

SWIB Board Meeting of March 20, 2024

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Name of Meeting: Regular Meeting of the Board of Trustees
Date/Time: Wednesday, March 20, 2024 9:00 am
Room: 1st Floor Conference Room
Address: 4703 Madison Yards Way, Madison, WI 53705
Virtual: [Click here to join the meeting;](#) 608-267-3179 code 496323931

OPEN SESSION	
1.	Committee Reports – Open Session Items <ul style="list-style-type: none"> A. Audit and Finance Committee B. Compensation and Workforce Development Committee C. Strategic Planning and Corporate Governance Committee
2.	Consent Agenda <ul style="list-style-type: none"> A. Open Session Minutes of December 15, 2023 B. Recommended Actions from Committee Agendas – Open Session Items
3.	Election of Secretary and Assistant Secretary
4.	Annual Committee Assignments by Board Chair
5.	Proposed 2025 Board Meeting Dates
6.	Investment Performance and Market Updates <ul style="list-style-type: none"> A. Board Investment Performance Report, Q4 2023 B. 2023 Callan Report
7.	Committee Open Session Business <ul style="list-style-type: none"> A. Amendments to Investment Committee Charter B. Amendments to WRS Investment Committee Investment Guidelines C. Approved Open Session Investment Committee Meeting Minutes of November 28, 2023, December 21, 2023, and January 23, 2024 D. Final Open Session Investment Committee Agenda for February 27, 2024 and Draft Open Session Agendas for March 21 and April 23, 2024 E. Draft Open Session Minutes of November 9, 2023 Enterprise Risk and Compliance Committee meeting
8.	Quarterly Investment Update, Q4 2023

CLOSED SESSION*
RECONVENE IN OPEN SESSION
9. Announcement of Matters Taken Up in Closed Session
10. 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, Q4 2023 B. Private Markets and Funds Alpha Commitments, Q4 2023 C. Board Contact Log
11. 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 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/or for any comments or discussion on prior closed session minutes that discuss the same; (ii) Section 19.85(1)(c) of the Wisconsin Statutes to discuss the compensation and performance evaluation data of specific SWIB employees, including SWIB’s executive director/chief investment officer and SWIB’s board of trustees, and/or for any comments or discussion on prior closed session minutes that discuss the same; and (iii) Section 19.85(1)(g) of the Wisconsin Statutes to confer with SWIB’s chief legal counsel to receive advice concerning legal strategy for ongoing and potential litigation, and/or for any comments or discussion on prior closed session minutes that discuss the same. 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. Audit and Finance Committee
- B. Compensation and Workforce Development Committee
- C. Strategic Planning and Corporate Governance Committee

Board Meeting

Tab 2 – Consent Agenda

- A. Open Session Minutes of December 15, 2023
- B. Recommended Actions from Committee Agendas –
Open Session Items

Regular Meeting of the Board of Trustees

Wednesday, March 20, 2024

STATE OF WISCONSIN INVESTMENT BOARD

CONSENT AGENDA – OPEN SESSION ITEMS

Proposed Motions:

1. Move to approve the Open Session Minutes of December 15, 2023, as presented.
2. Move to approve the 2024 Investment Services Staff Strategic Results Scorecard, as recommended by the Compensation and Workforce Development Committee.
3. Move to approve the incentive compensation awards for performance year 2023 for all SWIB employees in the aggregate of \$12,472,924, excluding the specific awards to the Executive Director/Chief Investment Officer, the Deputy Executive Director/Chief Operating Officer, Asset Class CIOs, Strategy Heads, Senior Portfolio Managers of Investment Management Staff, Chief Legal Counsel, Chief Financial Officer, Head of Risk Management, Head of Human Resources, and Internal Audit Director, as recommended by the Executive Director/Chief Investment Officer and the Compensation and Workforce Development Committee.

STATE OF WISCONSIN INVESTMENT BOARD
Board Meeting – Open Session

Friday, December 15, 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
Jeff DeAngelis, Trustee
Tom Merfeld, Trustee
Kristi Palmer, Trustee
Dave Schalow, Trustee
John Voelker, Trustee

Staff/Others Present: Nathan Ballard, Senior Legal Counsel
Eric Barber, Senior Legal Counsel
Zach Berghouse, Internal Auditor
Brandon Brickner, Internal Audit Director
Stefano Cavaglia, Senior Portfolio Manager
Sara Chandler, Chief Legal Counsel
Hassan Chehime, Head of Risk Management
Heather Dobson, Finance Operations Manager
Edwin Denson, Executive Director/Chief Investment Officer
Anne-Marie Fink, Private Markets & Funds Alpha CIO
Greg Fletcher, Performance Director
Shannon Gannon, Communications Director
Jameson Greenfield, Chief Financial Officer
Dan Gyrog, Internal Auditor
Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer
Leo Kropywiansky, Senior Portfolio Manager
Todd Mattina, Head Economist, Asset & Risk Allocation CIO
Mike Shearer, Head of Fixed Income Strategies
Dawn Tuescher, Executive Administrative Assistant
Chris Levell, NEPC
Joe Nankof, NEPC
Kevin Balaod, With Intelligence
Laura Albanese, FIN News
Harrison Bader, BlackRock
Bob Schaefer, Public Attendee
George Mickelson, Public Attendee
Anne Steinberg, Public Attendee
Eric Hanson, Public Attendee
Anne Chartier, Public Attendee
Pete Knotek, Public Attendee
William Backes, Public Attendee

Catarina, Public Attendee
Shari Eggleston, Public Attendee
Judith Stadler, Public Attendee
Elizabeth Hachten, Public Attendee
Kelly Kearns, Public Attendee
Steve Glass, Public Attendee
Susan Millar, Public Attendee
Lewis Kuhlman, Public Attendee
(Some individuals may have attended only portions of the meeting.)

Trustee Nick, Chair of the Board of Trustees, declared a quorum was present and called the Board of Trustees meeting to order at 10:10 a.m. on December 15, 2023.

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) reviewed the Committee charter; (iii) heard a report and market outlook presentation on the beta one strategy from staff and Meketa; and (iv) received a progress report on Project Centum. During the Committee’s executive closed session, the Committee met with Edwin Denson, ED/CIO, for an update on his 2023 performance goals.

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 Fiscal Year 2023 State Investment Fund audited financial statements; (iii) approved draft audit reports for Performance Measurement and Reporting and Data Architecture and Engineering; (iv) approved the proposed 2024 Internal Audit Plan; and (v) recommended that the Board approve the Total Cost of Management Plan for calendar year 2024. The Committee also reviewed open audit issues, the five-year forecast and the Quarterly Cost of Management Update for Q3 2023, and the 2023 Internal Audit Plan. In executive closed session, the Committee approved prior meeting minutes, received the Legislative Audit Bureau’s Report on Review of Statements of Economic Interest, and met with the Internal Audit Director.

C. Compensation and Workforce Development

Trustee DeAngelis, Chair of the Benchmark and Performance Committee, reported that in open session the Committee: (i) approved prior meeting minutes; (ii) reviewed the Compensation Philosophy; (iii) received the Compensation Consultant Report; (iv) reviewed the 2023 Incentive Compensation projections, (v) recommended that the Board approve 2024 Incentive Compensation Plan changes; (vi) recommended that the Board approve an updated Relative Performance Maximum for the investment grade fixed income portfolio; and (vii) received an update on talent acquisition and retention, staff credentials, and employee engagement. In executive closed session, the Committee reviewed succession planning with Edwin Denson, ED/CIO.

D. Benchmark and Performance

Trustee Schalow, Chair of the Benchmark and Performance Committee, reported that in open session the Committee: (i) approved prior meeting minutes; (ii) reviewed the Committee’s Charter, Policies, and

Benchmarking Philosophy and recommended that the Board approve amendments to the Committee Charter; (iii) received the Benchmark Consultant Report and Annual Benchmark Review from NEPC; (iv) recommended that the Board approve the benchmark changes recommended by NEPC and the Investment Committee; and (v) received a GIPS readiness update.

2. Consent Agenda

Sara Chandler, Chief Legal Counsel, distributed a proposed consent agenda. Trustee Nick asked whether there were any motions listed on the consent agenda that should be removed for further discussion and individual action. Hearing none, she 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 September 13 and October 17-18, 2023, as presented.
- 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.
- Move to approve the Relative Performance Maximums effective beginning in 2024, as recommended by Verus Advisory and the Compensation and Workforce Development Committee.
- 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.
- 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.
- 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.

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

3. Investment Performance and Market Updates

A. Board Investment Performance Report, Q3 2023

Greg Fletcher, Performance Director, presented the *Investment Performance Report*, as of September 30, 2023, included on pages 23-40 of the meeting materials. Mr. Fletcher reported that: (i) the Core Trust Fund (CTF) returned -2.28% net of all fees and expenses in Q3 2023, resulting in excess performance of 36 basis points (bps) for the quarter; (ii) the CTF returned 10.04% net of all fees and expenses for the one-year period, resulting in an excess return of 77 bps; (iii) the CTF five-year return net of all fees and expenses of 6.35% outperformed the Policy Benchmark by 51 bps on an annualized basis; and (iv) the CTF gross of fee return outperformed the 60/40 Reference Portfolio return by 79.4% (cumulative) over the past 20 years, which equates to an excess value add of \$31.1 billion over the same period.

Mr. Fletcher highlighted: (i) the CTF net of all fees and expenses return outperformed its benchmark for the year-to-date, one-, three-, and five-year time periods; (ii) the CTF net of external manager fee 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, one-, three-, and five-year periods; (v) the VTF net of external manager fee return underperformed its benchmark for the five-, ten-, and twenty-year period; 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 \$2.9 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, and the percentage of WRS assets that are internally managed assets remained consistent. 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 40 of the meeting materials. He noted that policy leverage contributed 9 bps of loss to CTF absolute performance year-to-date, but 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 42-54 of the meeting materials. He highlighted that the CTF's total fund performance exceeds the policy target over all periods and the unadjusted rankings are near median for the one- and ten-year periods, above median for the five-year period, but are third quartile for the three-year period. On an asset allocation adjusted basis, the CTF's rankings are in the first quartile for the last quarter, and 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 the CTF's relative performance converged with peers earlier in 2023 and then trailed for the last two quarters, but still exhibits low tracking error relative to peers.

4. Annual Presentation on Cost Benchmarking

Jameson Greenfield, Chief Financial Officer, presented the annual *SWIB's Cost Effectiveness Annual Evaluation*, included on pages 56-66 in the meeting materials. Mr. Greenfield reported that, based on data

collected and analyzed by CEM, the Board's independent cost consultant, SWIB's 2022 total costs (excluding performance fees) were equal to the U.S. peer median, 0.9 bps higher than the hypothetical CEM benchmark cost, but nearly 7 bps lower than the U.S Public Universe. SWIB's costs exceeded peer median by 14 bps when including performance fees, but this is predominantly due to hedge fund performance fees, which must be considered in the context of the total return generated from the asset class (*i.e.*, higher hedge fund performance fees are largely a function of superior hedge fund returns).

5. Asset Allocation Recommendations for 2024

Joe Nankof, Principal, NEPC, presented the *Asset Allocation Recommendations*, included on pages 68-98 of the meeting materials. Mr. Nankof reviewed the themes of the 2024 asset allocation analysis, including (i) increasing the focus of model portfolios on the longer-term horizon based on 30-year capital market assumptions, due in part to the recent higher volatility of returns in the shorter-term 10-year assumptions, and (ii) examining the allocations to private equity/debt and policy leverage, as well as the mix of public fixed income and public equities, in light of the shift in NEPC's capital market assumptions for future asset class returns and risk. With respect to the ten-year assumptions, Mr. Nankof highlighted that their use can result in a higher churn of the portfolio and transaction costs. He noted that NEPC had made modest changes to its recommendations since those presented at the October Board Workshop.

Mr. Nankof then summarized NEPC's asset allocation recommendations for the Core Trust Fund (CTF) to (i) decrease the target allocation to public equity from 48% to 40%, (ii) increase the target allocation to public fixed income from 25% to 27%, resulting in a net decrease of 6% to public markets overall, (iii) increase the target allocation to private equity/debt from 15% to 18% and expand the range around the private equity/debt allocation from +/- 7% to +/- 8%, (iv) decrease policy leverage from 15% to 12%, and (v) maintain the target allocations to real estate and inflation-sensitive assets. No changes were recommended for the CTF sub-asset class target allocations, the Reference Portfolio, or the Variable Trust Fund (VTF).

Mr. Nankof and Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, then compared the recommended asset allocation to both the current policy and to hypothetical alternative portfolios with higher fixed income allocations. They highlighted that the recommended asset allocation reduces risk while maintaining a generally consistent 30-year expected return without the increased costs and decreased liquidity associated with the higher fixed income portfolios. Mr. Nankof also compared the proposed increase in the public fixed income target allocation to prior allocation changes implemented at SWIB and to public fixed income allocations at peer public pension plans while noting that NEPC does not recommend trying to over-engineer the most efficient portfolio on an annual basis based on fluctuations to the capital market assumptions.

Mr. Nankof and Mr. Mattina concluded by answering questions from the Board related to private market allocations and peer comparisons. The Board thanked staff and NEPC for reviewing the options with the Trustees and collaboration in finalizing the asset allocation recommendations.

Motion: A motion was made by Trustee Schalow and seconded by Trustee Palmer to adopt and approve the asset allocation and active risk targets for the Core Trust Fund and the Variable Trust Fund as set forth and further described in the Asset Allocation Overview and Recommendations for 2024 included in the Board materials, as recommended by the Investment Committee and the Board's asset allocation consultant, NEPC. The motion passed unanimously.

6. Committee Open Session Business

A. Enterprise Risk and Compliance Committee Charter

Ms. Chandler discussed amendments to the Enterprise Risk and Compliance Committee Charter (ERCC), approved by the ERCC and included on pages 100-102 of the meeting materials. She noted minor changes to Committee membership and updating of staff titles.

B. Approved Open Session Investment Committee Minutes

Ms. Chandler stated that the approved open session minutes of the August 22, September 26 and October 24, 2023 Investment Committee meetings were included on pages 103-119 of the meeting materials for the Board's review and noted that staff had previously reviewed the agendas for these meetings with the Board.

C. Agendas for Upcoming Meetings

Ms. Chandler also stated that the final open session agenda for the November 28, 2023 Investment Committee meeting and the draft open session agendas for the December 21, 2023 and January 23, 2024 meetings were included on pages 120-125 of the meeting materials for the Board's review.

Motion: A motion was made by Trustee Merfeld and seconded by Trustee Voelker to approve the revised Enterprise Risk and Compliance Charter, as recommended by the Enterprise Risk and Compliance Committee and presented in the materials.

7. Quarterly Investment Update, Q3 2023

Mr. Mattina presented the *Performance Trends & Outlook*, included on pages 127-141 of the meeting materials. Mr. Mattina began with a review of the CTF five-year rolling annualized net of external manager 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 continued to outperform the policy benchmark though slightly underperformed the actuarial target rate of return for the same period. The CTF twenty-year net of fees return has outperformed both, but Mr. Mattina noted that markets have rallied in the last quarter, which is not included in the returns presented, and he expects that the CTF five-year rolling annualized net of external manager fee return could converge with the twenty-year net of fee return.

Mr. Mattina then provided a brief commentary on the CTF five-year return estimate, which projected an 8.4% five-year annualized return using NEPC's assumptions for 2023 and a 7.9% five-year annualized return using September year-to-date returns for 2023. He noted again that the markets have rallied since the end of September, which will cause both the 2023 estimated performance and the five-year return estimate to increase. Mr. Mattina also introduced new slides that present the forward estimate of the five-year annualized returns and dividend adjustment forward estimates. These slides highlight the potential impact to the five-year annualized return as the 2019, 2020, and 2021 performance years, which had meaningfully positive performance of 19.5%, 15.3%, and 17.0%, respectively, fall out of the five-year time period and are replaced with the NEPC 10-year expected return assumption of 6.7% which shows the potential for a negative dividend adjustment if only the 6.7% annual return assumption is earned. Mr. Mattina concluded with a discussion of benchmark performance year-to-date and an asset class review.

8. 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, 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 employees was made by Trustee Nick and seconded by Trustee Tinnen.

The Chair called for a roll call vote.

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

There being eight ayes and no nays, the Chair declared the motion passed. The Board convened in closed session at 11:48 a.m. and reconvened in open session at 2:48 p.m.

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

Trustee Nick announced that while in closed session the Board: (i) received a closed session quarterly investment update; (ii) discussed implementation of the 2024 asset allocation; (iii) heard a review of expected tail loss analysis; (iv) received a risk management update; and (ii) discussed Investment Committee closed session business.

10. Reports Filed Without Comment

In the absence of questions, the following reports, included on pages 276-289 of the meeting materials, were filed without comment: (i) Quarterly Charges to Funds Report, Q3 2023; (ii) Private Markets and Funds Alpha Commitments, Q3 2023, and (iii) Board Contact Log.

11. Future Items for Discussion

Ms. Chandler noted that the Annual Agenda Plan was included on pages 291-294 in the meeting materials for the Board’s information.

12. Adjournment

Trustee Nick offered closing remarks, noting that this was her last board meeting before stepping down as a Trustee, and that she was honored and thankful to have had the opportunity to serve the WRS beneficiaries for more than eight years and to work with SWIB staff. Edwin Denson, Executive Director/Chief Investment Officer, thanked Trustee Nick for her years of service and leadership and stated he appreciated the opportunity to deliver appreciation remarks to her at the Trustee reception the previous evening.

Hearing no additional items for discussion, Trustee Nick adjourned the meeting at 2:53 p.m.

Date of Board Approval:

Signed:

Clyde Tinnen, Board Secretary

DRAFT

Board Meeting

Tab 3 – Election of Secretary and Assistant Secretary

Board Meeting

Tab 4 – Annual Committee Assignments by Board Chair

Pursuant to the Board Procedures, a Secretary and an Assistant Secretary are elected each year. The Governor appoints the Board Chair and Vice Chair.

Tom Merfeld, Vice Chair and Secretary

Eric Barber, Assistant Secretary

Pursuant to each Committee Charter, the Board Chair shall appoint members of each Committee and appoint members to serve as Committee chair, vice chair and secretary for terms not to exceed one year. These appointments shall be in effect until February 28, 2025.

Audit and Finance Committee

Kristi Palmer, Chair John Voelker, Vice Chair & Secretary Barb Bolens Tom Merfeld State Controller, ex-officio State Auditor, ex-officio

Benchmark and Performance Committee

Dave Schalow, Chair Kristi Palmer, Vice Chair & Secretary Esther Ancel Jeff DeAngelis
--

Compensation Committee

Jeff DeAngelis, Chair Clyde Tinnen, Vice Chair & Secretary Tom Merfeld Dave Schalow
--

Strategic Planning and Corporate Governance Committee

Clyde Tinnen, Chair Esther Ancel, Vice Chair & Secretary Kathy Blumenfeld Barb Bolens John Voelker
--

*If a member has not been appointed, the Board Chair reserves the right to appoint additional Committee members on a temporary or permanent basis.

Board Meeting

Tab 5 – Proposed 2025 Board Meeting Dates

STATE OF WISCONSIN INVESTMENT BOARD Proposed 2025 Board Meeting Dates

Tuesday/Wednesday	March	18/19
Tuesday/Wednesday	June	10/11
Tuesday/Wednesday	September	9/10
Tuesday/Wednesday (off-site)	October	21/22
Tuesday/Wednesday	December	9/10

MEETING SITE:

Offices of the State of Wisconsin Investment Board
4703 Madison Yards Way, Madison, WI 53705
Conference Room – 1st Floor

*Board meetings are held the second Tuesday/Wednesday of the month in June, September & December and the third Tuesday/Wednesday in March & October.

Board Meeting

Tab 6 - Investment Performance and Market Updates

- A. Board Investment Performance Report, Q4 2023 – Greg Fletcher
- B. 2023 Callan Quarterly Report – Ivan “Butch” Cliff



Investment Performance Report

as of December 31, 2023

Executive Summary

December 31, 2023

- The Core Trust Fund returned 7.03% net of all fees and expenses in Q4, resulting in excess performance of -8 bps. For one year, the Core Trust Fund has returned 11.40% net of all fees and expenses, resulting in an excess return of +39 bps.
- The Core Trust Fund five-year net of all fees and expenses return of 9.29% outperforms the Policy Benchmark by +57 bps on an annualized basis.
- The Core Trust Fund gross of fee return outperformed the 60/40 Reference Portfolio return by 66.8% (cumulative) over a 20-year period, which equates to an excess value add of \$29.5 billion over the same period.

WRS Performance

as of December 31, 2023

Fund	Net of All Fees and Expenses Return %			
	Calendar – YTD	1 Year	3 Year	5 Year
Core Trust Fund	11.40	11.40	4.28	9.29
Core Trust Fund Benchmark	11.00	11.00	3.81	8.72
Excess	+0.39	+0.39	+0.46	+0.57
Net Excess Value Add (\$M)	+\$404.6	+\$404.6	+\$1,664.5	+\$3,182.2
Variable Trust Fund	22.24	22.24	6.41	12.71
Variable Trust Fund Benchmark	23.14	23.14	6.65	12.90
Excess	(0.90)	(0.90)	(0.24)	(0.19)
Net Excess Value Add (\$M)	(\$68.5)	(\$40.0)	(\$63.9)	(\$76.1)

SWIB's investment management has added more than \$3.1 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	9.40	7.09	7.12	7.96
Core Trust Fund Benchmark	8.72	6.69	6.79	7.56
Excess	+0.68	+0.40	+0.33	+0.40
Variable Trust Fund	12.76	9.25	8.39	8.76
Variable Trust Fund Benchmark	12.90	9.32	8.42	8.55
Excess	(0.14)	(0.07)	(0.03)	+0.21

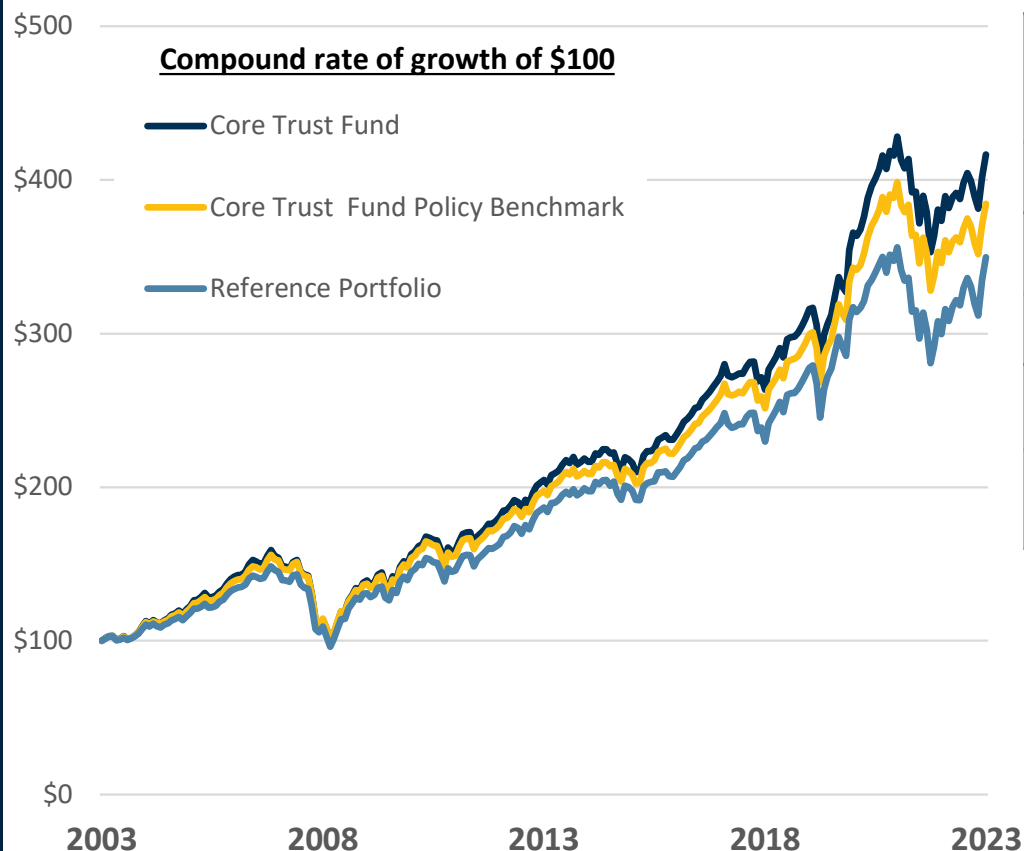
(Annualized Return shown for all periods greater than 1 yr)

Excess returns may contain rounding differences

CTF Performance vs. 60/40 Reference Portfolio

20-year cumulative return¹: January 1, 2004, to December 31, 2023

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



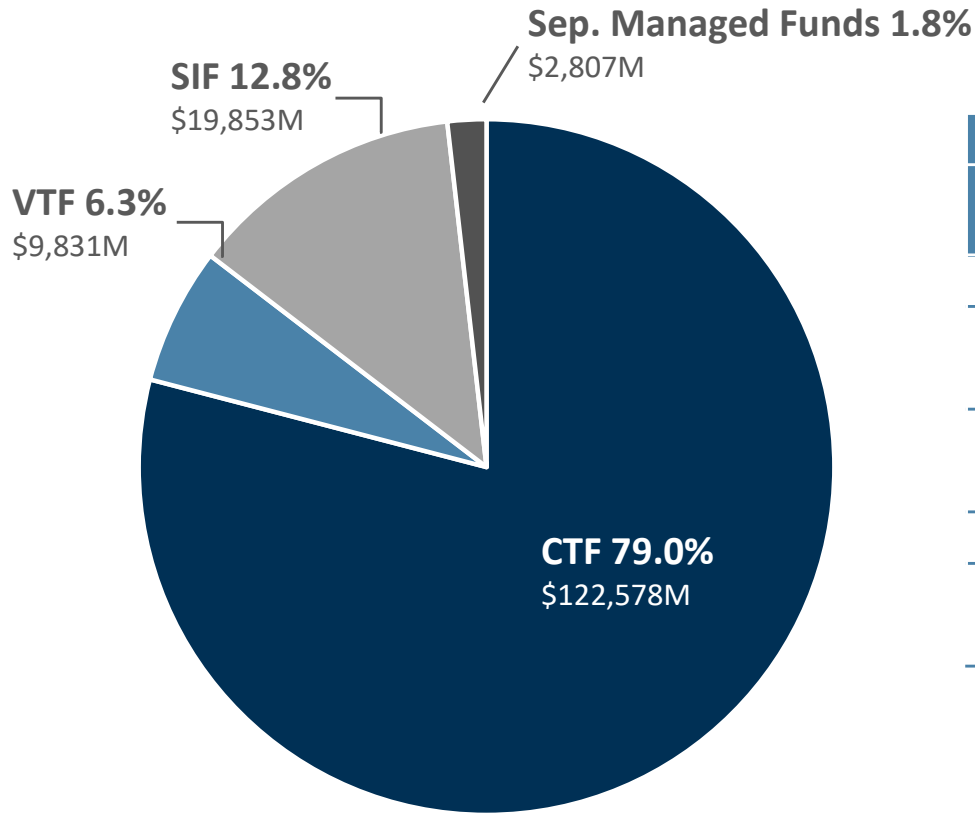
Portfolio / Benchmark	Annualized Gross Return	Cumulative Gross Return	Cumulative \$ Excess Value Added
Reference Portfolio ² (60% equity/40% bonds)	6.5%	249.7%	= Passive Market Return
Benefit of CTF Asset Allocation			
CTF Policy Benchmark	7.0%	284.4%	+\$16.6B
Benefit of CTF Active Management			
CTF Actual Results	7.4%	316.5%	+\$12.9B
CTF Excess Return vs. Reference Portfolio	+0.9% pts	+66.8% pts	+\$29.5B

¹ Core Trust Fund beginning market value, as of January 1, 2004, was \$56.9B and ending market value, as of December 31, 2023, was \$122.6B

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 December 31, 2023



Gross Market Value of Assets (\$millions)			
By Fund	12/31/2022	12/31/2023	1 Year Change
Total WRS	122,933	132,409	+9,476
Core Trust Fund	114,494	122,578	+8,085
Variable Trust Fund	8,439	9,831	+1,391
State Investment Fund (SIF) ¹	17,742	19,853	+2,111
Separately Managed Funds	2,618	2,807	+190
Total SWIB AUM	\$143,293	\$155,069	+\$11,777

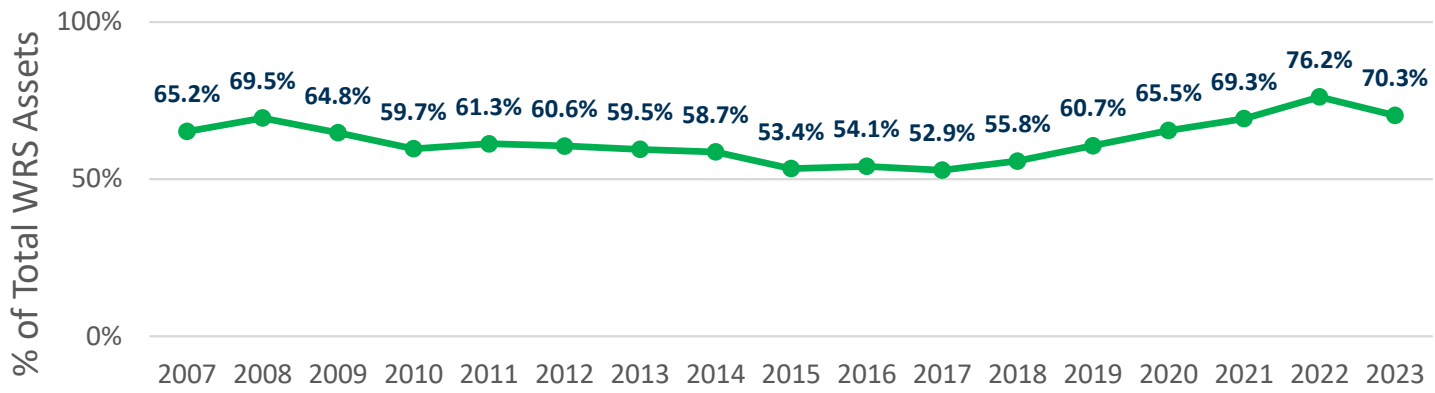
¹ Excludes cash invested in SIF held on behalf of CTF and VTF

Refer to the report disclosures section for additional details

WRS Assets as of December 31, 2023

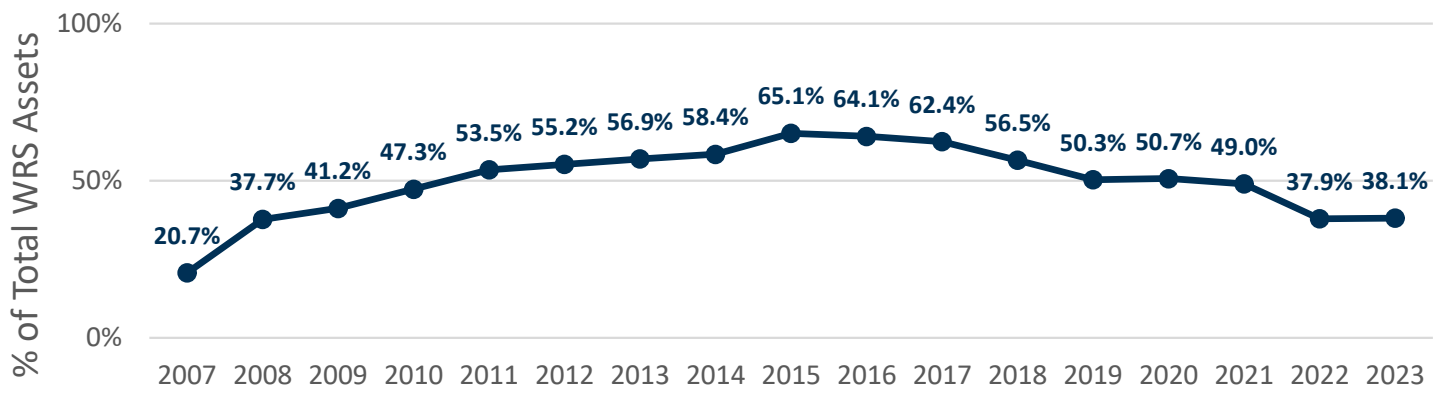
Breakdown of Active vs. Passive and Internal vs. External

Actively Managed Assets



Actively managed assets are a larger share of WRS AUM

Internally Managed Assets



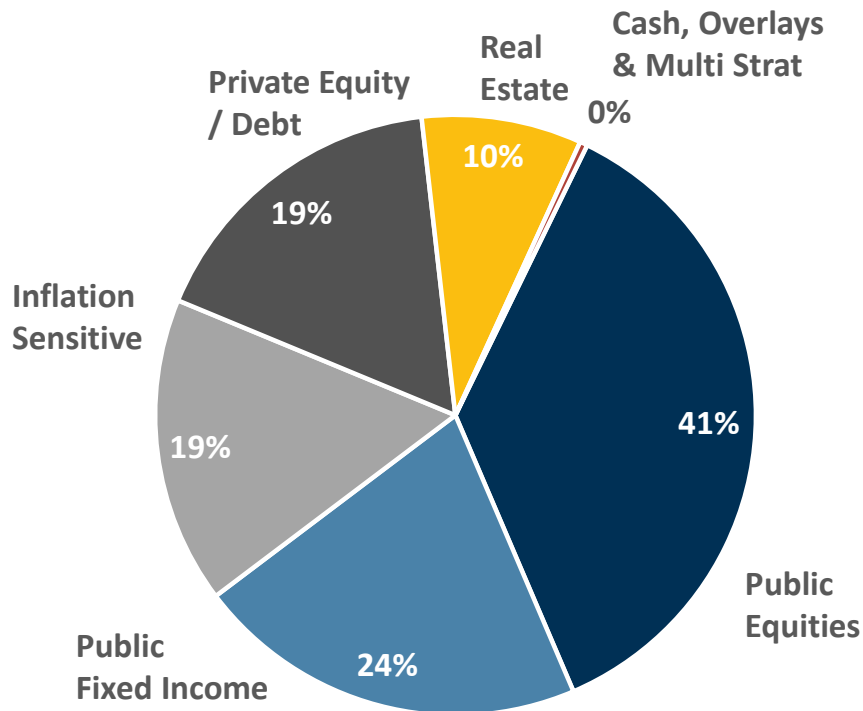
45% of Total SWIB Assets (including SIF) are internally managed

Refer to the report disclosures section for additional details

Core Trust Fund Assets Under Management

Breakdown by Asset Class as of December 31, 2023

**Total Exposure - % of Total
12/31/2023**



Total CTF by Asset Class	Total Exposure \$ & Adjusted AUM (\$millions)		
	Total Exposure \$ 12/31/2022	Total Exposure \$ 12/31/2023	Year over Year Change
Public Equities	49,623	50,730	+1,107
Public Fixed Income	27,155	29,495	+2,340
Inflation Sensitive	21,641	23,057	+1,416
Real Estate	12,003	12,037	+34
Private Equity / Debt	20,843	23,665	+2,822
Multi Asset	1	0	(1)
Cash & Overlays	303	562	+259
Total Exposure	\$131,570	\$139,546	+7,976
<i>Less: Policy Leverage</i>	<i>17,077</i>	<i>17,058</i>	<i>+19</i>
Total CTF AUM	\$114,494	\$122,488	+7,994

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

The Real Estate and Private Equity / Debt asset classes (29% of the Core Trust Fund) contain Illiquid Investments, as defined in "Report Disclosures: Glossary, Definitions & Data Sources," section below.

Core Trust Fund Allocation

All exposures shown as of December 31, 2023

Allocation – Exposure View

Strategies	(\$ millions)	As % of Total Fund		Target Range %	Notes
	Total Exposure	Portfolio Exposure %	Benchmark Target %		
Public Equities	50,730	41.42	41.77	35.77– 47.77	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 report disclosures section
Global Developed	40,953	33.43	33.60		
US Small Cap	3,010	2.46	2.49		
International Small Cap	2,722	2.22	2.26		
Emerging Markets	4,045	3.30	3.42		
Public Fixed Income	29,495	24.08	24.09	18.09 – 30.09	
Investment Grade	17,617	14.38	14.45		
Non-Investment Grade	8,871	7.24	7.23		
Emerging Market Debt	3,006	2.45	2.41		
Inflation Sensitive	23,057	18.82	19.00	14.0 – 24.0	
Real Estate	12,037	9.83	9.83	5.8 – 13.8	
Private Equity / Debt	23,665	19.32	19.32	10.0 – 26.0	
Cash / Overlays	562	0.46	0.00		
Leverage	(17,058)	(13.93)	(14.00)	(22.0) to (6.0)	
Total Fund – Total Exposure	\$139,546	113.93	114.00	106.0 – 122.0	
Total Fund – Market Value	\$122,488	100.00	100.00		

Asset \$ exposures and % weights may contain rounding differences

Core Trust Fund: Asset Class Returns

as of December 31, 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	\$50,383	21.68	21.68	5.98	12.12	8.18
Benchmark			22.62	22.62	6.36	12.44	8.47
Excess			(0.93)	(0.93)	(0.38)	(0.32)	(0.29)
Global Developed	2/28/2017	\$39,175	23.38	23.38	7.20	12.90	10.34
Benchmark			24.39	24.39	7.76	13.35	10.72
Excess			(1.01)	(1.01)	(0.57)	(0.45)	(0.38)
Global Equities w/EM	5/31/2021	\$1,498	22.70	22.70			3.60
Benchmark			22.74	22.74			2.96
Excess			(0.03)	(0.03)			+0.64
US Small Cap	2/28/2017	\$3,010	17.32	17.32	3.08	11.52	8.23
Benchmark			18.44	18.44	3.45	10.76	7.72
Excess			(1.12)	(1.12)	(0.37)	+0.76	+0.51
International Small Cap	1/31/2020	\$2,736	14.35	14.35	0.43		3.50
Benchmark			15.90	15.90	0.12		3.97
Excess			(1.55)	(1.55)	+0.31		(0.47)
Emerging Market ex China	3/31/2022	\$3,370	20.24	20.24			(0.23)
Benchmark			20.15	20.15			0.35
Excess			+0.08	+0.08			(0.59)
Emerging Market China	3/31/2022	\$587	(11.86)	(11.86)			(12.92)
Benchmark			(11.26)	(11.26)			(11.54)
Excess			(0.59)	(0.59)			(1.38)

Core Trust Fund: Asset Class Returns

as of December 31, 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	\$29,240	8.92	8.92	(2.29)	2.33	2.38
Benchmark			8.51	8.51	(2.28)	2.23	2.26
Excess			+0.40	+0.40	(0.01)	+0.10	+0.11
Investment Grade US Credit	2/28/2022	\$7,021	9.05	9.05			(1.90)
Benchmark			8.18	8.18			(1.90)
Excess			+0.87	+0.87			+0.00
US Treasuries	2/28/2022	\$7,100	3.77	3.77			(3.91)
Benchmark			4.05	4.05			(3.62)
Excess			(0.28)	(0.28)			(0.28)
US Long Treasuries	9/30/2022	\$908	2.99	2.99			1.98
Benchmark			3.06	3.06			1.96
Excess			(0.08)	(0.08)			+0.02
MBS	4/30/2020	\$2,335	7.30	7.30	(3.00)		(1.95)
Benchmark			5.05	5.05	(2.86)		(2.24)
Excess			+2.25	+2.25	(0.15)		+0.29

(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 report disclosures section for additional details

Core Trust Fund: Asset Class Returns

as of December 31, 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	\$5,856	13.05	13.05	0.55		2.89
Benchmark			12.65	12.65	1.79		3.50
Excess			+0.40	+0.40	(1.24)		(0.61)
Leveraged Loans	3/31/2023	\$3,015					10.03
Benchmark							9.97
Excess							+0.06
Emerging Market Debt - USD	6/30/2005	\$1,529	10.56	10.56	(2.98)	2.06	3.29
Benchmark			11.09	11.09	(3.56)	1.67	3.22
Excess			(0.53)	(0.53)	+0.58	+0.40	+0.07
Emerging Market Debt - Local	7/31/2017	\$1,476	13.13	13.13	(2.89)	1.13	(0.02)
Benchmark			12.70	12.70	(3.16)	1.14	0.24
Excess			+0.43	+0.43	+0.27	(0.01)	(0.25)
Inflation Sensitive	12/31/2003	\$23,054	3.92	3.92	(0.95)	3.24	2.01
Benchmark			3.90	3.90	(1.00)	3.15	1.94
Excess			+0.03	+0.03	+0.05	+0.09	+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 report disclosures section for additional details

Core Trust Fund: Asset Class Returns

as of December 31, 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	\$12,037	(7.10)	(7.10)	8.00	6.17	8.54
Benchmark			(12.89)	(12.89)	6.19	4.72	7.13
Excess			+5.78	+5.78	+1.81	+1.45	+1.41
Private Equity / Debt	11/30/2006	\$23,665	6.36	6.36	16.05	15.42	14.25
Benchmark			6.35	6.35	14.87	12.97	11.84
Excess			+0.00	+0.00	+1.19	+2.44	+2.41
<i>Other strategies:</i>							
Alpha Pool Overlay	1/31/2011	\$11,745	0.68	0.68	3.24	3.99	2.54
Benchmark (set to zero as of 1/1/2019)		(at 1/1/22 = \$6,336)	0.00	0.00	0.00	0.00	0.78
Excess			+0.68	+0.68	+3.24	+3.99	+1.76

(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 report disclosures section for additional details

Core Trust Fund: Asset Class Returns

Net of External Mgr Fee - Excess Returns as of December 31, 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 report disclosures section for additional details

Core Trust Fund: Alpha Pool Overlay

as of December 31, 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	\$11,745	0.68	0.68	3.24	3.99	2.54

- 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	\$7,934 (68%)	2.53
Multi Strat	2/1/2022	\$2,451 (21%)	-.57
Global Equity	4/1/2023	\$804 (7%)	-1.15

* 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)	11.00	11.00	3.81	8.72	6.69
Alpha Pool Overlay Return (Alpha Pool + Beta)	11.68	11.68	7.06	12.71	9.23

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

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

Variable Trust Fund

as of December 31, 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	\$9,830	22.31	22.31	6.47	12.76	9.25
Variable Trust Fund Benchmark			23.14	23.14	6.65	12.90	9.32
Excess			(0.83)	(0.83)	(0.18)	(0.14)	(0.07)

(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	9,796	99.65	100.00	
US Equities	6,851	69.69	70.00	65.0 – 75.0%
International Equities	2,945	29.96	30.00	25.0 – 35.0%
Cash & Overlays	34	0.35	0.00	
Total Fund	\$9,831	100.00	100.00	

- *Asset class exposures are within the Target Range*

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

Separately Managed Funds

as of December 31, 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	\$22,572	5.15	5.15	2.25	1.90	1.29
SIF Benchmark			4.92	4.92	2.23	1.83	1.25
Excess			+0.22	+0.22	+0.02	+0.06	+0.04
State Life Insurance Fund	10/31/1994	\$99	6.71	6.71	(5.33)	1.74	3.04
No Benchmark							
Historical Society Endowment Fund	12/31/1993	\$25	21.27	21.27	5.95	12.26	9.44
Historical Society Endowment Benchmark			20.68	20.68	5.72	11.89	9.23
Excess			+0.59	+0.59	+0.23	+0.37	+0.21
Injured Patients & Families Comp. Fund	10/31/1993	\$1,446	8.75	8.75	(1.39)	3.91	3.77
IP&FC Benchmark			8.44	8.44	(1.66)	3.43	3.32
Excess			+0.31	+0.31	+0.27	+0.48	+0.45
UW System Long Term Fund	3/31/2018	\$556	12.05	12.05	4.05	8.39	6.75
UW System Benchmark			11.88	11.88	3.94	8.22	6.55
Excess			+0.18	+0.18	+0.11	+0.17	+0.20
UW Cash Management Fund	4/30/2022	\$681	9.36	9.36			3.73
UW Cash Management Benchmark			9.36	9.36			3.81
Excess			+0.00	+0.00			(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 report disclosures section for additional details

Leverage Performance

As of December 31, 2023

CTF Policy Leverage Performance

as of December 31, 2023

Core Trust Fund	Net of External Manager Fee Return %			
	Calendar YTD	1 Year	3 Year	5 Year
Unlevered Returns (as estimated):				
Portfolio ¹	10.87	10.87	4.33	8.85
CTF Benchmark Return ¹	10.34	10.34	3.75	8.17
Excess Return	+0.54	+0.54	+0.58	+0.68
<hr/>				
Portfolio Return (Unlevered)	10.87	10.87	4.33	8.85
Absolute Return from Leverage ^{1,2}	0.66	0.66	0.06	0.55
Implementation (+) or (-)	(0.01)	(0.01)	(0.00)	0.00
<hr/>				
Levered Returns (as reported):				
Portfolio	11.53	11.53	4.39	9.40
CTF Benchmark	11.00	11.00	3.81	8.72
Excess	+0.53	+0.53	+0.58	+0.68

(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 report disclosures section for additional details

Callan Quarterly Report Summary

4th Quarter 2023

SWIB STATE OF WISCONSIN
INVESTMENT BOARD

March 20, 2024

**State Of Wisconsin Investment
Board**

**Callan Associates Performance
Reporting**

Ivan "Butch" Cliff, CFA
Executive Vice President
Director of Research

What Callan is doing for SWIB

Purpose of the project and the resulting service relationship

- SWIB contacted Callan mid-2011 and expressed the desire for performance and risk analysis relative to “true” peers
- Purpose was to better understand and evaluate results compared to relevant peer funds
 - Public funds only
 - Very large in asset size to reflect both the advantages of scale as well as burdens of huge assets
 - Reasonably large sample size for robust and meaningful analysis
- Callan constructed and is maintaining a custom peer group for SWIB using our proprietary fund sponsor database that aggregates data from Callan clients and outside data vendors
- SWIB custom peer group results:
 - ~60 public funds with assets in excess of \$10 BB
 - Callan continues to maintain peer group by adding new members where appropriate
- Callan supplies SWIB with a detailed quarterly report using this custom peer group
 - Asset allocation analysis (actual and policy) versus peers
 - Total fund performance and risk analysis versus target and peers
 - Asset class performance versus targets and peers
 - Present summary results to the Board annually

Relevant Background Information on SWIB Investment Program

Important differentiating factors when evaluating strategy/performance vs. peers

- SWIB is one of the few ~100% fully-funded public funds in the US (assets \geq liabilities).
- Results from strong governance, prudent and disciplined benefit/contribution policies, appropriate investment policies, and effective investment practices.
- ~100% funded status along with some benefit flexibility gives SWIB more strategic investment policy options
- Many public funds are ~70% funded (many less) and feel forced to take on increasing levels of equity-like risks in an attempt to close the gap.
 - Underfunded peers need to exceed actuarial returns to close their gaps (absent large contribution increases).
 - To “tread water” a 70% funded plan with a 7% return hurdle needs to generate a 10% return (7% / .70).
- SWIB only has to meet its actuarial return hurdle (6.8%) on assets to maintain fully-funded status.

Relevant Background Information on SWIB Investment Program

Important differentiating factors when evaluating strategy/performance vs. peers

- SWIB can afford to utilize a more diversified strategic investment policy than most public funds.
- SWIB's policy is less reliant on, and concentrated in, equity-like risks and can still meet goals.
 - Uses moderate financial leverage to diversify fund's risk exposures to better counterbalance equity-like risks.
 - SWIB uses tenets of a well-known investment strategy, Risk Parity, to construct a more risk-balanced portfolio that is more robust against equity drawdowns than traditional peer portfolios.
 - SWIB's strategy uses moderate financial leverage (~15%) to raise exposure to a conservative fixed income portfolio as a "flight to quality" hedge against volatile equity/credit market scenarios. SWIB's leverage allows for this extra fixed income and diversification without having to fund from growth assets. Most peers have less fixed income and/or more aggressive, higher risk fixed income programs to pursue higher return.
- SWIB maintains a cost-effective mix of internal and external investment management that provides a material total fund cost advantage vs. peers.



SWIB Performance Reporting
Gross of Fees as of 12/31/23

5 Year Cumulative Returns vs. Target (Gross, 12/31/23)

Cumulative Returns Actual vs Target

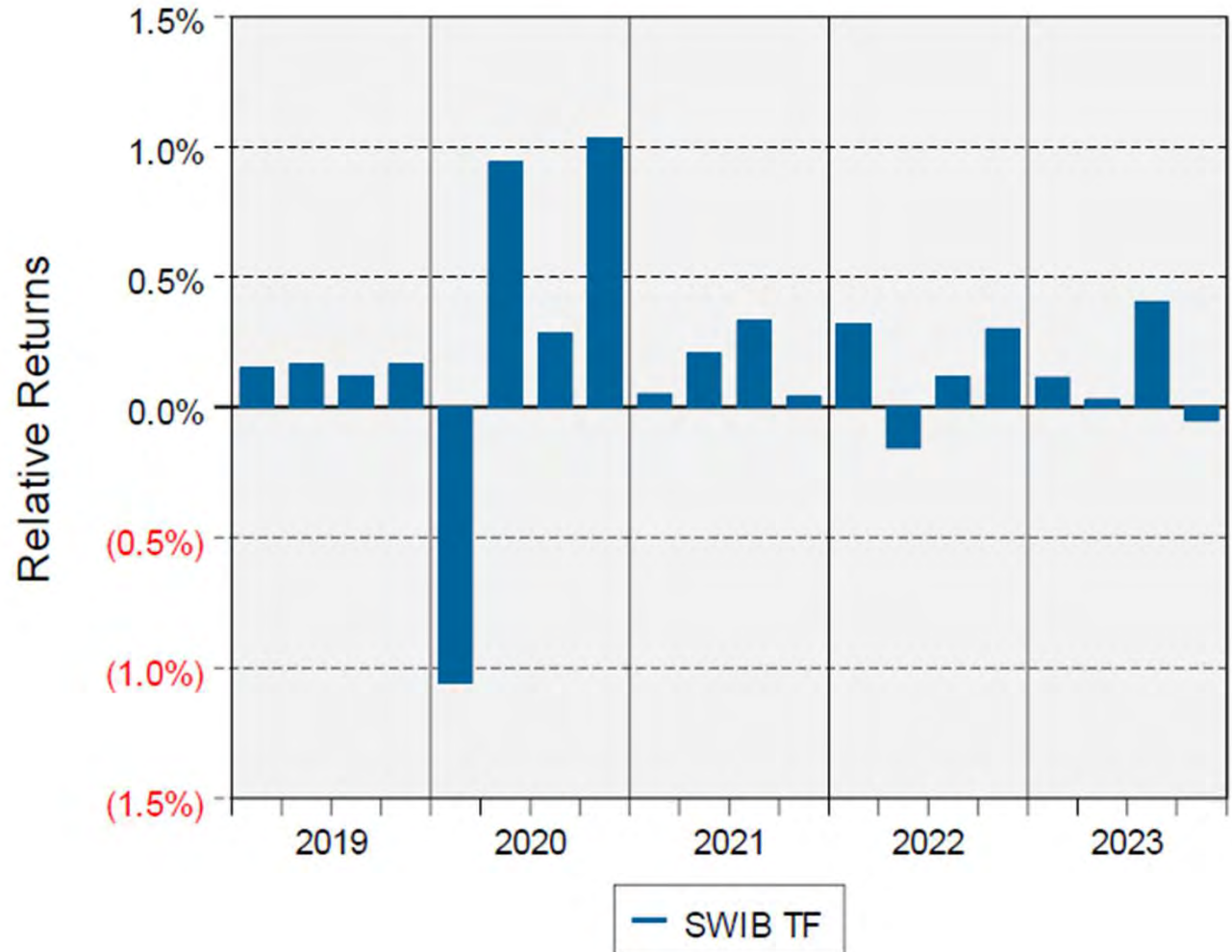


- Over last five years SWIB generated absolute returns of 9.58% annualized, beating its actuarially required return of 6.8% by 2.78%. The target policy return of 8.82% exceeded the actuarial return by 2.02%.
- SWIB has added value above it's target policy return with excess returns of +76 bps annualized, resulting in a cumulative excess return of +5.40%.
- Results generated with high diversification and very low tracking error due to robust risk management.

5 Year Return Consistency vs. Target (Gross, 12/31/23)

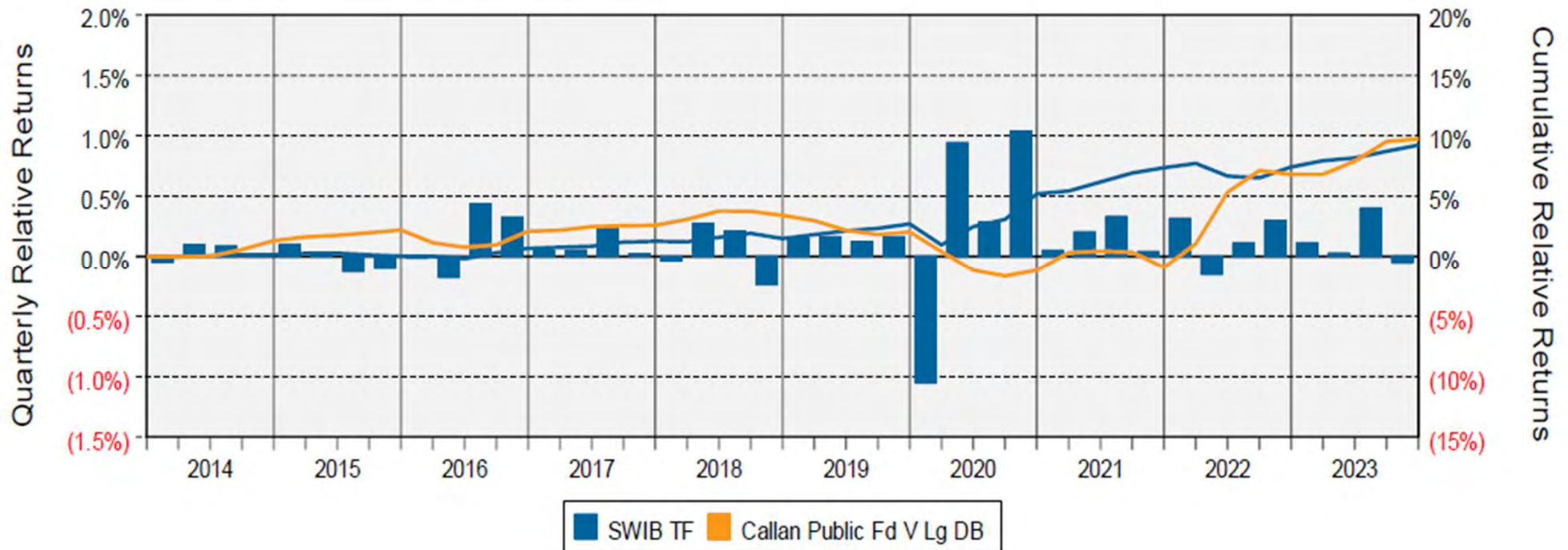
- Highly controlled tracking error relative to target (note small scale).
- Consistent positive excess returns over last 5 years with an 85% batting average (17/20 qtrs).
- Consistency and risk control resulted in a relatively smooth ride to excess return of +76 bps annualized over last 5 years.
- Strong 3 year results with excess return of +59 bps annualized and 83% batting average (10/12 qtrs).
- The trailing 1 year outperformance was +55 bps with a 75% batting average (3/4 qtrs.)
- Continuation of the normally low tracking error relative to the more extreme markets of 2020.

Relative Return vs Target



10 Year Return Consistency vs. Target (Gross, 12/31/23)

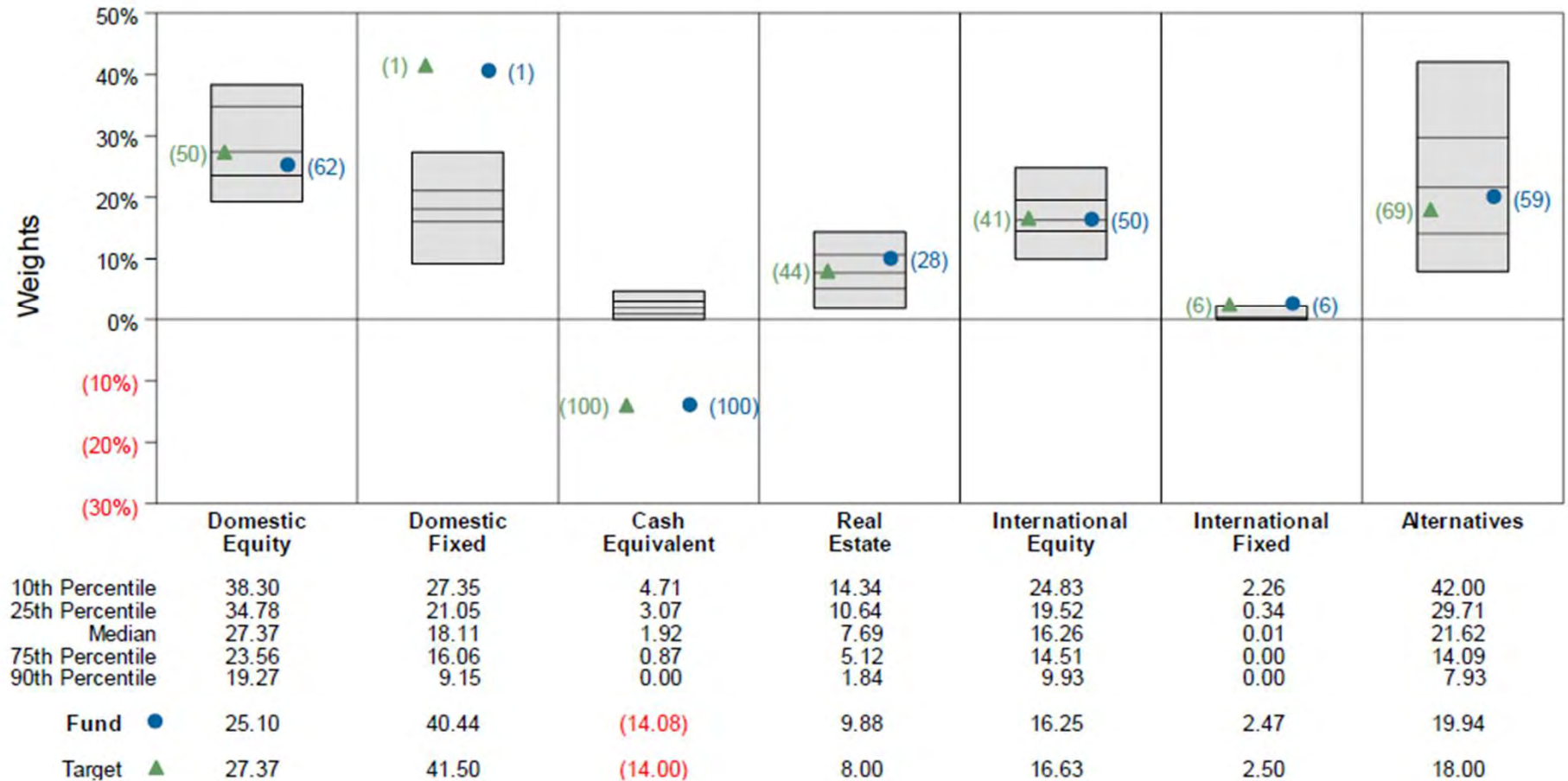
Cumulative and Quarterly Relative Returns vs Target



- Longer 10 year time frame shows similar consistency and risk control.
- Smooth accumulation of excess return over very long time periods.
- Annualized 10 year excess return of +49 bps resulting in a cumulative excess return of +9.09%.
- Both actual return of 7.35% and target return of 6.86% exceed actuarially required return of 6.80%.

Asset Allocation Comparison to Custom Peer Group (12/31/23)

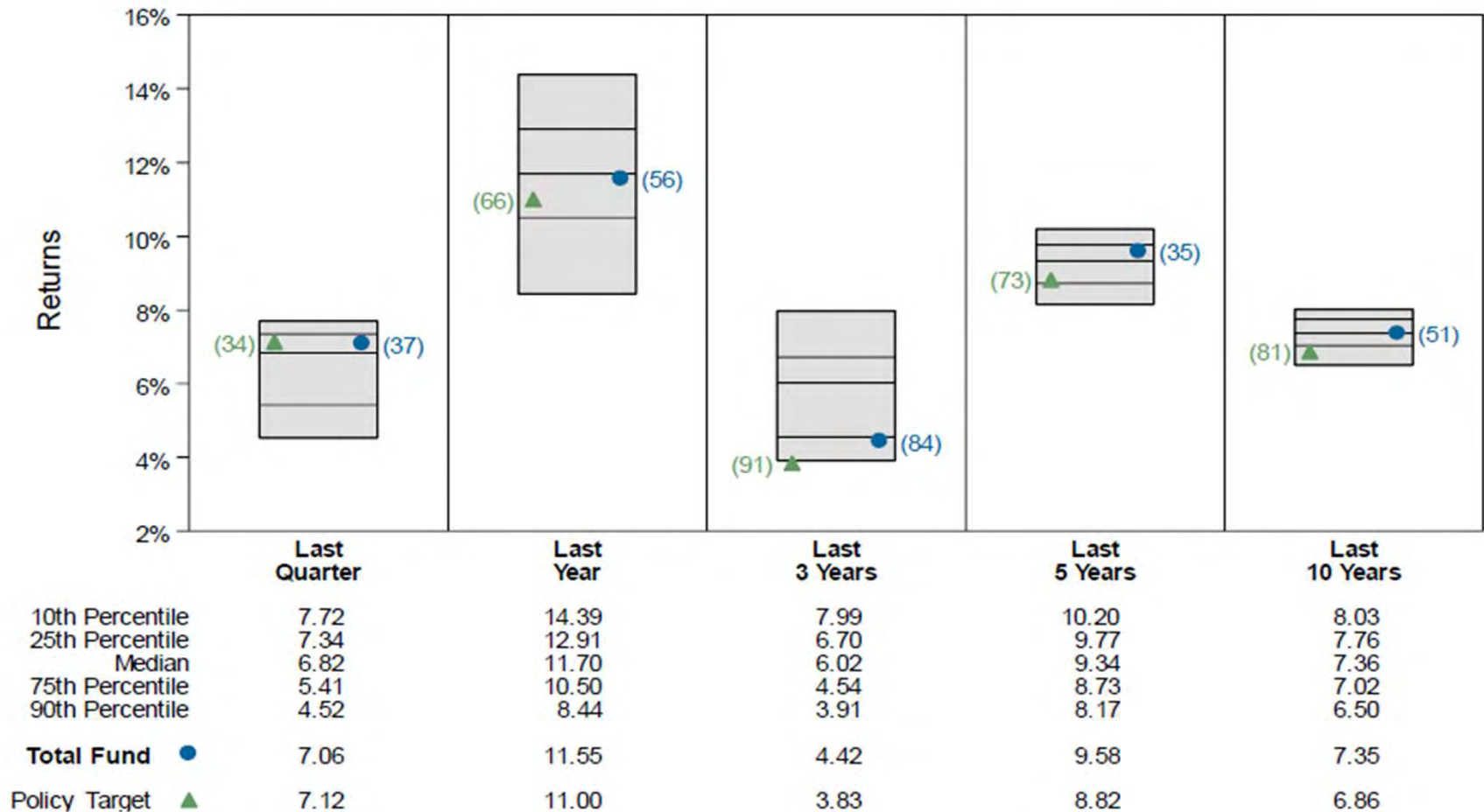
Asset Class Weights vs Callan Public Fund Spons- V Lg DB (>10B)



- SWIB's use of financial leverage (~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).
- Leverage enables much higher risk-reducing fixed income than peers, while still having similar amounts of growth assets.

Cumulative Performance Rankings vs. Peers (Gross, 12/31/23)

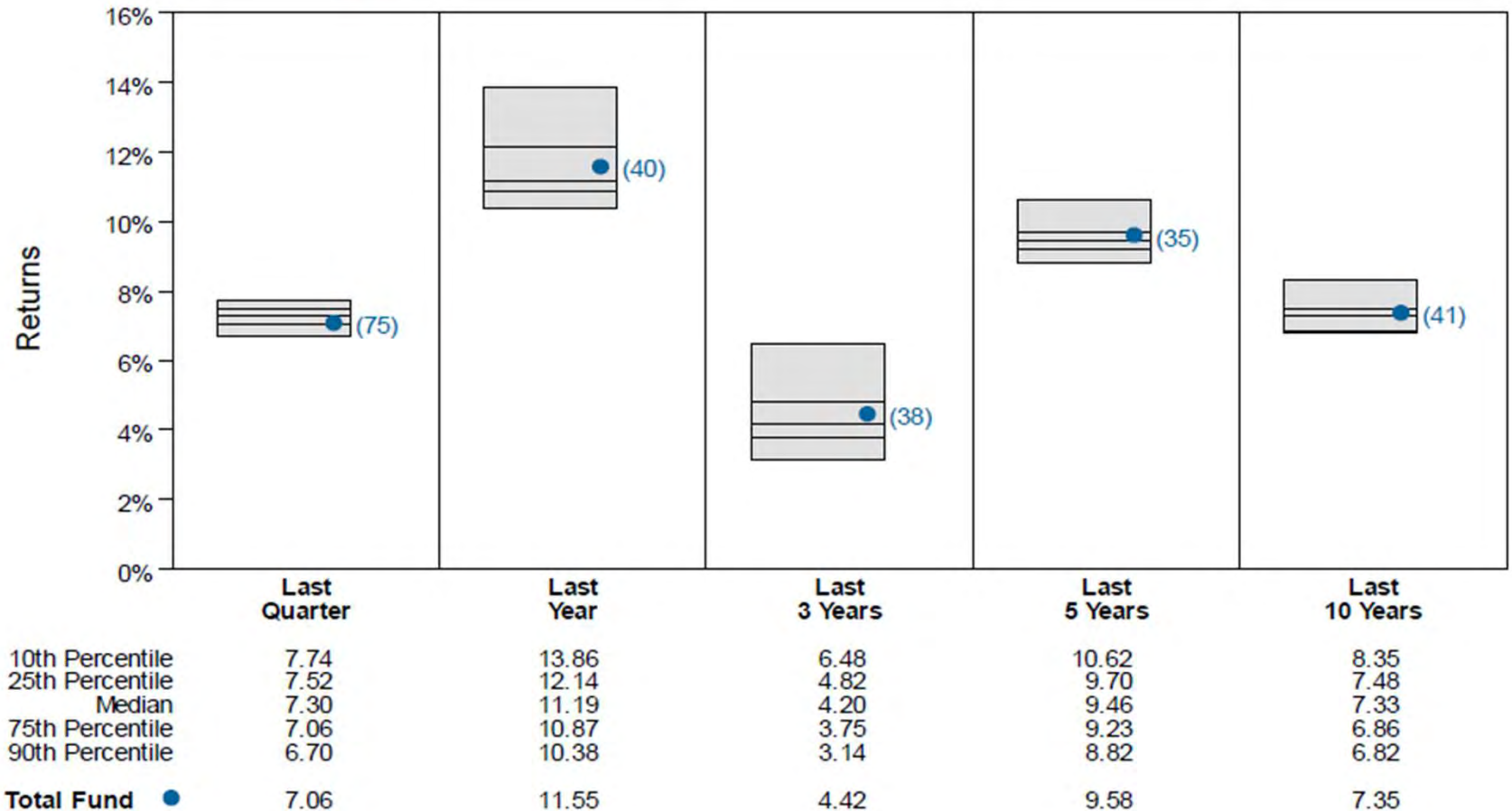
Callan Public Fund Spons- V Lg DB (>10B)



- Actual total returns above policy target returns for all periods shown except last quarter.
- Competitive 1, 5, 10 year rankings entirely due to value-add above target, as policy target return trailed peers.
- SWIB's policy target trailed peers badly in 2022, having a negative effect on the 3 year ranking (and for longer periods).

Callan Proprietary Allocation Adjusted Ranking vs. Peers (Gross, 12/31/23)

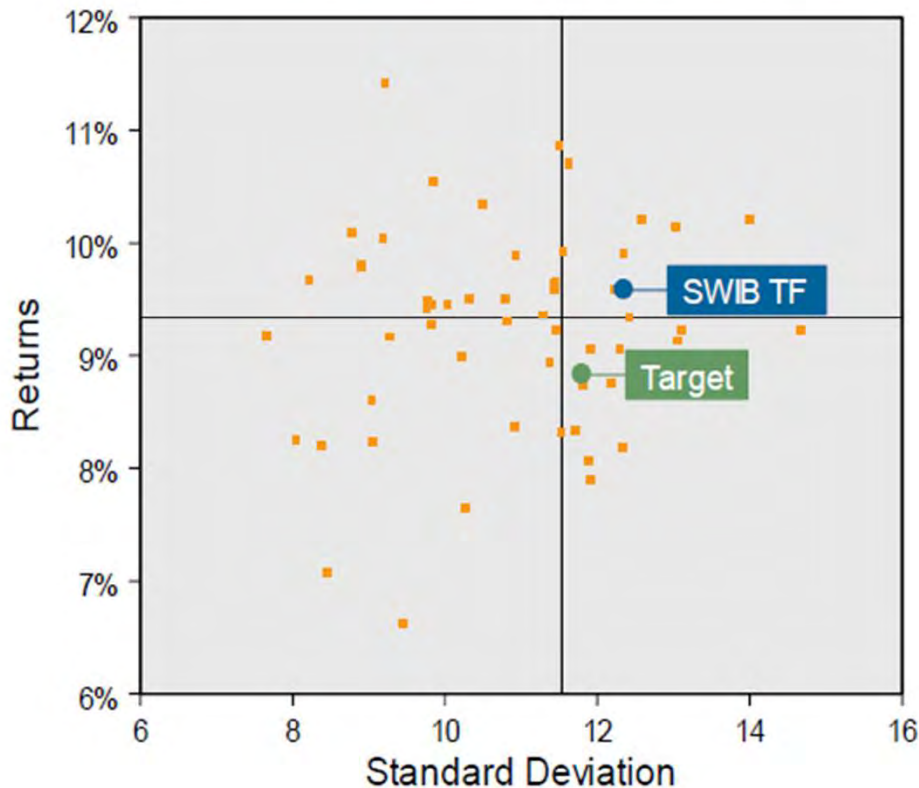
Asset Allocation Adjusted Ranking



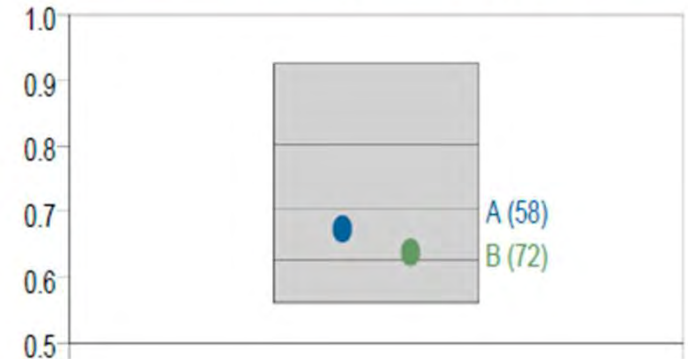
- Asset allocation adjusted ranking adjusts peers to match SWIB's more risk-balanced asset allocation (inc. leverage). Result is a risk-adjusted peer ranking not dominated by asset allocation, reflecting the quality of program implementation.
- Adjusting for SWIB's unique asset allocation policy moves even the poor 3 year ranking to above median.
- Asset allocation adjusted peer rankings are above median over all medium to long periods. Program well implemented.

Absolute Risk / Reward Tradeoff vs. Peers (Gross, 12/31/23)

Callan Public Fund Spons- V Lg DB (>10B) (Gross)
Annualized Five Year Risk vs Return



Sharpe Ratio vs. Callan Public Fund Spons- V Lg DB (>10B)

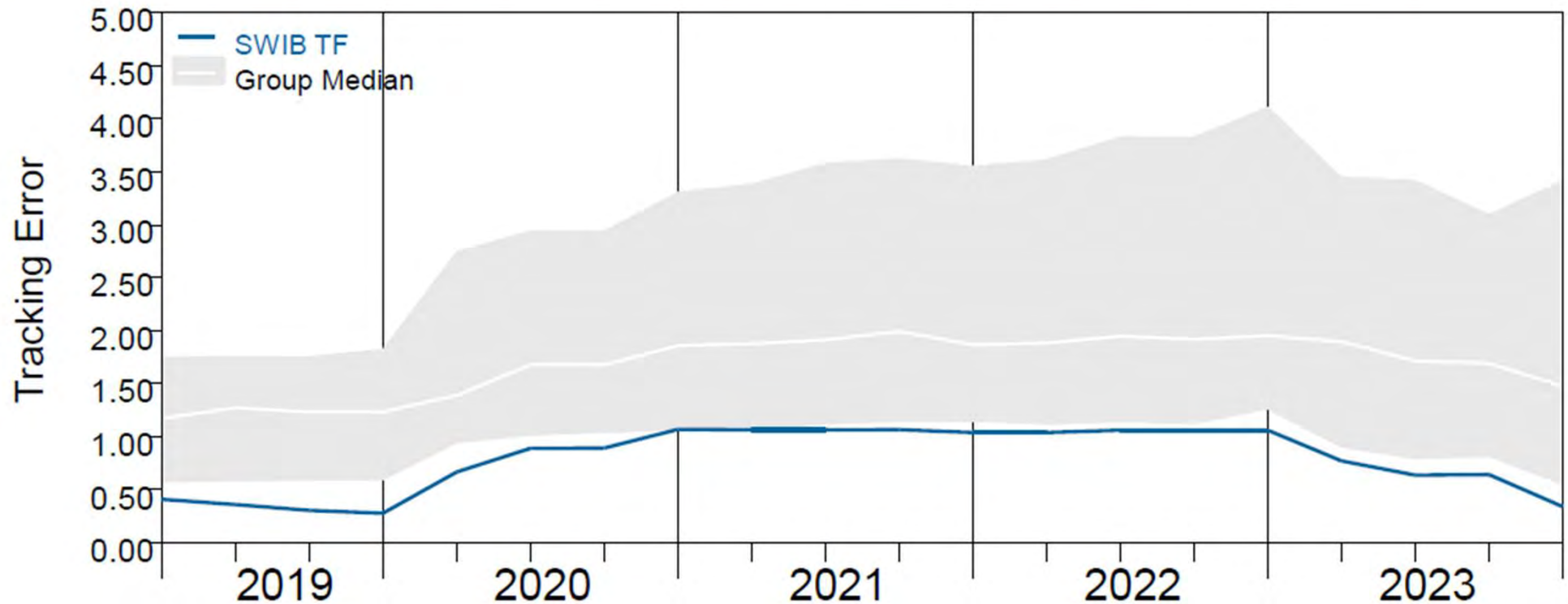


	Last 5 Years
10th Percentile	0.88
25th Percentile	0.75
Median	0.65
75th Percentile	0.58
90th Percentile	0.51
SWIB-Total Fund A	0.62
SWIB-Total Fund Target B	0.59

- Policy Target had slightly more risk and a lower return (-52 bps) than peer median (crosshairs).
- Actual implementation (SWIB TF) added some more risk and extra return over target (+76 bps) and peers (+24 bps).
- Absolute risk/reward tradeoff (Sharpe Ratio) near median even with more risk. Risk/return tradeoff is competitive.
- Actual Sharpe Ratio slightly better than policy target meaning implementation added more return than risk.

Tracking Error (active risk) vs. Target and Peers (Gross, 12/31/23)

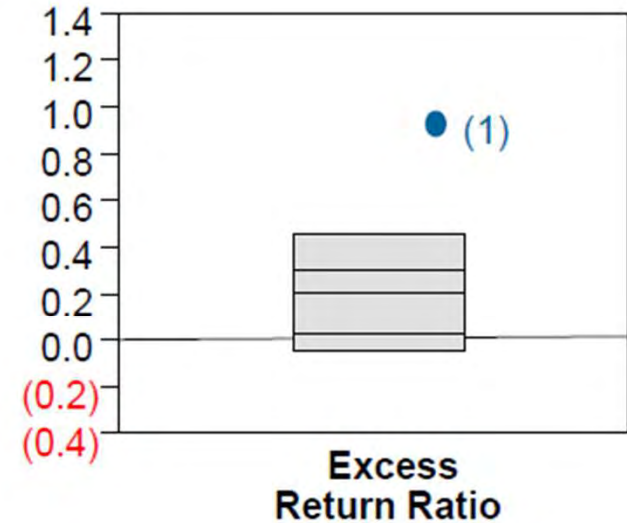
Rolling 12 Quarter Tracking Error vs Targets Compared to Callan Public Fund - Large



- Strong risk control practices result in consistently much lower tracking error than peers have versus their policy targets.
- SWIB's tracking error is consistently in the bottom decile vs. peers and less than half of median peer tracking error.
- Less chance of materially underperforming policy target. Focused on consistency of results (singles/batting average vs. home runs/strikeouts).

Relative Risk/Reward Tradeoff vs. Target and Peers (Gross, 12/31/23)

Risk Statistics Rankings (Gross) vs Large Public Funds
Five Years Ended December 31, 2023



10th Percentile
25th Percentile
Median
75th Percentile
90th Percentile

0.73
0.56
0.36
0.02
(0.12)

3.79
2.66
1.73
1.33
1.08

10th Percentile
25th Percentile
Median
75th Percentile
90th Percentile

0.46
0.30
0.20
0.03
(0.05)

SWIB TF ●

0.76

0.83

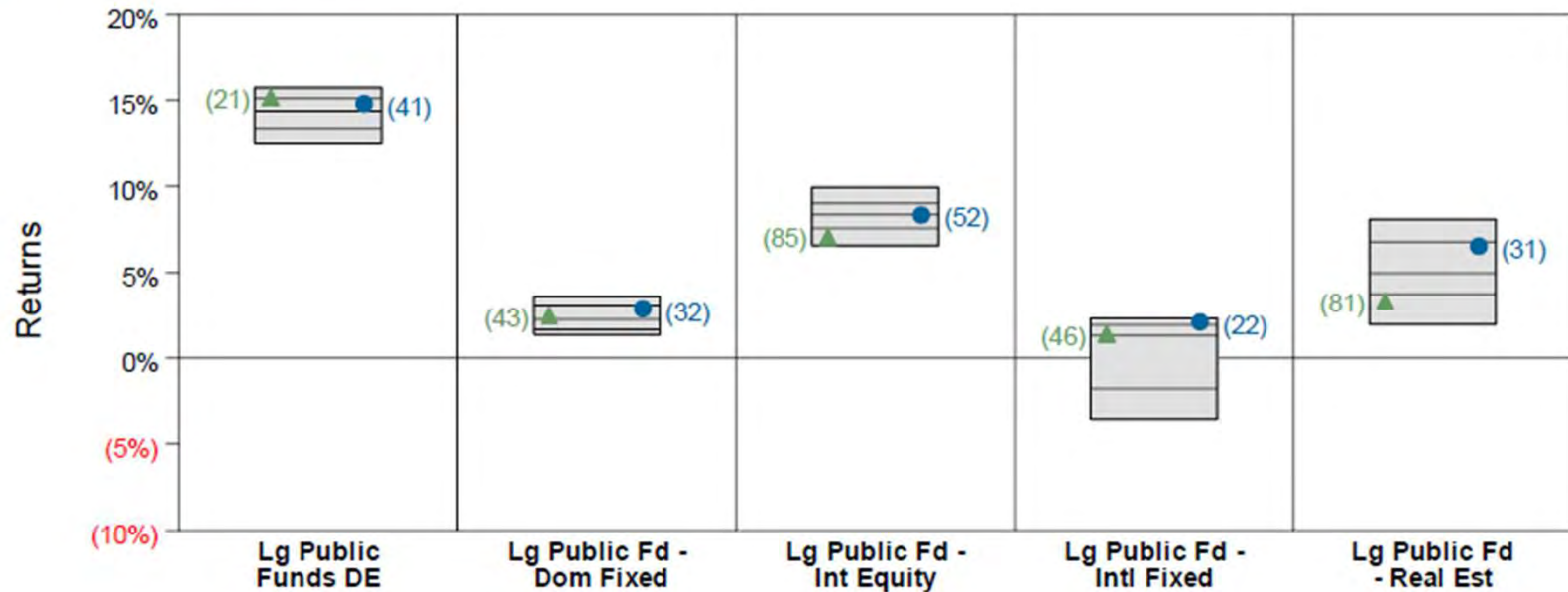
SWIB TF ●

0.92

- Positive Excess Returns, top decile vs. peers, without taking near as much active risk from policy target as peers.
- Consistently very low Tracking Error versus policy target in absolute terms and relative to peers (bottom decile).
- Combination results in top decile Excess Return Ratio (aka Information Ratio) rankings. Risk/return tradeoff is great.

Asset Class Comparisons vs. Targets and Peers (Gross, 12/31/23)

Total Asset Class Performance
Five Years Ended December 31, 2023



	Lg Public Funds DE	Lg Public Fd - Dom Fixed	Lg Public Fd - Int Equity	Lg Public Fd - Intl Fixed	Lg Public Fd - Real Est
10th Percentile	15.74	3.61	9.97	2.33	8.10
25th Percentile	15.11	3.09	9.04	1.95	6.81
Median	14.37	2.26	8.37	1.31	4.99
75th Percentile	13.38	1.67	7.58	(1.75)	3.75
90th Percentile	12.55	1.37	6.60	(3.59)	1.97
Asset Class Composite ●	14.73	2.81	8.27	2.02	6.47
Composite Benchmark ▲	15.16	2.49	7.08	1.40	3.34

- 4/5 asset classes outperformed their targets over 5 years. US Equity trailed its target but did well vs. peers.
- 4/5 asset classes rank above median vs. peers. Int'l Equity ranked slightly below median but beat its benchmark handily.
- Value has been added relative to target and peers through skillful implementation across multiple asset classes.

Biographical Information



Ivan “**Butch**” Cliff, CFA, is an Executive Vice President and Director of Research. He is responsible for the following groups: Global Manager Research, Capital Markets & Alternatives Research and Published Research. Butch is a member of Callan's Management, Client Policy Review, Institute Advisory and Alternatives Review Committees. He is also a Portfolio Manager and member of the Investment Committee that oversees all of Callan's discretionary multi-manager solutions. Butch is a shareholder of the firm.

Butch joined the Programming Group of Callan in 1989 and was instrumental in developing sophisticated performance analytics as well as solutions to data processing and management problems. In 1993 he became the Manager of the Database Group with responsibility for coordinating the design and implementation of performance measurement operations as well as overseeing the development and maintenance of Callan's databases. Butch was made Director of Operations in 2000 and has responsibility for the management and development of all Callan's performance monitoring systems and personnel. In 2007, Butch became the Director of Investment Research & Operations with responsibilities expanded to include oversight of Callan's Global Manager Research activities.

Prior to joining Callan, Butch worked for two years at Gifford Fong Associates developing analytical software for fixed income money managers.

Butch earned a BA in Economics from the University of California at Berkeley and earned the right to use the Chartered Financial Analyst designation.

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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 = $((1 + r^1) \times (1 + r^2) \times (1 + r^3) \dots)^{\wedge} (\text{calendar units} / \text{time interval measured}) - 1$; $r^{(n)}$ = 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).
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
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
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.
Illiquid Investments	Those investments that may be difficult to sell or be sold quickly because of a lack of market or ready or willing investors.
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.
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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> <p><u>SWIB Annual Reports:</u> Additional WRS disclosures can be found in the Annual Reports, available at https://www.swib.state.wi.us/list-of-investments.</p>

Leverage Disclosures

Calculation formulas to estimate impact

Report Disclosures

Notes on CTF Leverage Analysis

Term	Description / Definitions
<p>Portfolio Return (Unlevered)</p>	<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>
<p>CTF Benchmark Return (Unlevered)</p>	<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 7 – Committee Open Session Business

- A. Amendments to Investment Committee Charter

- B. Amendments to WRS Investment Committee Investment Guidelines

- C. Approved Open Session Investment Committee Meeting Minutes of November 28, 2023, December 21, 2023, and January 23, 2024

- D. Final Open Session Investment Committee Agenda for February 27, 2024 and Draft Open Session Agendas for March 21 and April 23, 2024

- E. Draft Open Session Minutes of November 9, 2023 Enterprise Risk and Compliance Committee meeting

SWIB INVESTMENT COMMITTEE CHARTER

Board Approval Date: April 2005

Last revised [March 2024]

The State of Wisconsin Investment Board (SWIB) Investment Committee, in conjunction with SWIB management and the Board of Trustees, has developed the following policies and procedures relating to the prudent management of SWIB's assets.

Committee Membership:

Executive Director/Chief Investment Officer (ED/CIO) (Chair)

Head of Asset & Risk Allocation

Head of Global Public Market Strategies

Head of Private Markets & Funds Alpha

Two individuals from the Investment Staff appointed by the Head of Asset & Risk Allocation with the approval of the ED/CIO

Two individuals from the Investment Staff appointed by the Head of Global Public Market Strategies with the approval of the ED/CIO

Two individuals from the Investment Staff appointed by the Head of Private Markets & Funds Alpha with the approval of the ED/CIO

Two individuals from the Investment Staff appointed by the ED/CIO

Deputy Executive Director/Chief ~~Administrative-Operating~~ Officer (non-voting)

Chief Legal Counsel (non-voting)

Head of Risk Management (non-voting)

The Chair of the Committee will appoint ~~a Vice-Chair and~~ a Secretary of the Committee, who will serve in such roles until the Chair appoints a replacement.

I. Committee Purpose and Charter

The Investment Committee (the "Committee") is created to provide oversight of SWIB investments within the parameters established by the Board of Trustees. Oversight will include an analysis of risk and return at the portfolio, asset class, and Core Trust Fund (CTF) and Variable Trust Fund (VTF) levels. Additionally, the Committee will provide input to the Board on asset allocation and benchmark recommendations.

In general, the Committee will focus on various policies and procedures of the agency to ensure they are consistent with industry standards and that they continue to keep pace with prudent investment theory and practice.

The Committee will review decisions made with regard to deviations from established benchmarks and allocation of investments among internal management and external management, including decisions with regard to passive, active and quantitative styles.

The Committee is responsible for (i) proposing to the Board of Trustees changes to its Investment Policy; (ii) approving the SWIB Investment Committee Wisconsin Retirement System Investment Guidelines (IC Guidelines); (iii) ~~approving investment guidelines for passive externally managed portfolios;~~ (iv) approving the general strategies for each investment division; and (v) approving new investment instruments. All investment guidelines must be consistent with the investment authority provided in Wis. Stat. ch. 25. External investment guidelines are independent of, and are not limited by, the internal investment guidelines.

II. Duties and Responsibilities

- A.** The Committee will suggest and recommend changes to the Board of Trustees' Investment Policy, as necessary.
- B.** The Committee will review periodically and approve changes and additions to the IC Guidelines and will report any revisions to the Board of Trustees.
- C.** The Committee may examine internally and externally managed portfolios, individual investments, correlation among portfolios, and such other matters as the Committee deems appropriate for the purpose of understanding, measuring, controlling, monitoring and reporting SWIB investment exposure.
- D.** The Committee will review and approve the use of new investment instruments prior to their implementation in internal SWIB portfolios.
- E.** The Committee will oversee the review and implementation of any other new investment programs or initiatives in all SWIB portfolios and will coordinate any necessary related Trustee approvals.
- F.** For purposes of fulfilling its risk management and oversight responsibilities, the Committee will act as liaison between the SWIB Investment Staff and SWIB Trustees on issues concerning investment risk management.
- G.** The Committee will review asset class strategies at least quarterly to assess established risk limits and evaluate strategy and will approve such strategies annually. The relevant Investment Staff shall be solely responsible for the specific investment decisions used to execute the approved strategies.
- H.** The Committee will review all compliance-related issues referred by the Enterprise Risk and Compliance Committee, including compliance with statutes, administrative rules, internal and external manager investment guidelines or as otherwise requested.

- I.** The Committee will review annual asset allocation plans and strategies and will review and approve any proposed changes to SWIB's strategic asset allocation and fund-level active risk objectives before they are presented to the Board for approval. The Committee will provide consultation and assistance to the Trustees, ED/CIO and staff concerning total fund allocation changes or rebalancings, as needed.

~~**J.** Passive External Manager Guideline Waivers.~~

~~The Committee will review and act on all requests from passive external managers for waivers to provisions in their investment guidelines. On an emergency basis when it is impractical to timely convene a meeting of the Investment Committee, either the Chair or Vice Chair of the Committee, with the concurrence of either the Secretary of the Committee or the Deputy Executive Director/Chief Administrative Officer, may approve a waiver. That waiver will be brought to the Committee for ratification at its next regularly scheduled meeting.~~

- K.J.** The Committee may review and analyze other compliance-, risk- or derivative-related matters that are directed to the attention of the Committee by the Trustees, the Legislative Audit Bureau, the Internal Audit group, SWIB investment operations and fund accounting staff, the Risk Management division, the Compliance division or others and report as appropriate.

- L.K.** The Committee will receive quarterly reports regarding transitions and shall review with the applicable Investment Staff the costs and impacts associated with the transitions. It will also from time to time review reports on the trading effectiveness of the SWIB traders.

- M.L.** The Committee will review annual benchmark recommendations from the Board-appointed benchmark consultant and will provide its evaluation and recommendation to the Board.

~~**N.** The Committee will review and revise passive external portfolio guidelines as necessary.~~

- O.M.** The Committee will establish procedures for the methodology and frequency of review of (i) fund, asset class and portfolio performance, (ii) performance attribution, (iii) allocation within asset classes and (iv) risk levels. Procedures will be shared with the Board of Trustees.

- P.N.** The Committee will conduct periodic round table discussions of the economic and investment environment.

III. General Committee Procedures

- A.** A majority of the voting members of the Committee constitute a quorum. A majority of a quorum is required to take any Committee action or approve any motion. If an approved motion lacked the support by the Committee Chair, the results of the vote shall be reported in a separate report to the Board of Trustees at its next regularly scheduled meeting. Any member proposing or

responsible for oversight of an investment being brought to the Committee for approval will be recused from the vote.

- B.** The Committee shall establish a regular monthly meeting schedule. Non-routine meetings may be called by any Committee member with sufficient lead time to provide appropriate notice of the meeting under Wis. Stat. § 19.84(3).
- C.** The Committee Charter shall be approved by the Board of Trustees.
- D.** Minutes of Committee meetings shall be kept and be provided to Trustees. Regular Board meetings shall include an agenda item for discussion of Committee actions and proceedings.
- E.** The Committee may establish standing subcommittees or temporary working groups to carry on assigned activities. Such subcommittees or working groups will report on their activities to the Committee as requested by the Committee.

IV. Derivative Investments

- A.** Procedures for review, processing and monitoring of derivative investments will be established by the Committee.
- B.** Specific investment policies regarding the use of derivative instruments are determined for each portfolio by the IC Guidelines. Such policies, as amended from time to time, are officially contained in the IC Guidelines or external manager contracts.
- C.** The Chief Financial Officer or designee will review with the Committee any changes in the accounting treatment and required note disclosures for external reporting purposes used for derivative instruments, based on the applicable fund, the characteristics of the instrument and any underlying assets or liabilities.

SWIB Investment Committee
WISCONSIN RETIREMENT SYSTEM
INVESTMENT GUIDELINES

Revised as of

~~May 23~~ December 21, 2023

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I. INTRODUCTION

The SWIB Board of Trustees (the “Board”) has delegated to the investment staff of SWIB standing authority to manage the assets of the Core Retirement Trust Fund (the “Core Fund”) and the Variable Retirement Trust Fund (the “Variable Fund”), which together make up the Wisconsin Retirement System (the “WRS”), pursuant to the Board’s WRS Investment Policy and to section 25.15(2) of the Wisconsin Statutes and section IB 2.02 of the Wisconsin Administrative Code. The Investment Committee was created to provide oversight of WRS¹ investments within the parameters established by the Board and pursuant to the Investment Committee’s Charter approved by the Board. To properly and prudently execute its delegated authority and oversight functions, the Investment Committee has established guiding policies, guidelines and procedures, which are set forth in this document, the Investment Committee Investment Guidelines (these “IC Guidelines”). These IC Guidelines articulate the policies and guidelines that are employed in the day-to-day management of the WRS assets by SWIB’s staff. This document will be reviewed periodically and updated as necessary by the Investment Committee to reflect changes in investment strategies and to reflect best industry practices for prudent investors. Notwithstanding the delegation of authority by the Board to the Investment Committee for the establishment, approval, and amendment of the policies, guidelines and procedures included in these IC Guidelines, the Board reserves all rights to modify and amend these IC Guidelines at any time in its discretion. Any changes to these IC Guidelines will be periodically reported to the Board. In addition to these IC Guidelines, SWIB staff may also have to comply with Risk, Compliance Division or legal requirements, and review operational readiness with Operations staff prior to the trading of the instruments and securities authorized herein.

II. LEVERAGE USE POLICY

Introduction

Leverage is an exposure to an asset that is not fully collateralized by cash assets or an exposure to an asset acquired that has not been fully funded. Leverage by itself does not necessarily create additional market risk or variation in market returns. Leverage may result in greater diversification and lower market risk than an unlevered portfolio under normal market conditions. The funds managed by SWIB can have exposure to leverage through different structures, instruments and vehicles.

¹ The Investment Committee also has oversight of the State Investment Fund and other funds managed by SWIB as described in the Board’s SIF and Separately Managed Funds Investment Policy and Guidelines.

SWIB uses leverage in two primary ways. The first is to express the overall policy asset allocation, which includes leverage (“Policy Leverage”). Generally, Policy Leverage is implemented passively. The total amount of Policy Leverage is approved by the Board through the WRS asset allocation process. The Board-approved asset allocation targets for each asset class together with the approved Policy Leverage is called the “Policy Portfolio.” The second use of leverage is to fund the alpha pool (“Alpha Pool Leverage”), which overlays alpha-producing strategies on the overall Core Fund Policy Portfolio. Those alpha strategies are funded with additional leverage but are not part of the Policy Portfolio. The total amount of Alpha Pool Leverage is limited by the Board-approved active risk target and range.

Certain internal active portfolios are also authorized to use portfolio-specific leverage. The Core Fund may provide limited unallocated cash to such internal active portfolios, and to other portfolios, to fund short-term financing needs, and charge a market-based funding rate to the applicable portfolio. Active internal and external portfolios may also fund portfolio leverage by financing assets within the portfolio.

Use of leverage introduces distinct liquidity risk that can vary based on leverage sources and margin requirements. Often, leverage requires liquid assets to satisfy margin obligations. Liquidity risk is managed by monitoring the level of liquidity required in various market scenarios and ensuring that an adequate reserve of liquid assets is available to meet commitments in times of market stress. Having a variety of leverage sources diversifies the refinancing risk and mitigates cost under varied market scenarios.

Alpha Pool and Policy Leverage can be generated through several different mechanisms. These mechanisms may be utilized in different proportions given market conditions and asset allocations. Each of these mechanisms have unique counterparty dynamics and risks, all of which are addressed by SWIB’s counterparty risk framework.

Derivative instruments. Leverage can be gained by replacing a physical instrument with a derivative instrument such as a futures contract, a swap contract, or a forward contract. Most of the proceeds generated from the sale of the physical instrument can then be used to finance further investment. The cost of the leverage is imbedded in the price of the derivative instrument. Use of derivative instruments provides the ability to source large scale leverage across many different asset classes in a standardized format. There is a risk of tracking error, or basis risk, between the physical instrument and the derivative instrument that could result in the returns of the two instruments diverging.

Securities Lending Cash Collateral. Through the course of securities lending, cash collateral may be received from borrowers. This cash may be used to finance leverage needs without creating basis risk. The available cash fluctuates day to day and is governed by the borrowing demand of and choice of collateral posted by market participants.

Repurchase Agreements (Repo). Repo is another way to gain leverage from physical instruments, like securities lending, without using derivative instruments. While securities lending relies on borrowing demand for the physical instrument, repo can

generate leverage from physical instruments that do not have borrow demand, and also creates zero basis risk. The repo and the underlying asset management may be executed internally, externally or a mix of the two. An agency repo model can be used to facilitate operational scale, collateral efficiency, and market access by partnering with an external agent.

Secured Borrow Agreements. Physical instruments can be pledged as collateral in a secured borrow agreement to gain financing from a bank or other financial institution, as and when needed. This form of financing creates zero basis risk and may have maturities ranging from three to six months. The stability of the available capital can vary based on the financing bank’s or financial institution’s balance sheet constraints.

New mechanisms may be added from time to time and included herein.

Leverage Use Philosophy

Leverage is used where it can improve investment portfolio efficiency in terms of return for risk versus alternative choices that do not use leverage. Leverage will also be used to improve portfolio diversification and reduce portfolio concentration.

Leverage Monitoring

Detailed reporting is regularly (i.e., daily, monthly and quarterly) produced by SWIB to provide feedback regarding leverage exposures for review by portfolio managers, the head of Asset and Risk Allocation (ARA), the Risk Management Division, and the Executive Director/Chief Investment Officer (ED/CIO). Leverage use risk metrics are reported at least quarterly to the Investment Committee. Leverage use is also periodically reported by the ED/CIO to the Board.

Policy and Alpha Pool Leverage Guidelines

1. Leverage ratios govern leverage derived from beta sources (i.e., from levered asset class exposures). Established leverage ratio ranges for each levered asset class are set forth below. Current Leverage Ratio is defined as the ratio of notional exposure to capital available in the portfolio (or total exposure to unencumbered exposure in the case of repo). If the Current Leverage Ratio for any levered asset class exceeds the Maximum Target Leverage Ratio, SWIB will, within 30 days (unless such time limit is waived with majority approval of the rebalancing task force), reduce exposure or add capital to bring the Current Leverage Ratio within the established range. A Current Leverage Ratio below the Minimum Target Leverage Ratio will be monitored as part of the overall optimization of capital and funding costs.

<i>Levered Asset Class</i>	Minimum Target Leverage Ratio	Target Leverage Ratio	Maximum Target Leverage Ratio
<i>US Large Cap Equity</i>	2.7	3.3	4.0
<i>US Small Cap Equity</i>	2.7	3.3	4.0

<i>MSCI World xUS Equity</i>	2.7	3.3	4.0
<i>US TIPS</i>	6.0	8.0	10.0
<i>US Treasuries</i>	8.0	10.0	12.0

III. DERIVATIVES USE POLICY

Introduction

A "derivative instrument" is an investment instrument which usually derives its value and marketability from an underlying instrument which represents direct ownership of an asset or a direct obligation of an issuer (e.g. a "spot" or cash market instrument). SWIB recognizes that derivatives provide a means through which SWIB can implement investment strategies in a more cost and time efficient manner than through the physical investment of the underlying securities. Additionally, derivatives can be used to facilitate SWIB's risk management activities including risk mitigation. Derivatives include such instruments as futures, swaps, options and currency forwards and may be exchange traded, traded over-the-counter (OTC) and/or cleared.

Derivatives Use Objectives

The overall strategic objective of SWIB's use of derivatives is to facilitate risk exposure management and to manage the cost of investing. Objectives for derivatives use include:

1. Constructing portfolios with risk and return characteristics that could not efficiently be created using underlying physical securities,
2. Changing systematic exposures without executing trades in the underlying physical securities,
3. Hedging or managing risks, and
4. Effecting varying active and passive investment strategies including, but not limited to: portable alpha, currency hedging, equitization, relative value trades, transition management, and rebalancings.

Derivatives Use Monitoring and Reporting

Derivatives use exposures will be monitored by portfolio managers that employ derivatives, the ED/CIO and the Risk Management Division. The Investment Committee will monitor derivatives use exposures and risk metrics on a quarterly basis or more frequently as needed.

Derivatives Guidelines Applicable to all WRS Internal Portfolios:

1. Exchange-traded derivatives must be traded on a recognized exchange approved by the Investment Committee, except for exchange-traded derivatives that are traded pursuant to Exchange for Related Position (EFRP) transactions, which are traded off-exchange and not subject to this requirement. Such approved exchanges are listed on *Appendix 1*. As

additional exchanges are approved *Appendix 1* shall be updated without amendment to these IC Guidelines.

2. OTC derivatives may only be traded with counterparties with which SWIB has a current International Swap and Derivative Association (ISDA) agreement that includes a Credit Support Annex (CSA).

In addition:

- a) The counterparty, or its guarantor, must, on each date on which a transaction is entered into, have an actual credit rating of not less than: (1) "A2/P2" on short-term debt from S&P or Moody's; and/or (2) "Baa2/BBB" on long-term debt from S&P or Moody's.
 - b) The collateral that SWIB holds under a CSA may be invested in the following:
 - i. Bank deposit accounts;
 - ii. Any money market fund having a rating of at least "Aaa" by Moody's or at least "AAA" by S&P;
 - iii. Overnight commercial paper having a rating of at least "P-1" by Moody's and "A-1" by S&P;
 - iv. Overnight repurchase agreements with U.S. government, agency or dollar cash collateral;
 - v. Overnight reverse repurchase agreements with U.S. government, agency or dollar cash collateral; and
 - vi. The State Investment Fund or similar short term investment funds.
3. For clarity, Items 1 and 2 do not apply to exchange-traded funds (ETFs), or to over-the-counter derivatives entered into on behalf of SWIB, or a title-holding entity that is wholly-owned by SWIB, by either an external manager or advisor in connection with a real estate separate account.
 4. Investments may be made in exchange-traded notes (ETNs) which are traded on exchanges included on an approved-exchange list maintained by the Compliance Division. The Risk and Compliance Divisions shall be notified upon any investment in a new ETN.
 5. Investments may be made in put option contracts and call option contracts on securities, futures or an index of a group of securities. Put and call options may be purchased or sold on investments that could be held in the portfolio if the options were exercised.
 6. Currency exposure management is permitted (but not required) through the use of exchange-traded currency instruments, and through the use of spot and forward contracts in foreign currencies (including FX Swaps). Direct currency hedging is permitted to directly hedge currency exposure back to the U.S. dollar. Cross-currency exposure

management to transfer out of an exposed currency and into a benchmark currency is permitted.

7. Guideline limits and soft parameters for each portfolio will be applied to the aggregate exposures which include both physical and synthetic securities.
8. New derivatives instruments will be reviewed and approved by the Investment Committee before their implementation or use.
9. SWIB shall not enter into new derivatives agreements with new counterparties until the ED/CIO has approved the agreement. Each relevant division head or portfolio manager shall submit to the ED/CIO a written summary of any proposed addition of a relationship that may require evaluation of counterparty credit risks. Such relationship may involve (a) entering into a master netting or trading agreement with a new counterparty, which acts either as a principal or as an agent on behalf of multiple principals, or (b) hiring an external manager to implement a strategy that may require the manager to evaluate and monitor counterparty credit risks on SWIB's behalf (excluding external managers selected by Private Markets and Funds Alpha staff [and ARA staff](#) pursuant to their portfolio guidelines). The ED/CIO will review all proposals of such new relationships to determine that (i) the addition of the relationship is consistent with SWIB's investment goals and strategies, (ii) the appropriate loss and drawdown limits for the credit risk associated with the proposed counterparty relationship have been considered, and (iii) appropriate due diligence has been conducted. The relevant division head or portfolio manager ("Initial Division User") shall retain responsibility for monitoring any such approved relationship. If another division expects to use the derivatives agreement for trading strategies after its initial approval, the ED/CIO, Initial Division User and the new division lead shall agree on the strategy for monitoring for the counterparty.

IV. Rebalancing Procedures

1. Mandatory rebalancing is triggered by the procedures in the Board's WRS Investment Policy and the procedures below, as applicable. The Core Fund and Variable Fund asset mixes will be reviewed at least monthly for potential rebalancing.
2. A rebalancing task force will consist of the ED/CIO and the heads of ARA, Global Public Markets Strategies (GPMS) and Private Markets & Funds Alpha (PMFA). The ED/CIO may call a meeting of the rebalancing task force to consider a discretionary rebalancing from time to time. In consultation with the rebalancing task force, and with a majority approval of the task force, a discretionary rebalancing may be initiated pursuant to the plan developed by the ARA Division.
3. Discretionary rebalancing may be used to bring public market asset classes partially or fully back to their strategic target weights, to reduce or use active risk, to otherwise minimize asset allocation drift, or to intentionally overweight or underweight an asset or sub-asset class.

4. In connection with any rebalancing, the ARA Division will develop and implement a plan (a "Rebalancing Plan") to affect the rebalancing. The Rebalancing Plan will include the total amount of each asset class to be bought and sold, the intended market exposures, and the time frame of purchases and sales. The Rebalancing Plan is based on best estimates of market prices, private market valuations, and benefits cash flows for when the rebalance will take effect. To the extent that the market prices are different at the time of a rebalancing from the anticipated market prices, valuations or cash flows, the Rebalancing Plan may be subsequently adjusted for additional purchases and/or sales to true up the market exposures to the anticipated levels of the originally approved rebalancing without further approval by the rebalancing task force.
5. The ARA Division, under the supervision of the head of ARA, has the discretion to approve intra-month allocation adjustments of unallocated fund-level cash to passive portfolios and to manage asset class mis-alignments. Such adjustments may be, for example, to allocate unallocated fund-level cash arising from a distribution, to raise liquidity to fund private markets capital calls, to adjust for benchmark weight changes, or to otherwise make adjustments during the month as conditions may arise to return the asset allocation to its intended allocation targets consistent with most recently approved Rebalancing Plan. The manner in which intra-month allocation adjustments of unallocated fund-level cash are allocated or cash deficits are funded depends on the source of such unallocated cash or cash deficit and shall follow Guideline 8 below, as applicable. Only passive portfolios may be utilized for allocations or deallocations. Once unallocated fund level cash is allocated to a passive portfolio, investment of such cash shall be made in accordance with the underlying passive portfolio's guidelines. Aggregate daily portfolio allocations or deallocations shall not exceed \$250 million unless approved by the ED/CIO.
6. Exchange-traded and OTC options or other derivatives may be purchased or sold in conjunction with managing asset class exposure and rebalancing. The aggregate notional value of the options will be limited to 2% of the market value of the trust fund at the date of purchase. The term of options used for this purpose may not exceed one year.
7. Cleared derivatives traded on a swap execution facility (SEF) may only be traded on or pursuant to the rules of the SEFs of which SWIB is a member or participant.
8. In connection with any rebalancing, the following procedures will be followed with respect to the following asset classes:
 - a. The Multi-Asset Strategy Class will rebalance 50% to Public Equities and 50% to Public Fixed Income. Accordingly, in connection with any rebalancing, for any percentage increase of assets in Multi-Asset, there will be a corresponding 50% reduction to Public Equities and a corresponding 50% reduction to Public Fixed Income, and vice versa if the Multi-Asset assets decrease. The rebalancing does not have to be proportional through the sub-asset classes.

- b. The Real Estate Asset Class will rebalance 50% to Public Equities and 50% to Public Fixed Income. Accordingly, in connection with any rebalancing, for any percentage increase in Real Estate there will be a corresponding 50% reduction to Public Equities and a corresponding 50% reduction to Public Fixed Income, and vice versa if the Real Estate assets decrease. The rebalancing does not have to be proportional through the sub-asset classes.
- c. The Private Equity Asset Class will rebalance on a 1 for 1 basis to Public Equities. Accordingly, in connection with any rebalancing, for any percentage increase in Private Equity there will be a corresponding 1% reduction to Public Equities. The rebalancing does not have to be proportional through the sub-asset classes.

V. Drawdown Procedures

1. On an annual basis, the Investment Committee shall approve the active risk budget for the next calendar year and the relative drawdown limits per strategy (based on percentage of assets under management (AUM)) for the Core Fund. The relative drawdowns are measured against the benchmark for each strategy on a monthly basis by the Risk Management Division. Relative drawdown limits are intended to protect the Core Fund from large relative drawdowns. Given the active risk that each strategy is expected to take and achieve, the Investment Committee acknowledges that (1) the relative drawdown limits may be reached in any given market environment, and (2) the probability of reaching the drawdown limits is not remote for the levels of active risk approved in the active risk budget.
2. If and when 60% of the relative drawdown limit is reached during the calendar year for any given strategy, the division head, the strategy head, the head of Risk Management, and the ED/CIO will all meet to discuss the relative drawdown limit, attribution, and outlook for the calendar year. The meeting will be documented by email confirmation sent to the Chief Legal Counsel and the head of Compliance.
3. If and when 90% of the relative drawdown limit is reached during the calendar year for any given strategy, the division head, strategy head, the head of Risk Management, and the ED/CIO will all meet to create a plan to address the drawdown for the strategy. The plan may require the strategy to reduce risk, stay the course until a given set of market conditions exist, make certain trades, and/or provide timing for implementation of the plan. A copy of the plan will be presented to the Investment Committee, generally at the next scheduled meeting.

VI. WRS General and Portfolio Guidelines – Internal Management

Each internal portfolio is assigned compulsory investment guidelines. Portfolio managers are generally not allowed to deviate from compulsory guidelines. If a deviation from compulsory guidelines occurs or is expected to occur, the staff member who becomes aware of it must

immediately notify the head of the Compliance and Risk Management divisions, ED/CIO, and the division head of the asset class in which the deviation occurred. Upon receiving notice of a deviation or potential deviation, the ED/CIO and relevant division head will either take action to correct the deviation or obtain a waiver approved by the ED/CIO. If the ED/CIO is not available, then the waiver may be granted by any division head (other than the division head of the portfolio that is requesting the waiver) and the Deputy Executive Director, in consultation with the head of Risk Management. All waivers will be reported to the Investment Committee and documented in the Investment Committee's meeting minutes.

All internal portfolios are also assigned "soft risk parameters." Soft risk parameters refer to desired characteristics and/or risk exposures. Portfolio managers are allowed, however, to deviate from soft parameters in pursuit of excess return or efficiency, subject to Investment Committee inquiry, discussion and concurrence of the continued exposure. Soft risk parameters for each portfolio are detailed in *Appendix 2*.

The following general compulsory guidelines ("General Guidelines") are applicable to all internally managed portfolios. Individual portfolio guidelines appear subsequently.

1. All portfolios must be managed in accordance with the fiduciary standards set forth in section 25.15(2) of the Wisconsin Statutes.
2. Credit quality rating requirements refer to an entire rating level, e.g., "A or better" includes "A-" and better ratings. The lower of split ratings is used. Investment grade securities are those rated "BBB-" or better (or the equivalent rating agency rating). Portfolios may invest in unrated securities, provided that the unrated securities have been assigned an internal SWIB rating by portfolio management staff using similar rating methodologies as the rating agencies.²
3. Fixed income securities backed by the full faith and credit of the U.S. government will be classified as U.S. government securities for purposes of these guidelines.
4. Any sovereign debt obligation (or the issuer in the event the obligation is unrated) in which SWIB invests must be rated "B3/B-" or above, unless otherwise approved in advance by the Investment Committee based on its guidelines for individual business case determinations.
5. Public equity investments in markets designated as "developed" or "emerging" are investments in entities that are incorporated or organized in countries included in the MSCI World Index or the MSCI Emerging Market Index, respectively. Public fixed income investments in markets designated as "emerging" are investments in the debt of countries (or of companies incorporated or organized in countries) included in the JP Morgan Emerging Markets Diversified Index. Public fixed income investments in the debt of countries (or of companies incorporated or organized in countries) not included in the JP Morgan Emerging Markets Diversified Index will be designated as "developed."

² Using ratings models that are reviewed by Risk and Compliance staff.

6. The Board approves the benchmarks for the Core Fund and Variable Fund, which are listed in *Appendix 3*. When new benchmarks are approved by the Board or modified by the Board, *Appendix 3* shall be updated without amendment to these IC Guidelines.
7. The Risk Management Division will monitor the risk exposures of all WRS portfolios. The head of Risk Management may recommend modifications to portfolio exposures to manage risk exposures. With the ED/CIO's concurrence, the manager of a portfolio will make changes as recommended by the head of Risk Management. In addition to such recommendations, drawdown control procedures for all active internal WRS portfolios will be implemented and monitored by the Risk Management Division and adhered to by the portfolios.
8. Portfolios may utilize cash instruments or derivatives in their investment strategy. All investments used will be subjected to the risk analysis and monitoring processes at the portfolio, asset class and fund levels. New derivative and investment instruments will be reviewed with and approved by the Investment Committee prior to implementation.
9. Exposure limits and credit quality exposure limits are to be applied at the time of purchase. Unless otherwise indicated, "value" shall mean market value including un-invested cash.
10. Covered Agency Transactions as defined in FINRA Rule 4210³ may be traded only with a counterparty with which SWIB has a current Master Securities Forward Transaction Agreement (MSFTA), and the settlement of any such transaction shall not be more than 90 days from the date of the trade.
 - a. The counterparty, or its guarantor, must, on each date on which a transaction is initiated, have a credit rating of not less than "Baa2/BBB" on long-term debt from S&P or Moody's.
 - b. If the counterparty is not rated, then its parent must have such a rating and must guarantee the obligations of the counterparty.
 - c. If a counterparty or its parent is downgraded to a credit rating below "Baa2/BBB" after the initiation of a trade, then trades may be initiated with that same counterparty only to reduce the existing exposure to that downgraded counterparty.

A. Small Cap ~~Portfolios~~Portfolio

The Small Cap ~~Portfolios~~Portfolio is invested primarily in publicly traded equity securities that are registered with the Securities and Exchange Commission, including common stocks, preferred stocks, ETFs, American Depository Receipts (ADRs), American Depository Shares (ADSs), convertible bonds, securities issued in initial public offerings, and when-issued securities. The Small Cap ~~Portfolios~~Portfolio may also be invested in equity securities that are

³ "Covered Agency Transactions" include certain to-be-announced (TBA) transactions, specified pooled transactions and collateralized mortgage obligations (CMOs).

publicly traded on stock exchanges in other developed countries, or that are issued through private placements.

1. ~~When aggregated with other SWIB portfolios, no~~ No more than 205% (long or short) of outstanding shares of any single issuer, excluding shares held in commingled funds and ETFs, may be ~~owned~~ held.
2. ~~When aggregated with other SWIB portfolios, no~~ No single ~~issuer's equity securities~~ issuer's equity securities may represent (long or short) more than ~~3%, excluding shares~~ the greater of (a) 7% of the total market value of the Small Cap Portfolio, or (b) 5% over the percentage of such issuer's equity securities in the portfolio's benchmark. Shares held in commingled funds and ETFs, ~~of the total market value of all SWIB equity portfolios~~ are excluded from this guideline.
- ~~3. When aggregated with other SWIB portfolios, securities subject to restrictions on trading pursuant to Rule 144 under the Securities Act of 1933 shall not constitute more than 1% of the market value of all SWIB equity portfolios.~~
- ~~3.~~ 4. Up to 10% of ~~each~~ the portfolio's market value may be invested in international and emerging markets companies through common stocks, ADRs, ADSs, or country-specific ETFs. ~~All international and emerging markets stock transactions must be in equity securities that are publicly traded on a stock exchange in a developed country.~~
- ~~4.~~ 5. ~~Portfolios~~ The portfolio may use exchange-traded futures contracts or ETFs to equitize cash and receivables.
- ~~5.~~ 6. ~~Portfolios~~ The portfolio may sell short any securities that may be purchased under applicable guidelines and may then use the proceeds from the short sale to purchase additional approved securities. The total value of the short sales in ~~a~~ the portfolio may not exceed 50% of ~~a~~ the portfolio's net market value.
- ~~6.~~ The portfolio's aggregate ex-ante tracking error will not exceed 8.75% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 8.75% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
7. Except as provided in 43 above, securities must be issued by an entity (a) that is incorporated in the United States; ~~provided that investment is also permitted if the issuer is or (b) incorporated in a tax haven~~ outside the United States if (1) the company's headquarters are located in the U.S. or (2) the ~~headquarters are located in Belize, Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Channel Islands, Cook Islands, Isle of Man, Marshall Islands, Panama, Liberia or Netherland Antilles and the~~ primary

exchange for the issuer's securities is located in the U.S. The issuers in (b) shall not count toward the 10% limit in 3 above.

8. The aggregate notional value of ~~put options sold and not covered by portfolio cash~~ long or short puts and calls is limited to ~~105%~~ 105% of the market value of the portfolio. ~~The aggregate notional~~
9. Gross exposure for the portfolio shall not exceed 205% of the portfolio's market value ~~of call options sold,~~ and ~~not covered by the underlying security positions is limited to 10~~ net exposure for the portfolio shall not exceed 105% of the portfolio's market value ~~of,~~ in each case unless approved by the portfolio ED/CIO.

B. Global Equity Portfolio

The Global Equity Portfolio is authorized to invest long or short in any publicly traded equity securities, including common stocks, preferred stocks, convertible bonds, ADRs, ADSs, ETFs, securities issued in initial public offerings, and when-issued securities, in each case that are issued and traded in U.S. and non-U.S. developed or emerging markets. For ETFs, the underlying securities shall be equity securities or indices that are permitted herein. The portfolio is also authorized to trade derivatives as outlined below.

1. Derivatives on which the pricing reference is equity-based may be used for hedging or speculative purposes. Derivatives on which the pricing reference is non-equity based may be used for hedging purposes but not speculative positioning.
2. The portfolio may hold no more than 10% (long or short) of outstanding shares of a single issuer, excluding shares held in commingled funds and ETFs.
3. The portfolio's aggregate ex-ante tracking error will not exceed 20% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 20% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
4. For the purpose of managing cash in the portfolio's cash account, the portfolio is authorized to invest long or short in any Investment Committee approved instrument or derivative to create a low-risk return on the cash within the portfolio, subject to the General Guidelines and Derivatives Guidelines contained herein.
5. Gross notional exposure for the portfolio shall not exceed \$20 Billion unless approved by the ED/CIO.

C. Passive Portfolios

The objective of the passive portfolios is to closely track the returns and risk of their respective benchmarks. Passive portfolios may also be used for strategies that are intended to provide liquidity or leverage as part of their prime directive.

1. The universe for inclusion in the portfolio shall be the full respective benchmark for each portfolio. Non-benchmark securities may be held from time-to time as a result of corporate actions, purchases or sales in advance of expected changes to the benchmark or to provide synthetic/derivative exposure to the underlying benchmark. Activity or retention of physical non-benchmark securities will only occur after the portfolio is entitled to receive the security and if the portfolio manager deems it beneficial to performance and not significantly detrimental to tracking error. Portfolios that provide liquidity or leverage will hold primarily non-benchmark securities in the form of derivatives that replicate the underlying target beta exposure.
2. Securities offered or sold to U.S. investors pursuant to Regulation D or Rule 144A under the Securities Act of 1933 may be purchased if they are publicly traded on a stock exchange in a developed country.
3. Portfolios may use physical securities or synthetic instruments, including exchange-traded futures contracts, ETFs, swaps, or other Investment Committee-reviewed derivative instruments to equitize cash and receivables, to achieve policy fund level leverage within Trustee-approved limits; for liquidity purposes; to replicate beta for the alpha-beta overlay; or for other passive investment strategies. Passive portfolios used to achieve policy fund level leverage shall be monitored by the ARA Division so that the Policy Leverage does not exceed Board-approved limits.
4. Portfolios may sell short from time to time as a result of corporate actions, benchmark changes or other similar events to more closely, more efficiently and/or more cost effectively track the returns and risk of their respective benchmarks if the portfolio manager deems it beneficial to performance and not significantly detrimental to tracking error. Short positions may not be used to intentionally take active risk. The portfolios may short any securities that may be purchased under Guidelines #1-3 and may then use the proceeds from the short sale to purchase additional approved securities.

D. ARA Passive External Managers

The ARA Passive External Managers will be comprised primarily of direct or commingled passive investments in strategies of external managers that are intended to generate a beta or SWIB policy benchmark return.

1. Investments in ARA Passive External Managers will be comprised of the following investment vehicles:

- a. Separately Managed Accounts (“SMAs”): SWIB intends for its portfolio to be comprised primarily of direct investments in various strategies via SMAs, the assets of which would reside at SWIB’s custodial bank.
- b. Commingled Investments or Fund Investments: Investments can be made in commingled funds or in a Fund-of-One structure where SWIB is the sole investor, the assets of which may not reside at SWIB’s custodial bank.

2. Investment Strategies and Broad Guidelines for ARA External Managers:

- a. Equities –Strategies will be invested in traditional long only portfolios and other public equity securities approaches across various geographies and market cap weights. Derivatives may be used and will be set forth in the individual manager guidelines.
- b. Fixed Income –Strategies will primarily be invested in traditional long only portfolios across the credit quality spectrum, varying geographies, including emerging and frontier market debt, high yield and structured securities. Derivatives may be used and will be set forth in the individual manager guidelines.
- c. Levered Strategies – Strategies that are designed to provide fund-level leverage will be subject to both the external manager guidelines in this section, as well as the applicable Leverage Use Policy guidelines in Section II above. The individual managers will also be subject to any additional guidelines outlined in the investment management agreement with respect to strategy and/or leverage management tool.

3. Approvals: ARA Passive External Manager allocations are subject to the following approvals:

<u>Investment</u>	<u>Head of ARA</u>	<u>ED/CIO</u>
<u>New Manager Relationship</u>	<u>Up to \$1.75 billion</u>	<u>More than \$1.75 billion</u>
<u>Additional Allocations to Existing Manager</u>	<u>Up to \$2 billion</u>	<u>More than \$2 billion</u>
<u>Includes all ARA investments aggregated with the Manager, regardless of vehicle, strategy or portfolio.</u>		

4. Other guideline limitations notwithstanding, the head of ARA or other staff authorized by the head of ARA may modify, amend or waive terms of ARA Passive External Manager investment management agreements and generally take any and all other actions that are necessary and reasonable to protect, maintain, or enhance the value of SWIB’s position in the investments.

5. All redemptions, terminations or reductions of capital will be at the discretion of the head of ARA for rebalancing, liquidity management, leverage management and/or policy benchmark exposure consideration.

E. ~~D.~~ Investment Grade Credit Portfolio

The Investment Grade Credit Portfolio is primarily invested in publicly traded and Rule 144A investment grade corporate bonds or other fixed income instruments, primarily in the United States and other developed markets. Subject to the limitations set forth below, the portfolio may also invest in bank loans, convertible, and equity securities.

1. Maximum single issuer concentration is limited to 8% of the portfolio's market value on a net basis for developed markets investment grade issuers and 3% for all other issuers, in each case, excluding Treasuries, Treasury futures and ETFs.
2. Positions may be purchased long and sold short, and the use of leverage will be incorporated in ex-ante risk assessments and active risk/tracking error contributions. The portfolio may take short exposure by shorting individual securities, including cash bonds and equity securities, utilizing single name CDS and CDX index securities, and shorting ETFs that have been approved by Compliance and included on an approved ETF trading list (including put or call options thereon).
3. The portfolio may use eligible derivative instruments to manage the duration, yield curve exposure, currency, interest rate, equity, and market exposure of the portfolio. Eligible derivatives include (i) credit index swaps (e.g., CDX) and single-name CDS; (ii) futures, forwards and swaps on securities, indices, and interest rates; (iii) options on securities, including equity securities.
4. Effective duration of the portfolio shall remain within two years of the assigned benchmark's duration.
5. Emerging market (EM) debt investment is limited to securities rated "B-" or above and:
 - a. EM sovereign debt must be of countries in the JP Morgan Emerging Market Bond Index Global Diversified ("JP Morgan EM Bond Index").
 - b. EM corporate debt must be denominated in U.S. Dollars.
 - c. Gross EM debt shall not exceed 15% of the portfolio's market value on a long or short basis (i.e., long % + short %). EM FX forwards used to hedge currency risk will not be counted against the EM debt exposure threshold.
6. Further limits:
 - a. Non-investment grade securities shall not exceed 20% of the portfolio's market value on a gross basis.

- b. Exposure to bank loans, including CLOs, shall not exceed 15% of the portfolio's market value on a net basis.
 - c. Exposure to convertible securities shall not exceed 10% of the portfolio's market value on a net basis.
 - d. Equity exposure shall not exceed 2% of the portfolio's market value on a net basis.
7. Ex-ante tracking error shall not exceed 52.5% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 52.5% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
 8. Gross exposure for the portfolio shall not exceed 300% of the portfolio's market value, and net exposure for the portfolio shall not exceed 200% of the portfolio's market value, in each case unless approved by the ED/CIO.

F. ~~E.~~ U.S. TIPS Index Portfolio

The U.S. TIPS Index Portfolio is invested in U.S. Treasury Inflation-Protected Securities (TIPS).

1. Individual securities must be U.S. TIPS which are included in the Barclays U.S. TIPS benchmark.
2. The portfolio's option adjusted duration should be +/- 1 year of the benchmark duration.

~~F.~~ ~~Currency Overlay~~

~~To separate the management of currency risk from the risk of asset allocation and security selection, a currency overlay may be established at the fund level for the Core Fund and/or the Variable Fund. The ED/CIO, the head of ARA, and the internal senior portfolio manager for the Currency Overlay shall set the currency overlay strategy.~~

- ~~1. The amount of the overlay will be expressed in relation to the size of the aggregate non-U.S. market value of the internally managed Global Sector Portfolios and the internally managed MSCI World ex U.S. Index Portfolio. This amount is referred to as the "portfolio reference value." For example, if the Global Sector Portfolios have a non-U.S. market value of \$1 billion and the MSCI World ex U.S. Index Portfolio has a market value of \$1 billion, then the portfolio reference value is \$2 billion.~~
- ~~2. Only the currencies in the MSCI All Country World Index (ACWI) may be used to implement the currency overlay.~~
- ~~3. Currencies may be bought or sold.~~

- ~~4. Positions in any individual non-U.S. currency may be taken equal to +/- 10% of the portfolio reference value for major currencies (Euro, UK Sterling and Japanese Yen) and +/- 5% for all other ACWI currencies. For example, if the portfolio reference value is \$2 billion, individual currency positions in major currencies could be taken of +/- \$200 million.~~
- ~~5. Up to 25% of the portfolio reference value may be hedged into U.S. dollars.~~
- ~~6. The risk of the currency overlay strategy in aggregate will be limited to 25% of the active risk target for the total trust fund, which is set by the Board.~~
- ~~7. Limits shall be calculated using the notional value of the currency instruments (i.e., forwards and futures) and the portfolio reference value at the time of purchase.~~

G. Exposure Management Portfolios

Portfolios may be established at the asset class level for multi-asset, public equity and public fixed income asset classes to provide for adjustment and management of the Core Fund and Variable Fund exposures and to utilize or adjust active risk of the Core Fund and Variable Fund. In determining portfolio investments, exposures held in both internally and externally managed portfolios will be considered. These portfolios may also be used to express investment strategies and ideas where the sizing of the investment requires it to be outside of an individual internal portfolio.

Each strategy and/or investment idea expressed in the portfolios shall be approved by any three of the ED/CIO and the heads of ARA, GPMS and PMFA. Portfolio oversight will be the responsibility of the ARA Division, and the Investment Committee will monitor each investment in the portfolios. The Investment Committee shall establish procedures to monitor these portfolios. These portfolios may invest in any instrument approved for the relevant asset class portfolios described elsewhere in these guidelines. The portfolios may use derivative instruments.

Portfolios will not have a separate benchmark or risk target, but will be included within the benchmark and risk parameters for the applicable aggregated asset class. The portfolios may include, for example, investments strategies to adjust aggregate equity beta, the allocations between specific sectors or sub-asset class exposures, currency exposures, volatility exposure, or credit exposure or duration.

H. Multi-Strat Portfolio

1. The Multi-Strat portfolio is authorized to invest in or short any instrument or derivative, subject to guidelines 5 and 6 below and the general guidelines contained herein.
2. Strategies may be managed either by internal investment staff or by an external manager.

3. Leverage and derivatives may be used to implement individual strategies and to adjust the market exposure of the Multi-Strat portfolio.
4. The Multi-Strat portfolio's aggregate ex-ante tracking error will not exceed 12% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 12% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
5. The ED/CIO and Head of Risk Management must be informed prior to the launch of a new strategy within the Multi-Strat portfolio. New strategies must be reported to the Investment Committee reasonably promptly following the launch.
6. ED/CIO approval, along with notice to the Head of Risk Management, is required prior to the Multi-Strat portfolio investing in an investment instrument or derivative that was previously approved by the Investment Committee for use by other asset class portfolios. Investment in such instruments must be reported reasonably promptly to the Investment Committee. Investment Committee review and approval is required prior to the Multi-Strat portfolio investing in any new investment instruments or derivatives not previously approved by the Investment Committee for any asset class portfolios.

I. Long Treasury Portfolio

The Long Treasury portfolio is a long duration, but not long-only, portfolio primarily invested in US Treasury securities, including nominal and inflation-indexed Treasuries and Treasury strips, and other US Government issued debt such as Agency debentures (which include debt, or bonds, issued by a US federal agency or a government-sponsored enterprise (GSE)). It may also invest in other fixed income securities, certain ETFs, and certain derivatives, as outlined below.

1. Securities other than nominal US Treasury securities including principal and interest strips, US Treasury Futures, and ETFs investing primarily in nominal US Treasury securities, but otherwise permitted in these portfolio guidelines, may not exceed 25%, in the aggregate, of the portfolio's market value.
2. Effective duration of the portfolio shall remain within five years of the assigned benchmark's duration.
3. The portfolio may invest long or short in ETFs that invest primarily in US Treasury securities and that have been approved by Compliance and included on an approved trading list (including put or call options thereon).

4. The portfolio's aggregate ex-ante tracking error will not exceed 3% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 3% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
5. Except for US Treasury securities, exchange-traded interest rate futures, and ETFs, no single issue may exceed 8% of the portfolio's market value.
6. The portfolio may use repurchase agreements and reverse repurchase agreements for cash management.
7. Derivatives use is permitted as allowed by SWIB's derivative policies for the purposes of duration, interest rate, yield curve, and volatility management. Derivatives use is permitted through the use of (a) exchange-traded and over-the-counter interest rate instruments, including futures and options, (b) interest rate swaps and swaptions, (c) total return swaps (TRS), and (d) other volatility derivatives (including options).
8. All instruments permitted in these guidelines may be traded long or short. Gross exposure for the portfolio shall not exceed 300% of the portfolio's market value, and net exposure for the portfolio shall not exceed 200% of the portfolio's market value, in each case unless approved by the ED/CIO.

J. ~~K.~~ **Mortgage-Backed Securities Portfolio**

The Mortgage-Backed Securities (MBS) portfolio is primarily invested in Agency-issued mortgage-related securities, including MBS pools, collateralized mortgage obligations (CMOs), credit risk transfer (CRT) securities, as well as other securities in the structured products sector such as TBA MBS, commercial mortgage-backed (CMBS), asset-backed (ABS), and private label mortgage-related securities. It may also invest in other fixed income securities, certain ETFs, and certain derivatives as outlined below.

1. Securities other than agency-issued mortgage-related securities (e.g., pools, CMOs, CRTs), mortgage TBAs, and mortgage ETFs, but otherwise permitted in these portfolio guidelines and with effective duration of greater than one year, may not exceed 25%, in the aggregate, of the portfolio's market value.
2. Effective duration of the portfolio shall remain within two years of the assigned benchmark's duration.

3. Private label MBS may not exceed 10% of the portfolio's market value. Private label mortgage securities backed by borrower collateral other than prime may not exceed 5% of the portfolio's market value.
4. The portfolio may invest long or short in ETFs that invest primarily in U.S. MBS and that have been approved by Compliance and included on an approved trading list (including put or call options thereon).
5. The portfolio's aggregate ex-ante tracking error will not exceed 5% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 5% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
6. Except for TBA MBS, US Treasuries and ETFs, no single issue may exceed 5% of the portfolio's market value. No single BBB-rated issue may exceed 2% of the portfolio's market value. The average rating of securities covered by these limits will be "Baa2/BBB" or better. No single issue rated below investment grade may exceed 1% of the portfolio's market value. Each tranche of a securitized product is considered a separate issue. Total exposure to issues rated below investment grade may not exceed 20% of the portfolio's market value, in the aggregate.
7. Fixed income securities with an effective duration of one year or less will have an average credit rating of "A" or better. The portfolio may also use repurchase agreements and reverse repurchase agreements for cash management.
8. Derivatives use is permitted for the purposes of duration, interest rate, yield curve, mortgage credit, and volatility management. Derivatives use is permitted through the use of (a) exchange-traded interest rate instruments, including futures and options, (b) interest rate swaps and swaptions, (c) total return swaps (TRS), (d) MBS options, (e) other volatility derivatives (including options), and (f) credit index swaps (e.g., CMBX, CDX).
9. All instruments permitted in these guidelines may be traded long or short. Excluding the TBA Strategy, gross exposure for the portfolio shall not exceed 300% of the portfolio's market value, and net exposure for the portfolio shall not exceed 200% of the portfolio's market value, in each case unless approved by the ED/CIO.
10. CLOs collateralized by corporate bank loans may not exceed 15% of the portfolio's market value.

K. High-Yield Bond Portfolio

The High-Yield Bond Portfolio is eligible to invest in any instruments included in the assigned benchmark — primarily U.S. dollar denominated publicly-traded and Rule 144A high-yield corporate bonds or other fixed income instruments rated between BB+/Ba1 and B-/B3. Subject to the limitations set forth below, the portfolio may also invest in non-U.S. dollar denominated bonds of issuers located outside of the United States, as well as convertible, preferred securities and equity securities.

1. The portfolio shall maintain at minimum a weighted average rating of B-. Subject to the foregoing, the portfolio may hold fixed income instruments rated below B-/B3.
2. Effective duration of the portfolio shall remain within +/- five years of the assigned benchmark's effective duration.
3. Positions may be purchased long and sold short, and the use of leverage will be incorporated in ex-ante risk assessments and active risk/tracking error contributions. The portfolio may take short exposure by shorting individual securities, cash bonds, buying single name CDS, shorting the CDX index, shorting high-yield and equity ETFs that have been approved by Compliance and included on an approved ETF trading list (including put or call options thereon), as well as shorting the underlying equity of a leveraged issuer.
4. Instruments not included in the benchmark, but otherwise permitted in these portfolio guidelines, may not exceed 25% of the portfolio's market value on a long or short basis (i.e., long % + short %). For the avoidance of doubt, any instrument that is subsequently removed from the portfolio's benchmark due solely to the instrument's maturity falling below the benchmark's stated thresholds shall not be deemed to be out of benchmark for purposes of the 25% limitation described in this Guideline #4.
5. Maximum single issuer concentration is limited to 5%, excluding Treasuries, Treasury futures and holdings of ETFs, of the portfolio's market value on a net basis.
6. Gross exposure to non-U.S. Dollar denominated instruments shall not exceed 10% of the portfolio's market value on a long or short basis (i.e., long % + short %).
7. Gross exposure to emerging market corporate debt is limited to (a) securities that are rated "B-/B3" or above and (b) issuers incorporated or organized in countries included in the JP Morgan Emerging Markets Diversified Index, and in aggregate shall not exceed 5% of the portfolio's market value on a net basis.
8. Exposure to any single industry sector shall remain within 20% of the assigned benchmark's industry sector weighting on a net basis.
9. Exposure to high-yield bank loans shall not exceed 10% of the portfolio's market value on a net basis.
10. Ex-ante tracking error shall not exceed 5% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared

to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 5% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.

11. The portfolio may use eligible derivative instruments to manage the duration, yield curve exposure, currency, interest rate, and market exposure of the portfolio. Eligible derivatives include (i) CDS (as described in more detail under Guideline #3 above); (ii) futures contracts on securities, indices, and interest rates; (iii) forward contracts for securities, indices, and interest rates; (iv) swap contracts for securities, indices, and interest rates; (v) options on high yield and equity ETFs (as described in more detail under Guideline #3 above); and (vi) options on the underlying equity of a leveraged issuer.
12. Gross exposure for the portfolio shall not exceed 300% of the portfolio's market value, and net exposure for the portfolio shall not exceed 200% of the portfolio's market value, in each case unless approved by the ED/CIO.
13. The portfolio may invest in debt instruments and loans and may include senior financing, subordinated or mezzanine financing, and "bridge" financing. Debt instruments and loans may be syndicated or privately issued credit. Debt instruments and loans may be of public or private company issuers. Strategies may include, without limitation, specialty and alternative credit opportunities, distressed and opportunistic strategies, or dislocated credit opportunities. Debt instruments and loans may include credit opportunities alongside SWIB external managers. In the aggregate, exposure to special or alternative opportunity financings described in this guideline shall not exceed 5% of the portfolio.

L. ~~M.~~ **Leveraged Loan Portfolio**

The Leveraged Loan Portfolio is eligible to invest in any instruments included in the assigned benchmark — primarily U.S. dollar denominated publicly-traded and senior secured syndicated leveraged loans. Subject to the limitations set forth below, the portfolio may also invest in non-U.S. dollar denominated loans and/or bonds of issuers located outside of the United States, as well as collateralized loan obligations (CLOs), derivatives, convertible, preferred securities and equity securities.

1. No less than 75% of the portfolio's market value can be invested in single-name first-lien bank loans, total return swaps on leveraged loans, and/or ETFs with a diversified portfolio of first-lien bank loans, in aggregate.
2. The portfolio shall maintain at minimum a weighted average rating of B. Subject to the foregoing, the portfolio may hold fixed income instruments rated below B-/B3 as well as unrated securities, provided the unrated securities have been assigned an internal SWIB

rating by portfolio management staff using similar rating methodologies as the rating agencies.

3. Positions may be purchased long and sold short, and the use of leverage will be incorporated in ex-ante risk assessments and active risk/tracking error contributions. The portfolio may take short exposure by shorting individual securities, including cash bonds and equity securities, utilizing single name CDS and CDX index securities, and shorting ETFs that have been approved by Compliance and included on an approved ETF trading list (including put or call options thereon).
4. Instruments not included in the benchmark, but otherwise permitted in these portfolio guidelines, may not exceed 50% of the portfolio's market value on a long or short basis (i.e., long % + short %).
5. Maximum single issuer concentration is limited to 5%, excluding Treasuries, Treasury futures and holdings of ETFs, of the portfolio's market value on a net basis.
6. Gross exposure to non-U.S. Dollar denominated instruments shall not exceed 10% in the aggregate of the portfolio's market value on a long or short basis (i.e., long % + short %).
7. Aggregate exposure to second-lien loan instruments is limited to 15% of the portfolio's market value on a long or short basis (i.e., long % + short %), and maximum exposure to a single second-lien loan instrument is limited to 2.5% of the portfolio's market value on a long or short basis (i.e., long % + short %).
8. Ex-ante tracking error shall not exceed 5% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 5% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
9. The portfolio may use eligible derivative instruments to manage the yield curve, currency, interest rate, and market exposures of the portfolio. Eligible derivatives include (i) CDS (as described in more detail under Guideline #3 above); (ii) futures contracts on securities, indices, and interest rates; (iii) forward contracts for securities, indices, and interest rates; (iv) swap contracts for securities, indices, loans, and interest rates; (v) options on leveraged loans, indices, and/or equity ETFs (as described in more detail under Guideline #3 above); and (vi) options on the underlying equity of a leveraged issuer.
10. Gross exposure for the portfolio shall not exceed 300% of the portfolio's market value, and net exposure for the portfolio shall not exceed 200% of the portfolio's market value, in each case unless approved by the ED/CIO.

11. Leveraged loans may include senior financing, subordinated or mezzanine financing, and “bridge” financing. Loans may be syndicated or private credit loans. Loans may be of public or private company issuers. Strategies may include, without limitation, specialty and alternative credit opportunities, distressed and opportunistic strategies, or dislocated credit opportunities. Loans may include credit opportunities alongside SWIB external managers. In the aggregate, exposure to special or alternative opportunity financings described in this guideline shall not exceed 5% of the portfolio.

M. ~~N.~~ Short Term Credit Portfolio

The Short-Term Credit Portfolio is an investment vehicle of cash and short-term investments of the WRS designed to achieve a return equal to a bank yield index + 30 bps. Its investment objectives are: 1) Safety of principal; 2) Return Objective; and 3) Liquidity.

Portfolio Allocation

(Percent of Portfolio at Par Value)

Treasuries, Agencies, and FDIC Insured Bank Deposits	0-100%
Repurchase Agreements	0-100%
Commercial Paper	0-100%
Corporate Notes	0-100%
Certificates of Deposit/Time Deposits	0-50%
Bankers’ Acceptances	0-50%
Yankee/Euro Certificates of Deposit/Time Deposits (U.S. Dollars)	0-50%

Maturity Guidelines

(Maximum)

Consistent with the portfolio purpose and objectives, the portfolio weighted average maturity will not exceed one year (the weighted average maturity of floating rate securities is based on interest rate reset dates).

Repurchase Agreements	1 year
Reverse Repurchase Agreements	1 year
U.S. Treasuries and Agencies	5 years
Commercial Paper/Bankers’ Acceptances	1 year
Corporate Notes – Fixed Rate	3.1 years
Corporate Notes – Floating Rate	5.1 years
Certificates of Deposit/Time Deposits	5 years
Yankee/Euro Certificates of Deposit/Time Deposits	5 years

Issuer Exposure

(Percent of Portfolio at Par Value)

The maximum exposure for each issuer/guarantor/counterparty shall be in the aggregate as follows:

U.S. Treasury Bills and U.S. Agency Discount Notes	No limit
Repurchase Agreements (Gov't/Agency Collateral)	25%
Repurchase Agreements (Other Collateral)	5%
Commercial Paper and Corporate Notes	5%
Certificates of Deposit/Time Deposits	5%
Bankers' Acceptances	5%
Yankee/Euro Certificates of Deposit/Time Deposits (U.S. Dollars)	5%
Wisconsin CD Program – individual bank (unless a higher limit from another category applies.)	\$20MM or 3% of bank assets, whichever is less
Bank Deposits	Up to the amount guaranteed by the FDIC or the amount allowable for a bank instrument, whichever is higher

CREDIT QUALITY

The minimum rating of an issuer/counterparty shall be the lowest in the event of a split rating and shall be as follows:

U.S. Treasury Bills and U.S. Agency Discount Notes	No minimum
Repurchase Agreements	BBB
Commercial Paper	A-2/P-2
Unrated Wisconsin Company Commercial Paper (maximum	Unrated

maturity of 90 days and percentage of the portfolio in unrated CP cannot exceed 15%)

Corporate Notes, Bankers' Acceptances, Certificates of Deposit/ Time Deposit, Bank Deposits and Yankee/Euro Certificates of Deposit/Time Deposits (U.S. Dollars) greater than 1 year A

Corporate Notes, Bankers' Acceptances, Certificates of Deposit/ Time Deposit, Bank Deposits and Yankee/Euro Certificates of Deposits (U.S. Dollars) less than 1 year (the percentage of the portfolio in BBB cannot exceed 15%). BBB

Wisconsin CD Program – individual bank Unrated

N. ~~O.~~ General Guidelines specific for Private Markets and Funds Alpha Portfolios

1. The portfolio manager shall be responsible for notifying the ED/CIO of any referrals or significant contacts by or on behalf of SWIB Trustees regarding consideration of an investment opportunity.

2. The Private Markets & Funds Alpha (PMFA) staff shall report to the Trustees all portfolio commitments to non-public investments.

3. Each portfolio manager shall obtain written confirmation from legal counsel (which may be external legal counsel) that documentation has been satisfactorily completed prior to closing of any investment in his or her portfolio that involves negotiated SWIB documentation.

4. Each portfolio manager shall submit to the head of PMFA a written summary of any proposed investment. The head of PMFA will review all such investments to determine that a) the investment falls within the portfolio's investment guidelines, including limits on invested capital, b) the investment is consistent with the portfolio's established strategy, and c) the appropriate due diligence standards are being applied. No such investment may be closed without approval of the head of PMFA or ED/CIO depending upon the nature and amount of the investment as required in the relevant portfolio guidelines. The portfolio manager shall retain responsibility for each investment decision. External managers with delegated investment discretion operate under separate authority. For purposes of this paragraph, "investments" does not include the individual properties within a Real Estate Equity Portfolio separate account tranche, but does include the tranche that holds such properties.

5. Dollar limitations for commitments to funds or other investments do not apply to incidental and customary contractual reinvestment, indemnity, reserve or similar obligations incorporated into the terms of an investment, provided such obligations are not expected to be material.

6. Private equity and venture capital investments in markets designated as “developed” or “emerging” are investments in countries included in the MSCI World Index or the MSCI Emerging Market Index, respectively. Real estate investments in markets designated as “developed” or “emerging” are investments in properties in countries included in the EPRA/NAREIT Developed Index and the EPRA/NAREIT Emerging Market Index, respectively.

7. Funds or commingled investments shall be considered U.S., non-U.S., “developed” or “emerging” based on their primary strategy and not on a look-through basis to the underlying investments.

8. Exposure limits and credit quality exposure limits are to be applied at the time of purchase. The term “exposure” is defined as the net asset value plus unfunded commitments. “Allocations” are calculated as the current net asset value of any existing investment(s) plus the intended subscription.

9. A “follow-on fund” is generally defined as an investment or an investment vehicle that has the same sponsor or manager and is either parallel to, or has a substantially similar investment strategy as, a fund in which SWIB is or has been an investor.

10. SWIB staff may determine to engage a consultant to review prospective investments, perform operational due diligence on prospective investments, or otherwise assist staff in the evaluation of investment opportunities and/or managers.

O. ~~P.~~ Private Debt Portfolio

The overall objective of the Private Debt Portfolio (the “Private Debt Portfolio” includes both the Wisconsin Private Debt Portfolio and the Non-Wisconsin Private Debt Portfolio) is to invest funds of the Core Fund in market rate fixed income instruments consistent with SWIB’s fiduciary responsibilities that are primarily private loans negotiated by SWIB directly or as part of an investor group that includes banks or other institutional investors. The two portfolios are invested as follows:

- Wisconsin Private Debt Portfolio – This portfolio’s investments will consist of loans or fixed income securities issued by companies or entities that are headquartered in Wisconsin, have existing operations in Wisconsin, or intend to apply the proceeds to new business operations in Wisconsin which contribute to the Wisconsin economy.
- Non-Wisconsin Private Debt Portfolio – This portfolio can invest in loans or fixed income securities issued by companies or entities located in or doing business in the United States.

The Private Debt Portfolio may also include securities sold to SWIB pursuant to Rule 144A or in the public fixed income markets. Investments may be made in fixed income instruments and in instruments with both fixed income and equity features.

1. Investments may carry a rating from a national rating agency, the National Association of Insurance Commissioners (NAIC) or SWIB. Notwithstanding the provisions of the

General Guidelines above, the ~~Portfolio Manager~~head of Private Debt may make investments that carry a “BBB” or better rating from a national rating agency or the NAIC, provided that if the investment carries only a SWIB rating, it shall be approved by the head of PMFA, regardless of size.

2. Investments may be made in below investment grade instruments provided that such investments do not in the aggregate constitute more than 25% of the Private Debt Portfolio’s par value. Any investment below investment grade requires approval from the head of PMFA.
3. The Private Debt Portfolio’s aggregate ~~portfolio~~ issuer limits shall be scaled by quality and a purchase may not cause the Private Debt Portfolio’s exposure to a borrower or issuer to exceed the following limits (at par value):

Rating	Maximum Position
U.S. Gov’t/Agency	No Limit
“AA” or higher	\$100 MILLION
“A”	\$75 MILLION
“BBB”	\$50 MILLION
“BB” or less	\$25 MILLION

4. The Private Debt Portfolio shall maintain at minimum a weighted average rating of “BBB”, where “AAA”=4, “AA”=3, “A”=2, “BBB”=1, and “BB” or less =0.
5. Other guideline limitations notwithstanding, ~~portfolio managers~~the head of Private Debt or other staff authorized by the head of PMFA may modify or waive terms of investments in the portfolio and generally take any and all other actions that are necessary and reasonable to protect, maintain or enhance the value of SWIB’s position in the investments.

P. ~~Q.~~ Venture Capital Portfolio

The SWIB Venture Capital Portfolio (the “Venture Capital Portfolio” includes both the Wisconsin Venture Capital Portfolio and the Non-Wisconsin Venture Capital Portfolio) consists of venture capital or venture capital-related investments and invests as follows:

- The Non-Wisconsin Venture Capital Portfolio shall make venture capital investments on a global basis in limited partnership or other fund vehicles, ~~through~~ strategic partnerships, or ~~as~~in co-investments in venture-backed companies or publicly traded companies that were venture backed.

- The Wisconsin Venture Capital Portfolio shall make venture capital investments in limited partnership or other fund vehicles or strategic partnerships that are either located in Wisconsin and/or which target Wisconsin as a primary market or as co-investments in venture-backed companies or publicly traded companies that were venture backed that are located or have operations in Wisconsin.

1. Any other guidelines notwithstanding, the Venture Capital Portfolio commitments are subject to the following approvals:

Approval By:	Head of PMFA	ED/CIO
New Manager		
• Venture Capital Funds	Up to \$60 million or less	More than \$60 million
• Venture Capital Co-Investments	Up to \$20 million or less	More than \$20 million
Follow-on Commitments		
• Venture Capital Funds	Up to \$75 million	More than \$75 million
• Venture Capital Co-Investments (excluding funds of one)	Up to \$25 million	More than \$25 million
SWIB ownership equal to or greater than 50% of an individual fund (excluding funds of one and any a fund/vehicle through which a co-investment is made)		
	ED/CIO, provided that notice shall be given to the ED/CIO if ownership of an individual fund (excluding <u>funds of one and a</u> fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%	

2. No more than 45% of the Venture Capital Portfolio’s exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Venture Capital Portfolio’s exposure may be invested in emerging markets. No more than 5% of the Venture Capital Portfolio’s exposure may be invested in companies located in emerging markets.

3. Venture capital investments may be made through funds, strategic partnerships, or co-investments. Venture capital co-investments (excluding funds of one) must be made in one of the following ways:

(1) alongside a fund with the same sponsor or manager as a fund in which SWIB is or has been an investor,

(2) alongside a fund with the same sponsor or manager as a fund on which SWIB is conducting due diligence and is actively evaluating for a prospective commitment, or
 (3) as approved by the ED/CIO.

4. From time to time, SWIB may consider formation of fund investments where it may participate both as a general partner and as limited partner.
5. Venture capital co-investments made within the Wisconsin Venture Capital Portfolio are limited to companies with their headquarters or primary operations in Wisconsin. Co-investments in the Non-Wisconsin Venture Capital Portfolio may not make up more than 15% of the Venture Capital Portfolio's exposure.
6. Neither the aggregate exposure (including co-investments) to any fund manager or sponsor, nor the aggregate amount of investments in any company, may exceed 20% of the Venture Capital Portfolio's exposure without approval of the ED/CIO.
7. No single co-investment (excluding funds of one) shall exceed 10% of the Venture Capital Portfolio's exposure.
8. The Venture Capital Portfolio may make co-investments in public company securities through private placements, including PIPEs, or other offerings. Co-investments in public company securities shall not exceed 10% of the Venture Capital Portfolio's exposure. For purposes of this guideline, public company securities received via a distribution are not counted and are expected to be sold as soon as reasonably practicable.
9. Subject to the approval thresholds and the restrictions above, the head of Venture Capital ~~Portfolio Manager~~ or other staff authorized by the head of PMFA may modify or waive terms of investments in the portfolio and generally take any and all other actions that are necessary and reasonable to protect, maintain or enhance the value of SWIB's position in the investments.

Q. ~~R.~~ Private Equity Portfolio

The Private Equity Portfolio consists of private equity or private equity-related investments, made on a global basis, in limited partnership or other fund vehicles, strategic partnerships, and co-investments in operating or holding companies. Investment guidelines and soft parameters shall be applied to the aggregate composition of the Private Equity Portfolio (including the Legacy, Private Equity Co-Investment, Current Return and Current Return Co-Investment Portfolios), unless otherwise stated.

1. Any other guidelines notwithstanding, all portfolio commitments are subject to the following approvals:

	Head of PMFA	ED/CIO
New Manager		

• Funds or Strategic Partnerships	\$150 million or less	Over \$150 million
• Co-Investments	\$50 million or less	Over \$50 million
Follow-on Commitments		
• Funds or Strategic Partnerships	\$300 million or less	Over \$300 million
• Co-Investments	\$100 million or less	Over \$100 million
SWIB ownership equal to or greater than 50% of an individual fund (excluding funds of one and a fund/vehicle through which a co-investment is made)	ED/CIO, provided that notice shall be given to the ED/CIO if ownership of an individual fund (excluding funds of one and a fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%	

2. The Private Equity Portfolio shall not include investments in venture capital funds.
3. Investments may be made through funds, strategic partnerships, or co-investments. Co-investments must be made in one of the following ways:
 - (1) alongside a fund with the same sponsor or manager as a fund in which SWIB is or has been an investor,
 - (2) alongside a fund with the same sponsor or manager as a fund on which SWIB is conducting due diligence and is actively evaluating for a prospective commitment, or
 - (3) as approved by the ED/CIO.
4. Neither the aggregate exposure (including co-investments) to any fund manager or sponsor, nor the aggregate amount of investments in any company, may exceed 10% of the total Private Equity Portfolio's exposure without approval of the ED/CIO.
5. No more than 45% of the Private Equity Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Private Equity Portfolio may be invested in emerging markets.
6. No more than 45% of the Private Equity Co-Investment Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Private Equity Co-Investment Portfolio's exposure may be invested in companies located in emerging markets.
7. The Private Equity Co-Investment Portfolio may make co-investments in public company securities through private placements, including PIPEs, or other offerings. Co-investments in public company securities shall not exceed 10% of the Private Equity Co-Investment Portfolio's exposure. For purposes of this guideline, public company

securities received via a distribution are not counted and are expected to be sold as soon as reasonably practicable.

8. Other guideline limitations notwithstanding, ~~portfolio manager~~ the head of Private Equity or other staff authorized by the head of PMFA may modify or waive terms of investments in the portfolio and generally take any and all other actions that are necessary and reasonable to protect, maintain or enhance the value of SWIB’s position in the investments.

R. ~~S.~~ Real Estate Equity Portfolio Guidelines

The Real Estate Equity Portfolio contains investments in a broad range of real estate and real estate-related assets, including equity and debt investments, either solely, or through investment vehicles and structures such as public or private Real Estate Investment Trusts (REITs), public or private real estate company securities, limited liability corporations, limited partnerships, joint ventures, separate accounts or co-investment vehicles. Investment guidelines and soft parameters for Real Estate shall be applied, on an invested basis, to the aggregate composition of the Real Estate Equity Portfolio (except that all REIT portfolios shall be included in the aggregate as Core holdings).

All portfolio commitments are subject to the following approvals:

	Head of PMFA	ED/CIO
Commingled Fund		
• New Fund	\$150 million or less	Over \$150 million
• Follow-on Fund	\$300 million or less	Over \$300 million
Core - Separate Account*	\$300 million or less	Over \$300 million
Non-Core – Separate Account*	\$200 million or less	Over \$200 million

*With respect to a separate account tranche, approval is required for the tranche, ~~but~~ and not for individual investments within the tranche.

1. Aggregate exposure (including co-investments) to any commingled fund manager or sponsor may not exceed 20% of the Real Estate Equity Portfolio’s exposure without approval of the ED/CIO. This limit does not apply to real estate investments for which SWIB has sole discretion to select, retain, and terminate manager(s) and/or advisor(s) without cause.
2. Aggregate direct public REIT and real estate company stock holdings (excluding underlying commingled fund holdings and externally managed REIT Portfolios) may not exceed 15% of the Real Estate Equity Portfolio’s exposure and portfolio investments in any one public REIT

or company may not exceed 3% of the Real Estate Equity Portfolio's exposure. SWIB's direct ownership position in any public REIT or company may not exceed 20% of outstanding voting equity, without ED/CIO approval. Any externally managed REIT portfolio(s) will be managed under separate authority, with guidelines set out in the management agreement(s) between SWIB and the selected manager(s).

3. No more than 45% of the Real Estate Equity Portfolio's exposure may be invested outside the U.S., without the approval of the ED/CIO. No more than 20% of the Real Estate Equity Portfolio's exposure may be invested in emerging markets, and no more than 10% of the Real Estate Equity Portfolio's exposure may be invested in separate accounts invested in emerging markets.
4. Other guideline limitations notwithstanding, the ~~portfolio manager~~[head of Real Estate](#) or other staff authorized by the head of PMFA may: modify or waive terms of investments in the portfolio, including without limitation mortgages and leases on real estate in the portfolio; enter into new mortgages and leases; execute deeds and bills of sale; make expenditures for maintenance and improvements; grant easements; hire consultants, service providers, real estate advisors and property managers; and generally take any and all other actions that are necessary and reasonable to protect, maintain or enhance investment value of SWIB's position in the investments.
5. Prior to funding a direct investment (including a property within a separate account tranche) where real property is a material component, the property shall be evaluated for the presence of environmental and code compliance issues. If environmental issues that require action by governmental authorities exist, then funding shall not occur until an adequate remediation program is in place. If code compliance issues exist, then an adequate plan to bring the property into compliance shall be in place.
6. SWIB may not initiate improvement or development of real property owned or controlled by SWIB without making provisions for compliance with applicable Federal, state and local codes and ordinances.

S. ~~F.~~ **Current Return Portfolio**

The Current Return Portfolio consists of current return or certain equity-related investments, made on a global basis, in limited partnership or other fund vehicles, strategic partnerships, and co-investments in operating or holding companies. Investments may be made in fixed income instruments and in instruments with both current pay and equity features. Investment guidelines and soft parameters shall be applied to the aggregate composition of the Private Equity Portfolio (including the Legacy, Private Equity Co-Investment, Current Return and Current Return Co-Investment Portfolios), unless otherwise stated.

1. Any other guidelines notwithstanding, all portfolio commitments are subject to the following approvals:

	Head of PMFA	ED/CIO
New Manager		
• Funds or Strategic Partnerships	\$150 million or less	Over \$150 million
• Co-Investments	\$50 million or less	Over \$50 million
Follow-on Commitments		
• Funds or Strategic Partnerships	\$300 million or less	Over \$300 million
• Co-Investments	\$100 million or less	Over \$100 million
SWIB ownership equal to or greater than 50% of an individual fund (excluding funds of one and a fund/vehicle through which a co-investment is made)	ED/CIO, provided that notice shall be given to the ED/CIO if ownership of an individual fund (excluding funds of one and a fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%	

2. Investments may be made through funds, strategic partnerships, or co-investments. Co-investments must be made in one of the following ways:
 - (1) alongside a fund with the same sponsor or manager as a fund in which SWIB is or has been an investor;
 - (2) alongside a fund with the same sponsor or manager as a fund on which SWIB is conducting due diligence and is actively evaluating for a prospective commitment; or
 - (3) as approved by the ED/CIO.
3. Neither the aggregate exposure (including co-investments) to any fund manager or sponsor, nor the aggregate amount of investments in any company, may exceed 10% of the total Private Equity Portfolio's exposure without approval of the ED/CIO.
4. No more than 45% of the Current Return Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Current Return Portfolio may be invested in emerging markets.
5. No more than 45% of the Current Return Co-Investment Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Current Return Co-Investment Portfolio's exposure may be invested in companies located in emerging markets.
6. The Current Return Co-Investment Portfolio may make co-investments in public company securities through private placements or other offerings. Co-investments in public company securities shall not exceed 10% of the Current Return Co-Investment

Portfolio's exposure. For purposes of this guideline, public company securities received via a distribution are not counted and are expected to be sold as soon as reasonably practicable.

7. Other guideline limitations notwithstanding, ~~portfolio managers~~ the head of Private Equity or other staff authorized by the head of PMFA may modify or waive terms of investments in the portfolio and generally take any and all other actions that are necessary and reasonable to protect, maintain or enhance the value of SWIB's position in the investments.

I. ~~U.~~ Hedge Fund Portfolio

The Hedge Fund Portfolio ("HF Portfolio") will be comprised primarily of direct investments in hedge funds and is intended to generate a low-beta, alpha-oriented return stream.

1. The HF Portfolio will be comprised of the following investment vehicles:
 - a. *Direct Investments or Fund-of-Funds*: SWIB intends for its portfolio to be comprised primarily of direct investments in hedge funds rather than fund-of-funds vehicles that use an intermediary investment advisor(s) to select and allocate to hedge funds through a commingled fund, ~~but~~ SWIB may make investments in fund-of-fund vehicles, as may be deemed appropriate by Funds Alpha staff and otherwise approved hereunder.
 - b. *Hedge Funds or Separately Managed Accounts ("SMAs")*: Investments can be made in limited liability partnerships with other investors or, in some cases depending upon the manager and size of investment, in separately managed accounts. SWIB expects its most investments will be in limited liability vehicles ~~rather than SMAs, but~~ SWIB may ~~make use of~~ invest via SMAs if it is in the best interest of SWIB to do so.
 - c. *Special Opportunity Investments*: SWIB may invest a portion of its portfolio in special opportunity investments, which may include: interests in the equity or revenues of hedge fund managers, co-~~invest~~ investments, or external manager "best ideas" opportunities. Special Opportunity Investments will be capped at 20% of the market value of the total HF Portfolio.
2. Hedge Fund Investment Strategies:
 - a. *Event-Driven* – investments up (debt or credit) and down (equity) the corporate capital structure where an expectation exists for realized profits over a short to medium time frame as a result of a known catalyst such as a merger, spinoff, or restructuring.
 - b. *Long-Short Equity* – long and short investments in publicly traded stocks.

- c. *Tactical Trading* – global investments in indexes, commodities, interest rates, and currencies and, in each case, their derivatives as a result of relative value or directional forecasts from a systematic or discretionary approach.
- d. *Relative Value* – strategies that seek to take advantage of price differentials by buying and selling different yet related securities. Relative value strategies include fixed income arbitrage, insurance linked, long/short credit, quantitative strategies, structured credit, and volatility-related investments.
- e. *Multistrategy* – funds that invest across multiple asset classes, typically (but not always) with multiple portfolio managers. Most multistrategy funds diversify across three or more underlying strategies.

The HF Portfolio has the following target weightings and ranges to the individual hedge fund strategies:

	<u>Target Allocation</u>	<u>Target Maximum</u>
Relative Value	20%	40%
Event-Driven	15%	30%
Long-Short Equity	20%	30%
Tactical Trading	20%	40%
Multistrategy	20%	40%
Special Opportunity Investments	<u>5%</u>	20%
	100%	

3. Approvals: HF Portfolio allocations are subject to the following approvals:

	Head of PMFA	ED/CIO
New Funds		
• Core	Up to \$300 million	More than \$300 million
• Special Opp/ Co-invest	Up to \$50 million	More than \$50 million
Additional Subscriptions to Existing Funds and/or Follow-On Funds		
• Core	Up to \$400 million aggregated	More than \$400 million

<ul style="list-style-type: none"> • Special Opp/ Co-invest 	Up to \$100 million aggregated	More than \$100 million
SWIB ownership equal to or greater than 50% of an individual fund, calculated at the master fund level (excluding funds of one and a fund/vehicle through which a co-investment is made)	ED/CIO, provided that notice shall be given to the ED/CIO if ownership of an individual fund (excluding funds of one and a fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%	

- The aggregate exposure to any hedge fund manager or sponsor (including co-investments) may not exceed 15% of the total HF Portfolio’s exposure without approval of the ED/CIO.
- Other guideline limitations notwithstanding, ~~portfolio managers~~ the head of Funds Alpha or other staff authorized by the head of PMFA may modify or waive terms of investments in the portfolio and generally take any and all other actions that are necessary and reasonable to protect, maintain, or enhance the value of SWIB’s position in the investments.
- All redemptions, terminations or reductions of capital will be at the discretion of the Funds Alpha Manager and the head of PMFA.

U. ~~V.~~ **Beta One Portfolio**

The Beta One Portfolio ~~will be~~ is comprised primarily of direct investments in strategies of external managers that are intended to generate both (1) ~~at the total return (or beta of one) of a~~ SWIB policy benchmark return and (2) an ~~active alpha~~ excess return ~~stream above (or alpha) over~~ the benchmark. ~~These managers are referred to as Beta One External Managers due to their dual mandate to manage both a Core Fund and Variable Fund asset allocation benchmark and a tracking through active security selection. Tracking error measures divergence around the given benchmark. The manager is expected to deliver the total return of the benchmark (or beta of one), plus an excess return (alpha) over the benchmark. This is distinctive compared to~~ In comparison, SWIB’s external hedge fund portfolio, ~~which~~ is designed to deliver only an excess return or alpha. This section does not govern passive external managers which the Asset and Risk Allocation Division oversees and monitors.

- Investments in Beta One External Managers will be comprised of the following investment vehicles:
 - Separately Managed Accounts (“SMAs”)*: SWIB intends for its portfolio to be comprised primarily of direct investments in various strategies via SMAs, the assets of which would reside at SWIB’s custodial bank.

- b. *Commingled Investments or Fund Investments*: Investments can be made in commingled funds and/or limited liability partnerships with other investors or in a Fund-of-One structure where SWIB is the sole investor. [Assets reside at the manager’s custodial bank.](#)
2. Investment Strategies and Broad Guidelines for Beta One External Managers:
- a. *Equities* – strategies will be comprised of various fundamental, quantitative and other approaches intended to produce an active return above the respective benchmarks. Strategies will be invested in traditional long only portfolios, active extension formats (i.e. 130/30, 150/50) and other public equity securities approaches across various styles, geographies and market cap weights. A limited use of shorting (up to ~~50~~80%) may be used in the active extension format in non-SMAs.
- b. *Fixed Income* – strategies will be comprised of various fundamental, quantitative, and other approaches intended to produce an active return above the respective benchmarks. Strategies will primarily be invested in ~~traditional long only~~ portfolios across the credit quality spectrum, varying across geographies, including emerging and frontier market debt, ~~high yield and structured securities~~across structures (e.g., asset-backed securities, corporate debentures, etc.) Individual manager guidelines may allow shorting of cash bonds. Derivatives may be used ~~primarily~~(long or short) for ~~duration~~both hedging and ~~currency management~~investment purposes and will be set forth in the individual manager guidelines.
- c. Notwithstanding any shorting permitted in (a) above, pursuant to SWIB’s policies, the investment guidelines for SMAs will prohibit the Beta One External Managers from shorting any equity securities and from purchasing equity securities in secondary offerings.
3. Any use of derivatives, leverage, and shorting allowed will be incorporated into the ex-ante risk assessments and active risk contributions.
4. Approvals: Beta One External Manager allocations are subject to the following approvals:

Investment	Head of PMFA	ED/CIO
New Manager Relationship	Up to \$1.75 billion	More than \$1.75 billion
Additional Subscriptions to Existing Manager	Up to \$2 billion	More than \$2 billion
Includes all Funds Alpha investments aggregated with the Manager, regardless of vehicle, strategy or portfolio.		

5. Other guideline limitations notwithstanding, the [head of](#) Funds Alpha ~~Manager~~ or other staff authorized by the head of PMFA may modify, amend or waive terms of Beta One Manager investment management agreements and generally take any and all other actions that are necessary and reasonable to protect, maintain, or enhance the value of SWIB's position in the investments.
6. All redemptions, terminations or reductions of capital will be at the discretion of the [head of](#) Funds Alpha ~~Manager~~ and the head of PMFA in consultation with the head of ARA for policy benchmark exposure consideration.
7. Notwithstanding the above discretion regarding redemptions, terminations or reductions, if the Risk Management Division determines that certain risk attributes in the context of the total Core Fund or the aggregate Beta One Portfolio are undesirable for the Core Fund, Variable Fund or the aggregate portfolio, then the head of Risk Management may recommend redemptions, terminations or reductions to portfolio exposures. With the ED/CIO's concurrence, the [head of](#) Funds Alpha ~~Manager~~ will make the changes as recommended by the head of Risk Management.

V. ~~W.~~ Private Markets and Funds Alpha Overage Portfolios

Portfolios may be established at the asset class level for private equity, co-~~invest~~[investment](#), real estate, venture capital, hedge fund, and private debt asset classes to provide for (i) excess exposure to certain investment ideas where the sizing of the investment requires it to be held, in part, outside of an individual internal portfolio or (ii) hedging transactions using public or private securities. In each case, a primary investment must be made by the relevant private markets or hedge fund portfolio with the excess exposure or hedging transaction being allocated to an overage portfolio. The relevant ~~private markets or funds alpha portfolio manager~~[PMFA asset class head](#) will be responsible for portfolio oversight and monitoring of the investment, including the securities in the overage portfolio.

These portfolios may also be used to express investment strategies and ideas that do not fit clearly in any of the private markets or ~~funds alpha~~[Funds Alpha](#) portfolios but are attractive from a risk/return perspective. In such cases, no primary investment will be made in the existing private markets portfolios, and the ED/CIO will designate a portfolio manager that will be responsible for portfolio oversight and monitoring.

These portfolios may invest in (1) any instrument approved for the relevant private markets asset class portfolios described elsewhere in these guidelines, and (2) any other public or private securities or derivatives approved for trading by SWIB solely for hedging purposes. Each investment idea expressed in the portfolios shall be approved by the head of PMFA, the relevant ~~portfolio manager~~[strategy head](#), and a majority of the ED/CIO and the heads of ARA and GPMS. Any approved investment shall be reported to the Investment Committee on a monthly basis. Other governance, monitoring, compliance or reporting for the investment may also be specified in the approval. Portfolios will not have a separate benchmark or risk target, but will

be included within the benchmark and [soft](#) risk parameters for the applicable aggregated asset class, portfolio, or Core Fund, as applicable and as approved at the time of the investment. If the investment will use active risk assigned to exposure management, it will be noted in the investment approval.

VII. EXTERNAL MANAGEMENT

Portfolios may be managed internally by SWIB investment professionals or externally by money management firms. In making the decision on how the portfolios will be managed, SWIB compares the resources, expertise, [diversification benefits](#), and cost of internal management versus external management. If the decision is made to manage the portfolios externally, SWIB will determine whether a separate account or commingled fund best suits SWIB's needs.

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.~~

APPENDIX 1 - APPROVED EXCHANGES

Approved Exchanges for Derivatives Trading as of March 29, 2022*

Australian Securities Exchange
BOX Options Exchange
CBOE Exchanges
Chicago Board of Trade
Chicago Mercantile Exchange
London Stock Exchange
Eurex Exchange
Euronext Exchanges
ICE Futures Exchanges
International Securities Exchange
Montreal Exchange
Nasdaq Exchanges
New York Mercantile Exchange
NYSE Exchanges
Osaka Exchange
TMX (Toronto Stock Exchange)
Tokyo Stock Exchange

*Approved exchanges shall include any and all exchanges that may be acquired by, merged with or otherwise reorganized with or into, or any subset of, any of the above-listed exchanges subsequent to the date above provided that such exchange continues to clear through a Qualifying Central Counterparty (QCCP). This list may be updated for such organizational or name changes from time to time by Legal & Compliance without any additional action of the Investment Committee, and all additions or changes shall be deemed Approved Exchanges for purposes of the WRS Investment Committee Investment Guidelines effective as of the date of such acquisition, merger or reorganization. On a quarterly basis, Compliance shall provide notice to the Investment Committee if there have been any such changes to the list.

The Multi-Asset and Exposure Management Portfolios are approved to trade on any of the above exchanges and any other exchange whose clearing house is a Qualifying Central Counterparty (QCCP) as defined by the Bank for International Settlement (BIS).

APPENDIX 2 - SOFT RISK PARAMETERS

SOFT RISK PARAMETERS – ASSET CLASS AND PORTFOLIO

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Asset Class Exposure*	Core Fund	
	Global Equities	Target ± 4.6%
	EM Equities	Target ± 2.8%
	Small Cap	Target ± 4.9%
	EAFE Small Cap	Target ± 4.3%
	U.S. Inv Grade	Target ± 4.8%
	High Yield and Levered Loans	Target ± 5.1%
	EM Debt	Target ± 5.6%
	Variable Fund	
	U.S. Equity	Target ± 5.0%
	Int'l Equity	Target ± 5.0%
*Post-Corridor Treatment		
Maximum Small Cap Exposure	CTF Domestic Public Equities	2.75x Benchmark
	VTF Domestic Public Equities	2.75x Benchmark
Ex Ante Tracking Error	Public Equities	0.75% - 2.25%
	Public Fixed	0.4% - 1.2%
	Core Fund	0.6% - 1.8%
	Variable Fund	0.3% - 0.9%
Counterparty Exposure (internal and external separate account portfolios)	WRS (Core and Variable Funds)	5 bp exposure (net of collateral, if any) to a single counterparty
Duration	Public Fixed	+/- 1 year of Benchmark

ACTIVE/INDEXED EQUITIES

Minimum Number of Holdings

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Ex Ante Tracking Error	Small Cap	100 <u>Long</u>
	Global Equity Portfolio	15 Long/short equity ideas
	Passives (Core Fund and Variable Fund Consolidation):	
	MSCI US	10 bp annualized
	MSCI ex US	20 bp annualized
	MSCI US Small Cap	30 bp annualized
	Small Cap	2% 6% <u>1.75% - 5.25%</u>
	Global Equity Portfolio	4%-12%
<u>Maximum EM Active Risk Exposure</u>	<u>Small Cap</u>	<u>Emerging Markets Tracking Error Contribution of 20%</u>
Maximum Position Size (Excluding ETFs)	Passives	5% notional value of futures
Maximum EM Active Risk Exposure	Global Equity Portfolio	Emerging Markets Tracking Error Contribution of 20%
Maximum Convertible Bond Issues	Global Equity Portfolio	0
	<u>Small Cap</u>	<u>0</u>
<u>Maximum Private Placements</u>	<u>Small Cap</u>	<u>0</u>
Ex-Ante Equity Beta	Global Equity Portfolio	Range of -0.3 to +0.3 with a target of zero over a market cycle. This is measured ex ante with a trailing two-year risk sampling period
Single Name Concentration	Small Cap	Benchmark weight \pm 2%
Maximum ETF Exposure	Passives	5% of portfolio value
	Small Cap	+/- 15% of portfolio value
Maximum Company Ownership (Excluding ETFs) <u>(L/S)</u>	Small Cap	10 <u>3</u> % of outstanding
Top Ten Holdings <u>(L/S)</u>	Small Cap	25 <u>20</u> % of portfolio
P/E Ratio	Small Cap	50%-150% of Benchmark
Maximum Sector Exposure	Small Cap	Benchmark weight \pm 10%
Maximum Notional Uncovered Sold Calls	Passives	5% of portfolio value
	Small Cap	5% of portfolio value

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Maximum Notional Uncovered Sold Puts	Passives	5% of portfolio value
	Small Cap	5% of portfolio value
Maximum Cash	Passives	1% in unequitized cash
	Small Cap	5%
FIXED INCOME		
	IG Credit	+/- 1 year of assigned Benchmark
Duration	MBS	+/- 1 year of assigned Benchmark
	Long Treasury	+/- 2 years of assigned Benchmark
	High Yield	+/- 2 years of assigned Benchmark
Maximum Corporate Industry Sector Exposure	IG Credit	Greater of 10% or 3 x Benchmark
	IG Credit	3.0 <u>1.5</u> %
Ex Ante Tracking Error	MBS	3.0%
	High Yield	3.0%
	Lev Loans	3.0%
	Long Treasury	1.5%
Maximum Equity Exposure	High Yield	5% of portfolio value
	Lev Loans	5% of portfolio value
Maximum investments in a single issuer, in the aggregate (excluding instruments listed in SIF guideline #2)	State Investment Fund	5% of portfolio value
MULTI-ASSET		
Ex ante volatility (tracking error) range	Multi-Strat	3% to 8%, measured with a trailing two-year risk sampling period
Ex-Ante Equity Beta		Range of -0.3 to +0.3 with a target of zero over a market cycle. This is measured ex ante with a trailing two-year risk sampling period
Ex-Ante Spread Beta	Multi-Strat	

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Ex-Ante Rates Beta		
Ex-Ante FX Carry Beta		
PRIVATE MARKETS & FUNDS ALPHA		
Maximum Co-Investments	Private Equity	30% of core Private Equity Portfolio for Private Equity Co-Investments 30% of Current Return Portfolio for Current Return Co-Investments
Maximum Co-Investments alongside funds with the same sponsor or manager as a fund on which SWIB was conducting due diligence and actively evaluating for a prospective commitment at the time of co-investment ⁴	Private Equity	5% of core Private Equity Portfolio for Private Equity Co-Investments 5% of Current Return Portfolio for Current Return Co-Investments
Minimum Funds	Private Equity	80% of aggregate Private Equity Portfolio
Maximum Venture Capital Exposure	Venture Capital	25% of Private Equity & Debt
Maximum Development Risk (Direct Holdings Only)	Real Estate	10%
Maximum Single Property Type Exposure - Quarterly	Real Estate	50%
Minimum Core Holdings (Including REIT portfolios)	Real Estate	50%
Maximum Value Holdings	Real Estate	30%
Maximum Opportunistic Holdings	Real Estate	30%
Maximum Core Portfolio Leverage	Real Estate	50%
Maximum Core Fund/Deal Leverage (Must be non-recourse to SWIB)	Real Estate	65%
Maximum Real Estate Equity Portfolio Leverage	Real Estate	60%

⁴ If SWIB subsequently commits to a limited partnership or other fund vehicle of the sponsor or manager, then such co-investment shall no longer be included for purposes of calculating this soft parameter.

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Maximum Holdings with Leverage > 80%	Real Estate	10%
Maximum Debt Holdings	Real Estate	25%
Ex ante volatility (tracking error) range	Hedge Fund	2.5% to 6.5%, measured with a trailing two-year risk sampling period
	Beta One	1.0% to 2.0%
Equity Delta to the S&P 500 Range	Hedge Fund	Range of -0.3 to +0.3 with a (target of zero) over a market cycle. This is measured ex ante with a trailing two-year risk sampling period
Target Beta Range	Beta One	Range of 0.85 to 1.15 with a (target of 1.0)
Maximum one-year annual Conditional Value at Risk (CVaR)	Hedge Fund	7% based on trailing two-year risk sampling period
Maximum Hedge Fund Active Risk Contribution	Hedge Fund	6.0 bps of Core Fund active risk
Maximum General Partner/Investment Manager Portfolio Concentration	Hedge Fund	12%
	Beta One	25%

APPENDIX 3 – CTF AND VTF BENCHMARKS
State of Wisconsin Investment Board
Target State Benchmarks 2023¹

Core Fund Benchmark²		
	Current Benchmark	
Public Equity	48% Fixed Blend of Six Components ³	<ul style="list-style-type: none"> - Current and previous benchmark asset classes are weighted by asset class strategic target weights - Current Benchmark updated 4/30/2012 to include Cash, which reflects leverage
Public Fixed Income	25% Fixed Blend of Eight Components ⁴	
Inflation Sensitive	19% Bloomberg US Treasury Inflation-Linked Bond Index	
Private Equity/Debt	15% Roll-Up of Five Components ⁵	
Real Estate	8% NCREIF Open End Diversified Core Equity (ODCE)	
Cash	(-15%) Bloomberg Short Term Bank Yield Index (BSBY) + 30bps	
Total	100%	
Variable Fund Benchmark		
	Current Benchmark	
Domestic Equities	70% MSCI USA Investable Market Index	
International Equities	30% MSCI All Country World Index (ACWI) ex US Custom Net Index	
Total	100%	

Note: Roll-Up refers to the market-weighted aggregation of benchmark components or indices, based on SWIB's actual market exposures.

¹ Reflects target weights under the 2023 Asset Allocation implementation plan forecasted for 12/31/2023.

² The major asset class weights are established through the annual asset allocation exercise. Private Equity/Debt weights float between 8% and 22% and Real Estate weights float between 4% and 12%. The Private Equity/Debt excess weights are taken from Public Equities and the Real Estate excess weights are taken 50% from Public Equities and 50% from Public Fixed Income.

³ Public Equity Benchmark: Fixed Blend of Six Components
79.70% MSCI World Custom Net Index
6.20% MSCI USA Small Cap Index
4.20% MSCI World Ex USA Small Cap Custom Net Index
6.80% MSCI Emerging Market ex China Custom Net Index
1.60% MSCI Emerging Market China Custom Net Index
1.50% MSCI Emerging Markets Small Cap Custom Net Index

⁴ Public Fixed Income Benchmark: Fixed Blend of Eight Components
24.00% Bloomberg Treasury Index
24.00% Bloomberg Credit Index
20.00% BofA Merrill Lynch Corporate HY Ba/B Index
10.00% Morningstar LSTA US Leveraged Loan 100 Index
8.00% Bloomberg Mortgage-Backed Securities Index
5.00% JPM EMBI Global Diversified
5.00% JPM GBI-EM Diversified
4.00% Bloomberg Long Treasury Index

⁵ Private Equity/Debt Benchmark: Roll-Up of Five Components
Component One: State Street Private Equity Index
Component Two: State Street Global Exchange Private Equity Index – Venture Capital
Component Three: Private Equity Legacy (SW050300) Actual Portfolio Returns
Component Four: Bloomberg Duration-Adjusted Baa Corporate plus 20 basis points
Component Five: Burgiss Global Senior Debt Universe

⁶ Effective 1/1/2010, the tax treatment of the MSCI benchmark updated to a custom net-of-tax benchmark based on SWIB-specific tax treatment.

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, November 28, 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 Operating Officer (non-voting)

Also in Attendance: John Voelker, Trustee
Joe Amoyal, Senior Trader–Non-Investment Grade Fixed Income
Nathan Ballard, Senior Legal Counsel
Eric Barber, Senior Legal Counsel
Chelsey Barczak, GPMS Business Director
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
Tunc Dayioglu, Senior Portfolio Manager–Funds Alpha
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Chirag Gandhi, Senior Portfolio Manager–Multi-Asset Strategies
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Jameson Greenfield, Chief Financial Officer
Dan Gyorog, Internal Auditor
Alex Hansen, Investment Operations Analyst–Private Markets & Funds Alpha
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation

Vince Janecky, Internal Auditor Data Analyst
Ryan Johnston, Senior Analyst–Funds Alpha
Salah Khalaf, Portfolio Manager–Private Markets & Funds Alpha
Jason Kowalke, Investment Operations Analyst–Private Markets & Funds Alpha
Jason Krueger, Compliance Analyst
Lisa Lange, Director of Compliance & Senior Legal Counsel
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
Jeff Lucas, Senior Portfolio Manager–Investment Grade Fixed Income
Bill Luetzow, Legal Counsel
Damian Maroun, Head of Trading and Execution
Ed Martinez, PMFA Business Director
Frank Mazzucco, Legal Counsel
Chad Neumann, Senior Portfolio Manager–Global Equity Strategy
Scott Parrish, Head of Private Equity
Anand Rakesh, Director of Risk Analytics & Financial Engineering Systems
Tom Robinson, Head of Corporate Governance
Joe Roth, Transition Management and Portfolio Support Manager
Edouard Senechal, Senior Portfolio Manager–Asset & Risk Allocation
Jack Su, Business Analyst
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Dawn Tuescher, Executive Administrative Assistant
Rob Vanderpool, Fund Administration Director
Zhenping Wang, Senior Analyst–Asset & Risk Allocation
Feng Zhao, Senior Portfolio Manager–Multi-Asset Strategies
Chris Levell, NEPC
Joe Nankof, NEPC
Eileen Neill, Verus Advisory
Carolyn Stittleburg, Legislative Audit Bureau
Rhyannon Whyte, Aksia
(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 October 24, 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. Mattina and seconded by Mr. Cavaglia to approve both the open session and the closed session minutes of October 24, 2023, as presented. The motion passed unanimously.

2. 2024 Asset Allocation Recommendations

Joe Nankof and Chris Levell, NEPC, presented the *Asset Allocation Review*, included on pages 9-34 in the meeting materials. Mr. Nankof reviewed the themes of the 2024 asset allocation analysis, including **(a)** increasing the focus of model portfolios on the longer-term horizon based on 30-year capital market assumptions, due in part to the recent higher volatility of returns in the shorter-term 10-year assumptions, and **(b)** examining the allocations to private equity/debt and policy leverage, as well as the mix of public fixed income and public equities, in light of the shift in NEPC's capital market assumptions for future asset class returns and risk. He noted that NEPC had made modest changes to its recommendations since those presented at the September Committee meeting and October Board Workshop.

Mr. Nankof then summarized NEPC's asset allocation recommendations for the Core Trust Fund (CTF) to **(i)** decrease the target allocation to public equity from 48% to 40%, **(ii)** increase the target allocation to public fixed income from 25% to 27%, resulting in a net decrease of 6% to public markets overall, **(iii)** increase the target allocation to private equity/debt from 15% to 18% and expand the range around the private equity/debt allocation from +/- 7% to +/- 8%, **(iv)** decrease policy leverage from 15% to 12%, and **(v)** maintain the target allocations to real estate and inflation-sensitive assets. No changes were recommended for the CTF sub-asset class target allocations, the Reference Portfolio, or the Variable Trust Fund (VTF).

Mr. Nankof and Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, then led the Committee's discussion comparing the recommended asset allocation to both the current policy and to hypothetical alternative portfolios with higher fixed income allocations. They highlighted that the recommended asset allocation reduces risk while maintaining a generally consistent 30-year expected return without the increased costs and decreased liquidity associated with the higher fixed income portfolios. Mr. Nankof also compared the proposed increase in the public fixed income target allocation to prior allocation changes implemented at SWIB and to public fixed income allocations at peer public pension plans while noting that NEPC does not recommend trying to over-engineer the most efficient portfolio on an annual basis based on fluctuations to the capital market assumptions.

Motion: A motion was made by Mr. Mattina and seconded by Mr. Shearer to approve and to recommend to the Board of Trustees the Asset Allocation Recommendations for 2024, in substantially the form included in the Committee materials. The motion passed unanimously.

3. Annual Benchmark Presentation

Mr. Nankof presented the results of the 2023 annual benchmark review, included on pages 35-70 in the meeting materials. He noted that NEPC, as the Board of Trustees' benchmark consultant, coordinated with the Asset and Risk Allocation division (ARA) and specific investment management staff where warranted. He summarized NEPC's recommendations to **(a)** adopt the State Street Private Equity Index (SSPEI) Private Debt Index benchmark for the current return portfolio, which provides broader coverage of relevant sub-strategies and geographies, beginning January 1, 2024, and **(b)** adopt the MSCI China All Shares Index for the China equity strategy, which aligns more closely with active

managers' portfolios, effective January 1, 2025 subject to operational readiness as determined by NEPC and SWIB's performance team and ED/CIO by October 1, 2024.

Mr. Nankof then discussed the additional benchmarks reviewed in 2023, noting that NEPC's recommendation is to maintain the status quo for **(i)** the approach to currency adjustments for the private equity portfolio benchmark, **(ii)** the benchmark for the leveraged loans portfolio, and **(iii)** the benchmark for CTF policy leverage. Mr. Nankof noted that all benchmarks will be reviewed in 2024 as part of the comprehensive benchmark review.

Motion: A motion was made by Mr. Stanton and seconded by Mr. Nicholson to approve, and to recommend to the Board of Trustees' Benchmark and Performance Committee, the changes to the benchmarks as presented and recommended by SWIB's benchmark consultant, NEPC, in its Annual Benchmark Review, included in the Committee's materials. The motion passed unanimously.

4. Q3 2023 Quarterly Updates

A. Multi-Asset Strategies

Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies, referred the Committee to the *Global Public Markets Strategies Quarterly Update*, included on pages 71-75 in the meeting materials, for the division's performance summary as of September 30, 2023. He confirmed that the multi-strat portfolio was in compliance with its guidelines for Q3 2023.

B. Funds Alpha

Derek Drummond, Head of Funds Alpha, presented the *Funds Alpha Q3 2023 Update*, included on pages 76-83 in the meeting materials. He discussed performance for the third quarter, commenting that **(a)** the hedge fund portfolio had positive excess value added (EVA), driven by a resurgence of macro trends and positive selection from the quantitative and equity long/short sub-strategies, and **(b)** the beta one portfolios had modestly negative EVA, driven by **(i)** major factor rotation and a rally in low-quality names in beta one equity and **(ii)** negative selection in emerging markets with moderate risk-on positioning in beta one fixed income. Mr. Drummond then reviewed manager positioning in the beta one portfolios, commenting that the beta one equities portfolio maintained its overweight to quality, and discussed the tracking error for both beta one portfolios and the hedge fund portfolio, which were below long-term targets.

Mr. Drummond provided an update on the market environment, noting that **(a)** breadth in the equity markets outside of a small number of large cap technology companies has increased and volatility has moderated, **(b)** liquidity remains scarce across asset classes, **(c)** corporate activity has increased moderately, and **(d)** key risks include Federal Reserve policy, consumer behavior, the role played by large, systemically important hedge fund platforms, and continued uncertainty around interest rates and the potential for persistently high inflation. Lastly, he confirmed that the portfolios were in compliance with their guidelines for Q3 2023.

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 proprietary investment strategies and investment instruments related to multi-asset, funds alpha, fixed income, asset and risk allocation, and exposure management, and **(c)** the review of broker information, was made by Ms. Fink and seconded by Ms. Linn.

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 2:03 p.m. and reconvened in open session at 4:07 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 proprietary investment strategies and investment instruments related to multi-asset, funds alpha, fixed income, asset and risk allocation, and exposure management, and **(c)** reviewed broker information.

7. Research Task Force Report

Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation, presented the *Research Task Force Update*, included on pages 215-223 in the meeting materials. He discussed recent task force initiatives, including **(a)** sponsoring seminars with diverging viewpoints on the likelihood of a recession, **(b)** coordinating upcoming presentations on interest rate policy and the 2024 election season, **(c)** hosting speakers on evergreen investment themes, including risk management for pension plans, reinsurance, carbon trading, and resource efficiency, **(d)** promoting internal knowledge-sharing and educational programs, including an upcoming wellness-at-work program, and **(e)** sponsoring membership in a forum for quantitative research in finance. Lastly, Mr. Cavaglia welcomed the five new members joining the Investment Forum task force in 2024.

8. Quarterly Performance Review (Q3 2023)

Mr. Denson noted that the *Investment Performance Report*, as of September 30, 2023, was included on pages 224-234 in the meeting materials for the Committee’s information.

9. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters–*

Asset Class and Portfolio, as of October 31, 2023, was included on pages 235-236 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.

10. Future Meeting Topics

Mr. Denson noted that draft agendas for the December 21, 2023 and January 23, 2024 Committee meetings were included on pages 237-240 in the meeting materials for the Committee's review.

11. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Stanton and seconded by Mr. Cavaglia. The motion passed unanimously, and the meeting adjourned at 4:12 p.m.

Date of Committee Approval: 12/21/23

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

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Thursday, December 21, 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
Joe Amoyal, Senior Trader–Non-Investment Grade Fixed Income
Eric Barber, Senior Legal Counsel
Chelsey Barczak, GPMS Business Director
Chris Benish, Portfolio Manager–Asset & Risk Allocation
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Christian Comito, Portfolio Manager–Investment Grade Fixed Income
Andrew Crossman, Analyst–Private Equity
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
Chirag Gandhi, Senior Portfolio Manager–Multi-Asset Strategies
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Chase Gendron, Investment Operations Analyst
Jameson Greenfield, Chief Financial Officer
Dan Gyorog, Internal Auditor
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation
Hillary Holstein, Portfolio Manager–Asset & Risk Allocation

Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Salah Khalaf, Portfolio Manager–Private Markets & Funds Alpha
Jason Kowalke, Investment Operations Analyst
Dylan Krivoshein, Investment Operations Analyst
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
Tony Lubarsky, Investment Operations Analyst
Bill Luetzow, Legal Counsel
Damian Maroun, Head of Trading and Execution
Ed Martinez, PMFA Business Director
Frank Mazzucco, Legal Counsel
Sunil Nair, Operational, Financing & Counterparty Risk Director
Chad Neumann, Senior Portfolio Manager–Global Equity Strategy
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
Joe Roth, Transition Management and Portfolio Support Manager
Jason Rothenberg, Head of Real Estate
Edouard Senechal, Senior Portfolio Manager–Asset & Risk Allocation
Aaron Shew, Investment Operations Analyst
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Dawn Tuescher, Executive Administrative Assistant
Rob Vanderpool, Fund Administration Director
Zhenping Wang, Senior Analyst–Asset & Risk Allocation
Kirk Wolff, Portfolio Manager–Private Equity
Audrey Woller, 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 November 28, 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. Mattina and seconded by Mr. Shearer to approve both the open session and the closed session minutes of November 28, 2023, as presented. The motion passed unanimously.

2. Amendments to Investment Committee WRS Investment Guidelines

Sara Chandler, Chief Legal Counsel, discussed the proposed amendments to the *SWIB Investment Committee Wisconsin Retirement System Investment Guidelines*, included on pages 10-58 in the meeting materials. Ms. Chandler noted that changes to the small cap portfolio guidelines were proposed following the implementation of the new benchmark and to maintain alignment with other internally managed portfolios, including removing limitations that had required aggregation with other SWIB portfolios, adding an aggregate ex ante tracking error limit, and restricting the portfolio's gross and net exposure to 205% and 105% of market value, respectively.

In addition, the proposed changes (a) clarified that the existing guidelines for the passive portfolios are also applicable to strategies intended to provide liquidity or leverage, (b) authorized the Asset & Risk Allocation (ARA) division to engage passive external managers following the transition of ARA's historical risk management function to the Risk Management team, (c) decreased the investment grade credit portfolio's ex ante tracking error limit to reflect the portfolio's revised strategy, (d) removed the currency overlay guidelines following the transition of currency hedging to ARA, (e) added exposure limits on special or alternative opportunity financings to each of the high yield and leveraged loan portfolio guidelines, (f) updated the guidelines applicable to the portfolios in the Private Markets & Funds Alpha (PMFA) division to exclude funds-of-one from the ED/CIO ownership threshold notification and consent requirements, increase the shorting limit in the beta one equity portfolio, and permit shorting of cash bonds in the beta one fixed income portfolio, and (g) incorporated certain conforming and clean-up changes to the soft risk parameters.

Lastly, Mike Shearer, Head of Investment Grade Fixed Income, responded to questions regarding allocation of investment opportunities between the high yield and leveraged loan portfolios.

Motion: A motion was made by Ms. Fink and seconded by Ms. Linn to approve the proposed amendments to the *SWIB Investment Committee WRS Investment Guidelines*, as presented in the Committee materials. The motion passed unanimously.

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*. Ms. Fink noted that the private markets teams have made targeted strategy adjustments following the slowdown in fundraising, decline in deal and exit activity, and persistence of net cash outflows. The teams have slowed new commitment pacing, particularly in private equity, and effectuated sales of controlled assets at attractive pricing to obtain liquidity. She also highlighted the benefits of SWIB's asset allocation target ranges and the corridor treatment, which has allowed the PMFA division to pursue compelling strategic opportunities, including secondary purchases as other investors reduce allocations to private markets.

4. Q3 2023 Quarterly Updates

A. Private Equity

Scott Parrish, Head of Private Equity, presented the *Quarterly Activity Report – Private Equity*, included on pages 59-80 in the meeting materials. He provided a private equity market update for Q3 2023, noting that (a) both U.S. private equity fundraising dollars and the number of funds decreased year-over-year, (b) U.S. private equity deal value and exit value in dollars also decreased, (c) median leverage multiples declined year-over-year and more equity is required for transactions, (d) strategic acquirers represented a slight majority of portfolio company exits, with sponsor-to-sponsor transactions constituting a substantial minority and IPO activity remaining limited, and (e) European private equity fundraising dollars and the number of funds increased materially year-over-year, although three mega-funds represented approximately 60% of the European capital raised, thus skewing the fundraising dollar numbers.

Mr. Parrish then reported that, as of September 30, 2023, the market value of the aggregate private equity asset class, excluding the venture capital and private debt portfolios, was nearly \$20 billion and, when including the venture capital and private debt portfolios, made up approximately 19.7% of the Core Trust Fund (CTF). He commented that capital calls continued to exceed distributions year-to-date, with the portfolios' net negative cash flow position improving moderately relative to 2022.

With respect to performance, Mr. Parrish highlighted that the private equity portfolios all outperformed their benchmarks for the one-, three-, and five-year time periods, except for the core private equity portfolio for the one-year period, and that, as of June 30, 2023, the combined private equity and co-investment portfolios achieved second quartile performance for vintage years 2014-2022 and first quartile performance for 2023. He also reviewed the equity multiples and internal rates of return (IRRs) for the portfolios' sub-strategies, highlighting 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, (b) public versus private portfolio company exposure, noting that public exposure continued to decrease as a result of fewer portfolio companies exiting via public offerings, and (c) industry diversification, noting that the current return portfolio's overweight to financials is overstated due to the classification of certain loan portfolios. He also reviewed the commitments made in Q3 2023 and the portfolio pipeline for Q4 2023. He further confirmed that the portfolio remained in compliance with all investment guidelines. Finally, Mr. Parrish led the Committee's discussion regarding the private equity portfolios' commitment pacing for 2023 and the composition of the investor base supporting recent European mega-funds.

B. Real Estate

Jason Rothenberg, Head of Real Estate, presented the *Quarterly Activity Report – Real Estate*, included on pages 81-93 in the meeting materials. He provided a real estate market overview, noting that (a) real estate capital markets remain volatile, as has been the case since the Federal Reserve began raising interest rates, (b) on the operating side, the broader outlook remains uncertain as pandemic-era trends and their effects continue to work their way through the various real estate sectors, (c) the real estate market remains sensitive to the

elevated cost and reduced availability of financing, with tightening credit conditions weighing on overall transaction volume, and **(d)** geographical dispersion in performance is attributable partially to property type, as areas focused on the industrial sector have generally performed better than those focused on office and retail, and the team has observed shifts in one- and five-year performance for certain regions following pandemic-era overbuilding.

Mr. Rothenberg reviewed the real estate portfolio, noting that the portfolio's market value remained approximately \$11.9 billion as of the end of Q3 2023, representing approximately 10% of the CTF. He then discussed the portfolio's **(i)** risk profile, which has not materially changed, and **(ii)** diversification by property type, highlighting that, as industrial has become a larger percentage of the benchmark at the expense of traditional office over the past five years, the team is aiming to reduce but not eliminate the portfolio's underweight to industrial while maintaining the underweight to office.

Mr. Rothenberg also discussed the portfolio's performance, highlighting outperformance relative to the benchmark over all time periods despite negative absolute returns for the one-year period, as the portfolio benefited from its underweight to office and from its ability to execute on opportunities in alternative sectors (e.g., credit, senior housing, and data centers). Lastly, he reviewed performance by sub-strategy, highlighted the four commitments made in the third quarter, discussed the pipeline under review, and 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 94-105 in the meeting materials. He provided a private debt market update for the third quarter, noting that **(a)** fundraising declined relative to the prior quarter, as larger funds elected to fundraise for longer periods and smaller funds encountered headwinds, with the full year on track to be modestly below 2022 levels, **(b)** assets under management (AUM) attributable to direct lending has increased significantly over the past decade as new managers continue to enter the market, **(c)** dry powder available to invest has declined year-over-year and relative to the longer-term average, and **(d)** the overall private credit default rate continued to decline in the third quarter.

Mr. Prestigiaco then reviewed the portfolio's **(i)** characteristics, noting that the portfolio added three new loans, with the average coupon increasing by 20 basis points (bps) and average life and duration decreasing modestly from the prior quarter, **(ii)** current below investment grade (BIG) holdings of 8%, flat from the prior quarter, and **(iii)** sector mix, which remains consistent with an overweight to industrial and underweight to financials arising from the portfolio's opportunity set. Mr. Prestigiaco stated that the team will seek to increase the portfolio's BIG exposure in 2024.

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. Lastly, he **(a)** reported that there were no problem credits or workouts in the portfolio, **(b)** confirmed that the portfolio remained in compliance with its guidelines, and **(c)** discussed the pipeline under review, noting that the

team is seeing more interesting opportunities as commercial 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, and (b) the review of specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, asset and risk allocation, and exposure management, was made by Mr. Drummond 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 1:45 p.m. and reconvened in open session at 3:25 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, and (b) reviewed specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, asset and risk allocation, and exposure management.

7. Transition Update (Q3 2023)

Mr. Denson referred the Committee to the transition management summary for Q3 2023, included on page 212 of the meeting materials, for a summary of the four transition events from the quarter.

8. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters–Asset Class and Portfolio*, as of November 30, 2023, was included on pages 213-214 in the meeting materials for the Committee’s review. Mr. Chehime noted that there was one new discussion trigger this month relating to the maximum position size within the passive index portfolios, and that none had been dropped this month.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the January 23, 2024 and February 27, 2024 Committee meetings were included on pages 215-218 in the meeting materials for the

Committee's review.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Ms. Fink and seconded by Ms. Linn. The motion passed unanimously, and the meeting adjourned at 3:27 p.m.

Date of Committee Approval: 01/23/24

Signed: /s/ Eric Barber
Eric Barber, Secretary
Investment Committee

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, January 23, 2024

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

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

Also in Attendance: Tom Merfeld, Trustee
John Voelker, Trustee
Joe Amoyal, Senior Trader–Non-Investment Grade Fixed Income
Nathan Ballard, Senior Legal Counsel
Chelsey Barczak, GPMS Business Director
Zach Berghouse, Internal Auditor
Kevin Blank, Analyst–Funds Alpha
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Sara Chandler, Chief of Staff & Strategy
Tunc Dayioglu, Senior Portfolio Manager–Funds Alpha
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
Jameson Greenfield, Chief Financial Officer
Thomas Gregg, Investment Operations Analyst

Dan Gyorog, Internal Auditor
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
Jason Kowalke, Investment Operations Analyst
Jason Krueger, Compliance Analyst
Alex Kubiak, Investment Operations Analyst
Lisa Lange, Director of Compliance & Senior Legal Counsel
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
Jeff Lucas, Senior Portfolio Manager–Investment Grade Fixed Income
Bill Luetzow, Legal Counsel
Matt Marek, Senior Analyst–Asset & Risk Allocation
Damian Maroun, Head of Trading and Execution
Ed Martinez, PMFA Business Director
Frank Mazzucco, Legal Counsel
Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap Strategy
Sunil Nair, Operational, Financing & Counterparty Risk 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
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Leif Thybony, Senior Portfolio Manager–Non-Investment Grade
Dawn Tuescher, Executive Administrative Assistant
Rob Vanderpool, Fund Administration Director
Joe Nankof, NEPC
Keri Ware, 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 1:01 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 December 21, 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. Mattina and seconded by Mr. Nicholson to approve both the open session and the closed session minutes of December 21, 2023, as presented. The motion passed unanimously.

2. Amendments to SWIB Investment Committee Charter

Eric Barber, Chief Legal Counsel, reviewed the proposed amendments to the *SWIB Investment Committee Charter*, included on pages 11-14 in the meeting materials. He noted that, in addition to non-substantive changes, the revisions remove the requirement that the Committee approve guidelines for passive external managers, harmonizing the Charter with the Committee's investment guideline amendments approved in December 2023 that permit the Asset & Risk Allocation (ARA) division to engage passive external managers.

Motion: A motion was made by Mr. Mattina and seconded by Ms. Cavaglia to recommend to the Board of Trustees that it adopt and approve the changes to the *SWIB Investment Committee Charter*, as shown in the Committee materials. The motion passed unanimously.

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*. Ms. Fink reminded the Committee of the changes to the standard Committee meeting quarterly schedule for 2024, which were implemented to provide the most recent data in each quarterly update. She noted that the private markets updates in this meeting on the new schedule would be abbreviated and focus on performance updates, since full updates were provided at the December meeting.

Ms. Fink then commented on positive overall performance from the PMFA division in 2023, technological and operational improvements that contributed to enhanced reporting, and the new team members who joined the division throughout the year.

4. Q3-Q4 2023 Quarterly Updates

A. Private Equity

Scott Parrish, Head of Private Equity, presented the *Quarterly Activity Report – Private Equity*, included on pages 15-23 in the meeting materials. He reported that, as of December 31, 2023, the market value of the aggregate private equity asset class, including the venture capital and private debt portfolios, made up approximately 19.2% of the Core Trust Fund (CTF). Mr. Parrish noted that this represented a slight decline from 19.7% as of the December Committee meeting, due primarily to the recent rally in public markets. With respect to performance, he highlighted that (a) as of September 30, 2023, the combined private equity and co-investment portfolios achieved second quartile performance for vintage years 2014-2023, and (b) as of December 31, 2023, the private equity portfolios all outperformed their benchmarks for the one-, three-, and five-year time periods, except for modest underperformance for the core private equity portfolio for the one-year period. He

then reviewed the commitments made in Q4 2023 and confirmed that the portfolio remained in compliance with its investment guidelines.

B. Real Estate

Jason Rothenberg, Head of Real Estate, presented the *Quarterly Activity Report – Real Estate*, included on pages 24-33 in the meeting materials. With respect to the real estate market, Mr. Rothenberg commented that slower overall transaction volume continued, although activity may increase in 2024 as firms deploy their dry powder. He then reviewed the real estate portfolio, noting that (a) net cash outflows continued due to the slow transaction market for sales, with ongoing slow distributions expected through at least the first half of 2024, (b) the portfolio’s market value was effectively unchanged year-over-year as capital contributions offset valuation declines, and (c) leverage increased modestly during the quarter due to continued asset-level depreciation.

Mr. Rothenberg then (i) discussed the portfolio’s performance, highlighting outperformance relative to the benchmark over all time periods despite negative absolute returns for the one-year period, (ii) reviewed performance by sub-strategy, noting challenging one-year performance for office and multi-family, and (iii) highlighted the five commitments made in the fourth quarter, discussed the pipeline under review, and 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 34-42 in the meeting materials. Mr. Prestigiaco reviewed the portfolio’s (i) characteristics, noting that the portfolio added four new loans during the fourth quarter, with the average coupon increasing by 20 basis points (bps) and average life and duration increasing modestly from the prior quarter, (ii) current below investment grade holdings of 8%, flat from the prior quarter, and (iii) sector mix, which shifted to slightly underweight industrial relative to the benchmark, in contrast to the portfolio’s historical overweight to industrial that arose from the portfolio’s opportunity set. 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. Lastly, he confirmed that the portfolio remained in compliance with its guidelines and discussed the pipeline under review.

D. Funds Alpha

Derek Drummond, Head of Funds Alpha, presented the *Funds Alpha Q4 2023 Update*, included on pages 43-48 in the meeting materials. He discussed performance for the fourth quarter, commenting that (a) the hedge fund portfolio generated positive excess value added (EVA), with strong performance across all sub-strategies led by event-driven and multi-strategy managers, (b) the beta one fixed income portfolio also had positive EVA, driven by risk-on positioning in U.S. and emerging markets, and (c) the beta one equity portfolio had negative EVA, driven by a rally in low-quality small cap names and major factor rotation.

Mr. Drummond then provided an update on the market environment, noting that (i) many hedge fund managers are cautiously optimistic for 2024, (ii) credit fundamentals have weakened and defaults have increased, which may present opportunities for SWIB to act as

a liquidity provider, and (iii) geopolitical risk remains elevated. Lastly, he reviewed manager positioning in the beta one portfolios, commenting that the beta one equity portfolio's overweight to quality declined over the past year, and confirmed that the portfolios were in compliance with their guidelines for Q4 2023.

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, and (b) the review of specific proprietary investment strategies and investment instruments related to global public market strategies, private equity, real estate, private debt, venture capital, funds alpha, and exposure management, was made by Mr. Drummond and seconded by Mr. Maung.

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 1:23 p.m. and reconvened in open session at 3:04 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, and (b) reviewed specific proprietary investment strategies and investment instruments related to global public market strategies, private equity, real estate, private debt, venture capital, funds alpha, and exposure management.

7. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters—Asset Class and Portfolio*, as of December 29, 2023, was included on pages 160-161 in the meeting materials for the Committee's review. Mr. Chehime noted that there were no new discussion triggers this month and that the soft risk parameters had been updated to reflect the guideline amendments approved by the IC at its December 2023 meeting. With the updates, the discussion trigger relating to the maximum position size within the passive index portfolios that had been flagged in December is no longer included.

8. Future Meeting Topics

Mr. Denson noted that draft agendas for the February 27, 2024 and March 21, 2024 Committee meetings were included on pages 162-165 in the meeting materials for the Committee's review.

9. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Maung and seconded by Ms. Fink. The motion passed unanimously, and the meeting adjourned at 3:06 p.m.

Date of Committee Approval: 02/27/24

Signed: /s/ Eric Barber
Eric Barber, Secretary
Investment Committee

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, February 27, 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. January 23, 2024	
10		2. Q4 2023 Quarterly Updates	Mike Shearer Nick Stanton
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		3. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
5	Motion	4. QIR Certification	Lisa Lange
		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 global public market strategies, global equities, small cap equities, multi-asset, fixed income strategies, short-term credit, 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

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

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Thursday, March 21, 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. February 27, 2024	
5		2. June Investment Forum Preview	Jack Drew
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		3. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
10	Motion	4. Amendments to Investment Committee WRS Investment Guidelines	Lisa Lange
5		5. Transition Update (Q4 2023)	Joe Roth
5		6. Research Task Force Report	Stefano Cavaglia
		7. Quarterly Performance Review (Q4 2024) (No presentation unless requested)	
		8. QIR Annual Certification Report (No presentation unless requested)	
		9. Soft Risk Parameters (No presentation unless requested)	
		10. Future Meeting Topics	

* 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 private markets and funds alpha 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.

	Motion	11. Motion to Adjourn	
		<p><i>NOTES: Items may be taken in order other than listed.</i></p> <p><i>The meeting site is physically accessible. Upon prior request, reasonable accommodations will be provided.</i></p>	

<p><u>Future Meetings</u></p> <p>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.</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 Eric Barber (Secretary), Chief Legal Counsel Hassan Chehime, Head of Risk Management</p>
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AGENDA / NOTICE

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, April 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. March 21, 2024	
5		2. Private Markets & Funds Alpha Division Update	Anne-Marie Fink
45		3. Q1 2024 Quarterly Updates A. Private Equity B. Real Estate C. Private Debt D. Funds Alpha	Scott Parrish Jason Rothenberg Chris Prestigiacomo Derek Drummond
	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 equity, real estate, private debt, venture capital, funds alpha, 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

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

STATE OF WISCONSIN INVESTMENT BOARD
Enterprise Risk and Compliance Committee-Open Session

Thursday, November 9, 2023

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

Committee Members Present: Hassan Chehime, Head of Risk Management (Co-Chair)
Lisa Lange, Director of Compliance & Senior Legal Counsel (Co-Chair)
Jameson Greenfield, Chief Financial Officer (Vice Chair)
Sara Chandler, Chief Legal Counsel (Secretary)
Edwin Denson, Executive Director/Chief Investment Officer
Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer
Todd Mattina, Head Economist, Asset & Risk Allocation CIO
Brandon Brickner, Internal Audit Director (*non-voting*)

Others Present: Eric Barber, Senior Legal Counsel
Trey Edgerle, Compliance Analyst
Jason Krueger, Compliance Analyst
Alyssa Moore, Compliance Analyst
Sunil Nair, Operational, Financing & Counterparty Risk Dir.
Olu Olubiyi, Information Security & Governance Manager
Dawn Tuescher, Executive Administrative Assistant

Open Session

Lisa Lange, Co-Chair of the Enterprise Risk and Compliance Committee (“ERCC”), declared that a quorum was present and called the meeting to order at 10:02 a.m.

1. Approval of Minutes

Ms. Lange confirmed that there were no questions or comments on either the open session or closed session minutes of May 25, 2023, which were included on pages 4-6 in the meeting materials.

Motion: A motion was made by Todd Mattina, Head Economist and Asset & Risk Allocation CIO, and seconded by Sara Chandler, Chief Legal Counsel, to approve the open session and closed session minutes of May 25, 2023, as presented. The motion passed unanimously.

2. Risk Management Division Update

Hassan Chehime, Head of Risk Management, presented the Risk Management Division Update, included on pages 7-9 in the meeting materials. Mr. Chehime updated the Committee on work done to further position and enhance the FactSet Risk System as the Risk Management Team’s

enterprise risk system. Mr. Chehime gave brief updates on a number of other initiatives and improvements to investment risk management, including dashboard updates in Snowflake, completion of ARA and ISS scorecard items, and potential changes to the PMFA investment guidelines and soft risk parameters.

3. Compliance Update

Lisa Lange, Director of Compliance and Senior Legal Counsel, presented the *Compliance Reporting & Updates* for Q2 2023 and Q3 2023, which were included on pages 10-24 in the meeting materials.

A. Q2 2023

Ms. Lange reported that the second quarter of 2023 had a similar number of personal trading requests as the prior corresponding quarter, with a higher approval rate due to policy updates late in the first quarter. There was one personal trading violation in the quarter, no guideline violations and one waiver granted. The Private Debt Portfolio was granted a waiver extension to exceed the \$25 million below investment-grade issuer limit. This waiver was granted as a one-time request with no intention of the portfolio to amend the guideline. Ms. Lange reported there were no late employee compliance affirmations.

B. Q3 2023

Ms. Lange noted that the third quarter saw slightly more personal trading requests than the prior quarter, with a slightly lower approval rate. There were two personal trading violations in the third quarter. Ms. Lange noted no guideline violations, no waivers granted, and no employees with late affirmations.

Ms. Lange discussed SWIB's annual ethics training and results of its ethics test. She concluded with a discussion of compliance and reporting changes in 2023, including changes to Federal Reserve Forms S and SLT, and SEC Form 13F-HR, and upcoming changes on the horizon in 2024, including changes to SEC Schedule 13G and new filings with the SEC on Form N-PX and Form SHO, among others.

4. ERCC Charter Review

Sara Chandler, Chief Legal Counsel, reviewed the Enterprise Risk and Compliance Committee Charter, included on pages 25-27, noting that the proposed minor changes all related to changes in titles.

Motion: A motion was made by Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer, and seconded by Sara Chandler, Chief Legal Counsel, to approve the changes to the

Enterprise Risk and Compliance Committee Charter, as presented. The motion passed unanimously.

5. Convene in Closed Session

Motion: A motion to go into closed session pursuant to section 19.85(1)(d) of the Wisconsin Statutes to consider confidential strategies for crime detection and prevention relating to SWIB’s information technology systems and 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 the review of proprietary credit counterparty and broker information, was made by Jameson Greenfield, Chief Financial Officer, and seconded by Hassan Chehime.

Ms. Chandler called for a roll call vote.

Chandler-Aye	Chehime-Aye	Denson-Aye	Greenfield-Aye
Klaskin-Aye	Lange-Aye	Mattina-Aye	

There being seven ayes and no nays, Ms. Lange declared the motion passed. The Committee convened in closed session at 10:33 a.m. and reconvened in open session at 11:10 a.m.

6. Announcement of Matters Taken Up in Closed Session

Ms. Lange announced that, while in closed session, the Committee approved prior meeting minutes and received an update on operational, financing and counterparty risk management and an information security update.

7. Future Meeting Topics

No future meeting topics were discussed.

8. Adjournment

Motion: A motion to adjourn was made by Ms. Chandler, and seconded by Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer. The motion passed unanimously, and the ERCC meeting was adjourned at 11:11 a.m.

Date of Committee Approval: _____

Signed: _____

Eric Barber, Secretary
Enterprise Risk and Compliance Committee

Board Meeting

Tab 8 – Quarterly Investment Update, Q4 2023



Quarterly Investment Update

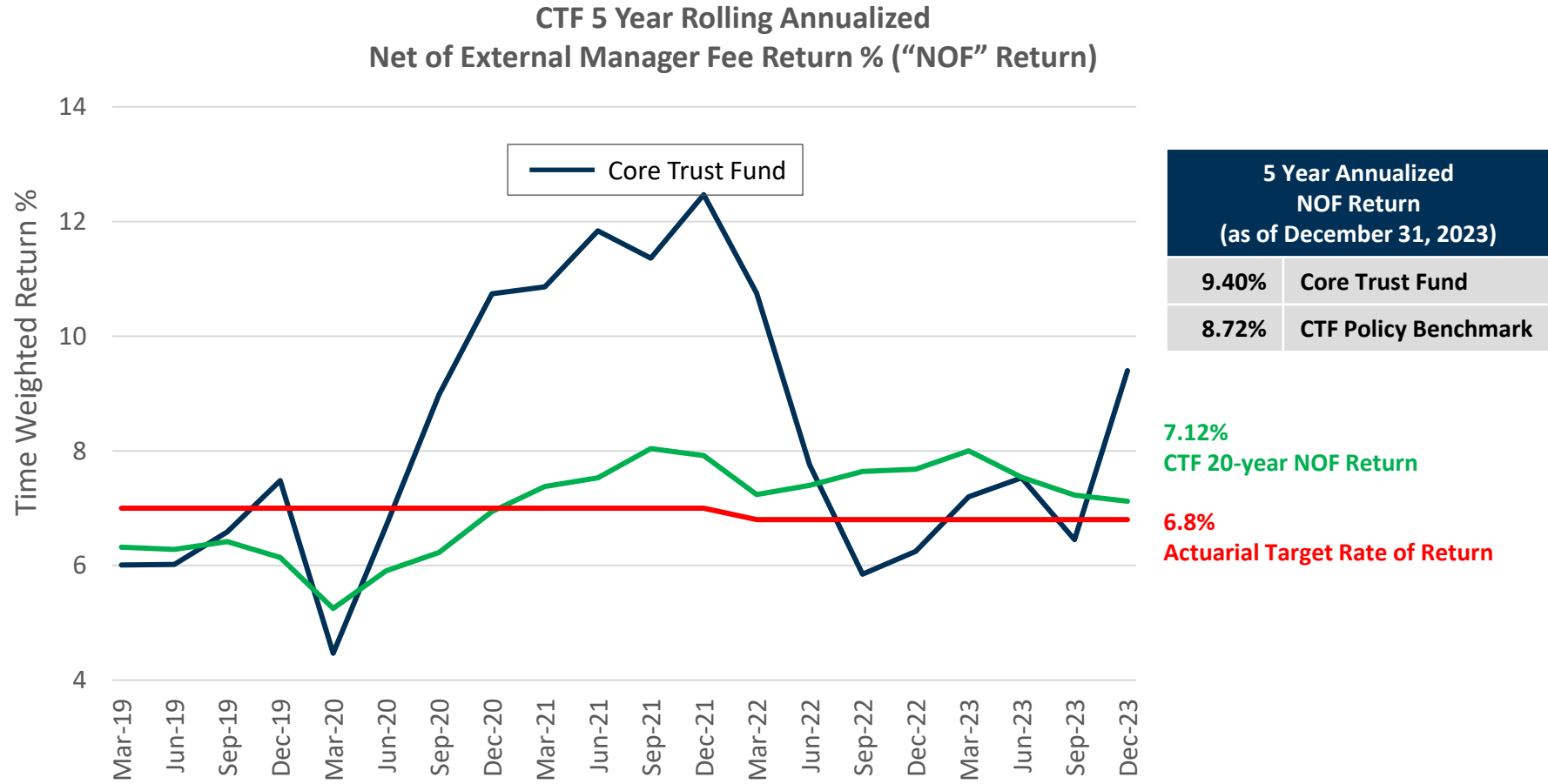
Board Meeting

March 20, 2024

Performance Trends & Outlook

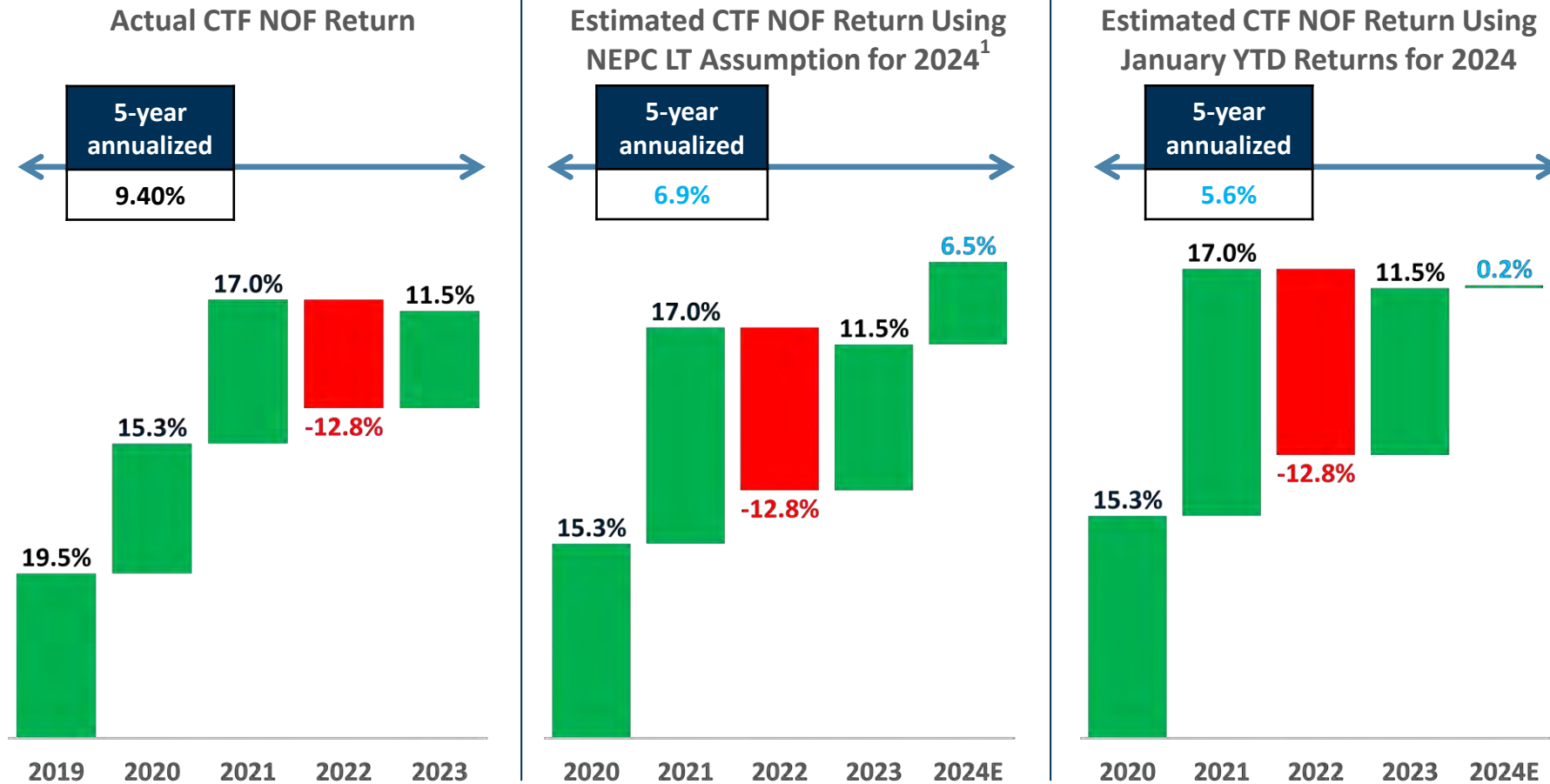
CTF 5 Year Rolling Return Trend

Quarter-end Results Through December 31, 2023



CTF 5-year Return Estimate

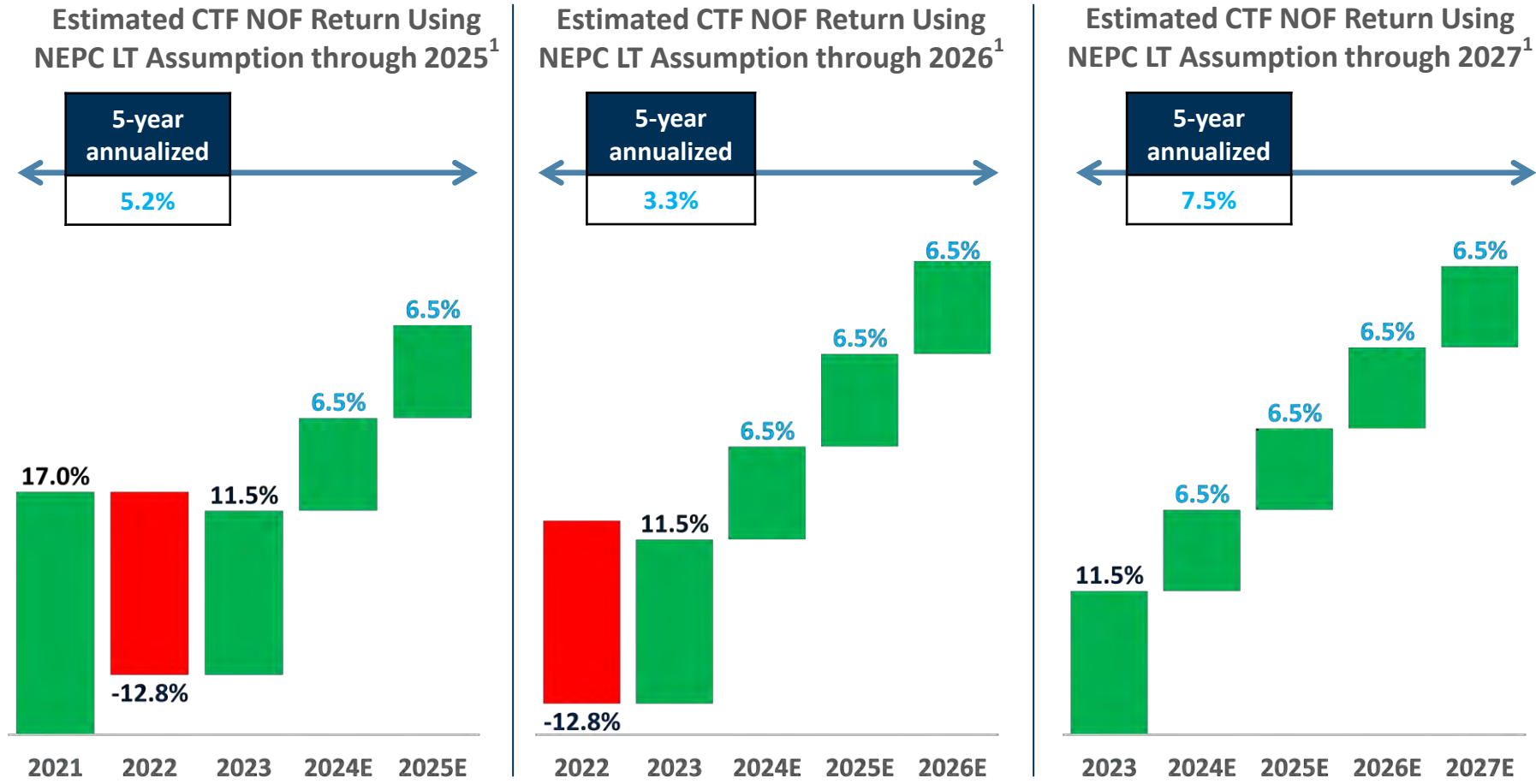
Calendar year and 5-year annualized returns



¹The NEPC 10-year expected return assumption is used to estimate 2024

CTF 5-year Return Forward Estimate

Calendar year and 5-year annualized returns



¹The NEPC 10-year expected return assumption is used to estimate 2024, 2025, 2026, and 2027

CTF Policy Benchmark & Other Indices

January 31, 2024: Total Rate of Return %, Annualized					
Index Name (Gross Return Basis, unless noted)	YTD	1yr	5yr	10yr	10yr volatility
CTF Policy Benchmark (Gross)	0.0	6.5	7.9	7.0	8.7
MSCI USA	1.6	21.1	14.3	12.5	15.3
MSCI USA Small Cap	(3.4)	3.6	9.0	8.7	19.5
MSCI World ex US Equities (Net)	0.4	9.5	7.1	4.8	15.2
MSCI World ex US Equities (Net) (Local)	2.4	11.4	8.9	7.2	12.3
MSCI EAFE Small Cap	(1.6)	4.1	5.0	5.2	16.6
MSCI Emerging Markets ex China	(2.5)	10.9	5.3		
MSCI China	(10.6)	(28.9)	(6.8)	0.6	23.7
MSCI ACWI	0.6	15.3	10.7	9.0	14.7
MSCI ACWI (Local)	1.3	16.2	11.5	10.1	13.5
Bloomberg US Gov't / Credit	(0.2)	2.4	1.1	1.8	5.0
ICE BOFA High Yield BB/B	0.1	8.7	4.3	4.5	7.3
Bloomberg U.S. TIPS	0.2	2.2	2.9	2.2	5.0

Source: Factset, SWIB

Economic Update

Summary

Growth

- SWIB view on Q4/Q4 real GDP growth in 2024 is +1.3%, slowing from a strong +3.1% in 2023.
 - (1) Fed policy and overall financial conditions are still restrictive, have not fully played out.
 - (2) High household liquid balances due to COVID stimulus have been run down...and eroded in real terms.

Inflation

- SWIB view on core Q4/Q4 PCE inflation in 2024 is +2.4%, slowing from +2.9% in 2023.
- Disinflation over the course of 2023 despite firm demand growth was due to benign supply side factors:
 - (1) A surprisingly large labor force increase
 - (2) Easing of goods supply-chain pressures

Fed

- If inflation plays out as forecast, the Fed will begin easing in mid-2024.

Labor market

- Labor market supply/demand are better balanced now. Wage growth has moderated but remains high.

Housing

- Housing is in structural under-supply due to a decade of under-building.
- Poor affordability caused a brief home price decline in H2'22, but prices resumed rising over the course of 2023.

Commercial real estate & SMID-cap banks

- Tight fed policy has led to correction in CRE prices after strong gains in 2020-2022. More downside is likely, especially for offices.
- Small-cap banks are disproportionately exposed to CRE and have traded poorly in the last month.
- Further CRE price declines will stress small-cap banks but are unlikely to cause systemic problems as in the GFC/S&L crises.

Growth & Inflation Outlook

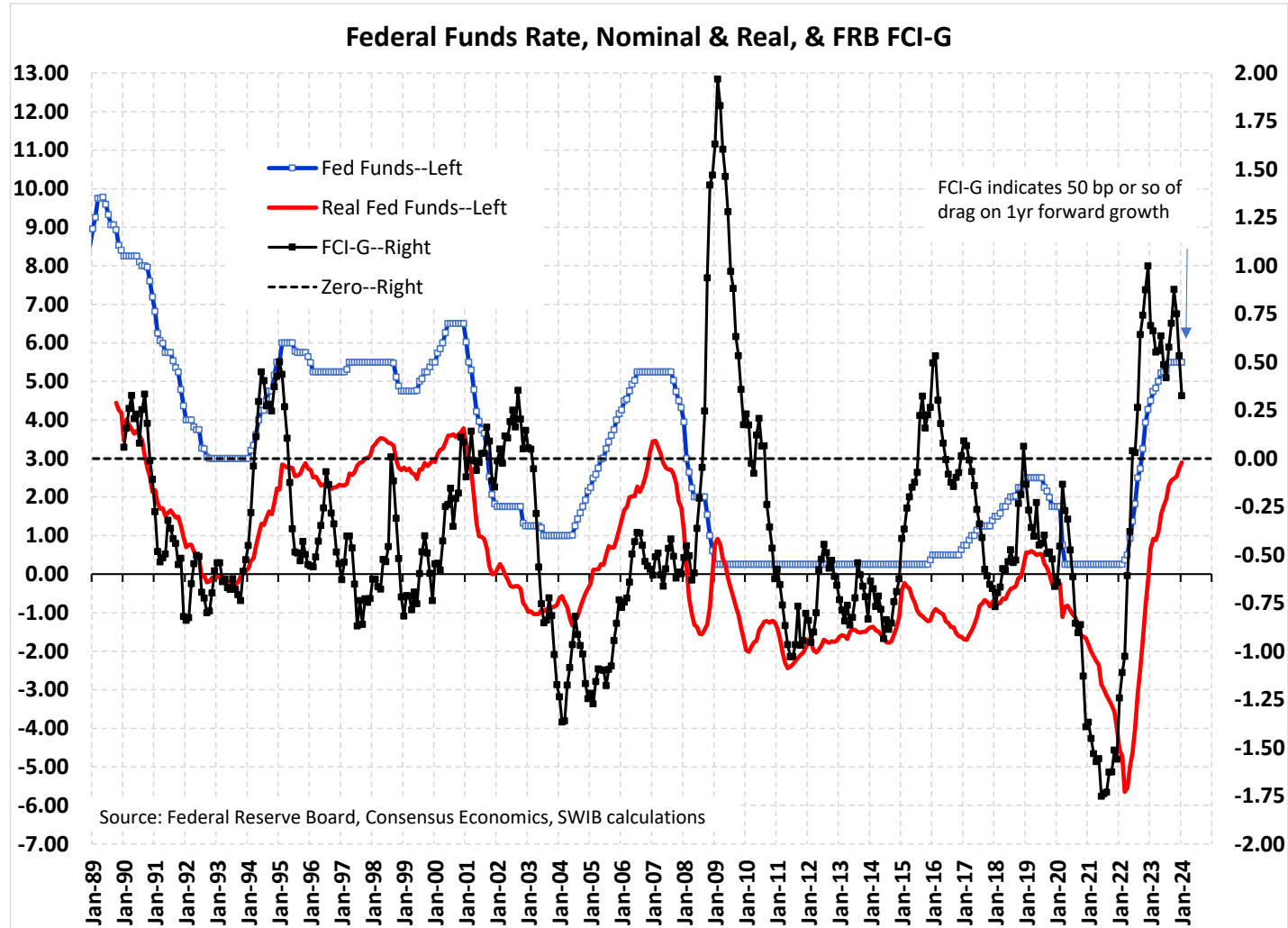
Growth

- SWIB view is for slowing of Q4/Q4 growth to +1.3% in 2024, from a strong +3.1% in 2023
 - (1) Effects of Fed tightening not yet fully played out
 - (2) While household balance sheets are in decent shape, pandemic stimulus funds have been spent down in real terms
- SWIB outlook is close to Bloomberg consensus

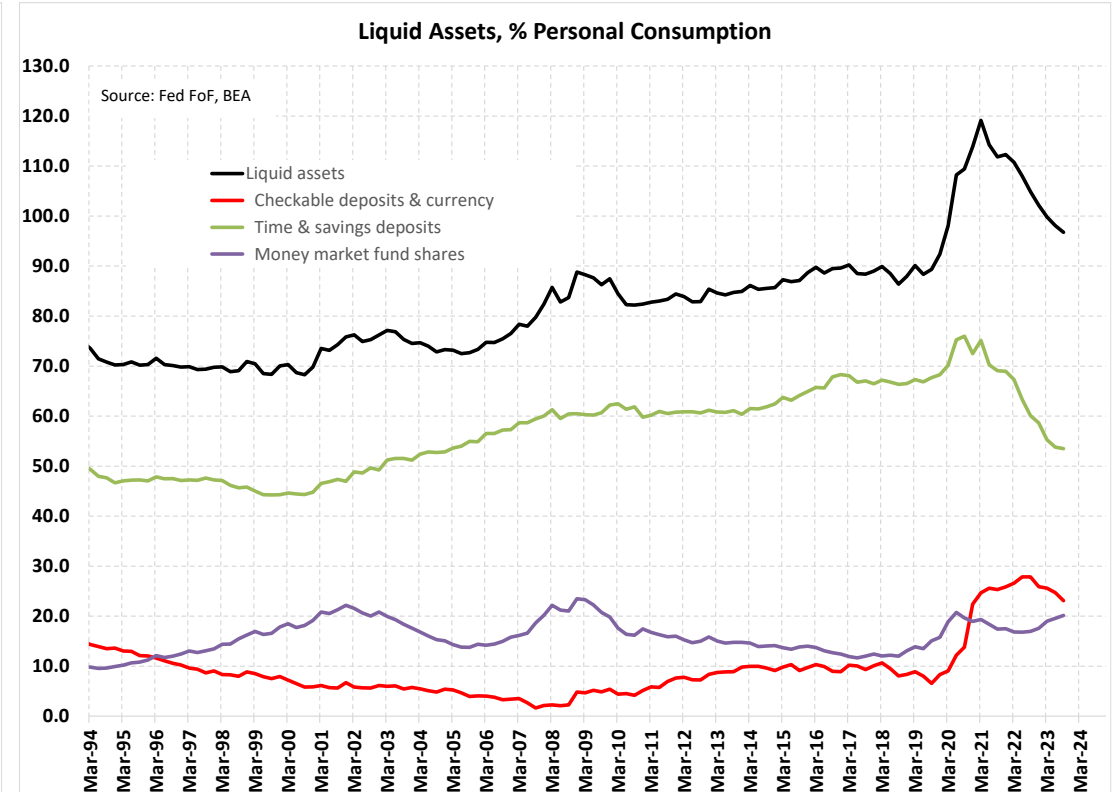
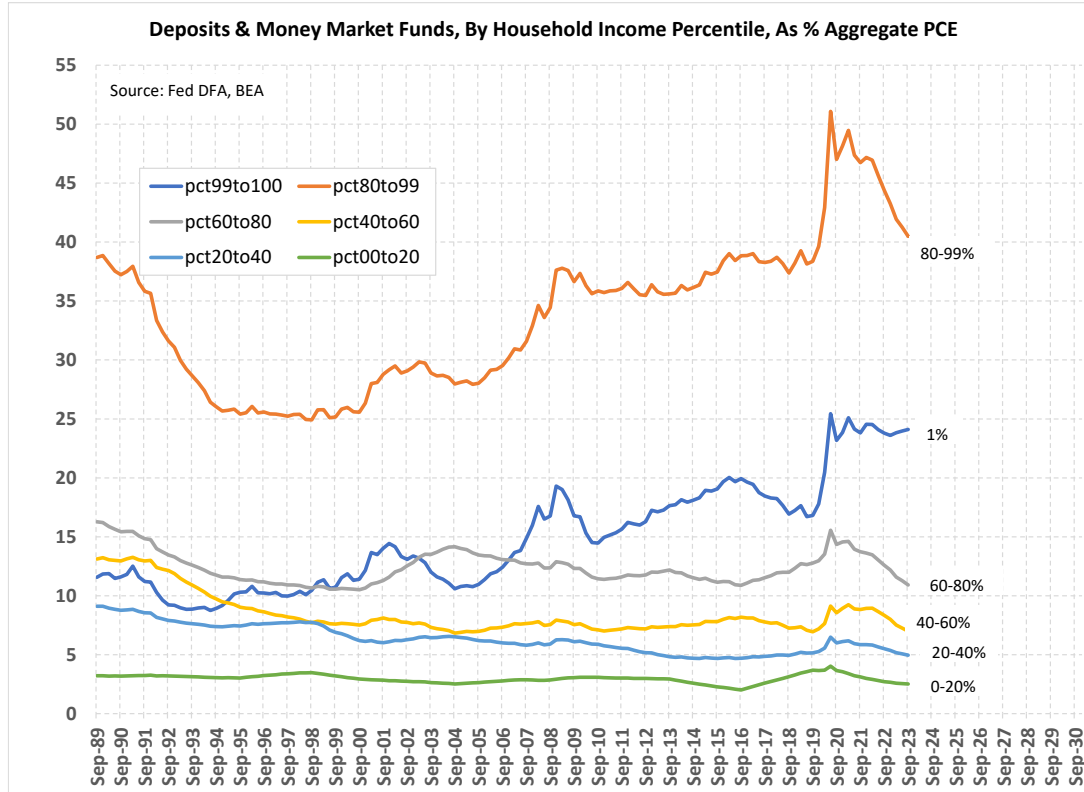
US Real GDP Q/Q SAAR									US Real GDP			Annual Average		
	Q1'23	Q2'23	Q3'23	Q4'23	Q1'24	Q2'24	Q3'24	Q4'24	2022	2023	2024	2022	2023	2024
Real GDP	2.2	2.1	4.9	3.3	1.9	1.1	0.9	1.2	0.7	3.1	1.3	1.9	2.5	2.2
Private consumption	3.8	0.8	3.1	2.8	2.0	0.9	0.9	1.8	1.2	2.6	1.4	2.5	2.2	1.9
Gross private investment	-9.0	5.2	10.0	2.1	0.3	2.8	2.7	1.0	-2.4	1.8	1.7	4.8	-1.2	2.9
Private fixed inv	3.1	5.2	2.6	1.7	7.4	1.9	1.8	2.6	-0.8	3.1	3.4	1.3	0.5	3.5
Nonresidential	5.7	7.4	1.5	1.9	2.6	1.8	1.8	2.4	5.6	4.1	2.1	5.2	4.4	2.4
Structures	30.3	16.1	11.2	3.2	5.0	2.0	2.0	2.5	0.8	14.8	2.9	-2.1	12.7	4.9
Equipment	-4.1	7.7	-4.4	1.0	2.0	1.0	0.8	1.0	5.3	-0.1	1.2	5.2	-0.1	0.9
Intel property	3.8	2.7	1.8	2.1	3.0	2.5	2.5	3.5	8.3	2.6	2.9	9.1	4.3	2.5
Residential	-5.3	-2.2	6.7	1.0	4.5	2.0	2.0	3.5	-17.4	-0.1	3.0	-9.0	-10.7	2.8
Δ in private inventories*	-2.3	-0.2	1.1	0.1	-0.3	0.2	0.2	-0.3	-1.0	-1.3	-0.2	0.5	-0.4	0.1
Net exports G&S*	0.6	0.1	0.0	0.4	0.1	-0.2	-0.2	-0.3	-3.0	-5.9	4.0	-0.5	0.8	0.0
Exports G&S	6.8	-9.3	5.4	6.3	2.5	-0.5	-0.5	0.3	4.3	2.1	0.4	7.0	2.7	1.7
Imports G&S	1.3	-7.6	4.2	1.9	1.5	1.0	1.0	2.0	2.1	-0.2	1.4	8.6	-1.7	1.2
Govt consn & inv	4.8	3.3	5.8	3.3	2.8	1.0	0.3	0.5	0.8	4.3	1.1	-0.9	4.0	2.5
Final domestic demand	3.8	2.0	3.5	2.7	3.1	1.1	1.0	1.7	0.8	3.0	1.7	1.7	2.2	2.3
Private final domestic demand	3.6	1.7	3.0	2.6	3.1	1.1	1.1	2.0	0.8	2.7	1.8	2.3	1.8	2.2
Real GDP, SWIB	2.2	2.1	4.9	3.3	1.9	1.1	0.9	1.2	0.7	3.1	1.3	1.9	2.5	2.2
Bloomberg consensus 26-Feb-24	2.2	2.1	4.9	3.3	1.6	1.1	1.1	1.5	0.7	3.1	1.3	1.9	2.5	2.2
Fed SEP 13-Dec-24	--	--	--	--	--	--	--	--	--	--	1.4	--	--	--

* Contribution to growth

Fed tightening cycle has ended, but policy remains restrictive. FCI-G, the Fed's composite index of financial conditions, still indicates a drag of 50 bp or so on 1yr forward GDP growth.



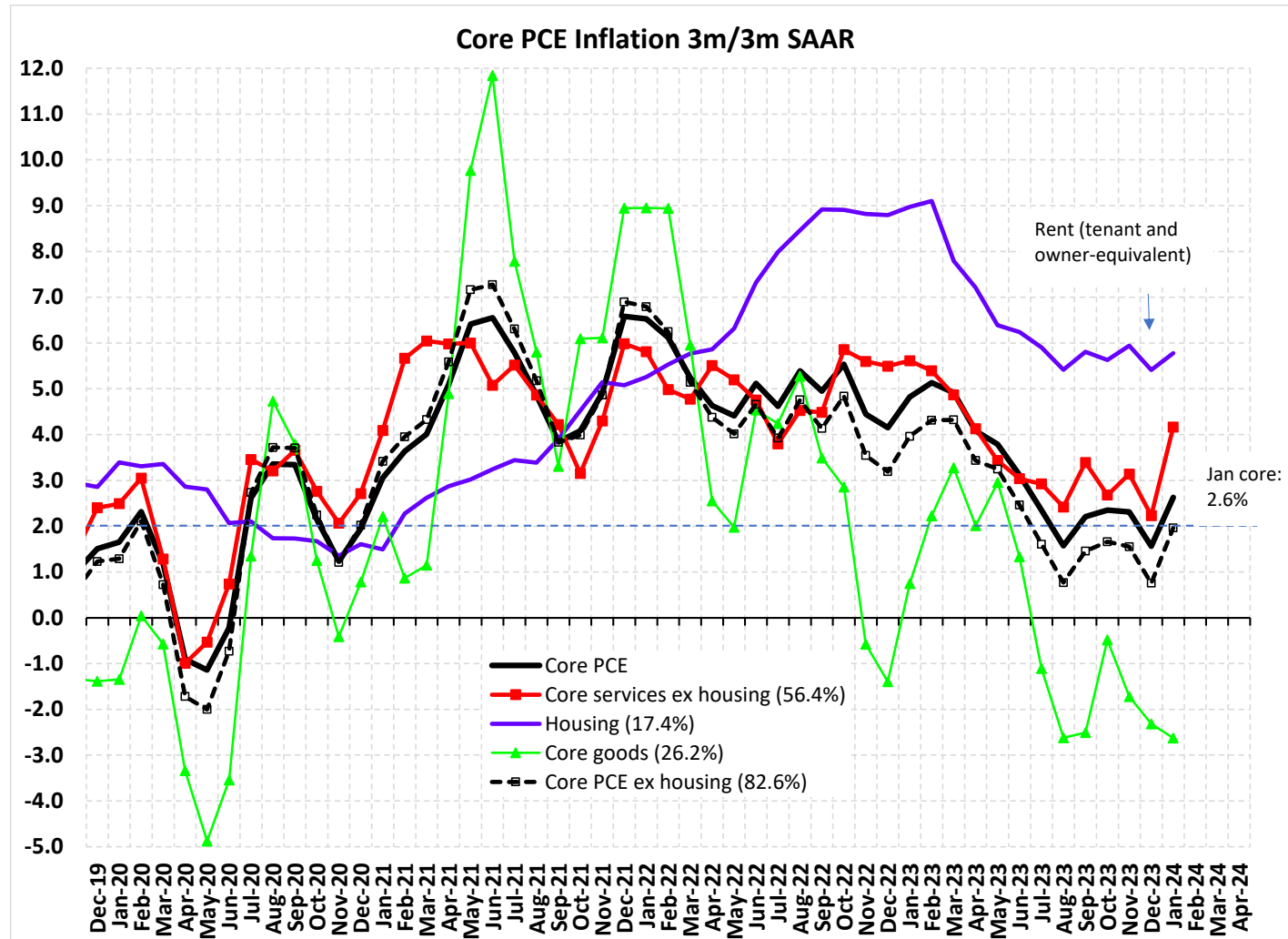
High household liquid balances due to COVID stimulus have been run down... ...and eroded by pricier consumption. Exception is the 1%.



SWIB outlook is for moderating inflation, in line with consensus and last FOMC SEP

Core PCE Outlook	Wgt	Y/Y Actual				Y/Y Forecast	
		Sep-23	Oct-23	Nov-23	Dec-23	Dec-24	Dec-25
Core PCE	100.0%	3.6	3.4	3.2	2.9	2.4	2.3
New motor vehicles	2.4%	2.6	1.9	1.4	1.0	0.0	0.0
Used motor vehicles	1.5%	-8.0	-7.1	-3.7	-1.3	-1.0	-1.0
Other durable goods	9.5%	-2.7	-2.5	-2.7	-3.3	-1.0	1.0
Core nondurables	12.7%	2.8	3.0	2.5	2.2	2.0	2.0
Housing	17.4%	7.2	6.9	6.7	6.4	5.3	3.5
Core utilities	0.8%	5.3	5.4	5.4	5.2	4.0	3.0
Health care	18.3%	2.1	2.3	2.4	2.4	2.2	2.2
Motor vehicle rental	0.2%	-8.6	-9.6	-10.7	-12.1	0.0	0.0
Air transportation	1.2%	2.3	1.0	6.2	4.4	3.5	2.5
Other transp services	2.4%	7.3	7.0	7.1	5.0	3.0	2.5
Food services	7.2%	5.8	5.3	5.2	5.1	3.5	3.0
Accommodation	1.2%	7.0	1.4	1.1	0.4	1.5	2.0
Education services	2.1%	2.3	2.2	2.1	2.0	2.0	2.0
Financial & insurance	8.1%	4.3	4.0	3.1	3.1	2.5	2.5
Other household svcs	11.7%	3.0	2.9	1.6	2.2	2.0	2.0
Non-profit consumption	3.4%	8.3	7.1	5.3	4.7	2.5	2.5
Core PCE forecasts		Sep-23	Oct-23	Nov-23	Dec-23	Dec-24	Dec-25
SWIB		3.6	3.4	3.2	2.9	2.4	2.3
FOMC SEP 13-Dec-23		3.6	3.4	3.2	2.9	2.4	2.2
BBG Consensus 26-Feb-24		3.6	3.4	3.2	2.9	2.4	2.2

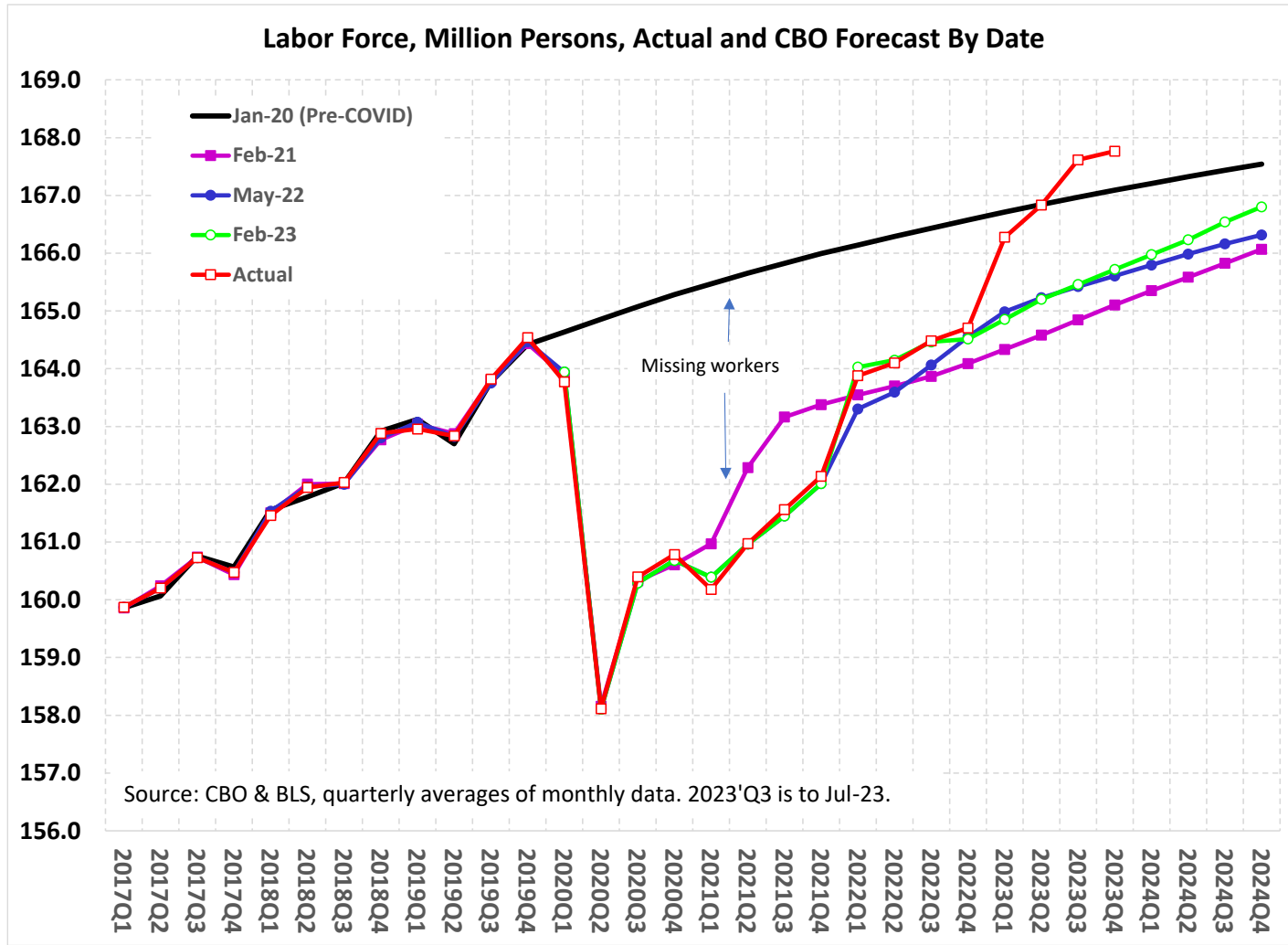
Dec-23 core PCE reading was low: +1.6% 3m/3m, but bounced back to +2.6% in Jan-24



- Services ex housing are labor-intensive and the majority of personal consumption...
- ...on this measure inflation has been behaving better, but a rebound in Jan-24 bears watching.
- Housing inflation (tenant rent, owner-equivalent rent) has eased but remains quite high, reflecting housing under-supply.
- Disinflation over the course of 2023 despite firm demand growth was due to benign supply side factors:
 - (1) A surprisingly large labor force increase
 - (2) Easing of goods supply-chain pressures

Disinflation with no recession part 1:

The labor force has recovered to above level projected by CBO pre-COVID

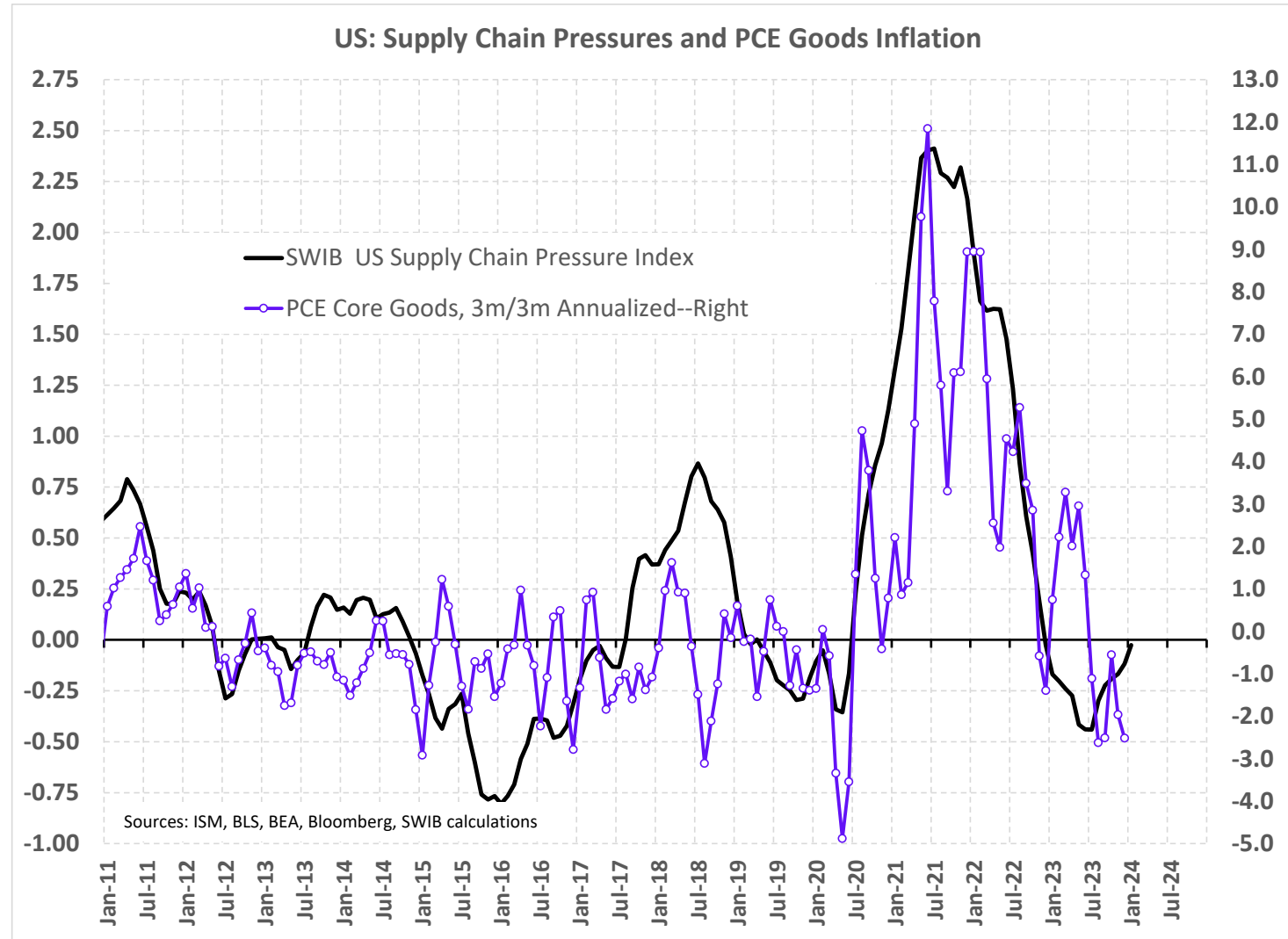


The labor force has surpassed the level that was being forecast for 2023 as of Jan-20, pre-COVID.

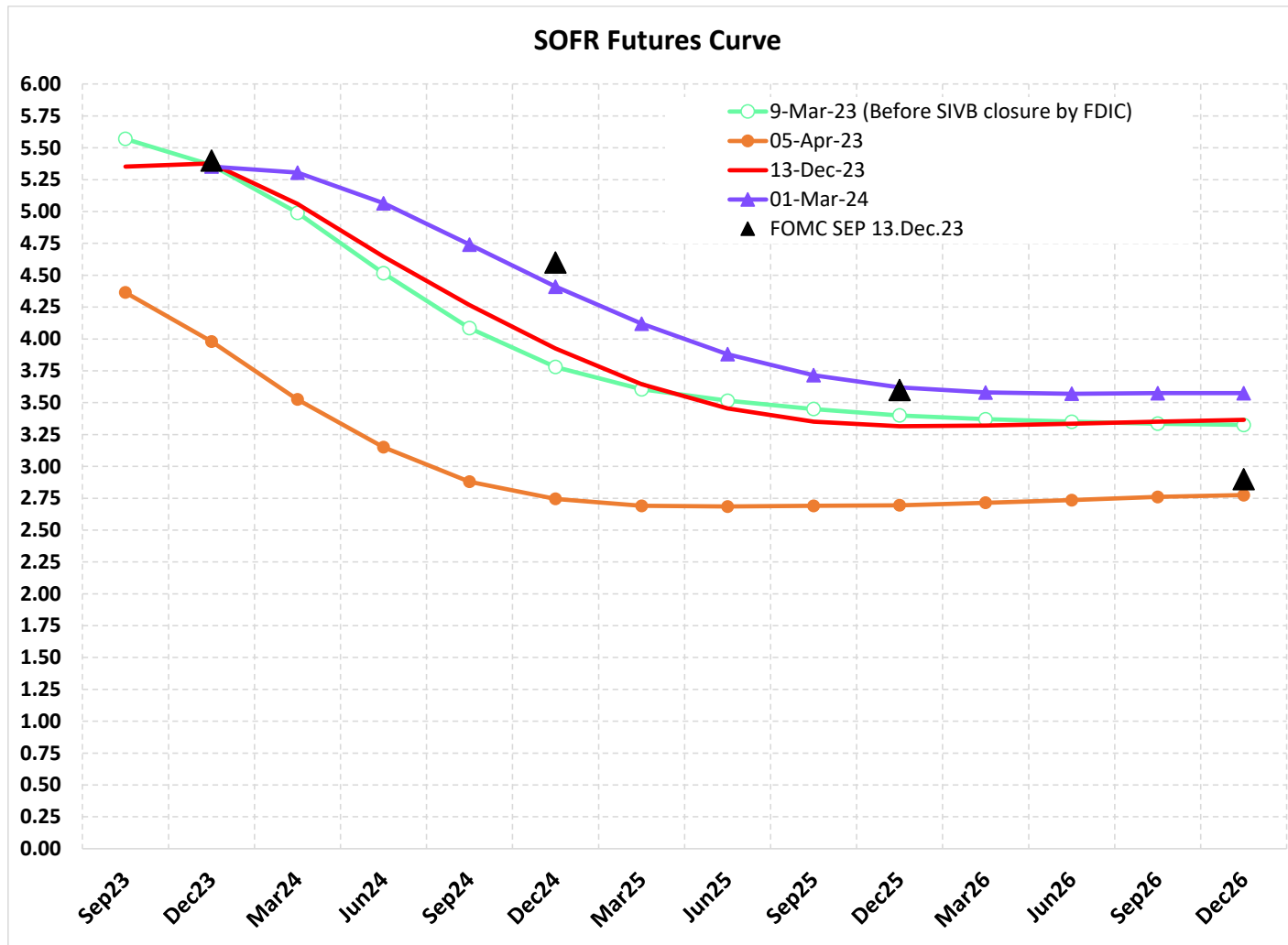
Labor force increases were notable over the course of 2023...

...and were due both to higher participation and increases in the population 16+.

Disinflation with no recession part 2: Supply chain pressures have eased



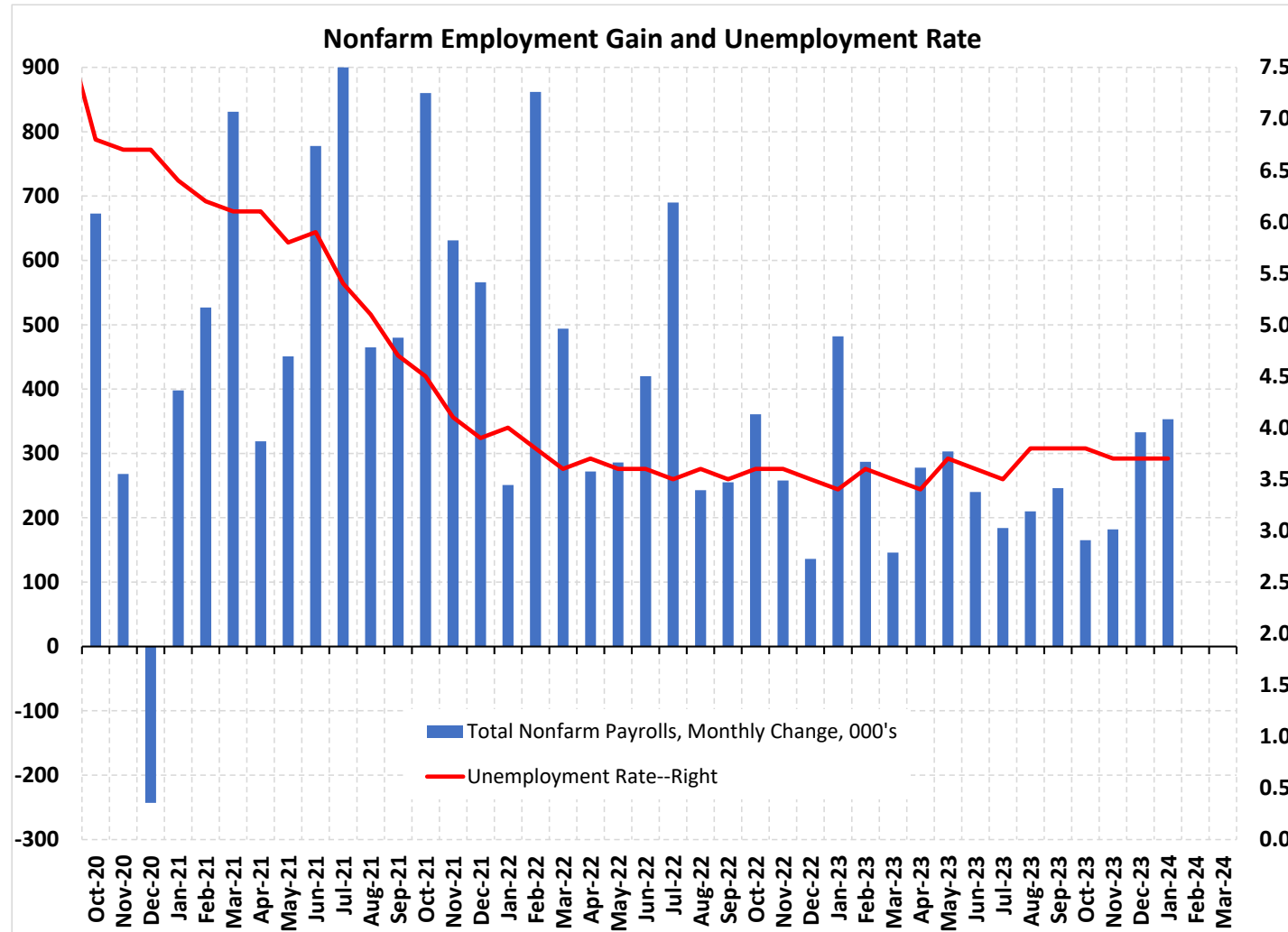
Market now roughly in line with Fed SEP of 13-Dec-23, pricing cuts from Jun-24 onwards



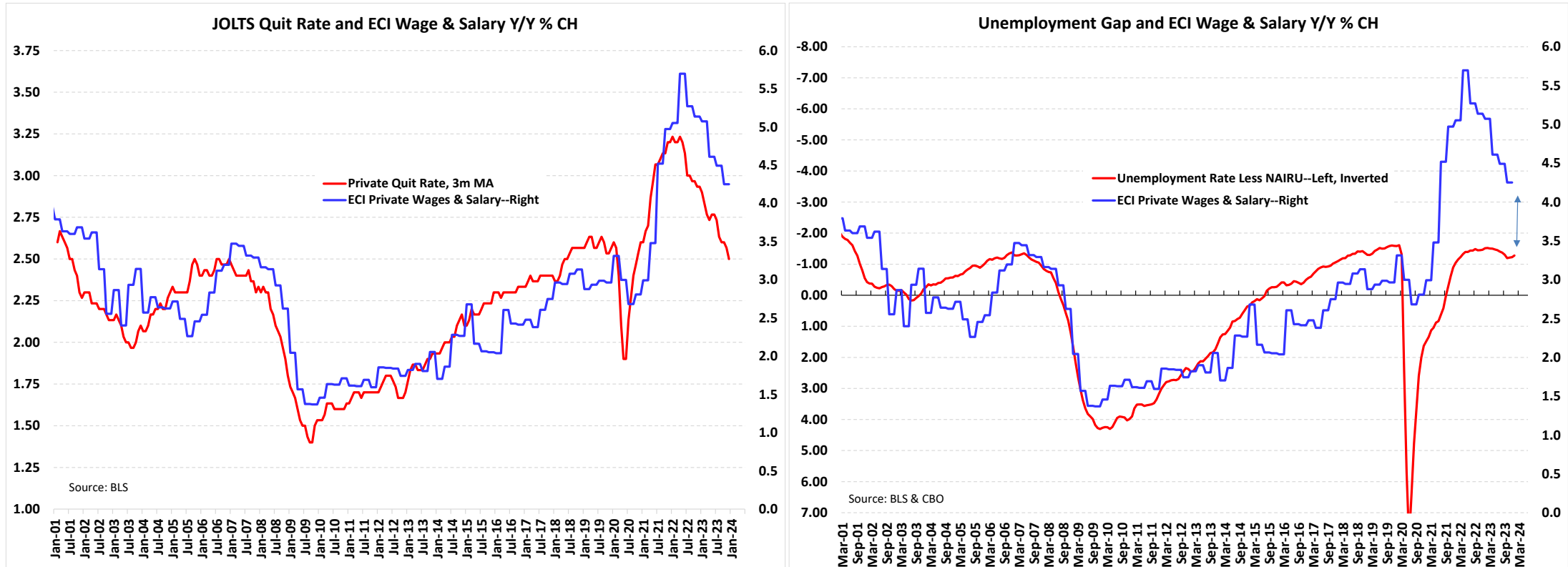
- Next Fed decision (and new SEP) comes on 20-Mar
- The 5-Apr-23 low in SOFR futures followed a period of regional banking sector stress

Labor Market

The labor market remains healthy: low unemployment rate and a broad-based rebound in payroll gains in Dec/Jan, exaggerated somewhat by shifting seasonal factors.

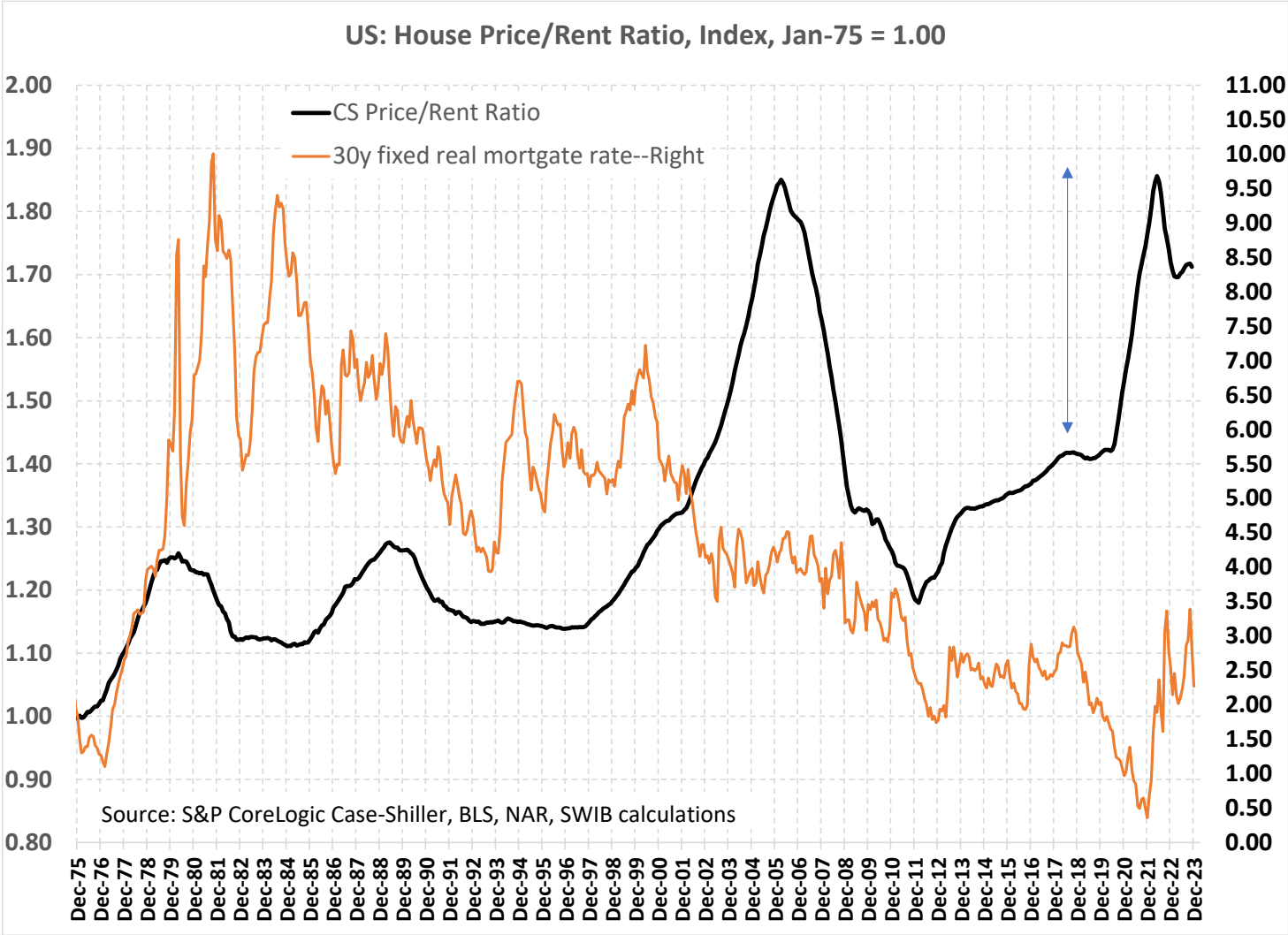


**Traditional wage Phillips curve can't explain high wage inflation of the last three years.
 Quit rate a better indicator of labor market tightness—it has fallen to pre-pandemic levels.
 Wage & salary growth has moderated but remains high.**



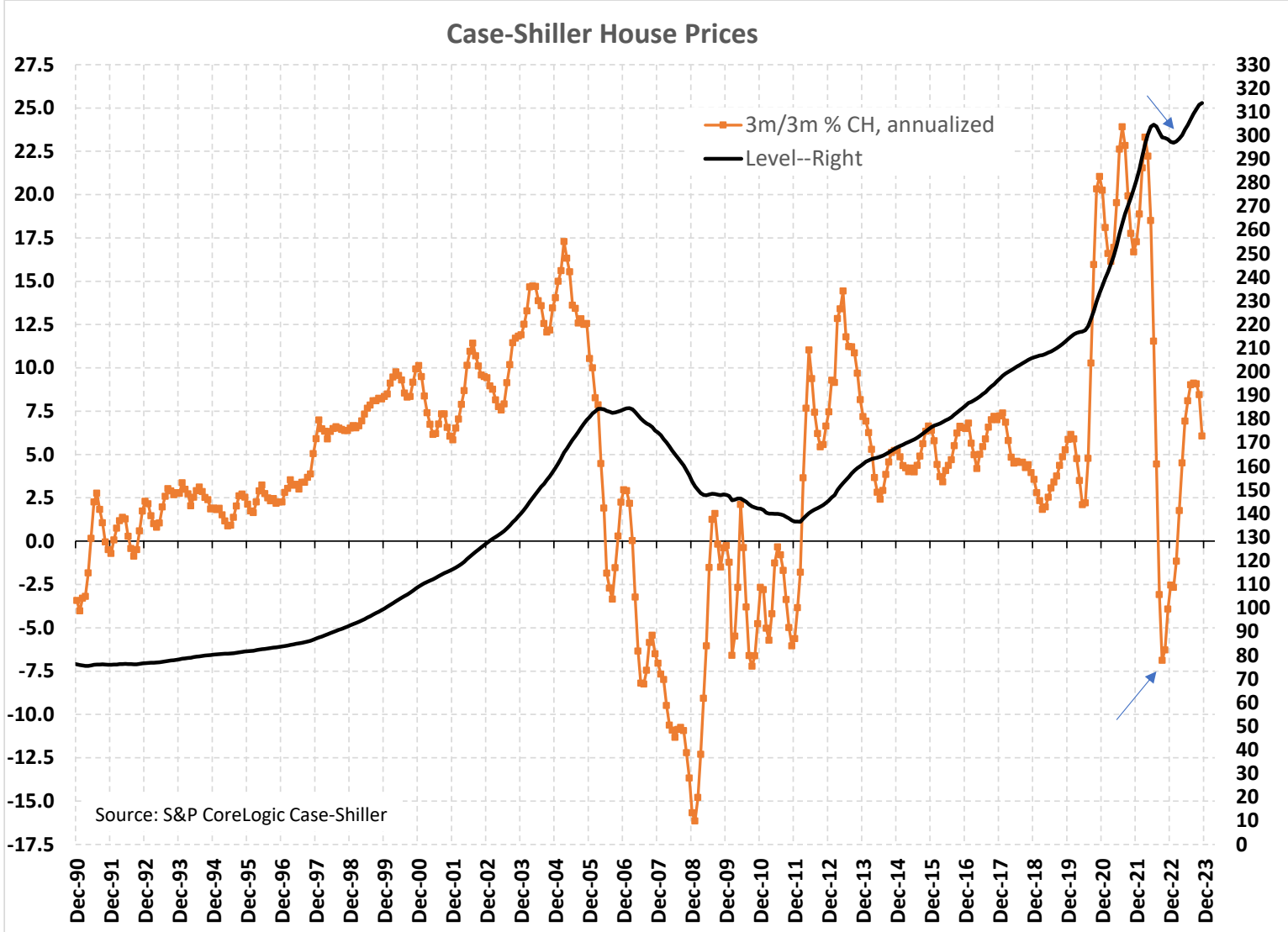
Housing Market

Housing market overvaluation reached lofty 2006 levels by May-22, but has only partially corrected

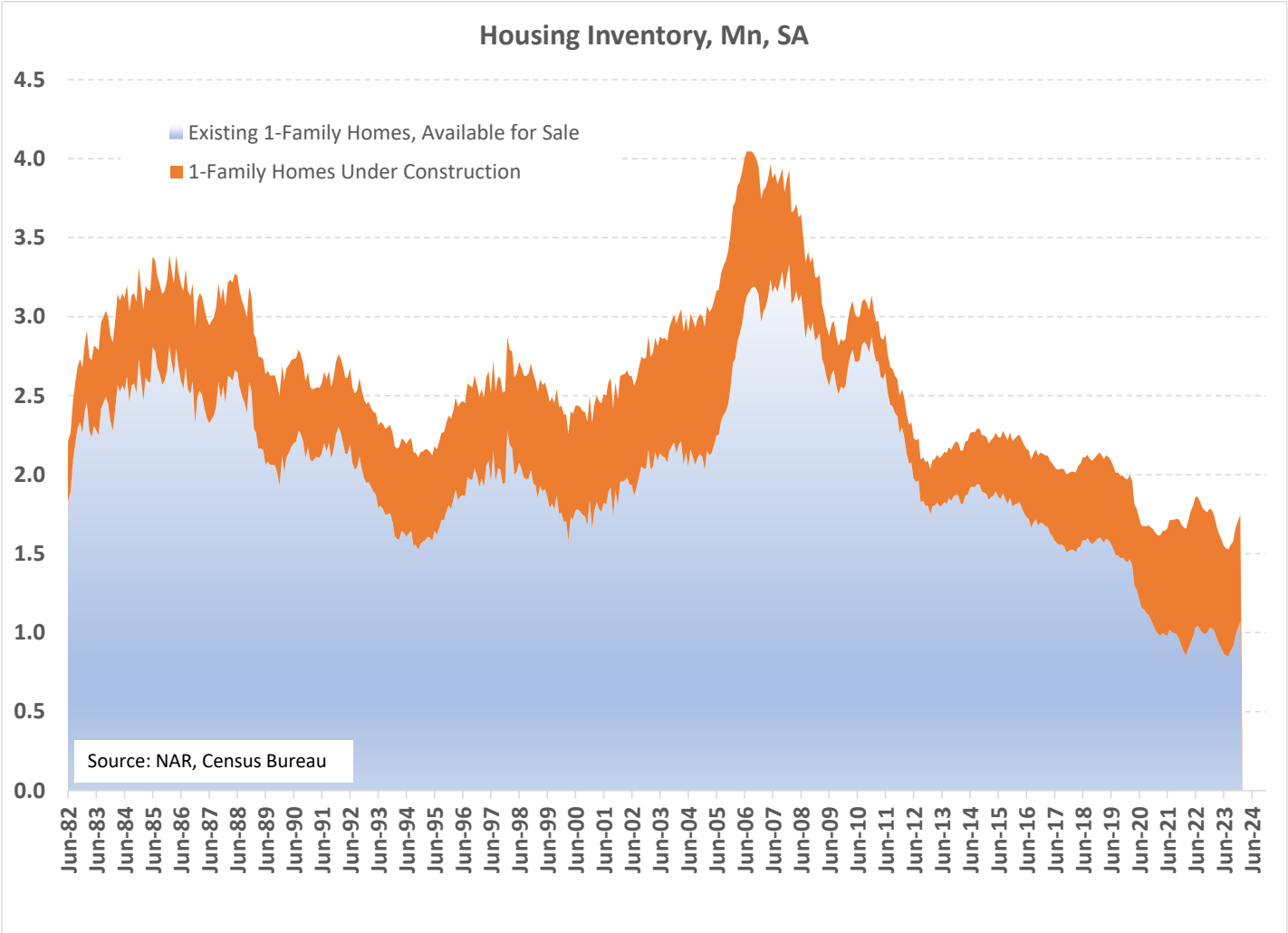


- Easy monetary policy, COVID-related 2nd-home buying were two big forces behind the run-up.
- Both forces are in reverse now, and extreme overvaluation has been partially corrected.
- Supply fundamentals remain firm. Various estimates put the shortage of housing stock relative to households at 1 to 3 million units.

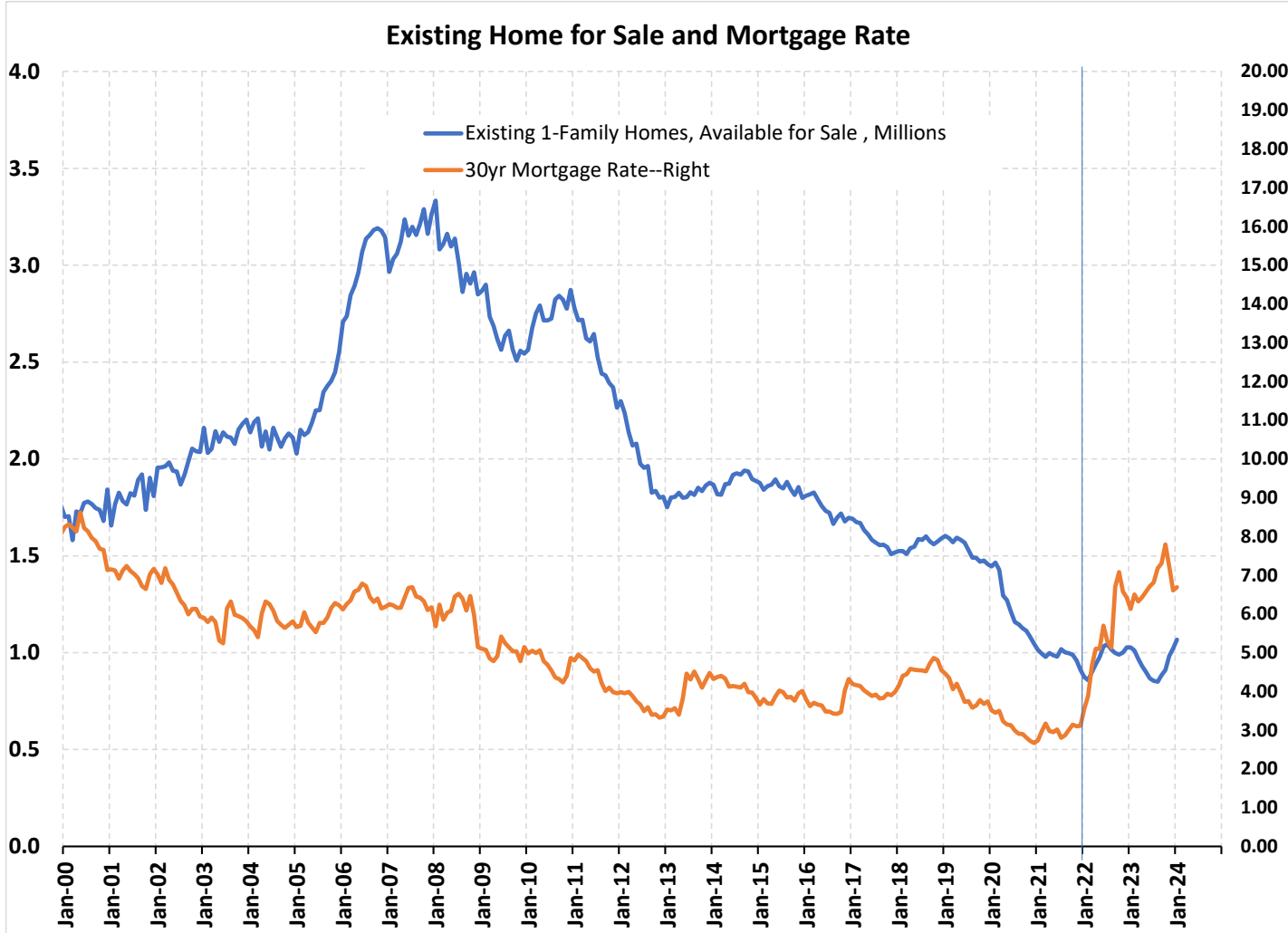
House price decline was brief and shallow in H2'22, and increases resumed in 2023



Existing-for-sale + under construction stocks remain near record lows

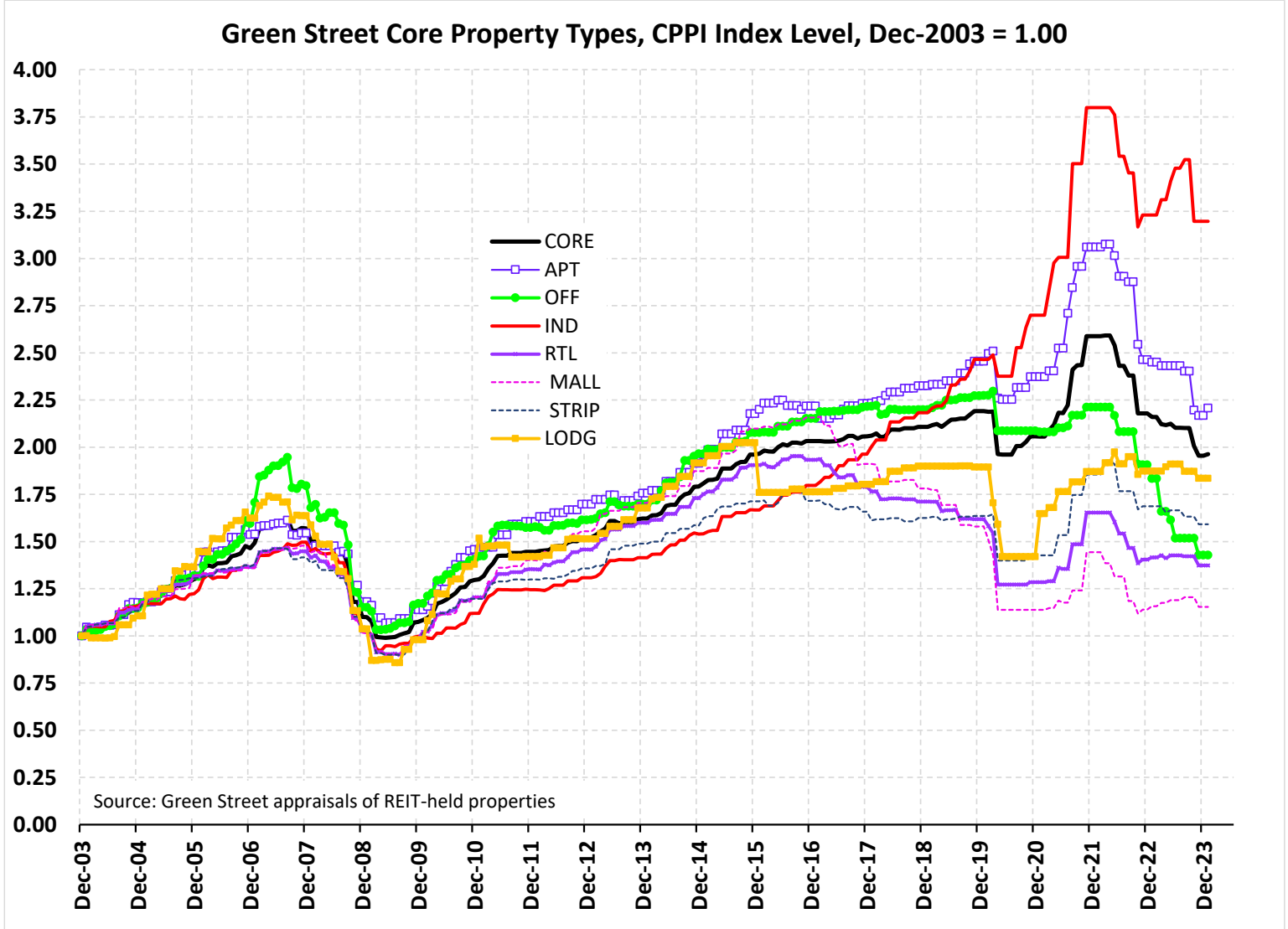


Mortgage lock-in: inventory of homes for sale had reached rock bottom even before rates rose. Owners with pre-existing low-rate mortgages now even more reluctant to sell.



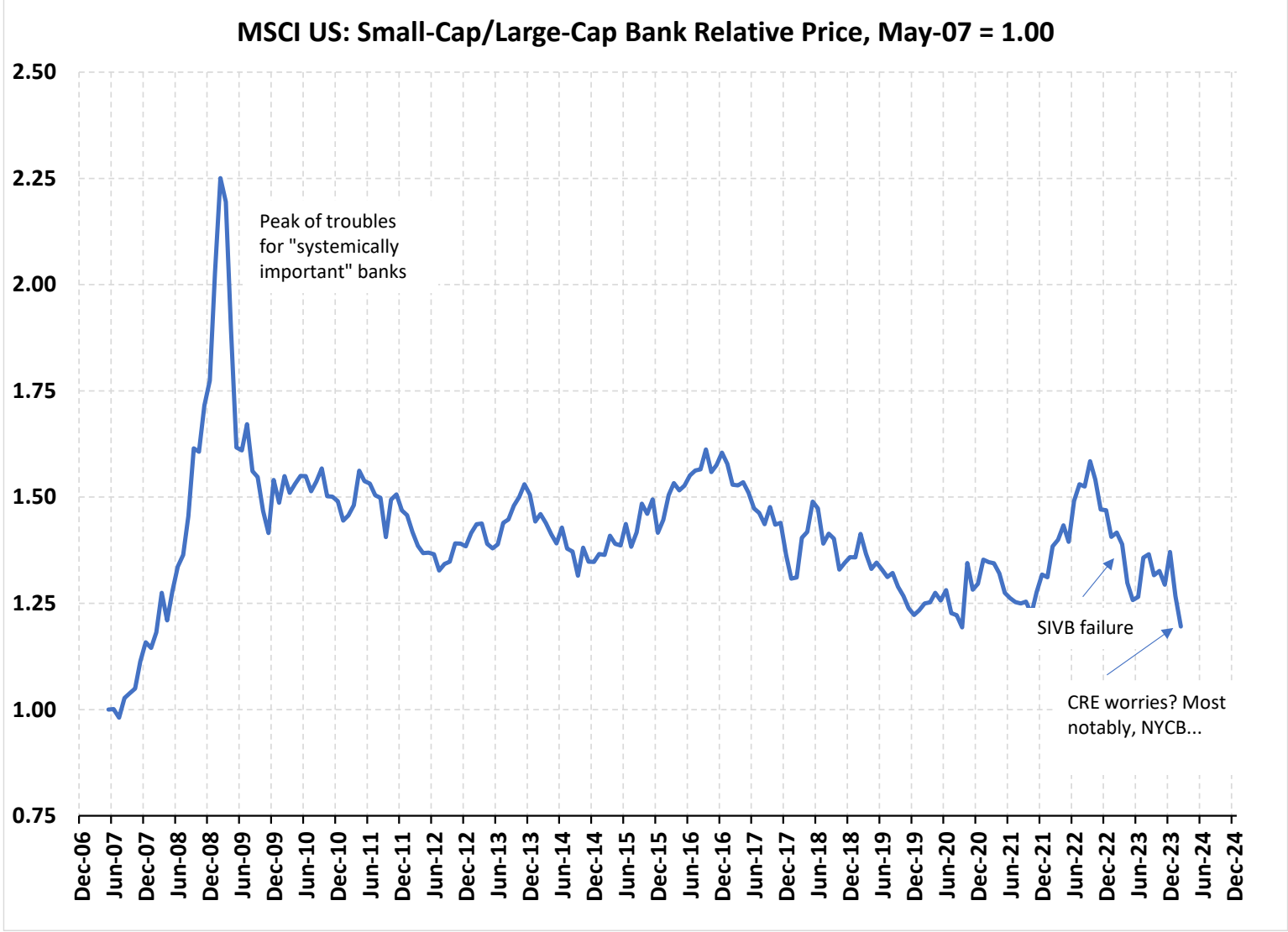
Commercial Real Estate & Small-Cap Banks

Commercial real estate prices have fallen since mid-'22, with Fed tightening the common factor

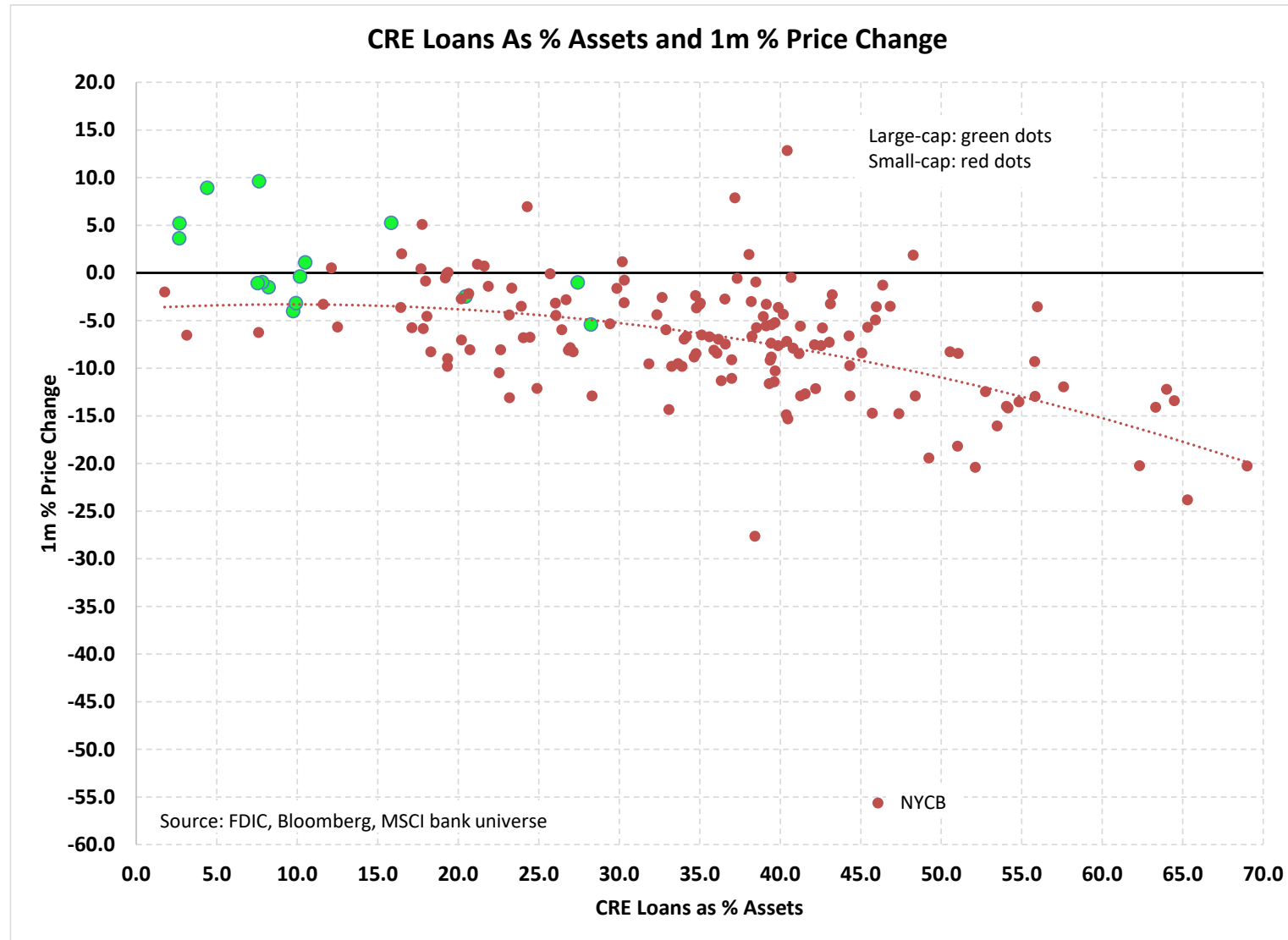


- A good deal of the decline is simply reversal of exceptional gains made in 2020-21, when rates were low.
- But some downside remains, most notably for offices, which have yet to find a new hybrid work equilibrium.

Regional bank concerns marked spring '23. Weakness has returned, with a CRE flavor.

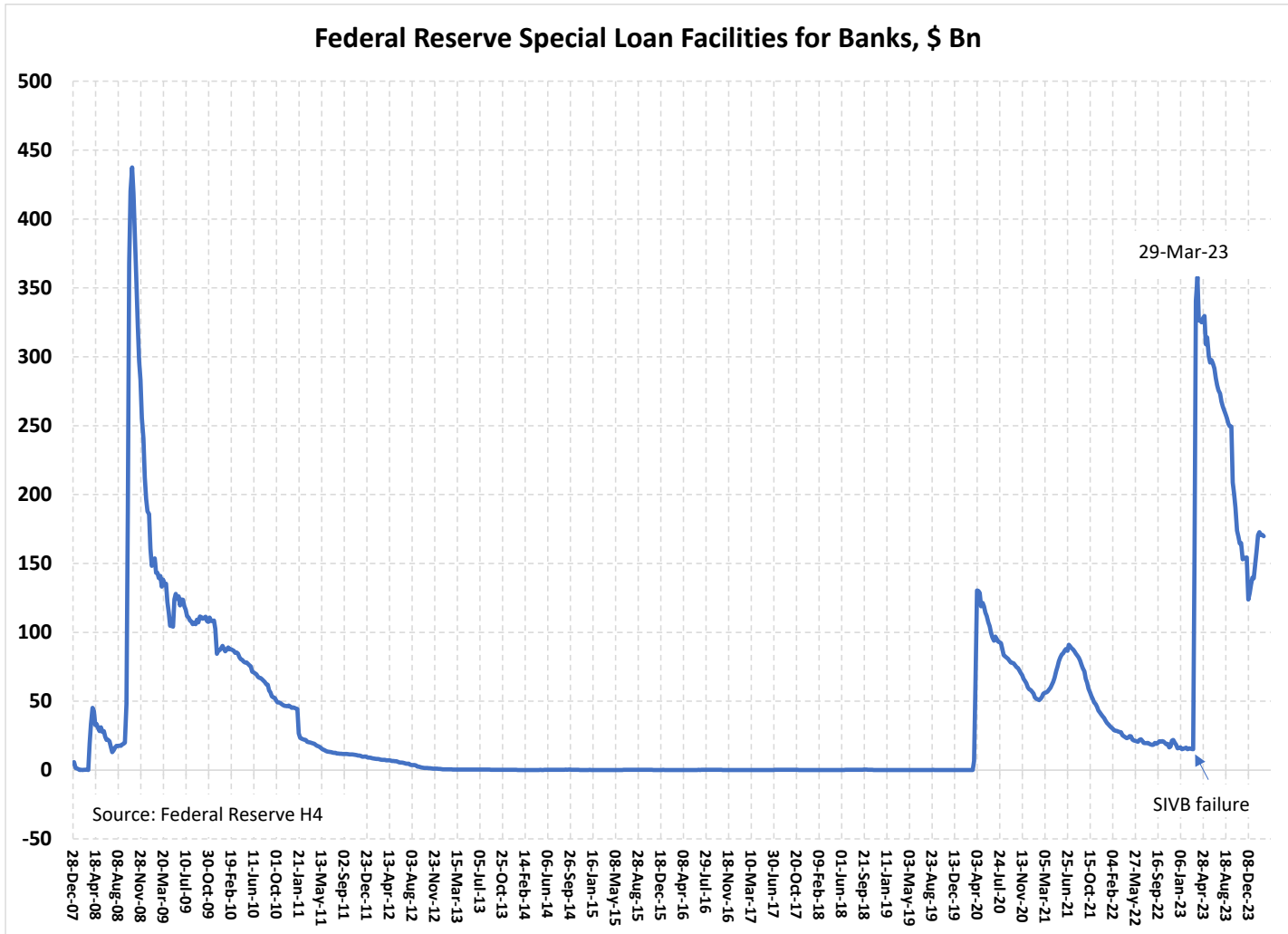


Small-cap banks disproportionately exposed to CRE, and have underperformed recently

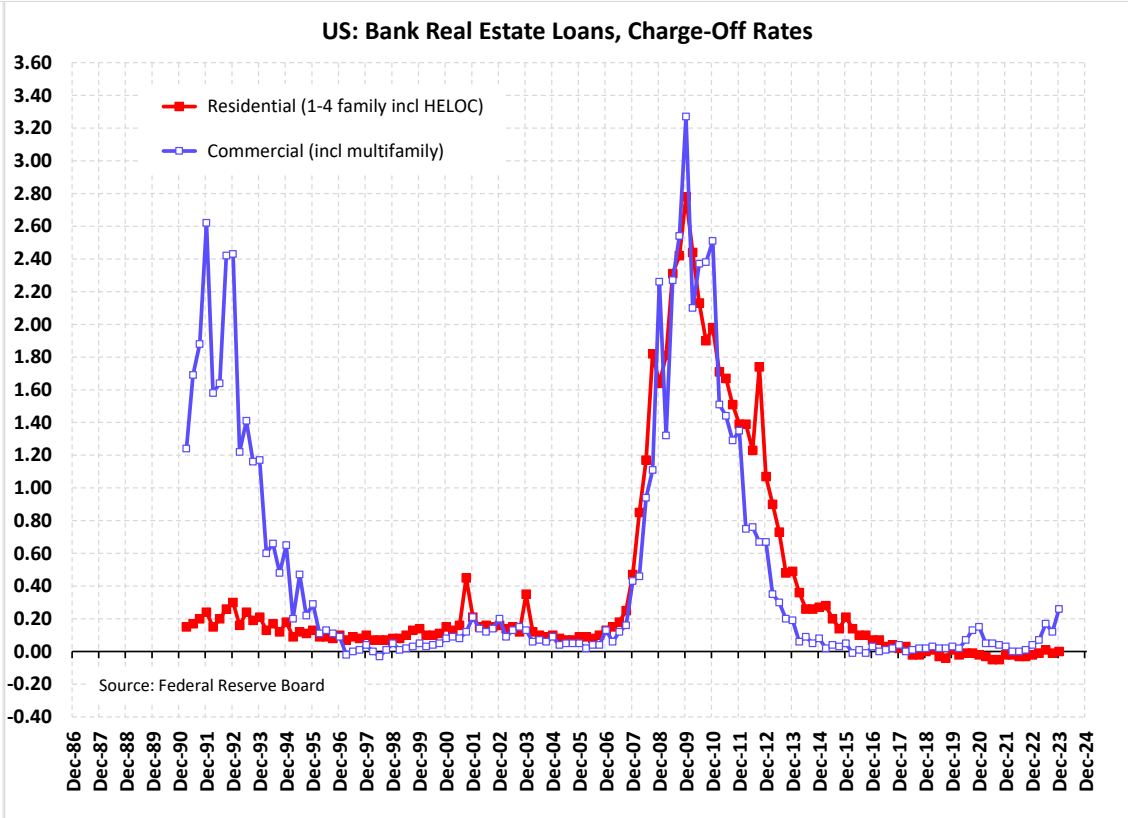
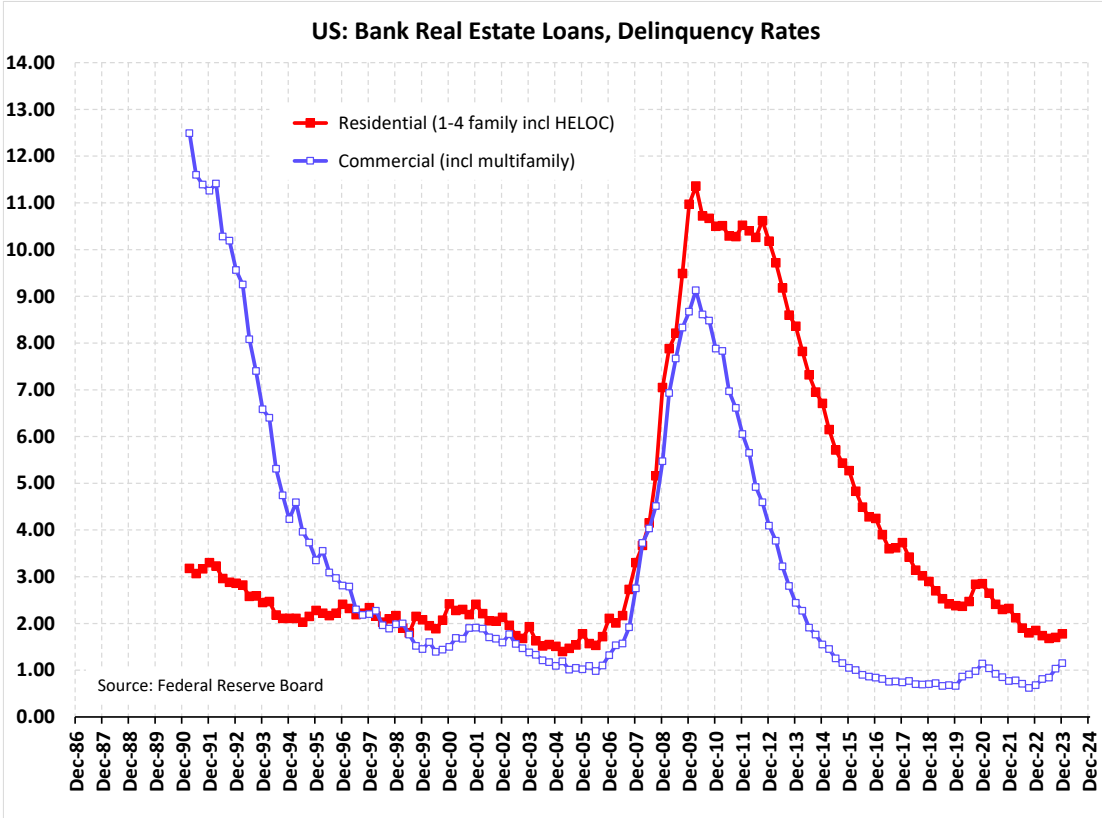


	CRE Loans, % Assets	CRE, Loans, % Loans	CRE Loans, \$ Bn
MSCI Large Cap	5.6	13.6	805.0
MSCI Small Cap	33.0	50.9	903.3

Bank usage of special Fed credits peaked in late March '23, has since declined



CRE loan delinquencies (and eventual charge-offs) likely to rise in next year. But this no GFC, nor an S&L crisis.



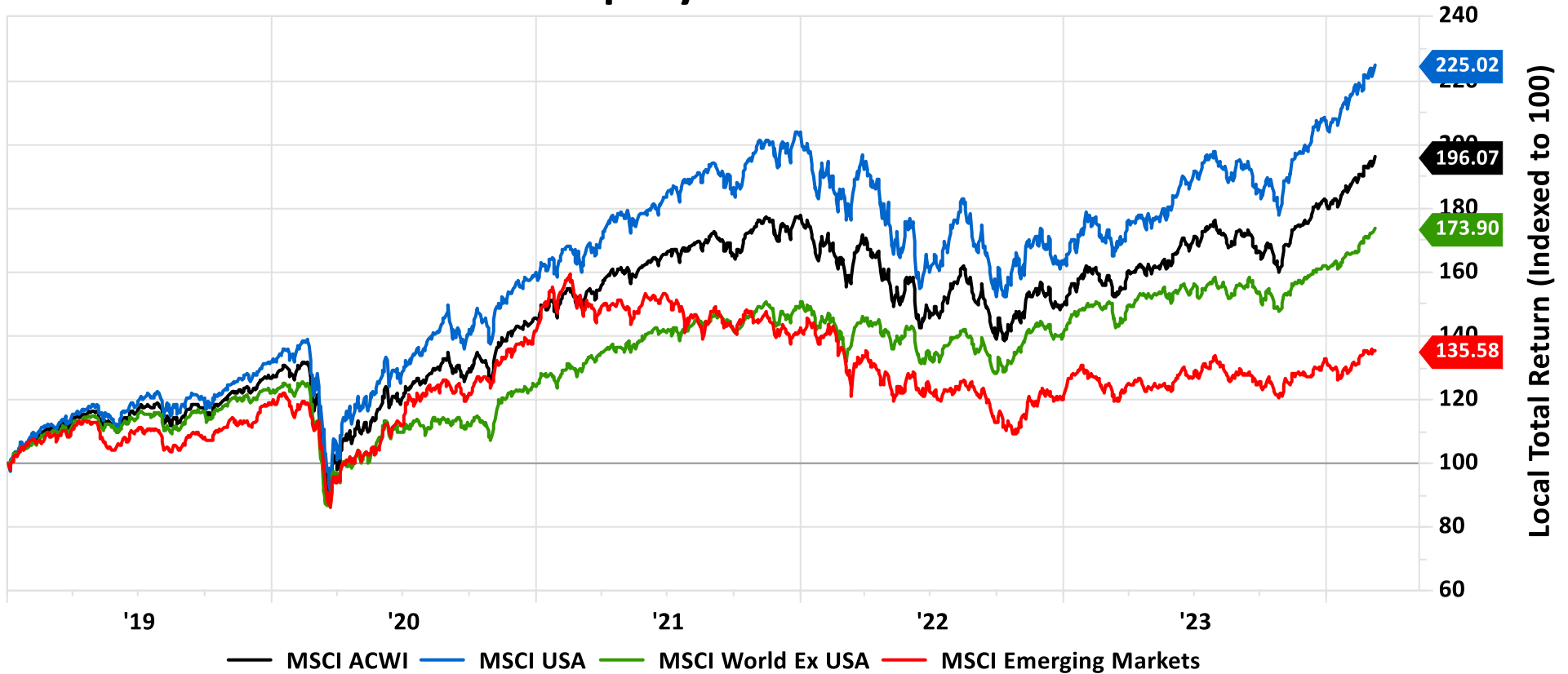
Asset Class Review

Global Equities - Performance

Both DM and EM equities strengthened in the last few weeks

03/08/2024

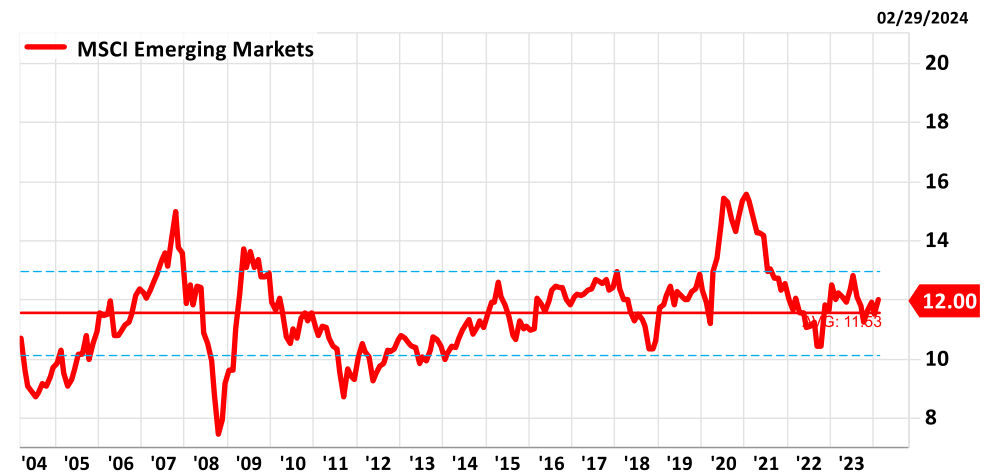
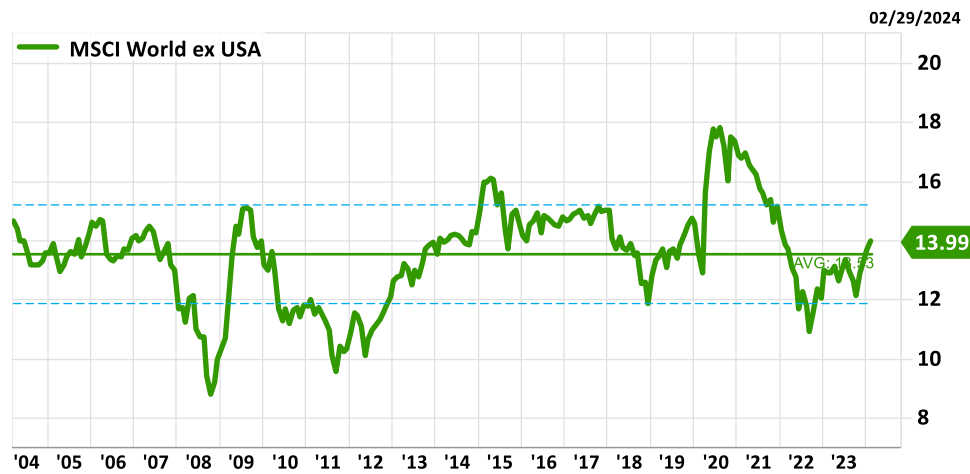
Local Equity Performance



Source: FactSet

Global Equities - Valuation

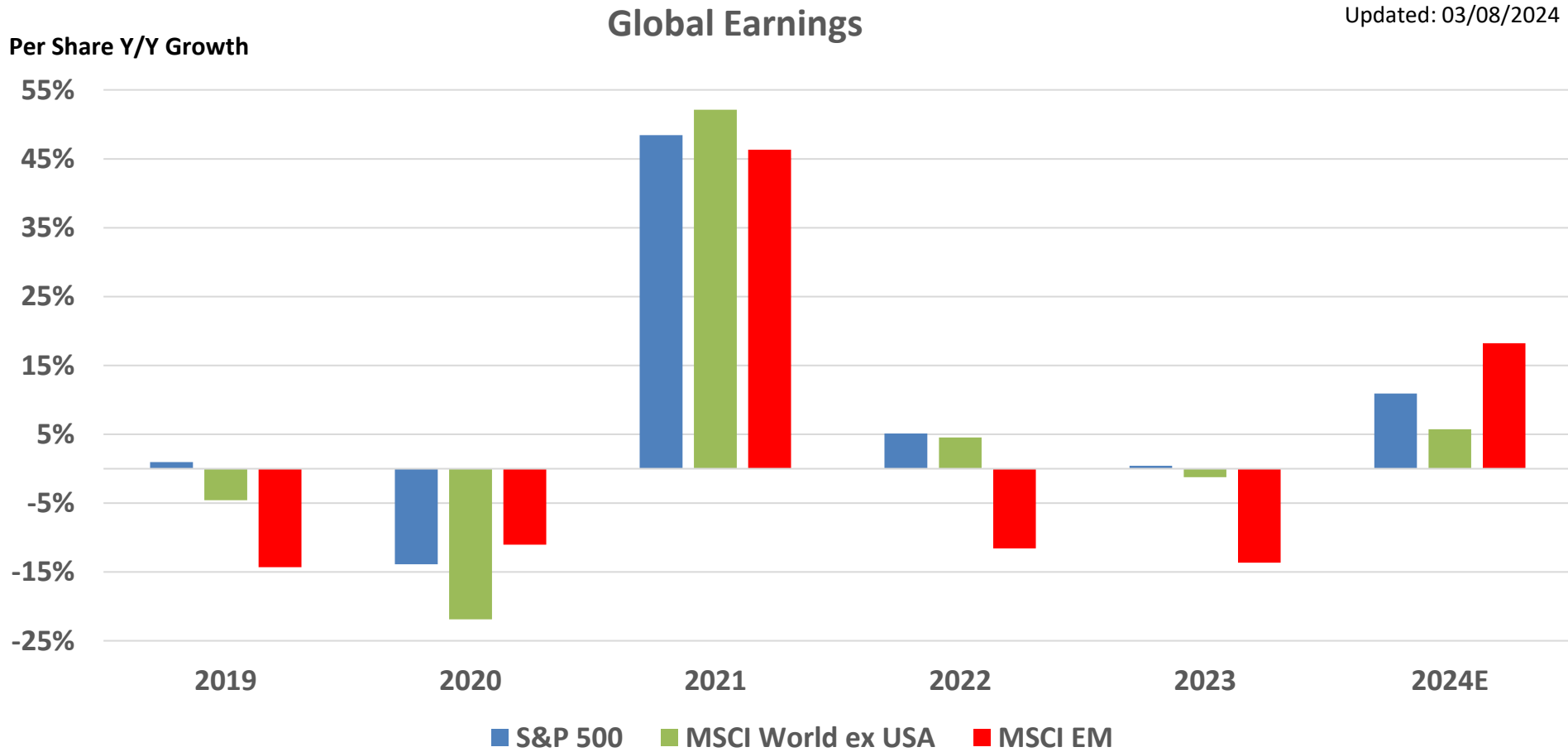
US P/E ratio is above one standard deviation of its 20-year average



Source: FactSet Market Aggregates - Next Twelve Month P/E Ratio, monthly, 20-year Average with 1 Std. Dev. Bands

Earnings Growth

Strong EM recovery expected in 2024



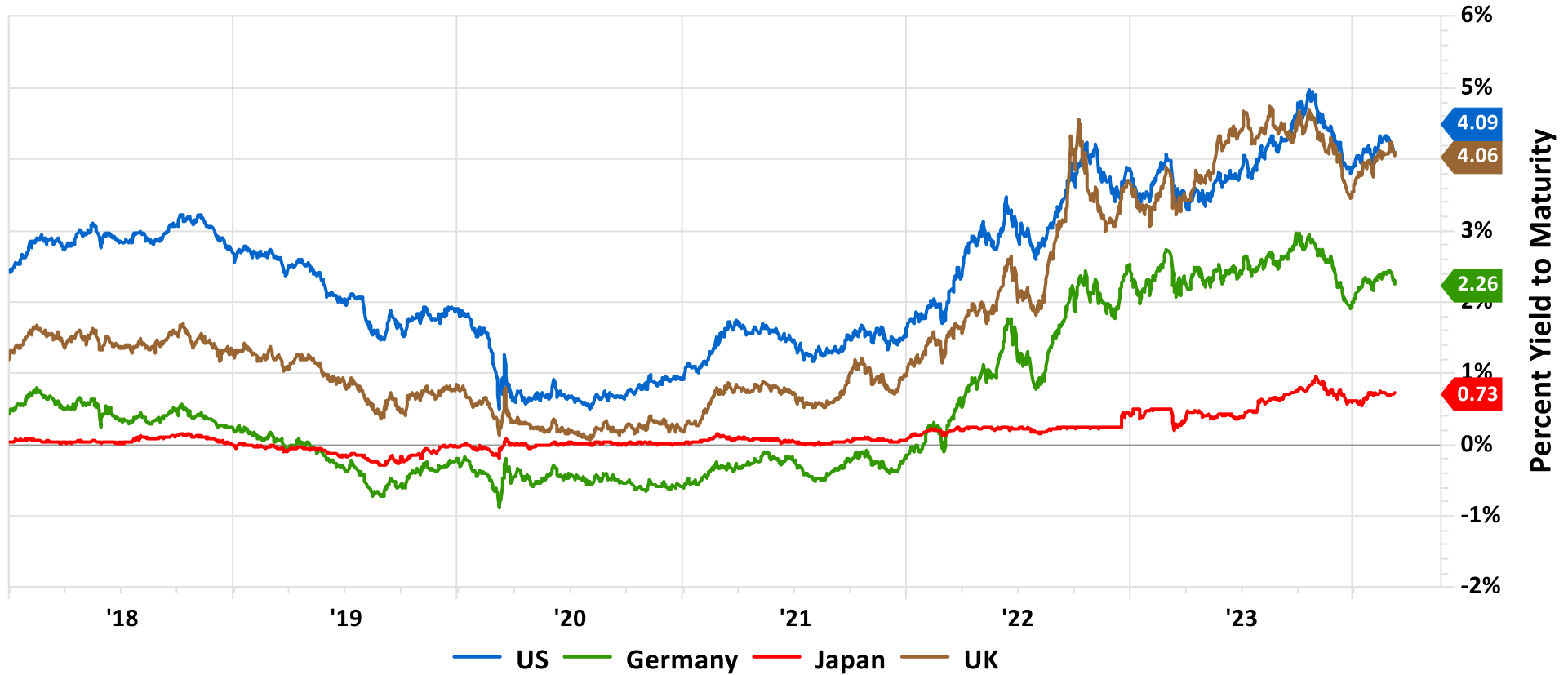
Source: Analyst Consensus; FactSet

Global Bonds

DM yields have increased in recent weeks

03/08/2024

10-Year Government Bond Yields

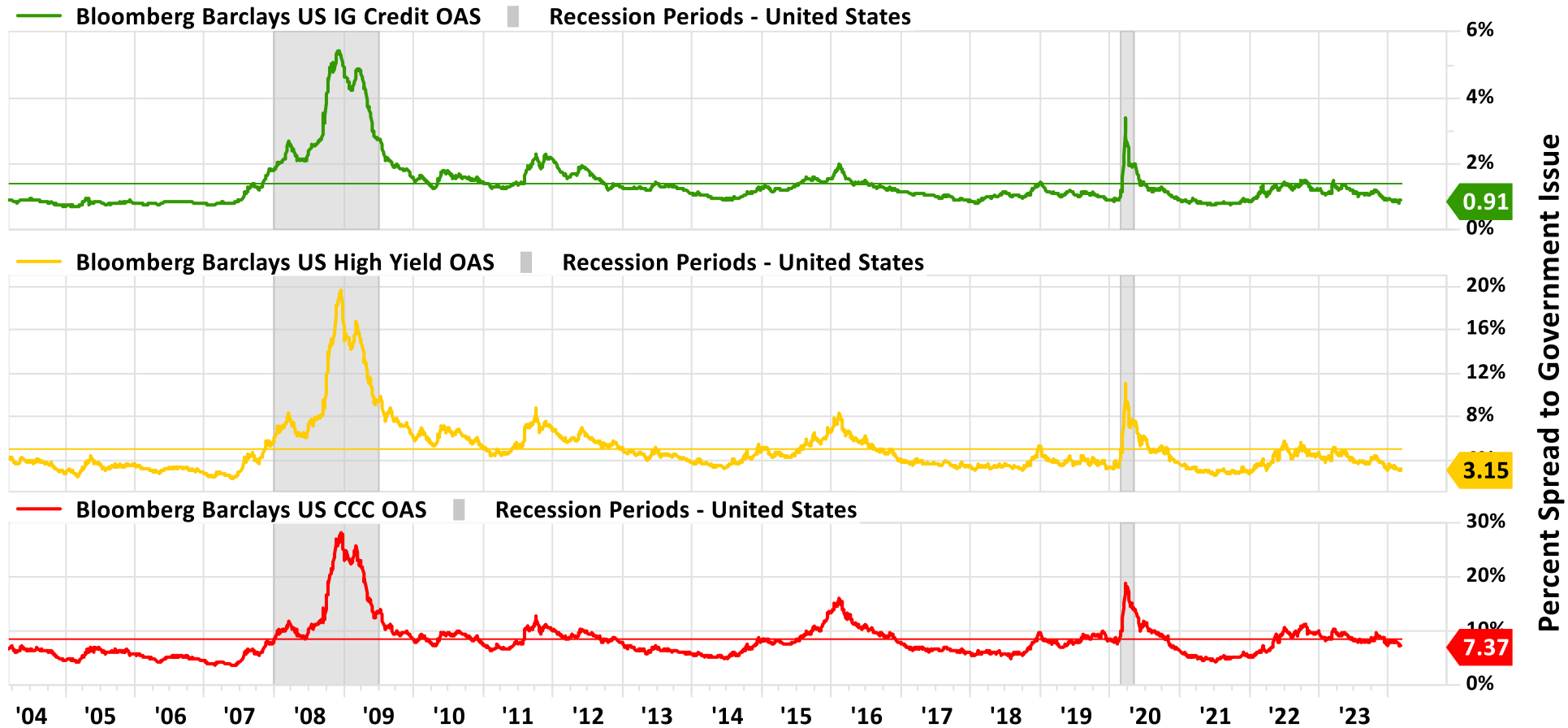


Source: FactSet

Credit Sectors

Spread levels near the long run averages

03/08/2024

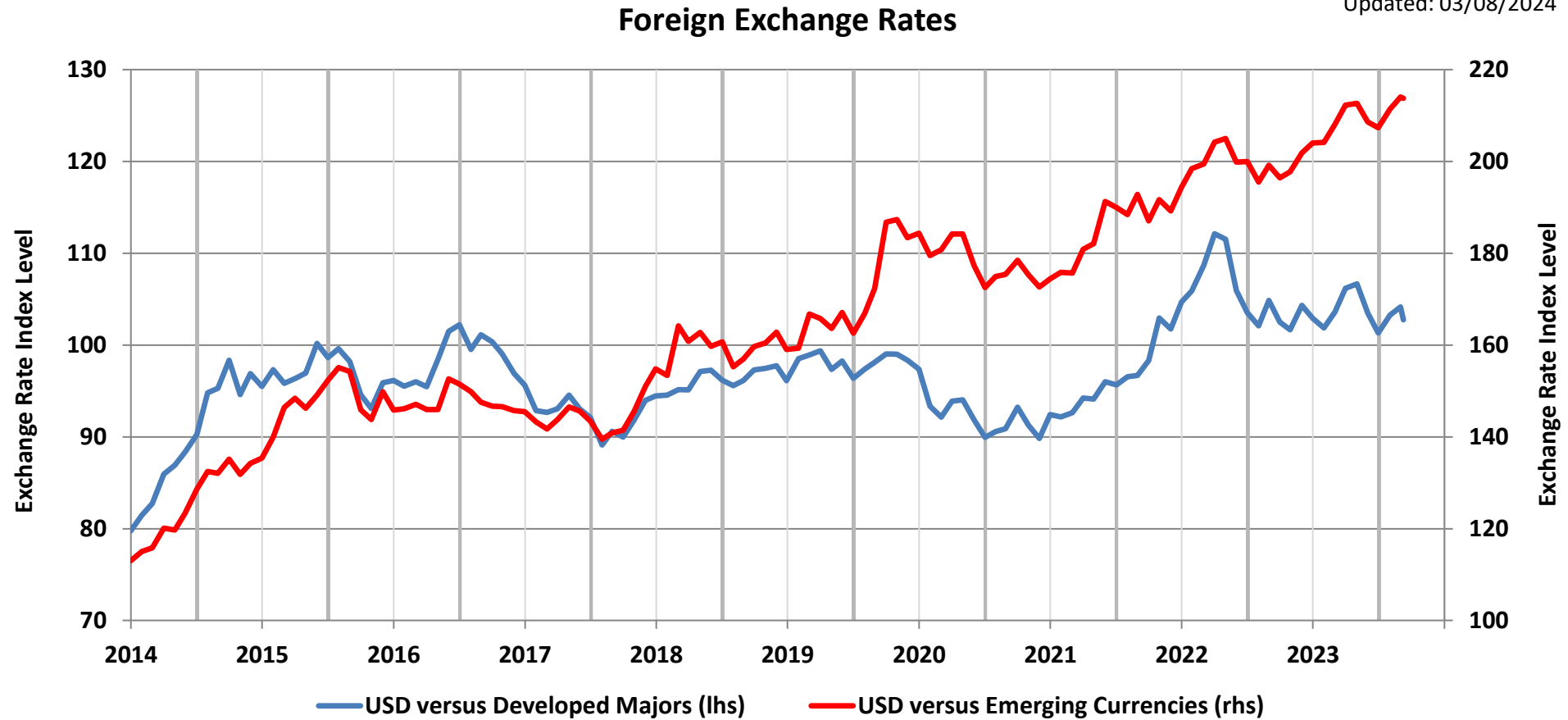


Source: FactSet

Currency Performance

USD strength versus EM currencies continues

Updated: 03/08/2024



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

U.S. Inflation

Medium term expectations have moved higher YTD

As of: 03/08/2024

US 5 Year Breakeven Inflation



Source: Bloomberg

Board Meeting

Tab 9 – Announcement of Matters Taken Up in Closed Session

Board Meeting

Tab 10 – In the Absence of Questions, the Following Reports will be filed without comment (for informational purposes):

- A. Quarterly Charges to Funds Reports, Q4 2023
- B. Private Markets and Funds Alpha Commitments, Q4 2023
- C. Board Contact Log

February 13, 2024

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 December 31, 2023.

Total Cost of Management Summary	1Q 2023	2Q 2023	3Q 2023	4Q 2023	Trailing 4 Qtr	
					Total	% of Total
Internal Operating Expenses						
Operating Budget Expenses	\$ 14,718,435	\$ 19,303,861	\$ 29,927,680	\$ 30,466,430	\$ 94,416,406	65.7%
Custodial, Investment Operations & Banking	2,057,242	1,723,893	2,137,630	2,213,596	8,132,361	5.6%
Legal	561,635	558,921	489,077	254,543	1,864,176	1.3%
Investment Research & Consulting	8,387,483	8,535,712	10,199,330	7,637,651	34,760,176	24.2%
Total Internal Operating Expenses	\$ 25,724,795	\$ 30,122,387	\$ 42,753,717	\$ 40,572,220	\$ 139,173,119	96.8%
Total Securities Lending Agent Expenses	\$ 1,455,665	\$ 1,064,140	\$ 971,498	\$ 1,086,188	\$ 4,577,491	3.2%
Total SWIB Operating Costs	\$ 27,180,460	\$ 31,186,527	\$ 43,725,215	\$ 41,658,408	\$ 143,750,610	100.0%
Externally Managed Separate Account Fees						
Beta One & Other - Separately Managed	\$ 10,289,679	\$ 15,796,013	\$ 4,854,855	\$ (1,657,872)	\$ 29,282,675	4.1%
Supplemental Information - External Fund Fees						
Real Estate	\$ 19,702,319	\$ 21,394,315	\$ 21,806,743	\$ 21,208,015	\$ 84,111,392	11.9%
Private Equity & Venture Capital	55,955,436	64,812,083	58,359,821	65,850,965	244,978,305	34.6%
Hedge Funds	52,940,887	56,693,136	93,214,422	70,745,475	273,593,920	38.6%
Beta One & Other - External Funds	55,999,027	3,082,375	16,839,386	371,046	76,291,834	10.8%
Total External Investment Management Fees	\$ 194,887,348	\$ 161,777,922	\$ 195,075,227	\$ 156,517,629	\$ 708,258,126	100.0%
Grand Total Cost of Management	\$ 222,067,808	\$ 192,964,449	\$ 238,800,442	\$ 198,176,037	\$ 852,008,736	

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, 2023, after consideration of all expenses, costs, and fees, SWIB generated more than \$3.1 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 December 31, 2023, SWIB’s total authorized full-time equivalent positions are 298 as shown in the table below. The Board of Trustees approved eight new positions in December 2023.

Assets Under Management & Positions		
	09/30/2023	12/31/2023
Internal Management	45.5%	45.4%
External Management	54.5%	54.6%
Total SWIB Positions	290	298

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)	3/31/2023		6/30/2023		9/30/2023		12/31/2023	
	Amount (in millions)	%	Amount (in millions)	%	Amount (in millions)	%	Amount (in millions)	%
Internally Managed Assets	\$49,730	39.2%	\$50,868	39.5%	\$46,836	37.6%	\$50,381	38.0%
Externally Managed Dedicated Assets	29,282	23.1%	29,758	23.1%	29,716	23.9%	32,166	24.3%
Externally Managed Commingled Assets	47,809	37.7%	48,259	37.4%	47,996	38.5%	49,854	37.7%
1. Passive Index	1,168	0.9%	1,011	0.8%	916	0.7%	788	0.6%
2. Limited Partnerships	32,060	25.3%	32,894	25.5%	33,681	27.0%	34,302	25.9%
3. Active Managed Commingled	14,581	11.5%	14,354	11.1%	13,399	10.8%	14,764	11.2%
Total WRS Assets	\$126,821	100.0%	\$128,885	100.0%	\$124,548	100.0%	\$132,401	100.0%

Other Funds

State Investment Fund - Internally Managed	\$19,285		\$19,718		\$19,995		\$19,853	
Separately Managed Funds - Internally Managed	\$98		\$96		\$89		\$97	
Separately Managed Funds - Externally Managed	\$2,582		\$2,603		\$2,538		\$2,710	
Total Assets Under Management	\$148,786		\$151,302		\$147,170		\$155,062	
Total Internal Assets Under Management	\$69,113	46.5%	\$70,682	46.7%	\$66,919	45.5%	\$70,332	45.4%
Total External Asset Under Management	\$79,673	53.5%	\$80,620	53.3%	\$80,251	54.5%	\$84,730	54.6%

STATE OF WISCONSIN INVESTMENT BOARD
Expenses for All Funds Under Management
Quarter Ending December 31, 2023

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
<u>Internal Expenses</u>		
Staff Compensation	Staff Compensation	\$ 24,803,860
Fringe Benefits	Fringe Benefits	3,017,922
Supplies, Travel & Facilities	General Supplies & Services	2,644,648
Total Internal Expenses *		\$ 30,466,430
<u>Custodial, Investment Operations and Banking Fees</u>		
BNY Mellon Asset Servicing - Custody	Master Custody Services	\$ 724,768
BNY Mellon Asset Servicing - Investment Operations	Investment Operating Services	1,327,207
Markit NA	Investment Data Management Software	161,621
Total Custodial, Investment Operations and Banking Fees		\$ 2,213,596
<u>Legal Fees</u>		
Chapman & Cutler LLP	Legal Work for Investment Strategies	\$ 102,962
Cox Castle & Nicholson LLP	Legal Work for Investment Strategies	71,265
DLA Piper LLP (US)	Legal Work for Investment Strategies	237,905
Godfrey & Kahn SC	Legal Work for Investment Strategies	38,745
Husch Blackwell	Legal Work for Investment Strategies	25,423
Ice Miller LLP	Legal Work for Investment Strategies	1,971
Legal Services Expense Accrual	Legal Work for Investment Strategies	(499,772)
Norton Rose Fulbright US LLP	Legal Work for Investment Strategies	8,904
Purrington Moody Weill LLP	Legal Work for Investment Strategies	15,258
Quarles & Brady	Legal Work for Investment Strategies	132,621
Vedder Price PC	Legal Work for Investment Strategies	57,031
Winston & Strawn LLP	Legal Work for Investment Strategies	62,230
Total Legal Fees		\$ 254,543
<u>Investment Counsel</u>		
12358433 Canada Inc.	Investment Consulting	\$ 58,475
3x108 Fintech Consulting Limited	Investment Consulting	91,420
AE Business Solutions	Investment Consulting Services	12,460
Aksia LLC	Hedge Fund Investment Consulting	193,750
Alembic Global Advisors	Market Research	2,000
Alex Solutions	Research and Data Services	42,250
Analytic Recruiting Inc	Investment Consulting	43,750
Apex Systems	Investment Consulting	20,748
Arb Journal	Regulatory Research & Analysis	23,500
Arthur Selender	Investment Consulting Services	6,000
B Riley FBR Inc	Investment Research	7,150
Backstop Solutions Group	Investment Software	46,375
Baele Consulting	Investment Consulting Services	4,764
Bank of America Merrill Lynch	Investment Research	52,450
Barrington Research Associates Inc	Investment Research	4,000
Barrons	Investment Research	512
BCA Research Inc	Global & Domestic Fixed Income Strategy Research	27,875
Berenberg	Investment Research	4,500
Bixby Research and Analytics LLC	Research and Data Services	16,667
Blackrock Financial Management Inc	Risk Services	85,709
Bloomberg Finance LP	Market, Company, Industry & Benchmark Information	1,169,761
BMO Capital Markets Corp	Investment Research Services	13,000
BNP Paribas	Research and Data Services	64,750
BNY Mellon Asset Servicing - Eagle/Pace	Investment Consulting Services	115,000
Bridge Consulting Partners Ltd	Investment Consulting Services	75,735
BTIG, LLC	Investment Research	3,200
Callan Associates Inc	Investment Consulting & Performance Benchmarking	12,500
Canaccord Genuity	Investment Research	5,450
Cantor Fitzgerald Investment Advisors, L.P.	Investment Research	1,500
Capital Economics LTD	Market Research	15,375
CappThesis, LLC	Research and Data Services	2,500

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
CBJL Incorporated	Investment Consulting Services	103,320
CBOE Global Markets, Inc.	Research and Data Services	1,620
CCG Data Solutions	Investment Consulting Services and Software	88,200
CFRA Research	Investment Research Services	23,793
Charles River System Inc	Portfolio Management Trading Software & Services	468,305
CIBC World Markets Inc	Investment Research	2,000
CL King & Associates	Investment Research	6,000
Compass Point Research & Trading, LLC	Investment Research	8,500
Copp Clark	Research and Data Services	3,824
CoStar Portfolio Strategy	Real Estate Consulting & Research Services	23,613
Council of Institutional Investors	Corporate Governance	31,200
Cowen and Company LLC	Investment Research	32,500
Craig-Hallum Capital Group	Investment Research	4,900
CUSIP Global Services	Research and Data Services	16,250
Cutter Associates	Investment Organization and Systems Consulting	18,500
DA Davidson & Co	Investment Research	19,050
Dacheng Xiu	Investment Research	62,475
Daiwa Capital Markets America	Investment Research	2,000
Davy Securities Limited	Investment Research	3,750
Department of Administration	Various Administrative and Technology Services	107,364
Deutsche Bank	Tax registration fees	25,400
DiatomC LLC	Investment Consulting	89,700
Dow Jones News Service	Company and Industry News Services	37,343
DTCC – EPN	Trade Settlement Service	2,400
DTCC ITP LLC	Trade Settlement Service	2,365
Echios LLC	Consulting	(19,034)
EFront Financial Solutions Inc	Private Markets Portfolio Management Services	199,889
Empirical Research Partners LLC	Investment Research	32,000
Ernst & Young LLP	Tax Compliance Services & Investment Consulting	15,000
Evercore Group LLC	Investment Research	31,000
Exchange Analytics Inc	Futures & Swaps Trading Regulation Training	3,000
FactSet Research Systems Inc	Financial & Economic Database	1,004,531
FBN Securities, Inc.	Investment Research	500
Finiato	Research Management Solution	5,000
FIS Data Systems Inc.	Research and Data Services	62,419
Fitch Solutions Inc	Credit Rating Services	63,375
FTSE Fixed Income LLC	Real Time Index Data	38,610
Funston Advisory Services LLC	Consulting Services	14,500
Furey Research Partners LLC	Small Cap Research	9,300
Gabriel Roeder Smith & Company	Actuarial Consulting	105,000
Gallagher	Insurance and Risk Management Services	15,875
Goodbody	Investment Research	4,250
Green Street Advisor	Real Estate Analytics	29,263
Guggenheim Securities LLC	Investment Research	4,000
Haver Analytics	Global Macroeconomic Research	22,740
Ice Data LP	Fixed Income Indices	71,610
iFathom Corporation	Investment Consulting	106,375
Institutional Shareholder Services Inc	Proxy Voting Analysis	61,304
International Corporate Governance Network	Corporate Governance Research	11,153
Investment Research Expense Accrual	Investment Research	(448,150)
IPC Systems Inc	Trading Telecommunication System	11,340
Jefferies Research Services LLC	Investment Research	42,575
JP Morgan	Public Market Management Fee	31,233
JPSB Consulting Limited	Investment Consulting	81,680
JW Michaels & Co	Recruitment Consulting	54,600
Keefe Bruyette & Woods (KBW)	Investment Research	25,500
Kepler Capital Markets Inc	Investment Research Services	6,750
KeyBanc Capital Markets Inc	Investment Research	15,700
Keystone Consulting Inc	Investment Information Technology Consulting Services	81,294
Knowledge Services	Recruitment and Staffing Services	38,079
Kreischer Miller LLP	Investment Consulting	28,500
Law360 Legal News and Data	Investment Research	3,609
Longbow Securities LLC	Investment Research	1,000
Loop Capital Markets LLC	Investment Research	8,100
Macquarie Capital (USA) Inc	Investment Research	1,500
Manalo Advisors Limited	Research and Data Services	3,750

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
Markit Group Limited	Investment Consulting Services	71,830
Markit-EDM Limited	Investment Consulting	200,885
McLagan Partners Inc	Investment Compensation Data and Analysis	25,000
Meketa Investment Group	Public Markets External Manager Consultant	68,938
MNI Market News	Research and Data Services	4,681
Moodys Analytics	Economic, Currency & Bond Analysis	85,712
Morningstar Inc	Industrial Sector Market Research & Analysis	8,250
MSCI - Barra	Research and Data Services	20,625
MSCI Inc - Risk Metrics Solutions	Research and Data Services	255,069
MSCI, Inc	Research and Data Services	113,798
MT Analytics ULC	Investment Consulting	99,516
My Data Outlet International, LLC	Research and Data Services	57,000
National Conference on Public Employee Retirement Systems	Investment Research	4,865
Needham & Company LLC	Investment Research	7,300
NEPC LLC	Investment Consulting Services	80,000
New Street Research LLC	Investment Research	(25,000)
Northcoast Research Partners, LLC	Research and Data Services	3,900
Northland Securities	Investment Research	4,600
Nuware Technology Corp	Investment Information Technology Consulting Services	60,720
NYSE Market Inc	New York Stock Exchange Data	6,105
Oliver James	Investment Consulting Services	48,150
Oppenheimer & Co Inc	Investment Research	8,500
Options Price Reporting Authority	Quote System for Options Market	2,268
Oxford Economics USA INC	Research and Data Service	22,171
Pacific Pension & Investment Institute	Access to Investment Research	14,000
Pac-invest	Research and Data Services	14,196
PEI Media Inc	Private Equity Real Estate News	13,200
Pitchbook Data Inc	Research and Data Services	20,000
PremiaLab	Investment Research	22,917
Preyer	Investment Consulting Services	81,255
Quantum Research Consulting LLC	Investment Consulting	55,800
RavenPack International S.L.U.	Research and Data Services	49,500
Raymond James	Research and Data Services	16,700
Redburn Europe Limited	Investment Research	6,250
Refinitiv	Investment Research	122,381
Renaissance Macro Research	Macro Economic Research	11,000
RIMES Technologies Corporation	Research and Data Service	86,250
Robert W. Baird & Co.	Investment Research	77,250
Rosenblatt Securities Inc	Investment Research	5,000
Roth Capital Partners	Investment Research	5,200
Russell Investment Group	Index Data	17,864
S&P Global Market Intelligence	Industry & Corporate Research	108,999
SailPoint Technologies, Inc.	Information Security Software	54,198
Sanford C Bernstein & Co LLC	Investment Research	32,000
Seaport Global Securities LLC	Research and Data Services	2,650
SEI Investments	Research and Data Services	22,736
SemiAnalysis	Investment Research	200
Sharp Decisions Inc	Investment Information Technology Consulting Services	12,972
Sidoti & Company LLC	Investment Research	6,000
SimCorp Data & Performance Capitalized Expenses	Investment System	(275,955)
SimCorp Implementation Capitalized Expenses	Investment System	(2,783,145)
Simcorp USA, Inc.	Investment System	2,514,901
Snowflake Inc	Research and Data Services	45,758
Software House Intl	Investment Software	6,837
Solve Advisors Inc	Investment Research	10,299
Spherion	Recruitment and Staffing Services	11,324
Stephens Inc	Investment Research	10,000
StepStone Group	Private Equity Consulting Services	223,207
StepStone Group Real Estate	Real Estate Consulting Services	59,330
Stifel Nicolaus & Company Incorporated	Investment Research	(30,150)
STOXX Limited	Research and Data Services	28,466
Strategic Economic Decisions Inc	Investment Research Reports	6,000
Susquehanna Financial Group LLP	Investment Research	1,900
SWIFT SC	Research and Data Services	533
SystemsAccountants	Investment Information Technology Consulting Services	80,640
Telsey Advisory Group	Consumer Sector Research	(26,250)

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES
The Benchmark Company LLC	Investment Research	1,800
The Financial Times Limited	Investment Research	1,103
The Leuthold Group LLC	Broad Based Market Research	1,000
The Loan Syndications and Trading Association	Investment Membership	14,000
The Nasdaq Stock Market, LLC	Research & Data Services	4,725
The Yield Book Inc	Research and Data Services	9,682
Toronto Stock Exchange	Market Data	14,538
TradeWeb	On-Line Fixed Income Trading Services	10,826
Trahan Macro Research LLC	Research and Data Services	19,750
Trivariate Research LP	Investment Research	6,500
Truist Securities, Inc.	Investment Research	(12,150)
Tudor Pickering Holt & Co	Investment Research	1,500
Unit4 Business Software Inc	Financial & Administration Services System	78,482
Unquote	Research and Data Services	3,365
Urban Land Institute	Investment Consulting Services	1,270
Verity LLC	Research Management System	54,433
Vertical Research Partners	Industrial Sector Market Research & Analysis	8,400
Virtu ITG Analytics LLC	Trading Transaction Cost Analysis	20,500
Visible Alpha LLC	Research and Data Services	19,950
Wall Street Calendar	Data Service	495
Wall Street Journal	Investment Research & Information	51
Wedbush	Investment Research	9,300
William Blair & Company LLC	Investment Research	(7,800)
Wolfe Trahan	Transportation and Macro Economic Research	34,900
Wolters Kluwer Law & Business	GDP Forecasting Services	3,267
Wolverine Execution Services LLC	Options Trading Platform	1,395
WorldBridge Partners Inc	Recruitment Consulting	63,310
Worth Charting LLC	Investment Consulting	9,750
Total Investment Counsel		\$ 7,637,651
<u>Separate Account Public Market Management Fees</u>		
Alliance Bernstein	Public Market Management Fees	\$ (6,882,463)
Blackrock	Public Market Management Fees	1,339,162
Dodge and Cox	Public Market Management Fees	1,113,468
Driehaus Private Equity	Public Market Management Fees	292,391
eSecLending	Public Market Management Fees	4,089
Fidelity Investments	Public Market Management Fees	1,435,106
Parametric	Public Market Management Fees	580,628
Prudential Global Investment Management (PGIM)	Public Market Management Fees	145,268
Robeco Institutional Asset Management	Public Market Management Fees	125,048
Wellington Trust Company	Public Market Management Fees	189,431
Total Separate Account Public Market Management Fees		\$ (1,657,872)
<u>Securities Lending Agent Fees</u>		
BNY Mellon Asset Servicing & eSec Lending	Securities Lending Agent Fees	\$ 1,086,188
Total Securities Lending Agent Fees		\$ 1,086,188
Total Quarterly Charges to Funds		\$ 40,000,536

*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. During 2023 there were no investments in Bankers' Bank certificates of deposit and no fees were incurred.

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 Fund Commitments*

October 2023 – December 2023

<i>Investment</i>	<i>Commitment (millions)</i>
Ares Corporate Opportunities Fund VII	\$100.0
Audax Private Equity/Strategic Capital - SW	\$100.0
Ballast Equity Partners Fund I	\$30.0
Blackstone IX	\$50.0
GHK Fund II	\$65.0
Hellman & Friedman Capital Partners XI	\$50.0
Lindsay Goldberg VI	\$100.0
Percheron Capital II	\$25.0
Searchlight Capital IV	\$75.0
Tower Arch Partners III	\$62.0
Turnspire Value Fund II	\$35.0

**Includes Current Return Portfolio*

Private Equity Co-Investment Commitments*

October 2023 – December 2023

<i>Investment</i>	<i>Commitment (millions)</i>
Industrials Co-Investment	\$25.0
Telecom Co-Investment	\$25.0
Industrials Co-Investment	\$30.0
Industrials Co-Investment	\$1.0
Healthcare Co-Investment	\$30.0
Healthcare Co-Investment	\$10.0
Consumer Co-Investment	\$35.0

*Includes Current Return Co-Investment Portfolio

Private Debt Investments/Commitments

October 1, 2023 to December 31, 2023 (Fourth Quarter)

<i>Investment</i>	<i>Investment/Commitment</i>
Infrastructure	\$10,000,000
Insurance Company	\$2,000,000
Industrial REIT	\$15,000,000
Total	\$27,000,000

Real Estate Commitments

October 2023 – December 2023

<i>Investment</i>	<i>Commitment (millions)</i>
FPA Core Plus Fund III-A, LP	\$45
Exeter Core Industrial Club Fund II, LP	68
SRE Wilson Industrial Holdings LLC	100
Wilson DWS Senior Finance, LLC	175
Heitman Real Estate Debt Partners III, LP	100
Total	\$488

Funds Alpha Commitments*

October 1 – December 31, 2023

Manager	Commitment (Millions)
Badgerstone Signature SRT	\$ 30
Voleon Composition	\$ 50
Man AHL	\$ 24
Reflow	\$ 100
Badgerstone Access	\$ 400
Walleye Opportunity	\$ 31
TOTAL	\$ 635

**Includes Hedge Funds and Beta One*

Board Contact Log

DATE OF INBOUND COMMUNICATION	DATE OF BOARD COMMUNICATION	COMMUNICATION SOURCE	TOPIC
December 8, 2023		Catherine Kaye	Fossil fuel divestment and systemic climate risks
December 8, 2023		Lewis Kuhlman	Fossil fuel divestment and systemic climate risks
December 8, 2023		Susan Millar	Fossil fuel divestment and systemic climate risks
December 11, 2023		Judith Brey	Fossil fuel divestment and systemic climate risks
December 11, 2023		Ann Chartier	Fossil fuel divestment and systemic climate risks
December 11, 2023		Beth Darlington	No comment submitted
December 11, 2023		Paul DeMain	Fossil fuel divestment and systemic climate risks
December 11, 2023		Norda Gromoll	Fossil fuel divestment and systemic climate risks
December 11, 2023		Donell Kerns, PhD	Fossil fuel divestment and systemic climate risks
December 11, 2023		Susan Phillips	Fossil fuel divestment and systemic climate risks
December 11, 2023		Susan Phillips	Fossil fuel divestment and systemic climate risks
December 11, 2023		Richard Spindler	Fossil fuel divestment and systemic climate risks
December 12, 2023		Anne Steinberg	Fossil fuel divestment and systemic climate risks

This log records referrals by Trustees, former Trustees, former SWIB staff, elected officials, other government officials, and the Executive Director. It is maintained pursuant to the Board's governance policy regarding referrals of investments and business opportunities.

Board Contact Log

DATE OF INBOUND COMMUNICATION	DATE OF BOARD COMMUNICATION	COMMUNICATION SOURCE	TOPIC
December 12, 2023		Ann Brummitt	Fossil fuel divestment and systemic climate risks
December 12, 2023		Natalie Chulew	Fossil fuel divestment and systemic climate risks
December 12, 2023		Peter Gorski	Fossil fuel divestment and systemic climate risks
December 12, 2023		Kelly Kearns	Fossil fuel divestment and systemic climate risks
December 12, 2023		Rita Meuer	Fossil fuel divestment and systemic climate risks
December 12, 2023		Connie Molbeck	Fossil fuel divestment and systemic climate risks
December 12, 2023		Thom Rutkowski	Fossil fuel divestment and systemic climate risks
December 13, 2023		John Lane Hall	Fossil fuel divestment and systemic climate risks
December 14, 2023		Mark Haag	Fossil fuel divestment and systemic climate risks
December 14, 2023		Tom Loeser	Fossil fuel divestment and systemic climate risks
December 14, 2023		Rick Whaley	Fossil fuel divestment and systemic climate risks
December 14, 2023		James Young	Fossil fuel divestment and systemic climate risks
December 14, 2023		John Zillmer	Fossil fuel divestment and systemic climate risks

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Board Contact Log

DATE OF INBOUND COMMUNICATION	DATE OF BOARD COMMUNICATION	COMMUNICATION SOURCE	TOPIC
December 15, 2023		Anna Keefe	Fossil fuel divestment and systemic climate risks
December 15, 2023		Judy Stadler	Fossil fuel divestment and systemic climate risks
December 15, 2023		Ron Story	Fossil fuel divestment and systemic climate risks
February 2024		Jane Snediker	Thanking SWIB for the decisions and work the company does
March 4, 2024		Ken Scott	Fossil fuel divestment and systemic climate risks
March 4, 2024		Judith Stadler	Fossil fuel divestment and systemic climate risks
March 4, 2024		Irene Schmidt	Fossil fuel divestment and systemic climate risks
March 4, 2024		Susan Millar	Fossil fuel divestment and systemic climate risks
March 5, 2024		Douglass Day	Fossil fuel divestment and systemic climate risks
March 6, 2024		Joan Janus	Fossil fuel divestment and systemic climate risks
March 6, 2024		Brian and Betty Bushnell	Fossil fuel divestment and systemic climate risks
March 6, 2024		Susan Bietila	Fossil fuel divestment and systemic climate risks
March 7, 2024		Anne Steinberg	Climate Risk for October Workshop

This log records referrals by Trustees, former Trustees, former SWIB staff, elected officials, other government officials, and the Executive Director. It is maintained pursuant to the Board's governance policy regarding referrals of investments and business opportunities.

Board Contact Log

DATE OF INBOUND COMMUNICATION	DATE OF BOARD COMMUNICATION	COMMUNICATION SOURCE	TOPIC
March 7, 2024		Lewis Kuhlman	Fossil fuel divestment and systemic climate risks
March 11, 2024		Peter Knotek	Fossil fuel divestment and systemic climate risks

This log records referrals by Trustees, former Trustees, former SWIB staff, elected officials, other government officials, and the Executive Director. It is maintained pursuant to the Board’s governance policy regarding referrals of investments and business opportunities.

Board Meeting

Tab 11 - 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"> • Open Audit Issues Report • Approval of Draft Audit Reports • Audit Plan Status • 2024 Internal Audit Goals • 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"> • Annual Charter Review • Open Audit Issues Report • Approval of Draft Audit Reports • Affirmations and Disclosures • Audit Plan Status • Internal Audit Strategic Plan • 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