Ohio School Employees Retirement System Risk Assessment Revisited

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Todd Green, ASA, FCA, MAAA
John Garrett, ASA, FCA, MAAA

www.CavMacConsulting.com

Usefulness of Models
In Risk Assessment

➢ "Prediction" is not the goal of modeling. Models are beneficial for:

- Identifying interactions between inputs that are not self-evident
- Communicating uncertainties using simple examples or graphs
- Answering "what if" or comparative questions
- Identifying sensitivities of outputs to particular inputs, providing guidance on areas that require additional analysis
- Revealing inconsistencies, discrepancies, or limitations in other types of analysis

➢ Models are useful as a tool for analyzing the system's objectives and strategies as well as effective as a decision-making tool

Positive Steps Already Taken

- ➢ Funding Policy
  - ▪ The statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. Employer contributions in excess of those required to support the basic benefits may be allocated to retiree health care funding.
  - ▪ Effective June 30, 2015, changes were made to funding policy to meet the competing goals of providing Healthcare and improving SERS' long term funding as quickly as possible.

Positive Steps Already Taken

- ➢ Cost of Living Adjustments
  - ▪ Before granting a cost of living increase, the Board may adjust the percentage of any increase if the board's actuary, in its annual actuarial valuation, or in other evaluations, determines that an adjustment does not materially impair the fiscal integrity of the retirement system or is necessary to preserve the fiscal integrity of the retirement system.

  - ▪ The enactment of SB 8 granted authority to the Board to decide how many anniversaries a new benefit recipient must achieve before they become eligible to receive a COLA.

  - ▪ The authority granted to SERS in regard to cost of living adjustments should be considered a positive factor in risk assessment. If additional contributions to the System are unlikely, the only alternative to alter trends in the projected funded status are temporary or permanent benefit reductions. Granting the Board this authority allows SERS to act quickly rather than rely on the legislative process to address an issue and mitigate a portion of the risk.

Positive Steps Already Taken

- ➢ Amortization policy

  - ▪ The SERS Board shall establish a period of not more than thirty years to amortize the SERS unfunded actuarial accrued pension liability. If in any year the period necessary to amortize the unfunded actuarial accrued pension liability exceeds thirty years, as determined by the annual actuarial valuation required by section 3309.21 of the Revised Code, the board, not later than ninety days after receipt of the valuation, shall prepare and submit to the Ohio Retirement Study Commission and the standing committees of the Ohio House of Representatives and the Ohio Senate with primary responsibility for retirement legislation a report that includes the following information:

    – The number of years needed to amortize the unfunded actuarial accrued pension liability as determined by the annual actuarial valuation;

    – A plan approved by the board that indicates how the board will reduce the amortization period of the unfunded actuarial accrued pension liability to not more than thirty years;

    – Whether the board has made any progress in meeting the thirty-year amortization period.

Plan Maturity Measures

➢ These are important, and have previously been discussed in the valuation presentation

  ▪ Ratio of market value of assets to payroll (called the asset volatility ratio)

  ▪ Ratio of net cash flow to market value of assets

  ▪ Ratio of retired liability to total liability

  ▪ Ratio of actives to retirees

  ▪ Negative Cash Flow

Stress Testing

➢ **Stress test**: an analysis or simulation designed to determine the ability of a financial institution to manage an economic crisis or certain stressors

➢ **Purpose** is to **identify the stressors** to the System and **optimize policies and procedures** (assumptions, funding policy, and perhaps benefits) in order to **improve sustainability** and **educate stakeholders** of potential risks

 ▪ Focus should be on the decisions to be considered based on the outcomes of the test

Procedure for Stress Test

➢ Size of active membership and growth in total covered payroll

- UAL amortized as level percent of payroll so an assumption is used to anticipate future changes in payroll

- If active membership decreases or salary increases are less than assumed, covered payroll may not increase as assumed

- Forces the UAL contribution **rate** to increase
  - Modeled 10% and 20% active population decline
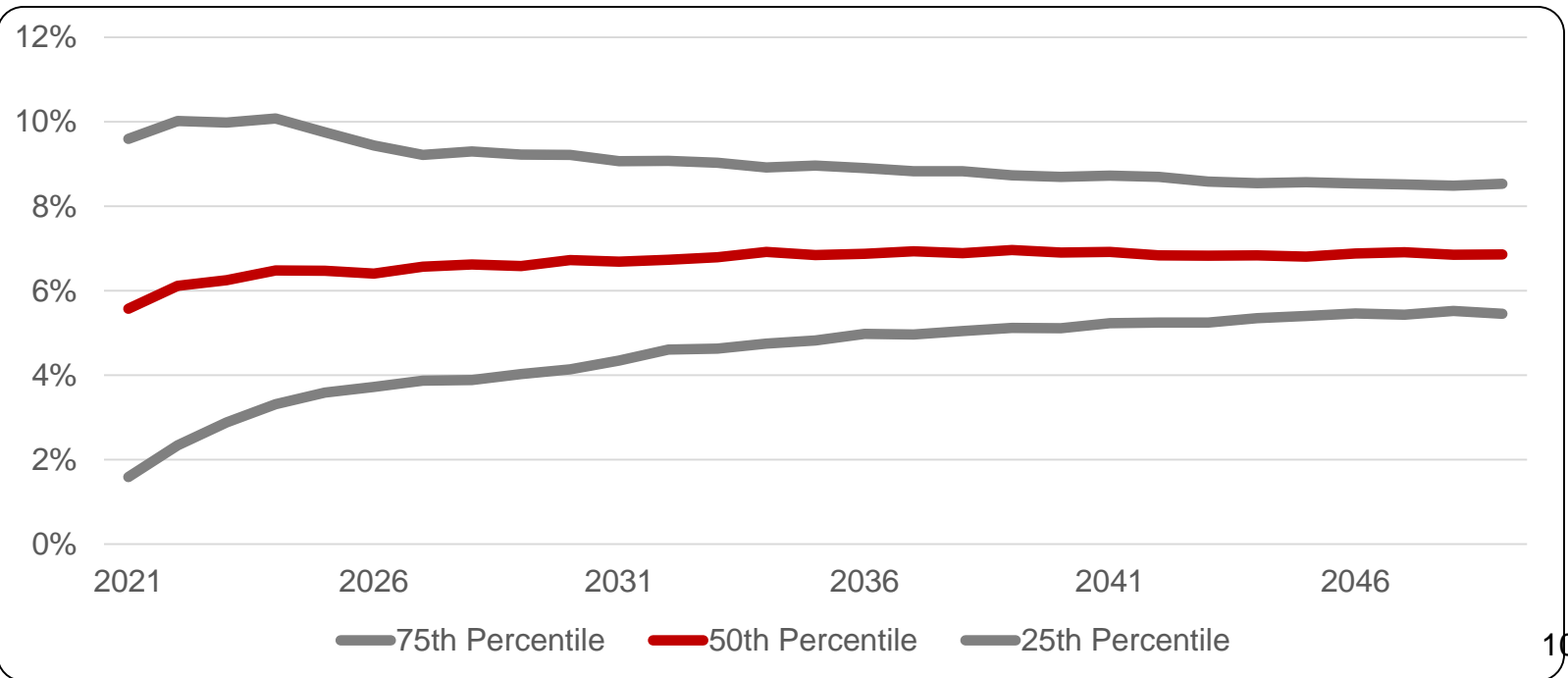
Stochastic Analysis

➤ Stochastic modeling such as an asset liability model (ALM) is the most sophisticated analysis available for investment return impact

➤ Produces a distribution of possible returns, directly reflecting the impact of investment return volatility on pension funding over time

  ▪ In viewing output, the median is the best estimate of future outcomes, the 25th percentile is the worst likely outcomes and the 75th percentile is the best likely outcomes

➤ Often used by investment consultants in asset/liability studies

Stochastic Analysis

The chart below is based on the capital market assumptions of the investment professionals serving the System. We utilize those assumptions to produce the percentile ranks of expected returns over 30 years assuming the System earned 3.3% for the year ended 2020. The analysis indicates that there is a 50% chance the cumulative market returns over the next 30 years will be between 5.45% and 8.54%. The 50th percentile cumulative investment return over the next 30 years is 6.86% which is less than the current assumed rate of return which is 7.50%.

Legend: 75th Percentile — 50th Percentile — 25th Percentile

Stochastic Analysis

➤ Assumptions used in the analysis are the same ones used in the annual actuarial valuation as of June 30, 2019 except for the two noted below.

- Stochastic modeling that follows assumes a 7.00% assumed rate of return assumption.

- To maintain consistency with the reduction in the assumed rate of return, the assumed inflation has been reduced from 3.00% to 2.50% and the payroll growth assumption has been reduced from 3.50% to 3.00%.

- The return for the year ended June 30, 2020 is 3.30%

# Change in Investment Return Assumption

The 7.5% assumption (red line) has the highest funded ratio because liabilities/costs are lowest and assets grow more quickly compared to the 7.0% Assumption.

Funded Ratio - Actuarial Value of Assets

— 7.50% Assumption   — 7.00% Assumption
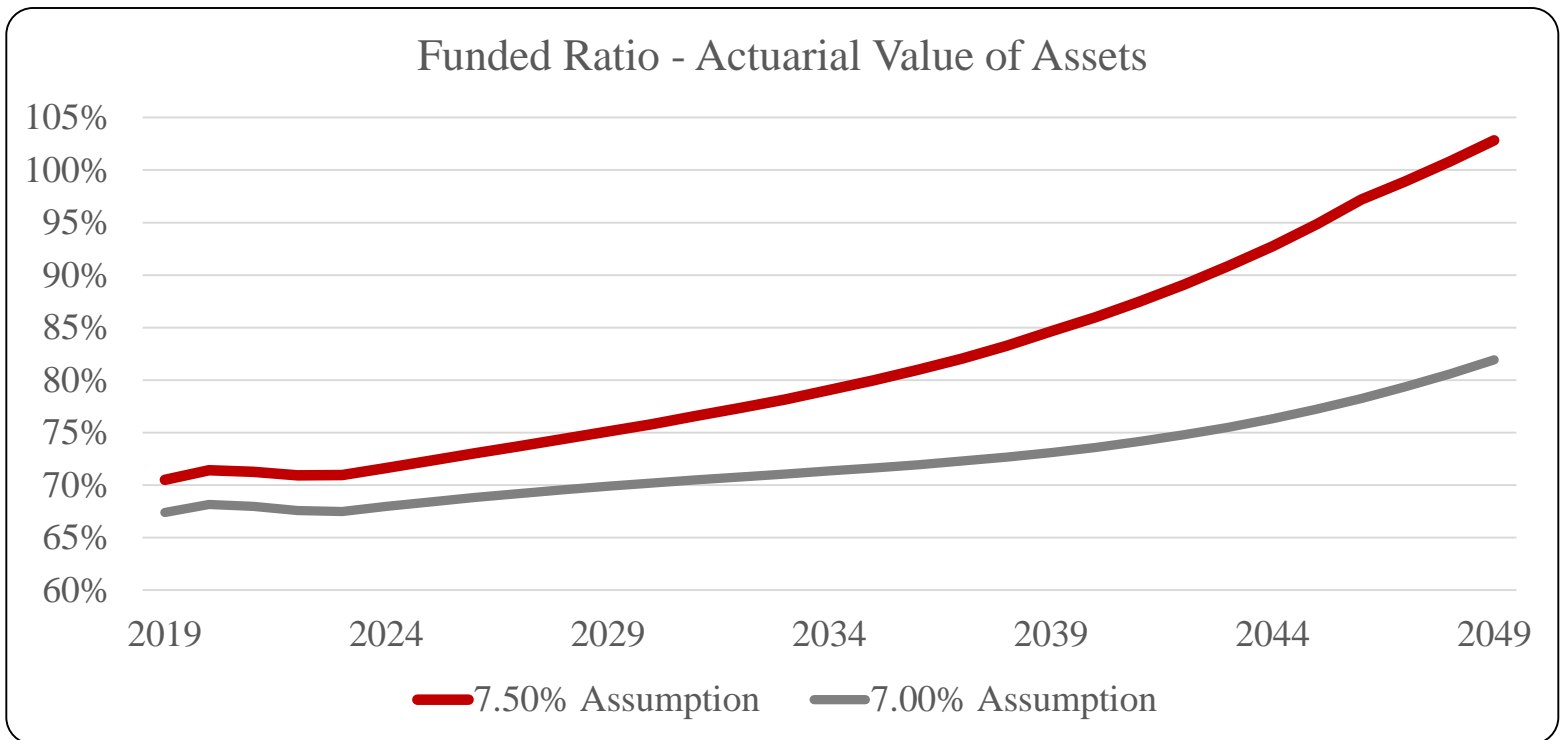
Stochastic Analysis – Funded Ratio

The median funded ratio tends to remain less than baseline deterministic scenario over the projection period due to return volatility. This graph indicates that in 30 years, the middle 50% of possible outcomes are between 15% and 165% funded.

Legend: 75th Percentile — 50th Percentile — 25th Percentile
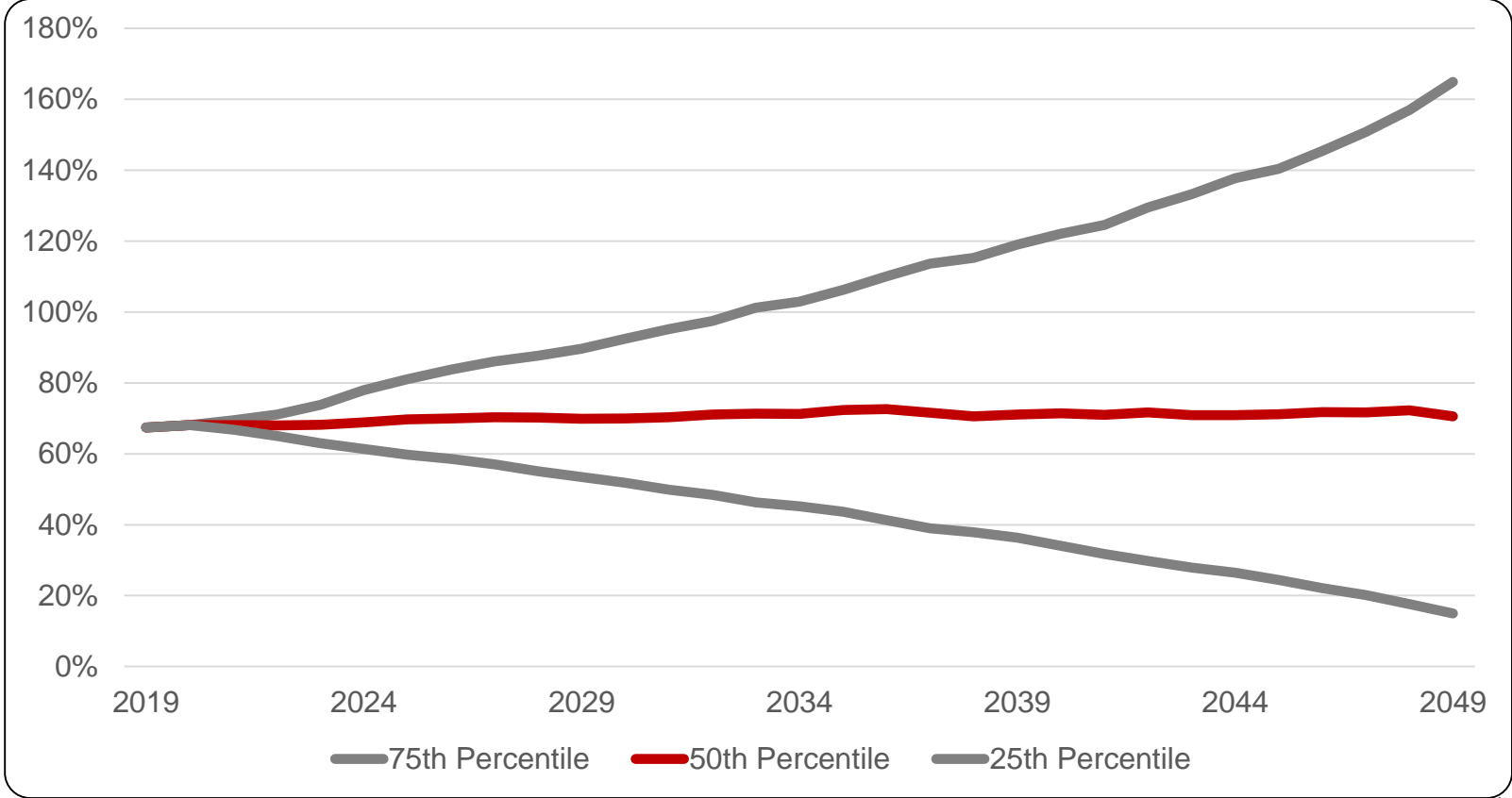
Net External Cash Flow

The median negative cash flow tends to -5.8% over the next 19 years. This is and the fact that total payroll is not growing at the assumed rate of 3.00% are the contributing factors to the fact that the median funded ratio is 70% in the projected funded ratio chart on the previous page.

Legend: 75th Percentile, 50th Percentile, 25th Percentile
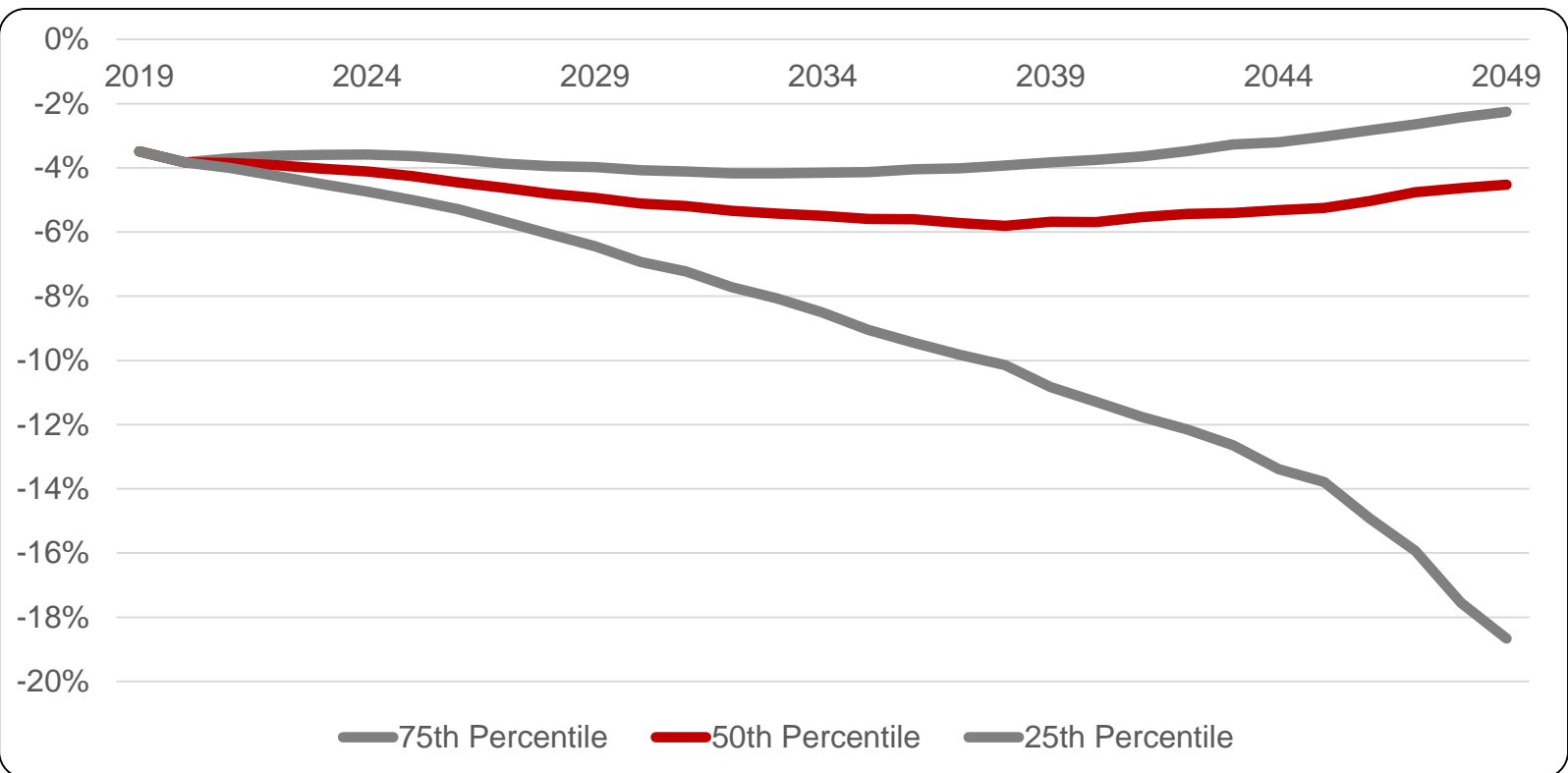
# Stress Testing:
10% Population Decline

Total payroll is assumed to grow at 3.00% per year. A reduction in population will result in a reduction in covered payroll which will reduce the funding available to the System since employer contributions are limited to 14% of payroll which will ultimately increase the amount of time necessary to completely amortize the unfunded liability. This graph indicates that in 30 years, the middle 50% of possible outcomes are between 0% and 155% funded.

Legend: 75th Percentile — 50th Percentile — 25th Percentile
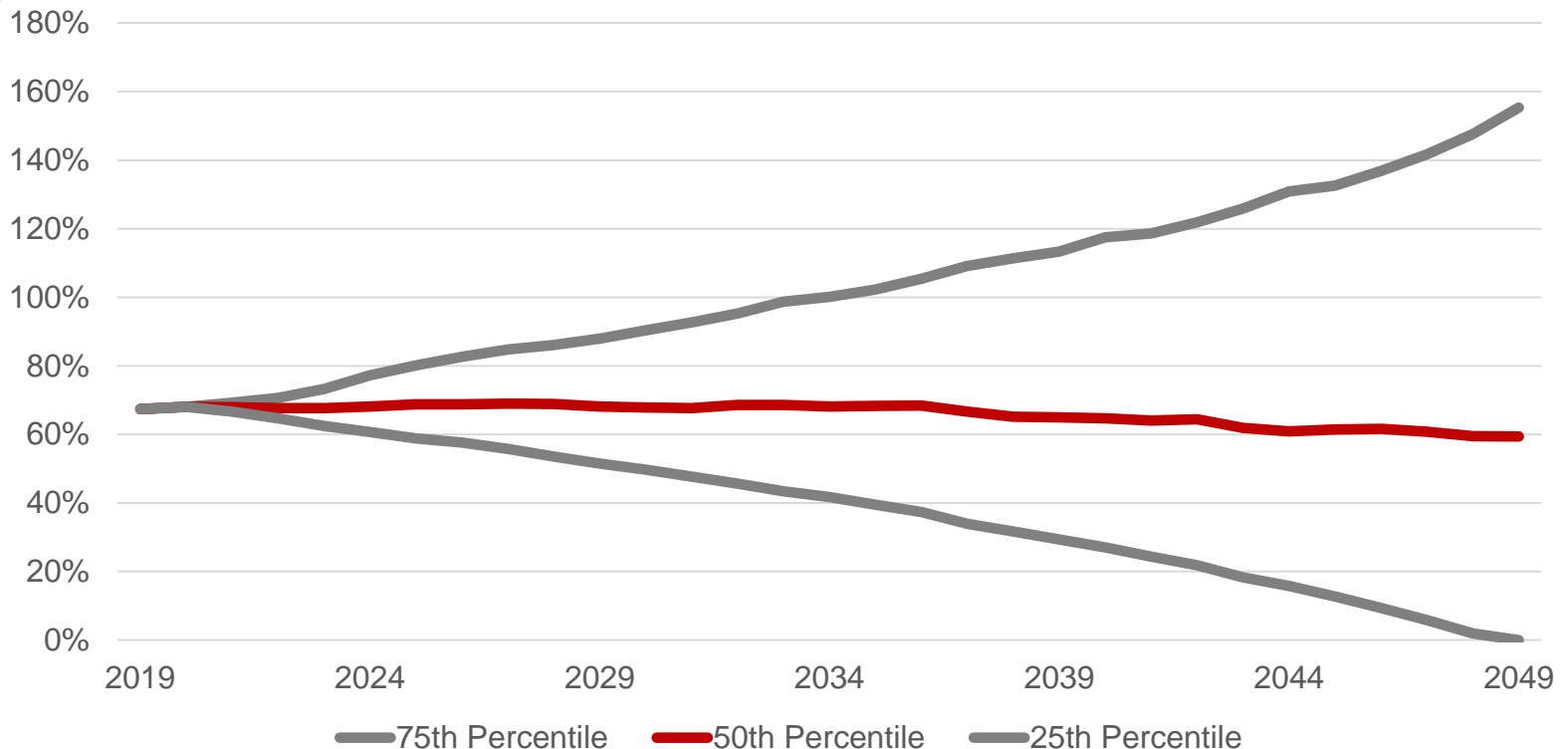
Stress Testing:
20% Population Decline

Total payroll is assumed to grow at 3.00% per year. A reduction in population will result in a reduction in covered payroll which will reduce the funding available to the System since employer contributions are limited to 14% of payroll which will ultimately increase the amount of time necessary to completely amortize the unfunded liability. This graph indicates that in 27 years, the middle 50% of possible outcomes are between 0% and 126% funded.

Legend: 75th Percentile | 50th Percentile | 25th Percentile
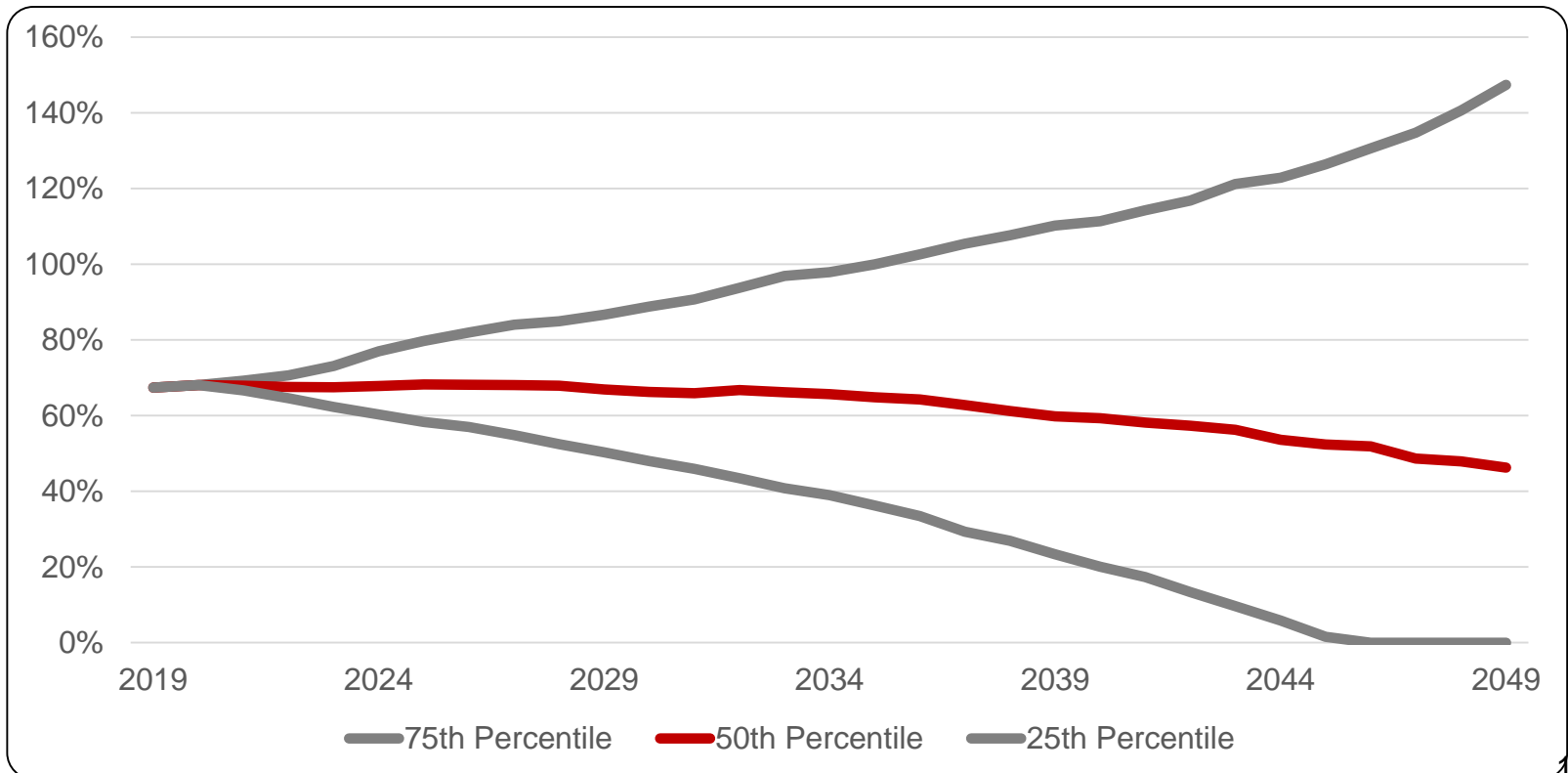
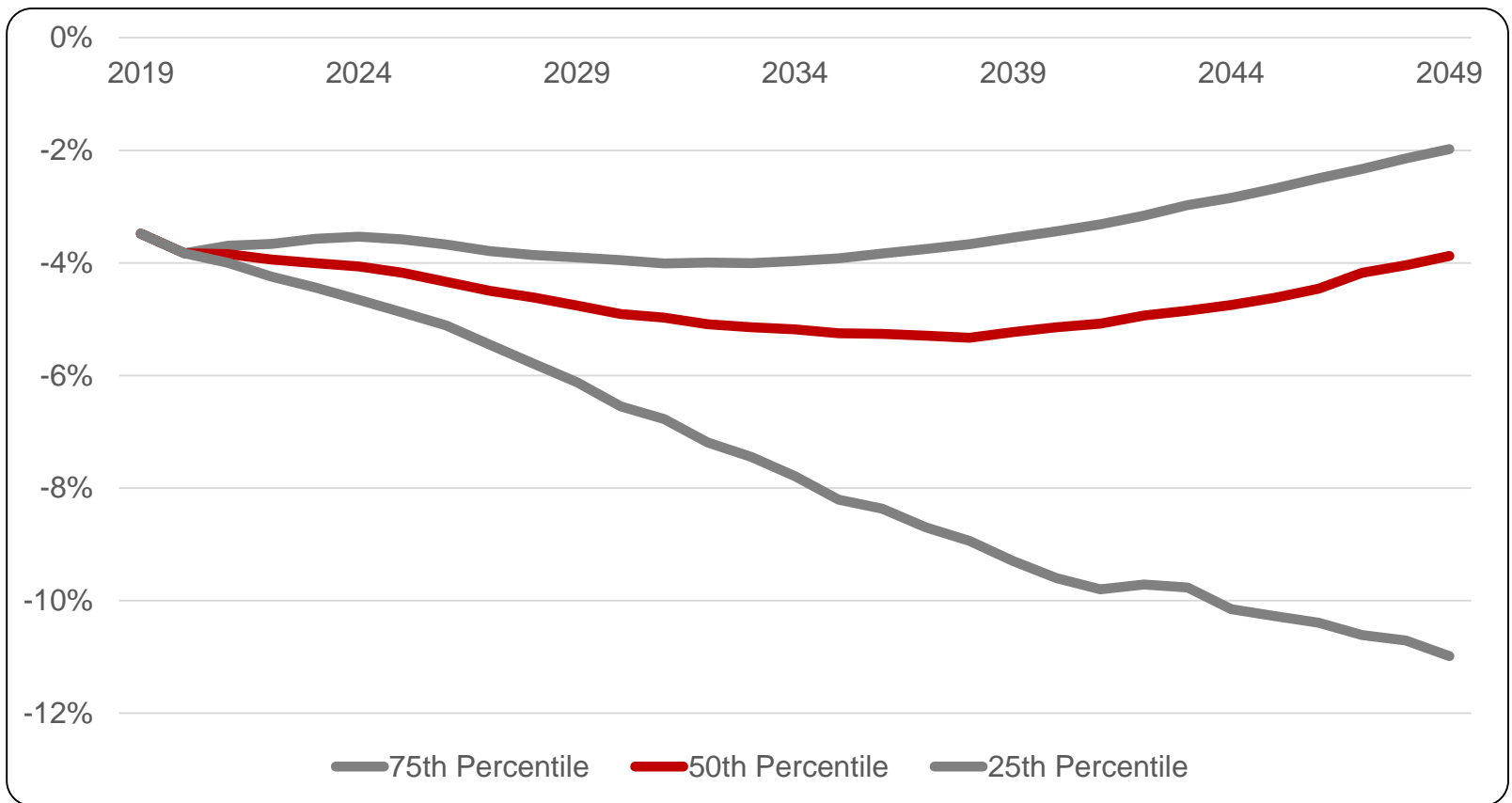# COLA Assumption

- ➢ Assumed COLA's
    - ▪ The expected COLA is approximately 2.00%.
    - ▪ Reduced the COLA Assumption from 2.50% to 2.00%
    - ▪ Positive impact on the projection

# Modeled Net External Cash Flow 2.0% Assumed COLAs

The median negative cash flow tends to -5.3% over the next 19 years compared to -5.8% under the 2.50% assumed COLA

Stochastic Analysis - 2.0% Assumed COLAs

The median funded ratio tends to remain less than baseline deterministic scenario over the projection period. This graph indicates that in 30 years, the middle 50% of possible outcomes are between 26% and 187% funded compared to 15% and 165% under the 2.50% assumed COLA.
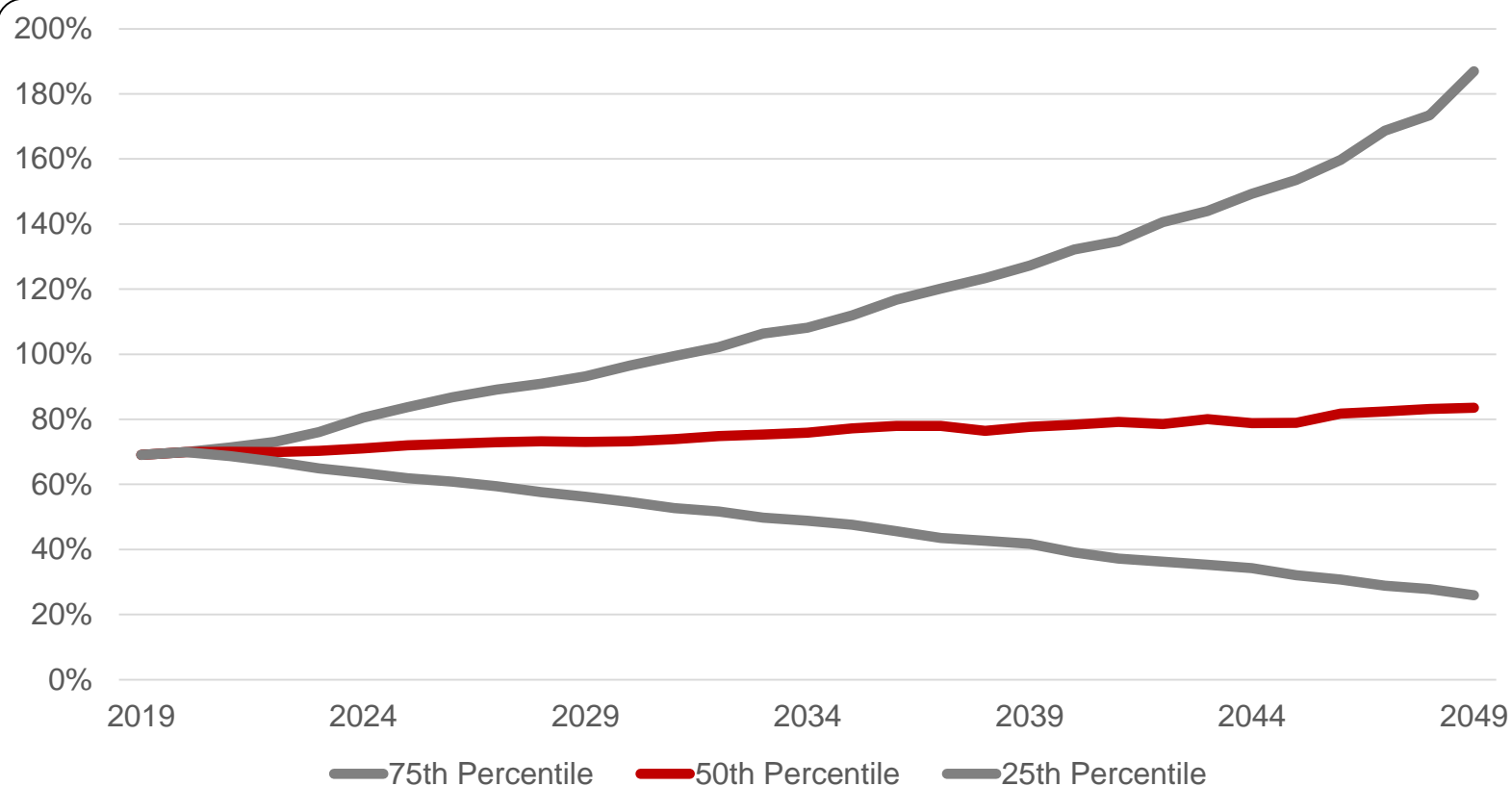
Stress Testing - 2.0% Assumed COLAs: 10% Population Decline

Total payroll is assumed to grow at 3.50% per year. A reduction in population will result in a reduction in covered payroll which will reduce the funding available to the System since employer contributions are limited to 14% of payroll which will ultimately increase the amount of time necessary to completely amortize the unfunded liability. This graph indicates that in 30 years, the middle 50% of possible outcomes are between 9% and 172% funded compared to 0% and 155% under the 2.50% assumed COLA.

Legend: 75th Percentile, 50th Percentile, 25th Percentile
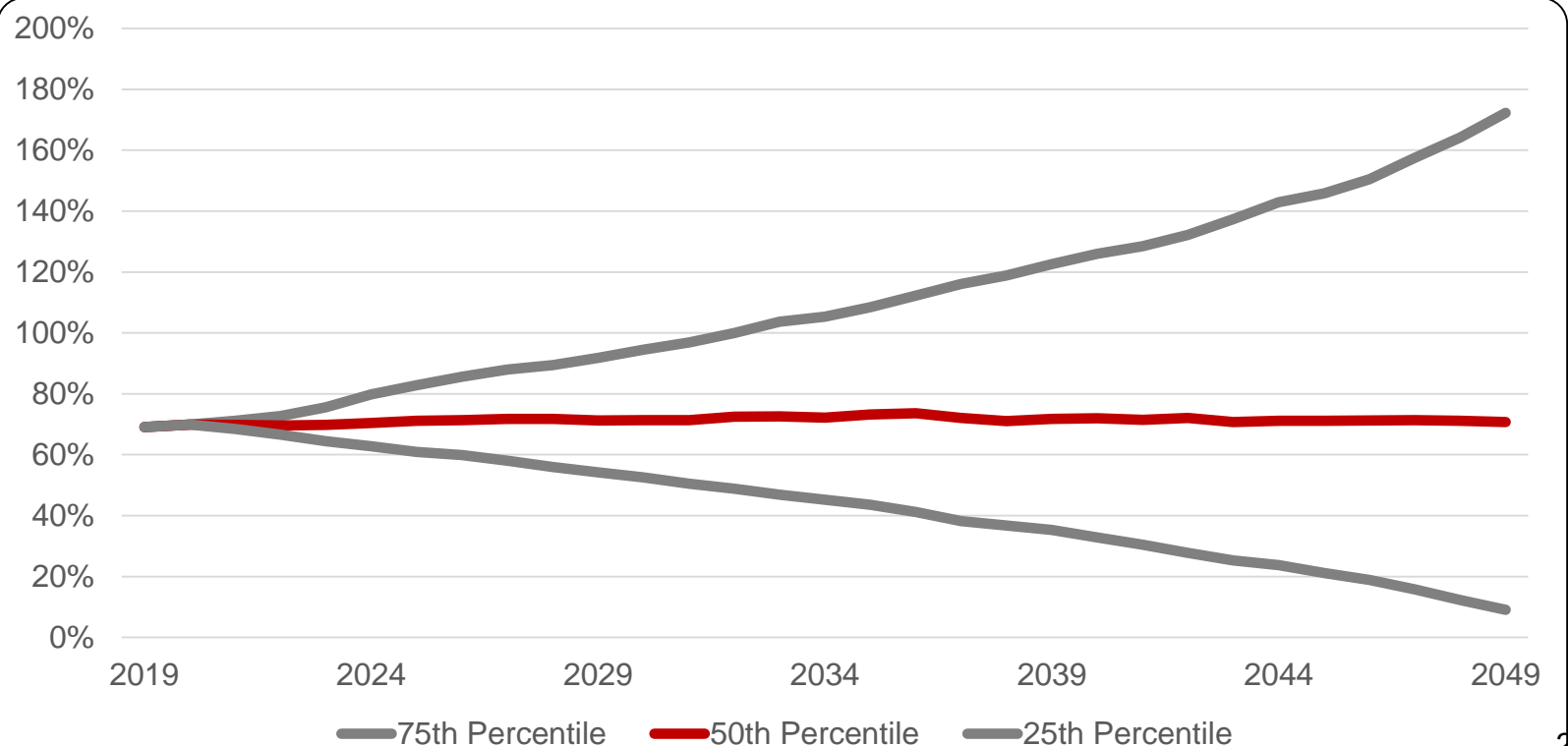
Summary Comments

- ➢ Comments
  - ▪ Reducing investment return assumptions:
    - – Change from 7.5% to 7.0% reduces investment income over 30 year period by approximately $8.0 billion.
    - – Net external cash flow exceeds sustainable levels
      - – Expected to peaks at -5.8% at 2038 (median output) and then improve
  - ▪ Models assume static plan provisions.
    - – In a low inflation environment the System will see liability gains due to lower COLA's being granted than what is currently assumed in the valuation (2.50%)
    - – Assuming 2.0% annual COLAs improves peak net external cash flow only 0.5% at the median.
  - ▪ Decline in population is a risk factor
  - ▪ Any reduction to the assumed investment return should be considered in conjunction with net external cash flow and potential plan changes.