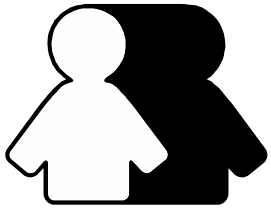

New York State and Local
Employees' Retirement System
Police and Fire Retirement System
Public Employees' Group Life Insurance Plan

Thomas P. DiNapoli, Comptroller

ANNUAL REPORT TO THE COMPTROLLER ON ACTUARIAL ASSUMPTIONS

Michael R. Dutcher
Retirement Systems Actuary

August 2019

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I. Executive Summary

Fiscal year 2019 (FY 2019) was the fourth in the current five year experience study cycle. The August 2015 report based on experience studies for the period April 1, 2010 through March 31, 2015 recommended changes in virtually all of the assumptions. This year's report displays the FY 2019 experience and recommends that the current assumptions be maintained with the exceptions of updating mortality improvement scale MP-2014 to MP-2018 and reducing the assumed investment return from 7.0% to 6.8%.

Summary of Assumptions and Methods

Assumption or Method	Recommendation
Inflation / COLA	2.5 % / 1.3%
Investment Return	**6.8 %**
ERS Salary Scale	4.2 % average (using FY 2015 data) Indexed by Service
PFRS Salary Scale	5.0 % average (using FY 2015 data) Indexed by Service
Asset Valuation Method	5 year level smoothing of gains or losses above or below the assumed return applied to all assets and cash flows
Pensioner Mortality	Gender/Collar specific tables based upon FY 2011-2015 experience with Society of Actuaries' Scale **MP-2018** loading for mortality improvement.
Active Member Decrements	Based upon FY 2011-2015 experience

This recommendation has been shared with the Systems' Actuarial Advisory Committee (AAC) for their review and comment. This Committee is composed of current or retired senior actuaries from major insurance companies or pension plans.

In addition to oversight provided by the AAC, the work of the Systems' actuaries is periodically reviewed by a number of organizations, including the Systems' financial statement auditors, internal auditors of the Office of the State Comptroller, examiners from the New York State Department of Financial Services (DFS), and a quinquennial review by an independent actuarial firm. The most recent review by an independent actuarial firm was completed in July 2018 by Grant Thornton, LLP.

The reviewed and finalized actuarial assumptions will be presented to Comptroller Thomas P. DiNapoli for certification for the purpose of developing employer contribution rates, payable on 2/1/2021, for the many different plans covered by the Employees' Retirement System (ERS) and the Police and Fire Retirement System (PFRS).

It is customary to avoid assumption changes between quinquennial experience studies (conducted in years divisible by five), where the five most recent years of system experience are combined and used as a basis for new assumptions. Annual tinkering with assumptions belies the long-term nature of pension funding.

However, it has been five years since the adoption of Society of Actuaries' Scale MP-2014 for mortality improvement. I recommend adopting scale MP-2018, the most recently available. This results in valuation gains, which I recommend be absorbed by a reduction in the assumed rate of return from 7.0% to 6.8%.

II. Economic Assumptions

A. Inflation (CPI-U) and the Cost of Living Adjustment (COLA)

The table below displays the applicable CPI-U data:

	CPI-U	Increase	COLA
3/31/2019	254.202	1.86%	1.0%
3/31/2018	249.554	2.36%	1.2%
3/31/2017	243.801	2.38%	1.2%
3/31/2016	238.132	0.85%	1.0%
3/31/2015	236.119		

As a result, the COLA minimum of 1.0% will be applied in September of 2019, which is 0.3% less than the current assumption. (Note that COLA applies to the first $18,000 of the pensioner's single-life pension. Spousal beneficiaries are entitled to one-half of the pensioner's COLA.)

B. Investment Rate of Return (Discount Rate)

The FY 2019 investment rate of return, as reported by the Division of Pension Investment and Cash Management, is 5.23%. The 3, 5, 10, and 20 year returns are 9.32%, 7.00%, 10.34%, and 6.64% respectively.

The data below is taken from the National Association of State Retirement Administrators (NASRA) website and represents the investment return assumption distribution for public systems in their database.

	Number of Public Systems		
i	February 2019	May 2015	March 2010
< 7.00	16	4	0
7.00	28	4	1
7.01-7.50	66	43	21
7.51-7.99	13	36	16
8.00	6	34	51
8.01-8.49	0	3	16
8.50	0	2	19
Median	7.25	7.75	7.97

The gains from the change in mortality improvement scale MP-2014 to MP-2018, along with the new entrant gains, provides an opportunity to join the growing group of public systems with an assumed return assumption below 7%. The most recently (2015) provided and relied on asset/liability study using Pension Investment and Cash Management (PICM) approved capital market assumptions and the Investment Advisory Committee endorsed asset allocation portfolio resulted in an expected arithmetic return of 7.34% and an expected geometric return of 6.58%. The 0.20% reduction moves the assumption from the middle into the lower half of the geometric/arithmetic range and closer to the 20 year return of 6.64%. PICM plans to provide a new asset/liability study in time for the setting of the 4-1-2020 valuation assumptions.

C. Salary Scales

The tables below display the actual and expected salary increases for full-time employees, under the assumptions set in 2018.

	FY 2016			FY 2017			FY 2018		
	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E
ERS	3.696%	4.228%	0.8742	4.848%	4.307%	1.1255	4.348%	4.341%	1.0016
PFRS	7.202%	5.161%	1.3954	5.104%	5.196%	0.9823	4.706%	5.227%	0.9002
Combined	4.168%	4.354%	0.9571	4.883%	4.430%	1.1023	4.396%	4.462%	0.9853

	FY 2019			FY 2016-FY2019		
	Actual	Expected	A/E	Actual	Expected	A/E
ERS	4.943%	4.423%	1.1176	4.464%	4.326%	1.0320
PFRS	5.314%	5.596%	0.9496	5.565%	5.298%	1.0505
Combined	4.993%	4.585%	1.0891	4.614%	4.459%	1.0347

Note that the expected salary experience using the current assumptions do not perfectly match the aggregated figures (using FY 2015 data) of 4.2% in ERS and 5.0% in PFRS. The implemented salary scale assumptions are indexed by years of service. Aggregating a service indexed salary scale will not yield the same result each year as the demographics of the valuation cohort (service, age, and plan) changes from year to year.

III. Asset Valuation Method

The values since FY 2000 are given below (in billions):

Market Value (MVA) v. Actuarial Value of Assets (AVA)

FY	[a]MVA	AVA	AL_{EAN}	UAL_{EAN}	GASB 25 Ratio AVA/ AL_{EAN}	[b]TPL_{EAN}	GASB 67 Ratio MVA/ TPL_{EAN}
2000	$128.9	$110.6	$90.6	$-20.0	122.1%	Use AL_{EAN} as a proxy	142.3%
2001	114.0	119.4	98.0	-21.4	121.9		116.3
2002	112.7	125.1	103.9	-21.2	120.4		108.5
2003	97.3	106.6	107.3	0.6	99.4		90.7
2004[c]	120.8	117.4	116.2	-1.2	101.0		104.0
2005	128.0	123.7	120.0	-3.7	103.1		106.7
2006	142.6	132.0	126.6	-5.4	104.3		112.6
2007	156.5	142.5	134.6	-7.9	105.9		116.3
2008	155.8	151.7	141.3	-10.4	107.4		110.3
2009	110.9	148.9	146.7	-2.1	101.5		75.6
2010	134.2	147.7	156.6	8.9	94.3		85.7
2011	149.5	148.6	164.3	15.7	90.5		91.0
2012	153.3	147.8	169.3	21.5	87.3		90.5
2013	164.1	155.3	175.1	19.8	88.7		93.7
2014	181.2	171.6	186.1	14.6	92.2		97.4
2015	189.3	184.2	196.5	12.4	93.7	$193.1	98.0
2016	183.5	190.6	203.0	12.4	93.9	202.7	90.6
2017	197.5	198.0	210.1	12.1	94.2	209.1	94.5
2018	212.0	206.7	217.6	10.9	95.0	216.3	98.0
2019	215.2	212.8	224.0	11.2	95.0	223.9	96.1
2020						229.9	

a) Financial Statement Plan Net Position (i.e. Invested Assets + Receivables)
[both the MVA & AVA exclude funds for group term life insurance]
b) Entry Age Normal Total Pension Liability (TPL_{EAN}) is similar to Accrued Liability (AL_{EAN}), the chief difference being that TPL is projected from the valuation one year earlier to allow sufficient time for financial statement auditors to audit the data and calculations
c) The equity smoothing was 'restarted'; MVA > AVA
as the market value of the fixed income portfolio exceeded the amortized cost.

IV. Demographic Assumptions

A. Pensioner Mortality Experience (annual option 0 in millions)

System	Retirement	Retiree	FY 2019			FY 2016-2019		
			Actual	Expected	A/E	Actual	Expected	A/E
ERS	Service	Male Clerk*	80.833	76.865	1.052	293.957	286.047	1.028
		Male Laborer*	44.733	42.272	1.058	162.535	157.757	1.030
		Female Clerk*	71.297	66.179	1.077	253.056	243.249	1.040
		Female Laborer*	9.830	8.082	1.216	33.477	30.269	1.106
	Disability	Male	7.527	8.167	0.922	28.069	31.094	0.903
		Female	4.915	4.671	1.052	17.819	18.112	0.984
PFRS	Service	All	20.424	21.025	0.971	76.676	76.826	0.998
	Disability	All	3.850	3.541	1.087	14.508	12.806	1.133
ERS & PFRS	Beneficiary**	Male	2.468	1.870	1.320	8.979	6.507	1.380
		Female	16.852	15.427	1.092	59.796	56.356	1.061
All Pensioner Mortality			**262.730**	**248.100**	**1.059**	**948.873**	**919.023**	**1.032**

* Clerk refers to White Collar while Laborer refers to Blue Collar
** Beneficiary dollars reflect actual pension received

B. Mortality Improvement

It has been five years since the adoption of Society of Actuaries' Scale MP-2014 for mortality improvement. I recommend that NYSLRS actuarial valuations update Society of Actuaries' Mortality Improvement Scale MP-2014 to MP-2018, the most recently available.

C. Active Member Decrement Experience

Decrement			FY 2019				FY 2016-2019			
			Exposures	Actual	Expected	A/E *	Exposures	Actual	Expected	A/E *
Withdrawal			**368,186**	**27,715**	**26,402**	**1.050**	**1,438,356**	**95,903**	**98,036**	**0.978**
ERS	Regular Plan	0 ≤ Srv < 2	89,285	16,099	15,620	1.031	329,109	52,656	57,289	0.919
		2 ≤ Srv < 3	29,514	3,021	3,265	0.925	101,055	10,416	11,163	0.933
		3 ≤ Srv < 4	22,733	1,886	1,882	1.002	79,786	6,603	6,574	1.004
		4 ≤ Srv < 5	18,305	1,320	1,146	1.152	67,261	4,701	4,183	1.124
		5 ≤ Srv < 10	60,593	2,936	2,255	1.302	260,564	11,778	9,864	1.194
		10 ≤ Service	123,501	2,123	1,811	1.172	506,587	8,347	7,374	1.132
PFRS	All Plans	All Service	24,256	330	423	0.779	93,996	1,402	1,589	0.882
ERS Service Retirement			**118,141**	**14,946**	**15,631**	**0.956**	**493,309**	**59,348**	**63,826**	**0.930**
Regular Plan	Tier 1	0 ≤ Srv < 20	281	63	56	1.133	2,103	394	399	0.988
		20 ≤ Srv < 30	200	66	58	1.133	1,456	398	415	0.958
		30 ≤ Service	395	112	90	1.240	2,879	802	690	1.163
	Tiers 2,3,4,5,6	0 ≤ Srv < 20	60,063	4,663	4,775	0.977	253,687	19,489	19,800	0.984
		20 ≤ Srv < 30	35,344	4,783	5,289	0.904	144,206	18,914	21,030	0.899
		30 ≤ Service	17,891	4,284	4,625	0.926	69,751	15,113	17,958	0.842
State CO	Tiers 1,2	All Service	3	2	1	2.653	41	21	10	2.177
	Tiers 3,5,6	All Service	2,880	754	533	1.415	14,454	3,178	2,633	1.207
County CO	All Tiers	All Service	1,085	219	205	1.069	4,734	1,039	890	1.167
PFRS Service Retirement			**7,911**	**1,231**	**947**	**1.300**	**33,079**	**4,335**	**3,824**	**1.134**
20 Year Plans	No additions	All Service	1,889	319	236	1.351	7,659	1,113	920	1.210
	with add'l 60ths	All Service	4,926	692	564	1.228	20,548	2,475	2,272	1.089
	State Police	All Service	1,096	220	147	1.498	4,872	747	631	1.183
Disability Retirements and Deaths										
Disability Retirement	ERS	Accidental	230,453	8	7	1.209	904,427	22	27	0.803
		Ordinary	122,757	285	323	0.883	509,665	1,126	1,355	0.831
	PFRS	Accidental	32,419	78	72	1.084	128,142	238	293	0.811
		Ordinary	11,440	5	6	0.838	44,657	13	23	0.566
		IPOD	32,419	69	63	1.088	128,142	237	260	0.911
Deaths	ERS	Accidental	458,102	0	5	0.000	1,818,441	3	20	0.152
	Regular Plan	Ordinary	458,102	546	640	0.853	1,818,441	2,440	2,567	0.951
	PFRS	Accidental	32,419	1	2	0.402	128,142	3	10	0.305
		Ordinary	32,419	16	23	0.704	128,142	72	91	0.793

* reflects quotient of unrounded Actual and Expected counts

V. Effect on Contributions

The table below summarizes the projected average employer contribution rates for the most recent valuations.

Valuation 4/1	Local Employer Billing Date 2/1	ERS (reg plan GLIP)	PFRS (GLIP)	Total Employer Contributions/ FY Benefits (billions)	Contribution Stabilization Program (CSP) Mitigated Rates (does not apply to GLIP, ~~strikethrough~~ => no amortizing)				CSP Balance (billions)
2005	2007	10.7%	17.0%	$2.7 / 6.4	ERS		PFRS		
2006	2008	9.6	16.6	2.6 / 6.8					
2007	2009	8.5	15.8	2.5 / 7.2					
2008	2010	7.3	15.1	2.3 / 7.7	Original		Original		
2009	2011	11.9 (0.4)	18.2 (0.1)	3.6 / 8.5	9.5%		17.5%		
2010	2012	16.3 (0.4)	21.6 (0.0)	4.9 / 8.9	10.5		18.5		
2011	2013	18.9 (0.4)	25.8 (0.1)	5.5 / 9.5	11.5	Alternate	19.5	Alternate	$0.3
2012	2014	20.9 (0.4)	28.9 (0.0)	6.2 / 10.0	12.5	12.0%	20.5	20.0%	1.1
2013	2015	20.1 (0.4)	27.6 (0.1)	6.1 / 10.5	13.5	12.0	21.5	20.0	2.1
2014	2016	18.2 (0.5)	24.7 (0.0)	5.5 / 11.1	14.5	12.5	22.5	20.5	3.3
2015	2017	15.5 (0.4)	24.3 (0.0)	4.8 / 11.5	~~15.1~~	13.0	23.5	21.0	4.1
2016	2018	15.3 (0.4)	24.4 (0.1)	4.9 / 12.1	~~14.9~~	13.5	~~24.3~~	21.5	4.2
2017	2019	14.9 (0.5)	23.5 (0.0)	4.9 / 12.8	~~14.4~~	14.0	~~23.5~~	22.0	3.8
2018	2020	14.6 (0.4)	23.5 (0.0)	4.9 / 13.4	~~14.2~~	~~14.2~~	~~23.5~~	22.5	3.3
2019	**2021**	**14.6 (0.5)**	**24.4 (0.0)**	**5.0 / 14.0**	**~~14.1~~**	**~~14.1~~**	**~~24.4~~**	**23.0**	**2.9**

The peak total employer contributions followed the Global Financial Crisis of 2008 (the lag due to asset smoothing) with employer contributions at 62% of benefit payments. This is expected to relax to 36% as the system steadily recovers from the crisis.

The 3/31/2019 CSP amortization balance is $1.82b state + $1.03b local = $2.85b total.

In ERS the associated new entrant rate for the valuation cohort is 12.2%, and 14.6%/12.2% = 120%.
In PFRS the associated new entrant rate for the valuation cohort is 20.6%, and 24.4%/20.6% = 118%.

Note that the average new entrant rates for the valuation cohort increased from 3/31/2018 (ERS 12.0% and PFRS 20.4%) due to the combined effect of the update from MP-2014 to MP-2018 and change from 7.0% to 6.8%.

The associated new entrant contribution is $4.2b. The additional $0.8b is 7.1% of the UAL_{EAN} of $11.2b.

The new entrant rate for the tier 6 valuation cohort is 8.4% in ERS and 14.0% in PFRS.

VI. Gain/Loss Analysis

		ERS	PFRS
2020 Estimated Contributions (2/1/20 Payment)		14.6%	23.5%
Changes Due to Gains/Losses In:			
	FY 2015 Investment Performance (7.2% v 7.5%)	0.1%	0.1%
	FY 2016 Investment Performance (0.2% v 7.0%)	1.0%	1.1%
	FY 2017 Investment Performance (11.5% v 7.0%)	-0.6%	-0.7%
	FY 2018 Investment Performance (11.4% v 7.0%)	-0.6%	-0.7%
	FY 2019 Investment Performance (5.2% v 7.0%)	0.3%	0.3%
	Mortality Improvement Scale MP-2014 to MP-2018	-2.4%	-2.1%
	Assumed return reduction from 7.0% to 6.8%	2.4%	3.1%
	Non-Investment Assumptions (Demographic, Salary Scale, COLA)	0.4%	0.4%
	Tier 6 New Entrant	-0.6%	-0.8%
	GLIP, Administrative Contributions	0.1%	0.1%
	Miscellaneous	-0.1%	0.1%
Net Change		0.0%	0.9%
2021 Estimated Contributions (2/1/21 Payment)		14.6%	24.4%

In a nutshell, the assumed return reduction puts upward pressure on the system average rates. New tier 6 members with less lucrative benefits and the change from mortality improvement scale MP-2014 to MP-2018 puts downward pressure on the rates. In ERS all gains and losses summed to 0 while in PFRS where the assumed return reduction has more leverage due to the maturity of the system, there was a net rate increase.

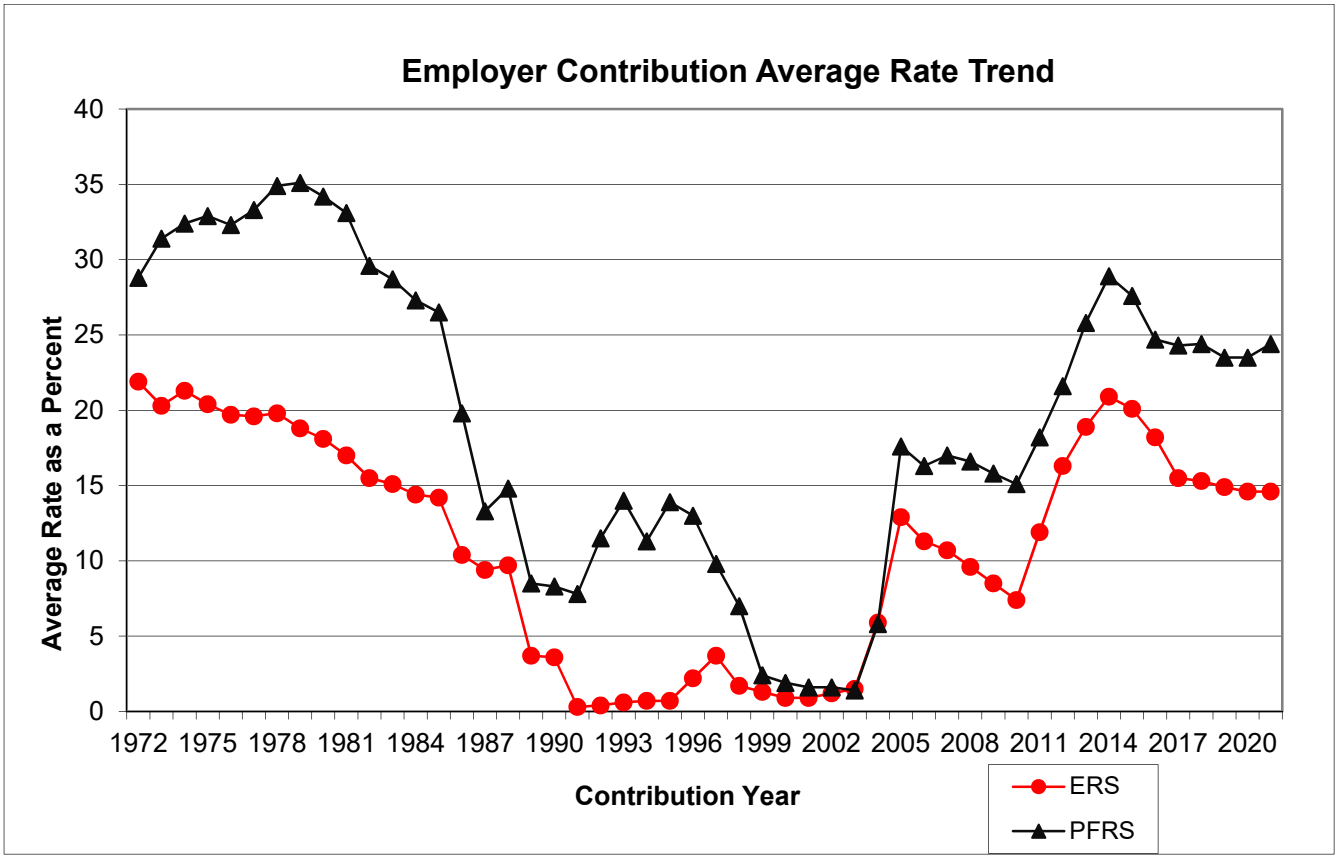
VII. Summary of Recommendations

I recommend that the mortality improvement assumption be updated from Scale MP-2014 to MP-2018 and the investment return assumption be decreased from 7.0% to 6.8%. I recommend all other assumptions be maintained. I am a Member of the American Academy of Actuaries and meet the Academy's Qualification Standards to issue this Statement of Actuarial Opinion.

This recommendation was reviewed by the Actuarial Advisory Committee (AAC) in a meeting on August 8, 2019.

VIII. Historical Employer Contribution Average Rate

Year	Average Rate ERS	PFRS	Year	Average Rate ERS	PFRS	Year	Average Rate ERS	PFRS
1972	21.9	28.8	1989	3.7	8.5	2006	11.3	16.3
1973	20.3	31.4	1990	3.6	8.3	2007	10.7	17.0
1974	21.3	32.4	1991	0.3	7.8	2008	9.6	16.6
1975	20.4	32.9	1992	0.4	11.5	2009	8.5	15.8
1976	19.7	32.3	1993	0.6	14.0	2010	7.4	15.1
1977	19.6	33.3	1994	0.7	11.3	2011	11.9	18.2
1978	19.8	34.9	1995	0.7	13.9	2012	16.3	21.6
1979	18.8	35.1	1996	2.2	13.0	2013	18.9	25.8
1980	18.1	34.2	1997	3.7	9.8	2014	20.9	28.9
1981	17.0	33.1	1998	1.7	7.0	2015	20.1	27.6
1982	15.5	29.6	1999	1.3	2.4	2016	18.2	24.7
1983	15.1	28.7	2000	0.9	1.9	2017	15.5	24.3
1984	14.4	27.3	2001	0.9	1.6	2018	15.3	24.4
1985	14.2	26.5	2002	1.2	1.6	2019	14.9	23.5
1986	10.4	19.8	2003	1.5	1.4	2020	14.6	23.5
1987	9.4	13.3	2004	5.9	5.8	2021	14.6	24.4
1988	9.7	14.8	2005	12.9	17.6			



IX. Risk Disclosures

Why should a governmental entity take on defined benefit (DB) pension risk? DB plans are an economically efficient means of attracting and retaining employees. For example, in the matter of public safety, special plans that offer half-pay at 20 or 25 years of service guarantee income in later middle age when physicality may wane while tasks remain grueling. During the career, disability and death benefits provide income protection to those who risk their lives in service to the public.

Optimizing the economic efficiencies of a DB plan requires prefunding the benefit promises, ideally by way of smooth employer contribution rates. Actuarial Standard of Practice No. 51 (ASOP 51 "Assessment and Disclosure of Risk Associated with measuring Pension Obligations and Determining Pension Plan Contributions") requires assessment and disclosure of risks inherent in the funding of DB plans. The two primary forms of risk are 1) insufficient employer contributions to fund the benefits, and 2) intolerable volatility in the employer contribution rate.

Employer Contribution Sufficiency Risk

Contribution Fulfillment Risk

In NYS, employers are required to pay the actuarially determined contribution. Employers who are delinquent are pursued and interest is charged on any late payments. Thus there is very little risk that employer contributions will not be paid. This is the most significant component of a well-funded DB plan. Poorly funded DB plans invariably have a stretch of time when employer contributions are neglected.

Actuarial Assumptions

Actuarial assumptions and methods determine the allocation of benefit costs over time; they do not, however, determine the ultimate benefit costs. The ultimate cost of benefits is based on the lucrativeness of the promises and the performance of the assets.

The expected long term employer contribution rate is the rate that would be charged if all assumptions were met annually. As experience deviates from what was assumed, the employer contribution rates deviate from the expected long term rate. When billing rates are greater than the expected long term rates, the current taxpayer is funding benefits earned in prior years. When billing rates are less than the expected long term rates, the current taxpayer is benefiting from contributions collected in prior years. The more conservative a set of assumptions, the more quickly contributions are collected, possibly levying too great a cost to current taxpayers. The less conservative a set of assumptions, the more likely contributions will increase, possibly levying too great a cost to future taxpayers. The best assumptions decrease the likelihood of deviations in one direction persisting over long periods. In so doing, governmental services are compensated by the taxpayers benefitting from those services (i.e. there is intergenerational equity).

New York State Retirement and Social Security Law (NYS RSSL) requires a review of all assumptions at least once every five years. To comply, the New York State and Local Retirement System (NYSLRS) undertakes a quinquennial comprehensive experience study and update of assumptions with a reasonableness review every year. Any emerging trends that are believed to continue in the future may warrant an assumption adjustment between quinquennial studies. Assumptions are reviewed annually by the Comptroller's Actuarial Advisory Committee and quinquennially by a consulting firm. The annual online publishing of the actuarial assumptions provides transparency to interested parties.

Assumed Investment Return Expectation Risk

Employer contribution rates are most sensitive to the assumed investment return. This report recommends decreasing this assumption from 7.0% to 6.8% for the 4-1-2019 actuarial valuation. The following table shows the FY 2021 system average billing rates and tier 6 expected long term billing rate (aka new entrant rate) for various assumed investment returns using the 4-1-2019 valuation cohort. The exceedance column shows the probability of exceeding the assumed return over a 30 year period using the capital market assumptions and policy asset allocation approved by Pension and Investment Cash Management (PICM) in 2015, the year of the most recently provided comprehensive asset/liability analysis.

	Employees' Retirement System		Police and Fire Retirement System		
Assumed Rate	FY 2021 System Average Billing Rate	Tier 6 New Entrant Rate	FY 2021 System Average Billing Rate	Tier 6 New Entrant Rate	Probability of Assumed Rate Exceedance
5.00%	37.5%	14.1%	53.7%	22.9%	75.6%
5.50%	30.9%	12.2%	45.1%	20.0%	67.8%
6.00%	24.4%	10.6%	36.9%	17.4%	59.3%
6.50%	18.2%	9.2%	29.0%	15.2%	50.9%
6.80%	**14.6%**	**8.4%**	**24.4%**	**14.0%**	**45.5%**
7.00%	12.2%	7.9%	21.3%	13.2%	42.1%

Inflation and Salary Scale Expectation Risk

The inflation assumption is used to compute COLA (cost of living adjustment) payments to retirees and beneficiaries. The COLA program provides payments equal to one half of the inflation rate based on the first $18,000 of the single life allowance. There is a floor of 1% and a cap of 3% so there is little risk of significant gains or losses in this valuation component.

The salary scale assumption is used to project future increases in a member's salary to estimate the final average salary at retirement as well as determine billable salary over a member's career. If members receive greater salary increases than assumed, greater benefits will be paid out in the future than expected, requiring an increase in employer contributions to make up for the shortfall. Salary increases vary within a relatively narrow range, so there is minor risk of significant gains or losses in this valuation component.

Demographic Expectation Risks

Demographic assumptions estimate member behavior with regard to decrements (i.e. change in status) such as retiring, withdrawing or dying. Since NYSLRS is large (over 1.1 million participants), these assumptions are developed with a high degree of credibility using NYSLRS own experience. Actual/Expected (A/E) ratios are displayed on pages 8 and 9 earlier in this report to show how actual pensioner mortality and active member decrements track expectations. Decrements vary within a relatively narrow range, so there is minor risk of significant gains or losses in this valuation component.

NYSLRS is not large enough to develop in-house mortality improvement assumptions and thus relies on mortality improvement scales based on nationwide experience derived from data collected from the Social Security Administration by the Society of Actuaries (SOA). This report recommends using scale MP-2018 for the 4-1-19 valuation. The SOA's initial scale, MP-2014, now looks to have been a bit optimistic. More recent tables vary within a relatively narrow range, so after this year's recommended change, there is minor risk of significant gains or losses in this valuation component.

Employer Contribution Volatility Risk

Investment Volatility Risk

Employer contribution rate smoothness is most sensitive to the investment return experience. We can evaluate exposure to investment volatility risk using the following Asset Leverage Ratio:

$$Asset\ Leverage\ Ratio = \frac{Market\ Value\ of\ Assets\ (MVA)}{Present\ Value\ of\ Valuation\ Cohort\ Billable\ Salary\ (PVBS)}$$

The following table displays the ratio and it components in the middle of the last four decades and for the most recent year (dollar amounts in billions).

	FYE	1985	1995	2005	2015	2019
ERS	MVA	$22.8	$53.3	$108.7	$161.2	$182.7
	PVBS	$102.0	$158.2	$176.1	$203.1	$239.2
	Ratio	22%	34%	62%	79%	76%
PFRS	MVA	$4.1	$9.8	$19.3	$28.2	$32.5
	PVBS	$11.9	$16.5	$27.0	$30.9	$37.6
	Ratio	35%	60%	71%	91%	86%

The ratio is zero at plan inception, but increases as assets accumulate. Poor investment performance in a new plan is not problematic as there was not much to lose and plenty of billable salary to collect contributions and accumulate assets before benefits become due. In a more mature fund with a high asset leverage ratio, investment volatility has a greater impact on the employer contribution rate. NYSLRS is now a mature plan with the associated significant exposure to investment volatility risk.

Mitigating Employer Contribution Volatility Risk

NYSLRS currently employs two methods to reduce employer contribution rate volatility. An industry and GASB standard level five year asset smoothing method is used to dampen annual investment return volatility. Any deviations from the current expected return of 6.8% are recognized in equal increments over a period of five years.

The Contribution Stabilization Program (CSP signed into law in 2010 - the Alternate Program was signed in 2014 and had a one year opt-in window) provides an optional additional layer of employer contribution rate smoothing. Under the CSP, on the billing date, a participating employers is required to remit a graded rate contribution and permitted to amortize over a 10 year period the balance between the actuarial contribution and the graded (12 year period for the Alternate Program). The graded rate increases or decreases up to 1% each year (0.5% for the Alternate Program) in the direction of the system average contribution rate. During “ordinary” investment periods, the actuarial and graded rates converge. Large deviations may occur when there is extraordinary asset performance, such as after the Global Financial Crisis of 2008.