PENSION RISK AND FALLING INTEREST RATES

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WHAT IS PENSION RISK?

- From the viewpoint of the plan sponsor, or the taxpayer, pension risk is the concern that the pension plan will be too costly or, conversely, that the plan has been overfunded and resources will have been misallocated.

- From the viewpoint of the plan participant, pension risk is the concern that the plan will not be able to pay benefits.

- From the viewpoint of the pension actuary, pension risk is the concern that pension plans will go by the wayside before we, ourselves, retire.

- What risk are we most concerned with:
  - Contribution levels
  - Funding level/solvency
  - Pension expense (GASB 67 & 68)

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COMPETING RISKS

- Contributions that are too low, which can result in:
  - Reductions of promised benefits upon bankruptcy or legal changes
  - Loss of confidence of plan members
  - Intergenerational equity
- Contributions that are too high, resulting in:
  - Misallocation of resources
  - Intergenerational equity
  - Unintended benefits
- Contributions that are too volatile, resulting in:
  - Budgetary volatility

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SOURCES OF RISK

- Gains and losses
- Changes in actuarial assumptions
- Changes in laws and regulations
- Systemic events, such as changes in life expectancies
- Statistical fluctuations
- Plan sponsor risk
  - Funding commitment
  - Granting of benefit increases
  - Granting of salary increases
  - Layoffs
- Correlation of Risks

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SOURCES OF GAINS AND LOSSES

- Economic
  - Investments
  - Salary increases
  - Inflation

- Demographic
  - Retirement
  - Turnover
  - Disability
  - Death (active vs. retired)
  - Benefit elections
  - Marital/Dependent Status

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TWO CATEGORIES OF RISK

- Experience gains and losses (short term)
  - Recognized in each valuation
  - Smoothing and amortization
- Changes in expectations (long-term)
  - Gains and losses until assumption change
  - Impact of assumption change is amortized

METHODS TO REDUCE VOLATILITY

- Asset smoothing

- Amortization of changes in unfunded liability

- Contribution smoothing

- Liability-driven investing (LDI)
  - Immunization-matching of maturities of fixed-income investments with maturities of plan liabilities
  - Annuity purchase
  - Matching of durations of liabilities with assets
    - Example: ERISA plans use corporate bond rates to determine liabilities
  - Reduces or eliminates gains as well as losses
  - Reduces expected returns increasing cost of plan

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COST OF REDUCING VOLATILITY

- Whenever you smooth or defer costs by amortization, you are creating intergenerational inequity as the price of less volatility

- Liability-driven investing can increase costs 20-30%, based on the assumption that stocks will outperform bonds in the future

- Annuities are a very expensive way to deliver benefits due to administrative costs and contingency loads

BENEFIT DESIGN TO REDUCE RISK

- Compensation risk
  - Limits on compensation
  - Career average salary
  - Benefits non-salary related
- Limited ancillary benefits
- Ultimate: Defined contribution plan
  - Eliminates nearly all risk to plan sponsor by shifting it to the participant
  - Less efficient at delivering benefits, workforce management aspects disappear
  - Leakage (loans, hardship withdrawals, distributions at termination of employment)
  - Investment management by participant instead of professionals leads to 1% per year lower investment return
    - 5% employer contribution might support a defined benefit of 21% of pay, but a defined contribution plan of only 12% of pay

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RISK-SHARING

- Variable annuities transfer longevity risk back to plan and return investment management to professionals
- Floor-offset plan
  - Defined contribution plan provides basic benefits
  - Defined benefit plan includes minimum pension in excess of DC benefit
- Direct risk-sharing provisions
  - Increased member contributions when market doesn't meet expectations
  - Decreased benefits (e.g., COLAs) based on plan funding level
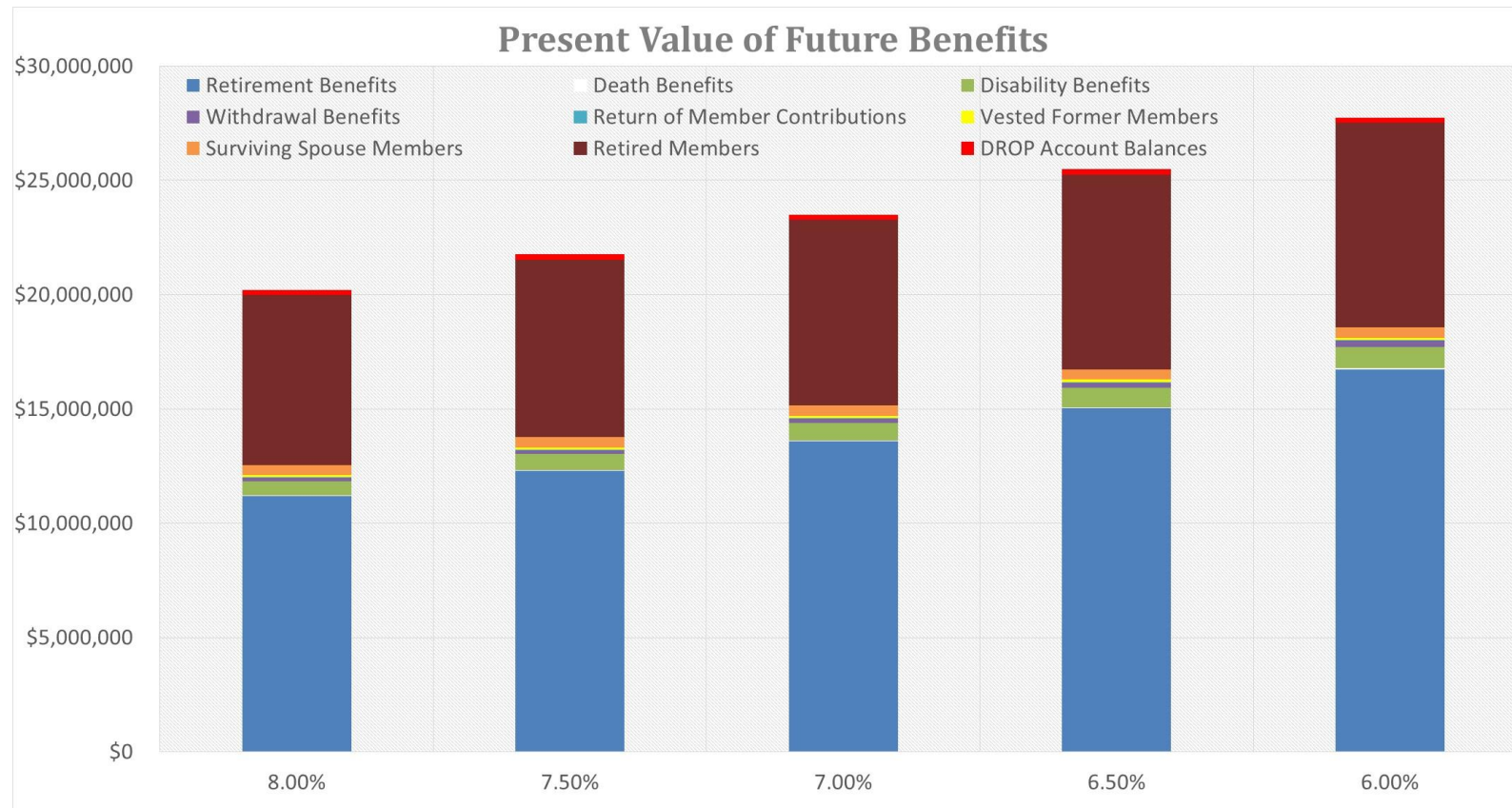
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CONTRIBUTING THE MEAN

- When we prepare an actuarial valuation, our answer is basically the mean of the distribution of potential contributions

- The distribution will have variability and, through simulations, we can create a more fully described distribution, including standard deviations

- We can create a contribution that is the median of the distribution, so that 50% of the time it will be too high and 50% too low.

- Similarly, we can determine a contribution that will be sufficient 75% or 95% or 99% of the time (confidence intervals)

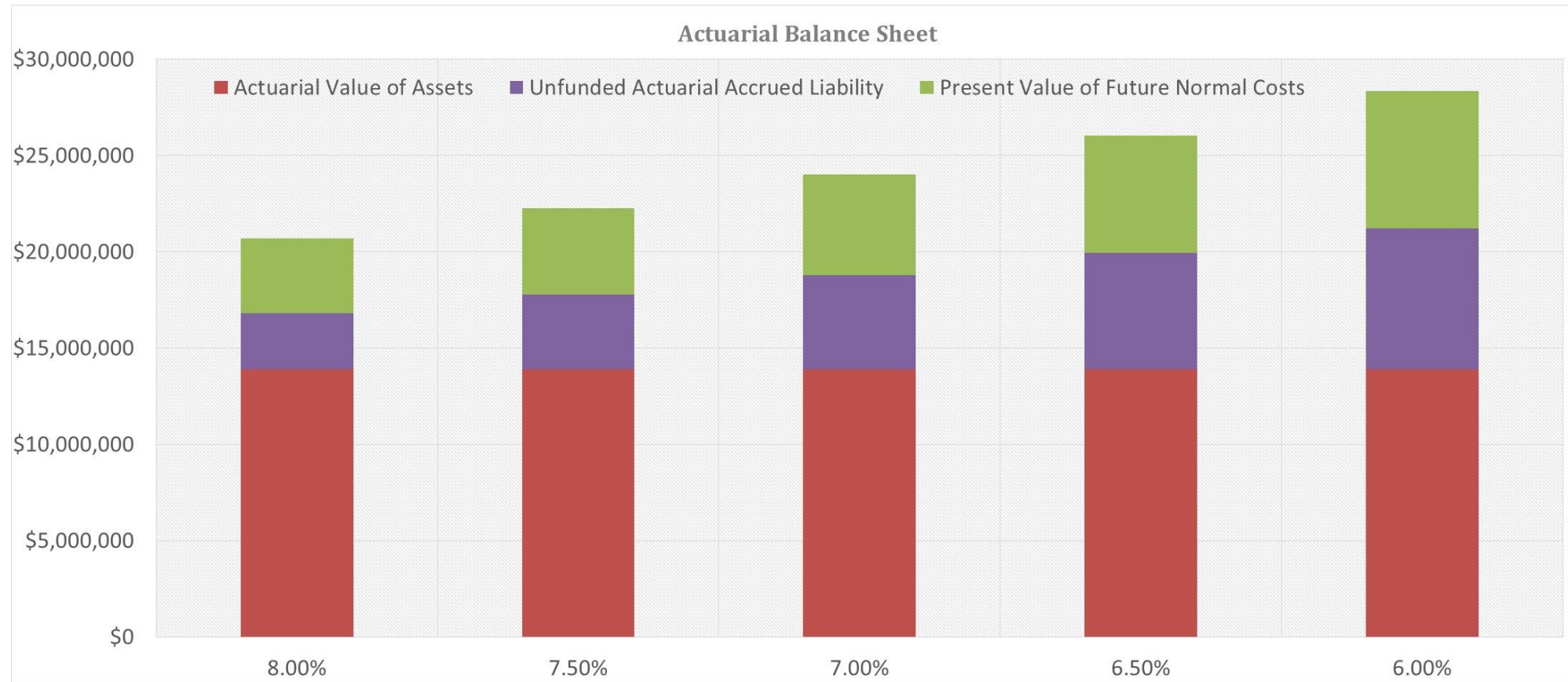# IMMEDIATE IMPACT OF A 1% INCREASE IN INTEREST RATES

- Example of plan that is 90% funded:
  - Liability = $1 million, Assets = $900,000
  - Assume assets are 50% fixed at 3%, 50% equity
  - If interest rate increases to 4%, fixed income drops from $450,000 to $415,000
  - Fund balance drops to $865,000
    - Plan is now 86.5% funded
    - If amortized over 10 years at 7%, $35,000 loss increases contribution by $4,650 per year
    - If asset gains and losses are smoothed over 5 years, this will be recognized at $7,000 per year
      - If amortized over 10 years, contribution increases by $931 each year for 5 years, stays level for 5 years then drops by $831 for each of the next five years.
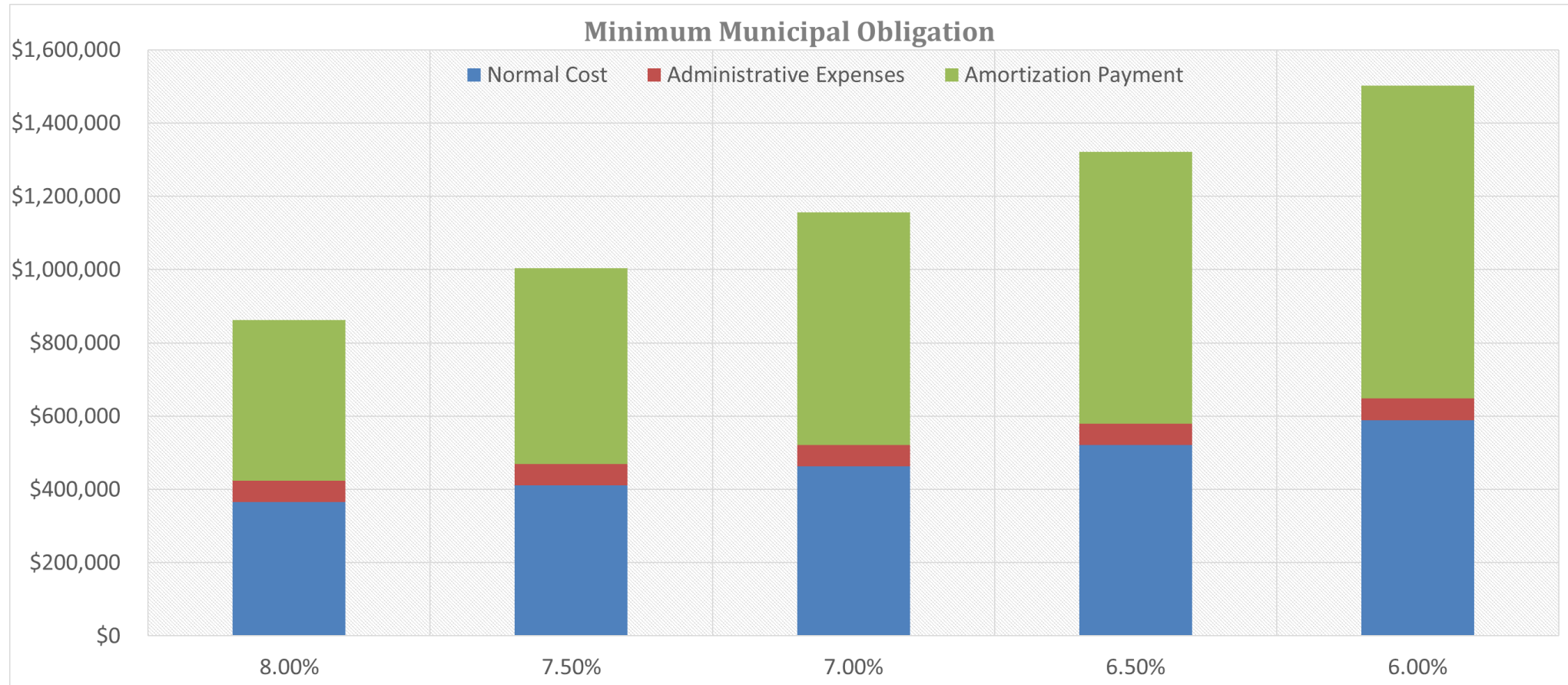
Present Value of Future Benefits

Legend:
- Retirement Benefits
- Death Benefits
- Disability Benefits
- Withdrawal Benefits
- Return of Member Contributions
- Vested Former Members
- Surviving Spouse Members
- Retired Members
- DROP Account Balances

X-axis: 8.00%, 7.50%, 7.00%, 6.50%, 6.00%

Y-axis: $0, $5,000,000, $10,000,000, $15,000,000, $20,000,000, $25,000,000, $30,000,000

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CHANGE IN UNFUNDED LIABILITY

Actuarial Balance Sheet

Minimum Municipal Obligation — stacked bar chart showing Normal Cost, Administrative Expenses, and Amortization Payment across discount rates 8.00%, 7.50%, 7.00%, 6.50%, and 6.00%.
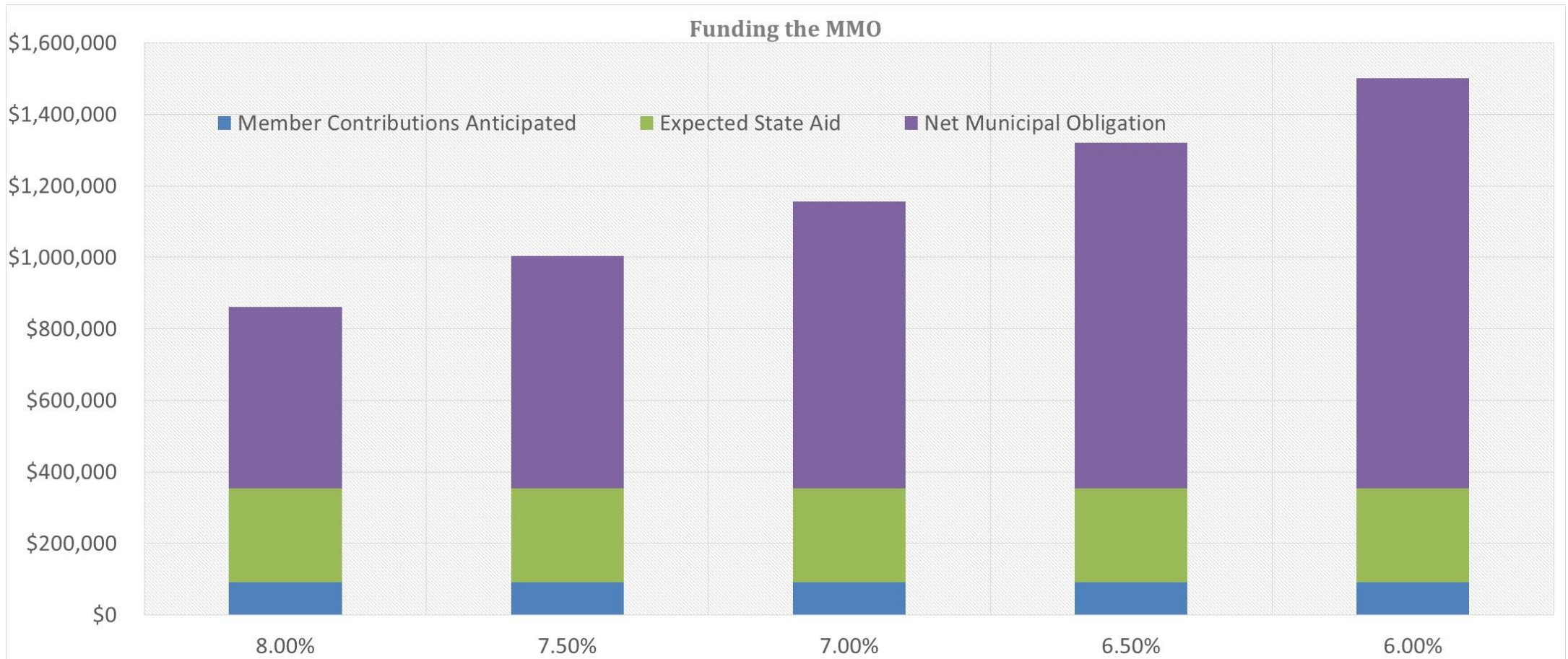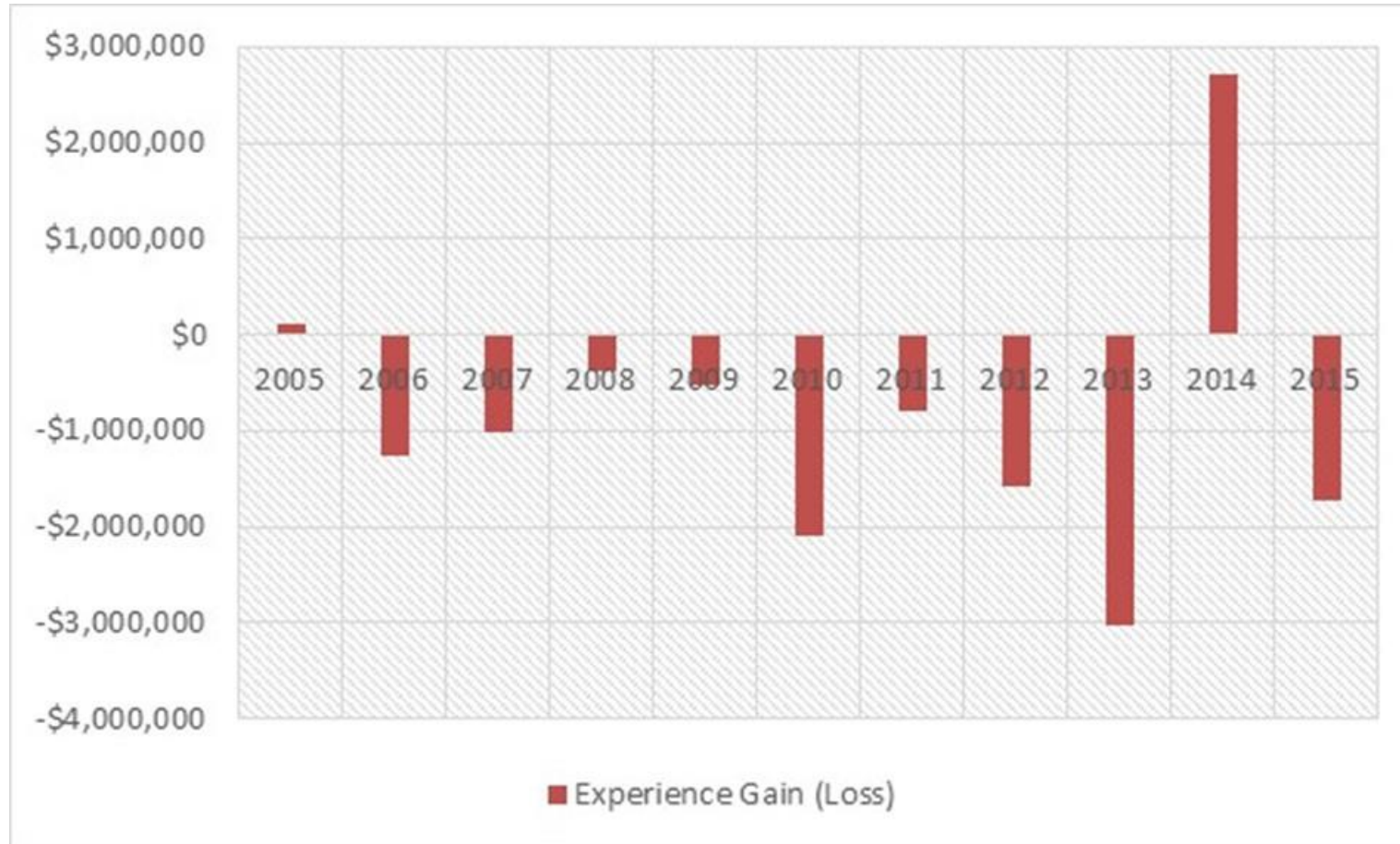
IMPACT ON SPONSOR CONTRIBUTION

TOTAL GAINS/LOSSES

EXPERIENCE GAINS/LOSSES ADD UP

SUSTAINABILITY OF PUBLIC PENSIONS

	SERS	PSERS	County Government Plans	Municipal Government Plans
Valuation Date	12/31/2015	6/30/2016	1/1/2014	1/1/2015
Investment Return Assumptions	7.50%	7.25%	7.0%-7.5%	6.44%
Market Value of Assets	$26.05 Billion	$49.96 Million		
Actuarial Value of Assets	$26.88 Billion	$57.39 Million	$8.56 Million	$15.45 Million
Actuarial Accrued Liability	$46.33 Billion	$100.11 Million	$9.82 Million	$23.48 Million
Shortfall	$19.45 Billion	$42.72 Million	$1.33 Million	$8.03 Million
Funding Percentage (Market)	56.3%	49.9%		
Funding Percentage (Actuarial)	58.0%	57.3%	87.2%	65.8%

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January 1, 2015 Unfunded Liabilities

- Bethlehem City, $35,998,374
- Allentown City, $42,132,900
- Wilkes Barre City, $49,450,744
- York City, $55,618,187
- Chester City, $61,239,939
- Reading City, $84,095,721
- Erie City, $86,464,278
- Scranton City, $158,351,576
- Pittsburgh City, $517,962,026
- The Rest (812 Municipalities), $417,165,150
- Next 90 Municipalities, $785,878,125
- Philadelphia City, $5,936,979,000

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QUESTIONS

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