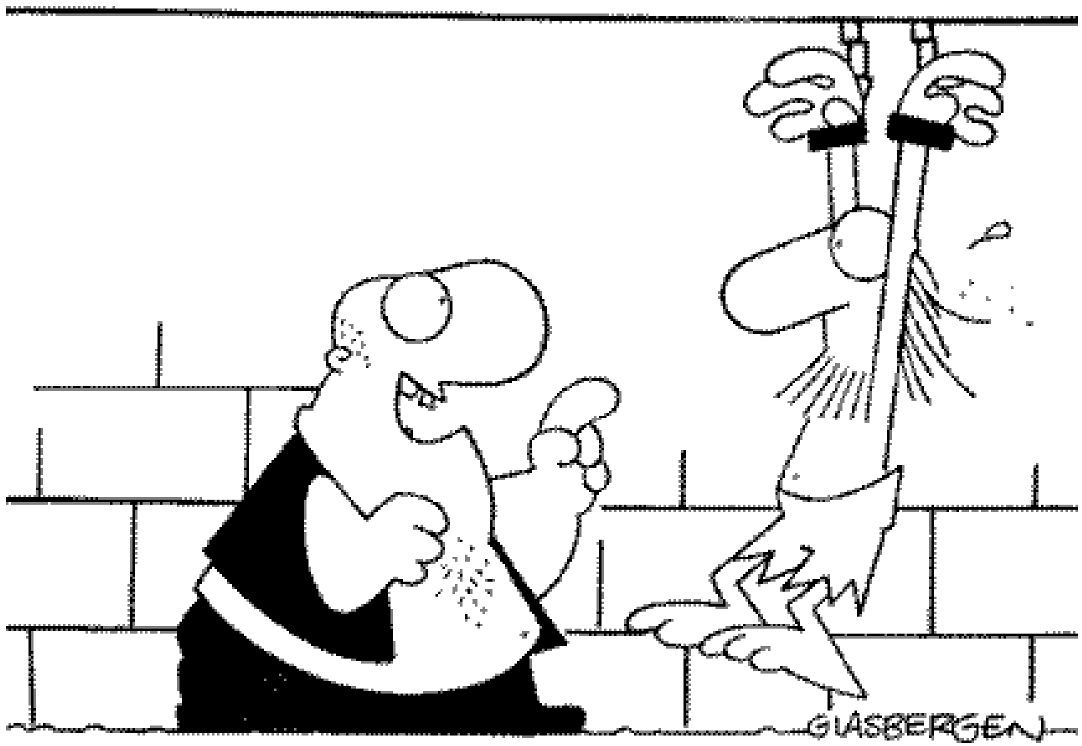
Actuary 101 and Troy ERS 12/31/2012 Valuation Results

November 11, 2013

Kenneth G. Alberts and Jeff Tebeau
Actuarial Consultants

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

Welcome to Actuarial 101

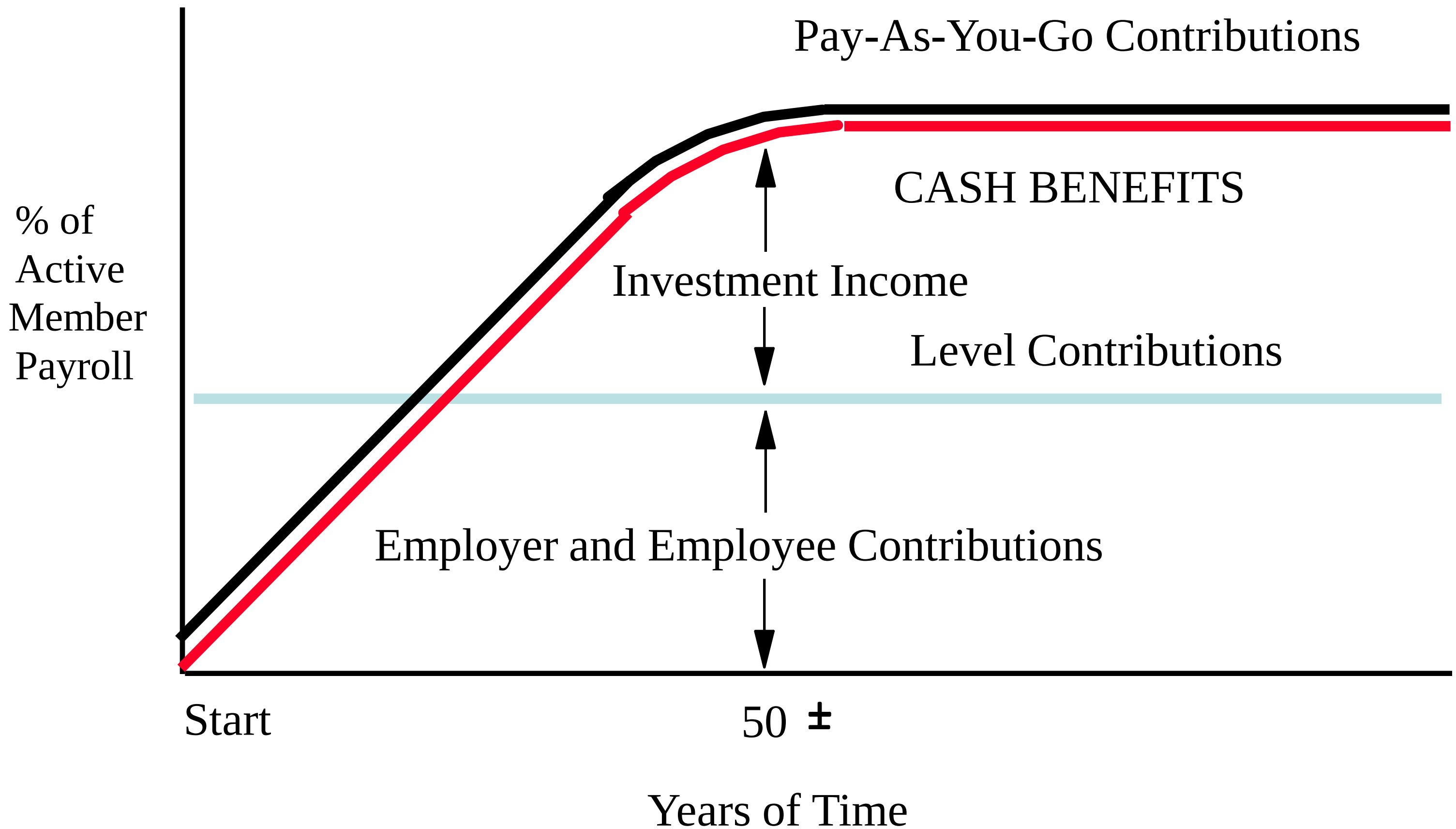


"How shall I torture you today?
Put you on the rack? Boil you in oil?
Make you listen to an actuary for an hour?

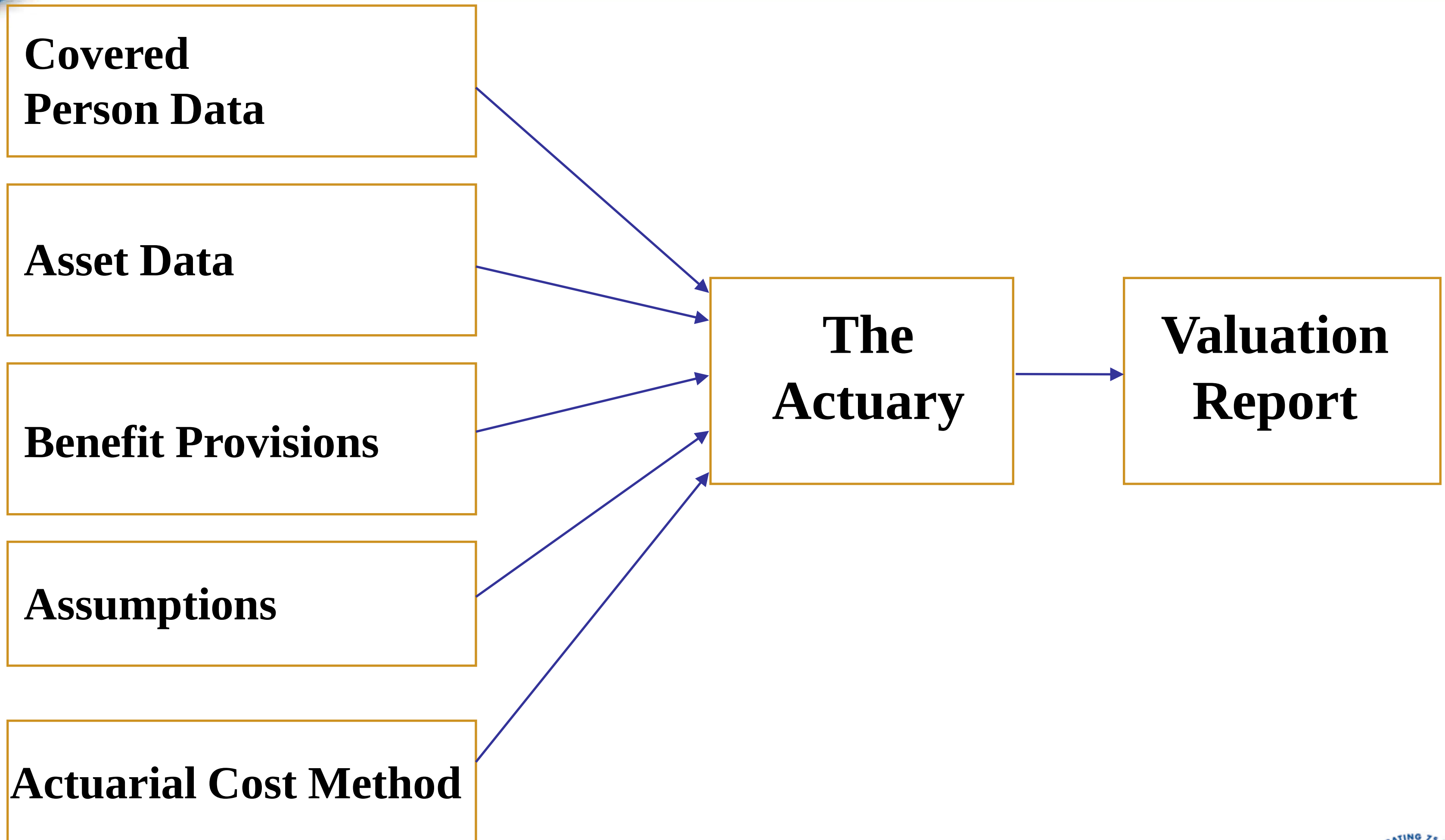
What is an Actuarial Valuation?

- A mathematical model that:
  - Estimates the cost of benefits provided by a retirement system
  - Determines the contribution (rate) needed to pre-fund the benefits provided by the retirement system
  - Measures funding progress
  - Analyzes experience during the year

The Whole Story



The Actuarial Valuation Process



Types of Assumptions

Demographic

- Retirement Rates
- Death Rates
  - Before Retirement
  - After Retirement
- Salary Increases

  (Merit and Longevity)
- Termination Rates
- Disability Rates

Economic

- Inflation
- Investment Return
- Salary Increases

  (Wage Inflation and Productivity)

The longer a plan is closed, the less important the active member assumptions are to the valuation process/results.

AXIOM

A change in assumptions will not change the long-term cost – only the timing of contributions to support promised benefits.

Value of All Expected Future Plan Obligations

C + I = B + E

Contributions + Investment Income = Benefits + Expenses

(Cost) = (Obligations)

The Concept of Present Value

- Actuarial calculations almost always begin with the calculation of a present value based on the amount and timing of B (benefits)
- The present value of B payable in the future is the amount of money that, if we had it today, would accumulate to the amount that will be payable in the future

The Concept of Present Value

- Assume you had to pay $1,080 next year;
- Assume you could earn exactly 8%;
- The present value of your debt is $1,000;
- The present value of B payable in the future is the amount of money that, if we had it today, would accumulate to the amount that will be payable in the future.

Actuarial Cost Method

- A method that assigns cost to past and future years in some manner
- There are several different methods (acceptable under actuarial standards) that assign these costs in different ways
- All the methods start with the total Present Value of Future Expected Benefit Payments (PVFB)

Actuarial Cost Method

- ERS uses the Aggregate Actuarial Cost Method for funding (a common method for closed plans) which does not produce an accrued liability
- The City of Troy uses the Entry Age Actuarial Cost Method for reporting ERS accrued liabilities in compliance with GASB Statement No. 50

The Aggregate Actuarial Cost Method

Present Value of Future Benefits
$160.4 million

Assets
$147.6 million

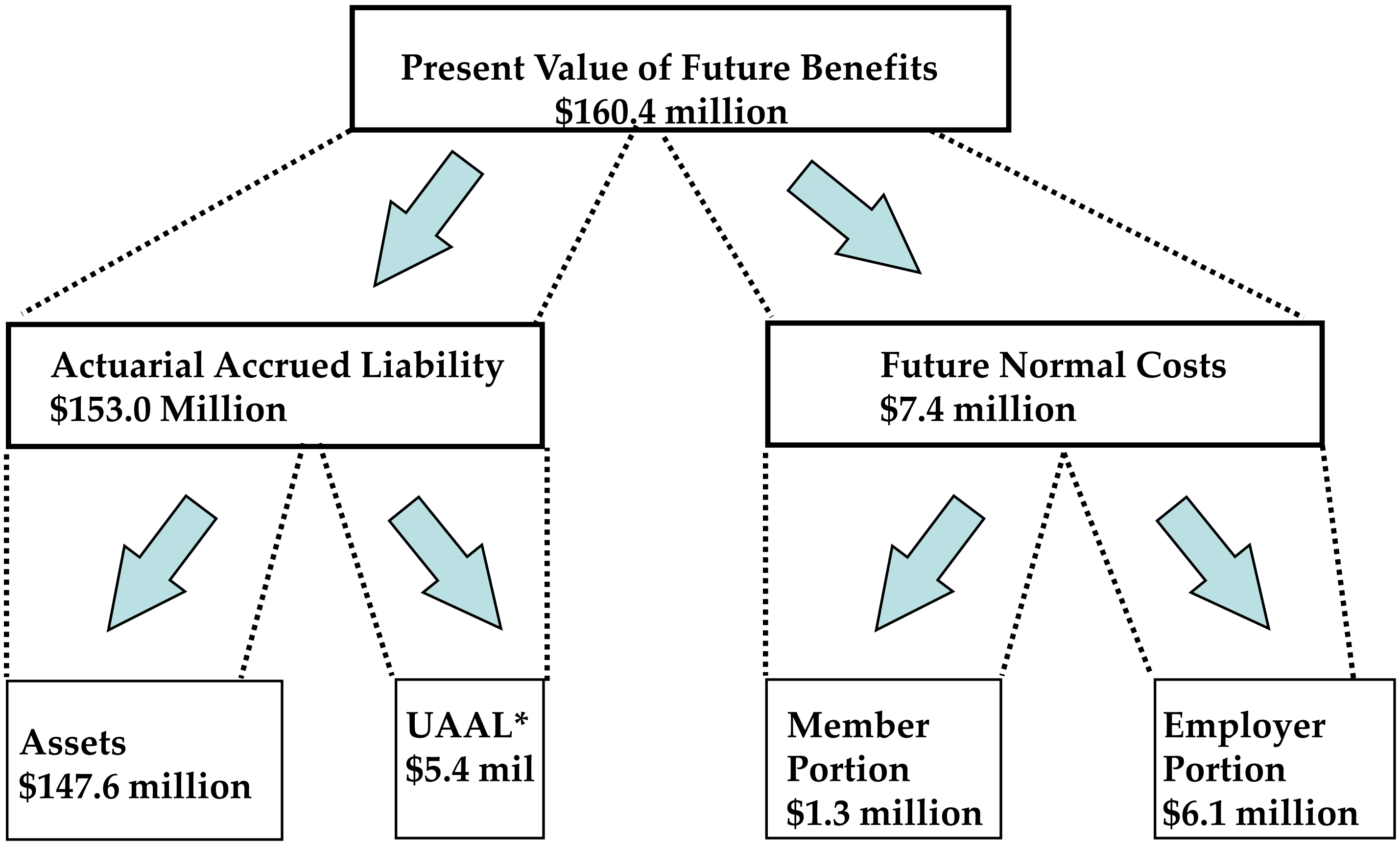
Future Normal Costs
$12.8 million

Member Portion
$1.3 million

Employer Portion
$11.5 million

Employer's $11.5 million is financed over the future working lifetime of the current covered active members resulting in a (normal cost) payment of $1.5 million for the year ending 6/30/15. This is the total employer contribution.

The Entry Age Actuarial Cost Method



**Unfunded Actuarial Accrued Liability*

If used for funding, employer contribution would be based on two pieces: normal cost and payment toward UAAL

Reasons for Smoothing Assets

- Market Value is a liquid value of non-liquid assets (70%+ invested in stocks)
- One day measure out of every 365 days
- This introduces volatility into the model that might not be real
- Funding value attempts to separate the real changes from the "noise" by smoothing the volatility

Funding (Actuarial/Smoothed) Value of Assets

Funding (Actuarial/Smoothed) Value of Assets

Future Need for Asset Smoothing

- As the plan winds down (maybe several years/decades in future), the plan may begin to invest in less volatile instruments, due to cash needs
- As asset allocation changes, it may be prudent to shorten smoothing period (currently 5 years)
- Eventually, asset smoothing may not be needed

Disclaimers

- Circular 230 Notice: Pursuant to regulations issued by the IRS, to the extent this presentation concerns tax matters, it is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or (ii) marketing or recommending to another party any tax-related matter addressed within. Each taxpayer should seek advice based on the individual's circumstances from an independent tax advisor.

- This presentation shall not be construed to provide tax advice, legal advice or investment advice.

- 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.

- This presentation expresses the views of the author and does not necessarily express the views of Gabriel, Roeder, Smith & Company.

ACKNOWLEDGEMENT

Thank you to Randy Dziubek and Brad Armstrong who checked and peer reviewed this presentation