



Arkansas Public Employees' Retirement System

Quarterly Board Meeting
Wednesday, November 15, 2023, 9:00 A.M.
124 West Capitol Avenue, Suite 400, Little Rock 72201

The meeting will be held in the APERS conference room located on the 4th floor. The meeting will be a hybrid and can be attended via Zoom via the link on our website, www.apers.org.

AGENDA

1. Call to Order
2. Recognition of the Presence of a Quorum
3. Notification of Meeting to News Media Pursuant to Act 93 of 1967 (A.C.A. § 25-19-101) – Freedom of Information Act
4. **Action Item:** Approval of the Minutes for the September 27th Board Meeting, the November 1st Member Appeals Subcommittee, and the November 7th Investment Finance Subcommittee (**Page 3**)
5. Subcommittee Reports:
 - a. Member Appeals Subcommittee Report: Judge Barry Moehring
 - b. Investments and Finance Subcommittee Report: Secretary Daryl Bassett
Action Item: Approval of the Subcommittee's Recommendations to include:
 - i. Large Cap Growth Investment Manager (**Page 13**)
 - ii. Real Estate Investment
 - iii. Investment Policy Statement Proposal (**Page 88**)
6. Investments: Ms. Brianne Weymouth, Mr. John Jackson, of Callan LLC, and Mr. Carlos Borromeo, Deputy Director of Investments and Finance
 - a. CIO Report (**Page 111**)
 - b. Quarterly Report for the Period Ending September 30, 2023 (**Page 119**)
 - c. Fixed Income Structure (**Page 140**)
7. Finance: Mr. Mita Drazilov and Ms. Heidi Barry, GRS, and Mr. Jason Willett, Chief Financial Officer
 - a. June 30, 2023 Actuarial Valuation Results (**Page 156**)
Action Item: Confirm the APERS employer contribution rate of 15.32% of payroll

Action Item: Approve the computed employer contributions for District Judges that are to apply beginning July 1, 2025

Action Item: Approve the annual reserve transfers

- b. Financial Statements for the Quarter Ending September 30, 2023 **(Page 182)**

8. Legal: Mr. Richmond Giles, Staff Attorney
 - a. Legal Report **(Page 184)**

9. Benefits: Ms. Allison Woods, Deputy Director of Benefits
 - a. Benefits Summary **(Page 186)**

10. Executive Report: Ms. Amy Fecher, Executive Director
 - a. Executive Report **(Page 190)**
 - b. Class Action Report **(Page 192)**

11. Board Meeting Dates: Ms. Amy Fecher, Executive Director

Action Item: Proposed Meeting Dates for 2024
February 21, 2024
May 15, 2024
August 21, 2024
November 20, 2024

12. Other Business

13. Adjournment

**Quarterly Meeting
Arkansas Public Employees' Retirement System
Board of Trustees
September 27, 2023**

A regular meeting of the Board of Trustees of the Arkansas Public Employees' Retirement System was held on Wednesday, September 27, 2023, at 9:00 a.m. This hybrid meeting was held via ZOOM remote conferencing as well as in person in the conference room, 124 West Capitol, Little Rock, Arkansas. Ms. Candace Franks presided.

Quorum Present

Ms. Candace Franks recognized the presence of a quorum and called the meeting to order.

Board Members Present:

Ms. Candace Franks, (State Employee, Retired). Chair, Little Rock, AR
Mr. Jim Hudson (Secretary of the Department of Finance and Administration), Little Rock, AR
Hon. Larry Walther, (State Treasurer), Little Rock, AR (Eric Munson Proxy for a portion of the meeting)
Judge Barry Moehring (Non-State Employee, County Judge), Bentonville, AR
Mr. Richard Wilson (Retired), Little Rock, AR
Mr. Gary Carnahan (Non-State Employee), Hot Springs, AR
Mr. Joe Hurst (Non-State Employee, Mayor), Van Buren, AR
Mr. Gary Wallace (Retired Law Enforcement), Greenbrier, AR
Mr. Russell White (Retired Law Enforcement), Alma, AR
Mr. Jason Brady, (State Auditor's Office) proxy
Ms. Kay Donham, (Retired), Benton, AR*
Mr. Dale Douthit, (State Employee), Russellville, AR*

Board Members Absent:

Mr. Daryl Bassett (State Employee), Sherwood, AR

Visitors:

Mr. Mike Wickline, Arkansas Democrat-Gazette
Mr. Eric Munson, State Treasurer's Office
Mr. Mita Drazilov, GRS
Ms. Heidi Berry, GRS
Mr. John Shellnut, DFA
Gary Robertson, Callan LLC*
John Jackson, Callan LLC
Brienne Weymouth, Callan LLC*
Larry Middleton, Stephens
Bo Brister, Stephens
Seth Middleton, Stephens
Michael Knapp, Arkansas Legislative Audit
Chris Villines, AR Assoc. of Counties*
Mark White, ATRS*
Melissa Cahill, Harbour Vest*

John Bridges, AR State Employee Assoc.*
Lauren Albanese, Financial Investment News*
Bill Paschall, Paschall Strategies*

APERS Steff:

Ms. Amy Fecher, APERS Executive Director
Ms. Allison Woods, Deputy Director of Benefits
Ms. Laura Gilson, General Counsel
Mr. Richmond Giles, Staff Attorney
Ms. Patty Shipp, Assurance Officer
Mr. Carlos Borromeo, Deputy Director of Investments & Finance
Ms. Usha Doolabh, Investments Manager
Ms. Jennifer Taylor, Director of Benefits Administration
Ms. Cheryl Wilburn, Benefits Operations Manager*
Mr. Jason Willett, Chief Financial Officer
Mr. Phillip Norton, Director of IT
Mr. Daryl Bussell, IT*
Ms. Kristi Brown, Retirement Coordinator*
Ms. Stephanie Blair, Public Affairs Manager*
Ms. Shelly George, Employer Services Manager*
Ms. Jacobia Bates, Director of Public Affairs
Ms. Ashley Golleher, Deputy Director of Operations
Ms. Phyllis Franklin, APERS Call Center*
Ms. Linda McGrath, Digital Services*
*Denotes remote attendees

News Media Notified

An e-mail with notification of the Arkansas Public Employees' Retirement System Board meeting was sent to the Arkansas Democrat-Gazette, the Associated Press, Television Station KLRT-FOX16, and Radio Station KAAY. This notification is pursuant to A.C.A. §25-19-101 (Act 93 of 1967) As amended, *a.k.a.* the Arkansas Freedom of Information Act.

Minutes

Prior to the Board meeting, a copy of the minutes from the May 16th Private Equity Workshop, May 17th Board Meeting, June 14th Investment Finance Subcommittee, and the August 15th Investment Finance Subcommittee meetings was e-mailed to each APERS Board member for review. Mr. Brady made a motion to accept the minutes as they were presented. Mr. Walther seconded the motion. With no objection, the motion passed.

Investments

Mr. Brady shared the Investment Finance Subcommittee report. He noted that the committee approved APERS to join the Seagate Securities Litigation Case. Mr. Brady shared that the committee approved APERS move forward with the hiring of two new investment managers: Neuberger Berman as the primary and HarbourVest as the secondary private equity manager. Mr. Brady made a motion to accept the report as presented. Mr. Wallace seconded the motion. With no objection, the motion passed.

CIO Report

Mr. Borromeo gave his CIO Report for the second quarter of 2023. He shared that by the end of Q1 2023, the investment portfolio had a fiscal year return of 5.76%. He shared that the U.S. economy showed resiliency and defied all the forecasts for a recession. There was progress on the inflation front that allowed the Fed to skip raising interest rates for the first time in 10 meetings which helped the S&P 500 Index gain +6.61% for the month of June. It officially exited bear market status, gaining +24.42% off its October 12, 2022 low.

Information Technology, thanks to A.I., led all sectors during the quarter, as well as YTD, returning +17.2% and +42.77% respectively. It was followed by Consumer Discretion (+14.58%), and Communication Services (+13.07%) for the quarter. Energy and Utilities lagged with losses of -0.89% and -2.53% for the quarter. Energy was hurt by a hard drop in U.S. oil prices, -8.18%, and a massive fall in natural gas, -29.55%, both the result of warmer weather, reduced demand, and a seemingly abundant supply. Utilities felt the pain of the additional rate hikes by the Fed that pushed the 2-year Treasury Note yield from 4.43% in December to 4.90% by the end of June.

APERS Second Quarter 2023 earnings are at 2.91% and Fiscal Year earnings are at 8.83%. Mr. Borromeo shared with the committee the “Things I worry about” in terms of market volatility and conditions. The top three concerns are the student loan grace period ending, the United Auto Workers strike, and a potential government shutdown.

Report for the period ending June 30, 2023

Mr. Jackson shared that GDP rose 2.4% in 2Q, building on the 2% gain in 1Q in spite of widespread expectations for a recession in 2023. Equity markets rebounded sharply in 1Q and 2Q while fixed income markets are down in 2Q. Stocks and bonds still have ground to make up after the first three quarters of 2022. Mr. Jackson told the board that the APERS Investment asset allocations are well within the range of the target.

Mr. Brady asked Mr. Jackson and Mr. Borromeo for their insight on real estate in terms of asset class and market values. Mr. Jackson shared that the real estate market has continued to suffer mainly due to remote work and decreasing demand for office space. However, he noted that historically real estate appreciation and rebound have been beneficial; given that significant write-downs have already occurred, we may see income generation of 5-10%. Mr. Borromeo added a comparison of today’s real estate market to the 2008-09 crisis, recession, and eventual rebound.

Mr. Carnahan asked for clarification on the 7.15% actuarially assumed rate of return versus Callan data. Mr. Walther stated that the long-term outlook demonstrates that APERS board policies are sound and will maintain returns for the long haul.

Mr. Borromeo shared progress and recommendations made to hire a large-cap growth manager. Mr. Borromeo and Callan narrowed the large-cap growth search down to six investment managers. The investment subcommittee asked that staff narrow the list down to three, and staff conduct the interviews. The three managers interviewed were JP Morgan, T. Rowe Price, and William Blair. Ultimately, Mr. Borromeo is recommending the board hire William Blair, a private firm, based out of Chicago. The board asked for more information on the firms and staff process of selection. The board will review and take action at the November 15, 2023, meeting.

Actuarial

Mr. Mita Drazilov, GRS, shared the Preliminary Valuation Results with the board. The purpose of the June 30, 2023 actuarial valuation is to determine the employer contribution rate for the 12-month period beginning July 1, 2025, and determine the financial position of APERS (i.e., funded ratio) as of June 30, 2023. GRS explained to the board that they may choose to set a minimum employer contribution rate. There was a discussion among the board as to whether they should lower the rate to 15.26% or keep the rate at 15.32%. Mr. Brady made a motion for a minimum employer contribution rate of 15.32%. Mr. Wallace seconded the motion. With no objection, the motion passed.

Financial Statements for the Quarter ending June 30, 2023:

Mr. Willett went over the Financial Report for the Fourth Quarter of 2023. The balance at the end of the Quarter ending June 30, 2023, was \$10,295,304,391.

Internal Audit- Patty Shipp– Assurance Officer

Ms. Shipp shared the Audit Report for FY23 with the board. She shared that part of her process was to update COOPS. This process had not been reviewed since prior to the pandemic. Ms. Shipp said she felt confident in the APERS staff's ability to serve the membership even if the office is displaced due to unforeseen circumstances. Ms. Shipp also reviewed plans for the FY24 Audit Plan. Cybersecurity will be a major focus. Ms. Shipp provided the board with copies of the full audit plan for their review. She also indicated that she is focused on the issue of return mail and ensuring the agency maintains proper contact information with members and retirees.

Summary of Retirees for the Quarter Ending March 31, 2023

Ms. Allison Woods, Deputy Director of Benefits, reviewed the numbers of new DROP participants, new retirees, and termination refunds. She stated that the ratio of active to retired is about even. Ms. Woods reiterated the importance of return mail and the processes for contacting members. She mentioned that APERS had one new employer to join this past quarter.

Legal Report

Laura Gilson informed the board that APERS along with the Mississippi Public Employee Retirement System (MPERS) will be lead plaintiffs in the Seagate Securities Litigation Suit.

She shared rules going before the Arkansas Legislative Council on October 19, 2023. There was a minor addition of a contribution rate table provided by Shelly George, Employer Services Manager. The table will help local elected officials understand their contribution rates and payments better. Mr. Villines and Judge Moehring shared support for this change.

Executive Director Report

Director Amy Fecher shared with the board that staff is reviewing investment policies to recommend any needed changes to ensure compliance with new state laws. Recommendations will be presented at the November board meeting.

Director Fecher reported attending two training sessions this quarter for social security administrators and the National Association of State Retirement Administrators Annual Conference. She indicated that both trainings were extremely beneficial.

She introduced Ashley Golleher, APERS Deputy Director of Operations. Ashley joined the agency on August 14th and is focused on Public Affairs, HR, IT, and Digital Services.

Director Fecher shared that a new APERS website is under development and will announce a rollout date soon. She told the board of the agency's focus to digitalize operations as well.

Adjournment

There being no further business, the meeting was adjourned.

Ms. Candace Franks, Chair

Ms. Amy Fecher, APERS Executive Director

Arkansas Public Employees' Retirement System Board of Trustees
Member Appeals Sub-Committee
November 1, 2023

A meeting of the Member Appeals Sub-Committee of the Arkansas Public Employees Retirement System (APERS) was held on Wednesday, November 1, 2023, at 1:30 P.M. This hybrid meeting was held via Zoom remote conferencing as well as in person in the Conference Room, 124 West Capitol, Little Rock, Arkansas.

Board Members Present

Judge Barry Moehring (Non-State Employee, County Judge), Bentonville, AR*
Ms. Kay Donham, (Retired), Benton, AR*
Mr. Larry Walther, (Ex-officio), Treasurer of the State*
Mr. Richard Wilson (Retired), Little Rock, AR
Mr. Dale Douthit, (State Employee), Russellville, AR
Mr. Russell White (Retired Law Enforcement), Alma, AR

Visitors

Judge Raymond Abramson
Mr. John Ogles, Attorney
Shyola Myers, Court Reporter
Madeline Moore, Paralegal
Judge Charles Molton
Eric Munson, Office of the Treasurer*

APERS Staff Present

Ms. Amy Fecher, Executive Director*
Ms. Allison Woods, Deputy Director of Benefits
Ms. Ashley Golleher, Deputy Director of Operations
Mr. Phillip Norton, Director of IT
Ms. Laura Gilson, General Counsel
Mr. Richmond Giles, Staff Attorney
Ms. Jacobia Bates, Director of Public Affairs
Kristi Brown, Retirement Services
Stephanie Blair, Communications Director
Monetteria Mull, Member Services
Cheryl Wilburn, Retirement Services
Shelly George, Employer Services

*Remote attendees

The APERS Member Appeal Subcommittee convened to hear a member appeal. Member Judge Raymond Abramson was represented by Attorney John Ogles. Richmond Giles, APERS Staff Attorney, represented APERS. Hearing Officer, Charles Molton, presided over the member appeal which was recorded. The subcommittee selected Judge Barry Moehring to lead the deliberations. The subcommittee voted to uphold the Executive Director's Determination.

With no further business, the meeting was adjourned.

Judge Barry Moehring, Sub-Committee Chair

Amy Fecher, APERS Executive Director

Arkansas Public Employees' Retirement System Board of Trustees
Investments and Finance Sub-Committee
November 7, 2023

A meeting of the Investments and Finance Sub-Committee of the Arkansas Public Employees Retirement System (APERS) was held on Tuesday, November 7, 2023, at 9:00 A.M. This hybrid meeting was held via Zoom remote conferencing as well as in person in the Conference Room, 124 West Capitol, Little Rock, Arkansas. Mr. Daryl Bassett presided.

Board Members Present

Mr. Daryl Bassett, (State Employee), Sherwood, AR chair of Investments and Finance Sub-Committee
Mr. Gary Carnahan, (Non-State Employee), Hot Springs, AR*
Mr. Larry Walther, (Ex-officio), Treasurer of the State
Mr. Gary Wallace, (Retired Law Enforcement), Greenbrier, AR
Mr. Jason Brady, (State Auditor's Office) *proxy*
Mr. Jim Hudson, (Department of Finance Administration)

APERS Staff Present

Ms. Amy Fecher, Executive Director*
Ms. Allison Woods, Deputy Director of Benefits
Mr. Carlos Borromeo, Deputy Director of Investments & Finance
Ms. Ashley Golleher, Deputy Director of Operations
Mr. Phillip Norton, Director of IT
Ms. Laura Gilson, General Counsel
Mr. Richmond Giles, Staff Attorney
Ms. Jacobia Bates, Director of Public Affairs
Eric Munson, Office of the Treasurer

*Remote attendees

Proposed Investment Policy Statement

Mr. Bassett called the meeting to order. He requested adjusting the agenda to begin with the Investment Policy Statement (IPS) to allow time for broad discussion. Director Fecher stated that Mr. Borromeo has been working to update the policy for greater transparency and clarity. Mr. Borromeo stated that the policy has not kept up with the fund since he became CIO. Mr. Borromeo reviewed the proposed IPS section by section with the Investments and Finance Subcommittee members.

Proposed changes to the first section provide added clarity to align with the Arkansas code (i.e., 9-member to 13-member board). The second section removed the phrase "from time to time" because the IPS is a living document and will be revised as needed. Section three renamed the

statutory governing authority and added the “Investments and Finance Subcommittee” to reflect its creation in February 2023.

Section four reflects proposed changes to give the Executive Director and CIO the authority to make decisions on behalf of the board because the existing IPS is silent on delegated authority. Mr. Walther stated that in his opinion, the Board had given the authority to pay benefits and make timely payments/investment payments. Mr. Bassett agreed that clarity is needed to have a defined hierarchy.

Mr. Brady stated that he had reviewed the proposed policy and made a few suggestions to APERS staff. He suggested a line of authority on the governance of the subcommittee in section three. Then on the actuarial return on investments section (on page 93 and page 95), he suggested throwing in generic terms so amendments to IPS are not needed as frequently. The subcommittee members discussed and agreed that generic terms would allow more flexibility.

Mr. Bassett stated that he is inclined to adopt changes of Mr. Brady. He said this is a living document, but we still need a little flexibility.

Mr. Walther made a motion to approve the recommendation of staff and include the revisions of Mr. Brady in the proposed Investment Policy Statement. The motion was seconded by Mr. Hudson and passed unanimously.

Update on Domestic Equity Large Cap Growth Manager Process

Mr. Borromeo shared the Callan search book. Callan narrowed 175 managers down to six managers. Mr. Borromeo worked with Callan to whittle down the managers to the final three. Director Fecher and Mr. Borromeo interviewed the final three managers as well as requested each firm’s recent holdings. Mr. Borromeo shared his memo on the analysis and reasoning for selecting William Blair. Sec. Bassett stated that as fiduciaries we look for consistency. Momentum traders lead you at times on a roller coaster, and we need and want consistency on rates of return for our members.

Mr. Brady stated that he felt comfortable with APERS’ due diligence on the Large Cap Growth Manager search. He found it interesting that this firm brings diversification and was not only focused on the Magnificent 7. Subcommittee members agreed that they felt more comfortable after reading the memo and understanding APERS’ due diligence and transparency on the recent search.

Mr. Hudson made a motion that the sub-committee approve the selection of William Blair as the primary fund manager for the Large Cap Growth Manager and authorize staff to make investments accordingly, the motion was seconded by Mr. Wallace. The motion passed unanimously.

Director Fecher stated that moving forward, APERS will follow this process of bringing documentation of the search process and presenting it to this subcommittee.

Update on Private Equity

Mr. Borrromeo provided an update on HarbourVest and Neuberger Berman. There was a recent Capital call of \$26M from HarbourVest.

Update on Securities Litigation

Ms. Gilson, APERS Chief Legal, provided an update on APERS Security Litigation. At this point, the attorneys have amended the complaint to include appropriate lead plaintiffs and are following the routine process at this early phase in litigation.

Real Estate Investment

Mr. Borrromeo presented a real estate investment opportunity. APERS is currently invested in Harrison Street Fund VIII. Harrison Street is currently raising capital for Fund IX. Mr. Borrromeo recommended a \$50 million commitment. The Harrison Street Fund IX strategy will invest in UA student housing, storage, digital, built-to-rent, and most importantly, no office space.

Mr. Brady made a motion to invest up to \$50M in Harrison Street Real Estate Fund IX, the motion was seconded by Mr. Hudson. With no objection the motion passed.

Fixed Income

Mr. Borrromeo stated that he would like to propose a cash ladder for liquidity purposes. This would be a cash asset allocation within the fixed-income asset allocation. Mr. Borrromeo would like to have a dedicated liquidity stream for benefits that would be a part of the fixed-income sleeve.

Mr. Brady recommended that Mr. Borrromeo bring forward a model for review by the subcommittee. Mr. Borrromeo agreed and stated that he would prepare and present a model by early January.

With no further business, the meeting was adjourned.

Daryl Bassett, Sub-Committee Chair

Amy Fecher, APERS Executive Director



August 2023
**Arkansas Public Employees'
Retirement System**
Investment Manager Search
Large Cap Growth Equity

CONFIDENTIAL

Important Disclosures regarding the use of this document are included at the end of this document. These disclosures are an integral part of this document and should be considered by the user.

Large Cap Growth Manager Evaluation

	<u>Investment Manager</u>	<u>Strategy</u>
The following investment manager organizations have submitted information to Callan regarding their investment management capabilities. The information has been summarized in this report for the consideration of Arkansas Public Employees' Retirement System.	Federated Hermes, Inc.	Federated Hermes MDT Large Cap Growth Institutional
	Jennison Associates LLC	Large Cap Growth Equity
	J.P. Morgan Asset Management	JPM US Large Cap Growth
	T. Rowe Price Associates, Inc.	US Large-Cap Growth Equity Strategy
	William Blair & Company LLC	Large Cap Growth
	Winslow Capital Management, LLC	Large Cap Growth

The investment manager organizations contained herein have submitted information to Callan regarding their investment management capabilities, for which information Callan has not necessarily verified the accuracy or completeness of or updated. The information provided to Callan has been summarized in this report for your consideration. Unless otherwise noted, performance figures reflect a commingled fund or a composite of discretionary accounts. All written comments in this report are based on Callan's standard evaluation procedures which are designed to provide objective comments based upon facts provided to Callan. The appropriateness of the candidate investment vehicle(s) discussed herein is based on Callan's understanding of the client's portfolio as of the date hereof. Certain operational topics may be addressed in this investment evaluation for information purposes. Unless Callan has been specifically engaged to do so, Callan has not conducted due diligence of the operations of the candidate or investment vehicle(s), as may be typically performed in an operational due diligence evaluation assignment. The investment evaluation and any related due diligence questionnaire completed by the candidate may contain highly confidential information that is covered by a non-disclosure or other related agreement with the candidate which must be respected by the client and its representatives. The client agrees to adhere to the conditions of any applicable confidentiality or non-disclosure agreement.

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Search Process, Profile & Summary

Search Process

Steps in the Manager Search Process

1 Client & Candidate Profiles

2 Quantitative Analysis

3 Qualitative Assessment

4 Manager Search Committee

5 Semi-Finalist Review

Finalists

Candidate Profile

1. Manager Type

Only qualified investment counselors or organizations registered under the Investment Advisers Act of 1940 that are currently managing assets will be considered. This includes investment counselors and investment counseling subsidiaries of banks, brokerage houses and insurance companies.

2. Investment Style

The client is seeking a U.S. Large Cap Growth manager. The manager will be benchmarked against the Russell 1000 Growth Index and the Callan Large Cap Growth peer group. The strategy should complement the existing CastleArk All Cap Growth portfolio, which includes significant exposure to the CastleArk Large Cap Growth strategy.

3. Managed Assets

Firms should have a minimum of \$5 billion in AUM. Strategy assets should be greater than \$3 billion; however, strategies with less than this will be considered on a case-by-case basis. Vehicle assets will also be considered on a case-by-case basis.

4. Professional Staff

Investment staff should be stable and of sufficient depth and breadth to perform the ongoing duties of the firm and to ensure continuity of the investment process. The firm's executive management team should be experienced and stable. Additionally, there should be a sufficient number of client service professionals relative to the firm's client base to ensure that the client has reasonable access to the firm.

5. Portfolio Manager Structure & Experience

Team approach is preferred but not required. Key professionals should have at least 10 years of investment experience. Teams that have worked together for at least five years are preferred.

6. Investment Vehicle

APERS prefers a commingled fund but will consider separate accounts and mutual funds. Daily valuation and liquidity is preferred, but monthly is acceptable.

7. Historical Performance & Risk Criteria

Performance over multiple cumulative, annual and rolling periods will be evaluated relative to the appropriate peer group and index. Risk-adjusted measures and holdings-based portfolio characteristics will also be considered. A track record of at least three years is preferred, and performance records from previous firms will be evaluated on a case-by-case basis.

Candidate Profile

8. Qualities Specifically Sought

- Firm must be a viable, ongoing business
- Organizational infrastructure to support institutional client base
- Disciplined investment process
- Low turnover of key personnel
- Low dispersion of returns within appropriate composite
- Commitment to client service and an ability to effectively articulate their investment process
- Willingness to visit client as needed

9. Qualities To Be Avoided

- Concentrated client base
- Candidates currently involved in a merger, acquisition, or recent transaction impacting the firm's senior executives
- Excessive recent personnel turnover

10. Specific Client Requests & Additional Considerations

The client would like to review 4 to 6 candidates. The client would like to include quantitative strategies if available.

Manager Summary Matrix

	Organization/Team	Strategy/Portfolio	Summary Opinion
Federated Hermes, Inc. Federated Hermes MDT Large Cap Growth Institutional	<ul style="list-style-type: none"> - Publicly traded company (NYSE ticker: FII) but privately controlled and headquartered in Pittsburgh, Pennsylvania. - In July 2018, Federated acquired a majority interest in Hermes Investment Management from BTPS and in 2020 rebranded as Federated Hermes. The remaining interest in Hermes was acquired in 2021. - In 2019, Federated acquired segments of PNC's liquidity, fixed, and equity business. \$15bn, a majority gov't money market, transitioned into existing/new mutual funds. - Daniel Mahr succeeded founder David Goldsmith as MDT's lead in 2008. Mahr is part of the five person PM team. - Ten person team performs all quantitative research; the remaining members focus on performance reporting and trade implementation 	<ul style="list-style-type: none"> - Quantitative approach using machine learning approaches to iterate models. - MDT's model forecasts 3 month returns using valuation factors based on structural earnings, tangible BV, and forward earnings estimates, along with growth factors which include analyst conviction, long-term EPS growth, stock price trends. Quality factors such as leverage, solvency, and adjusted volatility are also included in the model. - Team tests thousands of potential factor combinations using regression (or decision) trees based on 30-plus years of U.S. stock data; applying multiple regression trees (regression forest) enables model to identify historically successful factor blends. - Holds 100-150 stocks; sector weights +/- 1.0% of benchmark; position weights +/- 2.5%. 	<ul style="list-style-type: none"> - MDT has demonstrated long history of successful quantitative investing - model is unique amongst quantitative applications and results in less correlated results relative to other quantitative and fundamental portfolios. - MDT's quantitative approach seeks companies with attractive short-term returns resulting in higher trading and turnover. - Impressive trailing returns due to strong performance from 2021-2022.

Manager Summary Matrix

	Organization/Team	Strategy/Portfolio	Summary Opinion
Jennison Associates LLC Large Cap Growth Equity	<ul style="list-style-type: none"> - Jennison is a wholly owned subsidiary of PGIM and operates via revenue sharing agreement; PGIM is owned by PGIM Holding Co, which is owned by publicly traded Prudential Financial (ticker NYSE: PRU). - Longtime PM Sig Segalas, who co-founded the firm and had been managing strategy since its 1969 inception, passed away in January 2023. Kathleen McCarragher (PM since 1998) remains head of Growth Equity (as of 2003) and co-head of Large Cap Growth. Michael Del Balso (1999), co-head Large Growth Blair Boyer (2003), and Natasha Kuhlkin (2014) round out the PM team. - Most recent team departures include PM Mark Shattan in 2018 and two HC analysts (in 1Q22 and 4Q22). HC analyst positions have been replaced. PM Rebecca Irwin transitioned to a PM role on the Global Growth strategy in April 2023. - PM team is supported by dedicated sector analysts. 	<ul style="list-style-type: none"> - Portfolio managers seek companies growing faster than the S&P 500, preferably in terms of top-line sales growth. - PMs willing to pay higher multiples for higher duration growth attributes while emphasizing stronger balance sheets via lower-debt levels. - Strategy typically holds 50-75 names and averages 30-60% turnover. - May hold up to 20% non-U.S. allocation; typically ranged from 5-15% over the strategy history. 	<ul style="list-style-type: none"> - Segalas passing was a meaningful event but multi-year succession planning at the firm and a multi-portfolio manager structure causes little disruption at the strategy management level going forward. - Investment process leads to a higher volatility style than large cap growth peers and the Russell 1000 Growth Index. - Underperformed Russell 1000 Growth Index across 5- and 7- year trailing time periods; results driven by up market participation - downside capture will be higher relative to index.

Manager Summary Matrix

	Organization/Team	Strategy/Portfolio	Summary Opinion
J.P. Morgan Asset Management JPM US Large Cap Growth	<ul style="list-style-type: none"> - JPMAM is the asset management arm and an indirect wholly owned subsidiary of publicly traded JPMorgan Chase & Co (NYSE: JPM). - Lead PM Giri Devulpally has managed LCG since 2005; he is supported by a group of dedicated Large Growth professionals (separate from the Core team at JPM that ranks large/mid securities). - In 2021, analysts Holly Fleiss, Larry Lee, Joe Wilson, and Rob Maloney were promoted to co-PM's on the strategy in recognition of their contributions to the portfolio; however, there were no changes to responsibilities or decision-making as a result of the promotions. 	<ul style="list-style-type: none"> - Emphasize three tenets to generate alpha: 1) do not miss great winners; 2) do not get killed by big losers; and 3) take risks in favorable times. - Seek companies with large and/or growing addressable markets, sustainable competitive advantages, leading market share positions, and good price momentum. - Fundamentally driven portfolio but run quantitative screens based on earnings revisions, price momentum, and valuation; fundamental analysis is performed on smaller subset of names. - Projections and financial models created for 3-5 year time horizon. - 60-90 holdings and average 20-40% turnover annually. 	<ul style="list-style-type: none"> - Successful domestic equity platform across style and capitalization spectrum. - Deeply resourced at the firm level with over 350 equity investment professionals worldwide. - Devulpally adept at trading around price momentum to reposition the portfolio in different growth environments. - Historically performed better in upward trending markets relative to declining markets but portfolio style shift in 2022 significantly helped relative results in strong down market. - Weighted average market cap in line with Russell 1000 Growth Index and large growth peers; style may fluctuate over time.

Manager Summary Matrix

	Organization/Team	Strategy/Portfolio	Summary Opinion
T. Rowe Price Associates, Inc. US Large-Cap Growth Equity Strategy	<ul style="list-style-type: none"> - Publicly traded, Baltimore-based asset management firm founded by Thomas Rowe Price, Jr. in 1937. - Firm split into two organizations, T. Rowe Price Associates (TRPA) and T. Rowe Price Investment Management (TRPIM), effective March 7, 2022. TRPIM houses six strategies and their respective teams. - Rob Sharps became CEO 1/1/2022 when Bill Stromberg retired. - Andy McCormick, head of Global Fixed Income, will retire 12/21/23 and Arif Husain will succeed him and also retain his role as CIO. - Taymour Tammadon is sole portfolio manager on the strategy. - Former Associate PM David Rowlett left team to join TRP Large Cap Core in 2Q 2020. Jon Friar, who served as a portfolio manager for the firm's Business Services portfolio, joined as associate portfolio manager in January 2023. - TRP centralized research analyst platform supports PM decision making; analyst coverage divided by industry, sector, and geography. 	<ul style="list-style-type: none"> - Bottom up fundamental process that seeks companies where duration of growth is greater than market implies. Seeks earnings growth above 10% over a three-year period; emphasizes firms with strong market positions, reputations, and good management, particularly those with strong free cash flow, balance sheets, and improving margins and returns on invested capital. - Sector weights typically range from 0.5x to 3.0x relative to Russell 1000 Growth. Individual position sizes are +/- 4% relative to Russell 1000 Growth; Tammadon views risk in absolute terms in addition to how the portfolio compares to the benchmark, ensuring top ideas do not drive uncompensated risk for the whole portfolio. - 60-75 stock portfolio with turnover ranging from 30-45%. 	<ul style="list-style-type: none"> - Change at the organization and leadership level will continue to be monitored. - Depth and stability of TRP centralized research analyst platform source of competitive advantage. - Portfolio tends to emphasize Technology, Comm Services, and Consumer Discretionary sectors (comprising almost 75% of AUM).

Manager Summary Matrix

	Organization/Team	Strategy/Portfolio	Summary Opinion
William Blair & Company LLC Large Cap Growth	<ul style="list-style-type: none"> - William Blair was founded in 1935 and remains headquartered in Chicago, IL; firm is 100% employee owned and broad based amongst investment professionals at the firm. - President Brent Gledhill was appointed CEO to succeed John Ettelson, who became chairman of the firm, in January 2022. - Large Cap Growth strategy is co-managed by James Golan and David Ricci, who have overseen the strategy since 2005 and 2011, respectively; only strategy that they manage at the firm. - Portfolio management team is supported by seasoned equity research analysts that employ a sector specific, multi-cap approach to fundamental analysis. 	<ul style="list-style-type: none"> - Seeks to invest in structurally advantaged growth companies at valuations that reflect an under appreciation by the market - "structurally advantaged" = companies with strong management teams and growth prospects as well as solid financials. - Companies in the portfolio fall into two buckets: traditional quality growth and fallen quality growth. Traditional quality growth = securities trading at prices that do not reflect a longer duration of growth; fallen quality growth = experiencing a temporary event rendering it out of favor with investors. - Constructed with a sector and market cap neutral approach to mitigate benchmark risk but actively trade as needed. 	<ul style="list-style-type: none"> - Strength of the William Blair research platform is reflected in the investment team's ability to identify successful portfolio companies early in their growth cycles to trading more nimbly around valuations. - Team utilizes a robust financial modeling framework that incorporates multiple valuation methodologies; team's additional research via channel checking and other primary sources to ensure fundamental strength is thorough and notable. - Performance in-line with the benchmark over longer-term periods with stock selection as primary driver of excess returns; strategy will typically benefit from market environments that reward quality and growth.

Manager Summary Matrix

	Organization/Team	Strategy/Portfolio	Summary Opinion
Winslow Capital Management, LLC Large Cap Growth	<ul style="list-style-type: none"> - Established in 1992 by Clark Winslow in Minnesota; became a wholly owned subsidiary of Nuveen (now merged with TIAA) Investments at the end of 2008. - Strategy is managed by a multi-portfolio manager team led by Justin Kelly, lead PM on the strategy since 1999; Kelly remains focused on this flagship large cap growth offering. - Kelly oversees the portfolio with co-portfolio managers Patrick Burton and Steve Hamill; however, Kelly has final decision making authority. The PM team collaborates on stock selection and position sizing decisions. Peter Dlugosch is also listed as a PM but does not have decision making authority; Dlugosch focuses on risk management in addition to idea generation. - The portfolio management team is supported by 7 analysts who each cover a sector. 	<ul style="list-style-type: none"> - Employs a bottom-up, fundamental approach to stock selection. - Aims to invest in growth companies that exhibit high quality characteristics such as high returns on invested capital, dominant market share, and competitive advantages and a runway for growth but that are underestimated by the market. - Portfolio is split between three categories of growth: consistent, dynamic, and cyclical. This ensures diversification of business drivers and cycles. - Concentrated with 40-60 holdings and has low annual turnover. 	<ul style="list-style-type: none"> - Stable firm that remains reputable for its research and portfolio construction approaches relative to other large cap growth peers. - Investment team and process continuity are notable as the product benefits from consistency of execution. - Bucket approach to growth investing allows for diversification and capital allocation in various economic environments. - Strategy consistently plots large and growth, rendering it a an appropriate large cap growth option. - Strategy has produced a long-term competitive risk adjusted performance pattern.

Proposed Vehicle Information

	Product / Vehicle AUM (\$mm)	Minimum Account Size (\$mm)	Proposed Fee on \$403M (%)	Comments
Federated CIT (Founders Class)	549 / Unfunded	100	0.24 (all-in)	- Separate account (Vehicle AUM: 527MM) also available at 0.17% (mgt fee).
Jennison 3(c)11	70,886 / 850	5	0.38 (mgt) 0.38 (all in)	- Separate account (Vehicle AUM: 26,609MM) also available at 0.29% (mgt fee).
JPM Commingled (Class A)	84,475 / 4,383	100	0.39 (mgt) 0.40 (all in)	- Separate account (Vehicle AUM: 17,443MM) also available at 0.40% (mgt fee).
T. Rowe CIT (Class D)	57,990 / 5,951	200	0.40 (all in)	- Separate account (Vehicle AUM: 26,086MM) also available at 0.33% (mgt fee).
William Blair CIT (GAV; Class 1)	6,840 / 621	5	0.28 (all in)	- Separate account (Vehicle AUM: 4,681MM) also available at 0.28% (mgt fee).
Winslow CIT (Class C)	24,014 / 3,246	0	0.35 (all in)	- Separate account (Vehicle AUM: 1,592MM) also available at 0.35% (mgt fee).



Candidate Firm Information

Candidate Firm Summary

	Federated Hermes, Inc.	Jennison Associates LLC	J.P. Morgan Asset Management	T. Rowe Price Associates, Inc.	William Blair & Company LLC	Winslow Capital Management, LLC
Headquarters	Pittsburgh, PA	New York, NY	New York, NY	Baltimore, MD	Chicago, IL	Minneapolis, MN
Ownership / Parent	Publicly Owned / Federated Hermes, Inc.	Publicly Owned / Prudential Financial, Inc.	Publicly Owned / JPMorgan Chase & Co.	Publicly Owned / T. Rowe Price Group, Inc.	Employee Owned /	Subsidiary / Nuveen, LLC
Minority / Women / Disabled - Owned	No	No	No	No	No	No
Total Firm Assets (\$mm)	697,073	186,436	2,747,779	1,349,700	64,308	25,452
Have any open regulatory exams/investigations been escalated to enforcement?	No	No	No	No	No	No
Date of Last SEC Exam	09/30/2018	09/18/2020	06/05/2017	09/01/2020	12/17/2018	03/01/2023
GIPS Compliant	Yes	Yes	Yes	Yes	Yes	Yes
E&O Insurance	Yes	Yes	Yes	Yes	Yes	Yes
Disaster Recovery Plan in Place	Yes	Yes	Yes	Yes	Yes	Yes

Total Firm Assets Under Management

Total Firm Assets by Type (\$mm) as of June 30, 2023

	Corporate	Public(Govt)	Sub-Advised	Other	Total Org Assets
Federated Hermes, Inc.	14,310	141,376	40,678	500,709	697,073
Jennison Associates LLC	38,999	6,577	126,667	14,194	186,436
J.P. Morgan Asset Management	409,288	72,157	153,980	2,112,354	2,747,779
T. Rowe Price Associates, Inc.	82,220	49,205	184,822	1,033,453	1,349,700
William Blair & Company LLC	12,834	19,401	9,993	22,080	64,308
Winslow Capital Management, LLC	389	650	18,728	5,685	25,452



Candidate Product Information

Candidate Product Summary

	Federated Hermes, Inc.	Jennison Associates LLC	J.P. Morgan Asset Management	T. Rowe Price Associates, Inc.	William Blair & Company LLC	Winslow Capital Management, LLC
Product Name	Federated Hermes MDT Large Cap Growth Institutional	Large Cap Growth Equity	JPM US Large Cap Growth	US Large-Cap Growth Equity Strategy	Large Cap Growth	Large Cap Growth
Product Benchmark	Russell:1000 Growth	Russell:1000 Growth	Russell:1000 Growth	Russell:1000 Growth	Russell:1000 Growth	Russell:1000 Growth
Proposed Vehicle	CIT	3(c)11	Commingled	CIT	CIT	CIT
Product / Vehicle Inception	1987 / Unfunded	1970 / 2000	1992 / 2012	2001 / 2019	1993 / 2020	1992 / 2010
Total Product / Vehicle Assets (\$mm)	549 / Unfunded	70,886 / 850	84,475 / 4,383	57,990 / 5,951	6,840 / 621	24,014 / 3,246
Number of Holdings	99	53	69	52	33	43
Issue Diversification	12	11	9	7	8	9
Annual Turnover	150%	51%	36%	19%	34%	84%
Combined Z-Score*	0.78 (59th)	1.21 (4th)	0.97 (22nd)	0.93 (26th)	0.88 (35th)	1.08 (10th)
Weighted Median Market Cap (\$b)*	243.54 (43rd)	425.07 (14th)	363.45 (27th)	450.09 (7th)	205.62 (57th)	362.53 (27th)
Non-US Exposure	0.00%	11.51%	4.44%	2.67%	6.03%	2.48%

*Ranking vs Callan Large Cap Growth in parenthesis

Product Level Investment Professionals

	Product Level Resources				Gained (5 Yr)		Lost (5 Yr)	
	Portfolio Managers	Central Research Analysts	Dedicated Fundamental Analysts	Quantitative Analysts	Portfolio Managers	Dedicated Fundamental Analysts	Portfolio Managers	Dedicated Fundamental Analysts
Federated	5		5		2 (40%)	3 (60%)	1 (20%)	3 (60%)
Jennison	4		12		0 (0%)	6 (50%)	1 (17%)	4 (33%)
JPM	5	3			0 (0%)	1 (0%)	0 (0%)	0 (0%)
T. Rowe	2	202			0 (0%)	0	2 (100%)	0
William Blair	2	13			0 (0%)	0 (0%)	0 (0%)	0 (0%)
Winslow	4	7			0 (0%)	0 (0%)	0 (0%)	0 (0%)

Key Investment Professionals

Federated

Key Professionals	Started with Product	Joined Firm	Investment Experience
Frederick Konopka - PM	2004	1997	1997
Daniel Mahr - PM	2004	2002	2002
John Paul Lewicke - PM	2007	2007	2007
Shuo (Damien) Zhang - PM	2009	2009	2009
Tony Ng - PM	2011	2011	2011

T. Rowe

Key Professionals	Started with Product	Joined Firm	Investment Experience
Taymour Tamaddon - PM	2016	2003	2003
Jon Friar - PM	2023	2011	2007

Jennison

Key Professionals	Started with Product	Joined Firm	Investment Experience
Kathleen McCarragher - PM	1998	1998	1982
Michael Del Balso - PM	1999	1972	1968
Blair Boyer - PM	2003	1993	1983
Natasha Kuhlkin - PM	2014	2004	1995

William Blair

Key Professionals	Started with Product	Joined Firm	Investment Experience
Jim Golan - PM	2005	2000	1988
David Ricci - PM	2011	1994	1994

JPM

Key Professionals	Started with Product	Joined Firm	Investment Experience
Giridhar Devulpally - PM	2004	2003	1992
Holly Fleiss - PM	2020	2012	2004
Larry Lee - PM	2020	2006	1993
Joseph Wilson - PM	2020	2014	2005
Robert Maloney - PM	2022	2013	2000

Winslow

Key Professionals	Started with Product	Joined Firm	Investment Experience
Justin Kelly - PM	1999	1999	1993
Patrick Burton - PM	2010	2010	1984
Peter Dlugosch - PM	2022	2013	2001
Steven Hamill - PM	2023	2006	1993

Product Assets Under Management

Product Assets by Vehicle (\$mm) as of June 30, 2023

	Separate Account	Commingled	MF Institutional	MF Retail	Total
Federated	23		527		549
Jennison	28,177	1,371	41,338		70,886
JPM	17,443	4,383		62,649	84,475
T. Rowe	26,086	14,014	34	17,856	57,990
William Blair	4,681	621	1,390	149	6,840
Winslow	6,231	3,315	14,468		24,014

Product Asset Turnover

Product Asset Turnover (\$mm) as of June 30, 2023

	Total Product Assets	Largest Account	Total Accounts	5-Year Net Asset Growth*	2022 Assets	2021 Assets	2020 Assets	2019 Assets	2018 Assets
Federated	549	527	33	249	267	248	206	202	111
Jennison	70,886	25,130	119	-35,747	53,984	92,970	87,402	62,969	53,974
JPM	84,475	2,726	97	37,846	52,088	56,316	42,306	22,616	16,566
T. Rowe	57,990	17,856	86	-19,433	47,784	82,885	79,905	49,649	39,032
William Blair	6,840	794	52	2,981	5,075	5,045	2,414	1,469	978
Winslow	24,014	12,979	67	-11,487	19,568	29,544	26,458	21,726	18,024

* Net Asset Growth measures net asset flows by removing the performance impact on reported asset growth, thereby isolating growth due to net asset flows into or out of the product. This calculation is based upon each product's beginning and ending assets as well as the representative product return.

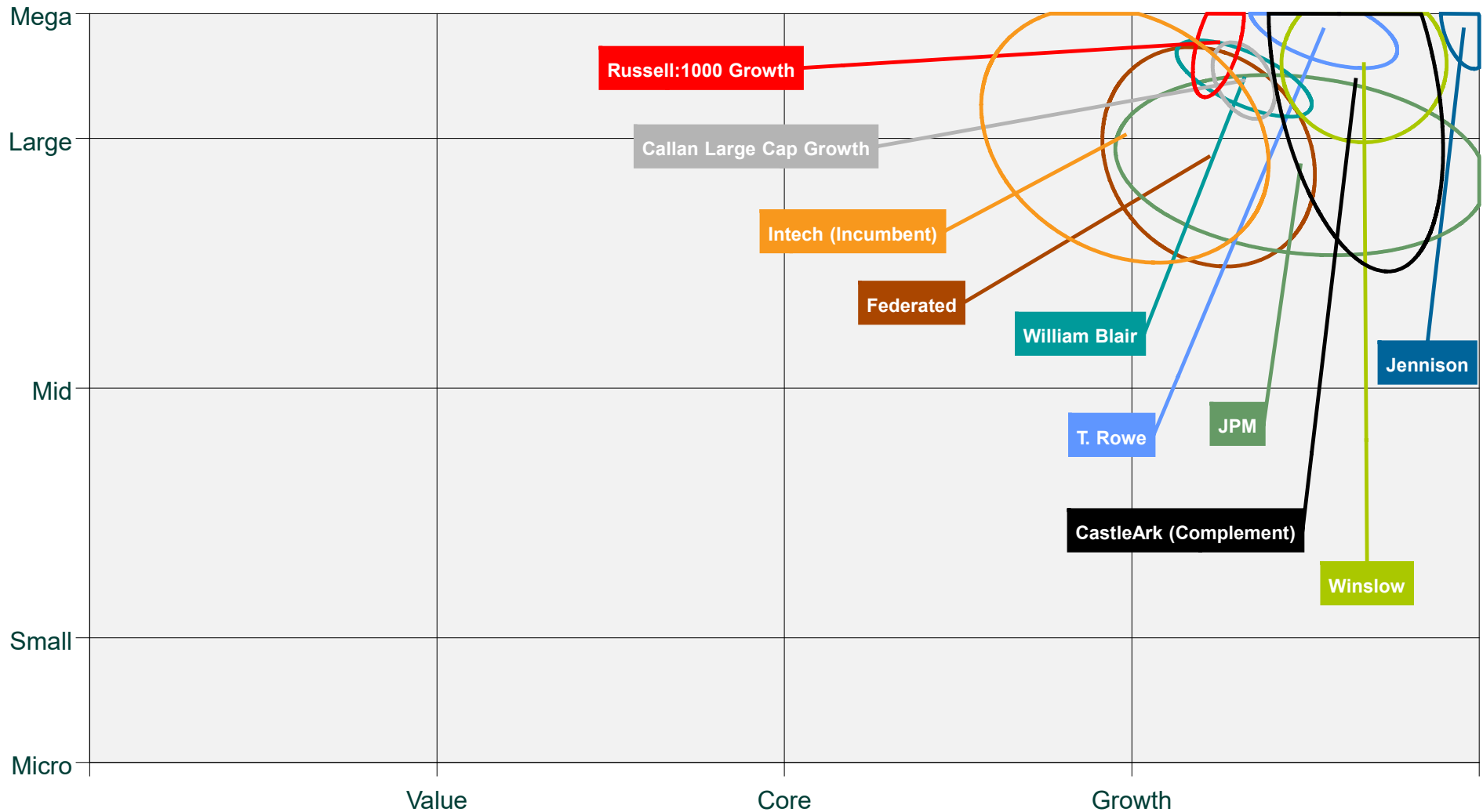


Candidate Portfolio Characteristics

Style Map

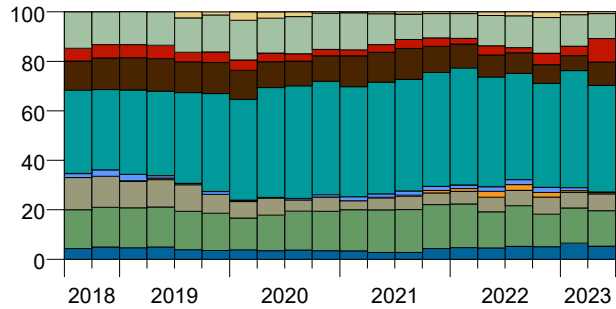
This page analyzes the historical investment style of a portfolio utilizing a detailed holdings-based style analysis to determine average actual exposures to various market capitalization and style segments. The market is segmented quarterly by capitalization and style. The capitalization segments are dictated by capitalization decile breakpoints. The style segments are determined using the "Combined Z score", based on the eight fundamental factors used in the MSCI stock style scoring system. The style map illustrates the average historical market capitalization and style score of the portfolio.

Style Map for Five Years Ended June 30, 2023

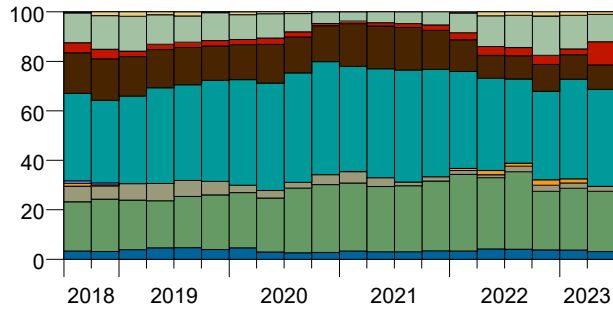


Sector Allocation

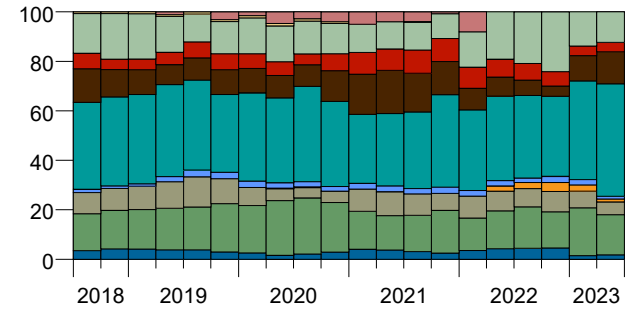
Federated



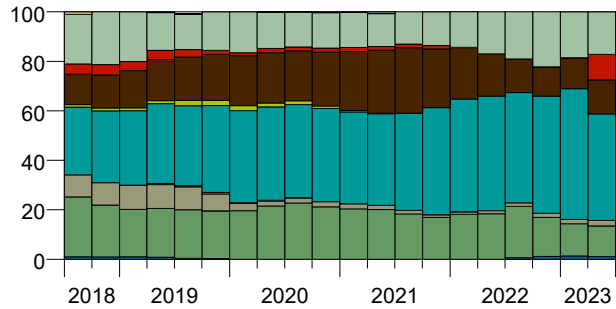
Jennison



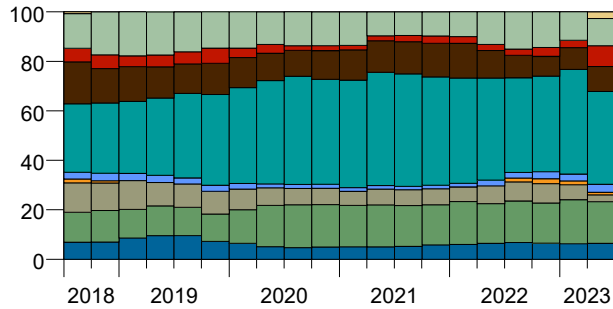
JPM



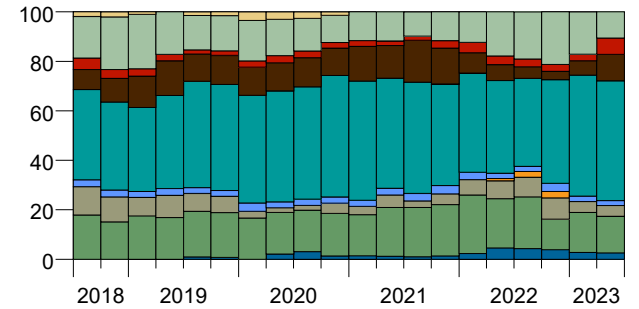
T. Rowe



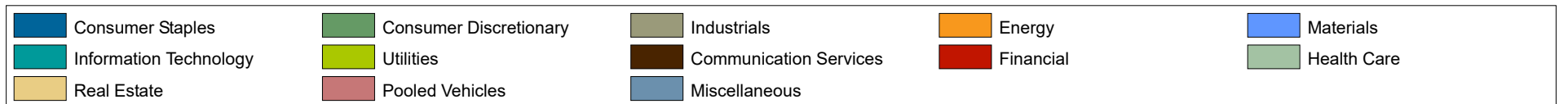
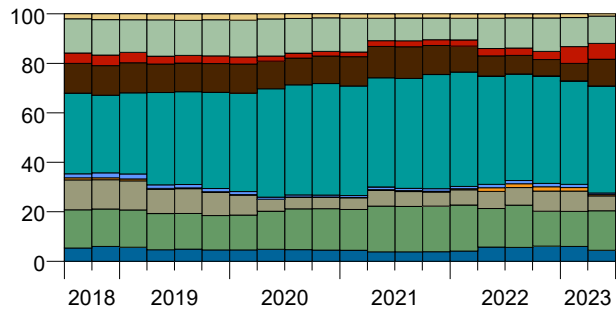
William Blair



Winslow

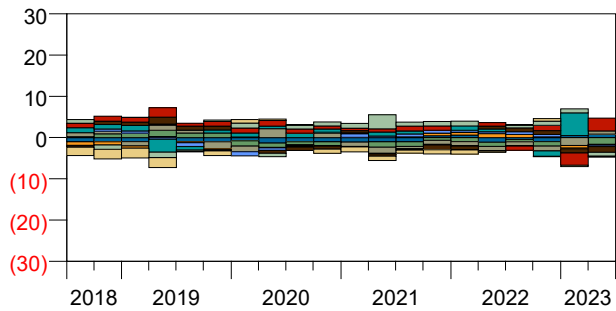


Index: Russell 1000 Growth Index

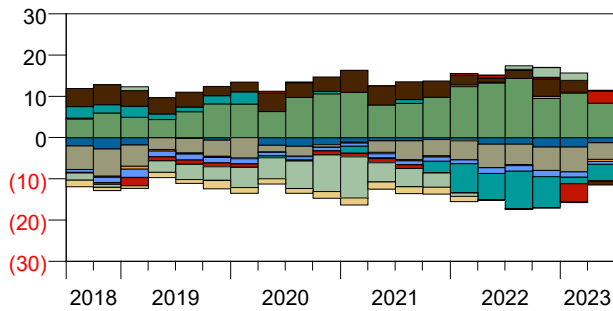


Sector Allocation Relative to Russell:1000 Growth

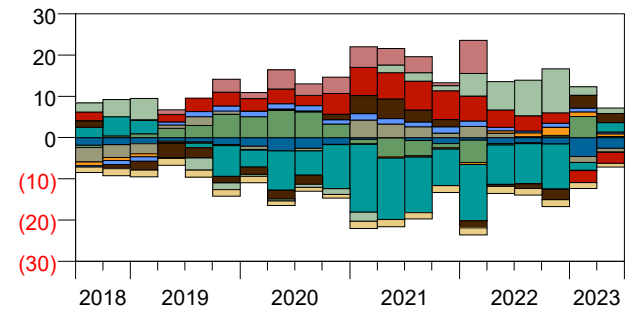
Federated



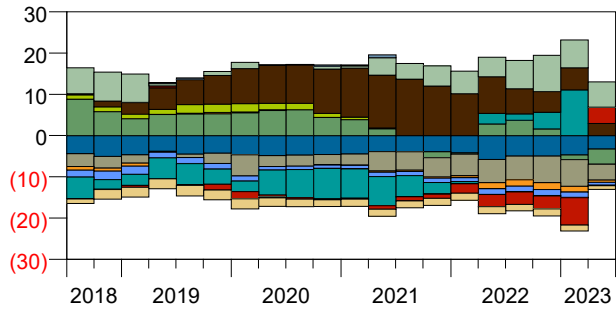
Jennison



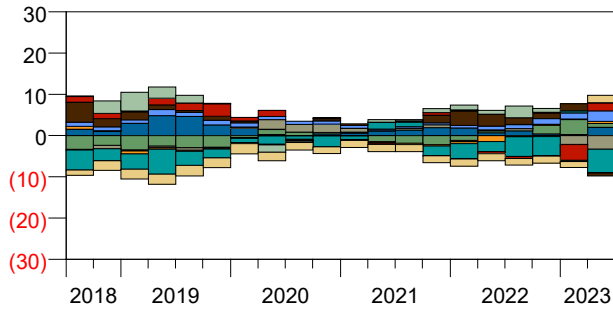
JPM



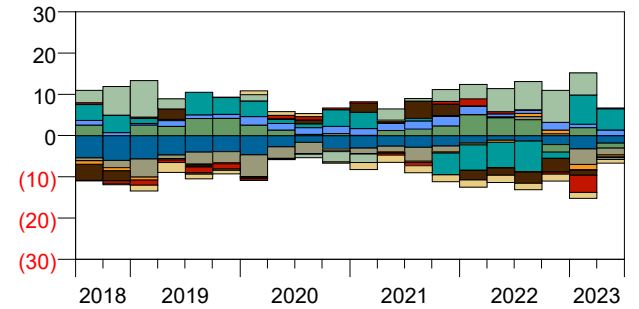
T. Rowe



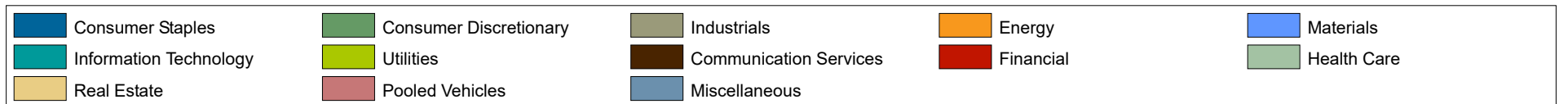
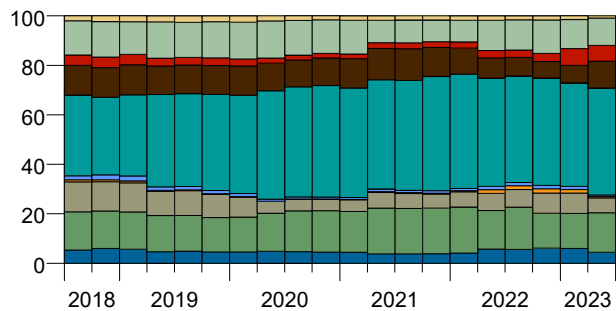
William Blair



Winslow



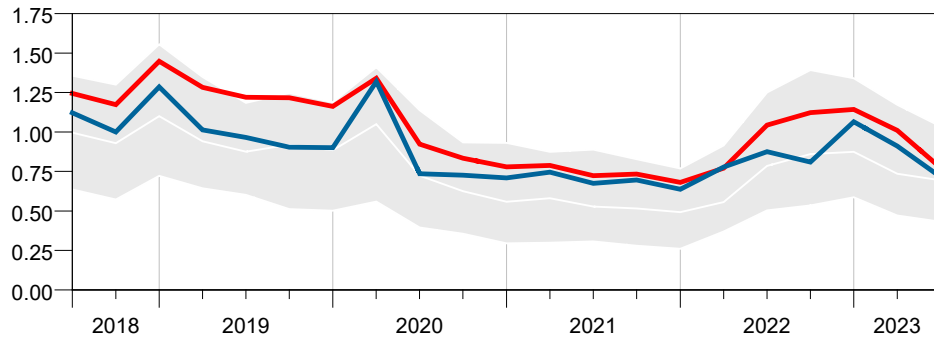
Index: Russell 1000 Growth Index



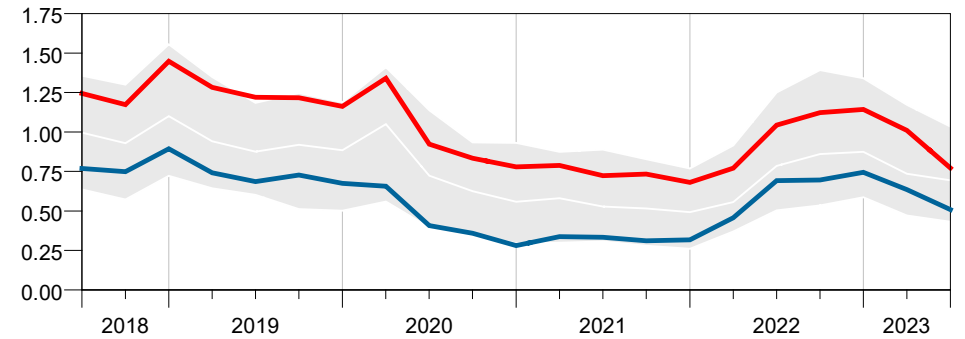
Dividend Yield

The charts below illustrate Dividend Yield for different managers over time. As a backdrop, the range (from 10th to 90th percentile) is shown for the Callan Large Cap Growth group. The Russell 1000 Growth Index index is shown in red for comparison.

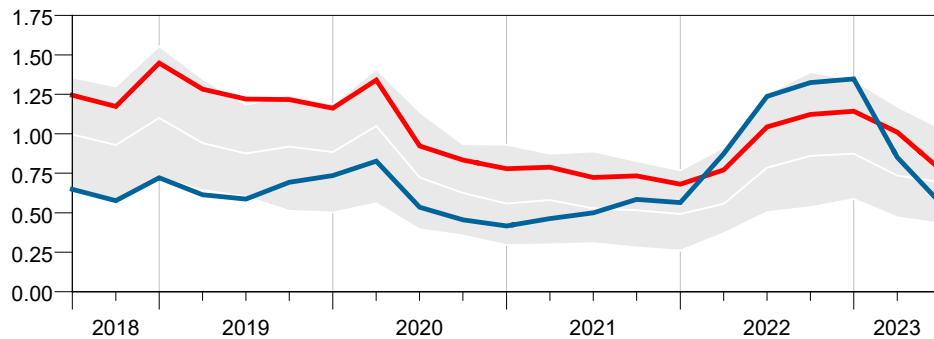
Federated



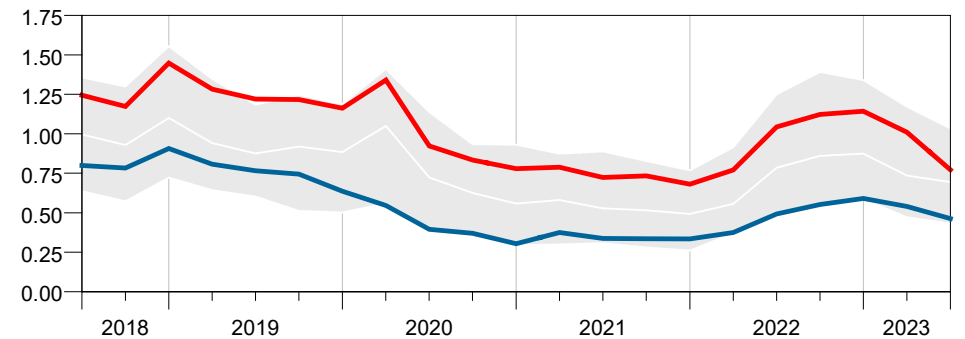
Jennison



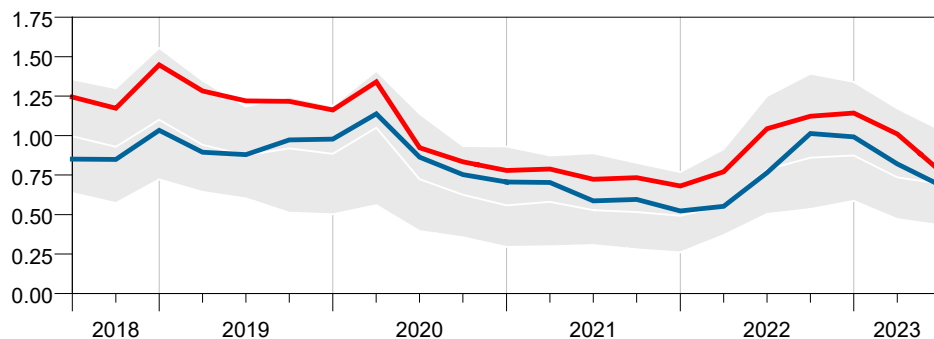
JPM



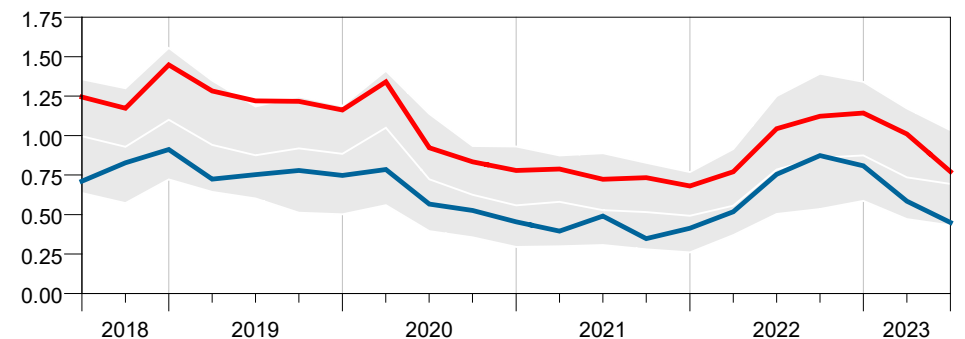
T. Rowe



William Blair



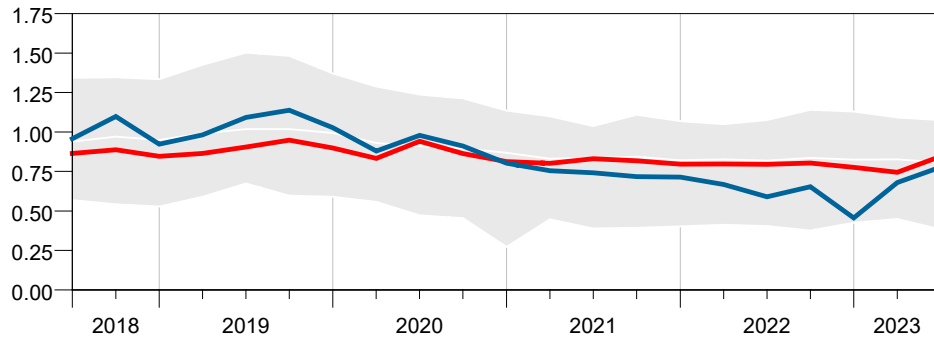
Winslow



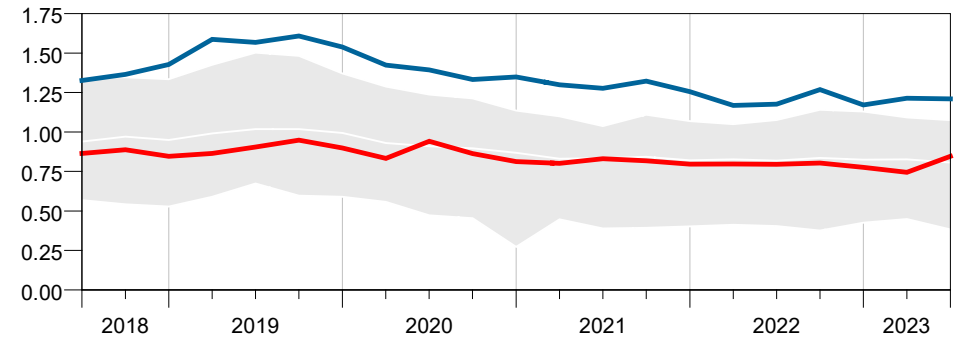
Combined Z Score

The charts below illustrate Combined Z Score for different managers over time. As a backdrop, the range (from 10th to 90th percentile) is shown for the Callan Large Cap Growth group. The Russell 1000 Growth Index index is shown in red for comparison.

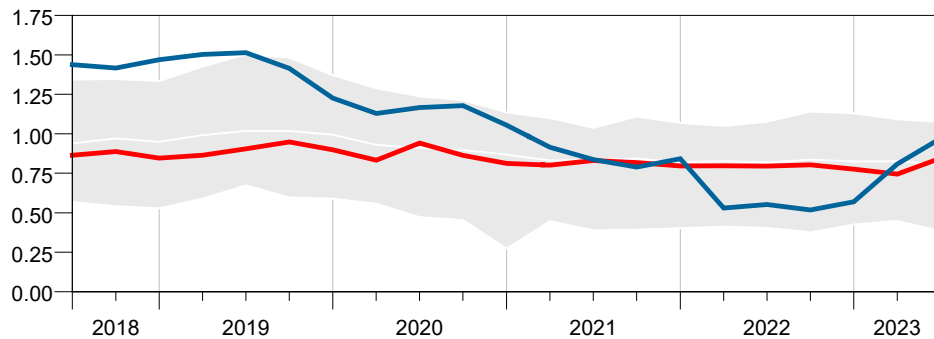
Federated



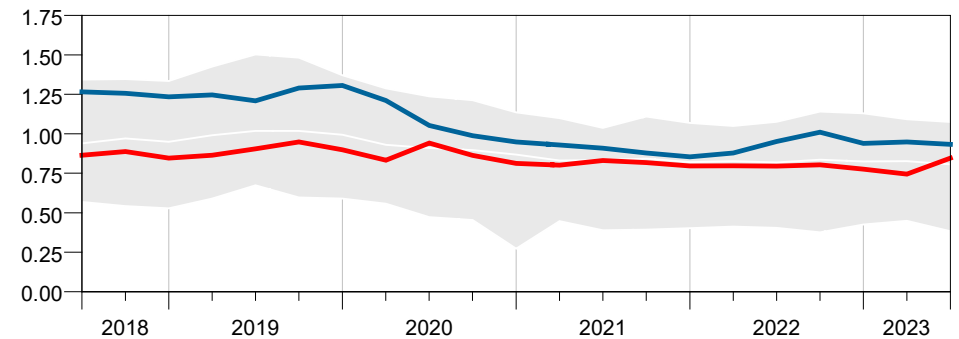
Jennison



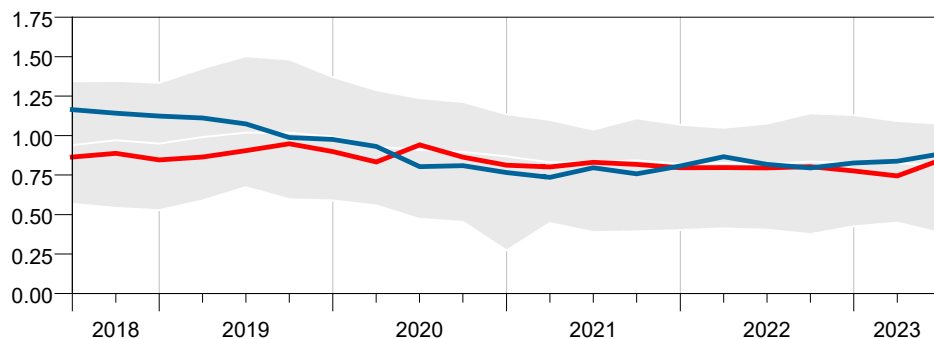
JPM



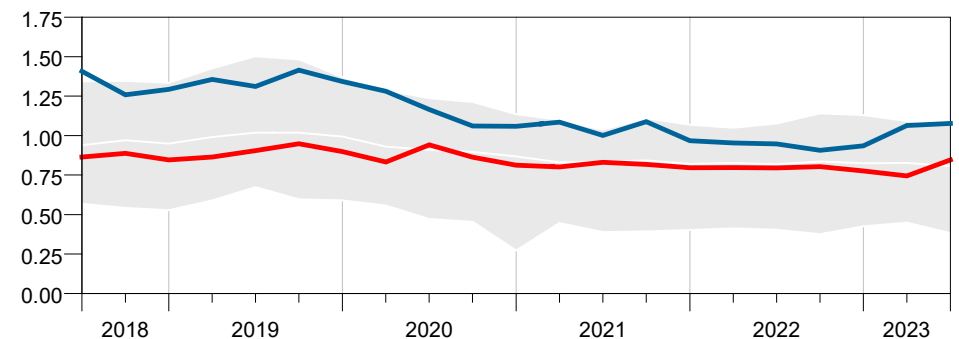
T. Rowe



William Blair



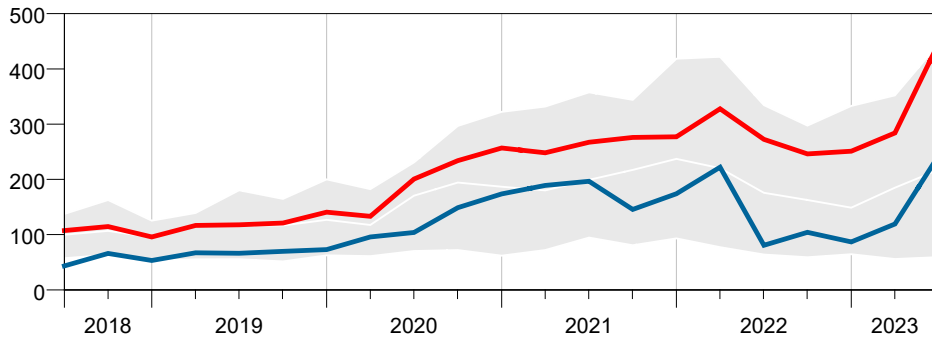
Winslow



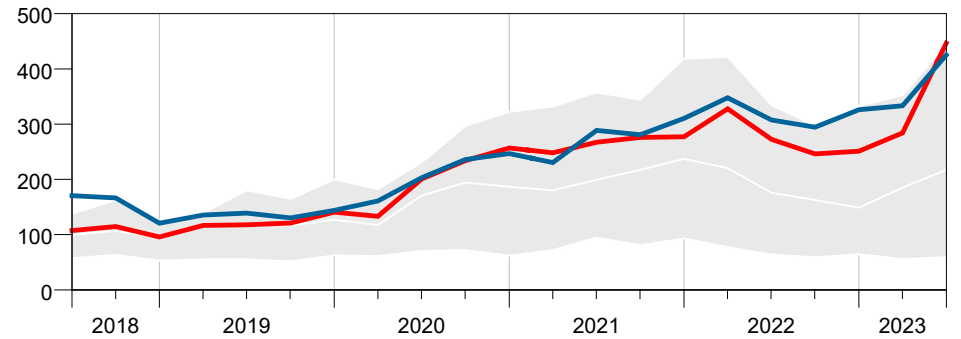
Weighted Median Market Capitalization

The charts below illustrate Weighted Median Market Capitalization for different managers over time. As a backdrop, the range (from 10th to 90th percentile) is shown for the Callan Large Cap Growth group. The Russell 1000 Growth Index index is shown in red for comparison.

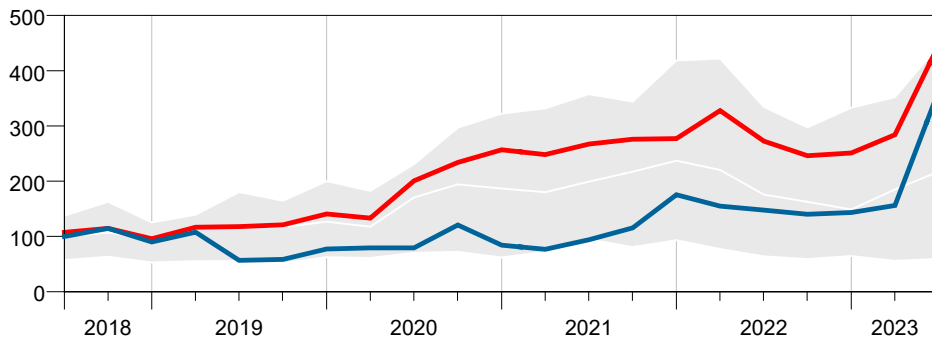
Federated



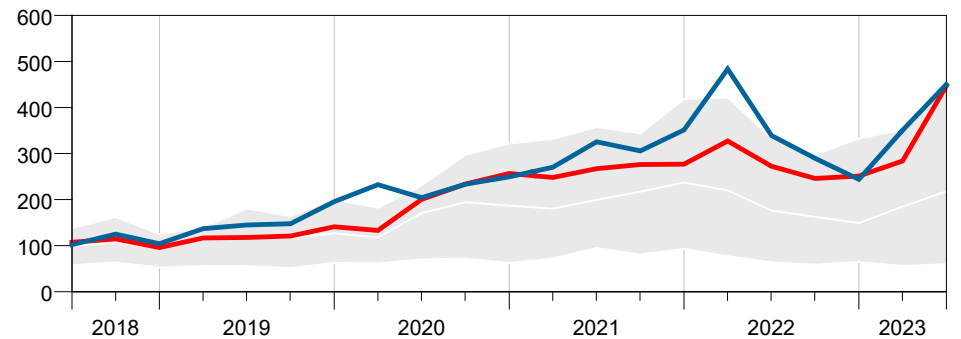
Jennison



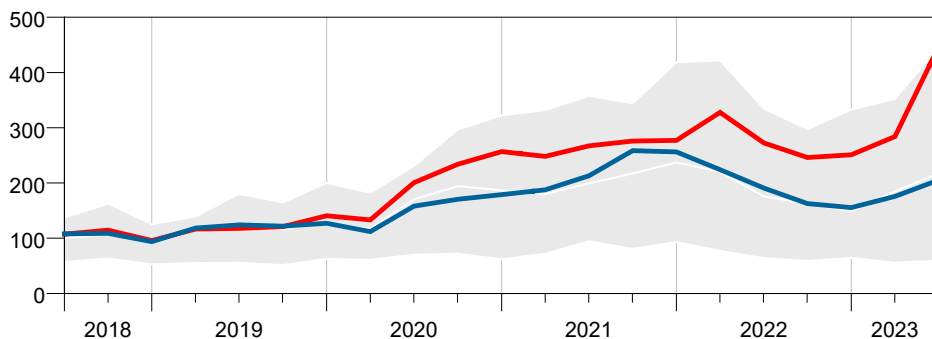
JPM



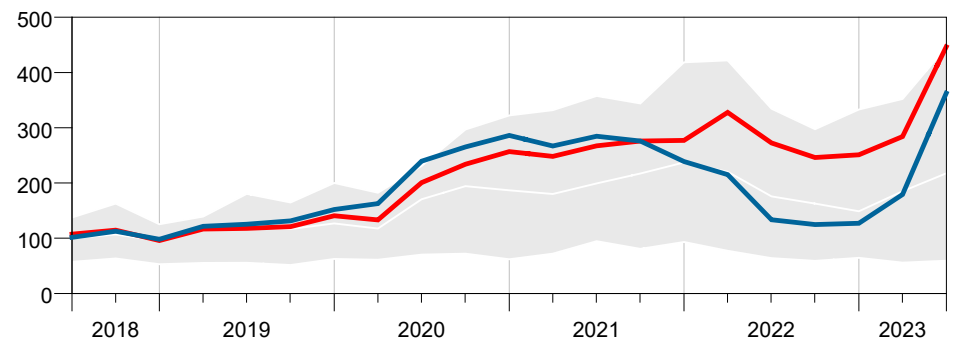
T. Rowe



William Blair



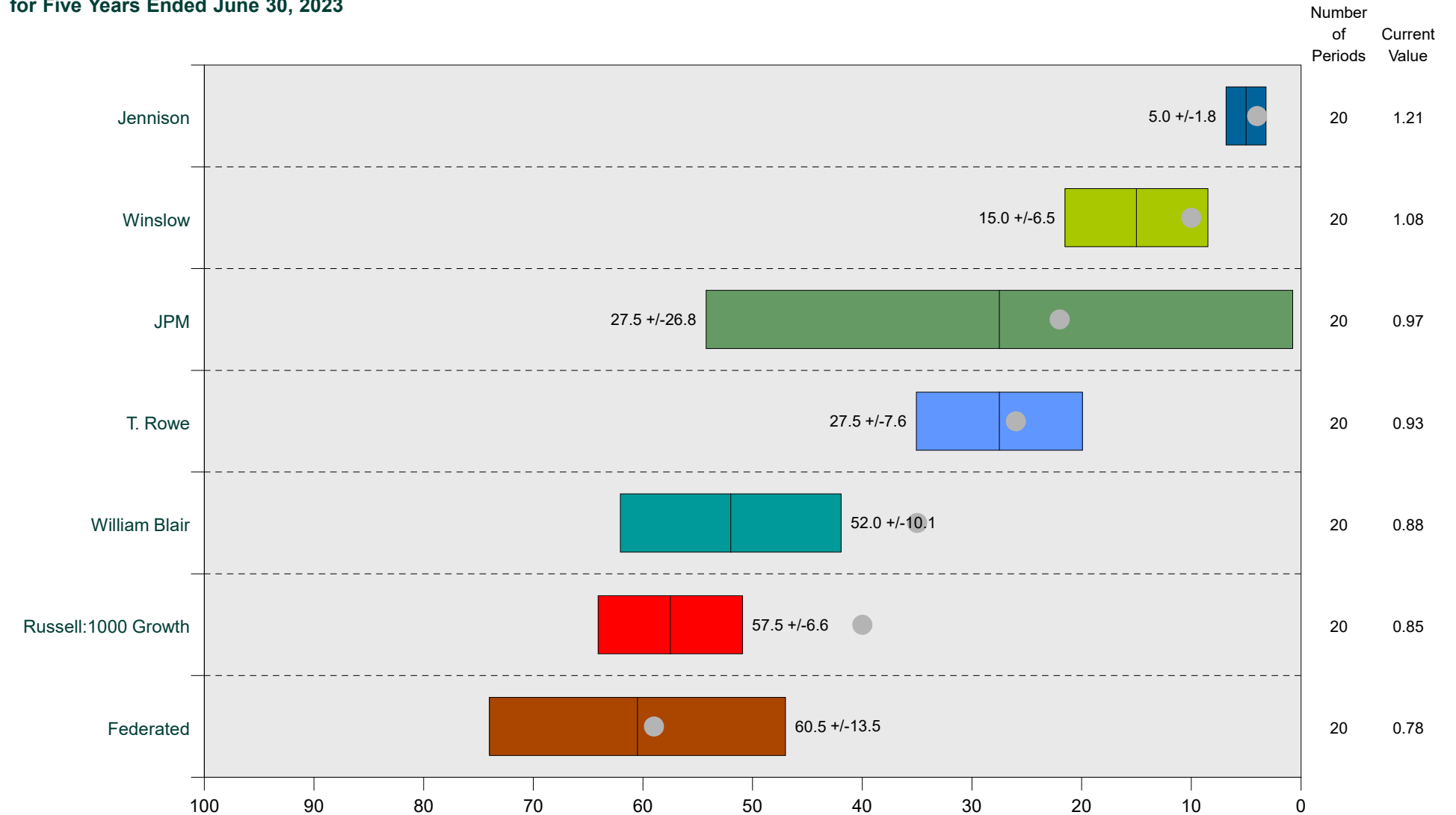
Winslow



Historical Rankings - Combined Z Score

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

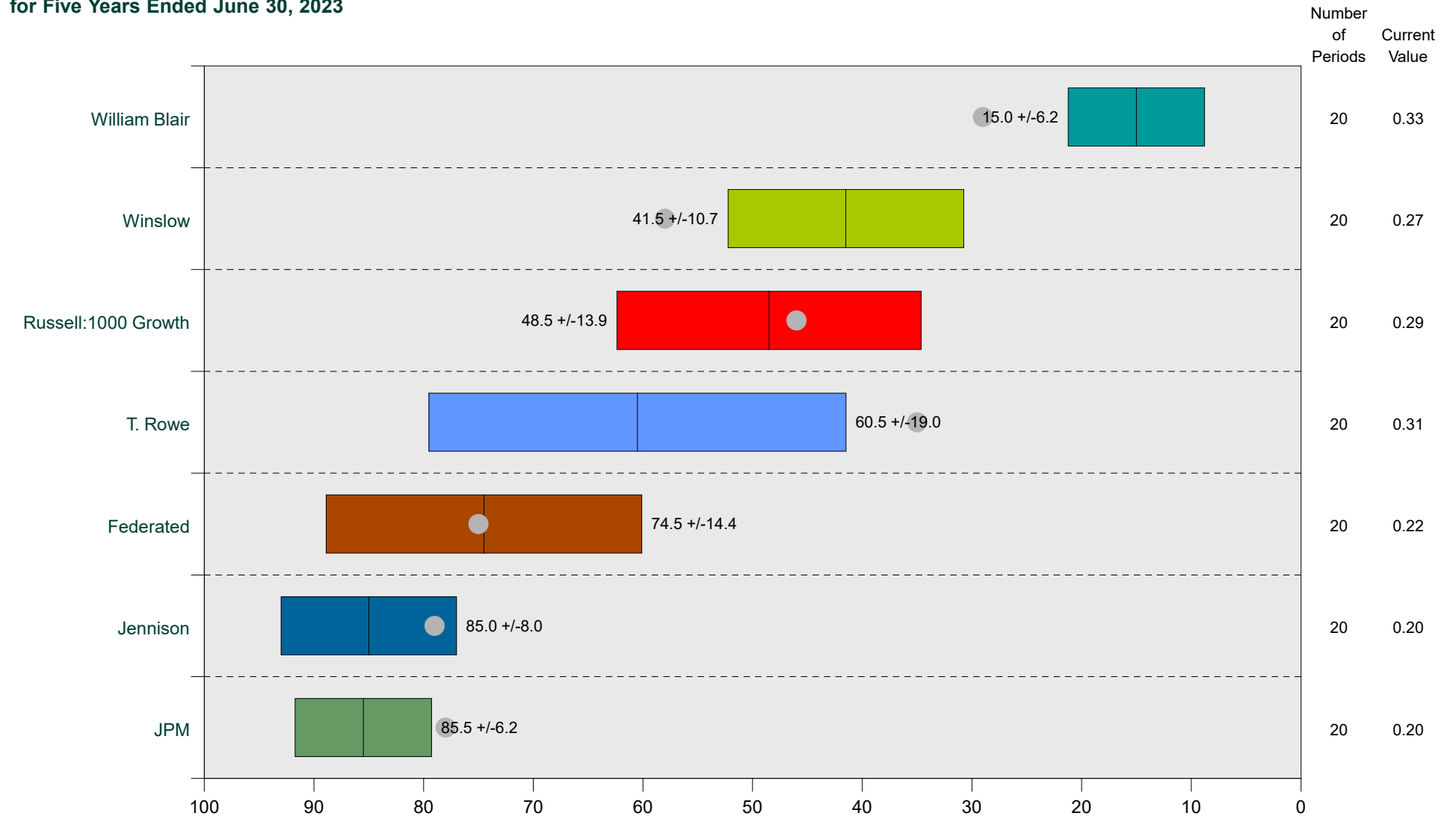
Combined Z Score Against Callan Large Cap Growth for Five Years Ended June 30, 2023



Historical Rankings - Stability Score

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

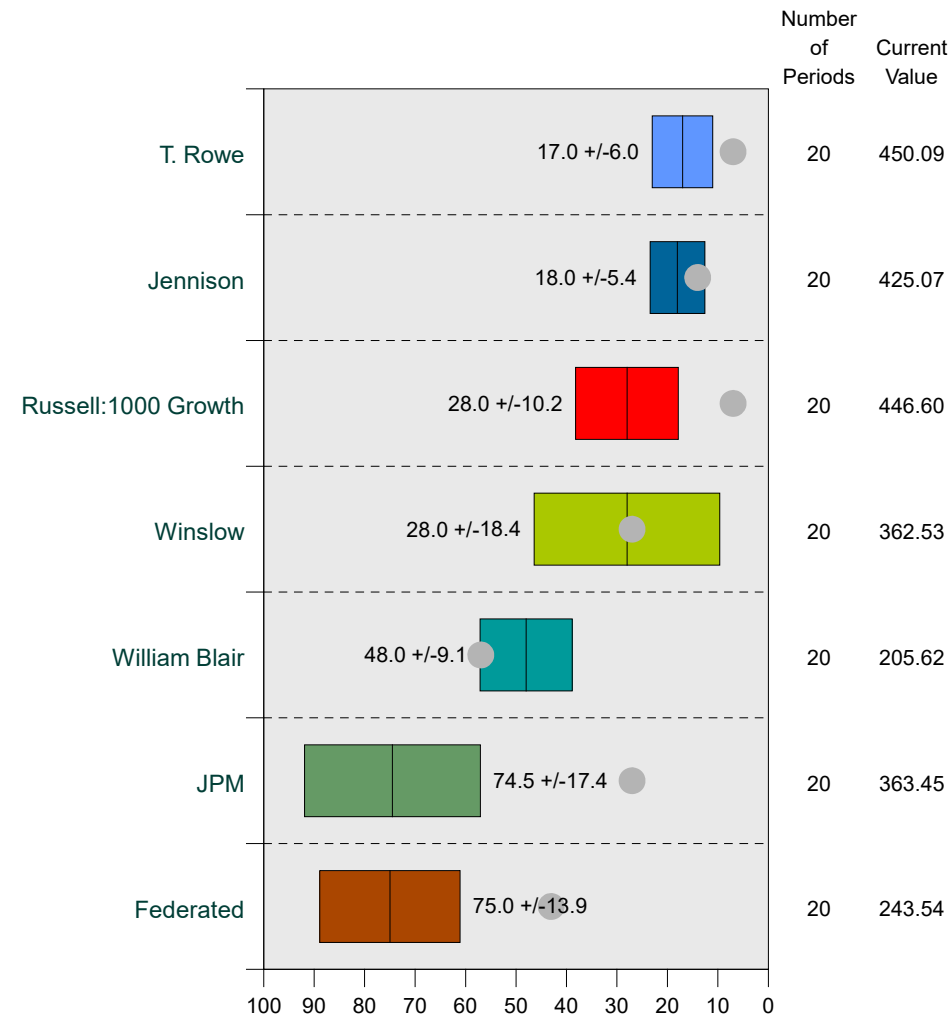
Stability Score Against Callan Large Cap Growth for Five Years Ended June 30, 2023



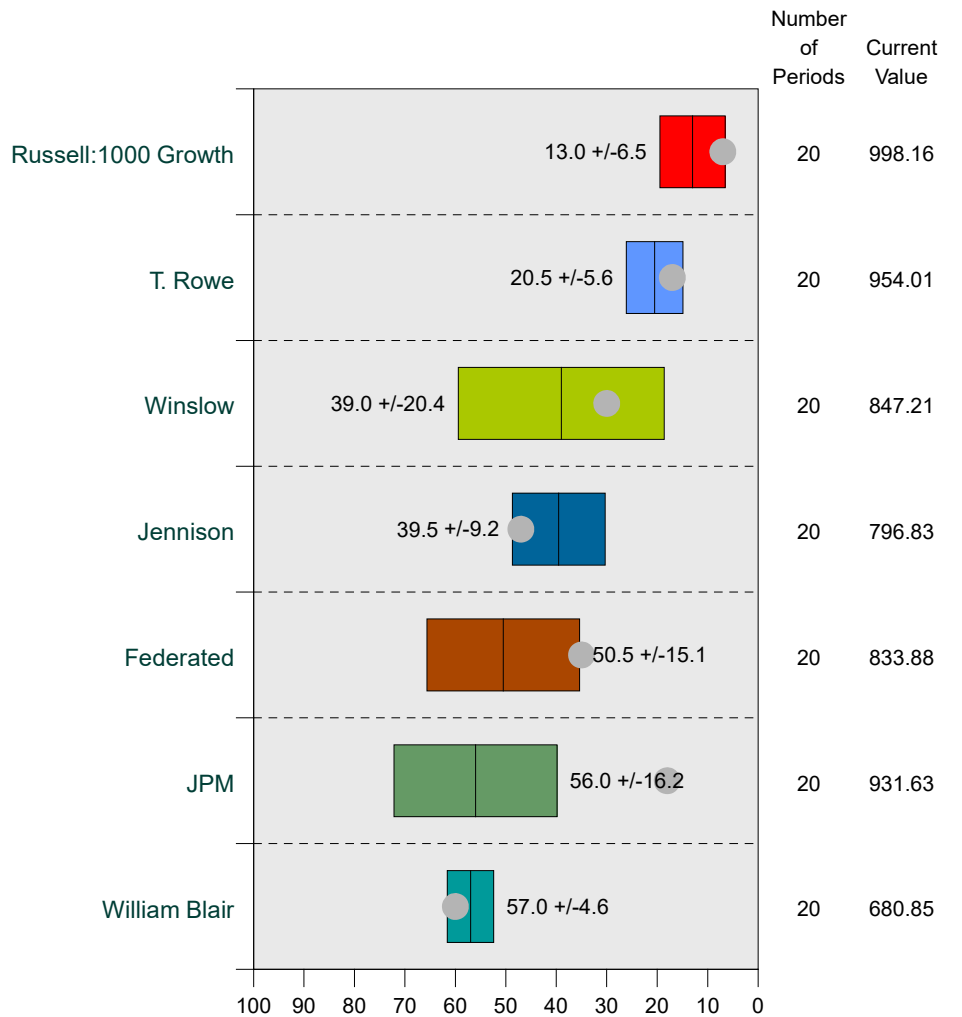
Historical Rankings - Weighted Median & Average Market Cap.

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

Weighted Median Market Cap Against Callan Large Cap Growth for Five Years Ended June 30, 2023



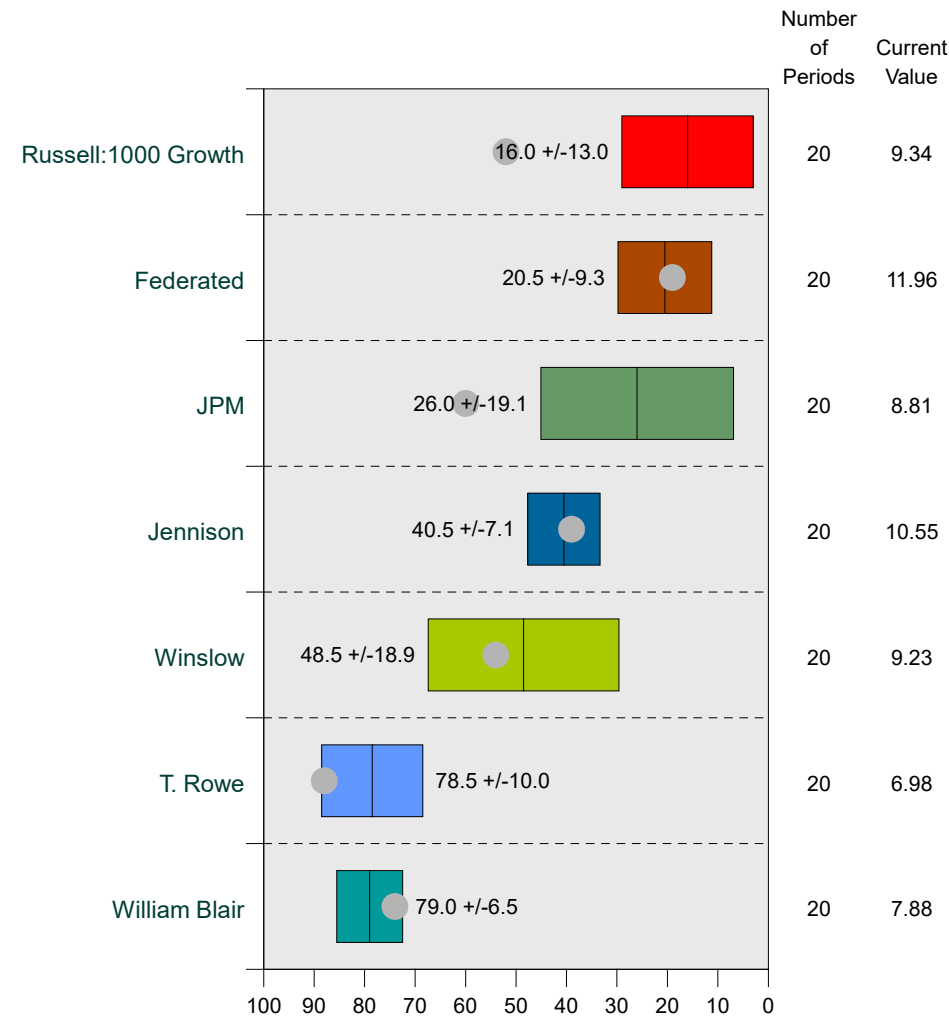
Weighted Average Market Cap Against Callan Large Cap Growth for Five Years Ended June 30, 2023



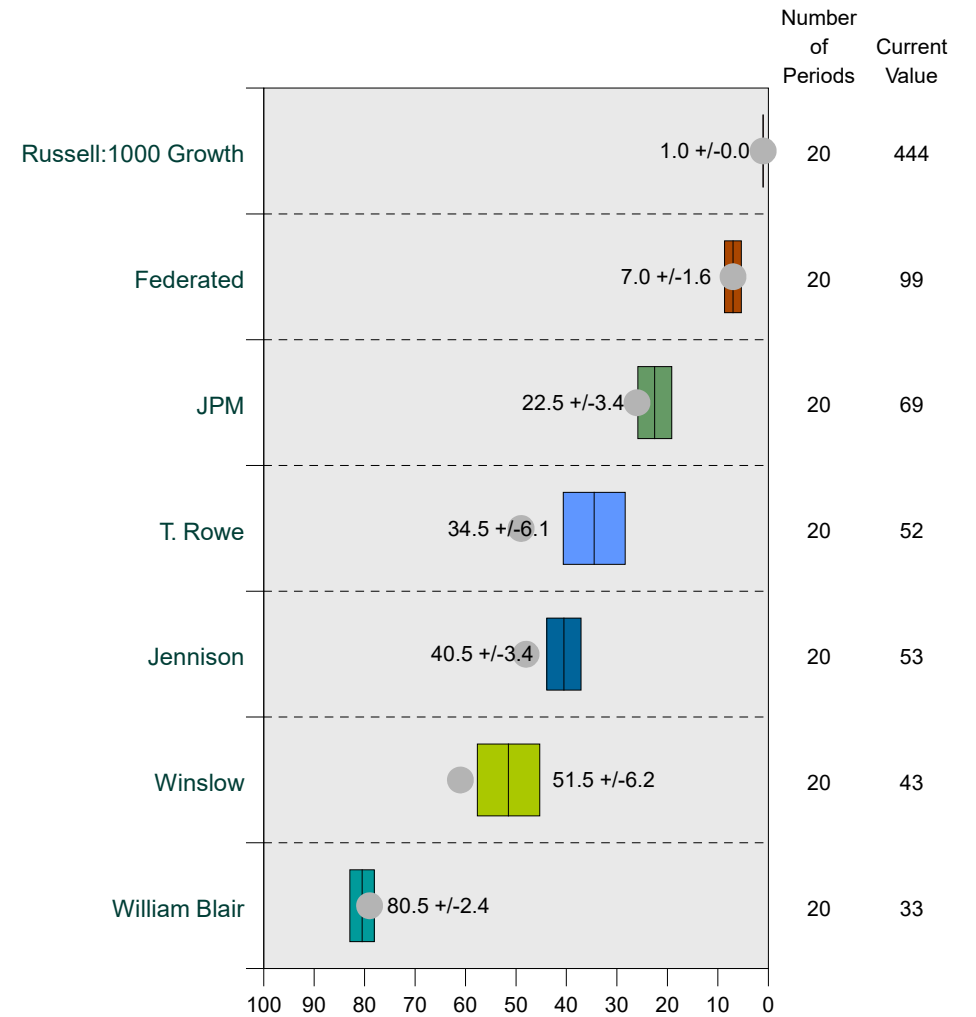
Historical Rankings - Issue Div. & Number of Holdings

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

Issue Diversification Against Callan Large Cap Growth for Five Years Ended June 30, 2023



Number of Holdings Against Callan Large Cap Growth for Five Years Ended June 30, 2023





Candidate Performance

Returns and Peer Group Rankings - Trailing Periods

Returns for Periods Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Rankings in Parentheses)

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
Federated	11.48 (59)	30.05 (14)	16.34 (2)	16.81 (1)	19.11 (2)	16.19 (10)
Jennison	15.83 (5)	32.99 (5)	9.30 (70)	13.26 (42)	17.26 (10)	16.07 (12)
JPM	13.15 (33)	26.59 (37)	12.98 (29)	16.77 (2)	20.18 (1)	17.59 (1)
T. Rowe	14.67 (11)	27.73 (29)	9.96 (63)	12.31 (66)	17.36 (9)	16.11 (11)
William Blair	12.16 (54)	24.80 (53)	11.14 (53)	14.31 (24)	17.00 (14)	16.48 (6)
Winslow	13.22 (32)	28.37 (25)	10.46 (57)	13.27 (41)	16.55 (18)	15.21 (35)
Intech (Incumbent)	9.43 (85)	13.01 (99)	7.88 (81)	10.59 (87)	12.81 (91)	12.68 (92)
CastleArk (Complement)	10.82 (73)	23.67 (62)	14.14 (12)	13.51 (34)	16.51 (20)	14.72 (50)
Callan Large Cap Growth*	12.29	25.13	11.31	12.98	15.44	14.72
Russell:1000 Growth	12.81 (40)	27.11 (32)	13.73 (15)	15.14 (13)	16.91 (15)	15.74 (19)

*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Returns and Peer Group Rankings - Calendar Years

Returns for Periods Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Rankings in Parentheses)

	2 Qtrs. 2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Federated	26.92 (47)	(24.10) (19)	31.31 (8)	39.27 (32)	33.58 (64)	3.03 (28)	26.88 (77)	7.86 (7)	(2.59) (99)	13.90 (21)
Jennison	37.16 (3)	(37.66) (88)	16.72 (84)	55.96 (7)	33.81 (59)	(0.17) (59)	37.38 (4)	(0.12) (81)	11.68 (8)	10.60 (68)
JPM	23.73 (66)	(24.89) (24)	19.30 (78)	57.09 (6)	39.97 (8)	0.98 (48)	38.95 (1)	(1.11) (84)	8.55 (26)	11.87 (45)
T. Rowe	31.33 (20)	(34.22) (78)	22.24 (63)	40.23 (26)	29.31 (88)	4.90 (10)	38.51 (3)	3.43 (49)	10.70 (10)	9.28 (86)
William Blair	25.58 (60)	(32.06) (68)	29.09 (19)	37.20 (43)	37.51 (26)	6.08 (7)	32.34 (26)	2.88 (63)	8.23 (28)	15.62 (9)
Winslow	26.06 (58)	(30.65) (55)	25.51 (41)	38.29 (36)	34.66 (47)	4.42 (12)	33.49 (21)	(1.61) (89)	7.01 (40)	11.29 (61)
Intech (Incumbent)	18.60 (83)	(33.07) (73)	29.58 (16)	29.50 (80)	34.70 (45)	(3.67) (84)	30.29 (41)	5.97 (21)	4.58 (68)	10.32 (71)
CastleArk (Complement)	25.01 (62)	(27.21) (33)	30.26 (12)	40.65 (25)	30.21 (86)	(3.43) (82)	32.34 (26)	8.38 (4)	4.26 (71)	6.42 (97)
Callan Large Cap Growth*	26.80	(30.09)	24.28	35.54	34.49	0.60	28.62	3.41	6.33	11.76
Russell:1000 Growth	29.02 (35)	(29.14) (43)	27.60 (26)	38.49 (35)	36.39 (33)	(1.51) (71)	30.21 (43)	7.08 (8)	5.67 (60)	13.05 (27)

*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Returns and Peer Group Rankings - Rolling Three-Year Periods

Returns for Rolling Three-Year Periods Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Rankings in Parentheses)

	Last 3 Yrs.	3 Yrs. Ending 6/30/22	3 Yrs. Ending 6/30/21	3 Yrs. Ending 6/30/20	3 Yrs. Ending 6/30/19
Federated	16.34 (2)	13.40 (8)	24.95 (40)	21.10 (24)	21.49 (17)
Jennison	9.30 (70)	8.83 (59)	27.23 (14)	22.91 (11)	21.16 (19)
JPM	12.98 (29)	14.35 (2)	28.93 (6)	24.98 (6)	24.15 (4)
T. Rowe	9.96 (63)	8.15 (70)	25.19 (34)	20.39 (28)	23.81 (6)
William Blair	11.14 (53)	10.10 (43)	26.67 (18)	23.42 (9)	21.70 (16)
Winslow	10.46 (57)	8.83 (60)	24.37 (47)	21.10 (23)	20.88 (25)
Intech (Incumbent)	7.88 (81)	8.50 (65)	21.61 (81)	15.78 (78)	17.21 (65)
CastleArk (Complement)	14.14 (12)	13.77 (4)	22.39 (76)	17.86 (55)	16.96 (67)
Callan Large Cap Growth*	11.31	9.39	24.15	18.27	18.42
Russell:1000 Growth	13.73 (15)	12.58 (12)	25.14 (36)	18.99 (43)	18.07 (57)

*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Returns and Peer Group Rankings - Rising/Declining Periods

Returns for Rising/Declining Periods for Ten Years Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Rankings in Parentheses)

	Declining Period 1/1/22 to 6/30/23	Rising Period 4/1/20 to 12/31/21	Declining Period 1/1/20 to 3/31/20	Rising Period 1/1/19 to 12/31/19	Declining Period 10/1/18 to 12/31/18	Rising Period 7/1/13 to 9/30/18
Federated	(2.46) (6)	54.08 (6)	(14.18) (55)	33.58 (64)	(16.63) (78)	17.05 (57)
Jennison	(9.91) (71)	51.07 (15)	(11.57) (18)	33.81 (59)	(16.29) (71)	19.47 (12)
JPM	(4.77) (18)	53.52 (9)	(11.49) (15)	39.97 (8)	(18.59) (93)	19.49 (10)
T. Rowe	(9.30) (68)	47.97 (38)	(13.65) (47)	29.31 (88)	(12.75) (20)	20.54 (4)
William Blair	(10.05) (73)	49.83 (20)	(12.71) (32)	37.51 (26)	(12.39) (16)	19.29 (13)
Winslow	(8.57) (63)	47.80 (41)	(12.39) (27)	34.66 (47)	(15.79) (57)	18.10 (28)
Intech (Incumbent)	(14.27) (90)	47.55 (43)	(15.05) (71)	34.70 (45)	(14.76) (46)	15.78 (80)
CastleArk (Complement)	(6.09) (32)	54.08 (5)	(14.02) (49)	30.21 (86)	(19.07) (94)	16.67 (65)
Callan Large Cap Growth*	(7.06)	46.95	(14.04)	34.49	(15.31)	17.30
Russell:1000 Growth	(5.80) (28)	51.01 (15)	(14.10) (54)	36.39 (33)	(15.89) (60)	17.47 (45)

*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Statistics and Peer Group Rankings - Up & Down Market Capture

The table below illustrates Up Market Capture and Down Market Capture for ten years versus the Callan Large Cap Growth group. A manager with an up-market capture greater than 100 has outperformed the index during the up market and a manager with a down-market capture less than 100 has outperformed the index during the down market. The Down Market Capture rankings are inverted.

Up Market Capture and Down Market Capture Relative to the Russell:1000 Growth for Ten Years Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Rankings in Parentheses)

	Up Market Capture (%)	Down Market Capture (%)
Federated	104.09 (18)	99.78 (61)
Jennison	111.47 (5)	106.05 (20)
JPM	114.88 (4)	96.93 (80)
T. Rowe	104.47 (16)	100.65 (55)
William Blair	106.75 (9)	99.58 (65)
Winslow	101.36 (24)	105.08 (26)
Intech (Incumbent)	74.76 (89)	101.23 (51)
CastleArk (Complement)	96.53 (43)	105.07 (27)
Callan Large Cap Growth*	94.66	101.48

*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Excess Correlation Table

This excess correlation table shows the correlation of one portfolio's excess return to another portfolio's excess return. Excess return is the return minus a benchmark. For instance, Excess Correlation could measure the correlation of Manager A's return in excess of a benchmark with Manager B's return in excess of the same benchmark. Excess Correlation is used to indicate whether different managers outperform a market index at the same time.

Benchmark: Russell 1000 Growth Index for Five Years Ended June 30, 2023

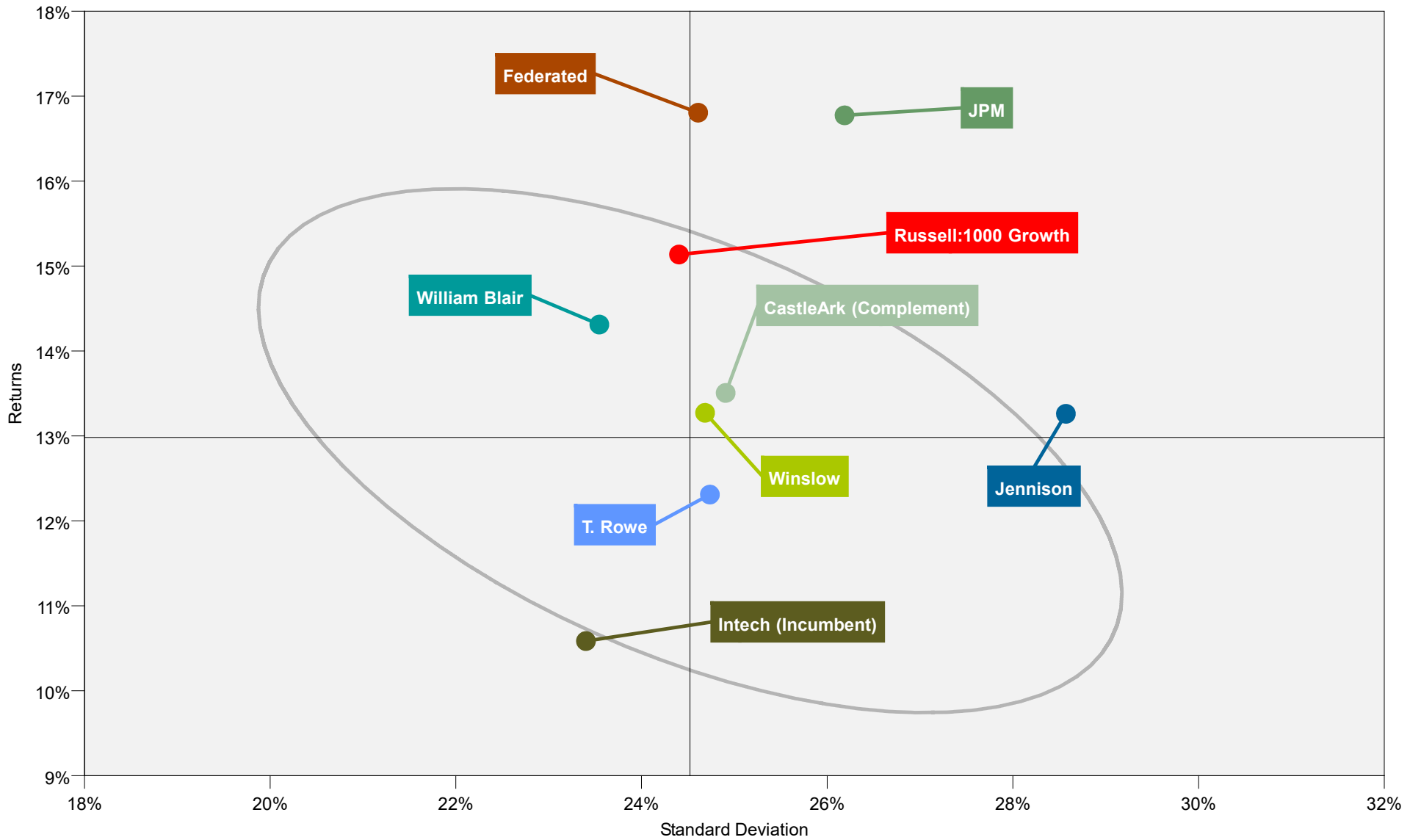
Federated	1.00							
Jennison	(0.23)	1.00						
JPM	0.40	0.37	1.00					
T. Rowe	(0.26)	0.59	0.12	1.00				
William Blair	0.10	(0.19)	(0.03)	0.33	1.00			
Winslow	0.29	0.16	0.42	0.28	0.54	1.00		
Intech (Incumbent)	0.29	(0.53)	(0.02)	(0.26)	0.47	(0.02)	1.00	
CastleArk (Complement)	0.42	(0.23)	0.33	(0.20)	(0.01)	0.15	(0.13)	1.00
	Federated	Jennison	JPM	T. Rowe	William Blair	Winslow	Intech (Incumbent)	CastleArk (Complement)

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Risk/Reward Structure

Risk/Reward for Five Years Ended June 30, 2023

Group: Callan Large Cap Growth (Ellipse with Median at Central Axis)



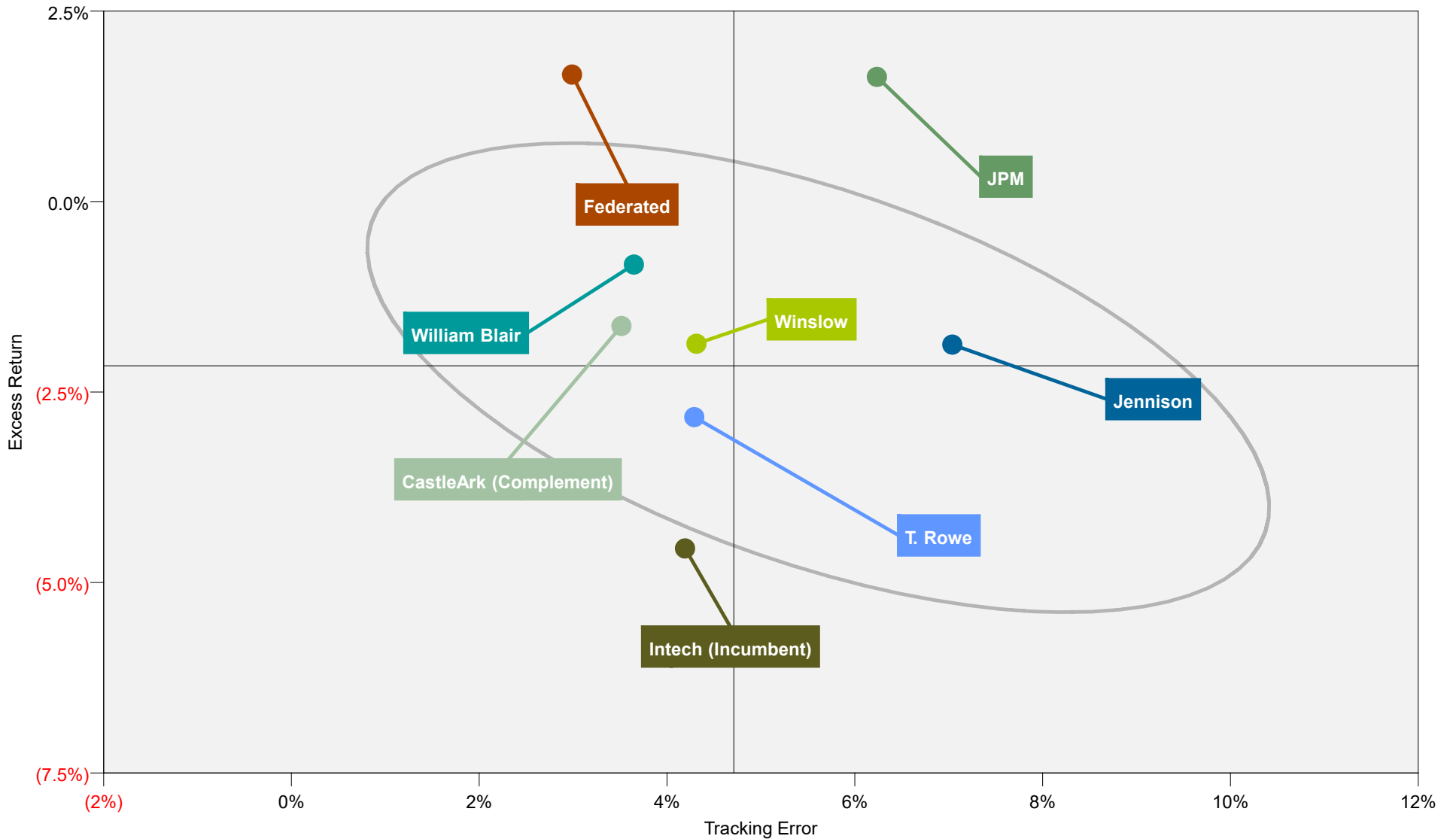
Manager candidate performance shown is gross-of-fees unless otherwise noted.

Excess Return vs. Tracking Error

Excess Return vs Tracking Error for Five Years Ended June 30, 2023

Benchmark: Russell 1000 Growth Index

Group: Callan Large Cap Growth (Ellipse with Median at Central Axis)



Manager candidate performance shown is gross-of-fees unless otherwise noted.

Risk Statistics

Return-Based Risk Statistics Relative to Russell:1000 Growth for Five Years Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Ranking in Parentheses)

	Standard Deviation	Downside Risk	Sharpe Ratio	Information Ratio	Alpha	Beta	Correlation
Federated	24.61 (47)	1.81 (95)	0.62 (10)	0.48 (4)	1.48 (8)	1.00 (43)	0.99 (19)
Jennison	28.57 (6)	5.16 (31)	0.41 (74)	(0.46) (58)	(2.89) (75)	1.14 (6)	0.98 (63)
JPM	26.19 (16)	3.50 (62)	0.58 (18)	0.17 (17)	1.07 (13)	1.04 (17)	0.97 (68)
T. Rowe	24.74 (40)	3.81 (56)	0.43 (69)	(0.55) (67)	(2.43) (70)	1.00 (46)	0.98 (43)
William Blair	23.55 (62)	2.62 (74)	0.54 (26)	(0.05) (29)	(0.19) (28)	0.95 (63)	0.99 (33)
Winslow	24.68 (42)	3.26 (66)	0.47 (51)	(0.34) (42)	(1.52) (51)	0.99 (47)	0.98 (44)
Intech (Incumbent)	23.40 (66)	4.41 (41)	0.39 (81)	(0.85) (94)	(3.47) (82)	0.95 (66)	0.99 (41)
CastleArk (Complement)	24.91 (37)	2.75 (70)	0.48 (47)	(0.43) (50)	(1.55) (51)	1.01 (33)	0.99 (31)
Callan Large Cap Growth*	24.52	3.94	0.48	(0.42)	(1.51)	0.99	0.98
Russell:1000 Growth	24.40 (53)	0.00 (100)	0.56 (24)	0.00 (26)	0.00 (26)	1.00 (45)	1.00 (1)

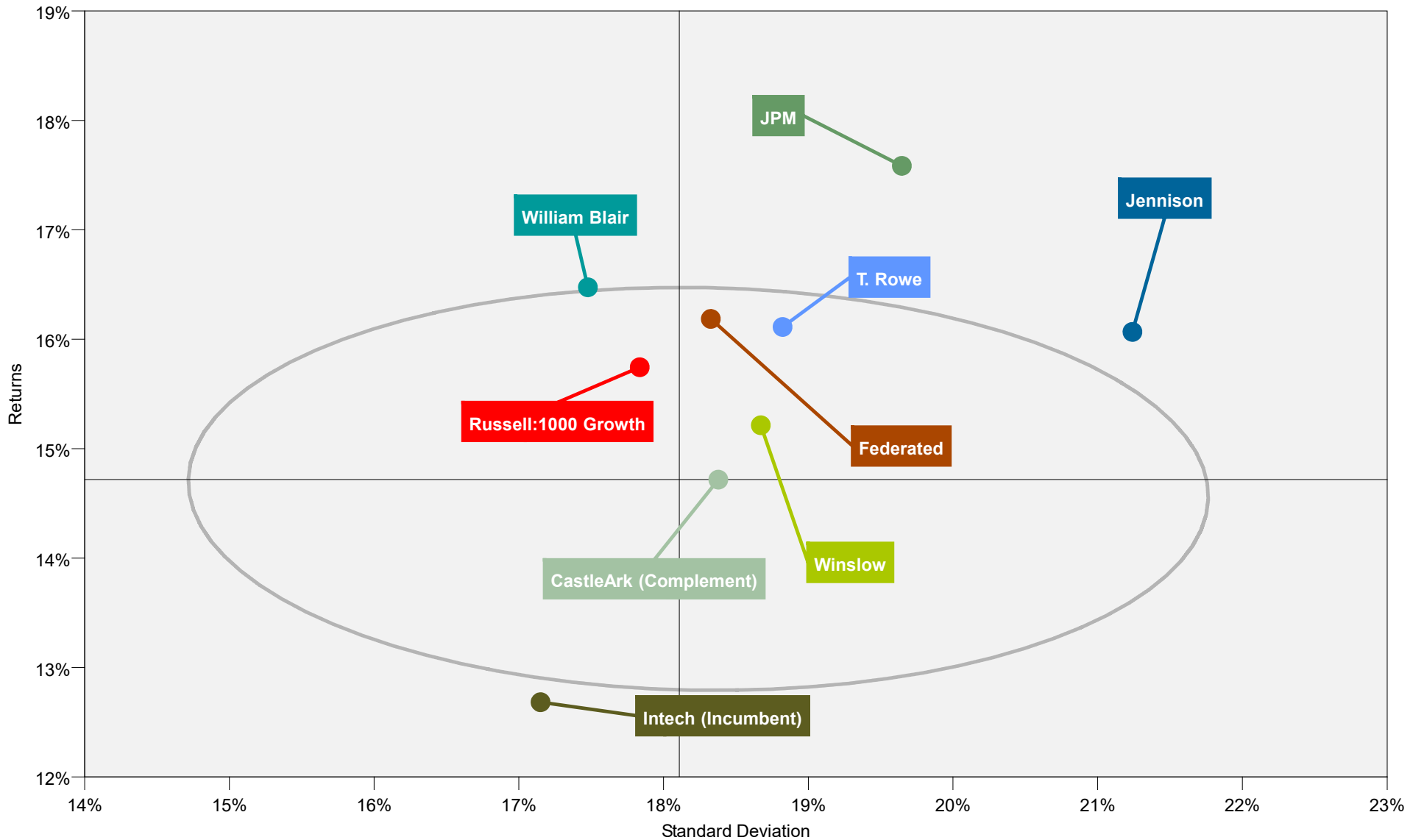
*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

Risk/Reward Structure

Risk/Reward for Ten Years Ended June 30, 2023

Group: Callan Large Cap Growth (Ellipse with Median at Central Axis)



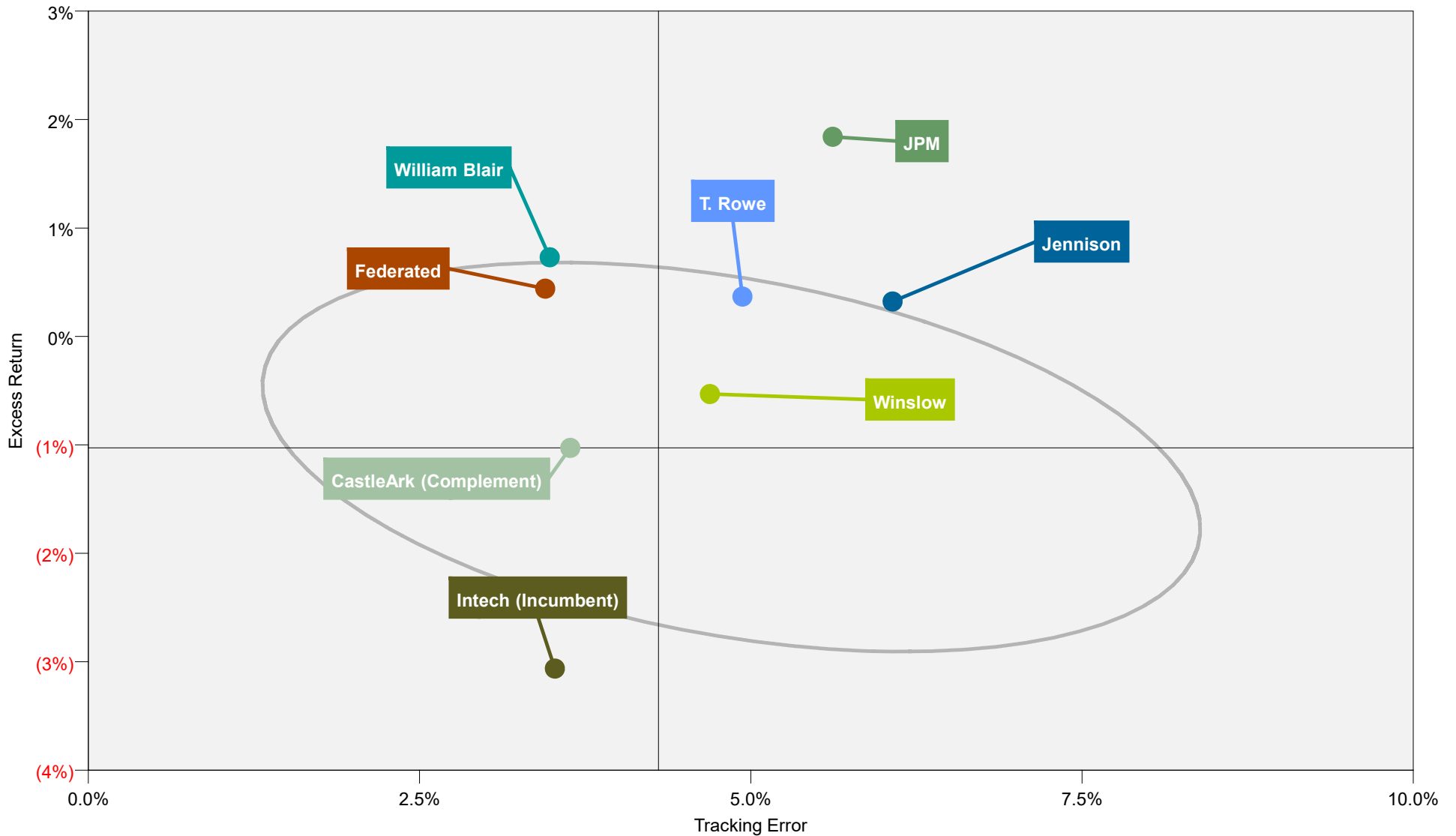
Manager candidate performance shown is gross-of-fees unless otherwise noted.

Excess Return vs. Tracking Error

Excess Return vs Tracking Error for Ten Years Ended June 30, 2023

Benchmark: Russell 1000 Growth Index

Group: Callan Large Cap Growth (Ellipse with Median at Central Axis)



Manager candidate performance shown is gross-of-fees unless otherwise noted.

Risk Statistics

Return-Based Risk Statistics Relative to Russell:1000 Growth for Ten Years Ended June 30, 2023

Group: Callan Large Cap Growth (Percentile Rankings in Parentheses)

	Standard Deviation	Downside Risk	Sharpe Ratio	Information Ratio	Alpha	Beta	Correlation
Federated	18.33 (43)	2.36 (73)	0.83 (23)	0.09 (24)	0.32 (24)	1.01 (44)	0.98 (31)
Jennison	21.24 (6)	4.30 (30)	0.71 (75)	(0.25) (61)	(1.40) (74)	1.15 (6)	0.97 (57)
JPM	19.65 (15)	3.45 (51)	0.84 (19)	0.18 (19)	1.02 (15)	1.06 (18)	0.96 (69)
T. Rowe	18.82 (29)	3.56 (43)	0.80 (32)	0.04 (29)	0.22 (28)	1.02 (35)	0.97 (61)
William Blair	17.48 (61)	2.18 (81)	0.89 (10)	0.35 (8)	1.22 (11)	0.96 (61)	0.98 (32)
Winslow	18.67 (34)	3.48 (46)	0.76 (53)	(0.11) (46)	(0.51) (51)	1.01 (38)	0.97 (56)
Intech (Incumbent)	17.15 (72)	3.53 (44)	0.68 (83)	(0.59) (96)	(2.01) (85)	0.95 (69)	0.98 (33)
CastleArk (Complement)	18.38 (41)	2.71 (67)	0.75 (62)	(0.27) (64)	(1.00) (65)	1.01 (40)	0.98 (36)
Callan Large Cap Growth*	18.11	3.46	0.76	(0.17)	(0.50)	1.00	0.97
Russell:1000 Growth	17.84 (56)	0.00 (100)	0.83 (24)	0.00 (36)	0.00 (36)	1.00 (49)	1.00 (1)

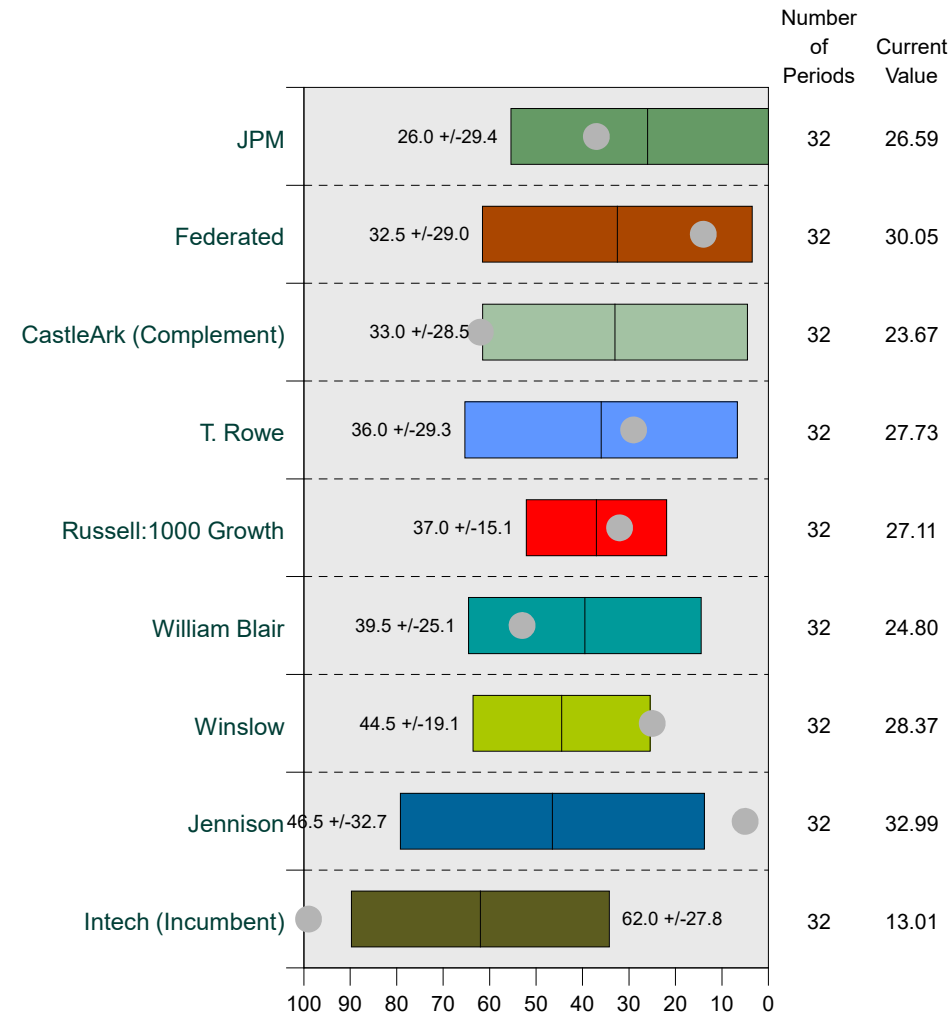
*Results reflect group median.

Manager candidate performance shown is gross-of-fees unless otherwise noted.

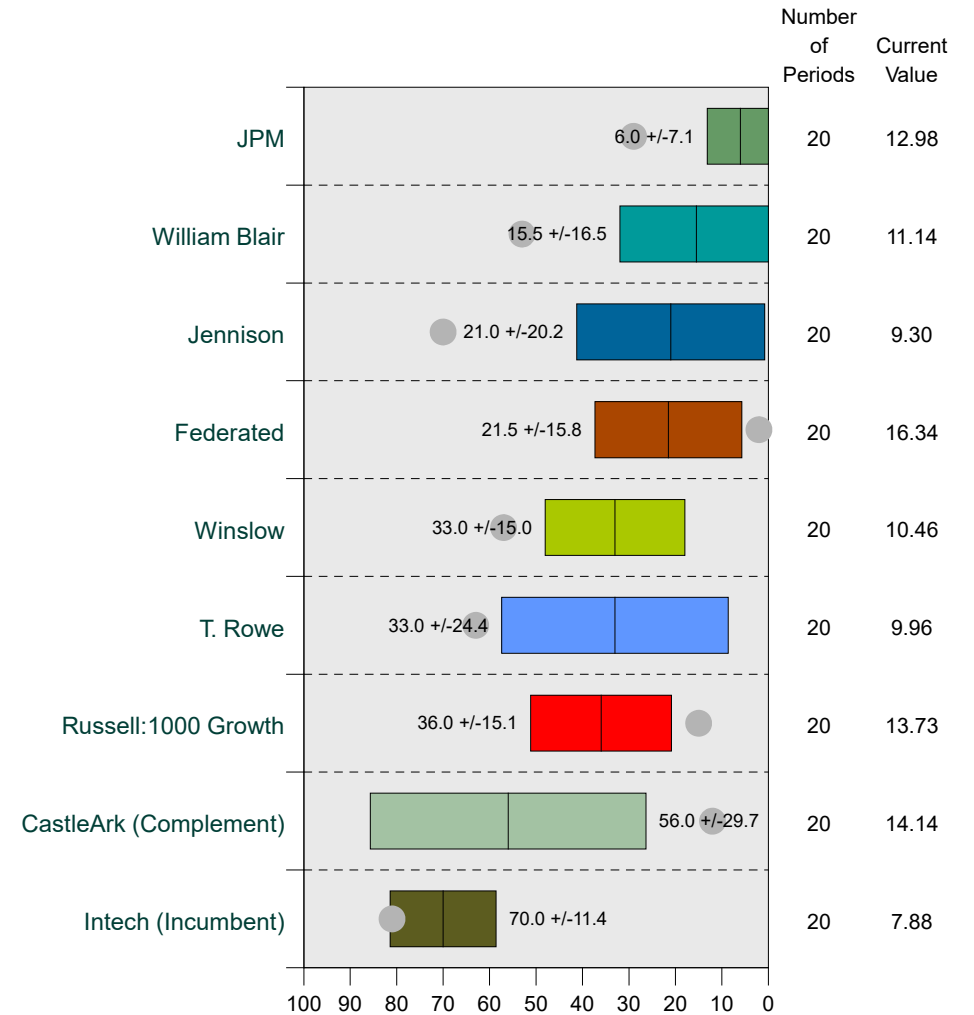
Historical Rankings - Returns

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

Rolling One-Year Returns Against Callan Large Cap Growth for Eight Years Ended June 30, 2023



Rolling Three-Year Returns Against Callan Large Cap Growth for Five Years Ended June 30, 2023

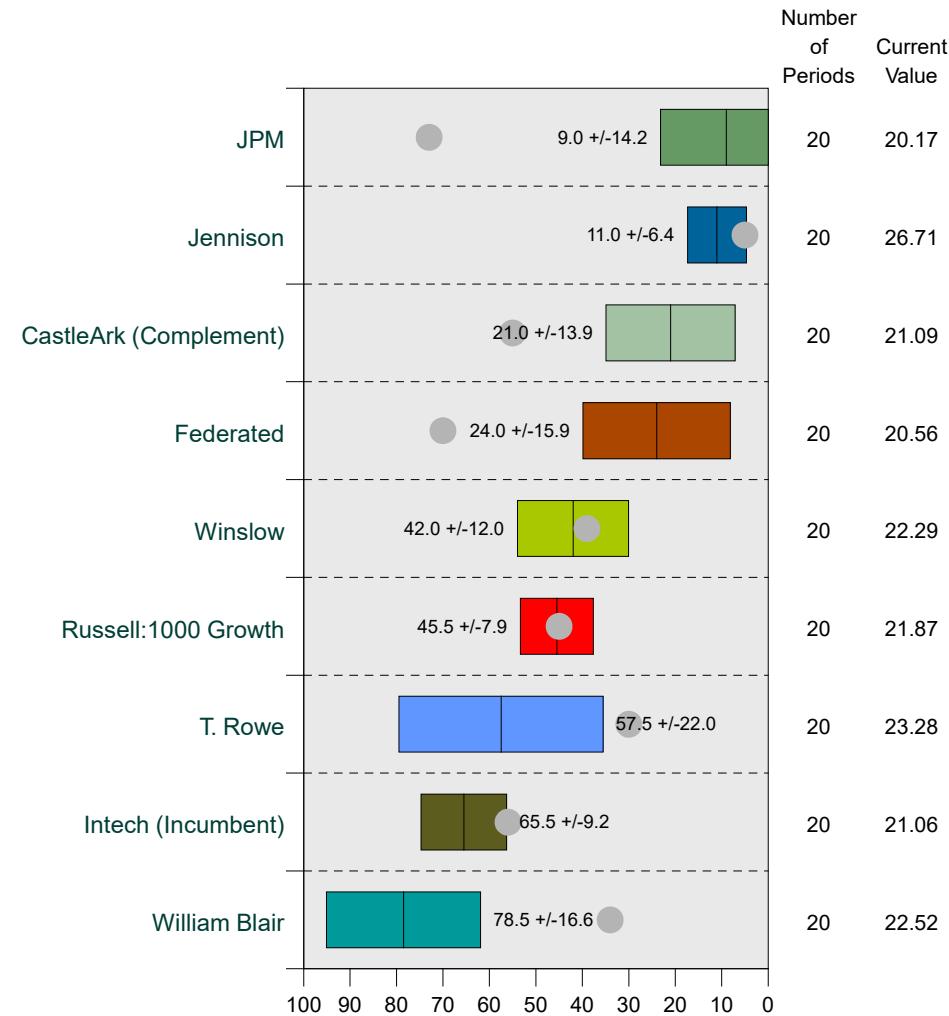


Manager candidate performance shown is gross-of-fees unless otherwise noted.

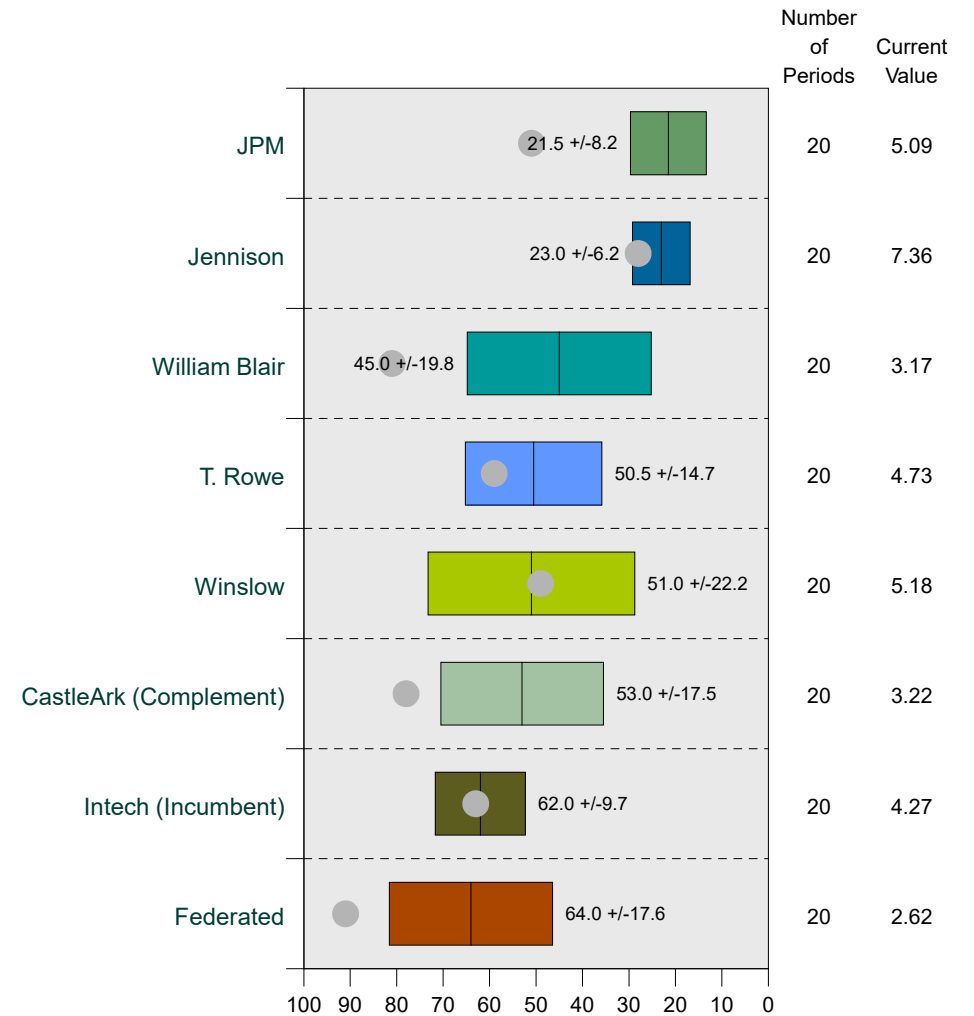
Historical Rankings - Standard Deviation & Tracking Error

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

Rolling Three-Year Standard Deviation Against Callan Large Cap Growth for Five Years Ended June 30, 2023



Rolling Three-Year Tracking Error Against Callan Large Cap Growth for Five Years Ended June 30, 2023

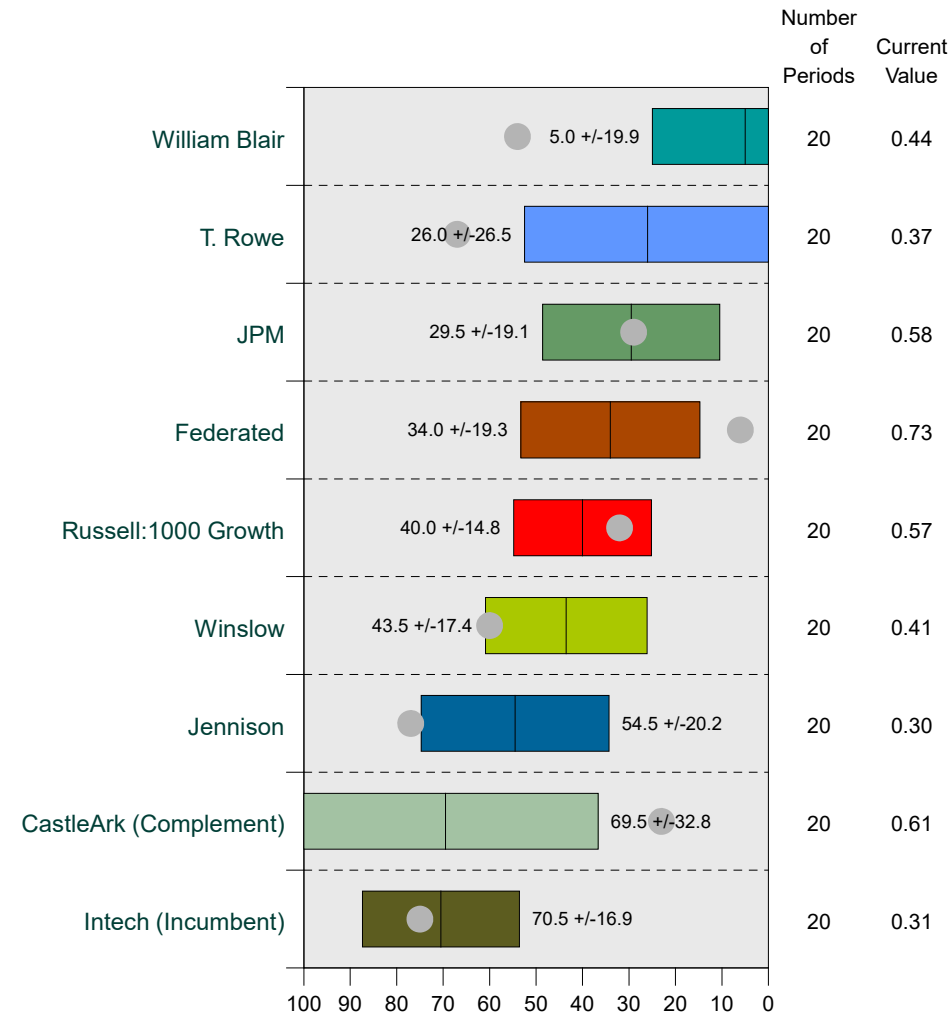


Manager candidate performance shown is gross-of-fees unless otherwise noted.

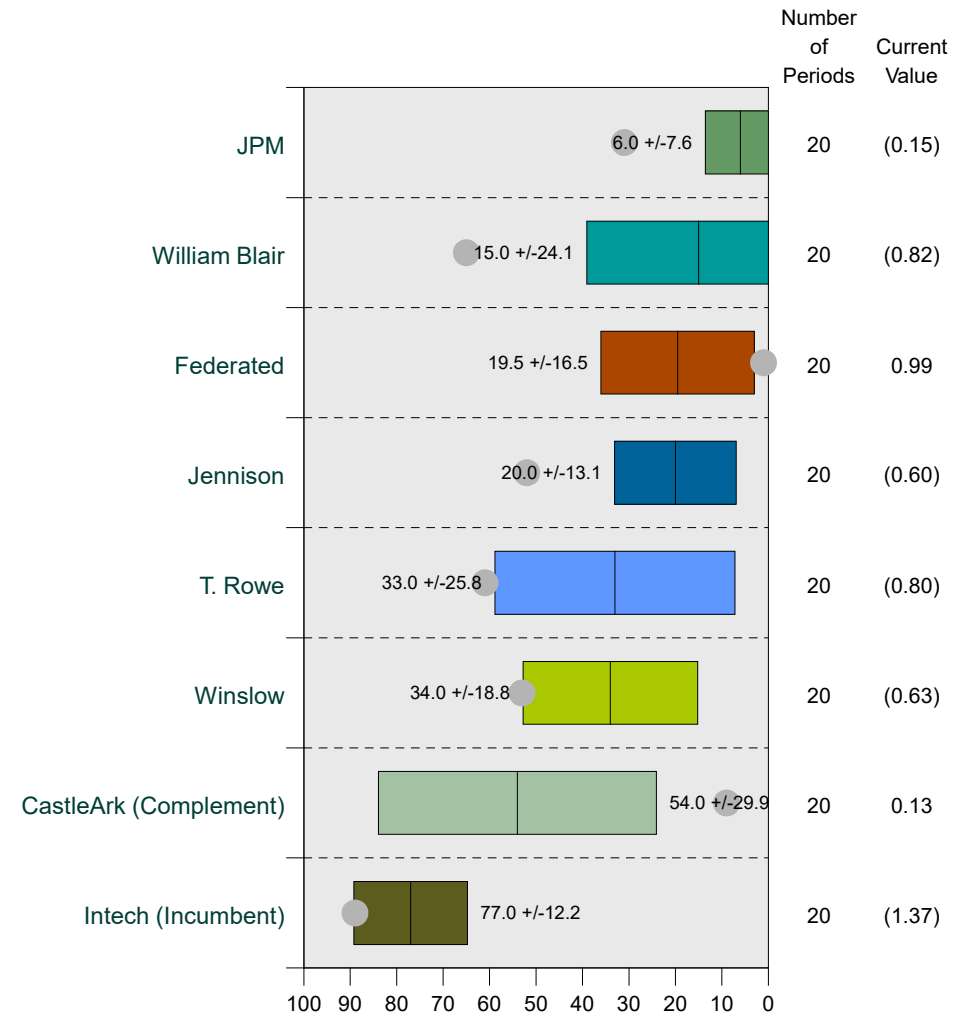
Historical Rankings - Sharpe Ratio & Excess Return Ratio

This page compares multiple portfolios to each other by analyzing both the historical median ranking for a given metric versus a relevant peer group, and the consistency and range (standard deviation) of that ranking over time. The midpoint of each sideways bar represents the median ranking of a given portfolio over time, and the width of the bar represents the consistency and range of that ranking (+/- 1 standard deviation). The slash-separated numbers show the median and standard deviation, respectively, of the portfolios' ranking. The current ranking of each portfolio is demarcated by a dot, while the corresponding current value of the metric is displayed on the far right.

Rolling Three-Year Sharpe Ratio Against Callan Large Cap Growth for Five Years Ended June 30, 2023



Rolling Three-Year Excess Return Ratio Against Callan Large Cap Growth for Five Years Ended June 30, 2023



Manager candidate performance shown is gross-of-fees unless otherwise noted.



Appendix

Firm Overview: Federated Hermes, Inc.

Federated Hermes, founded in 1955, was first registered as an investment advisor with the SEC in 1958 when it began managing money for retail mutual funds. In 1971, Federated Investment Counseling (FIC) was formed and registered with the SEC in the same year. Federated has had several acquisitions over the years including the Kaufmann Fund, Alliance Capital Management's cash management business, MDT Advisers, certain assets of Rochdale Investment Management LLC, Clover Capital Management Inc., and certain assets of David W. Tice & Associates LLC. In July 2018, Federated acquired a majority stake of Hermes Fund Managers Limited (Hermes). In February 2020, Federated Investors, Inc. changed its name to Federated Hermes, Inc. and changed its New York Stock Exchange ticker symbol to "FHI".

Firm	Contact
Federated Hermes, Inc. 1001 Liberty Avenue Pittsburgh, PA 15222-3779	John Stanley 412-288-1900 john.stanley@federatedhermes.com

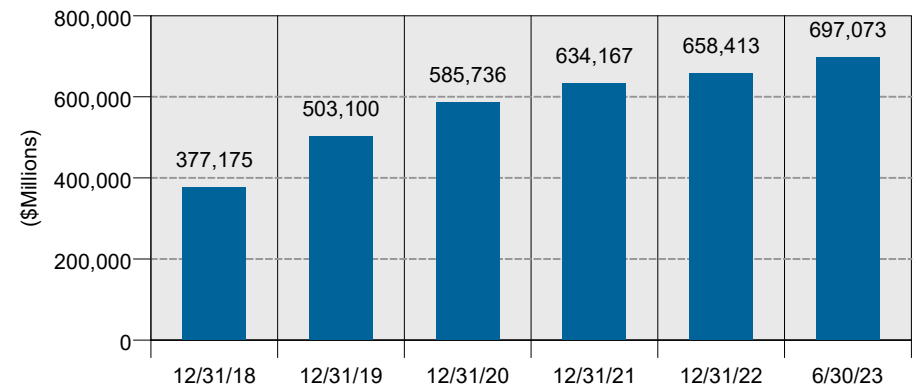
Ownership	Founded	Portfolio Managers	Analysts
Publicly Owned	1955	136	151

Total Firm Asset Breakdown

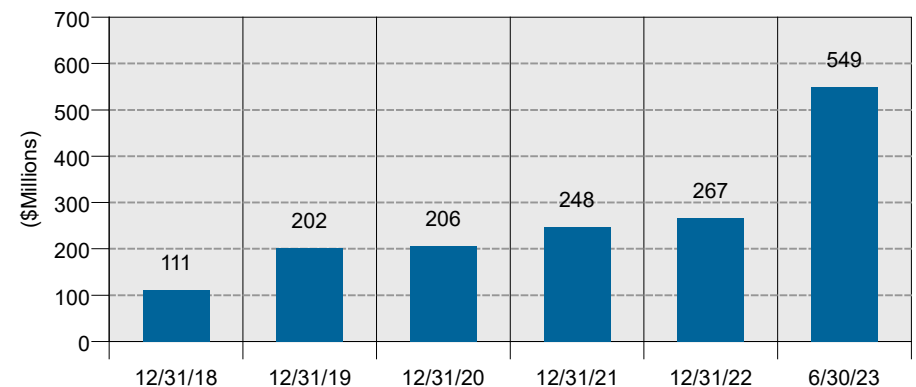
Domestic	\$(mm)	Client Type	\$(mm)
Equity	31,121	Corporate	14,310
Fixed Income	91,802	Public(Govt)	141,376
Balanced	2,810	Union/Multi-Employer	219
Alternatives	764	Superannuation	1,746
Other	517,065	Foundation/Endowment	860
Total	643,562	Health Care	236
		Insurance	2,285
Global	\$(mm)	High Net Worth	13
Equity	29,933	Wrap Account	8,214
Fixed Income	8,254	Sub-Advised	40,678
Balanced	275	Sovereign Wealth Funds	4,060
Alternatives	8,674	Other	483,075
Other	6,375	Total Org Assets	697,073
Total	53,511	Total Defined Contribution	55,426

Client Type AUM Total does not include DC assets.

Total Firm Asset Growth (\$mm) as of June 30, 2023

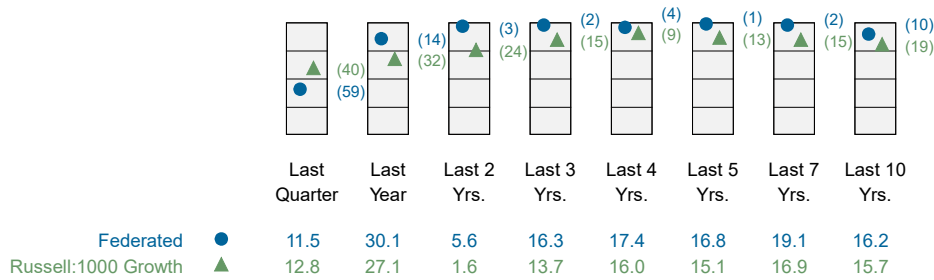


Total Product Asset Growth (\$mm) as of June 30, 2023

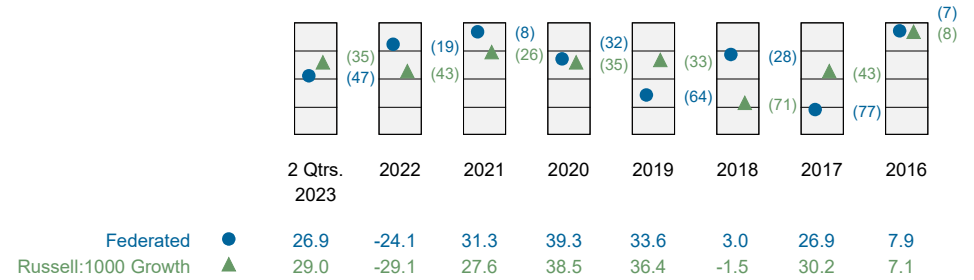


Product Overview: Federated

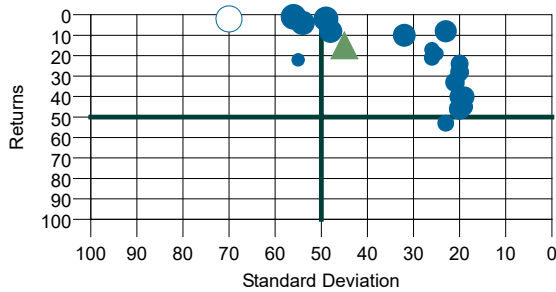
Returns vs. Callan Large Cap Growth



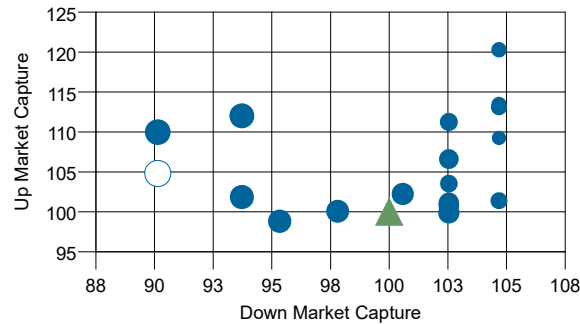
Calendar Year Returns



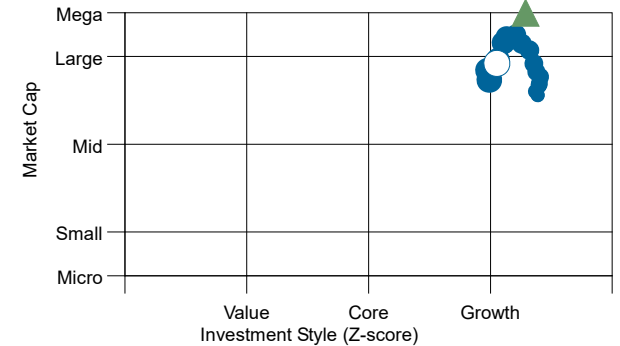
Return and Risk Rankings vs. Callan Large Cap Growth Group Rolling 3 Year for 5 Years



Upside/Downside Capture Rolling 3 Year for 5 Years



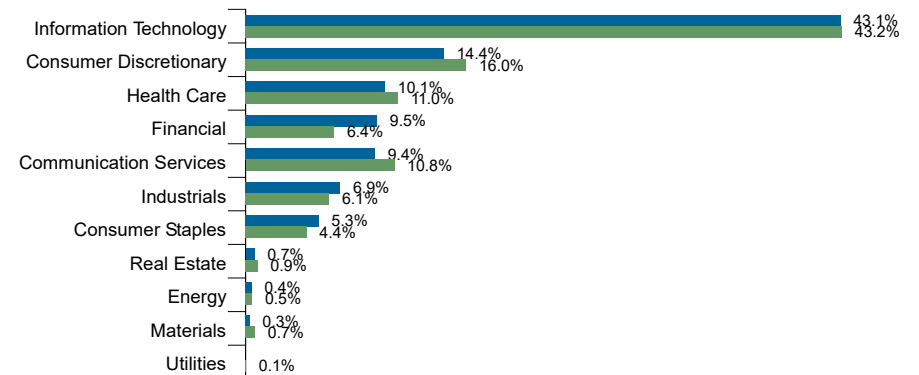
Holdings Based Style Map Rolling 1 Year



Portfolio Characteristics

	Federated	Russell:1000 Growth	Callan Large Cap Growth
Number of Holdings	99	444	50
Issue Diversification	12.0	9.3	9.8
Growth Z Score	0.3	0.3	0.3
Value Z Score	-0.5	-0.5	-0.5
Combined Z Score	0.8	0.8	0.8
Wtd. Median Market Cap.	243.5	446.6	217.7
Forecasted P/E (exc neg)	25.1	26.9	26.8
Price/Book Value	9.2	10.6	7.5
Forecasted Gr. in Earnings	14.8	13.0	13.8
Return on Equity	27.6	28.6	24.4
Dividend Yield	0.7	0.8	0.7

Equity Sector Exposure vs Russell:1000 Growth



Performance shown is gross-of-fees unless otherwise noted.

Firm Overview: Jennison Associates LLC

Jennison Associates LLC (Jennison) was founded in July 1969 as a SEC-registered investment advisor. In 1975, the firm acquired Boston-based, fixed income manager Carter, Doyle & Co. from Standard & Poor's Corp. In 1985, Jennison became a wholly owned subsidiary of the Prudential Insurance Company of America. In 2000, Prudential combined its public active equity asset management capabilities into Jennison and organized a new wholly-owned subsidiary, Prudential Asset Management Holding Company ("PAMHC"). Prudential then contributed its ownership in Jennison initially to PAMHC, and then later in 2000, to another asset management subsidiary, The Prudential Investment Corporation. In December 2001, Prudential Financial Inc. completed its IPO and, as part of the demutualization, Jennison became an indirect subsidiary of Prudential Financial Inc. Jennison added a global/international equity capability in 2011 and an emerging markets equity capability in 2014.

Firm

Jennison Associates LLC
466 Lexington Avenue
New York, NY 10017

Contact

Charlotte Walsh
(212) 833-0754
cwalsh@jennison.com

Ownership

Publicly Owned

Founded

1969

Portfolio Managers

28

Analysts

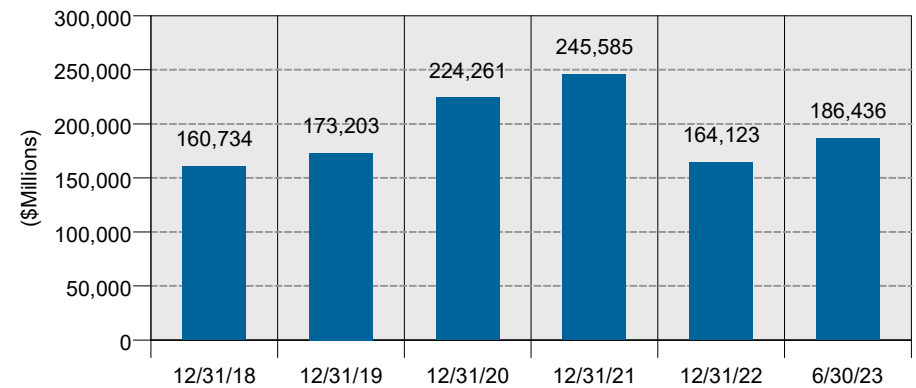
33

Total Firm Asset Breakdown

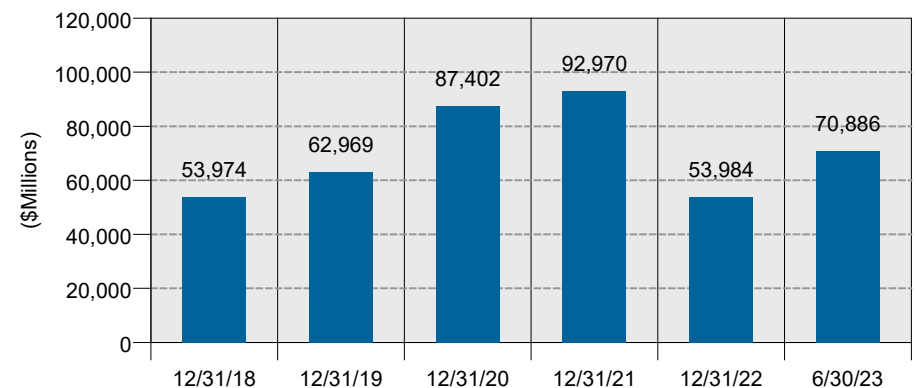
	\$(mm)	Client Type	\$(mm)
Domestic			
Equity	114,531	Corporate	38,999
Fixed Income	48,503	Public(Govt)	6,577
Balanced	603	Union/Multi-Employer	1,022
Total	163,636	Superannuation	1,245
		Foundation/Endowment	1,248
Global	\$(mm)	Health Care	1,108
Equity	22,594	Insurance	290
Alternatives	205	High Net Worth	9
Total	22,800	Wrap Account	1,985
		Sub-Advised	126,667
		Sovereign Wealth Funds	2,419
		Total Org Assets	186,436
		Total Defined Contribution	23,659

Client Type AUM Total does not include DC assets.

Total Firm Asset Growth (\$mm) as of June 30, 2023

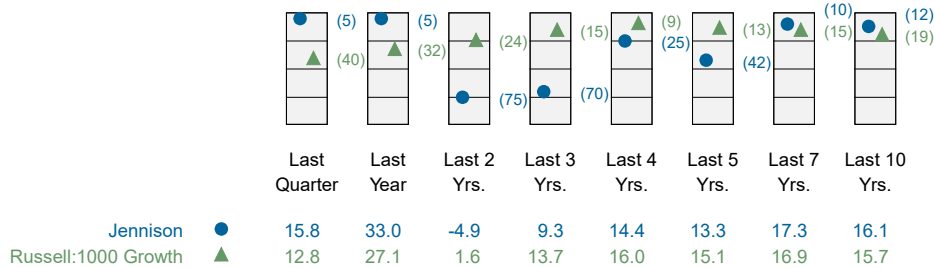


Total Product Asset Growth (\$mm) as of June 30, 2023

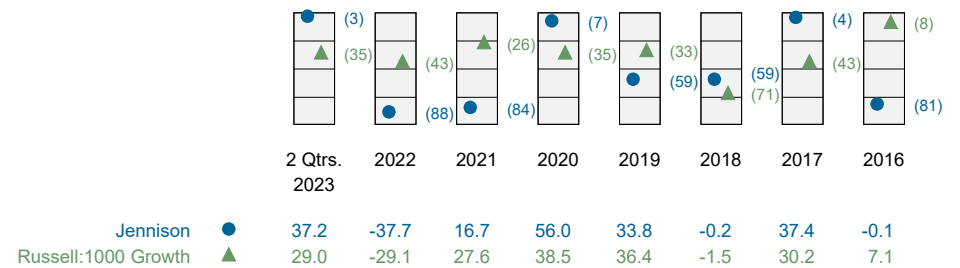


Product Overview: Jennison

Returns vs. Callan Large Cap Growth

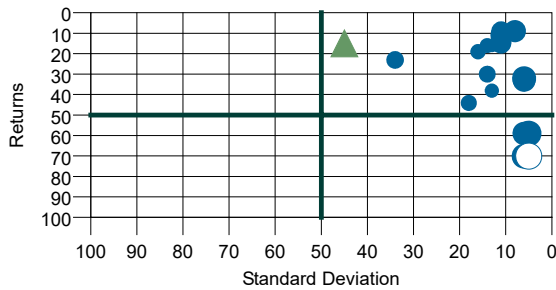


Calendar Year Returns



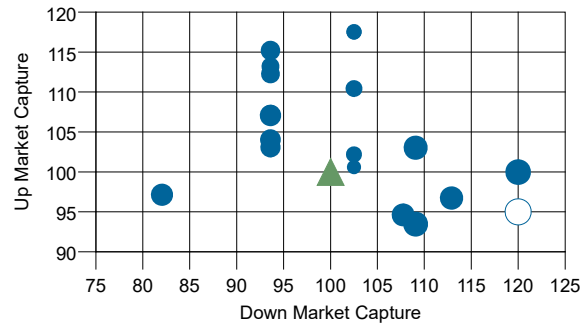
Return and Risk Rankings vs. Callan Large Cap Growth Group

Rolling 3 Year for 5 Years



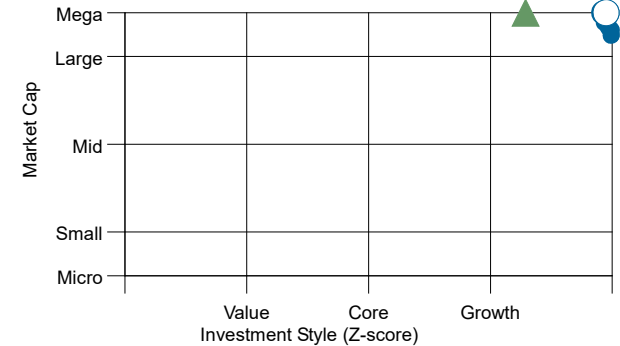
Upside/Downside Capture

Rolling 3 Year for 5 Years



Holdings Based Style Map

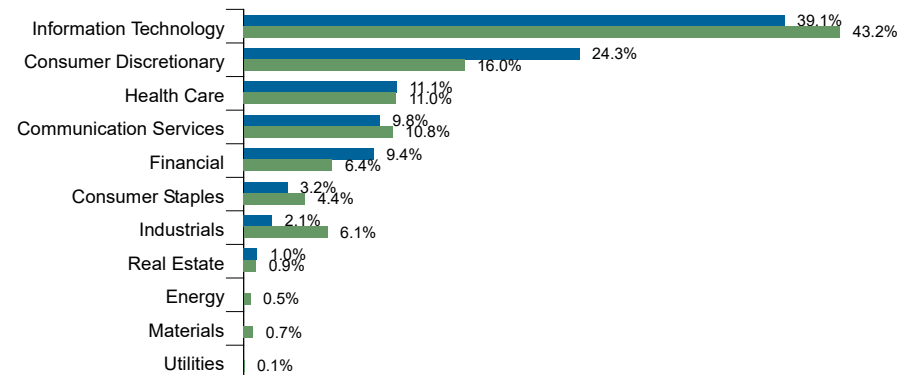
Rolling 1 Year



Portfolio Characteristics

	Jennison	Russell:1000 Growth	Callan Large Cap Growth
Number of Holdings	53	444	50
Issue Diversification	10.5	9.3	9.8
Growth Z Score	0.5	0.3	0.3
Value Z Score	-0.7	-0.5	-0.5
Combined Z Score	1.2	0.8	0.8
Wtd. Median Market Cap.	425.1	446.6	217.7
Forecasted P/E (exc neg)	31.2	26.9	26.8
Price/Book Value	8.0	10.6	7.5
Forecasted Gr. in Earnings	15.6	13.0	13.8
Return on Equity	25.6	28.6	24.4
Dividend Yield	0.5	0.8	0.7

Equity Sector Exposure vs Russell:1000 Growth



Performance shown is gross-of-fees unless otherwise noted.

Firm Overview: J.P. Morgan Asset Management

J.P. Morgan Asset Management ("JPMAM") was incorporated in Delaware in February 1984 and began operations in July 1984. The company evolved from the Trust and Investment Division of Morgan Guaranty Trust Company, which acquired its first tax-exempt account in 1913 and its first pension fund account in 1940. JPMAM was a wholly owned subsidiary of J.P. Morgan & Co. Incorporated, a bank holding company founded in 1861 and which also owns Morgan Guaranty Trust Company, J.P. Morgan Securities Inc. and J.P. Morgan Futures Inc. In January 2001, Chase Manhattan and J.P. Morgan merged and renamed the firm J.P. Morgan Chase & Co., a publicly traded corporation that is listed on the New York Stock Exchange (Ticker: JPM). On July 1, 2004, JPMorgan Chase & Co. and Bank One Corporation merged. The combined company retained the name of J.P. Morgan Chase & Co. In May 2008, J.P. Morgan Chase acquired Bear Stearns.

Firm	Contact
J.P. Morgan Asset Management 277 Park Avenue 8th Floor New York, NY 10172	Richard Forslund (415) 315-5147 richard.r.forslund@jpmorgan.com

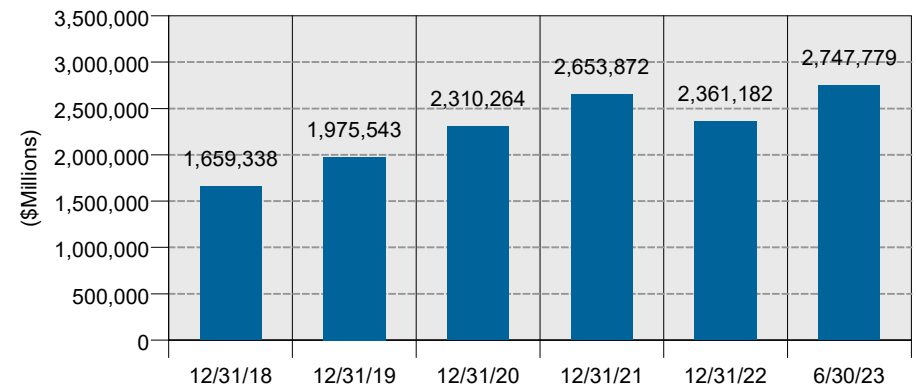
Ownership	Founded	Portfolio Managers	Analysts
Publicly Owned	1863	648	373

Total Firm Asset Breakdown

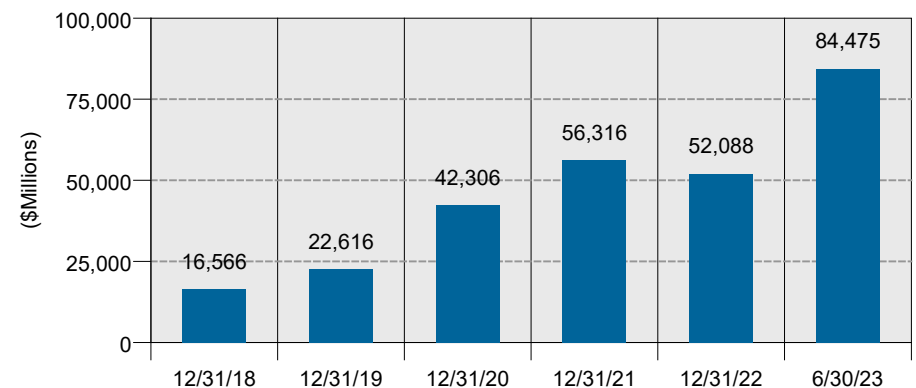
Domestic	\$(mm)	Client Type	\$(mm)
Equity	484,193	Corporate	409,288
Fixed Income	1,138,913	Public(Govt)	72,157
Balanced	190,357	Union/Multi-Employer	15,280
Alternatives	103,827	Foundation/Endowment	11,575
Total	1,917,289	Insurance	228,322
		High Net Worth	274,135
Global	\$(mm)	Wrap Account	184,567
Equity	251,759	Sub-Advised	153,980
Fixed Income	405,877	Superationals	84,523
Balanced	67,850	Other	1,313,952
Alternatives	105,004	Total Org Assets	2,747,779
Total	830,490	Total Defined Contribution	148,619

Client Type AUM Total does not include DC assets.

Total Firm Asset Growth (\$mm) as of June 30, 2023

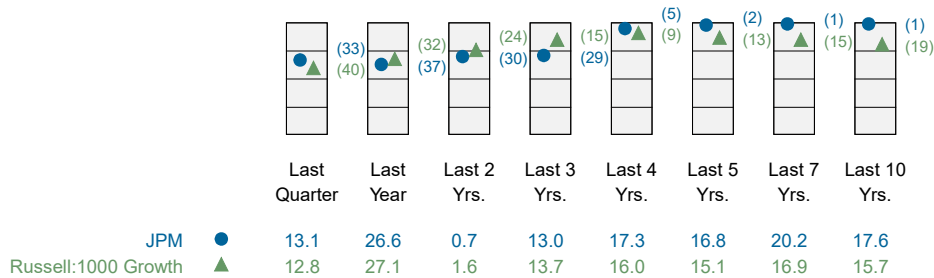


Total Product Asset Growth (\$mm) as of June 30, 2023

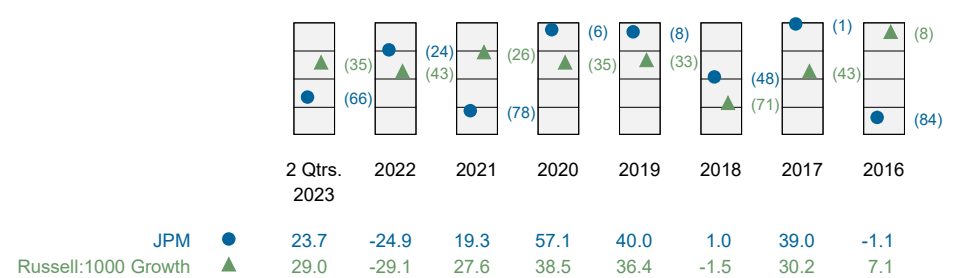


Product Overview: JPM

Returns vs. Callan Large Cap Growth

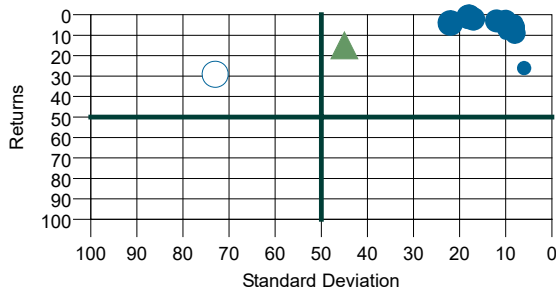


Calendar Year Returns



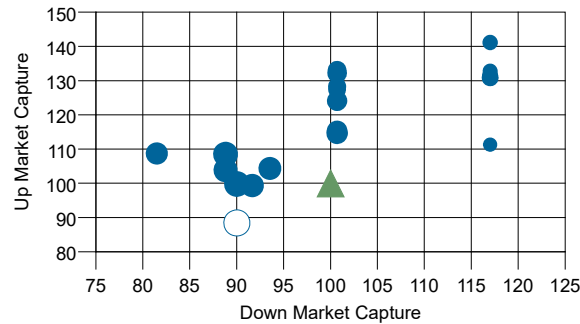
Return and Risk Rankings vs. Callan Large Cap Growth Group

Rolling 3 Year for 5 Years



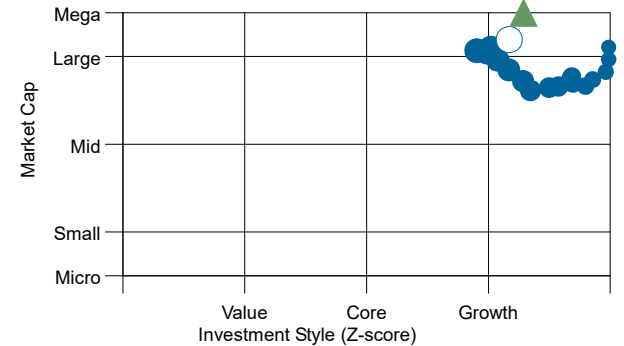
Upside/Downside Capture

Rolling 3 Year for 5 Years



Holdings Based Style Map

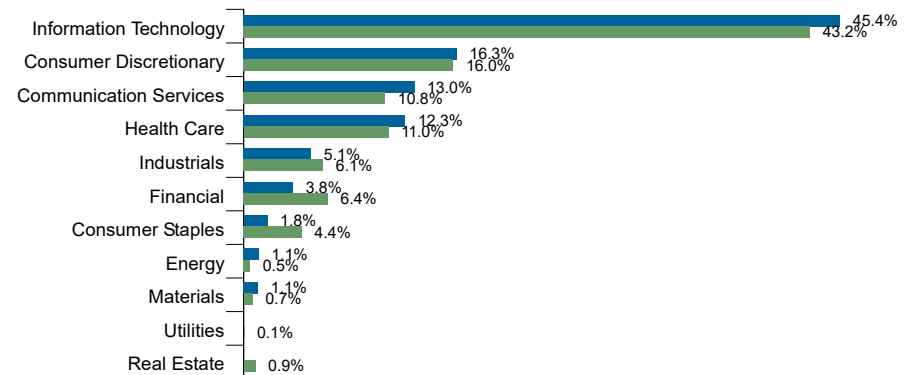
Rolling 1 Year



Portfolio Characteristics

	JPM	Russell:1000 Growth	Callan Large Cap Growth
Number of Holdings	69	444	50
Issue Diversification	8.8	9.3	9.8
Growth Z Score	0.4	0.3	0.3
Value Z Score	-0.6	-0.5	-0.5
Combined Z Score	1.0	0.8	0.8
Wtd. Median Market Cap.	363.5	446.6	217.7
Forecasted P/E (exc neg)	27.8	26.9	26.8
Price/Book Value	9.1	10.6	7.5
Forecasted Gr. in Earnings	14.6	13.0	13.8
Return on Equity	22.1	28.6	24.4
Dividend Yield	0.6	0.8	0.7

Equity Sector Exposure vs Russell:1000 Growth



Performance shown is gross-of-fees unless otherwise noted.

Firm Overview: T. Rowe Price Associates, Inc.

T. Rowe Price Associates, Inc. ("T. Rowe Price") was established in 1937 by Thomas Rowe Price, Jr. In April 1986, T. Rowe Price became a publicly traded corporation. In December 2000, T. Rowe Price reorganized its operations into a holding company structure and became a subsidiary of T. Rowe Price Group, Inc., a Maryland corporation. The firm offers a multi-asset product line with a broad array of investment options across asset classes and investment styles.

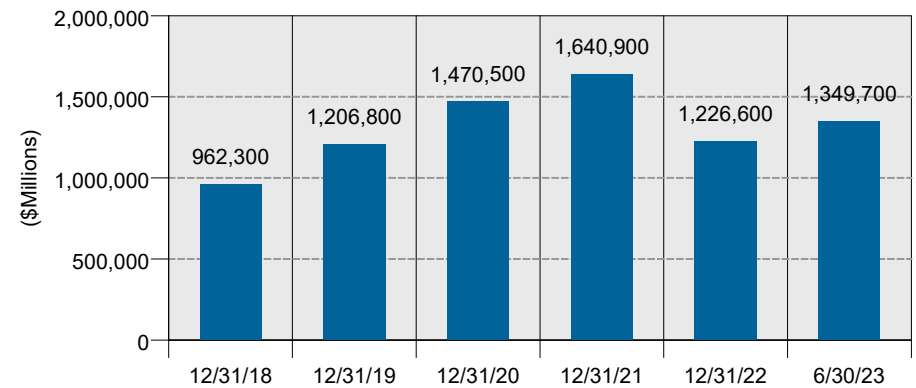
Firm	Contact
T. Rowe Price Associates, Inc. 100 East Pratt Street Baltimore, MD 21202	Andrew Gospodarek (415) 772-1105 andrew.gospodarek@troweprice.com

Ownership	Founded	Portfolio Managers	Analysts
Publicly Owned	1937	166	382

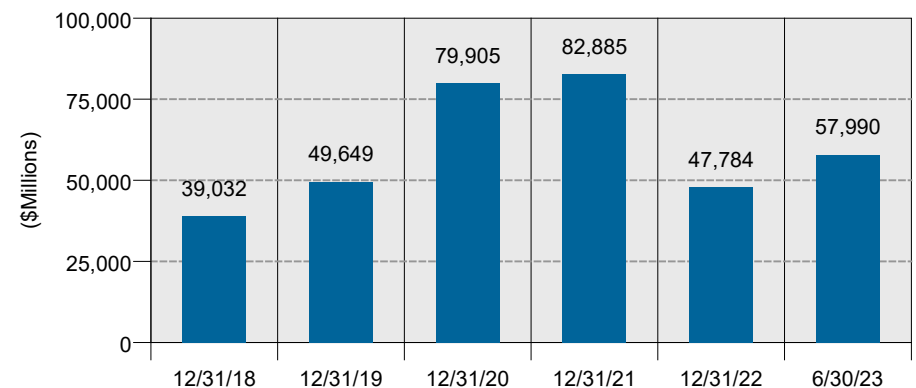
Total Firm Asset Breakdown

Domestic	\$(mm)	Client Type	\$(mm)
Equity	631,467	Corporate	82,220
Fixed Income	140,958	Public(Govt)	49,205
Balanced	444,697	Union/Multi-Employer	954
Total	1,217,122	Foundation/Endowment	6,997
		Health Care	1,620
Global	\$(mm)	Insurance	16,214
Equity	96,991	High Net Worth	5,604
Fixed Income	25,745	Sub-Advised	184,822
Balanced	9,842	Other	1,002,064
Total	132,578	Total Org Assets	1,349,700
		Total Defined Contribution	56,027

Total Firm Asset Growth (\$mm) as of June 30, 2023



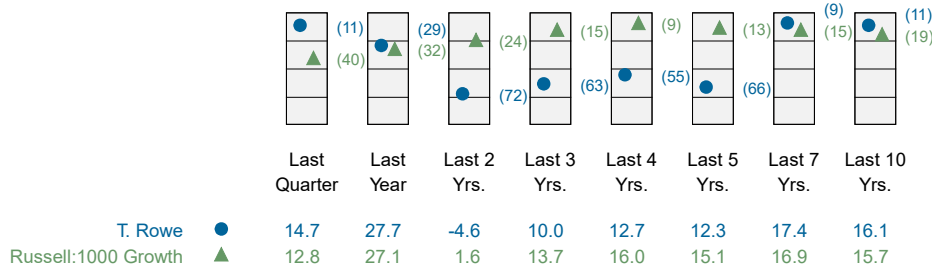
Total Product Asset Growth (\$mm) as of June 30, 2023



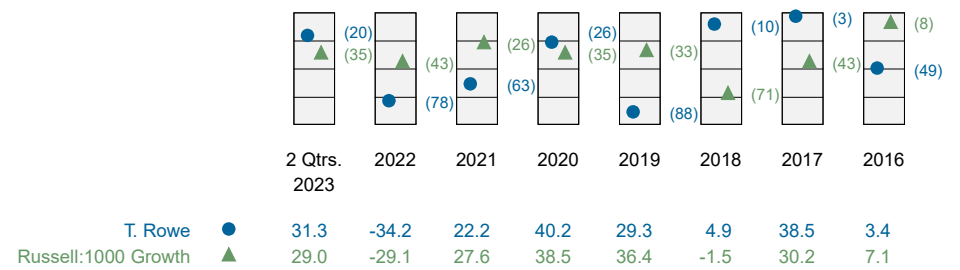
Client Type AUM Total does not include DC assets.

Product Overview: T. Rowe

Returns vs. Callan Large Cap Growth

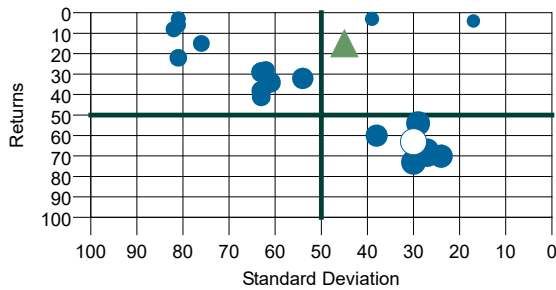


Calendar Year Returns



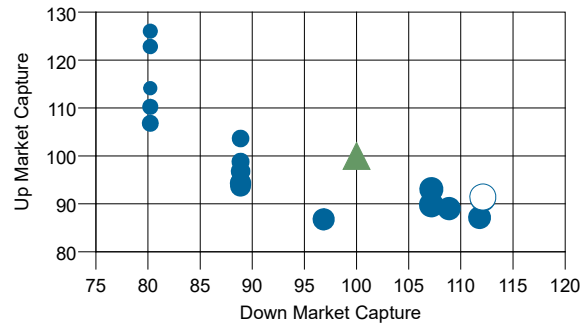
Return and Risk Rankings vs. Callan Large Cap Growth Group

Rolling 3 Year for 5 Years



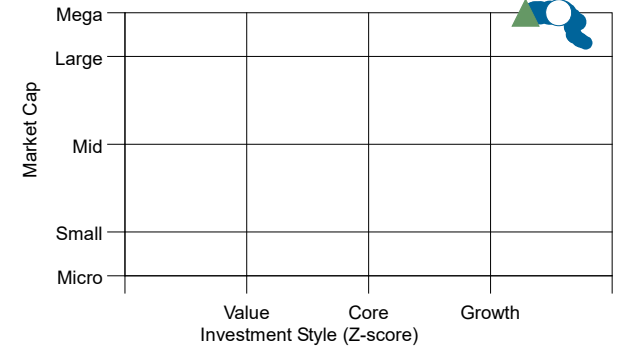
Upside/Downside Capture

Rolling 3 Year for 5 Years



Holdings Based Style Map

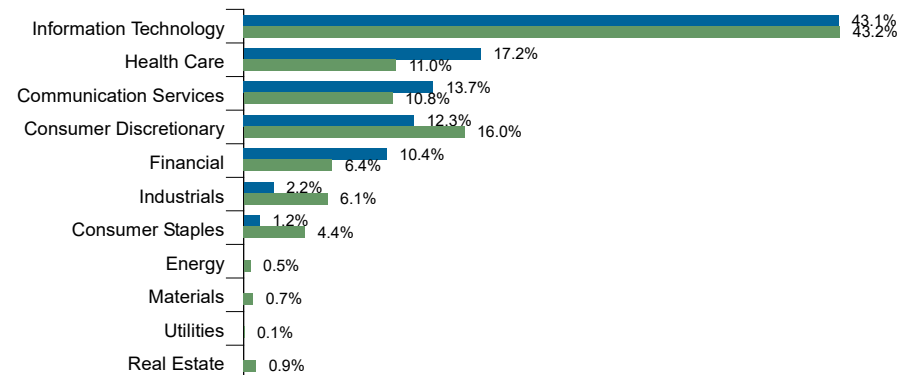
Rolling 1 Year



Portfolio Characteristics

	T. Rowe	Russell:1000 Growth	Callan Large Cap Growth
Number of Holdings	52	444	50
Issue Diversification	7.0	9.3	9.8
Growth Z Score	0.4	0.3	0.3
Value Z Score	-0.5	-0.5	-0.5
Combined Z Score	0.9	0.8	0.8
Wtd. Median Market Cap.	450.1	446.6	217.7
Forecasted P/E (exc neg)	27.4	26.9	26.8
Price/Book Value	6.8	10.6	7.5
Forecasted Gr. in Earnings	14.8	13.0	13.8
Return on Equity	20.9	28.6	24.4
Dividend Yield	0.5	0.8	0.7

Equity Sector Exposure vs Russell:1000 Growth



Performance shown is gross-of-fees unless otherwise noted.

Firm Overview: William Blair & Company LLC

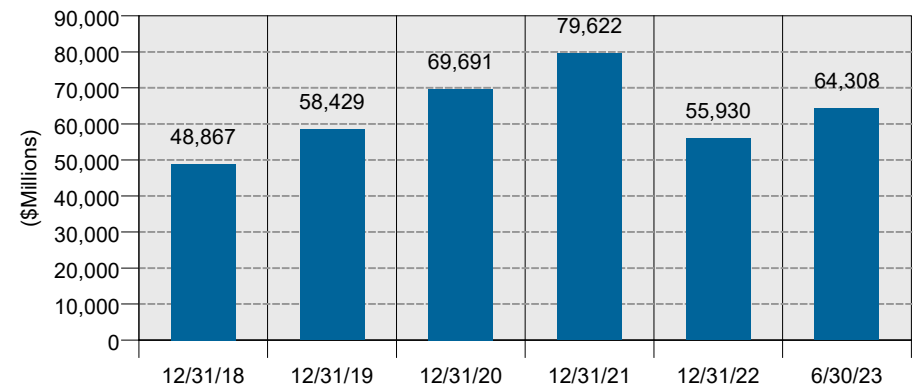
William Blair was founded in 1935 by William McCormick Blair and was registered under the Investment Advisors Act of 1940 in 1947. The entity housing the institutional investment management business is William Blair Investment Management, LLC which was registered as an investment adviser under the Act in 2014. The firm is 100% active employee owned. William Blair is headquartered in Chicago and now has offices around the world.

Firm		Contact	
William Blair & Company LLC The William Blair Building 150 North Riverside Plaza Chicago, IL 60606		Wally Fikri (312) 364-8089 wfikri@williamblair.com	
Ownership	Founded	Portfolio Managers	Analysts
Employee Owned	1935	30	40

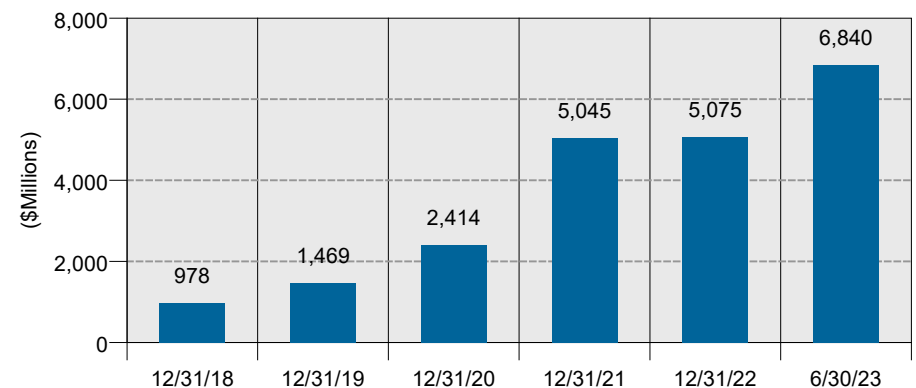
Total Firm Asset Breakdown

	\$(mm)	Client Type	\$(mm)
Domestic			
Equity	25,699	Corporate	12,834
Total	25,699	Public(Govt)	19,401
		Union/Multi-Employer	3,050
Global	\$(mm)	Foundation/Endowment	6,105
Equity	38,359	High Net Worth	40
Fixed Income	249	Wrap Account	302
Total	38,608	Sub-Advised	9,993
		Other	12,584
		Total Org Assets	64,308

Total Firm Asset Growth (\$mm) as of June 30, 2023



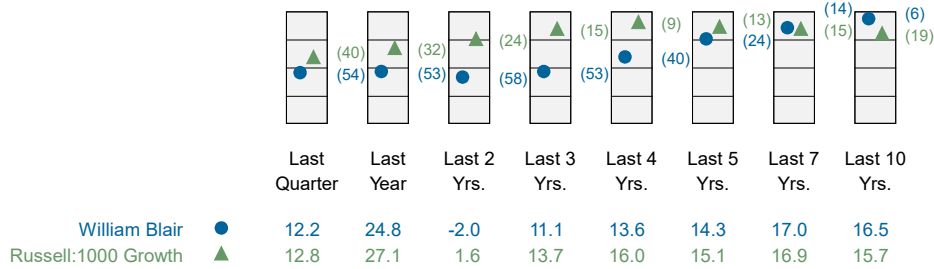
Total Product Asset Growth (\$mm) as of June 30, 2023



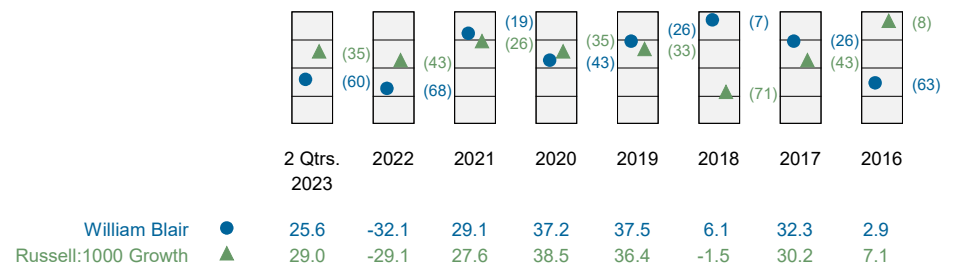
Client Type AUM Total does not include DC assets.

Product Overview: William Blair

Returns vs. Callan Large Cap Growth

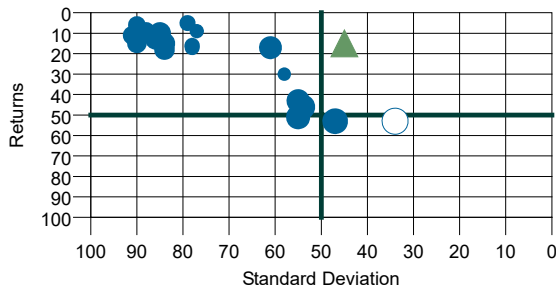


Calendar Year Returns



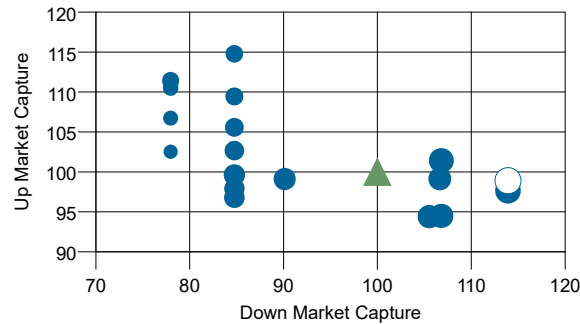
Return and Risk Rankings vs. Callan Large Cap Growth Group

Rolling 3 Year for 5 Years



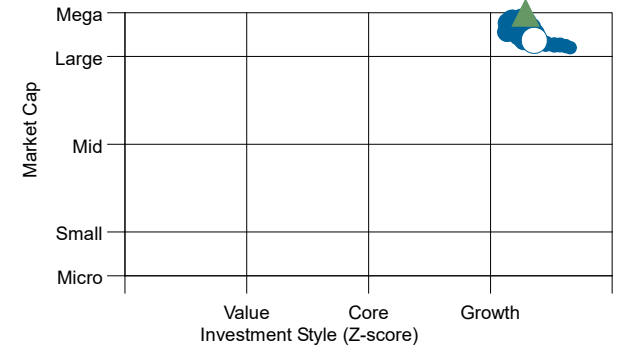
Upside/Downside Capture

Rolling 3 Year for 5 Years



Holdings Based Style Map

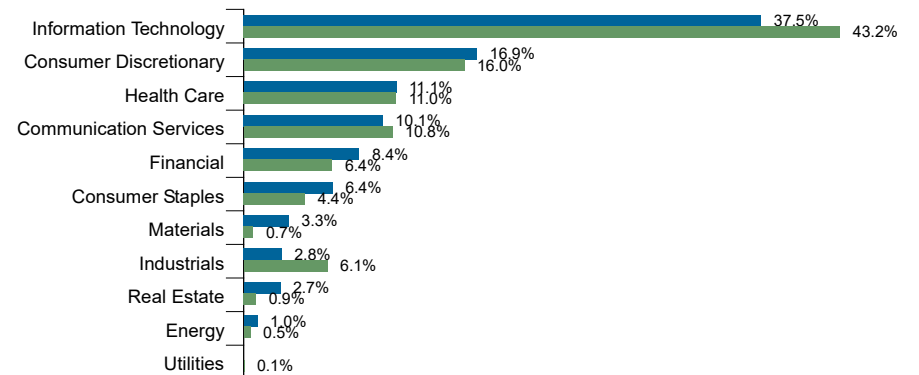
Rolling 1 Year



Portfolio Characteristics

	William Blair	Russell:1000 Growth	Callan Large Cap Growth
Number of Holdings	33	444	50
Issue Diversification	7.9	9.3	9.8
Growth Z Score	0.3	0.3	0.3
Value Z Score	-0.5	-0.5	-0.5
Combined Z Score	0.9	0.8	0.8
Wtd. Median Market Cap.	205.6	446.6	217.7
Forecasted P/E (exc neg)	28.8	26.9	26.8
Price/Book Value	7.6	10.6	7.5
Forecasted Gr. in Earnings	15.0	13.0	13.8
Return on Equity	23.3	28.6	24.4
Dividend Yield	0.7	0.8	0.7

Equity Sector Exposure vs Russell:1000 Growth



Performance shown is gross-of-fees unless otherwise noted.

Firm Overview: Winslow Capital Management, LLC

Winslow Capital Management (WCM) commenced operations on June 12, 1992. Final SEC registration was completed June 25, 1992. On November 20, 2008, WCM reached an agreement to become a wholly owned subsidiary of Nuveen Investments. The transaction closed December 26, 2008.

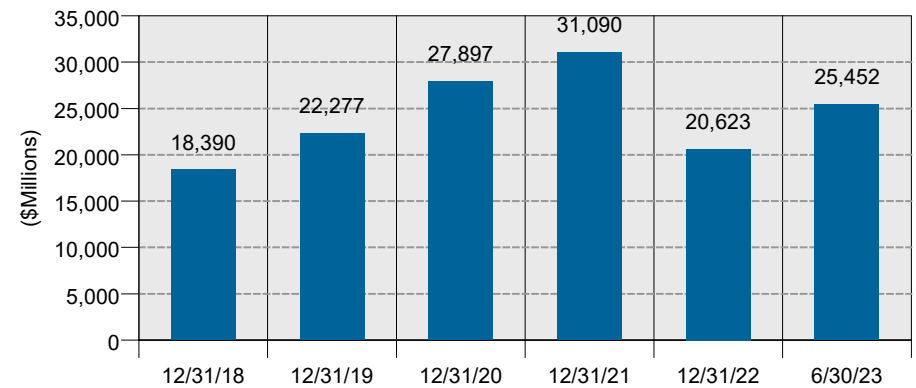
Firm	Contact
Winslow Capital Management, LLC 4400 IDS Center 80 South Eighth Street Minneapolis, MN 55402	Megan Anderson 612-376-9100 manderson@winscap.com

Ownership	Founded	Portfolio Managers	Analysts
Subsidiary	1992	6	5

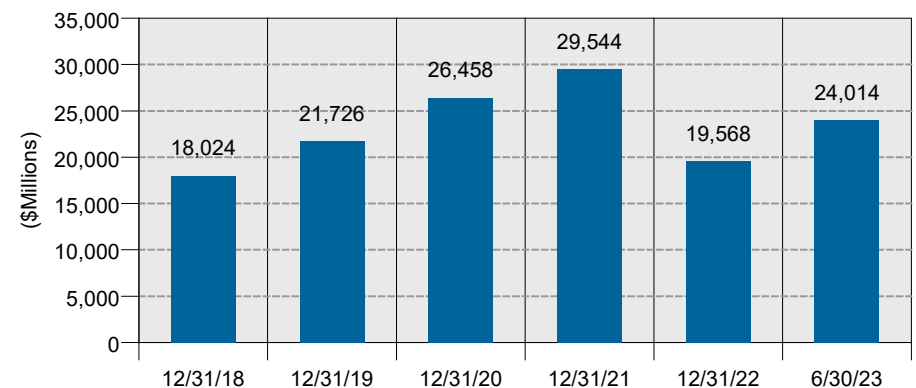
Total Firm Asset Breakdown

Domestic	\$(mm)	Client Type	\$(mm)
Equity	24,958	Corporate	389
Alternatives	494	Public(Govt)	650
Total	25,452	Union/Multi-Employer	75
		Foundation/Endowment	71
Global	\$(mm)	Health Care	342
		Insurance	64
		Wrap Account	4,639
		Sub-Advised	18,728
		Other	494
		Total Org Assets	25,452
		Total Defined Contribution	508

Total Firm Asset Growth (\$mm) as of June 30, 2023



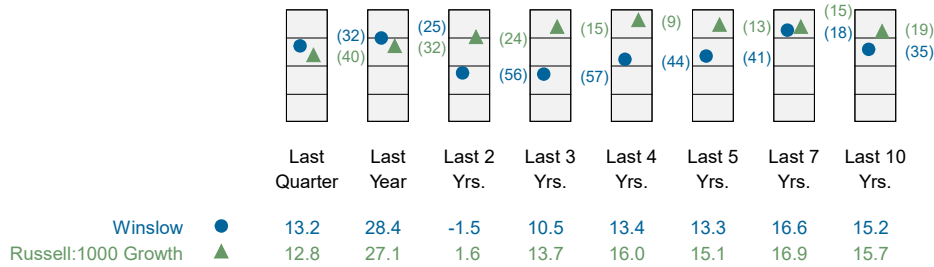
Total Product Asset Growth (\$mm) as of June 30, 2023



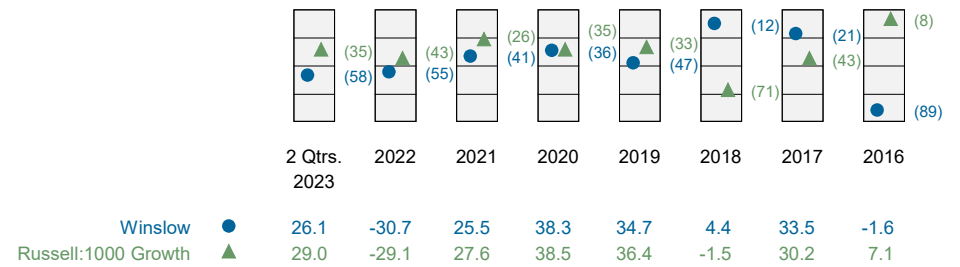
Client Type AUM Total does not include DC assets.

Product Overview: Winslow

Returns vs. Callan Large Cap Growth

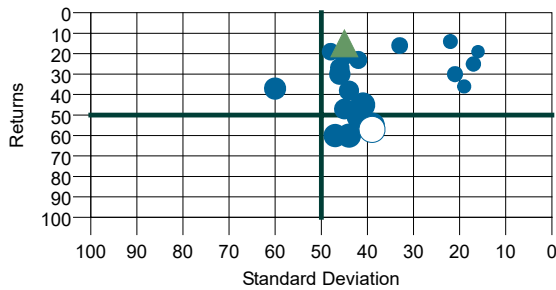


Calendar Year Returns



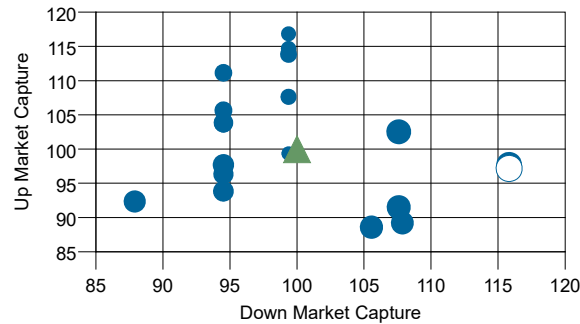
Return and Risk Rankings vs. Callan Large Cap Growth Group

Rolling 3 Year for 5 Years



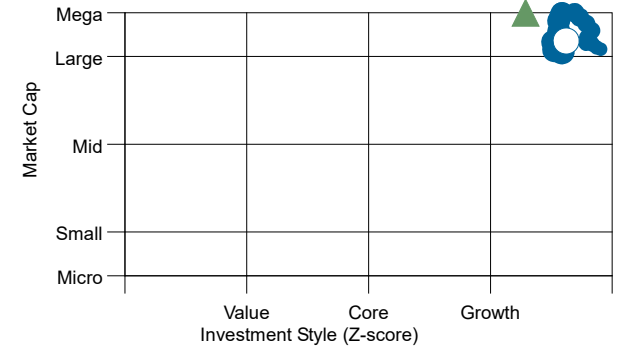
Upside/Downside Capture

Rolling 3 Year for 5 Years



Holdings Based Style Map

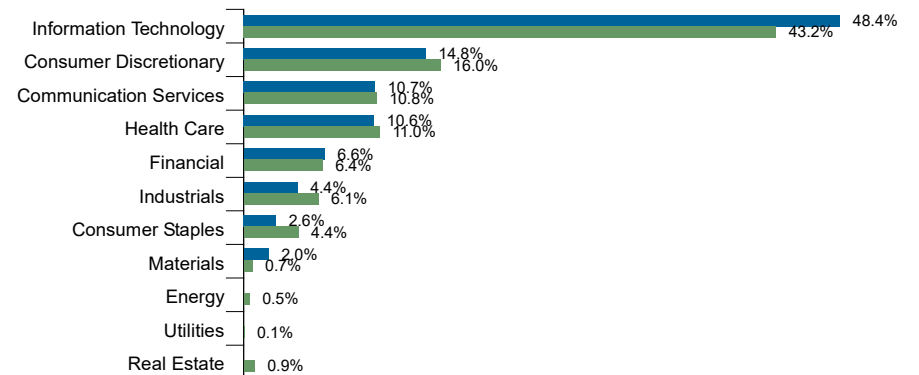
Rolling 1 Year



Portfolio Characteristics

	Winslow	Russell:1000 Growth	Callan Large Cap Growth
Number of Holdings	43	444	50
Issue Diversification	9.2	9.3	9.8
Growth Z Score	0.4	0.3	0.3
Value Z Score	-0.6	-0.5	-0.5
Combined Z Score	1.1	0.8	0.8
Wtd. Median Market Cap.	362.5	446.6	217.7
Forecasted P/E (exc neg)	31.1	26.9	26.8
Price/Book Value	9.5	10.6	7.5
Forecasted Gr. in Earnings	14.3	13.0	13.8
Return on Equity	23.3	28.6	24.4
Dividend Yield	0.5	0.8	0.7

Equity Sector Exposure vs Russell:1000 Growth



Performance shown is gross-of-fees unless otherwise noted.

Definitions

Alpha measures a portfolio's return in excess of the market return adjusted for risk. It is a measure of the manager's contribution to performance with reference to security selection. A positive alpha indicates that a portfolio was positively rewarded for the residual risk which was taken for that level of market exposure.

Beta measures the sensitivity of rates of portfolio returns to movements in the market index. A portfolio's beta measures the expected change in return per 1% change in the return on the market. If a beta of a portfolio is 1.5, a 1 percent increase in the return on the market will result, on average, in a 1.5 percent increase in the return on the portfolio. The converse would also be true.

Combined Z Score is the difference between the MSCI Growth Z Score and the MSCI Value Z Score (Growth - Value). A significant positive Combined Z Score implies significant "growthiness" in the stock or portfolio. A Combined Z Score close to 0.00 (positive or negative) implies "core-like" style characteristics, and a significantly negative Combined Z Score implies more "valueyness" in the stock or portfolio.

Correlation measures the degree to which two variables are associated. Correlation is a commonly used tool for constructing a well-diversified portfolio. Traditionally, equities and fixed-income asset returns have not moved closely together. The asset returns are not strongly correlated. A balanced fund with equities and fixed-income assets represents a diversified portfolio that attempts to take advantage of the low Correlation between the two asset classes. The value for Correlation ranges from +1.0 to -1.0. A positive Correlation means that the two variables move, to a degree, in the same manner or direction, and a negative Correlation means that the variables move, to a degree, in the opposite manner or direction. A Correlation of +1.0 (-1.0) means the two variables move in exactly the same (opposite) direction.

Coupon Rate is the market value weighted average coupon of all securities in the portfolio. The total coupon payments per year are divided by the total portfolio par value.

Dividend Yield reflects the total amount of dividends paid out for a stock over the proceeding twelve months divided by the closing price of a share of the common stock.

Downside Risk differentiates between "good risk" (upside volatility) and "bad risk" (downside volatility). Whereas standard deviation captures both upside and downside volatility, downside risk measures only the volatility of returns below the target. Returns above the target are assigned a deviation of zero. Both the frequency and magnitude of underperformance affect the amount of downside risk.

Effective Yield is the actual total annualized return that would be realized if all securities in the portfolio were held to their expected maturities. Effective yield is calculated as the internal rate of return, using the current market value and all expected future interest and principal cash flows.

Effective Duration is one measure of the portfolio's exposure to interest rate risk. Generally, the higher a portfolio's duration, the more that its value will change in response to interest rate changes. The option adjusted duration for each security in the portfolio is calculated using models which determine the expected stream of cash-flows for the security based on various interest rate scenarios.

Definitions (continued)

Excess Correlation is the correlation of a portfolio's excess return to another portfolio's excess return. Excess return is the portfolio return minus the benchmark return. For instance Excess Correlation could measure the correlation of Manager A's return in excess of a benchmark with Manager B's return in excess of the same benchmark. Excess Correlation is used to indicate whether different managers outperform a market index at the same time.

Excess Return is the portfolio return minus the benchmark return.

Excess Return Ratio is a measure of risk adjusted relative return. This ratio captures the amount of active management performance (value added relative to an index) per unit of active management risk (tracking error against the index.) It is calculated by dividing the manager's annualized cumulative excess return relative to the index by the standard deviation of the individual quarterly excess returns. The Excess Return Ratio can be interpreted as the manager's active risk/reward tradeoff for diverging from the index when the index is mandated to be the "riskless" market position.

Forecasted Growth in Earnings is a measure of a company's expected long-term success in generating future year-over-year earnings growth. This growth rate is a market value weighted average of the consensus (mean) analysts' long-term earnings growth rate forecast for each company in the portfolio. The definition of long-term varies by analyst but is limited to a 3-8 year range. This value is expressed as the expected average annual growth of earnings in percent.

Forecasted P/E is a forward-looking valuation measure of a company's common stock. It encapsulates the amount of earnings estimated for next year per dollar of current share price. This value is calculated by dividing the present stock price of each company in the portfolio by the consensus (mean) analysts' earnings forecasts for the next year. These earnings estimates are for recurring, non-extraordinary earnings per primary common share. The individual P/E stock ratios are then weighted by their respective portfolio market values in order to calculate a weighted average representative of the portfolio as a whole.

Growth Z Score is a holdings-based measure of the "growthiness" of an individual stock or portfolio of stocks based on fundamental financial ratio analysis. The MSCI Growth Z Score is an aggregate score based on the growth score of five separate financial fundamentals: Long Term Forward Earnings Growth, Short Term Forward Earnings Growth, Current Internal Growth ($ROE * (1 - \text{payout ratio})$), Long Term Historical Earnings Growth, and Long Term Historical Sales Growth.

Information Ratio measures the manager's market risk-adjusted excess return per unit of residual risk relative to a benchmark. It is computed by dividing alpha by the residual risk over a given time period. Assuming all other factors being equal, managers with lower residual risk achieve higher values in the information ratio. Managers with higher information ratios will add value relative to the benchmark more reliably and consistently.

Issue Diversification is the number of stocks (largest holdings) making up half of the market value of the total portfolio.

Market Capitalization (Weighted Median / Weighted Average) - Market capitalization is the market value of a company's outstanding shares. This figure is found by taking the stock price and multiplying it by the total number of shares outstanding. The weighted median market cap is the point at which half of the market value of the portfolio is invested in stocks with a greater market cap, and consequently the other half is invested in stocks with a lower market cap. Weighted average market cap for a portfolio is defined as the sum of each of the security's weight in the portfolio multiplied by its intrinsic market capitalization.

Definitions (continued)

Price to Earnings Ratio (P/E) is a measure of value for a company. It is equal to the price of a share of common stock divided by the earnings per share for a twelve-month period.

Price to Book Value (P/B) is a measure of value for a company. It is equal to the market value of all the shares of common stock divided by the book value of the company. The book value is the sum of capital surplus, common stock, and retained earnings.

Quality Rating is a way to measure the credit quality as determined by the individual security ratings. The ratings for each security are compiled into a composite rating for the whole portfolio. Quality symbols range from AAA (highest investment quality and lowest credit risk) to D (lowest investment quality and highest credit risk).

R-Squared (R²) is a statistical measure that indicates the extent to which the variability of a security or portfolio's returns is explained by the variability of the market. The value will be between 0 and 1. The higher the number, the greater the extent to which portfolio returns are related to market return.

Residual Risk is the unsystematic, firm-specific, or diversifiable risk of a security or portfolio that can be reduced by including assets that do not have similar unique risk. It is the portion of the total risk of a security or portfolio that is unique to the security or portfolio itself and is not related to the overall market.

Return on Equity (ROE) is a measure of a company's profitability, specifically relating profits to the equity investment employed to achieve the profits. Return on Equity focuses on the returns accruing to the residual owners of a company, the equity holders. It is equal to income divided by total common equity. Income is after all expenses, including income taxes and minority interest, but before provision for dividends, extraordinary items, and discontinued operations. Common equity includes common stock outstanding, capital surplus, and retained earnings.

Rising/Declining Periods is determined by evaluating the cumulative relative sub-asset class index performance to that of the broader asset class index. For example, in determining the Growth Style cycle, the S&P 500 Growth Index (sub-asset class) performance is compared to that of the S&P 500 Index (broader asset class). The analysis determines if a significant "cycle reversal" has occurred over a period. If the magnitude of the cumulative relative return is greater than one standard deviation when the number of periods is four or more quarters-or two standard deviations for periods less than 4 quarters-a significant reversal has occurred. The process is repeated until all the different combinations of recent periods are evaluated, and a break point is determined.

Sharpe Ratio is a measure of risk-adjusted return. It is calculated by subtracting the "risk-free" return (usually 3 Month Treasury Bill) from the portfolio return and dividing the resulting "excess return" by the portfolio's risk level (standard deviation). The result is a measure of return gained per unit of risk taken.

Stability Score is calculated as the difference between the Defensive and Dynamic scores and can range from -1 to +1. A stability score of +1 indicates a Low Risk and High Quality portfolio (or stock), whereas, a stability score of -1 indicates a High Risk and Low Quality portfolio (or stock). The underlying variables that drive the stability scores are Total Return Volatility, Debt/Equity Ratio, Earnings Volatility and Return on Assets and together encompass both observed price risk and current balance sheet risk.

Definitions (continued)

Standard Deviation is a statistical measure of portfolio risk. It reflects the average deviation of the observations from their sample mean. Standard deviation is used as an estimate of risk since it measures how wide the range of returns typically is. The wider the typical range of returns, the higher the standard deviation of returns, and the higher the portfolio risk. If returns are normally distributed (i.e., has a bell shaped curve distribution) then approximately 2/3 of the returns would occur within plus or minus one standard deviation from the sample mean.

Style Map (Holdings Based) - Morgan Stanley Capital International (MSCI) has developed security-level style scores which are based on multiple fundamental ratios that classify stocks as "value" or "growth." On a relative basis we can match these to a manager's portfolio holdings to get a score for the portfolio that is more reliable and current than traditional returns-based regression analysis. Using the combined Z score and weighted median market cap, the holdings based style map allows for viewing manager style in a two dimensional space.

Tracking Error is a statistical measure of a portfolio's risk relative to an index. It reflects the standard deviation of a portfolio's individual quarterly or monthly returns from the index's returns. Typically, the lower the Tracking Error, the more "index-like" the portfolio.

Up Market (Down Market) Capture is a measure of relative performance in up-markets (down-markets). It is determined by the index which has an Up Capture (Down Capture) ratio of 100% when the index is performing positively (negatively). If a manager captures more than 100% of the rising (declining) market it is said to be "offensive" ("defensive").

Value Z Score is a holdings-based measure of the "valueyness" of an individual stock or portfolio of stocks based on fundamental financial ratio analysis. The MSCI Value Z Score is an aggregate score based on the value scores of three separate financial fundamentals: Price/Book, Price/Forward Earnings, and Dividend Yield.

Weighted Average Life is the weighted average time remaining until the principal is paid off for all securities in a portfolio.

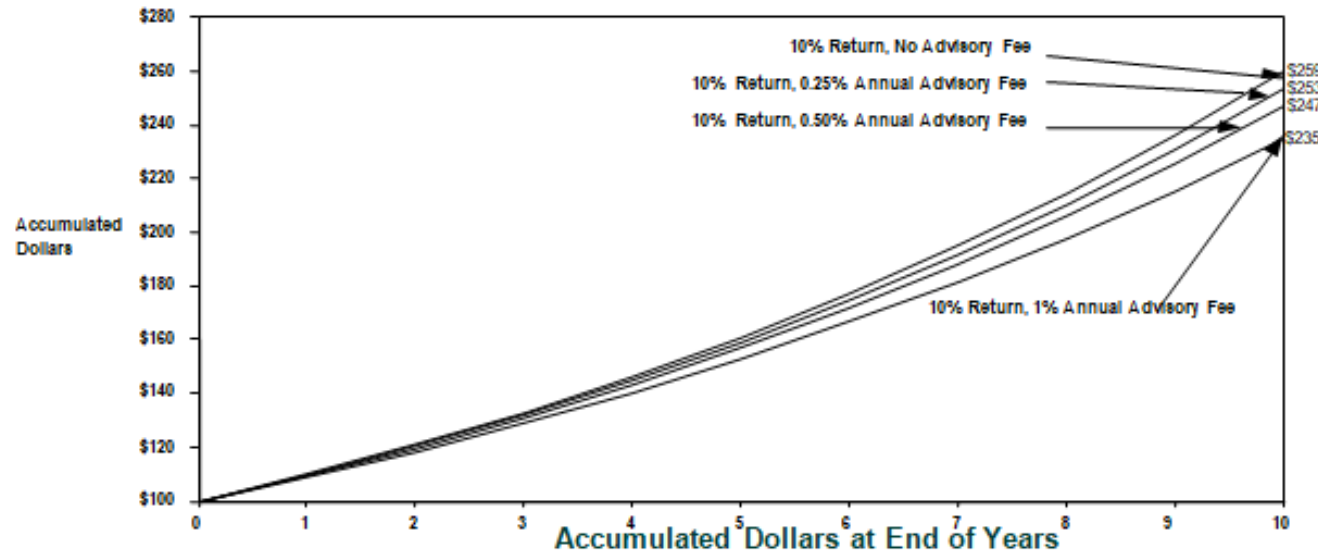
Advisory Fee Disclosure Statement

The preceding report has been prepared for the exclusive use of the Arkansas Public Employees' Retirement System. Unless otherwise noted, performance returns contained in this report do not reflect the deduction of investment advisory fees. The returns in this report will be reduced by the advisory fees and any other expenses incurred in the management of an investment account. The investment advisory fees applicable to the advisors listed in this report are described in Part II of each advisor's form ADV.

The following graphical and tabular example illustrates the cumulative effect of investment advisory fees on a \$100 investment growing at 10% over ten years. Fees are assumed to be paid monthly.

In addition to asset-based investment advisory fees, some strategies may include performance-based fees ("carry") that may further lower the returns realized by investors. These performance-based fees can be substantial, are most prevalent in "Alternative" strategies like hedge funds and many types of private markets, but can occur elsewhere. The effects of performance-based fees are dependent on investment outcomes and are not included in the example below.

The Cumulative Effect of Advisory Fees



	1	2	3	4	5	6	7	8	9	10
No Fee	110.0	121.0	133.1	146.4	161.1	177.2	194.9	214.4	235.8	259.4
25 Basis Points	109.7	120.4	132.1	145.0	159.1	174.5	191.5	210.1	230.6	253.0
50 Basis Points	109.5	119.8	131.1	143.5	157.1	172.0	188.2	206.0	225.5	246.8
100 Basis Points	108.9	118.6	129.2	140.7	153.3	166.9	181.8	198.0	215.6	234.9

10% Annual Return Compounded Monthly, Annual Fees Paid Monthly.

Callan Client Disclosure

The table below indicates whether one or more of the candidates listed in this report is, itself, a client of Callan as of the date of the most recent quarter end. These clients pay Callan for educational, software, database and/or reporting products and services; refer to our Form ADV 2A for additional information. Given the complex corporate and organizational ownership structures of investment management firms and/or trust/custody or securities lending firms, the parent and affiliate firm relationships are not listed here if they don't separately contract with Callan.

The client list below may include parent companies who allow their affiliates to use some of the services included in their client contract (eg, educational services including published research and attendance at conferences and workshops). Because Callan's investment manager client list changes periodically, the information below may not reflect changes since the most recent quarter end. Fund sponsor clients are welcome to request a complete list of Callan's investment manager clients at any time.

As a matter of policy, Callan follows strict procedures so that investment manager client relationships do not affect the outcome or process by which Callan's searches or evaluations are conducted.

Firm	Is an Investment Manager Client of Callan*	Is not an Investment Manager Client of Callan
Federated Hermes, Inc.	X	
Jennison Associates LLC	X	
J.P. Morgan Asset Management	X	
T. Rowe Price Associates, Inc.	X	
William Blair & Company LLC	X	
Winslow Capital Management, LLC		X

*Based upon Callan manager clients as of the most recent quarter end.

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Callan undertakes no obligation to update the information contained herein except as specifically requested by the client.

Past performance is no guarantee of future results.

Memorandum

To: Arkansas Public Employees Ret System Board of Trustees (“APERS”)
From: John Jackson, Callan LLC; Brianne Weymouth, Callan LLC
Date: October 24, 2023
Subject: US. Large Cap Growth Equity Search Summary

OVERVIEW

Callan's investment manager searches are conducted through a disciplined, repeatable process. Below you will find a summary of process for the APERS U.S. Large Cap Growth Equity Search:

I. Identify Client and Manager Candidate Considerations

At the onset of each search, Callan meets with the client to review and document any specific characteristics sought in an investment manager. This includes factors such as the manager's strategy and approach, organizational structure, minimum/maximum assets under management, performance criteria relative to an appropriate index and peer group, and risk tolerance. These factors serve as the basis for developing the appropriate quantitative and qualitative screening criteria.

II. Conduct Quantitative Screening

After beginning with the broad universe of candidates (e.g., 327 strategies in this search), we narrow the field using client-specified screening criteria to screen our proprietary database. Screens examine numerous quantitative factors including performance, volatility, correlation with the existing structure, and assets under management. We screen performance across multiple time periods, market cycles, and statistical analyses to identify consistency of returns and avoid performance bias.

III. Perform Qualitative Screening

Qualitative screening focuses the field even further. Qualitative screens examine manager type, organizational history, depth and experience of investment personnel, investment process and style, client servicing capability and resource allocation. We generate qualitative assessments based on manager research conducted by our dedicated asset class specialists and generalist consultants through regular in-house meetings, conference calls, and on-site manager due diligence.

IV. Oversight Committee Review of Preliminary Recommendations

Our Manager Search Committee - an oversight body that is comprised of 10 senior consultants - reviews each search to thoroughly examine candidates and ensure Callan has met the client's specified criteria. Collectively, the Manager Search Committee vets the candidates and identifies semi-finalist candidates to present to the client. Six (6) semi-finalist candidate firms were selected for this search. All candidates were suitable for this assignment.

V. Review Semi-finalist Candidates

A manager evaluation document comparing the six (6) semi-finalist candidates was prepared by Callan for the APERS (see attached). Callan reviewed the report with APERS' staff to highlight important considerations in conducting the search, compare the manager candidates, and assist in the identification of finalist candidates. The following three candidates were identified for advancement:

- J.P. Morgan Asset Management
- T. Rowe Price Associates, Inc.
- William Blair & Company LLC

Key distinguishing features were:

- Greatest stability in organizational and team structure
- Degree of diversification benefit compared to existing growth manager (i.e. lower correlation)
- Most successful long-term performance
- Strongest risk/return characteristics

VI. Interview Finalists

APERS Staff interviewed the finalists and selected William Blair's Large Cap Growth Strategy as the product to be recommended to the Board of Trustees.

TO: Arkansas Public Employees Retirement System Board of Trustees
FROM: Carlos Borromeo, Chief Investment Officer
DATE: October 24, 2023
SUBJECT: Domestic Large Cap Growth ("LCG") Investment Manager search

As reported to the Board by the APERS Investment Committee, the Board terminated INTECH as one of the Board's Large Cap Growth ("LCG") Investment Managers. INTECH was a quantitative (quant") manager meaning there was zero human element involved in their stock selection. The stock selection process was all computer/machine ("black box") model-driven.

The Board requested that the Board's General Investment Consultant, Callan, and the system's CIO start the process for a search to replace INTECH.

LCG is a very crowded space. There were numerous qualified investment managers. The Callan process started with 327 different LCG strategies, and 175 different investment managers. Callan conducted the quantitative screening, as well as qualitative screening. Callan's oversight committee vetted the candidates and presented a list of six firms.

The Investment Subcommittee met on August 15, 2023. Trustee Basset motioned that staff interview three of the six firms and make a recommendation for hire to the full Board at the September meeting. Mr. Brady seconded the motion. The motion passed.

Executive Director Fecher and I interviewed three firms. I also did an internal due diligence process. It is pertinent that the new investment manager fit well with the existing APERS domestic equity stable of managers. The three firms interviewed were William Blair ("Blair"), JP Morgan ("JPM"), and T. Rowe Price ("TRP").

Information and data that was relevant included:

- Diversification vs APERS existing LCG investment manager across different time horizons,
- Comparison of how the managers invested and managed different market risks during the most recent inflationary environment (inflation), the different market and economic cycles (cyclicality), and the most recent interest hike environment (duration).
- Exposure to "momentum" stocks which means picking stocks that have been doing well and expecting those stocks to continue doing well. Example: the Super 6 or Magnificent 7 stocks.
- Tracking error versus the RU1000G Index
- The contribution/detraction from the manager's investment performance due to the Super 6 names, of the Magnificent 7 names.
- Team/Tenure/Stability. Lead PM background and experience.

The data showed the following information

- Correlation to APERS existing LCG manager(s), JPM had the highest correlation, Blair had the lowest correlation.
- Tracking error to the RU100G, Blair had the best tracking error, meaning, the least likely to be a benchmark hugger.
- Blair was the best momentum factor diversifier when compared to the existing APERS investment managers.
- Regarding exposure to the Magnificent 7, Blair had the lowest exposure to the Magnificent 7, which implies their strong ability to pick other stocks extremely well.
- JPM and Blair investment team lead PM have the longest tenure. TRP's lead PM is the least tenured.

Additional notes:

JP Morgan

- Highest correlation to APERS existing managers across all time horizons, 3y, 5y, 10y, and 20y
- Over last 5y similar investment style to APERS existing managers when it comes to inflation and higher interest rates
- Over last 5y similar investment style to APERS existing managers when it comes to economic cycles.
- Same momentum factor as the APERS existing managers.
- Tracking error to RU1000G is tight.
- Lead PM is engineer by education, and software development. Joined firm in 2003
- Portfolio does not do well when momentum gains strength. Very similar to the current APERS investment managers.

Willaim Blair

- Over last 5yr Lowest correlation to APERS existing managers.
- Over last 5yr when it comes to economic cycles, their style best compliments APERS existing managers.
- Over last 5yr when it comes to the interest rate environment, inflation, their style best compliments APERS existing managers.
- Had has the lowest exposure to the Magnificent 7, and yet their performance has been solid which suggests that they are better stock pickers than the other 2 managers.
- Manager has been underweight momentum.
- Best tracking error to the RU1000G
- One of Lead PMs (Jim Golan) started in research, specifically in I.T. research.
- Firm is 100% employee owned.

T. Rowe Price

- Over last 5yr their style had a bias to interest rate risk. This severely impeded their performance over the past 2yr as interest rates rose significantly.
- They have experienced organizational change, which suggests that tenure is a bigger issue.
- Same momentum factor as the APERS existing managers.
- Tracking error to RU100G is tight.
- Shortest tenured PM. Background is healthcare. Applied Physics degree.



ARKANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM

BOARD OF TRUSTEES

INVESTMENT POLICY STATEMENT



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ARKANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM

INVESTMENT POLICY

I. INTRODUCTION

The Arkansas Public Employees Retirement System ("APERS") was established by the General Assembly in 1957 as a multi-employer defined benefit plan for State of Arkansas employees. The administration and control of the system shall be vested to a thirteen member Board of Trustees as defined in Title 24 of the Arkansas Code of 1987 which contains the statutes that govern the Arkansas Public Employees Retirement System. Including other responsibilities, the Board of Trustees may do any and all things necessary for the proper administration of the system and carry out make effective the provisions of this Title 24, and provide for the administrative direction and control of the executive director and such clerical staff as may be required in the administration of the system.

II. STATEMENT OF PURPOSE

The assets of the Arkansas Public Employees Retirement System ("APERS") shall be invested as determined from time to time by the APERS Board. The purpose of the Investment Policy Statement ("IPS") is to establish a framework that sets forth the investment objectives of APERS and the investment policies to be followed in carrying out those objectives.

III. STATUTORY AUTHORITY

The primary statutory authority for the investment activities of APERS is found in Sections 24-2-601 through 24-2-619 of the Arkansas Code, as amended. Trustees shall invest and manage trust assets as a prudent investor would, by considering the purposes, terms, distribution requirements, and other circumstances of the trust. Trustees who have special skills or expertise, have a duty to use those special skills or expertise (24-2-611). The prudent investor rule shall be applied by each party serving in a fiduciary capacity for APERS.

IV. INVESTMENT OBJECTIVES

The investment objectives shall be: (1) the prudent investment of APERS' assets in order to provide benefits to participants and their beneficiaries; and (2) to maximize total return - consistent with prudent risk taking on the amounts available to provide such benefits. For this purpose, short-term fluctuations in value shall be considered secondary to long-term investment considerations. This objective is not to be a goal from year to year, but is intended as a long-term guideline to those involved in investing the Trust's assets. This policy does not require the elimination of risk, but instead strives to achieve a balance between risk and return. Some risk must be taken to achieve desired levels of return. The objective is to ensure that economic and investment risk taken is prudent and properly managed within a framework of contributions from each asset class. The investments of the APERS' Fund shall be diversified in order to mitigate the risk of large losses, and will be implemented with an appropriate number of managers whose investment styles are varied enough to balance the overall risk of the Fund in consideration of the return objective.

V. ASSET ALLOCATION (BY MAJOR CATEGORIES)

Asset allocation provides for diversification of assets in an effort to maximize the Fund's investment return consistent with its risk portfolio. Allocation targets and ranges are established and referred to as "Policy" portfolio.

Asset Class	Market Value Exposure	
	Target	Range
Domestic Equity + Convertible Bonds	39%	34% - 44%
International Equity	17%	12% - 22%
Cash + Fixed Income	21%	16% - 26%
Real Assets	16%	11% - 21%
Private Equity	5%	0% - 10%
Other Private Markets	2%	0%- 7%
	100%	

The Board of Trustees shall receive an Asset Allocation Review prepared by the Investment Consultant at least annually to determine if the Fund allocation is consistent with the level of risk and volatility acceptable to the Board. This review will include the Fund's expected return and risk outlook based on capital market assumptions developed by the Investment Consultant.

Periodically, (e.g., three to five years, or when a significant change to the Fund's assets or liabilities has occurred), an Asset-Liability Study will be conducted by the Investment Consultant and presented to the Board. This Study will integrate actuarial liability projections with the asset allocation model in a simulation exercise that examines the financial condition of the Fund consistent with appropriate investment planning horizon.

Should the amount invested in an asset class fall outside the target ranges, Staff will rebalance to the allocation within the specified ranges. Within these broader asset classes, the Trustees shall establish commitment levels to various investment styles, as the dynamics of the Fund's financial needs dictate.

VI. PORTFOLIO GUIDELINES

Through selecting, timing and weighing investments, the Fund's objective is to maximize the total return of the account assets, through price appreciation and/or yield, consistent with the level of risk taken. In determining the appropriate risk posture for the Fund, consideration should be given to the overall risk characteristics of the Fund, and the extent to which components of the Fund are diversified. Additionally, the Board of Trustees establishes the following specific guidelines:

- A. Securities may not be purchased on margin.
- B. The System may establish a Securities Lending Program subject to restrictions established by the Board.
- C. Each investment manager will be required to invest within the specific guidelines and parameters set by the Board of Trustees.
- D. APERS recognizes legal responsibility to seek to invest in the Arkansas economy, while realizing its primary, legal, and fiduciary commitment is to beneficiaries of the retirement system, under the prudent investor rule.

- E. It is the intent of APERS to include qualified minority (African-American, Hispanic American, American Indian, Asian-American, or Pacific Islander-American), female, and disabled owned businesses in the Fund's investment manager selection process. The inclusion of the above managers in the selection process will be recorded and periodically reviewed by APERS staff and presented to the Board as requested. This process is intended to ensure all investment managers are given equitable consideration in the manager selection process in keeping with the fiduciary obligations of the APERS Board for the beneficiaries and annuitants of the System.

VII. CUSTODIANSHIP OF SECURITIES

Securities may be held by the State Treasurer of, under the authority granted by Arkansas Code 24-2-606. APERS may establish an arrangement with a financial institution, as specified by this Code, for the custodianship of its securities subject to the approval of the Board of a Request for Proposal as well as a proposed contract.

VIII. ROLES AND RESPONSIBILITIES

A. Custodian Bank

The custodian bank shall, by nominee arrangement, hold any and all securities for the beneficial interest of the APERS fund. Custodial activities will include, but are not limited to, the purchase, registration, and sale of stocks, bonds, notes, and other securities, as well as the collection of any income. Furthermore, the custodian bank shall sweep idle cash balances in short-term investment vehicles that are consistent with the investment guidelines promulgated by OCC Reg 9 and/or SEC Rule 2a-7. Dividends, interest, proceeds from sales, new contributions and all other moneys are to be invested or reinvested promptly.

B. Administrative Staff

The Administrative Staff, at the direction of the Board of Trustees, shall execute all investment transactions for any assets managed in-house. In addition, they are responsible for communicating the necessary information to fulfill contractual obligations with the investment professionals. The Administrative Staff shall also communicate relevant Board decisions to investment managers, custodian bank, actuary, and consultant.

C. Board of Trustees

The Board of Trustees shall oversee the total investment program. The Board shall approve the investment policy and provide overall direction to the Administrative Staff in the execution of the investment policy. The Board of Trustees shall review and approve or disapprove investment recommendations not governed by Investment Policy prior to their execution. The Board shall also review and approve investment policy changes. Furthermore, the Board shall review and approve or disapprove any contracts of a financial nature, when performed by other than APERS' staff persons, such as, although not limited to, those for investment counselors, custodial arrangements, option programs, and security lending.

IX. TOTAL FUND PERFORMANCE MEASUREMENT STANDARDS

The Total Fund Performance and that of the underlying strategies will be measured against appropriate benchmarks and peer groups. Benchmarks establish target investment exposures and provide a relative measure to gauge whether a particular strategy is meeting its goals and objectives. The Total Fund Policy Benchmark is an aggregation of the asset class benchmarks weighted by the policy portfolio.

- A. The Total Fund's objective is to rank in the upper 50th percentile compared to the results of other similarly managed public fund portfolios measured over a market cycle.
- B. The Total Fund's objective is to generate an annualized total return that exceeds the return of the Policy Benchmark, after managers' fees, over a market cycle.

X. PROXY VOTING

The Board has directed that the individual investment managers will be responsible for voting proxies in the best interest of APERS. Each investment counselor is responsible for maintaining records of how each proxy is voted. A written report of proxy voting will be provided to the Board within 30 days from the end of each quarter. In general, each investment counselor is expected to vote for improvements in corporate governance, for the alignment interests of corporate management with shareholder interests, and for equal access to the management proxy card. A detailed explanation will be given for each instance where the proxy is voted against these concepts or against management.

XI. REVIEW OF INVESTMENT PROCESS

- A. Periodically, the Board will review the investment results achieved by each manager over a market cycle (typically, a three to five-year time horizon) to determine whether:
 1. The investment managers performed in adherence to the investment philosophy and policy guidelines set forth herein.
 2. The investment managers performed satisfactorily when compared with:
 - a. Its appropriate benchmark.
 - b. Other similarly managed funds.
- B. In addition to reviewing each investment manager's results, the Board will re-evaluate, from time to time, its progress in achieving the total fund, equity, fixed-income, and international equity segments objectives previously outlined.
- C. The periodic re-evaluation also will involve an evaluation of the continued appropriateness of:
 1. The manager structure;
 2. The allocation of assets among the managers; and
 3. The investment objectives for the Fund's assets. The Board may appoint investment consultants to assist in the ongoing evaluation process. The consultants selected by the Board are expected to be familiar with the investment practices of other similar retirement plans and will be responsible for suggesting appropriate changes in the Fund's investment program over time.

XII. STATEMENT OF INVESTMENT POLICY

- ♦ ADOPTED 1985
- ♦ AMENDED NOVEMBER 2004
- ♦ AMENDED JULY 2007
- ♦ AMENDED MAY 2010
- ♦ AMENDED NOVEMBER 2019
- ♦ REVIEWED NOV 2020



ARKANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM

BOARD OF TRUSTEES

INVESTMENT POLICY STATEMENT



**ARKANSAS PUBLIC EMPLOYEES' RETIREMENT SYSTEM
BOARD OF TRUSTEES**

INVESTMENT POLICY STATEMENT



Adopted by the Board of Trustees
Month DD, YYYY

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 - ADOPTED 1985
 - AMENDED NOVEMBER 2004
 - AMENDED JULY 2007
 - AMENDED NOVEMBER 2019
 - REVIEWED NOVEMBER 2020

ARKANSAS PUBLIC EMPLOYEES' RETIREMENT SYSTEM

INVESTMENT POLICY STATEMENT

I. INTRODUCTION

The Arkansas Public Employees Retirement System ("APERS" or "System") was established by the Arkansas General Assembly in 1957 as a multi-employer defined benefit retirement plan for State of Arkansas employees. The administration and control of the system shall be vested in a thirteen-member Board of Trustees ("board" or "trustees"). APERS is governed by the laws of the State of Arkansas and its governing statutes, rules, and regulations. Arkansas State Code "Title 24. Retirement and Pensions." contains the statutes that govern the Arkansas Public Employee Retirement System. Including other responsibilities, the Board of Trustees may do any and all things necessary for the proper administration of the system and carry out make effective the provisions of this Title 24. Arkansas Code §24-4-104(d)(2) states that the Board shall appoint an executive director who shall be the executive administrative officer of the Arkansas Public Employees Retirement System. Arkansas Code §24-4-105 provides for the administrative direction and control of the executive director and clerical staff as may be required in the administration of the system. Arkansas Code §24-2-201 et seq. and §§24-2-601 through 24-2-619 are the primary statutory authority for the investment activities of APERS.

II. STATEMENT OF PURPOSE

Arkansas Code § 24-2-613(b)(1) Trustees shall develop an investment policy. This policy shall be a written statement of goals for the fund and rules to be followed to achieve those goals.

The Investment Policy Statement ("IPS" or "Statement") incorporates the laws, documents, principles, and standards that guide the management of the System's investments. This IPS governs the investment assets of APERS and is established to provide a framework for the management of those assets. The Executive Director and Chief Investment Officer shall administer this Statement pursuant to laws of the State of Arkansas, and the investment policies adopted by the APERS Board of Trustees. This IPS is intended to be binding upon all persons with authority over the System's assets, including external investment managers/advisors, custodians, consultants, and staff.

The Board intends for this IPS to be a dynamic document subject to review and refinement. Policies may be modified to reflect changes in assets and investment strategy, benefit changes, and economic conditions.

The purpose of this Statement is to:

- A. Set forth the investment policies, objectives, and guidelines the Board of Trustees determines to be appropriate, prudent, and in consideration of the System's needs, to comply with all current state laws and to direct the System's investment activities.
- B. Establish criteria to evaluate the System's investment performance. (Section VIII)
- C. Communicate investment policies, objectives, guidelines, and performance criteria to staff, external investment managers/advisors, consultants, custodians, and any/all other interested parties.
- D. Serve as a review document to guide ongoing oversight of the System's investments for compliance with the laws of Arkansas and applicable federal laws.
- E. Demonstrate the Retirement Board's fulfillment of its responsibilities to manage the investments of the System solely in the interest of members and their beneficiaries.
- F. Document the Retirement Board's fulfillment of its overall fiduciary responsibilities with respect to the investment of System assets

III. STATUTORY GOVERNING AUTHORITY

Arkansas Code § 24-2-602 states that the boards of trustees of the Arkansas Public Employees Retirement System...shall have full power to invest and reinvest the moneys of the respective systems and to hold, purchase, sell, assign, transfer, or dispose of any investments so made as well as the proceeds of the investments and moneys.

Board of Trustees

The Board is responsible for establishing the policy for the system and overseeing the investment of the portfolio and the expenditures required to meet system obligations. Specifically regarding investments, the board takes action based upon information presented at Board and/or Investment Finance Subcommittee meetings and upon recommendations made by staff. Arkansas Code §24-2-611 states "Trustees shall invest and manage trust assets as a prudent investor would, by considering the purposes, terms, distribution requirements, and other circumstances of the trust. The trustees shall exercise reasonable care, skill, and caution. Investment and management decisions respecting individual assets must be evaluated not in isolation but in the context of the portfolio as a whole and as a part of an overall investment strategy having risk and return objectives reasonably suited to the trust."

Investment Finance Subcommittee (IFS)

The APERS Board of Trustees created the Investment Finance Subcommittee in 2023. The APERS Board of Trustees delegated the IFS with investment and finance oversight responsibilities. The IFS makes recommendations to the Board and supports the Board's deliberations on topics covered and set forth in this policy. The IFS approves or disapproves investments recommended by the ED and CIO.

Executive Director (ED)

Arkansas Code §24-4-104(d)(2) and (3) authorize the board to appoint an executive director who shall be the executive administrative officer of the system and shall also be ex officio secretary of the board. The board may delegate to the executive director any of the powers and duties vested in or imposed upon it by law.

Chief Investment Officer (CIO)

The CIO is part of the investment staff, reports to the ED, works with the Board as well as the IFS on policy-related issues and directs the investment program consistent with this IPS and within applicable state and federal laws. The CIO and ED implement this policy and board decisions made in connection with this policy. The CIO and the investment staff manage daily cash-flow and liquidate assets as necessary to pay benefits. The board delegates duties to the CIO to perform that are consistent with this investment policy statement.

Investment Staff

The investment staff, under the direction of the CIO, are responsible for the daily operation and implementation of the investment program. Investment staff are also responsible for supporting the investment program at the strategic, compliance and operational levels through the establishment of appropriate procedures as well as implementation of tools and processes to implement, measure and monitor the investment program as further described in this IPS and the internal investment department policy and procedure document.

Custodian Bank

Arkansas Code §24-2-606: Securities may be held by the State Treasurer or, APERS may establish an arrangement with a financial institution for the custodianship of its securities subject to the approval of the Board.

The Custodian Bank serves as the master custodian of the System's assets and is responsible for maintaining the official book of record under the supervision of the CIO and the investment staff, calculating investment performance, and serving as an additional layer of risk control in the safekeeping of System's assets.

IV. DELEGATED AUTHORITY

The Board maintains the ultimate oversight of the system's assets. The Board requires all trustees, the executive director, the chief investment officer, and the investment staff to make all investment decisions in the best interest of the system.

The Investment Finance Subcommittee of the Board of Trustees is authorized to invest in or otherwise sell or dispose of any system asset, without regard to amount, when the

transaction is recommended by the ED and the CIO and the transaction, in the judgement of the IFS, is in compliance with the IPS. All investments will be reported at a regular board meeting by the chair of their designee to the full board of trustees.

The ED and CIO are authorized to invest the funds of the system in accordance with the directions, and Investment Policy Statement established by the board. The ED and CIO are responsible to exercise the delegated investment decisions adopted by the board, and applicable laws of Arkansas, and the policies contained in the policy.

To improve the efficient use of its resources, the board delegates the day-to-day investment operations and implementation through the ED, CIO, and investment staff. The ED and CIO are responsible for performing these delegated duties consistent with the IPS and as otherwise directed by the Board.

The ED and CIO are authorized to: manage the assets so as to assure sufficient cash is available at all times to pay the system's benefits as they come due; assure that the system's asset allocation as approved by the board is achieved and maintained; and that sufficient funds are available for the funding of investments which have been authorized by the board, the Investment Finance Subcommittee, and the ED and CIO, and to take actions necessary or required to achieve the board's objectives.

The ED and CIO have investment discretion to invest the system's cash in short-term fixed income securities, and/or money market funds for the purpose to provide liquidity, enhance income, and provide for temporary investment of system funds.

The ED and CIO are authorized by the board to retain and terminate investment managers within each asset class, with the approval of the Investment Finance Subcommittee, as necessary to achieve the investment objectives of the system. The size of an investment made is subject to specific limitations provided for the asset class applicable to the investment. No existing investment manager shall be terminated without the Investment Finance Subcommittee approval, except for exigent circumstances that include, without limitation, departure of key persons, regulatory events, bankruptcy or insolvency, fraud or other bad acts, in each case, as determined by the ED and CIO exercising reasonable judgement.

V. INVESTMENT OBJECTIVES

The APERS Board of Trustees has a fiduciary responsibility to the members and beneficiaries of the system. All investment transactions undertaken on behalf of the System will be for the sole benefit of the members and their beneficiaries, for the exclusive purpose of providing benefits to them and defraying administrative expenses.

§24-1-101 All assets and income of any state-supported retirement system

administered by an agency of the State of Arkansas shall be held, invested, or disbursed for the exclusive purpose of providing for benefits, investment management, and administrative expenses... and shall not be encumbered for or diverted to any other purposes.

The System's long-term objective is to earn an average rate of return greater than the rate of return of representative indices for individual asset classes but no less than the actuarial assumption rate. The indices are identified in the Asset Allocation Policy. Volatility of returns, or risk, for the System, as measured by standard deviation of investment returns, should be commensurate with the level of returns expected to be achieved over a long period of time.

Assets will be invested with a total return posture given appropriate consideration for portfolio volatility (risk) and liquidity.

The actuarial consultant recommends the actuarial return assumption for the investment program after consulting with APERS staff regarding the expectations surrounding the long-term investment returns available from a well-diversified investment portfolio. The Board is responsible for approving an Actuarial Return Assumption and accepting that the commensurate risk posture of that portfolio is in line with the Board's Risk Tolerance.

The specific investment return objective is to maximize the probability of achieving the Actuarial Return Assumption without exceeding the Risk Tolerance of the Board.

The Actuarial Return Assumption is adopted by the Board and will be evaluated annually by the Board.

VI. ASSET ALLOCATION POLICY

Asset allocation determines the different asset classes in the investment portfolio and the distribution of funds among those asset classes. As fiduciaries, the board of trustees have a duty to diversify the investments of the fund to minimize and manage risk, while maximizing the investment return. Arkansas Code §24-2-612. Trustees shall diversify the investments of the trust unless the trustees reasonably determine that, because of special circumstances, the purposes of the trust are better served without diversifying.

The Board recognizes that the most important determinant of long-term return and risk is the asset allocation decision. Approximately 80% to 90% of the variability in returns of a fund across time is expected to be attributable to the asset allocation decision. The remaining ten percent 10% to 20% is expected to be attributable to either selection of individual assets, investment managers, or market timing.

Strategic Asset Allocation is constructed based on long-term asset class forecasts with targets to maintain a set combination of asset classes. The Board's Strategic Target

Allocation is intended to reflect, and be consistent with, the return objective and risk tolerance expressed in this IPS. It is designed to provide the highest probability of meeting or exceeding the Board's objectives at a controlled level of risk and liquidity that is acceptable to the Board. In establishing the asset allocation, the Board considers APERS' ability to withstand not only the long-term risk of underperforming its return objective but also short and intermediate-term volatility in investment performance and fluctuations in the financial condition of the fund.

Strategic Target Allocation should deliver:

1. A representation of the board's long-term return objective with its implied risk tolerance;
2. Sufficient confidence for the board to "stay the course" given extreme market moves;
3. A benchmark against which to measure performance.

The ED and CIO should ensure the risk representations in the capital markets models and assumptions used by the Board in setting the Strategic Target Allocation and Risk Tolerance are consistent internally, consistent with industry best practice, and consistent with the Board's investment risk philosophy and with the risk analytics used for monitoring portfolio risk.

The Executive Director and Chief Investment Officer consistently review the asset allocation as well as the asset class benchmarks and will recommend any changes/updates as deemed necessary.

The Strategic Target Allocation, asset classes, targets, and acceptable ranges as determined and approved by the Board to facilitate the achievement of long-term investment objectives within acceptable risk parameters are in the table to follow. Target allocations may not be attained at any specific point in time as actual asset allocation is often dictated by current and anticipated financial market conditions, as well as any actions and/or decisions by the board. Asset classes will not be "out of alignment" during any transition period, e.g., due to changes in asset allocation policy.

The Board approves and adopts the expected returns and risk assumptions, as well as the asset allocation mix. The most recent Expected Returns and Risk Assumptions, as well as the Asset Allocation are shown in Exhibits 1 and 2. The staff will continually update these exhibits to reflect any action of the board.

Strategic Asset Allocation: Targets and Ranges (See Exhibits 1 and 2)

Note: All ranges for the asset class targets shall be +/- 5%

Asset Class Policy Benchmarks

Asset Class	Policy Benchmark
Domestic Equity + Convertible Securities	Russell 3000 Index
International Equity	MSCI ACWI ex US
Real Assets	CPI-U + 4%
Cash + Fixed Income	Bloomberg Aggregate
Private Equity + Diversified Strategy	each investment will have its own benchmark

Annual Review. The Executive Director and Chief Investment Officer will work with the investment consultant and prepare an Asset Allocation Review for the board to review. The strategic asset allocation will be reviewed annually to determine if the asset allocation remains acceptable to the Board. This annual review will include recent and historical investment experience and consider new developments. This includes a review and revision, where appropriate, of the long-term capital market assumptions regarding expected investment returns, standard deviations, and correlations, and the Board's long-term goals and objectives. A formal asset allocation will be conducted every three to five years, or as needed, or as directed by the board, to verify or amend the targets.

Asset Liability. An Asset-Liability study will be conducted and presented to the board. The study will integrate the actuarial liability projections with the asset allocation model. It is an exercise that examines the financial condition of the fund for consistency with the investment planning horizon. This study should be conducted every three to five years, or when a significant change to the fund's assets or liabilities has occurred, or, as directed by the board.

Rebalancing Policy. The Executive Director and Chief Investment Officer are responsible for a periodic and orderly rebalancing of the portfolio so that asset classes remain within the strategic asset allocation range, and for establishing an orderly rebalancing should one or more of the asset classes fall outside the established range. The goal of the rebalancing policy is to maintain the Board-approved strategic allocation and its risk and return profile. The Board has chosen a rebalancing policy that is governed by allocation ranges rather than time periods. The ranges, specified in the table above, are a function of the volatility of each asset class and the proportion of the total fund allocated to the asset class.

Investment staff will ensure that the integrity of the board's strategic target allocation is preserved through a disciplined process that allows the flexibility to rebalance the portfolio between investment managers within an asset class and between asset classes, within the board-approved ranges, to adjust for market movements and consider current market conditions, or valuations, in portfolio allocations.

Investment staff is responsible for implementing all portfolio re-balancing activities, subject to approval by the CIO, that are appropriate for existing circumstances. Investment staff will consider cash flows, opportunity costs, transaction costs and portfolio disruptions in any rebalancing implementation.

The CIO will report the results of any rebalancing activity to the board upon completion of the rebalance at the next regularly scheduled Board meeting.

Risk Management. APERS will have a risk management program/system to help ensure that investment risk is managed to be consistent with the risk appetite established in this IPS. The CIO establishes and oversees risk management and compliance.

VII. INVESTMENT GUIDELINES

The following guidelines are applicable to the total fund.

- A. Securities may not be purchased on a margin.
- B. Securities may not be sold short.
- C. No single investment may comprise more than 5% of an investment strategy. An exception is for passively managed index products where there is no limitation.
- D. Each investment manager is expected to invest APERS' funds according to the mandate APERS retained them to fulfill and according to state and federal laws.
- E. The fund may establish a Securities Lending Program subject to restrictions established by the Board. The objective of the securities lending program is to generate incremental income from overnight and certain term loans of securities held, subject to guidelines, utilizing a high-quality and reasonably conservative cash collateral re-investment program that safeguards the return of principal and maintains adequate daily liquidity to support trade settlement activity and portfolio restructuring activities. The Board may appoint the custodian bank or a third party to serve as the system's lending agent.
- F. A transition manager may be retained to assist in the transfer of assets from one investment manager to another and serves as a liaison between the CIO and the investment staff, the Custodian, the investment manager distributing assets, and the investment manager receiving assets. This transition may occur either within an asset class or between asset classes. The transition manager will facilitate

clear communication between all parties, work to minimize market impact, trading costs and opportunity cost and may include interim investment management services of account assets for a limited period of time.

The transition manager is required to be a registered investment adviser under the Investment Adviser's Act of 1940 as amended (unless properly exempted from registration by the SEC) or otherwise regulated by an appropriate governmental regulatory oversight organization (unless exempt from such registration requirement), act as a fiduciary to APERS, not delegate such fiduciary responsibility, and provide agency-only execution services. The Transition Manager will provide a detailed post-trade analysis for investment staff.

- G. A risk analytics system, or firm/advisor, may be retained to assist with the CIO with oversight, monitoring, and management of risk in the investment portfolio, as well as to assist to ensure risk representations are consistent.
- H. Under Arkansas Code §24-2-608(b), the Board believes in investing in Arkansas related investments if the investment does not impair the board's fiduciary responsibility or violates §24-2-610, the prudent investor rule.
- I. All investment transactions, which does include the investment manager selection process, will be for the sole benefit of the system. The Board believes that all investment managers should be given equitable consideration in their selection process.

VIII. PERFORMANCE MONITORING

Performance measurement will be based on total rate of return and will be monitored over a sufficient time period to reflect the investment expertise of the investment manager(s) over three to five years. Performance results and evaluation relative to objectives will be reported to the Board on a quarterly basis.

A. Return Expectations

1. Total Portfolio specific performance objectives include, but may not be limited to, the following:
 - a) Achieve a total rate of return over rolling five-year periods meeting or exceeding the Actuarial Return Assumption.
 - b) Exceed an appropriate benchmark reflective of asset class participation over rolling five-year periods (i.e., actual allocation index during the implementation period and Policy Index once fully implemented).
2. Individual Investment Managers
The CIO and the investment consultant(s) will determine performance expectations for each manager. Specific performance objectives for

actively managed strategies include, but may not be limited to, the following:

- a) Exceed an appropriate index or benchmark over rolling five-year periods.
- b) Rank above median in an appropriate universe of managers possessing a similar style over rolling five-year periods.
- c) The CIO and investment consultant will evaluate performance relative to expectations and appropriate peer groups for each private market investment manager.

There may be short-term variations from these objectives. The board believes that over the long-term (market cycle to market cycle), these goals should be attainable.

B. Consequences of Underperformance

If an investment manager's performance falls below expectations, and if the performance fails to improve relative to the standards detailed above and/or qualitative factor changes remain unresolved, the manager may be terminated or the investment redeemed.

IX. PROXY VOTING

The Board has directed that the individual investment managers will be responsible for voting proxies solely in the pecuniary interest of the pension plan. Each investment manager is responsible for maintaining records of how each proxy is voted. A written report shall be provided to the investment staff within 45 days from the end of each quarter. For each vote the report shall contain a vote caption, the plan's vote, the recommendation of company management and, if applicable, the proxy advisor's recommendation. The report(s) shall be posted on the APERS' website.

X. INVESTMENT POLICY STATEMENT

- ADOPTED 1985
- AMENDED NOVEMBER 2004
- AMENDED JULY 2007
- AMENDED MAY 2010
- AMENDED NOVEMBER 2019
- REVIEWED NOVEMBER 2020

2023 Expected Return and Risk Assumptions

Asset Class	2023 Expected Return	2022 Expected Return	Change in Expected Return	Risk
Domestic Equity	7.35%	6.60%	0.75%	18.05%
International Equity	7.45%	6.80%	0.65%	21.25%
Convertible Bonds	7.15%	6.25%	0.90%	14.25%
Fixed Income	4.25%	1.75%	2.50%	4.10%
Real Assets	6.40%	5.80%	0.60%	13.80%
<i>Real Estate</i>	5.75%	5.75%	0.00%	14.20%
<i>Timber</i>	5.40%	5.40%	0.00%	15.60%
<i>Farmland</i>	5.55%	5.50%	0.05%	15.95%
Diversified Strategies	5.55%	4.10%	1.45%	8.45%
Private Equity	8.50%	8.00%	0.50%	27.60%
Cash	2.75%	1.20%	1.55%	0.90%
<i>Inflation (CPI-U)</i>	2.50%	2.25%	0.25%	

Asset Allocation

Adopted Feb. 2023

	Current Policy	Nov 16 Board Meeting: 5% PE (Mix 2)	Change	Today's proposal: 5% PE, 3%Converts	Change
Domestic Equity	33%	35%	2%	36%	3%
International Equity	24%	19%	-5%	17%	-7%
Convertible Bonds	4%	0%	-4%	3%	-1%
Fixed Income	18%	20%	2%	21%	3%
Real Assets	16%	16%	0%	16%	0%
Diversified Strategies	5%	5%	0%	2%	-3%
Private Equity	0%	5%	5%	5%	5%
	100%	100%		100%	
Portfolio Characteristics:					
Expected Return	7.00%	7.07%	0.07%	7.08%	0.08%
Risk	12.60%	12.63%	0.03%	12.65%	0.05%
Sharpe Ratio	0.317	0.322	0.005	0.323	0.006
% Domestic Equity of Public Equity	58%	65%	7%	68%	10%

Chief Investment Officer Report

For the Quarter Ending September 30, 2023



Q3 2023 Summary

The tone from June 2023 continued into the 3rd quarter of 2023:

- The Fed remained “hawkish”.
- The looming government shutdown was averted at the last minute as Speaker McCarthy worked with the opposite aisle to get the bill passed. It did cost him the Speaker position
- The strike by the autoworkers
- A spike in interest rates and oil prices
- The Fed chose to not raise rates at the September meeting. They did indicate higher rates for 2023 and 2024 than was indicated in their June forecast.

Q3 2023 Summary

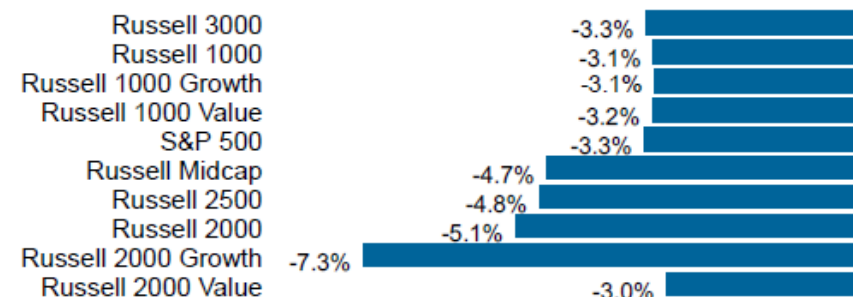
The Bloomberg Agg fell -2.49% for the month of September for its fifth consecutive monthly loss

- Note: It's been a while since the 90-day U.S. T-bill has outperformed the Bloomberg Agg

Returns for Periods ended 9/30/23

	Quarter	YTD	Last Year	5 Years
Fixed Income				
Bloomberg Aggregate	-3.23	-1.21	0.64	0.10
90-day T-Bill	1.31	3.60	4.47	1.72

U.S. Equity: Quarter Ended 9/30/23



For the month of September the S&P 500 fell -4.51%

For the 3rd quarter the S&P 500 fell -3.27%.

All equity indices posted a loss during the quarter.

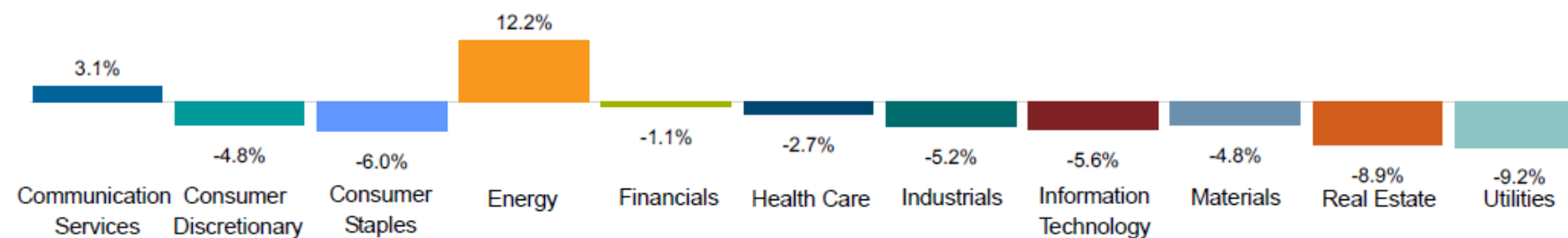
For the quarter, value outperformed growth, buy only by losing less.

For the year, growth continues to lead value.

Q3 2023 Summary

Only 2 sectors posted a positive return: Energy and Communication Services

Industry Sector Quarterly Performance (S&P 500) as of 9/30/23



Mag 7 Stock	Q3 2023 Return
Apple	-11.61%
Microsoft	-7.08%
Meta	4.61%
Tesla	-4.41%
Nvidia	2.84%
Amazon	-2.49%
Google (C Shares)	8.99%
Google (A Shares)	9.32%

The most pronounced laggards for the quarter are considered to be “bond surrogates.”

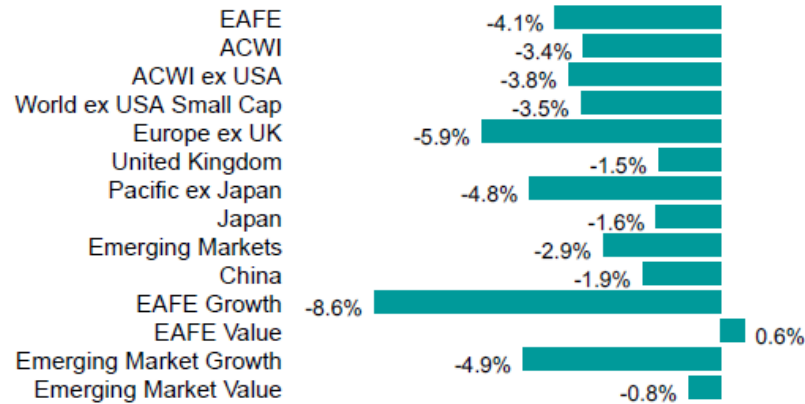
85% of the S&P 500’s 2023 return is attributed to the Mag 7.

For the quarter, the Mag 7 fell -3.83% led by Apple who has been targeted by China.

Q3 2023 Summary

International Equities. Same theme. All indices were in the negative.

Global Equity Returns: Quarter Ended 9/30/23



Concerns are somewhat similar to the U.S.

The European Central Bank raised rates for the 10th consecutive time.

Bank of England kept their key interest rate unchanged for the first time in almost two years.

Asia Pacific is also dealing with higher interest rates.

Japanese stocks gained.

Emerging markets fell as China's recovery remains weaker than expected.

Q3 2023 Summary

	Q3	Calendar	Last
U.S. Equity	2023	Year	1-year
S&P 500	-3.27%	13.07%	21.62%
Russell 1000 Growth	-3.13%	24.98%	27.72%
Russell 1000 Value	-3.16%	1.79%	14.44%
Russell 2000 Index	-5.13%	2.54%	8.93%
Russell 2000 Growth	-7.32%	5.24%	9.59%
Russell 2000 Value	-2.96%	-0.53%	7.84%
Russell 3000 Index	-3.25%	12.39%	20.46%
International Equity			
MSCI EAFE	-4.11%	7.08%	25.65%
MSCI ACWI xUS	-3.77%	5.34%	20.39%
Fixed Income			
Bloomberg Agg	-3.23%	-1.21%	0.64%

	Q3 2023	30-Sep-23	
Domestic Equity	-4.01%	\$ 3,872,081,260	37.8%
International Equity	-4.71%	\$ 2,623,430,264	25.6%
Alternatives	2.22%	\$ 223,616,430	2.2%
Fixed Income	-2.67%	\$ 1,836,696,646	17.9%
Real Assets	-1.50%	\$ 1,443,208,786	14.1%
Cash	1.20%	\$ 250,175,559	2.44%
APERS Total Portfolio	-3.47%	\$ 10,249,208,945	

\$ 10,473,725,330	FY2023	8.83%
\$ 10,042,629,672	FY2022	-10.54%
\$ 11,602,695,185	FY2021	31.49%
\$ 9,093,497,703	FY2020	2.41%
\$ 9,153,121,783	FY2019	5.78%
\$ 8,904,393,859	FY2018	10.25%

CIO Current Concerns			
2 U.S. Allies are involved in war/conflict - In both conflicts, oil is involved			
Ukraine - Russia - Oil			
Israel - Hamas - Iran - Oil			
New Leadership in the U.S. House - Nov 17 Debt Ceiling expires			
Apple guidance - China banning			
Higher Interest Rates have been pressuring stocks - Investors rebalance into fixed income			
Possible/Potential Shocks/Concern	Impact	Probability	Change
Stress in China's property sector	Medium	INCREASED	INCREASE
China's economy slows down	Medium	INCREASED	INCREASE
U.S. Economic Slowdown	High	Medium	Medium
Future U.S. Stocks returns unimpressive	High	Medium	Medium
Tighter financial conditions, possible weaker stock prices, along w surging bond yields could prompt market volatility and lower consumer confidence.			



Glossary of Terminology

The Super 6 = “MANMAT” = Microsoft, Apple, NVIDIA, Meta (facebook), Amazon, Tesla.

Magnificent 7 = “MANMAT” + Alphabet (Google) = MANMAAT

Fed = The U.S. Federal Reserve Bank

S&P 500 = Standard and Poor’s 500

Q3 = Third Quarter

YTD = Year to Date

Bloomberg Agg = Bloomberg Aggregate Index

U.S. T-bill = United States Treasury Bill

Value = Value Stocks

Growth = Growth Stocks

EAFE = Europe Asia Far East

ACWI = All Country World Index

IG = Investment Grade



Executive Summary Third Quarter 2023

Arkansas Public Employees
Retirement System

Brianne Weymouth, CAIA
Senior Vice President

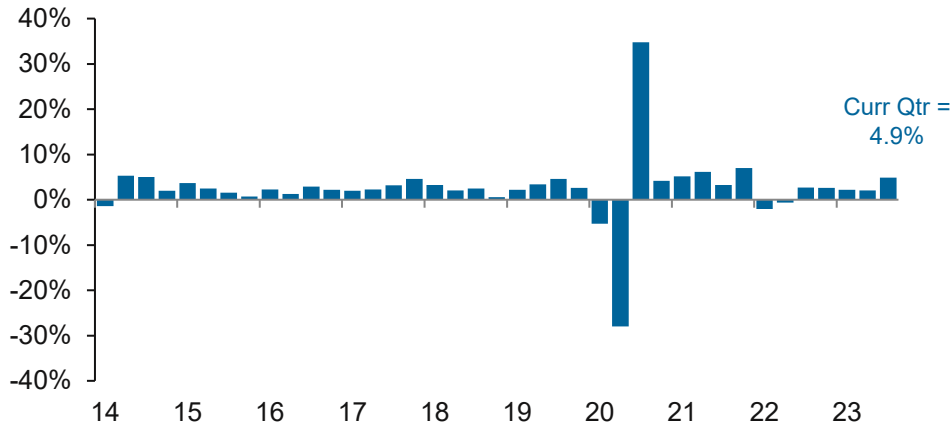
John Jackson, CFA
Senior Vice President

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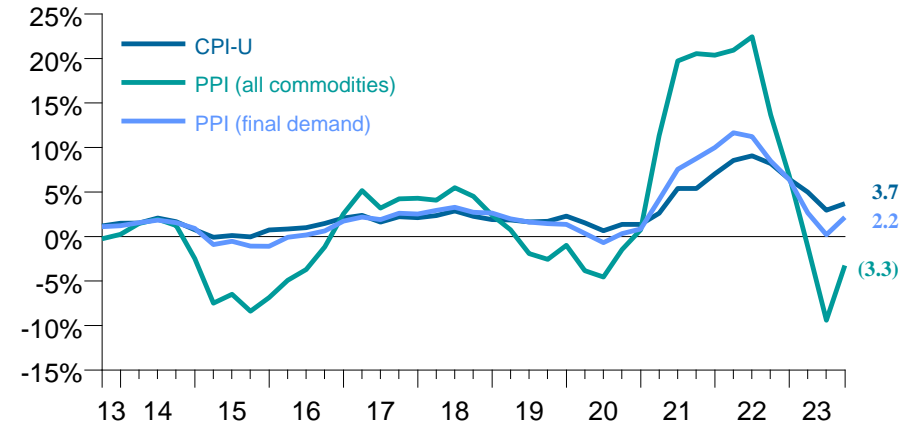
U.S. Economy—Summary

For periods ended 9/30/23

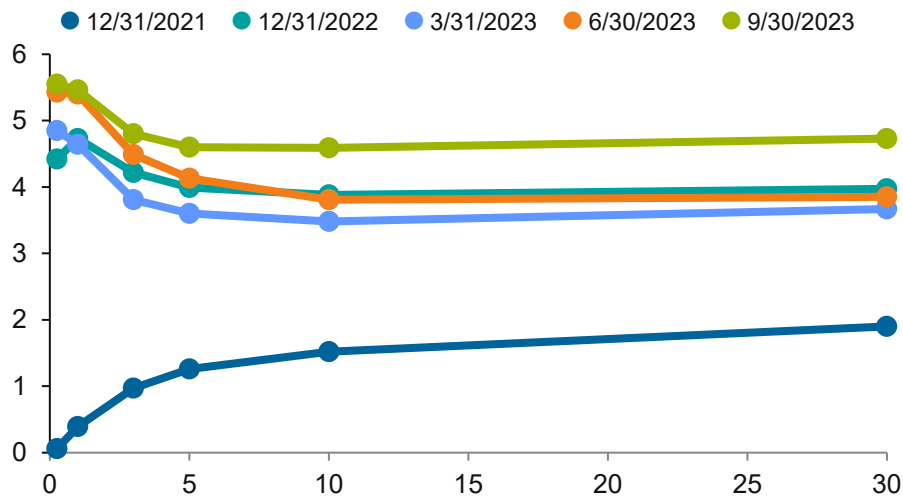
Quarterly Real GDP Growth



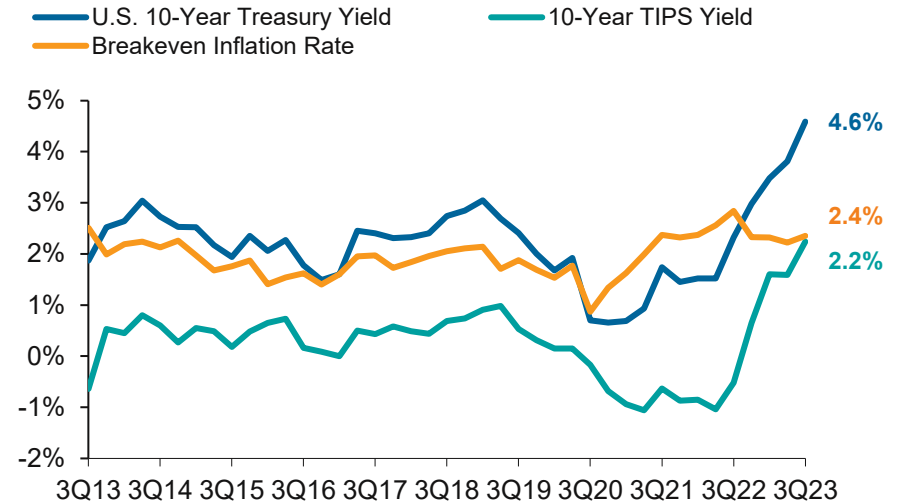
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Historical 10-Year Yields Through 9/30/23



Sources: Bloomberg, Bureau of Labor Statistics, Callan

Equity Markets Down in 3Q, Following Rebound in First Half of 2023

Stocks and bonds still have ground to make up after declines in 2022

S&P 500 down 3.3% in 3Q23.

- Loss through first three quarters of 2022 was 23.9%; rebound in the following three quarters reduced the loss to 2.9% by September, but decline in 3Q shows S&P is still over 7% below 1/2022 high-water mark

Fixed income recovered in first half of 2023 as high inflation began to ease; speculation about interest rate cuts evaporated

- Bloomberg Aggregate: up 3% in 1Q, but declined 0.8% in 2Q and another 3.2% in 3Q as Fed continued to raise rates
- CPI-U: +3.7% year-over year for 3Q, and still up 5.8% since the start of 2022

Economic data defied expectations of recession in 2023; GDP growth came in at 2.1% in 1Q and 2.2% in 2Q, and surged to a stunning 4.9% in 3Q

- Job market remains solid, providing support to Fed efforts to fight inflation

Returns for Periods ended 9/30/23

	Quarter	YTD	Last Year	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	-3.25	12.39	20.46	9.14	11.28	8.09
S&P 500	-3.27	13.07	21.62	9.92	11.91	7.92
Russell 2000	-5.13	2.54	8.93	2.40	6.65	8.00
Global ex-U.S. Equity						
MSCI World ex USA	-4.10	6.73	24.00	3.44	3.84	4.98
MSCI Emerging Markets	-2.93	1.82	11.70	0.56	2.07	--
MSCI ACWI ex USA Small Cap	-1.70	5.03	19.01	2.58	4.35	7.41
Fixed Income						
Bloomberg Aggregate	-3.23	-1.21	0.64	0.10	1.13	3.59
90-day T-Bill	1.31	3.60	4.47	1.72	1.11	1.89
Bloomberg Long Gov/Credit	-9.37	-5.40	-2.93	-1.21	1.94	4.67
Bloomberg Global Agg ex-US	-4.00	-3.20	3.39	-3.10	-1.73	2.04
Real Estate						
NCREIF Property	-1.37	-5.07	-8.39	5.26	7.40	8.31
NCREIF:NFI-ODCE Eq Wt Net	-2.12	-8.42	-13.08	5.22	7.55	6.94
Alternatives						
CS Hedge Fund Index	1.81	3.71	4.66	4.77	4.08	5.96
Cambridge Private Equity*	1.59	3.71	0.39	15.37	14.91	13.67
Bloomberg Commodity	4.71	-3.44	-1.30	6.13	-0.75	2.45
Gold Spot Price	-3.28	2.18	11.61	9.30	3.47	7.60
Inflation - CPI-U	0.88	3.70	3.70	4.04	2.77	2.56

*Cambridge PE data as of 2Q23

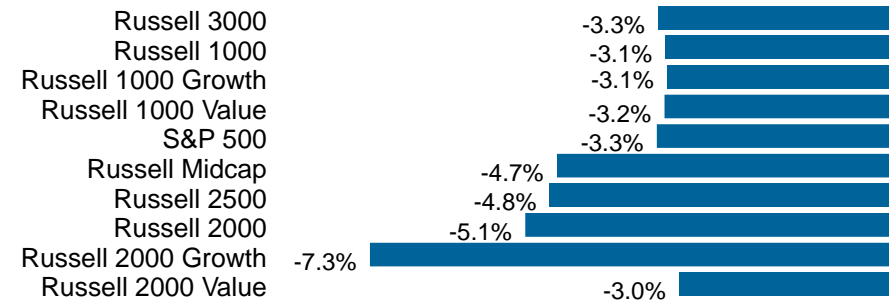
Sources: Bloomberg, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

U.S. Equity Performance: 3Q23

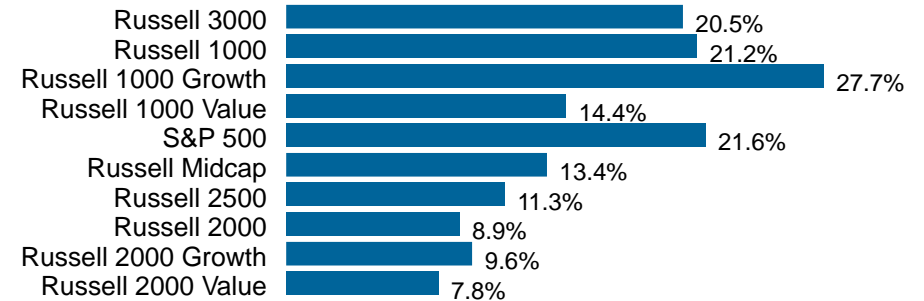
The U.S. equity markets cooled in 3Q after an exuberant start to the year

- ▶ All U.S. equity indices posted losses during 3Q23. August and September were marked by investor fears about the potential of a “higher for longer” interest rate environment, leading to broader market declines.
- ▶ While all indices were negative, the Russell 2000 Value Index led the pack during the quarter, a reversal of the previous two quarters when the Russell 1000 Growth Index led.
- ▶ Only two of the 11 S&P 500 Index sectors generated positive 3Q returns; Energy was up 12% and Communication Services was up 3%. However, on a YTD basis, six sectors generated positive returns, with Information Technology, Communication Services and Consumer Discretionary substantially leading the group.

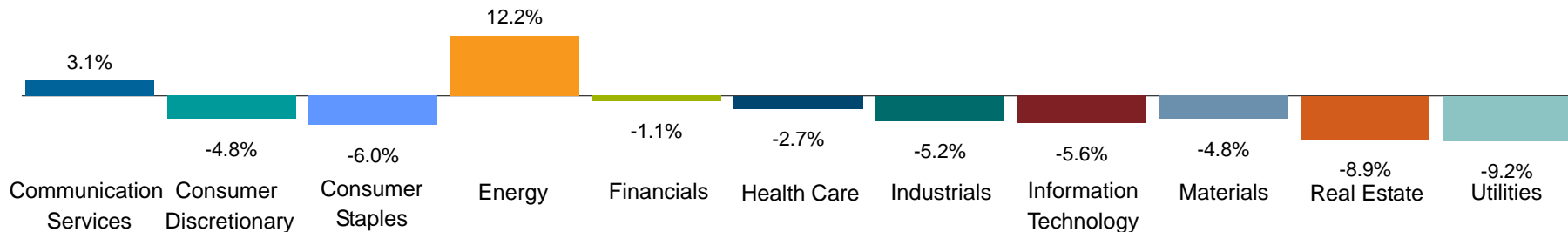
U.S. Equity: Quarter Ended 9/30/23



U.S. Equity: One-Year Returns Ended 9/30/23



Industry Sector Quarterly Performance (S&P 500) as of 9/30/23



Sources: FTSE Russell, S&P Dow Jones Indices

Global/Global ex-U.S. Equity Performance: 3Q23

Global growth concerns

Most global markets were in the red for 3Q23.

Narrow market

- ▶ Global markets retreated in 3Q23 amid fears of a global recession driven by higher interest rates and slowing growth in regions outside the U.S.
- ▶ Emerging markets outperformed developed markets, buoyed by good results from India, whose economy grew nearly 8% on the heels of supportive infrastructure spending.
- ▶ Japan was strong again in local currency as it continues to benefit from post-COVID exuberance, easy monetary policy, and a new economic stimulus plan.

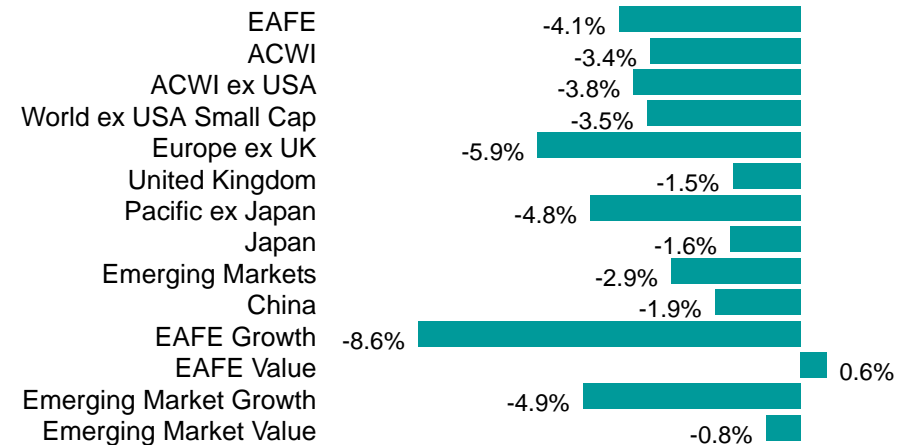
Growth vs. value

- ▶ With energy as a strong outperformer on the heels of oil price increases, value outpaced growth by a wide margin in global ex-U.S. markets.

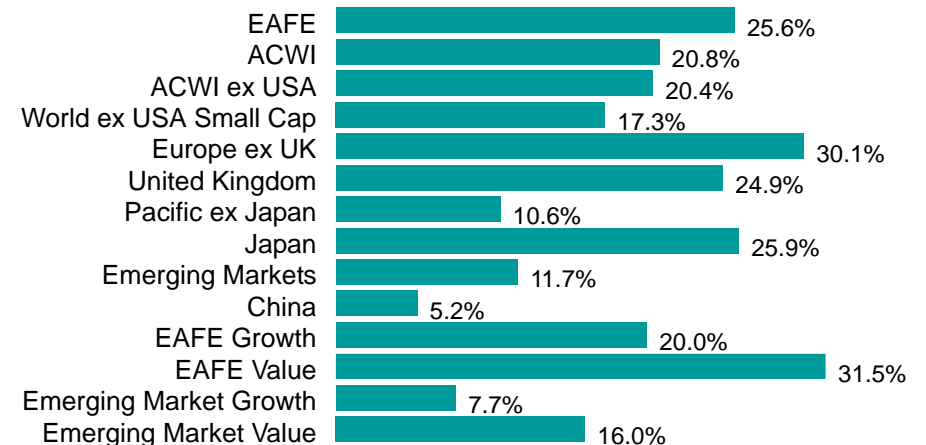
U.S. dollar vs. other currencies

- ▶ The stronger U.S. dollar, which gained 3% over the quarter, was a notable headwind for the period.

Global Equity Returns: Quarter Ended 9/30/23



Global Equity Returns: One Year Ended 9/30/23



Source: MSCI

U.S. Fixed Income Performance: 3Q23

Yields continue to march upward as spreads remain range-bound

U.S. fixed income fell for a second straight quarter

- ▶ The Bloomberg Aggregate Index is on track for a third calendar year of negative returns, with the rise in yields continuing to detract from performance.

U.S. Treasury 10-year yield climbed roughly 80 bps

- ▶ 10-year ended the quarter at 4.59%, its highest level since 2007.
- ▶ The yield curve's inversion narrowed as long-term rates rose more than short-term rates.

TIPS outperformed nominal Treasuries

- ▶ 10-year break-even spreads widened over 10 bps.

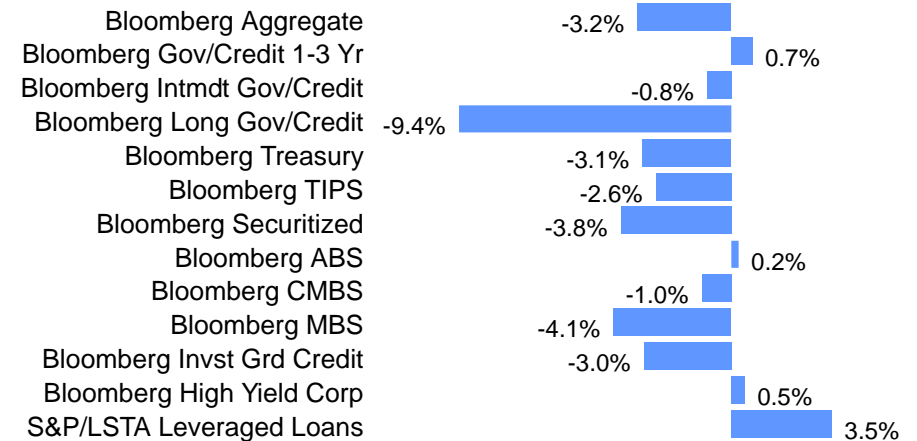
Fed policy rate held to 5.25%-5.50%

- ▶ The updated dot plot suggested an additional rate hike may be in the cards before year-end.

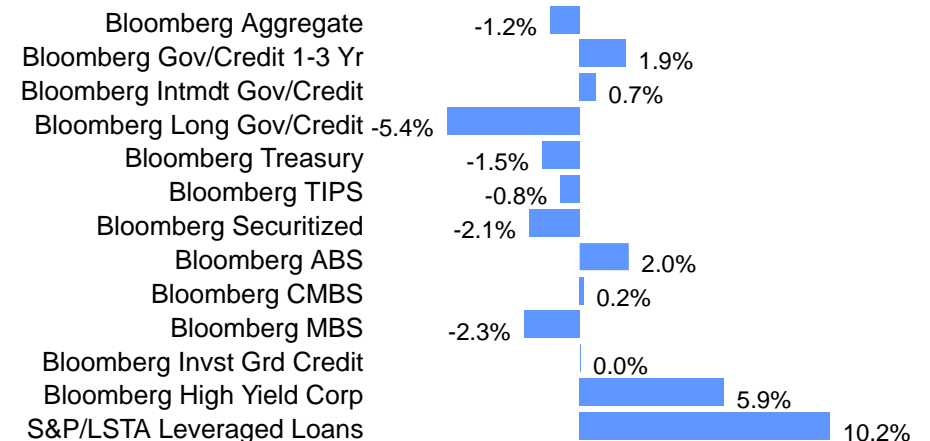
Lower-quality credit continued to outperform

- ▶ High yield spreads were flat, but the sector was buoyed by strong performance in July. Additionally, a combination of higher yields and no duration continued to drive bank loan outperformance.
- ▶ IG corporate spreads tightened slightly and remained close to their 10-year average.
- ▶ Agency RMBS underperformed other securitized sectors as interest rate volatility weighed on the sector.

U.S. Fixed Income Returns: Quarter Ended 9/30/23



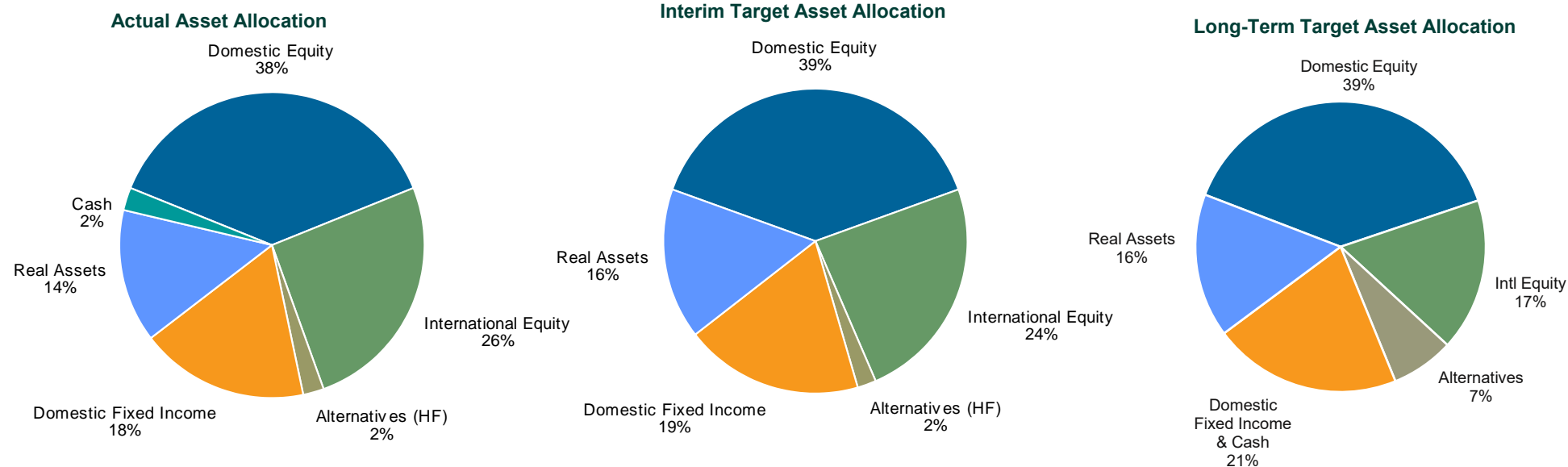
U.S. Fixed Income Returns: YTD Ending 9/30/23



Sources: Bloomberg, S&P Dow Jones Indices

Actual vs. Target Asset Allocation*

September 30, 2023



Asset Class	\$Millions Actual	Weight Actual	Interim Target	Percent Difference	\$Millions Difference
Domestic Equity	3,872	37.8%	39.0%	(1.2%)	(125)
International Equity	2,623	25.6%	24.0%	1.6%	164
Alternatives (HF)	224	2.2%	2.0%	0.2%	19
Domestic Fixed Income	1,837	17.9%	19.0%	(1.1%)	(111)
Real Assets	1,443	14.1%	16.0%	(1.9%)	(197)
Cash	250	2.4%	0.0%	2.4%	250
Total	10,249	100.0%	100.0%		

- The APERS Investment Policy states that rebalancing to the target asset allocation should take place when the actual asset allocation falls outside of a +/- 5% range from the target asset allocation. All asset classes are within their allowable ranges.

*The long-term asset allocation was approved in 2023. The benchmark will be modified to reflect the new long-term targets when the Private Equity allocation has been implemented. Benchmark definitions can be found in the appendix.

Investment Manager Asset Allocation

September 30, 2023

	September 30, 2023				June 30, 2023	
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
Domestic Equity	\$3,872,081,260	37.78%	\$(88,312,587)	\$(164,893,366)	\$4,125,287,213	38.59%
Lazard Asset Mgmt.	467,314,126	4.56%	(381,326)	(41,011,865)	508,707,318	4.76%
CastleArk Mgmt. LLC	474,331,629	4.63%	(20,413,243)	(23,253,906)	517,998,778	4.85%
Mellon S&P 500 Index Fd	679,162,779	6.63%	(65,024,172)	(25,362,189)	769,549,140	7.20%
Horrell Capital - Passive	198,501,532	1.94%	(83,727)	(8,232,774)	206,818,033	1.93%
Mellon Large Cap Growth	386,023,943	3.77%	(956)	(12,464,665)	398,489,563	3.73%
Wellington Management	458,491,802	4.47%	(354,085)	(13,742,671)	472,588,558	4.42%
Intech	91	0.00%	(371,442)	(6,365)	377,898	0.00%
LSV Asset Management	355,907,983	3.47%	(509,206)	(1,925,428)	358,342,617	3.35%
Stephens Investment Mgmt.	446,888,117	4.36%	(753,184)	(22,461,999)	470,103,300	4.40%
Froley Revy Investment	405,459,257	3.96%	(421,245)	(16,431,505)	422,312,007	3.95%
International Equity	\$2,623,430,264	25.60%	\$(2,504,237)	\$(129,615,426)	\$2,755,549,927	25.77%
Artisan Partners	673,150,031	6.57%	(914,953)	(17,897,610)	691,962,595	6.47%
Mellon ACWI ex US Fund	584,408,641	5.70%	(91,791)	(22,656,670)	607,157,102	5.68%
Baillie Gifford Overseas	482,527,541	4.71%	(524,815)	(55,035,645)	538,088,001	5.03%
Lazard Asset Mgmt.	550,106,793	5.37%	(440,245)	(25,979,509)	576,526,548	5.39%
Acadian ACW ex US SmallCap	184,580,361	1.80%	(279,512)	(2,513,517)	187,373,390	1.75%
Franklin Templeton Intl SmallCap	148,656,896	1.45%	(252,921)	(5,532,474)	154,442,291	1.44%
Alternatives	\$223,616,430	2.18%	\$(560,637)	\$4,864,632	\$219,312,434	2.05%
AQR Capital	0	0.00%	(3)	0	3	0.00%
Hedge Funds	\$223,616,430	2.18%	\$(560,633)	\$4,864,632	\$219,312,431	2.05%
Blackstone Alt. Asset Mgmt	223,616,430	2.18%	(560,633)	4,864,632	219,312,431	2.05%
Domestic Fixed Income	\$1,836,696,646	17.92%	\$(931,098)	\$(50,344,889)	\$1,887,972,633	17.66%
DoubleLine Capital	582,165,535	5.68%	(282,564)	(17,884,186)	600,332,285	5.62%
MacKay Shields	622,574,079	6.07%	(317,522)	(16,350,753)	639,242,354	5.98%
PGIM	631,957,032	6.17%	(331,012)	(16,109,949)	648,397,994	6.06%
Real Assets	\$1,443,208,786	14.08%	\$(19,991,205)	\$(22,139,951)	\$1,485,339,942	13.89%
REITS	\$10,759,340	0.10%	\$(1,449)	\$(861,991)	\$11,622,780	0.11%
MCM EB DV Non-SL REIT Fd	10,759,340	0.10%	(1,449)	(861,991)	11,622,780	0.11%
Core Real Estate	\$921,340,278	8.99%	\$(2,889,716)	\$(17,572,748)	\$941,802,742	8.81%
Invesco Real Estate	569,483,459	5.56%	(518,746)	(9,017,401)	579,019,606	5.42%
Heitman Real Estate Tr LP	351,856,819	3.43%	(2,370,970)	(8,555,347)	362,783,136	3.39%
Value Add Real Estate	\$324,047,436	3.16%	\$(14,553,089)	\$(8,155,016)	\$346,755,542	3.24%
Clarion Lion Industrial Trust	82,228,230	0.80%	(243,746)	611,458	81,860,518	0.77%
Harrison Street Fund VIII	44,480,708	0.43%	(187,500)	58,261	44,609,947	0.42%
Heitman Value Partners IV	45,477,284	0.44%	(99,479)	1,076,418	44,500,345	0.42%
LaSalle Inc & Growth VI LP	5,006,567	0.05%	0	(541,601)	5,548,168	0.05%
LaSalle Inc & Growth VII LP	21,450,195	0.21%	(87,122)	(6,792,827)	28,330,144	0.26%
Starwood SOF XII	16,821,504	0.16%	(234,056)	502,808	16,552,752	0.15%
TA Realty X	0	0.00%	(5,530)	(2,753)	8,283	0.00%
TA Realty XI	8,774,280	0.09%	(13,878,289)	(720,104)	23,372,673	0.22%
TA Realty XII	99,808,668	0.97%	182,632	(2,346,676)	101,972,712	0.95%
Farmland	\$89,704,145	0.88%	\$(834,079)	\$921	\$90,537,303	0.85%
IFC Core Farmland Fund	52,592,621	0.51%	(729,844)	599,683	52,722,782	0.49%
PGIM Agriculture	37,111,524	0.36%	(104,235)	(598,762)	37,814,521	0.35%
Timber	\$97,357,587	0.95%	\$(1,712,873)	\$4,460,420	\$94,610,040	0.88%
Pinnacle	97,357,587	0.95%	(1,712,873)	4,460,420	94,610,040	0.88%
Cash	\$250,175,559	2.44%	\$30,361,970	\$2,002,419	\$217,811,171	2.04%
Composite Fund	\$10,249,208,945	100.0%	\$(81,937,794)	\$(360,115,045)	\$10,691,261,784	100.0%

Asset Class Performance and Market Values

September 30, 2023

	Market Value \$(Dollars)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Domestic Equity	\$3,872,081,260	37.78%	(4.01%)	14.99%	7.73%	7.89%
Russell 3000 Index	-	-	(3.25%)	20.46%	9.38%	9.14%
International Equity	\$2,623,430,264	25.60%	(4.71%)	23.07%	4.38%	4.08%
Benchmark**	-	-	(3.49%)	20.19%	3.42%	1.86%
Alternatives	\$223,616,430	2.18%	2.22%	9.24%	5.06%	5.13%
Hedge Funds	\$223,616,430	2.18%	2.22%	7.24%	7.13%	5.69%
HFRI FOF: Diversified Index***	-	-	0.68%	6.80%	5.15%	5.39%
Domestic Fixed Income	\$1,836,696,646	17.92%	(2.67%)	2.72%	(3.90%)	0.93%
Blmbg Aggregate	-	-	(3.23%)	0.64%	(5.21%)	0.10%
Real Assets	\$1,443,208,786	14.08%	(1.50%)	(9.66%)	11.94%	5.92%
NCREIF Total Index****	-	-	(1.37%)	4.31%	8.59%	7.36%
REITS	\$10,759,340	0.10%	(7.42%)	2.23%	6.10%	1.29%
S&P DJ US Select REIT	-	-	(7.40%)	2.61%	6.12%	1.56%
Core Real Estate	\$921,340,278	8.99%	(1.87%)	(12.29%)	7.75%	5.32%
NFI-ODCE Eq Wt Net	-	-	(2.12%)	(13.08%)	6.69%	5.22%
Value Add Real Estate	\$324,047,436	3.16%	(2.39%)	(12.72%)	16.64%	13.63%
NCREIF Total Index	-	-	(1.37%)	(8.39%)	6.04%	5.26%
Farmland	\$89,704,145	0.88%	0.01%	4.68%	-	-
NCREIF Farmland Index	-	-	(0.26%)	5.81%	7.17%	6.13%
Timber	\$97,357,587	0.95%	4.73%	16.83%	14.02%	6.15%
NCREIF Timberland Index	-	-	1.37%	10.03%	9.15%	5.87%
Cash	\$250,175,559	2.44%	1.20%	4.42%	1.80%	1.74%
Total Fund	\$10,249,208,945	100.00%	(3.41%)	9.91%	5.25%	5.28%
Total Fund ex Cash	\$9,999,033,385	97.56%	(3.47%)	9.90%	5.24%	5.29%
Benchmark*	-	-	(2.93%)	13.85%	5.11%	5.77%

- **Domestic Equity** underperformed the benchmark in the third quarter and over the last 5-year period.
- **International Equity** underperformed the benchmark in the third quarter but has exceeded the benchmark return over longer time periods.
- **Hedge Funds** outperformed the index in the third quarter and leads the benchmark over longer time periods.
- **Domestic Fixed Income** outperformed the benchmark in the third quarter and leads the index over longer trailing time periods.
- **Farmland** and **Timber** outperformed their respective benchmarks for the quarter. The Timber allocation outpaced its benchmark over the last one-, three-, and five-year periods, while Farmland trailed its benchmark over the last year.
- **Value Add Real Estate** lagged the benchmark in the third quarter, but the allocation meaningfully outperformed over the trailing three- and five-year periods.
- **Core Real Estate** edged its benchmark return for the quarter and outperformed over longer periods.
- **REITS** performed in line with the benchmark for the quarter and modestly underperformed over the last five years.

* Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% CPI All Urban Cons +4%, 3% MSCI World Index and 2% Blmbg Aggregate Index

** MSCI EAFE through 12/31/2020; MSCI ACWI ex US IMI (Net) thereafter.

*** 60% MSCI World and 40% Bloomberg Aggregate through 6/30/2023; HFRI FOF: Diversified Index thereafter

**** CPI All Urban Consumers +4% through 6/30/2023; NCREIF Total Index thereafter

Total Fund Performance

September 30, 2023

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 20 Years
10th Percentile	(1.32)	→ 13.96	7.58	6.86	7.61	7.78
25th Percentile	(1.80)	12.42	6.31	→ 6.25	7.18	7.47
Median	(2.30)	11.09	→ 5.25 ←	→ 5.48 ←	→ 6.68 ←	→ 7.19 ←
75th Percentile	(2.92)	← 9.75	4.16	← 4.81	6.12	6.79
90th Percentile	(3.33)	← 8.49	3.13	4.28	5.55	6.43
● Total Fund	(3.41) (92)	9.91 (73)	5.25 (50)	5.28 (59)	6.69 (50)	7.22 (45)
● Policy Target	(2.50) (62)	14.35 (7)	5.26 (49)	5.86 (36)	6.76 (47)	7.20 (48)

- The above chart shows the distribution of returns for the Callan Public Fund DB Peer Group across time periods ended September 30, 2023. Returns longer than one year annualized.
- The returns and peer group ranking for the APERS Total Fund and Total Fund Target are shown in the bottom two rows.
 - **The 25th percentile return** represents the value above which 25% of the returns fall. In other words, it's the point where a quarter of the peer group earned a higher return, and three-quarters of the peer group earned a lower return.
 - **The median return** represents the middle value in a distribution of returns. If we arrange all the returns in ascending order, the median is the value that separates the lower half from the higher half.
 - **The 75th percentile return** represents the value above which 75% of the returns fall. In other words, it's the point where three-quarters of the peer group earned a higher return, and a quarter of the peer group earned a lower return.
- Over the last one- and 5-year periods, the Fund underperformed its benchmark and finished below its peer group median.
- Over the last 3- and 10-year periods, the Fund finished in line with the benchmark and peer group median.
- For the trailing 20-year period, the Fund edged its benchmark return and ranked in the top half of its peer group.

Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% NCREIF Total Index, 2% HFRI FOF: Diversified Index

Investment Manager Returns and Peer Group Rankings

September 30, 2023

	Last Quarter		Last Year		Last 3 Years		Last 5 Years	
Domestic Equity	(4.01%)	89	14.99%	98	7.73%	91	7.89%	74
Russell 3000 Index	(3.25%)	30	20.46%	19	9.38%	65	9.14%	18
Pub Pln- Dom Equity	(3.41%)		19.58%		9.94%		8.53%	
Lazard Asset Mgmt.	(8.07%)	99	12.22%	86	6.26%	78	6.85%	79
Russell 3000 Index	(3.25%)	54	20.46%	46	9.38%	61	9.14%	34
Callan All Cap Broad	(3.02%)		19.20%		10.89%		8.27%	
CastleArk	(4.51%)	81	21.61%	35	8.50%	64	10.24%	24
Russell 3000 Growth Index	(3.34%)	60	26.63%	14	7.54%	75	11.70%	10
Callan All Cap Broad	(3.02%)		19.20%		10.89%		8.27%	
Mellon S&P 500 Index Fd	(3.27%)	85	21.63%	42	10.16%	52	9.61%	56
S&P 500 Index	(3.27%)	85	21.62%	42	10.15%	52	9.92%	46
Callan Large Cap Core	(2.46%)		21.19%		10.30%		9.80%	
Horrell Capital - Passive	(3.98%)	69	12.53%	85	10.10%	57	9.07%	35
Bloomberg Arkansas Index	2.59%	2	18.51%	60	27.09%	3	13.34%	5
S&P 500 Index	(3.27%)	54	21.62%	35	10.15%	57	9.92%	31
Callan All Cap Broad	(3.02%)		19.20%		10.89%		8.27%	
Mellon Large Cap Growth	(3.13%)	36	-		-		-	
Russell 1000 Growth Index	(3.13%)	36	27.72%	43	7.97%	26	12.42%	15
Callan Large Cap Growth	(3.42%)		26.41%		5.97%		10.53%	
Wellington Management	(2.91%)	76	17.06%	45	12.50%	67	7.29%	45
Russell 1000 Value Index	(3.16%)	86	14.44%	66	11.05%	83	6.23%	78
Callan Large Cap Value	(2.07%)		16.45%		13.95%		6.97%	
LSV Asset Management	(0.55%)	22	18.81%	23	21.86%	16	5.69%	34
Russell 2000 Value Index	(2.96%)	63	7.84%	89	13.32%	85	2.59%	94
Callan Small Cap Value	(1.97%)		13.45%		16.80%		5.20%	
Stephens Investment Mgmt.	(4.79%)	11	10.45%	57	3.40%	42	4.14%	63
Russell 2000 Growth Index	(7.32%)	66	9.59%	60	1.09%	64	1.55%	89
Callan Small Cap Growth	(6.49%)		10.67%		2.95%		5.00%	
Froley Revy Investment	(3.90%)	90	2.52%	91	0.88%	83	6.90%	35
ML All Conv	(2.53%)	59	7.49%	47	3.06%	44	8.36%	16
Callan Convert Bonds DB	(2.36%)		7.30%		2.60%		6.28%	

- Total Domestic Equity underperformance over the last year has weighed on long-term results, as the composite trails the benchmark and peer group median over the trailing 3- and 5-year periods.
- LSV, Wellington, and Stephens led their respective benchmarks for the quarter, and LSV and Stephens ranked in the top half of their peer universe. All three managers have outperformed their benchmark over the last 5-year period.
- CastleArk, Lazard, and Froley Revy underperformed their respective benchmarks and median peer for the third quarter. CastleArk and Froley Revy trailed the benchmark over the last five years but rank in the top half of peers. Lazard has underperformed the benchmark and its peer group median over longer periods.

Investment Manager Returns and Peer Group Rankings

September 30, 2023

	Last Quarter		Last Year		Last 3 Years		Last 5 Years	
International Equity	(4.71%)	91	23.07%	36	4.38%	45	4.08%	27
Benchmark*	(3.49%)	17	20.19%	73	3.42%	71	1.86%	89
Pub Pln- Intl Equity	(3.70%)		22.07%		4.27%		3.48%	
Artisan Partners	(2.59%)	25	33.54%	7	15.35%	1	8.83%	1
MSCI EAFE	(4.11%)	44	25.65%	38	5.75%	43	3.24%	68
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Mellon ACWI ex US Fund	(3.73%)	37	20.79%	70	4.05%	60	2.90%	75
MSCI ACWI ex US	(3.77%)	37	20.39%	74	3.74%	62	2.58%	81
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Baillie Gifford Overseas	(10.24%)	97	14.63%	96	(6.59%)	97	1.38%	93
MSCI ACWIxUS Gross	(3.68%)	36	21.02%	69	4.24%	57	3.07%	71
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Lazard Asset Mgmt.	(4.51%)	49	23.51%	53	4.83%	51	3.41%	64
MSCI ACWIxUS Gross	(3.68%)	36	21.02%	69	4.24%	57	3.07%	71
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Acadian ACW ex US SmallCap	(1.35%)	10	18.86%	53	-	-	-	-
MSCI ACWI ex US Small Cap	(1.70%)	18	19.01%	53	4.02%	30	2.58%	33
Callan Intl Small Cap	(3.83%)		20.07%		1.65%		1.66%	
Franklin Templeton Intl SmallCap	(3.59%)	45	21.78%	32	-	-	-	-
MSCI ACWI ex US Small Cap	(1.70%)	18	19.01%	53	4.02%	30	2.58%	33
Callan Intl Small Cap	(3.83%)		20.07%		1.65%		1.66%	
Alternatives	2.22%		9.24%		5.06%		5.13%	
Hedge Funds	2.22%		7.24%		7.13%		5.69%	
HFRI FOF: Diversified Index***	0.68%		6.80%		5.15%		5.39%	
Blackstone Alt. Asset Mgmt.	2.22%	13	7.24%	27	7.13%	10	5.69%	16
HFRI FOF: Diversified Index***	0.68%	84	6.80%	30	5.15%	51	5.39%	19
Callan Core Diversif FoF	1.35%		5.86%		5.21%		4.08%	

- Total **International Equity** underperformed the benchmark in the third quarter but has outpaced the benchmark over longer periods. The composite ranks in the 27th percentile of peers over the last five years.
- Artisan and Acadian led their respective benchmarks for the quarter, while Baillie Gifford, Lazard, and Franklin Templeton underperformed. Artisan, Lazard, Acadian, and Franklin Templeton ranked in the top half of their peer groups.
- Over the 5-year period, Artisan and Lazard have outperformed their respective benchmarks. Baillie Gifford underperformed over the last five years.
- **Hedge Funds**, Blackstone, has outpaced its target return and ranks in the top quartile of peers over the trailing 3- and 5-year periods.

** MSCI EAFE through 12/31/2020; MSCI ACWI ex US IMI (Net) thereafter.

*** 60% MSCI World and 40% Bloomberg Aggregate through 6/30/2023; HFRI FOF: Diversified Index thereafter

Investment Manager Returns and Peer Group Rankings

September 30, 2023

	Last Quarter		Last Year		Last 3 Years		Last 5 Years	
Domestic Fixed Income	(2.67%)	57	2.72%	32	(3.90%)	56	0.93%	51
Blmbg Aggregate Index	(3.23%)	78	0.64%	95	(5.21%)	92	0.10%	94
Pub Pln- Dom Fixed	(2.52%)		2.32%		(3.65%)		0.97%	
DoubleLine Capital	(2.98%)	63	1.77%	53	(3.64%)	26	0.34%	94
MacKay Shields	(2.56%)	20	3.25%	8	(3.76%)	31	1.25%	20
PGIM	(2.49%)	16	3.09%	13	(4.28%)	62	1.14%	27
Blmbg Aggregate Index	(3.23%)	82	0.64%	91	(5.21%)	96	0.10%	97
Callan Core Plus FI	(2.88%)		1.84%		(4.13%)		0.91%	
Real Assets	(1.50%)		(9.66%)		11.94%		5.92%	
NCREIF Total Index****	(1.37%)		4.31%		8.59%		7.36%	
REITS	(7.42%)		2.23%		6.10%		1.29%	
S&P DJ US Select REIT	(7.40%)		2.61%		6.12%		1.56%	
MCM EB DV Non-SL REIT Fd	(7.42%)	49	2.23%	57	6.10%	27	1.29%	92
S&P DJ US Select REIT	(7.40%)	44	2.61%	50	6.12%	26	1.56%	88
Callan Real Estate REIT	(7.43%)		2.59%		4.95%		4.32%	
Core Real Estate	(1.87%)		(12.29%)		7.75%		5.32%	
NCREIF NFI-ODCE Eq Wt Net	(2.12%)		(13.08%)		6.69%		5.22%	
Invesco Real Estate	(1.56%)	85	(12.39%)	62	6.89%	45	5.19%	59
Heitman Real Estate Trust LP*****	(2.37%)	88	(12.12%)	60	9.15%	22	5.59%	47
NCREIF NFI-ODCE Eq Wt Net	(2.12%)	87	(13.08%)	66	6.69%	49	5.22%	58
Callan OE Core Cmngrd RE	(0.61%)		(11.40%)		6.64%		5.38%	
Value Add Real Estate	(2.39%)		(12.72%)		16.64%		13.63%	
NCREIF Total Index	(1.37%)		(8.39%)		6.04%		5.26%	
Clarion Lion Industrial Trust	0.75%		-		-		-	
Harrison Street Fund VIII	0.13%		15.73%		-		-	
Heitman Value Partners IV	2.42%		(6.00%)		17.03%		15.21%	
LaSalle Inc & Growth VI LP	(9.76%)		(33.77%)		(15.29%)		(10.14%)	
LaSalle Inc & Growth VII LP	(24.05%)		(43.08%)		(6.00%)		(1.53%)	
Starwood SOF XI	3.08%		2.07%		-		-	
TA Associates Realty Fund XI	(4.29%)		(40.38%)		10.39%		10.85%	
TA Associates Realty Fund XII	(2.29%)		(10.06%)		24.90%		-	
NCREIF Total Index	(1.37%)		(8.39%)		6.04%		5.26%	
Farmland	0.01%		4.68%		-		-	
IFC Core Farmland Fund	1.15%		8.44%		-		-	
PGIM Agriculture	(1.59%)		(0.79%)		-		-	
NCREIF Farmland Index	(0.26%)		5.81%		7.17%		6.13%	
Timber	4.73%		16.83%		14.02%		6.15%	
Pinnacle	4.73%		16.83%		14.02%		6.15%	
NCREIF Timberland Index	1.37%		10.03%		9.15%		5.87%	
Cash	1.20%		4.42%		1.80%		1.74%	
Total Fund	(3.41%)	92	9.91%	73	5.25%	50	5.28%	59
Callan Public Fund Spr DB	(2.30%)		11.09%		5.25%		5.48%	
Total Fund ex Cash	(3.47%)	92	9.90%	73	5.24%	50	5.29%	59
Benchmark*	(2.93%)	75	13.85%	11	5.11%	54	5.77%	43
Callan Public Fund Spr DB	(2.30%)		11.09%		5.25%		5.48%	

- **Domestic Fixed Income** leads the index over the last 3- and 5-year periods. All three managers delivered excess returns over the benchmark in the third quarter and have outperformed over longer periods.
- The **Real Assets** composite underperformed its target for the third quarter and over the last year. REITS performed in line with the benchmark for the quarter, and Core Real Estate outperformed.
- The **Total Fund** underperformed its benchmark and ranked below its peer group median for the quarter. The Fund ranked at the 50th percentile of peers and exceeded the benchmark over the last 3-year period. Over the last 5 years, the Fund trailed its benchmark and ranked at the 59th percentile of its peer group.

* Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% CPI All Urban Cons +4%, 3% MSCI World Index and 2% Blmbg Aggregate Index

*** MSCI EAFE through 12/31/2020; MSCI ACWI ex US IMI (Net) thereafter.

*** 60% MSCI World and 40% Bloomberg Aggregate through 6/30/2023; HFRI FOF: Diversified Index thereafter

**** CPI All Urban Consumers +4% through 6/30/2023; NCREIF Total Index thereafter

Organizational Developments

3rd Quarter 2023

Acadian Asset Management – International Small Cap Equity

On October 4, 2023, Acadian announced a 7% staff reduction across the firm 28 people were terminated in total, including 7 individuals across their investment team:

- 3 individuals were from the Analytics & Data and Implementation teams (51 remaining members).
- 3 individuals were mid-level researchers (11 remaining members, although 2 new senior hires are starting in October).
- 1 associate PM on the Core Equity Team – AVP level (30 remaining members, with 1 new hire starting later this year).

The firm continues to hire across its investment platform and has made several significant additions in the past five years with the expansion of its credit capabilities. Callan does not believe this announcement is an actionable event as the staffing reduction should not impact Acadian's investment strategies.

Work Plan Update

Asset Liability Study

- Completed in February 2019. The Board decided to keep the current asset allocation unchanged

Investment Policy Review and Update – Completed in August 2019

Non-US Equity Structure Study

- The Board reviewed the Non-US Equity Structure Study at the November 2019 Board Meeting
- The Board selected a structure which included a new allocation to Non-US Small Cap Equity
- The Non-US Small Cap Equity search was concluded in November 2020 with the selection of Acadian Asset Management and Franklin Templeton Investments

Real Assets Structure Study

- The Board reviewed the Real Assets Structure at the February 2021 meeting. The Board chose to eliminate the Energy equity allocation, in favor of additional Core and Core Plus real estate, and Farmland. Additional Allocations to Value-add real estate were also approved
- At the May 2021 Board Meeting, the Board approved the Real Estate Pacing Study and new commitments to Starwood and Harrison Street Partners
- At the November 2021 Board Meeting, Farmland managers were interviewed and both IFC and PGIM were allocated \$50 million.
- Core Plus Real Estate Manager Interviews occurred at the February Board Meeting, all three managers, Carlyle, Principal, and Clarion, were hired to manage \$85 million.

Domestic Equity Structure Study

- Presented at the August 2022 Board Meeting. The Board decided to maintain the current Domestic Equity Structure.

Private Equity Education and Total Fund Asset Allocation Review

- Private equity education was provided at the Trustee Workshop in October 2022. In the November 2022 meeting the Board received an asset allocation review which included portfolios containing private equity.
- The Board requested that Callan complete a Private Equity pacing analysis using a 5% private equity target allocation for the Fund.

Work Plan Update

Total Fund Asset Allocation Review Update and Private Equity Pacing Study Analysis

- Presented at the February 2023 meeting

Private Equity Education, Pacing Study Review

- Additional Private Equity education provided on May 16th, 2023
- Private Equity Pacing Study results presented at the May 16th, 2023 meeting

Upcoming Projects:

- Investment Policy Review
- Fixed Income Structure Study

Total Fund Relative Attribution

September 30, 2023

Relative Attribution Effects for Quarter ended September 30, 2023

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	39%	39%	(4.01%)	(3.25%)	(0.29%)	0.00%	(0.29%)
Domestic Fixed Income	18%	19%	(2.67%)	(3.23%)	0.10%	0.00%	0.10%
International Equity	26%	24%	(4.71%)	(3.49%)	(0.32%)	(0.01%)	(0.33%)
Alternatives	2%	2%	2.22%	0.68%	0.03%	0.00%	0.03%
Real Assets	14%	16%	(1.50%)	(1.37%)	(0.02%)	(0.04%)	(0.06%)
Cash	2%	0%	1.20%	1.20%	0.00%	0.06%	0.06%
Total			(3.41%)	(2.93%)	(0.49%)	0.01%	(0.48%)

- Active management was the primary detractor for the quarter. Domestic and International Equity outweighed positive contributions from and Fixed Income managers. Variance from policy weights had a muted impact overall.

- Over the last three years, active management had a positive impact on relative performance. Domestic Equity was the only asset class where active management detracted. The Fund benefited from an overweight to domestic Equity and an underweight to Fixed Income, but an underweight to Real Assets and an overweight to International Equity were detractors.

- The Fund trailed its policy benchmark return over the last five years. Active management within International Equity and Fixed Income added value, while Domestic Equity and Real Assets managers were the primary detractors. Underweights to Real Assets and Fixed Income and the overweight to International Equity also detracted. The small allocation to cash also was a headwind to relative performance.

Three 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	39%	37%	7.73%	9.38%	(0.62%)	0.13%	(0.50%)
Domestic Fixed Income	17%	18%	(3.90%)	(5.21%)	0.22%	0.11%	0.33%
International Equity	25%	24%	4.38%	3.42%	0.25%	(0.07%)	0.18%
Alternatives	4%	5%	5.06%	4.22%	0.05%	0.01%	0.06%
Real Assets	13%	16%	11.94%	8.59%	0.26%	(0.17%)	0.09%
Cash	1%	0%	1.80%	1.80%	0.00%	(0.02%)	(0.02%)
Total			5.25%	5.11%	0.15%	(0.01%)	0.14%

Five Year Annualized Relative Attribution Effects

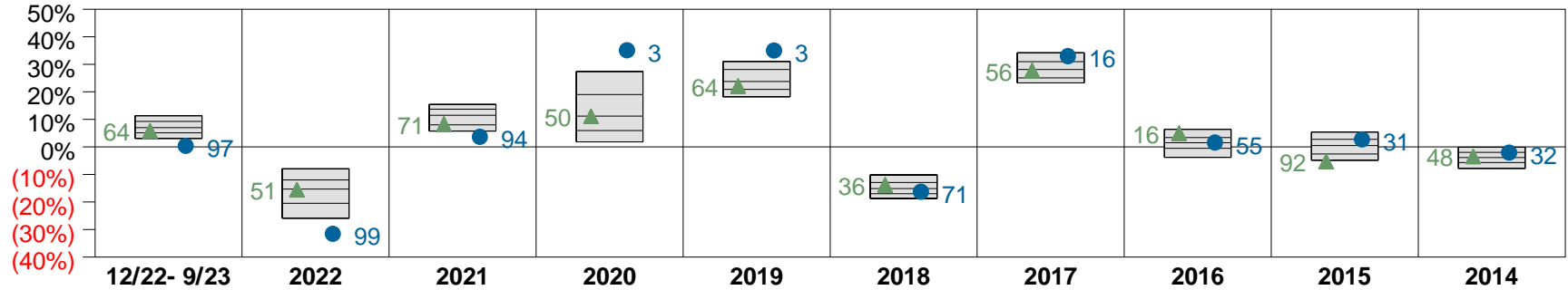
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	39%	37%	7.89%	9.14%	(0.48%)	0.03%	(0.45%)
Domestic Fixed Income	17%	18%	0.93%	0.10%	0.11%	(0.08%)	0.04%
International Equity	25%	24%	4.08%	1.86%	0.56%	(0.07%)	0.48%
Alternatives	4%	5%	5.13%	5.70%	(0.03%)	0.00%	(0.02%)
Real Assets	14%	16%	5.92%	7.36%	(0.36%)	(0.15%)	(0.51%)
Cash	1%	0%	1.74%	1.74%	0.00%	(0.02%)	(0.02%)
Total			5.28%	5.77%	(0.20%)	(0.29%)	(0.49%)

Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% NCREIF Total Index, 2% HFRI FOF: Diversified Index

Manager Spotlight

Baillie Gifford

Performance vs Callan Non-US Equity (Gross)



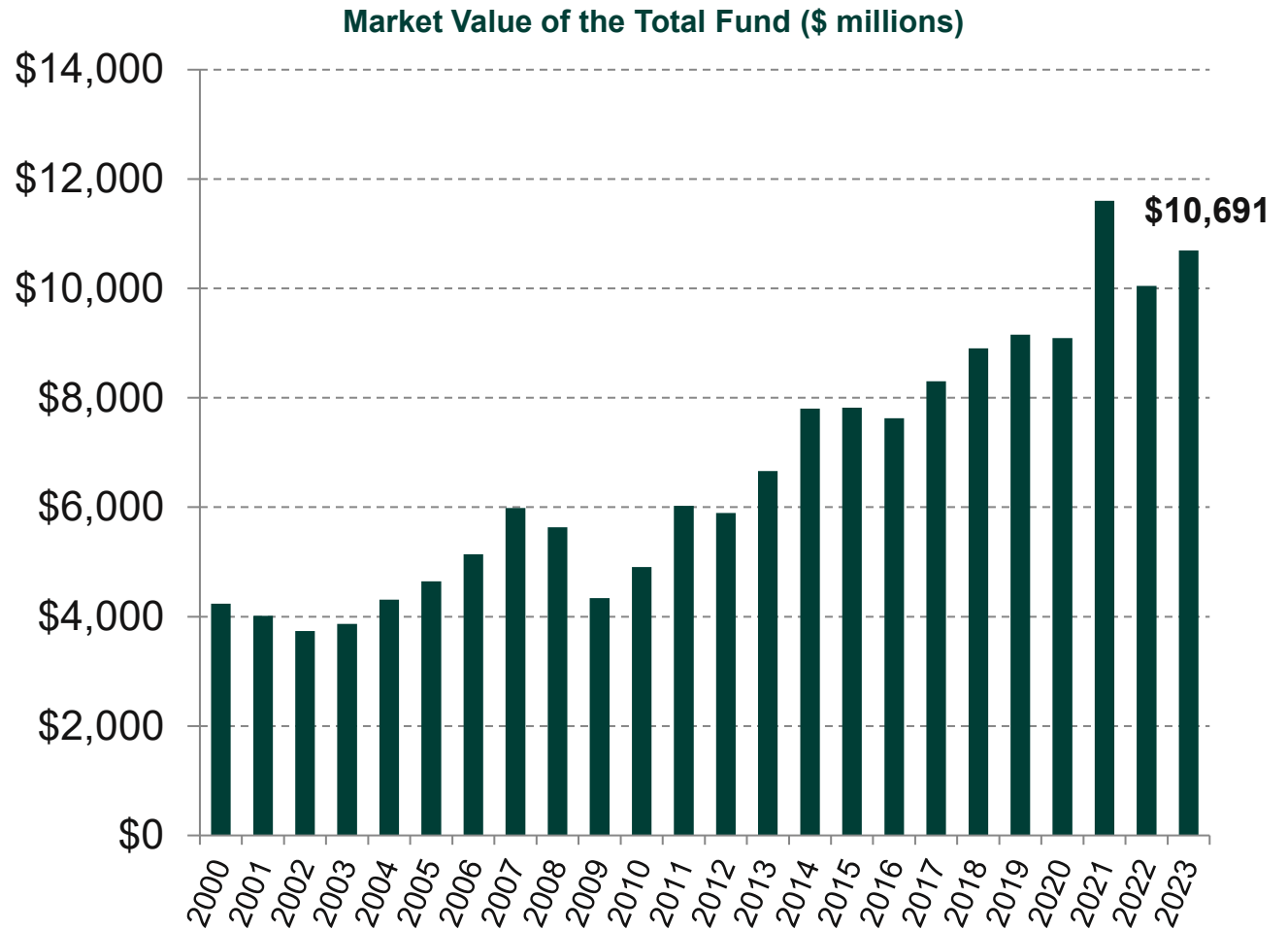
	12/22- 9/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	11.33	(7.90)	15.44	27.39	31.03	(10.17)	34.21	6.37	5.38	(0.13)
25th Percentile	9.25	(11.97)	13.69	19.00	28.11	(12.90)	30.96	3.40	2.76	(1.97)
Median	7.02	(15.29)	11.50	11.19	23.78	(15.12)	28.16	1.50	0.54	(3.85)
75th Percentile	5.16	(20.51)	7.98	5.93	20.88	(17.01)	25.08	(0.47)	(2.53)	(5.70)
90th Percentile	3.07	(25.95)	5.73	1.81	18.19	(18.73)	23.28	(3.82)	(4.89)	(7.82)
Baillie Gifford Overseas	● (0.06)	(31.98)	3.22	34.64	34.52	(16.76)	32.51	1.13	2.25	(2.50)
MSCI ACWI xUS GD	▲ 5.82	(15.57)	8.29	11.13	22.13	(13.77)	27.77	5.01	(5.25)	(3.44)

- Baillie Gifford outperformed the benchmark and placed in the top third of its peer group in 5 of the last 9 full calendar years.
- Recently, Baillie Gifford has underperformed the benchmark and ranked in the bottom decile of peers in two consecutive calendar years. The strategy trails the benchmark and ranks in the 99th percentile of its peer group year-to-date.

Historical Market Values of the Total Fund

Fiscal Year-End Market Values

Fiscal Year Ending	Market Value
2000	\$4,236,749,732
2001	\$4,012,745,608
2002	\$3,739,381,695
2003	\$3,869,787,673
2004	\$4,307,589,827
2005	\$4,642,924,118
2006	\$5,136,985,259
2007	\$5,985,111,493
2008	\$5,633,155,289
2009	\$4,341,419,711
2010	\$4,907,734,835
2011	\$6,022,965,592
2012	\$5,896,862,618
2013	\$6,662,631,673
2014	\$7,800,291,923
2015	\$7,820,289,128
2016	\$7,624,665,446
2017	\$8,301,352,120
2018	\$8,904,393,859
2019	\$9,153,121,783
2020	\$9,093,497,703
2021	\$11,602,695,185
2022	\$10,042,629,672
2023	\$10,691,261,784



Benchmark Definitions

- Total Fund Benchmark (Target):** Blend of asset class benchmarks at policy weights. The Long-Term Target was established in July 2023; however, the benchmark will be modified in accordance with the actual implementation. This process reflects the practical implementation of the strategic long-term asset allocation.

	Long-Term Target	3Q 2023 Target
Russell 3000	39.0%	39.0%
MSCI ACWI xUS IMI	17.0	24.0
Bloomberg Aggregate	21.0	19.0
Real Assets	16.0	16.0
Alternatives	7.0	2.0
- Private Equity	5.0	0.0
- Hedge Funds	2.0	2.0
Total Target	100.0%	100.0%

- Domestic Equity Benchmark:** Russell 3000 Index
- International Equity Benchmark:** MSCI ACWI xUS IMI Index; Prior to 12/31/2020 MSCI EAFE Index
- Fixed Income Benchmark:** Bloomberg Aggregate Index
- Real Assets:** NCREIF Property Index; Prior to 7/1/2023 CPI All Urban Consumers + 4%
- Private Equity:** Russell 3000 Index +3%
- Hedge Funds:** HFRI Diversified Index; Prior to 7/1/2023 60% MSCI World and 40% Bloomberg Aggregate.

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Past performance is no guarantee of future results.

November 15, 2023



APERS Fixed Income Structure Education

John Jackson, CFA
Senior Vice President

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Senior Vice President

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Framing the Discussion

A recommended fiduciary process for all types of funds

Step 1

Conduct
Fiduciary
Review

Step 2

Design
Optimal
Portfolio

- Set asset-allocation policy
- Determine manager structure
- Identify appropriate performance benchmarks

Step 3

Formalize
Investment
Policy

Step 4

Implement
Policy

Step 5

Monitor
and
Supervise

← Review



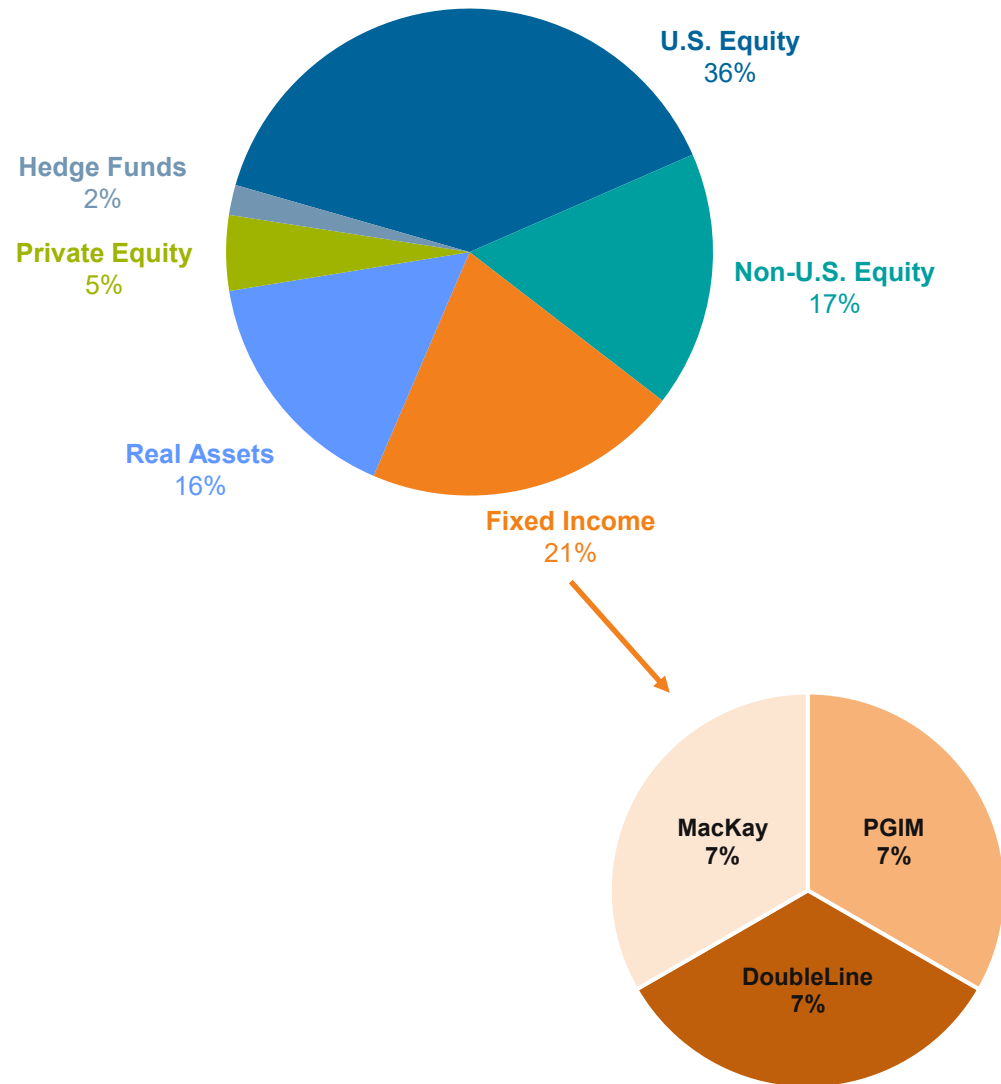
What Is Manager Structure?

Manager structure is defined by the number and types of managers within an asset class

- ▶ Develop long-term strategic asset allocation among managers that is efficient and representative of the strategic investment philosophy of the portfolio
- ▶ Where there is an existing structure, identify and recommend allocation adjustments for unintended exposures or “gaps” in the portfolio
- ▶ Outline a series of action steps to implement the structure

There is no single “best” structure

APERS Long-Term Strategic Asset Allocation



Optimizing the Investment Structure

Callan's philosophical tenets

Durable

Investment structures should be built for the long term. Long-term relationships and evaluation periods lend themselves to investment success.

Simple

Or rather, only as complex as it needs to be. Overly complex structures can lead to unexpected results and risk exposures. Complexity can yield investment results, but can also cause confusion.

Well Understood

While there is no expectation that committee members will be investment experts, they should all have a good, working knowledge of the investment process of the investments.

Cost Effective

While no uniform relationship exists between lowest cost investments and highest performance, there is also no guarantee that paying high costs will generate the best results. Spend where there can be a positive impact on the portfolio. Save where you can.

Implementation Considerations

Client's definition of risk

- ▶ Overall volatility
- ▶ Tracking error
- ▶ Outperforming a benchmark or meeting a hurdle rate

Use of index funds

- ▶ Strategy allocation
- ▶ Subsectors

Types (styles) of managers

- ▶ Specialists (e.g., growth and value managers)
- ▶ Generalists (e.g., core manager)

Number of managers

- ▶ "Less is more"
- ▶ Often driven by the asset class and active / passive determination

Types of vehicles

- ▶ Separately managed accounts
- ▶ Commingled / mutual fund
- ▶ Manager-of-managers

Cost sensitivity

U.S. Fixed Income Structure

Guiding principles / best practices

Fixed income: a security that provides a return in the form of fixed periodic payments and the eventual return of principal at maturity

Role: (usually) to act as a **low-risk anchor**

- ▶ Broad, diversified exposure
- ▶ Typically includes a majority allocation to investment-grade quality securities

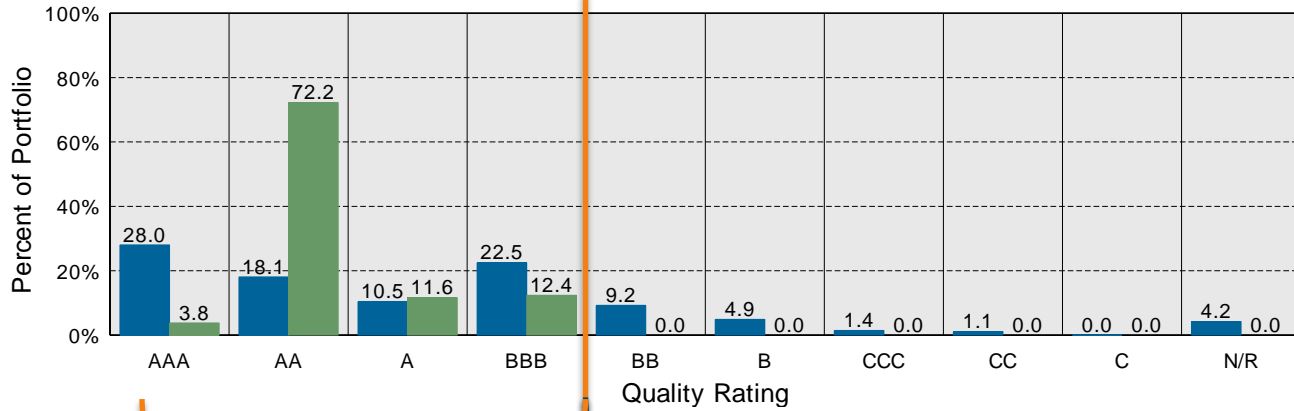
The main determinants of fixed income performance: **quality, duration, and sector**

- **Quality:** an assessment of the creditworthiness or financial stability of a bond issuer, typically a corporation, government, or other entity that issues debt securities. It is a measure of the issuer's ability to meet its debt obligations, including interest payments and the repayment of the principal amount at maturity.
- **Duration:** a measure of the sensitivity of a bond's price to changes in interest rates, measured in years. It helps investors understand how much the price of a bond is likely to change in response to fluctuations in interest rates. Generally, bonds with longer durations are more sensitive to interest rate changes, while bonds with shorter durations are less sensitive.
- **Sector:** in the context of fixed income, the term "sector" refers to the categorization of bonds based on the industry or economic sector to which the bond issuer belongs. It is a way to group bonds with similar characteristics.

APERS Fixed Income Quality

June 30, 2023

Quality Distribution

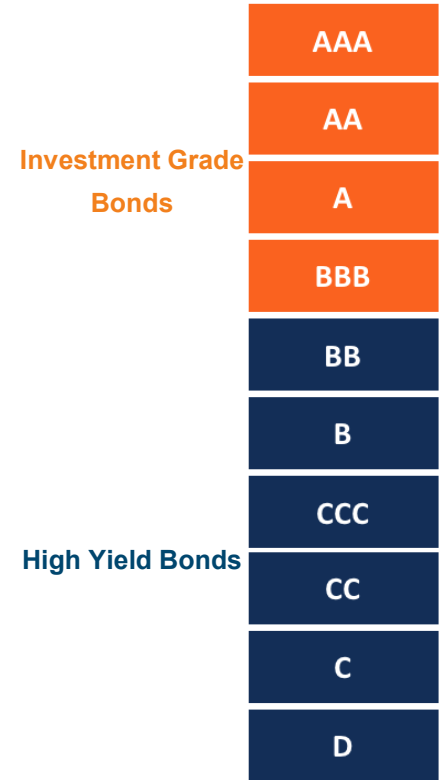


Investment Grade

High Yield

Weighted Average:		Quality
■	Domestic Fixed Income:	A-
■	Bloomberg Aggregate:	AA

S&P Ratings Scale

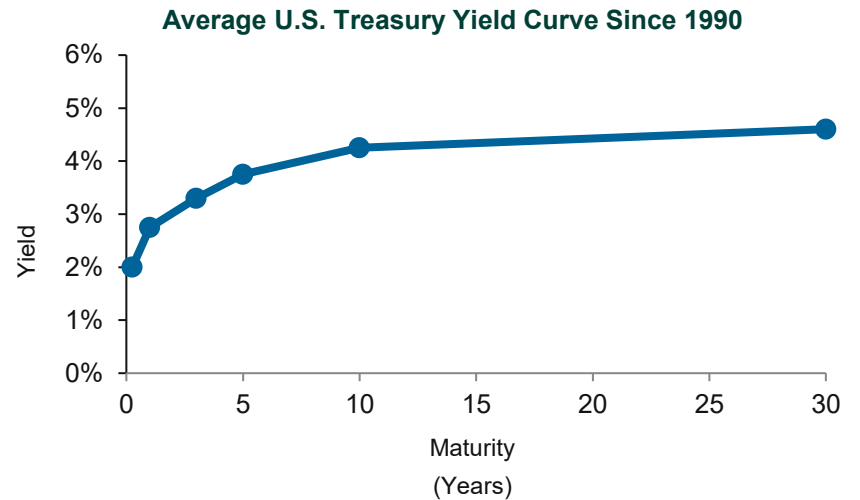


- The APERS portfolio has an overall credit quality slightly below the Bloomberg Aggregate Index.
- The APERS portfolio also has allocations to high yield bonds.

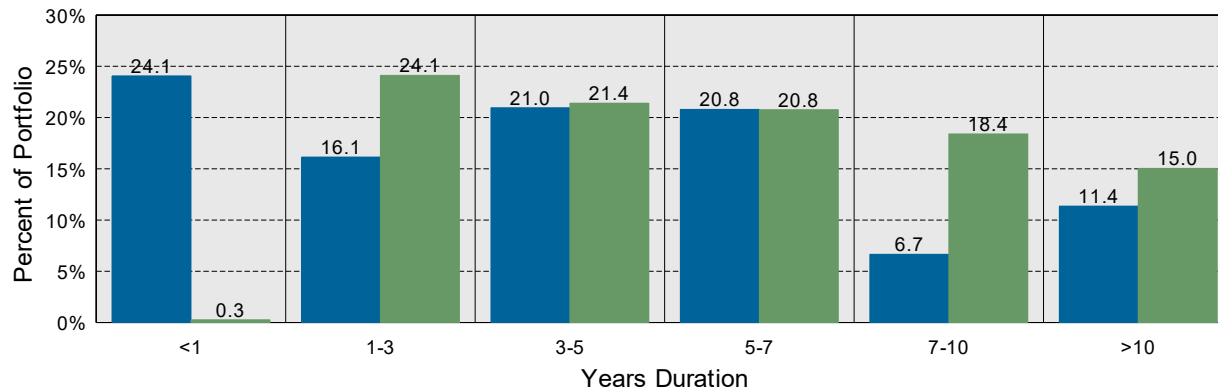
APERS Duration Distribution

September 30, 2023

Weighted Average:		Duration
■ Domestic Fixed Income:		6.17
■ Bloomberg Aggregate:		6.15



Duration Distribution



- The APERS portfolio has a similar overall duration to the benchmark, but it holds significantly more securities with a shorter duration (<1 year) than the index.

APERS Sector Composition

September 30, 2023

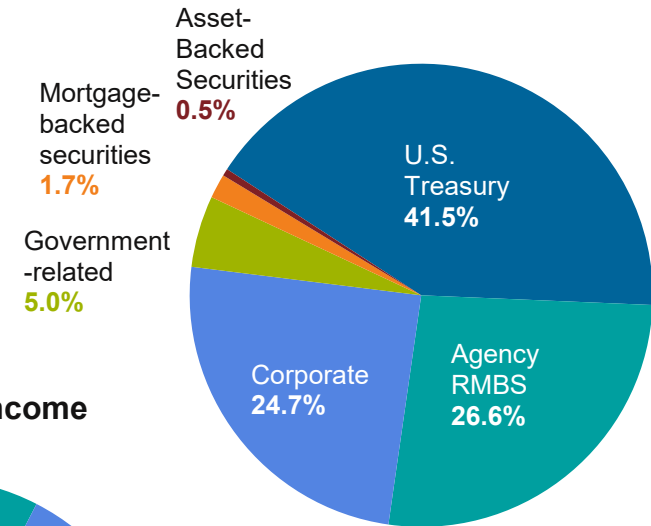
Aggregate index covers most of the U.S. core fixed income market

- Rated investment-grade by at least two ratings agencies
- Fixed rate
- Dollar-denominated
- Non-convertible
- Publicly issued

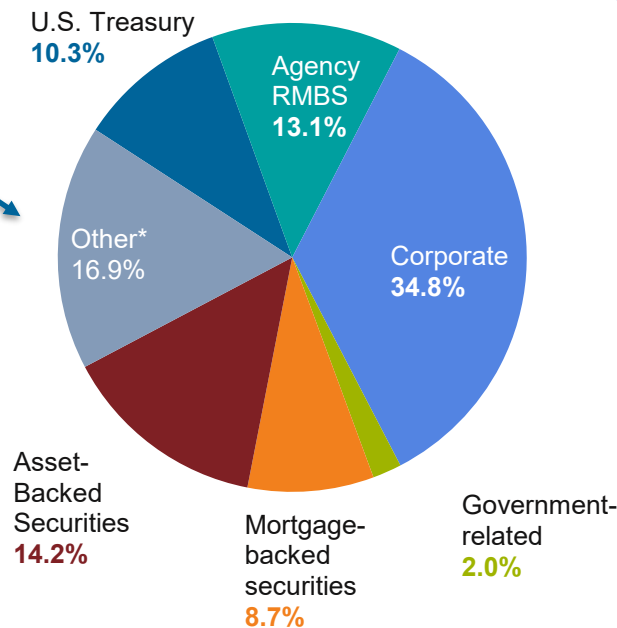
The Aggregate does not include some security types included in core plus strategies:

- High yield bonds – below investment grade
- Global ex-U.S. developed market bonds
- Emerging market bonds

Bloomberg Aggregate



APERS Fixed Income



*Other includes Non-Agency Mortgage-backed securities, CMOs, Bank Loans, Municipals, Global & Emerging Mkt Bonds

U.S. Fixed Income Strategies

Descriptions

- **Passive Core:** replicates the return of the Bloomberg Aggregate Index (“Aggregate”)
- **Active Core:** attempts to add modest amounts of value over the return of the Aggregate Index while experiencing a limited amount of tracking error
- **Core Plus:** attempts to add excess return over the Aggregate with relatively high tracking error
 - ▶ May use non-index securities such as high yield and global ex-U.S. bonds
- **High Yield:** non-investment grade corporate bonds
- **Global / Global ex-U.S.:** broadly diversified allocations to fixed income securities across the globe
 - ▶ May be active or passive, hedged or unhedged, with varying degrees of risk and use of non-benchmark securities
- **Emerging Market Debt:** fixed income securities issued by entities in less developed countries
 - ▶ May be issued in foreign currencies (euro or U.S. dollar, known as “hard currency”) or local currency
- **Bank Loans:** also known as leveraged loans, are loans made by banks or other financial institutions to companies.
 - ▶ The companies that receive these loans generally have below-investment grade ratings. Bank loans are floating rate securities, meaning they pay interest rates that adjust periodically.

Fixed Income Strategy Return / Risk

Extending maturity increases both return and risk.

- ▶ 3-month T-bills have lowest risk, but also lowest return.
- ▶ Returns diminish as maturity increases.

Long maturity bonds have significant absolute risks but lower risks relative to pension liabilities.

High yield bonds have higher returns than other bonds but can have equity-like risk.

Returns and Risks for 20 Years

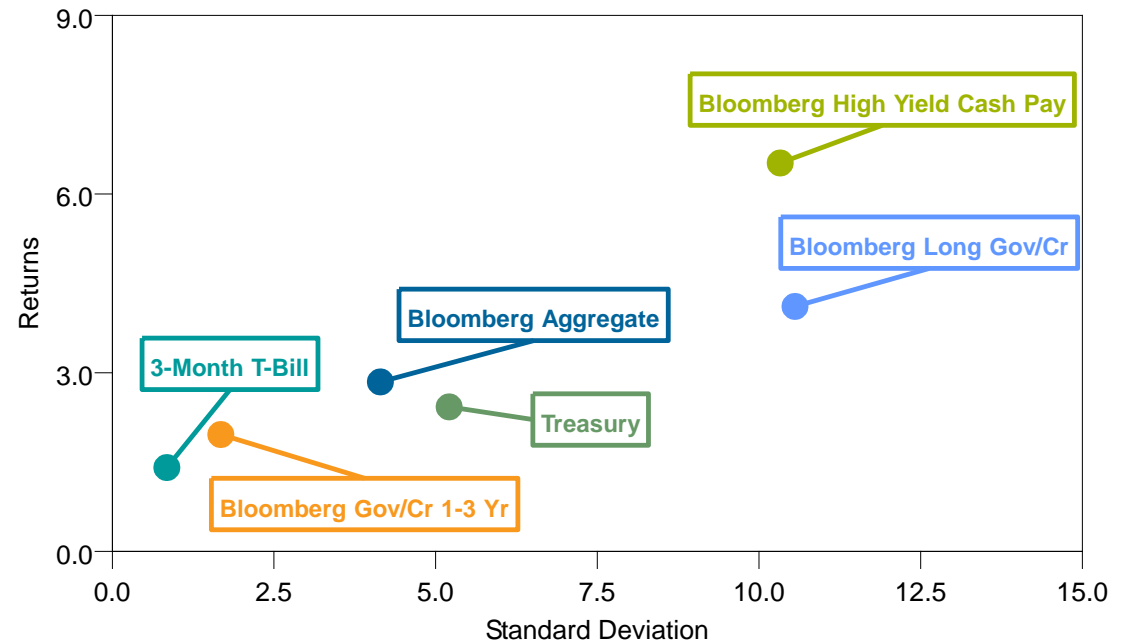
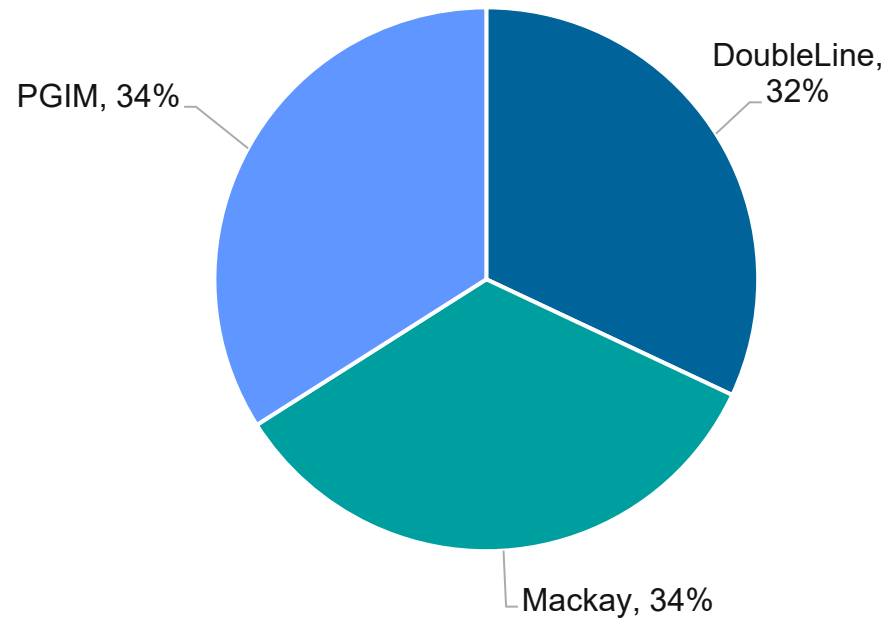


Chart data as of 9/30/23.

APERS Fixed Income Structure

Current Fixed Income Manager Structure



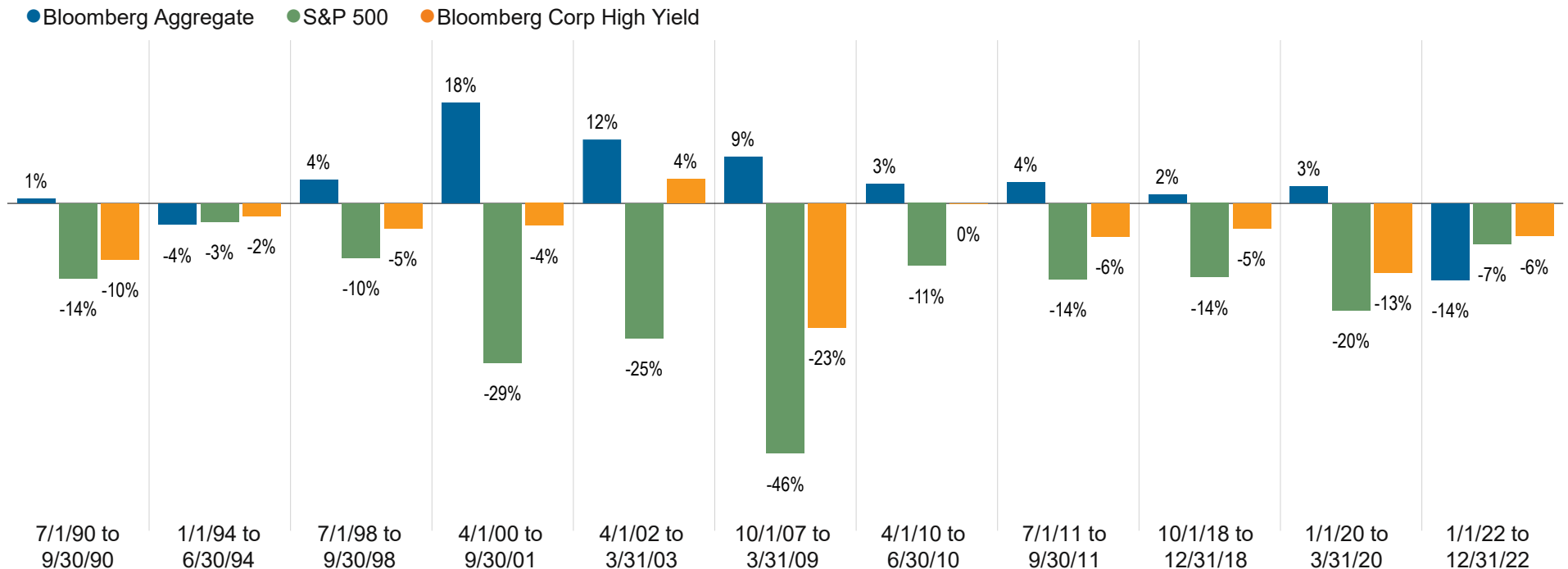
- The current target structure employs three core plus active managers which are essentially equally weighted
- As of September 30, 2023, the total assets in the fixed income portfolio were \$1.837 billion or approximately 18% of total fund assets
- Increasing fixed income up to its new target of 21% would increase the fixed income by approximately \$315 million

Fixed Income

Role as the “Anchor to Windward”

Within a total fund return strategy, the role of fixed income is to serve as a low-risk, diversifying anchor against the riskier investments.

Cumulative Returns for U.S. Equity Declining Periods (last 30 years)

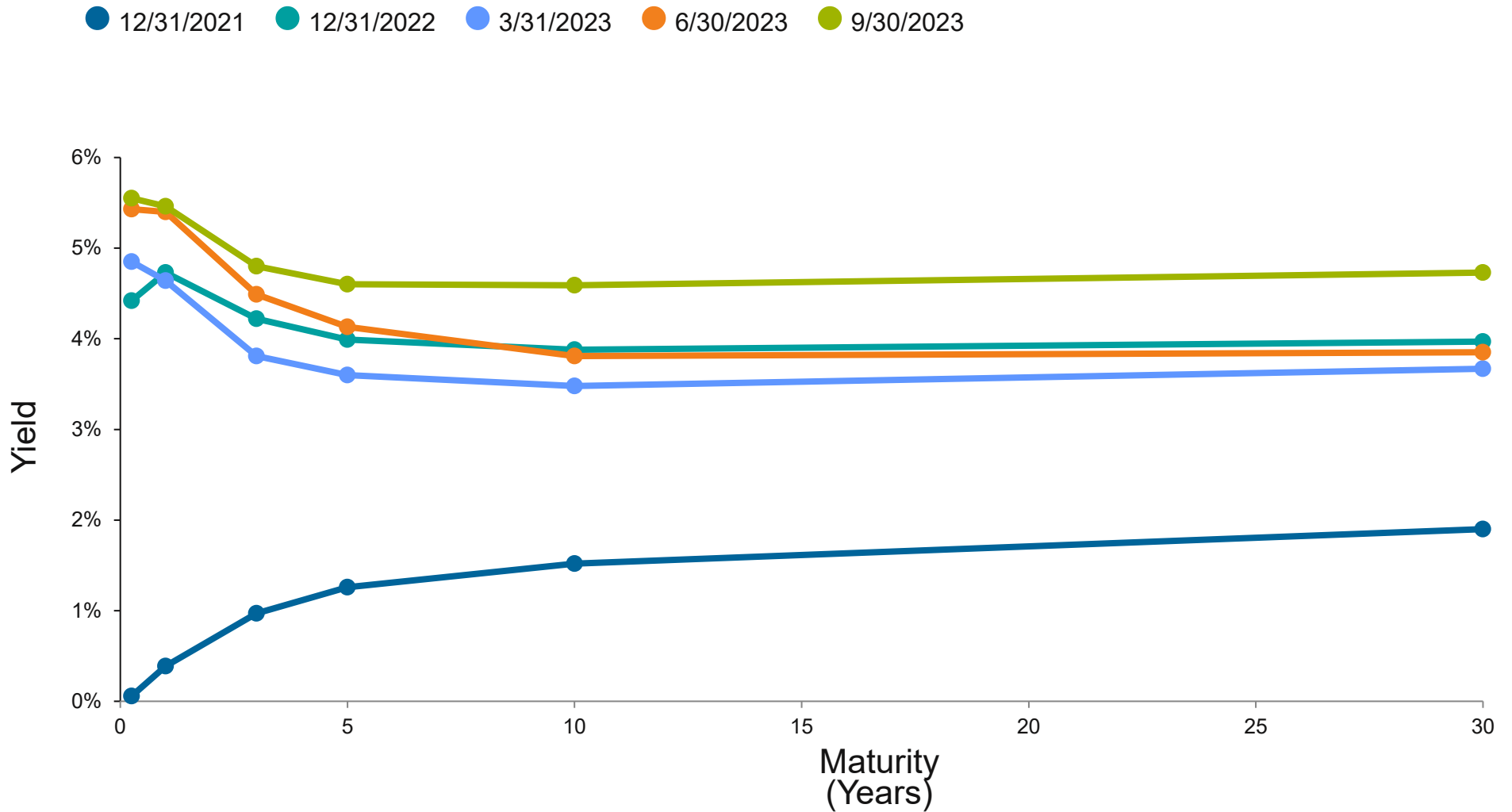


- During most periods when the S&P 500 has generated a negative return, core fixed income as represented by the Bloomberg Aggregate Index was positive. Historically, during quarters when equity has generated a negative return, core fixed income has been negative 10% of the time.
- As illustrated above, high yield fixed income securities tend to be more correlated to equity than core fixed income.

Callan

Appendix

U.S. Treasury Yield Curves



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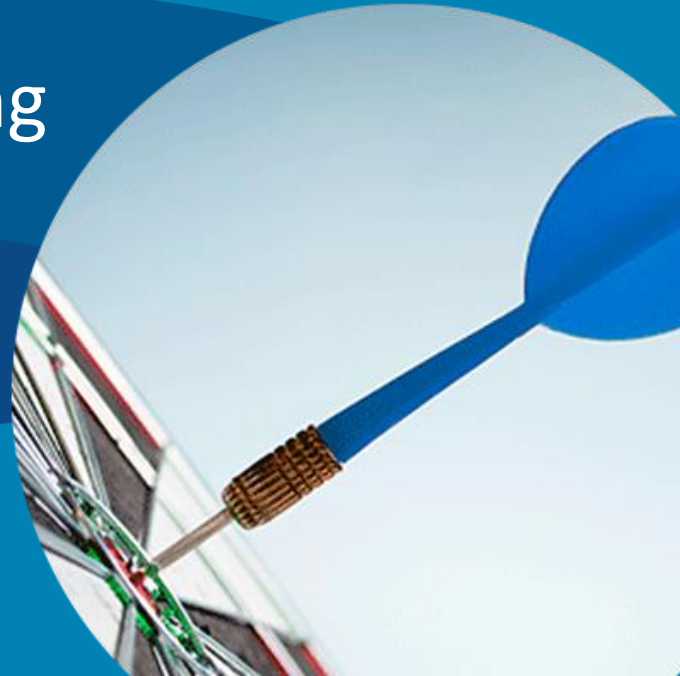
Past performance is no guarantee of future results.



APERS Annual Valuation Results June 30, 2023

November 15, 2023 Board Meeting

Presented by: Heidi G. Barry, ASA, FCA, MAAA
Mita D. Drazilov, ASA, FCA, MAAA



Agenda

- Results as of the June 30, 2023 actuarial valuation
 - APERS
 - District Judges
 - Projections

APERS

Overview

- The purpose of the June 30, 2023 actuarial valuation is twofold:
 - Determine the employer contribution rate for the 12-month period beginning July 1, 2025
 - Determine the financial position of APERS (i.e., funded ratio) as of June 30, 2023
- Board actions today:
 - Confirm the employer contribution rate for APERS of 15.32% of payroll preliminarily adopted at the September 2023 meeting
 - Approve the computed employer contributions for District Judges that are to apply beginning July 1, 2025
 - Approve the reserve transfers from the Employer Accumulation Account to the Retirement Reserve Account and the Deferred Annuity Account

Participant Data

t	U				k O @) k\hU			
	V	U	h	@	V	k	U	h
6/30/12	45,937	\$ 1,606.1	\$ 34,962	2.3%	29,282	1.6	\$ 399.5	24.9%
6/30/13	45,707	1,612.7	35,285	0.9%	30,533	1.5	426.2	26.4%
6/30/14	45,841	1,638.0	35,735	1.3%	31,914	1.4	457.1	27.9%
6/30/15	45,722	1,645.0	35,979	0.7%	33,106	1.4	483.9	29.4%
6/30/16	45,676	1,686.5	36,923	2.6%	34,214	1.3	509.7	30.2%
6/30/17	46,094	1,668.8	36,204	(1.9)%	36,260	1.3	540.1	32.4%
6/30/18	46,207	1,723.6	37,302	3.0%	37,398	1.2	575.1	33.4%
6/30/19	45,965	1,802.4	39,212	5.1%	38,543	1.2	609.1	33.8%
6/30/20	44,373	1,795.7	40,469	3.2%	39,805	1.1	637.1	35.5%
6/30/21	42,669	1,781.8	41,759	3.2%	40,762	1.0	658.8	37.0%
6/30/22	42,771	1,925.5	45,020	7.8%	41,390	1.0	671.2	34.9%

Participant Data (Concluded)

- There are 38,158 members who participate in the New Contributory Plan
 - This total includes members who have made an election to participate in the New Contributory Plan
 - Member contribution rate for the 12-month period beginning July 1, 2025 will be 6.00% of payroll
- There are 5,194 members who participate in the Non-Contributory Plan
- There are an additional 1,473 members with a \$103 million payroll who participate in the DROP plan (not included in active counts above)
 - Employers will make contributions on the pay of these DROP participants

Development of Funding Value of Assets

	\$
A. Funding Value Beginning of Year	\$ 10,220,259,497
B. Market Value End of Year	10,263,062,809
C. Market Value Beginning of Year	9,703,178,137
D. Non-Investment Net Cash Flow	(247,166,785)
E. Investment Income	
E1. Market Total: B - C - D	807,051,457
E2. Assumed Rate	7.15%
E3. Amount for Immediate Recognition	\$ 722,014,038
E4. Amount for Phased-In Recognition	85,037,419
F. Phased-In Recognition of Investment Income	
F1. Current Year: 0.25 x E4	21,259,355
F2. First Prior Year	(471,723,828)
F3. Second Prior Year	504,333,542
F4. Third Prior Year	(110,576,961)
F5. Total Phase-Ins	(56,707,892)
G. Preliminary Funding Value End of Year: A + D + E3 + F5	\$ 10,638,398,858
H. Adjustment to Minimum of 75% of B, Maximum 125% of B	-
I. Final Funding Value End of Year: G + H	\$ 10,638,398,858
J. Difference Between Market & Funding Value	(375,336,049)
K. Market Value End of Year	10,263,062,809
L. Market Rate of Return	8.4%
M. Ratio of Funding Value to Market Value	104%

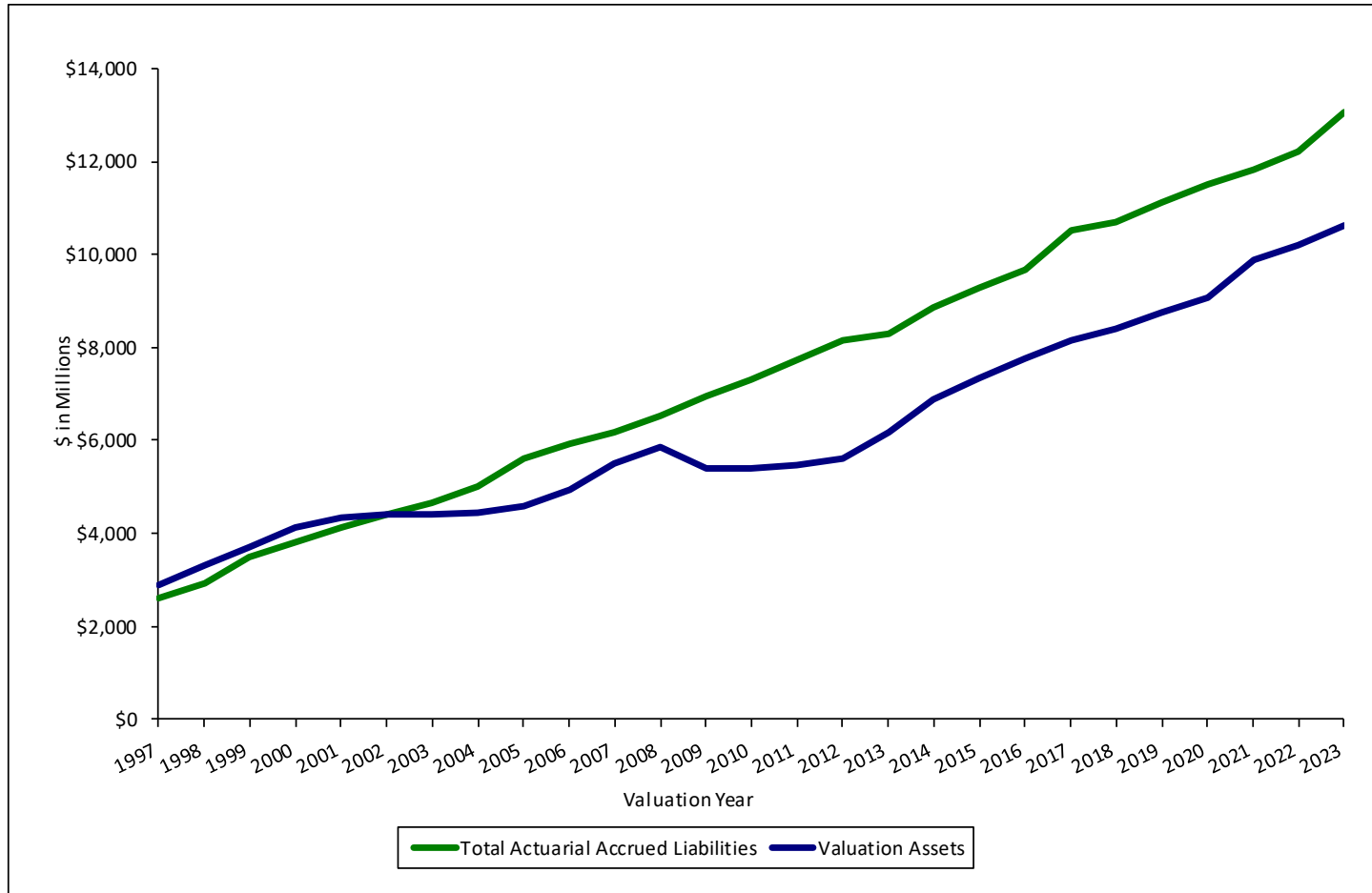
- Funding Value of Assets (FVA) as of June 30, 2022 was \$10,220.3M (row A)
- Non-Investment net cash flow (i.e., dollars in less dollars out) for the System during the calendar year was -\$247.2M (row D)
- The System earned \$807.1M (row E1) in investment income during the year versus \$722.0M (row E3) expected
- This additional investment income of \$85.0M (row E4) is then recognized in the FVA over the next 4 years
- 25% of the current year's investment income above expectations and 25% of the prior 3 years' unrecognized investment income (totaling -\$56.7M; row F5) are then recognized in the June 30, 2023 FVA
- The sum of the above (rows A+D+E3+F5) equals the Preliminary FVA (row G). The 25% corridor is then applied, if necessary, resulting in the final June 30, 2023 FVA equal to \$10,638.4M (row I)
- As of June 30, 2023 the FVA Value of Assets is 4% higher than the Market Value of Assets (MVA) (row M)



APERS Funded Ratio

- Funding value of assets total \$10.64B
- Actuarial accrued liabilities total \$13.07B
- Unfunded actuarial accrued liabilities total \$2.43B
- The APERS funded ratio on a funding value of assets basis is 81%
 - On a market value of assets basis, the funded ratio is 79%
- The funded ratios were 84% and 79%, respectively, in the previous valuation

APERS Funded Ratio (Concluded)



Employer Contribution Rate

#	#			#
	#	#	#	u
Normal Cost:				
Age and service annuities (including DROP and reduced retirement)				8.68%
Separation benefits				2.68%
Disability benefits				0.56%
Death-in-service annuities				0.18%
Administrative expenses				0.40%
Total	9.96%	13.11%	9.71%	12.50%
Member contributions	0.00%	6.00%	0.00%	4.86%
Employer Normal Cost	9.96%	7.11%	9.71%	7.64%
Unfunded Actuarial Accrued Liabilities				7.62% *
Preliminary Computed Employer Contribution Rate				15.26%

- The computed employer contribution rate presented on this slide (i.e., 15.26% of payroll) is before the application of any Board adopted minimum or maximum employer contribution rate.
- The normal cost portion of the computed employer contribution rate (i.e., 7.64% of payroll) is the employer cost of the active membership accruing an additional year of service credit.
- The amortization payment portion of the computed employer contribution to finance the unfunded actuarial accrued liabilities (i.e., 7.62% of payroll) is based upon the “layered” amortization method in conjunction with the Board’s adopted funding policy.
- The Board adopted a minimum employer contribution rate of 15.32% at the September Board meeting.

* The unfunded actuarial accrued liability and total payroll is projected to the end of Fiscal Year 2025 when determining the unfunded amortization rate. Unfunded actuarial accrued liabilities were amortized over multiple amortization periods as shown on the next page. The weighted average amortization period was calculated to be 17.3 years. To maintain the minimum employer contribution rate, the weighted average amortization period would be 17.1 years.

Layered Amortization

Year	Amount	Term	Year	Rate	Rate
Initial Unfunded Actuarial Accrued Liability.					
	\$ 2,237,467,492	N/A	\$ 2,173,364,284	17 yrs.	12.545929
Changes from experience deviations.					
Changes from actuarial assumptions and actuarial cost method revisions.					
6/30/2023	\$ 192,713,806	20	\$ 220,638,036	20	14.072825
u					0.63%

Summary of Risk Measures

Year	7	k	y ⁰	u	†	o)
K	†	U†	h	u h	u h	u h	u h
2005 @#	82 %	83 %	22	0.9	3.8	4.6	**
2006	83	87	19	0.8	3.9	4.7	**
2007 @	89	97	18	0.5	4.2	4.7	**
2008 #	90	86	14	0.5	4.3	4.7	**
2009 @	78	62	30	1.1	3.8	4.8	**
2010	74	65	30	1.2	3.6	4.8	**
2011 #	71	75	30	1.5	3.4	4.8	**
2012	69	70	30	1.5	3.3	4.8	**
2013 #	74	77	25	1.3	3.6	4.9	**
2014 #	78	85	23	1.1	4.0	5.1	59 %
2015 #	79	81	25	1.1	4.2	5.3	58 %
2016	80	76	21	1.1	4.3	5.4	56 %
2017 #	78	76	25	1.3	4.6	5.9	56 %
2018	79	80	26	1.2	4.6	5.8	63 %
2019	79	79	24	1.2	4.5	5.8	62 %
2020	79	76	23	1.3	4.7	6.0	62 %
2021 @	84	94	16	1.0	5.2	6.2	76 %
2022	84	79	14	1.0	5.0	6.0	70 %
2023 #	81	79	17-20	1.1	4.7	5.8	60 %

@ After legislated changes in benefit provisions.

After changes in actuarial assumptions.

^ UAAL is amortized over multiple amortization periods according to the Board's Funding Policy beginning with the June 30, 2023 valuation.

** Unavailable.



DISTRICT JUDGES



District Judges Division

- District Judges Retirement System (DJRS) was incorporated into APERS in 2007
- DJRS became a separately experience-rated division within APERS beginning with the June 30, 2007 actuarial valuation
- District Judges division consists of two plans
 - Old Plan
 - Benefits for service prior to January 1, 2005
 - New Plan (closed to new hires)
 - Benefits for service on or after January 1, 2005

District Judges Division

- Old Plan
 - Each participating employer separately experience rated until UAAL is paid off
 - 29 employers still paying off Old Plan UAAL
 - When UAAL is paid off, becomes cost sharing
- New Plan
 - Cost sharing arrangement
- Purpose of the June 30, 2023 actuarial valuation
 - Determine July 1, 2025 employer contribution for 29 still paying Old Plan employers (expressed in \$)
 - Determine July 1, 2025 employer contribution for New Plan and Paid-Off Old Plan (expressed as a % of pay)

District Judges Division – Participants

- 11 remaining active members with payroll of \$1.7 million in New Plan
- 190 benefit records in all plans with annual benefits of \$2.6 million
 - A retiree’s monthly benefit may be allocated to more than one employer or more than one plan
 - The actual number of retired members was reported to be 131
- 70 inactive records with future annual benefits of \$0.4 million
 - An inactive member’s monthly benefit may be allocated to more than one employer or more than one plan
 - The actual number of deferred members was reported to be 61

District Judges Division – Liabilities and Assets

- New Plan and Paid-Off Old Plans
 - Actuarial accrued liabilities of \$30.2 million
 - Funding value of assets of \$26.4 million
 - Funded ratio of 87%
- Old Plans
 - Actuarial accrued liabilities of \$6.8 million
 - Funding value of assets of \$2.5 million
 - Funded ratio of 36%
- Combined funded ratio is 78%

District Judges Division – Computed Employer Contributions

#	#	#
	V h	o h
Normal Cost:		
Age and Service Annuities (including reduced retirement)	18.49%	
Separation Benefits	1.85%	
Disability Benefits	1.74%	
Death-in-Service Annuities	0.72%	
Total	22.80%	
Member Contributions	5.00%	
Employer Normal Cost	17.80%	
Unfunded Actuarial Accrued Liabilities	79.10% *	\$527,995 **
Unfunded Actuarial Accrued Liabilities	96.90%	\$527,995

* Unfunded actuarial accrued liabilities were amortized over a 3.6-year period.

** Unfunded actuarial accrued liabilities were amortized over a 12-year period.



PROJECTIONS

Projections

- Return scenarios

- Scenario A: The market returns are 7.00% in the next 4 years
- Scenario B: The market returns are 10.0% in the next year and 7.00% in the 2nd, 3rd and 4th years
- Scenario C: The market returns are 5.0% in the next year and 7.00% in the 2nd, 3rd and 4th years
- Scenario D: The market returns are 2.0% in the next year and 7.00% in the 2nd, 3rd and 4th years
- Scenario E: The market returns are 0.0% in the next year and 7.00% in the 2nd, 3rd and 4th years
- Scenario F: The market returns are (5.0)% in the next year and 7.00% in the 2nd, 3rd and 4th years

Projections (Continued)

- The projection results shown in this presentation assume that the unfunded actuarial accrued liabilities will be amortized over multiple closed layers which will reduce by one year each year
- These projections are intended to show the near term effect on employer contributions of the phase-in of unrecognized investment gains and losses
- The projections do not consider non-investment gains and losses which can have a material effect on future valuation results
- The projections do not reflect a Board minimum or maximum rate in the future

Projections (Continued)

- The projections that follow are based upon many assumptions about the future
- Actual future valuation results will take all known future information into account and will differ from the projections -- perhaps materially
- Note that payroll growth at lower than assumed rates will generally result in employer contribution rates that are higher than shown on the following page

Arkansas Public Employees Retirement System Projected Valuation Results (Concluded)

(Amounts in \$ Millions)

	U† k	-					k	
		†		y	†	k		h
Scenario A	7.00%	\$ 14,870	\$ 12,098	\$ 2,772	\$ (10)	81%		15.03%
Scenario B	10.00%	14,870	12,449	2,421	5	84%		14.79%
Scenario C	5.00%	14,870	11,864	3,006	(20)	80%		15.19%
Scenario D	2.00%	14,870	11,513	3,357	(34)	77%		15.43%
Scenario E	0.00%	14,870	11,279	3,591	(44)	76%		15.59%
Scenario F	-5.00%	14,870	10,695	4,175	(68)	72%		16.00%

Notes:
 * Employer rate that results from decreasing amortization period layers by one year every year.
 Does not reflect a Board maximum or minimum contribution rate
 Totals may not add due to rounding.



THANK YOU



Disclaimers

- This presentation is intended to be used in conjunction with the June 30, 2023 actuarial valuation report dated October 31, 2023. This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- This presentation should not be relied on for any purpose other than the purpose described in the presentation.
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- This presentation expresses the views of the authors and does not necessarily express the views of Gabriel, Roeder, Smith & Company.



Quarterly Board Meeting

Statement of Fiduciary Net Position as of September 30, 2023

ASSETS	
Cash and Cash Equivalents	\$ 33,068,137
Receivables	
Dec 2004 Actuarial Liability Receivable	4,719,113
Contributions Receivable	3,482,100
Overpayment Receivable	757,135
Allowance for Doubtful Accounts	(743,493)
Total Receivables	<u>8,214,856</u>
Investments at Fair Value	
Investment Assets	9,832,692,738
Securities Lending Collateral	592,069,032
Total Investments	<u>10,424,761,770</u>
Fixed Assets (Net)	8,610,892
Prepays and Other Assets	656,073
TOTAL ASSETS	<u><u>10,475,311,727</u></u>
LIABILITIES	
Securities Lending Liability	592,094,075
Accrued Expense and Other Liabilities	3,908,453
Other Post Employment Benefits	4,872,673
	<u>600,875,201</u>
TOTAL LIABILITIES	<u>600,875,201</u>
NET POSITION RESTRICTED FOR PENSION BENEFITS	<u><u>\$ 9,874,436,526</u></u>

Unaudited
11/3/2023



Quarterly Board Meeting

**Statement of Changes in Fiduciary Net Position
for the Period Ending September 30, 2023**

ADDITIONS

Contributions

Employer	\$ 81,505,071
Employee	23,811,057
Total Contributions	<u>105,316,128</u>

Investment Income

Investment Income	(345,864,861)
Less: Investment Expense	(1,253,924)
Net Investment Income	<u>(347,118,785)</u>

Other Additions

Transfers from Teachers and Highway	797,332
Miscellaneous Additions	63,371
Miscellaneous Administrative Transfers	297,620
Total Other Additions	<u>1,158,322</u>

TOTAL ADDITIONS	(240,644,336)
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DEDUCTIONS

Benefits	172,525,067
Refund of Contributions	5,270,474
Administrative Expense	2,427,989

TOTAL DEDUCTIONS	<u>180,223,529</u>
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NET INCREASE/(DECREASE)	(420,867,865)
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ADJUSTMENTS

Actuarial Adjustment to DJ Unfunded Liability	<u>-</u>
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NET POSITION RESTRICTED FOR PENSION BENEFITS

Beginning of Year	<u>10,295,304,391</u>
End of 1st Quarter	<u><u>\$ 9,874,436,526</u></u>



Quarterly Board Meeting

November 15, 2023

Legal Report

ADMINISTRATIVE MEMBER APPEALS

Hon. Raymond R. Abramson

Retired APERS member Abramson appealed the July 18, 2023, decision of the Executive Director denying his request to receive additional service credit and retirement benefits for employment as an independent contractor with Monroe County. The Litigation Subcommittee heard the appeal November 1, 2023, and upheld the decision of the Executive Director. Abramson may appeal the decision to Pulaski County Circuit Court.

APPEAL FROM ADMINISTRATIVE MEMBER APPEAL – LITIGATION

None

RULES PROMULGATION

The following rules were successfully reviewed by the Joint Public Retirement & Social Security Programs Committee, the ALC Administrative Rules Committee, and Arkansas Legislative Council. All rules have an effective date of November 13, 2023.

1. **APERS Rule 24 CAR § 1-213. DROP provisions.** Pursuant to Act 247 of 2023, APERS amended Section (i) of this rule to remove the reference to a one-year marriage period for a member to select a spousal option beneficiary under Ark. Code Ann. § 24-4-606.
2. **APERS Rule 312 – 2011 (5) – Contributions Required of New County and Elected Officials Who Are Elected for the First Time after July 1, 2001.** APERS amended the rule to clarify the law as it applies to local elected officials under Ark. Code Ann. § 24-4-521(b)(5) and Ark. Code Ann. § 24-4-101(15)(B).
3. **APERS Rule 410 – 2005 (5) – Purchase of AR National Guard or Armed Forces Reserve Service Credit.** APERS amended the rule to remove inconsistencies with current law, to remove any restatements of law provided under Ark. Code Ann. § 24-2-503, and to make technical corrections for clarity.



Quarterly Board Meeting

November 15, 2023

Legal Report

4. **Rule 411 – 2009 (5) – Purchase of Service Authorized by Section 2 of Act 295 of 2009.**
APERS repealed this rule since Ark. Code Ann. § 24-2-503 covers the purchase of service and the rule was duplicative.

SECURITIES LITIGATION CASES

Company name	Case Caption	Date Case Filed	Lead Plaintiff Status	Firm
Seagate	In re Seagate Technology Holdings plc	10/19/2023	Granted	BLBG



Quarterly Board Meeting
Benefits Summary

Membership

- **Mandatory participating public employers:** All employees of the State of Arkansas, except those who are members of another state retirement system, and all county employees must become members of the system as a condition of employment.
- **Optional participating public employers:** All employees of the following political subdivisions must become members of the system as a condition of employment after the date the employer elects to become a participating public employer.
 - Municipality
 - Regional Solid Waste Management Board
 - Rural Waterworks Facilities Board
 - Joint County and Municipal Sanitation Authority
 - Regional Airport Authority
 - Suburban Improvement District
 - Border Municipal Airport Authority
 - Public Water Authority
 - Public Facilities Board
 - Regional Water Distribution Board

Participating Employers – New This Quarter

Employer Name	Employer Type	Effective Date	No. of Employees
City of Pea Ridge	Municipality	July 1, 2023	20

Active Members – New This Quarter

	Jul 2023	Aug 2023	Sep 2023
Number	1,214	1,364	1,048
Total Active Members	44,178	44,048	43,898

Active Members - Historical

	1 year	5 years	10 years	20 years
Number	42,771	46,094	45,937	42,230
Average Pay	\$45,020	\$36,204	\$34,962	\$26,320



Quarterly Board Meeting
Benefits Summary

Eligibility for Benefits

- **Normal retirement:** Members may voluntarily retire once they attain normal retirement age, which is the youngest of the following ages:
 - Age 65 with at least five (5) years of actual service
 - Any age with 28 years of actual service
 - Age 55 with 35 years of credited service
- **Early retirement:** Members who have not attained normal retirement age may retire with an early annuity, which is reduced by the difference between their age and normal retirement age. Early retirement can begin at the youngest of the following ages:
 - Age 55 with at least five (5) years of actual service
 - Any age with 25 years of actual service
 - Up to 10 years before normal retirement age
- **Disability retirement:** Members with at least five (5) years of actual service who become totally and permanently disabled for any suitable job or position may receive a disability annuity.
- **Survivor retirement:** Survivors of members with at least five (5) years of actual service who die before retirement may receive a survivor annuity. Eligible survivors include a spouse, dependent children, and in some cases, dependent parents.

Inactive Members – New This Quarter

	Jul 2023	Aug 2023	Sep 2023
Number	124	130	150
Total Inactive Members	14,954	15,084	15,234

Inactive Members - Historical

	1 year	5 years	10 years	20 years
Number	15,066	14,873	13,053	8,361
Total Benefits	\$88.8 m	\$76.0 m	\$61.0 m	\$35.0 m



Quarterly Board Meeting
Benefits Summary

Benefits

- **Refund of contributions:** When members terminate covered service, they can request a refund of their accumulated contributions and interest, which is credited at the rate of two percent (2%).
- **Straight life annuity:** Members who retire receive a straight life annuity equal to a percentage of their final average compensation (FAC) multiplied by the number of years of credited service.
- **Annuity options:** Before members receive their first payment, they can elect to receive the straight life annuity or elect to have their annuity reduced under one of four options that provide continuing benefits to a designated beneficiary.
- **Cost-of-living adjustments:** Each July 1, the system redetermines the amount of each monthly benefit that has been paid for at least twelve months. The amount of the redetermined benefit – a cost of living adjustment (COLA) – is based on the date that the retiree was first hired.
- **Benefit calculation example:** Final Average Compensation X Multiplier X Credited Service
 $\$45,020 \times 2.00\% \times 16.75 \text{ yrs.} = \$15,082 \text{ annually} / \$1,257 \text{ monthly}$

Refunds – New This Quarter

	Jul 2023	Aug 2023	Sep 2023
Number	263	248	267
Total Benefits	\$1.5	\$1.6 m	\$1.9 m

Retirees – New This Quarter

	Jul 2023	Aug 2023	Sep 2023
Number	264	159	157
Total Retirees	38,951	39,003	39,014

Retirees - Historical

	1 year	5 years	10 years	20 years
Number	41,390	36,260	29,282	17,748
Total Benefits	\$671.2 m	\$540.1 m	\$399.5 m	\$167.6 m



Quarterly Board Meeting
Benefits Summary

Benefit Formula Components

Multiplier	Group	Before July 1, 2007	On or after July 1, 2007
	Non-contributory	1.75%	1.72%
	Contributory	2.03%	2.00%
Final Average Compensation	Group	Before July 1, 2022	On or after July 1, 2022
	All Members	3-year average	5-year average
Credited Service	Group	Service Credit Rate	
	Regular Members	One (1) month for each month of service	
	Local Elected Officials	Two (2) months for each month of service	



Quarterly Board Meeting

Executive Director Report

Member Communications

Newsletter

A top priority for APERS is communicating with our members and retirees to share important information and updates regarding their retirement. One way that we communicate effectively is through the “APERSpective Newsletter”. The newsletter has been re-branded to include content for both retirees and members to share relevant information with all members. The newsletter will be distributed twice per year to share pertinent information on APERS retirement. The newsletter was sent out in October and the next edition will be in April 2024. The April edition will feature the new APERS website and encourage members to sign up for digital communications.

Style Guide

The APERS team is collectively working to improve our member-facing communications. The goal is to create consistency in writing style and terminology while providing direct, helpful, and friendly communications to our membership. We have introduced a framework for our member and retiree communications in the form of a style guide. The Public Affairs team facilitated training sessions for all APERS employees in the month of October.

Education and Outreach

ASPRS Retiree Meeting

APERS participated in a quarterly meeting of the Arkansas State Police Retirees Association at the State Police Headquarters in October. We discussed the items currently being updated such as the State Police Member Handbook and website and answered questions from retirees and staff. We have assigned two staff members as a direct point of contact for ASPRS.

Employer Survey

APERS conducted an Employer Survey to solicit feedback for 2024 outreach planning. We received over 50 responses to host individual and/or regional trainings. Host sites provide APERS the opportunity to conduct training across the state for our state and non-state employers and members.

Retirement Education

The APERS Public Affairs team presented retirement education throughout the month of October at various annual association conferences. Education was provided to employees of the following agencies: Department of Human Services, Department of Commerce, and Arkansas Department of Education, Division of Higher Education.



Quarterly Board Meeting

Executive Director Report

Road Map to Retirement

The APERS team met with directors of the Employee Benefits Division (EBD), Arkansas State Employee Benefits Association (ARSEBA), and Arkansas State Employees Association (ASEA) to discuss holistic ways to better communicate with our collective membership. We have developed a retirement roadmap handout to provide comprehensive information to all members (state and non-state) as they navigate the retirement process. We intend to expand collaboration and partnership opportunities in the future to serve APERS members and retirees better.

Media

APERS was featured as the cover story in the October 23-29 edition of Arkansas Business. This publication focused on Wealth Management in Arkansas. The article discussed public pensions to include both APERS and the Arkansas Teacher Retirement System, and our diverse investment mix and returns. You can access the article here: [ArkansasBusiness.pdf \(apers.org\)](#)

Public Pension Standards Award

APERS was awarded the Public Pension Standards Award for Funding and Administration for the 17th year in a row by the Public Pension Coordinating Council, a confederation of the National Association of State Retirement Administrators, The National Conference on Public Employee Retirement Systems, and the National Council on Teacher Retirement. The award recognizes meeting professional standards for plan funding and administration as set forth in the Public Pension Standards.

Document Revisions

The APERS team has been working through all of our policies and documentation to update as needed to reflect our current practice as needed. This quarter we have completed the following items:

- Internal Staff Policies
- Investment Policy Statement
- APERS Board of Trustees Manual

Staff Training

In October, three staff members attended the National Pension Education Association's (NPEA) annual conference. The conference focused on current topics, and this year's agenda included national legislative and judicial happenings, cybersecurity, staff recruitment and retention, and media trends. The staff brought back valuable information, including how other retirement systems have expanded their social media platforms and communication by using podcasts and videos. These tools provide convenient training options resulting in more educated members and fewer phone calls to the systems. The staff looks forward to exploring these ideas.

Class Action Settlement Proceeds

Fiscal		
Year		Total Proceeds
2009	\$	2,808,033.51
2010	\$	2,333,548.87
2011	\$	1,222,467.30
2012	\$	734,293.86
2013	\$	501,060.63
2014	\$	1,034,993.49
2015	\$	499,547.35
2016	\$	1,367,167.89
2017	\$	354,154.24
2018	\$	801,714.62
2019	\$	1,442,809.72
2020	\$	1,319,992.13
2021	\$	575,013.13
2022	\$	553,429.10
2023	\$	390,107.88
2024	\$	38,579.68
	\$	<u>15,976,913.40</u>

Claims Filing Deadline Date between 07/03/2023 and 09/29/2023

Class Action Account Number	Account Name	Notice Date Account Open	Exclusion Date Status Date	Claim Due Account Status	Period Begin Claim Status	Period End Comments	Currency * Projected	Gross Settlement Recognized Loss
WORKHORSE GROUP INC., Securities Litigation		N/A	07/03/2023	07/03/2023	03/10/2020	05/10/2021	USD	35,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
WORKHORSE GROUP INC., Securities Litigation		N/A	07/03/2023	07/03/2023	03/10/2020	05/10/2021	USD	35,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
MOHAWK INDUSTRIES, INC Securities Litigation		N/A	05/10/2023	07/05/2023	04/28/2017	07/25/2019	USD	60,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
SolarWinds Corporation Securities Litigation		N/A	07/07/2023	07/07/2023	10/18/2018	12/17/2020	USD	26,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
BRAXIA SCIENTIFIC CORP., Securities Litigation		N/A	N/A	07/07/2023	05/12/2020	03/11/2021	CAD	1,900,000.0000
NO SELECTED ACCOUNTS AFFECTED								
Reckitt Benckiser Group plc Securities Litigation		N/A	06/28/2023	07/07/2023	07/28/2014	04/09/2019	USD	19,600,000.0000
NO SELECTED ACCOUNTS AFFECTED								
JA SOLAR HOLDINGS CO., LTD., Securities Litigation		N/A	06/22/2023	07/08/2023	11/17/2017	09/14/2018	USD	21,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
ZILLOW GROUP, INC., Securities Litigation (17CV01387)		N/A	N/A	07/11/2023	11/17/2014	08/08/2017	USD	15,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								

*Projected Recognized Loss amount is not the final proceeds to be received by the client for the specified class action event/account. It is the potential recognized loss value calculated by BNYM's vendor for class action processing. The Projected Recognized Loss amount is an estimate, and may vary from the final Court approved/analyzed recognized loss proceeds received.

Claims Filing Deadline Date between 07/03/2023 and 09/29/2023

Class Action Account Number	Account Name	Notice Date Account Open	Exclusion Date Status Date	Claim Due Account Status	Period Begin Claim Status	Period End Comments	Currency * Projected	Gross Settlement Recognized Loss
CARDINAL HEALTH, INC., Securities Litigation		N/A	08/21/2023	07/24/2023	03/02/2015	05/02/2018	USD	109,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
CARDINAL HEALTH, INC., Securities Litigation		N/A	08/21/2023	07/24/2023	03/02/2015	05/02/2018	USD	109,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
SPRINT CORPORATION, Securities Litigation		N/A	07/25/2023	07/25/2023	10/25/2017	11/01/2019	USD	3,750,000.0000
NO SELECTED ACCOUNTS AFFECTED								
SPRINT CORPORATION, Securities Litigation		N/A	07/25/2023	07/25/2023	10/25/2017	11/01/2019	USD	3,750,000.0000
NO SELECTED ACCOUNTS AFFECTED								
GRUPO TELEVISIA, S.A.B., Securities Litigation (18CV01979)		N/A	07/10/2023	08/08/2023	04/11/2013	11/17/2017	USD	95,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
GRUPO TELEVISIA, S.A.B., Securities Litigation (18CV01979)		N/A	07/10/2023	08/08/2023	04/11/2013	11/17/2017	USD	95,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
HP INC Securities Litigation		N/A	07/07/2023	08/14/2023	02/23/2017	10/03/2019	USD	10,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								
HP INC Securities Litigation		N/A	07/07/2023	08/14/2023	02/23/2017	10/03/2019	USD	10,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								

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Claims Filing Deadline Date between 07/03/2023 and 09/29/2023

Class Action Account Number Account Name	Notice Date Account Open	Exclusion Date Status Date	Claim Due Account Status	Period Begin Claim Status	Period End Comments	Currency * Projected	Gross Settlement Recognized Loss
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	N/A	07/31/2023	08/14/2023	07/29/2014	03/26/2019	USD	17,500,000.0000
NO SELECTED ACCOUNTS AFFECTED							
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	N/A	07/31/2023	08/14/2023	07/29/2014	03/26/2019	USD	17,500,000.0000
NO SELECTED ACCOUNTS AFFECTED							
U.S. XPRESS ENTERPRISES, INC Securities Litigation	N/A	06/19/2023	08/16/2023	05/07/2018	04/02/2019	USD	13,000,000.0000
NO SELECTED ACCOUNTS AFFECTED							
ARCONIC INC., Securities Litigation	N/A	07/19/2023	08/21/2023	11/04/2013	06/27/2017	USD	74,000,000.0000
NO SELECTED ACCOUNTS AFFECTED							
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHO)	N/A	07/27/2023	08/21/2023	11/03/2016	08/03/2017	USD	300,000,000.0000
NO SELECTED ACCOUNTS AFFECTED							
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHO)	N/A	07/27/2023	08/21/2023	11/03/2016	08/03/2017	USD	300,000,000.0000
NO SELECTED ACCOUNTS AFFECTED							
ARCONIC INC., Securities Litigation	N/A	07/19/2023	08/21/2023	11/04/2013	06/27/2017	USD	74,000,000.0000
NO SELECTED ACCOUNTS AFFECTED							
TACTILE SYSTEMS TECHNOLOGY. INC, Securities Litigation	N/A	08/02/2023	08/23/2023	05/07/2018	06/08/2020	USD	5,000,000.0000
NO SELECTED ACCOUNTS AFFECTED							

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Claims Filing Deadline Date between 07/03/2023 and 09/29/2023

Class Action Account Number	Account Name	Notice Date Account Open	Exclusion Date Status Date	Claim Due Account Status	Period Begin Claim Status	Period End Comments	Currency * Projected	Gross Settlement Recognized Loss
SUNLANDS TECHNOLOGY GROUP, Securities Litigation		N/A	09/06/2023	08/28/2023	02/23/2018	09/18/2018	USD	6,200,000.0000
NO SELECTED ACCOUNTS AFFECTED								
KRAFT HEINZ COMPANY, Fair Fund		N/A	N/A	08/31/2023	02/26/2016	02/21/2019	USD	62,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
KRAFT HEINZ COMPANY, Fair Fund		N/A	N/A	08/31/2023	02/26/2016	02/21/2019	USD	62,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
6D GLOBAL TECHNOLOGIES, INC., Securities Litigation (15CV08061)		N/A	09/15/2023	09/06/2023	06/16/2014	09/10/2015	USD	260,000.0000
NO SELECTED ACCOUNTS AFFECTED								
NUTANIX, INC., Securities Litigation		N/A	09/13/2023	09/06/2023	11/30/2017	05/30/2019	USD	71,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
SYNCHRONY FINANCIAL, Securities Litigation		N/A	07/10/2023	09/07/2023	01/19/2018	07/12/2018	USD	34,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
LONGEVERON INC., Securities Litigation		N/A	08/25/2023	09/08/2023	01/19/2021	08/12/2021	USD	1,397,500.0000
NO SELECTED ACCOUNTS AFFECTED								
FIFTH THIRD BANCORP, Securities Litigation		N/A	08/24/2023	09/09/2023	05/21/2018	05/22/2019	USD	5,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								

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Claims Filing Deadline Date between 07/03/2023 and 09/29/2023

Class Action Account Number	Account Name	Notice Date Account Open	Exclusion Date Status Date	Claim Due Account Status	Period Begin Claim Status	Period End Comments	Currency * Projected	Gross Settlement Recognized Loss
FIFTH THIRD BANCORP, Securities Litigation		N/A	08/24/2023	09/09/2023	05/21/2018	05/22/2019	USD	5,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								
BUMBLE INC., Securities Litigation		N/A	07/12/2023	09/11/2023	09/07/2021	01/24/2022	USD	18,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
TENARIS S.A., Securities Litigation		N/A	09/28/2023	09/12/2023	05/01/2014	12/05/2018	USD	9,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								
TENARIS S.A., Securities Litigation		N/A	09/28/2023	09/12/2023	05/01/2014	12/05/2018	USD	9,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								
INTERFACE, INC., Securities Litigation		N/A	08/28/2023	09/13/2023	05/12/2016	09/28/2020	USD	7,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								
AEGEAN MARINE PETROLEUM NETWORK INC., Securities Litigation (Individual Defendant's Settlement)		N/A	09/28/2023	09/20/2023	02/27/2014	11/05/2018	USD	11,949,999.0000
NO SELECTED ACCOUNTS AFFECTED								
MAXAR TECHNOLOGIES INC., Securities Litigation		N/A	08/28/2023	09/27/2023	02/24/2017	09/27/2023	USD	36,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								
MAXAR TECHNOLOGIES INC., Securities Litigation		N/A	08/28/2023	09/27/2023	02/24/2017	09/27/2023	USD	36,500,000.0000
NO SELECTED ACCOUNTS AFFECTED								

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Claims Filing Deadline Date between 07/03/2023 and 09/29/2023

Class Action Account Number	Account Name	Notice Date Account Open	Exclusion Date Status Date	Claim Due Account Status	Period Begin Claim Status	Period End Comments	Currency * Projected	Gross Settlement Recognized Loss
D-MARKET Electronic Services & Trading. Securities Litigation		N/A	07/10/2023	09/27/2023	05/28/2021	11/23/2021	USD	13,900,000.0000
NO SELECTED ACCOUNTS AFFECTED								
EXELON CORPORATION Securities Litigation		N/A	08/17/2023	09/28/2023	02/08/2019	10/31/2019	USD	173,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								
EXELON CORPORATION Securities Litigation		N/A	08/17/2023	09/28/2023	02/08/2019	10/31/2019	USD	173,000,000.0000
NO SELECTED ACCOUNTS AFFECTED								

*Projected Recognized Loss amount is not the final proceeds to be received by the client for the specified class action event/account. It is the potential recognized loss value calculated by BNYM's vendor for class action processing. The Projected Recognized Loss amount is an estimate, and may vary from the final Court approved/analyzed recognized loss proceeds received.