Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

Montana Teachers' Retirement System

Valuation Results
July 1, 2023

Presented October 6, 2023

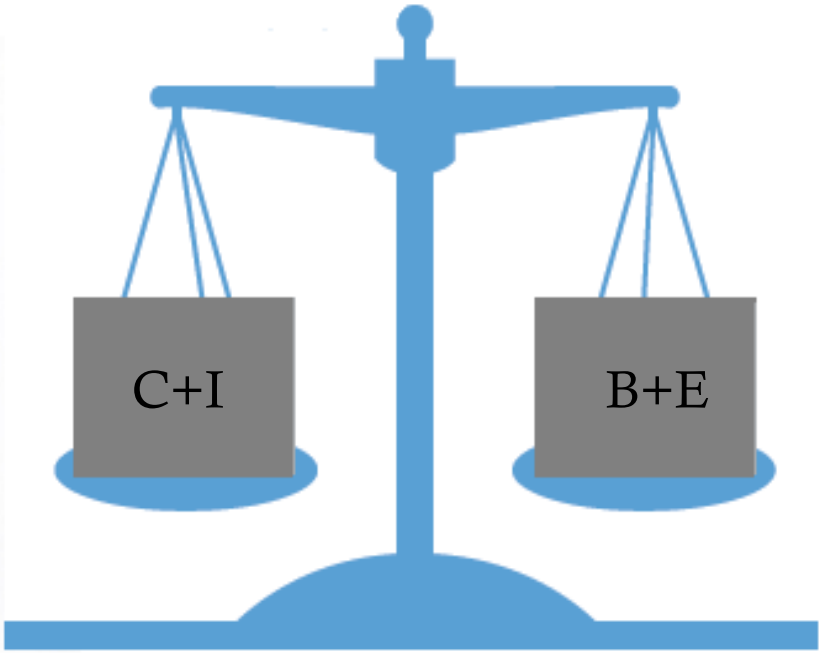
Why does my Plan need an Actuary?

Develop	• Develop a strategy to systematically fund the promised benefits of the system
Measure	• Measure assets and liabilities (future benefit payments)
Determine	• Determine actuarial contribution rates
Analyze	• Analyze experience (actual vs. expected)
Report	• Report on trends, risks, accounting, etc.

Basic Retirement Funding Formula

C + I = B + E

C = Contributions
I = Investment Income
B = Benefits Paid
E = Expenses



"Money In = Money Out"

Benefit Financing

$$C + I = B + E$$

B depends on

- Plan Provisions
- Experience

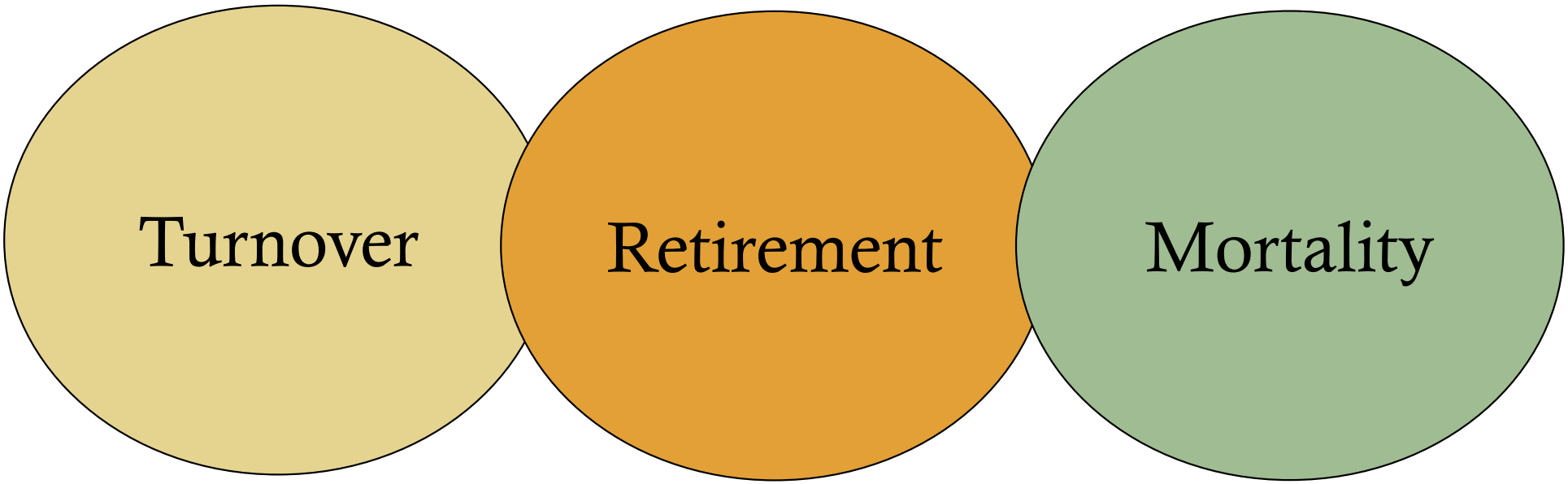
C depends on

- Short Term: Actuarial Assumptions
  Actuarial Cost Method
- Long Term: I, B, E

Actuarial Valuation

- For a defined benefit pension plan, the ultimate value of future cash flows cannot be predicted with certainty
  - To estimate the probability and the likely cost of a future event such as disability, retirement, or death, **actuaries need to make assumptions**

Actuarial Assumptions



Will an employee work long enough to vest and qualify for monthly benefits?

When will the employee retire and start collecting benefits?

How long will monthly benefits be paid?

Actuarial Assumptions

Salary Increases

How will salaries grow in future years for each employee?

Discount Rate

What is the present value of all of those future benefits in terms of today's dollars?

If we put money aside today, what rate of return can we expect to earn on it?

General Cost Impact of Assumption Changes

- General cost impact of each change **in isolation**

Assumption	Change in Assumption	Typical Effect On Liabilities/Costs
Turnover	Increase	Decrease
Retirement	Retire Later	Decrease
Mortality	Decrease (longer life expectancy)	Increase
Disability	Lower Disability	Decrease
Salary Increase	Increase (higher pay)	Increase
Discount Rate	Lower Return	Increase

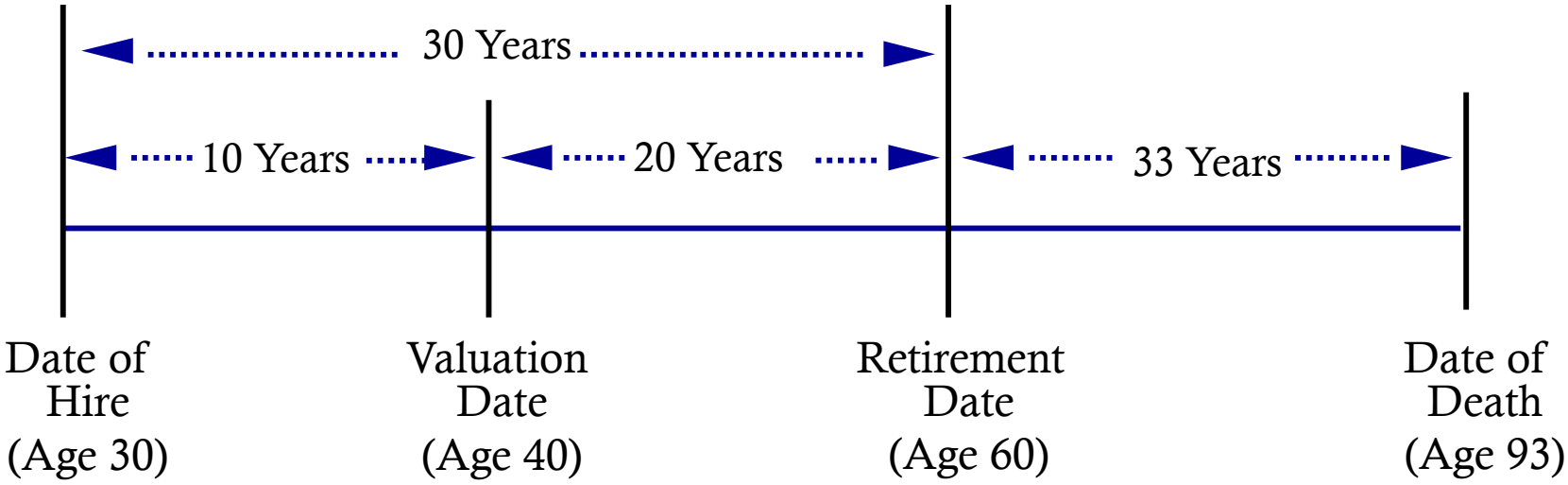
Actuarial Valuation

KNOWN at valuation date:

1. age
2. salary
3. gender
4. service to date
5. membership group

ASSUMED at valuation date:

1. future salary increases
2. retirement date(s)
3. death rates before and after
4. disability rates
5. other termination rates



Results

Changes Since Prior Valuation

- New ASOP 4 Disclosures have been added to the report
  - Low-Default-Risk Obligation Measure (LDROM) Disclosure
  - Reasonable Actuarially Determined Contribution
  - Contribution Allocation Procedure
- No impact on the results of the valuation

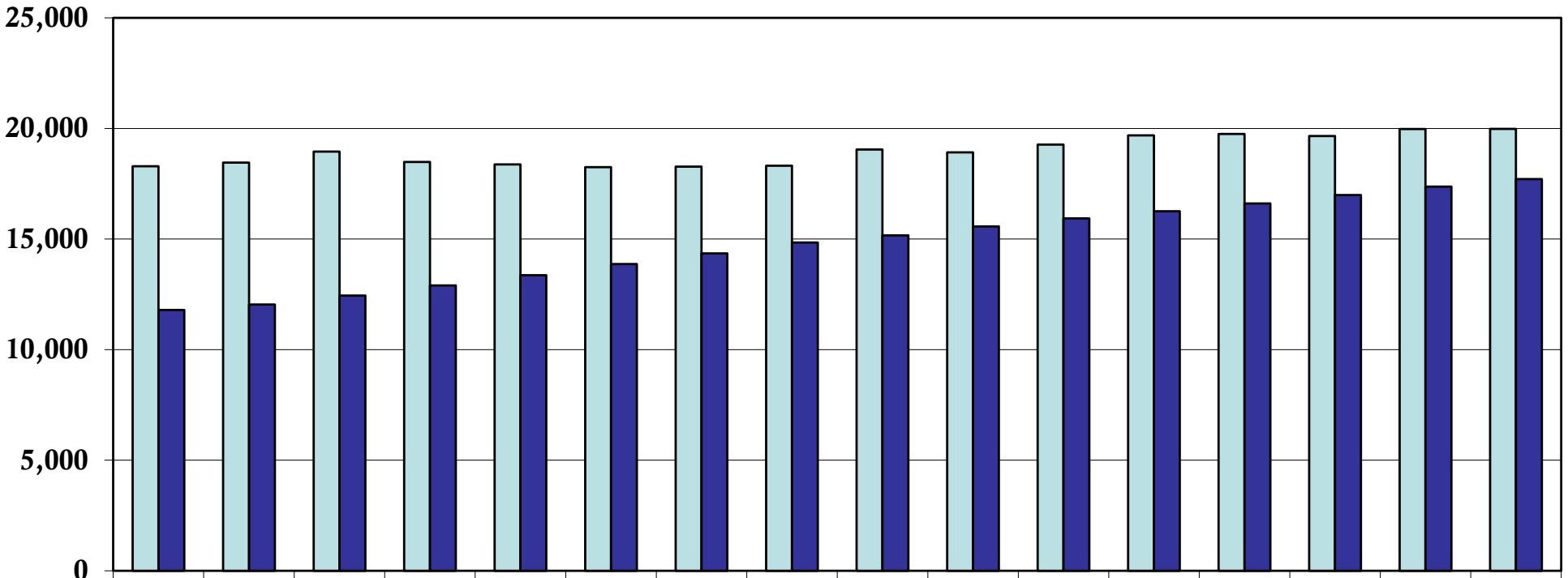
Comments on Valuation

- Asset returns
  - Market asset return (Net of Investment and Administrative Expenses) 8.30% vs. 7.30% expected (1.00% more than expected).
  - Actuarial asset return (Net of Investment and Administrative Expenses) 7.66% vs. 7.30% expected (0.36% more than expected).
- Market value of assets are $51,061,539 less than the actuarial value of assets. Unrecognized investment gains/losses will be recognized over the next three years
  - 2024 Investment Gain of $71.8 million
  - 2025 Investment Loss of $134.5 million
  - 2026 Investment Gain of $11.6 million

Comments on Valuation

- Funded Ratio
  - Funding increased from 71.73% to 72.49%
- Amortization Period
  - Amortization period decreased from 25 years to 24 years

Active and Retired Membership



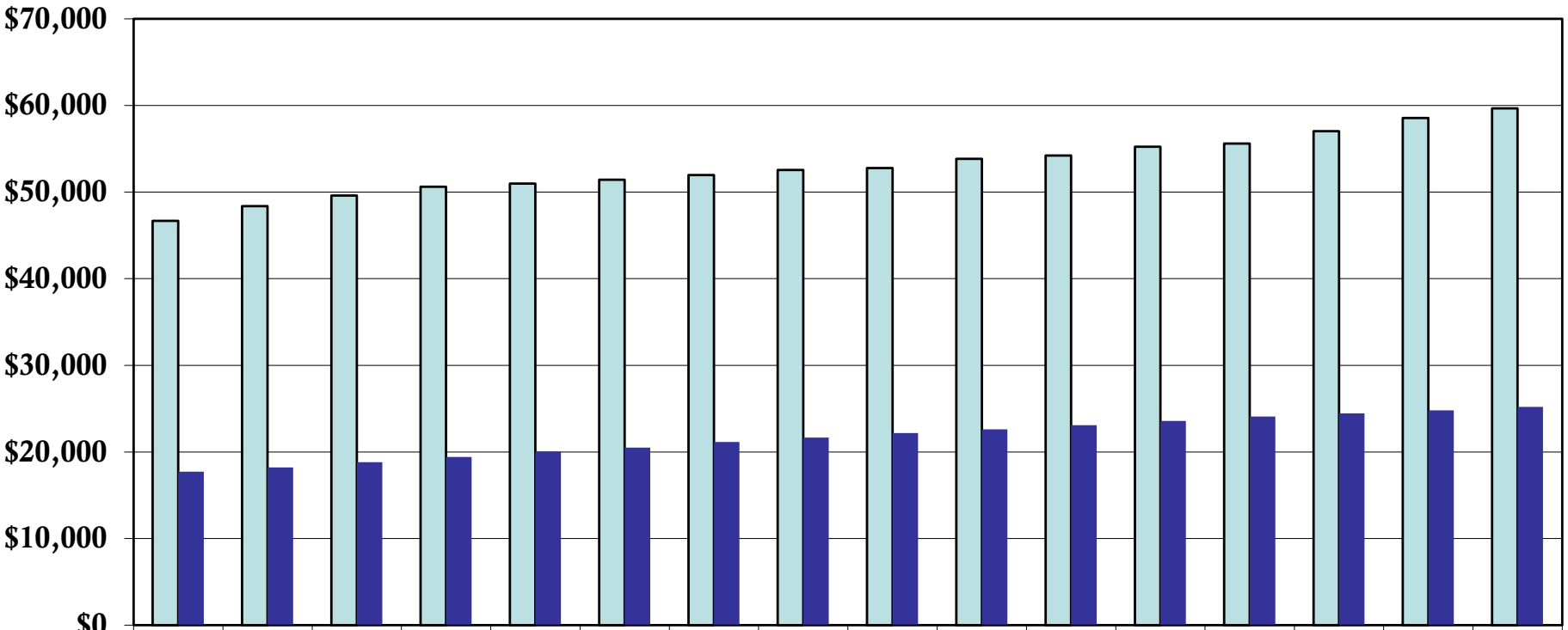
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actives	18,292	18,456	18,953	18,484	18,372	18,249	18,272	18,316	19,048	18,917	19,267	19,686	19,751	19,658	19,975	19,978
Retirees	11,788	12,036	12,440	12,899	13,363	13,868	14,349	14,839	15,164	15,566	15,933	16,256	16,605	16,985	17,369	17,707

0.6% annual increase for active members since 2008; 0.0% increase for 2023.

2.7% annual increase for retired members since 2008; 1.9% increase for 2023.

1.6 actives per retiree 15 years ago; 1.1 actives per retiree now.

Average Salary and Benefits

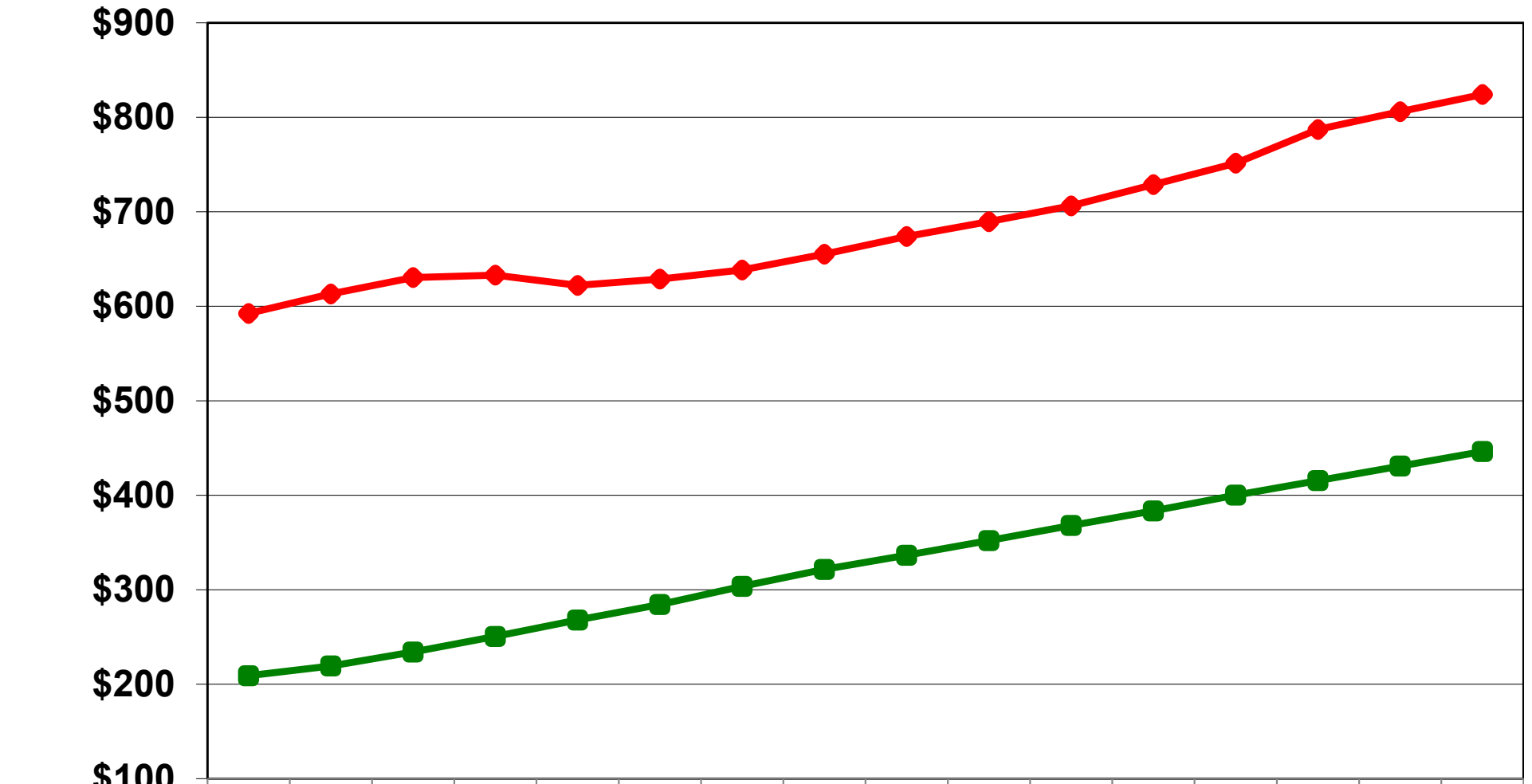


	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Full-Time Salary	$46,677	$48,377	$49,598	$50,616	$50,987	$51,421	$51,967	$52,551	$52,776	$53,844	$54,222	$55,231	$55,603	$57,028	$58,560	$59,667
Retirees Benefits	$17,729	$18,218	$18,814	$19,420	$20,044	$20,503	$21,153	$21,667	$22,188	$22,614	$23,096	$23,591	$24,096	$24,465	$24,811	$25,204

1.7% annual increase for average salary since 2008; 1.9% increase for 2023.

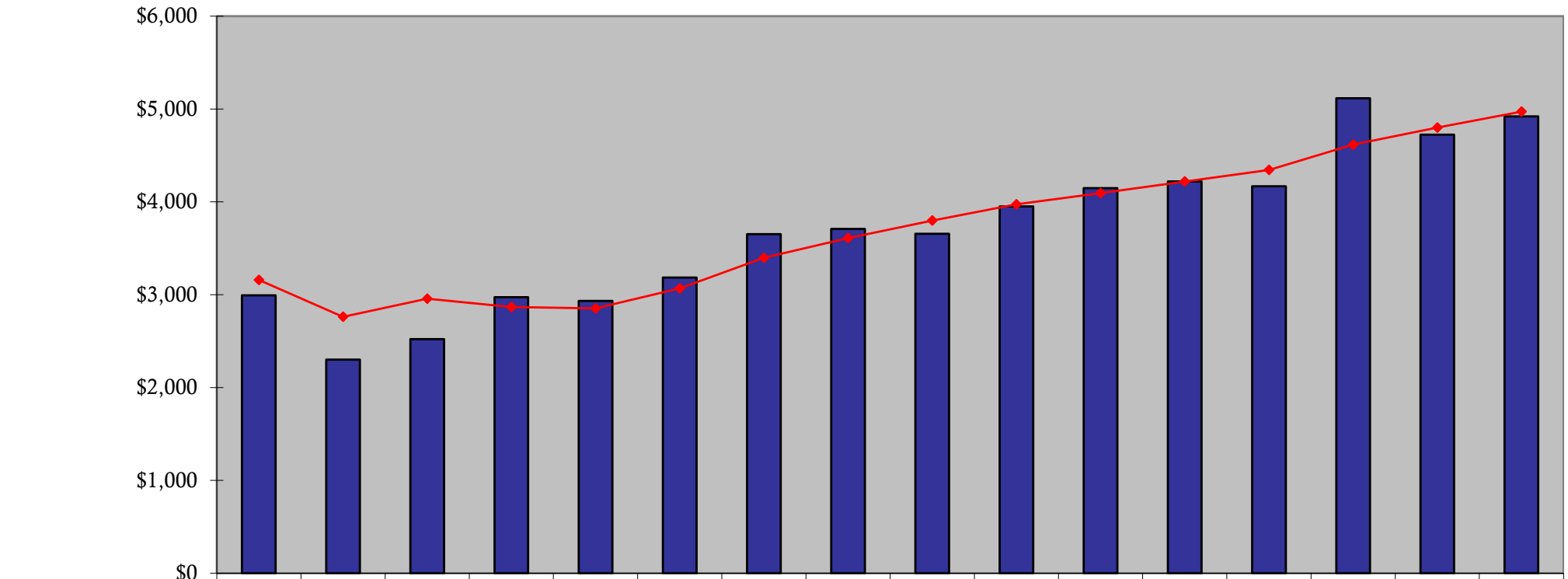
2.4% annual increase for average benefits since 2008; 1.6% increase for 2023.

Payroll & Benefits (Millions)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Full-time Payroll	$592.5	$613.1	$630.4	$633.0	$622.1	$628.8	$638.5	$655.2	$673.9	$689.6	$706.4	$728.8	$751.5	$787.2	$806.1	$824.2
Benefits	$209.0	$219.3	$234.0	$250.5	$267.9	$284.3	$303.5	$321.5	$336.5	$352.0	$368.0	$383.5	$400.1	$415.5	$430.9	$446.3

Assets ($ Millions)



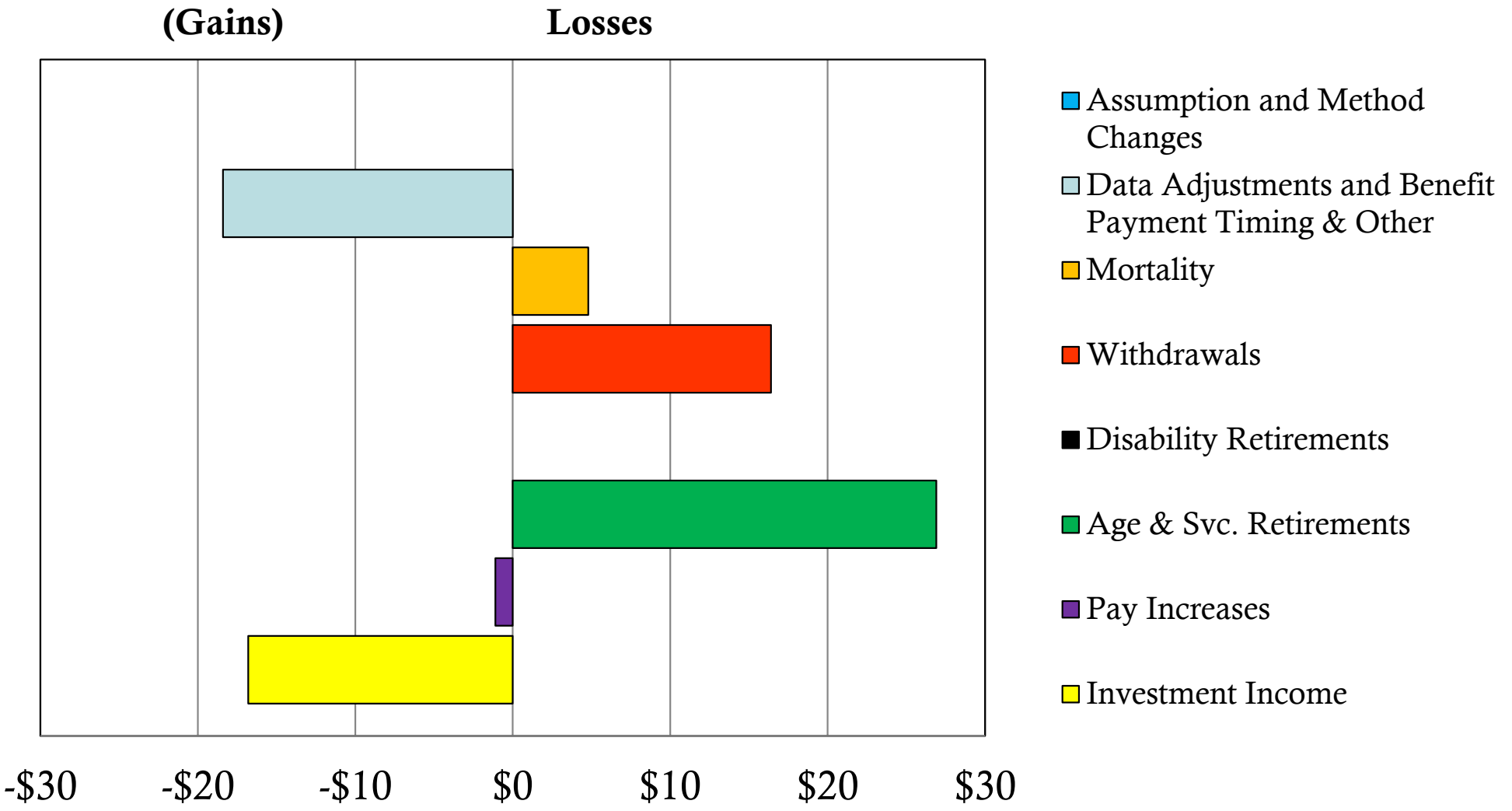
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Market Value	$2,993	$2,302	$2,521	$2,972	$2,932	$3,185	$3,652	$3,708	$3,657	$3,951	$4,148	$4,220	$4,168	$5,117	$4,724	$4,921
Actuarial Value	$3,159	$2,762	$2,957	$2,867	$2,852	$3,068	$3,397	$3,610	$3,799	$3,974	$4,094	$4,220	$4,344	$4,616	$4,800	$4,972

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Market Return	(4.9)%	(20.8)%	12.9%	21.7%	2.2%	12.9%	17.1%	4.6%	2.1%	11.9%	8.8%	5.7%	2.7%	27.7%	(4.1)%	8.3%
Actuarial Return	7.2%	(10.3)%	9.8%	(0.1)%	3.2%	12.0%	13.2%	9.6%	8.8%	8.2%	6.9%	7.0%	7.0%	10.7%	8.1%	7.7%

Funding Results

	July 1, 2022 Valuation	July 1, 2023 Valuation
Total Normal Cost Rate	10.87%	10.75%
Less Member Rate	8.15%	8.15%
Employer Normal Cost Rate	2.72%	2.60%
Rate to Amortize UAL	9.14%	9.36%
Total Employer Statutory Rate	11.86%	11.96%
Actuarial Accrued Liability	$6,691.3 million	$6,858.3 million
Actuarial Value of Assets	$4,799.6 million	$4,971.9 million
Unfunded Accrued Liability	$1,891.7 million	$1,886.4 million
Funded Ratio	71.73%	72.49%
Amortization Period	25 Years	24 Years

2022 (Gain)/Loss Analysis
($ Millions)



Actuarial Certifications & Disclosures

- Additional information regarding the assumptions and methods can be found in the July 1, 2023 actuarial valuation report.

- The actuaries who prepared these results, Todd B. Green, ASA, EA, FCA, MAAA, and Bryan Hoge, FSA, EA, FCA, MAAA, are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.