

SWIB Board Meeting of September 11, 2024

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Name of Meeting: Regular Meeting of the Board of Trustees
Date/Time: Wednesday, September 11, 2024 9:00 am
Room: 1st Floor Conference Room
Address: 4703 Madison Yards Way, Madison, WI 53705
Virtual: [Join the meeting now](#); 608-267-3179 code 616381485

OPEN SESSION	
1.	Committee Reports – Open Session Items <ul style="list-style-type: none"> A. Audit and Finance Committee B. Benchmark and Performance Committee C. Compensation and Workforce Development Committee D. Strategic Planning and Corporate Governance Committee
2.	Consent Agenda <ul style="list-style-type: none"> A. Open Session Minutes of June 12, 2024 B. Recommended Actions from Committee Agendas – Open Session Items
3.	Investment Forum Recap
4.	Fiduciary & Public Records Topics
5.	Investment Performance and Market Updates <ul style="list-style-type: none"> A. Board Investment Performance Report, Q2 2024 B. Callan Quarterly Report
6.	Committee Open Session Business <ul style="list-style-type: none"> A. Amendments to WRS Investment Committee Investment Guidelines B. Approved Open Session Investment Committee Meeting Minutes of May 28, June 25, and July 23, 2024 C. Final Open Session Investment Committee Agenda for August 27, 2024 and Draft Open Session Agendas for September 24 and October 22, 2024 D. Draft Open Session Minutes of May 14, 2024 Enterprise Risk and Compliance Committee meeting
7.	Quarterly Investment Update, Q2 2024
CLOSED SESSION*	

* 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.

RECONVENE IN OPEN SESSION

8. Announcement of Matters Taken Up in Closed Session

9. In the Absence of Questions, the Following Reports will be Filed Without Comment (For informational purposes):

- A. Quarterly Charges to Funds Reports, Q2 2024
- B. Private Markets and Funds Alpha Commitments, Q2 2024
- C. Board Contact Log

10. Future Items for Discussion

- A. Annual Board Agenda Plan

Motion to Adjourn

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

Estimated times are for planning purposes only. Agenda items will last until discussion is concluded.

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

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

Board Meeting

Tab 1 – Committee Reports – Open Session Items

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

Board Meeting

Tab 2 – Consent Agenda

- A. Open Session Minutes of June 12, 2024
- B. Recommended Actions from Committee Agendas –
Open Session Items

Regular Meeting of the Board of Trustees

Wednesday, September 11, 2024

STATE OF WISCONSIN INVESTMENT BOARD

CONSENT AGENDA – OPEN SESSION ITEMS

Proposed Motions:

1. Move to approve the Open Session Minutes of June 12, 2024, as presented.
2. *[TBD after Committee meetings]*

STATE OF WISCONSIN INVESTMENT BOARD

Board of Trustees Meeting – Open Session

Tuesday/Wednesday, June 11-12, 2024

Investment Forum: Virtual

Regular Board Meeting: 4703 Madison Yards Way, Madison, WI

OPEN SESSION

Trustee Tinnen, Chair, called the meeting of the Board of Trustees to order at 1:30 p.m. on June 11, 2024. Trustee Tinnen introduced the other Trustees and Edwin Denson, Executive Director/Chief Investment Officer. Mr. Denson thanked the CFA Society Madison for joining the Board of Trustees in hosting this annual event and then acknowledged and thanked the planning committee and additional contributors.

INVESTMENT FORUM (Session I, June 11, 2024) (See Attachment 1 for Attendance List)

1. The Impact of GLP-1 Drugs on the Economy and Healthcare

Dr. Jay Rao, Founder & Chief Investment Officer, Integral Health Asset Management

Dr. Jay Rao, Founder and Chief Investment Officer at Integral Health Asset Management spoke about the potential impacts of GLP-1 drugs on healthcare and the broader economy. Dr Rao first discussed the history of innovation around this new class of treatments. He then discussed treatment implications, both near term and longer term, of this class of drugs becomes more widely accepted. One component of this acceptance will be the willingness of health insurance companies to approve these drugs for coverage, something he expects to begin soon. Additionally, as these drugs pass trials for treatment of coincident conditions such as kidney disease and sleep apnea, Dr. Rao expects further adoption of these GLP-1 drugs across the healthcare system. Currently these drugs are primarily being used in the developed economies of the U.S. and Europe, and he expects worldwide adoption to further contribute to the growth in prescription of these treatments.

One early headwind to acceptance of GLP-1 drugs appears to be drop rates, that is, where patients will take the drug for a short period of time, see improvements, and then discontinue treatment. He expects further research and technological advancements, such as more durable treatments with 6-month administration rates as opposed to monthly, as well as orally administrable treatments as opposed to injectables, will help reduce drop rates. Another headwind is simply supply/demand imbalances, and he expects this to come into balance in the next 2-3 years as manufacturers invest in production capacity. Overall, he sees the market for GLP-1 drugs as a potentially billion patient market, with up to 2.4% impact on global GDP, making for a bull case of \$144 billion in sales of GLP-1 treatments by 2035.

2. Commercial Real Estate Cycles

Ed Reardon, Managing Director, Head of Securitization Research, Deutsche Bank

Ed Reardon, Managing Director and Head of Securitization Research at Deutsche Bank, spoke about the current state of the commercial real estate (CRE) market. At a high level, he sees higher interest rates and tighter underwriting standards causing a decline in CRE sales of roughly 30-40% in 2024. For the same reasons, construction activity has also slowed. Mr. Reardon thinks the office property sector of the CRE

market will remain under pressure for the near term and will require a multi-year workout to clear supply/demand imbalances. However, he did note that other sectors of the CRE market have been performing well year to date. Going forward, Deutsche Bank expects a soft landing for the economy and while this could lead to lower rates and increased transaction rates, a soft landing could also hurt some of those currently well-performing CRE sectors. Mr. Reardon believes dry power raised and ready to invest in distressed CRE could provide a buffer as we move into the second half of 2024.

3. AI: Demystifying Hype. Determining Risks. Discovering Potential

Talia Goldberg, Partner, Bessemer Venture Partners

Talia Goldberg, Partner at Bessemer Venture Partners, spoke about the potential and the risks of new artificial intelligence (AI) technologies, as well as their implications for business and the economy. In her opinion, AI is a result of the natural technological progression that started with computer, internet, and mobile technologies. In each of those areas there was a dominant winner, and currently she expects OpenAI to become the industry standard AI technology company. From the perspective of investment, Ms. Goldberg sees AI continuing to drive significant investor interest, noting AI venture capital deal count was up 33% year-over-year through the end of 2023 and deal value increasing roughly six times (6x). This trend has continued in 2024 with robust demand for investment in innovative AI startups.

Ms. Goldberg believes these new AI products have been adopted by customers at an unprecedented rate, a trend driven by the view that AI will transform how we live, work, and interface with machines. She believes customers are already seeing these transformative effects and are rushing into the technology to become early adopters. As the customer base for AI technologies is rapidly increasing, AI companies are scaling revenue and capturing value at a faster rate than prior technological shifts. Overall, Ms. Goldberg sees AI as a new technology that is still early in the development and adaption phase, but with massive and rapid return to investors willing to engage.

The Board recessed for the day at 4:30 p.m.

REGULAR BOARD MEETING (June 12, 2024)

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

Staff/Others Present: Nathan Ballard, Senior Legal Counsel
Eric Barber, Chief Legal Counsel
Zach Berghouse, Internal Auditor
Brandon Brickner, Head of Internal Audit
Sara Chandler, Chief of Staff and Strategy
Hassan Chehime, Head of Risk Management
Edwin Denson, Executive Director/Chief Investment Officer
Anne-Marie Fink, Private Markets & Funds Alpha CIO
Greg Fletcher, Performance Director
Jameson Greenfield, Chief Financial Officer
Dan Gyrog, Internal Auditor
Brian Heimsoth, Senior Portfolio Manager
Vince Janecky, Internal Audit Data Analyst
Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer
Leo Kropywiansky, Senior Portfolio Manager
Todd Mattina, Head Economist, Asset & Risk Allocation CIO
Jay Risch, Government Relations Liaison
Dawn Tuescher, Executive Administrative Assistant
Joe Nankof, NEPC
Ethan Kenney, Legislative Audit Bureau
Sam Rebenstorf, Legislative Audit Bureau
Erik Thulien, Legislative Audit Bureau
Megan Westerman, Legislative Audit Bureau
Harrison Bader, BlackRock
Jessica Hamlin, Pitchbook News
Eric Hanson, Public Attendee
Bob Schaefer, Public Attendee
Judy Stadler, Public Attendee
Anne Steinberg, Public Attendee
(Some individuals may have attended only portions of the meeting.)

Trustee Tinnen, Chair of the Board of Trustees, declared a quorum was present and called the Board of Trustees meeting back to order at 10:21 a.m. on June 12, 2024.

1. Committee Reports – Open Session Items

A. 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) reviewed and recommended that the Board approve changes to the Audit and Finance Committee Charter and reviewed and approved changes to the Internal Audit Division Charter; (iii) reviewed and approved the 2023 Wisconsin Retirement System audited financial statements, which included a clean and unmodified opinion from the Legislative Audit Bureau (LAB); (iv) received an open audit issues report; (v) approved the draft Vendor Management and Procurement and the draft High Yield audit reports; (vi) reviewed the annual affirmations and disclosures; (vii) reviewed and approved an update to the 2024 Internal Audit Plan; (viii) reviewed the Internal Audit Strategic Plan; (ix) reviewed the Five-Year Audit Summary; (x) received a Quarterly Cost of Management Update for Q1 2024; and (xi) recommended that the Board approve the FY 2025 State Operating Budget.

B. Benchmark and Performance Committee

Trustee Schalow, Chair of the Benchmark and Performance Committee, reported that in open session the Committee: (i) approved prior meeting minutes; (ii) reviewed and recommended that the Board approve the BSBY replacement benchmark recommendations from NEPC; and (iii) received a preview of the comprehensive benchmark review.

C. Compensation and Workforce Development Committee

Trustee Tinnen, Vice Chair and Secretary of the Compensation and Workforce Development Committee, reported that in open session, the Committee: (i) approved prior meeting minutes; and (ii) reviewed and recommended that the Board approve amendments to the Long-Term Incentive Plan (LTIP).

D. Strategic Planning and Corporate Governance Committee

Trustee Tinnen, Chair of the Strategic Planning and Corporate Governance Committee, reported that in open session, the Committee: (i) approved prior meeting minutes; (ii) heard a strategy report and market outlook from Aksia, SWIB's hedge fund consultant; (iii) received an update on Project Centum; and (iv) reviewed and recommended that the Board approve amendments to the Corporate Governance Policy. Trustee Tinnen reported that during its executive closed session the Committee approved prior meeting minutes and met with the ED/CIO to review his performance goals.

2. Consent Agenda

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

- Move to approve the Open Session Minutes of March 20, 2024, as presented.
- Move to approve the changes to the Corporate Governance Policy as reviewed by the Strategic Planning and Corporate Governance Committee with the Committee's suggested revisions, as

recommended by the SPCG Committee, and authorize the Chief Legal Counsel, in consultation with the Chief of Staff and Strategy, to make such revisions.

- Move to approve the changes to the Long-Term Incentive Plan, as recommended by the Compensation and Workforce Development Committee and as set forth in the Committee's materials.
- Move to approve the changes to the benchmarks used for Policy Leverage and the Short-Term Credit Portfolio, as recommended by the Benchmark and Performance Committee, and as set forth in the Committee's materials.
- Move to approve the changes to the Audit and Finance Committee Charter, as recommended by the Audit and Finance Committee, and as set forth in the Committee's materials.
- Move to approve the preliminary FY 2025 State Operating Budget of \$102.8 million, as recommended by the Audit and Finance Committee, and as set forth in the Committee's materials.

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

3. Investment Performance and Market Updates

A. Board Investment Performance Report, Q1 2024

Greg Fletcher, Performance Director, presented the *Investment Performance Report*, as of March 31, 2024, included on pages 19-36 of the meeting materials. Mr. Fletcher reported that: (i) the Core Trust Fund (CTF) returned 3.49% net of all fees and expenses in Q1 2024, resulting in excess performance of 59 basis points (bps) for the quarter; (ii) the CTF returned 10.72% net of all fees and expenses for the one-year period, resulting in an excess return of 94 bps; (iii) the CTF five-year return net of all fees and expenses was 8.38% and outperformed the Policy Benchmark by 67 bps on an annualized basis; and (iv) the CTF gross of fee return outperformed the 60/40 Reference Portfolio return by 60.7% (cumulative) over the past twenty years.

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 fees and expenses return outperformed its benchmark for the year-to-date period, but underperformed for the one-year, three-year, and five-year time periods; (v) the VTF net of external manager fee return underperformed its benchmark for the five-year, ten-year, and twenty-year periods; and (vi) the VTF gross of fee return outperformed its benchmark for the thirty-year time period. Mr. Fletcher then noted that SWIB's investment management has added more than \$3.7 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 and internally managed assets have declined slightly. 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 that 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 36 of the meeting materials. He noted that policy leverage contributed 16 bps to CTF absolute performance year-to-date, 47 bps for the one-year period and 44 bps over the five-year period and was flat for the three-year period.

B. Callan Quarterly Report

Mr. Fletcher noted that the *Callan Quarterly Report Summary* as of March 31, 2024 was included on pages 37-51 of the meeting materials. He highlighted that the CTF's total fund unadjusted performance rankings are near or above median over the five- and ten-year periods but are below median for the one- and three-year period. On an asset allocation adjusted basis, the CTF's performance rankings are in the first quartile for the last quarter and second quartile over the one-, three-, five- and ten-year periods. When comparing the CTF ten-year cumulative performance to peers, Mr. Fletcher noted that the CTF exhibits low tracking error relative to its peers and produces stable, ascending cumulative performance over the period.

4. Investment Committee Open Session Business

A. Amendments to WRS Investment Committee Investment Guidelines

Mr. Barber discussed amendments to the *SWIB Investment Committee Wisconsin Retirement System Investment Guidelines*, approved by the Investment Committee on March 21, 2024 and included on pages 53-71 of the meeting materials. He noted amendments to: Private Markets Funds Alpha portfolios related to approval thresholds; private debt instruments; exposure limits; and soft risk parameters.

B. Approved Open Session Investment Committee Minutes

Mr. Barber stated that the approved open session minutes of the February 27, March 21, and April 23, 2024 Investment Committee meetings were included on pages 72-86 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

Mr. Barber also stated that the final open session agenda for the May 28, 2024 Investment Committee meeting and the draft open session agendas for the June 25 and July 23, 2024 meetings were included on pages 87-92 of the meeting materials for the Board's review.

5. Quarterly Investment Update, Q1 2024

Todd Mattina, Head Economist, Asset & Risk Allocation CIO, presented the *Performance Trends & Outlook*, included on pages 95-99 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 the five-year rolling return continues to outperform the actuarial target and policy benchmark.

Mr. Mattina then provided a brief commentary on the CTF five-year return estimate, which projected a five-year annualized return of 6.9% using NEPC's assumptions for 2024. He also discussed the five-year forward estimate and highlighted the potential negative 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 performance time period and are replaced with the NEPC

10-year-expected return assumption of 6.5%. Mr. Mattina concluded by referencing the *Economic Update* included on pages 100-126 of the meeting materials for the Board’s review.

6. Motion to Convene in Closed Session

Motion: A motion to convene in closed session pursuant to: (i) Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies of internal WRS portfolios, 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 19.84(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, was made by Trustee Tinnen and seconded by Trustee Voelker.

The Chair called for a roll call vote.

Ancel–Aye	Blumenfeld–Aye	Bolens - Aye	Merfeld - 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 11:06 a.m. and reconvened in open session at 12:55 p.m.

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

Trustee Tinnen announced that while in closed session the Board: (i) received a closed session quarterly investment update; (ii) received a risk management update; and (iii) discussed Investment Committee closed session business. In executive closed session the Board: (i) approved the prior meeting minutes and the closed session consent agenda; and (ii) received update on various litigation matters from the Chief Legal Counsel.

8. Reports Filed Without Comment

In the absence of questions, the following reports, included on pages 207-220 of the meeting materials, were filed without comment: (i) Quarterly Charges to Funds Report, Q1 2024; (ii) Private Markets and Funds Alpha Commitments, Q1 2024, and (iii) Board Contact Log.

9. Future Items for Discussion

There were no future items for discussion noted.

The Board recessed at 12:56 p.m.

INVESTMENT FORUM (Session II, June 12, 2024) (See Attachment 1 for Attendance List)

The Chair called Session II of the Investment Forum to order at 1:30 p.m.

1. Energy Transition & Investment Opportunities

Phil Deutsch, Fund Head & Partner, NGP; Chief Executive Officer, NGP ETP III

Phil Deutsch, Fund Head and Partner at NGP and Chief Executive Officer at NGP ETP III, discussed the energy transition from fossil fuels to renewables, and the investment opportunities around this transition. Specific to U.S. power generation, the shift from coal to natural gas and renewables has led to a 20% reduction in emissions. In this shift, wind and solar are the early dominant sources of global power generation additions. While the world is still early in the energy transition, Mr. Deutsch expects the growth in renewables to remain strong between now and 2029. Additionally, he sees battery costs declining while production capacity is still increasing. These factors should decrease the cost of energy storage and electric vehicles (EV). Near-term Mr. Deutsch sees headwinds to EV adoption, however, he believes long-term EV adoption will expand..

Mr. Deutsch expects that the Inflation Reduction Act recently passed by congress will unlock \$3 trillion of infrastructure spending between now and 2032, with an additional \$800 billion being allocated to domestic semiconductor manufacturing, EV and battery production, clean power, and clean energy manufacturing. Overall, Mr. Deutsch thinks that investment in sustainable real assets presents a significant opportunity between now and 2030.

2. Real Interest Rates: Higher for Longer?

Ken West, John D. MacArthur & Ragnar Frisch Professor of Economics, University of Wisconsin Madison; Director of the Julie Plant Grainger Institute of Economic Research

Ken West, John D. MacArthur & Ragnar Frisch Professor of Economics at the University of Wisconsin, Madison, and director of the Julie Plant Grainger Institute of Economic Research, spoke about real interest rates and whether we can expect these rates to remain higher for longer. He noted that prior to 2022, real rates, inflation expectations, and nominal interest rates all remained low. However, starting in 2022, the economy shifted first to a higher inflation level, followed by a higher nominal interest rate environment, and then a higher real interest rate environment. Dr. West argues that prior to 2022, real interest rates were low, in a large part, due to the increased supply of savings that was driven by domestic demographics and broader global change, such as China entering the World Trade Organization. The period from 2020-2022 saw a recession, triggered by the Covid pandemic and other short-term factors, that led to high inflation and higher real rates. Some argue that once these short-term factors dissipate, the economy will revert to real rates as low as we saw in the pre-Covid period.

Dr. West explained that there isn't a strong consensus among economists. Some argue that a medium-term reversion in real rates is likely, as gains in life expectancy will outweigh the aging baby boomer cohort. Other economists do not expect reversion because of a diminution of the high saving baby boomer demographic and broader deglobalization trends, which could lead to China and other actors placing less savings in Western economies. Dr. West concluded with his perspective that most indicators suggest real rates will remain higher going forward.

3. Tails & Survival

Nassim Nicholas Taleb, Distinguished Professor of Risk Engineering, New York University’s Tandon School of Engineering; Scientific Advisor, Universa Investments

Nassim Nicholas Taleb, Distinguished Professor of Risk Engineering at New York University’s Tandon School of Engineering, and Scientific Advisor at Universa Investments, drew on parts of his past major publications, such as *The Black Swan*, to show how traditional statistical approaches to risk management widely used in the financial profession are prone to misinterpretation by practitioners. To him “Black Swans” are just tails that are hiding in a model, and often these tails are wider than traditional models expect. He argues that allocators should not rely solely on correlations to drive asset allocation decisions. In his opinion, Modern Portfolio Theory is not compatible with fat-tailed distributions, and as a result, pensions that target an optimal portfolio in effect end up with a less optimal one, as this theory fails to protect against tail risks and under-allocates to the high-returning asset classes. Overall, Dr. Taleb is a proponent of portfolio constructions that includes some form of portfolio insurance that provide some protection from a fat-tail outcome that he believes will occur some point in the future.

4. Adjournment

Trustee Tinnen thanked the presenters and attendees for taking part in the Investment Forum and adjourned the meeting at 4:30 p.m.

Date of Board Approval:

Signed:

Clyde Tinnen, Board Secretary

Attachment 1

Investment Forum Audience Members Attending Day 1

First

Name	Last Name	Organization
Macauly	Addesso	SWIB
Esther	Ancel	SWIB
Steve	Andres	SWIB
Gulden	Aydogdu	Bank
William	Backes	retired
Nathan	Ballard	SWIB
Eric	Barber	SWIB
Christopher	Benish	SWIB
Henry	Benton	SWIB
Zach	Berghouse	SWIB
Naveen	Bhagam	SWIB
Sanil	Bhaskaran	SWIB
Kevin	Blank	SWIB
Kathy	Blumenfeld	Wisconsin Department of Administration
Ava	Boettcher	SWIB
Barb	Bolens	University of Wisconsin-Madison School of Business
Patrick	Bourbon	BFM
Thomas	Bowes	SWIB
David	Boyne	Michigan Department of Treasury
Brandon	Brickner	SWIB
Adam	Brown	SWIB
Rosa	Brown	SWIB
Maya	Bruesewitz	SWIB
Michael	Brusberg	SWIB
Eric	Buchholtz	SWIB
Nick	Bultman	SWIB
Bill	Campbell	SWIB
stefano	cavaglia	SWIB
Sara	Chandler	SWIB
hassan	chehme	SWIB
Maggie	Clanfield	SWIB
Jan	Cliff	Johnson Financial Group
Molly	Cole	WFAA
Amy	Collien	SWIB
Christian	Comito	SWIB
Andrew	Crossman	SWIB
John	Culley	SWIB
John	David Stanfield	Terra Institute
Paige	Davis	SWIB
tunc	dayioglu	SWIB
John	Del Virginia	Integral Health Asset Management
Kim	DeMane	SWIB

Kent	Demien	Johnson Financial Group
Ramesh	Devarajan	SWIB
Walter	Dewey	Resonant Capital
Roger	Ding	SWIB
Jack	Drew	SWIB
David	Duchow	US Bank Private Wealth Management
Chris	Eckerman	SWIB
Shirley	Eckes	ETF
Trey	Edgerle	SWIB
Greg	Edwards	Hawk Center UW Madison School of Business
Randy	Eggert	SWIB
Kathleen	Erdman	Third Act Wisconsin/WI State Retirement Fund
Erin	Escobar	SWIB
Elizaveta	Familiant	SWIB
Kaya	Farhat	SWIB
Diana	Felsmann	Wisconsin Department of Employee Trust Funds
Samantha	Fenske	Lincoln County
Anne-Marie	Fink	SWIB
Andy	Fischer	SWIB
Trevor	Foemmel	SWIB
Jason	Fralish	SWIB
Rhiannon	Friedel	SWIB
Megan	Gall	SWIB
Shannon	Gannon	SWIB
Maximillian	Garcia	SWIB
Ethan	Gegare	University of Wisconsin Foundation
Ben	Gmeinder	BHCCU
Prajna	Gopal Hardikar	SWIB
Jameson	Greenfield	SWIB
Thomas	Gregg	SWIB
Dan	Gyrog	SWIB
Jay	Harding	SWIB
Michael	Harmelink	SWIB
Dylan	Hastings	SWIB
Brian	Heimsoth	SWIB
TiaRae	Heminger	SWIB
Hillary	Holstein	SWIB
Theresa	Holterman	SWIB
Beth	Holzberger	SWIB
Gabriel	Huber	WFAA
Vince	Janecky	SWIB
brenden	johnson	Indiana Univeristy
Ryan	Johnston	SWIB
Jack	Julka	SWIB
Parag	Kansara	SWIB
Afafe	Karimallah	SWIB

Sukru	Kaya	Market
Salah	Khalaf	SWIB
Rochelle	Klaskin	SWIB
Peter	Knotek	Climate Safe Pensions Wisconsin
Dylan	Krivoshein	SWIB
Andy	Kuehn	SWIB
Rachel	Kuenzi	SWIB
Katie	Kuryla	SWIB
Matt	Kuznacic	SWIB
Vicki	LaFond	SWIB
Lisa	Lange	SWIB
James	Laufenberg	SWIB
Sean	Lavin	SWIB
John	Liber	SWIB
Diane	Linn	SWIB
Shan	Lo	SWIB
Anthony	Lubarsky	SWIB
Bill	Luetzow	SWIB
Ed	Martinez	SWIB
Todd	Mattina	SWIB
Frank	Mazzucco	SWIB
Jeremy	McCauley	SWIB
Jane	McKenna	TruStage
Tom	Merfeld	SWIB
Jason	Mirr	SWIB
Anand	Mohan Rakesh	SWIB
Alyssa	Moore	SWIB
Jerri	Morales	SWIB
Vadim	Moroz	SWIB
	Muhammad Aun	
Syed	Haider	SWIB
Joy	Mukherjee	SWIB
Olu	Olubiyi	SWIB
Sadi	Ozelge	SWIB
Gozde	Ozelge	Bank
Cian	Pallasch	DOA
Mark	Paloian	SWIB
Ethan	Park	Wisconsin Foundation and Alumni Association
Scott	Parrish	SWIB
Jeanne	Peltier	SWIB
Dan	Perik	SWIB
Brian	Planey	SWIB
Josh	Proefrock	SWIB
Ceferino	Quesada	SWIB
Gregory	Rademacher	Buttonwood Partners, Inc
Zhihui	Redlin	SWIB
Fahad	Rehman	SWIB

Steve	Reno	SWIB
Robby	Richlen	SWIB
Taylor	Rinzel	Johnson Financial Group
Jay	Risch	SWIB
Tom	Robinson	SWIB
Jason	Rothenberg	SWIB
Andrea	Ruiz	SWIB
Brian	Russell	SWIB
Charles	Saunders	University of Wisconsin
Dave	Schalow	SWIB
Uwe	Schillhorn	Emerging Markets Investor Alliance
Erin	Schleusner	SWIB
Scott	Schrier	SWIB
Paige	Schultz	SWIB
edouard	senechal	SWIB
Tim	Sharko	SWIB
Michael	Shearer	SWIB
Thomas	Sheridan	SWIB
Aaron	Shew	CMERS
Cora	Shi	SWIB
Tricia	Sieg	Wisconsin Department of Employee Trust Funds
Gabriel	Simkin	GMJF
Natasha	Singh	SWIB
Ken	Smedema	SWIB
Hannibal	Smith	SWIB
Gabriel	Souza	SWIB
Judith	Stadler	Climate Safe Pensions Wisconsin
Aaron	Stakston	SWIB
Nick	Stanton	SWIB
Evan	Stark	SWIB
Anne	Steinberg	Climate Safe Pensions Wisconsin
Aaron	Stoltenberg	SWIB
Catherine	Su	SWIB
Adam	Sweet	Jacobson & Schmitt Advisors
Steve	Szymanowski	SWIB
Mark	Taylor	SWIB
Joe	Testerman	SWIB
Mike	Thew	SWIB
Leif	Thybony	SWIB
Dawn	Tuescher	SWIB
Aaditya	Vaidya	SWIB
Jim	Vander Meer	SWIB
John	Voelker	WI Department of Employee Trust Funds
Janet	W. Reinke	TruStage
Renee	Walk	WI Department of Employee Trust Funds
Madeline	Warkins	SWIB
Lori	Wersal	WRS Retiree

Amanda	West	SWIB
Amy	Widiger	SWIB
Barrett	Wienczek	SWIB
Lisa	Winer	SWIB
Tim	Wirkus	SWIB
ping	wong	SWIB
Mathew	Xavier Earathu	SWIB
Jeff	Yoder	SWIB
Ivy	Zhang	SWIB
Sarah	Zhao	SWIB
Feng	Zhao	SWIB

Investment Forum Audience Members Attending Day 2

First

Name	Last Name	Organization
Macauly	Addesso	SWIB
William	Backes	Climate Safe Pensions Wisconsin
Nathan	Ballard	SWIB
Eric	Barber	SWIB
Christopher	Benish	SWIB
Henry	Benton	SWIB
Zach	Berghouse	SWIB
Naveen	Bhagam	SWIB
Kevin	Blank	SWIB
Kathy	Blumenfeld	SWIB - DOA
Ava	Boettcher	SWIB
Barb	Bolens	University of Wisconsin-Madison School of Business
Becky	Bormett	SWIB
Patrick	Bourbon	Bourbon Financial
Thomas	Bowes	SWIB
David	Boyne	Michigan Department of Treasury
Brandon	Brickner	SWIB
Adam	Brown	SWIB
Rosa	Brown	SWIB
Michael	Brusberg	SWIB
Eric	Buchholtz	SWIB
Nick	Bultman	SWIB
stefano	cavaglia	SWIB
Sara	Chandler	SWIB
hassan	chehime	SWIB
Bridget	Chen	SWIB
Maggie	Clanfield	SWIB
Jan	Cliff	Johnson Financial Group
Andrew	Crossman	SWIB
John	Culley	SWIB
John	David Stanfield	Action Network and 350 Madison
Paige	Davis	SWIB

tunc	dayioglu	SWIB
Kent	Demien	Johnson Financial Group
Roger	Ding	SWIB
John	Drake	SWIB
Tom	Drake	SWIB
Jack	Drew	SWIB
David	Duchow	US Bank Private Wealth Management
Thomas	Dupont	CMC UW Madison
Shirley	Eckes	ETF
Greg	Edwards	Hawk Center UW Madison School of Business
Randy	Eggert	SWIB
Erin	Escobar	SWIB
Diana	Felsmann	ETF
Anne- Marie	Fink	SWIB
Trevor	Foemmel	SWIB
Jason	Fralish	SWIB
Rhiannon	Friedel	SWIB
Megan	Gall	SWIB
Shannon	Gannon	SWIB
Maximillian	Garcia	SWIB
Ethan	Gegare	UW Foundation
Ben	Gmeinder	BHCCU
Thomas	Gregg	SWIB
Dan	Gyrog	SWIB
Michael	Harmelink	SWIB
Dylan	Hastings	SWIB
Brian	Heimsoth	SWIB
Brian	Hellmer	Mendota Financial
TiaRae	Heminger	SWIB
Hillary	Holstein	SWIB
Beth	Holzberger	SWIB
William	Horns	SWIB
Vince	Janecky	SWIB
Brenden	Johnson	Indiana University
Jack	Julka	SWIB
Salah	Khalaf	SWIB
Rochelle	Klaskin	SWIB
Matthew	Klecker	Public Attendee
Peter	Knotek	Climate Safe Pensions Wisconsin
Jason	Kowalke	SWIB
Dylan	Krivoshein	SWIB
Katie	Kuryla	SWIB
Lisa	Lange	SWIB
James	Laufenberg	SWIB
Sean	Lavin	SWIB
Alex	Li	SWIB

John	Liber	SWIB
Diane	Linn	SWIB
Shan	Lo	SWIB
Anthony	Lubarsky	SWIB
Bill	Luetzow	SWIB
Ed	Martinez	SWIB
Todd	Mattina	SWIB
Frank	Mazzucco	SWIB
Jeremy	McCauley	SWIB
Tom	Merfeld	SWIB
Jason	Mirr	SWIB
Anand	Mohan Rakesh	SWIB
Alyssa	Moore	SWIB
Supreme	Moore Omokunde	SWIB
Jerri	Morales	SWIB
Vadim	Moroz	SWIB
	Muhammad Aun	
Syed	Haider	SWIB
Joy	Mukherjee	SWIB
chad	neumann	SWIB
Chase	Nicholson	SWIB
Sadi	Ozelge	SWIB
Gozde	Ozelge	Bank
Mark	Paloian	SWIB
Scott	Parrish	SWIB
Dan	Perik	SWIB
Brian	Planey	SWIB
Ceferino	Quesada	SWIB
Gregory	Rademacher	Buttonwood Partners
Zhihui	Redlin	SWIB
Robby	Richlen	SWIB
Jay	Risch	SWIB
Tom	Robinson	SWIB
Jason	Rothenberg	SWIB
Andrea	Ruiz	SWIB
Brian	Russell	SWIB
Charles	Saunders	University of Wisconsin
Uwe	Schillhorn	Emerging Markets Investor Alliance
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Jim	Vander Meer	SWIB
John	Voelker	WI Dept of Employee Trust Funds
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Madeline	Warkins	SWIB
Amanda	West	SWIB
Amy	Widiger	SWIB
Barrett	Wiencek	SWIB
Lisa	Winer	SWIB
Tim	Wirkus	SWIB
ping	wong	SWIB
Ivy	Zhang	SWIB
Feng	Zhao	SWIB
Sarah	Zhao	SWIB

DRAFT

Board Meeting

Tab 3 – Investment Forum Recap

Board Meeting

Tab 4 – Fiduciary & Public Records Topics

Board Meeting

Tab 5 – Investment Performance and Market Updates

- A. Board Investment Performance Report, Q2 2024
- B. Callan Quarterly Report



Investment Performance Report

as of June 30, 2024

Executive Summary

June 30, 2024

- The Core Trust Fund returned 1.34% net of all fees and expenses in Q2, resulting in excess performance of +29 bps. For one year, the Core Trust Fund has returned 9.69% net of all fees and expenses, resulting in an excess return of +125 bps.
- The Core Trust Fund five-year net of all fees and expenses return of 7.82% outperforms the Policy Benchmark by +71 bps on an annualized basis.
- The Core Trust Fund net of external manager fee return outperformed the 60/40 Reference Portfolio return by 37.4% (cumulative) over a 20-year period, which equates to an excess value add of \$18.3 billion over the same period.

WRS Performance

as of June 30, 2024

Fund	Net of All Fees and Expenses Return %			
	Calendar – YTD	1 Year	3 Year	5 Year
Core Trust Fund	4.87	9.69	2.80	7.82
Core Trust Fund Benchmark	3.98	8.44	2.12	7.11
Excess	+0.89	+1.25	+0.68	+0.71
Net Excess Value Add (\$M)	+\$1,068.5	+\$1,395.2	+\$2,457.0	+\$4,073.8
Variable Trust Fund	11.69	19.94	5.94	11.62
Variable Trust Fund Benchmark	11.31	19.86	5.99	11.73
Excess	+0.38	+0.08	(0.05)	(0.11)
Net Excess Value Add (\$M)	+\$32.6	+\$5.4	(\$11.0)	(\$42.0)

SWIB's investment management has added more than \$4.0 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 %
	10 Year	15 Year	20 Year	30 Year
Core Trust Fund	6.97	8.78	7.22	8.25
Core Trust Fund Benchmark	6.48	8.23	6.85	7.81
Excess	+0.49	+0.55	+0.37	+0.44
Variable Trust Fund	9.79	12.22	8.80	9.27
Variable Trust Fund Benchmark	9.80	12.12	8.81	9.03
Excess	(0.01)	+0.10	(0.02)	+0.25

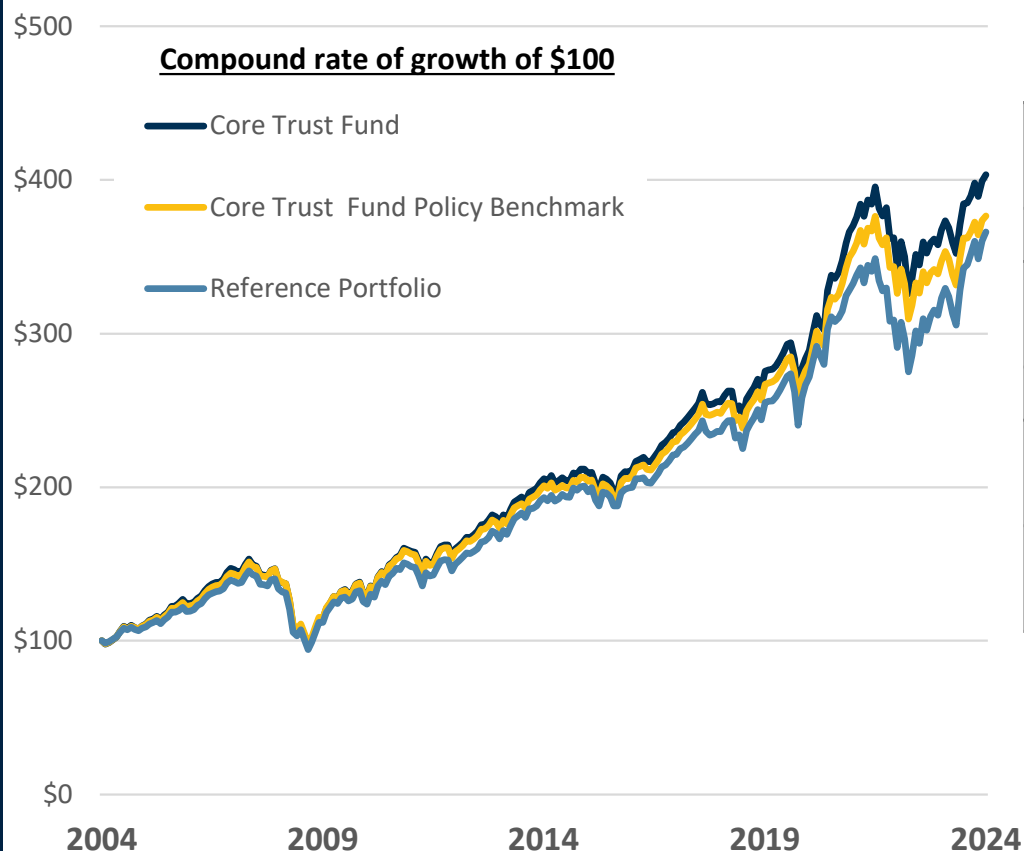
(Annualized Return shown for all periods greater than 1 yr)

Excess returns may contain rounding differences

CTF NOF Performance vs. 60/40 Reference Portfolio

20-year cumulative return¹: July 1, 2004, to June 30, 2024

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



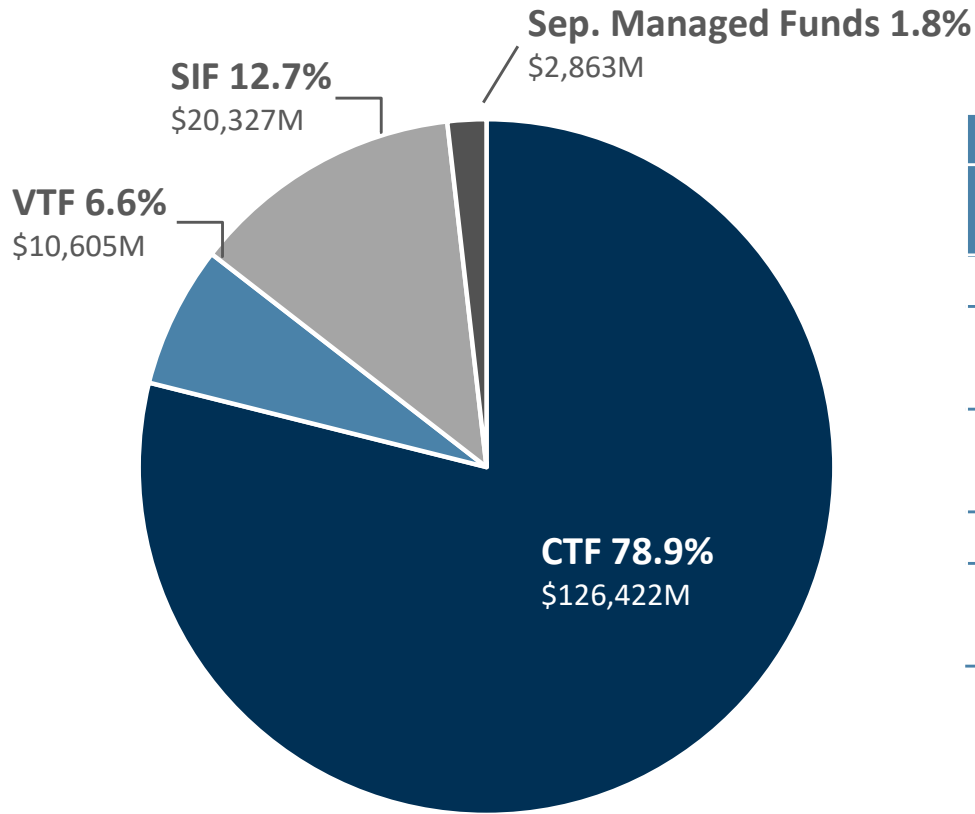
Net of External Manager Fee Return & EVA			
Portfolio / Benchmark	Annualized Return	Cumulative Return	Cumulative \$ Excess Value Added
Reference Portfolio ² (60% equity/40% bonds)	6.7%	266.1%	= Passive Market Return
Benefit of CTF Asset Allocation			
CTF Policy Benchmark	6.9%	276.6%	+\$7.8B
Benefit of CTF Active Management			
CTF Fund	7.2%	303.5%	+\$10.5B
CTF Excess Return vs. Reference Portfolio	+0.5% pts	+37.4% pts	+\$18.3B

¹ Core Trust Fund beginning market value, as of July 1, 2004, was \$59.1B and ending market value, as of June 30, 2024, was \$126.4B

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 June 30, 2024



Gross Market Value of Assets (\$millions)			
By Fund	6/30/2023	6/30/2024	1 Year Change
Total WRS	128,902	137,027	+8,125
Core Trust Fund	119,686	126,422	+6,737
Variable Trust Fund	9,217	10,605	+1,388
State Investment Fund (SIF) ¹	19,718	20,327	+609
Separately Managed Funds	2,699	2,863	+164
Total SWIB AUM	\$151,319	\$160,217	+\$8,898

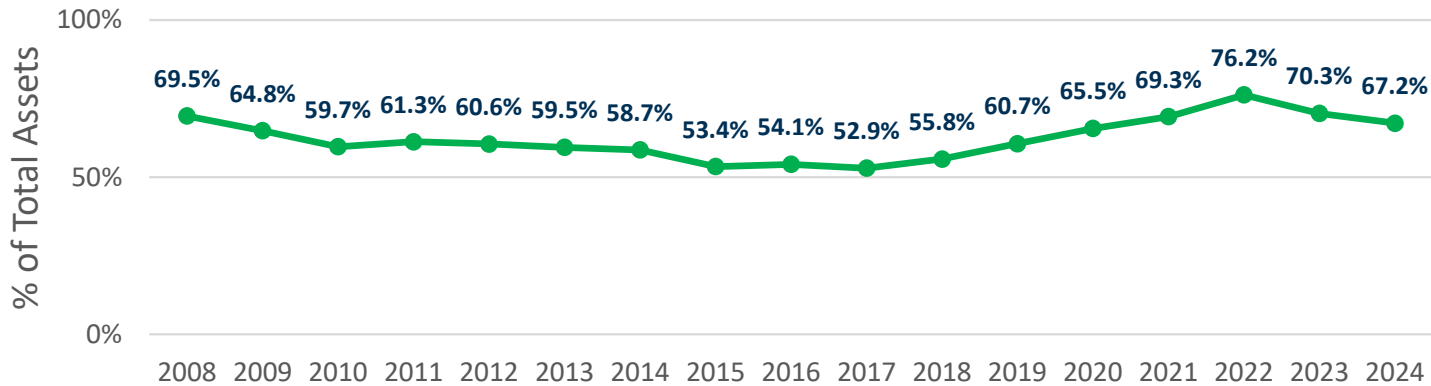
¹ Excludes cash invested in SIF held on behalf of CTF and VTF

Refer to the disclosure section for additional details

WRS Assets as of June 30, 2024

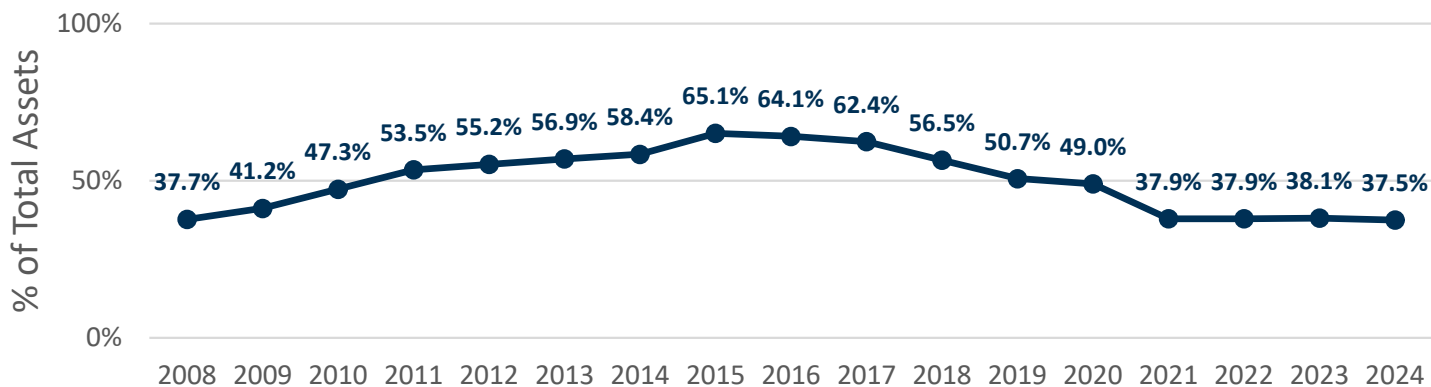
Breakdown of Active vs. Passive and Internal vs. External

Actively Managed Assets



Actively managed assets are a larger share of WRS AUM

Internally Managed Assets



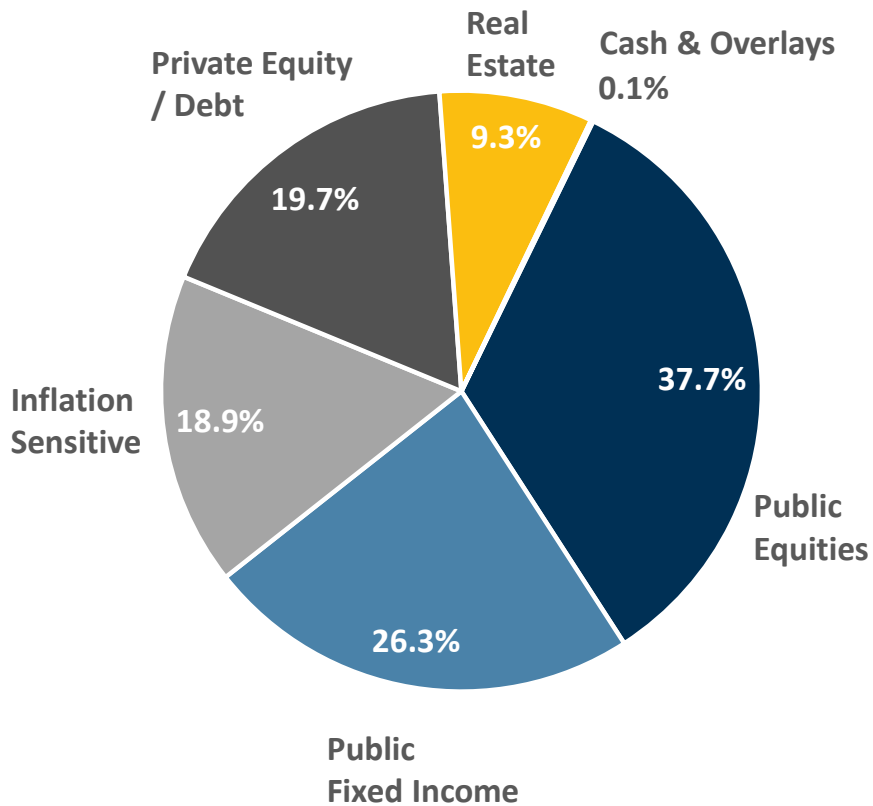
45% of Total SWIB Assets (including SIF) are internally managed

Refer to the disclosure section for additional details

Core Trust Fund Assets Under Management

Breakdown by Asset Class as of June 30, 2024

**Total Exposure - % of Total
6/30/2024**



Total Exposure \$ & Adjusted AUM (\$millions)			
Total CTF by Asset Class	Total Exposure \$ 6/30/2023	Total Exposure \$ 6/30/2024	Year over Year Change
Public Equities	52,469	47,632	-4,837
Public Fixed Income	28,874	33,258	+4,384
Inflation Sensitive	22,361	23,854	+1,493
Real Estate	12,018	11,710	-308
Private Equity / Debt	22,211	24,923	+2,712
Cash & Overlays	(612)	166	+778
Total Exposure	\$137,321	\$141,543	+4,222
<i>Less: Policy Leverage</i>	<i>17,635</i>	<i>15,097</i>	<i>+2,538</i>
Total CTF AUM	\$119,686	\$126,446	+6,760

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", below.

Core Trust Fund Allocation

All exposures shown as of June 30, 2024

Allocation – Exposure View

Strategies	(\$ millions)	As % of Total Fund		Target Range %	Notes
	Total Exposure	Portfolio Exposure %	Benchmark Target %		
Public Equities	47,632	37.67	37.66	31.66– 43.66	Public & Private exposures include cash Strategies include exposure management investments Cash / Overlays: Includes liquidity, overlay cash, cash used to fund synthetic beta related to Alpha Pool. Benchmark Target weights are adjusted monthly to reflect the actual exposure to Private Equity/Debt and Real Estate. Offsetting adjustments are made to Public Equities and Public Fixed Income. Additional CTF leverage details available in disclosure section
Global Developed	38,733	30.63	30.57		
US Small Cap	2,619	2.07	2.09		
International Small Cap	2,458	1.94	1.95		
Emerging Markets	3,821	3.02	3.05		
Public Fixed Income	33,258	26.30	26.37	20.37 – 32.37	
Investment Grade	20,075	15.88	15.82		
Non-Investment Grade	9,945	7.86	7.91		
Emerging Market Debt	3,238	2.56	2.64		
Inflation Sensitive	23,854	18.87	19.00	14.0 – 24.0	
Real Estate	11,710	9.26	9.26	5.26 – 13.26	
Private Equity / Debt	24,923	19.71	19.71	10.0 – 26.0	
Cash / Overlays	166	0.13	0.00		
Leverage	(15,097)	(11.94)	(12.00)	(20.0) to (4.0)	
Total Fund – Total Exposure	\$141,543	111.94	112.00	104.0 – 120.0	
Total Fund – Market Value	\$126,446	100.00	100.00		

Asset \$ exposures and % weights may contain rounding differences

Core Trust Fund: Asset Class Returns

as of June 30, 2024

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	\$47,207	11.21	19.35	5.50	10.96	8.71
Benchmark			10.59	19.15	5.58	11.20	8.89
Excess			+0.62	+0.19	(0.09)	(0.24)	(0.18)
Global Developed	2/28/2017	\$36,772	12.21	20.89	6.98	11.84	11.34
Benchmark			12.01	20.73	7.35	12.30	11.67
Excess			+0.20	+0.17	(0.37)	(0.46)	(0.33)
Global Equities w/EM	5/31/2021	\$1,723	15.06	22.22	7.16		7.80
Benchmark			11.54	19.86	5.87		6.17
Excess			+3.52	+2.36	+1.29		+1.63
US Small Cap	2/28/2017	\$2,619	4.97	12.00	0.13	8.75	8.36
Benchmark			2.03	10.50	(1.31)	7.77	7.47
Excess			+2.94	+1.50	+1.44	+0.98	+0.89
International Small Cap	1/31/2020	\$2,447	5.53	10.25	(1.49)		4.36
Benchmark			2.98	11.60	(1.83)		4.20
Excess			+2.55	(1.35)	+0.34		+0.16
Emerging Market ex China	3/31/2022	\$3,112	8.46	17.37			3.49
Benchmark			8.47	18.57			3.96
Excess			(0.01)	(1.20)			(0.47)
Emerging Market China	3/31/2022	\$496	5.31	0.07			(8.11)
Benchmark			4.68	(1.71)			(7.23)
Excess			+0.63	1.78			(0.88)

Core Trust Fund: Asset Class Returns

as of June 30, 2024

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	\$33,481	1.05	6.06	(1.70)	1.12	2.01
Benchmark			0.25	4.95	(1.69)	0.87	1.84
Excess			+0.80	+1.11	(0.01)	+0.26	+0.17
Investment Grade US Credit	2/28/2022	\$7,922	0.05	5.54			(1.48)
Benchmark			(0.46)	4.42			(1.69)
Excess			+0.51	+1.12			+0.21
US Treasuries	2/28/2022	\$8,199	(0.91)	1.46			(3.46)
Benchmark			(0.86)	1.55			(3.22)
Excess			(0.05)	(0.09)			(0.24)
US Long Treasuries	9/30/2022	\$1,042	(4.73)	(5.13)			(1.36)
Benchmark			(5.01)	(5.61)			(1.54)
Excess			+0.28	+0.48			+0.18
MBS	4/30/2020	\$2,646	0.91	5.12	(2.31)		(1.51)
Benchmark			(0.98)	2.12	(2.92)		(2.20)
Excess			+1.89	+3.00	+0.61		+0.69

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

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

Core Trust Fund: Asset Class Returns

as of June 30, 2024

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	\$6,629	3.02	10.81	(0.22)		3.22
Benchmark			2.55	10.13	1.67		3.67
Excess			+0.47	+0.68	(1.89)		(0.45)
Leveraged Loans	3/31/2023	\$3,316	4.73	11.85			12.02
Benchmark			4.10	10.78			11.42
Excess			+0.63	+1.07			+0.60
Emerging Market Debt - USD	6/30/2005	\$1,629	3.05	10.10	(1.94)	0.36	2.73
Benchmark			2.34	9.23	(2.60)	(0.03)	2.60
Excess			+0.71	+0.87	+0.66	+0.39	+0.13
Emerging Market Debt - Local	7/31/2017	\$1,603	(3.69)	0.00	(3.04)	(1.22)	(0.56)
Benchmark			(3.71)	0.67	(3.27)	(1.29)	(0.33)
Excess			+0.02	(0.67)	+0.23	+0.07	(0.23)
Inflation Sensitive	12/31/2003	\$23,851	0.72	2.72	(1.27)	2.16	1.50
Benchmark			0.70	2.71	(1.33)	2.07	1.43
Excess			+0.02	+0.02	+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 disclosure section for additional details

Core Trust Fund: Asset Class Returns

as of June 30, 2024

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	\$11,710	(3.48)	(6.12)	5.19	4.80	7.54
Benchmark			(7.45)	(12.00)	2.47	2.56	5.77
Excess			+3.97	+5.88	+2.72	+2.24	+1.77
Private Equity / Debt	11/30/2006	\$24,923	4.05	7.34	10.83	15.24	13.60
Benchmark			3.88	6.82	8.93	12.83	11.30
Excess			+0.17	+0.52	+1.90	+2.41	+2.30
<i>Other strategies:</i>							
Alpha Pool Overlay	1/31/2011	\$12,594	1.69	3.63	2.43	4.04	2.51
Benchmark (set to zero as of 1/1/2019)		(at 1/1/22 = \$6,336)	0.00	0.00	0.00	0.00	0.70
Excess			+1.69	+3.63	+2.43	+4.04	+1.81

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

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

Core Trust Fund: Asset Class Returns

Net of External Mgr Fee - Excess Returns as of June 30, 2024



Excess Return - % points

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

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

Core Trust Fund: Alpha Pool Overlay

as of June 30, 2024

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	\$12,594	1.69	3.63	2.43	4.04	2.51

- 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 Net Return %	1 Year Net Return %
Hedge Funds	1/31/2011	\$8,734 (69%)	3.31	5.95
Multi Strat	2/1/2022	\$2,520 (20%)	4.11	3.95
Global Equity	4/1/2023	\$802 (6%)	3.21	2.04

Alpha Pool Overlay Return (Alpha Pool + Beta Return)	Calendar YTD	1 Year	3 Year	5 Year	10 Year
CTF Policy Benchmark (Beta)	3.98	8.44	2.12	7.11	6.48
Alpha Pool Overlay Return (Alpha Pool + Beta)	5.67	12.07	4.55	11.15	8.99

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

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

Variable Trust Fund

as of June 30, 2024

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	\$10,605	11.72	20.01	6.00	11.68	9.79
Variable Trust Fund Benchmark			11.31	19.86	5.99	11.73	9.80
Excess			+0.41	+0.15	+0.01	(0.05)	(0.01)

(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	10,660	100.51	100.00	
US Equities	7,473	70.47	70.00	65.0 – 75.0%
International Equities	3,186	30.04	30.00	25.0 – 35.0%
Cash & Overlays	(55)	(0.51)	0.00	
Total Fund	\$10,605	100.00	100.00	

- *Asset class exposures are within the Target Range*

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

Separately Managed Funds

as of June 30, 2024

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	\$22,953	2.71	5.50	3.15	2.19	1.55
SIF Benchmark			2.65	5.36	3.12	2.13	1.51
Excess			+0.06	+0.14	+0.04	+0.07	+0.04
State Life Insurance Fund	10/31/1994	\$95	(2.80)	0.27	(5.39)	(0.75)	1.95
No Benchmark							
Historical Society Endowment Fund	12/31/1993	\$27	10.53	18.67	5.64	11.19	9.88
Historical Society Endowment Benchmark			9.96	17.88	5.48	10.75	9.62
Excess			+0.56	+0.80	+0.16	+0.44	+0.26
Injured Patients & Families Comp. Fund	10/31/1993	\$1,467	1.45	5.95	(1.27)	2.44	3.47
IP&FC Benchmark			1.27	5.46	(1.37)	2.01	3.02
Excess			+0.18	+0.49	+0.10	+0.43	+0.45
UW System Long Term Fund	3/31/2018	\$578	5.84	10.71	2.57	7.35	7.16
UW System Benchmark			5.76	10.60	2.48	7.18	6.96
Excess			+0.09	+0.11	+0.10	+0.17	+0.20
UW Cash Management Fund	4/30/2022	\$696	2.73	7.73			4.14
UW Cash Management Benchmark			2.72	7.79			4.20
Excess			+0.01	(0.07)			(0.06)

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

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

Leverage Performance

As of June 30, 2024

CTF Policy Leverage Performance

as of June 30, 2024

Core Trust Fund	Net of External Manager Fee Return %			
	Calendar YTD	1 Year	3 Year	5 Year
Unlevered Returns (as estimated):				
Portfolio ¹	4.79	9.53	3.19	7.55
CTF Benchmark Return ¹	3.85	8.15	2.40	6.73
Excess Return	+0.94	+1.38	+0.79	+0.82
<hr/>				
Portfolio Return (Unlevered)	4.79	9.53	3.19	7.55
Absolute Return from Leverage ^{1,2}	0.13	0.29	(0.28)	0.38
Implementation (+) or (-)	(0.00)	(0.01)	(0.00)	0.00
<hr/>				
Levered Returns (as reported):				
Portfolio	4.92	9.81	2.91	7.93
CTF Benchmark	3.98	8.44	2.12	7.11
Excess	+0.94	+1.37	+0.79	+0.82

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

Leverage notes:

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

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

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

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

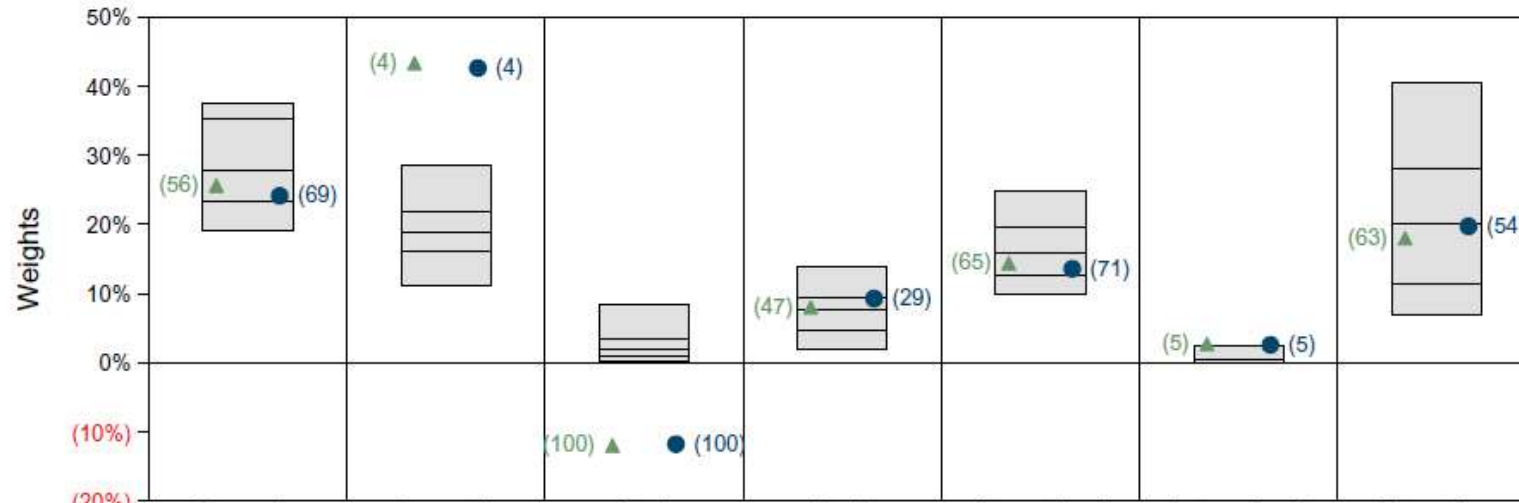
Callan Quarterly Report Summary

2nd Quarter 2024

Callan Peer Rank Update

CTF Asset Allocation Comparison to Peer Group (6.30.2024)

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



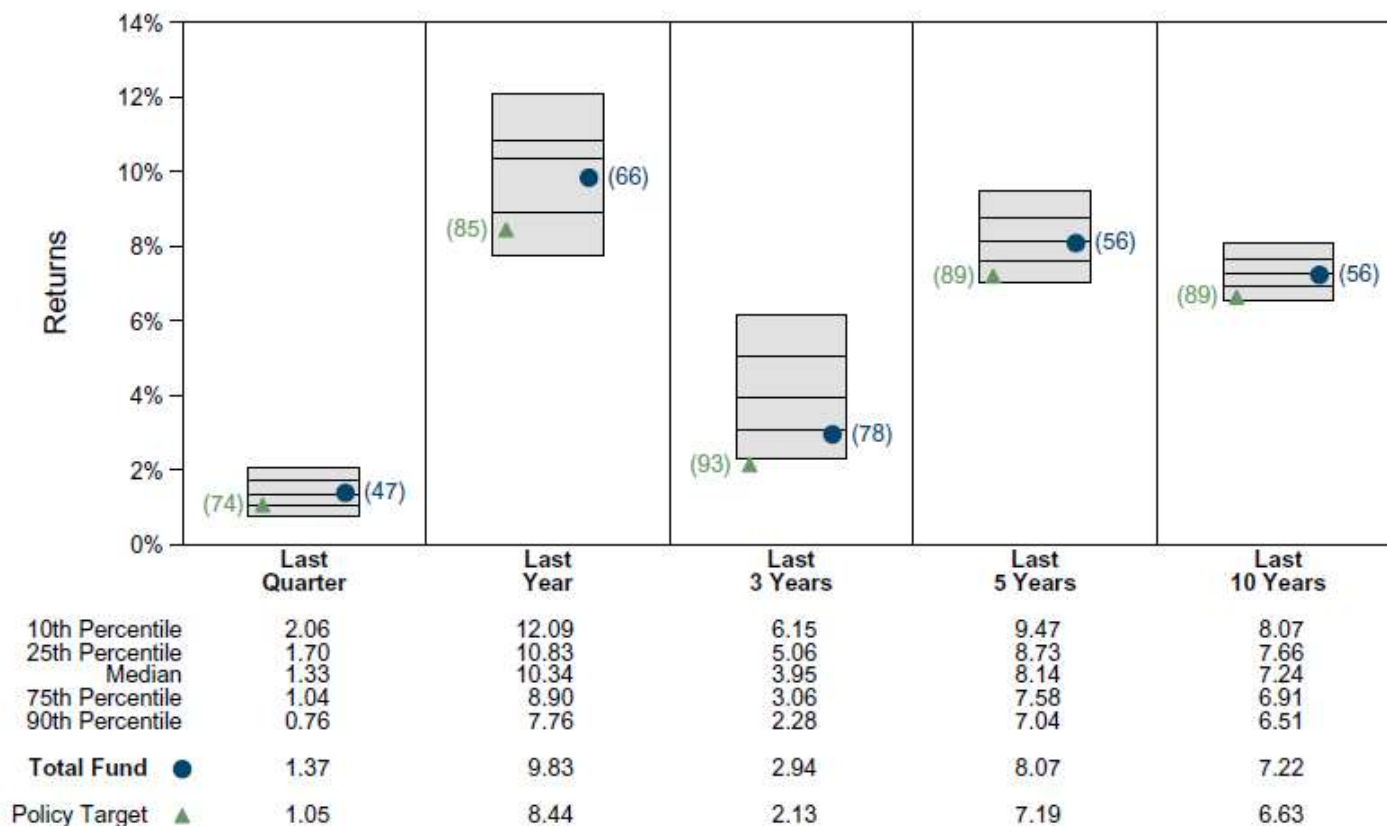
	Domestic Equity	Domestic Fixed	Cash Equivalent	Real Estate	International Equity	International Fixed	Alternatives
10th Percentile	37.62	28.52	8.32	13.77	24.87	2.37	40.37
25th Percentile	35.15	21.74	3.31	9.48	19.68	0.41	28.11
Median	27.75	18.79	1.85	7.68	15.79	0.03	20.14
75th Percentile	23.27	16.22	0.97	4.73	12.63	0.00	11.49
90th Percentile	19.20	11.24	0.26	1.86	9.80	0.00	6.94
Fund ●	24.11	42.61	(11.81)	9.26	13.56	2.56	19.71
Target ▲	25.62	43.30	(12.00)	8.00	14.38	2.70	18.00
% Group Invested	97.22%	97.22%	91.67%	94.44%	97.22%	58.33%	94.44%

- SWIB's use of financial leverage (> 10%) enables more risk reducing/diversifying assets without sacrificing growth assets

Callan Peer Rank Update

CTF Performance vs. Peer Group (Gross Return, 6.30.2024)

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

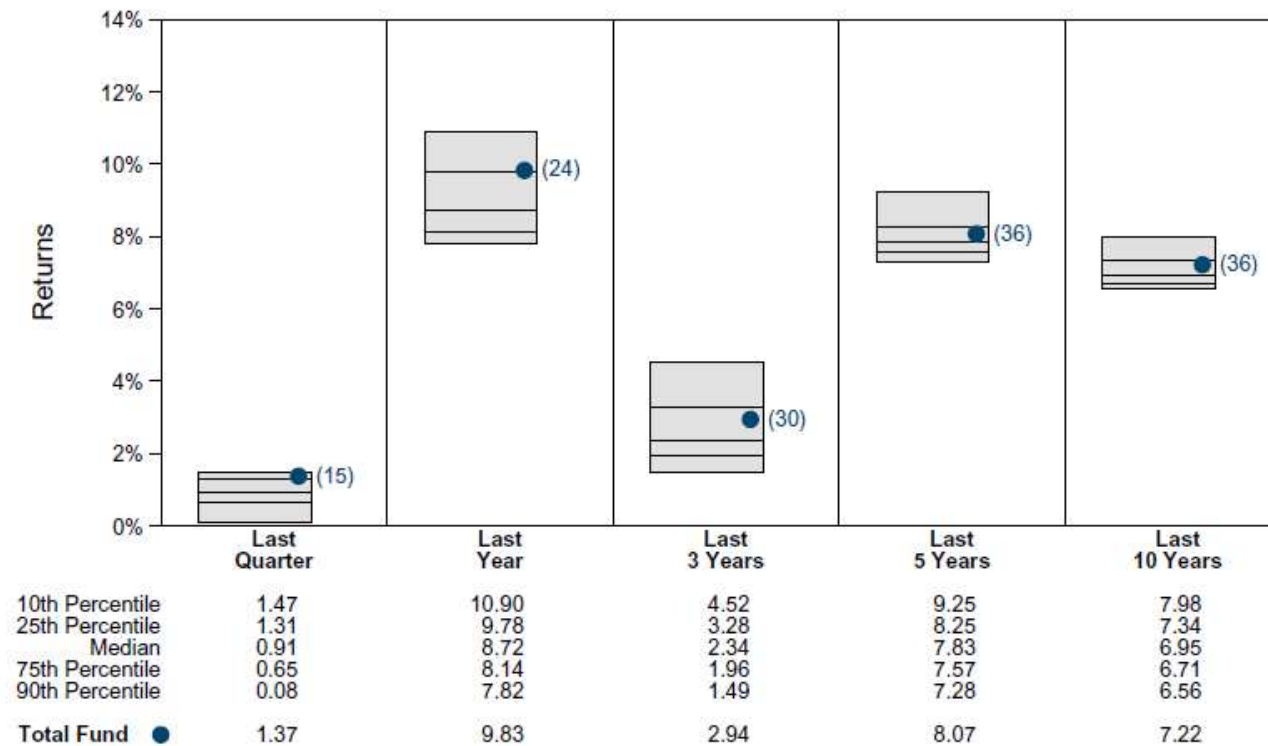


- CTF return exceeds Policy Target over all periods
- Return is below median for the 1- and 3-year periods and longer term 5- and 10-year periods are near the median

Callan Peer Rank Update

*CTF Performance on Asset Allocation Adjusted Basis vs. Peer Group
(Gross Return, 6.30.2024)*

Asset Allocation Adjusted Ranking

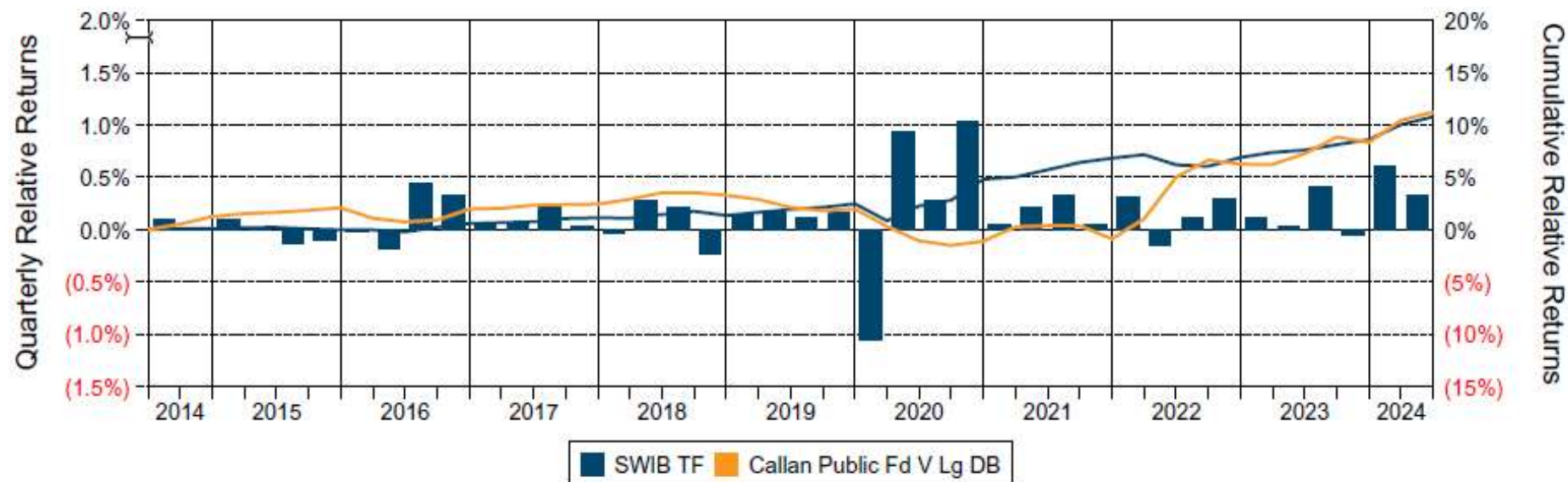


- Uses adjustment to peer universe to match the CTF risk-balanced allocation
- Achieved 1st quartile results last quarter and for 1-year period; 2nd quartile ranking over 3-, 5-, and 10-year periods

Callan Peer Rank Update

10 Year Return Consistency vs. > \$10B Peer Group (6.30.2024)

Cumulative and Quarterly Relative Returns vs Target



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

Report Disclosures

Glossary, Definitions & Data Sources

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Gross of Fee Return (“GoF Return”)	The return 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. For certain externally managed funds, gross return may include management fees and carried interest. GoF Return is used by SWIB for long-term history (> 20 years), internal analytics and to fulfill consultant data submissions where GoF returns are requested. SWIB’s primary reported return types are Net of External Manager Fee (“NoF Return”) and Net of All Fees and Expenses Return (“NoA Return”).
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 (measurement may be calculated using any return type). 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 NoA 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.
Net of External Manager Fee Excess Value Add \$	A fund’s Excess Value Add \$ may be calculated using NoF returns. The CTF Fund long-term performance comparisons vs. the 60/40 Reference Portfolio and Policy Benchmark are measured over 20-year time intervals. NoF return historical records date back to 1998.
SWIB Inception To Date Reporting	The Quarterly Performance Summary discloses a reporting period described as 10 years or ITD . The return disclosed in this reporting field yields either 10-year annualized returns for funds or portfolios with at least 10 years of return history or the data field may revert to the return since inception for portfolios with less than 10 years of history. The quarterly report provides a performance start date for those portfolios with the abbreviated return history.
Performance Start Date	The date denotes the initial period of a portfolio or composites’ return data series that is stored and calculated by the SWIB Performance Measurement Service Agent.
Time-weighted Rate of Return	A method of calculating period-by-period returns that reflects the change in value and negates the effects of external cash flows. This methodology is applied to portfolios that are processed with daily frequency and where daily valuation updates of the underlying instruments are available.
Modified Dietz Total Rate of Return	A measurement that evaluates a portfolio's return based on a weighted calculation of its cash flow. The method considers the timing of cash flows and assumes a constant rate of return over the specified time period. This methodology is applied to portfolios and composites that are processed with monthly frequency (and where only monthly valuation updates are available).

Report Disclosures

Key Terms and Portfolio Return Information

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

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Custom Weighted 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.
Internally Managed Portfolios	Portfolios managed by SWIB investment professionals. Each internal portfolio is assigned compulsory investment guidelines and is also assigned "soft risk parameters." Soft risk parameters refer to desired characteristics and/or risk exposures.
Externally Managed Portfolios	Portfolios managed by third-party investment managers hired by SWIB. External active and passive managers operate under contractual investment guidelines approved by SWIB's Investment Committee or by SWIB's investment management staff, as designated in the Investment Committee Charter.
Active Management	Actively managed portfolios have the objective of out-performing their respective benchmarks (or generating alpha) by using investment insights or quantitative tools to deploy buy, hold, and sell decisions. This style of management will result in portfolio positioning decisions that will add active risk and generate higher tracking error. Actively managed portfolios are governed through investment guidelines and soft risk parameters.
Passive Management	Passively managed portfolios have the objective of closely tracking the returns and risk of their respective benchmarks. This style of management usually involves mirroring the benchmark security holdings (or constituents) to closely replicate the benchmark risk and return.

Report Disclosures

Key Terms and Portfolio Return Information

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

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
<p>(continued)</p> <p>Note on report data sources and processing</p>	<p><u>Project Centum Platform Migration Changes</u></p> <p>On 1/1/2024, the BNYM ABOR RAM processing platform became the primary source for Core and Variable Trust Fund return calculations and market value amounts contained in this report. The State Investment Fund (SIF) and the SWIB-managed Separately Managed Funds continues to be processed using the BNYM IBOR market value and return calculation source.</p> <p>This report contains return calculations that are processed using Total Exposed (Notional-based) Assets for accounts with substantial derivative positions that generate leverage for the Core Trust Fund. The objective of this calculation is to generate meaningful returns that compare to the account or composite’s benchmark. This processing continues to be performed on the BNYM IBOR platform and applies to following composites:</p> <ul style="list-style-type: none"> CTF – Public Equities (pg. 9) CTF – Global Developed (pg. 9) CTF – Public Fixed Income (pg. 10) CTF – US Treasuries (pg. 10) CTF – Inflation Sensitive (pg. 11)

Leverage Disclosures

Calculation formulas to estimate impact

Report Disclosures

Notes on CTF Leverage Analysis

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

Report Disclosures

Notes on CTF Leverage Analysis

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

Board Meeting

Tab 6 – Committee Open Session Business

- A. Amendments to WRS Investment Committee Investment Guidelines
- B. Approved Open Session Investment Committee Meeting Minutes of May 28, June 25, and July 23, 2024
- C. Final Open Session Investment Committee Agenda for August 27, 2024 and Draft Open Session Agendas for September 24 and October 22, 2024
- D. Draft Open Session Minutes of May 14, 2024 Enterprise Risk and Compliance Committee meeting

SWIB Investment Committee
WISCONSIN RETIREMENT SYSTEM
INVESTMENT GUIDELINES

Revised as of

~~March 21~~ June 25, 2024

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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.

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

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.

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."
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.

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

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 Portfolio

The Small Cap 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 Depositary Receipts (ADRs), American Depositary Shares (ADSs), convertible bonds, securities issued in initial public offerings, and when-issued securities. The Small Cap Portfolio may also be invested in equity securities that are publicly traded on stock exchanges in other developed countries, or that are issued through private placements.

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

1. No more than 5% (long or short) of outstanding shares of any single issuer, excluding shares held in commingled funds and ETFs, may be held.
2. No single issuer's equity securities may represent (long or short) more than 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 are excluded from this guideline.
3. Up to 10% of the portfolio's market value may be invested in international and emerging markets companies through common stocks, ADRs, ADSs, or country-specific ETFs.
4. The portfolio may use exchange-traded futures contracts or ETFs to equitize cash and receivables.
5. 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 the portfolio may not exceed 50% of 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 3 above, securities must be issued by an entity (a) that is incorporated in the United States or (b) incorporated outside the United States if (1) the company's headquarters are located in the U.S. or (2) 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 long or short puts and calls is limited to 5% of the market value of the portfolio.
9. Gross exposure for the portfolio shall not exceed 205% of the portfolio's market value, and net exposure for the portfolio shall not exceed 105% of the portfolio's market value, in each case unless approved by the 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:

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

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. 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~~ Derivatives use ~~eligible derivative instruments to manage the~~ permitted as allowed by the Derivatives Use Policy for the purposes of credit, duration, yield curve exposure, ~~currency, interest rate, equity, and market exposure of the~~ portfolio. Eligible and volatility management. Derivatives use is permitted through the use of (a) exchange-traded and over-the-counter interest rate instruments, including forwards, futures and options, (b) interest rate swaps and swaptions, (c) total return swaps (TRS) with index or underlying basket of permitted instruments, (d) options on permitted ETFs and indices, (e) other volatility derivatives include (including options), (f) credit index swaps (e.g., CDX) and single-name CDS; ~~(ii) futures, including options on these instruments, forwards and swaps~~ (g) options on equity securities, indices, and interest rates; ~~(iii) options on securities, including equity securities~~ ETFs for purposes of tail hedging.
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 2.5% 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 2.5% 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. 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 portfolios option adjusted duration should be +/- 1 year of the benchmark duration.

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~~ The head of ARA may approve strategies and/or investment ideas in the portfolios up to an ex-ante contribution to overall Core Fund active risk of 0.20% (excluding investments in PMFA overage portfolios), as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If, at the time of investment, the portfolios' ex-ante contribution to active risk exceeds 0.20%, then the strategy and/or investment idea ~~expressed in the portfolios shall~~ must be approved by ~~any three of the ED/CIO and the heads of ARA, GPMS and PMFA.~~ Portfolio implementation, oversight and reporting to the Investment Committee 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~~ [the Derivatives Use Policy](#) 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 [forwards](#), [futures](#), and options, (b) interest rate swaps and swaptions, (c) total return swaps (TRS) [with index or underlying basket of permitted instruments](#), ~~and~~ (d) [options on permitted ETFs and indices](#), and (e) 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. **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 [as allowed by the Derivatives Use Policy](#) for the purposes of duration, interest rate, yield curve, mortgage [and structured products](#) credit, [prepayment](#) and volatility management. Derivatives use is permitted through the use of (a) exchange-traded interest rate instruments, including [forwards](#), futures and options, (b) interest rate swaps and swaptions, (c) total return swaps (TRS) [with index or underlying basket of permitted instruments](#), (d) ~~MBS options~~ [options on permitted ETFs and indices](#), (e) other volatility derivatives (including options), ~~and~~ (f) [MBS options](#), (g) credit index swaps (e.g., CMBX, CDX [and similar instruments](#)) [and options](#), and (h) [options on equity indices and ETFs for purposes of tail hedging](#).

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 forgoing, 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~~

11. Derivatives use ~~eligible derivative instruments to manage the~~ is permitted as allowed by the Derivatives Use Policy for the purposes of duration, yield curve exposure, ~~currency, interest rate, and market exposure of the portfolio. Eligible derivatives include~~ and volatility management. Derivatives use is permitted through the use of (ia) ~~CDS (as described in more detail under Guideline #3 above);~~ (ii) ~~futures contracts on securities, indices, exchange-traded~~ and over-the-counter interest rates; (iii) ~~forward contracts for securities, indices, rate instruments, including forwards, futures and options,~~ (b) interest rates; rate swaps and swaptions, (iv) ~~swap contracts for securities, indices, and interest rates;~~ (v) total return swaps (TRS) with index or underlying basket of permitted instruments, (d) options on permitted ETFs and indices, (e) other volatility derivatives (including options), (f) credit index swaps (e.g., CDX) and single-name CDS, including options on ~~high yield~~ these instruments, and ~~equity ETFs (as described in more detail under Guideline #3 above); and~~ (vi) (g) options on ~~the underlying~~ equity of a leveraged issuer ~~securities, indices and ETFs for purposes of tail hedging.~~

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. 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.~~ Derivatives use is permitted as allowed by the Derivatives Use Policy for the purposes of duration, yield curve exposure, and volatility management. Derivatives use is permitted through the use of (a) exchange-traded and over-the-counter interest rate instruments, including forwards, futures and options, (b) interest rate swaps and swaptions, (c) total return swaps (TRS) with index or underlying basket of permitted instruments, (d) options on permitted ETFs and indices, (e) other volatility derivatives (including options), (f) credit index swaps (e.g., CDX) and single-name CDS, including options on these instruments and (g) options on equity securities, indices and ETFs for purposes of tail hedging.
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. 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 maturity of 90 days and percentage of the portfolio in unrated CP cannot exceed 15%)	Unrated
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. 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 (which includes co-investments) plus unfunded commitments. "Allocations" are calculated as the current net asset value of any existing investment(s) plus the intended subscription.

9. 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. 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 debt 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. Instruments can be fixed or floating rate. 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 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 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, 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. 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, strategic partnerships, or 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
• Venture Capital Funds	Up to \$65 million	More than \$65 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 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%
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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 co-investments 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. Co-investments in the Venture Capital Portfolio may not make up more than 15% of the Venture Capital Portfolio’s exposure.
6. Neither the aggregate exposure 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 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. 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.

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

	Head of PMFA	ED/CIO
• Funds or Strategic Partnerships	\$250 million or less	Over \$250 million
• Co-Investments	\$75 million or less	Over \$75 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. The Private Equity 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 2% of the Private Equity 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, 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. 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	\$250 million or less	Over \$250 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, 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 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. 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 debt instruments and in instruments with both current pay and equity features.

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

	Head of PMFA	ED/CIO
• Funds or Strategic Partnerships	\$250 million or less	Over \$250 million
• Co-Investments	\$75 million or less	Over \$75 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%
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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 25% of the Current Return 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. The Current Return Portfolio may make co-investments in public company securities through private placements or other offerings. Co-investments in public company securities shall not exceed 2% of the Current Return 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.
6. Other guideline limitations notwithstanding, 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.

T. 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. 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 most investments will be in limited liability vehicles. SWIB may 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-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.~~ *Relative Value* – strategies that seek to take advantage of price differentials by buying and selling different yet related securities. Relative value strategies include, but are not limited to, fixed income arbitrage, insurance linked, quantitative strategies, merger arbitrage, convertible arbitrage, and volatility-related investments.
- b. *Credit* - long/short and event driven investment strategies to various fixed-income instruments including bank loans, corporate, government bonds, distressed debt, and securitized credit.
- c. ~~*Equity Long-/Short Equity*~~ – long and short investments in publicly traded stocks and related securities either on a discretionary or systematic basis.
- d. ~~*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. ~~*Multi-Strategy*~~ – 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. – funds seek to maximize risk-adjusted returns by investing in a variety of underlying investment strategies.

They often employ flexibility in terms of capital, aiming to allocate dynamically to the best opportunities and shifting resources to where they are most needed.

f. Specialty Finance - broad collection of lending strategies which typically have private, customized structures with a front ended cash flow profile at the portfolio level, short duration, and asset backed collateral.

g. Special Opportunity Investments & Coinvests– 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-investments, or external manager “best ideas” opportunities.

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 Credit	15 <u>10</u> %	30%
<u>Equity</u> Long-/Short- Equity	20%	30%
Tactical Trading	20 <u>10</u> %	40 <u>30</u> %
Multi- S strategy	20 <u>25</u> %	40 <u>50</u> %
<u>Specialty Finance</u>	<u>10</u> %	<u>15</u> %
Special Opportunity Investments	<u>5</u> %	20 <u>15</u> %
	100%	

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

	Head of PMFA	ED/CIO
• Core	Up to \$300 million aggregated	More than \$300 million
• Special Opp/ Co-invest	Up to \$75 million aggregated	More than \$75 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%	

4. 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.
5. Other guideline limitations notwithstanding, 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.
6. All redemptions, terminations or reductions of capital will be at the discretion of the Funds Alpha Manager and the head of PMFA.

U. Beta One Portfolio

The Beta One Portfolio is comprised primarily of direct investments in strategies of external managers that are intended to generate both (1) the total return (or beta of one) of a SWIB policy benchmark and (2) an excess return (or alpha) over the benchmark through active security selection. Tracking error measures divergence around the given benchmark. In comparison, SWIB's external hedge fund portfolio 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.

1. Investments in Beta One External Managers will be comprised of the following investment vehicles:
 - a. *Separately Managed Accounts ("SMAs")*: in which external managers direct positioning but the assets reside at SWIB's custodial bank.
 - b. *Commingled Investments or Fund Investments*: in which SWIB has a percentage ownership in limited liability partnerships or other structures alongside 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 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 portfolios across the credit quality spectrum, across geographies, including emerging and frontier market debt, across structures (e.g., asset-backed securities, corporate debentures, etc.) Individual manager guidelines may allow shorting of cash bonds. Derivatives may be used (long or short) for both hedging and 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
Beta One Fixed Income	Up to \$1.8 billion	More than \$1.8 billion
Beta One Equity	Up to \$1 billion	More than \$1 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 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 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 will make the changes as recommended by the head of Risk Management.

V. Private Markets and Funds Alpha Overage Portfolios

Portfolios may be established at the asset class level for private equity, co-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 PMFA strategy 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 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 strategy head, and a majority of~~ the ED/CIO and with the ~~heads of ARA and GPMS.~~ Any recommendation of the head of PMFA. The ARA Division is responsible for reporting on 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 management staff.

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

Small Cap	100 Long
Global Equity Portfolio	15 Long/short equity ideas

Ex Ante Tracking Error

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	1.75% - 5.25%
Global Equity Portfolio	4%-12%

Maximum EM Active Risk Exposure Global Equity Portfolio Emerging Markets Tracking Error Contribution of 20%

Small Cap Emerging Markets Tracking Error Contribution of 20%

Maximum Convertible Bond Issues Global Equity Portfolio 0

Small Cap 0

Maximum Private Placements Small Cap 0

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 Small Cap +/- 15% of portfolio value

Maximum Company Ownership (Excluding ETFs) (L/S) Small Cap 3% of outstanding

Top Ten Holdings (L/S) Small Cap 20% of portfolio

P/E Ratio Small Cap 50%-150% of Benchmark

Maximum Sector Exposure Small Cap Benchmark weight \pm 10%

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
	IG Credit	Greater of 10% or 3 x Benchmark
Maximum Corporate Industry Sector Exposure	IG Credit	Greater of 10% or 3 x Benchmark
Ex Ante Tracking Error	IG Credit	1.5%
	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		
Ex-Ante Spread Beta	Multi-Strat	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 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
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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
	Venture Capital	5% of Current Return Portfolio for Current Return Co-Investments 5% of Venture Capital Portfolio for Venture Capital Co-Investments
Maximum Venture Capital Exposure	Venture Capital	25% of sum of Private Equity, Current Return, Private Debt and Venture Capital
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%
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 Equity	0.8% to 2.0%
	Beta One Fixed Income	0.8% to 2.0%

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.

Equity Delta to the S&P 500 Range	Hedge Fund	-0.3 to +0.3 (target of zero) over a market cycle measured ex ante with a trailing two-year risk sampling period
Target Beta Range	Beta One Equity	0.8 to 1.2 (target of 1.0) (CTF + VTF)
	Beta One Fixed Income	0.8 to 1.2 (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% (CTF+VTF)

APPENDIX 3 – CTF AND VTF BENCHMARKS
State of Wisconsin Investment Board
Target State Benchmarks 2024¹

Core Trust Fund Benchmark²		
	Current Benchmark	
Public Equity	40% MSCI ACWI Investable Market Index (IMI) with a 50% weight to the China large cap	<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	27% Fixed Blend of Eight Components ³	
Inflation Sensitive	19% Bloomberg U.S. Treasury Inflation-Linked Bond Index	
Private Equity/Debt	18% Roll-Up of Five Components ⁴	
Real Estate	8% NCREIF Open End Diversified Core Equity (ODCE)	
Cash	(-12%) Bloomberg Short Term Bank Yield Index (BSBY) + 30bps	
Total	100%	

Variable Trust 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 2024 Asset Allocation implementation plan forecasted for 12/31/2024.

² The major asset class weights are established through the annual asset allocation exercise. Private Equity/Debt weights float between 10% and 26% 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 Fixed Income Benchmark: Fixed Blend of Eight Components
24.00% Bloomberg U.S. Treasury Index
24.00% Bloomberg U.S. Credit Index
20.00% ICE BofA BB-B US High Yield Index
10.00% Morningstar LSTA U.S. 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 U.S. Treasury Long Index

⁴ Private Equity/Debt Benchmark: Roll-Up of Five Components
Component One: State Street Private Equity Index (SSPEI) – All Regions
Component Two: SSPEI Venture Capital – U.S. Region
Component Three: Private Equity Legacy (SW050300) Actual Portfolio Returns
Component Four: Bloomberg Duration-Adjusted Baa Corporate plus 20 basis points
Component Five: SSPEI Private Debt – All Regions

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, May 28, 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: Barb Bolens, Trustee
Clyde Tinnen, 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, Head of Internal Audit
Kate Burkart-Paulson, Senior Legal Counsel
Sara Chandler, Chief of Staff & Strategy
Bridget Chen, Senior Analyst–Investment Grade Fixed Income
Christian Comito, Senior Portfolio Manager–Investment Grade Fixed Income
Andrew Crossman, Senior Analyst–Private Equity
Tunc Dayioglu, Senior Portfolio Manager–Funds Alpha
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
Tom Freeman, Director of Quantamental Research

Scott Freundlich, Portfolio Manager–Non-Investment Grade
 Fixed Income
 Shannon Gannon, Communications Director
 Max Garcia, Analyst–Funds Alpha
 Chase Gendron, Investment Operations Analyst
 Jameson Greenfield, Chief Financial Officer
 Thomas Gregg, Investment Operations Analyst
 Dan Gyrog, Internal Auditor
 Alex Hansen, Investment Operations Analyst
 Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation
 Vince Janecky, Internal Auditor Data Analyst
 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
 Jason Krueger, Compliance Analyst
 Alex Kubiak, Investment Operations Analyst
 Rachel Kuenzi, Fund Administration Intern
 Katie Kuryla, Senior Paralegal & Records Specialist
 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
 Jeff Lucas, Senior Portfolio Manager–Investment Grade Fixed Income
 Bill Luetzow, Legal Counsel
 Michael Mandarino, Senior Analyst–Non-Investment Grade Fixed Income
 Matt Marek, Senior Analyst–Asset & Risk Allocation
 Damian Maroun, Head of Trading and Execution
 Ed Martinez, PMFA Business Director
 Frank Mazzucco, Senior Legal Counsel
 Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap Strategy
 Sunil Nair, Operational, Financing & Counterparty Risk Director
 Chad Neumann, Senior Portfolio Manager–Global Equity Strategy
 Hunter Olson, Analyst–Non-Investment Grade Fixed Income
 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
 Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation & Rates
 Mgmt.
 Susan Schmidt, Head of Equities
 Edouard Senechal, Senior Portfolio Manager–Asset & Risk
 Allocation
 Sam Shibilski, Fund Administration Analyst
 Gabriel Souza, Investment Operations Analyst
 Mark Taylor, Senior Portfolio Manager–Fixed Income Strategies
 Matt Terpstra, Internal Auditor
 Rob Thornton, ARA Business Director

Leif Thybony, Senior Portfolio Manager–Non-Investment Grade Fixed
Income
Dawn Tuescher, Executive Administrative Assistant
Zhenping Wang, Senior Analyst–Asset & Risk Allocation
Joe Nankof, NEPC
(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 April 23, 2024 Investment Committee (IC) meeting. Hearing no comments, Mr. Denson stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Shearer and seconded by Mr. Mattina to approve both the open session and the closed session minutes of April 23, 2024, as presented. The motion passed unanimously.

2. Benchmark Presentation

Joe Nankof, NEPC, the Board of Trustees' benchmark consultant, delivered a benchmark presentation, included on pages 11-32 in the meeting materials. He noted that the existing benchmarks for both the Core Trust Fund (CTF) policy leverage and the short-term credit (STC) portfolio incorporate the three-month Bloomberg Short-Term Bank Yield Index (BSBY), which the index provider has indicated it is discontinuing. After reviewing NEPC's analysis of potential benchmark alternatives and relevant historical data, Mr. Nankof summarized NEPC's recommendations to **(a)** adopt the three-month T-Bill (TBSM3M) Yield plus 50 basis points (bps) as the benchmark for CTF policy leverage, and **(b)** adopt the ICE three-month T-Bill (G001) Total Return plus 20 bps as the benchmark for the STC portfolio. Lastly, he led the Committee's discussion regarding NEPC's methodology for recommending specific spreads above base reference rates, the consideration of potential benchmark alternatives, and the Committee's ongoing process for reviewing and recommending to the Board of Trustees that it adopt the proposed new benchmarks.

Motion: A motion was made by Mr. Mattina and seconded by Mr. Shearer to approve, and to recommend to the Board of Trustees' Benchmark and Performance Committee, **(1)** the change to the CTF policy leverage benchmark to the 3-month T-Bill (TBSM3M) Yield plus 50 basis points, and **(2)** the change to the short term credit portfolio benchmark to the ICE 3-Month T-Bill (G001) Total Return plus 20 basis points, each as presented and recommended by SWIB's benchmark consultant, NEPC. The motion passed unanimously.

3. Private Markets & Funds Alpha Division Performance Update

Anne-Marie Fink, Private Markets & Funds Alpha—Chief Investment Officer, reminded the Committee that benchmark returns for the private equity, current return and venture capital portfolios were not yet available when Q1 2024 quarterly updates were provided at the prior Committee meeting. Scott Parrish, Head of Private Equity, then presented a performance update for the private equity and current return portfolios, included on pages 33-35 in the meeting materials. He highlighted that **(a)** the private equity portfolio outperformed its benchmark by 37 bps in Q1 2024, led by small buyouts and distressed/turnaround strategies, and that absolute and relative performance remained strong over the one-, three-, and five-year periods, and **(b)** the current return portfolio outperformed its benchmark by 78 bps for the quarter, driven by mezzanine, senior debt, and opportunistic strategies, and that absolute and relative performance remained positive over all time periods.

4. Global Public Markets Strategies Division Update

Nick Stanton, Head of Multi-Asset Strategies, reported on performance from the Global Public Markets Strategies division in the *Global Public Markets Strategies Quarterly Update, Q1 2024*, included on pages 36-38 in the meeting materials. He highlighted that all eight division strategies generated positive relative returns in Q1 2024, and reviewed performance of division strategies over the year-to-date, three-, and five-year periods.

5. Q1 2024 Quarterly Updates

A. Global Equities

Susan Schmidt, Head of Equities, presented the *Global Equity Strategy Review*, included on pages 39-45 in the meeting materials. She reported that the global equity strategy outperformed its benchmark by 242 bps in Q1 2024, driven by positive responses to robust earnings reports, evolving market dynamics that prompted the Federal Reserve to leave interest rates unchanged, and strong performance from idiosyncratic investment themes. Ms. Schmidt then **(a)** presented a market overview, noting that management teams are increasingly cautious due to elevated geopolitical risk and the Federal Reserve's decision to delay rate cuts, **(b)** delivered an earnings season review for Q1 2024, commenting that over 70% of S&P 500 companies exceeded earnings expectations, and **(c)** confirmed that the portfolio remained in compliance with its guidelines.

B. Small Cap Strategy

Joy Mukherjee, Senior Portfolio Manager—U.S. Small Cap Strategy, referred to the *U.S. Small Cap Strategy Review*, included on pages 46-51 in the meeting materials. He noted that the portfolio outperformed its benchmark by 232 bps in Q1 2024 and that absolute and relative performance over the three- and five-year periods were positive. Mr. Mukherjee then **(a)** discussed the major contributors to and detractors from performance for the first quarter, noting that strong Q4 2023 earnings reports, coupled with bullish expectations for the second half of 2024, contributed to strong performance of portfolio names, **(b)** provided sector commentary, stating that industrials and healthcare were the top-performing sectors in the

quarter, while the communication services and real estate sectors detracted, and (c) confirmed that the portfolio remained in compliance with its guidelines.

C. Fixed Income Strategies

Mike Shearer, Head of Fixed Income Strategies, presented the *Fixed Income Strategies Review*, included on pages 52-64 in the meeting materials. He reviewed Q1 2024 performance for the fixed income portfolios, highlighting that all five portfolios generated positive relative performance for the quarter, driven by both sector and security selection. Mr. Shearer then provided a fixed income market review, commenting that (a) U.S. Treasury yields rose during the quarter, as inflation and employment data led to reduced expectations for Federal Reserve interest rate cuts, (b) the U.S. yield curve ended the quarter modestly flatter, and (c) spreads across investment grade credit and high yield tightened during the quarter, while U.S. mortgage-backed securities (MBS) spreads generally remained stable. Lastly, he confirmed that the portfolios were in compliance with their guidelines in Q1 2024.

D. Multi-Asset Strategies

Chase Nicholson, Senior Portfolio Manager–Multi-Asset Strategies, presented the *Multi-Strat Portfolio Review*, included on pages 65-69 in the meeting materials. He reported that the multi-asset portfolio outperformed its benchmark by 270 bps in Q1 2024, primarily from systematic strategies. Mr. Nicholson then (a) provided market commentary, noting that trend efficacy was highest in agricultural and equity markets, with no identifiable trends in bond markets, and (b) reviewed equity factor correlations in connection with monitoring overall portfolio volatility. Lastly, he confirmed that the portfolio remained in compliance with its guidelines.

E. LIRM

Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation & Rates Mgmt., presented the *Investment Strategies: Liquidity, Inflation and Rates Management (LIRM)* quarterly update, included on pages 70-77 in the meeting materials. With respect to the market, she noted that (a) money market fund net assets continued to increase, (b) U.S. Treasury bill supply peaked at the end of the first quarter, and (c) market participants are pricing in a smaller number of interest rate cuts by the Federal Reserve amid persistent inflation. Ms. Ruiz then reviewed performance for the State Investment Fund (SIF) and the STC portfolio in Q1 2024, highlighting that both returned positive absolute and relative performance. Lastly, she confirmed that the portfolios remained in compliance with their guidelines.

6. 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 markets and funds alpha, fixed income strategies, global equities, small cap equities, multi-asset, short-term credit, and exposure management, was made by Mr. Nicholson and seconded by Mr. Rector.

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 1:43 p.m. and reconvened in open session at 3:14 p.m.

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

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

8. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters—Asset Class and Portfolio*, as of April 30, 2024, was included on pages 214-215 in the meeting materials for the Committee’s review. Mr. Chehime noted that there were three new discussion triggers this month relating to the small cap portfolio’s ex ante tracking error, the MBS portfolio’s active duration, and the hedge fund portfolio’s one-year annual conditional value at risk (CVaR), and that no discussion triggers had been dropped.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the June 25, 2024 and July 23, 2024 Committee meetings were included on pages 216-219 in the meeting materials for the Committee’s review.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Mattina and seconded by Mr. Rector. The motion passed unanimously, and the meeting adjourned at 3:15 p.m.

Date of Committee Approval: 06/25/24

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

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, June 25, 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: Barb Bolens, Trustee
Clyde Tinnen, Trustee
Joe Amoyal, Senior Trader–Non-Investment Grade Fixed Income
Nathan Ballard, Senior Legal Counsel
Zach Berghouse, Internal Auditor
Kevin Blank, Analyst–Funds Alpha
Brandon Brickner, Head of Internal Audit
Kate Burkart-Paulson, Senior Legal Counsel
John Burkhartzmeyer, Senior Trader
Sara Chandler, Chief of Staff & Strategy
Tunc Dayioglu, Senior Portfolio Manager–Funds Alpha
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Chase Gendron, Investment Operations Analyst
Jameson Greenfield, Chief Financial Officer
Dan Gyrog, Internal Auditor
Alex Hansen, Investment Operations Analyst
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation
Vince Janecky, Internal Auditor Data Analyst

Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Ryan Johnston, Senior Analyst–Funds Alpha
Salah Khalaf, Portfolio Manager–Private Markets & Funds Alpha
Jason Kowalke, Investment Operations Analyst
Dylan Krivoshein, Investment Operations Analyst
Jason Krueger, Compliance Analyst
Rachel Kuenzi, Fund Administration Intern
Lisa Lange, Director of Compliance & Senior Legal Counsel
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
Bill Luetzow, Legal Counsel
Ed Martinez, PMFA Business Director
Frank Mazzucco, Senior Legal Counsel
David Meyer, Senior Trader
Sunil Nair, Operational, Financing & Counterparty Risk Director
Anand Rakesh, Director of Risk Analytics & Financial Engineering
Systems
Robby Richlen, Analyst–Funds Alpha
Edouard Senechal, Senior Portfolio Manager–Asset & Risk
Allocation
Gabriel Souza, Investment Operations Analyst
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Leif Thybony, Senior Portfolio Manager–Non-Investment Grade Fixed
Income
Dawn Tuescher, Executive Administrative Assistant
Eileen Neill, Verus Advisory
(Some individuals may have attended only portions of the meeting.)

OPEN SESSION

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

1. Approval of the Minutes

Mr. Denson asked if there were any comments on either the open or closed session minutes of the May 28, 2024 Investment Committee (IC) meeting. Hearing no comments, Mr. Denson stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Shearer and seconded by Mr. Nicholson to approve both the open session and the closed session minutes of May 28, 2024, as presented. The motion passed unanimously.

2. Amendments to Investment Committee WRS Investment Guidelines

Lisa Lange, Director of Compliance and Senior Legal Counsel, discussed the proposed amendments to the *SWIB Investment Committee Wisconsin Retirement System Investment*

Guidelines, included on pages 10-57 in the meeting materials. She reported that the proposed changes update language across the fixed income portfolios regarding the use of derivative instruments, with differences among the portfolios based on the relevant strategy, including additional guidelines for the long treasury portfolio, permitting tail hedging for certain portfolios, and refining the relevant guidelines for the investment grade credit, high yield and leveraged loan portfolios. Mike Shearer, Head of Fixed Income Strategies, then answered questions regarding the various tail hedging strategies that may be employed by the fixed income portfolios.

Ms. Lange then reviewed the proposed changes to the governance structure for the exposure management and Private Markets & Funds Alpha (PMFA) overage portfolios, such that **(i)** the head of Asset & Risk Allocation (ARA) may approve exposure management trades if, at the time of investment, the aggregate ex ante active risk contribution of the exposure management portfolios (excluding the PMFA overage portfolios), measured at the overall Core Trust Fund (CTF) level, is equal to or less than 0.20%, with trades in excess of such threshold requiring Executive Director/Chief Investment Officer (ED/CIO) approval, and **(ii)** the ED/CIO must approve PMFA overage investments with the recommendation of the head of PMFA. Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, answered questions regarding the anticipated size and risk attributes of potential exposure management trades.

Lastly, Ms. Lange reported that the proposed changes **(a)** remove a reference to the short-term credit portfolio's benchmark, **(b)** update strategy classifications for the hedge fund portfolio to align with classifications used by the portfolio's external investment consultant and modified the target allocations and maximums for the strategies, and **(c)** remove an issuer concentration soft risk parameter for the State Investment Fund (SIF).

Motion: A motion was made by Mr. Mattina 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. Transition Update (Q1 2024)

Brian Heimsoth, Senior Portfolio Manager–Asset & Risk Allocation, presented the *Transition Management Summary, Q1 2024*, included on page 58 in the meeting materials. Mr. Heimsoth reviewed the four transition events during the quarter, highlighting that each fell within the established shortfall tolerance range. He noted that **(a)** the first transition, which was managed internally, transitioned internally managed small cap portfolio assets to effectuate a rebalance between active and passive strategies, **(b)** the second and third, which were managed by the BlackRock Transition Management team, implemented a reduction in public equities with an offsetting reduction in CTF policy leverage, and **(c)** the fourth transition, which was also managed internally, implemented the approved asset allocation policy change to increase exposure to the internal fixed income portfolios and decrease global equities.

4. Convene in Closed Session

Motion: A motion to go into closed session as authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes to consider confidential strategies for the investment of public funds, including **(a)** the review of active risk profiles of portfolio investments and

the Core and Variable Trust Funds, (b) the review of specific proprietary investment strategies and investment instruments related to exposure management, and (c) the review of broker information, was made by Ms. Linn and seconded by Mr. Stanton.

Mr. Denson called for a roll call vote.

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

There being twelve ayes and no nays, Mr. Denson declared the motion passed. The Committee convened in closed session at 1:16 p.m. and reconvened in open session at 2:17 p.m.

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

Mr. Denson announced that, while in closed session, the Committee (i) reviewed active risk profiles of portfolio investments and the Core and Variable Trust Funds, (ii) reviewed specific proprietary investment strategies and investment instruments related to exposure management, and (iii) reviewed broker information.

6. Research Task Force Report

Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation, presented the *Research Task Force Update*, included on pages 135-144 in the meeting materials. He discussed recent task force initiatives, including (a) sponsoring seminars relating to current events, including the macroeconomic outlook and the likelihood of a recession, geopolitical risks and the U.S. presidential election, (b) hosting speakers on broader investment themes such as artificial intelligence, factor rotation, and carbon trading, and (c) promoting knowledge-sharing and educational programs, including participation in sessions related to SWIB’s membership in the International Centre for Pension Management and a forum for quantitative research in finance. Lastly, Mr. Cavaglia discussed the task force’s updated guidelines, included on pages 145-146 in the meeting materials for the Committee’s reference.

7. Quarterly Performance Review (Q1 2024)

Mr. Denson noted that the *Investment Performance Report*, as of March 31, 2024, was included on pages 147-179 in the meeting materials for the Committee’s information.

8. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters–Asset Class and Portfolio*, as of May 31, 2024, was included on pages 180-181 in the meeting materials for the Committee’s review. Mr. Chehime noted that there were no new discussion triggers this month and that two discussion triggers had been dropped relating to the Variable Trust Fund’s (VTF) ex ante tracking error and the MBS portfolio’s active duration.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the July 23, 2024 and August 27, 2024 Committee meetings were included on pages 182-185 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 2:23 p.m.

Date of Committee Approval: 07/23/24

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

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, July 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: 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, Head of Internal Audit
Kate Burkart-Paulson, Senior Legal Counsel
Sara Chandler, Chief of Staff & Strategy
Bridget Chen, Senior Analyst–Investment Grade Fixed Income
Tunc Dayioglu, Senior Portfolio Manager–Funds Alpha
Jack Drew, Trader
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
Shannon Gannon, Communications Director
Max Garcia, Analyst–Funds Alpha
Chase Gendron, Investment Operations Analyst
Jameson Greenfield, Chief Financial Officer
Thomas Gregg, Investment Operations Analyst

Dan Gyorog, Internal Auditor
Alex Hansen, Investment Operations Analyst
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
Rachel Kuenzi, Fund Administration Intern
Lisa Lange, Director of Compliance & Senior Legal Counsel
Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
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, Senior Legal Counsel
Sunil Nair, Operational, Financing & Counterparty Risk Director
Hunter Olson, Analyst–Non-Investment Grade Fixed Income
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
Jason Rothenberg, Head of Real Estate
Dan Schally, Analyst–Real Estate
Edouard Senechal, Senior Portfolio Manager–Asset & Risk
Allocation
Gabriel Souza, Investment Operations Analyst
Rob Thornton, ARA Business Director
Dawn Tuescher, Executive Administrative Assistant
Kasey Bernard, 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 June 25, 2024 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. Drummond and seconded by Mr. Shearer to approve both the open session and the closed session minutes of June 25, 2024, as presented. The

motion passed unanimously.

2. June Investment Forum Debrief

Jack Drew, Trader, provided a summary of the June Investment Forum, which was held virtually on June 11-12, 2024. Mr. Drew reported that more than 250 individuals registered for the conference, including SWIB staff and trustees, members of the CFA Society of Madison, and Wisconsin Retirement System (WRS) participants. He noted that feedback has been favorable, with attendees pleased with the conference's substantive topics and speaker lineup.

3. October Board Workshop Preview

Todd Mattina, Head Economist & Asset and Risk Allocation Chief Investment Officer, provided an overview of the upcoming October Board Workshop, which will include **(a)** a review of SWIB's long-term target asset allocation to private markets and a longer-term pacing plan, **(b)** an overview of innovative projects undertaken across the agency, including a technology strategy update and a discussion regarding a funds alpha managed account platform that launched in June 2023, and **(c)** external speaker presentations.

4. Private Markets & Funds Alpha Division Update

Anne-Marie Fink, Private Markets & Funds Alpha—Chief Investment Officer, presented the *Private Markets & Funds Alpha Division Update*. She highlighted that the Private Markets & Funds Alpha (PMFA) division has been active in refining eFront platform analytics and negotiating with external managers to obtain preferential terms and access to compelling opportunities.

5. Q2 2024 Quarterly Updates

A. Real Estate

Jason Rothenberg, Head of Real Estate, presented the *Quarterly Activity Report – Real Estate*, included on pages 9-21 in the meeting materials. He provided a real estate market overview, noting that **(a)** a valuation reset is continuing in the real estate market along with overall muted transaction activity, **(b)** redemption queues for U.S. open-ended funds have increased over the past three years as managers have been unable to fully satisfy redemption requests, **(c)** managers still have significant dry powder available to deploy, primarily in non-core strategies, and **(d)** the manufactured housing, student housing, hotel, and data center property sub-types have performed well, while the office sector continues to struggle. Mr. Rothenberg then reviewed changes to the portfolio's benchmark, with NCREIF updating and expanding the definitions of the residential, office, industrial, and retail sectors to encompass certain alternative property sub-types and increase alignment with the broader investable universe. He commented that these changes to add more niche property types are expected to shift the composition of the benchmark over time.

Mr. Rothenberg reviewed the real estate portfolio, noting that the portfolio's market value held steady at approximately \$11.6 billion as of the end of Q2 2024, representing approximately 9.2% of the Core Trust Fund (CTF). He discussed the portfolio's **(i)** risk profile, which has not materially changed, and **(ii)** diversification by property type,

highlighting that the team continues to reduce the portfolio's underweight to industrial while maintaining the underweight to office.

Mr. Rothenberg also reviewed the portfolio's performance, highlighting outperformance relative to the benchmark over all time periods despite negative absolute returns for the one-year period. He then **(a)** discussed performance by sub-strategy, noting challenging one-year performance for office and multi-family, **(b)** reviewed the two commitments made in the second quarter in the industrial space as well as the pipeline under review, and **(c)** confirmed that the portfolio remained in compliance with its investment guidelines.

Lastly, he answered questions regarding the anticipated timeline for fulfillment of open-ended funds' redemption requests, the portfolio's exposure to credit strategies, the terms of available co-investment opportunities, and the portfolio's underweight to the office sector.

B. Private Equity

Scott Parrish, Head of Private Equity, presented the *Quarterly Activity Report – Private Equity*, included on pages 22-45 in the meeting materials. He provided a private equity market update for Q2 2024, noting that **(a)** U.S. private equity fundraising dollars were flat year-over-year while the number of funds decreased, with two funds accounting for approximately 25% of the committed capital, **(b)** U.S. and global enterprise value-to-revenue entry multiples have declined significantly since the 2021 peak and are generally at or below pre-pandemic levels, **(c)** U.S. private equity deal volume and value declined year-over-year, while exit volume increased modestly and exit value was flat, **(d)** the share of portfolio company exits made through sponsor acquisitions is at its highest since 2021, as significant dry powder among sponsors propelled acquisitions, and **(e)** European private equity fundraising dollars and the number of funds both increased materially year-over-year.

Mr. Parrish then reported that, as of June 30, 2024, the market value of the aggregate private equity asset class, excluding the venture capital and private debt portfolios, was approximately \$21.7 billion and made up approximately 17.3% of the CTF. He commented that capital calls continued to exceed distributions year-to-date, but that the portfolios' net cash outflow position is improving.

With respect to performance, Mr. Parrish highlighted that, as of March 31, 2024, the combined private equity and current return portfolios, inclusive of co-investments, achieved second quartile performance for vintage years 2014-2022 and first quartile performance for 2023, and the private equity and current return portfolios outperformed their benchmarks for the one-, three-, and five-year time periods. He also commented on the equity multiples and internal rates of return (IRRs) for the portfolios' sub-strategies, highlighting strong performance from the large-cap, medium-cap, and growth sub-strategies.

Mr. Parrish then reviewed the private equity portfolios' **(a)** sub-asset class diversification, highlighting the increased percentage from co-investments and growth, small- and mid-buyout managers, **(b)** public versus private portfolio company exposure, noting that public exposure continued to decrease because of recent sales of public companies from the portfolio, and **(c)** geographic and industry diversification. Mr. Parrish and Chris Eckerman,

Senior Portfolio Manager–Private Equity, then led the Committee’s discussion regarding access to co-investment opportunities alongside small- and mid-buyout managers.

Lastly, Mr. Parrish reviewed the commitments made in Q2 2024, discussed the portfolio pipeline for Q3 2024, and confirmed that the portfolio remained in compliance with all 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 46-57 in the meeting materials. Mr. Prestigiaco provided a private debt market update for the second quarter, noting that **(a)** fundraising continued to decline, with the average fundraising duration at its longest in over 15 years, and the weakest start to a year since 2016, **(b)** investors continue to prefer larger, more established managers, which received the significant majority of fund commitments during the quarter, **(c)** direct lending remains the preferred sub-strategy within private debt, **(d)** dry powder available to invest remained high relative to the longer-term average, and **(e)** slower economic growth and elevated interest rates may impact the current relatively low overall private credit default rates.

Mr. Prestigiaco then reviewed the portfolio’s characteristics, noting that one loan paid off and four new loans were added during the quarter, with the average coupon increasing by 10 basis points (bps) and average life increasing slightly. He also noted that the portfolio’s current below investment grade (BIG) holdings of approximately 8% was lower than the prior quarter due to a recent loan upgrade.

With respect to the portfolio’s performance, Mr. Prestigiaco highlighted that the portfolio outperformed its benchmark over the three- and five-year time periods but underperformed for the one-year period, despite strong relative performance in June. He then **(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. Lastly, he led the Committee’s discussion regarding the criteria for including a loan on the watchlist and the team’s “barbell” strategy of investing in loans that are both higher and lower quality relative to the benchmark.

D. Funds Alpha

Derek Drummond, Head of Funds Alpha, presented the *Funds Alpha Q2 2024 Update*, included on pages 58-65 in the meeting materials. He discussed performance for the second quarter, highlighting that **(a)** the beta one equity portfolio outperformed its benchmark by 115 bps year-to-date and was effectively flat during the second quarter, **(b)** the beta one fixed income portfolio generated 66 bps of positive relative returns year-to-date, driven by risk-on spread compression in U.S. and emerging markets, and **(c)** the hedge funds portfolio outperformed its benchmark by 372 bps year-to-date, with strong performance across all sub-strategies led by equity long/short and macro managers.

Mr. Drummond then provided an update on the market environment, noting that **(i)** hedge fund managers are cautiously optimistic that the favorable alpha environment will continue, **(ii)** U.S. fixed income managers have taken risk down as credit spreads rallied, while idiosyncratic risk among emerging market debt managers remains elevated, **(iii)** while

volatility remains low, greater dispersion among stocks created a favorable environment for security selection alpha, and (iv) assets under management for platforms employing a pass-through expense model have increased significantly since 2020. He also reviewed manager positioning in the beta one portfolios, commenting that the beta one equity portfolio's quality bias decreased over the past year, and confirmed that all portfolios were in compliance with their guidelines for Q2 2024. Lastly, Mr. Drummond answered questions regarding the performance of large multi-strategy platforms relative to smaller managers.

6. 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, funds alpha, and exposure management, was made by Mr. Maung and seconded by Mr. Mattina.

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 1:49 p.m. and reconvened in open session at 2:36 p.m.

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

Mr. Denson announced that, while in closed session, the Committee (i) reviewed active risk profiles of portfolio investments and the Core and Variable Trust Funds and (ii) reviewed specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, funds alpha, and exposure management.

8. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters—Asset Class and Portfolio*, as of June 28, 2024, was included on pages 161-162 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 unequitized cash within the passive index portfolios, and that no discussion triggers had been dropped.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the August 27, 2024 and September 24, 2024 Committee meetings were included on pages 163-166 in the meeting materials for the Committee's review.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Stanton and seconded by Mr. Nicholson. The motion passed unanimously, and the meeting adjourned at 2:38 p.m.

Date of Committee Approval: 08/27/24

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

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, August 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. July 23, 2024	
5		2. Global Public Market Strategies Division Update	Mike Shearer Nick Stanton
20		3. Q2 2024 Quarterly Updates A. LIRM B. Multi-Asset C. Fixed Income Strategies D. Global Equities E. Small Cap	Andrea Ruiz Chase Nicholson Mike Shearer Susan Schmidt Joy Mukherjee
	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	

* 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 equities, small cap equities, fixed income strategies, multi-asset, 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.

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

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

Future Meetings

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

AGENDA / NOTICE

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, September 24, 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. August 27, 2024	
5		2. October Board Workshop Preview	Todd Mattina
5		3. Transition Update (Q2 2024)	Joe Roth
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		4. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
15		5. Separately Managed Funds Update	Rob Thornton Mike Shearer
5		6. Research Task Force Report	Stefano Cavaglia
10		7. Corporate Governance Update	Tom Robinson
		8. Quarterly Performance Review (Q2 2024) (No presentation unless requested)	
		9. Soft Risk Parameters (No presentation unless requested)	
		10. Fair Value Measurement Review of WRS Investments (No presentation unless requested)	
		11. 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 asset and risk allocation and exposure management, and (iii) the review of broker information, and (b) to discuss and approve prior closed session minutes that discuss the same. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General’s Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

	Motion	12. 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>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, October 22, 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. September 24, 2024	
30	Motion	2. Annual Benchmark Presentation	Joe Nankof, NEPC
5		3. Private Markets & Funds Alpha Division Update	Anne-Marie Fink
45		4. Q3 2024 Quarterly Updates A. Private Equity B. Real Estate C. Private Debt D. Funds Alpha	Scott Parrish Jason Rothenberg Chris Prestigiacommo Derek Drummond
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		5. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
5		6. October Board Workshop Debrief	Todd Mattina
		7. Soft Risk Parameters (No presentation unless requested)	
		8. Future Meeting Topics	
	Motion	9. 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

11/26/24 – Nov Committee Mtg.
 12/19/24 – Dec Committee Mtg.
 1/28/25 – Jan Committee Mtg.
 2/25/25 – Feb Committee Mtg.
 4/1/25 – March Committee Mtg.
 4/29/25 – April 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

Tuesday, May 14, 2024

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)
Eric Barber, Chief Legal Counsel (Secretary)
Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer
Todd Mattina, Head Economist, Asset & Risk Allocation CIO
Cefe Quesada, Chief Technology Officer
Brandon Brickner, Internal Audit Director (*non-voting*)

Others Present: Sara Chandler
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 1:07 p.m. Ms. Lange first welcomed Cefe Quesada, Chief Technology Officer, as the newest member of the Committee.

1. Approval of Minutes

Ms. Lange confirmed that there were no questions or comments on either the open session or closed session minutes of November 9, 2023, which were included on pages 4-6 in the meeting materials.

Motion: A motion was made by Jameson Greenfield, Chief Financial Officer, and seconded by Rochelle Klaskin, Deputy Executive Director/Chief Operating Officer, to approve the open session and closed session minutes of November 9, 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 FactSet Risk System as the Risk Management Team’s enterprise risk system. With the help of Business Systems Analysts (“BSAs”), they continue to refine and improve the FactSet Risk System, including a Jira ticketing process and pre-loading testing, although it meets all the current requirements. Mr. Chehime gave brief updates on a number of other initiatives and improvements to investment risk management, including new reports (for Credit Risk analytics, CTF Aggregate Risk Model risk analytics and Drawdown time-series monitoring), the SimCorp transition plan, and answered questions from Committee members.

3. Compliance Update

Lisa Lange, Director of Compliance and Senior Legal Counsel, presented the *Compliance Reporting & Updates* for Q4 2023 and Q1 2024, which were included on pages 10-27 in the meeting materials.

A. Q4 2023

Ms. Lange reported that the fourth quarter of 2023 had a lower number of personal trading requests as the prior corresponding quarter, with a slightly higher approval rate. There were two personal trading violations in the quarter, no guideline violations no waivers granted and no employees with late affirmations.

B. Q1 2024

Ms. Lange noted that the third quarter had a higher number of 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 or waivers granted. There were two employees with late affirmations.

Ms. Lange discussed SWIB’s annual ethics reporting for 2023 and an MNPI and Insider Trading Training. She concluded with a discussion of compliance and reporting changes coming up in 2024.

4. 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,

Hassan Chehime, Head of Risk Management and seconded by Todd Mattina, Head Economist and Asset & Risk Allocation CIO .

Mr. Barber called for a roll call vote.

Barber-Aye
Klaskin-Aye

Cehime-Aye
Lange-Aye

Denson-Aye
Mattina-Aye

Greenfield-Aye
Quesada-Aye

There being seven ayes and no nays, Ms. Lange declared the motion passed. The Committee convened in closed session at 1:40 p.m. and reconvened in open session at 2:28 p.m.

5. Announcement of Matters Taken Up in Closed Session

Ms. Lange announced that, while in closed session, the Committee (i) reviewed strategies for crime detection and prevention with respect to SWIB’s information technology systems, (ii) confidential strategies for the investment of public fund, including the review of proprietary credit counterparty and broker information.

6. Future Meeting Topics

No future meeting topics were discussed.

7. Adjournment

Motion: A motion to adjourn was made by Mr. Mattina and seconded by Mr. Greenfield. The motion passed unanimously, and the ERCC meeting was adjourned at 2:29 p.m.

Date of Committee Approval: _____

Signed: _____

Eric Barber, Secretary
Enterprise Risk and Compliance Committee

Board Meeting

Tab 7 – Quarterly Investment Update, Q2 2024



Quarterly Investment Update

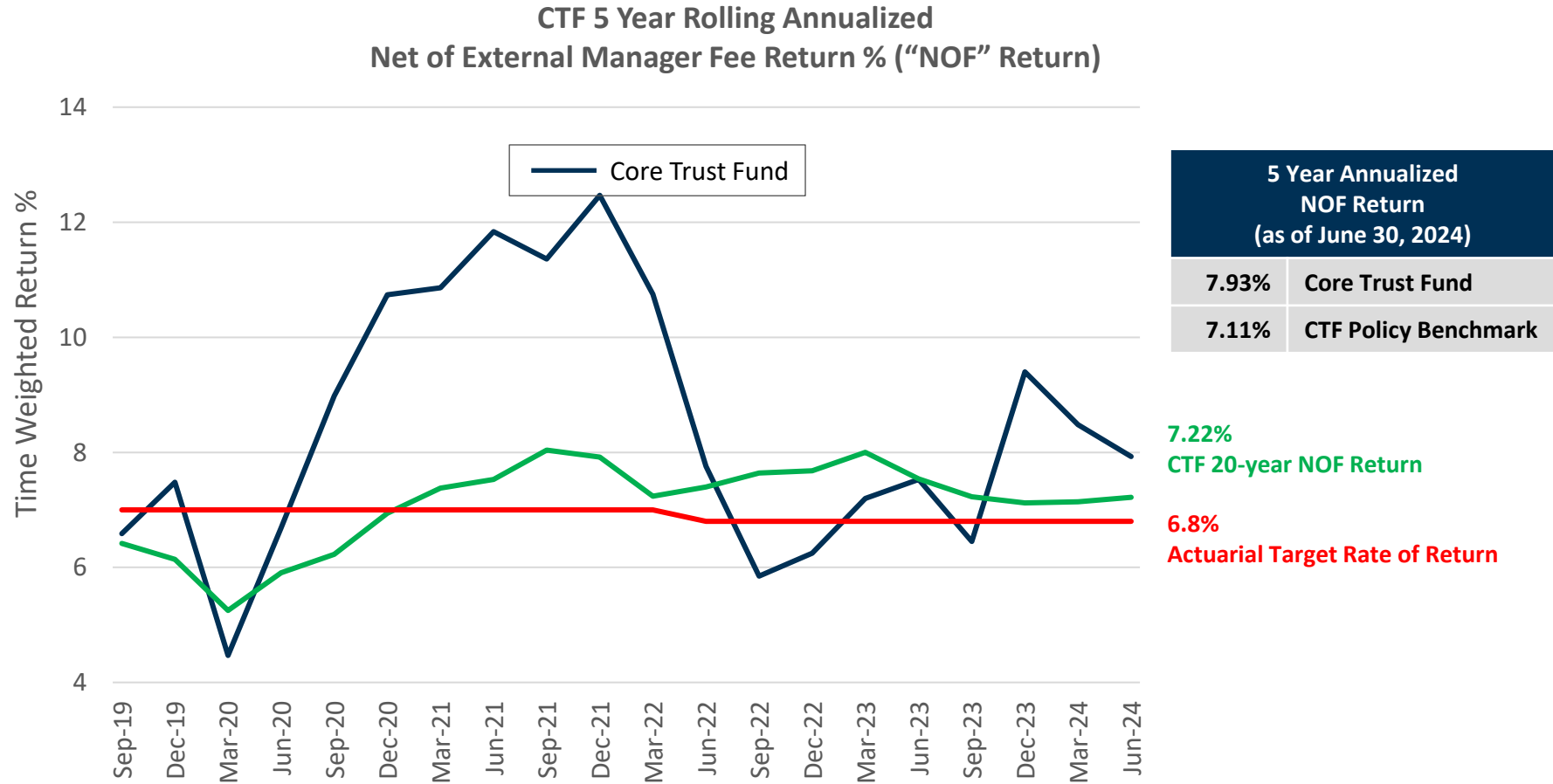
Board Meeting

September 11, 2024

Performance Trends & Outlook

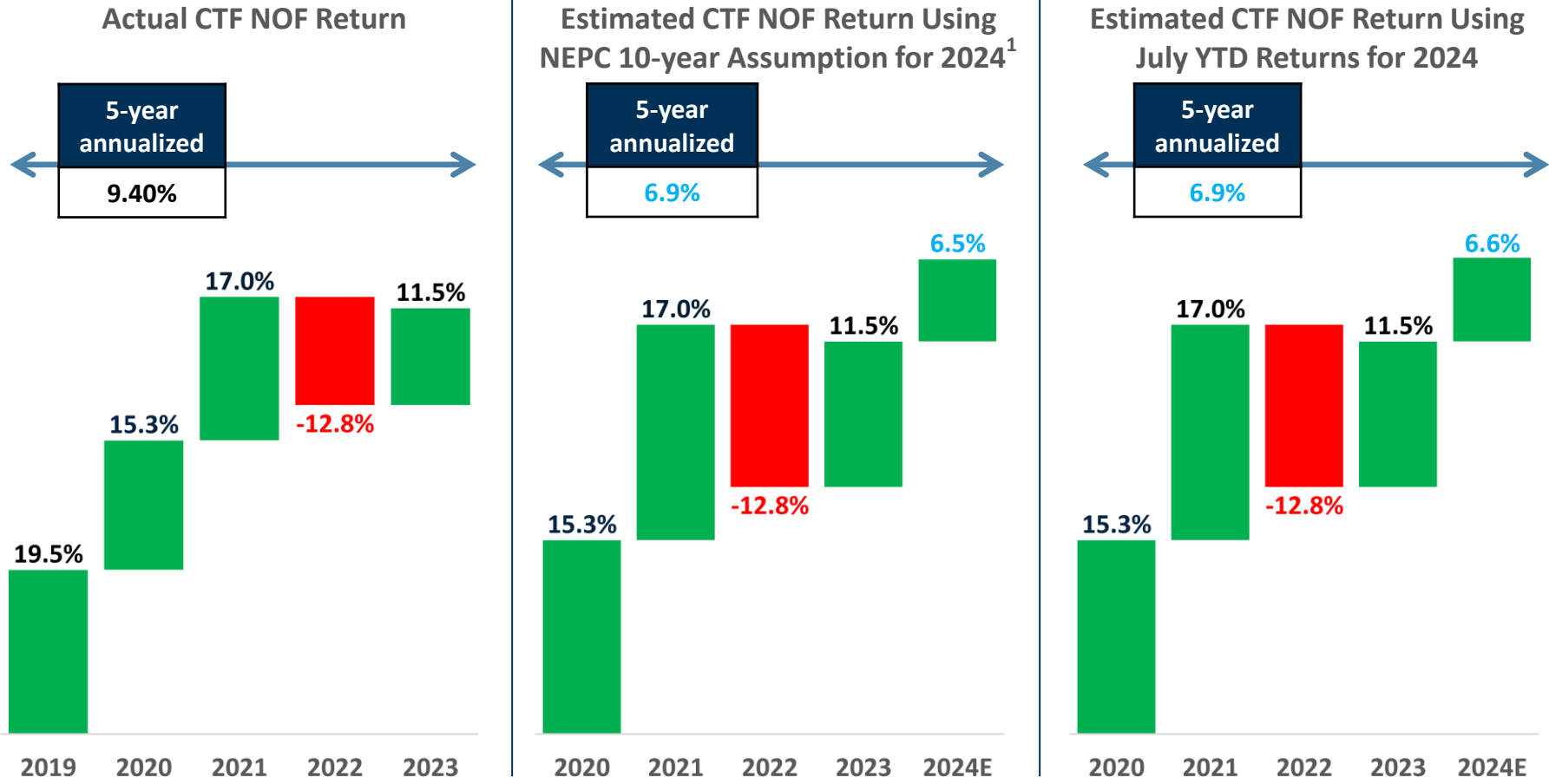
CTF 5 Year Rolling Return Trend

Quarter-end Results Through June 30, 2024



CTF 5-year Return Estimate

Calendar year and 5-year annualized returns

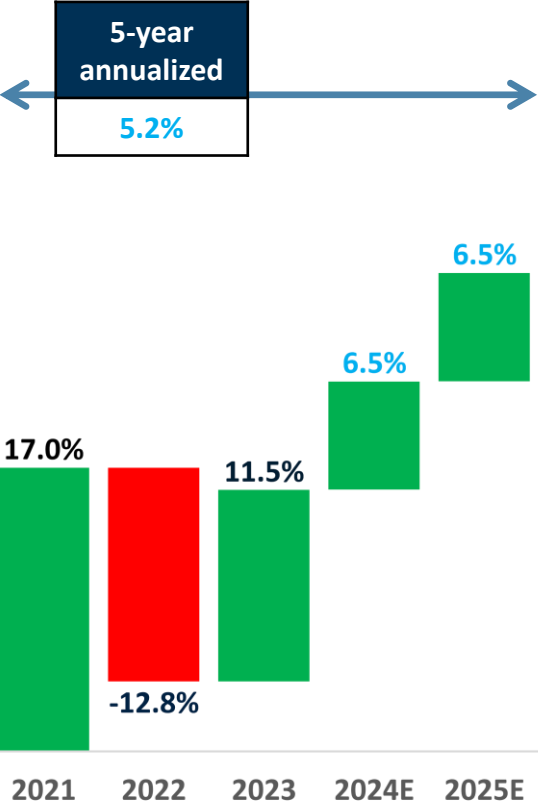


¹The NEPC 10-year expected return assumption is used to estimate 2024.

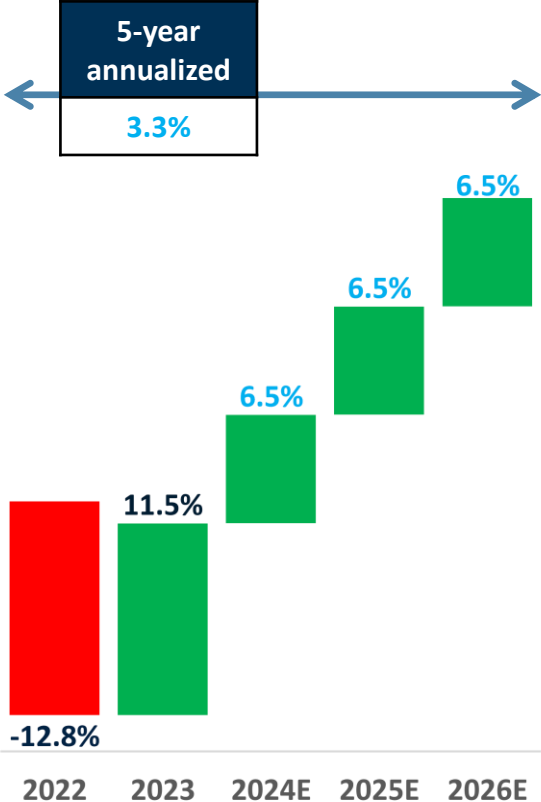
CTF 5-year Return Forward Estimate

Calendar year and 5-year annualized returns

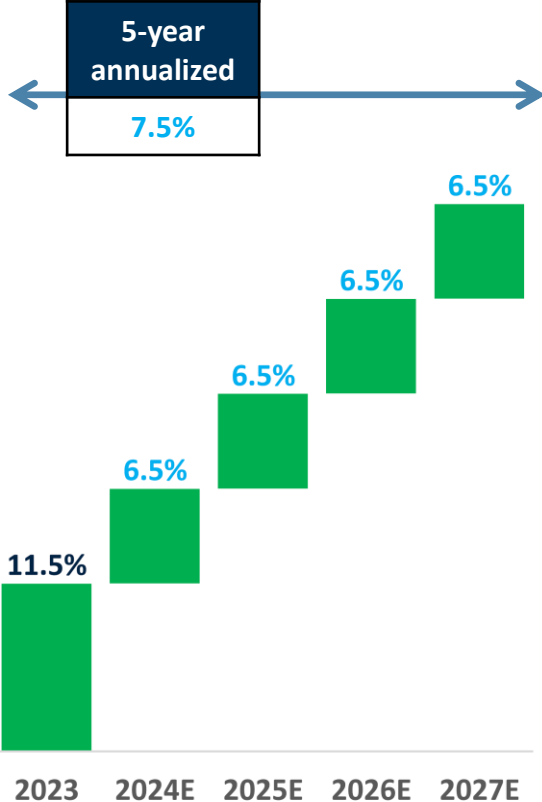
Estimated CTF NOF Return Using NEPC
10-year Assumption through 2025¹



Estimated CTF NOF Return Using NEPC
10-year Assumption through 2026¹



Estimated CTF NOF Return Using NEPC
10-year Assumption through 2027¹

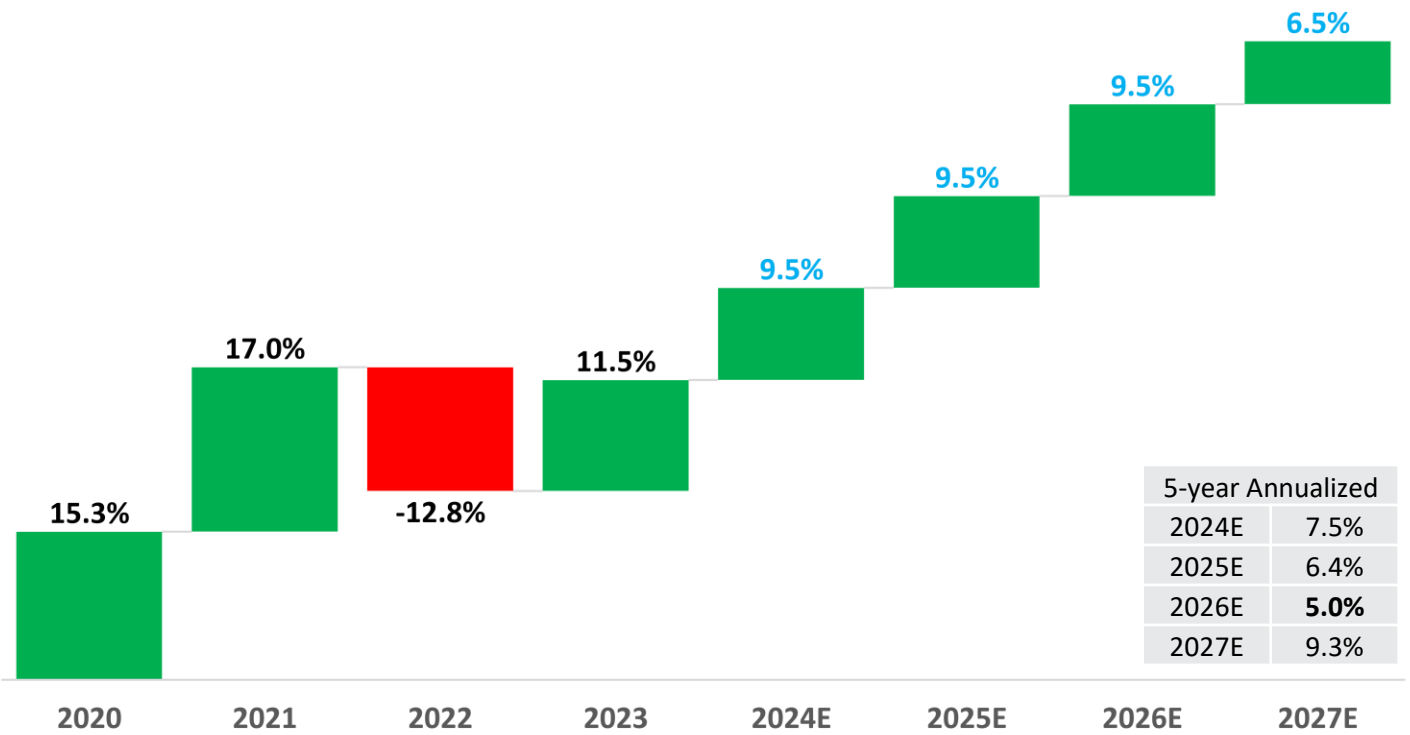


¹ 6.5% is NEPC's 10-year expected return for SWIB's 2024 policy portfolio and is used to estimate future year performance through 2027. SWIB's asset allocation process balances risk and expected return to set its asset allocation. The 10-year expected return does not always equal or exceed the WRS assumed rate of return, currently 6.8%. SWIB's actual results may be more or less than the NEPC 10-year expected return.

Average Return Required for No Dividend Cut

Calendar year and 5-year annualized returns

A 9.5% average return for 2024-2026 avoids a negative CTF dividend adjustment¹



¹ Based on SWIB calculations, calendar year returns of 9.5% in 2024E to 2026E would maintain the 5-year annualized return at 5% or higher to avoid a negative dividend adjustment. The ETF Effective Rate is assumed to be the same as the 5-year annualized CTF NOF Return. NEPC 10-year expected return assumption is used to estimate 2027.

CTF Policy Benchmark & Other Indices

July 31, 2024: Total Rate of Return %, Annualized					
Index Name (Gross Return Basis, unless noted)	YTD	1yr	5yr	10yr	10yr volatility
CTF Policy Benchmark (Gross)	5.7	8.4	7.5	6.9	8.7
MSCI USA	16.3	22.0	14.9	13.1	15.5
MSCI USA Small Cap	9.9	13.1	10.2	9.8	19.7
MSCI World ex US Equities (Net)	8.2	11.1	7.5	4.8	15.2
MSCI World ex US Equities (Net) (Local)	11.9	14.2	9.0	7.4	12.4
MSCI EAFE Small Cap	6.6	9.6	6.0	5.5	16.7
MSCI Emerging Markets ex China	9.6	15.0	7.7		
MSCI China	3.5	(12.2)	(4.3)	0.6	23.7
MSCI ACWI	13.4	17.6	11.6	9.3	14.8
MSCI ACWI (Local)	14.8	18.9	12.3	10.6	13.6
Bloomberg US Gov't / Credit	1.6	5.1	0.3	1.7	5.2
ICE BOFA High Yield BB/B	4.2	10.5	3.9	4.6	7.3
Bloomberg U.S. TIPs	2.5	4.4	2.4	2.1	5.1

Source: Factset, SWIB

Economic Update

Summary

Growth

- SWIB view on Q4/Q4 real GDP growth in 2024 is +1.7%, slowing from a strong +3.1% in 2023.
 - (1) Fed policy and overall financial conditions are still restrictive. Effects have not fully played out.
 - (2) High household liquid balances due to COVID stimulus have been run down...and eroded in real terms.
 - (3) A boom of state and local investment spending is losing steam.

Inflation and labor market

- SWIB view on core Q4/Q4 PCE inflation in 2024 is +2.7%, slowing from +2.9% in 2023.
- Inflation surprised to the upside early in the year but has since been better behaved, opening the door to Fed rate cuts.
- Labor market supply and demand are close to balanced now. Wage growth has moderated but remains somewhat high.

Fed

- The market is currently pricing 100 bp of Fed cuts by end-year.
- With 3 meetings left this implies at least one 50 bp cut, or the unlikely possibility of an inter-meeting cut.

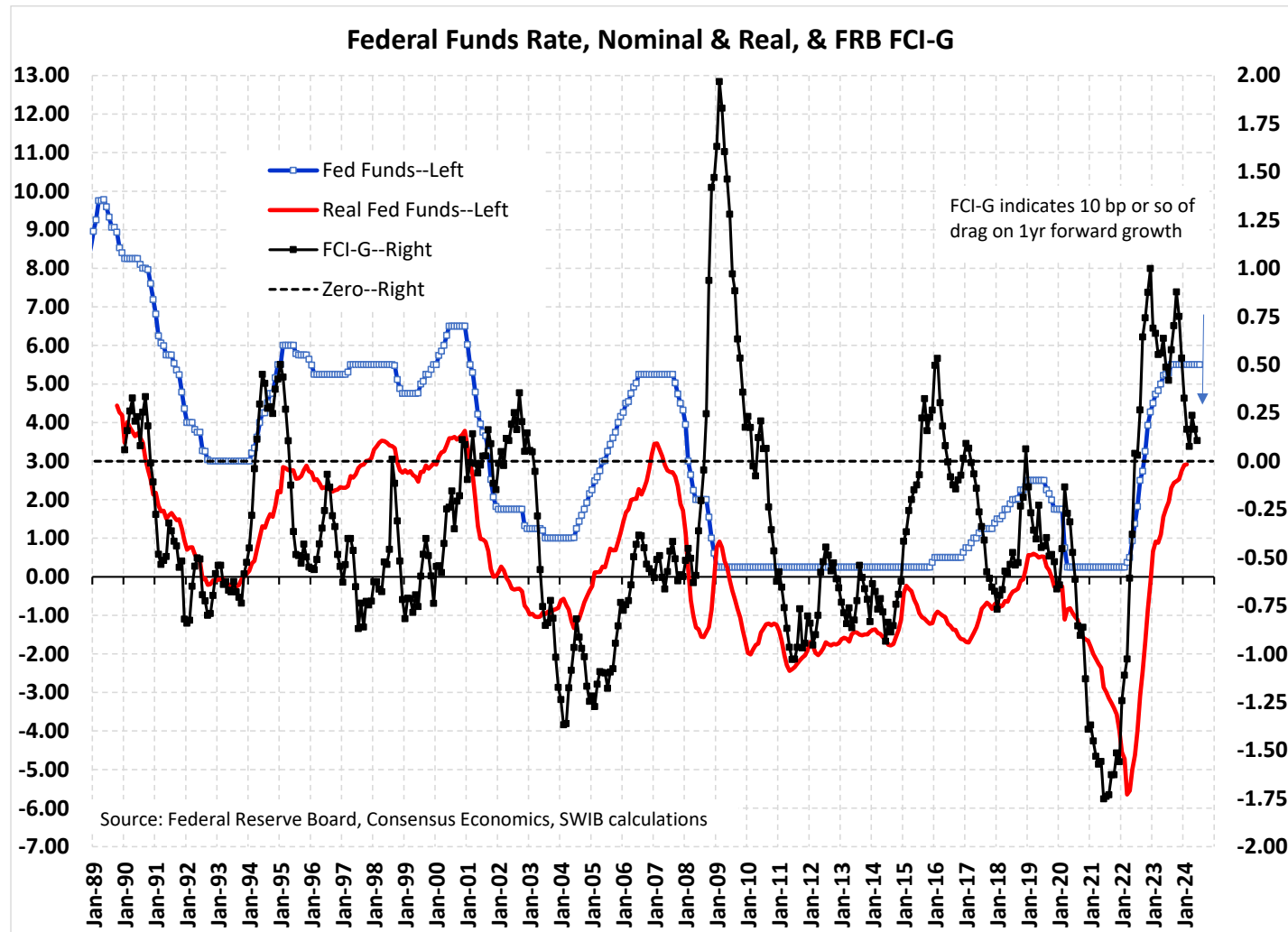
Growth

- SWIB view is for slowing of Q4/Q4 growth to +1.7% in 2024, from a strong +3.1% in 2023
- Consumer spending growth likely to slow somewhat
- Non-residential structures and state and local government investment also moderating

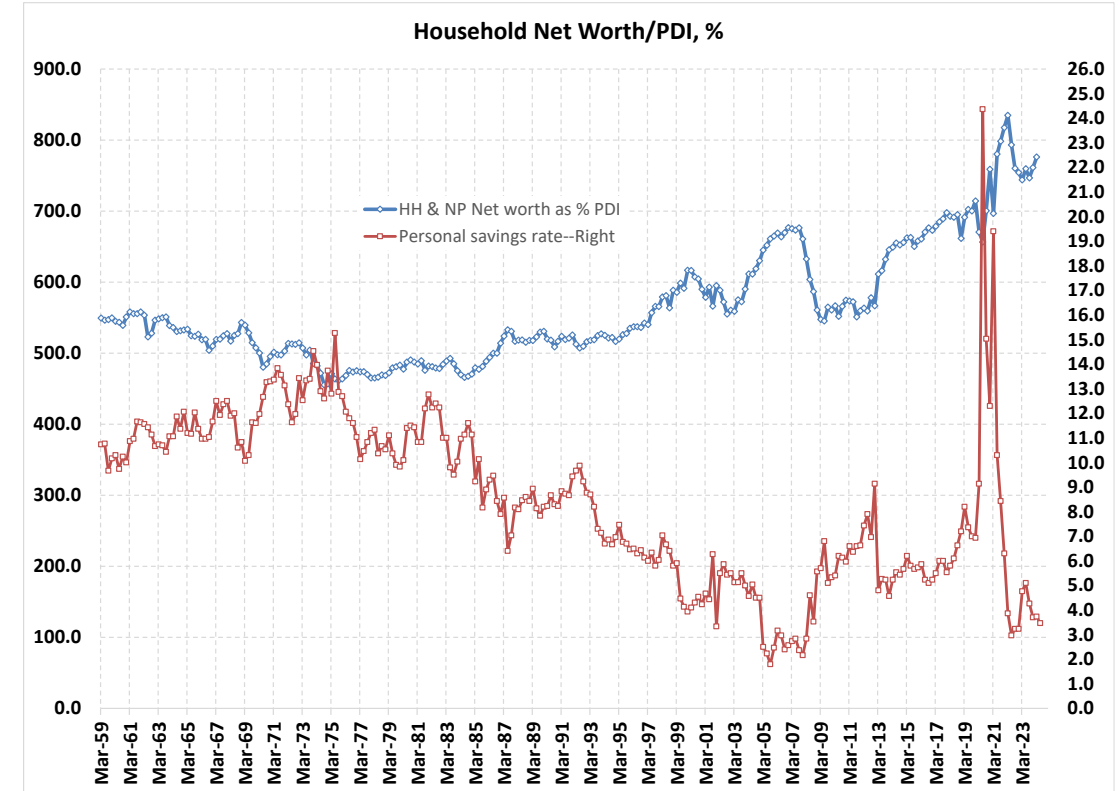
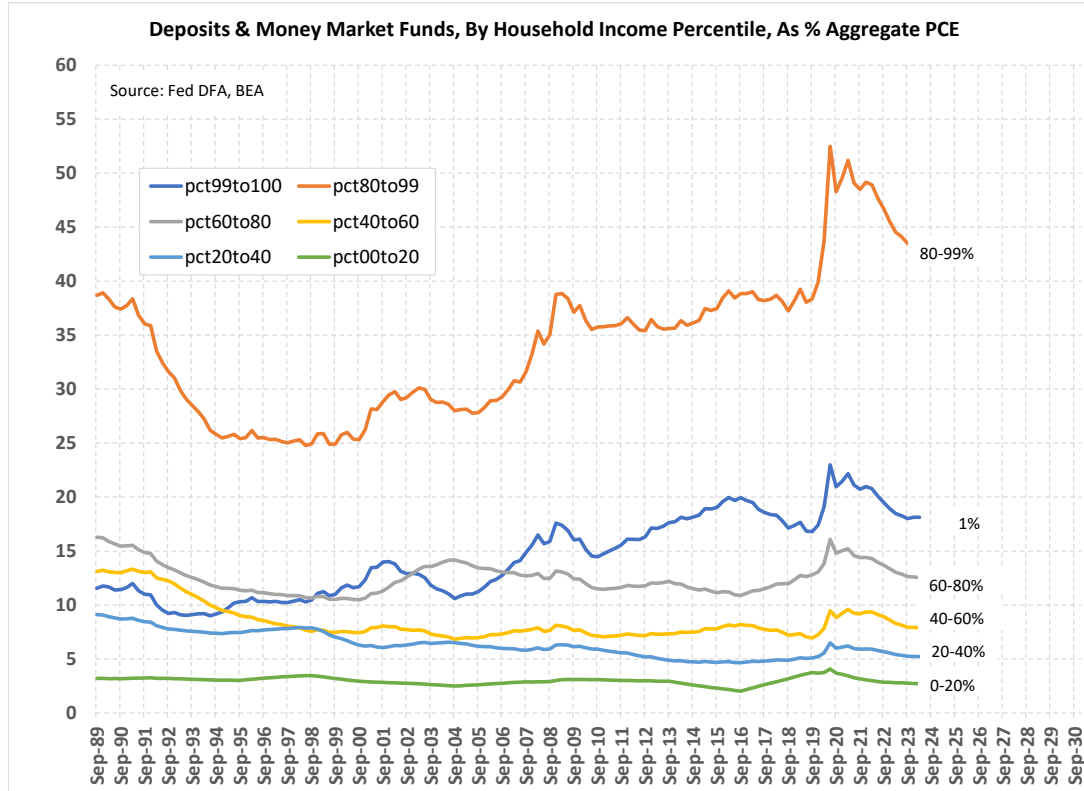
US Real GDP Q/Q SAAR									US Real GDP			Annual Average		
	Q1'23	Q2'23	Q3'23	Q4'23	Q1'24	Q2'24	Q3'24	Q4'24	2022	2023	2024	2022	2023	2024
Real GDP	2.2	2.1	4.9	3.4	1.4	2.8	1.4	1.4	0.7	3.1	1.7	1.9	2.5	2.5
Private consumption	3.8	0.8	3.1	3.3	1.5	2.3	2.2	1.5	1.2	2.7	1.9	2.5	2.2	2.2
Private fixed inv	3.1	5.2	2.6	3.5	7.0	3.6	6.0	1.9	-0.8	3.6	4.6	1.3	0.6	4.6
Nonresidential	5.7	7.4	1.5	3.8	4.4	5.2	2.1	3.3	5.6	4.6	3.7	5.2	4.5	3.9
Structures	30.3	16.1	11.2	10.9	3.4	-3.4	0.0	2.5	0.8	16.9	0.6	-2.1	13.2	4.6
Equipment	-4.1	7.7	-4.4	-1.1	1.6	11.6	1.5	1.8	5.3	-0.6	4.0	5.2	-0.3	2.5
Intel property	3.8	2.7	1.8	4.3	7.7	4.5	4.0	5.0	8.3	3.1	5.3	9.1	4.5	4.8
Residential	-5.3	-2.2	6.7	2.8	16.0	-1.4	0.5	-4.0	-17.4	0.4	2.5	-9.0	-10.6	4.5
Δ in private inventories*	-2.3	-0.2	1.1	-0.4	-0.5	0.8	0.0	0.2	-0.3	-0.4	0.1	0.5	-0.4	0.1
Net exports G&S*	0.6	0.1	0.0	0.2	-0.7	-0.8	-0.4	-0.4	0.1	0.2	-0.6	-0.5	0.6	-0.4
Exports G&S	6.8	-9.3	5.4	5.0	1.6	2.0	-0.8	0.3	4.3	1.8	0.8	7.0	2.6	1.7
Imports G&S	1.3	-7.6	4.2	2.2	6.1	6.9	2.2	3.0	2.1	-0.1	4.5	8.6	-1.7	3.7
Govt consn & inv	4.8	3.3	5.8	4.6	1.8	3.1	2.5	1.3	0.8	4.6	2.2	-0.9	4.1	3.2
Final domestic demand	3.8	2.0	3.5	3.5	2.4	2.7	3.0	1.5	0.8	3.2	2.4	1.7	2.3	2.8
Private final domestic demand	3.6	1.7	3.0	3.3	2.6	2.6	3.0	1.6	0.8	2.9	2.4	2.3	1.9	2.7
Real GDP, SWIB	2.2	2.1	4.9	3.4	1.4	2.8	1.4	1.4	0.7	3.1	1.7	1.9	2.5	2.5
Bloomberg consensus 16-Aug-24	2.2	2.1	4.9	3.4	1.4	2.8	1.5	1.5	0.7	3.1	1.6	1.9	2.5	2.3
Fed SEP 12-Jun-24	--	--	--	--	--	--	--	--	--	--	2.1	--	--	--

* Contribution to growth

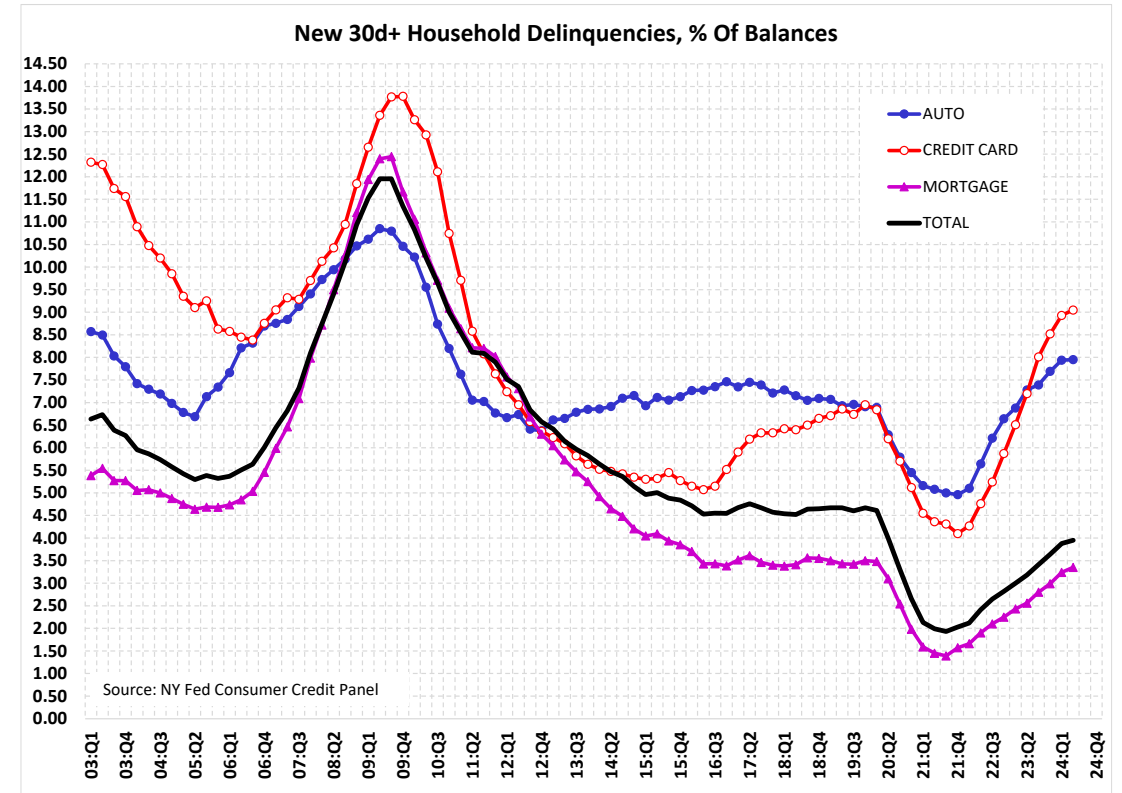
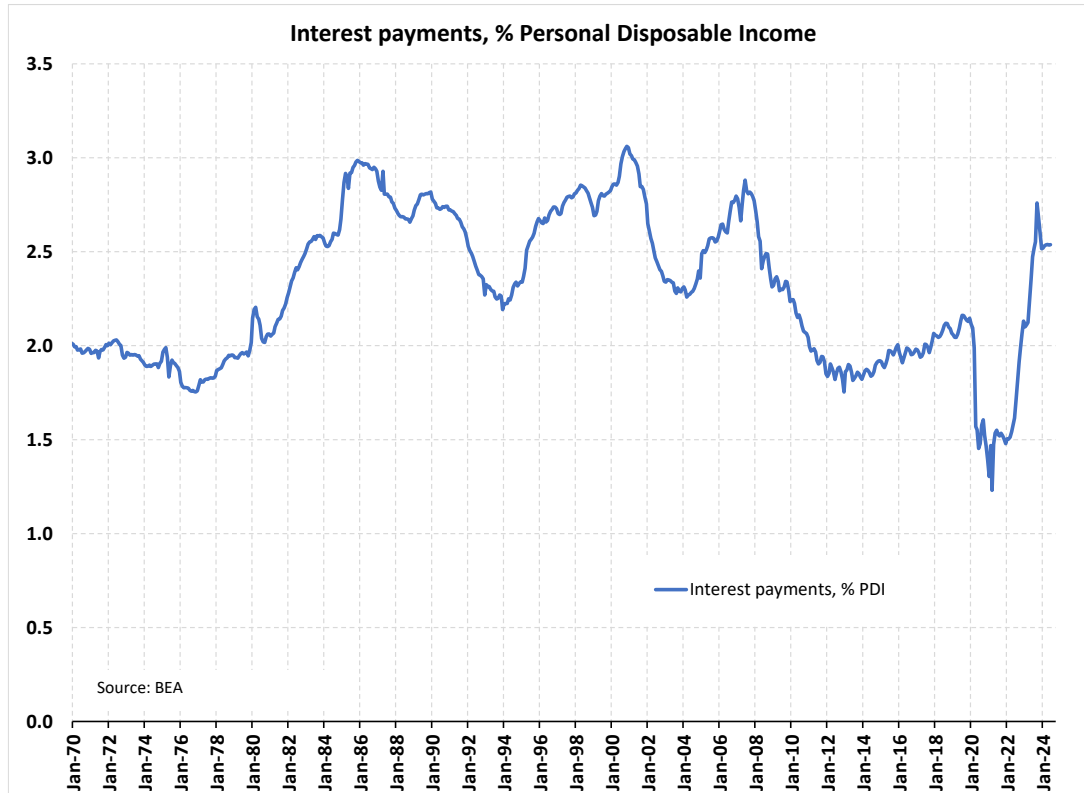
Fed tightening cycle has ended, but policy remains restrictive. FCI-G, the Fed's composite index of financial conditions, still indicates a modest drag on 1yr forward GDP growth.



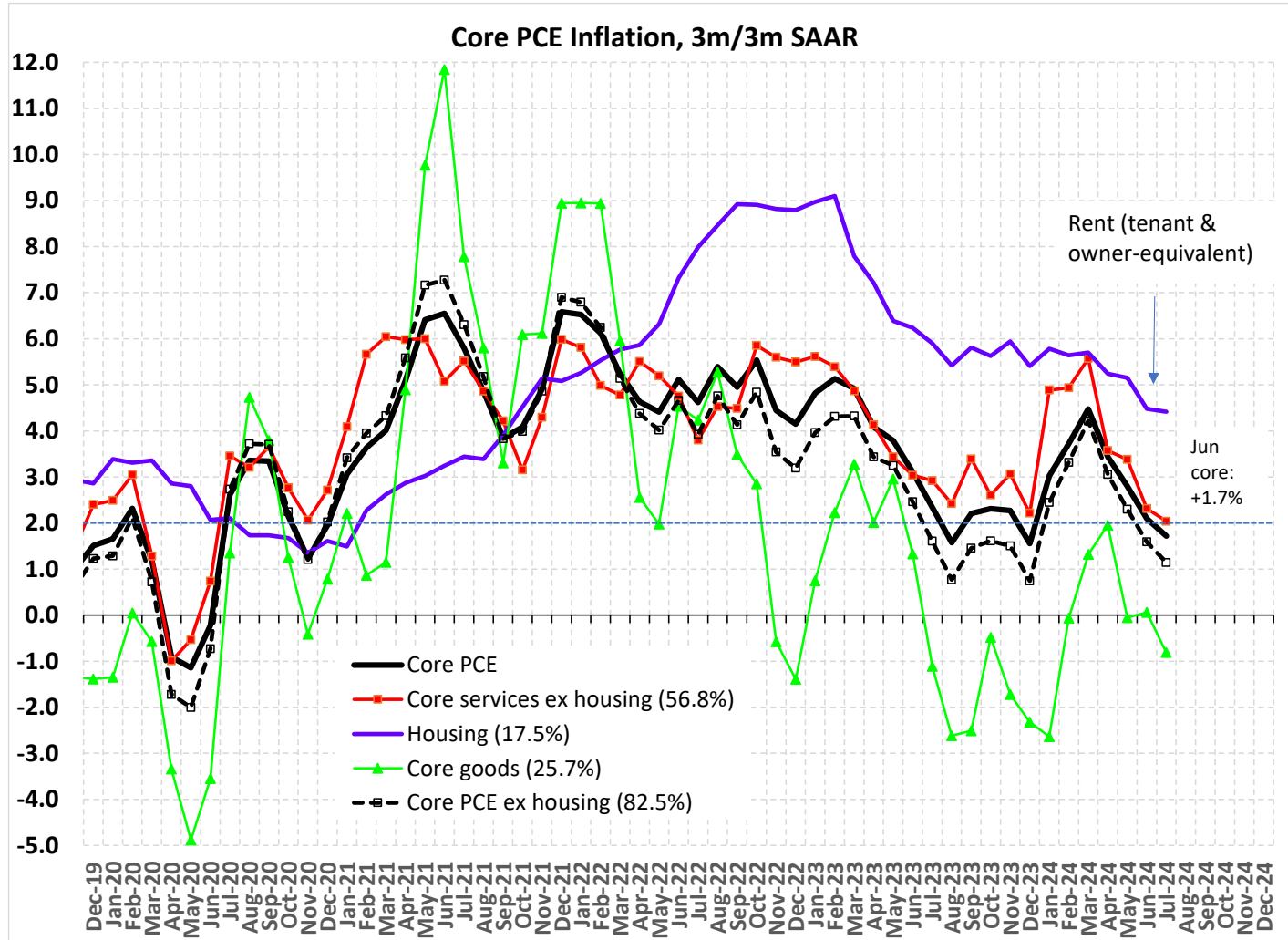
High household liquid balances due to COVID stimulus have been run down, and eroded by pricier consumption, especially in the lower income quintiles. Savings rate near record lows, held down to a degree by wealth effects.



While household finances are generally in decent shape, interest burden has risen on floating-rate debt. Auto and card delinquencies are rising.

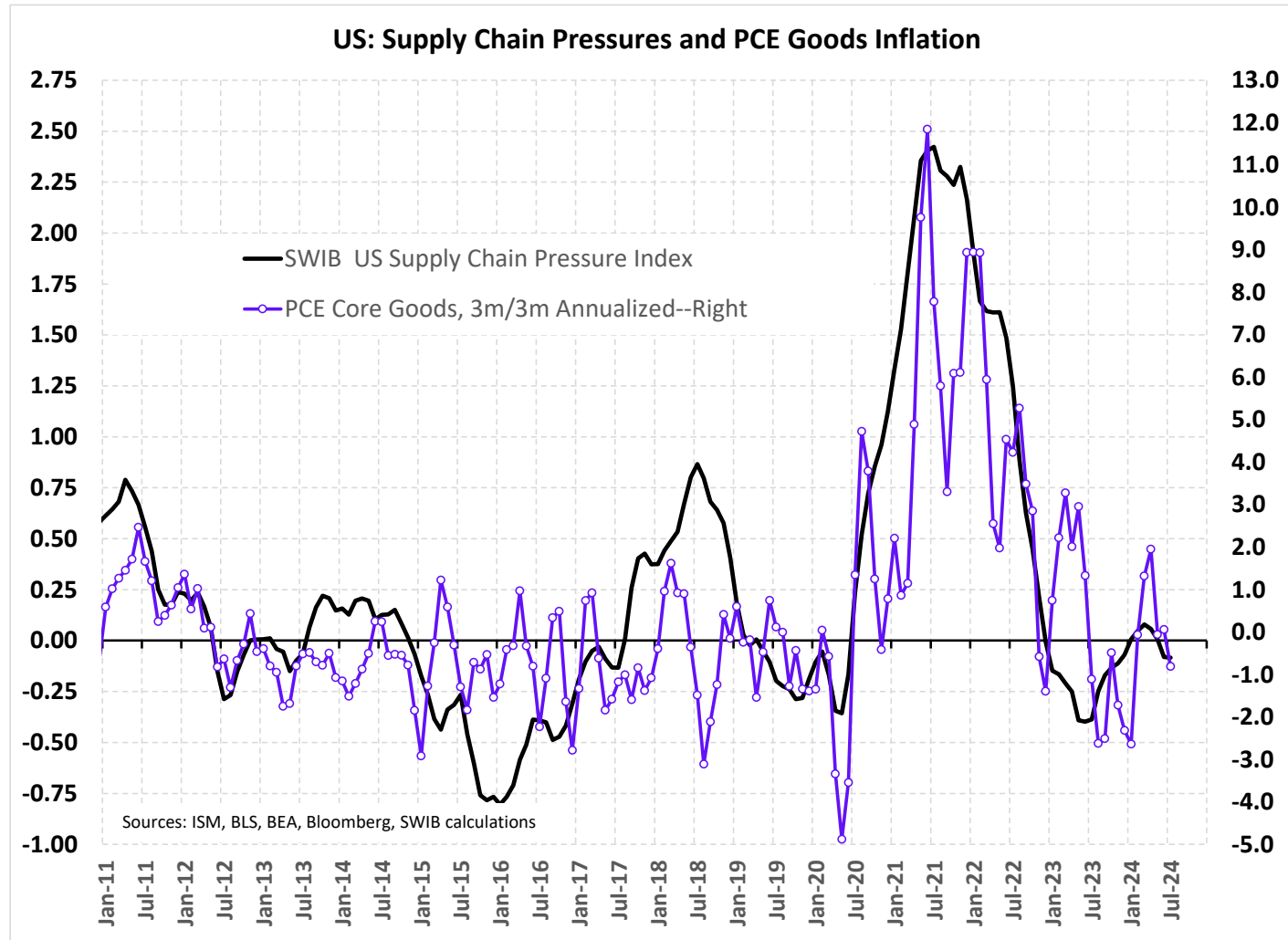


Jul-24 core PCE inflation eased to +1.7% 3m/3m



- Core PCE inflation is moderating after a pickup early in the year.
- Services ex housing, housing, and goods inflation all moving in the right direction

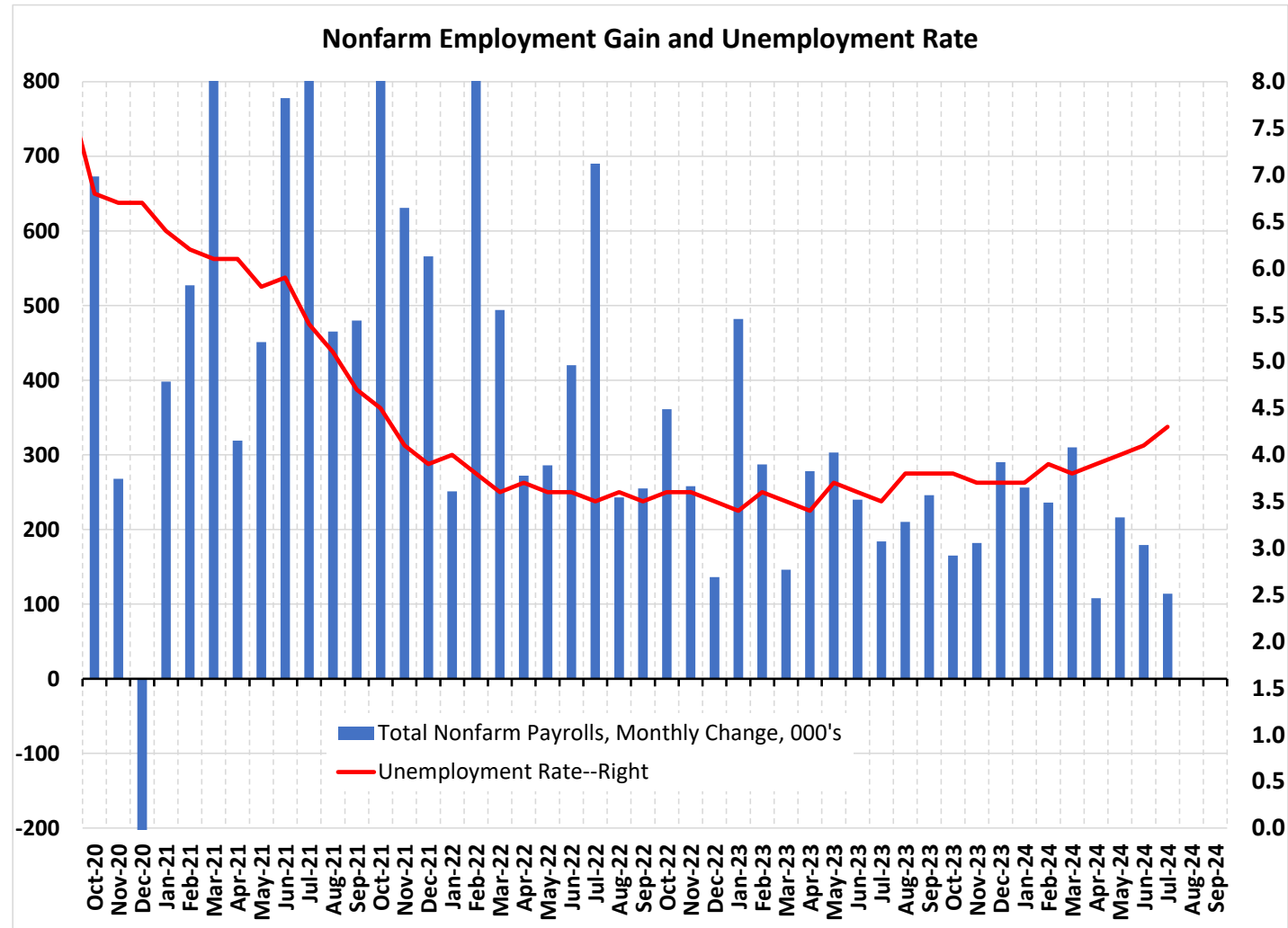
Supply chain pressures have moved from deflationary to neutral



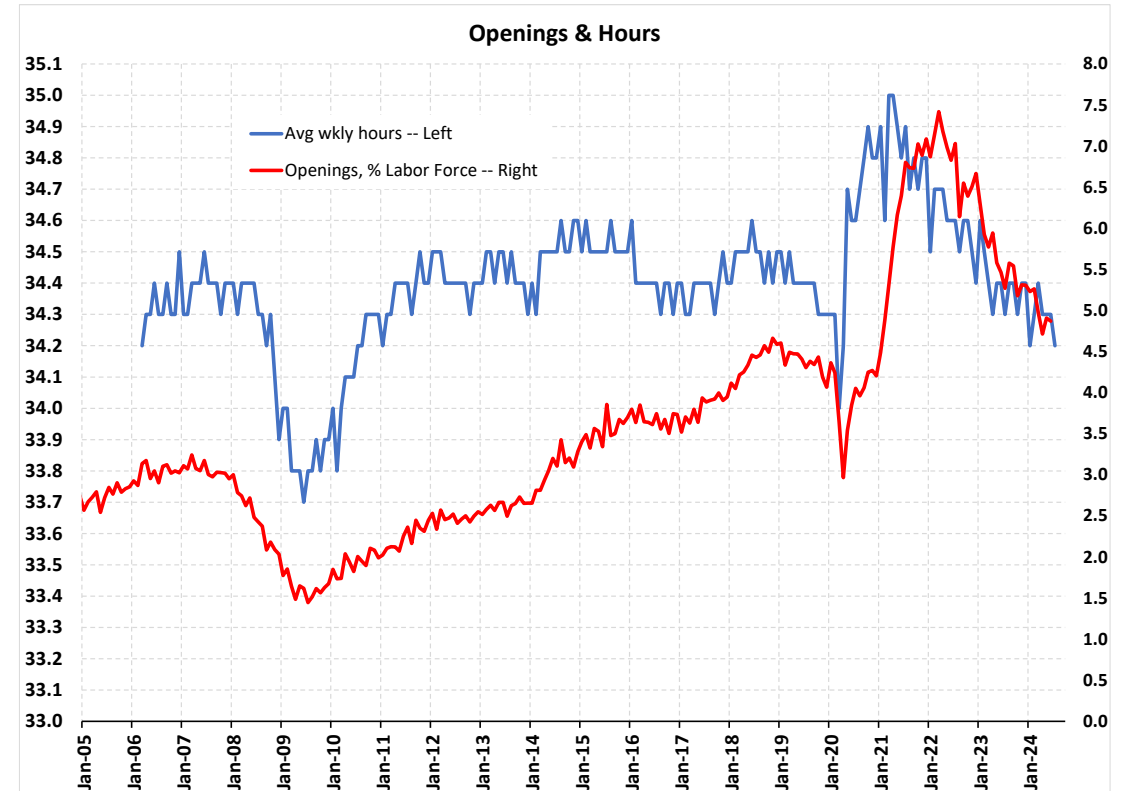
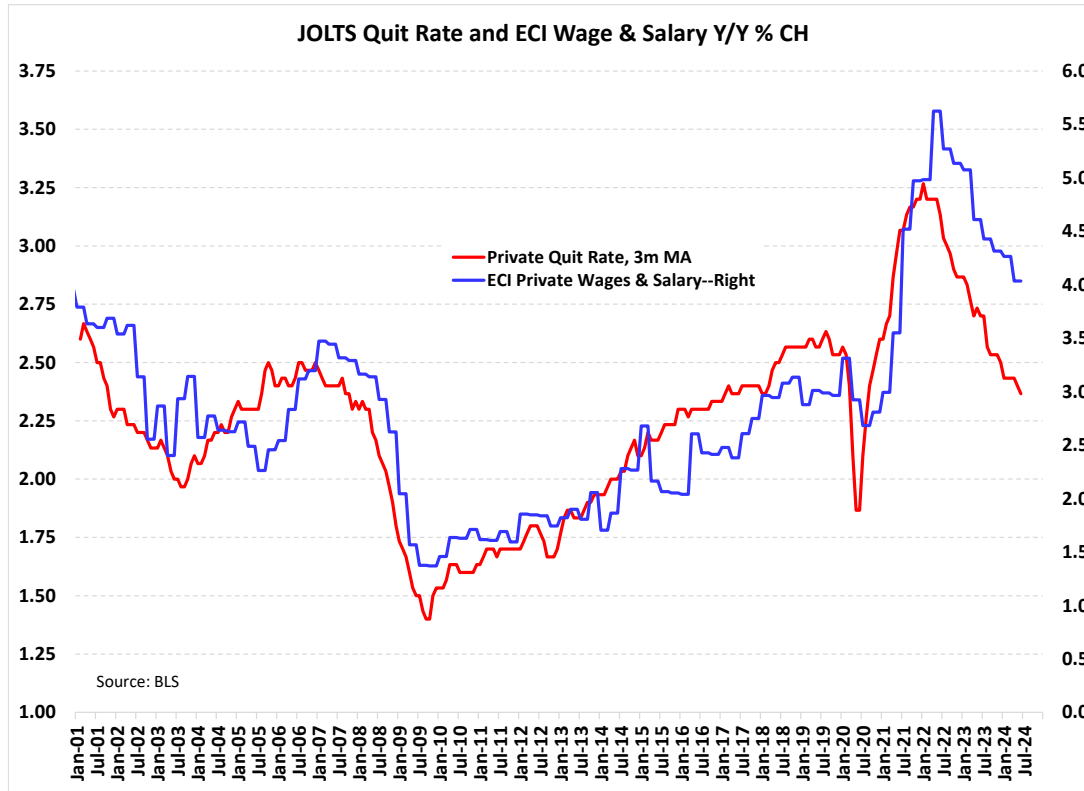
SWIB outlook is for moderating inflation, in line with consensus and last FOMC SEP

Core PCE Outlook	Wgt	Y//Y		
		Dec-23	Dec-24	Dec-25
Core PCE	100.0%	2.9	2.7	2.3
New motor vehicles	2.3%	1.0	0.0	0.0
Used motor vehicles	1.4%	-1.0	-5.0	-1.0
Other durable goods	9.4%	-3.4	-0.5	1.0
Core nondurables	12.6%	2.3	2.2	2.0
Housing	17.5%	6.3	5.3	3.5
Core utilities	0.8%	5.3	4.0	3.0
Health care	18.6%	2.5	2.3	2.2
Motor vehicle rental	0.2%	-12.3	0.0	0.0
Air transportation	1.2%	3.3	3.5	2.5
Other transp services	2.3%	5.0	3.0	2.5
Food services	7.2%	5.1	3.5	3.0
Accommodation	1.2%	0.9	1.5	2.0
Education services	2.0%	2.1	2.0	2.0
Financial & insurance	8.2%	3.1	3.0	2.5
Other household svcs	11.7%	2.4	3.0	2.0
Non-profit consumption	3.4%	4.5	2.5	2.5
Core PCE forecasts		Dec-23	Dec-24	Dec-25
SWIB		2.9	2.7	2.3
FOMC SEP 12-Jun-24		2.9	2.8	2.3
BBG Consensus 16-Aug-24		2.9	2.7	2.2

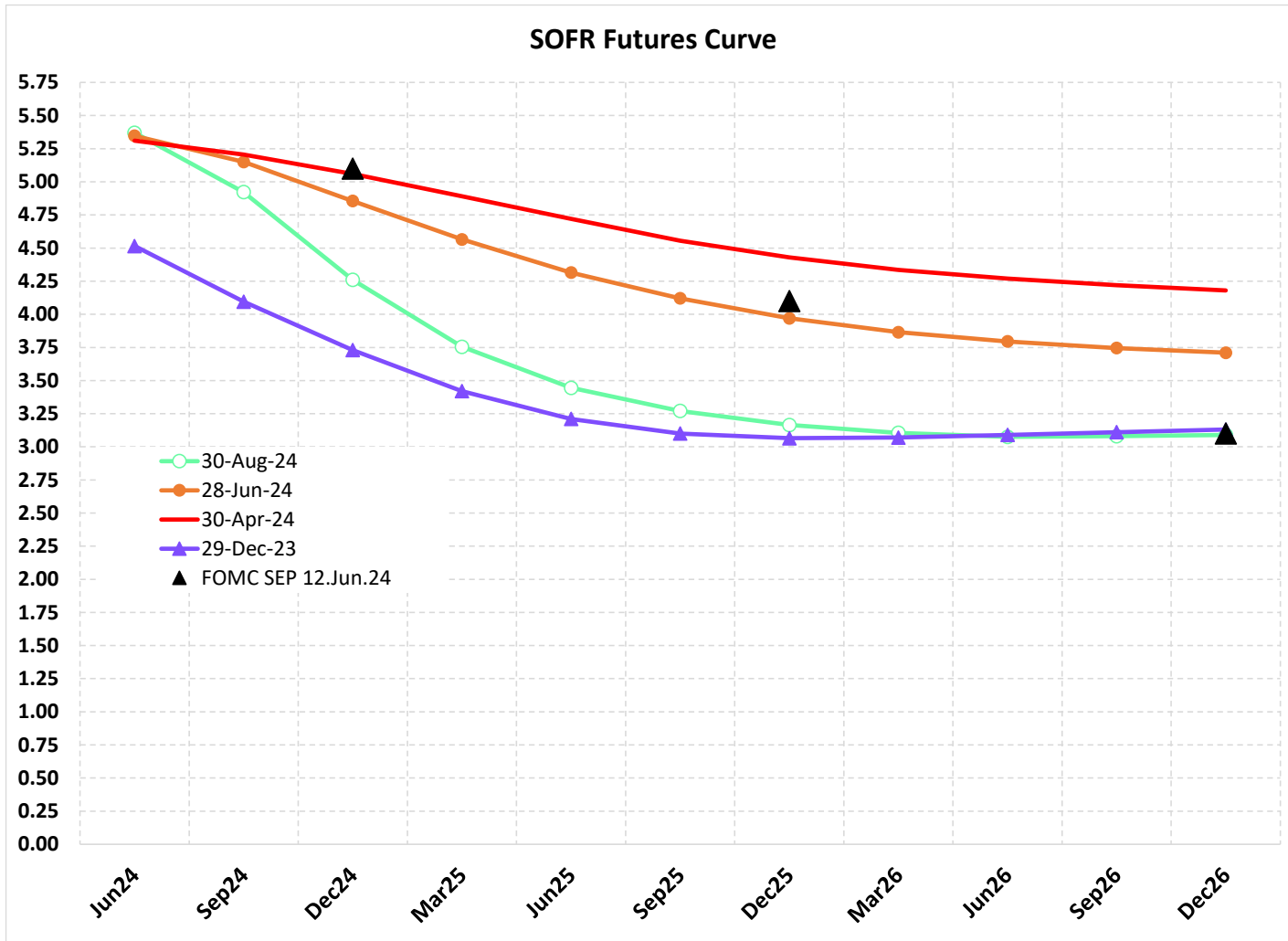
Job gains moderating and the unemployment rate has crept up to 4.3%



Quit rate, weekly hours, and openings have declined, indicating a near-balanced labor market. Wage & salary growth has moderated but remains elevated.



SOFR futures have been up and down this year—currently pricing 100 bp of Fed cuts by 18-Dec-24 meeting



● Next Fed decision (and new SEP) comes on 18-Sep

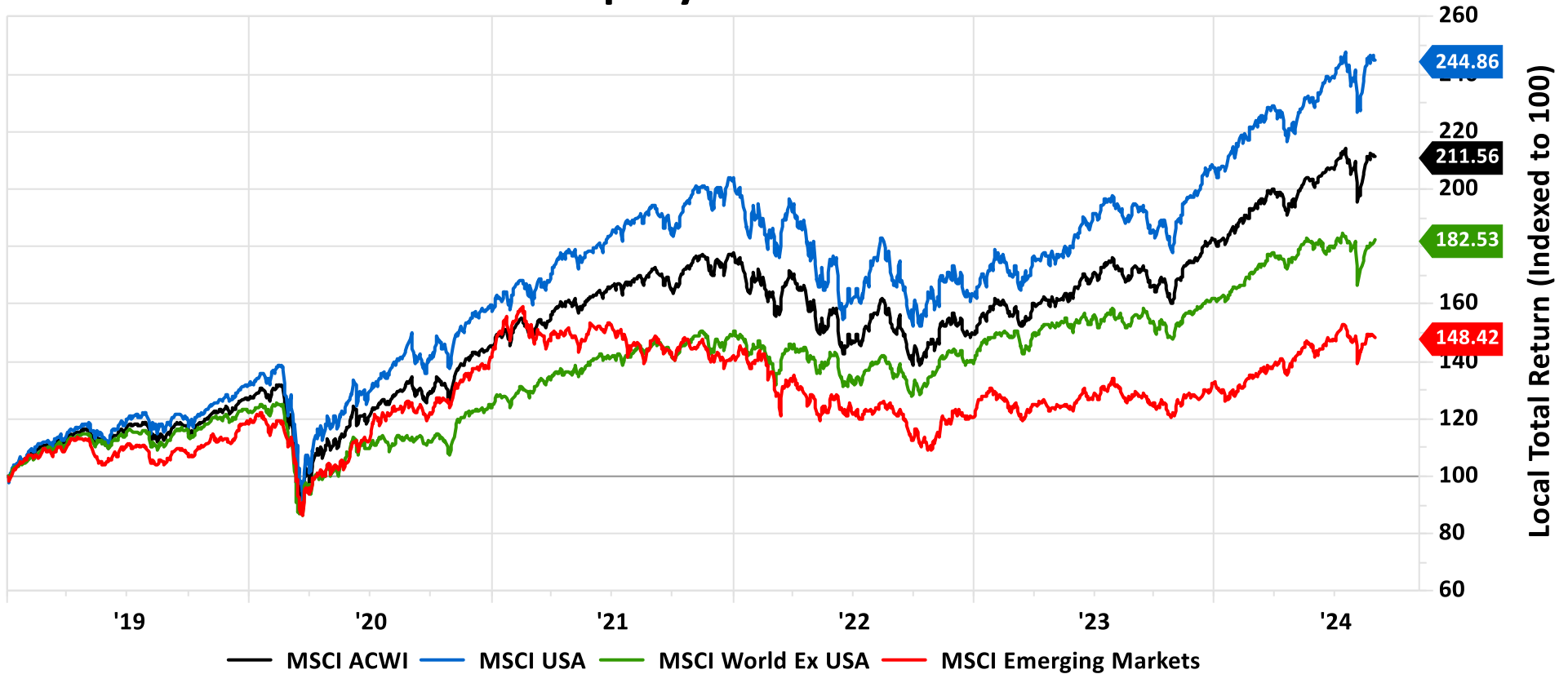
Asset Class Review

Global Equities - Performance

Both DM and EM equities were volatile in the last few weeks

08/30/2024

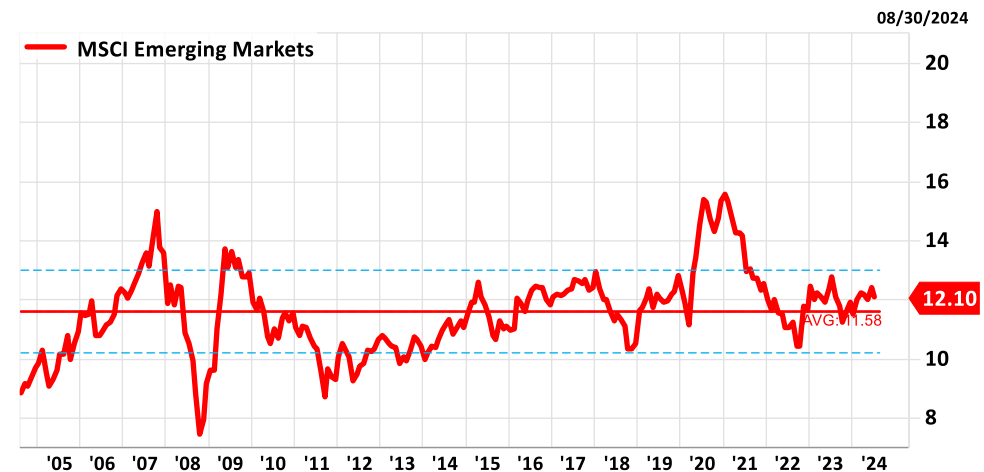
Local Equity Performance



Source: FactSet

Global Equities - Valuation

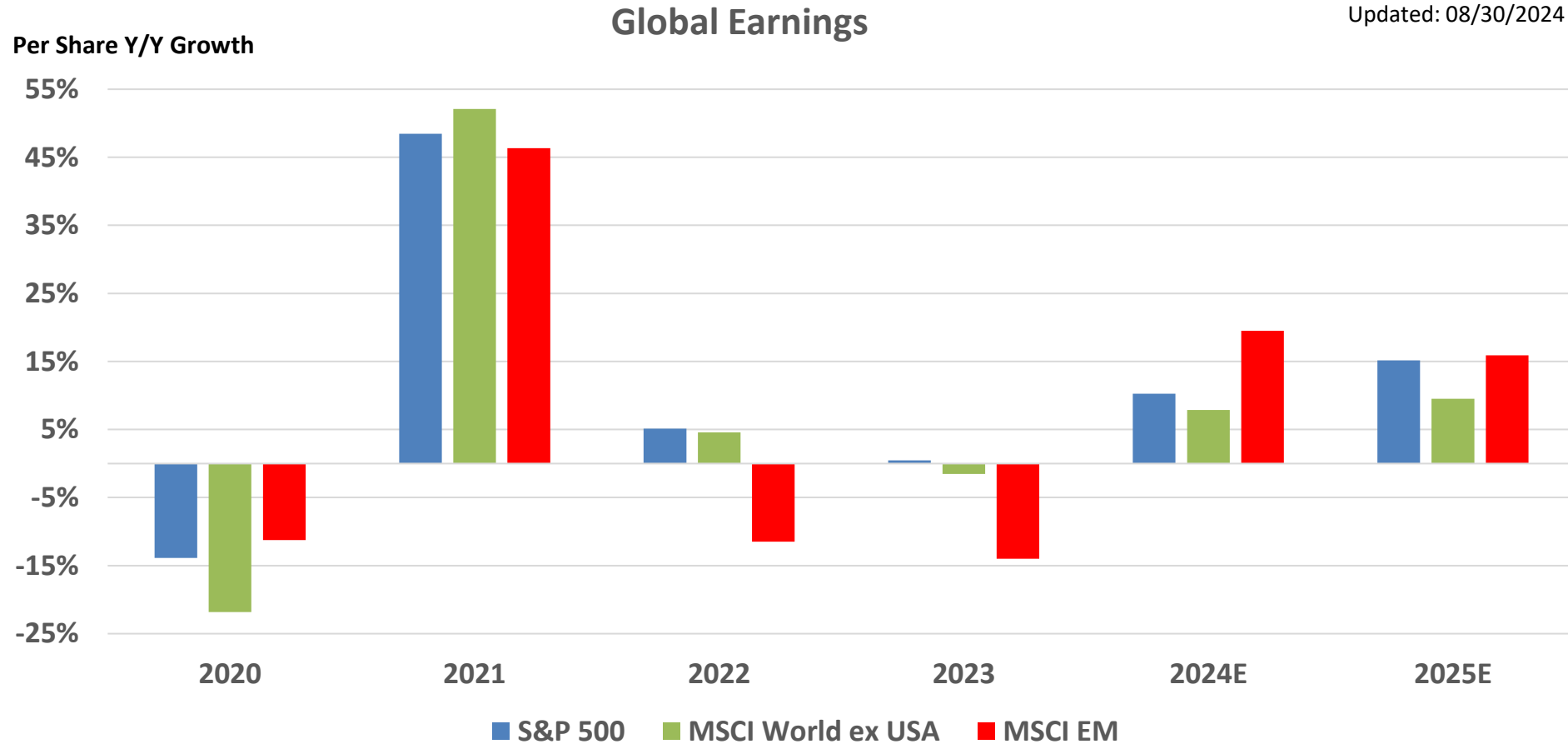
US P/E ratio is above one standard deviation of its 20-year average



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

Earnings Growth

Strong EM rebound forecasted through 2025



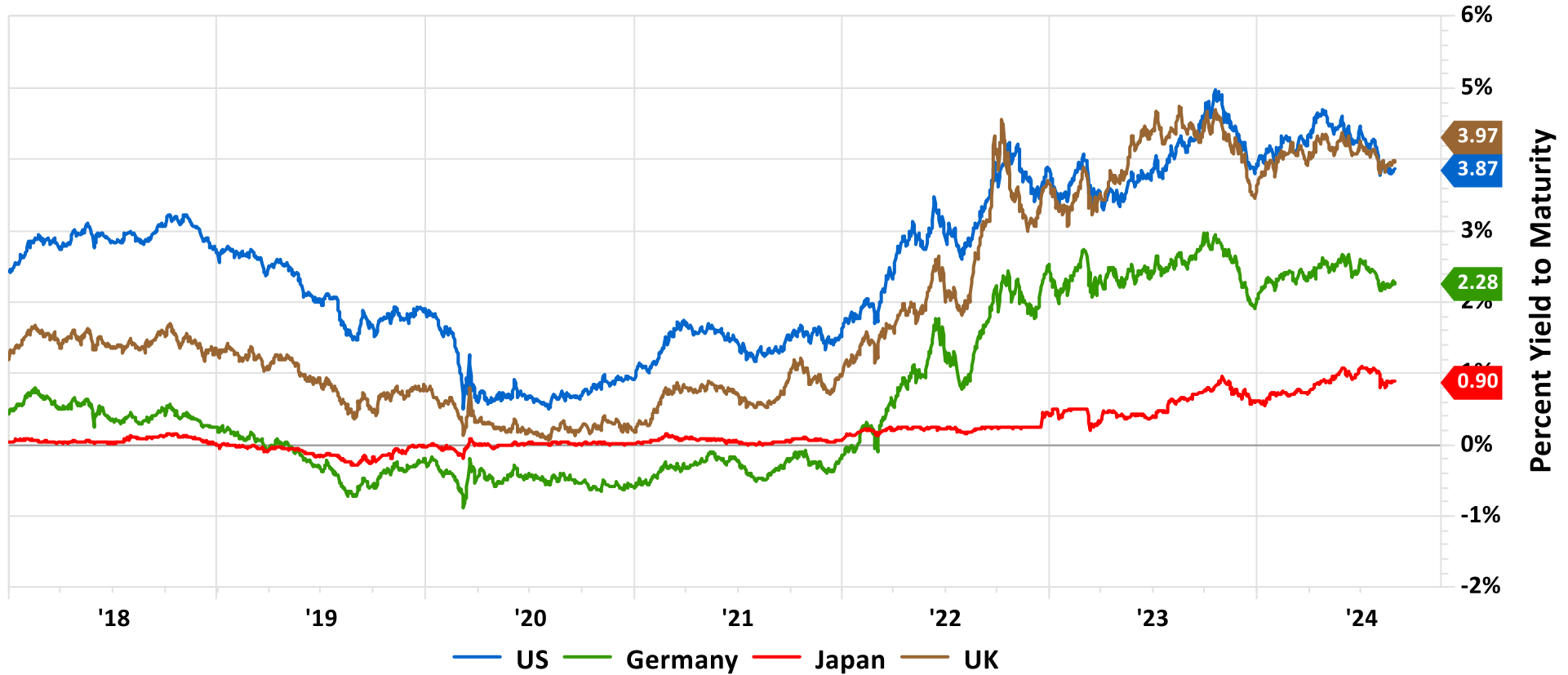
Source: Analyst Consensus; FactSet

Global Bonds

DM yields have decreased in recent months

08/30/2024

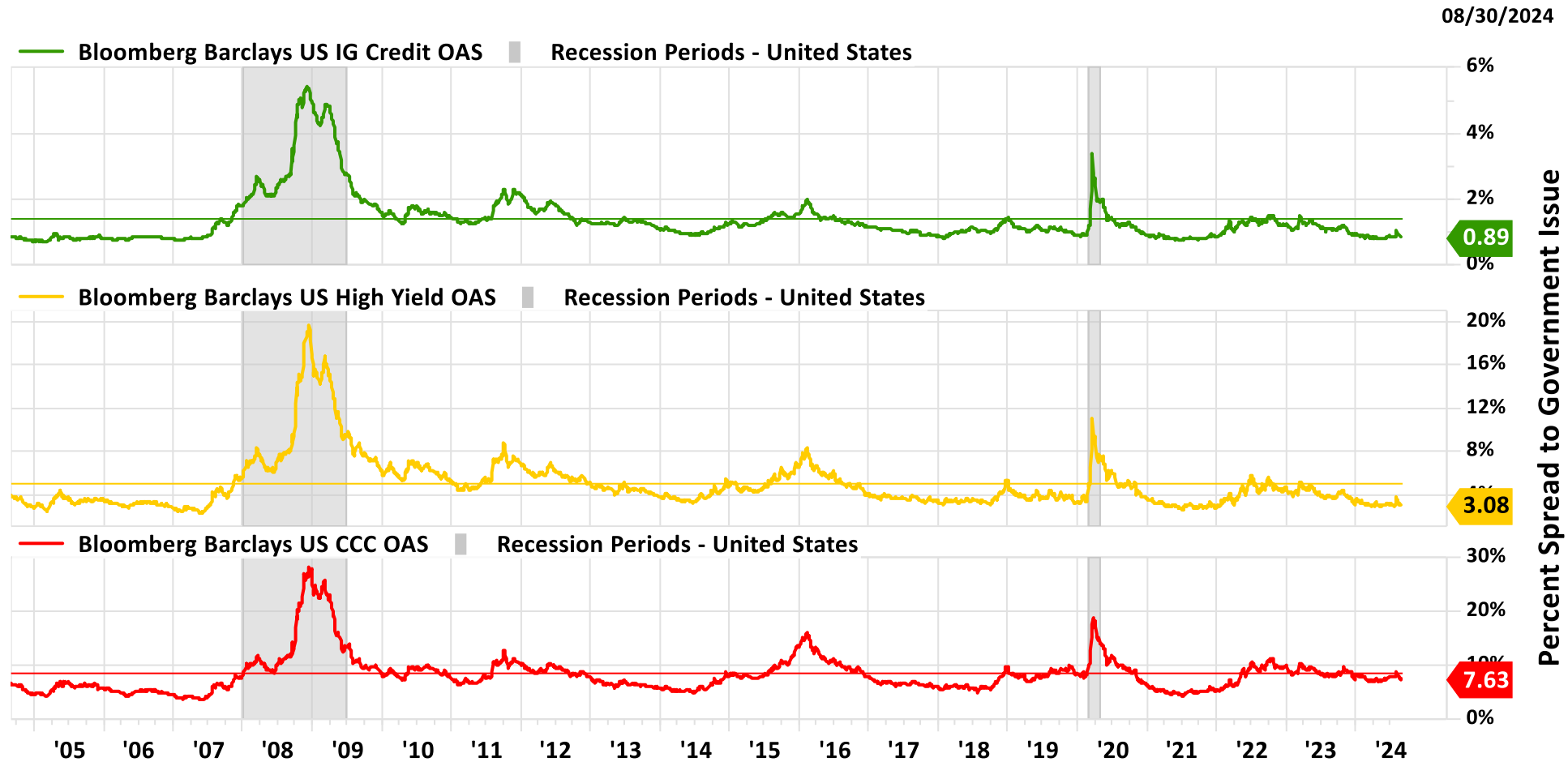
10-Year Government Bond Yields



Source: FactSet

Credit Sectors

Spread levels are below the long run averages

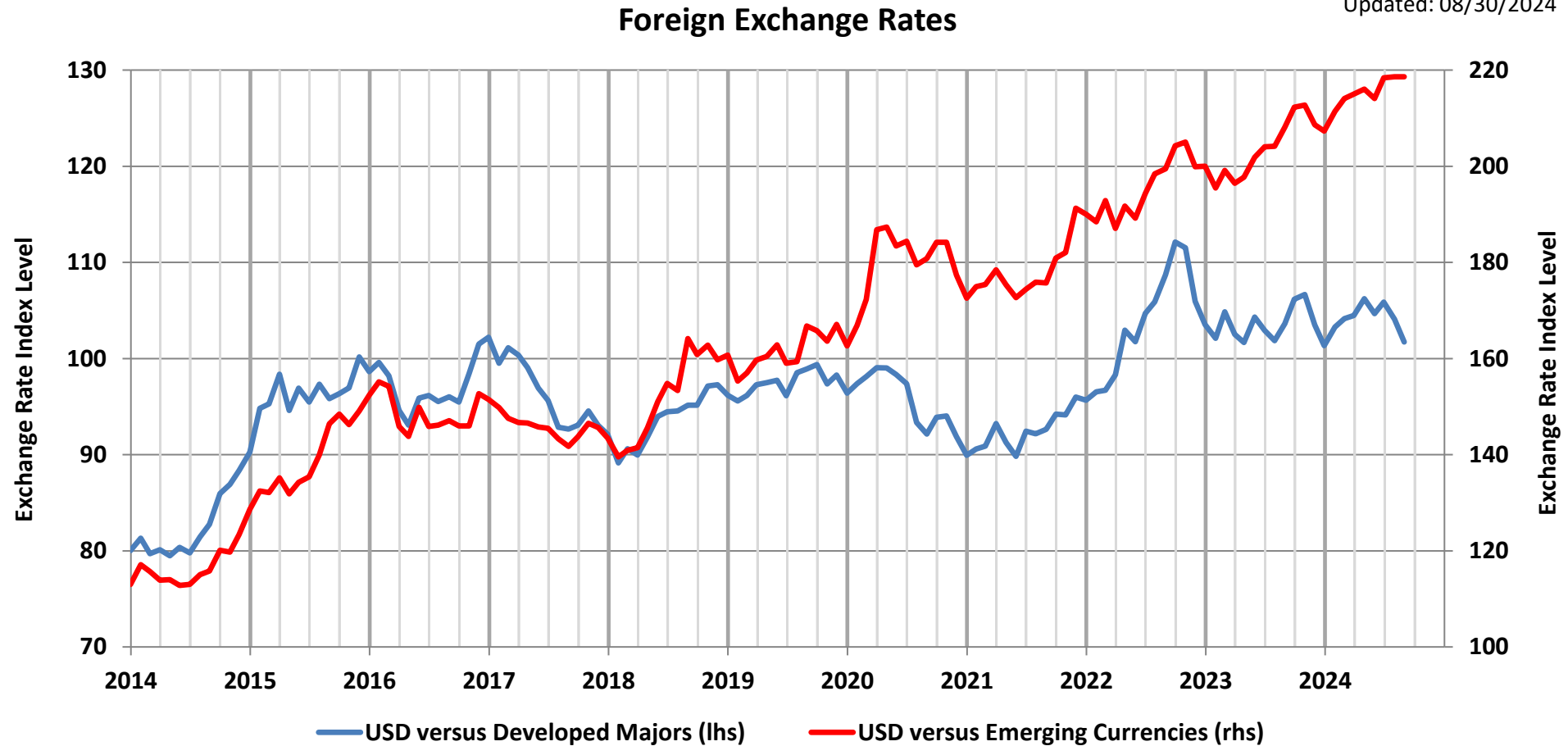


Source: FactSet

Currency Performance

USD versus DM remains in range; strength versus EM currencies continues

Updated: 08/30/2024



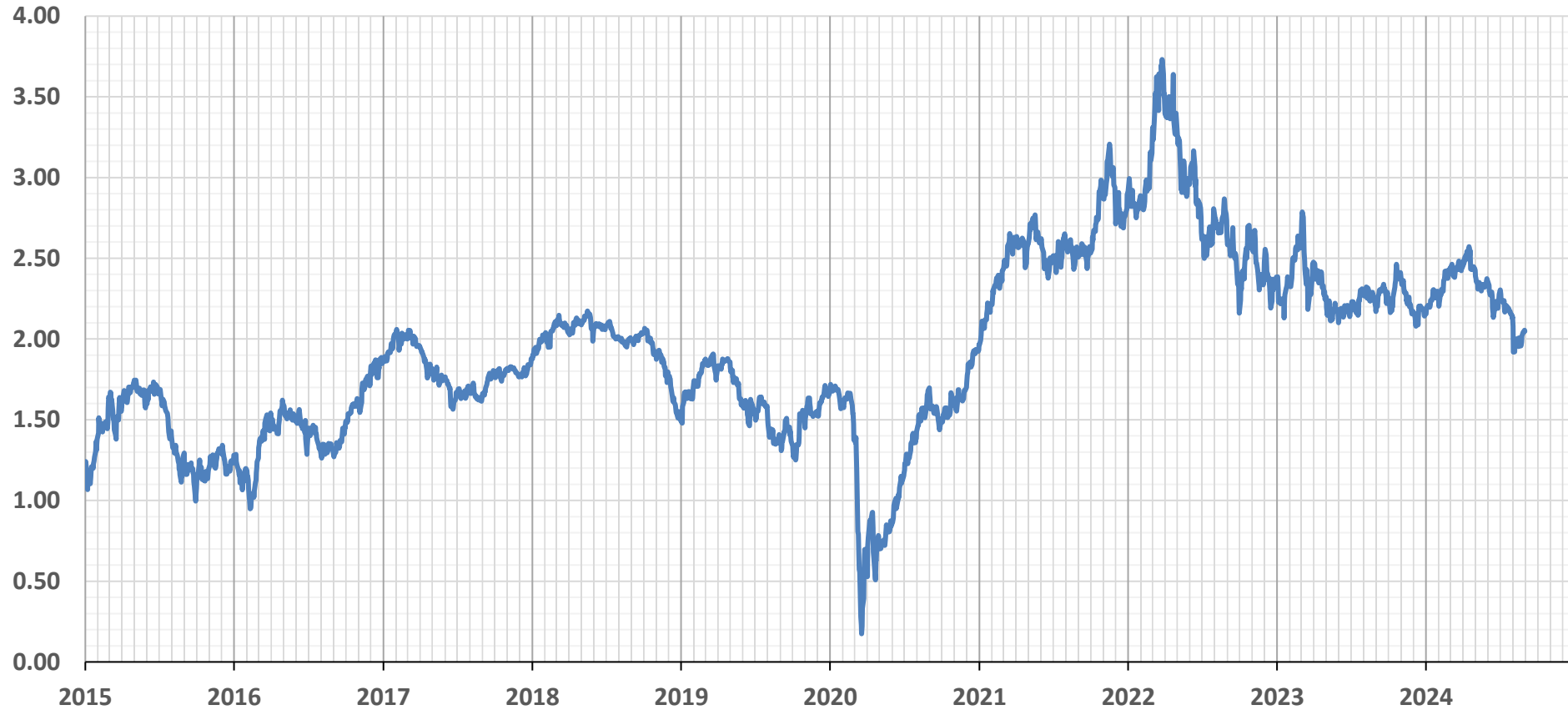
Source: Bloomberg, DXY Index, JPM Emerging Markets Currency Index (Inverted)

U.S. Inflation

Medium term expectations have declined significantly in recent months

As of: 08/30/2024

US 5 Year Breakeven Inflation



Source: Bloomberg

Board Meeting

Tab 8 – Announcement of Matters Taken Up in Closed Session

Board Meeting

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

- A. Quarterly Charges to Funds Reports, Q2 2024
- B. Private Markets and Funds Alpha Commitments, Q2 2024
- C. Board Contact Log

August 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 June 30, 2024.

Total Cost of Management Summary	3Q 2023	4Q 2023	1Q 2024	2Q 2024	Trailing 4 Qtr Total	% of Total
Internal Operating Expenses						
Operating Budget Expenses	\$ 29,927,680	\$ 30,466,430	\$ 16,684,634	\$ 53,105,483	\$ 130,184,227	72.3%
Custodial, Investment Operations & Banking	2,137,630	2,213,596	2,085,638	2,351,406	8,788,270	4.9%
Legal	489,077	254,543	470,162	82,559	1,296,341	0.7%
Investment Research & Consulting	10,199,330	7,637,651	9,086,537	8,818,009	35,741,527	19.8%
Total Internal Operating Expenses	\$ 42,753,717	\$ 40,572,220	\$ 28,326,971	\$ 64,357,457	\$ 176,010,365	97.7%
Total Securities Lending Agent Expenses	\$ 971,498	\$ 1,086,188	\$ 1,104,239	\$ 942,792	\$ 4,104,717	2.3%
Total SWIB Operating Costs	\$ 43,725,215	\$ 41,658,408	\$ 29,431,210	\$ 65,300,249	\$ 180,115,082	100.0%
Externally Managed Separate Account Fees						
Beta One & Other - Separately Managed	\$ 4,854,855	\$ (1,657,872)	\$ 21,469,368	\$ 558,616	\$ 25,224,967	3.1%
Supplemental Information - External Fund Fees						
Real Estate	\$ 21,806,743	\$ 21,208,015	\$ 21,563,935	\$ 21,501,161	\$ 86,079,854	10.5%
Private Equity & Venture Capital	58,359,821	65,850,965	55,512,830	76,352,891	256,076,507	31.3%
Hedge Funds	93,214,422	70,745,475	108,182,074	72,599,021	344,740,992	42.2%
Beta One & Other - External Funds	16,839,386	371,046	52,379,087	35,263,865	104,853,384	12.8%
Total External Investment Management Fees	\$ 195,075,227	\$ 156,517,629	\$ 259,107,295	\$ 206,275,554	\$ 816,975,705	100.0%
Grand Total Cost of Management	\$ 238,800,442	\$ 198,176,037	\$ 288,538,505	\$ 271,575,803	\$ 997,090,787	

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 June 30, 2024, SWIB's total authorized full-time equivalent positions are 298 as shown in the table below.

Assets Under Management & Positions		
	3/31/2024	6/30/2024
Internal Management	45.2%	44.8%
External Management	54.8%	55.2%
Total SWIB Positions	298	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									
	9/30/2023		12/31/2023		3/31/2024		6/30/2024		
	Amount		Amount		Amount		Amount		
	(in millions)	%	(in millions)	%	(in millions)	%	(in millions)	%	
Wisconsin Retirement System (WRS)									
Internally Managed Assets	\$46,836	37.6%	\$50,381	38.0%	\$51,697	37.8%	\$51,414	37.4%	
Externally Managed Dedicated Assets	29,716	23.9%	32,166	24.3%	36,294	26.6%	35,951	26.2%	
Externally Managed Commingled Assets	47,996	38.5%	49,854	37.7%	48,357	35.5%	49,644	36.2%	
1. Passive Index	916	0.7%	788	0.6%	741	0.5%	761	0.6%	
2. Limited Partnerships	33,681	27.0%	34,302	25.9%	34,657	25.4%	35,214	25.7%	
3. Active Managed Commingled	13,399	10.8%	14,764	11.2%	12,959	9.5%	13,669	10.0%	
Total WRS Assets	\$124,548	100.0%	\$132,401	100.0%	\$136,348	100.0%	\$137,009	100.0%	
Other Funds									
State Investment Fund - Internally Managed	\$19,995		\$19,853		\$20,430		\$20,327		
Separately Managed Funds - Internally Managed	\$89		\$97		\$94		\$93		
Separately Managed Funds - Externally Managed	\$2,538		\$2,710		\$2,751		\$2,770		
Total Other Funds	\$22,622		\$22,660		\$23,276		\$23,190		
Total Assets Under Management	\$147,170		\$155,062		\$159,624		\$160,199		
Supplemental AUM Breakout									
Total Internal Assets Under Management	\$66,919	45.5%	\$70,332	45.4%	\$72,222	45.2%	\$71,834	44.8%	
Total External Asset Under Management	\$80,251	54.5%	\$84,730	54.6%	\$87,402	54.8%	\$88,365	55.2%	

STATE OF WISCONSIN INVESTMENT BOARD
Expenses for All Funds Under Management
Quarter Ending June 30, 2024

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES *
<u>Internal Expenses</u>		
Staff Compensation	Staff Compensation	\$ 43,535,973
Fringe Benefits	Fringe Benefits	7,166,752
Supplies, Travel & Facilities	General Supplies & Services	2,402,758
Total Internal Expenses		\$ 53,105,483
<u>Custodial, Investment Operations and Banking Fees</u>		
BNY Asset Servicing - Custody	Master Custody Services	\$ 632,266
BNY Asset Servicing - Investment Operations	Investment Operating Services	1,532,022
Markit Group Limited	Investment Consulting Services	163,325
Markit NA	Investment Data Management Software	23,793
Total Custodial, Investment Operations and Banking Fees		\$ 2,351,406
<u>Legal Fees</u>		
Chapman & Cutler LLP	Legal Work for Investment Strategies	\$ 4,309
DLA Piper LLP (US)	Legal Work for Investment Strategies	87,026
Godfrey & Kahn SC	Legal Work for Investment Strategies	24,595
Latham & Watkins LLP	Legal Work for Investment Strategies	1,454
Legal Services Expense Accrual	Legal Work for Investment Strategies	(175,255)
Morgan, Lewis & Bockius LLP	Legal Work for Investment Strategies	598
Purrrington Moody Weill LLP	Legal Work for Investment Strategies	31,184
Quarles & Brady	Legal Work for Investment Strategies	77,864
Rutherford & Bechtold LLC	Legal Work for Investment Strategies	2,128
Vedder Price PC	Legal Work for Investment Strategies	28,657
Total Legal Fees		\$ 82,559
<u>Investment Counsel</u>		
12358433 Canada Inc.	Investment Consulting	\$ 13,500
3x108 Fintech Consulting Limited	Investment Consulting	153,621
AE Business Solutions	Investment Consulting Services	22,610
Aksia LLC	Hedge Fund Investment Consulting	293,750
Alembic Global Advisors	Market Research	3,500
Alex Solutions	Research and Data Services	43,000
Alliance Bernstein	Investment Research	19,500
Ampcus Inc.	Investment Consulting	12,000
Arthur Selender	Investment Consulting Services	2,000
B Riley FBR Inc	Investment Research	7,500
Backstop Solutions Group	Investment Software	71,003
Bank of America Merrill Lynch	Investment Research	57,375
Barrington Research Associates Inc	Investment Research	5,950
Barrons	Investment Research	158
BCA Research Inc	Global & Domestic Fixed Income Strategy Research	28,417
Berenberg	Investment Research	8,500
BiZZdesign United States Inc.	Enterprise Architecture Software	5,000
Blacklight Technology Partners, LLC	Research and Data Services	25,750
Blackrock Financial Management Inc	Risk Services	81,903
Bloomberg Finance LP	Market, Company, Industry & Benchmark Information	1,418,495
BMO Capital Markets Corp	Investment Research Services	11,100
BNP Paribas	Research and Data Services	49,600
BNY Asset Servicing - Eagle/Pace	Investment Consulting Services	115,000
Bridge Consulting Partners Ltd	Investment Consulting Services	89,265
BTIG, LLC	Investment Research	9,250
Callan Associates Inc	Investment Consulting & Performance Benchmarking	6,250
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
CBJL Incorporated	Investment Consulting Services	91,840
CBOE Global Markets, Inc.	Research and Data Services	1,620
CCG Data Solutions	Investment Consulting Services and Software	63,000
CFRA Research	Investment Research Services	24,507
Charles River System Inc	Portfolio Management Trading Software & Services	421,863
CIBC World Markets Inc	Investment Research	1,750
CL King & Associates	Investment Research	7,000
Compass Point Research & Trading, LLC	Investment Research	10,500
Consensus Economics Inc	Investment Research Services	39,500
CoStar Portfolio Strategy	Real Estate Consulting & Research Services	23,232
Craig-Hallum Capital Group	Investment Research	6,500

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES *
Credit Benchmark, LTD	Benchmark Service	50,000
CUSIP Global Services	Research and Data Services	5,417
Cutter Associates	Investment Organization and Systems Consulting	17,150
DA Davidson & Co	Investment Research	22,750
Dacheng Xiu	Investment Research	62,475
Datacamp Inc	Research and Data Services	6,982
Davy Securities Limited	Investment Research	500
Deutsche Bank	Tax registration fees	37,475
DiatomC LLC	Investment Consulting	98,280
DTCC – EPN	Trade Settlement Service	3,600
DTCC ITP LLC	Trade Settlement Service	1,591
efilemyforms.com	On-Line Filing Service	70
EFront Financial Solutions Inc	Private Markets Portfolio Management Services	233,665
Elevation LLC	Research and Data Services	12,500
Eliassen Group	Information Technology Consulting Services	59,280
Empirical Research Partners LLC	Investment Research	28,000
EquiLend Holdings LLC	Investment Data	(10,700)
Ernst & Young LLP	Tax Compliance Services & Investment Consulting	25,825
Evercore Group LLC	Investment Research	34,500
FactSet Research Systems Inc	Financial & Economic Database	1,055,636
FIS Data Systems Inc.	Research and Data Services	62,846
Fitch Solutions Inc	Credit Rating Services	28,299
FocusEconomics S.L.U	Investment Consulting	37,899
Funston Advisory Services LLC	Consulting Services	14,500
Furey Research Partners LLC	Small Cap Research	8,000
Gallagher	Insurance and Risk Management Services	15,875
Global Financial Data Inc	Research and Data Services	33,600
Goodbody	Investment Research	1,250
Green Street Advisor	Real Estate Analytics	31,025
Guggenheim Securities LLC	Investment Research	500
Hammerstone Markets Inc	Investment Research	300
Haver Analytics	Global Macroeconomic Research	22,740
Ice Data LP	Fixed Income Indices	119,724
iFathom Corporation	Investment Consulting	105,635
Institutional Shareholder Services Inc	Proxy Voting Analysis	96,412
International Swaps and Derivatives Assn	Derivative Industry Research	11,458
Intex Solutions, Inc.	Research and Data Services	30,260
Investment Research Expense Accrual	Investment Research	(410,081)
IPC Systems Inc	Trading Telecommunication System	7,000
Jefferies Research Services LLC	Investment Research	31,850
JPSB Consulting Limited	Investment Consulting	64,640
Keefe Bruyette & Woods (KBW)	Investment Research	25,500
Kepler Capital Markets Inc	Investment Research Services	6,000
KeyBanc Capital Markets Inc	Investment Research	25,000
Keystone Consulting Inc	Investment Information Technology Consulting Services	80,028
Knowledge Services	Recruitment and Staffing Services	31,176
Lake Street Capital Markets, LLC	Investment Research	1,650
Loop Capital Markets LLC	Investment Research	12,000
Macquarie Capital (USA) Inc	Investment Research	1,500
Manalo Advisors Limited	Research and Data Services	3,727
Markit Group Limited	Investment Consulting Services	73,686
Markit NA	Investment Data Management Software	6,020
Markit-EDM Limited	Investment Consulting	200,885
McLagan Partners Inc	Investment Compensation Data and Analysis	22,500
Meketa Investment Group	Public Markets External Manager Consultant	72,483
MNI Market News	Research and Data Services	5,120
Moodys Analytics	Economic, Currency & Bond Analysis	90,817
Morningstar Inc	Industrial Sector Market Research & Analysis	20,350
Motion Recruitment Partners	Information Technology Consulting Services	11,880
MSCI - Barra	Research and Data Services	24,926
MSCI Inc - Risk Metrics Solutions	Research and Data Services	275,874
MSCI, Inc	Research and Data Services	147,215
My Data Outlet International, LLC	Research and Data Services	49,667
Needham & Company LLC	Investment Research	9,500
NEPC LLC	Investment Consulting Services	80,000
Northcoast Research Partners, LLC	Research and Data Services	2,000
Northland Securities	Investment Research	4,700
Nuware Technology Corp	Investment Information Technology Consulting Services	66,560
NYSE Market Inc	New York Stock Exchange Data	5,928
Oppenheimer & Co Inc	Investment Research	7,250
Options Price Reporting Authority	Quote System for Options Market	2,237
Oxford Economics USA INC	Research and Data Service	28,508
Pacific Pension & Investment Institute	Access to Investment Research	14,000
Pac-invest	Research and Data Services	13,776

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES *
PEI Media Inc	Private Equity Real Estate News	11,875
Piper Sandler & Co	Investment Research	36,300
Pitchbook Data Inc	Research and Data Services	20,500
PremiaLab	Investment Research	27,500
Preyer	Investment Consulting Services	90,773
Quantum Research Consulting LLC	Investment Consulting	62,100
Raymond James	Research and Data Services	13,100
Redburn Europe Limited	Investment Research	13,750
Refinitiv	Investment Research	244,602
Renaissance Macro Research	Macro Economic Research	11,000
Reorg Research Limited	Research and Data Services	15,000
RIMES Technologies Corporation	Research and Data Service	48,563
Robert W. Baird & Co.	Investment Research	63,000
Rosenblatt Securities Inc	Investment Research	3,550
Roth Capital Partners	Investment Research	6,000
Russell Investment Group	Index Data	8,932
S&P Global Market Intelligence	Industry & Corporate Research	108,999
SailPoint Technologies, Inc.	Information Security Software	28,325
Sanford C Bernstein & Co LLC	Investment Research	6,250
Sapiat Pte Ltd	Investment Risk Analysis	20,500
Seaport Global Securities LLC	Research and Data Services	2,850
SEI Investments	Research and Data Services	22,736
Sheffield Haworth Inc	Recruitment Consulting	164,000
Sidoti & Company LLC	Investment Research	7,900
SimCorp Data & Performance Capitalized Expenses	Investment System	(260,475)
SimCorp Implementation Capitalized Expenses	Investment System	(1,753,554)
Simcorp USA, Inc.	Investment System	1,771,640
Smartkarma Innovations Pte Ltd	Research and Data Services	8,600
Snowflake Inc	Research and Data Services	70,303
Solve Advisors Inc	Investment Research	10,299
SPACInsider	Research and Data	3,149
Spherion	Recruitment and Staffing Services	6,414
Standards Board for Alternative Investments Limited	Investment Membership	2,517
State Street	Investment Consulting	16,667
Stephens Inc	Investment Research	11,625
StepStone Group	Private Equity Consulting Services	220,763
StepStone Group Real Estate	Real Estate Consulting Services	59,330
Strategic Economic Decisions Inc	Investment Research Reports	6,000
Susquehanna Financial Group LLP	Investment Research	1,500
SWIFT SC	Research and Data Services	179
SystemsAccountants	Investment Information Technology Consulting Services	81,920
The Benchmark Company LLC	Investment Research	3,500
The Financial Times Limited	Investment Research	11,780
The Leuthold Group LLC	Broad Based Market Research	1,000
The Nasdaq Stock Market, LLC	Research & Data Services	3,150
Toronto Stock Exchange	Market Data	14,603
TradeWeb	On-Line Fixed Income Trading Services	10,826
Trahan Macro Research LLC	Research and Data Services	16,000
Trivariate Research LP	Investment Research	6,500
Tudor Pickering Holt & Co	Investment Research	2,500
UFP Research SA	Investment Research	12,500
Unit4 Business Software Inc	Financial & Administration Services System	81,409
Variyas Global Solutions, Inc.	Information Technology Consulting Services	171,316
Verity LLC	Research Management System	51,395
Vertical Research Partners	Industrial Sector Market Research & Analysis	14,000
Verus Advisory Inc	Benchmarking Consulting Services	2,500
Virtu ITG Analytics LLC	Trading Transaction Cost Analysis	25,000
Visible Alpha LLC	Research and Data Services	49,210
Wedbush	Investment Research	11,050
Wisconsin Technology Council	Investment Research Sponsorship	7,500
Wolfe Trahan	Transportation and Macro Economic Research	33,300
Wolters Kluwer Law & Business	GDP Forecasting Services	14,561
Wolverine Execution Services LLC	Options Trading Platform	930
Workday, Inc.	Financial & Administration Services System	115,820
WorldBridge Partners Inc	Recruitment Consulting	107,810
Worth Charting LLC	Investment Consulting	9,000
Total Investment Counsel		\$ 8,818,009
<u>Separate Account Public Market Management Fees</u>		
Alliance Bernstein	Public Market Management Fees	\$ 876,441
Blackrock	Public Market Management Fees	1,617,210
Dodge and Cox	Public Market Management Fees	1,143,042
Driehaus	Public Market Management Fees	(3,967,101)
eSecLending	Public Market Management Fees	4,044

EXPENSE CATEGORY	SERVICE PROVIDED	EXPENSES *
Fidelity Investments	Public Market Management Fees	1,499,796
Parametric	Public Market Management Fees	598,696
Prudential Global Investment Management (PGIM)	Public Market Management Fees	(1,340,280)
Robeco Institutional Asset Management	Public Market Management Fees	126,767
Total Separate Account Public Market Management Fees		\$ 558,616
Securities Lending Agent Fees		
BNY Asset Servicing & eSecLending	Securities Lending Agent Fees	\$ 942,792
Total Securities Lending Agent Fees		\$ 942,792
Total Quarterly Charges to Funds		\$ 65,858,865

*All costs reported are on an accrual basis. 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. There are currently no investments in Bankers' Bank certificates of deposit and no fees were incurred.

BNY: 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, which serves as the official book of record for SWIB's accounting and performance measurement functions. BNY 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 of fee basis rather than gross. Net fees reflect fee offsets, waivers, and deferrals.

Private Equity Commitments*

April 2024 – June 2024

<i>Investment</i>	<i>Commitment (millions)</i>
Blackfin Financial Services Fund IV	€50.0
FP Credit Partners III	\$125.0
Inflexion Enterprise Fund VI	£50.0
Mittelstandspartner III-A GmbH & Co.	€50.0
Shamrock Capital Growth Fund VI	\$50.0
Shamrock Capital Clover Fund I	\$15.0
Trident X	\$150.0
Financials Co-Investment	\$57.5
Media/Telecom Co-Investment	\$20.0
Industrials Co-Investment	\$13.0
Industrials Co-Investment	\$12.5
Media/Telecom Co-Investment	\$40.0

*Includes Current Return Portfolio and Co-Investments.

Private Debt Investments/Commitments

April 1, 2024 to June 30, 2024 (Second Quarter)

<i>Investment</i>	<i>Investment/Commitment</i>
Infrastructure/Logistics	\$7,000,000
Automotive Supplier	\$8,000,000
Utility	\$25,000,000
Total	\$40,000,000

Real Estate Commitments

April 2024 – June 2024

<i>Investment</i>	<i>Commitment (millions)</i>
High Street Real Estate Fund VIII, LP	\$55
Penwood Select Industrial Partners VII Co-Invest, LP	35
Total	\$90

Funds Alpha Commitments*

January 1st – March 31st, 2024

Manager	Commitment (Millions)
Brigade	\$ 235
Artisan	\$ 80
Dodge and Cox	\$ 280
Oak Hill	\$ 58
Badgerstone Access	\$ 82
BH Coinvest II	\$ 15
Bayview MSR	\$ 50
Bayview MSR Overage	\$ 150
Four World Project Ship	\$ 25
TOTAL	\$ 975

**Includes Hedge Funds and Beta One*

Board Contact Log

DATE OF INBOUND COMMUNICATION	DATE OF BOARD COMMUNICATION	COMMUNICATION SOURCE	TOPIC
June 17, 2024	September 3, 2024	Dianne M. Weigle	Bitcoin
August 15, 2024	September 3, 2024	Lyn Swanson Kennedy	Request to divest from RCI Hospitality Holdings and as characterized by the email, similar companies
August 20, 2024	September 3, 2024	Dennis Dettlaff	Fossil fuel divestment and systemic climate risks
August 20, 2024	September 3, 2024	Susan Millar	Fossil fuel divestment and systemic climate risks
August 20, 2024	September 3, 2024	Mary Jo Wentz	Fossil fuel divestment and systemic climate risks
August 20, 2024	September 3, 2024	Richard Spindler	Fossil fuel divestment and systemic climate risks
August 20, 2024	September 3, 2024	Anne Steinberg	Organizational statement on SWIB's Statement on Divestment
August 21, 2024	September 3, 2024	Ellen Jessen	Fossil fuel divestment and systemic climate risks
August 23, 2024	September 3, 2024	Karen Herrera	Fossil fuel divestment and systemic climate risks
August 23, 2024	September 3, 2024	Judith Stadler	Fossil fuel divestment and systemic climate risks
August 27, 2024	September 3, 2024	Seth Jensen	Fossil fuel divestment and systemic climate risks
August 28, 2024	September 3, 2024	Eric Hansen	Statement on Divestment and systemic climate risks
August 28, 2024	September 3, 2024	Anne Steinberg	Statement on Divestment and systemic climate risks
August 28, 2024	September 3, 2024	Pete Knotek	Statement on Divestment and systemic climate risks

Board Meeting

Tab 10 – Future Items for Discussion

2024 Board Meeting and Agenda Plan

March 2024	
SPCG	<p>Open Session</p> <ul style="list-style-type: none"> • Real Estate Strategy Report and Market Outlook • Corporate Governance Program Update • June Investment Forum Preview • Project Centum Update <p>Executive Closed Session</p> <ul style="list-style-type: none"> • ED/CIO Goals Review
Audit & Finance	<p>Open Session</p> <ul style="list-style-type: none"> • Open Audit Issues Report • Approval of Draft Audit Reports • Internal 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 • WRS Audited Financial Statements • Open Audit Issues Report • Approval of Draft Audit Reports • Affirmations and Disclosures • Internal 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
Benchmark and Performance	<p>Open Session</p> <ul style="list-style-type: none"> • Preview of Comprehensive Benchmark Review
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"> • Open Audit Issues Report • Approval of Draft Audit Reports • Internal Audit Plan Status • 2025 Internal Audit Plan Preview • Financial Reporting • Administrative Reports
Benchmark & Performance	<p>Open Session</p> <ul style="list-style-type: none"> • Preview of Comprehensive Benchmark Review
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 • Internal Audit Plan Status • Proposed 2025 Internal 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 (if any) • 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