



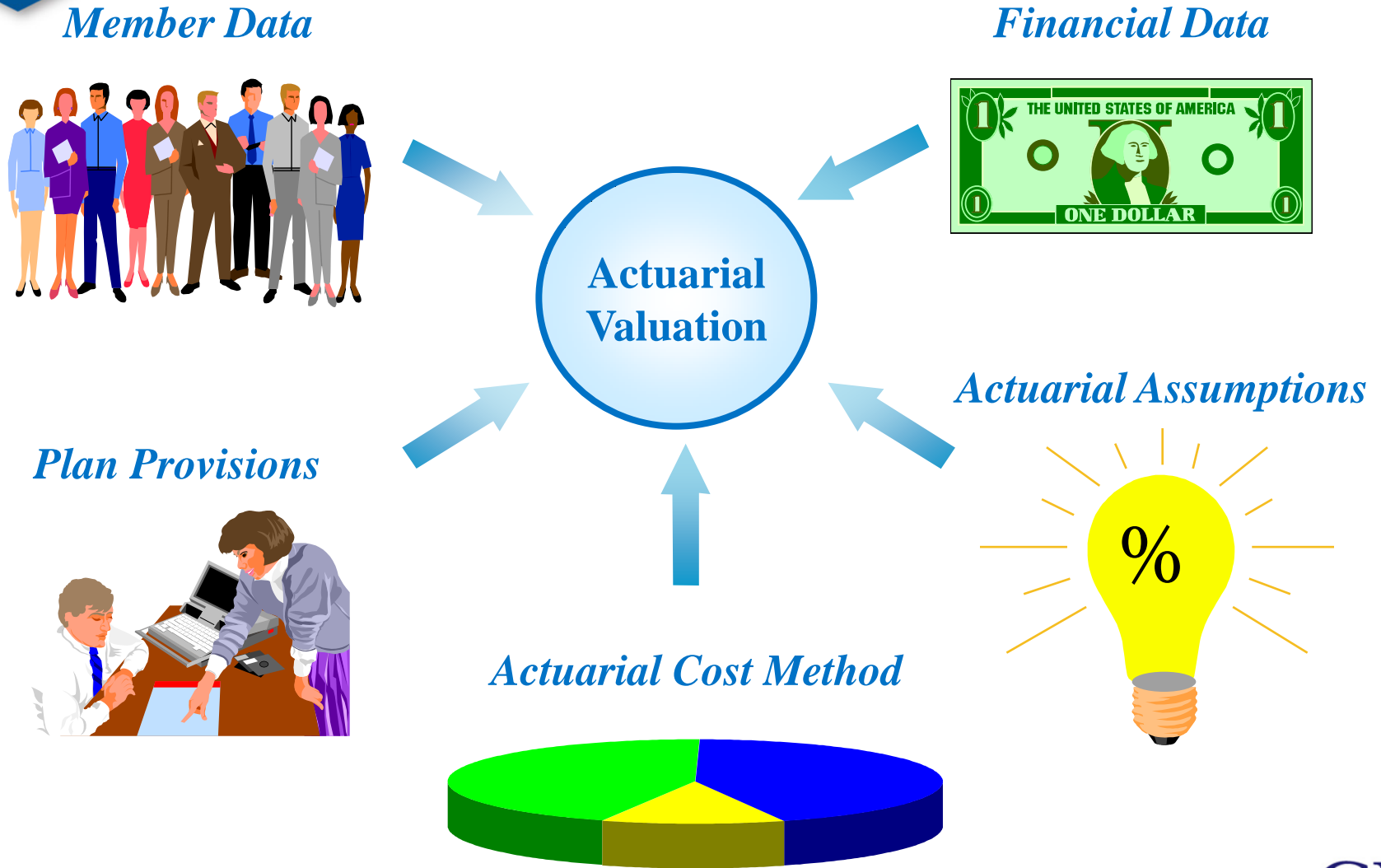
Michigan State Police Retirement System

Pension Actuarial Valuation Results as of September 30, 2016



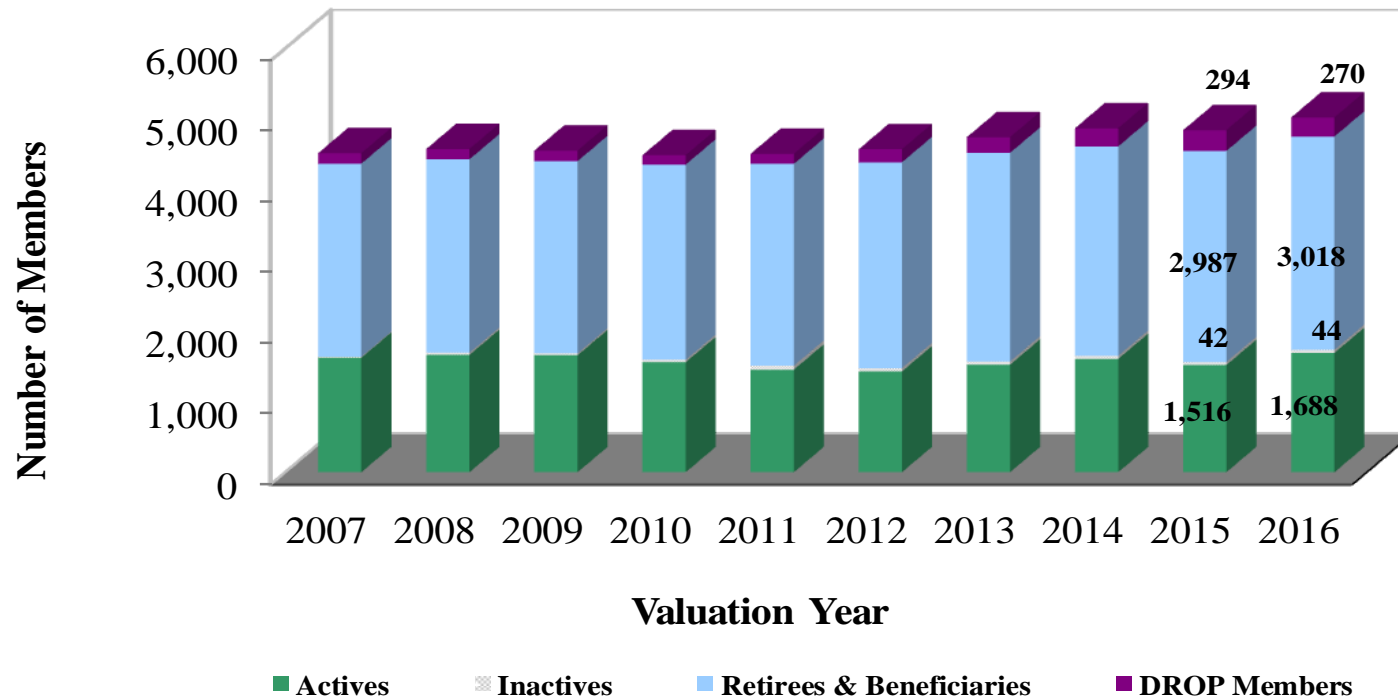
Gabriel Roeder Smith & Company
Consultants & Actuaries
www.gabrielroeder.com

Actuarial Valuation Process



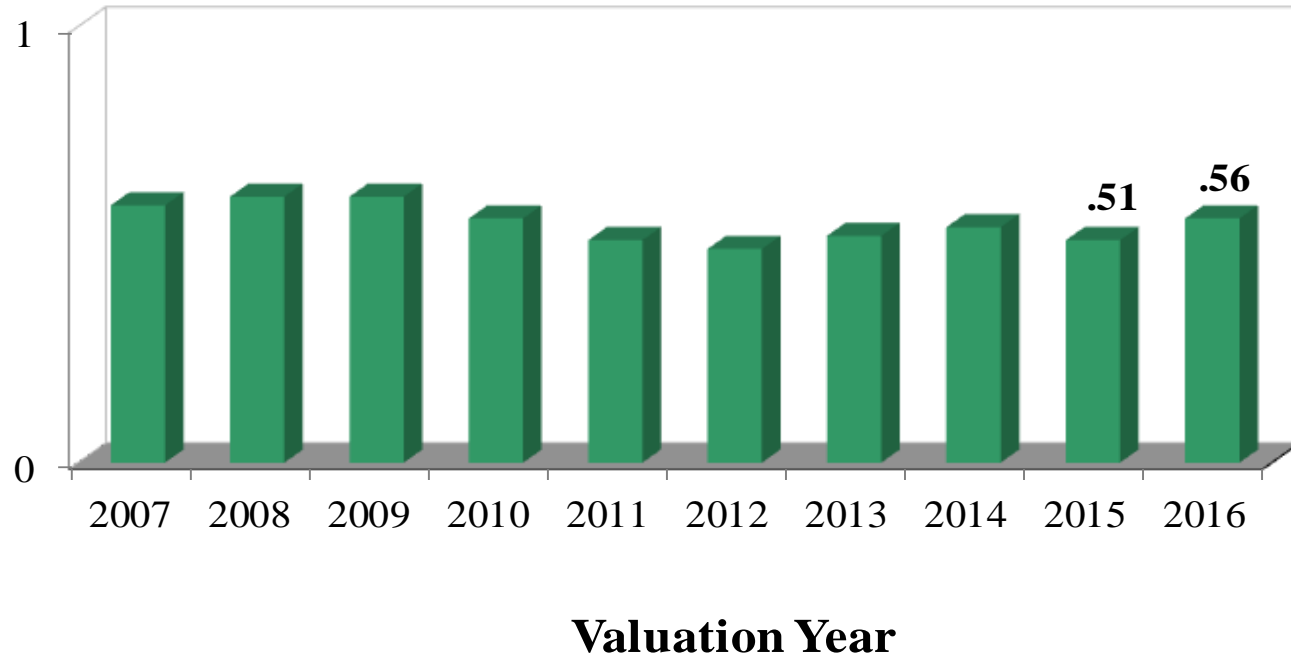


Membership Data



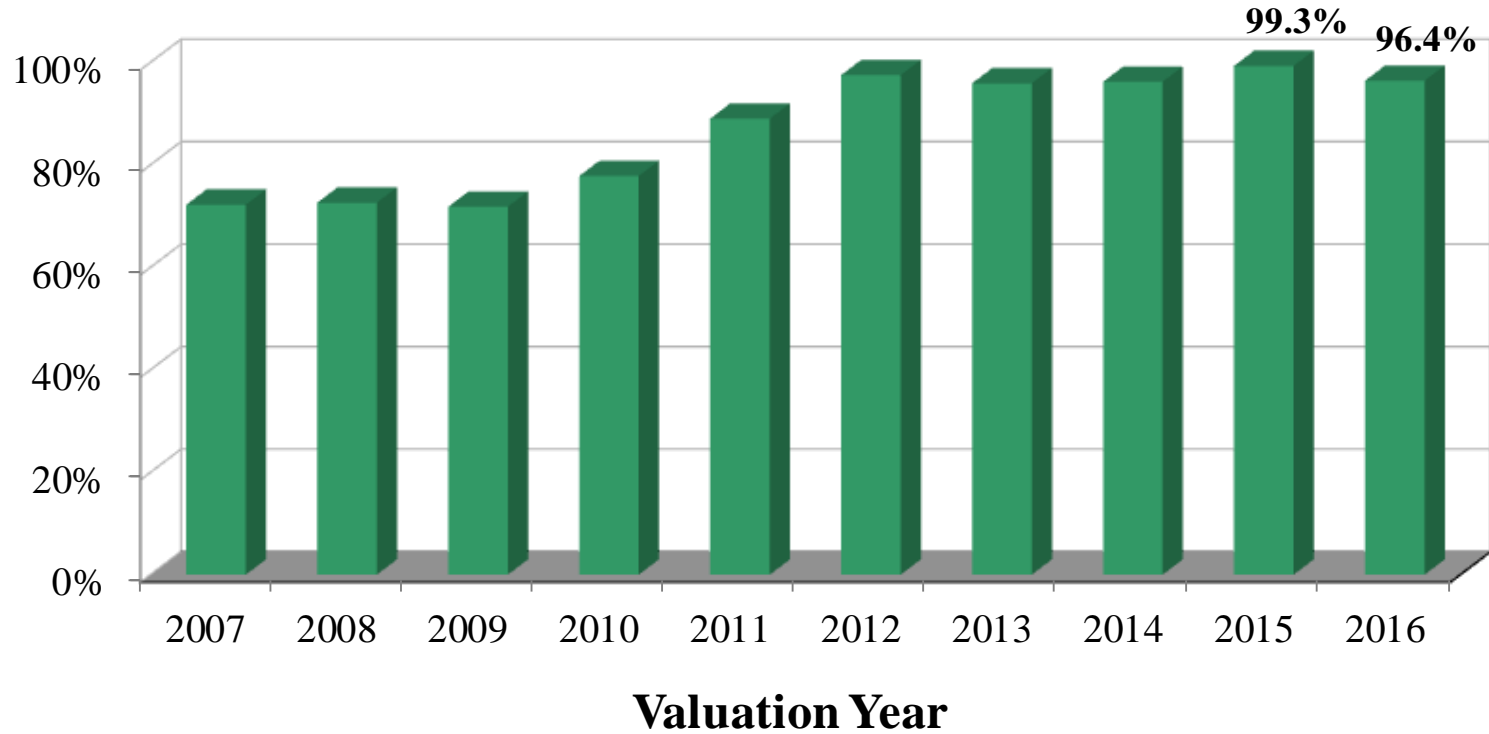


Ratio of Active Members to Pension Benefit Recipients



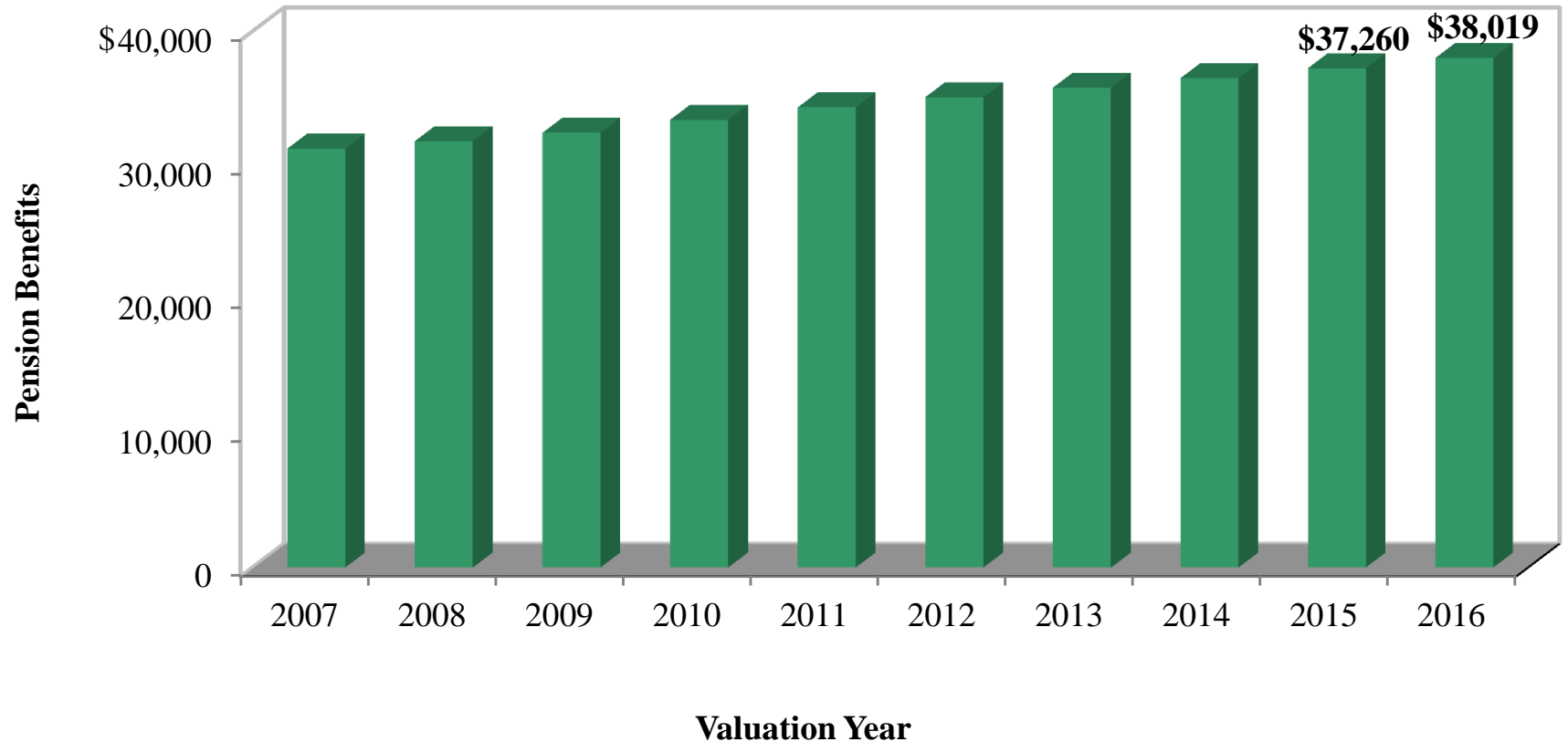


Pension Benefits Expressed as %'s of Active Member Pay



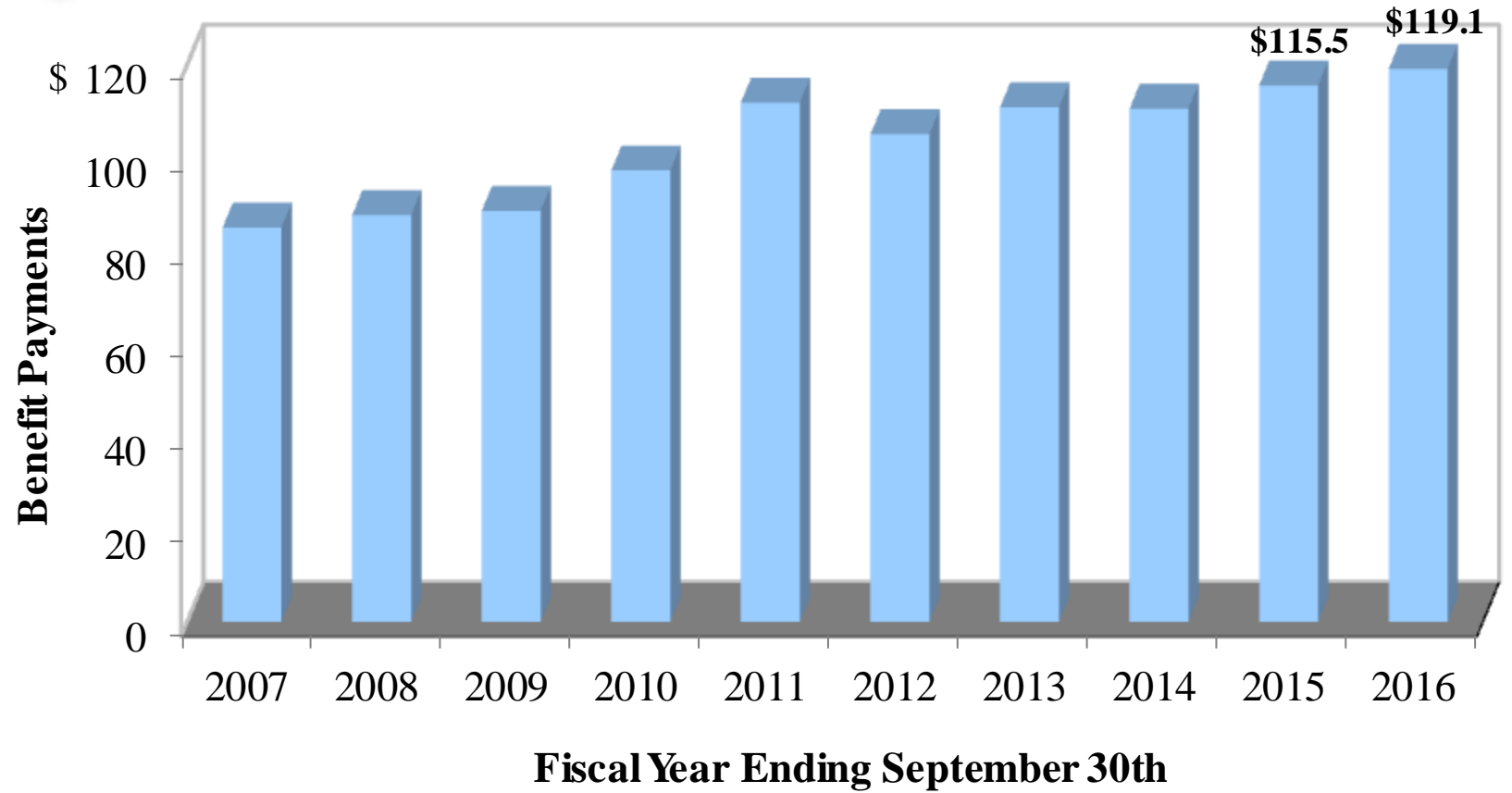


Average Annual Pensions as of September 30th of the Indicated Valuation Year





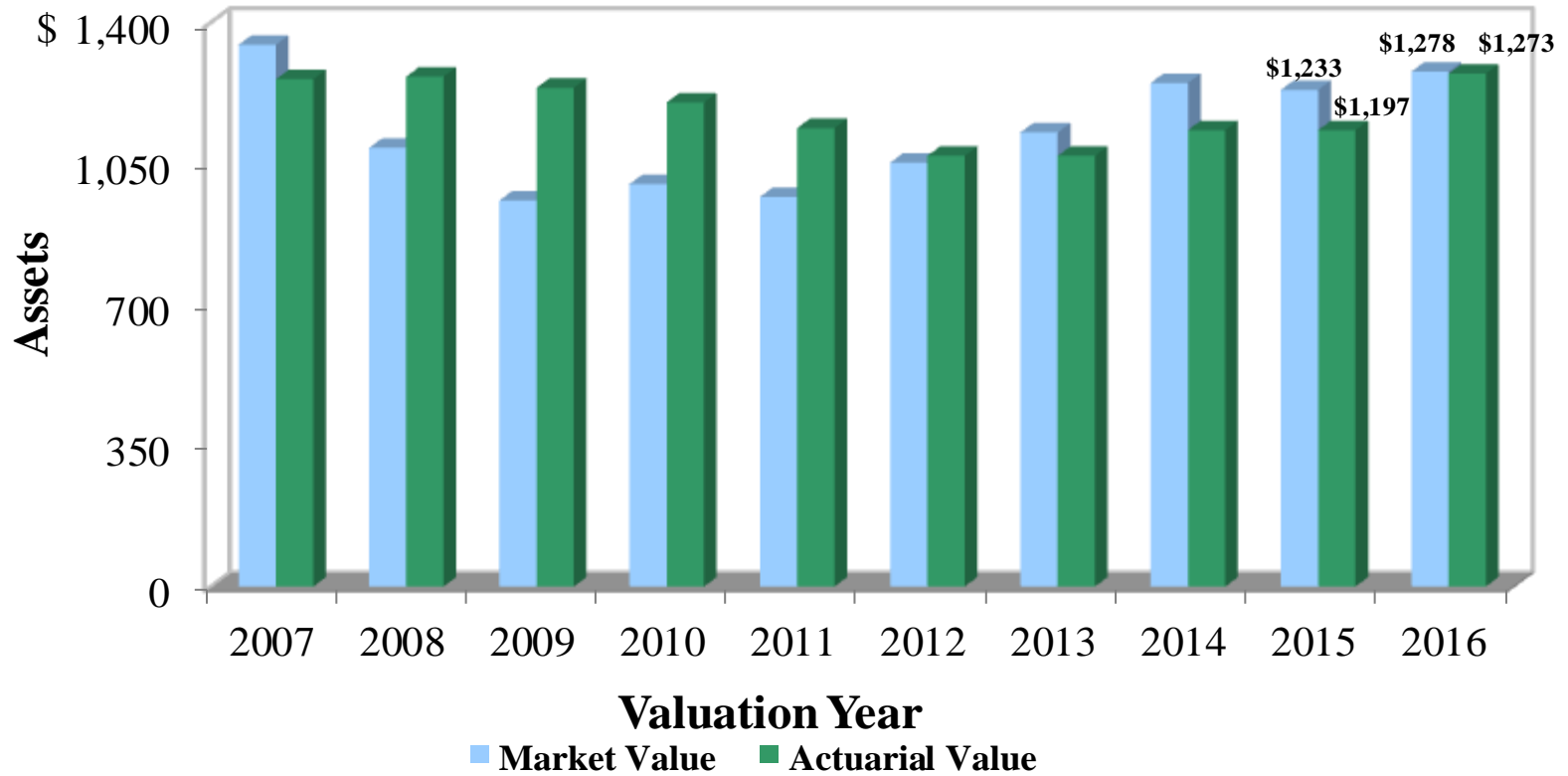
Actual Pension Benefit Payments by Fiscal Year (Amounts in Millions)



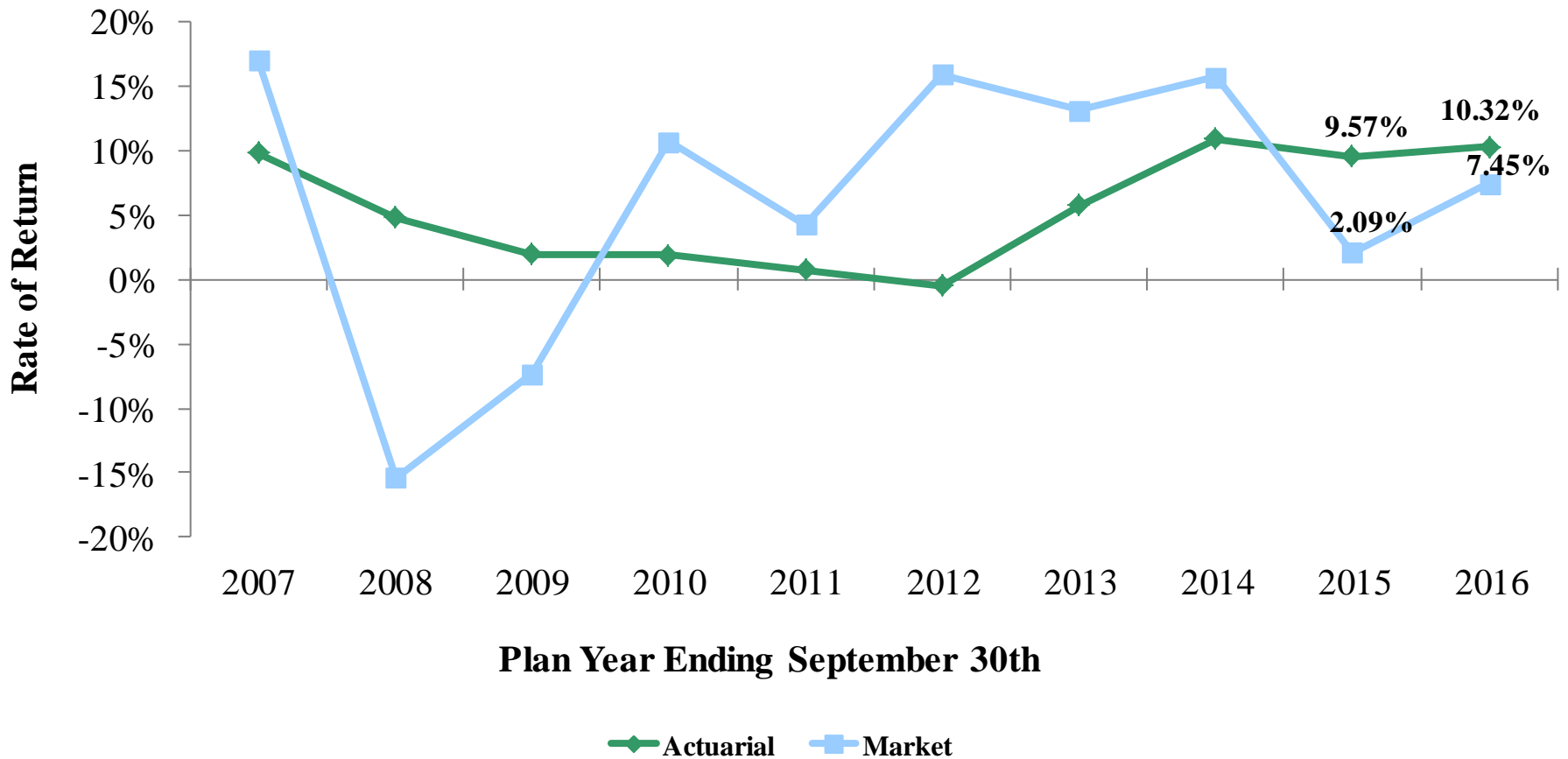


Pension Assets

(Amounts in Millions)



Actuarial & Market Net Rates of Return[#]

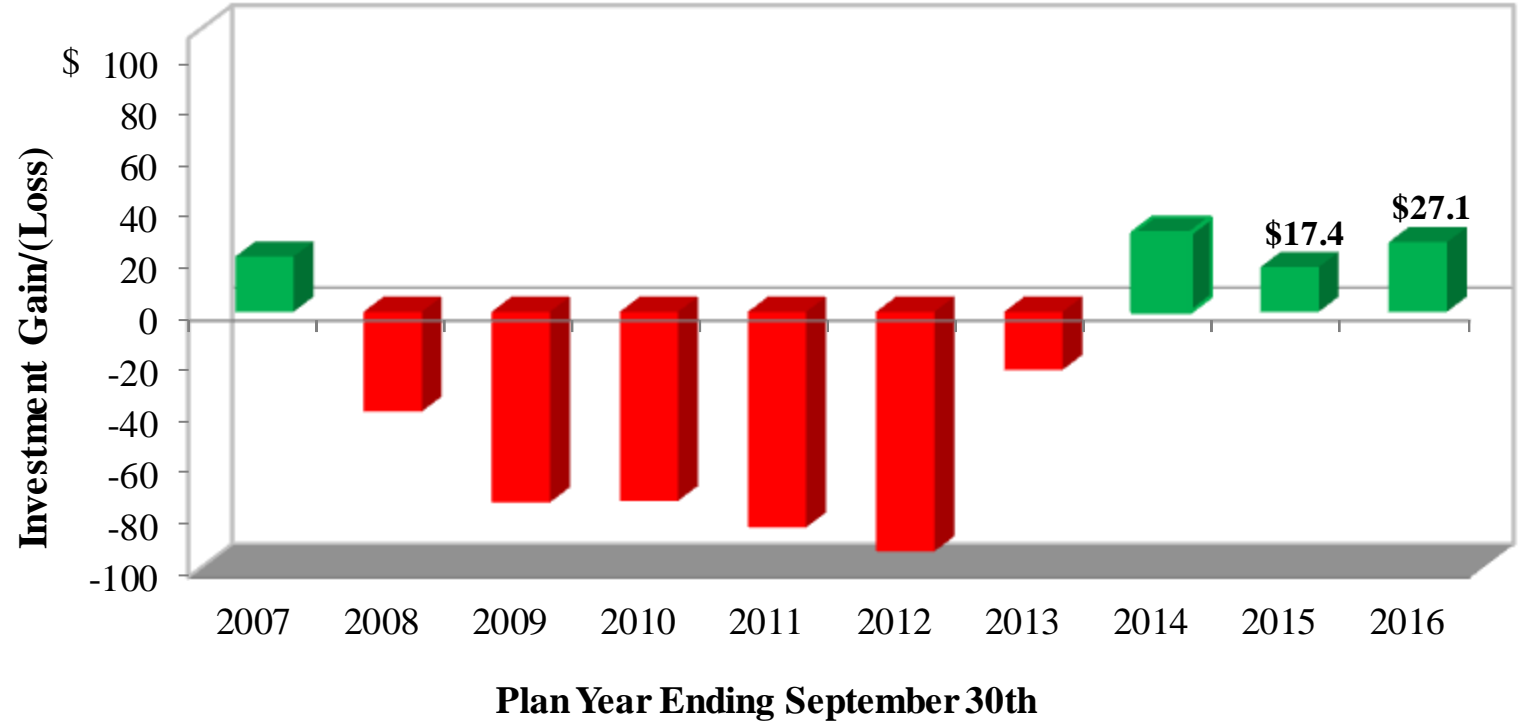


[#] Rates of return on Non-Hybrid actuarial assets.



Investment Gain/(Loss)

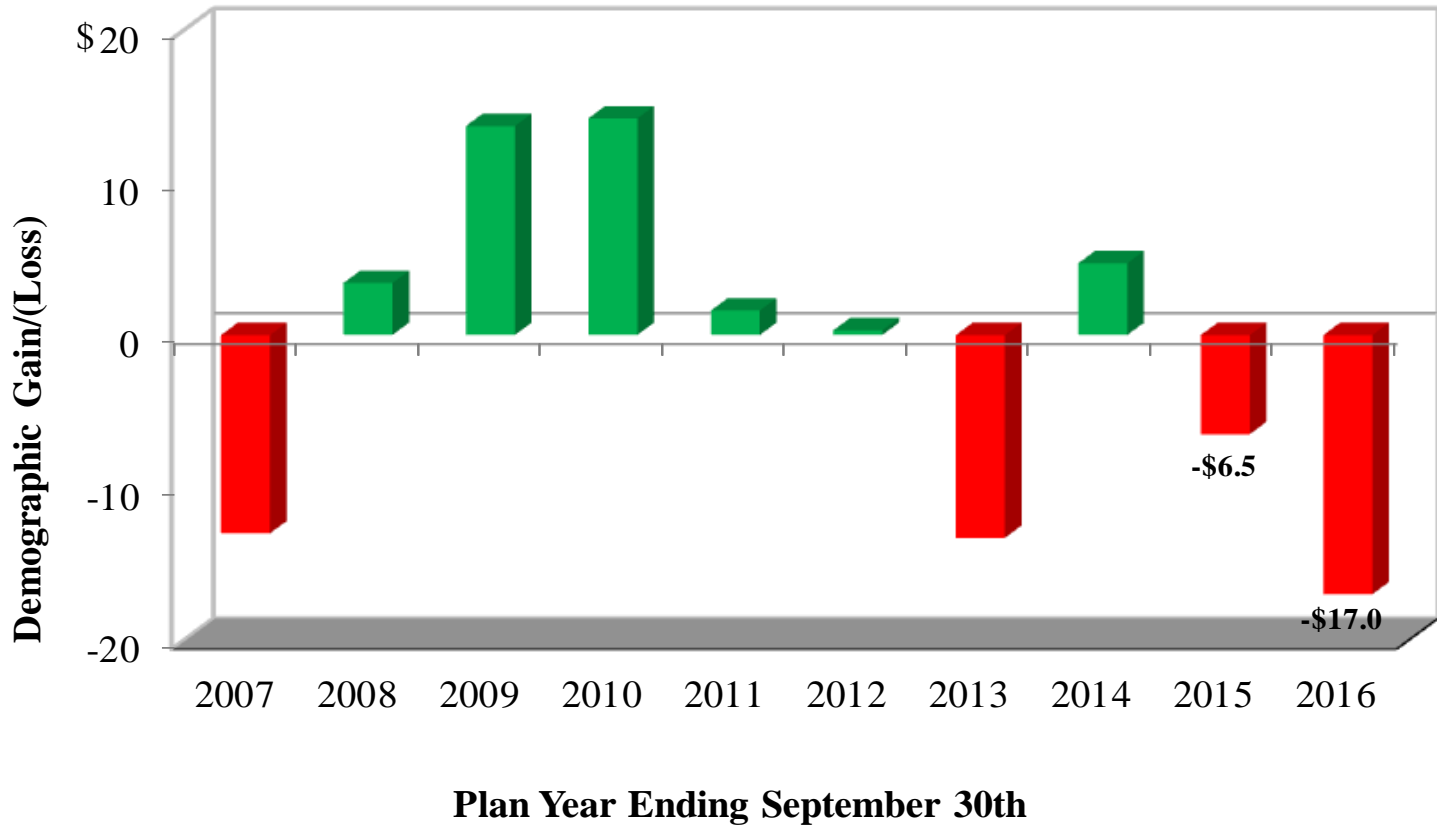
(Amounts in Millions)





Demographic Gain/(Loss)

(Amounts in Millions)





Gain/(Loss) by Type of Activity

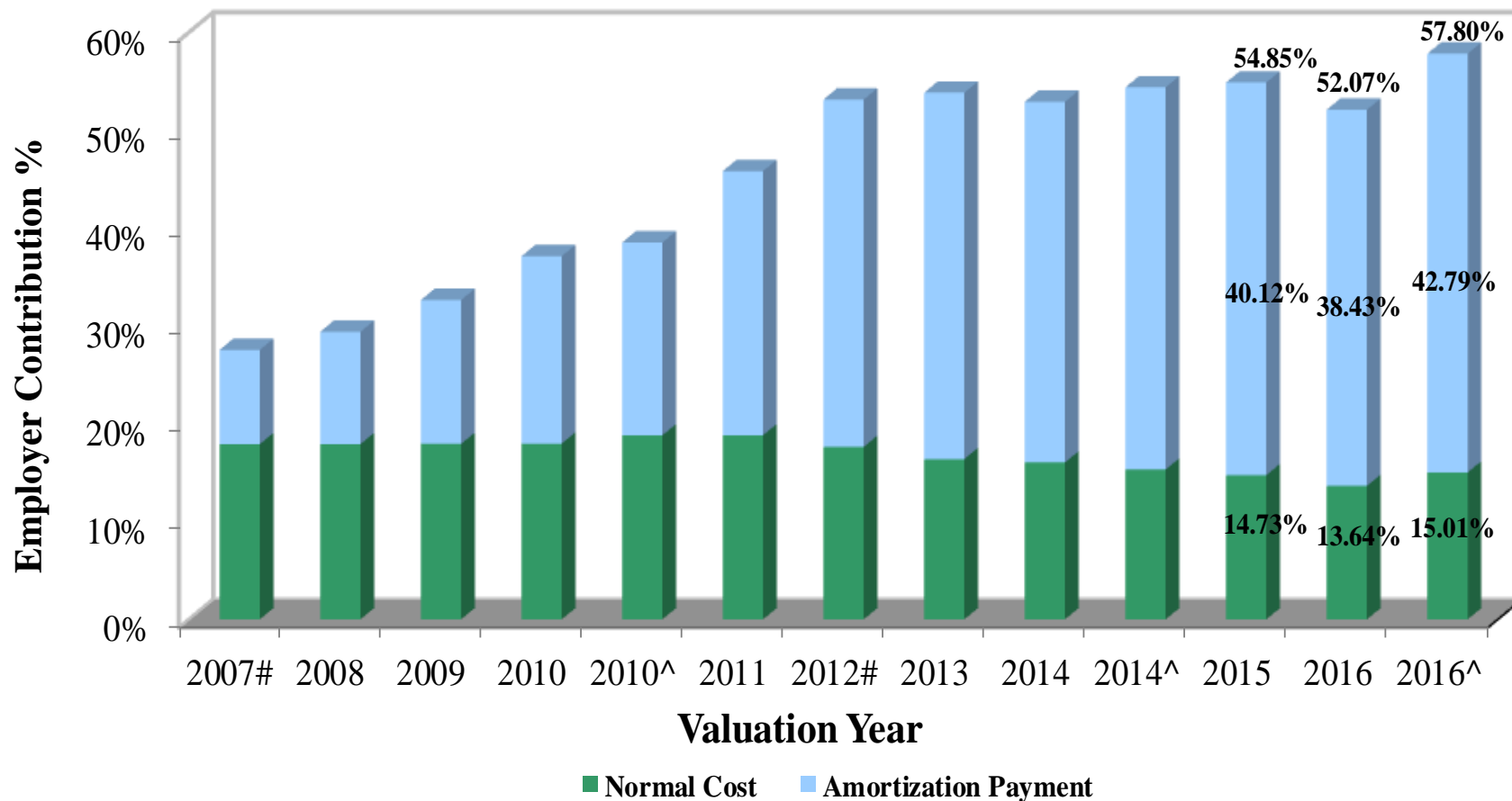
(Amounts in Millions)

Plan Year						
Ending 9/30	2016	2015	2014	2013	2012	2011
New Entrants *	0.00	0.00	0.00	0.00	(0.73)	(0.89)
Retiree Deaths	(2.84)	(0.71)	(2.78)	(6.34)	(5.57)	(5.38)
Investments	27.08	17.43	30.70	(22.72)	(93.39)	(84.04)
Pay Increases	1.14	5.40	8.93	(1.34)	11.94	11.74
Withdrawal	(1.48)	(0.54)	0.42	0.36	(0.02)	0.37
Retirements	1.12	(3.03)	(0.75)	(1.80)	(2.40)	(2.64)
Other	(14.98)	(7.62)	(1.11)	(4.20)	(2.93)	(1.58)
Total	10.04	10.93	35.41	(36.04)	(93.10)	(82.42)

* *New entrants with past service (rehires).*



Historical Employer Contribution %'s Valuation as of September 30

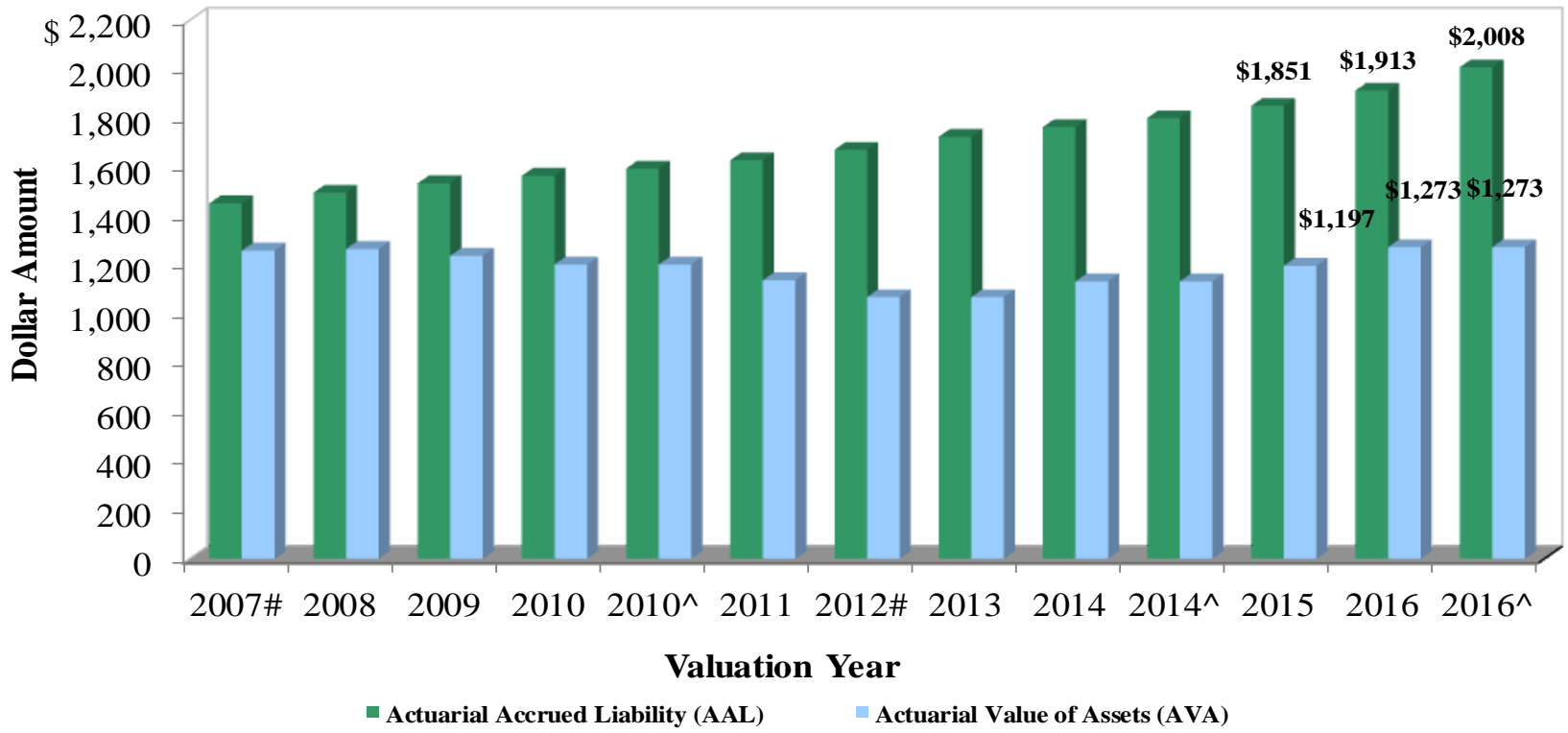


Revised benefit provisions.

^ Revised actuarial assumptions.



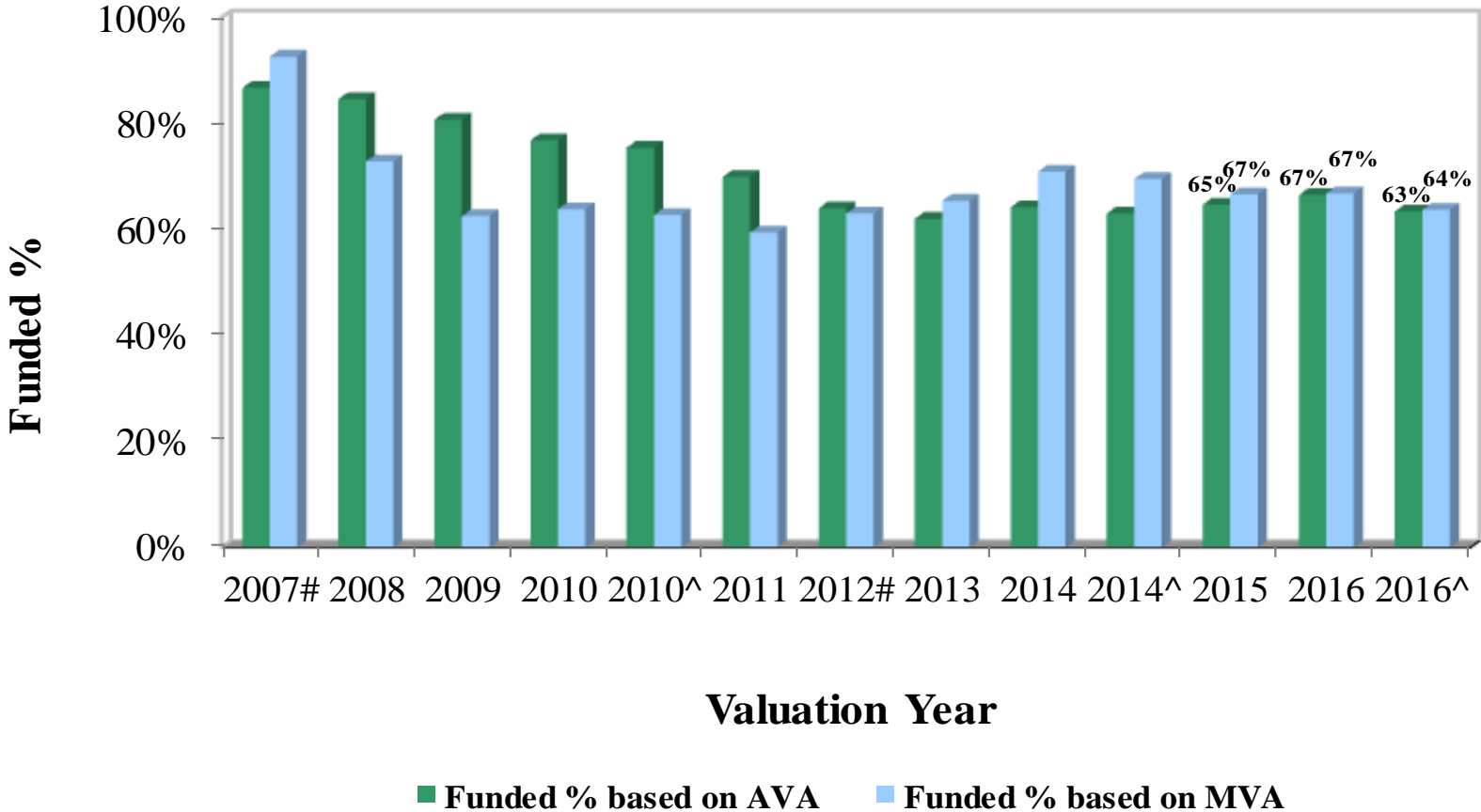
Actuarial Accrued Liability Compared to Actuarial Value of Assets (in millions)



Revised benefit provisions.
^ Revised actuarial assumptions.



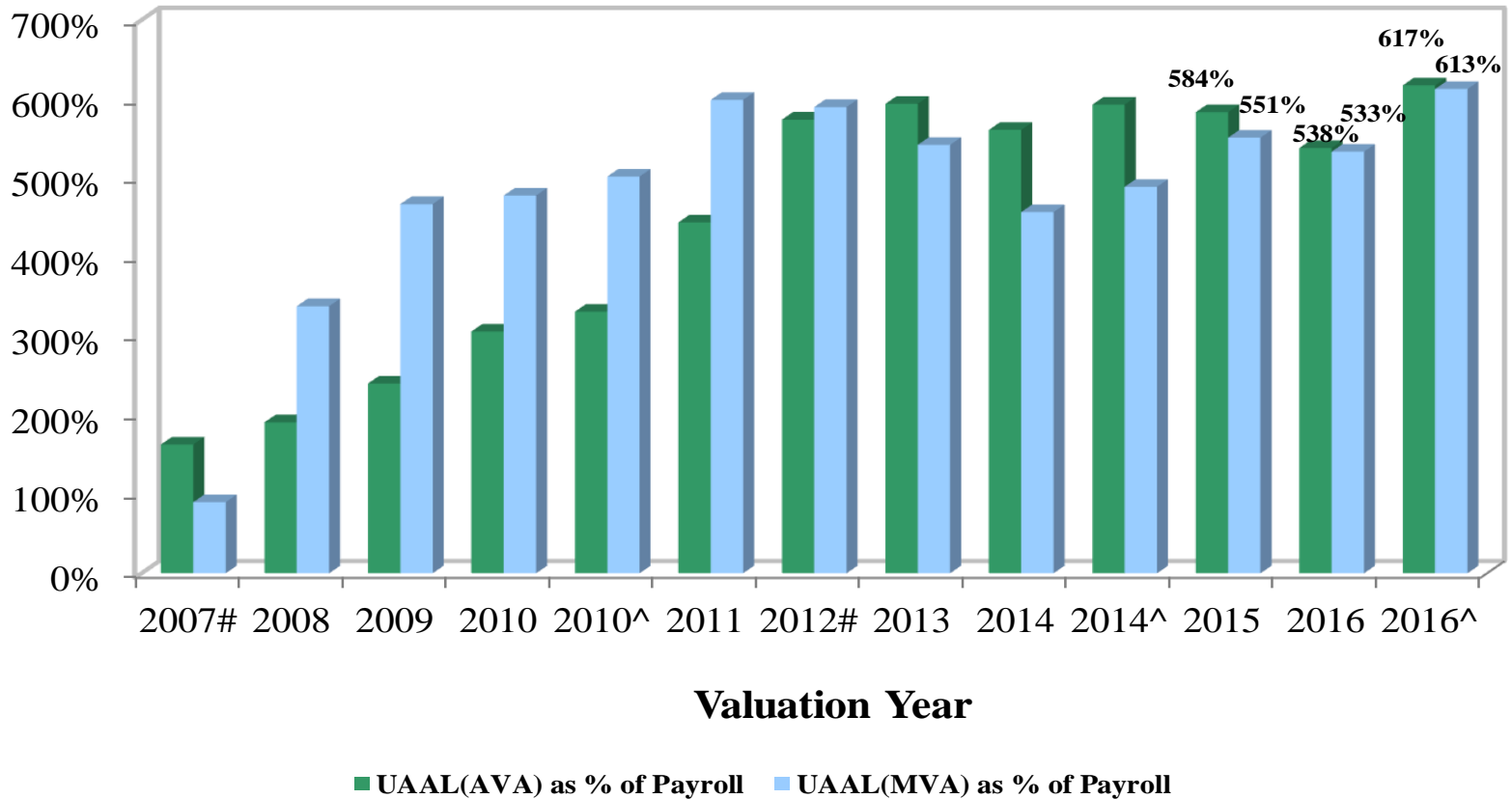
Retirement System Funded % Based on Actuarial Value and Market Value of Assets



Revised benefit provisions.
^ Revised actuarial assumptions.



Unfunded Actuarial Accrued Liability as a Percentage of Payroll



Revised benefit provisions.

^ Revised actuarial assumptions.



Comment on the Investment Markets and Other Issues

- ◆ Investment markets have been very volatile
- ◆ Valuation is based on a 5-year smoothed value of assets
 - ▶ Reduces the volatility of the valuation results
- ◆ 9/30/16 smoothed value of assets was lower than market value
 - ▶ Provides some margin for possible adverse investment experience over the next few years
- ◆ Optional Forms of Payment
 - ▶ Needed mostly for Hybrid Plan members
 - ▶ May wish to review factors after completion of the next experience study



Disclaimers

- ◆ This presentation is intended to be used in conjunction with the September 30, 2016 pension annual actuarial valuation report issued on April 24, 2017. 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.