by Instrument (% of Total Trust)



## Net Notional by Instrument (% of Total Trust)



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## In conclusion, key points are the following:

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- Risk metrics and Trust positioning have been steady over past two years
- VaR and tracking error remain stable and are a point of focus for SAA transition
- Securities Lending program smaller but still additive
- Changes upcoming to future Risk reports given SAA