

# The State Teachers Retirement System of Ohio

Five Year Experience Review

July 1, 2003 – June 30, 2008

November 20, 2008



## Agenda

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- Introduction
- Demographic Assumptions
  - Termination Experience
  - Disability Experience
  - Retirement Experience
  - Mortality Experience
- Review of Economic Assumptions
- Cost Impact

## How Assumptions Are Set – Review from October

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- Review past experience - prepare five-year experience review
- Compare past experience (“actual”) with assumptions (“expected”)
- Determine trends - make judgment about future
- Develop component parts of each assumption
  - Maintain linkage with investments
  - Maintain internal consistency
- Keep in mind
  - No “right” answer - best estimate range
  - Assumptions are long-term

## Actuarial Assumptions

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### Demographic

- Termination
- Disability
- Service retirement
- Death after retirement
- Death in active service

### Economic

- Interest rate (return on assets)
- Salary increases
- Payroll growth
- Inflation

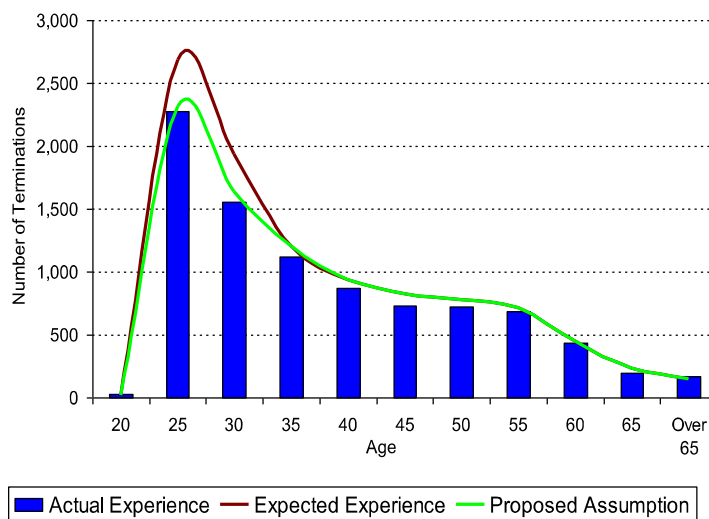
Actuaries make assumptions as to when and why a member will leave active service, and estimate the amount and duration of the pension benefits paid

## Non-Vested Termination

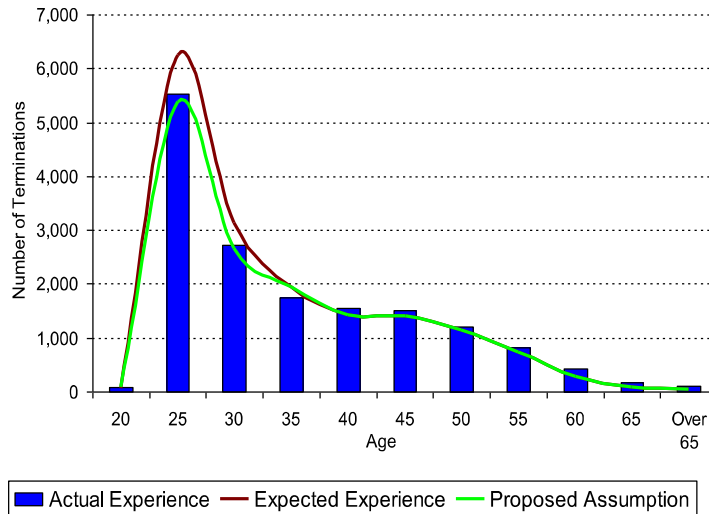
- Likelihood that members with less than five years of service will terminate
  - Rates vary based on the age of the active member
    - Rates between ages 25 and 35 have the most significant impact on the valuation
    - Rates at other ages have lesser effect on valuation
- Results of five-year experience review
  - Between ages of 25 and 35, actual experience shows fewer terminations than expected
  - After age 35, actual experience has been close to expected

**Recommendation: Decrease the rates between age 25 and 35**

## Non-Vested Termination – Males 2004-2008



## Non-Vested Termination – Females 2004-2008



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## Vested Termination

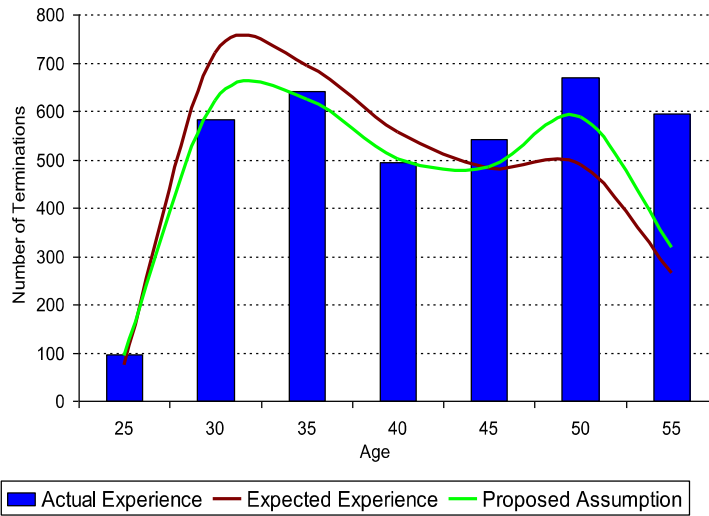
- Likelihood that members with five or more years of service will terminate
  - Rates vary based on the age of the active member
    - Once members reach retirement eligibility, the vested termination rates no longer apply
  - Vested termination rates are significantly lower than non-vested termination rates
    - Once members are vested, they are more likely to work a full career
- Results of five-year experience review
  - Prior to age 45, both males and females exhibited fewer vested terminations than expected
  - After age 45 for males and age 50 for females, actual experience showed more vested terminations than expected

**Recommendation: Decrease the vested termination rates prior to age 45, and increase the rates at later ages**

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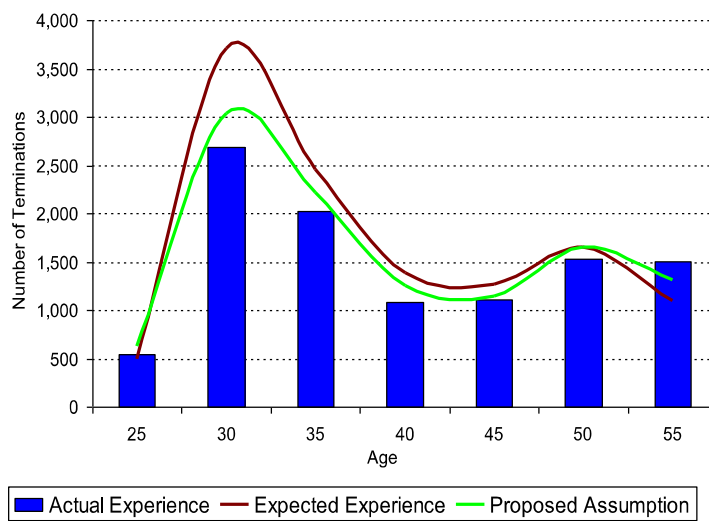
### Vested Termination – Males 2004-2008



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### Vested Termination – Females 2004-2008



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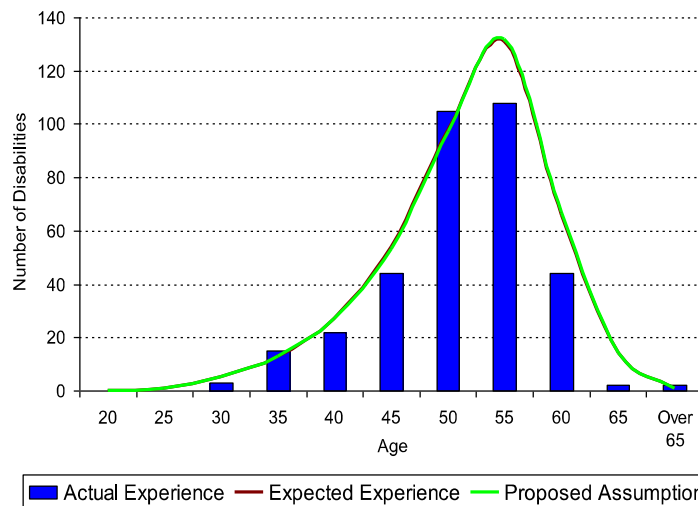
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## Disability Retirement

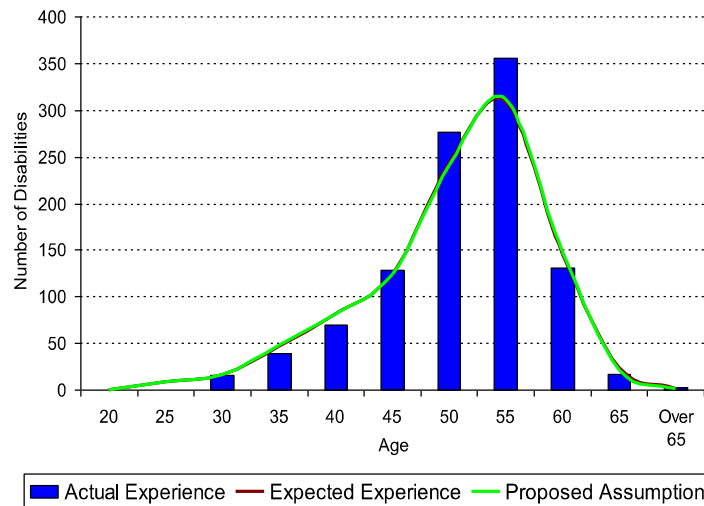
- Likelihood that active members will become disabled
  - Rates vary based on the age of the active member
  - Disability rates are very low
    - Of the approximately 170,000 active members, between 200 and 300 members will commence disability benefits each year
    - Represents an aggregate rate of approximately 0.15%
- Results of the five-year experience review
  - Males exhibited slightly higher than expected disability retirement experience, while females exhibited slightly lower than expected disability experience
  - In the aggregate, the experience was very close to expected

**Recommendation: Maintain current rates of disability**

## Disability Retirement – Males 2004-2008



## Disability Retirement – Females 2004-2008



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## Service Retirement

- Age 60 with five years of service
- Age 55 with 25 years of service
- 30 years of service, regardless of age
  - Adjust rates to recognize that the 2.5% multiplier at 35 years of service has changed retirement patterns
  - Separate the 30 years of service criteria into two groups
    - 30 to 34 years
    - 35 or more years

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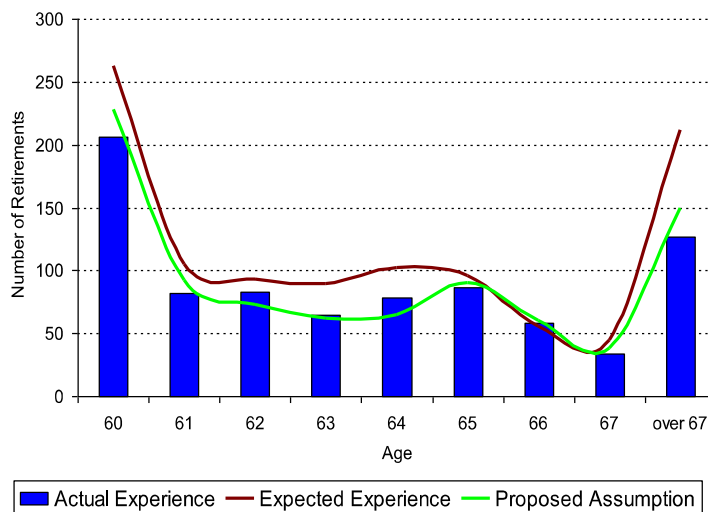
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## Service Retirement – Age 60 with Five Years of Service

- Likelihood that active members who are age 60 with five years of service will retire
  - Constitutes small group of active members
  - Majority of retirements fall into the other service retirement categories
- Results of the five-year experience review
  - The experience for both males and females shows fewer retirements than expected

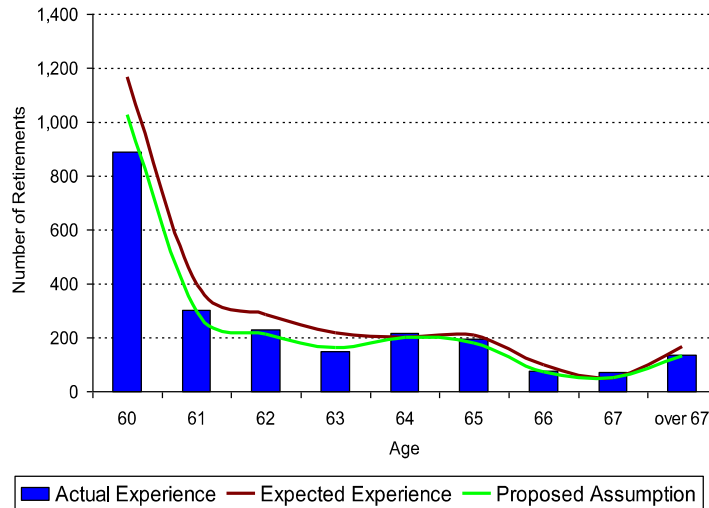
Recommendation: Reduce retirement rates

## Service Retirement – Age 60 with Five Years of Service – Males 2004-2008





## Service Retirement – Age 60 with Five Years of Service – Females 2004-2008



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## Service Retirement – Age 55 with 25 Years of Service

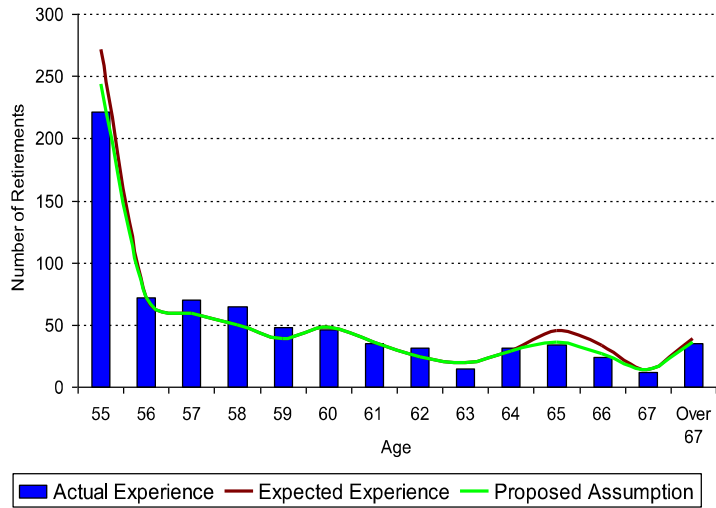
- Likelihood that active members who are age 55 with 25 years of service will retire
- Results of five-year experience review
  - The experience at age 55 showed fewer retirements than expected
  - The experience at most other ages showed the retirement pattern was close to expected
    - At age 65, actual retirements were slightly less than expected
    - For females at ages 61 and 62, the actual retirements were greater than expected

**Recommendation: Adjust the rates to reflect experience**

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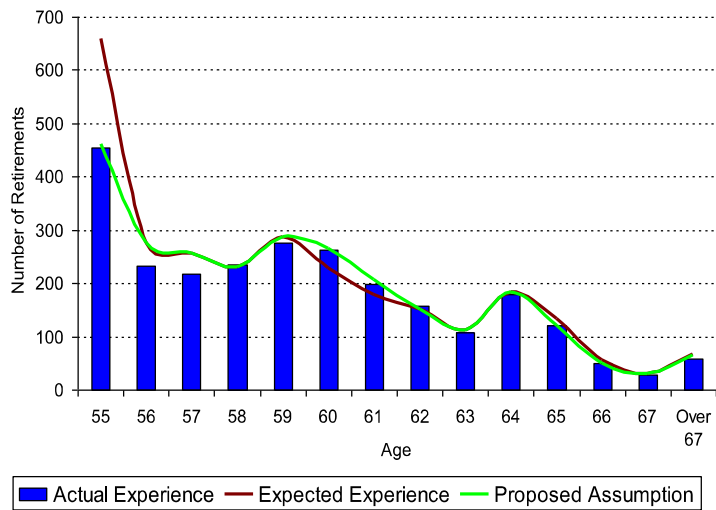
Service Retirement – Age 55 with 25 Years of Service  
 – Males 2004-2008



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Service Retirement – Age 55 with 25 Years of Service  
 – Females 2004-2008



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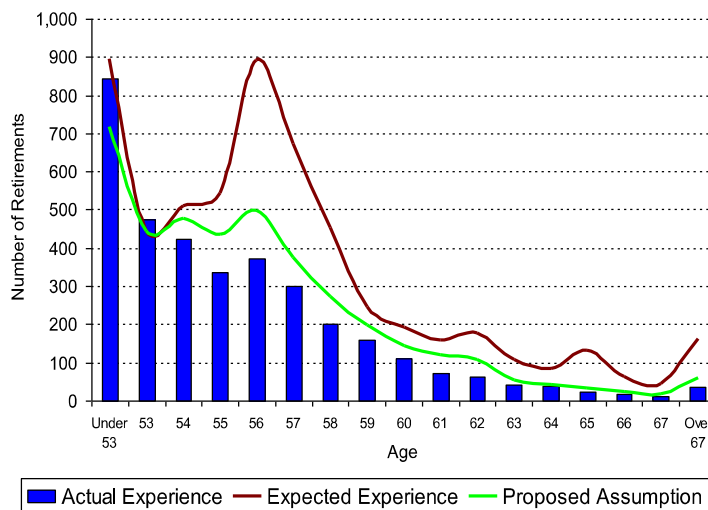
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## Service Retirement – 30 Years of Service Regardless of Age

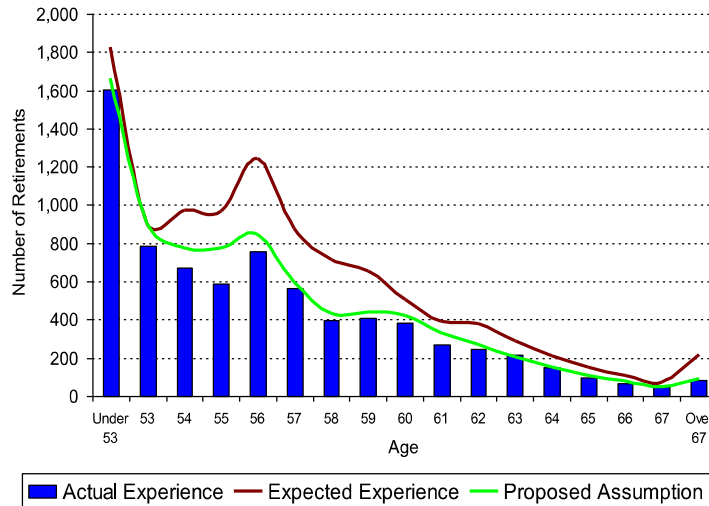
- Likelihood that active members with at least 30 years of service will retire
  - Rates should be adjusted to recognize that the 2.5% multiplier at 35 years of service has significantly changed retirement patterns
  - Separate the 30 years of service criteria into two groups
    - 30 to 34 years
    - 35 or more years
  
- Results of five-year experience review
  - Significantly fewer retirements than expected, particularly between ages 55 and 60
  - Since 35 year benefit is relatively new, transition period may be impacting experience

Recommendation: Reduce the retirement rates at all ages

## Service Retirement – 30 to 34 Years of Service Regardless of Age – Males 2004-2008



## Service Retirement – 30 to 34 Years of Service Regardless of Age – Females 2004-2008



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## Service Retirement – 35 Years of Service Regardless of Age

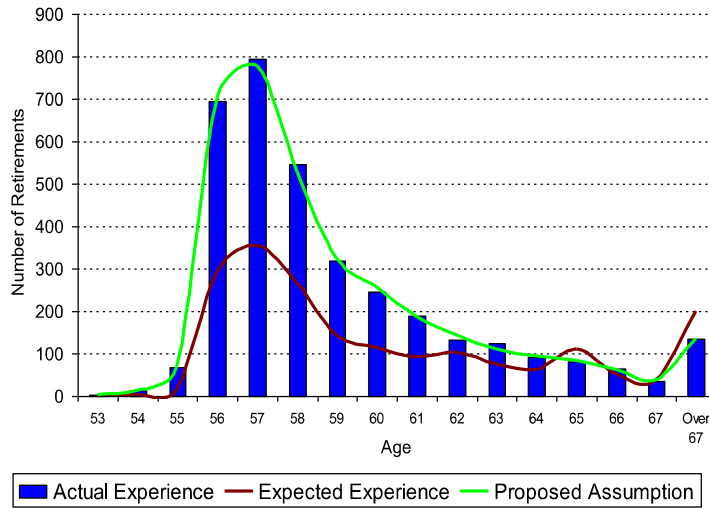
- Likelihood that active members with at least 35 years of service will retire
  - These members have qualified for the 2.5% benefit at 35 years of service
  - Qualifying for this benefit increases members' incentive to retire
- Results of five-year experience review
  - Significantly more retirements than expected, particularly between ages 56 and 62
  - This pattern is the opposite of the trend that we observed for members with 30 to 35 years of service

**Recommendation: Increase the retirement rates at all ages**

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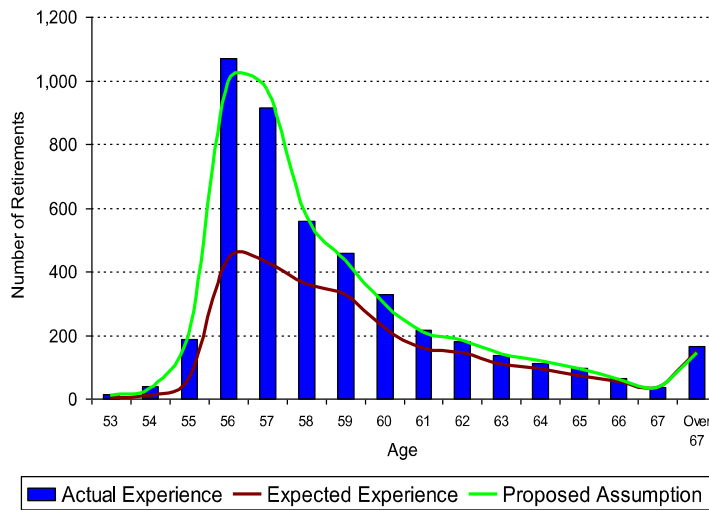
### Service Retirement – 35 Years of Service Regardless of Age – Males 2004-2008



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### Service Retirement – 35 Years of Service Regardless of Age – Females 2004-2008



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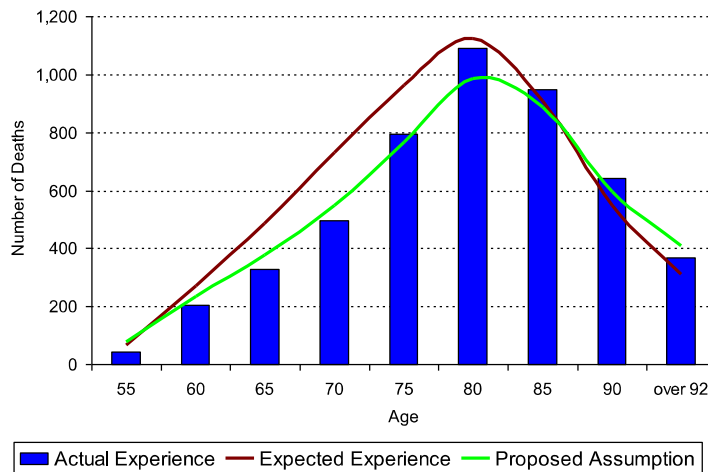
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## Service Retiree Mortality Experience

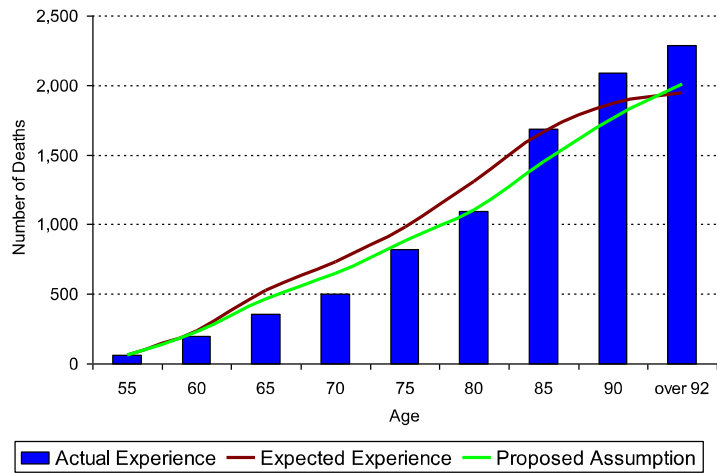
- Most important demographic assumption
  - Liabilities are driven by length of time that benefits will be paid
  - The valuations have shown mortality losses, meaning that annuitants are living longer than expected
  - Mortality rates should be updated every five years to reflect mortality improvements, including improvements projected after valuation date
- Results of five-year experience review
  - Fewer deaths than expected, particularly prior to age 85
  - STRS Ohio member life expectancy is longer than that of the general population

Recommendation: Adopt the RP 2000 Combined Table projected to 2018 and set back 2 years, with females prior to age 85 set back 3 years

## Service Retiree Mortality – Males 2004-2008



## Service Retiree Mortality – Females 2004-2008



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## Disabled Retiree Mortality Experience

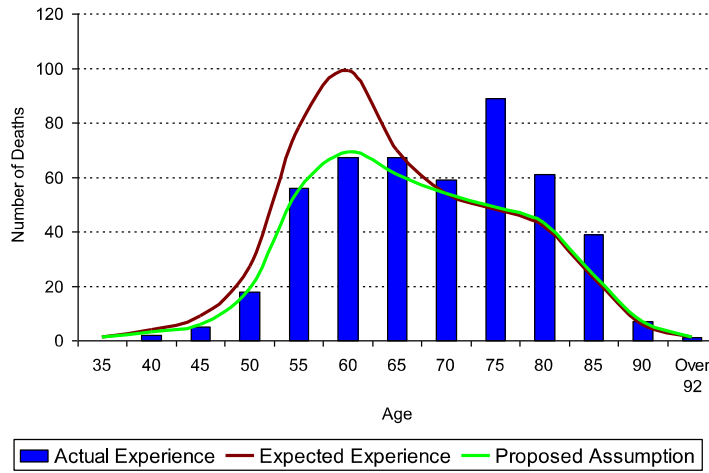
- Mortality rates applied to members receiving disability benefits
  - Disabled members experience higher mortality rates than service retirees
- Since there are fewer disabled retirees, the experience is less credible than the service retiree mortality experience
- Results of five-year experience review
  - Fewer deaths than expected prior to age 65

**Recommendation: Reduce current rates by 30% prior to age 65**

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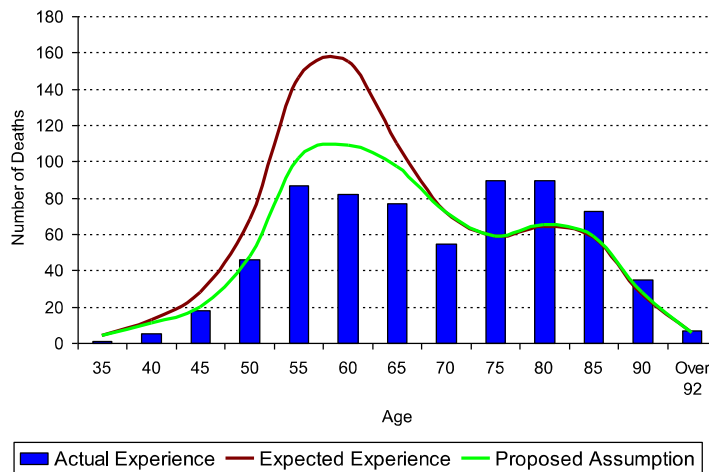
### Disabled Retiree Mortality – Males 2004-2008



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### Disabled Retiree Mortality – Females 2004-2008



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## Active Mortality Experience

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- Mortality rates applied to active members
  - Very few members die in active service
    - Liability associated with active death is a small percentage of the total liability
    - Plan experience is insufficient to set assumption
- The current assumptions include separate mortality tables for active and retired members
  - We recommend that the retired member mortality be based on the RP 2000 Combined Table
  - This table includes adjustment at earlier ages to reflect the fact that many younger members are actively employed

**Recommendation: Apply same mortality table to retired and active members**

## Economic Assumptions – Recap of Information Presented in October

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Inflation

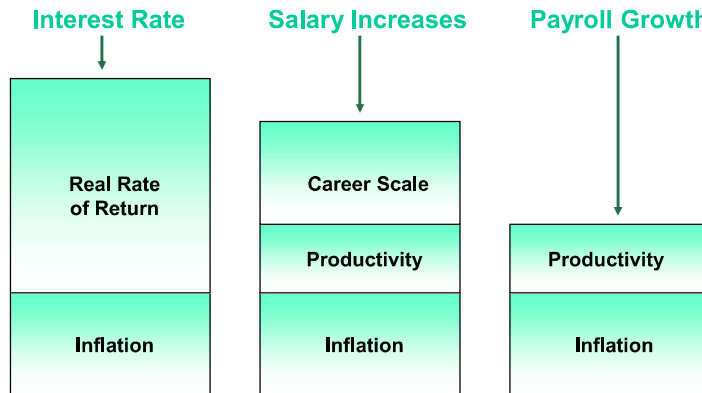
Interest rate (return on assets)

Payroll growth

Salary increases

## Building Block Method — Basis for Setting Economic Assumptions

Each economic assumption has 2 or 3 components (or building blocks)



Building blocks must be consistent across all economic assumptions

## Summary of Economic Assumption Recommendations

### Investment return assumption

We recommend maintaining the 8% investment return assumption

- The current components of the 8.0% rate are 3.5% inflation and 4.5% real return
- We propose decreasing the inflation assumption to 3.0%, and increasing the real rate of return assumption to 5.0%

### Payroll growth

The current assumption is 4.5% per year

- The components are 3.5% inflation and 1.0% real wage growth
  - We propose decreasing the inflation assumption to 3.0%
  - We propose adding a component to the payroll growth assumption to anticipate continued migration to the DC plan
- These changes will result in a payroll growth assumption of 3.5% over the next ten years, and 4.0% thereafter

## Summary of Economic Assumption Recommendations

### Individual salary increases

The current salary increase assumption components are 3.5% inflation, 1.0% real wage growth, and a merit and seniority scale that varies by age

- We recommend lowering the inflation assumption to 3.0% for individual salary increase assumptions
- We recommend maintaining the 1.0% real wage growth assumption component
- To better match recent experience, we recommend modifying the merit and seniority scale

The net effect of the proposed changes is an increase in the total expected salary increases prior to age 35, and a decrease to the expected salary increases after age 35

## Cost Impact

The following table summarizes the estimated impact of the proposed assumption changes on the July 1, 2008 pension valuation

	Normal Cost Rate	Unfunded Accrued Liability	Funding Period (years)	Funded Ratio
<b>Prior to Proposed Changes</b>	13.75%	\$17,169	28.3	80.1%
Impact of Termination Rates	0.37%	(230)	1.3	0.2%
Impact of Retirement Rates	(0.03%)	166	0.3	(0.2%)
Impact of Mortality Rates	0.24%	1,817	8.0	(1.6%)
Impact of Salary Increases	(0.28%)	(688)	(4.6)	0.6%
Impact of Payroll Growth Assumption	—	—	7.9	—
<b>After Proposed Changes</b>	14.05%	\$18,234	41.2	79.1%

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