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# Annual Report to the Comptroller on Actuarial Assumptions

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AUGUST 2016



Office of the NEW YORK STATE

**COMPTROLLER**

THOMAS P. DiNAPOLI



**NYSLRS**

New York State & Local Retirement System



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# I. Executive Summary

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Fiscal year 2016 (FY 2016) was the first 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 2016 experience and recommends that the current assumptions be maintained.

## Summary of Assumptions and Methods

Assumption or Method	Recommendation
Inflation / COLA	2.5 % / 1.3%
Investment Return	7.0 %
ERS Salary Scale	3.8 % average (using FY 2015 data) Indexed by Service
PFRS Salary Scale	4.5 % 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-2014 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 August 2013 by Buck Consultants, LLC.

The reviewed and finalized actuarial assumptions will be presented to Comptroller Thomas P. DiNapoli for certification and will be used in developing employer contribution rates, payable on 2/1/2018, 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. That is my recommendation for FY 2016.

## 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
3/31/2016	238.132	0.85%	1.0%
3/31/2015	236.119		

As a result, there will be a  $\frac{0.85\%}{2} = 0.43\%$  rounded up to 1.0% COLA applied in September of 2016, 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 2016 investment rate of return, as reported by the Division of Investment and Cash Management, is 0.19%. This is well below the 7.00% assumption. The 3, 5, 10, and 20 year returns are 6.66%, 7.25%, 5.69% and 7.63% respectively.

In February, 2016, a National Association of State Retirement Administrators Issue Brief titled "Public Pension Plan Investment Return Assumption" presented the following investment return assumption distribution for public systems:

<i>i</i>	Number of Public Systems		
	February 2016	May 2015	March 2010
< 7.00	7	4	0
7.00	5	4	1
7.01-7.50	50	43	21
7.51-7.99	30	36	16
8.00	31	34	51
8.01-8.49	3	3	16
8.50	1	2	19
Median	7.62	7.75	7.97

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## C. Salary Scales

The table below displays the actual and expected salary increases for full-time employees.

	FY 2016		
	Actual	Expected	A/E
ERS	3.696%	3.844%	0.9616
PFRS	7.202%	4.692%	1.5350
Combined	4.168%	3.958%	1.0531

Note that the expected salary scale for FY 2016 in PFRS was 4.692% (slightly higher than the FY 2015 and stated assumption value of 4.5%). Service indexing has a large range in salary growth assumptions. When reducing a service indexed salary scale to one number, the year to year expectations are constant only insofar as the demographics (service, age, and plan) of the group remains constant. The PFRS full-time employees averaged slightly less service in FY 2016 than they did in FY 2015.

The higher than expected increase in PFRS salaries was primarily due to overtime costs associated with the Clinton Correctional Facility escape in June of 2015, retroactive salary settlements, and pay increase peaks in collective bargaining agreements.

# III. Asset Valuation Method

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

## Market Value v. Actuarial Value of Assets

FY	<sup>a</sup> MVA	AVA	AL <sub>EAN</sub>	UAL <sub>EAN</sub>	GASB 25 Ratio	<sup>b</sup> TPL <sub>EAN</sub>	GASB 67 Ratio
2000	\$128.9	\$110.6	\$90.6	\$-20.0	<b>122.1%</b>	Use AL <sub>EAN</sub> as a proxy	<b>142.3%</b>
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 <sup>c</sup>	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		<b>75.6</b>
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	<b>87.3</b>		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						209.1	

a) Financial Statement Plan Net Position (i.e. Invested Assets + Receivables)  
[both the MVA & AVA exclude funds for group term life insurance]

b) TPL<sub>EAN</sub> is similar to AL<sub>EAN</sub>, the chief difference being that it 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 2016		
			Actual	Expected	A/E
ERS	Service	Male Clerk*	68.341	66.497	1.028
		Male Laborer*	38.043	36.733	1.036
		Female Clerk*	57.335	55.755	1.028
		Female Laborer*	7.762	7.059	1.100
	Disability	Male	6.827	7.417	0.920
		Female	3.934	4.387	0.897
PFRS	Service	All	17.739	17.501	1.014
	Disability	All	2.712	2.879	0.942
ERS & PFRS	Beneficiary**	Male	2.063	1.411	1.462
		Female	14.231	12.844	1.108
<b>All Pensioner Mortality</b>			<b>218.987</b>	<b>212.483</b>	<b>1.031</b>

\* Clerk refers to White Collar while Laborer refers to Blue Collar

\*\* Beneficiary dollars reflect actual pension received

### B. Mortality Improvement

NYSLRS actuarial valuations use Society of Actuaries (SOA) Mortality Improvement Scale MP-2014.



## C. Active Member Decrement Experience

Decrement	FY 2016			
	Exposures	Actual	Expected	A/E
ERS Withdrawals 0 ≤ Srv < 2 Age 55 Plan	72,377	11,237	12,590	0.893
ERS Withdrawals 2 ≤ Srv < 3 "	22,231	2,384	2,454	0.971
ERS Withdrawals 3 ≤ Srv < 4 "	17,515	1,526	1,428	1.069
ERS Withdrawals 4 ≤ Srv < 5 "	15,776	1,181	971	1.216
ERS Withdrawals 5 ≤ Srv < 10 "	71,284	3,239	2,737	1.183
ERS Withdrawals 10 ≤ Service "	130,191	2,362	1,883	1.254
PFRS Withdrawals	22,615	318	372	0.855
<b>All Withdrawals</b>	<b>351,987</b>	<b>22,247</b>	<b>22,436</b>	<b>0.992</b>
ERS T-1 Reg Plan Srv Ret 0 ≤ Srv < 20	789	138	146	0.945
ERS T-1 Reg Plan Srv Ret 20 ≤ Srv < 30	561	144	157	0.917
ERS T-1 Reg Plan Srv Ret 30 ≤ Service	1,077	302	265	1.140
ERS T-2,3,4,5,6 Reg Plan Srv Ret 0 ≤ Srv < 20	66,045	4,916	5,059	0.972
ERS T-2,3,4,5,6 Reg Plan Srv Ret 20 ≤ Srv < 30	36,940	4,710	5,230	0.901
ERS T-2,3,4,5,6 Reg Plan Srv Ret 30 ≤ Srv	16,597	3,223	4,268	0.755
ERS State T-1,2 Correction Officer Srv Ret	21	10	5	2.000
ERS State T-3,5,6 Correction Officer Srv Ret	4,411	868	840	1.033
ERS County Correction Officer Srv Ret	1,286	309	250	1.236
<b>All ERS Service Retirements</b>	<b>127,725</b>	<b>14,620</b>	<b>16,219</b>	<b>0.901</b>
PFRS 20 Year Plan Srv Ret	1,968	269	228	1.180
PFRS 20 Year Plan w add'l 60ths Srv Ret	5,323	580	567	1.023
PFRS State Police 20 Year Plan Srv Ret	1,292	147	166	0.886
<b>All PFRS Service Retirements</b>	<b>8,583</b>	<b>996</b>	<b>961</b>	<b>1.036</b>
ERS Accidental Deaths Age 55 Plan	451,379	3	5	0.600
ERS Ordinary Deaths Age 55 Plan	451,379	592	642	0.922
PFRS Accidental Deaths	31,468	1	2	0.500
PFRS Ordinary Deaths	31,468	19	22	0.864
ERS Accidental Disability	222,368	4	7	0.571
ERS Ordinary Disability	132,665	331	355	0.932
PFRS Accidental Disability	31,468	49	74	0.662
PFRS Ordinary Disability	10,726	4	5	0.800
PFRS IPOD Disability	31,468	51	66	0.773

## 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 (billions)	Contribution Stabilization Program (CSP) Mitigated Rates (does not apply to GLIP, <del>strikethrough</del> => no amortizing)				CSP Balance (billions)
2005	2007	10.7%	17.0%	\$2.7	ERS		PFRS		
2006	2008	9.6	16.6	2.6					
2007	2009	8.5	15.8	2.5					
2008	2010	7.3	15.1	2.3	Original		Original		
2009	2011	11.9 (0.4)	18.2 (0.1)	3.6	9.5%		17.5%		
2010	2012	16.3 (0.4)	21.6 (0.0)	4.9	10.5		18.5		
2011	2013	18.9 (0.4)	25.8 (0.1)	5.5	11.5	Alternate	19.5	Alternate	\$0.3
2012	2014	20.9 (0.4)	28.9 (0.0)	6.2	12.5	12.0%	20.5	20.0%	1.1
2013	2015	20.1 (0.4)	27.6 (0.1)	6.1	13.5	12.0	21.5	20.0	2.1
2014	2016	18.2 (0.5)	24.7 (0.0)	5.5	14.5	12.5	22.5	20.5	3.3
2015	2017	15.5 (0.4)	24.3 (0.0)	4.8	<del>15.4</del>	13.0	23.5	21.0	4.1
2016	<b>2018</b>	<b>15.3 (0.4)</b>	<b>24.4 (0.1)</b>	<b>4.9</b>	<b><del>14.9</del></b>	<b>13.5</b>	<b><del>24.3</del></b>	<b>21.5</b>	<b>4.2</b>

The 3/31/2016 CSP amortization balance is \$2.84b state + \$1.33b local = \$4.17b total.

In ERS the associated new entrant rate is 11.9%, and  $15.3\%/11.9\% = 129\%$ .

In PFRS the associated new entrant rate is 20.2%, and  $24.4\%/20.2\% = 121\%$ .

The associated new entrant contribution is \$3.9b. The additional \$1.0b is 8.1% of the  $UAL_{EAN}$  of \$12.4b.

## VI. Gain/Loss Analysis

	ERS	PFRS
<b>2017 Estimated Contributions (2/1/17 Payment)</b>	15.5%	24.3%
<b>Changes Due to Gains/Losses In:</b>		
FY 2012 Investment Performance (6.0% <small>v 7.5%</small> )	0.3%	0.3%
FY 2013 Investment Performance (10.4% <small>v 7.5%</small> )	-0.3%	-0.4%
FY 2014 Investment Performance (13.0% <small>v 7.5%</small> )	-0.7%	-0.8%
FY 2015 Investment Performance (7.2% <small>v 7.5%</small> )	0.1%	0.1%
FY 2016 Investment Performance (0.2% <small>v 7.0%</small> )	1.1%	1.2%
Non-Investment Assumptions (Demographic, Salary Scale, COLA)	0.1%	0.9%
New Entrant	-0.7%	-0.8%
GLIP, Administrative Contributions	-0.0%	0.0%
Miscellaneous	-0.1%	-0.4%
<b>Net Change</b>	-0.2%	0.1%
<b>2018 Estimated Contributions (2/1/18 Payment)</b>	15.3%	24.4%

In a nutshell, the impact of the FY 2014 investment performance and the new entrant gains due to the growth in the number of less expensive tier 6 members more than offset the FY 2016 investment performance. Actual ERS salary increases for full timers was very near the expected value, so ERS nets a small reduction. PFRS salary increases for full timers was greater than expected, so PFRS did not net a small reduction.

## VII. Summary of Recommendations

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I recommend that the current 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.

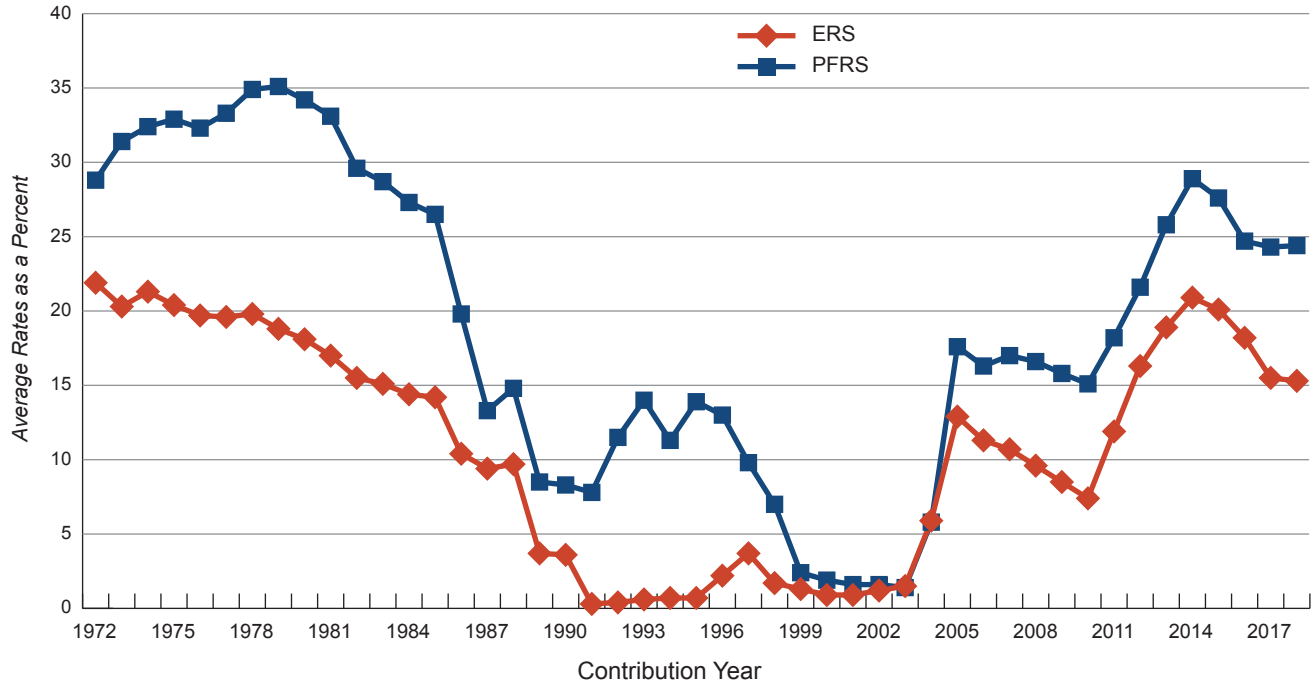
This recommendation was reviewed by the Actuarial Advisory Committee (AAC) in a meeting on August 12, 2016.

## VIII. Historical Employer Contribution Average Rate

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

## Employer Contribution Average Rate Trend (1972–2018)







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

Prepared by Michael R. Dutcher, Retirement Systems Actuary