Cavanaugh Macdonald
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Montana Teachers' Retirement System

SAVA Committee
Joint meeting with LFC
June 12, 2012

Actuaries

Actuaries

Work on Problems in Business and Finance Involving

- Payment of money in the future that is contingent upon occurrence of future events
- Risk management

Actuaries' Work for Retirement System

Actuarial Valuation

- Calculate Contribution Rates
- Determine funded status
- Prepare GASB Reporting Information
- Special studies on proposed legislation
- Opinion on actuarial soundness

Cash Flow Characteristics and Need for Actuarial Valuations

Basic Retirement Funding Equation

$$C + I = B + E$$

C = Contributions

I = Investment Income

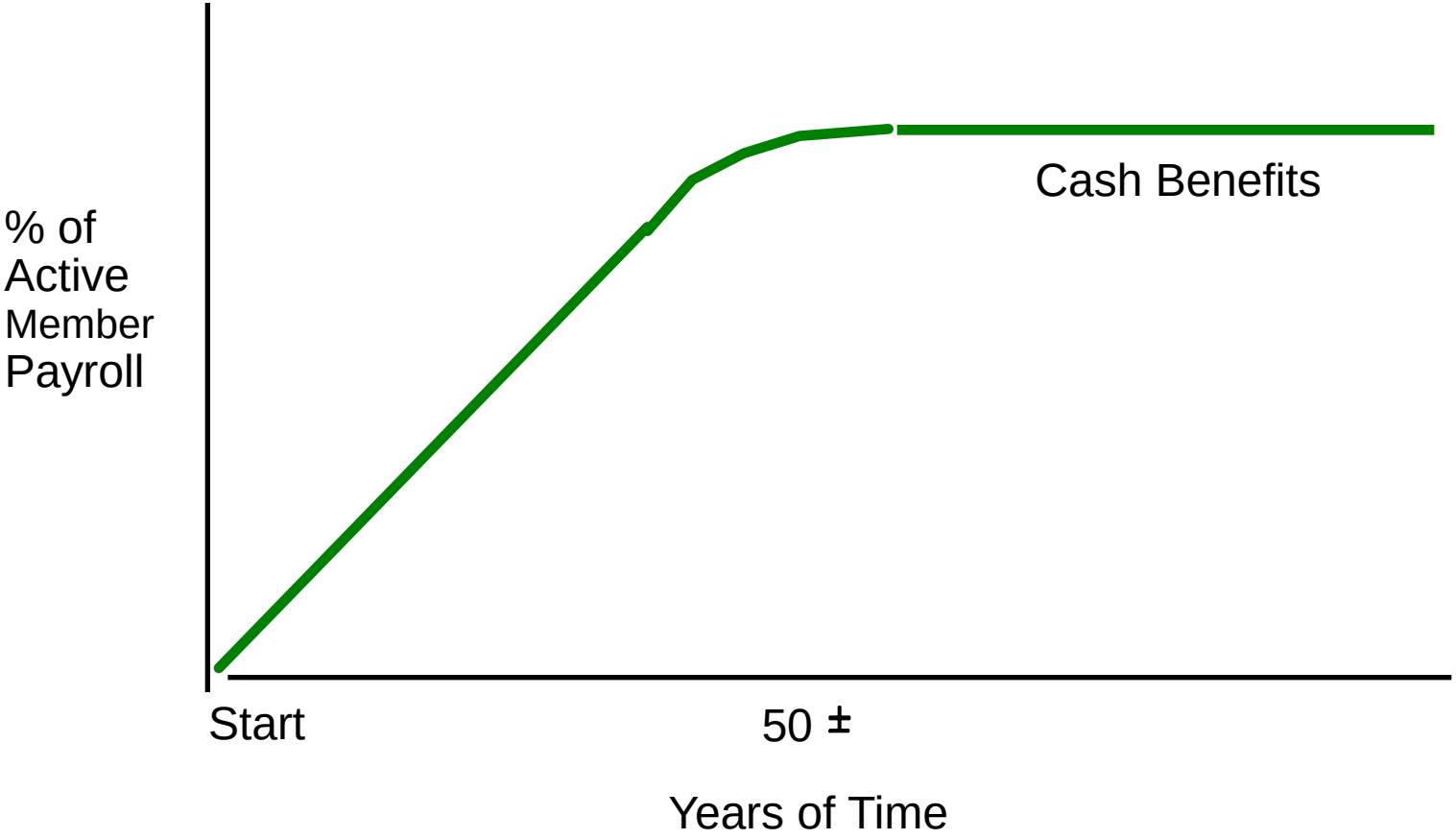
B = Benefits Paid

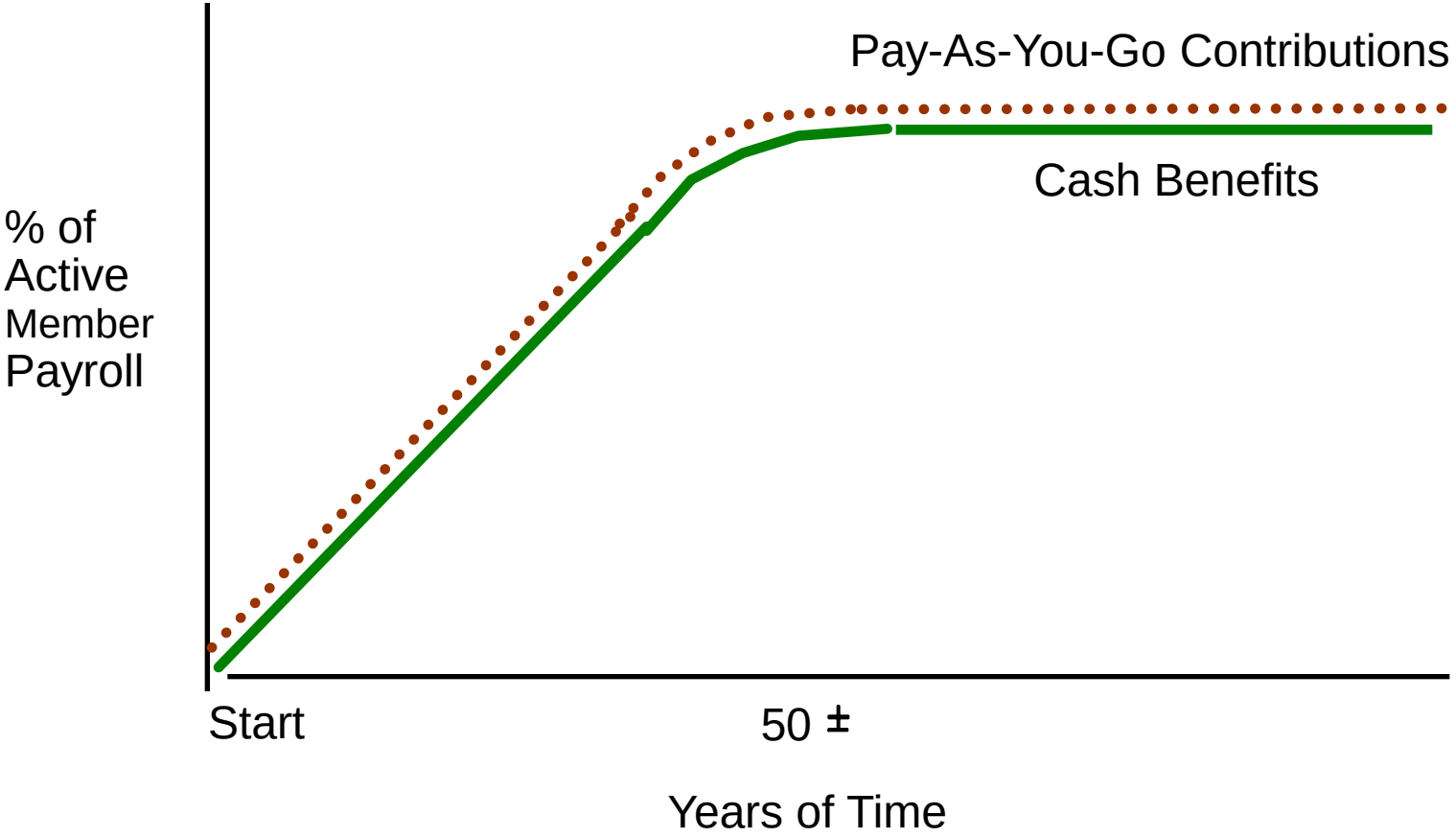
E = Expenses (administration)

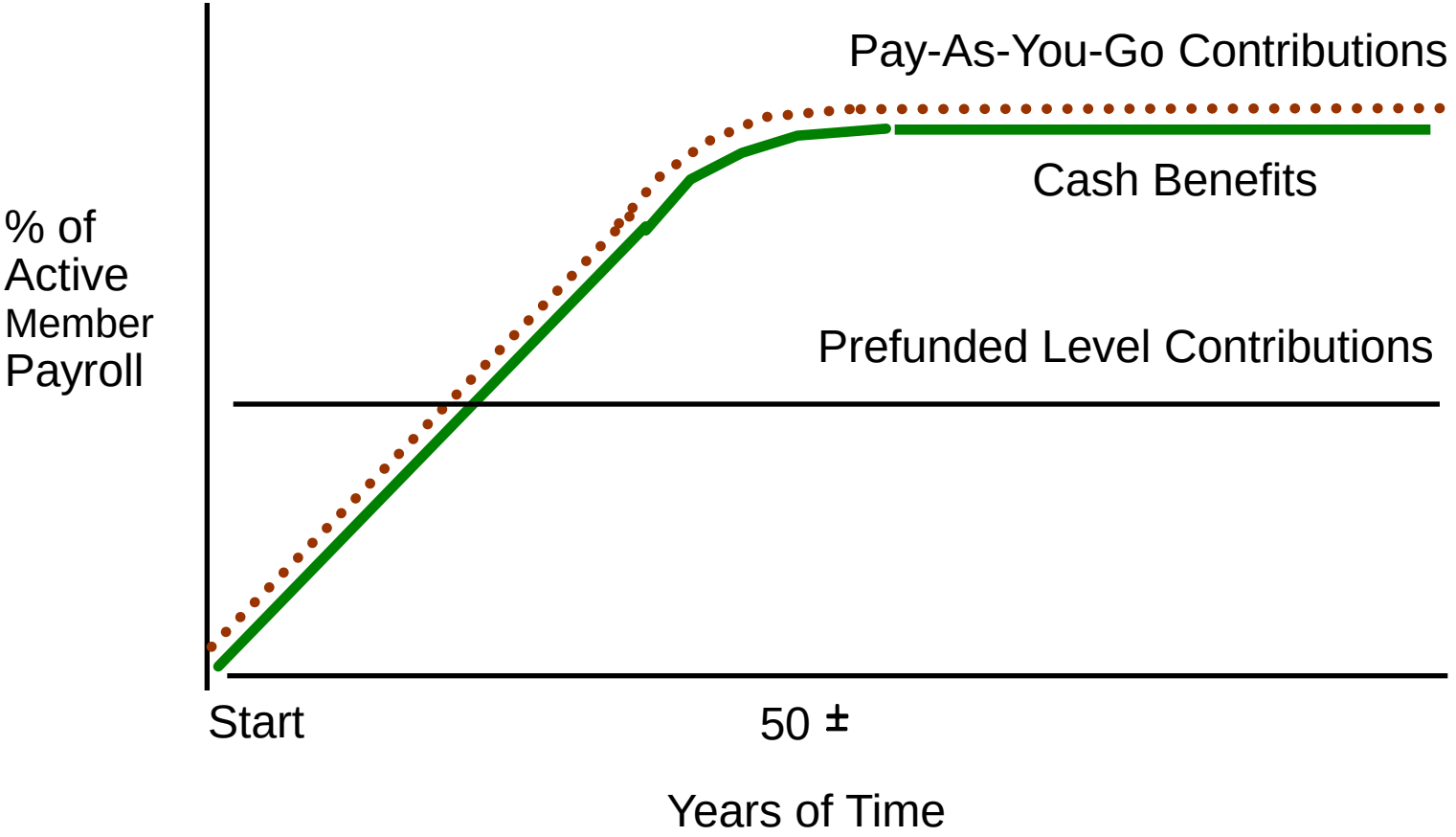
Two Fundamentally Different Methods of Financing Retirement Benefits

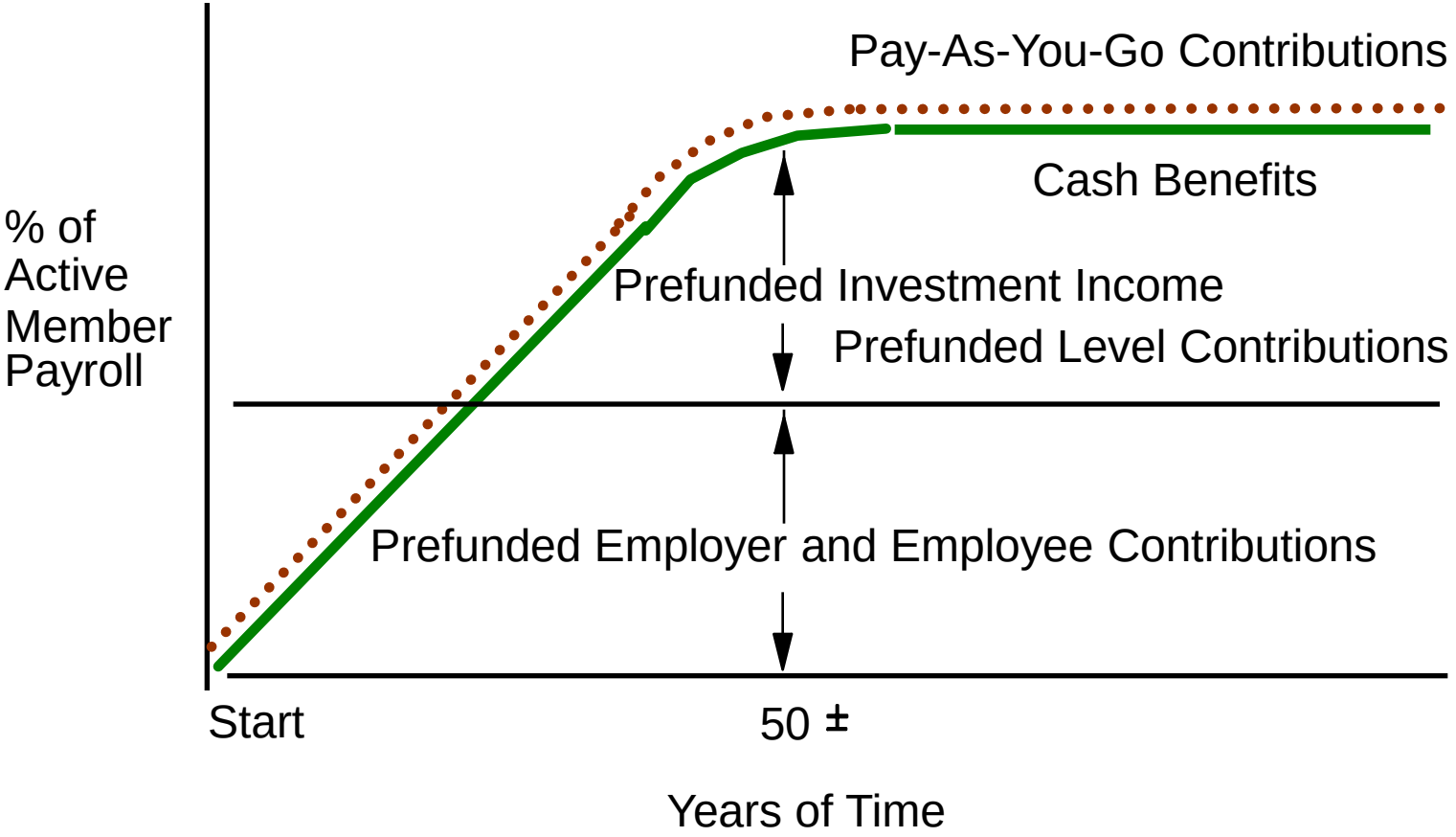
Social Security: Pay-As-You-Go
Current generation pays benefits of prior generation.

Most Public Systems: Prefunded
Current generation saves money for its own retirement; prior generation did the same.


% of
Active
Member
Payroll
Cash Benefits
Start
50 ±
Years of Time


Pay-As-You-Go Contributions
Cash Benefits
% of Active Member Payroll
Start
50 ±
Years of Time


Pay-As-You-Go Contributions
Cash Benefits
% of
Active
Member
Payroll
Prefunded Level Contributions
Start
50 ±
Years of Time


Pay-As-You-Go Contributions
Cash Benefits
% of
Active
Member
Payroll
Prefunded Investment Income
Prefunded Level Contributions
Prefunded Employer and Employee Contributions
Start
50 ±
Years of Time

Selecting Assumptions About Future Events

Decremental

- Withdrawal
- Death while active
- Disability
- Retirement
- Death after retirement

Economic

- Inflation
- Real return for assets
- Salary increases
- COLA’s

Understanding Economic Assumptions

Interest Rate
- Inflation Rate
= Real Rate of Return

Interest rate determines how much money we think we'll have.

Inflation rate tells us what we think it will buy.

Understanding Economic Assumptions

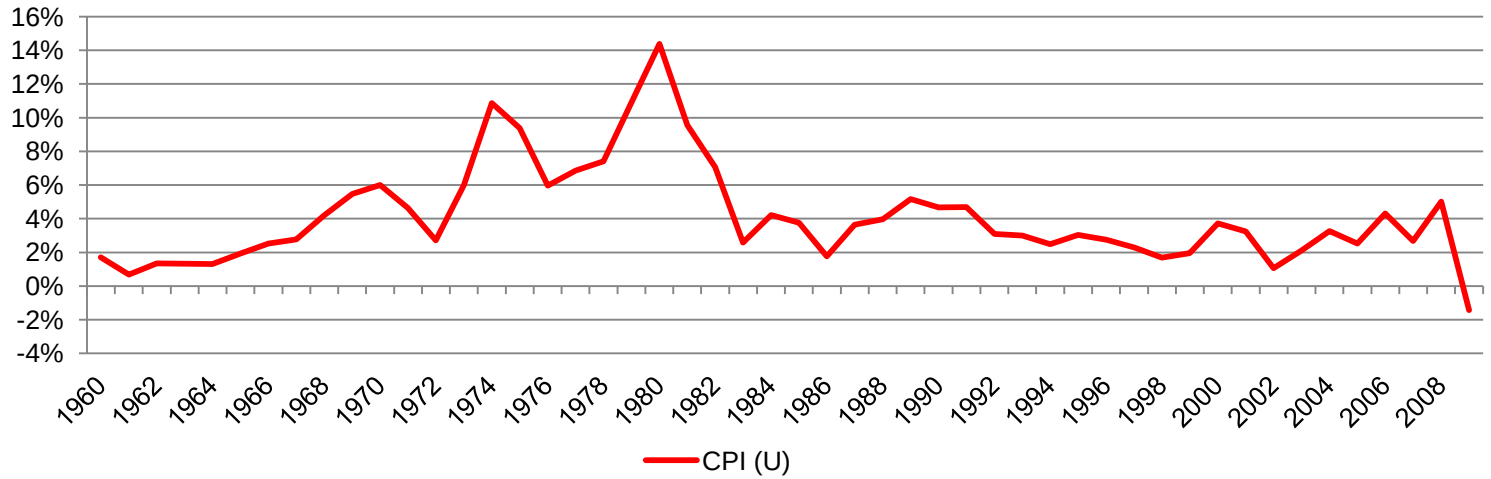
- ASOP 27 provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit pension plans
- No one knows what the future holds with respect to economic and other contingencies, the best an actuary can do is use professional judgment to estimate possible future economic outcomes based upon past experience and future expectations (the actuary should not give undue weight to recent experience)

Understanding Economic Assumptions

- The actuary's best-estimate assumption is generally represented by a best-estimate range, which is the narrowest range for which the actuary reasonably anticipates that the actual results, are more likely to fall than not, and then select a point within the best estimate range
- Constructing the investment return range
  - Building-Block Method: expected future investment return of each asset class is a combination of the components of investment return which includes inflation and real return for each asset class which must be consistently applied

Economic Assumptions
Price Inflation

- Historical data: Annual CPI (U) Increases



- Recommendation:

Price Inflation Assumption	
Reasonable Range	2.00% - 4.00%
Recommended	3.50%

Economic Assumptions
Investment Return

- Stochastic projection expected range of real rates of return

Time Span in Years	Mean Real Return	Standard Deviation	Real Returns by Percentile				
			5th	25th	50th	75th	95th
1	5.31%	12.53%	-9.9%	-1.8%	4.6%	11.6%	22.9%
5	4.76%	5.56%	-2.3%	1.7%	4.6%	7.7%	12.3%
10	4.69%	3.93%	-0.3%	2.5%	4.6%	6.8%	10.0%
20	4.66%	2.78%	1.1%	3.1%	4.6%	6.1%	8.4%
30	4.65%	2.27%	1.7%	3.4%	4.6%	5.9%	7.7%
50	4.64%	1.76%	2.4%	**3.7%**	4.6%	**5.6%**	7.0%

- Based on capital market assumptions utilized by Board of Investments to set asset allocation policy

Economic Assumptions
Administrative and Investment Expenses

- Administrative and Investment Expenses

FY Ending June 30	Administrative Expenses	Investment Expenses	Total Expenses	Market Value of Assets	Expense Ratio
2005	$1,560,820	$5,988,496	$7,549,316	$2,487,136,540	0.30%
2006	$1,579,155	$7,687,038	$9,266,193	$2,745,771,047	0.34%
2007	$1,434,103	$13,126,101	$14,560,204	$3,209,259,107	0.45%
2008	$1,750,765	$23,228,638	$24,979,403	$2,993,392,632	0.83%
2009	$1,853,873	$15,459,976	$17,313,849	$2,301,828,565	0.75%

- Recommended long-term expense ratio of 0.50%

Economic Assumptions
Investment Return

- Recommendation
  - ASOP No. 27 building block approach
  - Projection results – 50 years

Item	25th Percentile	50th Percentile	75th Percentile
Real Rate of Return	3.70%	4.60%	5.60%
Inflation	3.50%	3.50%	3.50%
Expenses	(0.50)%	(0.50)%	(0.50)%
New Investment Return	6.70%	7.60%	8.60%

Investment Return Assumption	
Reasonable Range	6.70% - 8.60%
Recommended*	7.75%

* System will require an 8.50% rate of return in the future in order for the current statutory rates (17.11%) to be sufficient to fund the System

Fundamentals of Actuarial Valuations & Plan Sponsor Liabilities

Present Value

The present value of an amount of money payable in the future is the amount of money that, if we had it today, would accumulate to the amount that will be payable considering

- Investment Return
- Probability that money will be paid

Valuation Results

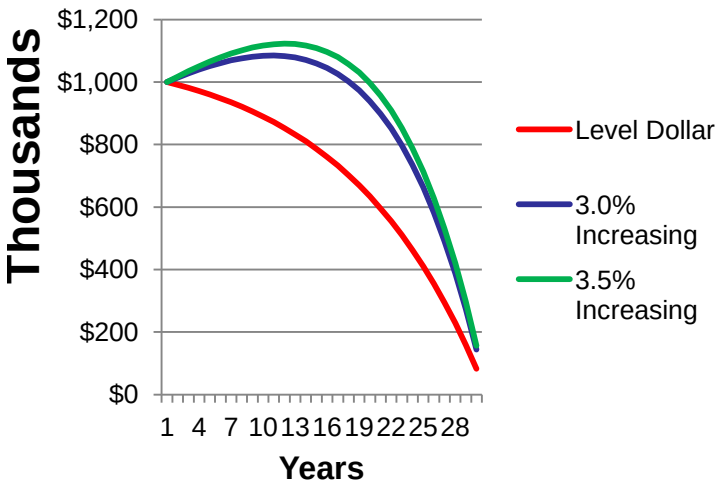
Contribution For	Description
Normal Cost	Value of this year's expected benefit accruals
UAAL	Unfunded Actuarial Accrued Liability = Accrued Liability - Assets

"Unfunded Liabilities" are a natural part of retirement system funding, comparable to a mortgage on a home. A plan which is 100% funded is required to contribute the normal cost.

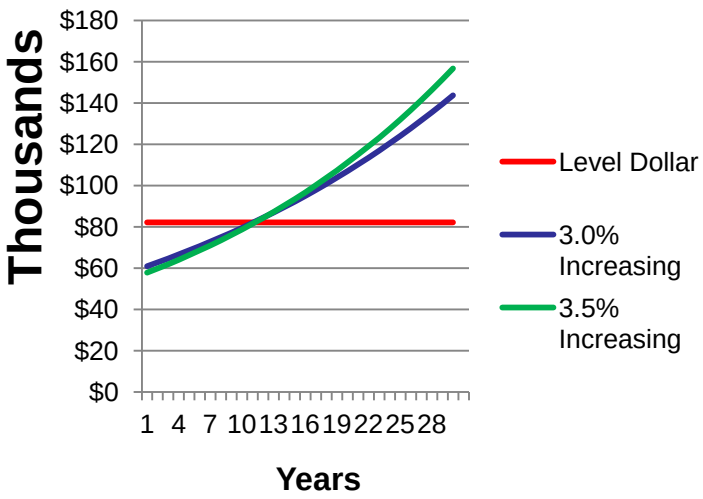
UAAL Financing
Level Percent of Pay vs. Level Dollar

- Payroll Growth Assumption
  - Critical to Level-Percent of pay financing the UAAL
  - Currently assume 4.5%

UAAL Balance



UAAL Payment



Causes of Unfunded Actuarial Accrued Liabilities

1. Granting initial benefits or granting benefit increases for service already rendered.

2. Actual experience which is less favorable than assumed. Examples follow:
   a. Lower rates of investment earnings
   b. Salary spiking
   c. Earlier retirement date(s)
   d. Lower death rates
   e. Lower rates of non-death terminations

Changes in Major Assumptions
Effect on Liabilities and Contributions

Assumption	Action	Usual Effect
Interest Rate	Increase	Decrease
Retirement Rate	Retire younger	Increase
Turnover Rate	More Terminations	Decrease

Asset Valuation Methods for Public Retirement Systems

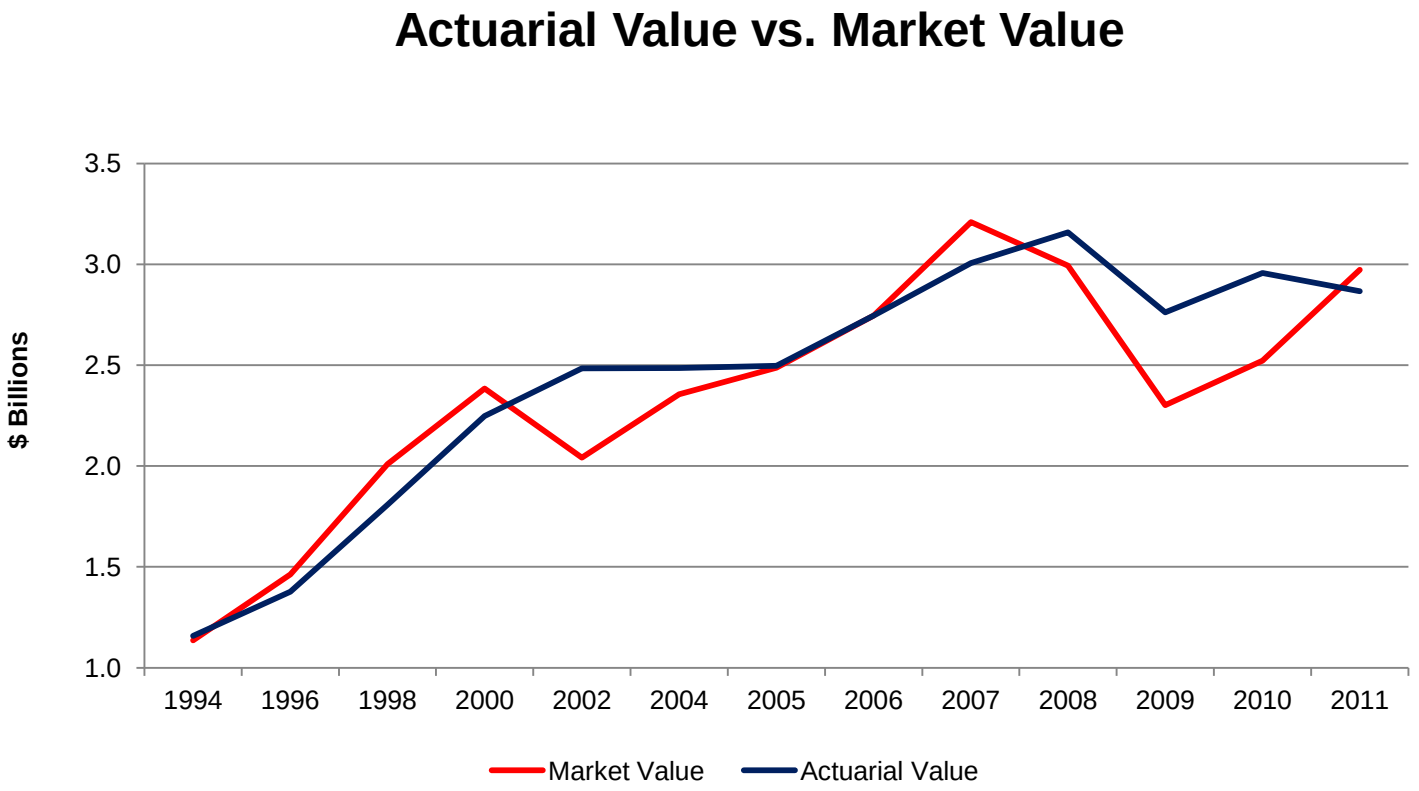
Asset Valuation Methods

- Market
- Smoothed Market

Asset Valuation Methods

- Market Price on one day is not a reliable measure of long term value
  - Short term factors obscure long term value
  - Sharp ups and downs
  - Misleading

Funding Value of Assets



Actuarial Value is expected to be:

- Below Market when market is doing well
- Above Market when market is doing poorly

July 1, 2011
Valuation Results

Funding Results

	July 1, 2011 Valuation
Total Normal Cost Rate	9.64%
Less Member Rate	7.15%
Employer Normal Cost Rate	2.49%
Rate to Amortize UAAL	7.47%
Total Employer Statutory Rate	9.96%
Actuarially Required	13.49%
Actuarial Accrued Liability	$4,658.6 million
Actuarial Value of Assets	$2,866.5 million
Unfunded Accrued Liability	$1,792.1 million
Amortization Period (Statutory Rate)	71 years
Contribution Rate Shortfall	3.53%

Conclusion

- Recent market downturn has put pressure on employer contribution rates just as the economy has shrunk state revenues
- Employer and employee contribution rates are set in State Statute
  - Employers contribute 7.47%
  - Employees contribute 7.15%
  - State contributes 2.49%
- In the past these contributions were sufficient to fund the normal cost and amortize the UAAL within a 30 year period
- Absent of extraordinary investment gains in the future, current employer and employee contribution rates are not sufficient to fund the System (System will run out of money)

Conclusion

- System will require an 8.50% rate of return in the future in order for the current statutory rate to be sufficient to fund the System

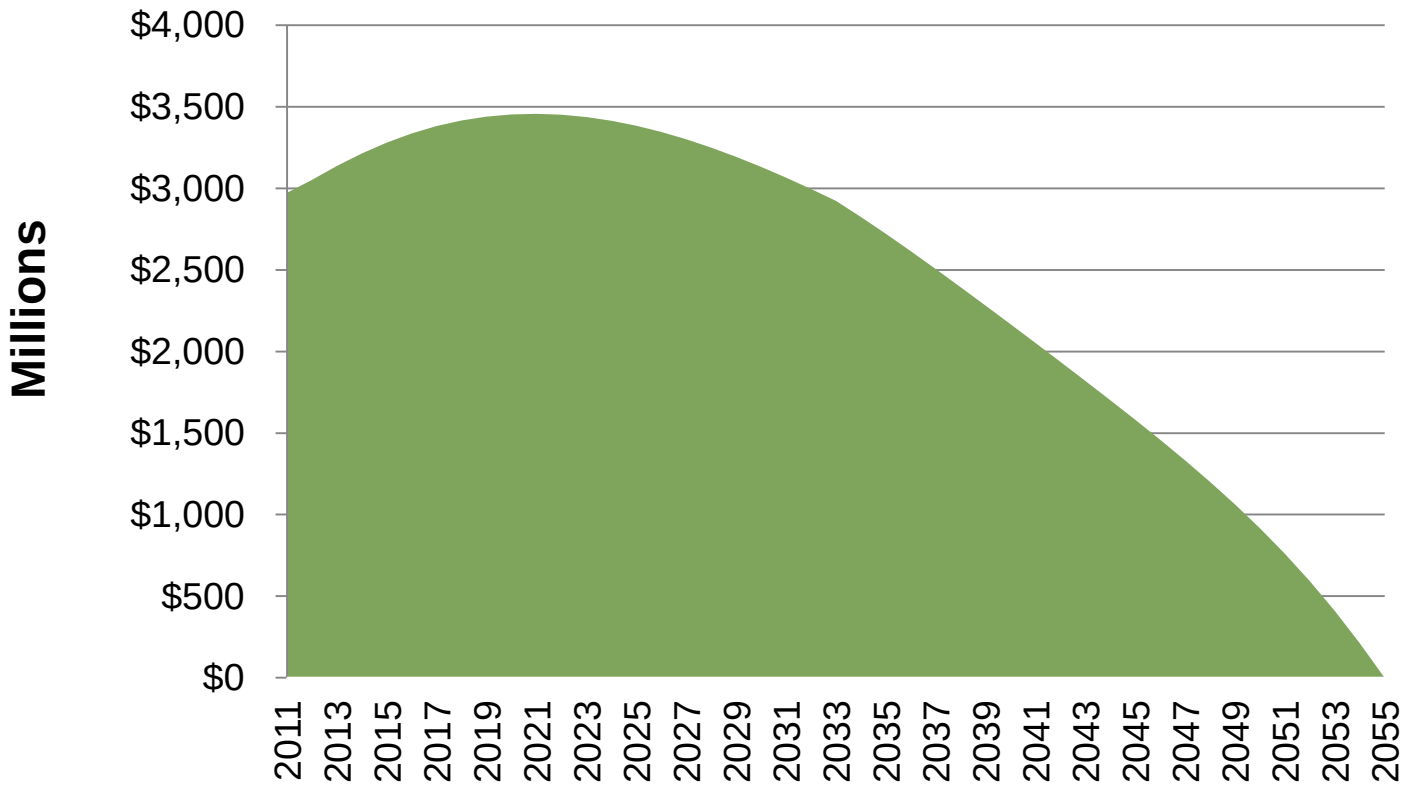
- TRS Board's proposal to Actuarial fund TRS as required by MT. Constitution
  - Balance contributions and benefits
  - Increase Employee Contributions – current and future entrants
  - Substantial ongoing funding
  - Change benefit structure for new entrants
  - Share actuarial gain and loss risk
  - Limit risk of impairment of contract or funding litigation

Headline Funding Issue

- As of July 1, 2011, TRS has a $1.8 billion unfunded liability.
- Current statutory contribution rates already fund two-thirds of that liability, leaving a shortfall of about $633 million.
- Based on the 2011 actuarial valuation, this represents a 3.53% gap between current contribution rates and being actuarially funded over 30-years. In short, TRS needs additional funding of approximately $30 million a year, or smaller adjustments over the next few years.

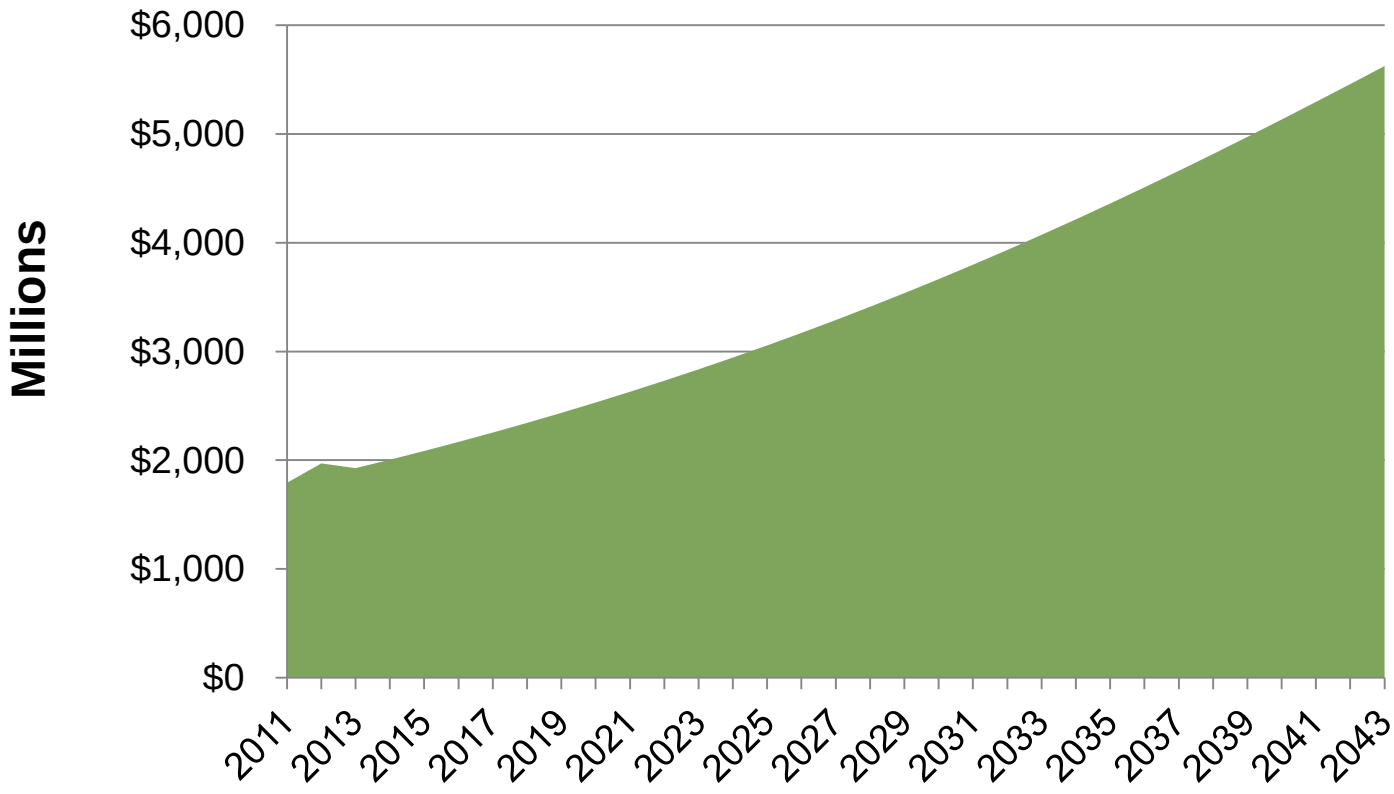
Projected TRS Assets

(If funding continues at current levels)



Projected TRS unfunded liability

(If funding continues at current levels)



Proposed Funding Legislation Changes Affecting Current Members

- Increase the employee contribution rate from 7.15% to 8.15%, reducing the employer's contribution toward the normal cost to only 1.49%. Set triggers to return the employee contribution rate to 7.15% once TRS has reached a sustainable funding level.
- Secure new funding source sufficient to reduce the amortization period to a point where the system is sustainable, e.g., increase in the employer contribution rate, and/or in the state supplemental contribution rate, a one-time transfer of surplus reserves, annual lump sum payments such as the Governor's proposal to transfer $25 million per year from State land revenues, or a combination of additional funding sources.
- Other minor plan changes may also be considered provided the legislature has taken all other steps reasonable and necessary to actuarially fund the system. One possibility might be an increase in early retirement age from 50 to 55.

Proposed Funding Legislation Changes Affecting New TRS Members

- Set employee contribution rate at 8.15%. with triggers to adjust for adverse experience
- Full retirement benefits at age 60 with 5 or more years, or any age with 30 years (eliminating 25-year retirement at any age). Or a rule of 90: age plus years of service equals 90.
- Early retirement at age 55 (instead of 50) and vested (5 years).
- Average final compensation based on 5 highest consecutive years' earnings.

Changes Affecting New TRS Members
(Continued)

- Keep multiplier at 1.6667% for members who retire with less than 30 years of service. Raise it to 2.0% for members who retire with 30 or more years of service.
- Limit disability benefits to members who are not eligible for unreduced service retirement benefits.
- Limit eligibility for unreduced survivor benefits to members who die while an active contributing member or within one year of leaving active service.

Housekeeping Legislation

- Definitional changes
- IRS qualification requirements
- Clarification of tax deferral options regarding termination pay
- Administrative changes affecting retiree health insurance premiums withheld from benefits
- Other non-substantive changes

Post-Retirement Employment

- Clarify application of earnings limitations
- IRS requirement affecting normal retirement age
- Bona fide separation from service
- Definition of a governmental plan

University Supplemental Contribution Increase

- As a result of closing the TRS, 19-20-621, MCA requires each employer within the University System fund their share of the UAAL by July1, 2033
- Current supplemental contribution rate is 4.72%
- 2010 study shows the rate should be 8.52%
- Based on July 1, 2012, actuarial valuation anticipate the required contribution rate increase will not be as great

Summary

- The TRS must be funded, as required by the Montana Constitution
- To do that, we need to make significant changes in fund and/or benefits
- Resources are available to fund the System
- Today we must begin to move TRS in the right direction
- Doing nothing is the most expensive option