

State of Wisconsin Investment Board Update

Rochelle Klaskin

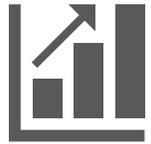
Deputy Executive Director/Chief Administrative Officer

Anne-Marie Fink

Private Markets & Funds Alpha Chief Investment Officer



Agenda



Performance



Cost Effectiveness



Asset Allocation



Market Update



SWIB News



Questions

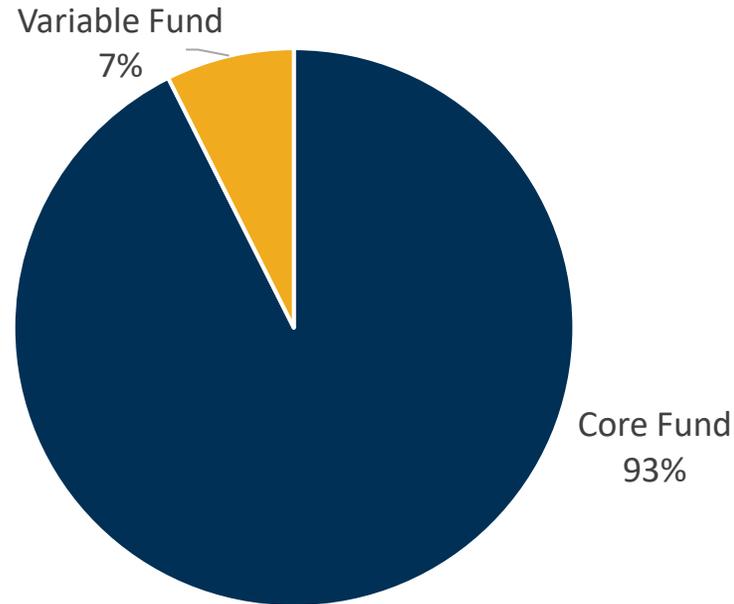


Performance



WRS Assets Under Management

Year-to-Date as of December 31, 2021



Fund	12/31/2020 AUM (in millions)	12/31/2021 AUM (in millions)	1-Year AUM Change (in millions)
Total WRS	\$129.8	\$147.2	\$17.4
Core Fund	\$120.2	\$136.3	\$16.1
Variable Fund	\$9.6	\$10.9	\$1.3

WRS Investment Performance

Year-to-Date as of December 31, 2021

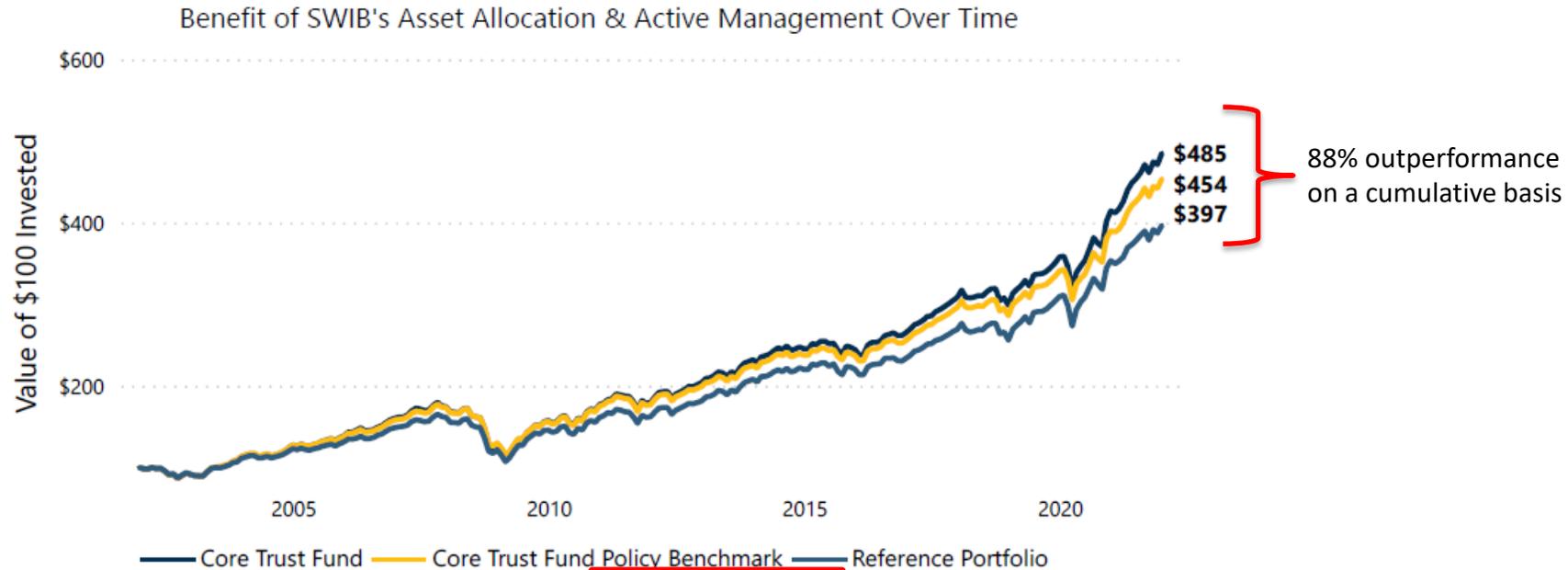
Core Fund	YTD	5-Year	10-Year	20-Year	30-Year
Performance	16.89%	12.47%	10.10%	7.92%	8.70%
Benchmark	16.25%	11.94%	9.66%	7.68%	8.31%
	0.64%	0.53%	0.44%	0.24%	0.39%

Variable Fund	YTD	5-Year	10-Year	20-Year	30-Year
Performance	19.95%	15.52%	13.75%	8.54%	9.57%
Benchmark	20.21%	15.58%	13.69%	8.68%	9.27%
	(-0.26)	(-0.06%)	0.06%	(-0.14%)	0.30%

Year-to-date (YTD) returns are net of all fees. Five-, 10-year returns are net of external manager fees. Thirty-year returns are gross of fees. YTD returns and benchmarks are subject to final valuation and adjustments that may occur during the calendar year.

CTF Performance vs. 60/40 Reference Portfolio*

January 2002 to December 2021



\$34.3bn total

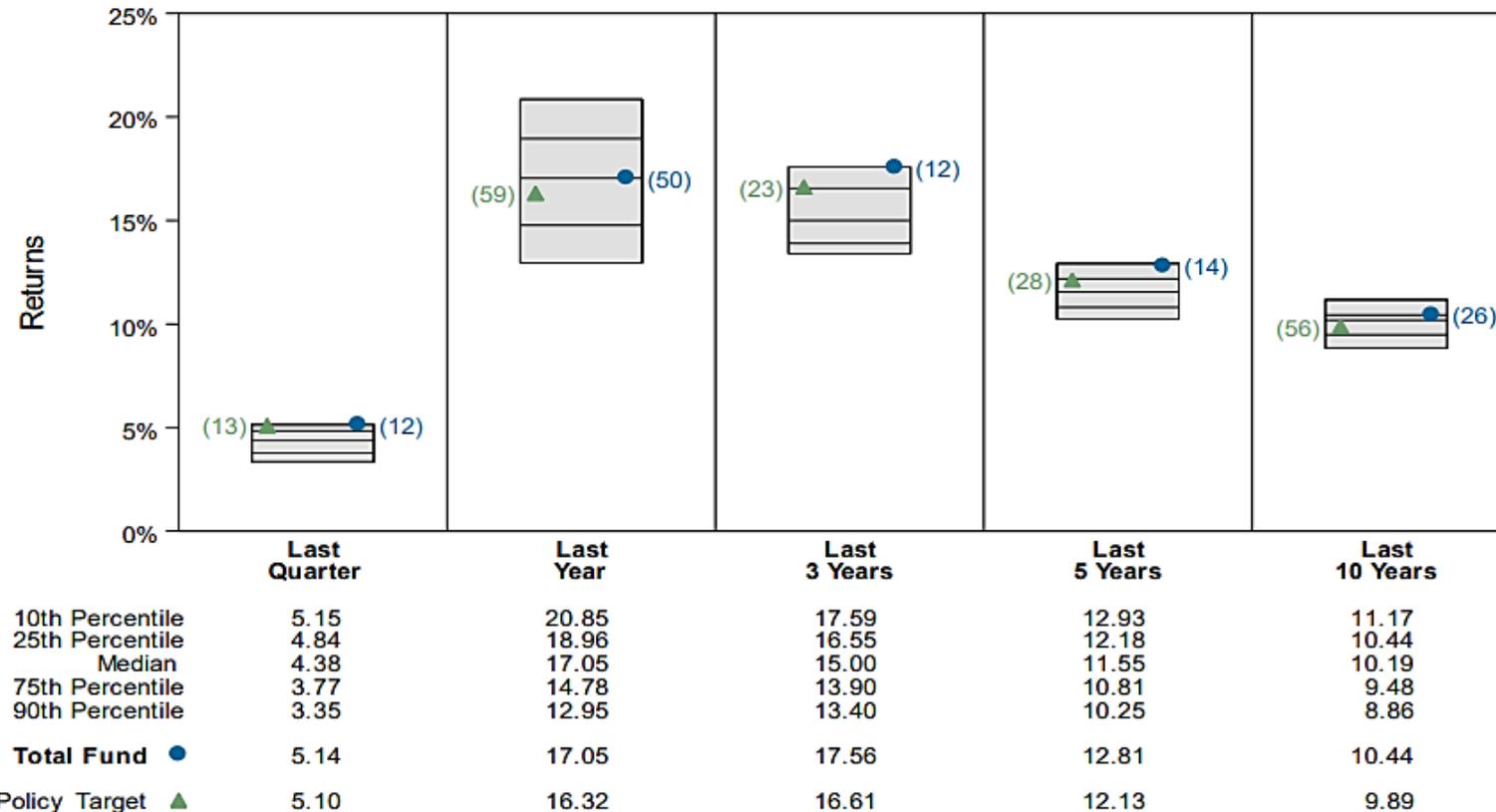
Reference Portfolio Ending Value	Additional Policy Portfolio Return Above Reference*	Additional Active Portfolio Return	CTF Ending Value**
102.0bn	+\$23.2bn	+\$11.1bn	=\$136.3bn

*The reference portfolio is 60% MSCI World and 40% Bloomberg Barclays Gov't/Credit (domestic)(rebalanced monthly). Core Trust Fund outperformance is calculated using gross returns.

**CTF beginning market value, as of January 1, 2002, was \$52.2 billion.

Cumulative Performance vs. Peers (Gross, 12/31/21)

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



- Actual total returns well above policy target returns for all periods shown.
- 10-year ranking vs. peers is near top quartile due to value-add above policy target, as target return was close to median.
- Top quartile rankings over medium term 2020 market volatility (and 2019) benefitted SWIB's risk-balanced stance vs. peers.

Adding Value to the WRS

\$2.2 Billion

SWIB's investment management has added value to the WRS trust funds of more than \$2.2 billion over benchmark returns over the last five years.



WRS Investment Performance

Year-to-Date as of January 31, 2022

Core Fund	YTD	5-Year	10-Year
Performance	-3.54%	11.30%	9.30%
Benchmark	-3.78%	10.71%	8.84%

Variable Fund	YTD	5-Year	10-Year
Performance	-4.90%	13.81%	12.55%
Benchmark	-5.22%	13.81%	12.47%

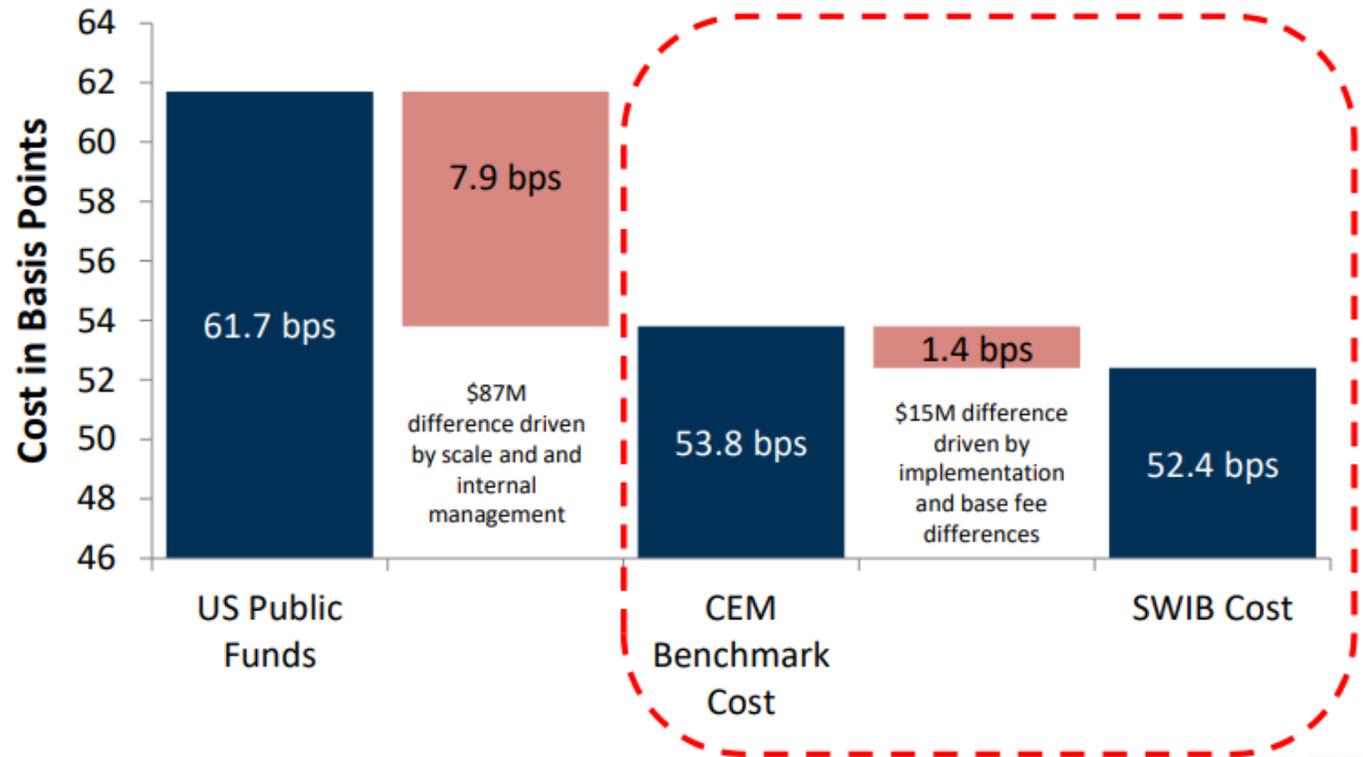
Year-to-date (YTD) returns are net of all fees. Five-, 10-year returns are net of external manager fees. YTD returns and benchmarks are subject to final valuation and adjustments that may occur during the calendar year.

\$ Cost Effectiveness

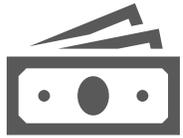


Total Costs Compare Favorably

SWIB's costs are 9.3 bps (\$103 million) lower than U.S. public fund average and 1.4 bps (\$15 million) lower than the CEM Benchmark, which is adjusted for investing style.



SWIB Cost Exceed the Peer Median



SWIB's costs were 6.2 bps higher than its peer group, due to relatively higher hedge fund performance fees.

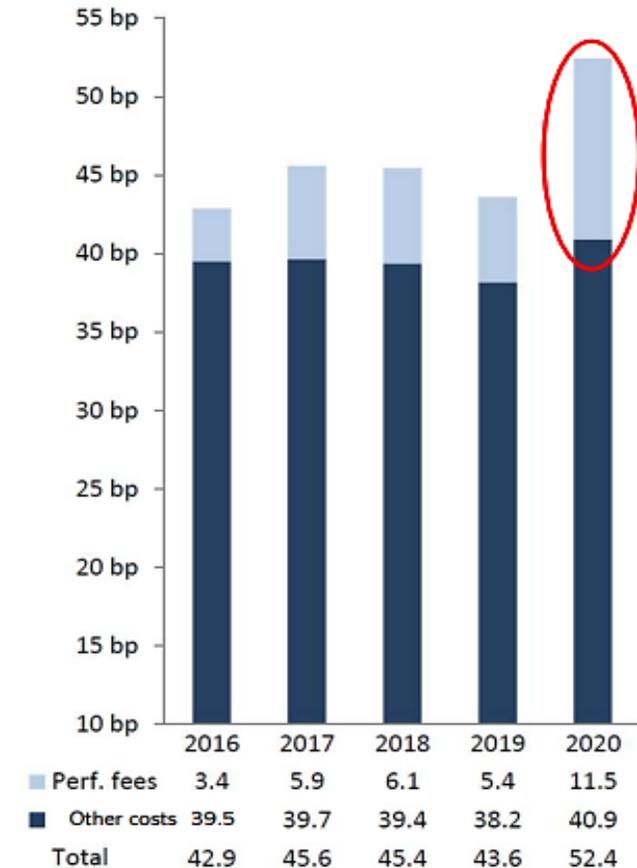


SWIB's hedge fund portfolio achieved top decile performance in 2020.

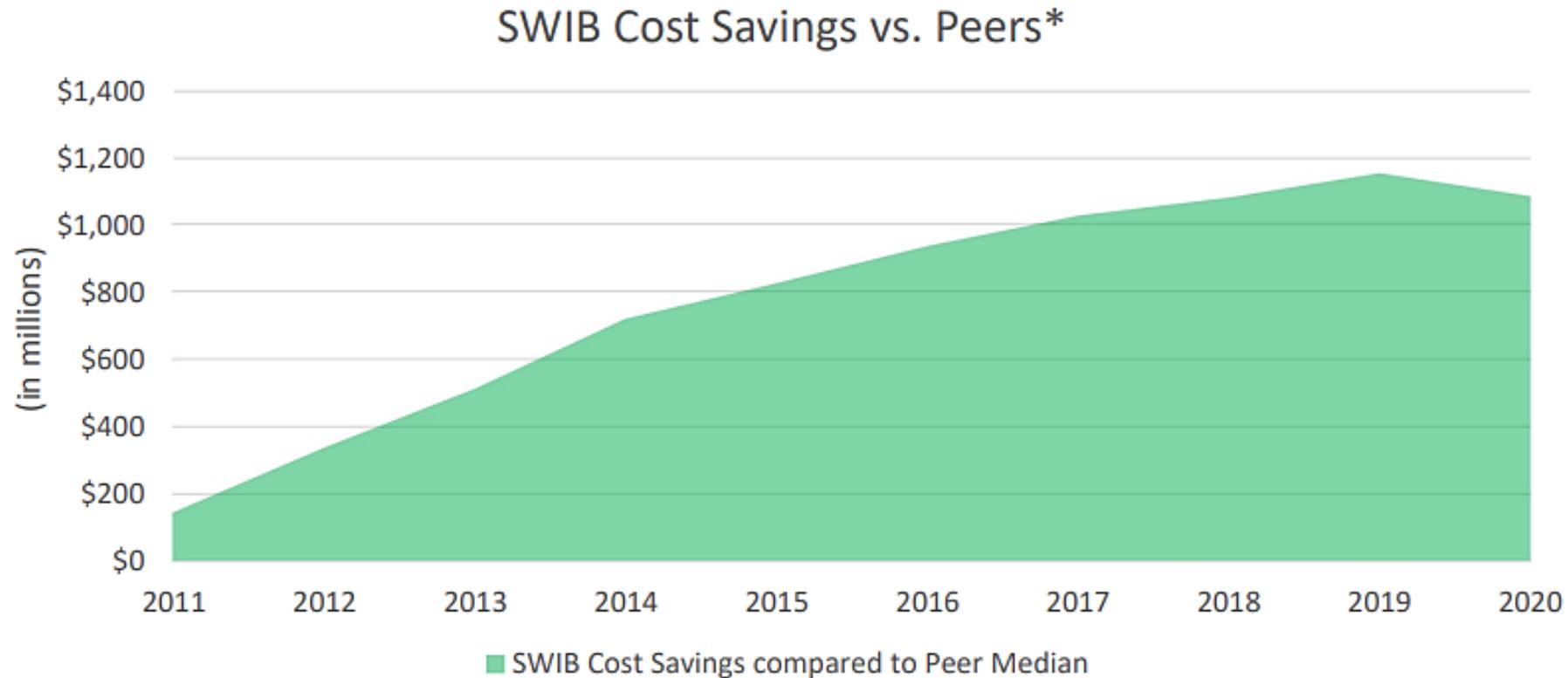


If hedge fund performance fees equaled the peer group median, SWIB's total cost would have been 0.7 bps below its peer group.

Trend in cost



SWIB Saved \$1.1 Billion vs. Peers from 2011-2020



*This analysis compares SWIB's savings vs. the peer group median costs for every \$100 under management and multiplies that average savings by SWIB's median assets under management.

Internal Management is More Cost Effective

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

Public Market Asset Type (Active Strategies)	Internal Management Cost (bps)	External Management Cost (bps) ¹
Global Large Cap Equity	15.1	41.9
Small Cap Equity	17.4	55.8
Domestic Fixed Income	7.3	12.6

¹External management costs represent the median cost for SWIB's CEM public fund peers for each asset class. SWIB engages external managers for Global Large Cap Equity at a cost of 23.1 bps and Domestic Fixed Income at a cost of 13.3 bps.

Cost Savings vs. Peers



Additional investments in infrastructure required by more complex internal management narrowed SWIB's cost savings advantage.



Peers have shifted to more internal management.



In 2020, SWIB's performance significantly exceeded that of its peers.





Asset Allocation



Asset Allocation Changes

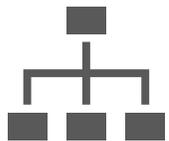


- Increased Private Equity to 12% and lowered Real Estate to 7%.
- Recognizes current market value and future expected pacing.



Removed Multi-Asset line item but kept strategy as part of active risk budget.

- For asset allocation policy targets, 4% from Multi-Asset moves to 1% Public Equity and 3% Inflation Sensitive Assets.



Changed Public Equity and Fixed Income sub-asset structures.



Public Equity Structure

Former Structure	Current Structure
Global Focus	Increased Access to Global Opportunities
Emerging Market Underweight	China Underweight

- More closely matches global market capitalization.
- Includes full U.S. market.
- Adds emerging markets small cap.
- Breaks out China to maintain underweight to China.
 - Increases ex-China emerging markets to market weight.



Public Fixed Income Structure

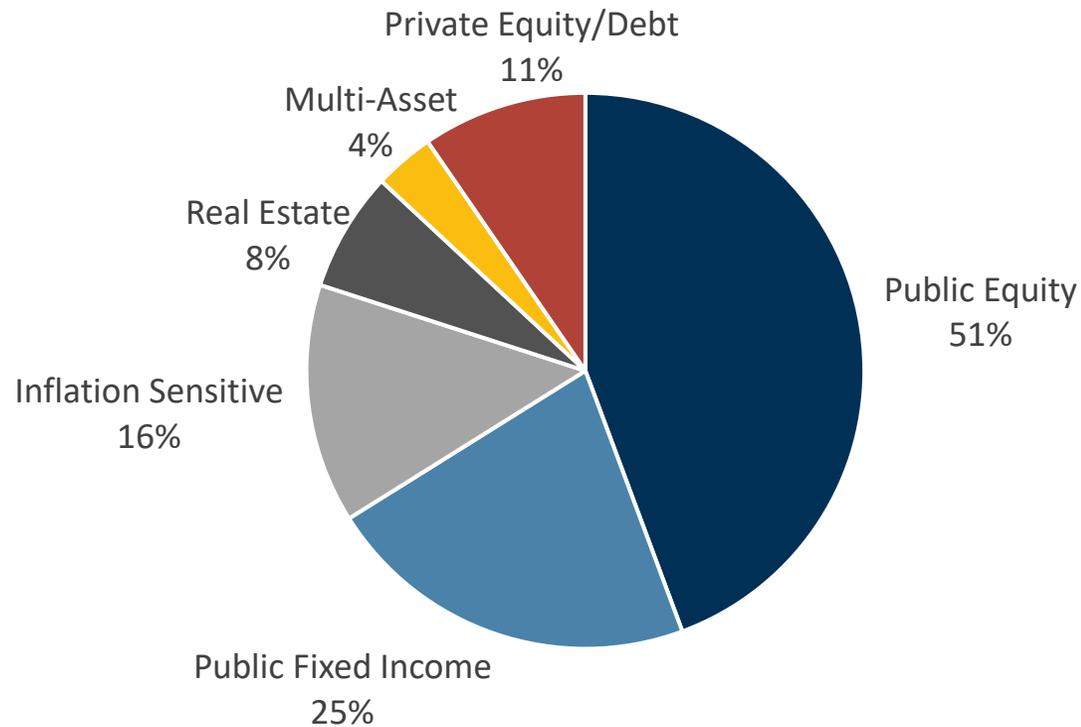
Current Structure	Proposed Structure
U.S. Focus	U.S. Focus
Government/Credit Market weight split	Reduce and change to equal weight; reinstate long Treasury allocation for duration exposure
Return-seeking beta and alpha in High Yield and Blended Emerging Market Debt	Significantly expand and include levered loans.

- Re-introduces long-term Treasuries to maintain duration exposure.
- Adds leveraged loans and move to 50%/25%/25% split in risky credit between high yield, loans, and emerging market debt.
- Relative reduction in investment grade due to thin spreads.

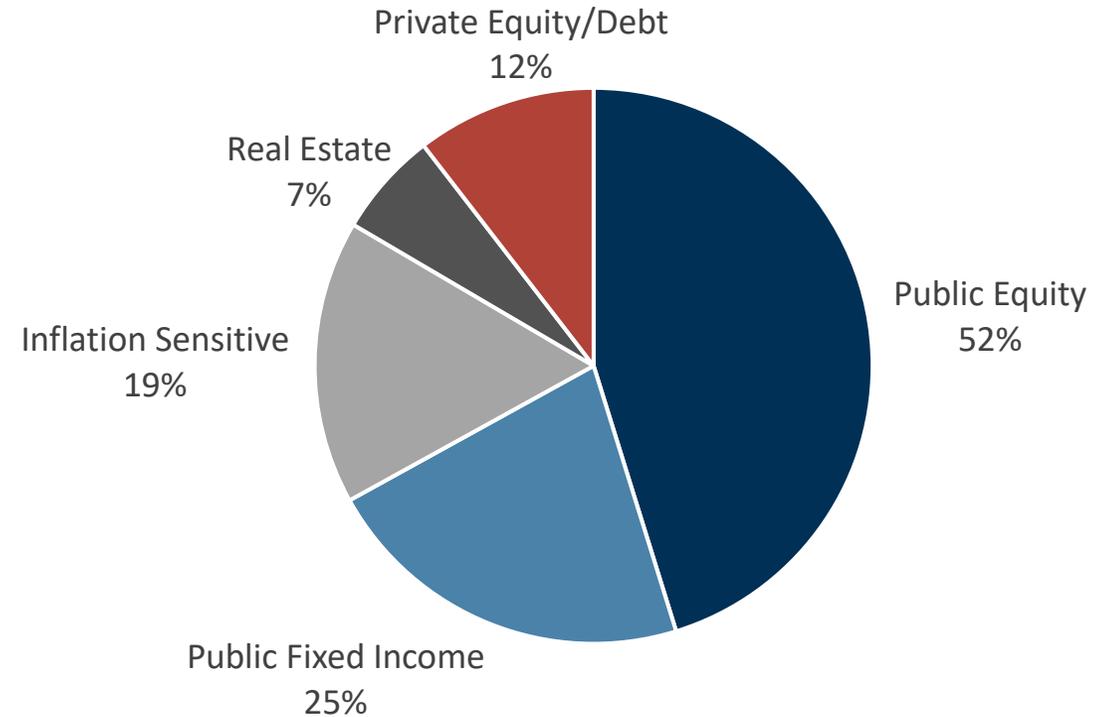


Asset Allocation Targets

2021 Asset Allocation Targets



2022 Asset Allocation Targets



Asset allocation target totals exceed 100% due to SWIB's overall leverage of Core Fund assets.

2022 Asset Allocation Targets

	Former Policy Portfolio	Current Policy Portfolio	Rebalance Ranges
Public Equity	51%	52%	46% - 58%
Public Fixed Income	25%	25%	19% - 31%
Inflation Sensitive Assets	16%	19%	14% - 24%
Private Equity/Debt	11%	12%	9% - 15%
Real Estate	8%	7%	3% - 11%
<u>Multi-Asset</u>	<u>4%</u>		
Total	115%	115%	110%* - 120%
<i>10 Yr Expected Return</i>	5.2%	5.4%	*SWIB Staff allowed to eliminate leverage, i.e., down to 100%
<i>30 Yr Expected Return</i>	6.4%	6.6%	
<i>Standard Deviation</i>	12.5%	13.1%	
<i>Sharpe Ratio 10 Yr</i>	0.316	0.317	
<i>Target Active Risk</i>	1.2%	1.2%	



Combination of All Stress Test Scenarios

2031 Results by %-tile of Investment Return Outcomes

	ROR	StdDev	Contribution Rates			Dividend Rates			Highest	Worst Retiree
			95th	50th	5th	95th	50th	5th	Div. Dep. PRB	Funded %
1	4.0%	6.9%	12.9%	14.9%	16.6%	0.5%	-1.2%	-2.9%	90%/yr50	59%/yr50
2	5.0%	11.3%	10.0%	14.3%	17.0%	2.0%	-0.3%	-3.0%	24%/yr50	76%/yr50
Actuarial Rate → 3	6.0%	15.5%	7.7%	13.6%	17.4%	4.5%	0.7%	-3.2%	10%/yr10	90%/yr10
4	7.0%	20.4%	4.0%	12.9%	17.9%	6.6%	1.6%	-3.5%	13%/yr10	83%/yr10
5	8.0%	26.3%	0.0%	12.2%	18.6%	9.0%	2.4%	-4.1%	16%/yr10	71%/yr10
6	9.0%	33.7%	0.0%	11.7%	19.6%	11.6%	3.2%	-5.2%	21%/yr10	55%/yr10
7	10.0%	44.0%	0.0%	11.4%	21.2%	14.6%	3.7%	-7.1%	28%/yr10	35%/yr10

- Because forward-looking return assumptions are lower than before, more risk is required to hit the same return targets.
- In 2019, Scenario 3 had a standard deviation of 10.7% to hit a 6% return target and Scenario 4 had a standard deviation of 14.7% to hit a 7% return target.



Market Update



Global Equities - Performance

Equity markets have pulled back with inflation concerns and a crisis in Ukraine

03/04/2022

Local Equity Performance



Global Equities - Valuation

U.S. P/E ratios have declined less than ex U.S.



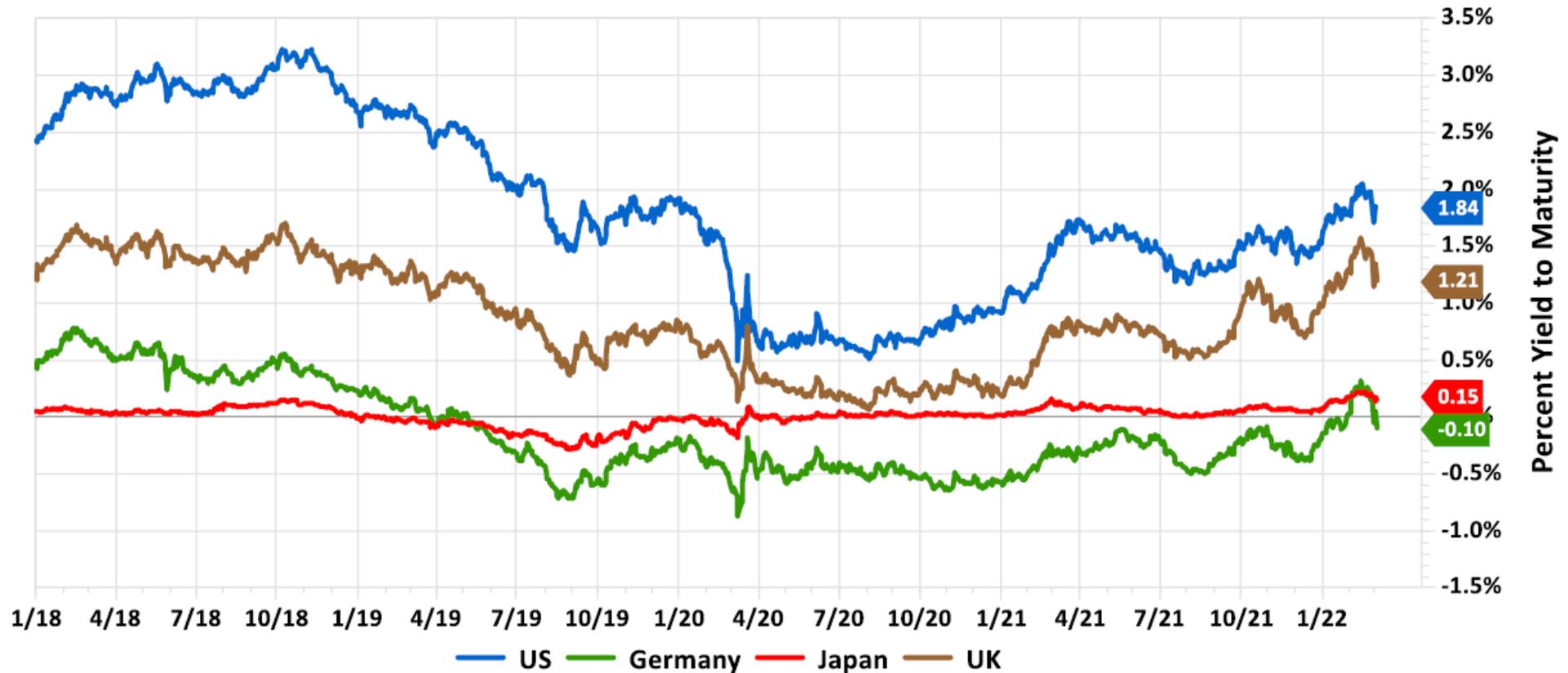
Data source: FactSet Market Aggregates – Next Twelve-Month P/E Ratio, monthly, 20-year Average with 1 Std. Dev. Bands

Global Bonds

Yields have retreated in recent weeks with a flight to safety following crisis in Ukraine

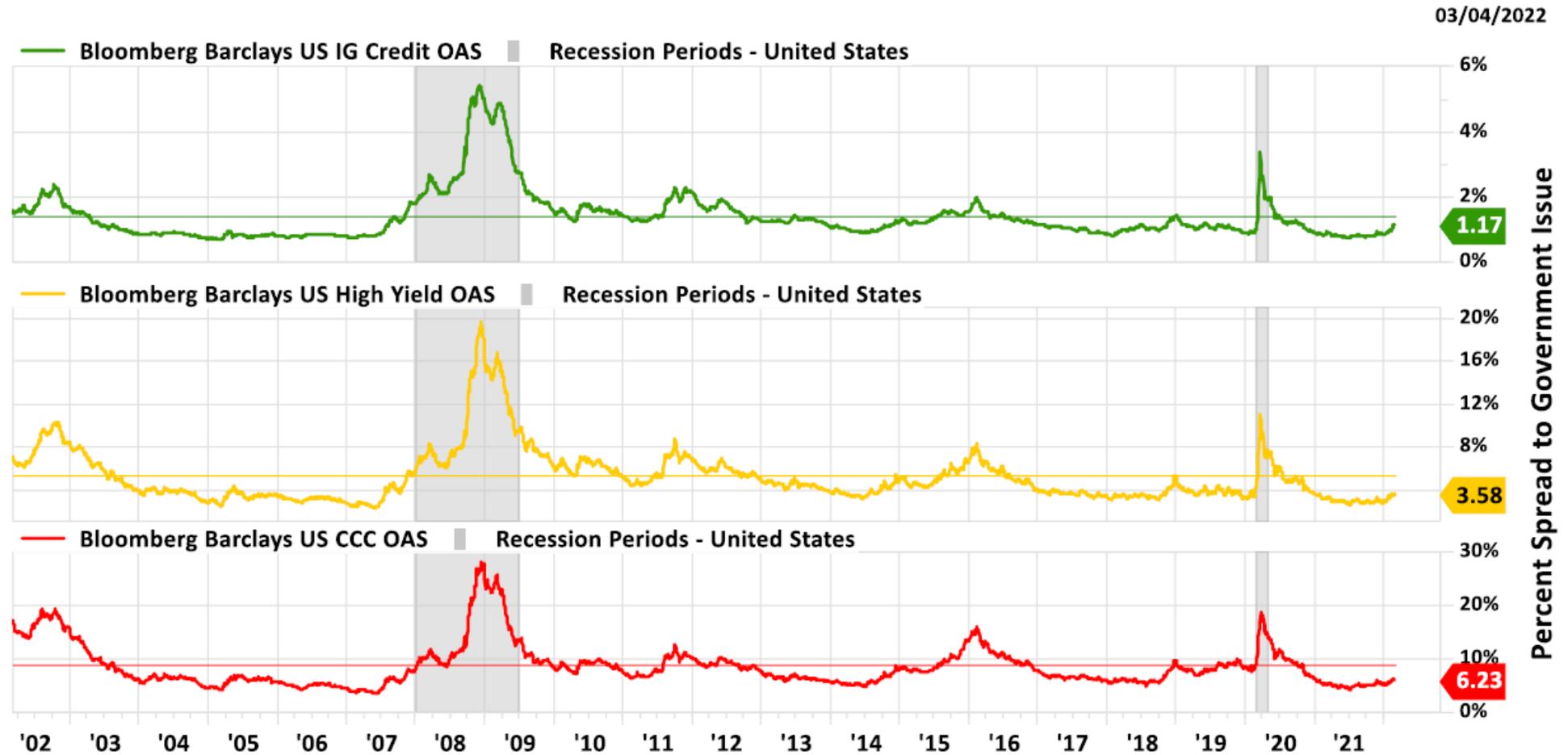
03/04/2022

10-Year Government Bond Yields



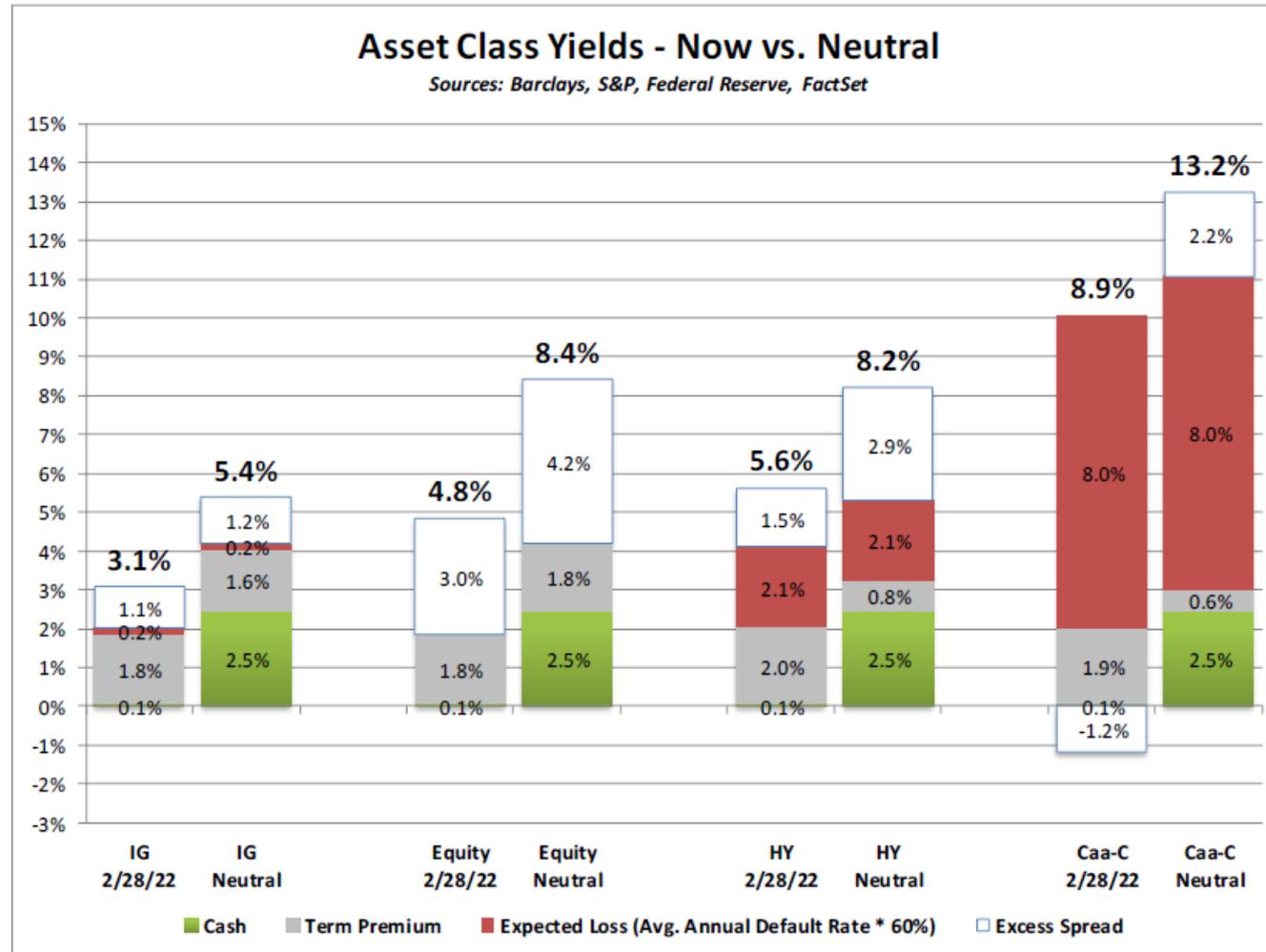
Credit Sectors

Spreads are higher recently, but below long run averages.



Asset Yields

Zero cash rates and compressed risk premia reduce expected returns.



U.S. Inflation

Medium term expectations are higher as Ukraine crisis unfolds.

As of: 03/04/2022

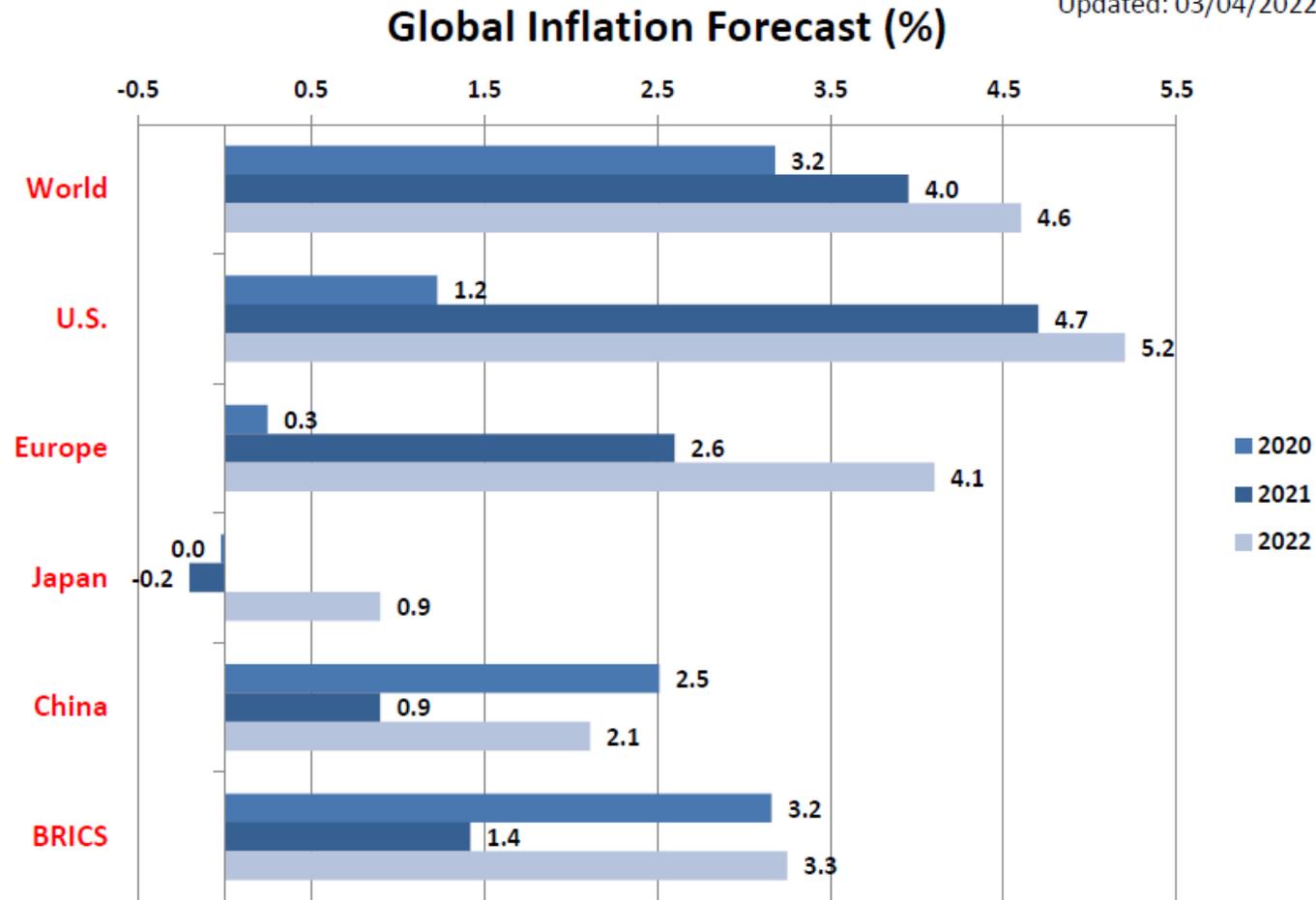
US 5 Year Breakeven Inflation



Global Inflation

Inflation expected to accelerate globally in 2022.

Updated: 03/04/2022



Data source: Bloomberg Consensus



SWIB News



Board of Trustees Update



Clyde Tinnen



Kathy Blumenfeld



Esther Ancel



Barbara Nick

- Gov. Evers appointed Clyde Tinnen to the Board for a six-year term.
- Kathy Blumenfeld will serve on the Board as part of new role as secretary of the Department of Administration.
- Esther Ancel and Barbara Nick were reappointed to six-year terms.



New SWIB Podcast Episodes



www.swib.state.wi.us/podcasts

Check out the two newest episodes:

- Episode 14 – Hear SWIB Executive Director/CIO Edwin Denson reflect on 2021 and look ahead at 2022.
- Episode 15 – Dan Doonan, executive director of the National Institute on Retirement Security, talks “Pensionomics” and how the WRS is a strong economic pillar for Wisconsin.



Need More Information?



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www.linkedin.com/company/the-state-of-wisconsin-investment-board



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? Questions

