

SWIB Board Materials for September 14, 2022

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Name of Meeting: Regular Meeting of the Board of Trustees

Date/Time: Wednesday, September 14, 2022 Approx. 9:20 am (following Benchmark and Performance)

Room: Board Room, 2nd Floor

Address: 121 E. Wilson St., Madison WI 53703

OPEN SESSION	
1. Committee Reports – Open Session Items	<ul style="list-style-type: none"> A. Strategic Planning and Corporate Governance Committee B. Audit and Finance Committee C. Compensation and Workforce Development Committee D. Benchmark and Performance Committee
2. Consent Agenda	<ul style="list-style-type: none"> A. Minutes of June 15, 2022 and August 4, 2022 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 2022 B. Callan Quarterly Report
6. Investment 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 for May 24, June 28 and July 26, 2022 C. Final Open Session Agenda for August 23, 2022 and Draft Open Session Agendas for September 27 and October 25, 2022
7. Quarterly Investment Update, Q2 2022	
CLOSED SESSION*	

* The motion to go into closed session at this meeting is made (i) pursuant to Sections 19.36(5) and 19.85(1)(e) of the Wisconsin Statutes to (a) consider confidential and proprietary strategies for the investment of public funds relating to specific proprietary investment strategies of internal WRS portfolios and risk management, and (b) approve prior closed session minutes that discuss the same; and (ii) pursuant to Section 19.85(1)(c) of the Wisconsin Statutes to review performance evaluation data for SWIB's board of trustees. 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.	<p>In the Absence of Questions, the Following Reports will be Filed Without Comment (For informational purposes):</p> <ul style="list-style-type: none"> A. Draft Open Session Minutes of May 18, 2022 Enterprise Risk and Compliance Committee Meeting B. New Contracts, Q2 2022 C. Quarterly Charges to Funds Reports, Q2 2022 D. Private Markets and Funds Alpha Commitments, Q2 2022
10.	Future Items for Discussion
11.	Motion to Adjourn
<p><i>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.</i></p> <p><i>The meeting site is physical accessible. Upon prior request, reasonable accommodations will be provided.</i></p>	

Board Meeting

Tab 1 - Committee Reports - Open Session Items

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

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

Barb Nick, Vice-Chair and Secretary

Sara Chandler, Assistant Secretary

Pursuant to each Committee Charter, the Board Chair shall appoint members of each Committee and appoint members to serve as Committee chair, vice chair and secretary for terms not to exceed one year. These appointments shall be in effect until February 28, 2023.

Audit and Finance Committee

Kristi Palmer, Chair
John Voelker, Vice Chair & Secretary
Clyde Tinnen
David Stein

State Controller, ex-officio
State Auditor, ex-officio

Benchmark and Performance Committee

Dave Schalow, Chair
Clyde Tinnen, Vice Chair & Secretary
Esther Ancel
Jeff DeAngelis

Compensation Committee

David Stein, Chair
Jeff DeAngelis, Vice Chair & Secretary
Barb Nick
Dave Schalow

Strategic Planning and Corporate Governance Committee

Barb Nick, Chair
Esther Ancel, Vice Chair & Secretary
Kathy Blumenfeld
Kristi Palmer
John Voelker

Board Meeting

Tab 2 - Consent Agenda

- A. Minutes of June 15, 2022 and August 4, 2022
- B. Recommended Actions from Committee Agendas –
Open Session Items

Regular Meeting of the Board of Trustees

Wednesday, September 14, 2022

STATE OF WISCONSIN INVESTMENT BOARD

CONSENT AGENDA – OPEN SESSION ITEMS

Proposed Motions:

1. Move to approve the Open Session Minutes and Closed Session Minutes of June 15, 2022 and August 4, 2022, in each case, as presented.
2. Move to approve the amended Total Cost of Management Plan and Policy, as recommended by the Strategic Planning and Corporate Governance Committee.
3. Move to approve the amended Compensation Plan, as recommended by the Compensation and Workforce Development Committee.
4. Move to approve the amended Incentive Compensation Deferral Policy, as recommended by the Compensation and Workforce Development Committee.

STATE OF WISCONSIN INVESTMENT BOARD

Board Meeting & Investment Forum – Open Session

Tuesday/Wednesday, June 14-15, 2022

Investment Forum: Teleconference

Regular Board Meeting: 121 East Wilson Street, Madison, Wisconsin

OPEN SESSION

Dave Stein, Chair, called the meeting of the Board of Trustees to order at 1:30 p.m. on June 14, 2022. Trustee Stein 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 14, 2022) (See Attachment 1 for Attendance List)

1. ESG Meets Investing: You can Do Good and Do Well

Panos Seretis, Managing Director, Head of ESG, Sustainable Finance EMEA, Bank of America Merrill Lynch

Panos Seretis, Managing Director at Bank of America Merrill Lynch, discussed ESG (Environmental, Social and Governance) focused investing, which is the fastest growing investing theme over the past five years. Beyond the environmental and societal benefits of ESG investing, one of the largest benefits is to portfolio risk management, as using ESG screens may help to avoid the negative impacts of reputational risk on stock performance as well as reduce the risk of bankruptcy. Mr. Seretis cited a study by Bank of America showing that 90% of bankruptcies from 2005-2015 could have been avoided by screening out poor ESG scores.

Historically, he noted, the E (Environmental) part of ESG has been the focus, especially around carbon emissions; however, he expects the focus will expand over the next few years to include biodiversity with new 2030 European Union targets focused on waste, land, and water management. In addition, there has been a recent increased focus on the S (Social) part of ESG investing. As far as idea generation goes, Mr. Seretis believes the devil is in the details, where screens require the use of different metrics across sectors and geographies. Given the fast growth in ESG, it is important that regulations keep up, and investors can expect to see an increase over the coming years in the form of minimum ESG thresholds for investment funds, as well as increased disclosure requirements for corporations.

2. Combining Big Data, Academic Research and Traditional Fundamentals for Market and Macro Analysis

Dan Gerard, Senior Multi Asset Strategist, State Street

Dan Gerard, Senior Multi Asset Strategist at State Street, provided his insights into the drivers of risk and return for global financial markets for the rest of 2022. Mr. Gerard noted that financial markets remain very macro-driven as risk concentration continues to be high. Given this risk concentration, Mr. Gerard believes the Federal Reserve and China will continue to be outsized contributors to market volatility. The fundamental growth backdrop is still relatively strong, but he projects that this will lead the Federal Reserve to be more aggressive than the markets have currently priced in. Mr. Gerard predicts that China's prioritizing of COVID over growth will continue to result in an impinged supply chain, hurting market normalization. Persistent inflation and risks to growth mean investors will need to be selective in market exposure, and Mr. Gerard believes investors must balance quality defensive positions with commodity exposure for an inflation hedge, as well as anti-cyclical growth assets like Health Care.

3. Alternative Proteins Industry: Trends and Innovations

Sharyn Murray, Senior Investor Engagement Manager, Good Food Institute

The Good Food Institute (GFI) is a nonprofit organization working to build a sustainable, secure, and just food system by partnering with companies and investors to drive investment, accelerate innovation, and scale the supply chain. Sharyn Murray, Senior Investor Engagement Manager at GFI, described the increasing food production gap and the solution that alternative proteins can provide to mitigate the environmental impact of our food system, decrease the risk of zoonotic disease, and ultimately feed more people with fewer resources. Ms. Murray reviewed the science and technological advances of plant-based meat, cultivated meat, and fermentation, along with the remaining challenges to enable scaled consumer adoption. As an example, she described how the more mature market for plant-based milk products accounts for 15% of retail milk market share, showing the potential for other categories like alternative proteins. Plant-based meat is the leading alternative protein category and has already experienced annual sales growth of 14%, despite remaining a very small part of the total market. Looking forward, Ms. Murray noted that the industry is focused on innovation in taste and texture and the ability to achieve scaled production and distribution that will allow price parity.

The Board recessed for the day at 4:23 p.m.

REGULAR BOARD MEETING (June 15, 2022)

Board Members Present: Dave Stein, Chair
Esther Ancel, Trustee
Kathy Blumenfeld, Trustee
Kristi Palmer, Trustee
Timothy Sheehy, Trustee
Clyde Tinnen, Trustee
John Voelker, Trustee

Staff/Others Present: Nathan Ballard, Senior Legal Counsel
Brandon Brickner, Internal Audit Director
Sara Chandler, Chief Legal Counsel
Edwin Denson, Executive Director/Chief Investment Officer
Anne-Marie Fink, Private Markets & Funds Alpha Chief Investment Officer
Greg Fletcher, Performance Director
Mike Jacobs, Agency Business Director
Rochelle Klaskin, Deputy Executive Director/Chief Administrative Officer
Leo Kropywiansky, Senior Portfolio Manager
Matt Marek, Senior Analyst
Dawn Tuescher, Executive Administrative Assistant
Sam Rebenstorf, Legislative Audit Bureau
Chris Levell, NEPC
Bob Schaefer, State Engineers Association & Wisconsin Coalition of Annuitants
(Some individuals may have attended only portions of the meeting.)

Trustee Stein, Chair of the Board, declared a quorum was present and called the Board of Trustees meeting back to order at 9:55 a.m. on Wednesday, June 15, 2022.

Trustee Stein announced that this will be the last meeting for Trustee Sheehy. Trustee Stein thanked Trustee Sheehy for his service on the Board since February 2016, and for serving admirably as Vice Chair and Secretary on the Compensation and Audit and Finance Committees.

Trustee Sheehy thanked and commended Chairman Stein for providing the Board with strong leadership as well as the rest of the Trustees for their professionalism and friendship and commented on how much he has enjoyed his time on the SWIB Board.

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, after approving the prior meeting minutes, the Committee heard from Brandon Brickner, Internal

Audit Director, regarding (1) the open audit issues report, (2) the Asset Allocation Process draft audit report, (3) annual affirmations and disclosures, (4) the status of the 2022 internal audit plan, and (5) the five-year audit summary. The Committee reviewed and discussed (1) GIPS standards, (2) the Q1 2022 Quarterly Cost of Management Update, (3) and the FY 2023 Total Cost of Management Reconciliation. In closed session, the Committee approved prior meeting minutes, reviewed and approved the draft audit report for SimCorp Pre-Implementation Review, and met with the Internal Audit Director in Executive Closed Session.

B. Strategic Planning and Corporate Governance Committee

Trustee Ancel, Vice-Chair of the Strategic Planning and Corporate Governance Committee, reported that in open session, after approving the prior meeting minutes, the Committee heard a report from SWIB's Hedge Fund Consultant, Aksia LLC, and was updated by staff on the status of Project Centum. The Committee also approved amendments to the Corporate Governance Policy and the Securities Litigation Procedures. During closed session, the Committee received an additional update regarding Project Centum and met with Edwin Denson, Executive Director/Chief Investment Officer, to discuss his 2022 performance goals.

C. Compensation Committee

Trustee Stein, Chair of the Compensation Committee, reported that in open session, the Committee approved (1) prior meeting minutes, (2) amendments to the Compensation Committee charter, and (3) amendments to the SWIB Recruitment Philosophy. The Committee also received a recruiting update and heard from McLagan regarding a proposed long-term incentive plan. In closed session, after approving prior meeting minutes, the Committee had further discussion regarding long term incentive plans.

2. Consent Agenda

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

- Move to approve the Open Session Minutes, Closed Session Minutes, and Executive Closed Session Minutes, in each case, of March 16, 2022, as presented.
- Move to approve the FY 2023 Chapter 20 Operating Budget of \$102.7 million, as recommended by the Audit and Finance Committee.
- Move to approve the amended Corporate Governance Policy, as amended and recommended by the Strategic Planning and Corporate Governance Committee.
- Move to approve the amended Securities Litigation Procedures, as recommended by the Strategic Planning and Corporate Governance Committee.
- Move to approve the amended Compensation and Workforce Development Committee Charter, as recommended by the Compensation Committee.

- Move to approve the amended SWIB Recruitment Philosophy, as recommended by the Compensation Committee.

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

3. Investment Performance and Market Updates

A. Board Investment Performance Report, Q1 2022

Greg Fletcher, Performance Director, presented the *Investment Performance Report*, as of March 31, 2022, included on pages 19-48 of the meeting materials. Mr. Fletcher reported that (a) the Core Trust Fund (CTF) returned -3.42% net of all in Q1 2022, resulting in an excess return of 30 basis points (bps) for the quarter, (b) the CTF returned 9.94% net of all for the one-year period, resulting in an excess return of 99 bps, (c) the CTF five-year net-of-fee return of 10.75% outperformed the Policy Benchmark by 59 bps on an annualized basis, and (d) the CTF gross return outperformed the 60/40 Reference Portfolio return by 92.3% (cumulative) over the past 20 years, which equates to \$34.7 billion.

Mr. Fletcher highlighted that the CTF net-of-fee return outperformed its benchmark for the three-, five-, ten-, twenty- and thirty-year time periods, and the Variable Trust Fund (VTF) had strong absolute returns over all time periods with excess returns over its benchmark for the ten-year period. Mr. Fletcher then noted that SWIB's investment management has added more than \$2.6 billion above benchmark returns to the WRS over the last five years

Mr. Fletcher then discussed that the percentage of WRS assets that were internally managed had remained stable at roughly 50% over the last few years. He also highlighted that the percentage of actively managed assets continued to increase in 2022. Next, Mr. Fletcher: (a) provided a breakdown of CTF asset class exposures, noting that all are within target range and that the portfolio remains well diversified; (b) reviewed the asset class performance for the CTF over various time periods; (c) reviewed VTF performance and asset class exposures, noting asset class exposures were within target range; and (d) noted that all Separately Managed Funds had positive relative performance over most time periods, with three slightly under-performing year-to-date.

Mr. Fletcher concluded by reviewing the *Leverage Performance*, included on pages 34-35 of the meeting materials. He noted that policy leverage contributed 51bps of loss to CTF absolute performance year-to-date, as expected in a negative return environment.

B. Callan Quarterly Report

Mr. Fletcher noted that the *Callan Quarterly Report Summary* as of March 31, 2022 was included on pages 36-40 of the meeting materials. He highlighted that SWIB's total fund unadjusted rankings are in the top quartile of peer returns over the 3- and 5-year periods, second quartile for the 10-year period, and at median for the 1-year period. Mr. Denson called attention to the 10-year return consistency, noting that SWIB's approach to risk and asset allocation versus the policy target and peers generated meaningful outperformance following Q1 2020.

4. Investment Committee Open Session Business

A. Amendments to WRS Investment Policy

Ms. Chandler reviewed changes to the *Wisconsin Retirement System Investment Policy*, included on pages 50-51 of the meeting materials, noting that the amendment revised the policy so that there was not a minimum number of members of the Management Council.

Motion: A motion was made by Trustee Stein and seconded by Trustee Blumenfeld to approve the amendments to the WRS Investment Policy, as presented. The motion passed unanimously.

B. Amendments to WRS Investment Committee Investment Guidelines

Ms. Chandler discussed amendments to the *SWIB Investment Committee WRS Investment Guidelines*, made by the Investment Committee on March 19, 2022 and included on pages 52-98 of the meeting materials, noting that the revised guidelines reflect the Committee's ongoing implementation of the 2022 asset allocation approved by the Board in December 2021. She noted **(a)** minor updates to the guidelines related to ETFs and ETNs, **(b)** new guidelines for the leveraged loan portfolio, and **(c)** amendments to allow below-investment-grade short-term holdings for the mortgage-backed securities portfolio.

C. Approved Open Session Investment Committee Minutes

Ms. Chandler stated that the approved open session minutes of the February 22, March 29, and April 26, 2022 Investment Committee meetings were included on pages 99-115 of the meeting materials for the Board's review and noted that staff had previously reviewed the agendas for these meetings with the Board.

D. Agendas for Upcoming Meetings

Ms. Chandler also stated that the final open session agenda for the May 24, 2022 Investment Committee meeting and the draft open session agendas for the June 28 and July 26, 2022 meetings were included on pages 116-121 of the meeting materials for the Committee's review.

5. Quarterly Investment Update, Q1 2022

Edwin Denson presented the *Quarterly Investment Update*, included on pages 123-155 of the meeting materials. Mr. Denson began with a brief commentary on the CTF 5-year return estimate, which projects a five-year annualized return of 10.4% using NEPC assumptions for 2022, but which is reduced to 7.3% when using preliminary realized year-to-date returns through April. He commented that since April the CTF has lost approximately an additional 4%, which takes the five-year annualized return projection lower, to approximately 6.5%. Mr. Denson stated that ETF projects it would take a loss of approximately 18% in 2022 before any negative annuity adjustments would be triggered. Noting that every asset class benchmark has experienced losses this year, Mr. Denson commented that the five-year estimate is impacted by two key components, the losses across the market in 2022, but also the fact that a positive 15.8% return for 2017 is no longer included in the five-year period.

Leo Kropywiansky, Senior Portfolio Manager-Asset & Risk Allocation, then presented the

Economic Outlook portion of the presentation. Mr. Kropywiansky opined that while inflation remains high, disinflation remains the most plausible path over the next two years, in large part due to the Federal Reserve's (Fed) signaled tightening over the next year. Mr. Kropywiansky cautioned that continued 75 basis point rate increases could be a signal of stronger inflation concerns from the Fed and noted that it will likely take six to eighteen months before the full effect of these interest rate increases can be observed. Overall, he sees a general consensus for a "soft landing," with real GDP growth dipping below 2% in 2024, but a shallow recession in the next two years is a live possibility.

Mr. Denson and Mr. Kropywiansky then addressed questions from the Board and noted the *Asset Class Review* presentations were included in the materials for the Board's review.

6. Motion to Convene in Closed Session

Motion: A motion to convene in closed session pursuant to 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, risk management, and asset allocation, and to approve prior closed session minutes that discuss the same was made by Trustee Stein and seconded by Trustee Sheehy.

The Chair called for a roll call vote.

Ancel–Aye	Blumenfeld–Aye	Palmer–Aye	Sheehy–Aye
Stein–Aye	Tinnen–Aye	Voelker - Aye	

There being seven ayes and no nays, the Chair declared the motion passed. The Board convened in closed session at 11:15 a.m. and reconvened in open session at 11:57 a.m.

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

Trustee Stein announced that while in closed session the Board received updates on risk management and asset allocation and discussed Investment Committee closed session business.

8. Reports Filed Without Comment

In the absence of questions, the following reports, included on pages 207-222 of the meeting materials, were filed without comment: **(a)** New Contracts, Q1 2022; **(b)** Quarterly Charges to Funds Report, Q1 2022; and **(c)** Private Markets and Funds Alpha Commitments, Q1 2022.

9. Future Items for Discussion

There were no future items for discussion noted.

The Board recessed at 11:59 a.m.

INVESTMENT FORUM (Session II, June 15, 2022) (See Attachment 1 for Attendance List)

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

1. 2022 Policy Outlook & Midterm Election Impact

Liam Donovan, Principal, Bracewell, LLP

Liam Donovan, Principal at Bracewell, LLP, discussed the policy outlook for 2022 and the impact of the midterm elections. He began by commenting on the amount Congress is trying to accomplish during this usually slow time of year, as he believes Democrats would like to get something done given their midterm prospects for retaining the House and Senate. Democrats main focus is on alternatives to the now dead \$3.5T Build Back Better, which would focus on energy/climate and health policy (including drug pricing and ACA premium support). Republicans are focused on deficit reduction and program funding.

With midterm elections approaching, the Democrats are facing a tough environment with an overall Presidential approval rating of 38.9%, with Biden's approval rating underwater in 33 states (including eight that he won in 2020). This backdrop is setting up well for Republicans to gain seats this election cycle. Negative public opinion is mostly being driven by inflation, and there are two likely scenarios expected, both resulting in not much getting done. The first is that the GOP takes control of the House, while Democrats retain control of the Senate. In this scenario, the Republicans will likely gain little more than House oversight. The second scenario is that the GOP takes control of both the House and the Senate, resulting in the GOP forcing significant legislative concessions, handcuffing the Biden Administration's regulatory agenda, and controlling full veto power over nominations. Either scenario is going to result in a lot of institutional turnover and polarization as both parties are expected to look much younger and more extreme in their views.

2. Supply Chain Disruptions: Where We Are and Where We (Might) Be Going

Jake Dean, Director of the Grainger Center for Supply Chain Management, University of Wisconsin-Madison

Jake Dean, Director of the Grainger Center for Supply Chain Management at the University of Wisconsin-Madison, discussed the current state of the supply chain disruption and contributing factors, including quickly changing patterns of durable goods consumption, cost inflation within the supply chain, and stock availability. Mr. Dean believes that COVID-related disruptions to the supply chain have been mostly worked through and that current challenges are coming from other factors. Inventory levels are the resulting shock absorber and a key metric for the condition of supply chains. Mr. Dean discussed the trend of regionalization of suppliers and innovation in software and robotics, which may contribute to long-term changes in supply chain management. Mr. Dean stated that the timing of supply chain normalization will remain uncertain until there is a new normal for consumption patterns, which remain in a state of unpredictable change and could be pushed out by a recession.

3. Think for Yourself

Vikram Mansharamani, Harvard University Lecturer, Author and Investor

Vikram Mansharamani discussed the concepts behind his book, *Think for Yourself: Restoring Common Sense in an Age of Experts and Artificial Intelligence*, which is a guide for those

looking to restore self-reliant thinking in a data-driven and technology-dependent yet overwhelmingly uncertain world. Mr. Mansharamani stressed the importance of taking a generalist viewpoint and using multiple sources of information flows in order to triangulate independent conclusions that have less bias.

4. Adjournment

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

Date of Board Approval: _____

Signed: _____
Barb Nick, Board Secretary

Attachment 1

Last Name	First Name	Representing	Day One	Day Two
Addesso	Macaulay	SWIB	X	X
Adler	Doug	SWIB	X	X
Anderson	Erica	Perigon	X	X
Ancel	Esther	SWIB Trustee	X	X
Bahadoran	Navid	SWIB	X	
Baird	Larina	SWIB	X	X
Balaod	John Kevin	With Intelligence		X
Ballard	Nathan	SWIB	X	
Barczak	Chelsey	SWIB	X	X
Benish	Chris	SWIB	X	X
Bergstein	Maddie	University of Wisconsin Foundation	X	X
Blank	Kevin	SWIB	X	X
Bloom	Derek	SWIB	X	
Blumenfeld	Kathy	SWIB Trustee	X	X
Bormett	Becky	SWIB	X	X
Brickner	Brandon	SWIB	X	X
Brown	Adam	SWIB	X	X
Brusberg	Michael	SWIB	X	X
Burkart-Paulson	Kate	SWIB	X	X
Cavaglia	Stefano	SWIB	X	
Chandler	Sara	SWIB	X	X
Chen	Bridget	SWIB	X	X
Cheng	Grace	SWIB	X	
Clanfield	Maggie	SWIB	X	X
Cliff	Jan	Johnson Financial Group	X	X
Collien	Amy	SWIB	X	X
Comito	Christian	SWIB		X
Covino	Rob	Voya Investment Management		X
Cox	Dan	SWIB	X	X
Crossman	Andrew	SWIB	X	X
Cullison	Eric	SWIB	X	
Cummisford	Robert	Wealth Enhancement Group	X	
Dayioglu	Tunc	SWIB	X	
Denson	Edwin	SWIB	X	
Diercks	David		X	X
Ding	Roger	SWIB	X	X
Dobson	Heather	SWIB	X	X
Dogaru	Alexandra	SWIB	X	X
Drake	John	SWIB	X	X
Drummond	Derek	SWIB	X	
Ebeling	Michael	SWIB	X	X

Last Name	First Name	Representing	Day One	Day Two
Eckerman	Chris	SWIB	X	X
Edwards	Greg	UW School of Business	X	X
Eggert	Randy	SWIB	X	X
Epstein	Patti	Wisconsin Dept of Financial Institutions	X	X
Fink	Anne-Marie	SWIB	X	X
Gandhi	Chirag	SWIB	X	
Gegare	Ethan	University of Wisconsin Foundation	X	X
Giageos	Doug	RMR Wealth Advisors	X	X
Giordano	Christine	Markets Group	X	X
Greenfield	Jameson	SWIB	X	X
Gresl	Michael	SWIB	X	X
Haberland	Catherine	Wisconsin Dept of Financial Institutions	X	X
Harmelink	Michael	SWIB	X	X
Hayashi	Takaaki		X	X
Hedley	Nick	Markets Group	X	
Heimsoth	Brian	SWIB	X	X
Hellmer	Annette	Johnson Financial Group	X	X
Holzberger	Beth	SWIB	X	X
Hua	Chongyu	SWIB	X	X
Jacobs	Michael	SWIB	X	X
Johnson	Nick	SWIB	X	
Johnson	Phil	SWIB	X	X
Johnston	Ryan	SWIB	X	
Jordan	Dave	SWIB	X	
Klaskin	Rochelle	SWIB	X	X
Krasowski	Sam	Marathon County Finance Dept		X
Lahman	John	SWIB	X	X
Lambert	Linda	WI Dept of Financial Institutions	X	
Lange	Lisa	SWIB	X	X
Lau	Teresa	SWIB	X	X
Laufenberg	James	SWIB	X	X
Levell	Christopher	NEPC	X	X
Levine	Jonathan	SWIB	X	X
Li	Alex	SWIB	X	X
Linn	Diane	SWIB		X
Lo	Shan	SWIB	X	X
Loboda	Jon	SWIB	X	X
Lu	Shaonan	SWIB	X	X
Lucas	Jeff	SWIB	X	X
Luetzow	Bill	SWIB	X	X
Lynch	Sean	SWIB	X	
Maier	Nate	SWIB	X	

Last Name	First Name	Representing	Day One	Day Two
Marek	Matt	SWIB	X	X
Maroun	Damian	SWIB		X
Marroquin	Mario	Markets Group	X	X
Martin	Dean	SWIB	X	X
Martinez	Ed	SWIB	X	X
Maung	Lin	SWIB	X	X
Mazzucco	Frank	SWIB	X	X
Michaelis	Stacey	SWIB	X	X
Mukherjee	Joy	SWIB	X	X
Neumann	Chad	SWIB	X	X
Nguyen	Trang	University of Wisconsin Foundation	X	X
Nicholson	Chase	SWIB	X	
Nick	Barbara	SWIB Trustee	X	
Noronha	Sarah	SWIB	X	X
Olson-Collins	Cheryll	Wisconsin Dept of Financial Institutions	X	X
Pall	Jason	UW Credit Union	X	
Palmer	Kristi	SWIB Trustee	X	X
Parrish	Scott	SWIB	X	X
Perik	Dan	SWIB	X	X
Phan	Tinh	SWIB	X	X
Planey	Brian	SWIB	X	X
Preisler	Chris	SWIB	X	X
Rector	Jason	SWIB	X	
Reinke	Janet	Cuna Mutual Group	X	X
Richlen	Robert	SWIB	X	X
Risch	Jay	SWIB	X	X
Rothenberg	Jason	SWIB	X	X
Russell	Brian	SWIB		X
Shearer	Michael	SWIB	X	X
Shi	Cora	SWIB	X	X
Stanton	Nick	SWIB		X
Stein	Dave	SWIB Trustee	X	X
Steinbeck	Tilly	SWIB	X	
Strole	Jacob	SWIB		X
Sweet	Adam	Jacobson & Schmitt Advisors		X
Templeton	Will	University of Wisconsin Foundation	X	X
Terpstra	Matt	SWIB	X	X
Tinnen	Clyde	SWIB Trustee	X	X
Tuescher	Dawn	SWIB	X	X
Vander Meer	Jim	SWIB	X	
Vanderpool	Rob	SWIB	X	X
Versal	Sarah	SWIB	X	X
Voelker	John	SWIB Trustee	X	X

Last Name	First Name	Representing	Day One	Day Two
Wegner	Gretchen	SWIB	X	X
Wetzel	Jessica	Wisconsin Dept of Financial Institutions	X	
Widiger	Amy	SWIB	X	X
Wilhelm	Terri	SWIB	X	X
Wisniewski	Jessica	SWIB		X
Wolff	Kirk	SWIB	X	X
Wong	Ping	SWIB	X	X
Zhang	Ivy	SWIB	X	X
Zire	Mohamed	SWIB	X	X

STATE OF WISCONSIN INVESTMENT BOARD
Board of Trustees Meeting – Open Session

Thursday, August 4, 2022

Via Teleconference

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

Staff/Others Present: Sara Chandler, Chief Legal Counsel
Edwin Denson, Executive Director/Chief Investment Officer
Rochelle Klaskin, Deputy Executive Director/Chief Administrative Officer
Dawn Tuescher, Executive Administrative Assistant
Lauren Albanese, Financial Investment News
Samuel Karasek, HFM Global

Open Session

Trustee Stein, Chair of the Board of Trustees, declared a quorum was present and called the Board of Trustees meeting to order at 9:02 a.m. Trustee Stein introduced new trustee Jeff DeAngelis to the Board.

1. Motion to Convene in Closed Session

Motion: A motion was made by Trustee Stein and seconded by Trustee Palmer to convene in closed session pursuant to Wisconsin Statutes §19.85(1)(e) to consider confidential information relating to the negotiation of contracts with consultants for the investment of public funds and to deliberate confidential strategies for the investment of public funds.

Trustee Stein called for a roll call vote.

Ancel-Aye	Blumenfeld-Aye	DeAngelis-Aye	Nick-Aye	Palmer-Aye
Schalow-Aye	Stein-Aye	Tinnen-Aye	Voelker-Aye	

There being nine ayes and no nays, Trustee Stein declared the motion passed. The Board convened in closed session at 9:13 a.m. and reconvened in open session at 12:03 p.m.

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

Trustee Stein announced that while in closed session the Board met with candidates for the Board's Benchmark and Incentive Compensation RPMs consultant. After presentations from the candidates, the Trustees deliberated and made a tentative selection subject to contracting.

3. Adjourn

Motion: A motion to adjourn was made by Trustee Stein and seconded by Trustee Schalow. The motion passed unanimously, and the meeting was adjourned at 12:05 p.m.

Date of Approval: _____

Signed: _____
Barb Nick, Board Secretary

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 2022
- B. Callan Quarterly Report



Investment Performance Report

as of June 30, 2022



Executive Summary

June 30, 2022

- The Core Trust Fund returned (10.13%) net of fees in Q2, resulting in underperformance of (15 bps) in Q2. For one year, the Core Trust Fund has returned (7.27%) net of fees, resulting in an excess return of +49 bps.
- The Core Trust Fund five-year net of fee return of +7.76% outperforms the Policy Benchmark by +53 bps on an annualized basis.
- The Core Trust Fund gross return outperformed the 60/40 Reference Portfolio return by +95.8% (cumulative) over a 20-year period, which equates to \$33.9 billion over the same period.

WRS Performance

as of June 30, 2022

Fund	Net of All Fee and Expense Return %			
	Calendar – YTD	1 Year	3 Year	5 Year
Core Trust Fund	(13.25)	(7.36)	7.51	7.67
Core Trust Fund Benchmark	(13.33)	(7.75)	6.88	7.23
Excess	+0.08	+0.39	+0.63	+0.43
Net Excess Value Add (\$M)	+\$144.5	+\$589.5	+\$2,206.4	+\$2,488.7
Variable Trust Fund	(20.07)	(15.27)	7.28	8.19
Variable Trust Fund Benchmark	(20.26)	(15.46)	7.33	8.26
Excess	+0.20	+0.19	(0.05)	(0.07)
Net Excess Value Add (\$M)	+\$24.8	+\$22.8	(\$8.3)	(\$21.4)

SWIB's investment management has added more than \$2.4 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 Fee and Expense Return %			Gross of Fee Return %
	5 Year	10 Year	20 Year	30 Year
Core Trust Fund	7.76	7.95	7.40	8.28
Core Trust Fund Benchmark	7.23	7.52	7.14	7.79
Excess	+0.53	+0.43	+0.26	+0.49
Variable Trust Fund	8.25	10.44	7.96	8.76
Variable Trust Fund Benchmark	8.26	10.36	8.02	8.45
Excess	(0.01)	+0.08	(0.06)	+0.31

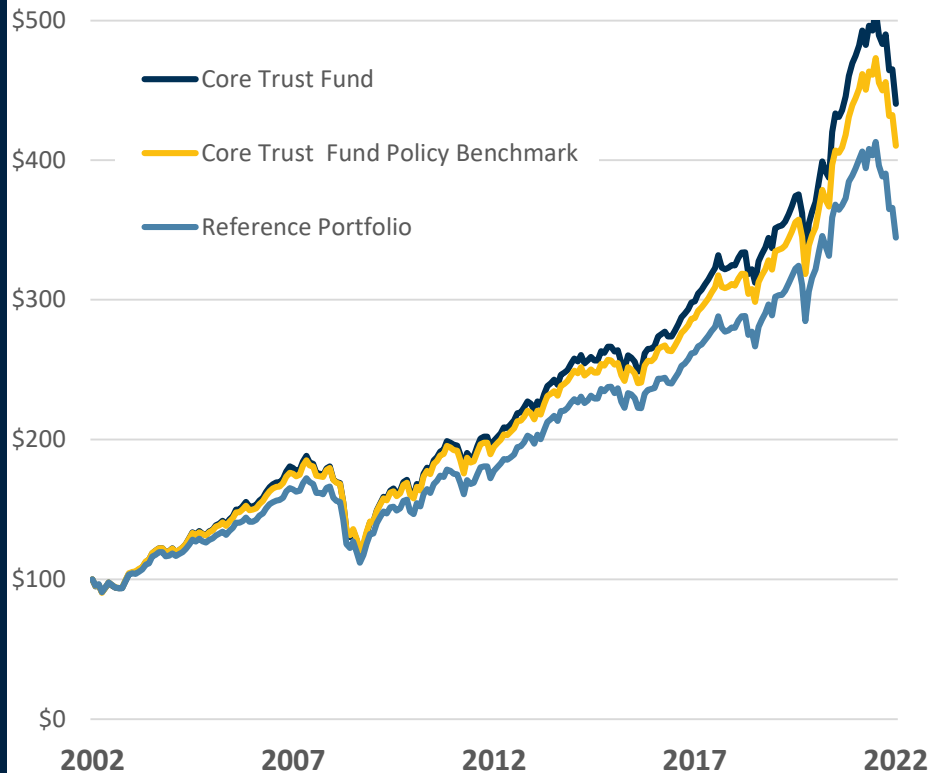
(Annualized Return shown for all periods greater than 1 yr)

Excess returns may contain rounding differences

CTF Performance vs. 60/40 Reference Portfolio

20-year cumulative return¹: July 1, 2002, to June 30, 2022

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



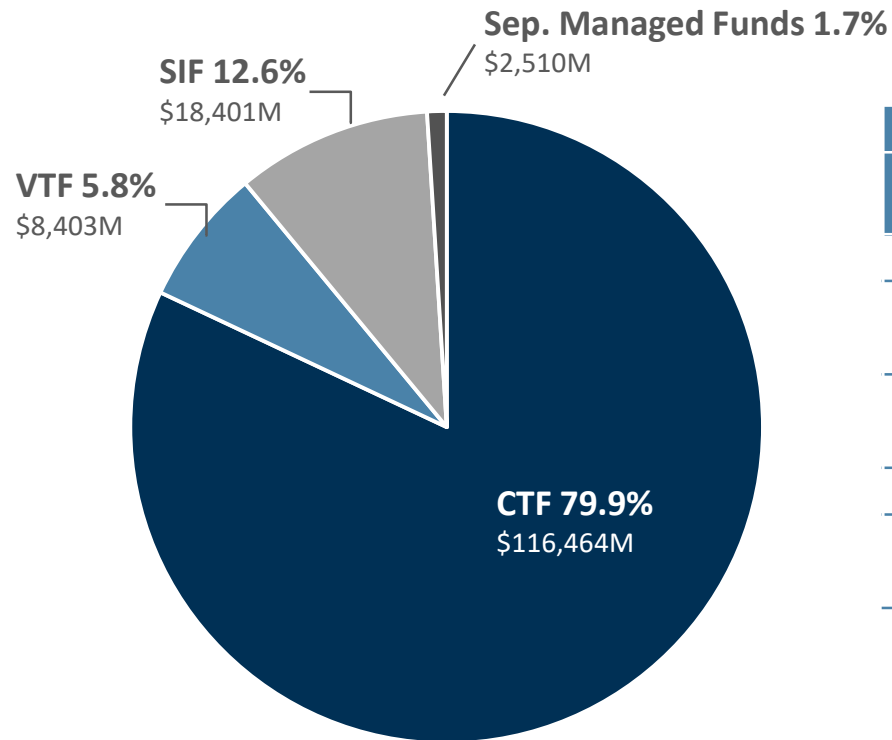
Portfolio / Benchmark	Annualized Gross Return	Cumulative Gross Return	Cumulative \$ Value Added
Reference Portfolio ² (60% equity/40% bonds)	6.4%	244.6%	= Passive Market Return
Benefit of CTF Asset Allocation			
CTF Policy Benchmark	7.3%	310.4%	+\$23.6B
Benefit of CTF Active Management			
CTF Actual Results	7.7%	340.4%	+\$10.3B
CTF Excess Return vs. Reference Portfolio	+1.3% pts	+95.8% pts	+\$33.9B

¹ Core Trust Fund beginning market value, as of July 1, 2002, was \$49.3B and ending market value, as of June 30, 2022, was \$116.5B

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, 2022



Gross Market Value of Assets (\$millions)			
By Fund	6/30/2021	6/30/2022	1 Year Change
Total WRS	140,154	124,867	(15,287)
Core Trust Fund	129,709	116,464	(13,245)
Variable Trust Fund	10,446	8,403	(2,042)
State Investment Fund (SIF) ¹	15,426	18,401	+2,975
Separately Managed Funds	2,345	2,510	+165
Total SWIB AUM	\$157,925	\$145,779	(\$12,147)

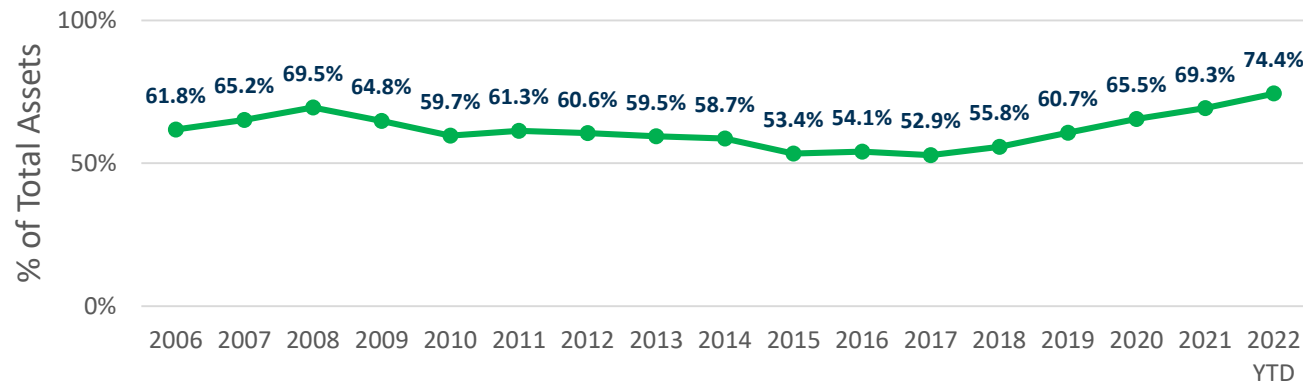
¹ Excludes cash invested in SIF held on behalf of CTF and VTF

Refer to the disclosure section for additional details

WRS Assets as of June 30, 2022

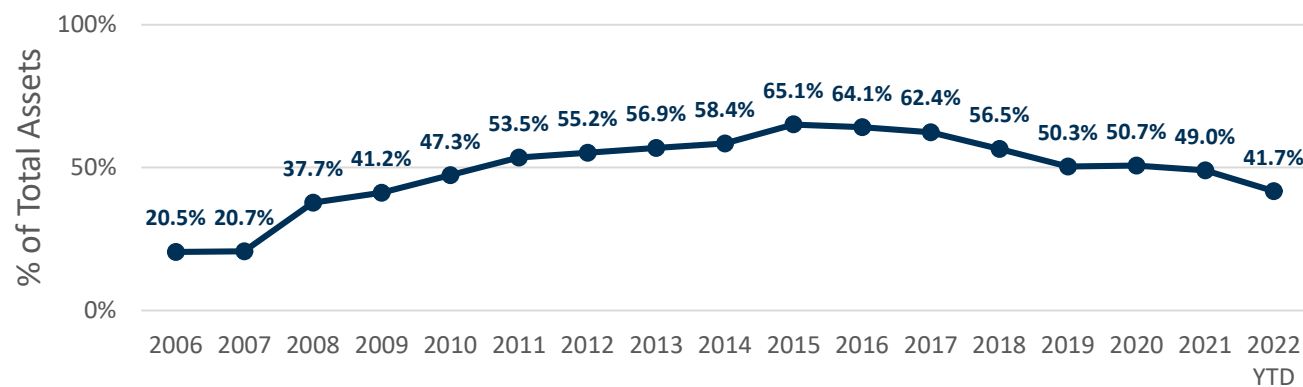
Breakdown of Active vs. Passive and Internal vs. External

Actively Managed Assets



More assets are being actively managed

Internally Managed Assets

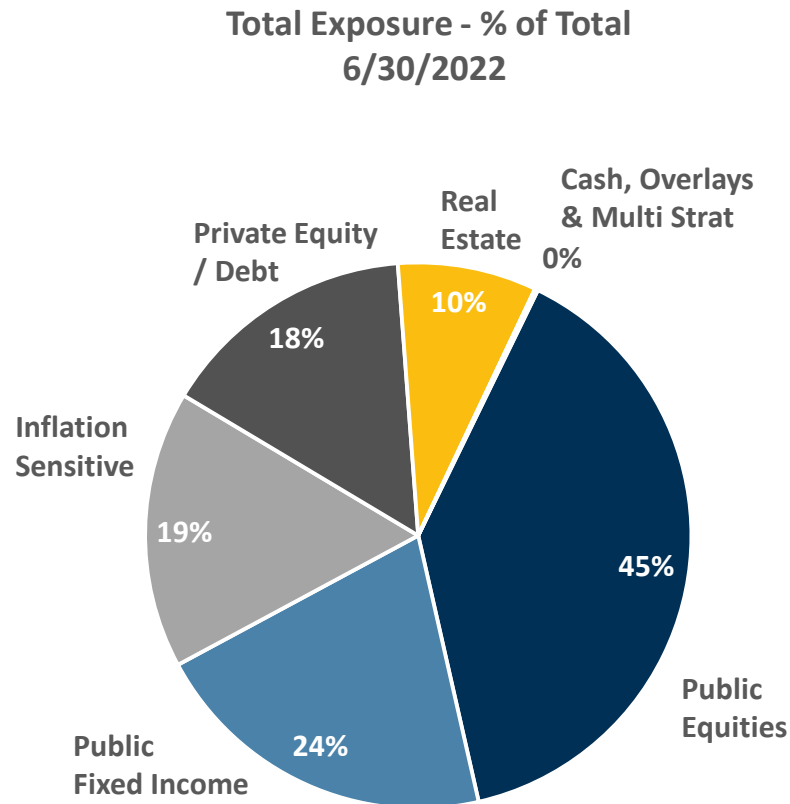


48% of Total SWIB Assets (including SIF) are internally managed

Refer to the disclosure section for additional details

Core Trust Fund Assets Under Management

Breakdown by Asset Class as of June 30, 2022



Total Exposure \$ & Adjusted AUM (\$millions)			
Total CTF by Asset Class	Total Exposure \$ 6/30/2021	Total Exposure \$ 6/30/2022	Year over Year Change
Public Equities	67,140	52,745	(14,395)
Public Fixed Income	30,593	27,819	(2,774)
Inflation Sensitive	20,717	22,099	+1,382
Real Estate	8,464	11,061	+2,597
Private Equity / Debt	14,975	20,502	+5,527
Multi Asset	4,420	9	(4,411)
Cash & Overlays	28	(250)	(278)
Total Exposure	\$146,336	\$133,984	(12,352)
<i>Less: Policy Leverage</i>	<i>16,642</i>	<i>17,522</i>	<i>+880</i>
Total CTF AUM	\$129,694	\$116,463	(13,231)

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

Core Trust Fund Allocation

All exposures shown as of June 30, 2022

Allocation – Exposure View

Strategies	(\$ millions)	As % of Total Fund		Target Range %	Notes
	Total Exposure	Portfolio Exposure %	Benchmark Target %		
Public Equities	52,745	45.29	45.15	39.15 – 51.15	<p>Public & Private exposures include cash</p> <p>Strategies include exposure management investments</p> <p>Cash / Overlays: Includes liquidity, overlay cash, cash used to fund synthetic beta related to Alpha Pool.</p> <p>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.</p> <p>* Target ranges reflect Board-approved corridor treatment</p> <p>Additional CTF leverage details available in disclosure section</p>
Global Developed	41,834	35.92	35.71		
US Small Cap	3,640	3.13	3.12		
International Small Cap	2,387	2.05	2.08		
Emerging Markets	4,884	4.19	4.24		
Public Fixed Income	27,819	23.89	23.75	17.75 – 29.75	
Investment Grade	19,987	17.16	16.98		
Non-Investment Grade	5,103	4.38	4.39		
Emerging Market Debt	2,729	2.34	2.38		
Inflation Sensitive	22,099	18.97	19.00	14.0 – 24.0	
Real Estate	11,061	9.50	9.50	actual exposure*	
Private Equity / Debt	20,502	17.60	17.60	actual exposure*	
Multi Asset	9	0.01	0.00	0.0	
Cash / Overlays	(250)	(0.21)	0.00		
Leverage	(17,522)	(15.04)	(15.00)	(20.0) to (10.0)	
Total Fund – Total Exposure	\$133,984	115.04	115.00	110.0 – 120.0	
Total Fund – Market Value	\$116,463	100.00	100.00		

Asset \$ exposures and % weights may contain rounding differences

Core Trust Fund: Asset Class Returns

as of June 30, 2022

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	\$52,724	(20.42)	(16.00)	6.37	7.32	9.21
Benchmark			(20.56)	(15.87)	6.72	7.57	9.30
Excess			+0.14	(0.13)	(0.35)	(0.24)	(0.09)
Global Developed	2/28/2017	\$41,155	(20.19)	(14.53)	6.90	7.83	8.36
Benchmark			(20.30)	(13.96)	7.49	8.20	8.73
Excess			+0.11	(0.57)	(0.60)	(0.37)	(0.37)
US Small Cap	2/28/2017	\$3,640	(24.06)	(23.27)	5.16	6.24	6.18
Benchmark			(22.84)	(24.62)	4.48	5.33	5.49
Excess			(1.22)	+1.36	+0.68	+0.92	+0.69
International Small Cap	12/31/2019	\$2,381	(24.18)	(22.68)			(0.98)
Benchmark			(24.50)	(23.70)			(1.37)
Excess			+0.32	+1.01			+0.39
Emerging Market ex China	3/31/2022	\$3,721					(18.65)
Benchmark							(17.91)
Excess							(0.74)
Emerging Market China	3/31/2022	\$955					2.54
Benchmark							3.37
Excess							(0.83)

(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, 2022

Asset Class Group: Public Fixed Income & Inflation Sensitive	Performance Start Date	Total Exposure Value (\$millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year or ITD
Public Fixed Income	12/31/2003	\$27,819	(12.84)	(12.67)	(0.94)	1.05	1.74
Benchmark			(11.98)	(11.96)	(1.10)	0.91	1.54
Excess			(0.86)	(0.71)	+0.16	+0.14	+0.20
Investment Grade US Credit	2/28/2022	\$6,644					(10.24)
Benchmark							(9.24)
Excess							(1.00)
US Treasuries	2/28/2022	\$10,777					(6.73)
Benchmark							(6.77)
Excess							+0.04
MBS	4/30/2020	\$2,245	(10.74)	(11.10)			(4.98)
Benchmark			(8.78)	(9.03)			(4.44)
Excess			(1.96)	(2.07)			(0.53)
High Yield	7/31/2019	\$5,093	(19.08)	(17.13)			(0.88)
Benchmark			(13.66)	(12.19)			(0.09)
Excess			(5.42)	(4.94)			(0.79)

(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, 2022

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
Emerging Market Debt - USD	6/30/2005	\$1,366	(20.30)	(20.95)	(5.14)	(0.97)	2.17
Benchmark			(20.31)	(21.22)	(5.22)	(1.19)	2.21
Excess			+0.01	+0.27	+0.08	+0.22	(0.04)
Emerging Market Debt - Local	7/31/2017	\$1,364	(13.66)	(18.86)	(5.75)		(3.10)
Benchmark			(14.53)	(19.28)	(5.80)		(2.75)
Excess			+0.87	+0.42	+0.04		(0.35)
Inflation Sensitive	12/31/2003	\$22,096	(8.92)	(5.09)	3.15	3.65	1.32
Benchmark			(8.92)	(5.14)	3.04	3.52	1.25
Excess			+0.01	+0.05	+0.11	+0.13	+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, 2022

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	\$11,061	12.71	25.30	10.83	9.73	11.26
Benchmark			15.34	27.26	10.30	8.90	9.77
Excess			(2.63)	(1.95)	+0.52	+0.83	+1.49
Private Equity / Debt	11/30/2006	\$20,502	6.36	25.97	23.43	19.67	15.96
Benchmark			4.27	21.45	19.77	16.50	13.52
Excess			+2.09	+4.52	+3.66	+3.17	+2.45
<i>Other strategies:</i>							
Alpha Pool Overlay	1/31/2011	\$10,789	1.29	3.13	5.36	3.74	3.38
Benchmark (set to zero as of 1/1/2019)		(at 1/1/22 = \$6,336)	0.00	0.00	0.00	0.67	1.77
Excess			+1.29	+3.13	+5.36	+3.08	+1.61
Multi Asset	3/31/2003	\$9	(15.84)	(10.77)	6.07	6.09	5.85
Benchmark		(at 1/1/22 = \$4,619)	(16.60)	(12.53)	4.49	5.73	6.59
Excess			+0.76	+1.76	+1.59	+0.35	(0.74)
Emerging Market Equity	2/28/2017	\$120	(17.55)	(24.01)	1.13	1.97	3.46
Benchmark		(at 1/1/22 = \$4,039)	(17.62)	(25.26)	0.61	2.23	3.75
Excess			+0.07	+1.25	+0.52	(0.26)	(0.29)

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

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

Core Trust Fund: Asset Class Returns

Net of External Mgr Fee - Excess Returns as of June 30, 2022



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, 2022

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	\$10,789	1.29	3.13	5.36	3.74	3.38

- Prior to the inclusion of Global Macro and Multi Strat sub strategies to the Pool in 1Q 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).

Alpha Pool: Key Sub Strategies	Inclusion Date	Market Value (\$ millions)	Calendar YTD or Since Inclusion Net Return %
Hedge Funds	1/31/2011	\$6,699 (62%)	1.10
Global Macro	3/1/2022	\$1,448 (13%)	-4.51
Multi Strat	2/1/2022	\$2,293 (21%)	3.50

Alpha Pool Overlay Return (Alpha Pool + Beta Return)	Calendar YTD	1 Year	3 Year	5 Year	10 Year
CTF Policy Benchmark (Beta)	(13.33)	(7.75)	6.88	7.23	7.52
Alpha Pool Overlay Return (Alpha Pool + Beta)	(12.04)	(4.63)	12.24	10.98	10.90

(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, 2022

Performance

Fund	Performance Start Date	Market Value (\$ millions)	Net of External Manager Fee Return %				
			Calendar YTD	1 Year	3 Year	5 Year	10 Year
Variable Trust Fund	6/30/77	\$8,403	(20.04)	(15.23)	7.33	8.25	10.44
Variable Trust Fund Benchmark			(20.26)	(15.46)	7.33	8.26	10.36
Excess			+0.22	+0.23	+0.00	(0.01)	+0.08

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

Portfolio Allocation

By Portfolio	(\$ millions)	As % of Total Fund		
	Total Exposure	Portfolio Exposure	Exposure Target	Target Range
Public Equities	8,403	100.00	100.00	
US Equities	5,861	69.75	70.00	65.0 – 75.0%
International Equities	2,527	30.07	30.00	25.0 – 35.0%
Cash & Overlays	15	0.18	0.00	
Total Fund	\$8,403	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, 2022

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	\$20,195	0.18	0.21	0.59	1.08	0.66
SIF Benchmark			0.26	0.28	0.53	1.06	0.62
Excess			(0.07)	(0.06)	+0.06	+0.03	+0.03
State Life Insurance Fund	10/31/1994	\$103	(16.13)	(15.00)	(1.13)	1.38	2.50
No Benchmark							
Historical Society Endowment Fund	12/31/1993	\$21	(18.89)	(13.03)	7.83	8.71	10.14
SHS Benchmark			(18.39)	(12.73)	7.40	8.43	9.93
Excess			(0.50)	(0.30)	+0.42	+0.28	+0.21
Injured Patients & Families Comp. Fund	10/31/1993	\$1,384	(12.79)	(11.40)	1.27	2.78	3.73
IP&FC Benchmark			(12.29)	(11.05)	0.81	2.45	3.20
Excess			(0.50)	(0.36)	+0.46	+0.33	+0.54
UW System Long Term Fund	3/31/2018	\$523	(12.92)	(7.63)	6.87		6.72
UW System Benchmark			(12.96)	(7.67)	6.66		6.50
Excess			+0.03	+0.04	+0.20		+0.23
UW Cash Management Fund	4/30/2022	\$479					(2.78)
UW Cash Management Benchmark							(2.70)
Excess							(0.08)

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

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

Leverage Performance

As of June 30, 2022

CTF Policy Leverage Performance

as of June 30, 2022

Core Trust Fund	Net of External Manager Fee Return %			
	Calendar YTD	1 Year	3 Year	5 Year
Unlevered Returns (as estimated):				
Portfolio ¹	(11.47)	(6.14)	7.12	7.28
CTF Benchmark Return ¹	(11.59)	(6.62)	6.40	6.77
Excess Return	+0.12	+0.48	+0.72	+0.52
<hr/>				
Portfolio Return (Unlevered)	(11.47)	(6.14)	7.12	7.28
Absolute Return from Leverage ^{1,2}	(1.74)	(1.13)	0.48	0.46
Implementation (+) or (-)	0.00	0.00	+0.01	+0.01
<hr/>				
Levered Returns (as reported):				
Portfolio	(13.21)	(7.27)	7.61	7.76
CTF Benchmark	(13.33)	(7.75)	6.88	7.23
Excess	+0.12	+0.48	+0.73	+0.53

(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 7% 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

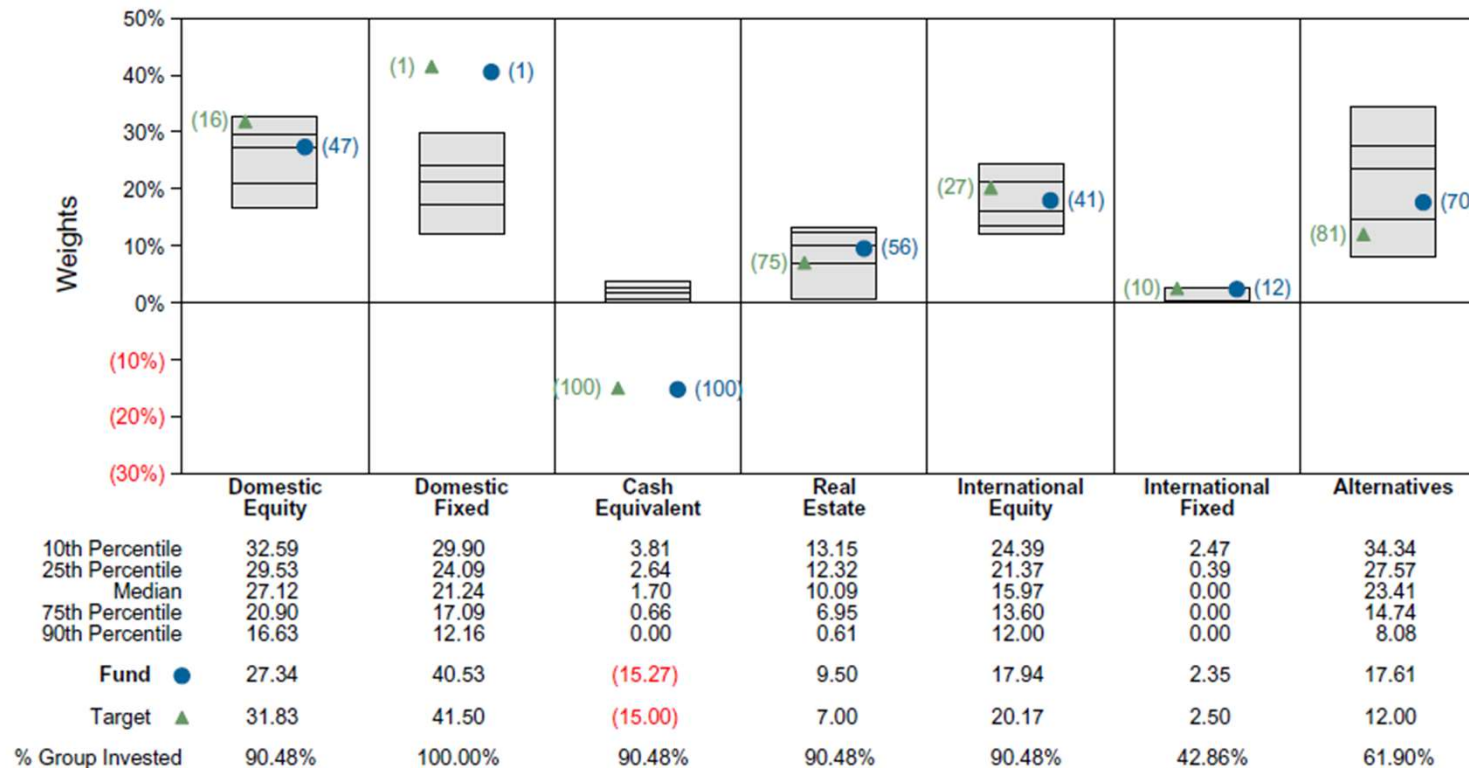
Callan Quarterly Report Summary

2nd Quarter 2022

Callan Peer Rank Update

CTF Asset Allocation Comparison to Peer Group (6.30.2022)

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

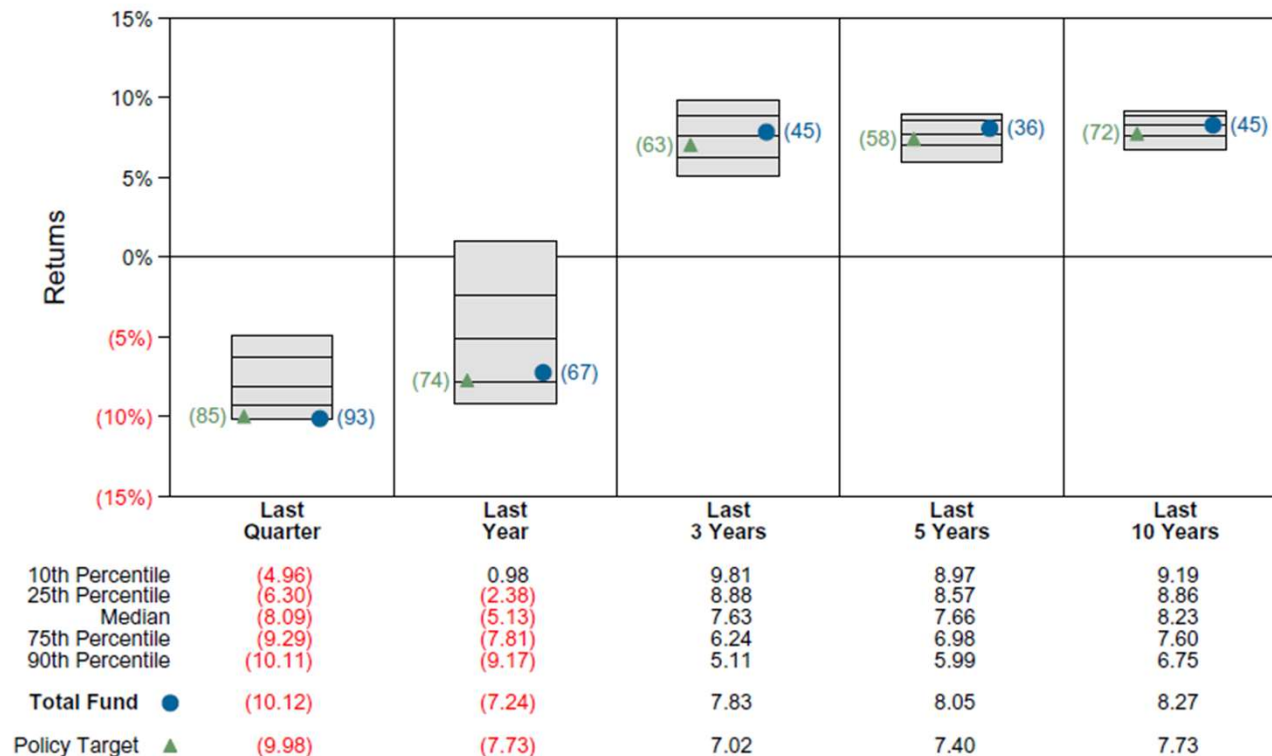


- SWIB's use of financial leverage (approximately 15%) enables more risk reducing/diversifying assets without sacrificing growth assets

Callan Peer Rank Update

CTF Performance vs. Peer Group (Gross Return, 6.30.2022)

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

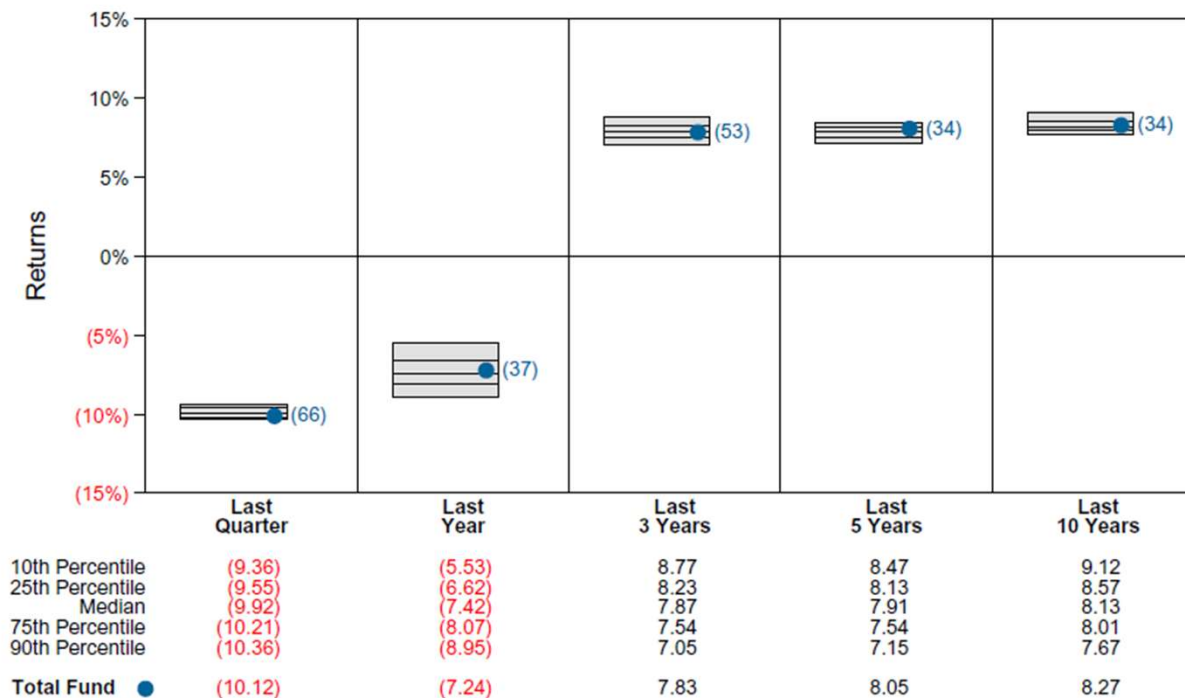


- 2nd quartile over 3-, 5- and 10-year periods
- 3rd quartile for 1-year period

Callan Peer Rank Update

*CTF Performance on Asset Allocation Adjusted Basis vs. Peer Group
(Gross Return, 6.30.2022)*

Asset Allocation Adjusted Ranking

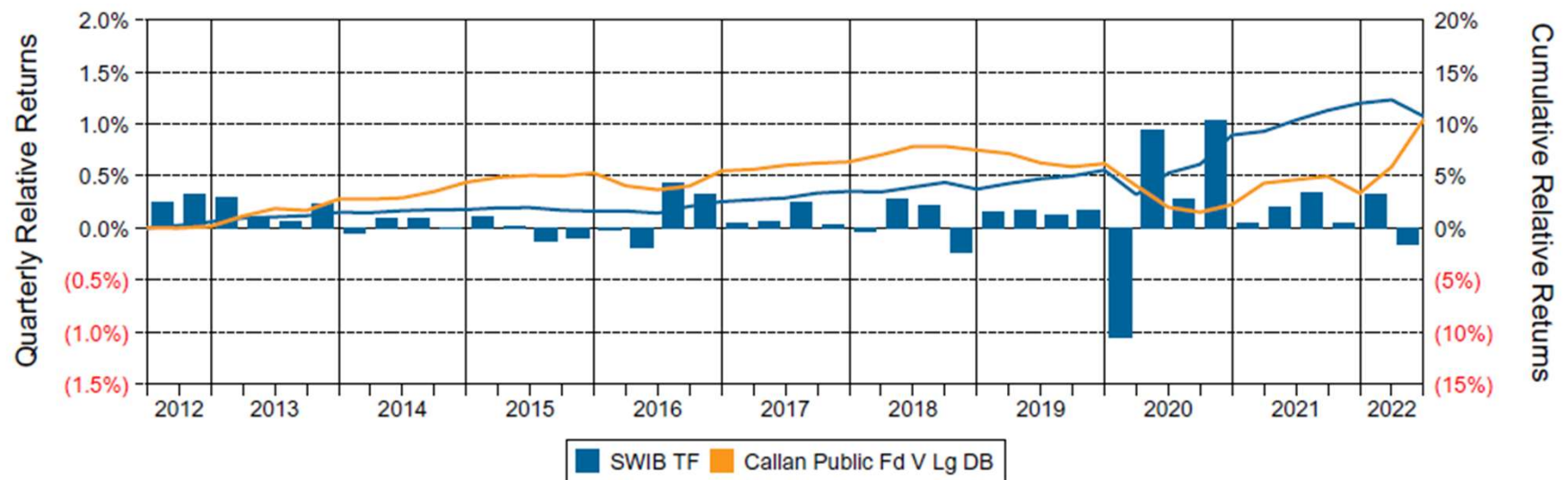


- Uses adjustment to peer universe to match the CTF risk-balanced allocation
- At or above median over 1-, 3-, 5-, and 10-year periods

Callan Peer Rank Update

10 Year Return Consistency vs. > \$10B Peer Group (6.30.2022)

Cumulative and Quarterly Relative Returns vs Target



- Maintained favorable CTF cumulative performance vs. peers over the last ten years
- Outperformance gap vs. peers narrowed during 1H 2022

Report Disclosures

Glossary, Definitions & Data Sources

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Gross of Fee Return ("GoF Return")	The returns generated in investment portfolios (or accounts) that reflect the deduction of transaction expenses incurred as a result of executing a trade or acquiring or disposing of the investment. In some instances, these expenses are not readily separable from the cost of the investment and are not distinctly recorded within accounting records invoiced by third parties. Security lending income is included in GoF return (however, Security Lending expense is not). Starting on 1/1/2021, the SWIB practice of "grossing up" external management fees, performance fees and any identifiable carried interest by crediting the investment accounts was discontinued. The use of GoF Return is limited to performance comparison to gross benchmark returns, long term CTF / VTF return periods where GoF is the sole return type available and for the purpose of fulfilling data submissions to consultants for peer performance comparison purposes.
Net of Fee Return ("NoF Return")	The GoF return that reflects 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 Return ("NoA Return")	The NoF return that reflects 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 1/1/2017.
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 = $((1 + r^1) \times (1 + r^2) \times (1 + r^3) \dots)^{\frac{\text{calendar units}}{\text{time interval measured}}} - 1$; $r^{(n)}$ = 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

Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Excess Return % ("Excess")	Portfolio return or security level return minus the benchmark return. Portfolio or Composite Returns are generally compared against benchmarks with a similar level of risk. It is widely used as a measure of the value added by the portfolio or investment manager or the manager's ability to outperform the market.
Net Excess Value Add \$ ("NEVA")	Net Excess Value Add \$ ("NEVA") calculates the portfolio's performance return in total dollars relative to a benchmark. NEVA is a measure used to assess the value-add dollars that a particular investment strategy or team generated over specified time periods. NEVA is also used to monitor the return objectives set forth in the annual Active Risk Budget which is prepared for the CTF and VTF funds managed by SWIB.
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).
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.

Report Disclosures

Key Terms and Portfolio Return Information

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



Report Disclosures

Key Terms and Portfolio Return Information

Term	Description / Definitions
Note on report data sources	<p><u>Return Calculations</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>Benchmark Market Data and Selection Process</u> The data source for this information is provided by multiple investment industry market data vendors and analytics firms depending on the investment strategy. The SWIB Benchmark and Performance Committee governs the benchmark selection process. An independent consultant (selected by the Board of Trustees or “Board”) makes recommendations to initially select or change benchmarks.</p> <p><u>Peer Rank Return Comparison Data</u> This information is provided and processed by industry consultants that consume return information for SWIB managed funds and then provide investor universe return comparisons and analytics using proprietary databases. When consultant info is included in the Quarterly Performance Summary the preparer of the work is identified.</p>

Leverage Disclosures

Calculation formulas to estimate impact

Report Disclosures

Notes on CTF Leverage Analysis

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

Report Disclosures

Notes on CTF Leverage Analysis

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

Board Meeting

Tab 6 - Investment Committee Open Session Business

- A. Amendments to WRS Investment Committee Investment Guidelines
- B. Approved Open Session Committee Meeting Minutes of May 24, June 28 and July 26, 2022
- C. Final Open Session Agenda for August 23, 2022 and Draft Open Session Agendas for September 27 and October 25, 2022 Meetings

SWIB Investment Committee
**WISCONSIN RETIREMENT SYSTEM
INVESTMENT GUIDELINES**

Revised as of

~~March 29~~ June 28, 2022 =

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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 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

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.

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 liquidity risk and cost under varied market scenarios.

Leverage may be generated using derivative instruments (such as futures, forwards, options, and swaps), through the use of repurchase agreements (repo) to borrow capital against fully paid assets, or by explicit borrowing through other capital markets mechanisms (such as lines of credit, debt issuance or securities lending). Sources of leverage are evaluated based on liquidity risk, counterparty risk, cost, and stability. The balancing of these dimensions can vary through time as market conditions vary, especially with respect to liquidity.

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 ~~exchanged~~[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), the underlying securities of 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. ~~4.~~ 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. ~~5.~~ 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. ~~6.~~ Guideline limits and soft parameters for each portfolio will be applied to the aggregate exposures which include both physical and synthetic securities.
8. ~~7.~~ New derivatives instruments will be reviewed and approved by the Investment Committee before their implementation or use.
9. ~~8.~~ 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 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. 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).
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 Trust Fund and Variable Trust Fund, which are listed in *Appendix 3*. When new benchmarks are approved by the Board or modified by the Board, *Appendix 3* shall be updated without amendment to these IC Guidelines.
7. The Risk Management Division will monitor the risk exposures of all WRS portfolios. The head of Risk Management may recommend modifications to portfolio exposures to manage risk exposures. With the ED/CIO’s concurrence, the manager of a portfolio will make changes as recommended by the head of Risk Management. In addition to such recommendations, drawdown control procedures for all active internal WRS portfolios will be implemented and monitored by the Risk Management Division and adhered to by the portfolios.
8. Portfolios may utilize cash instruments or derivatives in their investment strategy. All investments used will be subjected to the risk analysis and monitoring processes at the portfolio, asset class and fund levels. New derivative and investment instruments will be reviewed with and approved by the Investment Committee prior to implementation.
9. Exposure limits and credit quality exposure limits are to be applied at the time of purchase. Unless otherwise indicated, “value” shall mean market value including un-invested cash.
10. To-be-announced mortgage-backed securities (TBA MBS) may be traded only with a counterparty with which SWIB has a current Master Securities Forward Transaction Agreement (MSFTA), and the settlement of any forward TBA contract shall not be more than 90 days from the date of the trade.
 - a. The counterparty, or its guarantor, must, on each date on which a transaction is initiated, have a credit rating of not less than “Baa2/BBB” on long-term debt from S&P or Moody’s.
 - b. If the counterparty is not rated, then its parent must have such a rating and must guarantee the obligations of the counterparty.

- c. If a counterparty or its parent is downgraded to a credit rating below “Baa2/BBB” after the initiation of a trade, then trades may be initiated with that same counterparty only to reduce the existing exposure to that downgraded counterparty.

A. Small Cap Portfolios

The Small Cap Portfolios are 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 Portfolios may also be invested in equity securities that are publicly traded on stock exchanges in other developed countries.

1. When aggregated with other SWIB portfolios, no more than 20% of outstanding shares of any single issuer, excluding shares held in commingled funds and ETFs, may be owned.
2. When aggregated with other SWIB portfolios, no single issuer’s equity securities may represent more than 3%, excluding shares held in commingled funds and ETFs, of the total market value of all SWIB equity portfolios.
3. When aggregated with other SWIB portfolios, securities subject to restrictions on trading pursuant to Rule 144 under the Securities Act of 1933 shall not constitute more than 1% of the market value of all SWIB equity portfolios.
4. Up to 10% of each portfolio’s market value may be invested in international and emerging markets companies through common stocks, ADRs, ADSs, or country-specific ETFs. All international and emerging markets stock transactions must be in equity securities that are publicly traded on a stock exchange in a developed country.
5. Portfolios may use exchange-traded futures contracts or ETFs to equitize cash and receivables.
6. Portfolios may sell short any securities that may be purchased under applicable guidelines and may then use the proceeds from the short sale to purchase additional approved securities. The total value of the short sales in a portfolio may not exceed 50% of a portfolio’s market value.
7. Except as provided in 4 above, securities must be issued by an entity that is incorporated in the United States; provided that investment is also permitted if the issuer is incorporated in a tax haven outside the United States if 1) the company’s headquarters are located in the U.S. or 2) the headquarters are located in Belize, Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Channel Islands, Cook Islands, Isle of Man, Marshall Islands, Panama, Liberia or Netherland Antilles and the primary exchange for the issuer’s securities is located in the U.S.
8. The aggregate notional value of put options sold and not covered by portfolio cash is limited to 10% of the market value of the portfolio. The aggregate notional value of

call options sold and not covered by the underlying security positions is limited to 10% of the market value of the portfolio.

B. Global Equity Portfolios

The global sector portfolios are invested primarily in publicly traded equity securities, including common stocks, preferred stocks, ADRs, ADSs, ETFs, convertible bonds, 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 markets. Collectively, the global sector portfolios are referred to herein as the “global sector aggregate portfolio.”

1. Investments in companies whose headquarters and/or primary exchange are located in emerging market countries shall not exceed 5% of the global sector aggregate portfolio’s market value.
2. The global sector aggregate portfolio may own no more than 10% of outstanding shares of a single issuer, excluding shares held in commingled funds and ETFs.
3. No single issuer’s equity securities, excluding shares held in commingled funds and ETFs, as a percentage of the total market value of the global sector aggregate portfolio, may exceed the greater of (i) 4.0% and (ii) the benchmark weight of the issuer plus 2.5%.
4. Securities subject to restrictions on trading pursuant to Rule 144 of the Securities Act of 1933 shall not constitute more than 1% of the market value of the global sector aggregate portfolio.
5. 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.
6. Sector portfolios may use exchange-traded futures contracts or ETFs to equitize cash and receivables.
7. Sector portfolios 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 global sector aggregate portfolio may not exceed 50% of the portfolio’s market value.
8. The aggregate notional value of put options sold and not covered by portfolio cash is limited to 10% of the market value of the portfolio. The aggregate notional value of call options sold and not covered by the underlying security positions is limited to 10% of the market value of the portfolio.

C. Passive Portfolios

The objective of the passive portfolios is to closely track the returns and risk of their respective benchmarks.

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. Activity or retention of 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.
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. Investment Grade Credit Portfolio

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

1. Maximum single issuer concentration is limited to 8% of the portfolio's market value on a net basis for developed markets investment grade issuers and 3% for all other issuers, in each case, excluding Treasuries, Treasury futures and ETFs.
2. Positions may be purchased long and sold short, and the use of leverage will be incorporated in ex-ante risk assessments and active risk/tracking error contributions. The portfolio may take short exposure by shorting individual securities, including cash bonds and equity securities, utilizing single name CDS and CDX index securities, and shorting ETFs that have been approved by Compliance and included on an approved ETF trading list (including put or call options thereon).
3. The portfolio may use eligible derivative instruments to manage the duration, yield curve exposure, currency, interest rate, equity, and market exposure of the portfolio. Eligible derivatives include (i) credit index swaps (e.g., CDX) and single-name

- CDS; (ii) futures, forwards and swaps on securities, indices, and interest rates; (iii) options on securities, including equity securities.
4. Effective duration of the portfolio shall remain within two years of the assigned benchmark's duration.
 5. Emerging market (EM) debt investment is limited to securities rated "B-" or above and:
 - a. EM sovereign debt must be of countries in the JP Morgan Emerging Market Bond Index Global Diversified ("JP Morgan EM Bond Index").
 - b. EM corporate debt must be of issuers in the Bloomberg US Credit Index.
 - 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 shall not exceed 10% 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 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.
 8. Gross exposure for the portfolio shall not exceed 200% of the portfolio's market value, and net exposure for the portfolio shall not exceed 150% of the portfolio's market value, in each case unless approved by the ED/CIO.

E. U.S. TIPS Index Portfolio

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

1. Individual securities must be U.S. TIPS which are included in the Barclays U.S. TIPS benchmark.

2. The portfolios option adjusted duration should be +/- 15% of the benchmark duration.

F. Currency Overlay

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

1. The amount of the overlay will be expressed in relation to the size of the aggregate non-U.S. market value of the internally managed Global Sector Portfolios and the internally managed MSCI World ex U.S. Index Portfolio. This amount is referred to as the “portfolio reference value.” For example, if the Global Sector Portfolios have a non-U.S. market value of \$1 billion and the MSCI World ex U.S. Index Portfolio has a market value of \$1 billion, then the portfolio reference value is \$2 billion.
2. Only the currencies in the MSCI All Country World Index (ACWI) may be used to implement the currency overlay.
3. Currencies may be bought or sold.
4. Positions in any individual non-U.S. currency may be taken equal to +/- 10% of the portfolio reference value for major currencies (Euro, UK Sterling and Japanese Yen) and +/- 5% for all other ACWI currencies. For example, if the portfolio reference value is \$2 billion, individual currency positions in major currencies could be taken of +/- \$200 million.
5. Up to 25% of the portfolio reference value may be hedged into U.S. dollars.
6. The risk of the currency overlay strategy in aggregate will be limited to 25% of the active risk target for the total trust fund, which is set by the Board.
7. Limits shall be calculated using the notional value of the currency instruments (*i.e.*, forwards and futures) and the portfolio reference value at the time of purchase.

G. Exposure Management Portfolios

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

Each strategy and/or investment idea expressed in the portfolios shall be approved by any three of the ED/CIO and the heads of ARA, GPMS and PMFA. Portfolio oversight will be the responsibility of the ARA Division, and the Investment Committee will monitor each investment in the portfolios. The Investment Committee shall establish procedures to

monitor these portfolios. These portfolios may invest in any instrument approved for the relevant asset class portfolios described elsewhere in these guidelines. The portfolios may use derivative instruments.

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

H. Multi-Strat Portfolio

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

I. Global Macro Portfolio

The Global Macro portfolio implements discretionary or systematic investment strategies by trading in exchange-traded and OTC instruments in interest rates, equity, credit, currency, commodity, and volatility markets.

1. The Global Macro portfolio is authorized to invest in or short any instrument or derivative, except as set forth in Guideline 6 below, subject to Guideline 5 below.
2. Strategies may be managed either by internal investment staff or by an external manager.
3. Leverage and derivatives may be used to implement strategies and to adjust the market exposure of the Global Macro portfolio. The use of leverage will be incorporated in ex-ante risk assessments and active risk contributions.
4. 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.
5. ED/CIO approval, along with notice to the Head of Risk Management, is required prior to the 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 portfolio investing in any new investment instruments or derivatives not previously approved by the Investment Committee for any asset class portfolios.
6. Investment is not permitted in the following tranching structured credit securities: asset-backed securities, collateralized debt obligations, collateralized loan obligations, collateralized mortgage obligations, credit risk transfer securities, private label mortgage-backed securities, commercial mortgage-backed securities, and residential mortgage-backed securities.
7. Currency forward contracts will be limited to a maximum tenor of one-year.

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 ~~15~~20% of the portfolio's market value, in the aggregate.
7. Fixed income securities with an effective duration of one year or less (i) may not, in the aggregate, exceed 25% of the portfolio's market value, and (ii) will have an average credit rating of "A" or better. The portfolio may also use repurchase agreements and reverse repurchase agreements for cash management.
8. Derivatives use is permitted for the purposes of duration, interest rate, yield curve, mortgage credit, and volatility management. Derivatives use is permitted through the use of (a) exchange-traded interest rate instruments, including futures and options, (b) interest rate swaps and swaptions, (c) MBS options, (d) other volatility derivatives (including options), and (e) credit index swaps (e.g., CMBX, CDX).
9. All instruments permitted in these guidelines may be traded long or short. Excluding the TBA Strategy, gross exposure for the portfolio shall not exceed 200% of the portfolio's market value, and net exposure for the portfolio shall not

exceed 150% 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 3% 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 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.
2. Effective duration of the portfolio shall remain within +/- five years of the assigned benchmark's effective duration.
3. Positions may be purchased long and sold short, and the use of leverage will be incorporated in ex-ante risk assessments and active risk/tracking error contributions. The portfolio may take short exposure by shorting individual securities, cash bonds, buying single name CDS, shorting the CDX index, shorting high-yield and equity ETFs that have been approved by Compliance and included on an approved ETF trading list (including put or call options thereon), as well as shorting the underlying equity of a leveraged issuer.
4. Instruments not included in the benchmark, but otherwise permitted in these portfolio guidelines, may not exceed 25% of the portfolio's market value on a long or short basis (i.e., long % + short %). For the avoidance of doubt, any instrument that is subsequently removed from the portfolio's benchmark due solely to the instrument's maturity falling below the benchmark's stated thresholds shall not be deemed to be out of benchmark for purposes of the 25% limitation described in this Guideline #4.
5. Maximum single issuer concentration is limited to 5%, excluding Treasuries, Treasury futures and holdings of ETFs, of the portfolio's market value on a net basis.
6. Gross exposure to non-U.S. Dollar denominated instruments shall not exceed 10% of the portfolio's market value on a long or short basis (i.e., long % + short %).
7. Gross exposure to emerging market corporate debt is limited to (a) securities that are rated "B-/B3" or above and (b) issuers incorporated or organized in countries included in the JP Morgan Emerging Markets Diversified Index, and in aggregate shall not exceed 5% of the portfolio's market value on a net basis.

8. Exposure to any single industry sector shall remain within 20% of the assigned benchmark's industry sector weighting on a net basis.
9. Exposure to high-yield bank loans shall not exceed 10% of the portfolio's market value on a net basis.
10. Ex-ante tracking error shall not exceed 5% as measured by SWIB's standard model used at any given time by SWIB's Risk Management Division. If market conditions (compared to active management actions) cause the portfolio's ex-ante tracking error to exceed this limit, then the portfolio will not be deemed to be out of compliance with these guidelines and this guideline will not be deemed to be violated; except that, if the portfolio's ex-ante tracking error exceeds 5% then the portfolio may not trade or take any other action which is predicted to increase the ex-ante tracking error of the portfolio.
11. The portfolio may use eligible derivative instruments to manage the duration, yield curve exposure, currency, interest rate, and market exposure of the portfolio. Eligible derivatives include (i) CDS (as described in more detail under Guideline #3 above); (ii) futures contracts on securities, indices, and interest rates; (iii) forward contracts for securities, indices, and interest rates; (iv) swap contracts for securities, indices, and interest rates; (v) options on high yield and equity ETFs (as described in more detail under Guideline #3 above); and (vi) options on the underlying equity of a leveraged issuer.
12. Gross exposure for the portfolio shall not exceed 200% of the portfolio's market value, and net exposure for the portfolio shall not exceed 150% of the portfolio's market value, in each case unless approved by the ED/CIO.

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.
10. Gross exposure for the portfolio shall not exceed 200% of the portfolio's market value, and net exposure for the portfolio shall not exceed 150% of the portfolio's market value, in each case unless approved by the ED/CIO.

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 plus unfunded commitments.

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

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

O. Private Debt Portfolio

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

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

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

1. Investments may carry a rating from a national rating agency, the National Association of Insurance Commissioners (NAIC) or SWIB. Notwithstanding the provisions of the General Guidelines above, the Portfolio Manager may make investments that carry a “BBB” or better rating from a national rating agency or the NAIC, provided that if the investment carries only a SWIB rating, it shall be approved by the head of PMFA, regardless of size.
2. Investments may be made in below investment grade instruments provided that such investments do not in the aggregate constitute more than 25% of the Private Debt Portfolio’s par value. Any investment below investment grade requires approval from the head of PMFA.
3. The Private Debt Portfolio’s aggregate portfolio issuer limits shall be scaled by quality and a purchase may not cause the Private Debt Portfolio’s exposure to a borrower or issuer to exceed the following limits (at par value):

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

4. The Private Debt Portfolio shall maintain at minimum a weighted average rating of “BBB”, where “AAA”=4, “AA”=3, “A”=2, “BBB”=1, and “BB” or less =0.
5. Other guideline limitations notwithstanding, portfolio managers 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, through strategic partnerships, or as 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.

~~A private equity consultant hired by SWIB will review prospective investments in limited partnerships or other fund vehicles with new managers and make individual written recommendations to SWIB staff. SWIB shall only invest in new limited partnerships or other fund vehicles with new managers that are affirmatively recommended by the Consultant. Follow-on funds, co-investments and secondary fund purchases do not require consultant review. A “follow-on fund” is an investment or an investment vehicle that has the same sponsor or manager and is either parallel to, or has a substantially similar investment strategy as, a fund in which SWIB is or has been an investor. From time to time, SWIB may also consider formation of fund investments where it may participate both as a general partner and as limited partner. In such cases, subject to the approval limits below, SWIB will retain a consultant to advise it on the strategy and opportunity.~~

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

Approval By:	Head of PMFA	ED/CIO
New Manager		
• Venture Capital Funds	Up to \$60 million or less	More than \$60 million
• Venture Capital	Up to \$20 million or less	More than \$20 million

Co-Investments		
Follow-on Commitments		
• Venture Capital Funds	Up to \$75 million	More than \$75 million
• Venture Capital Co-Investments (excluding funds of one)	Up to \$25 million	More than \$25 million
SWIB ownership equal to or greater than 50% of an individual fund (excluding funds of one and any 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 a fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%

2. No more than 45% of the Venture Capital Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Venture Capital Portfolio's exposure may be invested in emerging markets. No more than 5% of the Venture Capital Portfolio's exposure may be invested in companies located in emerging markets.
- ~~3. No more than 2% of the Core Fund may be invested in venture capital.~~
3. ~~4.~~ Venture capital investments may be made through funds, strategic partnerships, or co-investments. Venture capital co-investments (excluding funds of one) must be made in one of the following ways:
 - (1) alongside a fund with the same sponsor or manager as a fund in which SWIB is or has been an investor,
 - (2) alongside a fund with the same sponsor or manager as a fund on which SWIB is conducting due diligence and is actively evaluating for a prospective commitment, or
 - (3) as approved by the ED/CIO.
4. From time to time, SWIB may consider formation of fund investments where it may participate both as a general partner and as limited partner.
5. Venture capital co-investments made within the Wisconsin Venture Capital Portfolio are limited to companies with their headquarters or primary operations in Wisconsin. Co-investments in the Non-Wisconsin Venture Capital Portfolio may not make up more than 15% of the Venture Capital Portfolio's exposure.
6. Neither the aggregate exposure (including co-investments) to any fund manager or sponsor, nor the aggregate amount of investments in any company, may exceed 20% of the Venture Capital Portfolio's exposure without approval of the ED/CIO.

7. No single co-investment (excluding funds of one) shall exceed 10% of the Venture Capital Portfolio's exposure.
8. The Venture Capital Portfolio may make co-investments in public company securities through private placements, including PIPEs, or other offerings. Co-investments in public company securities shall not exceed 10% of the Venture Capital Portfolio's exposure. For purposes of this guideline, public company securities received via a distribution are not counted and are expected to be sold as soon as reasonably practicable.
9. Subject to the approval thresholds and the restrictions above, the Venture Capital Portfolio Manager or other staff authorized by the head of PMFA may modify or waive terms of investments in the portfolio and generally take any and all other actions that are necessary and reasonable to protect, maintain or enhance the value of SWIB's position in the investments.

Q. Private Equity Portfolio

The Private Equity Portfolio consists of private equity or private equity-related investments, made on a global basis, in limited partnership or other fund vehicles, strategic partnerships, and co-investments in operating or holding companies. Investment guidelines and soft parameters shall be applied to the aggregate composition of the Private Equity Portfolio (including the Legacy, Private Equity Co-Investment, Current Return and Current Return Co-Investment Portfolios), unless otherwise stated. ~~A private equity consultant hired by SWIB will review prospective investments in limited partnerships or other fund vehicles with new managers and make individual written recommendations to SWIB staff. SWIB shall only invest in limited partnerships or other fund vehicles with new managers that are affirmatively recommended by the Consultant. Follow-on funds, co-investments and secondary fund purchases do not require consultant review. A "follow-on fund" is an investment or an investment vehicle that has the same sponsor or manager and is either parallel to, or has a substantially similar investment strategy as, a fund in which SWIB is or has been an investor.~~

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

	Head of PMFA	ED/CIO
New Manager		
• Funds or Strategic Partnerships	\$150 million or less	Over \$150 million
• Co-Investments	\$50 million or less	Over \$50 million
Follow-on Commitments		
• Funds or Strategic Partnerships	\$300 million or less	Over \$300 million

• Co-Investments	\$100 million or less	Over \$100 million
SWIB ownership equal to or greater than 50% of an individual fund (excluding 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 a fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%	

2. The Private Equity Portfolio shall not include investments in venture capital funds.
3. Investments may be made through funds, strategic partnerships, or co-investments. Co-investments must be made in one of the following ways:
 - (1) alongside a fund with the same sponsor or manager as a fund in which SWIB is or has been an investor,
 - (2) alongside a fund with the same sponsor or manager as a fund on which SWIB is conducting due diligence and is actively evaluating for a prospective commitment, or
 - (3) as approved by the ED/CIO.
4. Neither the aggregate exposure (including co-investments) to any fund manager or sponsor, nor the aggregate amount of investments in any company, may exceed 10% of the total Private Equity Portfolio's exposure without approval of the ED/CIO.
5. No more than 45% of the Private Equity Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Private Equity Portfolio may be invested in emerging markets.
6. No more than 45% of the Private Equity Co-Investment Portfolio's exposure may be invested outside of the U.S., without the approval of the ED/CIO. No more than 20% of the Private Equity Co-Investment Portfolio's exposure may be invested in companies located in emerging markets.
7. The Private Equity Co-Investment Portfolio may make co-investments in public company securities through private placements, including PIPEs, or other offerings. Co-investments in public company securities shall not exceed 10% of the Private Equity Co-Investment Portfolio's exposure. For purposes of this guideline, public company securities received via a distribution are not counted and are expected to be sold as soon as reasonably practicable.
8. Other guideline limitations notwithstanding, portfolio managers 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). ~~A real estate consultant hired by SWIB will review prospective commingled fund investments with new managers and make individual written recommendations to SWIB staff. SWIB shall only invest in commingled fund investments with new managers that are affirmatively recommended by the Consultant. Follow-on funds and secondary fund purchases will not require consultant review. A "follow-on fund" is an investment or an investment vehicle that has the same sponsor or manager and is either parallel to, or has a substantially similar investment strategy as, a fund in which SWIB is or has been an investor.~~

All portfolio commitments are subject to the following approvals:

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

*With respect to a separate account tranche, approval is required for the tranche, but 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 does not apply to real estate investments for which SWIB has sole discretion to select, retain, and terminate manager(s) and/or advisor(s) without cause.
2. Aggregate direct public REIT and real estate company stock holdings (excluding underlying commingled fund holdings and externally managed REIT Portfolios) may not exceed 15% of the Real Estate Equity Portfolio's exposure and portfolio investments in any one public REIT or company may not exceed 3% of the Real Estate Equity Portfolio's exposure. SWIB's direct ownership position in any public REIT or company may not exceed 20% of outstanding voting equity, without ED/CIO approval. Any externally managed REIT portfolio(s) will be managed under separate authority, with

guidelines set out in the management agreement(s) between SWIB and the selected manager(s).

3. No more than 45% of the Real Estate Equity Portfolio's exposure may be invested outside the U.S., without the approval of the ED/CIO. No more than 20% of the Real Estate Equity Portfolio's exposure may be invested in emerging markets, and no more than 10% of the Real Estate Equity Portfolio's exposure may be invested in separate accounts invested in emerging markets.
4. Other guideline limitations notwithstanding, the portfolio manager 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 fixed income instruments and in instruments with both current pay and equity features. Investment guidelines and soft parameters shall be applied to the aggregate composition of the Private Equity Portfolio (including the Legacy, Private Equity Co-Investment, Current Return and Current Return Co-Investment Portfolios), unless otherwise stated. ~~A private equity consultant hired by SWIB will review prospective investments in limited partnerships or other fund vehicles with new managers and make individual written recommendations to SWIB staff. SWIB shall only invest in limited partnerships or other fund vehicles with new managers that are affirmatively recommended by the Consultant. Follow-on funds, co-investments and secondary fund purchases do not require consultant review. A "follow-on fund" is an investment or an investment vehicle that has the same sponsor or manager and is either parallel to, or has a substantially similar investment strategy as, a fund in which SWIB is or has been an investor.~~

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

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

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

7. Other guideline limitations notwithstanding, portfolio managers 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, but SWIB may make investments in fund-of-fund vehicles, as may be deemed appropriate by Funds Alpha staff and otherwise approved hereunder.
 - b. *Hedge Funds or Separately Managed Accounts ("SMAs")*: Investments can be made in limited liability partnerships with other investors or, in some cases depending upon the manager and size of investment, in separately managed accounts. SWIB expects its investments will be in limited liability vehicles rather than SMAs, but may make use of SMAs if it is in the best interest of SWIB to do so.
 - c. *Special Opportunity Investments*: SWIB may invest a portion of its portfolio in special opportunity investments, which may include: interests in the equity or revenues of hedge fund managers, co-invest, or external manager "best ideas" opportunities. Special Opportunity Investments will be capped at 20% of the market value of the total HF Portfolio.
2. Hedge Fund Investment Strategies:
 - a. *Event-Driven* – investments up (debt or credit) and down (equity) the corporate capital structure where an expectation exists for realized profits over a short to medium time frame as a result of a known catalyst such as a merger, spinoff, or restructuring.
 - b. *Long-Short Equity* – long and short investments in publicly traded stocks.
 - c. *Tactical Trading* – global investments in indexes, commodities, interest rates, and currencies and, in each case, their derivatives as a result of relative value or directional forecasts from a systematic or discretionary approach.
 - d. *Relative Value* – strategies that seek to take advantage of price differentials by buying and selling different yet related securities. Relative value strategies include fixed income arbitrage, insurance linked, long/short credit, quantitative strategies, structured credit, and volatility-related investments.

- e. *Multistrategy* – funds that invest across multiple asset classes, typically (but not always) with multiple portfolio managers. Most multistrategy funds diversify across three or more underlying strategies.

~~In the event a sub-strategy could fall under more than one Investment Strategy, the categorization designated by the Consultant will be utilized.~~

The HF Portfolio has the following target weightings and ranges to the individual hedge fund strategies, ~~based on the Consultant's "Lower Beta" model portfolio recommendations:~~

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

- ~~3. Roles of SWIB staff and Consultant: SWIB Funds Alpha staff and the HF Portfolio Consultant (the "Consultant") will be responsible for conducting initial and ongoing hedge fund due diligence, selecting individual hedge funds, and determining the allocations to individual hedge funds. The Consultant, in concert with staff, will conduct investment and operational due diligence and make individual hedge fund written recommendations to SWIB staff. SWIB staff will conduct its own review and assessment of the universe of recommended managers from the Consultant and recommend hedge funds according to the approval process. SWIB shall only invest in new Hedge Funds that are affirmatively recommended by the Consultant, and SWIB shall obtain an additional recommendation from the Consultant for additional subscriptions to existing funds of \$50 million or 30% of the current investment (whichever is less). Co-investments do not require consultant review unless SWIB is the lead investor. SWIB staff and the Consultant will be responsible for ongoing monitoring of SWIB's hedge fund investments.~~

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

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

• Core	Up to \$400 million aggregate invested	More than \$400 million
• Special Opp/ Co-invest	Up to \$100 million aggregate invested	More than \$100 million
SWIB ownership equal to or greater than 50% of an individual fund, calculated at the master fund level (excluding funds of one and a fund/vehicle through which a co-investment is made)	ED/CIO, provided that notice shall be given to the ED/CIO if ownership of an individual fund (excluding funds of one and a fund/vehicle through which a co-investment is made) is equal to or greater than 33 1/3%	

4. ~~5.~~ 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. ~~6.~~ Other guideline limitations notwithstanding, portfolio managers 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. ~~7.~~ 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 will be comprised primarily of direct investments in strategies of external managers that are intended to generate both (1) a beta or SWIB policy benchmark return and (2) an active alpha return stream above the benchmark. These managers are referred to as Beta One External Managers due to their dual mandate to manage both a Core Fund asset allocation benchmark and a tracking error around the given benchmark. The manager is expected to deliver the total return of the benchmark (or beta of one), plus an excess return (alpha) over the benchmark. This is distinctive compared to SWIB's external hedge fund portfolio, which is designed to deliver only an excess return or alpha. This section does not govern passive external managers which the Asset and Risk Allocation Division oversees and monitors.

1. Investments in Beta One 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 and/or limited liability partnerships with other investors or in a Fund-of-One structure where SWIB is the sole investor.
- 2. Investment Strategies and Broad Guidelines for Beta One External Managers:
 - a. *Equities* – strategies will be comprised of various fundamental, quantitative and other approaches intended to produce an active return above the respective benchmarks. Strategies will be invested in traditional long only portfolios, active extension formats (i.e. 130/30, 150/50) and other public equity securities approaches across various styles, geographies and market cap weights. A limited use of shorting (up to 50%) may be used in the active extension format in non-SMAs.
 - b. *Fixed Income* – strategies will be comprised of various fundamental, quantitative, and other approaches intended to produce an active return above the respective benchmarks. Strategies will primarily be invested in traditional long only portfolios across the credit quality spectrum, varying geographies, including emerging and frontier market debt, high yield and structured securities. Derivatives may be used primarily for duration and currency management and will be set forth in the individual manager guidelines.
 - c. Notwithstanding any shorting permitted above and pursuant to SWIB’s policies, the investment guidelines for SMAs will prohibit the Beta One External Managers from shorting any securities and from purchasing securities in certain 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. Roles of SWIB staff and Consultant: SWIB Funds Alpha staff and any Staff Consultant engaged by SWIB to conduct public markets managers search, ongoing due diligence, and/or external manager oversight (any such consultant a “Consultant”) will be responsible for (i) conducting initial and ongoing due diligence, (ii) selecting individual strategies, (iii) determining the allocations to individual strategies (subject to the applicable approvals below), and (iv) negotiating and executing investment management agreements and investment guidelines consistent with this document. The Consultant, in concert with staff, will conduct due diligence (which may include business management, trading and operations, operational due diligence, valuation, risk management, and disclosures and investment terms) and make individual strategy written recommendations to SWIB staff. SWIB staff will conduct its own review and assessment with advice of the Consultant and recommend strategies according to the approval process. SWIB shall only invest in new Beta One External Managers that are affirmatively recommended by the Consultant. SWIB staff and the Consultant will be responsible for on-going monitoring, reporting, and assessment of SWIB’s investments in Beta One External Managers.~~

4. ~~5.~~ Approvals: Beta One External Manager allocations are subject to the following approvals:

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

5. ~~6.~~ Other guideline limitations notwithstanding, the Funds Alpha Manager or other staff authorized by the head of PMFA may modify, amend or waive terms of Beta One Manager investment management agreements and generally take any and all other actions that are necessary and reasonable to protect, maintain, or enhance the value of SWIB's position in the investments.
6. ~~7.~~ All redemptions, terminations or reductions of capital will be at the discretion of the Funds Alpha Manager and the head of PMFA in consultation with the head of ARA for policy benchmark exposure consideration.
7. ~~8.~~ 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 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 Funds Alpha Manager 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-invest, real estate, venture capital, hedge fund, and private debt asset classes to provide for (i) excess exposure to certain investment ideas where the sizing of the investment requires it to be held, in part, outside of an individual internal portfolio or (ii) hedging transactions using public or private securities. In each case, a primary investment must be made by the relevant private markets or hedge fund portfolio with the excess exposure or hedging transaction being allocated to an overage portfolio. The relevant private markets or funds alpha portfolio manager 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 portfolio manager, and a majority of the ED/CIO and the heads of ARA and GPMS. Any approved investment shall be reported to the Investment Committee on a monthly basis. Other governance, monitoring, compliance or reporting for the investment may also be specified in the approval. Portfolios will not have a separate benchmark or risk target, but will be included within the benchmark and risk parameters for the applicable aggregated asset class, portfolio, or Core Trust 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.

VI. 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, and cost of internal management versus external management. If the decision is made to manage the portfolios externally, SWIB will determine whether a separate account or commingled fund best suits SWIB's needs.

External active and passive managers operate under contractual investment guidelines approved by SWIB's Investment Committee or by SWIB's investment management staff, as designated in the Investment Committee Charter.

APPENDIX 1 - APPROVED EXCHANGES

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

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

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

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

APPENDIX 2 - SOFT RISK PARAMETERS

SOFT RISK PARAMETERS – ASSET CLASS AND PORTFOLIO

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Asset Class Exposure*	Core Fund	
	Global Equities	Target \pm 4.6%
	EM Equities	Target \pm 2.8%
	Small Cap	Target \pm 4.9%
	EAFE Small Cap	Target \pm 4.3%
	U.S. Inv Grade	Target \pm 4.8%
	High Yield and Levered Loans	Target \pm 5.1%
	EM Debt	Target \pm 5.6%
	Variable Fund	
	U.S. Equity	Target \pm 5.0%
	Int'l Equity	Target \pm 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	+/- 15% of Benchmark
Base Portfolio	Global Sector Aggregate Portfolio	8-12% of Aggregate Sector Portfolio
Scaled Portfolio	Global Sector Aggregate Portfolio	88-92% of Aggregate Sector Portfolio

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
ACTIVE/INDEXED EQUITIES		
Minimum Number of Holdings	Small Cap Diversified Consolidation	100
	Global Sector Aggregate Portfolio	Lesser of 100 names or 25% of index names
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 Diversified Consolidation	2% - 6%
	Global Sector Aggregate Portfolio	1% - 4%
Maximum Position Size (Excluding ETFs)	Passives	5% notional value of futures
Single Name Concentration	Small Cap Diversified Consolidation	Benchmark weight \pm 2%
	Global Sector Aggregate Portfolio	Benchmark weight \pm 2%
Maximum Total Value of Short Sales	Global Sector Aggregate Portfolio	40% of portfolio value
Maximum ETF Exposure	Passives	5% of portfolio value
	Small Cap Diversified Consolidation	+/- 15% of portfolio value
	Global Sector Aggregate Portfolio	+/- 15% of portfolio value
Maximum Company Ownership (Excluding ETFs)	Small Cap Diversified Consolidation	10% of outstanding
	Global Sector Aggregate Portfolio	10% of outstanding

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
Top Ten Holdings	Small Cap Diversified Consolidation	25% of portfolio
P/E Ratio	Small Cap Diversified Consolidation	50%-150% of Benchmark
	Global Sector Aggregate Portfolio	50%-150% of Benchmark
Maximum Sector Exposure	Small Cap Diversified Consolidation	Benchmark weight $\pm 10\%$
	Global Sector Aggregate Portfolio	Benchmark weight $\pm 5\%$
Maximum Notional Uncovered Sold Calls	Passives	5% of portfolio value
	Small Cap Diversified Consolidation	5% of portfolio value
	Global Sector Aggregate Portfolios	5% of portfolio value
Maximum Notional Uncovered Sold Puts	Passives	5% of portfolio value
	Small Cap Diversified Consolidation	5% of portfolio value
	Global Sector Aggregate Portfolio	5% of portfolio value
Maximum Cash	Passives	1% in unequitized cash
	Small Cap Diversified Consolidation	5%
	Global Sector Aggregate Portfolio	5%
FIXED INCOME		
Duration	IG Credit	+/- 1 year of assigned Benchmark
	MBS	+/- 1 year of assigned Benchmark
Maximum Corporate Industry Sector Exposure	IG Credit	Greater of 10% or 3 x Benchmark
Ex Ante Tracking Error	IG Credit	3.0%
	MBS	3.0%

PORTFOLIO ASSET CLASS CHARACTERISTIC	ASSET CLASS	DISCUSSION TRIGGER
	High Yield	3.0%
	Lev Loans	3.0%
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
	Global Macro	2.5% to 12.5%, measured with a trailing two-year risk sampling period
Ex-Ante Equity Beta		
Ex-Ante Spread Beta	Multi-Strat and Global Macro	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
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 ²	Private Equity	5% of core Private Equity Portfolio for Private Equity Co-Investments 5% of Current Return Portfolio for Current Return Co-Investments
Minimum Funds	Private Equity	80% of aggregate Private Equity Portfolio
Maximum Venture Capital Exposure	Venture Capital	25% of Private Equity & Debt

² If SWIB subsequently commits to a limited partnership or other fund vehicle of the sponsor or manager, then such co-investment shall no longer be included for purposes of calculating this soft parameter.

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

APPENDIX 3 – CTF AND VTF BENCHMARKS
State of Wisconsin Investment Board
Target State Benchmarks 2022¹

Core Trust Fund Benchmark²		
	Current Benchmark	
Public Equity	52% Fixed Blend of Six Components ³	<ul style="list-style-type: none"> - Current and previous benchmark asset classes are weighted by asset class strategic target weights - Current Benchmark updated 4/30/2012 to include Cash, which reflects leverage
Public Fixed Income	25% Fixed Blend of Eight Components ⁴	
Inflation Sensitive	19% Bloomberg US Treasury Inflation-Linked Bond Index	
Private Equity/Debt	12% Roll-Up of Five Components ⁵	
Real Estate	7% NCREIF Open End Diversified Core Equity (ODCE)	
Cash	(-15%) 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 2022 Asset Allocation implementation plan as of 8/31/2022.

² The major asset class weights are established through the annual asset allocation exercise; Private Equity weights float between 9% and 15% and Real Estate weights float between 4% and 10%. The Private Equity excess weights are taken from Public Equities, Real Estate excess weights are taken 50% from Public Equities and 50% from Public Fixed Income.

³ Public Equity Benchmark: Fixed Blend of Six Components
77.60% MSCI World Custom Net Index
6.90% MSCI USA Small Cap Index
4.60% MSCI EAFE Small Cap Custom Net Index
7.50% MSCI Emerging Market ex China Custom Net Index
1.90% MSCI Emerging Market China Custom Net Index
1.50% MSCI Emerging Market Small Cap Custom Net Index

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

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

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 24, 2022

Via Teleconference

Committee Members Present: Edwin Denson, Executive Director/Chief Investment Officer (Chair)
Anne-Marie Fink, Private Markets & Funds Alpha–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
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Investment Grade Fixed Income
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

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

Also in Attendance: John Voelker, Trustee
Chelsey Barczak, GPMS Business Director
Kevin Blank, Analyst–Funds Alpha
Derek Bloom, Senior Portfolio Manager–Asset & Risk Allocation
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Bill Campbell, Data Management Director
Bridget Chen, Senior Analyst–Investment Grade Fixed Income
Christian Comito, Portfolio Manager–Investment Grade Fixed
Income
Dan Cox, Senior Portfolio Manager–Investment Grade Fixed
Income
Greg Fletcher, Performance Director
Bob Fritzsche, IT Business Director
Jameson Greenfield, Chief Financial Officer
John Heshelman, Senior Portfolio Manager–Non-Investment
Grade Fixed Income
Mike Jacobs, Agency Business Director
Dave Jordan, Head of Non-Investment Grade Fixed Income
Salah Khalaf, Portfolio Manager–Private Markets & Funds
Alpha
Lisa Lange, Director of Compliance & Senior Legal Counsel
Jonathan Levine, Senior Portfolio Manager–Investment Grade
Fixed Income
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–Multi-Asset Strategies
Bill Luetzow, Compliance Counsel
Matt Marek, Senior Analyst–Asset & Risk Allocation
Damian Maroun, Head of Trading and Execution
Edward Martinez, PMFA Business Director
Frank Mazzucco, Legal Counsel
Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap
Strategy
Chad Neumann, Senior Portfolio Manager–Global Large Cap
Strategy
Chris Preisler, Communications Specialist
Anand Rakesh, Director of Risk Analytics & Financial
Engineering Systems
Robby Richlen, Financial Analyst
Tom Robinson, Head of Corporate Governance
Joe Roth, Business Analyst
Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation &
Rates Mgmt.
Jon Simon, Senior Portfolio Manager–Investment Grade
Fixed Income
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Dawn Tuescher, Executive Administrative Assistant
Zhenping Wang, Analyst–Asset & Risk Allocation
Terri Wilhelm, Senior Paralegal
Ping Wong, Portfolio Manager–Liquidity, Inflation & Rates
Mgmt.
Lauren Albanese, Financial Investment News
Ben Bronson, Aksia
Chris Levell, NEPC
Eileen Neill, Verus Advisory
Liz Wedelstaedt, Cabrera Capital Markets LLC
(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 1:31 p.m. All attendees participated in this meeting telephonically.

1. Approval of the Minutes

Mr. Denson asked if there were any comments on either the open or closed session minutes of the April 26, 2022 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 Ms. Fink and seconded by Mr. Stanton to approve both the open session and the closed session minutes of April 26, 2022, as presented. The motion passed unanimously.

2. Quarterly Performance Review (Q1 2022)

Greg Fletcher, Performance Director, presented the *Investment Performance Report*, as of March 31, 2022, included on pages 9-18 in the meeting materials. Mr. Fletcher reported that **(a)** the Core Trust Fund (CTF) returned -3.42% net of fees in Q1 2022, resulting in an excess return of 30 basis points (bps) for the quarter, **(b)** the CTF returned 9.94% net of fees for the one-year period, resulting in an excess return of 99 bps, **(c)** the CTF five-year net-of-fee return of 10.75% outperformed the Policy Benchmark by 59 bps on an annualized basis, and **(d)** the CTF's gross return outperformed the 60/40 reference portfolio's return by 92.3% (cumulative) and 1.2% on an annualized basis over the past 20 years, which equates to \$34.7 billion.

With respect to long-term performance, Mr. Fletcher highlighted that the CTF outperformed its benchmark for all time periods, and the Variable Trust Fund (VTF) had absolute returns in line with equity markets over all time periods with excess returns over its benchmark for the ten- and thirty-year periods. He also noted that SWIB's investment management has added more than \$2.6 billion above benchmark returns over the last five years to the Wisconsin Retirement System (WRS).

Mr. Fletcher then discussed the percentage of WRS assets that were internally managed versus externally managed, noting that internally managed assets had remained stable at roughly 50% over the last few years, with 51% of total SWIB assets currently internally managed when including the State Investment Fund (SIF). He stated that the percentage of actively managed assets continued to increase year-over-year, as it has since 2017.

He reviewed the performance by asset class, highlighting that **(a)** public equities had performed roughly in line with the benchmark for the first quarter, but underperformed the benchmark over the one-, three-, five- and ten-year periods, **(b)** fixed income investment strategies had negative absolute returns for the year-to-date and one-year periods, as expected amid inflationary pressures and elevated interest rates, although relative performance remained strong, and **(c)** with the private equity benchmark returning to more normalized levels, aggregate private equity and debt provided outperformance for the one-, three-, five- and ten-year periods, while real estate had relative negative performance for the first quarter. Lastly, he reported that the Separately Managed Funds generated positive relative performance over the one-, three-, five- and ten-year periods, despite relative underperformance year-to-date for the funds with fixed income exposure.

3. Q1 2022 Quarterly Updates

A. Small Cap Diversified Strategy

Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap Strategy, referred to the *Small Cap Diversified Strategy Review*, included on pages 21-25 in the meeting materials. He reported that the small cap diversified portfolio underperformed its Russell 2000 benchmark by 47 bps in Q1 2022 and had transitioned to the MSCI USA Small Cap Index benchmark as of April 1. He noted that strong security selection in the health care and consumer sectors

positively impacted performance, while the information technology and materials sectors detracted. Mr. Mukherjee confirmed that the portfolio was in compliance with its guidelines and soft risk parameters as of March 31, 2022, with the exception of the soft risk parameter related to ex ante tracking error, which the team decreased temporarily in connection with the benchmark transition and the uncertain market environment.

B. Global Large Cap Equities

Chad Neumann, Senior Portfolio Manager–Global Large Cap Strategy, provided the *Global Sector Aggregate Strategy Review*, included on pages 26-30 in the meeting materials. He reported that the global sector aggregate portfolio underperformed its benchmark by 23 bps in Q1 due to stock selection and a challenging market environment for the modified portfolio. He noted that the portfolio as previously structured had been discontinued as of January 3, 2022 and that staff continue to develop a proposal for the successor global large cap equity strategy.

Mr. Neumann reported that sector performance remained volatile in Q1, as the consumer discretionary and consumer staples sectors positively impacted performance while sectors with growth-oriented attributes, such as communication services and real estate, detracted. Lastly, Mr. Neumann stated that the portfolio was in compliance with its guidelines and soft risk parameters as of March 31, 2022, with the exception of the soft risk parameter related to ex ante tracking error, which is low while many sectors are indexed during the portfolio's restructuring.

C. Funds Alpha

Derek Drummond, Head of Funds Alpha, presented the *Funds Alpha Q1 2022 Update*, included on pages 31-40 in the meeting materials. He highlighted that Funds Alpha generated approximately \$195 million in Excess Value Added (EVA) in Q1, primarily from beta one equities and hedge funds. With respect to tracking error for the beta one portfolios, Mr. Drummond reported that the beta one equity portfolio tracking error remains above its long-term target, although it is expected to decrease as market conditions normalize, and the beta one fixed income portfolio's tracking error has continued to decline since 2021 as anticipated.

He then commented on the current market environment, noting **(a)** with respect to hedge funds, many managers remain cautiously optimistic with potential opportunities amid the volatility in both equity markets and rates and the increasing security-specific idiosyncratic risk opportunity set, despite risks relating to geopolitical tensions, central bank policies and mid-term elections, **(b)** the team has received a greater number of inbound calls from high-quality managers offering opportunities to provide liquidity, and **(c)** with regard to beta one equities, quantitative managers have generated improved performance in recent months.

Regarding the active management environment, Mr. Drummond highlighted that **(a)** moderate volatility is present both within and across asset classes, **(b)** in the equity markets, greater performance dispersion may create additional stock-selection opportunities for managers, and **(c)** in the credit markets, global dislocations have increased market uncertainty and broadened the opportunity set.

Finally, Mr. Drummond confirmed that the portfolios were in compliance with their guidelines and soft risk parameters, with the exception of the one-year conditional volatility (CVaR) soft risk parameter, and answered questions regarding the team's evaluation of opportunities in the fixed income space.

4. Convene in Closed Session

Motion: A motion to go into closed session at this meeting 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 small cap equities, global large cap equities, funds alpha, currency exposure and exposure management, and (c) the review of broker information, was made by Mr. Denson and seconded by Ms. Fink.

The Chair called for a roll call vote.

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

There being ten ayes and no nays, Mr. Denson declared the motion passed. The Committee convened in closed session at 2:02 p.m. and reconvened in open session at 3:58 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 small cap equities, global large cap equities, funds alpha, currency exposure and exposure management, and (iii) reviewed broker information.

6. Currency Task Force Report

Jeff Lucas, Senior Portfolio Manager–Multi-Asset Strategies, noted that a copy of the agenda for the May 16, 2022 Currency Task Force meeting was included on page 179 in the meeting materials for the Committee's information. He also provided a market update, commenting that the dollar continued to outperform on a year-to-date basis and particularly since the beginning of the second quarter, with continued strength against both emerging market and developed market currencies excluding the Mexican peso and Brazilian real.

7. Research Task Force Report

Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation, presented the *Research Task Force Report*, included on pages 185-187 in the meeting materials. Ms. Zhang provided an organizational update, including welcoming Stefano Cavaglia, Senior Portfolio Manager–Asset & Risk Allocation, as the new chair. She then reviewed the Research Task Force's projects in progress, including (a) putting on a training focused on information collection designed specifically to inform the investment process, (b) coordinating a trial of products

offered by an alternative data provider, (c) planning speaker sessions regarding the impact of proposed Securities and Exchange Commission (SEC) rules and the current political climate, and (d) finalizing speakers for the June Investment Forum.

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, 2022, was included on pages 188-189 in the meeting materials for the Committee’s review. He noted that there were two new discussion triggers this month relating to the mortgage-backed securities (MBS) portfolio’s ex ante tracking error and the beta one portfolios’ ex ante tracking error, and that the discussion trigger relating to the multi-strat portfolio’s ex ante spread beta had been dropped since last month.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the June 28, 2022 and July 26, 2022 IC meetings were included on pages 190-193 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. Shearer. The motion passed unanimously, and the meeting adjourned at 4:04 p.m.

Date of Committee Approval: 06/28/2022

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

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, June 28, 2022

Offices of the Investment Board
121 East Wilson Street, Madison, Wisconsin

Committee Members Present: Edwin Denson, Executive Director/Chief Investment Officer (Chair)
Anne-Marie Fink, Private Markets & Funds Alpha–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
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Investment Grade Fixed Income
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Sara Chandler, Chief Legal Counsel (non-voting)
Hassan Chehime, Head of Risk Management (non-voting)

Also in Attendance: Joe Amoyal, Senior Portfolio Manager–Non-Investment Grade Fixed
Income
Larina Baird, Internal Auditor
Nathan Ballard, Senior Legal Counsel
Chelsey Barczak, GPMS Business Director
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Bill Campbell, Data Management Director
Bridget Chen, Senior Analyst–Investment Grade Fixed Income
Christian Comito, Portfolio Manager–Investment Grade Fixed
Income
Chris Eckerman, Senior Portfolio Manager–Co-Investments
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Jameson Greenfield, Chief Financial Officer
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk
Allocation
John Heshelman, Senior Portfolio Manager–Non-Investment
Grade Fixed Income
Mike Jacobs, Agency Business Director
Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Dave Jordan, Head of Non-Investment Grade Fixed Income
Salah Khalaf, Portfolio Manager–Private Markets & Funds
Alpha

Leo Kropywiansky, Senior Portfolio Manager–Asset & Risk Allocation
 Jason Krueger, Compliance Analyst
 Lisa Lange, Director of Compliance & Senior Legal Counsel
 John Lahman, Senior Portfolio Manager–Investment Grade Fixed Income
 Jonathan Levine, Senior Portfolio Manager–Investment Grade Fixed Income
 Alex Li, Analyst–Asset & Risk Allocation
 Shan Lo, Senior Portfolio Manager–Multi-Asset Strategies
 Bill Luetzow, Compliance Counsel
 Damian Maroun, Head of Trading and Execution
 Edward Martinez, PMFA Business Director
 Frank Mazzucco, Legal Counsel
 Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap Strategy
 Chad Neumann, Senior Portfolio Manager–Global Large Cap Strategy
 Scott Parrish, Head of Private Equity
 Chris Prestigiacomo, Head of Private Debt & Venture Capital
 Joe Roth, Business Analyst
 Jason Rothenberg, Head of Real Estate
 Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation & Rates Mgmt.
 Edouard Senechal, Senior Portfolio Manager–Asset & Risk Allocation
 Chris Spiering, Senior Portfolio Manager–Non-Investment Grade Fixed Income
 Matt Terpstra, Internal Auditor
 Dawn Tuescher, Executive Administrative Assistant
 Terri Wilhelm, Senior Paralegal
 Marc Gesell, Verus Advisory
 Chris Levell, 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 1:31 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 24, 2022 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. Stanton and seconded by Mr. Maung to approve both the open session and the closed session minutes of May 24, 2022, as presented. The motion passed unanimously.

2. October Board Workshop Preview

Sara Chandler, Chief Legal Counsel, discussed the upcoming October Board Workshop, which will be held in Milwaukee. Ms. Chandler noted that this is an “off year” for the Wisconsin Retirement System (WRS) actuarial consultant’s asset allocation review, but that NEPC will do a presentation on their asset allocation work and a deep dive on allocations to private markets investments. Additional topics planned for the workshop include updates on factor investing and the macro environment, an education session on SWIB’s corridor treatment, and external speakers including Manny Roman, CEO of PIMCO, and Jack Lew, managing partner at Lindsay Goldberg and former U.S. Treasury Secretary.

3. Transition Update (Q1 2022)

Joe Roth, Business Analyst, reviewed the three transition events for Q1 2022 on the *Transition Management Summary, Q1 2022*, included on page 10 in the meeting materials. In the first transition, which was performed internally, approximately \$3 billion was transitioned over three months to return the multi-asset strategy to the alpha pool in connection with approved asset allocation policy changes for 2022. Mr. Roth highlighted that this transition underperformed the legacy 60/40 reference benchmark by only five basis points (bps), which was attributable to direct liquidation costs, with virtually no tracking error.

The second transition, also performed internally, implemented certain fixed income portfolio changes, including increasing the high-yield allocation in the Core Trust Fund (CTF), transitioning the global macro portfolio to a stand-alone strategy in the alpha pool, and transitioning the legacy government/credit portfolio to a credit-only, investment grade benchmark. Mr. Roth highlighted that this transition of approximately \$2.7 billion outperformed the legacy 60/40 reference benchmark by 21 bps.

Lastly, Mr. Roth reviewed the third transition to convert a beta one fixed income mandate from a blended government/credit benchmark to an all-investment grade credit benchmark. This \$1.5 billion transition, managed by the BlackRock Transition Management team, was completed in two tranches and fell within the established shortfall tolerance range.

4. Amendments to Investment Committee WRS Investment Guidelines

Ms. Chandler discussed the proposed amendments to the *SWIB Investment Committee Wisconsin Retirement System Investment Guidelines*, included on pages 11-56 in the meeting materials. She noted that the proposed changes updated the derivatives guidelines to permit investments in exchange-traded notes (ETNs), the underlying securities of which are traded on exchanges included on an internal approved-exchange list maintained by the Compliance division, with notification required to the Risk and Compliance divisions for any investment in a new ETN not previously held in the applicable portfolio.

In addition, the proposed changes **(a)** increased the total exposure limit for below-investment grade (BIG) issues in the mortgage-backed securities (MBS) portfolio from 15% to 20% of

the portfolio, consistent with similar limitations for the high-yield bond and investment grade credit portfolios, **(b)** incorporated global changes applicable to the portfolios in the Private Markets & Funds Alpha (PMFA) division so that external consultants are no longer required to provide a written recommendation for prospective investments with new managers and instead to provide investment staff the discretion to use consultants, **(c)** removed the limitation that no more than 2% of the CTF may be invested in venture capital, consistent with the removal of the corresponding regulatory requirement in prior years, and **(d)** added new ex-ante tracking error soft risk parameter discussion triggers for the high-yield bond and leveraged loan portfolios.

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

5. Private Markets & Funds Alpha Division Update

Anne-Marie Fink, Private Markets & Funds Alpha–Chief Investment Officer, presented the *Private Markets & Funds Alpha Overview*. She highlighted that, with respect to the Committee’s decision to remove the external consultant recommendation requirement from the guidelines, the PMFA division does not currently intend to stop working with consultants and will continue doing so where they are beneficial, while also focusing on leveraging staff’s internal capabilities and expertise.

Ms. Fink then reported that, in response to the “denominator effect” and associated increase in the private markets’ portfolios as a percentage of the CTF, the Board recently approved continued application of the corridor treatment, which reflects the inability to rebalance private investments and adjusts the policy benchmark to the actual exposure to private markets asset classes even if the exposure is outside the previously established rebalancing ranges. This broader corridor treatment will be in place until the implementation of the approved 2023 asset allocation targets. She noted that this approach benefits the PMFA division by reducing the impact of the timing mismatch arising from the delay in private markets’ quarterly reporting and valuations while positioning staff with the ability to pursue compelling strategic opportunities as other investors reduce or halt allocations due to the denominator effect. Scott Parrish, Head of Private Equity, noted that investment staff plans to take advantage of the opportunity to increase exposure to high quality, in-demand managers.

6. Q1 2022 Quarterly Updates

A. Private Equity

Mr. Parrish presented the *Quarterly Activity Report – Private Equity*, included on pages 57-79 in the meeting materials. He provided a private equity market update for Q1 2022, noting that **(a)** U.S. private equity fundraising dollars decreased relative to Q1 2021, while the number of funds raised remained flat, indicating that sponsors have been raising smaller funds on average so far in 2022, **(b)** U.S. private equity deal activity in dollars and the number of deals have increased year-over-year, while the number of exits and exit value have declined, with both returning closer to 2020 levels after the record levels set in 2021, and **(c)** nearly two-thirds of portfolio company exit activity involved sponsor-to-sponsor

transactions, as there was no market for IPOs for private equity-backed companies in the quarter.

Mr. Parrish then reported that, as of March 31, 2022, the market value of the aggregate private equity portfolio (excluding private debt and venture capital) exceeded \$16 billion and, when including the venture capital, private debt, and overage portfolios, made up approximately 14.9% of the CTF. The Committee discussed the increased total exposure as of the meeting date, due in large part to the denominator effect. He observed that the number of capital call notices received in Q1 2022 declined relative to Q1 2021, as sponsors are now issuing capital calls to pay back subscription lines of credit used to fund transactions that were closed in 2021.

With respect to performance, Mr. Parrish highlighted that the core private equity and current return portfolios outperformed their benchmarks for the one-, three-, and five-year time periods and that, as of March 31, 2022, the combined private equity and co-investment portfolios achieved second quartile performance for vintage years 2014-2019 and first quartile performance for 2020 and 2021. He also discussed the five-year internal rates of return (IRRs) for the portfolios' sub-strategies, noting particularly strong performance in growth equity and equity co-investments. Mr. Parrish responded to questions regarding **(i)** the credit/distressed sub-strategy, noting that the team continues to evaluate compelling opportunities, and **(ii)** the discrepancies, particularly in recent years, between the capital-weighted pooled average and median performance numbers.

Mr. Parrish then discussed the private equity portfolio's **(a)** sub-asset class diversification, answering questions regarding transparency into the benchmark's diversification, **(b)** public versus private portfolio company exposure, stating that public exposure was generally consistent with recent years, and **(c)** geographic and industry diversification, noting the overweight to the U.S., and answering questions regarding the underweight to energy and overweight to information technology. He highlighted the commitments made in Q1 2022 in one of the team's busiest quarters ever, with approximately \$1.6 billion made in fund commitments. Lastly, he reviewed the portfolio pipeline for Q2 2022 and confirmed that the portfolio remained in compliance with all investment guidelines.

B. Real Estate

Jason Rothenberg, Head of Real Estate, presented the *Quarterly Activity Report – Real Estate*, included on pages 80-93 in the meeting materials. He discussed the current market and the real estate portfolio's benchmark, noting that **(a)** the one-year benchmark return is at its highest level since inception, with one-year net income returns near all-time lows for core real estate, **(b)** particularly strong returns from the industrial sector are driving benchmark returns, and **(c)** property type weights in the benchmark have shifted in the past few years, with industrial and multi-family increasing as a percentage of the benchmark and retail and office decreasing. Mr. Rothenberg responded to questions regarding the real estate industry's use of appraisers and valuation practices, cap rates relative to historical levels, and the anticipated impact of rising interest rates.

Mr. Rothenberg then reviewed the real estate portfolio, noting that its market value of \$10.2 billion as of March 31, 2022 represented approximately 7.8% of the CTF. He commented on the portfolio's risk profile, stating that there were no material changes in the relative percentage of core, opportunistic, and value holdings, and answered questions

regarding the portfolio's total leverage relative to the benchmark. He then reviewed the portfolio's diversification by property type and noted that the increase to the industrial and multi-family sectors and decrease to office and retail is directionally similar to the benchmark.

Mr. Rothenberg then reviewed the portfolio's performance, reporting that the portfolio outperformed the benchmark over the one-, three-, five-, and ten-year time periods, and answered questions regarding the portfolio's exposure to multi-family investments. Lastly, he discussed the five new commitments made in the quarter and the active pipeline under review, and confirmed that the portfolio remained in compliance with its investment guidelines.

C. Private Debt

Chris Prestigiaco, Head of Private Debt & Venture Capital, presented the *Private Debt Portfolio Investment Committee Quarterly Report*, included on pages 94-100 in the meeting materials. He reported that one new loan was closed during the quarter, with a credit quality of BBB and a credit spread of over 165 bps, and three loans were paid off as expected. He then reviewed the portfolio characteristics, noting that (a) the portfolio's market value declined by approximately \$58 million from the prior quarter, (b) the portfolio's and the benchmark's yields to maturity increased from the prior quarter, (c) the portfolio's aggregate BIG holdings declined to 5% as loans were paid off in the quarter, and the team continues to seek out more BIG opportunities, (d) the team continues to work on decreasing the portfolio's concentration in the industrial sector, and (e) geographic diversification continues to increase, with approximately 43% of non-Wisconsin loans made to companies outside of the portfolio's legacy non-Wisconsin region.

Mr. Prestigiaco reviewed the portfolio's performance, highlighting that the portfolio outperformed its benchmark over all time periods, despite negative absolute performance for the one-year period. With respect to the market, although fundraising among private debt funds has declined relative to the prior quarter, interest remains strong in private debt investing and overall fundraising is expected to be flat for the year. Mr. Prestigiaco answered questions regarding the team's deal sourcing process, particularly with respect to non-Wisconsin loans, and the percentage of the portfolio allocated to loans with AA and A credit quality. Finally, he reported that there were no problem credits or workouts in the portfolio, which remained in compliance with its guidelines.

7. Convene in Closed Session

Motion: A motion to go into closed session at this meeting 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, and exposure management was made by Ms. Fink and seconded by Ms. Linn.

The Chair called for a roll call vote.

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

There being ten ayes and no nays, Mr. Denson declared the motion passed. The Committee convened in closed session at 2:35 p.m. and reconvened in open session at 3:30 p.m.

8. 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, and exposure management.

9. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters—Asset Class and Portfolio*, as of May 31, 2022, was included on pages 185-186 in the meeting materials for the Committee’s review. He noted that there was one new discussion trigger this month relating to the global macro portfolio’s ex ante spread beta. He also noted that the discussion trigger relating to the beta one portfolios’ ex ante tracking error had been dropped since last month.

10. Future Meeting Topics

Mr. Denson noted that draft agendas for the July 26, 2022 and August 23, 2022 IC meetings were included on pages 187-190 in the meeting materials for the Committee’s review.

11. Adjournment

Motion: A motion to adjourn the meeting was made by Ms. Fink and seconded by Mr. Stanton. The motion passed unanimously, and the meeting adjourned at 3:33 p.m.

Date of Committee Approval: 7/26/2022

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

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting–Open Session

Tuesday, July 26, 2022

Offices of the Investment Board
121 East Wilson Street, Madison, Wisconsin

Committee Members Present: Edwin Denson, Executive Director/Chief Investment Officer (Chair)
Anne-Marie Fink, Private Markets & Funds Alpha–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
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Investment Grade Fixed Income
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

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

Also in Attendance: Larina Baird, Internal Auditor
Nathan Ballard, Senior Legal Counsel
Chelsey Barczak, GPMS Business Director
Derek Bloom, Senior Portfolio Manager–Asset & Risk Allocation
Brandon Brickner, Internal Audit Director
Kate Burkart-Paulson, Senior Legal Counsel
Bridget Chen, Senior Analyst–Investment Grade Fixed Income
Trey Edgerle, Compliance Analyst
Greg Fletcher, Performance Director
Chirag Gandhi, Senior Portfolio Manager–Global Macro
Jameson Greenfield, Chief Financial Officer
Brian Heimsoth, Senior Portfolio Manager–Asset & Risk
Allocation
John Heshelman, Senior Portfolio Manager–Non-Investment
Grade Fixed Income
Mike Jacobs, Agency Business Director
Phil Johnson, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Dave Jordan, Head of Non-Investment Grade Fixed Income
Salah Khalaf, Portfolio Manager–Private Markets & Funds
Alpha
John Lahman, Senior Portfolio Manager–Investment Grade
Fixed Income
Lisa Lange, Director of Compliance & Senior Legal Counsel

Jonathan Levine, Senior Portfolio Manager–Investment Grade
Fixed Income
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–Multi-Asset Strategies
Bill Luetzow, Legal Counsel
Damian Maroun, Head of Trading and Execution
Edward Martinez, PMFA Business Director
Frank Mazzucco, Legal Counsel
Joy Mukherjee, Senior Portfolio Manager–U.S. Small Cap
Strategy
Chad Neumann, Senior Portfolio Manager–Global Large Cap
Strategy
Anand Rakesh, Director of Risk Analytics & Financial Engineering
Systems
Jay Risch, Government Relations Liaison
Tom Robinson, Head of Corporate Governance
Andrea Ruiz, Senior Portfolio Manager–Liquidity, Inflation &
Rates Mgmt.
Jon Simon, Senior Portfolio Manager–Investment Grade Fixed Income
Chris Spiering, Senior Portfolio Manager–Non-Investment Grade
Fixed Income
Matt Terpstra, Internal Auditor
Rob Thornton, ARA Business Director
Dawn Tuescher, Executive Administrative Assistant
Rob Vanderpool, Fund Administration Director
Terri Wilhelm, Senior Paralegal
Eileen Neill, Verus Advisory
Chris Levell, 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 1:32 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 28, 2022 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. Stanton to approve both the open session and the closed session minutes of June 28, 2022, as presented. The motion passed unanimously.

2. June Investment Forum Debrief

Jonathan Levine, Senior Portfolio Manager–Investment Grade Fixed Income, noted that feedback for the annual Investment Forum, held on June 14-15, 2022, has been favorable, with attendees pleased with the conference’s substantive topics, speaker lineup and virtual format. He highlighted that approximately 180 participants attending each day. Over 90% of survey participants found the session topics to be relevant and timely, and 75% reported that they would prefer to continue the virtual format for future conferences.

3. Q2 2022 Quarterly Updates

Nick Stanton, Head of Multi-Asset Strategies, presented the *Global Public Markets Strategies Quarterly Update*, included on pages 11-20 in the meeting materials. Mr. Stanton reported on performance from the Global Public Market Strategies division for Q2 2022, noting that only one of the seven division strategies generated positive performance relative to its benchmark year-to-date with all division strategies and benchmarks exhibiting negative absolute returns year-to-date. He confirmed that each portfolio was in compliance with its guidelines during Q2 2022.

Mike Shearer, Head of Investment Grade Fixed Income, then provided a market review, included on pages 21-24 in the meeting materials. He noted that **(a)** rising inflation and concerns about the Federal Reserve continuing to raise interest rates contributed to persistent market volatility and recessionary concerns, **(b)** geopolitical risk arising out of the Russia-Ukraine conflict, continued supply chain disruptions, higher energy prices, and the imposition of COVID-19 containment measures in China also led to elevated volatility, **(c)** sovereign rates increased in both developed and emerging markets, **(d)** the U.S. dollar strengthened materially relative to both developed and emerging market currencies in Q2, with the Euro trading below parity with the U.S. dollar for the first time in nearly two decades, **(e)** credit spreads continued to widen during the quarter for both U.S. investment grade credit and high yield bonds, and **(f)** performance of the equity markets mirrored the broader risk-off trend with declines in broad-based indices, while more market-neutral factors performed relatively well. Mr. Shearer, Mr. Stanton, and Dave Jordan, Head of Non-Investment Grade Fixed Income, then responded to questions regarding portfolio positioning in the new market environment.

4. Convene in Closed Session

Motion: A motion to go into closed session at this meeting 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 short-term credit, investment grade and non-investment grade fixed income, multi-asset, and exposure management was made by Ms. Fink and seconded by Mr. Drummond.

The Chair called for a roll call vote.

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

There being ten ayes and no nays, Mr. Denson declared the motion passed. The Committee convened in closed session at 1:48 p.m. and reconvened in open session at 6:04 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, and (ii) reviewed specific proprietary investment strategies and investment instruments related to short-term credit, investment grade and non-investment grade fixed income, multi-asset and exposure management.

6. QIR Certification

Lisa Lange, Director of Compliance and Senior Legal Counsel, presented a proposal that the Committee appoint Jon Simon as a Qualified Independent Representative (QIR) for Fixed Income Total Return Swap Baskets, as set forth on pages 181-186 in the meeting materials. She noted that the appointment would be for all approved counterparties with whom SWIB has a master netting agreement for such instruments. Ms. Lange noted that Mr. Simon's signed Internal QIR Certificate and Agreement documenting his relevant knowledge and experience were included in the meeting materials for the Committee's review. She also explained that, if approved as a new QIR, Mr. Simon will become subject to quarterly and annual certifications regarding his QIR status as a condition of his employment.

Motion: A motion was made by Mr. Stanton and seconded by Mr. Cavaglia to approve that Jon Simon meets all of the QIR Criteria with respect to Fixed Income Total Return Swap Baskets, for all approved counterparties with whom SWIB has a master netting agreement for such instruments, from time to time, and he is approved to act and is hereby appointed as a QIR with respect to such counterparties. The motion passed unanimously.

7. Soft Risk Parameters

Hassan Chehime, Head of Risk Management, noted that the report *Soft Risk Parameters—Asset Class and Portfolio*, as of June 30, 2022, was included on pages 187-188 in the meeting materials for the Committee's review. He noted that there were three new discussion triggers this month relating to the ex ante tracking errors of the leveraged loan, high yield, and beta one portfolios.

8. Fair Value Measurement of WRS Investments

Mr. Denson noted that a report entitled *Fair Value Measurement Review of WRS Investments*, with an overview of the nature and liquidity of SWIB's assets, was included on pages 189-199 in the meeting materials for the Committee's review.

9. Future Meeting Topics

Mr. Denson noted that draft agendas for the August 23, 2022 and September 27, 2022 IC meetings were included on pages 200-203 in the meeting materials for the Committee's review.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Shearer and seconded by Ms. Fink. The motion passed unanimously, and the meeting adjourned at 6:08 p.m.

Date of Committee Approval: 8/23/2022

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

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, August 23, 2022 1:00 pm
Room: Presentation Room – 1st Floor
Address: 121 E. Wilson St., Madison WI 53703

Est. Time Minutes	Action Item	Topic	Presenter
		OPEN SESSION	
	Motion	1. Approval of the Minutes – Open Session A. July 26, 2022	
35		2. Q2 2022 Quarterly Updates A. Small Cap B. Global Large Cap Equities C. Funds Alpha	Joy Mukherjee Chad Neumann Derek Drummond
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		3. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
5	Motion	4. QIR Certification	Lisa Lange
5		5. Brokerage Task Force Report	Damian Maroun
5		6. Currency Task Force Report	Shan Lo
5		7. Research Task Force Report	Stefano Cavaglia
		8. Quarterly Performance Review (Q2 2022) (No presentation unless requested)	
		9. Soft Risk Parameters (No presentation unless requested)	

* 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 small cap equities, global large cap equities, funds alpha, commodities, currency exposure 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.

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

Future Meetings

9/27/22 – September Committee Mtg.
10/25/22 – October Committee Mtg.
11/22/22 – November Committee Mtg.
12/15/22 – December Committee Mtg.

Voting Committee Members:

Edwin Denson (Chair), Executive Director/Chief Investment Officer
Anne-Marie Fink, Private Markets & Funds Alpha–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
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Investment Grade Fixed Income
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Non-voting Committee Members

Rochelle Klaskin, Deputy Executive Director/CAO
Sara Chandler (Secretary), Chief Legal Counsel
Hassan Chehime, Head of Risk Management

AGENDA / NOTICE

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, September 27, 2022 1:00 pm
Room: Presentation Room – 1st Floor
Address: 121 E. Wilson St., Madison WI 53703

Est. Time Minutes	Action Item	Topic	Presenter
		OPEN SESSION	
	Motion	1. Approval of the Minutes – Open Session A. August 23, 2022	
5	Motion	2. Approval of Provisional Benchmark	Eileen Neill, Verus
10	Motion	3. Amendments to Investment Committee WRS Investment Guidelines	Sara Chandler
5		4. Private Markets & Funds Alpha Division Update	Anne-Marie Fink
30		5. Q2 2022 Quarterly Updates A. Private Equity B. Real Estate C. Private Debt	Scott Parrish Jason Rothenberg Chris Prestigiaco
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		6. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
10		7. Corporate Governance Update	Tom Robinson
10		8. Transition Update (Q2 2022)	Joe Roth
5		9. October Board Workshop Preview	Sara Chandler

* 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 strategies related to asset allocation, and (iii) the review of specific proprietary investment strategies and investment instruments related to private equity, real estate, private debt, venture capital, and exposure management, and (b) to discuss and approve prior closed session minutes that discuss the same. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

		10. Soft Risk Parameters (No presentation unless requested)	
		11. Future Meeting Topics	
	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 physical accessible. Upon prior request, reasonable accommodations will be provided.</i></p>	

Future Meetings

10/25/22 – October Committee Mtg.
11/22/22 – November Committee Mtg.
12/15/22 – December Committee Mtg.

Voting Committee Members:

Edwin Denson (Chair), Executive Director/Chief Investment Officer
Anne-Marie Fink, Private Markets & Funds Alpha–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
Jason Rector, Portfolio Manager–Funds Alpha
Mike Shearer, Head of Investment Grade Fixed Income
Nick Stanton, Head of Multi-Asset Strategies
Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation

Non-voting Committee Members

Rochelle Klaskin, Deputy Executive Director/CAO
Sara Chandler (Secretary), Chief Legal Counsel
Hassan Chehime, Head of Risk Management

Name of Meeting: Staff Investment Committee Meeting
Date/Time: Tuesday, October 25, 2022 1:00 pm
Room: Presentation Room – 1st Floor
Address: 121 E. Wilson St., Madison WI 53703

Est. Time Minutes	Action Item	Topic	Presenter
		OPEN SESSION	
	Motion	1. Approval of the Minutes – Open Session A. September 27, 2022	
30	Motion	2. Annual Benchmark Presentation	Eileen Neill, Verus
10		3. Q3 2022 Quarterly Updates	Dave Jordan Mike Shearer Nick Stanton
	Motion	CLOSED SESSION*	
	Motion	RECONVENE IN OPEN SESSION	
		4. Announcement of Committee Actions Relating to Items Taken Up in Closed Session	
15		5. Separately Managed Funds Update	Rob Thornton
5		6. October Board Workshop Debrief	Sara Chandler
		7. Soft Risk Parameters (No presentation unless requested)	
		8. Future Meeting Topics	
	Motion	9. Motion to Adjourn	

* A motion to go into closed session at this meeting is authorized pursuant to sections 19.85(1)(e) and 19.36(5) of the Wisconsin Statutes (a) to consider confidential strategies for the investment of public funds, including (i) the review of active risk profiles of portfolio investments and the Core and Variable Trust Funds and (ii) the review of specific proprietary investment strategies and investment instruments related to short-term credit, investment grade and non-investment grade fixed income, multi-asset 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.

	<p><i>NOTES: Items may be taken in order other than listed.</i></p> <p><i>The meeting site is physical accessible. Upon prior request, reasonable accommodations will be provided.</i></p>	
<p><u>Future Meetings</u></p> <p>11/22/22 – November Committee Mtg. 12/15/22 – December 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 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 Jason Rector, Portfolio Manager–Funds Alpha Mike Shearer, Head of Investment Grade Fixed Income Nick Stanton, Head of Multi-Asset Strategies Ivy Zhang, Senior Portfolio Manager–Asset & Risk Allocation</p> <p><u>Non-voting Committee Members</u></p> <p>Rochelle Klaskin, Deputy Executive Director/CAO Sara Chandler (Secretary), Chief Legal Counsel Hassan Chehime, Head of Risk Management</p>	

Board Meeting

Tab 7 - Quarterly Investment Update, Q2 2022



Quarterly Investment Update

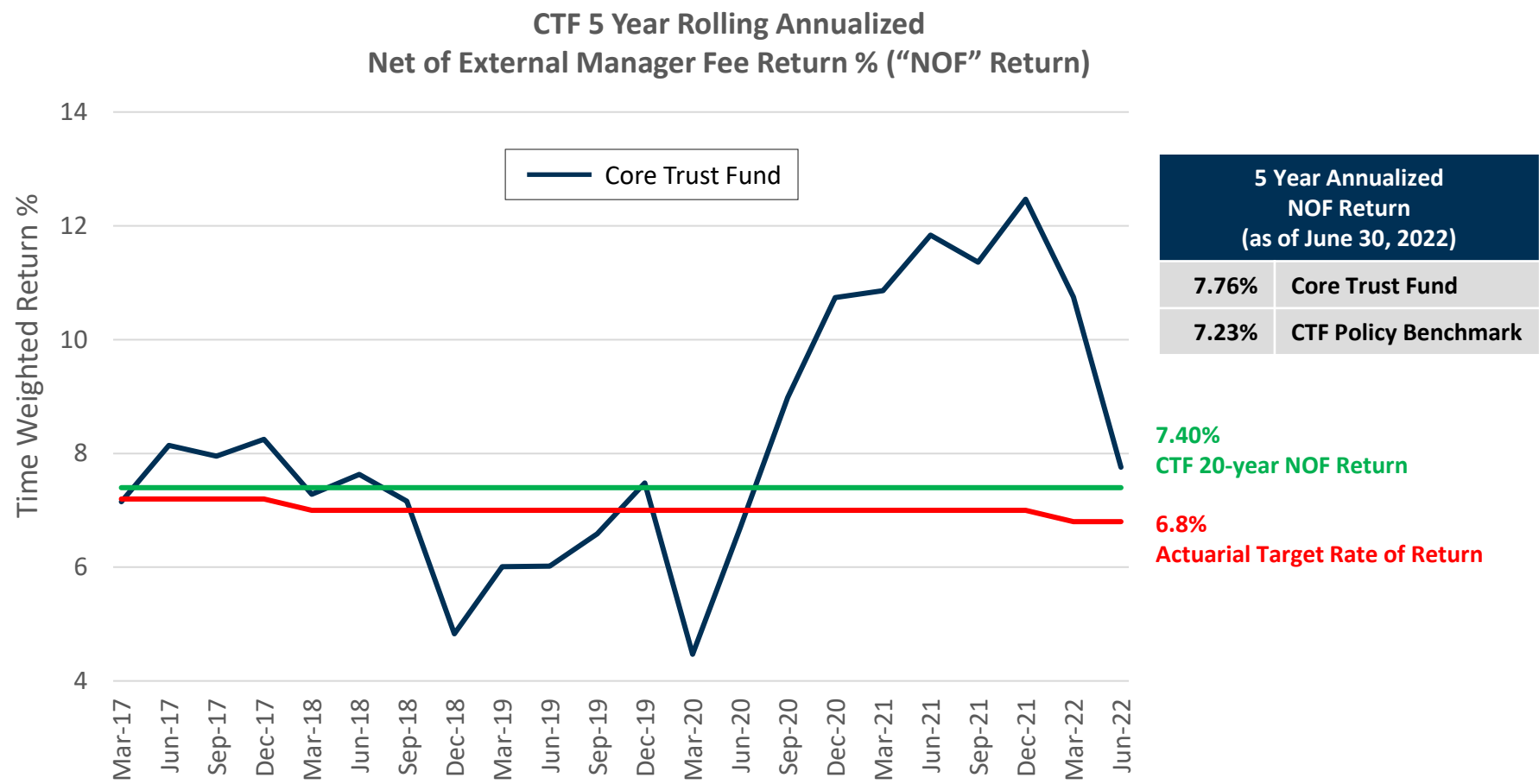
Board Meeting

September 14, 2022

Performance Trends & Outlook

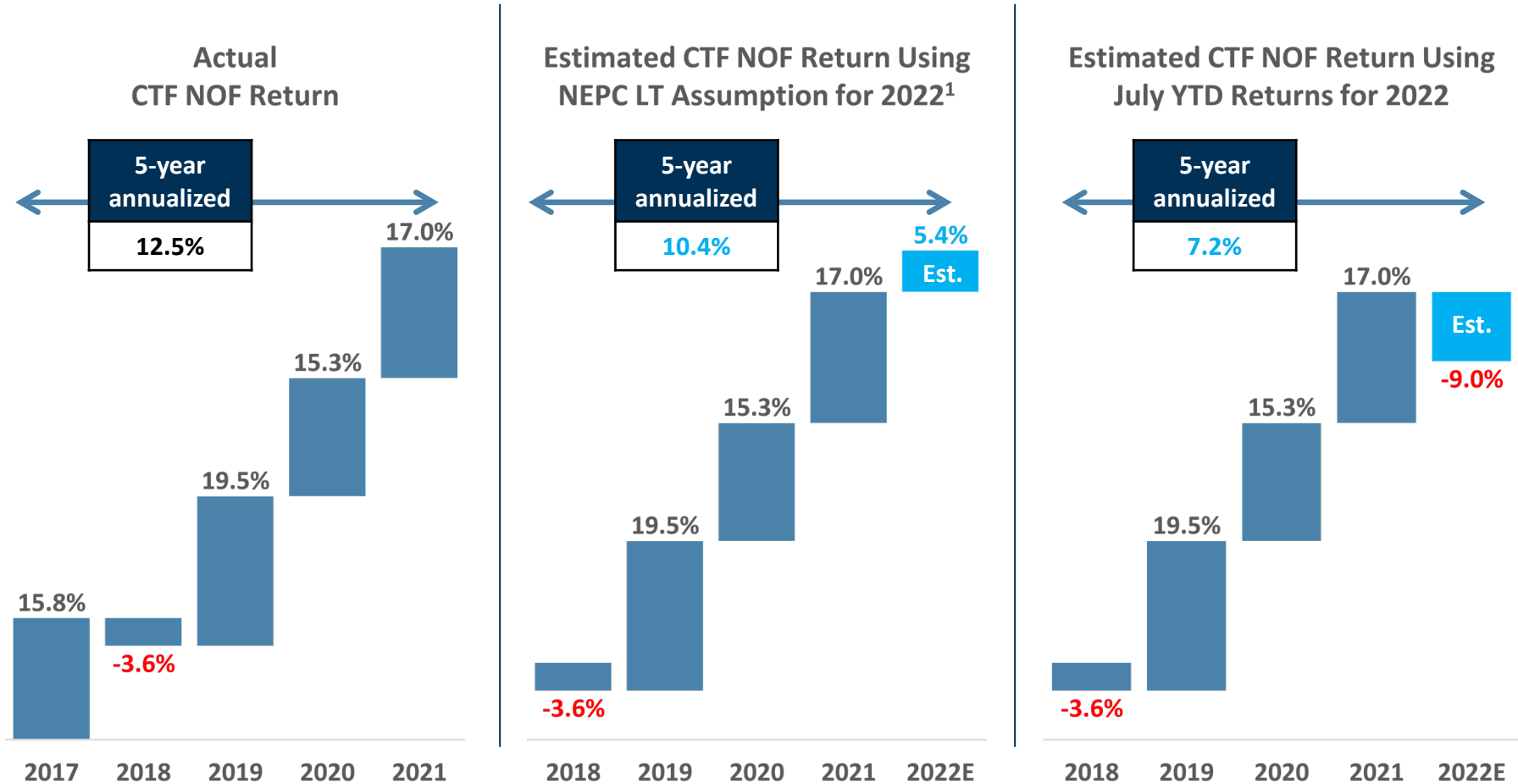
CTF 5 Year Rolling Return Trend

Quarter-end Results Through June 30, 2022



CTF 5-year Return Estimate

Calendar year and 5-year annualized returns



¹ The NEPC 10-year expected return assumption is used to estimate 2022

CTF Policy Benchmark & Other Indices

Equity and Fixed Income asset classes declined severely to start the year

July 31, 2022: Total Rate of Return %, Annualized					
Index Name (Gross Return Basis, unless noted)	YTD	1yr	5yr	10yr	10yr volatility
CTF Policy Benchmark (Gross)	(9.1)	(4.7)	8.0	8.1	7.9
MSCI USA	(13.7)	(6.9)	12.8	13.7	14.2
MSCI USA Small Cap	(13.1)	(10.6)	9.1	12.0	17.8
MSCI World ex US Equities	(14.7)	(13.2)	3.1	5.7	14.0
MSCI World ex US Equities (Local)	(6.7)	(2.0)	5.4	8.6	11.8
MSCI EAFE Small Cap	(19.5)	(19.9)	2.7	8.2	15.3
MSCI Emerging Markets ex China	(16.7)	(15.2)	2.9		
MSCI China	(19.6)	(28.2)	(1.4)	4.5	19.5
MSCI ACWI	(14.4)	(10.1)	8.4	9.9	13.5
MSCI ACWI (Local)	(11.7)	(6.3)	9.4	11.3	12.4
Bloomberg US Gov't / Credit	(9.1)	(10.1)	1.4	1.7	4.0
ICE BOFA High Yield BB/B	(8.3)	(7.2)	3.1	4.8	6.9
Bloomberg U.S. TIPs	(5.0)	(3.6)	4.0	2.0	4.6

Source: Factset, SWIB

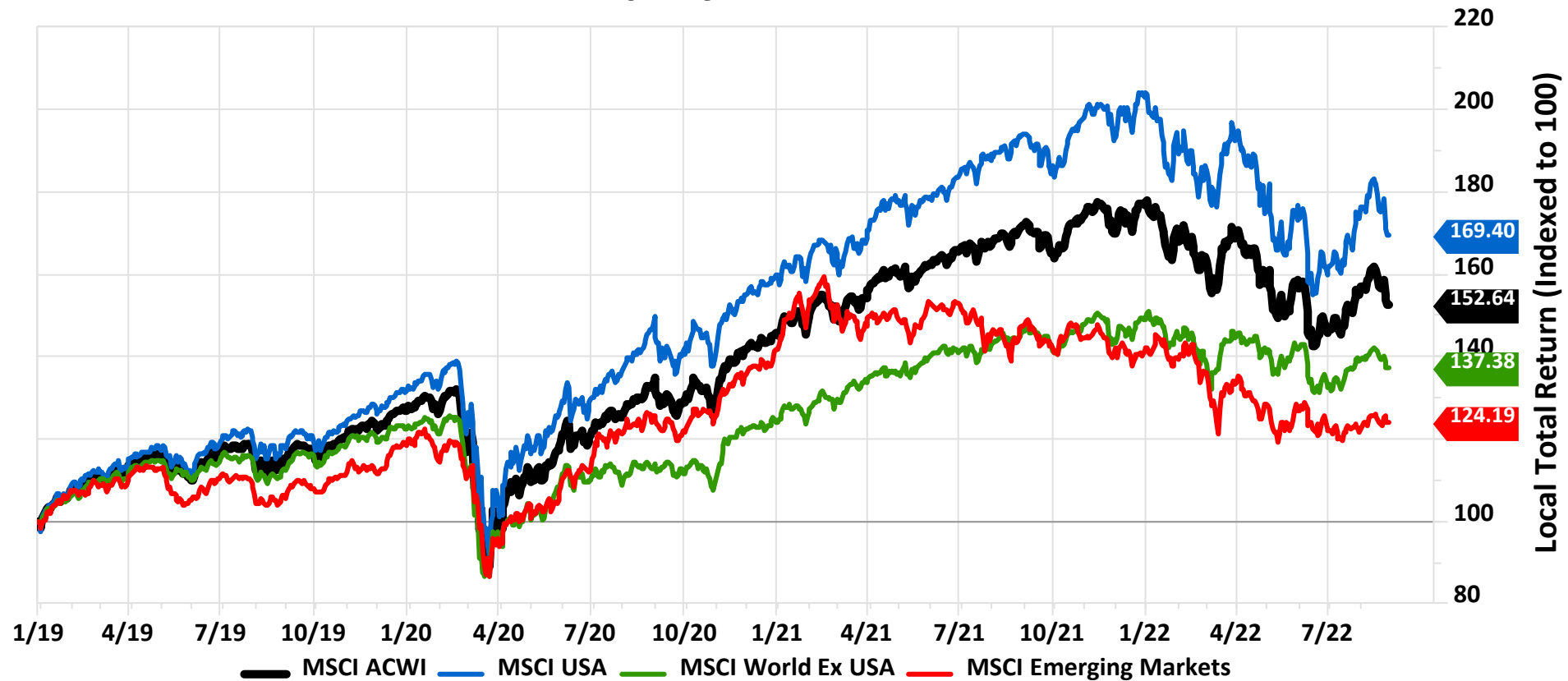
Asset Class Review

Global Equities - Performance

Equity markets have bounced back broadly after steep selloff in the first two quarters

08/31/2022

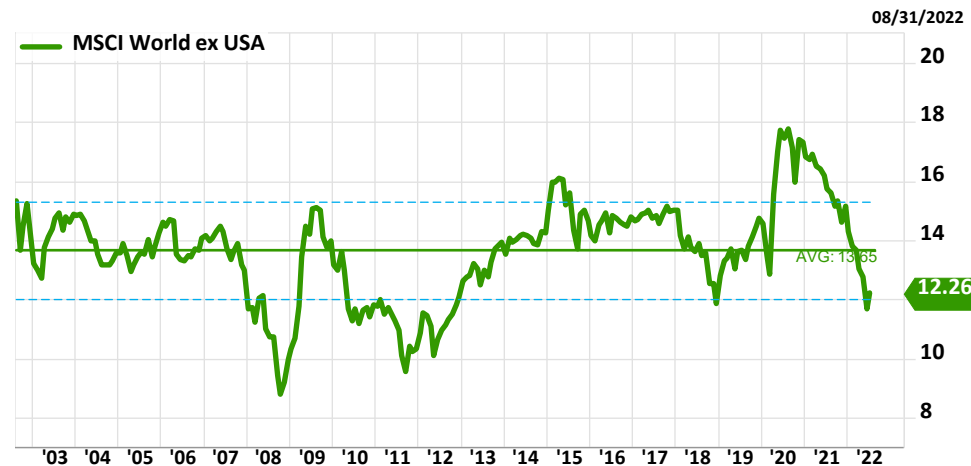
Local Equity Performance



Source: FactSet

Global Equities - Valuation

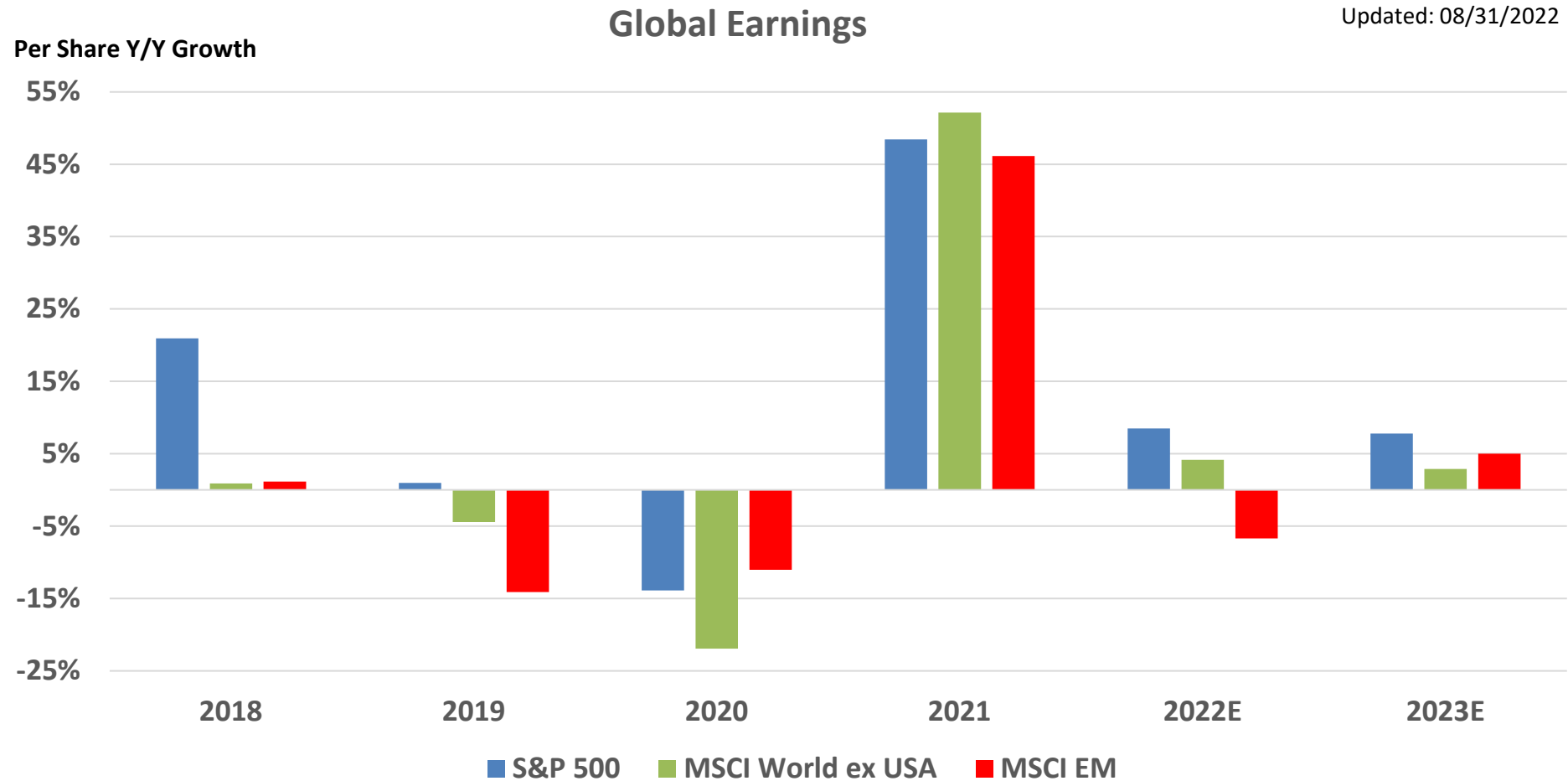
U.S. P/E ratios have risen recently while EM P/E ratios continue to decrease



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

Earnings Growth

2022 expectations have fallen in recent weeks



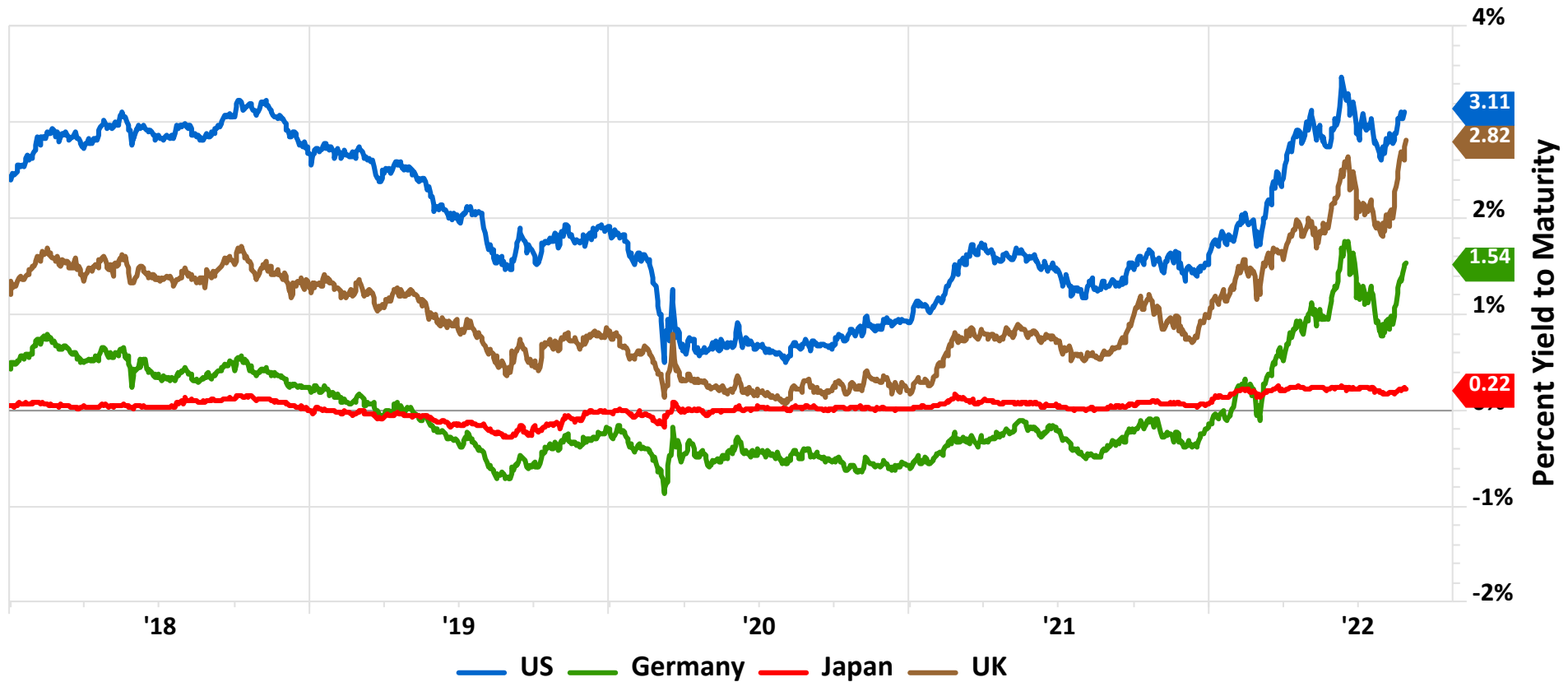
Source: Analyst Consensus; FactSet

Global Bonds

US yield edges up as investors weigh inflation and global economic growth

08/31/2022

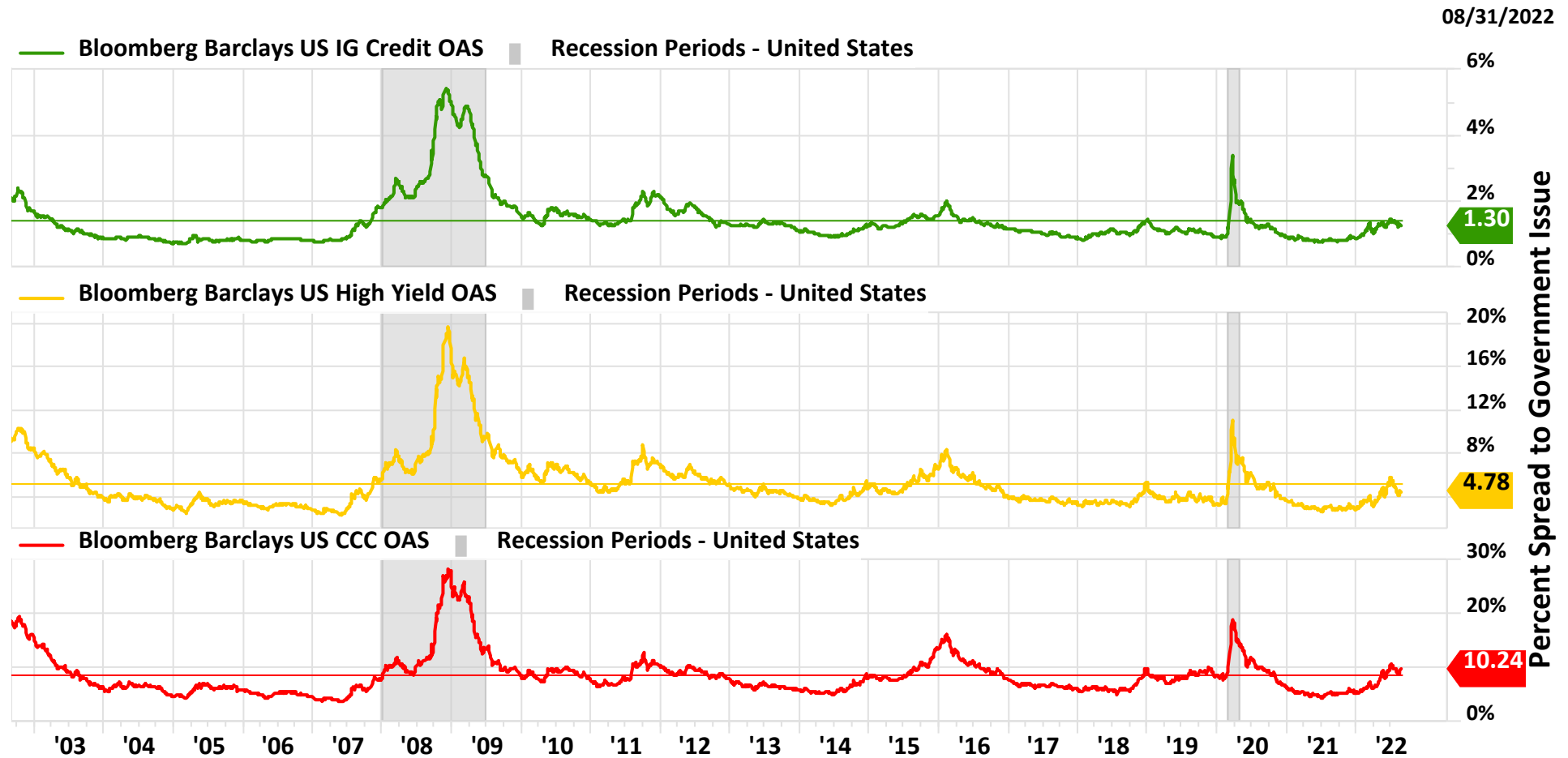
10-Year Government Bond Yields



Source: FactSet

Credit Sectors

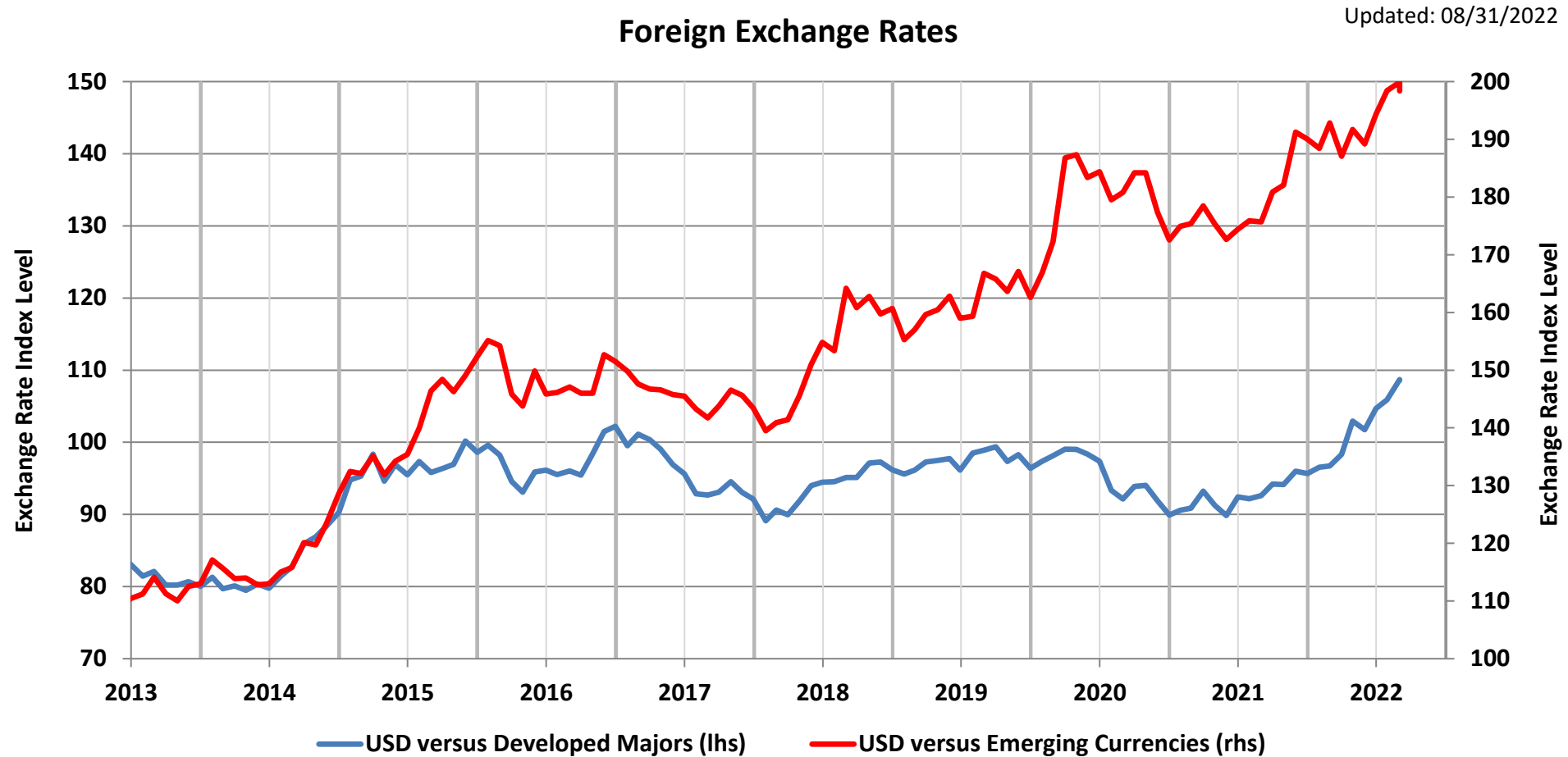
Spreads are higher and have reached the long run averages



Source: FactSet

Currency Performance

USD has continued to strengthen



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

U.S. Inflation

Medium term expectations remain higher than Fed's long-range targets

As of: 08/31/2022

US 5 Year Breakeven Inflation

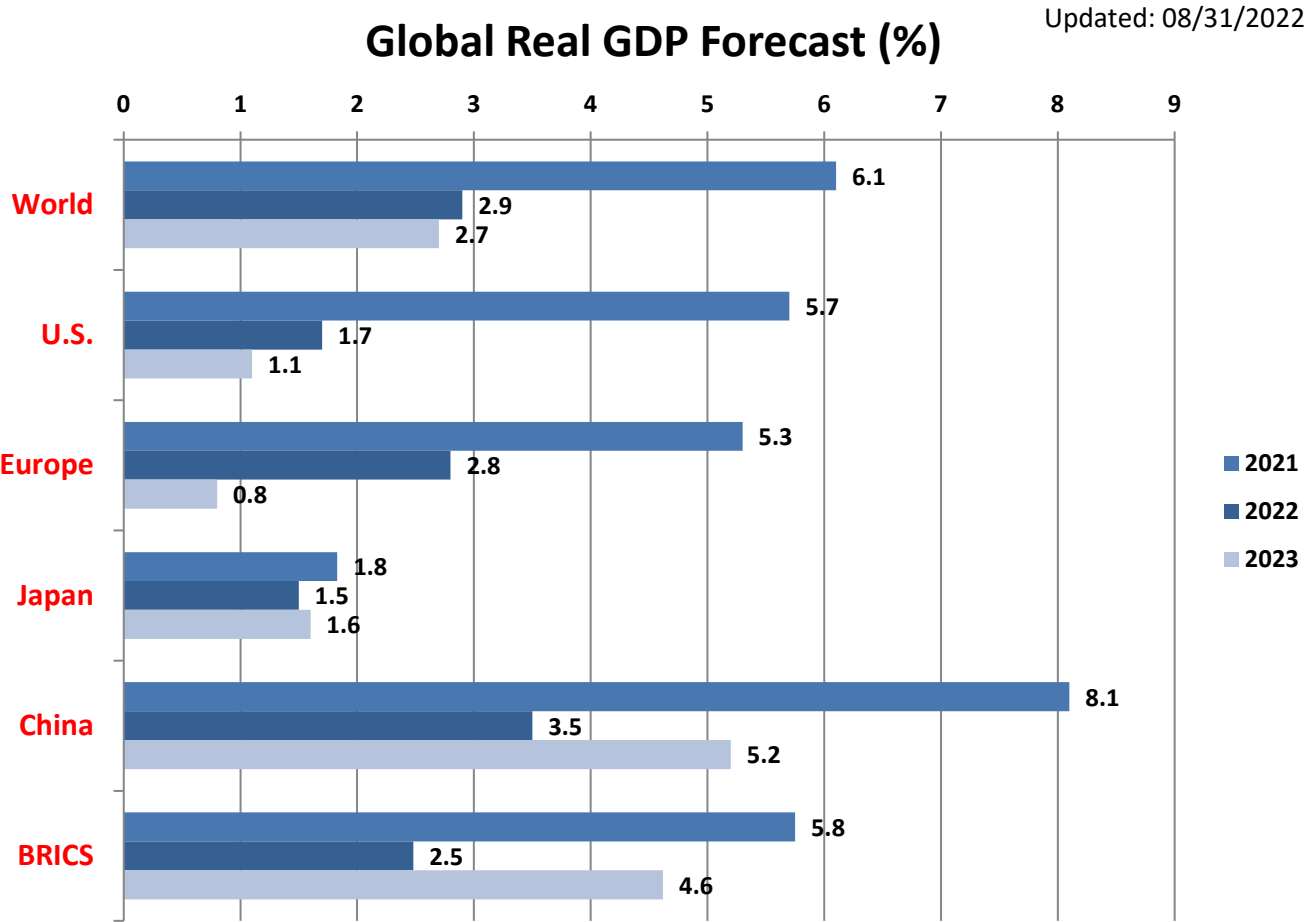


Source: Bloomberg

Appendix

Global Growth

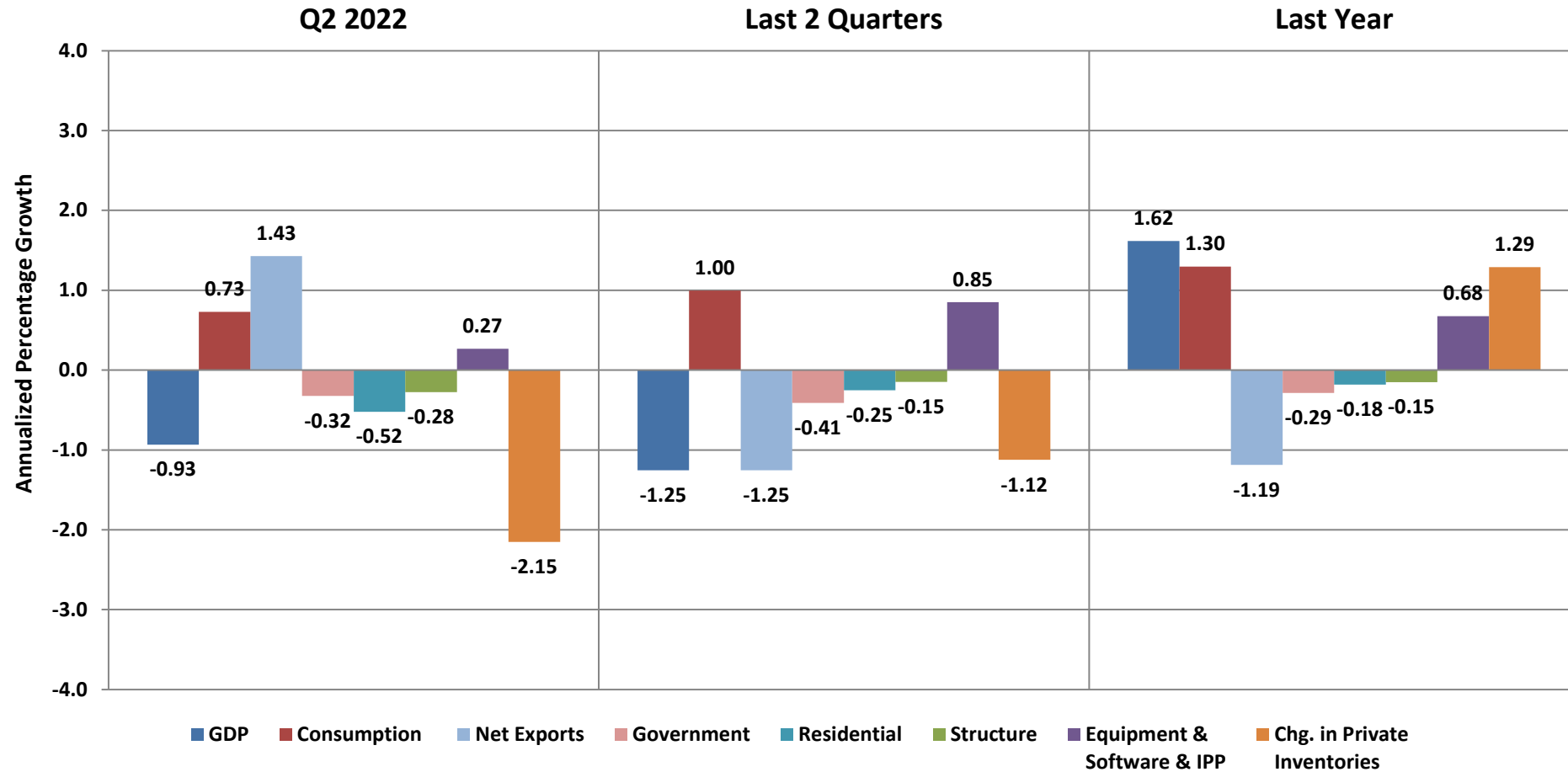
2022 growth expectations have cooled globally



Source: Bloomberg Consensus

U.S. Growth

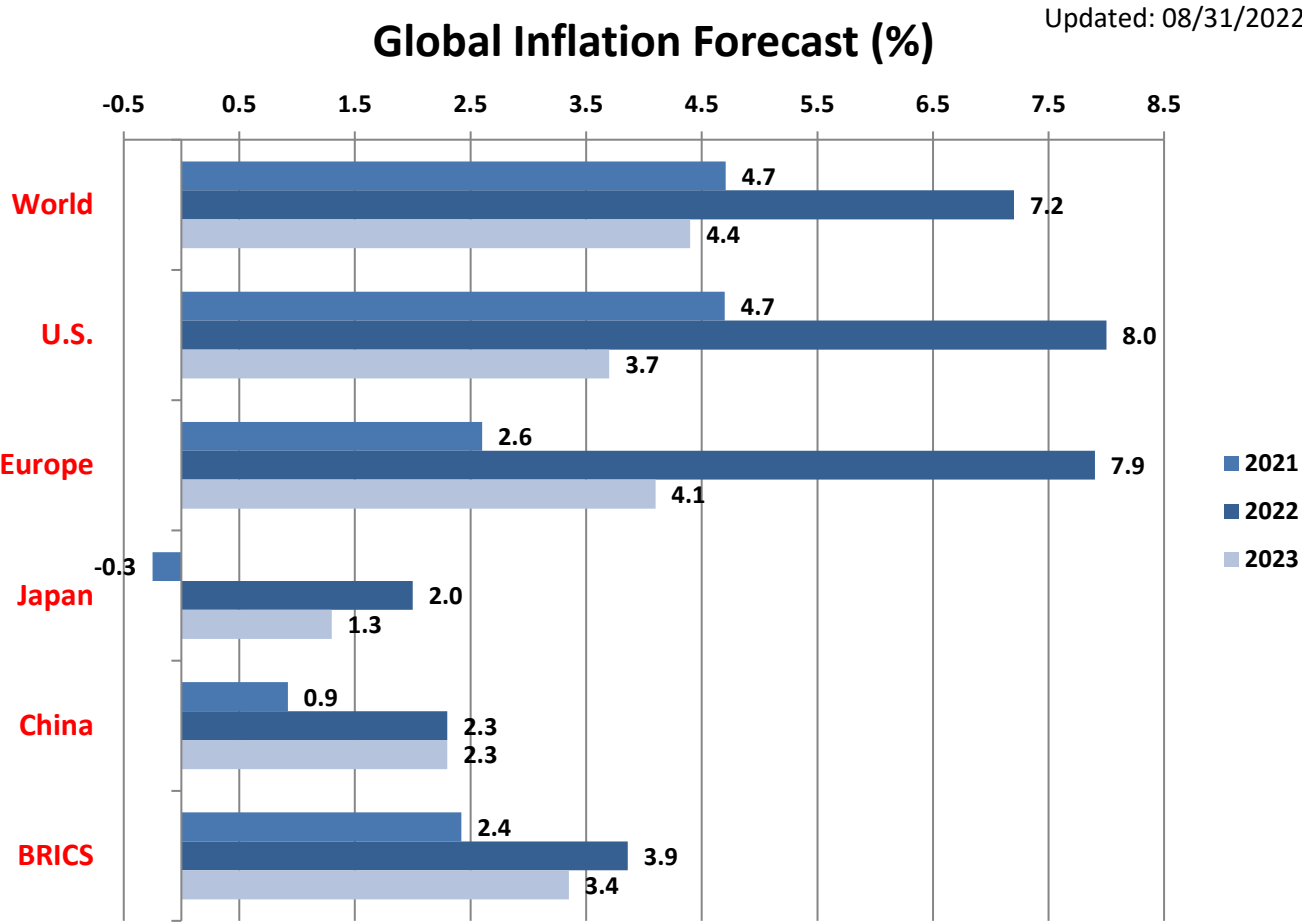
First half of 2022 driven by consumption and private investment



Source: Bloomberg, Bureau of Economics Analysis

Global Inflation

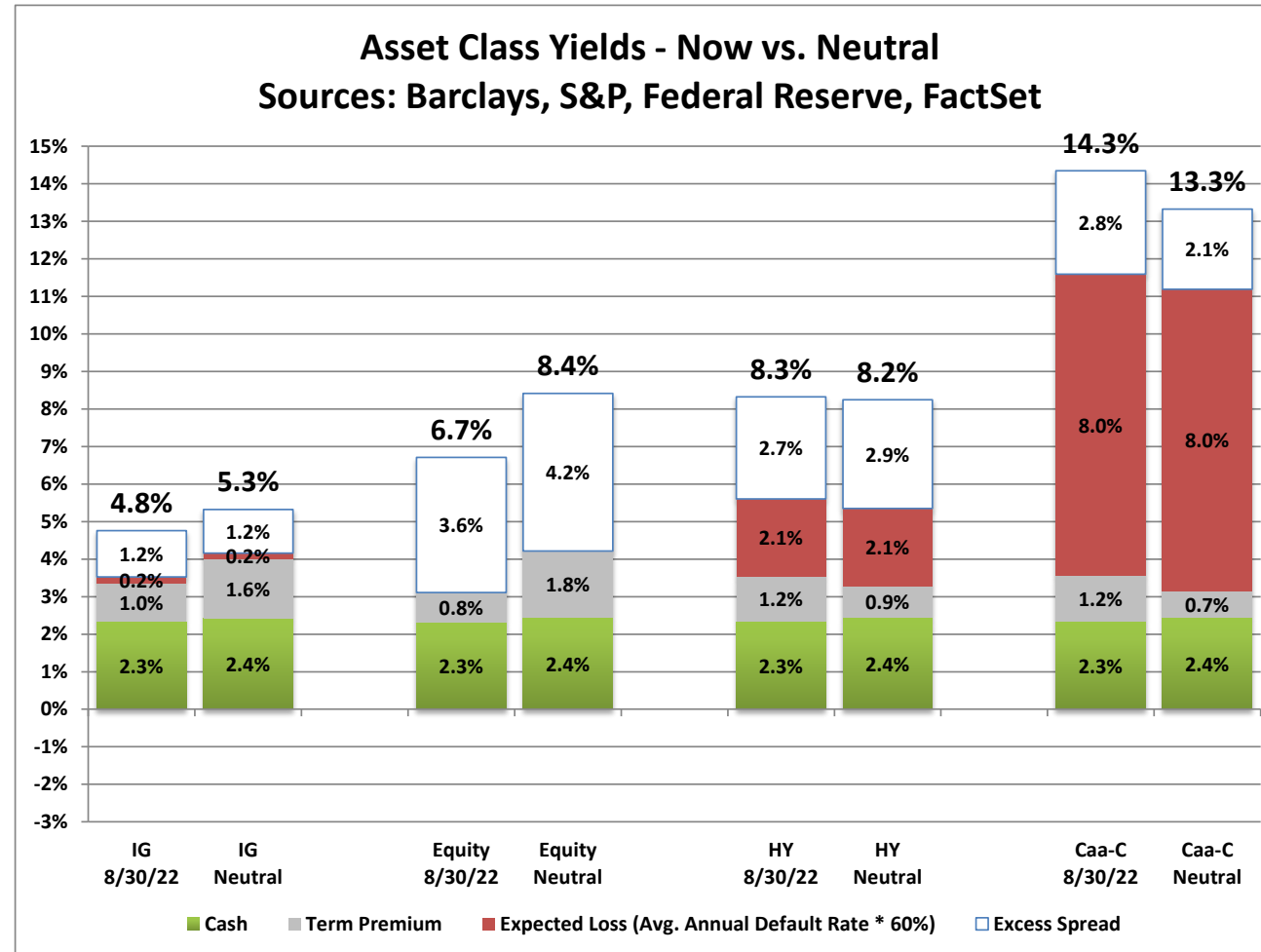
Consensus expectations for 2022 are higher globally



Source: Bloomberg Consensus

Asset Yields

Yield on cash investments has returned to equilibrium level



Valuation Indicators

U.S. equity and credit valuations are closer to long run averages

Valuation Metric	Valuation Date	Current	1 Yr	5Yr	10 Yr	All Data	Earliest Data
10 Year Treasury Yield (%)	Aug-2022	3.1	2.2	1.9	2.1	5.9	Jan-62
S&P 500 Forward P/E (NTM)	Aug-2022	17.9	19.3	19.1	17.7	16.4	Jan-90
MSCI xUS Forward P/E (NTM)	Aug-2022	12.0	13.5	14.9	14.8	14.0	Feb-05
Private Equity Multiple (EBITDA, Large)	Jun-2022	12.1	8.9	10.8	10.5	9.2	Jan-94
Barclays Corp Investment Grade OAS (bps)	Aug-2022	140	118	117	125	131	Jun-89
Barclays Corp High Yield OAS (bps)	Aug-2022	478	377	397	433	496	Jan-94
US Inflation (Calendar YoY %)	Aug-2022	8.5	7.4	3.2	2.2	3.8	Jan-62
US Real GDP Growth (Calendar YoY %)	Aug-2022	1.7	3.9	2.0	2.1	3.0	Dec-61
US Volatility	Aug-2022	23.4	24.6	20.9	18.0	19.7	Jan-90
Europe Volatility	Aug-2022	27.5	26.5	21.5	21.0	23.9	Jan-99
UK Volatility	Aug-2022	17.2	20.6	18.9	17.1	18.6	Jan-00
Japan Volatility	Aug-2022	18.2	23.4	21.9	22.5	24.6	Jan-98

US 2022 GDP Growth Forecast: 1.7%

US 2022 CPI Forecast: 8.0%

Source: FactSet, 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. Draft Open Session Minutes of May 18, 2022
Enterprise Risk and Compliance Committee Meeting
- B. New Contracts, Q2 2022
- C. Quarterly Charges to Funds Report, Q2 2022
- D. Private Markets and Funds Alpha Commitments, Q2 2022

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

Wednesday, May 18, 2022

Via Teleconference

Committee Members Present: Lisa Lange, Director of Compliance & Senior Legal Counsel (Co-Chair)
Hassan Chehime, Head of Risk Management (Co-Chair)
Jameson Greenfield, Chief Financial Officer (Vice Chair)
Sara Chandler, Chief Legal Counsel (Secretary)
Edwin Denson, Executive Director/Chief Investment Officer
Brian Heimsoth, Portfolio Manager
Mike Jacobs, Agency Business Director
Rochelle Klaskin, Deputy Executive Director/Chief Administrative Officer
Brandon Brickner, Internal Audit Director (*non-voting*)

Others Present: Eric Barber, Senior Legal Counsel
Navid Bahadoran, Risk Analytics & Systems Analyst
Sunil Nair, Operational Risk Director
Olu Olubiyi, Information Security & Governance Manager
Anand Rakesh, Director of Risk Analytics & Financial Engineering Systems
Dawn Tuescher, Executive Administrative Assistant

Open Session

Lisa Lange, Co-Chair of the Enterprise Risk and Compliance Committee (“ERCC”), declared that a quorum was present and called the meeting to order at 10:01 a.m.

1. Approval of Minutes

Ms. Lange confirmed that there were no questions or comments on the open session minutes of November 9, 2021, which were included in the meeting materials.

Motion: A motion was made by Ms. Chandler and seconded by Mr. Greenfield to approve the open session minutes of November 9, 2021, 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 7-13 in the meeting materials. Mr. Chehime introduced Navid Bahadoran and Mark Paloian as new risk analysts. Mr. Chehime gave an update on SWIB’s Enterprise Risk Framework. Mr. Chehime then gave an overview of the risk analytics and systems that make up the Enterprise Risk System, noting that FactSet MAC was the primary system.

Sunil Nair, Operational Risk Director, then discussed the team's approach to actively managing operational risk, including determining the optimal operational risk platform. Finally, Mr. Nair drew attention to the significant progress with respect to business continuity planning and IT disaster recovery planning.

3. Compliance Update

Lisa Lange, Director of Compliance and Senior Legal Counsel, presented the *Compliance Reporting & Updates* for Q4 2021 and Q1 2022, which were included on pages 14-28 in the meeting materials.

A. Q4 2021

Ms. Lange reported that the fourth quarter of 2021 had more trade requests than the prior corresponding quarter, but was generally in line with recent quarters. There was one personal trading violation in the quarter, deemed minor, and one special approval under the personal trade approvals policy. There were no guideline violations, but two waivers were granted. The Non-Wisconsin Venture Capital portfolio was granted a waiver of the consultant review guideline. Investment and operational due diligence on this matter was conducted by SWIB internal staff, including investment management, legal, and compliance. The Mortgage-Backed Securities portfolio was granted a waiver of out-of-benchmark securities limit, increasing the limit to 30% from 25%, until guidelines were reviewed at the February Investment Committee meeting. Ms. Lange also reported one individual with a late compliance affirmation.

B. Q1 2022

Ms. Lange noted that first quarter of 2022 saw fewer personal trading requests and approvals than the prior quarter. The lower approvals were due, in part, to significant SWIB trading activity tied to transitions and asset allocation implementation. There were two personal trading violations, both deemed minor. There were two employees with late compliance affirmations. Ms. Lange noted no guideline violations and three waivers granted. In connection with asset allocation changes, the Government/Credit portfolio was granted a waiver allowing shorting of cash bonds in addition to ETFs in connection with allocation changes. Similarly, due to asset allocation adjustments, the High Yield portfolio was granted two waivers to the leverage guideline, increasing the limit to 20% from 10%, while assets were being moved into the portfolio and invested.

Ms. Lange also gave a historical overview of SWIB staff personal trading and answered questions.

In conclusion, Ms. Lange highlighted that each year SWIB staff are required to certify that they are in compliance with the Ethics Policy and make disclosures regarding outside business activities/boards, certain financial interests, or relationships that could result in potential conflicts of interest. Compliance staff reviews all disclosures to ensure the required approvals are in place and there are no conflicts of interest. She noted that twelve staff have been approved for outside business activities that did not relate to their roles at SWIB, with three requests either being denied or withdrawn during 2020-21.

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 or prevention relating to SWIB's information technology infrastructure 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 Mr. Denson and seconded by Mr. Jacobs.

Ms. Lange called for a roll call vote.

Chandler-Aye	Cehime-Aye	Denson-Aye	Greenfield-Aye
Heimsoth-Aye	Jacobs-Aye	Klaskin-Aye	Lange-Aye

There being eight ayes and no nays, Ms. Lange declared the motion passed. The Committee convened in closed session at 10:28 a.m. and reconvened in open session at 10:57 a.m.

5. Announcement of Matters Taken Up in Closed Session

Ms. Lange announced that, while in closed session, the Committee was provided an update on information security and governance and counterparty risk management.

6. Future Meeting Topics

No future meeting topics were discussed.

7. Adjournment

Motion: A motion to adjourn was made by Ms. Chandler and seconded by Ms. Klaskin. The motion passed unanimously, and the ERCC meeting was adjourned at 10:59 a.m.

Date of Committee Approval: _____

Signed: _____
Sara Chandler, Secretary
Enterprise Risk and Compliance Committee

New and Amended Contracts Approved April - June 2022

New Contracts:

BNY Mellon

BNY Mellon is the sole source vendor to provide consulting services to support the planning and implementation of a new operating model on the Eagle Access spoke. The estimated cost for this service is \$68,600.

BNY Mellon

BNY Mellon is the sole source vendor to provide the services required to upgrade Eagle from its current version 15 to the newest version 17. The estimated cost for these services is \$224,800.

Capital Data Inc.

Capital Data Inc. is the State contracted vendor to provide SWIB's new building at Madison Yards with necessary servers, switches, and storage. The cost for this equipment and associated services is \$299,000.

Focus Economics

Focus Economics is the sole source vendor to provide access to their economic data focusing on projections and research opinions for global market. The cost for this proprietary research is \$35,000.

IHS Markit

IHS Markit is the sole source vendor to provide valuation data for bank loan securities on their platform. The cost for three years of service is \$340,000.

ICE Data Indices, LLC

ICE Data Indices, LLC is the sole source vendor to provide historical index data on their platform. The cost for three years of service is \$40,500.

IT-Venture LTD

IT-Venture LTD is the sole source vendor to provide data strategy and PowerBI consulting services for eFront reporting. The estimated cost for this service is \$146,575.

Lucera Financial Infrastructures

Lucera Financial Infrastructures is the vendor selected from a competitive bid process to provide online fixed income aggregation services. The annual cost for this service is \$50,000.

My Data Outlet International, LLC

My Data Outlet International, LLC is the sole source vendor to provide data retrieval functions using SQL stored procedures to access underlying Refinitiv quantitative analytics data. The annual cost for this service is \$122,000.

Preyer US Corp.

Preyer US Corp is the sole source vendor to provide analysis and best practice consulting for the SimCorp system. The estimated cost for this service is \$50,000.

Refinitiv

Refinitiv is the sole source vendor to provide access to its quantitative analytics production database to allow enhanced functionality for users. The annual cost for this system is \$615,000.

Taranis, Inc.

Taranis Inc. is selected from SWIB's competitively bid pool of vendors that provide contract workers with investment industry experience to provide one temporary investment-related resource with expertise relating to workflows, implementation, design, and enhancements within the Charles River platform. The resource will be engaged for six months at a cost of \$145,000.

Amended Contracts/Extensions:**Bridge Consulting Partners**

- One contract worker extended through 09/30/2022 at a cost of \$160,000.

Sharp Decisions

- One contract worker extended through 09/30/2022 at a cost of \$171,500.

V-Soft Consulting Group

- One contract worker extended through 06/05/2022 at a cost of \$30,000.

Note: the dollar amounts listed above for contract workers represent the estimated total contract costs and may not reflect actual costs incurred. For example, estimated and actual costs may differ due to variances in actual hours worked by the contractor, travel expenses, etc.

August 15, 2022

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

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

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

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

Dear Senator Marklein, Senator Cowles, Representative Born, and Secretary Blumenfeld:

State statutes require the State of Wisconsin Investment Board (SWIB) to report all costs and expenses charged to the trust funds under management during the prior quarter as well as 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, 2022.

Total Cost of Management Summary	3Q2021	4Q2021	1Q2022	2Q2022	Trailing 4 Qtr Total	% of Total
Internal Operating Expenses						
Operating Budget Expenses	\$ 12,882,486	\$ 14,225,300	\$ 14,062,637	\$ 42,801,859	\$ 83,972,282	61.0%
Custodial, Investment Operations & Banking	1,712,812	1,752,273	1,803,372	1,692,456	6,960,913	5.1%
Legal	642,792	821,846	625,000	625,000	2,714,638	2.0%
Investment Research & Consulting	10,099,210	10,521,546	10,007,468	9,150,155	39,778,379	29.0%
Total Internal Operating Expenses	\$ 25,337,300	\$ 27,320,965	\$ 26,498,477	\$ 54,269,470	\$ 133,426,212	97.0%
Securities Lending Agent Expenses	706,762	784,251	1,282,912	1,412,138	4,186,063	3.0%
Total SWIB Operating Costs	\$ 26,044,062	\$ 28,105,216	\$ 27,781,389	\$ 55,681,608	\$ 137,612,275	100.0%
External Investment Management Fees						
Externally Managed Separate Account Fees						
Beta One & Other - Separately Managed	\$ 15,897,862	\$ 9,818,853	\$ 12,730,351	\$ 6,621,385	45,068,451	6.9%
Supplemental Information - External Fund Fees						
Real Estate	\$ 17,175,742	\$ 17,693,091	\$ 19,209,516	\$ 19,257,344	73,335,693	11.2%
Private Equity & Venture Capital	56,476,982	61,375,539	56,999,361	72,498,709	247,350,590	37.6%
Hedge Funds	46,910,532	42,415,360	72,033,779	60,862,749	222,222,421	33.9%
Beta One & Other - External Funds	18,697,235	4,722,875	18,411,505	26,091,654	67,923,270	10.4%
Total External Investment Management Fees	\$ 155,158,353	\$ 136,025,718	\$ 179,384,512	\$ 185,331,841	\$ 655,900,425	100.0%
Total Cost of Management	\$ 181,202,415	\$ 164,130,934	\$ 207,165,901	\$ 241,013,449	\$ 793,512,700	

SWIB operating costs are charged to the trust funds under management and externally managed fund fees are netted against the 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, 2021, after consideration of all expenses, costs, and fees, SWIB

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.

generated more than \$2.2 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, 2022, SWIB's total authorized positions are 290 as shown in the table below.

Assets Under Management & Positions		
	3/31/2022	6/30/2022
Internal Management	50.7%	48.4%
External Management	49.3%	51.6%
Total SWIB Positions	290	290

In addition, Attachment B provides details of the services provided to SWIB and their associated quarterly costs.

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.

For definitions of the expense categories presented in the Total Cost of Management Summary table, please refer to Attachment C

Sincerely,



Edwin Denson
Executive Director/Chief Investment Officer

Attachments

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

Total Assets Under Management

Wisconsin Retirement System (WRS)	9/30/2021		12/31/2021		3/31/2022		6/30/2022	
	Amount (in millions)	Percent	Amount (in millions)	Percent	Amount (in millions)	Percent	Amount (in millions)	Percent
Internally Managed	\$72,136	51.2%	\$72,165	49.0%	\$64,161	45.5%	\$52,094	41.7%
Externally Managed Dedicated Accounts	35,978	25.5%	36,740	25.0%	36,289	25.8%	27,907	22.4%
Externally Managed Commingled Accounts	32,809	23.3%	38,311	26.0%	40,434	28.7%	44,852	35.9%
1. Passive Index Funds	2,894	2.1%	2,857	1.9%	2,283	1.6%	1,689	1.4%
2. Limited Partnerships	22,128	15.7%	26,574	18.1%	28,548	20.3%	30,212	24.2%
3. Actively Managed Commingled Accounts	7,787	5.5%	8,881	6.0%	9,603	6.8%	12,950	10.4%
TOTAL WRS Assets	\$140,923	100.0%	\$147,217	100.0%	\$140,884	100.0%	\$124,853	100.0%
State Investment Fund - Internally Managed	\$14,648		\$16,051		\$16,930		\$18,401	
Separately Managed Funds - Internally Managed	\$123		\$123		\$111		\$101	
Separately Managed Funds - Externally Managed	\$2,225		\$2,276		\$2,095		\$2,409	
Total Assets Under Management	\$157,919		\$165,666		\$160,020		\$145,764	
Total Internal Management	\$86,906	55.0%	\$88,338	53.3%	\$81,202	50.7%	\$70,596	48.4%
Total External Management	\$71,012	45.0%	\$77,328	46.7%	\$78,818	49.3%	\$75,168	51.6%

STATE OF WISCONSIN INVESTMENT BOARD
Expenses for All Funds Under Management
Quarter Ending June 30, 2022

EXPENSE CATEGORY ¹	SERVICE PROVIDED	EXPENSES
<u>Internal Operating Expenses</u>		
Staff Compensation	Staff Compensation	\$ 35,222,915
Fringe Benefits	Fringe Benefits	5,633,291
Equipment, Supplies & Services	General Supplies & Services	1,945,653
Total Internal Operating Expenses		\$ 42,801,859
<u>Custodial, Investment Operations and Banking Fees</u>		
BNY Mellon Asset Servicing - Custody	Master Custody Services	\$ 308,898
BNY Mellon Asset Servicing - Investment Operations	Investment Operating Services	1,378,501
Markit NA	Investment Data Management Software	5,019
US Bank	Banking Fees	38
Total Custodial, Investment Operations and Banking Fees		\$ 1,692,456
<u>Legal Fees</u>		
Chapman & Cutler LLP	Legal Work for Investment Strategies	\$ 15,000
Cox Castle & Nicholson LLP	Legal Work for Investment Strategies	3,354
DLA Piper LLP (US)	Legal Work for Investment Strategies	100,211
Godfrey & Kahn SC	Legal Work for Investment Strategies	1,704
Husch Blackwell	Legal Work for Investment Strategies	2,438
Latham & Watkins LLP	Legal Work for Investment Strategies	25,823
Legal Services Expense Accrual	Legal Work for Investment Strategies	506,219
Purrington Moody Weill LLP	Legal Work for Investment Strategies	68,503
Quarles & Brady	Legal Work for Investment Strategies	74,040
Shearman & Sterling LLP	Legal Work for Investment Strategies	161,099
Vedder Price PC	Legal Work for Investment Strategies	11,875
Legal Services Expense Accrual Reversal	Legal Work for Investment Strategies	(345,265)
Total Legal Fees		\$ 625,000
<u>Investment Counsel</u>		
ABG Sundal Collier Inc	Investment Research	\$ 750
Adeptyx Consulting	Investment Consulting Services	28,116
Aksia LLC	Hedge Fund Investment Consulting	193,750
Alembic Global Advisors	Market Research	3,000
Alex Solutions	Research and Data Services	39,750
Aon Hewitt Investment Consulting Inc	Investment and Risk Management Research	15,000
Apex Systems	Investment Consulting	50,289
Arthur Selender	Investment Consulting	2,000
B Riley FBR Inc	Investment Research	5,000
Backstop Solutions Group	Investment Software	12,400
Bank of America Merrill Lynch	Investment Research	93,950
Barrington Research Associates Inc	Investment Research	3,100
BCA Research Inc	Global & Domestic Fixed Income Strategy Research	33,458
Berenberg	Investment Research	48,350
Blackrock Financial Management Inc	Risk Services	75,000
Bloomberg Finance LP	Market, Company, Industry & Benchmark Information	994,409
BMO Capital Markets Corp	Investment Research Services	22,050
BNY Mellon Asset Servicing - Custody	Master Custody Services	48,000
BNY Mellon Asset Servicing - Eagle/Pace	Investment Consulting Services	188,360
Bridge Consulting Partners Ltd	Investment Consulting	84,480
Broad Street Consulting Group	Recruitment Consulting	19,500
BTIG, LLC	Investment Research	1,000
Canaccord Genuity	Investment Research	5,250
Carnegie Inc	Investment Research	500
CBJL Incorporated	Investment Consulting	95,940
CBOE Global Markets, Inc.	Research and Data Services	1,500
CFRA Research	Investment Research Services	17,325
Charles River System Inc	Portfolio Management Trading Software & Services	357,082
CIBC World Markets Inc	Investment Research	4,750
CL King & Associates	Investment Research	5,500
Codrington Japan	Investment Research	1,000

EXPENSE CATEGORY ¹	SERVICE PROVIDED	EXPENSES
Colliers Securities LLC	Investment Research	1,500
Compass Point Research & Trading, LLC	Investment Research	500
Consensus Economics Inc	Investment Research Services	34,800
Copp Clark	Research and Data Services	3,713
CoStar Portfolio Strategy	Real Estate Consulting & Research Services	28,738
Cowen and Company LLC	Research and Data Services	33,100
Craig-Hallum Capital Group	Investment Research	5,200
Crane Data LLC	Research and Data Services	3,000
Cross Current Research LLC	Healthcare Sector Research	5,000
CUSIP Global Services	Research and Data Services	10,833
DA Davidson & Co	Investment Research	20,200
Dacheng Xiu	Investment Research	37,500
Daiwa Capital Markets America	Investment Research	9,100
Datacamp Inc	Research and Data Services	4,587
Davy Securities Limited	Investment Research	4,750
Deutsche Bank	Tax registration fees	57,395
DNB Bank ASA	Investment Research	10,000
Dow Jones News Service	Company and Industry News Services	924
DTCC – EPN	Trade Settlement Service	3,001
DTCC ITP LLC	Trade Settlement Service	3,366
EFront Financial Solutions Inc	Private Markets Portfolio Management Services	154,390
Elevation LLC	Research and Data	10,000
Empirical Research Partners LLC	Investment Research	137,500
Ernst & Young LLP	Tax Compliance Services & Investment Consulting	19,000
Euromonitor International	Research and Data Services	19,482
Evercore Group LLC	Investment Research	72,350
Exane Inc	Investment Research	64,935
FactSet Research Systems Inc	Financial & Economic Database	969,680
FBN Securities, Inc.	Investment Research	5,000
FIS Data Systems Inc.	Research and Data Services	21,230
Fitch Solutions Inc	Credit Rating Services	17,500
FocusEconomics S.L.U	Investment Consulting	34,980
Furey Research Partners LLC	Small Cap Research	11,000
Gallagher	Insurance and Risk Management Services	15,533
Gartner Inc	Technology Sector Research	29,285
Global Peer Financing Association	Investment Consulting	1,000
Goodbody	Investment Research	6,750
Grandview Analytics LLC	Investment Information Technology Consulting Services	48,462
Green Street Advisor	Real Estate Analytics	16,937
Guggenheim Securities LLC	Investment Research	17,050
Hammerstone Markets Inc	Investment Research	300
Haver Analytics	Global Macroeconomic Research	22,700
HSBC Securities (USA) Inc.	Investment Research	2,250
Ice Data LP	Fixed Income Indices	28,035
Informa Business Intelligence Inc (Sagient Research Systems)	Investment Research	5,250
Institutional Investor	Investment Data and Research Services	19,500
Institutional Shareholder Services Inc	Proxy Voting Analysis	41,914
Intelligent Automation Consulting	Automation Consulting Services	7,050
Investec Securities (US) LLC	Investment Research	5,000
IT-Venture LTD	Investment Consulting	127,600
Janney Montgomery Scott	Investment Research	2,000
Jefferies Research Services LLC	Investment Research	73,150
Keefe Bruyette & Woods (KBW)	Investment Research	31,250
Kepler Capital Markets Inc	Investment Research Services	4,400
KeyBanc Capital Markets Inc	Investment Research	25,000
Keystone Consulting Inc	Investment Information Technology Consulting Services	281,075
KPMG Limited	Tax Representation Services	9,778
Kreischer Miller LLP	Investment Consulting	(29,800)
Kroll Bond Rating Agency, Inc. (KBRA)	Investment Research and Data Services	15,000
Liberum Capital Inc	Investment Research	16,000
Longbow Securities LLC	Investment Research	1,500
Loop Capital Financial Consulting Services	Valuation Consulting Services	2,300
Mackey LLC	Research Management System	52,079
Macquarie Capital (USA) Inc	Investment Research	22,850
Markit Group Limited	Investment Consulting	1,250
Markit NA	Investment Data Management Software	20,167

EXPENSE CATEGORY ¹	SERVICE PROVIDED	EXPENSES
Markit-EDM Limited	Investment Consulting	187,884
Matrix IDM, LLC	Investment Consulting	28,000
McLagan Partners Inc	Investment Compensation Data and Analysis	46,813
Meketa Investment Group	Public Markets External Manager Consultant	66,930
MKM Partners	Investment Research Services	8,250
MNI Market News	Research and Data Services	2,835
Money-Media Inc	Research and Data Services	5,030
Moodys Analytics	Economic, Currency & Bond Analysis	80,237
Morningstar Inc	Industrial Sector Market Research & Analysis	12,500
MSCI - Barra	Research and Data Services	46,350
MSCI Inc - Risk Metrics Solutions	Research and Data Services	340,245
MSCI, Inc	Research and Data Services	27,807
MUFG Securities America	Investment Research	10,500
My Data Outlet International, LLC	Research and Data Services	23,833
National Bank Financial Inc	Investment Research	3,200
Needham & Company LLC	Investment Research	15,000
Nephron Research LLC	Investment Research	2,500
New Street Research LLC	Investment Research	25,000
Northland Securities	Investment Research	3,000
Novus Partners Inc	Profit & Loss Analytics System	18,885
Nuware Technology Corp	Investment Information Technology Consulting Services	196,126
NYSE Market Inc	New York Stock Exchange Data	6,098
Oliver James	Investment Consulting	86,280
Oppenheimer & Co Inc	Investment Research	7,500
Options Price Reporting Authority	Quote System for Options Market	2,394
Pac-invest	Research and Data Services	12,276
Phil Erlanger Research Co Inc	Investment Research	4,000
Piper Sandler & Co	Investment Research	51,300
PremiaLab	Investment Research	12,451
Preyer	Investment Consulting	16,667
Raymond James	Research and Data Services	17,200
Redburn Europe Limited	Investment Research	19,650
RedLine Associates, Inc	Recruitment Consulting	34,000
Refinitiv	Research Pricing (Autex, Baseline, FirstCall)	94,845
Renaissance Macro Research	Macro Economic Research	29,500
Robert W. Baird & Co.	Investment Research	56,350
Rosenblatt Securities Inc	Investment Research	13,600
Roth Capital Partners	Investment Research	3,600
Russell Investment Group	Index Data	8,932
Rystad Energy AS	Investment Research	22,500
S&P Global Market Intelligence	Industry & Corporate Research	122,523
SailPoint Technologies, Inc.	Information Security Software	18,750
Sanford C Bernstein & Co LLC	Investment Research	86,355
Santander Investment Securities Inc	Investment Research	12,900
Seaport Global Securities LLC	Research and Data Services	19,630
SEB Securities Inc	Investment Research	5,500
Sharp Decisions Inc	Investment Information Technology Consulting Services	86,772
Sidoti & Company LLC	Investment Research	7,750
Simcorp USA, Inc.	Investment System	1,537,646
SMBC Nikko Securities America Inc	Investment Research	8,000
Snowflake Inc	Research and Data Services	25,000
Solve Advisors Inc	Investment Research	9,000
SPACInsider	Research and Data	2,999
State Street	Investment Consulting	20,000
Stephens Inc	Investment Research	19,760
StepStone Group	Private Equity Consulting Services	218,986
StepStone Group Real Estate	Real Estate Consulting Services	57,883
Stifel Nicolaus & Company Incorporated	Investment Research	40,300
Stuart Frankel & Co., Inc	Investment Research	9,000
Susquehanna Financial Group LLP	Investment Research	1,500
SVB Leerink	Research and Data Services	9,000
SWIFT SC	Research and Data Services	892
SystemsAccountants	Investment Information Technology Consulting Services	78,080
Taranis, Inc.	Investment Information Technology Consulting Services	32,340
TD Securities (USA) LLC	Investment Research	4,500
Telsey Advisory Group	Consumer Sector Research	31,250

EXPENSE CATEGORY ¹	SERVICE PROVIDED	EXPENSES
The Benchmark Company LLC	Investment Research	4,000
The Financial Times Limited	Investment Research	6,459
The Leuthold Group LLC	Broad Based Market Research	10,000
The Nasdaq Stock Market, LLC	Research & Data Services	4,500
Toronto Stock Exchange	Market Data	14,226
TradeWeb	On-Line Fixed Income Trading Services	9,534
Trahan Macro Research LLC	Research and Data Services	2,000
Trivariate Research LP	Investment Research	15,000
Truist Securities, Inc.	Investment Research	9,120
Tudor Pickering Holt & Co	Investment Research	7,900
Unit4 Business Software Inc	Financial & Administration Services System	69,827
Urban Land Institute	Investment Consulting Services	1,150
Vadim Moroz	Investment Consulting	53,100
Investment Research Accrual Reversal	Investment Research	(850,000)
Vertical Research Partners	Industrial Sector Market Research & Analysis	10,375
Verus Advisory Inc	Benchmarking Consulting Services	42,000
Virtu ITG Analytics LLC	Trading Transaction Cost Analysis	20,500
Visible Alpha LLC	Research and Data Services	32,957
V-Soft Consulting Group Inc	Investment Information Technology Consulting Services	50,400
WallachBeth Capital LLC	Investment Consulting Services	3,000
Washington Speakers Bureau	Investment Consulting Services	10,000
Wedbush	Investment Research	11,500
WestPark Capital, Inc.	Investment Research	1,000
William Blair & Company LLC	Investment Research	11,000
With Intelligence LLC	Investment Data and Research	4,500
Wolfe Trahan	Transportation and Macro Economic Research	47,585
Wolters Kluwer Law & Business	GDP Forecasting Services	11,535
Wolverine Execution Services LLC	Options Trading Platform	1,367
WorldBridge Partners Inc	Recruitment Consulting	210,310
Worth Charting LLC	Investment Consulting	6,500
Yipit, LLC	Research and Data Services	15,000
Total Investment Counsel		\$ 9,150,155
<u>Securities Lending Agent Fees</u>		
BNY Mellon Asset Servicing	Securities Lending Agent Fees	\$ 1,412,138
Total Securities Lending Agent Fees		\$ 1,412,138
Total Quarterly Charges to Funds		\$ 55,681,608

¹All costs reported are on an accrual basis except for internal operating costs which are on a cash basis of accounting. Negative expense amounts are due to accrual adjustments and/or other miscellaneous adjustments.

Explanation of Expenses

Internal Operating Expenses

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

Custodial & Banking Fees

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

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

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

Legal Fees, Services, and Expenses

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

Investment Counsel

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

Securities Lending Agent Fees

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

Externally Managed Separate Account Fees

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

External Funds Fees

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

Private Equity Commitments*

April 2022 – June 2022

<i>Investment</i>	<i>Commitment (millions)</i>
Ares Special Opportunities Fund II	\$50.0
Blackstone Tactical Opportunities Fund IV	\$100.0
Centerbridge Seaport Acquisition Fund LP	\$40.0
EQT IX	€150.0
Glendon Opportunities Fund III	\$100.0
Hg Genesis 10	€65.0
Sterling Foundation Fund I	\$50.0
Varsity Healthcare Partners IV	\$50.0
Water Street Partners V	\$37.0

**Includes Current Return Portfolio and Co-Investments.*

Private Equity Commitments*

April 2022 – June 2022

<i>Investment</i>	<i>Commitment (millions)</i>
Information Technology Co-Investment	\$21.0
Information Technology Co-Investment	\$7.6
Healthcare Co-Investment	\$29.8
Financials Co-Investment	\$30.0
Information Technology Co-Investment	\$16.5

**Includes Current Return Portfolio and Co-Investments.*

Private Debt Investments/Commitments

April 2022 – June 2022

<i>Investment</i>	<i>Investment/Commitment</i>
Asset Manager (credit)	\$13,000,000
Real Estate (entity HQ)	\$25,000,000
Total	\$38,000,000

Real Estate Commitments

April 2022 – June 2022

<i>Investment</i>	<i>Commitment (millions)</i>
RREEF Core Plus Industrial Fund, LP	\$150
Realterm Airport Logistics Properties, LP	\$26
Wilson HCF Wisconsin Holdings 8,LLC	\$25
Blackstone Real Estate Partners X, LP	\$300
Gateway Real Estate Fund VII, LP	\$50
Gateway VII Co-Investment Account (SWIB), LP	\$50
AG Asia Realty Fund V, LP	\$50
Rockwood Multifamily Partners, L.P.	\$100
Total	\$751

Funds Alpha Commitments*

April 2022 – June 2022

Investment	Commitment (millions)
Elliott	\$67
Silver Point	\$19
NHC - Periscope	\$100
Four World	\$25
Avidity	\$40
DK Income Fund	\$10
LibreMax SOP I	\$4
Brevan Howard Co Invest	\$34
LibreMax CLO	\$14
Eaton Vance	\$310
MW Tops Americas	\$1,000
Prudential	\$420
GS China	\$294
GS EM ex China CTF	\$1,219
GS EM ex China VTF	\$178
BLK EM Ex China	\$1,196
BLK China	\$239
Clocktower	\$200
Total	\$5,369

**Includes Hedge Funds and Beta One*

Board Meeting

Tab 10 - Future Items for Discussion

2022 Board Meeting and Agenda Plan

<p>March 2022 (TUESDAY)</p> <p>Committees:</p> <p>SPCG:</p> <p>Open Session</p> <ul style="list-style-type: none"> Real Estate Strategy Report and Market Outlook Project Centum Update Recruiting Update Corporate Governance Program Update Investment Forum Preview <p>Executive Closed Session:</p> <ul style="list-style-type: none"> ED/CIO Goals Review <p>Compensation:</p> <p>Open Session:</p> <ul style="list-style-type: none"> Charter Review Strategic Results Scorecard Approval Incentive Compensation Program Review 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 <p>Audit & Finance:</p> <p>Open Session:</p> <ul style="list-style-type: none"> Charter Review Open Audit Issues Report Approval of Draft Audit Reports Audit Plan Status 2022 Internal Audit Goals Quarterly Cost Update (Q4) Administrative Reports 	<p>(WEDNESDAY)</p> <p>Board Meeting:</p> <p>Open Session:</p> <ul style="list-style-type: none"> Committee Reports <ul style="list-style-type: none"> Incentive Compensation Award Recommendations Election of Secretary and Assistant Secretary Annual Committee Assignments Proposed Meeting Dates for Next Year Q4 Performance Report Q4 Callan Peer Report Q4 Investment Update Investment Committee Open Session Business Q4 PMFA Commitments Q4 New Contracts Q4 Direct Charges to Funds <p>Closed Session:</p> <ul style="list-style-type: none"> Investment Committee Closed Session Business Risk Management Update <p>Executive Closed Session:</p> <ul style="list-style-type: none"> Incentive Compensation Award Recommendations for Specific Individuals
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<p>June 2022 (TUESDAY)</p> <p>Committees:</p> <p>SPCG:</p> <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"> • Project Centum Update • ED/CIO Goals Review • Consultant RFP Interviews <p>Audit & Finance:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Open Audit Issues Report • Approval of Draft Audit Reports • Affirmations and Disclosures • Audit Plan Status • Five-Year Audit Summary • Quarterly Cost Update (Q1) • Total Cost of Management Update (FY) • Administrative Reports <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • LAB Review of Statements of Economic Interest (generally, no presentation) <p>Compensation:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Charter Review • Recruiting Update <p>INVESTMENT FORUM</p>	<p>(WEDNESDAY)</p> <p>Board:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Committee Reports • Risk Management Update • Q1 Performance Report • Q1 Callan Peer Report • Q1 Investment Update • Investment Committee Open Session Business • Q1 PMFA Commitments • Q1 New Contracts • Q1 Direct Charges to Funds <p>Closed Session:</p> <ul style="list-style-type: none"> • Investment Committee Closed Session Business • Risk Management Update <p>INVESTMENT FORUM</p>
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<p>September 2022 (TUESDAY)</p> <p>Committees:</p> <p>SPCG:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Private Equity Strategy Report and Market Outlook • Project Centum Update • Corporate Governance 2022 Proxy Voting Review, ISS Update and ESG Trends • Trustee Manual Review/Policies Updates • October Workshop Preview <p>Closed Session:</p> <ul style="list-style-type: none"> • Project Centum Update • Annual Consultant Reporting <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • ED/CIO Goals Review <p>Audit & Finance:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Approve WRS Audited Financial Statements • Open Audit Issues Report • Approval of Draft Audit Reports • Audit Plan Status • 2023 Audit Plan Preview • Quarterly Cost Update (Q2) • Administrative Reports <p>Closed Session:</p> <ul style="list-style-type: none"> • Security Management, IT and Data Management Update <p>Compensation and Workforce Development:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Recruiting Metrics • Compensation Plans 	<p>(WEDNESDAY)</p> <p>Committees:</p> <p>Benchmark:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Annual Benchmark Preview <p>Board Meeting:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Committee Reports • Investment Forum Recap • Fiduciary Training • Public Records Training • Q2 Performance Report • Q2 Callan Peer Report • Q2 Investment Update • Investment Committee Open Session Business • Q2 PMFA Commitments • Q2 New Contracts • Q2 Direct Charges to Funds <p>Closed Session:</p> <ul style="list-style-type: none"> • Investment Committee Closed Session Business • Risk Management Update <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • Board Self Evaluation with Governance Consultant
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<p>October 2022 (TUESDAY) BOARD WORKSHOP</p> <p>Outside Speakers Asset Allocation Review with Actuaries</p>	<p>(WEDNESDAY) BOARD WORKSHOP</p> <p>Outside Speakers Asset Allocation Review with Actuaries</p>
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<p>December 2022 (TUESDAY)</p> <p>Committees:</p> <p>SPCG:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Beta One Strategy Report and Market Outlook • Charter Review • Project Centum Update <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • ED/CIO Goals Review <p>Audit & Finance:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Approve SIF Audited Financial Statements • Open Audit Issues Report • Approval of Draft Audit Reports • Audit Plan Status • Strategic Plan Review • Proposed 2023 Audit Plan • CY23 Total Cost of Management (Budget and Position Request) • Quarterly Cost Update (Q3) • Five Year Forecast • Administrative Reports <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • LAB Review of Statements of Economic Interest (generally, no presentation) • Evaluation of Internal Audit Director • Internal Audit Director Salary Recommendation <p>Benchmark and Performance:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Charter, Policies and Philosophy Review • Benchmark Consultant Report <p>Compensation and Workforce Development:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Compensation Philosophy Review • Compensation Consultant • Scoring of Strategic Results Scorecard / Review Division Scorecards • Incentive Compensation Plan Changes for Next Performance Year • Incentive Compensation Projections • People Metrics • Recruiting Metrics <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • Succession Planning 	<p>(WEDNESDAY)</p> <p>Board Meeting:</p> <p>Open Session:</p> <ul style="list-style-type: none"> • Committee Reports • Q3 Performance Report • Q3 Callan Peer Report (Callan onsite) • Cost Benchmarking Report • Asset Allocation Recommendation • Q3 Investment Update • Investment Committee Open Session Business • Q3 PMFA Commitments • Q3 New Contracts • Q3 Direct Charges to Funds <p>Closed Session:</p> <ul style="list-style-type: none"> • Asset Allocation Implementation • Investment Committee Closed Session Business • Risk Management Update • Annual review of expected tail loss analysis <p>Executive Closed Session:</p> <ul style="list-style-type: none"> • Internal Audit Director Salary
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