Commission on Government Forecasting and Accountability

802 Stratton Ofc. Bldg., Springfield, IL 62706

MONTHLY BRIEFING FOR THE MONTH ENDED: NOVEMBER 2019

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AUTHOR(S) OF REPORT
Julie Bae
Ryan Mueller

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SPECIAL PENSION BRIEFING

STATE RETIREMENT SYSTEMS OVERVIEW

Julie Bae, Pension Analyst
Ryan Mueller, Legislative Staff Intern

The Commission has reviewed the State-funded retirement systems' FY 2019 actuarial reports, which were issued prior to November 1st, pursuant to P.A. 97-0694, the State Actuary Law. Under the State Actuary Law, the systems must annually submit a proposed certification for the following fiscal year prior to November 1st of the current calendar year. The State Actuary then must issue a preliminary report concerning the systems' proposed certification by January 1st. The State Actuary's report must identify any recommended changes in actuarial assumptions based upon the review of the retirement systems' actuarial assumptions.

Using the actuarial (smoothed) value of assets, the total unfunded liabilities of the State systems totaled $137.2 billion on June 30, 2019, led by the Teachers' Retirement System (TRS), whose unfunded liabilities amounted to $78.1 billion. As the largest of the State systems, TRS accounts for approximately 56.9% of the total assets and liabilities of the five State systems combined. The State Employees' Retirement System (SERS) had unfunded liabilities of $30.3 billion, approximately 22.1% of the total unfunded liabilities of the five systems, followed by the State Universities Retirement System (SURS) with unfunded liabilities of $26.8 billion, which represents 19.5% of the total unfunded liabilities. Table 1, on the following page, provides a summary of the financial condition of each of the five State retirement systems, showing their respective liabilities and assets as well as their accumulated unfunded liabilities and funded ratios.

TABLE 1

Summary of Financial Condition FY 2019 State Retirement Systems Combined Assets at Actuarial Value / With Asset Smoothing (P.A. 96-0043) ($ in Millions)				
System	Accrued Liability	Actuarial Assets	Unfunded Liability	Funded Ratio
TRS	$131,457.0	$53,391.2	$78,065.8	40.6%
SERS	$48,731.4	$18,429.2	$30,302.3	37.8%
SURS	$46,443.9	$19,650.1	$26,793.9	42.3%
JRS	$2,793.0	$1,068.7	$1,724.3	38.3%
GARS	$374.6	$60.1	$314.5	16.0%
TOTAL	**$229,800.0**	**$92,599.2**	**$137,200.7**	**40.3%**

A more realistic valuation of the true financial position of the State retirement systems would be based upon the market value of the assets, as shown in Table 2 below. Based upon the market value of assets, the combined unfunded liabilities of the State systems totaled $137.3 billion on June 30, 2019. TRS, whose unfunded liabilities amounted to $78.2 billion, again represents approximately 57.0% of the combined total unfunded balance. Table 2 provides a summary of the financial condition of each of the five State retirement systems, showing their respective liabilities and assets as well as their accumulated unfunded liabilities and funded ratios.

TABLE 2

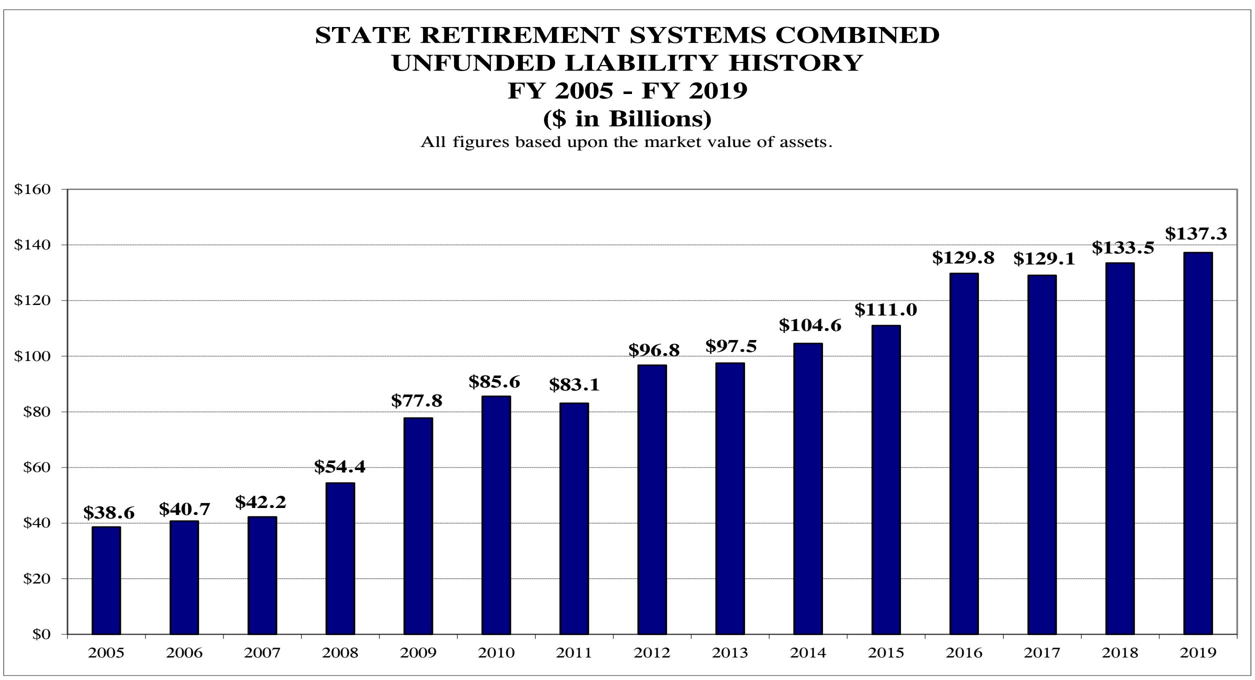
Summary of Financial Condition FY 2019 State Retirement Systems Combined Assets at Market Value / Without Asset Smoothing (P.A. 96-0043) ($ in Millions)				
System	Accrued Liability	Market Assets	Unfunded Liability	Funded Ratio
TRS	$131,457.0	$53,262.4	$78,194.6	40.5%
SERS	$48,731.4	$18,478.3	$30,253.1	37.9%
SURS	$46,443.9	$19,657.5	$26,786.5	42.3%
JRS	$2,793.0	$1,073.1	$1,719.9	38.4%
GARS	$374.6	$59.7	$314.9	15.9%
TOTAL	**$229,800.0**	**$92,531.0**	**$137,269.0**	**40.3%**

The funded ratios of the respective systems may be compared to the aggregate funded ratio. The combined funded ratio based on both the actuarial and market value of assets for FY 2019 is approximately 40.3% as shown in Tables 1 and 2 (the 15-year history of the systems' cumulative funded ratio is shown in Chart 5). GARS has the poorest funded ratio, followed by SERS and the Judges' Retirement System (JRS).

Chart 1 below shows a 15-year history of the cumulative unfunded State pension liability and is based upon calculations performed by the retirement systems' actuaries using the *market value* of assets for all years, including FY 2019. The aggregate unfunded liability has been growing significantly over the past decade. One of the main drivers continues to be actuarially insufficient State contributions determined by the current pension funding policy under P.A. 88-0593. As the actuaries for the State retirement systems have noted in the respective annual actuarial valuation reports, the funding plan under P.A. 88-0593 produces employer (State) contributions that are actuarially insufficient, meaning if all other actuarial assumptions are met, unfunded liabilities will still increase due to the State contributing an amount that is not sufficient to stop the growth in the unfunded liability. Hence, there is a distinction between contributions that are statutorily sufficient and contributions that are considered actuarially sufficient (the annual reports of the State Actuary have noted this distinction as well).

Other reasons for an increase in unfunded liability would be the results of poor investment performance, unfavorable actuarial experiences or actuarial assumptions changes that increase the liability such as a reduction in assumed investment returns. Further details on the main factors affecting unfunded liability can be found be in Charts 3 and 4.

CHART 1



In the following paragraphs, we provide some context of the recent history in the State's cumulative unfunded liability. In FY 2015 and 2016, the aggregate unfunded liability grew, largely due to changes in actuarial assumptions, along with actuarially insufficient State Contributions. The lowering of investment assumption rates by all the systems except SURS in FY 2016 led to a significant increase in the combined unfunded liability of $9.67 billion, accounting for 71% of the $13.61 billion increase over the combined FY 2015 unfunded liability.

During FY 2017, the combined unfunded liability on a market value basis slightly decreased for the first time in the past 6 years, mainly caused by higher-than-expected investment returns from all the systems. However, the unfunded liability increased to $133.5 billion in FY 2018 again. The main drivers behind the growth were the actuarially insufficient state contributions under the statutory funding plan and SURS' reduced investment return assumption as well as the five systems' unfavorable actuarial experiences from demographic and other factors.

The unfunded liability grew to $137.3 billion during FY 2019, largely due to the continued actuarially insufficient State contributions and lower-than-expected investment returns. Actuarial gains from SERS members who elected to participate in the pension buyout plans and net actuarial gains reported by two systems, SERS and GARS, helped offset the cumulative actuarial loss of the five Systems combined. Details on the factors affecting the unfunded liability in FY 2019 can be found in Chart 3.

Table 3 below shows the historical changes in the investment return assumptions for each of the five State systems. In FY 2019, SERS, JRS, and GARS reduced their respective assumed investment rate by a quarter percentage point, while the investment assumption rate for TRS and SURS remained the same.

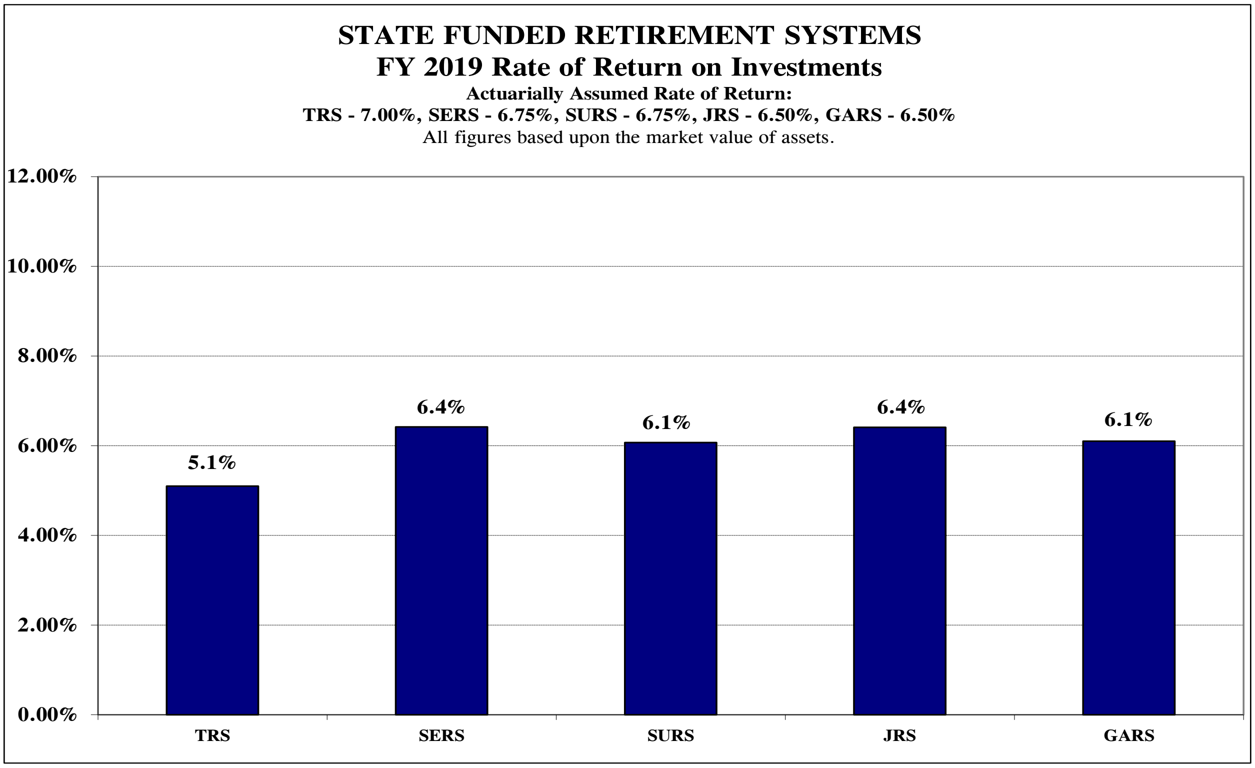
TABLE 3

Historical Change in Investment Rate Assumptions							
System	**Prior to FY 10**	**FY 10**	**FY 12**	**FY 14**	**FY 16**	**FY 18**	**FY 19**
TRS	8.50%	8.50%	***8.00%***	***7.50%***	***7.00%***	7.00%	7.00%
SERS	8.50%	***7.75%***	7.75%	***7.25%***	***7.00%***	7.00%	***6.75%***
SURS	8.50%	***7.75%***	7.75%	***7.25%***	7.25%	***6.75%***	6.75%
JRS	8.00%	***7.00%***	7.00%	7.00%	***6.75%***	6.75%	***6.50%***
GARS	8.00%	***7.00%***	7.00%	7.00%	***6.75%***	6.75%	***6.50%***

NOTE: The years associated with investment rate assumption changes above reflect the actuarial valuation year, not the fiscal year in which the State contribution was calculated using the new rate. Changes in the assumed investment rates are marked in italics and bold.

Chart 2 on the following page presents market investment return rates experienced by each of the systems in FY 2019. All the five systems did not meet their actuarially assumed rates of return during FY 2019, and thus actuarial losses occurred due to lower-than-assumed investment returns.

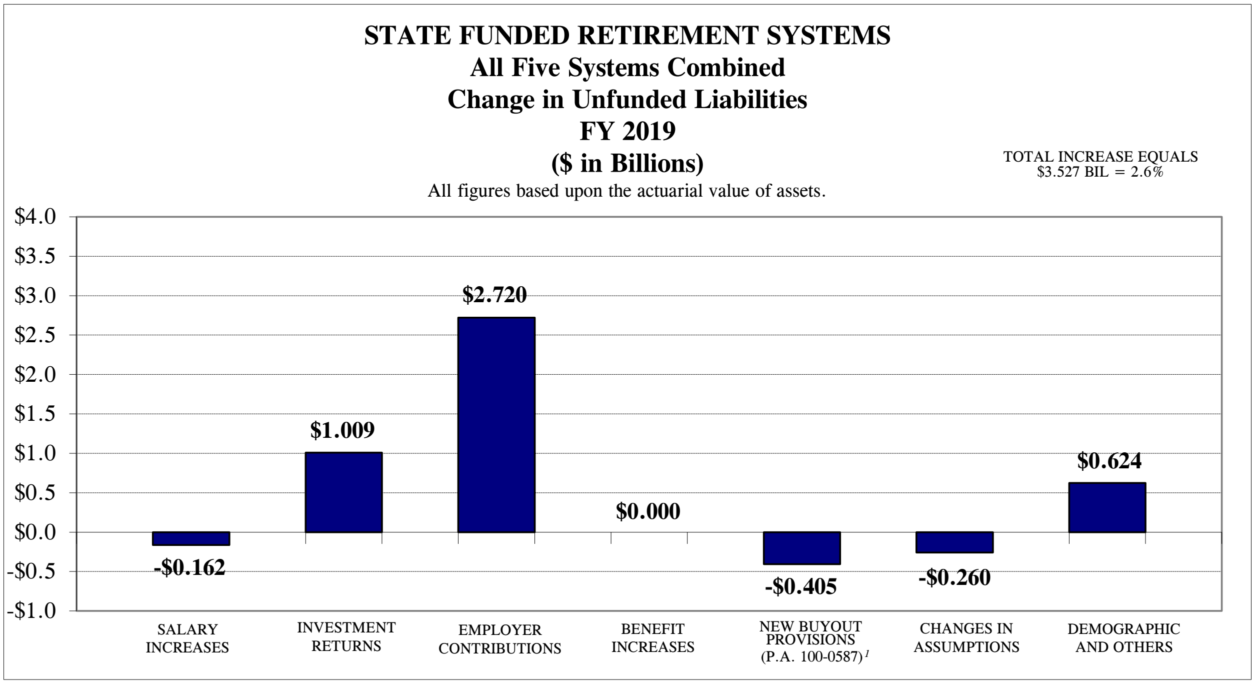
CHART 2



To reduce the impact of volatile investment performance from year-to-year, asset smoothing was implemented beginning with the FY 2009 actuarial valuation reports of the state systems with the adoption of P.A. 96-0043, which took effect on July 15, 2009. Asset smoothing is a technique that averages the annual fluctuation in investment performance over a period of five years. Also, actuarial assumption smoothing was implemented pursuant to P.A. 100-0023, effective July 6, 2017. Actuarial assumption smoothing aims to "smooth out" the annual variation in the required State contribution due to any actuarial assumptions over a five-year period in equal annual amounts, beginning in the fiscal year in which the change first applies to the required State contribution.

Chart 3 below outlines the factors that have caused the unfunded liability to change for FY 2019 only.

CHART 3



[1] *P.A. 100-0587 created the two voluntary pension buyout plans for TRS, SURS, and SERS, and P.A. 101-0010 extended the buyout plans by 3 years to June 30th, 2024. Each system made their respective participation assumptions regarding the pension buyout plans in the FY 2019 actuarial valuation reports. (More information on the pension buyout plans is discussed on page 10.)*

At the end of FY 2018, the aggregate unfunded liability based on the actuarial value of assets was $133.674 billion. The unfunded liability based on the actuarial value of assets stood at $137.201 billion as of the end of FY 2019. It grew by $3.527 billion during FY 2019, an increase of 2.6% over FY 2018. The primary reason for the increase was, again, actuarially insufficient State contributions, which increased the unfunded liability by $2.720 billion, accounting for 77.1% of the total increase.

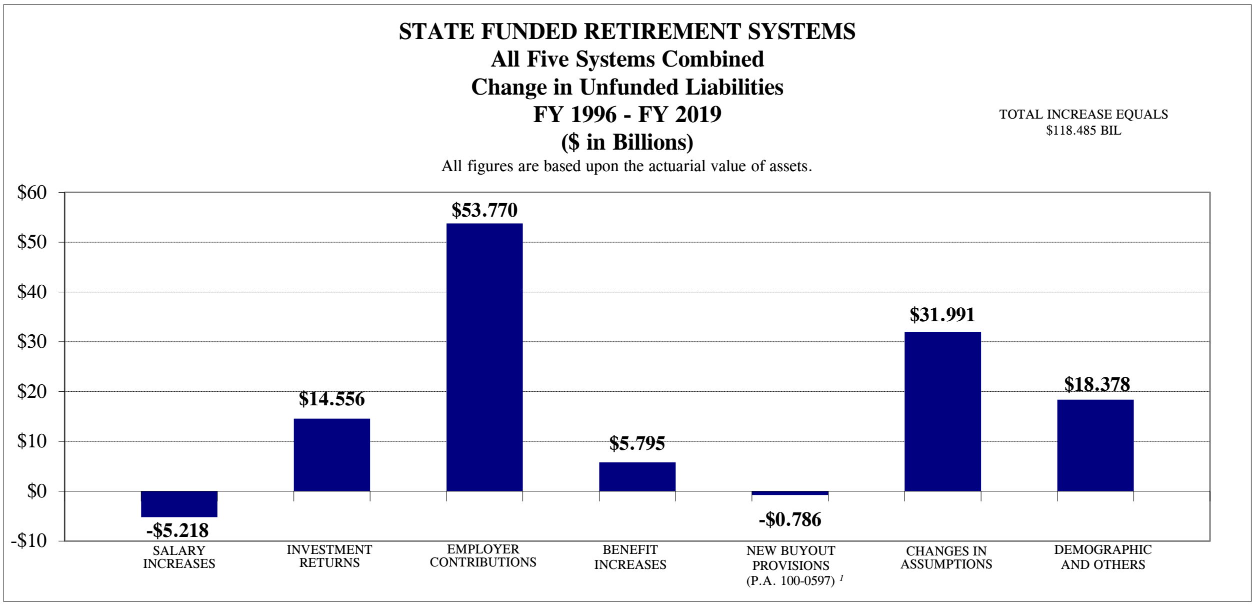
There were two more factors that worsened the unfunded liability. One was an actuarial loss that resulted from lower-than-assumed investment returns by all the five systems, which brought the combined unfunded liability up by $1.009 billion. The other factor was the unfavorable experience from demographic and other factors, mainly by TRS and SURS, such as earlier retirement than assumed, and it increased the unfunded liability by $0.624 billion.

However, actuarial gains from three components helped lessen the effect of actuarial losses; a gain from SERS members who participated in the pension buyout plans and a gain from changes in actuarial assumptions as well as lower-than-expected salary increases decreased the unfunded liability by $0.405 billion, $0.260 billion, and $0.162 billion, respectively. It is worth noting that SERS, JRS, and GARS realized actuarial gains by altering their actuarial assumptions in FY

2019 even though the three systems lowered their respective investment assumption rates by 0.25%. This is a result of gains from other assumption changes surpassing the impact of the reduced assumed rates of return. In addition, SERS was the only system that reported an actuarial gain from the two pension buyout programs created under P.A. 100-0587.

Chart 4 below shows the change in the unfunded liability since the enactment of P.A. 88-0593 in FY 1996, which created the 50-year funding policy that governs annual State contributions to the five State systems.

CHART 4



[1] *P.A. 100-0587 created the two voluntary pension buyout plans for TRS, SURS, and SERS, and P.A. 101-0010 extended the buyout plans by 3 years to June 30th, 2024. Each system made their respective participation assumptions regarding the pension buyout plans in the FY 2019 actuarial valuation reports. (More information on the pension buyout plans is discussed on page 10.)*

From FY 1996 through FY 2019, the unfunded liability increased by $118.485 billion to $137.201 billion. Actuarially insufficient State contributions contributed the most to the increase in unfunded liability, accounting for approximately 45.4% of the total increase. Assumption changes caused a $31.991 billion increase, or a 27.0% of the total increase. “Demographic and other factors” and investment returns that didn’t meet assumed rates were the next factors that served to worsen the unfunded liability over time.

CHART 5

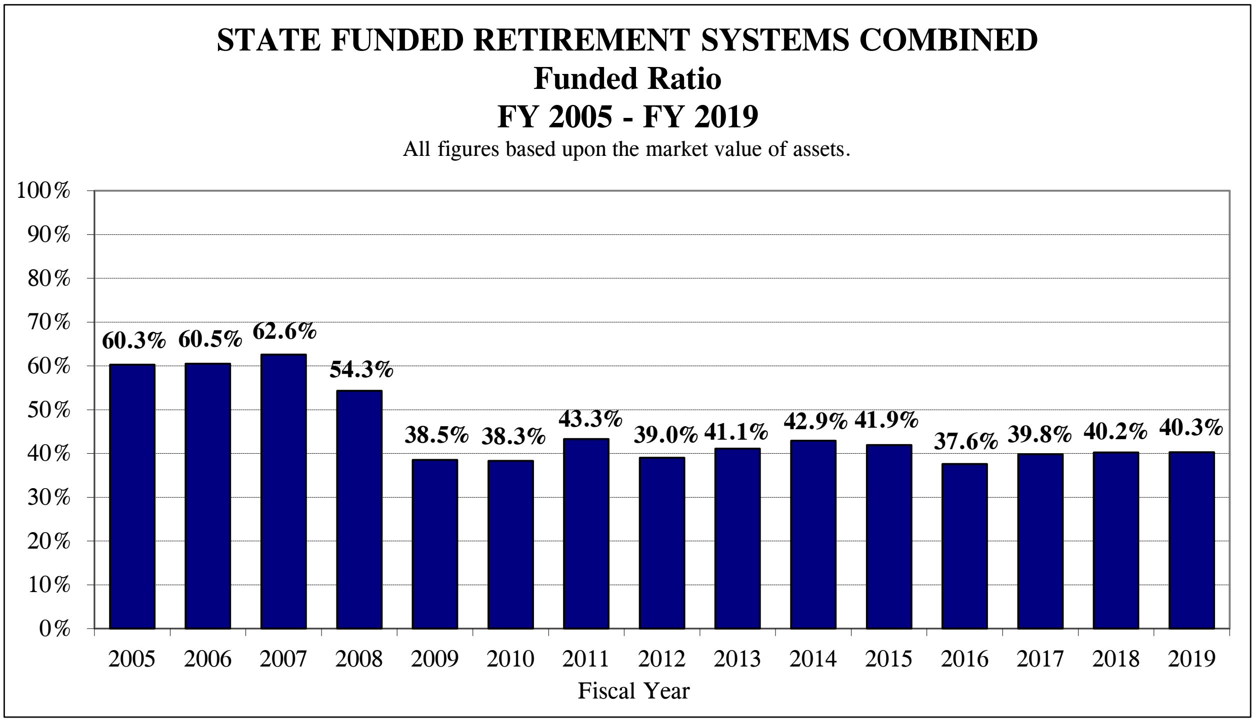


Chart 5 above shows the systems' funded ratio based on the market value of assets, without the asset smoothing method.

The funded ratio at any single point in time is less important than the trend over time. In FY 2004, the State sold $10 billion in pension obligation bonds and used part of the proceeds to pay all of the contributions for FY 2004. The bond sale generated $7.3 billion to reduce unfunded liabilities of the state-funded retirement systems. In the wake of the bond sale, the funded ratio remained relatively stable from FY 2004 through FY 2007. In FY 2008 and FY 2009, the funded ratio fell significantly due to much lower than expected investment revenues and actuarially insufficient employer contributions. The funded ratio remained relatively stable in FY 2010 due in large part to higher-than-expected investment returns. FY 2011 also saw exceptionally strong investment returns, which caused the funding ratio to increase.

However, these gains were largely erased by poor investment returns in FY 2012. As previously mentioned, actuarially insufficient State contributions and TRS' change in investment return assumption from 8.5% to 8.0% played a significant role in lowering the FY 2012 cumulative funded ratio to 39.0%. Then, the ratio slightly increased in FY 2013 and 2014, which mainly resulted from higher-than-expected investment returns. However, the upward movement did not last long. In FY 2015 and 2016, the funding ratio went down again. The sudden drop in the funding ratio in FY 2016 was due to the actuarial assumptions changes by TRS, SERS, JRS, and GARS including lowering their respective assumed investment rates, along with lower-than-projected investment returns as well as actuarially insufficient employer contributions.

The funded ratio ticked upwards slightly in FY 2017 and 2018. Robust investment performances in FY 2017, well above the respective systems' assumed rates of return, helped to push the funded ratio up to 39.8%. Also, FY 2018 was another good year in terms of investment performances, although returns were not as strong as they were in FY 2017.

During FY 2019, the funded ratio improved slightly from the previous year even though the unfunded liability grew this year as a result of the aforementioned factors. It is worth noting that FY 2019 was the first year that SERS and GARS were able to reduce their unfunded liability since FY 2015 and FY 2004, respectively.

Significant Pension-related Legislative Changes in FY 2019

Extension of the Two Voluntary Pension Buyout Programs under P.A. 101-0010, Effective June 5, 2019

(Affected Systems: TRS, SURS, and SERS)

The two existing pension buyout programs for TRS, SURS, and SERS, created by P.A. 100-0587, were extended by 3 years to June 30, 2024, from June 30, 2021, as summarized below.

- Total pension buyout plan: For Tier 1 and 2 members, if an eligible inactive, vested member irrevocably participates in the total pension buyout plan, the member would receive an accelerated pension benefit payment equal to 60% of the present value of a member's pension benefit in lieu of receiving any pension benefit.

- 3% COLA buyout plan: If an eligible Tier 1 member irrevocably participates in the COLA buyout plan, the member would receive a lump sum payment equal to 70% of the difference of the present value of 3% compounded COLA and the present value of a reduced COLA (simple 1.5%) in exchange for receiving a simple 1.5% COLA at the later of January 1 following age 67 or the first anniversary of retirement.

Each system made participation assumptions regarding the pension buyout plans in their respective 2019 valuations as shown in the table below:

System	Total Pension Buyout Plan	COLA Buyout
TRS	22% of eligible inactive members	15% of eligible Tier 1 members
SERS	5% of eligible inactive members	21% of eligible Tier 1 Regular formula members; and 28% of eligible Tier 1 Alternative formula members
SURS[1]	0% of eligible inactive members	0% of eligible Tier 1 members

[1] *According to the FY 2019 SURS preliminary actuarial valuation, issued on September 26, 2019, SURS noted that "there has been no buyout elections" from their eligible members as of the date their report was published.*

Reinstatement of Teachers' Final Average Salary (FAS) Cap of 6% under P.A. 101-0010, Effective June 5, 2019

(Affected Systems: SURS and TRS)

P.A. 94-0004, which took effect on June 1, 2005, implemented an "excess salary increase penalty" for school districts and universities in both TRS and SURS. Under the Act, if a teacher's full-time equivalent annual salary increases more than the salary increase cap with the same employer, the (local) employer would have to make a payment to the retirement system equal to the present value of the increase in benefits resulting from the salary increase in excess of the salary increase cap. P.A. 94-0004 established a 6% "excess salary increase penalty." P.A. 100-0587, which took effect on June 4, 2018, lowered the cap to 3%. Pursuant to P.A. 101-0010, the final salary cap now reverted back to 6%.

According to TRS, the school districts 6% "penalty" payments to TRS for FY 2016, FY 2017, and FY 2018 are $4.1 million, $3.3 million, and $4.0 million, respectively. More information on historical revenues collected from individual school districts via the "excess salary increase penalty" is available in the 2018 Report on the Financial Condition of the State Retirement Systems in appendix S on page 133.

Table 4 on the following page shows the FY 2020 State contributions based on the five systems' final certification letters for FY 2020 and the FY 2021 estimated State contributions. FY 2021 projected State contributions were certified by the Boards of trustees of the five systems and based on the FY 2019 preliminary actuarial valuation reports. The FY 2020 State contributions to the five systems are $9.2 billion. The FY 2021 State contributions are projected to be $9.8 billion, an increase of $537.8 million or 5.8% over FY 2020.

TABLE 4

FY 2020 Pension Appropriation by Fund [1]

($ in Millions)

System	General Funds	Other State Funds	Total
TRS	$4,813.6	$0.0	$4,813.6
SURS	$1,639.7	$215.0	$1,854.7
SERS	$1,550.4	$834.8	$2,385.3
GARS	$25.8	$0.0	$25.8
JRS	$144.2	$0.0	$144.2
Total	**$8,173.6**	**$1,049.8**	**$9,223.5**

[1] The certified FY 2020 State contributions on the final certification letters of the five pension systems may not be identical to State contributions appropriated by P.A. 101-0007 (FY 2020 appropriation bill). If the appropriated contributions are lower than the final certified contributions, the pension systems could receive the remaining portion via the Continuing Appropriation Act (40 ILCS 15).

FY 2021 Estimated Pension Appropriation by Fund [2]

($ in Millions)

System	General Funds	Other State Funds	Total [3]
TRS	$5,140.7	$0.0	$5,140.7
SURS	$1,781.7	$215.0	$1,996.7
SERS	$1,591.2	$856.8	$2,447.9
GARS	$27.3	$0.0	$27.30
JRS	$148.6	$0.0	$148.62
Total	**$8,689.5**	**$1,071.8**	**$9,761.3**

[2] This chart is meant to be an estimate only insofar as the FY 2021 appropriation by fund is concerned. The amounts in this chart reflect the State systems' preliminary FY 2021 certification. Also, pursuant to P.A. 97-0694, the State Actuary Law, the State Actuary is required to conduct a review of the systems' actuarial assumptions/methods that are used to perform actuarial valuations and to determine the State contributions. Then, the State Actuary is required to recommend changes in the assumptions/methods before the State systems finalize certifications of the annual State contributions.

[3] The SURS "Other State Funds" amount assumes that SURS will receive a FY 2021 appropriation from the State Pension Fund in the same amount that SURS is expected to receive from the State Pension Fund in FY 2020. SURS' historical appropriation from the State Pension Fund varies from year to year.

SERS' FY 2021 estimated appropriation includes a total of $99.4 million in 2003 POB debt service. Of this amount, according to SERS, $64.6 million comes from the General Revenue Fund (GRF) and $34.8 million comes from the other state funds. The SERS appropriation breakdown is based upon a SERS' historical assumption that 65% of the SERS appropriation will come from GRF, while 35% will come from other state funds.

Total FY 2020 Pension Appropriation: $9,223.5 Million
Total FY 2021 Estimated Pension Appropriation: $9,761.3 Million

Total Estimated Increase, FY 2021 over FY 2020: $537.8 Million
Total Estimated GF Increase, FY 2021 over FY 2020: $515.9 Million

The following pages include pension funding projections for the five State retirement systems based on the respective retirement systems' FY 2019 actuarial valuations. These projections were generated by the retirement systems' respective actuaries.

FUNDING PROJECTIONS FOR THE STATE RETIREMENT SYSTEMS
All Five Systems Combined
Projections Based on the Retirement Systems' FY 2019 Actuarial Valuations
($ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution*	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2020	$20,119.2	$9,223.0	45.8%	$1,534.5	$235,898.8	$96,210.5	$139,688.3	40.8%
2021	**$20,513.3**	**$9,761.3**	**47.6%**	**$1,561.4**	**$241,933.4**	**$101,361.5**	**$140,572.0**	**41.9%**
2022	$21,049.4	$10,138.1	48.2%	$1,601.3	$247,877.4	$105,984.4	$141,893.0	42.8%
2023	$21,605.4	$10,361.4	48.0%	$1,641.7	$253,947.7	$110,473.4	$143,474.3	43.5%
2024	$22,174.5	$10,625.0	47.9%	$1,684.0	$259,888.5	$115,304.7	$144,583.8	44.4%
2025	$22,739.8	$10,881.9	47.9%	$1,724.7	$265,673.1	$120,205.9	$145,467.2	45.2%
2026	$23,318.7	$11,155.8	47.8%	$1,767.2	$271,277.5	$125,192.8	$146,084.7	46.1%
2027	$23,915.9	$11,441.7	47.8%	$1,810.5	$276,676.1	$130,275.1	$146,401.0	47.1%
2028	$24,522.4	$11,709.7	47.8%	$1,855.0	$281,856.1	$135,443.7	$146,412.4	48.1%
2029	$25,153.7	$11,994.5	47.7%	$1,901.1	$286,795.9	$140,720.0	$146,075.9	49.1%
2030	$25,810.3	$12,271.4	47.5%	$1,949.0	$291,487.9	$146,114.5	$145,373.4	50.1%
2031	$26,482.5	$12,563.3	47.4%	$1,998.4	$295,901.0	$151,643.3	$144,260.7	51.2%
2032	$27,173.0	$12,893.4	47.4%	$2,049.1	$300,017.0	$157,356.0	$142,660.9	52.4%
2033	$27,880.4	$13,261.4	47.6%	$2,100.8	$303,818.9	$163,319.0	$140,498.8	53.8%
2034	$28,604.0	$14,549.0	50.9%	$2,153.1	$307,295.5	$170,513.0	$136,783.4	55.5%
2035	$29,349.4	$14,928.3	50.9%	$2,207.6	$310,501.6	$178,162.3	$132,339.3	57.4%
2036	$30,110.2	$15,314.6	50.9%	$2,263.0	$313,369.9	$186,261.0	$127,108.9	59.4%
2037	$30,895.4	$15,714.8	50.9%	$2,320.0	$315,897.2	$194,874.0	$121,023.2	61.7%
2038	$31,700.1	$16,125.1	50.9%	$2,377.9	$318,066.0	$204,059.1	$114,007.0	64.2%
2039	$32,515.0	$16,540.0	50.9%	$2,436.0	$319,881.6	$213,892.9	$105,988.7	66.9%
2040	$33,344.9	$16,963.9	50.9%	$2,495.5	$321,369.5	$224,478.6	$96,891.9	69.9%
2041	$34,187.4	$17,393.4	50.9%	$2,556.3	$322,537.8	$235,898.9	$86,638.9	73.1%
2042	$35,043.4	$17,831.0	50.9%	$2,616.6	$323,427.0	$248,274.7	$75,152.3	76.8%
2043	$35,909.2	$18,272.8	50.9%	$2,678.0	$324,092.0	$261,736.8	$62,355.2	80.8%
2044	$36,782.4	$18,719.9	50.9%	$2,740.3	$324,603.7	$276,434.8	$48,167.8	85.2%
2045	$37,668.5	$19,172.9	50.9%	$2,802.1	$325,029.9	$292,525.4	$32,505.4	90.0%

* Pursuant to TRS' preliminary FY 2021 certification letter dated October 29, 2019, the FY 2021 required State Contribution includes $400,000 for minimum benefit reimbursements.

FUNDING PROJECTIONS FOR THE TEACHERS' RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2019 Preliminary Actuarial Valuation
Actuarially Assumed Rate of Return: 7.00%
($ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution*	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2020	$10,954.6	$4,813.1	43.9%	$985.9	$135,208.1	$55,533.4	$79,674.6	41.1%
2021	**$11,214.6**	**$5,140.7**	**45.8%**	**$1,009.3**	**$138,964.2**	**$58,603.3**	**$80,360.9**	**42.2%**
2022	$11,601.8	$5,401.5	46.6%	$1,044.2	$142,746.6	$61,404.7	$81,341.9	43.0%
2023	$11,996.3	$5,538.5	46.2%	$1,079.6	$146,779.7	$64,170.5	$82,609.2	43.7%
2024	$12,395.8	$5,697.3	46.0%	$1,115.6	$150,825.6	$67,244.9	$83,580.7	44.6%
2025	$12,785.7	$5,877.5	46.0%	$1,150.7	$154,875.4	$70,455.5	$84,419.9	45.5%
2026	$13,180.2	$6,061.4	46.0%	$1,186.2	$158,915.9	$73,806.8	$85,109.0	46.4%
2027	$13,580.9	$6,249.9	46.0%	$1,222.3	$162,924.2	$77,298.6	$85,625.6	47.4%
2028	$13,981.3	$6,424.9	46.0%	$1,258.3	$166,882.6	$80,916.5	$85,966.0	48.5%
2029	$14,393.4	$6,608.1	45.9%	$1,295.4	$170,773.4	$84,669.1	$86,104.3	49.6%
2030	$14,822.1	$6,787.1	45.8%	$1,334.0	$174,580.5	$88,556.0	$86,024.5	50.7%
2031	$15,256.4	$6,971.9	45.7%	$1,373.1	$178,280.9	$92,581.5	$85,699.4	51.9%
2032	$15,697.4	$7,177.9	45.7%	$1,412.8	$181,852.8	$96,769.7	$85,083.1	53.2%
2033	$16,144.7	$7,404.1	45.9%	$1,453.0	$185,270.6	$101,142.4	$84,128.2	54.6%
2034	$16,595.9	$8,263.9	49.8%	$1,493.6	$188,516.5	$106,366.0	$82,150.5	56.4%
2035	$17,058.0	$8,494.0	49.8%	$1,535.2	$191,568.8	$111,844.8	$79,723.9	58.4%
2036	$17,528.7	$8,728.4	49.8%	$1,577.6	$194,418.4	$117,607.2	$76,811.2	60.5%
2037	$18,014.1	$8,970.1	49.8%	$1,621.3	$197,050.8	$123,684.4	$73,366.3	62.8%
2038	$18,506.7	$9,215.4	49.8%	$1,665.6	$199,437.0	$130,096.9	$69,340.1	65.2%
2039	$18,998.9	$9,460.4	49.8%	$1,709.9	$201,566.3	$136,879.3	$64,687.1	67.9%
2040	$19,493.9	$9,706.9	49.8%	$1,754.5	$203,442.9	$144,085.9	$59,357.0	70.8%
2041	$19,987.3	$9,952.6	49.8%	$1,798.9	$205,051.4	$151,748.1	$53,303.2	74.0%
2042	$20,483.5	$10,199.7	49.8%	$1,843.5	$206,409.2	$159,930.0	$46,479.1	77.5%
2043	$20,978.1	$10,446.0	49.8%	$1,888.0	$207,545.5	$168,705.9	$38,839.6	81.3%
2044	$21,470.1	$10,690.9	49.8%	$1,932.3	$208,511.6	$178,170.7	$30,340.9	85.4%
2045	$21,966.4	$10,938.1	49.8%	$1,977.0	$209,358.5	$188,422.7	$20,935.9	90.0%
2046	$22,470.2	$1,103.9	4.9%	$2,022.3	$210,153.5	$189,138.1	$21,015.3	90.0%

* Total State Contributions for FY 2021 includes a $400,000 minimum benefit reimbursements

FUNDING PROJECTIONS FOR THE STATE EMPLOYEES' RETIREMENT SYSTEM Projections Based on the Retirement System's FY 2019 Actuarial Valuation Actuarially Assumed Rate of Return: 6.75% ($ in Millions)								
Fiscal Year	**Annual Payroll**	**Total State Contribution**	**State Contribution as a % of Payroll**	**Total Employee Contribution**	**Accrued Liabilities**	**Actuarial Value of Assets**	**Unfunded Liabilities**	**Funded Ratio**
2020	$4,397.0	$2,385.3	54.2%	$249.0	$50,098.0	$19,393.0	$30,705.0	38.7%
2021	**$4,464.0**	**$2,447.9**	**54.8%**	**$251.0**	**$51,410.0**	**$20,591.0**	**$30,819.0**	**40.1%**
2022	$4,533.0	$2,452.0	54.1%	$254.0	$52,663.0	$21,675.0	$30,988.0	41.2%
2023	$4,603.0	$2,478.0	53.8%	$256.0	$53,853.0	$22,699.0	$31,154.0	42.1%
2024	$4,677.0	$2,512.0	53.7%	$259.0	$54,972.0	$23,709.0	$31,263.0	43.1%
2025	$4,753.0	$2,546.0	53.6%	$261.0	$56,009.0	$24,679.0	$31,330.0	44.1%
2026	$4,834.0	$2,588.0	53.5%	$264.0	$56,957.0	$25,616.0	$31,341.0	45.0%
2027	$4,921.0	$2,634.0	53.5%	$267.0	$57,813.0	$26,523.0	$31,290.0	45.9%
2028	$5,012.0	$2,678.0	53.4%	$271.0	$58,583.0	$27,406.0	$31,177.0	46.8%
2029	$5,112.0	$2,727.0	53.3%	$275.0	$59,269.0	$28,276.0	$30,993.0	47.7%
2030	$5,218.0	$2,776.0	53.2%	$279.0	$59,879.0	$29,142.0	$30,737.0	48.7%
2031	$5,329.0	$2,830.0	53.1%	$284.0	$60,410.0	$30,009.0	$30,401.0	49.7%
2032	$5,445.0	$2,891.0	53.1%	$289.0	$60,859.0	$30,889.0	$29,970.0	50.8%
2033	$5,565.0	$2,960.0	53.2%	$294.0	$61,231.0	$31,798.0	$29,432.0	51.9%
2034	$5,691.0	$3,275.0	57.5%	$299.0	$61,530.0	$33,003.0	$28,528.0	53.6%
2035	$5,823.0	$3,351.0	57.5%	$305.0	$61,759.0	$34,281.0	$27,478.0	55.5%
2036	$5,958.0	$3,428.0	57.5%	$311.0	$61,918.0	$35,646.0	$26,272.0	57.6%
2037	$6,098.0	$3,509.0	57.5%	$317.0	$62,015.0	$37,116.0	$24,899.0	59.9%
2038	$6,245.0	$3,594.0	57.6%	$323.0	$62,058.0	$38,713.0	$23,345.0	62.4%
2039	$6,397.0	$3,681.0	57.5%	$329.0	$62,054.0	$40,457.0	$21,597.0	65.2%
2040	$6,556.0	$3,773.0	57.6%	$336.0	$62,017.0	$42,376.0	$19,642.0	68.3%
2041	$6,722.0	$3,868.0	57.5%	$344.0	$61,958.0	$44,495.0	$17,463.0	71.8%
2042	$6,893.0	$3,967.0	57.6%	$351.0	$61,885.0	$46,841.0	$15,044.0	75.7%
2043	$7,070.0	$4,068.0	57.5%	$359.0	$61,810.0	$49,441.0	$12,369.0	80.0%
2044	$7,253.0	$4,174.0	57.5%	$368.0	$61,742.0	$52,323.0	$9,418.0	84.7%
2045	$7,441.0	$4,282.0	57.5%	$376.0	$61,685.0	$55,515.0	$6,171.0	90.0%
Note: Pursuant to P.A. 93-0589, the FY 2021 State Contribution includes $99.4 million for debt service for the 2003 Pension Obligation Bonds authorized by P.A. 93-0002. State contribution amounts shown for FY 2022 - 2045 do not include debt service as these amounts are not known until the annual SERS preliminary certification letters are issued pursuant to P.A. 97-0694 (State Actuary Law).								

FUNDING PROJECTIONS FOR THE STATE UNIVERSITIES RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2019 Actuarial Valuation
Actuarially Assumed Rate of Return: 6.75%
($ in Millions)

Fiscal Year	Annual Payroll*	Total State Contribution**	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2020	$4,600.7	$1,854.7	40.3%	$284.6	$47,369.2	$20,100.2	$27,269.0	42.4%
2021	**$4,667.2**	**$1,996.7**	**42.8%**	**$285.9**	**$48,286.2**	**$20,912.2**	**$27,374.0**	**43.3%**
2022	$4,747.5	$2,105.9	44.4%	$288.1	$49,152.5	$21,589.2	$27,563.3	43.9%
2023	$4,839.1	$2,168.0	44.8%	$291.0	$49,965.5	$22,235.9	$27,729.5	44.5%
2024	$4,934.9	$2,239.7	45.4%	$294.3	$50,715.2	$22,935.5	$27,779.7	45.2%
2025	$5,034.2	$2,283.4	45.4%	$297.8	$51,395.3	$23,615.0	$27,780.3	45.9%
2026	$5,137.3	$2,331.5	45.4%	$301.7	$52,001.7	$24,277.6	$27,724.1	46.7%
2027	$5,246.3	$2,382.9	45.4%	$305.9	$52,535.0	$24,930.5	$27,604.5	47.5%
2028	$5,361.1	$2,432.8	45.4%	$310.6	$52,993.1	$25,573.2	$27,419.9	48.3%
2029	$5,479.1	$2,484.9	45.4%	$315.4	$53,370.1	$26,206.0	$27,164.1	49.1%
2030	$5,599.7	$2,534.2	45.3%	$320.5	$53,666.2	$26,830.8	$26,835.3	50.0%
2031	$5,725.3	$2,587.0	45.2%	$325.7	$53,875.4	$27,450.4	$26,425.0	51.0%
2032	$5,856.9	$2,648.7	45.2%	$331.2	$54,004.4	$28,085.8	$25,918.7	52.0%
2033	$5,995.3	$2,719.6	45.4%	$337.0	$54,056.4	$28,754.9	$25,301.5	53.2%
2034	$6,139.5	$2,825.3	46.0%	$343.1	$54,033.0	$29,501.9	$24,531.1	54.6%
2035	$6,288.3	$2,896.0	46.1%	$349.5	$54,006.9	$30,372.9	$23,634.0	56.2%
2036	$6,440.8	$2,968.4	46.1%	$356.0	$53,919.3	$31,319.1	$22,600.2	58.1%
2037	$6,597.7	$3,042.9	46.1%	$362.7	$53,773.2	$32,354.4	$21,418.8	60.2%
2038	$6,759.7	$3,119.8	46.2%	$369.7	$53,571.0	$33,493.0	$20,078.0	62.5%
2039	$6,927.1	$3,199.3	46.2%	$376.9	$53,321.0	$34,755.2	$18,565.8	65.2%
2040	$7,099.5	$3,281.2	46.2%	$384.4	$53,030.0	$36,160.4	$16,869.6	68.2%
2041	$7,279.0	$3,366.3	46.2%	$392.2	$52,709.2	$37,733.4	$14,975.8	71.6%
2042	$7,464.0	$3,454.0	46.3%	$400.3	$52,373.3	$39,502.3	$12,871.0	75.4%
2043	$7,654.0	$3,544.1	46.3%	$408.6	$52,035.0	$41,494.5	$10,540.5	79.7%
2044	$7,848.0	$3,636.1	46.3%	$417.1	$51,704.3	$43,735.5	$7,968.8	84.6%
2045	$8,045.5	$3,729.6	46.4%	$425.7	$51,393.5	$46,254.2	$5,139.4	90.0%

* Payroll projections include SMP payroll. 30% of new SURS members are assumed to enter SMP.

** State Contribution Only. Includes Self-Managed Plan (SMP) Contributions.

FUNDING PROJECTIONS FOR THE JUDGES' RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2019 Actuarial Valuation
Actuarially Assumed Rate of Return: 6.50%
($ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2020	$157.0	$144.2	91.9%	$13.8	$2,849.3	$1,120.7	$1,728.6	39.3%
2021	**$157.7**	**$148.6**	**94.2%**	**$14.1**	**$2,899.7**	**$1,186.3**	**$1,713.4**	**40.9%**
2022	$157.6	$151.5	96.1%	$14.0	$2,943.9	$1,242.4	$1,701.5	42.2%
2023	$157.6	$150.3	95.4%	$13.9	$2,980.8	$1,291.2	$1,689.6	43.3%
2024	$157.6	$149.9	95.1%	$14.1	$3,010.4	$1,335.5	$1,674.9	44.4%
2025	$157.8	$149.7	94.8%	$14.1	$3,032.3	$1,374.5	$1,657.7	45.3%
2026	$158.2	$149.8	94.7%	$14.3	$3,046.6	$1,408.8	$1,637.8	46.2%
2027	$158.7	$149.9	94.5%	$14.2	$3,052.8	$1,438.0	$1,614.9	47.1%
2028	$159.3	$149.7	94.0%	$14.1	$3,052.2	$1,462.3	$1,590.0	47.9%
2029	$160.5	$150.2	93.6%	$14.2	$3,044.6	$1,482.7	$1,562.0	48.7%
2030	$161.7	$150.3	93.0%	$14.5	$3,030.2	$1,499.2	$1,531.0	49.5%
2031	$163.1	$150.8	92.4%	$14.6	$3,009.9	$1,515.7	$1,497.2	50.3%
2032	$164.9	$152.2	92.3%	$15.2	$2,983.2	$1,524.5	$1,458.7	51.1%
2033	$166.7	$154.1	92.5%	$15.7	$2,951.2	$1,536.1	$1,415.0	52.1%
2034	$168.8	$160.0	94.8%	$16.3	$2,914.3	$1,552.4	$1,361.9	53.3%
2035	$171.2	$162.3	94.8%	$16.9	$2,873.4	$1,570.9	$1,302.5	54.7%
2036	$173.8	$164.8	94.8%	$17.4	$2,829.0	$1,592.6	$1,236.5	56.3%
2037	$176.6	$167.4	94.8%	$18.0	$2,781.5	$1,618.4	$1,163.1	58.2%
2038	$179.5	$170.2	94.8%	$18.5	$2,731.8	$1,649.8	$1,082.1	60.4%
2039	$182.7	$173.2	94.8%	$19.1	$2,680.5	$1,688.0	$992.5	63.0%
2040	$186.1	$176.5	94.8%	$19.6	$2,628.2	$1,734.3	$893.8	66.0%
2041	$189.6	$179.8	94.8%	$20.2	$2,575.9	$1,790.5	$785.4	69.5%
2042	$193.4	$183.4	94.8%	$20.7	$2,524.3	$1,857.8	$666.4	73.6%
2043	$197.3	$187.0	94.8%	$21.2	$2,474.0	$1,937.9	$536.1	78.3%
2044	$201.3	$190.9	94.8%	$21.8	$2,425.7	$2,032.1	$393.6	83.8%
2045	$205.5	$194.9	94.8%	$22.3	$2,379.9	$2,142.0	$237.9	90.0%

FUNDING PROJECTIONS FOR THE GENERAL ASSEMBLY RETIREMENT SYSTEM Projections Based on the Retirement System's FY 2019 Actuarial Valuation Actuarially Assumed Rate of Return: 6.50% ($ in Millions)								
Fiscal Year	**Annual Payroll**	**Total State Contribution**	**State Contribution as a % of Payroll**	**Total Employee Contribution**	**Accrued Liabilities**	**Actuarial Value of Assets**	**Unfunded Liabilities**	**Funded Ratio**
2020	$10.0	$25.8	257.8%	$1.2	$374.3	$63.3	$311.0	16.9%
2021	**$9.8**	**$27.3**	**278.0%**	**$1.1**	**$373.4**	**$68.7**	**$304.7**	**18.4%**
2022	$9.6	$27.2	284.7%	$1.1	$371.4	$73.2	$298.2	19.7%
2023	$9.4	$26.5	283.2%	$1.1	$368.8	$76.8	$292.0	20.8%
2024	$9.3	$26.1	282.4%	$1.1	$365.3	$79.8	$285.5	21.8%
2025	$9.0	$25.4	281.4%	$1.0	$361.1	$81.8	$279.3	22.7%
2026	$9.0	$25.2	280.2%	$1.0	$356.3	$83.5	$272.8	23.4%
2027	$8.9	$24.9	279.3%	$1.0	$351.1	$85.0	$266.1	24.2%
2028	$8.8	$24.3	276.7%	$1.0	$345.3	$85.7	$259.5	24.8%
2029	$8.8	$24.2	275.0%	$1.0	$338.9	$86.3	$252.6	25.5%
2030	$8.7	$23.8	272.3%	$1.0	$332.1	$86.5	$245.5	26.1%
2031	$8.7	$23.6	270.0%	$1.0	$324.9	$86.7	$238.2	26.7%
2032	$8.8	$23.5	268.9%	$1.0	$317.5	$87.0	$230.5	27.4%
2033	$8.8	$23.6	269.1%	$1.0	$309.7	$87.6	$222.1	28.3%
2034	$8.8	$24.7	282.7%	$1.0	$301.7	$89.7	$212.0	29.7%
2035	$8.9	$25.1	282.8%	$1.0	$293.5	$92.6	$200.9	31.6%
2036	$8.9	$25.1	282.7%	$1.0	$285.2	$96.2	$189.0	33.7%
2037	$9.0	$25.4	282.6%	$1.0	$276.7	$100.8	$176.0	36.4%
2038	$9.1	$25.7	282.8%	$1.1	$268.3	$106.4	$161.8	39.7%
2039	$9.2	$26.0	282.6%	$1.1	$259.8	$113.5	$146.4	43.7%
2040	$9.3	$26.3	282.9%	$1.1	$251.5	$121.9	$129.6	48.5%
2041	$9.4	$26.6	282.8%	$1.1	$243.3	$131.9	$111.4	54.2%
2042	$9.5	$27.0	282.8%	$1.1	$235.3	$143.6	$91.7	61.0%
2043	$9.8	$27.7	282.7%	$1.1	$227.5	$157.5	$70.0	69.2%
2044	$9.9	$28.0	282.7%	$1.1	$220.1	$173.5	$46.6	78.8%
2045	$10.0	$28.3	282.7%	$1.2	$213.0	$191.7	$21.3	90.0%