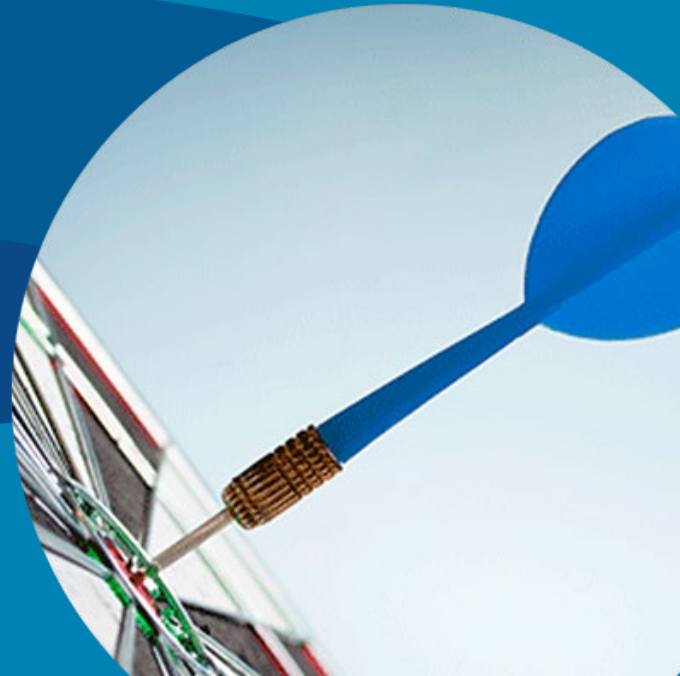




# Wisconsin Retirement System

42<sup>nd</sup> Annual Actuarial Valuation of  
Retired Lives  
December 31, 2024



# Operation of the System (Simplified Description)

	Core Annuities	Variable Annuities
Investment Return Hurdle to Trigger Annuity Adjustment	Returns over/under 5%	Returns over/under 5%
Ratio of Assets to Liabilities	If > 0.5%, dividend may be granted If <-0.5%, prior dividends reduced	If > 2%, variable annuity increased If <-2%, variable annuity decreased
Increase/Decrease Rounding Conventions	Rounded to nearest 0.1%	Truncated, carried to next year
Adjustment Effective Date	April following 12/31 valuation	April following 12/31 valuation

# Smoothing Mechanisms

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## Core

- Undesirable for retirees to experience wide swings in monthly benefits from year to year (especially downward swings)
- Mitigated in Core division by asset smoothing process and portfolio mix
- Asset smoothing has worked well historically, but could not prevent negative dividends in 2009-2013

# Smoothing Mechanisms

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## Variable

- Variable fund is marked to market each year and subject to wide swings
- Dropping fractions of a percent from the adjustment is a form of smoothing
- Usually has very little effect due to the magnitude of the gains and losses

# Summary of Results – December 31, 2024

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**\$ Millions**

	<b>Core</b>	<b>Variable</b>
Number of Annuitants	242,226	43,853
Annual Amount of Annuities Paid	\$ 6,986.1	\$ 521.1
Fund Balance	77,893.5	5,770.5
Actuarial Reserve	76,167.9	4,989.5
<b>Ratio</b>	<b>1.023</b>	<b>1.157</b>

Core effective earnings rate = 7.5%, dividend adjustment = 2.3%.

Variable effective earnings rate = 20.0%, and the variable adjustment = 15.0%.

(Report- Cover Letter & Pages 6 and 16)



# Summary of Results – Annuity Adjustments

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- \* 2.3% Core Dividend < 2.9% CPI Increase
- \* 15.0% Variable Adjustment follows 15%/-21% Adjustments in previous two years

- Positive core dividend despite volatile investment markets
  - Provides inflationary protection
  - This is a byproduct of the dividend process and not a primary objective
- Positive variable adjustment
  - Previous four of five years had double digit positive variable adjustments

# Summary of Results – Core Assets

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Due to smoothing via Market Recognition Account, as of December 31, 2024 there are approximately \$3.4 billion in unrecognized losses in the Core fund

- Last year was \$4.7 billion in unrecognized losses
- Will be recognized over the next four years
- Roughly ½ of loss applies to the annuitant reserve, the other half shared by active members and employers
- May decrease probability of future positive annuity adjustments

# Operation of Market Recognition Account (MRA)

– \$ Millions **2023 Valuation 11.40% Core Return**

	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>
Actual Investment Earnings	\$ 12,721				
Assumed Investment Earnings	8,082				
Gain/(Loss) to be phased-in	4,639				
Phased-in recognition					
• Current year	\$ 928	?	?	?	?
• First prior year	(5,068)	\$ 928	?	?	?
• Second prior year	2,495	(5,068)	\$ 928	?	?
• Third prior year	1,773	2,495	(5,068)	\$ 928	?
• Fourth prior year	<u>2,204</u>	<u>1,773</u>	<u>2,495</u>	<u>(5,068)</u>	<u>\$ 928</u>
Total recognized gain (loss)	\$ 2,332	\$ 128	\$ (1,645)	\$ (4,140)	\$ 928

**2024-2027: Expect \$4.7 billion in deferred asset Losses**  
**-- Shared by annuitants, actives and employers**



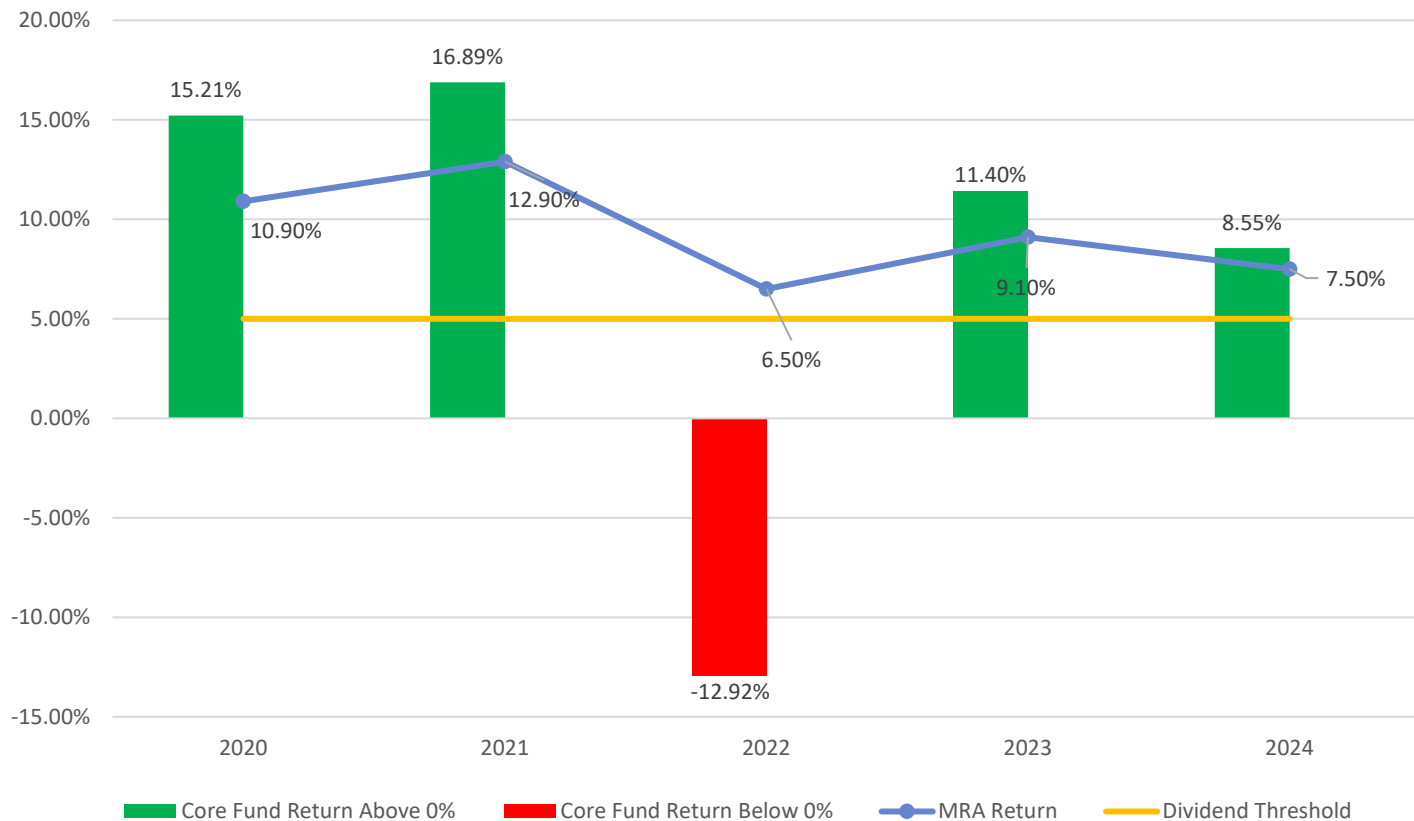
# Operation of Market Recognition Account (MRA)

– \$ Millions **2024 Valuation 8.55% Core Return**

	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>
Actual Investment Earnings	\$ 10,311				
Assumed Investment Earnings	8,477				
Gain/(Loss) to be phased-in	1,834				
Phased-in recognition					
• Current year	\$ 367	?	?	?	?
• First prior year	928	\$ 367	?	?	?
• Second prior year	(5,068)	928	\$ 367	?	?
• Third prior year	2,495	(5,068)	928	\$ 367	?
• Fourth prior year	<u>1,773</u>	<u>2,495</u>	<u>(5,068)</u>	<u>928</u>	<u>\$ 367</u>
Total recognized gain (loss)	\$ 495	\$ (1,278)	\$ (3,773)	\$ 1,295	\$ 367

**2025-2028: Expect \$3.4 billion in deferred asset Losses**  
**-- Shared by annuitants, actives and employers**

# Core Fund Returns – Market Value vs. Market Recognition Account



# Asset Rate of Return Calculation

$$\text{Rate of Return} = \text{Investment Earnings} / \text{Asset Value}$$

- Rate of Return will vary based on calculation inputs:
  - Asset value could be smoothed or unsmoothed
  - Asset value could be beginning, middle or end of year
  - Timing of Contributions and Benefit Payments will vary
- Result is different Rate of Return calculated by:
  - SWIB (investment manager)
  - ETF (calculations governed by statute)
  - GRS (actuaries)

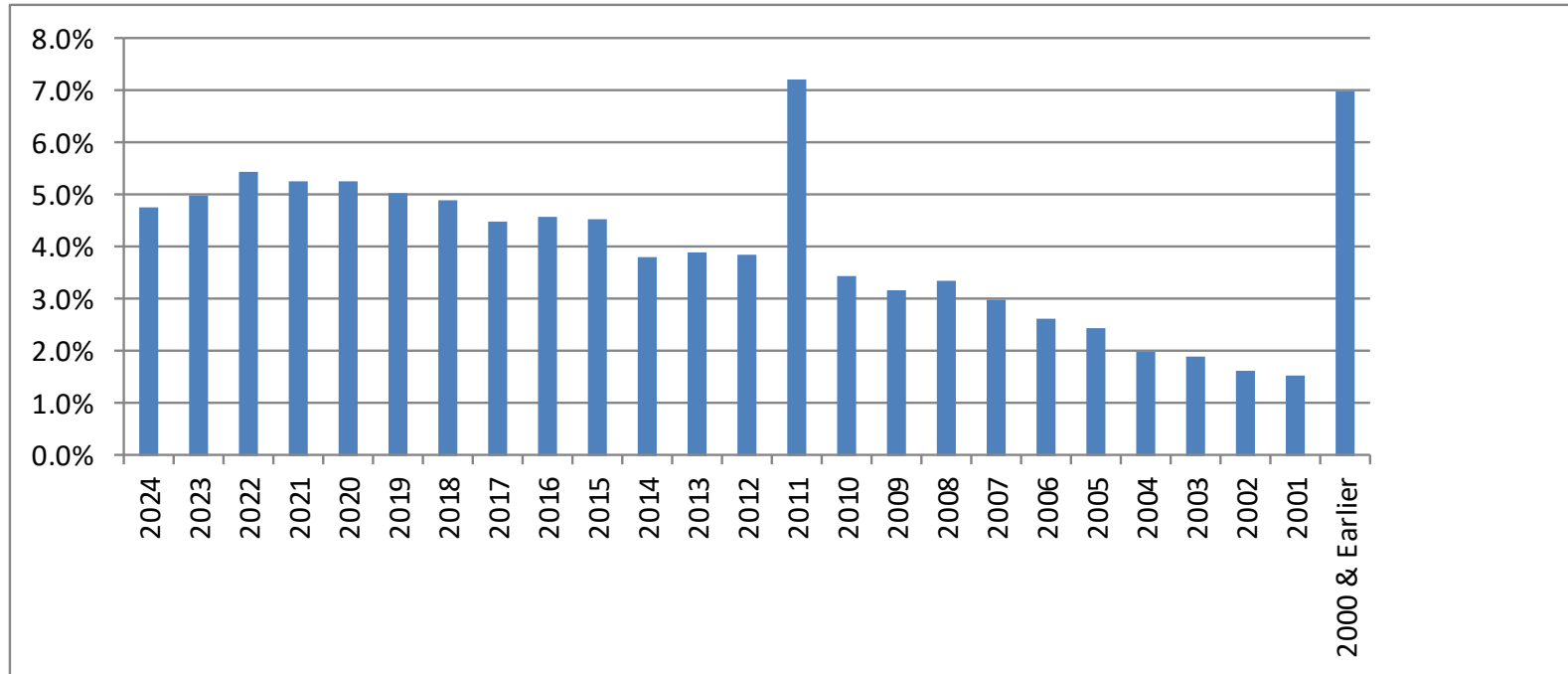
# Primary Sources of Core Dividend

	<u>% of APV<sup>(1)</sup></u>
1. SWIB net of fee investment return	8.55%
2. MRA adjustment	<u>(1.05)%</u>
3. Published effective earnings rate	7.50%
4. Adjustment to relate earnings to average core annuity fund balance	<u>(0.35)%</u>
5. Earnings rate based on average balance	7.15%
6. Expected dividend before adjustments: 1.0715/1.05-1	2.05%
7. Adjustment to relate average asset to ending liability	0.05%
8. Carryover from last year due to timing of dividend, accounting adjustments and rounding	0.16%
9. Experience study adjustment	0.00%
10. Experience and other effects	0.01%
11. Statutory adjustment to round to nearest one-tenth percent	<u>0.03%</u>
12. <b>Computed average dividend rate: (6)+(7)+(8)+(9)+(10)+(11)</b>	<b>2.3%</b>
13. Adjustment for members at or near the statutory floor	0.0%
14. <b>Final computed dividend rate: (12)+(13), if greater than 0.5% (or less than -0.5%) of core annuities, otherwise 0%</b>	<b>2.3%</b>

<sup>(1)</sup> Actuarial Present Value

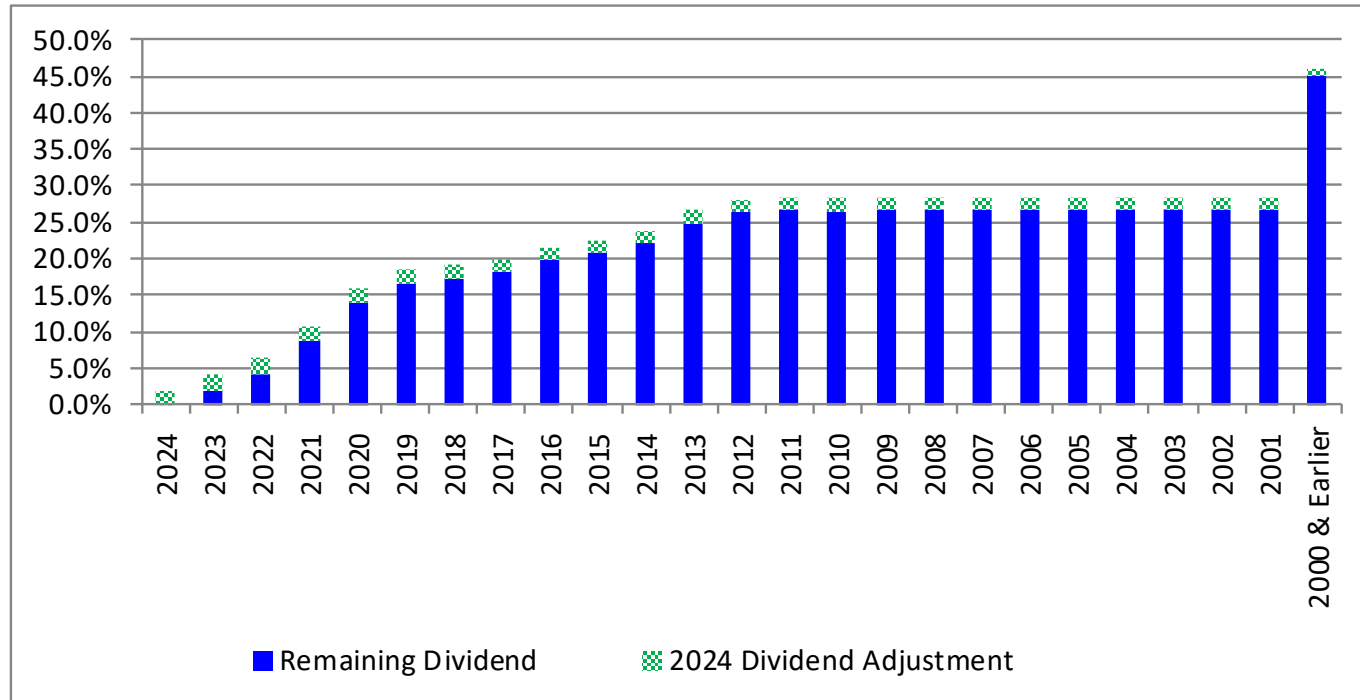


# Liabilities (as a Percentage of Total) by Year of Retirement



(Report-7)

# Dividend Remaining (as a Percentage of Total Benefit) by Year of Retirement



(Report-7)

# Liability Attributable to Dividends – “Dividend Liability”

Valuation	Liability for Dividend Remaining (billions)	Liability for Dividend Adjustment (billions)	Liability after Dividend Adjustment (billions)
12/31/2015	\$5.5	\$0.2	\$5.7
12/31/2016	5.4	1.0	6.4
12/31/2017	6.1	1.3	7.4
12/31/2018	6.9	0.0	6.9
12/31/2019	6.5	1.0	7.5
12/31/2020	7.0	3.1	10.1
12/31/2021	9.4	4.8	14.2
12/31/2022	13.4	1.1	14.5
12/31/2023	13.7	2.7	16.4
12/31/2024	15.4	1.8	17.2

- “Liability for dividend remaining” = value of all previously granted dividends
  - (\$9.2 Billion at 12/31/2008 decreasing to \$3.0 Billion at 12/31/2013)
- 2025 “liability for dividend remaining” is >2008, BUT as a percentage of total liabilities, it is smaller
- Substantial asset losses could decrease the “liability for dividend remaining” to low levels

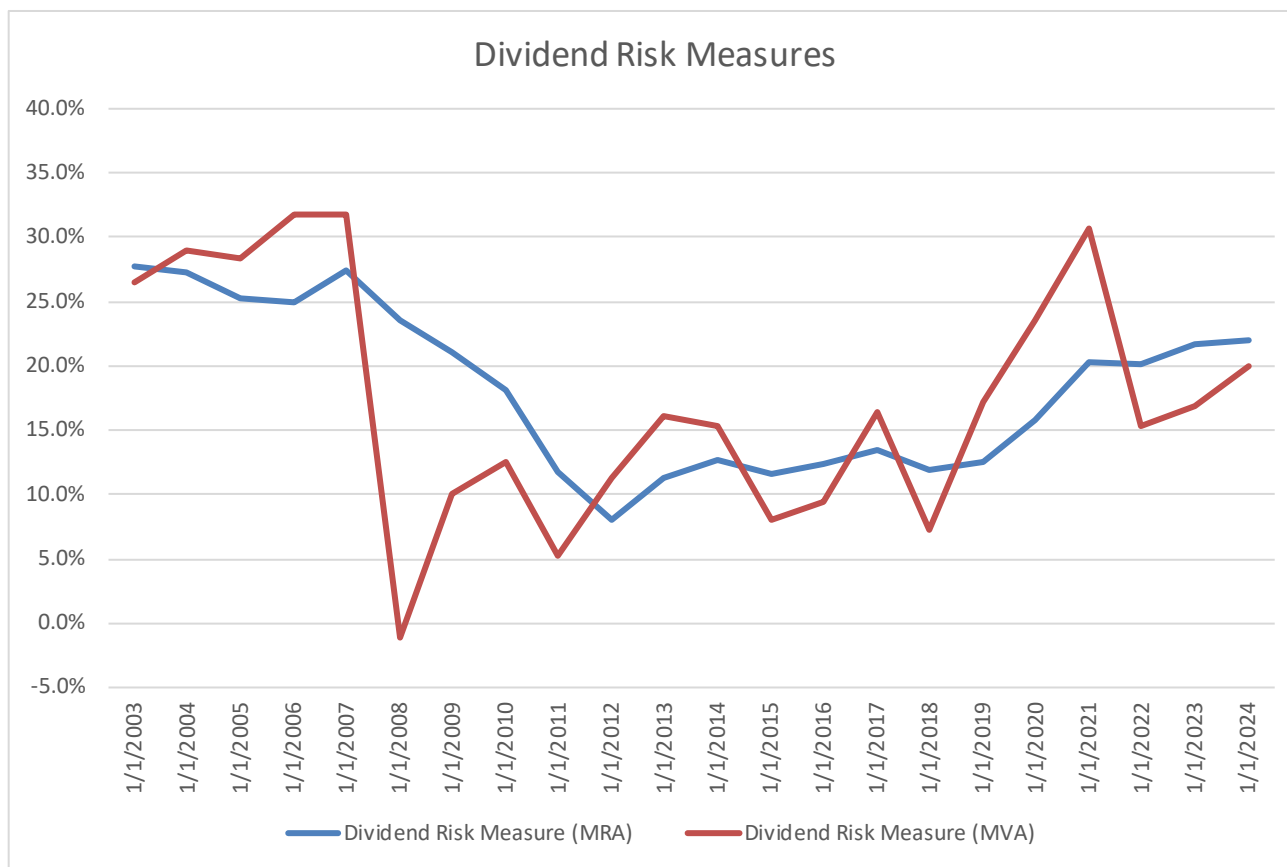
# Dividend Risk Measure (MRA)

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- Dividend Liability (after Dividend adjustment in April) / Total Core Retiree Assets
- Example (2024)
  - Dividend Liability = \$17.2 billion
  - Total Retiree Assets (Core) = \$77.9 billion
  - Dividend Risk Measure =  $17.2/77.9 = 22.0\%$
- In other words, Retiree Assets (after MRA smoothing) would need to decrease by 22.0% to deplete the existing Dividend Liability by year end
- Dividend Risk Measure was 21.6% last year



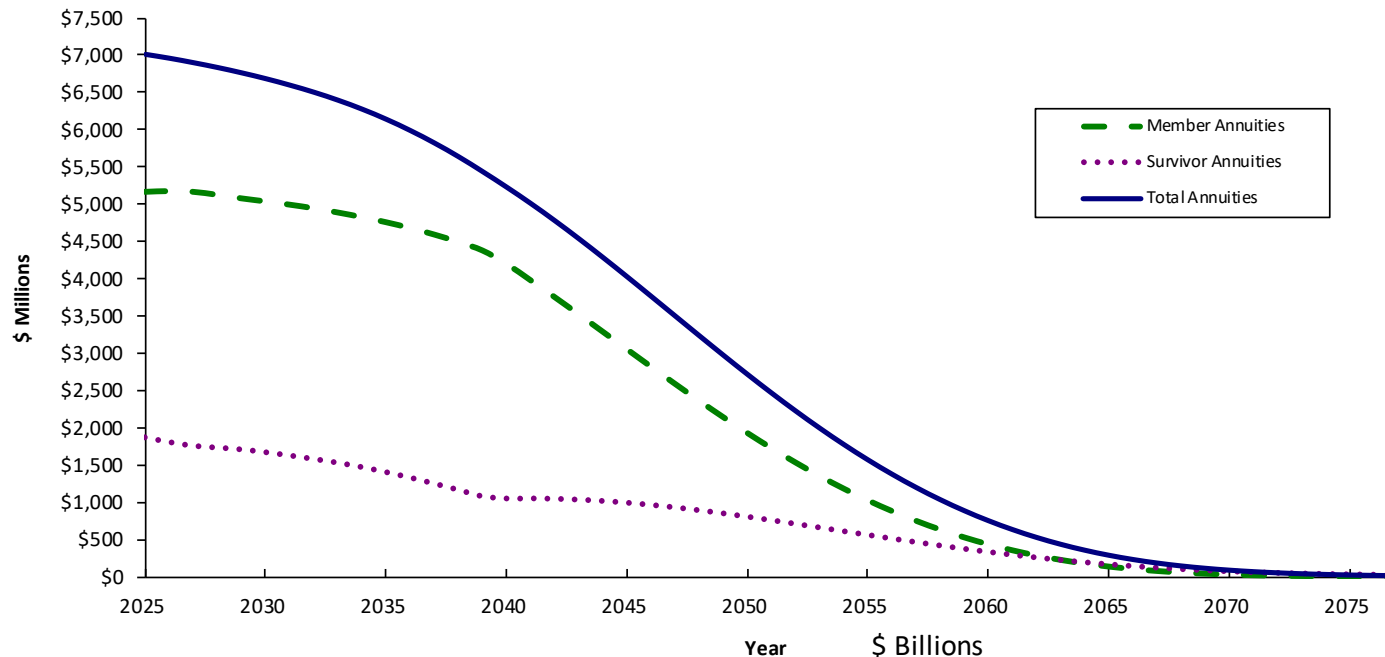
# Dividend Risk Measures History\*



\*Higher values are desirable.

(Report-32)

# Projected Future Core Annuities



	With Expected Dividends	Without Expected Dividends
Total Future Benefit Payments	\$158.9	\$126.6
Present Assets	77.9	77.9
Future Investment Return Needed	81.0	48.7

Based upon the assumptions used in the valuation, future dividends are expected to be approximately 1.7% per year. Of course actual dividends will be based upon actual future

(Report-13) investment return and the operation of the Market Recognition Account.



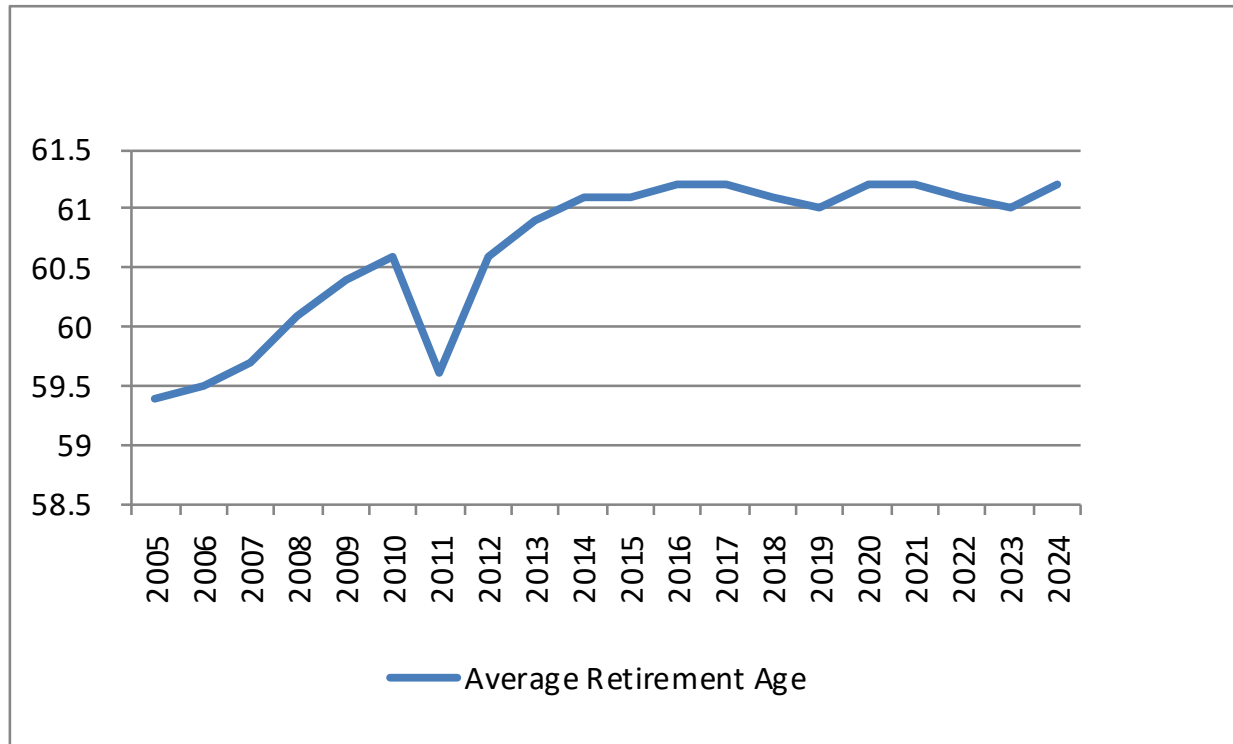
# Primary Sources of Variable Adjustment

	<u>% of APV<sup>(1)</sup></u>
1. SWIB net of fee investment return	18.7%
2. Adjustment to published effective rate	<u>1.3%</u>
3. Published effective earnings rate	20.0%
4. Adjustment to relate earnings to average variable annuity fund balance	<u>(0.4)%</u>
5. Earnings rate based on average balance	19.6%
6. Expected change before adjustments: $1.196/1.05-1$	13.9%
7. Adjustment to relate average asset to ending liability	0.5%
8. Carryover from last year due to timing of distribution, accounting adjustments and truncation	0.9%
9. Experience study adjustment	0.0%
10. Experience and other effects	0.4%
11. Statutory adjustment: (truncate to whole percent)	<u>(0.7)%</u>
<b>12. Variable annuity change: (6)+(7)+(8)+(9)+(10)+(11)</b>	<b>15.0%</b>

<sup>(1)</sup> Actuarial Present Value

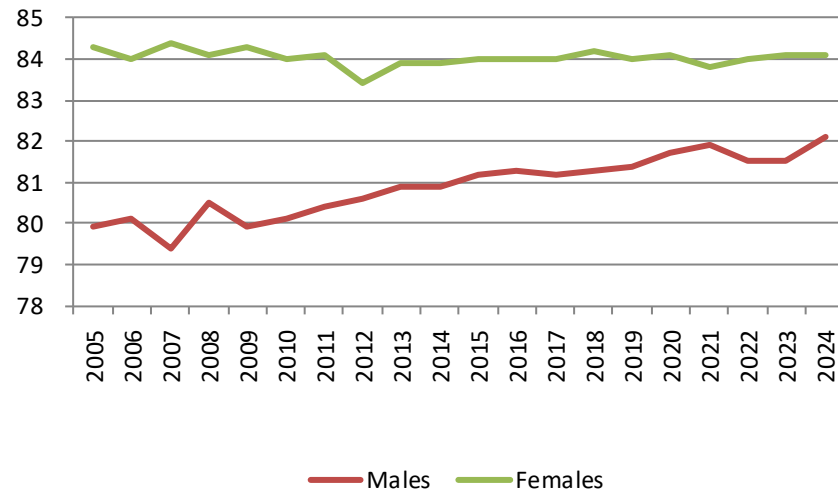
# Average Retirement Age

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# Average Age at Death

Average age at death, while an interesting statistic, is not a proper measure of life expectancy, because it does not include people who have not yet died. The expected age at death for a healthy 65-year-old retiree is 87.0 for males and 89.0 for females.



# Comparative Statement – Core

Valuation Date	Number	\$ Millions			Ratio	Change in		
		Annual	Fund	Actuarial		Annuities		CPI*
		Annuities	Balance	Reserve		Average	Maximum	
2015	191,795	\$ 4,364.9	\$ 49,147.0	\$ 48,897.5	1.005	0.5 %		0.7 %
2016	197,647	4,523.1	51,972.0	50,941.4	1.020	2.0 %		2.1 %
2017	203,202	4,747.0	54,900.0	53,590.0	1.024	2.4 %		2.1 %
2018	211,126	5,040.9	56,493.8	56,629.3	0.998	0.0 %		1.9 %
2019	216,944	5,183.7	59,138.4	58,157.0	1.017	1.7 %		2.3 %
2020	222,723	5,423.2	63,805.8	60,691.1	1.051	5.1 %		1.4 %
2021	228,161	5,842.6	69,910.7	65,085.4	1.074	7.4 %		7.0 %
2022	233,804	6,409.7	72,108.4	70,987.2	1.016	1.6%		6.5 %
2023	238,111	6,639.1	75,583.6	72,951.6	1.036	3.6%		3.4 %
2024	242,226	6,986.1	77,893.5	76,167.9	1.023	2.3%		2.9 %
<b>35-Year Average</b>						<b>3.2 %</b>		<b>2.7 %</b>
<b>20-Year Average</b>						<b>1.6 %</b>		<b>2.6 %</b>
<b>10-Year Average</b>						<b>2.6 %</b>		<b>3.0 %</b>
<b>5-Year Average</b>						<b>4.0 %</b>		<b>4.2 %</b>

*\*Based on December CPI-U67 index.*

(Report-21)

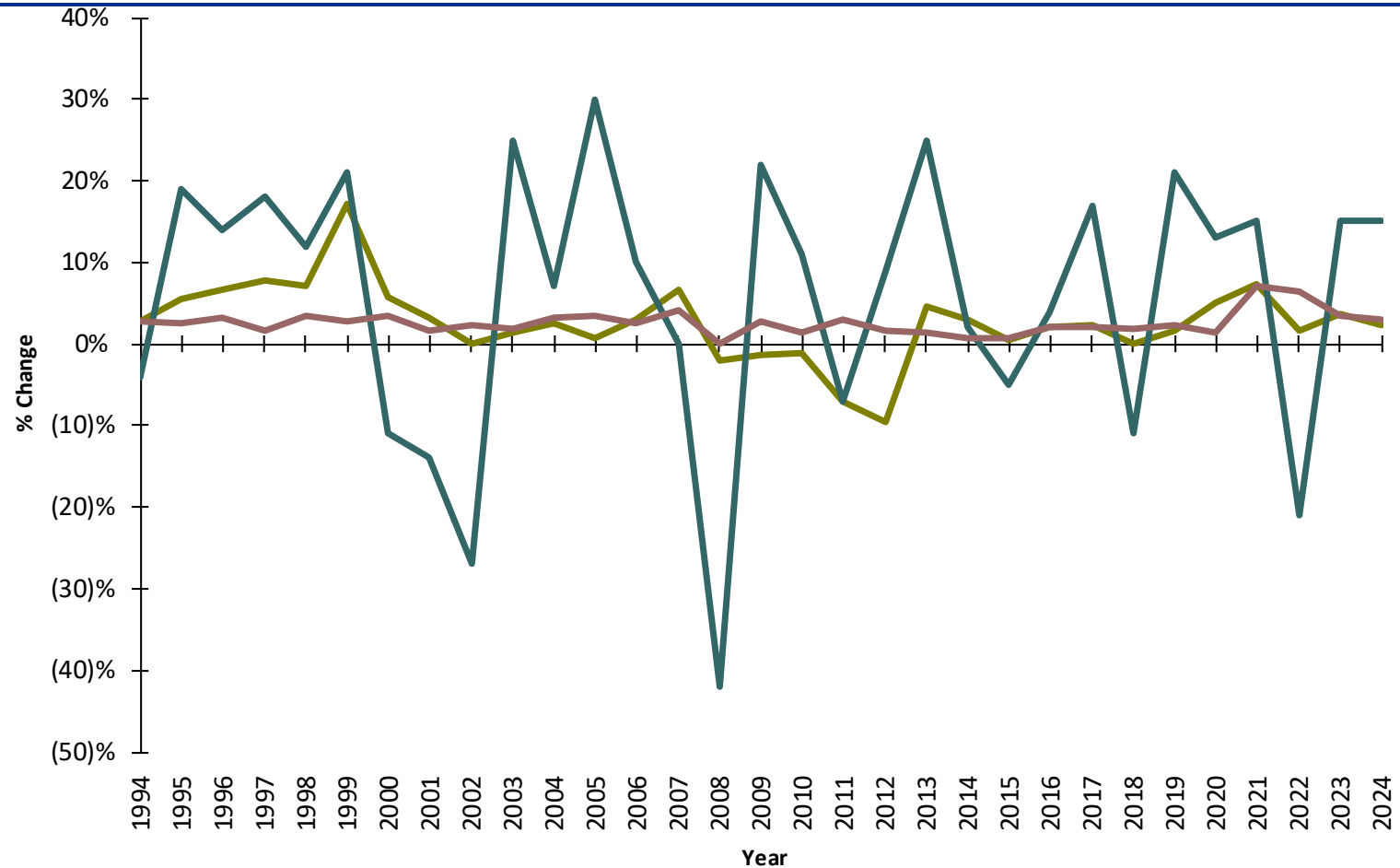
# Comparative Statement – Variable

Valuation Date	Number	\$ Millions			Ratio	Change in	
		Annual Annuities	Fund Balance	Actuarial Reserve		Annuities	CPI*
2015	40,152	\$ 387.8	\$ 3,704.8	\$ 3,910.1	0.947	(5.0)%	0.7 %
2016	40,647	363.6	3,792.0	3,645.1	1.040	4.0 %	2.1 %
2017	40,877	369.9	4,324.9	3,682.1	1.175	17.0 %	2.1 %
2018	41,187	425.8	3,738.6	4,207.6	0.891	(10.0)%	1.9 %
2019	41,777	379.7	4,519.4	3,728.6	1.212	21.0 %	2.3 %
2020	41,753	449.7	4,954.0	4,383.0	1.130	13.0 %	1.4 %
2021	42,251	502.6	5,618.0	4,866.0	1.155	15.0 %	7.0 %
2022	43,007	578.5	4,403.0	5,586.5	0.788	(21.0)%	6.5 %
2023	43,560	457.8	5,089.2	4,404.8	1.155	15.0 %	3.4 %
2024	43,853	521.1	5,770.5	4,989.5	1.157	15.0 %	2.9 %
<b>35-Year Average</b>						<b>3.7 %</b>	<b>2.7 %</b>
<b>20-Year Average</b>						<b>3.4 %</b>	<b>2.6 %</b>
<b>10-Year Average</b>						<b>5.5 %</b>	<b>3.0 %</b>
<b>5-Year Average</b>						<b>6.3 %</b>	<b>4.2 %</b>

*\*Based on December CPI-U67 index.*

(Report-22)

# History of % Dividend Adjustments



(Report-23)





# Looking Ahead

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- As of the December 31, 2024 valuation, there are roughly \$3.4 billion in unrecognized asset losses in the Core fund
  - About half of this will be applied to annuitant reserve
  - Will be recognized over the next four years
  - May decrease probability of future positive annuity adjustments
- We will continue monitoring various plan risks, including dividend liability risk

# CURRENT EVENTS

# Mortality Assumptions in the News

- Society of Actuaries released a new mortality table in January 2025!
- “Pub-2016 Public Retirement Plans Mortality Tables Exposure Draft”
  - A comprehensive review of recent mortality experience of public retirement plans in the United States



First mortality update since the publication of Pub-2010

# Mortality Assumptions in the News

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- Study based on 58 million life-years of exposure and 774 thousand deaths from public pension systems across the United States
- Data received from a total of 41 different public pension systems
  - Representing 100 plans and 3 job categories
    - Teachers, Public Safety personnel, or General employees

# Mortality Assumptions in the News

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- Mortality experience collected from calendar years 2013–2020
  - To avoid using experience affected by the COVID-19 pandemic, data contributed for calendar year 2020 was excluded from the study

# Mortality Assumptions in the News

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- Study results show
  - The amount-weighted deferred annuity values for all groups are less than those produced by the Pub-2010 tables, with the exception of
    - Male Safety members, which increased by 1.0% - 1.3%
- For WRS
  - This new mortality table will be investigated during the 2024-2026 Experience Study
  - WRS specific data will drive the final table

# Questions

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## Disclaimers

- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- This presentation is intended to be used in conjunction with the actuarial valuation report for retired lives issued on February 24, 2025. This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- Readers are cautioned to examine original source materials and to consult with subject matter experts before making decisions related to the subject matter of this presentation.
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