

# **UNDERSTANDING THE IMPACT OF ACTUARIAL INFORMATION**

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# KEY METRICS FOR A VALUATION

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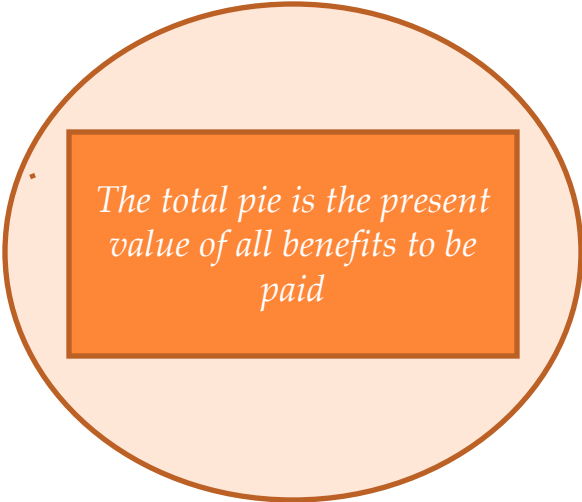
- What is being measured?
- All the benefits that the plan has promised to pay
- Based on the membership of the plan at the single point in time
  - There is a difficulty...
  - The benefits will all be paid at different times...
  - So how can we figure out a contribution at a single point in time for benefits paid out at all different points in time?



# KEY METRICS FOR A VALUATION

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- We will take every single benefit promise and value it at that same point in time
- The sum of all benefits expected ever to be paid, valued at the single point in time is the
- Present value of future benefits



*The total pie is the present value of all benefits to be paid*

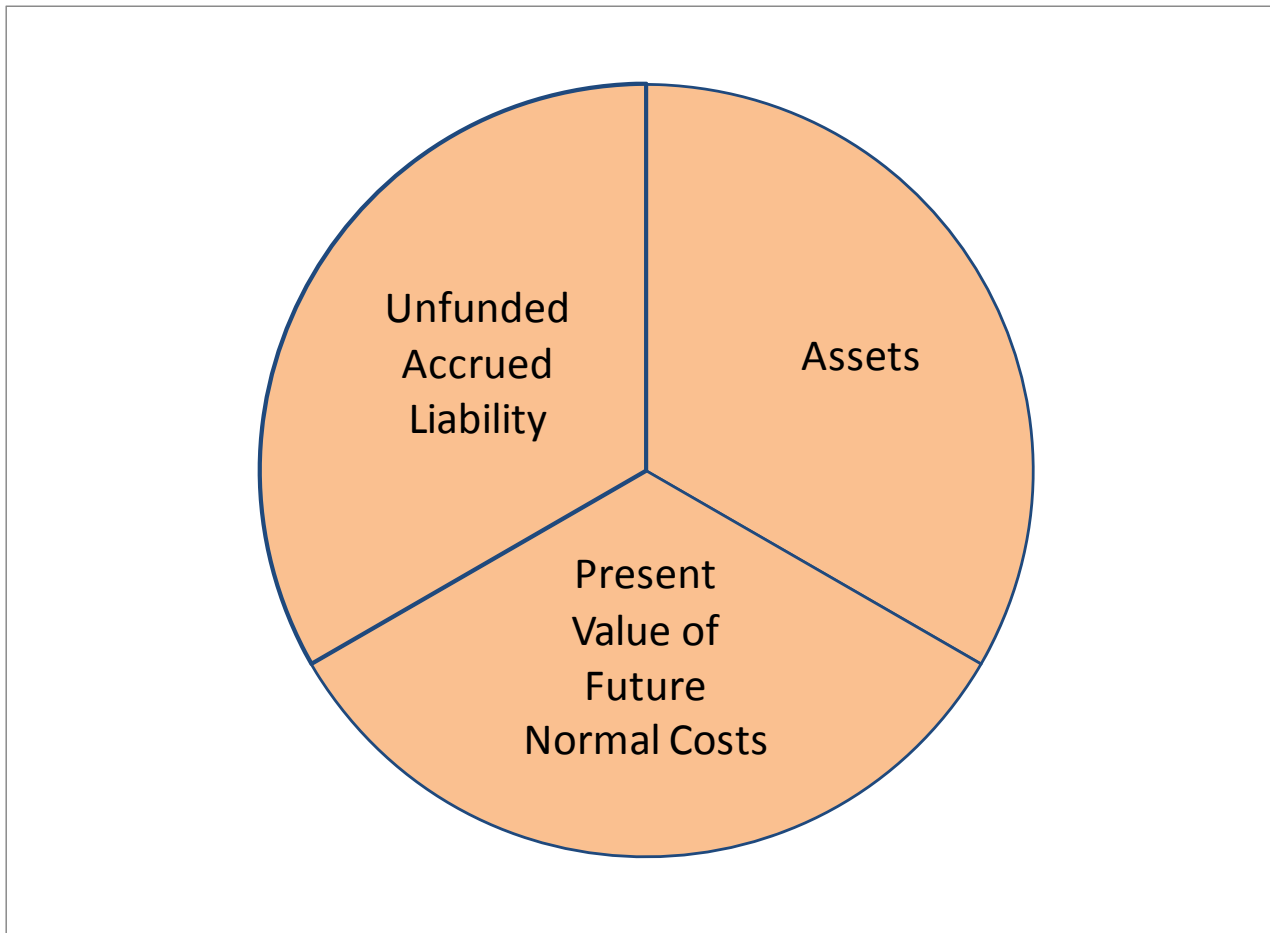
# KEY METRICS FOR A VALUATION

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- Now that we know the extent of the “promise”, how do we prepare to meet the promise?
- A funding method takes the entire pie, and slices it into annual costs (normal cost) and then amortizing the portion of the pie that won't be paid off through the annual payments
  - The normal cost is often viewed as the cost of benefits accruing during the year- we always want to stay current on accruing costs
  - The amount of contribution “left over” is used to pay off the unfunded accrued liability (the portion that won't ever be paid off through normal cost)

# KEY METRICS FOR THE VALUATION

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# KEY METRICS FOR A VALUATION

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- How is the plan publicly measured?
  - The funded ratio
  - This is a ratio of the actuarial value of assets to the accrued liability
  - This measurement is often used to quote the health of the plan
  - Is the funded ratio truly a measure of health?

# KEY METRICS FOR A VALUATION

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- The *trend* of a funded ratio is a better indicator of the health of a plan
- A brand new plan would have a 0% funded ratio
- A mature plan, we hope, would have a 100% funded ratio
  - At 100%, the funding requirements are merely to stay up with the normal cost- the cost of benefits accruing during the year

# KEY METRICS FOR A VALUATION

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- How do you know if your plan is “in trouble”
- If the plan is not meeting its annual required contribution
  - This may mean the normal cost is being paid, but the principle on the unfunded accrued liability is not being paid down
  - This will create a decline in the funded ratio (because the UAL will grow quickly, outpacing asset growth)

# TRAPS AND PITFALLS

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- Some special items to watch for in your pension fund (using actuarial information)
  - Using the surplus to pay for benefits
  - Looking at the funded ratio as a measure of health (use the trend and look at whether the ARC is being made)
  - Ask what “principle” has been paid off on the UAL
  - Actuarial value of assets is greater than the market value of assets
    - This means deferred losses will be entering the funding of the plan
  - Consistently biased assumptions

# TRENDS IN ACTUARIAL ISSUES (JUST TO NAME A FEW)

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- Re-examination of the use of asset corridors
- Year by year amortization of UAL
  - This lends itself well to a closed strategy (paying off principle with each payment) yet reduces volatility when compared to a fully closed amortization policy
- Special treatment of anomalous results
  - i.e. the 2008 losses
- Development of overall strategies for liability management
- Using projections in decision making
- Tiering as a way to manage long term liabilities
- Development of new cola strategies

# UNDERSTANDING THE IMPACT OF ACTUARIAL INFORMATION - TOPICS TO BE COVERED -

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- Pension System Sustainability
  - Managing Pension Assets and Liabilities
  - Receiving the ARC
- Basic Pension Funding Model
  - Calculation of the ARC
- Pension Plans and Market Cycles
  - Retroactive Benefit Increases
  - What many plans have done wrong

# BACKGROUND - PENSION PLAN SUSTAINABILITY

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In order for a pension system to remain sustainable, three things have to happen:

- 1) System assets have to be managed, and;
- 2) System liabilities have to be managed, and;
- 3) The actuarial required contribution has to be received annually from the system plan sponsor(s)

# BACKGROUND - PENSION PLAN SUSTAINABILITY

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## Managing Assets

- Definition/Objective – Well known...Multiple interpretations
  - Achieving, over the long term, the actuarially assumed rate of return, **and or;**
  - Outperforming passive benchmarks, **and or;**
  - Outperforming peers
- Most systems do a fine job with this... lots of resources are applied
- Managing assets interfaces with actuarial information because of “smoothing.” Understanding how that works is critical

# BACKGROUND - PENSION PLAN SUSTAINABILITY

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## Managing Liabilities

- Definition/Objective – obscure, at best
  - Stay reasonably well funded?
  - Keep contribution levels manageable?
  - ???
- “Managing Liabilities” as a concept, very unfortunately, is typically so far “under the radar” that it is not even really part of the pension plan vernacular

# BACKGROUND - PENSION PLAN SUSTAINABILITY

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## Managing Liabilities

- So what does managing liabilities mean?
  - It means being very careful when you make promises...
  - It means only granting benefit improvements when they are truly “affordable.”
- And in order to know if they are truly “affordable” there has to be, somewhere within the pension plan system, a very clear understanding of **the impact of actuarial information.**
- Many systems did not have this very clear understanding of the impact of actuarial information, and as a result, when they were overfunded, they made promises they thought were affordable at the time, but they were wrong
  - Later in the presentation, we’ll show you why they were wrong

# BACKGROUND - PENSION PLAN SUSTAINABILITY

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## Receiving the Required Contribution

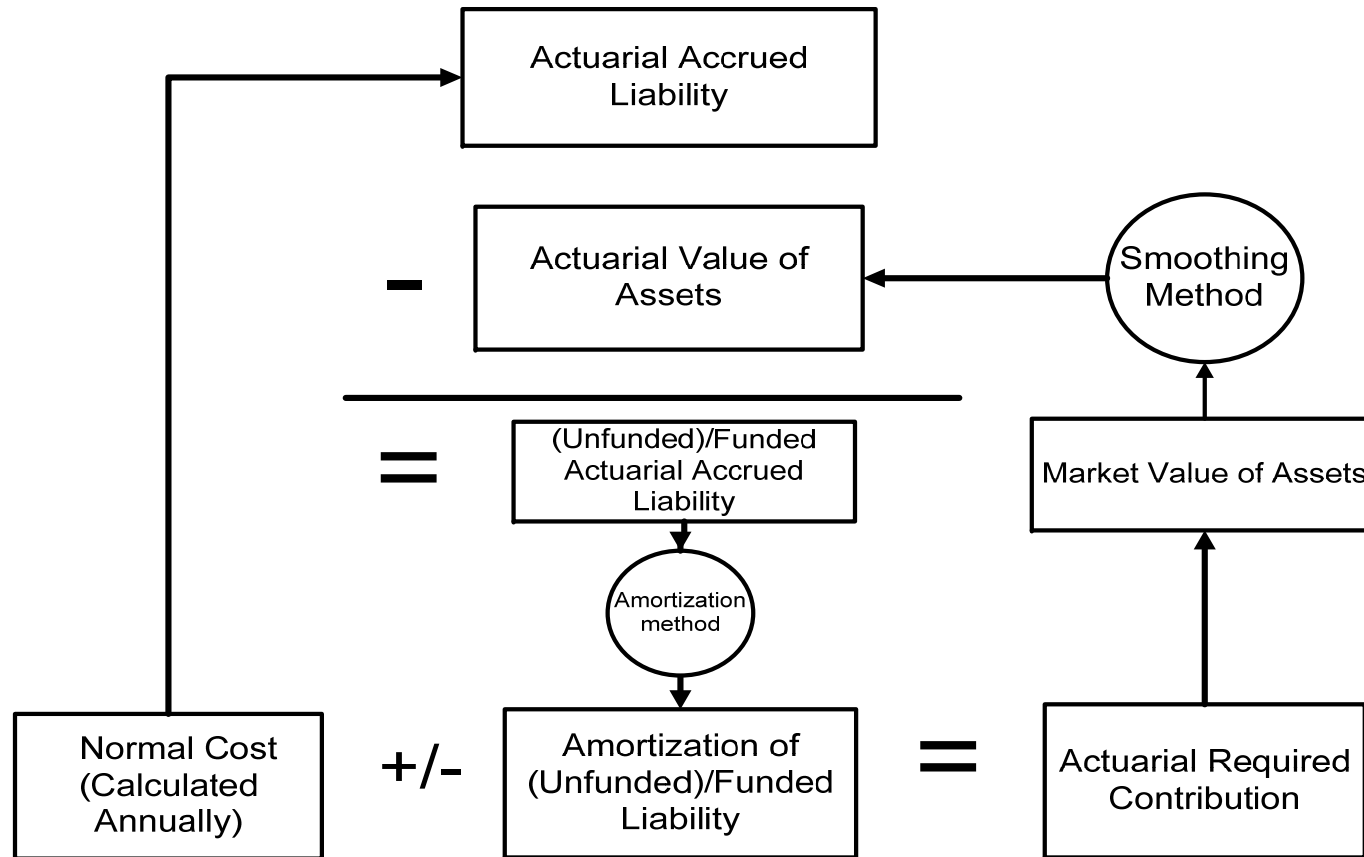
- The actuarially required contribution is the annual amount that is required to fund the system
- When employers skip an actuarially required contribution, they defer that cost to the future and jeopardize the long-term funding of the plan. When governing bodies reduce contributions to a plan without considering the actuarially determined required employer contributions, the resulting systemic underfunding ensures future financial shortfalls and places the burden for that shortfall on future taxpayers
- Just like not managing liabilities, not receiving the annual required contribution is a significant factor in why so many systems are so poorly funded today...
- ...and in order to understand the importance of receiving the actuarially required contribution, **a very clear understanding of the impact of actuarial information is necessary**

# PENSION PLAN SUSTAINABILITY - THE BASIC FUNDING MODEL -

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- Therefore, for all three things that a pension system must do to remain sustainable, a very clear understanding of the impact of actuarial information is necessary
- The next four slides describe the basic actuarial pension funding model applicable to all state and local DB pension systems
- In order to manage a pension system, one needs to understand the model, and in order to understand the model, one needs to understand the impact of actuarial information

# BASIC FUNDING MODEL



See the next three slides, for a description of terms...

# BASIC FUNDING MODEL

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## ○ Basic Funding Model Concepts

- Normal Cost is the actuarially determined pension cost of the current year of service for active employees
  - It is the amount that needs to be contributed each year, based on actuarial assumptions, that when invested over the remaining lives of the active employees, earning the assumed rate of return, will accumulate to an amount that will be sufficient to provide a stream of cash flows that will pay out promised benefits from retirement until mortality, that were earned during the current year of service
- It is calculated by the actuary for every active employee in the system annually, and aggregated into a single amount
- Normal Cost is added to the liability annually

# BASIC FUNDING MODEL

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## ○ Basic Funding Model Concepts

- Liabilities are stated at present value...that means they grow by interest every year...
- ...At the same rate that the assets are assumed to grow via investments
- Difference between assets and liabilities is a plan's funded or (unfunded) position
- Amortization of the (unfunded)/funded position is calculated every year...it's either like paying a mortgage payment...or like receiving an annuity
- The actuarially required contribution only has two components, normal cost plus/minus amortization of (unfunded)/funded position. It is typically expressed as a percentage of payroll

# BASIC FUNDING MODEL

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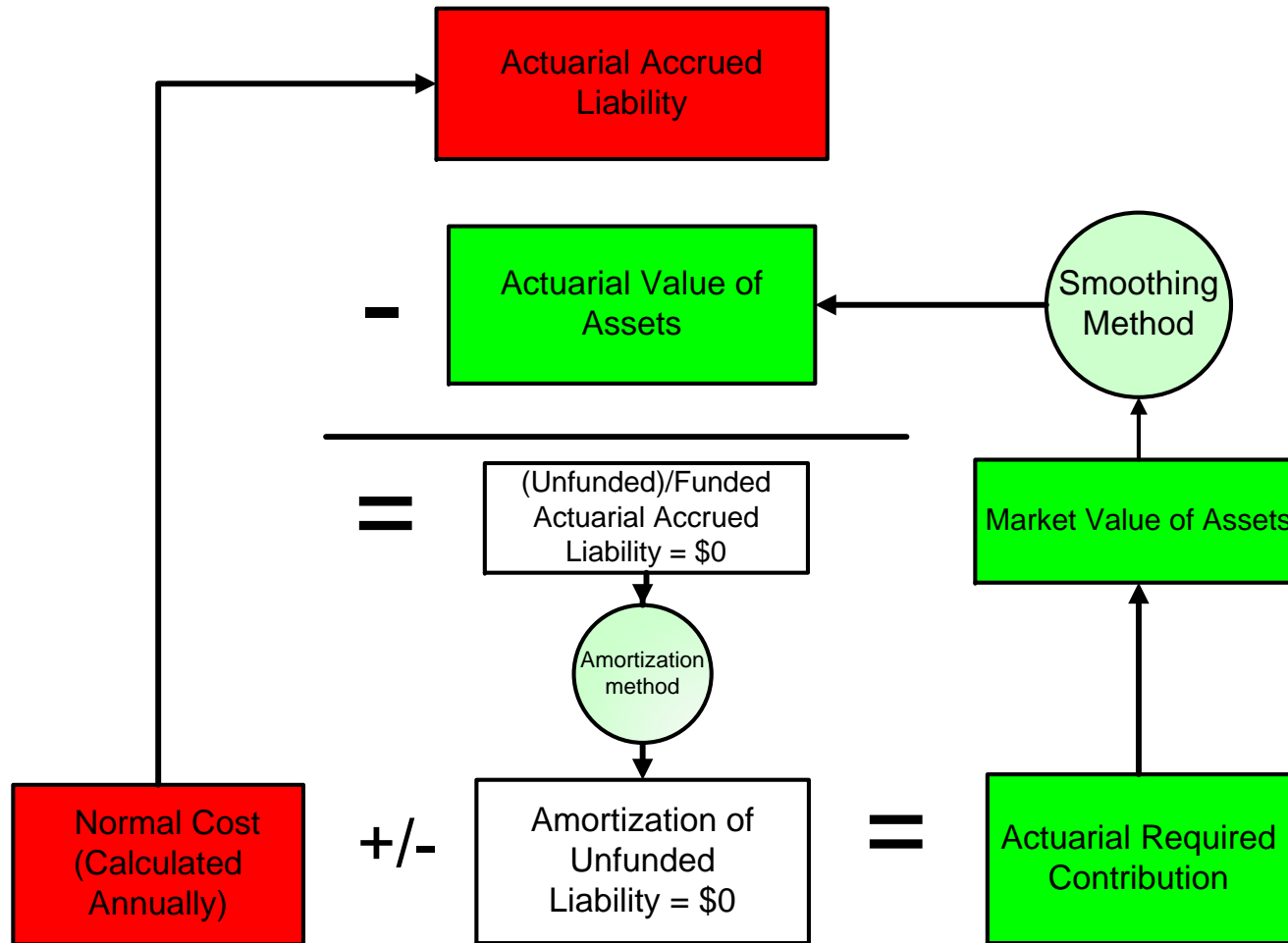
- Basic Funding Model Concepts
  - In “Actuary Land” if:
    - normal cost is contributed annually; and
    - all actuarial assumptions are met; then
    - then the system will always be 100% funded...
  - ***News Flash...*** Everything doesn't turn out as planned!
- The next set of slides looks at the impacts on the pension funding model as the market moves through a market cycle. You are going to see the typical result of not understanding the impact of actuarial information

## BASIC FUNDING MODEL... AND WHAT HAPPENS DURING A MARKET CYCLE

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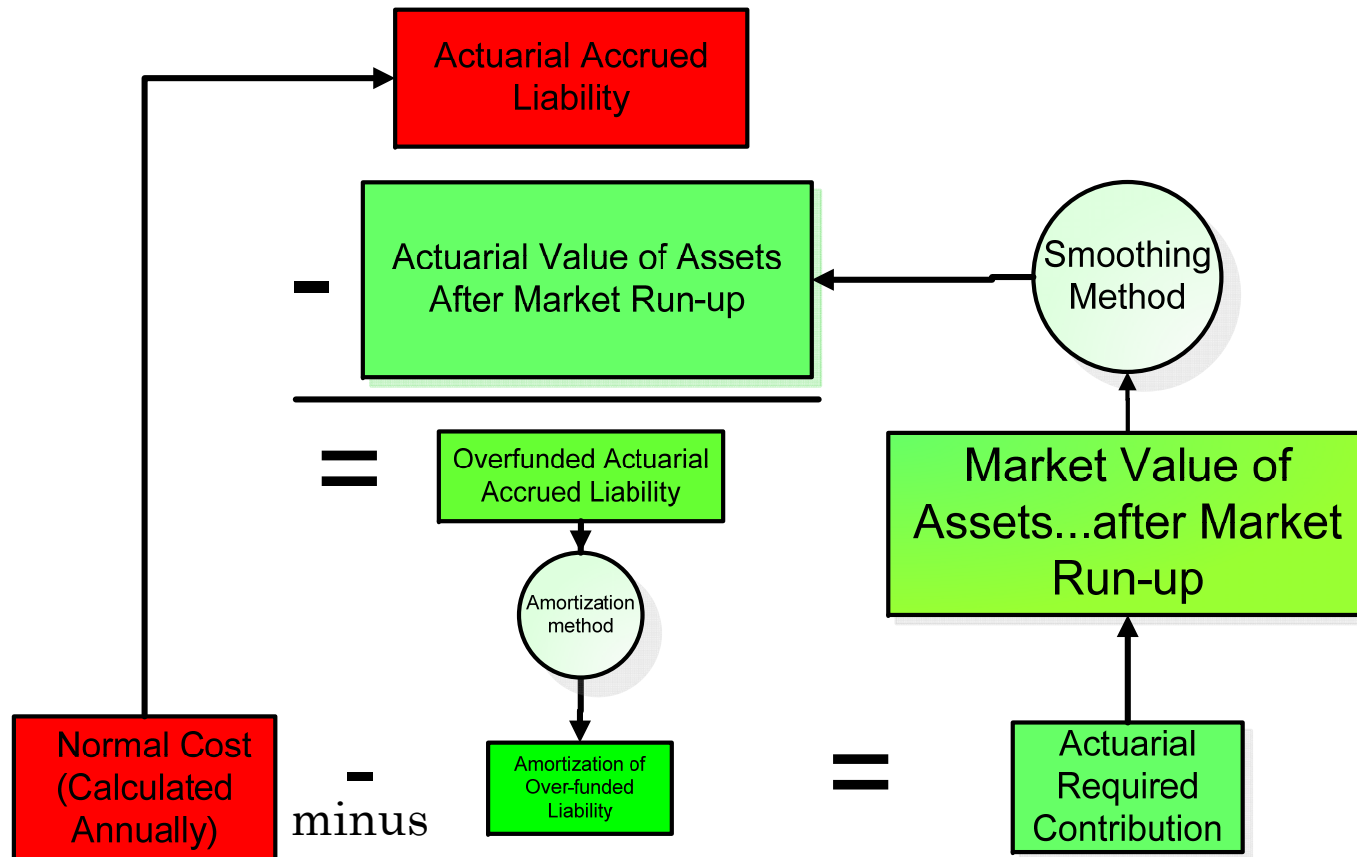
- We'll start with a plan that is 100% funded, where the market value of assets, the actuarial value of assets and the actuarial value of liabilities are all the same (I've added some color-coding to assets and liabilities on the pension funding model)
- Then we'll show what typically happens at pension plans, as the markets first move up, and then back down
- Let's see what happens...

# BASIC FUNDING MODEL – 100% FUNDED



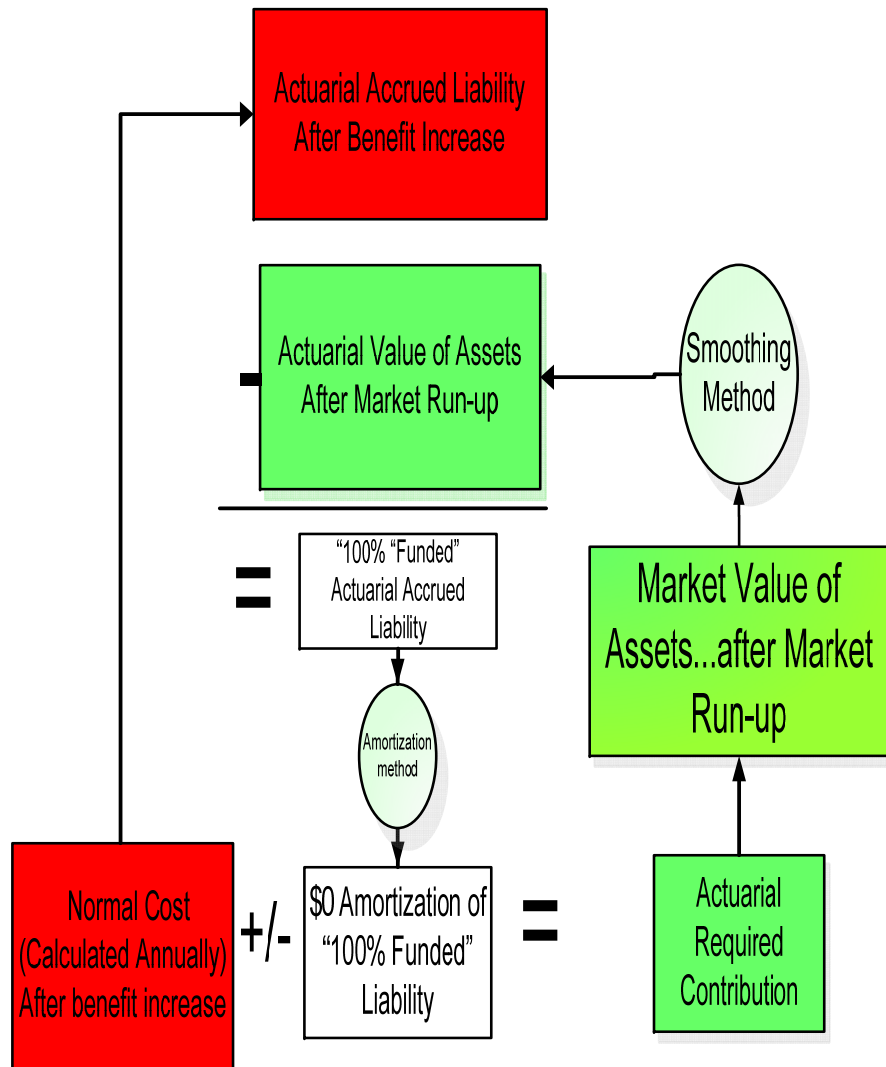
Here, it is assumed that the plan is exactly 100% funded...there is no unfunded liability, nor is there a surplus, so there is no amortization of unfunded position, and the actuarially required contribution therefore equals Normal Cost.

# WHAT HAPPENS WHEN ASSETS RUN UP...?



If the asset market value runs up, that will drive up the actuarial value of assets and the plan will appear overfunded. The overfunded liability will produce “negative amortization,” driving down the required contribution, below normal cost.

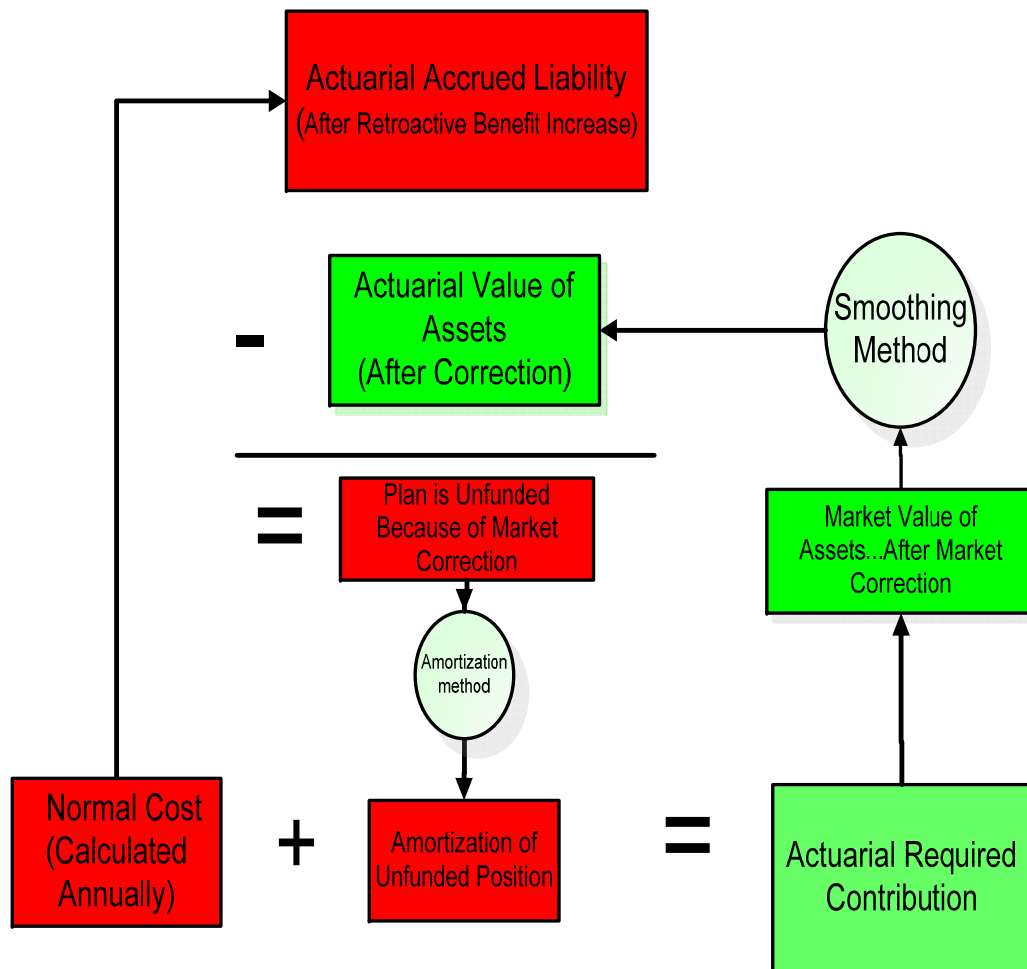
# TYPICALLY, AFTER ASSETS RUN UP, BENEFITS ARE INCREASED, RETROACTIVELY...



But if, after a market value run-up, benefits are increased retroactively, then the liabilities for past service will increase. Normal cost will increase as well. If a plan was 100% funded before an asset run-up, a retroactive benefit increase could raise actuarial liabilities up to a new, higher level, equal to the new level of assets, and the funded position amortization could be, at least in the short term, a non-factor...

But it is **imperative**, to understand that the increase in liabilities will exist for a very long time...until the last active employee who was awarded the increase, dies, and that will be decades...

# THEN, WHEN MARKETS CORRECT...



When markets subsequently correct and assets fall, and that ripples through to the actuarial value of assets, the system's funded position will then turn negative, and amortization of that underfunded position will drive up contributions...until either assets run up again, or contributions make up the difference, or all the actives who were given the increase finally die.

# RETROACTIVE BENEFIT INCREASES AFTER MARKET RUN-UPS... CONCLUSIONS

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- Retroactive benefit increases cause increases in liabilities for past service, and the impact of those benefit increases will be included in funded position amortization, for decades
- Market run-ups also increase assets (market value and actuarial value) and that will provide offsetting amortization impact... , but only until the market corrects...probably in the not-too-distant future
- **Using a market-driven asset surplus to justify a retroactive benefit increase is therefore the same as using a temporary funding source to fund a permanent increase in operational costs**

# UNDERSTANDING THE IMPACT OF ACTUARIAL INFORMATION

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- Nationally, the current underfunded status of many state and local pensions funds can be linked to this exact situation...the raising of benefits, retroactively, based on a market-driven asset surplus, which turned out to be temporary
- It happened because, within many pension systems, there was not a clear understanding of the impact of actuarial information
- See the quote on the next slide...

# UNDERSTANDING THE IMPACT OF ACTUARIAL INFORMATION

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Quote from a State Pension Fund Director whose plan is 59% funded on an actuarial basis as of 12/31/08:

“...A bit of bad advice set up the mess in [our state]. When the State raised benefits in the early ‘90s, an actuary told lawmakers that investment income would cover most of the difference.”

Now, let's look at the structure of Pension Plans



# **2010 GFOA National Conference, Atlanta, GA**

## **UNDERSTANDING THE IMPACT OF ACTUARIAL INFORMATION**

**Barbara J. Avard, Administrator  
Charlotte Firefighters' Retirement System (NC)**

# PENSION SYSTEM STRUCTURE

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- Key Decision Makers
  - Board of Trustees
  - Plan Sponsor/Employer
  - State or Local Legislative Body
  - Employee Labor Organization
  - Pension Plan Staff
  - Professional Service Providers (actuary, investment consultant, etc.)



# PENSION SYSTEM STRUCTURE

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- Plan Document- are there requirements contained in your plan document that mandate some or all of the actuarial assumptions? Benefit provisions?
- Pension plan policies-
  - Benefit policy
  - Investment policy
  - Funding policy



# PENSION PLAN STRUCTURE

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- Types of actuarial assumptions
  - Decremental (withdrawal, death while active, retirement, disability, death after retirement)
  - Economic (inflation, real return on assets, wage escalation, COLAs)
- Actuarial assumptions should be reviewed annually with actuary
- Validate valuations by use of an experience study every five years



# PENSION SYSTEM STRUCTURE

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- Asset Valuation Method
  - Market
  - Smoothed Market



# KEY ROLE OF PLAN ADMINISTRATOR

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- The Administrator/Executive Director
  - Liaison with professional service providers
  - Liaison with legislative body(ies) and key decision makers
  - Primary resource for Board of Trustees
  - Provide education to members, retirees and related parties about actuarial information



## CASE STUDY

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- Charlotte Firefighters' Retirement System
  - Some actuarial requirements in the Act (mortality tables, interest rates)
  - Board of Trustees administers Plan and Primary decision maker with respect to actuarial assumptions
  - Conservative return assumption of 7.75%
  - Statutory matching contribution rate for employer and members at 12.65% (members not Soc Sec)



# CASE STUDY

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- Cash flow excellent – weekly contributions wired
- No statutory COLA
- Bonus payment (“13<sup>th</sup> check” Ad hoc)
- No benefit enhancements since 1989 and none planned
- 95.7% funded ratio as of 7/1/2009

