



Report From the Investment Department

Aug. 17, 2023

- **Matters requiring board action:**
 - None
- **Educational or scheduled updates and reviews requiring no action today:**
 - Summary of Investment Activity Report, June and July 2023
 - Proxy Voting Summary for six months ending June 30, 2023
 - Review of Securities Compliance Policies and Procedures
 - As required by Section 3307.043 of the Ohio Revised Code
 - Semiannual Derivatives Exposure as of June 30, 2023
 - Domestic equity asset class update and outlook
 - Callan Annual Performance Review
 - Review of June and July 2023 investment transactions
- **Summary of requests**

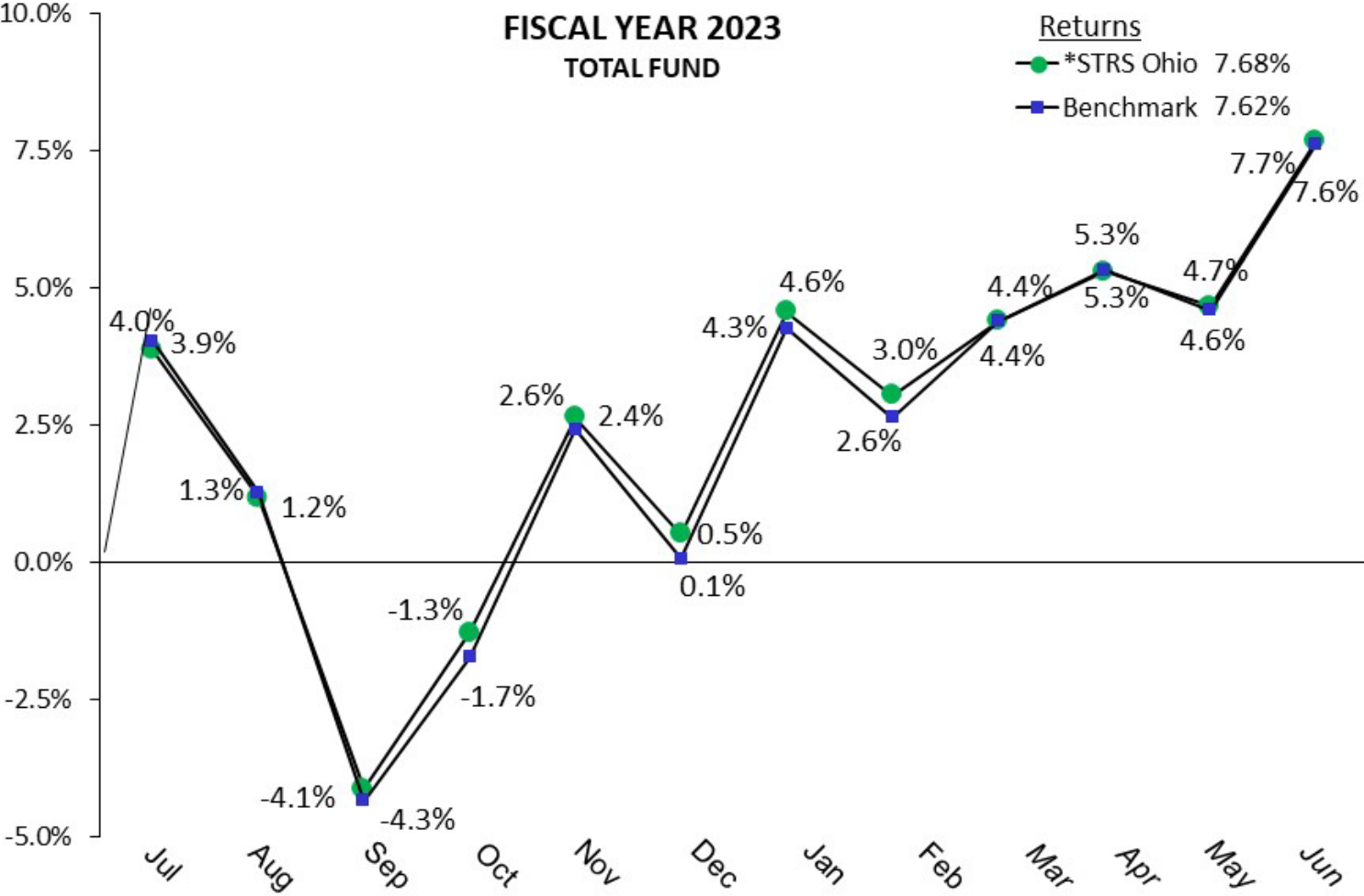
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- **June returns and activity**
- **Fiscal 2023 final results**
- **July returns and activity**
- **Update: General Investment Consultant Search**

- **The total fund return for June was 2.79%***
- **Strong returns from domestic equities +6.8%, and international equities 4.0%**
- **Rebalancing activity**
 - Reduced domestic and international equities by \$1.3 billion
 - Allocated \$1.2 billion to fixed income
- **Total investment assets increased by \$2.4 billion during fiscal 2023 and ended at approximately \$90.1 billion**

** Gross returns, except for alternative investments & real estate where the return is net of all external investment management fees and costs, including carried interest and other fund expenses.*

Monthly Benchmark Return and Actual Fiscal YTD Returns



* Gross returns, except for alternative investments & real estate where the return is net of all external investment management fees and costs, including carried interest and other fund expenses.

- **Total fund fiscal 2023 return was 7.68%**
- **Outperformed total fund benchmark return of 7.62%**
 - +6 basis points higher than the benchmark
 - -7 basis points net of investment fees and expenses
- **Outperformed by 67 basis points, annualized for the past five years**
 - Value-add net of all investment cost equals +54 basis points per year for five years
- **Long-term returns exceed actuarial rate and benchmark in multiple periods**

- **The preliminary total fund return for July was +1.49%***
- **Equity markets remained strong**
 - Domestic equity returns +3.5%, international equity returns +2.9%
- **Rebalancing activity driven by markets**
 - Removed \$600 million from equities and allocated to fixed income and liquidity reserves
- **Total investment assets ended July at \$91.1 billion, higher by \$1.0 billion in fiscal 2024**

** Gross returns, except for alternative investments & real estate where the return is net of all external investment management fees and costs, including carried interest and other fund expenses.*

Update: General Investment Consultant Search



- ✓ **Contact investment consultants** April 2023
- ✓ **Issuance of RFP** May 2023
- ✓ **RFP response deadline** June 2023
- ✓ **Evaluation of qualifying proposals** August 2023
- **Finalist firms present to committee** September 2023
- **Finalist firms present to committee** October 2023
- **Selection of successful firm(s)** November 2023
- **Contract(s) negotiated / executed** December 2023
- **Commencement date of contract(s)** Jan. 1, 2024

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- **Mid-year update for the six-month period ending June 30, 2023**
- **No Proxy Voting Policy recommendations at this time**
- **Formal annual policy review occurs each February**
- **Prior board approved policy updates implemented late June 2023**

Proxy Voting Summary for Six Months Ending June 30, 2023



- “Busy season,” during the six-month period:

- 4,629 meetings

- 6,266 ballots

- 51,523 proposals voted

- All proposals were voted in accordance with STRS Ohio Proxy Voting Guidelines

- “Phone Book” – providing detail on all proposals voted is available

NUMBER OF MEETINGS:	4,629
BALLOTS VOTED:	6,266

MANAGEMENT PROPOSALS	Number of Times Issues Appeared on a Ballot	STRS Ohio Voted "FOR"	STRS Ohio Voted "AGAINST"	STRS Ohio Voted "ABSTAIN"	STRS Ohio Voted "WITHHOLD"	STRS Ohio Voted "TAKE NO ACTION"	STRS Ohio Voted "OTHER"	STRS Ohio Voted "WITH MGMT"	Percentage (%) of Voting	STRS Ohio Voted	Percentage (%) of Voting
Audit	3,221	2,983	190	1	0	47	0	2,983	93%	191	6%
Capitalization	2,973	2,475	421	0	0	77	0	2,475	83%	421	14%
Company Articles	1,186	997	135	0	0	54	0	997	84%	135	11%
Compensation	6,808	4,655	932	0	1	153	1,067	5,664	83%	991	15%
Corporate Governance	0	0	0	0	0	0	0	0	0%	0	0%
Director Election	24,717	19,943	2,041	275	2,290	168	0	20,207	82%	4,342	18%
Director Related	3,998	3,519	359	53	0	67	0	3,617	90%	314	8%
Environmental/Social (blended)	35	35	0	0	0	0	0	35	100%	0	0%
Environmental	19	18	1	0	0	0	0	18	95%	1	5%
Miscellaneous	135	106	23	1	0	5	0	107	79%	23	17%
Routine/Procedural	83	28	53	2	0	0	0	83	100%	0	0%
Non-Routine Business	660	599	58	0	0	3	0	599	91%	58	9%
Routine Business	5,484	5,114	193	0	0	177	0	5,128	94%	179	3%
Social	118	102	13	0	0	3	0	102	86%	13	11%
Strategic Transactions	550	391	157	0	0	2	0	392	71%	156	28%
Takeover Related	245	214	29	0	0	2	0	215	88%	28	11%
Total	50,232	41,179	4,605	332	2,291	758	1,067	42,622	85%	6,852	14%

SHAREHOLDER PROPOSALS	Number of Times Issues Appeared on a Ballot	STRS Ohio Voted "FOR"	STRS Ohio Voted "AGAINST"	STRS Ohio Voted "ABSTAIN"	STRS Ohio Voted "WITHHOLD"	STRS Ohio Voted "TAKE NO ACTION"	STRS Ohio Voted "OTHER"	STRS Ohio Voted "WITH MGMT"	Percentage (%) of Voting	STRS Ohio Voted	Percentage (%) of Voting
Audit	98	81	17	0	0	0	0	96	98%	2	2%
Capitalization	0	0	0	0	0	0	0	0	0%	0	0%
Company Articles	31	6	24	0	0	1	0	28	90%	2	6%
Compensation	86	45	39	0	0	2	0	41	48%	43	50%
Corporate Governance	50	49	1	0	0	0	0	3	6%	47	94%
Director Election	303	200	61	5	11	26	0	255	84%	22	7%
Director Related	133	113	18	0	0	2	0	48	36%	83	62%
Environmental/Social (blended)	57	0	57	0	0	0	0	56	98%	1	2%
Environmental	170	0	158	0	0	12	0	158	93%	0	0%
Miscellaneous	66	22	40	0	0	4	0	51	77%	11	17%
Routine/Procedural	0	0	0	0	0	0	0	0	0%	0	0%
Non-Routine Business	39	25	13	0	0	1	0	13	33%	25	64%
Routine Business	53	8	45	0	0	0	0	46	87%	7	13%
Social	205	66	138	0	0	1	0	138	67%	66	32%
Strategic Transactions	0	0	0	0	0	0	0	0	0%	0	0%
Takeover Related	0	0	0	0	0	0	0	0	0%	0	0%
Total	1,291	615	611	5	11	49	0	933	72%	309	24%

GRAND TOTAL	51,523	41,794	5,216	337	2,302	807	1,067	43,555	85%	7,161	14%
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STATE TEACHERS
RETIREMENT SYSTEM
OF OHIO

275 East Broad Street
Columbus, OH 43215-3771
888-227-7877
www.strsoh.org

Memo

To: STRS Ohio Board
From: Matt Worley 
Date: August 17, 2023
Subject: Report on Review of Securities Compliance Policies and Procedures

The chief investment officer is given the responsibility under Senate Bill 133 ("SB 133" – effective Sept. 15, 2004), as codified in Section 3307.043, to reasonably supervise the staff to prevent violations of the state and federal securities laws. As part of that responsibility, the chief investment officer is obligated to:

1. institute policies and procedures reasonably expected to prevent and detect violations of state and federal securities laws; and
2. undertake an annual review as to the adequacy of those policies and procedures and the effectiveness of their implementation.

On the attached sheet, I have listed the policies and procedures in place that implement the requirements of Section 3307.043 and have identified any updates to those policies and procedures that have occurred in the last year.

This memo is to report to you that I have undertaken a review of those policies and procedures and I have determined that they are adequate and effective.

August 17, 2023

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Securities Compliance Policies and Procedures

- I. Portfolio management processes
 - A. Statement of Investment Objective – Board policy (updated 12/2022)
 - B. Statement of Fund Governance – Board policy (updated 12/2022)
 - C. Investment Staff Guidelines and Procedures – Staff Guidelines (updated 07/2023)
 - D. Proxy Voting Policy – Board policy (updated 06/2023)
 - E. Portfolio Statements of Characteristics – Staff guidelines (updated 07/2023)
 - F. The STRS Ohio Qualified Independent Representative Policy

- II. Trading Practices
 - A. Broker Evaluation including: Best Execution Guidelines, Investment Protection Principles, Brokerage Commission Policy, Ohio and Emerging Brokerage Firm Procedures and Ohio Investment Manager and Broker Policy and Program, Soft Dollar Policy – (updated 06/2023)

- III. Conduct of STRS Ohio Staff Regarding Investments
 - A. Personal Trading Guidelines and Ethics Policy (as contained in the STRS Ohio Associate Guidelines)
 - B. CFA Code of Ethics and Standards of Professional Conduct – CFA Institute
 - C. MNPI (Material Non-Public Information) Policy – Staff Policy (updated 08/2023)

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Semiannual Derivatives Exposure as of June 30, 2023



STRS Ohio Derivative Exposure

As of
June 30, 2023

Derivatives have been an efficient and cost-effective tool for managing the total STRS Ohio assets. They are used to the limited extent as provided for by the *Statement of Investment Objectives and Policy*. The staff plans to continue the effective usage of derivatives.

Derivative Investment Description	Derivative Position Exposure	% of Total Fund	Policy Investment Maximum (% of Total Fund)
International			
MSCI EAFE Futures	\$ 112,193,775	0.12%	
MSCI Emerging Futures	\$ 27,741,620	0.03%	
Equity Swaps	\$ 801,792,184	0.89%	
External Managers	\$ 14,512,458	0.02%	
Warrants & Rights	\$ 163,110	0.00%	
Total International	\$ 956,403,147	1.06%	10%
Domestic Equities			
Domestic Equity Swaps	\$ 0	0.00%	
S&P 500 Index Futures	\$ 0	0.00%	
Russell 2000 Index Futures	\$ 0	0.00%	
Call Options (bought)*	\$ 0	0.00%	
Put Options (sold)*	\$ 0	0.00%	
Warrants & Rights	\$ 0	0.00%	
Total Domestic Equities	\$ 0	0.00%	10%
Real Estate			
	\$ 0	0.00%	
Total Real Estate	\$ 0	0.00%	1%
Fixed Income			
External Managers	\$ 76,450,056	0.08%	
Total Fixed Income	\$ 76,450,056	0.08%	5%
Alternative Investments			
Liquid Alt. – External Mgrs.	\$ 13,563,700	0.02%	
Liquid Alt. – OTC Swaps	\$ 28,924,387	0.03%	
Total Alternative Investments	\$ 42,488,087	0.05%	10%
Total Derivative Position Exposure	\$ 1,075,341,290	1.19%	
TOTAL FUND	\$ 90,062,792,973		

* The absolute value of the option market value is used.

Footnote on hedging derivatives: Derivatives that reduce risk (hedge) are not included in the above total. STRS Ohio has hedged \$11.2 billion of currency exposure through forward contracts. This amount essentially reflects the investment Policy benchmark in which the neutral position for currencies is 50% hedged for developed markets. Within the opportunistic/diversified portfolio of Alternative Investments, STRS Ohio utilizes options & futures with a combined notional value of \$1.9 billion to hedge \$179 million of equity risk in the liquid alternatives theme.

Semiannual Derivatives Exposure as of June 30, 2023



STRS Ohio Derivative Exposure by Month

	Jan. 2023	Feb. 2023	Mar. 2023	Apr. 2023	May. 2023	Jun. 2023	Policy Limits
International	0.91%	0.92%	0.93%	0.95%	1.26%	1.06%	10%
Domestic Equities	0.47%	0.47%	0.27%	0.28%	0.18%	0.00%	10%
Real Estate	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1%
Fixed Income	0.07%	0.08%	0.07%	0.08%	0.06%	0.08%	5%
Alternative Investments	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	10%
Total Fund	1.50%	1.52%	1.32%	1.36%	1.55%	1.19%	

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Domestic Equities Review

Aug. 17, 2023

Russell 3000 Index (Last Five Fiscal Years)

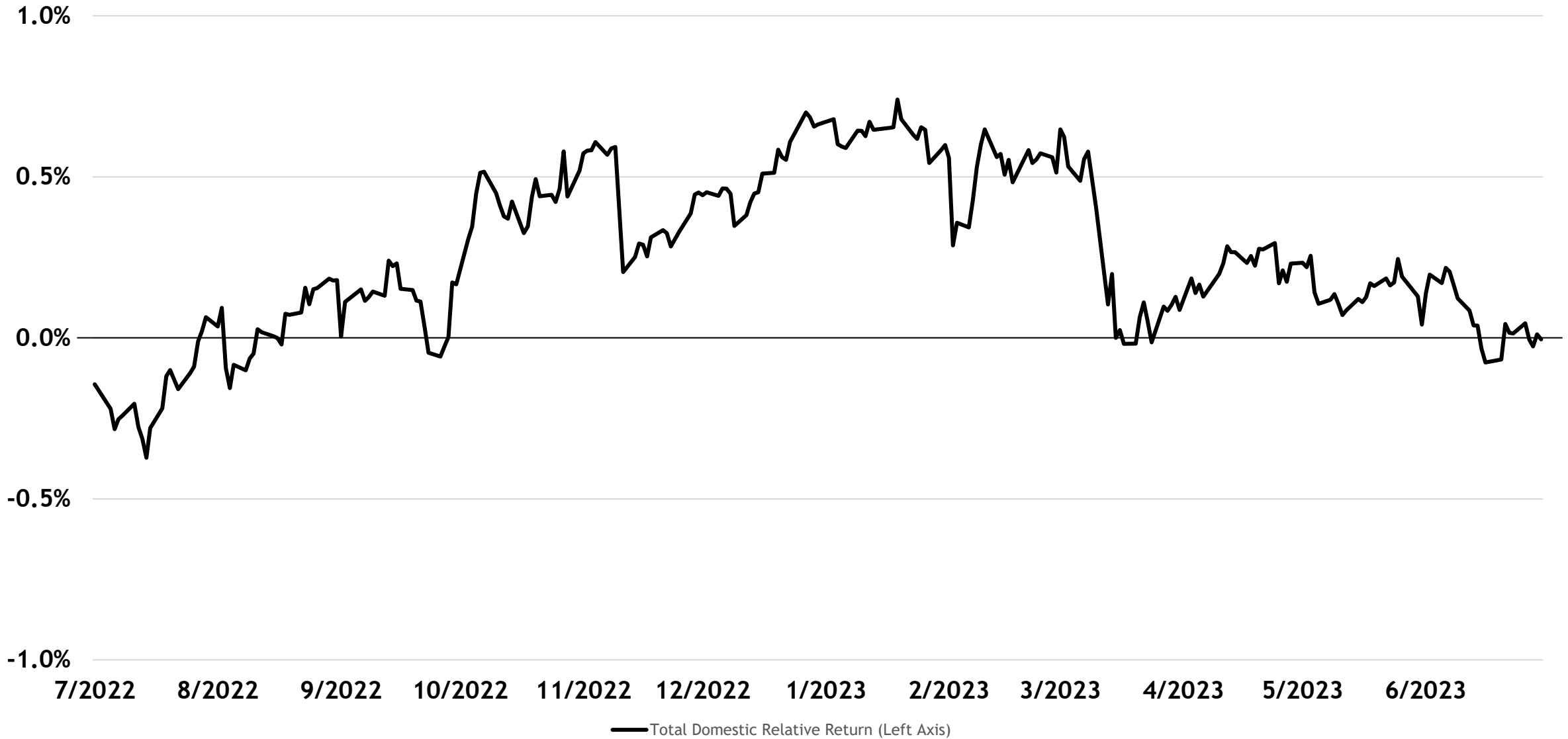


Performance Fiscal 2023

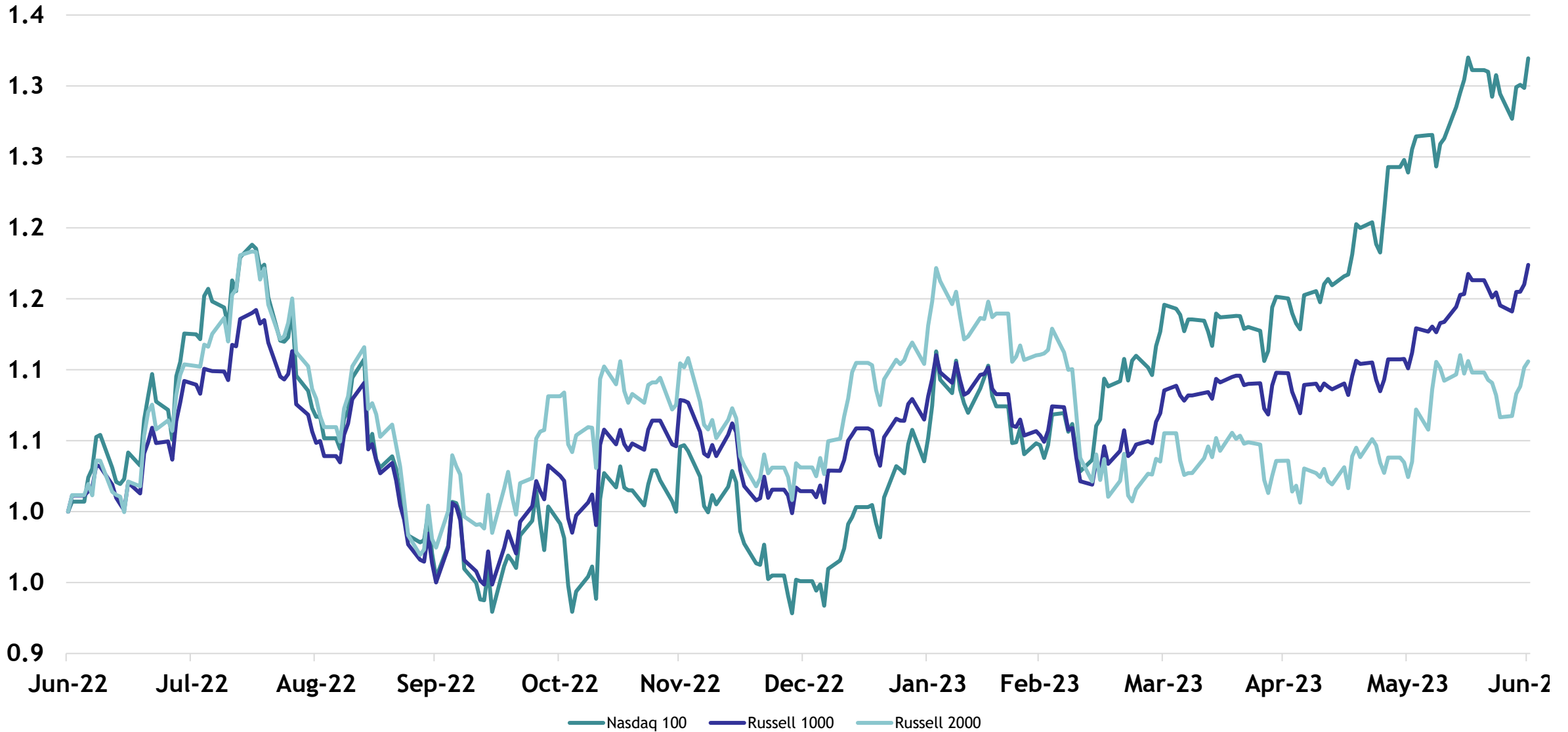


- **STRS Ohio** **18.94%**
- **Russell 3000** **18.95%**
- **Relative** **-.01%**

Relative Performance One Year



Large Cap Growth Outperformed Late in the Year



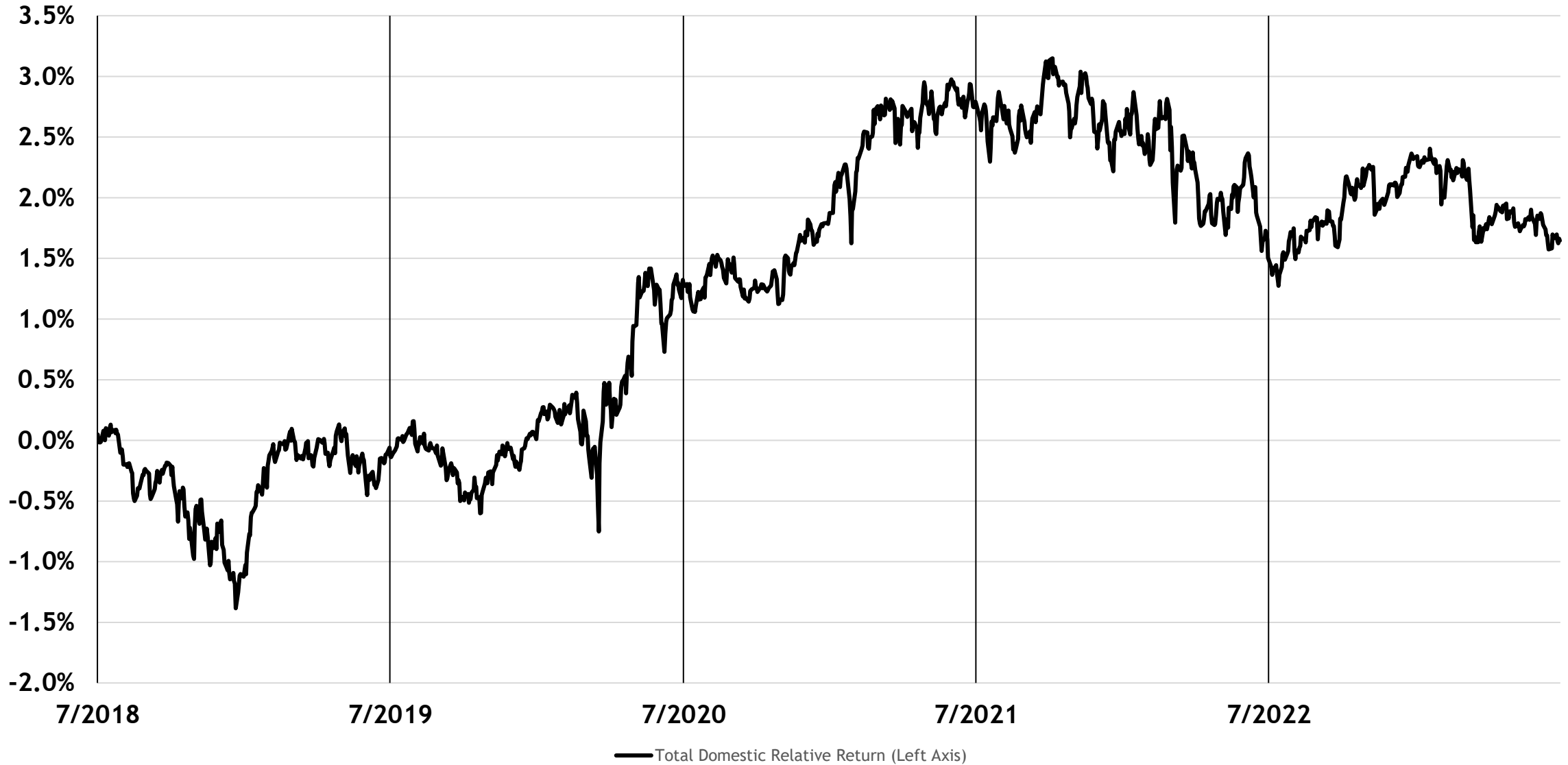
- **Growth beat Value**
 - R1000 Growth 27.1%
 - R1000 Value 11.5%
- **Large cap beat small cap**
 - R1000 19.4%
 - R2000 12.3%
- **Mega Caps finished the year strongly**
- **Inflation/recession fears waned later in the fiscal year**

Trailing Period Performance (Annualized)

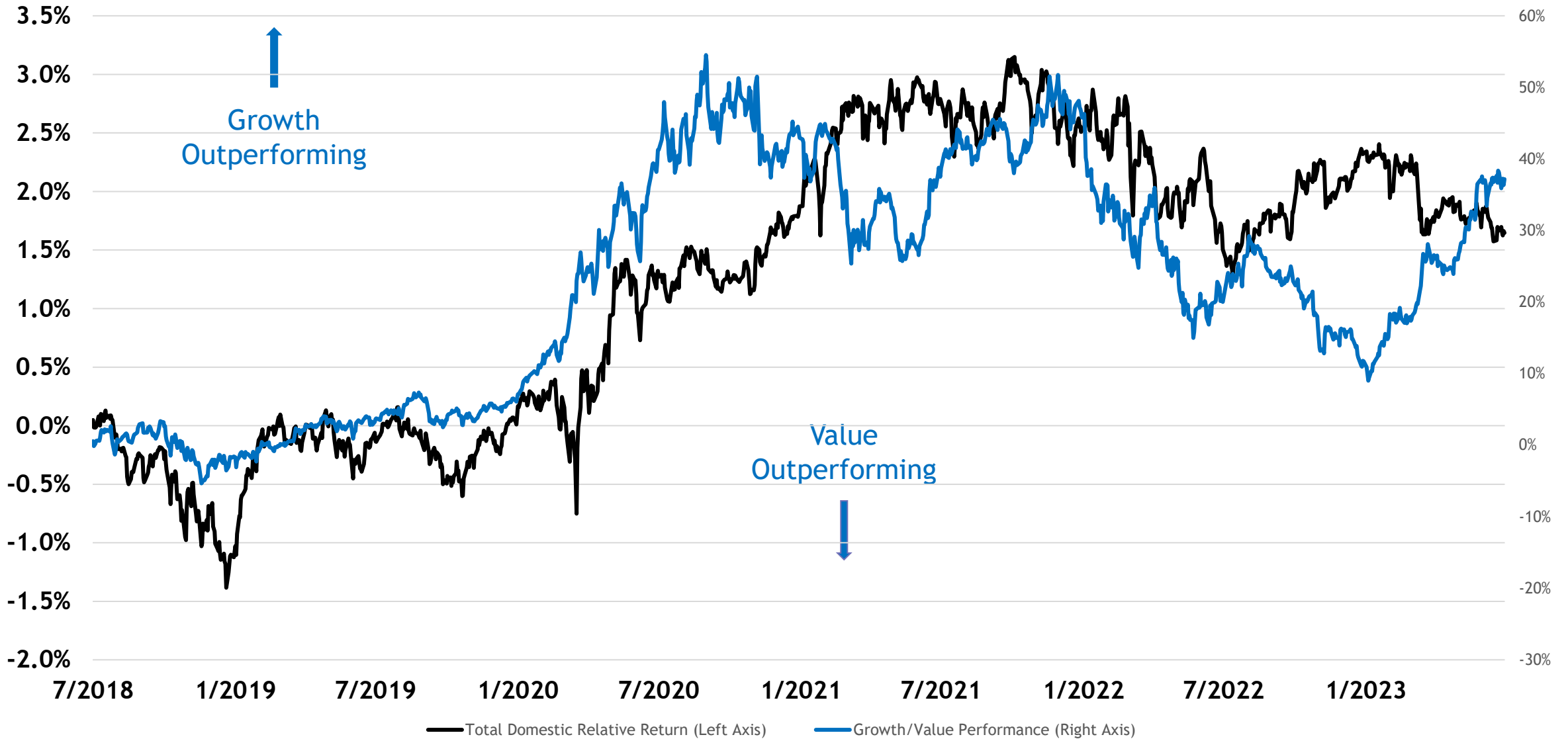


	STRS Ohio	R3000	Relative	Callan Peer Percentile Ranking
1-year	18.94%	18.95%	-0.01%	27
3-years	13.98%	13.89%	+0.09%	54
5-years	11.67%	11.39%	+0.28%	8
10-years	12.46%	12.34%	+0.12%	16

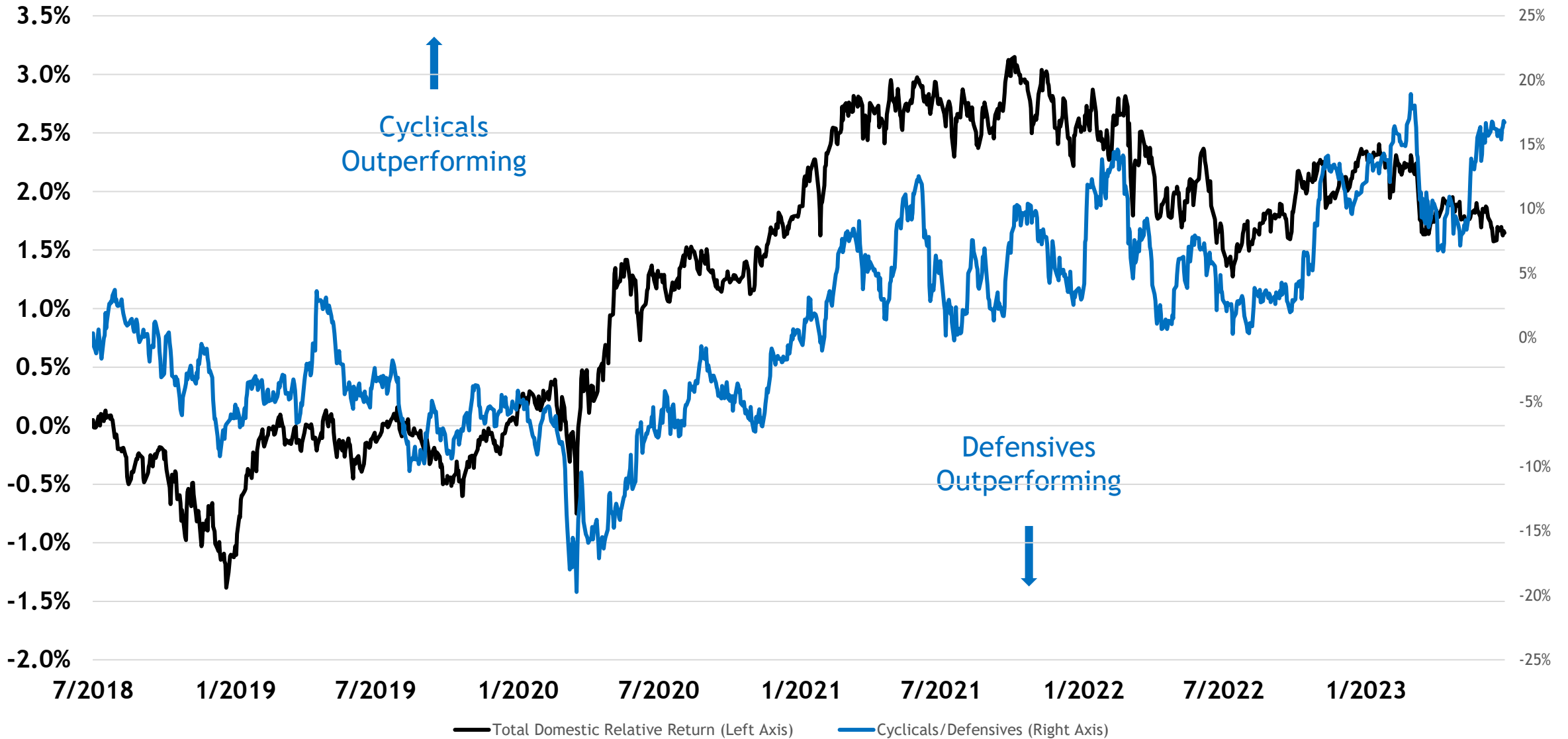
Relative Performance (Five Years)



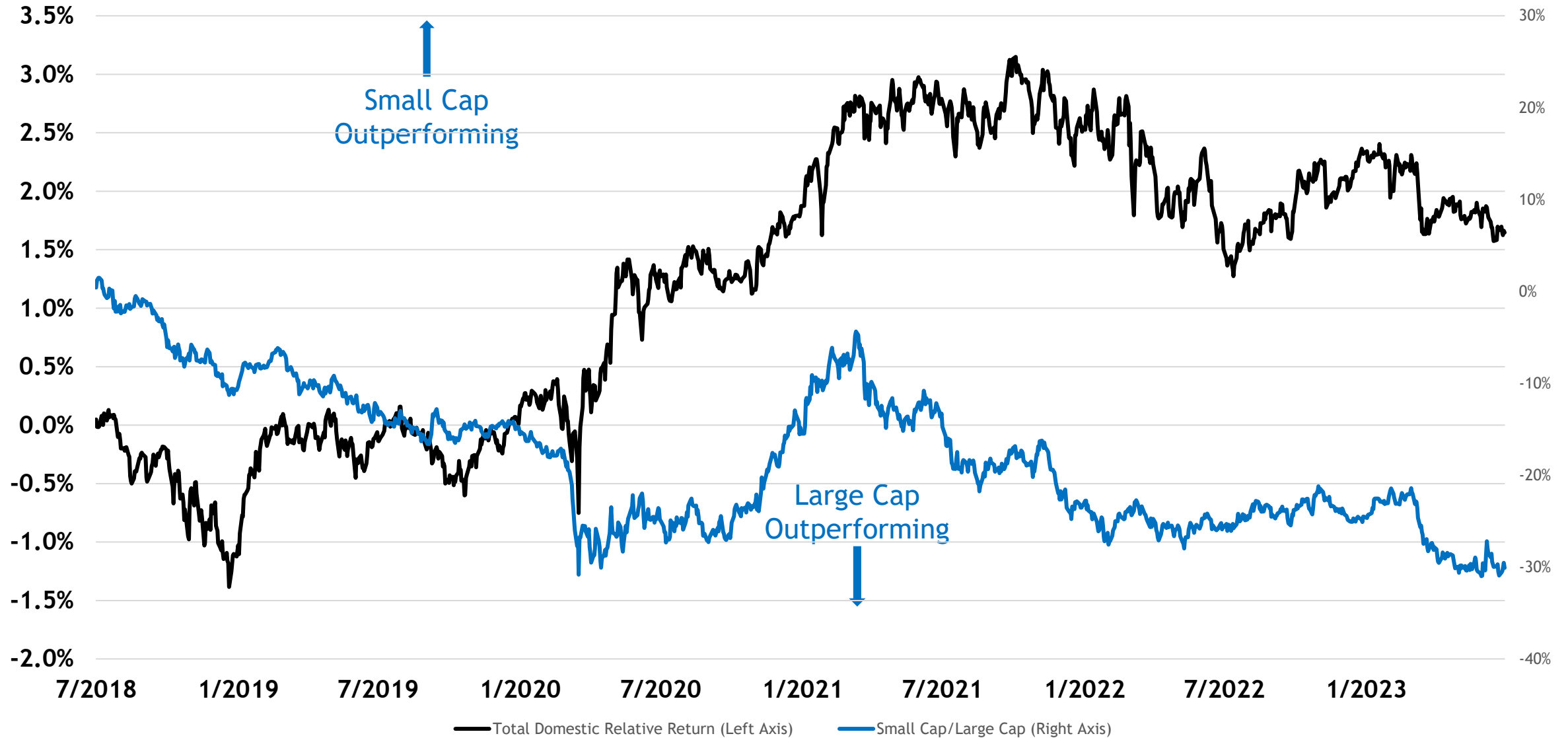
Performance in Growth and Value Regimes



Relative Performance vs. Cyclical/Defensives



Relative Performance vs. Small Cap/Large Cap





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Callan LLC

Performance Review

STRS Ohio Board Meeting

August 2023

Michael Joecken
Senior Vice President

Brady O'Connell, CFA, CAIA
Senior Vice President

Trustee Summary Report Period Ending June 30, 2023

STRS Ohio Total Fund Report Fiscal YTD 1, 3, 5, 10 & 20 Years Ending June, 2023

Periods Ending June, 2023
Annualized Rates of Return

	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years
Experienced Returns						
Have returns affected funded ratio?						
1. Total fund return *	7.68%	7.68%	10.30%	8.20%	8.73%	8.41%
2. Actuarial discount rate ***	7.00%	7.00%	7.15%	7.27%	7.48%	7.73%
3. Relative Performance (1-2)	0.68%	0.68%	3.15%	0.93%	1.25%	0.67%
Has plan been rewarded for capital market risk?						
4. Total fund benchmark return	7.62%	7.62%	9.14%	7.53%	8.25%	7.99%
5. Minimum risk/high cost policy of 91-Day T-Bills	3.59%	3.59%	1.27%	1.55%	0.99%	1.30%
6. Impact of asset mix policy (4-5)	4.03%	4.03%	7.87%	5.98%	7.27%	6.69%
Has plan been rewarded for active management risk?						
7. Active management effect (1-4) *	0.06%	0.06%	1.16%	0.67%	0.48%	0.41%
8. Net active management return estimated **	-0.07%	-0.07%	1.04%	0.54%	0.35%	0.29%

* Gross Returns are net of transaction costs and gross of management fees, except for alternative investments & real estate where the return is also net of all external investment management fees and costs, including carried interest and other fund expenses. Certain Callan returns may differ from STRS due to rounding.

** Net returns are net of all internal and external investment management fees and costs, including carried interest and other fund expenses.

*** The actuarial rate of return assumption was decreased from 7.45% to 7.00%, effective as of 6/30/2021.

The STRS real estate return includes the use of leverage.

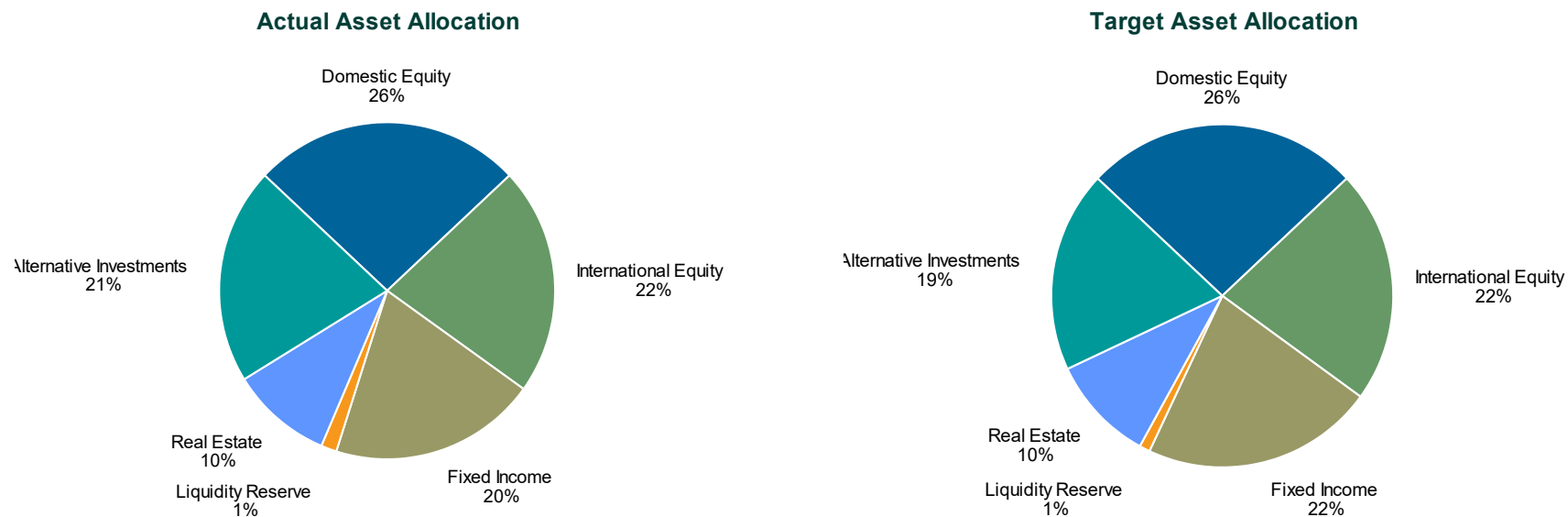
The STRS Ohio total fund policy return (blended benchmark) is 26% Russell 3000, 22% International Blended Benchmark, 22% Fixed Income Blended Benchmark, 10% Real Estate Blended Benchmark, 19% Alternative Investments Blended Benchmark (prior to July 1, 2021, the Alternative Investment benchmark was the Alternative Investment Actual Return), and 1% 90-day Treasury Bill as of July 1, 2022.



STRS Ohio Investment Performance

STRS Asset Allocation v. Policy Target

As of June 30, 2023



Asset Class	\$Millions Actual	Weight Actual	Target	Percent Difference	\$Millions Difference
Domestic Equity	23,401	26.0%	26.0%	(0.0%)	(16)
International Equity	19,766	21.9%	22.0%	(0.1%)	(48)
Fixed Income	18,031	20.0%	22.0%	(2.0%)	(1,782)
Liquidity Reserve	1,331	1.5%	1.0%	0.5%	431
Real Estate	8,842	9.8%	10.0%	(0.2%)	(164)
Alternative Investments	18,691	20.8%	19.0%	1.8%	1,579
Total	90,063	100.0%	100.0%		

STRS Ohio v. Callan Public Fund Sponsor Database

Callan Public Fund Sponsor Database

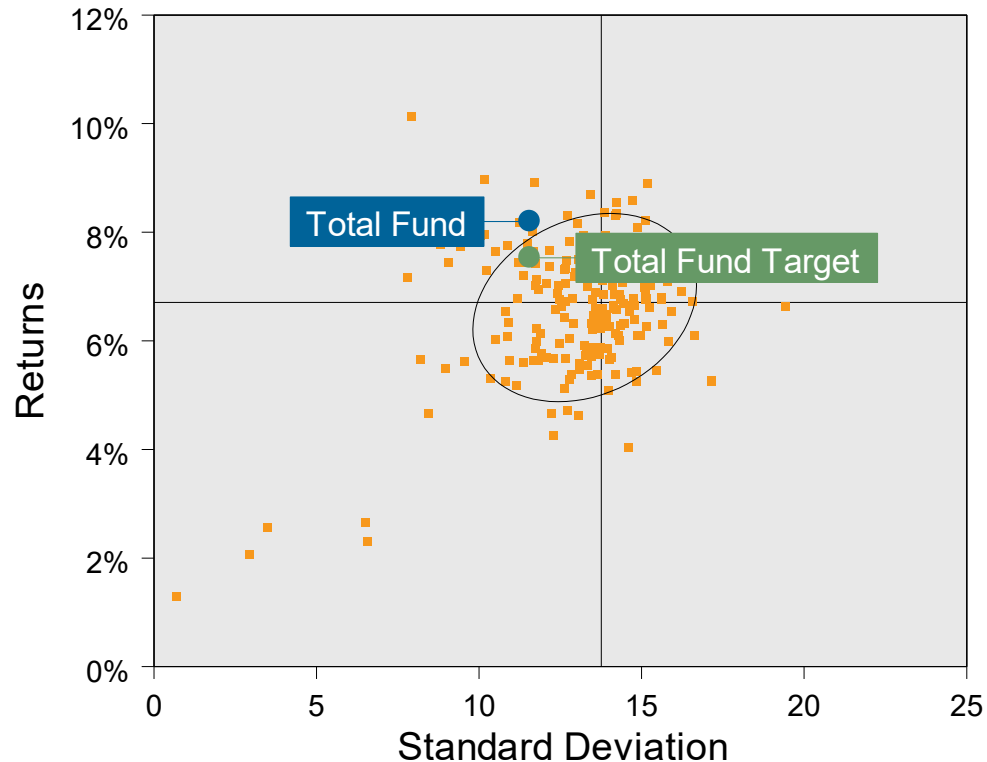


- For one-year ended 6/30/2023, STRS Ohio outperformed the benchmark by 6 basis points and ranked at the 76th percentile of the Callan Public Fund Sponsor Database.
- For the past five-years ended 6/30/2023, STRS Ohio had a 67 basis point advantage over the benchmark and ranked at the 8th percentile of the Callan Public Fund Sponsor Database.
- For 10-years ended 6/30/2023, STRS Ohio bested the benchmark by 48 basis points and ranked at the 5th percentile of the Callan Public Fund Sponsor Database.

Gross returns are illustrated, except for alternative investments & real estate where the return is net of all external investment management fees and costs, including carried interest and other fund expenses. Certain Callan returns may differ from STRS Ohio due to rounding.

STRS Ohio v. Callan Public Fund Sponsor Database

Callan Public Fund Sponsor Database (Gross)
Annualized Five Year Risk vs Return



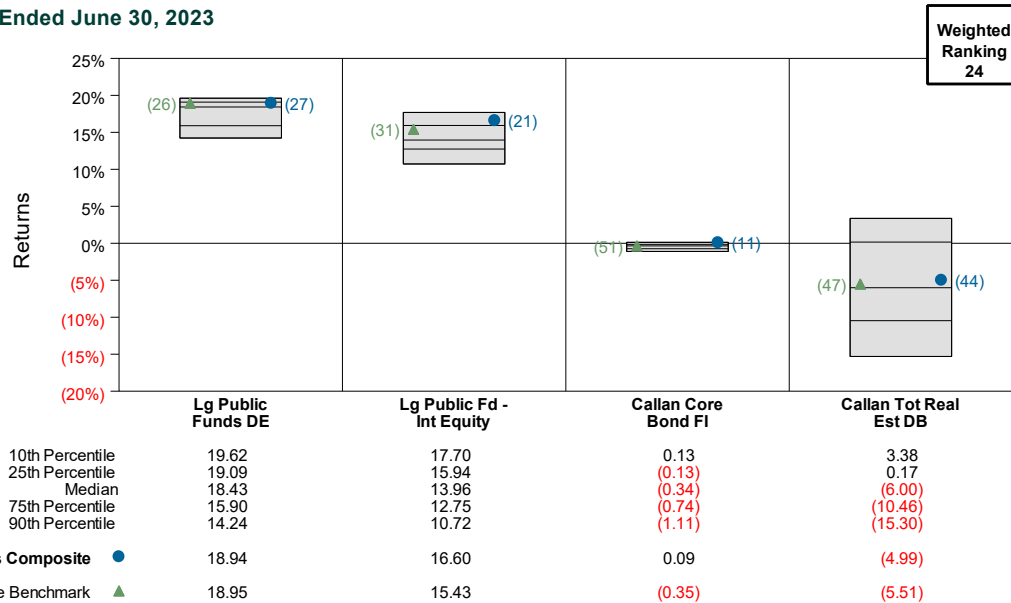
- For the five-years ending June 30, 2023, STRS Ohio posted an annualized return of 8.20% relative to the 7.53% return of the total fund target.
- STRS Ohio achieved a return that ranked at the 8th percentile during the last five years, while exhibiting less risk than the median of the Callan Public Fund Sponsor Database, (“risk” as measured by Standard Deviation and Median represented by the vertical crosshair).
- The ellipse represents the 10th to the 90th percentile of Callan’s Public Fund Sponsor Database.

STRS Ohio Attribution – 1 Year

One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	26%	26%	18.94%	18.95%	(0.00%)	(0.12%)	(0.12%)
International Equity	22%	22%	16.60%	15.43%	0.23%	(0.03%)	0.20%
Fixed Income	18%	22%	0.09%	0.35%	0.08%	0.34%	0.42%
Real Estate	11%	10%	(4.99%)	(5.51%)	0.06%	(0.08%)	(0.02%)
Alternative Investments	21%	19%	(1.41%)	(0.49%)	(0.20%)	(0.25%)	(0.45%)
Global Equities	0%	0%	-	-	0.00%	(0.00%)	(0.00%)
Liquidity Reserve	1%	1%	3.88%	3.59%	0.00%	(0.02%)	(0.01%)
Total Fund Allocation	0%	0%	10.32%	10.32%	0.00%	0.04%	0.04%
Total			7.68%	= 7.62%	+ 0.17%	+ (0.11%)	0.06%

Total Asset Class Performance One Year Ended June 30, 2023



- The Total Fund one-year return beat its benchmark by 6 basis points.
- Relative outperformance from International Equity, Fixed Income, and Real Estate drove above-benchmark performance during the past year. Domestic Equity and Alternative Investments underperformed.
- Asset allocation differences from target had a small net negative impact on performance.
- Domestic Equity was in line with its composite benchmark and ranked at the 27th percentile of the peer group.
- International Equity led its benchmark and ranked at the 21st percentile of peers.
- Fixed Income led its composite benchmark and ranked at the 11th percentile of its peers.
- Real Estate beat its performance benchmark and ranked at the 44th percentile of the peer group.

*Total Fund Allocation portfolio inception: January 2014.

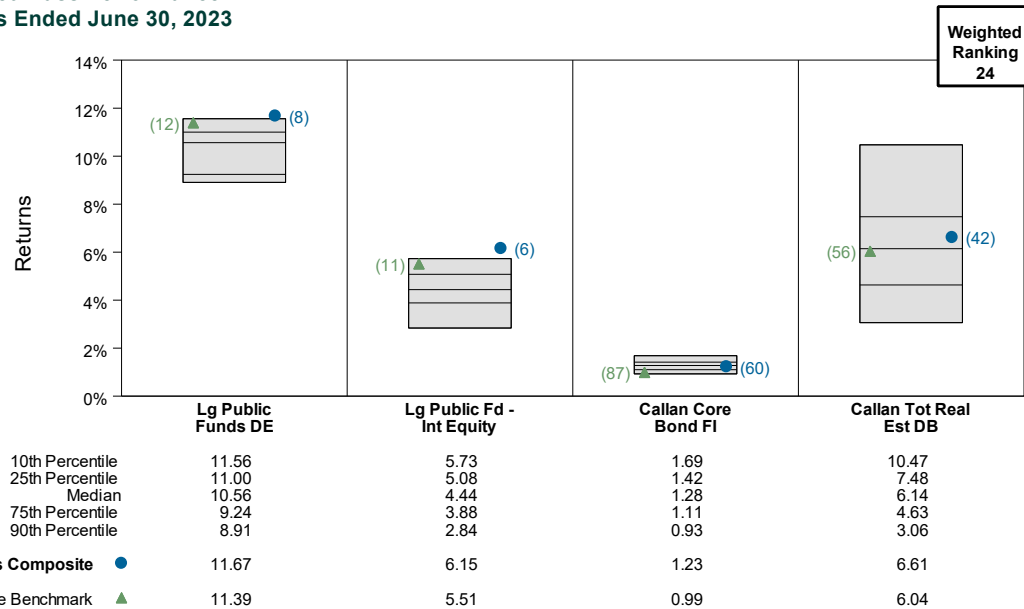
STRS Ohio Attribution – 5 Years

Five Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return	
Domestic Equity	27%	28%	11.67%	11.39%	0.08%	(0.06%)	0.02%	
International Equity	22%	23%	6.15%	5.51%	0.14%	0.02%	0.16%	
Fixed Income	19%	21%	1.23%	0.99%	0.04%	0.12%	0.16%	
Real Estate	10%	10%	6.61%	6.04%	0.07%	(0.03%)	0.04%	
Alternative Investments	19%	17%	12.64%	11.93%	0.14%	0.08%	0.22%	
Global Equities	1%	0%	-	-	0.00%	0.01%	0.01%	
Liquidity Reserve	2%	1%	1.58%	1.55%	0.00%	(0.00%)	(0.00%)	
Total Fund Allocation	1%	0%	7.33%	7.33%	0.00%	0.06%	0.06%	
Total			8.20%	7.53%	+	0.47%	+	0.19%
								0.67%

- The Total Fund five-year return had a 67 basis points advantage over the benchmark.
- Positive relative performance was driven by active management across all asset classes. An underweight to Fixed Income and overweight to Alternative Investments contributed positively.
- At the Total Fund level, both active management and asset allocation decisions added value.

Total Asset Class Performance Five Years Ended June 30, 2023



- Domestic Equity outperformed its benchmark and finished at the 8th percentile of peers.
- International Equity exceeded its benchmark and finished at the 6th percentile of peers.
- Fixed Income outperformed its benchmark and finished at the 60th percentile of peers.
- Real Estate beat its benchmark and finished at the 42nd percentile of peers.

*Total Fund Allocation portfolio inception: January 2014.

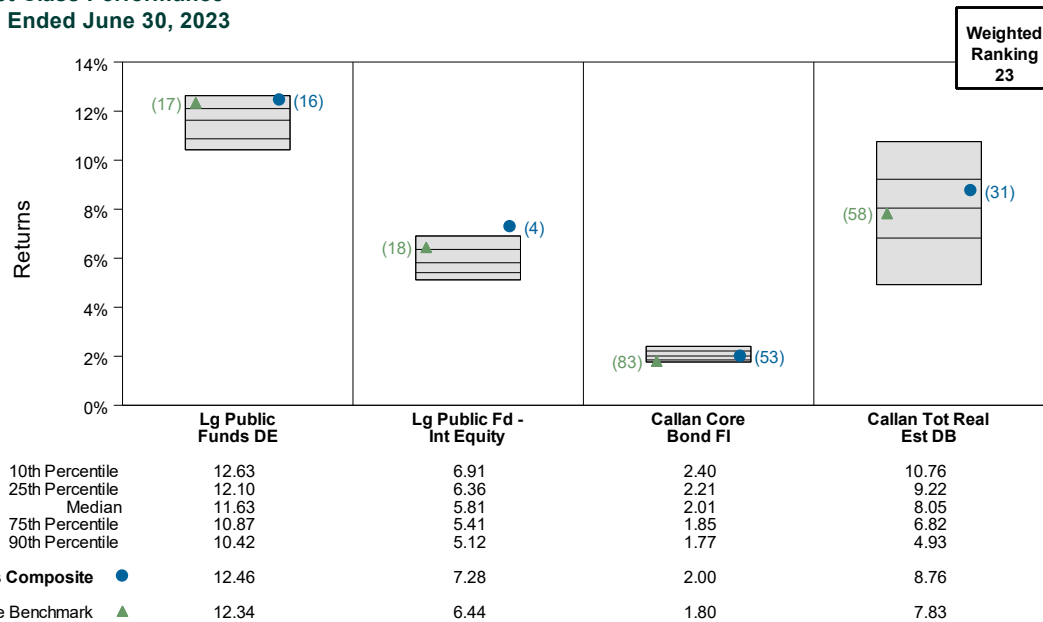
STRS Ohio Attribution – 10 Years

Ten Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	29%	29%	12.46%	12.34%	0.03%	(0.05%)	(0.02%)
International Equity	23%	24%	7.28%	6.44%	0.20%	0.02%	0.22%
Fixed Income	18%	20%	2.00%	1.80%	0.03%	0.09%	0.12%
Real Estate	10%	10%	8.76%	7.83%	0.10%	(0.02%)	0.08%
Alternative Investments	16%	16%	11.39%	11.04%	0.07%	0.03%	0.09%
Global Equities	1%	0%	-	-	0.00%	0.01%	0.01%
Liquidity Reserve	2%	1%	1.03%	0.98%	0.00%	(0.08%)	(0.08%)
Total Fund Allocation	0%	0%	-	-	0.00%	0.04%	0.04%

Total **8.73% = 8.25% + 0.43% + 0.04%** **0.47%**

Total Asset Class Performance Ten Years Ended June 30, 2023

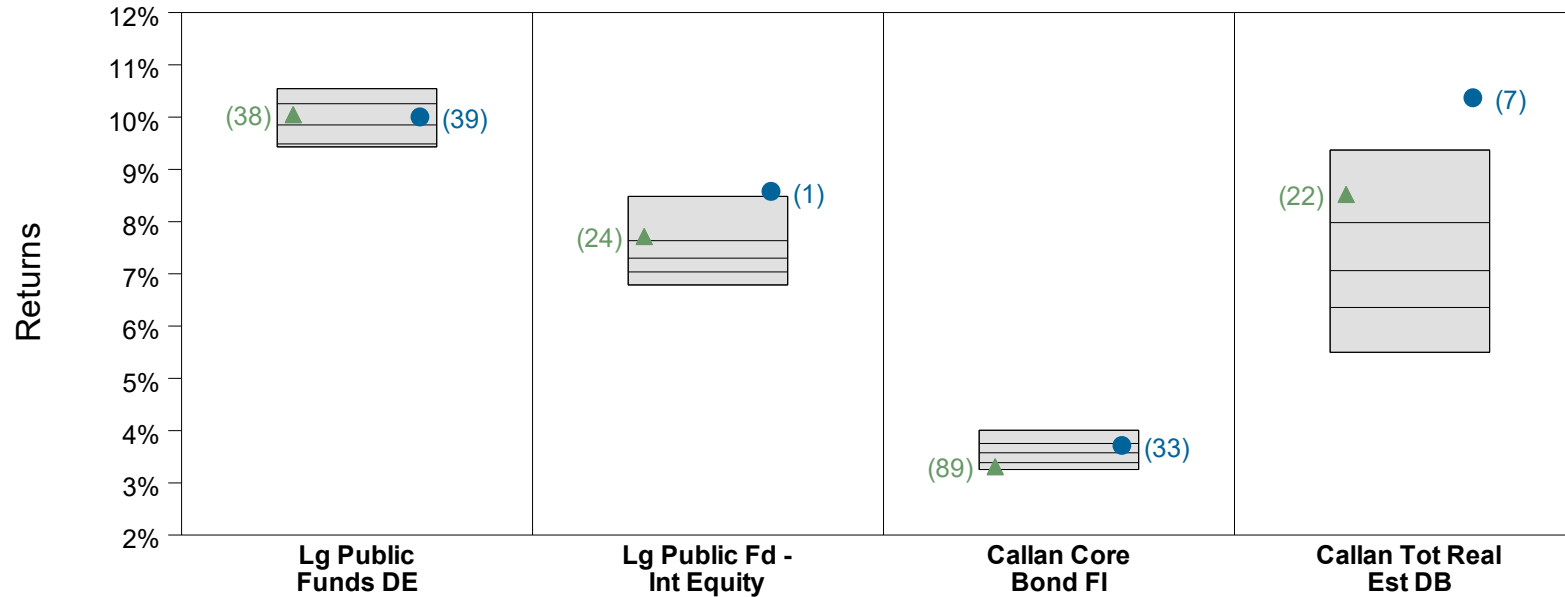


- The Total Fund 10-year return led the benchmark by 47 basis points with outperformance from favorable manager and security selection decisions.
- International Equity, Fixed Income, Real Estate, and Alternative Investments outperformed their respective benchmarks.
- Asset allocation decisions combined for a marginal positive impact during the period.
- Domestic Equity outperformed its benchmark and ranked at the 16th percentile of peers.
- International Equity outperformed its benchmark and ranked in at the 4th percentile of peers.
- Fixed Income outperformed its benchmark and ranked at the 53rd percentile of peers.
- Real Estate led its benchmark and ranked at the 31st percentile of peers.

*Total Fund Allocation portfolio inception: January 2014.

STRS Ohio Asset Class Returns

Total Asset Class Performance
Twenty Years Ended June 30, 2023



	Lg Public Funds DE	Lg Public Fd - Int Equity	Callan Core Bond FI	Callan Tot Real Est DB
10th Percentile	10.54	8.48	4.01	9.37
25th Percentile	10.26	7.64	3.75	7.98
Median	9.85	7.30	3.58	7.06
75th Percentile	9.49	7.04	3.39	6.36
90th Percentile	9.43	6.79	3.26	5.50

Asset Class Composite	●	9.99	8.57	3.70	10.36
Composite Benchmark	▲	10.05	7.71	3.31	8.52

▪ Total Fund 20-year gross return: 8.41%

Gross returns are illustrated, except for alternative investments & real estate where the return is net of all external investment management fees and costs, including carried interest and other fund expenses. Certain Callan returns may differ from STRS Ohio due to rounding.



Additional Trustee Summary Reports

Gross and Net Total Fund Returns Period Ending June 30, 2023

Gross and Net Total Fund Return

Periods Ending June, 2023 Annualized Rates of Return

Gross and net total fund return

	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	20 Year
1. Total fund return *	7.68%	7.68%	10.30%	8.20%	8.73%	8.41%
2. External alternative & real estate mgmt. fees reflected in line 1 **	0.22%	0.22%	0.22%	0.23%	0.21%	0.17%
3. Gross total fund return (1 + 2)	7.90%	7.90%	10.52%	8.43%	8.94%	8.57%
4. Total investment management costs	0.35%	0.35%	0.34%	0.36%	0.34%	0.29%
5. Net total fund return (3-4) ***	7.55%	7.55%	10.18%	8.07%	8.60%	8.28%

* Gross Returns are net of transaction costs and gross of management fees, except for alternative investments & real estate where the return is also net of all external investment management fees and costs, including carried interest and other fund expenses.

** Includes management fees net of fee waivers/rebates and does not include carried interest or other fund expenses.

*** Net returns are net of all internal and external investment management fees and costs, including carried interest and other fund expenses.

Total Investment Management Costs

Total Investment Management Costs

	2022 Investment Management Costs *			Dec. 2022 Assets (Billions)
	Fees to Assets Managed (bps)	Fees to Total Fund (bps)	Fees (\$000's)	
Total Investment Management Costs *				
Externally Managed:				
Alternative Investments	103	20	\$ 204,958	\$ 18.4
Real Estate	153	2	\$ 19,363	\$ 1.3
All Other External Managers **	39	6	\$ 52,583	\$ 12.1
Internal Managers	13	7	\$ 63,833	\$ 54.1
Total Investment Management Costs *	35	35	\$ 321,375	\$ 85.9

* Annual fees are based upon the CEM investment report for calendar year 2022.

Investment Management costs include internal investment department salaries, incentive compensation, benefits, external manager fees, the allocation of ITS costs, overhead expenses, oversight, custodial & other costs. Investment management costs exclude carried interest and other fund expenses.

** Includes fixed income, domestic equity and international equity external manager fees.



Investment Manager Performance

Asset Class Performance vs. Benchmarks

	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Total Domestic Equity	8.30%	18.94%	13.98%	11.67%
Domestic Equity Benchmark	8.39%	18.95%	13.89%	11.39%
Total International Equity	3.54%	16.60%	11.39%	6.15%
Int'l Blended Benchmark	3.28%	15.43%	9.73%	5.51%
Total Fixed Income	(0.69%)	0.09%	(2.97%)	1.23%
Fixed Income Blended Benchmark	(0.73%)	(0.35%)	(3.35%)	0.99%
Total Real Estate	(0.97%)	(4.99%)	7.76%	6.61%
Real Estate Blended Benchmark	(1.29%)	(5.51%)	7.36%	6.04%
Total Alternative Investments[^]	2.12%	(1.41%)	19.16%	12.64%
Alternative Investment Blended Bmk	2.29%	(0.49%)	-	-
Liquidity Reserve	1.24%	3.88%	1.37%	1.58%
Liquid Reserve Index	1.17%	3.59%	1.27%	1.55%
Total Fund	3.15%	7.68%	10.30%	8.20%
Total Fund Benchmark	3.05%	7.62%	9.14%	7.53%

Asset Class Performance vs. Benchmarks

	Last 10 Years	Last 15 Years	Last 20 Years	Last 25 Years	Last 30 Years
Total Domestic Equity	12.46%	10.70%	9.99%	7.52%	9.43%
Domestic Equity Benchmark	12.34%	10.61%	10.05%	7.77%	10.14%
Total International Equity	7.28%	5.19%	8.57%	6.67%	-
Int'l Blended Benchmark	6.44%	4.41%	7.71%	5.61%	-
Total Fixed Income	2.00%	3.42%	3.70%	4.56%	5.19%
Fixed Income Blended Benchmark	1.80%	3.03%	3.31%	4.13%	4.59%
Total Real Estate	8.76%	6.61%	10.36%	10.14%	10.14%
Real Estate Blended Benchmark	7.83%	6.63%	8.52%	8.57%	8.70%
Total Alternative Investments	11.39%	9.49%	11.75%	8.80%	9.37%
Liquidity Reserve	1.03%	0.85%	1.47%	2.01%	2.49%
Liquid Reserve Index	0.98%	0.72%	1.30%	1.78%	2.30%
Total Fund	8.73%	7.43%	8.41%	7.06%	7.96%
Total Fund Benchmark	8.25%	7.21%	7.99%	6.80%	7.82%

Investment Manager Returns and Peer Group Rankings

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years					
Total Domestic Equity	8.30%	22	18.94%	27	13.98%	54	11.67%	8	12.46%	16
Domestic Equity Benchmark	8.39%	15	18.95%	26	13.89%	57	11.39%	12	12.34%	17
Lg Public Funds DE	7.84%		18.43%		14.07%		10.56%		11.63%	
Total 1000 Equity	8.66%	48	19.62%	45	14.11%	47	12.25%	37	12.72%	51
Russell 1000 Index	8.58%	48	19.36%	46	14.09%	47	11.92%	42	12.64%	52
Callan Large Cap	8.51%		18.61%		13.81%		11.40%		12.78%	
Total Internal 1000 Equity	8.66%	48	19.59%	45	14.14%	47	12.32%	37	12.75%	51
Callan Large Cap	8.51%		18.61%		13.81%		11.40%		12.78%	
STRS Analyst Select Fund	8.10%	54	18.54%	43	15.09%	39	11.99%	46	11.71%	75
Russell 1000 Index	8.58%	41	19.36%	31	14.09%	60	11.92%	48	12.64%	50
Callan Large Cap Core	8.44%		18.14%		14.38%		11.72%		12.63%	
Concentrated Select Fund	5.04%	71	11.39%	86	16.35%	21	9.01%	74	-	
Russell 1000 Index	8.58%	48	19.36%	46	14.09%	47	11.92%	42	12.64%	52
Callan Large Cap	8.51%		18.61%		13.81%		11.40%		12.78%	
STRS Large Cap Passive Quantitative	9.89%	40	20.87%	39	14.65%	41	13.20%	25	13.52%	41
Russell Top 200	9.89%	40	20.88%	39	14.65%	41	13.19%	25	13.52%	41
Callan Large Cap	8.51%		18.61%		13.81%		11.40%		12.78%	
Integrated Factor Index	3.61%	86	11.38%	86	13.02%	61	8.94%	75	-	
Russell 1000 Index	8.58%	48	19.36%	46	14.09%	47	11.92%	42	12.64%	52
Callan Large Cap	8.51%		18.61%		13.81%		11.40%		12.78%	
STRS Large Cap Value	4.07%	52	14.44%	22	15.26%	76	9.27%	36	10.25%	31
Large Cap Value Custom Index	4.07%	52	11.54%	62	14.30%	82	8.11%	71	9.35%	81
Callan Large Cap Value	4.22%		12.34%		16.40%		8.77%		9.87%	
STRS Large Cap Growth	15.02%	8	30.58%	13	11.28%	50	14.97%	14	15.46%	25
Russell 1000 Growth Index	12.81%	40	27.11%	32	13.73%	15	15.14%	13	15.74%	19
Callan Large Cap Growth	12.29%		25.13%		11.31%		12.98%		14.72%	
STRS Mid Cap Value	4.45%	54	13.36%	57	17.02%	63	7.43%	69	8.85%	77
Russell Mid Cap Value Idx	3.86%	76	10.50%	78	15.04%	92	6.84%	82	9.03%	76
Callan Mid Cap Value	4.48%		14.28%		18.09%		8.16%		9.72%	
STRS Mid Cap Growth	6.78%	24	22.66%	21	5.43%	69	9.52%	53	11.34%	58
Russell Mid Cap Growth Idx	6.23%	33	23.13%	15	7.63%	48	9.71%	48	11.53%	48
Callan Mid Cap Growth	5.70%		18.91%		7.59%		9.63%		11.50%	
Total 2000 Equity	4.89%	39	13.20%	60	13.13%	76	6.36%	54	10.11%	47
Russell 2000 Index	5.21%	32	12.31%	68	10.82%	94	4.21%	94	8.26%	91
Callan Small Cap Core	4.62%		14.11%		14.48%		6.58%		10.00%	
Total Internal 2000 Equity	5.28%	29	12.32%	68	12.89%	79	4.09%	95	8.64%	86
Small Cap Select	6.13%	12	16.54%	20	14.05%	61	4.08%	95	-	
STRS Quantitative 2000	4.68%	47	9.72%	87	12.12%	86	3.90%	96	8.89%	83
Russell 2000 Index	5.21%	32	12.31%	68	10.82%	94	4.21%	94	8.26%	91
Callan Small Cap Core	4.62%		14.11%		14.48%		6.58%		10.00%	

Investment Manager Returns and Peer Group Rankings

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Last 10 Years	
Total External 2000 Equity	4.68%	51	13.71%	54	13.23%	60	7.66%	35	10.95%	29
Callan Small Cap	4.73%		14.23%		14.24%		6.65%		10.17%	
Small Cap Core	4.97%	38	15.53%	32	21.42%	5	7.80%	31	11.42%	12
Fuller & Thaler Core	3.92%	61	18.63%	9	21.46%	5	10.23%	3	13.38%	3
Fuller & Thaler Micro-Cap	8.05%	5	7.56%	97	21.80%	3	2.15%	99	7.19%	97
Russell 2000 Index	5.21%	32	12.31%	68	10.82%	94	4.21%	94	8.26%	91
Callan Small Cap Core	4.62%		14.11%		14.48%		6.58%		10.00%	
Small Cap Value	3.65%	49	13.33%	37	16.11%	80	6.48%	39	9.61%	33
Chartwell	3.66%	48	12.02%	42	14.86%	86	3.94%	88	8.14%	82
Neuberger Berman	3.63%	51	14.54%	25	17.13%	69	8.83%	11	10.95%	8
Russell 2000 Value Index	3.18%	62	6.01%	85	15.43%	82	3.54%	91	7.29%	96
Callan Small Cap Value	3.63%		11.39%		18.35%		5.89%		9.13%	
Small Cap Growth	6.38%	35	12.05%	88	0.93%	94	7.42%	60	11.66%	39
Weatherbie Capital 2000 Growth	6.38%	35	12.05%	88	0.93%	94	7.42%	60	12.86%	20
Russell 2000 Growth Index	7.05%	27	18.53%	36	6.10%	71	4.22%	95	8.83%	98
Callan Small Cap Growth	5.46%		16.97%		8.52%		7.92%		11.28%	
Total International Equity	3.54%	7	16.60%	21	11.39%	1	6.15%	6	7.28%	4
Int'l Blended Benchmark	3.28%	9	15.43%	31	9.73%	20	5.51%	11	6.44%	18
Lg Public Fd - Int Equity	2.57%		13.96%		8.08%		4.44%		5.81%	
Total EAFE	4.52%	8	19.50%	34	12.95%	10	7.00%	10	8.11%	10
MSCI World ex US 50% Hedged	3.87%	30	18.86%	43	11.48%	18	6.55%	14	7.20%	20
Callan NonUS Eq	3.21%		18.10%		9.01%		4.90%		6.35%	
Total Internal EAFE	4.65%	7	18.41%	46	12.26%	13	5.81%	27	6.94%	25
STRS Structured EAFE	3.97%	27	18.95%	41	11.77%	16	6.88%	11	7.50%	15
STRS EAFE Quantitative	5.30%	2	17.29%	65	12.65%	11	4.76%	53	6.35%	49
MSCI World ex US 50% Hedged	3.87%	30	18.86%	43	11.48%	18	6.55%	14	7.20%	20
Callan NonUS Eq	3.21%		18.10%		9.01%		4.90%		6.35%	
Total External EAFE	4.43%	11	20.31%	26	13.48%	9	8.03%	4	9.21%	2
Arrowstreet Capital	5.78%	1	19.92%	29	16.09%	3	9.50%	1	10.69%	1
AllianceBernstein EAFE Value	3.45%	41	20.26%	26	14.53%	7	5.06%	47	7.19%	20
MFS	4.02%	25	20.98%	20	10.15%	32	8.72%	3	-	
MSCI World ex US 50% Hedged	3.87%	30	18.86%	43	11.48%	18	6.55%	14	7.20%	20
Callan NonUS Eq	3.21%		18.10%		9.01%		4.90%		6.35%	

Investment Manager Returns and Peer Group Rankings

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Emerging	1.69%	7.25%	5.30%	2.14%	3.67%
MSCI Emerging Mkts Idx	0.90%	1.75%	2.32%	0.93%	2.97%
Emerging Mkts Equity DB	1.73%	5.26%	3.47%	2.65%	4.68%
Total Internal Emerging	1.97%	7.81%	6.71%	3.14%	4.20%
STRS Active Emerging Combined	1.78%	5.09%	7.72%	4.03%	4.53%
STRS Emerging Market Quantitative	2.31%	5.89%	4.37%	1.14%	-
MSCI Emerging Mkts Idx	0.90%	1.75%	2.32%	0.93%	2.97%
Emerging Mkts Equity DB	1.73%	5.26%	3.47%	2.65%	4.68%
Total External Emerging	0.81%	5.48%	0.66%	(0.93%)	2.07%
Genesis	0.68%	5.34%	0.63%	1.16%	3.25%
MSCI Emerging Mkts Idx	0.90%	1.75%	2.32%	0.93%	2.97%
Emerging Mkts Equity DB	1.73%	5.26%	3.47%	2.65%	4.68%
Total Global Ex-US	2.89%	16.05%	11.32%	6.45%	16
Int'l Blended Benchmark	3.28%	15.43%	9.73%	5.51%	6.44%
MSCI ACWI ex US	2.44%	12.72%	7.22%	3.52%	4.75%
Callan NonUS Eq	3.21%	18.10%	9.01%	4.90%	6.35%
Total Internal Global Ex-US	2.87%	17.03%	13.16%	7.29%	8
International Value	2.87%	17.09%	13.19%	7.31%	-
International Analyst	2.86%	15.22%	-	-	-
Int'l Blended Benchmark	3.28%	15.43%	9.73%	5.51%	6.44%
MSCI ACWI ex US	2.44%	12.72%	7.22%	3.52%	4.75%
Callan NonUS Eq	3.21%	18.10%	9.01%	4.90%	6.35%
Total External Global Ex-US	2.92%	15.02%	8.98%	5.54%	32
Int'l Blended Benchmark	3.28%	15.43%	9.73%	5.51%	6.44%
Callan NonUS Eq	3.21%	18.10%	9.01%	4.90%	6.35%
Global ex-U.S. Standard	2.94%	15.04%	9.44%	5.80%	-
Lazard	3.62%	17.14%	10.23%	5.78%	-
Wellington International Opportunities	2.66%	13.50%	9.06%	6.01%	-
William Blair	2.71%	-	-	-	-
Int'l Blended Benchmark	3.28%	15.43%	9.73%	5.51%	6.44%
MSCI ACWI ex US	2.44%	12.72%	7.22%	3.52%	4.75%
Global ex-U.S. Small Cap	2.81%	15.31%	-	-	-
Acadian	2.84%	14.85%	-	-	-
American Century	2.69%	15.13%	-	-	-
Wellington Small Cap	3.08%	18.06%	-	-	-
MSCI ACWI exUS SmCap (Dev.Mkts50%Hedg)	3.06%	12.68%	-	-	-
Total Fixed Income	(0.69%)	0.09%	(2.97%)	1.23%	2.00%
Fixed Income Blended Benchmark	(0.73%)	(0.35%)	(3.35%)	0.99%	1.80%
Core Fixed Income	(0.53%)	0.50%	(2.96%)	1.25%	2.02%
Bimbg US Universal	(0.59%)	(0.04%)	(3.43%)	0.98%	1.80%
Callan Core Bond FI	(0.64%)	(0.34%)	(3.39%)	1.28%	2.01%
Liquid Treasury Portfolio	(1.13%)	(0.94%)	(2.83%)	0.88%	-
Bimbg US Intmtd Treasury Idx	(1.15%)	(1.02%)	(2.88%)	0.82%	0.93%
High-Yield	1.61%	9.78%	3.81%	3.78%	4.79%
BNY Mellon	1.59%	9.24%	3.20%	-	-
JP Morgan	1.38%	10.74%	4.55%	-	-
PGIM	1.76%	8.39%	4.26%	-	-
PIMCO	1.67%	10.06%	3.42%	3.74%	4.98%
Bimbg High Yield Idx	1.75%	9.06%	3.13%	3.36%	4.43%
Callan High Yield Fix Inc	1.53%	9.09%	3.56%	3.72%	4.67%
Emerging Debt	1.31%	7.51%	(1.13%)	1.27%	3.21%
Fidelity Instl. Asset Management	1.29%	6.78%	(0.76%)	1.15%	3.51%
MFS	1.18%	7.89%	(1.25%)	-	-
Payden & Rygel	1.70%	8.02%	(1.65%)	-	-
Emerging Debt Index	1.12%	5.64%	(2.71%)	1.02%	2.73%
Callan Emerging Debt USD	2.34%	8.55%	(2.17%)	0.98%	2.86%
Liquidity Reserve	1.24%	3.88%	1.37%	1.58%	1.03%
Liquidity Reserve Index	1.17%	3.59%	1.27%	1.55%	0.98%
Callan Cash Database	1.26%	3.88%	1.41%	1.73%	1.27%

Investment Manager Returns and Peer Group Rankings

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Real Estate	(0.97%)	(4.99%)	7.76%	6.61%	8.76%
Real Estate Blended Benchmark	(1.29%)	(5.51%)	7.36%	6.04%	7.83%
Private Real Estate	(1.64%)	(6.27%)	7.14%	6.49%	8.88%
Direct Real Estate	(2.23%)	(8.12%)	6.61%	6.18%	8.51%
East Region	(0.92%)	(6.41%)	3.79%	2.39%	3.96%
Midwest Region	(2.36%)	(11.43%)	2.19%	2.14%	6.19%
South Region	0.30%	(1.49%)	13.38%	11.86%	12.93%
West Region	(4.51%)	(11.15%)	8.63%	9.67%	12.64%
NCREIF Total Index	(1.81%)	(6.44%)	6.85%	5.94%	7.84%
Commingled Funds Real Estate	1.03%	3.31%	9.67%	8.03%	10.74%
Opportunity Fund	(1.64%)	(3.58%)	13.96%	9.63%	12.53%
International	2.48%	5.46%	7.52%	7.17%	10.41%
Specialty Real Estate Funds	(0.16%)	8.65%	10.97%	-	-
NCREIF Total Index	(1.81%)	(6.44%)	6.85%	5.94%	7.84%
Public Real Estate	2.98%	0.84%	9.30%	4.76%	6.56%
REITs - Active	3.08%	1.84%	-	-	-
External REIT	3.01%	-	-	-	-
CenterSquare Investment Management	3.25%	-	-	-	-
Heitman	3.59%	-	-	-	-
Principal Asset Management	2.06%	-	-	-	-
FTSE NAREIT Equity REITs	2.62%	(0.13%)	8.91%	4.55%	6.42%

Investment Manager Returns and Peer Group Rankings

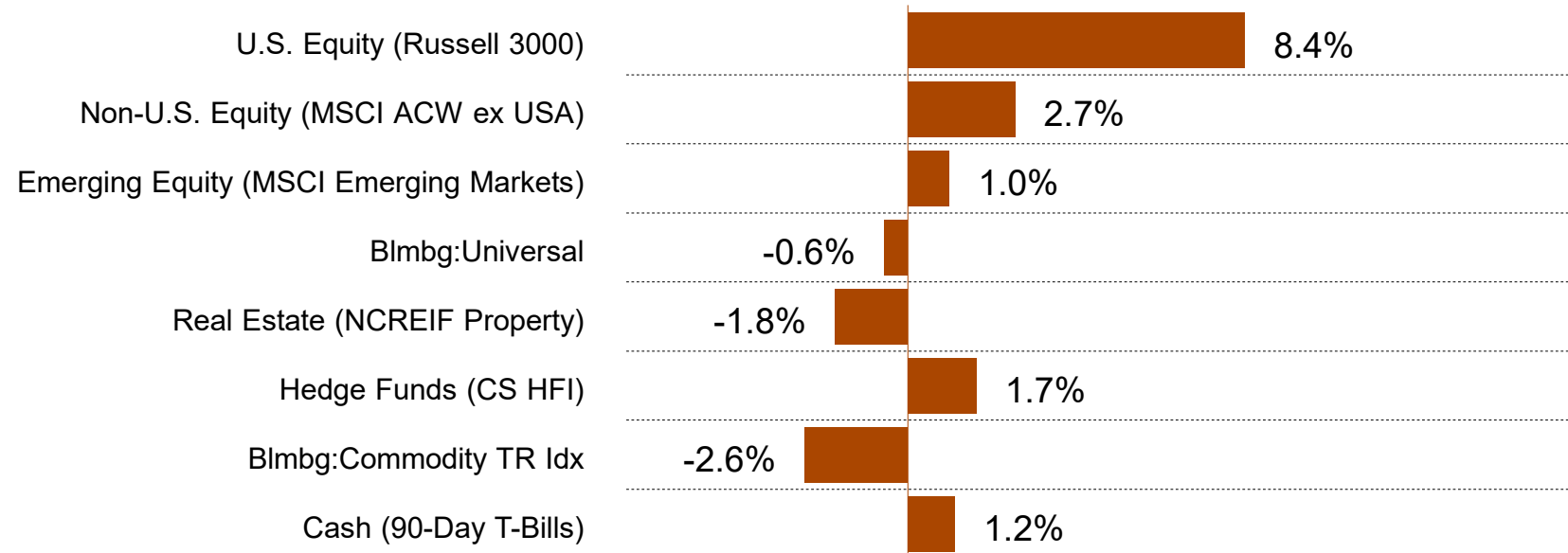
	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Alternative Investments	2.12%	(1.41%)	19.16%	12.64%	11.39%
Alt. Investment Blended Bmk	2.29%	(0.49%)	-	-	-
Private Equity	1.18%	(8.55%)	22.83%	17.63%	16.25%
Domestic Private Equity	3.36%	(3.82%)	25.17%	18.92%	17.34%
Domestic Venture Capital	(3.71%)	(18.05%)	21.77%	17.58%	14.92%
Global Private Equity	3.49%	(3.75%)	19.27%	15.30%	15.12%
Private Equity Benchmark	2.13%	(5.69%)	-	-	-
Opportunistic/Diversified	3.19%	8.11%	14.46%	7.34%	6.34%
Opportunistic	3.17%	8.16%	16.32%	8.47%	8.19%
Diversified	3.43%	7.62%	7.42%	3.57%	3.14%
Opportunistic/Div. Blended Bmk	2.42%	4.34%	-	-	-
Total Fund	3.15%	7.68%	10.30%	8.20%	8.73%
Total Fund Target	3.05%	7.62%	9.14%	7.53%	8.25%



Market Summary

Quarterly Market Performance Ending June 30, 2023

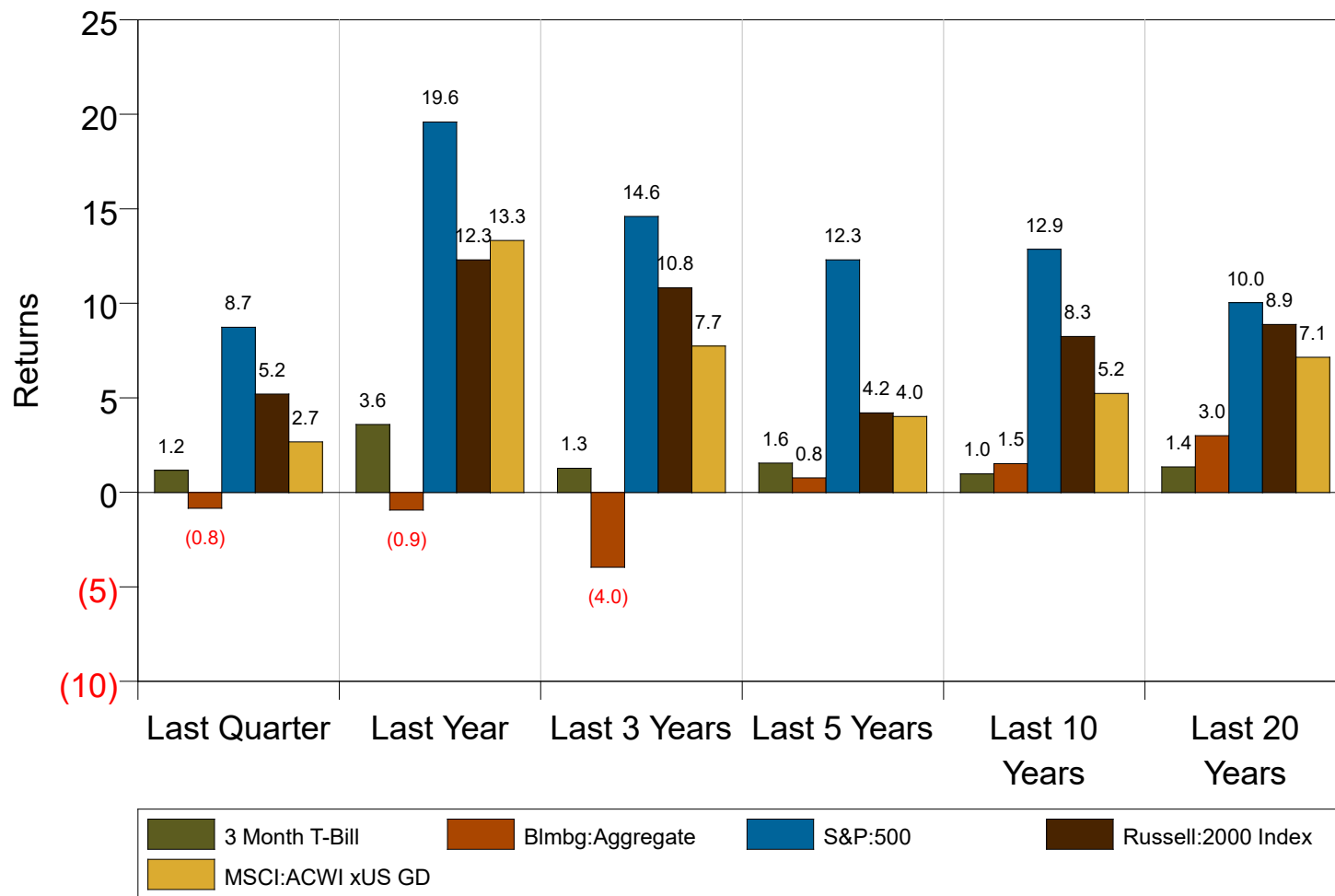
Broad Market Quarterly Returns



*Sources: Barclays, Citigroup, Credit Suisse Hedge Index, Merrill Lynch, MSCI, NCREIF, Russell Investment Group, Standard & Poor's

Performance Across Asset Classes

Time Periods Ended June 30, 2023





Callan LLC

Alternative Investments Performance Review

STRS Ohio Board Meeting

August 2023

Pete Keliuotis, CFA
Executive Vice President

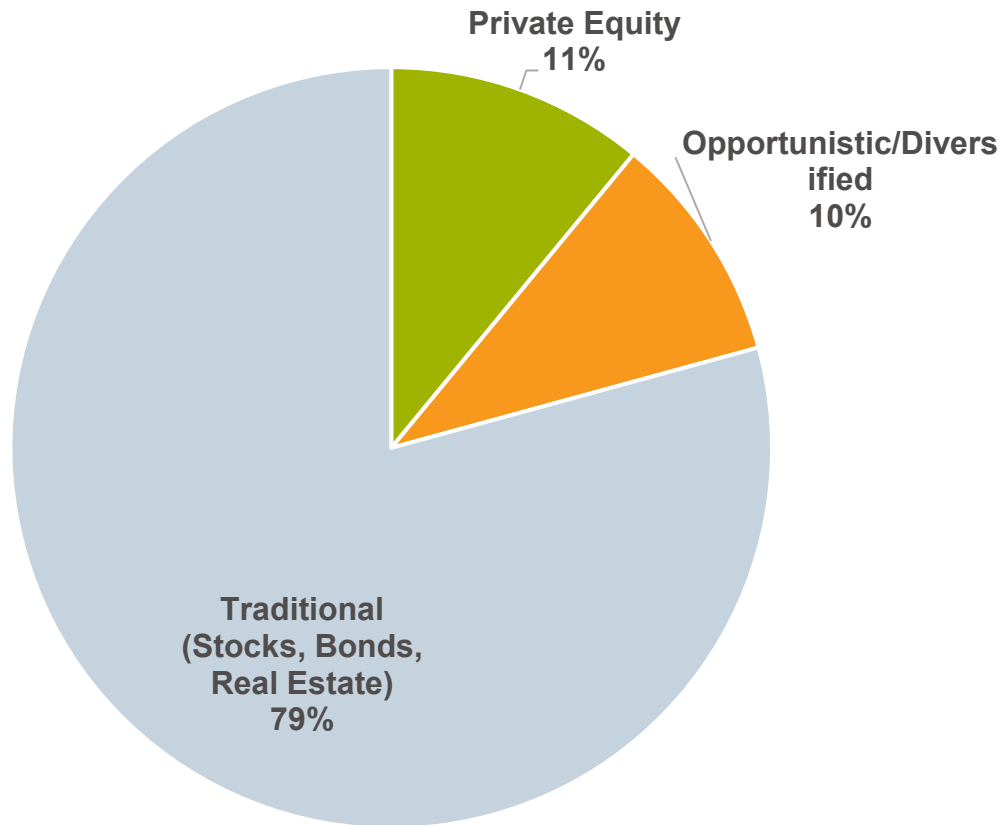


STRS Ohio Alternative Investment Performance

STRS Ohio Alternatives Overview

As of June 30, 2023

STRS Ohio Alternatives Allocations



Alternative Investments (or “Alternatives”) Descriptions:

1. Private Equity: Achieve higher return by investing in private, non-liquid companies
2. Opportunistic: credit-related strategies that diversify asset class risk by investing across different types of opportunistic assets
3. Diversified: uncorrelated, liquid strategies

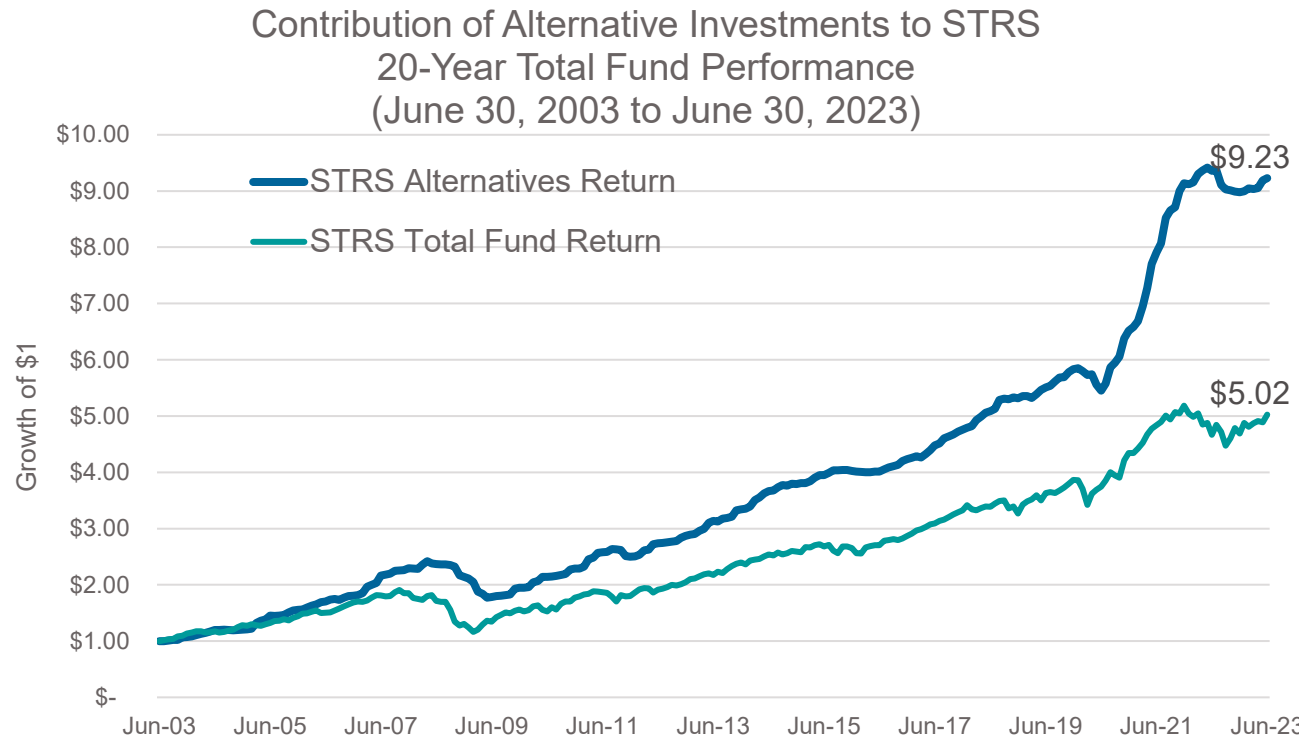
STRS Ohio component Alternative Investments Benchmarks (as of 7/1/2021):

1. Private Equity Benchmark:
Cambridge Associates Private Equity and Venture Capital Index
2. Opportunistic/Diversified Blended Benchmark:
Cambridge Associates Private Credit Index and HFRI Fund of Funds Composite Index at actual weights

Beginning July 1, 2021, STRS Ohio Alternative Investment Blended Benchmark consists of the Private Equity Benchmark and the Opportunistic/Diversified Blended Benchmark at current policy weights

STRS Ohio 20-Year Performance: Alternatives and STRS Total Fund

As of June 30, 2023



	STRS Total Fund Return ¹	STRS Alternatives Return ²
Annualized Return	8.41%	11.75%
Annualized Risk	10.30%	8.20%
Sharpe Ratio	0.68	1.27

- STRS Alternatives have enhanced Total Fund return and reduced Total Fund risk over the last 20 years.

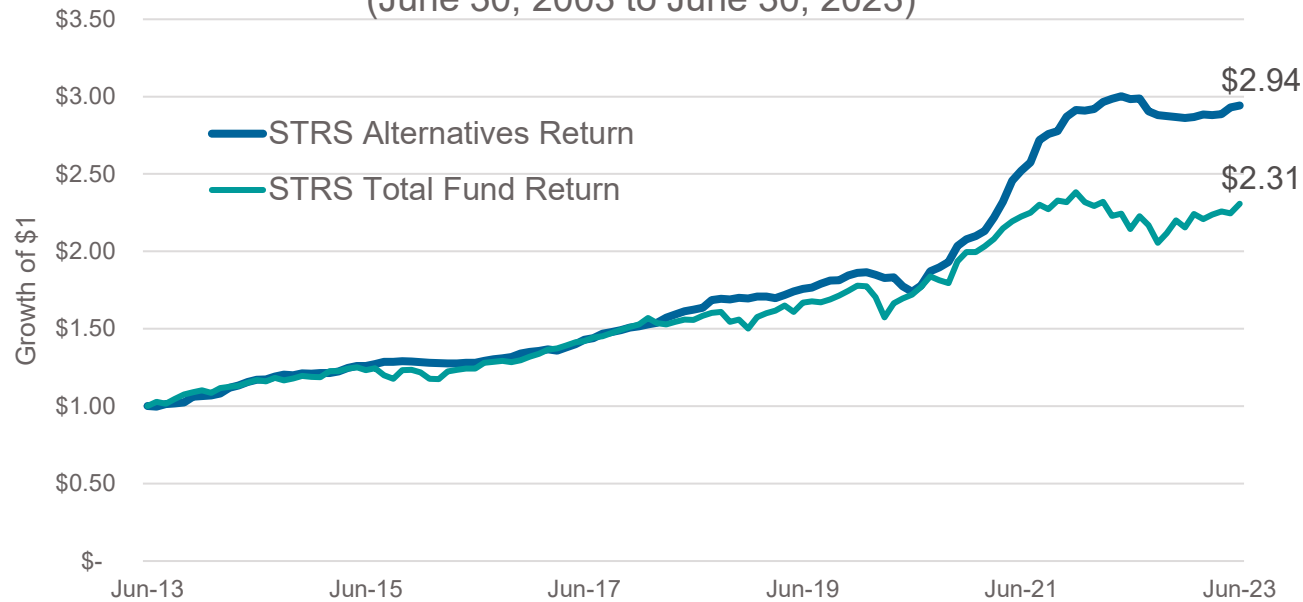
¹ The Total Fund return shown includes Alternative Investments & Real Estate where the return is also net of all external investment management fees and costs, including carried interest and other fund expenses

² STRS Ohio Alternative Investments returns are presented net of all external investment management fees and costs, including carried interest and other fund expenses

STRS Ohio 10-Year Performance: Alternatives and STRS Total Fund

As of June 30, 2023

Contribution of Alternative Investments to STRS
20-Year Total Fund Performance
(June 30, 2003 to June 30, 2023)¹



STRS Ohio Private Equity Performance
Annualized Returns ending June 30, 2023¹

	STRS Ohio Alternatives	STRS Ohio Total Fund	Alternatives Blended Benchmark
Last 10 years	11.39%	8.73%	
Last 5 years	12.64%	8.20%	
Last 3 years	19.16%	10.30%	
Last 2 years²	8.02%	1.88%	6.31%
Last 1 year	(1.41%)	7.68%	(0.49%)
Last Quarter	2.12%	3.15%	2.29%
Risk (10-Yr)	7.08%	8.65%	
Sharpe Ratio (10-Yr)	1.47	0.89	

- STRS Ohio Alternatives return exceeds STRS Ohio Total Fund return in all time periods except the last one year and last quarter.
- STRS Ohio Alternatives return trails the STRS Ohio Alternative Investment Blended Benchmark over the last quarter and last year; however, exceeds the benchmark over the two-year time period since it has been adopted.

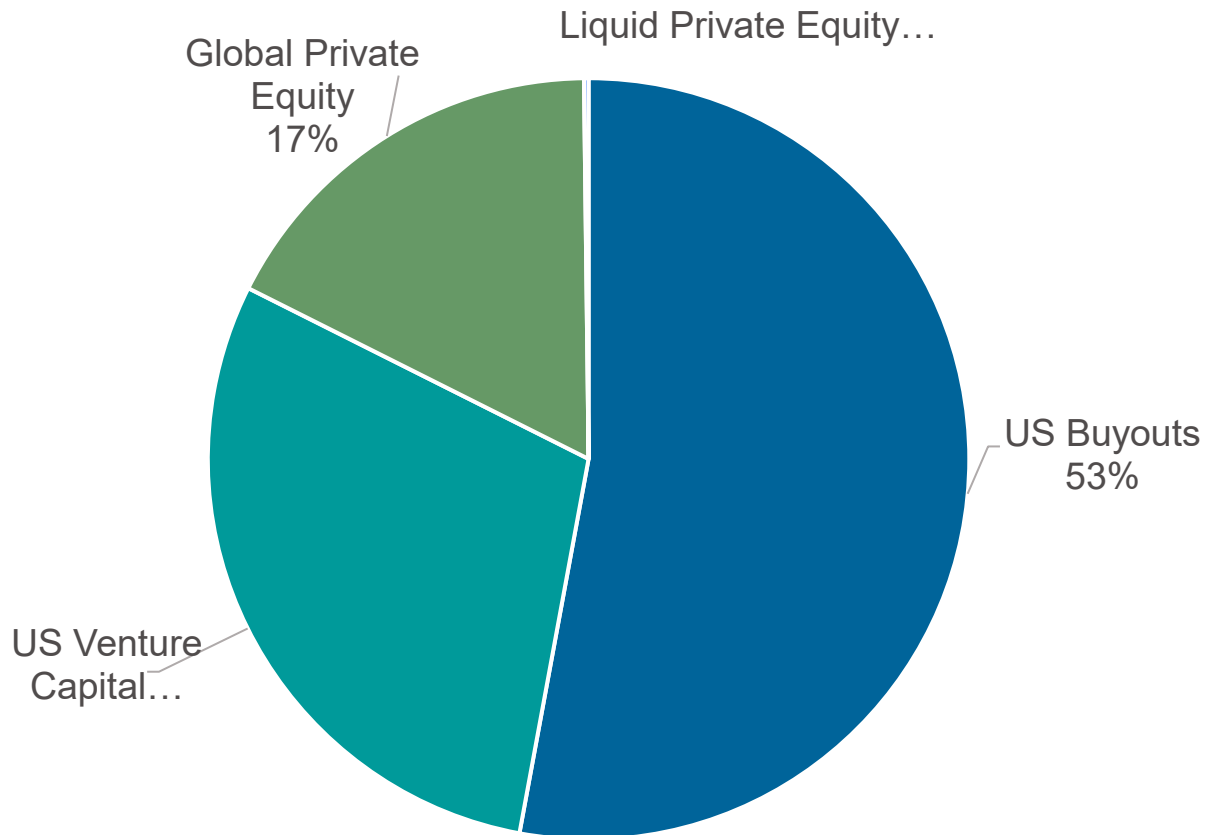
¹ STRS Ohio Alternative Investments returns are presented net of all external investment management fees and costs, including carried interest and other fund expenses.

² Reflects time period the new Alternative Investments Blended Benchmark has been in place.

STRS Ohio Private Equity Portfolio

As of June 30, 2023

STRS Ohio Private Equity Allocations



Market Value: \$9.9 billion

Uncalled Capital: \$2.8 billion

Diversification

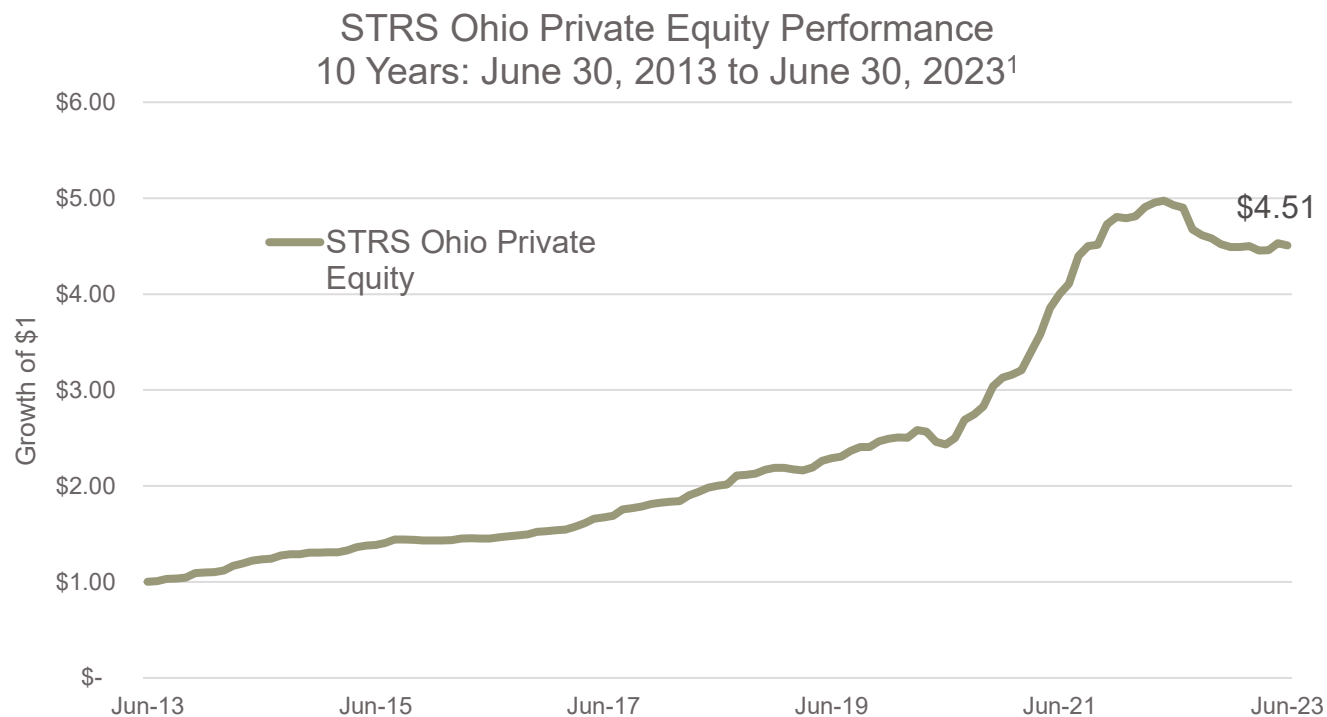
- Sector (buyout, venture)
- Geography (US, non-US)
- Time (vintage year)
- Industry

Implementation

- 215 partnerships
- 66 general partners

STRS Ohio Private Equity Performance

As of June 30, 2023



STRS Ohio Private Equity Performance
Annualized Returns ending June 30, 2023¹

	STRS Ohio Private Equity	STRS Ohio Private Equity Benchmark
Last 10 years	16.25%	
Last 5 years	17.63%	
Last 3 years	22.83%	
Last 2 years²	6.15%	6.96%
Last 1 year	(8.55%)	(5.69%)
Last Quarter	1.18%	2.13%
Risk (10-Yr)	9.52%	
Sharpe Ratio (10-Yr)	1.60	

- STRS Ohio Private Equity returns trail the Private Equity Benchmark for the last two years², last one year, and last quarter.

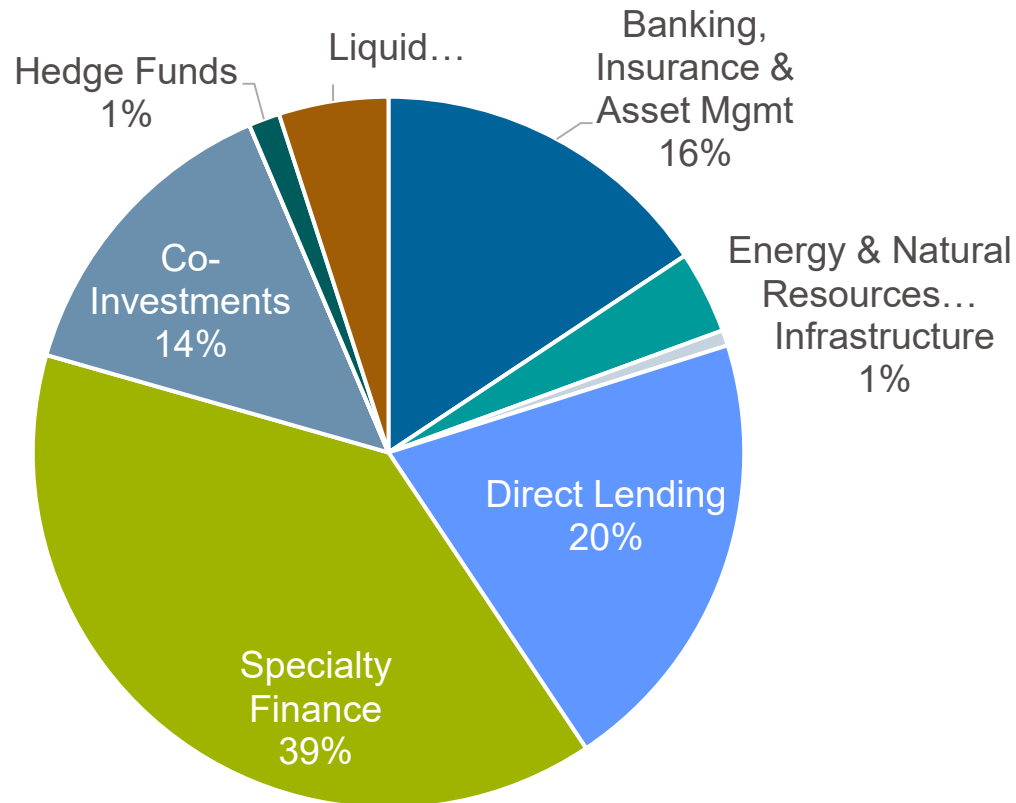
¹ STRS Ohio Private Equity returns are presented net of all external investment management fees and costs, including carried interest and other fund expenses.

² Reflects time period the new Private Equity Benchmark has been in place.

STRS Ohio Opportunistic/Diversified (O/D) Portfolio

As of June 30, 2023

STRS Ohio Opportunistic/Diversified Allocations



Market Value: \$8.8 billion

Uncalled Capital: \$3.9 billion

Diversification

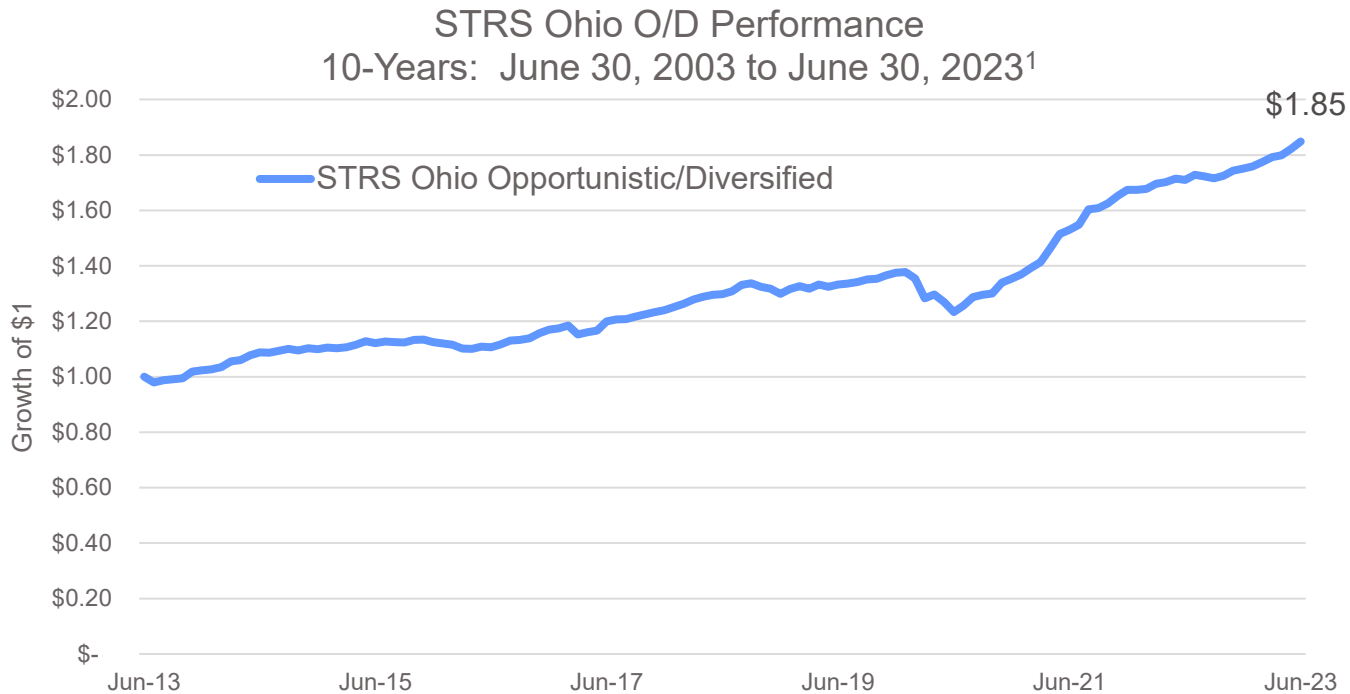
- Strategy (Theme)
- Time (vintage year)
- Industry

Implementation

- External
 - 154 partnerships
 - 65 general partners
- Internal
 - 54 co-investments, \$1.2 billion
 - \$0.4 billion liquid alternatives

STRS Ohio Opportunistic/Diversified (O/D) Performance

As of June 30, 2023



STRS Ohio O/D Performance
Annualized Returns ending June 30, 2023

	STRS Ohio O/D	STRS Ohio O/D Benchmark
Last 10 years	6.34%	
Last 5 years	7.34%	
Last 3 years	14.46%	
Last 2 years ²	9.94%	6.30%
Last 1 year	8.11%	4.34%
Last Quarter	3.19%	2.42%
Risk (10-Yr)	5.34%	
Sharpe Ratio (10-Yr)	1.00	

- STRS Ohio Opportunistic/Diversified returns exceed the Opportunistic/Diversified Benchmark over the last two years², the last one year, and the last quarter.

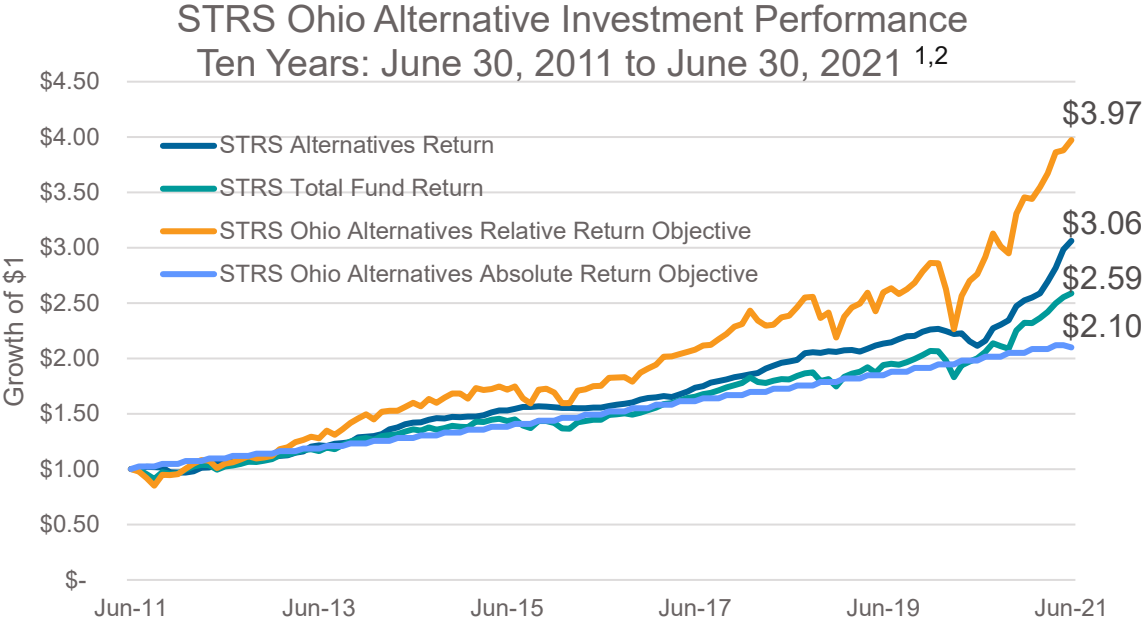
¹ STRS Ohio Opportunistic/Diversified returns are presented net of all external investment management fees and costs, including carried interest and other fund expenses.

² Reflects time period the new Opportunistic/Diversified Blended Benchmark has been in place.



Appendix: June 30, 2021 Performance

STRS Ohio Alternatives Performance (Private Equity + O/D)



STRS Ohio Alternative Investments Performance Comparison Annualized Periods ending June 2021

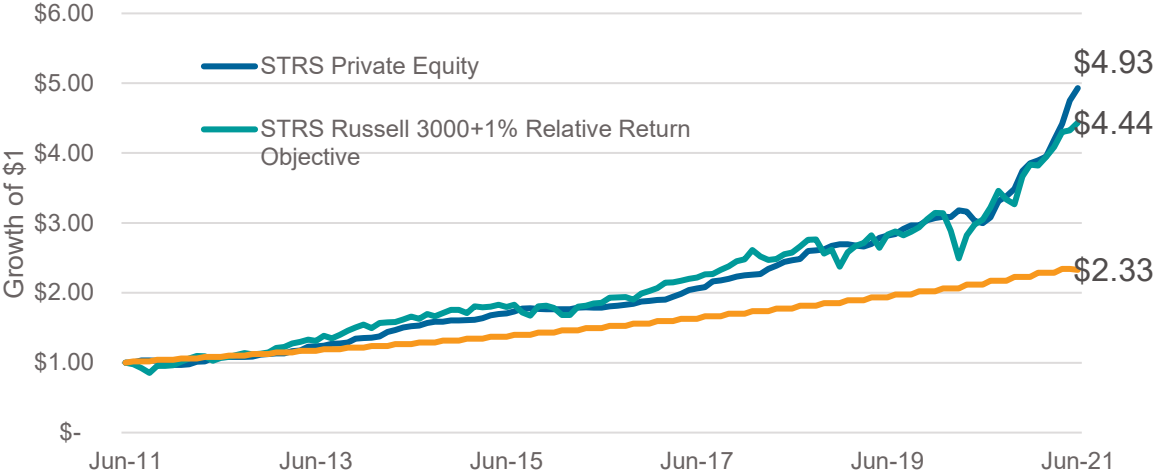
	STRS Ohio Alternatives	STRS Ohio Total Fund	STRS Ohio Alternatives Relative Return Objective ²	STRS Ohio Alternatives Absolute Return Objective ^{2,3}
Last 10 years	11.84%	9.97%	14.79%	7.81%
Last 5 years	14.52%	12.34%	17.77%	7.27%
Last 3 years	15.83%	12.62%	18.55%	7.09%
Fiscal Year 2021	44.99%	29.28%	43.91%	7.09%
Risk (10-Yr)	4.91%	7.80%	14.15%	
Sharpe Ratio (10-Yr)	2.30	1.21	1.00	

- STRS Ohio Alternatives returns exceed STRS Ohio Total Fund returns in all time periods.
- STRS Ohio Alternatives returns have meaningfully exceeded long-term Absolute Return Objectives over all time periods
- STRS Ohio Alternatives returns meaningfully exceeded the Relative Return Objective in FY2021
- STRS Ohio Alternatives returns have lagged the Relative Return Objective in longer term historical periods due to lower-risk / lower yielding Opportunistic/Diversified (or “O/D”) returns (as described on a later slide), but STRS Ohio Alternatives have provided a better long-term risk-adjusted return than the Relative Return Objective as illustrated above by the significantly lower volatility and significantly higher Sharpe Ratio over the 10-year period.

¹ STRS Ohio Alternatives returns are always presented net of all management fees, fund expenses and carried interest
² STRS Ohio measured Alternatives performance relative to the Alternatives Relative Return Objective and the Alternatives Absolute Return Objective through 6/30/2021
³ Higher returns over longer periods reflect Objectives from earlier STRS Ohio Asset Allocation Studies

STRS Ohio Private Equity Performance

STRS Ohio Private Equity Performance
Ten Years: June 30, 2011 to June 30, 2021 ^{1,2,3,4}



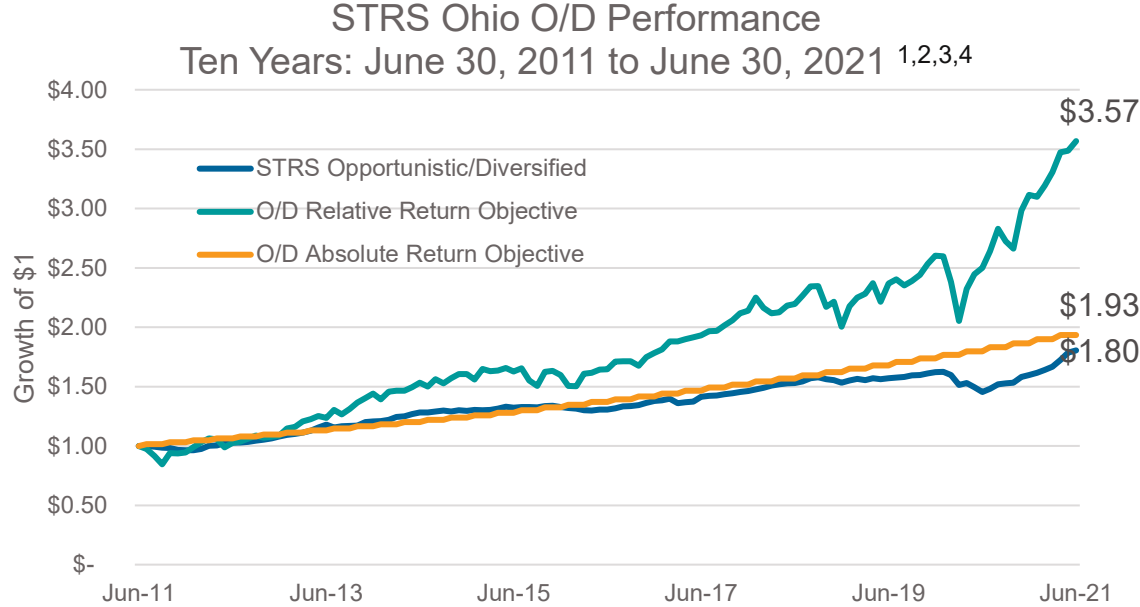
STRS Ohio Private Equity Performance
Annualized Periods ending June 2021 ^{1,2}

	STRS Ohio Alternatives	STRS Ohio Alternatives Relative Return Objective ^{2,3}	STRS Ohio Alternatives Absolute Return Objective ^{2,4}
Last 10 years	17.29%	16.06%	8.83%
Last 5 years	22.47%	19.05%	8.32%
Last 3 years	25.96%	19.90%	8.15%
Fiscal Year 2021	64.48%	45.56%	8.15%
Risk (10-Yr)	6.53%	14.14%	
Sharpe Ratio (10-Yr)	2.56	1.10	

- STRS Ohio Private Equity returns exceed Absolute Return Objectives for all time periods
- STRS Ohio Private Equity returns outperformed the Relative Return Objective in all time periods
- STRS Ohio Private Equity returns have also generated significantly better risk-adjusted returns than the Relative Return Objective as illustrated above by the significantly lower volatility and significantly higher Sharpe Ratio over the 10-year period

¹ STRS Ohio PE returns are always presented net of all management fees, fund expenses and carried interest
² STRS Ohio measured Private Equity performance relative to the Private Equity Relative Return Objective and the Private Equity Absolute Return Objective through 06/30/2021
³ STRS Ohio Private Equity Relative Return Objective equals the Russell 3000 Equity Index plus 1% per year
⁴ STRS Ohio Private Equity Absolute Return Objective is based upon a 10.70% Objective starting fiscal 2007, a 9.00% Objective starting fiscal 2013 and an 8.15% Objective starting fiscal 2018

STRS Ohio Opportunistic/Diversified (O/D) Performance



STRS Ohio Private Equity Performance
Annualized Periods ending June 2021 ^{1,2}

	STRS Ohio Opportunistic/Diversified ²	STRS Ohio O/D Relative Return Objective ³	STRS Ohio O/D Absolute Return Objective ⁴
Last 10 years	6.08%	13.57%	6.79%
Last 5 years	6.69%	16.73%	6.48%
Last 3 years	5.64%	17.57%	6.35%
Fiscal Year 2021	24.07%	42.78%	6.35%
Risk (10-Yr)	4.23%	14.15%	
Sharpe Ratio (10-Yr)	1.30	0.92	

- STRS Ohio Opportunistic/Diversified returns have trailed Relative Return Objectives over all periods shown but have exceeded the Absolute Return Objective in two of the four time periods shown. STRS Ohio Private Equity returns outperformed the Relative Return Objective in all time periods
- The Relative Return Objective underperformance is due primarily to (1) very strong public US stock returns over the last 10 years, (2) an investment emphasis on credit assets within Opportunistic and (3) an emphasis on lower risk Diversified strategies within O/D that have caused lower returns, which collectively made the Relative Return Objective difficult to outperform.

¹ STRS Ohio O/D returns are always presented net of all management fees, fund expenses and carried interest
² STRS Ohio measured O/D performance relative to the O/D Relative Return Objective and the O/D Absolute Return Objective through 06/30/2021
³ STRS Ohio O/D Relative Return Objective equals the Russell 3000 Equity Index minus 1% per year
⁴ STRS Ohio O/D Absolute Return Objective is based upon a 7.50% Objective starting in fiscal 2009, a 7.00% Objective beginning fiscal 2013 and an 6.35% Objective beginning fiscal 2018



Market Summary

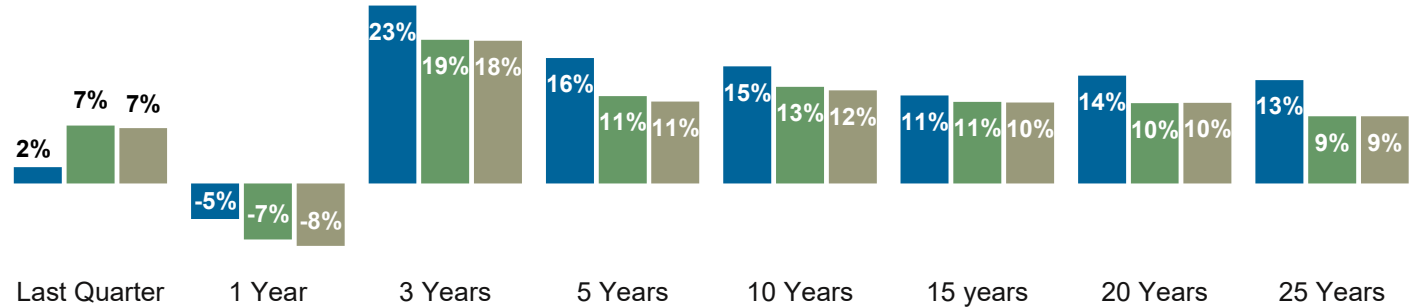
Private Equity Market Overview

As of March 31, 2023

Private Equity Performance Trends

- Private equity was only down about half as much as public markets through 2022 on a PME basis. Valuations are typically smoothed as they are based on the operating metrics of portfolio companies and other valuation metrics less sensitive to daily market volatility. As a result, private equity lagged public markets through the first quarter of 2023.
- Venture capital and growth equity have experienced the sharpest declines over the past year, due to their overweight to technology, which underperformed, as well as post-IPO public equity holdings.

Pooled Horizon Net IRRs (as of March 31, 2023)



Pooled Horizon Net IRRs by Strategy (As of March 31, 2023)

	Last Quarter	1 Year	3 Years	5 Years	10 Years	15 years	20 Years	25 Years
Venture Capital	-0.70%	-16.37%	24.98%	20.43%	18.73%	13.20%	12.62%	19.35%
Growth Equity	1.27%	-9.26%	21.28%	16.51%	15.11%	12.70%	14.39%	14.17%
Buyouts	3.52%	0.69%	23.86%	16.00%	15.24%	10.84%	15.07%	12.82%
Mezzanine	3.49%	6.08%	14.91%	10.88%	11.08%	10.34%	11.38%	10.02%
Credit Opportunities	2.01%	4.00%	13.42%	7.30%	7.86%	9.17%	9.79%	9.53%
Control-Oriented Distressed	1.60%	2.59%	26.00%	13.90%	12.14%	10.72%	11.85%	11.51%
Total Private Equity	2.12%	-4.57%	22.98%	16.20%	15.12%	11.36%	13.95%	13.37%

Source: Refinitiv/Cambridge. PME: Public Market Equivalent. * Russell 3000 Index + 2.0%

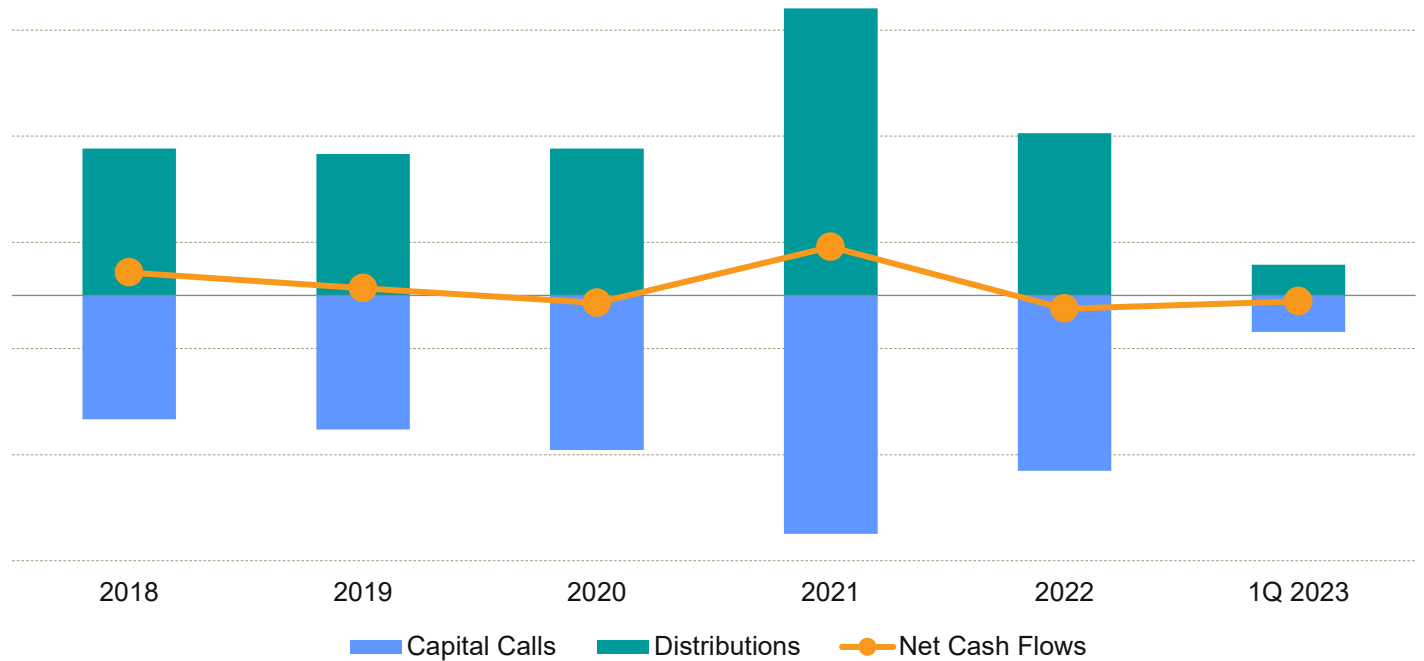
Private Equity Market Overview

As of March 31, 2023

2022 – Normalization Relative to 2021

- 2021 was an exceptional year for private equity cash flows, with record levels of distributions driven by a surge in exit activity.
- In 2022, LP cash flows returned to pre-pandemic levels.
- Net cash flow was negative in 2022, with contributions of \$331 billion outpacing distribution activity of \$306 billion. This was only the second calendar year since 2010 with negative net cash flow in the private equity markets.
- With an anticipated slower fundraising environment and less active exit environment, cash flow activity is expected to be further reduced in 2023.

LP Cash Flows by Year



Source: Refinitiv/Cambridge

Private Equity Market Trends

As of June 30, 2023

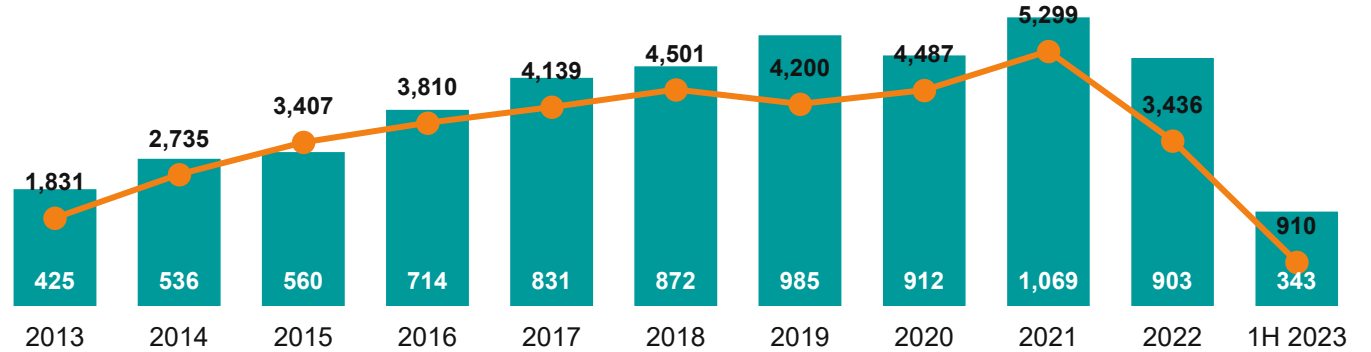
“Flight to Quality” in Fundraising

- Fundraising was modestly down over the last year in terms of the dollars raised.
- “Flight to quality” – significantly fewer funds have closed this year, as fundraising was concentrated with larger managers.
- Fundraising timelines have extended due to a plethora of funds in the market, slowing distributions, and constrained LP commitment budgets from the “denominator effect.”

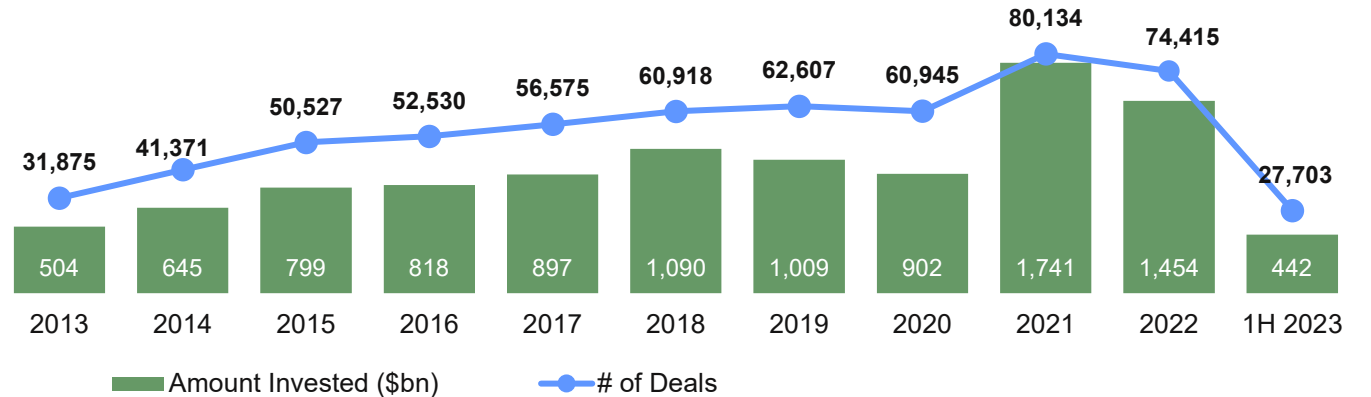
Slowing Deal Activity

- Annual deal activity was down from record 2021 levels, though it remained high relative to prior years.
- The pace of investment has slowed down from its peak and appears to be returning to pre-pandemic levels.
- Buyout deal activity remained relatively strong, while the majority of the decrease in 2022 levels was attributable to a lower number of financing rounds for venture-backed companies.

Funds Holding Final Closes by Year



Annual Buyout and Venture Deal Activity



Source: PitchBook

Private Equity Market Trends

As of June 30, 2023

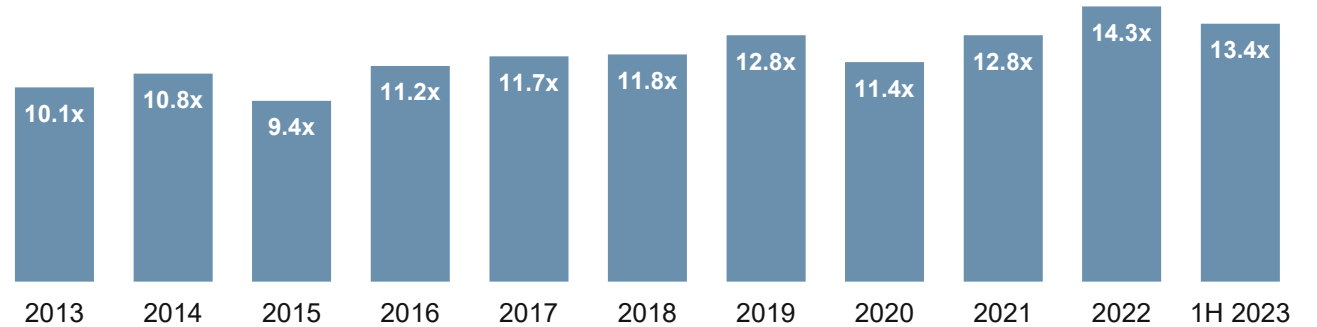
Buyout Valuations Remain Strong

- Buyout valuations have not yet experienced the declines seen in the public markets.
- Purchase prices may decline later in 2023 as valuations further reflect public markets, and as higher debt costs increase the equity share of buyout deals.

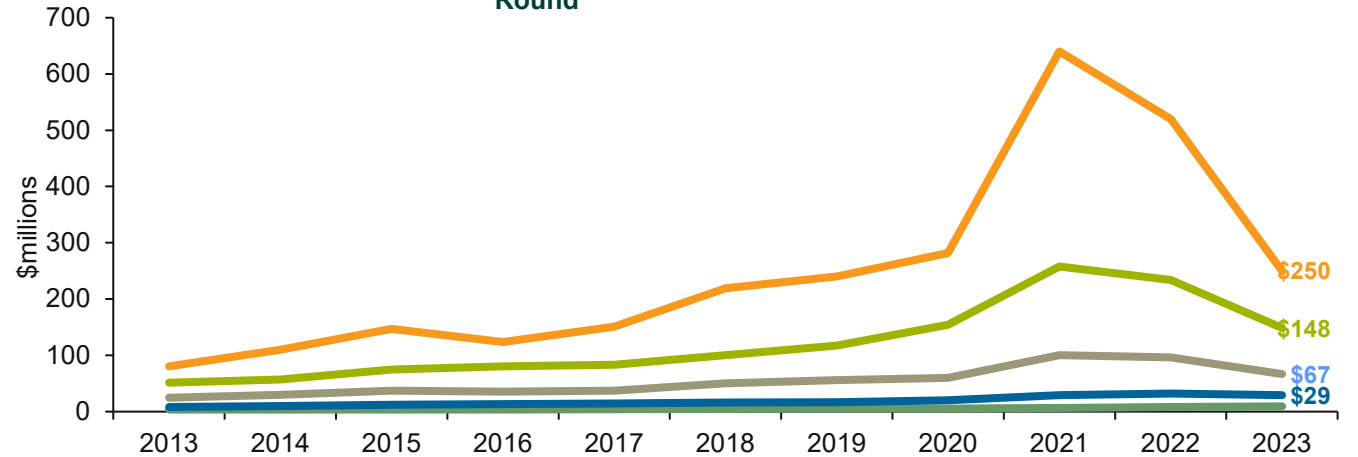
Venture Capital Valuations Decline

- In response to the downturn in the public technology markets and minimal IPO activity, venture capital valuations have largely declined through 2022 and 2023. Late-stage venture has been especially impacted as these companies are closer to an IPO.
- Many venture-backed companies are delaying their next financing round to avoid a mark down in valuations. Many will have to raise new capital over the next few quarters, however, which may further impact valuations.

US Buyout EBITDA Multiples



Annual Median Pre-Money Valuations of Venture-Backed Companies by Financing Round

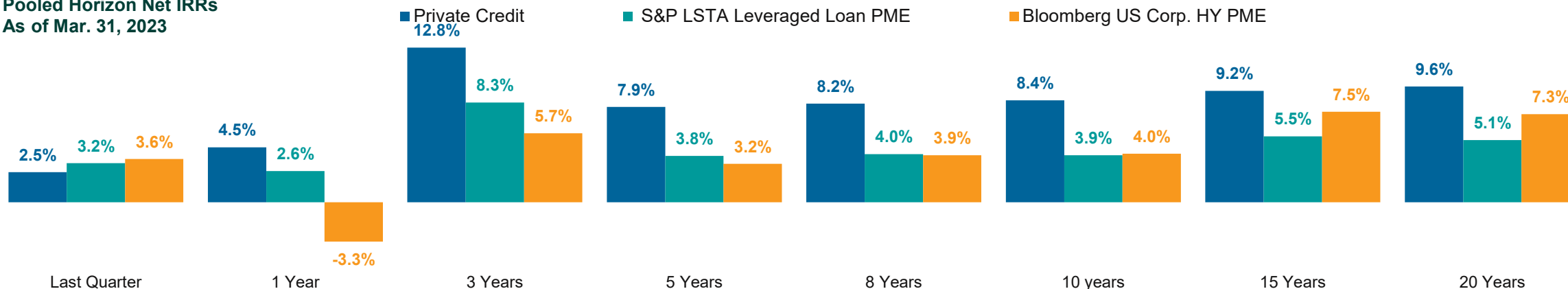


Source: PitchBook. Both charts show the median multiple/valuation for each calendar year.

Private Credit Market Overview

Performance over time and compared to relevant indices (as of March 31, 2023)

Pooled Horizon Net IRRs
As of Mar. 31, 2023



Pooled Horizon Net IRRs by Strategy
As of Mar. 31, 2023

Strategy	Last Quarter	1 Year	3 Years	5 Years	8 Years	10 Years	15 Years	20 Years
Senior Debt	2.8	4.3	8.8	5.9	7.0	6.8	7.0	6.9
Mezzanine	3.5	6.1	14.9	10.9	11.2	11.0	10.5	11.4
Credit Opportunities	2.0	4.0	13.4	7.3	7.3	7.9	9.2	9.4
Total Private Credit	2.5	4.5	12.8	7.9	8.2	8.4	9.2	9.6

Private credit performance varies across sub-asset class and underlying return drivers. On average, the asset class has generated net IRRs of 8% to 10% for trailing periods ended March 31, 2023. Higher-risk strategies performed better than lower-risk strategies.

*PME: Public market equivalent, a benchmark that applies the cash flows of the private credit funds to a public market index and then calculates an IRR.
Source: Refinitiv/Cambridge

Private Credit Fundraising Landscape

Activity remains strong through 2Q23

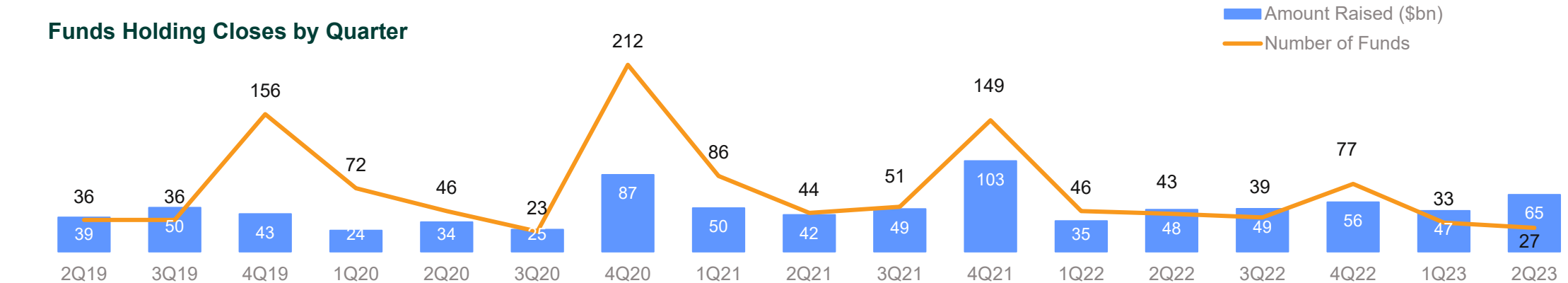
As interest rates declined after the GFC private credit attracted increased interest from institutional investors.

- ▶ Private credit fundraising was robust leading into the Covid dislocation with a particular focus on direct lending, asset-based lending and distressed strategies.
- ▶ In the current rising rate environment, a renewed focus has been placed on relative value, downside protection and managers' internal workout resources
- ▶ Renewed interest in strategies with strong collateral protection such as asset-based lending as well as capital solutions and distressed strategies.
- ▶ Larger sponsor-backed lending seeing a new focus due to the high yield/BSL disintermediation by private debt.

Largest Funds Holding Closes in 2Q23

Name	Amount (\$millions)	Strategy
HSBC Bank UK London SME Fund	\$18,713	Direct Lending
HPS Strategic Investment Partners V	\$12,000	Mezzanine Debt
HPS Core Senior Lending Fund II	\$7,300	Direct Lending
Permira Credit Solutions V	\$4,520	Direct Lending

Funds Holding Closes by Quarter

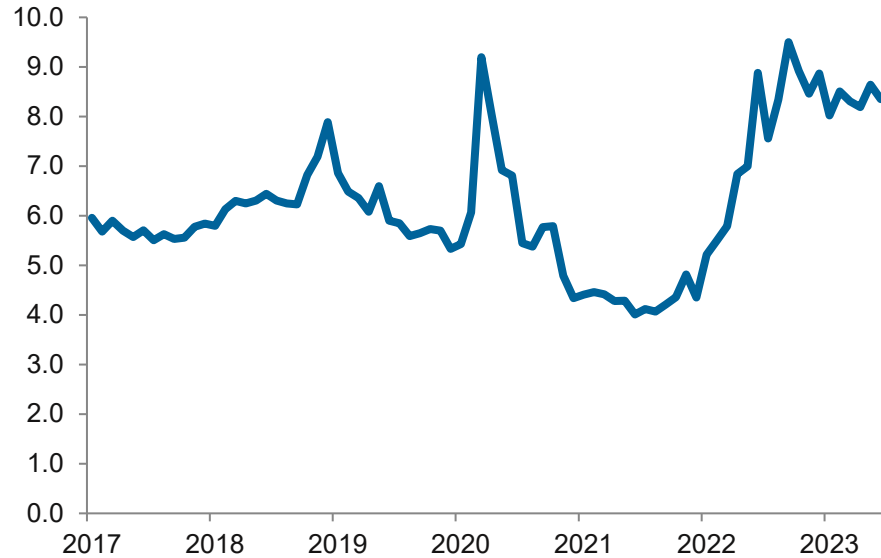


Source: Pitchbook

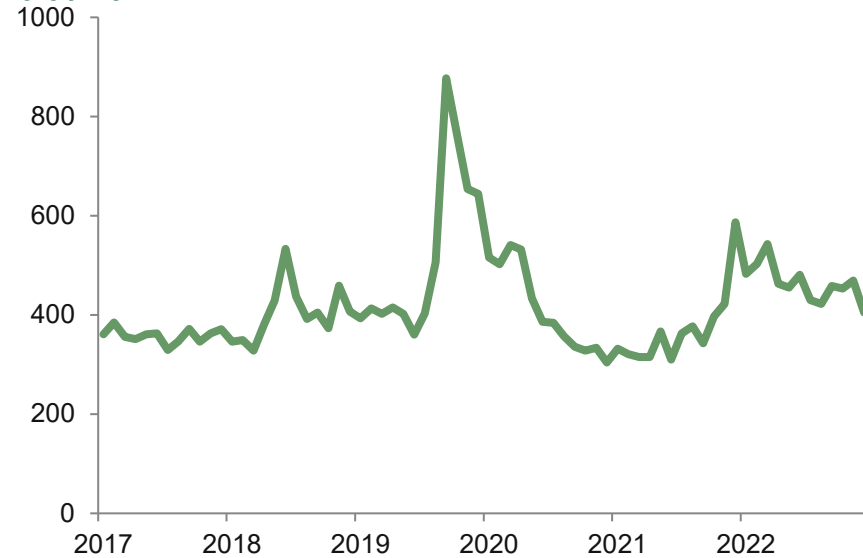
Private Credit Market Trends

As of June 30, 2023

High Yield Effective Yields Ended 6/30/23



US Corporate High Yield Spreads Ended 6/30/23



U.S. sub-investment grade corporate yields rose dramatically at the beginning of 2022 with yields peaking in September. This was a combination of higher interest rates due to tighter Fed policy and a widening of high yield spreads.

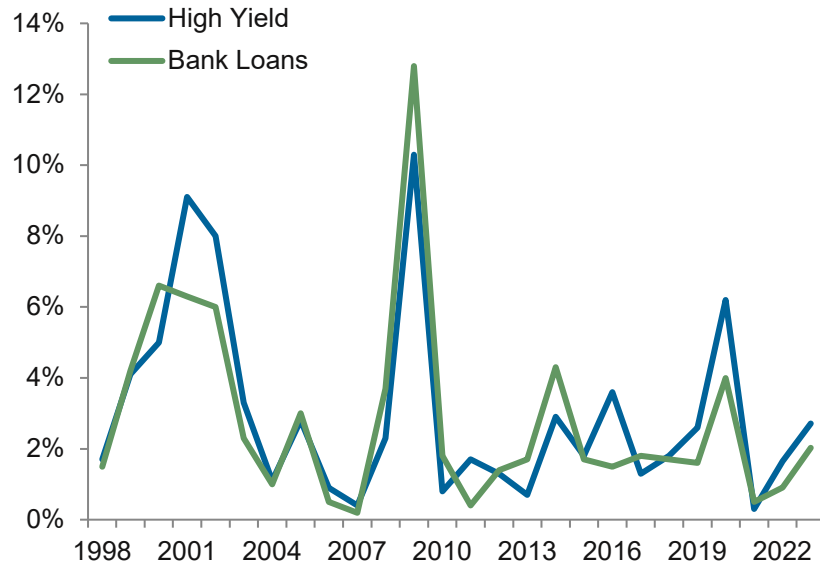
Spreads widened during the first half of 2022 due to weaker credit conditions as the U.S. economic outlook worsened. This has since moderated.

Sources: Bank of America, Federal Reserve Bank of St. Louis

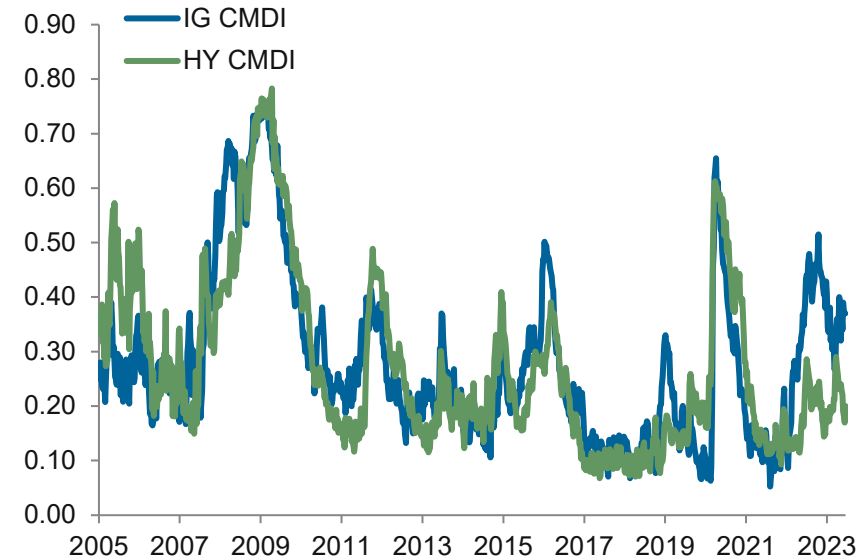
Private Credit Market Trends

As of June 30, 2023

US Corporate Default Rates Ended 6/30/23



Corporate Bond Market Distress Index (CMDI) Ended 6/30/23



Default rates for U.S. corporate bonds ticked up in 1Q but remained well below the historical average of 3%-4%. Callan expects defaults to increase somewhat in coming months as economic growth slows and potentially turns negative.

The Corporate Bond Market Distress Index (CMDI) rose rapidly during the first nine months of 2022, especially for investment grade bonds, highlighting market volatility and a drying up of liquidity, but has fallen since then. In 2023, as the IG distress index continues to fall, the HY bond indicator is on the rise. The CMDI incorporates a range of indicators, including new issuance and pricing for primary and secondary market bonds and relative pricing between traded and nontraded bonds.

Source: Federal Reserve Bank of New York, JPM

- **Matters requiring board action:**
 - None
- **Educational or scheduled updates and reviews requiring no action today:**
 - Summary of Investment Activity Report, June and July 2023
 - Proxy Voting Summary for six months ending June 30, 2023
 - Review of Securities Compliance Policies and Procedures
 - As required by Section 3307.043 of the Ohio Revised Code
 - Semiannual Derivatives Exposure as of June 30, 2023
 - Domestic equity asset class update and outlook
 - Callan Annual Performance Review
 - **Review of June and July 2023 investment transactions**
- **Summary of requests**

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