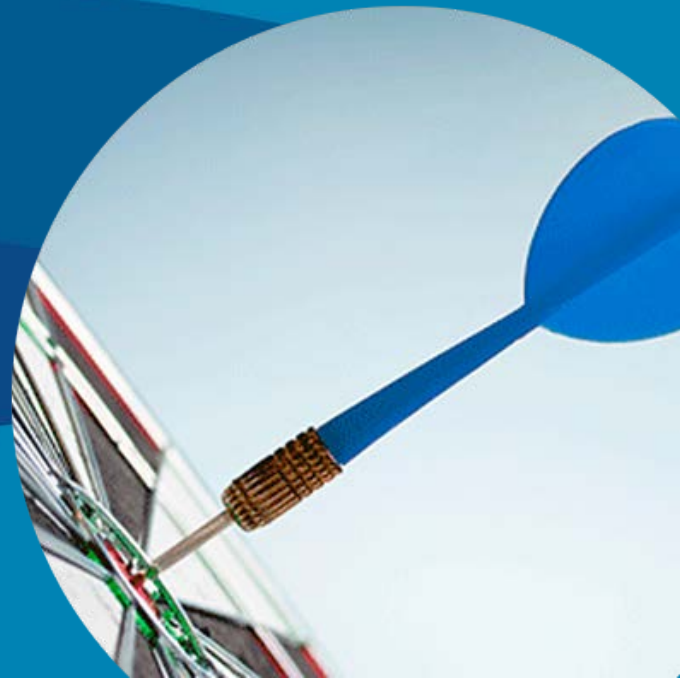


Michigan State Police Retirement System

Pension Actuarial Valuation Results
as of September 30, 2017



September 30, 2017 Valuation

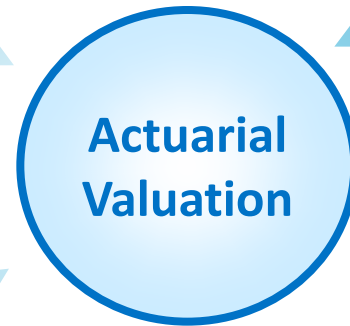
- Purpose of the September 30, 2017 valuation is twofold:
 - Determine the employer contribution for fiscal year 2020
 - Measure the System's funding progress
- Reflects the Dedicated Gains Policy adopted by the Board of Trustees
 - The investment return assumption for the Non-Hybrid plan reduced from 7.50% to 7.05% as a result of the Policy

Actuarial Valuation Process

Member Data



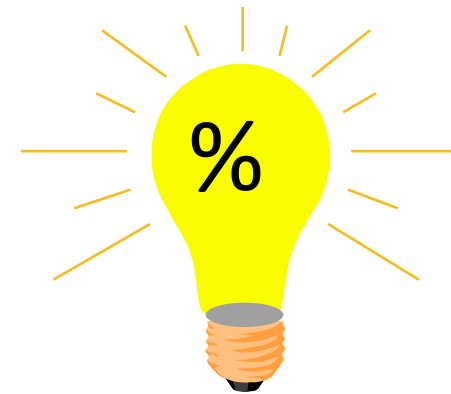
Financial Data



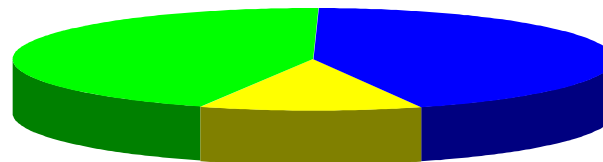
Plan Provisions



Actuarial Assumptions



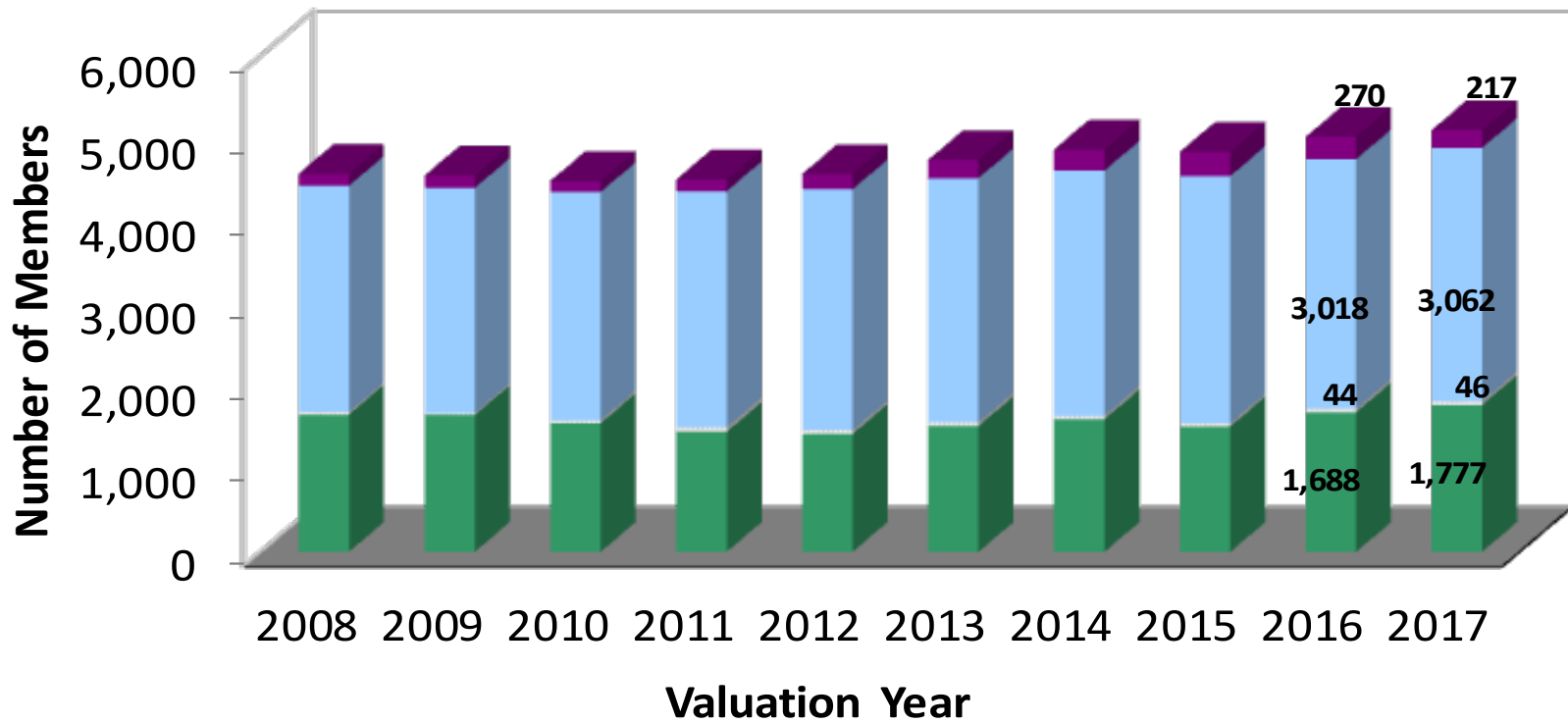
Actuarial Cost Method



Dedicated Gains Policy

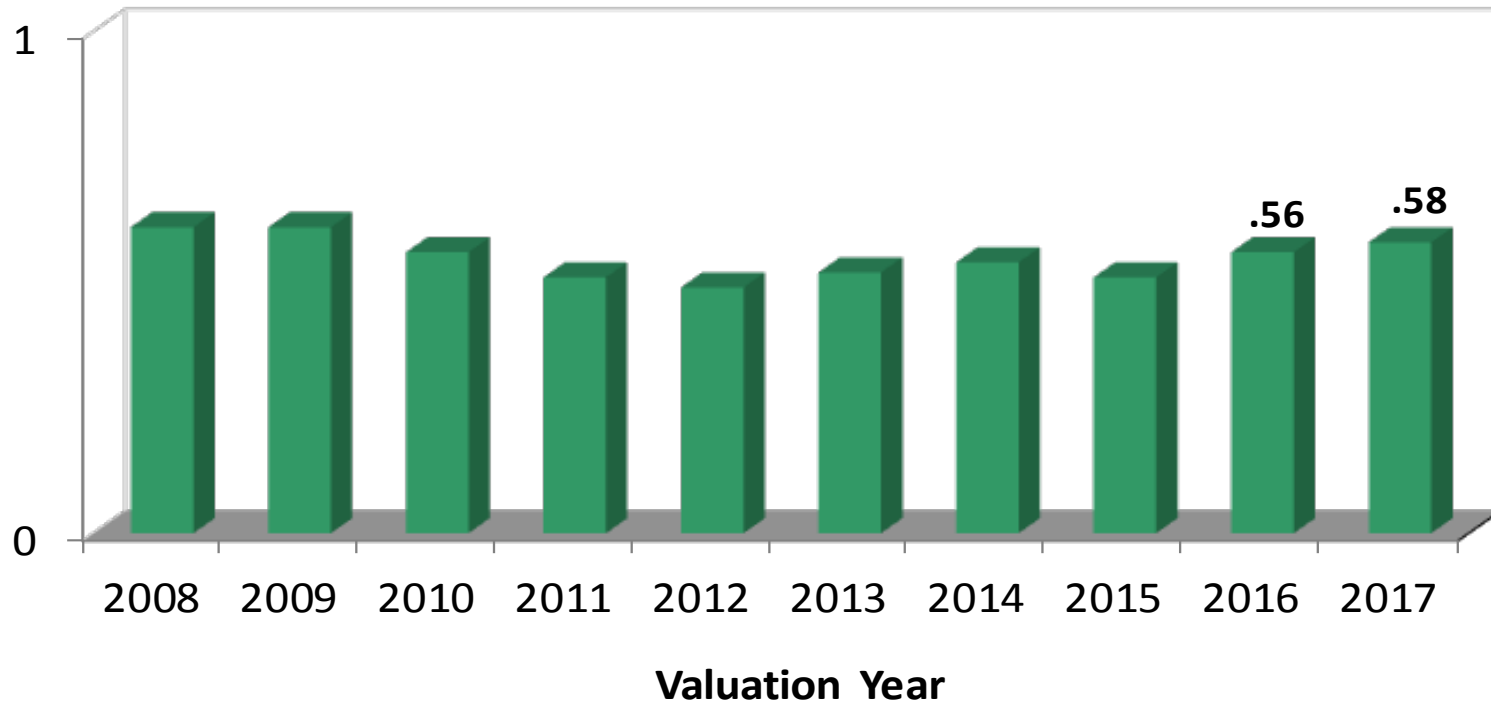
- Adopted in 2017
- The purpose of the Policy is to reduce the investment return assumption for actuarial valuation purposes if the fiscal year's market value rate of return exceeds a certain amount
- The immediate recognition of the market value return is expected to offset the increase in the computed employer contribution from where it otherwise would have been
- SPRS specific provisions:
 - It was assumed that the reduction in the investment return assumption would be applicable to the Non-Hybrid portion of the pension plan only

Membership Data

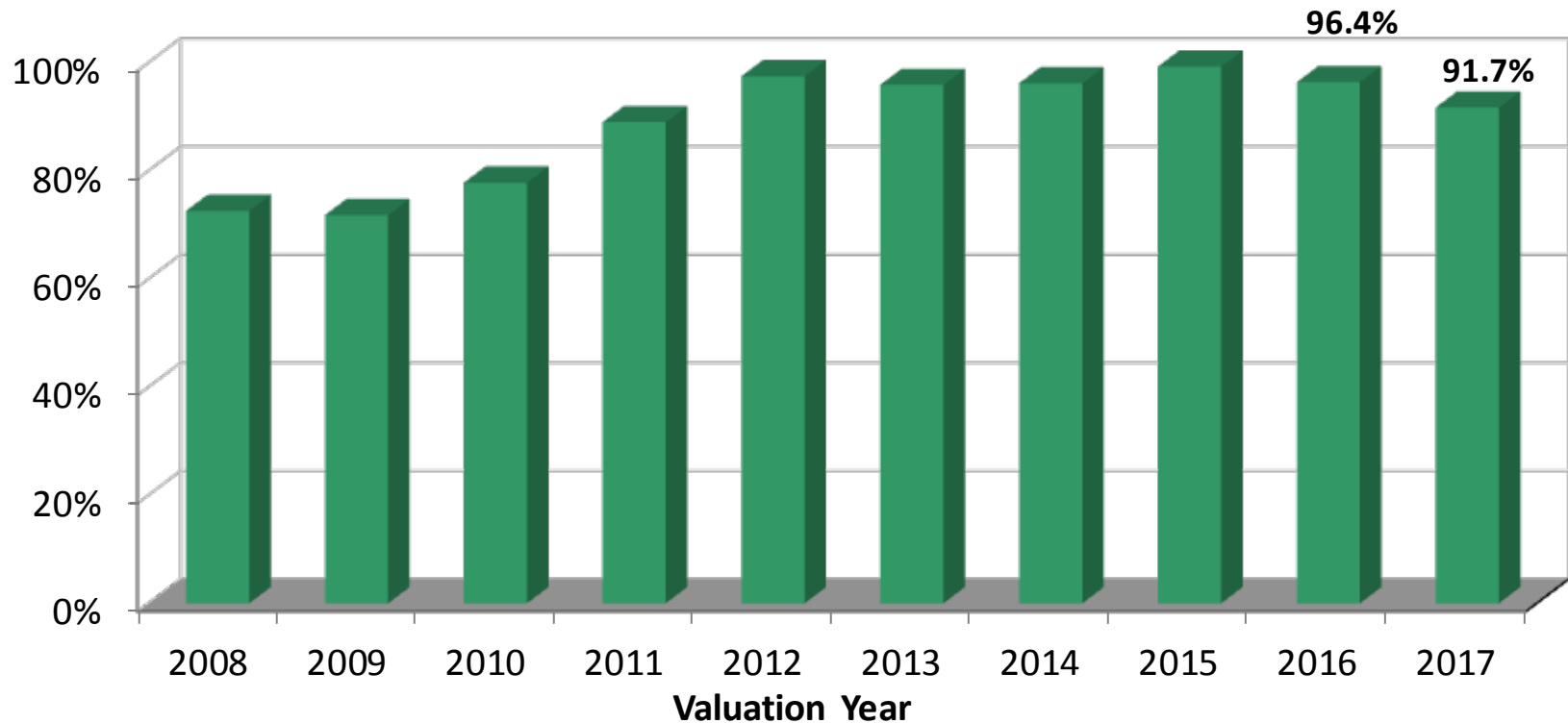


■ Actives ■ Inactives ■ Retirees & Beneficiaries ■ DROP Members

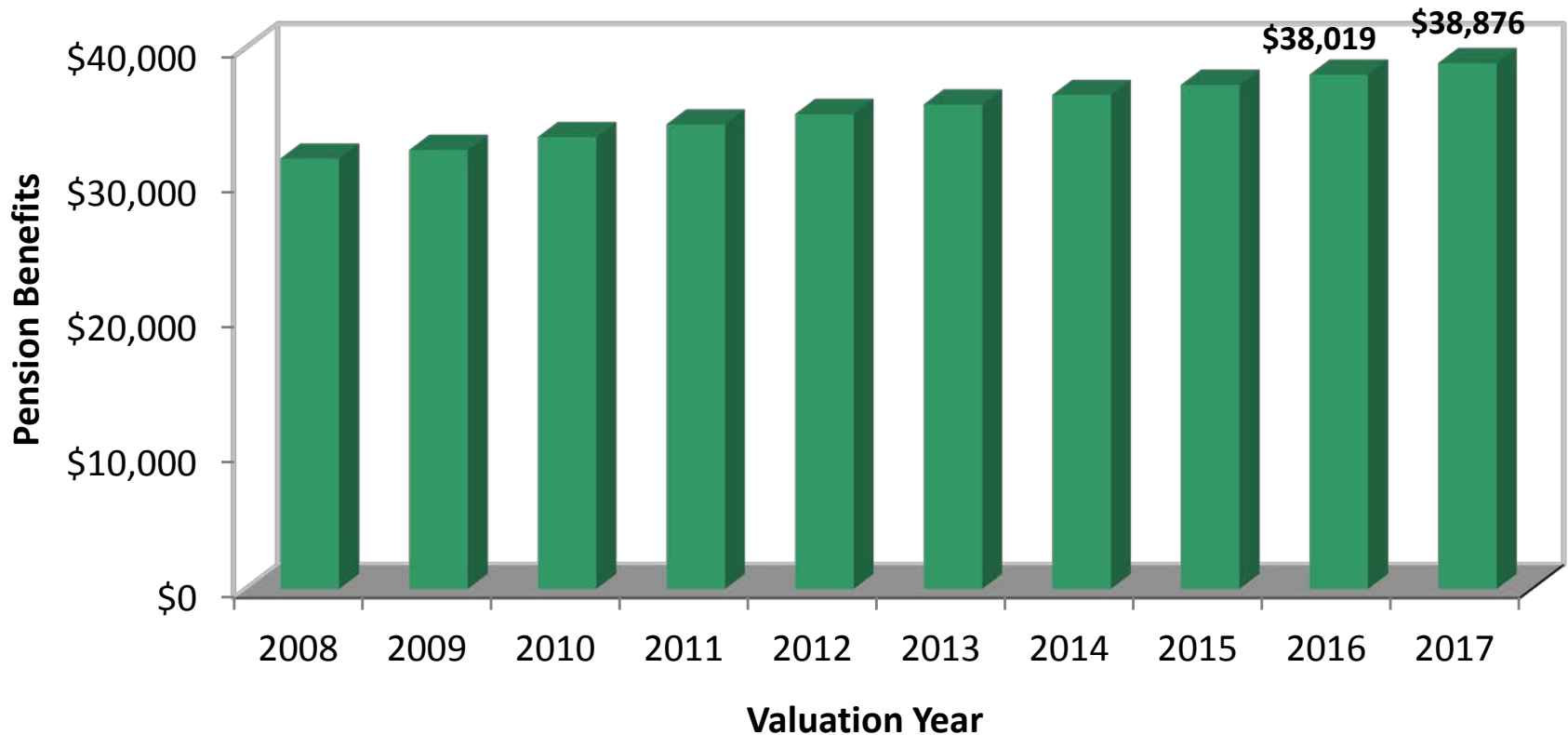
Ratio of Active Members to Pension Benefit Recipients



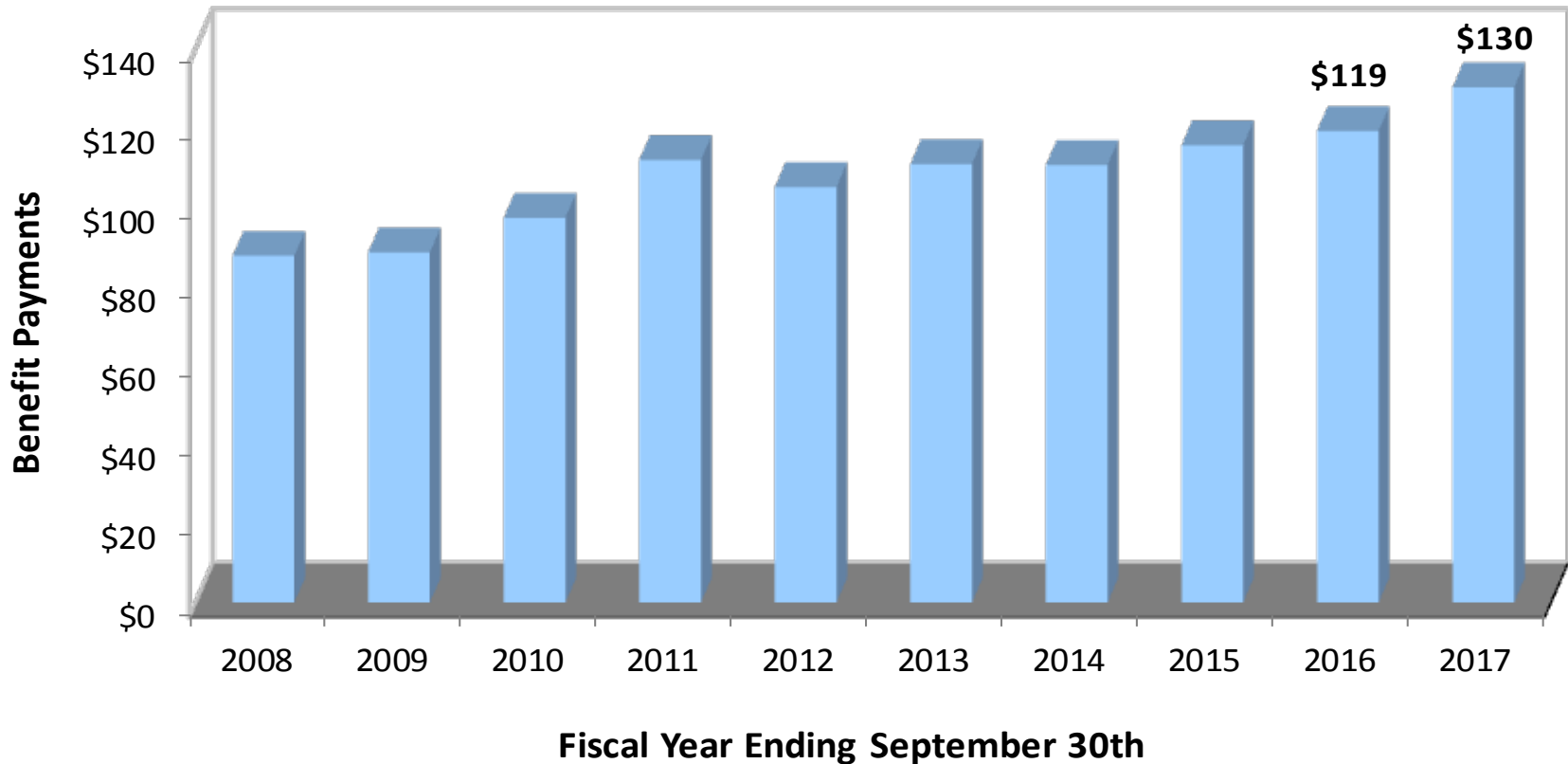
Pension Benefits Expressed as %'s of Active Member Pay



Average Annual Pensions as of September 30th of the Indicated Valuation Year

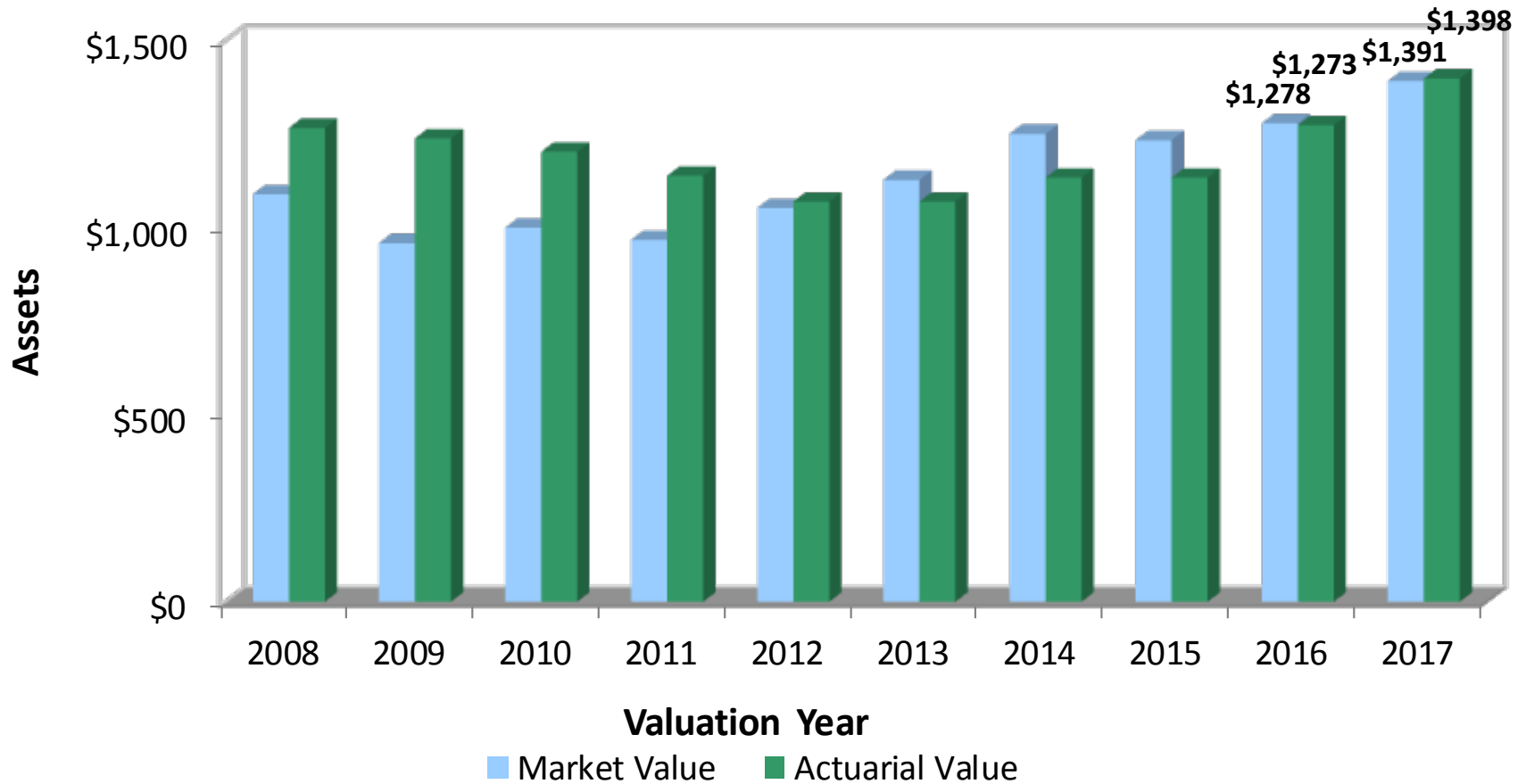


Actual Pension Benefit Payments by Fiscal Year (Amounts in Millions)

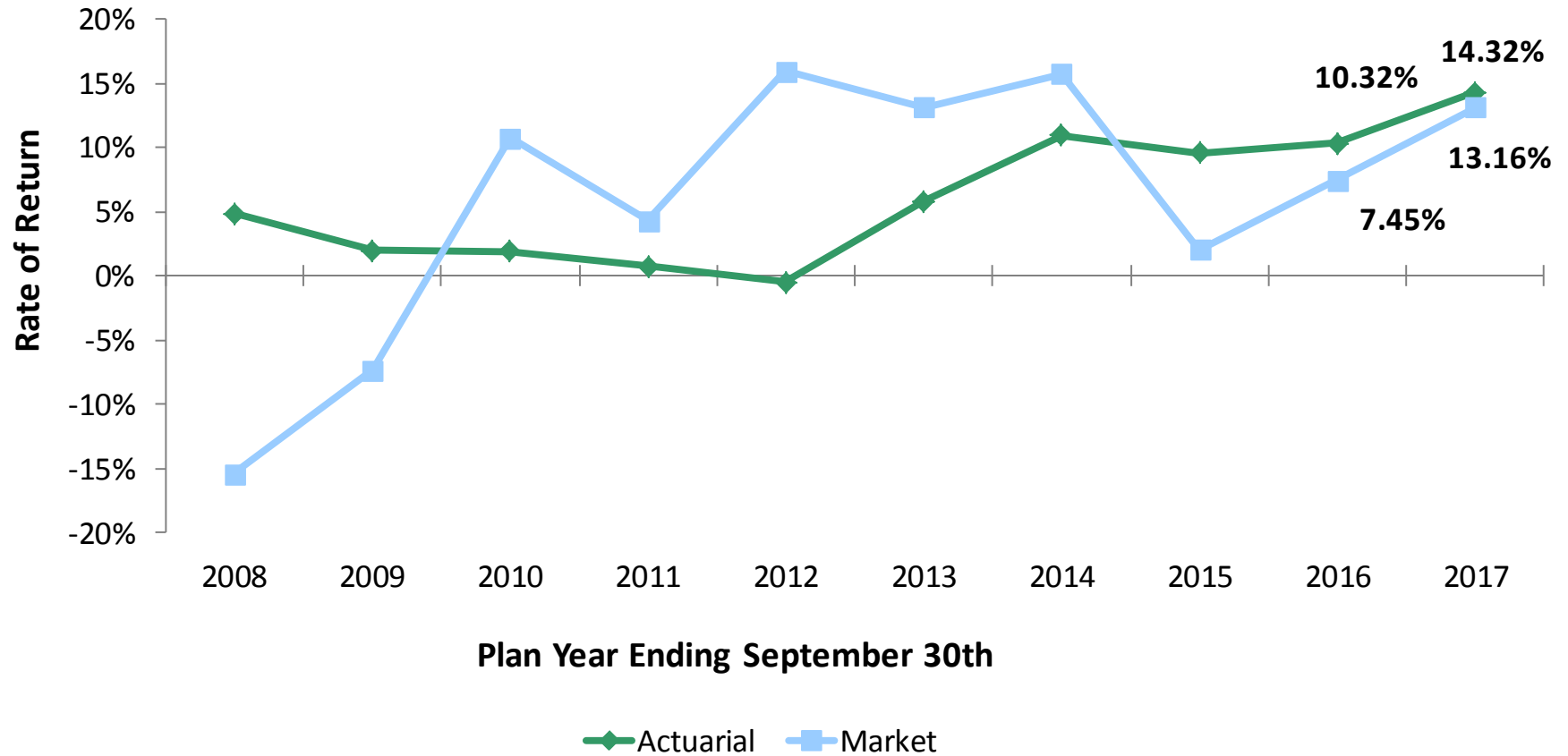


Pension Assets

(Amounts in Millions)



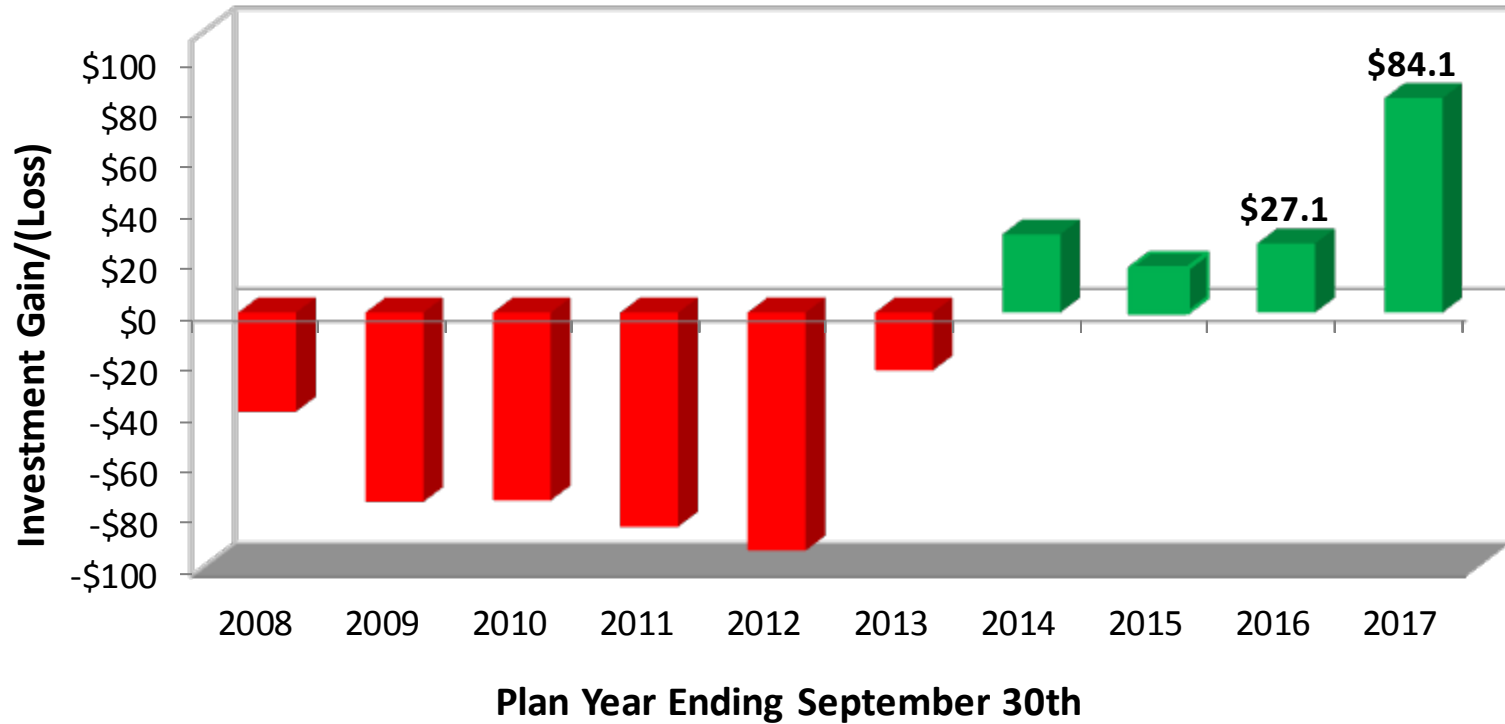
Actuarial & Market Net Rates of Return[#]



[#] Rates of return on Non-Hybrid actuarial assets.

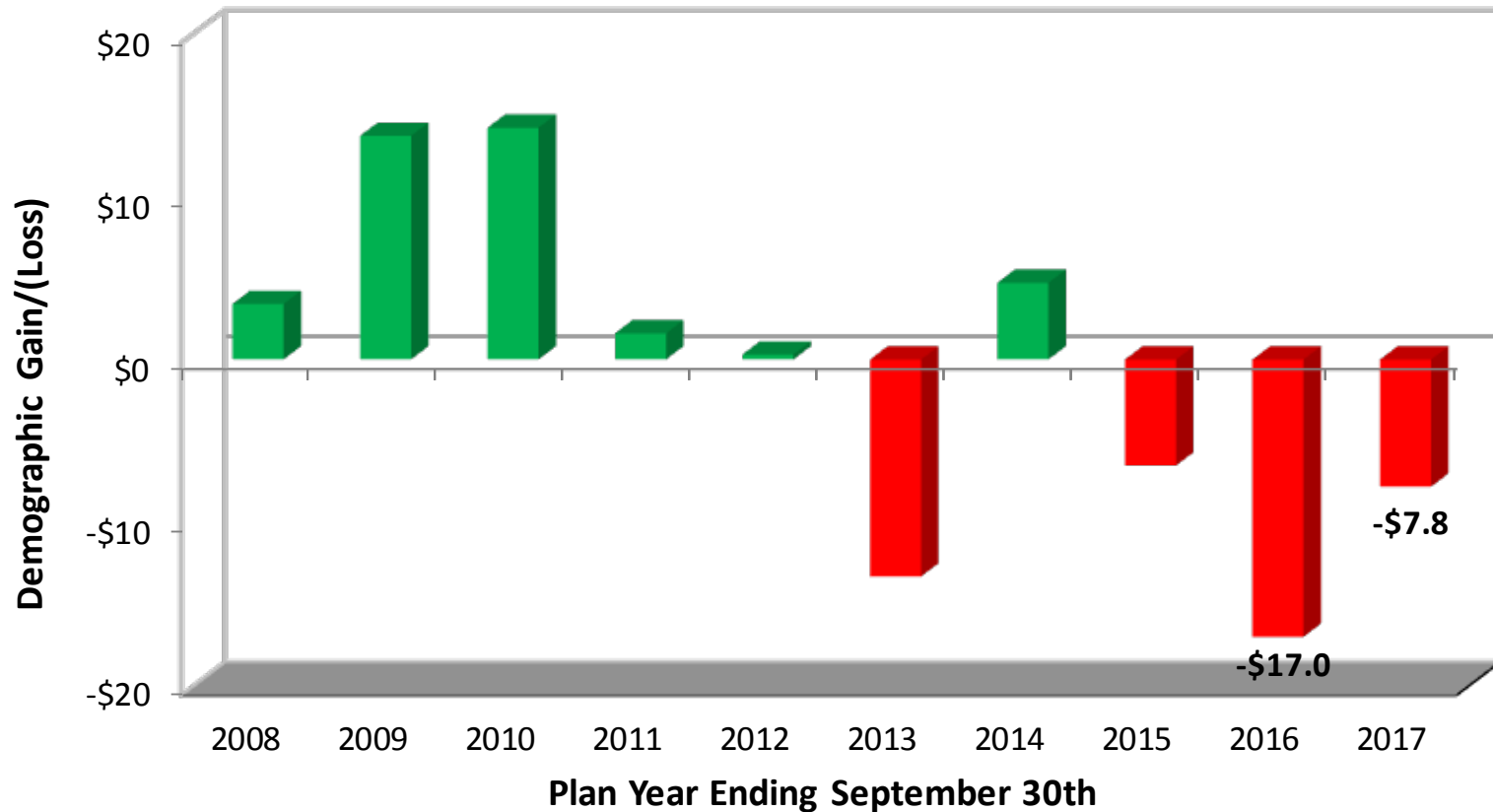
Investment Gain/(Loss)

(Amounts in Millions)



Demographic Gain/(Loss)

(Amounts in Millions)



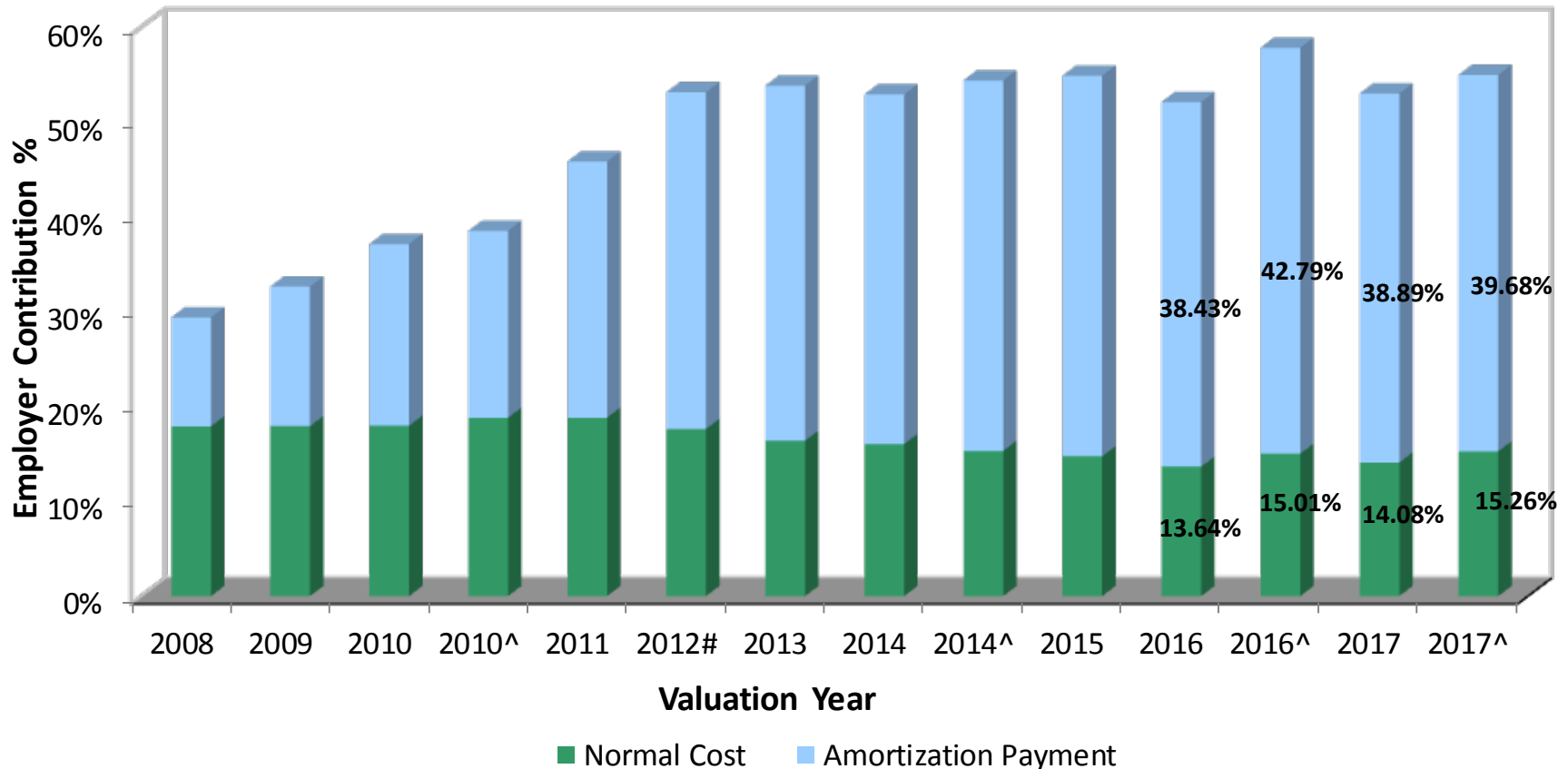
Gain/(Loss) by Type of Activity

(Amounts in Millions)

Plan Year Ending 9/30	2017	2016	2015	2014	2013	2012
New Entrants *	0.00	0.00	0.00	0.00	0.00	(0.73)
Retiree Deaths	(1.83)	(2.84)	(0.71)	(2.78)	(6.34)	(5.57)
Investments	84.14	27.08	17.43	30.70	(22.72)	(93.39)
Pay Increases	(4.37)	1.14	5.40	8.93	(1.34)	11.94
Withdrawal	0.43	(1.48)	(0.54)	0.42	0.36	(0.02)
Retirements	2.47	1.12	(3.03)	(0.75)	(1.80)	(2.40)
Other	(4.46)	(14.98)	(7.62)	(1.11)	(4.20)	(2.93)
Total	76.38	10.04	10.93	35.41	(36.04)	(93.10)

* New entrants with past service (rehires).

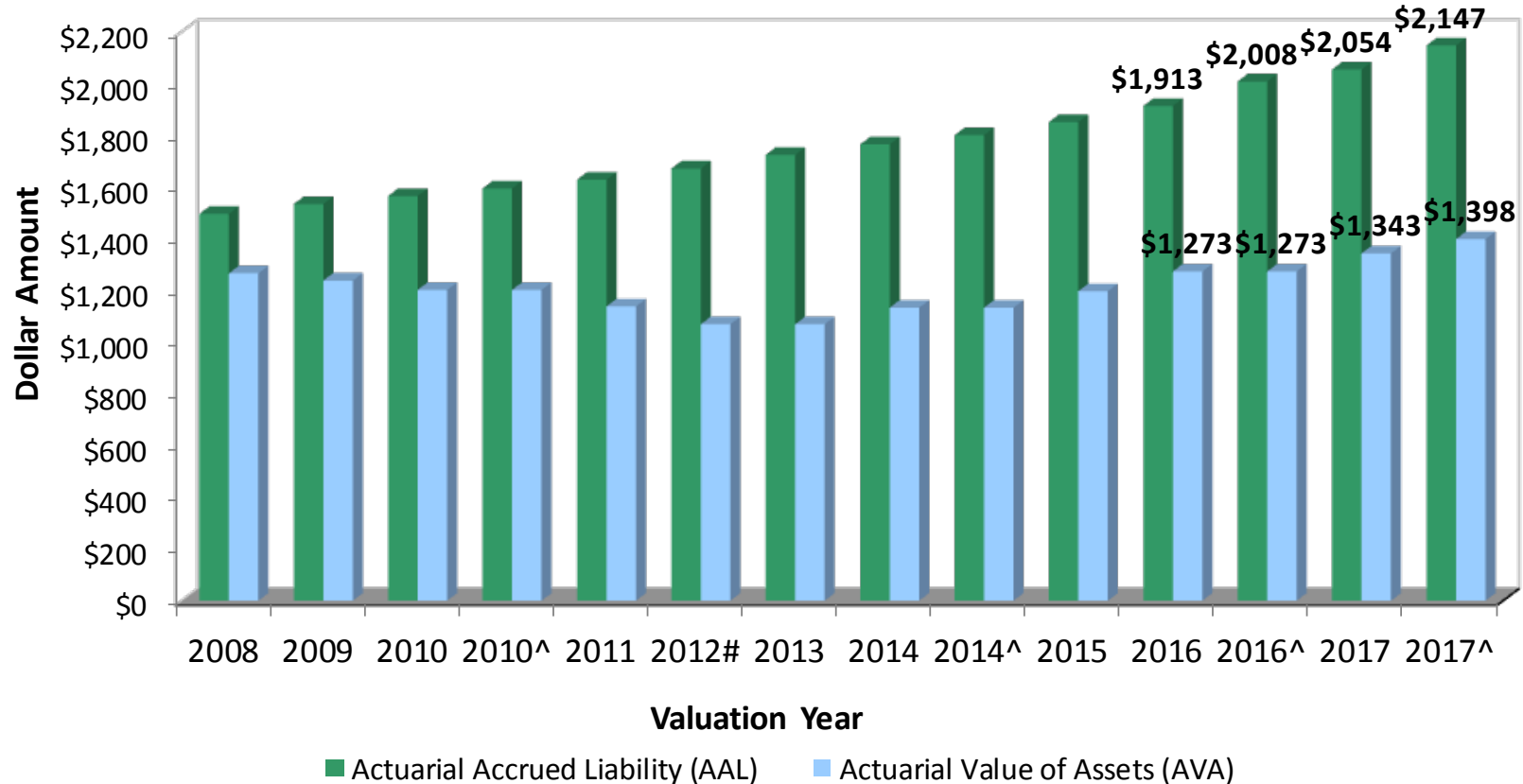
Historical Employer Contribution %'s Valuation as of September 30



Revised benefit provisions.

^ Revised actuarial assumptions.

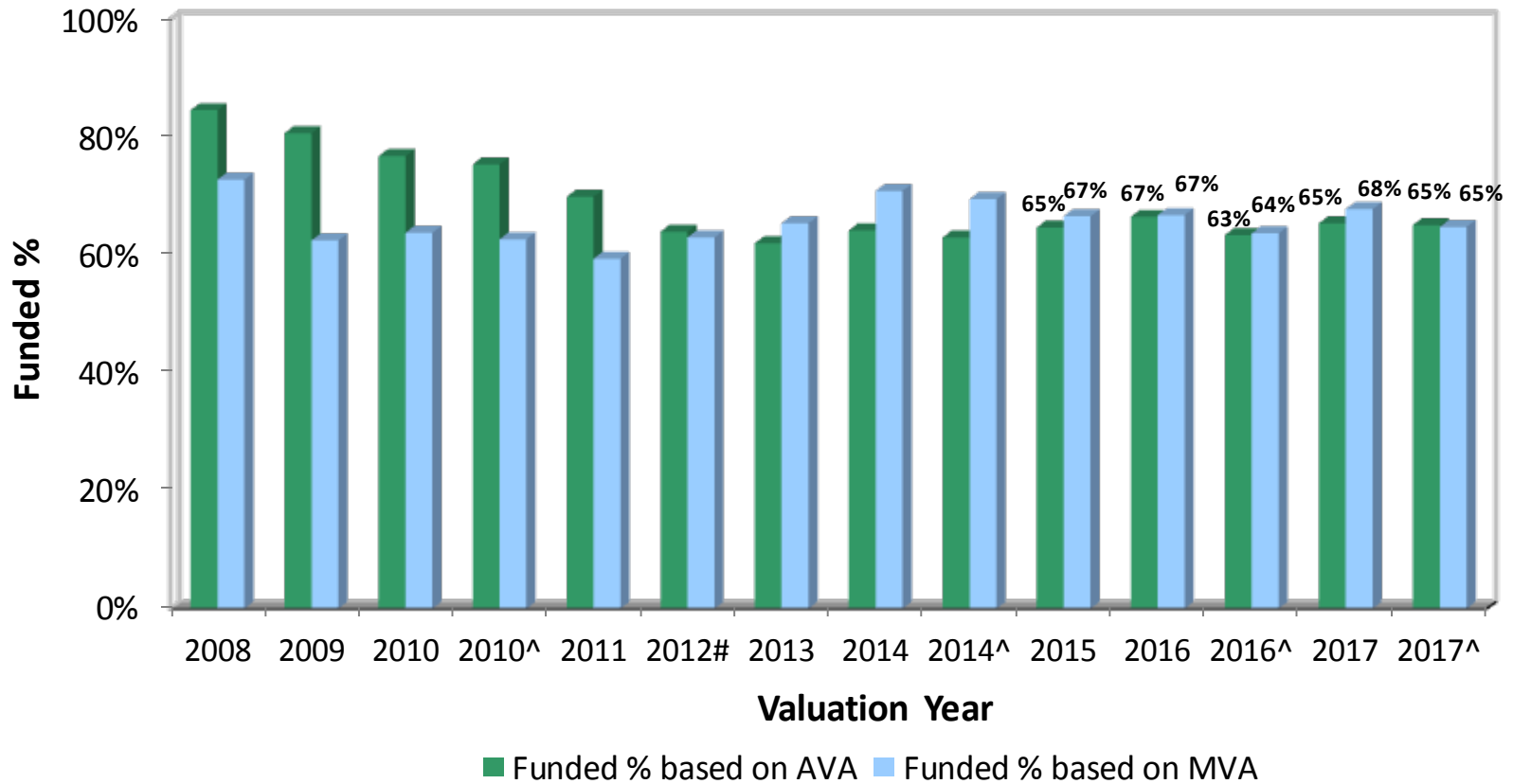
Actuarial Accrued Liability Compared to Actuarial Value of Assets (Amounts in millions)



Revised benefit provisions.

^ Revised actuarial assumptions.

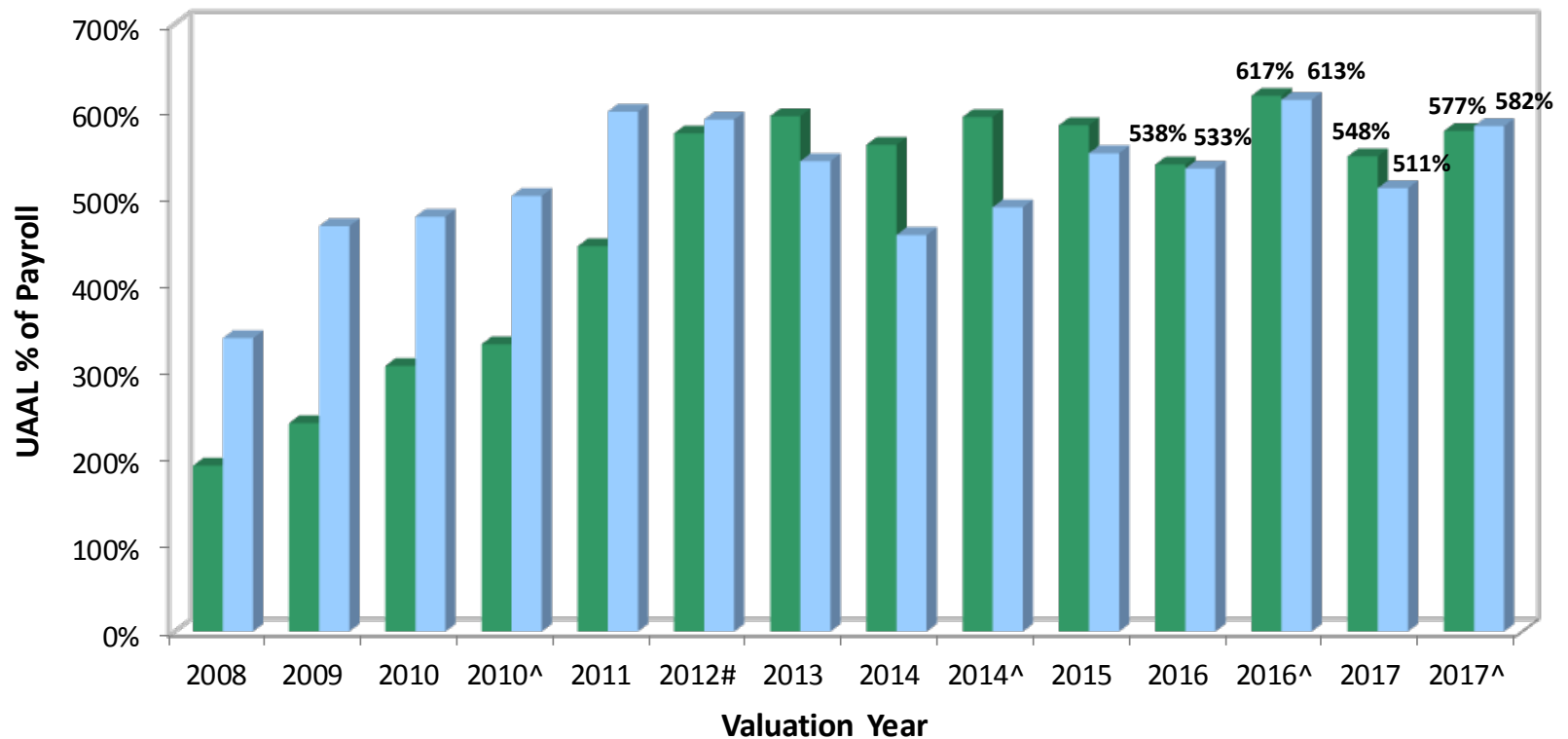
Retirement System Funded % Based on Actuarial Value and Market Value of Assets



Revised benefit provisions.

^ Revised actuarial assumptions.

Unfunded Actuarial Accrued Liability as a Percentage of Payroll



■ UAAL(AVA) as % of Payroll

■ UAAL(MVA) as % of Payroll

Revised benefit provisions.

^ Revised actuarial assumptions.

Disclaimers

- This presentation is intended to be used in conjunction with the September 30, 2017 pension actuarial valuation report issued on April 3, 2018. This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- The actuaries submitting this presentation (Mita Drazilov and Louise Gates) are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.