Kentucky Teachers' Retirement System

Gary L. Harbin, CPA
Executive Secretary

July 17, 2015

Information for

KTRS Funding Work Group

Presented by

Gary L. Harbin, CPA
Executive Secretary

Teachers' Retirement System

BRIEF OVERVIEW

Presented by

Gary L. Harbin, CPA

Executive Secretary

Established in 1938, KTRS provides "Retirement Security" for Kentucky's educators.

Kentucky Teachers' Retirement System
~ Staff ~

Retirement Staff of 102 Professionals	
Member Benefits	19
Member Services	9
Retiree Insurance	11
Call Center	6
Technology	14
Accounting	12
Investments	19
Facility Services	3
Administrators	9
TOTAL	**102**

Credentialed Employees	
CFAs	5
CIPMs	2
MBAs	5
Masters Degree	7
CPAs	6
JDs	4

- **Career Employees**
- **High Morale**
- **Low Turnover**

Professional Consultants and Other Service Providers Assisting KTRS Board of Trustees and Staff

Actuarial Services

Cavanaugh Macdonald Consulting

Legal Services

Ice Miller
Klausner Kaufman Jensen & Levinson
Reinhart, Boerner VanDeuren
Stoll, Keenon, and Ogden

Auditing & Financial Consulting

Mountjoy Chilton Medley

Communications

Peritus

Health & Benefits
Retiree Health Insurance

Aon Risk Solutions

Investment Consulting

Aon Hewitt

Professional Organizations for the Teachers' Plan

NCPERS
1941

Association of Public Pension Fund Auditors

NASRA

NATIONAL INSTITUTE ON Retirement Security
Reliable Research. Sensible Solutions.

GASB
Governmental Accounting Standards Board

PUBLIC SECTOR HEALTHCARE ROUNDTABLE

NAPPA
National Association of Public Pension Attorneys

GFOA
Government Finance Officers Association

SALGBA
STATE AND LOCAL GOVERNMENT BENEFITS ASSOCIATION
The premier organization for public sector benefits professionals.

NPEA
NATIONAL PENSION EDUCATION ASSOCIATION

NCTR
NATIONAL COUNCIL *on* TEACHER RETIREMENT
Supporting Retirement Security for America's Teachers

IIA
The Institute of Internal Auditors

Coalition to Preserve Retirement Security

National Association of State Investment Officers

Low Cost of Benefits

Low Administrative Costs

Low Investment Costs

Solid Investment Performance

Positive Impact on Kentucky’s Economy

How much do Kentucky teachers' pension benefits cost?

- Social Security benefits for workers in Kentucky average **$1,173** per month.
- Retirement benefits for Kentucky's teachers average **$3,042** per month.

	Normal Cost	Breakdown of Normal Cost	
		Teachers' Contribution*	**State's Contributions**
Normal cost of Kentucky K-12 teachers' pension benefits	16.75%	9.11%	7.64%
Comparative cost of Social Security	12.40%	6.20%	6.20%
Marginal incremental cost for Kentucky teachers' pension benefits	4.35%	2.91%	1.44%

** Teachers also have withheld from their paychecks an additional 3.75% of their salary to pay for retiree medical benefits.*

Low Administrative Costs
Low Investment Costs

Low Cost of Benefit

Low Administrative Costs

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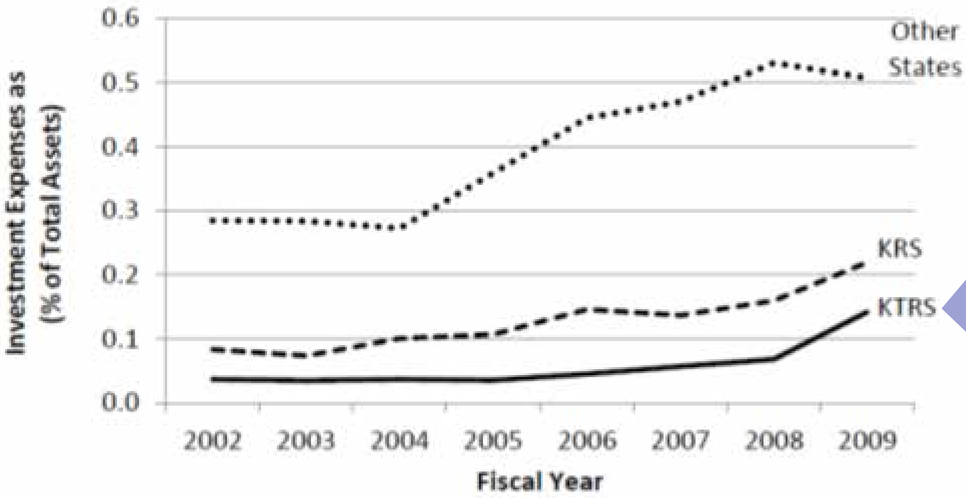
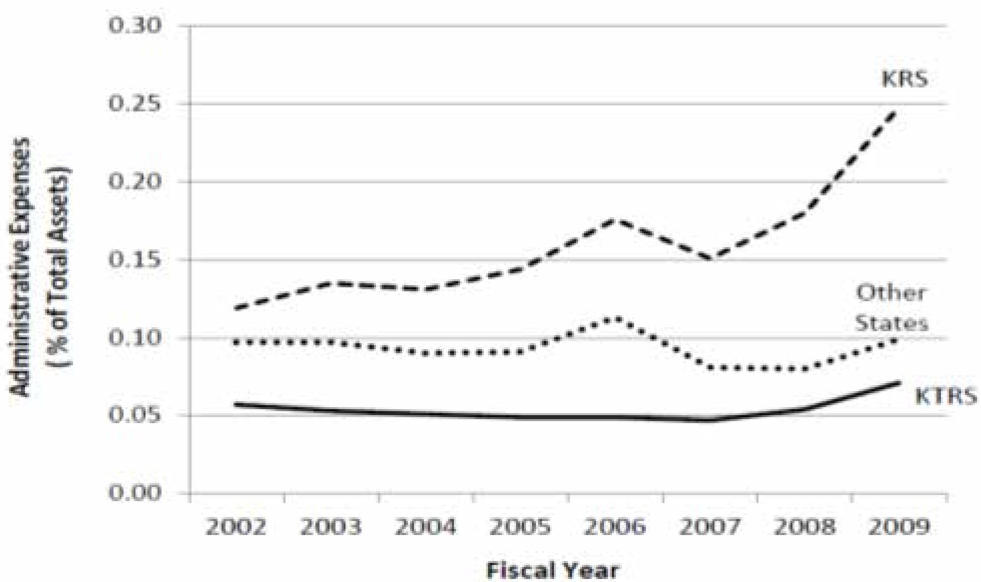
Solid Investment Performance

Positive Impact on Kentucky’s Economy



Note: Value of pension plan assets is the market value.
Source: Staff analysis of data from Boston College's Center for Retirement Research; Commonwealth. Kentucky Retirement. *Comprehensive*, various years; ; Commonwealth. Kentucky Teachers'. *Comprehensive*, various years.

INVESTMENT EXPENSES
as a Percentage of Pension Assets for KRS, KTRS, and the Average of Other States FY 2002 to FY 2009



Note: Value of pension plan assets is the market value.
Source: Staff's analysis of data from Boston College's Center for Retirement Research.

ADMINISTRATIVE EXPENSES
as a Percentage of Pension Plan Assets for KRS, KTRS, and Average of Other States FY 2002 to FY 2009

KENTUCKY TEACHERS RETIREMENT SYSTEM

ADMINISTRATIVE EXPENSES ANALYSIS

KRTS Expenses Compared to Similar Size Systems

As of 6/30/2014	Assets End of Year	Actual Expenses	Basis Points
Kentucky Teachers	**18,720,359,574**	**9,078,009**	**0.0485%**
Kansas Public Employees	16,575,660,909	10,085,572	0.0608%
New Mexico Public Employees	15,104,097,545	10,416,788	0.0690%
Georgia Employees	17,266,692,000	14,476,000	0.0838%
Louisiana Teachers	17,900,035,458	15,026,969	0.0839%
Ohio Teachers Retirement System	75,420,054,000	63,485,000	0.0842%
Indiana Public Employees	24,695,285,000	28,959,000	0.1173%

Recent Board Accomplishments

- Return to work made actuarially sound.
- Average retirement age increased from 54 to 58.
- Air-Time costs made actuarially sound.
- COLAs are funded.
- Pre-funding of medical benefits saved $5 billion.

Recent Board Accomplishments *continued* …

- Partnered with University of Kentucky & University of Louisville to purchase retiree medical prescriptions - saving $11million annually.
- Placement agents prohibited.
- Investment Committee structure generates top investment performance.

Solid Investment Performance

Low Cost of Benefit

Low Administrative Costs

Low Investment Costs

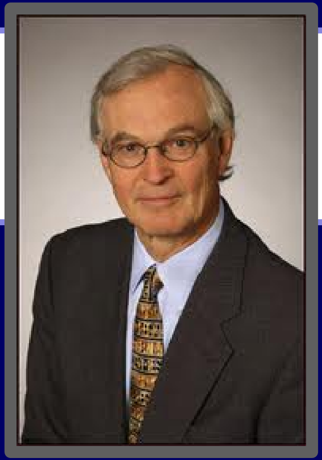
Solid Investment Performance

Positive Impact on Kentucky’s Economy

The Structure of the KTRS Investment Committee …

- Exceeds current industry standards.
- Is leading "Best Practices" for Investment Committee Structure.
- Has been recommended for use in other States.
- KTRS investment costs are among the lowest in the nation.

Bevis Longstreth



Professional Investment Activities

- Since 2005, Member Board of Directors of Grantham, Mayo & Van Otterloo, LLC, Chairma n of the Risk Committee.
- From 1972 to 1981 and since 1984, Member, Finance Committee, Rockefeller Family Fund, responsible for investment strategy, manager selection and monitoring, Chairman from 1987 to 2004.

- Appointed Commissioner, Securities and Exchange Commission, 1981: re-appointed, 1982; resigned January 13, 1984.
- Member of the Board of Governors of American Stock Exchange from 1992 to 1998.
- Member of Board of Trustees of College Retirement Equities Fund (CREF) of TIAA-CREF from 1996 to 2006.

- Member of Board of Directors of AMVESCAP PLC (INVESCO) from 1993 to 2006.
- Member of the Pension Finance Committee of The World Bank from 1987 to 1995.
- Author of three books including, Modern Investment Management and the Prudent Man Rule.
- Author of over forty investment articles appearing in various publications including Financial Times, New York Times, Washington Post, Chicago Tribune, The Banker Magazine, The Journal of Portfolio Management.

George M. Philip

Professional Activities

- President University of New York at Albany
- From 1971 to 2007 – New York State Teachers Retirement System*
  - Chief Real Estate Investment Officer - 1988 to 1992
  - Chief Investment Officer - 1992 to 2007
  - Executive Director - 1995 to 2007

* *One of the ten largest public pension funds in the United States, $105 billion fund with 400,000 members. Mr. Philip was instrumental in diversification of portfolio including real estate and other alternative assets.*

- Currently is Investment Advisor to New York State Teachers' Retirement System.
- Serves and has served on numerous boards and investment committees including:
  - New York Stock Exchange, Advisory Committee
  - Chair of the Council of Institutional Investors
  - Director of US Airways Group
  - Director of First Niagara Financial Group ($15Bn Bank Group)
  - Director of the Real Estate Investment Standards Board

Positive Impact on Kentucky's Economy

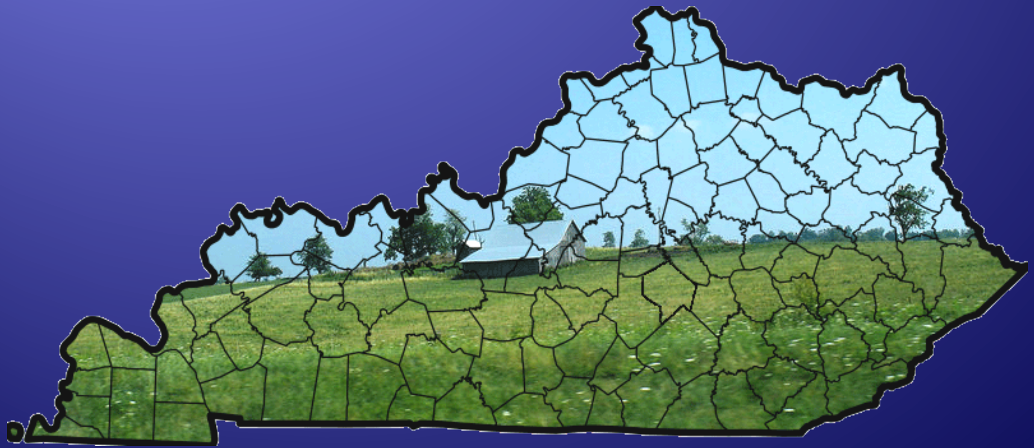
Low Cost of Benefit

Low Administrative Costs

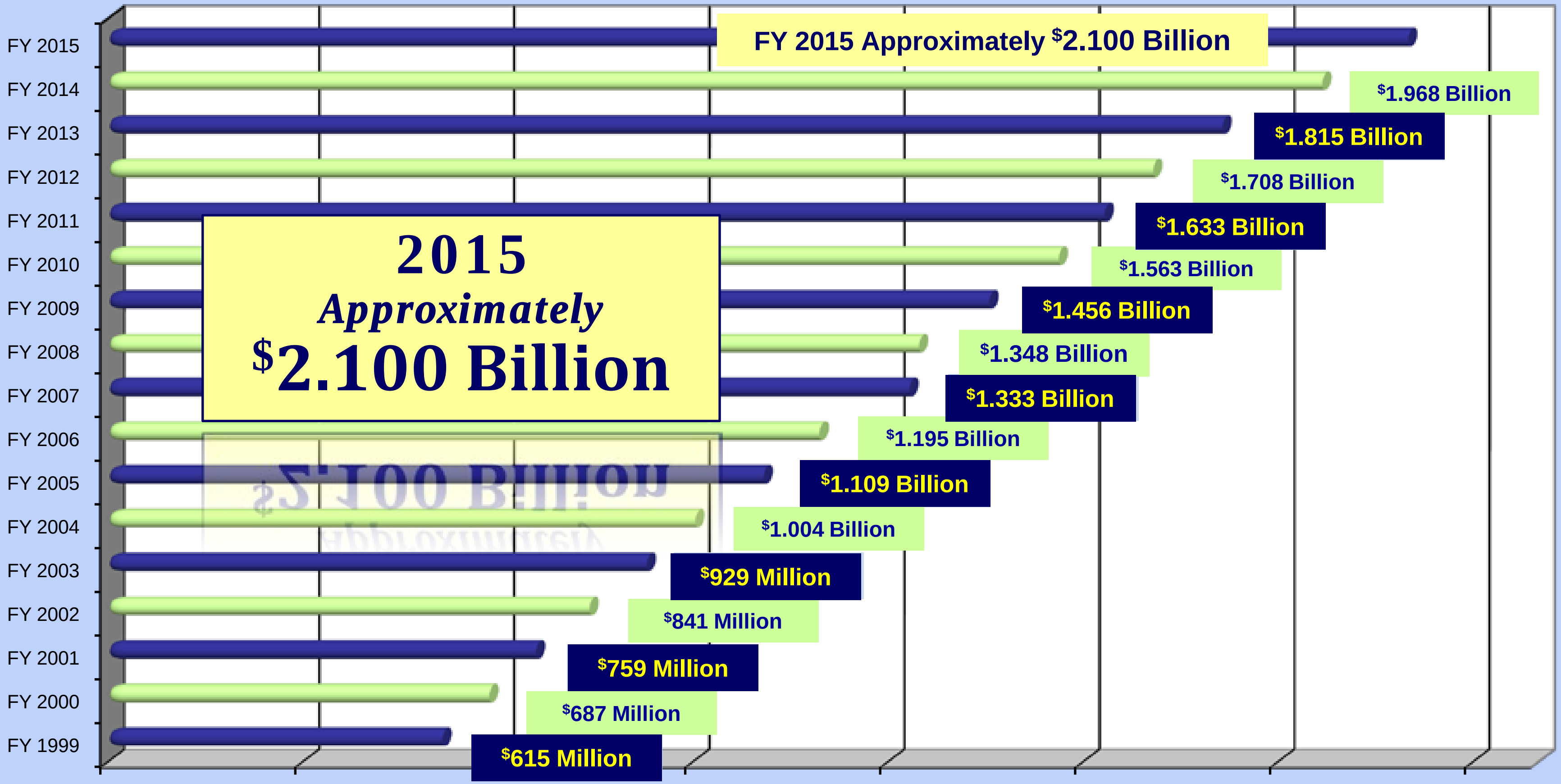
Low Investment Costs

Solid Investment Performance

Positive Impact on Kentucky's Economy



KTRS Distributes Hundreds of Millions of Dollars Annually



92% of KTRS retirees live in Kentucky.

Kentucky Teachers Retirement System

Schedule of Funds Available for Retirement Benefits

For the Twenty-Nine Year Period Ending June 30, 2014

Defined Benefit Plan – Retirement Benefits – (Pre-Funded)

in billions

Beginning Balance as of	July 1, 1985	$ 1.8
Member & Other Contributions		6.0
Employer Contributions		10.2
Investment Income		21.5
Benefit Payments & Refunds		(21.2)
Administrative Expenses		(0.2)
Ending Balance as of	June 30, 2014	$18.1

Kentucky Teachers Retirement System

Schedule of Funds Available for Medical Benefits

For the Twenty-Nine Year Period Ending June 30, 2014

Medical Benefits – (Pay-go until June 2010)

Medical Insurance … in billions

Beginning Balance as of	**July 1, 1985**	**$ 0.0**
Member & Other Contributions		1.3
Employer Contributions		2.1
Investment Income		0.3
Medical Insurance Benefits		(3.2)
Administrative Expenses		-
Ending Balance as of	**June 30, 2014**	**$ 0.5** *

** Through Shared Responsibility, this fund became a pre-funded fund as of July 1, 2011.*

Investment
OVERVIEW

Presented by

P.J. Kelly, CFA, CAIA

Partner

Aon Hewitt

AON
Empower Results®

Kentucky Teachers’ Retirement System
Funding Working Group

July 17, 2015

Aon Hewitt
Retirement and Investment

Empower Results®

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Aon Hewitt Investment Consulting Background

Aon Hewitt Investment Consulting – Overview

Investment consulting professionals:
- More than **270** in the U.S.; more than **600** worldwide

Assets under advisement:
- **$1.7 trillion** in in the U.S.; more than **$4.5 trillion** in global assets

U.S. investment consulting clients: **488**
- Public and Corporate Pension Plans
- Defined Contribution Retirement Plans
- Endowments and Foundations
- Taft-Hartley Plans

#1 Industry Rankings
- Total U.S. Client Assets
- Total Public Plan Assets

Sources: November 2013 issue of *Pensions & Investments* and Plan Sponsor 2013 survey

Independent and objective advice – **100%** of revenue derived from consulting clients

Full suite of services, including delegated solutions, specialty consulting, and fiduciary services

Experience | Depth of Dedicated Resources | Thought Leadership

Data as of December 31, 2014

P.J. Kelly Biography – Lead Consultant to KTRS

P.J. Kelly, CFA, CAIA
Partner

- Partner with more than 19 years of investment experience; 18 years with AHIC
- Extensive experience working with a variety of client types but a particular focus on public retirement system defined benefit plans
- Frequent speaker before industry groups such as the National Conference on Teacher Retirement, National Association of Public Pension Attorneys and National Association of Securities Professionals, on a broad range of topics pertaining to the firm's research initiatives and industry best practices
- Served on the Ennis, Knupp & Associates Board of Directors, one of the predecessor firms of AHIC
- Awarded the IMN Public Fund Consultant of the Year in 2009 for his post-financial crisis client work
- Bachelor of Science degree in finance from Northern Illinois University
- CFA (Chartered Financial Analyst) and CAIA (Chartered Alternatives Investment Analyst) charterholder and a member of the CFA Institute
- Chairman of the Investment Committee and active volunteer for the Make a Wish Foundation of Illinois

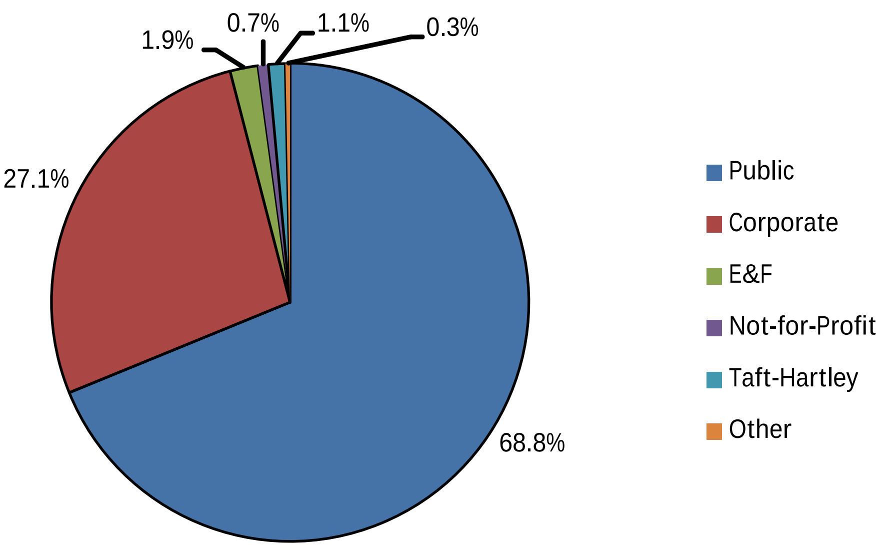
Deep Public Fund Experience, Long Standing Client Partnerships

We are an institutional investment consulting firm advising sophisticated clients

	AUA [1]	# of Clients
Traditional Consulting	$1.7 Trillion	384
Public Sector Clients	$1.2 Trillion	42
Delegated Consulting	$35.6 billion	104
Specialty Services		
Private Equity	$35 Billion	40
Real Estate	$33 Billion	50
Hedge Funds	$35 Billion	70

[1] Asset under advisement

Breakdown of Client Assets Under Advisement



Data as of December 31, 2014

Empower Results®

We Serve Diverse and Sophisticated Institutional Investors

Representative List of Clients

Public Pension Funds

- Arkansas Teacher Retirement System
- Colorado Public Employees' Retirement Association
- Commonwealth of Puerto Rico
- Employees Retirement System of Texas
- Florida State Treasury
- Ohio Public Employees Retirement System
- Nebraska Investment Council
- New Jersey Division of Investment
- New York State Teachers Retirement System
- Ohio Public Employees Deferred Compensation Program
- Ohio Public Employees Retirement System
- San Diego City Retirement System
- Sonoma County Employees' Retirement Association
- State Board of Administration of Florida
- South Carolina Retirement System
- Teacher Retirement System of Texas

Corporate

- 7-Eleven
- Alaska Airlines
- Allegheny Technologies
- American Honda Motors
- BAE Systems
- BMW of North America
- BlueCross BlueShield
- Ernst & Young
- Home Depot
- MillerCoors
- Monsanto Company
- National Grid USA
- NextEra
- Reed Elsevier
- Safeway
- Steelcase

Endowed / Not-for-Profit

- Casey Family Programs
- Colorado Trust
- Masonic Homes of California
- NCAA
- Paso del Norte Health Foundation
- University of Illinois
- University of New Mexico Foundation
- U.S. Conference of Catholic Bishops

Defined Contribution Plans

- California State University
- Harvard University
- Ohio Public Employees Deferred Compensation
- Massachusetts Deferred Compensation
- Stanford University
- U.S. Federal Thrift Savings Plan
- University of Notre Dame

Data as of December 31, 2014

Depth & Experience

- Consulting staff of over **270** investment professionals

- More than **85** professionals dedicated to Investment Manager Research
  - Includes more than **40** dedicated to alternative strategies

- Highly credentialed employees:
  - 57 CFAs
  - 15 CAIAs
  - 20 FSAs
  - 5 JDs
  - 46 additional degrees and certifications including PhD, ACA, AIF, ASA, CEBS, CERA, CFP, ChFC, CIPM, CLU, CPA, EA, FIA, FLMI, FSA, MS, MBA, PRM, QKA, QPA, and RPA

- 105 Professionals with advanced degrees

- Leaders with experience – 50 Partners average 23 years in the industry

Data as of December 31, 2014

Services Provided to KTRS

Aon Hewitt Investment Consulting (AHIC) assists KTRS with the following:

- Development of Investment Policy and Strategy
  - Asset Liability Modeling
  - Liquidity Modeling
  - Investment Policy Statement Development and Maintenance
- Asset Allocation
- Asset Class Structure
- Investment Manager Selection
- Performance Measurement and Assessment
- Topical Research
- Educational and Training Support

KTRS Performance

KTRS Performance Report Card – Making the Grade

Periods Ending March 31, 2015	One-Year	Three-Year	Five-Year	Ten-Year
KTRS Pension Return	**8.6%**	**11.3%**	**10.5%**	**7.2%**
KTRS Policy Benchmark	7.4%	10.4%	10.0%	--
Public Fund Index	6.8%	9.8%	9.6%	7.0%
Public Fund Universe Percentile Ranking* (1st is the best)	10th	8th	13th	36th
Actuarial Assumed Rate of Return	7.5%	7.5%	7.5%	7.5%

- Outperformed the Policy Benchmark for each period shown by meaningful margins – A+
- Exceeded the return of the Public Fund Index for each period shown – A+
- Ranks near the top of the Public Fund Universe for each period shown except for the 10-year period where the return ranks near the top third of results – A
- Exceeded the actuarial assumed rate of return of 7.5% for each period shown with the exception of the 10-year period which includes the 2008 financial crisis – A

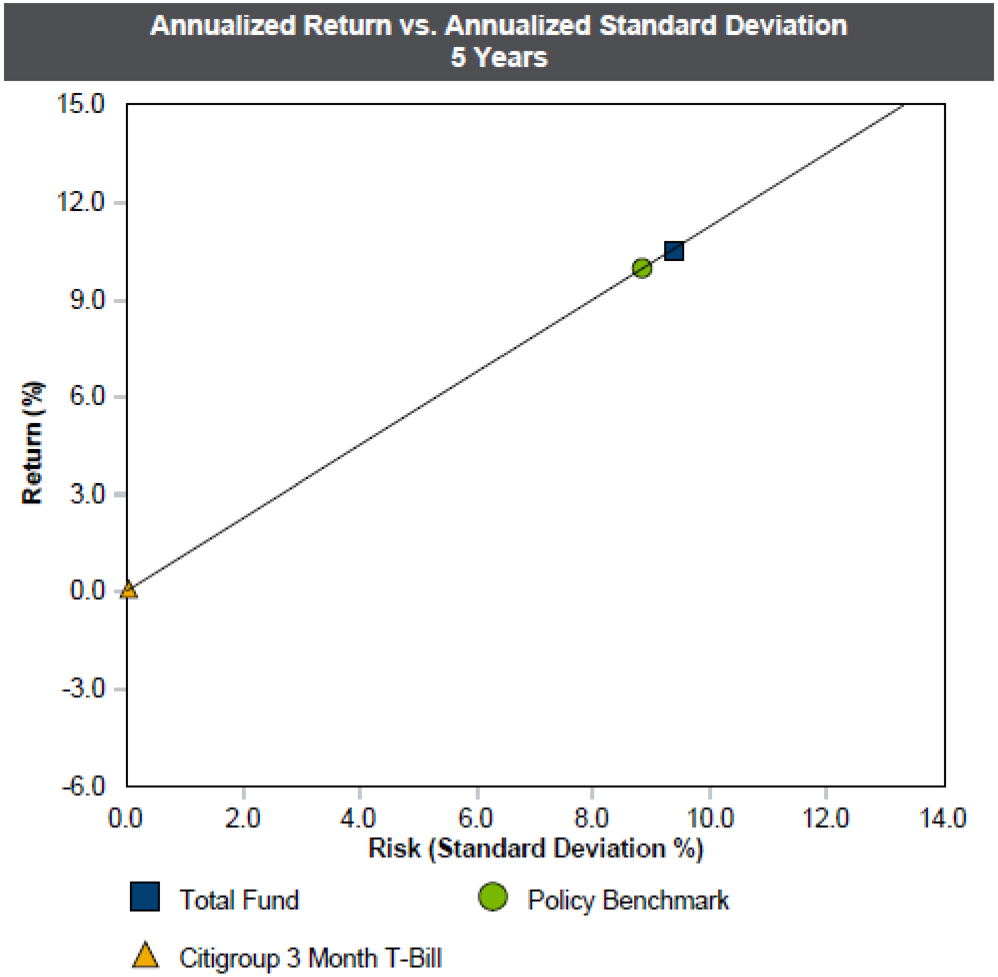
* Universe includes Public Plans > $1 billion. Universe compiled by Investment Metrics with supplemental data from BNY Mellon. Population of universe for 1-,3-,5- and 10-year periods are 79, 76, 73 and 69, respectively.

Performance Attribution

Contribution to Relative Return	One-Year	Three-Year	Five-Year
Asset Allocation Relative to Policy Targets	-0.01%	-0.10%	-0.22%
U.S. Equity Performance	0.63%	0.47%	0.22%
International Equity Performance	0.27%	0.19%	0.21%
Fixed Income Performance	-0.03%	0.13%	0.15%
Additional Categories Performance	0.02%	0.29%	0.16%
Real Estate Performance	0.25%	0.20%	0.17%
Other Asset Categories	0.05%	-0.07%	-0.03%
Impact of Cash Flows	-0.02%	-0.28%	-0.24%
Total Outperformance vs. Policy Benchmark	**1.16%**	**0.83%**	**0.42%**

- The favorable relative performance was produced by a variety of areas within the portfolio
- The impact of cash flows (raising cash to pay benefits and transferring assets for other portfolio activities) was a meaningful drag on performance over the three- and five-year period

Risk Adjusted Performance



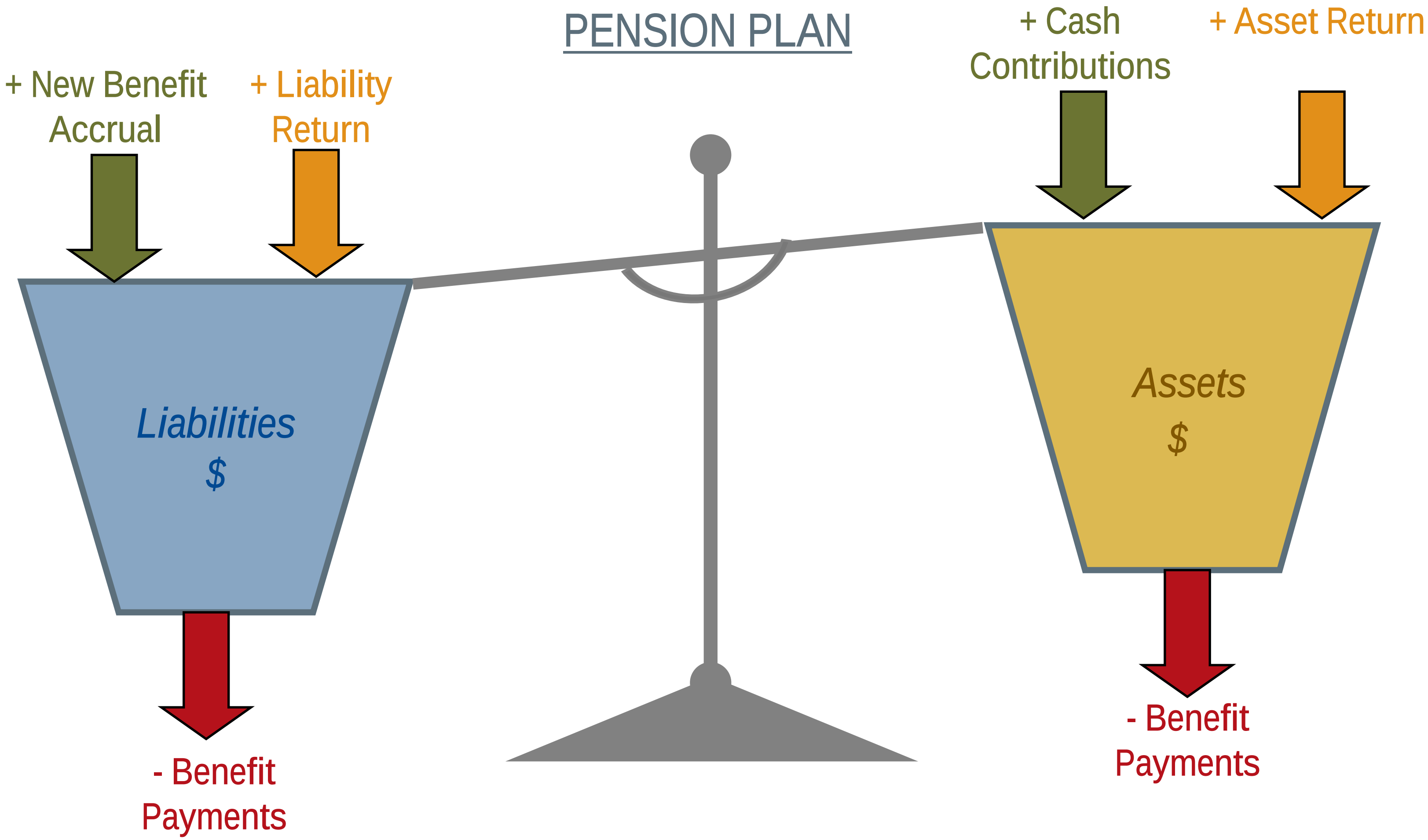
§ The 5-Year return was achieved at a similar level of risk than that of the policy benchmark

Implications of Underfunding

Asset/Liability Background: What is an Asset/Liability Study?

- Provides fiduciaries with an understanding of the dynamic relationship between plan assets and liabilities over time
- Identifies future trends in the financial health of the plan based on economic uncertainties, as well as funding and other policies, that may not be evident from an actuarial valuation which provides only a snapshot at a point in time
- Illustrates the impact of various asset allocation targets on required contributions and funded status under a range of different macroeconomic scenarios
- Helps determine the level of risk that is appropriate in the context of the plan’s liabilities and circumstances
- An asset liability study helps fiduciaries take appropriate action to achieve long-term goals of the plan

Pension – Balance of Liabilities and Assets



2013 KTRS Asset-Liability Study Profile

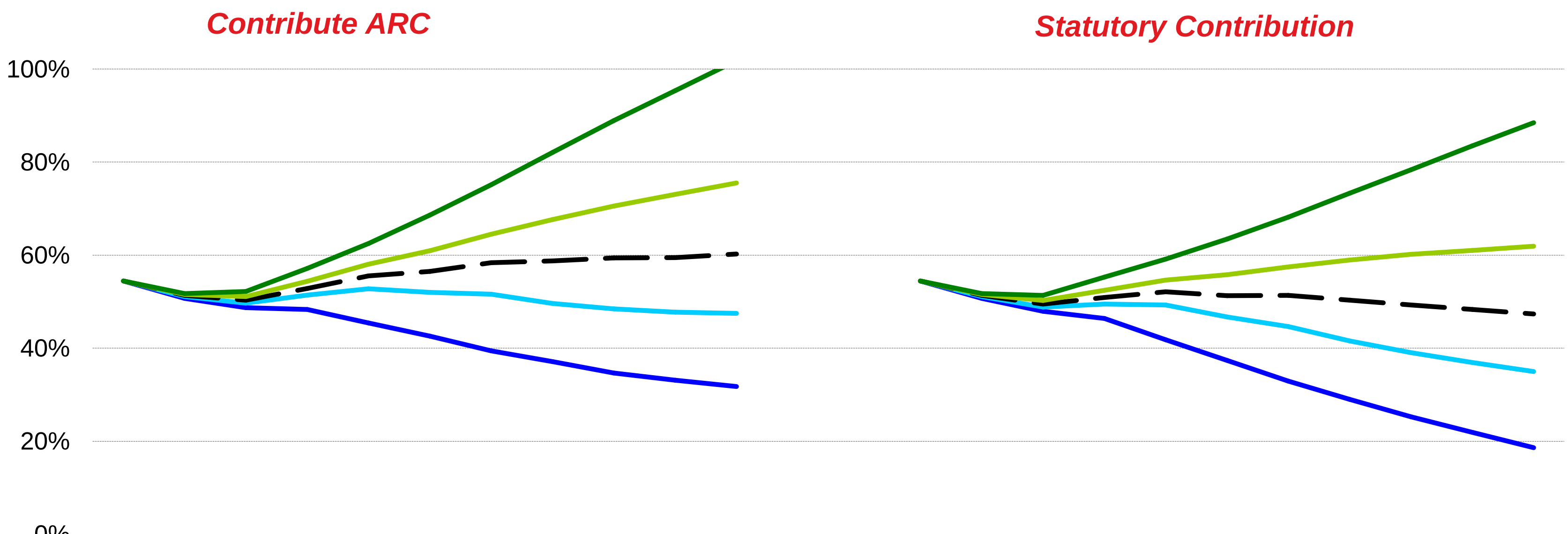
Asset-Liability Snapshot as of 6/30/2012				
Metric ($, Millions)	**Value**		**Fund %: (MVA)**	**(AVA)**
Market Value of Assets	$14,797			
Actuarial Value of Assets	$14,691			
Liability Metrics				
Actuarial Accrued Liability (AL)	$26,974	1	55%	54%
PV of Future Benefits (PVFB)	$31,864	1	46%	46%

1 *Based on plan's valuation interest rate of 8.00% (smoothed interest rate method with corridor); Long term asset return assumption is 7.5%; Valuation interest rate is expected asset return for the next 25 years such that the average return for the 30 year period (last 5 years and next 25 years) is 7.5%; Valuation interest rate is limited to at least 7% and at most 8%.*

Fiscal Year Asset Allocation as of 6/30/2012		
Metric ($, Millions)	**Value**	**Alloc %**
U.S. Equity	$6,659	45%
International Equity	$2,516	17%
Real Estate	$592	4%
High Yield/Non-U.S. Debt	$888	6%
Commodities (Timber)	$148	1%
Other Alternatives (Private Equity)	$592	4%
Core Fixed Income	$3,107	21%
Cash	$296	2%

Asset-Liability Growth Metrics			
Metric ($, Millions)	**Value**	**% Liability**	**% Assets**
AL Interest Cost	$2,023.0	7.5%	13.7%
AL Normal Cost	$489.2	1.8%	3.3%
Total Liability Hurdle Rate	**$2,512.2**	**9.3%**	**17.0%**
Expected Return on Assets	$1,109.8	4.1%	7.5%
ER + EE Contributions	$867.1	3.2%	5.9%
Total Exp. Asset Growth	**$1,976.9**	**7.3%**	**13.4%**
Hurdle Rate Shortfall	**-$535.4**	**-2.0%**	**-3.6%**
Benefit Payments	$1,621.7	6.0%	11.0%

2013 Asset Liability Results – Projected Funded Ratios

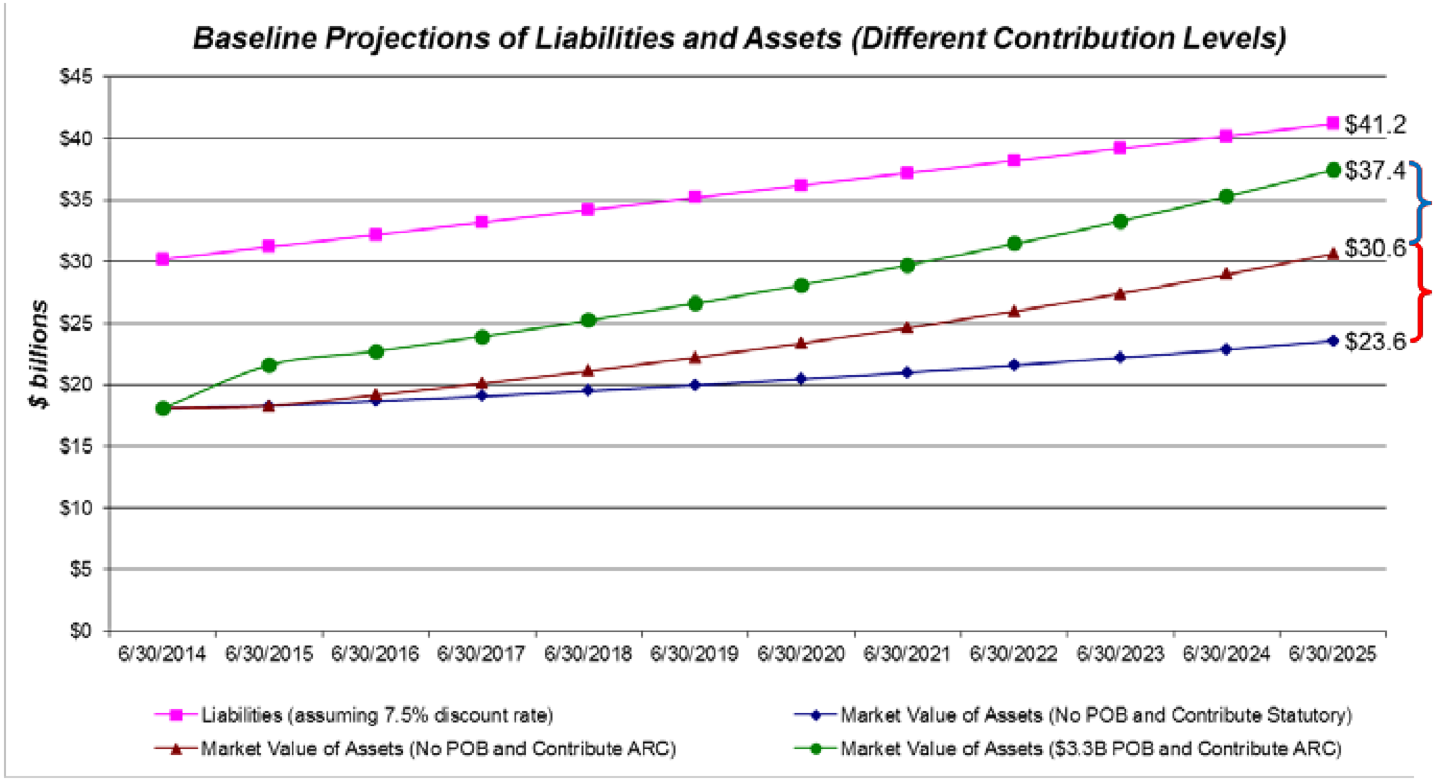


	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
5th %	54%	51%	49%	48%	45%	43%	39%	37%	35%	33%	32%			54%	51%	48%	46%	42%	37%	33%	29%	25%	22%	19%
25th %	54%	51%	50%	51%	53%	52%	52%	50%	48%	48%	47%			54%	51%	49%	50%	49%	47%	45%	42%	39%	37%	35%
50th %	54%	51%	50%	53%	56%	57%	58%	59%	59%	59%	60%			54%	51%	50%	51%	52%	51%	51%	50%	49%	48%	47%
75th %	54%	52%	51%	54%	58%	61%	64%	68%	71%	73%	76%			54%	52%	50%	52%	55%	56%	57%	59%	60%	61%	62%
95th %	54%	52%	52%	57%	63%	69%	75%	82%	89%	95%	102%			54%	52%	51%	55%	59%	64%	68%	73%	78%	84%	88%

- The last AL study supported contributing the ARC versus statutory required contribution and closing the funding gap through a pension obligation bond offering
- The most likely outcome (50th percentile represented by the dashed line) showed declining funded ratios without improved funding through higher contributions

Empower Results®

Value of Contributing Sooner



$3.3B contribution from POB proceeds can double in value after 10 years (i.e., assets are $6.8B higher)

Contributing ARC over 10 years can increase the asset value by $7B ($2B from additional investment returns and $5B from additional contributions)

- Contributing ARC (instead of Statutory) is approximately $0.5B more contributions per year or $5B more contributions over 10 years; this can potentially produce an asset value that is $7B higher (assuming 7.5% asset return) which is 40% higher than the extra $5B contribution
- Contributing $3.3B in POB can potentially produce an asset value that is $6.8B higher after 10 years (assuming 7.5% asset return) which is 106% higher than the extra $3.3B contribution

The Burden of Underfunding Placed on Asset Returns

Funded Ratio	Assumed Return/Liability Discount Rate	Required Asset Return to Compensate for Underfunding
120%	7.5%	**6.3%**
100%	7.5%	**7.5%**
80%	7.5%	**9.4%**
60%	7.5%	**12.5%**
40%	7.5%	**18.8%**
20%	7.5%	**37.5%**

- At funded ratios below 100%, the assets need to return more than the assumed rate of return to maintain pace with the growth of liabilities
- At a 60% funding level, the assets need to return 12.5% to keep pace -- a high assumption by any historical or projected standards

The Cost of Waiting

Investment Return Assumption			**7.50%**
POB Amount		**$**	**3,300,000,000**

	Year	**POB Current Year**	**POB in Five Years**	**The Cost of Waiting**
	2015	$3,300,000,000	-	-
	2016	$3,547,500,000	-	-
	2017	$3,813,562,500	-	-
	2018	$4,099,579,688	-	-
	2019	$4,407,048,164	-	-
	2020	$4,737,576,776	$3,300,000,000	$1,437,576,776
	2021	$5,092,895,035	$3,547,500,000	$1,545,395,035
	2022	$5,474,862,162	$3,813,562,500	$1,661,299,662
	2023	$5,885,476,824	$4,099,579,688	$1,785,897,137
	2024	$6,326,887,586	$4,407,048,164	$1,919,839,422
10 Years	2025	$6,801,404,155	$4,737,576,776	**$2,063,827,379**
	2026	$7,311,509,467	$5,092,895,035	$2,218,614,432
	2027	$7,859,872,677	$5,474,862,162	$2,385,010,515
	2028	$8,449,363,128	$5,885,476,824	$2,563,886,303
	2029	$9,083,065,362	$6,326,887,586	$2,756,177,776
	2030	$9,764,295,264	$6,801,404,155	$2,962,891,109
	2031	$10,496,617,409	$7,311,509,467	$3,185,107,942
	2032	$11,283,863,715	$7,859,872,677	$3,423,991,038
	2033	$12,130,153,493	$8,449,363,128	$3,680,790,366
	2034	$13,039,915,005	$9,083,065,362	$3,956,849,643
20 Years	2035	$14,017,908,631	$9,764,295,264	**$4,253,613,367**

- The power of compounding makes the cost of waiting high
- Interest rates are low and may rise in the coming years, increasing the cost of financing

Liquidity Stress Testing Analysis

Analyzing Liquidity Risk

Liquidity Risk

- On average, investing in long-term, less-liquid areas of the capital markets has yielded higher returns over time
- AHIC expects this “liquidity premium” to continue being an important source of additional return for investors with the ability to maintain a long-term time horizon
- Investors that can not maintain a long-term time horizon due to onerous liquidity requirements or a lack of appropriate contributions, should maintain a higher level of liquidity and thereby expect lower returns going forward

Liquidity Modeling

- Liquidity modeling or stress-testing is designed to determine the amount of liquidity available to pay benefits under a variety of macro economic environments
- Demonstrates how the portfolio’s liquidity profile could evolve with a given investment strategy under various conditions
- Incorporates the profile of the liabilities as well as expected future contributions

Findings from Analysis

- KTRS current level of liquidity and allocation is appropriate given a recessionary scenario, but in a more pessimistic or more prolonged downturn, issues could arise
- The POB under consideration and funding at the ARC improves KTRS’ ability to weather anticipated liquidity demands and makes continued investment in illiquid asset classes more feasible

Modeling Parameters – Degrees of Illiquidity

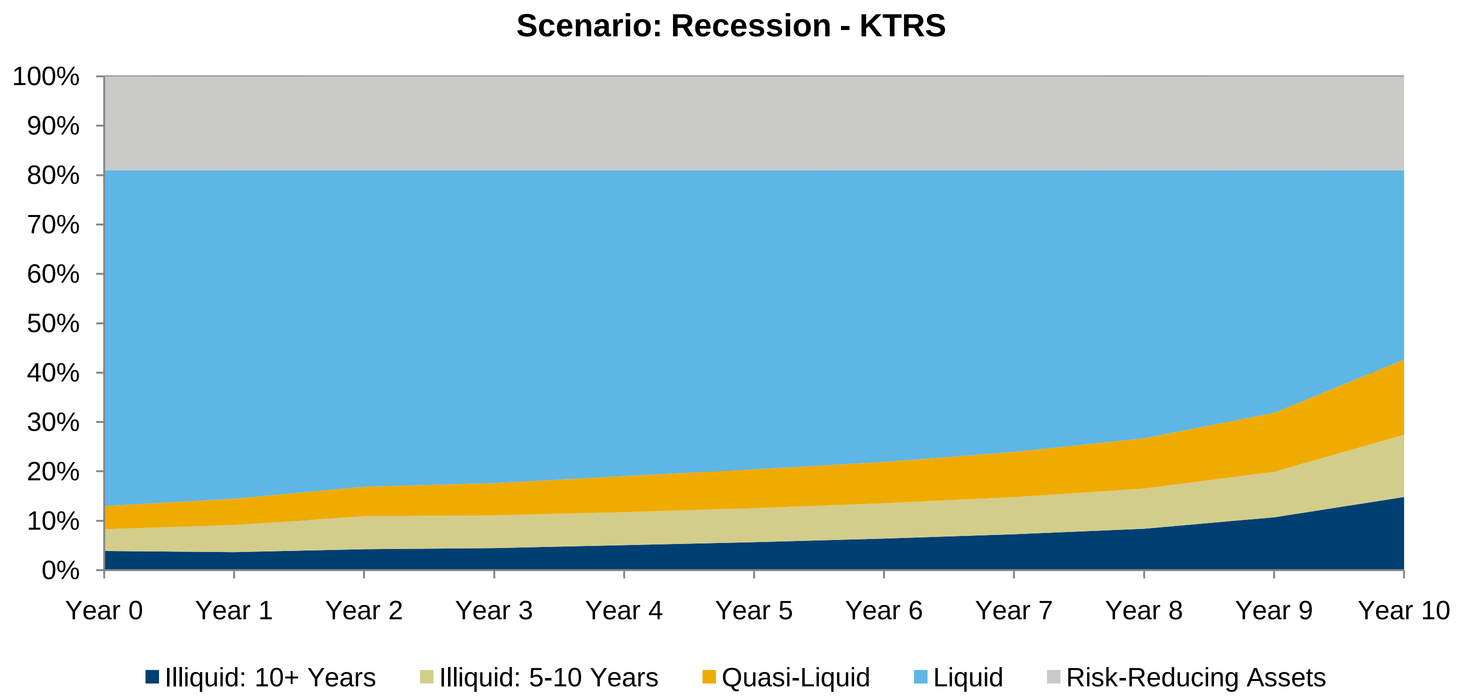
- We categorized investments by liquidity into four buckets
  - **Liquid:** less than 3 months needed for return of capital (e.g. publicly traded securities)
  - **Quasi-Liquid:** Typical lock-up of 3-12 months. Conservatively, we assumed a 1-year lock-up in most economic environments, 2 years in a Recession scenario, and 3 years in a Black Skies scenario (e.g. many hedge funds, core real estate)
  - **Illiquid: Potential lock-up of 5-10 years,** depending on economic environment (e.g. closed-ended real estate)
  - **Illiquid: Potential lock-up of 10+ years** (e.g. private equity)
- This is intended to be a <u>conservative</u> approximation of the actual liquidity properties of the assets
- We started with the current allocations, then see how the actual allocations would change in different economic scenarios

Types of Economic Scenarios Tested

- Central Scenario
  - Markets perform as expected (~50th percentile)
- Blue Skies Scenario
  - Optimistic outlook for markets (~10th percentile)
  - Return-seeking assets increase materially
  - The funded ratio increases
- Recession Scenario (Shown)
  - Somewhat pessimistic outlook for the markets (~90th percentile)
  - Return-seeking assets decline in the first two years with a modest rebound in later years. The value of public equities drops by about 17% during those first two years
  - The funding ratio declines
- Black Skies Scenario
  - Very pessimistic outlook for markets (~99th percentile)
  - Return-seeking assets decline significantly. The value of public equities roughly splits in half over three years, without an immediate rebound
  - The funded ratio declines significantly

Recession Economic Scenario – Steady State (No POB)

§ The exhibit below shows the liquidity lock-up of the current strategy, assuming commitments are continued as expected

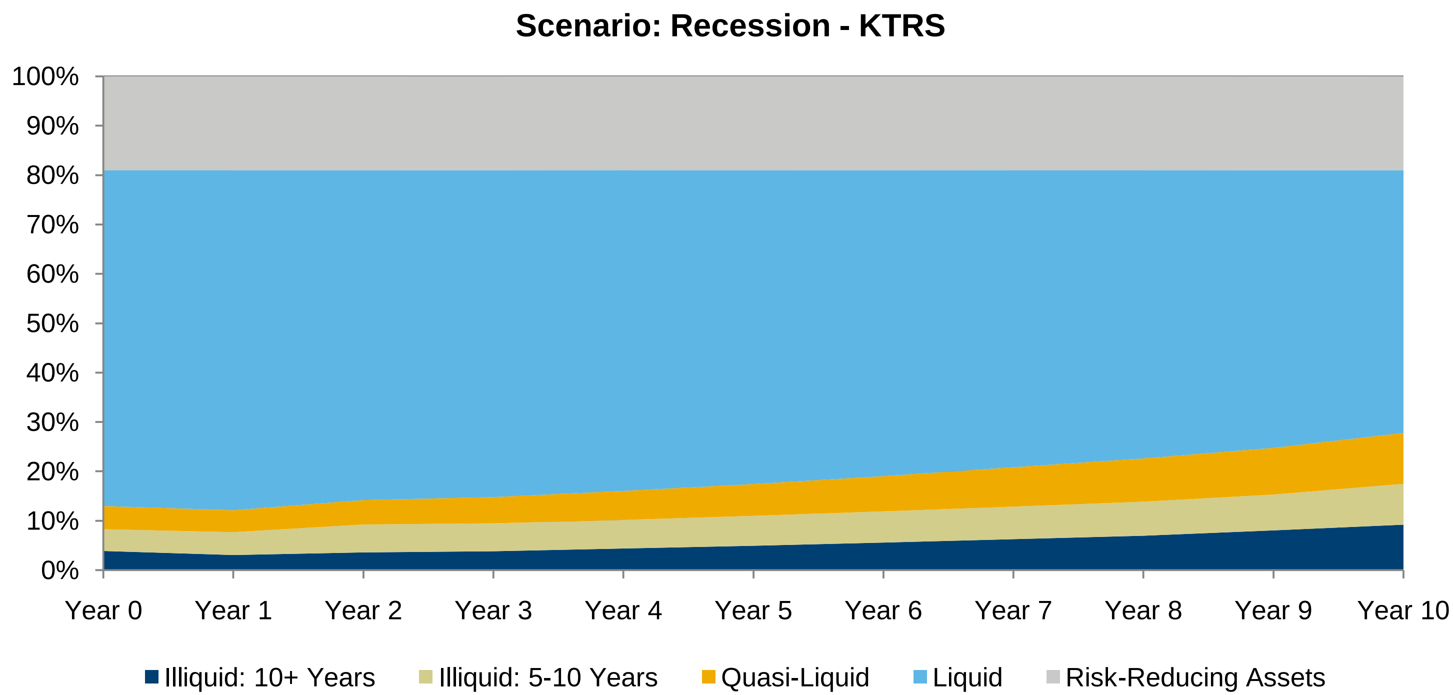


§ Commitments to illiquid alternatives are maintained at the steady state level, but subpar markets cause the total portfolio to shrink

§ Total illiquid assets reach about 43% of the plan due to the shrinking market value of the total plan in this scenario

Recession Economic Scenario – Steady State ($3.3 Billion POB)

- The exhibit below shows the liquidity lock-up of the current strategy, assuming commitments are continued as expected



- Commitments to illiquid alternatives are maintained at the steady state level, but subpar markets cause the total portfolio to shrink
- Total illiquid assets reach about 28% of the plan due to the shrinking market value of the total plan in this scenario

Recession Economic Scenario – Steady State (cont'd)

§ The tables below show the liquidity lock-up of two assumptions: No POB and $3.3 Billion POB

No POB											
Asset Allocation	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Risk-Reducing Assets	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
Liquid Return-Seeking	68	67	64	63	62	61	59	57	54	49	38
Total Liquid	**87%**	**86%**	**83%**	**82%**	**81%**	**80%**	**78%**	**76%**	**73%**	**68%**	**57%**
Illiquid: 10+ Year Lock-up	4%	4%	4%	4%	5%	6%	6%	7%	8%	11%	15%
Illiquid: 5-10 Year Lock-up	4	5	7	7	7	7	7	8	8	9	13
Quasi-Liquid	5	5	6	7	7	8	8	9	10	12	15
Total Quasi + Illiquid	**13%**	**14%**	**17%**	**18%**	**19%**	**20%**	**22%**	**24%**	**27%**	**32%**	**43%**

$3.3 Billion POB											
Asset Allocation	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Risk-Reducing Assets	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
Liquid Return-Seeking	68	69	67	66	65	64	62	60	58	56	53
Total Liquid	**87%**	**88%**	**86%**	**85%**	**84%**	**83%**	**81%**	**79%**	**77%**	**75%**	**72%**
Illiquid: 10+ Year Lock-up	4%	3%	4%	4%	4%	5%	6%	6%	7%	8%	9%
Illiquid: 5-10 Year Lock-up	4	5	6	6	6	6	6	7	7	7	8
Quasi-Liquid	5	4	5	5	6	6	7	8	9	9	10
Total Quasi + Illiquid	**13%**	**12%**	**14%**	**15%**	**16%**	**17%**	**19%**	**21%**	**23%**	**25%**	**28%**

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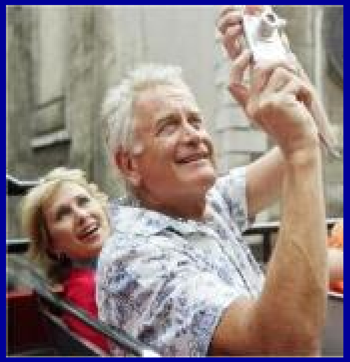
Pension Funding
OVERVIEW

KTRS Quick Facts …

Membership of Over 141,000



Over 49,500 Receive a Benefit from KTRS

KTRS Distributes Over $144 Million Monthly in Retirement Benefits

KTRS has over $ 18.5 Billion in Assets

1 in 4 Teachers are Eligible to Retire …
Almost 15,000 Teachers!

Schedule of Active Members by Employer

FY Ending June 30, 2014

	EMPLOYERS	ACTIVE MEMBERS		SALARIES	
Non- University Employers					
Local School Districts	173	69,961		3,034,202,815	
Regional Cooperatives	8	340		16,558,252	
State Agencies	15	1,640		86,927,768	
Other	6	105		2,537,457	
TOTAL		**72,046**	***95%***	**3,140,226,292**	***94%***
University Employers	6	4,023	*5%*	211,973,992	*6%*
TOTAL	**208**	**76,069**	***100%***	**3,352,200,284**	***100%***

Field of Membership

Active	0 – 26 Years	Non-eligible	43,976
	27+ Years*	Eligible	14,991
	Total Active		58,967
	Sub/PT/Retired Return to Work		15,584
	Total Contributing Members		74,551

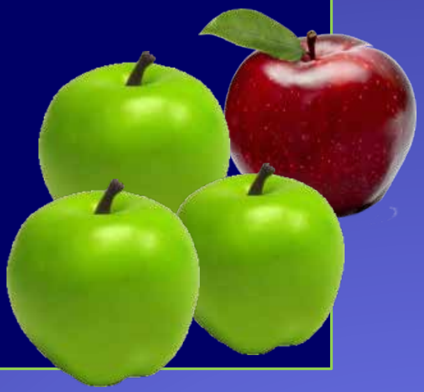
Inactive	18,506
Retired, Beneficiaries & Survivors	48,463
Total	141,520

** and/or age 55 with 5 or more years of service within the next fiscal year*

Field of Membership

Active	0 – 26 Years	Non-eligible	43,976
	27+ Years*	Eligible	14,991

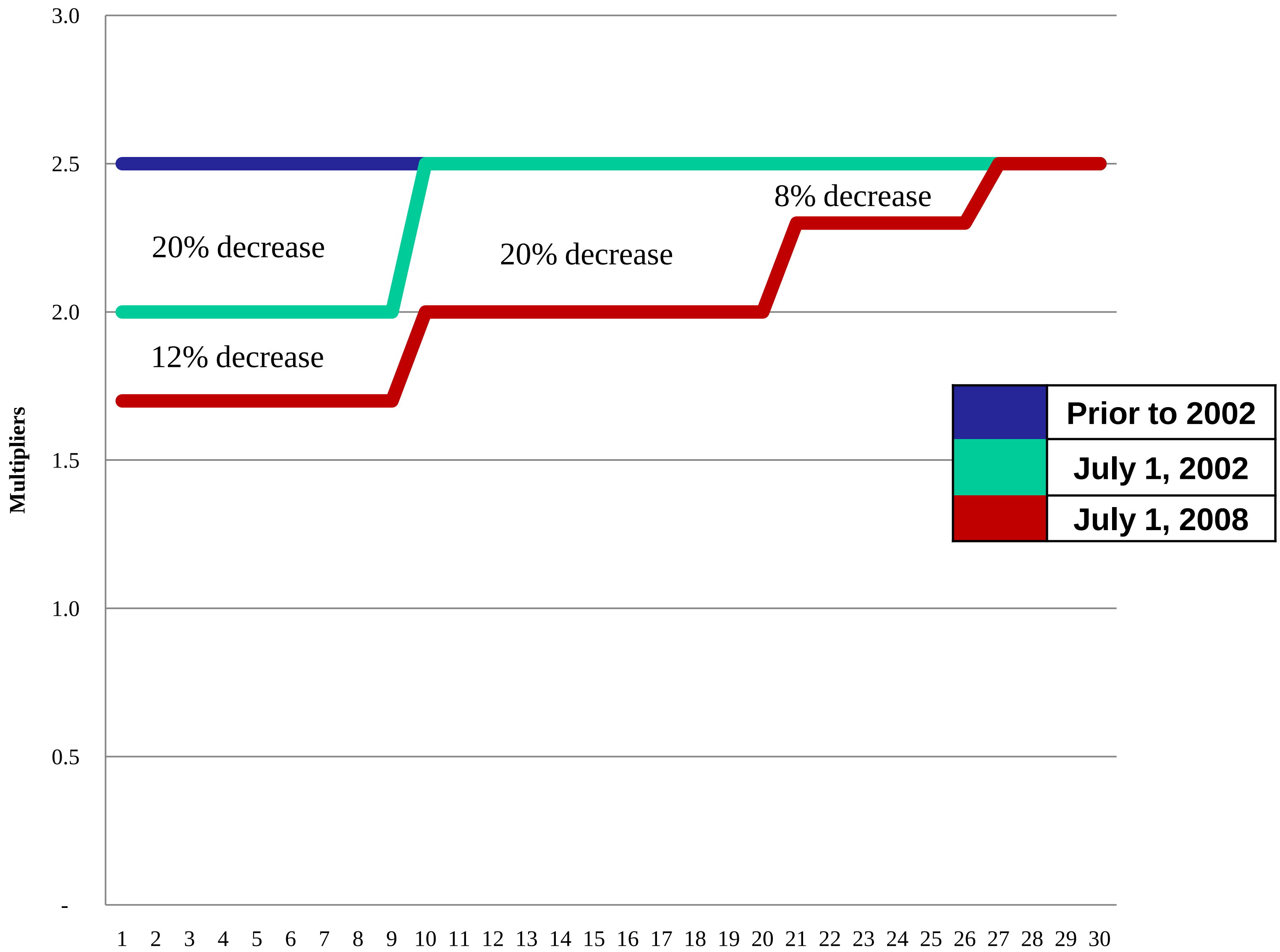
1 in 4 Teachers are Eligible to Retire



Inactive	18,506
Retired, Beneficiaries & Survivors	48,463
Total	141,520

** and/or age 55 with 5 or more years of service within the next fiscal year*

Pension Reform since July 2002



The Importance of Funding

- KTRS has been experiencing a negative cash flow since 2008.
- KTRS will have to sell approximately $3.4 billion in assets in FY 2016-2019.
- KTRS investment strategy is becoming increasingly constrained by liquidity requirements. These constraints will lower future investment returns.
- Additional funding will help stabilize this deteriorating situation.

The Importance of Funding

Most teachers do not participate in Social Security and a Federal law offset will, in almost every case, eliminate their ability to receive a Social Security survivor benefit from their spouse's account.

Under Age 80

Females	[illegible]	[illegible]
Males	12,636	30%
Total	**41,956**	**100%**

Age 80 & Above

Females	[illegible]	[illegible]
Males	1,771	27%
Total	**6,507**	**100%**

52% of retirees younger than age 80 are single.

52% of retirees less than age 80 are single.
85% of retirees age 80 and above are single.

The Importance of Funding

Most teachers do not participate in Social Security and a Federal law offset will, in almost every case, eliminate their ability to receive a Social Security survivor benefit from their spouse's account.

Under Age 80

	NUMBER	PERCENT
Females	29,320	70%
Males	12,636	30%
Total	**41,956**	**100%**

Age 80 & Above

	NUMBER	PERCENT
Females	4,736	73%
Males	1,771	27%
Total	**6,507**	**100%**

52% of retirees less than age 80 are single.

85% of retirees age 80 and above are single.

Kentucky Teachers' Retirement System

Retiree Analysis

Retiree AGE- ***Dec 31st***

	2007	2008	2009	2010	2011	2012	2013	2014
Age **100** years old or more	37	41	38	46	56	62	50	**54**
Age **95-99** years old	266	273	278	279	276	233	220	**196**
Age **90-94** years old	758	704	710	708	705	707	743	**758**
Age **80-89** years old	3,687	3,784	3,890	4,074	4,239	4,295	4,522	**4,684**
TOTAL RETIREES	**4,748**	**4,802**	**4,916**	**5,107**	**5,276**	**5,297**	**5,337**	**5,692**

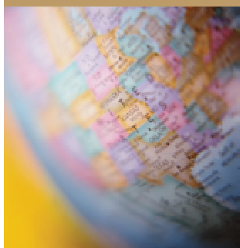
Recap of Actuarial Status of the System

as of June 30, 2014

		In Millions of Dollars		
Pre-funded	Assets	Liabilities	Unfunded	Percent
RETIREMENT Benefit Fund	16,174.2	30,184.4	14.010.2	53.6%
GASB 67 Valuation	18,092.6	39,684.8	21,592.2	45.6%

*Pre-funded**	Assets	Liabilities	Unfunded	Percent
MEDICAL Benefit Fund	508.9	3,194.7	2,685.8	15.9%

* Transitioning to Pre-funded as of July 1, 2010



CENTER *for* RETIREMENT RESEARCH *at* BOSTON COLLEGE

STATE AND LOCAL PENSION PLANS

NUMBER 45, JUNE 2015

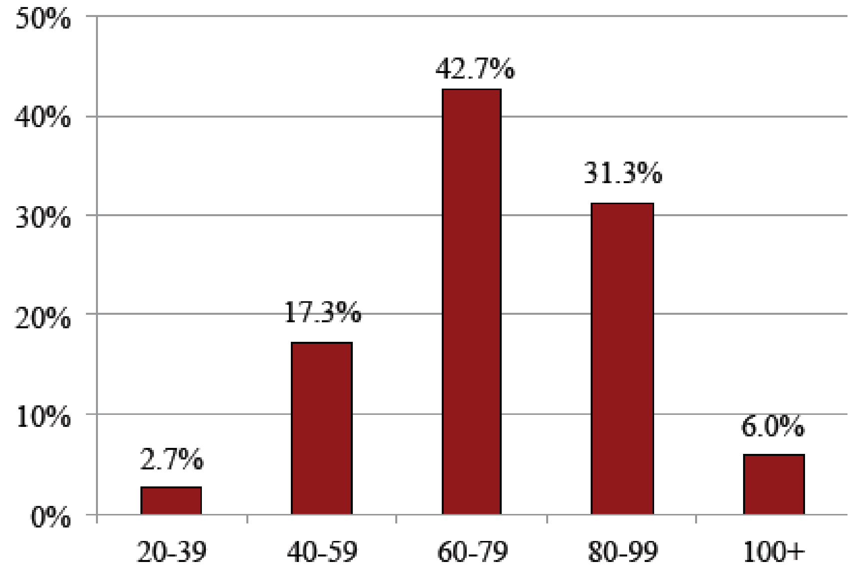
THE FUNDING OF STATE AND LOCAL PENSIONS: 2014-2018

*By Alicia H. Munnell and Jean-Pierre Aubry**

The ADEC (Formerly the ARC)

The new GASB standards replaced the Annual Required Contribution (ARC) with the Actuarially Determined Employer Contribution (ADEC). Unlike with assets and liabilities, plans do not seem to be maintaining two sets of required-contribution numbers – one for the actuarial valuation and one for the financial statements – but rather have shifted to using the ADEC for both purposes. While both the ARC and ADEC are meant to capture the employer's "required contribution" to keep the plan on a steady path toward full funding, the two concepts differ slightly. First, while GASB 25 limited the range of allowable assumptions and methods that could be used to calculate the ARC, GASB 67 places no limitation on the calculation of the ADEC. Second, for the few plans that use a statutory contribution rate, GASB allows for the ADEC to reflect the statutory contribution rather than an actuarially calculated contribution. While conceptually these differences could cause a discontinuity between the ARC and ADEC, in practice they do not appear to be consequential. For the plans in our database, the ARC and ADEC are nearly identical; most plans have continued to use the same methods and assumptions they became accustomed to under the old GASB standards, and the few plans with a statutory rate have continued to report an actuarially determined contribution rather than the statutory rate. Thus, it is possible to extend our prior ARC series using the ADEC for 2014 forward.

Figure 3. Distribution of Funded Ratios for Public Plans, FY 2014

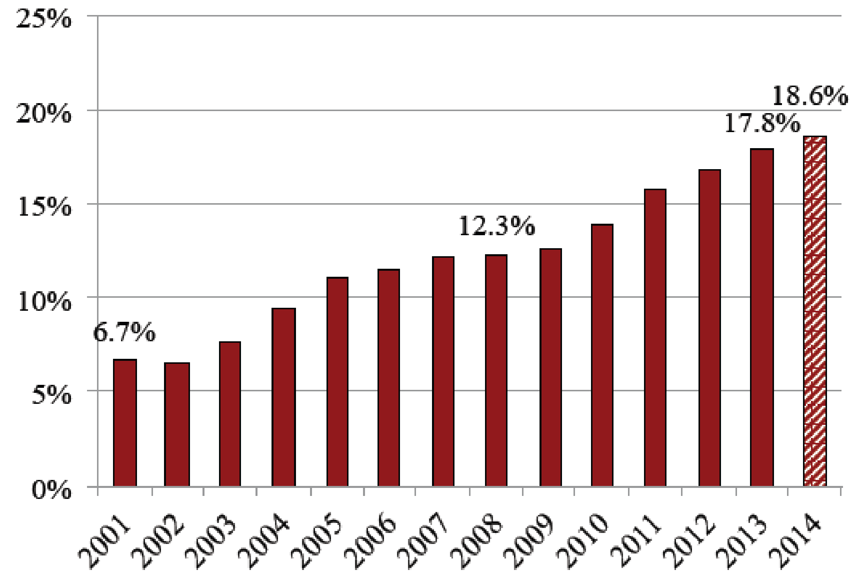


Sources: 2014 actuarial valuations; and authors' calculations from the PPD (2014).

Source: The Funding of State and Local Pensions: 2014-2018; Center for Retirement Research at Boston College, State and Local Pensions Plans, Number 45, June 2015.

Both the ARC and the ADEC equal the normal cost – the present value of the benefits accrued in a given year – plus a payment to amortize the unfunded liability, generally over 20-30 years. These measures have increased because the financial crisis led to higher unfunded liabilities and thereby a higher amortization component of the calculation. In 2014, the ADEC was 18.6 percent of payroll, up sharply from 2013 (see Figure 4).

FIGURE 4. REQUIRED CONTRIBUTION AS A PERCENTAGE OF PAYROLL, FY 2001-2014



Notes: The measure for 2001-2013 is the ARC; the measure for 2014 is the ADEC. The 2014 value involves projections for about one third of plans.
Sources: 2014 actuarial valuations; and PPD (2001-2014).

The increase in required contributions over the past several years began just as the recession eroded state and local government revenues. As a result, states and localities cut back on their pension contributions. As revenues have started to recover, sponsors are paying an increasing share of their required contribution, rising to 88 percent in 2014 (see Figure 5 on the next page). Hopefully, this trend will continue as the economy improves, mirroring the pattern of decline and recovery evident in the wake of the bursting of the dot.com bubble at the turn of the century.

Source: The Funding of State and Local Pensions: 2014-2018; Center for Retirement Research at Boston College, State and Local Pensions Plans, Number 45, June 2015.

GASB 67

Table 3. Plans Adopting a Significantly Lower GASB 67 Blended Rate, 2014

Plan	Rate		Funded status	
	Actuarial	GASB 67	Actuarial	GASB 67
Duluth Teachers	8.0%	5.4%	56.9%	46.8%
Kentucky Teachers	7.5	5.2	53.6	45.6
New Jersey PERS	7.9	5.4	60.9	42.7
New Jersey Police & Fire	7.9	6.3	72.6	58.9
New Jersey Teachers	7.9	4.7	54.0	33.6
Texas ERS	8.0	6.1	77.2	63.4
Texas LECOS	8.0	5.7	73.2	56.4

Note: A number of other plans, such as IL SERS and IL SURS, have reduced their rate by less than 50 basis points.
Sources: 2014 actuarial valuations; and PPD (2014).

The new GASB 67 standards involve two major changes relating to the valuation of assets and liabilities used to measure reported funded ratios. First, assets are reported at market value rather than actuarially smoothed. Second, projected benefit payments are discounted by a combined rate that reflects the expected return for the portion of liabilities that is projected to be covered by plan assets and the return on high-grade municipal bonds for the portion that is to be covered by other resources.8 It was always unclear the extent to which discount rates would really change for reporting purposes, and in fact only seven plans in our sample reduced their rates by more than 50 basis points (see Table 3).

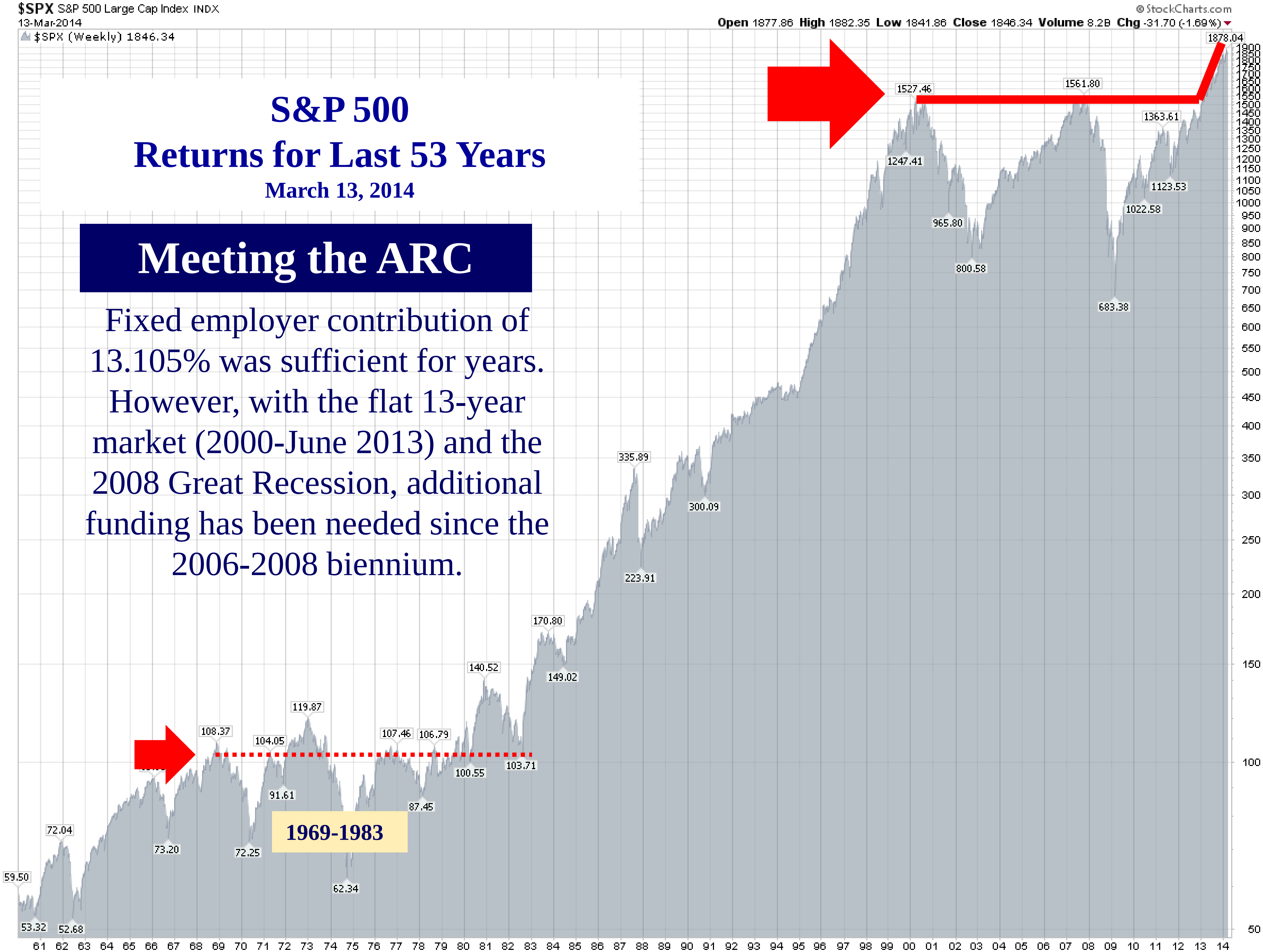
Even though market assets were greater than actuarially smoothed assets for some of these plans in FY 2014, lowering the discount rate reduced the funded status for all the plans. Until more is understood about the adoption of GASB 67, our updates will continue to focus on assets and liabilities reported in the actuarial valuations.

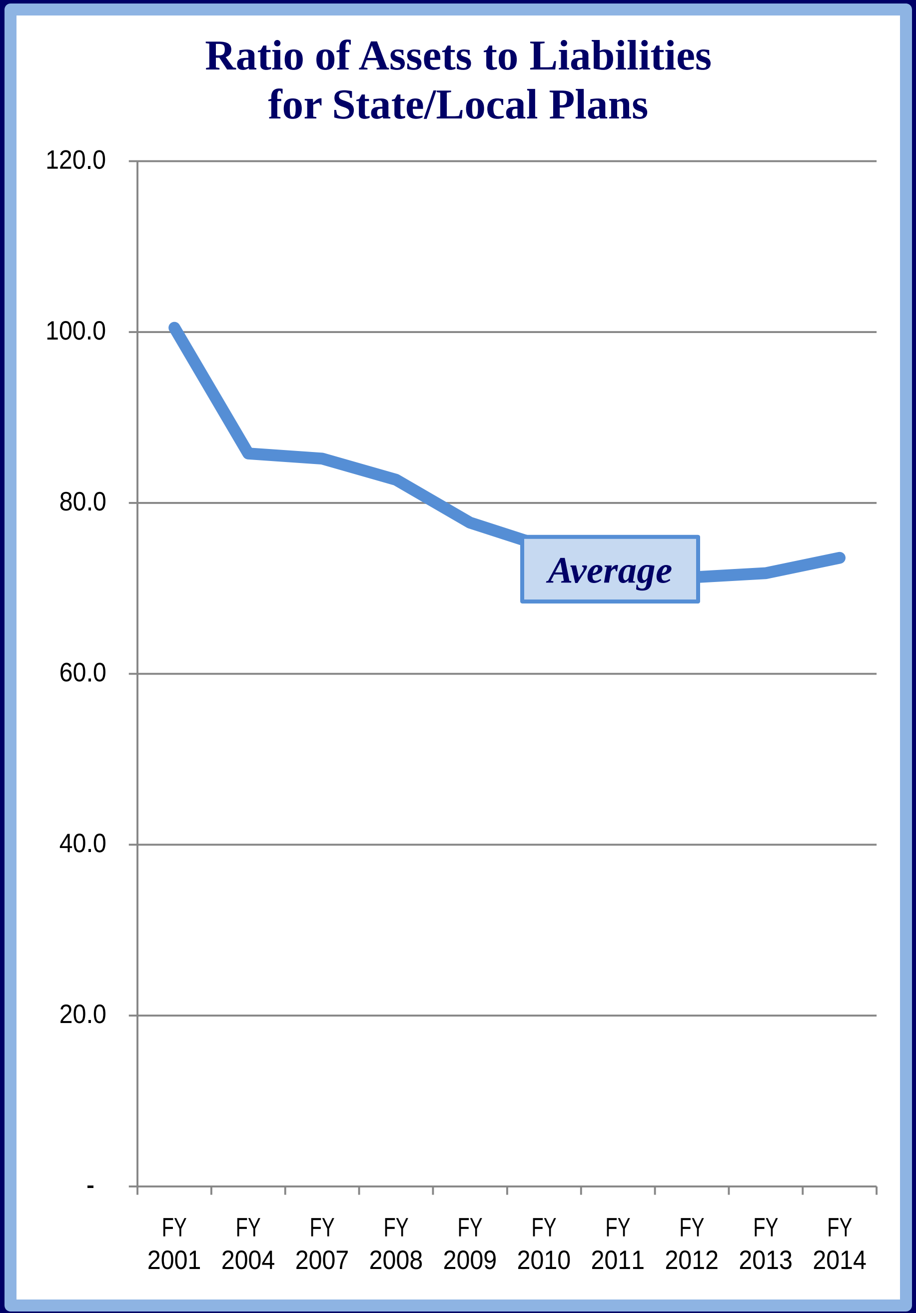
Source: The Funding of State and Local Pensions: 2014-2018; Center for Retirement Research at Boston College, State and Local Pensions Plans, Number 45, June 2015.

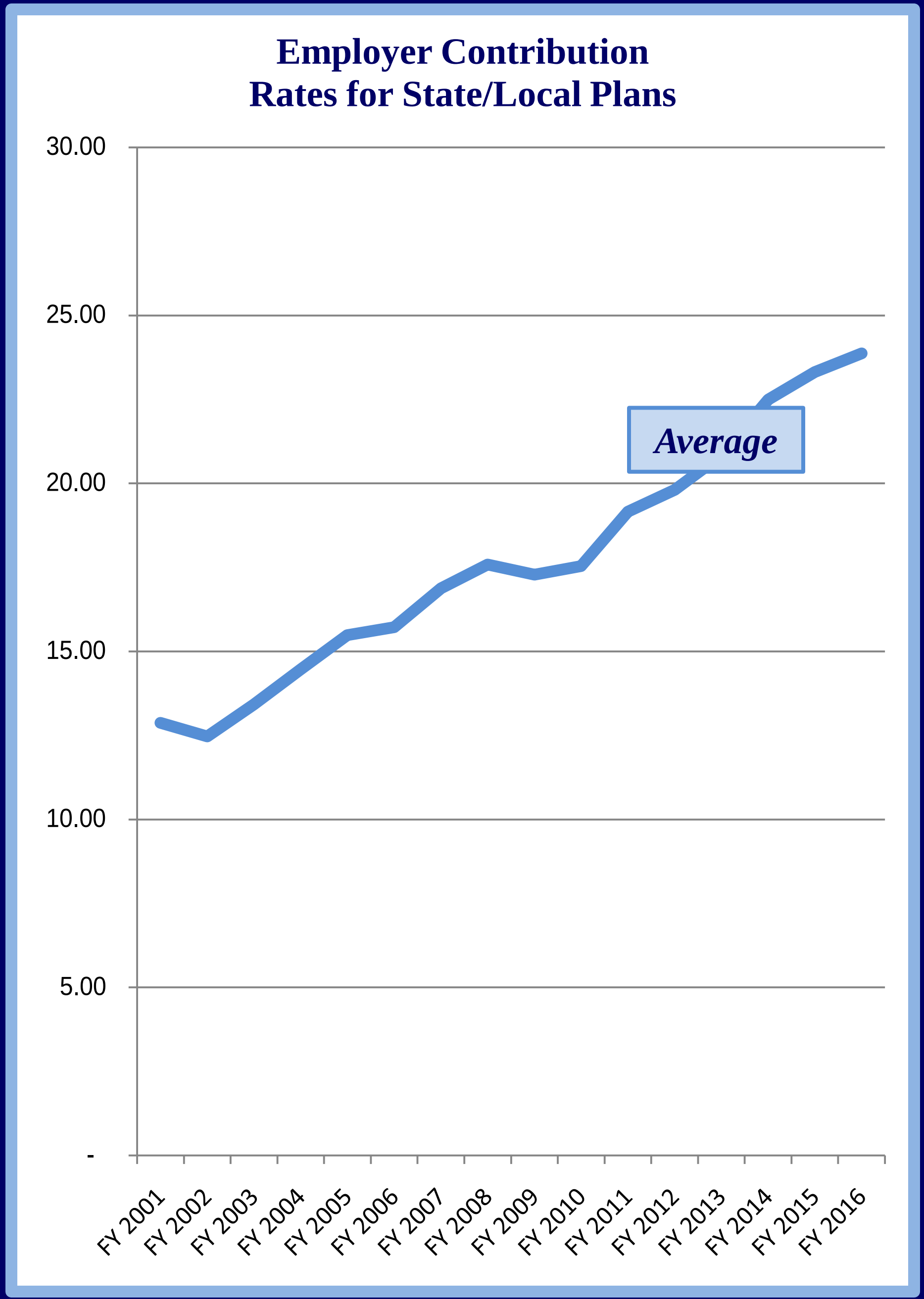
S&P 500
Returns for Last 53 Years
March 13, 2014

Meeting the ARC

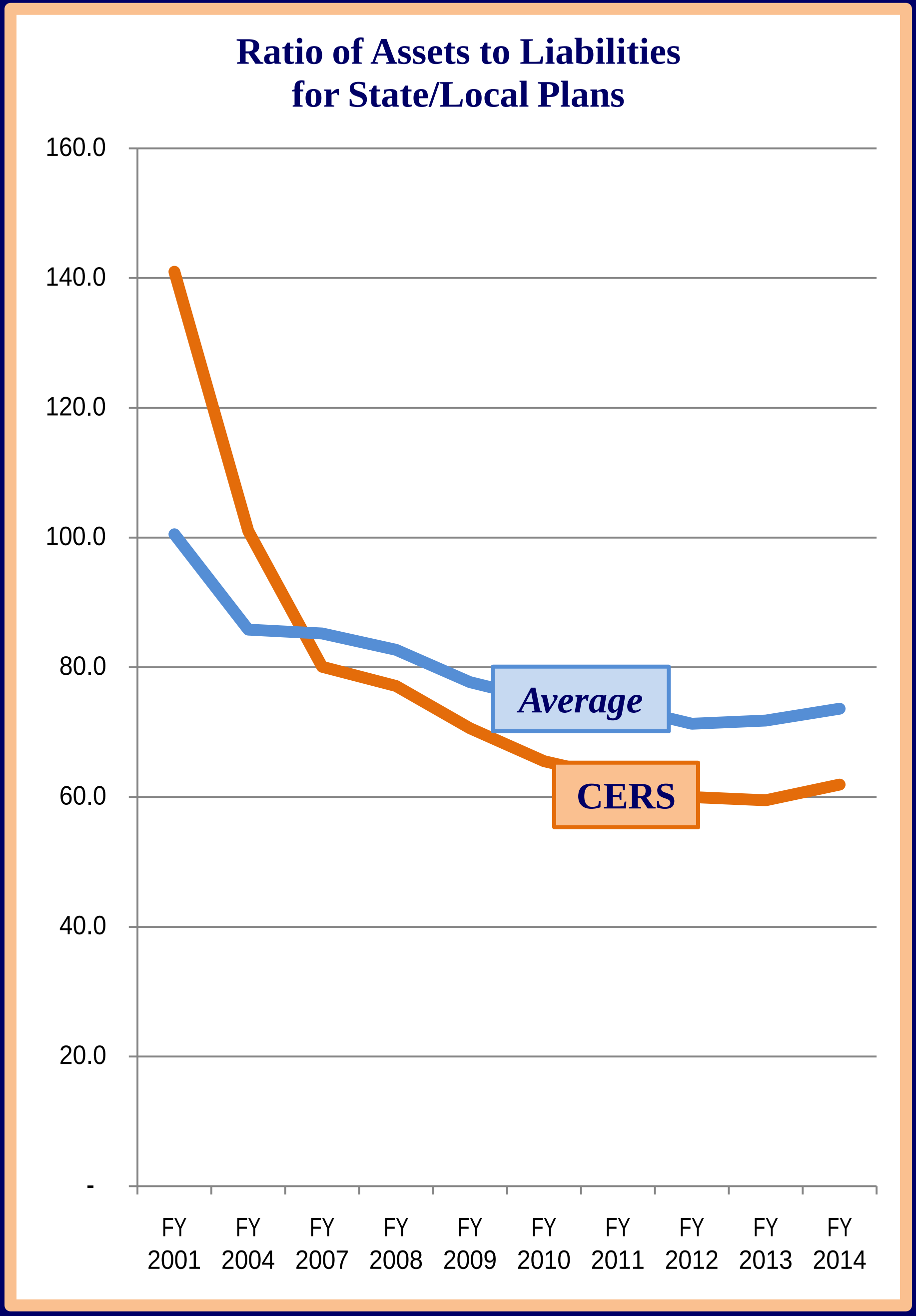
Fixed employer contribution of 13.105% was sufficient for years. However, with the flat 13-year market (2000-June 2013) and the 2008 Great Recession, additional funding has been needed since the 2006-2008 biennium.

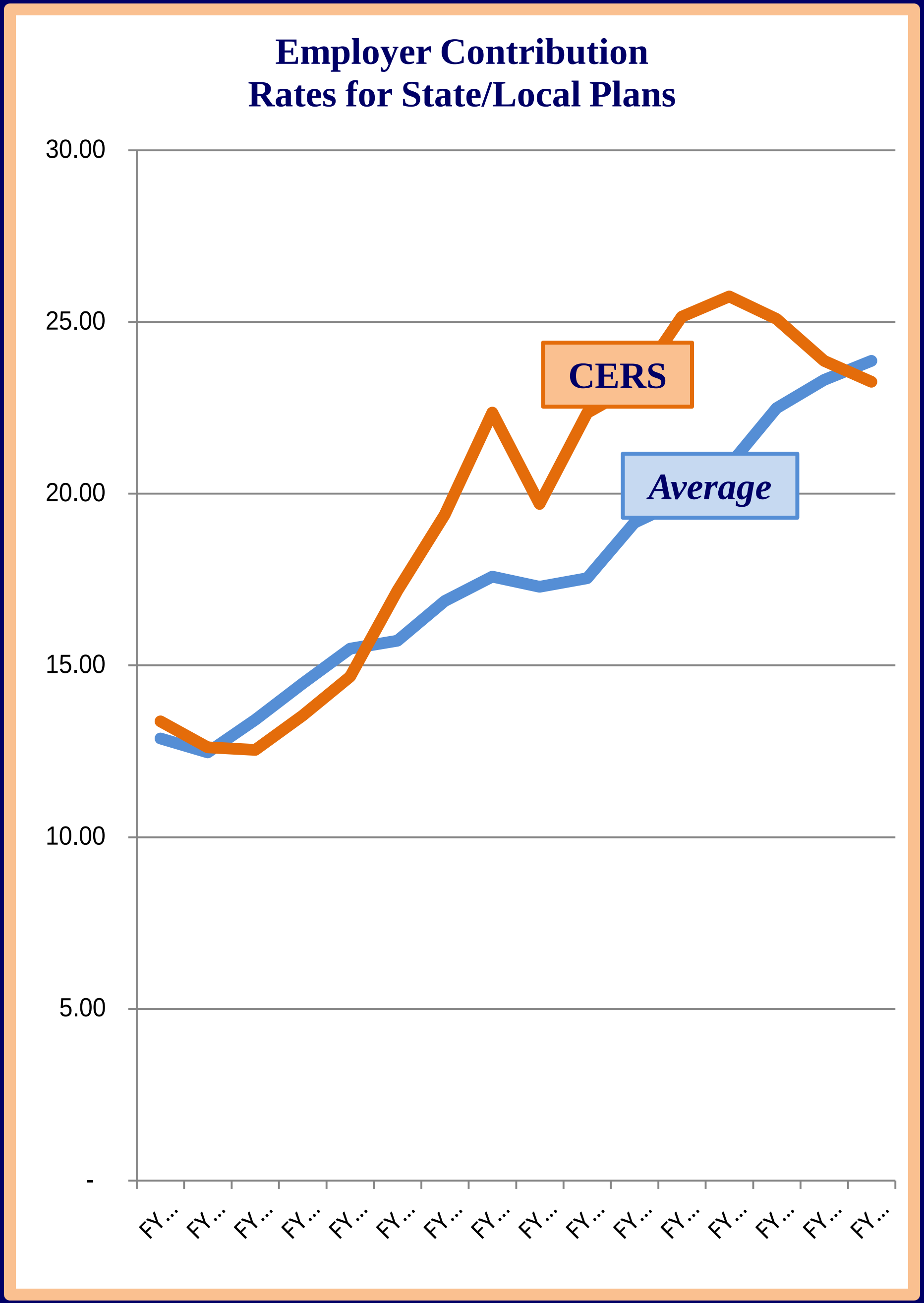






Sources: (1) The Funding of State and Local Pensions: 2014-2018; Center for Retirement Research at Boston College, State and Local Pensions Plans, Number 45, June 2015. (2) KRS Schedule of KERS and CERS Nonhazardous Contribution Rates on kyret.ky.gov. (Adjusted for employer contributions of 6.2% for Social Security.)





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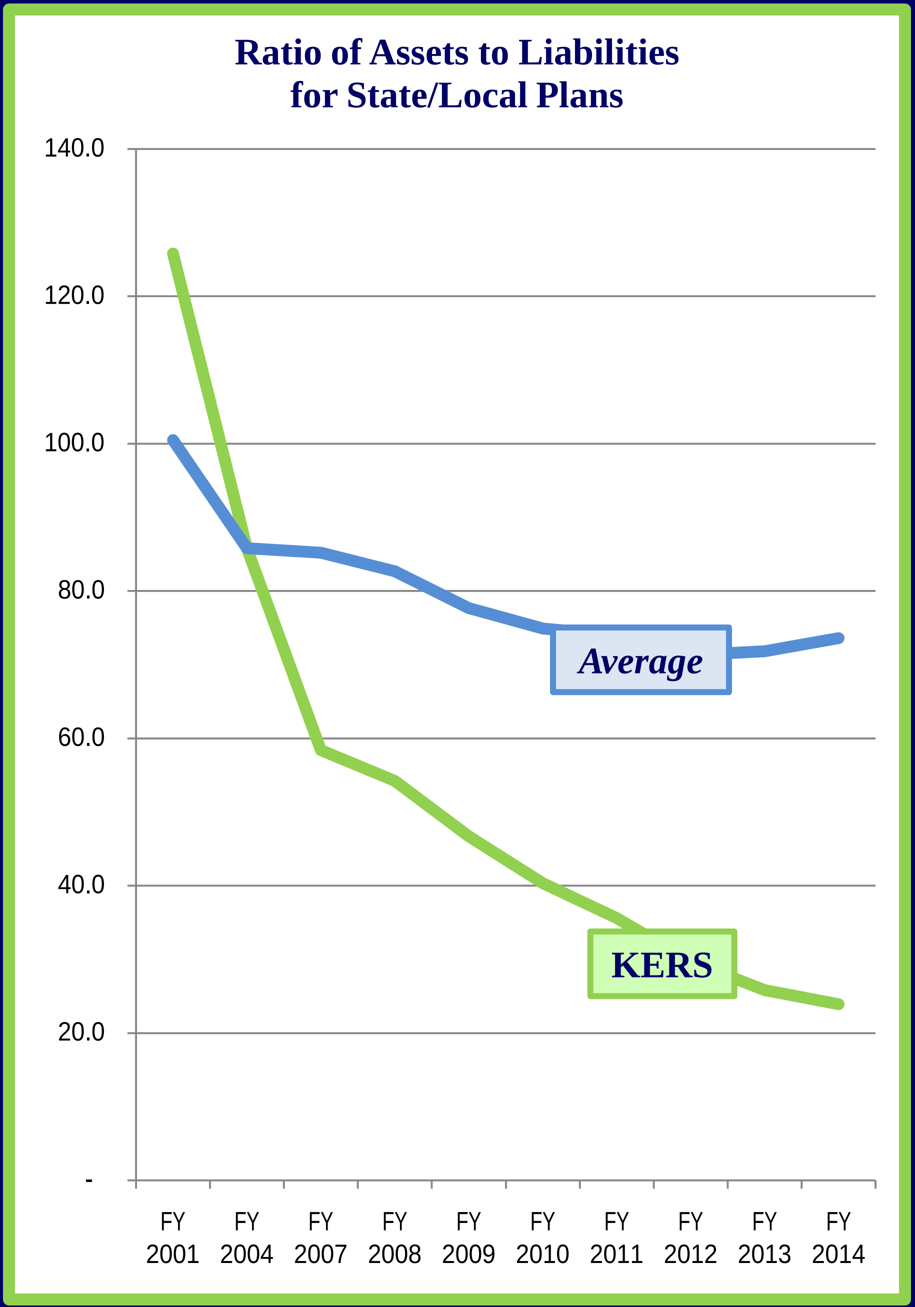

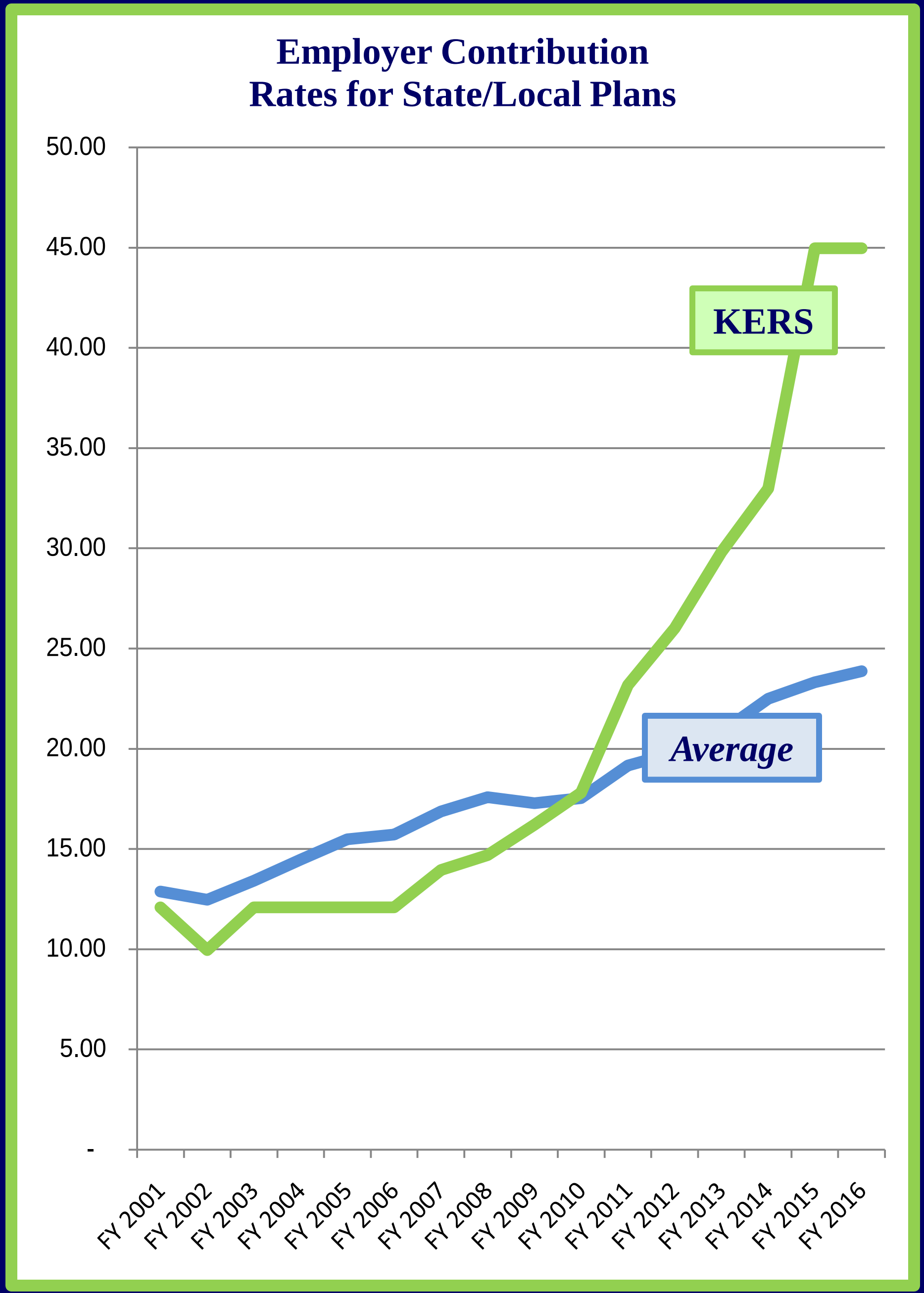

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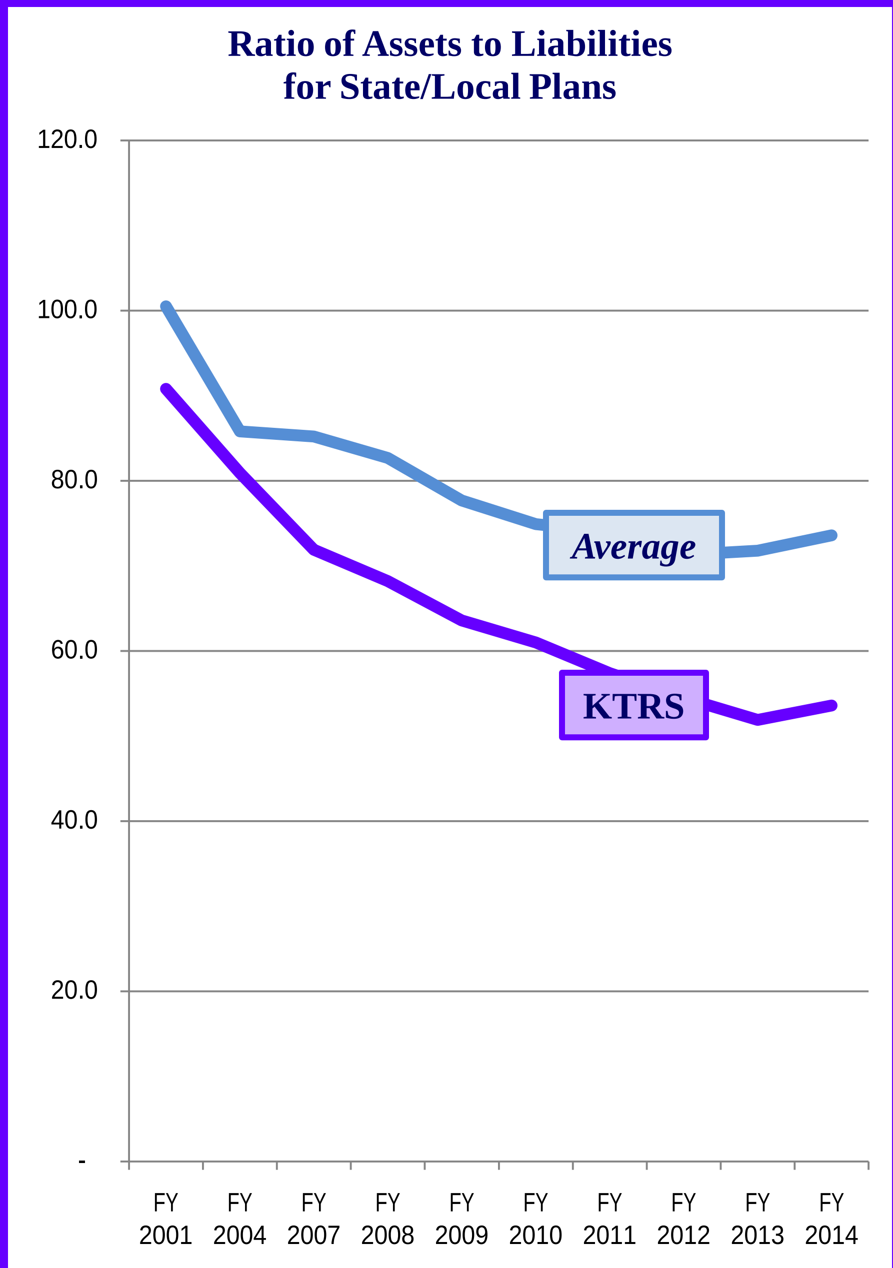

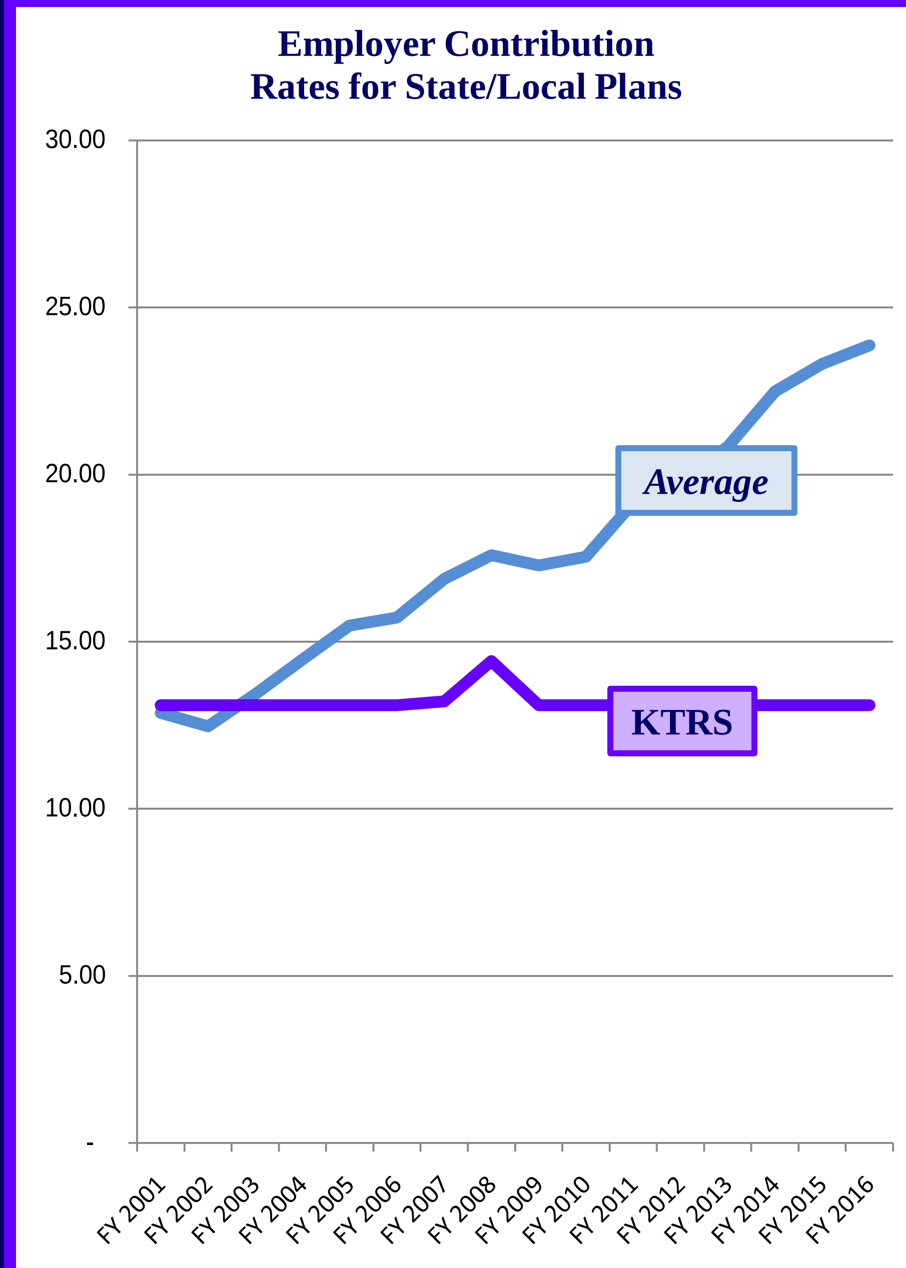

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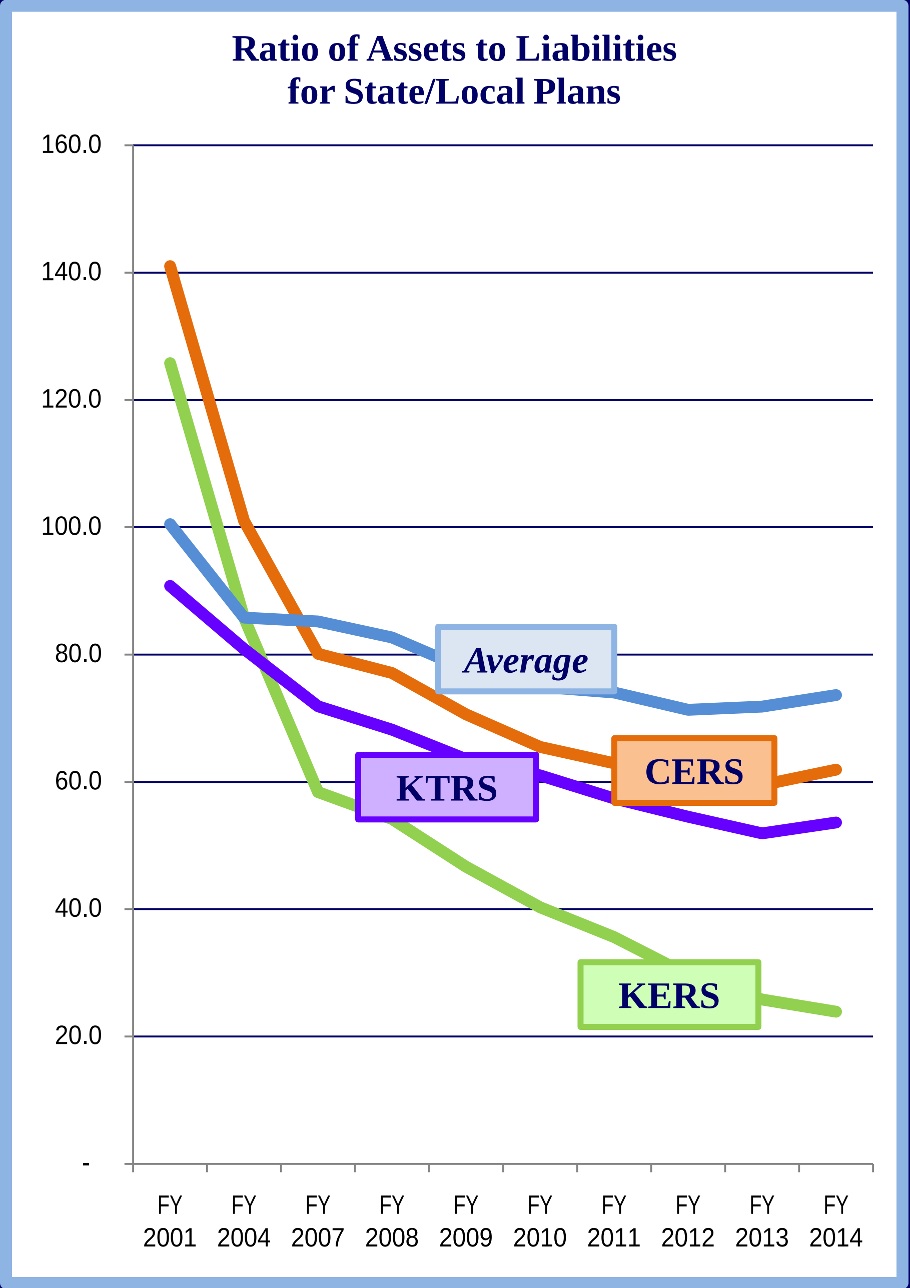

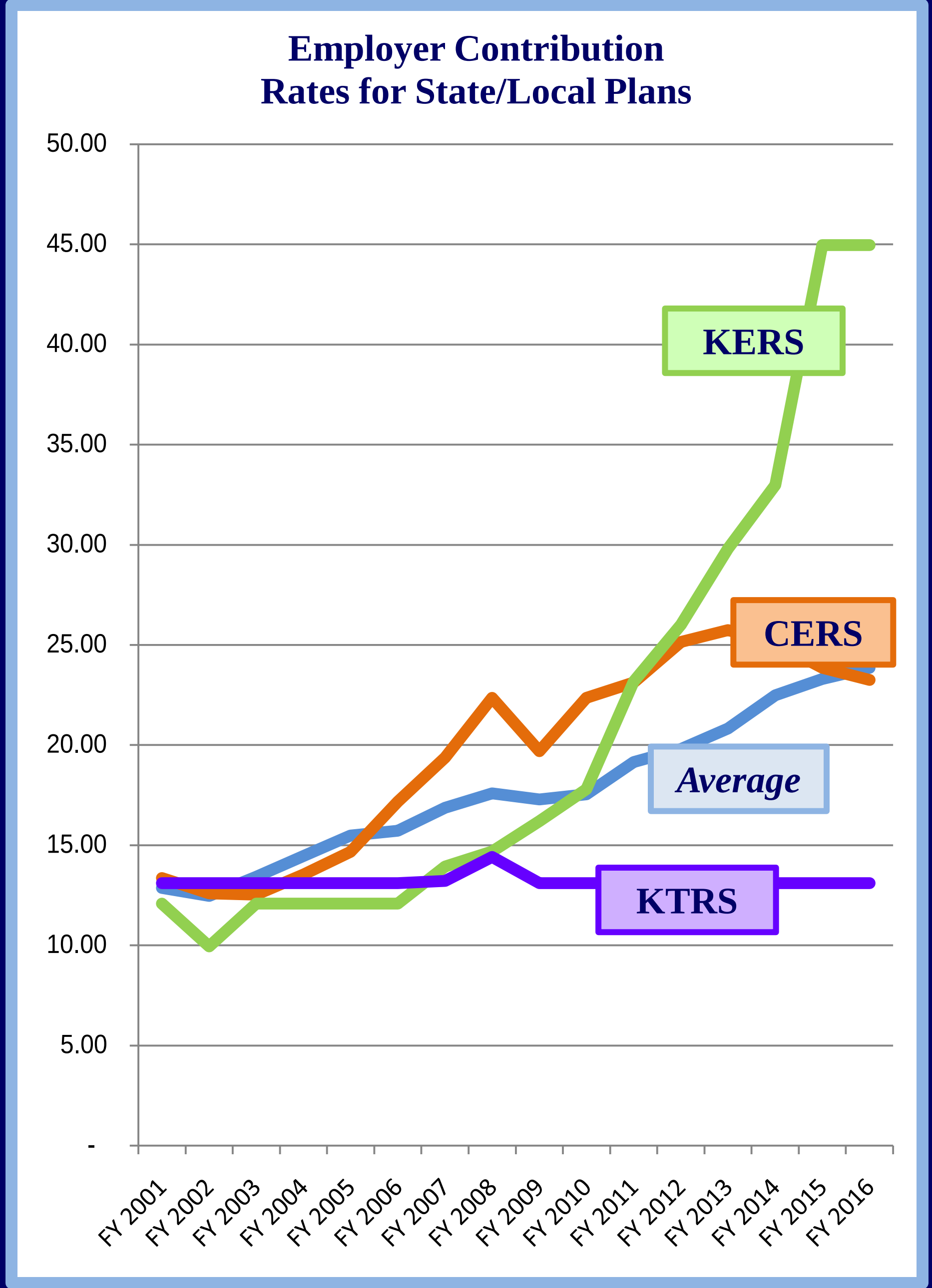

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Additional Funding Needed

Fiscal Year	Additional Funding Needed - Retirement Plan				State's Portion of Retiree Medical Insurance Funding				
					Statutory Retirement Contributions Used to Fund Medical Benefits			Transition Funding	State's Portion of Shared Responsibility Funding
	Requested		Appropriated	Unavailable for Appropriation	Permitted by actuary	To Be Repaid with Interest	Amount Repaid with Interest	Bonded	Bonded or Directly Appropriated through the Budget
FY 1998-99		(30,600,000)			30,600,000				
FY 1999-00		(32,600,000)			32,600,000				
FY 2000-01		(75,300,000)			75,300,000				
FY 2001-02		(77,600,000)			77,600,000				
FY 2002-03		(58,400,000)			58,400,000				
FY 2003-04		(33,800,000)			33,800,000				
FY 2004-05		(27,400,000)			27,400,000	29,169,700			
FY 2005-06						62,294,800			
FY 2006-07	0.11%	3,174,600	3,174,600	-		73,000,000	13,325,100		
FY 2007-08	1.32%	38,965,900	38,965,900	-		125,000,000	27,458,300		
FY 2008-09	1.88%	60,499,800		60,499,800		133,400,000	41,812,500		
FY 2009-10	2.46%	82,331,200		82,331,200		134,200,000	60,023,200		
FY 2010-11	3.59%	121,457,000		121,457,000			465,384,165	138,700,000	7,200,000
FY 2011-12	5.81%	208,649,000		208,649,000				108,100,000	14,400,000
FY 2012-13	7.27%	260,980,000	-	260,980,000				78,000,000	28,500,000
FY 2013-14	8.02%	299,420,000	-	299,420,000				45,900,000	38,700,000
FY 2014-15	10.42%	386,400,000		386,400,000				-	*50,200,000*
FY 2015-16	12.97%	487,400,000		487,400,000				-	*61,300,000*
		1,949,277,500	42,140,500	1,907,137,000	335,700,000	557,064,500	608,003,265	370,700,000	200,300,000

Issue Date	Gross w/fees	Net	Average Rate
August 2010	467,555,000	465,384,165	2.7225%
February 2011	269,815,000	268,400,000	4.1950%
February 2013	153,290,000	152,400,000	1.8990%
Total Bonds	890,660,000	886,184,165	

Contributions for Teachers’ Pensions

	Contribution Rates per Budget						Contribution Rates		Total Teachers' Rates
	Retirement System			Funded COLAs, Minimum Benefits, Sick Leave					
Fiscal Year	Employer	Employee	Total	Employer	Employee	Total	Employer	Employee	
1998-99	13.105%	9.855%	22.96%	2.40%		2.40%	15.51%	9.86%	25.36%
1999-00	13.105%	9.855%	22.96%	2.40%		2.40%	15.51%	9.86%	25.36%
2000-01	13.105%	9.855%	22.96%	2.40%		2.40%	15.51%	9.86%	25.36%
2001-02	13.105%	9.855%	22.96%	2.97%		2.97%	16.07%	9.86%	25.93%
2002-03	13.105%	9.855%	22.96%	3.14%		3.14%	16.25%	9.86%	26.10%
2003-04	13.105%	9.855%	22.96%	3.29%		3.29%	16.40%	9.86%	26.25%
2004-05	13.105%	9.855%	22.96%	3.56%		3.56%	16.67%	9.86%	26.52%
2005-06	13.105%	9.855%	22.96%	3.59%		3.59%	16.70%	9.86%	26.55%
2006-07	13.215%	9.855%	23.07%	3.93%		3.93%	17.15%	9.86%	27.00%
2007-08	14.425%	9.855%	24.28%	4.17%		4.17%	18.60%	9.86%	28.45%
2008-09	13.105%	9.855%	22.96%	4.25%		4.25%	17.36%	9.86%	27.21%
2009-10	13.105%	9.855%	22.96%	4.28%		4.28%	17.39%	9.86%	27.24%
2010-11	13.105%	10.105%	23.21%	4.15%		4.15%	17.26%	10.11%	27.36%
2011-12	13.105%	10.355%	23.46%	3.88%		3.88%	16.99%	10.36%	27.34%
2012-13	13.105%	10.855%	23.96%	3.69%		3.69%	16.80%	10.86%	27.65%
2013-14	13.105%	11.355%	24.46%	3.50%		3.50%	16.61%	11.36%	27.96%
2014-15	13.105%	12.105%	25.21%	3.00%		3.00%	16.11%	12.11%	28.21%
2015-16	13.105%	12.855%	25.96%	2.90%		2.90%	16.01%	12.86%	28.86%

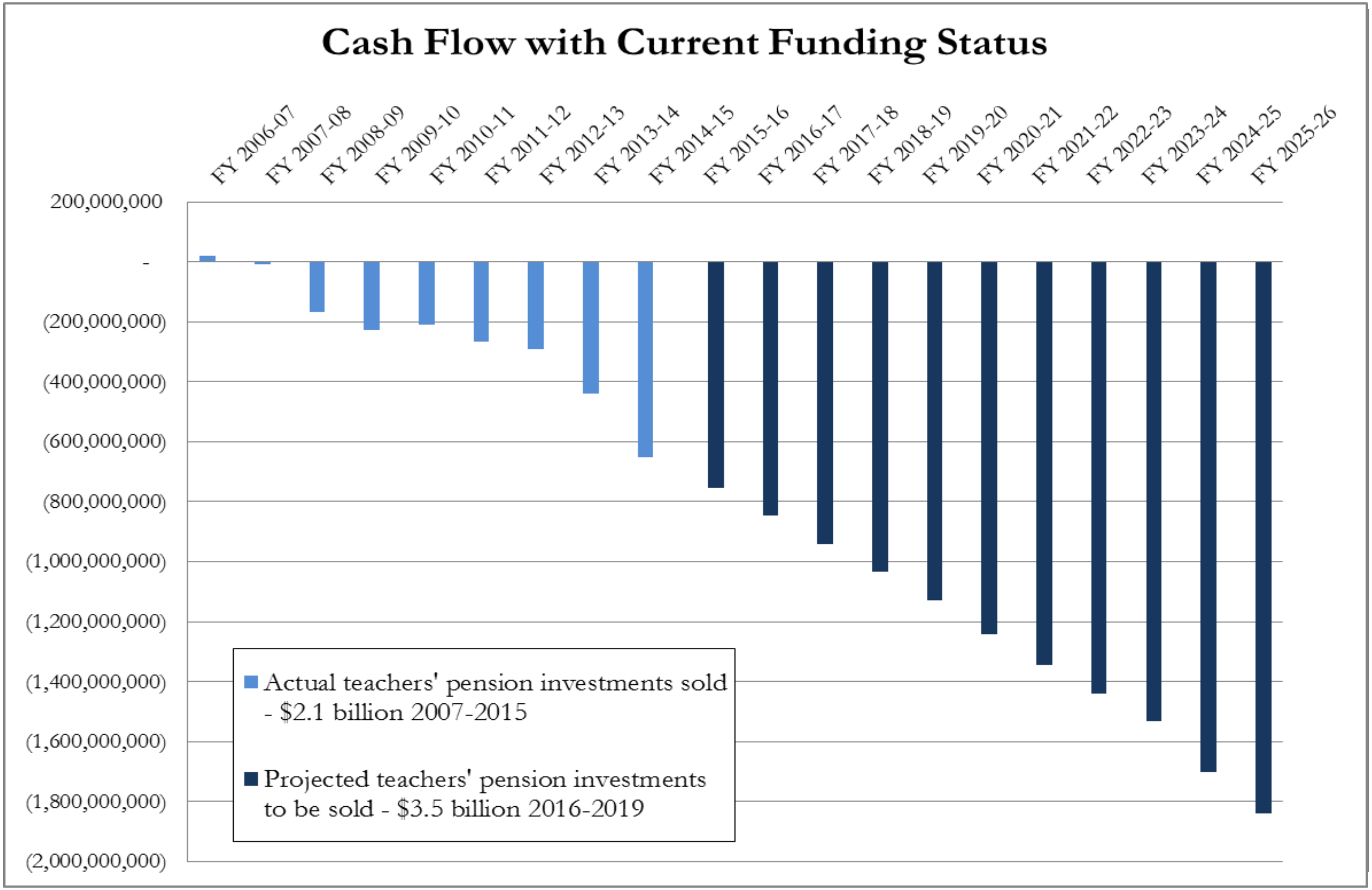
For new hires after June 30, 2008, there is an additional 1% contributed to the pension fund

Kentucky Teachers' Retirement System
Cash Flow Data for Pension Benefits

Dollar amounts in millions

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011 (Adjusted)	FY 2012	FY 2013	FY 2014
Contributions								
Employer	434.9	466.2	442.5	479.8	553.0	557.3	568.2	563.3
Member	269.7	291.4	293.7	297.6	302.3	309.7	304.7	305.0
	704.6	757.6	736.2	777.4	855.3	867.0	872.9	868.3
Investment Income								
Interest	251.9	240.7	206.7	194.1	200.0	210.2	254.9	207.3
Dividends	165.2	165.5	150.8	133.4	152.2	163.4	184.1	179.2
Rental Income	30.3	28.7	29.8	31.0	30.6	30.5	30.1	29.2
Securities Lending Net	1.3	1.5	2.1	1.1	1.7	2.2	2.2	1.9
Investment Expense	(8.7)	(9.5)	(16.3)	(18.2)	(22.2)	(28.1)	(33.1)	(37.2)
	440.1	426.9	373.1	341.3	362.3	378.2	438.1	380.5
	1,144.7	1,184.5	1,109.3	1,118.7	1,217.6	1,245.2	1,311.0	1,248.8
Deductions		*6.2%*	*7.0%*	*5.5%*	*6.1%*	*5.7%*	*5.9%*	*5.3%*
Benefits	1,102.5	1,171.0	1,253.0	1,321.8	1,402.5	1,482.9	1,570.7	1,654.4
Refunds of Contributions	14.8	16.0	15.2	15.3	17.3	19.5	22.1	25.5
Administrative Expense	7.4	7.6	8.2	8.8	7.3	7.8	8.4	8.0
	1,124.7	1,194.5	1,276.4	1,345.9	1,427.2	1,510.3	1,601.2	1,687.8
Cash Flow	20.0	(10.0)	(167.1)	(227.2)	(209.6)	(265.1)	(290.2)	(439.0)
Percent of benefits paid from selling assets		*0.90%*	*13.30%*	*17.20%*	*14.90%*	*17.90%*	*18.50%*	*26.50%*

					(Projected)							
	FY 2015	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**
CONTRIBUTIONS												
Employer	536.5	550.7	561.9	577.5	593.3	609.9	626.9	644.6	663.0	681.8	701.4	721.4
FY16 Budget Commitment	-	-	9.6	19.3	37.6	55.9	64.8	83.4	99.1	116.4	116.4	116.4
Member	300.0	323.4	333.5	344.2	355.1	366.6	378.5	390.9	403.8	417.1	431.0	445.3
	836.5	874.1	905.0	941.0	986.0	1,032.4	1,070.2	1,118.9	1,165.9	1,215.3	1,248.8	1,283.1
INVESTMENT INCOME												
Interest	152.4	150.4	142.3	131.9	119.0	108.7	94.3	80.5	80.9	85.0	89.5	69.9
Dividends	138.9	107.3	106.6	105.9	105.2	104.5	103.8	103.2	102.5	101.9	44.0	43.8
Rental Income	29.0	30.6	30.2	29.8	29.5	29.1	28.8	28.4	28.1	27.7	27.4	27.1
Securities Lending Net	1.8	1.8	1.8	1.7	1.7	1.7	1.6	1.5	1.5	1.4	1.3	1.1
	322.1	290.1	280.9	269.3	255.4	244.0	228.5	213.6	213.0	216.0	162.2	141.9
	1,158.6	1,164.2	1,185.9	1,210.3	1,241.4	1,276.4	1,298.7	1,332.5	1,378.9	1,431.3	1,411.0	1,425.0
DEDUCTIONS	5.4%	6.5%	6.00%	6.00%	6.00%	5.80%	5.80%	5.50%	5.50%	5.20%	5.20%	5.00%
Benefits	1,743.9	1,857.3	1,968.7	2,086.9	2,212.1	2,340.4	2,476.1	2,612.3	2,756.0	2,899.3	3,050.1	3,202.6
Refunds of Contributions	22.0	19.0	19.6	20.2	20.8	21.4	22.0	22.7	23.4	24.1	24.8	25.5
Investment Expense	34.3	34.3	34.2	33.9	33.3	32.6	31.6	30.3	28.7	26.8	24.7	22.2
Administrative Expense	8.4	8.8	9.2	9.7	10.2	10.7	11.2	11.8	12.3	13.0	13.6	14.3
	1,808.6	1,919.4	2,031.7	2,150.7	2,276.4	2,405.1	2,540.9	2,677.1	2,820.4	2,963.2	3,113.2	3,264.6
Cash Flow	(650.0)	(755.2)	(845.8)	(940.4)	(1,035.0)	(1,128.7)	(1,242.2)	(1,344.6)	(1,441.5)	(1,531.9)	(1,702.2)	(1,839.6)
Percent of Benefits From Selling Assets	37.30%	40.70%	43.00%	45.10%	46.80%	48.20%	50.20%	51.50%	52.30%	52.80%	55.80%	57.40%

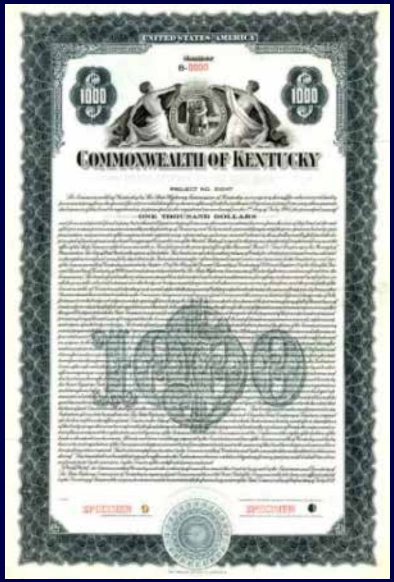

Cash Flow with Current Funding Status
FY 2006-07
FY 2007-08
FY 2008-09
FY 2009-10
FY 2010-11
FY 2011-12
FY 2012-13
FY 2013-14
FY 2014-15
FY 2015-16
FY 2016-17
FY 2017-18
FY 2018-19
FY 2019-20
FY 2020-21
FY 2021-22
FY 2022-23
FY 2023-24
FY 2024-25
FY 2025-26
200,000,000
-
(200,000,000)
(400,000,000)
(600,000,000)
(800,000,000)
(1,000,000,000)
(1,200,000,000)
(1,400,000,000)
(1,600,000,000)
(1,800,000,000)
(2,000,000,000)
Actual teachers' pension investments sold - $2.1 billion 2007-2015
Projected teachers' pension investments to be sold - $3.5 billion 2016-2019

House Bill 4, in its original version without amendment, would have provided a long-term funding solution for the teachers' pensions with the following features:

- A bond of up to $3.3 billion issued at historically low interest rates;

- The bond would increase retirement security for teachers by immediately increasing the funded ratio of the plan from 53% to 66%;
- The bond would not increase payments from the state's budget because debt service on the bond would come from funds already dedicated to fund teachers' pensions;
- The bond would not increase the state's debt because the debt owed teachers is already on the state's balance sheet;

House Bill 4, in its original version without amendment, would have provided a long-term funding solution for the teachers' pensions with the following features continued …



- The bond would provide needed cash flow to pay retired teachers' pensions and thereby stop the liquidation of investment assets to meet retiree payroll;
- The bond would make it possible for the Commonwealth to slowly phase in, over eight years, to the full annual required contribution; and
- After reaching the annual required contribution, the state would be on track to fully fund teachers' pensions over the next 20 years.

Teachers' Pension Fund
Requested Analysis of Funding Scenarios with Eight Year Phase-In

	*Other Scenarios Requested for Comparison**		*Options Proposed by KTRS*	
	No Bond General Fund Dollars Required for Teachers' Pension Fund with No Bond and Phasing into ARC over 8 years	**$520 Million Bond** General Fund Dollars Required for Teachers' Pension Fund with $520 Million Bond and Phasing into ARC over 8 years	**$1.9 Billion Bond** General Fund Dollars Required for Teachers' Pension Fund with $1.9 Billion Bond and Phasing into ARC over 8 years	**$3.3 Billion Bond** General Fund Dollars Required for Teachers' Pension Fund with $3.3 Billion Bond and Phasing into ARC over 8 years
FY 2015-16	$ 107,000,000	$ 107,000,000	$ -	$ -
FY 2016-17	185,590,094	181,590,094	62,598,194	44,000,000
FY 2017-18	263,932,438	255,932,438	125,288,638	88,000,000
FY 2018-19	350,186,537	338,186,537	196,570,537	132,000,000
FY 2019-20	437,245,246	421,245,246	267,858,146	176,000,000
FY 2020-21	514,818,464	494,818,464	329,776,564	220,000,000
FY 2021-22	601,898,113	577,898,113	401,420,713	264,000,000
FY 2022-23	673,233,999	645,233,999	470,071,099	308,000,000
FY 2023-24	745,025,536	711,271,059	543,885,845	354,870,269
FY 2024-25	774,314,570	745,167,716	565,508,418	394,449,831
FY 2025-26	802,417,430	778,720,169	586,673,614	408,450,462
FY 2026-27	826,949,040	755,513,919	602,438,659	420,789,350
FY 2027-28	853,916,045	779,026,800	620,282,695	431,477,414
FY 2028-29	889,754,016	811,767,234	645,977,150	449,646,789
FY 2029-30	927,290,936	846,058,755	673,440,371	468,667,582
FY 2030-31	967,446,235	882,798,957	702,996,464	489,918,834
FY 2031-32	1,008,589,014	920,336,251	732,950,246	510,504,923
FY 2032-33	1,051,670,204	959,603,855	764,197,727	532,466,101
FY 2033-34	1,094,218,564	998,789,915	794,949,127	553,456,218
FY 2034-35	1,138,734,044	1,039,087,741	827,002,703	575,193,801
FY 2035-36	1,184,480,415	1,081,056,756	859,534,460	597,481,271
Total ARC Payments	$ 15,398,710,940	$ 14,331,104,017	$ 10,773,421,370	$ 7,419,372,846

**The first two scenarios use the KTRS assumed rate of return of 7.5%. However, these scenarios do not factor in negative cash flow thus the 7.5% return is unlikely and ARC payments will be higher.*

ARC Payments After Phase In Period

Teachers' Pension Fund
Requested Analysis of General Fund Dollars Required for Bond Payments

	Other Scenarios Requested for Comparison		*Options Proposed by KTRS*	
	No Bond	**$520 Million Bond**	**$1.9 Billion Bond**	**$3.3 Billion Bond**
	General Fund Dollars Required for Debt Service with No Bond	General Fund Dollars Required for Debt Service for a $520 Million Bond	General Fund Dollars Required for Debt Service for a $1.9 Billion Bond	General Fund Dollars Required for Debt Service for a $3.3 Billion Bond
FY 2015-16	$ -	$ 10,356,450	$ 37,767,580	$ 67,852,975
FY 2016-17	-	22,703,500	83,497,560	140,682,450
FY 2017-18	-	24,666,900	91,351,160	145,590,950
FY 2018-19	-	26,586,180	99,028,280	150,389,150
FY 2019-20	-	27,952,841	103,505,568	157,515,894
FY 2020-21	-	29,261,738	107,776,525	164,405,488
FY 2021-22	-	30,506,629	111,821,913	171,020,881
FY 2022-23	-	31,189,960	114,641,420	178,808,330
FY 2023-24	-	31,817,115	117,243,130	186,221,435
FY 2024-25	-	32,387,278	119,622,855	193,235,323
FY 2025-26	-	32,895,570	120,779,340	199,318,830
FY 2026-27	-	33,348,500	121,755,300	205,000,850
FY 2027-28	-	33,753,925	122,581,500	210,313,750
FY 2028-29	-	34,110,300	123,253,200	215,244,900
FY 2029-30	-	34,220,115	122,785,650	219,292,125
FY 2030-31	-	34,270,720	122,141,200	222,862,000
FY 2031-32	-	34,276,275	121,370,650	226,034,925
FY 2032-33	-	34,250,940	120,524,800	228,891,300
FY 2033-34	-	33,982,485	119,547,250	231,328,325
FY 2034-35	-	33,673,005	118,431,450	233,327,475
FY 2035-36	-	33,320,505	117,170,650	234,869,425
Cost of Bonds	$ -	$ 639,530,931	$ 2,316,596,981	$ 3,982,206,781

Teachers' Pension Fund

Requested Analysis of General Fund Dollars Required For Bond Payments and Phasing into ARC

	Other Scenarios Requested for Comparison		*Options Proposed by KTRS*	
	No Bond General Fund Dollars Required for Teachers' Pension Fund with No Bond and Phasing into ARC over 8 years	**$520 Million Bond** General Fund Dollars Required for Teachers' Pension Fund with $520 Million Bond and Phasing into ARC over 8 years	**$1.9 Billion Bond** General Fund Dollars Required for Teachers' Pension Fund with $1.9 Billion Bond and Phasing into ARC over 8 years	**$3.3 Billion Bond** General Fund Dollars Required for Teachers' Pension Fund with $3.3 Billion Bond and Phasing into ARC over 8 years
FY 2015-16	$ 107,000,000	$ 117,356,450	$ 37,767,580	$ 67,852,975
FY 2016-17	185,590,094	204,293,594	146,095,754	184,682,450
FY 2017-18	263,932,438	280,599,338	216,639,798	233,590,950
FY 2018-19	350,186,537	364,772,717	295,598,817	282,389,150
FY 2019-20	437,245,246	449,198,087	371,363,714	333,515,894
FY 2020-21	514,818,464	524,080,202	437,553,089	384,405,488
FY 2021-22	601,898,113	608,404,742	513,242,626	435,020,881
FY 2022-23	673,233,999	676,423,959	584,712,519	486,808,330
FY 2023-24	745,025,536	743,088,174	661,128,975	541,091,704
FY 2024-25	774,314,570	777,554,994	685,131,273	587,685,154
FY 2025-26	802,417,430	811,615,739	707,452,954	607,769,292
FY 2026-27	826,949,040	788,862,419	724,193,959	625,790,200
FY 2027-28	853,916,045	812,780,725	742,864,195	641,791,164
FY 2028-29	889,754,016	845,877,534	769,230,350	664,891,689
FY 2029-30	927,290,936	880,278,870	796,226,021	687,959,707
FY 2030-31	967,446,235	917,069,677	825,137,664	712,780,834
FY 2031-32	1,008,589,014	954,612,526	854,320,896	736,539,848
FY 2032-33	1,051,670,204	993,854,795	884,722,527	761,357,401
FY 2033-34	1,094,218,564	1,032,772,400	914,496,377	784,784,543
FY 2034-35	1,138,734,044	1,072,760,746	945,434,153	808,521,276
FY 2035-36	1,184,480,415	1,114,377,261	976,705,110	832,350,696
Cost of Bonds and ARC	$ 15,398,710,940	$ 14,970,634,948	$ 13,090,018,351	$ 11,401,579,627

Funded Status of Teachers' Pensions	Lowest (70.0%)	Lower (70.5%)	Higher (71.2%)	Highest (73.0%)
Cost to General Fund	Highest	Higher	Lower	Lowest

General Fund Dollars Required After Phase In Period

Recap of Actuarial Status of the System

as of June 30, 2014

In Millions of Dollars

Pre-funded	Assets	Liabilities	Unfunded	Percent
RETIREMENT Benefit Fund	16,174.2	30,184.4	14.010.2	53.6%
GASB 67 Valuation	18,092.6	39,684.8	21,592.2	45.6%

*Pre-funded**	Assets	Liabilities	Unfunded	Percent
MEDICAL Benefit Fund	508.9	3,194.7	2,685.8	15.9%

** Transitioning to Pre-funded as of July 1, 2010*

Additional Funding Needed

Fiscal Year	Additional Funding Needed - Retirement Plan				State's Portion of Retiree Medical Insurance Funding				
					Statutory Retirement Contributions Used to Fund Medical Benefits			Transition Funding	State's Portion of Shared Responsibility Funding
		Requested	Appropriated	Unavailable for Appropriation	Permitted by actuary	To Be Repaid with Interest	Amount Repaid with Interest	Bonded	Bonded or Directly Appropriated through the Budget
FY 1998-99		(30,600,000)			30,600,000				
FY 1999-00		(32,600,000)			32,600,000				
FY 2000-01		(75,300,000)			75,300,000				
FY 2001-02		(77,600,000)			77,600,000				
FY 2002-03		(58,400,000)			58,400,000				
FY 2003-04		(33,800,000)			33,800,000				
FY 2004-05		(27,400,000)			27,400,000	29,169,700			
FY 2005-06						62,294,800			
FY 2006-07	0.11%	3,174,600	3,174,600	-		73,000,000	13,325,100		
FY 2007-08	1.32%	38,965,900	38,965,900	-		125,000,000	27,458,300		
FY 2008-09	1.88%	60,499,800		60,499,800		133,400,000	41,812,500		
FY 2009-10	2.46%	82,331,200		82,331,200		134,200,000	60,023,200		
FY 2010-11	3.59%	121,457,000		121,457,000			465,384,165	138,700,000	7,200,000
FY 2011-12	5.81%	208,649,000		208,649,000				108,100,000	14,400,000
FY 2012-13	7.27%	260,980,000	-	260,980,000				78,000,000	28,500,000
FY 2013-14	8.02%	299,420,000	-	299,420,000				45,900,000	38,700,000
FY 2014-15	10.42%	386,400,000		386,400,000				-	*50,200,000*
FY 2015-16	12.97%	487,400,000		487,400,000				-	*61,300,000*
		1,949,277,500	42,140,500	1,907,137,000	335,700,000	557,064,500	608,003,265	370,700,000	200,300,000

Issue Date	Gross w/fees	Net	Average Rate
August 2010	467,555,000	465,384,165	2.7225%
February 2011	269,815,000	268,400,000	4.1950%
February 2013	153,290,000	152,400,000	1.8990%
Total Bonds	890,660,000	886,184,165	

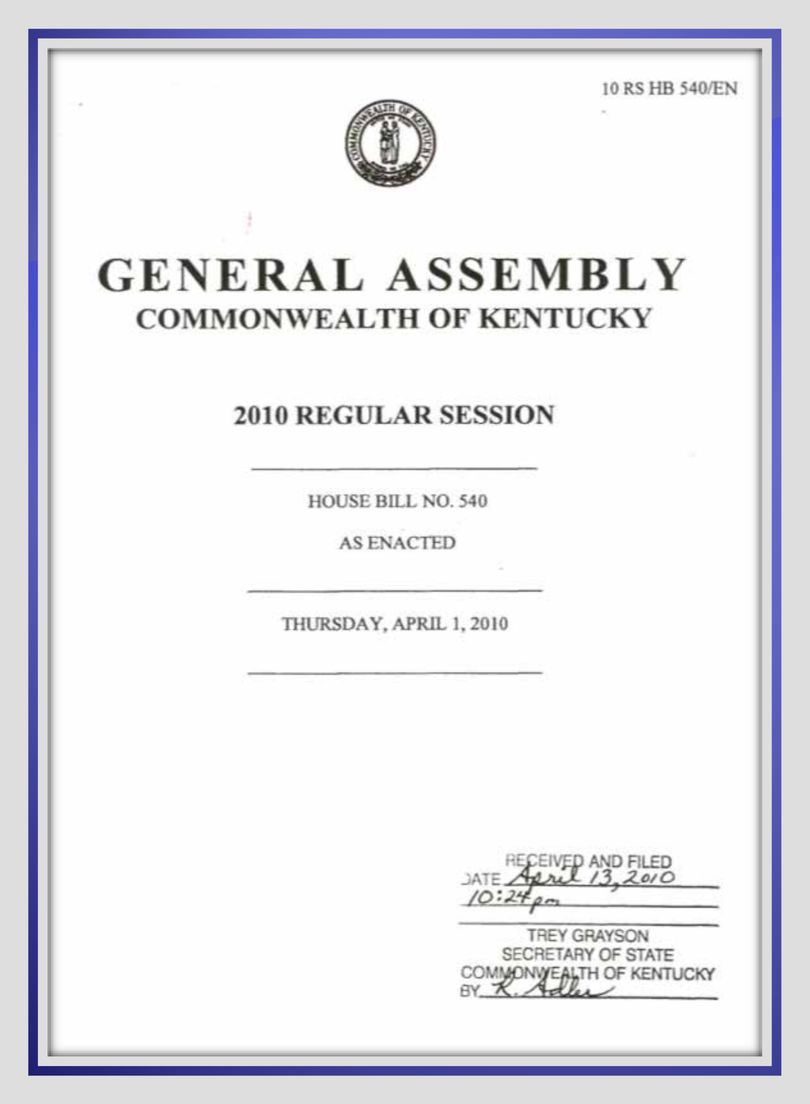
Medical Insurance Funding

OVERVIEW

Presented by

Jane C. Gilbert, CPA

Director, Retiree Healthcare


10 RS HB 540/EN

GENERAL ASSEMBLY
COMMONWEALTH OF KENTUCKY

2010 REGULAR SESSION

HOUSE BILL NO. 540

AS ENACTED

THURSDAY, APRIL 1, 2010

RECEIVED AND FILED
DATE April 13, 2010
10:24 pm
TREY GRAYSON
SECRETARY OF STATE
COMMONWEALTH OF KENTUCKY
BY

House Bill 540

A Solution of

Shared Responsibility

for Long-Term Funding of Retiree Health Care

Savings to Local Districts, Other Employers & State

Average Retiring Members Pay	$61,888
Average New Full-time Members Pay	$39,679
-------- *Difference* -------	$22,209
Number of Members Eligible to Retire	*15,181*
Savings to Local Districts & Other Employers	$337 Million per year
Multiplied by the State Matching Contribution (13.105)	Savings to State $44 Million per year

Shared Responsibility

House Bill 540 is a **Shared Responsibility** solution that provides permanent funding for retiree health care by prefunding this important benefit.

Shared Responsibility calls upon each party *(active teachers, retired teachers, school districts, and the state)* to share in a piece of the solution by investing a little more now to receive substantial returns later.

Shared Responsibility

House Bill 540 provides a long-term, sustainable method for funding medical insurance for retired teachers. It is a plan that has been developed with much study, deliberation and input from all of Kentucky's education community within the KTRS field of membership:

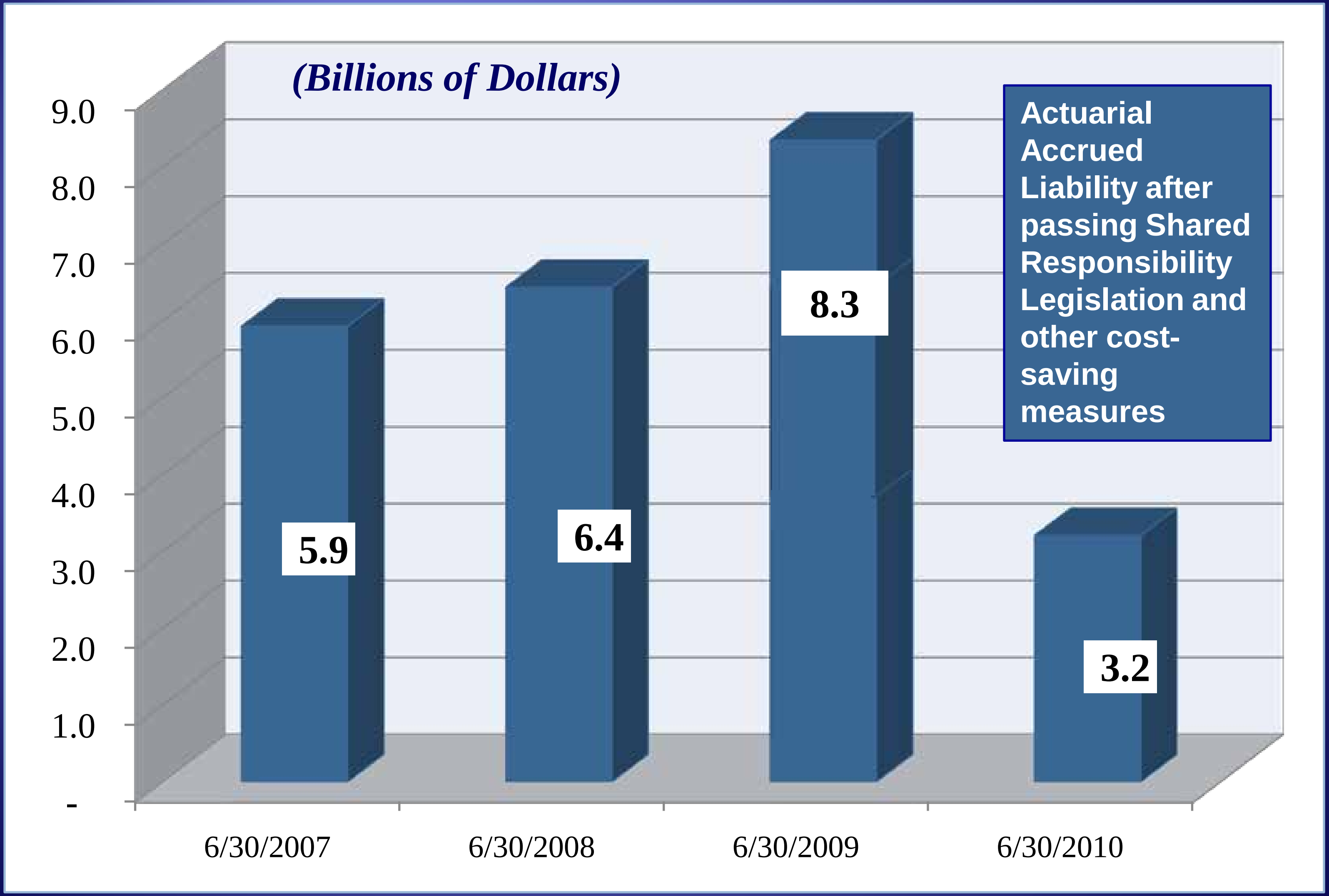
KTRS Board of Trustees-*fiduciary*
Jefferson County Teachers Association
Kentucky Association of School Administrators & 3KT
Kentucky Association of School Superintendents & 3KT
Kentucky Education Association
Kentucky Education Association-Retired
Kentucky Retired Teachers Association
Kentucky School Boards Association & 3KT
Universities & Community Colleges & others

The Success of House Bill 540 is Far Reaching

Governor Beshear expresses his appreciation to Kentucky's educational groups for working together to achieve this historic legislation.

Rep. Carl Rollins (Sponsor of HB 540), Gary L. Harbin (KTRS), Sharron Oxendine (KEA), Governor Beshear, Brent McKim (JCTA), Barbara G. Sterrett (KTRS Trustee, Chair), Dr. Bob Wagoner (KRTA), Bob King (Council on Post Secondary Education), Todd Hollenbach (KY State Treasurer)

Actuarial Accrued Liability



- 6/30/2011 = $3.1
- 6/30/2012 = $3.3
- 6/30/2013 = $3.1
- 6/30/2014 = $2.7

KNOW YOUR Rx COALITION

Applies to Both Over and Under 65 Retirees

Know Your Rx Coalition *Pharm-Assist* Offering

MONDAY-FRIDAY 8AM –6 PM E.T.

KYRx@uky.edu

- Free counseling service via live pharmacists
  - Identification of lower cost prescription alternatives
  - Contacting physician to facilitate seeking authorization for lower cost alternative therapies
  - Liaison for retirees/physicians for issues with Rx benefit including prior authorization, step therapy, and other programs
  - Educational resources for retirees – adverse effects, drug interactions and general medication information

Over 20,000 calls made and received for the 10 months of 2014.

Know Your Rx Coalition

855-218-5979

Clinical Director

Lucy Wells

Dedicated Clinical Pharmacists

Travis Albrecht
Marissa Boelhauf
Lea Goggin
Amy Griesser
Matt McMahan
April Prather
Allison Russell

Current Membership

KTRS
KENTUCKY TEACHERS' Retirement System
Serving Kentucky Teachers — Since 1940 —

ASBURY UNIVERSITY
Academic Excellence & Spiritual Vitality

TRANSYLVANIA UNIVERSITY
FOUNDED 1780

1847 MIDWAY College

UNIVERSITY OF THE CUMBERLANDS
CUMBERLAND COLLEGE
WILLIAMSBURG, KY
VITA ABUNDANTIOR

UK
UNIVERSITY OF KENTUCKY

GOD HAS MADE OF ONE BLOOD ALL PEOPLES OF THE EARTH
BEREA COLLEGE

LINDSEY WILSON COLLEGE

UNIVERSITY OF PIKEVILLE
UPIKE

SCC
ST. CATHARINE COLLEGE 1931

EKU

UNIVERSITY OF LOUISVILLE

BRESCIA UNIVERSITY

KENTUCKY CHRISTIAN UNIVERSITY 1919

SPALDING UNIVERSITY

History of KTRS MEHP Premiums

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Premium Cost	$210	$232	$260	$274	$288	$315	$283	$278	$285	$342	$289	$270	$290	$290	$240

2015 Premium …. $240

Still Bending the Trend!

History of KTRS MEHP Premiums

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Premium Cost	$21[illegible]													$290	$240

2006 - 2010

KTRS is Bending the Trend!

2006	2007	2010
Began Medicare Part D as a result of the Medicare Modernization Act of 2003.	Full RFP with move to full replacement and fully insured Medicare Advantage PFFS with original savings of $10 million per year for 2007 and 2008. Valued benefit of SilverSneakers added in 2007.	Shared Responsibility enacted.
Received $12 million per year in RDS primary subsidy for a four year total of $54 million.	With Medicare Advantage, now in our 9th year, KTRS has been able to mirror our existing plan design from 2006 with minimal member disruption in regards to plan design and network. No material change in deductibles, copayments, coinsurance, and out of pocket maximums from 2006 through 2015 on the medical side of the KTRS MEHP.	In Mid 2010 converted to a fully insured Medicare Advantage Passive Local PPO.

History of KTRS MEHP Premiums

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Premium Cost	$21													$290	$240

2011 - 2014
KTRS Continues to Bend the Trend!

2011	2012	2013	2014
Moved to an EGWP PDP With Medco.	**KTRS joined the Know Your Rx Coalition with Express Scripts as PBM with EGWP plus wrap.**	MEHP Spousal Shared Risk Waiver enacted.	Moved to ESI Medicare High Performance Formulary with 3rd tier non-formulary drugs at 50%.
Part B Only Waiver Plan Brought Under the Medicare Advantage Program.	Medco and Express Scripts merged.	Medicare Right Payer enacted.	Began pilot program with Edumedics on diabetes and/or high blood pressure and high cholesterol.

History of KTRS MEHP Premiums

YEAR	200	2014	2015
Premium Cost	$21	$290	$240

The Trend Continues ….!

~ 2 0 1 5 ~

Market check turned into full RFP and KTRS converted to **fully insured Medicare Advantage National Passive PPO at a $40 PPPM savings of $13 million per year with premium rate guarantees for 2015 and 2016 and a rate cap for 2017.**

Added value benefits of onsite UHC FTE, $500 hearing aid allowance every 36 months, and 6 general podiatry visits at no cost to the patient.

Also, RFP on the Medicare Part D EGWP Drug Plan resulting in a conversion back to self-funded with projected savings of $20 PPPM for $6 million per year.

KTRS

KENTUCKY TEACHERS' Retirement System

Serving Kentucky Teachers — Since 1940 —

Teachers' Retirement System of the State of Kentucky

Our Members Come First!

1.800.618.1687

502.848.8500

www.ktrs.ky.gov

Protecting & Preserving Teachers' Retirement Benefits