

April 2023

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; Mr. Elliott, Mr. Hollingsworth,
Ms. Sissney and Mr. Walls, Jr.)*

*All or part of the April 27, 2023, 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, 5th Floor, Boardroom. T***

The open portions of the April 27, 2023, 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. A recording of the meeting will be available at www.trs.texas.gov.

**AGENDA
April 28, 2023 – 8:00 a.m.**

1. Call roll of Committee members.
2. Consider the approval of the proposed minutes of the December 2022 committee meeting – Committee Chair.
3. Receive an overview of the Investment Management Committee's Calendar Year 2023 Work Plan – Jase Auby.
4. CIO Update including Fleet Strategy; Talent Management; Accomplishments; and Key Dates and Upcoming Events – Jase Auby.
5. Discuss the Fourth Quarter 2022 Performance Review – Steve Voss and Mike McCormick, AON.
6. Annual Review of Public Markets – Dale West, Brad Gilbert, KJ Van Ackeren, Steven Wilson and Ashley Baum.
7. Semi-Annual Risk Report – James Nield and Stephen Kim.

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 December 8, 2022

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on December 8, 2022, 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 who participated:

Mr. David Corpus, Chair
Mr. Jarvis V. Hollingsworth
Mr. Christopher Moss
Mrs. Nanette Sissney
Mr. Robert H. Walls, Jr.

Other TRS Board Members attended virtually:

Mr. Mike Ball

Other TRS Board Members Present:

Mr. John Elliott
Mr. James D. Nance

Others present:

Brian Guthrie, TRS
Andrew Roth, TRS
Heather Traeger, TRS
Jase Auby, TRS
Katy Hoffman, TRS
James Nield, TRS
Mark Telschow, TRS
Jamie Llano, TRS
Katherine Farrell, TRS
Suzanne Dugan, Cohen Milstein
Dr. Keith Brown, Board Advisor
Steve Voss, Aon Hewitt
Mike McCormick, Aon Hewitt.

Investment Management Committee Chairman, Mr. David Corpus, called the meeting to order at 12:58 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 September 2022, Investment Management Committee meeting – Chair David Corpus.

On a motion by Mr. Hollingsworth, seconded by Mr. Moss, the committee unanimously voted to approve the proposed minutes for the September 2022 Investment Management Committee meeting as presented.

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

Mr. Jase Auby provided an overview of IMD matters. First he said top of mind was performance, as of September 30, 2022 the Trust value was \$173 billion with a one-year absolute return of -9.9 percent. He said as a long-term investor markets go up and down over time noting for the fourth quarter had a +5.8 percent return. He reported the SPN and Legal Summits were held here in Austin and that IMD was engaged in the annual priority setting process. He noted attrition within IMD was down and that more qualified applicants were applying for the job openings they did have.

4. Discuss the Third Quarter 2022 Performance Review – Steve Voss and Mike McCormick, AON.

Mr. Mike McCormick provided an overview of the Trust's performance. He reviewed the market performance noting the higher than expected inflation driving rates up and pushing bond returns negative. He said the uncertainty of how much negative pressure the U.S. Fed would need to put on the economy to stem inflation has driven return seeking assets, stocks, private equity, infrastructure generally negative. He reported public equities down 14 percent for the one-year period, stable value, long Treasuries, down 21 percent and risk parity down 26 percent. He said the outlier was real assets, real estate infrastructure, energy-type investments all producing trailing on-year returns of up to 25.3 percent.

5. Annual update of the Trading Group – Jamie Llano.

Mr. Jamie Llano provided an overview of trading and TRS trading performance. He reported their group was fully staffed with an average of 18 years of investment experience. He said the trading group has three mandates: implementation; index management; and market intelligence. He reported for year-end they had traded \$344 billion in value, beating the benchmark by 7.3 basis point. He said the breakdown on what was traded: equity is \$77 billion, futures and derivatives \$216 billion and foreign exchange \$50 billion. Mr. Llano discussed the foreign exchange as a special topic. He noted the market trades \$6 trillion a day, an almost 24-hour trading desk and not a centralized exchange. He concluded by reviewing 2022 accomplishments and 2023 priorities.

6. Annual update of Risk and Portfolio Management – James Nield and Mark Telschow.

Mr. James Nield provided an overview of the Risk and Portfolio Management Group. He said the four mandates for the group are portfolios, risk management, portfolios, trust management and trust strategy. He said on a daily basis there is a review of over 200 risk signals to direct attention to what is going on the world and what merits the group's focus. He said a list is compiled of the activity and shared monthly with the Management Committee in the risk monthly report. He noted if any action is needed, they refer to the battle plans and take action as needed.

Mr. Mark Telschow provided an update on portfolios which include governmental bonds, which is 16 percent of the Trust level allocation and risk parity which is 8 percent of the Trust allocation. He noted it has been a very difficult year for both government bonds and risk parity. He said the primary driver being the Fed raising rates from near zero up past 3 percent and continuing. He reviewed how assets had performed broadly over the past year saying there was a general decline in value given the Fed raising rates. Mr. Telschow reviewed the research portfolio process which has allowed the development of portfolios that could save the trust fees in the future, the latest is an internal commodities portfolio.

Mr. Nield reviewed the third mandate, Trust Management and provided an overview of that process. He said lastly, the group looks to optimize the balance sheet, to add incremental value to the organization with those assets. He said securities lending is an example of the group creating additional yield for the Trust on those assets. He said Risk Management helps determine how much liquidity the Trust needs and Trust Management figures out how to get that liquidity in the most efficient manner creating synergy between the two.

Mr. Nield concluded with the fourth mandate, Trust Strategy. He said the process begins with research, including capital market assumptions resulting in real-time insight into how markets are doing and which assets are more or less attractive through time. He discussed the Peer Intelligence Report and the Keystone Project which for the team is the asset allocation study.

There being no more business before the Investment Management Committee, the committee adjourned at 3:18 p.m.

Approved by the Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas on April __, 2023.

Katherine H. Farrell
Secretary of the TRS Board of Trustees

Date

Investment Management Committee – CY 2023

Schedule as of March 2023
Note: All committee schedules are subject to change

Committee Workplan

Informative (Receive)

Pre-Action (Review)

Action (Consider)

*Approved by committee only

February

April

May

July

September

December

- CIO Update including Fleet Strategy; Talent Management; Accomplishments; Notices; Awards; Key Dates and Upcoming Events; and Market Update – Jase Auby (30 min)
- Annual Review of Emerging Manager - Kirk Sims (15 min)

- CIO Update including Fleet Strategy; Talent Management; Accomplishments; Notices; Awards; Key Dates and Upcoming Events; and Market Update – Jase Auby (15 min)
- Discuss the Fourth Quarter 2022 Performance Review – Steve Voss and Mike McCormick, Aon (20 min)
- Annual Review of Public Markets – Dale West, Brad Gilbert, KJ Van Ackeren, Steven Wilson and Ashley Baum (60 min)
- Review of the Semi-Annual Risk Report – James Nield (15 min)

- CIO Update including Fleet Strategy; Talent Management; Accomplishments; Notices; Awards; Key Dates and Upcoming Events; and Market Update – Jase Auby (15 min)
- Discuss the First Quarter 2023 Performance Review – Steve Voss and Mike McCormick, Aon (20 min)
- Annual Review of External Private Markets – Eric Lang, Carolyn Hansard, Neil Randall, and Grant Walker (60 min)
- **Review of Proposed Modifications to Investment Policy Statement – Katy Hoffman (15 min)**

- CIO Update including Fleet Strategy; Talent Management; Accomplishments; Notices; Awards; Key Dates and Upcoming Events, and Market Update – Jase Auby (30 min)
- Discuss the Second Quarter 2023 Performance Review – Steve Voss and Mike McCormick – AON (20 min)
- Review of the Semi-Annual Risk Report – James Nield and Stephen Kim (15 min)

- CIO Update including Fleet Strategy; Talent Management; Accomplishments; Notices; Awards; Key Dates and Upcoming Events; and Market Update – Jase Auby (15 min)
- Discuss the Third Quarter 2023 Performance Review – Steve Voss and Mike McCormick, Aon (20 min)
- Annual Review of the Trading Group – Jaime Llano (15 min)
- Annual Review of Risk & Portfolio Management and **SAA Kickoff** – James Nield and Mike Simmons (30 min)
- Review of Investment Operations - Kendall Courtney (15 min)

Note: Times indicated are best estimate.

Fiscal Year 2023

Fiscal Year 2024

CIO Update

Jase Auby, Chief Investment Officer

April 2023



CIO Update

IMD at a Glance

Priorities

- **Performance.** Trust ended calendar year 2022 with 1-year return of -10.3% and 63 bp of excess return
- **Legislative.** Engaged in the 88th Texas Legislative session to offer subject matter expertise on the IMD's four investment related proposals
- **New Headquarters.** Final preparations for move to new building in Mueller is on schedule, expected May 2023
- **Financing.** Expanded Trust financing capabilities by completing first direct repo from a well known money market fund
- **Compensation.** Initiated studies on base pay (last done in 2021) and incentive pay (last done in 2018)

Key Dates and Upcoming Events

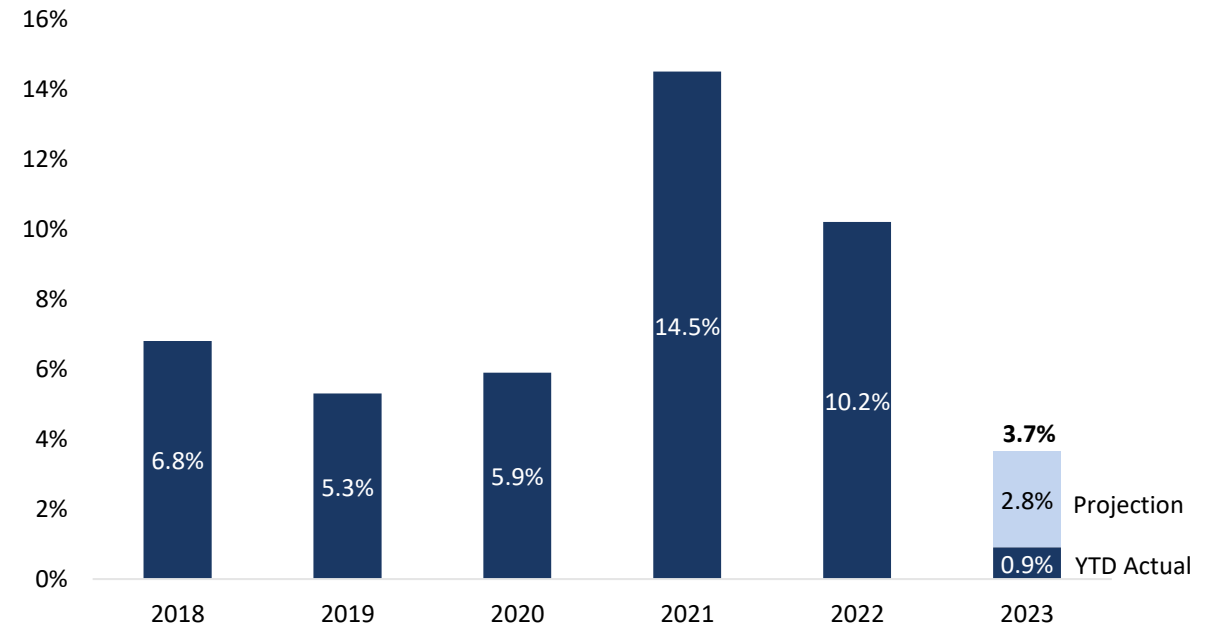
Event	Location	Dates
Milken Institute Global Conference	Los Angeles, CA	April 30 - May 3, 2023
GCM Grosvenor Consortium	New York City	May 23-24, 2023
RFK Compass Investor Conference	Chatham, MA	June 13-16, 2023

Our People

Snapshot as of March 2023

IMD FTEs	223
Shared-Services	21
Contractors	12
Secondes	5

Attrition Trend 2018 – 2023 (As of March 2023)



CIO Update

Metrics Reporting – As of December 31, 2022



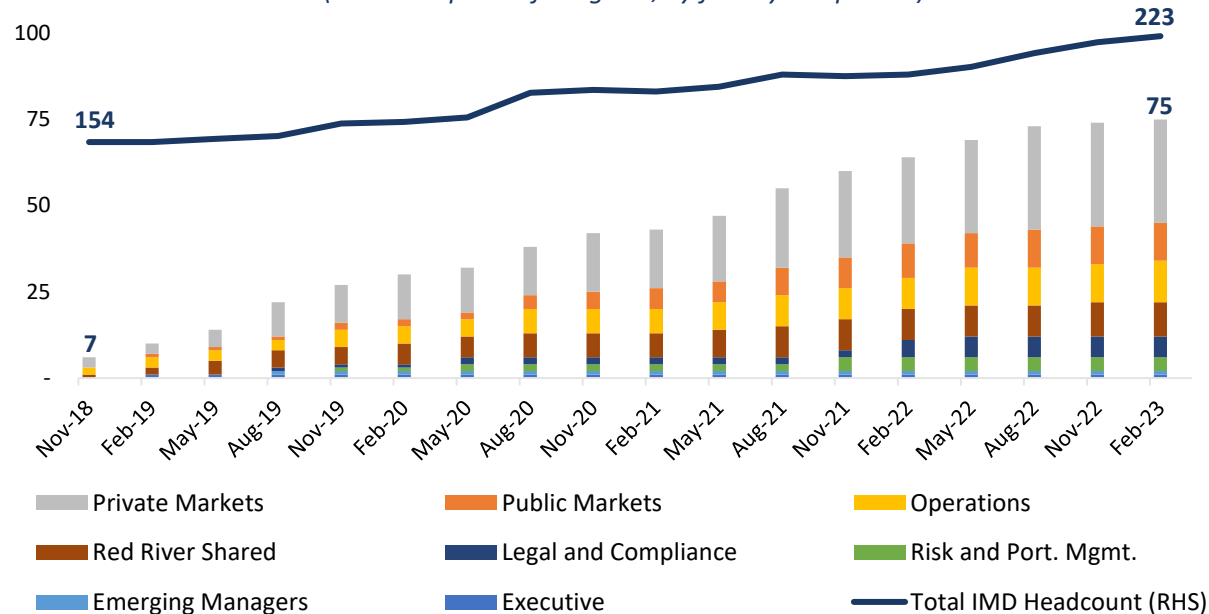
Metric	Objective	Target	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Total Trust Excess Return	Return in excess of the benchmark return for the Total Trust (3 Year Rolling)	+100 bp	+33 bp	+66 bp	+36 bp	+49 bp
Private Markets Excess Return	Return in excess of the benchmark return for Private Markets investments (3 Year Rolling)	+155 bp	+127 bp	+77 bp	-2 bp	-13 bp
Active Public Markets Excess Return	Return in excess of the benchmark return for Active Public Markets investments (3 Year Rolling)	+100 bp	-14 bp	+36 bp	+23 bp	+54 bp
Principal Investments	Percent of portfolio capital plan in principal investments approved (cumulative year-to-date) ¹	2022: 42%	YTD: 45%	YTD: 36%	YTD: 40%	2022: 39%
Public Equity Allocation	Percent of internal public equity allocation	45%	52%	50%	50%	49%
Estimated Total Net Fee Savings	External manager annual net fee savings ²	Total: \$1,465M	Total: \$1,223M			

Investment Management

Building the Fleet

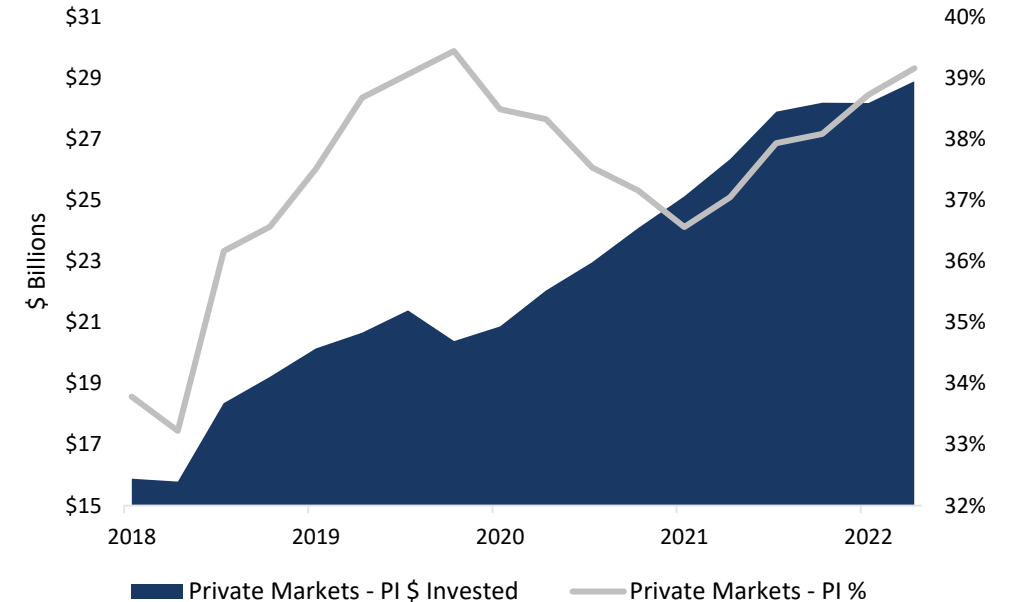
Building the Fleet Positions and Total Headcount Growth

(Since Inception of Program, by fiscal year quarter)



Private Markets Principal Investment Activity

(Since Inception of Program)



- Fleet growth strong despite slowdowns in hiring throughout the pandemic and challenges from the Great Resignation
- Since inception of the program in 2018, total headcount has grown 45% and the IMD has hired 75 Fleet FTEs as part of the initiative
- Over 90% of Fleet FTEs were at the Senior Associate level and below

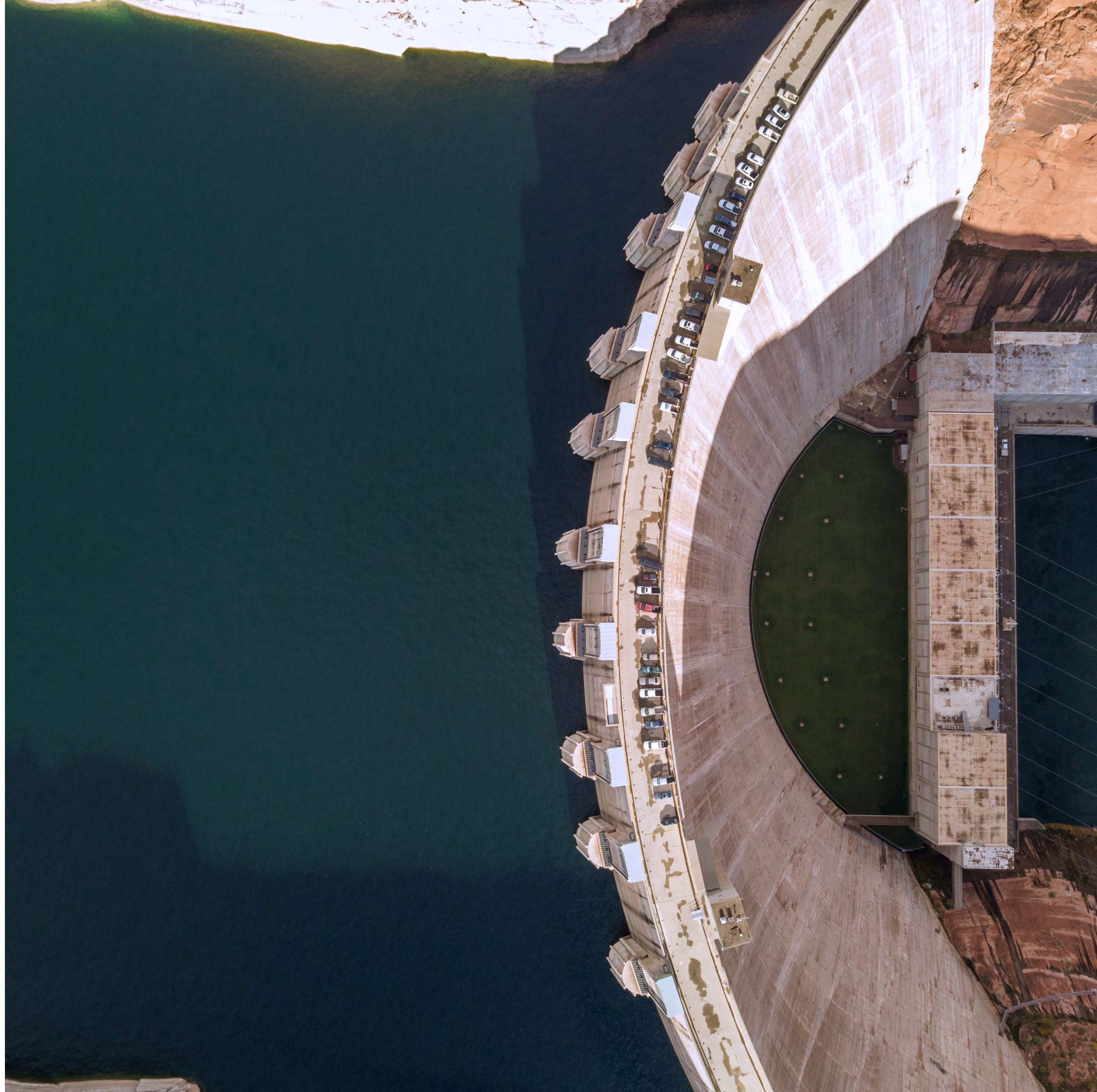
- Focus was to increase percentage of portfolio allocated to Principal Investments (PI), but it was equally important to raise the amount of dollars invested in PIs over time
- Additional efforts to increase internal management in public markets portfolios



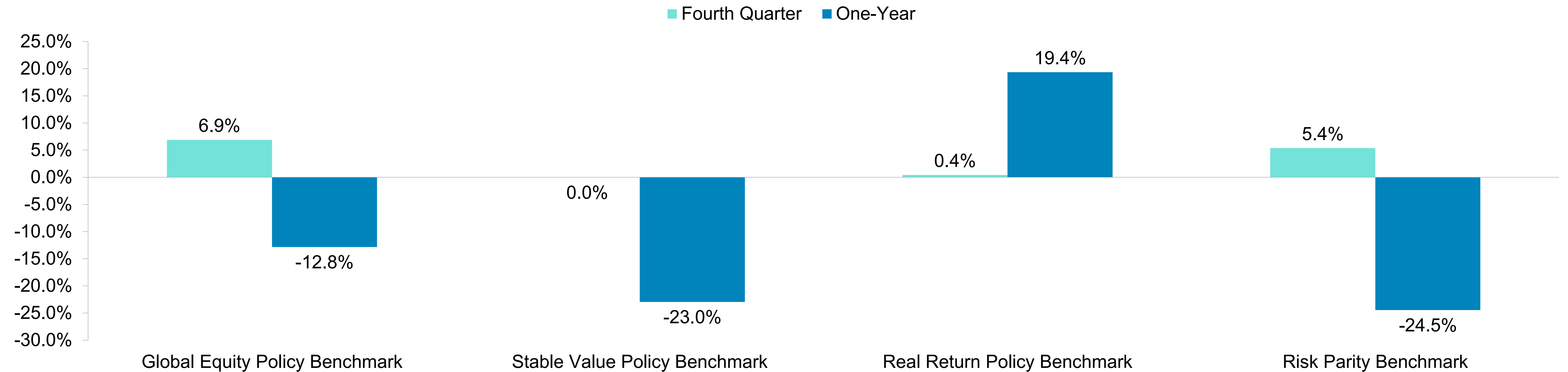
Teacher Retirement System of Texas

Performance Review:
Fourth Quarter 2022

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



In Q4 2022, equity markets rebounded as high-interest rate concerns abated. Yields trended higher with major central banks indicating continued support for aggressive monetary policy to control rising inflation.

Global equities rose 6.9% for the quarter but ended the year down -12.8%

The U.S. Federal Reserve (Fed) increased its benchmark interest rate by 125bps to a range of 4.25%-4.5% over the quarter. Fed chair Jerome Powell reiterated that monetary policy needs to be restrictive enough to bring inflation under control. According to the median estimate on the Fed dot plot, officials expect the policy rate to reach 5.1% by the end of 2023, up from the 4.6% forecasted in September.

TRS returned 4.3% for the quarter which was 0.1 percentage points above its benchmark

–Outperformance at the asset class level for Risk Parity and Real Return were the primary drivers for relative results.

For the trailing twelve months, TRS returned -10.3% versus the benchmark return of -10.9%

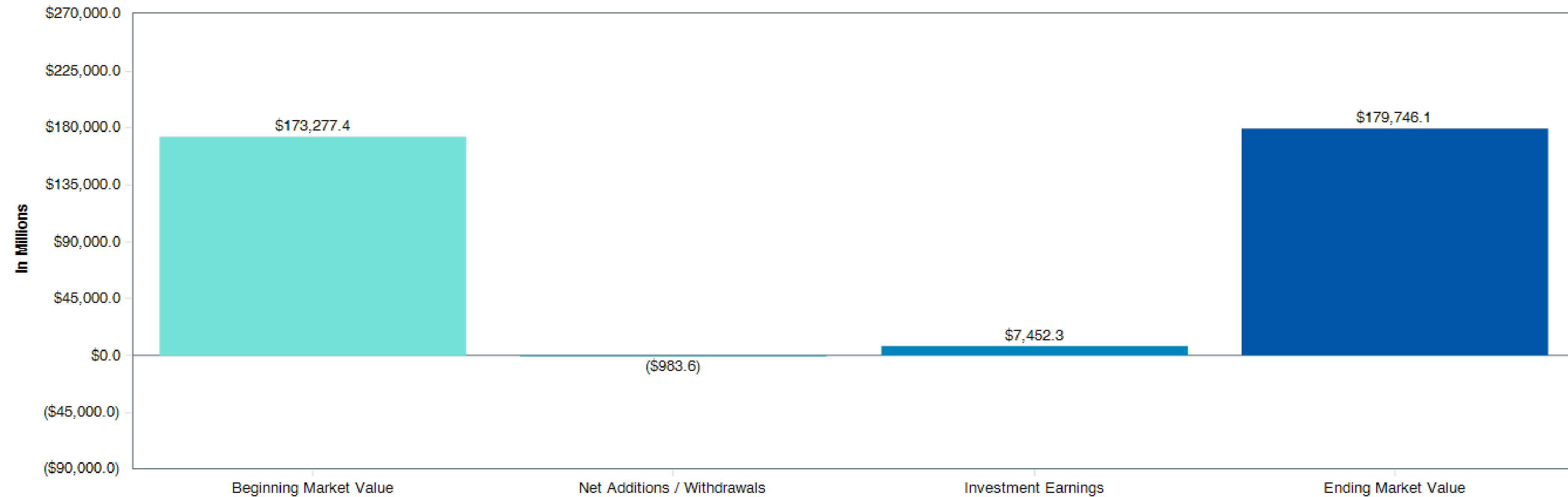
–Outperformance from the Stable Value and Risk Parity asset classes were the primary drivers of relative performance

1. Market Summary – Fourth Quarter 2022

	Fourth Quarter	One Year	Three Years	Five Years	Ten Years
Global Equity:					
TF USA Benchmark	7.1%	-19.3%	7.2%	8.9%	12.2%
TRS Non-US Developed Benchmark	16.1	-14.5	1.2	1.7	4.6
TRS Emerging Markets Benchmark	6.8	-22.2	-3.6	-1.9	1.2
HFRI Fund of Funds Composite Index	1.7	-5.3	3.7	3.0	3.5
State Street Private Equity Index (quarter lagged)	-1.4	-1.2	18.8	15.8	13.8
Global Equity Policy Benchmark	6.9	-12.8	7.6	7.5	8.9
Stable Value:					
Bloomberg Barclays Long Treasury Index	-0.6%	-29.3%	-7.4%	-2.2%	0.6%
HFRI Fund of Funds Conservative Index	1.5	0.1	4.7	3.9	3.6
Absolute Return Benchmark	2.0	5.9	3.7	4.0	3.3
90 Day U.S. Treasury Bill	0.9	1.5	0.7	1.2	0.8
Stable Value Policy Benchmark	0.0	-23.0	-4.4	-0.6	1.4
Real Return:					
Bloomberg Barclays U.S. TIPS Index	2.0%	-11.8%	1.2%	2.1%	1.1%
NCREIF ODCE (quarter lagged)	0.3	21.0	11.4	9.3	9.9
Energy, Natural Resources & Infrastructure Benchmark	0.7	15.2	9.2	7.2	--
Goldman Sachs Commodities Index	3.4	26.0	10.5	6.5	-3.3
Real Return Policy Benchmark	0.4	19.4	10.8	8.4	7.8
Risk Parity:					
Risk Parity Benchmark	5.4%	-24.5%	-2.8%	1.0%	3.3%
TRS Policy Benchmark	4.2%	-10.9%	5.4%	5.8%	7.1%

2. Market Value Change

From October 1, 2022 to December 31, 2022



Summary of Cash Flows

	1 Quarter	1 Year	3 Years	5 Years
Total Fund				
Beginning Market Value	173,277,443,496	204,712,889,318	162,585,302,761	151,251,851,617
+ Additions / Withdrawals	-983,577,952	-4,038,144,721	-12,533,823,123	-20,589,380,807
+ Investment Earnings	7,452,264,177	-20,928,614,878	29,694,650,082	49,083,658,910
= Ending Market Value	179,746,129,720	179,746,129,720	179,746,129,720	179,746,129,720

3. Asset Allocation Detail

	Market Value \$ in millions) as of 12/31/2022		Interim Policy Target	Relative to Interim Policy Target	Long Term Policy Target	Long Term Policy Ranges
	(\$)	(%)				
Investment Exposure	--	106.1%	104.0%	+2.1%	104.0%	99-115%
Total U.S.A.	\$27,377	15.2%	16.3%	-1.1%	18.0	13-23%
Non-U.S. Developed	\$23,121	12.9%	11.7%	+1.2%	13.0	8-18%
Emerging Markets	\$14,752	8.2%	8.0%	+0.2%	9.0	4-14%
Private Equity	\$31,346	17.4%	18.1%	-0.7%	14.0	9-24%*
Global Equity	\$96,956	53.7%	54.2%	-0.5%	54.0	47-61%
Government Bonds	\$24,642	13.7%	14.4%	-0.7%	16.0	0-21%
Stable Value Hedge Funds	\$9,743	5.4%	4.4%	+1.0%	5.0	0-10%
Absolute Return	\$4,920	2.7%	0.0%	+2.7%	0.0	0-20%
Stable Value	\$39,306	21.9%	18.8%	+3.1%	21.0	14-28%
Real Estate	\$30,860	17.2%	17.3%	-0.1%	15.0	10-20%
Energy, Natural Resource and Inf.	\$11,677	6.5%	6.6%	-0.1%	6.0	1-11%
Commodities	\$407	0.2%	0.0%	+0.2%	0.0	0-5%
Real Return	\$42,944	23.9%	23.9%	0.0%	21.0	14-28%
Risk Parity	\$11,945	6.6%	7.2%	-0.6%	8.0	0-13%
Risk Parity	\$11,945	6.6%	7.2%	-0.6%	8.0	0-13%
Cash	\$3,394	1.9%	2.0%	-0.1%	2.0	0-7%
Asset Allocation Leverage	-\$14,438	-8.0%	-6.0%	-2.0%	-6.0	--
Net Asset Allocation	-\$11,045	-6.1%	-4.0%	-2.1%	-4.0	--
Total Fund	\$179,746	100.0%		---	100.0%	--

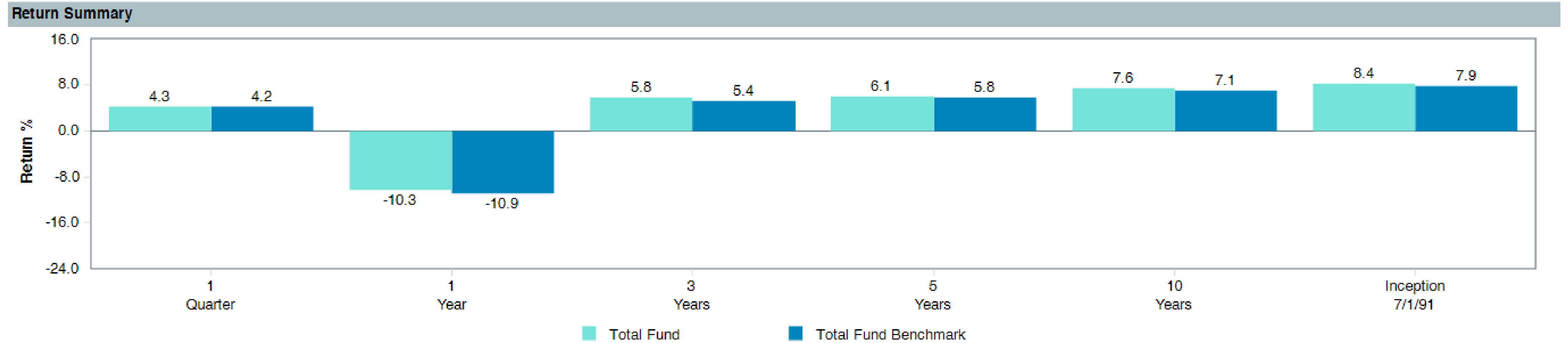


Note: Asset allocation information shown above is based upon MOPAR reporting. The excess returns shown above may not be a perfect difference between the actual and benchmark returns due entirely to rounding.

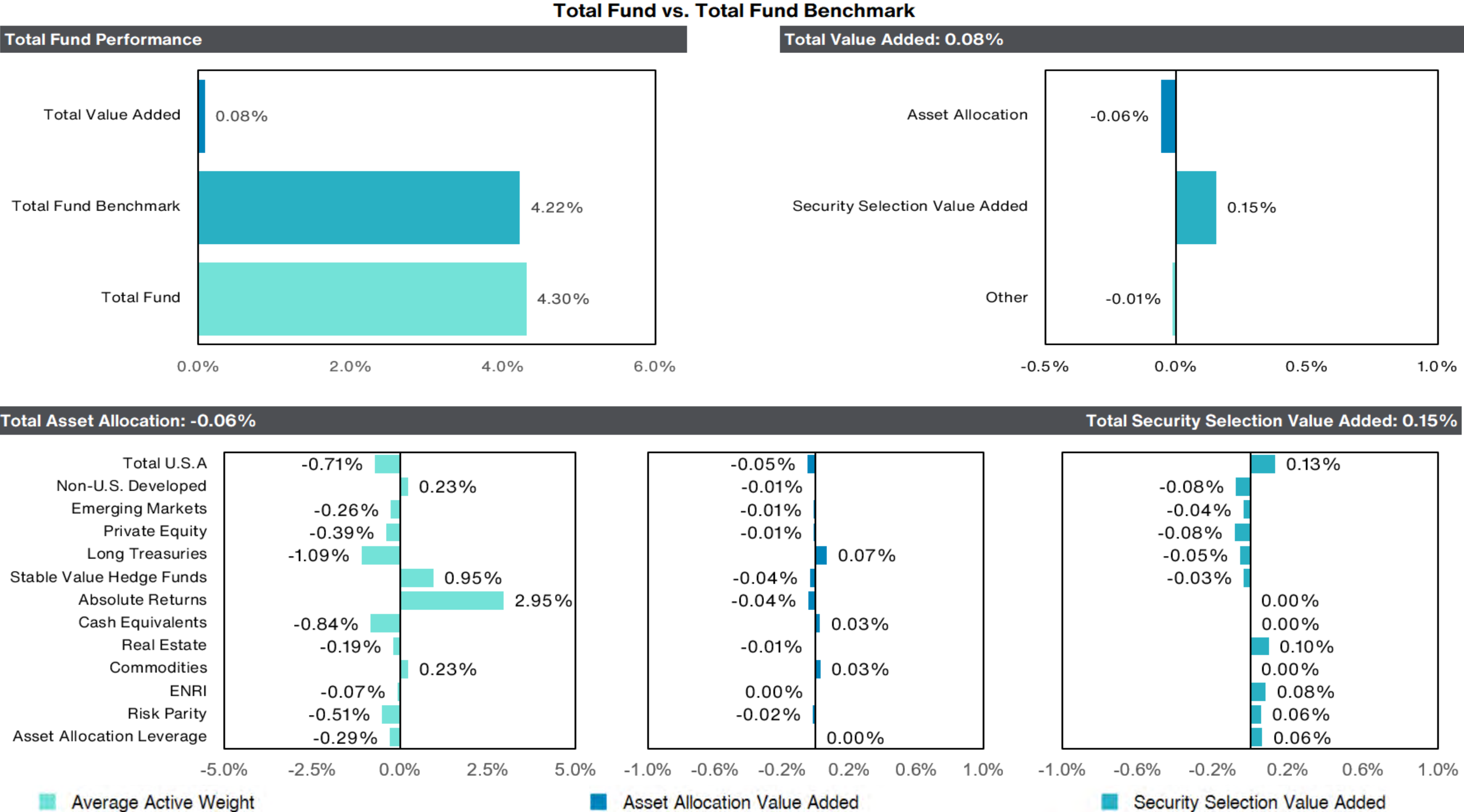
*Reverts to 9-19% on 7/31/23

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

4. Total TRS Performance Ending 12/31/2022



5. Total Fund Attribution – One Quarter Ending 12/31/2022

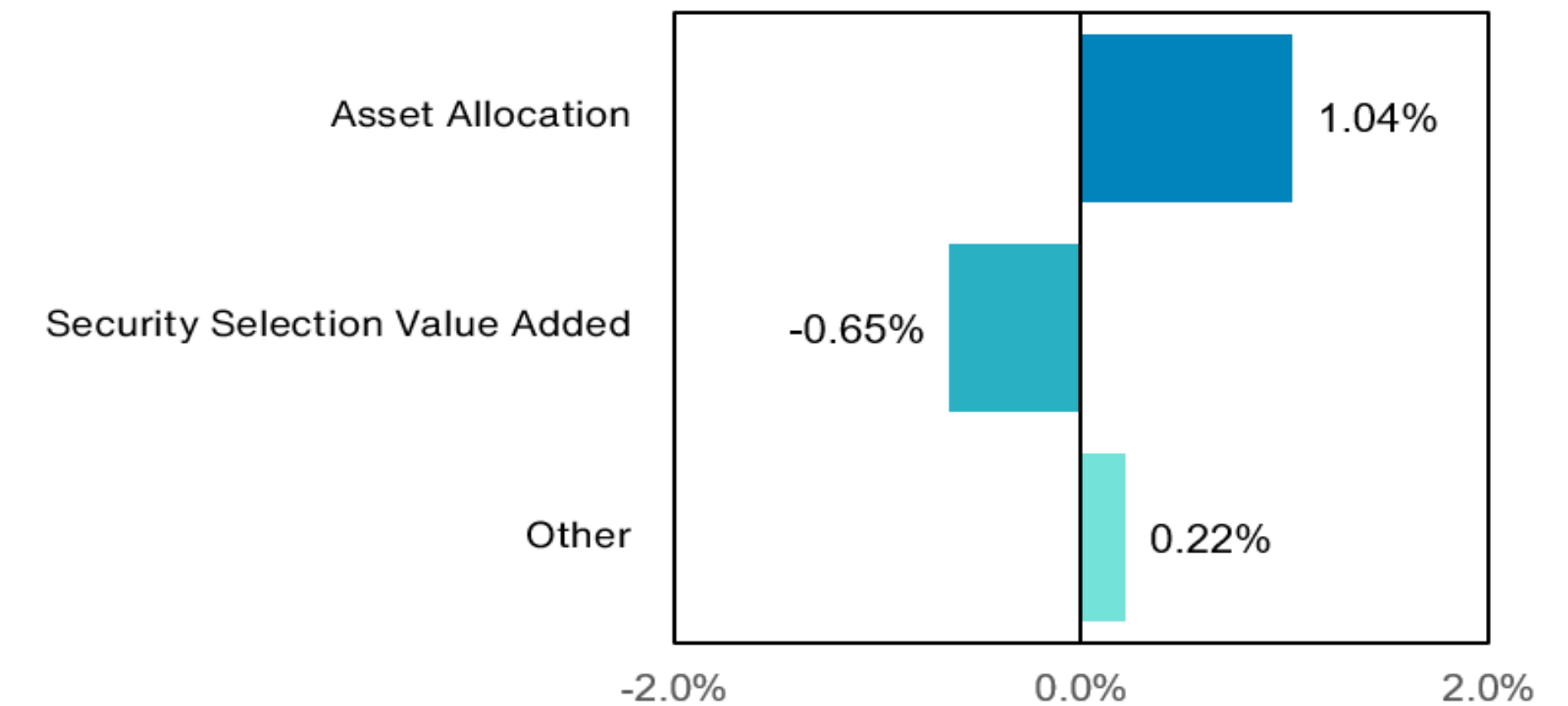
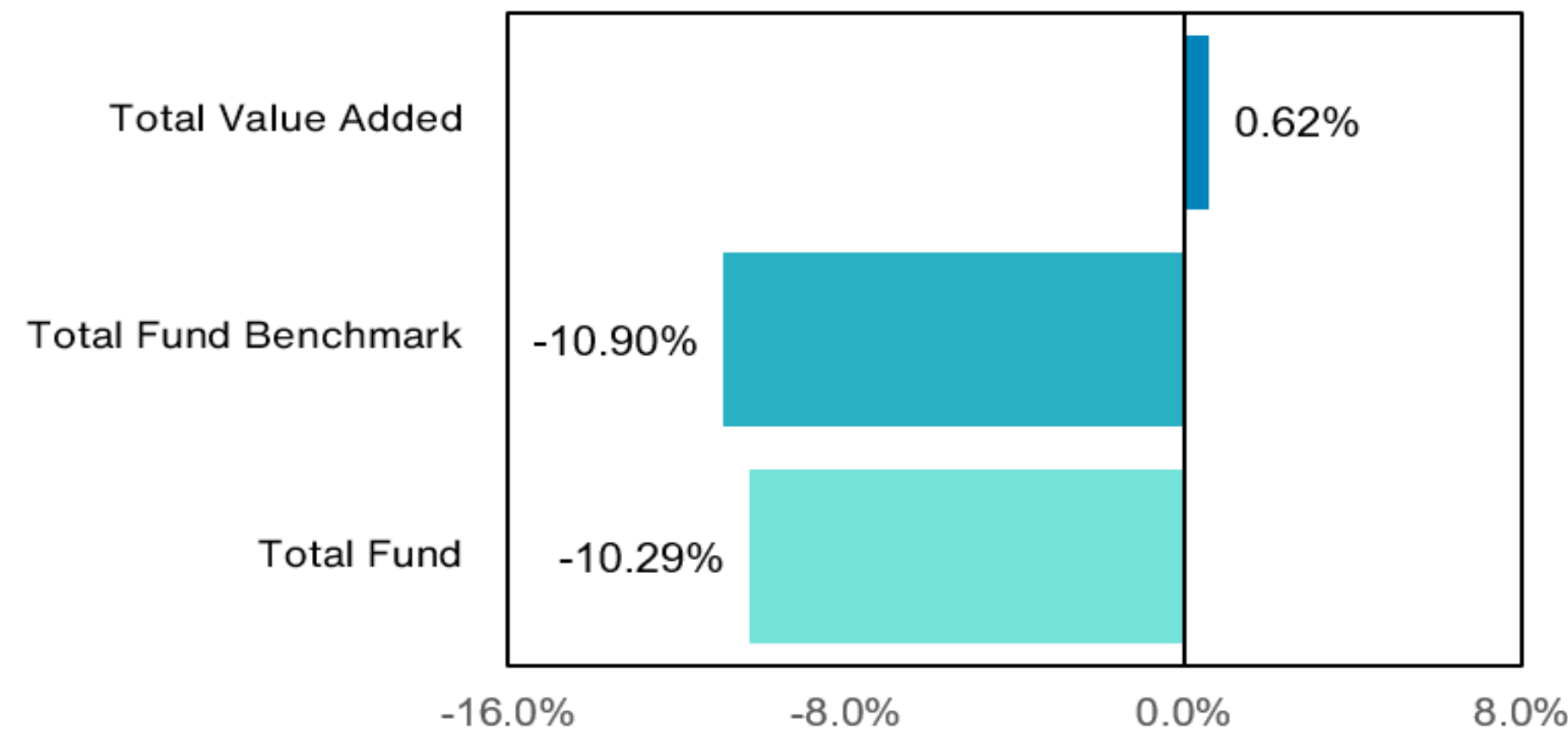


5. Total Fund Attribution – One Year Ending 12/31/2022

Total Fund vs. Total Fund Benchmark

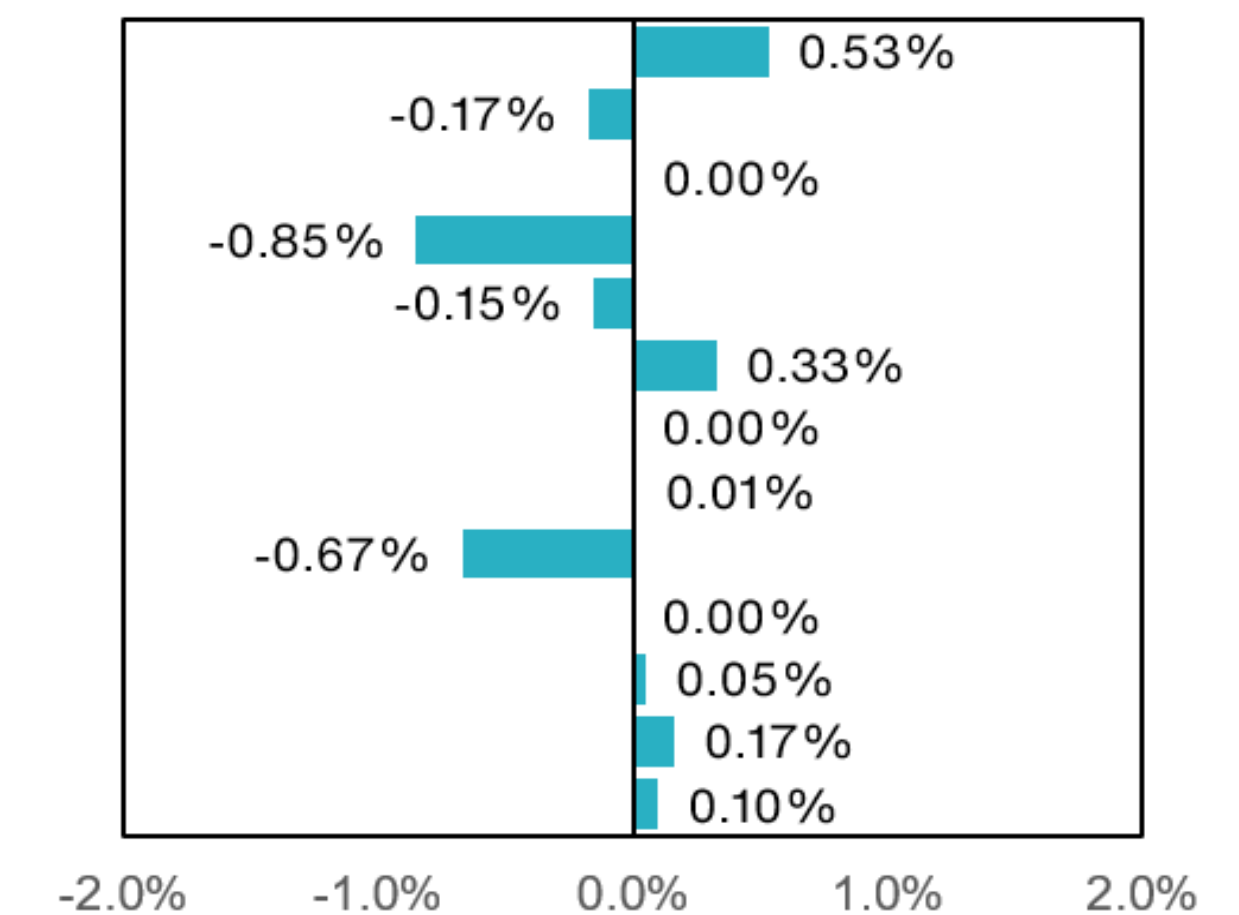
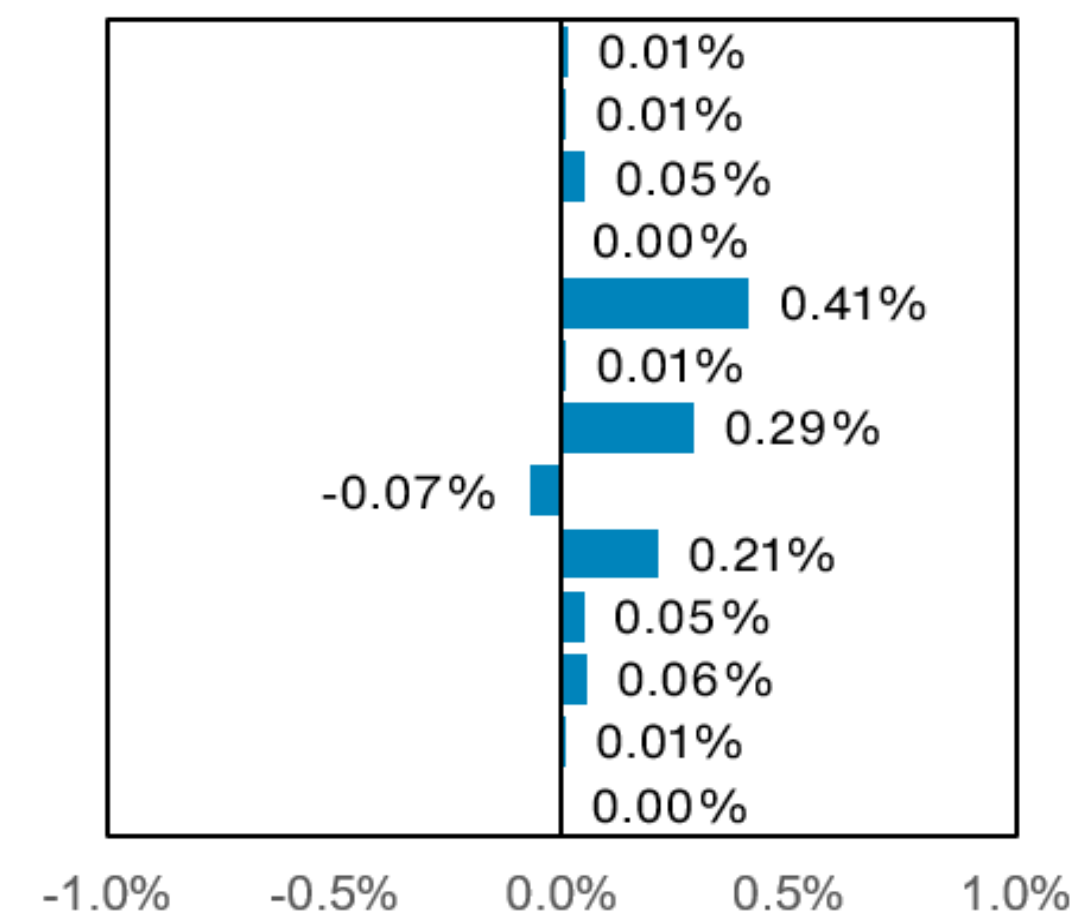
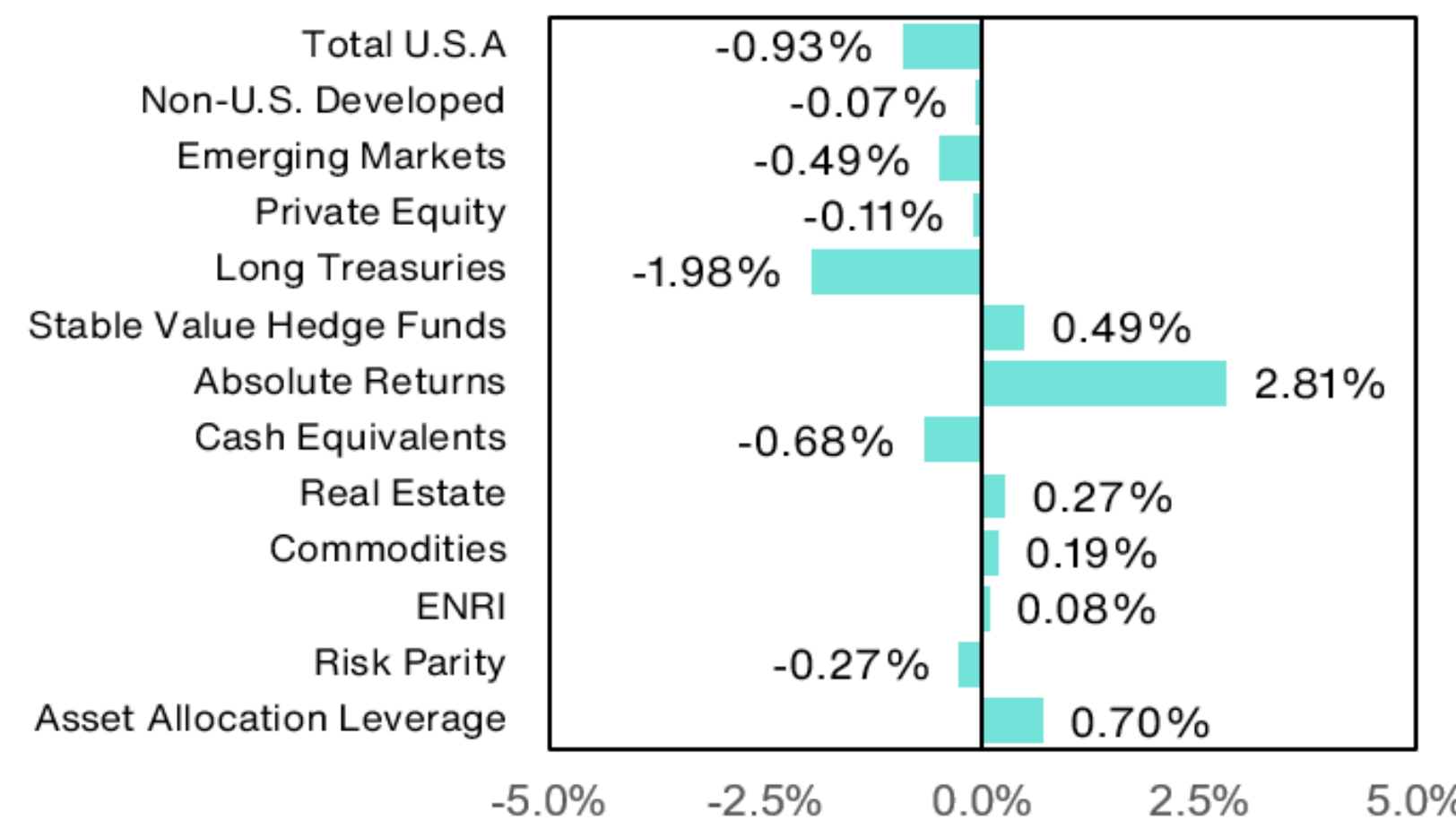
Total Fund Performance

Total Value Added: 0.62%



Total Asset Allocation: 1.04%

Total Security Selection Value Added: -0.65%

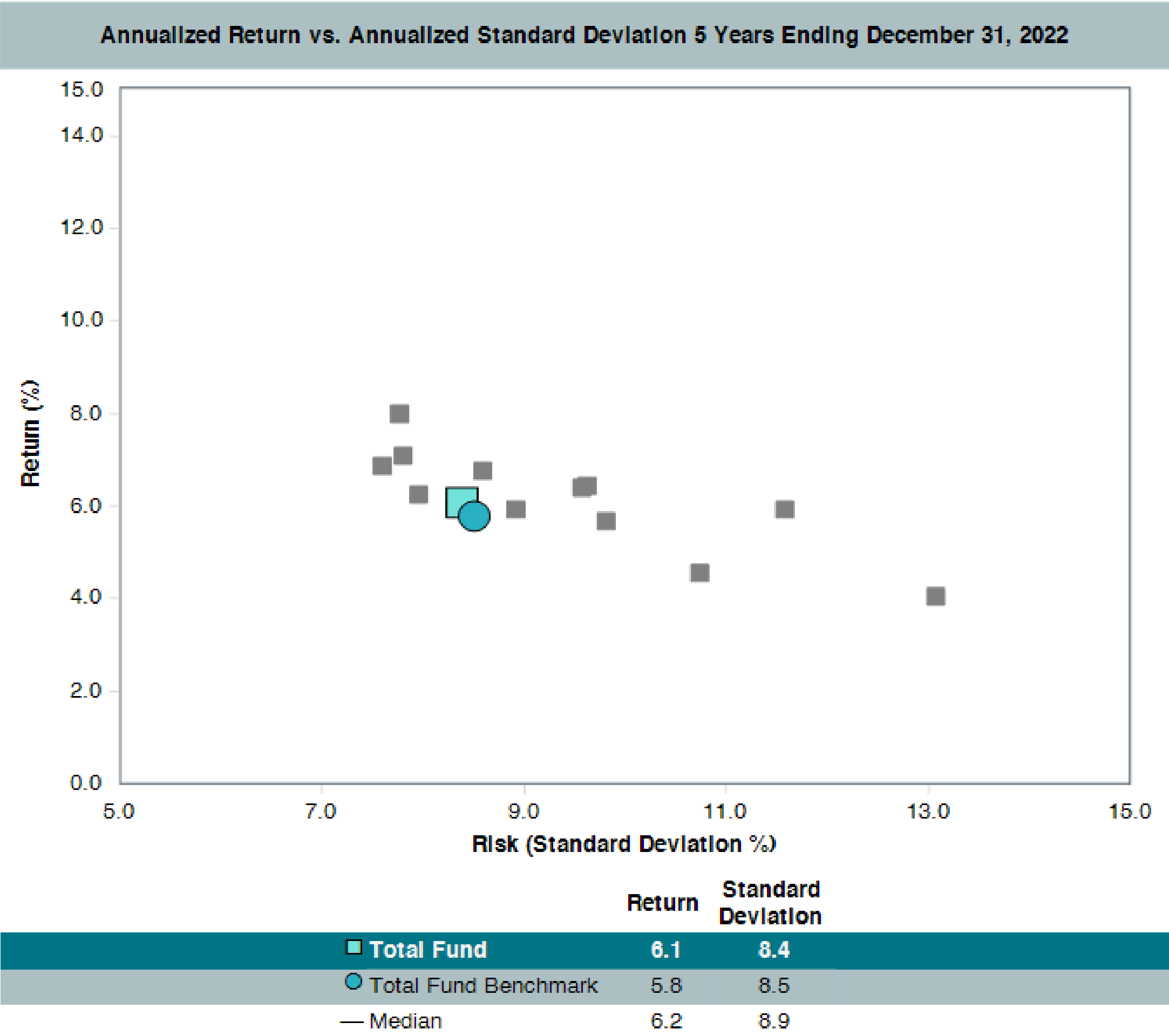
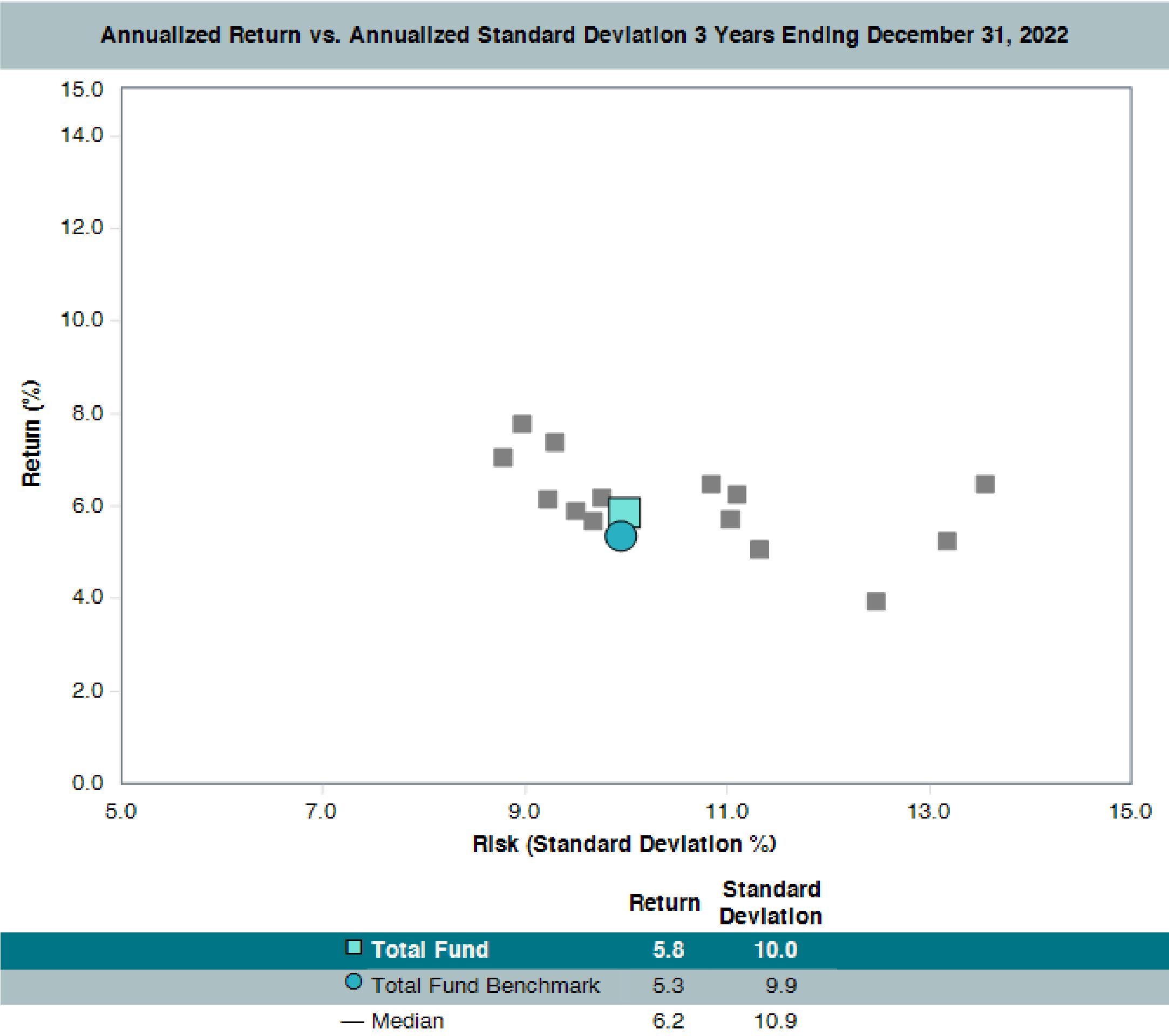


Average Active Weight

Asset Allocation Value Added

Security Selection Value Added

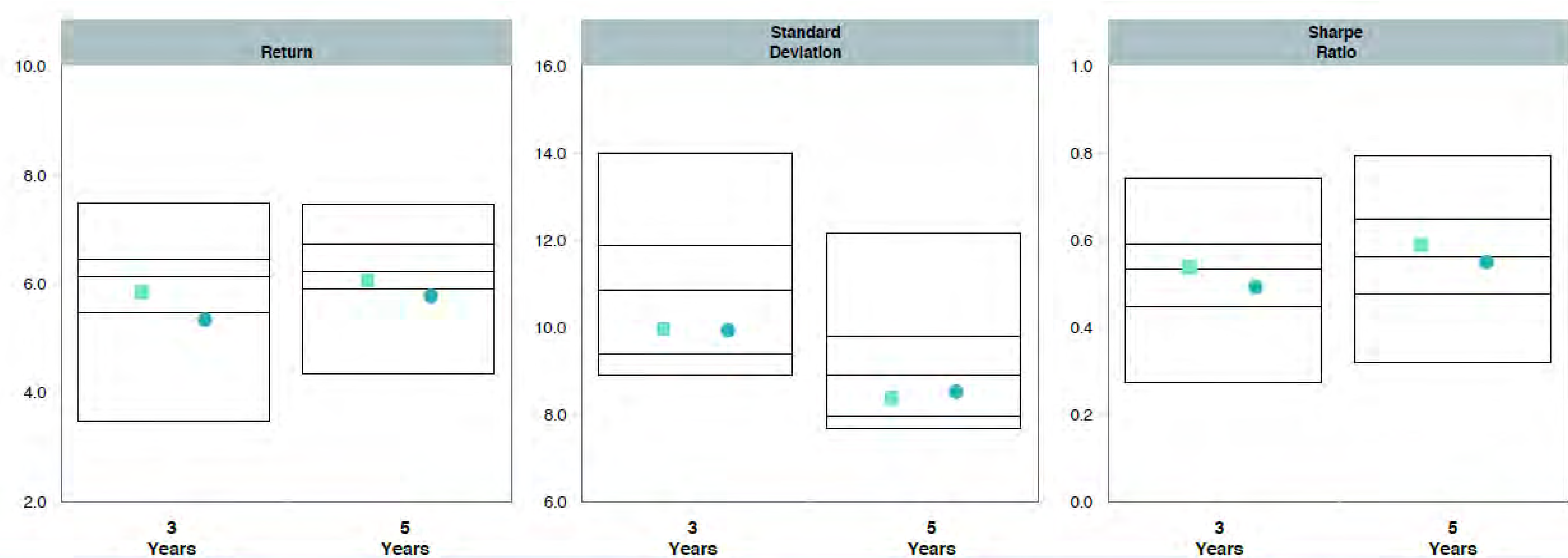
6. Risk Profile: Total Fund Risk-Return vs. Peers



Note: Public Plan peer group composed of 15 and 13 public funds, respectively, with total assets in excess of \$10B as of 12/31/2022. 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

Total Fund vs. All Public Plans > \$10B



	3 Years		5 Years	
Total Fund	5.8	(60)	6.1	(56)
Total Fund Benchmark	5.4	(77)	5.8	(80)
5th Percentile	7.5		7.5	
1st Quartile	6.5		6.7	
Median	6.2		6.2	
3rd Quartile	5.5		5.9	
95th Percentile	3.5		4.4	
Population	15		13	

	3 Years		5 Years	
Total Fund	10.0	(56)	8.4	(65)
Total Fund Benchmark	9.9	(56)	8.5	(61)
5th Percentile	14.0		12.2	
1st Quartile	11.9		9.8	
Median	10.9		8.9	
3rd Quartile	9.4		8.0	
95th Percentile	8.9		7.7	
Population	15		13	

	3 Years		5 Years	
Total Fund	0.5	(49)	0.6	(41)
Total Fund Benchmark	0.5	(63)	0.5	(64)
5th Percentile	0.7		0.8	
1st Quartile	0.6		0.7	
Median	0.5		0.6	
3rd Quartile	0.4		0.5	
95th Percentile	0.3		0.3	
Population	15		13	

Parentheses contain percentile rankings.

7. IPS Stated Trust Return Objectives ending 12/31/2022

	Five Year	Seven Year	Ten Year	Twenty Year
Total Fund	6.1	7.9	7.6	7.8
Total Fund Benchmark	5.8	7.4	7.1	7.4
Difference	+0.3	+0.5	+0.5	+0.4
Total Fund	6.1	7.9	7.6	7.8
Assumed Rate of Return	7.3	7.5	7.7	7.8
Difference	-1.2	+0.4	-0.1	0.0
Total Fund	6.1	7.9	7.6	7.8
CPI + 5%	9.0	8.5	7.6	7.6
Difference	-2.9	-0.6	0.0	+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.

8. Global Equity: Performance Summary Ending 12/31/2022

	Fourth Quarter	One Year	Three Year	Five Year	Ten Year
Total Global Equity	6.7	-13.6	7.2	6.9	8.7
Total Global Equity Benchmark	6.9	-12.8	7.6	7.5	8.9
<i>Difference</i>	<i>-0.2</i>	<i>-0.8</i>	<i>-0.4</i>	<i>-0.6</i>	<i>-0.2</i>
Total U.S. Equity	8.1	-16.2	7.3	8.0	11.0
Total U.S. Equity Benchmark	7.1	-19.3	7.2	8.9	12.2
<i>Difference</i>	<i>+1.0</i>	<i>+3.1</i>	<i>+0.1</i>	<i>-0.9</i>	<i>-1.2</i>
Non-U.S. Equity	11.8	-18.3	-0.1	0.7	3.9
Non-U.S. Equity Benchmark	12.3	-17.5	-0.6	0.4	3.3
<i>Difference</i>	<i>-0.5</i>	<i>-0.8</i>	<i>+0.5</i>	<i>+0.3</i>	<i>+0.6</i>
Non-U.S. Developed	15.4	-15.8	1.2	1.5	5.0
TRS Non-U.S. Developed Benchmark	16.1	-14.5	1.2	1.7	4.6
<i>Difference</i>	<i>-0.7</i>	<i>-1.3</i>	<i>0.0</i>	<i>-0.2</i>	<i>+0.4</i>
Emerging Markets	6.5	-22.0	-2.2	-0.8	2.2
TRS Emerging Market Benchmark	6.8	-22.2	-3.6	-1.9	1.2
<i>Difference</i>	<i>-0.3</i>	<i>+0.2</i>	<i>+1.4</i>	<i>+1.1</i>	<i>+1.0</i>

8. Global Equity: Performance Summary Ending 12/31/2022 (cont'd)

	Fourth Quarter	One Year	Three Year	Five Year	Ten Year
Total Public Equity	10.3	-17.2	3.2	3.9	6.8
Public Equity Benchmark	10.1	-18.2	3.0	4.2	7.0
<i>Difference</i>	<i>+0.2</i>	<i>+1.0</i>	<i>+0.2</i>	<i>-0.3</i>	<i>-0.2</i>
Total Private Equity	0.1	-5.0	17.3	14.7	14.6
Private Equity Benchmark	0.5	0.1	19.1	16.1	14.0
<i>Difference</i>	<i>-0.4</i>	<i>-5.1</i>	<i>-1.8</i>	<i>-1.4</i>	<i>+0.6</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.

9. Stable Value: Performance Summary Ending 12/31/2022

	Fourth Quarter	One Year	Three Year	Five Year	Ten Year
Total Stable Value	0.1	-18.5	-2.1	0.9	2.9
Total Stable Value Benchmark	0.0	-23.0	-4.4	-0.6	1.4
<i>Difference</i>	<i>+0.1</i>	<i>+4.5</i>	<i>+2.3</i>	<i>+1.5</i>	<i>+1.5</i>
Total Government Bonds	-1.0	-30.2	-7.9	-2.3	0.8
Treasury Benchmark	-0.6	-29.3	-7.4	-2.2	0.6
<i>Difference</i>	<i>-0.4</i>	<i>-0.9</i>	<i>-0.5</i>	<i>-0.1</i>	<i>+0.2</i>
Stable Value Hedge Funds	0.9	7.3	8.4	6.4	5.8
Hedge Funds Benchmark	1.5	0.1	4.7	3.9	3.6
<i>Difference</i>	<i>-0.6</i>	<i>+7.2</i>	<i>+3.7</i>	<i>+2.5</i>	<i>+2.2</i>
Absolute Return	2.8	0.0	5.9	6.5	7.6
Absolute Return Benchmark	2.0	5.9	3.7	4.0	3.3
<i>Difference</i>	<i>+0.8</i>	<i>-5.9</i>	<i>+2.2</i>	<i>+2.5</i>	<i>+4.3</i>

10. Real Return: Performance Summary Ending 12/31/2022

	Fourth Quarter	One Year	Three Year	Five Year	Ten Year
Total Real Return	1.4	16.8	12.2	10.3	9.1
Real Return Benchmark	0.4	19.4	10.8	8.4	7.8
<i>Difference</i>	<i>+1.0</i>	<i>-2.6</i>	<i>1.4</i>	<i>1.9</i>	<i>1.3</i>
Real Estate	0.9	16.7	13.7	11.9	12.2
Real Estate Benchmark	0.3	21.0	11.4	9.3	9.9
<i>Difference</i>	<i>+0.6</i>	<i>-4.3</i>	<i>2.3</i>	<i>2.6</i>	<i>2.3</i>
Energy, Natural Resources, and Infrastructure	2.1	16.9	8.5	7.6	--
Energy and Natural Res. Benchmark	0.7	15.2	9.2	7.2	--
<i>Difference</i>	<i>1.4</i>	<i>1.7</i>	<i>-0.7</i>	<i>+0.4</i>	
Commodities	17.8	15.2	14.5	4.6	-6.5
Commodities Benchmark	3.4	26.0	10.5	6.5	-3.3
<i>Difference</i>	<i>+14.4</i>	<i>-10.8</i>	<i>+4.0</i>	<i>-1.9</i>	<i>-3.2</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 12/31/2022

	Fourth Quarter	One Year	Three Year	Five Year	Ten Year
Total Risk Parity	6.3	-22.5	-3.8	0.5	2.9
Risk Parity Benchmark	5.4	-24.5	-2.8	1.0	3.3
<i>Difference</i>	+0.9	+2.0	-1.0	-0.5	-0.4

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. Risk Parity: Performance Summary Ending 12/31/2022

	Fourth Quarter	One Year	Three Year	Five Year	Ten Year
Cash Equivalents	1.0	2.6	1.3	1.5	2.0
Cash Benchmark	0.9	1.5	0.7	1.2	0.8
<i>Difference</i>	+0.1	+1.1	+0.6	+0.3	+1.2

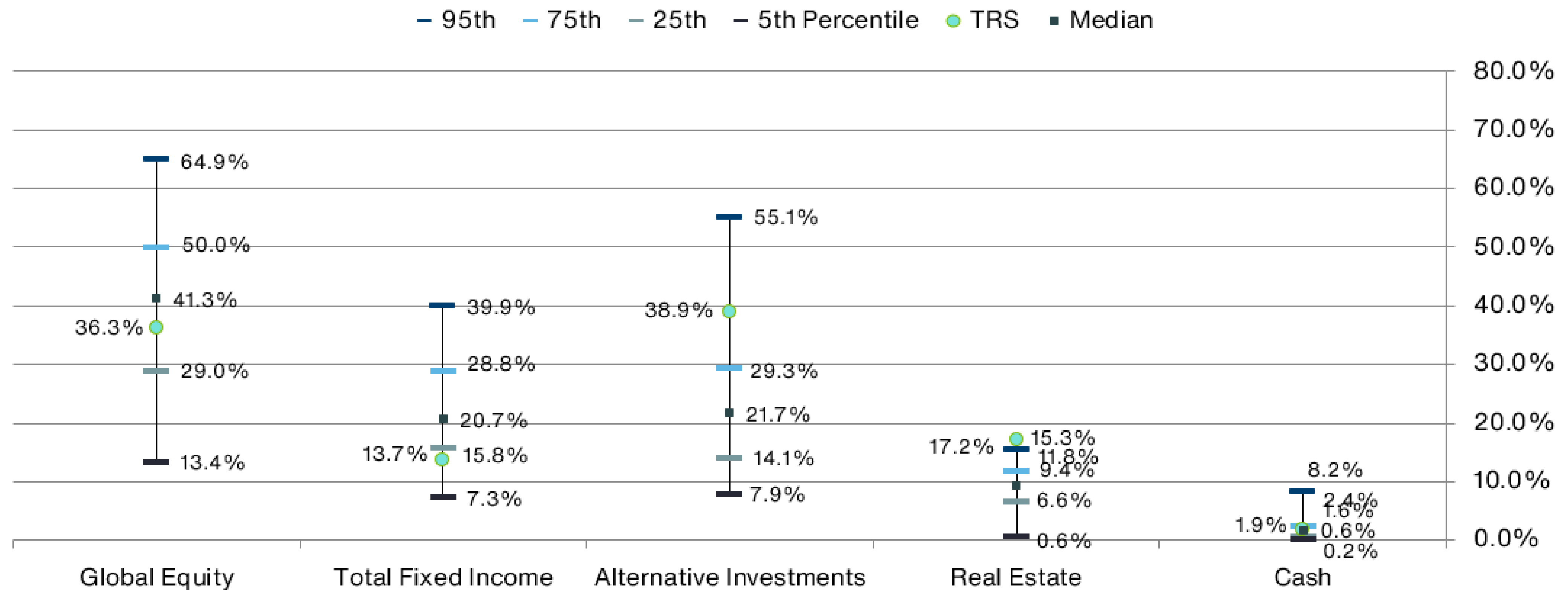
Note: The excess returns shown in this presentation may differ from State Street statements due entirely to rounding. These differences are generally within a few basis points and are not material.

Appendix – Supplemental Reporting



TRS Commitment Levels vs. Peers (>\$10 Billion) as of 12/31/2022

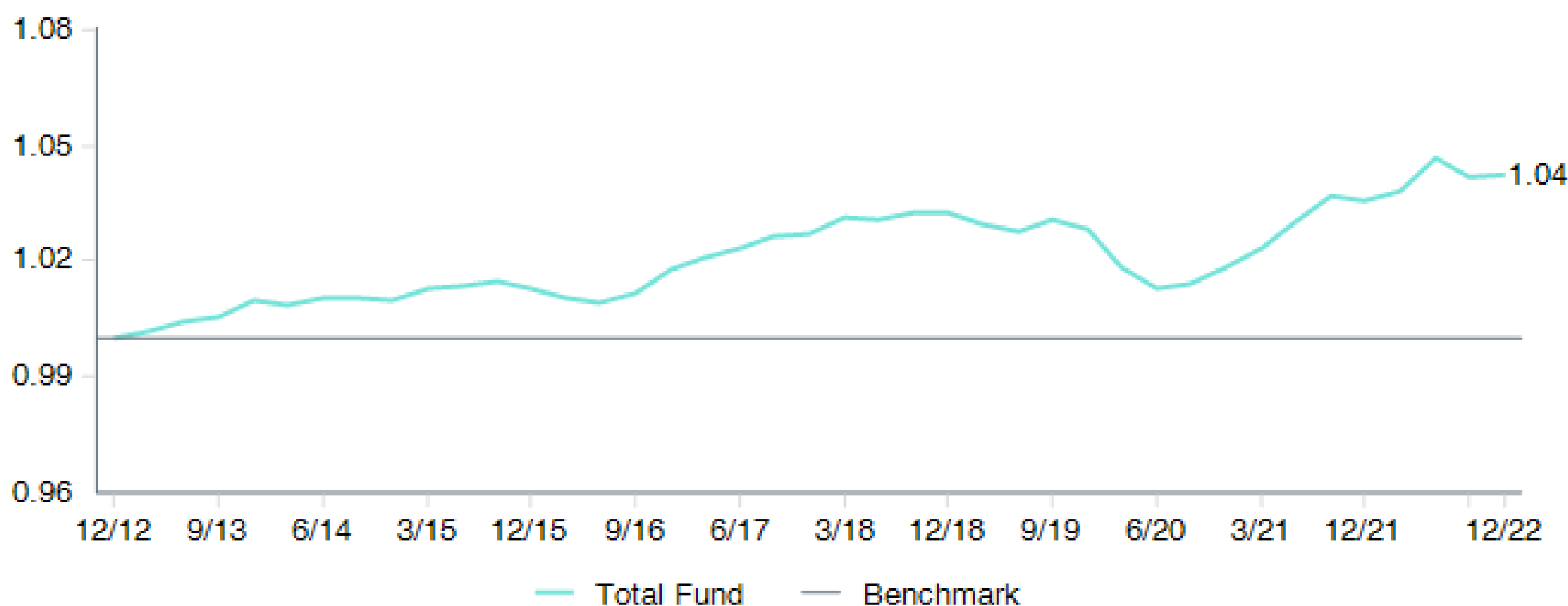
- The chart below depicts the asset allocation of peer public funds with assets greater than \$10 billion.
 - The ends of each line represent the 95th and 5th percentile of exposures, the middle light blue and grey lines represent the 25th and 75th percentile of exposures, the purple square represents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



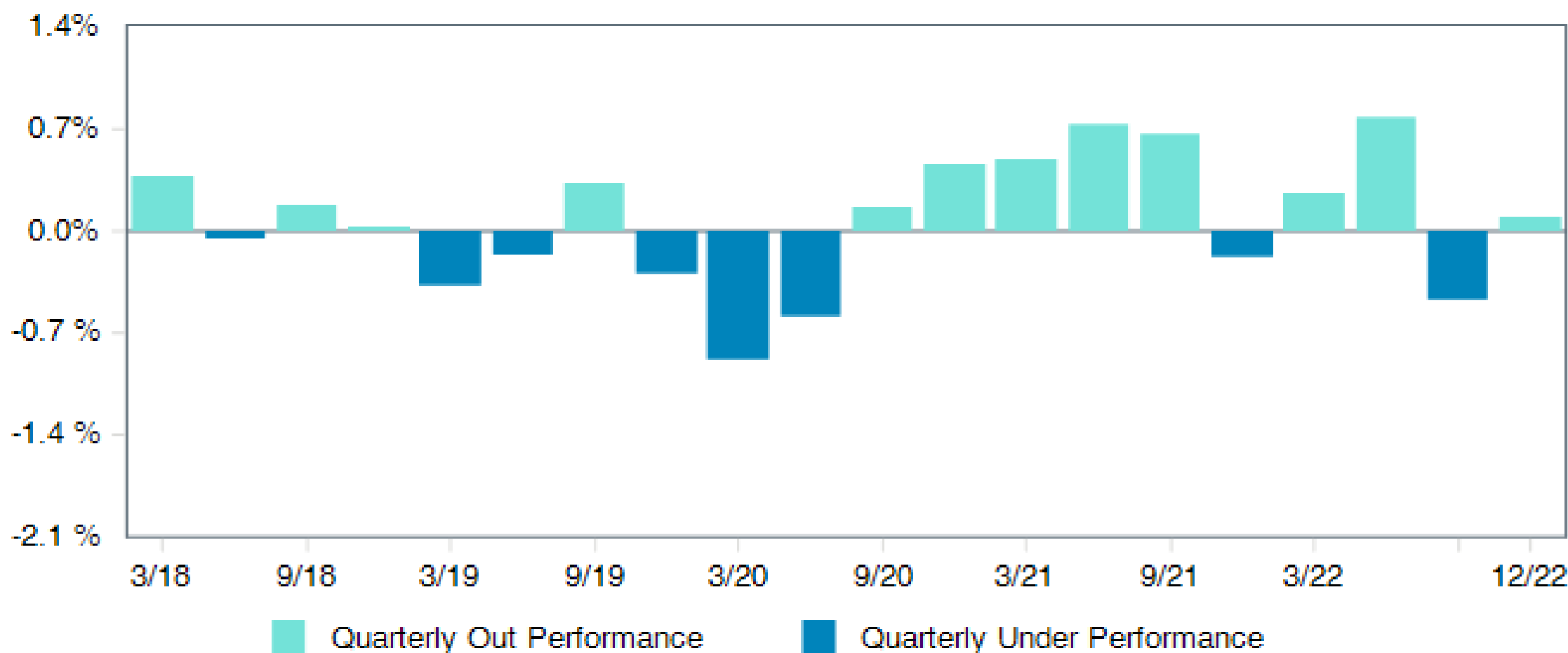
Historical Excess Performance Ending 12/31/2022

Total Fund vs. Total Fund Benchmark

Ratio of Cumulative Wealth - 10 Years

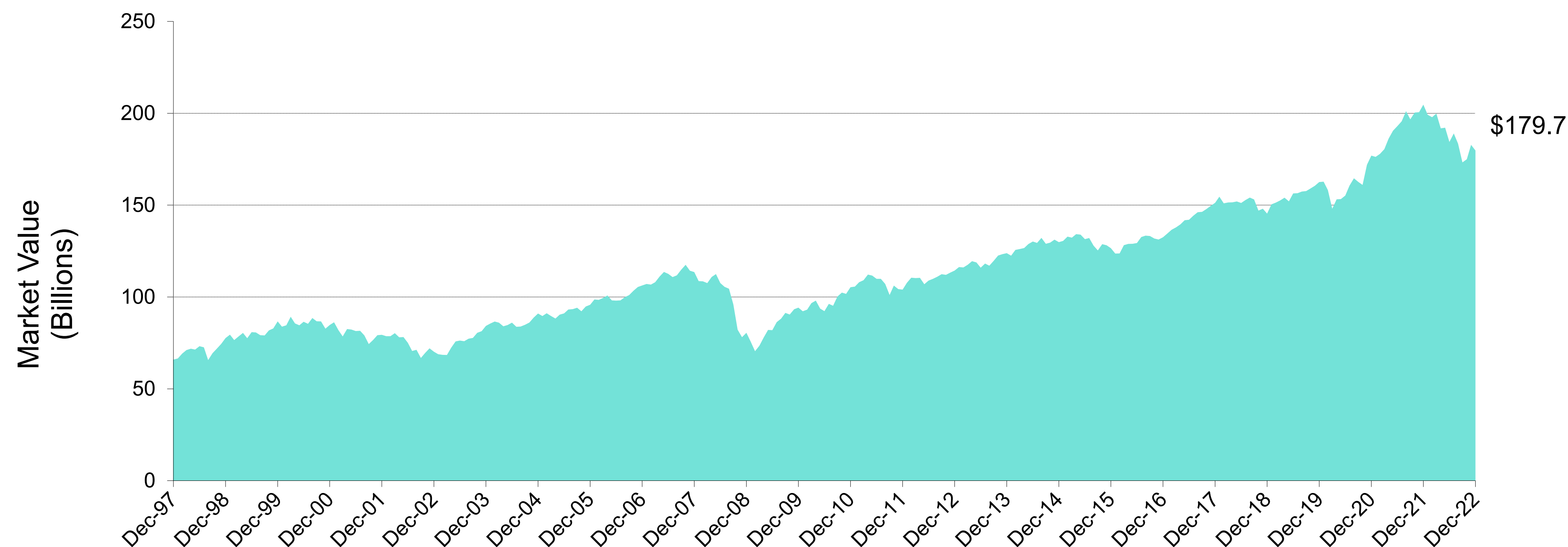


Quarterly Excess Performance



TRS Asset Growth

Total Fund Historical Growth (September 1997 - December 2022)



External Manager Program: Public Equity Performance as of 12/31/2022

	Allocation (\$ in billions)	Fourth Quarter	One Year	Three Year	Five Year
EP Total Global Equity	\$27.1	9.5	-16.4	5.3	5.1
EP Global Equity Benchmark	--	9.5	-18.3	3.4	4.2
<i>Difference</i>	--	0.0	+1.9	+1.9	+0.9
EP U.S.A.	\$9.8	6.4	-15.8	9.0	9.4
EP U.S.A. Benchmark	--	7.1	-19.3	7.2	8.9
<i>Difference</i>	--	-0.7	+3.5	+1.8	+0.5
EP Non-U.S. Developed	\$6.0	16.2	-16.2	2.6	2.5
MSCI EAFE + Canada Policy Index	--	16.1	-14.5	1.2	1.7
<i>Difference</i>	--	+0.1	-1.7	+1.4	+0.8
EP Emerging Markets	\$5.6	6.8	-20.3	0.2	0.6
MSCI Emerging Markets Policy Index	--	6.8	-22.2	-3.6	-1.9
<i>Difference</i>	--	0.0	+1.9	+3.8	+2.5
EP World Equity	\$5.7	10.8	-13.9	7.9	7.5
EP World Equity Benchmark	--	9.5	-18.3	4.4	5.6
<i>Difference</i>	--	+1.3	+4.4	+3.5	+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.

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

External Manager Program: Stable Value/Total Program Performance as of 12/31/2022

	Allocation (\$ in billions)	Fourth Quarter	One Year	Three Year
EP Total Stable Value	\$9.7	0.9	7.3	8.4
EP Stable Value Benchmark	--	1.5	0.1	4.7
<i>Difference</i>	--	-0.6	+7.2	+3.7
Total External Public Program	\$43.5	7.1	-12.3	5.2
EP External Public Benchmark	--	7.2	-15.1	2.9
<i>Difference</i>	--	-0.1	+2.8	+2.3

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.

Public Strategic Partnership Program (SPN): Performance as of 12/31/2022

	Allocation (\$ in billions)	Fourth Quarter	One Year	Three Year
Public Strategic Partnership	\$6.7	7.8	-20.1	1.7
Public SPN Benchmark	--	7.1	-21.1	0.5
<i>Difference</i>	--	+0.7	+1.0	+1.2
BlackRock	\$2.3	7.9	-18.6	2.2
JP Morgan	\$2.3	7.2	-21.1	2.4
Morgan Stanley	\$2.0	8.5	-20.7	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.

Benchmarks

Total Fund Performance Benchmark – 16.3% MSCI U.S.A. IMI, 11.7% MSCI EAFE plus Canada Index, 8.0% MSCI Emerging Markets Index, 18.1% State Street Private Equity Index (1 quarter lagged), 14.4% Blmb. Barc. Long Term Treasury Index, 4.4% HFRI FoF Conservative Index, 2.0% Citigroup 3 Mo. T-Bill Index, 17.3% NCREIF ODCE Index (1 quarter lagged), 6.6% Energy and Natural Resources Benchmark, 7.2% Risk Parity Benchmark, and -6.0% Asset Allocation Leverage Benchmark.

Global Equity Benchmark – 30.0% MSCI U.S.A. IMI, 21.7% MSCI EAFE plus Canada Index, 14.8% MSCI Emerging Markets Index, and 33.5% 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)

Stable Value Benchmark – 76.4% Blmb. Barc. Long Term Treasury Index and 23.6% 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 – 72.5% NCREIF ODCE Index and 27.5% 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

- 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:

- Please review this report and notify Aon Investments USA Inc. (Aon) with any issues or questions you may have with respect to investment performance or any other matter set forth herein.
- The client portfolio data presented in this report have been obtained from the custodian. Aon has compared this information to the investment managers' reported returns and believes the information to be accurate. Aon has not conducted additional audits and cannot warrant its accuracy or completeness. This document is not intended to provide, and shall not be relied upon for, accounting and legal or tax advice.
- Refer to Hedge Fund Research, Inc. 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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Annual Review of Public Markets

Dale West, Senior Managing Director, Public Markets
Brad Gilbert, Senior Director, External Public Markets
KJ Van Ackeren, Senior Director, Internal Fundamental

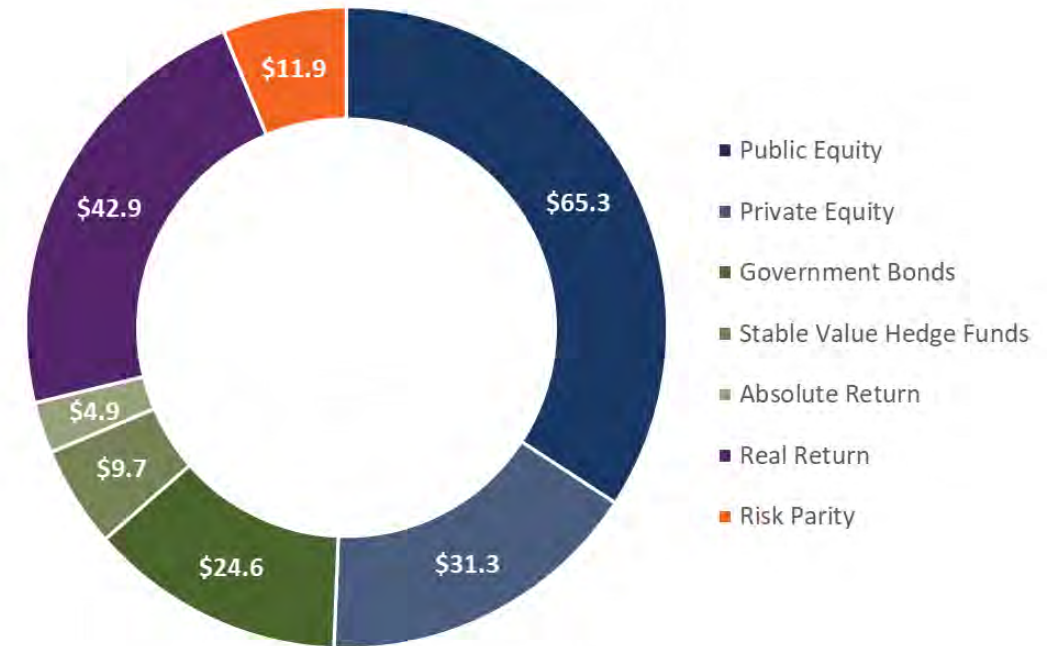
April 2023



Agenda

- I. Public Equity
- II. Stable Value Hedge Fund
- III. Absolute Return

**TOTAL TRUST as of
December 31, 2022**



Trust Investment Exposure	\$190.8
Cash/Asset Allocation Leverage	(\$11.0)
Total Trust	\$179.8 billion

Public Markets Overview

Internal Fundamental (IFM)

Members: 22

AUM: \$10.8B

Mission: Develop and invest across a collection of boutique strategies implemented by internal teams using predominantly fundamental research.

External Public Markets (EPU)

Members: 12

AUM: \$43.5B

Mission: Identify and invest with external managers to access strategies which complement internal TRS capabilities. Mandates include equity funds, hedge funds and Strategic Partnerships.

Multi-Asset Strategies (MSG)

Members: 15

AUM: \$13.9B

Mission: Create value by using quantitative analysis to systematically identify and capitalize on opportunities across all public assets with a disciplined and risk-managed approach.

Special Opportunities (SO)

Members: 6

AUM: \$4.9B

Mission: To opportunistically capture unique and niche investments for the Trust. Investments are predominantly public market co-investments and illiquid credit.

Public Markets Analytics (PuMA)

Members: 6

Mission: Provide timely, high-quality data and analysis to enhance investment understanding and decisions across Public Markets.

Philosophy

Active Management

We believe active management will add value over time

Factors

Targeting factors that are compensated in the long run, such as value, is a key active strategy

Internal

We prefer to manage strategies internally when we have the resources and skills to compete with external managers

External

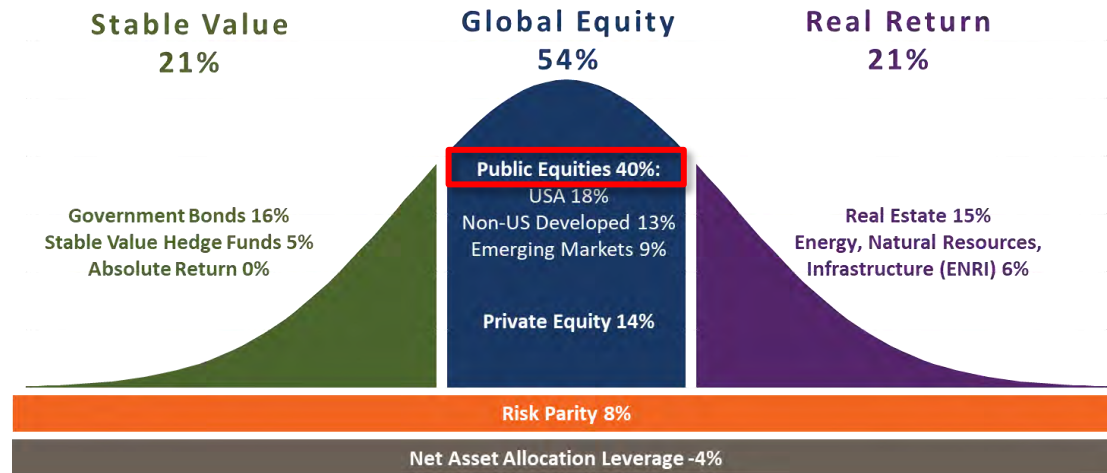
When we don't have internal capabilities, we can select external managers who will add value net of fees

Efficient Markets

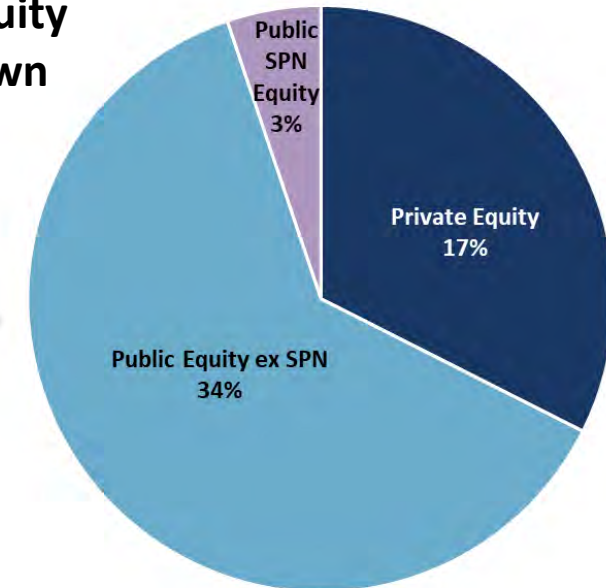
Active management is most successful in less efficient markets, including international and small caps

Global Equity Overview

Global Equity's role in the Trust:



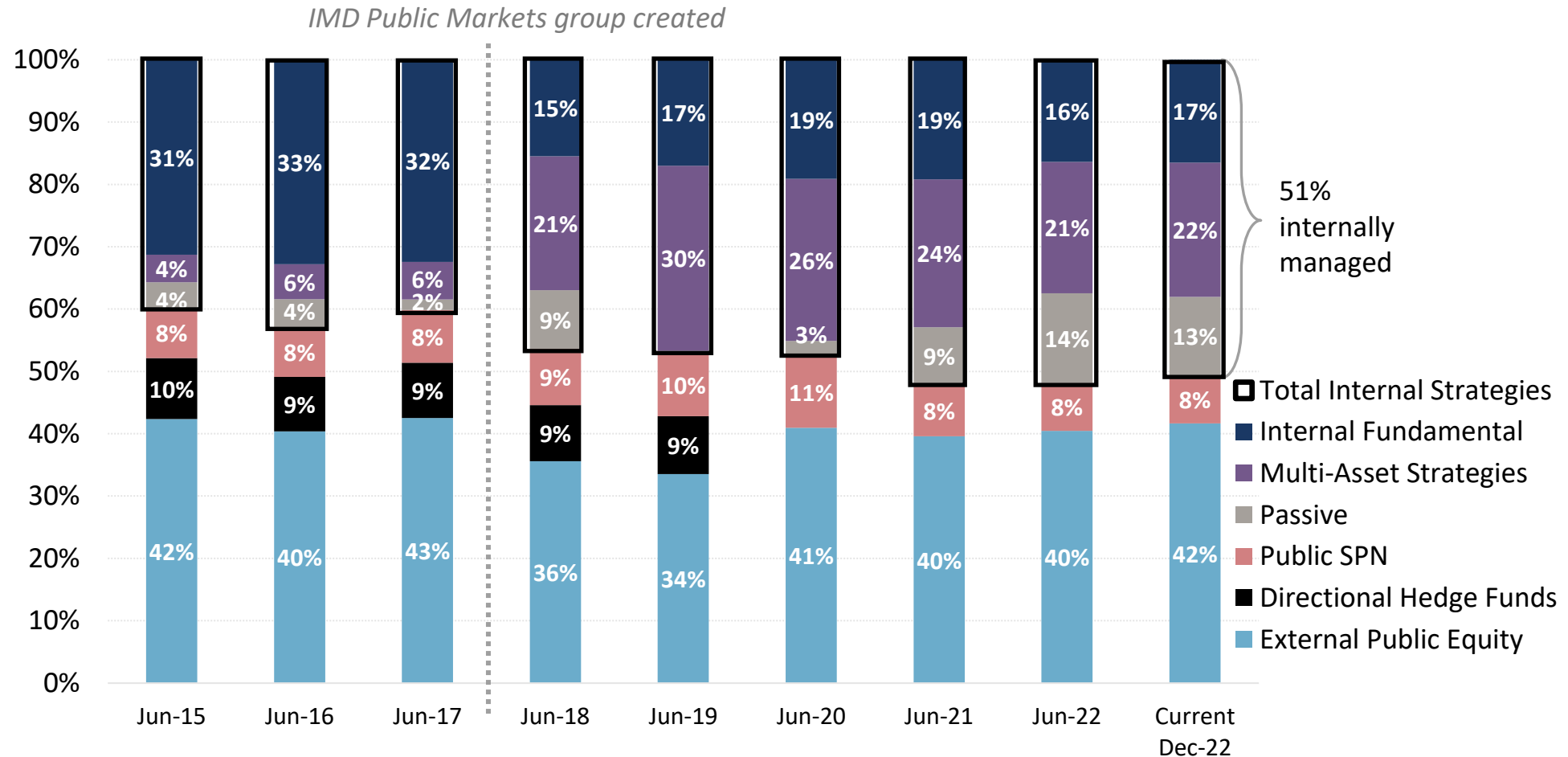
Global Equity Breakdown



Public Equity Portfolio		
As of 12/31/2022	Assets (in billions)	Assets % of Trust
External Manager/ Public SPN*	\$32.1	18%
Multi-Asset Strategies	13.9	8%
Internal Fundamental	10.8	6%
Passive & Transition	8.2	5%
Total Public Equity	\$65.0	36%

Internal & External Management

Public Equity Split by Strategy Group



Public Equity Performance

Public Equity Portfolios excluding Strategic Partnership

As of December 31, 2022

	Assets (\$ millions)	Assets (percent of Trust)	1-Year		3-Year (Annualized)	
			Return (%)	Alpha (bp)	Return (%)	Alpha (bp)
US	\$21,545	12.0	-16.6	267	6.8	-46
TRIS USA Benchmark			-19.3		7.2	
Non-US Developed	19,813	11.0	-16.3	-179	0.7	-52
TRIS Non-US Developed Benchmark			-14.5		1.2	
Emerging Markets	12,905	7.2	-22.4	-19	-2.5	102
TRIS Emerging Market Benchmark			-22.2		-3.6	
World Equity	5,682	3.2	-13.8	450	7.9	357
TRIS Custom World Benchmark			-18.3		4.4	
Total Public Equity	\$59,945	33.3	-17.3	73	3.1	16
Public Equity Policy Benchmark			-18.0		2.9	

TRIS benchmarks are adjusted for securities TRIS is not authorized to buy because of IPS or statutory provisions, and where TRIS has not exercised a fiduciary exemption. The Custom World Benchmark includes US small cap securities in line with the IPS benchmark for USA.

- Public equity portfolios outperformed over the 1 and 3-year periods
- The portfolios generated \$512M in dollar value added (DVA) over the last 1-year and \$478M over the last 3-years

Public Equity Performance by Strategy Group

- Internal quantitative strategies extended their strong relative performance due to the favorable environment for factor investing
- External strategies led the way with consistent outperformance across regions
- Internal Fundamental's largest portfolios lagged but have seen promising results from newly launched innovation portfolios

Public Equity Contribution to Excess Return (bp)		
As of December 31, 2022		
	1-yr	3-yr
Total	+73	+16
External Manager (ex-Strategic Partnership)	+86	+47
Multi-Asset Strategies	+67	+6
Internal Fundamental	-72	-35
Passive & Transition	-7	-2

Special Topic: Internal Fundamental Management

Align

- Identify strengths of team members
- Match skillsets with strategies to optimize performance
- Ownership culture – “Leading from every seat”

Evaluate

- Identify opportunities for process improvements across the team
- Shut down or re-evaluate underperforming strategies

Develop

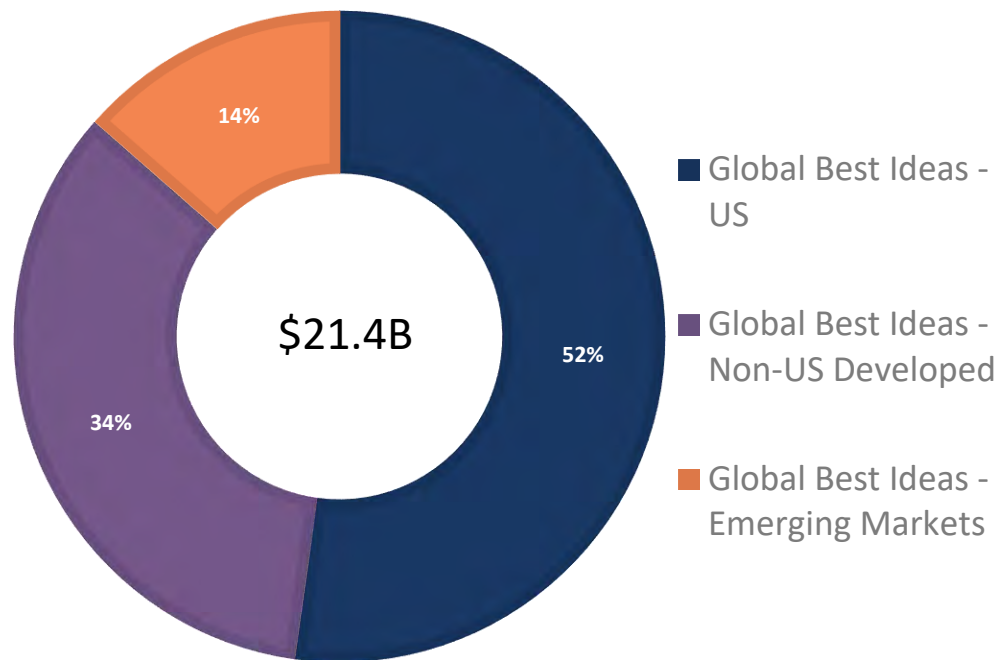
- Offer a platform that fosters the next generation of investors
- Implement risk management tools to hedge unintended risk
- Develop best investors by strategy type

Expand

- Expand in areas that meet the objectives of the Trust and match our internal skillsets

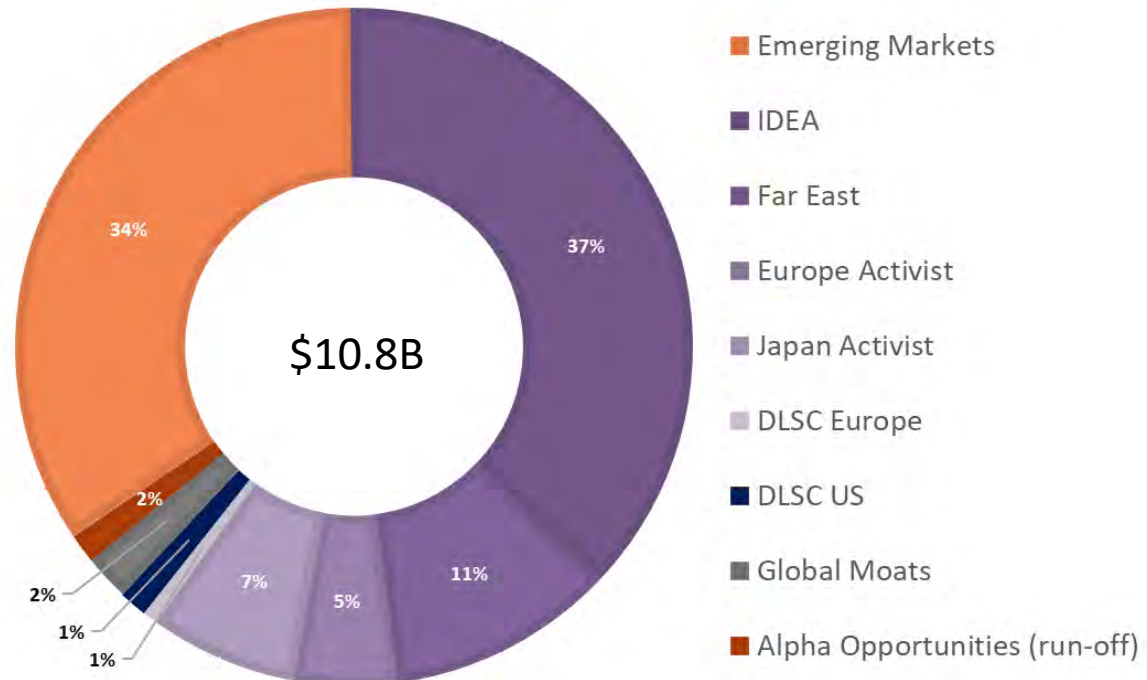
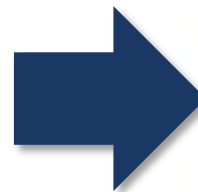
Internal Fundamental Portfolio Mix

- Boutique structure leads to more targeted strategies with well-defined philosophy and process
 - No need to invest in all markets and all strategies
- The portfolio has \$0 allocated to US Large Cap today



2017

Source: State Street Bank



2022

Continuous Improvement

- Innovate
 - Launching portfolios that provide a benefit to Active Public Markets
- Improve
 - Drawdown control – Re-underwriting of Far East portfolio
 - Expand geography of successful strategies
 - Data Analytics - Recurring deep dives into risk profile and performance drivers
 - Identifying opportunities for increased primary research
 - Essentia Analytics – Evaluate decision-making and hone investment skills
- Discontinue
 - US Large Cap in 2017
 - Alpha Opportunities in 2018
 - US SMid in 2021

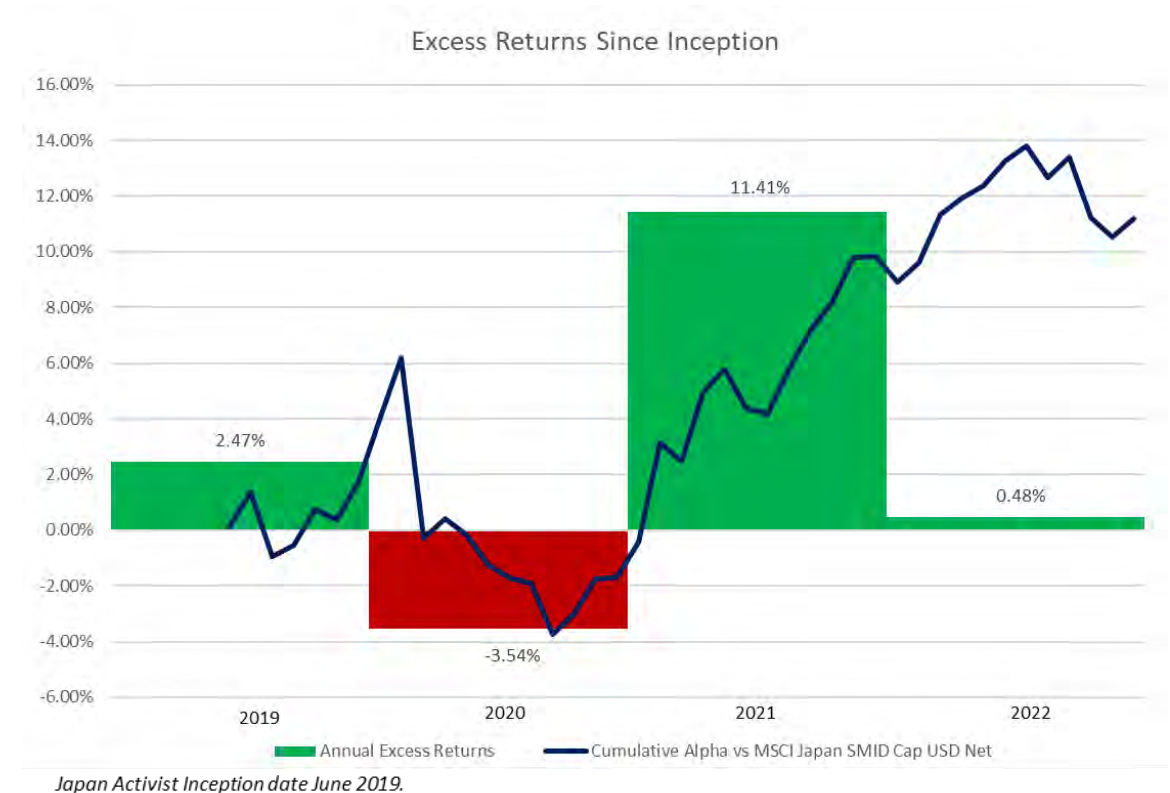
Innovation Portfolios

Strategy	Inception Date	AUM (\$ millions)	1-yr	3-yr	SI
			Annualized Excess Return (bp)¹		
Japan Activist	Jun-2019	\$755.9	48	270	360
Deleveraging Small Cap US	Jun-2020	\$143.9	399		767
Deleveraging Small Cap Europe	Oct-2021	\$77.2	831		675
Europe Activist	Dec-2021	\$531.8	-163		-163
Global Moats	Sep-2022	\$236.0			711
			Cumulative PnL (\$M)		
Equity Capital Markets	Aug-2019	\$0.0	-\$50.0	-\$8.9	\$2.3

- Newer vintage innovation portfolios have demonstrated strong performance
- Assets will expand over time as track record is built and/or regime is favorable for the strategy

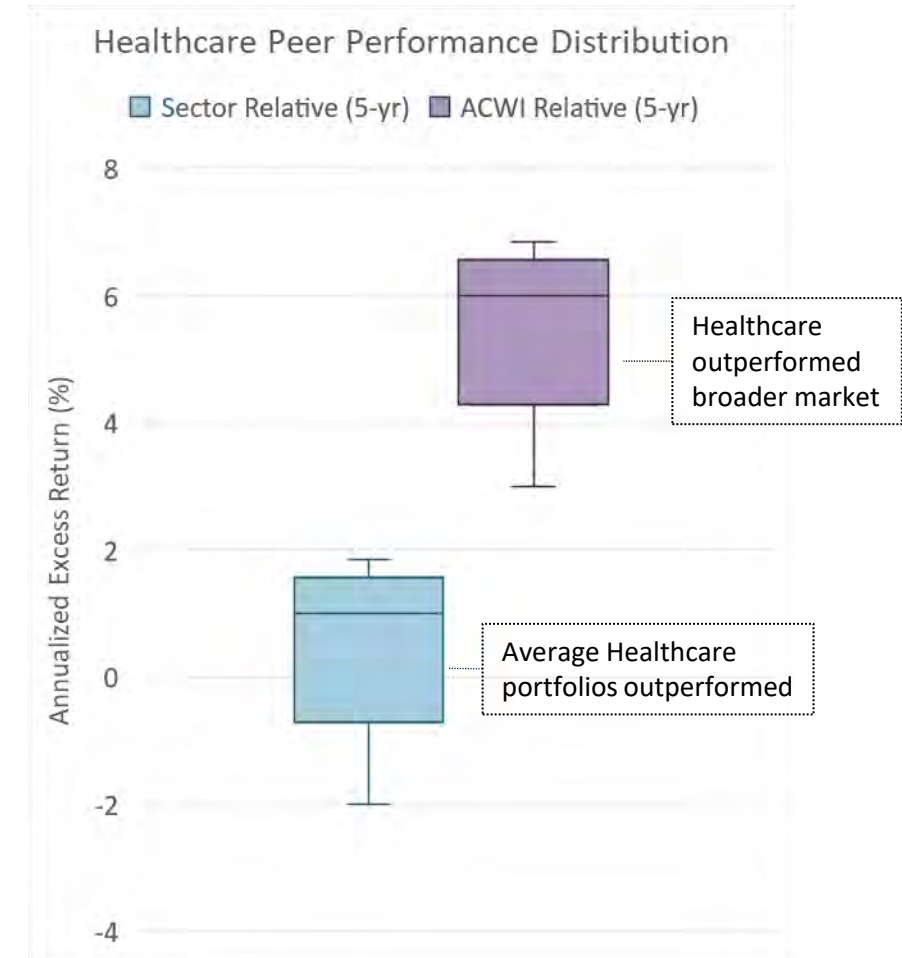
Case Study #1 – Japan Activist

- Philosophy: Activism as an asset class presents an opportunity to harvest alpha from a persistent source of equity risk premia
- Opportunity
 - Shift in corporate governance resulting from structural reform and Abenomics
- Why manage internally?
 - Identified opportunity through IFM Portfolio Manager that oversees Far East
 - External Public Markets evaluated a manager for Japan allocation but determined IFM was a better allocation given the similar return profile
- Sizing
 - \$750M – approximately half of IFM Japan exposure



Case Study #2 – Healthcare Innovation

- Philosophy: Healthcare companies with true innovation will be rewarded over the long term. Copycat drugs and incremental improvements will be commoditized over time.
- Opportunity
 - Healthcare makes up 10-20% of most global economies
 - Favorable demographics to drive secular growth
 - Advances in basic sciences and technology are unlocking innovation
- Why manage internally?
 - Portfolio Manager with over 20 years of experience in Healthcare
 - High returns coupled with high dispersion of returns between industries and companies leads to better opportunities
 - Large number of external health care funds have demonstrated success in generating excess returns
- Sizing
 - Evaluating a launch of a paper portfolio
 - Capacity of \$1-2B



Source: Peer Performance from eVestment. Includes global healthcare funds where >80% of assets are in healthcare holdings and MSCI World Healthcare is the preferred benchmark. Excludes biotech-only funds.

Public Markets SPN

Performance as of December 31, 2022

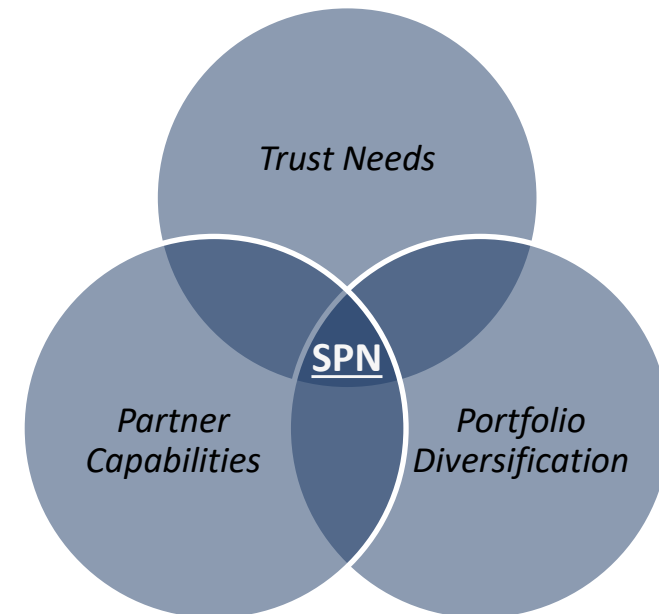
Program	Assets		Annualized Return			Annualized Alpha		
	NAV (\$, millions)	% of Trust	1-Year	3-Year	Since Incept.	1-Year	3-Year	Since Incept.
BlackRock	\$2,306	1.3%	-18.5%	2.2%	6.4%	+252bp	+173bp	+121bp
JP Morgan	2,341	1.3	-21.1	2.4	6.4	-5	+191	+120
Morgan Stanley	2,011	1.1	-20.7	0.3	5.5	37	-21	+30
Total Public SPN¹	\$6,658	3.7%	-20.1%	1.7%	6.1%	+95bp	+127bp	+84bp

Multi-Asset SPN Portfolio Objectives:

- Outperform custom benchmark with same objectives and constraints as TRS
- Deliver best in class resources to Texas

Portfolio Achievements:

- \$1.3 billion in relative value since inception
- 11 out of 15 years of positive outperformance
- Customized research projects, conferences, deep dives, insight series



Public Markets 2023 Priorities

- Taking advantage of opportunities resulting from market turbulence
- Consolidating established internal quantitative strategies into one portfolio
- Managing an active internal portfolio R&D pipeline
- Growing rotational analyst program for long-term recruiting
- Developing the Analytics function through enhanced data infrastructure and partnering with investment teams to provide forward-looking actionable insights

APPENDIX

Public Markets Senior Leadership Team



Dale West, CFA
Sr. Managing Director
MBA, Stanford



Mark Albert, CFA
Director
MBA, University of Michigan



Mohan Balachandran, PhD
Sr. Managing Director
PhD, Physics, Brown University



Ashley Baum, CFA, CPA
Sr. Director
MPA, UT Austin



Patrick Cosgrove, CFA
Sr. Director
MBA, St. Mary's University



Jean-Benoit Daumerie, CFA
Director
MBA, Rice University



Brad Gilbert, CFA, CAIA
Sr. Director
BBA, UT Austin



Joel Hinkhouse, CFA
Director
MBA, University of Chicago



Matt Talbert, PhD
Director
PhD, Economics, UT Austin



KJ Van Ackeren, CFA
Sr. Director
MBA, Texas Christian University



Kyle Wynne, CFA, FRM
Director
MS, University of Chicago

- Five distinct groups with one leadership team
- One comprehensive view of portfolio construction
- Improved communication and alignment

External Public Markets



Brad Gilbert, CFA, CAIA
Sr. Director, Head of
External Public Markets
BBA, UT Austin



Jean-Benoit Daumerie, CFA
Director
MBA, Rice University



Scott Gonsoulin, CFA
Director
MS, Texas A&M



Joel Hinkhouse, CFA
Director
MBA, University of Chicago



Lulu Llano, CFA
Director
BBA, UT Austin



Steven Wilson, CAIA
Director
MBA, Rice University



John Hall, CFA
Investment Manager
MBA, London Business School



Sibe Wen, CFA, CAIA, FRM
Sr. Associate
MS, UT Austin



Michael Ijeh, CAIA
Associate
BBA, Texas Tech



McKenna Phillips, CFA
Associate
BBA, UT Austin



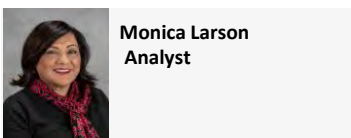
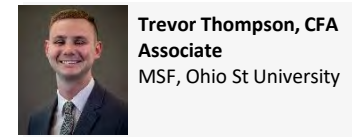
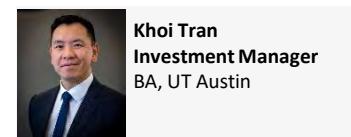
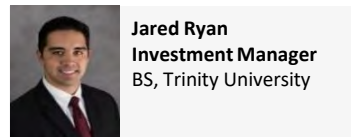
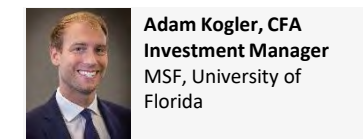
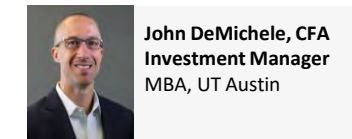
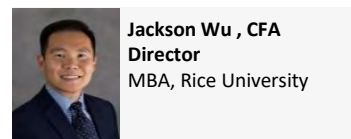
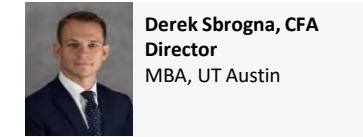
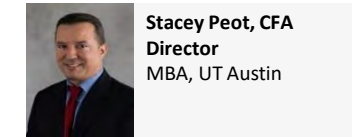
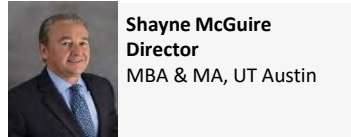
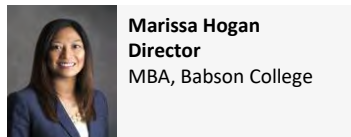
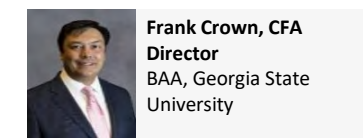
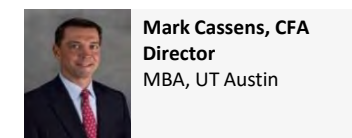
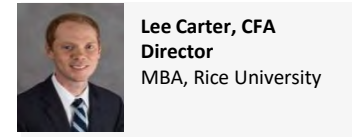
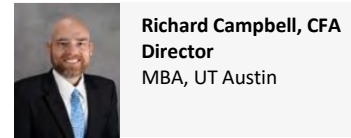
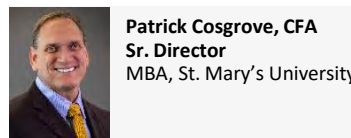
Mindu Dasanayake
Sr. Analyst
BBA, UT San Antonio



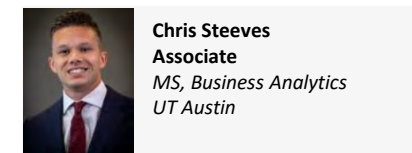
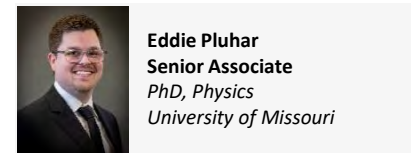
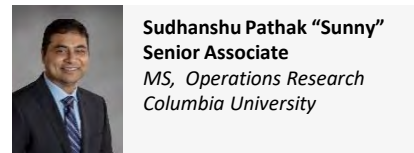
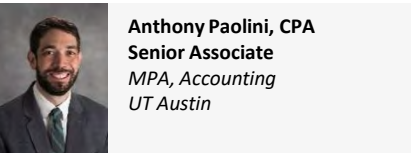
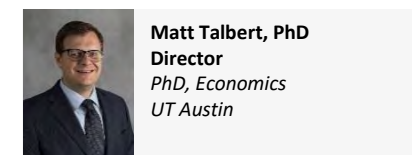
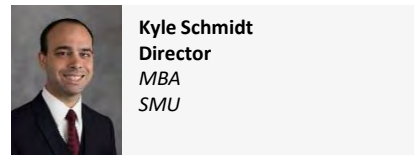
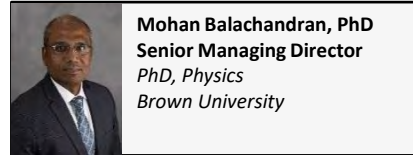
Jon Klekman
Analyst
BA, SUNY Binghamton

EXPERIENCE SUMMARY
8 CFA Charterholders
6 Master's Degrees
4 CAIA Charterholders
1 Certified FRM

Internal Fundamental



Multi-Asset Strategies



EXPERIENCE SUMMARY

3 PhD Degrees
3 CFA Charterholders
1 CPA
10 Master's Degrees

Public Markets Analytics



Kyle Wynne, CFA, FRM
Director of Public Markets Analytics
MS, University of Chicago



Kevin Taylor
Investment Manager
MS, UT Austin



Chad White
Sr. Associate
MSF, Tulsa
MS, MS&T



Lamont Colter
Associate
BS, Texas State University



Irma A. Martinez
Sr. Analyst
BBA, St. Edwards



John Onyango
Analyst
BBA, Texas State University

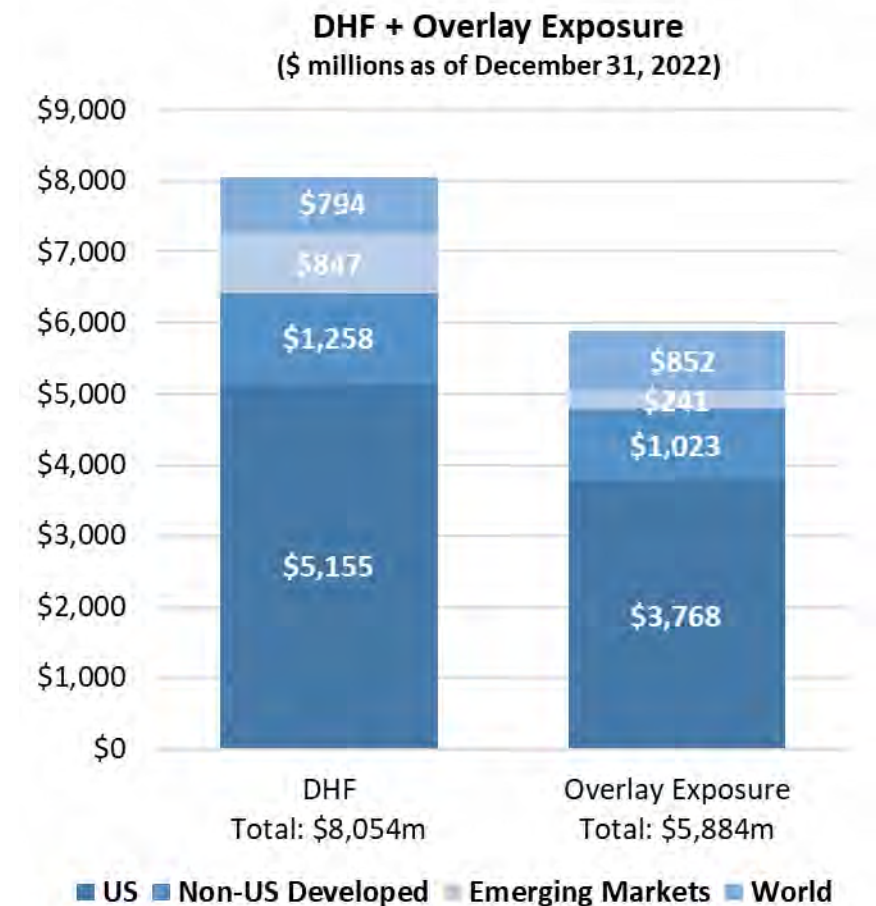
EXPERIENCE SUMMARY

- 1 CFA Charterholder
- 3 Master's Degree Holders
- 1 Certified FRM

Directional Hedge Fund Update

Overview of Changes

- In the 2019 SAA review, Directional Hedge Funds (DHF) were integrated within the Public Equity portfolio
- Funds are allocated to specific regional portfolios based on manager holdings
- The IMD uses an overlay portfolio to achieve full portfolio risk (Beta 1.0 to policy benchmarks)
 - The Risk & Portfolio Management Team (RPM) helped design the overlay and currently manages it
- The Public Markets Portfolio Construction Team incorporates DHF manager allocations and risk contributions into portfolio decisions
- Currently DHF represents 3.9% of Trust assets



Directional Hedge Fund Update

Results to Date

DHF + Overlay Performance Inception to Date (Oct 19 - Dec 22)				
	DHF + Overlay Return	Benchmark Return	Excess Return (bp)	Dollar Value Added (millions)
US	11.4%	9.6%	183	\$145.7
Non-US Developed	3.5%	3.5%	-1	-\$24.7
Emerging Markets ¹	14.7%	9.2%	554	\$251.7
World ²	7.0%	-1.7%	865	\$100.5
				\$473.2

¹ Emerging Markets+Overlay inception: November 2020.

² World DHF+Overlay inception: February 2021.

Returns and excess returns are annualized for periods longer than one year.

- The DHF + Overlay portfolio generated \$473 million in DVA since inception (October 2019)
 - These results are included in overall Public Equity performance
- The overlay has made the DHF allocation more efficient by bringing equity risk up to full target and by making hedge fund returns comparable to broad equity benchmarks

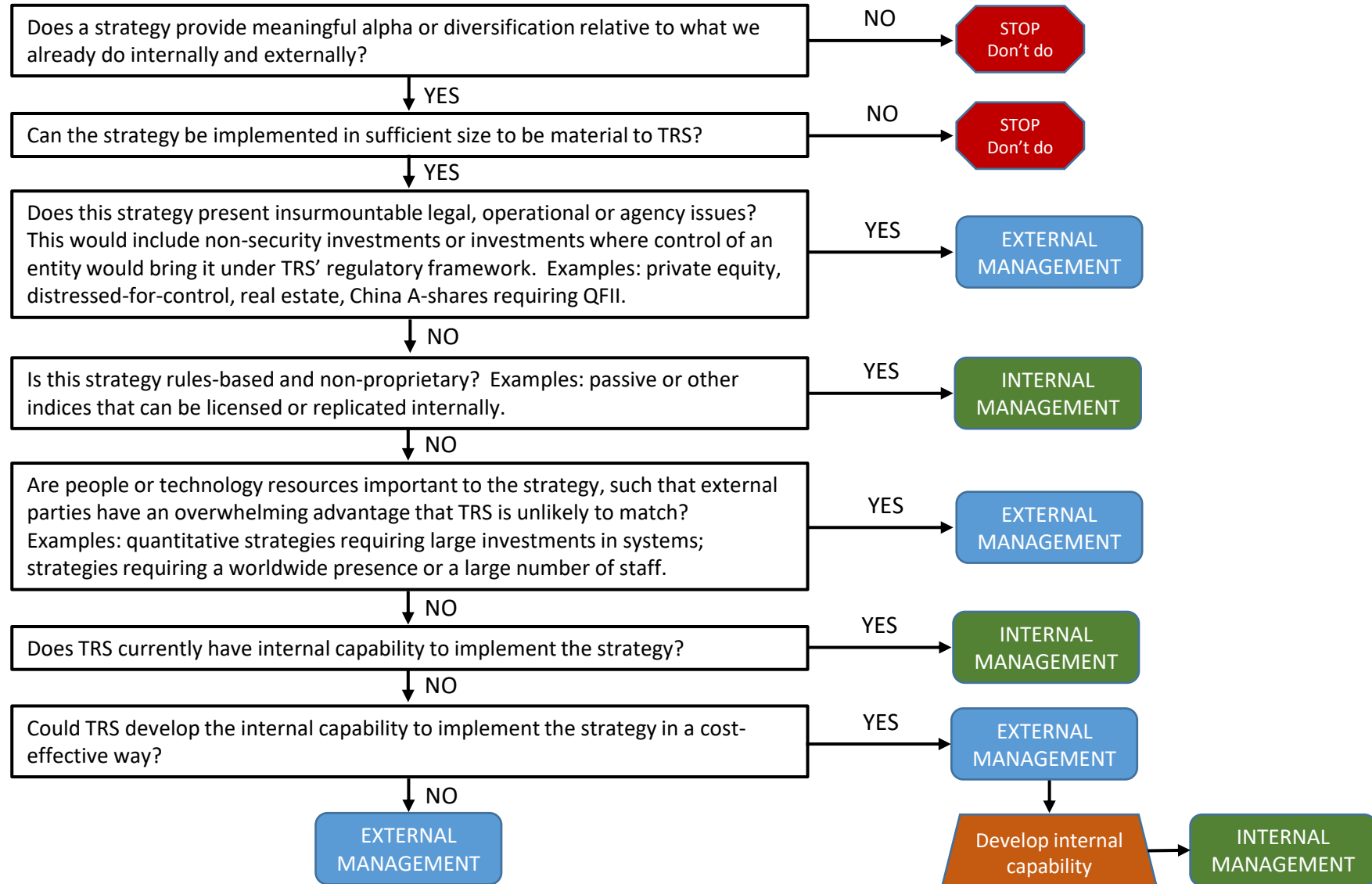
Legislative Authority Detail for Agency Agreements

As of December 31, 2022

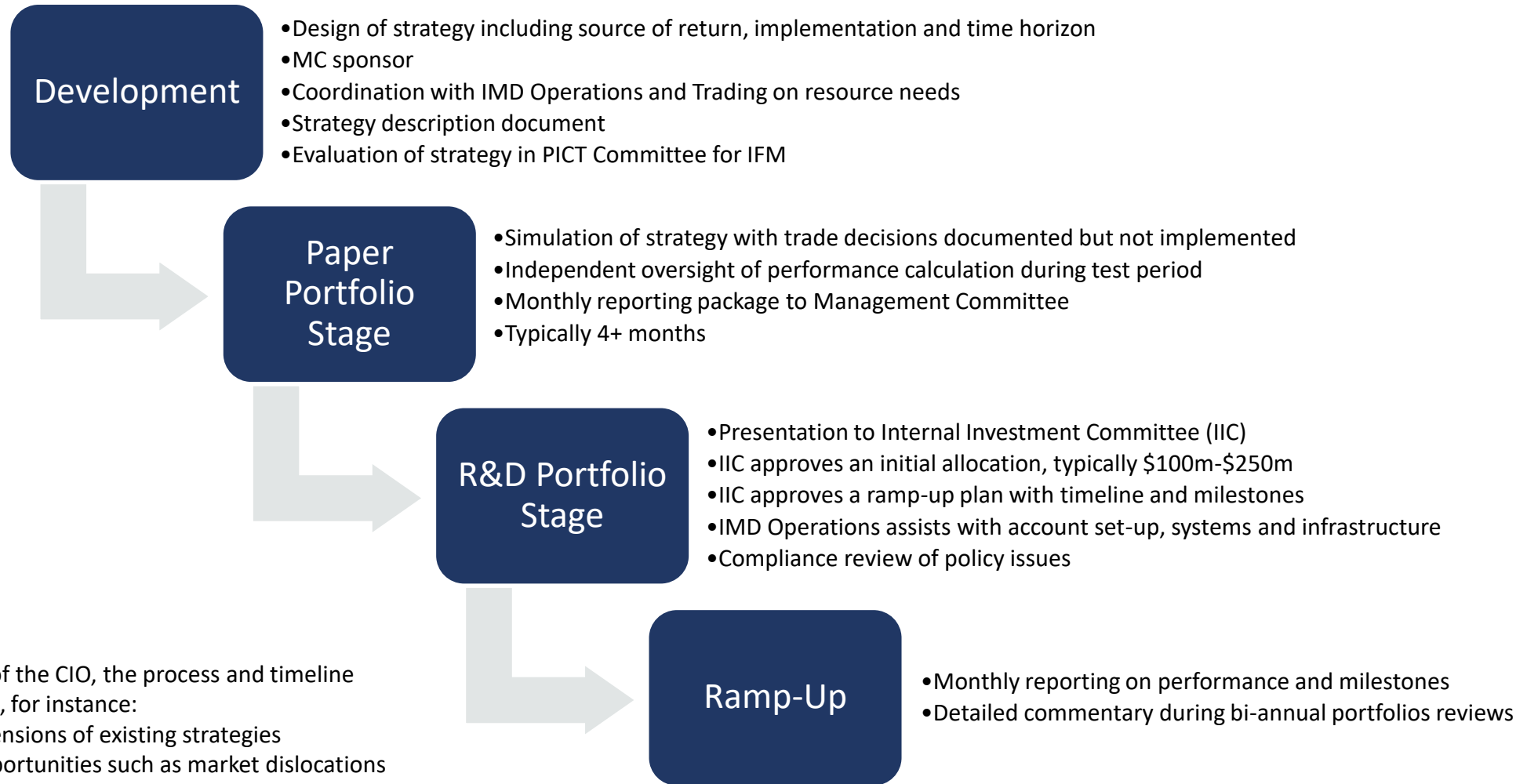
	# of Portfolios			Assets (\$ billion)			Percentage of Trust		
	Agency	LP	Total	Agency	LP	Total	Agency	LP	Total
External Managers									
US Portfolio	2	14	16	\$1.2	\$4.6	\$5.7	0.6%	2.5%	3.2%
Non-US Developed	3	4	7	\$1.8	\$3.0	\$4.8	1.0%	1.6%	2.7%
Emerging Markets	5	6	11	\$2.9	\$1.8	\$4.8	1.6%	1.0%	2.7%
World Equity	2	5	7	\$1.8	\$3.1	\$4.9	1.0%	1.7%	2.7%
Total Equity	12	29	41	\$7.7	\$12.5	\$20.2	4.3%	6.9%	11.2%
Public Markets SPN	3		3	\$6.7		\$6.7	3.7%		3.7%
Real Estate	1		1	\$0.3		\$0.3	0.2%		0.2%
Totals	16	29	45	\$14.6	\$12.5	\$27.1	8.1%	6.9%	15.1%
Hedge Funds									
Global Equity					\$7.0			3.9%	
Stable Value					\$10.0			5.6%	
Risk Parity					\$0.3			0.1%	
Totals					\$17.3			9.6%	

- TRS is limited by law to 30% Agency Agreement authority. 15.1% is currently utilized
- TRS is limited by law to 10% hedge funds. 9.6% is currently utilized

Internal / External Decision Tree for Investment Strategies



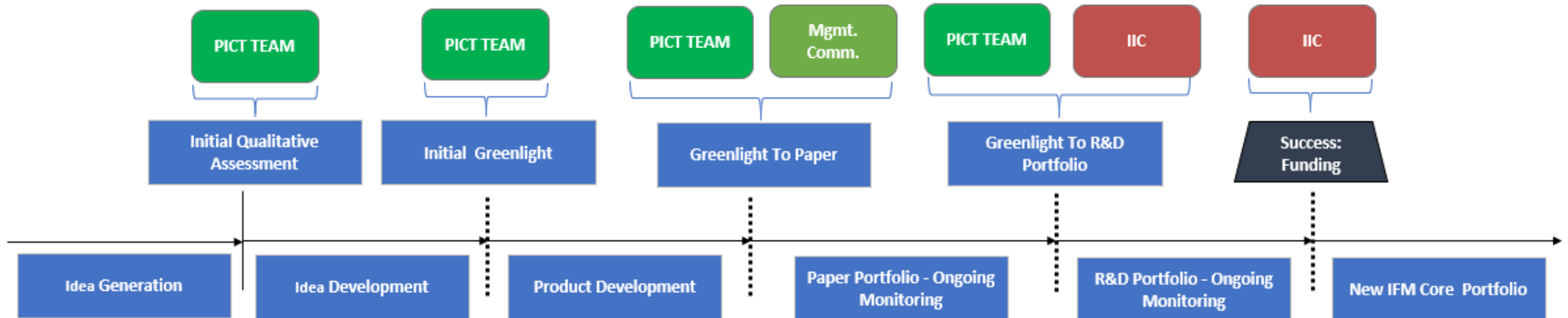
Developing New Internal Portfolios



Portfolio Innovation Process

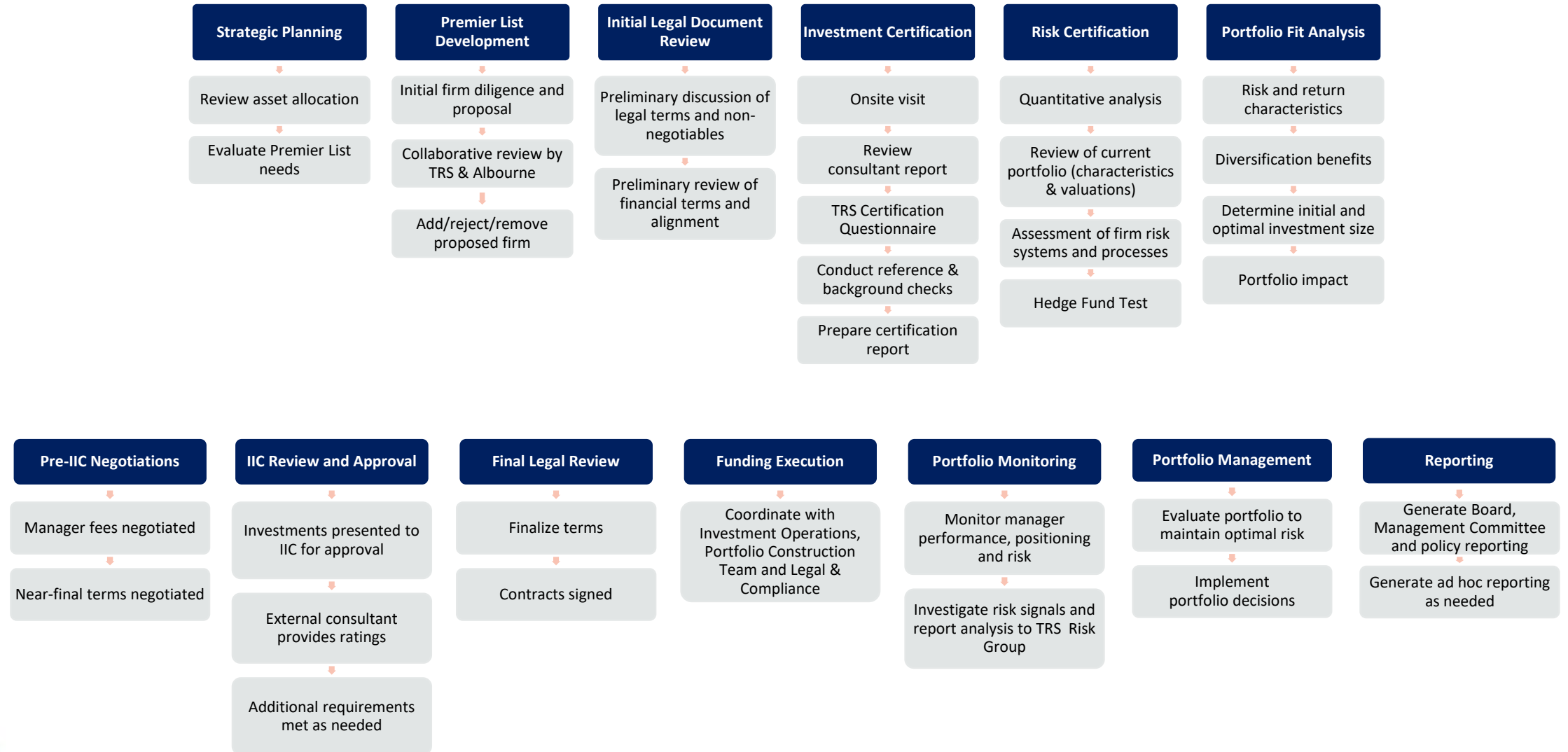
- Portfolio Innovation & Construction Team (PICT)
 - Committee includes 4 members from Internal Fundamental and 1 member from External Public
- Criteria
 - Alpha-rich opportunity (i.e., high dispersion of returns)
 - Track record of Portfolio Manager
 - Proof of concept observed in the industry
 - Scalable

- Role of committee:
 - Determine validity of strategy
 - Provide feedback throughout new portfolio development, paper portfolio and R&D phases of execution
 - Assign personnel to assist with research phase



External Manager Critical Processes

Texas Way



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Annual Review of Stable Value Hedge Funds

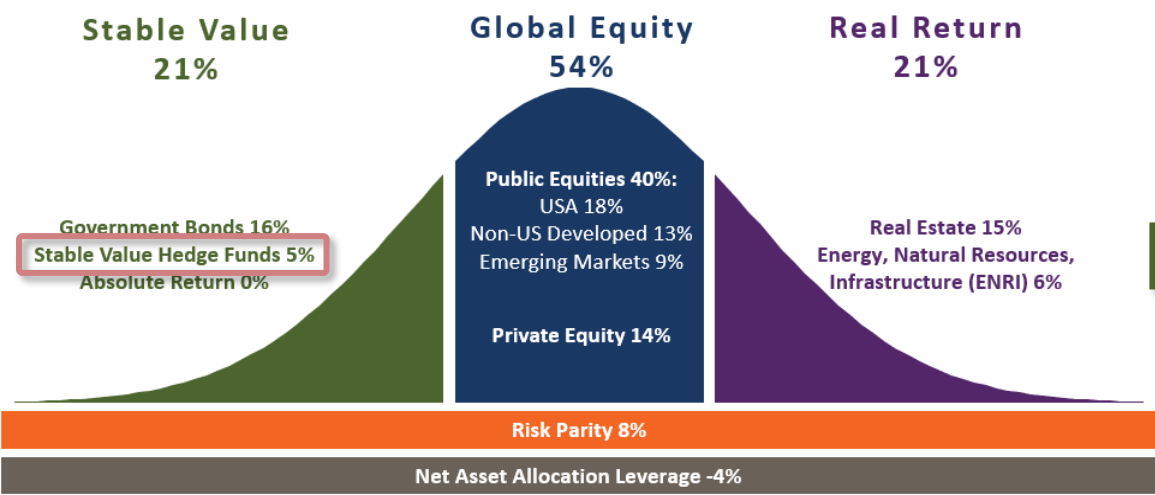
Steven Wilson, Director, Public Markets

April 2023

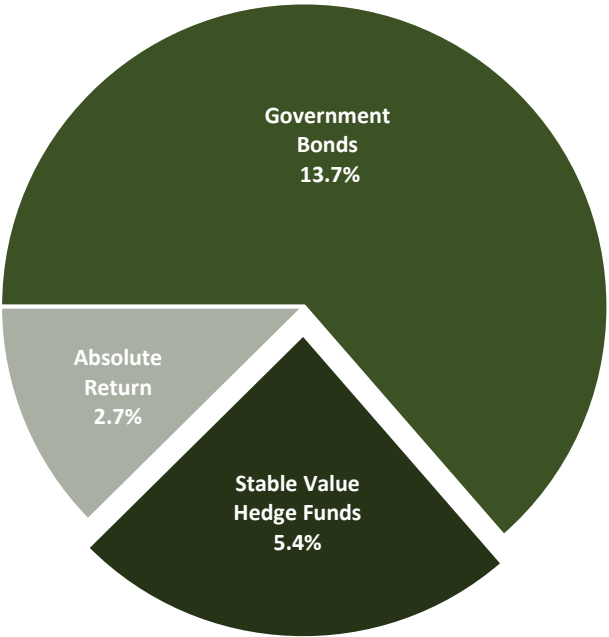


Stable Value Overview

Stable Value’s role in the Trust:



Stable Value Breakdown



STABLE VALUE HEDGE FUND PORTFOLIO		
As of 12/31/2022	Assets (in billions USD)	Assets (percent of Trust)
Equity Market Neutral	\$3.7	2.1%
Macro and Commodities	1.8	1.0%
Fixed Income	0.4	0.2%
Multi-Strategy	1.9	1.0%
Trends and Volatility	1.4	0.8%
Reinsurance	0.6	0.3%
Total Portfolio	\$9.7	5.4%






Stable Value Hedge Fund Performance

Stable Value Hedge Funds As of December 31, 2022							
		1-Year		3-Year		Since Inception October 2011	
	Assets (in millions)	Return (%)	Alpha (bp)	Return (%)	Alpha (bp)	Return (%)	Alpha (bp)
Stable Value Hedge Funds	\$9,743	7.3	722	8.4	370	5.4	177
<i>HFRI Fund of Funds Conservative Index</i>		<i>0.1</i>		<i>4.7</i>		<i>3.6</i>	

Returns and excess returns are annualized for periods longer than one year.

- SVHF outperformance in 2022 was driven by double digit performance in equity market neutral strategies as well as trend following
 - Macro, Reinsurance and Fixed Income underperformed the broader portfolio
- SVHF has been a consistent outperformer over longer time periods
 - Over 3 years, SVHF added \$965 million in dollar value add (DVA) versus the policy benchmark
 - Since inception, SVHF added \$1,508 million in DVA versus the policy benchmark

Stable Value Hedge Fund Portfolio

Stable Value Hedge Fund Objectives	Status	Details
Hedge Fund Types Focus on absolute return hedge funds		<ul style="list-style-type: none"> Return: 5.4%¹ Sharpe Ratio: 1.5
Market Sensitivity and Risk Core strategies have low to negative market sensitivity		<ul style="list-style-type: none"> Correlation to Global Equities²: 0.3 Beta to Global Equities: 0.1
Market Regime Performance Expected to have positive returns when markets are down		<ul style="list-style-type: none"> Outperformed equities in every down month for stocks, by an average of 3.7% Positive returns in 70% of 46 down equity months since October 2011
Performance versus US Treasuries Expected to outperform US Treasuries over the long term		<ul style="list-style-type: none"> 5.4% return versus Treasuries³ 1.0%; 3.1% volatility versus Treasuries 11.8% 12/31/22 10-year Treasury yield-to-maturity: 3.9%
Performance versus Benchmark Stable Value HF benchmark ⁴ with target tracking error of 4%		<ul style="list-style-type: none"> 1.8% ahead of Stable Value HF benchmark since inception Tracking error of 2.6%

Sources: State Street Bank, Bloomberg

Note: Performance is annualized and is net of fees

¹Dates: October 2011 (inception) to December 2022

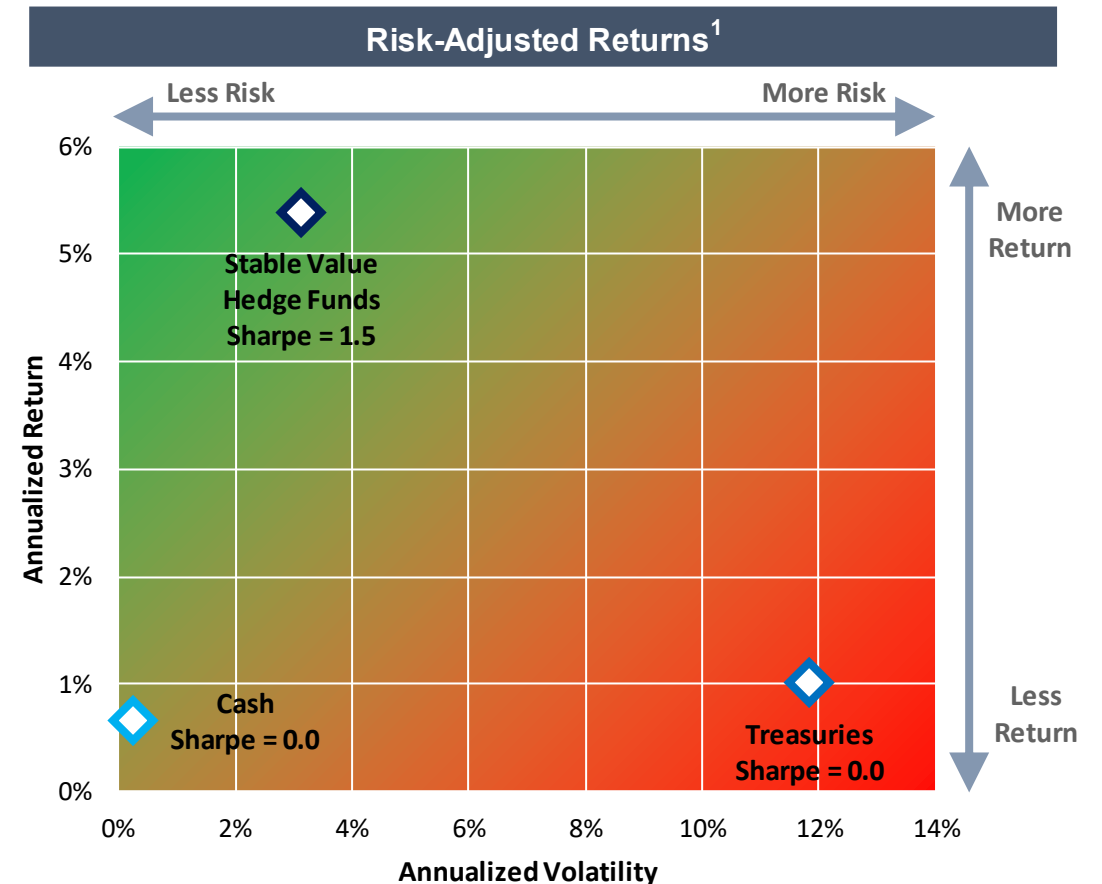
²MSCI All Country World Index

³Bloomberg Barclays US Long Treasury Total Return Index

⁴HFRI Fund of Funds Conservative Index

Stable Value Hedge Funds and Treasuries

- Stable Value Hedge Funds have generated 5x the return of Treasuries on one quarter of the volatility, since inception
- While yields on Treasuries are more attractive now than a year ago, they remain at levels well below the historical performance of Stable Value Hedge Funds
 - SVHF also generated positive returns in a rising inflation environment, which is historically not conducive to Treasury market returns
- Stable Value Hedge Funds remain an important absolute return asset for the Trust



¹ Dates: October 2011 (inception) to December 2022

² Return of Bloomberg US Long Treasury Total Return Index

³ Return of Citigroup 3-month Treasury Bill

Stable Value Hedge Funds Liquidity

- A core function of this portfolio is to generate returns when traditional asset classes perform poorly. Taking profits from this portfolio when it performs well helps avoid locking in losses on negative returning assets
- To achieve this, the portfolio needs to be unresponsive to the direction of equity and credit markets, while also being liquid enough to obtain our cash when needed
- In 2022, the portfolio was able to send \$1.6B in liquidity back to the Trust, representing all investment profits as well as outright trims to the portfolio

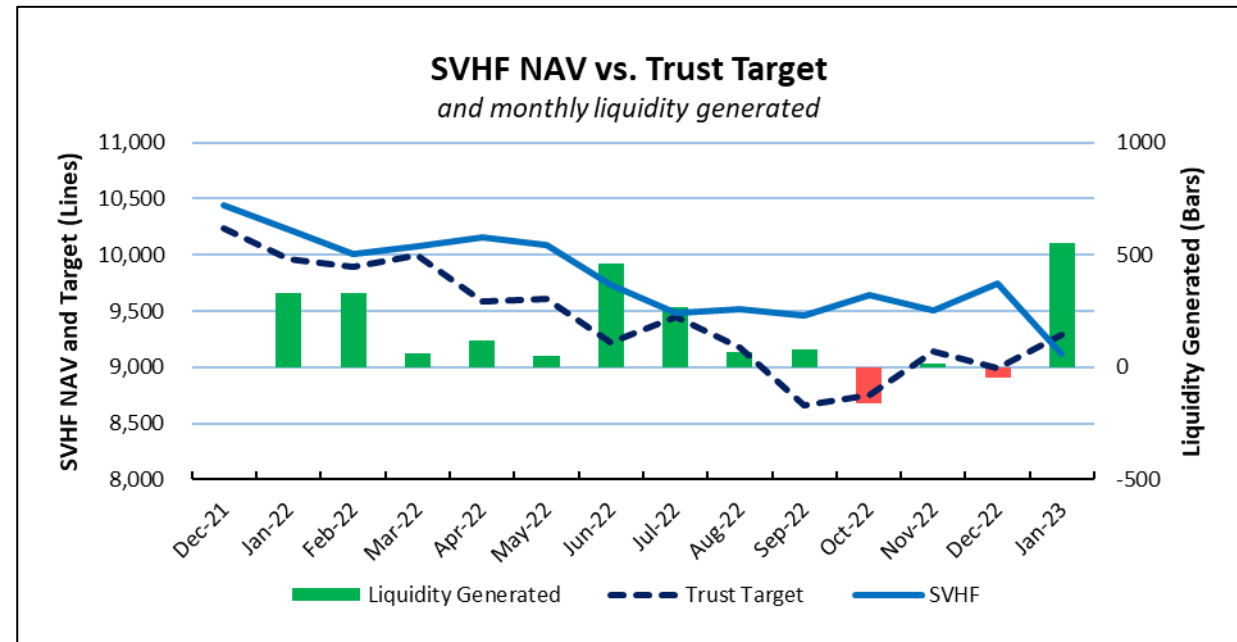
2022 Calendar Year

\$705M

In Investment Profits

\$1.6B

Cash sent back to the Trust



Annual Review of Absolute Return

Ashley Baum, Senior Director

April 2023



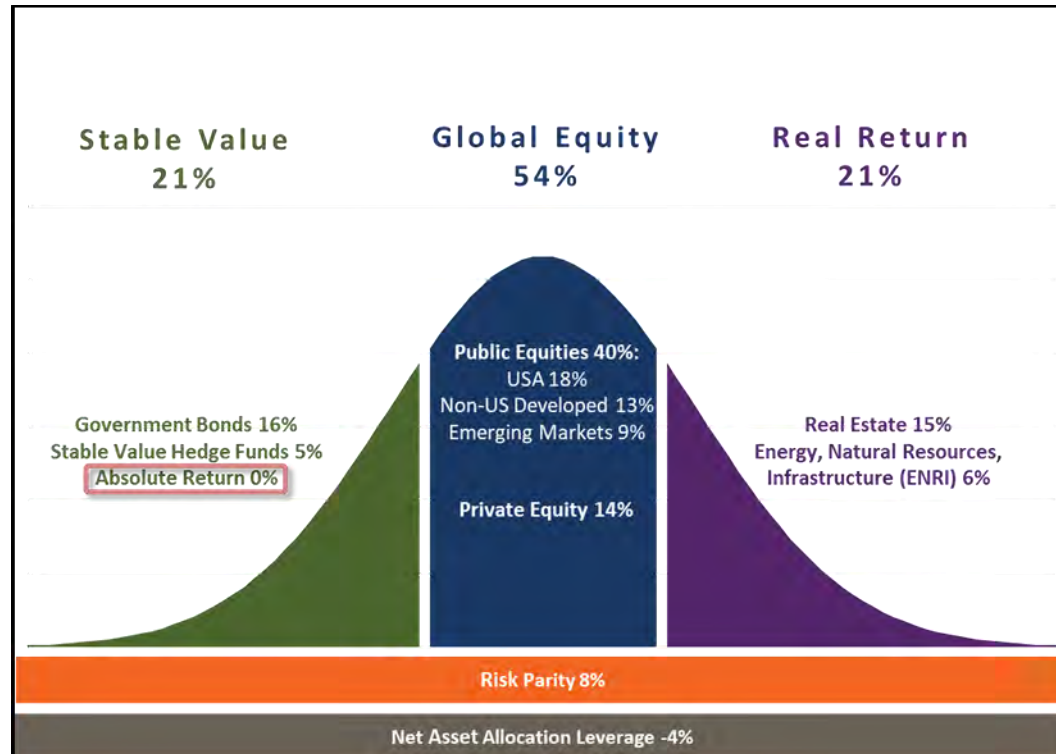
Role in the Trust

Absolute Return (AR)

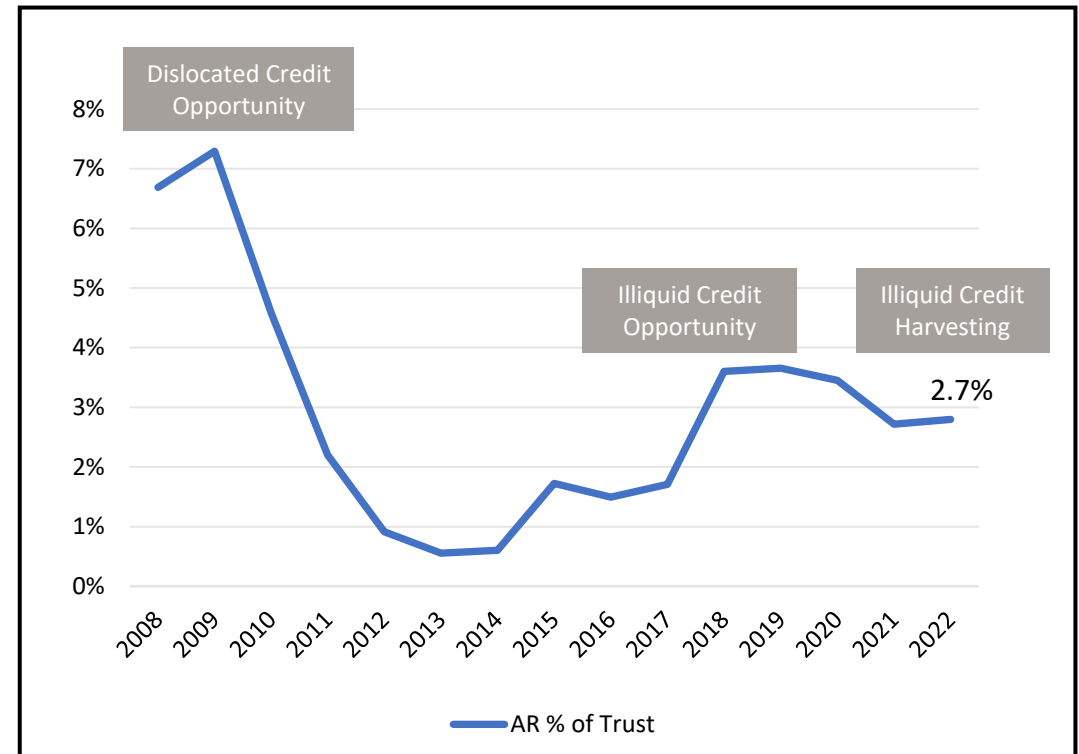
Absolute Return (“AR”) is “a broad category that includes all assets that have a high probability of generating a positive absolute return regardless of market conditions over a one- to three-year period”

- Policy range of 0-20% with a target of 0%
- Actual size depends on the opportunities available

AR TARGET % OF TRUST



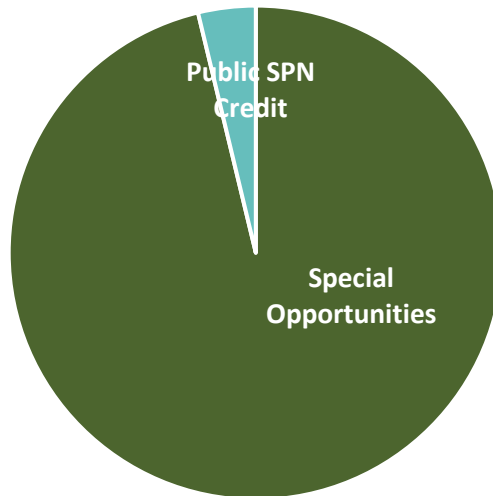
HISTORICAL TRUST ALLOCATION



Absolute Return Portfolio Summary

- Absolute Return represents 2.7% of the Trust, composed of:
 - 0.1% Public Strategic Partnership Network (“SPN”) Credit Assets
 - 2.6% Special Opportunities (“SO”)¹
 - 1.7% in Illiquid Credit
 - 0.9% in Multi-Strategy

MARKET VALUE BY STRATEGY



Market Value of \$4.9B as of 12/31/22

Special Opportunities Portfolio Goals

Deliver an 8% IRR over a 3-year basis

Scale portfolio up/down opportunistically

Capture unique and niche investments

Act as innovation agent for the IMD

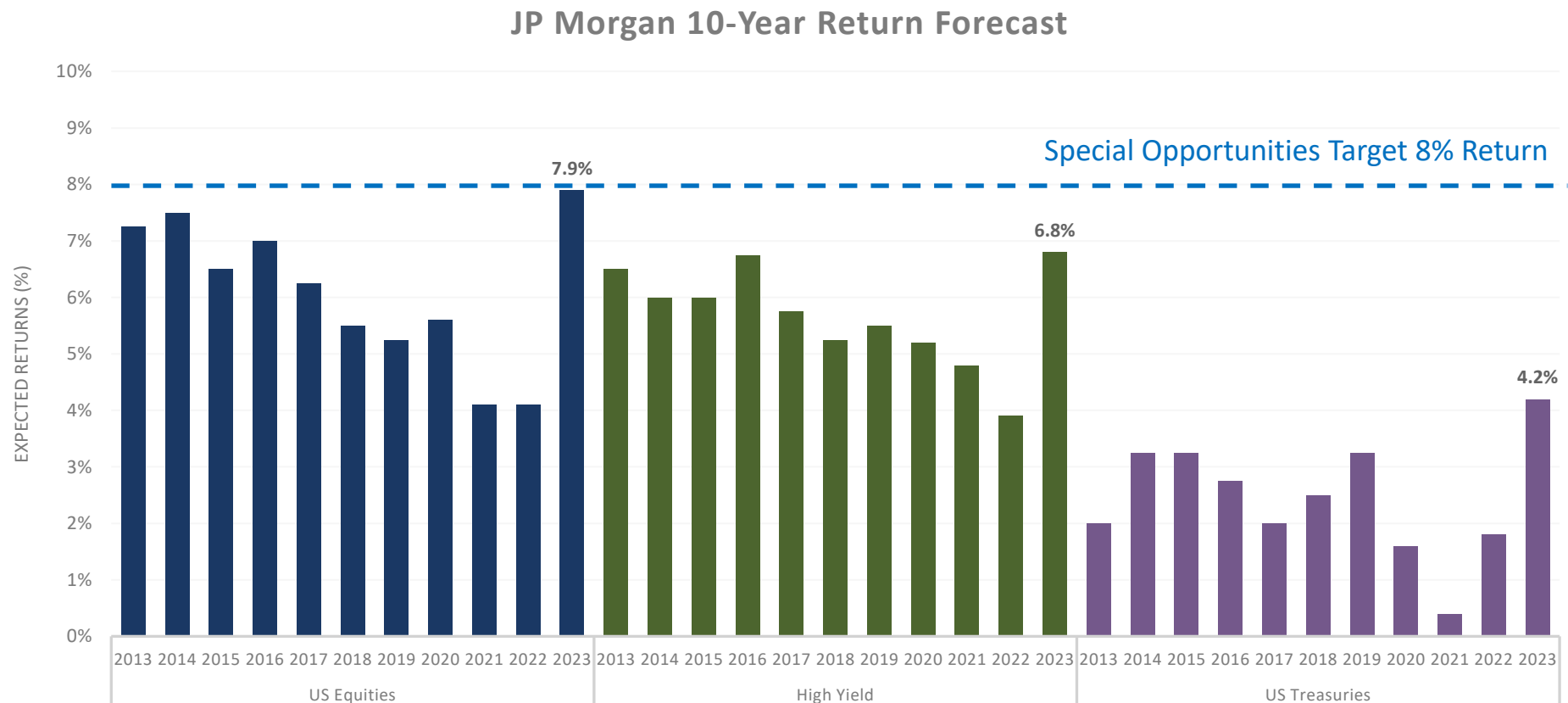
- Special Opportunities Portfolio launched in 2013 and includes fund and principal investments
- Over the last 10 years, TRS has deployed over \$14B in these opportunities, resulting in a 16.3% return and a 9.2% IRR
- SO manages the portfolio to a maximum weight of 5% during normal environments, although it will often be well below that level

¹ Special Opportunities has positions held in Global Equities (\$202M as of 12/31/2023) which are not included in the Absolute Return portfolio

Source: State Street, TRS IMD

Why Deploy In Absolute Return?

- Investments expected to return 8% are attractive relative to other public market assets
- Expected returns in liquid public markets consistently fell from when we began this effort in 2013 through 2021
- However, in 2022 expected returns rose following a sharp increase in risk free rates and steep market declines



Source: J.P. Morgan Long-Term Capital Market Assumptions 2013-2022; 10-year assumptions are published the year prior

Special Opportunities Portfolio Return

As of 12/31 each year

- The Special Opportunities team targets an 8% return over a 1- to 3-year basis
- Since inception, the portfolio has exceeded its target return on a 1-year basis 7 out of 10 years and on a 3-year basis 5 of 8 periods

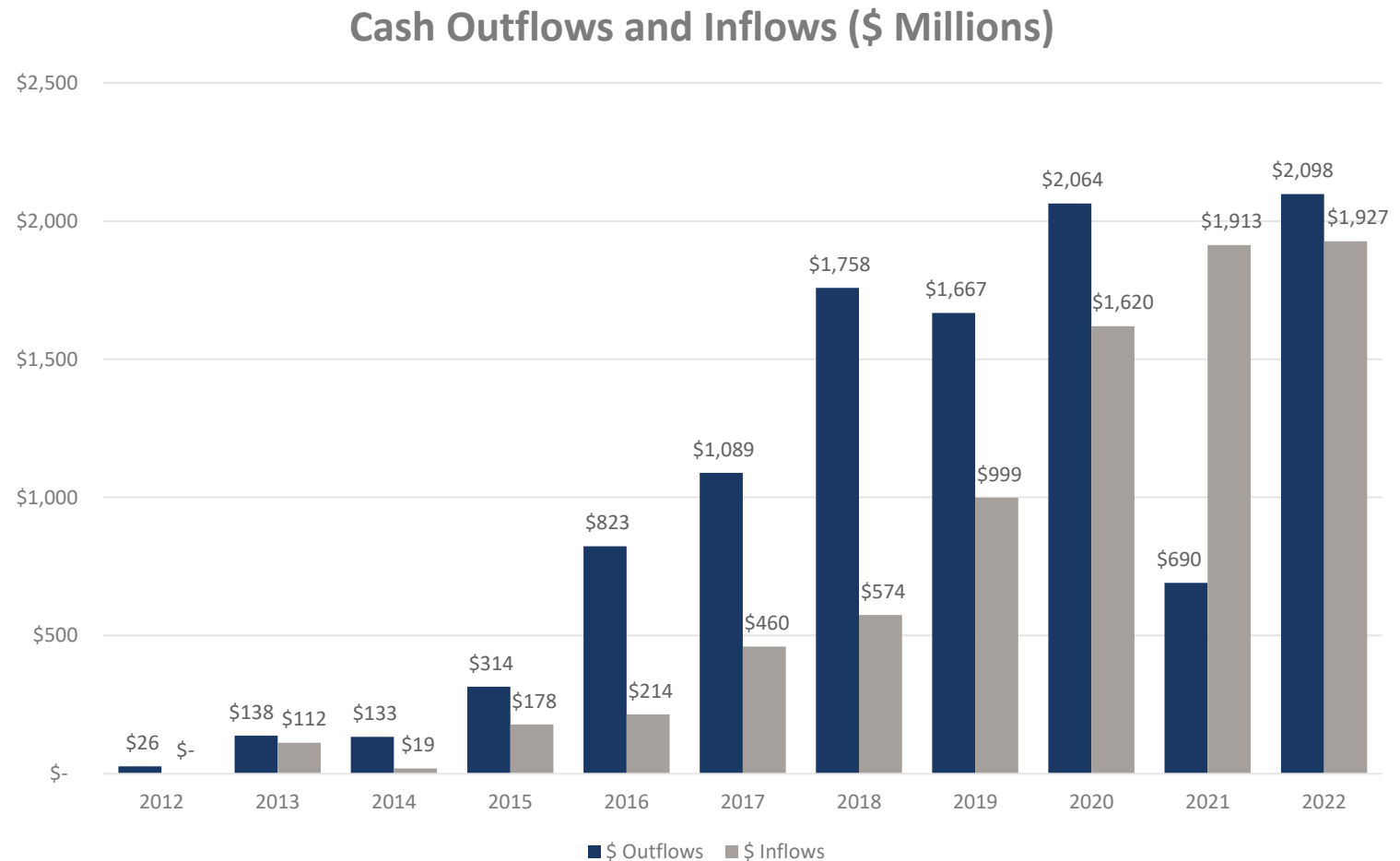


¹ Returns presented include Tactical Value from its inception in 2015. Special Opportunities began managing Tactical Value in March 2020.

Opportunistic Deployment

Cash Outflows and Inflows by Year

- SO does not deploy capital unless the opportunity set is compelling
- SO deploys and returns capital more frequently than other areas of the Trust
- This results in more variable cash flows, with a total invested amount (\$14.3 billion) much larger than current market value (\$4.9 billion)



Special Opportunities Performance Summary

\$ in Millions

PORTFOLIO INVESTMENTS PERFORMANCE as of 12/31/22											
Portfolio	Market Value	Total Exposure	% of Portfolio	Time Weighted Return				Internal Rate of Return			
				1-Year	3-Year	5-Year	Since Incept.	1-Year	3-Year	5-Year	Since Incept.
Funds	\$3,671	\$6,305	78%	3.0%	9.3%	8.3%	9.0%	1.7%	8.7%	8.7%	9.4%
Principal Investments	\$1,264	\$1,759	22%	-5.5%	2.1%	8.9%	3.2%	-4.7%	2.6%	7.7%	8.1%
Special Opportunities Assets	\$4,935	\$8,064	100%	1.0%	7.8%	8.4%	16.3%	0.1%	7.4%	8.5%	9.2%

Public Market Equivalent ("PME") Benchmark Analysis Since Inception

Special Opportunities Assets as of 12/31/2022



- The portfolio allocation between Funds and Principal Investments varies depending on the opportunity set and implementation options
- SO is achieving its goal of selecting investments with asymmetric return profiles. Of the \$1.6B deployed in 32 realized Principal Investments:
 - 84% were profitable, resulting in \$271M in gains
 - 16% were not, resulting in \$23M in losses

Notable Investment: Texas Debt Capital

- In October 2021, TRS announced a new leveraged loan investment platform known as Texas Debt Capital (“TDC”)
- TDC is a partnership between TRS as Limited Partner and CIFIC Asset Management as General Partner
- TRS has committed equity that will provide for \$2B loan purchasing capacity in the US and Europe
- The platform will invest in large, liquid loans issued by TRS’s private equity investment partners as well as other financial sponsors
- TDC will opportunistically issue collateralized loan obligations (“CLOs”)
- Consistent with our original intention, in March CIFIC priced the inaugural CLO for Texas Debt Capital, a \$399M issuance at attractive financing levels

“CIFIC prints CLO to securitise Texas pension joint venture”

Wednesday, March 1, 2023

TDC CLO 2023-1 Capital Structure

Tranche	Size (\$M)	Rating	Spread	Price
A	256	AAA-	180	100%
B	48	AA-	230	100%
C	23	A-	300	100%
D	23	BBB-	510	100%
E	12	BB-	843	99%
Sub	36	NR		
Total	399			

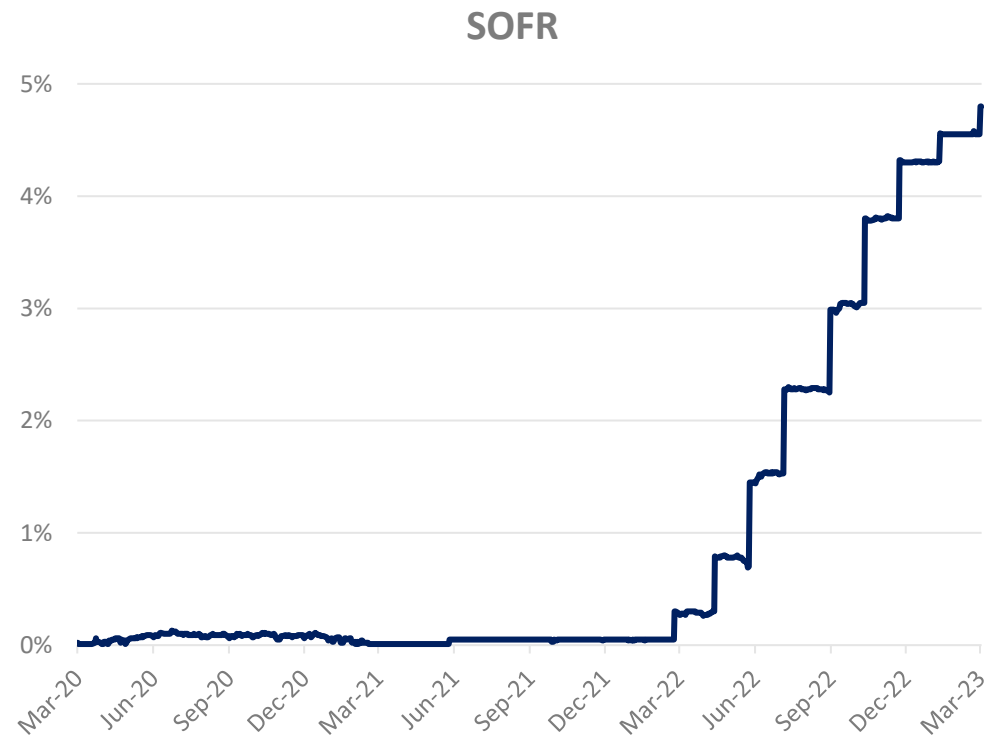
Highlighted Transaction Stats:

- AAA tranche priced 10 bps tight of 10-day rolling average
- Weighted average spread of 237 bps is 5th tightest US CLO issued in 2023 with a 5-year investment period

Theme: Tightening Financial Conditions

Tightening financial conditions brought on by rising rates and the associated constraint of available capital presents SO with many opportunities. Our focus areas, all beneficiaries of tightening financial conditions, are below:

Risk Free Rates Rising



Source: Federal Reserve Database

SO Focus Areas

Regulatory
Capital

GP Solutions

Warehousing

Summary: 10 Year Portfolio Assessment

Portfolio Goal		Status (12/31/22)
Deliver an 8% IRR over a 3-year basis	➔	<ul style="list-style-type: none">• Exceeded return target 5 out of 8 periods since inception• Since inception IRR 9.2%
Scale portfolio up/down opportunistically	➔	<ul style="list-style-type: none">• Deployed \$14.3B with NAV of \$4.9B• Significant capital returned• Designed capacity structures to be ready to invest when compelling (\$3B dry powder available)
Capture unique and niche investments	➔	<ul style="list-style-type: none">• Deployed into direct lending, reg cap, hedge fund co-investments
Act as innovation agent for the IMD	➔	<ul style="list-style-type: none">• Implemented TRS custom funds• Formed TRS standard structure & terms for co-investing• Created CLO platform• Established warehousing relationships• Sourced investments resulting in \$800M invested by other IMD teams

APPENDIX

Organization

Special Opportunities Team

Members of the Special Opportunities Investment Committee



Ashley Baum, CFA, CPA
Senior Director
Head of Special Opportunities
MPA, Accounting
University of Texas at Austin



Michael Phillips, CFA
Director
Head of Credit for Special Opportunities
MA, Music
Cambridge



Dylan Campbell, CFA
Senior Associate
MA, Finance
Claremont McKenna



Holly Poole
Senior Associate
MA, Finance
Claremont McKenna



Liam Garrett
Senior Analyst
MS, Finance
University of Texas at Austin



Carl Spansk, CFA, CAIA
Senior Analyst
MS, Finance
University of Texas at Austin



Jon Klekman
Shared Analyst
Relationship Management
BA
SUNY Binghamton

TBD

Interviewing In Progress

Advisors



K.J. Van Ackeren, CFA
Senior Director
Fundamental Research, IFM
MBA
Texas Christian University



Mohan Balachandran
Senior Managing Director
Head of MSG, Member of IIC
PhD, Physics
Brown University



Steven Wilson, CAIA
Director
External Public Markets
MBA
Rice University

EXPERIENCE SUMMARY

1 PhD Degree
5 CFA Charterholders
2 CAIA Charterholders
1 CPA
8 Master's Degrees

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Investment Risk Report

James Nield, Chief Risk Officer

Stephen Kim, Director

April 2023



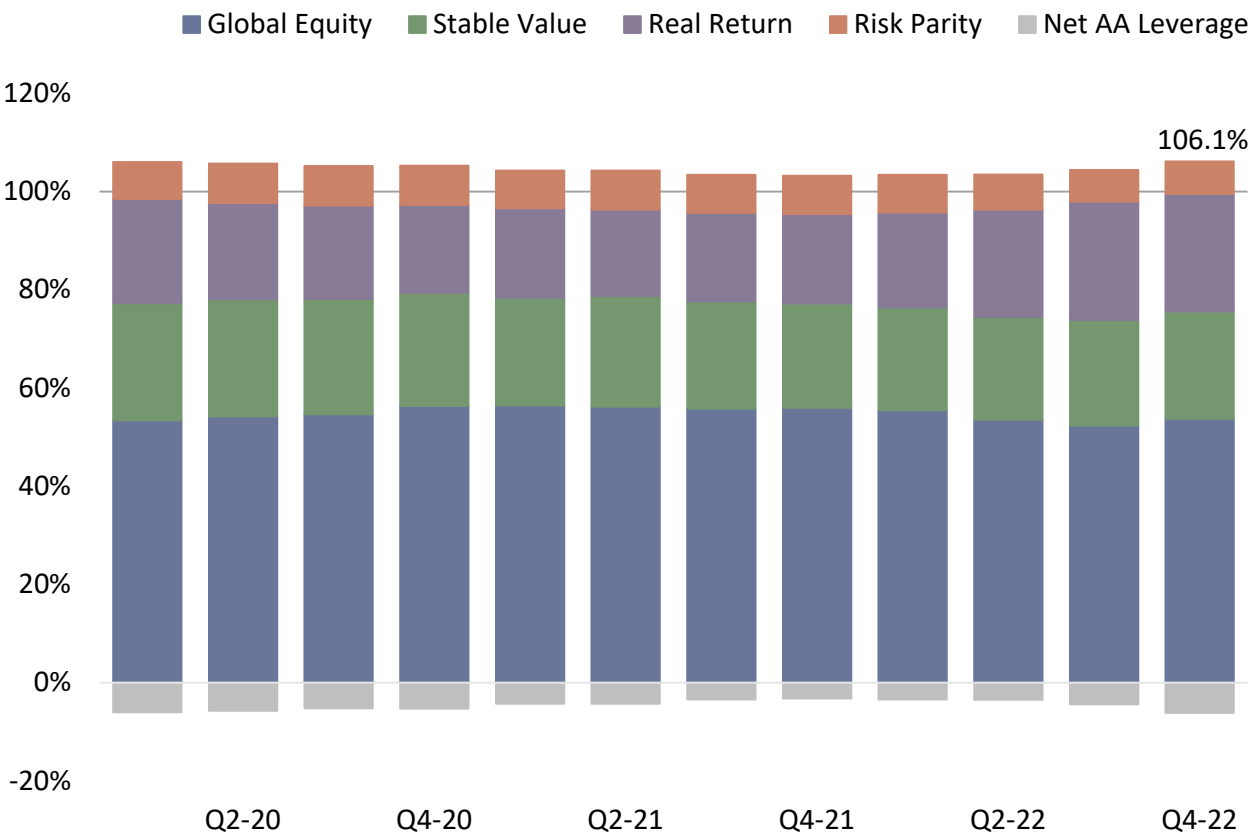
All metrics in compliance

<u>Risk Metric</u>	<u>Value</u>	<u>In Compliance?</u>	<u>Page(s)</u>
1. Asset Allocation (AA): Overweight Stable Value	Overweight 3.0%	✓	3 - 5
2. Drawdown Risk: VaR estimate increased	6.9% VaR	✓	6 - 8
3. Tracking Error: Total Trust TE range bound	161 bp	✓	9 - 10
4. Leverage: Trust levered by 6.1%	-6.1% Net	✓	11 - 13
5. Liquidity: Remained strong	3.7x Coverage Ratio	✓	14
6. Counterparty Risk: Within Policy limit	Lowest Rating: A-	✓	15
7. Derivatives: Gross notional exposure declined	19.8% Gross Notional	✓	16 - 17
8. Securities Lending: Earnings stable	13.2% Utilization	✓	18

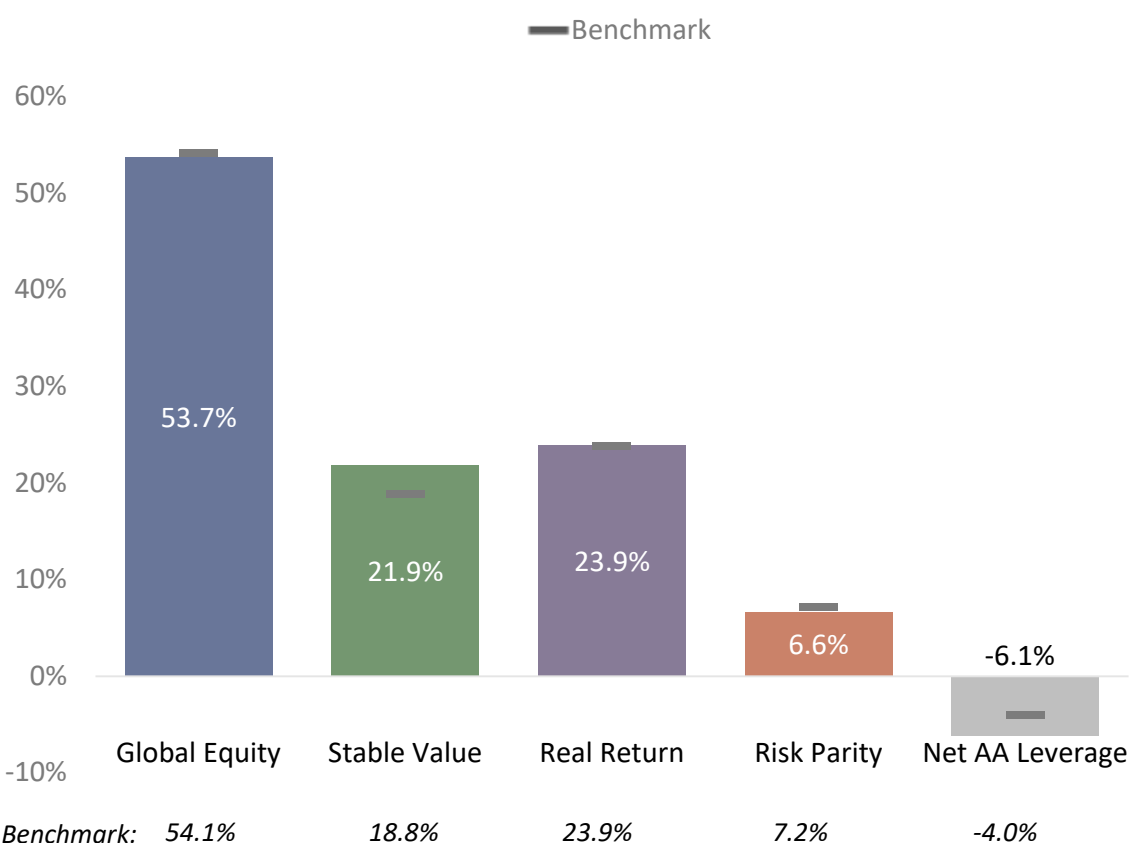
Unless otherwise noted, data presented as of December 31, 2022

Trust overweight investment exposure primarily due to Stable Value

Asset Class Weights Trend

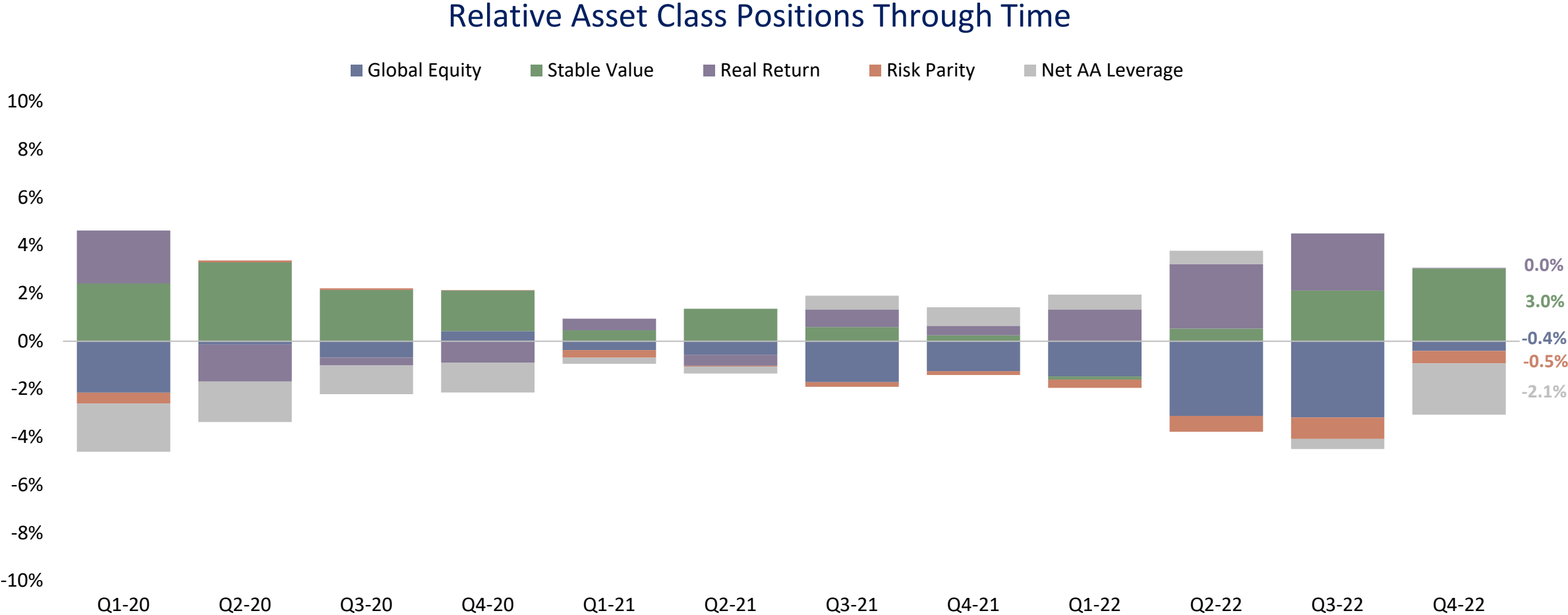


Asset Class Weights

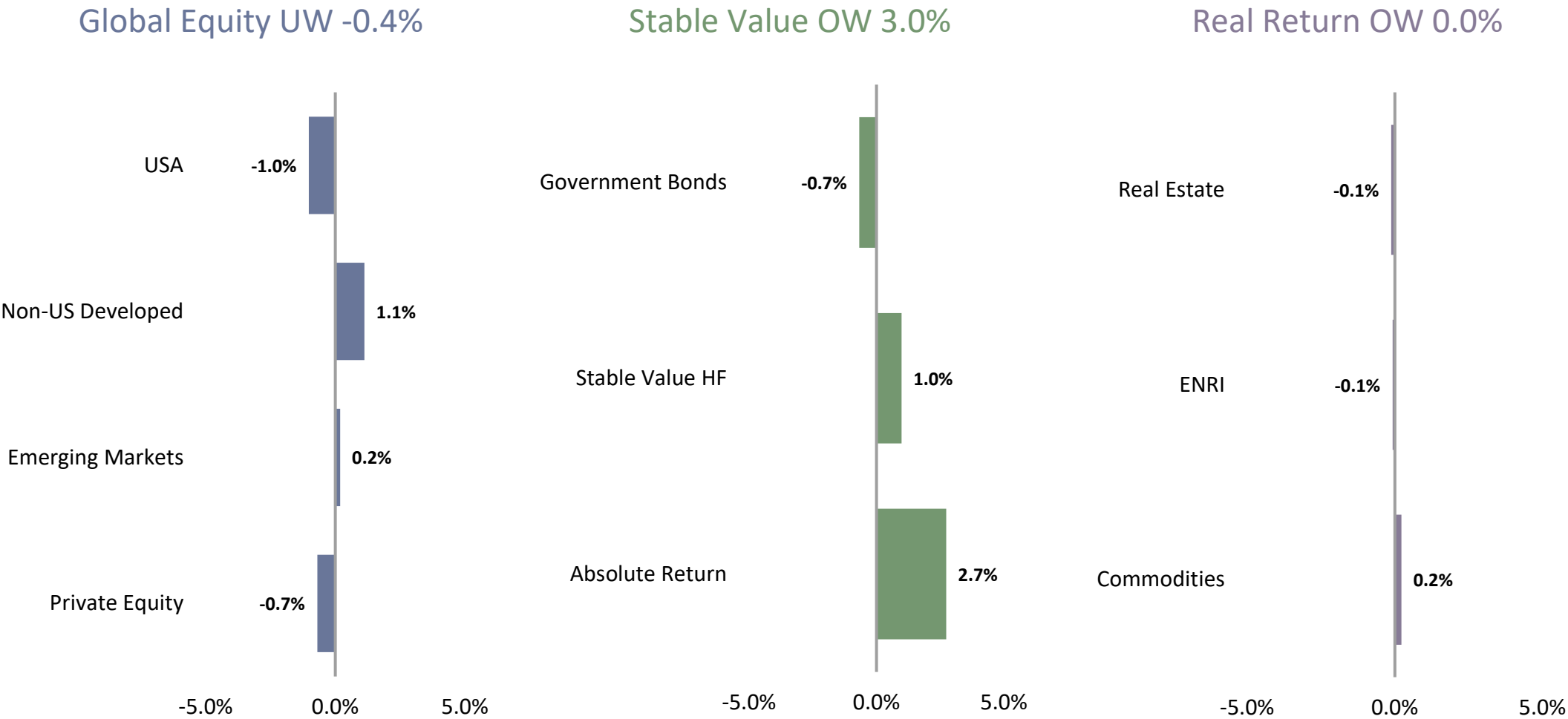


Source: State Street Bank; note: Net AA leverage is -6.1%, which indicates the Trust is levered by 6.1%

Stable Value exposure increased via Net AA Leverage

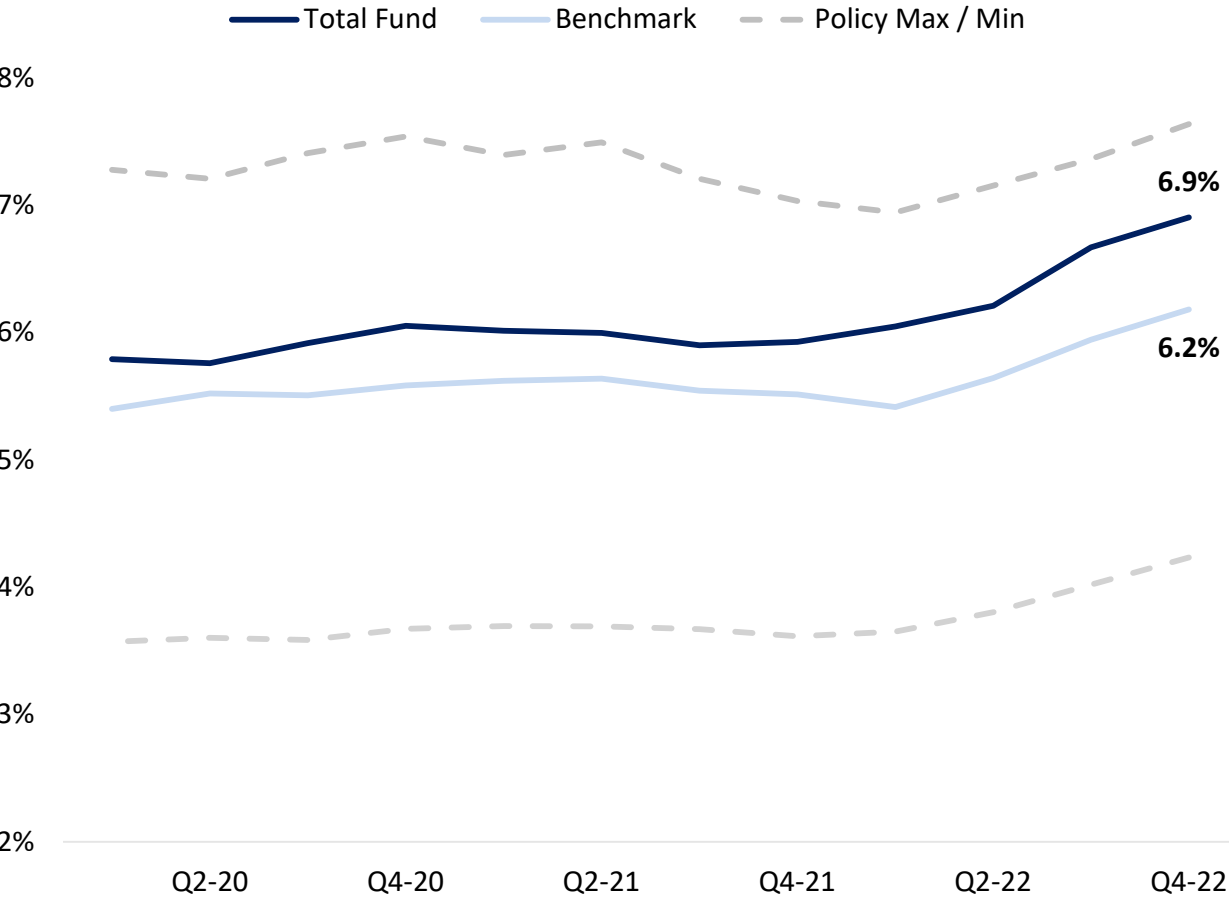


Global Equity and Real Return near targets

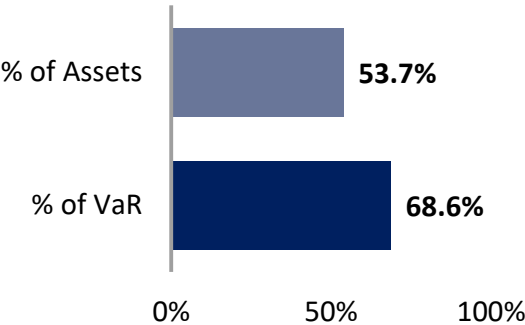


VaR estimates increased given 2022 market volatility

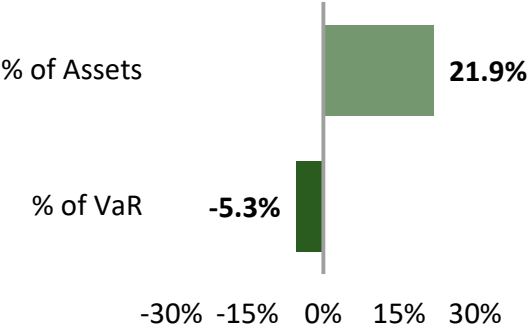
VaR History



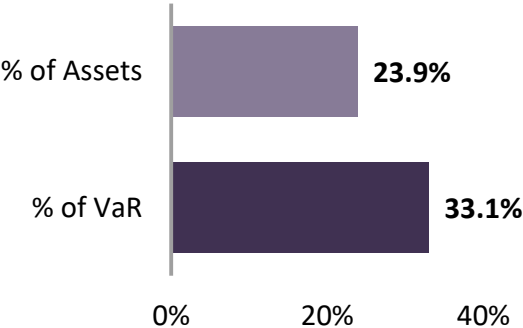
Global Equity



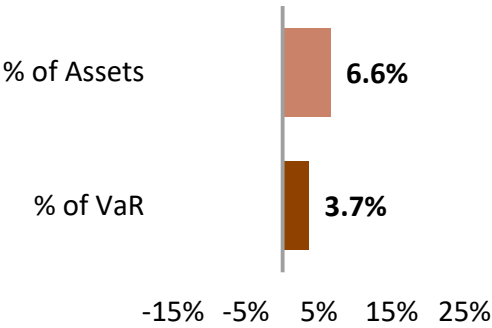
Stable Value



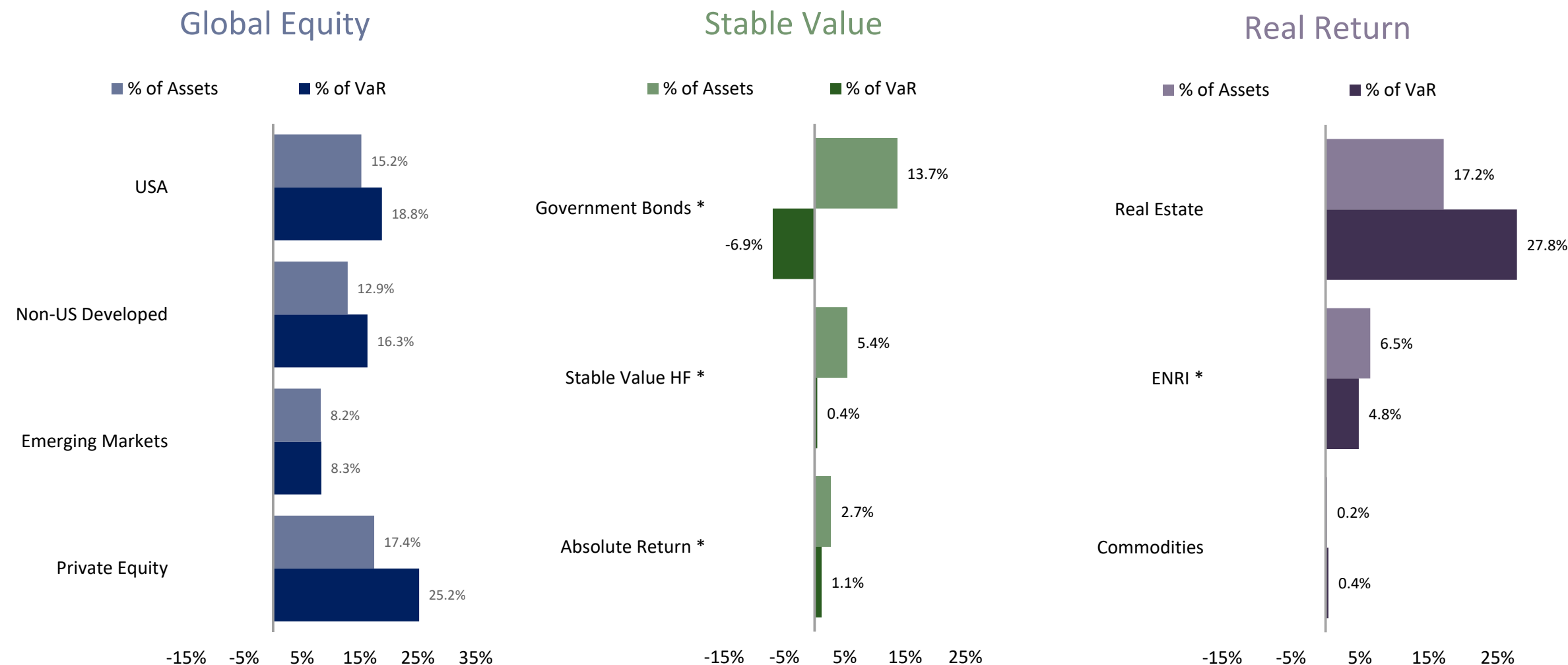
Real Return



Risk Parity

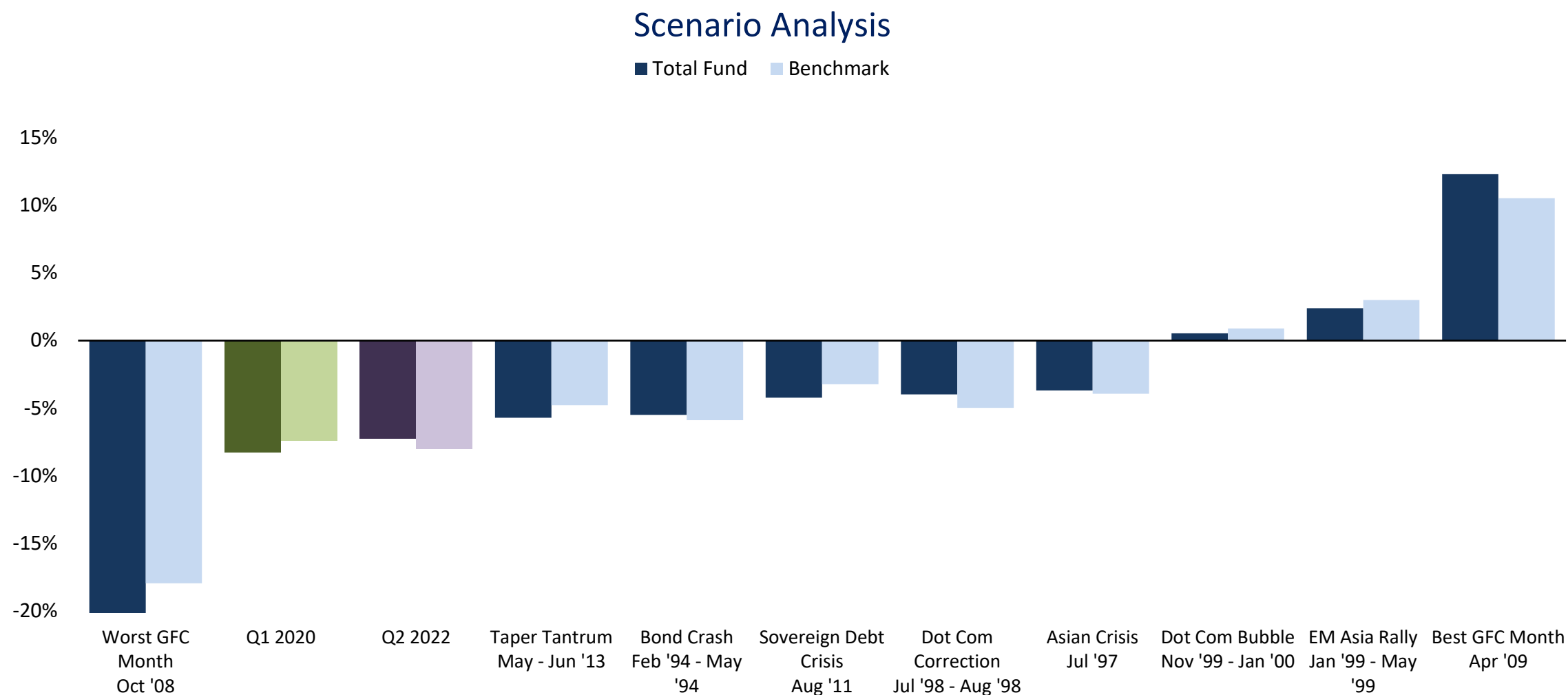


Stable Value assets remain a key source of diversification



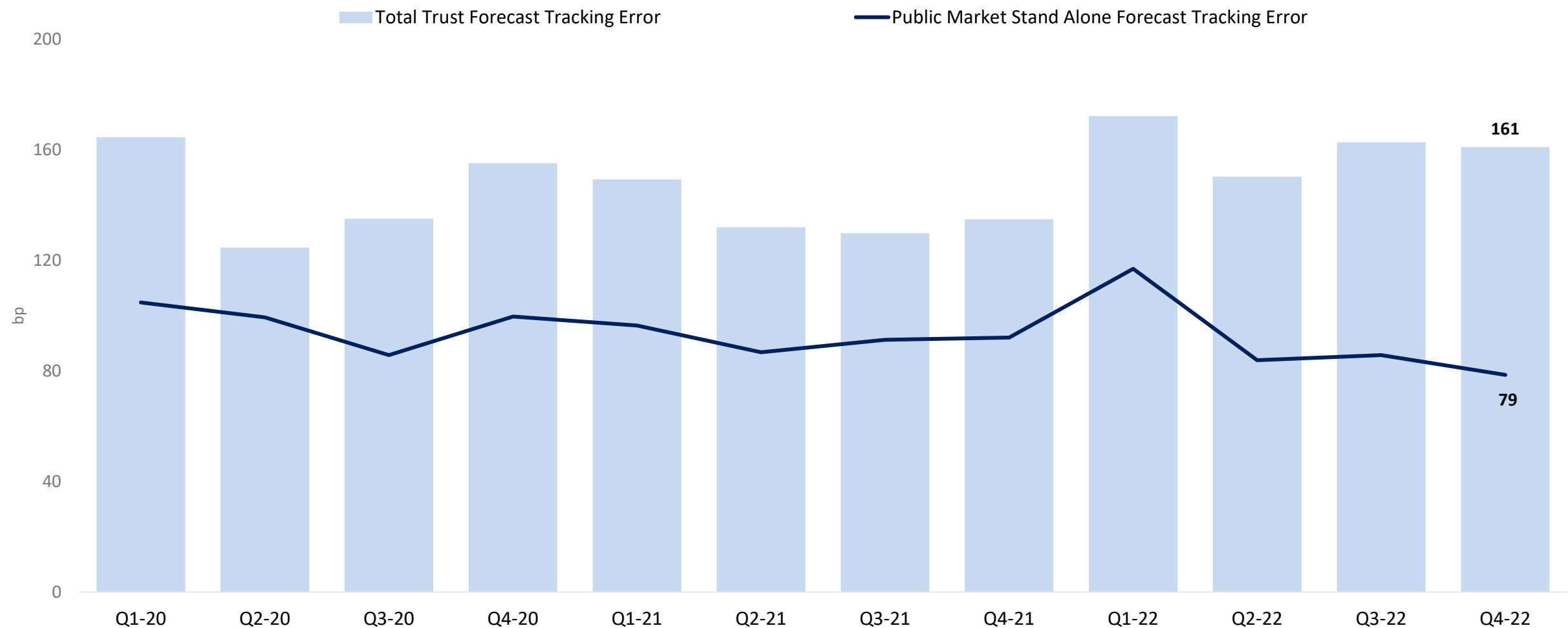
* These assets contribute less risk than their dollar allocation

Predicted Trust drawdowns in line with benchmark

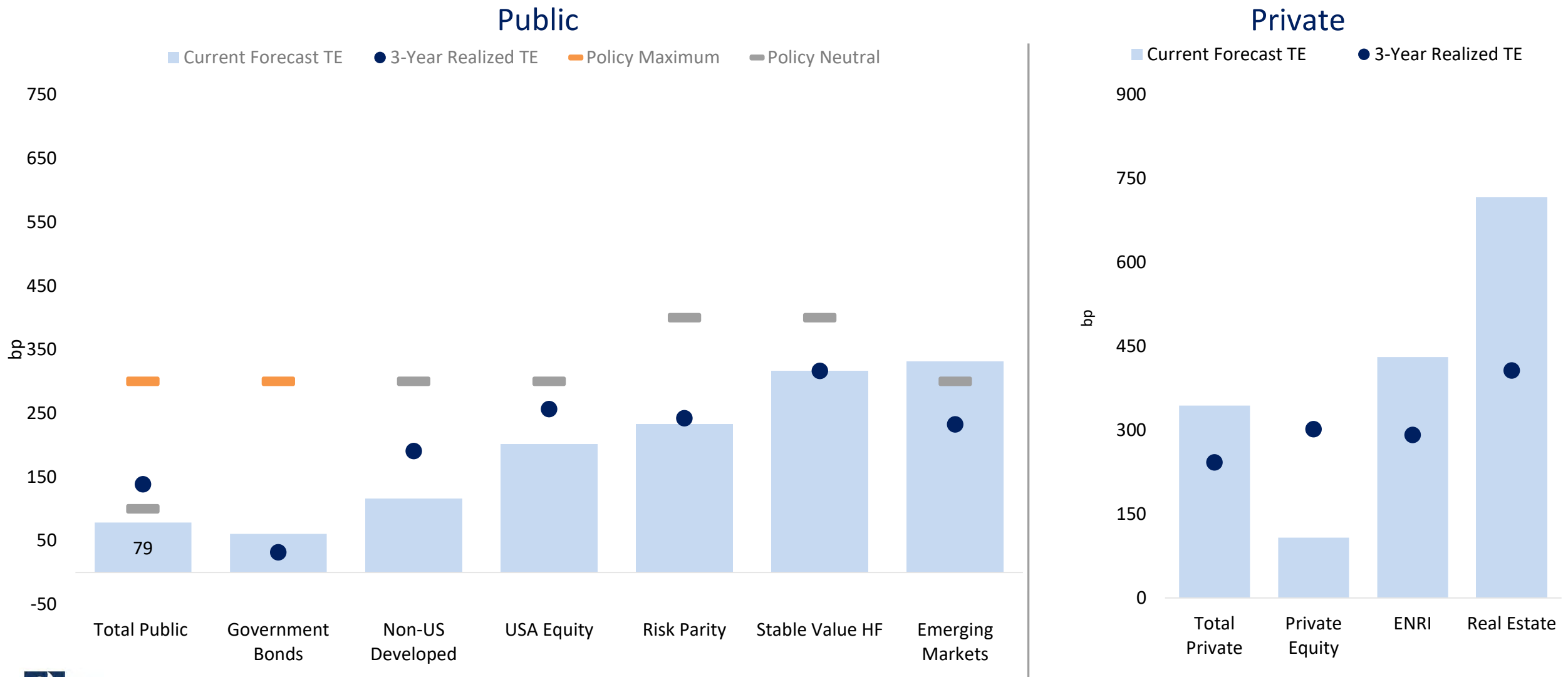


Source: State Street Bank; note: data shown are predicted drawdowns given current allocation, except for Q1 2020 and Q2 2022, which reflect realized performance

Forecasted Trust tracking error remains range bound

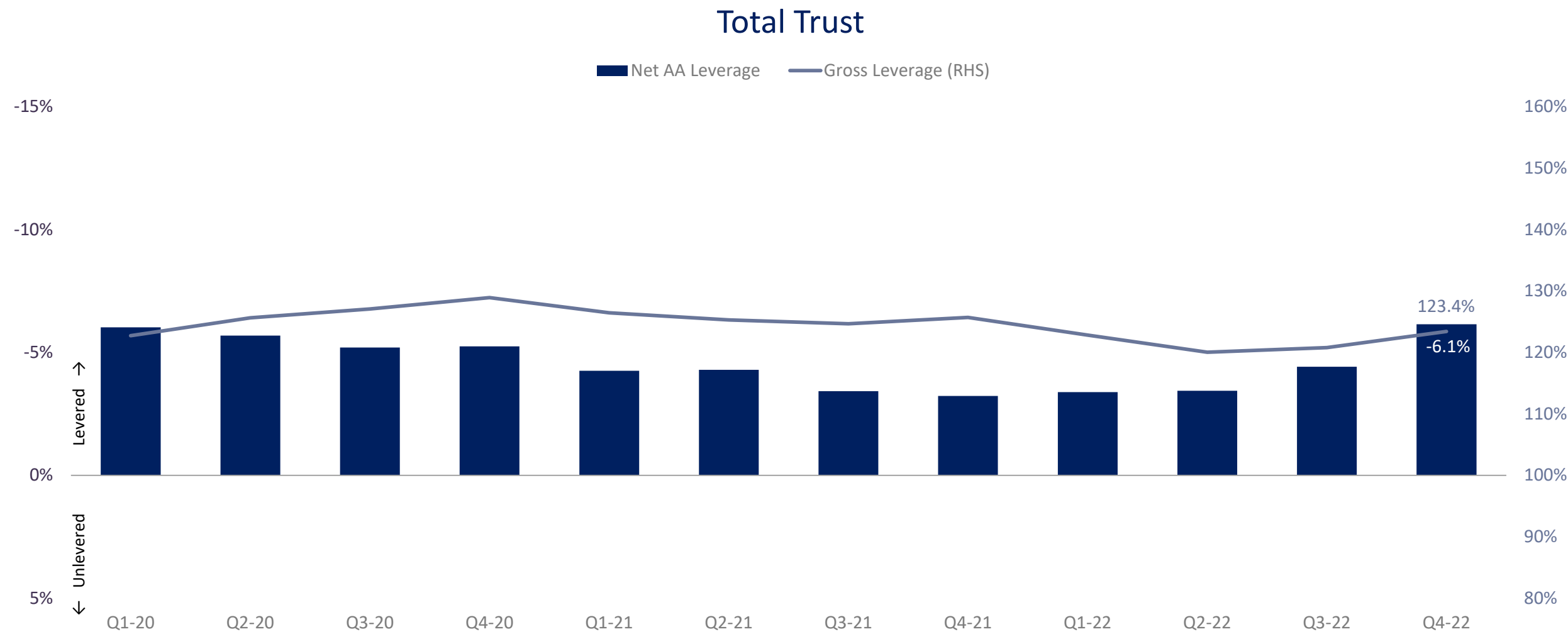


Forecasted Tracking Error near historical norms



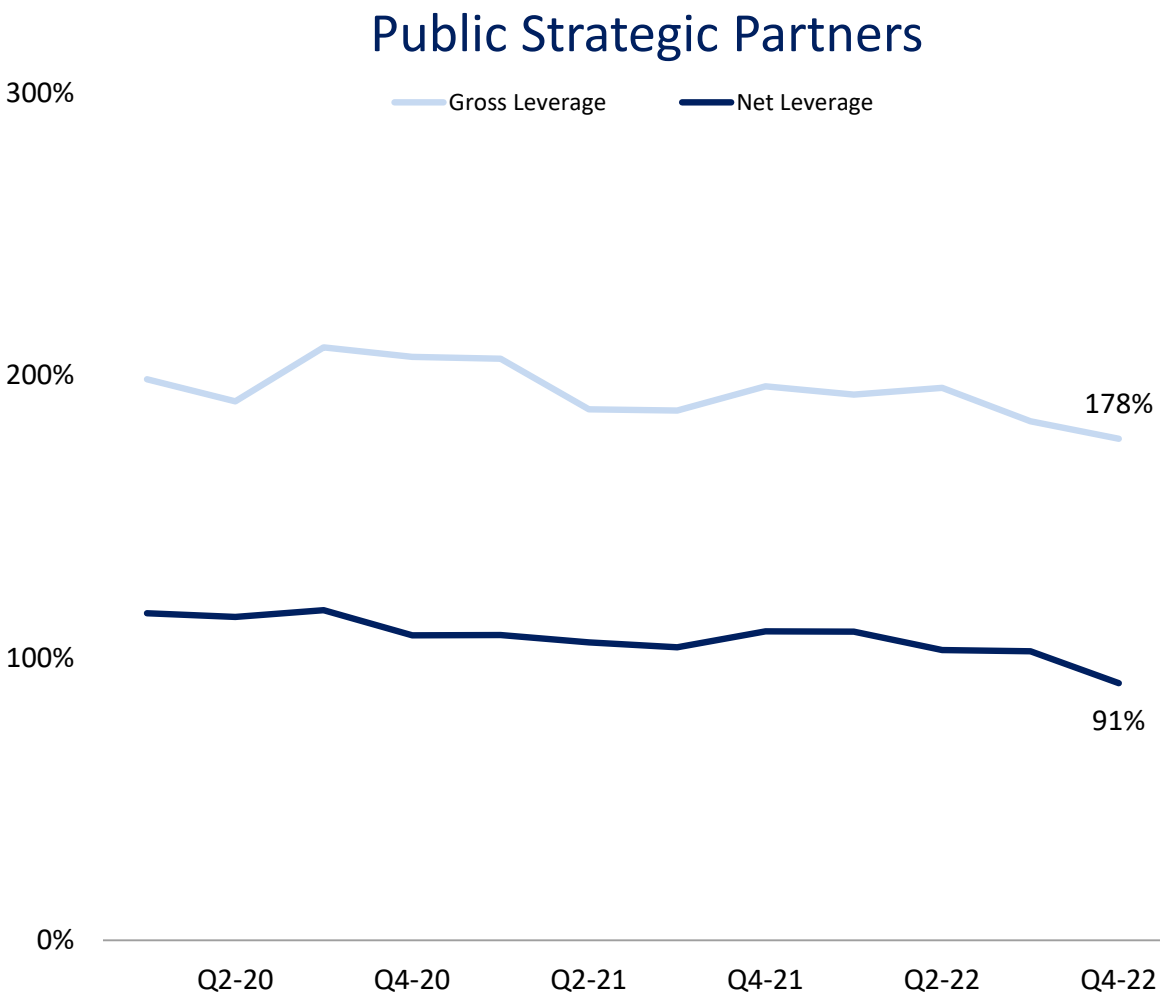
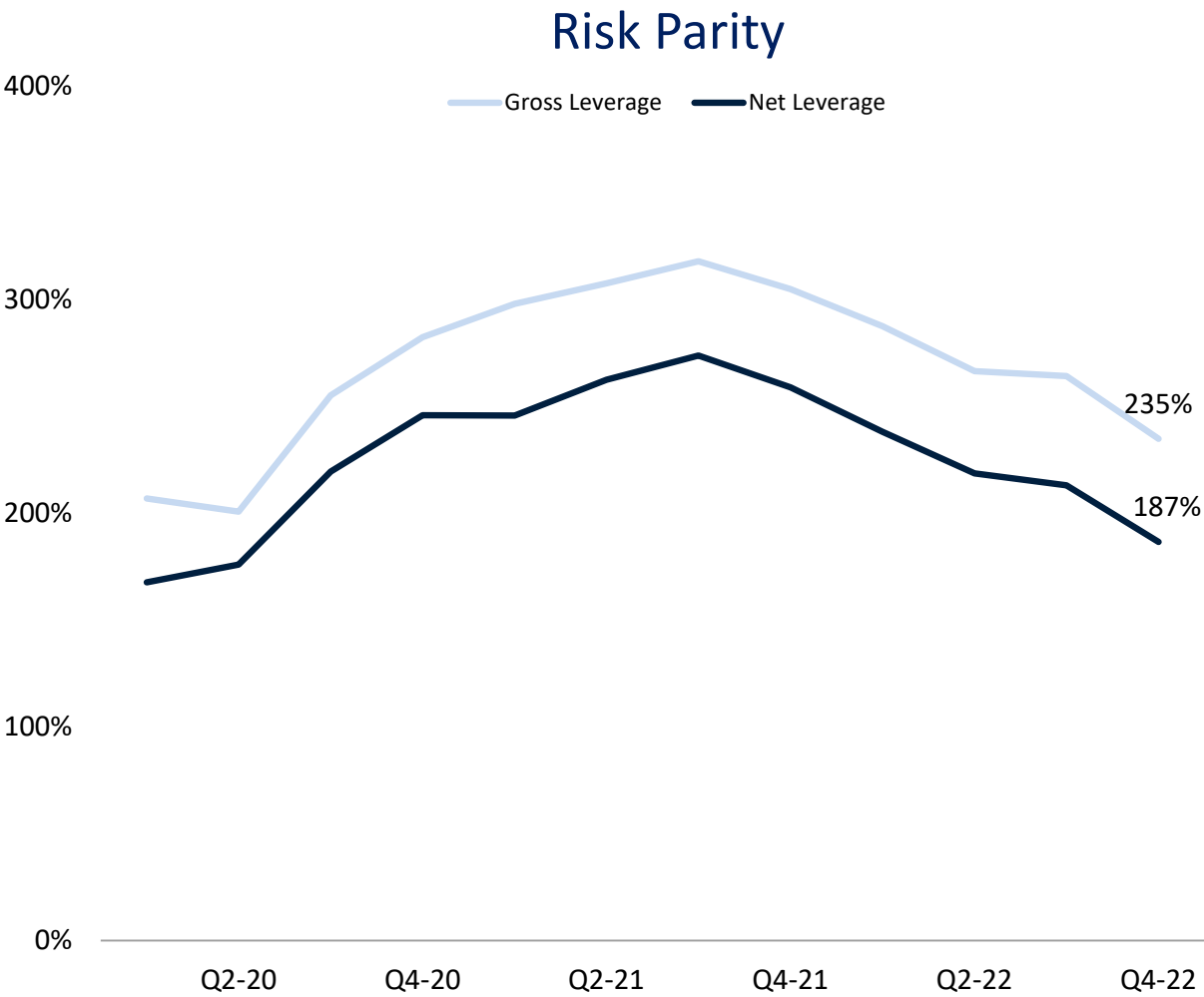
Source: State Street Bank; note: current forecast tracking error uses past experiences from January 1, 2008 to December 31, 2022 and therefore includes the effects of the Global Financial Crisis; External World Equity had tracking error of 320 bp realized, 230 bp forecasted with a policy neutral of 300

Net and Gross AA Leverage increased due to Absolute Return

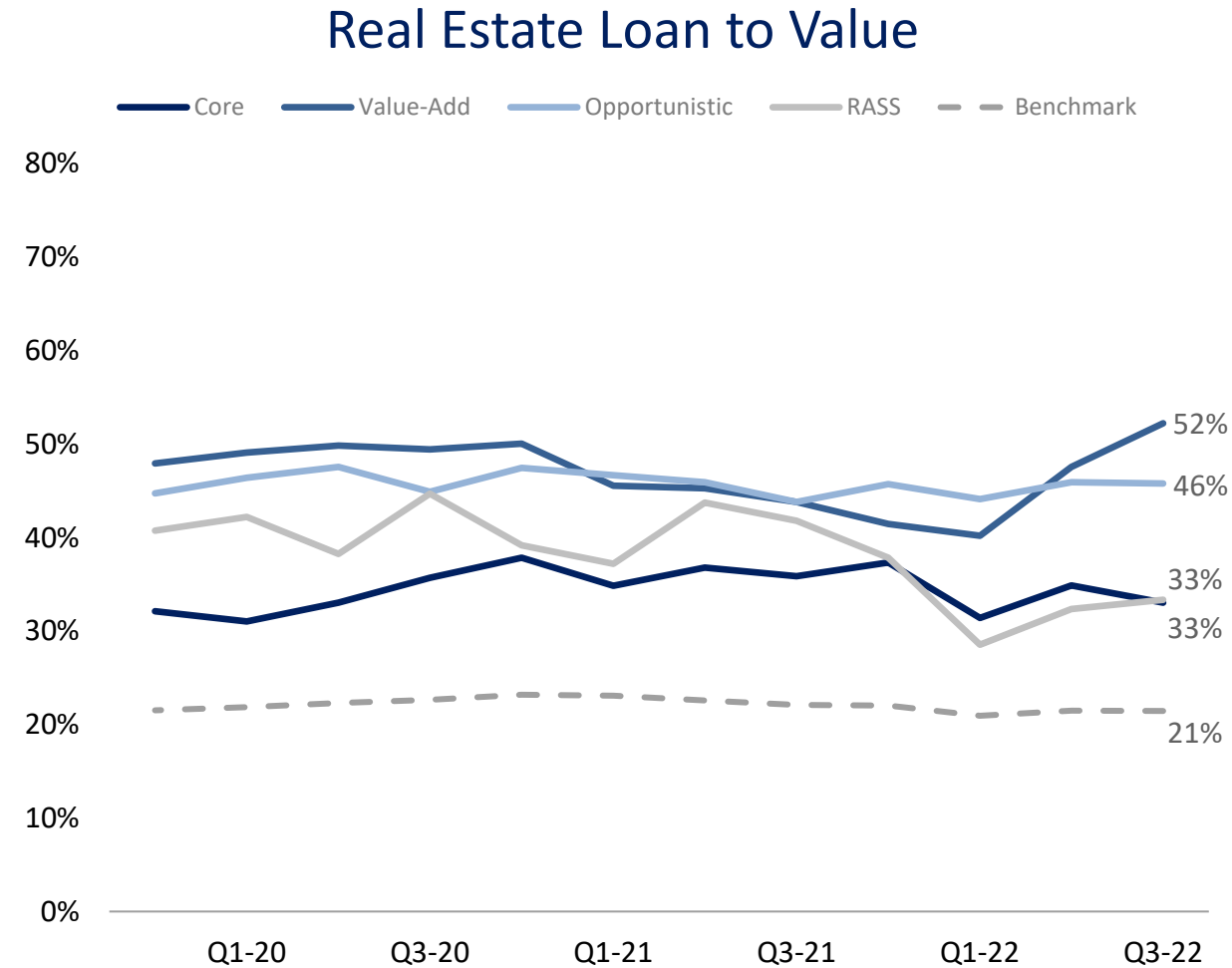
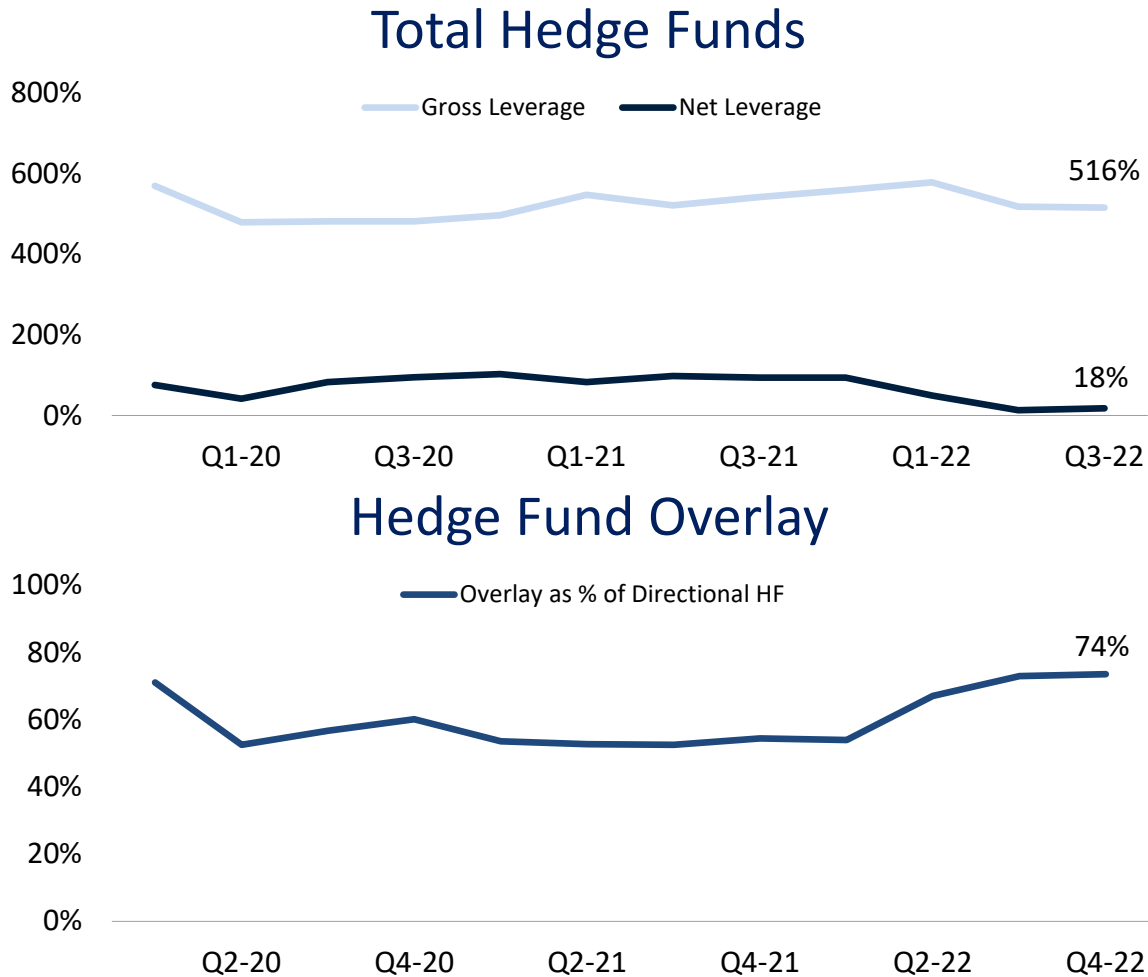


Source: State Street Bank; note: total Trust leverage excludes securities lending which is reported separately; Net AA Leverage includes adjustments for delta-notionalization of options and exclusion of spot forwards of 30 days or less

Risk Parity and SPN leverage decreased



Hedge Fund Overlay increased to offset reduced Hedge Fund leverage

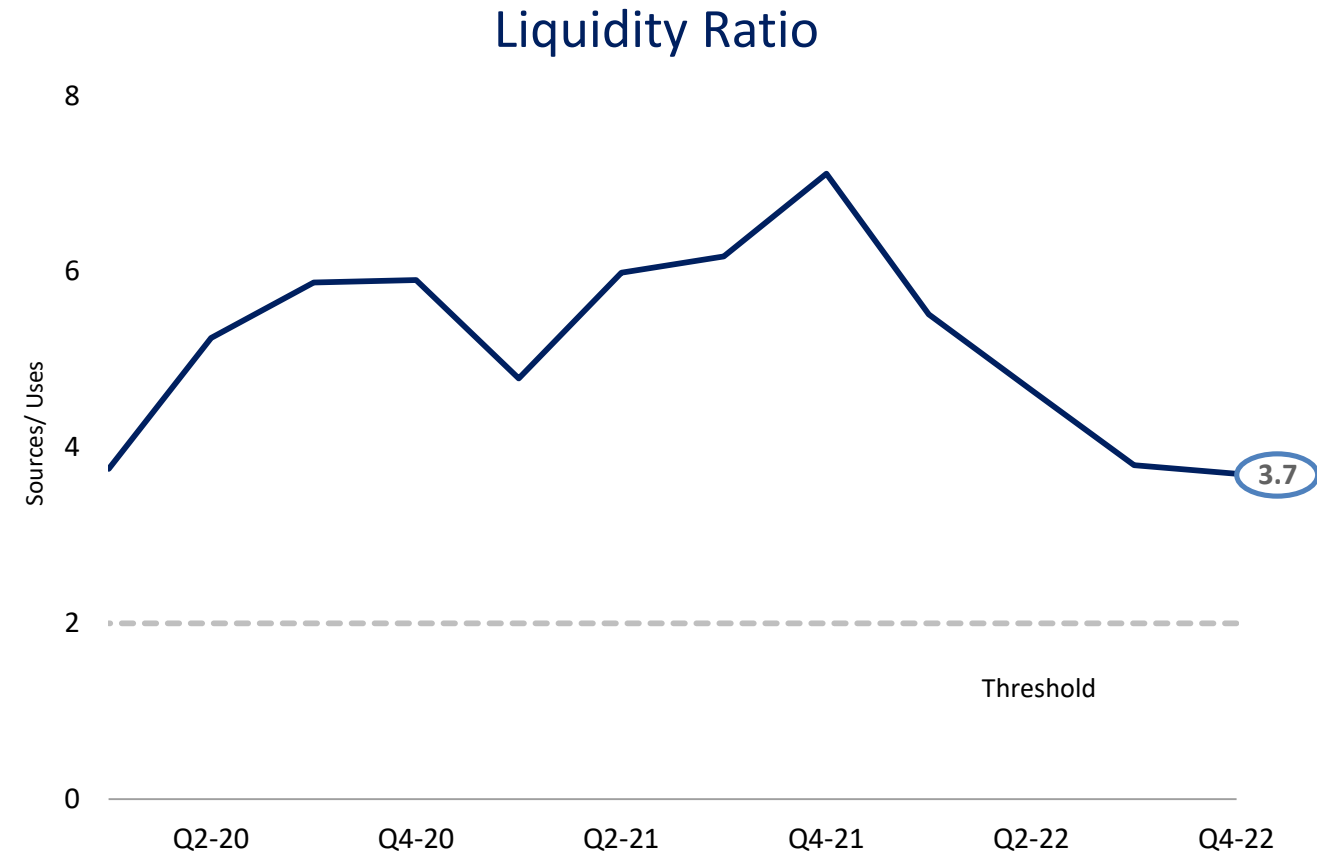


Trust liquidity remained strong

Sources of Liquidity (\$, billions)	Market Value	Stressed Value
Internal Cash	\$ 2.8	\$ 2.8
Government Bonds	8.3	6.8
Risk Parity	11.9	6.9
Other Liquid Assets (Equity, Commodities)	53.8	27.4
Total Sources of Liquidity	\$ 76.8	\$ 43.9
<i>Note: Excluded illiquid assets, bond collateral, and Hedge Funds</i>	\$ 102.9	NA

Uses of Liquidity (\$, billions)	Market Value	Stressed Value
Operational Uses of Liquidity		\$ (0.4)
Stressed Securities Lending		(0.9)
Stressed Derivatives		(5.5)
Stressed Repo		(2.6)
Stressed Private Markets		(2.5)
Total Uses of Liquidity	\$ 0.2	\$ (11.8)

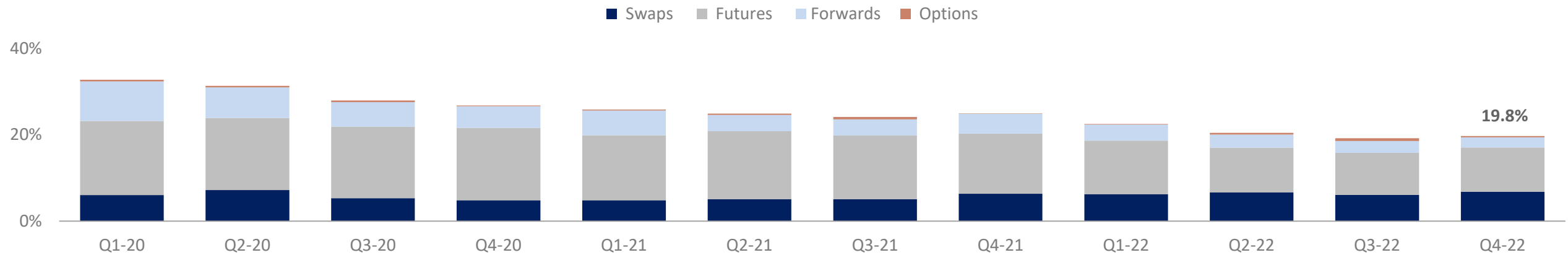
Liquidity Ratio	
Ratio (Sources/Uses)	3.7
Alert Threshold	2.0
Test Result	Pass
<i>Note: Net Stressed Liquidity (Sources less Uses)</i>	\$ 32.1
<i>Note: Past 12 Months of Benefit Payments</i>	\$ 4.2



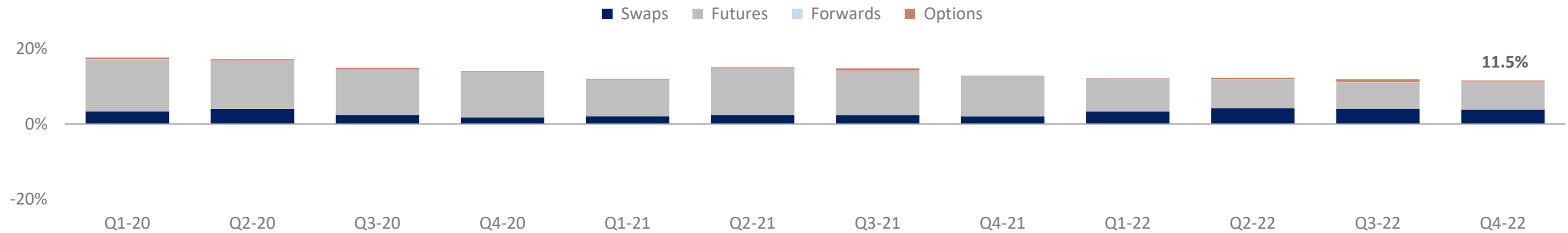
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Derivative gross and net notional decreased from Risk Parity and SPN deleveraging

Gross Notional by Instrument (% of Total Trust)



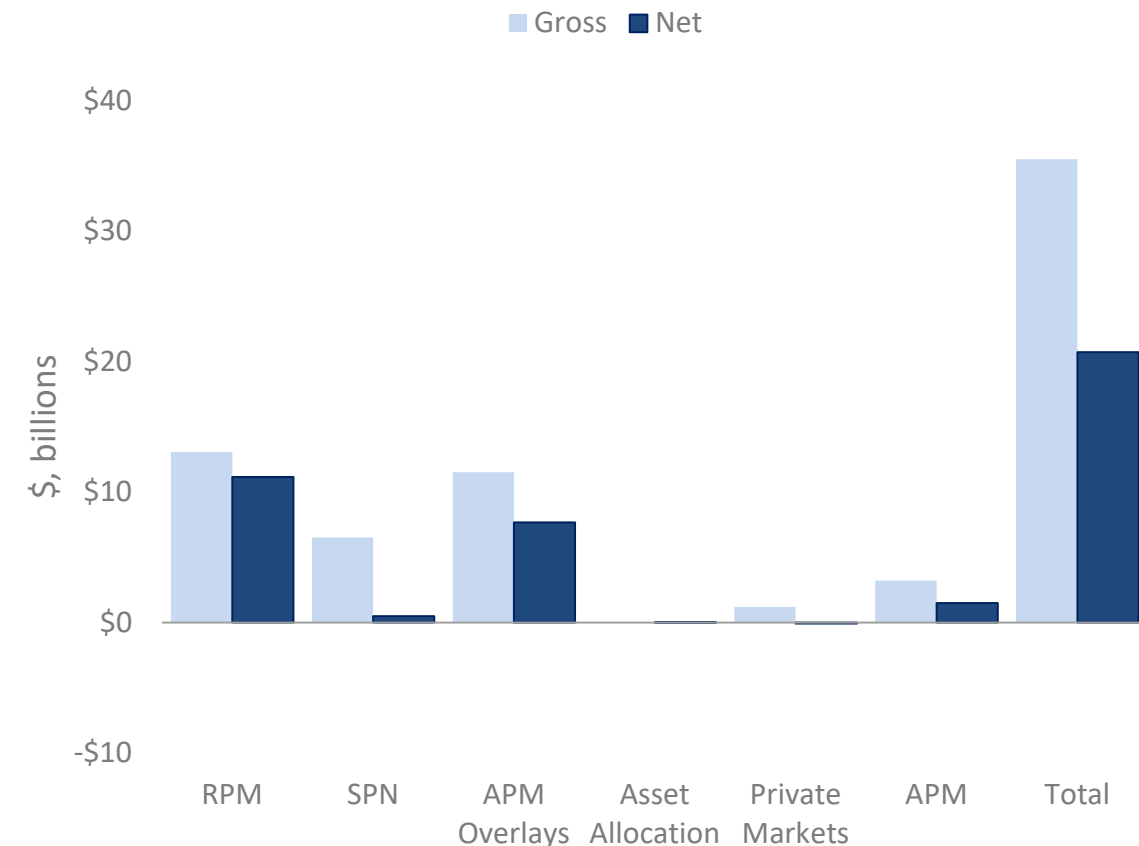
Net Notional by Instrument (% of Total Trust)



Source: State Street Bank; note: derivative positions represent transactions in which TRS is a counterparty; net leverage includes adjustments for delta-notionalization for options and exclusion of spot forwards of 30 days or less

Derivatives contributed small portion of drawdown risk

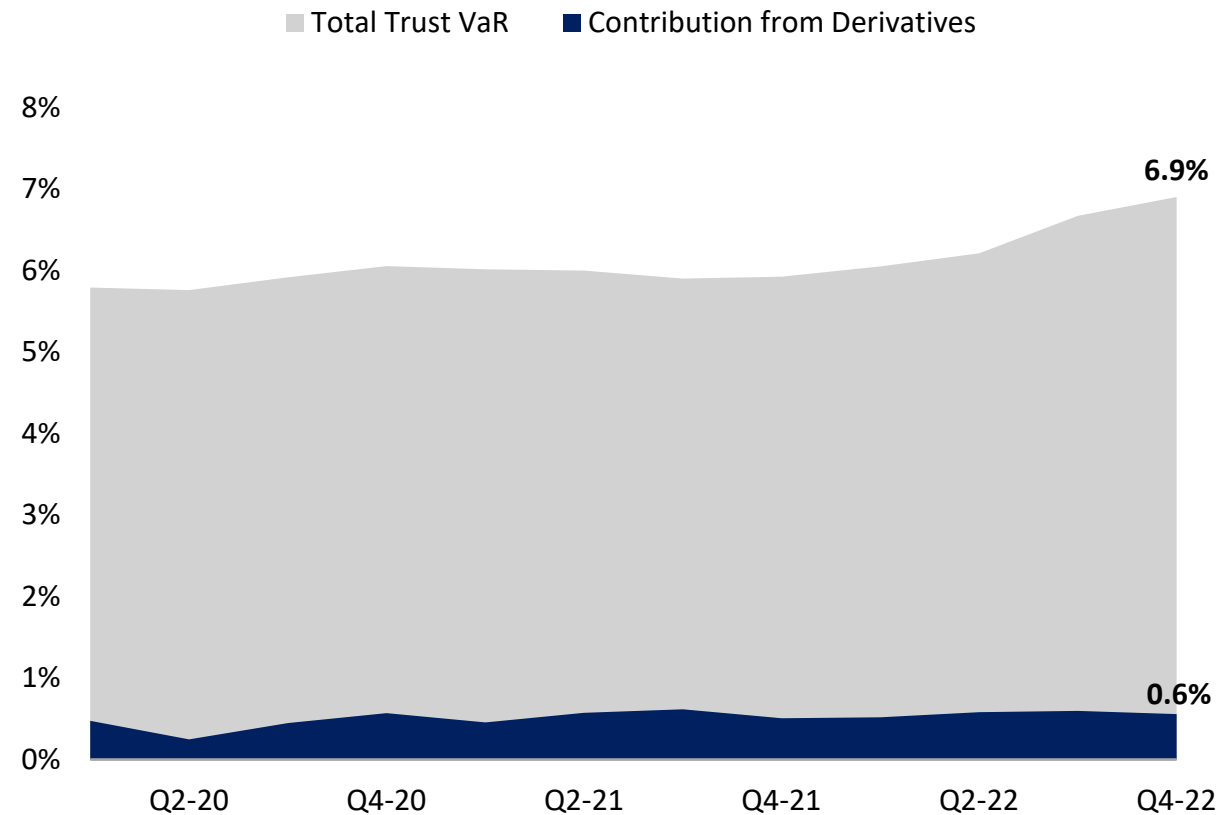
Gross vs Net Derivatives Notional by Portfolio



● Total Gross = \$35.5b

● Total Net = \$20.7b

VaR Contribution from Derivatives



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In conclusion, key points are the following:

- Overweight investment exposure, particularly Stable Value
- VaR estimates increased due to 2022 volatility
- Counterparty risk within policy limits
- Risk metrics remain in compliance

APPENDIX

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