Agenda

ND Teachers' Fund for Retirement Board Meeting

Thursday, April 30 , 2015
1:30 pm

Workforce Safety and Insurance Board Room
1600 East Century Avenue, Bismarck, ND

1. Call to Order and Approval of Agenda - Pres. Gessner (Board Action) 5 min
2. Approval of Minutes March 26, 2015 Meeting – Pres. Gessner (Board Action) 5 min
3. Actuarial Experience Study – Kim Nicholl, Matt Strom, Segal (Board Action) 90 min
4. Resolution for Clarence Corneil – Fay Kopp (Board Action) 10 min

**** **BREAK** - Coffee Party in Honor of **Clarence Corneil**, former TFFR trustee

5. 2015 Legislative Report – Fay Kopp (Information) 10 min
6. Asset Liability Study Planning– Fay Kopp (Board Action??) 15 min
7. GASB Update – Shelly Schumacher (Information) 10 min
8. 2015-16 Board Calendar and Education Plan– Fay Kopp (Board Action) 10 min
9. Consent Agenda – (Board Action) 5 min
   QDRO application
   *Executive Session possible if Board discusses confidential information under NDCC 15-39.1-30.
10. Other Business
    Next Board Meeting: July 23, 2015
11. Adjournment

Any person who requires an auxiliary aid or service should contact the Retirement and Investment Office at 701-328-9885 at least three (3) days before the scheduled meeting.

NORTH DAKOTA TEACHERS' FUND FOR RETIREMENT
MINUTES OF THE
MARCH 26, 2015, BOARD MEETING

BOARD MEMBERS PRESENT:	Mike Gessner, President Kirsten Baesler, State Superintendent (teleconference) Mike Burton, Trustee Kim Franz, Trustee Mel Olson, Trustee Kelly Schmidt, State Treasurer
ABSENT:	Rob Lech, Trustee
STAFF PRESENT:	Terra Miller Bowley, Audit Services Supervisor David Hunter, ED/CIO Fay Kopp, Deputy ED/CRO Darlene Roppel, Retirement Assistant Shelly Schumacher, Retirement Program Manager
OTHERS PRESENT:	Janilyn Murtha, Attorney General's Office

CALL TO ORDER:

Mr. Mike Gessner, President of the Teachers' Fund for Retirement (TFFR) Board of Trustees, called the board meeting to order at 1:00 p.m. on Thursday, March 26, 2015, at Workforce Safety & Insurance Office (WSI), 1600 E Century Avenue, Bismarck, ND.

THE FOLLOWING MEMBERS WERE PRESENT REPRESENTING A QUORUM: MR. BURTON, MRS. FRANZ, MR. GESSNER, MR. OLSON, AND TREASURER SCHMIDT.

Mr. Lech was absent.

APPROVAL OF AGENDA:

The Board considered the meeting agenda. President Gessner asked to include comments by Ms. Jan Murtha, Attorney General's Office, regarding board mentors after Agenda item 2.

TREASURER SCHMIDT MOVED AND MR. OLSON SECONDED TO APPROVE THE AGENDA WITH THE ADDITION OF BOARD MENTOR COMMENTS.

AYES: TREASURER SCHMIDT, MR. BURTON, MRS. FRANZ, MR. OLSON, AND PRESIDENT GESSNER.
NAYS: NONE
MOTION CARRIED.
ABSENT: SUPT. BAESLER AND MR. LECH

MINUTES:

The board considered the minutes of the TFFR board meeting held January 22, 2015.

MRS. FRANZ MOVED AND TREASURER SCHMIDT SECONDED TO APPROVE THE MINUTES OF THE TFFR BOARD MEETING HELD JANUARY 22, 2015.

AYES: MR. OLSON, TREASURER SCHMIDT, MR. BURTON, MRS. FRANZ, AND PRESIDENT GESSNER.
NAYS: NONE
MOTION CARRIED.
ABSENT: SUPT. BAESLER AND MR. LECH

President Gessner asked Mrs. Fay Kopp, Deputy Executive Director/Chief Retirement Officer, to explain the studies that will be conducted in the future. Mrs. Kopp described the general timing and purpose of upcoming studies including the actuarial experience study, asset liability study, actuarial audit, and IRS compliance review.

BOARD MENTORSHIP:

Ms. Murtha explained that the purpose of a TFFR board mentor is to act as an additional and informal resource for a new board member due to their board knowledge and experience. Ms. Murtha stated that while the board chair at the January 2015 meeting briefly inquired as to the availability of board members to act as mentors and encouraged that a new board member contact another board member with questions, this conversation does not appear to constitute appointment of a board committee and would not implicate open meeting notice requirements because no formal appointment or action by the board was made, directed, or intended. Board discussion followed.

Supt. Baesler joined the meeting at 1:20 p.m. by teleconference.

2015 LEGISLATIVE UPDATE:

Mrs. Kopp reported that the TFFR technical corrections bill, HB1064, has passed and is awaiting the Governor's signature.

The RIO budget bill, SB2022, includes the budget authority and continuing appropriations for the Retirement and Investment Office (RIO) administrative expenses for operating the retirement program for the TFFR Board and the investment program for the State Investment Board (SIB). The bill was amended in the Senate, but no action has been taken by House Appropriations Committee to date.

Mrs. Kopp also commented on other bills being monitored. Board discussion followed.

TFFR INVESTMENT UPDATE:

Mr. David Hunter, Executive Director/Chief Investment Officer, reviewed a presentation on TFFR investment performance, capital markets update, labor market conditions, and asset class performance as of December 31, 2014. Board discussion followed.

The presentation is on file at RIO.

PUBLIC PENSION PLAN COMPARISONS:

Mrs. Kopp presented the annual Public Pension Plan Comparisons report, comparing TFFR to the 2013 Public Fund Survey (PFS) conducted by the National Association of State Retirement Administrators (NASRA) and the National Council on Teacher Retirement (NCTR). It includes key characteristics of 126 large public retirement plans like TFFR. The survey contains information about funding levels, investments, membership changes, and actuarial assumptions. The report and presentation is on file at RIO.

Mrs. Kopp also reported on a recent National Council on Teacher Quality (NCTQ) report, as well as other surveys and reports comparing various NDTFFR plan provisions with other public pension plans.

After discussion,

MR. BURTON MOVED AND MRS. FRANZ SECONDED TO ACCEPT THE ANNUAL PENSION PLAN COMPARISON REPORT.

AYES: TREASURER SCHMIDT, SUPT. BAESLER, MRS. FRANZ, MR. OLSON, MR. BURTON AND PRESIDENT GESSNER
NAYS: NONE
MOTION CARRIED.
ABSENT: MR. LECH

The board recessed at 2:45 p.m. and reconvened at 3:00 p.m.

ACTUARIAL CONTRACT:

Mrs. Kopp reviewed the current contract with Segal and their proposal dated February 10, 2015 to extend their contract for 2015-17. The Segal proposal appears to be very competitive when compared to other public pension plans with varying actuarial consultants and payment structures. Staff recommends accepting Segal's proposal.

TREASURER SCHMIDT MOVED AND MR. OLSON SECONDED THE MOTION TO ACCEPT SEGAL'S PROPOSAL TO EXTEND THE ACTUARIAL CONSULTING CONTRACT FOR 2015-17 AS OUTLINED IN THEIR 2/10/2015 LETTER.

AYES: MRS. FRANZ, MR. BURTON, SUPT. BAESLER, MR. OLSON, TREASURER SCHMIDT, AND PRESIDENT GESSNER.
NAYS: NONE

MOTION CARRIED.
ABSENT: MR. LECH

Supt. Baesler left the meeting at 3:20 p.m.

GASB UPDATE:

Mrs. Shelly Schumacher, Retirement Program Manager, reported CliftonLarsonAllen (CLA) completed the census data audit of 17 TFFR employers with very positive results.

More information has been added to the TFFR website. GASB talking points have been drafted to assist TFFR staff, employers, and others in communicating the pension standards. This will be sent to administrators this spring and will also be posted to the TFFR website.

Board discussion followed.

AUDIT SERVICES UPDATE:

Ms. Terra Miller Bowley, Supervisor of Audit Services, provided an update of audit activities that have occurred from July 1, 2014-March 13, 2015. The Office of the State Auditor has awarded the contract for external auditor to CliftonLarsonAllen, LLC for both RIO and PERS for the next three fiscal years. Audit Services is now current with regards to the school district audit inventory.

Board discussion followed. Ms. Miller Bowley will report quarterly to the TFFR board. The board commended her on a job well done.

The report is on file at RIO.

RETIREMENT STAFFING UPDATE:

Mrs. Kopp reported that Ms. Denise Osmond has been hired as Retirement Program Specialist and is doing an excellent job.

BOARD EDUCATION TOPICS:

Mrs. Kopp requested suggestions from board members for topics they would like for board education and to help them carry out their board responsibilities. Mrs. Kopp will present the 2015-16 board calendar and education plan at the April meeting for approval.

CONSENT AGENDA:

TREASURER SCHMIDT MOVED AND MRS. FRANZ SECONDED TO APPROVE THE CONSENT AGENDA WHICH INCLUDES THREE DISABILITY APPLICATIONS: 2015-3D, 2015-4D, 2015-5D, AND ONE QUALIFIED DOMESTIC RELATIONS ORDER (QDRO): 2015-1Q.

AYES: MR. OLSON, MRS. FRANZ, TREASURER SCHMIDT, MR. BURTON, AND PRESIDENT GESSNER.
NAYS: NONE
MOTION CARRIED.
ABSENT: SUPT. BAESLER AND MR. LECH

OTHER BUSINESS:

The next board meeting will be held April 30, 2015.

ADJOURNMENT:

With no further business to come before the Board, President Gessner adjourned the meeting at 3:40 p.m.

Respectfully Submitted:

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Mr. Mike Gessner, President
Teachers' Fund for Retirement Board

_____
Darlene Roppel
Reporting Secretary

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **April 23, 2015**

SUBJ: **Actuarial Experience Study**

Experience Study Overview

As you know, actuaries make assumptions as to when and why a member will leave active service and estimate the amount and duration of the pension benefits paid. An Experience Study is a review of the assumptions used by the actuary. These include economic assumptions like inflation, salary increase, payroll growth, and investment return. Demographic assumptions include termination, disability, retirement, and mortality. Keeping assumptions up-to-date will minimize actuarial gains and losses and keep the actuarially determined contribution rate stable.

The Experience Review generally tries to answer three questions for each assumption:

1) What was the plan's actual experience?
2) How does that compare with current assumptions?
3) Is a change warranted?

An Experience Study is required by ND state statute and board policy every five years. The last one was for the 2005-09 time period; this one covers the 2010-2014 time frame.

Based on the results of the Experience Review and the Actuary's best estimate:

- Segal will recommend revised assumptions to the Board.
- TFFR Board must decide whether to adopt all, none, or some of the recommendations.

Summary of Experience Study Results

Enclosed are the results of the Experience Review conducted by Segal for the TFFR Board for the 2010-2014 time period. In general, the actuary's recommendations included in the Experience Review would increase TFFR plan costs. About half of the increased costs are due to updated mortality assumptions (using new 2014 tables), and the other half reflects reducing the investment return assumption from 8.0% to 7.75%. Segal also recommends other more minor demographic and economic assumption changes which are included in the report.

Based on the 2014 valuation, **IF** the TFFR Board adopts **ALL** demographic and economic assumption recommendations, TFFR's funding level would decrease by about 3% (from 61.8% to 58.9%); UAAL would increase by $155.7 million (from $1.198 billion to $1.354 billion); actuarially determined contribution rate (ADC) would increase by 2.18% (from 11.57% to 13.75%); and effective amortization period would be extended about 10 more years (from 24 to 34 years). TFFR would then be projected to be 100% funded in approximately 2044 instead of 2034.

IF new assumptions are adopted by the Board, we recommend that the revised assumptions be used in the July 1, 2015 valuation report. We also recommend that the new assumptions be incorporated into all affected member calculations including, but not limited to, election of optional forms of benefit payment at retirement, service credit purchases and payment schedules, no later than January 1, 2016. Computer systems will need to be updated to calculate benefit options and service purchases using new assumptions. In most cases, the new assumptions will result in an increase in the retirement benefit for members electing an optional form of benefit at retirement (ie. joint and survivor options). For service credit purchases, the new assumptions will likely result in an increase in cost for members. Staff will work with Segal to calculate member impact and update actuarial tables and computer systems appropriately. We anticipate this can be completed by January 1, 2016.

Kim Nicholl and Matt Strom will be at the April 30th TFFR Board meeting to present the results of the Experience Study, review their recommendations and cost impact, and answer questions.

Enclosure

NORTH DAKOTA RETIREMENT AND INVESTMENT OFFICE
Teachers' Fund for Retirement
State Investment Board

Segal Consulting

North Dakota Teachers' Fund for Retirement

Experience Review

July 2009 – June 2014

April 30, 2015

Presented By:

Kim Nicholl, FSA, MAAA, EA

Matt Strom, FSA, MAAA, EA

This document has been prepared by Segal Consulting for the benefit of the Board of Trustees of the North Dakota Teachers' Fund for Retirement and is not complete without the presentation provided at the April 30, 2015 meeting of the Board of Trustees. This document should not be shared, copied or quoted, in whole or in part, without the consent of Segal Consulting, except to the extent otherwise required by law. Except where otherwise specifically noted, the actuarial calculations and projections were completed under the supervision of Matthew A. Strom, FSA, MAAA, Enrolled Actuary.

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Agenda

- Overview
- Economic Assumptions
  - Inflation
  - Salary Increase
  - Payroll Growth
  - Investment Return
- Demographic Assumptions
  - Termination
  - Disability
  - Retirement
  - Mortality
  - Spouse Information
- Cost Impact
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Overview: Purpose of an Experience Study

- An experience study provides the basis for developing recommended assumptions to be used in the annual actuarial valuation
  - Performed on a periodic basis, typically every five years
  - Last TFFR experience study was conducted in 2009 for the 5-year period ending June 30, 2009
  - Current study is based on the period July 1, 2009 through June 30, 2014
- Actuarial Standards of Practice #27 and #35 provide guidance on best practices for performing assumption-setting analysis
  - Each assumption should be the actuaries best estimate
- Segal's role is to make appropriate "best estimate" recommendations to the Board for each assumption
  - The assumptions are the Board's assumptions and the Board can adopt all, none, or some of the recommendations of the actuary

Overview: How Assumptions Are Set

- Review past experience
- Compare past experience (“actual”) with assumptions (“expected”)
- Determine trends – make judgments about future
- Develop component parts of each assumption
  - Maintain linkage with investments
  - Maintain internal consistency
- Keep in mind
  - No “right” answer – best estimate
  - Assumptions are long-term

Overview: Actuarial Assumptions

Demographic

- Termination
- Disability
- Retirement
- Death after retirement
- Death in active service

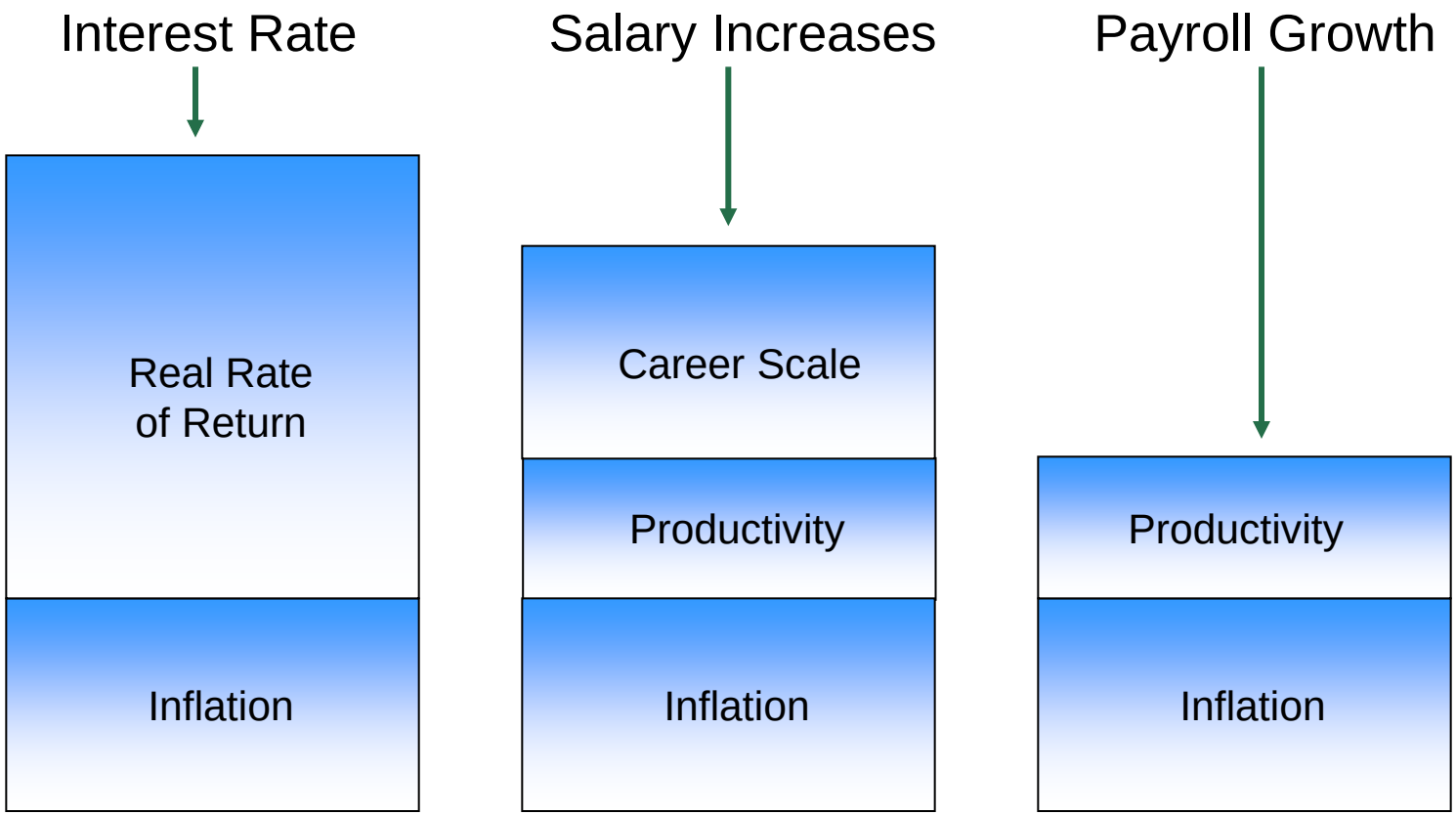
Economic

- Inflation
- Salary increase
- Payroll growth
- Investment return

Actuaries make assumptions as to when and why a member will leave active service and estimate the amount and duration of the pension benefits paid.

Building Block Method – Basis for Setting Economic Assumptions

Each economic assumption has 2 or 3 components (or building blocks)



Building blocks should be consistent across all economic assumptions, but may be adjusted for conservatism.

Assumed Rate of Inflation

- Inflation represents the annual increase in the cost of living.
- The inflation assumption, currently 3.00%, indirectly affects the valuation.
  - Inflation is a component of the following economic assumptions:
    - Investment return
    - Payroll growth
    - Individual salary increases
- Segal's recommendation is to lower the assumption from 3.00% to 2.75%. This recommendation is based on:
  - Current market expectations indicate that low inflation is expected to continue; and
  - Both Callan and Segal Rogerscasey expect inflation to be less than 2.50% over the next 10-20 years.

Assumed Rate of Inflation *(continued)*

- As of June 30, 2014, the historical national inflation (CPI-U) averages are:
  - 5-year average is 2.02%.
  - 10-year average is 2.31%.
  - 20-year average is 2.41%.
  - 30-year average is 2.81%.
  - 50-year average is 4.16%.
- In addition to historical inflation, other metrics to consider are current market expectations and inflation assumptions used for similar pension plans.

Assumed Rate of Inflation *(continued)*

- By observing the difference between the yields on US Treasury bonds with and without inflation indexing, we can calculate the rate of inflation that investors expect.
- As of June 2014, the yields on 30-year Treasury bonds were as follows:
  - Inflation indexed: 1.03%
  - Non-inflation indexed: 3.39%
  - The difference between these figures is 2.36%.
    - This difference of 2.36% represents the financial market's current expectations of inflation over the next 30 years.
- Social Security uses three inflation assumptions to project its future financial status:
  - Low inflation of 2.0%;
  - Moderate inflation of 2.7%; and
  - High inflation of 3.4%.

Assumed Rate of Inflation *(continued)*

- The National Association of State Retirement Administrators (NASRA) Public Fund Survey collects general information on 126 public pension systems.
- The median inflation assumption of these 126 systems is 3.00%.
- We recommend that the Board adopt an assumption that falls between:
  - The rate indicated by financial market data; and
  - The median rate used by peer retirement systems.

We recommend that the Board lower the inflation assumption from 3.00% to 2.75%.

Assumed Rate of Payroll Growth

- The amortization of the unfunded actuarial accrued liability (UAAL) is calculated as a level percentage of payroll over a closed period of time.
  - The amortization amount is expected to increase each year as payroll increases (i.e., amortization payments are back loaded.)
  - The payroll growth assumption is used to estimate the annual increase in total payroll.
- A lower payroll growth assumption is more conservative.
  - A lower payroll growth assumption results in larger amortization payments.
  - For example, a 0% payroll growth assumption uses level amortization payments, similar to a mortgage.
- The current payroll growth assumption of 3.25% consists of the following components:
  - Inflation: 3.00%
  - Productivity: 1.50%
  - Adjustment for conservatism: -1.25%

Assumed Rate of Payroll Growth *(continued)*

- As the recommended inflation component is 2.75%, we need to examine the productivity component.
- Productivity can be measured as the excess of the increase in the National Average Wage over inflation.
  - The 20-year average of the National Average Wage is 3.4%.
  - The 20-year average inflation is 2.4%.
  - Therefore, productivity has averaged about 1.0% over the last 20 years.
  - We expect productivity in North Dakota to be greater than the national average due to its overall strong economy.
- We recommend no change in the 1.50% productivity component of the payroll growth assumption.

Assumed Rate of Payroll Growth *(continued)*

- The following table summarizes the Fund's historical payroll and active population growth:

Year Ended June 30	Covered Payroll ($ in Millions)	Active Members
1994	$262.4	9,653
1999	314.6	10,046
2004	376.5	9,826
2009	440.0	9,707
2014	557.2	10,305
• 5-year average:	4.8%	1.2%
• 10-year average:	4.0%	0.5%
• 15-year average:	3.9%	0.2%
• 20-year average:	3.8%	0.3%

- Based on the 30-year open group projection (level active population) used in connection with the July 1, 2014, actuarial valuation, projected total payroll increased by 3.23% per year, on average.

Assumed Rate of Payroll Growth *(continued)*

- The following table summarizes the components of the current and recommended payroll growth assumption:

Component	Current	Recommended
Inflation	3.00%	2.75%
Productivity	1.50%	1.50%
Adjustment for Conservatism	-1.25%	-1.00%
Total	3.25%	3.25%

- We recommend no change to the 3.25% payroll growth assumption and to maintain the conservative approach.

Assumed Rate of Individual Salary Increases

- Individual member salary increases components:
  - Inflation
  - Productivity
  - Merit and seniority increases
- Since merit and seniority increases are unique to each retirement system, it is appropriate to base this assumption on recent experience.
  - We study the merit and seniority increases (plus productivity) separately from inflation.
  - Between 2009 and 2014, inflation averaged 2.0%.

Assumed Rate of Individual Salary Increases *(continued)*

- The following table compares the actual and expected individual salary increases over the past 5 years, adjusted to remove actual annual inflation of about 2%.

Service Range	Actual Increase	Expected Increase
0 – 4	7.84%	7.25%
5 – 9	4.30%	4.57%
10 – 14	3.62%	3.76%
15 – 19	3.07%	3.25%
20 – 24	2.69%	2.89%
25 – 29	2.39%	2.50%
30+	2.06%	2.50%
Total	**4.01%**	**4.10%**

- Based on this experience, we recommend no change to the merit and seniority (and productivity) portion of individual salary increases.

Assumed Rate of Individual Salary Increases *(continued)*

- The following tables show the total current and proposed individual salary increase assumption by years of service.
- The only change is a 0.25% reduction due to lower recommended inflation.

Years of Service	Current Total Salary Increase Rate	Proposed Total Salary Increase Rate
0 – 0.99	14.75%	14.50%
1 – 1.99	8.00%	7.75%
2 – 2.99	7.75%	7.50%
3 – 3.99	7.50%	7.25%
4 – 4.99	7.25%	7.00%
5 – 5.99	7.00%	6.75%
6 – 6.99	6.75%	6.50%
7 – 7.99	6.50%	6.25%

Years of Service	Current Total Salary Increase Rate	Proposed Total Salary Increase Rate
8 – 9.99	6.25%	6.00%
10 – 11.99	6.00%	5.75%
12 – 13.99	5.75%	5.50%
14 – 15.99	5.50%	5.25%
16 – 18.99	5.25%	5.00%
19 – 22.99	5.00%	4.75%
23 – 24.99	4.75%	4.50%
25+	4.50%	4.25%

Salary Spiking Prior to Retirement

- We studied salary increases during the last 5 years of employment before retirement for members who have retired since 2009.
  - We found that there are some members whose salary dramatically increased (“spiked”) in the years leading up to retirement.
  - However, there were also members who received smaller salary increases than expected.
  - Therefore, in aggregate, the salary increases near retirement are consistent with the current assumption.
- While this salary spiking is built into the assumption and requires no additional change, if salary spiking is not desired, the Board may want to consider taking action. For example:
  - School districts must pay for actuarial cost of salary increases above x%
  - Within 5 years of retirement, increases above y% are not pensionable
- The table on the following slide shows the average salary increase by year for recent retirees as well as for all active members.

Salary Spiking Prior to Retirement *(continued)*

Average Salary Increase

Year Ending June 30,	2011 Retirements	2012 Retirements	2013 Retirements	2014 Retirements	Average Salary Increase for Actives Age 50 and Older Who Did Not Retire in 2011-2014.
2008	5.09%	5.42%			5.16%
2009	5.04%	4.90%	4.58%		5.08%
2010	4.47%	5.04%	4.96%	4.87%	5.58%
2011		4.77%	4.47%	4.78%	4.94%
2012			3.80%	4.29%	4.00%
2013				3.12%	4.23%

Assumed Rate of Investment Return

- The current investment return assumption of 8.00% consists of two components:
  - Inflation: 3.00%
  - Real rate of return: 5.00%, net of 0.65% for investment and administrative expenses
    - Real return represents the excess of what the assets earn over inflation
    - Our approach is to analyze inflation and real return separately
- Currently, the assumed real rate of return is 5.00%, net of 0.65% for expected investment and administrative expenses.
  - We recommend removing the administrative expense from the investment return assumption and adding an explicit load to the normal cost.
  - This approach is required by the Governmental Accounting Standards Board (GASB) for GASB 68 purposes.

Assumed Rate of Investment Return *(continued)*

- The following table shows that **investment expenses** over the last 5 years have been about 0.79% of the market value of assets (MVA):

Year Ended June 30	Market Value of Assets ($ in Thousands)	Investment Expense ($ in Thousands)	Investment Expense (% of MVA)
2010	$ 1,437,950	$ 14,961	1.04%
2011	1,726,179	14,019	0.81%
2012	1,654,150	12,044	0.73%
2013	1,839,584	14,206	0.77%
2014	2,090,977	13,771	0.66%
Total	$ 8,748,840	$69,001	0.79%

Assumed Rate of Investment Return *(continued)*

- While average investment expenses as a % of MVA over the last 5 years have been about 0.79%, investment expenses declined by an average of 9.5 basis points per year.
  - 11 basis point drop in the most recent fiscal year end.
- RIO notes that SIB client assets under management increased by 56% in the past two fiscal years
  - From $6.0 billion at 6/30/2012 to $9.4 billion at 6/30/2014
- This robust asset growth has allowed RIO to increase its negotiating leverage with investment managers, which has been instrumental in reducing investment fees (in bps).
  - RIO expects this trend to continue in future years.
- Considering actual recent experience and expected future trends, we recommend lowering the expected real rate of return by 0.50% to account for investment expenses.

Assumed Rate of Investment Return *(continued)*

- The following table shows that **administrative expenses** over the last 5 years have been about 0.34% of payroll:

Year Ended June 30	Covered Payroll ($ in Thousands)	Administrative Expense ($ in Thousands)	Administrative Expense (% of Payroll)
2010	$ 465,000	$ 1,903	0.41%
2011	488,800	2,004	0.41%
2012	505,300	1,597	0.32%
2013	526,700	1,624	0.31%
2014	557,200	1,586	0.28%
Total	$2,543,000	$ 8,714	0.34%

- We recommend removing the administrative expense from the investment return assumption and increasing the normal cost by the prior year's administrative expenses plus inflation, which will be converted to a percentage of payroll in the actuarially determined contribution rate.

Assumed Rate of Investment Return *(continued)*

- We have based our analysis of the expected real rate of return on the Horizon Survey of Capital Market Assumptions (2014 Edition).
  - This survey compiles and averages the capital market assumptions of 23 investment consultants (including Callan and Segal Rogerscasey).
  - We also analyzed the expected real rate of return using Segal Rogerscasey's 2015 capital market assumptions.
- We believe the Horizon survey is the better alternative because it aggregates the capital market assumptions of most major investment consultants.
- The calculation of the expected real rate of return based on the Horizon survey and Segal Rogerscasey's assumptions are shown on the following slides.
- Note that expected arithmetic returns are used to determine the expected returns by asset class. The portfolio's expected geometric return (which is the appropriate basis for this assumption) is estimated by reducing the arithmetic return by half of the portfolio's expected variance.

Assumed Rate of Investment Return – Segal Rogerscasey

Asset Class	20-Year Horizon Annual Arithmetic Real Return	Target Allocation	Weighted Real Return
US Equities Large Cap	6.70%	24%	1.61%
US Equities Small/Mid Cap	6.70%	7%	0.47%
Intl Equities Developed	7.40%	17%	1.26%
Emerging Markets Equities	9.70%	4%	0.39%
US Bonds Core	1.60%	12%	0.19%
US Bonds High Yield	4.45%	5%	0.22%
Intl Debt Developed	1.60%	5%	0.08%
Cash Equivalents	1.00%	1%	0.01%
Real Estate	4.50%	15%	0.68%
Infrastructure	4.50%	5%	0.23%
Private Equities	11.80%	5%	0.59%
Total		**100%**	**5.73%**
Adjustment to Geometric			(0.62%)
Geometric Real Rate of Return			**5.11%**

Assumed Rate of Investment Return – Horizon Survey

Asset Class	20-Year Horizon Annual Arithmetic Real Return	Target Allocation	Weighted Real Return
US Equities Large Cap	7.05%	24%	1.69%
US Equities Small/Mid Cap	8.10%	7%	0.57%
Intl Equities Developed	7.71%	17%	1.31%
Emerging Markets Equities	10.24%	4%	0.41%
US Bonds Core	2.48%	12%	0.30%
US Bonds High Yield	4.71%	5%	0.24%
Intl Debt Developed	2.05%	5%	0.10%
Cash Equivalents	1.11%	1%	0.01%
Real Estate	4.95%	15%	0.74%
Infrastructure	6.16%	5%	0.31%
Private Equities	10.97%	5%	0.55%
Total		**100%**	**6.23%**
Adjustment to Geometric			(0.62%)
Geometric Real Rate of Return			**5.61%**

Assumed Rate of Investment Return

- Using the Fund's target asset allocation and the capital market assumptions from the Horizon survey, the expected real rate of return is 5.61%.
  - The expected real rate of return is reduced by 0.50% to account for investment expenses.
  - As described earlier, instead of reducing the real rate of return to account for administrative expenses, we recommend adding an explicit administrative expense load to the normal cost.
- The expected real rate of return is 5.11%, net of expected investment expenses of 0.50%.

Gross Real Rate of Return	5.61%
Less Investment Expenses	(0.50%)
Net Real Rate of Return	5.11%

Assumed Rate of Investment Return *(continued)*

- Over a 20-year period, the Fund is expected to earn an annual real rate of return of at least 5.11% half of the time.
- Lowering the expected real rate of return to 5.00% will increase the likelihood of meeting the expectation over a 20-year period to 52%.
- The following table shows the components of the current and recommended investment return assumption.

Component	Current	Recommended	50/50	8.00%	7.50%
Inflation	3.00%	2.75%	2.75%	2.75%	2.75%
Real Rate of Return	5.65%	5.61%	5.61%	5.61%	5.61%
Investment Expense	(0.65%)	(0.50%)	(0.50%)	(0.50%)	(0.50%)
Risk Adjustment	(0.00%)	(0.11%)	(0.00%)	0.14%	(0.36%)
Total	8.00%	7.75%	7.86%	8.00%	7.50%
Confidence Level	N/A	52%	50%	48%	55%

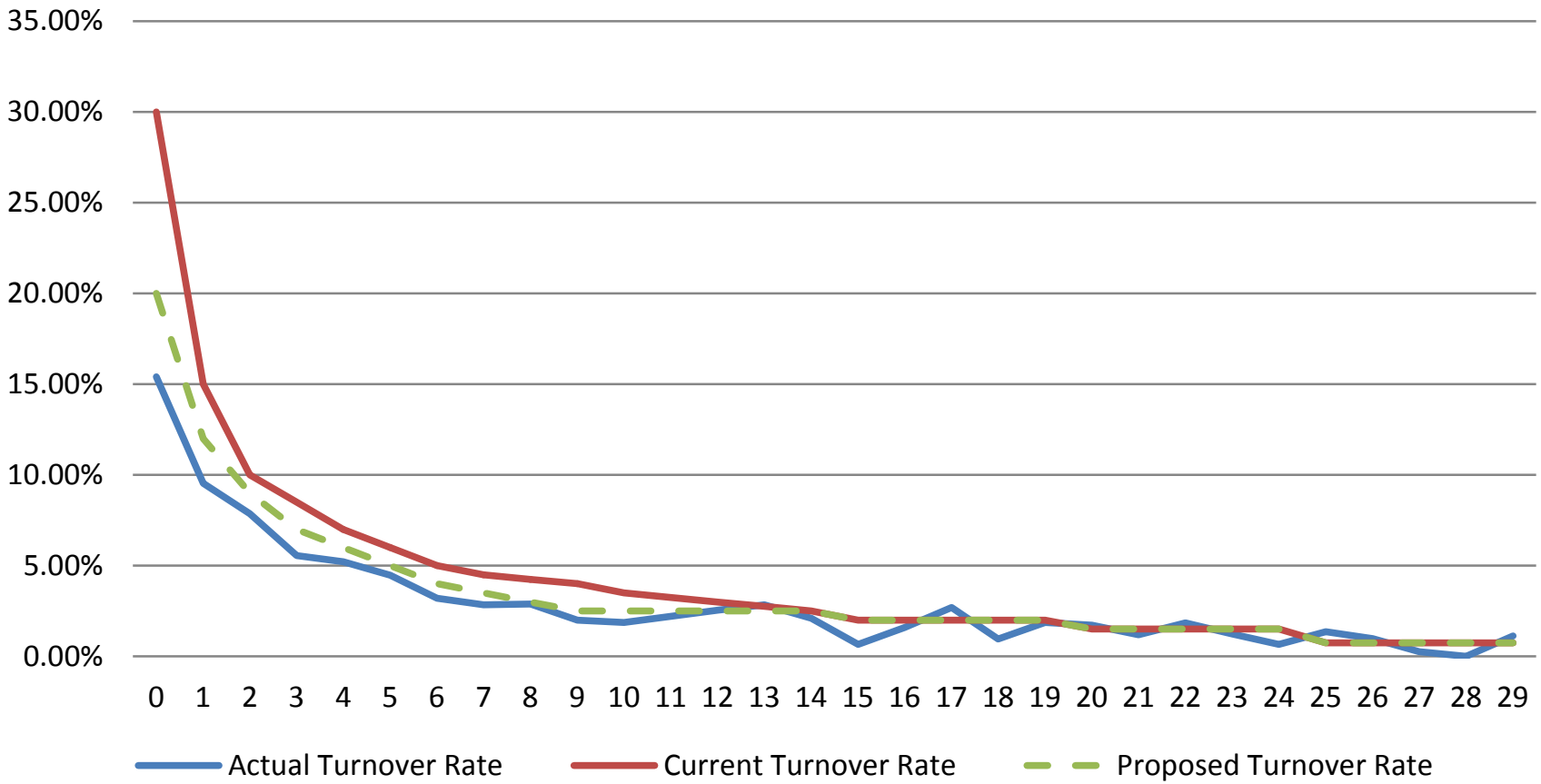
Demographic Assumptions

- Termination
- Disability
- Retirement
- Death after retirement
- Death in active service
- Spouse information

Termination

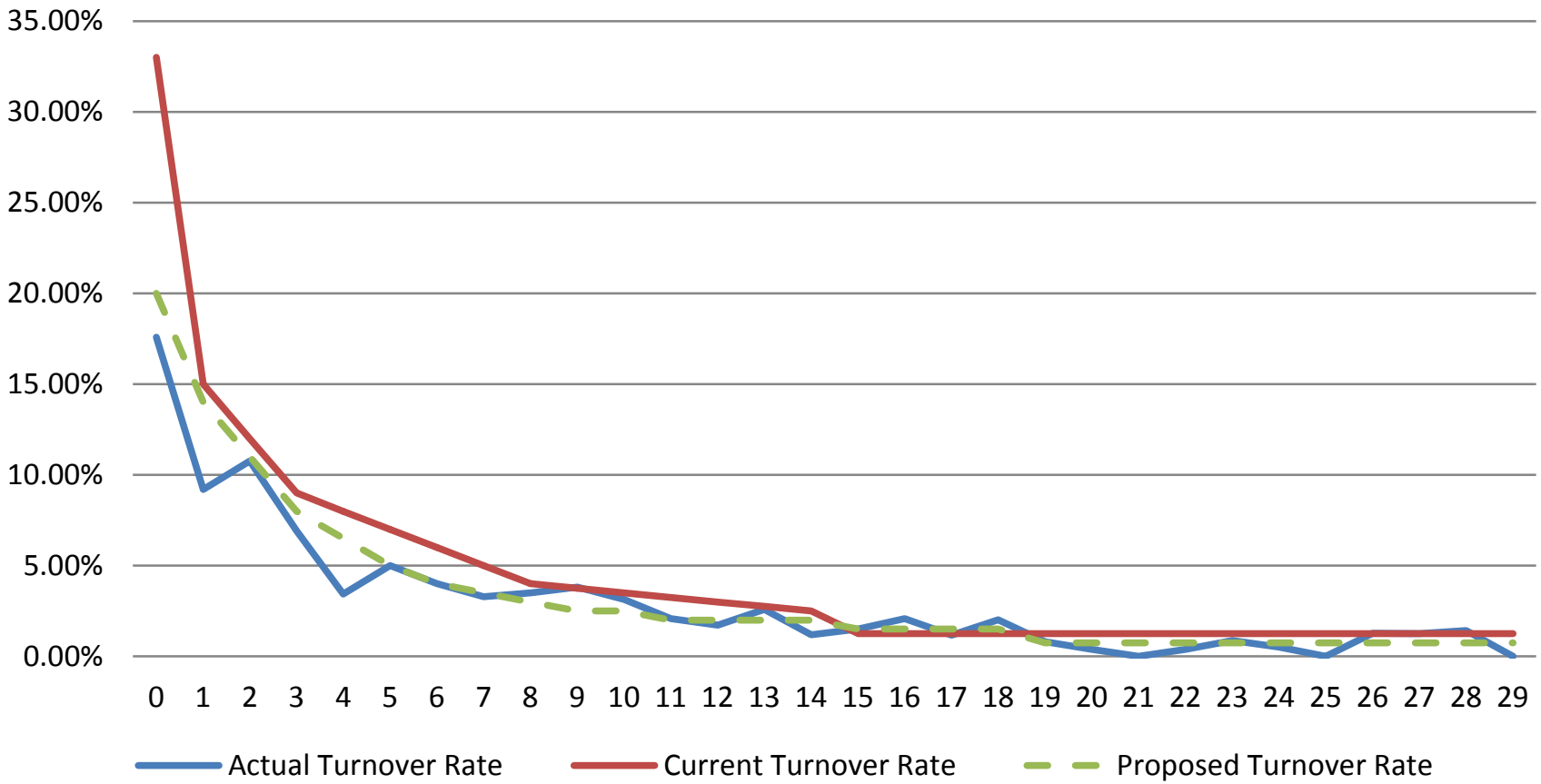
- Current rates are gender distinct and based on years of service.
- Experience shows that fewer members than expected are leaving the Fund with less than 15 years of service.
- The experience is closer to expected for longer service members.
- We recommend lowering turnover rates for shorter service members.
- The graphs on the following pages show the actual, expected, and proposed termination rates based on years of service.

Termination – Females



Exposures	Actual Terminations	Expected Terminations	Actual to Expected	Proposed Terminations	Actual to Proposed
28,414	1,175	1,742	67%	1,409	83%

Termination – Males



Exposures	Actual Terminations	Expected Terminations	Actual to Expected	Proposed Terminations	Actual to Proposed
10,152	408	588	69%	474	86%

Disability Retirement

- Rates vary based on member's age.
- From 2009 to 2014:
  - 41 members were expected to start receiving a disability pension; and
  - 46 members actually started receiving a disability pension.
- The experience is reasonably close to expected.
- From 2004 to 2009, there were 40 new disability pensions awarded.
- We recommend no change to the disability rates.

Retirement Eligibilities

- Tiers
  - Tier 1: Hired before July 1, 2008
    - Grandfathered: As of June 30, 2013, either at least age 55 and at least 3 years of service or age plus service is at least 65.
    - Non-grandfathered: As of June 30, 2013, does not meet the requirements to be grandfathered.
  - Tier 2: Hired after June 30, 2008
- Eligibility for reduced benefits
  - For all Tier 1 members, age 55 and 3 years of service
  - For Tier 2 members, age 55 and 5 years of service

Retirement Eligibilities *(continued)*

- Eligibility for unreduced benefits
  - For Tier 1 members, the earlier of:
    - Age 65 and 3 years of service.
    - If grandfathered, age plus service is at least 85.
    - If non-grandfathered, age plus service is at least 90 with a minimum age of 60.
  - For Tier 2 members, the earlier of:
    - Age 65 and 5 years of service.
    - Age plus service is at least 90 with a minimum age of 60.

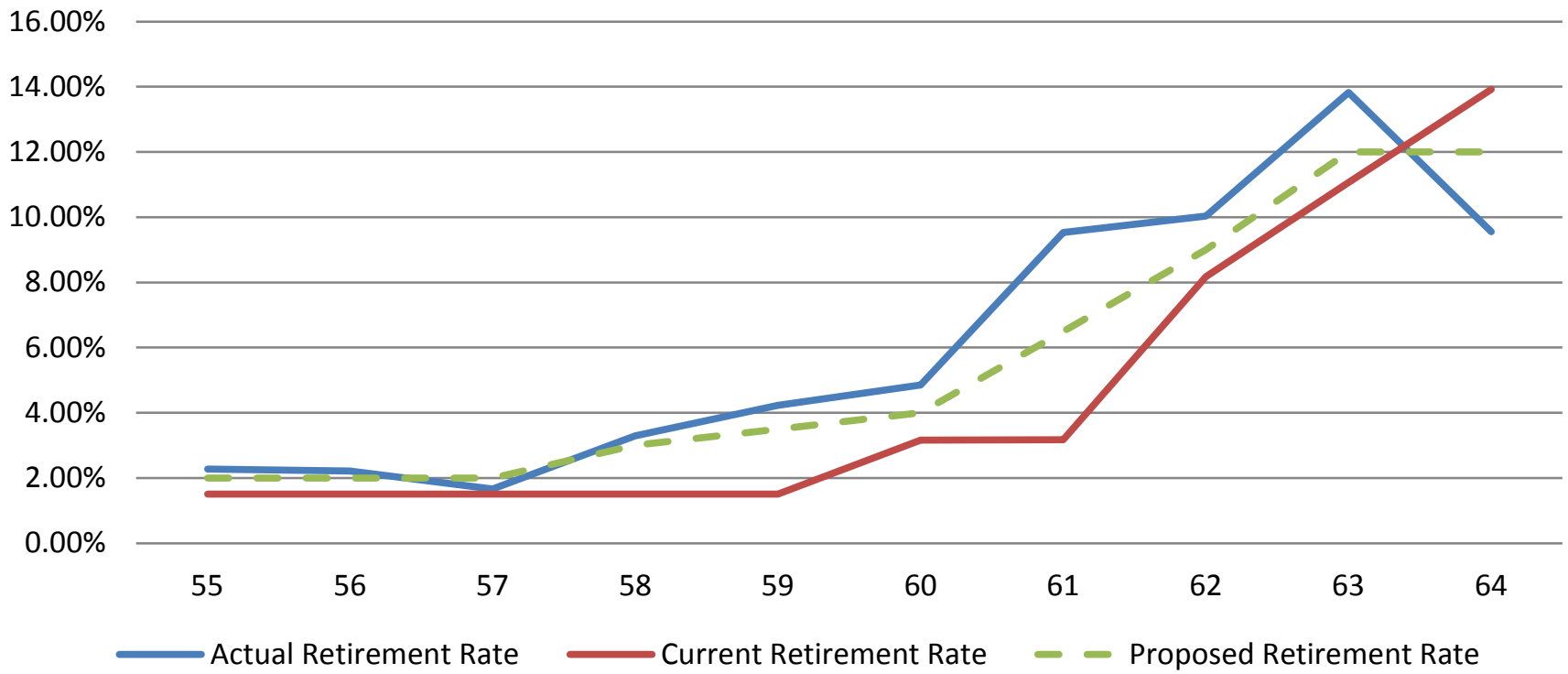
Active Member Retirements

- Current rates:
  - Vary based on member's age and gender.
  - Vary depending on whether the member is eligible for a reduced or unreduced benefit.
  - In the first year that the member becomes eligible for an unreduced benefit, the unreduced retirement rate is increased by 10%.
- We have analyzed Tier 1 retirement experience for the following groups:
  - Eligible for a reduced benefit.
  - Eligible for an unreduced benefit in the 1st year only.
  - Eligible for an unreduced benefit in all other years.
- There is no Tier 2 retirement experience and little grandfathered versus non-grandfathered experience to analyze at this point.
- However, the retirement rates take into account each individual's eligibility requirements.

Active Member Retirements – Summary of Experience

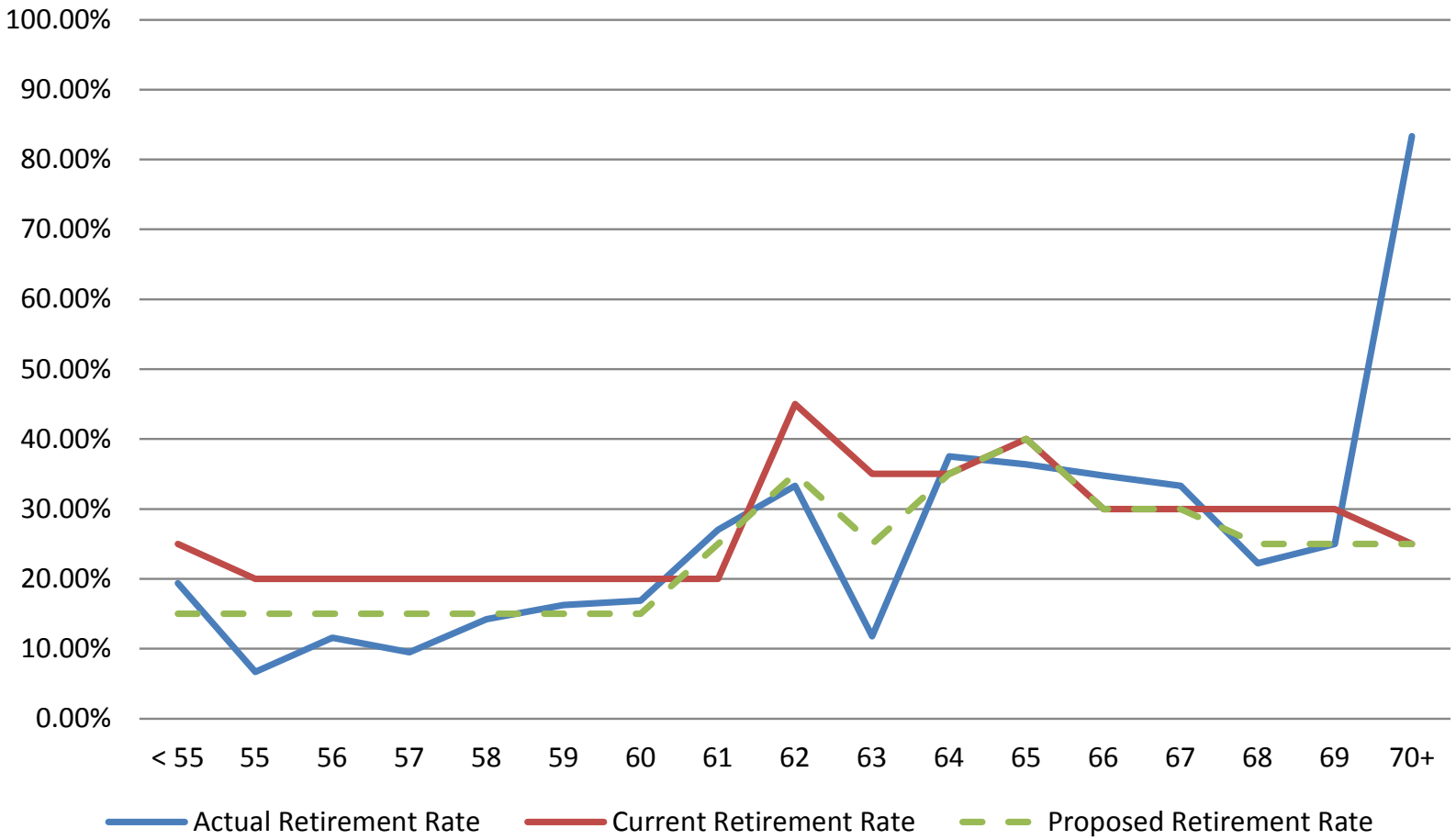
- Reduced retirements:
  - There were more retirements than expected, so we recommend higher rates at most ages.
  - There were insufficient actual retirements to justify gender distinct rates, so we recommend unisex rates of retirement.
- First year of eligibility for unreduced benefits:
  - In the first year of being eligible for unreduced benefits, members retired at an average rate of 30% per year.
  - After the first year of being eligible for unreduced benefits, members retired at an average rate of 20% per year.
  - Therefore, we recommend continuing to use the 10% increase in retirement rates for the first year of eligibility for unreduced benefits.
- After the first year of eligibility for unreduced benefits:
  - There were fewer retirements than expected, so we recommend lowering rates, primarily at younger ages.
  - However, we recommend increased rates for females ages 64 to 66.

Active Member Retirements – Reduced Benefits



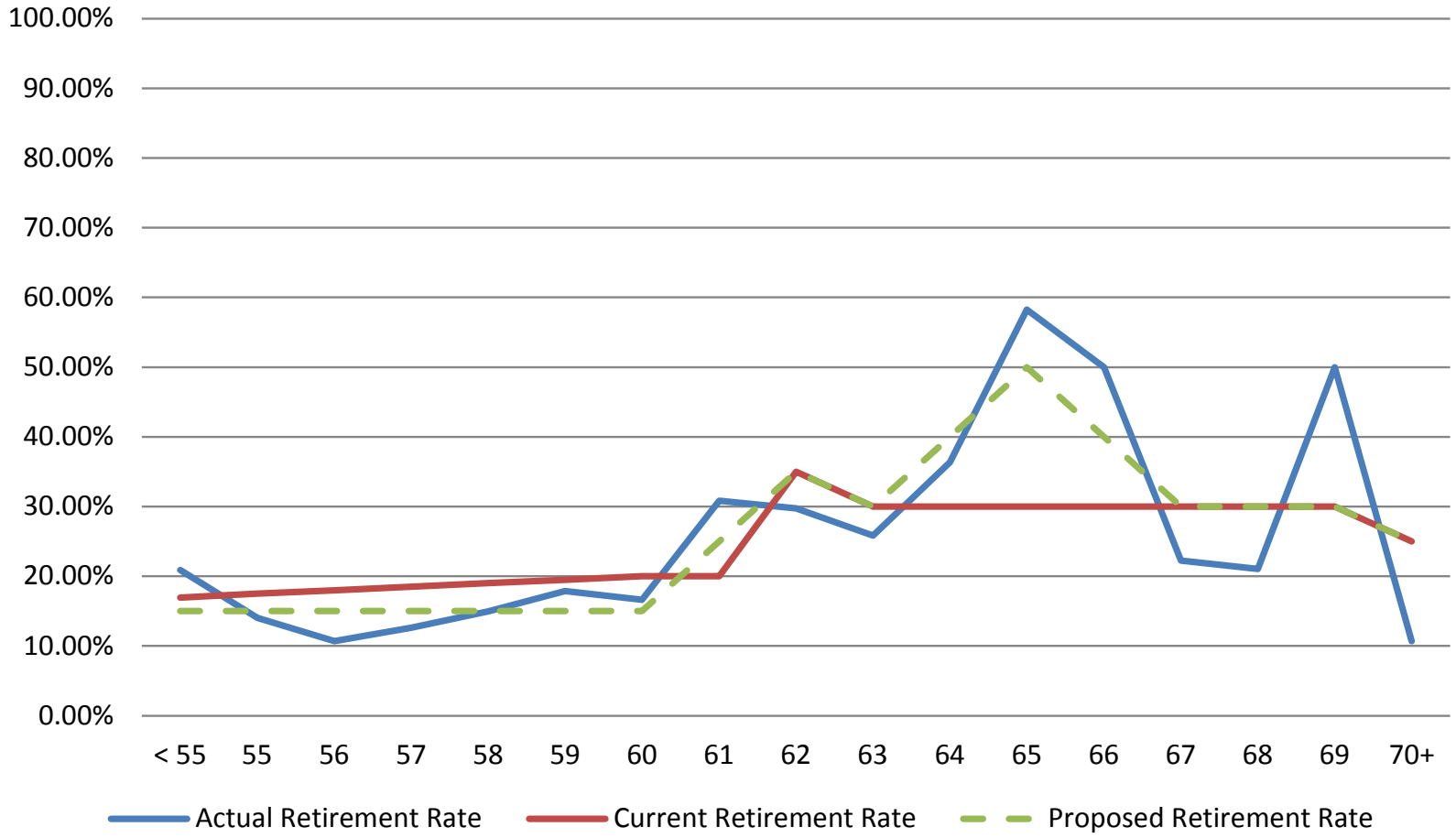
Exposures	Actual Retirements	Expected Retirements	Actual to Expected	Proposed Retirements	Actual to Proposed
5,972	268	174	154%	236	114%

Active Member Retirements – Unreduced Benefits (Male)



Exposures	Actual Retirements	Expected Retirements	Actual to Expected	Proposed Retirements	Actual to Proposed
1,347	259	334	78%	277	94%

Active Member Retirements – Unreduced Benefits (Female)



Exposures	Actual Retirements	Expected Retirements	Actual to Expected	Proposed Retirements	Actual to Proposed
3,415	702	742	95%	705	100%

Inactive Vested Retirements

- The current assumption is that all inactive vested members will retire at normal retirement age.
- From 2009 to 2014, of the 2,321 inactive vested members eligible to commence benefits early with reduced benefits, 104 elected to retire.
- Therefore, we recommend adding retirement rates of 5% at each early retirement age prior to normal retirement age and continuing to assume that 100% of remaining inactive vested members retire at normal retirement age.
- There is a small subsidy in the early retirement benefit, so this approach is more conservative.

Exposures	Actual Retirements	Expected Retirements	Actual to Expected	Proposed Retirements	Actual to Proposed
2,321	104	0	N/A	116	90%

Death After Retirement (Non-Disabled)

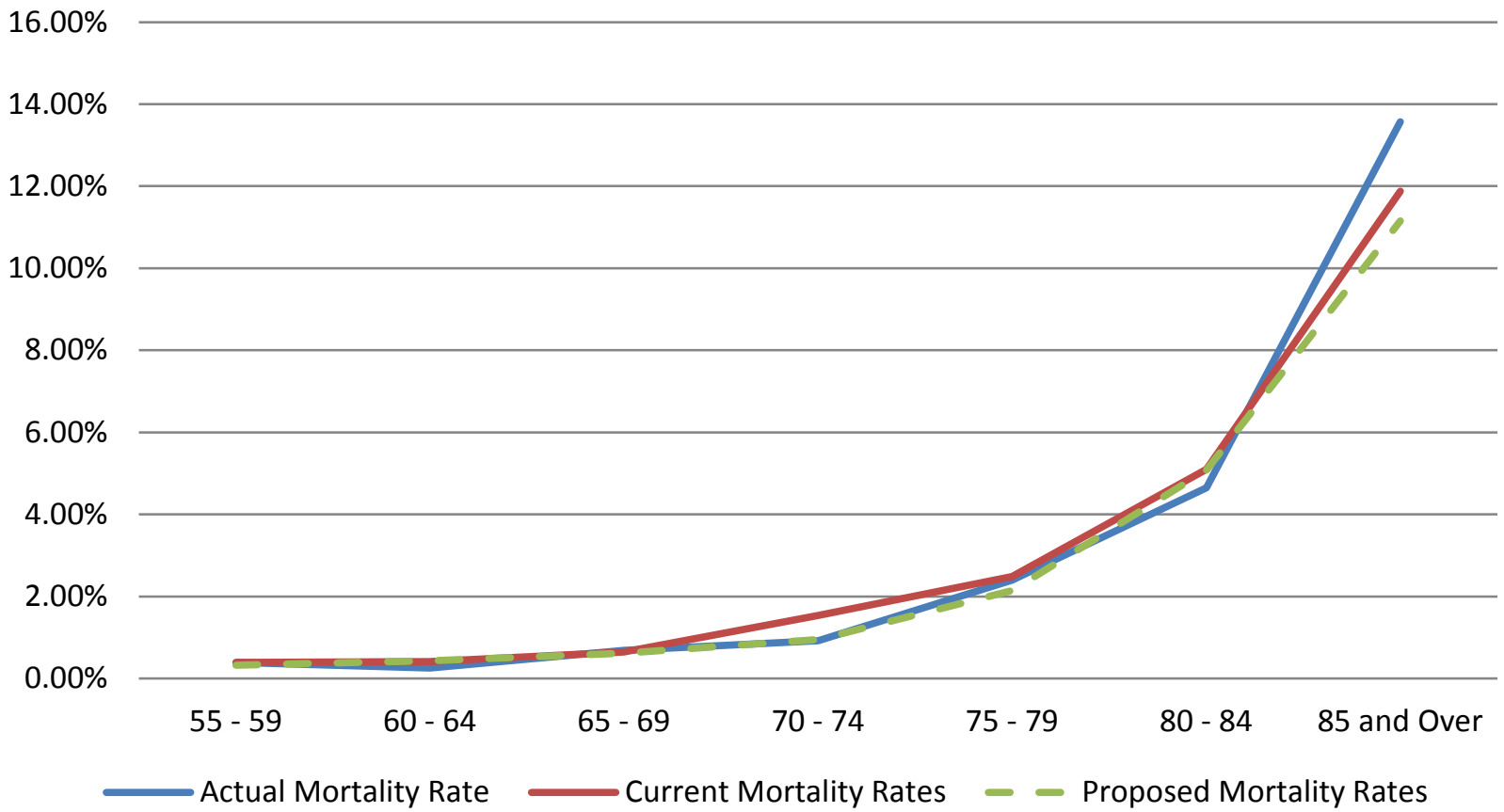
- Rates vary based on gender and age of the annuitant.
- Our analysis uses a benefit-weighted approach, which weights the probability of death with each annuitant's pension benefit. This methodology takes into consideration any correlation between the health of the annuitant and the size of the benefit.
- Experience for non-disabled annuitants has been consistent with the current assumption.
- However, the current assumption no longer has a sufficient margin for future mortality improvement.
- Therefore, we recommend revising the non-disabled mortality assumption to use a variation of the new mortality tables ("RP-2014") recently released by the Society of Actuaries.
- We have adjusted the RP-2014 annuitant table to match the Fund's experience.
- To account for future mortality improvement, we recommend applying the new generational mortality improvement scale ("MP-2014") that is intended to be used with the new RP-2014 tables.

Life Expectancy Based on Recommended Table

- The following table shows the future life expectancy (and expected age at death) at various ages using the recommended mortality table.

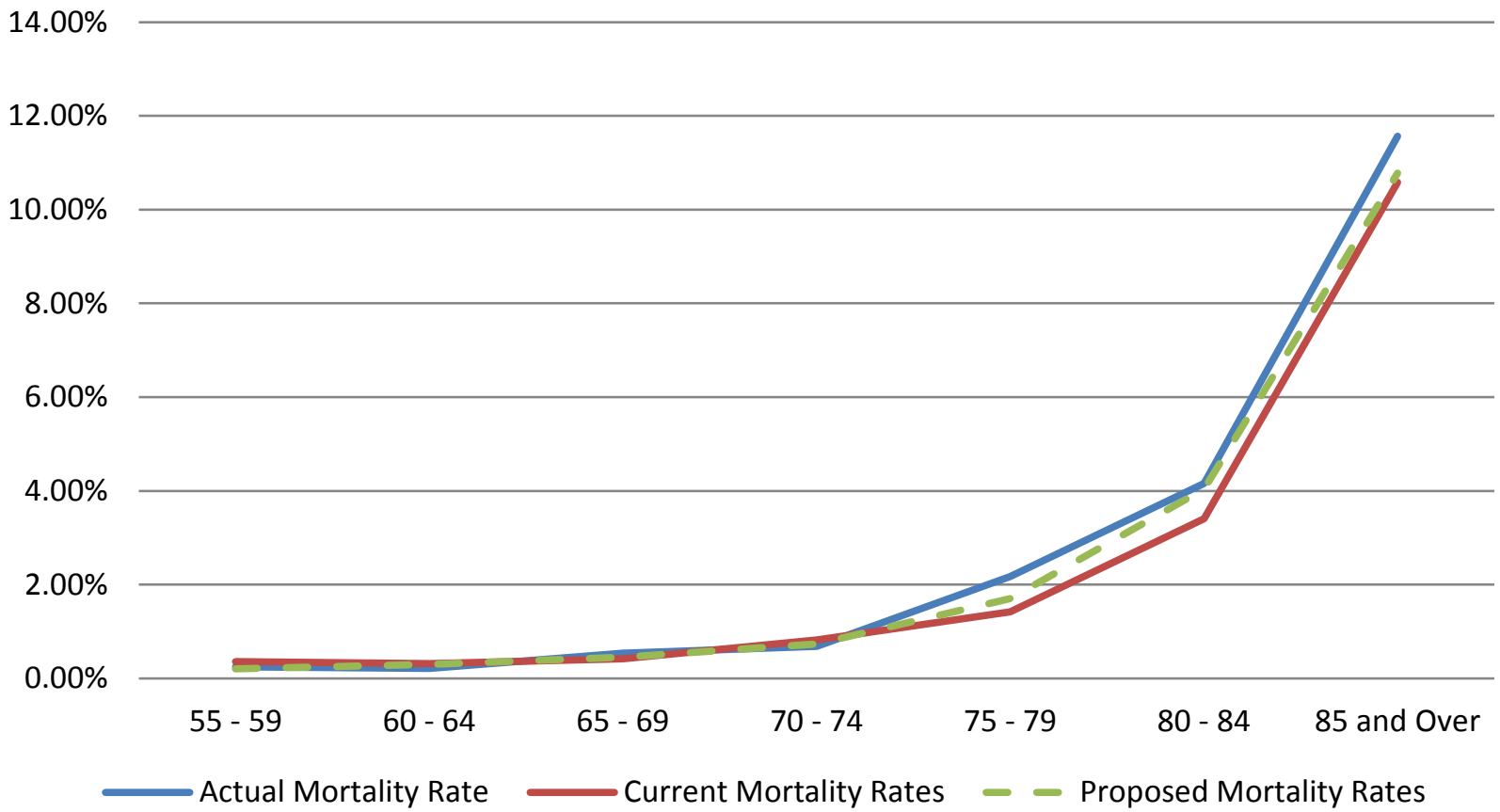
Age	Male	Female
55	34.1 (89.1)	36.3 (91.3)
60	29.1 (89.1)	31.2 (91.2)
65	24.3 (89.3)	26.2 (91.2)
70	19.6 (89.6)	21.4 (91.4)
75	15.0 (90.0)	16.7 (91.7)

Death After Retirement (Non-Disabled) – Male



Exposures	Actual Deaths	Expected Deaths	Actual to Expected	Proposed Deaths	Actual to Proposed
269,702	4,049	4,330	94%	3,841	105%

Death After Retirement (Non-Disabled) – Female

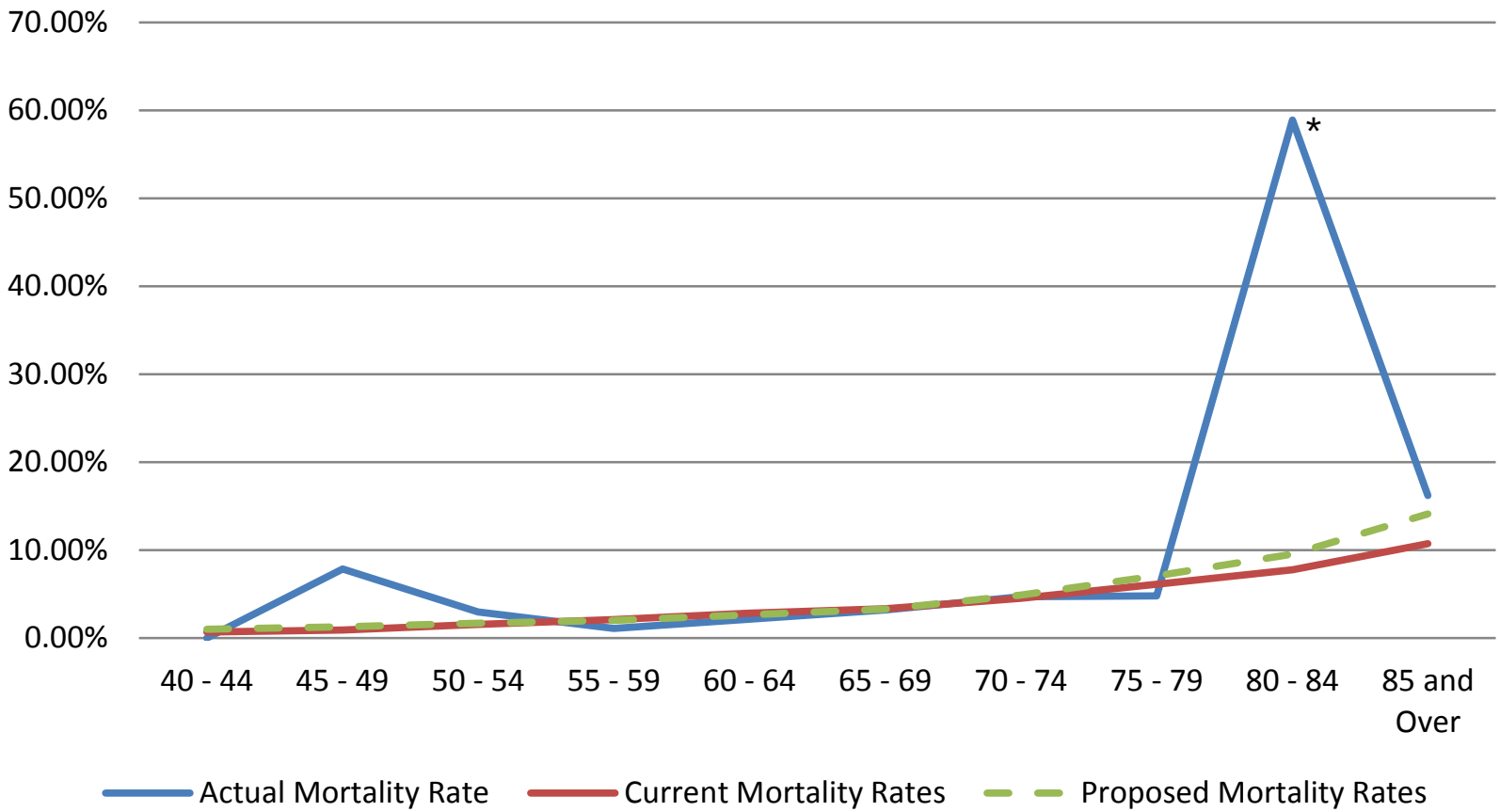


Exposures	Actual Deaths	Expected Deaths	Actual to Expected	Proposed Deaths	Actual to Proposed
388,250	6,385	5,809	110%	5,992	107%

Death After Retirement (Disabled)

- Rates vary based on gender and age of the annuitant.
- Experience for disabled annuitants has been consistent with the current assumption. The ratio of actual to expected deaths is 122%, so there is still sufficient margin for future mortality improvements.
- However, we recommend updating the assumption to use a variation of the most recent RP-2014 Disabled Mortality Table.
- We have adjusted the RP-2014 disabled mortality table to match the Fund's experience and built in sufficient margin for future mortality improvements.

Death After Retirement (Disabled) – Male & Female



Exposures	Actual Deaths	Expected Deaths	Actual to Expected	Proposed Deaths	Actual to Proposed
7,602	248	204	122%	209	119%

* 59% is an outlier due to the small sample size. There were 3 deaths and 6 exposures, not weighted for benefit size.

Death In Active Service

- Mortality rates applied to active members
  - Very few members die in active service.
    - Liability associated with active death is a small percentage of the total liability.
    - Plan experience is insufficient to set assumption.
- The current assumptions include separate mortality tables for active and retired members.
  - Since we are using the new RP-2014 annuitant table for retired lives, we recommend using the RP-2014 employee table for active members.
  - This table includes adjustment at earlier ages to reflect the fact that many younger members are actively employed.

Spouse Information

- Current assumptions:
  - 75% of members are married.
  - Male spouses are three years older than female spouses.
  - 100% of spouses are opposite gender.
- We have limited data on spouse information.
- However, these assumptions are reasonable and consistent with similar plans.
- In addition, all optional forms of payment are actuarially equivalent, so these assumptions are not materially relevant.
- Therefore, we recommend no change to these assumptions.

Summary of Economic Assumptions

Assumption	Current	Proposed
Inflation	3.00%	2.75%
Productivity	1.50%	1.50%
Payroll Growth	3.25%	3.25%
Salary Scale	Merit rates based on years of service plus inflation and productivity.	No change to merit rates. Total rates decreased by 0.25% due to lower recommended inflation.
Investment Return	8.00%	7.75%
Administrative Expense	Implicitly included in the investment return assumption.	Explicit load to normal cost equal to prior year administrative expenses plus inflation.

Summary of Demographic Assumptions

Assumption	Current	Proposed
Turnover	Gender distinct rates based on years of service.	Lower rates for members with less than 15 years of service and for males with 20 or more years of service.
Disability	Age based rates	No change
Active Retirement	Gender distinct rates based on age that range from 1.5% to 100% at age 75. Higher rates are assumed when a member is eligible to retire with unreduced benefits. In the first year that members become eligible for unreduced benefits, the unreduced retirement rate is increased 10%.	Unisex, increased rates for members retiring early with reduced benefits. Lower rates at younger ages for members retiring with unreduced benefits. Increased rates for females around age 65. No change to the 10% rate increase in the first year that members become eligible for unreduced benefits.
Inactive Retirements	100% at normal retirement age	5% at early retirement ages and 100% at normal retirement age

Summary of Demographic Assumptions *(continued)*

Assumption	Current	Proposed
Healthy Mortality	GRS specific mortality tables.	RP-2014 Healthy Annuitant Table set back one year, multiplied by 50% for ages under 75 and grading up to 100% by age 80. The MP-2014 improvement scale is applied.
Disabled Mortality	RP-2000 Disabled Mortality Table for males and females multiplied by 80% and 95%, respectively.	RP-2014 Disabled Mortality Table set forward four years.
Active Mortality	Healthy Post-Retirement Mortality multiplied by 60% for males and 40% for females.	RP-2014 Employee Mortality Table with generational mortality improvement using scale MP-2014.
Spouse Information	75% married, male spouses are three years older than female spouses, and 100% of spouses are opposite gender.	No changes.

Cost Impact (Based on the July 1, 2014, Actuarial Valuation)

Description	Current Assumptions	Proposed Mortality Assumptions	Proposed Mortality and Turnover Assumptions	Proposed Mortality, Turnover, and Retirement Assumptions
Actuarial Accrued Liability	$3,138.8M	$3,235.3M	$3,232.4M	$3,222.6M
Actuarial Value of Assets	$1,940.5M	$1,940.5M	$1,940.5M	$1,940.5M
Unfunded Actuarial Accrued Liability	$1,198.3M	$1,294.8M +96.5M	$1,291.9M -2.9M	$1,282.1M -9.8M
Funded Percentage	61.8%	60.0%	60.0%	60.2%
Normal Cost	$63.0M	$65.0M +2.0M	$65.6M +0.6M	$65.2M -0.4M
Actuarially Determined Contribution Rate	11.57%	12.93% +1.36%	13.01% +0.08%	12.83% -0.18%
Margin / (Deficit)	1.18%	(0.18%)	(0.26%)	(0.08%)
Effective Amortization Period	24 years	30 years	30 years	29 years

Cost Impact (Based on the July 1, 2014, Actuarial Valuation)

Description	Proposed Demographic and Current Economic Assumptions	Proposed Demographic Assumptions and 7.75% Interest Rate	Proposed Demographic Assumptions, 7.75% Interest Rate, Salary Scale, and Inflation
Actuarial Accrued Liability	$3,222.6M	$3,313.3M	$3,294.5M
Actuarial Value of Assets	$1,940.5M	$1,940.5M	$1,940.5M
Unfunded Actuarial Accrued Liability	$1,282.1M	$1,372.8M +90.7M	$1,354.0M -18.8M
Funded Percentage	60.2%	58.6%	58.9%
Normal Cost	$65.2M	$70.6M +5.4M	$68.0M -2.6M
Actuarially Determined Contribution Rate	12.83%	14.33% +1.50%	13.75% -0.58%
Margin / (Deficit)	(0.08%)	(1.58%)	(1.00%)
Effective Amortization Period	29 years	38 years	34 years

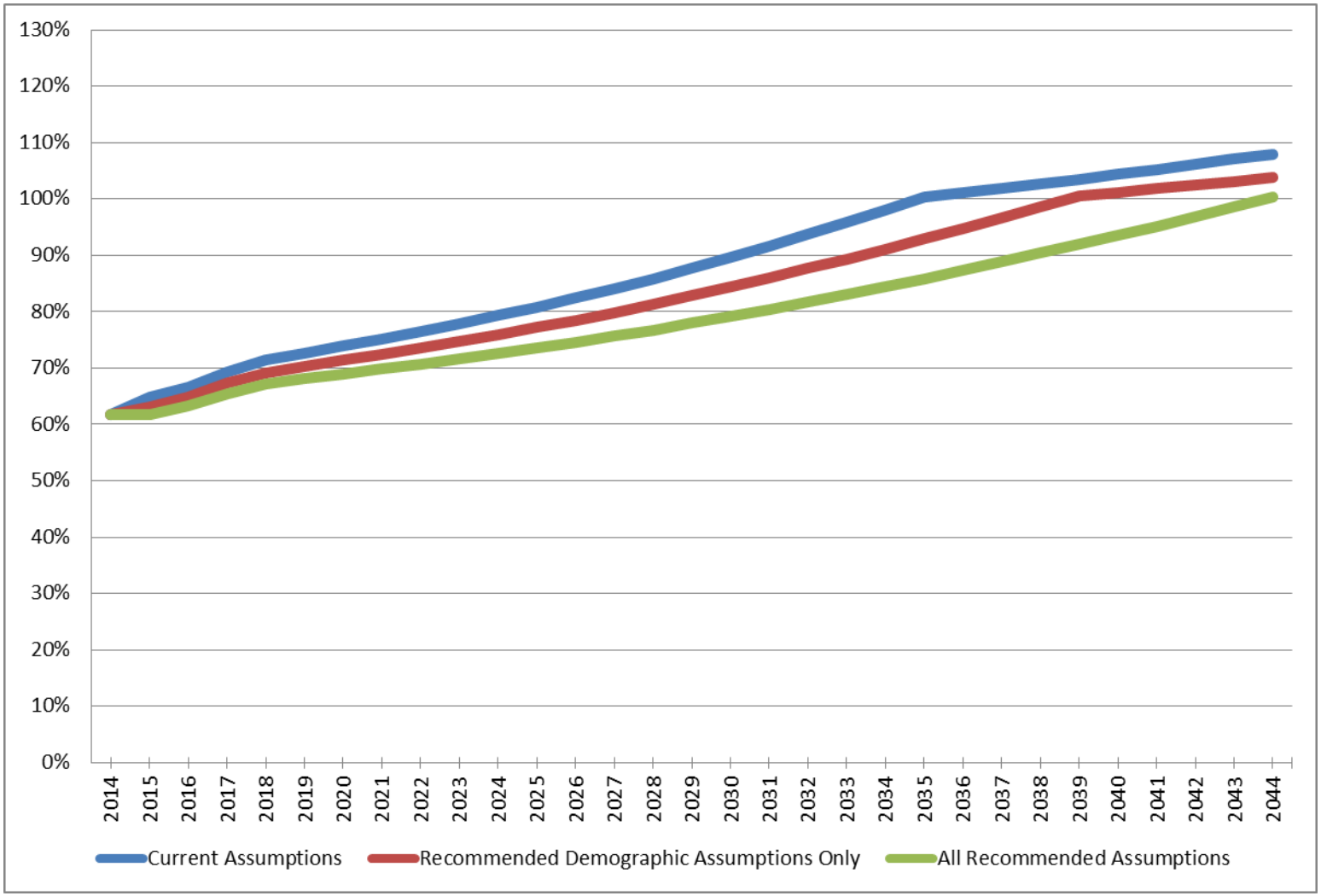
Cost Impact (Based on the July 1, 2014, Actuarial Valuation)

Description	Current Assumptions	Proposed Assumptions	Change
Actuarial Accrued Liability	$3,138.8M	$3,294.5M	$155.7M
Actuarial Value of Assets	$1,940.5M	$1,940.5M	$0.0M
Unfunded Actuarial Accrued Liability	$1,198.3M	$1,354.0M	$155.7M
Funded Percentage	61.8%	58.9%	(2.9%)
Normal Cost	$63.0M	$68.0M	$5.0M
Actuarially Determined Contribution Rate	11.57%	13.75%	2.18%
Margin / (Deficit)	1.18%	(1.00%)	(2.18%)
Effective Amortization Period	24 years	34 years	10 years

Cost Impact – Projections

- Projections of estimated funded ratios and margin for 30 years
  - Baseline based on July 1, 2014, actuarial valuation using current assumptions
- Includes contribution rates from HB 1134
  - Member rate is 11.75% for FY15 and thereafter
  - Employer rate is 12.75% for FY15 and thereafter
  - Increases “sunset” back to 7.75% once the funded ratio reaches 100% (based on actuarial assets)

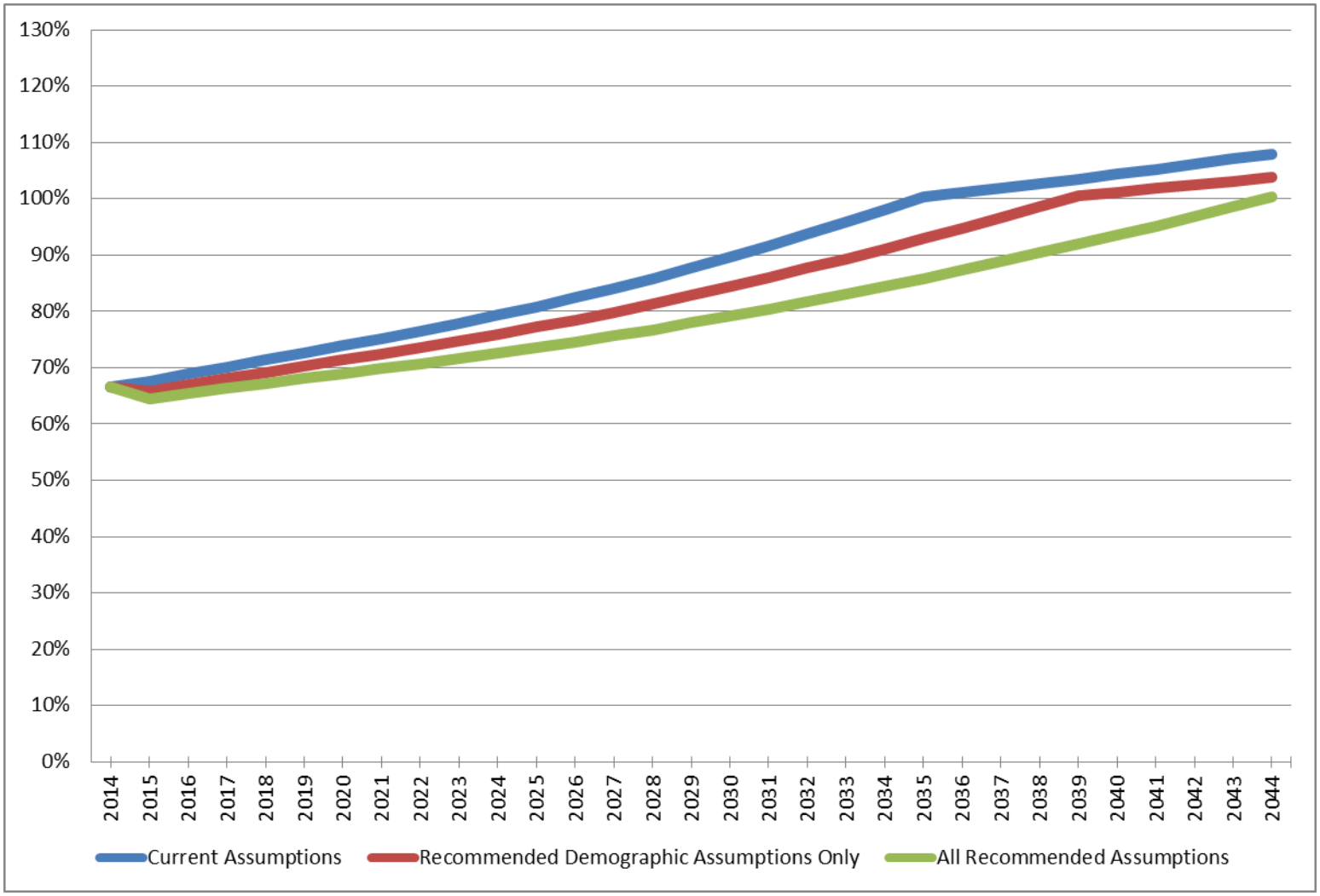
Projected Funded Ratios (AVA Basis)



Projected Funded Ratios (AVA Basis)

Valuation Year	Current Assumptions	Recommended Demographic Assumptions Only	All Recommended Assumptions
2014	62%	62%	62%
2015	65%	63%	62%
2016	67%	65%	63%
2017	69%	67%	66%
2018	71%	69%	67%
2019	73%	70%	68%
2024	79%	76%	73%
2029	88%	83%	78%
2034	98%	91%	84%
2039	104%	101%	92%
2044	108%	104%	100%

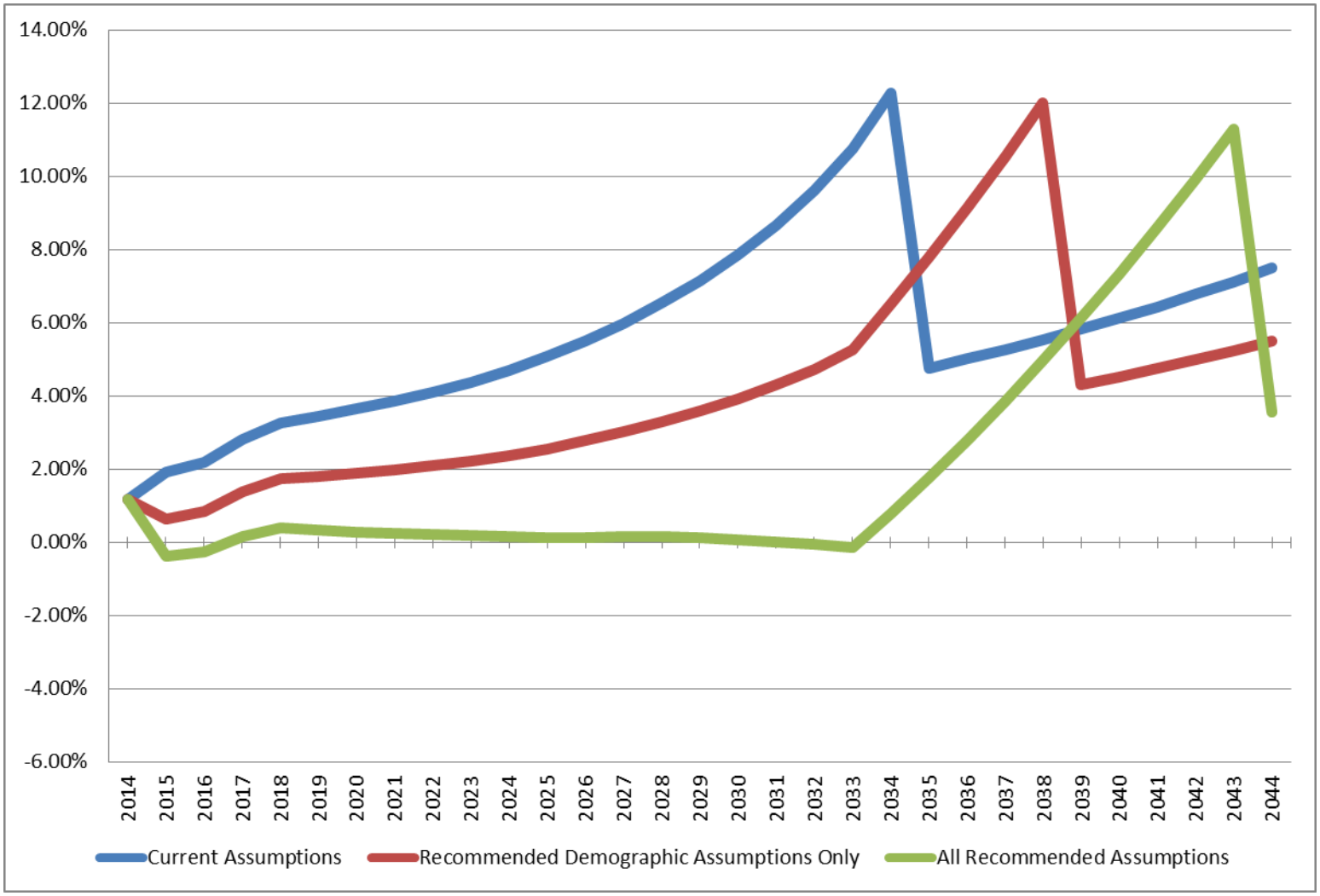
Projected Funded Ratios (MVA Basis)



Projected Funded Ratios (MVA Basis)

Valuation Year	Current Assumptions	Recommended Demographic Assumptions Only	All Recommended Assumptions
2014	67%	67%	67%
2015	68%	66%	64%
2016	69%	67%	65%
2017	70%	68%	66%
2018	71%	69%	67%
2019	73%	70%	68%
2024	79%	76%	73%
2029	88%	83%	78%
2034	98%	91%	84%
2039	104%	101%	92%
2044	108%	104%	100%

Projected Margin (AVA Basis)



Projected Margin (AVA Basis)

Valuation Year	Current Assumptions	Recommended Demographic Assumptions Only	All Recommended Assumptions
2014	1.18%	1.18%	1.18%
2015	1.91%	0.63%	-0.37%
2016	2.20%	0.84%	-0.26%
2017	2.81%	1.37%	0.16%
2018	3.27%	1.73%	0.40%
2019	3.45%	1.79%	0.34%
2024	4.69%	2.36%	0.14%
2029	7.15%	3.59%	0.12%
2034	12.28%	6.50%	0.79%
2039	5.82%	4.30%	6.12%
2044	7.49%	5.50%	3.57%

Questions?

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Actuarial Certification

We are pleased to submit this presentation on the actuarial experience of the North Dakota Teachers' Fund for Retirement for the period July 1, 2009, through June 30, 2014. This investigation is the basis for our recommendation of the assumptions and methods to be used for the July 1, 2015, actuarial valuation.

All current actuarial assumptions and methods were reviewed as part of this study. Some of our recommendations reflect changes to the assumptions and methods used in the July 1, 2014, actuarial valuation while other current assumptions and methods remain appropriate.

Our analysis was conducted in accordance with generally accepted actuarial principles as prescribed by the Actuarial Standards Board (ASB) and the American Academy of Actuaries. Additionally, the development of all assumptions contained herein is in accordance with ASB Actuarial Standard of Practice (ASOP) No. 27 (*Selection of Economic Assumptions for Measuring Pension Obligations*) and ASOP No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*).

The undersigned actuaries are experienced with performing experience studies for large public-sector pension plans and are qualified to render the opinions contained in this report.

Sincerely,

Kim Nicholl, FSA, MAAA, EA, FCA
Senior Vice President and Actuary

Matthew A. Strom, FSA, MAAA, EA
Vice President and Actuary

Appendix

- Full schedule of proposed assumption tables
  - Salary Increase
  - Turnover
  - Unreduced retirement
  - Reduced retirement
  - Healthy post-retirement mortality
  - Disabled post-retirement mortality
  - Active/pre-retirement mortality

APPENDIX
Proposed Salary Increase (Service-Based Rates)

Years of Service	Current Total Salary Increase Rate	Proposed Total Salary Increase Rate
0	14.75%	14.50%
1	8.00%	7.75%
2	7.75%	7.50%
3	7.50%	7.25%
4	7.25%	7.00%
5	7.00%	6.75%
6	6.75%	6.50%
7	6.50%	6.25%

Years of Service	Current Total Salary Increase Rate	Proposed Total Salary Increase Rate
8 – 9	6.25%	6.00%
10 – 11	6.00%	5.75%
12 – 13	5.75%	5.50%
14 – 15	5.50%	5.25%
16 – 18	5.25%	5.00%
19 – 22	5.00%	4.75%
23 – 24	4.75%	4.50%
25+	4.50%	4.25%

APPENDIX
Proposed Turnover Rates (Males)

Years of Service	Current Turnover Rate	Proposed Turnover Rate	Years of Service	Current Turnover Rate	Proposed Turnover Rate
0	33.00%	20.00%	15	1.25%	1.50%
1	15.00%	14.00%	16	1.25%	1.50%
2	12.00%	11.00%	17	1.25%	1.50%
3	9.00%	8.00%	18	1.25%	1.50%
4	8.00%	6.50%	19	1.25%	0.75%
5	7.00%	5.00%	20	1.25%	0.75%
6	6.00%	4.00%	21	1.25%	0.75%
7	5.00%	3.50%	22	1.25%	0.75%
8	4.00%	3.00%	23	1.25%	0.75%
9	3.75%	2.50%	24	1.25%	0.75%
10	3.50%	2.50%	25	1.25%	0.75%
11	3.25%	2.00%	26	1.25%	0.75%
12	3.00%	2.00%	27	1.25%	0.75%
13	2.75%	2.00%	28	1.25%	0.75%
14	2.50%	2.00%	29+	0.00%	0.75%

Termination rates end at first retirement eligibility.

APPENDIX
Proposed Turnover Rates (Females)

Years of Service	Current Turnover Rate	Proposed Turnover Rate	Years of Service	Current Turnover Rate	Proposed Turnover Rate
0	30.00%	20.00%	15	2.00%	2.00%
1	15.00%	12.00%	16	2.00%	2.00%
2	10.00%	9.00%	17	2.00%	2.00%
3	8.50%	7.00%	18	2.00%	2.00%
4	7.00%	6.00%	19	2.00%	2.00%
5	6.00%	5.00%	20	1.50%	1.50%
6	5.00%	4.00%	21	1.50%	1.50%
7	4.50%	3.50%	22	1.50%	1.50%
8	4.25%	3.00%	23	1.50%	1.50%
9	4.00%	2.50%	24	1.50%	1.50%
10	3.50%	2.50%	25	0.75%	0.75%
11	3.25%	2.50%	26	0.75%	0.75%
12	3.00%	2.50%	27	0.75%	0.75%
13	2.75%	2.50%	28	0.75%	0.75%
14	2.50%	2.50%	29+	0.00%	0.75%

Termination rates end at first retirement eligibility.

APPENDIX
Proposed Unreduced Retirement (Males)

Age	Current Retirement Rate	Proposed Retirement Rate	Age	Current Retirement Rate	Proposed Retirement Rate
50	25.00%	15.00%	63	35.00%	25.00%
51	25.00%	15.00%	64	35.00%	35.00%
52	25.00%	15.00%	65	40.00%	40.00%
53	25.00%	15.00%	66	30.00%	30.00%
54	25.00%	15.00%	67	30.00%	30.00%
55	20.00%	15.00%	68	30.00%	25.00%
56	20.00%	15.00%	69	30.00%	25.00%
57	20.00%	15.00%	70	25.00%	25.00%
58	20.00%	15.00%	71	25.00%	25.00%
59	20.00%	15.00%	72	25.00%	25.00%
60	20.00%	15.00%	73	25.00%	25.00%
61	20.00%	25.00%	74	25.00%	25.00%
62	45.00%	35.00%	75	100.00%	100.00%

Additional 10% rate increase in the first year that members become eligible for unreduced benefits.

APPENDIX
Proposed Unreduced Retirement (Females)

Age	Current Retirement Rate	Proposed Retirement Rate	Age	Current Retirement Rate	Proposed Retirement Rate
50	15.00%	15.00%	63	30.00%	30.00%
51	15.50%	15.00%	64	30.00%	40.00%
52	16.00%	15.00%	65	30.00%	50.00%
53	16.50%	15.00%	66	30.00%	40.00%
54	17.00%	15.00%	67	30.00%	30.00%
55	17.50%	15.00%	68	30.00%	30.00%
56	18.00%	15.00%	69	30.00%	30.00%
57	18.50%	15.00%	70	25.00%	25.00%
58	19.00%	15.00%	71	25.00%	25.00%
59	19.50%	15.00%	72	25.00%	25.00%
60	20.00%	15.00%	73	25.00%	25.00%
61	20.00%	25.00%	74	25.00%	25.00%
62	35.00%	35.00%	75	100.00%	100.00%

Additional 10% rate increase in the first year that members become eligible for unreduced benefits.

APPENDIX
Proposed Reduced Retirement (Unisex)

Age	Current Retirement Rate		Proposed Retirement Rate
	Male	Female	
55	1.50%	1.50%	2.00%
56	1.50%	1.50%	2.00%
57	1.50%	1.50%	2.00%
58	1.50%	1.50%	3.00%
59	1.50%	1.50%	3.50%
60	4.00%	3.00%	4.00%
61	4.00%	3.00%	6.50%
62	9.00%	8.00%	9.00%
63	7.00%	12.00%	12.00%
64	10.00%	15.00%	12.00%

APPENDIX
Proposed Healthy Mortality

Males			Females		
Age	Current Mortality Rate	Proposed Mortality Rate	Age	Current Mortality Rate	Proposed Mortality Rate
50	0.22%	0.20%	50	0.12%	0.14%
55	0.38%	0.27%	55	0.28%	0.17%
60	0.36%	0.37%	60	0.35%	0.24%
65	0.46%	0.51%	65	0.33%	0.37%
70	1.20%	0.77%	70	0.67%	0.58%
75	1.99%	1.22%	75	1.07%	0.95%
80	3.95%	3.62%	80	2.38%	2.82%
85	7.83%	6.93%	85	5.55%	5.40%
90	13.70%	12.15%	90	10.39%	9.56%
95	20.78%	20.11%	95	15.90%	16.30%
100	27.29%	29.38%	100	22.29%	25.11%

Proposed mortality rates above are sample rates for 2014. For actuarial valuation purposes, mortality rates will be projected from 2014 on a generational basis using the MP-2014 improvement scale.

APPENDIX
Proposed Disabled Mortality

Males			Females		
Age	Current Mortality Rate	Proposed Mortality Rate	Age	Current Mortality Rate	Proposed Mortality Rate
40	1.81%	1.53%	40	0.71%	0.81%
45	1.81%	1.98%	45	0.71%	1.14%
50	2.32%	2.28%	50	1.10%	1.40%
55	2.84%	2.59%	55	1.57%	1.64%
60	3.36%	3.04%	60	2.07%	1.99%
65	4.01%	3.83%	65	2.66%	2.63%
70	5.01%	5.10%	70	3.58%	3.80%
75	6.57%	7.12%	75	4.96%	5.64%
80	8.75%	10.44%	80	6.87%	8.37%
85	11.33%	15.87%	85	9.52%	12.29%
90	14.67%	23.19%	90	13.30%	18.15%
95	21.40%	31.03%	95	18.48%	26.06%
100	27.56%	39.51%	100	22.56%	35.29%

APPENDIX
Proposed Active Mortality

Males			Females		
Age	Current Mortality Rate	Proposed Mortality Rate	Age	Current Mortality Rate	Proposed Mortality Rate
20	0.03%	0.04%	20	0.01%	0.02%
25	0.03%	0.05%	25	0.01%	0.02%
30	0.04%	0.05%	30	0.01%	0.02%
35	0.04%	0.05%	35	0.02%	0.03%
40	0.06%	0.06%	40	0.02%	0.04%
45	0.08%	0.10%	45	0.03%	0.07%
50	0.13%	0.17%	50	0.05%	0.11%
55	0.23%	0.28%	55	0.11%	0.17%
60	0.21%	0.47%	60	0.14%	0.24%
65	0.27%	0.83%	65	0.13%	0.37%
70	0.72%	1.39%	70	0.27%	0.63%
75	1.20%	2.32%	75	0.43%	1.08%
80	2.37%	3.88%	80	0.95%	1.84%

Proposed mortality rates above are sample rates for 2014. For actuarial valuation purposes, mortality rates will be projected from 2014 on a generational basis using the MP-2014 improvement scale.

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **April 23, 2015**

SUBJ: **Resolution for Clarence Corneil**

As you know, Clarence Corneil resigned from the TFFR Board in November 2014, after representing retired teachers on the Board for over 12 years with distinction. Since the Board did not have the opportunity to recognize Clarence before he left, I asked him to attend the April 30 board meeting.

I have drafted the enclosed Board resolution for your consideration, and have scheduled a coffee party to honor Clarence during the meeting break on April 30.

Enclosure

ND TFFR Board Resolution
in Appreciation of
Clarence Corneil

WHEREAS, Mr. Clarence Corneil served as trustee of the ND Teachers' Fund for Retirement Board representing retired members with distinction for 12 years, from 2002 to 2014; and

WHEREAS, Mr. Corneil also honorably served as trustee and parliamentarian of the ND State Investment Board representing TFFR members during his tenure; and

WHEREAS, Mr. Corneil dedicated his professional career to the ND education community in a career spanning nearly four decades having worked as a teacher and principal in Dickinson and Dickinson area schools until his retirement in 1997; and

WHEREAS, Mr. Corneil has been actively involved in numerous professional, civic, community, church, and state activities and associations; and

WHEREAS, Mr. Corneil has been a passionate defender of defined benefit plans and their ability to provide retirement security, and has been dedicated to protecting the interests of the pension system and its active and retired members; and

WHEREAS, Mr. Corneil provided steadfast leadership on pension issues, and supported efforts to strengthen TFFR's funding structure, prudently invest fund assets, and safeguard its financial integrity; and

WHEREAS, Mr. Corneil has distinguished himself as a knowledgeable and experienced trustee whose commitment to integrity and excellence have earned him the respect of those who have worked with him; now therefore, be it

RESOLVED, that the TFFR Board express its heartfelt thanks to Mr. Corneil for his dedicated and compassionate service to the Board, and for his positive leadership and unwavering support of educators, students, and citizens of North Dakota leaving a legacy of trust and caring for others; and be it further

RESOLVED, that the Board wishes Clarence Corneil, and his wife, Jan, good health and happiness in their retirement; and be it further

RESOLVED, that a copy of this Resolution be presented to Mr. Corneil, printed in the official TFFR Board minutes, and submitted to the National Council on Teacher Retirement, on behalf of the many lives he has so positively touched.

DATED this 30 day of April, 2015

_____
Mike Gessner, President

_____
Rob Lech, Vice President

_____
Mel Olson, Trustee

_____
Kim Franz, Trustee

_____
Mike Burton, Trustee

_____
Kelly Schmidt, State Treasurer

_____
Kirsten Baesler, State Superintendent

COPY

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **April 23, 2015**

SUBJ: **2015 Legislative Report**

Although the 64th Legislative Assembly has not yet ended, I would like to provide the Board with a 2015 Legislative Wrap Up as it relates to TFFR using the most recent information available.

TFFR's technical corrections bill, **HB 1064**, passed with few concerns and was signed by the Governor. The only issues were those raised in the House about: 1) whether the Legislature could adopt future amendments to the IRS by reference; 2) the process of actually incorporating the IRS tax code references to reflect when each of the provisions were amended under federal law instead of using the phrase "as amended"; and 3) implications of the U.S. vs. Windsor court decision on current TFFR statutes. Jan Murtha, TFFR legal counsel from Attorney General's Office, and Ice Miller, outside tax counsel, did a great job assisting us in responding to these concerns. I will ask Segal's compliance expert to review TFFR's updated statutes this summer in preparation for filing an IRS determination letter request later this year (Cycle E filing deadline is January 31, 2016).

At this writing, RIO's budget bill, **SB 2022,** has not yet been approved. Nearly all of the discussion and amendments have been focused on the PERS portion of the appropriations bill. However, one amendment removed RIO's request for additional salary adjustment funds. We will work with the Conference Committee on restoring these funds.

While the TFFR plan was not specifically affected, there was much public pension related discussion and action on various PERS related bills. **HB 1080** was PERS' funding improvement bill (contribution increases and benefit reductions similar to TFFR). This bill was amended, and eventually failed. **HB 1154** would have allowed current members of the PERS defined contribution plan to transfer to the PERS defined benefit plan (failed). **SB 2038** would have closed the current PERS defined benefit plan, and required all new state employees to participate in the PERS defined contribution plan (failed). **SB 2039** and **SCR 4003** were the companion bills that would have used a portion of the Foundation Aid Stabilization Fund and established a new Public Employees Retirement Stabilization Fund in the State Constitution for the purpose of addressing existing or anticipated unfunded benefit obligations of state retirement funds. The pension related provisions were subsequently removed, but final action has not been taken on these two bills.

You may recall that there were some concerns and a resolution passed by the ND School Board Association last fall regarding funding for TFFR contribution increases. We monitored a number of education related bills for potential amendments regarding this topic. These include **SB 2013** which is the DPI appropriations bill and **SB 2031** which is the school district foundation aid bill. To date, we have not seen any amendments on any bills which would provide for state funding of TFFR contribution increases.

Bills potentially affecting the investment program of TFFR fund assets include **HB 1329** which would have changed membership of the SIB (failed) and **HCR 3041** which would have provided for a Legislative Management study of the investment practices of the SIB (failed).

Finally, there were various other bills we monitored with potential impact on the TFFR plan. **HB 1250** would have required all Governor- appointed boards and commissions to publish meeting minutes (failed). **HB 1339** would have provided an income tax exclusion for municipal, state, and federal retirement pension payments and social security benefits (failed). **HB 1361** would have required legislative management to review all boards and commissions (failed). **SB 2355** regarding ESPB unintentionally made some changes to TFFR which were eventually removed (failed).

In summary, while there was plenty of discussion relating to the funding and investments of state pension plans, the 2015 legislative session was a relatively quiet one for TFFR.

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **April 23, 2015**

SUBJ: **Asset Liability Study Planning**

The next study the TFFR Board will be conducting is the Asset Liability Study (ALS). The purpose of this Study is to identify the optimal distribution of TFFR funds among the various asset classes that offers the highest probability of consistently achieving investment objectives within the confines of a predetermined level of risk. Enclosed is a copy of the TFFR Board's current Investment Policy Statement.

NDCC 15-39.1-05.2 (TFFR statutes):

> *"The TFFR Board shall establish investment policy for the trust fund under section 21-10-02.1. The investment policy must include acceptable rates of return, liquidity, and levels of risk, and long-range asset allocation targets."*

NDCC 21-10-02.1 (SIB statutes):

1. *"The governing body of each fund enumerated in section 21-10-06 shall establish policies on investment goals and objectives and asset allocation for each respective fund. The policies must provide for:*

    a. *The definition and assignment of duties and responsibilities to advisory services and persons employed by the board.*
    b. *Rate of return objectives, including liquidity requirements, and acceptable levels of risk.*
    c. *Long-range asset allocation goals.*
    d. *Guidelines for the selection and redemption of investments.*
    e. *Investment diversification, investment quality, qualification of advisory services, and amounts to be invested by advisory services.*
    f. *The types of reports and procedures to be used in evaluating performance.*

2. *The asset allocation and any subsequent allocation changes for each fund must be approved by the governing body of that fund and the state investment board. The governing body of each fund shall use the staff and consultants of the retirement and investment office in developing asset allocation and investment policies."*

An Asset Liability Study is required by TFFR Board policy, and must be done every 5 years. The last Study was done in 2010-11 by Callan (SIB investment consultant) for $48,500 with the assistance of the SIB Chief Investment Officer (interim LeRoy Gilbertson and John Geissinger), Fay Kopp, and other RIO staff.

You may recall that NDPERS also utilized Callan for their Asset Liability Study done at about the same time 5 years ago. Both TFFR and PERS went through a similar process with Callan of defining broad asset classes and establishing a new framework that was more flexible and better matched the investment strategy implementation by the SIB. Both TFFR and PERS ultimately approved a very similar asset allocation which is being implemented by the SIB.

Dave Hunter, Chief Investment Officer, and I will work with the consultant selected by the TFFR Board on the asset liability study. Options for TFFR Board consideration include:

1) Coordinate Study with PERS, and work toward using same consultant.
2) Request presentation and cost proposal from Callan (SIB/RIO investment consultant).
3) Request presentation and cost proposal from Segal's investment affiliate, Segal Rogerscasey, (TFFR/RIO actuarial consultant).
4) Bid the Study to other actuarial/investment consulting firms utilizing formal RFP process (no statutory requirement to bid this contract)
5) Other

At the meeting, please plan to discuss how to proceed with the Asset Liability Study.

Enclosure

1. PLAN CHARACTERISTICS AND FUND CONSTRAINTS.

The North Dakota Teachers' Fund for Retirement (TFFR) is a pension benefit plan that was established in 1913 to provide retirement income to all public school and certain state teachers and administrators in the state of North Dakota. The plan is administered by a seven member Board of Trustees comprised of five active and retired members of the fund appointed by the Governor of North Dakota and two elected officials - the State Treasurer and the State Superintendent of Public Instruction.

The plan is a multi-employer defined benefit public pension plan that provides retirement, disability, and death benefits in accordance with Chapter 15-39.1 of the North Dakota Century Code (NDCC). Monthly retirement benefits are based on the formula: Number of Years of service X 2.0% X Final Average Salary. Adjustments to the basic formula are made depending on the retirement option selected.

Funding is provided by monthly employee and employer contributions scheduled to increase as follows:

	7/1/11	7/1/12	7/1/14
Employee	7.75%	9.75%	11.75%
Employer	8.75%	10.75%	12.75%

Employee and employer contributions will be reduced to 7.75% each when TFFR reaches 100% funded level on an actuarial value basis.

The TFFR Board has an actuarial valuation performed annually and an Experience Study and Asset Liability Study performed every five years. The current actuarial assumed rate of return on assets is 8.0%. Key plan and financial statistics are recorded in the most recent valuation report on file at the North Dakota Retirement and Investment office (RIO).

2. FUND GOALS

The Plan benefits are financed through both statutory employer and employee contributions and the investment earnings on assets held in the Fund. The TFFR Board recognizes that a sound investment program is essential to meet the pension obligations.

As a result, the Fund goals are to:

- Improve the Plan's funding status to protect and sustain current and future benefits.
- Minimize the employee and employer contributions needed to fund the Plan over the long term.

- Avoid substantial volatility in required contribution rates and fluctuations in the Plan's funding status.
- Accumulate a funding surplus to provide increases in retiree annuity payments to preserve the purchasing power of their retirement benefit.

The Board acknowledges the material impact that funding the pension plan has on the State/School District's financial performance. These goals affect the Fund's investment strategies and often represent conflicting goals. For example, minimizing the long-term funding costs implies a less conservative investment program, whereas dampening the volatility of contributions and avoiding large swings in the funding status implies a more conservative investment program. The Board places a greater emphasis on the strategy of improving the funding status and reducing the contributions that must be made to the Fund, as it is most consistent with the long-term goal of conserving money to apply to other important state/local projects.

3. RESPONSIBILITIES AND DISCRETION OF THE STATE INVESTMENT BOARD (SIB).

The TFFR Board is charged by law under NDCC 21-10-02.1 with the responsibility of establishing policies on investment goals and asset allocation of the Fund. The SIB is charged with implementing these policies and investing the assets of the Fund in the manner provided in NDCC 21-10-07, the prudent investor rule. Under this rule, the fiduciaries shall exercise the judgment and care, under the circumstances then prevailing, that an institutional investor of ordinary prudence, discretion, and intelligence exercises in the management of large investments entrusted to it, not in regard to speculation but in regard to the permanent disposition of funds, considering probable safety of capital as well as probable income. The Fund must be invested exclusively for the benefit of the members and their beneficiaries in accordance with this investment policy.

Management responsibility for the investment program not assigned to the SIB in Chapter 21-10 of the North Dakota Century Code (NDCC) is hereby delegated to the SIB, who must establish written policies for the operation of the investment program, consistent with this investment policy.

The SIB may delegate investment responsibility to professional money managers. Where a money manager has been retained, the SIB's role in determining investment strategy and security selection is supervisory, not advisory

At the discretion of the SIB, the Fund's assets may be pooled with other funds. In pooling funds, the SIB may establish whatever asset class pools it deems necessary with specific quality, diversification, restrictions, and performance objectives appropriate to the prudent investor rule and the objectives of the funds participating in the pools.

The SIB is responsible for establishing criteria, procedures, and making decisions with respect to hiring, keeping, and terminating money managers. SIB investment responsibility also includes selecting performance measurement services, consultants, report formats, and frequency of meetings with managers.

The SIB will implement changes to this policy as promptly as is prudent.

4. RISK TOLERANCE

The Board is unwilling to undertake investment strategies that might jeopardize the ability of the Fund to finance the pension benefits promised to plan participants.

However, funding the pension promise in an economical manner is critical to the State/School Districts ability to continue to provide pension benefits to plan participants. Thus, the Board actively seeks to lower the cost of funding the Plan's pension obligations by taking on risk for which it expects to be compensated over the long term. The Board understands that a prudent investment approach to risk taking can result in periods of under-performance for the Fund in which the funding status may decline. These periods, in turn, can lead to higher required contribution rates. Nevertheless, the Board believes that such an approach, prudently implemented, best serves the long-run interests of the State/School District and, therefore, of plan participants.

5. INVESTMENT OBJECTIVES

The Board's investment objectives are expressed in terms of reward and risk expectations relative to investable, passive benchmarks. The Fund's policy benchmark is comprised of policy mix weights of appropriate asset class benchmarks as set by the SIB

1) The fund's rate of return, net of fees and expenses, should at least match that of the policy benchmark over a minimum evaluation period of five years.
2) The fund's risk, measured by the standard deviation of net returns, should not exceed 115% of the policy benchmark over a minimum evaluation period of five years

3) The risk adjusted performance of the fund, net of fees and expenses, should at least match that of the policy benchmark over a minimum evaluation period of five years.

6. POLICY ASSET MIX

Benefit payments are projected to occur over a long period of time. This allows TFFR to adopt a long-term investment horizon and asset allocation policy for the management of fund assets. Asset allocation policy is critical because it defines the basic risk and return characteristics of the investment portfolio. Asset allocation targets are established using an asset-liability analysis designed to assist the Board in determining an acceptable volatility target for the fund and an optimal asset allocation policy mix. This asset-liability analysis considers both sides of the plan balance sheet, utilizing both quantitative and qualitative inputs, in order to estimate the potential impact of various asset class mixes on key measures of total plan risk, including the resulting estimated impact of funded status and contribution rates. After consideration of all the inputs and a discussion of its own collective risk tolerance, the Board approves the appropriate policy asset mix for the Fund.

Asset Class	Policy Target (%)	Rebalancing Range (%)
Global Equity	57	46-65
Domestic Equity	31	26-36
Large	24	20-28
Small	7	4-10
International Equity	21	16-26
Developed	17	12-22
Emerging	4	2-6
Private Equity	5	4-8
Global Fixed Income	22	16-28
Domestic Fixed	17	13-21
Investment Grade	12	10-18
Non-Investment Grade	5	3-7
International Fixed	5	3-7
Developed	5	3-7
Emerging		0-3
Global Real Assets	20	12-28
Global Real Estate	10	5-15
Other	10	0-15
Infrastructure		0-10
Timber		0-7
Commodities		0-5
Inflation Linked-Bonds		0-10
Other Inflation Sensitive		0-5
Global Alternatives		0-10
Cash	1	0-2

While the Board recognizes fluctuations in market values will lead to short-term deviations from policy targets, the Board does not intend to engage in tactical asset allocation. Allocations to Global Alternatives will result in pro-rata reduction in the policy targets.

7. RESTRICTIONS

While the SIB is responsible for establishing specific quality, diversification, restrictions, and performance objectives for the investment vehicles in which the Fund's assets will be invested, it is understood that:

a. Futures and options may be used to hedge or replicate underlying index exposure, but not for speculation.
b. Derivatives use will be monitored to ensure that undue risks are not taken by the money managers
c. No transaction shall be made which threatens the tax exempt status of the Fund.
d. All assets will be held in custody by the SIB's master custodian or such other custodians as are acceptable to the SIB.
e. No unhedged short sales or speculative margin purchases shall be made.
f. Social investing is prohibited unless it meets the Exclusive Benefit Rule and it can be substantiated that the investment must provide an equivalent or superior rate of return for a similar investment with a similar time horizon and similar risk.

> For the purpose of this document, Social Investing is defined as *"The investment or commitment of public pension fund money for the purpose of obtaining an effect other than a maximized return to the intended beneficiaries."*

g. Economically targeted investing is prohibited unless the investment meets the Exclusive Benefit Rule.

   For the purpose of this document economically targeted investment is defined as an investment designed to produce a competitive rate of return commensurate with risk involved, as well as to create collateral economic benefits for a targeted geographic area, group of people, or sector of the economy.

   Also, for the purpose of this document, the Exclusive Benefit Rule is met if the following four conditions are satisfied:

   1) The cost does not exceed the fair market value at the time of investment.

2) The investment provides the Fund with an equivalent or superior rate of return for a similar investment with a similar time horizon and similar task

3) Sufficient liquidity is maintained in the Fund to permit distributions in accordance with the terms of the plan.

4) The safeguards and diversity that a prudent investor would adhere to are present.

Where investment characteristics, including yield, risk, and liquidity are equivalent, the Board's policy favors investments which will have a positive impact on the economy of North Dakota.

8. INTERNAL CONTROLS

A system of internal controls must be in place by the SIB to prevent losses of public funds arising from fraud or employee error. Such controls deemed most important are the separation of responsibilities for investment purchases from the recording of investment activity, custodial safekeeping, written confirmation of investment transactions, and established criteria for broker relationships. The annual financial audit must include a comprehensive review of the portfolio, accounting procedures for security transactions and compliance with the investment policy.

9. EVALUATION AND REVIEW

Investment management of the Fund will be evaluated against the Fund's investment objectives. Emphasis will be placed on five year results. Evaluation should include an assessment of the continued feasibility of achieving the investment objectives and the appropriateness of the Investment Policy Statement for achieving those objectives.

Performance reports will be provided to the TFFR Board periodically, but not less than annually. Such reports will include asset returns and allocation data as well as information regarding all significant and/or material matters and changes pertaining to the investment of the Fund, including but not limited to:

1) A list of the advisory services managing investments for the board.
2) A list of investments at market value, compared to previous reporting period, of each fund managed by each advisory service.

3) Earnings, percentage earned, and change in market value of each fund's investments.
4) Comparison of the performance of each fund managed by each advisory service to other funds under the board's control and to generally accepted market indicators.
5) All material legal or legislative proceedings affecting the SIB.
6) Compliance with this investment policy statement.

TFFR Board Adopted: May 25, 1995.
Amended: November 30, 1995; August 21, 1997; July 15, 1999; July 27, 2000; September 18, 2003; July 14, 2005; September 21, 2006; September 20, 2007; October 27, 2011 September 26, 2013.

Approved by SIB: November 18, 2011

MEMORANDUM

TO: **TFFR Board**
FROM: **Fay Kopp and Shelly Schumacher**
DATE: **April 23, 2015**
SUBJ: **GASB Update**

Here is a brief update on GASB related activities since the Board last met.

- **Potential GASB Compliance Issue**

  A new interpretation and compliance issue dealing with implementation of GASB 67 and 68 has recently come up. The issue is whether GASB's measure of Covered Employee Payroll goes beyond pensionable compensation, and includes overtime, bonuses, and potentially other compensation as well. Like other public pension plans around the country, NDTFFR does not collect Total Covered Employee Payroll information; ND TFFR employers only report that portion of Total Covered Employee Payroll which is considered Pensionable Compensation (base salary plus other payments for teaching, supervisory, administrative, and extracurricular services). ND TFFR excludes very few payments from Total Covered Employee payroll, therefore we believe the difference between Pensionable Compensation and Total Covered Employee Payroll is immaterial for financial reporting purposes.

  National organizations like National Council on Teacher Retirement (NCTR), National Association of Public Pension Attorneys (NAPPA), and Public Pension Financial Forum (P2F2) are working on this issue. We have also discussed this with TFFR's actuary and auditor.

- **Audit Report on GASB Schedules**

  CliftonLarsonAllen (CLA) has completed their audit of the GASB schedules, and has finalized their Independent Audit Report dated April 10, 2015 on the Schedule of Employer Allocations and Schedule of Pension Amounts by Employer (enclosed). CLA will report on GASB census data audits and audited GASB schedules at the SIB Audit Committee meeting on May 21.

- **GASB Communication Materials**

  GASB talking points are being distributed to TFFR participating employers for use in communicating new pension standards (enclosed). They are also being added to the TFFR website.

  Shelly will provide additional GASB training and information at the statewide Business Manager workshops on May 5-8 in Bismarck, Minot, Grand Forks, and Valley City.

In the months ahead, TFFR staff will continue to work with employers and their auditors to assist them with incorporating the 2014 GASB pension information into their 2015 annual financial statements.

Enclosures

NORTH DAKOTA RETIREMENT AND INVESTMENT OFFICE -
NORTH DAKOTA TEACHERS' FUND FOR RETIREMENT
Bismarck, North Dakota

SCHEDULES OF EMPLOYER ALLOCATIONS AND
PENSION AMOUNTS BY EMPLOYER
June 30, 2014

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Independent Auditors' Report

Governor Jack Dalrymple
The Legislative Assembly
David Hunter, Executive Director/CIO
State Investment Board
Teacher's Fund for Retirement Board
North Dakota Retirement and Investment Office

Report on Schedules

We have audited the accompanying schedule of employer allocations of the North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement (TFFR), a department of the State of North Dakota, as of and for the year ended June 30, 2014, and the related notes.

We have also audited the total for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense as of and for the year ended June 30, 2014 and the net pension liability as of and for the year ended June 30, 2013 (specified column totals), included in the accompanying schedule of pension amounts by employer of TFFR, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer in order to design audit procedures that are

appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense for the total of all participating entities for TFFR as of and for the year ended June 30, 2014 and net pension liability as of and for the year ended June 30, 2013, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the North Dakota Retirement and Investment Office (RIO), which includes TFFR, as of and for the year ended June 30, 2014, and our report thereon, dated November 11, 2014, expressed an unmodified opinion on those statements.

Restriction on Use

Our report is intended solely for the information and use of the management of RIO, Board of Trustees, TFFR employers as of and for the year ended June 30, 2014 and their auditors and is not intended to be and should not be used by anyone other than these specified parties.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Audit Standards*, we have also issued our report dated April 10, 2015, on our consideration of RIO's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering RIO's internal control over financial reporting.

CliftonLarsonAllen LLP

CliftonLarsonAllen LLP

Baltimore, Maryland
April 10, 2015

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Alexander School	$ 830,899	0.143245%
Anamoose School	618,769	0.106675%
Apple Creek Elem School	338,460	0.058350%
Ashley School	877,146	0.151218%
Bakker Elem School	33,500	0.005775%
Barnes County North	1,681,343	0.289860%
Beach School	2,056,674	0.354566%
Belcourt School	7,783,579	1.341873%
Belfield Public School	1,270,974	0.219113%
Beulah School	3,233,309	0.557416%
Billings Co. School Dist.	730,500	0.125937%
Bismarck Public Schools	61,729,312	10.642008%
Bismarck State College	31,287	0.005394%
Blessed John Paul Ii Catholic Sch Network	30,583	0.005272%
Bottineau School	3,517,441	0.606400%
Bowbells School	506,559	0.087330%
Bowman School	2,588,190	0.446199%
Burke Central School	834,871	0.143930%
Burleigh County Spec. Ed.	67,427	0.011624%
Carrington School	2,652,356	0.457261%
Cavalier School	1,975,331	0.340543%
Center Stanton School	1,318,874	0.227371%
Central Cass School	3,318,777	0.572150%
Central Elementary School	60,675	0.010460%
Central Valley School	1,213,536	0.209211%
Dakota Prairie School	1,642,062	0.283088%
Devils Lake School	9,920,576	1.710287%
Dickinson School	15,053,043	2.595114%
Divide School	2,153,799	0.371311%
Drake School	531,426	0.091617%
Drayton School	1,073,296	0.185034%
Dunseith School	2,417,614	0.416792%
E Central Ctr Exc Childn	753,226	0.129855%
Earl Elem. School	30,500	0.005258%
Edgeley School	1,159,504	0.199896%
Edmore School	636,310	0.109699%
Eight Mile School	1,194,837	0.205987%
Elgin-New Leipzig School	956,798	0.164950%
Ellendale School	1,704,838	0.293911%
Emerado Elementary School	532,695	0.091836%

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Enderlin Area School District	1,798,257	0.310016%
Fairmount School	938,411	0.161780%
Fargo Public Schools	63,192,777	10.894306%
Fessenden-Bowdon School	890,345	0.153494%
Finley-Sharon School	1,089,511	0.187829%
Flasher School	1,051,427	0.181264%
Fordville Lankin School	543,046	0.093620%
Fort Ransom Elem School	151,858	0.026180%
Fort Totten School	1,527,893	0.263406%
Fort Yates School	1,016,294	0.175207%
Gackle-Streeter Pub Sch	714,480	0.123175%
Garrison School	2,037,409	0.351245%
Glen Ullin School	988,078	0.170343%
Glenburn School	1,490,810	0.257013%
Goodrich School	276,766	0.047714%
Grafton School	3,993,377	0.688450%
Grand Forks School	41,737,522	7.195464%
Great North West Cooperative	127,950	0.022058%
Grenora School	969,771	0.167187%
Griggs County Central Sch	1,687,790	0.290972%
Gst Educational Services	1,444,577	0.249042%
Halliday School	414,542	0.071466%
Hankinson School	1,553,754	0.267864%
Harvey School	2,087,474	0.359876%
Hatton Eielson Psd	1,055,272	0.181927%
Hazelton - Moffit School	764,749	0.131841%
Hazen School	2,578,459	0.444521%
Hebron School	1,090,884	0.188066%
Hettinger School	1,534,952	0.264623%
Hillsboro School	2,120,182	0.365515%
Hope School	589,222	0.101581%
Horse Creek Elem. School	34,500	0.005948%
James River Multidistrict Spec Ed Unit	1,132,973	0.195322%
Jamestown School	12,587,748	2.170102%
Kenmare School	1,704,244	0.293808%
Kensal School	374,636	0.064586%
Kidder County School District	2,129,282	0.367084%
Killdeer School	2,322,433	0.400383%
Kindred School	2,927,266	0.504655%
Kulm School	1,025,716	0.176831%

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Lake Region Spec Ed	1,676,302	0.288991%
Lakota School	1,137,076	0.196030%
Lamoure School	1,398,670	0.241128%
Langdon Area School	1,954,383	0.336932%
Larimore School	2,067,930	0.356507%
Leeds School	1,000,320	0.172453%
Lewis And Clark School	2,355,419	0.406069%
Lidgerwood School	1,084,728	0.187005%
Linton School	1,579,946	0.272379%
Lisbon School	3,216,870	0.554582%
Litchville-Marion School	806,940	0.139115%
Little Heart Elem. School	93,871	0.016183%
Logan County	3,989	0.000688%
Lone Tree Elem. School	194,193	0.033479%
Lonetree Spec Ed Unit	138,100	0.023808%
Maddock School	916,807	0.158056%
Mandan Public Schools	16,362,090	2.820791%
Mandaree School	1,603,025	0.276358%
Manning Elem School	67,756	0.011681%
Manvel Elem. School	734,118	0.126560%
Maple Valley School	1,535,009	0.264632%
Mapleton Elem. School	624,849	0.107723%
Marmarth Elem. School	152,312	0.026258%
Max School	1,064,424	0.183505%
May-Port C-G School	2,419,251	0.417074%
Mcclusky School	730,071	0.125863%
Mckenzie County	52,000	0.008965%
Mckenzie County School	4,451,391	0.767411%
Medina School	915,109	0.157763%
Menoken Elem School	115,900	0.019981%
Midkota	1,000,510	0.172486%
Midway School	1,333,369	0.229870%
Milnor School	1,393,821	0.240292%
Minnewaukan School	1,613,737	0.278205%
Minot School	40,092,868	6.911929%
Minto School	1,065,255	0.183648%
Mohall Lansford Sherwood	2,215,188	0.381894%
Montpelier School	658,564	0.113535%
Morton County	25,882	0.004462%
Mott-Regent School	1,438,836	0.248052%

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Mt Pleasant School	1,438,971	0.248076%
Munich School	750,564	0.129396%
N Central Area Career And Tech Center	137,820	0.023760%
Napoleon School	1,390,415	0.239705%
Naughton Rural School	65,511	0.011294%
Nd Center For Distance Education	881,057	0.151892%
Nd Dept Of Public Instruction	110,191	0.018997%
Nd School For Blind	641,824	0.110649%
Nd School For Deaf	811,734	0.139941%
Nd United	293,459	0.050592%
Nd Youth Correctional Cnt	1,131,369	0.195046%
Nedrose School	1,301,671	0.224405%
Nelson County	10,607	0.001829%
Nesson School	1,343,679	0.231647%
New England School	1,087,601	0.187500%
New Public School	1,995,103	0.343952%
New Rockford Sheyenne School	1,627,943	0.280654%
New Salem-Almont	1,546,941	0.266689%
New Town School	3,778,325	0.651376%
Newburg United District	581,064	0.100174%
North Border School	2,649,367	0.456746%
North Sargent School	1,188,780	0.204943%
North Star	1,428,747	0.246313%
North Valley Area Career	587,647	0.101309%
Northern Cass School Dist	2,377,286	0.409839%
Northern Plains Spec Ed	188,004	0.032412%
Northwood School	1,293,641	0.223021%
Oakes School	1,900,372	0.327620%
Oberon Elem School	437,642	0.075449%
Oliver - Mercer Spec Ed	853,576	0.147155%
Page School	666,813	0.114957%
Park River Area School District	1,995,232	0.343974%
Parshall School	1,649,224	0.284323%
Peace Garden Spec Ed	437,889	0.075491%
Pembina Spec Ed Coop	167,922	0.028949%
Pingree - Buchanan School	759,383	0.130916%
Pleasant Valley Elem	16,653	0.002871%
Powers Lake School	938,531	0.161801%
Richardton-Taylor	1,543,307	0.266063%
Richland School	1,504,994	0.259458%

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Robinson School	70,620	0.012175%
Rolette County	3,984	0.000687%
Rolette School	1,027,903	0.177208%
Roosevelt School	382,597	0.065959%
Roughrider Area Career And Tech Center	159,749	0.027540%
Roughrider Service Program	87,133	0.015021%
Rugby School	2,904,445	0.500720%
Rural Cass Spec Ed	999,887	0.172379%
Sargent Central School	1,323,924	0.228242%
Sawyer School	795,679	0.137173%
Scranton School	1,001,196	0.172604%
Se Region Career And Tech	1,257,571	0.216803%
Selfridge School	785,386	0.135399%
Sheyenne Valley Area Voc	673,958	0.116189%
Sheyenne Valley Spec Ed	1,480,286	0.255198%
Slope County	22,792	0.003929%
Solen - Cannonball School	1,643,353	0.283311%
Souris Valley Spec Ed	1,464,235	0.252431%
South Cent. Prairie Sp Ed	92,600	0.015964%
South Heart School	1,232,757	0.212525%
South Prairie Elem School	1,191,974	0.205494%
South Valley Spec Ed	628,490	0.108350%
Southwest Special Education Unit	60,320	0.010399%
St. John'S School	2,270,215	0.391381%
St. Thomas School	634,787	0.109436%
Stanley School	2,810,250	0.484481%
Starkweather School	555,020	0.095684%
Sterling School	205,087	0.035357%
Strasburg School District	812,275	0.140035%
Surrey School	2,134,233	0.367937%
Sweet Briar Elem School	72,000	0.012413%
Tgu School District	2,496,437	0.430381%
Thompson School	1,863,106	0.321196%
Tioga School	2,345,263	0.404319%
Turtle Lake-Mercer School	1,205,660	0.207853%
Twin Buttes Elem. School	440,692	0.075974%
Underwood School	1,424,552	0.245590%
United School	2,771,048	0.477723%
Upper Valley Spec Ed	2,111,013	0.363934%
Valley - Edinburg School	1,401,830	0.241673%

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Valley City School	5,824,480	1.004128%
Velva School	2,316,129	0.399296%
Wahpeton School	6,234,148	1.074754%
Ward County	26,031	0.004488%
Warwick School	1,522,299	0.262441%
Washburn School	1,428,913	0.246342%
West Fargo School	43,479,882	7.495843%
West River Student Services	577,229	0.099513%
Westhope School	935,687	0.161311%
White Shield School	1,370,831	0.236328%
Williston School	13,883,985	2.393571%
Wilmac Special Education	2,466,035	0.425139%
Wilton School	1,133,768	0.195459%
Wing School	629,112	0.108458%
Wishek School	1,090,646	0.188025%
Wolford School	458,187	0.078990%
Wyndmere School	1,364,980	0.235320%
Yellowstone Elem. School	460,673	0.079419%
Zeeland School	446,642	0.077000%
Grand Totals:	**$ 580,053,235**	**100%**

North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement

Schedule of Pension Amounts by Employer
As of and for the year ended June 30, 2014
With Net Pension Liability for June 30, 2013

			Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Employer Name	Net Pension Liability for the year ended June 30, 2013	Net Pension Liability for the year ended June 30, 2014	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Alexander School	$ 1,658,140	$ 1,500,954	$ 11,477	$ -	$ -	$ -	$ 11,477	$ -	$ 170,512	$ -	$ -	$ 170,512	$ 91,238	$ -	$ 91,238
Anamoose School	1,234,822	1,117,765	8,547	-	-	-	8,547	-	126,981	-	-	126,981	67,945	-	67,945
Apple Creek Elem School	675,433	611,405	4,675	-	-	-	4,675	-	69,457	-	-	69,457	37,165	-	37,165
Ashley School	1,750,432	1,584,497	12,116	-	-	-	12,116	-	180,002	-	-	180,002	96,316	-	96,316
Bakker Elem School	66,849	60,512	463	-	-	-	463	-	6,874	-	-	6,874	3,678	-	3,678
Barnes County North	3,355,289	3,037,219	23,224	-	-	-	23,224	-	345,035	-	-	345,035	184,622	-	184,622
Beach School	4,104,297	3,715,223	28,408	-	-	-	28,408	-	422,058	-	-	422,058	225,836	-	225,836
Belcourt School	15,532,920	14,060,450	107,511	-	-	-	107,511	-	1,597,300	-	-	1,597,300	854,687	-	854,687
Belfield Public School	2,536,354	2,295,916	17,555	-	-	-	17,555	-	260,821	-	-	260,821	139,561	-	139,561
Beulah School	6,452,398	5,840,731	44,660	-	-	-	44,660	-	663,521	-	-	663,521	355,038	-	355,038
Billings Co. School Dist.	1,457,790	1,319,596	10,090	-	-	-	10,090	-	149,909	-	-	149,909	80,214	-	80,214
Bismarck Public Schools	123,187,109	111,509,377	852,639	-	-	-	852,639	-	12,667,724	-	-	12,667,724	6,778,276	-	6,778,276
Bismarck State College	62,439	56,520	432	-	-	-	432	-	6,421	-	-	6,421	3,436	-	3,436
Blessed John Paul II Cath. Schl Net	61,026	55,241	422	-	-	-	422	-	6,276	-	-	6,276	3,358	-	3,358
Bottineau School	7,019,414	6,353,997	48,585	-	-	-	48,585	-	721,829	-	-	721,829	386,238	-	386,238
Bowbells School	1,010,893	915,064	6,997	-	-	-	6,997	-	103,953	-	-	103,953	55,624	-	55,624
Bowman School	5,164,999	4,675,374	35,750	-	-	-	35,750	-	531,133	-	-	531,133	284,200	-	284,200
Burke Central School	1,666,069	1,508,131	11,532	-	-	-	11,532	-	171,327	-	-	171,327	91,674	-	91,674
Burleigh County Spec. Ed.	134,554	121,799	931	-	-	-	931	-	13,837	-	-	13,837	7,404	-	7,404
Carrington School	5,293,048	4,791,285	36,636	-	-	-	36,636	-	544,301	-	-	544,301	291,246	-	291,246
Cavalier School	3,941,973	3,568,287	27,284	-	-	-	27,284	-	405,366	-	-	405,366	216,904	-	216,904
Center Stanton School	2,631,945	2,382,445	18,217	-	-	-	18,217	-	270,651	-	-	270,651	144,821	-	144,821
Central Cass School	6,622,952	5,995,118	45,841	-	-	-	45,841	-	681,059	-	-	681,059	364,423	-	364,423
Central Elementary School	121,080	109,602	838	-	-	-	838	-	12,451	-	-	12,451	6,662	-	6,662
Central Valley School	2,421,733	2,192,160	16,762	-	-	-	16,762	-	249,035	-	-	249,035	133,254	-	133,254
Dakota Prairie School	3,276,900	2,966,260	22,681	-	-	-	22,681	-	336,974	-	-	336,974	180,309	-	180,309
Devils Lake School	19,797,515	17,920,776	137,028	-	-	-	137,028	-	2,035,842	-	-	2,035,842	1,089,343	-	1,089,343
Dickinson School	30,039,875	27,192,194	207,921	-	-	-	207,921	-	3,089,096	-	-	3,089,096	1,652,921	-	1,652,921
Divide School	4,298,130	3,890,681	29,749	-	-	-	29,749	-	441,990	-	-	441,990	236,501	-	236,501
Drake School	1,060,517	959,984	7,340	-	-	-	7,340	-	109,056	-	-	109,056	58,354	-	58,354
Drayton School	2,141,871	1,938,828	14,825	-	-	-	14,825	-	220,255	-	-	220,255	117,855	-	117,855
Dunseith School	4,824,597	4,367,241	33,393	-	-	-	33,393	-	496,129	-	-	496,129	265,470	-	265,470
E Central Ctr Exc Childn	1,503,143	1,360,650	10,404	-	-	-	10,404	-	154,573	-	-	154,573	82,709	-	82,709
Earl Elem. School	60,864	55,095	421	-	-	-	421	-	6,259	-	-	6,259	3,349	-	3,349
Edgeley School	2,313,906	2,094,556	16,016	-	-	-	16,016	-	237,946	-	-	237,946	127,321	-	127,321
Edmore School	1,269,826	1,149,451	8,789	-	-	-	8,789	-	130,580	-	-	130,580	69,871	-	69,871
Eight Mile School	2,384,413	2,158,379	16,504	-	-	-	16,504	-	245,197	-	-	245,197	131,201	-	131,201
Elgin-New Leipzig School	1,909,387	1,728,384	13,216	-	-	-	13,216	-	196,348	-	-	196,348	105,063	-	105,063
Ellendale School	3,402,182	3,079,666	23,548	-	-	-	23,548	-	349,857	-	-	349,857	187,202	-	187,202
Emerado Elementary School	1,063,052	962,278	7,358	-	-	-	7,358	-	109,317	-	-	109,317	58,494	-	58,494

The accompanying notes are an integral part of the Schedule of Pension Amounts by Employer

North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement

Schedule of Pension Amounts by Employer
As of and for the year ended June 30, 2014
With Net Pension Liability for June 30, 2013

			Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Employer Name	Net Pension Liability for the year ended June 30, 2013	Net Pension Liability for the year ended June 30, 2014	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Enderlin Area School District	3,588,606	3,248,418	24,839	-	-	-	24,839	-	369,028	-	-	369,028	197,460	-	197,460
Fairmount School	1,872,693	1,695,168	12,962	-	-	-	12,962	-	192,575	-	-	192,575	103,043	-	103,043
Fargo Public Schools	126,107,598	114,153,013	872,853	-	-	-	872,853	-	12,968,047	-	-	12,968,047	6,938,974	-	6,938,974
Fessenden-Bowdon School	1,776,778	1,608,345	12,298	-	-	-	12,298	-	182,712	-	-	182,712	97,766	-	97,766
Finley-Sharon School	2,174,224	1,968,115	15,049	-	-	-	15,049	-	223,582	-	-	223,582	119,635	-	119,635
Flasher School	2,098,231	1,899,325	14,523	-	-	-	14,523	-	215,768	-	-	215,768	115,454	-	115,454
Fordville Lankin School	1,083,703	980,972	7,501	-	-	-	7,501	-	111,441	-	-	111,441	59,630	-	59,630
Fort Ransom Elem School	303,048	274,320	2,098	-	-	-	2,098	-	31,163	-	-	31,163	16,675	-	16,675
Fort Totten School	3,049,070	2,760,028	21,104	-	-	-	21,104	-	313,546	-	-	313,546	167,773	-	167,773
Fort Yates School	2,028,118	1,835,859	14,038	-	-	-	14,038	-	208,558	-	-	208,558	111,596	-	111,596
Gackle-Streeter Pub Sch	1,425,819	1,290,656	9,869	-	-	-	9,869	-	146,621	-	-	146,621	78,455	-	78,455
Garrison School	4,065,855	3,680,425	28,142	-	-	-	28,142	-	418,105	-	-	418,105	223,721	-	223,721
Glen Ullin School	1,971,814	1,784,893	13,648	-	-	-	13,648	-	202,768	-	-	202,768	108,498	-	108,498
Glenburn School	2,975,067	2,693,041	20,592	-	-	-	20,592	-	305,936	-	-	305,936	163,701	-	163,701
Goodrich School	552,316	499,958	3,823	-	-	-	3,823	-	56,796	-	-	56,796	30,391	-	30,391
Grafton School	7,969,188	7,213,735	55,159	-	-	-	55,159	-	819,497	-	-	819,497	438,498	-	438,498
Grand Forks School	83,291,462	75,395,706	576,501	-	-	-	576,501	-	8,565,127	-	-	8,565,127	4,583,049	-	4,583,049
Great North West Cooperative	255,334	231,129	1,767	-	-	-	1,767	-	26,257	-	-	26,257	14,050	-	14,050
Grenora School	1,935,282	1,751,823	13,395	-	-	-	13,395	-	199,011	-	-	199,011	106,487	-	106,487
Griggs County Central Sch	3,368,161	3,048,871	23,313	-	-	-	23,313	-	346,359	-	-	346,359	185,330	-	185,330
Gst Educational Services	2,882,799	2,609,519	19,953	-	-	-	19,953	-	296,447	-	-	296,447	158,624	-	158,624
Halliday School	827,258	748,837	5,726	-	-	-	5,726	-	85,070	-	-	85,070	45,519	-	45,519
Hankinson School	3,100,674	2,806,740	21,461	-	-	-	21,461	-	318,852	-	-	318,852	170,612	-	170,612
Harvey School	4,165,763	3,770,862	28,833	-	-	-	28,833	-	428,379	-	-	428,379	229,218	-	229,218
Hatton Eielson Psd	2,105,905	1,906,272	14,576	-	-	-	14,576	-	216,557	-	-	216,557	115,876	-	115,876
Hazelton - Moffit School	1,526,132	1,381,460	10,563	-	-	-	10,563	-	156,937	-	-	156,937	83,974	-	83,974
Hazen School	5,145,576	4,657,792	35,615	-	-	-	35,615	-	529,136	-	-	529,136	283,131	-	283,131
Hebron School	2,176,968	1,970,598	15,068	-	-	-	15,068	-	223,865	-	-	223,865	119,786	-	119,786
Hettinger School	3,063,157	2,772,780	21,202	-	-	-	21,202	-	314,994	-	-	314,994	168,548	-	168,548
Hillsboro School	4,231,038	3,829,949	29,285	-	-	-	29,285	-	435,091	-	-	435,091	232,810	-	232,810
Hope School	1,175,856	1,064,389	8,139	-	-	-	8,139	-	120,917	-	-	120,917	64,701	-	64,701
Horse Creek Elem. School	68,851	62,324	477	-	-	-	477	-	7,080	-	-	7,080	3,788	-	3,788
James River Multidtrct Spec Ed Unit	2,260,960	2,046,628	15,649	-	-	-	15,649	-	232,502	-	-	232,502	124,408	-	124,408
Jamestown School	25,120,127	22,738,822	173,869	-	-	-	173,869	-	2,583,183	-	-	2,583,183	1,382,216	-	1,382,216
Kenmare School	3,400,990	3,078,587	23,540	-	-	-	23,540	-	349,735	-	-	349,735	187,137	-	187,137
Kensal School	747,619	676,747	5,175	-	-	-	5,175	-	76,880	-	-	76,880	41,137	-	41,137
Kidder County School District	4,249,200	3,846,390	29,411	-	-	-	29,411	-	436,959	-	-	436,959	233,809	-	233,809
Killdeer School	4,634,654	4,195,304	32,079	-	-	-	32,079	-	476,596	-	-	476,596	255,018	-	255,018
Kindred School	5,841,660	5,287,890	40,433	-	-	-	40,433	-	600,717	-	-	600,717	321,433	-	321,433
Kulm School	2,046,916	1,852,875	14,168	-	-	-	14,168	-	210,491	-	-	210,491	112,630	-	112,630

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North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement

Schedule of Pension Amounts by Employer
As of and for the year ended June 30, 2014
With Net Pension Liability for June 30, 2013

			Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Employer Name	Net Pension Liability for the year ended June 30, 2013	Net Pension Liability for the year ended June 30, 2014	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Lake Region Spec Ed	3,345,230	3,028,113	23,154	-	-	-	23,154	-	344,001	-	-	344,001	184,069	-	184,069
Lakota School	2,269,155	2,054,047	15,706	-	-	-	15,706	-	233,344	-	-	233,344	124,859	-	124,859
Lamoure School	2,791,190	2,526,594	19,319	-	-	-	19,319	-	287,027	-	-	287,027	153,583	-	153,583
Langdon Area School	3,900,174	3,530,450	26,995	-	-	-	26,995	-	401,067	-	-	401,067	214,604	-	214,604
Larimore School	4,126,765	3,735,561	28,563	-	-	-	28,563	-	424,368	-	-	424,368	227,072	-	227,072
Leeds School	1,996,239	1,807,002	13,817	-	-	-	13,817	-	205,280	-	-	205,280	109,841	-	109,841
Lewis And Clark School	4,700,473	4,254,883	32,534	-	-	-	32,534	-	483,365	-	-	483,365	258,640	-	258,640
Lidgerwood School	2,164,686	1,959,481	14,983	-	-	-	14,983	-	222,602	-	-	222,602	119,110	-	119,110
Linton School	3,152,937	2,854,049	21,823	-	-	-	21,823	-	324,227	-	-	324,227	173,488	-	173,488
Lisbon School	6,419,592	5,811,036	44,433	-	-	-	44,433	-	660,147	-	-	660,147	353,233	-	353,233
Litchville-Marion School	1,610,333	1,457,679	11,146	-	-	-	11,146	-	165,596	-	-	165,596	88,607	-	88,607
Little Heart Elem. School	187,327	169,569	1,297	-	-	-	1,297	-	19,263	-	-	19,263	10,308	-	10,308
Logan County	7,964	7,209	55	-	-	-	55	-	819	-	-	819	438	-	438
Lone Tree Elem. School	387,538	350,801	2,682	-	-	-	2,682	-	39,852	-	-	39,852	21,324	-	21,324
Lonetree Spec Ed Unit	275,591	249,466	1,907	-	-	-	1,907	-	28,340	-	-	28,340	15,164	-	15,164
Maddock School	1,829,585	1,656,147	12,663	-	-	-	12,663	-	188,142	-	-	188,142	100,672	-	100,672
Mandan Public Schools	32,652,211	29,556,889	226,002	-	-	-	226,002	-	3,357,731	-	-	3,357,731	1,796,663	-	1,796,663
Mandaree School	3,198,996	2,895,742	22,142	-	-	-	22,142	-	328,963	-	-	328,963	176,022	-	176,022
Manning Elem School	135,214	122,396	936	-	-	-	936	-	13,904	-	-	13,904	7,440	-	7,440
Manvel Elem. School	1,465,002	1,326,124	10,140	-	-	-	10,140	-	150,651	-	-	150,651	80,611	-	80,611
Maple Valley School	3,063,261	2,772,874	21,202	-	-	-	21,202	-	315,005	-	-	315,005	168,554	-	168,554
Mapleton Elem. School	1,246,953	1,128,746	8,631	-	-	-	8,631	-	128,228	-	-	128,228	68,613	-	68,613
Marmarth Elem. School	303,951	275,137	2,104	-	-	-	2,104	-	31,256	-	-	31,256	16,725	-	16,725
Max School	2,124,172	1,922,807	14,702	-	-	-	14,702	-	218,435	-	-	218,435	116,881	-	116,881
May-Port C-G School	4,827,862	4,370,196	33,416	-	-	-	33,416	-	496,464	-	-	496,464	265,649	-	265,649
Mcclusky School	1,456,934	1,318,821	10,084	-	-	-	10,084	-	149,821	-	-	149,821	80,167	-	80,167
Mckenzie County	103,775	93,937	718	-	-	-	718	-	10,671	-	-	10,671	5,710	-	5,710
Mckenzie County School	8,883,205	8,041,107	61,485	-	-	-	61,485	-	913,488	-	-	913,488	488,792	-	488,792
Medina School	1,826,194	1,653,077	12,640	-	-	-	12,640	-	187,793	-	-	187,793	100,485	-	100,485
Menoken Elem School	231,291	209,365	1,601	-	-	-	1,601	-	23,784	-	-	23,784	12,727	-	12,727
Midkota	1,996,621	1,807,347	13,820	-	-	-	13,820	-	205,319	-	-	205,319	109,863	-	109,863
Midway School	2,660,872	2,408,630	18,417	-	-	-	18,417	-	273,626	-	-	273,626	146,412	-	146,412
Milnor School	2,781,512	2,517,834	19,252	-	-	-	19,252	-	286,032	-	-	286,032	153,051	-	153,051
Minnewaukan School	3,220,376	2,915,095	22,290	-	-	-	22,290	-	331,162	-	-	331,162	177,199	-	177,199
Minot School	80,009,389	72,424,762	553,785	-	-	-	553,785	-	8,227,621	-	-	8,227,621	4,402,455	-	4,402,455
Minto School	2,125,827	1,924,305	14,714	-	-	-	14,714	-	218,606	-	-	218,606	116,972	-	116,972
Mohall Lansford Sherwood	4,420,634	4,001,572	30,597	-	-	-	30,597	-	454,588	-	-	454,588	243,242	-	243,242
Montpelier School	1,314,230	1,189,646	9,096	-	-	-	9,096	-	135,146	-	-	135,146	72,315	-	72,315
Morton County	51,650	46,754	357	-	-	-	357	-	5,311	-	-	5,311	2,842	-	2,842
Mott-Regent School	2,871,339	2,599,145	19,874	-	-	-	19,874	-	295,269	-	-	295,269	157,993	-	157,993

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North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement

Schedule of Pension Amounts by Employer
As of and for the year ended June 30, 2014
With Net Pension Liability for June 30, 2013

			Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Employer Name	Net Pension Liability for the year ended June 30, 2013	Net Pension Liability for the year ended June 30, 2014	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Mt Pleasant School	2,871,617	2,599,397	19,876	-	-	-	19,876	-	295,297	-	-	295,297	158,008	-	158,008
Munich School	1,497,830	1,355,841	10,367	-	-	-	10,367	-	154,027	-	-	154,027	82,417	-	82,417
N Ctrl Area Career And Tech Ctr	275,035	248,963	1,904	-	-	-	1,904	-	28,283	-	-	28,283	15,134	-	15,134
Napoleon School	2,774,718	2,511,683	19,205	-	-	-	19,205	-	285,333	-	-	285,333	152,677	-	152,677
Naughton Rural School	130,734	118,341	905	-	-	-	905	-	13,444	-	-	13,444	7,194	-	7,194
Nd Center For Distance Education	1,758,234	1,591,559	12,170	-	-	-	12,170	-	180,805	-	-	180,805	96,745	-	96,745
Nd Dept Of Public Instruction	219,901	199,055	1,522	-	-	-	1,522	-	22,613	-	-	22,613	12,100	-	12,100
Nd School For Blind	1,280,823	1,159,405	8,865	-	-	-	8,865	-	131,711	-	-	131,711	70,476	-	70,476
Nd School For Deaf	1,619,894	1,466,334	11,212	-	-	-	11,212	-	166,579	-	-	166,579	89,133	-	89,133
Nd United	585,630	530,114	4,053	-	-	-	4,053	-	60,222	-	-	60,222	32,224	-	32,224
Nd Youth Correctional Cnt	2,257,765	2,043,736	15,627	-	-	-	15,627	-	232,173	-	-	232,173	124,232	-	124,232
Nedrose School	2,597,612	2,351,367	17,979	-	-	-	17,979	-	267,121	-	-	267,121	142,932	-	142,932
Nelson County	21,172	19,165	147	-	-	-	147	-	2,177	-	-	2,177	1,165	-	1,165
Nesson School	2,681,442	2,427,250	18,560	-	-	-	18,560	-	275,741	-	-	275,741	147,544	-	147,544
New England School	2,170,416	1,964,668	15,023	-	-	-	15,023	-	223,191	-	-	223,191	119,425	-	119,425
New Public School	3,981,434	3,604,007	27,557	-	-	-	27,557	-	409,424	-	-	409,424	219,075	-	219,075
New Rockford Sheyenne School	3,248,725	2,940,756	22,486	-	-	-	22,486	-	334,077	-	-	334,077	178,759	-	178,759
New Salem-Almont	3,087,072	2,794,428	21,367	-	-	-	21,367	-	317,453	-	-	317,453	169,864	-	169,864
New Town School	7,540,036	6,825,266	52,188	-	-	-	52,188	-	775,366	-	-	775,366	414,885	-	414,885
Newburg United District	1,159,569	1,049,646	8,026	-	-	-	8,026	-	119,242	-	-	119,242	63,804	-	63,804
North Border School	5,287,087	4,785,888	36,595	-	-	-	36,595	-	543,688	-	-	543,688	290,918	-	290,918
North Sargent School	2,372,328	2,147,439	16,420	-	-	-	16,420	-	243,954	-	-	243,954	130,536	-	130,536
North Star	2,851,209	2,580,924	19,735	-	-	-	19,735	-	293,199	-	-	293,199	156,886	-	156,886
North Valley Area Career	1,172,708	1,061,539	8,117	-	-	-	8,117	-	120,593	-	-	120,593	64,527	-	64,527
Northern Cass School Dist	4,744,112	4,294,386	32,836	-	-	-	32,836	-	487,852	-	-	487,852	261,041	-	261,041
Northern Plains Spec Ed	375,187	339,620	2,597	-	-	-	2,597	-	38,582	-	-	38,582	20,644	-	20,644
Northwood School	2,581,591	2,336,865	17,868	-	-	-	17,868	-	265,473	-	-	265,473	142,050	-	142,050
Oakes School	3,792,382	3,432,877	26,249	-	-	-	26,249	-	389,983	-	-	389,983	208,673	-	208,673
Oberon Elem School	873,364	790,572	6,045	-	-	-	6,045	-	89,811	-	-	89,811	48,056	-	48,056
Oliver - Mercer Spec Ed	1,703,400	1,541,924	11,790	-	-	-	11,790	-	175,166	-	-	175,166	93,728	-	93,728
Page School	1,330,691	1,204,546	9,210	-	-	-	9,210	-	136,839	-	-	136,839	73,220	-	73,220
Park River Area School District	3,981,689	3,604,238	27,559	-	-	-	27,559	-	409,450	-	-	409,450	219,089	-	219,089
Parshall School	3,291,196	2,979,201	22,780	-	-	-	22,780	-	338,444	-	-	338,444	181,096	-	181,096
Peace Garden Spec Ed	873,850	791,012	6,048	-	-	-	6,048	-	89,861	-	-	89,861	48,083	-	48,083
Pembina Spec Ed Coop	335,101	303,334	2,319	-	-	-	2,319	-	34,459	-	-	34,459	18,439	-	18,439
Pingree - Buchanan School	1,515,425	1,371,768	10,489	-	-	-	10,489	-	155,836	-	-	155,836	83,385	-	83,385
Pleasant Valley Elem	33,233	30,083	230	-	-	-	230	-	3,417	-	-	3,417	1,829	-	1,829
Powers Lake School	1,872,936	1,695,388	12,964	-	-	-	12,964	-	192,600	-	-	192,600	103,057	-	103,057
Richardton-Taylor	3,079,826	2,787,869	21,317	-	-	-	21,317	-	316,708	-	-	316,708	169,465	-	169,465
Richland School	3,003,369	2,718,660	20,788	-	-	-	20,788	-	308,846	-	-	308,846	165,258	-	165,258

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North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement

Schedule of Pension Amounts by Employer
As of and for the year ended June 30, 2014
With Net Pension Liability for June 30, 2013

			Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Employer Name	Net Pension Liability for the year ended June 30, 2013	Net Pension Liability for the year ended June 30, 2014	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Robinson School	140,932	127,572	975	-	-	-	975	-	14,493	-	-	14,493	7,755	-	7,755
Rolette County	7,952	7,199	55	-	-	-	55	-	818	-	-	818	438	-	438
Rolette School	2,051,280	1,856,826	14,198	-	-	-	14,198	-	210,940	-	-	210,940	112,870	-	112,870
Roosevelt School	763,512	691,133	5,285	-	-	-	5,285	-	78,514	-	-	78,514	42,012	-	42,012
Roughrider Area Career &Tech Ctr	318,791	288,570	2,207	-	-	-	2,207	-	32,782	-	-	32,782	17,541	-	17,541
Roughrider Service Program	173,876	157,393	1,203	-	-	-	1,203	-	17,880	-	-	17,880	9,567	-	9,567
Rugby School	5,796,110	5,246,658	40,118	-	-	-	40,118	-	596,033	-	-	596,033	318,927	-	318,927
Rural Cass Spec Ed	1,995,382	1,806,226	13,811	-	-	-	13,811	-	205,192	-	-	205,192	109,794	-	109,794
Sargent Central School	2,642,027	2,391,572	18,287	-	-	-	18,287	-	271,688	-	-	271,688	145,376	-	145,376
Sawyer School	1,587,853	1,437,330	10,990	-	-	-	10,990	-	163,284	-	-	163,284	87,370	-	87,370
Scranton School	1,997,987	1,808,584	13,829	-	-	-	13,829	-	205,459	-	-	205,459	109,938	-	109,938
Se Region Career And Tech	2,509,614	2,271,711	17,370	-	-	-	17,370	-	258,072	-	-	258,072	138,090	-	138,090
Selfridge School	1,567,318	1,418,741	10,848	-	-	-	10,848	-	161,172	-	-	161,172	86,240	-	86,240
Sheyenne Valley Area Voc	1,344,952	1,217,455	9,309	-	-	-	9,309	-	138,306	-	-	138,306	74,005	-	74,005
Sheyenne Valley Spec Ed	2,954,058	2,674,023	20,446	-	-	-	20,446	-	303,775	-	-	303,775	162,545	-	162,545
Slope County	45,480	41,169	315	-	-	-	315	-	4,677	-	-	4,677	2,503	-	2,503
Solen - Cannonball School	3,279,481	2,968,597	22,699	-	-	-	22,699	-	337,240	-	-	337,240	180,451	-	180,451
Souris Valley Spec Ed	2,922,028	2,645,029	20,225	-	-	-	20,225	-	300,481	-	-	300,481	160,782	-	160,782
South Cent. Prairie Sp Ed	184,792	167,274	1,279	-	-	-	1,279	-	19,003	-	-	19,003	10,168	-	10,168
South Heart School	2,460,094	2,226,885	17,028	-	-	-	17,028	-	252,979	-	-	252,979	135,365	-	135,365
South Prairie Elem School	2,378,706	2,153,213	16,464	-	-	-	16,464	-	244,610	-	-	244,610	130,886	-	130,886
South Valley Spec Ed	1,254,211	1,135,316	8,681	-	-	-	8,681	-	128,975	-	-	128,975	69,012	-	69,012
Southwest Special Education Unit	120,374	108,963	833	-	-	-	833	-	12,378	-	-	12,378	6,623	-	6,623
St. John'S School	4,530,451	4,100,979	31,357	-	-	-	31,357	-	465,881	-	-	465,881	249,285	-	249,285
St. Thomas School	1,266,782	1,146,695	8,768	-	-	-	8,768	-	130,267	-	-	130,267	69,704	-	69,704
Stanley School	5,608,135	5,076,502	38,817	-	-	-	38,817	-	576,702	-	-	576,702	308,583	-	308,583
Starkweather School	1,107,595	1,002,599	7,666	-	-	-	7,666	-	113,898	-	-	113,898	60,945	-	60,945
Sterling School	409,277	370,479	2,833	-	-	-	2,833	-	42,087	-	-	42,087	22,520	-	22,520
Strasburg School District	1,620,982	1,467,319	11,220	-	-	-	11,220	-	166,691	-	-	166,691	89,193	-	89,193
Surrey School	4,259,074	3,855,327	29,479	-	-	-	29,479	-	437,974	-	-	437,974	234,352	-	234,352
Sweet Briar Elem School	143,687	130,066	995	-	-	-	995	-	14,776	-	-	14,776	7,906	-	7,906
Tgu School District	4,981,897	4,509,630	34,482	-	-	-	34,482	-	512,304	-	-	512,304	274,125	-	274,125
Thompson School	3,718,021	3,365,565	25,734	-	-	-	25,734	-	382,336	-	-	382,336	204,581	-	204,581
Tioga School	4,680,215	4,236,546	32,394	-	-	-	32,394	-	481,281	-	-	481,281	257,525	-	257,525
Turtle Lake-Mercer School	2,406,013	2,177,931	16,653	-	-	-	16,653	-	247,418	-	-	247,418	132,389	-	132,389
Twin Buttes Elem. School	879,441	796,073	6,087	-	-	-	6,087	-	90,436	-	-	90,436	48,391	-	48,391
Underwood School	2,842,840	2,573,348	19,677	-	-	-	19,677	-	292,338	-	-	292,338	156,425	-	156,425
United School	5,529,907	5,005,690	38,275	-	-	-	38,275	-	568,658	-	-	568,658	304,279	-	304,279
Upper Valley Spec Ed	4,212,737	3,813,383	29,158	-	-	-	29,158	-	433,209	-	-	433,209	231,803	-	231,803
Valley - Edinburg School	2,797,498	2,532,305	19,363	-	-	-	19,363	-	287,676	-	-	287,676	153,930	-	153,930

The accompanying notes are an integral part of the Schedule of Pension Amounts by Employer

North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement

Schedule of Pension Amounts by Employer
As of and for the year ended June 30, 2014
With Net Pension Liability for June 30, 2013

			Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Employer Name	**Net Pension Liability for the year ended June 30, 2013**	**Net Pension Liability for the year ended June 30, 2014**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Outflows of Resources**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Inflows of Resources**	**Proportionate Share of Plan Pension Expense**	**Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Employer Pension Expense**
Valley City School	11,623,335	10,521,481	80,451	-	-	-	80,451	-	1,195,265	-	-	1,195,265	639,565	-	639,565
Velva School	4,622,071	4,183,914	31,992	-	-	-	31,992	-	475,302	-	-	475,302	254,326	-	254,326
Wahpeton School	12,440,870	11,261,517	86,109	-	-	-	86,109	-	1,279,334	-	-	1,279,334	684,549	-	684,549
Ward County	51,951	47,026	360	-	-	-	360	-	5,342	-	-	5,342	2,859	-	2,859
Warwick School	3,037,899	2,749,916	21,027	-	-	-	21,027	-	312,397	-	-	312,397	167,158	-	167,158
Washburn School	2,851,545	2,581,227	19,737	-	-	-	19,737	-	293,233	-	-	293,233	156,904	-	156,904
West Fargo School	86,768,515	78,543,146	600,568	-	-	-	600,568	-	8,922,684	-	-	8,922,684	4,774,371	-	4,774,371
West River Student Services	1,151,918	1,042,720	7,973	-	-	-	7,973	-	118,455	-	-	118,455	63,383	-	63,383
Westhope School	1,867,264	1,690,253	12,924	-	-	-	12,924	-	192,017	-	-	192,017	102,745	-	102,745
White Shield School	2,735,627	2,476,298	18,935	-	-	-	18,935	-	281,313	-	-	281,313	150,526	-	150,526
Williston School	27,706,904	25,080,381	191,773	-	-	-	191,773	-	2,849,189	-	-	2,849,189	1,524,551	-	1,524,551
Wilmac Special Education	4,921,218	4,454,703	34,062	-	-	-	34,062	-	506,065	-	-	506,065	270,786	-	270,786
Wilton School	2,262,546	2,048,064	15,660	-	-	-	15,660	-	232,665	-	-	232,665	124,495	-	124,495
Wing School	1,255,461	1,136,448	8,690	-	-	-	8,690	-	129,103	-	-	129,103	69,081	-	69,081
Wishek School	2,176,493	1,970,169	15,065	-	-	-	15,065	-	223,816	-	-	223,816	119,760	-	119,760
Wolford School	914,353	827,675	6,329	-	-	-	6,329	-	94,026	-	-	94,026	50,312	-	50,312
Wyndmere School	2,723,959	2,465,736	18,854	-	-	-	18,854	-	280,113	-	-	280,113	149,884	-	149,884
Yellowstone Elem. School	919,319	832,170	6,363	-	-	-	6,363	-	94,536	-	-	94,536	50,585	-	50,585
Zeeland School	891,318	806,823	6,169	-	-	-	6,169	-	91,657	-	-	91,657	49,044	-	49,044
Total for all entities	**$ 1,157,555,127**	**$ 1,047,822,708**	**$ 8,012,012**	**$ -**	**$ -**	**$ -**	**$ 8,012,012**	**$ -**	**$ 119,035,086**	**$ -**	**$ -**	**$ 119,035,086**	**$ 63,693,590**	**$ -**	**$ 63,693,590**

The accompanying notes are an integral part of the Schedule of Pension Amounts by Employer

Note 1 – Nature and Organization of the Pension Plan

North Dakota Teachers' Fund for Retirement

The following brief description of TFFR is provided for general information purposes only. Participants should refer to NDCC Chapter 15-39.1 for more complete information.

TFFR is a cost-sharing multiple-employer defined benefit pension plan covering all North Dakota public teachers and certain other teachers who meet various membership requirements. TFFR provides for pension, death and disability benefits. The cost to administer the TFFR plan is financed by investment income and contributions.

Responsibility for administration of the TFFR benefits program is assigned to a seven-member Board of Trustees (Board). The Board consists of the State Treasurer, the Superintendent of Public Instruction, and five members appointed by the Governor. The appointed members serve five-year terms which end on June 30 of alternate years. The appointed Board members must include two active teachers, one active school administrator, and two retired members. The TFFR Board submits any necessary or desirable changes in statutes relating to the administration of the fund, including benefit terms, to the Legislative Assembly for consideration. The Legislative Assembly has final authority for changes to benefit terms and contribution rates.

Pension Benefits

For purposes of determining pension benefits, members are classified within one of three categories. Tier 1 grandfathered and Tier 1 non-grandfathered members are those with service credit on file as of July 1, 2008. Tier 2 members are those newly employed and returning refunded members on or after July 1, 2008.

Tier 1 Grandfathered

A Tier 1 grandfathered member is entitled to receive unreduced benefits when three or more years of credited service as a teacher in North Dakota have accumulated, the member is no longer employed as a teacher and the member has reached age 65, or the sum of age and years of service credit equals or exceeds 85. TFFR permits early retirement from ages 55 to 64, with benefits actuarially reduced by 6% per year for every year the member's retirement age is less than 65 years or the date as of which age plus service equal 85. In either case, benefits may not exceed the maximum benefits specified in Section 415 of the Internal Revenue Code.

Pension benefits paid by TFFR are determined by NDCC Section 15-39.1-10. Monthly benefits under TFFR are equal to the three highest annual salaries earned divided by 36 months and multiplied by 2.00% times the number of service credits earned. Retirees may elect payment of benefits in the form of a single life annuity, 100% or 50% joint and survivor annuity, ten or twenty-year term certain annuity, partial lump-sum option or level income with Social Security benefits. Members may also qualify for benefits calculated under other formulas.

Tier 1 Non-grandfathered

A Tier 1 non-grandfathered member is entitled to receive unreduced benefits when three or more years of credited service as a teacher in North Dakota have accumulated, the member is no longer employed as a teacher and the member has reached age 65, or has reached age 60 and the sum of age and years of service credit equals or exceeds 90. TFFR permits early retirement from ages 55 to 64, with benefits actuarially

reduced by 8% per year from the earlier of age 60/Rule of 90 or age 65. In either case, benefits may not exceed the maximum benefits specified in Section 415 of the Internal Revenue Code.

Pension benefits paid by TFFR are determined by NDCC Section 15-39.1-10. Monthly benefits under TFFR are equal to the three highest annual salaries earned divided by 36 months and multiplied by 2.00% times the number of service credits earned. Retirees may elect payment of benefits in the form of a single life annuity, 100% or 50% joint and survivor annuity, ten or twenty-year term certain annuity, partial lump-sum option or level income with Social Security benefits. Members may also qualify for benefits calculated under other formulas.

Tier 2

A Tier 2 member is entitled to receive unreduced benefits when five or more years of credited service as a teacher in North Dakota have accumulated, the member is no longer employed as a teacher and the member has reached age 65, or has reached age 60 and the sum of age and years of service credit equals or exceeds 90. TFFR permits early retirement from ages 55 to 64, with benefits actuarially reduced by 8% per year from the earlier of age 60/Rule of 90 or age 65. In either case, benefits may

Pension benefits paid by TFFR are determined by NDCC Section 15-39.1-10. Monthly benefits under TFFR are equal to the five highest annual salaries earned divided by 60 months and multiplied by 2.00% times the number of service credits earned. Retirees may elect payment of benefits in the form of a single life annuity, 100% or 50% joint and survivor annuity, ten or twenty-year term certain annuity, partial lump-sum option or level income with Social Security benefits. Members may also qualify for benefits calculated under other formulas.

Death and Disability Benefits

Death benefits may be paid to a member's designated beneficiary. If a member's death occurs before retirement, the benefit options available are determined by the member's vesting status prior to death. If a member's death occurs after retirement, the death benefit received by the beneficiary (if any) is based on the retirement plan the member selected at retirement.

An active member is eligible to receive disability benefits when: (a) a total disability lasting 12 months or more does not allow the continuation of teaching, (b) the member has accumulated five years of credited service in North Dakota, and (c) the Board of Trustees of TFFR has determined eligibility based upon medical evidence. The amount of the disability benefit is computed by the retirement formula in NDCC Section 15-39.1-10 without consideration of age and uses the member's actual years of credited service. There is no actuarial reduction for reason of disability retirement.

Member and Employer Contributions

Member and employer contributions paid to TFFR are set by NDCC Section 15-39.1-09. Every eligible teacher in the State of North Dakota is required to be a member of TFFR and is assessed at a rate of 11.75% of salary as defined by NDCC Section 15-39.1-04. Every governmental body employing a teacher must also pay into TFFR a sum equal to 12.75% of the teacher's salary. Member and employer contributions will be reduced to 7.75% each when the fund reaches 100% funded ratio on an actuarial basis.

A vested member who terminates covered employment may elect a refund of contributions paid plus 6% interest or defer payment until eligible for pension benefits. A non-vested member who terminates covered employment must claim a refund of contributions paid before age 70½. Refunded members forfeit all

service credits under TFFR. These service credits may be repurchased upon return to covered employment under certain circumstances, as defined by the NDCC.

Note 2 - Measurement Focus and Basis of Accounting

The schedules are presented in accordance with the standards issued by the Governmental Accounting Standards Board (GASB), which is the nationally accepted standard setting body for establishing accounting principles generally accepted in the United States of America for governmental entities. As prescribed by GASB they are reported using the economic resources measurement focus and the accrual basis of accounting.

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the Teachers' Fund for Retirement (TFFR) and additions to/deductions from TFFR's fiduciary net position have been determined on the same basis as they are reported by TFFR. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Note 3 - Net Pension Liability

The net pension liability of $1,047,822,708 was measured as of July 1, 2014, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that date. The Employers' proportions of the net pension liability are based on the Employers' shares of covered payroll in the pension plan relative to the covered payroll of all participating TFFR employers.

Note 4 – Actuarial Assumptions

The total pension liability in the July 1, 2014 actuarial valuation was determined using the following assumptions, applied to all periods included in the measurement:

Inflation	3.00%
Salary increases	4.50% to 14.75%, varying by service, including inflation and productivity
Investment rate of return	8.00%, net of investment expenses
Cost-of-living adjustments	None

For inactive members and healthy retirees, mortality rates are based on 80% of GRS Table 378 and 75% of GRS Table 379. For active members, mortality rates are based on the post-retirement mortality rates multiplied by 60% for males and 40% for females. For disabled retirees, mortality rates are based on the RP-2000 Disabled-Life tables for Males and Females multiplied by 80% and 95%, respectively.

The actuarial assumptions used were based on the results of an actuarial experience study dated January 21, 2010. They are the same as the assumptions used in the July 1, 2014, funding actuarial valuation for TFFR.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the Fund's target allocation are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Global Equities	57%	7.53%
Global Fixed Income	22%	1.40%
Global Real Assets	20%	5.38%
Cash Equivalents	1%	0.00%

Discount rate

The discount rate used to measure the total pension liability was 8 percent as of June 30, 2014. The projection of cash flows used to determine the discount rate assumes that member and employer contributions will be made at rates equal to those based on the July 1, 2014, Actuarial Valuation Report. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs of future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments for current plan members as of June 30, 2014. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2014.

Note 5 - ADDITIONAL FINANCIAL AND ACTUARIAL INFORMATION

Additional financial information supporting the preparation of the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer (including the disclosure of the net pension liability and the unmodified audit opinion on the financial statements) is located in the North Dakota Retirement and Investment Office's Comprehensive Annual Financial Report for the fiscal year ended June 30, 2014. The supporting actuarial information is included in the June 30, 2014, GASB Statements No. 67 and 68 Accounting and Financial Reporting for Pensions actuarial valuation for each retirement plan. The additional financial and actuarial information is available at www.nd.gov/rio or by contacting RIO at: ND Retirement and Investment Office, 1930 Burnt Boat Drive, P.O. Bo 7100, Bismarck, ND 58507-7100 or by calling (701) 328-9885.

Independent Auditors' Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

Governor Jack Dalrymple
The Legislative Assembly
David Hunter, Executive Director/CIO
State Investment Board
Teacher's Fund for Retirement Board
North Dakota Retirement and Investment Office

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the schedule of employer allocations and the total for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense as of and for the year ended June 30, 2014 and the net pension liability as of and for the year ended June 30, 2013 (specified column totals), included in the schedule of pension amounts by employer of the North Dakota Retirement and Investment Office - North Dakota Teachers' Fund for Retirement (TFFR), and have issued our report thereon dated April 10, 2015.

Internal Control over Financial Reporting

Management of the North Dakota Retirement and Investment Office (RIO), which includes TFFR, is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audits, we considered RIO's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer, but not for the purpose of expressing an opinion on the effectiveness of RIO's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of RIO's internal control over financial reporting.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audits we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether RIO's schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer amounts. However, providing an opinion on compliance with those provisions was not an objective of our audits, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the result of that testing, and not to provide an opinion on the effectiveness of RIO's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering RIO's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

CliftonLarsonAllen LLP

Baltimore, Maryland
April 10, 2015

New GASB Pension Standards Talking Points

The Government Accounting Standards Board (GASB) recently approved two new statements (GASB 67 and 68) that will change the way public retirement systems (i.e.TFFR) and employers (i.e. school districts, cities, counties, and the state) will account for and disclose pension information.

- GASB changes were designed to improve pension information and increase transparency, consistency, and comparability of pension information.

- New GASB requirements do not affect TFFR's funded ratio, or statutory contribution requirements. New requirements do not change the actual pension liability – only where and how pension costs are accounted for in financial statements.

- GASB 68 requires the entities that are actually making the pension contributions (i.e. school districts) to report their proportionate share of the collective net pension liability, regardless of whether the entities are legally required to fund the plan. The ND Legislature has the legal authority to set member and employer contribution rates, and employers are liable for paying those contributions required by law.

- Participating employers/school districts will need to include the new GASB 68 requirements in their June 30, 2015 financial statements.

- TFFR will provide most of the required GASB 68 information needed by employers/school districts including actuarial and financial calculations, template footnote disclosures, and audited schedules. Allocation % and $ amounts are calculated based on annual covered payroll. School districts should work closely with their financial auditors on implementation.

- The presence of a large number on the employer/school district balance sheet which represents unfunded pension costs could give the incorrect impression that school districts have a large debt that must be paid immediately. That is not the case. Pension costs are paid off over long periods – much like home mortgages – through regular contributions paid to the retirement plan.

- While it is unknown whether the new GASB statements will affect a particular employer/school district's bond rating, most rating agencies already consider unfunded pension liabilities as debt-like instruments, and have historically incorporated pension information into their analysis of a government's ability to meet its debt obligations. For example, in a recent report, Moody's Investor Services indicated that the new accounting will have little credit impact because Moody's already approaches the liabilities in a similar way.

- Steps are being taken to reduce TFFR's net pension liability. Increased member and employer contributions, benefit changes, and solid investment performance is expected to show positive funding results. Due to legislative action, TFFR's long term funding outlook is positive, and benefits are secure for past, present and future ND educators.

- Additional GASB information is available in the Employer section of the TFFR website.

ND Teachers' Fund for Retirement
701.328.9895 or 800.952.2970

April 2015

TFFR Board Calendar and Education Plan 2015-16

JULY 23, 2015 – 1 pm
Election of Officers
Asset Liability Study Planning
Annual TFFR Program Review
Annual Customer Satisfaction Reports
Annual Technology Review
Qtrly Audit Services Update (3/30)
Qtrly Investment Update (3/30)
Education: Member/Employer
Web Services Demo

SEPTEMBER 24, 2015 – 1 pm
IRS Qualification Review Results
Asset Liability Study Report
Annual TFFR Investment Report (6/30)
Annual RIO Budget and Expense Report
Annual Retirement Statistics Report
GASB Update

OCTOBER 22, 2015 – 1 pm
2015 Actuarial Valuation Report – Segal
2015 GASB Report - Segal
Asset Liability Study Report
Annual TFFR Program Audit Report (6/30)
Education: Actuarial Valuation Process

JANUARY 21, 2016 – 1 pm
2017 Legislative Planning
Actuarial Audit Planning
Annual Retirement Trends Report
Qtrly Audit Services Update (9/30)
Qtrly Investment Update (9/30)
GASB Update
Education: Fiduciary Duties/Ethics

MARCH 17, 2016 – 1 pm
2017 Legislative Planning
Annual Pension Plan Comparisons
Qtrly Audit Services Update (12/30)
Qtrly Investment Update (12/30)
Education: Disability & QDROs

APRIL 21, 2016 – 1 pm
Actuarial Audit Report
2016-17 Board Calendar and Educ Plan
Education: Open Records/Open Meetings

Note: Agenda items or education topics may be rearranged if needed.

4/15/15

Spotlight *on*

The Annual Required Contribution Experience of State Retirement Plans, FY 01 to FY 13

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National Association of State Retirement Administrators

March 2015

Executive Summary

After its creation in the 1990s, the annual required contribution (ARC) quickly became recognized as the unofficial measuring stick of the effort states and local governments are making to fund their pension plans. A government that has paid the ARC in full has made an appropriation to the pension trust to cover the benefits accrued that year and to pay down a portion of any liabilities that were not pre-funded in previous years. Assuming projections of actuarial experience hold true, an allocation short of the full ARC means the unfunded liability will grow and require greater contributions in future years.

This study evaluates the ARC that was received by 112 state public pension plans, including the District of Columbia, from fiscal years 2001 to 2013. This study finds that although variation exists in ARC effort among states and other pension plan sponsors, i.e., cities, school districts, etc., most governments made good-faith efforts to fund their pension plans, and only a few severely neglected their pension funding responsibilities. This ARC experience unfolded during a tumultuous period, as capital markets declined sharply in 2000-02 and again in 2008-09, and states and local governments twice experienced economic recessions. Combined with other factors, the market declines caused required pension contributions to rise significantly, while the economic recessions challenged the ability of states and local governments to respond.

States and their political subdivisions establish and maintain funding policies in the form of statutes, ordinances, board rules, and case law that prescribe how public pension benefits will be funded. While federal regulations governing private sector pension plans often are cited as onerous and creating volatility and uncertainty,[i] funding policies for public plans typically are designed to establish contributions that will remain approximately level as a percent of payroll over time. This objective is intended to promote intergenerational cost equity and budget predictability.

Although many factors play a role in determining how a pension plan is financed, this study finds that plans with strong required contribution governance arrangements generally have received a significantly higher portion of their ARC during this study's measurement period. Some states, however, have consistently received a high portion of their ARC even without a statutory requirement to do so. Conversely, some of the plans that have received a small portion of their ARC, have statutory requirements but failed to receive their ARC. Nevertheless, even in the periods of recession during this study, most state and local governments increased pension contributions and continued to provide pension benefits for former, current and future employees.

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NASRA gratefully acknowledges the financial support from AARP to undertake this research project

Introduction

About the Annual Required Contribution

The annual required contribution, or ARC, refers to the amount needed to be contributed by employers to adequately fund a public pension plan. The ARC is the sum of two factors: a) the cost of pension benefits being accrued in the current year (known as the normal cost), plus b) the cost to amortize, or pay off, the plan's unfunded liability. The ARC is the required employer contribution after accounting for other revenue, chiefly expected investment earnings and contributions from employee participants.

The ARC was introduced by the Governmental Accounting Standards Board (GASB) in 1994 in its Statements 25 and 27 and was intended to provide a measure of the extent to which employers were funding the pension benefits they were promising their workers. Although GASB standards do not have the force of law, they are an integral part of Generally Accepted Accounting Principles, with which the vast majority of pension plan sponsors (the entities that sponsor pension plans, such as states, cities, school districts, counties, etc.) seek to comply.

For many pension plan sponsors, public sector pension funding policies (in the form of statutes, ordinances, board rules, legal rulings, etc.) prescribe how pension benefits will be funded. Funding policies for many plan sponsors require pension contributions to be made in a manner consistent with the ARC, i.e., an amount to fund benefits accrued in the current year (the normal cost) and an amount to eliminate the unfunded liability over the course of the funding period. Funding policies generally do not specifically mention GASB or the ARC.

Countless studies document the importance of making consistent and adequate contributions to fund pension benefits.[ii] In general, these studies find that adequate contributions play a vital role in the long-term funding condition of public pension plans. Moreover, as a matter of simple mathematics, just as a failure to consistently and fully pay one's mortgage will increase its long-term cost, so also will a failure to pay the ARC increase the long-term cost of funding a pension plan.

New GASB statements governing public pensions (Statement 67) and the employers that sponsor them (Statement 68), supplant Statements 25 and 27 and eliminate the ARC as a required disclosure by public retirement systems and their sponsoring employers. Statements 67 and 68 were issued in 2012 and take effect in fiscal years 2014 and 2015, respectively. Public retirement systems are, nonetheless, expected to continue to calculate an actuarially determined contribution (ADC, which is a contribution amount, similar to the ARC, determined in compliance with professional actuarial practices and methods). Plans that do calculate an ADC are required by the new GASB standards to report this amount, along with the assumptions used to make the calculation and a history of contributions paid by employers and received by the pension plan. Thus, public retirement systems and their employers beginning in FY 14 and FY 15, respectively, no longer will be required to report an ARC as defined by GASB. Instead, they must include in the required supplementary information of their financial reports detailed information regarding the calculation and payment of an ADC.

The new GASB Statements, 67 and 68, stipulate the calculation and disclosure of public pension liabilities on an accounting basis only and no longer serve as an indicator of a pension plan's funding condition.

Some pension plan sponsors issued pension obligation bonds (POBs) during the measurement period of this study and used the proceeds from those bonds to make contributions to their pension plan(s). A POB is a security, issued by a government that sponsors a pension plan, whose proceeds are used to fund the pension plan, typically to reduce the plan's unfunded liability, and sometimes to fund the cost of current contributions. POB proceeds typically are invested with other assets held in the pension trust fund. POB's are issued with the expectation that the return on the invested proceeds will exceed the cost of borrowing.

The addition of POB proceeds can cause an ARC payment to spike in the year in which the proceeds are received by the plan. This study treats POB proceeds as a normal employer contribution, and, for retirement systems that have considered POB proceeds as contributions and reported on them, incorporates the contribution into the calculations.

The ARC is affected by the many factors on which it is based, including actuarial methods and assumptions. Thus, as investment return assumptions, actuarial cost methods, mortality assumptions, amortization periods, etc., differ from one another, so will the ARC be different. As a result, the ARC for two hypothetical plans with identical financial and demographic compositions could differ. The discussion that follows includes examples of actuarial methods and assumptions that can affect the ARC.

About this study

NASRA compiled comprehensive information regarding the ARC experience of 112 state-sponsored and statewide public pension plans in the U.S. for fiscal years 2001 through 2013. Together, these plans account for more than 80 percent of all public pension assets and participants in the U.S. As the new GASB policies take effect, and the ARC as defined and prescribed in outgoing Statements 25 and 27 comes to a close, this effort to compile and review this information is intended to provide an assessment of the

ARC experience of individual states and for statewide plans in the aggregate.

The data in this study includes the ARC experience for each state, including the weighted average of the ARC paid to the statewide plans in each state for the fiscal year 2001-2013 period. In addition to covering much of the lifetime of the ARC, this period also was eventful due to the effects of two momentous market declines, in 2000-02 and again in 2008-09, and two economic recessions, in 2001 and 2007-09. The market declines inflicted significant investment losses on public pension portfolios, and the recessions, particularly the latter one, decimated state and local government revenues. Each of these events challenged the ability of state and local pension plan sponsors to pay their annual required contribution: the market declines increased the ARC, while the recessions impaired the ability of employers to make required contributions.

For each of the 112 plans for each fiscal year from 2001 to 2013, the information collected for this study includes the ARC, expressed in dollars, and the percentage of the ARC received. The data was aggregated by year and by plan, to identify a median and weighted average ARC effort, expressed as a percentage, for each FY and a weighted average for each state for each FY.

Key Findings

1. Policies (i.e., statutes, constitutional provisions, or retirement board requirements) that require payment of the ARC generally produce better pension funding outcomes than polices that do not require payment of the ARC. Some plan sponsors, however, consistently pay their ARC without a requirement to do so, and some have challenged requirements to pay their ARC and underfunded their pension plans.
2. Only a few states have conspicuously failed to adequately fund their pension plans.
3. The few states that conspicuously failed to fund their pension plans have a disproportionate effect on the total ARC experience.
4. Most states made a good-faith effort to fund their pension plans; a good-faith effort is defined here as paying 95 percent or more of the ARC.
5. Failing to make even a good-faith effort to fund the ARC increases future costs of funding the pension.
6. Policy constraints that prevent payment of the ARC can negatively affect the ability of employers to fund the pension plan.

Review of Findings

As shown in Figure A, the actual ARC combined for all plans rose sharply during the measurement period from $27.7 billion to $93.7 billion. Other studies suggest that FY 2001 was at or near the low point of required pension contributions during the past 30 years.[iii] The increase that began in FY 01 is due to several factors, including the fact that required costs of public pensions as a group were unusually low in FY 01 due to the strong investment returns enjoyed by public pension funds from 1995 to early 2000. In addition to reducing

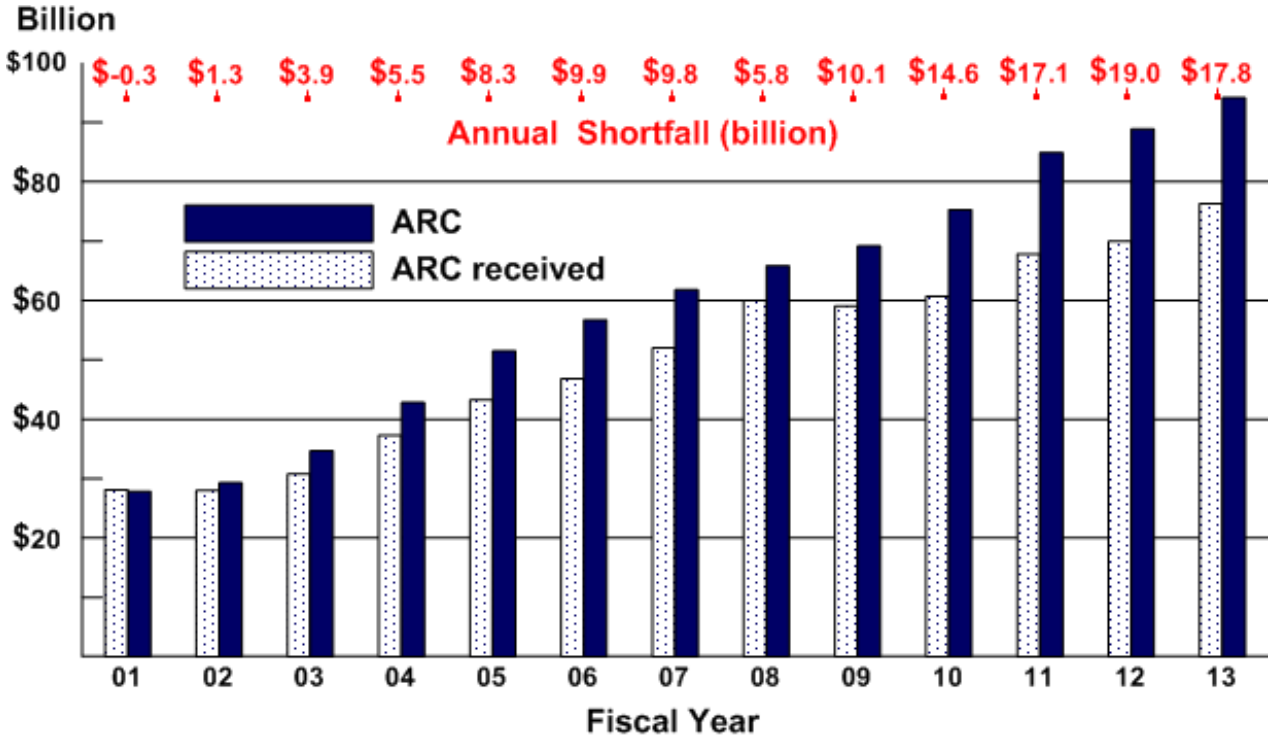


Figure A. Combined Annual Required Contribution and ARC received, for statewide plans

required contributions (including to as low as zero in some cases), these investment returns also strengthened pension funding levels, which created pressure in many states to increase pension benefit levels, resulting in higher required pension contributions. (Most employees are required to contribute to their pension plan, and these required contributions continued unabated, as employer contributions in many cases declined.)

In some states, the combination of the benefit increases approved in the late 1990s made at the end of the millennium, followed by the market losses in 2000-02 created what some have referred to as a "perfect storm" for public pensions and their sponsoring employers. Employers whose required pension costs reached unusually low levels, faced significant cost increases to counteract the effects of market losses and/or benefit increases at a time when economic conditions created fiscal struggles for state and local governments.

As shown in Figure B, on a weighted average basis, the ARC paid to statewide retirement systems declined sharply from above 100 percent in FY 01 to 83 percent in FY 06, reached its low point at 79 percent in FY 12, and recovered in FY 13 to 81 percent. This decline in ARC effort occurred even as employers were increasing their contributions, as shown in Figure A. The decline in the weighted average of ARC contributed is a result primarily of rising ARCs and a weakened capacity of state and local governments to meet higher contribution requirements amid a challenging fiscal environment. Appendix B provides the ARC experience during this timeframe for each state and plan in the study.

Most States are Making an Effort to Fund Their Plans

Figure C displays the weighted average ARC effort for each state for the FY 2001-2013 period. Despite perceptions that many states have fallen far short of their pension funding requirements, in fact, most states have made a reasonable effort to fund their share of pension contributions during the period covered by this study. Figure C 1 illustrates the distribution of states' ARC experience on a weighted average basis and illustrates that on a weighted average basis for the measurement period:

- The median ARC experience is 95.1 percent, meaning that one-half of the plans received at least 95.1 percent of their required contributions.
- All but two states paid at least one-half of their ARC.
- All but six states paid at least 75 percent of their ARC.
- The average plan received 89.3 percent of its ARC.
- The weighted average ARC received was 84.4 percent: of $779 billion of combined ARC, plans received $657 billion.

As an illustration of the effect that a few states have on the aggregate experience, excluding the two states with the lowest weighted average ARC experience increases the weighted average from 84.4 percent to 88.5 percent.

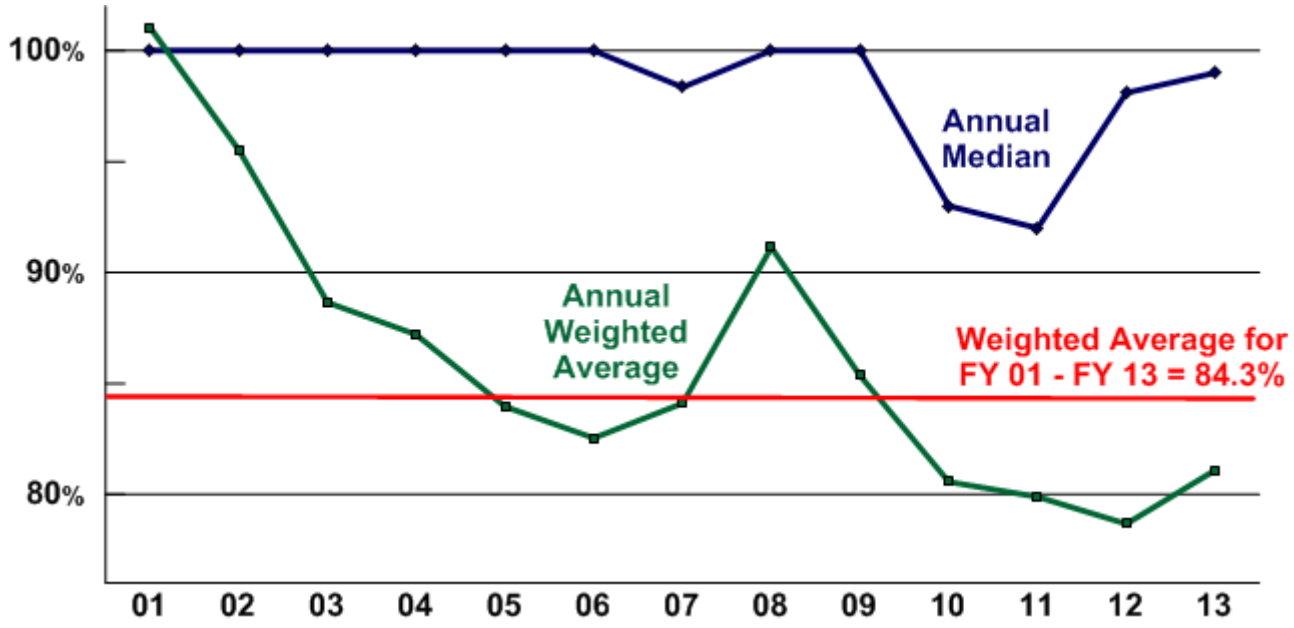


Figure B. Median and annual and weighted average contributed to statewide plans

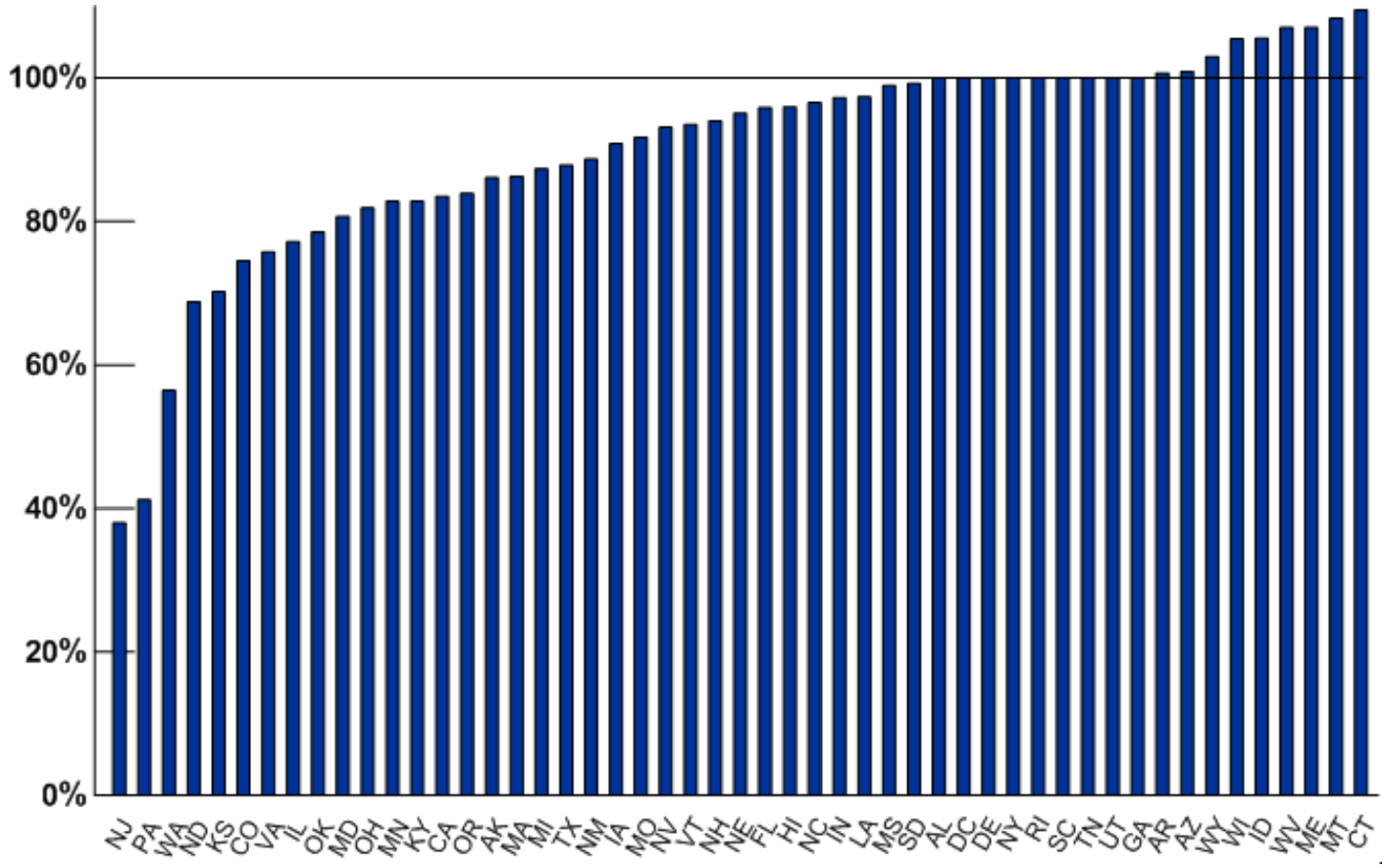


Figure C 1. Weighted average of Annual Required Contribution paid, by state

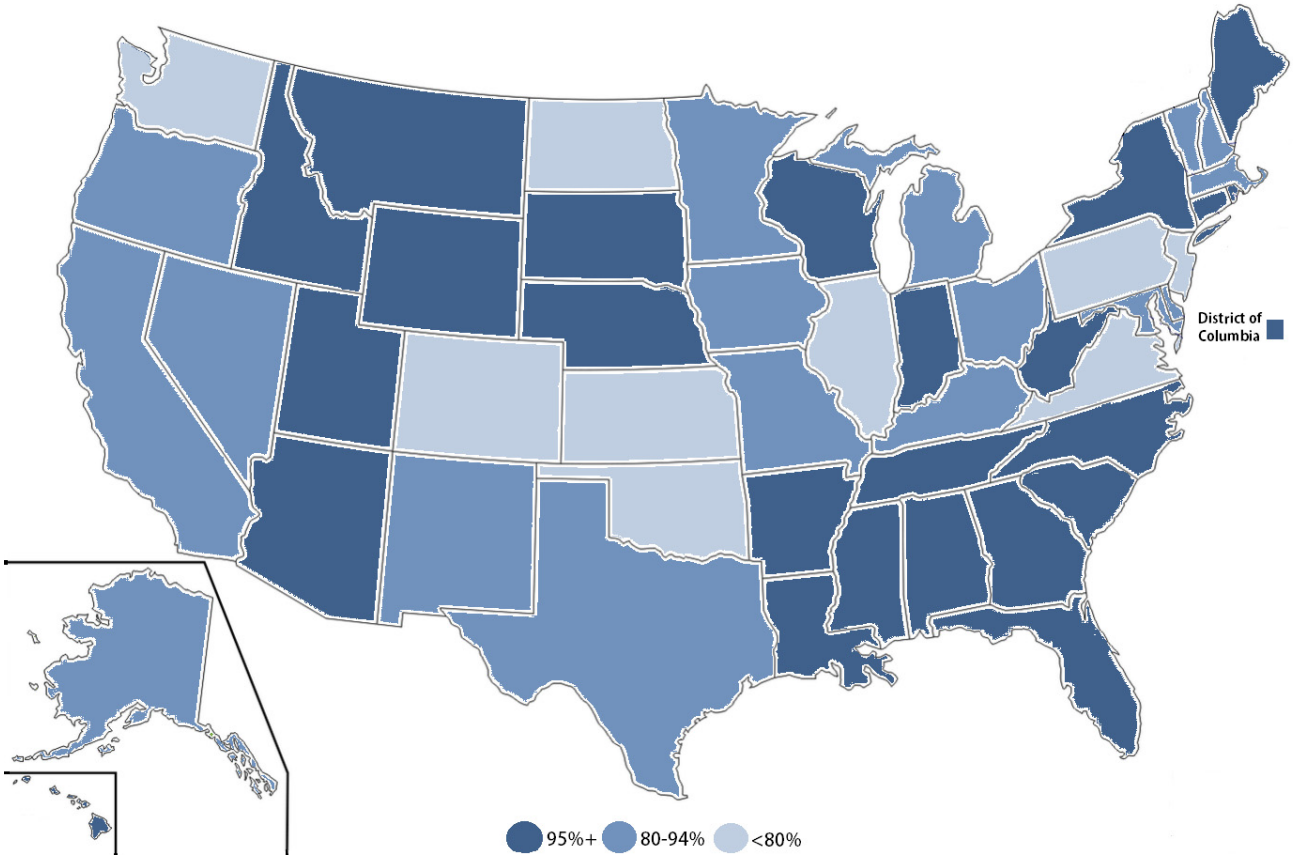


Figure C 2. Weighted average of Annual Required Contribution paid, by state

Notably, this effort to fund pension plans occurred as the ARC grew sharply during the period measured. From 2001 to 2013, the ARC grew by 239 percent, from $27.7 billion to $93.8 billion. Actual contributions grew more slowly, albeit significantly: by 174 percent, from $27.8 billion to $76.2 billion.

Measured as a percentage of total worker payroll, employer pension contributions declined steadily over the 20-year period from 1983 to 2002, reaching a low point in 2002 following the strong investment gains of 1995 to 1999.[iv] Much of the increase in required contributions that followed 2002 was caused by some combination (depending on the plan) of a) the significant investment market declines in 2000 -02 and 2008-09; b) higher benefit levels approved by many plans in the late 1990s; and c) the failure by some employers to make required contributions.

ARC Background

Key actuarial factors affect the ARC

Although the ARC is defined by GASB in its Statements 25 and 27 (now replaced by Statements 67 and 68), required contributions differ significantly for plans because of the actuarial factors a plan uses. Some of the factors that have the largest effect on the ARC include the investment return assumption, the amortization method and period, and the actuarial cost method. Other actuarial methods and assumptions also affect a plan's ARC, although to a lesser extent than these.

Actuarial Assumptions

The condition and cost of a pension plan is measured by a series of mathematical calculations known as an actuarial valuation. An actuarial valuation involves the use of numerous assumptions, which fall into one of two broad categories: demographic and economic. Demographic assumptions are those associated with the behavior of plan participants, e.g., the age when they will retire, life expectancy, etc. Economic assumptions are associated with such factors as the rate of salary growth and the expected return on invested assets. These assumptions affect the plan's cost and funding condition differently, as some assumptions have a larger effect than others.

Investment Return Assumption

Of all the factors used in actuarial assumptions, the investment return typically has the greatest effect on the plan's ARC (i.e., the contribution needed to fund the plan). This is because, for most public pension plans, actual investment earnings account for a majority of revenue over time; as a result, even a relatively minor change in the assumed rate of investment return can significantly affect the required contribution to the plan.

As an illustration, the Colorado Public Employees' Retirement Association (PERA) publishes in its annual financial report a sensitivity analysis showing the effect minor changes in the investment return assumption would have on the ARC of PERA's five pension plans. At the time of this study, PERA's investment return assumption is 7.5 percent. According to its FY 13 annual financial report, a reduction in the investment return assumption to 7.0 percent would result in an increase to the plans' ARC ranging from 11 percent for one PERA plan to more than 25 percent for another. Likewise, an increase in the investment return assumption would have a similar, but opposite, effect.

Amortization Policy

A plan's amortization policy is "the length of time and the structure selected for increasing or decreasing contributions to systematically eliminate any unfunded actuarial accrued liability or surplus."[v] Funding a pension plan is analogous to paying off a home mortgage: just as home mortgages can be structured differently, such as fixed vs. variable rates, and paid over varying lengths of time, such as 15 or 30 years, so too are the amortization policies of public pension plans. One of the main factors that determine the ARC is the cost to amortize the plan's unfunded liability, so the ARC can be significantly affected by both the structure and the length of time used to eliminate the unfunded liability.

The amortization structure, or method, determines the amount and timing of paying down the plan's unfunded liability, which is the amount owed in future benefits for which assets have not been accumulated. As a result, the structure or method the plan chooses affects the ARC.

The two primary amortization methods are the *Level Dollar* and *Level Percent of Payroll*. Most plans, by far, use the level percent of payroll method. As its name implies, the Level Percent of Payroll method identifies an annual required payment, expressed as a *percentage of payroll*, that remains steady from one year to the next. Under this approach, the dollar amount typically increases each year to reflect salary growth. Typically, the Level Percent of Payroll method begins the amortization period with a lower annual payment that increases steadily throughout the amortization period. This is the most common amortization method used among public pension plans.[vi]

The differing approaches of level percentage and level dollar result in different ARC outcomes, although both are intended to pay off a plan's unfunded liability within a designated amortization period.

Amortization Period

The period over which the obligation is amortized, or paid off, affects the annual cost to pay off the unfunded liability. Under its previous standards,[vii] GASB established a maximum amortization period of 30 years, meaning that public

pension plans and their sponsoring employers wishing to comply with GASB standards would need to calculate the annual cost of amortizing their pension plan's unfunded liability on the basis of an amortization period not to exceed 30 years. Some plans used amortization periods shorter than 30 years.

Similar to a home mortgage, other factors held equal, the ARC for a plan using a 30-year amortization period is less than the ARC for a plan using a 15-year amortization period. Of course, the plan using the shorter amortization period would also be in a position to eliminate their unfunded liability more quickly than the plan using the longer amortization period, and the total cost of amortizing the ARC over a longer period will be higher. A pension plan may elect to use a longer amortization period to reduce the annual cost of the plan.

Investment returns and the ARC

Although the ARC is affected by multiple factors, actual returns on the plan's investment portfolio can have a major effect on the required contributions to a public pension plan. The ARC usually increases following periods of poor investment performance, and decreases following periods of strong investment performance. Similar to a credit card or a home mortgage, missing a payment will cause future payments and costs to be higher.

The payment of required contributions can have an effect on a plan's investment earnings. The typical public plan model is to invest accumulated contributions over time to grow the pension trust fund from which benefits are distributed. As a result, a shortfall in required contributions has a compounding effect on a fund's revenues. Since contributions form the basis for investments, a contributions shortfall reduces revenue both from the missed contributions and the foregone investment earnings those revenues would have otherwise generated.

As shown in Figure A, the aggregate ARC for the plans included in this study has been growing steadily throughout the measurement period. This increase in the ARC is due primarily to two factors: a) strong investment returns from 1995 to 1999 that reduced required contributions to low levels by historical standards; and b) the steep market losses of 2000-2002 and 2008-09. In some states, higher ARCs are attributable to the chronic failure to pay their full ARC, which increased unfunded liabilities and the cost associated with amortizing those liabilities.

Actuarial Cost Method

An actuarial cost method determines how pension costs are allocated during the portion of plan participants' lives. Outgoing GASB standards[viii] permitted the use of one of six different cost methods, although the one used most often (by far) was *Entry Age*, followed by *Projected Unit Credit*, then *Aggregate Cost*. The entry age and aggregate cost methods are designed to produce a pension contribution that is a level percent of pay throughout the working life of a plan participant. The aggregate cost method differs from entry age in that under the aggregate cost method, the actuarial value of assets and liabilities are always equal, so there is no unfunded liability. By contrast, the projected unit credit method produces lower costs in the early years of an employee's career, and increases those costs in the latter years of the employee's career. As a result, plan costs using the projected unit credit method are projected to rise, whereas costs for plans using the entry age and aggregate cost methods are projected to remain stable.

The Process for Approving Pension Contributions

Laws and practices governing payment of pension contributions vary widely among states: some states require that the amount recommended by the retirement system actuary be paid; some states consistently pay the amount recommended by the retirement system actuary, even if it is not legally required; other states appropriate pension contributions in amounts that are not linked to an actuarial calculation. Still other states base their contributions on a statutorily fixed rate, such as a percentage of employee payroll.

Because employer pension contributions generally are approved as part of a budgeting and legislative appropriations process, there is a delay between identification of the required contribution and the actual appropriation. Depending on the state's basis for determining and funding pension contributions, this delay can result in a delay in meeting the full ARC, as the budgeting and legislative appropriations process requires time to "catch up" with the pension plan's actuarial experience. (New GASB standards, effective in FY 14, require the use of the entry age method for purposes calculating the condition of the plan in compliance with GASB Statement 67.)

Pension Obligation Bonds

A pension obligation bond (POB) is a type of bond issued by the sponsoring employer of a governmental pension plan in exchange for periodic payments, typically over a 20- to 30-year period. Governments that issue POBs typically seek to invest borrowed funds that will produce investment earnings greater than the interest rate at which the funds are borrowed. POBs do not enjoy the tax-exempt status of other municipal bonds, such as those used to finance infrastructure and other public works. Some states and local governments issued POBs during the measurement period of this study, and the proceeds of these bonds are counted in the ARC experience.

Following are examples of three POB issuances that materially affected the plan's ARC:

- The State of Illinois issued $10 billion in pension obligation bonds in 2004 and distributed the proceeds among five statewide pension funds, including the State Employees' Retirement System, the Teachers' Retirement System, and the State Universities Retirement System (SURS) . Of these three plans, only the SURS counted their portion of the bond proceeds, in the amount of $1.4 billion, toward their ARC.
- The State of Connecticut issued $2.28 billion in FY 2008 to reduce the unfunded liability of the Teachers' Retirement System.
- The Denver Public Schools plan issued $750 million in POBs in FY 2008 which was deposited into the pension fund and counted as employer contributions

The proceeds from a POB can cause the appearance of a spike in a retirement system's financial report, and is evident in Appendix B of this report, which details the ARC experience of plans included in this study. The Government Finance Officers Association (GFOA) has prepared a Best Practice on the use of POBs, in which GFOA recommends the use of caution in using POBs.[ix] Also, a Center for State & Local Government Excellence issue brief on this topic suggests that POBs issued to-date generally have not fared well.[x]

Of course, employers who issue POBs must pay for them, usually via annual debt amortization payments, over the life of the issuance. The cost of paying off these issuances is not always reflected in public retirement system financial reports.

States' Experiences

Outlier States

New Jersey and Pennsylvania have weighted average ARC experiences that are notably lower than those of other states. New Jersey's average is 38.0 percent and Pennsylvania's is 41.2 percent. For both states, the chronic underfunding began when required contributions had dropped to very low levels by historical standards, including to as low as zero for some plans, chiefly as a result of strong investment gains experienced from 1995 to 1999. When required contribution rates rose, chiefly as a result of the 2000-02 market decline, the states experienced great difficulty in restoring the stream of pension funding payments that had previously been in place.

The predictable result of this underfunding was a precipitous decline in the funding level of the plans in these states that are part of this analysis. The average percentage drop in funding level from FY 01 to FY 13 for the five total plans in New Jersey and Pennsylvania that are included in this study was 47 percent, which is nearly twice the size of the decline in the funding level for the full group.

Unsurprisingly, the issue of how pensions in New Jersey and Pennsylvania are funded has become a prominent topic of discussion in these states. A 2010 budget agreement between the New Jersey governor and legislature provided that the state would fund at least one-seventh of its ARC in FY 11, growing by another one-seventh each year until reaching full funding of the ARC in FY 17. This agreement was not fulfilled in FY 2014.

Pennsylvania's pension funding effort began to show positive effects as the state began making progress toward restoring its pension funding effort. Employer contribution rates over the past three years (rising from 12 percent of pay to 21 percent) are higher than at any time over the past 20 years and are scheduled to increase to even higher levels over the coming years. Prior projections of employer contribution rates have declined from their original level over the last several years as a result of recent efforts made to fund the state's plans: employer contribution rates would have been higher were it not for actions taken by the Pennsylvania General Assembly to fund the plans.

Contribution Governance Arrangements

Laws and practices governing payment of pension contributions vary widely among states: some states require that the amount recommended by the retirement plan actuary (which usually is the ARC) be paid; some states consistently pay the amount recommended by the retirement system actuary, even though it is not required; other states appropriate pension contributions in amounts that are not linked to an actuarial calculation. Other states base their contributions on a statutory rate, such as a fixed percentage of employee payroll. Public plans generally adhere to the following objectives in establishing a funding policy:[xi]

- **Payment of earned benefits:** Required contributions should be sufficient to ensure accumulation of assets to pay promised benefits to current plan participants. This objective should be inclusive of the benefits promised to current retirees, accrued benefits earned by active workers, as well as future benefits projected to be earned by current workers.
- **Contribution rate and budgetary predictability:** Plan funding policy should be developed in such a way that contributions, as a percent of payroll, are kept relatively level and free from year-to-year volatility.
- **Intergenerational equity:** Contributions by a given generation of taxpayers should be commensurate with the costs of the benefits for plan participants who provide essential government services to those taxpayers during their lifetime. Efforts should be made to ensure that current taxpayers are not under,

or overcharged at the expense, or to the advantage of future taxpayers.

Most states' contribution governance arrangement is established in state statute or constitutions, or both. For most states, the statutory language contains an implicit or explicit obligation to pay the full ARC amount as identified by its component parts, i.e., the normal cost and the amount required to pay down the unfunded liability over a specified timeframe. For those states subject to such requirements, it is generally required that these figures are to be determined and reported to the board by the plan's actuary. Some state laws require payment of the ARC while also placing a limit on increases in contributions by capping the amount by which the employer contribution may rise in subsequent years.

Kansas statutes, for example, until FY 13 imposed a limit of 0.6 percent of the prior year's rate on increases to required contribution rates. This restriction is intended to protect public employers from the budgetary consequences of rising pension costs. This limitation also prevented the pension plan from receiving adequate contributions, resulting in a weighted average ARC received during the measurement period of 70.2 percent. Legislation approved in 2012 increased the annual rate caps to 1.1 percent, and then 1.2 percent of the prior year's rate in FY16 and FY17, respectively.

Similar to Kansas, Iowa statutes until FY 13 imposed a limit on changes to the required contribution rate of one-half of one percentage point annually in either direction from the prior year's rate. This limit was increased to one percentage point annually beginning in FY 13. This restriction is also intended to shield public employers (and perhaps also employees, who pay a fixed percentage of the total rate) from the effects of volatile contribution rates. Iowa PERS received 90.2 percent of its ARC, on a weighted average basis, during this study's measurement period.

Drivers of Contribution Shortfalls in States with ARC Requirements

Even though some states have a policy that requires payment of the ARC, other factors can affect those policies and the actual payment of the ARC. For example, in New Jersey, two separate legal rulings found that the state's ARC requirement, set in statute, did not constitute a "self-executing appropriation."[xii, xiii] Agreements negotiated in 1995 and 1997 between the State of Connecticut and the State Employees Bargaining Agent Coalition (SEBAC) reduced the amount of the state's contributions to the State Employees Retirement System below the amounts recommended by the plan's actuaries.[xiv] These are two examples of distinct causes for a state's pension contribution experience conflicting with statutory obligations. These examples illustrate that a strong funding requirement and weak funding discipline are not mutually exclusive.

Because employer pension contributions generally are approved as part of a budgeting and legislative appropriations process, often a delay exists between identification of the required contribution and the actual appropriation. Depending on the state's basis for determining and funding pension contributions, this delay can result in a delay in meeting the full ARC, as the budgeting and legislative appropriations process requires time to "catch up" with the pension plan's actuarial experience.

Experience of Plans with Different Contribution Rate Governance Arrangements

Figure D summarizes the weighted average ARC effort for each plan for the FY 2001-2013 period, by plans' type of contribution rate governance arrangement as described above.

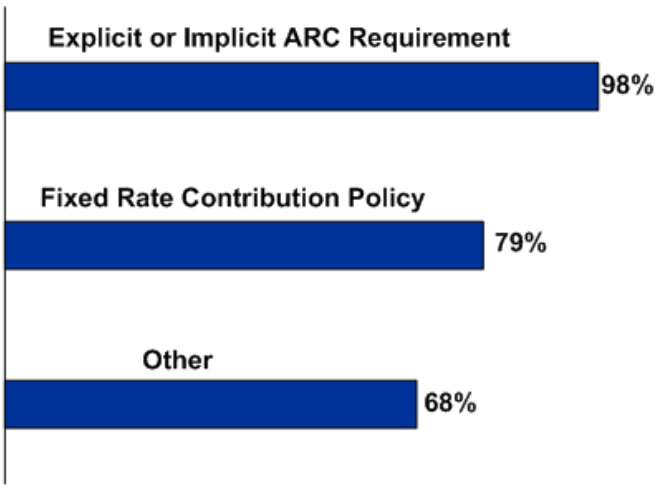


Figure D. Plan weighted ARC effort, FY 2001-2013, by contribution rate governance arrangement

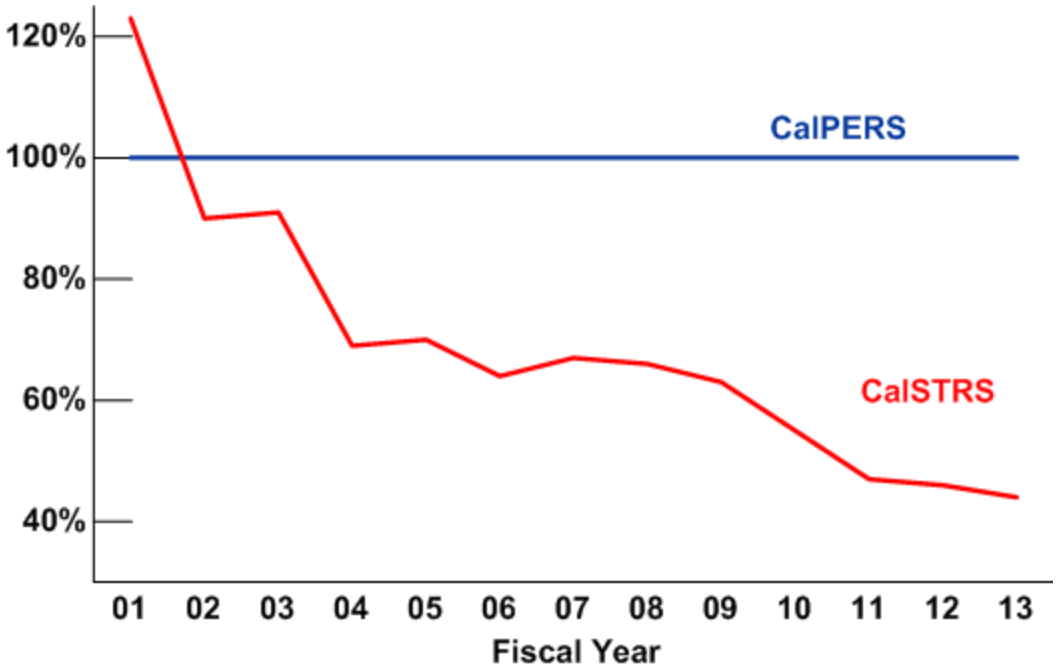


Figure E. Percent of ARC paid, California PERF & California State Teachers, FY 2001-2013

To determine whether the statutory reference is a determinant in whether or not a plan is more likely to receive a higher percentage of its' ARC over the timeframe, plans were categorized as either having a) a law requiring payment of the ARC; b) having an ARC requirement that is subject to a cap (established by statute or other method); or c) having no ARC requirement. Of the 112 plans analyzed, 56 are governed under laws that contain an implicit or explicit ARC requirement, 25 plans have a fixed-rate contribution policy (in most cases set by statute),[xv] and 31 plans are governed by other funding arrangements constrained by peripheral requirements such as cap on annual contribution rate increases or other state policy which supersedes an ARC requirement.

While not representing a guarantee that the ARC will be received, the plans in this study that have ARC requirements set in statute have, over the balance of the term, received a higher percentage of their ARC than those plans whose ARC statute is subject to a cap and those states with a fixed-rate contribution policy. The plan ARC experience on a weighted average basis for the FY 2001-2013 period is shown in Figure D.

Differing ARC experiences resulting from different contribution rate policies can be identified by focusing on the experience of individual plans. The two California statewide plans provide a clear example of the contrast in the effects of different funding governance arrangements, as illustrated in Figure E.

The contribution rate policy in place for the California Public Employees' Retirement Fund (which is the main plan administered by the California Public Employees' Retirement System (CalPERS) resulted in the plan receiving 100 percent of their ARC for each year in period. By contrast, the fixed-rate policy in place for the California Teachers plan (CalSTRS), resulted in a contribution received by CalSTRS that exceeded the ARC at the beginning of the measurement period, but subsequently fell below the ARC for more than a decade. By FY 13, it was just above 40 percent. The result is a decline in the CalSTRS funding level that is much greater than it would have been had the full ARC been paid. In 2014, the California Legislature approved and the governor signed a bill establishing a path to restore the contribution rate to CalSTRS to full funding over a seven-year period.

One-Time and Dedicated Funding Sources

Some public plans receive funding from one-time or dedicated sources outside of the normal legislative appropriations process. These funding sources can be one-time appropriations or an ongoing source of revenue and provide an opportunity to pay off a portion of the plan's unfunded liability irrespective of the plan's amortization schedule. In some cases, these dedicated funding sources produce payment of a contribution in excess of the ARC. Examples of states that have used this strategy include:

- Alaska whose legislature passed a law in 2014 appropriating $3 billion from the state's oil reserve fund to pay unfunded pension liabilities;
- Montana, whose legislature approved a bill in 2013 appropriating a portion of the state's coal severance tax to the state's public employee defined benefit trust

funds until such time as the funds are actuarially sound;

- Oklahoma, whose Teacher Retirement System receives 5 percent of the state's sales, use, and corporate and individual income taxes; 1 percent of cigarette taxes; and 5 percent of net lottery proceeds as an ongoing, dedicated funding source;
- Rhode Island, whose statutes require additional contributions from the state in any year in which the actuarially determined contribution rate for state employees and teachers is lower than the rate for the prior fiscal year. The additional contributions are specified in statute as equal to twenty percent of the rate reduction. Rhode Island statutes also require that any general fund surplus monies be used to pay down the state retirement plan's unfunded pension liability.

For states using a one-time or ongoing dedicated funding source, the additional funds affect plan funding in a way that examining the percentage of ARC received in a given year cannot identify.

The ARC and Political Culture

A review of states' collective ARC record shows that some states have statutes requiring payment of the ARC, yet somehow the ARC is not consistently funded. And other states have statutes that do not require payment of the ARC, yet the ARC is consistently paid in those places. One possible explanation for this paradox is that a state's political culture affects whether or not pensions are appropriately funded.

For example, despite the fact that Kentucky has long had a statute that required payment of the ARC, state policymakers also were able and willing to find reasons to not fund their pensions. By contrast, although South Dakota relies on a fixed rate to fund its pension plans, the state has consistently paid its full ARC. The difference may be simply a matter of different political climates, with different degrees of importance placed on funding pension benefits and on funding discipline.

Conclusion

Evidence strongly indicates that most states and local governments sponsoring pension plans in this study made a good-faith effort to fund all or most of their required contributions since 2001, and that the minority of states who fell well short of their ARC requirements disproportionately impact the overall average experience of public pensions receiving their annual required contributions. The ARC grew substantially during this study's measurement period, and evidence suggests that plans operating under a legal structure in which the ARC must be paid are more likely to receive their required contribution, which is vital to the long-term success of a pension plan.

Whether a pension plan's sponsoring employer is governed by an ARC requirement is not the sole factor in determining whether the full ARC is received, although the findings in this study indicate that plans with ARC requirements generally received a higher percentage of their required contributions than those plans governed under less stringent funding arrangements. Other factors to consider when examining a plan's ARC history is whether or not extraneous agreements or legal rulings have bearing or whether the state has utilized dedicated funding sources to service the unfunded liability.

The onset of new accounting standards for public pensions and the employers that sponsor them herald the end of the ARC as defined by these statements. The closing of this chapter presents an opportunity to review and assess the public pension experience with a uniform reporting standard for required contributions.

In their paper, "The Miracle of Funding of State and Local Pension Plans," the Center for Retirement Research attributes the sharp improvement in public pension funding levels to the establishment of the ARC by the Governmental Accounting Standards Board:

> The miraculous aspect of the funding of state and local pensions is that it occurred without any national legislation. Public plans were not in very good shape in the late 1970s. The 1978 Pension Task Force Report on Public Employee Retirement Systems noted a "high degree of pension cost blindness." But public officials responded and took action to manage their pensions on a business-like basis. Assets per worker increased markedly by the mid-1990s when GASB issued Statements No. 25 and No. 27. Since then, the funding status of public plans has looked very much like that of their private sector counterparts.[xvi]

Even though the ARC as defined in previous GASB statements no longer will be included in government accounting standards, public pensions are expected to continue to calculate an actuarially determined annual contribution amount, and new GASB standards will require disclosure of the effort made to fund this amount. The previous standards resulted in a broad recognition and appreciation for the value of adequately and appropriately calculating and funding an annual public pension contribution. Indeed, many professional groups associated with the public pension community have acknowledged the importance of continuing to properly calculate and fund annual pension contributions, and have prepared guidance to how to do so.[xvii]

[i] National Institute on Retirement Security, Issue Brief: "Who Killed the Private Sector DB Plan?", March 2011

[ii] For example, National Institute on Retirement Security, "Lessons from Well-Funded Public Pensions: An Analysis of Plans that Weathered the Financial Storm," June 2011; Center for Retirement Research, "The Miracle of Funding by State and Local Pension Plans," April 2008, etc.

[iii] National Association of State Retirement Administrators, "State and Local Government Spending on Public Employee Retirement Systems," May 2014

[iv] Ibid

[v] Government Finance Officers Association, "Best Practice: Core Elements of a Funding Policy," March 2013

[vi] Texas Pension Review Board, "Understanding the Basics of Actuarial Methods," April 2013

[vii] Governmental Accounting Standards Board, "Statement 25, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans," and "Statement 27, Accounting for Pensions by State and Local Governmental Employers"

[viii] Ibid

[ix] Government Finance Officers Association, "Best Practice: Evaluating the Use of Pension Obligation Bonds," March 2005

[x] Center for State & Local Government Excellence, "Issue Brief: An Update on Pension Obligation Bonds," July 2014

[xi] For example, "Planning a Successful Pension Funding Policy," Segal Public Sector Letter, November 2011; "Pension Funding: A Guide for Elected Officials," Pension Funding Task Force, 2013; and Resolution 2011-01 –"Funding Discipline in Public Employee Retirement Systems," National Association of State Retirement Administrators

[xii] Camden v. Byrne, 82 N.J. 133 (1980) and Jersey Education Assoc. v. State, 412 N.J. Super. 192 (App. Div.) (March 4, 2010)

[xiii] 1995 Memorandum of Agreement http://www.ct.gov/opm/lib/opm/pensioncommission/sebac_4.pdf/ 1997 Memorandum of Agreement http://www.ct.gov/opm/lib/opm/pensioncommission/sebac_5.pdf

[xiv] In 2014, the California state legislature passed a law establishing a path to full funding for the California State Teachers Retirement System

[xv] Center for Retirement Research, "Issue Brief: The Miracle of Funding of State and Local Pension Plans," April 2008

[xvi] See Funding Policies @NASRA.org, esp. Pension Funding Task Force, "Pension Funding: An Elected Official's Guide," 2013, and Multiple authors, "Understanding New Public Pension Funding Guidelines and Calculations," 2013

Appendix A:

List of Plans Included in the Report

AK Alaska PERS
AK Alaska Teachers
AL Alabama Teachers
AL Alabama ERS
AR Arkansas Teachers
AR Arkansas PERS
AZ Arizona SRS
AZ Arizona Public Safety Personnel
CA California PERF
CA California Teachers
CO Colorado School
CO Colorado State
CO Colorado Municipal
CO Denver Public Schools
CO Colorado Affiliated Local
CT Connecticut Teachers
CT Connecticut SERS
DC District of Columbia Police & Fire
DC District of Columbia Teachers
DE Delaware State Employees
FL Florida RS
GA Georgia Teachers
GA Georgia ERS
HI Hawaii ERS
IA Iowa PERS
ID Idaho PERS
IL Illinois Teachers
IL Illinois Municipal
IL Illinois Universities
IL Illinois SERS
IN Indiana Teachers
IN Indiana PERF
KS Kansas PERS
KY Kentucky Teachers
KY Kentucky County
KY Kentucky ERS
LA Louisiana Teachers
LA Louisiana SERS
MA Massachusetts Teachers
MA Massachusetts SERS
MD Maryland Teachers
MD Maryland PERS
ME Maine State and Teacher
ME Maine Local
MI Michigan Public Schools
MI Michigan SERS
MI Michigan Municipal
MN Minnesota Teachers
MN Minnesota PERF
MN Minnesota State Employees
MO Missouri Teachers
MO Missouri State Employees
MO Missouri Local
MO Missouri PEERS
MO Missouri DOT and Highway Patrol
MS Mississippi PERS
MT Montana PERS
MT Montana Teachers
NC North Carolina Teachers and State Employees
NC North Carolina Local Government
ND North Dakota Teachers
ND North Dakota PERS
NE Nebraska County Cash Balance
NE Nebraska State Cash Balance
NE Nebraska State & School
NH New Hampshire Retirement System
NJ New Jersey Teachers
NJ New Jersey PERS - state
NJ New Jersey PERS - local
NJ New Jersey Police & Fire - state
NJ New Jersey Police & Fire - local
NM New Mexico PERF
NM New Mexico Teachers
NV Nevada Regular Employees
NV Nevada Police Officer and Firefighter
NY New York State & Local ERS
NY New York State Teachers
NY New York State & Local Police & Fire
OH Ohio Teachers
OH Ohio PERS
OH Ohio Police & Fire
OH Ohio School Employees
OK Oklahoma Teachers
OK Oklahoma PERS
OR Oregon PERS
PA Pennsylvania School Employees
PA Pennsylvania State ERS
RI Rhode Island ERS
RI Rhode Island Municipal
SC South Carolina RS
SC South Carolina Police
SD South Dakota PERS
TN Tennessee State and Teachers
TN Tennessee Political Subdivisions
TX Texas Teachers
TX Texas ERS
TX Texas County & District
TX Texas Municipal
UT Utah Noncontributory
VA Virginia Retirement System
VT Vermont Teachers
VT Vermont State Employees
WA Washington PERS 2/3
WA Washington PERS 1
WA Washington Teachers Plan 1
WA Washington Teachers Plan 2/3
WA Washington LEOFF Plan 2
WA Washington School Employees Plan 2/3
WI Wisconsin Retirement System
WV West Virginia Teachers
WV West Virginia PERS
WY Wyoming Public Employees

Appendix B:

State ARC Experience FY 2001 to FY 2013

State	Weighted ARC Average %	(Shortfall) or Surplus $
AK	86.3	(546,062)
AL	100.0	0
AR	100.7	41,431
AZ	100.9	83,185
CA	83.5	(20,554,750)
CO	74.5	(3,492,735)
CT	109.5	1,380,651
DC	100.0	0
DE	100.0	0
FL	95.8	(1,233,829)
GA	100.0	982
HI	96.0	(220,868)
IA	90.8	(834,152)
ID	105.4	173,380
IL	77.1	(13,841,151)
IN	97.2	(383,689)
KS	70.2	(2,039,080)
KY	83.9	(2,645,105)
LA	97.4	(404,929)
MA	87.3	(2,005,778)
MD	80.7	(2,812,082)
ME	107.0	266,619
MI	87.9	(2,590,386)
MN	82.8	(1,570,111)
MO	91.7	(1,183,997)
MS	98.9	(81,246)
MT	107.0	152,828
NC	96.6	(318,446)
ND	68.8	(362,897)
NE	95.1	(102,451)
NH	94.0	(127,938)
NJ	38.0	(23,282,274)
NM	82.8	(1,348,758)
NV	93.1	(998,656)
NY	100.0	0
OH	81.9	(8,229,977)
OK	78.5	(2,527,153)
OR	86.1	(1,311,784)
PA	41.2	(14,874,178)
RI	100.0	0
SC	100.0	0
SD	99.2	(8,482)
TN	100.0	0
TX	88.7	(5,150,802)
UT	100.0	0
VA	75.7	(3,583,405)
VT	93.5	(61,043)
WA	56.5	(6,935,317)
WI	103.0	239,970
WV	105.5	358,451
WY	108.3	104,506
Total	84.3	(122,861,509)

North Dakota Statewide Retirement Plan ARC Experience

Systems/Plans measured:

- **North Dakota Public Employees' Retirement System (PERS)**
- **North Dakota Teachers' Fund for Retirement (TFR)**

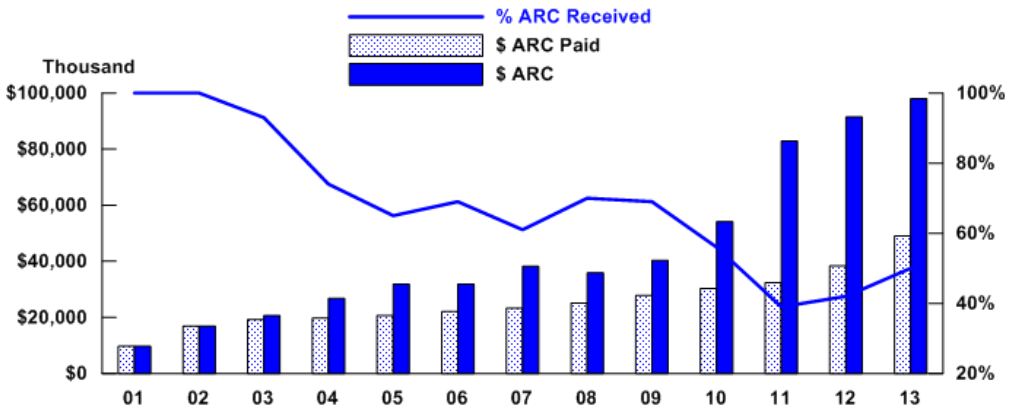
Employer Contribution Legal Framework

For the North Dakota PERS and TFR, participating employers are required to contribute an amount equal to a fixed percentage of employee compensation specified in statute.

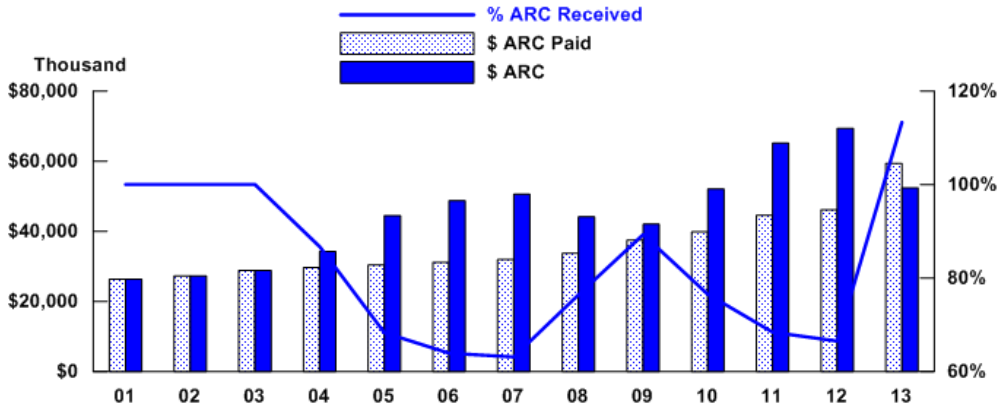
Key Results and ARC Parameters

Plan	Weighted Average ARC Experience, FY01-FY13	(Shortfall) or Surplus (in thousands)	Actuarial Cost Method	Investment Return Assumption
North Dakota PERS	57.8%	($244,025)	Entry age	8.0%
North Dakota Teachers	79.7%	($118,872)	Entry age	8.0%

ND PERS ARC Experience



ND Teachers ARC Experience



CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

State and Local Pension Plans

Number 43, April 2015

HOW WILL LONGER LIFESPANS AFFECT STATE AND LOCAL PENSION FUNDING?

*By Alicia H. Munnell, Jean-Pierre Aubry, and Mark Cafarelli**

Introduction

The fact that people are living longer is good news from a human perspective. But longer lifespans also make defined benefit pension plans more expensive because sponsors must pay benefits to retirees for a longer period of time. The question is the extent to which state and local plans have already incorporated this pattern of continued longevity improvement into their cost estimates. For example, CalPERS – one of the nation's largest plans – revised its longevity assumptions in 2014, significantly increasing its liabilities and reducing its funded ratio by 5 percentage points. This change raises the question whether more cost increases due to longevity improvements are on the horizon. To answer the question, this *brief* explores what public plan liabilities and funded ratios would look like under two alternative scenarios: 1) if public plans were required to use the new mortality table designed for private sector plans; and 2) if public plans were required to go one step further and fully incorporate expected future mortality improvements.

The discussion proceeds as follows. The first section describes how public and private plans currently incorporate longevity improvements into their cost estimates. The second section presents a simple model that relates the impact of improved longevity to liabilities, showing that, if beneficiaries live an additional year, liabilities increase by 3.5 percent. The third section estimates the impact of changing the longevity assumptions to: 1) the new standard designed for use in the private sector; and 2) the more stringent standard that incorporates future mortality improvements. The results suggest that, under the first standard, public plans underestimate life expectancy by only 0.5 year. Adopting the second standard would increase life expectancy by 2.3 years and reduce the funded ratio of public plans from 73 percent to 67 percent. Of course, public plans vary significantly, so the impacts would be much larger for some and smaller for others.

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Estimating Longevity Improvements

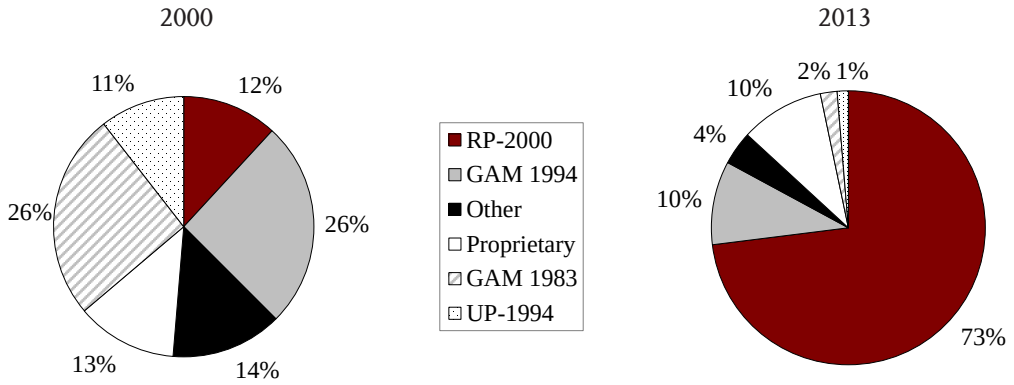
The private sector is under much more specific guidance than the public sector in terms of how to calculate expected mortality. The Pension Protection Act of 2006 directed the Internal Revenue Service (IRS) to publish mortality tables for private sector funding calculations. Currently, these IRS tables are based on the RP-2000 mortality table, which was constructed by the Society of Actuaries (SOA) with data from over 100 private pension plans for the period 1990-1994. These mortality rates are then updated using the mortality improvement Scale AA.[1] In an effort to approximate future mortality improvements, the 2014 IRS table actually uses estimated retiree mortality rates for 2021.

In 2009, the SOA initiated a new study of mortality trends, focusing on death rates of participants in private pension plans in 2006. They then applied an updated mortality improvement scale, MP-2014, to create RP-2014. It is uncertain when these new tables will be adopted.[2]

Unlike the private sector, public sector plans are not required to use a specific mortality table and, at the turn of the century, state and local plans used a wide variety of approaches (see Figure 1). By 2013, however, 73 percent of plans in the *Public Plans Database* (PPD) used the RP-2000 as their base.[3] But the base table is only the starting point; public plan actuaries make a variety of adjustments to align the tables with the expected mortality of their plan members.[4] The common adjustments are mortality improvement scales, setbacks, or some combination of the two. A mortality improvement scale specifies the pace at which mortality rates will decline each year. A setback involves applying mortality rates at younger ages to older ages. For example, a 3-year setback would use age-62 mortality rates for a 65-year old.

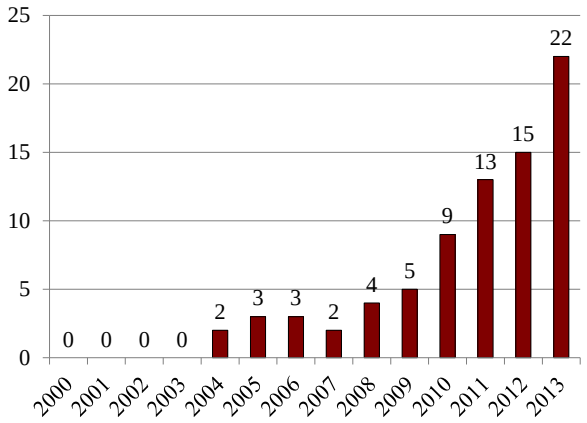
In developing mortality tables, actuaries use two different approaches: "static" and "generational."[5] The static method is a snapshot of mortality rates at a given point in time. As noted, the IRS tables used by private plans choose a point in time that is seven years in the future in an effort to partially reflect future mortality improvements. The generational method goes further, fully incorporating anticipated future improvements in longevity. Interestingly, while state and local plans primarily use a static approach, they have been gradually moving toward an explicit generational method (see Figure 2 on the next page).

Figure 1. Distribution of Mortality Tables Used by Large State and Local Pension Plans, 2000 and 2013



Note: Alabama Teachers Retirement System (2000), DC Teachers Retirement System (2013), and North Dakota Teachers Retirement System (2013) use different mortality tables for male and female retirees. For these plans, the figure reflects the male mortality tables. For a description of the various methods, see endnote 6.
Source: Various pension plan actuarial valuations.

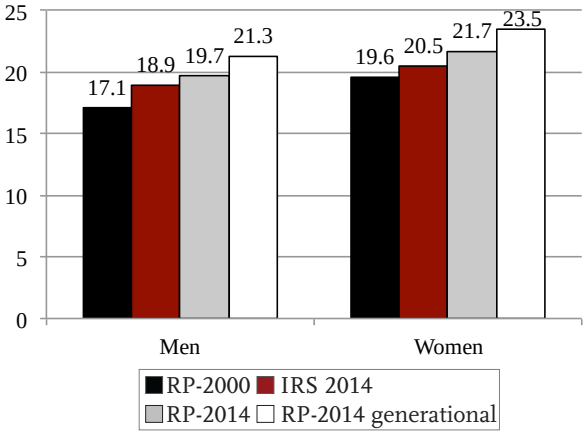
Figure 2. Number of State and Local Pension Plans Using Generational Scaling, 2000-13



Source: Various pension plan actuarial valuations.

Figure 3 compares life expectancies for men and women at age 65 from old, scaled, new, and generational tables. The first comparison shows that – between the original RP-2000 and the current 2014 IRS table – life expectancy for healthy annuitants increased by 1.8 years for men and 0.9 years for women. The second comparison – between the 2014 IRS table and life expectancy implied by RP-2014 – suggests that the IRS tables (which, as noted, actually project mortality rates in 2021) do not fully account for all the gains in life expectancy that occurred from 2000-2014.[7] The third comparison – between RP-2014 life expectancy calculated on a static basis and on a generational basis – shows that the latter adds 1.6 years for men and 1.8 years for women. The comparisons suggest that even though the IRS tables are intended to be up to date, they still show lower mortality improvements than the RP-2014. In addition, the application of generational tables to the RP-2014, which incorporate *future* improvements, would result in a further increase.

Figure 3. Life Expectancy at Age 65 for Healthy Annuitants Under Various Mortality Tables



Source: Authors' calculations from Society of Actuaries (2015); and Internal Revenue Service (2013).

How Do Differences in Life Expectancy Affect Liabilities?

The overall goal of this analysis is to calculate how much applying private sector life expectancy assumptions would affect public sector liabilities and funded status.[8] The first step is to establish a relationship between life expectancy and liabilities. To this end, we estimate a model where the present value of pension liabilities (L) is approximated as follows:

$$L = p\, b \left(\frac{1-(1+r)^{-n}}{r} \right)$$

This relationship can be transformed into a linear equation as follows:

$$\text{Log}(L) = a + ß_1 \log(p) + ß_2 \log(b) + ß_3 \log(r) + ß_4 n + ß_5\, n \log(r) + \varepsilon,$$

where p is the number of participants; b is the average annual benefit; r is the discount rate; and n – our life expectancy variable – is the average length of expected future payouts.

The linear equation can then be estimated using data from the 150 state and local pension plans in the PPD over the period 2001-2013.[9] The variable of interest is life expectancy, which reflects the specific mortality assumptions for men and women for each year for each plan.[10] The PPD data suggest that the average age for current annuitants is 63 in police and fire plans and 68 in plans for teachers and general employees, so the life expectancy is calculated at those ages for each type of plan. The male-female ratio is assumed to be 80-20 for police and fire plans, 20-80 for teacher plans, and 45-55 for plans for general employees; the life expectancies for men and women are weighted to reflect these aggregate ratios.

The results in Table 1 show that state and local pension plans would see their liabilities increase by 3.5 percent for each additional year of life expectancy.[11] These results are consistent with previous research on private sector plans and hypothetical arrangements.[12]

Table 1. Factors Affecting Pension Liabilities

Variables	Coefficients
Log (p)Number of participants	0.810
Log (b)Average benefit level	0.654
Log (r)Discount rate	-0.953
Life expectancy	**0.035**
Constant	2.323
R-squared	0.953
Number of observations	1,750

Notes: The data for liabilities and participants are for retirees only. The coefficients report effects from an OLS estimation and are significant at the 99-percent level. The model includes plan and year fixed effects.
Source: Authors' calculations.

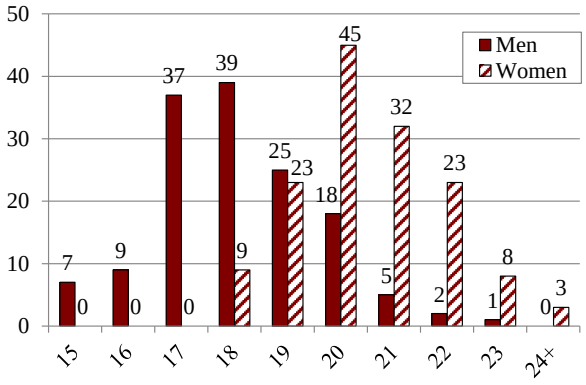
Updating Public Plan Assumptions to Static and Generational RP-2014

The results from the equation are then used to calculate what pension liabilities and funded ratios of state and local plans would be if liabilities were calculated based on the new RP-2014 mortality table and then on a generational version of RP-2014. (We are not advocating that state and local plans adopt RP-2014, since their mortality experience is quite different from private plans. Rather, RP-2014 is simply used as a benchmark.)[13]

The exercise starts with each of the 150 plans' current male-female weighted life expectancies at 63 or 68 and 2013 liabilities and assets to get a base funded ratio. Public plans show enormous variation in their life expectancies (see Figure 4). Life expectancy at 65 for men ranges from 15-23 years and for women from 18-25 years, which means that some of the high projections far exceed those implied by RP-2014.

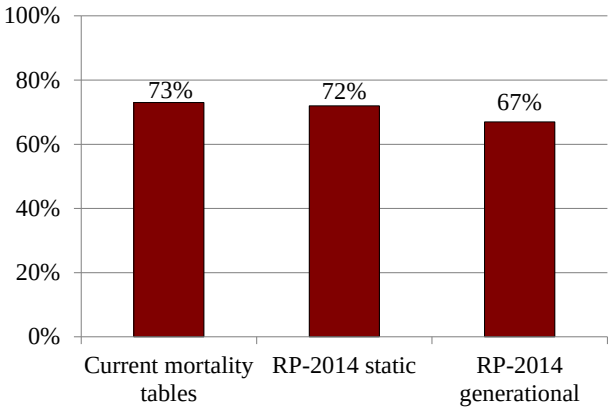
The next step is to compare each plan's assumed life expectancy with that implied by RP-2014 and multiply that difference by 3.5 percent to estimate the impact on liabilities. Finally, we recalculate the liabilities and reestimate the funded ratio.[14] The results of the exercise show that, on average, public plan life expectancies were 0.5 year lower than that implied by static RP-2014 tables. This difference means that liabilities would increase by 1.75 percent if plans adopted RP-2014, which would reduce the 2013 funded status of state and local plans from 73 percent to 72 percent (see Figure 5). If plans were required to adopt a generational, rather than a static, version of RP-2014, their assumptions would fall short by 2.3 years, implying an 8-percent increase in liabilities and a funded ratio of 67 percent.

Figure 4. Distribution of State and Local Plans by Average Life Expectancy at Age 65



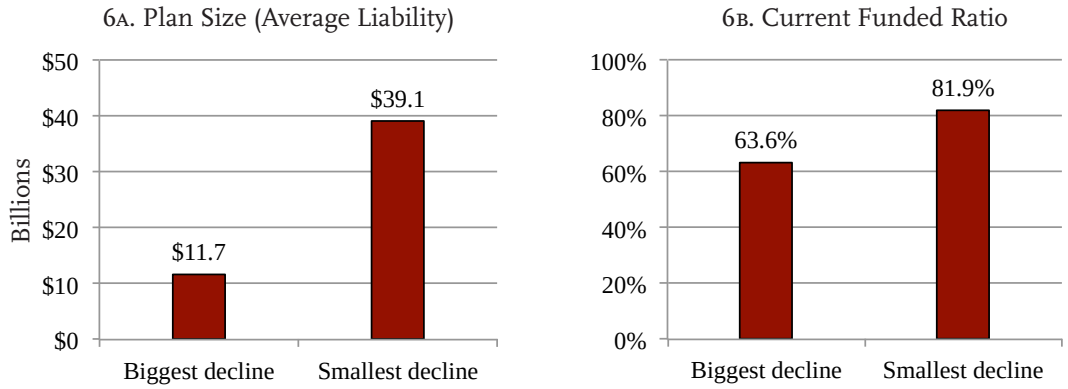
Source: Authors' calculations.

Figure 5. Average Funded Ratio by Mortality Table



Source: Authors' calculations.

Figures 6a and 6b. Plan Size and Funded Ratio for Plans with Biggest and Smallest Declines in Funded Ratio from Adopting Generational RP-2014



Source: Authors' calculations.

The results for each of the 150 plans are shown in the Appendix. Three conclusions emerge from examining the individual plan data. First, the biggest decline in funded ratios occurs among the smallest plans; large plans appear to keep their life expectancy assumptions more up to date (see Figure 6a). Second, the decline in funded status appears to be inversely related to the initial funded level – that is, the worst funded plans tend have the most outdated mortality assumptions (see Figure 6b). Finally, adopting mortality assumptions designed for private plans appears to have a roughly equal impact on the funded ratio of plans for teachers (7.3-percent decline in funded ratio), general employees (7.0-percent decline), and police and fire personnel (8.8-percent decline).

Conclusion

The question underlying this analysis is whether outdated mortality assumptions are a serious problem among state and local plans. The answer appears to be "no." It's true that if plans were to adopt the generational version of RP-2014, the aggregate funded ratio would drop from an estimated 73 percent to 67 percent; but even the private sector is not considering using such low mortality rates. Simply adopting the static RP-2014 would only reduce the funded ratio from 73 percent to 72 percent. In short, public sector plans seem to be making a serious effort to keep their life expectancy assumptions up to date. The big increase in 2013 of CalPERS' liability and decline in funding was reflective of an effort to better incorporate future mortality improvements when estimating mortality, not a sign of a serious problem.[15]

Endnotes

1 For example, the mortality rate for a 65-year-old man in the RP-2000 is 1.3 percent and the annual percentage decline in mortality based on the Scale AA is 1.4 percent, so to calculate the mortality rate in 2014 requires reducing the initial rate by 1.4 percent for 14 years – producing a 2014 mortality rate of 1.1 percent.

2 Some critics suggest that, because of the sample used, RP-2014 may be biased toward faster rates of longevity improvement. See American Academy of Actuaries Pension Committee (2014).

3 The PPD is developed and maintained through a collaboration of the Center for Retirement Research at Boston College, the Center for State and Local Government Excellence, and the National Association of State Retirement Administrators. It contains data for 150 large state and local plans – 114 state and 36 local – and accounts for 91 percent of assets and workers relative to the totals reported by the U.S. Census Bureau.

4 Plan actuaries perform periodic experience studies (every three to five years for most large plans) to ensure that assumptions used by the plan align with the plan's actual mortality experience.

5 Alternative terms for "static" and "generational" projections of life expectancy are, respectively, "period" and "cohort." An example of how the two approaches differ may be helpful. Under the basic static method, for a 65-year-old in 2015 the mortality rates at 66, 67, 68 etc. are the rates applicable to individuals *currently* at those ages in 2015. In contrast, a "generational" approach would take into account that mortality rates for individuals would likely decline in the future. Thus, for a 65-year-old in 2015, the mortality rate at 66 would be that for a 66-year-old in 2016; at 67 that for a 67-year-old in 2017, etc. Since death rates are projected to decline in the future, a static calculation significantly understates how long someone is actually likely to live.

6 Each mortality table is based on different sources of actual mortality experience. The RP-2000 is described in the text. The UP-1994 (Uninsured Pensioner) tables are based on group annuitant experience from 1985-1990, the federal Civil Service Retirement System experience, and Social Security's Actuarial Study No. 107. The 1994 GAM (Group Annuity Mortality) tables are based on the same experience as UP-94 except that the GAM-94 tables include a 7-percent margin designed for insurance reserves. The 1983 GAM tables are based on insured group annuity experience submitted by Prudential and by the Bankers Life, U.S. white population statistics for the period from 1965-1978, Canadian population statistics from 1966-1976, and mortality rates for persons covered under Medicare during 1973-1977.

7 To test for consistency between the RP-2014 and the RP-2000 rates, SOA actuaries applied both the Scale AA and the Scale MP-2014 to the RP-2000 rates and concluded that the Scale MP-2014 was more accurate.

8 The following analysis builds on a similar study by Kisser et al. (2012) for private defined benefit plans over the period 1995-2007.

9 Complete historical data are not available for every plan, so the total number of observations is 1,750.

10 Life expectancy can be derived from mortality rates in three steps: 1) compute survival rates from mortality rates – that is, a 1-percent chance of dying turns into a 99-percent chance of surviving; 2) calculate the probability of, say, a 65-year-old living to 66, to 67, to 68 and so on, where each year's rate is the product of the previous survival rates; and 3) sum the conditional survival rates to determine the number of years the 65-year-old is expected to live.

11 The dependent variable is the liability for annuitants – that is, for those already retired. The percentage increase in active worker liability will be of a similar order of magnitude.

12 Antolin (2007) computes pension liabilities for a hypothetical pension fund that is closed to new entrants and finds that an unexpected improvement in life expectancy of one year per decade could increase pension liabilities by 8-10 percent. Dushi, Friedberg, and Webb (2010) find that updating the mortality tables used to estimate the pension liabilities reported on Forms 10-K, which typically reflect mortality rates in the early 1980s, would increase life expectancy at age 60 by about three years and increase liabilities by 12 percent for the average male plan participant. Kisser et al. (2012) estimate the above equation for

private defined benefit plans and find that an additional year of life expectancy increases liabilities by about 3 percent.

13 Public plans were excluded from the mortality data used to create RP-2014 because their mortality experience differed significantly from those of private plans for which the RP-2014 table was devised. In response to comments, the SOA recommended a separate study of public plan mortality experience, with the expectation that the study would include separate tables for public safety workers, teachers, and other public entities.

14 The variation in assumptions and methodology means that some rules are required to determine how plans would respond to the imposition of RP-2014. First – for plans that currently use the static method – if a plan's current life expectancy exceeds that implied by RP-2014, we assume that the plan maintains its current life expectancy under the RP-2014 static scenario. In these cases, to project life expectancy under the generational approach, we add the difference between the RP-2014 static and generational assumptions to the plan's own static assumption. Second – for plans that currently use the generational method – we calculate a new life expectancy only under the RP-2014 generational scenario and do not include any estimate of life expectancy under the RP-2014 static scenario.

15 Specifically, CalPERS shifted from virtually no projection of future mortality improvement to a 20-year static projection (the approximate duration of CalPERS' benefit payments).

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APPENDIX

Appendix Table 1. Life Expectancy and Funded Ratio for State and Local Plans under Current and RP-2014 Mortality Assumptions

Plan name	Life expectancy			Funded ratio		
		RP-2014			RP-2014	
	Current	Static	Generational	Current	Static	Generational
Total	17.9	18.4	20.2	73%	72%	67%
Alabama ERS	15.1	18.0	19.6	66	60	56
Alabama Teachers	18.1	18.2	20.4	66	66	61
Alameda County Employee's Retirement Association	17.3	18.0	19.6	76	74	70
Alaska PERS	17.6	18.0	19.6	55	54	51
Alaska Teachers	21.2	21.2	23.3	48	48	45
Arizona Public Safety Personnel	20.0	21.5	23.4	59	56	52
Arizona SRS	18.9	18.9	20.5	75	75	71
Arizona State Corrections Officers	18.8	21.5	23.4	67	61	57
Arkansas PERS	16.9	18.0	19.6	74	72	68
Arkansas Teachers	18.9	18.9	21.1	73	73	68
Boston Retirement Board	16.9	18.0	19.6	62	60	56
California PERF	18.0	18.0	19.6	83	83	79
California Teachers	18.2	18.2	20.4	67	67	62
Chicago Municipal Employees	16.2	18.0	19.6	37	35	33
Chicago Police	19.6	21.5	23.4	30	28	26
Chicago Teachers	20.2	n/a	22.3	49	49	46
City of Austin ERS	18.7	n/a	20.3	70	70	67
Colorado Municipal	18.5	18.5	20.1	73	73	69
Colorado School	18.5	18.5	20.6	60	60	56
Colorado State	18.5	18.5	20.1	57	57	54
Connecticut Municipal	16.3	18.0	19.6	88	82	78
Connecticut SERS	18.4	18.4	20.0	41	41	39
Connecticut Teachers	19.3	19.3	21.4	57	57	53
Contra Costa County	18.6	18.6	20.2	76	76	72
Cook County Employees	18.7	n/a	20.3	57	57	54
Dallas Police and Fire	19.2	21.5	23.4	76	70	66
DC Police & Fire	20.2	21.5	23.4	110	105	99
DC Teachers	19.4	19.4	21.5	90	90	84
Delaware State Employees	17.0	n/a	19.6	91	91	83
Denver Schools	16.9	18.2	20.4	81	78	72
Duluth Teachers	19.9	n/a	22.1	54	54	50
Fairfax County Schools	19.2	19.2	21.4	75	75	70
Florida RS	17.5	18.0	19.6	85	84	79

Plan name	Life expectancy			Funded ratio		
		RP-2014			RP-2014	
	Current	Static	Generational	Current	Static	Generational
Georgia ERS	15.2	18.0	19.6	71%	65%	61%
Georgia Teachers	19.0	19.0	21.1	81	81	75
Hawaii ERS	18.0	18.0	19.6	60	60	57
Houston Firefighters	20.9	21.5	23.4	87	85	80
Idaho PERS	16.8	18.0	19.6	85	82	77
Illinois Municipal	17.1	18.0	19.6	88	85	80
Illinois SERS	17.0	18.0	19.6	34	33	31
Illinois Teachers	19.1	19.1	21.3	41	41	38
Illinois Universities	18.6	18.6	20.7	41	41	39
Indiana PERF	16.4	18.0	19.6	80	76	72
Indiana Teachers	18.2	18.2	20.4	46	46	42
Iowa Municipal Fire and Police	21.5	21.5	23.4	74	74	69
Iowa PERS	16.1	18.0	19.6	81	76	72
Kansas PERS	15.5	n/a	19.6	60	60	52
Kentucky County	15.6	18.0	19.6	59	55	52
Kentucky ERS	15.6	18.0	19.6	26	24	22
Kentucky Teachers	18.4	18.4	20.5	52	52	48
Kern County Employees Retirement Association	17.4	18.0	19.6	61	60	57
LA County ERS	18.3	18.3	19.9	75	75	71
Los Angeles City Employees Retirement System	17.3	18.0	19.6	69	67	63
Los Angeles Fire and Police	20.9	21.5	23.4	83	81	76
Los Angeles Water and Power	17.3	18.0	19.6	79	77	73
Louisiana Municipal Police	20.1	21.5	23.4	64	61	57
Louisiana Schools	16.2	18.0	19.6	62	58	55
Louisiana SERS	16.2	18.0	19.6	60	56	53
Louisiana State Parochial Employees	16.5	18.0	19.6	93	88	83
Louisiana Teachers	18.0	18.2	20.4	56	56	52
Maine Local	17.0	18.0	19.6	88	85	81
Maine State and Teacher	18.2	18.2	20.4	78	78	72
Maryland PERS	15.6	18.0	19.6	63	58	55
Maryland Teachers	18.8	18.8	20.9	67	67	62
Massachusetts SRS	17.0	18.0	19.6	69	67	63
Massachusetts Teachers	17.5	18.2	20.4	56	54	51
Michigan Municipal	16.9	18.0	19.6	72	69	65

Plan name	Life expectancy			Funded ratio		
		RP-2014			RP-2014	
	Current	Static	Generational	Current	Static	Generational
Michigan Public Schools	17.0	18.2	20.4	60%	57%	53%
Michigan SERS	16.2	18.0	19.6	60	57	54
Milwaukee City ERS	18.0	n/a	19.6	95	95	90
Minneapolis ERF	17.4	18.0	19.6	74	73	69
Minnesota GERF	19.6	n/a	21.2	73	73	69
Minnesota Police and Fire Retirement Fund	22.6	n/a	24.6	81	81	76
Minnesota State Employees	18.8	n/a	20.4	82	82	78
Minnesota Teachers	20.4	n/a	22.5	72	72	67
Mississippi PERS	16.8	18.0	19.6	58	55	52
Missouri DOT and Highway Patrol	16.9	21.5	23.4	46	40	37
Missouri Local	16.5	18.0	19.6	87	82	78
Missouri PEERS	17.3	18.0	19.6	82	80	75
Missouri State Employees	17.1	18.0	19.6	73	70	67
Missouri Teachers	18.3	18.3	20.5	80	80	74
Montana PERS	17.0	18.0	19.6	80	77	73
Montana Teachers	18.9	18.9	21.0	67	67	62
Nebraska Schools	18.9	18.9	21.0	77	77	72
Nevada Police Officer and Firefighter	19.4	21.5	23.4	71	66	62
Nevada Regular Employees	17.0	18.0	19.6	69	67	63
New Hampshire Retirement System	18.6	18.6	20.2	57	57	54
New Jersey PERS	16.9	18.0	19.6	62	60	57
New Jersey Police & Fire	21.1	n/a	23.4	73	73	67
New Jersey Teachers	18.2	n/a	20.4	57	57	53
New Mexico PERA	17.3	18.0	19.6	73	71	67
New Mexico Teachers	18.7	18.7	20.9	60	60	56
New York City ERS	18.0	18.0	19.6	68	68	65
New York City Fire	21.5	21.5	23.4	54	54	51
New York City Police	21.5	21.5	23.4	67	67	63
New York City Teachers	18.2	18.2	20.4	58	58	54
New York State Teachers	18.2	18.2	20.4	88	88	81
North Carolina Local Government	15.4	18.0	19.6	100	91	86
North Carolina Teachers and State Employees	18.0	18.0	19.6	94	94	89
North Dakota PERS	18.5	18.5	20.1	62	62	59

Plan name	Life expectancy			Funded ratio		
		RP-2014			RP-2014	
	Current	Static	Generational	Current	Static	Generational
North Dakota Teachers	18.8	18.8	20.9	59%	59%	55%
NY State & Local ERS	18.0	n/a	19.6	89	89	84
NY State & Local Police & Fire	21.5	n/a	23.4	90	90	84
Ohio PERS	17.1	18.0	19.6	82	80	76
Ohio Police & Fire	19.1	n/a	23.4	67	67	58
Ohio School Employees	17.7	18.0	19.6	65	65	61
Ohio Teachers	18.7	18.7	20.9	66	66	62
Oklahoma PERS	16.7	18.0	19.6	82	78	74
Oklahoma Police Pension and Retirement System	20.2	21.5	23.4	89	85	80
Oklahoma Teachers	19.2	19.2	21.3	57	57	53
Orange County ERS	18.5	18.5	20.1	66	66	62
Oregon PERS	18.0	n/a	19.6	91	91	86
Pennsylvania Municipal Retirement System	16.2	18.0	19.6	99	93	88
Pennsylvania School Employees	18.5	18.5	20.6	64	64	59
Pennsylvania State ERS	16.2	18.0	19.6	59	56	53
Philadelphia Municipal Retirement System	14.7	18.0	19.6	47	42	40
Phoenix ERS	16.2	18.0	19.6	64	60	57
Rhode Island ERS	17.0	18.0	19.6	57	55	53
Rhode Island Municipal	17.0	18.0	19.6	82	79	75
Sacramento County ERS	17.7	18.0	19.6	83	82	78
San Diego City ERS	16.2	18.0	19.6	70	66	63
San Diego County	17.7	18.0	19.6	79	78	74
San Francisco City & County	17.3	18.0	19.6	81	79	74
South Carolina Police	18.3	21.5	23.4	69	62	58
South Carolina RS	16.8	18.0	19.6	63	60	57
South Dakota RS	17.3	18.0	19.6	100	97	92
St. Louis School Employees	16.2	18.2	20.4	84	79	73
St. Paul Teachers	19.8	19.8	22.0	60	60	56
Texas County & District	17.2	n/a	19.6	89	89	82
Texas ERS	18.2	n/a	19.8	80	80	75
Texas LECOS	18.2	n/a	23.4	73	73	61
Texas Municipal	18.3	n/a	19.9	84	84	80
Texas Teachers	19.6	19.6	21.7	81	81	75
TN Political Subdivisions	18.0	18.0	19.6	95	95	90
TN State and Teachers	18.0	18.0	19.6	93	93	88

Plan name	Life expectancy			Funded ratio		
		RP-2014			RP-2014	
	Current	Static	Generational	Current	Static	Generational
University of California	19.1	19.1	21.3	76%	76%	71%
Utah Noncontributory	17.3	18.0	19.6	82	80	76
Utah Public Safety	21.5	21.5	23.4	73	73	68
Vermont State Employees	16.7	18.0	19.6	77	73	70
Vermont Teachers	19.2	19.2	21.4	60	60	56
Virginia Retirement System	17.7	18.0	19.6	66	65	62
Washington LEOFF Plan 2	20.2	n/a	23.4	115	115	103
Washington PERS 2/3	20.2	n/a	21.8	102	102	97
Washington School Employees Plan 2/3	20.2	n/a	21.8	102	102	96
Washington Teachers Plan 2/3	21.9	n/a	24.0	105	105	98
West Virginia PERS	16.0	18.0	19.6	80	74	70
West Virginia Teachers	16.8	18.2	20.4	58	55	51
Wisconsin Retirement System	18.0	18.0	19.6	100	100	95

Source: Authors' calculations based on various actuarial valuations.

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The CRR gratefully acknowledges the Center for State and Local Government Excellence for its support of this research. The Center for State and Local Government Excellence (http://www.slge.org) is a proud partner in seeking retirement security for public sector employees, part of its mission to attract and retain talented individuals to public service. The opinions and conclusions expressed in this *brief* are solely those of the authors and do not represent the opinions or policy of the CRR or the Center for State and Local Government Excellence.

EPI BRIEFING PAPER
ECONOMIC POLICY INSTITUTE • MARCH 5, 2015 • BRIEFING PAPER #390

WILL SWITCHING GOVERNMENT WORKERS TO ACCOUNT-TYPE PLANS SAVE TAXPAYERS MONEY?

BY MONIQUE MORRISSEY

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Executive Summary

The Great Recession sparked a debate over the use of traditional defined-benefit (DB) pensions in states and municipalities across the United States. Critics of these plans used the economic downturn, which strained government budgets and worsened pension finances, to advocate for major changes in public pension systems.

Although benefit cuts, increased employee contributions, and a rebound in stock prices have improved pension fund finances, severe underfunding remains a challenge in places where the problem predated the recession and was the result of lawmakers neglecting to make required contributions over many years.[1] This is helping to sustain the idea that we can no longer afford to provide teachers, police, firefighters, and other civil servants with secure defined-benefit pensions.

Earlier would-be reformers pushed for 401(k)-style defined-contribution (DC) plans prevalent in the private sector. But disastrous results in West Virginia, Michigan, and Alaska have shifted attention to "hybrid" plans, such as cash balance plans, that combine elements of defined-benefit and defined-contribution systems. Advocates of these types of plans say they are a compromise between those who want to maintain traditional pension plans and those who push for a transition to a 401(k)-style system. However, DC and hybrid plans, which can collectively be referred to as account-type plans, fail on three important points:

- **They do not help states save money**. Traditional defined-benefit pensions are more efficient than DC plans and most hybrid plans due to economies of scale, risk pooling, and other factors. Moreover, changing plan type introduces transition costs. Thus, it is not surprising that states that switched to DC and hybrid plans did not save money except to the extent that they simply cut benefits or required workers to contribute more toward their retirement.
- **They create more workforce management problems than they solve**. For example, many cash balance plans provide the biggest benefits to job leavers, promoting high turnover in public-sector jobs, which require a high level of skill and experience.
- **They increase retirement insecurity**. Account-type plans introduced around the country threaten the retirement security of young and old alike. While a well-designed hybrid plan could theoretically help younger workers without undermining the retirement security of midcareer and older workers, none of the plans offered in the current political climate has done so.

These plans are presented as solutions to a pension crisis, but do nothing to address the central problem of significantly underfunded plans: elected officials who have consistently failed to fund promised benefits. Account-type plans introduced in recent years cost taxpayers more, not less, but advocates such as the Pew Charitable Trusts and the Laura and John Arnold Foundation say they are fairer, cause fewer labor market distortions, promote risk-sharing, and are more transparent.[2] Specifically, advocates say they redistribute benefits toward younger workers, helping with recruitment, reducing job lock, and improving retirement security for mobile workers; they eliminate discontinuities in benefit formulas that discourage workers from working beyond a certain age; they facilitate risk sharing between taxpayers and workers (and, by extension, between current and future generations); and they make pension funding more predictable.

There is a germ of truth to some of these claims. There is no doubt, for example, that workers with traditional pensions do not accumulate significant benefits when starting their careers—though in practice, neither do most participants in account-style plans. However, DB pensions are flexible and can be designed with the goals articulated above in mind. The fact that they are not offers evidence that they serve other purposes, such as recruiting career-minded workers.

Other claims have not borne out, notably the suggestion that costs of cash balance plans are more transparent and predictable. In fact, cost estimates of cash balance plans rely on many of the same actuarial assumptions as traditional pensions while introducing new sources of uncertainty, such as increased turnover. Even variable interest credits, promoted as a way cash balance plans can share risk between employers and employees, increase the risks workers face without necessarily reducing risks for employers and taxpayers.

More generally, attempts to shift risk from employers to workers by moving workers into account-type plans tend to be inefficient because workers are less able to gauge the value of the benefit and are rationally more risk averse. Public-sector workers have consistently shown a strong preference for easy-to-understand and secure retirement benefits and a willingness to pay for these benefits directly (through employee contributions) and indirectly

(by accepting lower salaries). Thus, a shift to account-style plans is likely to harm recruitment and retention or require offsetting increases in other forms of compensation.

Instead of being fair to workers at different stages of their careers and with different work histories, cash balance plans often provide more valuable benefits to younger workers and job leavers than to older workers and career employees. In an effort to show that these plans can be as generous as the pensions they are intended to replace, advocates have showcased cash balance plans with high interest credits. Perversely, these plans provide the greatest benefit, relative to salary, to young job leavers who are savvy and financially secure enough to leave their savings to accrue interest in the plan. (Fortunately for taxpayers, but unfortunately for these mobile workers, many instead cash out their benefits when they move to new jobs).

Pew and Arnold never claim that account-type plans provide a direct cost advantage to employers and taxpayers. However, since these plans are typically introduced alongside cuts to benefits workers have already accrued, this point is often lost on elected officials and the general public. Since cost savings have strong appeal at a time of budget austerity and cash balance plans are the hot topic in pension debates, this report will focus primarily on cash balance plans' impact on employers and taxpayers. However, it will also consider claims that cash balance and other account-type plans improve workers' retirement security.

Overview: Defined-benefit, defined-contribution, and hybrid plans

This section provides a brief description of four types of employer-based retirement plans discussed in this paper: traditional defined-benefit (DB) pensions, 401(k)-style defined-contribution (DC) plans, and two types of hybrid plans that combine DB and DC features (two-tier DB-DC plans and cash balance plans).[3]

Though all four types of plan exist in the private sector, there are differences in how benefits are funded. In the private sector, participation in traditional DB pensions and cash balance plans is automatic and benefits are entirely employer-funded. Meanwhile, participation in DC plans is voluntary and employers typically contribute less than employees, usually through partial matching contributions.

In the public sector, participation in a primary retirement plan of some type is usually automatic and workers typically contribute a fixed share of salary toward their retirement benefits, though there may be additional voluntary contributions to DC plans. In recent years, public-sector workers have been responsible for roughly half the cost of new pension benefits, though there is significant variation across plans (author's analysis of CSLGE and CRR's Public Plans Database 2010; Munnell, Aubry, and Sanzenbacher 2015).

While public-sector employee contributions to traditional pensions and cash balance plans are understood to be fixed in the short run—subject to collective bargaining agreements, for example—employer contributions are variable by design. Employers are responsible for the actuarially required contribution (ARC) minus the employee contribution, where the ARC equals the normal cost of the plan—the estimated cost of funding benefits accrued by workers in a given year—plus or minus any amount needed to amortize an unfunded liability or surplus over a number of years.[4] However, employee contributions can also be adjusted in response to economic conditions, providing for significant risk sharing between employers and employees. Thirty-five states have increased employee contributions since the Great Recession (NASRA 2015).

To determine the present cost of funding future benefits in traditional pensions and cash balance plans, plan actu-

aries consider many factors, including expected years to retirement, expected returns on pension fund assets, and expected salary growth. Factors that vary by worker are averaged so that the normal cost, and therefore the contribution, is the same percent of salary for all workers.

Traditional defined-benefit pensions

Traditional "final-average-salary" defined-benefit (DB) pensions are the most common retirement plans in the public sector. They are designed to provide retirees and their spouses with stable incomes for as long as they live. Traditional DB plans also include disability insurance, of particular importance to the roughly one in four state and local government workers not covered by Social Security.

A traditional defined-benefit plan promises a specified monthly benefit at retirement based on years of service and salary—usually the highest or final salary averaged over three to five years. For example, a worker who retires at a normal retirement age of 62 might get a benefit equal to 1.5 percent times her years of service times her final salary averaged over the last five years of her career, where 1.5 percent is referred to as the benefit "multiplier," "factor," or "accrual rate." Thus, the pension in this example will replace 45 percent of final average salary after 30 years, with Social Security replacing another 35 percent for a median earner (author's estimate based on Goss 2014). In plans whose membership includes teachers or general employees with Social Security coverage, multipliers typically range from 1.5 percent to 2.0 percent. In police and firefighter plans and plans whose members are not covered by Social Security, multipliers typically range from 2.0 percent to 2.5 percent (author's analysis of CSLGE and CRR's Public Plans Database 2001–2012).

The normal cost of traditional pension benefits takes into account salary projections—how much workers' accrued service credits will be worth at retirement when multiplied by projected final average salaries. This is done to average costs across workers and to prevent costs from rising due to an aging workforce. This means a substantial portion of the normal cost is for projected benefits, as opposed to benefits that would be owed if a worker left today. It also means increased employee contributions or slower salary growth can reduce employer costs when assumptions are not met or under adverse economic conditions, as happened in the wake of the 2008 downturn.

The estimated present value of future pension obligations is sensitive to the discount rate used. It is sometimes argued that DB pension benefits are guaranteed and therefore should be discounted to their present value using a low "risk-free" interest rate,{5}} which greatly increases the perceived cost of these benefits (see, for example, Biggs 2012). Though the choice of discount rate depends on the context, it generally makes sense to use the expected rate of return on pension fund assets to discount projected benefits, especially since employers can reduce the cost of these benefits if expectations are not met (U.S. GAO 2014; Morrissey 2011). This is by definition the best estimate of contributions needed to fund these benefits, but does not take into account the investment risk borne by employers and taxpayers. It is appropriate to use the risk-free rate to set an upper bound on the cost to taxpayers of benefits actually owed to workers (excluding the effect of projected salary increases), as will be done later in this report. This is a measure not of expected outlays but of what it might cost to immediately offload pension liabilities.

Defined-contribution plans

Defined-contribution (DC) plans, such as 401(k) plans in the private sector, are savings plans set up and administered by employers but with individual accounts managed by participants, who choose from a number of investment options. Employers are not required to contribute to these accounts, though a common arrangement is an employer match on the voluntary employee contribution up to a specified level (for example, a 50 percent match up to 6 percent of pay). Instead of

monthly pension checks, participants in DC plans usually receive lump sums when they retire, the size of which depends on how much they set aside, their investment return, and whether they borrowed or cashed out any of the money in their accounts.

Relative to the private-sector 401(k) plans, public-sector DC plans (usually known as 403(b) or 457(b) plans) may offer more protections to workers, such as the option of purchasing a life annuity. However, as in the private sector, employees bear all the investment risk. Currently, only three states, Alaska, Michigan, and Oklahoma, have mandatory DC plans as the primary retirement plan for some or all state employees.

Two-tier DB-DC plans

Some state and local governments combine a smaller DB pension with a DC plan, a hybrid arrangement viewed as a way to combine the advantages of both types of plans (Munnell et al. 2011). Nine states—California, Georgia, Indiana, Michigan, Oregon, Rhode Island, Tennessee, Utah, and Virginia—currently have two-tier plans.[6]

It is difficult to generalize across these plans, which vary in terms of employer contributions and the adequacy of the minimum (or maximum employer-subsidized) benefit. Utah, for example, has an employer-funded DB component that rivals some stand-alone DB plans, with a benefit multiplier of 1.5 percent. Utah's DC plan is almost an afterthought, with the employer contributing only to the extent that the normal cost of the DB plan falls below 10 percent of pay. Perhaps more typical is Virginia's plan, which combines a DB benefit with a 1 percent multiplier and a DC plan with a minimum 1 percent employee and 1 percent employer contribution. This is not enough to ensure an adequate retirement for career employees unless they make additional voluntary contributions, which are eligible for a 50 percent employer match up to 5 percent of pay.

Cash balance plans

Cash balance plans are another type of hybrid plan with features common to both DB and DC plans. Like DB pensions, they are employer-provided plans with automatic participation and pooled and collectively managed funds. Benefits, however, are communicated to employees as account balances that appear similar to DC accounts, though they are only "notional" or hypothetical accounts.

Annual benefit accruals are calculated as a fixed share of salary (the "pay credit") eligible to earn a specified "interest credit" that may be fixed or variable—for example, tied to Treasury bond rates or pension fund returns. The interest credit cannot be less than 0 percent, which means employers incur at least some long-term liabilities and explains why even cash balance plans with variable interest credits are legally considered "defined-benefit" plans. As will be discussed later, plan sponsors offering fixed interest credits or variable credits with rate-of-return guarantees above 0 percent can incur investment risks comparable to the risks incurred by sponsors of traditional DB pensions.

Unlike DC plans, cash balance plans are required to offer life annuities as the default payout option, though benefits are more commonly taken in lump sums. A few public cash balance plans, such as those in the Texas Municipal Retirement System, require that at least some account balances be annuitized at retirement (TMRS 2013). Despite the availability of life annuities, participants in cash balance plans—like those with DC plans—may find it difficult to anticipate how their account balances will translate into retirement income, especially if the interest credit or annuity conversation rate is variable. Even if these rates are fixed, however, participants need to factor salary growth and other assumptions into retirement calculations, and experience has shown that workers with account-type plans tend to greatly underestimate the savings needed for retirement.

In public-sector cash balance plans, the pay credit is typically split between employers and employees, and the employee contribution is deducted from employees' salaries. The employer is also responsible for making up any difference between the interest credit and investment returns—or conversely, reaps any excess returns. However, the employer does not actually contribute its portion of the pay credit toward the notional accounts. Rather, as with traditional DB plans, required employer contributions are calculated as the normal cost minus the employee contribution plus any amortization payment. The normal cost is calculated as a share of total payroll and based on actuarial projections that typically involve many of the same assumptions used to estimate the normal cost of traditional DB pensions.

Generally, employers contribute significantly less than their share of the pay credit plus interest credit each year, so costs may or may not be more predictable (and underfunding may or may not be less likely) than under traditional DB plans. On one hand, cost estimates of cash balance plans may be somewhat less sensitive to salary growth and other assumptions than cost estimates for traditional DB pensions. On the other hand, there is less experience on which to base assumptions, especially on turnover and cash-outs (which are likely to increase with cash balance plans). The cost of complex variable interest credits designed to share risk between employers and employees is also hard to predict.

Though a hot topic in public pension debates, cash balance plans remain relatively rare. Some state and local government employees in California, Nebraska, and Texas have cash balance plans as their primary retirement benefit. Other state and local governments offer cash balance plans as an option. Two other states (Kansas and Kentucky) will require future employees to participate in cash balance plans. Legislation creating a cash balance plan was passed in Louisiana but overturned in court.

For further reading, see *A Review of Defined-benefit, Defined-contribution, and Alternative Retirement Plans* published by the Texas Pension Review Board (2012).

Cost-effectiveness of traditional pensions

Switching public-sector workers to account-type plans is often assumed to save employers, and by extension taxpayers, money. But as will be explained below, DB plans tend to be more efficient than DC plans and two-tier DB-DC plans, meaning benefits will be higher for any given level of costs and costs lower for any given level of benefits due to economies of scale and professional investment management. Traditional DB pensions also provide more risk pooling and intergenerational risk smoothing than most other plan types, including cash balance plans with variable interest credits. Finally, switching plan types introduces transition costs.

The popular misconception that individual-account plans are cheaper stems from their widespread adoption in the private sector, where employers replaced DB pensions with less generous DC plans. The rise of 401(k) plans in the 1980s and 1990s coincided with a long bull market that gave false confidence to many individual investors. As a result, private-sector employers may have been able to shift some of the cost and all the risk of retirement onto employees without fully offsetting this with higher pay. But 401(k) plans became less popular after asset bubbles burst in 2000 and 2007. Public-sector workers accept lower salaries than similarly skilled private-sector workers but are compensated for this (at least in part) with more generous and secure benefits (see, for example, Allegretto, Corcoran, and Mishel 2004, 2008, 2011; Bender and Heywood 2010; Keefe 2010; Munnell et al. 2011; Schmitt 2010). Moreover, public-sector workers already contribute toward their own retirements, so there is no a priori reason to expect cost savings from a switch to DC plans in the public sector rather than the reverse.

Since there is no cost advantage to DC and hybrid plans, advocates instead point to what they see as a better distribution of benefits. For example, Josh McGee of the Arnold Foundation concedes that taxpayers will not benefit from changing plan type, but views final-average-salary DB pensions as unfair to mobile workers because benefits are more valuable to workers who stay with the same employer until retirement (McGee and Winters 2015). As will be discussed later in this report, a worker who works for two or more employers providing similar final-average-salary DB pensions will not receive as large a benefit as a worker who spends his or her career with either employer, since these plans are designed in part to encourage retention.

Other advocates of account-type plans point to supposed advantages that may provide indirect cost savings. For example, some critics of traditional DB plans claim that younger workers or skilled workers prefer account-type plans (see, for example, Chingos and West 2013). If true, offering account-type plans could make it easier to recruit and retain these workers, though there is little evidence to support this assertion. Other public pension fund critics inflate the cost of traditional pensions using a lower rate to discount future DB benefits in order to account for the investment risk borne by taxpayers (see, for example, Biggs 2012). Since the other side of the coin is that for any given cost, the future value to workers of DC or variable-rate cash balance benefits is lower than that of traditional DB benefits due to the investment risk borne by *workers*, this is not a point in favor of DC or hybrid plans.[7]

New account-type plans are often introduced alongside cuts to earned benefits and other changes that obscure the cost, which is often equal or greater than the cost of the traditional DB pension the new plan replaces. In Rhode Island, for example, a switch to a two-tier DB-DC plan was promoted as necessary for budgetary reasons even though actuarial reports showed the switch would increase costs (Hiltonsmith 2013; Morrissey 2013). Rhode Island Governor Gina Raimondo, who as state treasurer supported the plan, was able to obscure the higher cost of the new plan by extending the amortization period for paying down legacy costs and making cuts to earned pension benefits that are now being challenged in court (Comtois 2014; Hiltonsmith 2013; Morrissey 2013). This is not unusual, even in a climate of budget austerity, because proponents are eager to show that the new plan provides adequate benefits—but the new system introduces transition costs and is less efficient overall.

Pooled funds are more efficient

Participants in DC plans earn lower investment returns and pay higher fees than DB pension funds and other large institutional investors, reducing net returns by a percentage point or more (Boivie and Weller 2012; Fornia and Rhee 2014; Munnell et al. 2011). This has a significant effect on outcomes since most retirement wealth derives from investment earnings. The difference between a 6 percent and a 7 percent return, for example, amounts to a 17 percent higher benefit for the latter after 30 years assuming 4 percent annual growth in wages and contributions (the difference is greater if you assume lower investment returns, slower wage growth, or a longer investment horizon).

Cash balance plans, like traditional DB plans, have pooled and professionally managed investments. However, for reasons that will be explained below, switching to a cash balance plan is likely to increase employee turnover and cash-outs, reducing the fund's investment horizon and possibly its rate of return. Evidence on this point is limited, however, since few public-sector cash balance plans have been in operation a significant length of time. Advocates of cash balance plans dispute the claim that rates of return will drop if final-average-salary DB plans are converted to cash balance plans (Pew and Arnold 2014). This may be true in the case of plans with fixed interest credits such as two of the longest-running cash balance systems in the country—the Texas Munic-

ipal Retirement System (TMRS) and the Texas County and District Retirement System (TCDRS). TMRS and TCDRS assume rates of return approaching or equal to those assumed by final-average-salary DB plans (7 percent and 8 percent respectively) (TMRS 2014a and TCDRS 2014). However, in cash balance plans with variable interest credits, fund managers may be more risk averse because employers bear downside investment risk with little or no upside potential.

Traditional pensions are better at risk pooling than most account-type plans

DB pensions also provide risk pooling, reducing the need for precautionary saving. Whereas individual savers in DC and many hybrid plans need to accumulate enough to guard against the possibility of outliving their savings or retiring in a bear market, traditional DB pensions need only accumulate enough for average life spans based on average expected investment returns.

Like traditional DB plans, cash balance plans with fixed interest credits shield participants from investment risk. Cash balance plans also offer life annuities as the default payout, though participants usually have the option of taking a partial or total lump sum, and most do. Since annuitization takes place at retirement, cash balance plans shield participants from individual but not cohort longevity risk (except past retirement).[8] This makes it more difficult for participants to anticipate their retirement income, but is viewed as a positive form of risk sharing by cash balance advocates. Even advocates, however, acknowledge potential problems with annuity rates that are not known in advance and not transparent (Pew and Arnold 2014).

When annuities are optional and many participants take lump sums, this may introduce what is known as an adverse selection problem, since participants who opt for annuities are likely to have longer-than-average life expectancies. This has not been well researched in the context of public-sector cash balance plans. However, adverse selection is likely to drive up costs for plan sponsors, reduce benefits to participants who annuitize, or both, relative to traditional DB pensions whose participants usually receive lifetime payments rather than lump sums.

Switching plan types introduces transition costs

Switching plan types usually increases administrative costs, since the existing pension must be maintained for current workers and retirees even if future benefits accrue under a different system. Two-tier DB-DC plans are inherently more expensive for similar reasons. However, cash balance plans that operate as a separate tier of an existing DB plan may not significantly increase administrative costs.

Switching plans may also lower investment returns. A key advantage of traditional pensions is that they have long investment horizons because benefit payments are usually a small fraction of plan assets. Closing a plan to new employees in order to switch to a DC or hybrid plan will increase benefit outlays as a share of plan assets. The need to pursue an increasingly conservative investment strategy will reduce investment returns and increase costs in the DB plan's waning years (CalPERS 2011).

Switching to an account-type plan may also accelerate payments to amortize unfunded liabilities. The Government Accounting Standards Board (GASB) has advised employers to amortize unfunded liabilities as a fixed percentage of payroll (which normally increases with inflation and economic growth) or as a level cost, whichever is greater. When pension plans are closed to new workers, covered payroll shrinks, and employers switch to level (as opposed to increasing) amortization payments. In this case, switching to DC and hybrid plans increases short-term outlays, making it difficult to justify the switch as a solution to budget problems. Supporters of cash balance plans counter that GASB standards have changed, and that plans operating as a new "tier" of an existing

pension would not lead to higher amortization payments (Costrell 2012; Biggs, McGee, and Podgursky 2014). However, Keith Brainard of the National Association of State Retirement Administrators points out that legal provisions in many states require policymakers to continue to adhere to these commonsense practices (Brainard 2012).

A closer look at cash balance plan costs and benefits

How cash balance plans compare with traditional DB pensions depends on their design, in particular whether they have fixed or variable interest credits. In general, cash balance plans with fixed interest credits are more like traditional DB pensions in that they provide participants with relatively secure benefits but expose employers to investment risk. Cash balance plans with variable interest credits tied to pension fund returns resemble DC plans to the extent that they shift much of the investment risk onto participants, though they must at a minimum offer a 0 percent floor on investment returns. As will be discussed in a later section, cash balance plans may also have more complex variable interest credits with minimum rate-of-return guarantees above zero.

Cash balance plans with fixed interest credits offer a more secure retirement benefit than those with variable interest credits, but tend to have higher costs or offer fewer protections than traditional DB pensions. In theory, the best cash balance plans can provide career workers with retirement benefits that approach those of traditional DB pensions while increasing the retirement benefits earned by some shorter-term workers. However, the cost will be higher, important disability and other benefits will be lost, or both.

Traditional DB pensions tend to provide better protections for disabled workers and survivors and are more likely to shield retirees from inflation through cost-of-living adjustments. In addition to lacking these protections, many cash balance plans provide meager retirement benefits, though the examples in this report focus on "full-featured" cash balance plans in the interest of making apples-to-apples comparisons. However, the fact that many cash balance plans provide inadequate benefits is probably not coincidental, since it is harder for workers to gauge the generosity of these plans.

The apparent simplicity of cash balance plan benefit formulas is misleading

The costs and risks of cash balance plans are often misunderstood because they are naively associated with the pay credit and interest credit. A cash balance plan with a relatively large pay credit and a relatively low interest credit is not necessarily more generous or less risky to the employer than one with a low pay credit and high interest credit.

This is perhaps best explained with an example. In the most generous TMRS plans, such as the one in Plano, workers contribute 7 percent of pay, with employers responsible for an additional 14 percent pay credit and a fixed 5 percent interest credit and annuity conversion rate (Lowman 2013; TMRS 2014c).[9] For career employees, retirement benefits approach those of a typical final-average-salary DB pension. For example, a TMRS participant in Plano retiring at age 62 with 30 years of service would receive an annuity replacing approximately 48 percent of his or her final average salary with a 2 percent cost-of-living adjustment (COLA) (author's estimates based on salary growth and life expectancy assumptions in TMRS 2014b; TMRS 2014d).[10] For a career worker, this is roughly equivalent to a final-average-salary DB plan with a 1.6 percent multiplier and 2 percent COLA, though without disability insurance and other protections usually provided by traditional DB pensions.[11]

The combined employer and employee pay credit of 21 percent appears high compared with the normal cost of most traditional DB pensions. For example, the normal cost of the Hawaii Employee Retirement System—a

middle-of-the-road traditional DB plan with a 2 percent multiplier and 2.5 percent COLA—is less than 13 percent of pay (CSLGE and CRR's Public Plans Database 2010). However, pay credits are not actual contributions. The normal cost of cash balance plan benefits is actuarially determined, just as it is in a traditional DB pension. The normal cost of the Plano plan, for example, is 11 percent of pay, much less than the combined employer and employee pay credit of 21 percent (TMRS 2014a).

One reason the normal cost differs from the pay credit is that TMRS actuaries assume a rate of return on plan assets (7 percent) that is higher than the interest credit (5 percent), though the reverse is also possible (TMRS 2014a). A 7 percent rate-of-return assumption is on the conservative side for DB plans, but there is nothing to prevent any DB plan from investing more conservatively and lowering the assumed rate of return. Conversely, cash balance plans can have relatively high rate-of-return assumptions. For example, the Texas County and District Retirement System (TCDRS) assumes an 8 percent rate of return (TCDRS 2014). (TCDRS, founded 20 years after TMRS, mostly covers county rather than city employees.) With respect to investment risk, the only difference between a cash balance plan with a fixed interest credit and a final-average-salary DB plan is that cash balance plans may be required to hold more liquid investments due to employee turnover and cash-outs. This is a potential disadvantage, not advantage, of these types of plans.

Just as the pay credit is not a good measure of the cost of a cash balance plan, the interest credit is not a good measure of the investment risk borne by employers and taxpayers. As with traditional DB pensions, it is the assumed rate of return and the riskiness of plan assets that matter. A relatively high pay credit can offset a relatively low interest credit, and a relatively low pay credit can offset a relatively high interest credit, so over any given time period the same outcome can be achieved with different combinations of the two variables. Nevertheless, the size of the pay credit versus the interest credit is important because this determines the distribution of retirement benefits between younger and older workers and between workers with relatively high wage growth and relatively low wage growth. All else equal, younger workers will fare better with a low pay credit and high interest credit, as will workers with relatively flat age-earnings profiles.

Another reason the TMRS plan's normal cost is less than the pay credit is the plan's 5-year vesting period, as well as the assumption, based on experience, that a significant number of job leavers will cash out their benefits before retirement, forgoing the employer match. Though job leavers who cash out their balances lose one-half to two-thirds of the value of the accrued benefit as well as guaranteed interest credits going forward, the forfeiture rate ranges from 27 percent (for 55-year-old workers in a plan with a 2-to-1 employer match) to 56 percent (for 25-year-olds in a plan with a 1-to-1 match) (TMRS 2014a). Since a major criticism of final-average-salary DB plans is that they do not provide much retirement security for younger and more mobile workers, it is important to keep in mind that account-type plans may fail in this regard as well. Still, younger job leavers who are vested in a cash balance plan and do not cash out their savings will fare better in a cash balance plan than a traditional pension, as will be discussed later in this report.

Though the size of a fixed interest credit determines the distribution of benefits between younger and older participants in a cash balance plan, not the investment risk borne by employers, it is possible to design a cash balance plan that reduces employer investment risk. But this is done by shifting much of this risk onto participants through a variable interest credit, not by specifying a low interest credit, as will be discussed in the next section. In contrast to plans in the venerable TMRS and TCDRS systems, which were established in 1947 and 1967 respectively, cash balance plans introduced in recent years typically shift much of the investment risk onto workers through variable interest credits.

Risk, intergenerational fairness, and transparency

Taxpayers in some states face the prospect of paying down large unfunded liabilities, the result of lawmakers neglecting to make required contributions over many years. The problem in these states has little to do with the pensions themselves—for politicians who wanted to spend more and tax less, pensions were simply the easiest bill to shirk.

Nevertheless, pension underfunding has opened the door to critics who say traditional pensions expose taxpayers to too much risk and encourage cost shifting to future generations. These critics say the solution is account-type plans in which workers bear more of the investment and longevity risks. In addition, some retirement experts favor account-type plans because it may be easier to adjust benefits prospectively in response to changing economic conditions. These experts are concerned that in times of budget austerity, current workers are protected by grandfather clauses while new hires bear the brunt of benefit cuts.

Another supposed advantage of account-type plans is that costs are more transparent and predictable, which is undoubtedly true of DC plans. However, as with contributions to traditional DB pensions, contributions to cash balance plans are based on actuarial valuations. Though advocates suggest that these valuations require making fewer assumptions or are less sensitive to these assumptions than valuations for final-average-salary DB plans, introducing novel benefit formulas may make costs more, not less, predictable. In particular, complex variable interest credits designed to share investment risks between employers and workers are poorly understood and may not even reduce taxpayer risk.

Whether these plans actually reduce taxpayer risk, attempts to shift risk from employers to workers tend to be inefficient because workers are less able to gauge the value of the benefit and are rationally more risk averse. Individual workers with target retirement dates need to save more than pension funds that pool the savings of overlapping generations of workers because such pooling allows the funds to smooth the retirement outcomes of workers who retire during bull and bear markets. Moreover, it is difficult to use retirement benefits as a recruitment tool if it is difficult for workers to anticipate their benefits. In any case, there are ways to address taxpayer risk and pension underfunding that do not exacerbate retirement insecurity, notably through variable employee contributions.

Cash balance plans reduce risks to employers by shifting them to workers

Cash balance plans can enable risk sharing between employers and workers through variable annuity conversion rates and interest credits. When annuity conversion rates are tied to cohort life expectancy at retirement, the cost of unforeseen increases in life expectancy during participants' working years is passed on to participants in the form of lower monthly benefits. Though variable annuity conversion rates reduce longevity risks for employers, they increase longevity risks for workers, who may place a much lower value on uncertain benefits.

Similarly, cash balance plans with variable interest credits are designed to shift investment risk onto participants. Most workers are risk averse, so the fact that those who retire in bull markets will fare better does not make up for the fact that those who retire in bear markets will fare worse, even if, on average, participants come out even or a bit ahead.

In Louisiana, the interest credit in a cash balance plan enacted in 2012 but later struck down as unconstitutional would have ranged from 0 percent to 10 percent depending on the pension fund's investment return. As a result, individual participants would have seen widely varying outcomes depending on the timing of their retirement and investment returns. Approximately one in four participants would have replaced less than half

of his or her preretirement income after 30 years, compared with a predetermined replacement rate of 75 percent under the existing plan (Morrissey 2012).[12] The loss of secure benefits was a particular concern in Louisiana because most public-sector workers there are not covered by Social Security.

Account-type plans may or may not have more transparent and predictable costs

Advocates sometimes suggest that account-type plans can reduce funding risk, making it harder for elected officials to neglect pension contributions and pass these costs on to future generations. For example, Pew and Arnold assert that a "key element" of cash balance plans is "fully funded retirement benefits" (Pew and Arnold 2014). However, without effective legal protections, elected officials may shortchange contributions to cash balance plans as they have shortchanged traditional pensions. In the past, participants were often assured that pension benefits were guaranteed no matter the state of the pension fund. Since courts have recently allowed pension underfunding to be used as a rationale for reneging on pension obligations, it is unlikely that workers today will be complacent about underfunding in any form.

A frequent criticism of public pensions is that lawmakers can skimp on pension obligations by pressuring plans to use overly optimistic actuarial assumptions. However, there is not much evidence that rosy assumptions were a major factor in most states and cities with large unfunded pension liabilities, since rather than lowballing required contributions, elected officials simply ignored them.[13]

Though contributions to cash balance plans are also based on actuarial valuations, advocates suggest that these require making fewer assumptions than valuations for final-average-salary DB plans. Pew and Arnold cite "reducing the number of assumptions policymakers must make to accurately project costs" as one of the supposed advantages of cash balance plans over traditional pensions. They list "long-term investment returns, salary increases, employee turnover, and life expectancy" as the assumptions made by DB plan actuaries and suggest that by shortening this list, cash balance plans could make pension funding more predictable (Pew and Arnold 2014). However, cash balance plan actuaries make every single assumption listed above, and many more (see, for example, TMRS 2014a). This is because, as described earlier, employers do not simply contribute their share of the pay credit to the plan and then provide a guaranteed return on that amount plus the employee contribution. Rather, plan actuaries make a number of assumptions to estimate the average normal cost of the plan as a percent of payroll for workers at different stages in their careers and with varying propensities to quit, cash out, retire, and die, among other variables.

Cash balance advocates also claim that actuarial valuations may be less sensitive to certain assumptions, such as salary growth assumptions. However other assumptions will be shakier than those used for traditional DB pensions. In particular, there is less relevant experience on which to base assumptions about employee turnover and cash-outs. In addition, cash balance plans introduced in recent years have variable interest credits whose costs are poorly understood.

Variable interest credits are promoted as a way to share risk without increasing costs, though how this actually plays out can be hard to predict. In the original version of the Louisiana plan, for example, the variable interest credit was not capped. This was changed after the state legislature's chief actuary found that—contrary to claims by proponents—it would likely increase costs to taxpayers (Richmond 2012; Shuler 2012; Shuler 2013).[14]

Similarly a cash balance plan in Kentucky promoted by Pew and Arnold initially provided an interest credit equal to 4 percent plus three quarters of the return above that floor. Pew acknowledged that the switch to a cash balance plan would not save money, but claimed it would provide "a more predictable cost structure" and would be "more flexible if things did not go as expected" (Pew

2013). Pew suggested that the new benefit formula would reduce the risk to taxpayers if investment returns did not match assumptions, as occurred in 2005–2012. However, the new benefit, as initially described, appeared likely to cost more without necessarily reducing the investment risk faced by taxpayers. An outside actuary reviewing the plan for the Kentucky Public Pension Coalition found that the projected cost of the interest credit would be closer to 9 percent than to the 7.37 percent projected by Pew, or than to the Kentucky Retirement System's assumed rate of return of 7.75 percent (Lowman 2012).

It is counterintuitive that guaranteeing a 4 percent floor on investment returns would be riskier or more expensive than backing a 7.75 percent investment return assumption under the old plan. But under the old plan, taxpayers were only exposed to the risk that investment returns would fail to meet the 7.75 percent assumption over the long run, whereas under the new plan, participants are credited with an annual return equal to 4 percent plus three-fourths of the excess return. Short-run rate-of-return guarantees are more expensive than long-run guarantees, and only under the new system do participants benefit from the upside risk. The Kentucky plan was later amended to reduce costs, including specifying that only 5-year average returns above 4 percent would accrue to active participants and reducing the interest credit for non-active members to 4 percent (Kentucky Legislature; Task Force on Kentucky Public Pensions 2012a and 2012b; Lowman 2012, 2015).

Variable contributions promote risk sharing without retirement insecurity

There are ways to reduce taxpayer risk that do not worsen retirement insecurity. Pension funds can always reduce risk by investing more conservatively, though this is costly. Risk sharing happens in practice with changes in employee contributions. In more prosperous times, workers typically were responsible for somewhat less than half the cost of public employee pensions. However, as many government employers faced the prospect of paying down large unfunded liabilities in the wake of the 2008 downturn, employee contributions climbed (NASRA 2014). According to Center for Retirement Research, state and local government workers are now responsible for half the normal cost of their pensions on average (Munnell, Aubry, and Sanzenbacher 2015). Thus, with such variability to employee contribution rates, employees are already taking on a substantial share of risk in these plans.

Workforce management

Many criticisms of traditional DB plans relate to features designed to achieve workforce management goals such as recruitment, retention, and orderly retirement. To critics, these features are unfair to mobile workers, cause job lock, and encourage workers to retire too soon. However, critics ignore or downplay negative features of account-type plans, which tend to create more workforce management issues than they solve. In particular, plans that shift investment risk to workers are often shown as providing a steady accrual of retirement wealth, even though account balances will fluctuate, creating unpredictable and even perverse retirement incentives. Though cash balance plans with fixed interest credits do not have this effect, they often provide the biggest benefits to job leavers, promoting high turnover.

Traditional DB pensions encourage retention when employees are likely to be most productive

Final-average-salary DB plans are designed to reduce turnover among experienced midcareer workers while encouraging an orderly transition into retirement around a normal retirement age. (Boivie and Weller 2012 provide a useful review of research on recruitment, retention, and other workforce effects of traditional pensions.) Reducing turnover is especially important in the public sector, where jobs in teaching and public safety require considerable on-the-job training and many skills are not

easily transferable. Firefighters, for example, attend state- or department-run academies and participate in apprenticeship programs for up to four years (U.S. BLS 2014). It is critical to fire departments and prospective firefighters that compensation both serves to attract and retain career-minded workers and ensures that these workers will have secure incomes when physically unable to do the job. Moreover, research has found that workers who value pensions also have other attributes desired by public employers (see Boivie and Weller 2012 for an overview).

Final-average-salary DB pensions encourage employee retention by "back-loading" benefits: Since accrued service credits are multiplied by a worker's final average salary, a salary increase is worth more to a worker with 30 years of service than one with five years of service.[15] The back-loading of benefits does not extend beyond the designated normal retirement age. Though workers who work beyond the normal retirement age continue to accrue service credits and will receive larger annual pension benefits, their lifetime benefits are reduced because they are not compensated for shorter expected retirements. In contrast, workers who retire before the normal retirement age receive reduced benefits to fully or partially offset longer expected retirements. For most workers, this tilts the labor-leisure balance in favor of leisure—retirement—at or before the normal retirement age, promoting an orderly transition to retirement.

Does the back-loading of benefits up to a point serve a purpose? The fact that workers are not compensated for delaying retirement beyond the normal retirement age reflects productivity, which increases with experience and tenure but may gradually level off or even decline due to health limitations or skill obsolescence. This is not to suggest that older workers who remain in the workforce are less productive than younger workers. The opposite may be true if workers in poor health or suffering from burnout are more likely to retire early while those who continue their educations or are promoted retire later. The point, rather, is that if workers were unable to retire, we would observe average productivity declining in old age. Thus, gently ushering out "superannuated" teachers with old-school teaching methods was a major factor behind the creation of teacher pensions (Graebner 1978). Similarly, early retirement is usually encouraged for public safety personnel with physically demanding and stressful jobs.

Notwithstanding the claims of some pension critics, a normal retirement age serves as a carrot-type nudge, not a mandated shove, toward retirement. Career workers who work past the normal retirement age remain well compensated compared with less experienced workers, and their lifetime incomes will be higher if they keep working. Moreover, employers who want to retain valued employees can offer promotions and other incentives to delay retirement. Conversely, employers have few alternatives outside of the retirement plan if they want to encourage workers to retire, since cutting the pay of older workers would hurt morale and run afoul of age discrimination laws.

Advocates of account-type plans downplay these advantages or ignore them altogether, focusing on how final-average-salary DB plans penalize mobile workers who have little choice in the matter, such as teachers married to military personnel. They cite statistics showing that few workers, including public school teachers, spend their careers with one employer, suggesting that traditional pensions are ill-suited for a modern workforce. They also say these pensions serve to lock in workers who would be happier and more productive if they changed jobs. Finally, they question the wisdom of encouraging workers to retire around a normal retirement age at a time when many Americans are working into their late 60s or longer.

One claim made by critics of public pensions—that most teachers never accumulate significant retirement benefits due to mobility—is based on a misreading of statistics showing that relatively few teachers retire from the school

district in which they began their teaching careers (McGee and Winters 2015). It is possible that most people who ever try teaching, however briefly, do not accrue much in the way of benefits, even if *most teachers teaching today* will do fine, and what matters is the latter. Many young teachers change districts for a better job match, marriage, education, or other reasons. Others take time off to raise children. However, teacher pensions are designed to provide adequate benefits for teachers who start accruing service credits in their 30s or later. More generally, 30-year careers, not 40-year careers, are the standard assumption in public-pension benefit calculations.

Of course, some attrition is of young teachers who decide the job is not right for them, and some of these former teachers will not have good benefits in their new jobs, especially in the private sector. But this is an indictment of our employer-based retirement system writ large, not teacher pensions, since it is unlikely these former teachers would have built up significant savings or benefits in other jobs. According to the Federal Reserve's Survey of Consumer Finances, nearly 40 percent of households headed by someone 35 or younger had nothing saved in retirement accounts in 2013, and even the typical family with savings had only $12,000 (Federal Reserve Board 2014). The important point is that there is little turnover among midcareer teachers, which is what matters if the concern is teachers laboring for years without accruing significant benefits.[16]

The design of a cash balance plan can favor younger workers over older workers or vice versa

Cash balance plans are advanced as a fairer alternative to final-average-salary DB pensions that provide more generous benefits to older career workers than to younger or more mobile workers. However, cash balance accruals are "fair" only if the interest credit is set at a rate that, all else equal, equalizes the value of contributions to older and younger workers.

Another way of saying this is that cash balance plans provide a benefit of equal value to younger and older workers only if the interest credit is one that would make participants indifferent about whether to leave their savings in the plan or invest them elsewhere (or that makes employers and taxpayers indifferent about the same).[17] Since interest credits vary widely, this is unlikely to be true of all cash balance plans, meaning that some favor younger workers and some older workers. The former is a more serious problem because it provides the largest benefits relative to pay to young job leavers—thus rewarding turnover.

What is a fair interest credit (one providing equal benefits to younger and older workers) is subject to debate. However, it will probably lie somewhere between the risk-free rate and the expected return on pension fund assets, both of which are used, in different contexts, to discount future retirement benefits (U.S. GAO 2014). This may be easiest to understand with an example. The Texas County and District Retirement System provides a relatively high (7 percent) interest credit. A hundred dollars credited to the account of a young worker who is 30 years from retirement will be worth $761 at retirement ($\$100 \times 1.07^{30}$). The same amount credited to an older worker who is 10 years from retirement will be worth $197 at retirement ($\$100 \times 1.07^{10}$). The present value of the younger worker's benefit, discounted using the 3 percent interest rate on Treasury bonds, is $314 ($\$761 \times 1.03^{-30}$). Using the same discount rate, the present value of the older worker's benefit is just $146 ($\$197 \times 1.03^{-10}$), which is less than half the benefit received by the younger worker. This method measures the cost of funding TCDRS benefits with no risk to taxpayers since Treasury securities are considered very safe investments. By this measure, TCDRS benefits are highly "front-loaded."

This is not a good measure of expected outlays, since TCDRS actuaries expect a much higher 8 percent return on assets. Using an 8 percent discount rate, expected out-

lays will actually be lower for younger workers ($761 x 1.08^{-30} = $76) than older ones ($197 x 1.08^{-10} = $91). This is what TCDRS actuaries think benefits will cost on average, ignoring the fact that employers are taking on investment risk.

A fair interest credit, at least from an employer or taxpayer perspective, will lie somewhere between these two extremes, though exactly where depends on risk aversion and other factors. Almost all investors—as opposed to gamblers—would accept a lower investment return to reduce risk, but few employers or taxpayers would want pension fund managers to invest the fund's entire portfolio in Treasury bonds on their behalf, doubling or tripling required contributions.

Though setting a fair interest credit may be tricky, there is little doubt that a 7 percent fixed interest credit is too high to equalize benefits between younger and older workers. Only a poorly informed or highly risk-seeking investor would forgo such a good deal to invest elsewhere, though job leavers may cash out for other reasons. This example shows that we should not assume cash balance plans provide an equal benefit to younger and older workers, since, depending on the interest credit, benefits may be back-loaded or, as in this case, front-loaded. This is not just a problem with plans like those in TCDRS that provide high fixed interest credits, but also plans like the one in Kentucky that provide generous variable credits.

Is a picture worth a thousand words? Peaks and valleys in accrual patterns can be misleading

In addition to questioning the back-loading of benefits, critics of traditional DB pensions point to discontinuities in benefit accrual caused by eligibility criteria and benefit formulas such as vesting periods or a normal retirement age.[18] Though such discontinuities are common in employee benefits and social insurance, they can look arbitrary in discussions that ignore the history and rationale behind eligibility rules and benefit formulas. It is important to note, however, that account-type plans, including cash balance plans, often have vesting periods, so concern for job leavers who do not vest is not a good reason to change the plan type as opposed to simply eliminating or shortening vesting periods.

Kinks in accrual patterns can make sense when employers are trying to balance retirement security with recruitment, retention, and other workforce management goals. Plans with simple rules allow employees and prospective employees to understand and plan around their retirement needs. The cost of administering benefits also needs to be considered, especially for workers who leave long before retirement age. As mentioned, employers seek to avoid costs associated with turnover, including recruitment and on-the-job-training costs, but also want to manage the transition to retirement. While too much turnover is a problem if midcareer employees leave after employers have invested in their training, too little turnover can be a problem if older workers cannot afford to retire. Many public safety jobs are physically demanding or stressful. Employers also need to be able to adjust their workforce to meet changing needs.

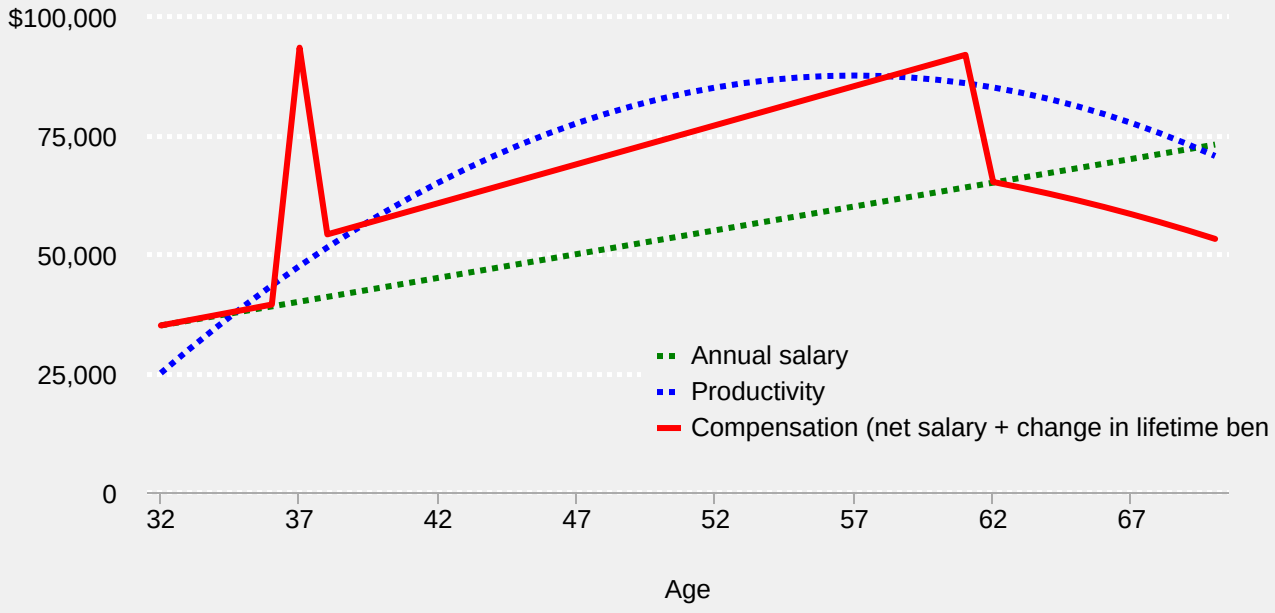
The red line in **Figure A** illustrates discontinuities, or kinks, in benefits under a simple final-average-salary DB plan.[19] In the figure, benefits appear extremely back-loaded and spikes at the end of the vesting period and the normal retirement age seem large and arbitrary. Pension fund critics have described such discontinuities as "peaks and valleys" (Costrell and Podgursky 2008; see also Johnson, Steuerle, and Quakenbush 2012; Morrissey 2009).

Critics of traditional pensions contrast the kinks in final-average-salary DB plans with smooth accruals in idealized account-type plans, as shown in **Figure B**.[20] Even ignoring the fact that vesting periods are not limited to traditional pensions, graphical comparisons of traditional final-average-salary DB plans and cash balance plans can give the misleading impression that a smooth line such as that in the graph of a cash balance plan indicates a steady

FIGURE A

Final-average-salary defined-benefit plan

Hypothetical benefits, salary, and productivity over work lifetime



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accrual of benefits—that is, benefits that are a fixed percent of pay for young and old alike. In fact, there is no way to tell at a glance whether this is the case, since even benefits that are a fixed percent of pay are increasing in dollar terms and thus will appear back-loaded (that is, increasing with age rather than causing the compensation line to run parallel to the salary line). Compensation and salary lines that appear roughly parallel, as in Figure B, actually show a front-loaded benefit, since the benefit is much larger relative to salary for younger workers. This is not to deny that final-average-salary DB benefits are back-loaded, but simply to point out that pictures tend to exaggerate this effect while obscuring what is likely to be the opposite effect in cash balance plans.[21]

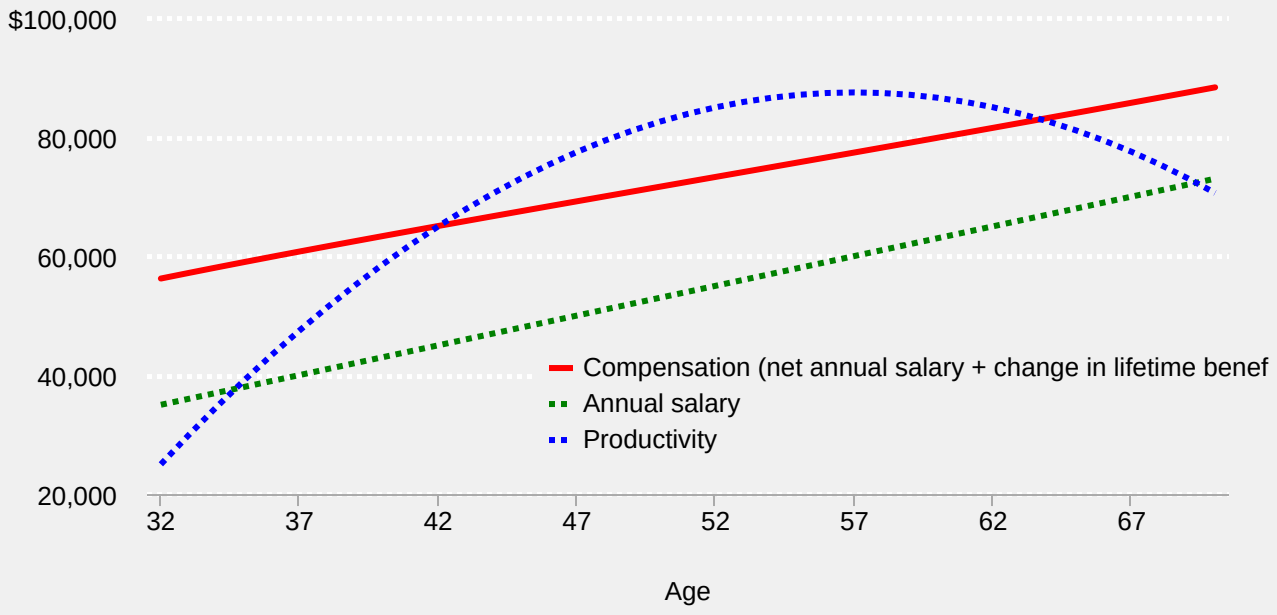
Similarly, "peaks and valleys" charts can be misleading because they suggest to casual readers that declining compensation under final-average-salary DB plans (the downward slope of a line on the chart) is inherently problematic even if the level of compensation remains high for older workers. (This is particularly true when pension benefits are shown in isolation, which is not the case in these figures.)

The strange or arbitrary-seeming kink in the DB plan's compensation curve caused by the vesting period can also be misleading. Even if benefits are not front-loaded, a plan without a vesting period will tend to increase costs associated with turnover if total compensation exceeds productivity for inexperienced workers. In contrast, the kink in the compensation curve caused by the vesting period may better align compensation and productivity. Final-average-salary DB plans help employers recruit career-oriented workers rather than workers who are likely to leave after a few years, saddling employers not only with the cost of recruiting and training replacements

FIGURE B

Cash balance plan with a fixed interest credit

Hypothetical benefits, salary, and productivity over work lifetime



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but also administering benefits and paying interest for job leavers for decades to come.

Though Figure B illustrates an idealized cash balance plan with a fixed interest credit and no vesting period, a smooth line is often used to illustrate benefits under DC and cash balance plans in which participants bear investment risks. This ignores the considerable risks borne by these participants. The red line in **Figure C** shows the effect of investment returns from 1975 to 2013 on a DC plan participant with a portfolio split equally between stocks and bonds.[22] The resulting peaks and valleys are much more extreme than those in the final-average-salary DB plan—they are literally "off the chart." Moreover, their effect on retirement decisions is not just arbitrary, but perverse: Since retirement account savings tend to increase when the economy is strong and contract when the economy is weak, older workers are encouraged to retire when hiring replacements is difficult and to delay retirement when unemployment is high (Boivie and Weller 2012; Ghilarducci, Saad-Lessler, and Fisher 2011; Weller and Wenger 2008).

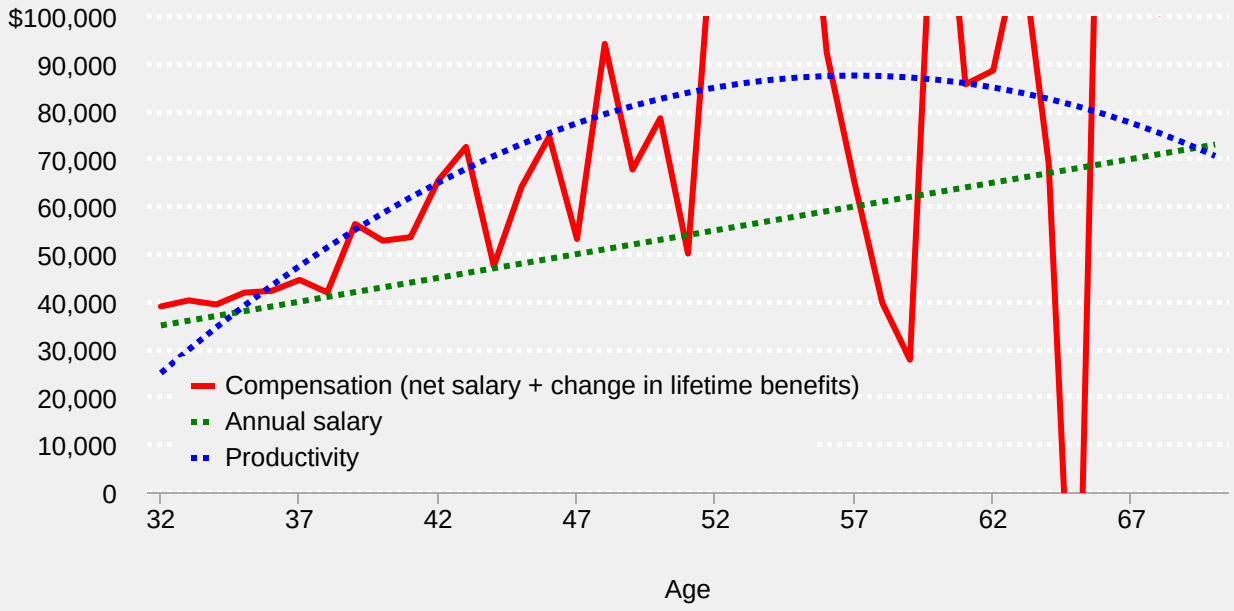
How workers value pensions

The overall cost-effectiveness of pooled pensions over defined-contribution plans and most hybrid plans is not seriously in dispute. But some advocates of account-type plans suggest that they may save employers money by appealing to a modern mobile workforce. In this view, final-average-salary DB pensions give older or long-career workers too many benefits and younger or more mobile workers too few, so redistributing benefits may allow employers to reduce compensation costs with no adverse effect on recruitment or retention.[23]

FIGURE C

Defined-contribution plan

Hypothetical benefits, salary, and productivity over work lifetime



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However, there is little evidence that public-sector workers of any age prefer account-type plans. The suggestion that these workers place a low value on traditional DB pensions is belied by the fact that they negotiate higher employee contributions rather than simply cutting benefits in the face of budget cuts. A study by the Center for Retirement Research comparing the experiences of public employers around the country found that pensions serve to retain skilled workers who would command higher salaries in the private sector, and that workers value pension benefits even if they fund the benefits themselves (Munnell, Aubry, and Sanzenbacher 2015). Meanwhile, a study purporting to find evidence that Illinois teachers were not willing to pay much for pension benefits actually showed that the vast majority of teachers who had the chance to purchase additional benefits did so.[24]

When given a choice, public-sector workers overwhelmingly opt for traditional DB pensions. A study of recent elections by newly hired (therefore typically younger) workers in seven states that offered a choice found that between 75 percent and 95 percent chose the DB plan over a DC or hybrid DB-DC plan (Olleman and Boivie 2011; Oakley and Boivie 2014). Hybrid plan advocates point to the fact that a majority of teachers in Washington state opted into a new DB-DC plan when it was introduced in 1997 (Goldhaber and Grout 2014). However, since then, a majority of new teachers—and indeed a majority of other Washington state workers—have chosen the DB plan even though the DB-DC plan is the default. Oakley and Boivie (2014) note that teachers in 1997 were likely swayed by unusually high stock returns during the dot-com bubble as well as an upfront payment for switching plans that was presented as a "bonus."

Conclusion

It is often assumed that traditional defined-benefit pensions are expensive and that switching to account-type plans, including cash balance plans, is a way to save state and local governments money. This is not correct. Generally, the only way to save money in the short run is to cut benefits or increase employee contributions. In the long run, benefit cuts are unlikely to save taxpayers money because public-sector workers value these benefits and are paid less than private-sector workers. Instead, cuts will likely lead to offsetting increases in other compensation or impair recruitment and retention, degrading the quality of public services.

Another criticism of traditional DB plans is that they are inflexible and benefit older workers at the expense of younger workers. However, benefit formulas and eligibility rules can be adjusted to change the timing and distribution of benefits. For example, increasing the salary averaging period will tend to reduce the back-loading of benefits, though it will also reduce benefits overall unless offset by other changes, such as an increase in the benefit multiplier. The value of benefits earned by younger and more mobile workers can be increased a number of ways, such as indexing them to inflation and shortening vesting. However, these changes will cost money at a time when most pension funds remain underfunded due to the lingering effects of the 2008 downturn. They will also increase turnover.

Plans that shift investment risk to workers are often shown as providing a steady accrual of retirement wealth, even though account balances will fluctuate, creating unpredictable and even perverse retirement incentives. Though cash balance plans with fixed interest credits do not have this effect, they often provide the biggest benefits to job leavers, promoting high turnover.

Even a cash balance plan with a fixed interest credit that equalizes the present value of benefits of younger and older workers will nevertheless result in greater retirement wealth for workers who participate when they are young, since contributions to their accounts have longer to accrue interest. In contrast, Social Security, a pay-as-you-go system tying benefits to wage-indexed lifetime earnings, provides similar retirement benefits to workers regardless of age. That younger workers have better outcomes even under such "fair" cash balance plans would not matter much if participation were universal, as in the Economic Policy Institute's Guaranteed Retirement Account plan, because most workers would accrue benefits at different life stages (Ghilarducci 2007). But it is important to keep in mind that even a fair cash balance plan does not result in equal retirement outcomes for younger and older participants.

Employers, and by extension taxpayers, care more about minimizing compensation costs relative to productivity than whether the present value of retirement benefits is a fixed percent of pay. This includes taking into account how workers value different types of benefits and how this affects recruitment and retention.

State and local governments have a duty to consider the retirement security of all workers, not only career employees. But before benefits are redistributed from older and career workers to younger and short-term workers through cash balance plans, it should be shown that career workers can still accrue benefits that enable them to retire from a life in public service without seeing a sharp drop in their standard of living.

The most generous and secure cash balance plans may be a good compromise in some circumstances, but the advantages of these and other account-type plans should not be oversold, nor should the disadvantages of traditional pensions be exaggerated. Traditional DB pensions help public employers recruit career-minded workers and facilitate orderly retirement. Advocates of DC and hybrid plans do not explain why they are more concerned about job lock among midcareer workers than the problem of older workers with inadequate or insecure retirement benefits hanging on to jobs for dear life. Rather than

attacking the pension benefits of career employees, those concerned with the retirement security of mobile workers should focus on expanding Social Security, the most portable and secure retirement benefit of all.

DC plans have been a disaster in the private and public sector. In West Virginia, Michigan, and Alaska, high costs and low account balances prompted these states to abandon DC plans in favor of a traditional DB plan, a two-tier DB-DC plan, and a cash balance plan, respectively (Pension Review Board 2012). Because problems with DC plans are so apparent, advocates of account-type plans are promoting hybrid plans instead. Though these are better than stand-alone DC plans, it is too soon to tell how these plans will work. Advocates of account-type plans ignore or downplay evidence that these plans cost more, exacerbate retirement insecurity, or both. Rather than a more equitable and efficient system, some account-type plans turn retirement into a gamble while others provide the biggest benefits to job leavers, promoting high turnover. These plans, at least in their current incarnation, are oversold and poorly understood, and we risk embarking on another failed experiment.

—The author would like to thank Tanyell Cooke for providing research assistance on the report.

Endnotes

1. For more on cuts and plan funding, see CSLGE and NASRA 2014, Morrissey 2014, Munnell et al. 2013, NASRA n.d., NASRA 2015.

2. The Laura and John Arnold Foundation (the Arnold Foundation) refers to Pew Charitable Trusts as its "partner" in public pension initiatives. While the Arnold Foundation openly favors account-type retirement plans, Pew says it does not support a one-size-fits-all retirement solution (McGee 2011; Pew 2013). However, Pew has never shown evidence of substantive disagreement with Arnold when it comes to promoting cash balance plans around the country.

3. Munnell et al. (2011 and 2014) and NASRA (2013) provide useful overviews of DC and hybrid plans in the public sector.

4. The normal cost of a pension is the estimated cost of pension benefits accrued by workers in a year, often expressed as a percent of pay. It takes into account salary projections—how much workers' service credits will be worth at retirement when multiplied by final average salaries—but not costs associated with past service liabilities. (NEA 2010 and NEA 2015 provide a useful glossary and overview of typical plan features.) The Public Funds Survey puts the workers' share of the actuarially required contribution (ARC) at slightly over a third (NASRA 2013). The ARC includes the normal cost plus any amount necessary to gradually amortize a surplus or unfunded liabilities over a number of years (often 30). These liabilities are the responsibility of the employer and may be due to a past failure by employers to contribute the required amounts, unmet investment or other assumptions, or some combination of the two.

5. A discount rate is used to translate future cash flows to present values, since most people prefer a dollar today to a dollar tomorrow. This is straightforward if the money is invested in highly tradable and "risk-free" assets such as U.S. Treasury securities, where "risk-free" is a reference to the extremely low risk of default (like all bonds, Treasuries still fluctuate in value in response to changes in interest rates). In this case, the discount rate is the same as the current yield on risk-free assets of the same maturity. This is also the discount rate that returns the cash value of the security if it were sold today (a risk-free asset worth $103 dollars next year can be sold for $100 today if the risk-free interest rate is 3 percent).

The story is more complicated when investment returns are uncertain but expected to be higher than the risk-free rate, as is the case with public pension fund assets. In this case, the expected return on fund investments is the rate used to estimate the amount that, contributed today, would most likely pay for future pension obligations, though plan sponsors may end up contributing more or less depending on actual returns. The expected return used in these calculations takes into account historical returns as well as other factors; for example, expected returns on stocks

should generally be lower than historical returns if price-earnings ratios are high by historical standards (Baker, DeLong, and Krugman 2005). This measure does not take into account plan sponsors' risk aversion—how much more they might be willing to pay to eliminate investment risk. Pension obligations discounted using the risk-free rate provide an upper-bound measure of this hypothetical value: Since pension funds are invested in portfolios that include stocks and other risky assets, we can assume that plan sponsors would not be willing to invest entirely in low-yield Treasuries to eliminate investment risk.

6. This does not include states that offer voluntary employee-funded DC plans on top of full DB pensions. These supplemental savings plans are available to workers in most states.

7. The argument for using the risk-free rate is that it accounts for the investment risk borne by employers by measuring the cost of eliminating this risk. As explained in an earlier endnote, discounting pension obligations with the risk-free rate provides an upper-bound estimate of plan sponsors' risk aversion.

8. Both cash balance plans and traditional DB pensions use risk pooling to insure individuals against the risk of living longer than average and thereby outliving their savings by providing retirement benefits in the form of an income stream. However, because traditional pensions provide benefits tied to final average salary for the life of the retiree, the normal cost of the plan requires projecting salary growth and life expectancy in retirement decades in advance. Because cash balance plans annuitize at retirement, they only need to project life expectancy over the retirement period.

9. Many TMRS plans are much less generous. The plan for the San Antonio Water System, for example, has a 3 percent employer contribution, a 3 percent employee contribution, and a normal cost of just 2 percent of pay (TMRS 2014; TMRS 2014b).

10. The maximum COLA available to TMRS plans is 70 percent of consumer price index (CPI) inflation and TMRS actuaries assume CPI inflation will average 3 percent annually.

11. TMRS plans, like most cash balance plans, allow disabled workers to access accumulated savings as opposed to providing supplemental insurance like most FAS DB pensions.

12. This estimate is based on the author's analysis of an earlier version of the plan. Replacement rates would be slightly lower under the revised plan, which capped the interest credit at 10 percent.

13. Detroit is an exception to that rule, but even here other factors played a bigger role.

14. The interest credit was equal to the portfolio return minus 1 percent, which was supposed to serve as a buffer against market losses.

15. Using our earlier example and assuming an additional year of work increases a worker's average salary over the past five years from $50,000 to $52,000 (a 4 percent increase), a worker with five years' tenure will increase her future pension by $930 per year if she works an additional year ((1.5 percent x 6 years x $52,000) – (1.5 percent x 5 years x $50,000)), whereas one with 30 years' tenure will increase her future pension by $1,680 per year for an additional year worked ((1.5 percent x 31 years x $52,000) – (1.5 percent x 30 years x $50,000)).

16. Even teachers who leave mid-career may be headed for greener pastures in other school districts. Though past service credits will no longer be affected by salary increases, a promotion boosts the value of any future service credits, and the latter effect can more than offset the former.

17. An interest credit that equalizes the value of benefits from a worker's perspective is not necessarily the same as one that equalizes the cost of benefits from an employer or taxpayer perspective. Furthermore, even one that equalizes the present value of benefits to workers at different stages in their careers will not result in equal retirement outcomes, since younger workers will have longer to accrue interest.

More so than cash balance plans, intergenerationally fair and portable benefits are provided by multiemployer pensions. These plans, which are common in industries such as construction where mobility is often inevitable, typically provide benefits based on a fixed dollar amount multiplied by years of service (Weinstein and Wiatrowski 1999;

Topoleski 2014; Munnell and Aubry 2014). Since employer contributions to these plans are usually a fixed dollar amount per hour rather than an amount that increases with age, there is redistribution from younger to older workers in terms of the cost of advance-funding these benefits, but outcomes are more equal.

18. In a final-average-salary DB pension, benefit formulas are based on a "normal retirement age" that is not the earliest eligibility age, usually referred to as the "early retirement age." Thus, in our earlier example, benefits are equal to 1.5 percent multiplied by years of service multiplied by final average salary at the normal retirement age of 62, even if workers are first eligible to collect retirement benefits at, say, 55. Workers who work beyond the normal retirement age receive larger pensions due to additional years of service and presumably higher final average salaries. However, the lifetime value of their pension is reduced because they receive the pension over fewer years. Workers who retire before the normal retirement age receive smaller pensions to partly or fully offset the cost of their longer expected retirement. Whether or not workers who retire early receive greater lifetime benefits depends on whether the employer wants to encourage early retirement. Social Security beneficiaries who retire at 62, for example, receive monthly benefits that are 20 percent lower than those who retire at 65, an adjustment intended to be actuarially fair (Munnell and Sass 2012). Pension plans may use a lower actuarial reduction than Social Security to encourage turnover among older workers, which can result in two noticeable "kinks" or discontinuities in a graphical representation of the pension benefit rather than one. For simplicity, this report will focus on the general question of whether discontinuities in benefits at designated ages can make sense in a real-world context.

19. Assumptions are as follows, adjusted for 2 percent inflation: Starting salary is $35,000 and grows by $1,000 per year. Starting productivity is $25,000 and grows by a declining amount equal to $5,000 per year minus $100 times years of service squared. The discount rate is 1 percent. The employee contribution rate is 5 percent. The benefit at the normal retirement age of 62 is equal to 1.5 percent multiplied by years of service and 3-year final average salary. The vesting period is 5 years. The early retirement age is 55, with lifetime benefits adjusted to equal lifetime benefits at the normal retirement age.

20. Cash balance plan salary, productivity, discount rate, and employee contribution assumptions are the same as for the final-average-salary DB plan. The employer is responsible for funding a 10 percent pay credit, which, along with the 5 percent employee contributions, is eligible for an employer-provided 5 percent interest credit. The benefit is withdrawn as a lump sum at age 70. The normal cost of the cash balance plan may be higher or lower than the normal cost of the final-average-salary DB plan depending on rate of return, tenure, cash-out, retirement age and life expectancy assumptions. Career workers will tend do better under the final-average-salary plan and mobile workers will tend to do better under the cash balance plan if they do not cash out.

21. This assumes the analysis takes into account the present value of future interest credits, which can be the bulk of the benefit for younger workers. The present value of the benefit is sometimes assumed to equal the pay credit, which is true only if the discount rate equals the interest credit.

22. The DC plan employer contribution is 10 percent and the DC employee contribution is 5 percent. Investments are divided equally between stocks and bonds and accrue returns equal to those on the S&P 500 index and the Barclay's US Aggregate Bond Index from 1975–2013.

23. The distribution of benefits between mobile and career employees is sometimes discussed as a "portability" issue. The ability of job leavers in many account-type plans to cash out their savings is not an advantage from a retirement security point of view, though the ability to roll savings over to another plan is. Describing account-type plans as more "portable" can give the misleading impression that mobile workers in DB plans lose their benefits, which is only true of employer-funded benefits for workers not yet vested in the plan. Since DC and hybrid plans can have vesting requirements, this is not an inherent advantage of account-type plans.

24. Of roughly 20,000 Illinois teachers offered the chance to purchase a pension upgrade in 1998, three-fourths had done so 10 years later, and more may have done so before retirement (Fitzpatrick 2014).

State lawmakers eye pension changes for new public sector workers

By Melissa Santos, Staff writer March 24, 2015

State lawmakers may increase the age when new public employees can retire with full pension benefits, and cap the amount of income used to calculate future public employees' pension checks.

The separate proposals are part of a push by some Republican lawmakers to reduce the state's long-term public pension liabilities.

"The problem is, we have to be very wary of pension costs for future generations," said Senate Majority Leader Mark Schoesler, R-Ritzville. "It's very important that we keep that system solvent."

But public employee groups told lawmakers Tuesday that the state's pension system is doing just fine, and that the proposals being considered in the Senate would hurt the state's ability to recruit and retain staff.

Senate Bill 5982 would add two years to the normal retirement age for people who enter most public employee pension plans in Washington after July 1, 2015. That would mean a standard retirement age of 67 for most new public agency employees, and a standard retirement age of 55 for new law enforcement officers and firefighters.

The new retirement ages wouldn't apply to current or former public employees — only those who first enroll in a public pension plan after July 1.

Under the bill, public employees still would have the option of early retirement with partial benefits, as they do today. However, payments received with early retirement would be calculated based on the difference from the new full-retirement age.

Another measure, Senate Bill 6005, would set the state's average annual wage as the maximum salary that could be used to calculate a public employee's monthly pension benefit — even if an employee's actual salary is higher than that. The state Employment Security Department reported that the state's average annual wage in 2013 was $52,635.

The proposed limit on calculating pension benefits would apply only to those entering a plan after July 1, and wouldn't include members of the Law Enforcement Officers' and Fire Fighters' Retirement System Plan 2 (LEOFF 2).

The two proposals received public hearings Tuesday before the Senate Ways & Means Committee, with labor organizations and public employee groups testifying against both bills.

Matt Zuvich, a lobbyist for the Washington Federation of State Employees, said there's no reason to overhaul a pension system that is working well and has little unfunded liability.

A 2012 analysis of state pensions by The Pew Center on the States ranked Washington as fourth in the country for the combined funding of its pension plans, while a March 2013 report from State Treasurer Jim McIntire called Washington "a national model for pension reform."

In addition to keeping the pension system solvent, lawmakers "also have a responsibility to be able to attract the best and brightest to state service," Zuvich said.

"I just don't see why we want to sign up to be in a race to the bottom in our ability to recruit," Zuvich said.

Other opponents argued that someone who starts working for a state agency at age 25 should have the ability to retire with full benefits at age 65, rather than waiting until they're 67.

"I don't think it's too much to ask that after 40 years of service they be able to retire with dignity and stability at that age," said Joe Kendo of the Washington State Labor Council.

Sen. John Braun, who sponsored both proposals, said he introduced the bills to try to address how today's state employees are projected to live longer, and thereby will need to collect more years of retirement benefits.

Braun, R-Centralia, said the state's unfunded pension liabilities will increase over time if lawmakers don't do something soon.

Braun's proposal to increase the retirement age for most public employees would save state and local governments about $3 billion in the next 25 years, according to an analysis by the Office of the State Actuary.

His plan to calculate public employee retirement benefits based on the state's average wage would save state and local governments even more: About $8.7 billion over 25 years, the state actuary estimated.

"If we're living longer, we have to figure out reasonable ways to pay for things like retirement systems," Braun said. "This is just adjusting for that."

Christie's Pension Package Tops Agenda at Final Assembly Budget Hearing

John Reitmeyer | March 25, 2015

Gov. Chris Christie is proposing nearly $34 billion in spending during the next fiscal year, but it's his plans for the public-employee pension system that came under fire yesterday during the Assembly Budget Committee's final public hearing on the governor's spending plan.

Christie wants to freeze the current pension system and shift employees to a new retirement plan with features of a 401(k). He also wants to provide employees with less-generous health coverage and use the savings to help pay off the current pension system's heavy debt.

His plan, based on recommendations included in a report released last month by a commission of experts Christie impaneled last year to study the affordability of employee benefits, would also ask local governments to direct savings realized from making their employees pay more for health coverage to help pay off the state's pension debt.

That's a concern, said Piscataway Mayor Brian Wahler during the hearing held in the State House in Trenton.

The local portion of the public-employee pension system is in much better shape than the state's, Wahler said. He also raised a fairness issue if local property taxpayers are in essence going to be asked to help bail out the state for skipping its own pension contributions.

"We are very concerned about this commission (report)," said Wahler, who also serves as president of the New Jersey League of Municipalities.

"Something's wrong," he said. "Don't steal, hijack our funds."

For Christie, a Republican considering a run for U.S. president in 2016, public-employee benefits reform has been a signature issue.

The governor worked with Democratic legislative leaders in 2011 to make a series of changes to public employee benefits, including making workers pay more for their pensions and health coverage. He then went out and promoted those efforts in speeches throughout the country as he became a leading figure in the Republican Party.

But last year, with state tax revenues coming in lower than expected, he said the costs of both employee pensions and health insurance are still rising and that new changes are in order. Christie laid out a new plan last month, along with his proposed $33.8 billion budget for the fiscal year that begins July 1, and he has since held a series of town hall-style events and gone on social media to make the case for the new changes.

Yet little mentioned by Christie is his administration's failure to live up to another component of the benefits-reform effort, which was the state's pledge to get back to full funding of the employer contribution into the pension system.

A prior study commission impaneled in 2005 recommended ending the state's record of taking pension-payment holidays. Instead of heeding that warning, prior governors have consistently failed to make the full state contribution, and Christie has been no different, even after signing the 2011 reform legislation. The skipped or reduced contributions have had a compounding effect, similar to the way an individual's credit card debt is affected by making only minimum payments.

The pension system's debt now ranges between $37 billion and $83 billion depending on which accounting standards are applied.

Taxpayers on the hook for pension spiking

Amanda Van Benschoten,, avbnky@enquirer.com 4:59 p.m. EDT March 27, 2015

Half a million dollars and counting. That's the bill taxpayers across Kentucky are being asked to foot for pension spiking among public retirees as the state cracks down on the practice – a crackdown both sides agree has become an inefficient, bureaucratic nightmare.

Cities, counties, schools and other public agencies across Kentucky are receiving invoices for retirees the states believes "spiked" their pensions: in other words, padded their pay in the years before retirement in order to receive larger pensions.

Kentucky Retirement Systems (KRS) is asking local governments to pay the difference between what a retiree received and what he or she was entitled to. The average bill runs between $1,300 and $1,600.

"There's tremendous exposure out there for public employers, and therefore the taxpayers," said J.D. Chaney, deputy executive director for the Kentucky League of Cities.

In all, the bills total $570,000 – and the full impact isn't even known yet. As of March 1, KRS had only evaluated about half of the 7,300 government employees who retired in 2014. Of the 3,500 or so evaluated so far, 10 percent were determined to have received larger pensions than they were entitled to.

The biggest bill is due in the Kenton County suburb of Villa Hills. The town of 7,400 owes more than $200,000 – nearly 10 percent of its annual budget. The city is in litigation over the issue.

"You're not just penalizing the city of Villa Hills," said Mayor Butch Callery. "You're penalizing the citizens of Villa Hills, because that money could be used to pay for road projects and other things."

The city of Florence was hit with a $2,445 bill last month for spiking by an employee of the city's former water and sewer board who actually left the city in 2003, but didn't retire until last year. The city paid the bill last month while also lobbying state lawmakers to change the current system.

Pension spiking has always been around, and in the past the cost was factored into what local governments pay into the pension system for their employees. In 2013, however, that changed as part of a broader reform package enacted by the state legislature to try and shore up Kentucky's rapidly depleting pension fund.

But KRS questions whether pension spiking was really that serious a problem to begin with.

"With 14 months of data right now, our view is that pension spiking is not as significant an issue as our lawmakers thought it could be (in 2013)," said the agency's director Bill Thelen.

As it turns out, taxpayers are on the hook on both ends of the process: Thelen said the cost in staff time and resources, as well as administrative hearings with cities, outweighs what the taxpayer-funded agency is collecting on the bills.

The average bill may run between $1,300 and $1,600, but it can cost up to $2,500 to collect on that bill, especially if a city or county wants an administrative hearing on the matter.

Both KRS and the league of cities agree something needs to change, but disagree on how to go about it.

Thelen wants state lawmakers to do away with the pension spiking collections entirely. But Chaney said state lawmakers should pass a law that simply doesn't overpay a retiree to begin with. (Other states, including Ohio, take the latter route.)

State lawmakers are divided on the right course to take, and they left Frankfort on Tuesday without addressing the issue – so taxpayers will continue footing the bill for a problem all sides agree needs to be fixed.

"It'll be back as an issue next year," Chaney said. "And it'll be louder: there will be more cities, more counties, more boards, more state agencies affected."

Funding shortfalls put pensions in peril

John W. Schoen, CNBC 2 p.m. EDT March 28, 2015

These days, a pension just isn't what it used to be.

For generations, a defined benefit pension — a fixed monthly check for life — provided an ironclad promise of a secure income for millions of retired American workers. But today, that promise has been badly corroded by decades of underfunding that have undermined what was one of the cornerstones of the American dream.

The safety net that millions of retirees spent decades working toward has been fraying for some time. The Great Recession, and the market collapse that wiped out trillions of dollars of investment wealth, weakened the pension system further, though some of the damage has been repaired since the stock market rebounded and the economic recovery took hold.

Hundreds of billions of dollars in defined benefits are still paid out every year to retirees. State and local public pension benefit payments reached $242.9 billion in 2013, according to the most recent Annual Survey of Public Pensions. And a Towers Watson study of more than 400 major companies that sponsor U.S. defined benefit plans estimated they paid out nearly $97 billion in benefit payments last year, and another $8.6 billion went toward lump sum payments and annuities.

But that's nothing compared to the private employers' projected benefit obligations last year, which climbed 15% from the previous year to a whopping $1.75 trillion, while plan assets grew by only 3%.

Disparities like that help explain why so many pensions are in peril. Simply put: Obligations have outpaced fund contributions and growth for private and public plans. That means that even workers who have paid into pensions for several years may not get the level of benefits they expect. And many younger employees may never have an opportunity to participate in a pension at all.

The result is that, unlike past generations of Americans, many workers today bear the brunt of the investment risk that underpins their hopes of income security once they are no longer able to work.

In 1975, some 88% of private sector workers and 98% of state and local sector workers were covered by defined benefit plans, according to a 2007 report by the researchers at the Center for Retirement Research at Boston College. By 2011, fewer than 1 in 5 private industry employees was covered by a pension that paid a guaranteed monthly check, according to the Labor Department.

That historic shift has been blamed by critics for an estimated deficit in retirement savings of more than $4 trillion for U.S. households where the breadwinner is between ages 25 and 64, according to Employee Benefits Research Institute.

"You have this hole in what private sector workers have for retirement. We're coming up on this place where all these people are not going to be able to retire," said Monique Morrissey, a researcher at the liberal Economic Policy Institute.

That shift away from a guaranteed pension check has been slower to take hold among public sector workers, where some 83% still have access to a pension that promises to pay monthly retirement income for life after a career of service. But that's changing.

Faced with rising health costs and retirees living longer than expected, many state and local governments are failing to keep up with the annual payments. A CNBC analysis of financial data for 150 state and local pension plans collected by Boston College's research center found that 91 had set aside less than 80% of the money needed to meet current and future obligations to retirees. Only six were fully funded.

One big reason: State and local governments aren't making the annual contributions required to fund those liabilities. Of the 150 plans tracked by the center, 47 paid less than 90% of what's needed to keep pension benefits funded and 79 paid more. (There was no data available for 24 of the 150 plans.)

"People appreciate services: They want cops and firefighters, they want teachers and all that stuff," said Morrissey. "But if you're a politician in a budget crunch, the one way to not raise taxes is to just not pay your pension bill. In the states and cities where there's a big problem, it's not because they underestimated cost. They simply didn't pay the bill."

In New Jersey, which has averaged less than half its required annual contributions for over a decade, a state judge last month ordered Gov. Chris Christie to make a court-ordered $1.6 billion payment into the state's public pension system after it was withheld from his proposed $34 billion state budget. Christie is appealing the ruling.

In New York, state lawmakers plan to defer more than $1 billion in required pension contributions over the next five years. In Illinois, the state's new Republican governor, Bruce Rauner, last month proposed more than $6 billion in spending cuts—more than a third of which would come from shifting government workers into pension plans with reduced benefits.

In Rhode Island, retirees are suing the state over a 2011 pension overhaul led by newly elected Democratic Gov. Gina Raimondo during her tenure as state treasurer. The reforms, which raised retirement ages and cut cost-of-living increases, were projected to save $4 billion over 20 years. (On Monday, the retirees accepted a proposed settlement that would reduce retirement benefits.)

With state and local politicians loathe to propose the tax increases needed to fund the shortfalls, many have overhauled their pensions systems instead by increasing the burden on public workers and retirees and cutting benefits.

"Nearly every state since 2009 enacted substantive reform to their retirement programs, including increased eligibility requirement, increased employee contributions or reduced benefits, including suspending or limiting (cost of living increases)," said Alex Brown, research manager at the National Association of State Retirement Administrators, a nonprofit association whose members are the directors of the nation's state, territorial, and largest statewide public retirement systems.

Those cuts range from about 1% for retirees in Massachusetts and Texas to as much as 20% in Pennsylvania and Alabama, according to a survey of state pension reforms last year by the association and the Center for State and Local Government Excellence.

For retirees like David Jolly, 90, that's mean getting by with a little less every year.

Jolly, who retired in 1986 as public works director for Island County, Wash., now lives with his wife on a combined monthly income of $1,888 from his state pension and Social Security. "Every time they try nibbling at it, it just makes it that much harder," he said. "They don't realize what the cost of living of older people is. ... It just keeps going up and the retirement pay just doesn't."

To close the pension funding gap, many state and local governments have also cut access to defined benefit pensions for new hires or increased contributions and minimum retirement age for active workers. "New employees can expect to work longer and save more to reach the benefit level of previously hired employees," according to asurvey by the retirement administrators association.

While closing plans to new members may reduce benefit liabilities decades from now, it also cuts into the contributions from active workers to support retirees. For over a decade, the ratio of active workers to retirees has been falling, placing an added strain on the public pension system.

For workers and retirees in the private sector, where defined benefit plans are much less common, funding levels are generally in better shape.

Rising investment returns since the financial collapse of 2008 helped boost funding levels for private industry plans in 2013 to 88% of their liabilities, according to a survey of the latest available data by pension fund consultant Milliman. But that still left the 100 largest companies surveyed with a combined pension plan funding deficit of $193 billion.

The pension funding shortfall is even worse for a handful of so-called multi-employer pension plans, which typically cover smaller companies and unions and face a different set of financial challenges. Declining union enrollments, for example, mean there are fewer active workers to cover the cost benefits for retirees, many of whom are living longer than expected than when these plans were established.

Multi-employer plans also face the added burden of their pooled pension liabilities. When one member of the plan fails to keep up with contributions, for example, the burden on the other members increases.

About a quarter of the roughly 40 million workers who participate in a traditional "defined benefit" plan—those that pay retirees a guaranteed check every month—are covered by these multi-employer plans, according to the Bureau of Labor Statistics. In the last four years, the Labor Department has notified workers in more than 600 of these plans that their plans are in "critical or endangered status."

Last year, the Pension Benefit Guaranty Corporation, the government insurance fund for pension plans that go bust, reported that its program backing multi-employer plans was $5 billion in the red. It projected that unless Congress acted, there was about a 35% probability its assets would be exhausted by 2022 and about a 90% probability by 2032. (Single-employer pension plans are covered by a separate program that is on a much more solid financial footing.)

After funding shortfalls threatened the solvency of the governments' insurance backstop for multi-employer pension plans, Congress eased the rules allowing plan administrators to cut benefits last year.Proponents of the proposed pension guaranty corporation reforms argue that they will help prevent more multi-employer plans from going under and that retirees are better off with smaller monthly payments than none at all.

That's something beneficiaries of private and public pensions are hearing a lot these days.

Nevada Legislature: Public employees protest bill to change PERS

Public employees lined up in the Assembly Government Affairs Committee on Monday to protest legislation the author conceded is designed to save money by reducing the average employee retirement check.

Assemblyman Glenn Trowbridge, R-Las Vegas, said AB312 would base a state or local government retiree's check on the highest five years of service instead of the current three. It also would bar public employees from retiring before they reach, 67, the age where private workers receive full Social Security benefits. Police and fire retirees would have to wait until age 57.

Five years instead of three "would make determining average compensation longer and therefore lower," Trowbridge said. He said the same is true of the higher retirement age.

He said even fiscal experts can't agree on how much those changes would save but that it could be "up to $41 million."

Trowbridge said the idea is to "gradually reduce the outflow of PERS revenue and, therefore, gradually reduce the unfunded liability."

Priscilla Maloney of the American Federation of State County and Municipal Employees said there have been no actuarial studies of the impact of the legislation but that she believes it would make state and other public service less desirable, making it harder to recruit good workers. She also argued that PERS is performing well and doesn't need changes.

"PERS is a well-funded, sound system on track to reduce the unfunded liability," she said.

Pointing out there are nearly a dozen PERS bills this session, she said, "all these bills do is chip away at what is already a sound system."

Ron Dreher of the Peace Officer Research Association said the bill would raise the age when peace officers retire to at least 57, 10 years lower than general employees but still well above where they retire now.

"Why would we change a system that is not broken," Dreher asked.

Dreher and other witnesses also pointed out that police and fire workers retire younger because of the dangers and physical demands of their jobs

Marty Bibb of the Retired Public Employees of Nevada, said the bill is unnecessary because PERS has a plan to reduce the unfunded liability. He said many state jobs are currently vacant because they can't find workers to take them.

The measure was supported by both the Las Vegas and Reno-Sparks chambers of commerce. Trey Abney of Reno-Sparks, described AB312 as "a reasonable reform."

He said lawmakers need to "start taking steps to deal with whatever that unfunded liability is."

Abney also said the money saved could go into such things as schools, infrastructure and other needs.

Committee members were told that unfunded liability is about 30 percent. That means if all public members retired at once, PERS would only be able to pay a bit more than 70 percent of total obligations.

But PERS supporters have repeatedly said that will never happen. And Trowbridge admitted to the committee that, if PERS does as well in the next three or four years as they have in the past two years,

that unfunded liability would go away because the system would be totally funded. PERS investments have made double-digit returns in the past few years.

PERS provides retirement benefits for more than 130,000 public workers in the state.

The committee took no action on the bill.

Public pension system's trustees look at new plan for future hires

By Bob Mercer American News Correspondent, Posted on Apr 4, 2015

PIERRE — A new and separate pension system that would apply for new employees is taking shape for the state and local governments and school districts that participate in the South Dakota Retirement System.

The SDRS Board of Trustees would need to take the new plan to the Legislature for approval.

Administrators said the new plan is designed for new employees. For now, the plan isn't intended for current members to cross over.

"I think we do need to do something," said trustee Kathy "K.J." Peterson. She is the chief deputy auditor for Pennington County.

Peterson described the board's role as 40-something parents who are trying to look out for children who aren't born yet.

"This is brave," she said. "We've got 90 percent of our work done here."

The biggest change from the current system is retirement ages would be pushed back two years across the board. The current 65 would become 67, the current 55 would become 57 and the current 45 would become 47.The new plan also would feature a variable return component tied to investment performance. The basic cost of living increase, meanwhile, would tie directly to the rate of inflation with a raise of at least 1 percent guaranteed.

The current system provides an annual cost of living adjustment of 2.1 to 3.1 percent. The COLA approach now in use is generally independent of earnings, unless the investment portfolio's value drops below certain thresholds.The current system is financially balanced on an assumed average annual rate of return of 7.25 percent. That has become difficult to steadily reach in the past decade of market swings.

Another significant change under the new plan would be the elimination of subsidies paid by the general membership for features such as early retirement, survivor benefits and judicial members' higher benefits.Eliminating those subsidies in the current plan isn't under consideration by the trustees at this point.

“The subsidies were put in intentionally,” actuary Doug Fiddler, one of the consultants, said.

Another change would be using five years of salary to determine final average compensation for calculating benefits under the new plan. The current plan uses three years.

The trustees and the consultants have worked for approximately two years discussing and analyzing data.Trustees received their first look at the general concepts for the new plan this week.

“We have something to react to,” Lt. Gov. Matt Michels, a trustee, said.

The preliminary information Thursday filled 46 pages, and the new design’s explanation ran 14 pages.

“This is the biggest report we’ve ever given to the board,” SDRS administrator Rob Wylie said.

“It’s a giant project. We expect it to last the whole year,” he continued.

Trustee James Johns, a captain in the Rapid City police department, asked the consultants to prepare a comparison of a new employee who would start on the first day of the new plan and a new employee who started on the last day before the new plan.

Trustees didn’t take a formal vote, but made known a consensus: They want to take the new plan to the Legislature for consideration in the 2016 session.

“Sounds like we have our marching orders,” Wylie said.

Lawmakers push to strip pensions for child predator teachers

By Dan Springer, Published March 24, 2015, FoxNews.com

Laurence Hill is a convicted rapist. His victims were 10- and 11-year-old girls he taught in a Seattle school. He served five years in prison for his crimes, and the Seattle School District paid his victims a $3 million settlement.

And yet, Hill has never missed a monthly pension paycheck. So far, he's collected $208,000 more from a state taxpayer-funded pension than he put into the system before getting fired.

Critics say Hill and more violent predators shouldn't get a dime.

"For them to now be in prison, a felony charge against them, and still be eligible to collect a state pension that the taxpayers also pay into, is not satisfactory," Washington state Sen. Barbara Bailey said.

Bailey, a Republican, has introduced a bill that would add Washington to the list of states penalizing those who violate the public trust, by taking away their pension.

The bill has a hearing scheduled for Tuesday.

"A pension, in a lot of ways, is regarded as a reward for a job well done," said Anne Marie Gurney, of the Freedom Foundation. "I think we would all agree that raping children is not a job well done."

Gurney, a researcher for the libertarian think tank, compiled a list of 130 Washington state teachers who lost their licenses. Twenty-two of those former teachers are felons who are still costing taxpayers $2 million a year for their pensions.

Among them is Craig Figley, who is serving a life sentence for molesting children. Another is William Pickerel, who sodomized boys he was coaching over a period of decades. His old school district is facing a $70 million lawsuit.

The Washington Education Association has defended the pension payments, arguing that the criminal justice system should have no bearing on a public employee's retirement benefits. Some state lawmakers are reluctant to take pensions away.

"We would have to be very careful that the sanctions were targeted against the individual that committed the crime, not unconnected parties that have a vested interest in that benefit such as spouses and dependent children," said Timm Ormsby, a Democrat in the Washington state House of Representatives.

Twenty-five states have so-called pension forfeiture laws, which can strip a worker's pension in certain cases. Bailey's bill would add Washington state to that list.

Many of the laws were passed after politicians were found guilty in high-profile corruption cases. Other legislative efforts were sparked by outrage following heinous crimes against children, like the ones at Miramonte Elementary in South Los Angeles which came to light in 2011.

Nevertheless, Bailey's proposal faces an uphill climb, according to observers. The Washington Education Association has enormous political clout, routinely spending more on lobbying in Olympia than any other group or industry.

While the WEA has not taken an official position on the pension-forfeiture bill, a union official who oversees pensions for retirees dismissed the issue, calling it a distraction from their effort to find more funding for education.

New Report Sounds Warnings Regarding Cash Balance Plans

A comprehensive new report from the Economic Policy Institute (EPI) warns that cash balance plans and other “account-type” plans do not help states save money, but rather create more workforce management problems than they solve and actually increase retirement insecurity. Dr. Monique Morrissey, an economist with EPI and the new report’s author, says that instead of providing a more equitable and efficient system, some cash balance plans can “turn retirement into a gamble” while others “provide the biggest benefits to job leavers, promoting high turnover.” Dr. Morrissey says that these account-type plans, “at least in their current incarnation, are oversold and poorly understood.”

After what she refers to as “disastrous results” following the shifts by West Virginia, Michigan, and Alaska to 401(k)-style defined-contribution (DC) plans, Morrissey notes that opponents of

traditional defined benefit (DB) plans in the public sector are increasingly advocating the adoption of cash balance plans as a "compromise." She points out that "advocates such as the Pew Charitable Trusts and the Laura and John Arnold Foundation" argue that cash balance plans are fairer, cause fewer labor market distortions, promote risk-sharing, and are more transparent.

"These plans are presented as solutions to a pension crisis," Morrissey says, "but do nothing to address the central problem of significantly underfunded plans: elected officials who have consistently failed to fund promised benefits." Indeed, account-type plans such as cash balance arrangements that have been introduced in recent years actually "cost taxpayers more, not less," Morrissey argues.

The EPI report, entitled *Will Switching Government Workers to Account-type Plans Save Taxpayers Money?* and released on March 5, 2015, explains that it is often assumed that traditional defined-benefit pensions are expensive and that switching to account-type plans such as cash balance plans is a way to save state and local governments money. "This is not correct," Morrissey says. "Generally, the only way to save money in the short run is to cut benefits or increase employee contributions." However, she goes on to note that in the long run, "benefit cuts are unlikely to save taxpayers money because public-sector workers value these benefits and are paid less than private-sector workers," and that, therefore, the cuts will instead "likely lead to offsetting increases in other compensation or impair recruitment and retention, degrading the quality of public services."

The EPI report also discusses the advantages of DB plans, underscoring that DB plans tend to be more efficient than DC plans and cash balance plans, "meaning benefits will be higher for any given level of costs and costs lower for any given level of benefits due to economies of scale and professional investment management." Morrissey also discusses how traditional DB pensions provide more risk pooling and intergenerational risk smoothing than most other plan types, including cash balance plans with variable interest credits.

The important role that DB plans play in managing the public sector workforce is also thoroughly examined. "Traditional DB pensions help public employers recruit career-minded workers and facilitate orderly retirement," Morrissey says. "Advocates of DC and hybrid plans do not explain why they are more concerned about job lock among midcareer workers than the problem of older workers with inadequate or insecure retirement benefits hanging on to jobs for dear life," she pointedly observes.

"This is a very important and valuable report," said Meredith Williams, NCTR's Executive Director. "At a time when cash balance plans are being promoted by critics of DB plans as a more equitable way to provide teachers with retirement security, particularly younger teachers, Dr. Morrissey's work provides an excellent rebuttal of their arguments," he said.

Williams called the EPI report one of the most thorough, complete, and well-documented discussions of many of the typical criticisms of DB plans that he has seen. He drew particular attention to its discussion of graphical comparisons of traditional final-average-salary DB plans and cash balance plans, and the way in which these can often exaggerate the back-loaded nature of the DB plan while obscuring the opposite effect in cash balance plans, as well as give the misleading impression that a smooth line such as that in the graph of a cash balance plan indicates a steady accrual of benefits, when in fact there is no way to tell if this is actually the case. "I strongly commend the EPI report to all NCTR members," he said.

Williams pointed out that the EPI report also acknowledged that in certain circumstances, the "most generous and secure cash balance plans may be a good compromise." Indeed, the report contains examples of a number of account-type hybrids in use in the public sector, and notes that these are better than stand-alone DC plans.

"In theory, the best cash balance plans can provide career workers with retirement benefits that approach those of traditional DB pensions while increasing the retirement benefits earned by some shorter-term workers," Morrissey also concedes. However, "the cost will be higher, important disability and other benefits will be lost, or both," she stresses.

Dr. Morrissey concludes that the advantages of cash-balance and other account-type plans "should not be oversold, nor should the disadvantages of traditional pensions be exaggerated."

EPI is a 501(c)(3) non-profit think tank based in Washington, D.C. It is generally viewed as presenting a liberal viewpoint on economic issues, and was founded with the help of a five-year funding pledge from eight unions, including the American Federation of State, County and Municipal Employees (AFSCME) and the Service Employees International Union (SEIU). Prior to joining EPI, Dr. Morrissey worked at the AFL-CIO Office of Investment and the Financial Markets Center.

EPI: *Will Switching Government Workers to Account-type Plans Save Taxpayers Money?*

Governing Warns New GASB Pension Rules Could "Blindside" Smaller Governments, School Districts

A new article in *Governing* magazine's online edition warns that the new public pension accounting standards and disclosure rules required by the Governmental Accounting Standards Board (GASB), and specifically GASB 68 (applicable to plan sponsors), could result in smaller governments and municipalities, "particularly school districts that may see outsized liabilities on their financial sheets," being "blindsided."

As the article explains, for most local governments, "managing their pension responsibilities has simply meant paying the bill that the pension plan sends them." However, under the new GASB rules, set to apply to employers' 2015 fiscal year, governments that are members of a pension plan will be required to report their share of that plan's unfunded liability on their balance sheets, "something most of those governments have never before had to do," the article notes. "Now most will be adding millions of dollars in liabilities, forcing lawmakers to acknowledge the role pension payments play in their government's overall financial picture," *Governing* warns.

Furthermore, the article points out that the "new liability is a volatile one," and that it "could swing up or down from year to year depending on the pension plan's market performance or if governments take a break in funding."

In the end, the new GASB rules "may also force a decision for some governments who will either be pushed into meeting their funding obligations or finding other strategies to keep plans solvent," the article suggests. More to the point, its authors observe that "[w]hether the tide goes toward figuring out a way to steadily fund pensions," as appears to be the case in some states, "or negotiating benefit reductions and a change in plan structure," as is being proposed in others, "remains to be seen."

Recognition of Nation's Retirement Crisis Increasing, but the Correct Solution Appears Less Clear

The realization that most Americans are ill-prepared for retirement appears to be increasing, both with the public as well as policymakers. Poll results, new studies, media coverage, and recent Congressional activity suggest that the attention paid to retirement security is on the rise.

For example, a new research report from the National Institute on Retirement Security (NIRS), entitled *The Continuing Retirement Savings Crisis*, has determined that retirement security in America continues to worsen, with the typical working household having virtually no retirement savings. Specifically, NIRS found that when all households are included—not just households with retirement accounts—the median retirement account balance has dropped to $2,500, which is $500 less than the comparable number identified in a previous NIRS report in 2013.

While the numbers look somewhat better for working households nearer retirement (age 55-64), where median retirement savings appear to be about $14,500, the NIRS analysis found that this still means that for about 62 percent of these households, the amount will not even replace one year's salary. Furthermore, they do not have enough time left to catch up on this savings shortfall, noted Diane Oakley, NIRS' Executive Director.

The NIRS analysis also documents that not only do nearly 40 million working-age households (45 percent) have nothing set aside for retirement at all, whether in an employer-sponsored 401(k) type plan or an IRA, but households that *do* own retirement accounts have more than 2.4 times the annual income of households that do not. It should therefore come as no surprise that the NIRS study found that while retirement account ownership improved for households in the third highest income quartile—with 75.6 percent of households holding assets in retirement accounts—retirement account ownership in the lowest income quartile dropped to 21.4 percent in 2013, down from 25.7 percent in 2010.

"The evidence is irrefutable that the hope of retirement is out of reach for millions of middle class Americans," said Oakley. Indeed, the NIRS 2015 public opinion research released earlier in March revealed that an overwhelming majority of Americans—86 percent—believe that the nation faces a retirement crisis. The NIRS opinion research also found that 75 percent of Americans are concerned about their ability to achieve a secure retirement. "It's no wonder Americans believe the nation faces a retirement crisis," Oakley pointed out.

These concerns were echoed at a hearing held by the U.S. Senate Special Committee on Aging on March 12, 2015, entitled "Bridging the Gap: How Prepared are Americans for Retirement?" Senator Susan Collins (R-ME), the Committee Chairman, noted that according to a recent survey conducted by PBS, 92 percent of respondents believe there is a retirement crisis in the nation. Senator Claire McCaskill (D-MO), the ranking Democrat on the Committee, called the retirement security crisis "very real," and underscored the NIRS report's findings.

In addition to noting how retirement savings were closely correlated with income, Senator McCaskill stressed that there are "significant racial disparities" in such savings as well, pointing to a recent study by the Urban Institute showing that white families had more than $100,000 more in average liquid retirement savings than African American and Hispanic families. This figure "has quadrupled in the last quarter century," she said.

Witnesses at the hearing provided a number of other interesting observations related to the lack of retirement security. These included:

- A survey done by Alliance Life Insurance Company showed that substantially more Americans feared a retirement shortfall more than feared death. (Jean Chatzky, Financial Editor, NBC *Today*)

- According to the Pew Research Center, 48 percent of parents are providing financial support for kids over age 18, 21 percent are providing support to parents over age 65, and 15 percent are doing both. (Chatzky)

- From 1992 to 2010, the percentage of consumers age 65 to 74 with mortgage debt doubled from 17 percent to 35 percent. Among those age 75 and up, it more than doubled from roughly 8 percent to nearly 22 percent. (Chatzky)

- According to Social Security Solutions, three-quarters of Americans tap their Social Security benefits at age 62 and by doing so, singles lose an average $181,000 and couples an average $323,000. (Chatzky)

- In a recent column in *The New York Times*, reporter Eduardo Porter cites an example of a 30-year-old worker, earning $30,000 a year, receiving 3% raises and making an annual return on her investments of 7%. If she saved 10 percent of her money in a passive index fund, she'd have $927,000 at age 70 and that nest egg would throw off $37,000 a year. If she put the money instead into a typical actively managed fund, fees and expenses would reduce her nest egg to $561,000 and the amount she could withdraw annually to $22,000 if she wanted that money to last as long as she did. (Chatzky)

- Medicare premiums are rising faster than benefit levels. As a result, Part B premiums alone are estimated to increase from 5.4 percent of the average Social Security benefit for someone retiring in 1990 to 10.4 percent for someone retiring in 2030. (Alicia Munnell, Director, Center for Retirement Research at Boston College)

- Social Security replacement rates for the average worker retiring at 65 are being reduced, going from a net 40 percent in 1985 to 31 percent by 2030. And these reductions are happening without any changes in current law. If benefits are cut back further to address Social Security's long-term financial shortfall, replacement rates will drop even more. (Munnell)

- In 2013, the typical working household approaching retirement with a 401(k) had only $111,000 in combined 401(k) and IRA balances. This amount translates into less than $400 per month, adjusted for inflation. (Munnell)

- The difference between claiming Social Security at age 62 and age 70 is 76 percent. (Munnell)

- Although nearly 90% of households in the highest income quartile own retirement accounts, only about a quarter of households in the lowest income quartile have such accounts. (Michal Grinstein-Weiss, Associate Professor, George Warren Brown School of Social Work, Washington University in St. Louis)

- Social Security and Supplemental Security Income account for more than 90 percent of income for retirees in the bottom 25 percent of the income distribution. Social Security payments account for approximately 70 percent of the annual income of retirees in the middle 50 percent. (Grinstein-Weiss)

- In 2013, the lowest income quartile of Americans received only 0.7 percent of the tax subsidies for employer based retirement savings plans, whereas the top income quintile received 68.4 percent of those subsidies. (Grinstein-Weiss)

- Studies show that having an account in one's name as a child is positively associated with financial outcomes later in life. Young adults who grew up with a savings account in their name are two times more likely to own checking accounts, two times more

likely to own credit cards, three times more likely to own certificates of deposit, and four times more likely to own stocks. This pattern holds true across high- and low-income families. (Grinstein-Weiss)

NIRS: *The Continuing Retirement Savings Crisis*

Impact of Improved Longevity on Public Pension Funding

The Center for Retirement Research (CRR) at Boston College has just released a new issue brief that examines how increased longevity affects state and local pension funding. The brief asks whether outdated mortality assumptions are a serious problem among state and local plans, and finds that "[t]he answer appears to be 'no.'"

CRR first points out that rising life expectancy makes defined benefit pension plans more expensive because sponsors "must pay benefits to retirees for a longer period of time." Based on a model that they use to relate the impact of improved longevity to liabilities, CRR estimates that if beneficiaries live an additional year, liabilities increase by 3.5 percent.

Their brief then examines to what extent state and local plans have already incorporated this pattern of continued longevity improvement into their cost estimates. CRR does so by estimating the impact of changing the longevity assumptions to: (1) the new standard designed for use in the private sector, referred to as RP-2014; and (2) a more stringent standard that incorporates future mortality improvements, referred to as a "generational" version of RP-2014.

By way of background, the Pension Protection Act of 2006 required the Internal Revenue Service (IRS) to publish mortality tables for private sector funding calculations, which the IRS based on a mortality table constructed by the Society of Actuaries (SOA). In 2009, the SOA initiated a new study of mortality trends, applied an updated mortality improvement scale, and created RP-2014. However, it is uncertain when these new tables will be adopted.

Public sector plans are not required to use a specific mortality table, but as of 2013, a large majority of them use the private sector standard as their base, adjusted to align the tables with the expected mortality of their plan members. While CRR notes that it is "not advocating that state and local plans adopt RP-2014, since their mortality experience is quite different from private plans," they are using RP-2014 simply as a benchmark.

CRR determines that if plans were to adopt the generational version of RP-2014, the aggregate funded ratio would drop from an estimated 73 percent to 67 percent. However, as they point out, "even the private sector is not considering using such low mortality rates." Therefore, if public plans simply adopted the "static RP-2014," this would only reduce the funded ratio from 73 percent to 72 percent, although CRR also notes that public plans vary significantly, "so the impacts would be much larger for some and smaller for others."

"In short," CRR finds, "public sector plans seem to be making a serious effort to keep their life expectancy assumptions up to date."
CRR: "How Will Longer Lifespans Affect State and Local Pension Funding?"