

SWIB Board Meeting of December 15, 2023

Table of Contents

Agenda	2
1. Committee Reports-Open Session Items	5
2. Consent Agenda	6
3. Investment Performance and Market Updates	20
4. Annual Presentation on Cost Benchmarking	53
5. Asset Allocation Recommendations for 2024	65
6. Committee Open Session Business	97
7. Quarterly Investment Update, Q3 2023	124
Closed Session	
8. Announcement of Matters Taken Up in Closed Session	140
9. Reports to Be Filed	141
10. Future Items for Discussion	156
11. Adjourn	

Name of Meeting: Regular Meeting of the Board of Trustees
Date/Time: Thursday, December 14, 2023 5:30 pm
Location: Great Dane Pub & Brewing Company
Address: 357 Price Pl, Madison, WI 53705

Estimated Time	OPEN SESSION
5:30 pm	Reception* Great Dane Pub & Brewing Company 357 Price Place Madison, WI 53705 Adjourn until Friday, December 15, 2023

**The Reception is open to the public. If a member of the public wishes to attend, please notify SWIB at 608-261-9341 or email dawn.tuescher@swib.state.wi.us on or before December 14th.*

Name of Meeting: Regular Meeting of the Board of Trustees
Date/Time: Friday, December 15, 2023 Approx. 10:15 am (following Benchmark)
Room: 1st Floor Conference Room
Address: 4703 Madison Yards Way, Madison, WI 53705
Virtual: [Click here to join the meeting](#) ; 608-267-3179, code 74789856

OPEN SESSION	
1.	Committee Reports – Open Session Items <ul style="list-style-type: none"> A. Strategic Planning and Corporate Governance Committee B. Audit and Finance Committee C. Compensation and Workforce Development Committee D. Benchmark and Performance Committee
2.	Consent Agenda <ul style="list-style-type: none"> A. Minutes of September 13 and October 17-18, 2023 B. Recommended Actions from Committee Agendas – Open Session Items
3.	Investment Performance and Market Updates <ul style="list-style-type: none"> A. Board Investment Performance Report, Q3 2023 B. Callan Quarterly Report
4.	Annual Presentation on Cost Benchmarking
5.	Asset Allocation Recommendations for 2024
6.	Committee Open Session Business <ul style="list-style-type: none"> A. Enterprise Risk and Compliance Committee Charter B. Approved Open Session Investment Committee Meeting Minutes of August 22, September 26 and October 24, 2023 C. Final Open Session Investment Committee Agenda for November 28, 2023 and Draft Open Session Agendas for December 21, 2023 and January 23, 2024
7.	Quarterly Investment Update, Q3 2023

CLOSED SESSION*
RECONVENE IN OPEN SESSION
8. Announcement of Matters Taken Up in Closed Session
9. In the Absence of Questions, the Following Reports will be Filed Without Comment (For informational purposes): <ul style="list-style-type: none"> A. Quarterly Charges to Funds Reports, Q3 2023 B. Private Markets and Funds Alpha Commitments, Q3 2023 C. Board Contact Log
10. Future Items for Discussion <ul style="list-style-type: none"> A. Annual Board Agenda Plan
Motion to Adjourn
<p><i>NOTES: Items may be taken in order other than listed.</i></p> <p><i>Estimated times are for planning purposes only. Agenda items will last until discussion is concluded.</i></p> <p><i>The meeting site is physical accessible. Upon prior request, reasonable accommodations will be provided.</i></p>

*For further details on virtual format of meeting, please contact Dawn Tuescher (608-261-9341 or dawn.tuescher@swib.state.wi.us).

* The motion to go into closed session at this meeting is made pursuant to: (i) Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to (a) consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies of internal WRS portfolios, asset allocation, and risk management, and (b) approve prior closed session minutes that discuss the same; and (ii) Section 19.85(1)(c) of the Wisconsin Statutes to consider and approve prior meeting minutes that discuss the performance evaluation and compensation data of specific SWIB persons. The Board may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General’s Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the Board will subsequently reconvene in open session to cover remaining agenda items.

Board Meeting

Tab 1 – Committee Reports – Open Session Items

- A. Strategic Planning and Corporate Governance Committee
- B. Audit and Finance Committee
- C. Compensation and Workforce Development Committee
- D. Benchmark and Performance Committee

Board Meeting

Tab 2 – Consent Agenda

- A. Minutes of September 13 and October 17-18, 2023
- B. Recommended Actions from Committee Agendas –
Open Session Items

Regular Meeting of the Board of Trustees

Friday, December 15, 2023

STATE OF WISCONSIN INVESTMENT BOARD

CONSENT AGENDA – OPEN SESSION ITEMS

Proposed Motions:

1. Move to approve the Open Session Minutes, Closed Session Minutes, and Executive Closed Session Minutes of September 13 and October 17-18, 2023, as presented.
2. Move to approve changes to the (i) Incentive Compensation Plan – Unclassified Investment Management Staff, (ii) Incentive Compensation Plan – Unclassified Investment Services Staff, (iii) Incentive Compensation Plan – Executive Staff, and (iv) Long-Term Incentive Compensation Plan, as recommended by the Compensation and Workforce Development Committee.
3. Move to approve the Relative Performance Maximums effective beginning in 2024, as recommended by Verus Advisory and the Compensation and Workforce Development Committee.
4. Move to approve the changes to the Benchmark and Performance Committee Charter, as reflected in the Committee materials and recommended by the Benchmark and Performance Committee.
5. Move to approve: (i) the benchmark changes, as recommended by SWIB’s benchmark consultant, NEPC, and SWIB’s Investment Committee, as described in the meeting materials; (ii) the change to the current return portfolio benchmark take effect on January 1, 2024; (iii) the change to the China equity benchmark take effect on January 1, 2025, subject to operational readiness; and (iv) all other benchmarks remain unchanged; in each case, as recommended by the Benchmark and Performance Committee.
6. Move to approve:
 - (i) the Total Cost of Management Plan for Calendar Year 2024;
 - (ii) the addition of 8 full-time positions for 2024, as described in the meeting materials;
and
 - (iii) amendments to the CY2023 Total Cost of Management Plan to reflect the actual amount of incentive compensation paid in the aggregate to all SWIB staff for the year;each as recommended by the Audit and Finance Committee.

STATE OF WISCONSIN INVESTMENT BOARD
Board Meeting – Open Session

Wednesday, September 13, 2023

Office of the Investment Board
4703 Madison Yards Way, Madison, WI

Board Members Present: Barb Nick, Chair
Clyde Tinnen, Vice Chair & Secretary
Esther Ancel, Trustee
Kathy Blumenfeld, Trustee
Jeff DeAngelis, Trustee
Tom Merfeld, Trustee
Kristi Palmer, Trustee
Dave Schalow, Trustee
John Voelker, Trustee

Staff/Others Present: Joe Amoyal, Senior Trader
Nathan Ballard, Senior Legal Counsel
Chris Benish, Portfolio Manager
Zach Berghouse, Internal Auditor
Brandon Brickner, Internal Audit Director
Ian Calame, Senior Portfolio Manager
Stefano Cavaglia, Senior Portfolio Manager
Sara Chandler, Chief Legal Counsel
Hassan Chehime, Head of Risk Management
Christian Comito, Portfolio Manager
John Culley, Portfolio Manager
Edwin Denson, Executive Director/Chief Investment Officer
Roger Ding, Senior Portfolio Manager
Tom Dobesh, Senior Portfolio Manager
Derek Drummond, Head of Funds Alpha
Kliton Duri, Senior Portfolio Manager
Chris Eckerman, Senior Portfolio Manager
Anne-Marie Fink, Private Markets & Funds Alpha CIO
Greg Fletcher, Performance Director
Tom Freeman, Director of Quantamental Research
Scott Freundlich, Portfolio Manager
Chirag Gandhi, Senior Portfolio Manager
Shannon Gannon, Communications Director
George Gao, Portfolio Manager
Mike Harmelink, Senior Portfolio Manager
Hillary Holstein, Portfolio Manager
Phil Johnson, Senior Portfolio Manager
Rochelle Klaskin, Deputy Executive Director/Chief Administrative Officer
Leo Kropywiansky, Senior Portfolio Manager
Lisa Lange, Director of Compliance and Senior Legal Counsel

Shan Lo, Senior Portfolio Manager
Jeff Lucas, Senior Portfolio Manager
Todd Mattina, Head Economist, Asset & Risk Allocation CIO
Jason Mirr, Senior Portfolio Manager
Joy Mukherjee, Senior Portfolio Manager
Chris Nelms, Portfolio Manager
Chad Neumann, Senior Portfolio Manager
Sadi Ozelge, Senior Portfolio Manager
Scott Parrish, Head of Private Equity
Chris Prestigiacomio, Head of Private Debt & Venture Capital
Jay Risch, Government Relations Liaison
Andrea Ruiz, Senior Portfolio Manager
Scott Schrier, Portfolio Manager
Mike Shearer, Head of Fixed Income Strategies
Chris Spiering, Senior Portfolio Manager
Mike Stamm, Director of Financing & Collateral Management
Nick Stanton, Head of Multi-Asset Strategies
Leif Thybony, Senior Portfolio Manager
Dawn Tuescher, Executive Administrative Assistant
Gretchen Wegner, Portfolio Manager
Ping Wong, Portfolio Manager
Harrison Bader, BlackRock
David Buerger, Wisconsin Ethics Commission
Alvaro Carrillo, BlackRock
Heather Gillers, Wall Street Journal
Jessica Hamlin, Pitchbook
Chris Levell, NEPC
Matt Rossi, Legislative Audit Bureau
Sam Rebenstorf, Legislative Audit Bureau
Lindsay Saienni, FIN News
Bob Schaefer, State Engineers Association & Wisconsin Coalition of Annuitants
Brigid Schutsky, BlackRock

(Some individuals may have attended only portions of the meeting.)

Trustee Tinnen, Vice Chair & Secretary of the Board of Trustees, declared a quorum was present and called the Board of Trustees meeting to order at 9:01 a.m. on September 13, 2023. Trustee Tinnen announced that Trustee Nick, Board Chair, and Edwin Denson, Executive Director/Chief Investment Officer, were attending virtually as they were in New York City to accept the Board of the Year award at the Institutional Investor 2023 Allocators' Choice Awards.

1. Committee Reports – Open Session Items

A. Strategic Planning and Corporate Governance Committee

Trustee Tinnen, Chair of the Strategic Planning and Corporate Governance Committee, reported that in its open session meeting the Committee: (i) approved prior meeting minutes; (ii) heard a report and market outlook presentation on private equity and private debt from staff and StepStone; (iii) heard a corporate governance and proxy voting review for 2023; (iv) reviewed board policies; (v) heard a preview of the

October Board Workshop; and (vi) received a progress report on Project Centum. During the Committee's closed session, the Committee: (i) approved prior meeting minutes; (ii) heard a report and market outlook presentation on co-investments and venture capital from staff and StepStone; (iii) received an IT security management update for 2023; and (iv) received an update on Board and staff consultant contracts.

B. Audit and Finance Committee

Trustee Palmer, Chair of the Audit and Finance Committee, reported that in open session the Committee: (i) approved prior meeting minutes; (ii) approved the 2022 Wisconsin Retirement System audited financial statements, which included an unmodified opinion from the Legislative Audit Bureau (LAB); (iii) reviewed the open audit issues report; (iv) approved the draft Budget and Monitoring audit report, (v) approved an update to the 2023 Internal Audit Plan; (vi) previewed the 2024 Internal Audit Plan; and (vii) received a Quarterly Cost of Management Update for Q2 2023. In closed session, the Committee approved prior meeting minutes and discussed closed session open audit issues.

C. Benchmark and Performance Committee

Trustee Schalow, Chair of the Benchmark and Performance Committee, reported that in open session the Committee: (i) approved prior meeting minutes; and (ii) received an annual benchmark preview from staff and NEPC.

D. Compensation

Trustee Tinnen, Vice Chair & Secretary of the Board, reported that in open session the Committee: (i) approved prior meeting minutes; and (ii) received a talent acquisition and employee engagement update.

2. Consent Agenda

Sara Chandler, Chief Legal Counsel, distributed a proposed consent agenda. Trustee Tinnen asked whether there were any motions listed on the consent agenda that should be removed for further discussion and individual action. Hearing none, he referred to the following items on the consent agenda:

- Move to approve the Open Session Minutes, Closed Session Minutes, and Executive Closed Session Minutes of June 14, 2023, as presented.

Motion: A motion was made by Trustee Schalow and seconded by Trustee Palmer to approve the consent agenda, as presented. The motion passed unanimously.

3. Investment Forum Recap

Sara Chandler, Chief Legal Counsel, reviewed the topics and format of the June 2023 Investment Forum and asked for Trustee feedback. Ms. Chandler stated that the virtual format made it easier to secure desired speakers and increased attendance, noting that over 200 participants attended the Forum.

4. Biennial Ethics Training

David Buerger, Staff Counsel, Wisconsin Ethics Commission, gave a presentation on the State Code of Ethics entitled *Lobbying and the Code of Ethics for Investment Board Members and Employees*, included on pages 25-55 of the meeting materials.

5. Fiduciary & Public Records Topics

Ms. Chandler noted that training videos on the topics of Fiduciary Duties and Public Records will be made available to Trustees through the BoardSmart portal before the end of the year.

6. Investment Performance and Market Updates

A. Board Investment Performance Report, Q2 2023

Greg Fletcher, Performance Director, presented the *Investment Performance Report*, as of June 30, 2023, included on pages 58-73 of the meeting materials. Mr. Fletcher reported that: (i) the Core Trust Fund (CTF) returned 2.32% net of fees in Q2 2023, resulting in excess performance of 2 basis points (bps) for the quarter; (ii) the CTF returned 7.02% net of fees for the one-year period, resulting in an excess return of 54 bps; (iii) the CTF five-year net-of-fee return of 7.53% outperformed the Policy Benchmark by 57 bps on an annualized basis; and (iv) the CTF gross return outperformed the 60/40 Reference Portfolio return by 83.6% (cumulative) over the past 20 years, which equates to \$32.5 billion over the same period.

Mr. Fletcher highlighted: (i) the CTF net of all fee and expense return outperformed its benchmark for the year-to-date, one-, three-, and five-year time periods; (ii) the CTF net of fee and expense return outperformed its benchmark for the five-, ten-, and twenty-year time periods; (iii) the CTF gross of fee return outperformed its benchmark for the thirty-year time period; (iv) the Variable Trust Fund (VTF) net of all fee and expense return underperformed for the year-to-date, three-year, and five-year periods; (v) the VTF net of fee and expense return outperformed its benchmark for the twenty-year period, but underperformed for the five- and ten-year periods; and (vi) the VTF gross of fee return outperformed its benchmark for the thirty-year time period. Mr. Fletcher then noted that SWIB's investment management has added more than \$2.6 billion above benchmark returns to the WRS over the last five years.

Mr. Fletcher referenced that the percentage of WRS assets that are actively managed declined, driven by a variety of factors, but that internally managed assets have increased to 39.5%. Next, Mr. Fletcher: (i) provided a breakdown of CTF asset class exposures, noting that the portfolio remains well diversified, and all asset classes are within target range; (ii) reviewed the asset class performance for the CTF over various time periods; (iii) reviewed VTF performance and asset class exposures, noting asset class exposures were within target range; and (iv) presented return information for the Separately Managed Funds.

Mr. Fletcher concluded by reviewing the *Leverage Performance*, included on page 75 of the meeting materials. He noted that policy leverage contributed 48 bps to CTF absolute performance year-to-date and remained a positive contributor over the one-, three- and five-year periods.

B. Callan Quarterly Report

Mr. Fletcher noted that the *Callan Quarterly Report Summary*, as of June 30, 2023, was included on pages 77-89 of the meeting materials. He highlighted that the CTF's total fund unadjusted rankings are near or above median over the five- and ten-year periods but are in the third quartile for the most recent one-year period. On an asset allocation adjusted basis, the CTF's rankings are at median for the last quarter, but in the second quartile for the one-, three-, five- and ten-year periods. When comparing the CTF ten-year cumulative performance to peers, Mr. Fletcher noted that following two years of meaningful outperformance from 2020-2021, the CTF then underperformed peers during 2022. He then pointed to more recent performance from the end of 2022 and the beginning of 2023, which shows the CTF's relative performance converging with peers.

7. Committee Open Session Business

Ms. Chandler noted to the board that Chase Nicholson, Senior Portfolio Manager, had been added to the Investment Committee.

A. Approved Open Session Investment Committee Minutes

Ms. Chandler stated that the approved open session minutes of the May 23, June 27, and July 25, 2023 Investment Committee meetings were included on pages 91-106 of the meeting materials for the Board's review and noted that staff had previously reviewed the agendas for these meetings with the Board.

B. Agendas for Upcoming Meetings

Ms. Chandler also stated that the final open session agenda for the August 22, 2023 Investment Committee meeting and the draft open session agendas for the September 26 and October 24, 2023 meetings were included on pages 107-112 of the meeting materials for the Board's review.

C. Draft Open Session Enterprise Risk and Compliance Committee Minutes

Ms. Chandler also noted that the draft open session minutes of the May 25, 2023 Enterprise Risk and Compliance Committee meeting were included on pages 113-115 of the meeting materials for the Board's review.

8. Quarterly Investment Update, Q2 2023

Todd Mattina, Head Economist, Asset & Risk Allocation CIO, presented the *Performance Trends & Outlook*, included on pages 119-121 of the meeting materials. Mr. Mattina began with a review of the CTF five-year rolling annualized net of fee return compared to the CTF twenty-year net of fee return and the actuarial target rate of return. He noted that despite volatility over the last few years, the five-year rolling return has outperformed both the policy benchmark and the actuarial target rate of return for the same period, as has the CTF twenty-year net of fees return. Mr. Mattina then provided a brief commentary on the CTF five-year return estimate, which projected the same five-year annualized return of 8.4% using either NEPC's assumptions for 2023 or year-to-date returns through the end of June.

Mr. Mattina also discussed the impact on the five-year return estimate of negative performance in 2022 as well as the fact that negative performance in 2018 is no longer included in the five-year period. With respect to the former point, the Board discussed that in upcoming years the five-year return estimate will be even heavily impacted by the 2019 and 2020 performance years, which had meaningfully positive performance of 19.5% and 15.3%, respectively, falling out of the five-year time period. Unless actual performance is sufficient to replace those positive performance years, it is likely that a negative dividend would be necessary in the future. Mr. Mattina concluded with a discussion of benchmark performance year-to-date and an asset class review.

Leo Kropywiansky, Senior Portfolio Manager, then provided an *Economic Update*, included on pages 123-152 of the meeting materials. Mr. Kropywiansky noted that despite large and rapid Federal Reserve interest rate hikes, the economy has been resilient. Consumer balance sheets are in good shape and, at the same time, household holdings of liquid assets are still elevated as a result of the government pandemic stimulus and reduced discretionary services spending during the pandemic. Mr. Kropywiansky argued that inflation is moderating, with core PCE measures in the 3.4% to 4.6% range in recent months, but that this is still well above the Federal Reserve's 2.0% target. While the consensus growth projection for 2023 is

strengthening, the consensus view for 2024 is declining, projecting a soft landing, but with a longer period of below-trend growth.

Mr. Kropywiansky then provided a brief review of the labor market, noting that the labor market remains tight, with solid jobs growth and strong nominal wage growth. Interestingly, the “missing workers” discussed so often during the pandemic might no longer be a supply-side problem, as the labor force has returned to levels that were expected for 2023 before the COVID-19 shock occurred, due to particularly notable labor force increases this year. Mr. Kopywiansky expects more demographic drag ahead though, as population aging will serve as a depressor of participation in the future and the recovery in the 16+ population is still 800,000 persons short of the pre-pandemic levels, which could also cause lagging participation in the future.

9. Motion to Convene in Closed Session

Motion: A motion to convene in closed session pursuant to: (i) Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to (a) consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies of internal WRS portfolios and risk management, and (b) approve prior closed session minutes that discuss the same; and (ii) Section 19.85(1)(c) of the Wisconsin Statutes to consider and approve prior meeting minutes that discuss the performance evaluation and compensation data of specific SWIB employees was made by Trustee Tinnen and seconded by Trustee Merfeld.

The Chair called for a roll call vote.

Ancel–Aye Blumenfeld–Aye DeAngelis–Aye Merfeld - Aye Nick-Aye
Palmer-Aye Schalow-Aye Tinnen-Aye Voelker-Aye

There being nine ayes and no nays, the Chair declared the motion passed. The Board convened in closed session at 11:00 a.m. and reconvened in open session at 11:38 a.m.

10. Announcement of Board Actions Relating to Items Taken up in Closed Session

Trustee Tinnen announced that while in closed session the Board: (i) received a risk management update; and (ii) discussed Investment Committee closed session business.

11. Reports Filed Without Comment

In the absence of questions, the following reports, included on pages 197-210 of the meeting materials, were filed without comment: (i) Quarterly Charges to Funds Report, Q2 2023; (ii) Private Markets and Funds Alpha Commitments, Q2 2023, and (iii) Board Contact Log.

12. Future Items for Discussion

Ms. Chandler noted that the Annual Agenda Plan was included on pages 184-187 in the meeting materials for the Board’s information.

13. Adjournment

Hearing no additional items for discussion, Trustee Tinnen adjourned the meeting at 11:40 a.m.

Date of Board Approval:

Signed:

Clyde Timmen, Board Secretary

DRAFT

STATE OF WISCONSIN INVESTMENT BOARD

Board of Trustees Meeting – Open Session

Tuesday/Wednesday, October 17-18, 2023

Heidel House Hotel & Convention Center
Green Lake, Wisconsin

Board Members Present for Both Days:

Barb Nick, Chair
Clyde Tinnen, Vice Chair & Secretary
Esther Ancel, Trustee
Kathy Blumenfeld, Trustee
Jeff DeAngelis, Trustee
Tom Merfeld, Trustee
Kristi Palmer, Trustee
Dave Schalow, Trustee

Staff/Others Present:

Nathan Ballard, Senior Legal Counsel
Brandon Brickner, Internal Audit Director
Sara Chandler, Chief Legal Counsel
Hassan Chehime, Head of Risk Management
Edwin Denson, Executive Director/Chief Investment Officer
Derek Drummond, Head of Funds Alpha
Anne-Marie Fink, Private Markets & Funds Alpha Chief Investment Officer
Jameson Greenfield, Chief Financial Officer
Brian Heimsoth, Senior Portfolio Manager
Rochelle Klaskin, Deputy Executive Director/Chief Administrative Officer
Leo Kropywiansky, Senior Portfolio Manager
Diane Linn, Senior Portfolio Manager
Todd Mattina, Head Economist, Asset & Risk Allocation CIO
Chase Nicholson, Senior Portfolio Manager
Scott Parrish, Head of Private Equity
Chris Prestigiacomio, Head of Private Debt & Venture Capital
Jason Rector, Portfolio Manager – Funds Alpha
Jason Rothenberg, Head of Real Estate
Mike Shearer, Head of Fixed Income Strategies
Nick Stanton, Head of Multi-Asset Strategies
Dawn Tuescher, Executive Administrative Assistant
Ivy Zhang, Senior Portfolio Manager
Chris Levell, NEPC
Joe Nankof, NEPC
Jim Anderson, Gabriel, Order, Smith & Co
Mark Buis, Gabriel, Order, Smith & Co
Rich Koch, Gabriel, Order, Smith & Co
Jan Hatzius, Goldman Sachs
Scott Konicki, Goldman Sachs
Frances Schwiep, Two Sigma
Brad Betts, BlackRock
Andrea Picard, BlackRock

Jeremy Kawaller, BlackRock
Mike Blue, HistoSonics
Jim Adox, Venture Investors
Sam Rebenstorf, Legislative Audit Bureau
Alex Paradowski, Legislative Audit Bureau
Eric Hansen, Public Attendee
Peter Knotek, Public Attendee
Anne Steinberg, Public Attendee
(Some individuals may have attended only portions of the meeting.)

TUESDAY, OCTOBER 17, 2023

Open Session

Trustee Nick, Chair of the Board of Trustees, declared a quorum was present and called the Board of Trustees meeting to order at 10:30 a.m.

1. Motion to Convene in Closed Session

Motion: A motion to convene in closed session pursuant to Section 19.85(1)(c) of the Wisconsin Statutes to discuss performance evaluation data of SWIB's Board of Trustees was made by Trustee Nick and seconded by Trustee Palmer.

The Chair called for a roll call vote.

Ancel-Aye	Blumenfeld-Aye	DeAngelis-Aye	Merfeld-Aye
Nick-Aye	Palmer-Aye	Schalow-Aye	Tinnen- Aye

There being eight ayes and no nays, the Chair declared the motion passed. The Board then convened in closed session at 10:31 a.m. and reconvened in open session at 1:00 p.m.

2. Announcement of Board Actions Relating to Items Taken up in Closed Session

Trustee Nick announced that while in executive closed session the Board completed its annual board self-evaluation.

3. Workshop Welcome & Kickoff

Trustee Nick welcomed staff, Trustees, and guests to SWIB's annual workshop and introduced Edwin Denson, Executive Director/Chief Investment Officer. Mr. Denson also welcomed attendees to the workshop and reviewed the topics to be covered over the two-day meeting.

4. Artificial Intelligence: Implications for Investors and Beyond

Anne-Marie Fink, Private Markets & Funds Alpha Chief Investment Officer, introduced Brad Betts, Managing Director at BlackRock; Frances Schwiep, Partner, Two Sigma Ventures; and Chris Prestigiacomo, Head of Private Debt & Venture Capital at SWIB, for a discussion on artificial intelligence (AI) and its role in the investment management industry. Mr. Betts and Ms. Schwiep provided an overview of AI, including technologies like ChatGPT and other AI interfaces. Both noted that, while the attention paid to these technologies is currently high, the underlying technology is not new and has been incorporated over time. Noting that this

development continues to outpace practical integration into useable technologies, both Ms. Schwiep and Mr. Betts discussed ways that the newer, cutting-edge developments could integrate into our day-to-day lives in the coming years. Both also highlighted that a substantial challenge to the incorporation of AI into investment management is balancing the tension between the value of removing unwanted human bias and the importance of keeping an element of human judgement.

5. WRS Actuarial Overview and Projections

Jim Anderson, Mark Buis, and Rick Koch, from Gabriel Roeder & Smith Co. (GRS), presented the biennial actuarial overview and stress testing of the Wisconsin Retirement System (WRS), included on pages 26-105 of the meeting materials. Mr. Anderson began with highlights and observations of the stress test, affirming that over the long term SWIB should continue to target the “Goldilocks Zone” that provides for positive returns with appropriate downside protection. He then reviewed the breakdown of the WRS beneficiaries, including the amount and type of benefits owed, and key attributes of the WRS plan, including risk sharing, return smoothing, and contribution rates. Mr. Anderson concluded his remarks with a review of the “dividend liability”, or the present value of the amount by which the total retiree assets exceed the base benefit liability. He pointed out that from 2021 to 2023 the dividend liability cushion, measured as a percentage of base benefit liability, has decreased from 30.7% to 18.0%, which indicates that a negative dividend adjustment is more likely now than in 2021.

Mr. Koch then explained that the goal of the stress testing is to understand the potential effect of different levels of stress on the system. He reviewed the four deterministic stress tests: (i) a -15% one-year return, followed by 6.8% thereafter; (ii) a -20% one-year return, followed by 6.8% thereafter; (iii) a -20% one-year return followed by a 20% second-year return and 6.8% thereafter; and (iv) a -30% one-year return followed by 6.8% thereafter. In each scenario, he reviewed the impact on dividends, the dividend reserve, the retiree liability, and contribution rates.

Finally, Mr. Buis discussed the stochastic stress testing, based on Monte Carlo simulations of 10,000 random trials for nine different risk/return scenarios. The results looked at contribution rates, dividend rates, and impact on the dividend reserve for the 1-, 5-, 10-, 20-, and 50-year periods. A combination of all of these results led GRS to recommend that SWIB target a rate of return between 6.0% and 7.5% for the long-term investment horizon with corresponding standard deviation between 9.4% and 17.1%, respectively, the “Goldilocks Zone”. Mr. Buis noted that the overall results and recommendation were similar to the 2021 study but highlighted a much lower standard deviation than in 2021, driving a smaller range of dividend/contribution results in the stress testing.

6. Asset Allocation

Joe Nankof, NEPC, presented the Asset Allocation Review, included on pages 106-186 in the meeting materials. Mr. Nankof began with a brief review of the current asset allocation, noting that: (i) the current policy has a more diversified risk profile than the 60/40 reference portfolio; (ii) the current equity portfolio allocation structure is generally aligned with the global market capitalization portfolio, with the exception of the relative half-weighting to China equity exposure; and (iii) by utilizing target weights to investment grade and return-seeking credit sectors, the current fixed income allocation is similar in risk profile to the U.S. investment-grade market, but with more diversification and more return expectation.

Mr. Nankof continued with a market update, noting that the S&P 500 bull market of the last 12 months was driven almost exclusively by large-cap tech stocks, the valuations of which are

significantly higher than the rest of the equities market and appear to be at or nearing 2000 tech-bubble levels. He then provided a brief U.S. economic outlook, stating that: (i) market expectations for interest rates have converged with FOMC projections, signaling a higher-for-longer bias; (ii) interest rate sensitive sectors of the economy are still realizing the impact of a tighter monetary policy environment; and (iii) resilient data from the services sector and labor market strength continue to underpin “no landing” and “soft landing” outcomes.

Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, then discussed the policy leverage framework, included on pages 148-155 of the meeting materials. He discussed the initial objectives of policy leverage, the history of the CTF’s policy and alpha pool leverage levels since 2011, and the increasing allocations to private markets investments over time. Mr. Mattina reviewed the policy leverage framework, highlighting that policy leverage allows SWIB to target the same return at lower risk levels than an unlevered portfolio and that the target leverage should adjust to reflect changes in the return expectations of the policy portfolio, the expected return on cash, and the risk profile of the policy portfolio. Lastly, he discussed the recommendation to reduce the overall target leverage level from 15% to 12%, noting also the ability for staff to eliminate leverage completely.

After explaining NEPC’s underlying assumptions and how they have changed relative to this time last year, Mr. Nankof discussed NEPC’s proposed changes to the current policy targets, including: (i) decreasing the allocation to public equities from 48% to 42%; (ii) increasing the allocation to private equity and debt from 15% to 18%; and (iii) reducing the overall target leverage level from 15% to 12%. NEPC is not recommending any changes to the underlying make-up of the public equity, public fixed income, and private markets portfolios at this time. In addition, they are not recommending any changes to the Variable Trust Fund asset allocation or the active risk targets for either fund.

The Board recessed at 4:56 p.m.

WEDNESDAY, OCTOBER 18, 2023

Open Session

Chair Nick declared that a quorum was present and called the second session of the Board Workshop to order at 9:00 a.m.

7. Implementation Working Group and Strategic Framework

Mr. Mattina presented an update on the newly formed implementation working group, included on pages 187-207 in the meeting materials. He noted that the purpose and objectives of the working group are to: (i) align with stakeholders on the rationale for active/passive and internal/external investment implementation; (ii) formalize and document a general framework for decision making on strategy implementation to complement SWIB’s other strategic processes for asset allocation and active risk budgeting; and (iii) identify operational, staffing and other constraints to more effective implementation. Mr. Mattina then reviewed historical implementation trends as well as the current implementation breakdown across active/passive and internal/external categories. He concluded by reviewing the work done to date to identify the key criteria for implementation decision-making, including the development of decision trees and a heatmap, and identified next steps for the group.

8. A View of the Markets

Mr. Mattina introduced, Jan Hatzius, Chief Economist and Head of Global Investment Research at Goldman Sachs, who provided an economic outlook, included on pages 209-223 of the meeting materials. Mr. Hatzius began by discussing Goldman Sachs's U.S. 12-month forward-looking recession probability analysis, which remains far below market consensus and is continuing to point to a soft landing based on factors like labor market adjustments, receding debt limit and banking risks, and disinflation progress. He then provided an overview of other macroeconomic trends, noting that: (i) a declining quit rate suggests a return to labor market balance; (ii) tighter lending standards seem to be having only a limited impact; and (iii) consensus continues to build around a higher-for-longer view on interest rates. Mr. Hatzius concluded by reviewing global trends including disposable income trends in the Eurozone, pessimism about China's economy and declining growth trends, and Japan's high inflation levels.

9. Motion to Convene in Closed Session

Motion: A motion to convene in closed session pursuant to: (i) Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies of internal WRS portfolios; and (ii) Section 19.85(1)(c) of the Wisconsin Statutes to consider the performance evaluation and compensation data of specific persons was made by Trustee Nick and seconded by Trustee Palmer.

The Chair called for a roll call vote.

Ancel-Aye	Blumenfeld-Aye	DeAngelis-Aye	Merfeld-Aye
Nick-Aye	Palmer-Aye	Schalow-Aye	Tinnen- Aye

There being eight ayes and no nays, the Chair declared the motion passed. The Board then convened in closed session at 11:07 a.m. and reconvened in open session at 2:19 p.m.

10. Announcement of Board Actions Relating to Items Taken up in Closed Session

Trustee Nick announced that while in closed session the Board heard a venture capital case study about how SWIB's capital catalyzes change and creates value for the WRS. During the executive closed session, the Board met with the ED/CIO to review his performance goals.

11. Workshop Wrap-Up

Mr. Denson thanked the presenters and attendees for their participation and recognized the staff for their efforts in coordinating the workshop.

The Board adjourned at 2:21 pm.

Date of Approval:

Signed:

Clyde Tinnen, Board Secretary

Board Meeting

Tab 3 - Investment Performance and Market Updates

- A. Board Investment Performance Report, Q3 2023
- B. Callan Quarterly Report



Investment Performance Report

as of September 30, 2023

Executive Summary

September 30, 2023

- The Core Trust Fund returned -2.28% net of all fees and expenses in Q3, resulting in excess performance of +36 bps. For one year, the Core Trust Fund has returned 10.04% net of all fees and expenses, resulting in an excess return of +77 bps.
- The Core Trust Fund five-year net of all fees and expenses return of 6.35% outperforms the Policy Benchmark by +51 bps on an annualized basis.
- The Core Trust Fund gross of fee return outperformed the 60/40 Reference Portfolio return by 79.4% (cumulative) over a 20-year period, which equates to an excess value add of \$31.1 billion over the same period.

WRS Performance

as of September 30, 2023

Fund	Net of All Fees and Expenses Return %			
	Calendar – YTD	1 Year	3 Year	5 Year
Core Trust Fund	4.08	10.04	5.37	6.35
Core Trust Fund Benchmark	3.63	9.28	4.55	5.84
Excess	+0.45	+0.77	+0.82	+0.51
Net Excess Value Add (\$M)	+\$495.6	+\$801.6	+\$2,832.4	+\$2,988.1
Variable Trust Fund	9.86	20.37	7.76	7.15
Variable Trust Fund Benchmark	10.51	20.90	7.90	7.34
Excess	(0.65)	(0.53)	(0.14)	(0.19)
Net Excess Value Add (\$M)	(\$53.2)	(\$40.0)	(\$36.4)	(74.2)

SWIB's investment management has added more than \$2.9 billion above benchmark returns over the last five years to the WRS.

(Annualized Return shown for all periods greater than 1 yr)

Fund	Net of External Manager Fee Return %			Gross of Fee Return %
	5 Year	10 Year	20 Year	30 Year
Core Trust Fund	6.45	6.81	7.23	7.81
Core Trust Fund Benchmark	5.84	6.39	6.89	7.38
Excess	+0.61	+0.42	+0.34	+0.42
Variable Trust Fund	7.21	8.99	8.47	8.55
Variable Trust Fund Benchmark	7.34	9.03	8.50	8.28
Excess	(0.14)	(0.04)	(0.03)	+0.28

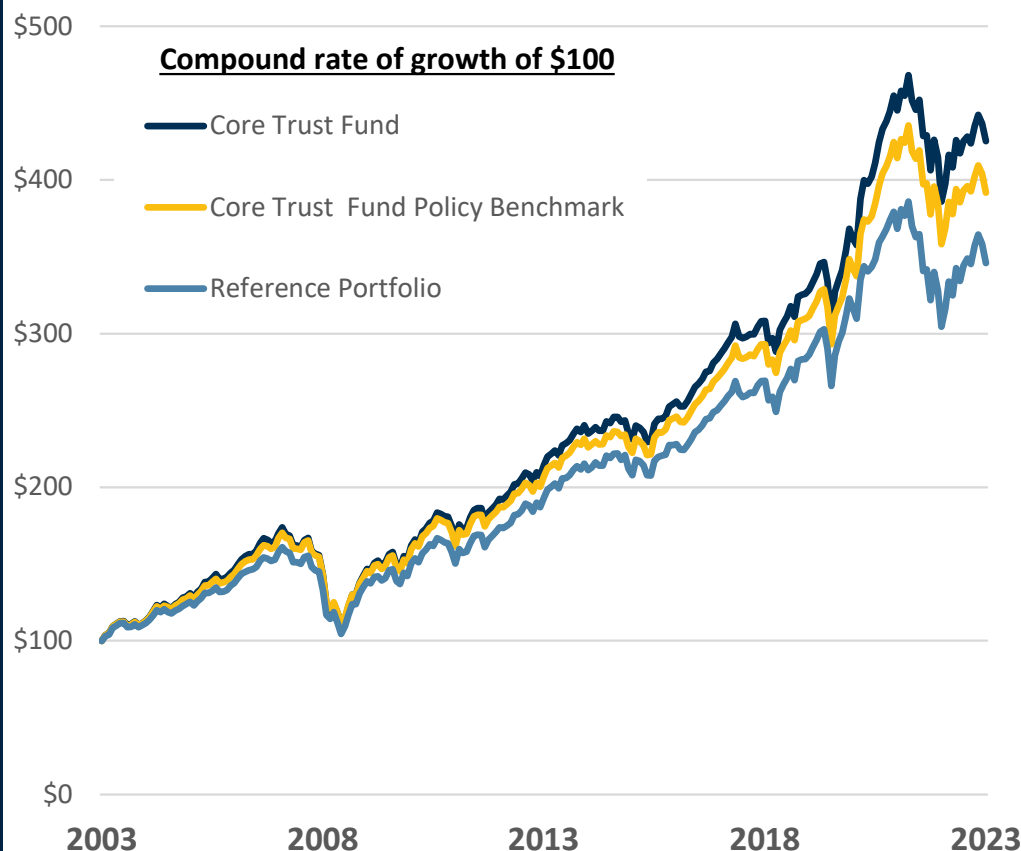
(Annualized Return shown for all periods greater than 1 yr)

Excess returns may contain rounding differences

CTF Performance vs. 60/40 Reference Portfolio

20-year cumulative return¹: October 1, 2003, to September 30, 2023

Indexed Benefit of CTF's Asset Allocation & Active Management Over Time



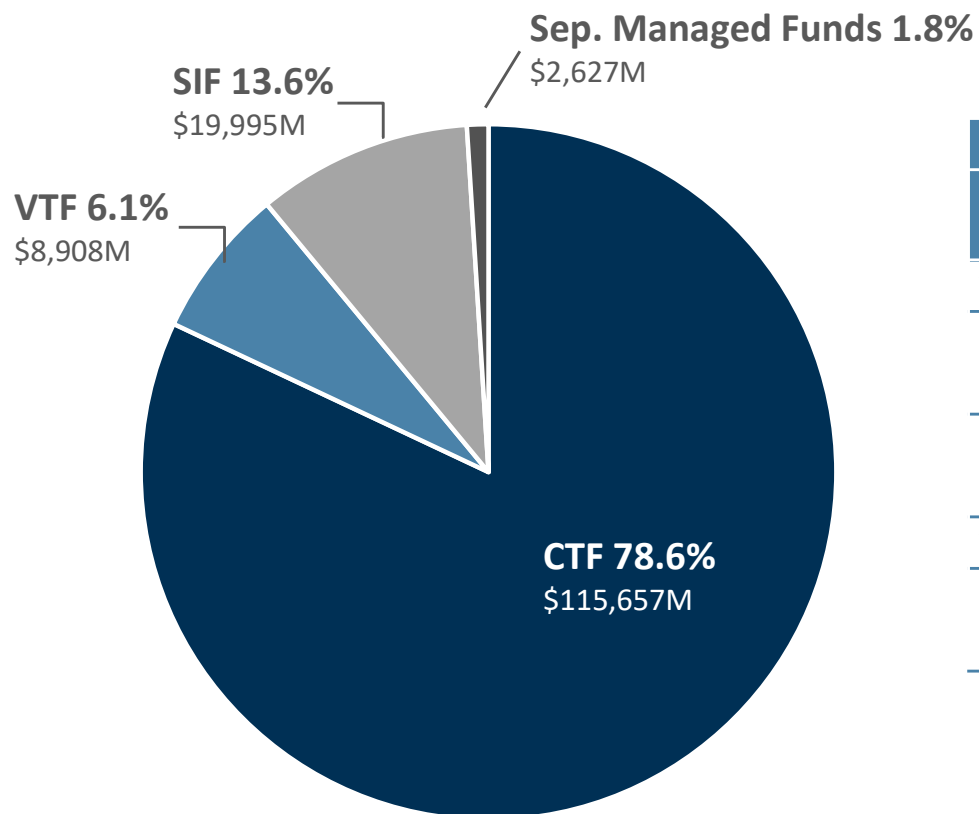
Portfolio / Benchmark	Annualized Gross Return	Cumulative Gross Return	Cumulative \$ Excess Value Added
Reference Portfolio ² (60% equity/40% bonds)	6.4%	246.0%	= Passive Market Return
Benefit of CTF Asset Allocation			
CTF Policy Benchmark	7.1%	291.8%	+\$18.7B
Benefit of CTF Active Management			
CTF Actual Results	7.5%	325.4%	+\$12.3B
CTF Excess Return vs. Reference Portfolio	+1.1% pts	+79.4% pts	+\$31.1B

¹ Core Trust Fund beginning market value, as of October 1, 2003, was \$51.7B and ending market value, as of September 30, 2023, was \$115.7B

² Reference Portfolio is composed of 60% MSCI World and 40% Bloomberg US Gov't / Credit (rebalanced monthly)

Total Assets Under Management (AUM)

as of September 30, 2023



Gross Market Value of Assets (\$millions)			
By Fund	9/30/2022	9/30/2023	1 Year Change
Total WRS	117,182	124,565	+7,383
Core Trust Fund	109,382	115,657	+6,275
Variable Trust Fund	7,800	8,908	+1,108
State Investment Fund (SIF) ¹	17,876	19,995	+2,118
Separately Managed Funds	2,532	2,627	+96
Total SWIB AUM	\$137,590	\$147,186	+9,597

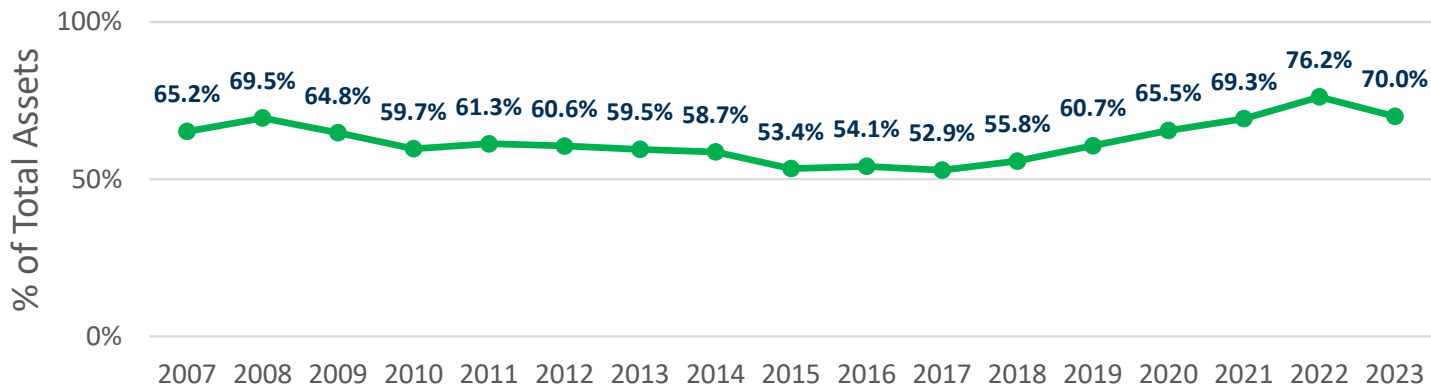
¹ Excludes cash invested in SIF held on behalf of CTF and VTF

Refer to the disclosure section for additional details

WRS Assets as of September 30, 2023

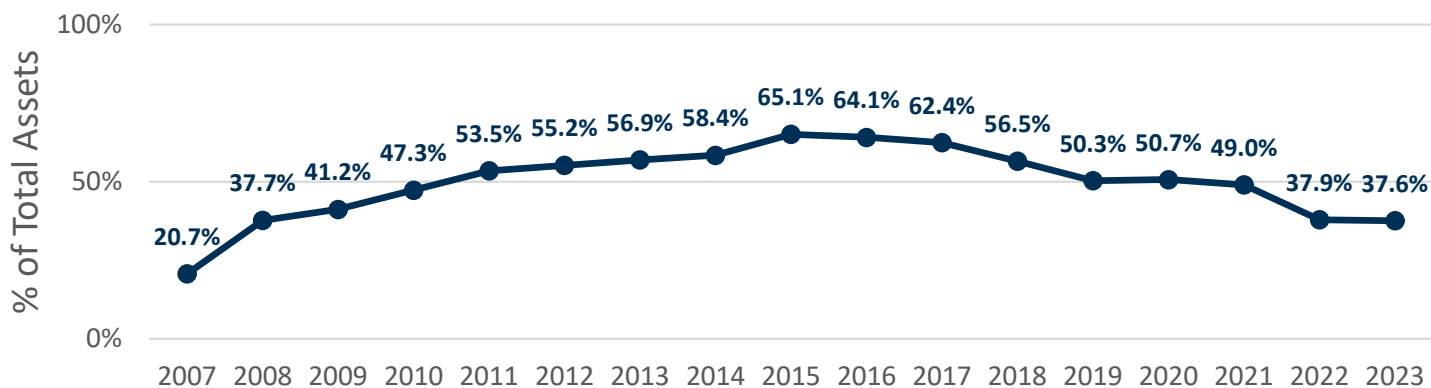
Breakdown of Active vs. Passive and Internal vs. External

Actively Managed Assets



Actively managed assets are a larger share of WRS AUM

Internally Managed Assets

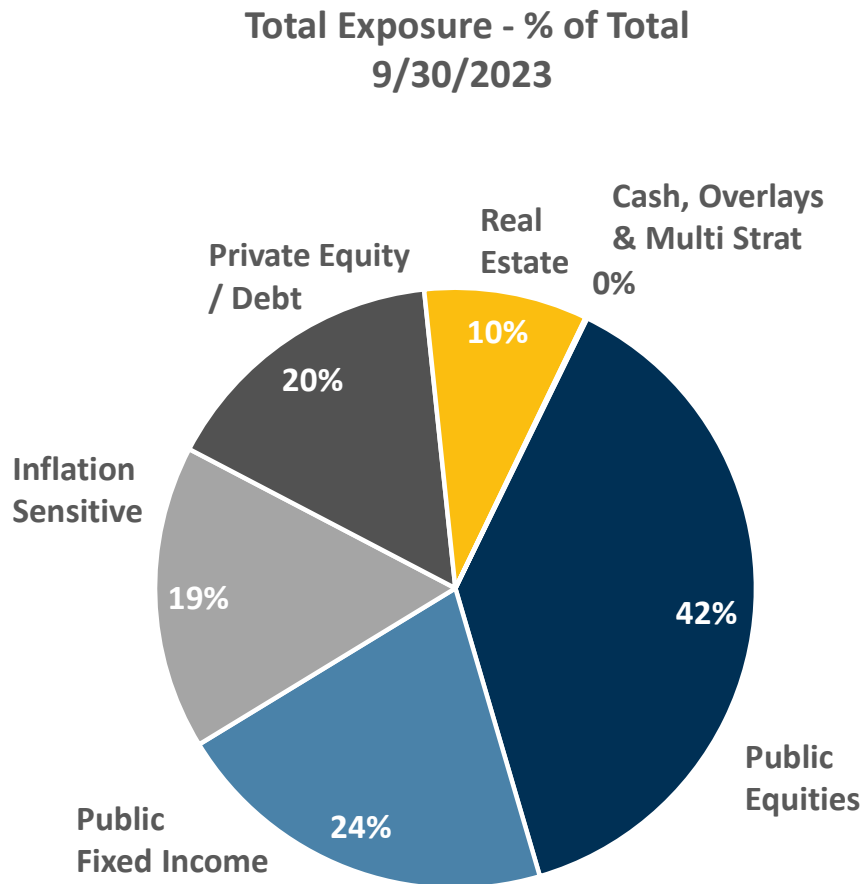


45% of Total SWIB Assets (including SIF) are internally managed

Refer to the disclosure section for additional details

Core Trust Fund Assets Under Management

Breakdown by Asset Class as of September 30, 2023



Total Exposure \$ & Adjusted AUM (\$millions)			
Total CTF by Asset Class	Total Exposure \$ 9/30/2022	Total Exposure \$ 9/30/2023	Year over Year Change
Public Equities	47,690	49,082	+1,392
Public Fixed Income	25,483	27,570	+2,087
Inflation Sensitive	20,740	21,822	+1,082
Real Estate	11,584	12,038	+454
Private Equity / Debt	20,449	22,971	+2,522
Multi Asset	8	0	(8)
Cash & Overlays	(8)	(40)	(32)
Total Exposure	\$125,945	\$133,443	+7,498
<i>Less: Policy Leverage</i>	<i>16,563</i>	<i>17,781</i>	<i>1,218</i>
Total CTF AUM	\$109,382	\$115,662	+6,280

Total Exposure is composed of the gross market value of investments, plus beta exposure added or offset through derivative instruments

Core Trust Fund Allocation

All exposures shown as of September 30, 2023

Allocation – Exposure View

Strategies	(\$ millions)	As % of Total Fund		Target Range %	Notes
	Total Exposure	Portfolio Exposure %	Benchmark Target %		
Public Equities	49,082	42.44	41.94	35.94 – 47.94	Public & Private exposures include cash Strategies include exposure management investments Cash / Overlays: Includes liquidity, overlay cash, cash used to fund synthetic beta related to Alpha Pool. Benchmark Target weights are adjusted monthly to reflect the actual exposure to Private Equity/Debt and Real Estate. Offsetting adjustments are made to Public Equities and Public Fixed Income. Additional CTF leverage details available in disclosure section
Global Developed	39,757	34.37	33.80		
US Small Cap	2,750	2.38	2.40		
International Small Cap	2,626	2.27	2.29		
Emerging Markets	3,948	3.41	3.44		
Public Fixed Income	27,570	23.84	23.80	17.80 – 29.80	
Investment Grade	16,645	14.39	14.28		
Non-Investment Grade	8,168	7.06	7.14		
Emerging Market Debt	2,757	2.38	2.38		
Inflation Sensitive	21,822	18.87	19.00	14.0 – 24.0	
Real Estate	12,038	10.41	10.41	6.4 – 14.4	
Private Equity / Debt	22,971	19.86	19.86	8.0 – 22.0	
Cash / Overlays	(40)	(0.03)	0.00		
Leverage	(17,781)	(15.37)	(15.00)	(20.0) to (10.0)	
Total Fund – Total Exposure	\$133,443	115.37	115.00	110.0 – 120.0	
Total Fund – Market Value	\$115,662	100.00	100.00		

Asset \$ exposures and % weights may contain rounding differences

Core Trust Fund: Asset Class Returns

as of September 30, 2023

Asset Class Group: Public Equities	Performance Start Date	Total Exposure Value (\$millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year or ITD
Public Equities	12/31/2002	\$48,688	9.50	20.67	7.49	6.69	7.82
Benchmark			10.01	21.08	7.65	7.00	8.06
Excess			(0.51)	(0.41)	(0.17)	(0.31)	(0.24)
Global Developed	2/28/2017	\$38,174	10.77	22.13	8.20	7.32	8.96
Benchmark			11.53	22.55	8.57	7.78	9.32
Excess			(0.76)	(0.42)	(0.37)	(0.45)	(0.37)
Global Equities w/EM	5/31/2021	\$1,341	9.84	16.25			(0.83)
Benchmark			10.44	21.34			(1.29)
Excess			(0.60)	(5.08)			+0.46
US Small Cap	2/28/2017	\$2,750	4.23	12.91	8.29	3.96	6.62
Benchmark			4.02	12.36	8.50	3.16	5.91
Excess			0.21	0.54	(0.21)	+0.80	+0.70
International Small Cap -a)	1/31/2020	\$2,619	6.05	21.57	3.46		1.63
Benchmark			5.20	21.11	2.24		1.53
Excess			+0.84	+0.47	+1.22		+0.11
Emerging Market ex China	3/31/2022	\$3,126	6.87	14.77			(7.81)
Benchmark			6.27	14.79			(7.48)
Excess			0.60	(0.02)			(0.33)
Emerging Market China	3/31/2022	\$646	(8.14)	1.77			(12.53)
Benchmark			(7.34)	5.17			(10.80)
Excess			(0.80)	(3.41)			(1.73)

-a) Benchmark error correction: the International Small Cap strategy excess returns reported as of March 31 and June 30, 2023, were overstated due to a manual processing error that associated an incorrect benchmark to this strategy. The strategy's YTD excess return reported as of June 30, 2023, was overstated by 172 bps. The benchmark returns above include a correction made for all prior periods.

Core Trust Fund: Asset Class Returns

as of September 30, 2023

Asset Class Group: Public Fixed Income & Inflation Sensitive	Performance Start Date	Total Exposure Value (\$millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year or ITD
Public Fixed Income	12/31/2003	\$27,338	1.60	4.89	(3.77)	1.14	1.67
Benchmark			1.38	4.54	(4.02)	1.09	1.57
Excess			+0.22	+0.36	+0.25	+0.04	+0.10
Investment Grade US Credit	2/28/2022	\$6,527	0.34	4.05			(7.21)
Benchmark			0.03	3.47			(6.92)
Excess			+0.31	+0.59			(0.28)
US Treasuries	2/28/2022	\$6,864	(1.80)	(1.30)			(7.78)
Benchmark			(1.52)	(0.81)			(7.46)
Excess			(0.27)	(0.49)			(0.32)
US Long Treasuries	9/30/2022	\$845	(8.73)	(9.18)			(9.18)
Benchmark			(8.55)	(9.09)			(9.09)
Excess			(0.18)	(0.09)			(0.09)
MBS	4/30/2020	\$2,180	(0.46)	2.00	(5.20)		(4.22)
Benchmark			(2.26)	(0.17)	(5.09)		(4.44)
Excess			+1.80	+2.17	(0.12)		+0.22

(periods greater than 1 yr show annualized return, since inception returns shown for strategies with less than 10-year history)

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Core Trust Fund: Asset Class Returns

as of September 30, 2023

Asset Class Group: Public Fixed Income & Inflation Sensitive	Performance Start Date	Total Exposure Value (\$millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year or ITD
High Yield	7/31/2019	\$5,451	5.67	10.58	0.50		1.41
Benchmark			5.16	9.74	1.34		2.01
Excess			+0.51	+0.84	(0.85)		(0.60)
Leveraged Loans	3/31/2023	\$2,717					6.42
Benchmark							6.53
Excess							(0.11)
Emerging Market Debt - USD	6/30/2005	\$1,400	1.23	9.89	(3.36)	(0.02)	2.47
Benchmark			1.76	10.01	(4.56)	(0.35)	2.47
Excess			(0.53)	(0.13)	+1.21	+0.33	0.00
Emerging Market Debt - Local	7/31/2017	\$1,354	3.73	12.89	(2.38)	(0.29)	(1.42)
Benchmark			4.28	13.10	(2.70)	0.00	(1.01)
Excess			(0.55)	(0.20)	+0.31	(0.29)	(0.41)
Inflation Sensitive	12/31/2003	\$21,819	(0.76)	1.29	(1.92)	2.22	1.33
Benchmark			(0.78)	1.25	(1.98)	2.12	1.26
Excess			+0.02	+0.04	+0.06	+0.10	+0.07

(periods greater than 1 yr show annualized return, since inception returns shown for strategies with less than 10-year history)

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Core Trust Fund: Asset Class Returns

as of September 30, 2023

Asset Class Group: Private Markets & Other Strategies	Performance Start Date	Total Exposure Value (\$millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year or ITD
Real Estate	12/31/2003	\$12,038	(4.89)	(3.87)	9.15	7.04	9.30
Benchmark			(11.01)	(10.73)	7.04	5.56	7.69
Excess			+6.13	+6.86	+2.10	+1.48	+1.61
Private Equity / Debt	11/30/2006	\$22,971	4.77	4.86	19.93	15.57	14.53
Benchmark			5.02	5.61	17.91	13.10	12.10
Excess			(0.25)	(0.75)	+2.02	+2.47	+2.43
<i>Other strategies:</i>							
Alpha Pool Overlay	1/31/2011	\$11,696	0.36	2.20	4.94	3.72	2.78
Benchmark (set to zero as of 1/1/2019)		(at 1/1/22 = \$6,336)	0.00	0.00	0.00	0.14	0.88
Excess			+0.36	+2.20	+4.94	+3.57	+1.90

(periods greater than 1 yr show annualized return, since inception returns shown for strategies with less than 10-year history)

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Core Trust Fund: Asset Class Returns

Net of External Mgr Fee - Excess Returns as of September 30, 2023



Excess Return - % points

¹ Either 10-year annualized return or Since Inception (ITD) annualized return is used if there is insufficient return history

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Core Trust Fund: Alpha Pool Overlay

as of September 30, 2023

Alpha Pool Return	Performance Start Date	Market Value (\$ millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year
Total Alpha Pool Composite	1/31/2011	\$11,696	0.36	2.20	4.94	3.72	2.78

- Prior to 2022, Hedge Fund sub strategy assets composed > 90% of the Alpha Pool Composite
- Each sub strategy in the composite incurs the cost of implementation expense (assessed on a pro rata basis using AUM). Hence, each sub strategy is assigned a Zero Benchmark.

Alpha Pool: Key Sub Strategies	Inclusion Date	Market Value (\$ millions)	Calendar YTD or Since Inclusion Net Return %
Hedge Funds	1/31/2011	\$7,976 (68%)	2.06
Multi Strat	2/1/2022	\$2,455 (21%)	1.06
Global Equity	4/1/2023	\$816 (7%)	-0.67

* The Global Macro sub strategy was discontinued 11/7/2022

Alpha Pool Overlay Return (Alpha Pool + Beta Return)	Calendar YTD	1 Year	3 Year	5 Year	10 Year
CTF Policy Benchmark (Beta)	3.63	9.28	4.55	5.84	6.39
Alpha Pool Overlay Return (Alpha Pool + Beta)	3.99	11.48	9.49	9.56	9.17

(Annualized Return shown for all periods greater than 1 yr)

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Variable Trust Fund

as of September 30, 2023

Performance

Fund	Performance Start Date	Market Value (\$ millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year
Variable Trust Fund	6/30/77	\$8,907	9.90	20.43	7.81	7.21	8.99
Variable Trust Fund Benchmark			10.51	20.90	7.90	7.34	9.03
Excess			(0.60)	(0.47)	(0.08)	(0.14)	(0.04)

(Annualized Return shown for all periods greater than 1 yr)

Portfolio Allocation

By Portfolio	(\$ millions)	As % of Total Fund		
	Total Exposure	Portfolio Exposure	Exposure Target	Target Range
Public Equities	8,891	99.81	100.00	
US Equities	6,220	69.82	70.00	65.0 – 75.0%
International Equities	2,671	29.99	30.00	25.0 – 35.0%
Cash & Overlays	17	0.19	0.00	
Total Fund	\$8,908	100.00	100.00	

- *Asset class exposures are within the Target Range*

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Separately Managed Funds

as of September 30, 2023

Fund	Performance Start Date	Market Value (\$ millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year or ITD
State Investment Fund (SIF)	6/30/1975	\$21,960	3.73	4.67	1.80	1.74	1.15
SIF Benchmark			3.55	4.51	1.79	1.68	1.12
Excess			+0.18	+0.16	+0.01	+0.06	+0.03
State Life Insurance Fund	10/31/1994	\$90	(3.58)	(1.14)	(8.09)	(0.09)	1.97
No Benchmark							
Historical Society Endowment Fund	12/31/1993	\$23	9.35	15.77	6.24	7.44	9.11
Historical Society Endowment Benchmark			9.11	15.55	5.89	7.25	8.92
Excess			+0.24	+0.22	+0.35	+0.18	+0.19
Injured Patients & Families Comp. Fund	10/31/1993	\$1,344	1.12	4.26	(2.58)	2.08	3.21
IP&FC Benchmark			1.06	3.92	(3.03)	1.79	2.74
Excess			+0.06	+0.34	+0.44	+0.29	+0.47
UW System Long Term Fund	3/31/2018	\$524	4.38	9.26	4.84	5.63	5.69
UW System Benchmark			4.19	9.09	4.70	5.43	5.48
Excess			+0.19	+0.17	+0.14	+0.20	+0.21
UW Cash Management Fund	4/30/2022	\$645	3.34	6.58			0.31
UW Cash Management Benchmark			3.33	6.58			0.39
Excess			+0.01	+0.01			(0.08)

(periods greater than 1 yr show annualized return, since inception returns shown for strategies with less than 10-year history)

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

Leverage Performance

As of September 30, 2023

CTF Policy Leverage Performance

as of September 30, 2023

Core Trust Fund	Net of External Manager Fee Return %			
	Calendar YTD	1 Year	3 Year	5 Year
Unlevered Returns (as estimated):				
Portfolio ¹	4.26	9.68	5.38	6.20
CTF Benchmark Return ¹	3.72	8.80	4.46	5.59
Excess Return	+0.54	+0.88	+0.93	+0.60
<hr/>				
Portfolio Return (Unlevered)	4.26	9.68	5.38	6.20
Absolute Return from Leverage ^{1,2}	(0.09)	0.48	0.09	0.25
Implementation (+) or (-)	(0.00)	(0.00)	0.00	0.01
<hr/>				
Levered Returns (as reported):				
Portfolio	4.17	10.16	5.48	6.45
CTF Benchmark	3.63	9.28	4.55	5.84
Excess	+0.54	+0.88	+0.93	+0.61

(Annualized Return shown for all periods greater than 1 yr)

Leverage notes:

¹ The Unlevered Portfolio Return, Unlevered CTF Benchmark Return, Absolute Return from Leverage and Implementation (+) or (-) are estimated

² Policy leverage was first introduced into the CTF and the benchmark at the end of April 2012

- Policy leverage at SWIB is implemented passively. Therefore, it generally does not contribute to active risk or excess returns¹
- Policy leverage amplifies absolute returns (whether positive or negative), which is an important component in SWIB’s strategy to meet the 6.8% actuarial target over the long-term
- The CTF benchmark return is levered to create an apples-to-apples comparison for evaluating relative performance of the CTF (i.e., excess return)

Excess returns may contain rounding differences
Refer to the disclosure section for additional details

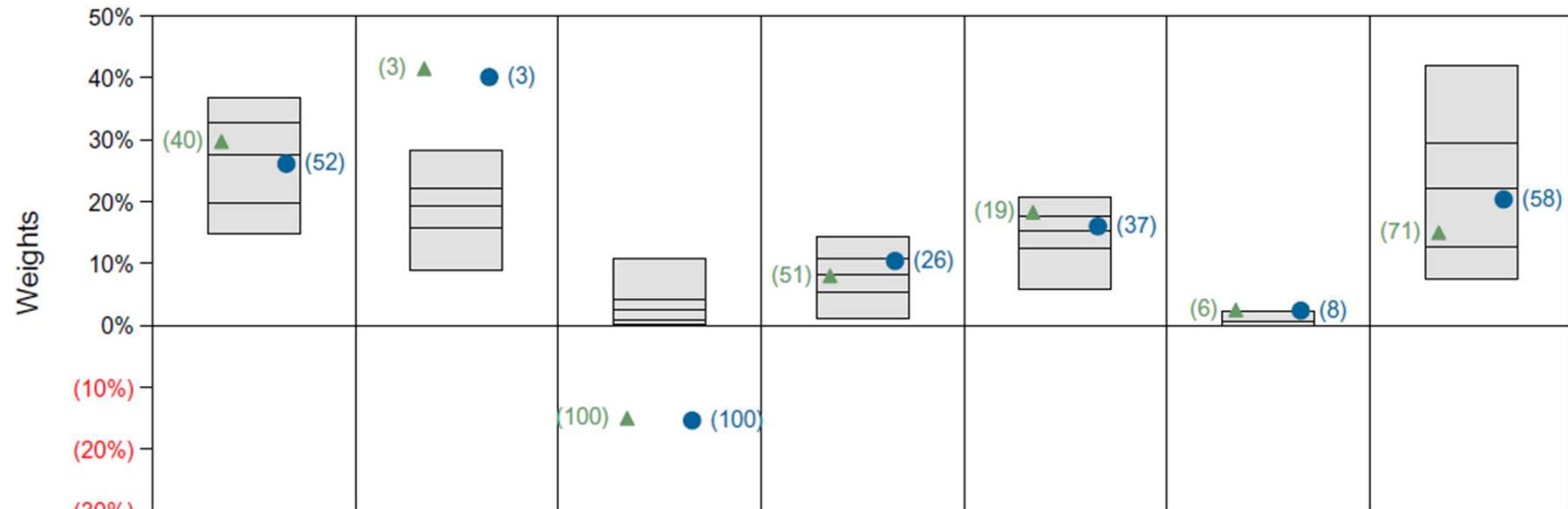
Callan Quarterly Report Summary

3rd Quarter 2023

Callan Peer Rank Update

CTF Asset Allocation Comparison to Peer Group (9.30.2023)

Asset Class Weights vs Callan Public Fund Spons- V Lg DB (>10B)



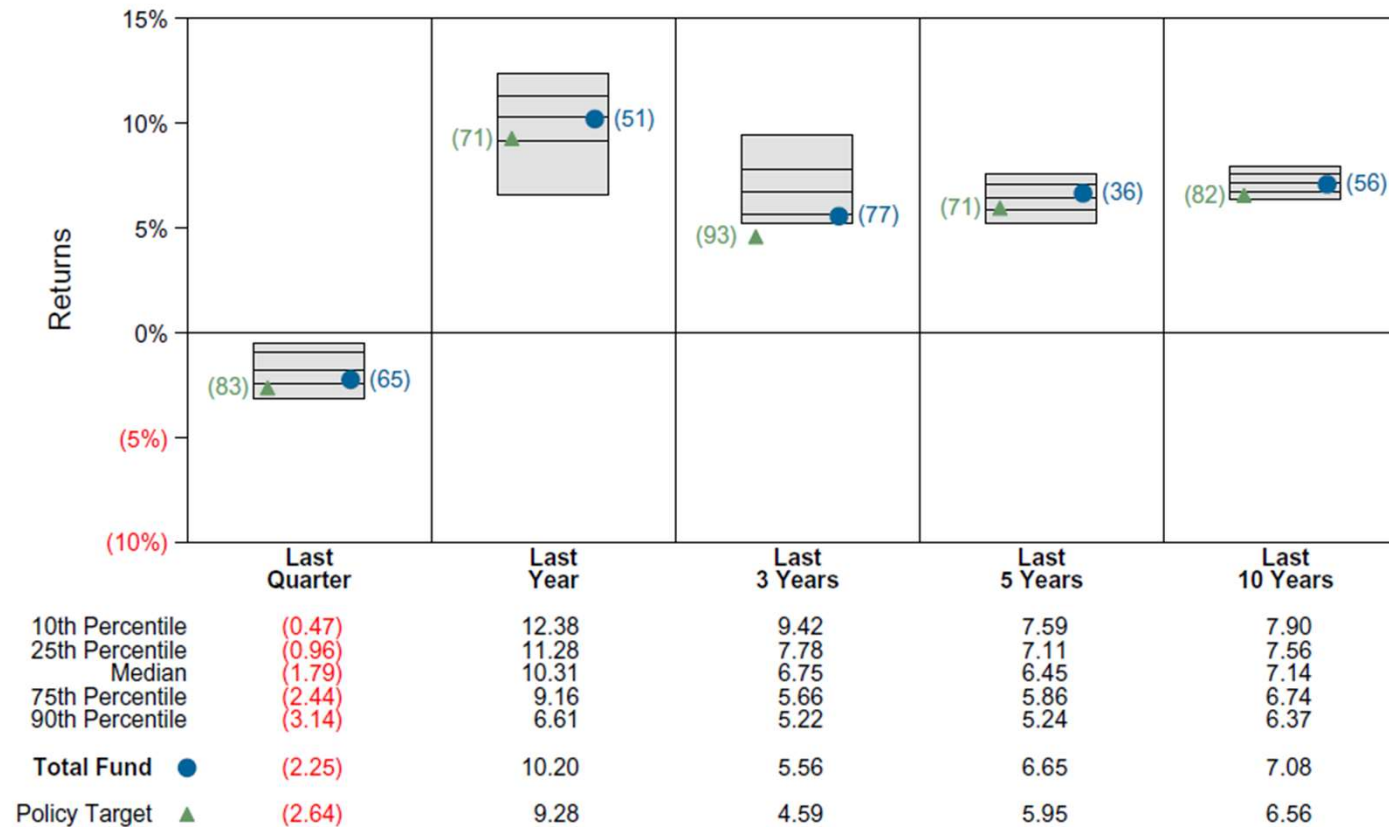
	Domestic Equity	Domestic Fixed	Cash Equivalent	Real Estate	International Equity	International Fixed	Alternatives
10th Percentile	36.83	28.34	10.78	14.29	20.75	2.33	42.00
25th Percentile	32.85	22.25	4.11	10.76	17.67	0.59	29.48
Median	27.46	19.23	2.43	8.10	15.18	0.01	22.03
75th Percentile	19.76	15.84	0.85	5.40	12.39	0.00	12.74
90th Percentile	14.78	8.79	0.16	1.16	5.89	0.00	7.59
Fund ●	26.10	40.12	(15.37)	10.41	16.00	2.39	20.35
Target ▲	29.72	41.50	(15.00)	8.00	18.28	2.50	15.00
% Group Invested	91.43%	97.14%	91.43%	91.43%	91.43%	54.29%	91.43%

- SWIB's use of financial leverage (approximately 15%) enables more risk reducing/diversifying assets without sacrificing growth assets

Callan Peer Rank Update

CTF Performance vs. Peer Group (Gross Return, 9.30.2023)

Callan Public Fund Spons- V Lg DB (>10B)

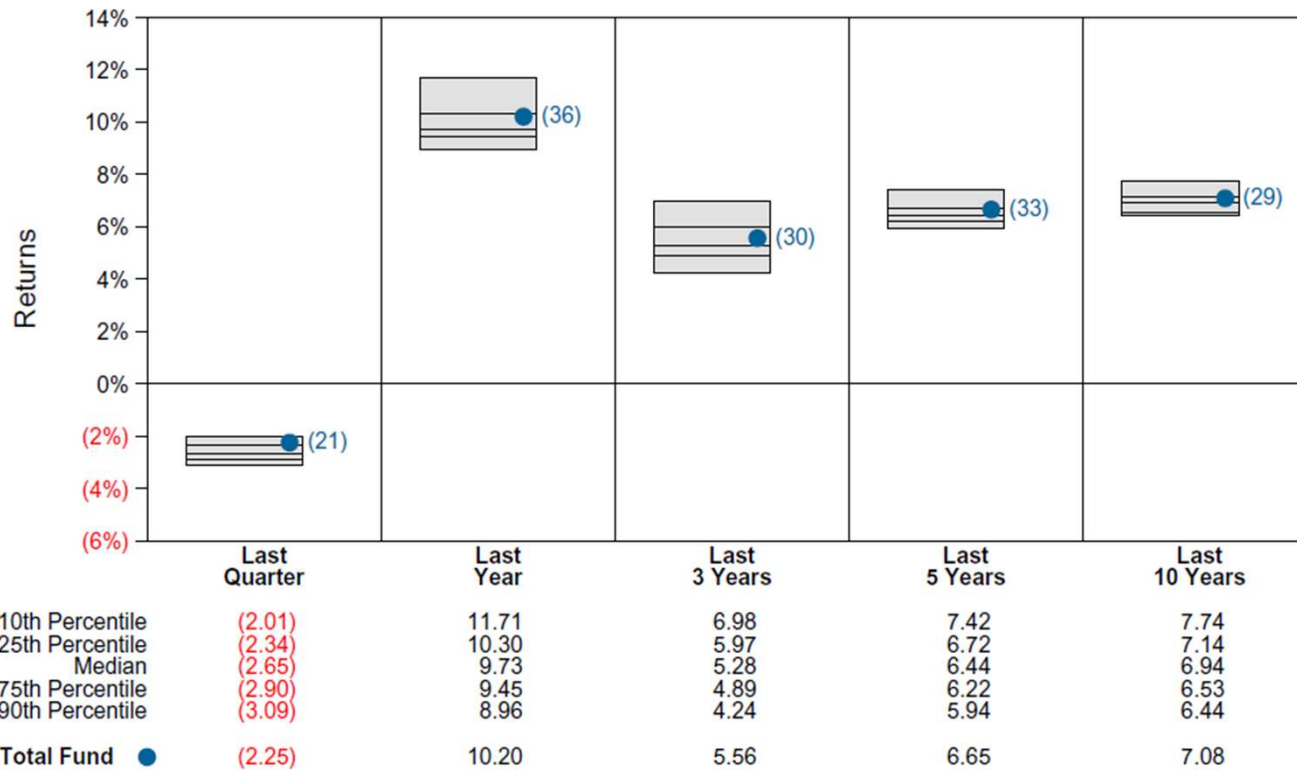


- CTF return exceeds Policy Target over all periods
- Return is near median for the 1-year period and longer term 5- and 10-year periods are above or near the median

Callan Peer Rank Update

*CTF Performance on Asset Allocation Adjusted Basis vs. Peer Group
(Gross Return, 9.30.2023)*

Asset Allocation Adjusted Ranking

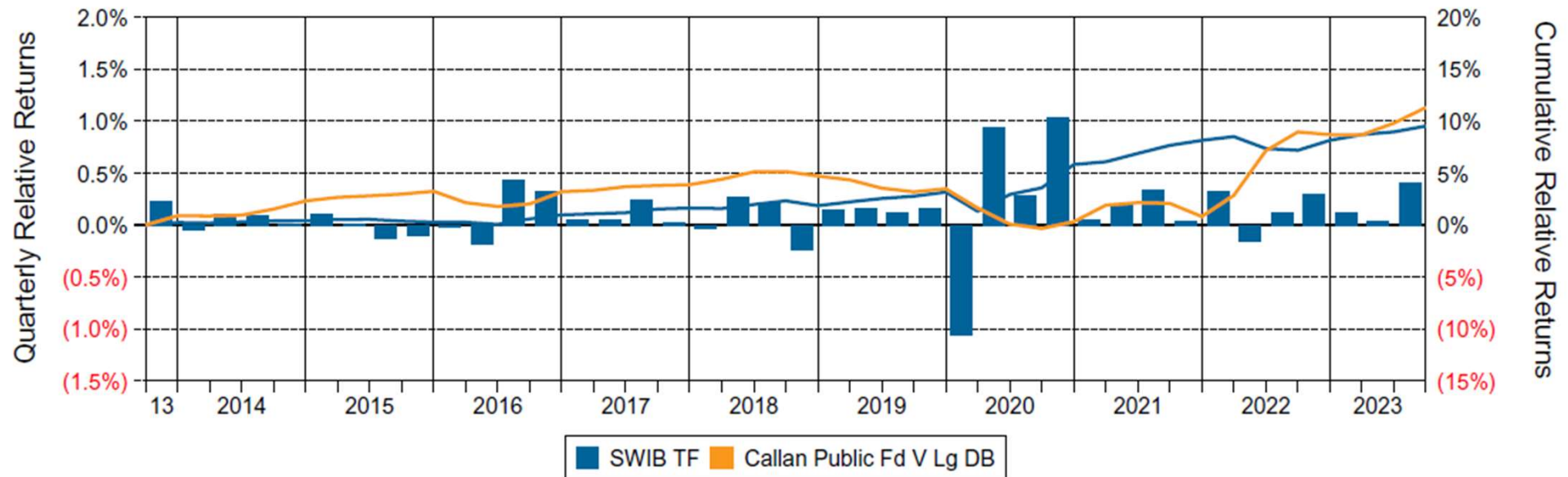


- Uses adjustment to peer universe to match the CTF risk-balanced allocation
- Achieved 1st quartile results last quarter, 2nd quartile ranking over 1-, 3-, 5-, and 10-year periods

Callan Peer Rank Update

10 Year Return Consistency vs. > \$10B Peer Group (9.30.2023)

Cumulative and Quarterly Relative Returns vs Target



- The CTF exhibits low tracking error relative to its peers and produces stable, ascending cumulative performance over 10 years
- CTF Qtrly relative returns vs. Policy Benchmark are generally positive over the 10-year period

Report Disclosures

Glossary, Definitions & Data Sources

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Gross of Fee Return (“GoF Return”)	The returns generated in investment portfolios (or accounts) that include the deduction of transaction expenses incurred as a result of executing a trade or acquiring or disposing of the investment. In some instances, these expenses are not readily separable from the cost of the investment and are not distinctly recorded within accounting records invoiced by third parties. Security lending income is included in GoF return (however, Security Lending expense is not). Starting on 1/1/2021, the SWIB practice of “grossing up” external management fees, performance fees and any identifiable carried interest by crediting the investment accounts was discontinued. The use of GoF Return is limited to performance comparison to gross benchmark returns, long term CTF / VTF return periods where GoF is the sole return type available and for the purpose of fulfilling data submissions to consultants for peer performance comparison purposes.
Net of External Manager Fee Return (“NoF Return”)	The GoF return plus additional deductions for external management fees, performance fees and any identifiable carried interest incurred in investment portfolios. SWIB has account records to support NoF return history over approximately 20 years.
Net of All Fees and Expenses Return (“NoA Return”)	The NoF return plus additional deductions for administrative expenses, categorized by SWIB as either Direct or Indirect expenses, that are permitted to be charged directly to the Trust Funds under statutory authority. The Cost Allocation Protocol governs the allocation methods and booking processes to allocate expenses at the investment account level. Examples of the type of expenses that fall under this category, include custody and banking fees, general operating expenses and investment consulting services. Security Lending expense is included in NoA Return. The recording of official, NoA return at the portfolio or account level began in 2017.
Annualized Return Calculation	SWIB reports containing portfolio and benchmark return calculations for time periods greater than 1 year generally utilize a geometric averaging calculation. Returns shown for periods of less than 1 year are not presented utilizing the annualization calculation method. In this instance, compound returns are reported for the specified calendar period (e.g., month to date, quarter to date or year to date). Annualized Return = $((1 + r^1) \times (1 + r^2) \times (1 + r^3) \dots)^{(\text{calendar units} / \text{time interval measured})} - 1$; $r^{(n)}$ = series of holding period returns and calendar units are often expressed as days, months or years
Cumulative Return Calculation	SWIB uses the cumulative return calculation (“cumulative basis”) to reflect the aggregate amount an investment has gained or lost over time for portfolios and benchmarks. This measurement shares aspects of the annualized return calculation, however, it excludes the geometric averaging. Cumulative Return = $((1 + r^1) \times (1 + r^2) \times (1 + r^3) \dots) - 1$; $r^{(n)}$ = series of holding period returns
Compound rate of growth of \$100	The cumulative and compounded rate of growth of portfolio and benchmark returns may also be presented on an indexed basis over time. Compound rate of growth of \$100 = $(\$100 \times (1 + r^1) \times (1 + r^2) \times (1 + r^3) \dots)$; $r^{(n)}$ = series of holding period returns

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Excess Return % (“Excess”)	Portfolio return or security level return minus the benchmark return. Portfolio or Composite Returns are generally compared against benchmarks with a similar level of risk. It is widely used as a measure of the value added by the portfolio or investment manager or the manager's ability to outperform the market.
Net Excess Value Add \$ (“NEVA”)	Net Excess Value Add \$ (“NEVA”) calculates the portfolio’s performance return in total dollars relative to a benchmark. NEVA is a measure used to assess the value-add dollars that a particular investment strategy or team generated over specified time periods. NEVA is also used to monitor the return objectives set forth in the annual Active Risk Budget which is prepared for the CTF and VTF funds managed by SWIB.
Gross Excess Value Add \$ (“GEVA”)	A fund’s Excess Value Add \$ may be calculated on a gross-basis when the comparable benchmark returns are also presented on a gross-basis. The CTF Performance comparison vs. the 60/40 Reference Portfolio and Policy Benchmark is presented on a gross-basis.
SWIB Inception To Date Reporting	The Quarterly Performance Summary discloses a reporting period described as 10 years or ITD . The return disclosed in this reporting field yields either 10-year annualized returns for funds or portfolios with at least 10 years of return history or the data field may revert to the return since inception for portfolios with less than 10 years of history. The quarterly report provides a performance start date for those portfolios with the abbreviated return history.
Performance Start Date	The date denotes the initial period of a portfolio or composites’ return data series that is stored and calculated by the SWIB Performance Measurement Service Agent.
Time-weighted Rate of Return	A method of calculating period-by-period returns that reflects the change in value and negates the effects of external cash flows. This methodology is applied to portfolios that are processed with daily frequency and where daily valuation updates of the underlying instruments are available.
Modified Dietz Total Rate of Return	A measurement that evaluates a portfolio's return based on a weighted calculation of its cash flow. The method considers the timing of cash flows and assumes a constant rate of return over the specified time period. This methodology is applied to portfolios and composites that are processed with monthly frequency (and where only monthly valuation updates are available).

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Policy Benchmark	The Fund level Benchmark as approved by the Benchmark Committee. The Benchmark is composed of multiple indices that reflect the Fund's exposure to a diverse set of investment strategies. (can also referred to as "Policy Target" as implemented through SWIB's Asset Allocation plan).
Reference Portfolio	Hypothetical global portfolio comprised of 60% MSCI World Net (using a SWIB custom net variant as of 2010) and 40% Bloomberg Barclays Government Credit Index. The return is presented on a gross of fee basis and assumes no contributions or withdrawals.
Zero or No Benchmark (for Official Measurement purposes)	<p>Zero Benchmark: This designation applies to the Core Trust Fund Alpha Pool Overlay. Since 1/1/2019, the benchmark associated with the Alpha Pool Overlay has been set to zero. The Cost of Implementation (which includes an estimate of financing costs) is directly allocated to the underlying strategies that make up the Alpha Pool Overlay and the effect of the cost allocation will usually result in a deduction from the strategy's return.</p> <p>No Benchmark: In certain instances, a benchmark is not assigned for the purpose of measuring excess performance. For example, SWIB's client, the State Life Insurance Fund (SLIF), has no assigned benchmark for its investment mandate due to the limitations placed on SWIB's investment activities by the SLIF. The SLIF portfolio invests in fixed income securities that approximate the expected life of the Fund's insurance contracts, and SWIB is directed to hold all securities to maturity other than in extraordinary circumstances.</p>
Reported Net Benchmark Returns	<p>The SWIB Benchmark and Performance Committee and its designated benchmark consultant follow the parameters set forth in the SWIB Benchmarking Philosophy. Under the Philosophy, selected benchmarks should exhibit the characteristics described in the <i>Benchmark Qualities</i> criteria to ensure portfolio and benchmark attributes are closely aligned.</p> <p>Net Total Return Benchmarks: benchmark type commonly used for most publicly-traded portfolio strategies. The benchmark returns reflect the price performance, plus the net amount of all special and regular dividends after applying an assumed foreign tax withholding rate (as determined by the benchmark data provider.)</p> <p>SWIB Custom Net Benchmark for non-U.S. Public Equity Strategies: SWIB's custodian bank customizes SWIB's non-U.S. equity benchmarks to reflect the actual, historical reinvestment of withholding tax rates rather than index provider's assumption for varying countries.</p> <p>Net of External Manager Fee-based Benchmarks: benchmark type most frequently used to gain better alignment when the measured SWIB portfolio return is inclusive of external management fees, performance fees and carried interest charges (e.g., private market investments.)</p>

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Custom weighted or calculated benchmarks	<p>SWIB managed funds and / or portfolios may require the construction of custom benchmarks that are created through applying static or asset weighted calculations to achieve a blended benchmark that is representative of the investment strategy. When available or feasible, SWIB will request its third-party benchmark data provider(s) to blend benchmarks as a part of the market data service. If this option is not available, SWIB will calculate the benchmark using market data inputs.</p> <p>In certain cases, SWIB may customize a benchmark to more accurately reflect the SWIB managed Fund's tax status and actual tax rate experience in non-U.S jurisdictions with investment portfolio with-holding taxes applicable to dividends and capital gains. This type of custom benchmark is designated as "SWIB Custom Net".</p>
Gross Market Value	The price at which the fund investor can buy or sell the underlying investment instruments held in the portfolio at a given time multiplied by the quantity held, plus any accrued income. The Gross Market Value of a portfolio is the market value of the portfolio or composite without any deduction for SWIB expenses.
Total Exposure	For SWIB managed funds governed by the WRS Investment Policy, this measure reflects the total value of the fund's exposure to investable markets by asset class and sub asset class. Total Exposure is inclusive of those instruments utilized under the WRS Leverage Use Policy to achieve the asset exposures approved under the asset allocation strategy and active risk target.
Internally Managed Portfolios	Portfolios managed by SWIB investment professionals. Each internal portfolio is assigned compulsory investment guidelines and is also assigned "soft risk parameters." Soft risk parameters refer to desired characteristics and/or risk exposures.
Externally Managed Portfolios	Portfolios managed by third-party investment managers hired by SWIB. External active and passive managers operate under contractual investment guidelines approved by SWIB's Investment Committee or by SWIB's investment management staff, as designated in the Investment Committee Charter.
Active Management	Actively managed portfolios have the objective of out-performing their respective benchmarks (or generating alpha) by using investment insights or quantitative tools to deploy buy, hold, and sell decisions. This style of management will result in portfolio positioning decisions that will add active risk and generate higher tracking error. Actively managed portfolios are governed through investment guidelines and soft risk parameters.
Passive Management	Passively managed portfolios have the objective of closely tracking the returns and risk of their respective benchmarks. This style of management usually involves mirroring the benchmark security holdings (or constituents) to closely replicate the benchmark risk and return.

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
<p>Note on report data sources and processing</p>	<p><u>Return Calculation Processing</u> Bank of New York Mellon, Global Risk Services (BNYM GRS), an independent 3rd party, provides services related to custodial records, accounting and performance return calculations for SWIB managed funds. BNYM also serves as the source for certain standard, market-based benchmarks and static weight blended benchmarks.</p> <p><u>Return Calculations Prepared on a Notional or Unlevered Basis (Core Trust Fund only)</u> SWIB uses leverage to help achieve the Core Trust Fund’s diversification objectives. A description of the Leverage Use Policy is contained in the Wisconsin Retirement System Investment Committee Investment Guidelines. For those accounts and composites deploying leverage, the calculation of notional or unlevered returns (using gross asset exposure) is required to achieve a comparable return vs. market indices. SWIB has directed its performance agent, BNYM GRS, to configure the performance measurement platform to process this type of calculation. Consistent with Leverage Use Policy guidelines, this calculation may be processed inside reported composites that contain US Large Cap Equity, US Small Cap Equity, MSCI World x US Equity, US TIPS and US Treasury exposures.</p> <p><u>State Investment Fund (SIF) Commingled Fund Processing</u> The State Investment Fund (SIF) pools the cash of the State of Wisconsin and its agencies, the Wisconsin Retirement System (WRS), and various local government units (Local Government Investment Pool) into a commingled fund with the investment objectives of safety of principal and liquidity while earning a competitive money market rate of return. For purposes of calculating earnings to each participant, all investments are valued at amortized cost. SIF returns are calculated using the monthly net earnings distributed to all commingled fund participants. SIF returns are presented net of all allocated SWIB administrative costs and State Controller’s Office costs that are allocated to the participants of the Local Government Investment Pool.</p> <p><u>Benchmark Market Data and Selection Process</u> The data source for this information is provided by multiple investment industry market data vendors and analytics firms depending on the investment strategy. The SWIB Benchmark and Performance Committee governs the benchmark selection process. An independent consultant (selected by the Board of Trustees or “Board”) makes recommendations to initially select or change benchmarks.</p> <p><u>Peer Rank Return Comparison Data</u> This information is provided and processed by industry consultants that consume return information for SWIB managed funds and then provide investor universe return comparisons and analytics using proprietary databases. When consultant info is included in the Quarterly Performance Summary the preparer of the work is identified.</p>

Leverage Disclosures

Calculation formulas to estimate impact

Report Disclosures

Notes on CTF Leverage Analysis

Term	Description / Definitions
Portfolio Return (Unlevered)	<p>This is an estimated-only CTF return because SWIB does not implement a CTF unlevered portfolio to calculate actual performance against. Leverage is used to expand the CTF's entire asset base. All definitions that include (unlevered) are ESTIMATES only for this reason.</p> <p>It is estimated by:</p> <ol style="list-style-type: none"> 1) <u>Excess Return (Levered)</u> is first subtracted from the <u>Portfolio Return (Levered)</u>¹; 2) The result of Step 1 is then divided by the <u>Policy Leverage Factor</u>; then 3) <u>Excess Return (Levered)</u> is added back to the result of Step 2 and that number is then adjusted to account for the cost of financing (i.e., the expense of acquiring leverage, which would not be applicable to an unlevered portfolio). $\text{Portfolio Return (Unlevered)} = \left(\frac{\text{Portfolio Return (Levered)} - \text{Excess Return (Levered)}}{\text{Policy Leverage Factor}} \right) + \text{Excess Return (Levered)} - \text{cost of implementation}$ <p>¹ Note, because <u>Excess Return (Levered)</u> is the difference between two similarly "levered" portfolios (Portfolio Return (Levered) and Benchmark Return (Levered)), it represents outperformance that is not attributable to leverage. Accordingly, it is subtracted first as it would be inaccurate to reduce such amount by the Policy Leverage Factor for purposes of this calculation.</p> <p><u>Policy Leverage Factor</u> is the amount of the approved Policy Leverage during any given period, time weighted for multi-year periods. Policy Leverage was first introduced into the CTF Portfolio and Benchmark at the end of April 2012 and was raised from 10% to 15%, effective Calendar Year 2021.</p>
CTF Benchmark Return (Unlevered)	<p>Estimated by the <u>Benchmark Return (Levered)</u> divided by the <u>Policy Leverage Factor</u> for the period.</p>

Report Disclosures

Notes on CTF Leverage Analysis

Term	Description / Definitions
Excess Return (Unlevered)	<p>The Excess Return (Unlevered) is the excess return that it is estimated SWIB would have achieved if it did not implement leverage for the CTF.</p> <p>Estimated as <u>Portfolio Return (Unlevered)</u> minus <u>Benchmark Return (Unlevered)</u>.</p> <p>Can also be estimated by taking the actual <u>Excess Return (Levered)</u> minus <u>Implementation (+) or (-)</u> (see below for definition).</p>
Absolute Return from Leverage	<p>Estimated by the <u>Portfolio Return (Levered)</u> minus <u>Portfolio Return (Unlevered)</u> minus <u>Implementation (+) or (-)</u>.</p>
Implementation (+) or (-)	<p>The relative cost of financing (i.e., the actual cost of financing minus the CTF benchmark cost of financing). The CTF benchmark cost of financing is the CTF cash benchmark, previously LIBOR plus 30 bps and now BSBY plus 30 bps. Implementation (+) or (-) can also result from outperformance or underperformance relative to how efficiently SWIB replicates the index in connection with policy leverage (this is called basis risk).</p> <p>Can either be positive or negative. When the leverage implementation is achieved at a cost saving compared to the CTF cash benchmark (i.e., less than the CTF cash benchmark), it is positive (+); but when it is achieved with additional cost compared to the CTF cash benchmark (i.e., more than the CTF cash benchmark), it is negative (-). Cost savings can generate minor excess returns for the CTF. Basis risk can also generate minor contributions to or detractions from relative performance with respect to policy leverage.</p>
Portfolio Return (Levered)	<p>Actual performance of the CTF Portfolio for the period presented, from all strategies including Policy Leverage.</p>
CTF Benchmark Return (Levered)	<p>Actual performance of the CTF Benchmark for the period, taking into account the use of Policy Leverage.</p>
Excess Return (Levered)	<p>Actual excess return of the CTF. Portfolio Return (Levered) minus Benchmark Return (Levered).</p>

Board Meeting

Tab 4 – Annual Presentation on Cost Benchmarking



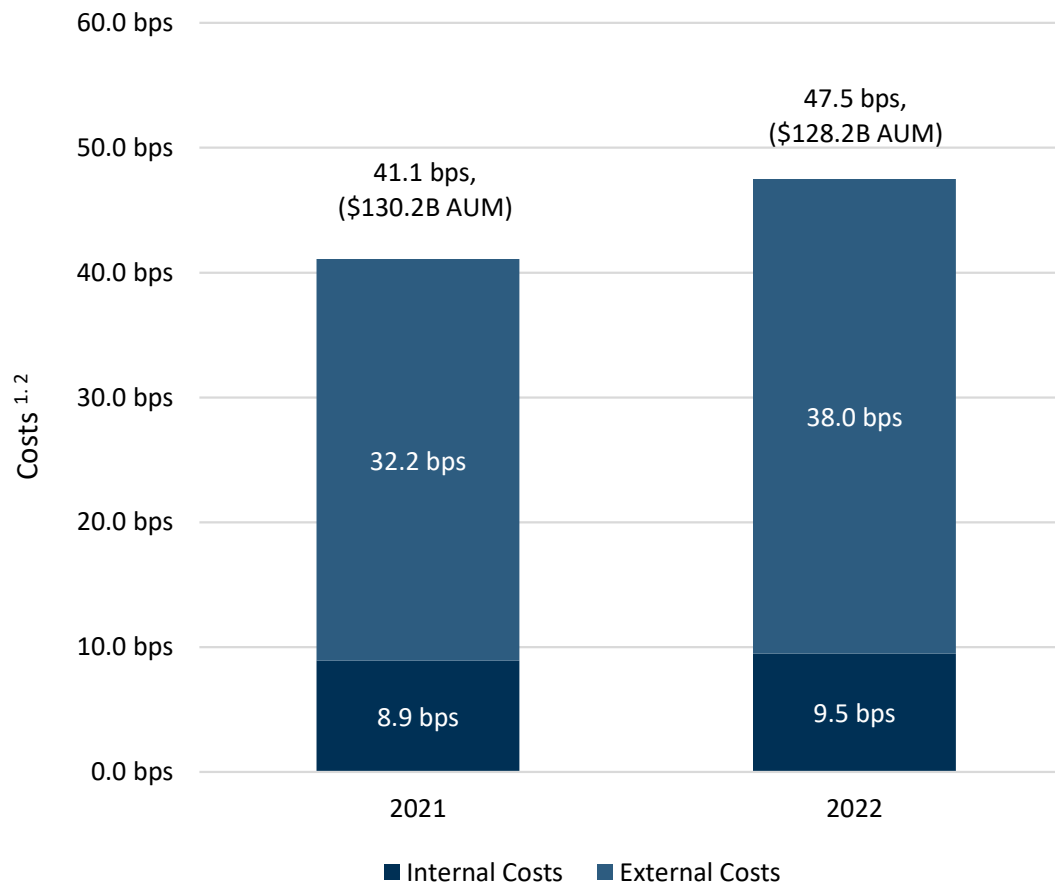
SWIB's Cost Effectiveness Annual Evaluation

December 2023

Data source: CEM Benchmarking, Inc. Reports

STATE OF WISCONSIN
INVESTMENT BOARD

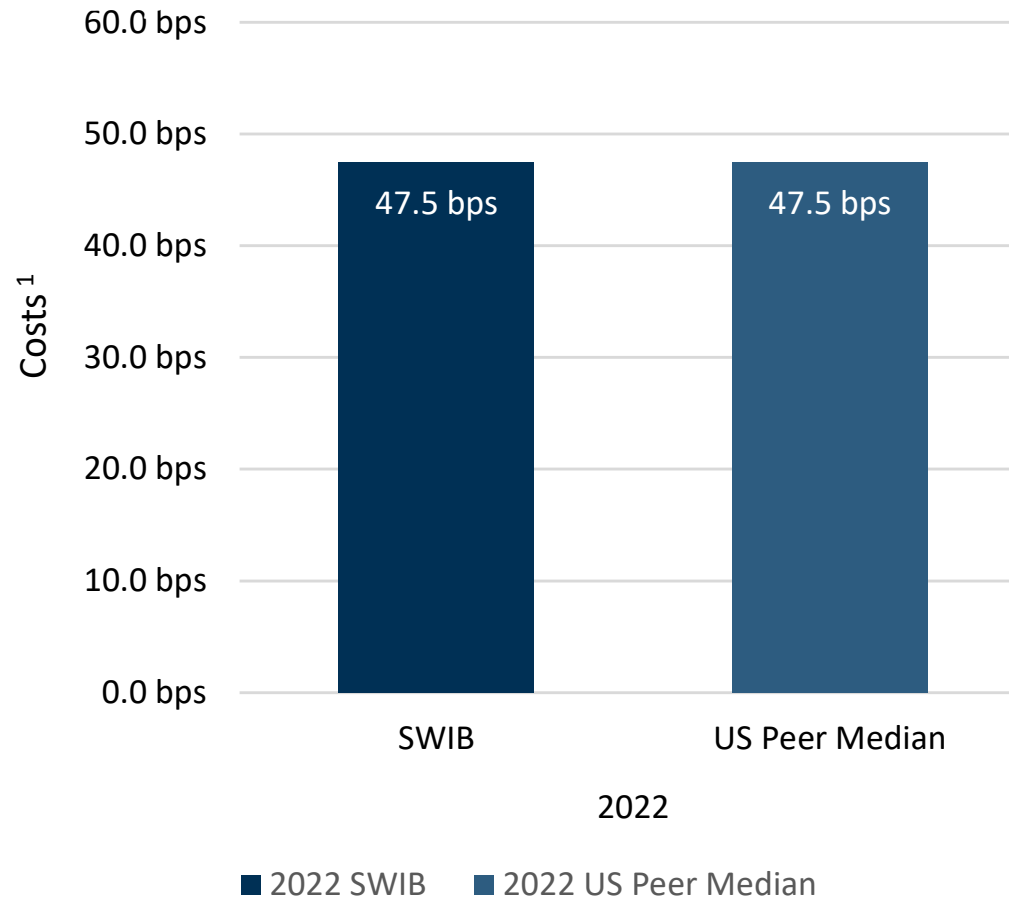
SWIB's Year-Over-Year Cost Composition



¹ Costs exclude external manager performance fees.

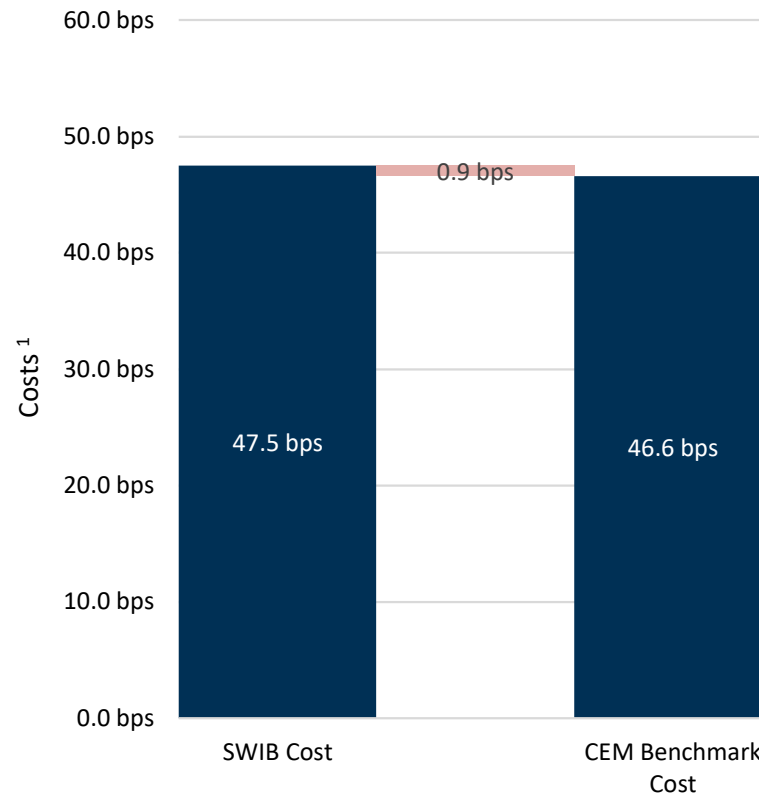
² External Costs presented above include gross base fees for private market assets. SWIB estimates net base fees, which are those actually charged to the CTF, approximated 75% of gross base fees during 2021 and 2022, representing a 3.8 bps difference in 2021 and 4.6 bps difference in 2022.

SWIB's Costs, Excluding Performance Fees, Equals SWIB's US Peer Median



¹ Costs exclude external manager performance fees.

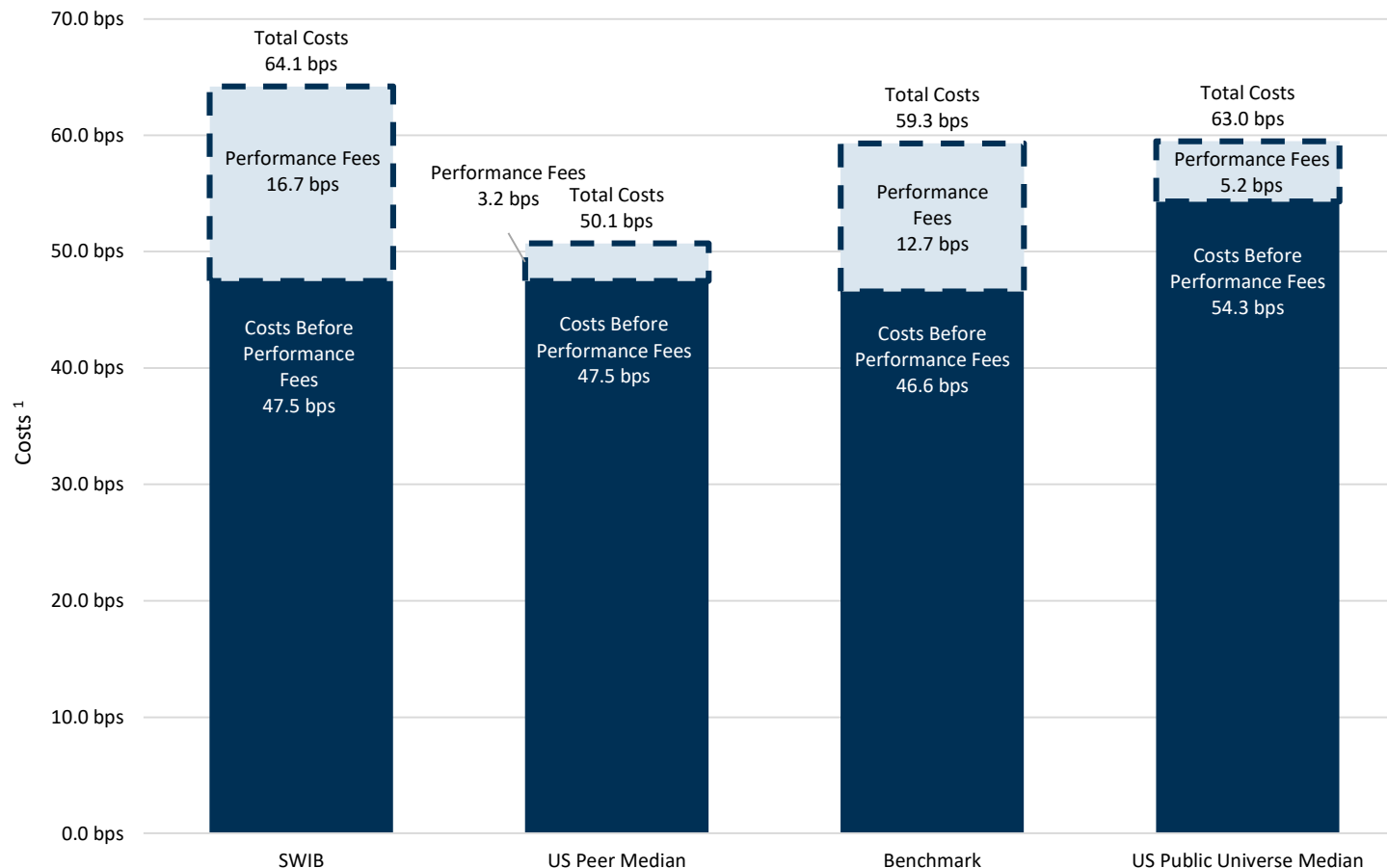
SWIB's Costs, Excluding Performance Fees, Exceed the CEM Benchmark by 0.9 bps in 2022



¹ Costs exclude external manager performance fees.

The CEM Benchmark is a measure that adjusts SWIB's US Pension Peer group to estimate the costs they would incur if they mirrored SWIB's fund size and asset mix.

Median Costs Including Performance Fees



¹ Costs for US Peer Median and US Public Universe Median represent the median of each data point, resulting in the sum of the median cost before performance fees and the median performance fees not equaling the median total costs for each category. As a result, the above total median figures vary modestly from the sum of the individual median inputs.

SWIB's total costs are higher than other CEM measures. However, when adjusted for performance fees, SWIB's costs are equal to the peer median, slightly higher than the CEM benchmark, and lower than the US Public Universe.

Performance Fees Driven by Excess Performance

Investment Manager	Performance Fee	2022 Annual Return	Contribution to 2022 CTF Net Return ¹
Hedge Fund Managers			
Manager A	1.9 bps	24.96%	4.0 bps
Manager B	1.8 bps	11.71%	3.1 bps
Manager C	1.4 bps	16.43%	2.8 bps
Manager D	1.3 bps	16.42%	1.7 bps
Manager E	0.8 bps	22.07%	3.4 bps
Manager F	0.6 bps	7.10%	7.0 bps
Manager G	0.9 bps	21.46%	3.2 bps
Manager H	0.8 bps	49.67%	1.6 bps
Subtotal	9.5 bps		26.9 bps
Beta One Equity Managers			
Manager A ²	1.9 bps	0.85%	2.9 bps
Manager B ³	1.0 bps	-18.59%	-12.8 bps
Subtotal	2.8 bps		-9.9 bps
Grand Total	12.3 bps		17.0 bps

¹ Represents Manager's contribution to 2022 CTF Net Return, after consideration of all fees.

² Beta One Equity Manager A exceeded 2022 benchmark returns by 13.03%

³ Performance fees generated for Beta One Equity Manager B largely driven by returns generated in 4Q21 as this manager has a performance fee measurement period that spans 10/1 - 9/30. The manager's excess net return over benchmark for the year ended 9/30/2022 was 1.94%.

The managers detailed above account for 73.7% of the 2022 performance fees charged across the Hedge Fund and Beta One platform while also accounting for 17.0 bps of CTF performance, after consideration of all fees.

Internal Management Is More Cost Effective

2022

Public Market Asset Type (active strategies)	Internal Mgmt Cost (bps)	External Mgmt Cost (bps) ¹
Global Large Cap Equity	10.3	40.6
Small Cap Equity	15.1	62.2
Domestic Fixed Income	9.3	11.3
High Yield Fixed Income	9.2	31.5

¹ External management costs represent the median cost for SWIB's CEM public fund peers for each asset class. SWIB engages external managers for Global Large Cap Equity at a cost of 44.1 bps (14.8 bps in base fees, 27.8 bps in performance fees & 1.5 bps of internal costs). SWIB engages external managers for Domestic Fixed Income at a cost of 12.6 bps (11.1 bps in base fees & 1.6 bps of internal costs).

SWIB's cost for internal active management remains considerably lower than the cost for external active management.

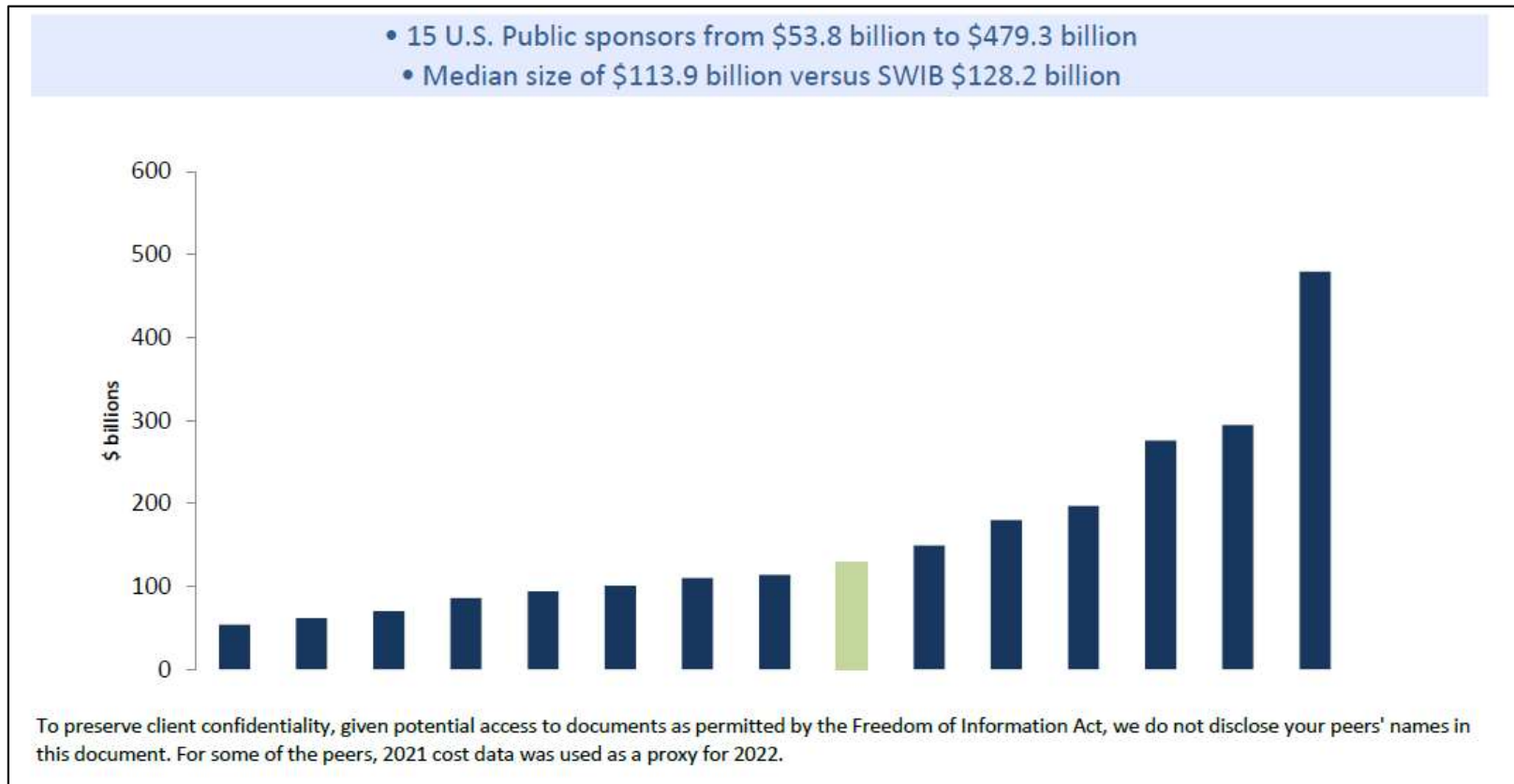
Appendix

U.S. Public Universe In 2022 CEM Report

1	<i>Anonymous U.S. Fund No. 1</i>	22	Louisiana Municipal Police Employees' Retirement System
2	Arlington County	23	Missouri State Employees' Retirement System
3	Austin Fire Fighters Relief and Retirement Fund	24	<i>New York City Retirement Systems</i>
4	Austin Police Retirement System	25	<i>North Carolina Retirement Systems</i>
5	<i>California State Teachers' Retirement System</i>	26	<i>Oregon Public Employees Retirement Fund</i>
6	<i>CalPERS</i>	27	Pension Benefit Guaranty Corporation
7	City of Austin Employees' Retirement System	28	Public Employees Retirement Association of New Mexico
8	District of Columbia Retirement Board	29	<i>Public Employees Retirement System of Nevada</i>
9	East Bay Municipal Utility District	30	San Diego City ERS
10	Educational Employees' Supplementary Retirement - Fairfax County Virginia	31	Seattle City Employees' Retirement System
11	<i>Florida State Board of Administration</i>	32	South Carolina Retirement System Investment Commission
12	Houston Police Officers Pension System	33	<i>State of Tennessee</i>
13	Illinois Municipal Retirement Fund	34	<i>State of Wisconsin Investment Board</i>
14	Indiana Public Retirement System	35	State Universities Retirement System of Illinois
15	Iowa Public Employees' Retirement System	36	<i>STRS Ohio</i>
16	Kansas Public Employees Retirement System	37	<i>Teacher Retirement System of Texas</i>
17	Kentucky Teachers' Retirement System	38	Teachers' Retirement System of the State of Illinois
18	<i>LACERA</i>	39	Utah Retirement Systems
19	Los Angeles City Employees' Retirement System	40	<i>Virginia Retirement System</i>
20	Los Angeles County Metropolitan Transit	41	<i>Washington State Investment Board</i>
21	Los Angeles Water & Power Employees Retirement Plan		

Funds in italics are also included in Peer group

SWIB Peer Group



SWIB's Total Cost Exceeds the CEM Benchmark in 2022 Due To...

	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• More active management, less lower cost passive	26,159	2.0
• Less external management, more lower cost internal	(36,337)	(2.8)
• More LPs as a percentage of external	10,930	0.9
• Less fund of funds	(3,030)	(0.2)
• More co-investment as a percentage of LP/Co	(11,770)	(0.9)
• More overlays	5,908	0.5
	<u>(8,140)</u>	<u>(0.6)</u>
2. Paying more than peers for some services		
• External investment management costs	18,805	1.5
• Internal investment management costs	12,498	1.0
• Oversight, custodial & other costs	39,076	3.0
	<u>70,379</u>	<u>5.5</u>
Total excess cost	62,240	4.9

Board Meeting

Tab 5 – Asset Allocation Recommendations for 2024

ASSET ALLOCATION RECOMMENDATION

2023 DECEMBER
BOARD MEETING

DECEMBER 15, 2023

Joe Nankof
Christopher Levell



TOPICS

- **Summary Recommendations**
- **Review of Alternatives and Recommendations**
- **Background and Capital Market Assumptions**

ASSET ALLOCATION FRAMEWORK

A MULTI-DIMENSIONAL APPROACH TO ASSET ALLOCATION

STRATEGIC VIEWS

Long-term

Focus of this review and today's

discussion: Serves as an implementation guide for strategic asset allocation targets and investment policy benchmarks

CURRENT OPPORTUNITIES

Intermediate

Recommended actions to improve investment outcomes relative to strategic asset allocation targets

DYNAMIC TILTS

Short-term

Represent an active tilt for public market asset classes relative to strategic asset allocation targets

EXECUTIVE SUMMARY

Study is best based on long run expectations which are more stable

- 30-year return expectations have only changed modestly despite move in rates
- Optimizing on 10-year return expectations would result in big swings in allocation year over year

Higher fixed income yields providing more attractive forward-looking returns

- Provides an opportunity to reduce overall portfolio risk
- Meaningfully reduce allocation to public equities
- Reduce portfolio leverage

Private Equity has generated significant value-added over the long-term

- Plan can withstand some additional illiquidity—current net cash outflow is 3-4% annually
- For the 10 years ending 6/30/23, SWIB Private Equity/Debt has generated annualized net of fee returns 5.7% in excess of the public markets
- The recommended increase is consistent with SWIB's strategic plan to add to private markets over time
 - Additional increases in policy target allocations will be considered as part of future studies





SUMMARY RECOMMENDATIONS



CURRENT POLICY AND RECOMMENDATION

The biennial asset/liability review is an opportunity to review the asset allocation relative to the liabilities and consider adjustments to long-term investment policy. This exercise is intended to evaluate the long-term strategic decisions outlined in the table below.

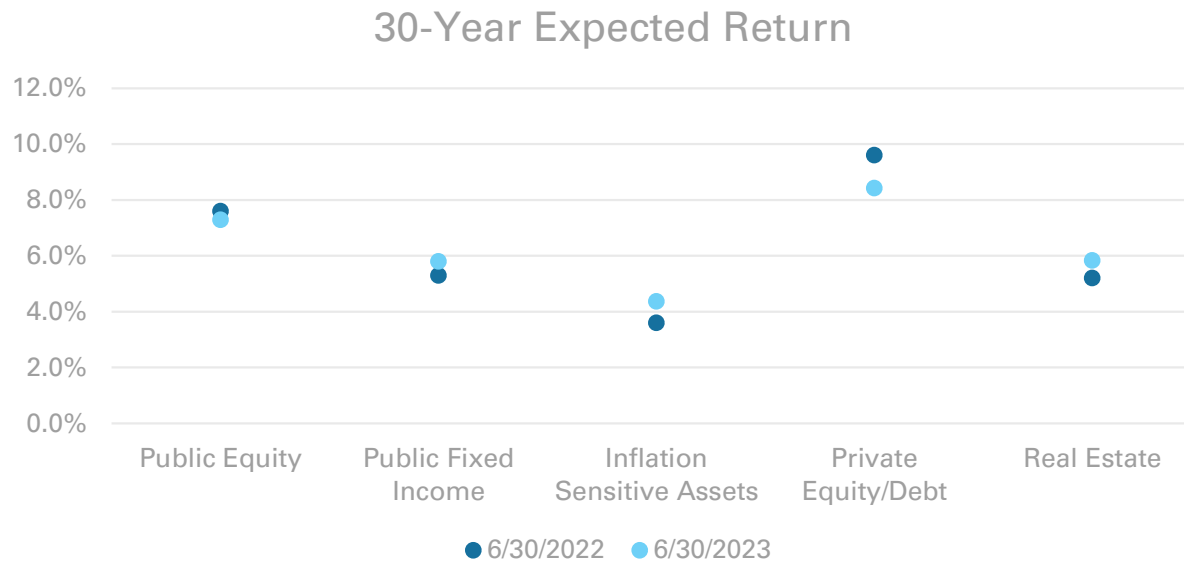
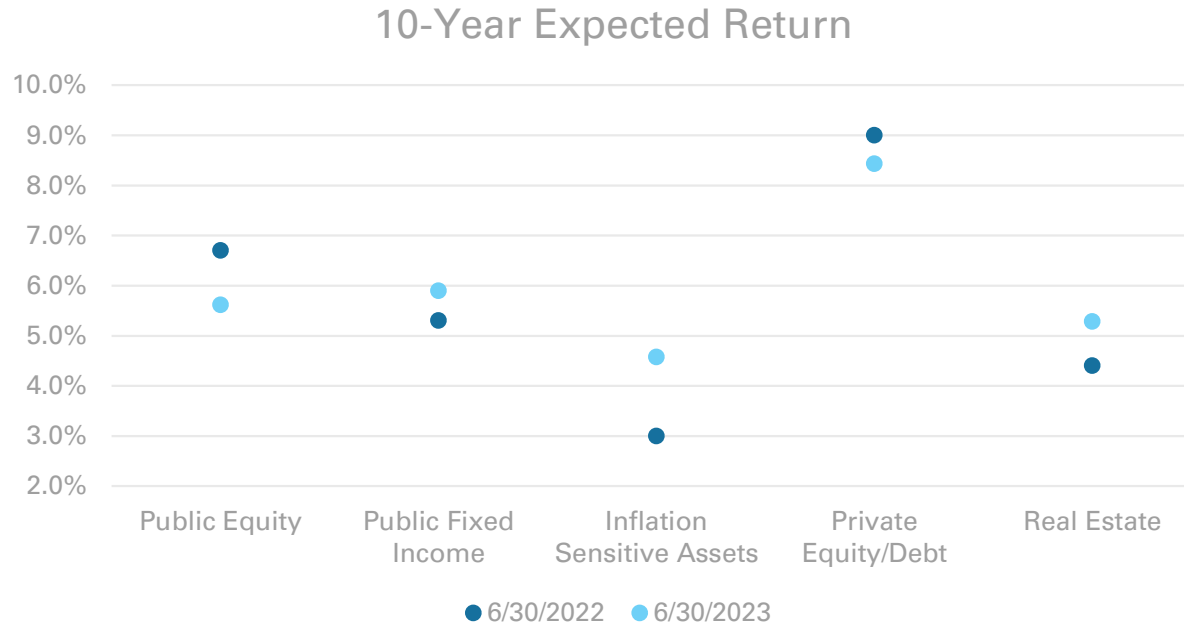
Decision	Current Policy Targets	Recommended Targets
Public Markets Allocation	48% Equity/25% Fixed Income/19% TIPS	40% Equity/27% Fixed Income/19% TIPS
Private Markets Allocation	15% Private Equity & Debt/8% Real Estate	18% Private Equity & Debt/8% Real Estate
Leverage Level	15%	12%
Public Equity Structure	Global Market Capitalization (China Half Weight)	No Change
Public Fixed Income Structure	60% Investment-Grade/40% Below Investment-Grade and Emerging Markets Debt	No Change



REVIEW OF ALTERNATIVES AND RECOMMENDATIONS



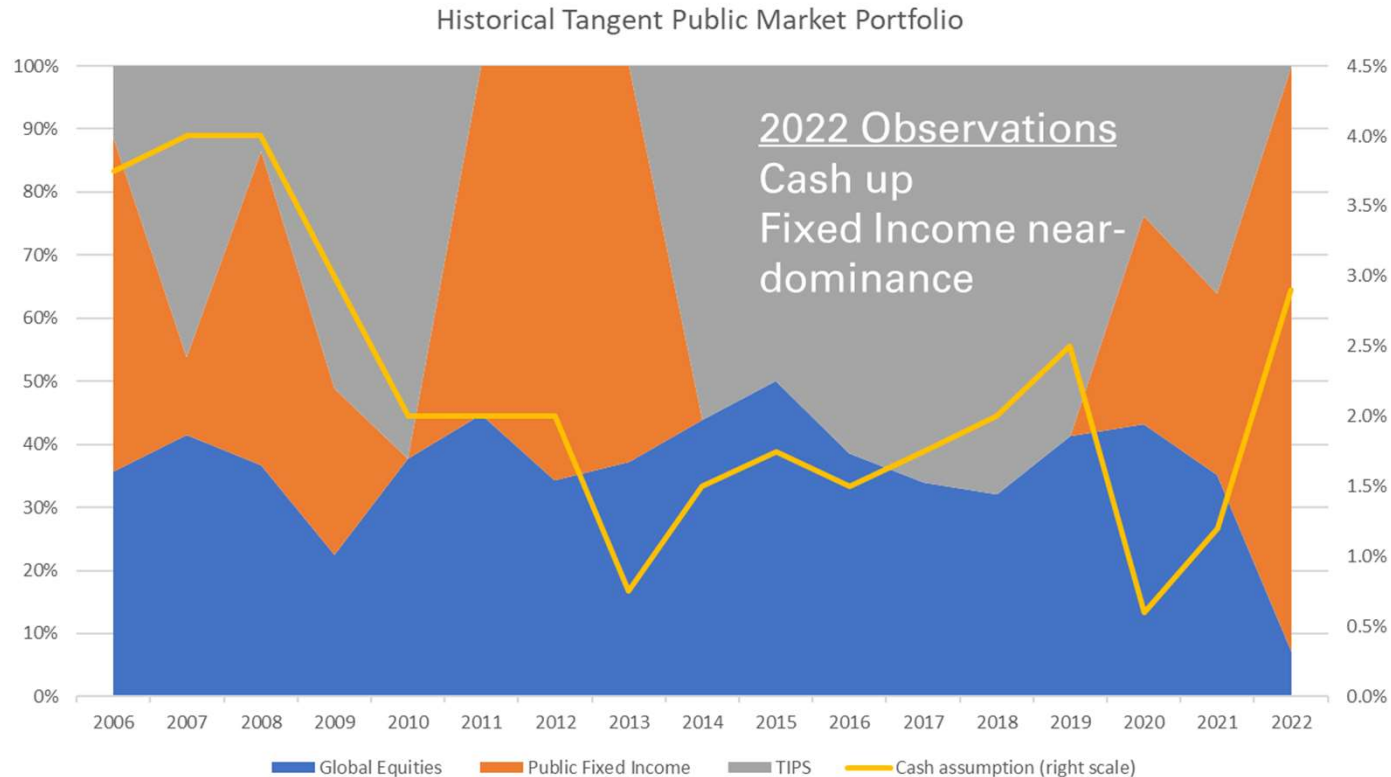
STABLE LONG-TERM ASSUMPTIONS SUGGEST MODEST CHANGES IN THE POLICY ALLOCATION



Sources: S&P, FactSet



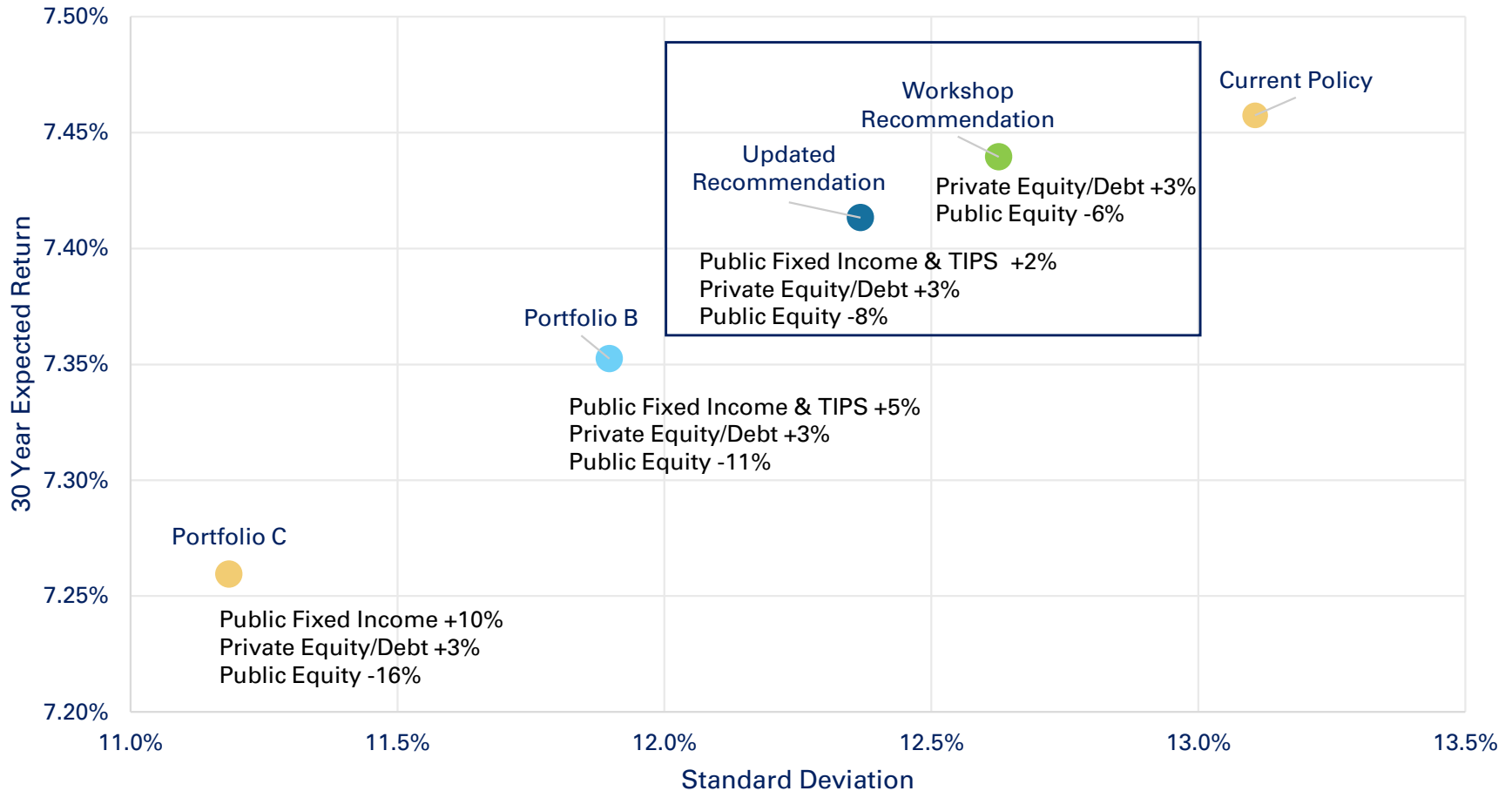
OVER-ENGINEERING THE PORTFOLIO BASED ON FLUCTUATIONS IN ANNUAL ASSUMPTIONS LEADS TO A VOLATILE ASSET MIX



- **Over time, the tangent optimal Sharpe ratio portfolio changes**
 - Varying cash assumptions
 - Equities generally between 1/3rd to half
 - Large differences in public fixed income and TIPS
- **Annual changes in assumptions best inform *direction* of asset mix changes**

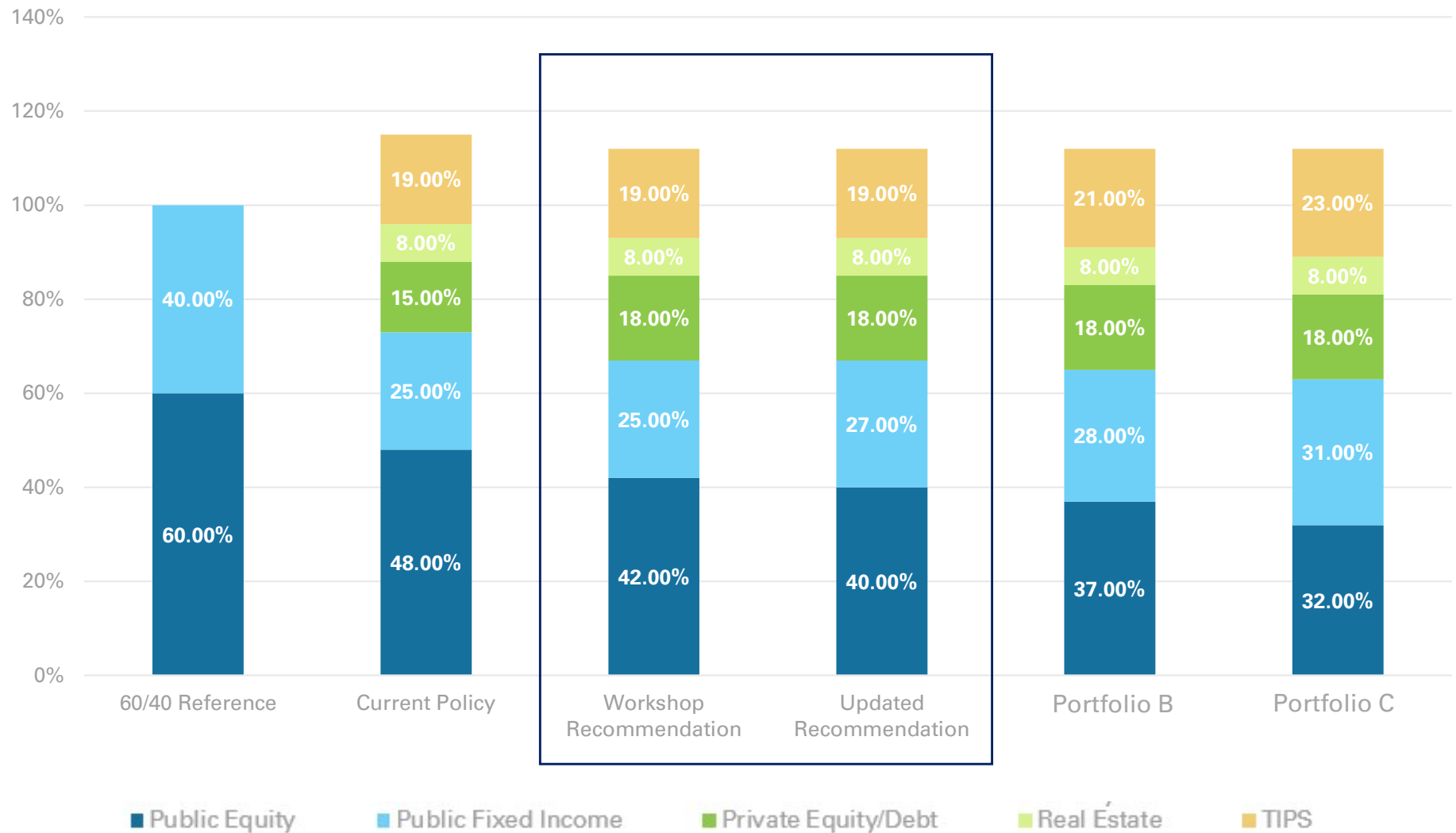
POLICY PORTFOLIO COMPARED TO ALTERNATIVE SCENARIOS

CURRENT POLICY AND RECOMMENDED SCENARIOS



Source: Bloomberg, FactSet

ASSET ALLOCATION

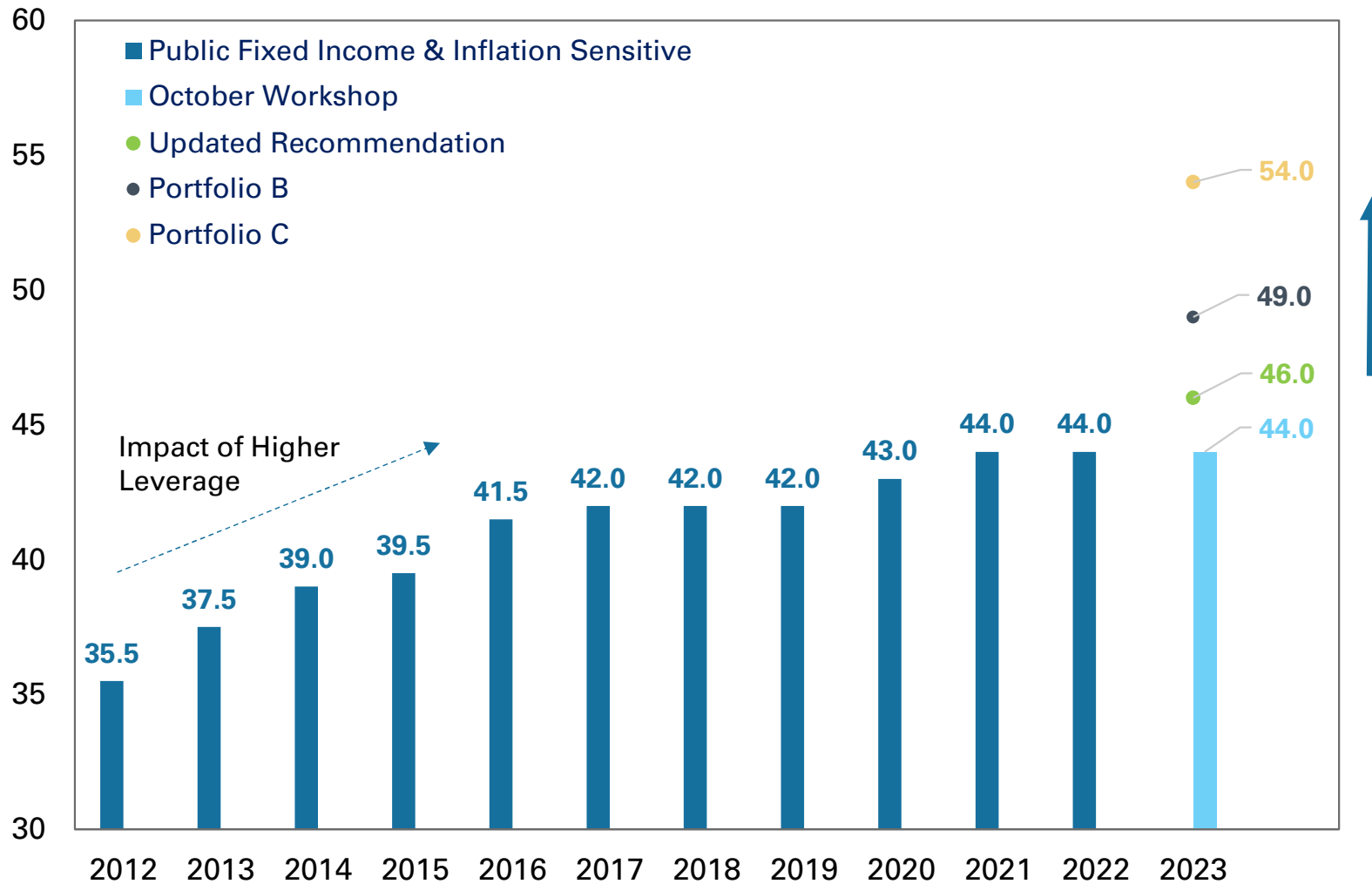


*60/40 Reference portfolio is 60% MSCI ACWI IMI/40% Bloomberg Aggregate



SCENARIOS IMPLY LARGE CHANGES COMPARED TO STABLE FIXED INCOME ALLOCATIONS

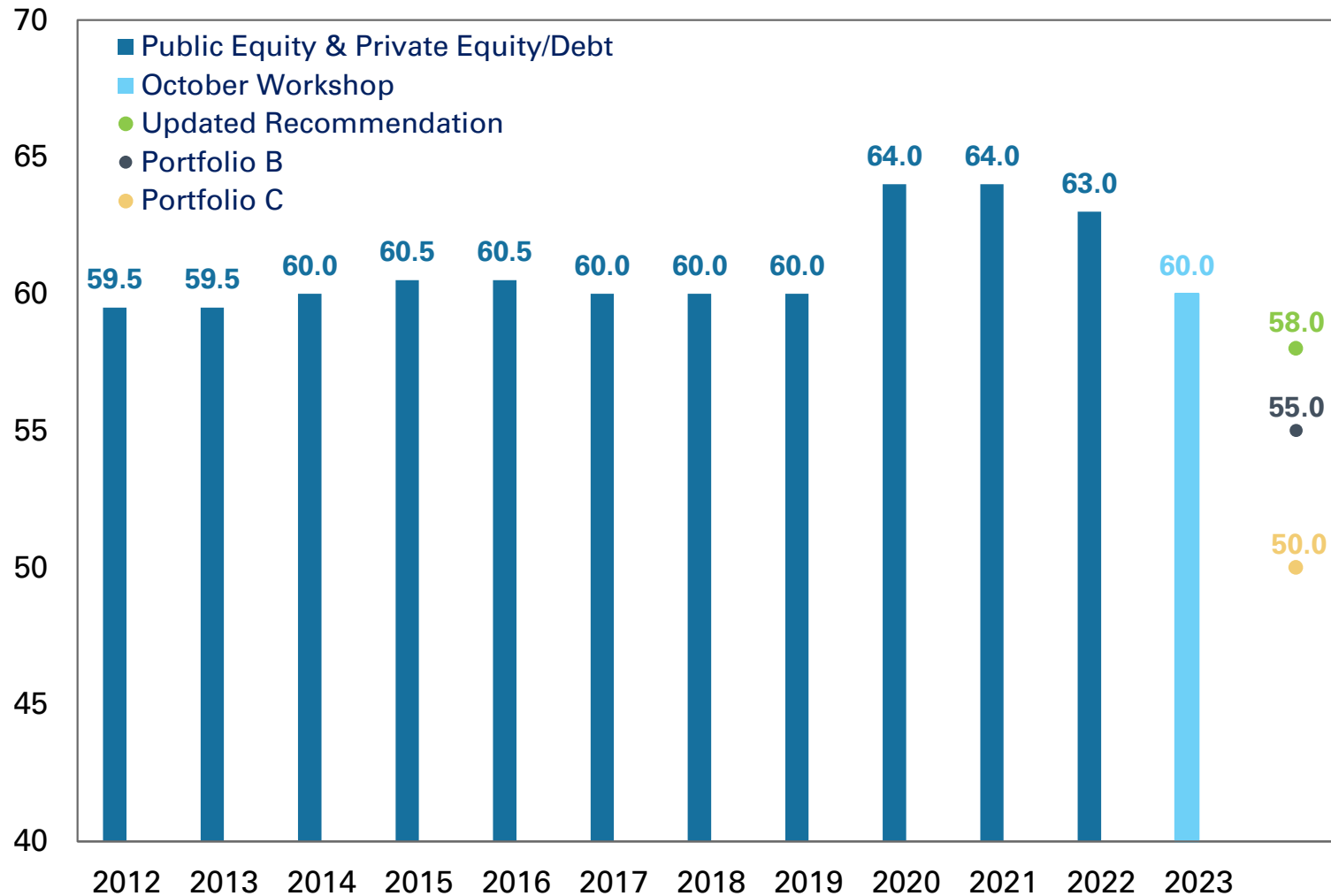
Public Fixed Income & Inflation Sensitive Allocations, 2012-2023



Source: SWIB data on historical Board policy decisions for CTF

OUTSIZED CHANGES IN PUBLIC EQUITY WOULD BE REQUIRED TO FUND HIGHER FIXED INCOME

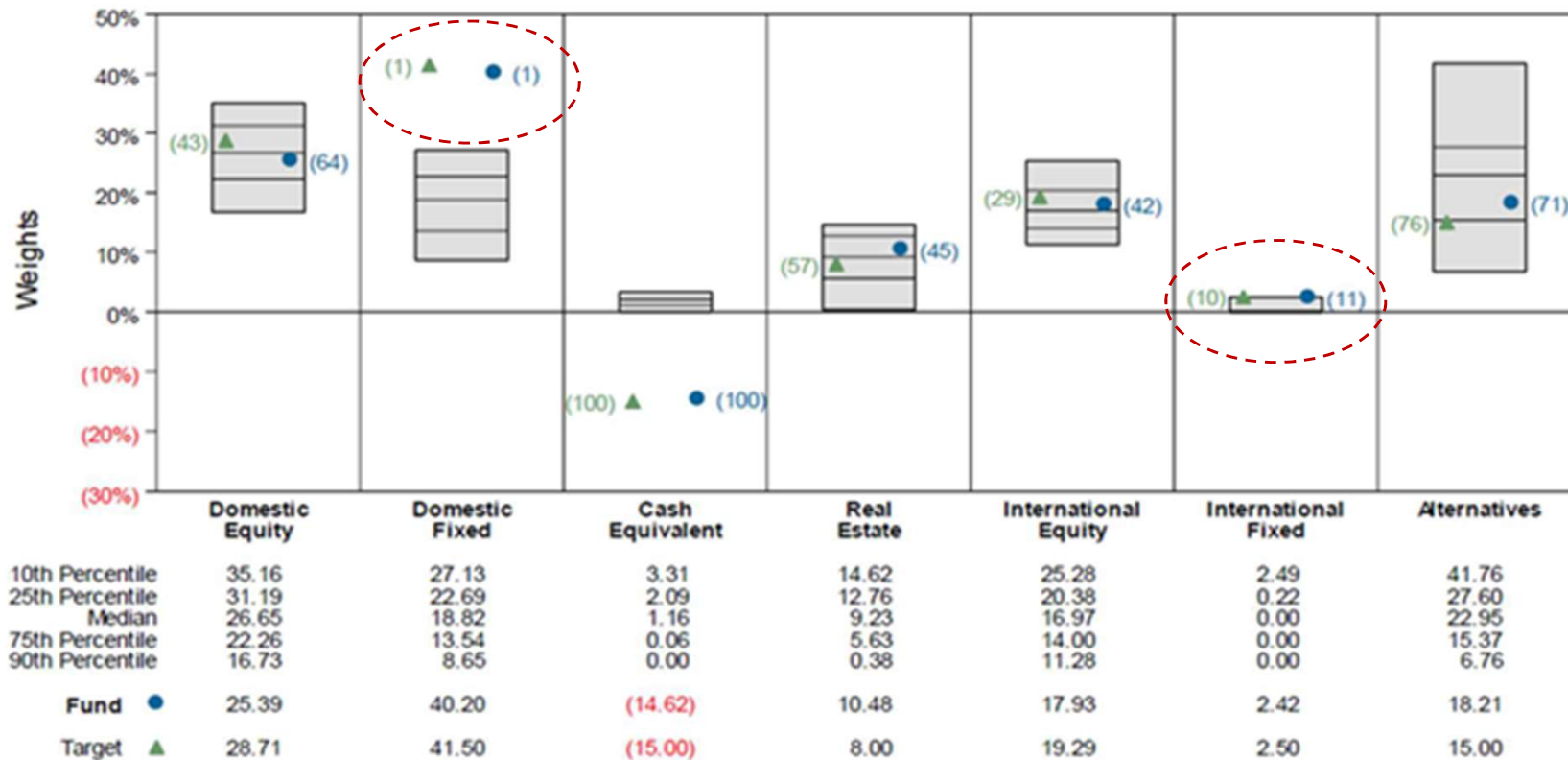
Public Equity & Private Equity/Debt, 2012-2023



Source: SWIB data on historical Board policy decisions for CTF

PORTFOLIO ALREADY BEGINNING WITH A HIGH FIXED INCOME ALLOCATION RELATIVE TO PEERS

Asset Class Weights vs Callan Public Fund Spons- V Lg DB (>10B)



- SWIB's use of financial leverage (now 15%) enables more risk reducing/diversifying assets w/o sacrificing growth assets.
- This somewhat unique strategy is a more diversified and risk-balanced portfolio than most peers.
- Much more fixed income in US especially, and Int'l as a hedge against equity-like risks (and using less risky fixed income).
- Slightly less illiquid non-real estate "Alternatives"

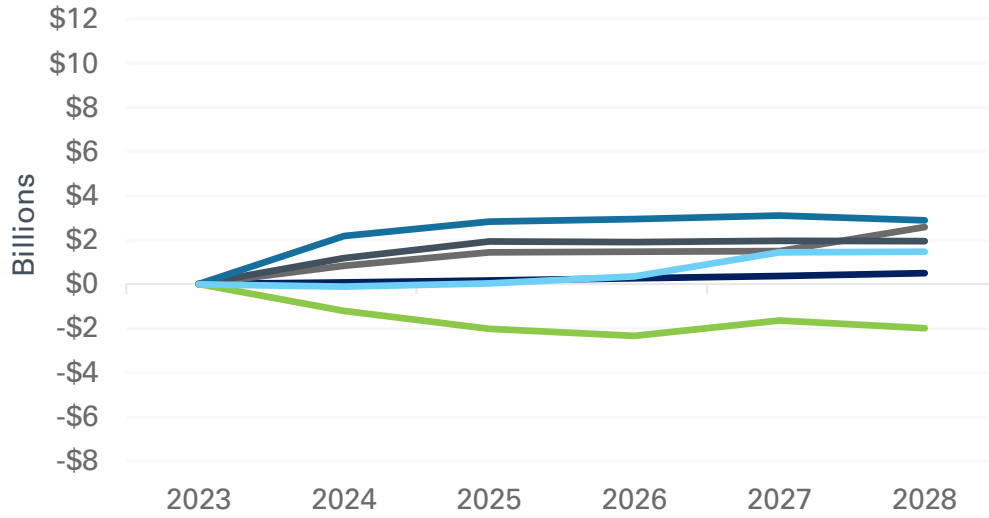


Source: Callan. Data as of 12/31/2022

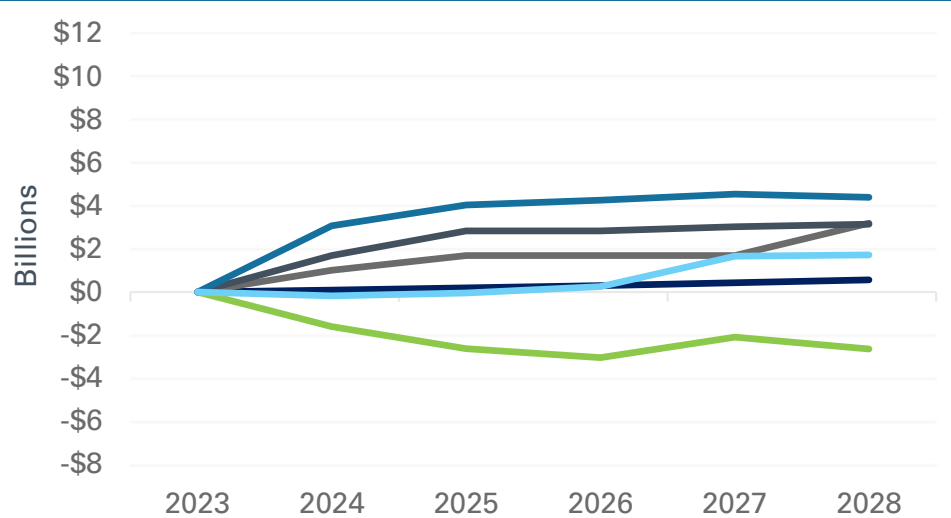
MACRO SENSITIVITY ANALYSIS

HIGHER FIXED INCOME ALTERNATIVES LAG IN EXPANSION

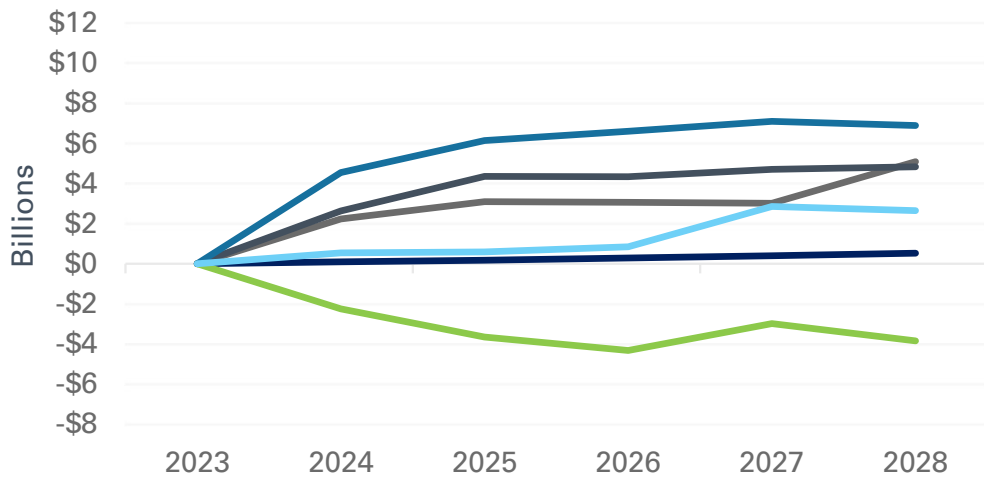
Workshop Recommendation v. Current Policy



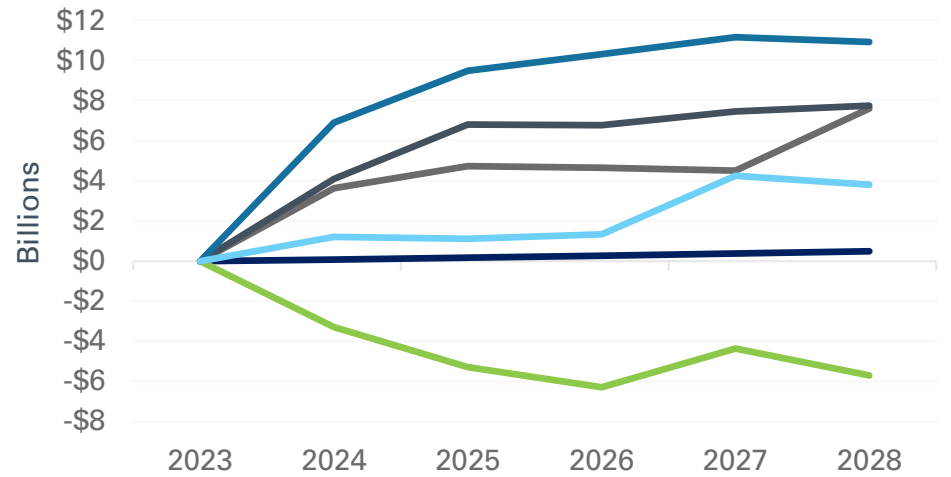
Updated Recommendation v. Current Policy



Portfolio B v. Current Policy



Portfolio C v. Current Policy



— Base Case — Stagflation — Recession — Expansion — Depression — Overextension

ALTERNATIVE ALLOCATIONS

ASSET ALLOCATION AND RISK/RETURN SUMMARY

Asset Class	10 Year Return Geometric Return	30 Year Return Geometric Return	Standard Deviation	Current Policy	Workshop Recommendation	Updated Recommendation	Portfolio B	Portfolio C
Public Equity	5.6%	7.3%	18.0%	48%	42%	40%	37%	32%
Public Fixed Income	5.9%	5.8%	6.3%	25%	25%	27%	28%	31%
Private Equity/Debt	8.4%	9.6%	20.3%	15%	18%	18%	18%	18%
Real Estate	5.3%	5.8%	15.0%	8%	8%	8%	8%	8%
TIPS	4.6%	4.4%	6.1%	19%	19%	19%	21%	23%
Cash	4.0%	3.4%	0.6%	0%	0%	0%	0%	0%
Leverage	4.3%	3.7%	0.6%	-15%	-12%	-12%	-12%	-12%
Total				100%	100%	100%	100%	100%
10 Year Compound Return				6.4%	6.5%	6.5%	6.5%	6.5%
10 Year Sharpe Ratio				0.18	0.19	0.20	0.21	0.22
30 Year Compound Return				7.5%	7.4%	7.4%	7.4%	7.3%
30 Year Sharpe Ratio				0.31	0.32	0.32	0.33	0.34
Standard Deviation				13.1%	12.6%	12.4%	11.9%	11.2%
T-Cost Impact					\$5M	\$11M	\$21M	\$39M
Portfolio Liquidity (Liquidity Coverage Ratio**)					5.3	5.0	4.5	3.8
Time to Implement					3m	4-5m	6-8m	12m

* SWIB Staff allowed to eliminate leverage, i.e., down to 100%

** Liquidity Coverage Ratio (LCR) is defined as high-quality liquid assets (passive Treasuries and Large Cap Stocks) divided by monthly cash outflows (i.e., benefit payments, capital calls, expenses and other ad hoc liquidity needs)



UPDATED RECOMMENDATION

ASSET ALLOCATION AND RISK/RETURN SUMMARY

Asset Class	10 Year Return Geometric Return	10 Year Sharpe Ratio	30 Year Return Geometric Return	30 Year Sharpe Ratio	Standard Deviation	Current Policy	Updated Recommendation	Recommended Rebalance Ranges
Public Equity	5.6%	0.09	7.3%	0.22	18.0%	48%	40%	+/- 6%
Public Fixed Income	5.9%	0.30	5.8%	0.38	6.3%	25%	27%	+/- 6%
Private Equity/Debt	8.4%	0.22	9.6%	0.30	20.3%	15%	18%	+/- 8%
Real Estate	5.3%	0.08	5.8%	0.16	15.0%	8%	8%	+/- 4%
TIPS	4.6%	0.09	4.4%	0.16	6.1%	19%	19%	+/- 5%
Cash	4.0%	N/A	3.4%	N/A	0.6%	0%	0%	
Leverage	4.3%	N/A	3.7%	N/A	0.6%	-15%	-12%	-4% to -20%*
Total						100%	100%	
10 Year Compound Return						6.4%	6.5%	
10 Year Sharpe Ratio						0.18	0.20	
30 Year Compound Return						7.5%	7.4%	
30 Year Sharpe Ratio						0.31	0.32	
Standard Deviation						13.1%	12.4%	
Target Active Risk**						1.2%	1.2%	

* SWIB Staff allowed to eliminate leverage, i.e., down to 0%

** Target Active Risk has a range of +/- 0.6%



PUBLIC EQUITY STRUCTURE

	Current Equity Allocation*	% of Total Portfolio	Recommended Equity Allocation*	% of Total Portfolio
Global Equities	80.6%	38.7%	80.6%	32.2%
US Small Cap Equities	5.9%	2.8%	5.9%	2.4%
Int'l Small Cap Equities	3.9%	1.9%	3.9%	1.6%
Emerging Market Large Cap				
China	1.4%	0.7%	1.4%	0.6%
x-China	6.7%	3.2%	6.7%	2.7%
Emerging Market Small Cap	1.5%	0.7%	1.5%	0.6%
Total		48%		40%
10 Year Compound Return	5.6%		5.6%	
30 Year Compound Return	7.3%		7.3%	
Standard Deviation	18.0%		18.0%	
10 Year Sharpe Ratio	0.09		0.09	
30 Year Sharpe Ratio	0.22		0.22	

* Market capitalization weights as of June 30, 2023; Actual market capitalization weights will float with market moves over time



Source: Bloomberg, FactSet

PUBLIC FIXED INCOME STRUCTURE

	Current Fixed Income Allocation	% of Total Portfolio	Recommended Fixed Income Allocation	% of Total Portfolio
US Treasuries	24.0%	6.0%	24.0%	6.5%
US Investment Grade Credit	24.0%	6.0%	24.0%	6.5%
Mortgage-Backed	8.0%	2.0%	8.0%	2.2%
Long Treasuries	4.0%	1.0%	4.0%	1.1%
High Yield Bonds	20.0%	5.0%	20.0%	5.4%
Leveraged Loans	10.0%	2.5%	10.0%	2.7%
Emerging Market Debt*	10.0%	2.5%	10.0%	2.7%
Total		25%		27%
10 Year Compound Return	5.9%		5.9%	
30 Year Compound Return	5.8%		5.8%	
Standard Deviation	6.3%		6.3%	
10 Year Sharpe Ratio	0.30		0.30	
30 Year Sharpe Ratio	0.38		0.38	

*Blended 50%/50% external and local.



REFERENCE PORTFOLIO ATTRIBUTION

	10 Year Expected Return	Standard Deviation	30 Year Expected Return
Reference Portfolio	5.65%	11.26%	6.62%
Private Markets	0.56%	0.14%	0.45%
Portfolio Structure	0.16%	0.36%	0.14%
Leverage	0.11%	0.61%	0.20%
Updated Recommendation	6.47%	12.37%	7.41%

CTF ACTIVE RETURN ENHANCES TOTAL RETURN

	Return Contribution	Risk
10 Years		
Proposed Policy Portfolio	6.5%	12.4%
Active Return	<u>0.3-0.8%</u>	<u>0.6-1.8%</u>
Total	6.8-7.3%	12.5-12.8%
30 Years		
Proposed Policy Portfolio	7.4%	12.4%
Active Return	<u>0.3-0.8%</u>	<u>0.6-1.8%</u>
Total	7.7-8.2%	12.5-12.8%



VARIABLE RETIREMENT TRUST ALLOCATION

	Current & Recommended Policy Portfolio	Rebalancing Range
US Equities	70%	65 - 75%
Int'l Equities incl. Emerging	30%	25 - 35%
10 Year Compound Return	5.5%	
30 Year Compound Return	7.3%	
Standard Deviation	17.7%	
10 Year Sharpe Ratio	0.09	
30 Year Sharpe Ratio	0.22	
Target Active Risk*	0.6%	

* Target Active Risk has a range of +/- 0.3%



Source: Bloomberg, FactSet

VTF ACTIVE RETURN ENHANCES TOTAL RETURN

	Return Contribution	Risk
10 Years		
Proposed Policy Portfolio	5.5%	17.7%
Active Return	<u>0.1-0.4%</u>	<u>0.3-0.9%</u>
Total	5.6-5.9%	17.8-17.9%
30 Years		
Proposed Policy Portfolio	7.3%	17.7%
Active Return	<u>0.1-0.4%</u>	<u>0.3-0.9%</u>
Total	7.4-7.7%	17.9-17.9%



BACKGROUND AND CAPITAL MARKET ASSUMPTIONS



10 & 30 YEAR GEOMETRIC RETURN FORECASTS

JUNE 30, 2023

Asset Class	10 Year Return	30 Year Return	Standard Deviation
U.S. Large-Cap Equity	4.6%	6.7%	16.9%
U.S. Small/Mid-Cap Equity	6.5%	7.5%	20.8%
Non-U.S. Developed Equity	5.0%	6.5%	19.6%
Non-U.S. Developed Small-Cap Equity	7.3%	7.8%	24.2%
Emerging Market Equity	9.2%	9.4%	28.6%
Emerging Market Small-Cap Equity	8.6%	9.3%	31.9%
Private Equity – Buyout	7.5%	8.8%	20.0%
Private Equity – Growth	8.8%	9.8%	31.4%
Private Equity - Early Stage Venture	10.0%	10.6%	45.0%
Private Equity – Secondary	7.0%	8.3%	21.0%
Non-U.S. Private Equity	10.7%	10.9%	32.0%
China Equity	9.9%	9.5%	30.7%
Global Equity*	5.7%	7.4%	18.0%
Private Equity*	9.1%	10.2%	25.7%
Cash	4.0%	3.4%	0.6%
U.S. TIPS	4.6%	4.4%	6.1%
U.S. Treasury Bond	4.2%	4.1%	5.4%
U.S. Corporate Bond	5.7%	5.8%	7.6%
U.S. Mortgage-Backed Securities	4.5%	4.3%	6.5%
U.S. Securitized Bond	5.3%	5.1%	8.2%
U.S. Collateralized Loan Obligation	5.8%	5.1%	7.6%
U.S. Long-Term Treasury Bond (10-30 Year)	3.9%	4.2%	11.8%
U.S. Aggregate Bond*	4.7%	4.7%	5.8%
U.S. High Yield Corporate Bond	6.8%	7.1%	11.1%
U.S. Leveraged Loan	7.6%	6.8%	9.1%
Emerging Market External Debt	7.7%	7.1%	13.0%
Emerging Market Local Currency Debt	6.5%	5.7%	13.0%
Private Debt - Credit Opportunities	8.0%	8.4%	14.8%
Private Debt – Distressed	8.8%	9.3%	14.6%
Private Debt - Direct Lending	8.6%	9.0%	11.0%
Private Debt*	8.6%	9.1%	11.8%
Real Estate - Core	5.3%	5.8%	15.0%

*Calculated as a blend of other asset classes



10 & 30 YEAR GEOMETRIC RETURN FORECASTS

SEPTEMBER 30, 2023

Asset Class	10 Year Return	30 Year Return	Standard Deviation
U.S. Large-Cap Equity	4.8%	6.9%	16.9%
U.S. Small/Mid-Cap Equity	6.9%	7.7%	20.8%
Non-U.S. Developed Equity	5.1%	6.5%	19.6%
Non-U.S. Developed Small-Cap Equity	7.3%	7.8%	24.2%
Emerging Market Equity	9.1%	9.4%	28.6%
Emerging Market Small-Cap Equity	8.5%	9.3%	31.9%
Private Equity – Buyout	7.7%	8.9%	20.0%
Private Equity – Growth	9.0%	9.9%	31.4%
Private Equity - Early Stage Venture	10.2%	10.7%	45.0%
Private Equity – Secondary	7.2%	8.3%	21.0%
Non-U.S. Private Equity	10.7%	10.9%	32.0%
China Equity	9.9%	9.4%	30.7%
Global Equity*	5.9%	7.5%	18.0%
Private Equity*	9.3%	10.2%	25.7%
Cash	4.4%	3.6%	0.6%
U.S. TIPS	5.2%	5.0%	6.1%
U.S. Treasury Bond	4.8%	4.7%	5.4%
U.S. Corporate Bond	6.3%	6.4%	7.6%
U.S. Mortgage-Backed Securities	5.1%	5.0%	6.5%
U.S. Securitized Bond	5.8%	5.7%	8.2%
U.S. Collateralized Loan Obligation	6.1%	5.2%	7.6%
U.S. Long-Term Treasury Bond (10-30 Year)	4.8%	5.0%	11.8%
U.S. Aggregate Bond*	5.3%	5.3%	5.8%
U.S. High Yield Corporate Bond	7.2%	7.7%	11.1%
U.S. Leveraged Loan	7.8%	6.8%	9.1%
Emerging Market External Debt	8.2%	7.7%	13.0%
Emerging Market Local Currency Debt	7.1%	6.1%	13.0%
Private Debt - Credit Opportunities	8.1%	8.5%	14.8%
Private Debt – Distressed	9.0%	9.5%	14.6%
Private Debt - Direct Lending	8.7%	9.1%	11.0%
Private Debt*	8.8%	9.2%	11.8%
Real Estate - Core	5.0%	5.9%	15.0%

*Calculated as a blend of other asset classes



ASSET ALLOCATION

Overview and Recommendations for 2024

December 15, 2023

Edwin Denson
Executive Director/Chief Investment Officer

Todd Mattina
Head Economist & Asset and Risk Allocation CIO

In Consultation with NEPC and the Investment Committee

2024 RECOMMENDATIONS SUMMARY

Strategic Asset Allocation Targets and Ranges

2024 Core Trust Fund recommendation and expectations:

	<u>Policy Targets*</u>	<u>Ranges*</u>
Public Equity	40%	34% - 46%
Public Fixed Income	27%	21% - 33%
Inflation Sensitive Assets	19%	14% - 24%
Private Equity/Debt	18%	10% - 26%
Real Estate	8%	4% - 12%
Leverage	<u>-12%</u>	-4% [†] to -20%
Total (Including Leverage)	100%	
<i>10 Yr. Expected Return</i>	<i>6.5%</i>	
<i>30 Yr. Expected Return</i>	<i>7.4%</i>	
<i>Expected Standard Deviation</i>	<i>12.4%</i>	
<i>10 Yr. Expected Sharpe Ratio</i>	<i>0.20</i>	
<i>30 Yr. Expected Sharpe Ratio</i>	<i>0.32</i>	
Target Active Risk	120bps +/- 60bps	

The Board of Trustees' external asset allocation consultant, NEPC, provided the following capital market assumptions used to develop the asset allocation recommendation and expectations:

<u>Asset Class</u>	<u>Long Term Expected Return</u>	<u>10 Year Expected Return</u>	<u>Standard Deviation</u>
Public Equity	7.3%	5.6%	18.0%
Public Fixed Income	5.8%	5.9%	6.3%
Inflation Sensitive Assets	4.4%	4.6%	6.1%
Private Equity/Debt	9.6%	8.4%	20.3%
Real Estate	5.8%	5.3%	15.0%

* Policy Targets and Ranges will vary from the above table. This is due to the Asset Allocation Corridor Treatment which requires that Private Equity/Debt and Real Estate asset class Policy Targets be derived from actual AUM, and then corresponding Policy Targets and Ranges for Public Equities and Public Fixed Income are adjusted. Mandatory rebalancing for Public Equities and Public Fixed Income as set forth in the Board of Trustees WRS Investment Policy is not triggered by the ranges in the above table, but by these adjusted ranges.

[†] SWIB Staff allowed to eliminate leverage (i.e., 0%).

- The recommended 2024 Policy Target for Public Equity (40%) is 8% lower than the 2023 target, reflecting the more attractive outlook in Public Fixed Income, higher recommended allocation in Private Equity/Debt and lower recommended allocation in Policy Leverage.
- The recommended 2024 Policy Target for Public Fixed Income (27%) is 2% higher than the 2023 target as higher fixed income yields have increased expected returns. The recommended 2024 Policy Target for Inflation Sensitive Assets (19%) remains unchanged.
- The recommended 2024 Policy Target for Private Equity/Debt (18%) is 3% higher than the 2023 target as increased capital deployments have tracked closely with SWIB’s multi-year pacing model. The recommended Policy Target for Real Estate (8%) is unchanged.
- The recommended 2024 Policy Target for Policy Leverage (12%) is 3% lower than the 2023 target as higher financing costs have increased relative to the excess return of the Policy Portfolio, reducing the “return to leverage”.
- The Target Active Risk of 120 basis points \pm 60 basis points will be maintained for the Core Trust Fund for 2024.
- The recommended 2024 Policy Targets may be implemented at any time after approval by the Board of Trustees as determined and approved by the ED/CIO, subject to market conditions and operational readiness.

2024 Variable Trust Fund recommendation and expectations:

	<u>Policy Targets</u>	<u>Ranges</u>
U.S. Equities	70.0%	65.0-75.0%
International Equities	30.0%	25.0-35.0%
	100.0%	
<i>10 Yr. Expected Return</i>	<i>5.5%</i>	
<i>30 Yr. Expected Return</i>	<i>7.3%</i>	
<i>Expected Standard Deviation</i>	<i>17.7%</i>	
<i>10 Yr. Expected Sharpe Ratio</i>	<i>0.09</i>	
<i>30 Yr. Expected Sharpe Ratio</i>	<i>0.22</i>	
Target Active Risk	60bps +/- 30bps	

- The recommended 2024 Policy Targets and Ranges are unchanged from 2023.
- The Target Active Risk of 60 basis points \pm 30 basis points will be maintained for the Variable Trust Fund for 2024.

2024 ASSET ALLOCATION OVERVIEW

Since the late 1980s, SWIB has conducted an asset allocation exercise annually, leading to policy and funding recommendations at the beginning of each calendar year. In the late 1990s, the process was expanded to include several planning sessions with investment staff, senior staff, consultants, and Trustees. SWIB’s process includes a full asset/liability modeling process, stress testing, and

discussion sessions with the Board every other year (“on-year”), opening the schedule to consideration of other strategic issues or structural asset allocation adjustments on an annual basis.

SWIB launched the current “on-year” process for the 2024 asset allocation during the first quarter of 2023 by collaborating with the Wisconsin Retirement System (WRS) actuarial consultant, Gabriel, Roeder, Smith and Company (GRS), and NEPC to execute an Actuarial Overview and Stress Testing Scenarios for the WRS. The results were presented by GRS during the 2023 October Workshop attended by Trustees, staff, and guest experts. GRS presented updated results of the stress testing executed in their 2021 study. The result of the stress testing of the WRS was a recommendation to continue to target an allocation that provides for a target return with appropriate downside protection. The above recommended asset allocation Policy Targets for the Core Trust Fund are consistent with this prescription.

The key theme from the review and discussion centered on the implications of the higher interest rate environment. Higher interest rates have increased the financing cost of Policy Leverage relative to the expected excess return of the Policy Portfolio. Given a lower “return to leverage”, the recommended allocation to Policy Leverage has been reduced by 3 percentage points to 12%. In addition, higher starting yields offered by bonds have resulted in an attractive outlook in fixed income relative to equities. The recommended reallocation to Public Fixed Income from Public Equity achieves the Core Trust Fund’s target return with lower investment volatility.

Another theme in the discussion was the higher recommended allocation to Private Equity/Debt. The higher allocation in 2023 has been consistent with SWIB’s multi-year pacing plan. Under the pacing model, the recommended allocation to Private Equity/Debt is expected to increase further over the medium term in a manner consistent with preserving the Core Trust Fund’s strong liquidity position. For long-term investors with adequate liquidity, Private Equity/Debt offers an alternative vehicle to implement equity exposure while increasing opportunities to add value.

The Private Equity/Debt and Real Estate ranges were also analyzed from both historical and ex-ante approaches to quantify the denominator effect and potential increased capital calls during times of market disruption. The analysis supports the recommendation to increase the Private Equity/Debt range from the target $\pm 7\%$ to the target $\pm 8\%$. The analysis for Real Estate supports maintaining the current range from the target $\pm 4\%$. The ranges for these two asset classes determine when the asset allocation corridor treatment is in effect. The rebalancing ranges around the private market allocations have been calibrated so that the asset allocation corridor treatment, which accepts the actual allocation of Private Equity/Debt and Real Estate as the target allocation while within the range, will be effective about 90% of the time.

The 2024 asset allocation recommendations at the asset class and sub-asset class levels are discussed below:

1. While the recommended allocation is lower for Public Equity, the sub-asset class targets within Public Equity continue to align with the global investible market in both the regional and market capitalization dimensions as represented by the MSCI ACWI IMI while preserving a half weight to China large cap equities.
2. While the recommended allocation is higher for Public Fixed Income, the relative allocations to the sub-asset classes within Public Fixed Income (see proposed sub-asset class targets on the next page) do not change this year.

3. The recommendation to increase Private Equity/Debt from 15% to 18% and maintain Real Estate at 8% reflects both longer term liquidity considerations and pacing aspects of the asset classes.
4. Active return (i.e., the return in excess of the policy benchmark) is an important contributor to overall fund return and diversifies risk. Consistent with recent years, the recommended Target Active Risk is 120 basis points +/- 60 basis points in the Core Trust Fund and 60 basis points +/- 30 basis points for the Variable Trust Fund.

Strategic Sub-Asset Class Allocation Targets

2024 Core Trust Fund recommendation and expectations for information:

<u>Public Equity</u>	<u>Policy Target[‡]</u>
Global	32.2%
US Small Cap	2.4%
Int'l Small Cap	1.6%
EME Large Cap China	0.6%
EME Large Cap ex China	2.7%
EME Small Cap	<u>0.6%</u>
	40.0%
<u>Public Fixed Income</u>	<u>Policy Target</u>
US Government	6.5%
US Investment Grade Credit	6.5%
MBS	2.2%
Long Treasuries	1.1%
High Yield Bonds	5.4%
Levered Loans	2.7%
EMD (External)	1.35%
EMD (Local Currency)	<u>1.35%</u>
	27.0%

[‡] Public Equity sub-asset class targets are informational and reflect the market capitalization of the MSCI ACWI Investable Market Index (IMI) with a 50% weight to the China large cap component as of 9/30/2023.

Board Meeting

Tab 6 – Committee Open Session Business

- A. Enterprise Risk and Compliance Committee Charter
- B. Approved Open Session Investment Committee Meeting Minutes of August 22, September 26 and October 24, 2023
- C. Final Open Session Investment Committee Agenda for November 28, 2023 and Draft Open Session Agendas for December 21, 2023 and January 23, 2024

SWIB ENTERPRISE RISK AND COMPLIANCE COMMITTEE CHARTER

Board Approval Date: June 2011
Last Amended [December ~~2022~~2023]

The State of Wisconsin Investment Board (SWIB) Enterprise Risk and Compliance Committee, in conjunction with SWIB management and the Board of Trustees, has developed the following policies and procedures relating to enterprise risk and compliance.

Enterprise Risk and Compliance Committee Membership:

Head of Risk Management (Co-Chair)

Director of Compliance & Senior Legal Counsel (Co-Chair)

Chief Financial Officer (Vice Chair)

Chief Legal Counsel (Secretary)

Executive Director/Chief Investment Officer

Deputy Executive Director/Chief ~~Administrative~~Operating Officer

~~Agency Business Director~~Chief Technology Officer

~~Head of~~Head Economist & Asset ~~&~~and Risk Allocation CIO (Section 25.167 CIO)

Internal Audit Director (non-voting)

I. Committee Purpose and Charter

The Enterprise Risk and Compliance Committee (the “Committee”) is created to oversee that significant enterprise and compliance risks are identified, monitored, and managed to aid in accomplishing SWIB’s goals and objectives. The Committee shall not be responsible for oversight of investment-related risks, which are monitored by the Risk Management Division and the Investment Committee.

The Committee will provide management input to help scope risk analysis activities and will support staff’s risk management activities to ensure operational reality drives risk analysis. The Committee oversees the development and periodically reviews the maintenance of a sound framework for enterprise risk management. The Committee will also monitor and provide consultation for the activities of the Enterprise Risk and Compliance functions. The Committee is part of the overall control structure of the organization and is responsible for reviewing and assessing the effectiveness of the organization’s enterprise-wide risk assessment processes and compliance program to ensure they are reasonably designed to prevent violations of SWIB’s investment guidelines and other investment-related policies and procedures, state statutes, and other laws and applicable regulations. When appropriate, the Committee may recommend improvements to such policies,

procedures, or processes. Further, the Committee may discuss any other enterprise risk matter it deems prudent and take necessary action.

In conjunction with the Section 25.167 CIO's exercise of the duties assigned in Wisconsin Statute Section 25.167, the Committee relies on the Head of Risk Management and Director of Compliance & Senior Legal Counsel for insight into SWIB's compliance with investment policies and guidelines and the development and implementation of operating procedures intended to ensure such compliance.

II. Authority

- A.** The Committee may examine methodology, staffing, technology needs, reporting processes, middle and back-office operational needs, and such other matters as the Committee deems appropriate for the purpose of understanding, measuring, controlling, monitoring and reporting SWIB's risk exposure.
- B.** For purposes of fulfilling its risk management and oversight responsibilities, the Committee will act as liaison between SWIB staff and SWIB Trustees on issues concerning enterprise risk management and compliance.
- C.** The Committee may review and analyze all matters directed to the attention of the Committee by the Trustees, Internal Audit Director, Legislative Audit Bureau, Committee members, or others and report as appropriate.
- D.** Unless related to confidential personnel matters, the Committee shall review all compliance related issues associated with SWIB operations including compliance with statutes, administrative rules, internal and external manager Investment Guidelines, regulatory reporting requirements and such other compliance matters as the Committee deems appropriate or as otherwise requested. For any such confidential personnel matters, the following Committee members will be separately notified by Human Resources of such compliance related issues: Executive Director/Chief Investment Officer, Deputy Executive Director/Chief ~~Administrative~~Operating Officer, Director of Compliance & Senior Legal Counsel, Chief Legal Counsel and Internal Audit Director. The Committee's Minutes shall include all compliance violations reviewed by the Committee, management's action to remedy the violations, and management's actions to avoid any risk of reoccurrence. Immediate notification of the chair of the Audit and Finance Committee is required for any issue that appears to involve fraud or would otherwise be considered material for financial statement purposes.
- E.** The Committee may review all risk related issues associated with enterprise risk management. From time to time, the Committee may ask SWIB staff to research, analyze and report on areas of risk.

- F. Upon the request of the Head of Risk Management, the Committee will review SWIB's Internal Control Plan, which is submitted annually to the Department of Administration (DOA) pursuant to statute.

III. General Committee Procedures

- A. A majority of the voting members of the Committee constitute a quorum, and a majority of a quorum is required to take Committee action. The Committee shall meet at least semi-annually, but meetings may be called by any Committee Member with sufficient lead time to provide appropriate notice of the meeting to the public. The Committee may invite members from the Investment Committee or other SWIB staff to respond to questions on specific risks related to investments or areas of concern.
- B. The Committee Charter shall be approved by the Board of Trustees. The Committee will review the Charter at least annually and make recommendations (if any) to the Board of Trustees for approval.
- C. The Committee may establish a standard reporting format and procedures for performing reviews of risk and compliance. Minutes of Committee meetings shall be kept and provided to the Board.

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, August 22, 2023

Offices of the Investment Board
4703 Madison Yards Way, Madison, Wisconsin

Committee Members Present: Edwin Denson, Executive Director/Chief Investment Officer (Chair)
Anne-Marie Fink, Private Markets & Funds Alpha–Chief
Investment Officer
Todd Mattina, Head Economist & Asset and Risk Allocation
Chief Investment Officer
Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation
Derek Drummond, Head of Funds Alpha
Diane Linn, Senior Portfolio Manager–Multi-Asset Strategies
Lin Maung, Senior Portfolio Manager–Private Equity
Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Fixed Income Strategies
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Sara Chandler, Chief Legal Counsel (non-voting)
Hassan Chehime, Head of Risk Management (non-voting)
Rochelle Klaskin, Deputy Executive Director/Chief Administrative
Officer (non-voting)

Also in Attendance: Tom Merfeld, Trustee
John Voelker, Trustee
Nathan Ballard, Senior Legal Counsel
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Christian Comito, Portfolio Manager–Investment Grade Fixed Income
Tom Dobesh, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Kliton Duri, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Scott Freundlich, Portfolio Manager–Non-Investment Grade
Fixed Income
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Jameson Greenfield, Chief Financial Officer
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation
Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Ryan Johnston, Senior Analyst–Funds Alpha
Salah Khalaf, Portfolio Manager–Private Markets & Funds Alpha

Leo Kropywiansky, Senior Portfolio Manager–Asset & Risk Allocation
Jason Krueger, Compliance Analyst
Lisa Lange, Director of Compliance & Senior Legal Counsel
Alex Li, Analyst–Asset & Risk Allocation
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
Jon Loboda, Performance Measurement Operations Manager
Bill Luetzow, Legal Counsel
Damian Maroun, Head of Trading and Execution
Ed Martinez, PMFA Business Director
Frank Mazzucco, Legal Counsel
Anand Rakesh, Director of Risk Analytics & Financial Engineering Systems
Robby Richlen, Analyst–Funds Alpha
Tom Robinson, Head of Corporate Governance
Edouard Senechal, Senior Portfolio Manager–Asset & Risk Allocation
Chris Spiering, Senior Portfolio Manager–Non-Investment Grade Fixed Income
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Dawn Tuescher, Executive Administrative Assistant
Zhenping Wang, Senior Analyst–Asset & Risk Allocation
Chris Levell, NEPC
Joe Nankof, NEPC
Matt Rossi, Legislative Audit Bureau
(Some individuals may have attended only portions of the meeting.)

OPEN SESSION

With a quorum present, Edwin Denson, Chair of the Investment Committee, called the meeting to order at 1:02 p.m. He introduced Chase Nicholson, Senior Portfolio Manager, as the newest member of the Committee.

1. Approval of the Minutes

Mr. Denson asked if there were any comments on either the open or closed session minutes of the July 25, 2023 Investment Committee (IC) meeting. Hearing no comments, Mr. Denson stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Shearer and seconded by Mr. Mattina to approve both the open session and the closed session minutes of July 25, 2023, as presented. The motion passed unanimously.

2. Q2 2023 Quarterly Updates

A. Multi-Asset Strategies

Nick Stanton, Head of Multi-Asset Strategies, referred the Committee to the *Global Public Markets Strategies Quarterly Update*, included on pages 9-13 in the meeting materials, for the division's performance summary as of June 30, 2023. He confirmed that the multi-strat portfolio was in compliance with its guidelines for Q2 2023.

B. Funds Alpha

Derek Drummond, Head of Funds Alpha, presented the *Funds Alpha Q2 2023 Update*, included on pages 14-21 in the meeting materials. He discussed performance for the second quarter, noting that Funds Alpha overall had negative excess value added (EVA) year-to-date, with positive EVA in the beta one fixed income portfolio offset by negative EVA in the beta one equity and hedge fund portfolios. Performance was driven by (a) selection in both U.S. credit and emerging markets with moderate risk-on positioning in beta one fixed income, (b) a concentrated rally in a narrow group of names in beta one equity, and (c) risk-on positioning in credit and event-driven strategies along with a resurgence of macro trends in hedge funds. Mr. Drummond then reviewed manager positioning in the beta one portfolios, commenting that the beta one equity portfolio was slightly underweight beta and that the beta one fixed income portfolio maintained a higher yield to maturity than the benchmark.

Mr. Drummond provided an update on the market environment, noting that (a) breadth in the equity markets outside of big technology has increased and volatility has moderated, (b) liquidity remains scarce across asset classes, (c) both leverage and corporate activity remain low, despite a modest uptick in initial public offerings, and (d) key risks include Federal Reserve policy, consumer behavior, and the unwinding of relative value/carry trades. Finally, he confirmed that the portfolios were in compliance with their guidelines as of June 30, 2023, with the combined beta one portfolio outside of the range on the ex-ante tracking error soft risk parameter.

3. Convene in Closed Session

Motion: A motion to go into closed session pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes to consider confidential strategies for the investment of public funds, including (a) the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds, (b) the review of specific proprietary investment strategies and investment instruments related to multi-asset, funds alpha, currency exposure and exposure management, and (c) the review of broker information, was made by Mr. Drummond and seconded by Mr. Stanton.

Mr. Denson called for a roll call vote.

Denson-Aye	Fink-Aye	Mattina-Aye	Cavaglia-Aye
Drummond-Aye	Linn-Aye	Maung-Aye	Nicholson-Aye
Rector-Aye	Shearer-Aye	Stanton-Aye	Zhang-Aye

There being twelve ayes and no nays, Mr. Denson declared the motion passed. The

Committee convened in closed session at 1:08 p.m. and reconvened in open session at 2:24 p.m.

4. Announcement of Committee Actions Relating to Items Taken Up in Closed Session

Mr. Denson announced that, while in closed session, the Committee (a) reviewed active risk profiles of portfolio investments and the Core and Variable Trust Funds, (b) reviewed specific proprietary investment strategies and investment instruments related to multi-asset, funds alpha, currency exposure and exposure management, and (c) reviewed broker information.

5. Research Task Force Report

Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation, presented the *Research Task Force Update*, included on pages 132-140 in the meeting materials. He reviewed with the Committee the mission of the Research Task Force, including the stimulation of a strong research environment at SWIB. Mr. Cavaglia then discussed recent task force initiatives, including (a) discussing responses to current events, including recessionary fears, the 2024 election season, and interest rate policy, (b) sponsoring presentations on artificial intelligence (AI) and its impact on businesses, asset pricing, and the investment management industry, (c) hosting speakers on evergreen investment themes, including tail hedging, resource efficiency, and climate change, (d) promoting internal knowledge-sharing and educational programs, and (e) sponsoring membership in a forum for quantitative research in finance and evaluating access to additional research databases.

6. Quarterly Performance Review (Q2 2023)

Mr. Denson noted that the *Investment Performance Report*, as of June 30, 2023, was included on pages 141-151 in the meeting materials for the Committee’s information.

7. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters–Asset Class and Portfolio*, as of July 31, 2023, was included on pages 152-153 in the meeting materials for the Committee’s review. Mr. Chehime noted that there were no new discussion triggers and that none had been dropped this month.

8. Fair Value Measurement of WRS Investments

Mr. Denson noted that a report entitled *Fair Value Measurement Review of WRS Investments*, with an overview of the nature and liquidity of SWIB’s assets, was included on pages 154-164 in the meeting materials for the Committee’s review.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the September 26, 2023 and October 24, 2023 Committee meetings were included on pages 165-168 in the meeting materials for the Committee’s review.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Ms. Linn and seconded by Mr. Nicholson. The motion passed unanimously, and the meeting adjourned at 2:30 p.m.

Date of Committee Approval: 09/26/2023

Signed: /s/ Sara Chandler
Sara Chandler, Secretary
Investment Committee

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, September 26, 2023

Offices of the Investment Board
4703 Madison Yards Way, Madison, Wisconsin

Committee Members Present: Edwin Denson, Executive Director/Chief Investment Officer (Chair)
Anne-Marie Fink, Private Markets & Funds Alpha–Chief Investment Officer
Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer
Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation
Derek Drummond, Head of Funds Alpha
Diane Linn, Senior Portfolio Manager–Multi-Asset Strategies
Lin Maung, Senior Portfolio Manager–Private Equity
Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Fixed Income Strategies
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Sara Chandler, Chief Legal Counsel (non-voting)
Hassan Chehime, Head of Risk Management (non-voting)
Rochelle Klaskin, Deputy Executive Director/Chief Administrative Officer (non-voting)

Also in Attendance: Joe Amoyal, Senior Trader–Non-Investment Grade Fixed Income
Nathan Ballard, Senior Legal Counsel
Zach Berghouse, Internal Auditor
Kevin Blank, Analyst–Funds Alpha
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Bridget Chen, Senior Analyst–Investment Grade Fixed Income
Christian Comito, Portfolio Manager–Investment Grade Fixed Income
Tom Dobesh, Senior Portfolio Manager–Non-Investment Grade Fixed Income
Kliton Duri, Senior Portfolio Manager–Non-Investment Grade Fixed Income
Chris Eckerman, Senior Portfolio Manager–Private Equity
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Scott Freundlich, Portfolio Manager–Non-Investment Grade Fixed Income
Chirag Gandhi, Senior Portfolio Manager–Multi-Asset Strategies
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Dan Gyorog, Internal Auditor
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation

Vince Janecky, Internal Auditor Data Analyst
Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Ryan Johnston, Senior Analyst–Funds Alpha
Salah Khalaf, Portfolio Manager–Private Markets & Funds Alpha
Lisa Lange, Director of Compliance & Senior Legal Counsel
Alex Li, Analyst–Asset & Risk Allocation
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
Jon Loboda, Performance Measurement Operations Manager
Bill Luetzow, Legal Counsel
Matt Marek, Senior Analyst–Asset & Risk Allocation
Ed Martinez, PMFA Business Director
Scott Parrish, Head of Private Equity
Chris Prestigiacommo, Head of Private Debt & Venture Capital
Anand Rakesh, Director of Risk Analytics & Financial Engineering
Systems
Robby Richlen, Analyst–Funds Alpha
Tom Robinson, Head of Corporate Governance
Jason Rothenberg, Head of Real Estate
Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation & Rates
Mgmt.
Edouard Senechal, Senior Portfolio Manager–Asset & Risk Allocation
Chris Spiering, Senior Portfolio Manager–Non-Investment
Grade Fixed Income
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Leif Thybony, Senior Portfolio Manager–Non-Investment
Grade Fixed Income
Dawn Tuescher, Executive Administrative Assistant
Zhenping Wang, Senior Analyst–Asset & Risk Allocation
Chris Levell, NEPC
Carolyn Stittleburg, Legislative Audit Bureau
(Some individuals may have attended only portions of the meeting.)

OPEN SESSION

With a quorum present, Edwin Denson, Chair of the Investment Committee, called the meeting to order at 1:00 p.m.

1. Approval of the Minutes

Mr. Denson asked if there were any comments on either the open or closed session minutes of the August 22, 2023 Investment Committee (IC) meeting. Hearing no comments, Mr. Denson stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Nicholson and seconded by Mr. Mattina to approve both the open session and the closed session minutes of August 22, 2023, as presented. The motion passed unanimously.

2. October Board Workshop Preview

Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, provided an overview of the upcoming October Board Workshop, which will include **(a)** the biennial presentation from the Wisconsin Retirement System's independent actuary in connection with the asset allocation review, including their stress testing analysis, **(b)** NEPC's preview of the asset allocation analysis and recommendations to be presented to the Board for approval in December 2023, **(c)** an update on a new strategic initiative regarding strategy implementation at SWIB, and **(d)** external speaker presentations regarding macroeconomic conditions, artificial intelligence and its implications in the investment arena, and how SWIB's Wisconsin-based investments catalyze change in the state.

3. Private Markets & Funds Alpha Division Update

Anne-Marie Fink, Private Markets & Funds Alpha–Chief Investment Officer, presented the *Private Markets & Funds Alpha Division Update*. She discussed the benefits of SWIB's corridor treatment, which has allowed the Private Markets & Funds Alpha (PMFA) division to pursue compelling strategic opportunities as other investors reduce allocations to private markets. In particular, she highlighted interesting secondary purchases for the real estate and venture capital portfolios as well as compelling opportunities in private credit and other asset-backed investments.

4. Q2 2023 Quarterly Updates

A. Private Equity

Scott Parrish, Head of Private Equity, presented the *Quarterly Activity Report – Private Equity*, included on pages 10-31 in the meeting materials. He provided a private equity market update for Q2 2023, noting that **(a)** both U.S. private equity fundraising dollars and the number of funds decreased relative to the first half of 2022, with a number of managers delaying fundraising until 2024, **(b)** U.S. private equity deal value and exit value in dollars decreased significantly relative to the first half of 2022, with add-on activity more prevalent and a difficult market for sales, **(c)** median leverage multiples decreased year-over-year and more equity is required for transactions, resulting in more co-investment opportunities, **(d)** the number of portfolio company exits was split evenly between strategic acquirers and sponsor-to-sponsor transactions, with nearly two-thirds of exit value attributable to strategic acquirers, and **(e)** more than half of the capital raised in the European private equity market in the first half of 2023 was raised in one mega-fund.

Mr. Parrish then reported that, as of June 30, 2023, the market value of the aggregate private equity asset class, excluding the venture capital and private debt portfolios, exceeded \$19 billion and, when including the venture capital and private debt portfolios, made up approximately 18% of the Core Trust Fund (CTF). He commented that capital calls continued to exceed distributions in the first half of 2023.

With respect to performance, Mr. Parrish highlighted that the private equity portfolios all outperformed their benchmarks for the one-, three-, five-, and ten-year time periods and that, as of March 31, 2023, the combined private equity and co-investment portfolios achieved

second quartile performance for vintage years 2014-2022. Year-to-date performance numbers as of the meeting date for the core private equity and current return portfolios were behind the benchmark. He also reviewed the internal rates of return (IRRs) for the portfolios' sub-strategies, noting improved performance from the senior sub-strategy.

Mr. Parrish then discussed the private equity portfolios' **(a)** sub-asset class diversification, highlighting the increased percentage of co-investments in the most recent quarter, **(b)** public versus private portfolio company exposure, noting that public exposure continued to decrease, and **(c)** industry diversification, noting that the portfolios' overweight to information technology decreased year-over-year as information technology valuations decreased while the team is making additional investments in the healthcare and industrials sectors. Finally, he highlighted the commitments made in Q2 2023, reviewed the portfolio pipeline for Q2 2023, and confirmed that the portfolio remained in compliance with all investment guidelines.

B. Real Estate

Jason Rothenberg, Head of Real Estate, presented the *Quarterly Activity Report – Real Estate*, included on pages 32-44 in the meeting materials. He provided a real estate market overview, noting that **(a)** the real estate market remains in the middle of a repricing, with continued muted transaction activity, **(b)** despite higher debt costs, many investors like SWIB are continuing to step into the market for compelling opportunities, **(c)** capital values continue to adjust from post-Covid peaks, including continued weakness in the office sector but only moderate declines in the industrial sector, and **(d)** net operating income (NOI) growth remains positive but is slowing while cap rate expansion continues to flow through valuations.

Mr. Rothenberg reviewed the real estate portfolio, noting that the portfolio's market value remained approximately \$11.9 billion as of the end of Q2 2023, representing approximately 10% of the CTF. He then reviewed the portfolio's **(i)** risk profile, noting that the portfolio's non-core exposure has modestly expanded given additional investment activity in this segment of the market, and **(ii)** diversification by property type, highlighting that the portfolio is benefitting from its underweight to office, the team is aiming to reduce but not eliminate the portfolio's underweight to industrial, and debt and credit opportunities may provide compelling equity-like returns with less risk.

Mr. Rothenberg discussed the portfolio's performance, highlighting outperformance relative to the benchmark over all time periods despite negative absolute returns year-to-date and for the one-year period, as the portfolio gave back some of its outsized absolute performance from the past few years. He then reviewed performance by sub-strategy, and answered questions about the geographic exposure of the portfolio and the benchmark as well as debt opportunities across property types and geographies. Lastly, he **(a)** reviewed the new commitment made in the second quarter, **(b)** discussed the pipeline under review, and **(c)** confirmed that the portfolio remained in compliance with its investment guidelines.

C. Private Debt

Chris Prestigiaco, Head of Private Debt & Venture Capital, presented the *Private Debt Portfolio Investment Committee Quarterly Report*, included on pages 45-56 in the meeting materials. He provided a private debt market update for the first half of 2023, noting that

(a) fundraising is tracking moderately ahead of 2022, with the full year on track to exceed \$200 billion for the fourth year in a row, (b) direct lending has trailed mezzanine fundraising in the first half of the year, with mezzanine benefiting from senior secured financing headwinds, (c) there is increased activity in special situations providing more structured debt/equity alternatives as pure distressed strategies have declined, (d) experienced managers continue to have the most success fundraising, (e) dry powder available to invest has continued to decline, and (f) despite anticipated upcoming stress in the private credit markets, the overall private credit default rate declined in the second quarter.

Mr. Prestigiaco then reviewed the portfolio's (i) characteristics, noting that the portfolio added the same number of new loans as were paid off during the quarter, with the average coupon increasing by twenty basis points (bps), (ii) current below investment grade (BIG) holdings of 8%, flat from the prior quarter, and (iii) sector mix, which remains consistent quarter-over-quarter with an overweight to industrial and underweight to financials arising from the opportunity set of the portfolio.

With respect to the portfolio's performance, Mr. Prestigiaco highlighted that the portfolio outperformed its benchmark over the three-, five- and ten-year time periods but underperformed for the one-year time period, which he anticipates will decrease in the next quarter. He reported that there were no problem credits or workouts in the portfolio, which remained in compliance with its guidelines. Lastly, he reviewed the pipeline under review, noting that the team is seeing more interesting opportunities as banks continue to pull back in the space.

5. Convene in Closed Session

Motion: A motion to go into closed session as authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes to consider confidential strategies for the investment of public funds, including (a) the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds, (b) the review of specific strategies related to asset allocation, and (c) the review of specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, multi-asset, currency exposure and exposure management, was made by Mr. Maung and seconded by Ms. Fink.

Mr. Denson called for a roll call vote.

Denson-Aye	Fink-Aye	Mattina-Aye	Cavaglia-Aye
Drummond-Aye	Linn-Aye	Maung-Aye	Nicholson-Aye
Rector-Aye	Shearer-Aye	Stanton-Aye	Zhang-Aye

There being twelve ayes and no nays, Mr. Denson declared the motion passed. The Committee convened in closed session at 1:37 p.m. and reconvened in open session at 3:51 p.m.

6. Announcement of Committee Actions Relating to Items Taken Up in Closed Session

Mr. Denson announced that, while in closed session, the Committee (a) reviewed active risk profiles of portfolio investments and the Core and Variable Trust Funds, (b) reviewed

specific strategies related to asset allocation, and (c) reviewed specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, multi-asset, currency exposure and exposure management.

7. Currency Task Force Report

Chirag Gandhi, Senior Portfolio Manager–Multi-Asset Strategies, reported that the Currency Task Force held its last meeting on August 29, 2023, and that a copy of the agenda was included on page 219 in the meeting materials. He commented on the increased attention paid to the currency markets across SWIB compared to when the Currency Task Force was initially created. Mr. Mattina then expressed appreciation for all who served on the Currency Task Force over the years.

Mr. Mattina noted the strong consensus from the task force that its functions could be effectively transitioned to the Asset & Risk Allocation division, including through its regular monthly policy rebalancing and currency exposure controls as needed through exposure management trades, as well as ongoing risk reporting from the Risk Management Division. He also noted that the currency expertise that had been brought together in the Currency Task Force would continue to gather through the Research Task Force and the weekly Asset Allocation, Valuation & Ideas meetings.

8. Corporate Governance Update

Tom Robinson, Head of Corporate Governance, presented the *Corporate Governance Update*, included on pages 221-227 in the meeting materials. He reported that SWIB’s proxy voting support levels through Q2 2023 increased to their highest levels since new voting guidelines were adopted in 2019, in part due to increasing board independence. He highlighted that (a) fewer directors and executive compensation proposals received low (sub-80%) market level support, (b) a minor change to SWIB’s custom voting guidelines that went into effect allowed more flexibility around corporate board structure with a combined CEO/Chair role, and (c) non-binding U.S. shareholder proposals continue to see historically low support levels, both from SWIB and across the market overall.

Mr. Robinson then reviewed SWIB’s voting trends, noting that SWIB’s support for management hit a seven-year high above 86% and that, although meeting counts have leveled off, proposal counts are on track to reach all-time highs. He shared additional proxy voting observations regarding (i) activist activity, where the “universal proxy rule” has not made a noticeable impact on proxy contests, and (ii) executive compensation in the U.S. market, where average support levels have reversed and are now increasing after several years of problematic pandemic-related actions. He also noted that the new “pay vs. performance” disclosure rule has not made a material impact on shareholder voting although additional disclosures are beneficial.

With respect to CEO and board trends in the U.S., Mr. Robinson noted (a) CEO turnover spiked in 2022 from holdouts in the pandemic and that additional increases are expected in coming years as CEOs retire, with boards paying increased attention to succession planning, and (b) the tension between the desire for directors that are functional leaders with tech backgrounds, who often do not have the board experience or financial expertise demanded by boards. Lastly, Mr. Robinson highlighted the significant regulatory and legislative updates expected in the near term, including a tempered version of the SEC’s emissions

disclosure rule and California’s state enhanced emissions disclosure rule.

9. Transition Update (Q2 2023)

Sara Chandler, Chief Legal Counsel, reported that there were no transition events in Q2 2023.

10. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters–Asset Class and Portfolio*, as of August 31, 2023, was included on pages 228-229 in the meeting materials for the Committee’s review. Mr. Chehime noted that there were no new discussion triggers and that none had been dropped this month.

11. Future Meeting Topics

Mr. Denson noted that draft agendas for the October 24, 2023 and November 28, 2023 Committee meetings were included on pages 230-233 in the meeting materials for the Committee’s review.

12. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Stanton and seconded by Ms. Linn. The motion passed unanimously, and the meeting adjourned at 4:08 p.m.

Date of Committee Approval: 10/24/23

Signed: /s/ Sara Chandler
Sara Chandler, Secretary
Investment Committee

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, October 24, 2023

Offices of the Investment Board
4703 Madison Yards Way, Madison, Wisconsin

Committee Members Present: Edwin Denson, Executive Director/Chief Investment Officer (Chair)
Anne-Marie Fink, Private Markets & Funds Alpha–Chief
Investment Officer
Todd Mattina, Head Economist & Asset and Risk Allocation
Chief Investment Officer
Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation
Derek Drummond, Head of Funds Alpha
Diane Linn, Senior Portfolio Manager–Multi-Asset Strategies
Lin Maung, Senior Portfolio Manager–Private Equity
Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Fixed Income Strategies
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Sara Chandler, Chief Legal Counsel (non-voting)
Hassan Chehime, Head of Risk Management (non-voting)
Rochelle Klaskin, Deputy Executive Director/Chief Administrative
Officer (non-voting)

Also in Attendance: John Voelker, Trustee
Zach Berghouse, Internal Auditor
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Christian Comito, Portfolio Manager–Investment Grade Fixed Income
Tom Dobesh, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Kliton Duri, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Tom Freeman, Director of Quantamental Research
Scott Freundlich, Portfolio Manager–Non-Investment Grade
Fixed Income
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Jameson Greenfield, Chief Financial Officer
Dan Gyrog, Internal Auditor
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation
Vince Janecky, Internal Auditor Data Analyst
Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income

Ryan Johnston, Senior Analyst–Funds Alpha
Jason Krueger, Compliance Analyst
Lisa Lange, Director of Compliance & Senior Legal Counsel
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
Tony Lubarsky, Investment Operations Analyst
Bill Luetzow, Legal Counsel
Matt Marek, Senior Analyst–Asset & Risk Allocation
Damian Maroun, Head of Trading and Execution
Frank Mazzucco, Legal Counsel
Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap Strategy
Chad Neumann, Senior Portfolio Manager–Global Equity Strategy
Anand Rakesh, Director of Risk Analytics & Financial Engineering
Systems
Robby Richlen, Analyst–Funds Alpha
Jay Risch, Government Relations Liaison
Tom Robinson, Head of Corporate Governance
Joe Roth, Transition Management and Portfolio Support Manager
Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation & Rates
Mgmt.
Susan Schmidt, Head of Equities
Edouard Senechal, Senior Portfolio Manager–Asset & Risk Allocation
Chris Spiering, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Leif Thybony, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Dawn Tuescher, Executive Administrative Assistant
Rob Vanderpool, Fund Administration Director
Zhenping Wang, Senior Analyst–Asset & Risk Allocation
Joe Nankof, NEPC
Marc Gesell, Verus Advisory
(Some individuals may have attended only portions of the meeting.)

OPEN SESSION

With a quorum present, Edwin Denson, Chair of the Investment Committee, called the meeting to order at 1:00 p.m.

1. Approval of the Minutes

Mr. Denson asked if there were any comments on either the open or closed session minutes of the September 26, 2023 Investment Committee (IC) meeting. Hearing no comments, Mr. Denson stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Shearer and seconded by Mr. Mattina to approve both the open session and the closed session minutes of September 26, 2023, as presented. The motion passed unanimously.

2. Annual Benchmark Presentation

Joe Nankof, NEPC, the Board of Trustees' benchmark consultant, presented an update on the 2023 annual benchmark review, included on pages 11-18 in the meeting materials. He noted that NEPC is coordinating with the Asset and Risk Allocation division (ARA) and specific investment management staff where warranted. Mr. Nankof commented that the benchmark review is ongoing and NEPC intends to present its recommendations at the November IC meeting for consideration prior to the December Board meeting.

With respect to the benchmarks under review in 2023, he summarized NEPC's recommendation to maintain the current approach to currency adjustments for the private equity portfolio benchmark and continue to adjust the Europe component on a quarterly basis to reflect the prevailing dollar/euro exchange rate. Mr. Nankof and Greg Fletcher, Performance Director, led the Committee's discussion regarding the current methodology for the private equity portfolio, which is used to avoid benchmark misfit arising out of currency mismatch. Lastly, Mr. Nankof discussed NEPC's review of existing and potential alternative benchmarks for certain other mandates, including the current return portfolio, the leveraged loan portfolio, the China equity strategy, and Core Trust Fund (CTF) policy leverage.

3. Q3 2023 Quarterly Updates

Mike Shearer, Head of Fixed Income Strategies, presented the *Global Public Markets Strategies Quarterly Update, Q3 2023*, included on pages 19-31 in the meeting materials. Mr. Shearer reported on performance from the Global Public Markets Strategies division for Q3 2023, noting that performance was mixed across the board but that the division in the aggregate provided positive excess returns year-to-date. He also confirmed that each portfolio was in compliance with its guidelines.

Mr. Shearer and Nick Stanton, Head of Multi-Asset Strategies, then provided a market review, included on pages 32-35 in the meeting materials. Mr. Shearer noted that **(a)** both equity and rates volatility increased in the third quarter, with high volatility of volatility, **(b)** the Federal Reserve enacted another rate increase in the third quarter, **(c)** yield curves steepened globally in general, although economic strains differed across markets, **(d)** the U.S. dollar depreciated at the beginning of the third quarter before rallying, following the release of mixed U.S. macroeconomic data, while emerging market currencies generally declined with an uptick in volatility, and **(e)** credit spreads generally remained stable, while U.S. mortgage-backed securities (MBS) spreads widened significantly in large part due to rates volatility. Finally, Mr. Stanton commented that equity markets overall declined during the third quarter, and then led the Committee's discussion regarding the momentum, quality and value equity factors, which all exhibited positive performance in the quarter.

4. Convene in Closed Session

Motion: A motion to go into closed session as authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes to consider confidential strategies for the investment of public funds, including **(a)** the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds, and **(b)** the review of specific proprietary investment strategies and investment instruments related to global equities, small cap equities, short-

term credit, fixed income strategies and exposure management, was made by Ms. Fink and seconded by Mr. Nicholson.

Mr. Denson called for a roll call vote.

Denson-Aye	Fink-Aye	Mattina-Aye	Cavaglia-Aye
Drummond-Aye	Linn-Aye	Maung-Aye	Nicholson-Aye
Rector-Aye	Shearer-Aye	Stanton-Aye	Zhang-Aye

There being twelve ayes and no nays, Mr. Denson declared the motion passed. The Committee convened in closed session at 1:21 p.m. and reconvened in open session at 3:41 p.m.

5. Announcement of Committee Actions Relating to Items Taken Up in Closed Session

Mr. Denson announced that, while in closed session, the Committee **(a)** reviewed active risk profiles of portfolio investments and the Core and Variable Trust Funds, and **(b)** reviewed specific proprietary investment strategies and investment instruments related to global equities, small cap equities, short-term credit, fixed income strategies and exposure management.

6. Separately Managed Funds Update

Rob Thornton, ARA Business Director, presented the annual *Separately Managed Funds Update*, included on pages 164-178 in the meeting materials. Mr. Thornton noted that **(i)** the ARA division is responsible for the oversight of the Separately Managed Funds (SMFs), with all quarterly rebalancing performed in accordance with the corresponding SMF's guidelines, **(ii)** SWIB fixed income staff continue to perform active portfolio management for a portion of the State Life Insurance Fund (SLIF), and **(iii)** the SMFs (other than the actively managed portion of the SLIF) are now in production on SimCorp Dimension.

Mr. Thornton then reviewed the investment objectives, asset allocations and performance for each SMF, noting that **(a)** the Injured Patients & Family Compensation Fund includes a portion actively managed by an external manager as well as passive investments, **(b)** the UW System Long Term Fund's public markets investments are held in BlackRock passive index funds and its existing private markets investments will gradually roll off, **(c)** the UW System Cash Management Fund is also largely invested in BlackRock passive index funds with an allocation to an actively managed BlackRock floating rate income fund, and **(d)** the State Historical Society Trust Fund is invested in BlackRock passive index funds. Mr. Shearer reviewed the investment objectives and asset allocation for the SLIF, which is made up entirely of investment-grade fixed income assets, given its unique focus on generating income.

Mr. Thornton commented that each SMF had positive absolute performance over the one-year period, with the exception of the SLIF, and that relative performance was positive for the three-, five-, and ten-year periods. Finally, he answered questions regarding the fee structure for management of the SMFs.

7. October Board Workshop Debrief

Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, provided a summary of the October Board Workshop, noting that feedback has been favorable. He highlighted that sessions included **(a)** the biennial presentation from the Wisconsin Retirement System’s independent actuary in connection with updated liability valuations to support the asset allocation review, including their stress testing analysis, **(b)** a discussion with NEPC, the Board’s asset allocation consultant, regarding its updated capital markets assumptions for risks and returns, along with a preview of the asset allocation recommendations to be presented to the Board for approval in December 2023, **(c)** an overview of a new strategic initiative regarding portfolio implementation at SWIB, and **(d)** external speaker presentations regarding macroeconomic conditions, the challenges and opportunities posed by artificial intelligence, and how SWIB’s Wisconsin-based private capital investments can catalyze change in Wisconsin’s healthcare technology ecosystem.

8. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters—Asset Class and Portfolio*, as of September 30, 2023, was included on pages 179-180 in the meeting materials for the Committee’s review. Mr. Chehime noted that there were no new discussion triggers and that none had been dropped this month.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the November 28, 2023 and December 21, 2023 Committee meetings were included on pages 181-184 in the meeting materials for the Committee’s review.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Shearer and seconded by Mr. Drummond. The motion passed unanimously, and the meeting adjourned at 4:00 p.m.

Date of Committee Approval: 11/28/23

Signed: /s/ Sara Chandler
Sara Chandler, Secretary
Investment Committee

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, November 28, 2023 1:00 pm
Room: 7th Floor Conference Room - 7022
Address: 4703 Madison Yards Way, Madison, WI 53705

Est. Time Minutes	Action Item	Topic	Presenter
		OPEN SESSION	
	Motion	1. Approval of the Minutes – Open Session A. October 24, 2023	
25	Motion	2. 2024 Asset Allocation Recommendations	Joe Nankof, NEPC
20	Motion	3. Annual Benchmark Presentation	Joe Nankof, NEPC
30		4. Q3 2023 Quarterly Updates A. Multi-Asset Strategies B. Funds Alpha	Chase Nicholson Derek Drummond
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		5. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
5		6. Research Task Force Report	Stefano Cavaglia
		7. Quarterly Performance Review (Q3 2023) (No presentation unless requested)	
		8. Soft Risk Parameters (No presentation unless requested)	
		9. Future Meeting Topics	
	Motion	10. Motion to Adjourn	

* A motion to go into closed session at this meeting is authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes (a) to consider confidential strategies for the investment of public funds, including (i) the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds, (ii) the review of specific proprietary investment strategies and investment instruments related to multi-asset, funds alpha, fixed income, asset and risk allocation, and exposure management, and (iii) the review of broker information, and (b) to discuss and approve prior closed session minutes that discuss the same. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General’s Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

	<p><i>NOTES: Items may be taken in order other than listed.</i></p> <p><i>The meeting site is physical accessible. Upon prior request, reasonable accommodations will be provided.</i></p>	
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<p><u>Future Meetings</u></p> <p>12/21/23 – December Committee Mtg. 1/23/24 – January Committee Mtg. 2/27/24 – February Committee Mtg. 3/21/24 – March Committee Mtg. 4/23/24 – April Committee Mtg. 5/28/24 – May Committee Mtg. 6/25/24 – June Committee Mtg.</p>	<p><u>Voting Committee Members:</u></p> <p>Edwin Denson (Chair), Executive Director/Chief Investment Officer Anne-Marie Fink, Private Markets & Funds Alpha–CIO Todd Mattina, Head Economist, Asset & Risk Allocation–CIO Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation Derek Drummond, Head of Funds Alpha Diane Linn, Senior Portfolio Manager–Multi-Asset Strategies Lin Maung, Senior Portfolio Manager–Private Equity Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies Jason Rector, Portfolio Manager–Funds Alpha Mike Shearer, Head of Fixed Income Strategies Nick Stanton, Head of Multi-Asset Strategies Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation</p> <p><u>Non-voting Committee Members</u></p> <p>Rochelle Klaskin, Deputy Executive Director/CAO Sara Chandler (Secretary), Chief Legal Counsel Hassan Chehime, Head of Risk Management</p>
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Name of Meeting: Staff Investment Committee Meeting
Date/Time: Thursday, December 21, 2023 1:00 pm
Room: 7th Floor Conference Room - 7022
Address: 4703 Madison Yards Way, Madison, WI 53705

Est. Time Minutes	Action Item	Topic	Presenter
		OPEN SESSION	
	Motion	1. Approval of the Minutes – Open Session A. November 28, 2023	
15	Motion	2. Amendments to Investment Committee WRS Investment Guidelines	Sara Chandler Lisa Lange
5		3. Private Markets & Funds Alpha Division Update	Anne-Marie Fink
30		4. Q3 2023 Quarterly Updates A. Private Equity B. Real Estate C. Private Debt	Scott Parrish Jason Rothenberg Chris Prestigiacomo
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		5. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
5		6. Transition Update (Q3 2023)	Joe Roth
		7. Soft Risk Parameters (No presentation unless requested)	
		8. Future Meeting Topics	
	Motion	9. Motion to Adjourn	

* A motion to go into closed session at this meeting is authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes (a) to consider confidential strategies for the investment of public funds, including (i) the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds, and (ii) the review of specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, and exposure management, and (b) to discuss and approve prior closed session minutes that discuss the same. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General’s Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

NOTES: Items may be taken in order other than listed.

The meeting site is physically accessible. Upon prior request, reasonable accommodations will be provided.

<p><u>Future Meetings</u></p> <p>1/23/24 – January Committee Mtg. 2/27/24 – February Committee Mtg. 3/21/24 – March Committee Mtg. 4/23/24 – April Committee Mtg. 5/28/24 – May Committee Mtg. 6/25/24 – June Committee Mtg.</p>	<p><u>Voting Committee Members:</u></p> <p>Edwin Denson (Chair), Executive Director/Chief Investment Officer Anne-Marie Fink, Private Markets & Funds Alpha–CIO Todd Mattina, Head Economist, Asset & Risk Allocation–CIO Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation Derek Drummond, Head of Funds Alpha Diane Linn, Senior Portfolio Manager–Multi-Asset Strategies Lin Maung, Senior Portfolio Manager–Private Equity Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies Jason Rector, Portfolio Manager–Funds Alpha Mike Shearer, Head of Fixed Income Strategies Nick Stanton, Head of Multi-Asset Strategies Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation</p> <p><u>Non-voting Committee Members</u></p> <p>Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer Sara Chandler (Secretary), Chief Legal Counsel Hassan Chehime, Head of Risk Management</p>
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Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, January 23, 2024 1:00 pm
Room: 7th Floor Conference Room - 7022
Address: 4703 Madison Yards Way, Madison, WI 53705

Est. Time Minutes	Action Item	Topic	Presenter
		OPEN SESSION	
	Motion	1. Approval of the Minutes – Open Session A. December 21, 2023	
5	Motion	2. Amendments to SWIB Investment Committee Charter	Sara Chandler
10		3. Q4 2023 Quarterly Updates	Mike Shearer Nick Stanton
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		4. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
		5. Soft Risk Parameters (No presentation unless requested)	
		6. Future Meeting Topics	
	Motion	7. Motion to Adjourn	
		<i>NOTES: Items may be taken in order other than listed.</i>	
		<i>The meeting site is physically accessible. Upon prior request, reasonable accommodations will be provided.</i>	

* A motion to go into closed session at this meeting is authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes (a) to consider confidential strategies for the investment of public funds, including (i) the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds, and (ii) the review of specific proprietary investment strategies and investment instruments related to private markets & funds alpha, global equities, small cap equities, short-term credit, fixed income strategies and exposure management, and (b) to discuss and approve prior closed session minutes that discuss the same. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General’s Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

Future Meetings

2/27/24 – February Committee Mtg.
 3/21/24 – March Committee Mtg.
 4/23/24 – April Committee Mtg.
 5/28/24 – May Committee Mtg.
 6/25/24 – June Committee Mtg.
 7/23/24 – July Committee Mtg.
 8/27/24 – August Committee Mtg.
 9/24/24 – Sept Committee Mtg.
 10/22/24 – Oct Committee Mtg.
 11/26/24 – Nov Committee Mtg.
 12/19/24 – Dec Committee Mtg.

Voting Committee Members:

Edwin Denson (Chair), Executive Director/Chief Investment Officer
Anne-Marie Fink, Private Markets & Funds Alpha–CIO
Todd Mattina, Head Economist, Asset & Risk Allocation–CIO
Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation
Derek Drummond, Head of Funds Alpha
Diane Linn, Senior Portfolio Manager–Multi-Asset Strategies
Lin Maung, Senior Portfolio Manager–Private Equity
Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Fixed Income Strategies
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Non-voting Committee Members

Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer
Eric Barber (Secretary), Chief Legal Counsel
Hassan Chehime, Head of Risk Management

Board Meeting

Tab 7 – Quarterly Investment Update, Q3 2023



Quarterly Investment Update

Board Meeting

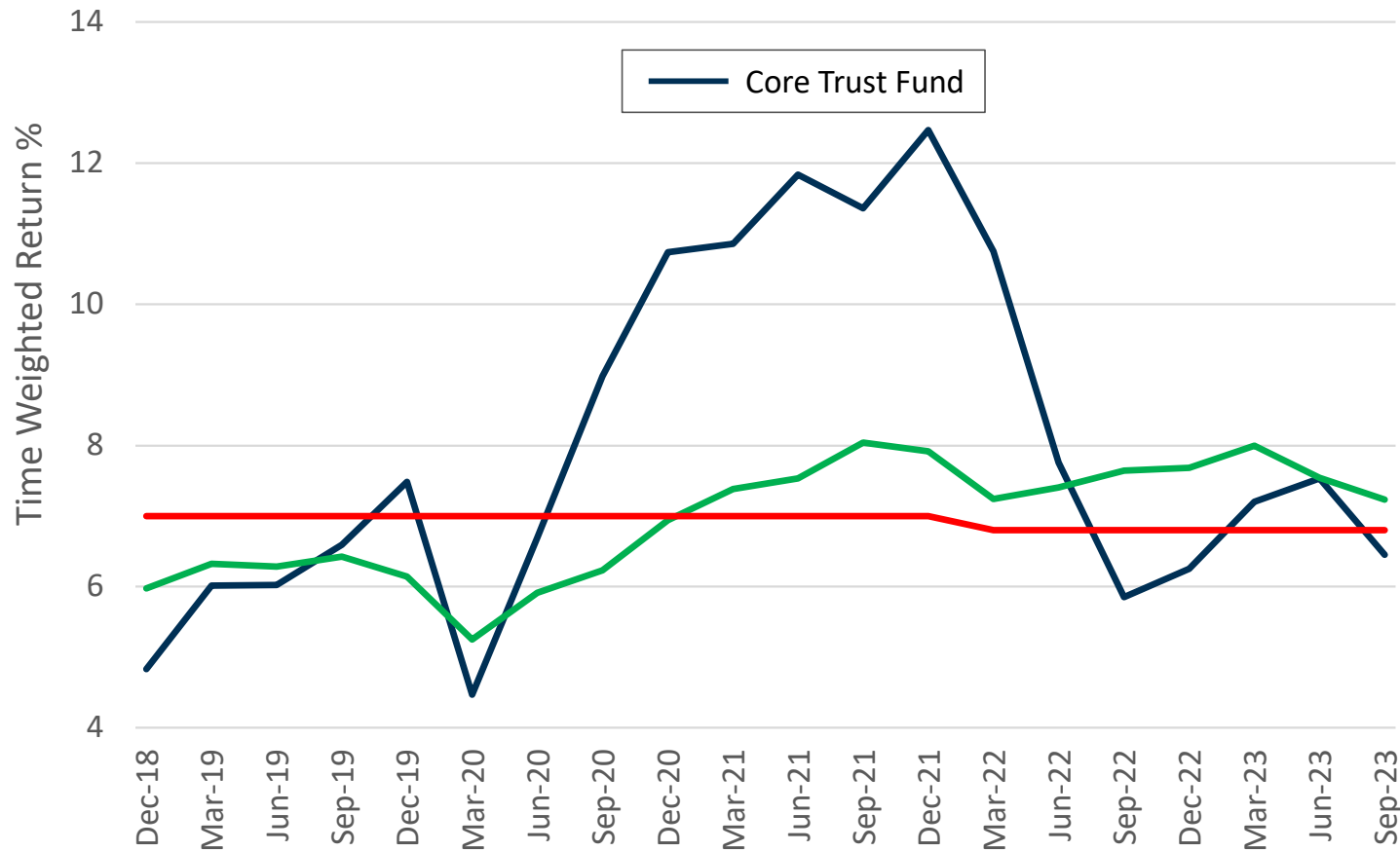
December 15, 2023

Performance Trends & Outlook

CTF 5-Year Rolling Return Trend

Quarter-end Results Through September 30, 2023

CTF 5-Year Rolling Annualized
Net of External Manager Fee Return % ("NOF" Return)



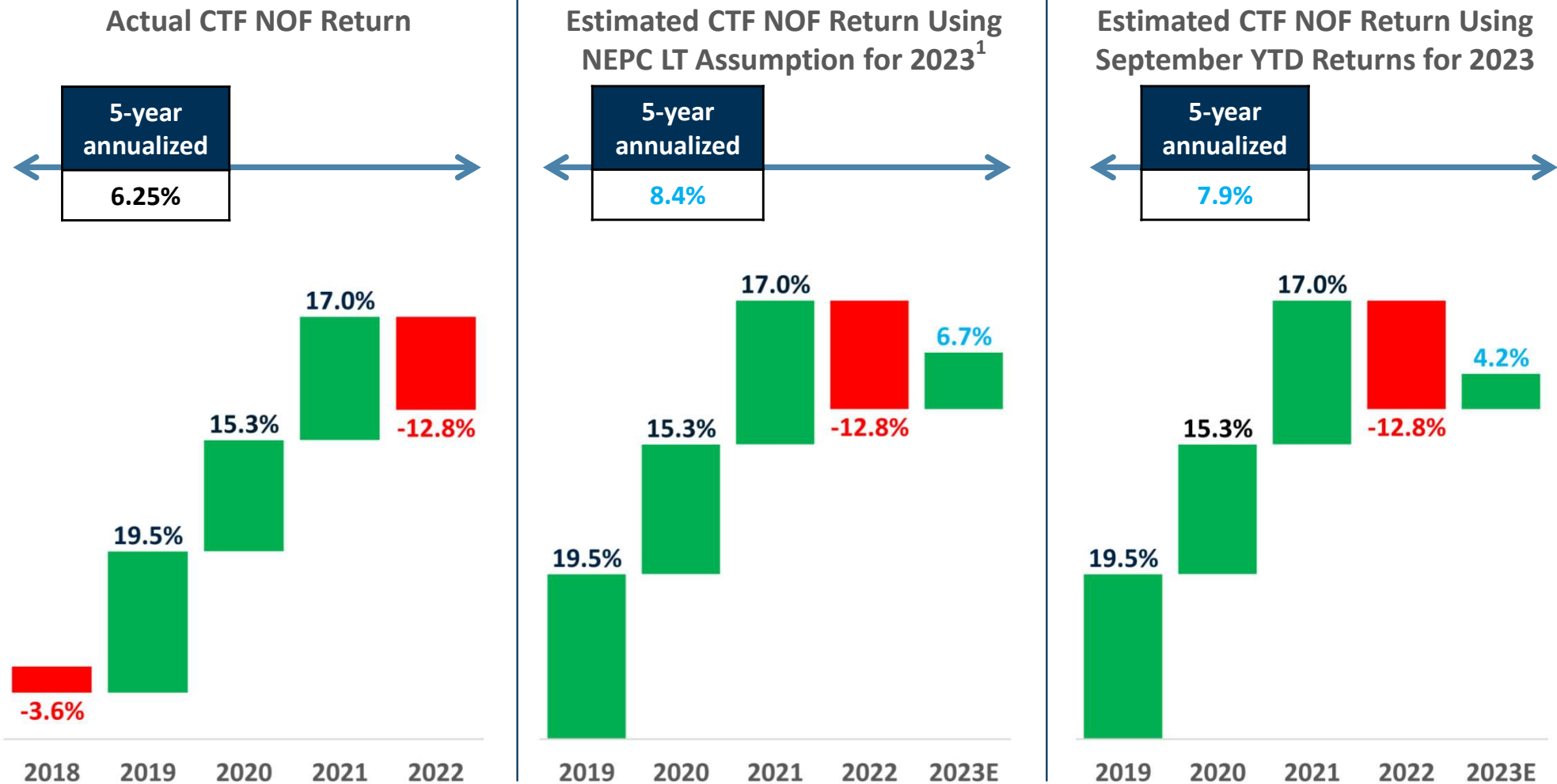
5-Year Annualized NOF Return (as of September 30, 2023)	
6.45%	Core Trust Fund
5.84%	CTF Policy Benchmark

7.23%
CTF 20-year NOF Return

6.8%
Actuarial Target Rate of Return

CTF 5-year Return Estimate

Calendar year and 5-year annualized returns

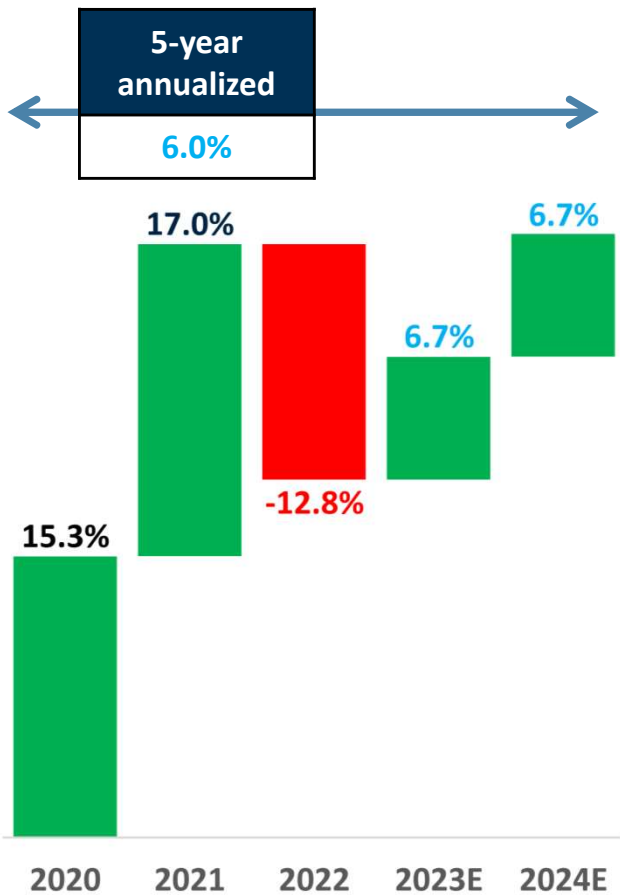


¹ The NEPC 10-year expected return assumption is used to estimate 2023.

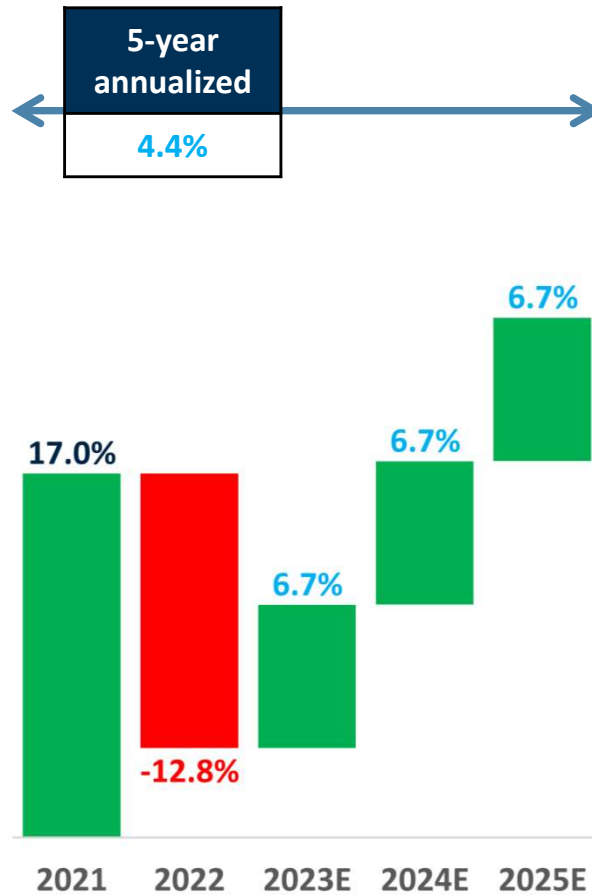
CTF 5-year Return Forward Estimate

Sustaining 5-year target return will be increasingly challenging

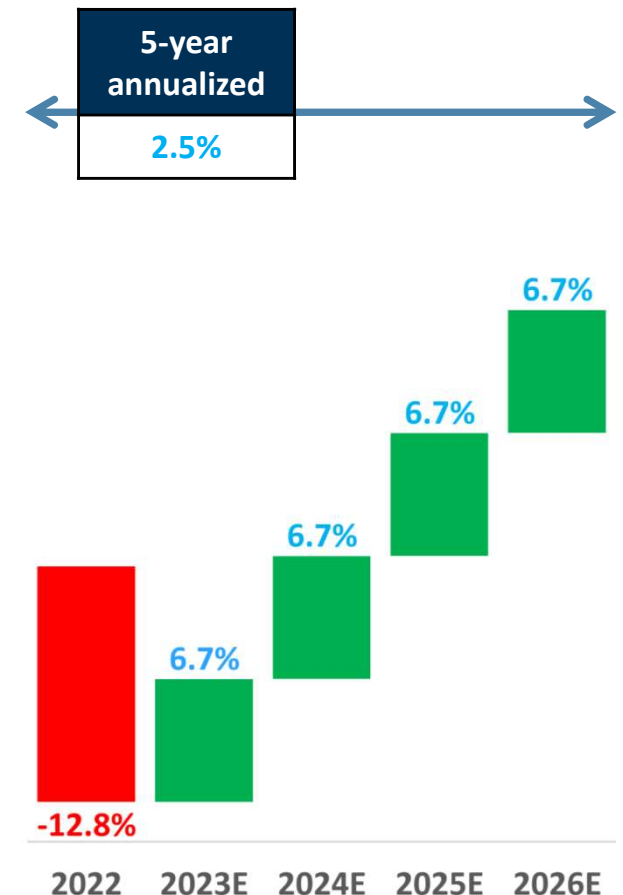
Estimated CTF NOF Return Using NEPC LT Assumption through 2024¹



Estimated CTF NOF Return Using NEPC LT Assumption through 2025¹



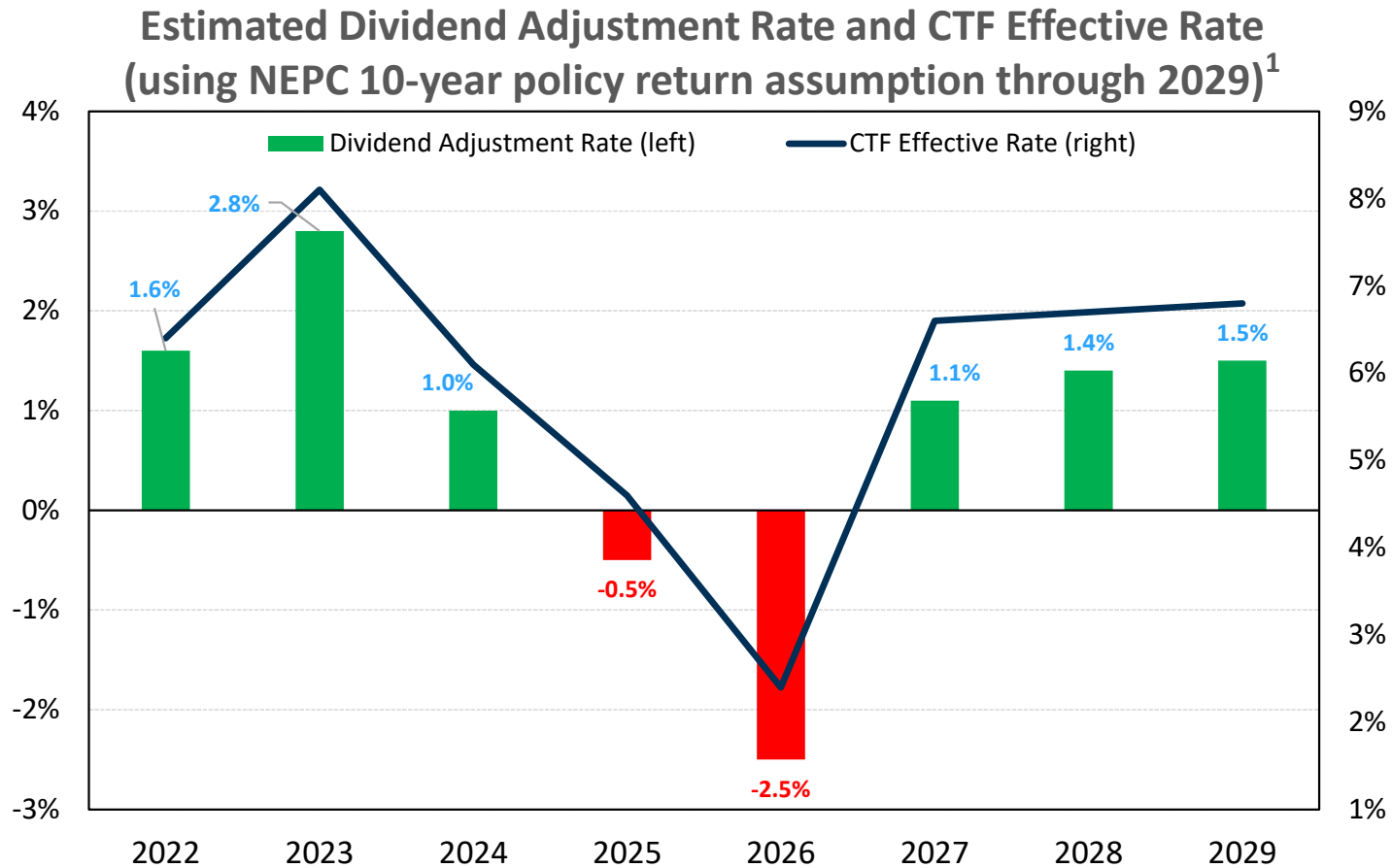
Estimated CTF NOF Return Using NEPC LT Assumption through 2026¹



¹The NEPC 10-year expected return assumption is used to estimate 2023 to 2026.

Dividend Adjustment Forward Estimates

Achieving target returns after 2023 still leads to negative dividend adjustments



¹ Estimated dividend adjustment rate based on realized CTF returns before 2023 and using NEPC's 10-year expected return for the policy portfolio from 2023 onward.

CTF Policy Benchmark & Other Indices

Equity and Fixed Income asset classes declined severely last year

October 31, 2023: Total Rate of Return %, Annualized					
Index Name (Gross Return Basis, unless noted)	YTD	1yr	5yr	10yr	10yr volatility
CTF Policy Benchmark (Gross)	1.7	4.2	6.5	6.1	8.5
MSCI USA	10.9	10.1	10.9	11.1	15.2
MSCI USA Small Cap	(2.5)	(4.5)	5.7	7.3	19.0
MSCI World ex US Equities	2.2	12.6	4.3	3.1	14.9
MSCI World ex US Equities (Local)	6.2	9.3	6.4	6.0	12.2
MSCI EAFE Small Cap	(3.7)	7.0	2.0	3.8	16.1
MSCI Emerging Markets ex China	2.7	7.6	4.4		
MSCI China	(11.1)	21.3	(2.5)	1.2	23.6
MSCI ACWI	7.2	11.1	8.0	7.4	14.5
MSCI ACWI (Local)	8.6	10.0	8.8	8.7	13.3
Bloomberg US Gov't / Credit	(2.3)	0.7	0.3	1.1	4.7
ICE BOFA High Yield BB/B	4.1	5.5	3.1	3.8	7.1
Bloomberg U.S. TIPs	(1.5)	(0.7)	2.3	1.6	4.9

Source: Factset, SWIB

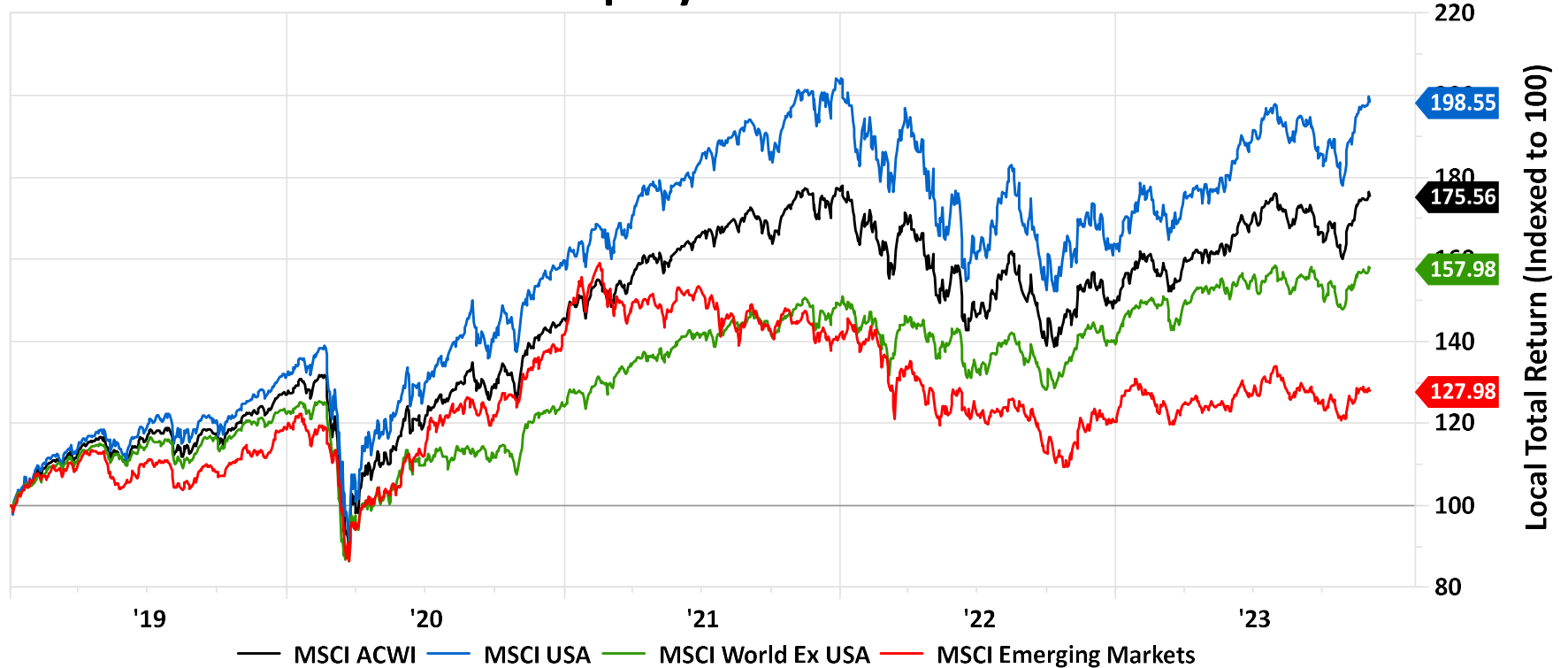
Asset Class Review

Global Equities - Performance

Both DM and EM equities strengthened in November

12/05/2023

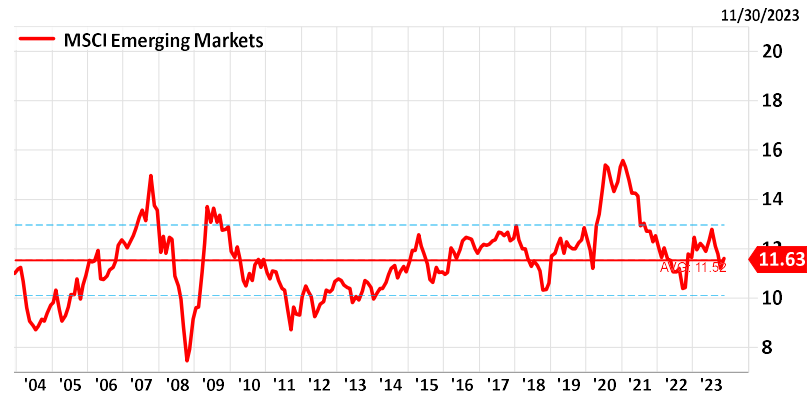
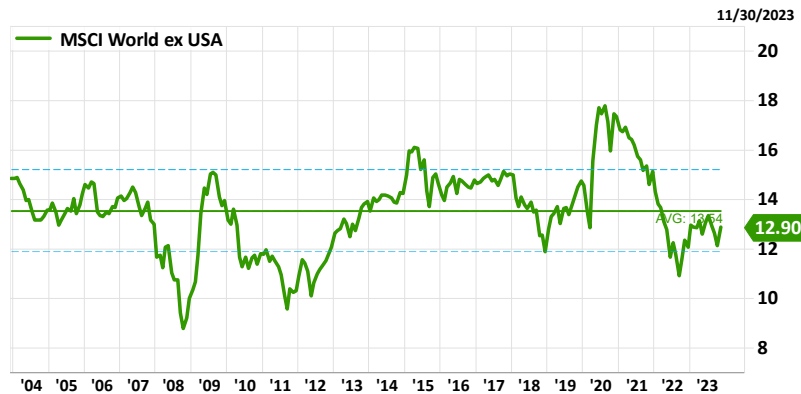
Local Equity Performance



Source: FactSet

Global Equities - Valuation

US P/E ratio is one standard deviation higher than its 20-year average

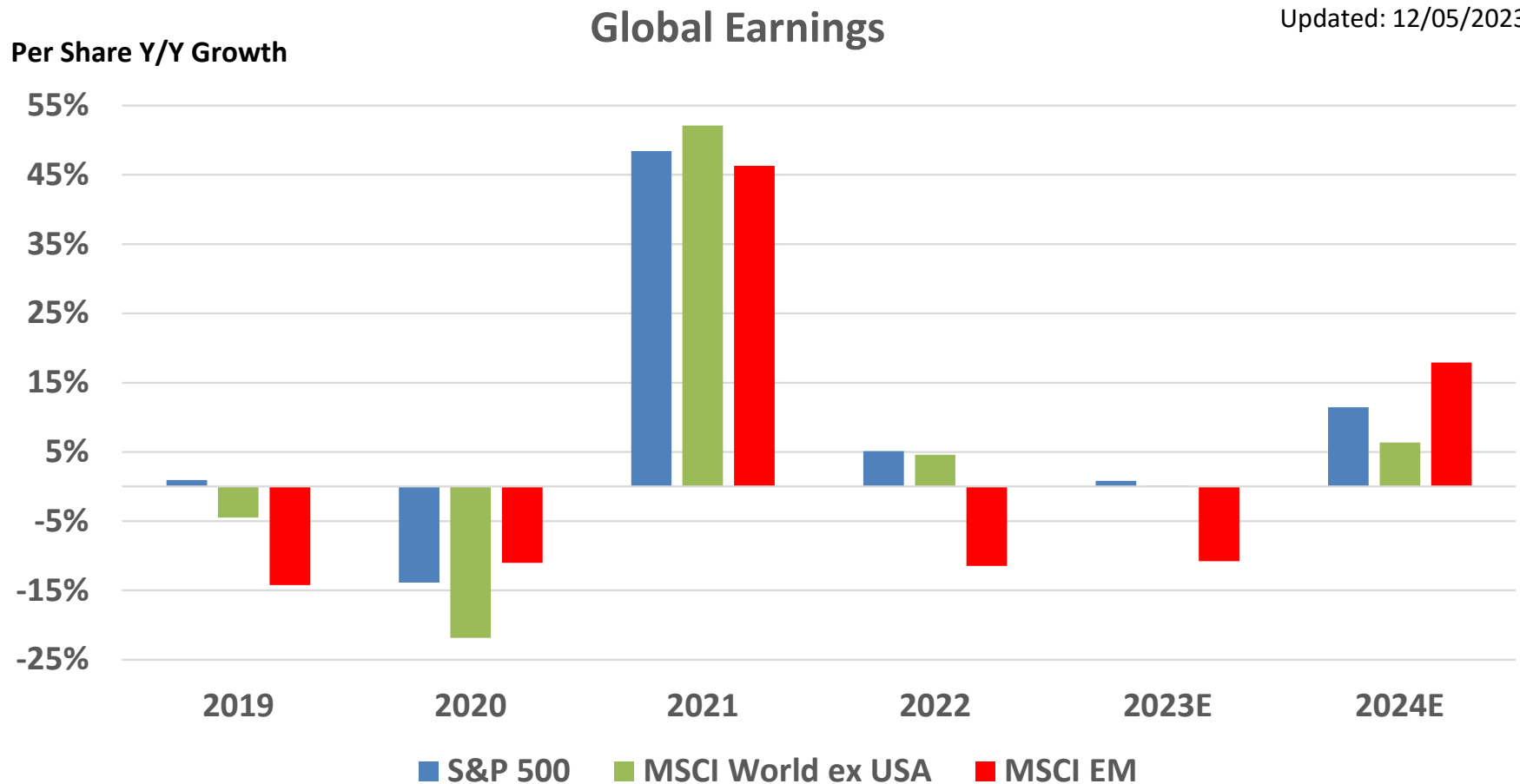


Source: FactSet Market Aggregates - Next twelve-month P/E ratio, monthly, 20-year average with 1 standard deviation bands.

Earnings Growth

Earnings rebound expected in 2024

Updated: 12/05/2023



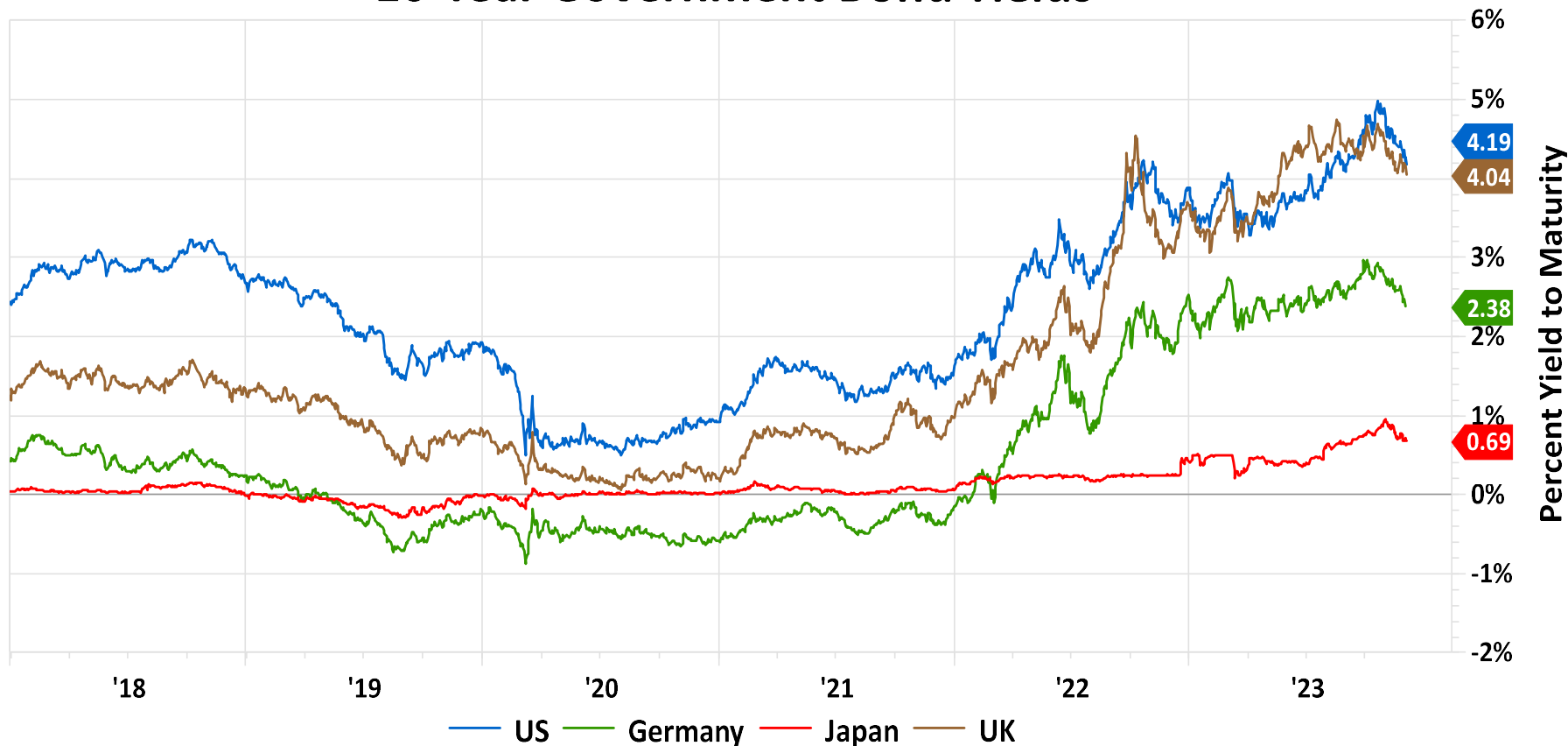
Source: Analyst Consensus; FactSet

Global Bonds

DM government bond yields declined sharply in November

12/05/2023

10-Year Government Bond Yields

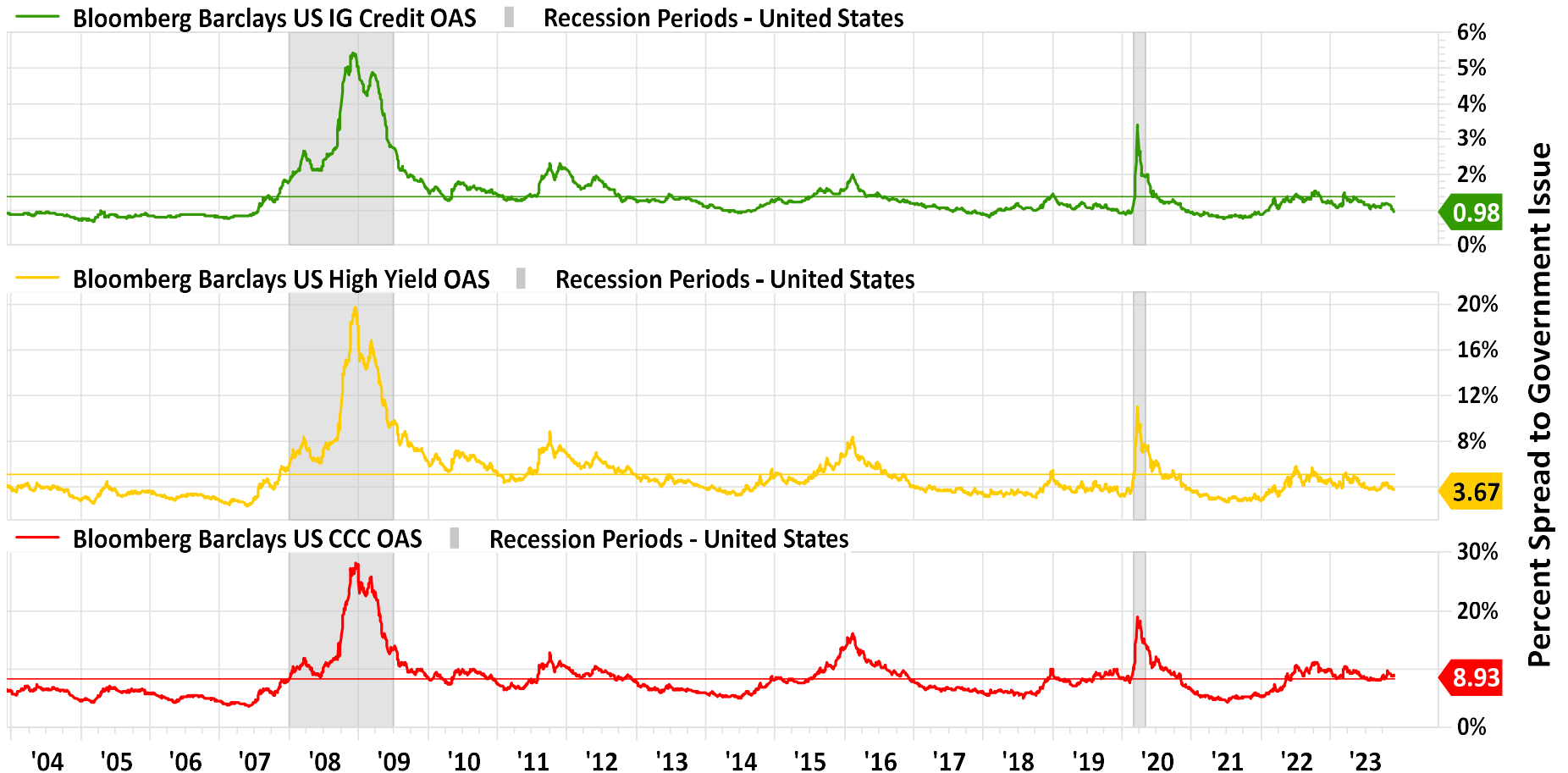


Source: FactSet

Credit Sectors

Spread levels near the long run averages

12/05/2023

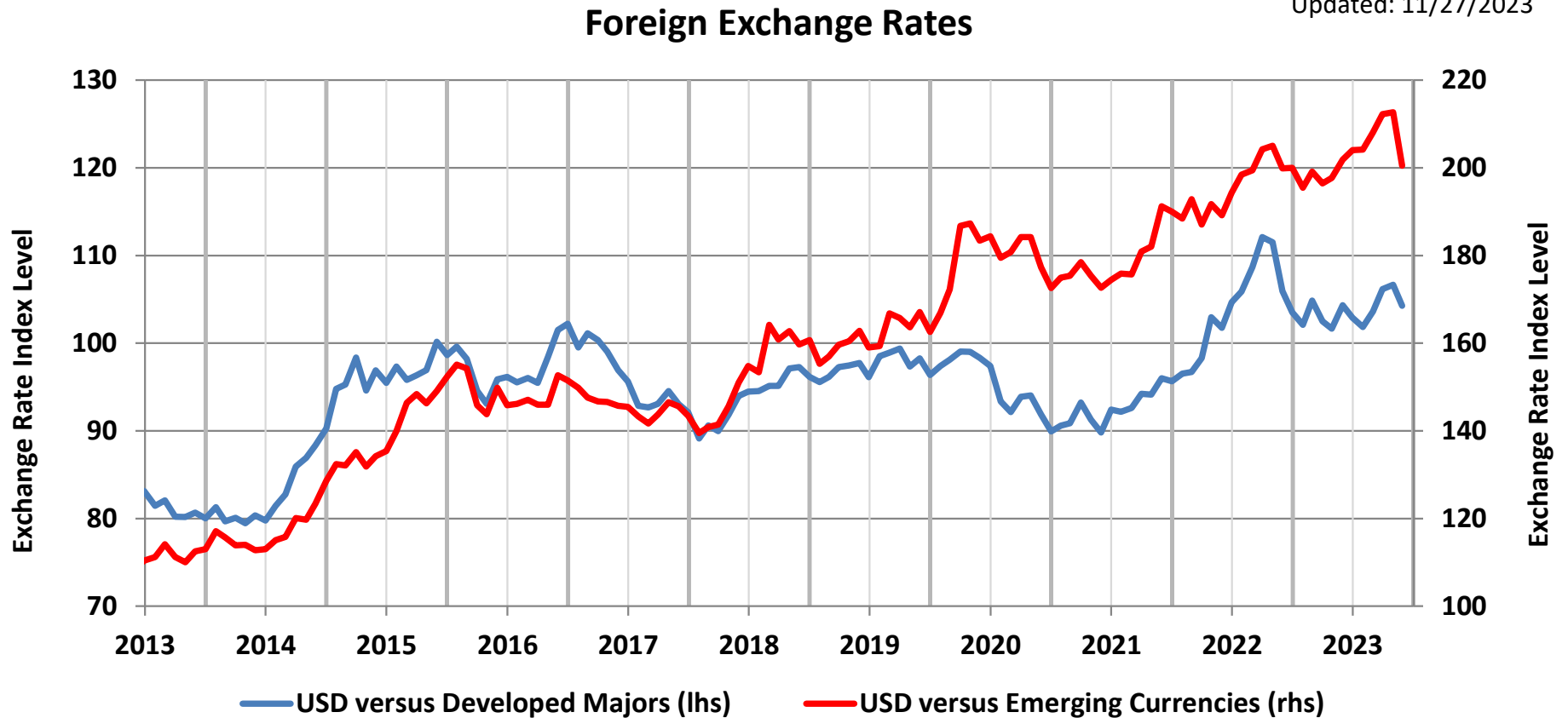


Source: FactSet

Currency Performance

U.S. dollar remains in a range year to date

Updated: 11/27/2023



Source: Bloomberg, DXY Index, JPM Emerging Markets Currency Index (Inverted)

U.S. Inflation

Medium term expectations have moved lower in recent weeks

As of: 11/27/2023

US 5-Year Breakeven Inflation



Source: Bloomberg

Board Meeting

Tab 8 – Announcement of Matters Taken Up in Closed Session

Board Meeting

Tab 9 – In the Absence of Questions, the Following Reports will be filed without comment (for informational purposes):

- A. Quarterly Charges to Funds Reports, Q3 2023
- B. Private Markets and Funds Alpha Commitments, Q3 2023
- C. Board Contact Log

November 10, 2023

Senator Howard Marklein, Co-Chair
 Joint Committee on Finance
 P.O. Box 7882
 Madison, WI 53707

Representative Mark Born, Co-Chair
 Joint Committee on Finance
 P.O. Box 8952
 Madison, WI 53708

Senator Eric Wimberger, Co-Chair
 Joint Legislative Audit Committee
 P.O. Box 7882
 Madison, WI 53707

Representative Robert Wittke, Co-Chair
 Joint Legislative Audit Committee
 P.O. Box 8953
 Madison, WI 53708

Secretary Kathy Blumenfeld
 Department of Administration
 101 East Wilson Street
 P.O. Box 7864
 Madison, WI 53707

Dear Senator Marklein, Senator Wimberger, Representative Born, Representative Wittke and Secretary Blumenfeld:

State statutes require the State of Wisconsin Investment Board (SWIB) to report all expenses charged to the trust funds under management and the number of full-time equivalent positions created or abolished during the quarter¹. The information contained in this report is for the quarter ended September 30, 2023.

Total Cost of Management Summary	4Q 2022	1Q 2023	2Q 2023	3Q 2023	Trailing 4 Qtr	
					Total	% of Total
Internal Operating Expenses						
Operating Budget Expenses	\$ 16,013,990	\$ 14,718,435	\$ 19,303,861	\$ 29,927,680	\$ 79,963,966	61.9%
Custodial, Investment Operations & Banking	1,961,451	2,057,242	1,723,893	2,137,630	7,880,216	6.1%
Legal	371,714	561,635	558,921	489,077	1,981,347	1.5%
Investment Research & Consulting	7,570,768	8,387,483	8,535,712	10,199,330	34,693,293	26.9%
Total Internal Operating Expenses	\$ 25,917,923	\$ 25,724,795	\$ 30,122,387	\$ 42,753,717	\$ 124,518,822	96.4%
Securities Lending Agent Expenses	\$ 1,125,732	\$ 1,455,665	\$ 1,064,140	\$ 971,498	\$ 4,617,035	3.6%
Total SWIB Operating Costs	\$ 27,043,655	\$ 27,180,460	\$ 31,186,527	\$ 43,725,215	\$ 129,135,857	100.0%
External Investment Management Fees						
Externally Managed Separate Account Fees						
Beta One & Other - Separately Managed	\$ 12,231,686	\$ 10,289,679	\$ 15,796,013	\$ 4,854,855	\$ 43,172,233	5.9%
Supplemental Information - External Fund Fees						
Real Estate	\$ 20,890,279	\$ 19,702,319	\$ 21,394,315	\$ 21,806,743	\$ 83,793,656	11.4%
Private Equity & Venture Capital	72,422,893	55,955,436	64,812,083	58,359,821	251,550,233	34.2%
Hedge Funds	61,423,994	52,940,887	56,693,136	93,214,422	264,272,439	36.0%
Beta One & Other - External Funds	15,891,147	55,999,027	3,082,375	16,839,386	91,811,935	12.5%
Total External Investment Management Fees	\$ 182,859,999	\$ 194,887,348	\$ 161,777,922	\$ 195,075,227	\$ 734,600,495	100.0%
Total Cost of Management	\$ 209,903,654	\$ 222,067,808	\$ 192,964,449	\$ 238,800,442	\$ 863,736,352	

¹Wisconsin Statutes Section 25.17 (13m): Investment-related costs and expenses charged to the WRS Trust Funds, State Investment Fund, State Life Insurance Fund, Historical Society Endowment Fund, Injured Patients and Families Compensation Fund and UW Trust Fund. Investment transaction expenses, such as trading commissions and interest expense, are included in investment returns, and therefore not included in this report.

SWIB operating costs are charged to the trust funds under management. Externally managed fund fees for commingled assets are netted against investment returns generated by SWIB’s external fund holdings. It is important to consider costs in the context of value-added investment returns. For example, during the five years ended December 31, 2022, after consideration of all expenses, costs, and fees, SWIB generated more than \$2.7 billion in additional profits beyond what would have been generated by the benchmark portfolio SWIB is measured against. These profits all go directly into the Wisconsin Retirement System for the benefit of its beneficiaries.

Attachment A provides a breakdown of the amount and percentage of assets managed under each type of dedicated and commingled account or partnership, and the change in the amount and percentage from the prior calendar quarter. As of September 30, 2023, SWIB’s total authorized full-time equivalent positions are 290 as shown in the table below.

Assets Under Management & Positions		
	06/30/2023	09/30/2023
Internal Management	46.7%	45.5%
External Management	53.5%	54.5%
Total SWIB Positions	290	290

In addition, Attachment B provides details of the services provided to SWIB and their associated quarterly costs. For definitions of the expense categories presented in the Total Cost of Management Summary table, please refer to Attachment C.

As new investment strategies are implemented and markets continue to evolve, SWIB will continue evaluating the most efficient means to manage the trust fund assets. Please contact us if you have any questions or comments about this report.

Sincerely,



Edwin Denson
Executive Director/Chief Investment Officer

Attachments

- cc: Members, Joint Committee on Finance
- Members, Joint Committee on Audit
- Robert Lang, Legislative Fiscal Bureau
- Joe Chrisman, Legislative Audit Bureau

Total Assets Under Management

Wisconsin Retirement System (WRS)	12/31/2022		3/31/2023		6/30/2023		9/30/2023	
	Amount (in millions)	Percent	Amount (in millions)	Percent	Amount (in millions)	Percent	Amount (in millions)	Percent
Internally Managed Assets	\$46,587	37.9%	\$49,730	39.2%	\$50,868	39.5%	\$46,836	37.6%
Externally Managed Dedicated Assets	29,344	23.9%	29,282	23.1%	29,758	23.1%	29,716	23.9%
Externally Managed Commingled Assets	46,979	38.2%	47,809	37.7%	48,259	37.4%	47,996	38.5%
1. Passive Index	1,488	1.2%	1,168	0.9%	1,011	0.8%	916	0.7%
2. Limited Partnerships	31,719	25.8%	32,060	25.3%	32,894	25.5%	33,681	27.0%
3. Active Managed Commingled	13,772	11.2%	14,581	11.5%	14,354	11.1%	13,399	10.8%
TOTAL WRS Assets	\$122,910	100.0%	\$126,821	100.0%	\$128,885	100.0%	\$124,548	100.0%
State Investment Fund - Internally Managed	\$17,742		\$19,285		\$19,718		\$19,995	
Separately Managed Funds - Internally Managed	\$95		\$98		\$96		\$89	
Separately Managed Funds - Externally Managed	\$2,523		\$2,582		\$2,603		\$2,538	
Total SWIB Assets Under Management	\$143,269		\$148,786		\$151,302		\$147,170	
Total Internal Management	\$64,423	45.0%	\$69,113	46.5%	\$70,682	46.7%	\$66,919	45.5%
Total External Management	\$78,846	55.0%	\$79,673	53.5%	\$80,620	53.3%	\$80,251	54.5%

STATE OF WISCONSIN INVESTMENT BOARD
Expenses for All Funds Under Management
Quarter Ending September 30, 2023

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
<u>Internal Expenses</u>		
Staff Compensation	Staff Compensation	\$ 23,285,450
Fringe Benefits	Fringe Benefits	4,412,320
Supplies, Travel & Facilities	General Supplies & Services	2,229,910
Total Internal Expenses *		\$ 29,927,680
<u>Custodial, Investment Operations and Banking Fees</u>		
BNY Mellon Asset Servicing - Custody	Master Custody Services	\$ 510,135
BNY Mellon Asset Servicing - Investment Operations	Investment Operating Services	1,454,667
Markit NA	Investment Data Management Software	172,828
Total Custodial, Investment Operations and Banking Fees		\$ 2,137,630
<u>Legal Fees</u>		
Arentfox Schiff LLP	Legal Work for Investment Strategies	\$ 15,580
Axley Brynelson, LLP	Legal Work for Investment Strategies	2,720
Chapman & Cutler LLP	Legal Work for Investment Strategies	59,440
Cox Castle & Nicholson LLP	Legal Work for Investment Strategies	1,937
DLA Piper LLP (US)	Legal Work for Investment Strategies	80,543
Godfrey & Kahn SC	Legal Work for Investment Strategies	13,135
Husch Blackwell	Legal Work for Investment Strategies	7,853
King & Spalding LLP	Legal Work for Investment Strategies	4,964
Lander & Rogers	Legal Work for Investment Strategies	1,320
Legal Services Expense Accrual	Legal Work for Investment Strategies	53,689
Purrington Moody Weill LLP	Legal Work for Investment Strategies	99,615
Quarles & Brady	Legal Work for Investment Strategies	111,800
Reinhart Boerner Van Deuren SC	Legal Work for Investment Strategies	342
Rimon, P.C.	Legal Work for Investment Strategies	1,140
Shearman & Sterling LLP	Legal Work for Investment Strategies	35,000
Total Legal Fees		\$ 489,077
<u>Investment Counsel</u>		
12358433 Canada Inc.	Investment Consulting Services	\$ 147,713
20-20 Investment Association	Investment Membership	15,000
3x108 Fintech Consulting Limited	Investment Consulting Services	191,362
AE Business Solutions	Investment Consulting Services	22,900
Aksia LLC	Hedge Fund Investment Consulting	267,466
Alex Solutions	Research and Data Services	40,750
Algomi Corporation	Investment Consulting Services	2,251
Apex Systems	Investment Consulting Services	66,612
AquaFold	Investment Research Software	898
Arthur Selender	Investment Consulting Services	22,000
Backstop Solutions Group	Investment Software	98,875
Barclays	US Constituent Data	15,000
Barrons	Investment Research	122
BCA Research Inc	Global & Domestic Fixed Income Strategy Research	27,875
BITA Risk Limited	Risk Oversight Services	51,360
Bixby Research and Analytics LLC	Research and Data Services	33,333
Blacklight Technology Partners, LLC	Research and Data Services	28,500
Blackrock Financial Management Inc	Risk Services	80,000
Bloomberg Finance LP	Market, Company, Industry & Benchmark Information	1,351,367
BNY Mellon Asset Servicing - Eagle/Pace	Investment Consulting Services	26,900
Bridge Consulting Partners Ltd	Investment Consulting Services	273,240
Callan Associates Inc	Investment Consulting & Performance Benchmarking	6,250
Canoe Software Inc.	Investment Software	24,400
Capital Economics LTD	Market Research	5,125
CappThesis, LLC	Research and Data Services	2,500
Carahsoft Technology Corp	Investment Consulting Services	75,481
CBJL Incorporated	Investment Consulting Services	235,545
CBOE Global Markets, Inc.	Research and Data Services	1,620
CCG Data Solutions	Investment Consulting Services and Software	37,800
CFRA Research	Investment Research Services	23,793
Charles River System Inc	Portfolio Management Trading Software & Services	446,259
Consensus Economics Inc	Investment Research Services	36,000

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
CoStar Portfolio Strategy	Real Estate Consulting & Research Services	23,613
CUSIP Global Services	Research and Data Services	16,250
Cutter Associates	Investment Organization and Systems Consulting	2,498
Dacheng Xiu	Investment Research	58,325
DiatomC LLC	Investment Consulting Services	88,040
Dow Jones News Service	Company and Industry News Services	409
DTCC – EPN	Trade Settlement Service	3,600
DTCC ITP LLC	Trade Settlement Service	2,341
Echios LLC	Consulting	19,034
EFront Financial Solutions Inc	Private Markets Portfolio Management Services	205,454
Elevation LLC	Research and Data Services	17,500
Ernst & Young LLP	Tax Compliance Services & Investment Consulting	56,143
eVestment Alliance LLC	Research and Data Services	76,457
FactSet Research Systems Inc	Financial & Economic Database	1,031,965
FIS Data Systems Inc.	Research and Data Services	22,442
Fitch Solutions Inc	Credit Rating Services	18,750
Funston Advisory Services LLC	Consulting Services	14,500
Gallagher	Insurance and Risk Management Services	15,875
Global Peer Financing Association	Investment Consulting	1,000
Goodbody	Investment Research	4,000
Green Street Advisor	Real Estate Analytics	29,263
Haver Analytics	Global Macroeconomic Research	29,688
Healthy Markets Association	Research & Data Service	20,000
Ice Data LP	Fixed Income Indices	63,200
iFathom Corporation	Investment Consulting	149,480
IHS Markit KY3P LLC	Risk Management Services	22,340
In Focus Information LLC	Private Placement Investment Research	1,500
InsiderScore LLC	Investment Research & Analytics	21,000
Institutional Investor	Investment Data and Research Services	19,500
Institutional Shareholder Services Inc	Proxy Voting Analysis	41,914
Intelligent Automation Consulting	Automation Consulting Services	6,000
Investment Research Expense Accrual	Investment Research	448,150
IPC Systems Inc	Trading Telecommunication System	10,920
JPSB Consulting Limited	Investment Consulting	123,780
Keystone Consulting Inc	Investment Information Technology Consulting Services	85,186
Knowledge Services	Recruitment and Staffing Services	54,400
Kreischer Miller LLP	Investment Consulting	10,500
Li Deng	Investment Consulting	5,000
Manalo Advisors Limited	Research and Data Services	3,750
Markit Group Limited	Investment Consulting Services	126,453
Markit-EDM Limited	Investment Consulting Services	194,508
McLagan Partners Inc	Investment Compensation Data and Analysis	25,000
Meketa Investment Group	Public Markets External Manager Consultant	69,228
MNI Market News	Research and Data Services	2,920
Moodys Analytics	Economic, Currency & Bond Analysis	85,334
MSCI - Barra	Research and Data Services	20,625
MSCI Inc - Risk Metrics Solutions	Research and Data Services	271,398
MSCI, Inc	Research and Data Services	113,798
MT Analytics ULC	Investment Consulting	127,920
My Data Outlet International, LLC	Research and Data Services	33,000
NEPC LLC	Investment Consulting Services	80,000
Newsfile	Investment Research	1,045
Nuware Technology Corp	Investment Information Technology Consulting Services	69,280
NYSE Market Inc	New York Stock Exchange Data	6,178
Oliver James	Investment Consulting Services	242,310
Options Price Reporting Authority	Quote System for Options Market	2,331
Oxford Economics USA INC	Research and Data Services	34,963
Pac-invest	Research and Data Services	13,716
PEI Media Inc	Private Equity Real Estate News	11,875
Pitchbook Data Inc	Research and Data Services	20,000
PremiaLab	Investment Research	13,750
Preyer	Investment Consulting Services	270,060
Quantum Research Consulting LLC	Investment Consulting Services	52,920
Refinitiv	Research and Data Services	242,681
RIMES Technologies Corporation	Research and Data Services	46,250
Russell Investment Group	Index Data	8,932
S&P Dow Jones Indices	Research and Data Services	56,309
S&P Global Market Intelligence	Industry & Corporate Research	160,220
Seaport Global Securities LLC	Research and Data Services	2,580

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
SEI Investments	Research and Data Services	22,736
Sharp Decisions Inc	Investment Information Technology Consulting Services	74,824
SimCorp Data & Performance Capitalized Expenses	Investment System	(250,295)
SimCorp Implementation Capitalized Expenses	Investment System	(2,666,288)
Simcorp USA, Inc.	Investment System	3,170,582
Simmons & Simmons	Global Regulatory Services	6,874
Snowflake Inc	Research and Data Services	50,000
Solve Advisors Inc	Investment Research	10,000
Spherion	Recruitment and Staffing Services	11,786
Statista	Investment Research	177
StepStone Group	Private Equity Consulting Services	223,483
StepStone Group Real Estate	Real Estate Consulting Services	60,777
SWIFT SC	Research and Data Services	544
SystemsAccountants	Investment Information Technology Consulting Services	80,640
Taranis, Inc.	Investment Information Technology Consulting Services	60,060
Telsey Advisory Group	Consumer Sector Research	18,750
The Financial Times Limited	Investment Research	425
The Nasdaq Stock Market, LLC	Research & Data Services	6,300
Toronto Stock Exchange	Market Data	19,536
Totem Macro LLC	Research and Data Services	45,000
TradeWeb	On-Line Fixed Income Trading Services	10,826
Unit4 Business Software Inc	Financial & Administration Services System	77,019
Urban Land Institute	Investment Consulting Services	1,200
Verity LLC	Research Management System	54,433
Verus Advisory Inc	Benchmarking Consulting Services	2,500
Virtu ITG Analytics LLC	Trading Transaction Cost Analysis	20,500
Visible Alpha LLC	Research and Data Services	19,950
WIPFLi LLP	Income Tax Preparation Services	1,150
Wolverine Execution Services LLC	Options Trading Platform	1,395
WorldBridge Partners Inc	Recruitment Consulting	176,800
Total Investment Counsel		\$ 10,199,330
<u>Separate Account Public Market Management Fees</u>		
Alliance Bernstein	Public Market Management Fees	\$ (1,795,982)
Blackrock	Public Market Management Fees	1,275,775
Dodge and Cox	Public Market Management Fees	730,482
Driehaus Private Equity	Public Market Management Fees	293,016
eSecLending	Public Market Management Fees	4,044
Fidelity Investments	Public Market Management Fees	1,334,827
Parametric	Public Market Management Fees	587,752
Prudential Global Investment Management (PGIM)	Public Market Management Fees	142,139
Robeco	Public Market Management Fees	12,453
Wellington Trust Company	Public Market Management Fees	2,270,350
Total Separate Account Public Market Management Fees		\$ 4,854,855
<u>Securities Lending Agent Fees</u>		
BNY Mellon Asset Servicing	Securities Lending Agent Fees	\$ 971,498
Total Securities Lending Agent Fees		\$ 971,498
Total Quarterly Charges to Funds		\$ 48,580,070

*All costs reported are on an accrual basis except for internal operating costs which are on a cash basis of accounting. Negative expense amounts are due to accrual adjustments and/or other miscellaneous adjustments.

Explanation of Expenses

Internal Operating Expenses

Internal operating expenses consist primarily of staff compensation and fringe benefits. SWIB employs a staff of professional investment and support staff to manage trust fund assets. Other internal operating expenses consist of office equipment, supplies, business travel, information technology equipment and services, and general services.

Custodial & Banking Fees

Wisconsin Certificate of Deposit Program: Under a contract with SWIB, Bankers' Bank administers the program under which the State Investment Fund (SIF) purchases certificates of deposit from Wisconsin-based banks and thrifts. Most administrative costs are paid by the participating banks. SWIB's expenses help underwrite other administrative costs, such as insurance that SWIB requires to be purchased.

BNY Mellon: Provides master custodial and administrative services (safekeeping of assets, income collection, valuations and accounting) for public and private domestic and foreign securities in the Wisconsin Retirement System (WRS), the SIF, and the other separately managed trust funds. In addition, SWIB receives performance measurement and analytical services through its contract with BNY Mellon, which serves as the official book of record for SWIB's accounting and performance measurement functions. BNY Mellon provides data and analytical tools used by SWIB for compliance and risk management. These include global collateral management, data management, and hosting services. Fees for these services are established by contract.

US Bank: The State of Wisconsin contracted with US Bank to be the state's working bank. The fees paid to US Bank by the SIF reflect bank service charges that are not directly applicable to the fund participants.

Legal Fees, Services, and Expenses

Under authority delegated by the Attorney General, pursuant to s. 25.18 (1) (a) Statutes, SWIB may employ legal counsel for any matters arising out of the scope of its investment authority. This includes legal services relating to bankruptcies, class actions, private markets transactions, fiduciary advice, securities law, investment litigation, and other similar matters.

Investment Counsel

Current law gives SWIB the authority to employ investment counsel in any matters arising out of the scope of its investment authority. Investment research and services provided include global market, industry, economic and company information, financial and performance analytics, news information, pricing and exchange data, credit ratings, financial modeling, economic forecasting, trading services, and a variety of Board consultations. These services enable SWIB to perform due diligence on current and future holdings and assist in monitoring investments.

Securities Lending Agent Fees

Securities lending programs generally earn income through the reinvestment of cash collateral posted by borrowers and through the collection of fees for loans where non-cash collateral is posted. SWIB's securities lending income is shared with the agent to pay the costs associated with the administration of the program. Securities lending agent fees are reported as expenses.

Externally Managed Separate Account Fees

External asset managers have been delegated authority within guidelines established by SWIB to determine investment strategy and purchase securities in SWIB's name within a SWIB account. Fees are typically assessed as a percentage of the market value of assets under management and in some cases, fees are based on investment performance.

External Funds Fees

SWIB invests in separate legal entities managed by external investment managers to gain exposure to select strategies including Public Markets, Private Equity, Venture Capital, Real Estate and Hedge Funds. In exchange for their investment management services, the external managers charge a fee within the entity they manage. Fees are typically assessed as a percentage of the market value of assets under management, commitments, and in some cases are based on investment performance. While the fees charged to these external vehicles do not meet the statutory definition of a cost or expense to SWIB, they are currently included in SWIB's total cost of management. Accordingly, these fees are reported as supplemental information. Beginning in 2023, External Funds Fees for private markets are reported on a net fee basis rather than gross. Net fees reflect fee offsets, waivers, and deferrals.

Private Equity Commitments*

July 2023 – September 2023

<i>Investment</i>	<i>Commitment (millions)</i>
Alchemy Special Opportunities Fund V	£50.0
Brandon Lane Partners (Series C)	\$200.0
Clairvest Equity Partners VII	\$65.0
PSG VI	\$100.0
Telescope Partners III	\$27.5
The Resolute Fund VI	\$125.0
VIA Equity V	€25.0
Information Technology Co-Investment	\$0.6
Financials Co-Investment	\$35.0
Information Technology Co-Investment	€2.5
Industrials Co-Investment	\$40.8
Consumer Co-Investment	\$0.8
Financials Co-Investment	\$30.0

**Includes Current Return Portfolio*

Private Equity Commitments*

July 2023 – September 2023

<i>Investment</i>	<i>Commitment (millions)</i>
Industrials Co-Investment	\$15.0
Industrials Co-Investment	\$1.4
Information Technology Co-Investment	\$37.0

**Includes Current Return Portfolio*

Private Debt Investments/Commitments

July 2023 to September 2023

<i>Investment</i>	<i>Investment/Commitment</i>
Investment Management	\$30,000,000
Utility Company	\$21,000,000
Utility Company	\$20,000,000
Real Estate Holding Company	\$6,000,000
Total	\$77,000,000

Real Estate Commitments

July 2023 – September 2023

<i>Investment</i>	<i>Commitment (millions)</i>
Wilson Blue Moon I, LLC	\$15
SRP Data Center Fund I, LP	50
Stream Data Center Fund I Co-Invest	50
Berkshire Bridge Loan Investors-MF1 III, LP	100
Total	\$215

Funds Alpha Commitments*

July 2023 – September 2023

Manager	Commitment (Millions)
I-94 Partners Fund	\$ 25
Reflow	\$ 75
Fourl World Zilte	\$ 25
Aquatic	\$ 50
Dodge and Cox	\$ 1,227
Wellington GRE X	\$ 2,400
TOTAL	\$ 3,802

**Includes Hedge Funds and Beta One*

Board Contact Log

DATE OF INBOUND COMMUNICATION	COMMUNICATION SOURCE	TOPIC
November 18, 2023	Heather Phelps	Fossil fuel divestment
November 27, 2023	Susan Kearns	Climate related risks
December 6, 2023	Douglass Day	Climate stress testing

This log records communications directed to SWIB's Board of Trustees. It is maintained pursuant to the procedures set forth at <https://www.swib.state.wi.us/board-contact>.

Board Meeting

Tab 10 - Future Items for Discussion

2024 Board Meeting and Agenda Plan

March 2024	
SPCG	<p>Open Session</p> <ul style="list-style-type: none"> • Real Estate Strategy Report and Market Outlook • Corporate Governance Program Update • June Investment Forum Preview • Project Centum Update <p>Executive Closed Session</p> <ul style="list-style-type: none"> • ED/CIO Goals Review
Audit & Finance	<p>Open Session</p> <ul style="list-style-type: none"> • Annual Charter Review • Open Audit Issues Report • Approval of Draft Audit Reports • Audit Plan Status • 2023 Internal Audit Goals • Internal Audit Strategic Plan • Financial Reporting • Administrative Reports <p>Executive Closed Session</p> <ul style="list-style-type: none"> • Evaluation of Internal Audit Director • Internal Audit Director Compensation Recommendation
Compensation & Workforce Development	<p>Open Session</p> <ul style="list-style-type: none"> • Annual Charter Review • Talent Acquisition Update • Strategic Results Scorecard Approval • Incentive Compensation Program Review • Review Strategic Results Scorecard and Division Scorecards • Incentive Compensation Award Recommendations <p>Executive Closed Session</p> <ul style="list-style-type: none"> • Incentive Compensation Award Recommendations for Specific Individuals • ED/CIO Evaluation and Compensation
Board Meeting	<p>Open Session</p> <ul style="list-style-type: none"> • Committee Reports • Election of Secretary and Assistant Secretary • Annual Committee Assignments • Proposed Meeting Dates for Next Year • Investment Performance and Market Updates; Callan Peer Report (onsite) • Investment Committee Open Session Business • Quarterly Investment Update • Q4 Direct Charges to Funds / PMFA Commitments <p>Closed Session</p> <ul style="list-style-type: none"> • Risk Management Update • Investment Committee Closed Session Business <p>Executive Closed Session</p> <ul style="list-style-type: none"> • Incentive Compensation Award Recommendations for Specific Individuals

2024 Board Meeting and Agenda Plan

June 2024	
SPCG	<p>Open Session</p> <ul style="list-style-type: none"> • Hedge Fund Strategy Report and Market Outlook • Project Centum Update <p>Executive Closed Session</p> <ul style="list-style-type: none"> • ED/CIO Goals Review
Audit & Finance	<p>Open Session</p> <ul style="list-style-type: none"> • Open Audit Issues Report • Approval of Draft Audit Reports • Affirmations and Disclosures • Audit Plan Status • Five-Year Audit Summary • Financial Reporting • Administrative Reports <p>Executive Closed Session</p> <ul style="list-style-type: none"> • LAB Review of Statements of Economic Interest
INVESTMENT FORUM	
Board Meeting	<p>Open Session</p> <ul style="list-style-type: none"> • Committee Reports • Investment Performance and Market Updates; Callan Peer Report • Investment Committee Open Session Business • Quarterly Investment Update • Q1 Direct Charges to Funds / PMFA Commitments <p>Closed Session</p> <ul style="list-style-type: none"> • Risk Management Update • Investment Committee Closed Session Business
INVESTMENT FORUM	

2024 Board Meeting and Agenda Plan

September 2024	
SPCG	<p>Open Session</p> <ul style="list-style-type: none"> • Private Equity Strategy Report and Market Outlook • Corporate Governance 2023 Proxy Voting Review • Trustee Manual Review/Policies Update • October Workshop Preview • Project Centum Update <p>Closed Session</p> <ul style="list-style-type: none"> • Consultant Annual Reporting • Security Management, IT, and Data Management Update • ED/CIO Goals Review
Audit & Finance	<p>Open Session</p> <ul style="list-style-type: none"> • WRS Audited Financial Statements • Open Audit Issues Report • Approval of Draft Audit Reports • Audit Plan Status • 2024 Audit Plan Preview • Financial Reporting • Administrative Reports
Benchmark & Performance	<p>Open Session</p> <ul style="list-style-type: none"> • Comprehensive Benchmark Review Preview
Compensation & Workforce Development	<p>Open Session</p> <ul style="list-style-type: none"> • Talent Acquisition and Employee Engagement Update
Board Meeting	<p>Open Session</p> <ul style="list-style-type: none"> • Committee Reports • Investment Forum Recap • Fiduciary Training • Public Records Training • Investment Performance and Market Updates; Callan Peer Report • Committee Open Session Business • Quarterly Investment Update • Q2 Direct Charges to Funds / PMFA Commitments <p>Closed Session</p> <ul style="list-style-type: none"> • Risk Management Update • Committee Closed Session Business • Board Self-Evaluation with Governance Consultant

OCTOBER BOARD WORKSHOP
<ul style="list-style-type: none"> • Outside Speakers • Asset Allocation review

2024 Board Meeting and Agenda Plan

December 2024	
SPCG	<p>Open Session</p> <ul style="list-style-type: none"> • Beta One Strategy Report and Market Outlook • Annual Charter Review • Project Centum Update <p>Executive Closed Session</p> <ul style="list-style-type: none"> • ED/CIO Goals Review
Audit & Finance	<p>Open Session</p> <ul style="list-style-type: none"> • SIF Audited Financial Statements • Open Audit Issues Report • Approval of Draft Audit Reports • Audit Plan Status • Proposed 2024 Audit Plan • Financial Reporting, including Budget and Position Request • Administrative Reports <p>Executive Closed Session</p> <ul style="list-style-type: none"> • LAB Review of Statements of Economic Interests
Benchmark & Performance	<p>Open Session</p> <ul style="list-style-type: none"> • Annual Charter, Policies, and Philosophy Review • Comprehensive Benchmark Review
Compensation & Workforce Development	<p>Open Session</p> <ul style="list-style-type: none"> • Compensation Philosophy Review • Compensation Consultant • Incentive Compensation Plan Changes for Next Performance Year • Incentive Compensation Projections • Annual RPM Review • People Metrics • Talent Acquisition Update <p>Executive Closed Session</p> <ul style="list-style-type: none"> • Succession Planning
Board Meeting	<p>Open Session</p> <ul style="list-style-type: none"> • Committee Reports • Investment Performance and Market Updates; Callan Peer Report • Cost Benchmarking Report • Asset Allocation Recommendation • Quarterly Investment Update • Investment Committee Open Session Business • Q3 Direct Charges to Funds / PMFA Commitments <p>Closed Session</p> <ul style="list-style-type: none"> • Asset Allocation Implementation • Risk Management Update • Investment Committee Closed Session Business • Annual Review of Expected Tail Loss Analysis