PSERS Stress Test Impact Analysis

Annual Report

2024

Independent Fiscal Office

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INDEPENDENT FISCAL OFFICE

February 28, 2024

Governor Josh Shapiro
Honorable Members of the General Assembly:

Act 128 of 2020 amended Title 24 of the Pennsylvania Consolidated Statutes to require the Public School Employees' Retirement System (PSERS) 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 the ratio 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 *Pennsylvania Public School Employees' Retirement System: PSERS Stress Testing Analysis* produced and certified by PSERS and its contracted actuary. Revenue projections are from the IFO using data from S&P Global and the IFO's mid-year update presented in January 2024. Other data sources are noted within this report.

The office would like to thank PSERS 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

PSERS Stress Test Impact Analysis

Introduction

Act 128 of 2020 requires the Independent Fiscal Office (IFO) to summarize the results from the annual Public School Employees' Retirement System (PSERS) Stress Testing and Risk Assessment report ("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 PSERS conduct three types of analyses based on published industry guidelines: (1) scenario, (2) simulation and (3) sensitivity.[2] The IFO summary must include the ratio of projected employer contributions to projected state revenues under the scenario analysis.

The report includes (1) a baseline projection, (2) three scenarios, (3) a simulation (stochastic) analysis and (4) a sensitivity analysis. The three scenarios provided by PSERS are:

- **Scenario 1: Excess Investment Return** - Investment returns are 2% above the baseline for the first 20 years, then revert to the baseline.
- **Scenario 2: Low Investment Return** - Investment returns are 2% below the baseline for the first 20 years, then revert to the baseline.
- **Scenario 3: Low Employer Contributions** - Employers contribute 80% of the actuarially determined contribution (ADC) for the first 20 years, then revert to 100% of the ADC.

The subsections that follow provide a brief description of (1) the methodology used by the IFO to compute the ratio of PSERS employer pension contributions to General Fund revenues and (2) PSERS baseline projections. The three summary scenarios then follow. The analysis concludes with results from the simulation and sensitivity analyses included in the PSERS report.

Methodology

The PSERS report projects the share of payroll required to meet employer contributions for fiscal years (FY) 2021-22 through FY 2051-52. This analysis only reflects revenue projections and pension contributions attributable to the General Fund from the state appropriation made through the Pennsylvania Department of Education (PDE) and focuses on changes that impact FY 2024-25 to FY 2051-52.

General Fund revenue estimates through FY 2024-25 are from the IFO's Mid-Year Update.[3] Growth rates through FY 2028-29 are from the IFO's Economic and Budget Outlook (Five-Year Outlook; November 2023).[4] Tax revenues for FY 2029-30 and beyond are assumed to grow at the same rate as nominal state GDP (S&P Global, January 2024). Nontax revenues for FY 2029-30 and beyond are assumed to grow at a rate of 2% per annum.

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[1] See: *Pennsylvania Public School Employees' Retirement System: PSERS Stress Testing Analysis* (December 2023).
[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 30-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 the impact on current funding status.
[3] See: *IFO Mid-Year Update, Fiscal Year 2023-24* (January 2024).
[4] See: *Pennsylvania Economic and Budget Outlook: Fiscal Years 2023-24 to 2028-29* (November 2023).

The IFO also projects the state's share of the employer contributions attributable to qualified school employees in the Economic and Budget Outlook report. Projections made in this analysis differ from that report due to the following payroll-related factors:

(1) State Share of Employer Contributions: In the Economic and Budget Outlook, the IFO assumes that the state's share of the employer contributions is approximately 57% for qualified public school employees. However, the stress test report uses an alternative payroll projection which includes charter school employees (a share of which is not reimbursed by the state). Therefore, for this analysis, the state's share of employer contributions is assumed to be 55.1% of projected payroll.

(2) Assumed Payroll Levels: When conducting the stress test, PSERS used the June 30, 2022 Actuarial Valuation to project payroll and other factors. In addition to differences in personnel included in projected payroll (noted above), payroll data used in the Economic and Budget Outlook are more recent and differ notably from the actuarially assumed payroll projections. This leads to a divergence in IFO projections as they appear in the two reports, and what may be ultimately used for Commonwealth budgeting purposes.

In addition to payroll differences, the annual state appropriation includes funding for (1) PSERS' Premium Assistance program and (2) the Act 5 Defined Contribution (DC) share. The Premium Assistance program helps eligible retirees pay for healthcare coverage through their public school employer health plans or the PSERS sponsored group health insurance program. The IFO increased the employer contribution share of payroll utilized in this report by approximately 0.7% each year for premium assistance costs, in order to better reflect the projected appropriation value. For DC contributions, PSERS provided the IFO with projections that range from 0.35% in FY 2024-25 to 2.02% in FY 2051-52.

Baseline Projections

The table on the next page displays PSERS' baseline projections. The baseline assumes a net investment return of 7.00% for all future years. For this report, the FY 2023-24 contribution level is unchanged across all scenarios as the appropriation for that year has been established and is treated as actual data. That year is not included in totals for any table in this report and is displayed for informational purposes only.

The projected state General Fund appropriation accounts for 6.5% of General Fund revenues in FY 2024-25 and decreases to 0.5% in FY 2051-52. From FY 2024-25 to FY 2051-52, the forecast projects that the Commonwealth will contribute $53.0 billion in General Fund revenues (2.7% of total revenues) to local school districts for employee pensions.

The baseline projections also detail the projected employer contribution rate (includes funding for the Premium Assistance Program and Act 5 DC contributions) as a share of payroll. Baseline effective employer contribution rates begin at 34.5% in FY 2024-25, peak at 42.3% in FY 2034-35, and then decline each year thereafter, to 4.5% by FY 2051-52. The final column of the table displays the system's projected funded status in the baseline scenario at the end of the calendar/valuation year. If these projections hold, then the system does not reach 100% funded status by the end of the projection period (ends at 99.5%).

PSERS Baseline Projections

Fiscal Year	Gen. Fund Revenue	Total Emp. Contr. Rate	Gen. Fund Contribution	Share of Revenue	Funded Ratio
2023-24	$45.0	34.0%	$3.00	6.7%	63.4%
2024-25	45.3	34.5	2.93	6.5	65.2
2025-26	46.0	35.5	3.03	6.6	67.1
2026-27	47.3	36.3	3.12	6.6	69.1
2027-28	48.4	36.9	3.19	6.6	71.2
2028-29	49.7	37.5	3.29	6.6	73.5
2029-30	51.1	38.3	3.37	6.6	75.9
2030-31	52.4	38.9	3.45	6.6	78.5
2031-32	54.0	39.5	3.53	6.5	81.3
2032-33	56.0	40.6	3.64	6.5	84.4
2033-34	58.0	41.4	3.74	6.5	87.7
2034-35	60.1	42.3	3.85	6.4	91.2
2035-36	62.2	24.5	2.24	3.6	92.9
2036-37	64.3	20.0	1.84	2.9	94.2
2037-38	66.4	18.1	1.68	2.5	95.4
2038-39	68.6	15.9	1.48	2.2	96.4
2039-40	70.9	14.0	1.31	1.8	97.2
2040-41	73.3	12.4	1.16	1.6	97.9
2041-42	75.9	7.9	0.74	1.0	98.2
2042-43	78.5	6.6	0.62	0.8	98.4
2043-44	81.2	6.1	0.58	0.7	98.5
2044-45	84.0	6.6	0.63	0.8	98.7
2045-46	86.9	6.3	0.61	0.7	98.9
2046-47	89.9	4.5	0.44	0.5	98.9
2047-48	93.0	5.4	0.53	0.6	99.1
2048-49	96.3	5.3	0.54	0.6	99.2
2049-50	99.8	4.9	0.50	0.5	99.4
2050-51	103.4	4.5	0.47	0.5	99.4
2051-52	107.1	4.5	0.48	0.5	99.5
Total	**$1,969.8**	**20.3%**	**$53.0**	**2.7%**	--

Notes: Dollars in billions. Employer contribution rate data from PSERS, General Fund projections by the IFO. Funded status refers to end of valuation year (i.e., FY 2023-24 is as of June 30, 2024).

Scenario 1: Excess Investment Return

The first scenario displays the impact on employer contributions due to an unexpected 2% overperformance (9% in net investment returns) for the first 20 years. This scenario results in cumulative savings of $8.2 billion, a 15.4% reduction to baseline employer contributions. The system would be 100% funded in 2033 and ends the projection period funded at 189.2%. Overall, General Fund appropriations for employer contributions would account for 2.3% of General Fund revenues over the period, a 0.4 percentage point reduction from the baseline.

Excess Investment Return (2% Overperformance)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF Contr.	Share of Revenue	Change from Baseline Percent	Change from Baseline Amount
2025-31	$340.2	$22.0	6.5%	-1.7%	-$0.4
2032-38	420.9	17.2	4.1	-16.1	-3.3
2039-45	532.3	3.0	0.6	-54.2	-3.5
2046-52	676.4	2.6	0.4	-26.5	-0.9
Total	**$1,969.8**	**$44.8**	**2.3%**	**-15.4%**	**-$8.2**

Notes: Dollars in billions. Employer contribution rates from PSERS, General Fund projections by the IFO.

Scenario 2: Low Investment Return

The table below displays results from 2% underperformance (5% net investment return) for the first 20 years. In this scenario, General Fund appropriations for employer contributions increase by 48.5% compared to the baseline. The additional $25.7 billion in employer contributions greatly exceeds the savings displayed in the 2% overperformance scenario ($8.2 billion) because compounding losses require perpetually higher contributions to offset prior year shortfalls. By the end of the projection period, the funded ratio is 73.3%, 26.2 percentage points lower than the baseline (not shown).

Low Investment Return (2% Underperformance)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF Contr.	Share of Revenue	Change from Baseline Percent	Change from Baseline Amount
2025-31	$340.2	$22.7	6.7%	1.5%	$0.3
2032-38	420.9	23.5	5.6	14.5	3.0
2039-45	532.3	14.7	2.8	124.7	8.1
2046-52	676.4	17.8	2.6	398.7	14.2
Total	**$1,969.8**	**$78.7**	**4.0%**	**48.5%**	**$25.7**

Notes: Dollars in billions. Employer contribution rates from PSERS, General Fund projections by the IFO.

Scenario 3: Low Employer Contributions

The final scenario considers the impact that a reduction in employer contributions, sometimes referred to as "pension collars," could have on the system. The scenario assumes that for the first 20 years, employers are only required to remit 80% of the ADC.

Low Employer Contributions (80% of ADC)

Fiscal Years Ending	Gen. Fund Revenue	Projected GF Contr.	Share of Revenue	Change from Baseline Percent	Change from Baseline Amount
2025-31	$340.2	$18.5	5.4%	-17.3%	-$3.9
2032-38	420.9	19.1	4.5	-7.1	-1.5
2039-45	532.3	10.7	2.0	63.5	4.1
2046-52	676.4	10.8	1.6	201.8	7.2
Total	**$1,969.8**	**$59.0**	**3.0%**	**11.4%**	**$6.0**

Notes: Dollars in billions. Employer contribution rates from PSERS, General Fund projections by the IFO.

The implementation of collared rates results in an additional $6.0 billion in employer contributions over the projection period. While the appropriation level is reduced by nearly $5.4 billion during the first half of the period, it must increase by $11.3 billion during the second half to offset the reduced contributions and returns they would have earned. The scenario results in a 92.3% funded status at the end of FY 2051-52.

Summary of Simulation and Sensitivity Analyses

In addition to various scenarios, the report includes a simulation analysis and sensitivity analysis. The **Simulation Analysis** is a stochastic analysis that uses results from 999 simulated investment returns over a 30-year period to illustrate the likelihood of potential outcomes for the system. The analysis presents five potential outcomes from the simulations based on percentiles of the distribution of outcomes. These potential outcomes are:

- 95th Percentile: Upside simulation with strong favorable results. Highly unlikely.
- 75th Percentile: A favorable, plausible outcome, but unlikely.
- 50th Percentile: The expected outcome based on current funding policy.
- 25th Percentile: An unfavorable, plausible outcome, but unlikely.
- 5th Percentile: Downside simulation with strong unfavorable results. Highly unlikely.

The table on the next page displays geometric average returns over 30 years, 30-year differentials from the baseline scenario and final funded-ratios at the end of year 30 (final column) based on the analysis.

Summary Results from Simulation Analysis

Distribution Percentiles	Average Return (%)	Additional Contributions		Final Fund. Ratio (%)
		Total	State GF	
95th-Upside	10.8%	-$28.3	-$15.6	508.8%
75th-Favorable	9.2	-20.7	-11.4	267.1
50th-Expected	8.0	-11.0	-6.0	160.8
Baseline	7.0	--	--	99.5
25th-Unfavorable	6.7	20.0	11.0	92.2
5th-Downside	4.6	83.7	46.1	47.3

Notes: Dollars in billions. Data from PSERS, calculations by the IFO. "Baseline" reflects baseline simulation used for scenario analyses. Additional contributions reflect changes compared to baseline and include premium assistance and defined contribution amounts. Average returns include 3.54% return in FY 22-23.

Results from the **Sensitivity Analysis** do not reflect quantifiable 30-year impacts. Instead, the analysis shows the initial impact on funding status that a change in the assumed 7.00% net investment rate of return would have on several metrics in the first projection year. It should be noted that the discount rate used to value future liabilities would change to match the assumed rate of return, which reinforces the impact that assumed returns have on liability and funded ratios. Unlike the scenario and stochastic analyses, PSERS' actuary used data from the most recent GASB 67 Actuarial Valuation for the sensitivity analysis. Therefore, the table below reflects changes in funding status as of June 30, 2023, and cannot be directly compared to the other analyses contained in this report.

Summary Results from Sensitivity Analysis (June 30, 2023)

Assumed Invest. Return Rate	Change from Baseline (%)	Unfunded Liability	Change in Liability	Funded Ratio (%)
8.00%	+1.0%	$33.4	-$11.1	68.4%
7.00	--	44.5	--	61.9
6.00	-1.0	57.7	13.2	55.6

Notes: Dollars in billions. Data from PSERS, calculations by the IFO.