SERS Stress Test Impact Analysis

Annual Report

2024

Independent Fiscal Office

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INDEPENDENT FISCAL OFFICE

November 27, 2024

Governor Josh Shapiro
The Honorable Members of the General Assembly:

Act 128 of 2020 amended Title 71 of the Pennsylvania Consolidated Statutes to require the State Employees' Retirement System (SERS) to conduct an annual stress test of the system and submit the results to the Governor, the General Assembly and the Independent Fiscal Office (IFO). The act directs the IFO to produce a report that summarizes the results, including a calculation of projected employer contributions to projected state General Fund revenues under a scenario analysis. In fulfillment of that obligation, the IFO submits this report to the Governor and members of the General Assembly.

The data and projections used in this report are from various sources. The simulations and related data are from the report entitled *Commonwealth of Pennsylvania State Employees' Retirement System: 2024 Stress Testing and Risk Assessment* produced and certified by SERS and its contracted actuary. Revenue projections were computed by the IFO using data from S&P Global and the IFO's *Pennsylvania Economic & Budget Outlook: Fiscal Years 2024-25 to 2029-30* released in November 2024. Other data sources are noted within this report.

The office would like to thank SERS and its staff, as well as all other individuals and organizations that assisted in the production of this report. Questions and comments can be submitted to contact@ifo.state.pa.us.

Sincerely,

Matthew J. Knittel
Director

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SERS Stress Test Impact Analysis

Introduction

Act 128 of 2020 requires the Independent Fiscal Office (IFO) to summarize the results from the annual State Employees' Retirement System (SERS) Stress Testing and Risk Assessment ("the report").[1] A stress test compares a set of simulations to certified baseline projections to illustrate the impact that changes in policy, economic or demographic variables could have on a pension system. Act 128 requires that SERS conduct three types of analyses based on published industry guidelines: (1) scenario, (2) simulation and (3) sensitivity.[2] The IFO summary must compute the ratio of projected employer contributions to projected state revenues under the scenario analysis.

The report includes 11 scenarios, one simulation and one sensitivity analysis. The report separates scenarios into three groups based on risk factors:

- **Investment Risk** - Investment performance exceeds or fails to meet the assumed rate of return (6.875% net of fees).
- **Demographic Risk** - Demographic factors, such as mortality rates and employee salary growth, differ from the baseline.
- **Contribution & Governance Risk** - Employers contribute less, or more, than the actuarially defined contribution (contribution risk) or policy changes are adopted that impact the number of retirements or future benefits (governance risk).

Of the 11 scenarios included in the report, the IFO selected three to summarize (numbers in parentheses correspond to the numbering convention used in the report). They are as follows:

- **Scenario 1: Future Investment Performance (2.1)** - Investment returns are 2% above or below the baseline for the first ten years, then revert to the baseline.
- **Scenario 2: Large Investment Loss (2.2)** - The system experiences a large loss (-20%) in the first year (2024), then reverts to the baseline return in subsequent years.
- **Scenario 3: Enact a Cost-of-Living Adjustment (4.5)** - An amount equivalent to a 13th check is provided each year to all current retired and disabled members.

The subsections that follow provide a brief description of (1) the methodology used by the IFO to compute the ratio of SERS employer pension contributions to General Fund revenues and (2) SERS baseline projections. The three summary scenarios then follow. The analysis concludes with results from the **Simulation (2.4)** and **Sensitivity (2.5) Analyses** submitted by SERS in its report.

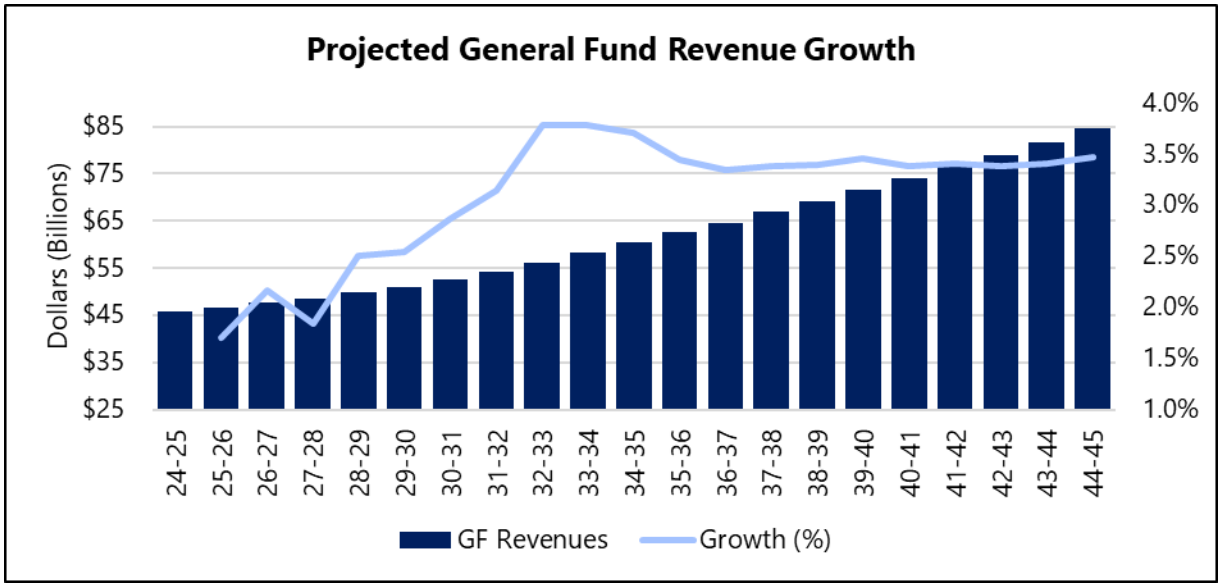
[1] See: *Commonwealth of Pennsylvania State Employees' Retirement System 2024 Stress Testing and Risk Assessment.*

[2] A Scenario Analysis alters a specific parameter or assumed return for a single year or multiple years but does not change the long-term rate of return assumed by the system. A Simulation Analysis allows future returns to be determined stochastically (i.e., randomly, as opposed to a single deterministic return) over the 20-year window. A Sensitivity Analysis changes the assumed rate of return in all future years by a specified percentage, such as 1.0 percentage point higher or lower, to display one-year impacts to funding and budgetary measures.

Methodology

Act 128 requires the IFO to compare employer pension contributions in the scenario analysis to state revenues the Commonwealth is projected to receive in that fiscal year. The report projects the employer contributions as the Actuarially Determined Contributions (ADC) for fiscal years (FY) 2024-25 through FY 2044-45. The IFO regularly projects General Fund revenue collections, and this analysis reflects revenue projections and pension contributions attributable only to the General Fund.[3] It does not include revenue projections and pension contributions for federal and state special funds.

General Fund revenue estimates through FY 2029-30 are from the IFO's *Economic and Budget Outlook* (November 2024). Tax revenues for FY 2030-31 and beyond are assumed to grow at the same rate as nominal state GDP (S&P Global forecast, October 2024). Nontax revenues for FY 2030-31 and beyond are assumed to grow at a rate of 2% per annum. Estimates include the phase-in of the reduced corporate net income tax rate through tax year 2031. It is noted that all revenue (IFO) and economic (S&P Global) projections assume that a recession does not occur, but there is a high probability that a moderate recession would occur once per decade.



The IFO analysis also projects the share of pension contributions that will be made using General Fund revenues. Using data from the *Economic and Budget Outlook*, the IFO estimates that between 53% and 54% of the ADC will come from the General Fund depending on the fiscal year. By FY 2044-45, the share is projected to fall to 52% of contributions. Note that figures include offsets for credits claimed by The Pennsylvania State University and Pennsylvania State System of Higher Education (PASSHE) due to their participation in the pre-funding option provided by Act 105 of 2019.[4]

[3] See: *Pennsylvania Economic and Budget Outlook Fiscal Years 2024-25 to 2029-30* (November 2024).
[4] See: *Financial Impact of Act 105 of 2019* (June 2022).

Baseline Projections

The table below displays SERS baseline projections. The baseline assumes a net investment return of 6.875% for all years. Fiscal year 2024-25 is consistent across all scenarios as the employer contribution rate and projected payroll have been determined. Therefore, that fiscal year is not included in totals for any table in this report and is displayed for informational purposes only.

SERS Baseline Projections

Fiscal Year	Gen. Fund Revenue	Projected GF ADC	Share of Revenue	Employer ADC (%)	Funded Ratio
2024-25	$45.9	$1.2	2.6%	31.1%	69.6%
2025-26	46.7	1.2	2.6	30.0	70.5
2026-27	47.7	1.2	2.6	29.9	70.9
2027-28	48.6	1.3	2.6	30.4	70.2
2028-29	49.8	1.3	2.5	29.3	72.1
2029-30	51.0	1.3	2.5	28.6	73.5
2030-31	52.5	1.3	2.4	27.9	75.0
2031-32	54.2	1.3	2.3	27.3	76.6
2032-33	56.2	1.2	2.2	26.8	78.2
2033-34	58.3	1.2	2.1	26.2	79.9
2034-35	60.5	1.2	2.1	25.6	81.7
2035-36	62.6	1.2	2.0	25.0	83.5
2036-37	64.7	1.2	1.9	24.5	85.5
2037-38	66.8	1.3	1.9	24.1	87.5
2038-39	69.1	1.2	1.8	23.5	89.7
2039-40	71.5	1.2	1.7	23.0	92.0
2040-41	73.9	1.0	1.4	18.2	94.5
2041-42	76.4	0.8	1.1	15.0	96.4
2042-43	79.0	0.6	0.7	10.2	98.0
2043-44	81.7	0.4	0.5	7.6	99.0
2044-45	84.6	0.4	0.5	7.2	99.6
Total	**$1,255.8**	**$22.0**	**1.8%**	**22.2%**	**--**

Notes: Dollars in billions. Baseline ADC from SERS, General Fund projections by the IFO. Funded status refers to end of valuation year that determines rates for associated fiscal year (e.g., FY 2024-25 funded status is of December 31, 2023).

The projected share of the General Fund ADC accounts for 2.6% of General Fund revenues in FY 2024-25 and falls to 0.5% in FY 2044-45 if all assumptions and projections hold. From FY 2025-26 to FY 2044-45, the forecast projects that the Commonwealth will contribute $22.0 billion in General Fund revenues (1.8% of revenues) to SERS for employee pensions.

The report also details the projected employer contribution rate as a share of payroll. This employer contribution rate reflects future changes in plan participation, including impacts from Act 5 of 2017. Baseline effective employer

contribution rates begin at 31.1% in FY 2024-25 and fall to 7.2% by FY 2044-45, decreasing as the unfunded liability is paid off over time. The final column displays the system's funded ratio in the baseline projection at the end of the calendar/valuation year. If current projections hold, then SERS would largely achieve 100% funded status by FY 2044-45.

Scenario 1: Future Investment Performance

The first scenario illustrates the potential impact of long-term investment over or underperformance on required employer contributions. For the scenario, SERS modeled the impact of overperforming or underperforming the assumed net investment rate of return by 2% (200 basis points) each year for the first 10 years, followed by reversion to the baseline rate of return (6.875%) for future years. The table below displays the 20-year projections (five-year increments) if the system underperforms its assumed net investment rate of return by 2% each year for 10 years.

Future Investment Performance (2% Underperformance)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF ADC	Share of Revenue	ADC Change from Baseline	
				Percent	Amount
2026-30	$243.7	$6.4	2.6%	3.3%	$0.2
2031-35	281.7	7.2	2.6	15.7	1.0
2036-40	334.7	7.9	2.4	26.4	1.6
2041-45	395.7	5.1	1.3	53.6	1.8
Total	**$1,255.8**	**$26.6**	**2.1%**	**20.9%**	**$4.6**

Notes: Dollars in billions. Baseline ADC from SERS, General Fund projections by the IFO.

If long-term underperformance occurs, then employers would contribute $4.6 billion (20.9%) more than the baseline scenario and total General Fund contributions would increase to $26.6 billion. The impact of long-term underperformance compounds over time and results in contributions that are 53.6% higher in the final five years of the projection period compared to the baseline. The system's funded status is 88.9% in 2043, 10.6 percentage points lower than the baseline (not shown).

The table on the next page displays results from 2% overperformance for the first 10 years. In the overperformance scenario, cumulative savings ($4.9 billion) exceed additional costs in the underperformance scenario ($4.6 billion) and reduces employer contributions by 22.1% compared to the baseline. By the end of the projection period, the funded ratio is 113.4%, 13.8 percentage points higher than the baseline (not shown).

Future Investment Performance (2% Overperformance)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF ADC	Share of Revenue	ADC Change from Baseline	
				Percent	Amount
2026-30	$243.7	$6.0	2.5%	-3.6%	-$0.2
2031-35	281.7	5.2	1.8	-17.6	-1.1
2036-40	334.7	4.3	1.3	-31.5	-2.0
2041-45	395.7	1.7	0.4	-47.8	-1.6
Total	**$1,255.8**	**$17.1**	**1.4%**	**-22.1%**	**-$4.9**

Notes: Dollars in billions. Baseline ADC from SERS, General Fund projections by the IFO.

Scenario 2: Large Investment Loss

The second scenario considers the impact of a single-year large investment loss on the system. The scenario assumes a -20% net investment return in 2024 and then immediate reversion to the baseline return in all future years.

Large Investment Loss (-20% Return CY 2024)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF ADC	Share of Revenue	ADC Change from Baseline	
				Percent	Amount
2026-30	$243.7	$7.4	3.0%	19.7%	$1.2
2031-35	281.7	8.5	3.0	35.3	2.2
2036-40	334.7	8.5	2.5	35.9	2.2
2041-45	395.7	5.5	1.4	68.2	2.2
Total	**$1,255.8**	**$29.9**	**2.4%**	**36.0%**	**$7.9**

Notes: Dollars in billions. Baseline ADC from SERS, General Fund projections by the IFO.

The significant investment loss increases employer contributions by $7.9 billion over the 20-year period. This amount is 72% higher than the $4.6 billion loss from the 10-year 2% underperformance scenario (page four). Over the 20 years, required employer contributions are 2.4% (+0.6 percentage points) of projected General Fund revenues, and the system achieves 88.1% funded status by 2043 (11.5 percentage points lower than the baseline). For 2025, the funded status would be 67.1% (not shown) – 3.4 percentage points lower than the baseline and 2.5 percentage points lower than the prior year (2023).

Scenario 3: Cost-of-Living Adjustment

The third scenario considers the impact that a cost-of-living adjustment (COLA) could have on the system. The stylized scenario assumes that the General Assembly enacts a law that provides active retirees an amount equal to one additional monthly payment (i.e., a "13th check"), an 8.33% increase in benefits. The scenario applies to all active retirees and disabled members, not a select class based on retirement date or service type.

The SERS report considers two funding options for the 13th check: (1) standard, 10-year level dollar amortization and (2) full and immediate funding. Results from the first funding option are shown in the table below.

Effect of COLA (13th Payment; 10-Year Amortization)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF ADC	Share of Revenue	ADC Change from Baseline	
				Percent	Amount
2026-30	$243.7	$7.1	2.9%	15.1%	$0.9
2031-35	281.7	7.2	2.6	15.2	1.0
2036-40	334.7	6.2	1.9	0.0	0.0
2041-45	395.7	3.3	0.8	0.0	0.0
Total	**$1,255.8**	**$23.9**	**1.9%**	**8.6%**	**$1.9**

Notes: Dollars in billions. Baseline ADC from SERS, General Fund projections by the IFO.

The 13th payment increases the initial unfunded actuarial liability (UAL) by approximately $2.7 billion (not shown). The system would increase employer contributions by $380 million (from all sources) each year for 10 years to pay down these additional liabilities. This amount would be unaffected by investment performance or other actuarial experience. In total, the Commonwealth would contribute $1.9 billion in General Fund revenues to fund the proposed COLA. At the end of the 10-year period, the system would return to baseline projections for contributions and funded status.

The second funding option considers the impact that a full and immediate funding strategy would have on the system. While the 10-year amortization schedule to pay down liabilities would remain, the Commonwealth would opt to fund the additional liability immediately as a lump sum ($2.7 billion) payment. Because the 10-year amortization payment schedule would still be effective, employers would be charged more than the baseline amounts during the first decade. However, during the second decade, the positive actuarial effect of the lump sum payment would off-set some employer contributions, which leads to lower net contributions over the 20 years compared to the baseline. Although illustrative, this payment schedule is unlikely to occur, because the Commonwealth would "pay twice" in the short term to generate longer-term savings and higher funded ratios.

Effect of COLA (13th Payment; Immediate Funding)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF ADC	Share of Revenue	ADC Change from Baseline	
				Percent	Amount
2026-30	$243.7	$6.6	2.7%	6.6%	$0.4
2031-35	281.7	6.7	2.4	6.7	0.4
2036-40	334.7	5.7	1.7	-8.6	-0.5
2041-45	395.7	2.8	0.7	-16.1	-0.5
Total	**$1,255.8**	**$21.8**	**1.7%**	**-1.1%**	**-$0.2**

Notes: Dollars in billions. Baseline ADC from SERS, General Fund projections by the IFO.

Summary of Simulation and Sensitivity Analyses

In addition to various scenarios, the report includes a simulation analysis and a sensitivity analysis. The **Simulation Analysis (2.4)** is a stochastic analysis that uses results from 5,000 simulated investment returns over a 20-year period to illustrate the likelihood of potential outcomes for the system. The analysis presents four potential outcomes from the simulations based on the distribution of outcomes. The figures in the table below represent average returns over the 20 years, 20-year totals or ratios at the end of year 20 (final column):

- 5th Percentile: A highly unlikely scenario, strong favorable results.
- 25th Percentile: A reasonably likely, favorable scenario.
- 75th Percentile: A reasonably likely, unfavorable scenario.
- 95th Percentile: A highly unlikely scenario, strong unfavorable results.

Summary Results from Simulation Analysis

Distribution Percentiles	Average Return (%)	Additional ADC (Total)	Additional ADC (GF)	Final Fund. Ratio (%)
5th Percentile	13.7%	-$27.3	-$13.7	363.0%
25th Percentile	10.1	-20.8	-10.5	176.4
Baseline	6.9	--	--	99.6
75th Percentile	5.5	11.6	5.9	83.7
95th Percentile	2.5	30.0	15.1	57.3

Notes: Dollars in billions. Data from SERS, General Fund projections by the IFO.

Results from the **Sensitivity Analysis (2.5)** do not quantify 20-year impacts. Instead, the analysis shows the initial impact that a change in the assumed net investment rate of return would have on several metrics in the first projection year. These metrics include total and employer normal cost rates (as a share of payroll), employer ADC, the funded ratio and unfunded actuarial accrued liability (UAAL). The table below summarizes the impact on three of those metrics. The valuation would be as of December 31, 2024, and would also be the effective date of the funded ratio. The impact on employer contributions or ADC represents a single fiscal year (FY 2025-26) but would also impact future contribution rates and amounts (not simulated).

Summary Results from Sensitivity Analysis (FY 2025-26)

Assumed Invest. Return Rate	Change from Baseline (%)	Additional ADC (Total)	Additional ADC (GF)	Funded Ratio (%)	Change in UAAL
7.875%	+1.0%	-$0.5	-$0.2	77.3%	-$5.0
6.875	--	--	--	70.5	--
5.875	-1.0	0.5	0.3	63.9	5.9
4.875	-2.0	1.1	0.6	57.5	12.8

Notes: Dollars in billions. Data from SERS, General Fund projections by the IFO.