Special Meeting of the

TRS Board of Trustees

AGENDA

Monday, November 21, 2016

	8:30 a.m.	Continental Breakfast	
1.	9 a.m.	Introduction, Overview of Trustee Educational Issues TRS Investment Overview for PFM TRS Benefits Overview for PFM	Gary Harbin
2.	9:30 a.m.	Ethics	Beau Barnes
3.	10 a.m.	Public Pension Oversight Board	Beau Barnes
	10:30 a.m.	Break	
4.	10:45 a.m.	Report of the Independent Actuary Pension Valuation Results 6-30-2016 GASB Statement 67 Report 6-30-2016 OPEB Valuation Results 6-30-2016	Ed Koebel Cavanaugh Macdonald
5.	11:30 a.m.	Refund Analysis	Nate Van Sickel
	12 p.m.	Lunch	
6.	1 p.m.	Asset Allocation/Investments 6.1. Asset Allocation 6.2 20160630 AON Private Equity Portfolio Review	Tom Siderewicz PJ Kelly
7.	2 p.m.	Report of the External Auditor	Mountjoy Chilton Medley
	2:45 p.m.	Break	
8.	3 p.m.	Board Governance Manual	Eric Wampler Beau Barnes

The meeting will take place at the Kentucky History Center
100 West Broadway, Frankfort, Kentucky.

Teachers' Retirement System

TRS Investment Overview

for PFM

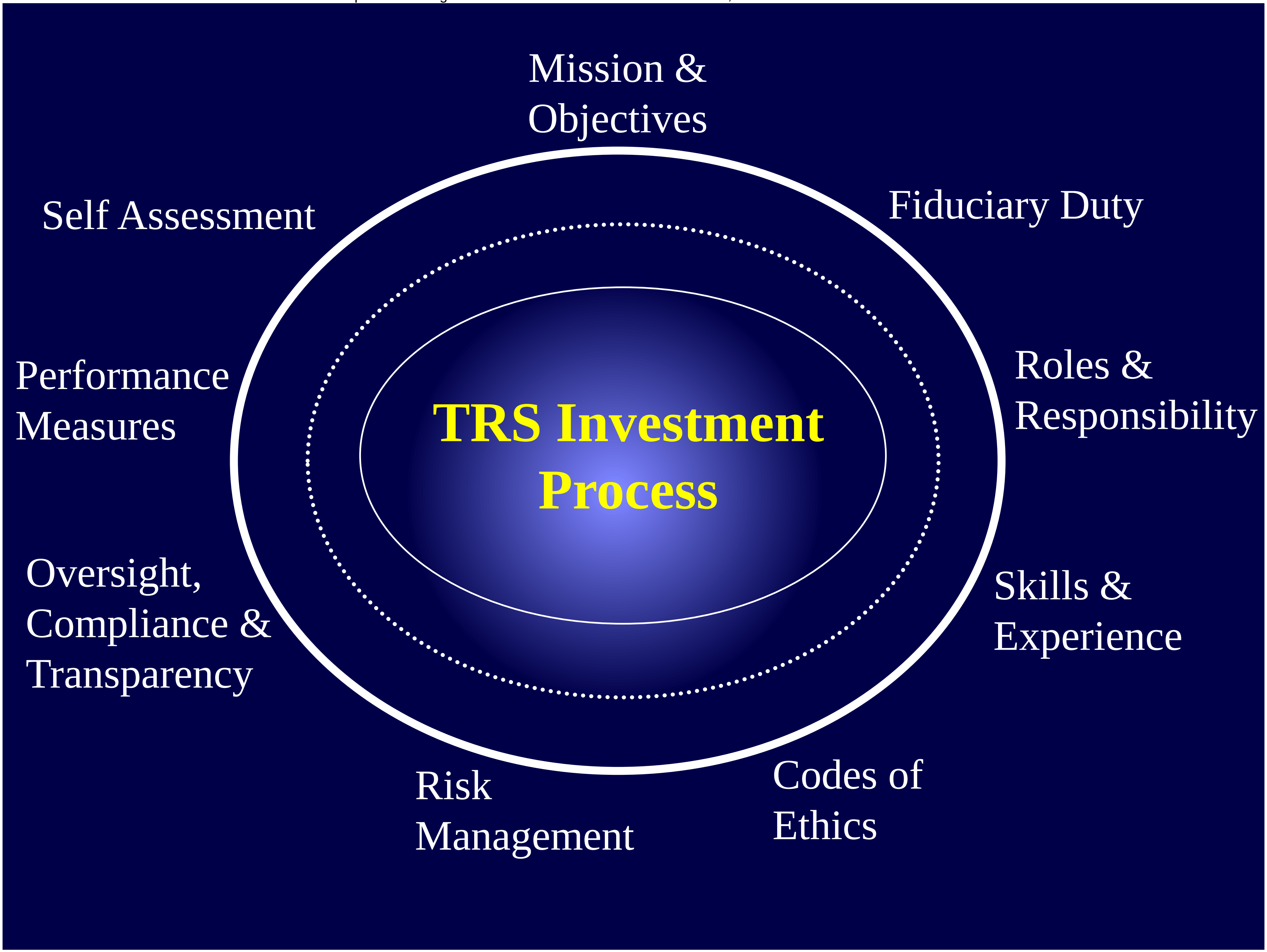
Gary L. Harbin, CPA
Executive Secretary

Nov. 3, 2016

Agenda

- Organizational structure and investment strategy
- Staffing and utilization of resources
- Process, theory of TRS asset allocation now, historically
- Current liquidity of investments
- Investment policies, processes, procedures and oversight:
  - Aggregate portfolio(s)
  - Internally managed assets
  - Externally managed assets
- Investment fees analysis
- Consultants and other third-party service providers

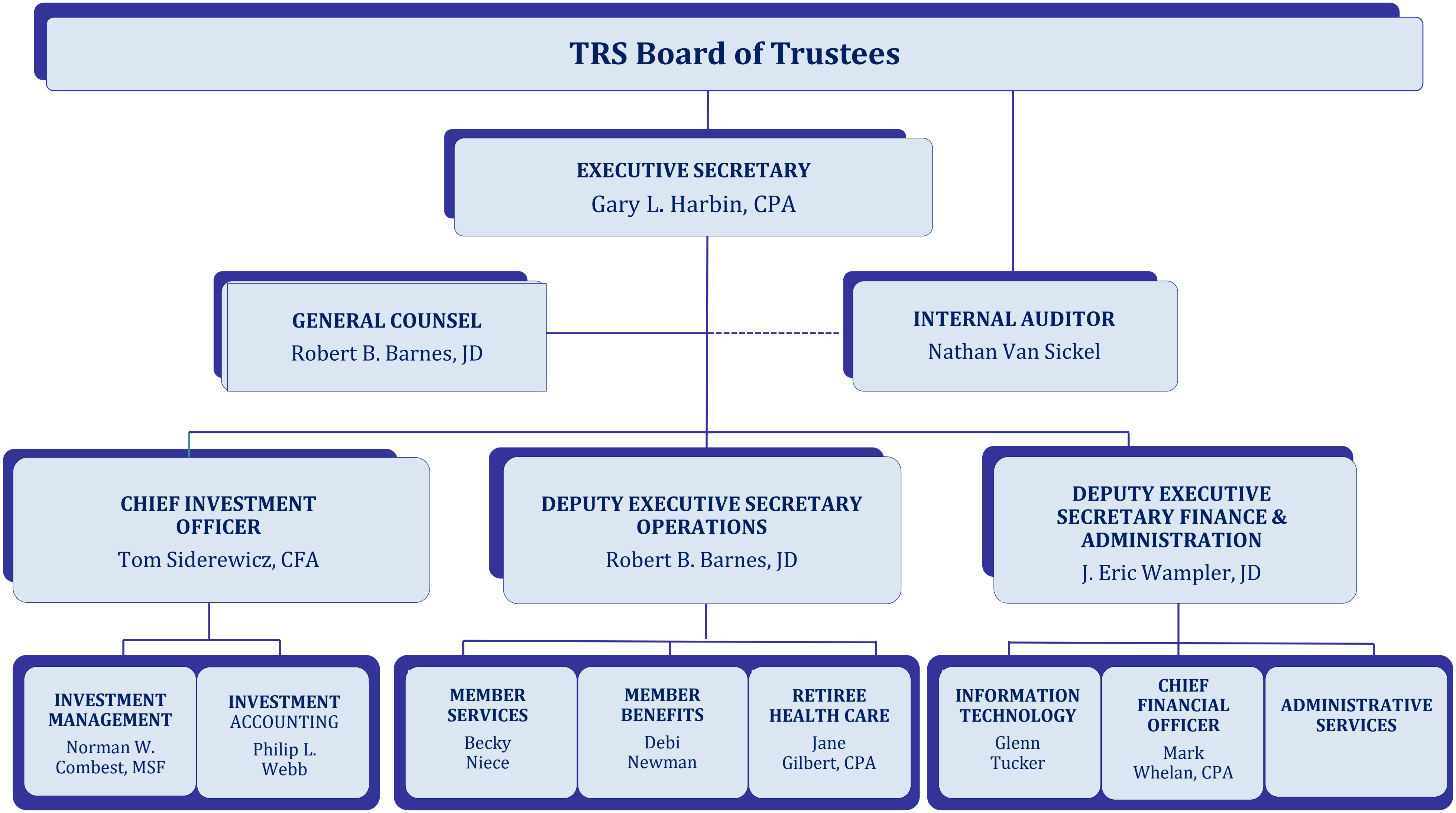
Organizational Structure and Investment Strategy


Mission & Objectives
Fiduciary Duty
Roles & Responsibility
Skills & Experience
Codes of Ethics
Risk Management
Oversight, Compliance & Transparency
Performance Measures
Self Assessment
TRS Investment Process

Mission and Objectives

- Provide current and future retirement benefits for more than 140,000 active and retired members
- Quantitative objective to exceed 7.5% actuarially assumed rate of return over long term with minimal volatility
- Objective achieved by diversification across a variety of asset classes as required by statute.

Teachers' Retirement System of the State of Kentucky
Organizational Chart



For the Members

Nine-member Board of Trustees is fiduciary by law

- 7 members elected by membership
- Treasurer, elected by statewide vote
- Education commissioner

All funds are held in trust to provide benefits for members

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Fiduciary Requirements

KRS 161.430 (2)

Board members and investment counselors must use assets "solely in the interests of the active contributing members and annuitants" and to:

a) Provide benefits and defray expenses of administration;

b) Act as a prudent expert;

c) Diversify investments to minimize risk of large losses, unless it is clearly prudent not to do so; and

d) Follow laws, regulations and other instruments governing system.

Investment of Funds

KRS 161.430 (1)

- Under direction of the trustees
- Using policies established by regulation
- Using well established and documented investment strategies
- Employing competent investment professionals, internally and externally, who are issued written mandates for their assignments

Investment Committee

- Structure exceeds industry standards & is leading "Best Practices" for Investment Committee structure
- Recommended for use elsewhere
- TRS investment costs among lowest in nation
- Independent, professional investing with counsel of outside experts since 2009

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Investment Committee

Bevis Longstreth

- Rockefeller Family Fund advisor
- Former commissioner, Securities and Exchange Commission
- Director, Grantham, Mayo & Van Otterloo LLC
- Former trustee, College Retirement Equities Fund of TIAA-CREF
- Former member, Pension Finance Committee of The World Bank

George M. Philip

- Former Executive Director & Chief Investment Officer, New York State Teachers Retirement System (one of largest U.S. public pension systems)
- New York Stock Exchange, Advisory Committee
- Former President, University of New York at Albany

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Staffing and Utilization of Resources

TRS Board of Trustees

TRS Investment Committee

Advisors

- Aon Hewitt, Investments
- Cavanaugh Macdonald, Actuary
- Outside experts with investment experience on Investment Committee

Examples of Outside Expertise

- Todd Investment Advisors
- GE Asset Management
- UBS Global Asset Management
- Wellington Asset Management
- Galliard Asset Management
- Ft. Washington Advisors
- Chrysalis
- Kohlberg Kravis & Roberts
- Baring Asset Management Ltd.
- Baillie Gifford Overseas Ltd.
- Prudential Real Estate
- Molpus Woodland Group
- Hancock Timber Resource Group

Inside Expertise

- Gary L. Harbin, CPA, Executive Secretary
- Tom Siderewicz, CFA, Chief Investment Officer
- Norman W. Combest, Director of Fixed Income and Alternative Credit
- John Browning, CFA, Director of Public Equity
- Karen Ashby, CFA, Director of Alternative Investments
- Mike Nohalty, CFA, Senior Investment Officer of Public Equities
- Lindsey Davis, Investment Specialist
- Phil Webb, Director of Investment Accounting
- Lisa Morrison, Retirement Investment Specialist
- Sarah Meehan, Investment Accountant

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TRS Investment Team

- **Gary L. Harbin, CPA,** Executive Secretary: Executive Secretary since 2000 after previously being Chief Deputy Executive Secretary. Formerly CFO of two nationwide companies and partner in a regional CPA firm, where he oversaw audits of TRS and other public plans for 19 years. Led "shared responsibility" coalition to pre-fund retiree health care and help eliminate $5 billion state liability. Developed actuarially sound strategies for return-to-work retirees. Reorganized Investment Committee to include recognized investment experts. Established an internal audit program, an information center and an imaging system for member records. Earned bachelor of science degree in accounting from University of Kentucky in 1972. Admitted to practice as a Certified Public Accountant in 1975.
- **Tom Siderewicz, CFA**, Chief Investment Officer: CIO since 2015. Began at TRS in 2011 as Senior Investment Officer and Fixed Income Portfolio Manager. Over 25 years in the securities industry as a trader, analyst and portfolio manager. Previously employed by Century Management Investment Advisors managing a multisector fixed income strategy for a publicly traded mutual fund, earning a 5-star rating from Morningstar. Additionally, member of firm's Investment Committee and co-portfolio manager of an all cap value equity strategy. Earlier, fixed income trader for Charles Schwab and Co. Earned a bachelor of arts in economics from California State University, Long Beach.
- **Norman W. Combest,** Director of Fixed Income and Alternative Credit: Responsible for oversight of fixed income and debt investments as well as alternative credit strategies. Began at TRS in 2011 as an Investment Officer and Fixed Income Portfolio Manager. Over 17 years in securities industry as an operations analyst, trader, credit analyst and portfolio manager. Prior to his investment career, was a Corporal in the U.S. Marine Corps. Graduated from University of Louisville with bachelor's of business administration with a concentration in finance. Received master's of science in strategic finance from the Indiana University Southeast.

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TRS Investment Team

- **Karen Ashby, CFA,** Director of Alternative Investments: At TRS since 2007. Manages alternative portfolio, which consists of private equity, infrastructure and timberland. Previously senior portfolio manager at JPMorgan and BB&T. Also was a member of the merger and acquisition team at LG&E Energy Corp. and Aegon USA's investment staff. Bachelor of science in business administration and master's degree in business administration in finance from U of L.

- **John B. Browning, CFA,** Director of Public Equity: Involved with public equities at TRS since 1987. Previously, employed by Vulcan Chemicals in the manufacture of chlorine. Earned bachelor of science in chemical engineering from UK in 1979. Member of CFA Society of Louisville and Market Technicians Association.

- **Lisa Morrison**, Retirement Investment Specialist: In Investment Division since 1992. Duties include management of TRS's portfolio monthly pricing, investment holdings and other reporting. Calculates, monitors and reports on the investment performance. Previously worked for the Kentucky Revenue Cabinet's Division of Collections from 1989 through 1992. Before Revenue, employed by Investors Heritage Insurance Co. Georgetown College graduate with bachelor of science in marketing/finance and computer science.

- **Mike Nohalty, CFA,** Senior Investment Officer of Public Equities: Manages $2.5 billion internally managed S&P 500 Index Fund and executes both internal and external equity transactions. Key liaison for all externally managed equity portfolios. Also manages the almost $1 billion Real Estate Portfolio. Point person for all corporate governance issues in equity portfolio. With TRS since 2007 and has 17 years of industry experience. Previously, banker at JPMorgan Chase and financial advisor at Waddell & Reed. Earned bachelor of science in business administration from U of L.

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

Actuarial Services
Cavanaugh Macdonald Consulting

Auditing & Financial Consulting
Mountjoy Chilton Medley

Health & Benefits
Retiree Health Insurance
Aon Risk Solutions

Investment Consulting
Aon Hewitt

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Cavanaugh Macdonald Consulting, LLC
CLIENT LIST

- Alabama Clerks' and Registers' Supernumerary Fund
- Alabama Employees' Retirement System
- Alabama Fire Fighters Annuity & Benefit Fund
- Alabama Judicial Retirement Fund
- Alabama Peace Officers' Benefit & Annuity Fund
- Alabama Teachers' Retirement System
- Colorado Public Employees' Retirement Association
- Connecticut Judges, Family Support Magistrates and Compensation
- Commissioners Retirement System
- Connecticut Municipal Employees Retirement System
- Connecticut Policemen and Firemen Survivor's Benefit Fund
- Connecticut State Employees Retirement System
- Connecticut State Probate Judges and Employees Retirement System
- Connecticut State Teachers' Retirement Board
- Georgia Department of Audits
- Georgia Employees' Retirement System
- Georgia Firefighters' Pension Fund
- Georgia Group State Employee Assurance Department
- Georgia Judicial Retirement System
- Georgia Legislative Retirement System
- Georgia Military Retirement Fund
- Georgia Public School Employees' Retirement System
- Georgia Sheriffs' Retirement System
- Georgia Teachers' Retirement System
- Iowa Judicial Retirement Fund
- Iowa Peace Officers' Retirement, Accident and Disability System
- Public Employees' Retirement System
- Kansas Public Employees Retirement System
- Kentucky County Employees' Retirement System
- Kentucky Employees' Retirement System
- Kentucky State Police Retirement System
- Minnesota Teacher Retirement Association
- Mississippi Highway Safety Patrol Retirement System
- Mississippi Municipal Retirement Systems
- Mississippi Public Employees Retirement System
- Mississippi Supplemental Legislative Retirement Plan
- Montana Firefighters' Unified Retirement System
- Montana Game Wardens' and Peace Officers' Retirement System
- Montana Highway Patrol Officers' Retirement System
- Montana Judges' Retirement System
- Montana Municipal Police Officers' Retirement System
- Montana Public Employees' Retirement System
- Montana Sheriffs' Retirement System
- Montana Teachers' Retirement System
- Montana Volunteer Firefighters' Compensation Act
- Nebraska Public Employees Retirement System
- New Mexico Public Employees Retirement Fund
- New Mexico Judicial Retirement Fund
- New Mexico Magistrates Retirement Fund
- New Mexico Legislative Division
- Ohio School Employees' Retirement System
- Oklahoma Police Pension & Retirement System
- Oklahoma Public Employees Retirement System
- Oklahoma Uniform Retirement System for Justices and Judges
- Virginia Judicial Retirement System
- Virginia Law Officers' Retirement System
- Virginia Political Subdivisions Retirement System
- Virginia State Employees' Retirement System
- Virginia State Police Retirement System
- Virginia Teachers' Retirement System

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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

#1 Industry Rankings

- Total U.S. Client Assets
- Total Public Plan Assets

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

U.S. investment consulting clients: **488**

- Public and Corporate Pension Plans
- Defined Contribution Retirement Plans
- Endowments and Foundations
- Taft-Hartley Plans

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

Investment Adviser

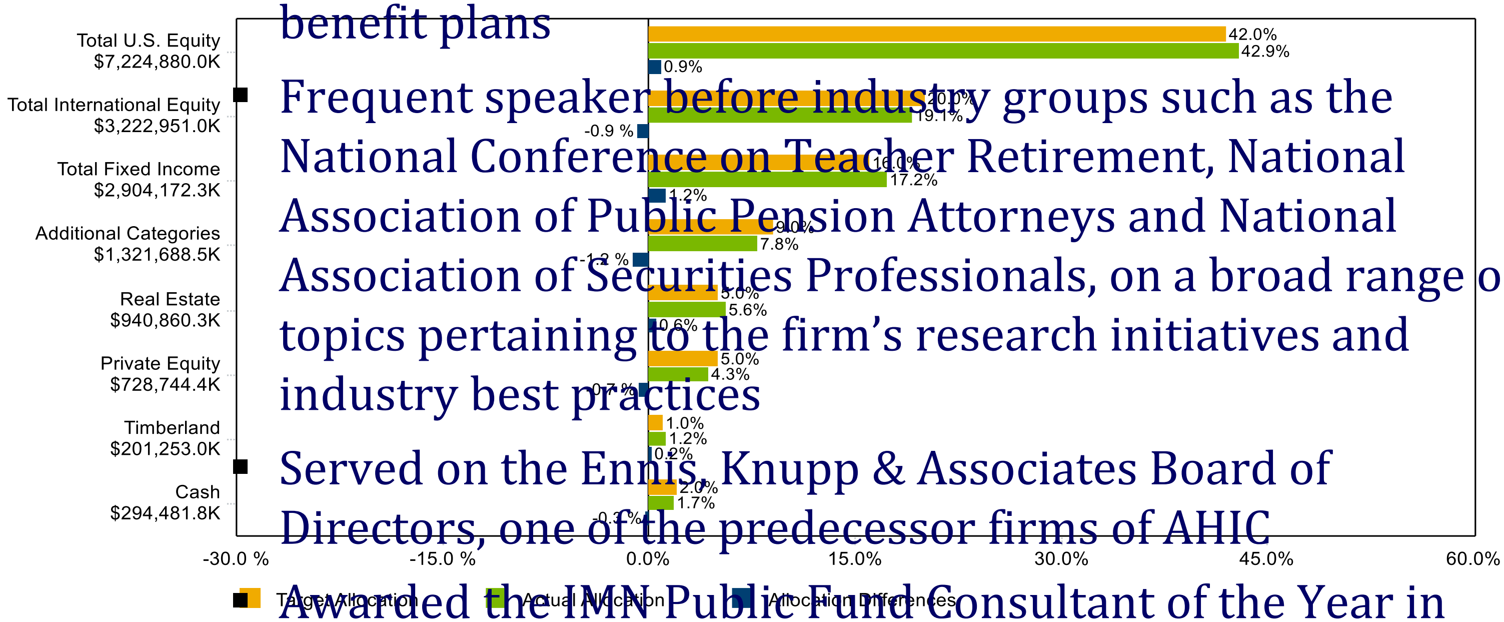
Aon Hewitt Investment Consulting

P.J.

Lead

P.J. Ke

- Partner with more than 20 years of investment experience; 19 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



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

Process, Theory of TRS Asset Allocation Now, Historically

What is Risk Management for Pension Plan?

Asset Risk:

Risk of large losses that could undermine System's ability to provide benefits

Liability Risk:

Risk required benefit payments will exceed assumptions

Usage Risk (Unique to Medical Plans):

Uncertainty regarding the required level of medical benefit payments.

No single solution for risk management

- Each pension plan is unique and requires specific analysis rather than generic recommendations.
- Thus each pension plan has a unique level of tolerance for risk.

How is TRS different from most public pension plans?

Differences directly bear on risk management.

- **Social Security –**
  - For most members, the TRS benefit replaces Social Security
- **Health Care –**
  - One of a minority of state pensions providing retiree health care
  - Was only state redirecting pension contributions to fund retiree health care with promise to repay.
- **Laws and Regulations**
  - Fixed employer contribution rate, investment policy governed by statute and regulation

How TRS addresses Risk Management

Asset Risk

- Annual asset allocation review
- Manager and style diversification within asset classes
- Risk parameters monitored monthly

Liability Risk

- Asset/liability modeling by advisors
- History of affordable benefit modifications recommended by Board of Trustees

Usage Risk

- Aggressive management of plan benefits to contain costs
- Utilization of Medicare Part D and Medicare Advantage Private fee-for-service to contain costs and reduce liabilities
- Participate with other pensions seeking national solutions

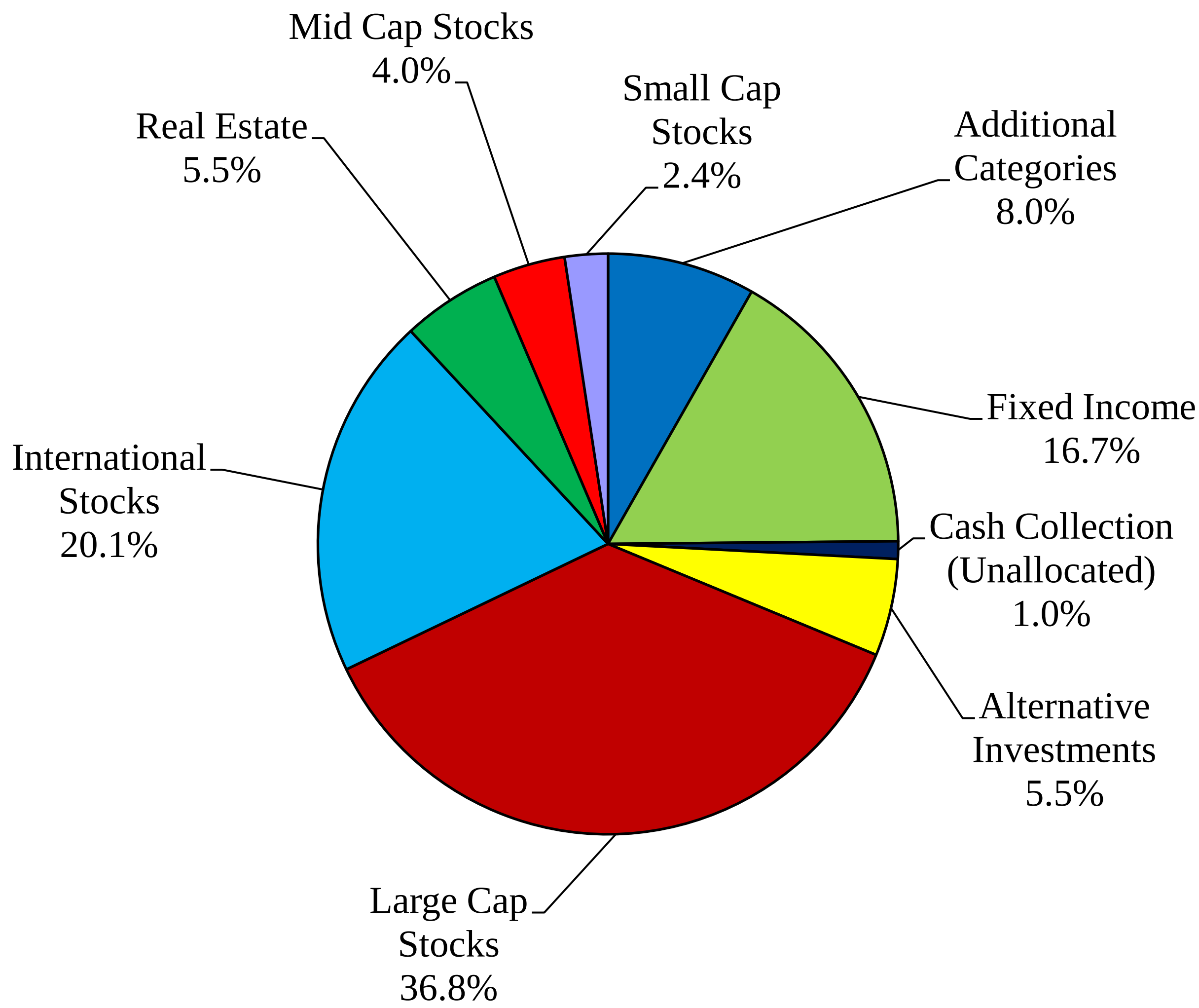
Asset Allocation

as of Sept. 30, 2016

	BOOK VALUE	% OF TOTAL	MARKET VALUE	% OF TOTAL
Cash Equivalents (Unallocated)	169,532,983.35	1.2	169,532,983.35	1.0
Fixed Income	2,667,511,898.90	19.0	2,873,428,222.70	16.7
Equities	8,298,570,839.73	58.9	10,940,897,629.02	63.3
Real Estate	823,890,654.98	5.8	950,324,669.28	5.5
Alternative Assets	795,425,429.20	5.4	953,713,170.21	5.5
Additional Categories	1,373,115,920.84	9.7	1,390,657,727.06	8.0
TOTAL	14,128,047,727.00	100.0	17,278,554,401.62	100.0

Total Cash Equivalents including Manager Allocated as of 9/30/16 = $351,682,360.68

Total Portfolio (MV) 9/30/16
Internally Managed 32.1%
Board of Trustees 1.0%
Externally Managed 66.9%



Changes in Asset Allocation

FY 2000, 2006, 2009, 2012 and 2016 including Sept. 30, 2016

Asset Class Breakdown	June 30, 2000	June 30, 2006	June 30, 2009	June 30, 2012	June 30, 2016	September 30, 2016
Large Cap Stocks	55.1 %	52.9 %	42.6 %	40.3 %	36.5 %	36.8 %
Mid Cap Stocks	0.0 %	3.1 %	4.1 %	4.5 %	4.0 %	4.0 %
Small Cap Stocks	2.4 %	3.0 %	2.7 %	2.7 %	2.4 %	2.4 %
International Stocks	0.0 %	2.4 %	11.3 %	15.6 %	19.2 %	20.1 %
Total Stocks	**57.5 %**	**61.4 %**	**60.7 %**	**63.1 %**	**62.1 %**	**63.3 %**
Fixed Income	33.9 %	30.1 %	33.1 %	23.0 %	17.1 %	16.7 %
Cash	6.8 %	5.7 %	1.1 %	2.9 %	1.7 %	1.0 %
Real Estate Equity	1.8 %	2.8 %	3.6 %	4.0 %	5.6 %	5.5 %
Alternative	0.0 %	0.0 %	1.5 %	3.0 %	5.6 %	5.5 %
Additional Categories	0.0 %	0.0 %	0.0 %	4.0 %	7.9 %	8.0 %
Total	**100.0 %**	**100.0 %**	**100.0 %**	**100.0 %**	**100.0 %**	**100.0 %**

Teachers' Retirement System

TOTAL PORTFOLIO HOLDINGS

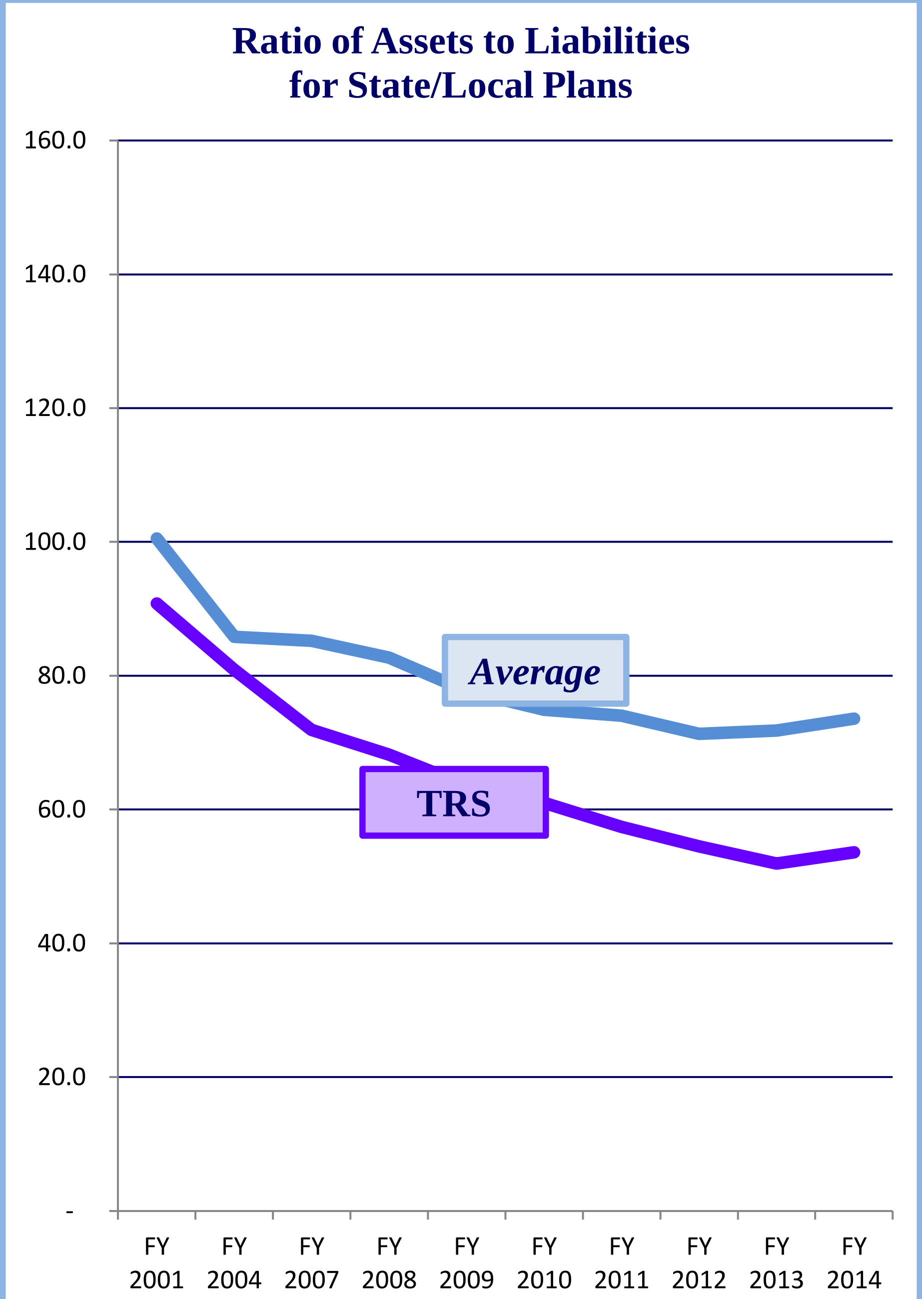
Sept. 30, 2016

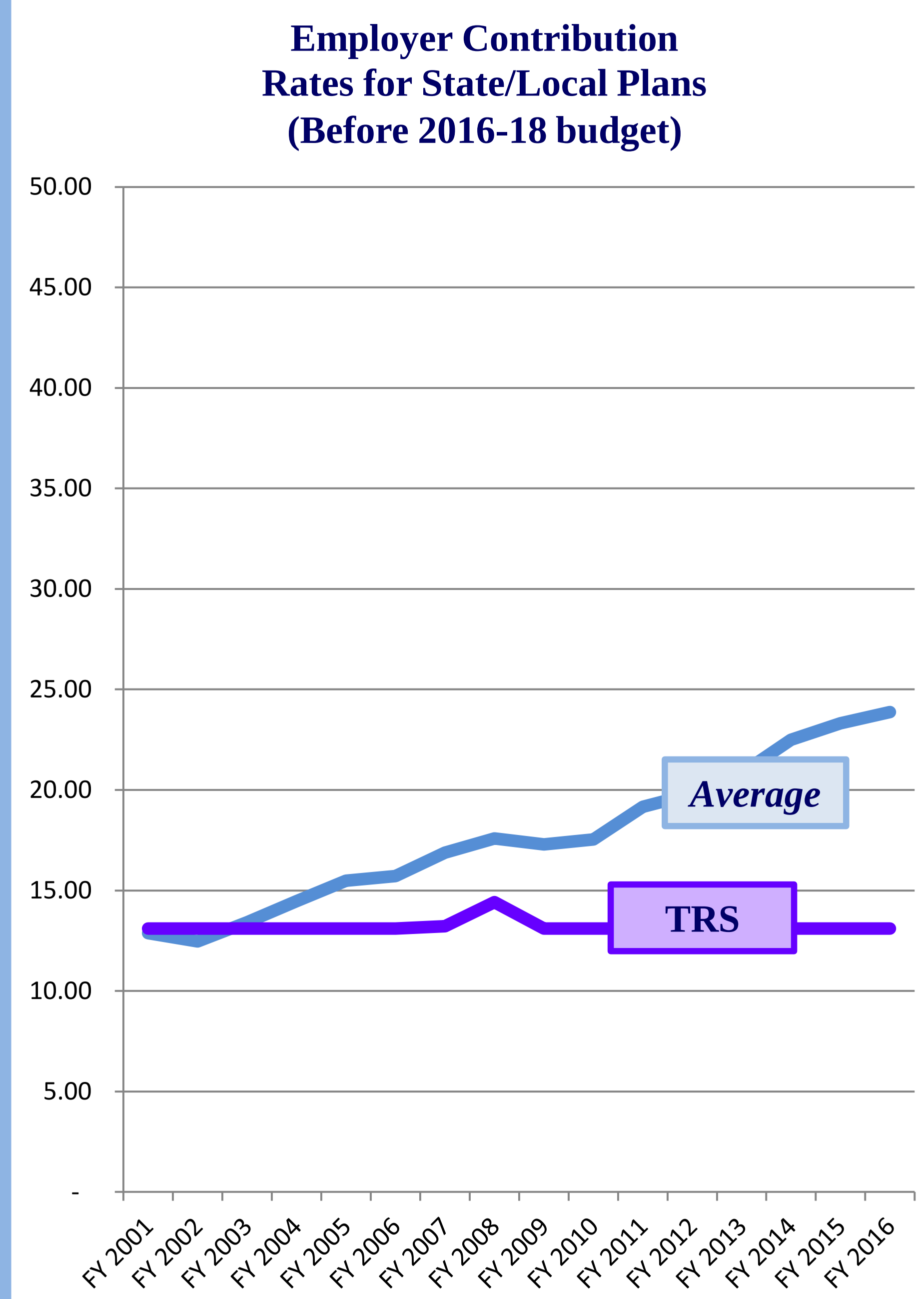
($ in millions)	$'s	Actual %	Target %	Strategic Ranges
Domestic Equities	$7,466.4	**43.2%**	**41.0%**	34.0 - 48.0%
Real Estate	950.3	**5.5%**	**6.0%**	4.0 - 8.0%
Alternative Inv.	953.7	**5.5%**	**7.0%**	4.0 - 10.0%
International Equities	3,474.5	**20.1%**	**20.0%**	17.0 - 23.0%
Additional Categories	1,390.7	**8.0%**	**9.0%**	6.0 – 12.0%
Fixed Income	2,873.4	**16.7%**	**15.0%**	12.0 - 19.0%
Cash	$169.5	**1.0%**	**2.0%**	1.0 - 3.0%
Total	**$17,278.5**	**100.0%**	**100.0%**	-

Asset Allocation

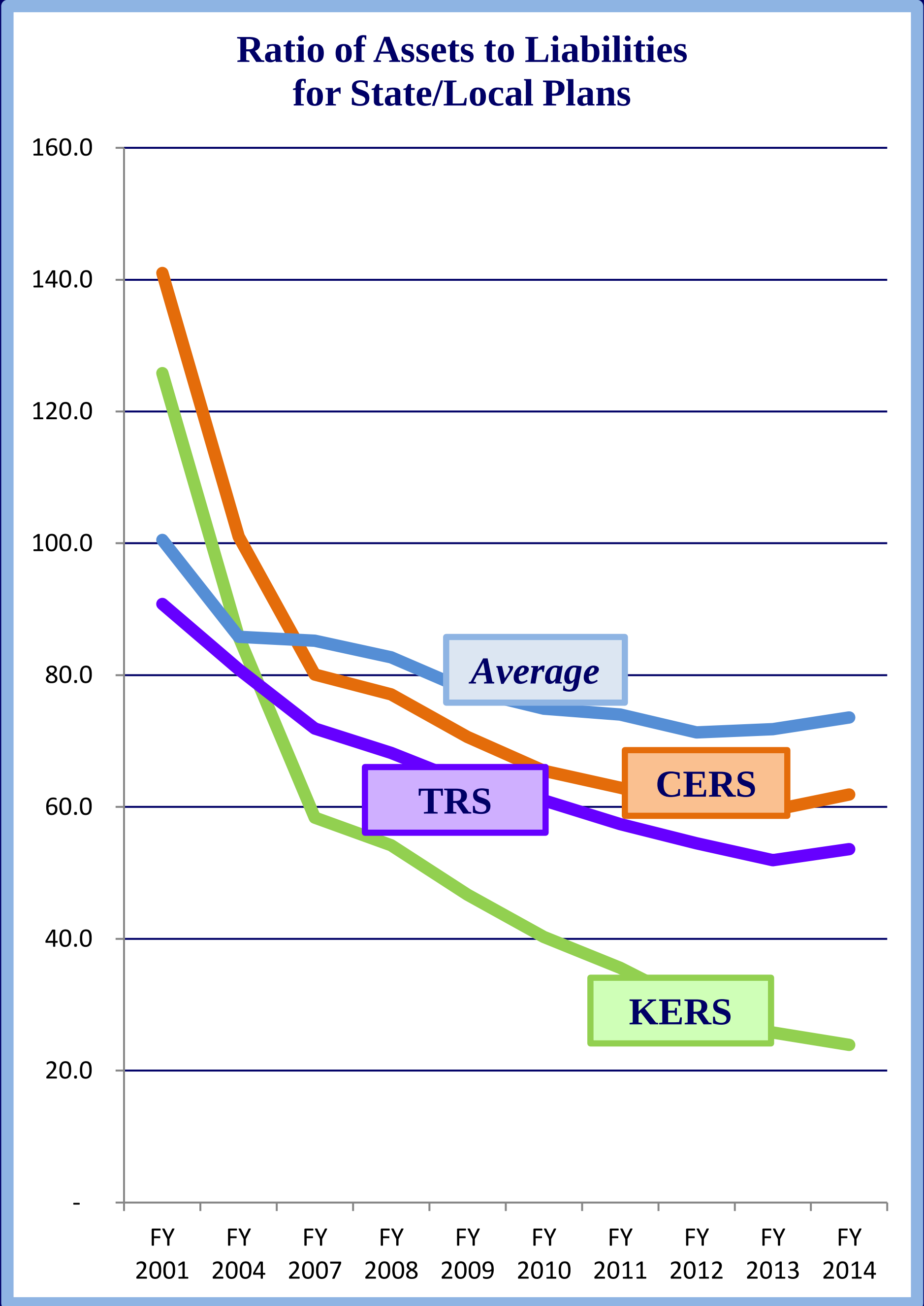
- Asset liability modeling used as a basis for determining asset mix
- Cash-flow requirements manageable with $973 M appropriation beginning with FY 17. Had been significant investment limitation in last decade

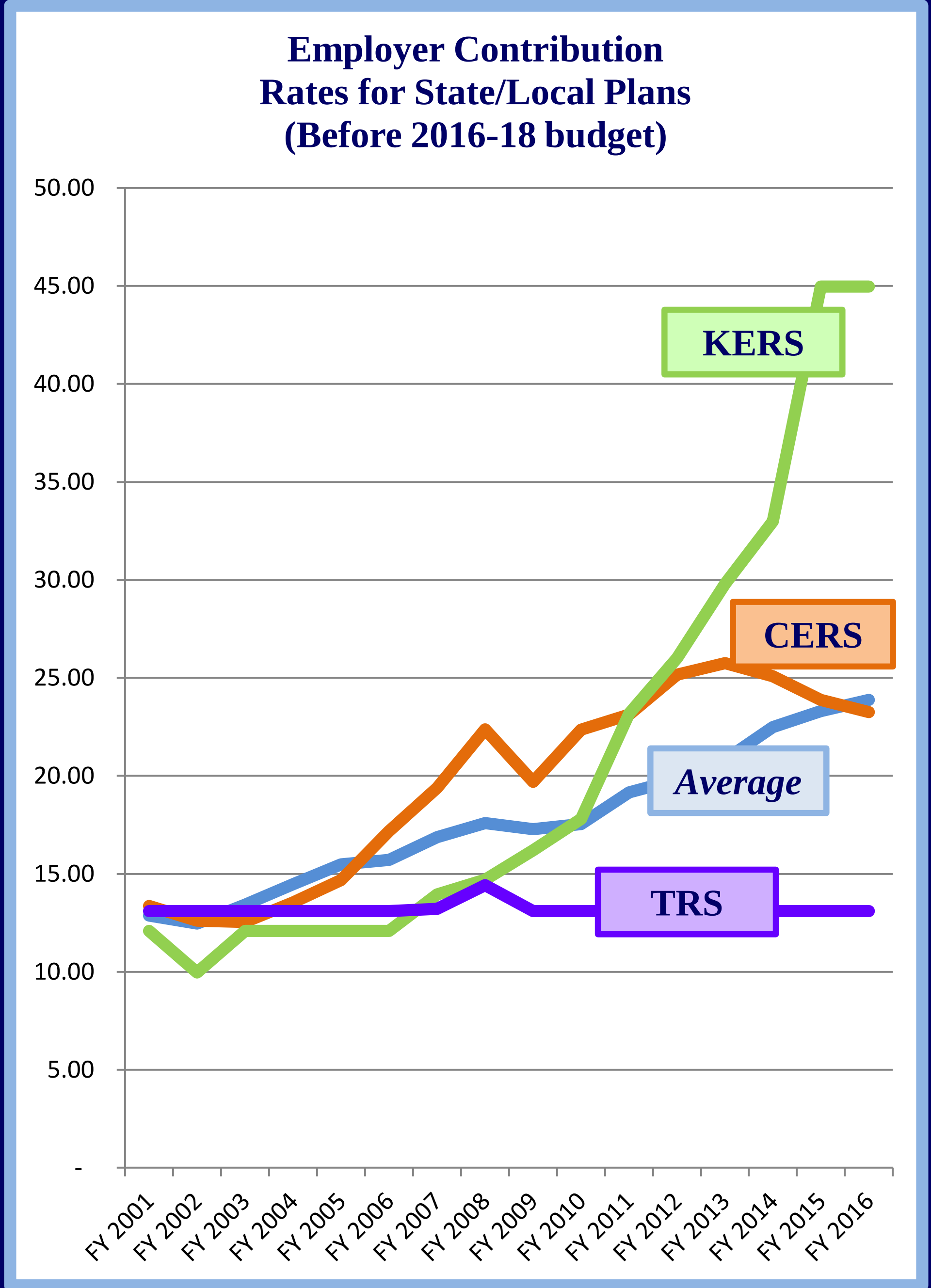
Current liquidity of investments





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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Pension Contributions Used for Medical Benefits

- Total of $897 million redirected from pension to retiree medical from 1998 through 2010
- State repaid amount redirected after 2004, including issuing $467 M in bonds in 2010
- Shared Responsibility legislation in 2010 prefunded insurance, alleviating any future need to borrow.
- Use had direct impact on investing pension assets and diversifying portfolio during this period.
- Also hastened advent of negative cash flow for pension benefits

Impact of Negative Cash Flow

Assets Sold	If Not Sold
$2.365 billion from 2011-2015	Profit of $319 million on those assets

RESULT

Investment account is <u>without</u> $2.684 billion that it would have invested now

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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

Current liquidity

Between 80 and 85 percent of the portfolio is in publicly traded liquid securities

Examples:

- Public equity
- Investment-grade fixed income
- Cash

Solution implemented

Governor prioritized pension funding

Gov. Matt Bevin was catalyst by proposing pension funding in his budget

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Additional Funding Summary

TRS Requested
$1.03 B

94%

Approved
$973 M

40

Investment Policies, Processes, Procedures and Oversight

INVESTMENT PERFORMANCE

TRS RETURNS

AS OF SEPT. 30, 2016

	Quarter	FYTD	1-Year	3-Year	5-Year	10-Year
Returns	4.34%	4.34%	9.22%	6.62%	10.47%	6.08%

Over the last 30 years, the compounded return has been 8.15% (Gross)

Historical Returns

Year	Return	Year	Return
1987	6.52%	2002	-4.10%
1988	6.81%	2003	4.80%
1989	7.20%	2004	9.70%
1990	6.88%	2005	7.50%
1991	9.60%	2006	5.40%
1992	12.50%	2007	15.30%
1993	12.10%	2008	-5.70%
1994	0.70%	2009	-14.30%
1995	16.90%	2010	13.10%
1996	13.50%	2011	21.60%
1997	19.60%	2012	2.40%
1998	19.40%	2013	14.10%
1999	11.50%	2014	18.10%
2000	4.10%	2015	5.10%
2001	-0.70%	2016	-1.00%

Performance Measures

Each portfolio compared to recognized benchmark

- *Examples:*
  - *Large-cap U.S. growth – Russell 1000 growth*
  - *Intermediate Bond Fund – Barclays Intermediate Government/Credit*

Each asset class compared to relevant benchmark

- *Examples:*
  - *Large-cap U.S. stocks – S&P 500*
  - *Fixed income – Barclays Government Credit Index*

Total portfolio compared to policy benchmark that weights appropriate indexes by System weight in each asset class

Investment Oversight, Compliance & Transparency

- Transactions reconciled daily with custodial bank
- Most trades executed in-house
- Transactions reviewed monthly by Investment Committee.
- Monthly monitoring of compliance with administrative regulations and asset allocation targets and ranges.
- Quarterly meeting and reporting on all investment managers to Investment Committee in public meetings.

Investment Oversight, Compliance & Transparency

- Quarterly reporting to Board of Trustees in public meetings
- Quarterly reporting of investment performance to Public Pension Oversight Board in public meetings
- Quarterly reporting of investment performance on TRS website
- Quarterly filing with Securities and Exchange Commission
- CAFR includes annual investment information summarized, including all fees and returns, which is posted to TRS website

TRS Approach

- TRS never has used placement agents.
- TRS has not used hedge funds for a variety of reasons.
- TRS has fiduciary duty and investment flexibility in procurement.
- Fees disclosed in annual report and quarterly on website.

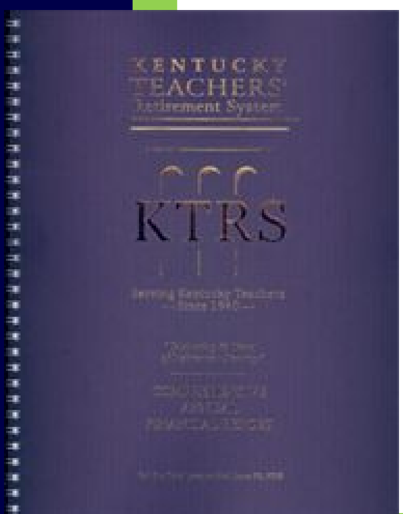
Ethics

- KRS 161.430 (1) – Code of Ethics and Standards of Professional Conduct promulgated by CFA Institute
- KRS 11A – Code of Ethics for state employees
- KRS 161.460 – Conflict of interest prohibited
  - All trustees, employees, and external investment managers sign conflict of interest statements.

Investment Fees Analysis

Transparent Low Fees & Investment Costs

Fees & investment costs documented annually in the TRS annual report



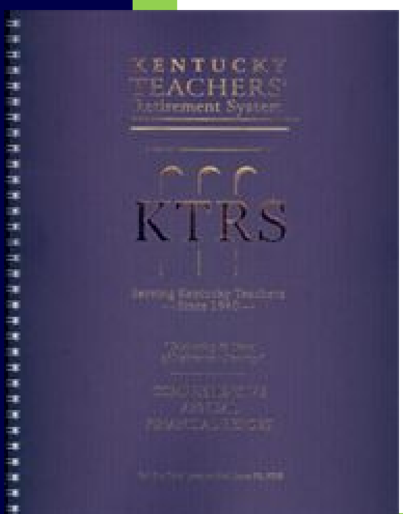
2015 Total $44,892,486

25/100 of 1% of Assets

50

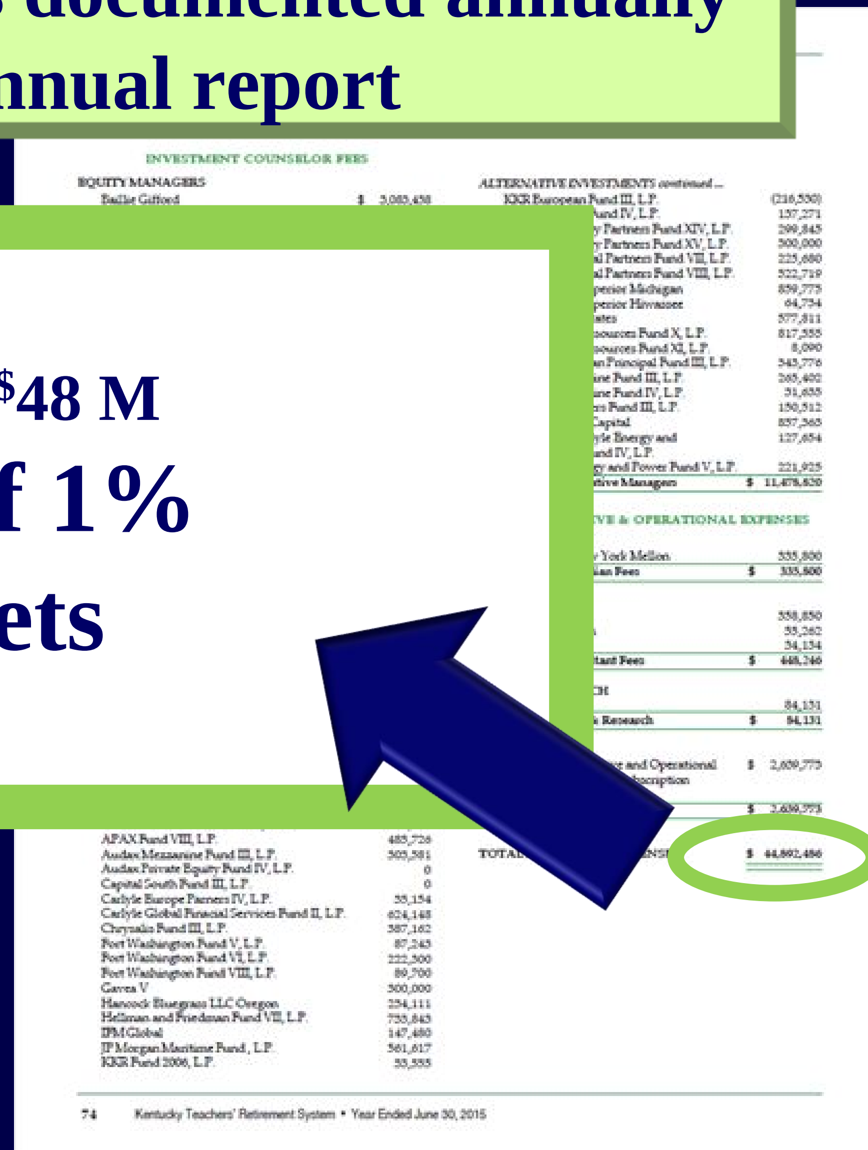
Transparent Low Fees & Investment Costs

Fees & investment costs documented annually in the TRS annual report



2016 Total $48 M

29/100 of 1% of Assets


INVESTMENT COUNSELOR FEES

EQUITY MANAGERS

ALTERNATIVE INVESTMENTS continued ...

KKR European Fund III, L.P. (216,530)

APAX Fund VIII, L.P. 485,726

Audax Mezzanine Fund III, L.P. 505,581

Audax Private Equity Fund IV, L.P. 0

Capital South Fund III, L.P. 0

Carlyle Europe Partners IV, L.P. 35,154

Carlyle Global Financial Services Fund II, L.P. 624,148

Chrysalis Fund III, L.P. 387,162

Fort Washington Fund V, L.P. 87,245

Fort Washington Fund VI, L.P. 222,500

Fort Washington Fund VIII, L.P. 89,700

Garrea V 300,000

Hancock Bluegrass LLC Oregon 234,111

Hellman and Friedman Fund VII, L.P. 735,843

IFM Global 147,480

JP Morgan Maritime Fund, L.P. 361,617

KKR Fund 2006, L.P. 35,353

74 Kentucky Teachers' Retirement System • Year Ended June 30, 2015

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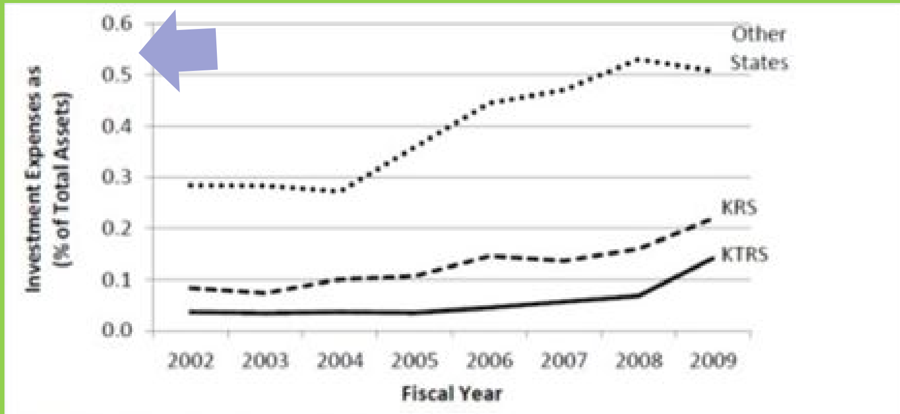
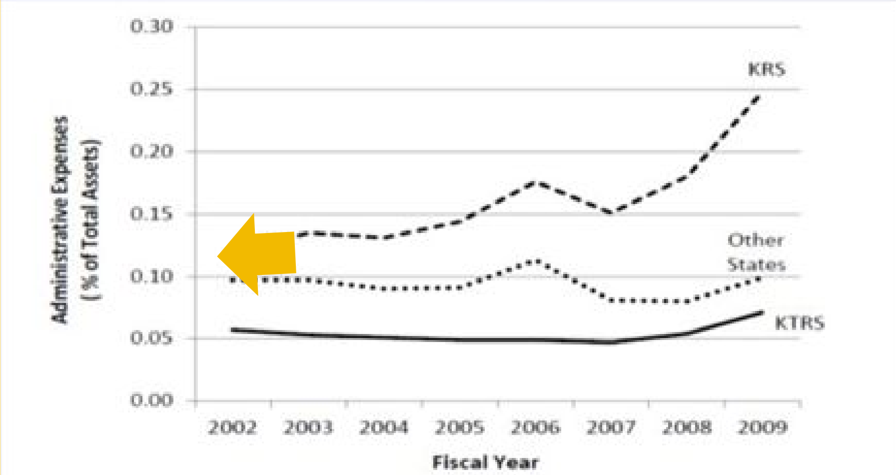
Program Review and Investigations Committee
Sept. 13, 2012

INVESTMENT EXPENSES
as a percentage of pension assets for KRS, TRS and the average of other states
FY 2002 to FY 2009



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.

ADMINISTRATIVE EXPENSES
as a percentage of pension plan assets for KRS, TRS, and 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.

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Consultants and Other Third-Party Service Providers

TRS Third-Party Service Providers

- Bloomberg
- BNYM
- Broadridge
- Burgiss Group
- Credit Sights
- Factset
- Interactive Data
- Investment Metrics
- ISS - Risk Metrics
- NYSE
- Preqin
- QED
- Segal Rogerscasey
- Standard & Poors
- Thomson Reuters
- Tradeweb
- Value Line Institutional Services
- Credit Sights
- BCA Research
- Marketaxess
- Triton
- Real Tick
- Abel Noser

TEACHERS'
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KENTUCKY

Teachers' Retirement System

of the State of Kentucky

Our Members Come First!

800-618-1687

502-848-8500

www.ktrs.ky.gov

Protecting & Preserving Teachers' Retirement Benefits

Teachers' Retirement System

TRS Benefits Overview

for PFM

Gary L. Harbin, CPA
Executive Secretary

Nov. 3, 2016

Agenda

- Mission and Objectives
- TRS is unique
- TRS Members & What They Do for Kentucky
- Member Benefits, Services & Employees
- Pension Overview
- Pension Changes
- Pension Benefits Processes
- Health Care Overview
- Health Care Changes

Mission & Objectives

Mission and Objectives

- Provide current and future retirement benefits for more than 140,000 active and retired members guaranteed to them under Kentucky's Inviolable Contract

- Provide health care to retirees according to law

- In achieving the first objectives, use processes that ensure the fiduciary duty to members, including assuring the system's cost-effectiveness and safeguarding against error and fraud

TRS is Unique

How is TRS different from most public pension plans?

- **Social Security –**
  - 96% of members receive benefits that replace and are in lieu of Social Security
  - Contributions, annuities differ for members accordingly
- **Health Care –**
  - One of a minority of state pensions providing retiree health care
- **Laws and Regulations**
  - Fixed employer contribution rate
  - Source of employee match depends on employer type
  - Inviolable Contract limits changes for retirees, current employees

TRS Members and What They Do for Kentucky

Who are TRS members?

173 school districts

State pays employer contribution

17 education agencies

State pays employer contribution

- 95 percent of TRS members employed by non-university employer
- 5 percent employed by university

KCTCS

KCTCS pays employer contribution

Five regional universities

University pays employer contribution

8

TRS Membership

	Not Eligible to Retire	Eligible to Retire	Total
Contributing Accounts			
Full-time	47,637	10,726	**58,363**
Part-time	13,570	2,789	**16,359**
Total Contributing Accounts	**61,407**	**13,515**	**74,722**
Non-Contributing Accounts			
Inactive	27,217	2,218	29,435
Total Contributing & Non-contributing accounts	**88,424**	**15,733**	**104,157**
Retirees and other annuitants			**52,012**
Total Accounts			**156,169**
Less: return-to-work & current-year retirees			9,581
Net Members and Annuitants			**146,588**

TRS Benefits Protect At-Risk Population

Most teachers are not in Social Security, and, in almost all cases, can't receive Social Security survivor benefits from a spouse because of federal law.

Member Recipients	
	PERCENT
Females	71%
Males	29%
Total	**100%**

54% of member recipients under 85 are single

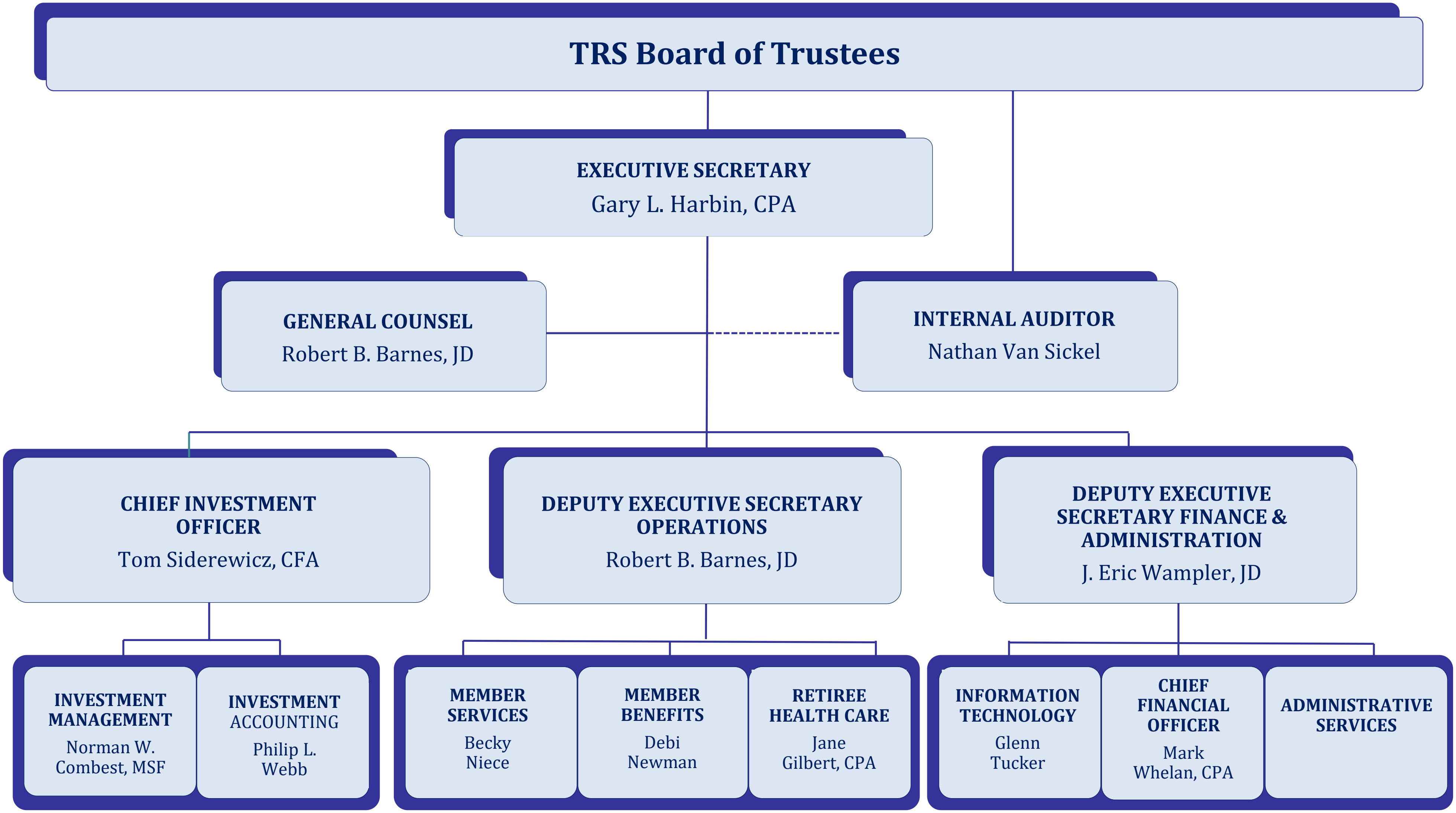
94% of member recipients 85 and above are single

Retired teachers have significant economic impact in every Kentucky county

- **TRS pays:**
  - $151.6 million in retirement annuity benefits *(July 2015)*
  - $20.1 million in medical benefits *(monthly average)*
- 89% of TRS retirees live in Kentucky

Member Benefits, Services & Employees

Teachers' Retirement System of the State of Kentucky
Organizational Chart



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

Actuarial Services
Cavanaugh Macdonald Consulting

Auditing & Financial Consulting
Mountjoy Chilton Medley

Health & Benefits
Retiree Health Insurance
Aon Risk Solutions

Investment Consulting
Aon Hewitt

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Member Benefits

- 15 counselors, 2 case consultants and 3 assistants
- Information Center
- Individual member counseling
- Annuity benefit estimates
- General account inquiries
- Member account auditing and adjustments
- Retirement processing (service and disability)
- Death & survivor benefit payments

15

Member Services

- 10 employees
- Member workshops & seminars
- Member account self-service portal & app
- Account refunds
- Personal payments (service credit purchases, etc.)
- Retiree payroll processing
- Document imaging
- Member account maintenance

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PATHWAY

Teachers' Retirement System
479 Versailles Road, Frankfort, Kentucky 40601
Monday - Friday 8 a.m. - 5 p.m. ET
Local 502-848-8500 Toll Free 800-618-1687

TRS Self-Service Login

Use your TRS ID and password to log in to the member self-service portal. If you are a first time user, click on Register and follow the steps to complete registration.

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TRS ID [TRS ID]

Continue

New user click to Register

Disclaimer: The TRS Pathway System and the TRS Member Self-Service Portal are operated and maintained by the Teachers' Retirement System (an agency of the Commonwealth of Kentucky) and contain confidential information and data. These websites are intended only to be accessed by authorized users. Unauthorized access, unauthorized use, misuse, distribution or abuse of this information is prohibited. Unauthorized attempts to upload information or change information on these services is strictly prohibited and may violate applicable state and federal laws.

TEACHERS' RETIREMENT SYSTEM PATHWAY

Desktop & Mobile app access for

Active Members

Retired Members

Pathway self-service portal https://mss.trs.ky.gov/

TRS Keeping In Touch

Special mailings and newsletters


Teachers' Retirement System
TRS KENTUCKY
ACTIVE MEMBER EDITION
OCTOBER 2016

INSIDE:

New TRS Look	2
Underwood Elected	2
Board Thanks Gov. Bevin	2
Security Dos & Don'ts	3
TRS Website Index	3
Death of an Active or	3
New Contact Info	4
Working Past 65?	4

NEW ADDRESS FOR TRS WEBSITE:

TRS.KY.GOV

TRS Investing Strategy Working Long Term

by Gary L. Harbin, CPA, Executive Secretary

The investing sage Warren Buffett once said that, "Someone's sitting in the shade today because someone planted a tree a long time ago." That's a fancy way of saying – fancier than I would have done growing up in Hodgenville – that investing is about the long term.

The top quartile performance of the Teachers' Retirement System over a 10-year period means the strategy on behalf of Kentucky educators is working even with a negative 1 percent return in the most recent fiscal year.

With returns the prior three years (ending June 30) that were among the best for pension plans across the country (14.1 percent, 18.1 percent, 3.1 percent) a 1 percent decline in market value is to be expected at some point.

One-year returns must be looked at in the long-term context, like planting a tree for the future.

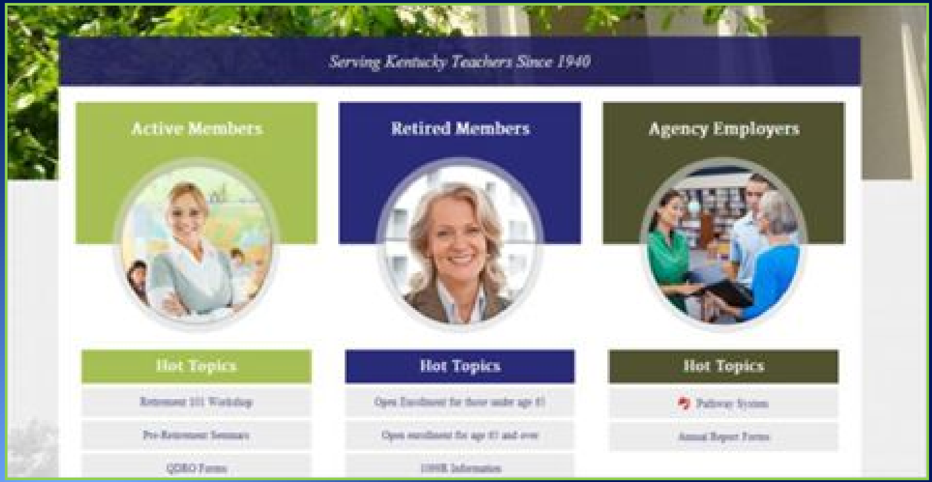
Without question, the long-term strategy for TRS investing continues to work as evidenced by the long term results, which include producing an 8 percent return over the last 30 years.

That same strategy will be employed as TRS's qualified investment staff begins to put the $973 million in additional pension funding approved recently by the legislature and Gov. Matt Bevin to work for teachers' pensions. This new money, which began arriving July 1 in the first of eight $125 million installments, is wonderful and appreciated.

Going forward, the new money will help grow the portfolio for the long-term success of TRS and reduce the asset sales, which have kept returns from being even better, to a manageable level.

The investment strategy for teachers works and will continue to provide shade in retirement for teachers as it has for 76 years.

PATHWAY https://mitrs.ky.gov KyTeachersRS facebook.com/KyTeachersRS



Online

Information Center

TRS Social Media

Like us on Facebook

facebook.com/KyTeachersRS

twitter

@KyTeachersRS

trs.ky.gov

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Pension Overview

How much do Kentucky teachers' pension benefits cost?

	Normal Cost	Breakdown of Normal Cost	
		Teachers' Contribution*	State's Contribution
Cost of Kentucky K-12 teachers' pension benefits	15.68%	9.11%	6.57%
Cost of Social Security	12.40%	6.20%	6.20%
Marginal difference	3.28%	2.91%	0.37%

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

A Portion of Your Salary Helps Pay for Your Benefits

12.855% of salary

9.105% PENSION

3.75% RETIREE HEALTH CARE

Non-university members

A Portion of Your Salary Helps Pay for Your Benefits

8.185% of salary

5.41% PENSION

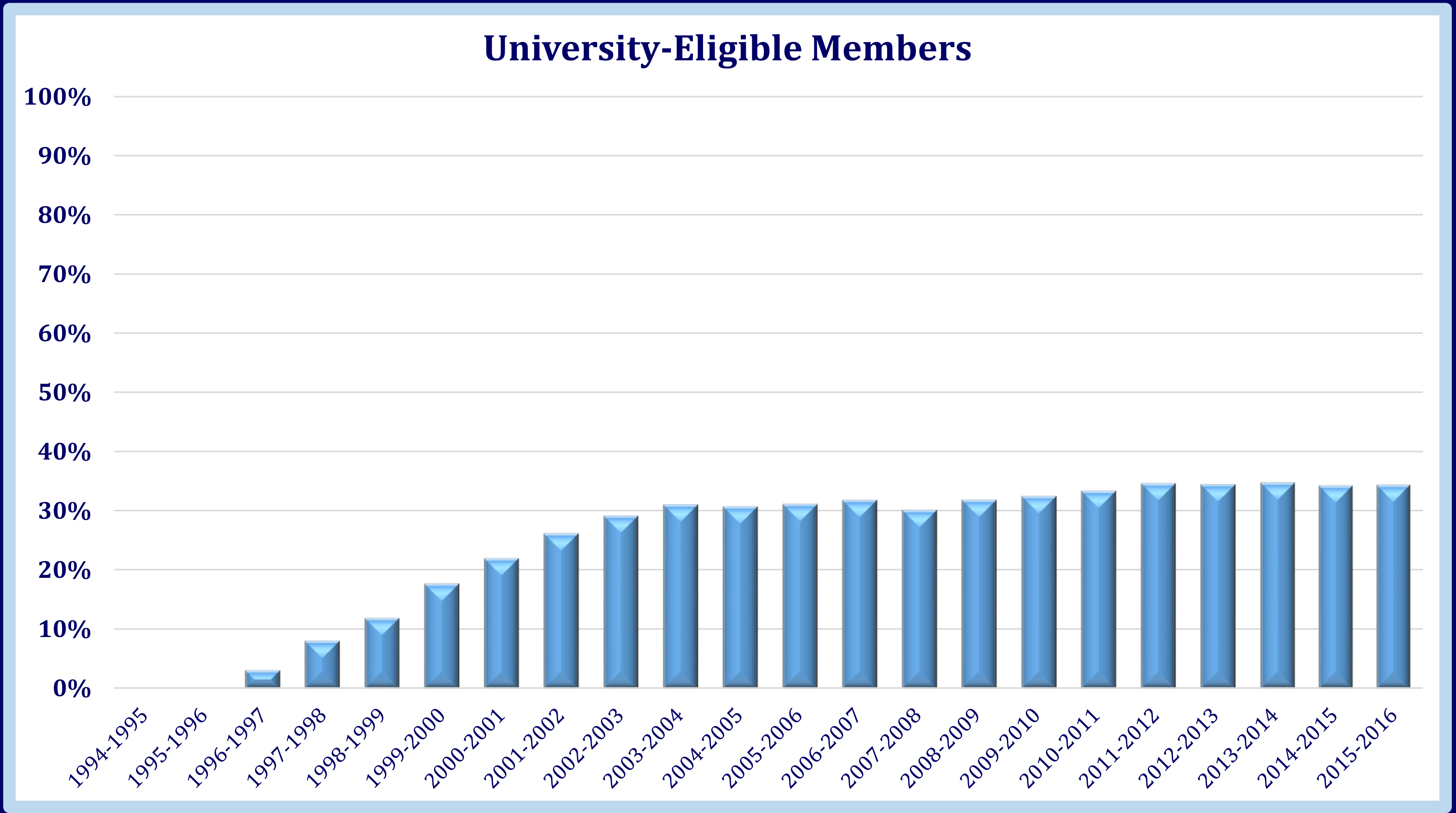
2.775% RETIREE HEALTH CARE

University members

Background

- University members pay and receive Social Security.
- Non-university members do not pay and do not receive Social Security on TRS employment.
- Universities voted in the 1950s to opt in to Social Security with institutions now covering employer cost.
- TRS maintains distinct benefit formulas for university and non-university members. Since July 1, 1994, universities also have offered optional retirement plans in lieu of TRS.

How these alternatives impact TRS

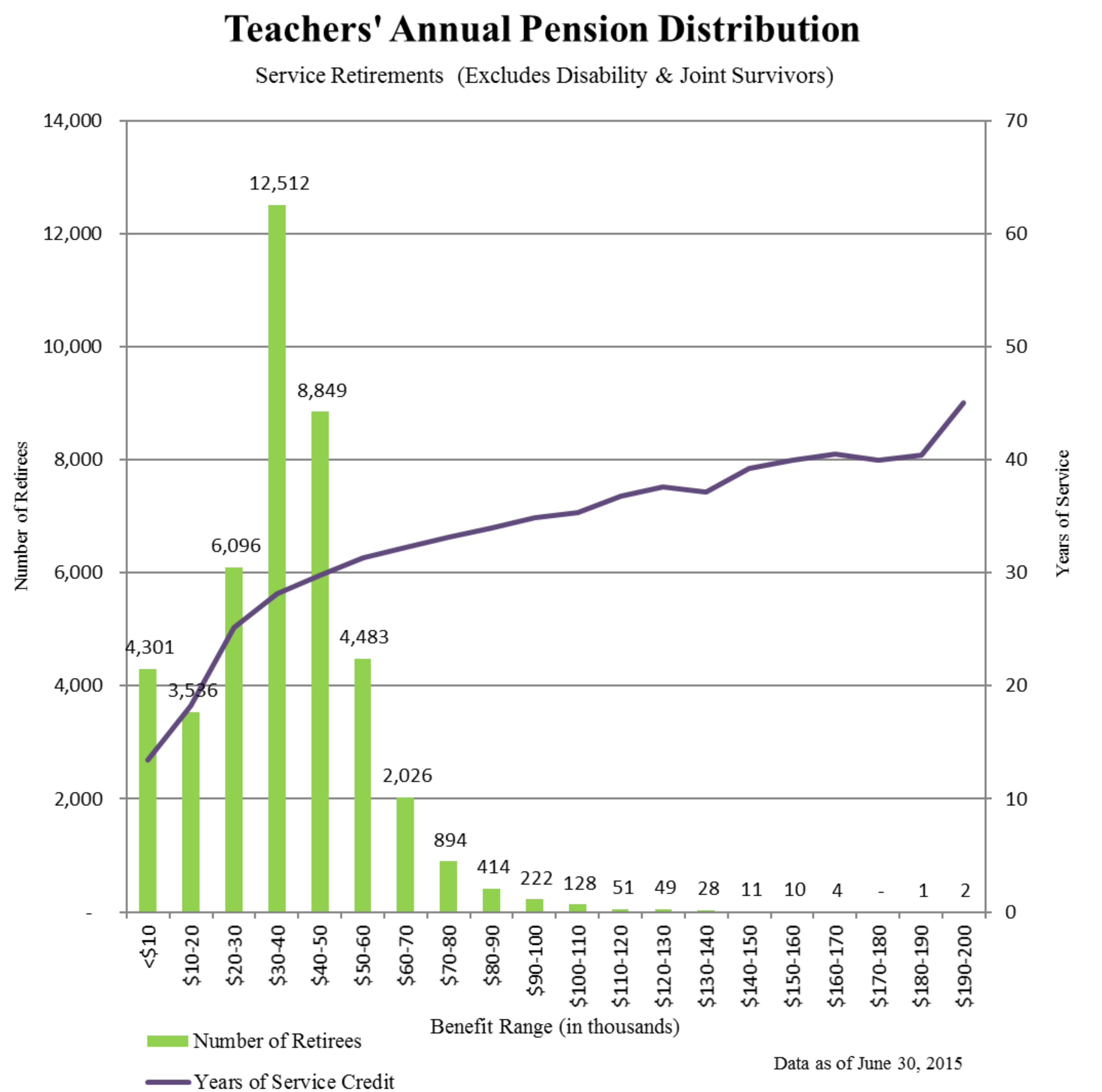


About one-third of university employees eligible for TRS select an ORP.

Why Not Teachers?

"Under our present revenue-producing system, the legislature would encounter serious difficulty in locating a sum of new money to bring the teachers into the Social Security program."

Gov. Lawrence W. Wetherby, Oct. 5, 1954 letter


Teachers' Annual Pension Distribution
Service Retirements (Excludes Disability & Joint Survivors)
Number of Retirees
Years of Service
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-
70
60
50
40
30
20
10
0
12,512
8,849
6,096
4,483
4,301
3,536
2,026
894
414
222
128
51
49
28
11
10
4
-
1
2
<$10
$10-20
$20-30
$30-40
$40-50
$50-60
$60-70
$70-80
$80-90
$90-100
$100-110
$110-120
$120-130
$130-140
$140-150
$150-160
$160-170
$170-180
$180-190
$190-200
Benefit Range (in thousands)
Number of Retirees
Years of Service Credit
Data as of June 30, 2015

27

How to Calculate Your Retirement

Total Service Credit		Multiplier		Final Average Salary		
	x		x		=	Annual Benefit

Service Credit

- Total number of years you contribute into TRS

Multiplier

- Value for each year of TRS service

Final Average Salary

- High five salaries with 27 years of service or at age 55
- High three with 27 years and age 55

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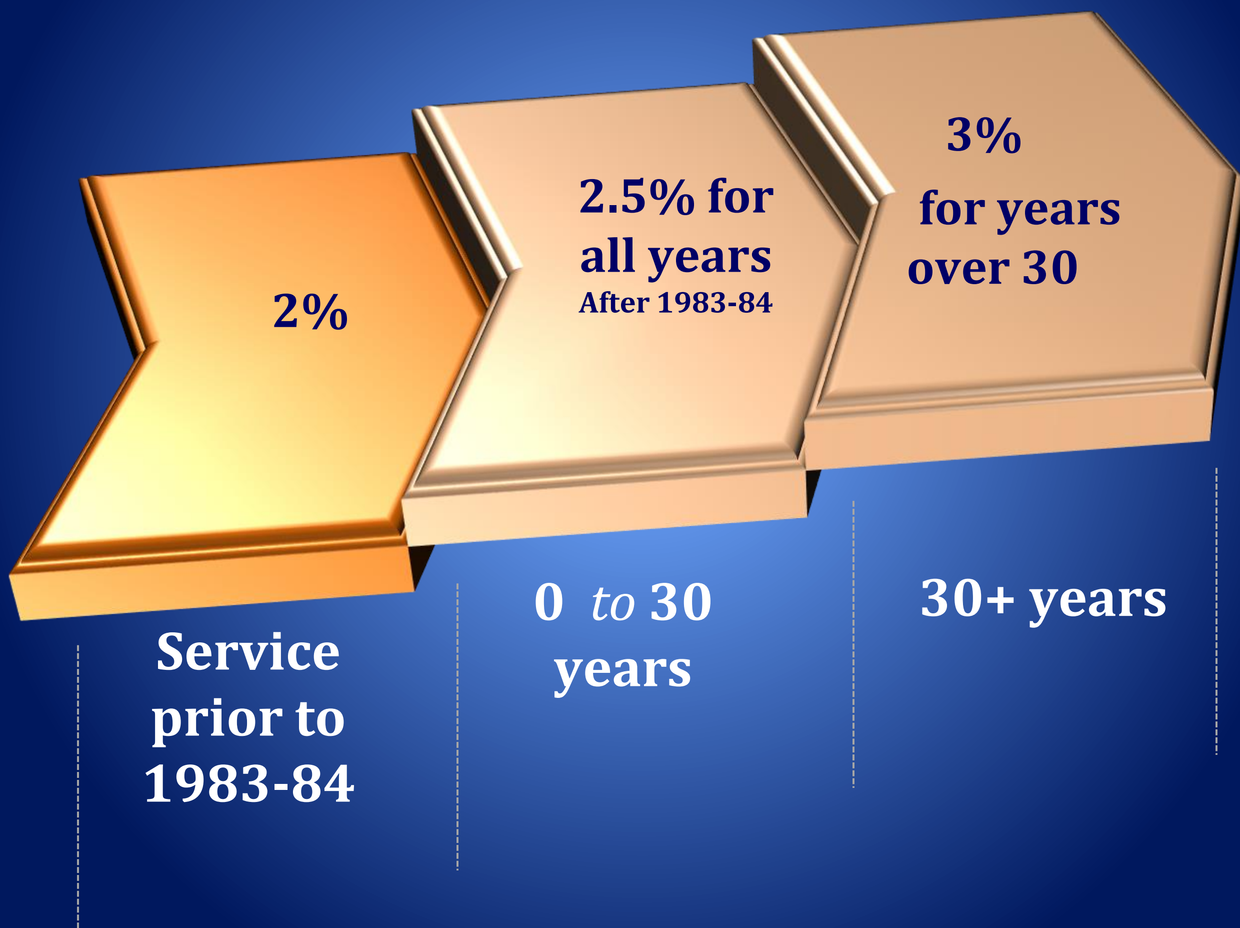
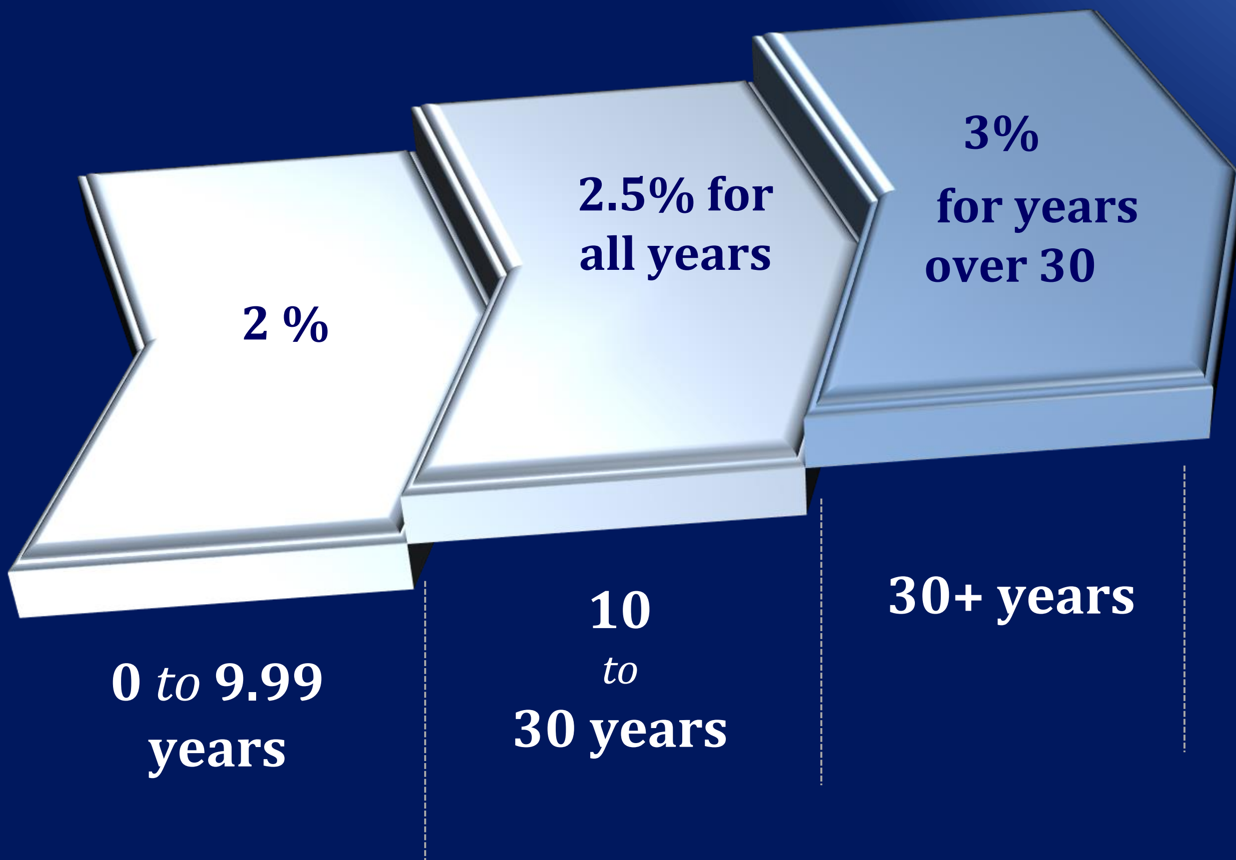
Multipliers for University Members Hired On or After July 1, 2008

Multipliers for Non-University Members Hired Before July 1, 2002



Multipliers for Non-University Members Hired Between July 1, 2002 and June 30, 2008



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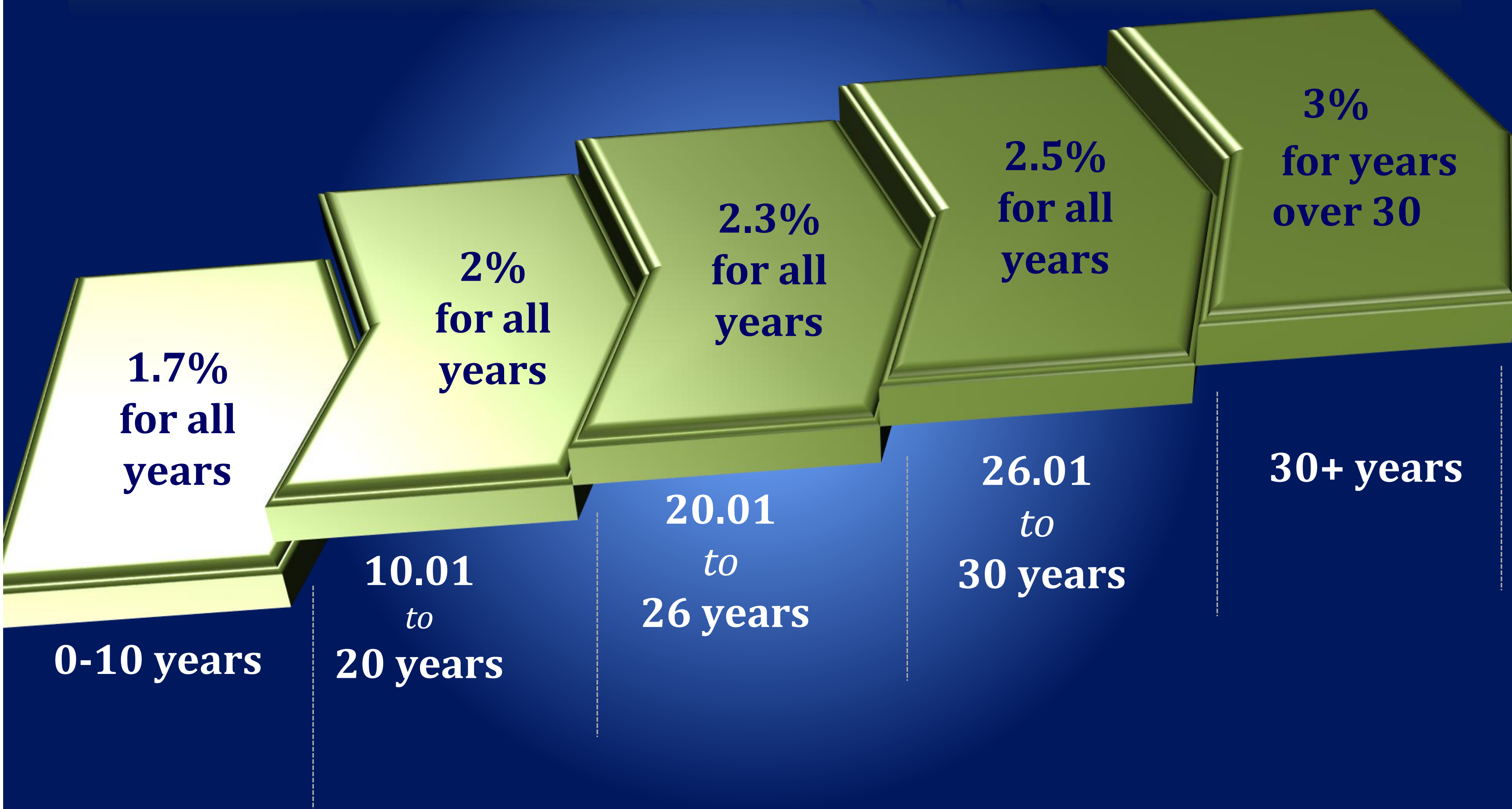
Multipliers for Non-University Members Hired On or After July 1, 2008



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Entry Date Prior To July 1, 2008

Retirement Eligibility

- 27 years service at any age — **No Penalty**
- Age 60 with at least 5 years — **No Penalty**
- Age 55 with at least 5 years — **PENALTY**

Penalty: *If you're under 60 with less than 27 years, you lose 5% for each year below age 60 or 27 service years – whichever is less.*

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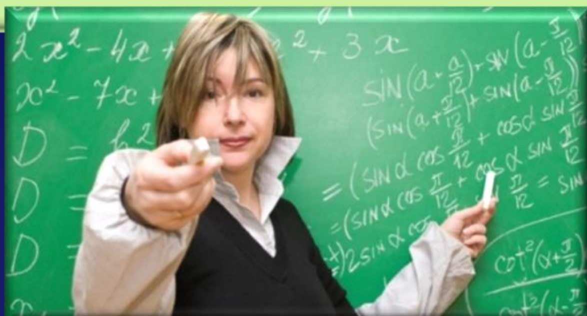
Entry Date On or After July 1, 2008

Retirement Eligibility



- 27 years service at any age — **No Penalty**
- Age 60 with at least 5 years — **No Penalty**
- Age 55 with at least 10 years — **PENALTY**

Penalty: *If you're under 60 with less than 27 years, you lose 6% for each year below age 60 or 27 service years – whichever is less.*

Retirement Options

All options – members receive a lifetime benefit

Option I – Maximum monthly benefit

Refundable balance paid to beneficiary

Option II – Five-year certain for beneficiary
10-year certain for beneficiary
15-year certain for beneficiary
20-year certain for beneficiary

No benefit to beneficiary after certain period

Option III – Joint survivor annuity

Option III A – Joint survivor annuity with pop-up

Option IV – Joint survivor annuity, one-half benefit to beneficiary

Option IV A – Joint survivor annuity, one-half benefit to beneficiary with pop-up

Lifetime benefit for member and beneficiary

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Documents Required for Retirement

Member Requirements

- ✓ Retirement application
- ✓ Copy of your birth certificate & Social Security card
- ✓ Copy of your marriage certificate
- ✓ Voided check
- ✓ Spousal acknowledgement

Requirement for a Beneficiary

(if option III, IIIa, IV or IVa is selected)

- ✓ Copy of beneficiary's birth certificate
- ✓ Copy of beneficiary's Social Security card

Copies of certified documents only

Retirement Application

Online through Pathway

- Must be registered for Pathway
- Select type of application (service or disability)
- Answer all questions
- Upload required documents
- Review summary and submit to TRS
- Member and employer must submit at least one month prior to retirement

TEACHERS' RETIREMENT SYSTEM
PATHWAY

https://mss.trs.ky.gov/

Active Members | **Retired Members**

TRS Self-Service Login

Use your TRS ID and password to log in to the member self-service portal. If you are a first time user, click on Register and follow the steps to complete registration.

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TRS ID [TRS ID]

Continue

New user click to Register

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Retirement Application

On paper using Form 23

- Must be received one month prior to retirement
- Health insurance enrollment included
- Complete retirement and insurance application thoroughly, even if waiving insurance
- Member and spouse must sign
- Must be witnessed by two people
- Do not detach any pages of the application
- Enclose required documents


TEACHERS' Retirement System
TRS
KENTUCKY

Application for
Service Retirement

479 Versailles Road
Frankfort, Kentucky 40601
PH: 502-848-8500
TOLL FREE: 1-800-618-1687
Monday through Friday
8:00 a.m. — 5:00 p.m. EST
www.ktrs.ky.gov

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Sick Leave Days

School Districts
Paid by employer and added to Final Average Salary

Universities & State Agencies
Converted to service credit and added to years of service

300 sick leave-day maximum for local school district members who started on or after July 1, 2008

Actuarial cost/ School officials cite this policy as a way to reduce teacher absenteeism and improve instruction by keeping teachers in the classroom more.

How Are Sick Days Calculated For School Districts?

Contract salary / contract days =
DAILY RATE

Daily rate x **local policy** =
SICK DAY VALUE

Sick day value x **number of unused sick days** = $$$$

EXAMPLE:

$69,115 / 187 = $369.60

$369.60 x 30% = $110.88

$110.88 x 175 sick days = $19,404

Disability Retirement

Any serious consideration of disability insurance should only be made after obtaining a thorough understanding of the TRS disability retirement program.

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Other Benefits

Spousal Survivor Benefits

available if member's death is prior to retirement and spouse is named as primary beneficiary

Children's Survivor Benefits

available to children under 18 if member's death is prior to retirement

Adult Child with Certified Disability

available for lifetime or until disability no longer exists or child marries

Reciprocity Benefits

KERS CERS SPRS

JFRP
KLRP

Judicial Form Retirement System
Judicial Retirement Plan and Legislators Retirement Plan

- Years added together for eligibility purposes
- Retirement date must be same in each system
- 2 applications must be completed, 1 for each system
- 2 checks, 1 from each system
- Highest earned salaries used regardless where earned

If you entered in KRS on or after Jan. 1, 2014, this may not apply.

Pension Changes

Recent Pension Changes

- Return to work made actuarially sound
- Average retirement age increased from 54 to 58
- Air-time costs made actuarially sound
- Cost-of-Living Adjustments (COLAs) funded

Pension Benefits Processes

Major Benefit Processes

1. Service retirements
2. Disability retirements
3. Deceased member
4. Deceased retiree
5. Refunds of active accounts
6. Service credit purchases
7. Adjustments
8. Retiree payroll
9. Internal audit

Service Retirement Process

1. Receive application from member
2. Receive identification documentation from member
3. Enter information from application into Pathway (Administrative Assistant, Member Benefits)
4. Confirm information from application (Counselor, Member Benefits)
5. Create final benefit estimate (Counselor, Member Benefits)
6. Make determination of eligible purchases and determine KRS 161.220 (9b) (anti-spiking) and (10) (allowable compensation) violations
7. Create final benefit calculation (Counselor, Member Benefits)
8. Confirm calculation results match the final benefit estimate
9. Approval of application and final calculation (Peer Review, Member Benefits)
10. Add gross amount to individual payroll reconciliation (Counselor, Member Benefits)

Disability Retirement Process

1. Receive application from member
2. Receive applicant statement of disability
3. Receive report of physician
4. Receive identification documentation from member
5. Enter information from application into Pathway (Administrative Assistant, Member Benefits)
6. Send information to each member of the Medical Review Committee
7. Receive reports of Medical Review members
8. Confirm information from application (Counselor, Member Benefits)
9. Create final benefit estimate (Counselor, Member Benefits)
10. Make determination of KRS 161.220 (9b) and (10) violations
11. Create final benefit calculation (Counselor, Member Benefits)
12. Confirm calculation results match the final benefit estimate
13. Approval of application and final calculation (Peer Review, Member Benefits)
14. Add gross amount to individual payroll reconciliation (Counselor, Member Benefits)

Active Member Refund Process

1. Receive application from member
2. Receive direct rollover statement (If applicable)
3. Receive authorization for direct deposit (If applicable)
4. Receive identification documentation from member
5. Enter information from application into Pathway (Administrative Assistant, Member Benefits)
6. Confirm information from application (Counselor, Member Benefits)
7. Approval of application (Director of Member Benefits)
8. Add gross amount to individual payroll reconciliation (Counselor, Member Benefits)

Health Care Overview

TRS Health Benefits

Retired teachers' health insurance provided through two plans:

- **Kentucky Employees' Health Plan (KEHP)**
  Under 65 and not Medicare-eligible
- **Medicare Eligible Health Plan (MEHP)**
  Medicare-eligible or 65 & over

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In the Beginning

- TRS medical insurance first offered in 1964
- Same year Medicare created
- Established on a pay-as-you-go basis
- Spousal coverage offered at no cost (now offered at full cost)

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Health Insurance Eligibility and Subsidy

KEHP
(Under 65)

&

MEHP
(65 & Over)
with UnitedHealthcare & Express Scripts

Retired and/or Age 65 on or after Jan. 1, 2005

Years of Service	Entry prior to July 1, 2002	Entry on or after July 1, 2002	Entry on or after July 1, 2008
27.0	Maximum	Maximum	Maximum
26-26.99	Maximum	95%	95%
25-25.99	Maximum	90%	90%
20-24.99	Maximum	65%	65%
15-19.99	75%	45%	45%
10-14.99	50%	25%	not eligible
5-9.99	25%	10%	not eligible

This chart does not reflect the additional Shared Responsibility amount KEHP members pay.

History of TRS 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

2016 Premium … $260

2017 Premium ... $252

Health Care Division

MEHP	
Enrollees	32,744
Waivers	5,352
KEHP	
Enrollees	15,400
Waivers	3,335

- 9 employees averaging 10.67 years of TRS experience
- Present at about 100 meetings a year
- Average of 5 visitors each day
- 832 calls in October, averaging 6.18 minutes
- Process about 500 applications monthly and 1,450 during open enrollment

Health Care Changes

Changes to Plan

2001

- Reduced adverse selection ("cherry picking") by making permanent any election by surviving spouses to terminate TRS coverage

2002

- Increased from 20 to 27 the number of years required to receive maximum TRS supplement
- Reduced percentage of supplement payable by TRS for less than 27 years of service
- Took initial step in requiring return-to-work retirees to obtain insurance with active employer if that coverage is as good as TRS coverage

Changes to Plan

TEACHERS' Retirement System TRS KENTUCKY

2006

- Positioned MEHP drug plan to take advantage of Medicare Part D subsidies

2007

- Positioned MEHP to secure federal Medicare Advantage subsidies

2008

- New members required to have minimum 15 years for insurance

Changes to Plan

TEACHERS' Retirement System TRS KENTUCKY

2010

- Shared Responsibility enacted to prefund the benefit
- That and federal subsidy solutions eliminated $5 billion in liability

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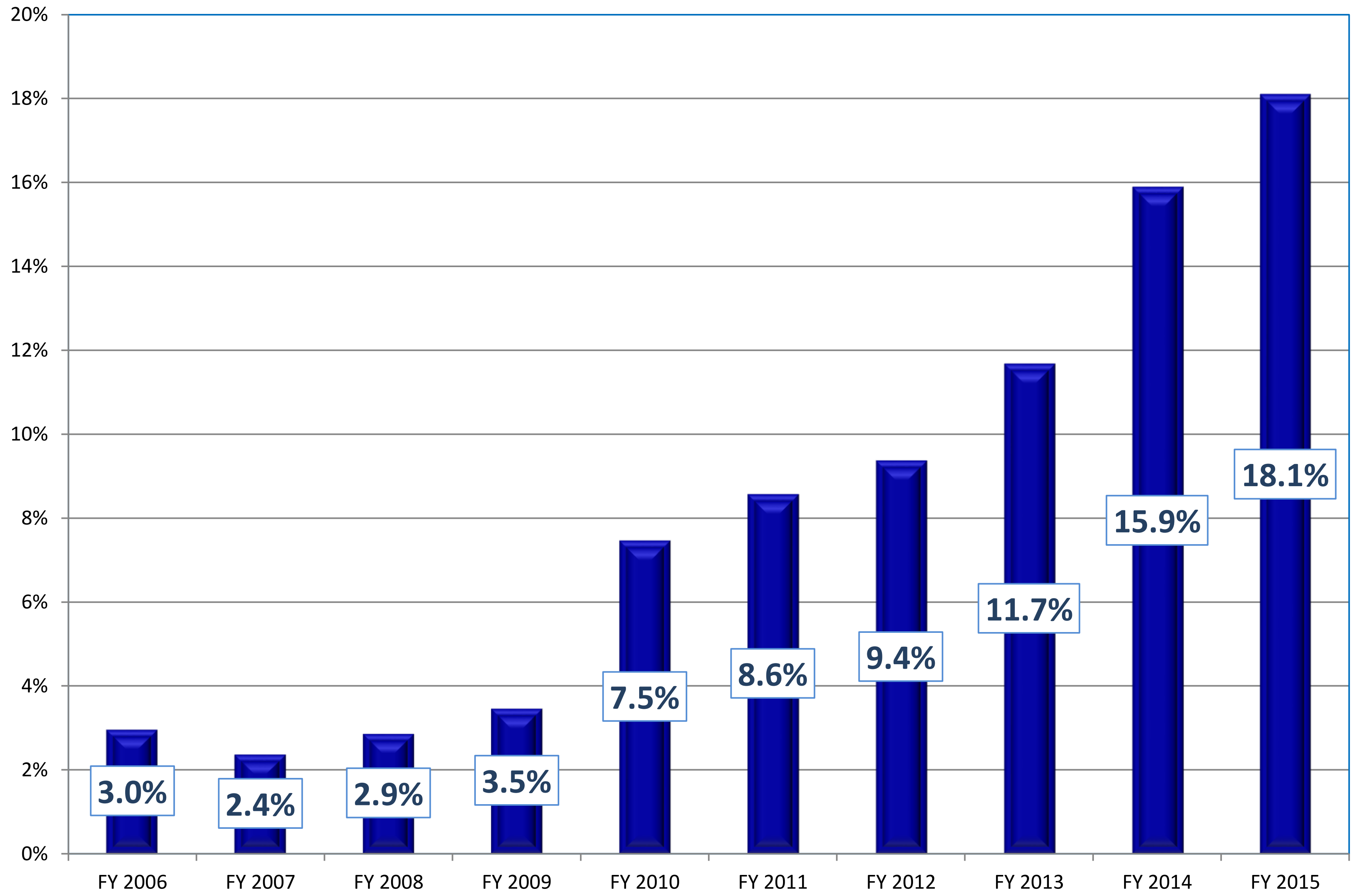
TRS Medical Insurance
Funded Status



Shared Responsibility Results

Liability Before

$6.2 B

Entirely on the State

$5 Billion Reduction in Liability

Liability After

$2.5 B

Eliminated Immediately

Now the Share of Members & Districts

$2.5 B

Remaining to State

$1.2 B

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Shared Responsibility Results

Saves State About $220 M Every Year

BEFORE

State	$294 M
Retirees	42 M
Teachers	25 M
Non-U. Employers	0 M
University Employers	1 M

AFTER

State	$ 74 M
Retirees	56 M
Teachers	128 M
Non-U. Employers	99 M
University Employers	5 M

Using 2016 unaudited medical contributions of $362 M

Changes to Plan

2010

- Moved MEHP drug plan from Medicare Part D Subsidy to Employer Group Waiver Prescription Drug Plan obtaining even greater federal subsidies

2012

- One of the first members of the Know Your Rx Coalition
- Further positioned the MEHP drug plan to take advantage of private drug manufacturers' 50 percent subsidy in Medicare Part D's coverage gap (the "donut hole")

Changes to Plan

2013

- Further reduced adverse selection ("cherry picking") with "Spousal Shared Risk Waiver," which made permanent any election by living members' spouses to terminate TRS Medicare coverage (absent a qualifying event)

Changes to Plan

2014

- Implemented a “Medicare High Performance Formulary” that has a 50 percent coinsurance level for a brand-name, non-preferred drug tier

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Teachers' Retirement System

of the State of Kentucky

TEACHERS'
Retirement System
TRS
KENTUCKY

Our Members Come First!

800-618-1687

502-848-8500

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Protecting & Preserving Teachers' Retirement Benefits

67

Teachers' Retirement System

Information on the TRS

Fiduciary and Ethics Overview

Presented by

Beau Barnes

Deputy Executive Secretary
Operations and General Counsel

Nov. 21, 2016

I. The Role of the Fiduciary

TRS Board Members are Fiduciaries.

What is a Fiduciary?

Fiduciary: "The term is derived from the Roman law, and means a person holding the character of a trustee, or a character analogous to that of a trustee, in respect to the trust and confidence involved in it and the scrupulous good faith and candor which it requires. A person having a duty, created by his or her undertaking, to act primarily for another's benefit in matters connected with such an undertaking… A person who manages money or property for another and who must exercise a standard of care in such management activity imposed by law or contract. A trustee, for example, possesses a fiduciary responsibility to the beneficiaries of the trust to follow the terms of the trust and the requirements applicable to state law."

Trustee: "Person holding property in trust. The person appointed, or required by law, to execute a trust: one in whom an estate, interest, or power is vested, under an express or implied agreement to administer or exercise it for the benefit or the use of another."

Black's Law Dictionary, Fifth Edition (1979)

Common and Case Law Guidelines

"The first duty of a trustee is the duty of loyalty." Bryan, et al. v. Security Trust Co., Ky., 176 S.w.2d 104 (1943).

"He [a trustee] owes the duty of utmost fidelity and loyalty to the beneficiary…" Hutchings, et al. v. Louisville Trust Company, Ky., 276 S.W.2d 461 (1954).

General Conduct

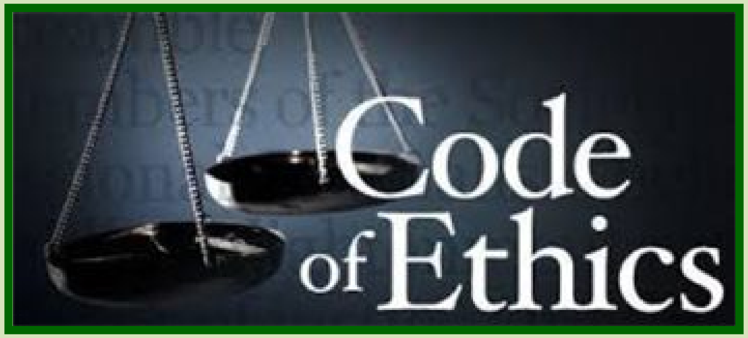
1. Undivided Loyalty — Trustees must discharge duties solely in interest of plan participants and beneficiaries and for exclusive purpose of providing benefits to participants and beneficiaries. Trustees should avoid any conflict of interest in which the trustee's interests conflict with interests of plan participants and beneficiaries.
2. Honesty and Duty of Full Disclosure — Trustees must disclose any material fact that could influence in any way the trustee's decisions, actions or willingness to make decisions or to take action. Abstain from votes where trustee has a conflict.
3. Avoiding Appearance of Impropriety — Lexington-Herald Leader / Courier-Journal test.
4. Due Care — The standard is, "What would a prudent public pension plan trustee do?"

Specific Duties Owed to Plan Participants and Beneficiaries

1. Providing plan participants and beneficiaries with due process.
2. Informing plan participants and beneficiaries about the plan. Summary plan description, newsletters and website.
3. Protecting the fund. Preventing incursions into fund for other political objectives. Requesting actuarially sound contributions to fund. Requiring and collecting contributions when due.
4. Having up-to-date investment policies and engaging qualified investment managers. Establishment of performance benchmarks and review by independent consultant. Diversifying investment portfolio so as to minimize risk. Investments should be made with only benefit of plan participants and beneficiaries in mind. Trustees do not have to be investment experts — they do need to feel assured that they have employed competent investment staff and managers with adequate checks and safeguards in place.

II.

Executive Branch



4

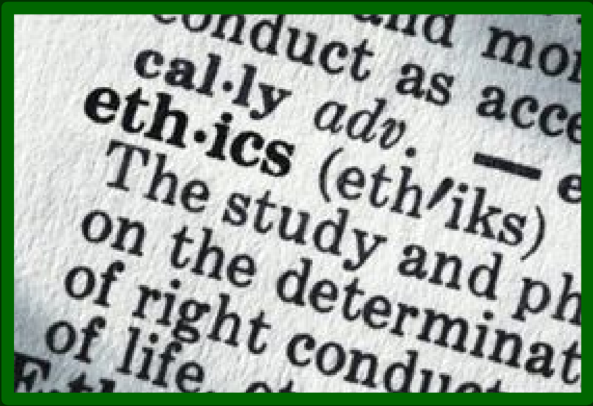
Executive Branch Code of Ethics

Statement of Public Policy

The public policy of the Commonwealth requires that:

- A public servant must be independent and impartial;
- Decisions and policies must be made through the established processes of government;
- A public servant should not use public office to obtain private benefits; and
- The public has confidence in the integrity of its government and public servants.

Source: KRS 11A.050



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Executive Branch Code of Ethics

Prohibited Conflicts of Interest

No public servant, by himself or through others, shall knowingly:

- Use or attempt to use his or her influence in any matter which involves a substantial conflict between his or her personal or private interest and his or her duties in the public interest;
- Use or attempt to use any means to influence a public agency in derogation of the state at large;
- Use his or her official position or office to obtain financial gain for him or herself or any members of the public servant's family; or
- Use or attempt to use his or her official position to secure or create privileges, exemptions, advantages, or treatment for him or herself or others in derogation of the public interest at large.

If a public servant appears before a state agency, he or she shall avoid all conduct which might in any way lead members of the general public to conclude that the public servant is using his or her official position to further his or her professional or private interest.

When a public servant abstains from action on an official decision in which the public servant may have a personal or private interest, he or she shall disclose that fact in writing to his superior, who shall cause the decision on these matters to be made by an impartial third party.

Source: KRS 11A.020

Executive Branch Code of Ethics

When to Abstain from Acting on an Official Decision

In determining whether to abstain from action on an official decision because of a possible conflict of interest, a public servant should consider the following guidelines:

- Whether a substantial threat to his or her independence of judgment has been created by the public servant's personal or private interest;
- The effect of his or her participation on public confidence in the integrity of the executive branch;
- Whether his or her participation is likely to have any significant effect on the disposition of the matter;
- The need for his or her particular contribution, such as special knowledge of the subject matter, to the effective functioning of the executive branch; or
- Whether the official decision will affect the public servant in a manner differently from the public or will affect the public servant as a member of a business, profession, occupation, or group to no greater extent generally than other members of such business, profession, occupation, or group. A public servant may request an advisory opinion from the Executive Branch Ethics Commission in accordance with the Commission's rules of procedure.

Source: KRS 11A.030

Executive Branch Code of Ethics

Prohibited Acts

A public servant is prohibited from the acts as follow:

- A public servant, in order to further his or her own economic interests, or those of any other person, shall not knowingly disclose or use confidential information acquired in the course of his or her official duties.
- A public servant shall not knowingly receive, directly or indirectly, any interest or profit arising from the use or loan of public funds in his or her hands or to be raised through any state agency.
- A public servant shall not act knowingly as representative or agent for the state or any agency in any business or regulatory action with him or herself, or with any business that the public servant or family member has any interest greater than 5 percent.
- A public servant shall not knowingly him or herself or through any business in which he or she owns or controls an interest of more than five percent (5%), or by any other person for the public servant’s use or benefit or on the public servant’s account, undertake, execute, hold, bid on, negotiate, or enjoy, in whole or in part, any contract, agreement, lease, sale, or purchase made, entered into, awarded, or granted by the agency by which the public servant is employed or which the public servant supervises, subject to the provisions of KRS 45A.340.
- A public servant shall not knowingly accept compensation, other than that provided by law for public servants, for performance of his or her official duties without the prior approval of the Commission.

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- A former officer or public servant listed in KRS 11A.010(9)(a) to (g) shall not, within six months of termination of his or her employment, knowingly by himself or through any business in which the public servant owns or controls an interest of at least 5 percent, or by any other person for his use or benefit or on the public servant's account, undertake, execute, hold, bid on, negotiate or enjoy, in whole or in part, any contract, agreement, lease, sale or purchase made, entered into, awarded or granted by the agency by which the public servant was employed. This provision shall not apply to a contract, purchase or good faith negotiation made under KRS 416 relating to eminent domain or to agreements that may directly or indirectly involve public funds disbursed through entitlement programs. This provision shall not apply to purchases from a state agency that are available on the same terms to the general public or made at public auction. This provision shall not apply to former Department of Public Advocacy officers whose continued representation of clients is necessary.

- A present or former officer or public servant listed in KRS 11A.010(9)(a) to (g) shall not, within six months after termination of office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with or is regulated by the state in matters in which the public servant was directly involved during the last 36 months of his or her tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation or profession in which he or she was involved prior to taking office or beginning his or her term of employment, or for which the public servant received, prior to state employment, a professional degree or license, provided that, for 6 months, he or she refrains from working on any matter in which the public servant was directly involved during the last 36 months in state government. This subsection shall not prohibit the ministerial functions, including but not limited to filing tax returns, filing permit or license applications or filing incorporation papers, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

- A former public servant shall not act as a lobbyist or lobbyist's principal in matters in which he or she was directly involved during the last 36 months of his or her tenure for a period of one year after the latter of:
  - (a) The date of leaving office or termination of employment; or
  - (b) The date the term of office expires to which the public servant was elected.

- A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last 36 months of his or her tenure, for a period of one year after the latter of:
  - (a) The date of leaving office or termination of employment; or
  - (b) The date the term of office expires to which the public servant was elected.

- Without the approval of his or her appointing authority, a public servant shall not accept outside employment from any person or business that does business with or is regulated by the state agency for which the public servant works or which he or she supervises, unless the outside employer's relationship with the state agency is limited to the receipt of entitlement funds.
  - (a) The appointing authority shall review administrative regulations established under KRS Chapter 11A when deciding whether to approve outside employment for a public servant.
  - (b) The appointing authority shall not approve outside employment for a public servant if the public servant is involved in decision-making or recommendations concerning the person or business from which the public servant seeks outside employment or compensation.
  - (c) The appointing authority, if applicable, shall file quarterly with the Executive Branch Ethics Commission a list of all employees who have been approved for outside employment along with the name of the outside employer of each.

Source: KRS 11A.040

Executive Branch Code of Ethics

Acceptance of Gifts

As a general rule, gifts should be avoided per the TRS Governance Manual.

The Executive Branch Code of Ethics provides that:

- No public servant, spouse, or dependent child knowingly shall accept any gifts or gratuities, including travel expenses, meals, alcoholic beverages and honoraria, totaling more than $25 in a calendar year from any person or business that does business with, is regulated by, is seeking grants from, is involved in litigation against or is lobbying or attempting to influence actions of the agency in which the public servant is employed or which he or she supervises, or from any group or association that has as its primary purpose the representation of those persons or businesses. Nothing in this subsection prohibits the commission from authorizing exceptions where such exemption would not create an appearance of impropriety.

- Nothing in KRS 11A shall prohibit or restrict the allocation of or acceptance by a public servant of a ticket for admission to a sporting event if the ticket or admission is paid for by the public servant at face value or is paid for at face value by the individual to whom the ticket is allocated.

"Gift" is defined, in part, ***as "anything of value"****, unless consideration of equal or greater value is received; "gift" does <u>not</u> include gifts from family members, campaign contributions, or door prizes available to the public." KRS 11A.010(5)* ***Note: Gift exceptions are still a problem if made on a quid pro quo basis.***

Source: KRS 11A.045

Executive Branch Code of Ethics

Statements of Financial Disclosure

Each officer, each public servant listed in KRS 11A.010(9)(a) to (g), and each candidate shall file a statement of financial disclosure with the commission.

Source: KRS 11A.050

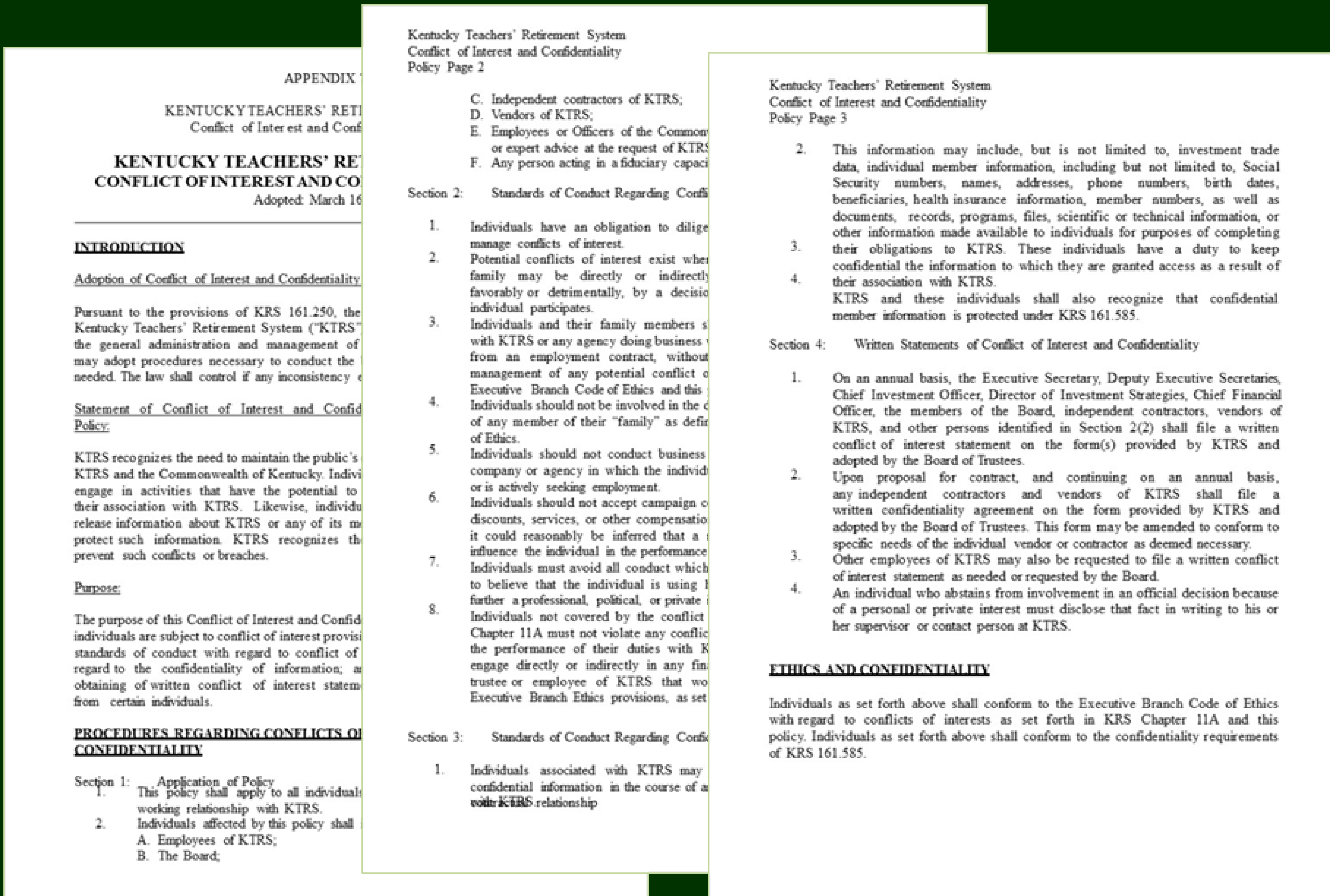
TRS Conflict of Interest Statute

No trustee or employee of the board of trustees shall:

1. Have any interest, direct or indirect, in the gain or profits of any investment or transaction made by the board;
2. Directly or indirectly for himself or as an agent for another, use any of the assets of the retirement system in any manner except to make current and necessary payments authorized by the board;
3. Become an endorser, surety, or obligor for moneys loaned to or borrowed from the board;
4. Have a contract or agreement with the retirement system, individually or through a business owned by the trustee or the employee;
5. Use his or her official position with the retirement system to obtain a financial gain or benefit or advantage for himself or herself or a family member;
6. Use confidential information acquired during his or her tenure with the retirement system to further his or her own economic interests or that of another person; or
7. Hold outside employment with, or accept compensation from, any person or business with which he or she has involvement as part of his or her official position with the retirement system. The provisions of this subsection shall not prohibit a trustee from serving as an employee of an agency participating in the Teachers' Retirement System.

Source: KRS 161.460

Policy & Form



APPENDIX

KENTUCKY TEACHERS' RETI

Conflict of Interest and Conf

KENTUCKY TEACHERS' RE

CONFLICT OF INTEREST AND CO

Adopted: March 16

INTRODUCTION

Adoption of Conflict of Interest and Confidentiality

Pursuant to the provisions of KRS 161.250, the Kentucky Teachers' Retirement System ("KTRS" the general administration and management of may adopt procedures necessary to conduct the needed. The law shall control if any inconsistency

Statement of Conflict of Interest and Confid Policy:

KTRS recognizes the need to maintain the public's KTRS and the Commonwealth of Kentucky. Indivi engage in activities that have the potential to their association with KTRS. Likewise, individu release information about KTRS or any of its m protect such information. KTRS recognizes th prevent such conflicts or breaches.

Purpose:

The purpose of this Conflict of Interest and Confid individuals are subject to conflict of interest provisi standards of conduct with regard to conflict of regard to the confidentiality of information; a obtaining of written conflict of interest statem from certain individuals.

PROCEDURES REGARDING CONFLICTS OI CONFIDENTIALITY

Section 1: Application of Policy

1. This policy shall apply to all individuals working relationship with KTRS.
2. Individuals affected by this policy shall
   A. Employees of KTRS;
   B. The Board;

Kentucky Teachers' Retirement System
Conflict of Interest and Confidentiality
Policy Page 2

C. Independent contractors of KTRS;
D. Vendors of KTRS;
E. Employees or Officers of the Common or expert advice at the request of KTRS
F. Any person acting in a fiduciary capaci

Section 2: Standards of Conduct Regarding Confli

1. Individuals have an obligation to dilige manage conflicts of interest.
2. Potential conflicts of interest exist wher family may be directly or indirectl favorably or detrimentally, by a decisio individual participates.
3. Individuals and their family members s with KTRS or any agency doing business from an employment contract, without management of any potential conflict o Executive Branch Code of Ethics and this
4. Individuals should not be involved in the of any member of their "family" as defir of Ethics.
5. Individuals should not conduct business company or agency in which the individ or is actively seeking employment.
6. Individuals should not accept campaign c discounts, services, or other compensatio it could reasonably be inferred that a influence the individual in the performance
7. Individuals must avoid all conduct which to believe that the individual is using further a professional, political, or private
8. Individuals not covered by the conflict Chapter 11A must not violate any conflic the performance of their duties with K engage directly or indirectly in any fin trustee or employee of KTRS that wo Executive Branch Ethics provisions, as set

Section 3: Standards of Conduct Regarding Confi

1. Individuals associated with KTRS may confidential information in the course of a with KTRS relationship

Kentucky Teachers' Retirement System
Conflict of Interest and Confidentiality
Policy Page 3

2. This information may include, but is not limited to, investment trade data, individual member information, including but not limited to, Social Security numbers, names, addresses, phone numbers, birth dates, beneficiaries, health insurance information, member numbers, as well as documents, records, programs, files, scientific or technical information, or other information made available to individuals for purposes of completing
3. their obligations to KTRS. These individuals have a duty to keep confidential the information to which they are granted access as a result of
4. their association with KTRS.
   KTRS and these individuals shall also recognize that confidential member information is protected under KRS 161.585.

Section 4: Written Statements of Conflict of Interest and Confidentiality

1. On an annual basis, the Executive Secretary, Deputy Executive Secretaries, Chief Investment Officer, Director of Investment Strategies, Chief Financial Officer, the members of the Board, independent contractors, vendors of KTRS, and other persons identified in Section 2(2) shall file a written conflict of interest statement on the form(s) provided by KTRS and adopted by the Board of Trustees.
2. Upon proposal for contract, and continuing on an annual basis, any independent contractors and vendors of KTRS shall file a written confidentiality agreement on the form provided by KTRS and adopted by the Board of Trustees. This form may be amended to conform to specific needs of the individual vendor or contractor as deemed necessary.
3. Other employees of KTRS may also be requested to file a written conflict of interest statement as needed or requested by the Board.
4. An individual who abstains from involvement in an official decision because of a personal or private interest must disclose that fact in writing to his or her supervisor or contact person at KTRS.

ETHICS AND CONFIDENTIALITY

Individuals as set forth above shall conform to the Executive Branch Code of Ethics with regard to conflicts of interests as set forth in KRS Chapter 11A and this policy. Individuals as set forth above shall conform to the confidentiality requirements of KRS 161.585.

KENTUCKY TEACHERS' RETIREMENT SYSTEM
EXTERNAL SERVICE PROVIDER
CONFLICT OF INTEREST STATEMENT

I, ______________________________, in my role as ____________________ ______________________for the Kentucky Teachers' Retirement System ("KTRS"), recognize the need to maintain the public's confidence and trust in the integrity of KTRS and the Commonwealth of Kentucky.

I understand that I have the obligation to diligently identify, disclose, avoid, and manage conflicts of interest that may arise through my relationship with KTRS.

I will conduct my activities with KTRS so that I do not advance or protect my own interests or the private interests of others with whom I have a relationship, in a way that is detrimental to the interests of KTRS.

In every instance in which I am acting on behalf of KTRS, I will conduct my activities in a manner to best promote the interests of KTRS.

I agree not to attempt to influence KTRS in disregard of the public interest at large.

In all matters where an official decision must be made that may favorably or detrimentally impact my own financial interests or the financial interests of other individuals or organizations with whom I have a relationship, I will reveal that relationship and abstain from involvement in the official decision.

When a conflict of interest arises, or when a potential conflict of interest arises, I will disclose that conflict or potential conflict to my contact person at KTRS and seek resolution of that issue.

I agree not to violate any conflict of interest statute or principle by the performance of my duties with KTRS. I will not engage directly or indirectly in any financial or other transaction with a trustee or employee of KTRS that would violate the standards of the Executive Branch Ethics provisions, as set forth in KRS Chapter 11A.

Agreed this the ________ day of _________________, 20__.

____

Signature____

Name____

Title____

TRS External Service Provider

Conflict of Interest Statement

Read, sign & return to TRS

TRS External Board of Trustees and Employees

Conflict of Interest Statement

Read, sign & return to TRS

KENTUCKY TEACHERS' RETIREMENT SYSTEM
BOARD OF TRUSTEES AND EMPLOYEES
CONFLICT OF INTEREST STATEMENT

I, ________________________________, in my role as ______________________ ________________________for the Kentucky Teachers' Retirement System ("KTRS"), recognize the need to maintain the public's confidence and trust in the integrity of KTRS and the Commonwealth of Kentucky.

I understand that I have the obligation to diligently identify, disclose, avoid, and manage conflicts of interest that may arise through my relationship with KTRS.

I will conduct my activities with KTRS so that I do not advance or protect my own interests or the private interests of others with whom I have a relationship, in a way that is detrimental to the interests of KTRS.

In every instance in which I am acting on behalf of KTRS, I will conduct my activities in a manner to best promote the interests of KTRS.

I agree not to attempt to influence KTRS in disregard of the public interest at large.

In all matters where an official decision must be made that may favorably or detrimentally impact my own financial interests or the financial interests of other individuals or organizations with whom I have a relationship, I will reveal that relationship and abstain from involvement in the official decision.

When a conflict of interest arises, or when a potential conflict of interest arises, I will disclose that conflict or potential conflict to the KTRS Executive Secretary, or his or her designee, and seek resolution of that issue.

I agree not to violate any conflict of interest statute or principle by the performance of my duties with KTRS. I will not engage directly or indirectly in any financial or other transaction with a trustee, employee of KTRS, or any other person or organization that would violate the standards of the Executive Branch Ethics provisions, as set forth in KRS Chapter 11A.

Agreed this the ________ day of ___________________, 20__.

____
Signature

____
Name

____
Title

In Summary

The provisions of the Executive Branch Code of Ethics and the TRS Conflict of Interest Statute provide base guidelines for conduct should certain situations arise. As always, it is important to be mindful that TRS needs to avoid not only any actual impropriety, but also even the appearance of impropriety. Just because the Code or Statute may not prohibit a course of conduct does not mean that it should be engaged in.

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Protecting & Preserving Teachers' Retirement Benefits

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Teachers' Retirement System

Gary L. Harbin, CPA
Executive Secretary

PPOB

Public Pension Oversight Board

Presented by

Beau Barnes
Deputy Executive Secretary
Operations and General Counsel

November 21, 2016

TEACHERS' Retirement System TRS KENTUCKY

7A.200 Public Pension Oversight Board.

The Public Pension Oversight Board of the Kentucky General Assembly is hereby established. The purpose of the board shall be to review, analyze, and provide oversight to the General Assembly on the benefits, administration, investments, funding, laws and administrative regulations, and legislation pertaining to the state-administered retirement systems.

PPOB Membership – 13 members

How Many	*How are they selected?*
2	State House Members appointed by the Speaker
2	Senators appointed by the President
1	State House Member appointed by the Minority Floor Leader
1	Senator appointed by the Minority Floor Leader
1	CFA or Individual with retirement experience appointed by the Speaker
1	CFA or Individual with retirement experience appointed by the President
1	CFA appointed by the Governor
1	Individual with retirement experience appointed by the Governor
3	The State Budget Director The Auditor of Public Accounts The Attorney General

7A.240 Authority of board.

TEACHERS' Retirement System TRS KENTUCKY

The Public Pension Oversight Board shall have the authority to:

(1) Except for information protected under KRS 61.661 or 161.585 or information specific to the account of a current or former employee or retiree, require the state-administered retirement systems, or any other state agency, to provide any and all information necessary to carry out the duties of the board, including any actuarial analysis. The cost of providing the information to the board, including any actuarial analysis, shall be included in the administrative budget of the state-administered retirement systems or the state agency;

(2) Conduct public hearings in furtherance of its general duties, at which it may request the appearance of officials of any state agency and solicit the testimony of interested groups and the general public;

7A.240 Authority of board.

The Public Pension Oversight Board shall have the authority to:

(3) Establish a uniform format for reports and data submitted to the board by the state-administered retirement systems and the frequency and due dates for the reports and data;

(4) Request the Auditor of Public Accounts to perform a financial or special audit of the state-administered retirement systems; and

(5) Subject to selection and approval by the Legislative Research Commission, utilize the services of consultants, actuaries, managers, legal counsel, and auditors to render professional, managerial, and technical assistance, as needed. The cost for actuarial services required by KRS 7A.250(8) and (9) shall be paid by the state-administered retirement systems to the Legislative Research Commission and shall be included in the administrative budget of the state-administered retirement systems.

7A.250 Powers and duties of board.

The Public Pension Oversight Board:

(1) Shall, from time to time, conduct an impartial review of all the laws governing the state-administered retirement systems and recommend any changes it may find desirable with respect to benefits and administration, funding of benefits, investments of funds, and the improvement of language, structure, and organization of the statutes;

(2) Shall, once every five (5) years, review the benefits provided to employees who begin participating in the systems administered by Kentucky Retirement Systems on or after January 1, 2014, and recommend any changes to the provisions affecting these employees that are necessary to maintain the actuarial soundness of the systems;

7A.250 Powers and duties of board.

The Public Pension Oversight Board:

(3) Shall review semiannually the investment programs of the state-administered retirement systems, including a review of asset allocation targets and ranges, risk factors, asset class benchmarks, total return objectives, relative volatility, performance evaluation guidelines, investment policies, and securities litigation policies and recoveries from fraud or other corporate malfeasance. The board may establish an advisory committee, as provided by KRS 7A.260, which may include investment professionals to assist in complying with the provisions of this subsection;

(4) May review any benefits, bylaws, policies, or charters established by the state-administered retirement systems;

7A.250 Powers and duties of board.

The Public Pension Oversight Board:

(5) Shall, at the request of the Speaker of the House of Representatives or the President of the Senate, evaluate proposed changes to laws affecting the state-administered retirement systems and report to the Speaker or the President on the probable costs, actuarial implications, and desirability as a matter of public policy;

(6) May review all new or amended administrative regulations of the state-administered retirement systems and provide comments to the Administrative Regulation Review Subcommittee established by KRS 13A.020;

(7) Shall research issues related to the state-administered retirement systems as directed by the Legislative Research Commission;

7A.250 Powers and duties of board.

The Public Pension Oversight Board:

(8) Shall at least once every five (5) years have an actuarial audit performed for the state-administered retirement systems to evaluate the reliability of each system's actuarial assumptions and methods. The actuarial audit shall be performed by an actuary retained by the Public Pension Oversight Board;

(9) Shall prior to each budget biennium have an actuarial review of the funding requests and needs submitted by the state-administered retirement systems. The review shall be performed by an actuary retained by the Public Pension Oversight Board; and

7A.250 Powers and duties of board.

TEACHERS' Retirement System TRS KENTUCKY

The Public Pension Oversight Board:

(10) Shall publish an annual report covering the board's evaluation and recommendations with respect to the operations of the state-administered retirement systems. The report shall be submitted to the Legislative Research Commission no later than December 31 of each year and shall include at a minimum any legislative recommendations made by the board, a summary of the financial and actuarial condition of the state-administered retirement systems, and an analysis of the adequacy of the current levels of funding.

Public Pension Oversight Board

Research Memorandum No. 519

Legislative Research Commission
Frankfort, Kentucky

December 2015

A report was issued …

December 2015

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Legislative Research Commission — Chapter 6
Public Pension Oversight Board

Chapter 6

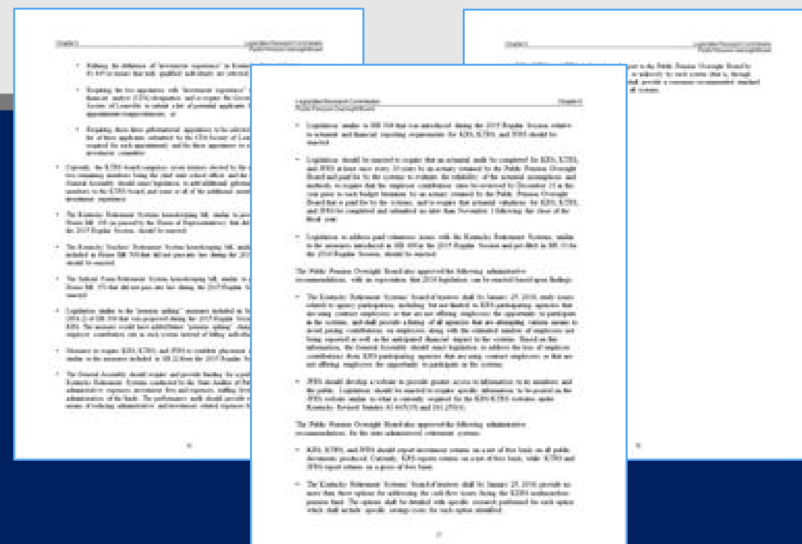
Public Pension Oversight Board Recommendations

The Public Pension Oversight Board adopted recommendations at its December 17, 2015, meeting. These recommendations included legislative recommendations for the 2016 Regular Session of the Kentucky General Assembly, administrative recommendations for the state-administered retirement systems, and recommendations to the Governor in development of the 2016-2018 biennial budget.

For the 2016 Regular Session of the Kentucky General Assembly, the board approved the following legislative recommendations:

- The Governor and the General Assembly should include in the 2016-2018 biennial budget the employer contribution rates recommended by the KRS Board of Trustees for KERS and SPRS based on the 6.75 percent investment return assumption adopted for the KERS nonhazardous and SPRS pension funds.
- The Public Pension Oversight Board supports measures that would provide additional funding to improve the financial health of the state-administered retirement systems and in particular measures that would improve the cash flow issues facing the Kentucky Employees Retirement System nonhazardous pension fund or that would improve the overall funding of the Kentucky Teachers' Retirement System pension fund and the State Police Retirement System pension fund.
- The General Assembly should evaluate the KTRS Funding Work Group findings and recommendations and adopt a financially sound approach to address the funding issues facing the KTRS pension fund.
- Currently, KRS and KTRS are exempt from Kentucky Revised Statutes Chapters 45 (Budget and Financial Administration) and 45A (Kentucky Model Procurement Code) relative to contracting. Legislation should be enacted to make KRS and KTRS subject to Kentucky Revised Statutes Chapters 45 and 45A.
- Legislation should be enacted to require Senate confirmation of the KRS and KTRS executive director/executive secretary and all nonelected board members.
- Currently, two trustees appointed by the Governor for the 13-member KRS board of trustees must have 10 years of "investment experience" as broadly defined by KRS 61.645 and must serve on the KRS investment committee and one trustee appointed by the Governor must be "knowledgeable about the impact of pension requirements on local governments." Legislation to address the qualifications of these trustee positions should be enacted, which may include one of the following options:

Recommendations were submitted to TRS



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Pension Valuation Results June 30, 2016

Teachers' Retirement System of Kentucky

November 21, 2016

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Key Findings

- Market Value Return of negative 1.0%
  - Trust Fund decreased $1.2 Billion due to investment loss and significant negative cash flow

- Actuarial Value of Asset Return of 7.6% (compared to 7.5% assumption)
  - Smoothing of investment gains and losses over 5 year period

2

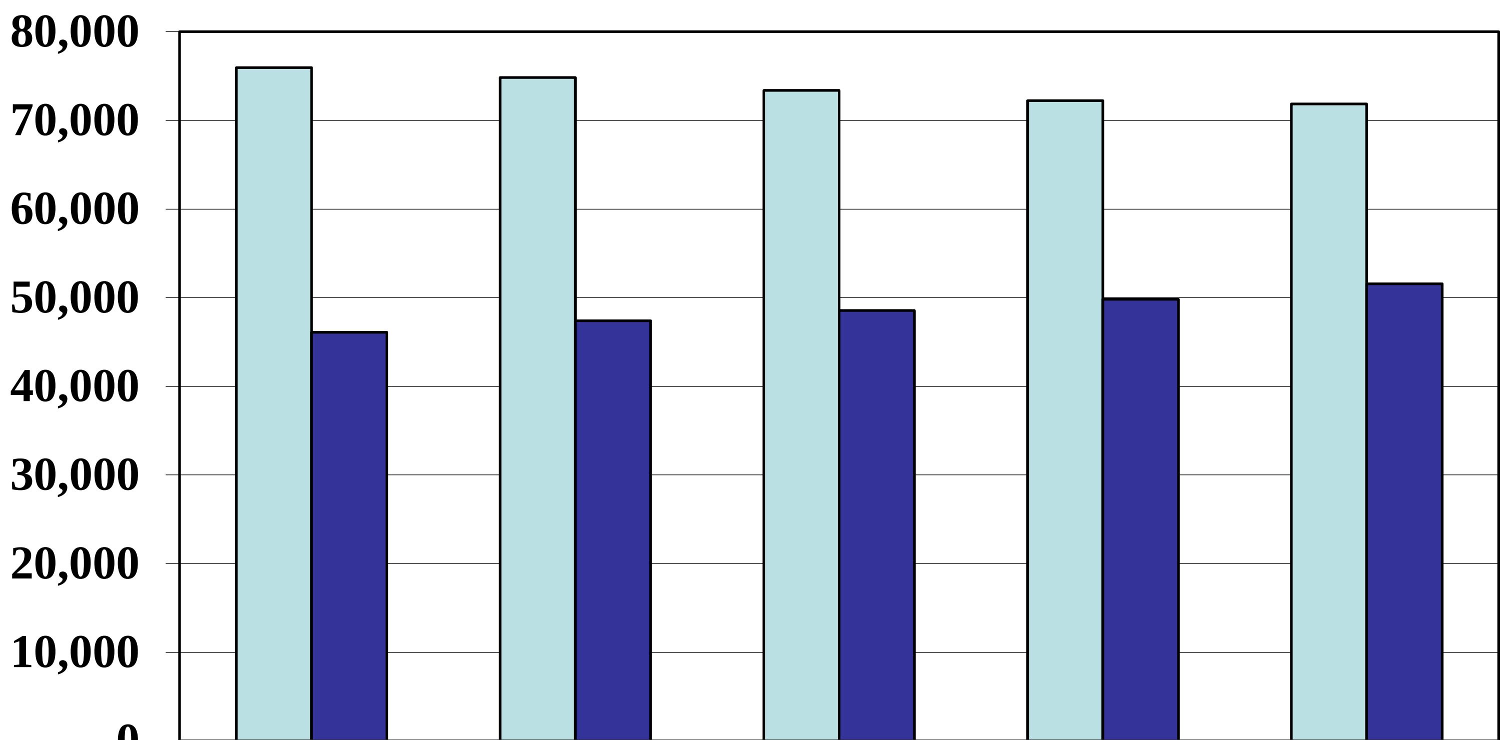
Key Findings

- Increase of 1.00% in State Pension Contribution Requirement from last year
  - Last year was a decrease of 0.07%
- Funding Ratio decreased from 55.3% to 54.6%
- Actual Employer Contribution for FY 2016 only 57% of what was required
  - Cumulative increase now at 14.61% of payroll or around $554 million for FY 2019
- But there is some good news…
  - 2016-2018 Biennium Budgeted Contributions include additional appropriations of $973 million

Changes from Last Year

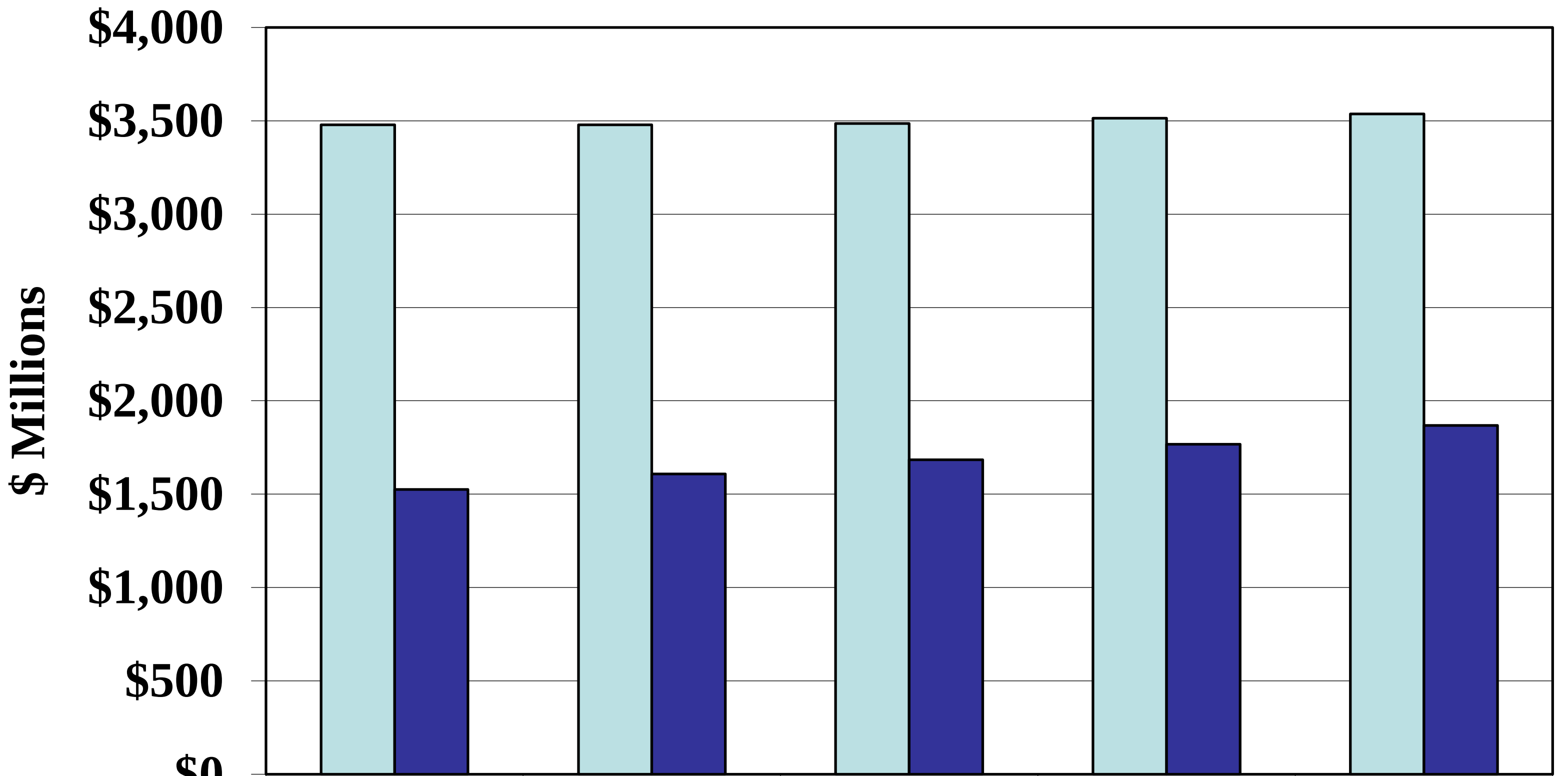
- Assumption Changes from Experience Study
  - Price Inflation changed from 3.5% to 3.0%
  - Wage Inflation changed from 4.0% to 3.5%
  - Assumed merit salary scale decreased 0.25% for all ages
  - Assumed rates of Withdrawal, Disability, Retirement and Mortality all adjusted to better match experience of System
- Changes decreased liabilities around $297 Million

Census Data – June 30



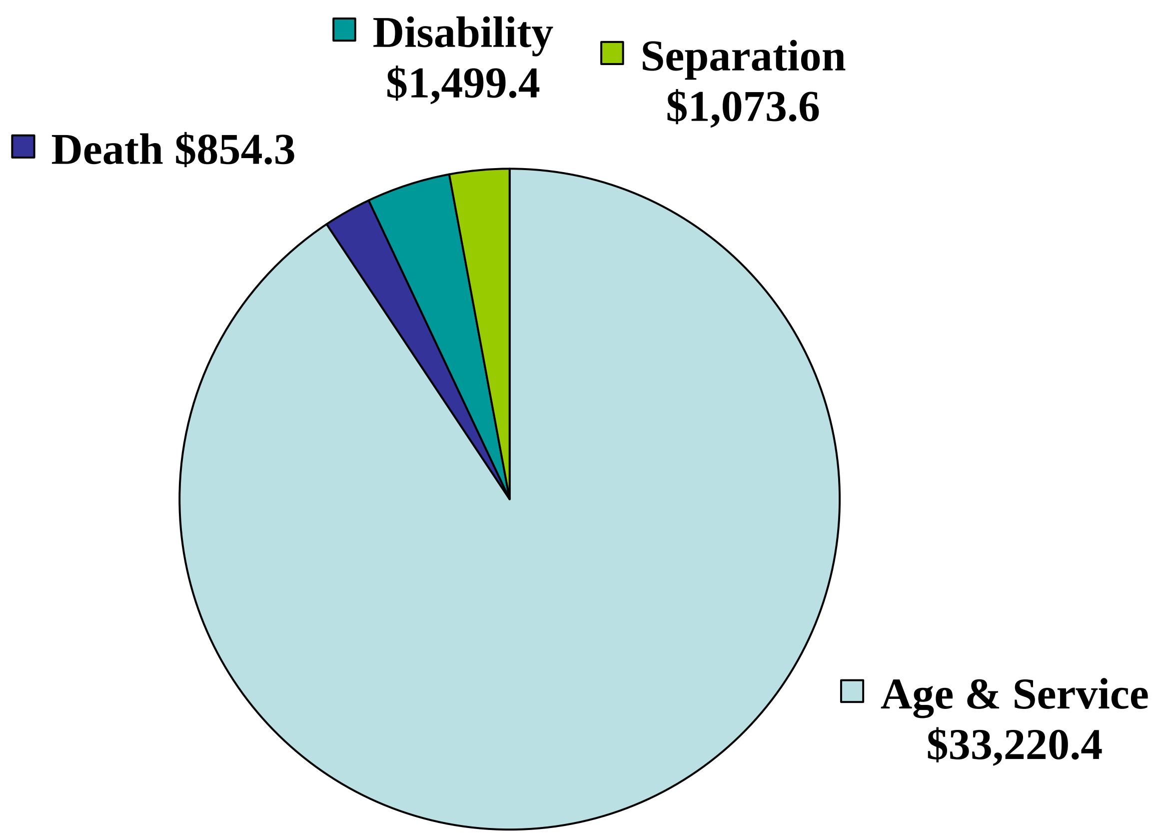
	2012	2013	2014	2015	2016
Actives	75,951	74,831	73,407	72,246	71,848
Retirees	46,094	47,406	48,576	49,822	51,563

Salary & Benefits History – June 30



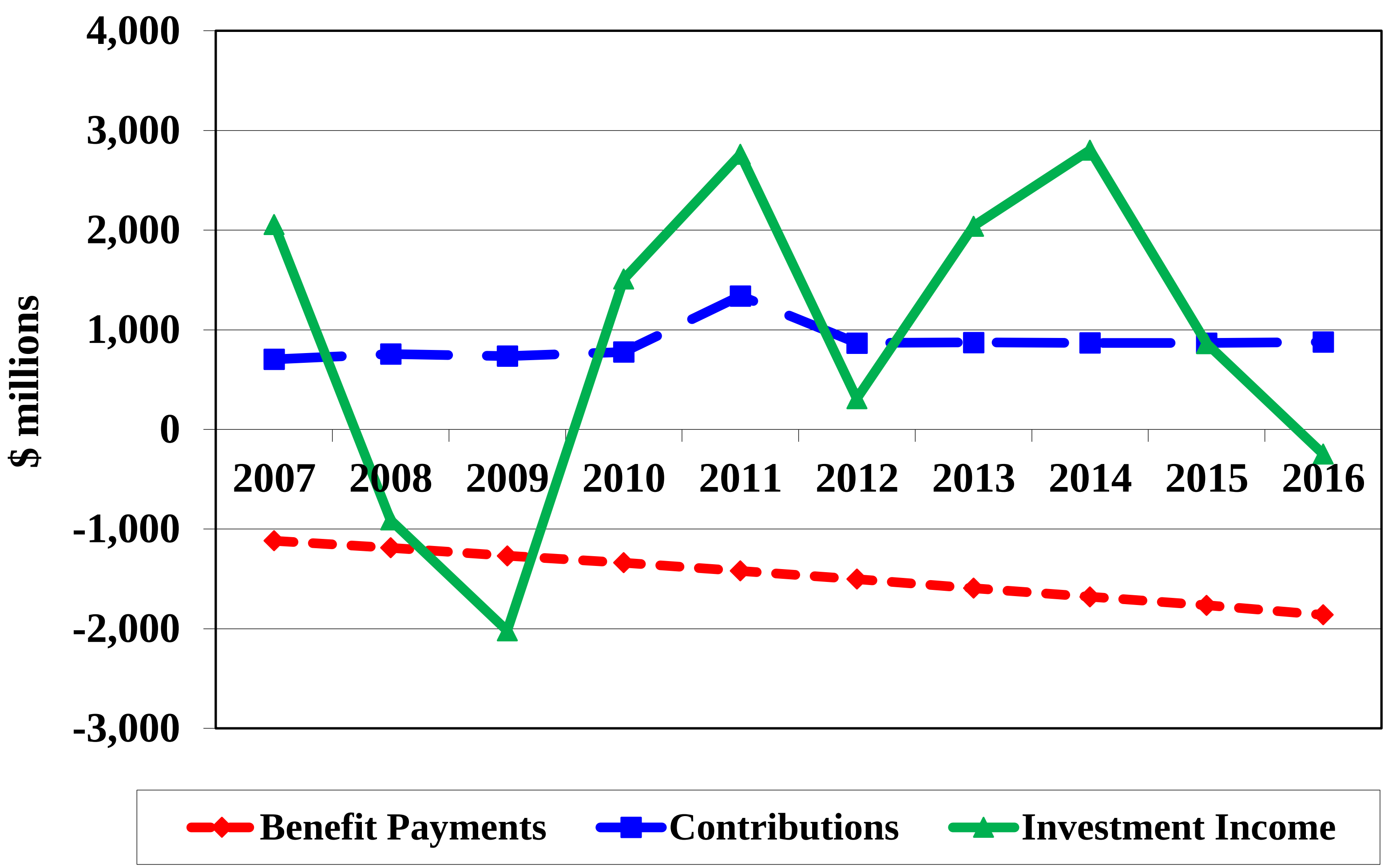
	2012	2013	2014	2015	2016
Salary	$3,480	$3,480	$3,486	$3,515	$3,537
Benefits	$1,525	$1,609	$1,685	$1,768	$1,869

Present Value of Future Benefits *($ millions)*



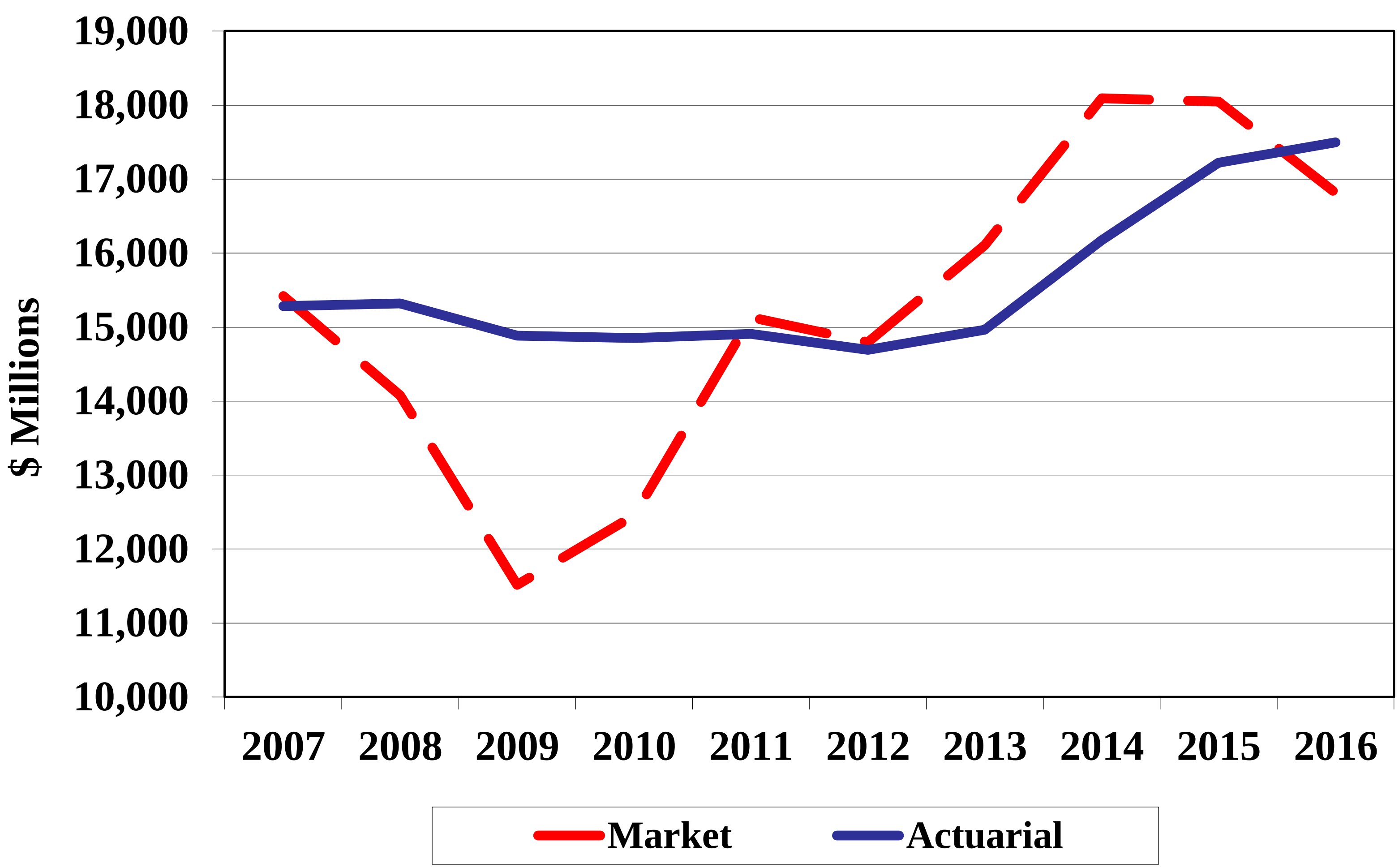
Total - $36,647.7

Cash Flow

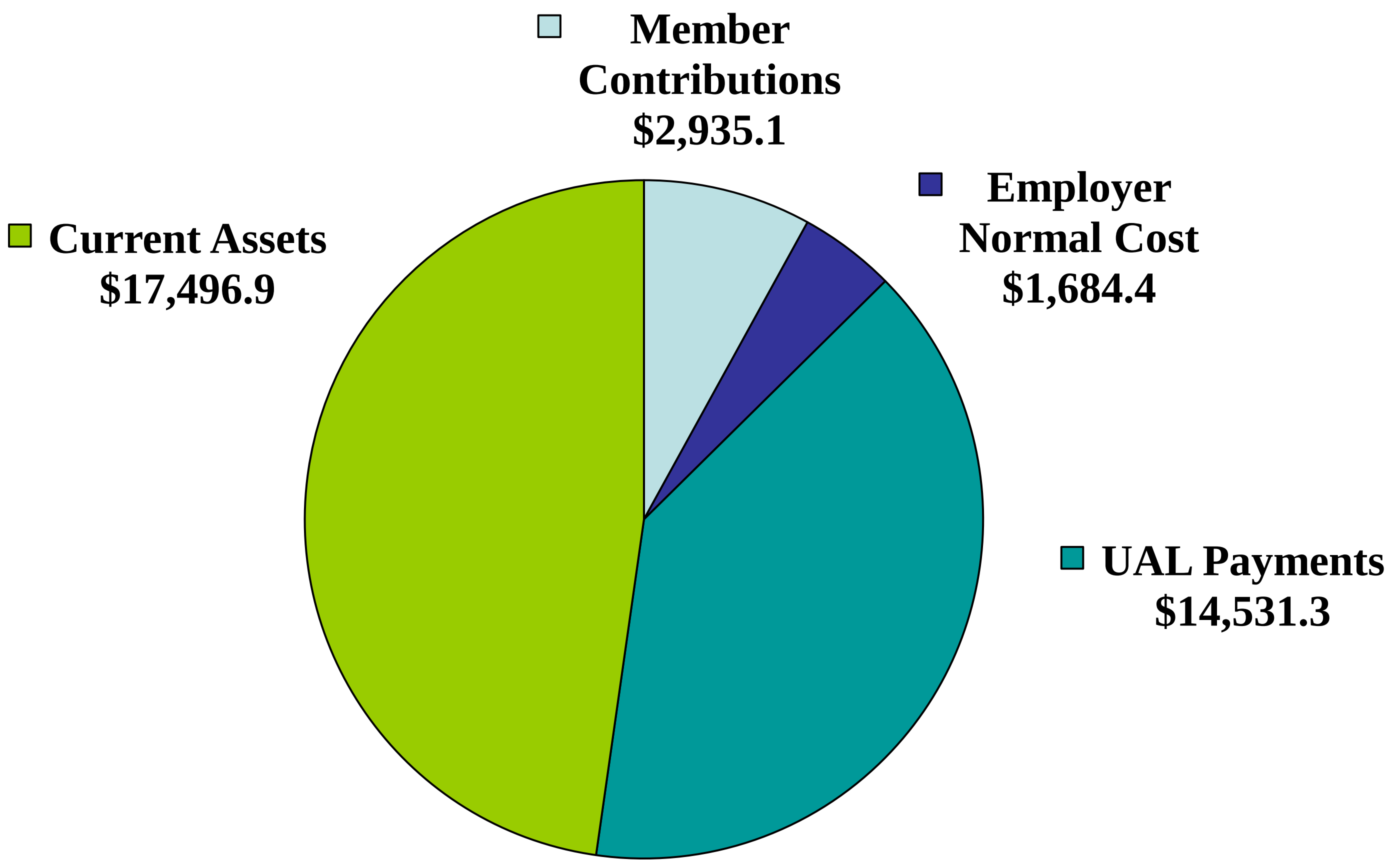

4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
$ millions
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Benefit Payments
Contributions
Investment Income

8

Asset Values

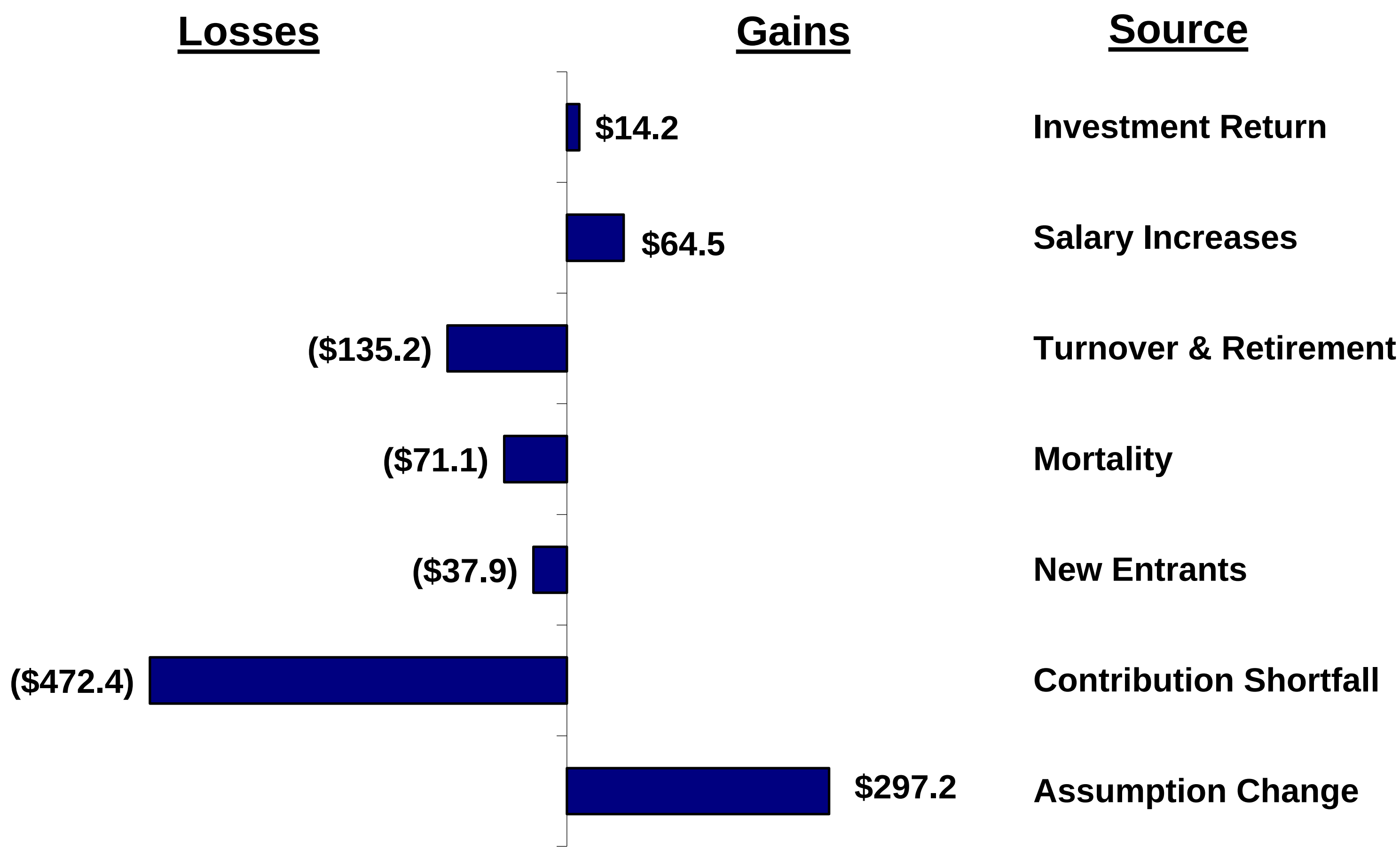


Financing of Retirement Benefit Promises
($ millions)



Total - $36,647.7

Actuarial Experience Gain/(Loss) Analysis *($ millions)*



Allocation of Contribution Rate - University

Val Year	Total Rate - Pension * Normal	UAL	Total	Member Rate *	Total Employer Rate *
2012	11.79%	21.10%†	32.89%†	7.625%	25.265%†
2013	12.29	23.05†	35.34†	7.625	27.715†
2014	12.27	23.70†	35.97†	7.625	28.345†
2015	12.34	23.56†	35.90†	7.625	28.275†
2016	11.03	25.87†	36.90†	7.625	29.275†

* Excludes Life and Medical
† Less 1% for Members Hired Before July 1, 2008

Allocation of Contribution Rate Non-University

Val Year	Total Rate - Pension * Normal	UAL	Total	Member Rate *	Total Employer Rate *
2012	15.15%	20.70%†	35.85%†	9.105%	26.745%†
2013	15.81	22.49†	38.30†	9.105	29.195†
2014	16.72	22.21†	38.93†	9.105	29.825†
2015	16.72	22.14†	38.86†	9.105	29.755†
2015	14.94	24.92†	39.86†	9.105	30.755†

* Excludes Life and Medical

† Less 1% for Members Hired Before July 1, 2008

Schedule of Employer Contributions

Fiscal Year Ending	Annual Required Contributions	Actual Employer Contributions	Percentage Contributed
2011	**$678,741,428**	**$1,037,935,993***	**153**
2012	**757,822,190**	**557,339,552**	**74**
2013	**802,984,644**	**568,233,446**	**71**
2014	**823,446,156**	**563,326,249**	**68**
2015	**913,653,854**	**559,579,290**	**61**
2016	**999,270,174**	**565,454,590**	**57**

***Includes Pension Obligation Bond proceeds of $465,384,165**

State Required Increase Contribution Rates

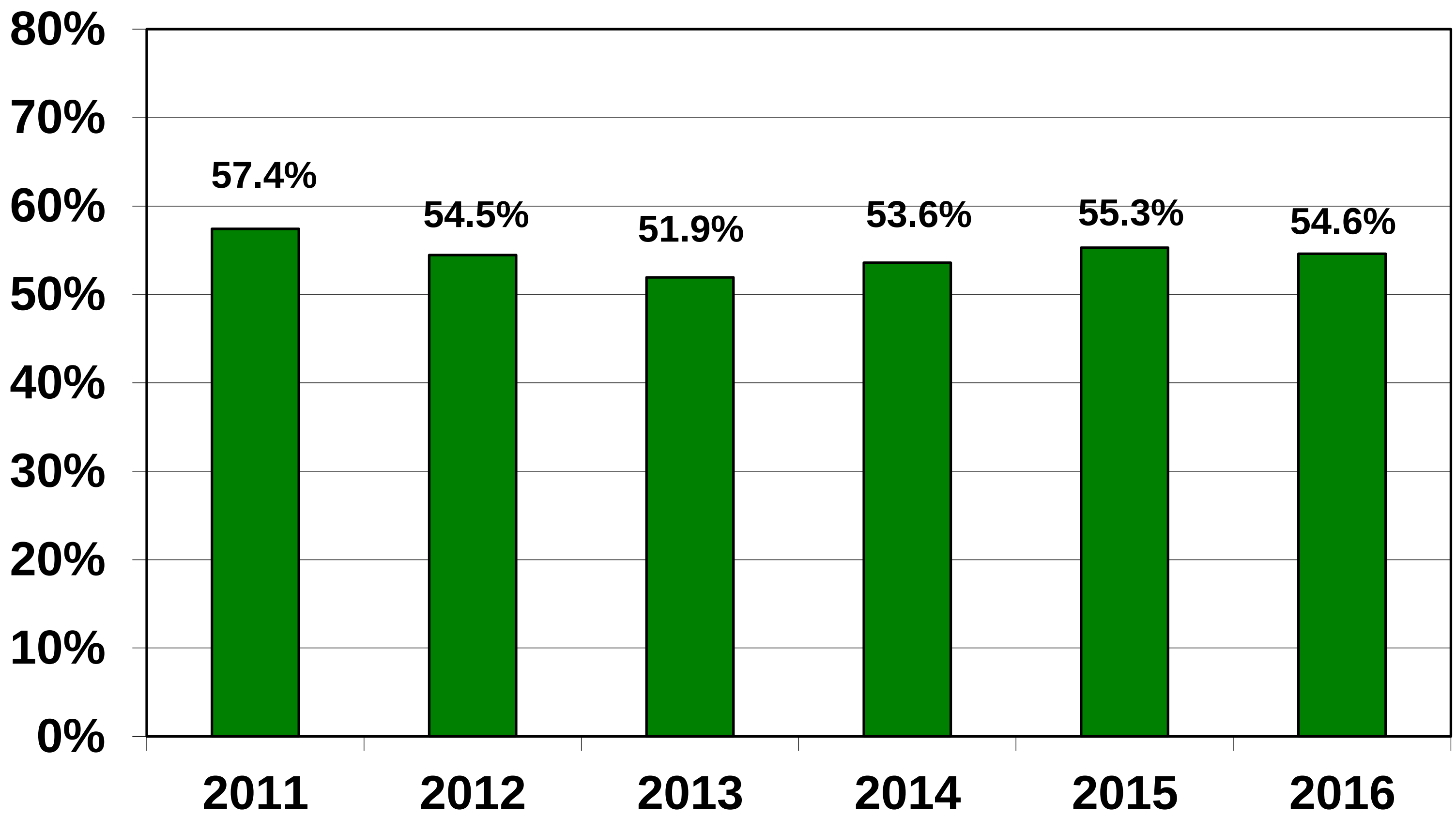
Valuation Date	Fiscal Year	Increase/ (Decrease)	Cumulative Increase	In Dollars
6/30/2004	6/30/2007	0.11%	0.11%	$ 3,174,600
6/30/2005	6/30/2008	1.21	1.32	38,965,900
6/30/2006	6/30/2009	0.56	1.88	60,499,800
6/30/2007	6/30/2010	0.58	2.46	82,331,200
6/30/2008	6/30/2011	1.13	3.59	121,457,000
6/30/2009	6/30/2012	2.22	5.81	208,649,000
6/30/2010	6/30/2013	1.46	7.27	260,980,000
6/30/2011	6/30/2014	0.75	8.02	299,420,000
6/30/2012	6/30/2015	2.40	10.42	386,400,000
6/30/2013	6/30/2016	2.55	12.97	487,400,000
6/30/2014	6/30/2017	0.83	13.80	520,372,000
6/30/2015	6/30/2018	(0.31)	13.49	512,883,000
6/30/2016	6/30/2019	1.12	14.61	553,597,000

Medical Insurance Fund Stabilization Funding

Fiscal Years	Loan Amount	Annual Payment	Balance as of June 30, 2016
2008/2009*	8,400,000	1,228,900	3,274,213
2009/2010*	9,200,000	1,345,200	4,611,791
2010/2011*	10,700,000	1,564,500	6,473,479
2011/2012	12,300,000	1,798,700	8,627,015
Total	$40,600,000	$5,937,300	$22,986,498

* For non-single subsidy funding.

Funded Percentage



GASB 67

- Even with budgeted contributions for 2017 and 2018 including additional appropriations, solvency test for GASB 67 has fund depletion date of 2040
- Blended Single Equivalent Interest Rate (SEIR) of 4.20%
  - Blend of 7.5% to 2039 and 3.01%, thereafter
  - Last year’s SEIR was 4.88%
- Ratio of Plan Net Position to Total Pension Liability has dropped each of the last two years and is now at 35.22%

GASB 67

Valuation Date	SEIR	Total Pension Liability	Plan Net Position	Net Pension Liability	Ratio
6/30/2014	5.23%	$39,684,776	$18,092,571	$21,592,205	45.59%
6/30/2015	4.88%	$42,476,699	$18,049,131	$24,427,568	42.49%
6/30/2016	4.20%	$47,736,901	$16,812,832	$30,924,069	35.22%

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November 21, 2016

Mr. Gary L. Harbin
Executive Secretary
Teachers' Retirement System of the
State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Dear Gary:

Enclosed are 25 bound copies and one unbound copy of the "Teachers' Retirement System of the State of Kentucky Report of Actuary on the Valuation Prepared as of June 30, 2016".

Sincerely yours,

Edward J. Koebel

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

E H Gary

Eric H. Gary, FSA, FCA, MAAA
Principal and Chief Health Actuary

Cathy Turcot

Cathy Turcot
Principal and Managing Director

Enclosure

S:\2016\Kentucky Teachers\Pension\Valuation\2016 KTRS Report.doc

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Teachers' Retirement System of the State of Kentucky Report of the Actuary on the Annual Valuation

Prepared as of June 30, 2016

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November 21, 2016

Board of Trustees
Teachers' Retirement System of the
State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:

Section 161.400 of the law governing the operation of the Teachers' Retirement System of the State of Kentucky provides that the actuary shall make an actuarial valuation of the System. We have submitted the results of the annual actuarial valuation prepared as of June 30, 2016. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The combined member and state contribution rates as a percentage of payroll for the fiscal year ending June 30, 2019 required to support the total benefits of the System are as follows:

Group	Combined Member and State Contribution Requirement
University members hired before July 1, 2008	35.90%
University members hired on or after July 1, 2008	36.90%
Non-University members hired before July 1, 2008	38.86%
Non-University members hired on or after July 1, 2008	39.86%

These rates represent an increase since the previous valuation in the Pension actuarially determined employer contribution rate of 1.00% of payroll for the fiscal year ending June 30, 2019. In addition, there has been a net decrease in the expected state special appropriation from 2.94% to 2.83%, or 0.11% of payroll and an increase of 0.01% in the amount required for life insurance benefits.

For the fiscal year ending June 30, 2019, in addition to the State statutory contribution rates and the state special appropriation, there is an additional employer contribution rate of 14.61% of payroll required in order to amortize the unfunded accrued liability according to the funding policy adopted by the Board. This is 1.12% greater than the 13.49% determined in the previous valuation.

Since the previous valuation, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2015. These revised changes were adopted by the Board on September 19, 2016 and are discussed on pages 4 and 5 of the report. The valuation takes into account the effect of membership to the System enacted through the most recent Session of the Legislature.

The financing objective of the System is that contribution rates will remain relatively level over time as a percentage of payroll. The promised benefits of the System are included in the actuarially calculated contribution rates which are developed using the entry age normal cost method.

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Five-year market related value of plan assets is used for actuarial valuation purposes. Gains and losses are reflected in the total unfunded accrued liability that is being amortized by regular annual contributions as a level percentage of payroll in accordance with the funding policy adopted by the Board, on the assumption that payroll will increase by 3.5% annually. The assumptions recommended by the actuary and adopted by the Board are reasonably related to the experience under the System and to reasonable expectations of anticipated experience under the System.

We have prepared the trend information shown in the Schedule of Funding Progress in the Financial Section of the Annual Report and Schedule A, Schedule B, Schedule C, Solvency Test and Analysis of Financial Experience shown in the Actuarial Section of the Annual Report.

The valuation reflects that a portion of the annual required contributions to the fund from 2005 to 2010 were allocated to the Medical Insurance Fund and are being repaid over time. A pension obligation bond was issued August 26, 2010 and was used to repay the balances of a substantial portion of the loans previously made to the Medical Insurance Fund. No additional contributions were allocated during the 2016 fiscal year.

This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the recommended funding amount for the System. The asset values used to determine unfunded liabilities and funded ratios are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return of assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

Board of Trustees
November 21, 2016
Page 3

In our opinion, the System has not been funded on an actuarially sound basis since the full actuarially determined contributions were not made by the employer. If contributions by the employer to the System in subsequent fiscal years are less than those required, the assets are expected to become insufficient to pay promised benefits. Assuming that contributions to the System are made by the employer from year to year in the future at rates recommended on the basis of the successive actuarial valuations, the continued sufficiency of the assets to provide the benefits called for under the System may be safely anticipated. It is our understanding that the State budget includes additional appropriations of $973 million to fund the required contribution for the 2016-2018 biennium.

Respectfully submitted,

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

Eric H. Gary, FSA, FCA, MAAA
Principal and Chief Health Actuary

Cathy Turcot
Principal and Managing Director

TABLE OF CONTENTS

**TEACHERS' RETIREMENT SYSTEM
OF THE STATE OF KENTUCKY
REPORT OF ACTUARY ON THE VALUATION
PREPARED AS OF JUNE 30, 2016**

SECTION I - SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the valuation and a comparison with the results of the previous valuation are summarized below (all dollar amounts are $1,000's):

Valuation Date	June 30, 2016	June 30, 2015
Number of active members	71,848	72,246
Annual salaries	$ 3,537,226	$ 3,515,113
Number of annuitants and beneficiaries	51,563	49,822
Annual allowances	$ 1,868,875	$ 1,767,637
Assets:		
Market value	$ 16,812,832	$ 18,049,131
Actuarial value	17,496,894	17,219,520
Unfunded accrued liability	$ 14,531,333	$ 13,930,442
Funded Ratio	54.6%	55.3%
Amortization period (years)	28.1	29.3

Contribution rates are shown separately for university and non-university members on the following pages.

CONTRIBUTION RATES FOR UNIVERSITY MEMBERS

Valuation Date	June 30, 2016		June 30, 2015	
For fiscal year ending:	**June 30, 2019**		**June 30, 2018**	
	Members hired before 7/1/2008	**Members on and after 7/1/2008**	**Members hired before 7/1/2008**	**Members on and after 7/1/2008**
Pension Plan:				
Normal	11.030%	11.030%	12.340%	12.340%
Accrued liability	24.870	25.870	22.560	23.560
Total	35.900%	36.900%	34.900%	35.900%
Member	7.625%	7.625%	7.625%	7.625%
State (ARC)	28.275	29.275	27.275	28.275
Total	35.900%	36.900%	34.900%	35.900%
Life Insurance Fund:				
State	0.040%	0.040%	0.030%	0.030%
Medical Insurance Fund:				
Member	2.775%	2.775%	2.775%	2.775%
State Match	2.775	1.775	2.775	1.775
Total	5.550%	4.550%	5.550%	4.550%
Total Contributions	41.490%	41.490%	40.480%	40.480%
Member Statutory	10.400%	10.400%	10.400%	10.400%
State Statutory	13.650	13.650	13.650	13.650
Required Increase	14.610	14.610	13.490	13.490
State Special	2.830	2.830	2.940	2.940
Total	41.490%	41.490%	40.480%	40.480%

CONTRIBUTION RATES FOR NON-UNIVERSITY MEMBERS

Valuation Date	June 30, 2016		June 30, 2015	
For fiscal year ending:	**June 30, 2019**		**June 30, 2018**	
	Members hired before 7/1/2008	**Members on and after 7/1/2008**	**Members hired before 7/1/2008**	**Members on and after 7/1/2008**
Pension Plan:				
Normal	14.940%	14.940%	16.720%	16.720%
Accrued liability	23.920	24.920	21.140	22.140
Total	38.860%	39.860%	37.860%	38.860%
Member	9.105%	9.105%	9.105%	9.105%
State (ARC)	29.755	30.755	28.755	29.755
Total	38.860%	39.860%	37.860%	38.860%
Life Insurance Fund:				
State	0.040%	0.040%	0.030%	0.030%
Medical Insurance Fund:				
Member	3.750%	3.750%	3.750%	3.750%
State Match	3.750	2.750	3.750	2.750
Total	7.500%	6.500%	7.500%	6.500%
Total Contributions	46.400%	46.400%	45.390%	45.390%
Member Statutory	12.855%	12.855%	12.855%	12.855%
State Statutory	16.105	16.105	16.105	16.105
Required Increase	14.610	14.610	13.490	13.490
State Special	2.830	2.830	2.940	2.940
Total	46.400%	46.400%	45.390%	45.390%

2. The valuation includes only the assets and liabilities associated with the pension plan. The valuation of the Medical Insurance Fund and the Active and Retired Life Insurance Benefits will be prepared separately.
3. Comments on the valuation results as of June 30, 2016 are given in Section IV and further discussion of the contribution levels is set out in Sections V and VI.
4. Since the previous valuation, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2015. The changes adopted by the Board on September 19, 2016, include various demographic and economic assumptions summarized below:
    - Price Inflation changed assumed rate from 3.50% to 3.00%,
    - Wage Inflation changed assumed rate from 4.00% to 3.50%,
    - Assumed Salary Scale adjusted to reflect a decrease of 0.25% in merit & promotion for all ages, and
    - Assumed rates of Withdrawal, Disability, Retirement, and Mortality have been adjusted to more closely reflect experience.
5. Schedule B shows the development of the actuarial value of assets. The assumed investment rate of return is 7.50%. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation.
6. The funding policy is shown in Schedule H of the Report.
7. Provisions of the System, as summarized in Schedule F, were taken into account in the current valuation. There have been no changes since the previous valuation.

SECTION II - MEMBERSHIP DATA

1. Data regarding the membership of the System for use as a basis of the valuation were furnished by the Retirement System office. The following table shows the number of active members and their annual salaries as of June 30, 2016 on the basis of which the valuation was prepared.

GROUP	NUMBER	ANNUAL SALARIES ($1,000's)
University hired before 7/1/2008	1,883	$ 137,213
University hired after 7/1/2008	1,453	72,056
Non-University Full Time hired before 7/1/2008	38,065	2,429,982
Non-University Full Time hired after 7/1/2008	18,846	826,256
Non-University Part Time hired before 7/1/2008	2,797	24,219
Non-University Part Time hired after 7/1/2008	8,804	47,500
Total	71,848	$ 3,537,226

2. The following table shows the number and annual retirement allowances payable to annuitants and beneficiaries on the roll of the Retirement System as of the valuation date.

THE NUMBER AND ANNUAL RETIREMENT ALLOWANCES OF ANNUITANTS AND BENEFICIARIES ON THE ROLL AS OF JUNE 30, 2016

GROUP	NUMBER	ANNUAL RETIREMENT ALLOWANCES[1] ($1,000's)
Service Retirements	44,970	$ 1,704,041
Disability Retirements	2,751	80,652
Beneficiaries of Deceased Members	3,842	84,182
Total	51,563	$ 1,868,875

[1] Includes cost-of-living adjustments effective through July 1, 2016.

3. Table 1 of Schedule G shows a distribution by age and years of service of the number and annual salaries of active members included in the valuation, while Table 2 shows the number and annual retirement allowances of annuitants and beneficiaries included in the valuation, distributed by age.

SECTION III - ASSETS

1. As of June 30, 2016 the market value of Pension Plan assets for valuation purposes held by the System amounted to $16,812,831,883. This value excludes assets in the Medical Insurance Fund, the 403(b) Program Reserve Fund, and the Life Insurance Fund, which are not included in the assets used for Pension Plan valuation purposes. The estimated market investment return for the plan year was (1.0)%. Schedule C shows the receipts and disbursements for the year preceding the valuation date and a reconciliation of the asset balances for the Pension Plan.

2. The five-year market related value of Pension Plan assets used for valuation purposes as of June 30, 2016 was $17,496,894,437. The estimated investment return for the plan year ending June 30, 2016 on an actuarial value of assets basis was 7.58%, compared to the assumed investment rate of return for the period of 7.50%. Schedule B shows the development of the actuarial value of assets as of June 30, 2016.

SECTION IV - COMMENTS ON VALUATION

1. Schedule A of this report contains the valuation balance sheet which shows the present and prospective assets and liabilities of the System as of June 30, 2016. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule D and Schedule E.

2. The valuation balance sheet shows that the System has total prospective liabilities of $16,231,288,904 for benefits expected to be paid on account of the present active members. The liability on account of benefits payable to annuitants and beneficiaries amounts to $20,002,749,810 of which $781,756,333 is for special appropriations remaining to be made toward funding minimum annuities, ad hoc increases and sick leave allowances granted after 1981. The liability for benefits expected to be paid to inactive members and to members entitled to deferred vested benefits is $413,616,742. The total prospective liabilities of the System amounts to $36,647,655,456. Against these liabilities, the System has present assets for valuation purposes of $17,496,894,437. When

this amount is deducted from the total liabilities of $36,647,655,456, there remains $19,150,761,019 as the present value contributions to be made in the future.

3. The employer's contributions to the System consist of normal contributions and accrued liability contributions. The valuation indicates that employer normal contributions at the rate of 11.03% of payroll for University and 14.94% of payroll for Non-University are required.

4. Prospective normal employer and employee contributions have a present value of $4,619,427,935. When this amount is subtracted from $19,150,761,019, which is the present value of the total future contributions to be made by the employer, there remains $14,531,333,084 as the amount of future unfunded accrued liability contributions.

5. The unfunded accrued liability increased by approximately $601 million for the plan year ending June 30, 2016 and the funding ratio decreased from 55.3% to 54.6%. The increase in the unfunded accrued liability was primarily due to the contribution shortfall for the plan year and demographic losses due to turnover, retirement and mortality. Offsetting these losses were a gain due to the assumption changes from the experience study and small gains for the investment return on an actuarial value basis that was greater than expected and salary increases that were less than assumed. See Section VII for a complete breakdown of the experience of the System.

SECTION V - CONTRIBUTIONS PAYABLE UNDER THE SYSTEM

1. Section 161.540 of the retirement law provides that each university member contribute 10.400% of annual salary to the System and each non-university member contribute 12.855% of annual salary. Of this amount, for each university member, 2.775% is paid to the Medical Insurance Fund for medical benefits and for each non-university member, 3.75% is paid to the Medical Insurance Fund for medical benefits. The remainder, 7.625% for university members and 9.105% for non-university members, is applicable for the retirement benefits taken into account in the valuation.

2. Section 161.550 provides that the State will match a portion of the member contributions and contribute a supplemental 3.25% of members' salaries towards discharging the System's unfunded obligations. Additional contributions are made to the Medical Insurance Fund as required under 161.550(3).

3. Therefore for university members, 10.875% of the salaries of active members who become members before July 1, 2008 and 11.875% of the salaries of active members who become members on or after July 1, 2008 is funded by statute or supplemental funding for the Pension Plan and Life Insurance Fund. For non-university members, 12.355% of the salaries of active members who become members before July 1, 2008 and 13.355% of the salaries of active members who become members on or after July 1, 2008 is funded by statute or supplemental funding for the Pension Plan and Life Insurance Fund. Of these amounts, 0.04% of payroll will be allocated to the Life Insurance Fund. Based on the results of the valuation, an additional 14.61% of payroll for both university and non-university will be required in order to maintain the amortization of the unfunded liability of the Pension Plan based on the funding policy adopted by the Board. An additional special appropriation of 2.83% of total payroll will be made by the State. Therefore, the total actuarially determined employer contribution rate to the Pension Plan is 28.275% for university members who become members before July 1, 2008 and 29.275% for university members who become members on or after July 1, 2008. The total actuarially determined employer contribution rate to the Pension Plan is 29.755% for non-university members who become members before July 1, 2008 and 30.755% for non-university members who become members on or after July 1, 2008. The total member and employer contribution rates to the Pension Plan are shown in the following table.

CONTRIBUTION RATES BY SOURCE

UNIVERSITY

	Members hired before 7/1/2008	Members hired on and after 7/1/2008
Member		
Statutory Total	10.400%	10.400%
Statutory Medical Insurance Fund	(2.775)	(2.775)
Contribution to Pension Plan	7.625%	7.625%
Employer		
Statutory Matching Total	10.400%	10.400%
Statutory Medical Insurance Fund	(2.775)	(1.775)
Supplemental Funding	3.250	3.250
Subtotal	10.875%	11.875%
Life Insurance	(0.040)%	(0.040)%
Additional to Comply with Board Funding Policy	14.610	14.610
Special Appropriation	2.830	2.830
Contribution to Pension Plan	28.275%	29.275%
Total Contribution to Pension Plan	35.900%	36.900%

NON-UNIVERSITY

	Members hired before 7/1/2008	Members hired on and after 7/1/2008
Member		
Statutory Total	12.855%	12.855%
Statutory Medical Insurance Fund	(3.750)	(3.750)
Contribution to Pension Plan	9.105%	9.105%
Employer		
Statutory Matching Total	12.855%	12.855%
Statutory Medical Insurance Fund	(3.750)	(2.750)
Supplemental Funding	3.250	3.250
Subtotal	12.355%	13.355%
Life Insurance	(0.040)%	(0.040)%
Additional to Comply with Board Funding Policy	14.610	14.610
Special Appropriation	2.830	2.830
Contribution to Pension Plan	29.755%	30.755%
Total Contribution to Pension Plan	38.860%	39.860%

4. The valuation indicates that normal contributions at the rate of 11.03% of active university members' salaries and 14.94% of active non-university members' salaries are required. The difference between the total contribution rate and the normal rate remains to be applied toward the liquidation of the unfunded accrued liability. This accrued liability rate is 24.87% for university members hired before July 1, 2008, 25.87% for university members hired on and after July 1, 2008, 23.92% for non-university members hired before July 1, 2008, and 24.92% for non-university members hired on and after July 1, 2008. These rates include special appropriations of 2.83% of payroll to be made by the State. These rates are shown in the following table:

ACTUARIALLY DETERMINED CONTRIBUTION RATES

RATE	PERCENTAGE OF ACTIVE MEMBERS' SALARIES			
	UNIVERSITY		NON-UNIVERSITY	
	Members hired before 7/1/2008	Members hired on and after 7/1/2008	Members hired before 7/1/2008	Members hired on and after 7/1/2008
Normal	11.03%	11.03%	14.94%	14.94%
Accrued liability*	24.87	25.87	23.92	24.92
Total	35.90%	36.90%	38.86%	39.86%

* Includes special appropriations of 2.83% of payroll to be made by the State.

5. The following table shows the components of the total UAAL and the derivation of the UAAL contribution rate in accordance with the funding policy:

TOTAL UAAL AND UAAL CONTRIBUTION RATE
(Dollar amounts in thousands)

	UAAL	REMAINING AMORTIZATION PERIOD (YEARS)	AMORTIZATION PAYMENT
Legacy	$14,543,130	28	$859,217
New Incremental 6/30/2015	(352,563)	19	(26,536)
New Incremental 6/30/2016	340,766	20	24,775
Total UAAL	$14,531,333		$857,456
Blended amortization period (years)			28.1

SECTION VI - COMMENTS ON LEVEL OF FUNDING

1. Our calculations indicate that the contribution rates shown in the previous section will be sufficient to cover the benefits of the System, the annual 1.5% increases in the allowances of retired members and beneficiaries, and the liabilities for minimum annuities, ad hoc increases and sick leave allowances granted after 1981.

2. The valuation indicates that the present statutory contribution rates, supplemental funding and special appropriations, if continued at the current level percentage, along with an additional required contribution of 14.61%, not currently provided in statute, are sufficient to meet the cost of benefits currently accruing and provide for the amortization of the unfunded accrued liability in accordance with the Board funding policy. However, as existing special contributions expire, the statutory contributions or supplemental funding may be required to increase as an equal percentage of payroll.

3. During the 2005 through 2010 fiscal years, a portion of the contributions required for the pension fund were allocated as loans to the Medical Insurance Fund for Stabilization Funding. Beginning with the 2009 fiscal year, contributions have also been allocated as loans for non-single subsidy funding. Payments are being made to repay these loans. In August 2010, a pension obligation bond was issued with proceeds used to fully repay the loans for the Stabilization Funding. Beginning with the 2011 fiscal year, there have been no further loans for Stabilization Funding. In addition, there were no loans for single-subsidy funding for fiscal years 2013 through 2015. The table on the following page shows the amounts borrowed, annual payments and remaining balances for the non-single subsidy funding as of June 30, 2016:

MEDICAL INSURANCE FUND STABILIZATION FUNDING

	Loan Amount	Annual Payment	Balances as of June 30, 2016
2008/2009	$ 8,400,000	$ 1,228,900	$ 3,274,213
2009/2010	9,200,000	1,345,200	4,611,791
2010/2011	10,700,000	1,564,500	6,473,479
2011/2012	12,300,000	1,798,700	8,627,015
Total	$ 40,600,000	$ 5,937,300	$ 22,986,498

3. There are no excess assets or contributions available to provide additional benefits, and there is a cumulative increase in the required employer contribution of 14.61% of payroll for the fiscal year ending June 30, 2019, as shown in the following table:

Valuation Date	Fiscal Year	Increase/ (Decrease)	Cumulative Increase	Amount
June 30, 2004	June 30, 2007	0.11%	0.11%	$ 3,174,600
June 30, 2005	June 30, 2008	1.21	1.32	38,965,900
June 30, 2006	June 30, 2009	0.56	1.88	60,499,800
June 30, 2007	June 30, 2010	0.58	2.46	82,331,200
June 30, 2008	June 30, 2011	1.13	3.59	121,457,000
June 30, 2009	June 30, 2012	2.22	5.81	208,649,000
June 30, 2010	June 30, 2013	1.46	7.27	260,980,000
June 30, 2011	June 30, 2014	0.75	8.02	299,420,000
June 30, 2012	June 30, 2015	2.40	10.42	386,400,000
June 30, 2013	June 30, 2016	2.55	12.97	487,400,000
June 30, 2014	June 30, 2017	0.83	13.80	520,372,000
June 30, 2015	June 30, 2018	(0.31)	13.49	512,883,000
June 30, 2016	June 30, 2019	1.12	14.61	553,597,000

In addition, as existing special contributions expire, the statutory contributions or supplemental funding may be required to increase as an equal percentage of payroll, in order to amortize the unfunded actuarial accrued liability in accordance with the Board funding policy. Any further benefit improvements must be accompanied by the entire additional contributions necessary to support the benefits.

SECTION VII – ANALYSIS OF FINANCIAL EXPERIENCE

The following table shows the estimated gain or loss from various factors that resulted in an increase of $600,891,107 in the unfunded accrued liability from $13,930,441,977 to $14,531,333,084 during the year ending June 30, 2016.

ANALYSIS OF FINANCIAL EXPERIENCE
(Dollar amounts in thousands)

ITEM	AMOUNT OF INCREASE/ (DECREASE)
Interest (7.50%) added to previous unfunded accrued liability	$ 1,044,783
Expected accrued liability contribution	(784,659)
Loss due to Contribution Shortfall and Timing	472,425
Experience:	
Valuation asset growth	(14,160)
Pensioners' mortality	71,058
Turnover and retirements	135,219
New entrants	37,907
Salary increases	(64,476)
Amendments	0
Assumption changes	(297,206)
Method changes	0
Total	$ 600,891

SECTION VIII - ACCOUNTING INFORMATION

Governmental Accounting Standards Board (GASB) has issued Statements No. 67 and 68 which replace Statement No. 25 and 27. The information required under the new GASB Statements will be issued in separate reports. The following information is provided for informational purposes only.

1. The following is a distribution of the number of employees by type of membership.

NUMBER OF ACTIVE AND RETIRED MEMBERS
AS OF JUNE 30, 2016

GROUP	NUMBER
Retirees and beneficiaries currently Receiving benefits	51,563
Terminated vested employees entitled to Benefits but not yet receiving benefits	9,240
Inactive non-vested members	46,055
Active plan members	71,848
Total	178,706

2. The schedule of funding progress is shown below.

SCHEDULE OF FUNDING PROGRESS
(Dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
6/30/2011*	$14,908,138	$25,968,693	$ 11,060,554	57.4%	$3,451,756	320.4%
6/30/2012	14,691,371	26,973,853	12,282,483	54.5	3,479,567	353.0
6/30/2013	14,962,758	28,817,232	13,854,474	51.9	3,480,066	398.1
6/30/2014**	16,174,199	30,184,404	14,010,205	53.6	3,486,327	401.9
6/30/2015	17,219,520	31,149,962	13,930,442	55.3	3,515,113	396.3
6/30/2016**	17,496,894	32,028,227	14,531,333	54.6	3,537,226	410.8

* Reflects change in assumptions and methods
** Reflects change in assumptions

3. The information presented above was determined as part of the actuarial valuation at June 30, 2016. Additional information as of the latest actuarial valuation follows.

Valuation date	6/30/2016
Actuarial cost method	Entry Age
Amortization method	Level percent of pay, closed
Remaining amortization period	28.1 years
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment Rate of Return*	7.50%
Projected salary Increases**	3.50 - 7.30%
Cost-of-living adjustments	1.50% Annually
*Includes price inflation at	3.00%
**Includes wage inflation at	3.50%

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Fiscal Year Ending June 30	Actuarially Determined Employer Contributions	Actual Employer Contributions	Percentage Contributed
2011	$ 678,741,428	$ 1,037,935,993*	153%
2012	757,822,190	557,339,552	74
2013	802,984,644	568,233,446	71
2014	823,446,156	563,326,249	68
2015	913,653,854	559,579,290	61
2016	999,270,174	565,454,590	57

* Includes Pension Obligation Bond proceeds of $465,384,165

SCHEDULE A

VALUATION BALANCE SHEET
SHOWING THE PRESENT AND PROSPECTIVE ASSETS AND LIABILITIES
AS OF JUNE 30, 2016
(Dollar amounts in thousands)

	ACTUARIAL LIABILITIES		
(1)	Present value of prospective benefits payable on account of present active members		
	- Service retirement benefits	$ 15,144,582	
	- Disability retirement benefits	711,697	
	- Death and survivor benefits	127,458	
	- Refunds of member contributions	247,552	
	Total		$ 16,231,289
(2)	Present value of prospective benefits payable on account of present retired members, beneficiaries of deceased members, and members entitled to deferred vested benefits		
	- Service retirement benefits	$ 18,488,211	
	- Disability retirement benefits	787,689	
	- Death and survivor benefits	726,850	
	Total		$ 20,002,750
(3)	Present value of prospective benefits payable on account of inactive members and members entitled to deferred vested benefits		$ 413,616
(4)	TOTAL ACTUARIAL LIABILITIES		$ 36,647,655
	PRESENT AND PROSPECTIVE ASSETS		
(5)	Actuarial value of assets		$ 17,496,894
(6)	Present value of total future contributions = (4)-(5)	$ 19,150,761	
(7)	Present value of future member contributions and employer normal contributions		4,619,428
(8)	Prospective unfunded accrued liability contributions = (6)-(7)		14,531,333
(9)	TOTAL PRESENT AND PROSPECTIVE ASSETS		$ 36,647,655

SCHEDULE A
(continued)

SOLVENCY TEST
(in millions of dollars)

Valuation Date	(1) Active Member Contributions	(2) Retirants And Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets (1)	(2)	(3)
6/30/2011	$3,325.7	$15,557.9	$7,085.1	$14,908.1	100%	74%	0%
6/30/2012	3,415.2	16,472.2	7,086.4	14,691.4	100	68	0
6/30/2013	3,514.4	17,716.4	7,586.5	14,962.8	100	65	0
6/30/2014	3,629.7	18,676.3	7,878.3	16,174.2	100	67	0
6/30/2015	3,700.6	19,522.5	7,926.8	17,219.5	100	69	0
6/30/2016	3,756.0	20,416.4	7,855.8	17,496.9	100	67	0

SCHEDULE B

**DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS
AS OF JUNE 30, 2016**

(1)	Actuarial Value of Assets Beginning of Year		$ 17,219,519,677
(2)	Market Value of Assets End of Year		16,812,831,883
(3)	Market Value of Assets Beginning of Year		18,049,130,737
(4)	Cash Flow		
	a.	Contributions	878,498,816
	b.	Benefit Payments	1,860,946,372
	c.	Administrative Expense	8,636,438
	d.	Net: (4)a – (4)b – (4)c	(991,083,994)
(5)	Investment Income		
	a.	Market total: (2) – (3) – (4)d	(245,214,860)
	b.	Assumed Rate	7.50%
	c.	Amount for Immediate Recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]	1,316,519,156
	d.	Amount for Phased-In Recognition: (5)a – (5)c	(1,561,734,016)
(6)	Phased-In Recognition of Investment Income		
	a.	Current Year: 0.20 x (5)d	(312,346,803)
	b.	First Prior Year	(92,160,668)
	c.	Second Prior Year	325,163,609
	d.	Third Prior Year	191,479,441
	e.	Fourth Prior Year	(160,195,981)
	f.	Total Recognized Investment Gain	(48,060,402)
(7)	Actuarial Value of Assets End of Year: (1) + (4)d + (5)c + (6)f		$ 17,496,894,437
(8)	Difference Between Market & Actuarial Values: (2) – (7)		$ (684,062,554)
(9)	Rate of Return on Actuarial Value:		7.58%

SCHEDULE C

PENSION PLAN ASSETS
SUMMARY OF RECEIPTS AND DISBURSEMENTS*
(Market Value)

	For the Year Ending	
	June 30, 2016	June 30, 2015
Receipts for the Year		
Contributions		
Members	$ 313,044,226	$ 308,159,763
Employers	565,454,590	559,579,290
Total	878,498,816	867,739,053
Net Investment Income	(245,214,860)	862,178,759
TOTAL	$ 633,283,956	$ 1,729,917,812
Disbursements for the Year		
Benefit Payments	$ 1,833,198,630	$ 1,741,456,095
Refunds to Members	27,747,742	23,032,624
Miscellaneous, including expenses	8,636,438	8,868,971
TOTAL	$ 1,869,582,810	$ 1,773,357,690
Excess of Receipts over Disbursements	$ (1,236,298,854)	$ (43,439,878)
Reconciliation of Asset Balances		
Asset Balance as of the Beginning of the Year	$ 18,049,130,737	$ 18,092,570,615
Excess of Receipts over Disbursements	(1,236,298,854)	(43,439,878)
Asset Balance as of the End of the Year	$ 16,812,831,883	$ 18,049,130,737
Rate of Return on Market Value	(1.0)%	5.1%

* Excludes assets for Medical Insurance Fund, the 403(b) Program Reserve Fund and the Life Insurance Fund.

SCHEDULE D

OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the valuation were selected based on the actuarial experience study prepared as of June 30, 2015, submitted to and adopted by the Board on September 19, 2016.

INVESTMENT RATE OF RETURN: 7.50% per annum, compounded annually, including price inflation at 3.00% per annum.

SALARY INCREASES: Representative values of the assumed annual rates of future salary increases are as follows and include wage inflation at 3.50% per annum:

Age	Annual Rate
20	7.20%
25	6.40
30	5.40
35	4.70
40	4.20
45	3.80
50	3.70
55	3.50
60	3.50
65	3.50

SEPARATIONS FROM SERVICE: Representative values of the assumed annual rates of death, disability, withdrawal, service retirement and early retirement are as follows:

Males

	Annual Rate of							
			WITHDRAWAL			RETIREMENT	
			Service			Before 27 Years of Service	After 27 Years of Service*
Age	DEATH	DISABILITY	0 – 4	5 – 9	10+		
20	0.019%	0.01%	11.00%				
25	0.021	0.01	11.00	3.00%			
30	0.025	0.01	11.00	3.00	3.00%		
35	0.043	0.04	12.00	3.50	1.40		
40	0.060	0.09	12.00	4.50	1.40		
45	0.084	0.20	12.00	4.50	1.30		17.0%
50	0.119	0.30	14.00	4.50	1.90		17.0
55	0.202	0.58	15.00	4.50	2.40	5.0%	45.0
60	0.340	0.75	15.00	4.00	2.40	13.0	35.0
62	0.419	0.75	15.00	3.80	2.40	15.0	25.0
65	0.565	0.75	15.00	3.50	2.40	20.0	25.0
70	0.913	0.75	20.00	0.00	0.00	20.0	20.0
75	1.556	0.75	20.00	0.00	0.00	100.0	100.0

*Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.

Females

	Annual Rate of						
			WITHDRAWAL			RETIREMENT	
			Service			Before 27 Years of Service	After 27 Years of Service*
Age	DEATH	DISABILITY	0 – 4	5 – 9	10+		
20	0.007%	0.01%	9.00%				
25	0.008	0.01	9.00	4.00%			
30	0.010	0.03	12.00	4.00	1.65%		
35	0.018	0.06	12.00	4.00	1.50		
40	0.026	0.12	12.00	4.00	1.30		
45	0.042	0.25	13.00	4.00	1.20		15.0%
50	0.062	0.44	13.00	5.00	1.50		18.0
55	0.096	0.65	15.00	5.00	2.00	5.5%	50.0
60	0.157	0.85	15.00	5.00	2.00	14.0	40.0
62	0.197	0.85	15.00	4.60	2.00	14.0	40.0
65	0.287	0.85	15.00	4.00	2.00	22.0	35.0
70	0.495	0.85	15.00	0.00	0.00	20.0	35.0
75	0.831	0.85	15.00	0.00	0.00	100.0	100.0

*Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.

DEATHS AFTER RETIREMENT: The RP-2000 Combined Mortality Table projected to 2025 using scale BB (set forward two years for males and one year for females) is used for death after service retirement and beneficiaries. The RP-2000 Disabled Mortality Table (set forward two years for males and seven years for females) is used for death after disability retirement. There is a margin for future mortality improvement in the tables used by the System. Based on the results of the most recent experience study adopted by the Board on September 19, 2016, the numbers of expected future deaths are 15-19% less than the actual number of deaths that occurred during the study period for healthy retirees and 13-17% less than expected under the selected table for disabled retirees. Representative values of the assumed annual rates of death after service retirement and after disability retirement are shown below:

	Annual Rate of Death After			
	Service Retirement		Disability Retirement	
Age	Male	Female	Male	Female
45	0.1609%	0.1135%	2.3306%	1.2482%
50	0.2474	0.1718	2.9279	1.5650
55	0.4246	0.2658	3.4400	1.7807
60	0.6985	0.4409	3.5881	2.3164
65	1.1300	0.8100	3.8275	3.1687
70	1.8697	1.3739	4.7566	4.4032
75	3.2147	2.2899	6.3153	6.0857
80	5.5160	3.7551	8.3527	8.4679
85	9.5631	6.3873	10.9122	12.7572
90	17.2787	11.2476	17.2787	19.4718
95	27.1263	18.1190	27.1263	24.2074

ASSETS: Five-year market related actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the ultimate assumed valuation rate of return of 7.50%. The amount recognized each year is 20% of the difference between market value and expected actuarial value.

EXPENSE LOAD: None.

PERCENT MARRIED: 100%, with females 3 years younger than males.

LOADS: Unused sick leave: 2% of active liability

SCHEDULE E

ACTUARIAL COST METHOD

1. The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future (currently at 7.50%), of each active member's expected benefit at retirement or death is determined, based on his age, service, sex and compensation. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service, disability or survivor's benefit. Future salary increases and post-retirement cost-of-living adjustments are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries and inactive members to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.
2. The employer contributions required to support the benefits of the System are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.
3. The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.
4. The unfunded accrued liability is determined by subtracting the present value of prospective employer normal contributions and member contributions, together with the current actuarial value of assets held, from the present value of expected benefits to be paid from the System.

SCHEDULE F

SUMMARY OF MAIN SYSTEM PROVISIONS AS INTERPRETED FOR VALUATION PURPOSES

The Teachers' Retirement System of the State of Kentucky was established on July 1, 1940. The valuation took into account amendments to the System effective through June 30, 2016. The following summary describes the main benefit and contribution provisions of the System as interpreted for the valuation.

1 - DEFINITIONS

"Final average salary" means the average of the five highest annual salaries which the member has received for service in a covered position and on which the member has made contributions or on which the public board, institution or agency has picked up the member contributions. For a member who retires after attaining age 55 with 27 years of service, "final average salary" means the average of the three highest annual salaries.

2 - BENEFITS

Service Retirement Allowance

Members Before 7/1/2008

Condition for Allowance: Completion of 27 years of service or attainment of age 55 and 5 years of service.

Amount of Allowance: The annual retirement allowance for non-university members is equal to:

(a) 2.0% of final average salary multiplied by service before July 1, 1983, plus

(b) 2.5% of final average salary multiplied by service after July 1, 1983.

(c) For individuals who become members of the Retirement System on or after July 1, 2002 and have less than 10 years of service at retirement, the retirement allowance is 2.0% of final average salary multiplied by service. If, however, they have 10 or more years, they receive a benefit percentage of 2.5% for all years of service up to 30 years.

(d) For members retiring on or after July 1, 2004, the retirement allowance formula is 3.0% of final average salary for each year of service credit earned in excess of 30 years.

The annual retirement allowance for university members is equal to 2.0% of final average salary multiplied by all years of service.

For all members, the annual allowance is reduced by 5% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

The minimum annual service allowance for all members is $440 multiplied by credited service.

Members on and after 7/1/2008

Condition for Retirement

Completion of 27 years of service, attainment of age 60 and 5 years of service or attainment of age 55 and 10 years of service.

Amount of Allowance

The annual retirement allowance for non-university members is equal to:

1.7% of final average salary if service is 10 years or less.
2.0% of final average salary if service is greater than 10 years and no more than 20 years.
2.3% of final average salary if service is greater than 20 years but no more than 26 years.
2.5% of final average salary if service is greater than 26 years but no more than 30 years.
3.0% of final average salary for years of service greater than 30 years.

The annual retirement allowance for university members is equal to:

1.5% of final average salary if service is 10 years or less.
1.7% of final average salary if service is greater than 10 years and no more than 20 years.
1.85% of final average salary if service is greater than 20 years but less than 27 years.
2.0% of final average salary if service is greater than or equal to 27 years.

.
For all members, the annual allowance is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

Disability Retirement Allowance

Condition for Allowance	Totally and permanently incapable of being employed as a teacher and under age 60 but after completing 5 years of service.
Amount of Allowance	The disability allowance is equal to the greater of the service retirement allowance or 60% of the member's final average salary. The disability allowance is payable over an entitlement period equal to 25% of the service credited to the member at the date of disability or five years, whichever is longer. After the disability entitlement period has expired and if the member remains disabled, he will be retired under service retirement. The service retirement allowance will be computed with service credit given for the period of disability retirement. The allowance will not be less than $6,000 per year. The service retirement allowance will not be reduced for commencement of the allowance before age 60 or the completion of 27 years of service.

Benefits Payable on Separation from Service	Any member who ceases to be in service is entitled to receive his contributions with allowable interest. A member who has completed 5 years of creditable service and leaves his contributions with the System may be continued in the membership of the System after separation from service, and file application for service retirement after the attainment of age 60.
Life Insurance	A separate Life Insurance fund has been created as of June 30, 2000 to pay benefits on behalf of deceased TRS active and retired members.

Death Benefits

A surviving spouse of an active member with less than 10 years of service may elect to receive an annual allowance of $2,880 except that if income from other sources exceeds $6,600 per year the annual allowance will be $2,160.

A surviving spouse of an active member with 10 or more years of service may elect to receive an allowance which is the actuarial equivalent of the allowance the deceased member would have received upon retirement. The allowance will commence on the date the deceased member would have been eligible for service retirement and will be payable during the life of the spouse.

If the deceased member is survived by unmarried children under age 18 the following schedule of annual allowances applies:

Number of Children	Annual Allowance
1	$ 2,400
2	4,080
3	4,800
4 or more	5,280

The allowances are payable until a child attains age 18, or age 23 if a full-time student.

If the member has no eligible survivor, a refund of his accumulated contributions is payable to his estate.

Options

In lieu of the regular Option 1, a retirement allowance payable in the form of a life annuity with refundable balance, any member before retirement may elect to receive a reduced allowance which is actuarially equivalent to the full allowance, in one of the following forms:

Option 2. A single life annuity payable during the member's lifetime with payments for 10 years certain.

Option 3. At the death of the member his allowance is continued throughout the life of his beneficiary.

Option 3(a). At the death of the beneficiary designated by the member under Option 3, the member's benefit will revert to what would have been paid had he not selected an option.

Option 4. At the death of the member one half of his allowance is continued throughout the life of his beneficiary.

	Option 4(a). At the death of the beneficiary designated by the member under Option 4, the member's benefit will revert to what would have been paid had he not selected an option.
Post-Retirement Adjustments	The retirement allowance of each retired member and of each beneficiary shall be increased by 1.50% each July 1.

3 - CONTRIBUTIONS

Member Contributions	University members contribute 7.625% of salary to the Retirement System. Non-university members contribute 9.105% of salary to the Retirement System. Member contributions are picked up by the employer.

SCHEDULE G

TABLE 1
AGE – SERVICE TABLE

Distribution of Active Members as of June 30, 2016 by Age and Service Groups

Attained Age	Completed Years of Service								
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 35	Over 35	Total
24 & Under	2,355								2,355
Total Pay	45,330,040								45,330,040
Avg. Pay	19,248								19,248
25 to 29	5,983	1,390	6						7,379
Total Pay	203,433,582	67,448,815	290,024						271,172,421
Avg. Pay	34,002	48,524	48,337						36,749
30 to 34	3,012	4,867	1,237	5					9,121
Total Pay	95,202,602	245,417,243	70,031,584	254,892					410,906,321
Avg. Pay	31,608	50,425	56,614	50,978					45,051
35 to 39	2,269	2,377	4,756	984	4				10,390
Total Pay	63,198,818	122,108,596	281,358,005	63,149,812	239,758				530,054,989
Avg. Pay	27,853	51,371	59,159	64,177	59,940				51,016
40 to 44	1,785	1,520	2,196	4,060	746	1			10,308
Total Pay	45,830,416	77,450,441	131,391,508	267,885,302	52,046,889	53,664			574,658,220
Avg. Pay	25,675	50,954	59,832	65,982	69,768	53,664			55,749
45 to 49	1,483	1,177	1,593	2,266	3,343	750	3		10,615
Total Pay	39,361,503	60,147,545	93,765,291	147,455,842	233,185,542	54,299,673	169,293		628,384,689
Avg. Pay	26,542	51,102	58,861	65,073	69,753	72,400	56,431		59,198
50 to 54	1,196	717	1,039	1,272	1,534	1,826	286	2	7,872
Total Pay	25,260,952	36,290,570	61,397,451	82,245,956	106,693,617	134,430,589	21,213,845	131,648	467,664,628
Avg. Pay	21,121	50,614	59,093	64,659	69,553	73,620	74,174	65,824	59,409
55 to 59	1,345	467	678	996	1,069	818	352	19	5,744
Total Pay	21,138,039	21,468,016	39,649,701	64,095,061	75,667,783	62,721,524	30,314,021	1,529,398	316,583,543
Avg. Pay	15,716	45,970	58,480	64,352	70,784	76,677	86,119	80,495	55,116
60 to 64	1,837	341	387	608	577	412	102	65	4,329
Total Pay	23,796,325	13,577,768	22,772,409	40,965,044	42,005,811	32,467,970	9,324,712	5,479,043	190,389,082
Avg. Pay	12,954	39,818	58,843	67,377	72,800	78,806	91,419	84,293	43,980
65 & Over	2,291	524	181	227	214	169	65	64	3,735
Total Pay	20,398,952	12,356,675	11,463,858	15,532,839	16,369,811	14,008,597	5,681,398	6,270,288	102,082,418
Avg. Pay	8,904	23,581	63,336	68,427	76,494	82,891	87,406	97,973	27,331
Total	23,556	13,380	12,073	10,418	7,487	3,976	808	150	71,848
Total Pay	582,951,229	656,265,669	712,119,831	681,584,748	526,209,211	297,982,017	66,703,269	13,410,377	3,537,226,351
Avg. Pay	24,747	49,048	58,984	65,424	70,283	74,945	82,554	89,403	49,232

Average Age: 43.5

Average Service: 10.8

SCHEDULE G

TABLE 2

NUMBER OF RETIRED MEMBERS AND BENEFICIARIES AND THEIR BENEFITS BY AGE AS OF JUNE 30, 2016

Attained Age	Number of Members	Total Annual Payment	Average Annual Benefits
49 & Under	848	$ 11,407,720	$ 13,453
50 – 54	1,322	51,147,401	38,689
55 – 59	4,074	174,702,723	42,882
60 – 64	8,959	364,324,086	40,666
65 – 69	13,703	520,359,554	37,974
70 – 74	9,332	336,374,000	36,045
75 – 79	5,933	201,434,460	33,952
80 – 84	3,715	114,780,225	30,896
85 – 89	2,315	62,949,170	27,192
90 & Over	1,362	31,395,212	23,051
Total	51,563	$ 1,868,874,551	$ 36,244

Average Current Age: 69.2

Average Age at Retirement: 55.9

SCHEDULE G

TABLE 3

SCHEDULE OF RETIRANTS, BENEFICIARIES AND SURVIVORS ADDED TO AND REMOVED FROM ROLLS

	ADDED TO ROLLS		REMOVED FROM ROLLS		ROLLS AT END OF YEAR			
Fiscal Year Ending June 30	Number	Annual Allowances (in millions)	Number	Annual Allowances (in millions)	Number	Annual Allowances (in millions)	Increase In Annual Allowances	Average Annual Allowance
2007	2,050	$82.1	1,041	$20.7	39,506	$1,135.6	5.7%	$28,746
2008	2,183	90.6	950	19.4	40,739	1,206.8	6.3%	29,623
2009	2,351	96.2	1,040	22.7	42,050	1,280.3	6.1%	30,447
2010	2,105	93.7	1,021	21.8	43,134	1,352.2	5.6%	31,348
2011	2,133	98.9	848	17.7	44,419	1,433.4	6.0%	32,270
2012	2,513	111.2	838	19.4	46,094	1,525.2	6.4%	33,089
2013	2,303	105.7	991	22.2	47,406	1,608.7	5.5%	33,934
2014	2,146	99.6	976	23.4	48,576	1,684.9	4.7%	34,685
2015	2,917	119.1	1,671	36.3	49,822	1,767.6	4.9%	35,479
2016	2,753	128.2	1,012	26.9	51,563	1,868.9	5.7%	36,244

SCHEDULE H

BOARD FUNDING POLICY

Introduction

Pursuant to the provisions of KRS 161.250, the Board of Trustees ("Board") of the Kentucky Teachers' Retirement Systems ("TRS") is vested with the responsibility for the general administration and management of the retirement system. The Board may adopt procedures necessary to conduct the business of the retirement system as needed. The applicable provisions of the Kentucky Revised Statutes ("state law") shall control if any inconsistency exists between state law and this policy.

Background:

State law provides that the retirement benefits promised to members of TRS are "…an inviolable contract of the Commonwealth…." (KRS 161.714.) To satisfy this solemn commitment, the Commonwealth of Kentucky ("state") is required to pay annual retirement appropriations necessary to fund the benefit requirements of members of the retirement system. All employers participating in TRS are responsible for paying the fixed employer contribution rate set forth in state law. However, the state—as plan guarantor—is solely responsible for paying the additional annual retirement appropriations necessary to keep the retirement system actuarially sound and able to satisfy the contract with members to provide promised benefits. (KRS 161.550(6).)

Since fiscal year 2008, the state has not paid the recommended annual retirement appropriations necessary to pre-fund the benefit requirements of members of the retirement system as determined by the actuary. Over this period of time, because of the failure to fund, the state's annual retirement appropriations have grown significantly from $60.5 million (Fiscal Year 2009) to $487 million (Fiscal Year 2016). The following schedule details the growth of the annual retirement appropriations payable by the state:

	Cumulative Increase as a % of Payroll	Cumulative Increase of Annual Retirement Appropriations Payable by the State
2009	1.88	$ 60,499,800
2010	2.46	82,331,200
2011	3.59	121,457,000
2012	5.81	208,649,000
2013	7.27	260,980,000
2014	8.02	299,420,000
2015	10.42	386,400,000
2016	12.97	487,400,000

(Source: TRS Report of the Actuary on the Annual Valuation Prepared as of June 30, 2013).

The Board has always taken action as required by state law and recommended annual retirement appropriations payable by the state that would ensure that the state meets the contractual obligations to members. This policy confirms the Board's process for recommending annual retirement appropriations payable by the state and the primary actuarial assumptions and methodologies associated with calculating the annual retirement appropriations. Other related actuarial assumptions and methodologies not listed in this policy are reported in annual valuations, the most recent experience study, or resolutions adopted by the Board.

1. Annual Retirement Appropriations Payable by the State: In each biennial budget request, the Board will recommend annual retirement appropriations payable by the state to meet the benefit requirements of the members of the retirement system. The annual retirement appropriations payable by the state are the sum of the fixed employer contribution rate set by state law and the additional annual retirement appropriations necessary to fund the benefit requirements of members of the retirement system. (KRS 161.550.) The recommended additional annual retirement appropriations payable by the state are calculated by the Board's actuary based upon the results of an annual valuation preceding the beginning of each biennium. (KRS 161.400.)

2. Calculation of Annual Retirement Appropriations Payable by the State: The Board will recommend annual retirement appropriations payable by the state, which—if paid—will meet the benefit requirements of the members of the retirement system consistent with generally accepted actuarial principles. Based

upon technical advice from the Board's actuary, the Board hereby adopts the following principles for calculating the recommended annual retirement appropriations payable by the state:

- Use the Entry Age Normal actuarial cost method;
- Use a five-year asset smoothing method;
- Use a thirty-year closed period to amortize legacy unfunded liability ("legacy unfunded liability" is that unfunded liability recognized as of the valuation prepared for June 30, 2014);
- Use a twenty-year closed period to amortize new sources of unfunded liability ("new sources of unfunded liability" is that unfunded liability consisting of all benefit changes, assumption and method changes, and experience gains and/or losses that have occurred since the previous valuation); and
- Reach a 100 percent minimum funded ratio within the thirty-year closed amortization period.

The Board also recognizes that, from time to time, the state may desire to contribute lump sum payments toward satisfaction of unfunded liability rather than amortization of the debt. Total unfunded liability is published in every annual valuation of the retirement system and TRS will work with the state to develop reasonable and appropriate plans for receipt of lump sum payments toward the satisfaction of unfunded liability.

This policy will be reviewed regularly and amended or revised as necessary.

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GASB STATEMENT NO. 67 REPORT

FOR THE

TEACHERS' RETIREMENT SYSTEM

OF THE STATE OF KENTUCKY

PREPARED AS OF JUNE 30, 2016

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The experience and dedication you deserve

November 21, 2016

Board of Trustees
Teachers' Retirement System of the
State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:

Presented in this report is information to assist the Teachers' Retirement System of the State of Kentucky (TRS), in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 67. This report has been prepared as of June 30, 2016 (the Measurement Date) to assist TRS in better understanding the requirements of GASB 67 and to identify the information to be provided by TRS's actuary, Cavanaugh Macdonald Consulting (CMC).

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of June 30, 2015. The valuation was based upon data, furnished by the Executive Secretary and TRS staff, concerning active, inactive and retired members along with pertinent financial information.

To the best of our knowledge, this report is complete and accurate. The necessary calculations were performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems.

The calculations were prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, and, in our opinion, meet the requirements of GASB 67.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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Board of Trustees
November 21, 2016
Page 2

These results are only for financial reporting and may not be appropriate for funding purposes or other types of analysis. Calculations for purposes other than satisfying the requirements of GASB 67 may produce significantly different results. Future actuarial results may differ significantly from the current results presented in this report due to such factors as changes in plan experience or changes in economic or demographic assumptions.

Respectfully submitted,

Edward J. Koebel

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

E H Gary

Eric H. Gary, FSA, FCA, MAAA
Principal and Chief Health Actuary

Cathy Turcot

Cathy Turcot
Principal and Managing Director

EJK/EHG/CT

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REPORT OF THE ANNUAL GASB STATEMENT NO. 67
REQUIRED INFORMATION FOR THE
TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
PREPARED AS OF JUNE 30, 2016

SECTION I – INTRODUCTION

The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67), "*Financial Reporting For Pension Plans*", in June 2012. This report, prepared as of June 30, 2016 (the Measurement Date), presents information to assist the Teachers' Retirement System of the State of Kentucky (TRS), in meeting the requirements of GASB 67. Much of the material provided in this report is based on the data, assumptions and results of the annual actuarial valuation of TRS as of June 30, 2015. The results of that valuation were detailed in a report dated December 7, 2015.

GASB 67 requires a measurement of the Total Pension Liability (TPL) utilizing the Entry Age Normal actuarial funding method. If the valuation date at which the TPL is determined is before the measurement date, as is the case here, the TPL must be rolled forward to the measurement date. The Net Pension Liability (NPL) is then set equal to the rolled forward TPL minus the System's Fiduciary Net Position (FNP) (basically the market values of assets) as of the Measurement Date. The benefit provisions recognized in the calculation of the TPL are summarized in Schedule B. The development of the roll-forward of the TPL is shown in the table on page 5.

Among the assumptions needed for the liability calculation is a Single Equivalent Interest Rate (SEIR) as described by GASB 67. To determine the SEIR, the FNP must be projected into the future for as long as there are anticipated benefits payable under the plan's provisions applicable to the membership and beneficiaries of the System on the Measurement Date. We have projected future employer contributions to be made based on the amounts required by statute. Although the TRS Board of Trustees adopted a funding policy, shown in Schedule E, on December 16, 2013, the State has not funded the actuarially determined contributions since 2009. However, it is our understanding that the State budget includes additional appropriations to the pension plan for fiscal years 2017 and 2018, which have been taken into account. On this basis, if the FNP is not projected to be depleted at any point in the future, the long term expected rate of return on plan investments expected to be used to finance the benefit payments may be used as the SEIR.

If, however, the FNP is projected to be depleted, the SEIR is determined as the single rate that will generate a present value of benefit payments equal to the sum of the present value determined by discounting all projected benefit payments through the date of depletion by the long term expected rate of return, and the present value determined by discounting those benefits after the date of depletion by a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate. Our calculations indicated that the FNP is projected to be depleted, so the bond rate is used in the determination of the SEIR. On this basis, we have determined that a discount rate of 4.20 percent meets the requirements of GASB 67.

The sections that follow provide the results of all the necessary calculations, presented in the order laid out in GASB 67 for note disclosure and Required Supplementary Information.

SECTION II – FINANCIAL STATEMENT NOTES

The material presented herein will follow the order presented in GASB 67. Paragraph numbers are provided for ease of reference.

Paragraphs 30(a) (1)-(3): The information required is to be supplied by the System.

Paragraph 30(a) (4): The data required regarding the membership of the TRS were furnished by the System office. The following table summarizes the membership of the System as of June 30, 2015, the actuarial valuation date.

Membership

	Number
Retirees And Survivors Currently Receiving Benefits	49,822
Terminated Vested Employees Entitled To But Not Yet Receiving Benefits	8,051
Inactive Non-vested Members	19,720
Active Members	72,246
Total	149,839

Paragraphs 30(a)(5)-(6) and Paragraphs 30(b)-(f): The information required is to be supplied by the System.

Paragraphs 31(a) (1)-(4): The information is provided in the following table. As stated on the previous page, the Net Pension Liability (NPL) is equal to the Total Pension Liability (TPL) minus the Fiduciary Net Position (FNP). That result as of June 30, 2016 is presented in the table below ($ thousands).

	Fiscal Year Ending 6/30/2016
Total Pension Liability (TPL)	$47,736,901
Fiduciary Net Position (FNP)	16,812,832
Net Pension Liability (NPL)	$30,924,069
Ratio of FNP to TPL	35.22%

Paragraph 31(b) (1)(a)-(f): This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The set of actuarial assumptions utilized in developing the TPL are outlined in Schedule C. The total pension liability was determined by an actuarial valuation as of June 30, 2015, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3.50 percent
Salary increases	4.00 – 8.20 percent, including inflation
Investment rate of return	7.50 percent, net of pension plan investment expense, including inflation
Municipal Bond Index Rate	3.01%
Single Equivalent Interest Rate	4.20%

Mortality rates were based on the RP-2000 Combined Mortality Table for Males or Females, as appropriate, with adjustments for mortality improvements based on a projection of Scale AA to 2020 with a set back of 1 year for females.

The actuarial assumptions used in the June 30, 2015 valuation were based on the results of an actuarial experience study for the period July 1, 2005 – June 30, 2010 adopted by the Board on December 19, 2011. The results of the experience study for the period July 1, 2010 – June 30, 2015 will be reflected in the June 30, 2016 valuation and the June 30, 2017 GASB 67 report.

The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis 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.

The target asset allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
U.S. Equity	45.0%	6.4%
Non U.S. Equity	17.0%	6.5%
Fixed Income	24.0%	1.6%
High Yield Bonds	4.0%	3.1%
Real Estate	4.0%	5.8%
Alternatives	4.0%	6.8%
Cash	2.0%	1.5%
Total	100.00%	

Discount rate. The discount rate used to measure the total pension liability was 4.20 percent. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rates and that Employer contributions will be made at statutorily required rates, and the additional amounts appropriated for fiscal years 2017 and 2018. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members until the 2040 plan year. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments through 2039 and a municipal bond index rate of 3.01 percent was applied to all periods of projected benefit payments after 2039. The Single Equivalent Interest Rate (SEIR) that discounts the entire projected benefit stream to the same amount as the sum of the present values of the two separate benefit payments streams was used to determine the total pension liability.

Paragraph 31(b) (1) (g): This paragraph requires disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the System, calculated using the discount rate of 4.20 percent, as well as what the System's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (3.20 percent) or 1-percentage-point higher (5.20 percent) than the current rate ($ thousands):

	1% Decrease (3.20%)	Current Discount Rate (4.20%)	1% Increase (5.20%)
System's net pension liability	$37,937,230	$30,924,069	$25,168,197

Paragraph 31(c): June 30, 2015 is the actuarial valuation date upon which the TPL is based. The TPL from this valuation was determined using a discount rate of 4.20%, which was based on a municipal bond index rate as of that date equal to 3.01%. The TPL used last year was determined using a discount rate equal to 4.88%, which was based on a municipal bond index rate of 3.82%. These two amounts are rolled forward to June 30, 2016 using standard roll forward techniques. The roll forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year and then applies the assumed interest rate (SEIR) for the year. The difference between the two roll-forward amounts as of June 30, 2016 is the gain or loss due to changes in assumptions and other inputs.

In addition, we have determined an expected TPL as of June 30, 2016 based on the TPL roll-forward in the June 30, 2015 GASB 67 report. The difference between this amount and the roll-forward of the actual TPL based on the 4.88% interest rate is reflected as an experience gain or loss for the year. These procedures are shown in the following table:

TPL Roll-Forward
(in thousands)

	Expected	Actual Before Assumption Change	Actual After Assumption Change
(a) Interest rate	4.88%	4.88%	4.20%
(b) TPL as of June 30, 2015	$42,476,699	$42,421,364	$46,355,565
(c) Entry Age Normal Cost for the Year July 1, 2015 – June 30, 2016	1,120,893	1,120,893	1,334,428
(d) Actual Benefit Payments (including refunds) For the year July 1, 2015 – June 30, 2016	1,860,946	1,860,946	1,860,946
(e) TPL as of June 30, 2016 (b) x (1 + (a)) + (c) – (d) x (1 + 0.5 x (a))	$43,764,102	$43,706,067	$47,736,901
(f) Difference between Expected and Actual Experience (Gain)/Loss		$(58,035)	
(g) Difference due to change in Assumptions and Other Inputs (Gain)/Loss			$4,030,834

SECTION III – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in the System's financial statements:

Paragraphs 32(a)-(c): The required tables are provided in Schedule A.

Paragraph 32(d): The money-weighted rates of return required are to be supplied by the System.

Paragraph 34: In addition the following should be noted regarding the RSI:

Changes of benefit terms. None

Changes of assumptions. In the 2011 valuation and later, the expectation of retired life mortality was changed to the RP-2000 Mortality Tables rather than the 1994 Group Annuity Mortality Table, which was used prior to 2011. In the 2011 valuation, rates of withdrawal, retirement, disability and mortality were adjusted to more closely reflect actual experience. In the 2011 valuation, the Board adopted an interest smoothing methodology to calculate liabilities for purposes of determining the actuarially determined contributions. Beginning with the 2014 valuation, the interest smoothing methodology is no longer used.

Methods and assumptions used in calculations of actuarially determined contributions. The actuarially determined contribution rates in the schedule of employer contributions are calculated as of June 30, three years prior to the end of the fiscal year in which contributions are reported (as of June 30, 2013 for the fiscal year 2016 contributions). The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of that schedule:

Actuarial cost method	Entry age
Amortization method	Level percentage of payroll, open
Remaining amortization period	30 years
Asset valuation method	5-year smoothed market
Inflation	3.50 percent
Salary increase	4.00 to 8.20 percent, including inflation
Ultimate Investment rate of return*	7.50 percent, net of pension plan investment expense, including inflation

*****The actuarially determined contribution rates are determined using the interest smoothing methodology adopted by the Board

SCHEDULE A

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)
($ in Thousands)

	2016	2015	2014
Total Pension Liability			
Service Cost	$ 1,120,893	$ 1,015,080	$ 1,002,338
Interest	2,027,457	2,029,372	1,956,610
Benefit Changes	0	0	0
Difference between expected and actual experience	(58,035)	0	0
Changes of Assumption and other inputs	4,030,834	1,511,960	(353,043)
Benefit Payments	(1,833,199)	(1,741,456)	(1,654,376)
Refund of Contributions	(27,748)	(23,033)	(25,462)
Net Change in Total Pension Liability	5,260,202	2,791,923	926,067
Total Pension Liability – Beginning	42,476,699	39,684,776	38,758,709
Total Pension Liability – Ending (a)	$47,736,901	$42,476,699	$39,684,776
Plan Net Position			
Contributions – State of Kentucky	$ 484,987	$ 480,073	$ 483,330
Contributions – Other Employers	80,468	79,506	38,445
Contributions – Member	313,044	308,160	304,982
Net Investment Income	(245,215)	862,179	2,803,249
Benefit Payments	(1,833,199)	(1,741,456)	(1,654,376)
Administrative Expense	(8,636)	(8,869)	(7,956)
Refund of Contributions	(27,748)	(23,033)	(25,462)
Other	0	0	41,551
Net Change in Plan Net Position	(1,236,299)	(43,440)	1,983,763
Plan Net Position – Beginning	18,049,131	18,092,571	16,108,808
Plan Net Position – Ending (b)	$16,812,832	$18,049,131	$18,092,571
Net Pension Liability – Ending (a) – (b)	$30,924,069	$24,427,568	$21,592,205

SCHEDULE A

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF THE NET PENSION LIABILITY
GASB 67 Paragraph 32(b)
($ in Thousands)

	2016	2015	2014
Total Pension Liability	$47,736,901	$42,476,699	$39,684,776
Plan Net Position	16,812,832	18,049,131	18,092,571
Net Pension Liability	$30,924,069	$24,427,568	$21,592,205
Ratio of Plan Net Position to Total Pension Liability	35.22%	42.49%	45.59%
Covered Payroll	$3,390,539	$3,455,008	$3,317,422
Net Pension Liability as a Percentage of Covered Payroll	912.07%	707.02%	650.87%

SCHEDULE A

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF EMPLOYER CONTRIBUTIONS
GASB 67 Paragraph 32(c)
($ in Thousands)

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Covered Payroll	$ 3,390,539	$ 3,455,008	$ 3,317,422	$ 3,310,710	$ 3,310,176	$ 3,283,749	$ 3,321,614	$ 3,253,077	$ 3,190,332	$ 2,975,289
Actual Employer Contributions	$ 565,455	$ 559,579	$ 563,326	$ 568,233	$ 557,340	$ 1,037,936	$ 479,805	$ 442,550	$ 466,248	$ 434,890
Actuarially Determined Employer Contributions	999,270	913,654	823,446	802,985	757,822	678,741	633,938	600,283	563,789	494,565
Annual Contribution Excess (Deficiency)	$ (433,815)	$ (354,075)	$ (260,120)	$ (234,752)	$ (200,482)	$ 359,195	$ (154,133)	$ (157,733)	$ (97,541)	$ (59,675)
Actual Contribution as a Percentage of Covered Payroll	16.68%	16.20%	16.98%	17.16%	16.84%	31.61%	14.44%	13.60%	14.61%	14.62%

SCHEDULE B

SUMMARY OF MAIN BENEFIT PROVISIONS

The Teachers' Retirement System of the State of Kentucky was established on July 1, 1940. The valuation took into account amendments to the System effective through June 30, 2015. The following summary describes the main benefit and contribution provisions of the System as interpreted for the valuation.

1 - DEFINITIONS

"Final average salary" means the average of the five highest annual salaries which the member has received for service in a covered position and on which the member has made contributions or on which the public board, institution or agency has picked up the member contributions. For a member who retires after attaining age 55 with 27 years of service, "final average salary" means the average of the three highest annual salaries.

2 - BENEFITS

Service Retirement Allowance

Members Before 7/1/2008

Condition for Allowance	Completion of 27 years of service or attainment of age 55 and 5 years of service.
Amount of Allowance	The annual retirement allowance for non-university members is equal to:

(a) 2.0% of final average salary multiplied by service before July 1, 1983, plus

(b) 2.5% of final average salary multiplied by service after July 1, 1983.

(c) For individuals who become members of the Retirement System on or after July 1, 2002 and have less than 10 years of service at retirement, the retirement allowance is 2.0% of final average salary multiplied by service. If, however, they have 10 or more years, they receive a benefit percentage of 2.5% for all years of service up to 30 years.

(d) For members retiring on or after July 1, 2004, the retirement allowance formula is 3.0% of final average salary for each year of service credit earned in excess of 30 years.

The annual retirement allowance for university members is equal to 2.0% of final average salary multiplied by all years of service.

For all members, the annual allowance is reduced by 5% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

The minimum annual service allowance for all members is $440 multiplied by credited service.

Members on and after 7/1/2008

Condition for Retirement	Completion of 27 years of service, attainment of age 60 and 5 years of service or attainment of age 55 and 10 years of service.
Amount of Allowance	The annual retirement allowance for non-university members is equal to:

1.7% of final average salary if service is 10 years or less.
2.0% of final average salary if service is greater than 10 years and no more than 20 years.
2.3% of final average salary if service is greater than 20 years but no more than 26 years.
2.5% of final average salary if service is greater than 26 years but no more than 30 years.
3.0% of final average salary for years of service greater than 30 years.

The annual retirement allowance for university members is equal to:

1.5% of final average salary if service is 10 years or less.
1.7% of final average salary if service is greater than 10 years and no more than 20 years.
1.85% of final average salary if service is greater than 20 years but less than 27 years.
2.0% of final average salary if service is greater than or equal to 27 years.

For all members, the annual allowance is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

Disability Retirement Allowance

Condition for Allowance	Totally and permanently incapable of being employed as a teacher and under age 60 but after completing 5 years of service.
Amount of Allowance	The disability allowance is equal to the greater of the service retirement allowance or 60% of the member's final average salary. The disability allowance is payable over an entitlement period equal to 25% of the service credited to the member at the date of disability or five years, whichever is longer. After the disability entitlement period has expired and if the member remains disabled, he will be retired under service retirement. The service retirement allowance will be computed with service credit given for the period of disability retirement. The allowance will not be less than $6,000 per year. The service retirement allowance will not be reduced for commencement of the allowance before age 60 or the completion of 27 years of service.

Benefits Payable on Separation from Service	Any member who ceases to be in service is entitled to receive his contributions with allowable interest. A member who has completed 5 years of creditable service and leaves his contributions with the System may be continued in the membership of the System after separation from service, and file application for service retirement after the attainment of age 60.
Life Insurance	A separate Life Insurance fund has been created as of June 30, 2000 to pay benefits on behalf of deceased TRS active and retired members.

Death Benefits

A surviving spouse of an active member with less than 10 years of service may elect to receive an annual allowance of $2,880 except that if income from other sources exceeds $6,600 per year the annual allowance will be $2,160.

A surviving spouse of an active member with 10 or more years of service may elect to receive an allowance which is the actuarial equivalent of the allowance the deceased member would have received upon retirement. The allowance will commence on the date the deceased member would have been eligible for service retirement and will be payable during the life of the spouse.

If the deceased member is survived by unmarried children under age 18 the following schedule of annual allowances applies:

Number of Children	Annual Allowance
1	$ 2,400
2	4,080
3	4,800
4 or more	5,280

The allowances are payable until a child attains age 18, or age 23 if a full-time student.

If the member has no eligible survivor, a refund of his accumulated contributions is payable to his estate.

Options

In lieu of the regular Option 1, a retirement allowance payable in the form of a life annuity with refundable balance, any member before retirement may elect to receive a reduced allowance which is actuarially equivalent to the full allowance, in one of the following forms:

Option 2. A single life annuity payable during the member's lifetime with payments for 10 years certain.

Option 3. At the death of the member his allowance is continued throughout the life of his beneficiary.

Option 3(a). At the death of the beneficiary designated by the member under Option 3, the member's benefit will revert to what would have been paid had he not selected an option.

Option 4. At the death of the member one half of his allowance is continued throughout the life of his beneficiary.

Option 4(a). At the death of the beneficiary designated by the member under Option 4, the member's benefit will revert to what would have been paid had he not selected an option.

Post-Retirement Adjustments	The retirement allowance of each retired member and of each beneficiary shall be increased by 1.50% each July 1.

3 - CONTRIBUTIONS

Member Contributions	University members contribute 7.625% of salary to the Retirement System. Non-university members contribute 9.105% of salary to the Retirement System. Member contributions are picked up by the employer.

SCHEDULE C

STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

INVESTMENT RATE OF RETURN: 7.50% per annum, compounded annually.

SALARY INCREASES: Representative values of the assumed annual rates of future salary increases are as follows and include inflation at 3.50% per annum:

Age	Annual Rate
20	8.10%
25	7.20
30	6.20
35	5.50
40	5.00
45	4.60
50	4.50
55	4.30
60	4.20
65	4.00

SEPARATIONS FROM SERVICE: Representative values of the assumed annual rates of death, disability, withdrawal, service retirement and early retirement are as follows:

Males

	Annual Rate of						
			WITHDRAWAL Service			RETIREMENT	
						Before 27 Years of Service	After 27 Years of Service*
Age	DEATH	DISABILITY	0 – 4	5 – 9	10+		
20	0.012%	0.01%	9.00%				
25	0.015	0.01	9.00	3.00%			
30	0.020	0.02	9.00	3.00	3.00%		
35	0.035	0.05	10.00	3.25	1.75		
40	0.046	0.09	10.00	4.00	1.40		
45	0.058	0.18	11.00	4.00	1.50		17.0%
50	0.074	0.33	9.00	4.00	2.00		17.0
55	0.124	0.55	12.00	3.50	2.50	5.5%	35.0
60	0.244	0.70	12.00	3.50	2.50	13.0	24.0
62	0.324	0.70	12.00	3.50	2.50	15.0	25.0
65	0.480	0.70	12.00	3.50	2.50	21.0	26.0
70	0.821	0.70	0.00	0.00	0.00	100.0	100.0

*Plus 10% in year when first eligible for unreduced retirement with 27 years of service.

Females

Age	Annual Rate of DEATH	DISABILITY	WITHDRAWAL Service 0 – 4	5 – 9	10+	RETIREMENT Before 27 Years of Service	After 27 Years of Service*
20	0.007%	0.01%	7.00%				
25	0.008	0.02	8.50	4.00%			
30	0.010	0.04	9.00	4.00	1.65%		
35	0.017	0.08	9.00	3.75	1.85		
40	0.024	0.14	8.50	3.25	1.50		
45	0.037	0.32	7.50	3.25	1.25		15.0%
50	0.055	0.42	9.50	3.50	1.75		15.0
55	0.103	0.56	11.00	4.00	2.00	6.0%	35.0
60	0.201	0.85	11.00	4.00	2.00	14.0	30.0
62	0.263	0.85	11.00	4.00	2.00	12.0	25.0
65	0.390	0.85	11.00	4.00	2.00	22.0	30.0
70	0.672	0.85	0.00	0.00	0.00	100.0	100.0

*Plus 10% in year when first eligible for unreduced retirement with 27 years of service.

DEATHS AFTER RETIREMENT: The RP-2000 Combined Mortality Table projected to 2020 using scale AA (set back one year for females) is used for death after service retirement and beneficiaries. The RP-2000 Disabled Mortality Table (set back seven years for males and set forward five years for females) is used for death after disability retirement. Mortality improvement is anticipated under these assumptions as recent mortality experience shows actual deaths are approximately 4% greater for healthy lives and 5% greater for disabled lives than expected under the selected tables. Representative values of the assumed annual rates of death after service retirement and after disability retirement are shown below:

Age	Annual Rate of Death After Service Retirement Male	Service Retirement Female	Disability Retirement Male	Disability Retirement Female
45	0.1161%	0.0745%	2.2571%	1.1535%
50	0.1487	0.1100	2.2571	1.6544
55	0.2469	0.2064	2.6404	2.1839
60	0.4887	0.4017	3.2859	2.8026
65	0.9607	0.7797	3.9334	3.7635
70	1.6413	1.3443	4.6584	5.2230
75	2.8538	2.1680	5.6909	7.2312
80	5.2647	3.6066	7.3292	10.0203
85	9.6240	6.1634	9.7640	14.0049
90	16.9280	11.2205	12.8343	19.4509
95	25.6992	17.5624	16.2186	23.7467

ASSETS: Market Value

EXPENSE LOAD: None.

PERCENT MARRIED: 100%, with females 3 years younger than males.

LOADS: Unused sick leave: 2% of active liability

SCHEDULE D

ACTUARIAL COST METHOD

1. The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future, of each active member's expected benefit at retirement or death is determined, based on his age, service, sex and compensation. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service, disability or survivor's benefit. Future salary increases and post-retirement cost-of-living adjustments are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries and inactive members to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.
2. The employer contributions required to support the benefits of the System are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.
3. The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.
4. The unfunded accrued liability is determined by subtracting the present value of prospective employer normal contributions and member contributions, together with the current actuarial value of assets held, from the present value of expected benefits to be paid from the System.

SCHEDULE E

BOARD FUNDING POLICY

Introduction

Pursuant to the provisions of KRS 161.250, the Board of Trustees ("Board") of the Kentucky Teachers' Retirement Systems ("TRS") is vested with the responsibility for the general administration and management of the retirement system. The Board may adopt procedures necessary to conduct the business of the retirement system as needed. The applicable provisions of the Kentucky Revised Statutes ("state law") shall control if any inconsistency exists between state law and this policy.

Background:

State law provides that the retirement benefits promised to members of TRS are "…an inviolable contract of the Commonwealth…." (KRS 161.714.) To satisfy this solemn commitment, the Commonwealth of Kentucky ("state") is required to pay annual retirement appropriations necessary to fund the benefit requirements of members of the retirement system. All employers participating in TRS are responsible for paying the fixed employer contribution rate set forth in state law. However, the state—as plan guarantor—is solely responsible for paying the additional annual retirement appropriations necessary to keep the retirement system actuarially sound and able to satisfy the contract with members to provide promised benefits. (KRS 161.550(6).)

Since fiscal year 2008, the state has not paid the recommended annual retirement appropriations necessary to pre-fund the benefit requirements of members of the retirement system as determined by the actuary. Over this period of time, because of the failure to fund, the state's annual retirement appropriations have grown significantly from $60.5 million (Fiscal Year 2009) to $520 million (Fiscal Year 2017). The following schedule details the growth of the annual retirement appropriations payable by the state:

	Cumulative Increase as a % of Payroll	Cumulative Increase of Annual Retirement Appropriations Payable by the State
2009	1.88	$ 60,499,800
2010	2.46	82,331,200
2011	3.59	121,457,000
2012	5.81	208,649,000
2013	7.27	260,980,000
2014	8.02	299,420,000
2015	10.42	386,400,000
2016	12.97	487,400,000
2017	13.80	520,372,000

(Source: TRS Report of the Actuary on the Annual Valuation Prepared as of June 30, 2014).

The Board has always taken action as required by state law and recommended annual retirement appropriations payable by the state that would ensure that the state meets the contractual obligations to members. This policy confirms the Board's process for recommending annual retirement appropriations payable by the state and the primary actuarial assumptions and methodologies associated with calculating the annual retirement appropriations. Other related actuarial assumptions and methodologies not listed in this policy are reported in annual valuations, the most recent experience study, or resolutions adopted by the Board.

1. Annual Retirement Appropriations Payable by the State: In each biennial budget request, the Board will recommend annual retirement appropriations payable by the state to meet the benefit requirements of the members of the retirement system. The annual retirement appropriations payable by the state are the sum of the fixed employer contribution rate set by state law and the additional annual retirement appropriations necessary to fund the benefit requirements of members of the retirement system. (KRS 161.550.) The recommended additional annual retirement appropriations payable by the state are calculated by the Board's actuary based upon the results of an annual valuation preceding the beginning of each biennium. (KRS 161.400.)

2. Calculation of Annual Retirement Appropriations Payable by the State: The Board will recommend annual retirement appropriations payable by the state, which—if paid—will meet the benefit requirements of the members of the retirement system consistent with generally accepted actuarial principles. Based upon technical advice from the Board's actuary, the Board hereby adopts the following principles for calculating the recommended annual retirement appropriations payable by the state:

- Use the Entry Age Normal actuarial cost method;
- Use a five-year asset smoothing method;
- Use a thirty-year closed period to amortize legacy unfunded liability ("legacy unfunded liability" is that unfunded liability recognized as of the valuation prepared for June 30, 2014);
- Use a twenty-year closed period to amortize new sources of unfunded liability ("new sources of unfunded liability" is that unfunded liability consisting of all benefit changes, assumption and method changes, and experience gains and/or losses that have occurred since the previous valuation); and
- Reach a 100 percent minimum funded ratio within the thirty-year closed amortization period.

The Board also recognizes that, from time to time, the state may desire to contribute lump sum payments toward satisfaction of unfunded liability rather than amortization of the debt. Total unfunded liability is published in every annual valuation of the retirement system and TRS will work with the state to develop reasonable and appropriate plans for receipt of lump sum payments toward the satisfaction of unfunded liability.

This policy will be reviewed regularly and amended or revised as necessary.

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OPEB Valuation Results June 30, 2016

Teachers' Retirement System of the State of Kentucky

November 21, 2016

TEACHERS' Retirement System TRS KENTUCKY

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Summary of Changes for 2016

Medical Insurance Fund & Life Insurance Fund

- Funded status has improved for the Medical Insurance Fund (MIF).
  - From 18.09% to 21.88%.
- Total annual required contribution (ARC) rate has increased for the MIF.
  - From 6.44% to 6.59%.
- Target Rate of Return for the MIF is 8.00%.
  - Market Value Return of -1.36%.
  - Actuarial Value of Asset Return of 5.90%.
    - Reflects smoothing of investment gains and losses over 5 year period.

Summary of Changes for 2016

Medical Insurance Fund & Life Insurance Fund

- Funded status has decreased for the Life Insurance Fund (LIF).
  - From 98.43% to 91.71%.
- Total contribution rate for the LIF has increased.
  - From 0.03% to 0.04%.
- Target Rate of Return for the LIF is 7.50%.
  - Market Value Return of 5.49%.
  - Actuarial Value of Asset Return of 3.85%.
    - Reflects smoothing of investment gains and losses over 5 year period.

TEACHERS' Retirement System TRS KENTUCKY

Summary of Changes for 2016

Medical Insurance Fund & Life Insurance Fund

- Assumption Changes from Experience Study.
  - Price Inflation changed from 3.5% to 3.0%.
  - Wage Inflation changed from 4.0% to 3.5%.
  - Assumed merit salary scale decreased 0.25% for all ages.
  - Assumed rates of Withdrawal, Disability, Retirement, Mortality, Terminated and Vested Withdrawal, and Retiree Health Care Participation all adjusted to better match experience of System.
- Changes increased liabilities.
  - MIF: $219 Million.
  - LIF: $4 million.

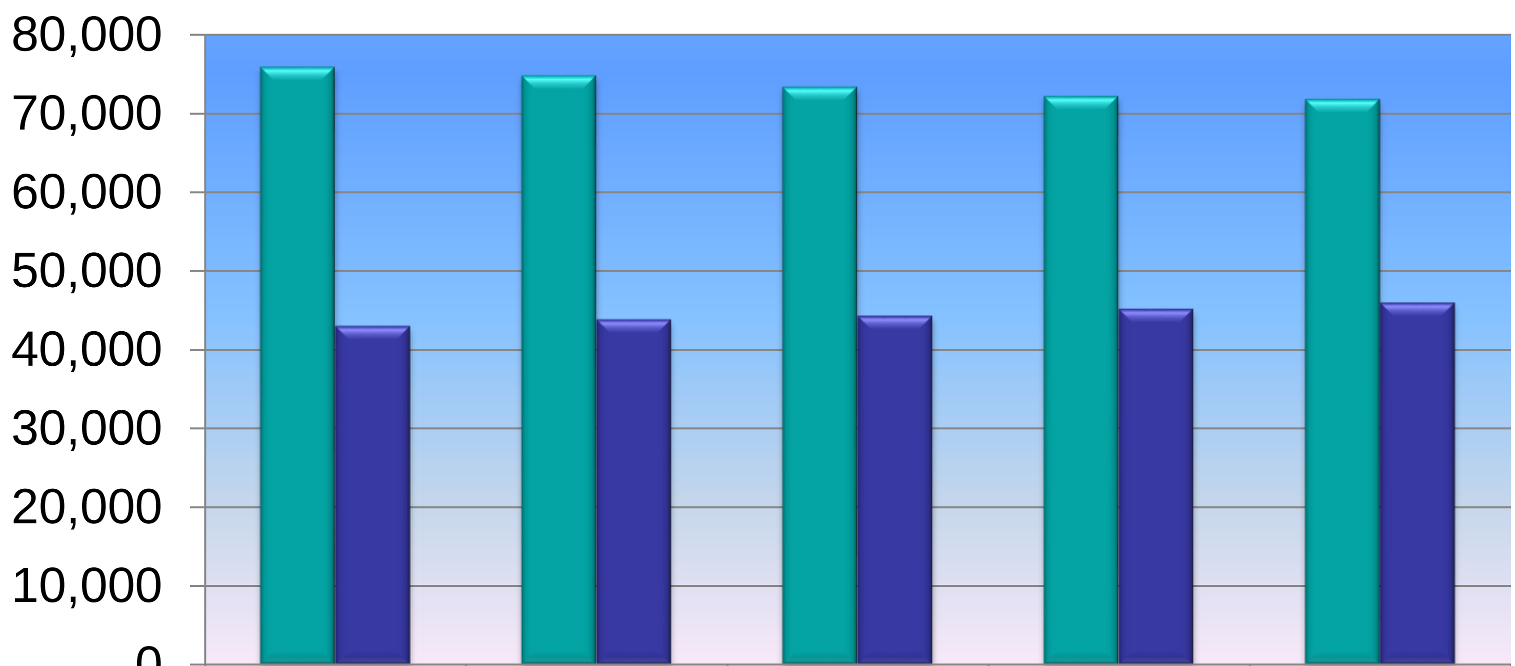
Summary of Changes for 2016

Medical Insurance Fund & Life Insurance Fund

- Medical Insurance Fund (MIF).
  - KEHP and MEHP FY 2017 cost bases are lower than assumed by June 30, 2015 valuation.
  - Increased KEHP contribution for those who retired prior to July 1, 2010.
- Changes decreased MIF liabilities by $278 million.

Census Data – June 30

Medical Insurance Fund

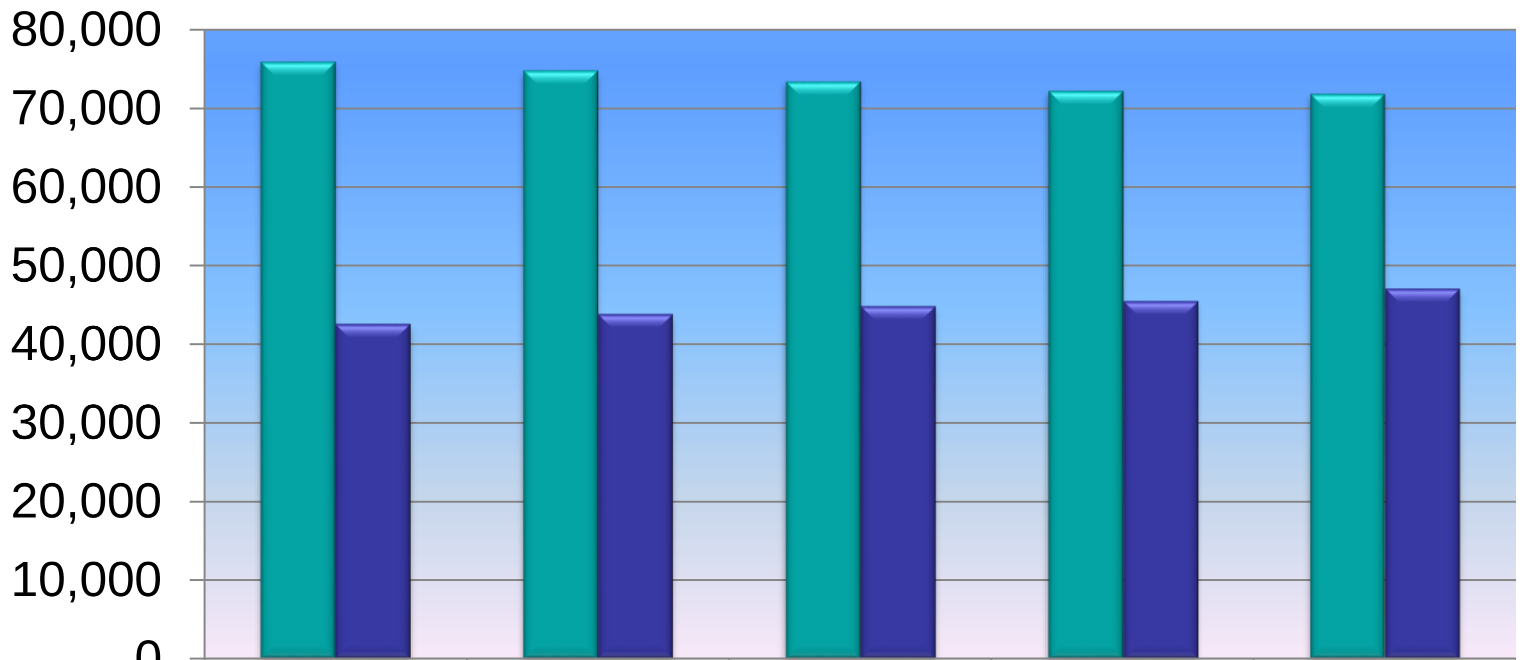


	2012	2013	2014	2015	2016
Actives	75,951	74,831	73,407	72,246	71,848
Retirees*	43,008	43,830	44,306	45,204	45,996

* Includes participating spouses

Census Data – June 30

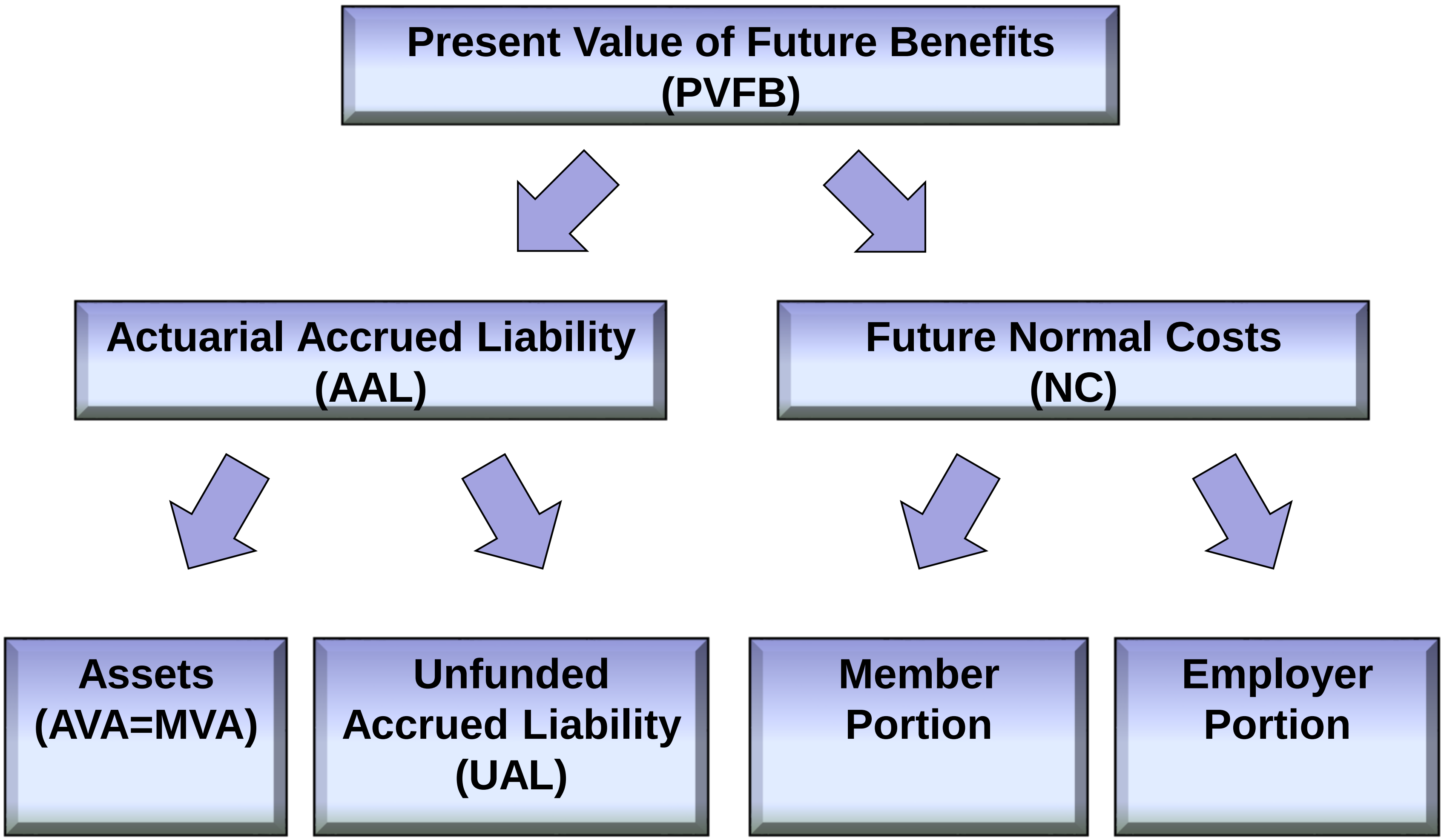
Life Insurance Fund



	2012	2013	2014	2015	2016
Actives	75,951	74,831	73,407	72,246	71,848
Retirees	42,602	43,845	44,855	45,484	47,071

TEACHERS' Retirement System TRS KENTUCKY

Funding Valuation Process



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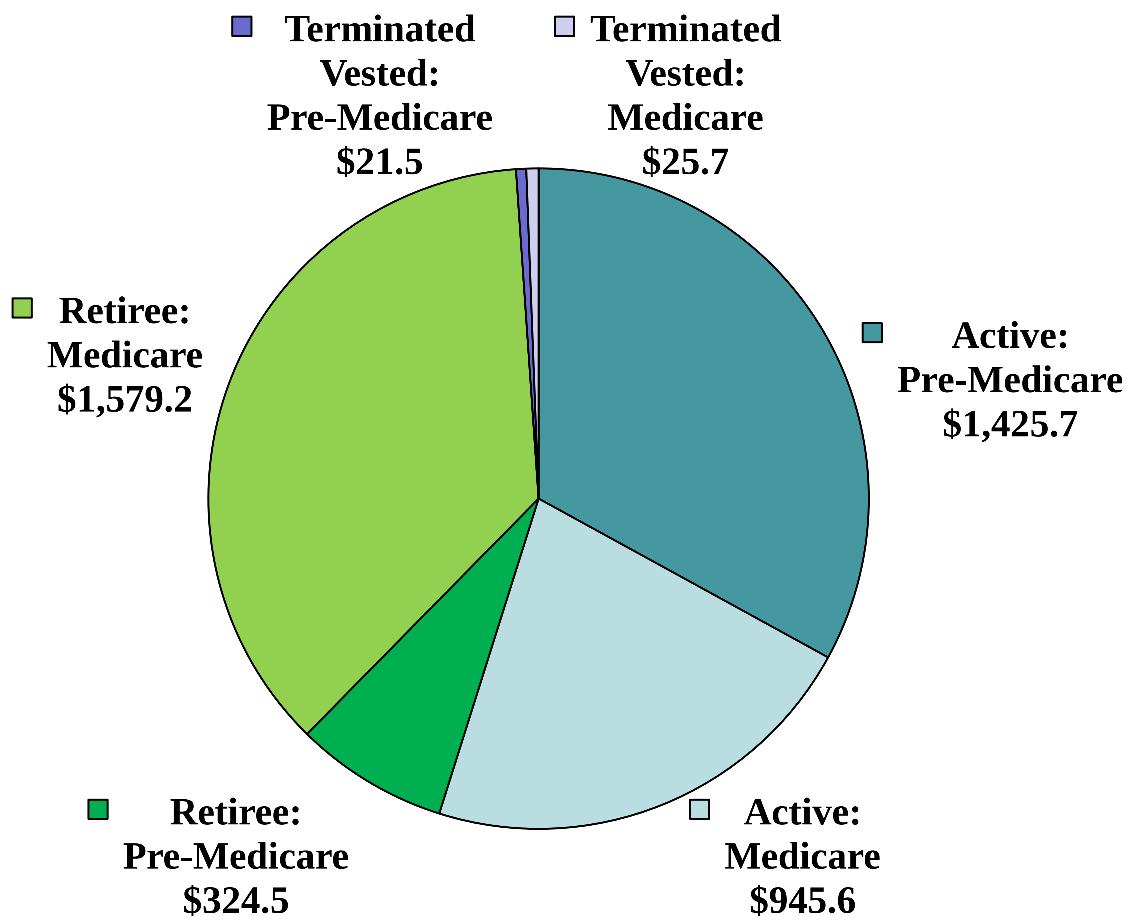
Present Value of Future Benefits ($ Millions)

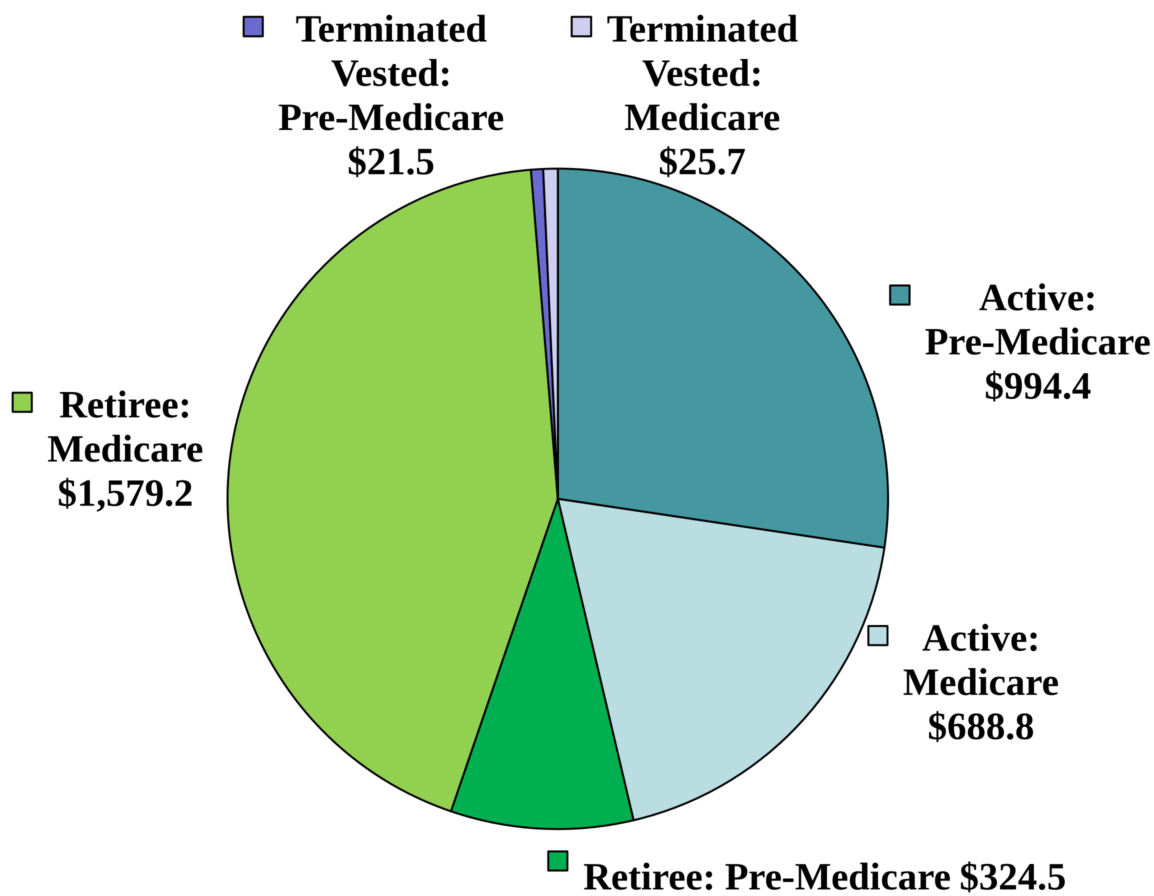
Medical Insurance Fund



Total - $4,322.2

Actuarial Accrued Liability ($ Millions)

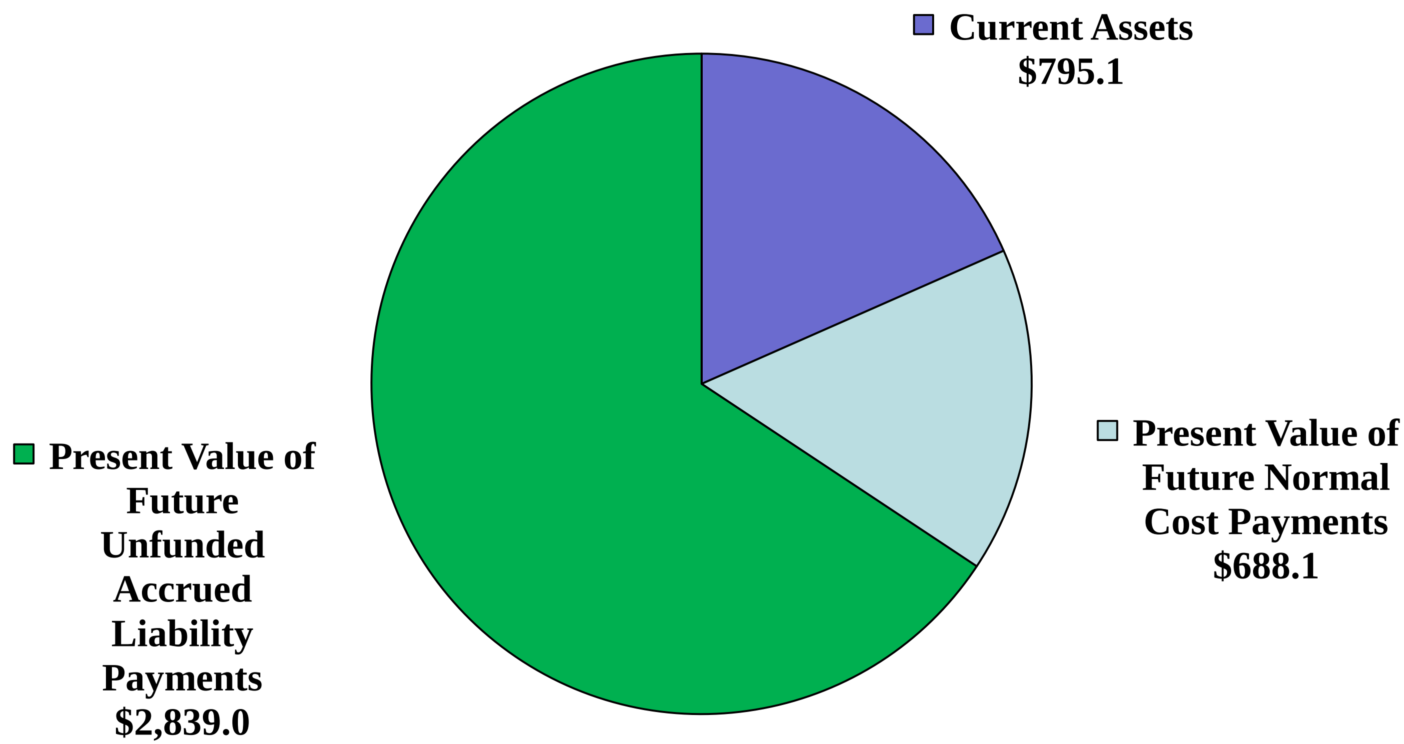
Medical Insurance Fund



Total - $3,634.1

Financing of Retirement Benefit Promises ($ Millions)

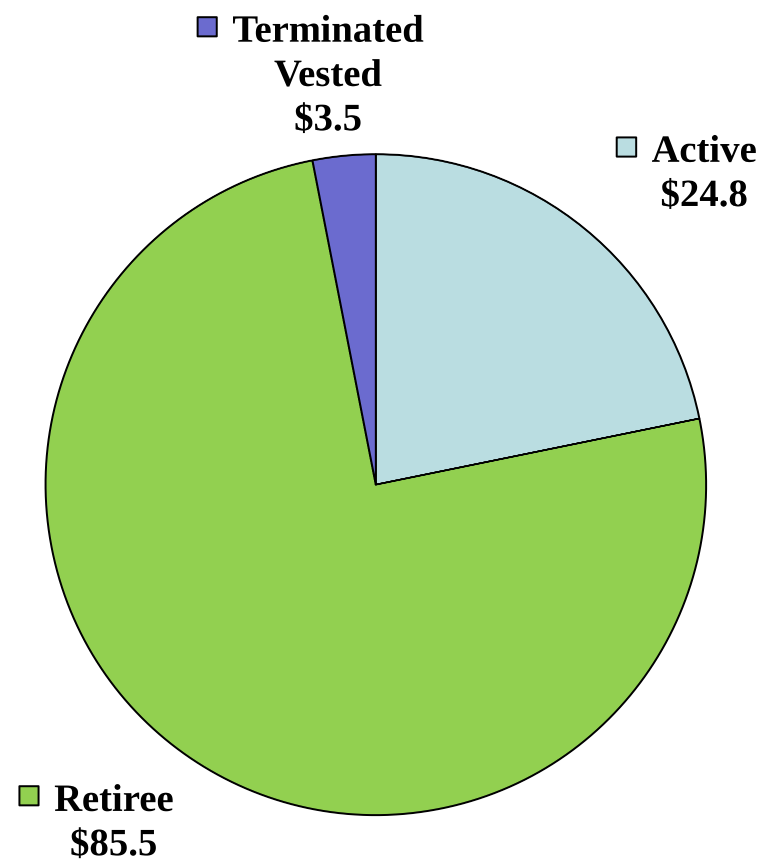
Medical Insurance Fund



Total - $4,322.2

Present Value of Future Benefits ($ Millions)

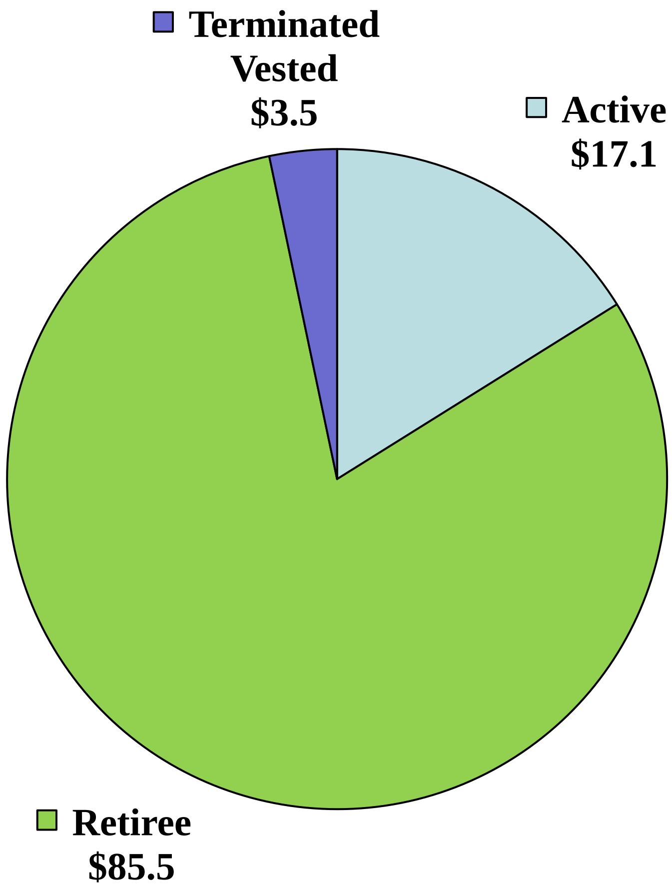
Life Insurance Fund



Total - $113.8

Actuarial Accrued Liability ($ Millions)

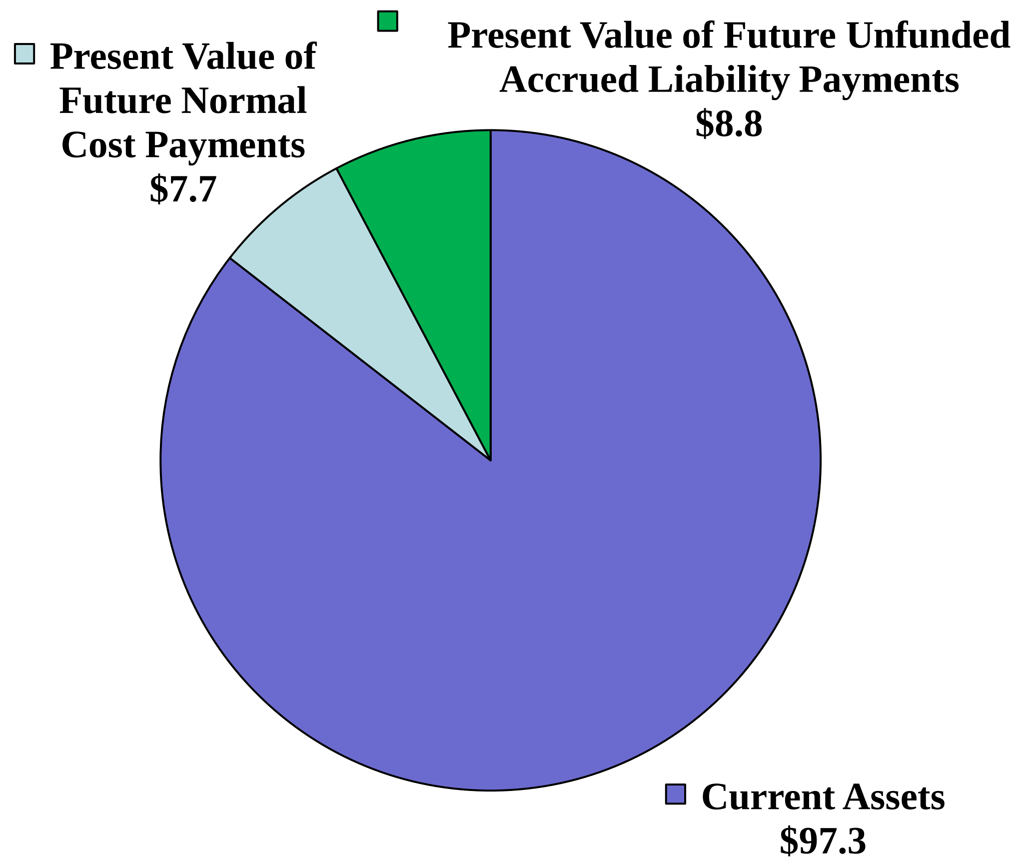
Life Insurance Fund



Total - $106.1

Financing of Retirement Benefit Promises($ Millions)

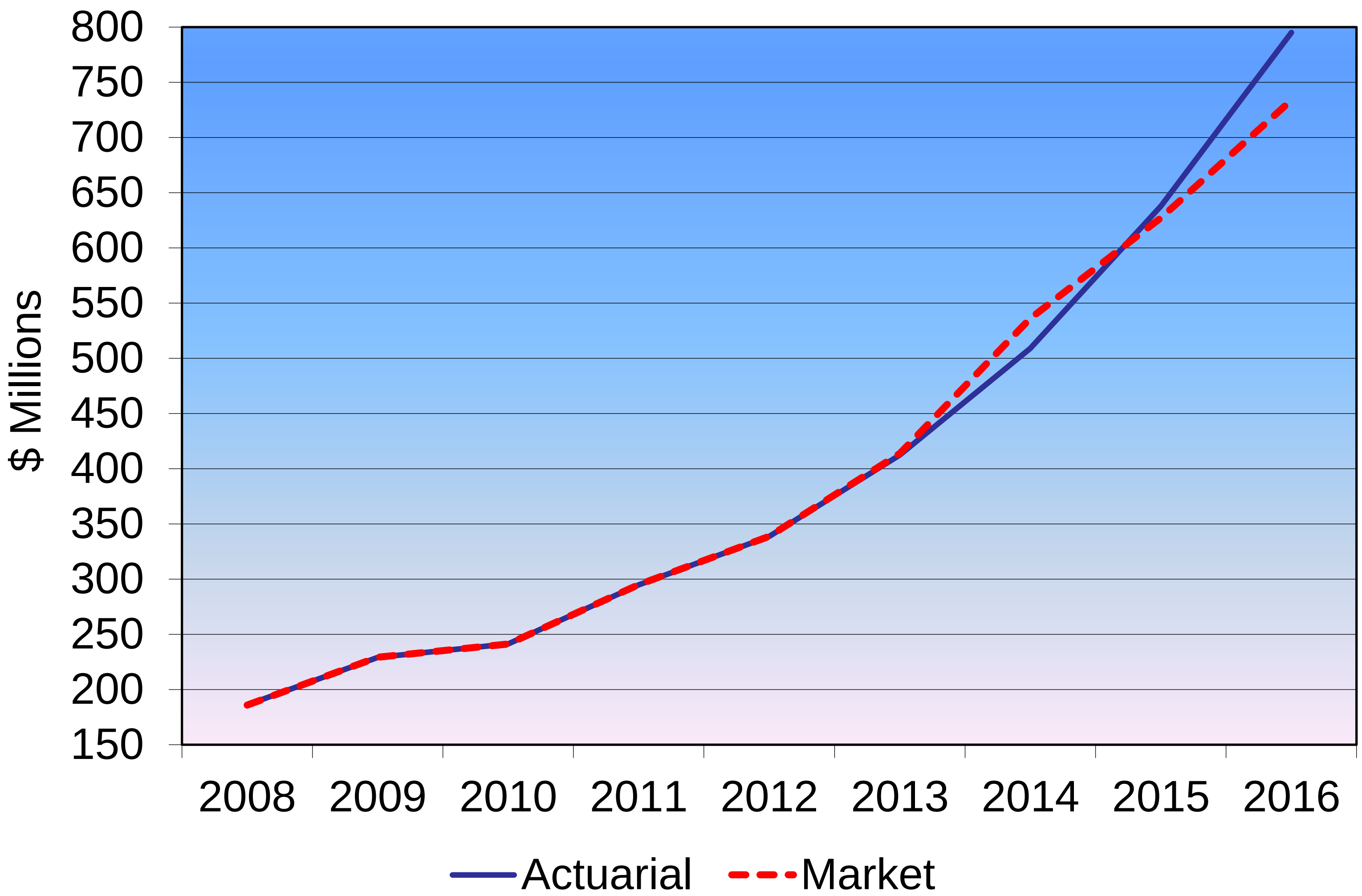
Life Insurance Fund



Total - $113.8

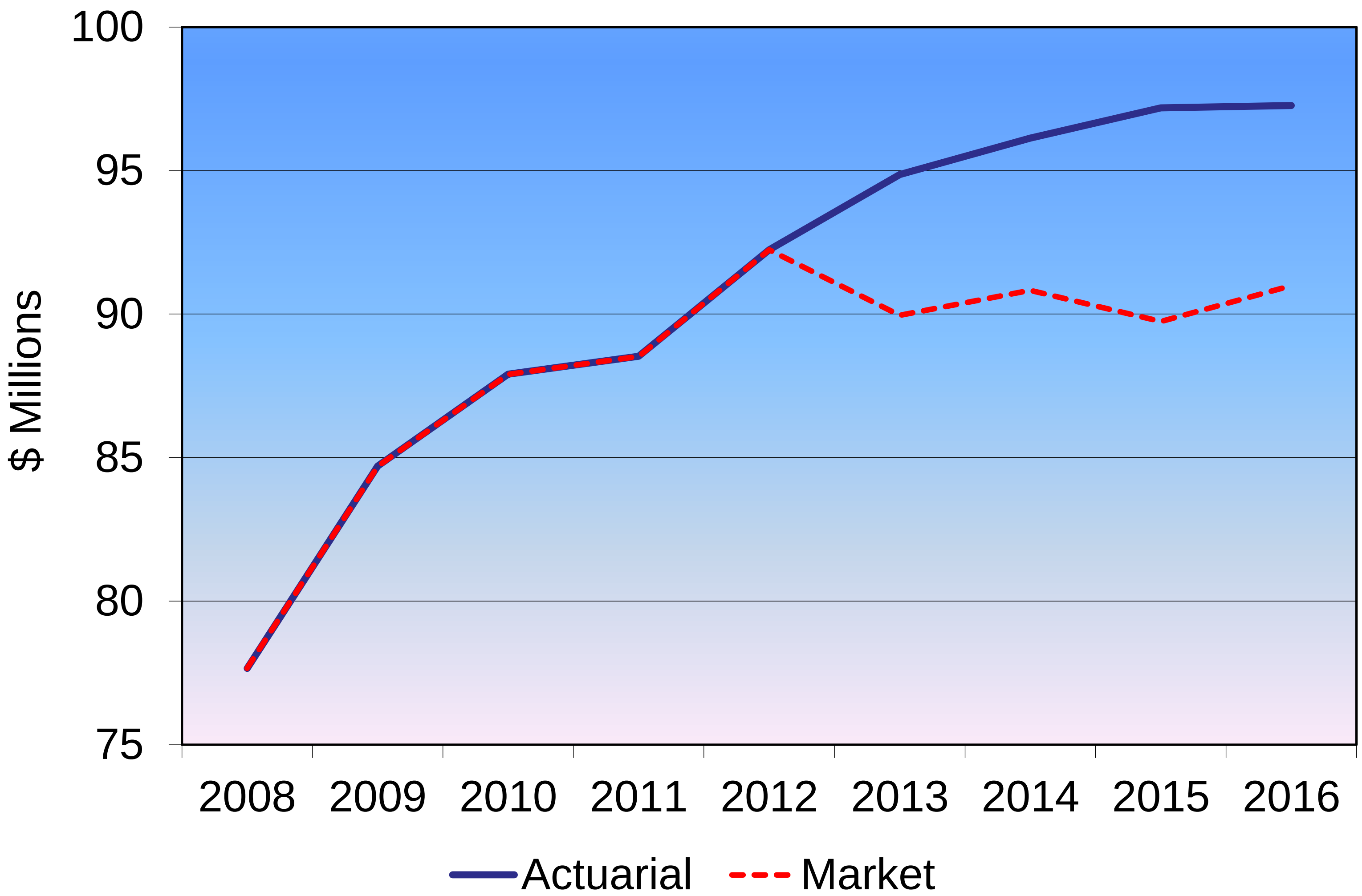
Asset Values

Medical Insurance Fund



Asset Values

Life Insurance Fund



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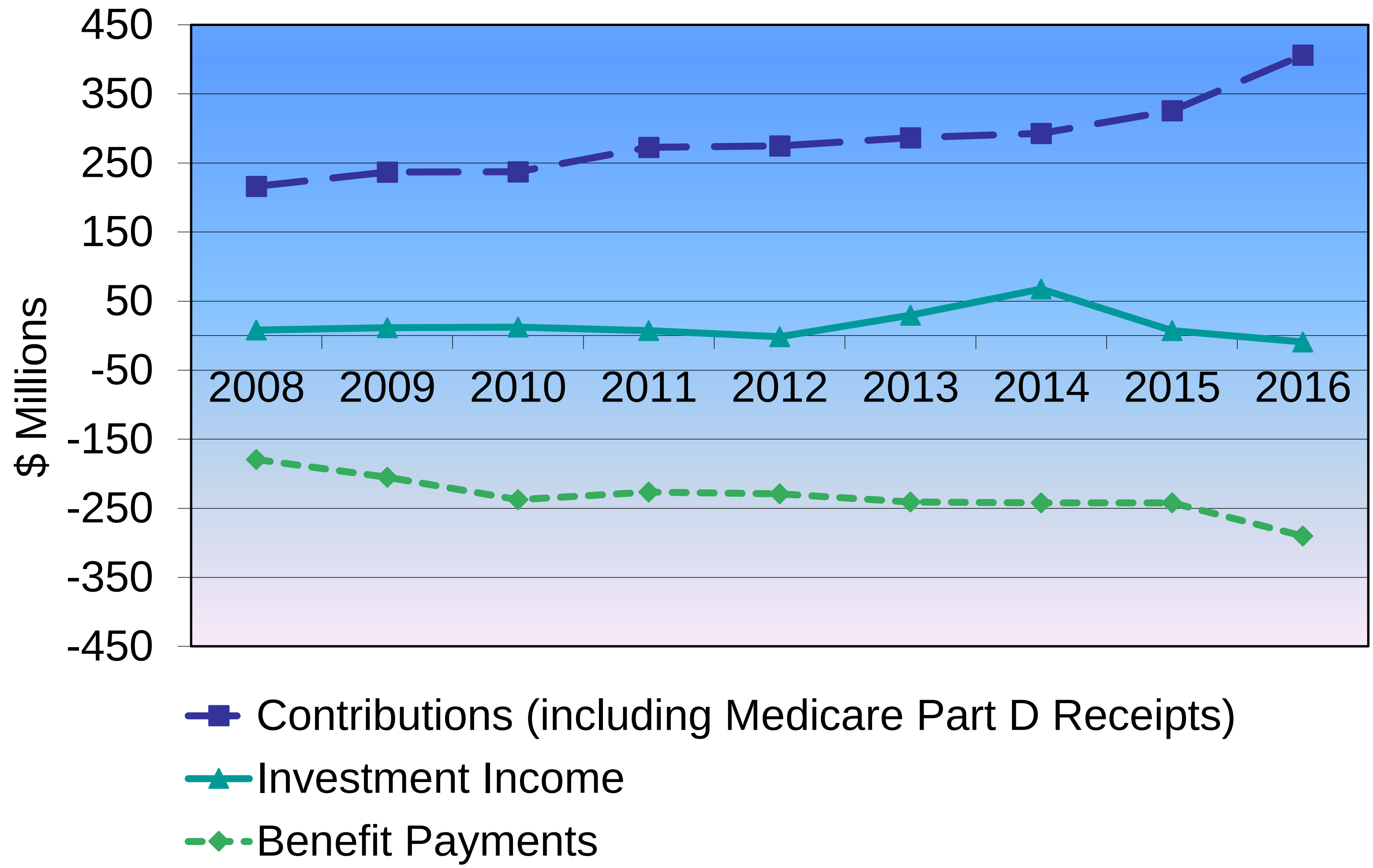
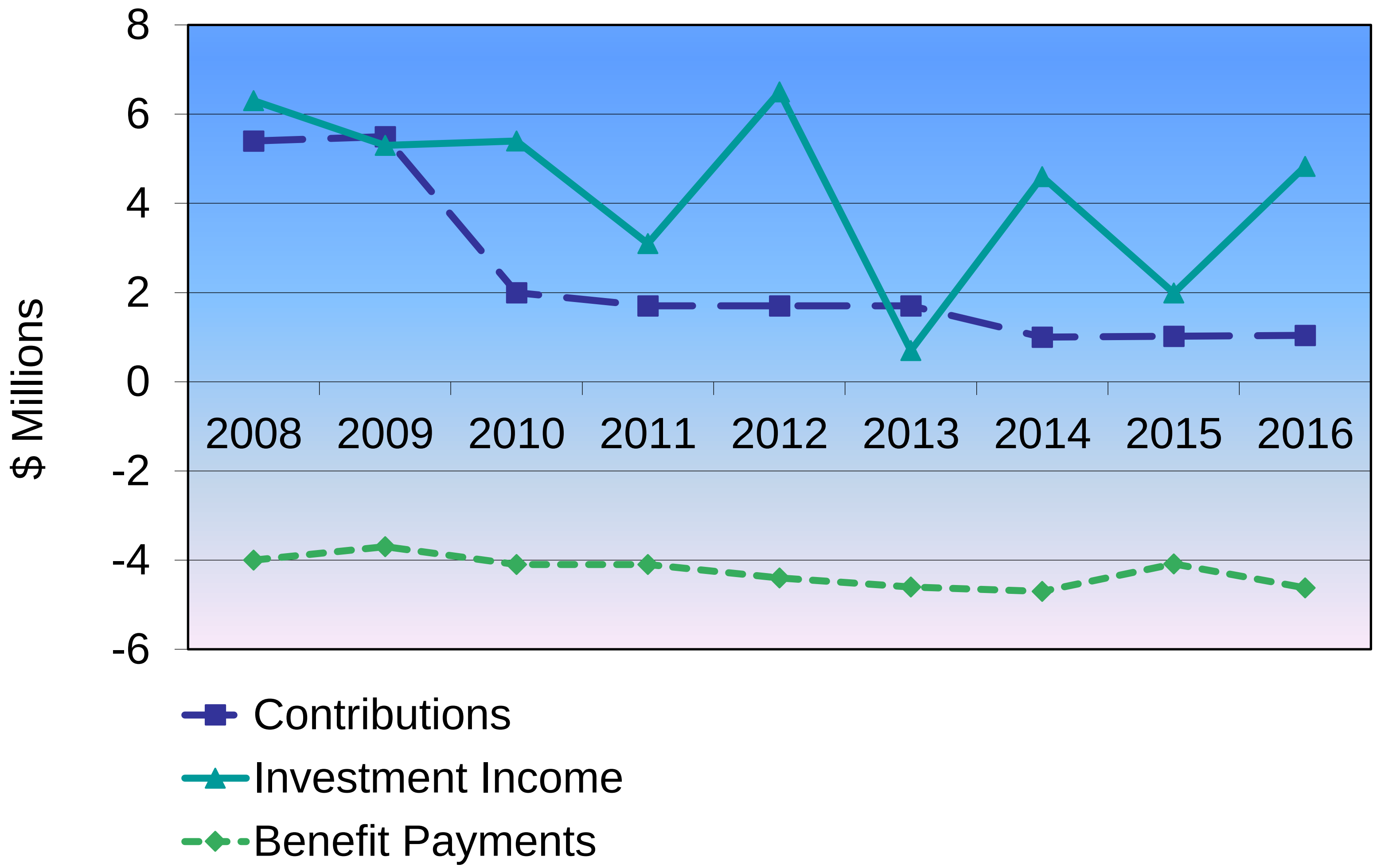
Cash Flow

Medical Insurance Fund



Cash Flow

Life Insurance Fund



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Allocation of Contribution Rate

Medical Insurance Fund

Valuation Year	Normal	Accrued Liability	Total	Member	Employer & State (ARC)	Total
2008	7.60%	6.99%	14.59%	0.81%[1]	13.78%	14.59%
2009	7.53	6.83	14.36	0.81[1]	13.55	14.36
2010	2.32	4.88	7.20	1.73[2]	5.47	7.20
2011	2.00	4.95	6.95	2.22[2]	4.73	6.95
2012	1.99	5.11	7.10	1.73[2]	5.37	7.10
2013	1.92	4.88	6.80	2.22[2]	4.58	6.80
2014	1.79	4.21	6.00	2.95[2]	3.05	6.00
2015	1.95	4.49	6.44	3.69[2]	2.75	6.44
2016	1.95	4.64	6.59	3.69[2]	2.90	6.59

[1] Expected level of active employee contributions for the subsequent fiscal year (before 10RS HB540)
[2] Expected level of active employee contributions for the subsequent fiscal year (after 10RS HB540)
Discount Rate for 2008, and 2009 Medical Plan Valuations = 4.5% (before 10RS HB540)
Discount Rate for 2010, 2011, 2012, 2013, 2014, 2015, and 2016 Medical Plan Valuations = 8.0% (after 10RS HB540)

TEACHERS' Retirement System TRS KENTUCKY

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Allocation of Contribution Rate

Life Insurance Fund

Valuation Year	Normal	Accrued Liability	Total	Member	Employer & State (ARC)	Total
2008	0.04%	0.01%	0.05%	0.00%	0.05%	0.05%
2009	0.04	0.01	0.05	0.00	0.05	0.05
2010	0.04	0.01	0.05	0.00	0.05	0.05
2011	0.03	0.00	0.03	0.00	0.03	0.03
2012	0.03	0.00	0.03	0.00	0.03	0.03
2013	0.03	0.00	0.03	0.00	0.03	0.03
2014	0.03	0.00	0.03	0.00	0.03	0.03
2015	0.03	0.00	0.03	0.00	0.03	0.03
2016	0.03	0.01	0.04	0.00	0.04	0.04

Discount Rate for Life Plan Valuations = 7.5%

2016 Experience Gain/Loss

($ Millions)

Experience Gain/(Loss) of the:	MIF	LIF
(1) Unfunded Actuarial Accrued Liability (UAAL) as of 6/30/2015	$2,887.7	$ 1.6
(2) Normal Cost from last valuation	68.4	1.0
(3) Expected employer contributions	226.2	1.0
(4) Interest accrual: [(1)+(2)-(3)]x i (i=8.0% for MIF, 7.5% for LIF)	218.4	0.1
(5) Expected UAAL before changes: (1)+(2)-(3)+(4)	$2,948.3	$ 1.7
(6) Change due to benefit provisions	(8.3)	0.0
(7) Change due to new actuarial assumptions	218.8	3.9
(8) Change due to claims experience	(269.2)	0.0
(9) Expected UAAL after changes: (5)+(6)+(7)+(8)	$2,889.6	$ 5.6
(10) Actual UAAL as of 6/30/2016	$2,839.0	$ 8.8
(11) Total gain/(loss): (9)-(10)	50.6	(3.2)
(a) Contribution shortfall and investment gain/(loss)	113.2	(3.5)
(b) Experience gain/(loss): (11)-(11a)	$ (62.6)	$ 0.3
(12) Accrued liabilities as of 6/30/2015	$3,525.6	$ 98.7
(13) Experience gain/(loss) as % of AAL at start of year: (11b)/(12)	(1.8%)	0.3%

Benefits of Pre-Funding

Medical Insurance Fund

Contributions for Fiscal Year Ending June 30, 2016			
Discount Rate	4.50%	7.50%	8.00%
Normal	5.26%	2.24%	1.95%
Accrued Liability	5.56	4.76	4.64
Total	10.82%	7.00%	6.59%
Member	3.69%	3.69%	3.69%
Employer (ARC)	2.97	2.97	2.97
State (ARC)	4.16	0.34	(0.07)
Total	10.82%	7.00%	6.59%

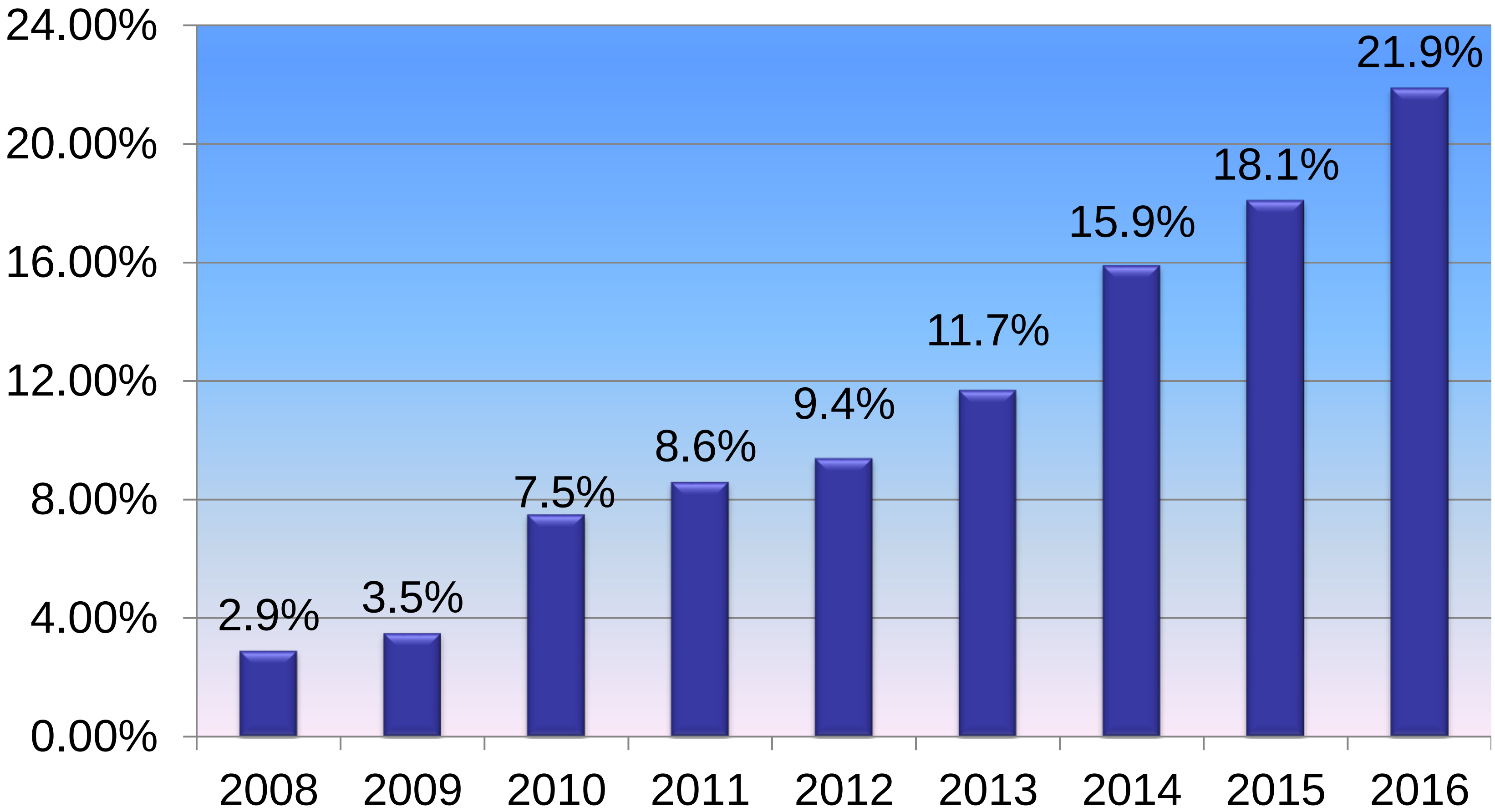
Medical Insurance Fund Stabilization Funding

Fiscal Years	Loan Amount	Annual Payment	Balances as of June 30, 2015
2008/2009*	$ 8,400,000	$1,228,900	$ 3,274,213
2009/2010*	9,200,000	1,345,200	4,611,791
2010/2011*	10,700,000	1,564,500	6,473,479
2011/2012	12,300,000	1,798,700	8,627,015
Total	$40,600,000	$5,937,300	$22,986,498

* For non-single subsidy funding.

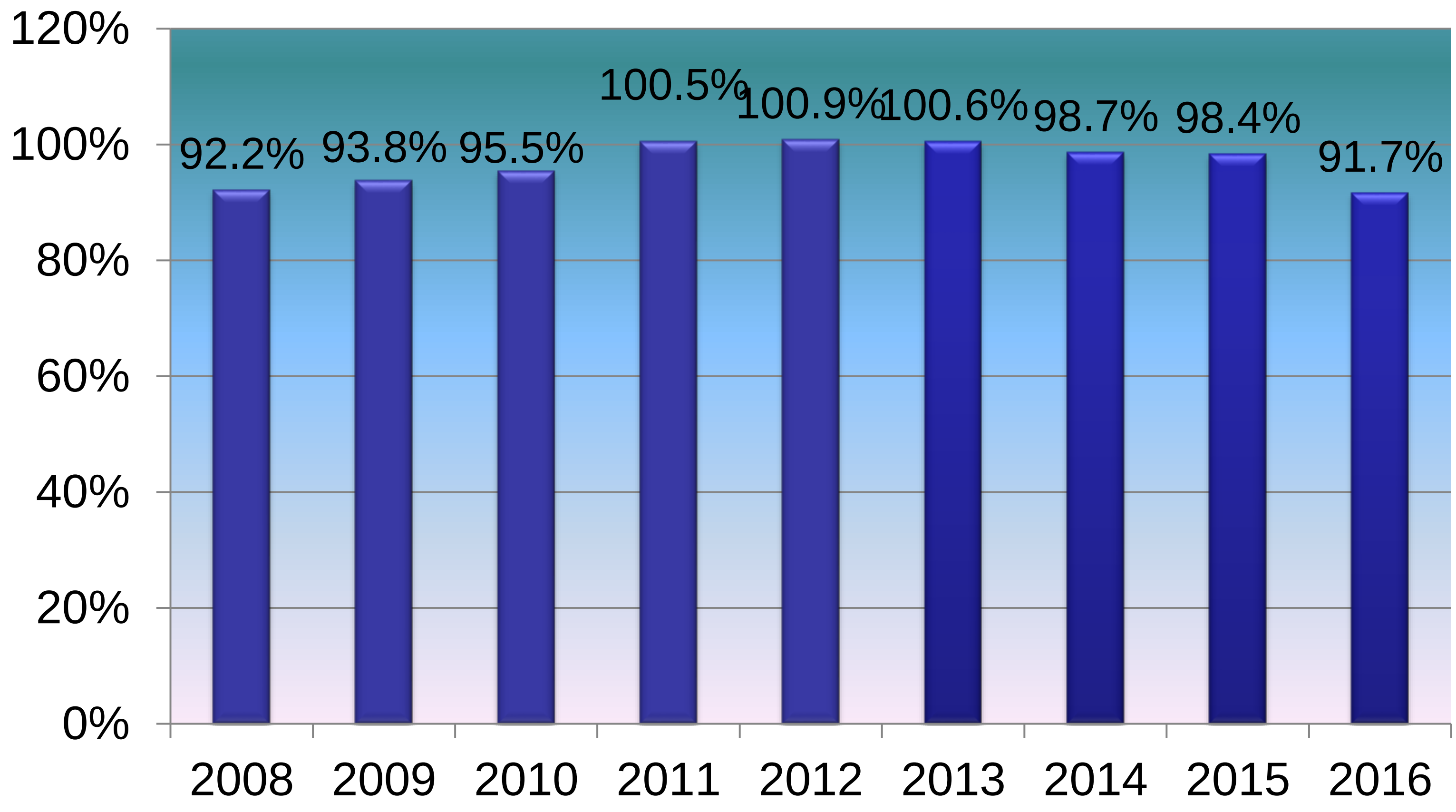
Funded Percentage

Medical Insurance Fund



Funded Percentage

Life Insurance Fund



New Accounting Standards

GASB 74 and GASB 75

- On June 2, 2015, GASB Statement No. 74 and GASB Statement No. 75 (GASB 74 and 75) were unanimously adopted by the GASB Board.
- The disclosure requirements of GASB 74 and 75 will be similar to the disclosure requirements for pension benefits under GASB Statement No. 67 and GASB Statement No. 68.
  - Total OPEB Liability (TOL), Net OPEB Liability (NOL), OPEB Expense (OE), Deferred Inflows, Deferred Outflows, etc.
  - Proportionate share of the total for cost-sharing employers.
- Effective date for KTRS plans (GASB 74) is the fiscal year ending June 30, 2017 and for KTRS employers (GASB 75) for the fiscal year ending June 30, 2018.

New Accounting Standards

GASB 74 and GASB 75

- De-linking OPEB Expense and OPEB Funding.
  - GASB's authority extends only to accounting and financial reporting, not to funding.
  - May need to create written funding policies for OPEB plans.
    - Review Amortization of Unfunded Accrued Liability
- Will require 2 types of actuarial reports, one type for funding and another type for accounting.

New Accounting Standards

GASB 74 and GASB 75

- The discount rate is based on the long-term expected return on assets held in the trust unless the fund is expected to be depleted before all benefit payments are made.
  - If the fund is expected to be depleted before all benefit payments are made, then the use of a blended, single rate that is the benefit payment weighted equivalent of the long-term rate while assets are available and a municipal bond index while in pay-as-you-go status.
    - A lower discount rate will result in a higher liability and expense.
    - Bond Buyer General Obligation 20-year Municipal Bond Index (published monthly by the Board of Governors of the Federal Reserve System) was 3.82% as of June 2015.
- New standards require the actuarial cost method to be Entry Age Normal (EAN).
  - Addressed with 6/30/2011 valuation when change was made for the pension plan.

CM

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TEACHERS'
Retirement System
TRS
KENTUCKY

Teachers' Retirement System of the State of Kentucky Report of the Actuary on the Annual Valuation of the Retiree Medical and Life Insurance Plans

Prepared as of June 30, 2016

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November 21, 2016

Board of Trustees
Teachers' Retirement System of the
State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:

Governmental Accounting Standards Board Statements No. 43 and 45 require the Teachers' Retirement System of the State of Kentucky (the System) to conduct actuarial valuations of the System's retiree medical and other post-employment benefit plans. This report covers the Retiree Medical Plan funded by the Medical Insurance Fund (MIF) and OPEB liabilities related to the Life Insurance Plan funded by the Life Insurance Fund (LIF). Cavanaugh Macdonald Consulting, LLC (CMC) has submitted the results of the annual actuarial valuation prepared as of June 30, 2016. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

The valuation indicates a total annual required contribution of 6.59% of active member payroll for the MIF payable for the fiscal year ending June 30, 2017 is required to support the benefits of the Kentucky Employees' Health Plan (KEHP) and the Medicare Eligible Health Plan (MEHP). Of this amount, 2.775% of payroll is estimated to be paid by University members and 3.750% of payroll is estimated to be paid by all other members, leaving 3.815% and 2.840% respectively, as the remaining annual required contribution. This annual required contribution reflects the actuarial value of assets of the MIF and an 8.00% discount rate for valuing liabilities.

Since the previous valuation, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2015. These revised changes were adopted by the Board on September 19, 2016 and are discussed on page 4 of the report. Additionally, the results of the valuation include a change to the KEHP dependent subsidies offered to retirees who retired prior to July 1, 2010. Finally, the initial per capita costs of health care and the rates of health care inflation used to project the per capita health care costs have been revised since the previous valuation to reflect recent experience and revised expectations.

The Life Insurance Plan valuation indicates a total annual required contribution of 0.04% of active member payroll payable for the fiscal year ending June 30, 2019 is required to support the benefits of the LIF. This annual required contribution reflects the actuarial value of assets of the LIF and a 7.50% discount rate for valuing liabilities.

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Board of Trustees
November 21, 2016
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The promised benefits of the Retiree Medical and Life Insurance Plans are included in the actuarially calculated contribution rates that are developed using the entry age normal actuarial cost method. Five-year market related value of plan assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded accrued liability that is being amortized by regular annual contributions as a level percentage of payroll within a 30-year period, on the assumption that payroll will increase by 3.50% annually. The assumptions recommended by the actuary and adopted by the Board are in aggregate reasonably related to the experience under the Retiree Medical and Life Insurance Plans and to reasonable expectations of anticipated experience under the Retiree Medical and Life Insurance Plans and meet the parameters for the disclosures under GASB 43 and 45.

CMC has prepared the trend information shown in the Schedule of Funding Progress in the Financial Section of the Annual Report and Section VII shown in the Actuarial Section of the Annual Report.

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Retiree Medical and Life Insurance Plans and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the Plans.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the recommended funding amount for the System. The asset values used to determine unfunded liabilities and funded ratios are not market values, but less volatile market-related values. A smoothing technique is applied to market values to determine the market-related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return of assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

In our opinion, if the contributions to the Medical Insurance Fund continue at the current statutorily required levels, the funded ratio of the Retiree Medical Plan will continue to increase, and the ability of the MIF to fund the benefits called for under the Retiree Medical Plan will improve.

Respectfully submitted,

Eric Gary, FSA, FCA, MAAA	Alisa Bennett, FSA, EA, FCA, MAAA
Principal and Chief Health Actuary	Principal and Consulting Actuary

EG/AB:bs

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TEACHERS' RETIREMENT SYSTEM
OF THE STATE OF KENTUCKY
REPORT OF THE ACTUARY ON THE ANNUAL VALUATION
OF THE RETIREE MEDICAL AND LIFE INSURANCE PLANS
PREPARED AS OF JUNE 30, 2016

SECTION I - SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the valuation and a comparison with the results of the previous valuation are summarized below:

MEDICAL INSURANCE FUND
(Dollar amounts in $1,000's)

Valuation Date	June 30, 2016	June 30, 2015
Number of active members	71,848	72,246
Annual salaries	$3,537,226	$3,515,113
Number of deferred vested members	8,145	5,430
Number of annuitants in medical plans	38,815	38,075
Number of spouses and beneficiaries in medical plans*	7,181	7,129
Total	45,996	45,204
Assets:		
Market value	$ 733,781	$ 626,962
Actuarial value	$ 795,055	$ 637,839
Unfunded actuarial accrued liability	$2,839,018	$2,887,745
Amortization period (years)	30	30
Discount rate	8.00%	8.00%

**Spouses of post-65 retirees and surviving spouses of deceased retirees with a date of death on or after July 1, 2002 pay 100% of the full contribution. 100% of the full contribution for non-Medicare eligible dependents is paid through a combination of payments from beneficiaries and the State.*

MEDICAL INSURANCE FUND CONTRIBUTION RATES FOR UNIVERSITY MEMBERS

Valuation Date	June 30, 2016		June 30, 2015	
Contribution for fiscal year ending:	June 30, 2017		June 30, 2016	
	Hired prior to 7/1/08	Hired on or after 7/1/08	Hired prior to 7/1/08	Hired on or after 7/1/08
Normal	1.95%	1.95%	1.95%	1.95%
Accrued liability	4.64	4.64	4.49	4.49
Total	6.59%	6.59%	6.44%	6.44%
Member	2.775%	2.775%	2.775%	2.775%
Employer (ARC)	2.775	1.775	2.775	1.775
State (ARC)	1.040	2.040	0.890	1.890
Total	6.590%	6.590%	6.440%	6.440%

MEDICAL INSURANCE FUND CONTRIBUTION RATES FOR SCHOOL DISTRICT EMPLOYEES (NON-FEDERAL)

Valuation Date	June 30, 2016		June 30, 2015	
Contribution for fiscal year ending:	June 30, 2017		June 30, 2016	
	Hired prior to 7/1/08	Hired on or after 7/1/08	Hired prior to 7/1/08	Hired on or after 7/1/08
Normal	1.95%	1.95%	1.95%	1.95%
Accrued liability	4.64	4.64	4.49	4.49
Total	6.59%	6.59%	6.44%	6.44%
Member	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	3.000	3.000	3.000	3.000
State (ARC)	(0.160)	(0.160)	(0.310)	(0.310)
Total	6.590%	6.590%	6.440%	6.440%

MEDICAL INSURANCE FUND CONTRIBUTION RATES FOR OTHER EMPLOYEES

Valuation Date	June 30, 2016		June 30, 2015	
Contribution for fiscal year ending:	**June 30, 2017**		**June 30, 2016**	
	Hired prior to 7/1/08	Hired on or after 7/1/08	Hired prior to 7/1/08	Hired on or after 7/1/08
Normal	1.95%	1.95%	1.95%	1.95%
Accrued liability	4.64	4.64	4.49	4.49
Total	6.59%	6.59%	6.44%	6.44%
Member	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	3.750	2.750	3.750	2.750
State (ARC)	(0.910)	0.090	(1.060)	(0.060)
Total	6.590%	6.590%	6.440%	6.440%

LIFE INSURANCE FUND
(Dollar amounts in $1,000's)

Valuation Date	June 30, 2016	June 30, 2015
Number of active members	71,848	72,246
Annual salaries	$3,537,226	$3,515,113
Number of vested former members	9,058	4,295
Number retirees in Life Insurance Plan	47,071	45,484
Assets:		
Market value	$90,991	$89,747
Actuarial value	$97,269	$97,186
Unfunded actuarial accrued liability*	$ 8,790	$ 1,553
Amortization period (years)	30	30
Discount rate	7.50%	7.50%
Contribution for fiscal year ending:	**June 30, 2019**	**June 30, 2018**
Normal	0.03%	0.03%
Accrued liability	0.01	0.00
Total	0.04%	0.03%

** Includes liability for death in active service. This amount could be segregated from the OPEB liability and assets could be split for active and post-employment purposes. However, since this could be administratively burdensome and since death in active service liabilities can be considered de minimis, it is acceptable to consider the entire liability an OPEB liability under GASB 43 and 45.*

2. The valuation indicates combined member, employer, and State contributions of 6.59% of active member payroll would be sufficient to support the current benefits of the Retiree Medical Plan and State contributions of 0.04% of active member payroll would be sufficient to support the current benefits of the Life Insurance Plan. Comments on the valuation results as of June 30, 2016 are given in Section IV and further discussion of the contribution levels is set out in Sections VI and VII.

3. Since the previous valuation, various economic and demographic assumptions have been revised to reflect the results of the experience investigation for the five-year period ending June 30, 2015. The changes adopted by the Board on September 19, 2016, include various demographic and economic assumptions summarized below:

   - Price Inflation changed assumed rate from 3.50% to 3.00%,
   - Wage Inflation changed assumed rate from 4.00% to 3.50%,
   - Assumed Salary Scale adjusted to reflect a decrease of 0.25% in merit & promotion for all ages, and
   - Assumed rates of Withdrawal, Disability, Retirement, and Mortality have been adjusted to reflect experience more closely.
   - Assumed rates of Retiree Medical Plan coverage election, spouse coverage by the Retiree Medical Plan, terminated and vested withdrawal, and terminated and vested participation in the Retiree Medical Plan have been adjusted to reflect experience more closely.
   - The assumed age difference between covered male and female spouses has been adjusted to reflect experience more closely.

   Additionally, the initial per capita costs of health care and the rates of health care inflation used to project the per capita health care costs have been revised to reflect recent experience.

4. Since the previous valuation, there has been a change to the KEHP dependent subsidies offered to retirees. KEHP-participating members who retired prior to July 1, 2010 will no longer be provided a premium subsidy for dependent coverage after June 30, 2016.

SECTION II - MEMBERSHIP DATA

1. Data regarding the membership of the Retiree Medical and Life Insurance Plans for use as a basis of the valuation were furnished by the System's office. The following tables summarize the membership of the System as of June 30, 2016, upon which the valuation was based. Detailed tabulations of the data are given in Schedule F.

ACTIVE MEMBERS AS OF JUNE 30, 2016

Group	Number	Annual Salaries ($1,000's)
University Full Time hired before 7/1/2008	1,833	$ 137,213
University Full Time hired after 7/1/2008	1,453	72,056
Non-University Full Time hired before 7/1/2008	38,065	2,429,982
Non-University Full Time hired after 7/1/2008	18,846	826,256
Non-University Part Time hired before 7/1/2008	2,797	24,219
Non-University Part Time hired after 7/1/2008	8,804	47,500
Total	71,848	$3,537,226

2. The following tables show the number of retired members and their beneficiaries receiving health care as of the valuation date as well as average ages.

RETIREES RECEIVING HEALTH BENEFITS AS OF JUNE 30, 2016

	Under 65	Over 65	Total
Number	11,813	27,002	38,815
Average Age	60.3	73.9	69.8

SPOUSES RECEIVING HEALTH BENEFITS AS OF JUNE 30, 2016

	Under 65	Over 65	Total
Number	2,790	4,391	7,181
Average Age	59.2	74.9	68.8

3. The Retiree Medical Plan valuation includes 8,145 deferred vested members eligible for health care at age 60 and the Life Insurance Plan valuation includes 9,058 deferred vested members eligible for retiree life insurance at age 60.

SECTION III - ASSETS

1. As of June 30, 2016, the market value of MIF assets held by the Retiree Medical Plan amounted to $733,780,967 and the market value of LIF assets held by the Life Insurance Plan amounted to $90,990,928.
2. The five-year market related value of MIF assets used for valuation purposes as of June 30, 2016 was $795,055,116 and the five-year market related value of LIF assets used for valuation purposes as of June 30, 2016 was $97,268,990. Schedule B shows the development of the actuarial value of assets as of June 30, 2016.
3. Schedule C shows the receipts and disbursements for the year preceding the valuation date and a reconciliation of the asset balances for the MIF and the LIF.

SECTION IV - COMMENTS ON VALUATION

1. Schedule A of this report outlines the results of the actuarial valuation. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule D.
2. The valuation shows the Retiree Medical Plan has an actuarial accrued liability of $1,683,152,725 for benefits expected to be paid on account of the present active membership, based on service to the valuation date. The liability on account of deferred vested members amounts to $47,229,083. The liability on account of benefits payable to retirees and covered spouses amounts to $1,903,691,219. The total actuarial accrued liability of the Retiree Medical Plan amounts to $3,634,073,027. Against these liabilities, the Retiree Medical Plan has present assets for valuation purposes of $795,055,116. When this amount is deducted from the actuarial accrued liability of $3,634,073,027, there remains $2,839,017,911 as the unfunded actuarial accrued liability for the Retiree Medical Plan.
3. The normal contribution is equal to the actuarial present value of benefits accruing during the current year. The normal contribution for the Retiree Medical Plan is determined to be $69,042,666, or 1.95% of payroll.

4. The valuation shows that the Life Insurance Plan has an actuarial accrued liability of $17,050,108 for benefits expected to be paid on account of the present active membership, based on service to the valuation date. The liability on account of deferred vested members amounts to $3,470,026. The liability on account of benefits payable to retirees amounts to $85,538,672. The total actuarial accrued liability of the Life Insurance Plan amounts to $106,058,806. This amount includes liability for death in active service. The liability for death in active service could be segregated from the OPEB liability and assets could be split for active and post-employment purposes. As this could be administratively burdensome and, as death in active service liabilities can be considered de minimis, it is viewed to be acceptable to consider the entire liability an OPEB liability under GASB 43 and 45. Against these liabilities, the Life Insurance Plan has present assets for valuation purposes of $97,268,990. When this amount is deducted from the actuarial accrued liability of $106,058,806, there remains $8,789,816 as the unfunded actuarial accrued liability for the life insurance plan.
5. The normal contribution is equal to the actuarial present value of benefits accruing during the current year. The normal contribution for the life insurance plan is determined to be $992,606, or 0.03% of payroll.

SECTION V – DERIVATION OF EXPERIENCE GAINS AND LOSSES

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) for the year ended June 30, 2016 is shown below ($1,000's).

Experience Gain/(Loss) of the:			Medical Insurance Fund	Life Insurance Fund
(1)		UAAL* as of 6/30/2015	$2,887,745	$ 1,553
(2)		Normal cost from last valuation	68,409	1,038
(3)		Expected employer contributions	226,232	1,024
(4)		Interest accrual: [(1) + (2) - (3)] x interest**	218,394	118
(5)		Expected UAAL before changes: (1) + (2) - (3) + (4)	$2,948,316	$ 1,685
(6)		Change due to benefit provisions	(8,264)	0
(7)		Change due to new actuarial assumptions	218,842	3,927
(8)		Change due to claims experience	(269,249)	0
(9)		Expected UAAL after changes: (5) + (6) + (7) + (8)	$2,889,645	$ 5,612
(10)		Actual UAAL as of 6/30/2016	$2,839,018	$ 8,790
(11)		Total gain/(loss): (9) - (10)	50,627	(3,178)
	(a)	Contribution and investment gain/(loss)	113,260	(3,507)
	(b)	Experience gain/(loss) (11) - (11a)	$ (62,633)	$ 329
(12)		Accrued liabilities as of 6/30/2015	$3,525,584	$98,739
(13)		Experience gain/(loss) as percent of actuarial accrued liabilities at start of year (11b) / (12)	(1.8%)	0.3%

* *Unfunded Actuarial Accrued Liability*
** *Interest is 8.0% for the Medical Insurance Fund and 7.5% for the Life Insurance Fund*

SECTION VI – CONTRIBUTIONS PAYABLE UNDER THE PLANS

1. Sections 161.420 and 161.550 of the Kentucky Revised Statutes provide the amounts employers and the State are required to contribute to the Medical Insurance Fund. These contribution amounts vary by date of membership and employee type.

Employer Percentage of Payroll Contribution Made to Medical Insurance Fund					
University Employees		School District Employees (Non-Federal)*		Other Employees	
Hired Before 7/1/2008	Hired On or After 7/1/2008	Hired Before 7/1/2008	Hired On or After 7/1/2008	Hired Before 7/1/2008	Hired On or After 7/1/2008
2.775	1.775	3.000	3.000	3.750	2.750

**In addition to the amounts contributed by School Districts on behalf of Non-Federal employees, the State contributes 0.75%.*

For the fiscal year ending June 30, 2017, member contributions will be 2.775% for University employees and 3.750% for all other members. Based upon the amortization of the unfunded accrued liability over a 30-year period as a level percentage of payroll, the valuation indicates employer and State contributions of 3.815% of payroll for University employees and 2.840% of payroll for all other members. The State is scheduled to contribute 0.03% of salary to the Life Insurance Fund for the fiscal year ending June 30, 2018. CMC's valuation indicates a contribution of 0.04% for the fiscal year ending June 30, 2019 is required to support sufficiently the benefits of the Life Insurance Plan.

REQUIRED CONTRIBUTION RATES

Medical Insurance Fund For Fiscal Year Ending June 30, 2017						
Normal	1.95%					
Accrued Liability	4.64					
Total	6.59%					
	University Employees		School District Employees (Non-Federal)		Other Employees	
	Hired prior to 7/1/08	Hired on or after 7/1/08	Hired prior to 7/1/08	Hired on or after 7/1/08	Hired prior to 7/1/08	Hired on or after 7/1/08
Member	2.775%	2.775%	3.750%	3.750%	3.750%	3.750%
Employer (ARC)	2.775	1.775	3.000	3.000	3.750	2.750
State (ARC)	1.040	2.040	(0.160)	(0.160)	(0.910)	0.090
Total	6.590%	6.590%	6.590%	6.590%	6.590%	6.590%

Life Insurance Fund For Fiscal Year Ending June 30, 2019	
Normal	0.03%
Accrued Liability	0.01
Total	0.04%
Member	0.00%
State (ARC)	0.04
Total	0.04%

2. The valuation indicates that a total normal contribution of 1.95% of payroll is required to meet the cost of benefits currently accruing under the Retiree Medical Plan and 0.03% of payroll is required to meet the cost of benefits currently accruing under the Life Insurance Plan. The difference between the total contribution and the normal contribution remains to be applied toward the liquidation of the unfunded actuarial accrued liability. This accrued liability payment is 4.64% of payroll for the Retiree Medical Plan and 0.01% of payroll for the Life Insurance Plan.

3. The unfunded actuarial accrued liability amounts to $2,839,017,911 for the Retiree Medical Plan and $8,594,846 for the Life Insurance Plan as of the valuation date. An accrued liability contribution of 4.64% of payroll for the Retiree Medical Plan and 0.01% of payroll for the Life Insurance Plan is sufficient to amortize the unfunded actuarial accrued liabilities over a 30-year period, based on the assumption that the payroll will increase by 3.50% annually.

SECTION VII - COMMENTS ON LEVEL OF FUNDING

1. The System's monthly contribution for retirees who opt into the Retiree Medical Plan is based upon date of hire, date of attaining age 65, and years of service at retirement. Additionally, beneficiary contributions may vary by date of hire, date of attaining age 65, years of service at retirement, plan election, Medicare eligibility, and tobacco use. Beneficiary contributions for dependents are targeted to be 100% of the cost of expected claims for spouses age 65 and older. Historically, this target has been achieved. 100% of the full cost for non-Medicare eligible dependents is paid through a combination of payments from beneficiaries and the State on a current disbursement basis. Current employer and State contributions have been determined to be sufficient to fund the cost of the benefits to be provided. Benefits for university, school district (non-Federal), and other members are identical, although active employee contributions collected from university, school district (non-Federal), and other members differ. A listing of active member Retiree Medical Plan contributions by fiscal year, date of membership, and employer type is provided in Schedule E.
2. This valuation provides the contributions required to fund sufficiently the Retiree Medical Plan and to ensure the future solvency of the Medical Insurance Fund. For University employees, a member contribution of 2.775% of payroll together with employer and State contributions of 3.815% of payroll are required to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability over a period of 30 years. For the remaining membership, a member contribution of 3.750% of payroll together with employer and State contributions of 2.840% of payroll is required to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability over a period of 30 years.

SECTION VIII - ACCOUNTING INFORMATION

1. Governmental Accounting Standards Board Statements 43 and 45 set forth certain items of required supplementary information to be disclosed in the financial statements of the Retiree Medical and Life Insurance Plans and the employer.

NUMBER OF ACTIVE AND RETIRED MEMBERS IN RETIREE MEDICAL PLAN AS OF JUNE 30, 2016	
GROUP	NUMBER
Retirees currently receiving health benefits	38,815
Spouses of retirees currently receiving health benefits	7,181
Terminated employees entitled to benefits but not yet receiving benefits	8,145
Active plan members	71,848
Total	125,989

NUMBER OF ACTIVE AND RETIRED MEMBERS IN LIFE INSURANCE PLAN AS OF JUNE 30, 2016	
GROUP	NUMBER
Retirees	47,071
Terminated employees	9,058
Active plan members	71,848
Total	127,977

SCHEDULE OF FUNDING PROGRESS
Medical Insurance Fund
(Dollar amounts in $1,000's)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
6/30/2011[1]	294,819	3,423,149	3,128,330	8.6	3,451,756	90.6
6/30/2012	338,746	3,594,540	3,255,794	9.4	3,479,567	93.6
6/30/2013	412,185	3,521,073	3,108,888	11.7	3,480,066	89.3
6/30/2014	508,913	3,194,689	2,685,776	15.9	3,486,327	77.0
6/30/2015	637,839	3,525,584	2,887,745	18.1	3,515,113	82.2
6/30/2016[1]	795,055	3,634,073	2,839,018	21.9	3,537,226	80.3

[1]Reflects change in decrement and participation assumptions.

SCHEDULE OF FUNDING PROGRESS
Life Insurance Fund
(Dollar amounts in $1,000's)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
6/30/2011[1]	88,527	88,088	(439)	100.5	3,451,756	(0.01)
6/30/2012	92,241	91,398	(843)	100.9	3,479,567	(0.02)
6/30/2013	94,863	94,325	(538)	100.6	3,480,066	(0.02)
6/30/2014	96,130	97,354	1,224	98.7	3,486,327	0.04
6/30/2015	97,186	98,739	1,553	98.4	3,515,113	0.04
6/30/2016[1]	97,269	106,059	8,790	91.7	3,537,226	0.25

[1]Reflects change in decrement and participation assumptions.

2. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2016. Additional information as of the latest actuarial valuation follows.

Valuation date	6/30/2016	
Actuarial Cost Method	Entry Age	
Amortization Method	Level Percent of Pay, Open	
Remaining Amortization Period	30 Years	
Asset Valuation Method	5-Year Smoothed Market	
Actuarial Assumptions:		
Investment Rate of Return*	8.00% Retiree Medical Plan	
	7.50% Life Insurance Plan	
Medical Trend Assumption	Pre-Medicare**	Medicare
Fiscal Year Ending 6/30/2017	7.75%	5.75%
Fiscal Year Ending 6/30/2018	7.00%	5.50%
Ultimate Trend Rate	5.00%	5.00%
Year of Ultimate Trend Rate	2023	2020

Includes price inflation at 3.00%.
***Alternate trend rates were used for Medicare Part B premiums and are disclosed in Schedule D.*

SCHEDULE OF EMPLOYER CONTRIBUTIONS
Medical Insurance Fund

Fiscal Year Ending Date	Annual Required Contribution (ARC) (a)	Actual Employer Contribution (b)	RDS Contribution (c)	Total Contribution (b) + (c)	Percentage of ARC Contributed [(b) + (c)] / (a)
6/30/2011	477,723,070	188,453,929	280,585	188,734,514	39.5
6/30/2012	470,217,067	177,450,206	297,639	177,747,845	37.8
6/30/2013	186,725,823	166,611,420	0	166,611,420	89.2
6/30/2014	159,583,400	162,568,395	0	162,568,395	101.9
6/30/2015	106,606,132	168,084,353	0	168,084,353	157.7
6/30/2016	97,982,580	221,966,705	0	221,966,705	226.5

SCHEDULE OF EMPLOYER CONTRIBUTIONS
Life Insurance Fund

Fiscal Year Ending Date	Annual Required Contribution (ARC) (a)	Actual Employer Contribution (b)	Percentage of ARC Contributed (b) / (a)
6/30/2011	1,725,878	1,668,822	96.7
6/30/2012	1,732,831	1,684,711	97.2
6/30/2013	1,739,908	1,680,495	96.6
6/30/2014	1,044,959	1,006,091	96.3
6/30/2015	1,050,216	1,019,519	97.1
6/30/2016	1,057,851	1,037,769	98.1

3. Following is the calculation of the Annual OPEB Cost (AOC) and the Net OPEB Obligation (NOO) for the fiscal year ending June 30, 2016. As the Retiree Medical and Life Insurance Plans are cost-sharing multiple-employer plans, GASB Statement 45 does not require the participating employers to disclose this information.

Annual OPEB Cost and Net OPEB Obligation

for the Medical Insurance Fund for Fiscal Year Ending June 30, 2016

(a) Employer Annual Required Contribution	$ 97,982,580
(b) Interest on Net OPEB Obligation	118,447,672
(c) Adjustment to Annual Required Contribution	80,918,376
(d) Annual OPEB Cost: (a) + (b) – (c)	$ 135,511,876
(e) Employer contributions for Fiscal Year 2016	221,966,705
(f) Increase in Net OPEB Obligation: (d) – (e)	($ 86,454,829)
(g) Net OPEB Obligation at beginning of Fiscal Year	1,480,595,898
(h) Net OPEB Obligation at end of Fiscal Year: (f) + (g)	$1,394,141,069

TREND INFORMATION FOR THE MEDICAL INSURANCE FUND

Fiscal Year Ending	Annual OPEB Cost (AOC)	Percentage of AOC Contributed	Net OPEB Obligation (NOO)
6/30/2011	$485,294,173	38.9%	$1,110,938,699
6/30/2012	480,545,219	37.0	1,413,736,073
6/30/2013	222,560,394	74.9	1,469,685,047
6/30/2014	196,836,134	82.6	1,503,952,786
6/30/2015	144,727,465	116.1	1,480,595,898
6/30/2016	135,511,876	163.8	1,394,141,069

Annual OPEB Cost and Net OPEB Obligation

for the Life Insurance Fund for Fiscal Year Ending June 30, 2016

(a) Employer Annual Required Contribution	$1,057,851
(b) Interest on Net OPEB Obligation	(628,174)
(c) Adjustment to Annual Required Contribution	(433,171)
(d) Annual OPEB Cost: (a) + (b) – (c)	$ 862,848
(e) Employer contributions for Fiscal Year 2016	1,037,769
(f) Increase in Net OPEB Obligation: (d) – (e)	($ 174,921)
(g) Net OPEB Obligation at beginning of Fiscal Year	(8,375,658)
(h) Net OPEB Obligation at end of Fiscal Year: (f) + (g)	($8,550,579)

TREND INFORMATION FOR THE LIFE INSURANCE FUND

Fiscal Year Ending	Annual OPEB Cost (AOC)	Percentage of AOC Contributed	Net OPEB Obligation (NOO)
6/30/2011	$1,546,950	107.9%	$(7,807,049)
6/30/2012	1,551,065	108.6	(7,940,695)
6/30/2013	1,555,031	108.1	(8,066,159)
6/30/2014	857,161	117.4	(8,215,089)
6/30/2015	858,950	118.7	(8,375,658)
6/30/2016	862,848	120.3	(8,550,579)

4. On June 2, 2015, GASB Statement No. 74 and GASB Statement No. 75 (GASB 74 and 75) were unanimously adopted by the GASB Board. The disclosure requirements of GASB 74 and 75 will be similar to the disclosure requirements for pension benefits under GASB Statement No. 67 and GASB Statement No. 68. GASB 74 relates to accounting disclosures for plan sponsors and, as such, replaces GASB 43 beginning with fiscal years ending June 30, 2017. GASB 75 relates to accounting disclosures for contributing employers and, as such, replaces GASB 45 beginning with fiscal years ending June 30, 2018. GASB 74 and 75 will require applicable OPEB plan sponsors and

contributing employers to disclose the net OPEB liability on the statement of financial position and book an accounting expense based upon the entry age normal actuarial cost method. Beyond the use of a specified actuarial cost method, GASB's new disclosure standards will also require the discount rate used to calculate liabilities to be based upon the yield of 20-year, tax-exempt municipal bonds and the expected rate of return on plan assets, to the extent plan assets are projected to be available for the payment of future benefits. Additionally, GASB 74 and 75 will bring about many other changes in the liability valuation and accounting disclosure processes currently in place which are expected to significantly impact data collection, timing, and effort. As details for the new GASB OPEB disclosure standards emerge, planning and coordination between plan sponsors, contributing employers, actuaries, and auditors is recommended.

SCHEDULE A

RESULTS OF THE VALUATION AS OF JUNE 30, 2016
(Dollar amounts in $1,000's)

	Medical Insurance Fund	Life Insurance Fund
PAYROLL	$ 3,537,226	$ 3,537,226
ACTUARIAL ACCRUED LIABILITY		
Present value of prospective benefits payable in respect of:		
(a) Present active members	$ 1,683,153	$ 17,050
(b) Present terminated vested members	47,229	3,470
(c) Present retired members and covered spouses	1,903,691	85,539
(d) Total actuarial accrued liability	$ 3,634,073	$ 106,059
PRESENT ASSETS FOR VALUATION PURPOSES	$ 795,055	$ 97,269
UNFUNDED ACTUARIAL ACCRUED LIABILITY	$ 2,839,018	$ 8,790
CONTRIBUTIONS:	Fiscal Year Ending June 30, 2017	Fiscal Year Ending June 30, 2019
Normal	1.95%	0.03%
Accrued Liability	4.64	0.01
Total	6.59%	0.04%
Member	3.69%	0.00%
Employer (ARC)	2.97	0.00
State (ARC)	(0.07)	0.04
Total	6.59%	0.04%

SCHEDULE A
(continued)

MEDICAL INSURANCE FUND
SOLVENCY TEST
(Dollar amounts in millions)

Valuation Date	(1) Active Member Contributions	(2) Retirants And Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets (1)	(2)	(3)
6/30/2011	n/a	$1,910.1	$1,513.1	$294.8	n/a	15%	0%
6/30/2012	n/a	2,046.7	1,547.9	338.7	n/a	17	0
6/30/2013	n/a	2,001.8	1,519.3	412.2	n/a	21	0
6/30/2014	n/a	1,771.9	1,422.8	508.9	n/a	29	0
6/30/2015	n/a	1,982.2	1,543.4	637.8	n/a	32	0
6/30/2016	n/a	1,950.9	1,683.2	795.1	n/a	41	0

LIFE INSURANCE FUND
SOLVENCY TEST
(Dollar amounts in millions)

Valuation Date	(1) Active Member Contributions	(2) Retirants And Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Accrued Liabilities Covered by Assets (1)	(2)	(3)
6/30/2011	n/a	$72.2	$15.9	$88.5	n/a	100%	103%
6/30/2012	n/a	75.2	16.2	92.2	n/a	100	105
6/30/2013	n/a	78.1	16.2	94.9	n/a	100	104
6/30/2014	n/a	81.0	16.3	96.1	n/a	100	93
6/30/2015	n/a	82.7	16.0	97.2	n/a	100	91
6/30/2016	n/a	89.0	17.1	97.3	n/a	100	49

SCHEDULE B

DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS
MEDICAL INSURANCE FUND

AS OF JUNE 30, 2016

(1)	Actuarial Value of Assets Beginning of Year		$	637,838,912
(2)	Market Value of Assets End of Year		$	733,780,967
(3)	Market Value of Assets Beginning of Year		$	626,962,370
(4)	Cash Flow			
	a.	Contributions	$	406,331,920
	b.	Benefit Payments		288,494,763
	c.	Administrative Expense		1,686,070
	d.	Net: (4)a – (4)b – (4)c	$	116,151,087
(5)	Investment Income			
	a.	Market total: (2) – (3) – (4)d	$	(9,332,490)
	b.	Assumed Rate		8.00%
	c.	Amount for Immediate Recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]		54,803,033
	d.	Amount for Phased-In Recognition: (5)a – (5)c	$	(64,135,523)
(6)	Phased-In Recognition of Investment Income			
	a.	Current Year: 0.20 x (5)d	$	(12,827,105)
	b.	First Prior Year		(7,773,884)
	c.	Second Prior Year		6,492,851
	d.	Third Prior Year		370,219
	e.	Fourth Prior Year		3
	f.	Total Recognized Investment Gain	$	(13,737,916)
(7)	Actuarial Value of Assets End of Year: (1) + (4)d + (5)c + (6)f		$	795,055,116
(8)	Difference Between Market & Actuarial Values: (2) – (7)		$	(61,274,149)
(9)	Rate of Return on Actuarial Value:			5.90%

SCHEDULE B
(Continued)

DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS
LIFE INSURANCE FUND

AS OF JUNE 30, 2016

(1)	Actuarial Value of Assets Beginning of Year		$	97,185,537
(2)	Market Value of Assets End of Year		$	90,990,928
(3)	Market Value of Assets Beginning of Year		$	89,746,507
(4)	Cash Flow			
	a.	Contributions	$	1,037,769
	b.	Benefit Payments		4,595,489
	c.	Administrative Expense		27,195
	d.	Net: (4)a – (4)b – (4)c	$	(3,584,915)
(5)	Investment Income			
	a.	Market total: (2) – (3) – (4)d	$	4,829,336
	b.	Assumed Rate		7.50%
	c.	Amount for Immediate Recognition: [(3) x (5)b] + [(4)d x (5)b x 0.5]		6,596,554
	d.	Amount for Phased-In Recognition: (5)a – (5)c	$	(1,767,218)
(6)	Phased-In Recognition of Investment Income			
	a.	Current Year: 0.20 x (5)d	$	(353,444)
	b.	First Prior Year		(941,279)
	c.	Second Prior Year		(406,987)
	d.	Third Prior Year		(1,226,477)
	e.	Fourth Prior Year		1
	f.	Total Recognized Investment Gain	$	(2,928,186)
(7)	Actuarial Value of Assets End of Year: (1) + (4)d + (5)c + (6)f		$	97,268,990
(8)	Difference Between Market & Actuarial Values: (2) – (7)		$	(6,278,062)
(9)	Rate of Return on Actuarial Value:			3.85%

SCHEDULE C

MEDICAL INSURANCE FUND
SUMMARY OF RECEIPTS AND DISBURSEMENTS
(Market Value)

	For the Year Ending	
	June 30, 2016	**June 30, 2015**
Receipts for the Year		
Contributions		
Members Statutory	$128,068,782	$100,622,991
Payment by Retired Members	56,296,433	56,844,689
Total Members	$184,365,215	$157,467,680
State Statutory Contributions	$ 21,824,740	$ 21,375,292
Employer Contributions	104,271,120	77,655,778
State Statutory – Transition Fund/KEHP	52,542,510	46,232,856
Total Employer	$178,638,370	$145,263,926
Grand Total	$363,003,585	$302,731,606
Recovery Income	43,328,335	22,820,427
Net Investment Income	(9,332,490)	7,354,704
TOTAL	$396,999,430	$332,906,737
Disbursements for the Year		
Administrative Expense	1,686,070	1,545,235
Medical Insurance Expense	288,494,763	240,394,582
TOTAL	$290,180,833	$241,939,817
Excess of Receipts over Disbursements	$ 106,818,597	$ 90,966,920
Reconciliation of Asset Balances		
Asset Balance as of the Beginning of the Year	$626,962,370	$535,995,450
Excess of Receipts over Disbursements	106,818,597	90,966,920
Asset Balance as of the End of the Year	$733,780,967	$626,962,370

SCHEDULE C
(Continued)

LIFE INSURANCE FUND
SUMMARY OF RECEIPTS AND DISBURSEMENTS
(Market Value)

	For the Year Ending	
	June 30, 2016	**June 30, 2015**
Receipts for the Year		
Contributions		
Members	$ 0	$ 0
State	872,990	855,012
Employer	164,779	164,507
Total	$ 1,037,769	$ 1,019,519
Net Investment Income	4,829,336	1,990,324
TOTAL	$ 5,867,105	$ 3,009,843
Disbursements for the Year		
Benefit Payments	$ 4,595,489	$ 4,061,000
Refunds to Members	0	0
Medical Insurance Payments	0	0
Miscellaneous, including expenses	27,195	25,306
TOTAL	$ 4,622,684	$ 4,086,306
Excess of Receipts over Disbursements	$ 1,244,421	($ 1,076,463)
Reconciliation of Asset Balances		
Asset Balance as of the Beginning of the Year	$ 89,746,507	$ 90,822,970
Excess of Receipts over Disbursements	1,244,421	(1,076,463)
Asset Balance as of the End of the Year	$ 90,990,928	$ 89,746,507

SCHEDULE D

STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The rates of retirement, disability, mortality, termination, salary increases, and rates of future benefit participation used in the valuation were selected based on the actuarial experience study prepared as of June 30, 2015, submitted to and adopted by the Board on September 19, 2016. The health care cost trend rates, and expected plan costs were determined by the actuary based on recent experience.

VALUATION DATE: June 30, 2016

DISCOUNT RATE: 8.0% per annum, compounded annually for the Medical Insurance Fund
7.5% per annum, compounded annually for the Life Insurance Fund

HEALTH CARE COST TREND RATES: Following is a chart detailing health care trend assumptions.

	Annual Trend Rate		
Fiscal Year Ended	Medicare Part B	Under Age 65	Ages 65 and Older
2017	1.02%	7.75%	5.75%
2018	(0.93)	7.00	5.50
2019	5.66	6.50	5.25
2020	4.84	6.00	5.00
2021	4.23	5.50	5.00
2022	5.04	5.25	5.00
2023	5.44	5.00	5.00
2024	5.10	5.00	5.00
2025	5.42	5.00	5.00
2026	5.62	5.00	5.00
2027	5.37	5.00	5.00
2028	5.12	5.00	5.00
2029 and beyond	5.00	5.00	5.00

AGE RELATED MORBIDITY: For retirees ages 65 and older, per capita health care costs are adjusted to reflect expected health care cost changes related to age. The increase to the net incurred health care claims is assumed to be:

Participant Age	Annual Increase
65 – 69	3.0%
70 – 74	2.5
75 – 79	2.0
80 – 84	1.0
85 - 89	0.5
90 and over	0.0

For the retiree health care liabilities of those under age 65, the current premium charged by the Kentucky Employees' Health Plan (KEHP) is used as the base cost and is projected forward using the health care trend assumption. No implicit rate subsidy is calculated or recognized as the implicit rate subsidy is deemed the responsibility of the KEHP. Under Actuarial Standard of Practice No. 6 (ASOP No. 6), aging subsidies (or implicit rate subsidies) should be recognized, as the differences in health care utilization and

SCHEDULE D
(Continued)

cost due to age have been demonstrated and well quantified. The impact of aging on a valuation's results can be as significant as the use of mortality, trend, and discounting. It has been the long-standing position that the responsibility for compliance with GASB Statement No. 43, when it relates to KEHP implicit subsidies, rests with KEHP, not the System, as the System has no operational authority over KEHP. As such, KEHP implicit subsidies are excluded from the OPEB valuation process of the Retiree Medical Plan. As GASB 74 and 75 prohibit such a deviation from ASOP No. 6, additional consideration to the current treatment of KEHP implicit rate subsidies may be needed in the future. The estimated impact of KEHP implicit subsidies to the actuarial accrued liability is an increase of $630,058,164.

RETIREE MEDICAL PLAN COSTS: Assumed per capita health care costs were based on past experience and trended based on the assumptions. Following are charts detailing retiree per capita assumptions. These amounts include medical, drug, and administrative costs and represent the amount that the System pays as the full contribution amount. The amounts include medical and drug costs. An additional $7.14 per month is paid to the Department of Employee Insurance (DEI) and is not included in the under age 65 costs listed below. For retirees ages 65 and older, the average costs shown are normalized to age 65 and then age adjusted in calculating liabilities.

Monthly Under Age 65 (KEHP) Full Costs as of January 1, 2017				
Tier Elected	LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP
Single	$ 702.10	$ 721.14	$ 678.22	$ 663.80
Parent Plus	967.18	1,023.04	964.58	930.94
Couple	1,302.74	1,564.20	1,477.72	1,431.76
Family	1,453.94	1,738.40	1,644.22	1,594.52
Family C-R	810.00	865.64	815.50	793.18

Average Monthly System Full Costs and Contributions			
Year	Under Age-65 (KEHP) Contributions	Ages 65 and Older (MEHP) Full Costs	Ages 65 and Older (MEHP) Contributions
CY 2007	$458	$283	$283
CY 2008	484	278	278
CY 2009	545	301[1]	285
CY 2010	594	373[1]	342
CY 2011	626	289	289
CY 2012	622	270[2]	270
CY 2013	635	294[2]	290
CY 2014	679	290[2]	290
CY 2015	669	240[2]	240
CY 2016	681	260[2]	260
CY 2017	680	252[2]	252

[1] Under GASB 43 and 45, cost reductions for the amount of the Medicare Part D Retiree Drug Subsidy cannot be taken into account in the gross cost calculations.

[2] 2,183 current, Medicare-eligible benefit recipients have been identified by the client to be ineligible for premium-free Medicare Part A benefits. For these individuals, the full cost of coverage is, on average, $589 per month. It is assumed 9% of current retirees under the age of 65 who were hired prior to 4/1/1986 will be ineligible for premium-free Medicare Part A benefits upon reaching Medicare eligibility (age 65) and 0% of these retirees will cover a spouse. All active members are assumed to have begun contributing to Medicare as of 4/1/1986 and are assumed eligible for premium-free Medicare Part A benefits.

SCHEDULE D
(Continued)

CURRENT RETIREE MEDICAL PLAN PARTICIPATION: Actual census data and current plan elections (including waivers) provided by the System were used for those retirees currently participating in the Retiree Medical Plan. Current participants are assumed to maintain their current Retiree Medical Plan coverage until they are no longer eligible.

ANTICIPATED RETIREE MEDICAL PLAN PARTICIPATION: The assumed annual rates of health care plan participation for future retirees are as follows:

	Member Participation		
Years of Service	Entered System Before 7/1/2002	Entered System After 6/30/2002 and Before 7/1/2008	Entered System After 6/30/2008
5-9.99	20%	20%	Not Eligible
10-14.99	49	20	Not Eligible
15-19.99	70	41	41%
20-24.99	91	61	61
25-25.99	91	76	76
26-26.99	91	84	84
27 or more	91	91	91

ANTICIPATED RETIREE MEDICAL PLAN ELECTIONS: The assumed rates of plan election for future retirees participating in the KEHP plans are provided in the following table. As the assumed plan election rates are estimates and actual results may be materially different, this assumption will need to be revised as experience evolves.

LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP
40%	45%	7%	8%

SPOUSE COVERAGE IN RETIREE MEDICAL PLAN: Actual census data and current plan elections were used for MEHP and KEHP covered spouses (including beneficiaries) of current retirees. For spouses of future retirees, 25% of future male retirees are assumed to cover their spouse and 15% of future female retirees are assumed to cover their spouse. Male retirees are assumed to be three years older than their spouse and female retirees are assumed to be one year younger than their spouse.

DISABLED DEPENDENT CHILDREN IN RETIREE MEDICAL PLAN: The liability associated with disabled dependent children was determined to be de minimis and was therefore excluded from this valuation.

SCHEDULE D
(Continued)

WITHDRAWAL ASSUMPTION: Future vested members who terminate employment prior to retirement are assumed to elect to withdraw their contributions based upon their age and service at termination of employment as follows:

Rates of Withdrawal Upon Termination of Employment			
Age at Termination of Employment	Years of Service		
	5 - 10	10 - 15	15+
Under Age 55	20%	15%	10%
Ages 55+	10%	10%	10%

All vested members who terminate employment prior to retirement are assumed to elect to withdraw their contributions prior to receiving a pension benefit based upon their service as follows:

Rates of Withdrawal Prior to Receiving a Pension Benefit			
Years of Service			
5 - 10	10 - 15	15 - 27	27+
25%	15%	10%	25%

All vested members who terminate employment prior to retirement and who are assumed to elect to receive a pension benefit are assumed to begin receiving their benefit at age 60.

PAYROLL GROWTH: 3.50% per annum, compounded annually.

PRICE INFLATION: 3.00% per annum, compounded annually.

AFFORDABLE CARE ACT (ACA): The impact of the Affordable Care Act (ACA) was addressed in this valuation. Review of the information currently available did not identify any specific provisions of the ACA that are anticipated to significantly impact results. While the impact of certain provisions such as the excise tax on high-value health insurance plans beginning in 2020 (if applicable), mandated benefits and participation changes due to the individual mandate should be recognized in the determination of liabilities, overall future plan costs and the resulting liabilities are driven by the assumed rate of health care inflation (i.e., trend). The trend assumption forecasts the anticipated increase to initial per capita costs, taking into account health care cost inflation, increases in benefit utilization, government-mandated benefits, and technological advances. Given the uncertainty regarding the ACA's implementation (e.g., the impact of excise tax on high-value health insurance plans, changes in participation resulting from the implementation of state-based health insurance exchanges), continued monitoring of the ACA's impact on the Retiree Medical Plan's liability will be required.

ASSET VALUATION METHOD: Five-year market related actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the ultimate assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected actuarial value. The ultimate assumed valuation rate of return is assumed to be 8.00% for the Medical Insurance Fund and 7.50% for the Life Insurance Fund.

SCHEDULE D
(Continued)

ACTUARIAL COST METHOD: The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future, of each active member's expected benefit at retirement or death is determined, based on his/her age, service, and gender. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability or survivor's benefit. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries and deferred vested members to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.

The employer contributions required to support the benefits of the System are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his/her anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his/her behalf.

The unfunded accrued liability is determined by subtracting the present value of prospective employer normal contributions and member contributions, together with the current actuarial value of assets held, from the present value of expected benefits to be paid from the System.

SCHEDULE D
(Continued)

SEPARATIONS FROM SERVICE: Representative values of the assumed annual rates of salary increases, death, disability, withdrawal, service retirement and early retirement are as follows:

MALES

Age	Annual Rate of SALARY*	DEATH	DISABILITY	WITHDRAWAL Years of Service 0 – 4	5 – 9	10+	RETIREMENT Before 27 Years of Service	After 27 Years of Service**
20	7.20%	0.019%	0.01%	11.00%				
25	6.40	0.021	0.01	11.00	3.00%			
30	5.40	0.025	0.01	11.00	3.00	3.00%		
35	4.70	0.043	0.04	12.00	3.50	1.40		
40	4.20	0.060	0.09	12.00	4.50	1.40		
45	3.80	0.084	0.20	12.00	4.50	1.30		17.0%
50	3.70	0.119	0.30	14.00	4.50	1.90		17.0
55	3.50	0.202	0.58	15.00	4.50	2.40	5.0%	45.0
60	3.50	0.340	0.75	15.00	4.00	2.40	13.0	35.0
62	3.50	0.419	0.75	15.00	3.80	2.40	15.0	25.0
65	3.50	0.565	0.75	15.00	3.50	2.40	20.0	25.0
70	3.50	0.913	0.75	20.00	0.00	0.00	20.0	20.0
75	3.50	1.556	0.75	20.00	0.00	0.00	100.0	100.0

FEMALES

Age	Annual Rate of SALARY*	DEATH	DISABILITY	WITHDRAWAL Years of Service 0 – 4	5 – 9	10+	RETIREMENT Before 27 Years of Service	After 27 Years of Service**
20	7.20%	0.007%	0.01%	9.00%				
25	6.40	0.008	0.01	9.00	4.00%			
30	5.40	0.010	0.03	12.00	4.00	1.65%		
35	4.70	0.018	0.06	12.00	4.00	1.50		
40	4.20	0.026	0.12	12.00	4.00	1.30		
45	3.80	0.042	0.25	13.00	4.00	1.20		15.0%
50	3.70	0.062	0.44	13.00	5.00	1.50		18.0
55	3.50	0.096	0.65	15.00	5.00	2.00	5.5%	50.0
60	3.50	0.157	0.85	15.00	5.00	2.00	14.0	40.0
62	3.50	0.197	0.85	15.00	4.60	2.00	14.0	40.0
65	3.50	0.287	0.85	15.00	4.00	2.00	22.0	35.0
70	3.50	0.495	0.85	15.00	0.00	0.00	20.0	35.0
75	3.50	0.831	0.85	15.00	0.00	0.00	100.0	100.0

* *Includes wage inflation at 3.5% per annum.*
** *Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.*

SCHEDULE D
(Continued)

DEATHS AFTER RETIREMENT: The RP-2000 Combined Mortality Table projected to 2025 using scale BB (set forward two years for males and one year for females) is used for death after service retirement and beneficiaries. The RP-2000 Disabled Mortality Table (set forward two years for males and seven years for females) is used for death after disability retirement. There is a margin for future mortality improvement in the tables used by the System. Based on the results of the most recent experience study adopted by the Board on September 19, 2016, the numbers of expected future deaths are 15-19% less than the actual number of deaths that occurred during the study period for healthy retirees and 13-17% less than expected under the selected table for disabled retirees. Representative values of the assumed annual rates of death after service retirement and after disability retirement are shown below:

	Annual Rate of Death After			
	Service Retirement		Disability Retirement	
Age	Male	Female	Male	Female
45	0.1609%	0.1135%	2.3306%	1.2482%
50	0.2474	0.1718	2.9279	1.5650
55	0.4246	0.2658	3.4400	1.7807
60	0.6985	0.4409	3.5881	2.3164
65	1.1300	0.8100	3.8275	3.1687
70	1.8697	1.3739	4.7566	4.4032
75	3.2147	2.2899	6.3153	6.0857
80	5.5160	3.7551	8.3527	8.4679
85	9.5631	6.3873	10.9122	12.7572
90	17.2787	11.2476	17.2787	19.4718
95	27.1263	18.1190	27.1263	24.2074

SCHEDULE E

SUMMARY OF MAIN PLAN PROVISIONS AS INTERPRETED FOR VALUATION PURPOSES

ELIGIBILITY FOR ACCESS TO RETIREE MEDICAL PLAN COVERAGE:

Service Retirement: For employees hired prior to July 1, 2008, Retiree Medical Plan coverage eligibility is attained when an employee retires, which is possible after the completion of 27 years of service or attainment of age 55 and 5 years of service. For employees hired on or after July 1, 2008, employees may retire after the completion of 27 years of service, the attainment of age 55 and 10 years of service, or the attainment of age 60 and 5 years of service, but must complete a minimum of 15 years of service to be eligible for Retiree Medical Plan coverage.

Disability Retirement: Disabled employees hired prior to July 1, 2008 with at least 5 years of service, who are totally and permanently incapable of being employed as a teacher, are eligible for Retiree Medical Plan coverage. Disabled employees hired after July 1, 2008 must have 15 years of service to be eligible for Retiree Medical Plan coverage.

Members and dependents under age 65 and eligible for Medicare due to a disability after January 1, 2013 are required to be covered under MEHP. Under age 65 members who retired prior to Jan. 1, 2013, are grandfathered from this requirement and allowed a choice of KEHP or MEHP coverage. Actual census data and current plan elections were used for current disabled retirees. Until sufficient experience emerges, the valuation conservatively assumes all future disabled members under the age of 65 will be covered under KEHP.

Survivors: Spouses of employees who die in service while eligible to retire, as well as survivors of service and disabled retirees, are eligible for Retiree Medical Plan coverage.

Termination: For employees hired prior to July 1, 2008 and who terminated with at least 5 years of service, Retiree Medical Plan coverage eligibility is attained at age 60. For employees hired on or after July 1, 2008 and who terminated with at least 15 years of service, Retiree Medical Plan coverage eligibility is attained at age 60.

Reemployed Retirees: Retirees who return to work in an agency that participates in KEHP are required to terminate their coverage through the System. Additionally, if a retiree returns to work somewhere that does not participate in the KEHP, but offers health insurance, the retiree must terminate System coverage unless the employer coverage is of lesser value. For valuation purposes, active employees identified as currently receiving retiree health care through the System are valued as retirees.

SCHEDULE E
(Continued)

COVERED MEMBER RETIREE MEDICAL PLAN CONTRIBUTIONS:

Under Age 65 Retiree Shared Responsibility Contribution: Effective July 1, 2010, retirees under the age of 65 began a three-year phase-in of the Shared Responsibility Contribution. This contribution reduces the applicable amount of the full contribution provided by the System to retirees, by adjusting the Shared Responsibility Contribution amount by 100% less the appropriate percentage from the Retiree Percentage Contribution table below. Effective July 1, 2012, the full Shared Responsibility Contribution equals the Standard Medicare Part B premium paid by retirees ages 65 and older.

Monthly Under Age 65 Shared Responsibility Contribution Timeline			
Effective Date	Medicare Part B Monthly Cost	Formula	Shared Responsibility Contribution
July 1, 2010	$110.50	(1/3 x $110.50)	$ 37.00
January 1, 2011	115.40	(1/3 x 115.40)	39.00
July 1, 2011	115.40	(2/3 x 115.40)	77.00
January 1, 2012	99.90	(2/3 x 99.90)	66.00
July 1, 2012	99.90	99.90	99.90
January 1, 2013	104.90	104.90	104.90
January 1, 2014	104.90	104.90	104.90
January 1, 2015	104.90	104.90	104.90
January 1, 2016	121.80	121.80	121.80
January 1, 2017	134.00	134.00	134.00

Retiree Years of Service Percentage Contribution: Retirees contribute the following percentages based on years of service at retirement, which are then applied to the Retiree Contribution Rate Basis:

Retiree Percentage Contribution*				
	Entered System Before 7/1/2002			
Year of Service	Age 65 or Older and Covered Before 1/1/2005	Age 65 After or Covered After 12/31/2004	Entered System After 6/30/2002 and Before 7/1/2008	Entered System After 6/30/2008
5 – 9.99	30%	75%	90%	Not Eligible
10 – 14.99	20	50	75	Not Eligible
15 – 19.99	10	25	55	55%
20 – 24.99	0	0	35	35
25 – 25.99	0	0	10	10
26 – 26.99	0	0	5	5
27 or more	0	0	0	0

**0% for disabled retirees that retired prior to 1/1/2002*

SCHEDULE E
(Continued)

COVERED MEMBER RETIREE MEDICAL PLAN CONTRIBUTIONS (CONTINUED):

Monthly Retiree Contribution Rate Basis Effective January 1, 2017					
	Under Age 65 (KEHP)				
Tier Elected	LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP	Ages-65 and Older (MEHP)
Single	$ 654.12	$ 641.16	$ 629.76	$ 650.70	$252.00
Parent Plus*	844.20	795.06	840.38	870.36	n/a
Couple*	1,014.76	1,051.22	1,186.86	1,179.28	n/a
Family*	1,115.96	1,095.42	1,302.86	1,291.54	n/a
Family C-R*	732.02	712.66	736.74	764.92	n/a

**For members who retired prior to July 1, 2010, the monthly Retiree Contribution Rate Basis is $654.12*

Under Age 65 Retiree Plan Cost Contribution: An additional contribution according to the table below is required to be paid by retirees under the age of 65 based upon the plan elected and the date of retirement:

Monthly Under Age 65 Plan Cost Contribution* Effective January 1, 2017				
Tier Elected	LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP
Retired Prior to July 1, 2010				
Single	$ 47.98	$ 79.98	$ 48.46	$ 13.10
Parent Plus	313.06	368.92	310.46	276.82
Couple	648.62	910.08	823.60	777.64
Family	799.82	1,084.28	990.10	940.40
Family C-R	155.88	211.52	161.38	139.06
Retired After June 30, 2010				
Single	$ 47.98	$ 79.98	$ 48.46	$ 13.10
Parent Plus	122.98	227.98	124.20	60.58
Couple	287.98	512.98	290.86	252.48
Family	337.98	642.98	341.36	302.98
Family C-R	77.98	152.98	78.76	28.26

** Does not include the additional contribution required to be paid by retirees under the age of 65 who use tobacco ($40 for Single or Family Cross-Reference, and $80 for Parent Plus, Couple or Family).*

SCHEDULE E
(Continued)

COVERED MEMBER MEDICAL PLAN CONTRIBUTIONS (CONTINUED):

Spouse Contributions: 100% of the full cost for non-Medicare eligible dependents is paid through a combination of payments from beneficiaries and the State. Spouses of current post-65 retirees and surviving spouses of deceased retirees with a date of death on or after July 1, 2002 pay 100% of the full contribution. Spouses of active members who died while eligible to retire prior to July 1, 2002, are provided the same subsidy by the System that would have been provided to the retiree for the lifetime of the spouse, or until remarriage. Spouses of active members who die while eligible to retire on or after July 1, 2002 later pay 100% of the full contribution.

Monthly Surviving Spouse Contribution Effective January 1, 2017					
Tier Elected by Surviving Spouse	Under Age 65 (KEHP)				Ages 65 and Older (MEHP)
	LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP	
Single	$709.24	$728.28	$685.36	$670.94	$252.00
Parent Plus	974.32	1030.18	971.72	938.08	n/a

SYSTEM RETIREE MEDICAL PLAN CONTRIBUTIONS: The System Contribution Rate Basis is determined annually by the System; and the full cost is projected based on historical claims data. For retirees, the following percentages are based on years of service at retirement and are then applied to the System Contribution Rate Basis:

Percentage of System Contribution Rate Provided to Retirees*				
Year of Service	Entered System Before 7/1/2002		Entered System After 6/30/2002 and Before 7/1/2008	Entered System After 6/30/2008
	Age 65 or Older and Covered Before 1/1/2005	Age 65 After or Covered After 12/31/2004		
5 – 9.99	70%	25%	10%	Not Eligible
10 – 14.99	80	50	25	Not Eligible
15 – 19.99	90	75	45	45%
20 – 24.99	100	100	65	65
25 – 25.99	100	100	90	90
26 – 26.99	100	100	95	95
27 or more	100	100	100	100

**100% for disabled retirees that retired prior to 1/1/2002*

SCHEDULE E
(Continued)

SYSTEM RETIREE MEDICAL PLAN CONTRIBUTIONS (CONTINUED):

Monthly System Contribution Rate Basis Effective January 1, 2017					
	Under Age 65 (KEHP)*				Ages-65 and Older (MEHP)
Tier Elected	LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP	
Single	$ 654.12	$ 641.16	$ 629.76	$ 650.70	$252.00
Parent Plus**	844.20	795.06	840.38	870.36	n/a
Couple**	1,014.76	1,051.22	1,186.86	1,179.28	n/a
Family**	1,115.96	1,095.42	1,302.86	1,291.54	n/a
Family C-R**	732.02	712.66	736.74	764.92	n/a

**Irrespective of a participating retiree's service, an additional $7.14 per month is paid by the System to the Department of Employee Insurance (DEI) for KEHP coverage.*
***For members who retired prior to July 1, 2010, the monthly Retiree Contribution Rate Basis is $654.12*

ACTIVE MEMBER RETIREE MEDICAL PLAN CONTRIBUTIONS: Actively employed members make payroll contributions to the Medical Insurance Fund based upon the following schedule:

Active Member Percentage of Payroll Contribution Made to Medical Insurance Fund

Active Member Percentage of Payroll Contribution Made to Medical Insurance Fund					
University Employees		School District Employees (Non-Federal)		Other Employees	
Hired Before 7/1/2008	Hired On or After 7/1/2008	Hired Before 7/1/2008	Hired On or After 7/1/2008	Hired Before 7/1/2008	Hired On or After 7/1/2008
2.775	2.775	3.750	3.750	3.750	3.750

SCHEDULE E
(Continued)

LIFE INSURANCE PLAN BENEFITS:

(1) Effective July 1, 2000, the Teachers' Retirement System shall:

(a) Provide a life insurance benefit in a minimum amount of five thousand dollars ($5,000) for its members who are retired for service or disability. This life insurance benefit shall be payable upon the death of a member retired for service or disability to the member's estate or to a party designated by the member on a form prescribed by the retirement system; and

(b) Provide a life insurance benefit in a minimum amount of two thousand dollars ($2,000) for its active contributing members. This life insurance benefit shall be payable upon the death of an active contributing member to the member's estate or to a party designated by the member on a form prescribed by the retirement system.

Note: Members employed on a substitute or part-time basis and working at least 69% of a full contract year in a single fiscal year will be eligible for a life insurance benefit for the balance of the fiscal year or the immediately succeeding fiscal year under certain conditions. For non-vested members employed on a substitute or part-time basis, the life insurance benefit is provided if death occurs as the result of a physical injury on the job. For vested members employed on a substitute or part-time basis, death does not have to be the result of a physical injury on the job for life insurance benefits to be provided.

SCHEDULE F

TABLE 1
ACTIVE MEMBER AGE AND SERVICE TABLE AS OF JUNE 30, 2016

Attained Age	Completed Years of Service								
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 35	Over 35	Total
24 & Under	2,355								2,355
Total Pay	45,330,040								45,330,040
Avg. Pay	19,248								19,248
25 to 29	5,983	1,390	6						7,379
Total Pay	203,433,582	67,448,815	290,024						271,172,421
Avg. Pay	34,002	48,524	48,337						36,749
30 to 34	3,012	4,867	1,237	5					9,121
Total Pay	95,202,602	245,417,243	70,031,584	254,892					410,906,321
Avg. Pay	31,608	50,425	56,614	50,978					45,051
35 to 39	2,269	2,377	4,756	984	4				10,390
Total Pay	63,198,818	122,108,596	281,358,005	63,149,812	239,758				530,054,989
Avg. Pay	27,853	51,371	59,159	64,177	59,940				51,016
40 to 44	1,785	1,520	2,196	4,060	746	1			10,308
Total Pay	45,830,416	77,450,441	131,391,508	267,885,302	52,046,889	53,664			574,658,220
Avg. Pay	25,675	50,954	59,832	65,982	69,768	53,664			55,749
45 to 49	1,483	1,177	1,593	2,266	3,343	750	3		10,615
Total Pay	39,361,503	60,147,545	93,765,291	147,455,842	233,185,542	54,299,673	169,293		628,384,689
Avg. Pay	26,542	51,102	58,861	65,073	69,753	72,400	56,431		59,198
50 to 54	1,196	717	1,039	1,272	1,534	1,826	286	2	7,872
Total Pay	25,260,952	36,290,570	61,397,451	82,245,956	106,693,617	134,430,589	21,213,845	131,648	467,664,628
Avg. Pay	21,121	50,614	59,093	64,659	69,553	73,620	74,174	65,824	59,409
55 to 59	1,345	467	678	996	1,069	818	352	19	5,744
Total Pay	21,138,039	21,468,016	39,649,701	64,095,061	75,667,783	62,721,524	30,314,021	1,529,398	316,583,543
Avg. Pay	15,716	45,970	58,480	64,352	70,784	76,677	86,119	80,495	55,116
60 to 64	1,837	341	387	608	577	412	102	65	4,329
Total Pay	23,796,325	13,577,768	22,772,409	40,965,044	42,005,811	32,467,970	9,324,712	5,479,043	190,389,082
Avg. Pay	12,954	39,818	58,843	67,377	72,800	78,806	91,419	84,293	43,980
65 & Over	2,291	524	181	227	214	169	65	64	3,735
Total Pay	20,398,952	12,356,675	11,463,858	15,532,839	16,369,811	14,008,597	5,681,398	6,270,288	102,082,418
Avg. Pay	8,904	23,581	63,336	68,427	76,494	82,891	87,406	97,973	27,331
Total	23,556	13,380	12,073	10,418	7,487	3,976	808	150	71,848
Total Pay	582,951,229	656,265,669	712,119,831	681,584,748	526,209,211	297,982,017	66,703,269	13,410,377	3,537,226,351
Avg. Pay	24,747	49,048	58,984	65,424	70,283	74,945	82,554	89,403	49,232

Average Age: 43.5

Average Service: 10.8

SCHEDULE F
(Continued)

TABLE 2
SCHEDULE OF TOTAL ACTIVE MEMBER VALUATION DATA

Valuation Date	Number	Annual Payroll	Annual Average Pay	Percentage Increase in Average Pay
6/30/2016	71,848	$3,537,226,348	$49,232	1.19%
6/30/2015	72,246	3,515,113,126	48,655	2.45
6/30/2014	73,407	3,486,326,799	47,493	2.12
6/30/2013	74,831	3,480,066,406	46,506	1.51
6/30/2012	75,951	3,479,567,004	45,813	1.33
6/30/2011	76,349	3,451,756,288	45,210	3.97

TABLE 3
ELIGIBLE DEFERRED VESTED MEMBERS AS OF JUNE 30, 2016
MALE AND FEMALE DEMOGRAPHIC BREAKDOWN

Attained Age	Medical Insurance Fund			Life Insurance Fund		
	Number of		Total Number	Number of		Total Number
	Males	Females		Males	Females	
Under 30	3	9	12	18	66	84
30-34	125	534	659	215	752	967
35-39	338	1,021	1,359	377	1,135	1,512
40-44	340	1,067	1,407	374	1,154	1,528
45-49	326	1,191	1,517	343	1,275	1,618
50-54	301	1,010	1,311	325	1,070	1,395
55-59	221	807	1,028	240	743	1,083
60 & Over	236	616	852	239	632	871
Total	**1,890**	**6,255**	**8,145**	**2,131**	**6,927**	**9,058**

SCHEDULE F
(Continued)

TABLE 4
ALL RETIREES AND SPOUSES RECEIVING HEALTH CARE BENEFITS AS OF JUNE 30, 2016
MALE AND FEMALE DEMOGRAPHIC BREAKDOWN

Attained Age	Number of		Total Number
	Males	Females	
Under 40	3	18	21
40-44	15	54	69
45-49	66	203	269
50-54	367	974	1,341
55-59	1,169	2,908	4,077
60-64	2,758	6,068	8,826
65-69	3,939	8,236	12,175
70-74	2,843	4,937	7,780
75-79	1,869	3,231	5,100
80-84	1,216	2,010	3,226
85-89	601	1,399	2,000
90-94	196	645	841
95-99	49	179	228
100	1	15	16
101	0	9	9
102	1	11	12
103	0	1	1
104	0	1	1
105 & Over	0	4	4
Total	**15,093**	**30,903**	**45,996**

SCHEDULE F
(Continued)

TABLE 5
SCHEDULE OF RETIRANTS, BENEFICIARIES AND SURVIVORS ADDED TO AND REMOVED FROM ROLLS*

Medical Insurance Fund									
Fiscal Year Ending June 30	Number of Members Added to Rolls	Number of Spouses** Added to Rolls	Total Number Added to Rolls	Number of Members Removed from Rolls	Number of Spouses** Removed from Rolls	Total Number Removed from Rolls	Number of Members on Rolls at the End of the Year	Number of Spouses** on Rolls at the End of the Year	Total Number on Rolls at the End of the Year
2011	1,770	629	2,399	1,052	541	1,593	35,033	6,922	41,955
2012	1,996	702	2,698	1,029	616	1,645	36,000	7,008	43,008
2013	1,853	664	2,517	1,076	619	1,695	36,777	7,053	43,830
2014	1,663	638	2,301	1,165	660	1,825	37,275	7,031	44,306
2015	1,990	731	2,721	1,190	633	1,823	38,075	7,129	45,204
2016	2,045	726	2,771	1,305	674	1,979	38,815	7,181	45,996

**Reflects members, spouses, and beneficiaries participating in a health care plan.*
***Includes spouses, beneficiaries, and surviving spouses.*

TABLE 6
SCHEDULE OF RETIRANTS, BENEFICIARIES AND SURVIVORS ADDED TO AND REMOVED FROM ROLLS*

Life Insurance Fund								
Fiscal Year Ending June 30	Number Added to Rolls	Life Insurance Benefit ($1,000's)	Number Removed from Rolls	Life Insurance Benefit ($1,000's)	Number on Rolls at the End of the Year	Life Insurance Benefit ($1,000's)	Increase in Life Insurance Benefit	Average Life Insurance Benefit
2011	2,025	10,125	858	4,290	41,118	205,590	2.92	5,000
2012	2,364	11,820	880	4,400	42,602	213,010	3.61	5,000
2013	2,195	10,975	952	4,760	43,845	219,225	2.92	5,000
2014	1,964	9,820	954	4,770	44,855	224,275	2.30	5,000
2015	2,270	11,350	1,641	8,205	45,484	227,420	1.40	5,000
2016	2,394	11,970	807	4,035	47,071	235,355	3.49	5,000

**The life insurance benefit is payable upon the death of only members retired for service or disability. Numbers do not include life insurance benefits payable upon the death of an active contributing member.*

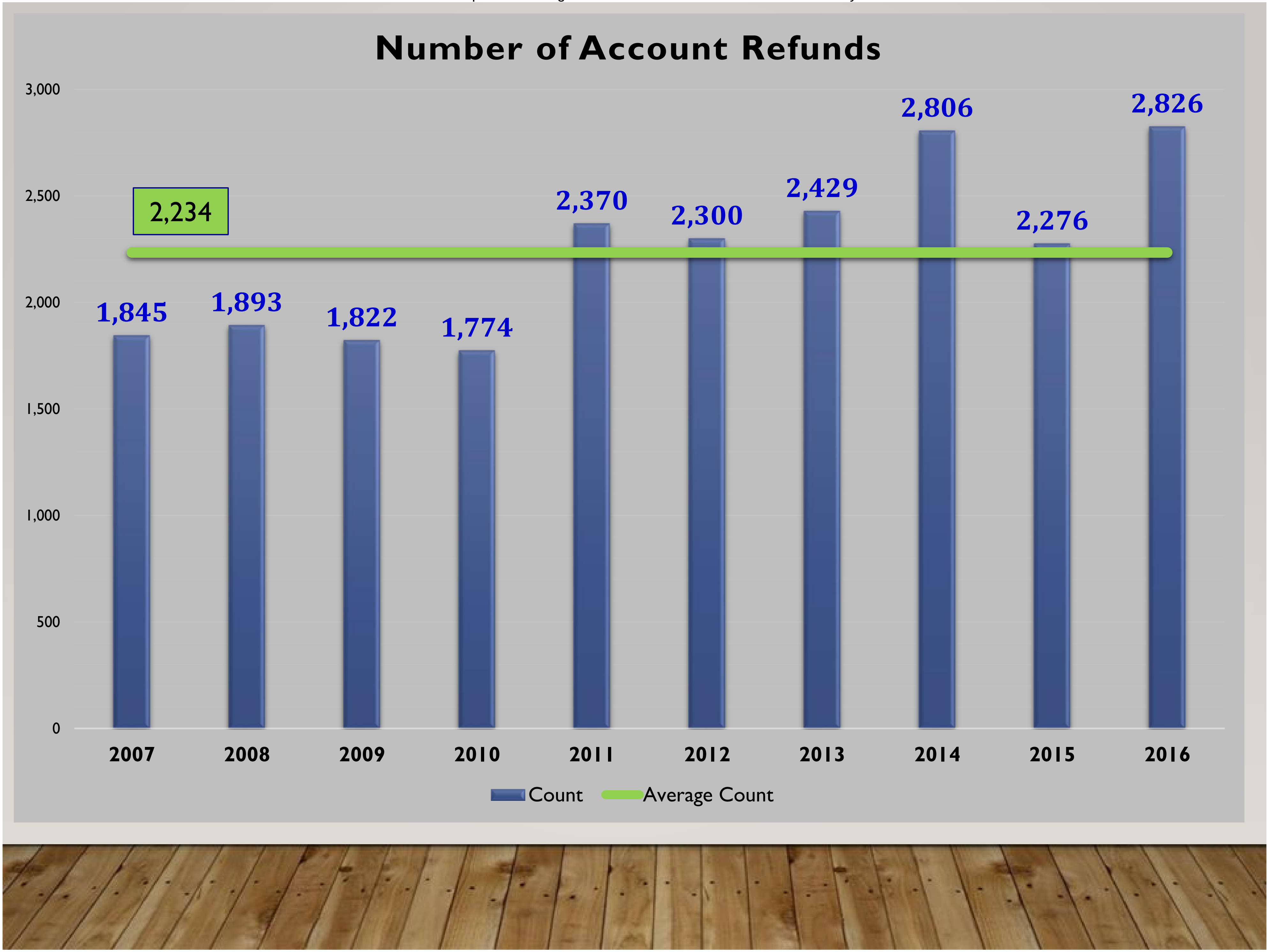
TEACHERS' RETIREMENT SYSTEM OF KENTUCKY

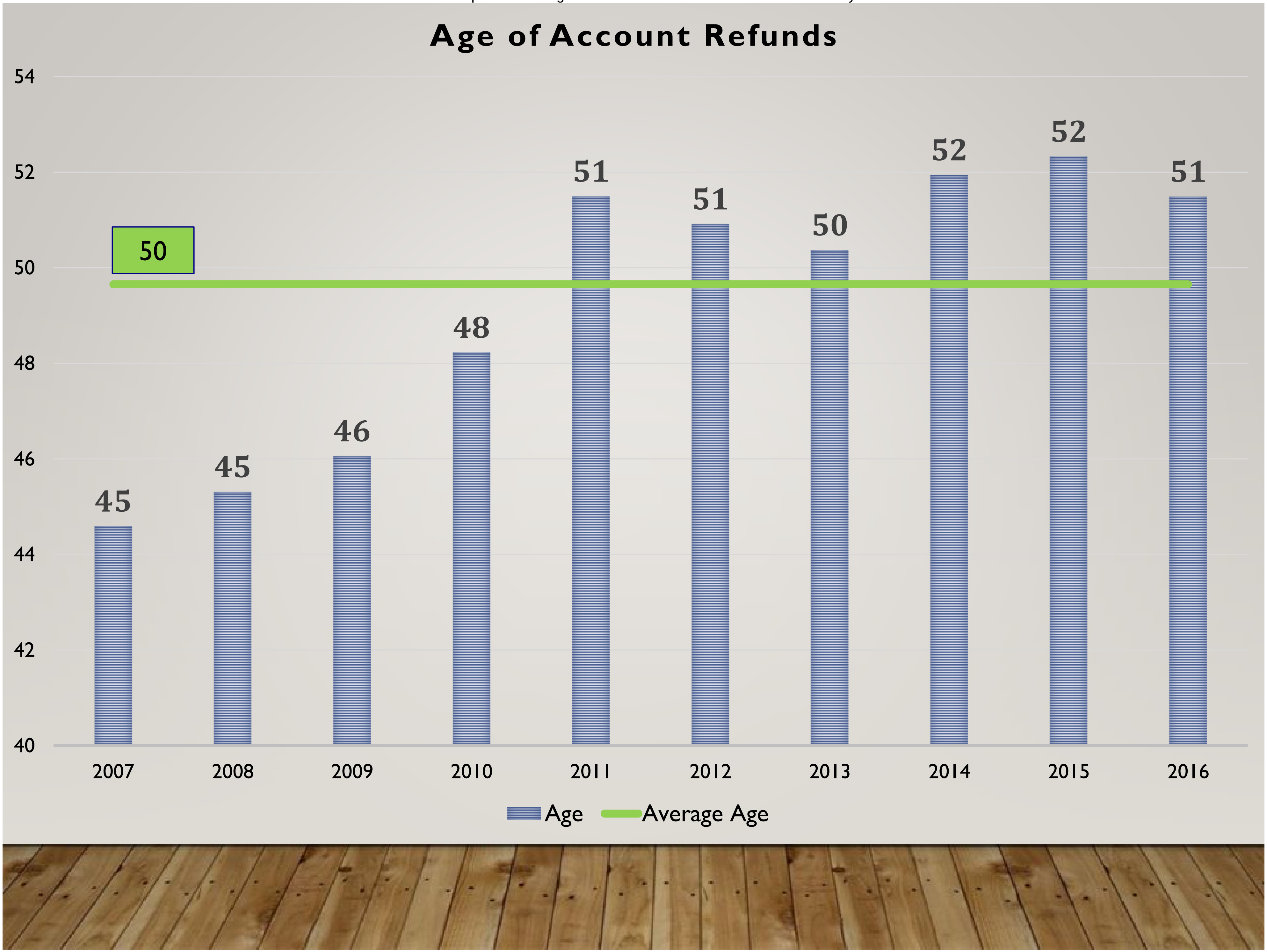
Refund Statistics

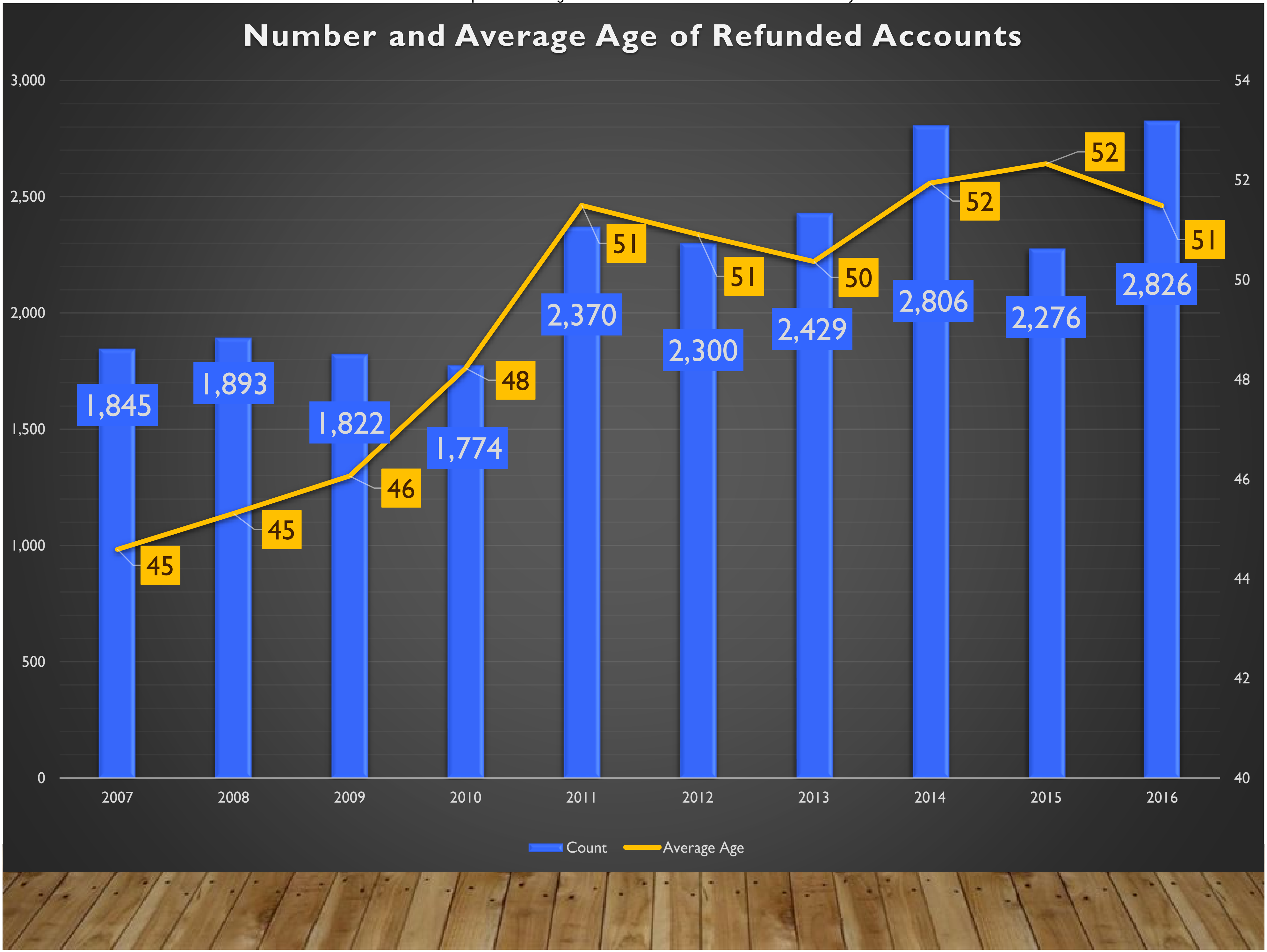
Presented by

Nate Van Sickel

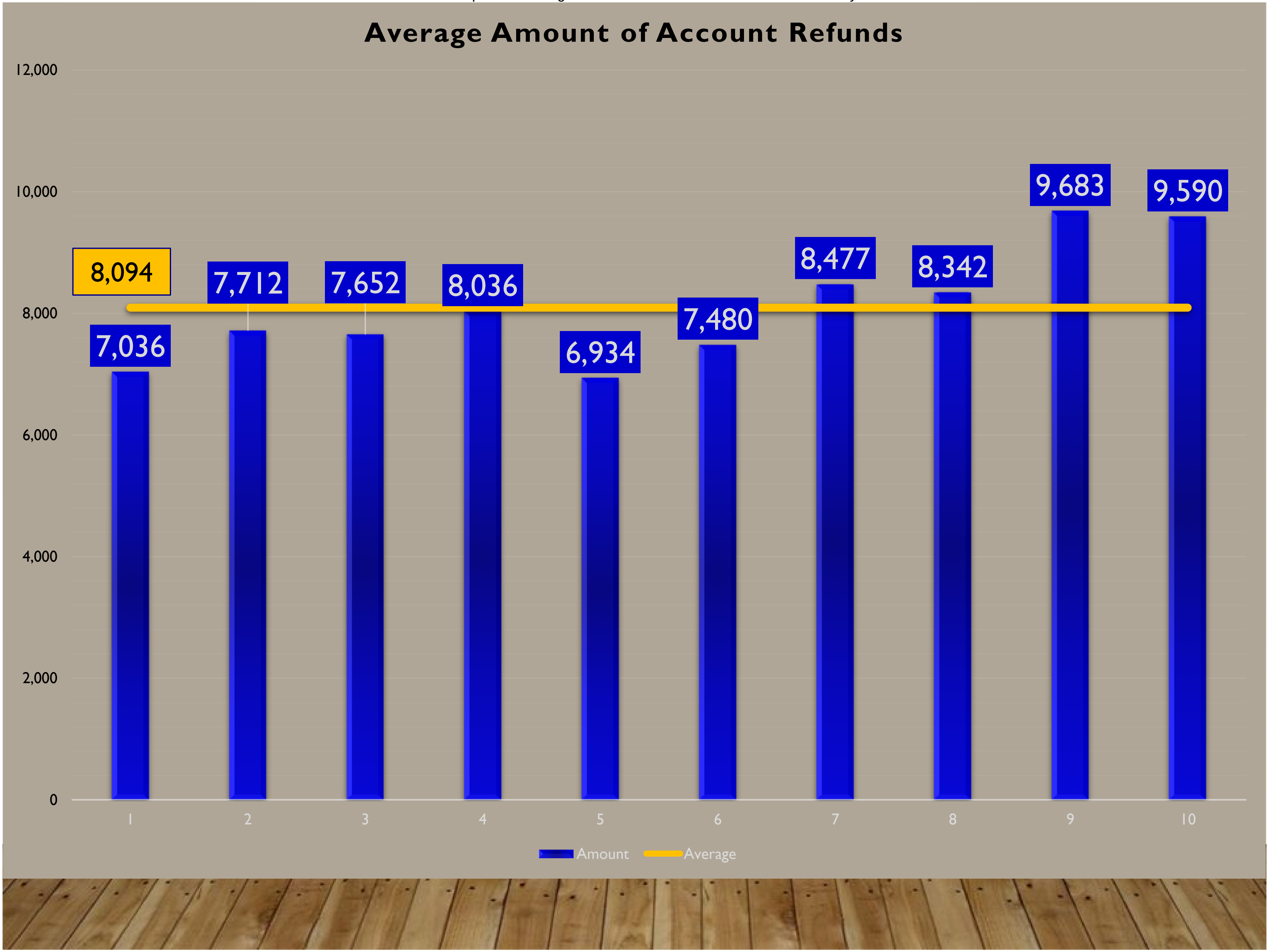
Internal Auditor

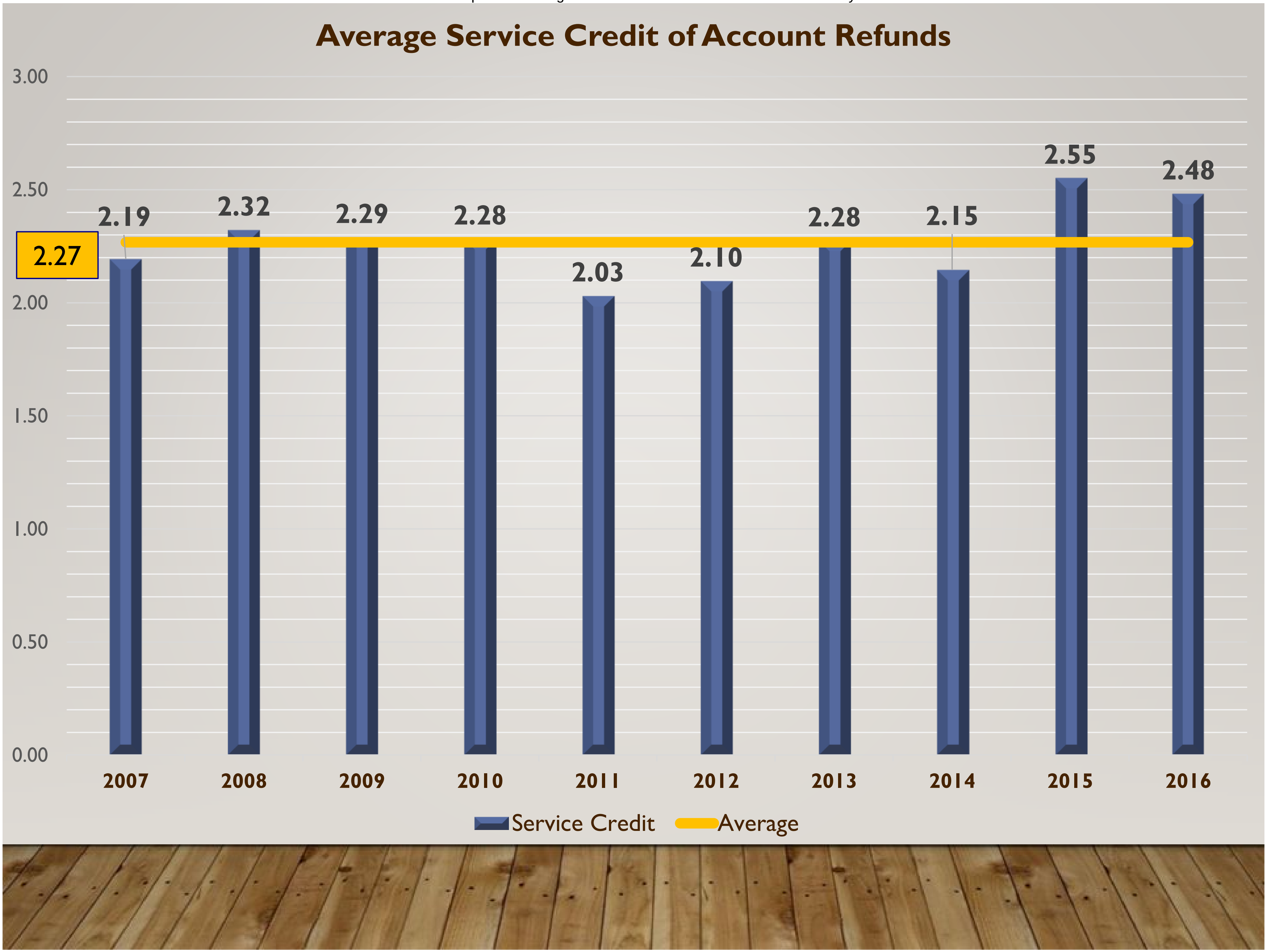

Number of Account Refunds
3,000
2,500
2,000
1,500
1,000
500
0
2,234
1,845
1,893
1,822
1,774
2,370
2,300
2,429
2,806
2,276
2,826
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Count
Average Count

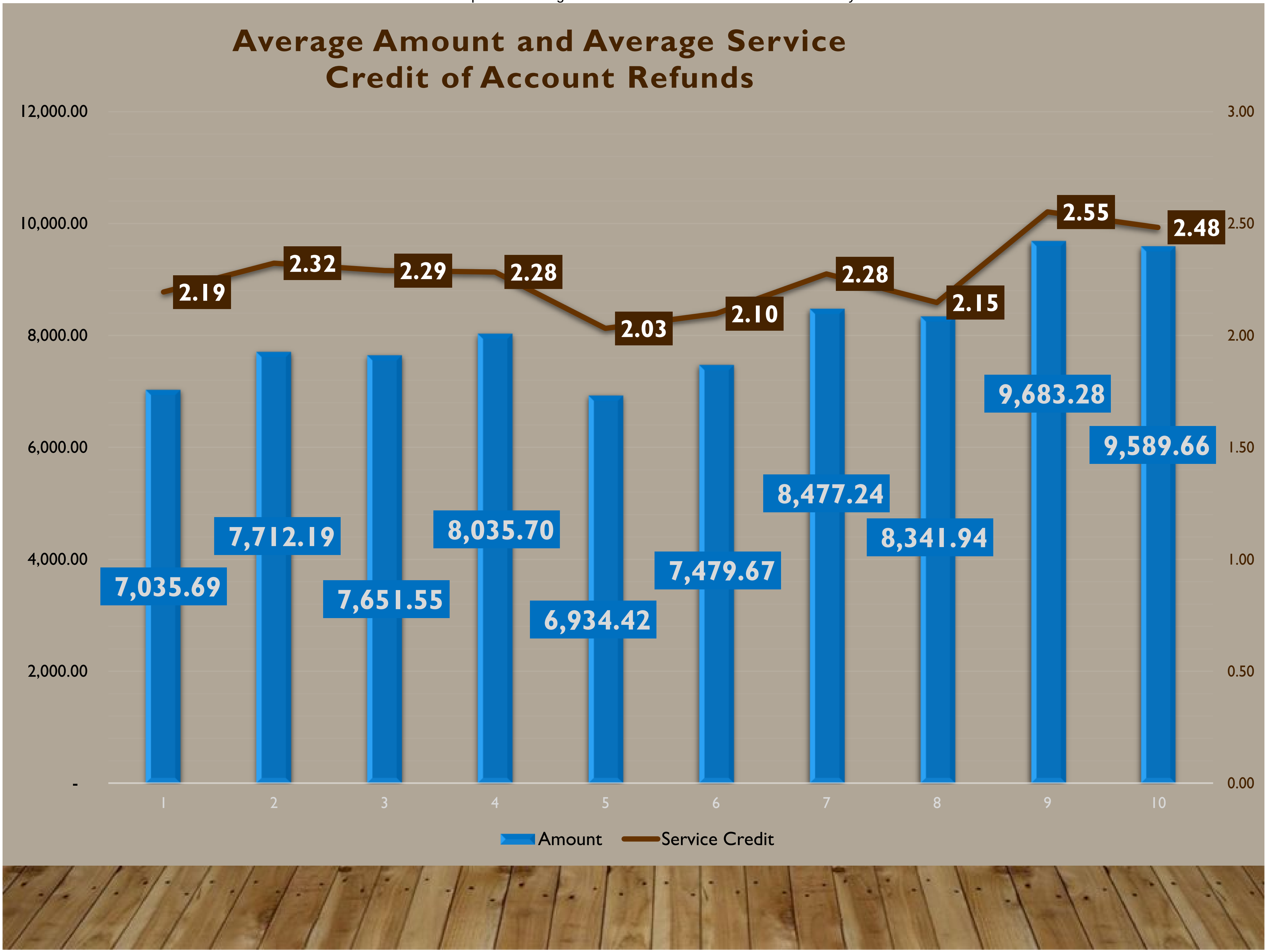

Age of Account Refunds
54
52
50
48
46
44
42
40
50
45
45
46
48
51
51
50
52
52
51
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Age
Average Age



Number and Average Age of Refunded Accounts
3,000
2,500
2,000
1,500
1,000
500
0
54
52
50
48
46
44
42
40
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
1,845
1,893
1,822
1,774
2,370
2,300
2,429
2,806
2,276
2,826
45
45
46
48
51
51
50
52
52
51
Count
Average Age


Average Amount of Account Refunds
12,000
10,000
8,000
6,000
4,000
2,000
0
8,094
7,036
7,712
7,652
8,036
6,934
7,480
8,477
8,342
9,683
9,590
1
2
3
4
5
6
7
8
9
10
Amount
Average


Average Service Credit of Account Refunds
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2.27
2.19
2.32
2.29
2.28
2.03
2.10
2.28
2.15
2.55
2.48
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Service Credit
Average


Average Amount and Average Service Credit of Account Refunds
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
-
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2.19
2.32
2.29
2.28
2.03
2.10
2.28
2.15
2.55
2.48
7,035.69
7,712.19
7,651.55
8,035.70
6,934.42
7,479.67
8,477.24
8,341.94
9,683.28
9,589.66
1
2
3
4
5
6
7
8
9
10
Amount
Service Credit

Teachers' Retirement System

of the State of Kentucky

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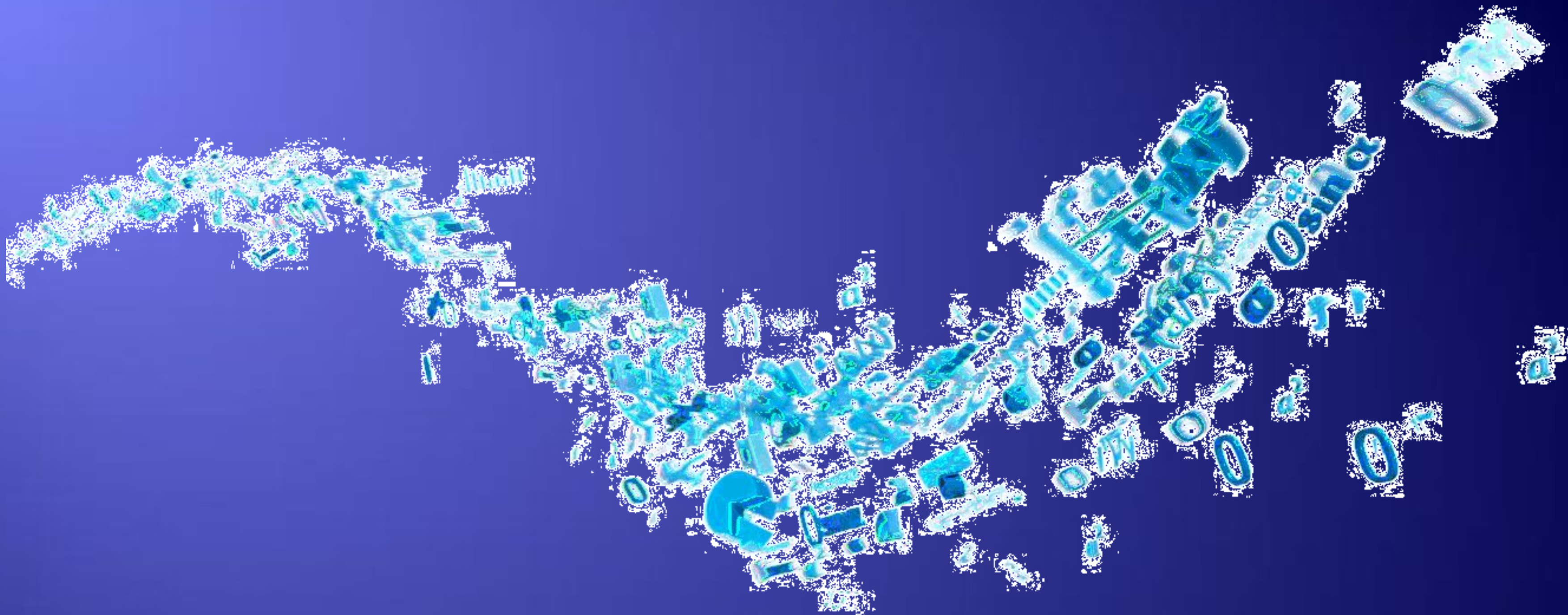

Asset Allocation

Teachers' Retirement System of Kentucky
October 2016

Aon Hewitt
Retirement and Investment

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Mission and Objectives

- Provide current and future retirement benefits for more than 140,000 active and retired members
- Quantitative objective to exceed 7.5% actuarially assumed rate of return over long term with minimal volatility
- Objective achieved by diversification across a variety of asset classes as required by statute.

Investment of Funds

KRS 161.430 (1)

- Under direction of the trustees
- Using policies established by regulation
- Using well established and documented investment strategies
- Employing competent investment professionals, internally and externally, who are issued written mandates for their assignments

Fiduciary Requirements

KRS 161.430 (2)

Board members and investment counselors must use assets "solely in the interests of the active contributing members and annuitants" and to:

a) Provide benefits and defray expenses of administration;

b) Act as a prudent expert;

c) Diversify investments to minimize risk of large losses, unless it is clearly prudent not to do so; and

d) Follow laws, regulations and other instruments governing system.

Asset Allocation

as of Sept. 30, 2016

	BOOK VALUE	% OF TOTAL	MARKET VALUE	% OF TOTAL
Cash Equivalents (Unallocated)	169,532,983.35	1.2	169,532,983.35	1.0
Fixed Income	2,667,511,898.90	19.0	2,873,428,222.70	16.7
Equities	8,298,570,839.73	58.9	10,940,897,629.02	63.3
Real Estate	823,890,654.98	5.8	950,324,669.28	5.5
Alternative Assets	795,425,429.20	5.4	953,713,170.21	5.5
Additional Categories	1,373,115,920.84	9.7	1,390,657,727.06	8.0
TOTAL	14,128,047,727.00	100.0	17,278,554,401.62	100.0

Total Cash Equivalents including Manager Allocated as of 9/30/16 = $351,682,360.68

Asset Allocation

- Asset allocation is the mix of investment categories included in a portfolio
- Asset allocation will have the greatest impact on the portfolio's long-term return
- Relative impact:
  - Policy/Asset Allocation: 90%
  - Structure: 5%
  - Managers: 5%
- Factors impacting the asset allocation decision:
  - Liabilities
  - Liquidity needs
  - Risk tolerance
  - Diversification
- These factors are considered during the asset allocation setting process
  - Asset liability studies (every three to five years)
  - Asset allocation reviews (annually)

Qualitative Factors Influencing Asset Allocation Decision

- Risk Tolerance and Return objectives
- Liability structure and Funded status
- Time and Resources
- Liquidity
- Leverage
- Time Horizon
- Fees
- Transparency
- Conventionality
- Ability to benchmark
- Peer practices
- Access
- Restrictions due to legal or regulatory imperatives or internal policies

How is TRS different from most public pension plans?

Differences directly bear on risk management.

- **Social Security –**
  - For most members, the TRS benefit replaces Social Security
- **Health Care –**
  - One of a minority of state pensions providing retiree health care
  - Was only state redirecting pension contributions to fund retiree health care with promise to repay.
- **Laws and Regulations**
  - Fixed employer contribution rate, investment policy governed by statute and regulation

Types of Studies

Metric	Asset Allocation Study/Review	Asset-Liability Study
Frequency	Annual	Tri-Annual
Efficient Frontier	✓	✓
Asset Mix	✓	✓
Broad Asset Classes	✓	✓
Sub-Asset Classes	✓	
Active Vs. Passive	✓	
Benchmarks	✓	
Rebalancing	✓	
Liability-Focus		✓
Cost Projections		✓
Funded Status Projections		✓

Consideration #1: Liabilities

- Ultimate goal is to have sufficient assets to pay the accrued (promised) benefits of the plan
  - Benefit liabilities should drive prudent investment decisions
  - Assuming too much or too little investment risk can jeopardize attaining this goal

- Achieving or exceeding assumed rate of return must be balanced with protecting the accumulated assets

- The focus should be specific to the circumstances of the investor

Consideration #2: Liquidity Needs

- A Fund's ability to invest in illiquid asset classes is inhibited when:
  - Withdrawals are unexpected
  - Withdrawals require a high or increasing percentage of the Fund's assets
- In mature pension plans, the percentage of plan assets that is needed to meet benefit payment typically increases
- Boards of mature plans are challenged to set an investment policy that balances a fund's conflicting objectives – investments that provide safety and liquidity versus investments that can potentially grow assets materially

Current liquidity

Between 80 and 85 percent of the portfolio is in publicly traded liquid securities

Examples:

- Public equity
- Investment-grade fixed income
- Cash

Consideration #3: Risk Tolerance

- Risk tolerance is often impacted by:
  - Ability to withstand periods of market downturn
  - Willingness to differ from peers
  - Confidence in the equity markets

- Common types of risk to consider when setting asset allocation are:
  - Market risk
  - Credit risk
  - Currency risk
  - Inflation risk
  - Default risk
  - Others

Consideration #4: Diversification

- Diversification is required under the Prudent Investor Rule
- Diversification by asset class serves to:
  - Reduce the risk of loss in a single investment
  - Reduce the volatility of returns
  - Diminish the impact of poor performance of a single asset class on the total fund
- Diversification creates a more efficient portfolio as the different asset classes are not perfectly correlated with each other
  - The most recent financial crisis saw increased correlations, however
- Each asset class has:
  - An expected risk/return profile
  - A role in the portfolio

Asset Classes – Theoretical Risk/Return Trade-offs

Roles of the Asset Classes

- Equities
  - Provide exposure to the incredibly diverse, large, and liquid global stock market
  - Provide an important and primary source of growth to the investment program
  - Downside is equities are typically very volatile and can have large draw-downs during difficult economic scenarios

- Private Equity
  - Enhance returns
  - Gain liquidity premium
  - Gain exposure to non-public investments
  - Downside is investments are very illiquid, long-term focused, and create additional due diligence and fiduciary challenges

- Real Estate
  - Good diversifier to stocks and bonds
  - Real assets can protect against inflation
  - Enhance yield relative to bonds and higher risk strategies can provide meaningfully to return

Roles of the Asset Classes (cont'd)

- High Quality Fixed Income
  - Provide downside protection, liquidity, and a fair return in most market environments
  - Can provide cash flow stream similar to liabilities
  - Downside is exposure to interest rate risk (some bonds provide floating rates)

- Additional Categories
  - Used to capture special market opportunities and sub asset classes that can enhance return and/or improve the diversification of the portfolio
    - Below Investment Grade Credit
    - Non-U.S. Bonds
    - Distressed Credit
    - Opportunistic Credit
    - Direct Lending
  - Diverting assets to these categories from fixed income, with interest rates near all-time lows, improves the return profile of the Fund

Risk-Reducing Assets vs. Return-Seeking Assets

- Risk-Reducing Assets:
  - Provide downside protection
  - Liquid
  - High credit quality
  - Low correlation to risky assets during financial crises
  - May not have a high expected return, but diversification plays an integral role in achieving long-term objectives
  - Likely subject to interim interest rate risk

- Return-Seeking Assets:
  - Helps plan achieve long-term growth needs
  - May be far more volatile than risk-reducing assets
  - May be far less liquid than risk-reducing assets
  - Provide diversification to other return-seeking assets during normal times

Asset Allocation

as of Sept. 30, 2016

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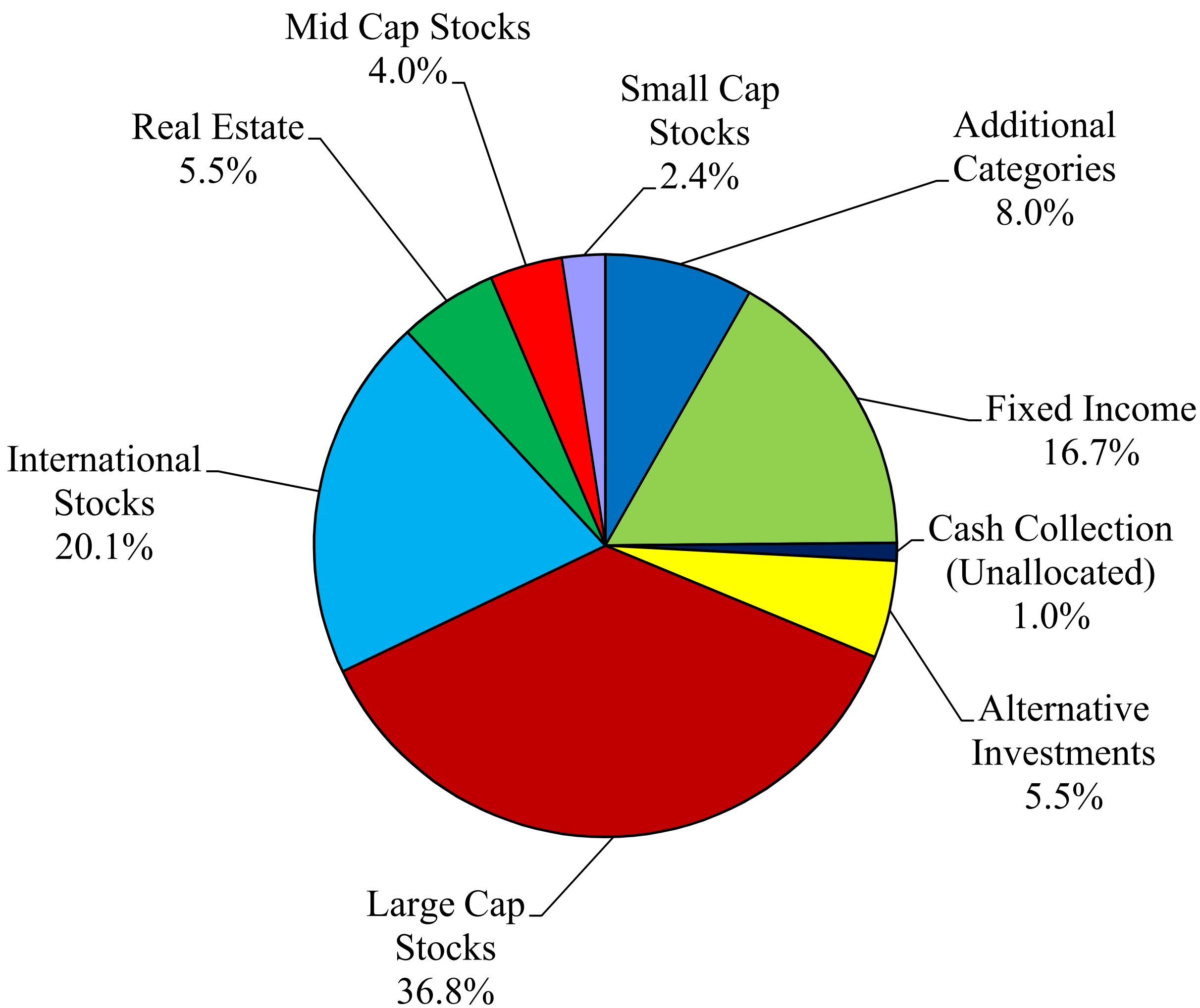
Total Cash Equivalents including Manager Allocated as of 9/30/16 = $351,682,360.68

Total Portfolio (MV) 9/30/16
Internally Managed 32.1%
Board of Trustees 1.0%
Externally Managed 66.9%



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Changes in Asset Allocation

FY 2000, 2006, 2009, 2012 and 2016 including Sept. 30, 2016

Asset Class Breakdown	June 30, 2000	June 30, 2006	June 30, 2009	June 30, 2012	June 30, 2016	September 30, 2016
Large Cap Stocks	55.1 %	52.9 %	42.6 %	40.3 %	36.5 %	36.8 %
Mid Cap Stocks	0.0 %	3.1 %	4.1 %	4.5 %	4.0 %	4.0 %
Small Cap Stocks	2.4 %	3.0 %	2.7 %	2.7 %	2.4 %	2.4 %
International Stocks	0.0 %	2.4 %	11.3 %	15.6 %	19.2 %	20.1 %
Total Stocks	**57.5 %**	**61.4 %**	**60.7 %**	**63.1 %**	**62.1 %**	**63.3 %**
Fixed Income	33.9 %	30.1 %	33.1 %	23.0 %	17.1 %	16.7 %
Cash	6.8 %	5.7 %	1.1 %	2.9 %	1.7 %	1.0 %
Real Estate Equity	1.8 %	2.8 %	3.6 %	4.0 %	5.6 %	5.5 %
Alternative	0.0 %	0.0 %	1.5 %	3.0 %	5.6 %	5.5 %
Additional Categories	0.0 %	0.0 %	0.0 %	4.0 %	7.9 %	8.0 %
Total	**100.0 %**	**100.0 %**	**100.0 %**	**100.0 %**	**100.0 %**	**100.0 %**

Teachers' Retirement System

TOTAL PORTFOLIO HOLDINGS

Sept. 30, 2016

($ in millions)	**$'s**	**Actual %**	**Target %**	**Strategic Ranges**
Domestic Equities	$7,466.4	**43.2%**	**41.0%**	34.0 - 48.0%
Real Estate	950.3	**5.5%**	**6.0%**	4.0 - 8.0%
Alternative Inv.	953.7	**5.5%**	**7.0%**	4.0 - 10.0%
International Equities	3,474.5	**20.1%**	**20.0%**	17.0 - 23.0%
Additional Categories	1,390.7	**8.0%**	**9.0%**	6.0 – 12.0%
Fixed Income	2,873.4	**16.7%**	**15.0%**	12.0 - 19.0%
Cash	$169.5	**1.0%**	**2.0%**	1.0 - 3.0%
Total	**$17,278.5**	**100.0%**	**100.0%**	-

Asset Allocation

- Asset liability modeling used as a basis for determining asset mix
- Cash-flow requirements manageable with $973 M appropriation beginning with FY 17. Had been significant investment limitation in last decade

INVESTMENT PERFORMANCE

TRS RETURNS

AS OF SEPT. 30, 2016

	Quarter	FYTD	1-Year	3-Year	5-Year	10-Year
Returns	4.34%	4.34%	9.22%	6.62%	10.47%	6.08%

Over the last 30 years, the compounded return has been 8.15% (Gross)

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Teachers' Retirement System

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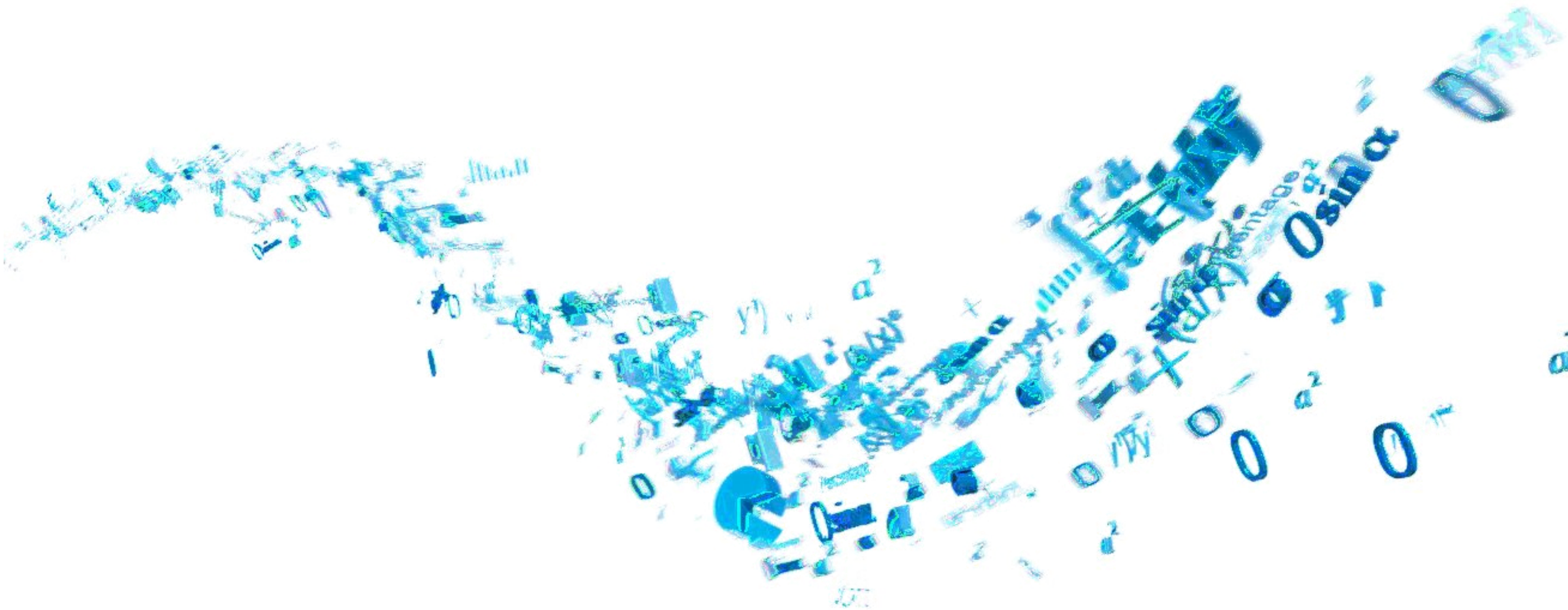
Protecting & Preserving Teachers' Retirement Benefits



Teachers’ Retirement System of the State of Kentucky

Private Equity Portfolio Review and Illiquid Portfolio Overview
June 30, 2016

Aon Hewitt
Retirement and Investment

Empower Results®

Table of Contents

Section 1:
Glossary of Terms

Glossary of Terms — Private Equity

- **Private Equity**: Private equity is broadly defined as investments in privately negotiated securities that typically do not trade in a capital market. Investments are typically illiquid and long-term in nature, thereby introducing greater risk into a portfolio, which is generally rewarded by higher returns than traditional asset classes. Aon Hewitt classifies its private equity investments into the following categories.
- **Vintage year**: The year of the first drawdown of capital.
- **Commitment**: A limited partner's obligation to provide a certain amount of capital to a fund.
- **Capital contribution**: The amount of capital drawn down by the general partner. Also known as the paid-in capital.
- **Distribution**: Cash or the value of stock distributed to the limited partners of a fund.
- **Market value**: The carrying value of the remaining investments.
- **Internal rate of return (IRR)**: The discount rate that equates the net present value (NPV) of an investment's cash inflows with its cash outflows.
- **Total Value** = Total Distributions + Net Asset Value.
- **DPI** = Total Distributions/Total Paid-In.
- **TVPI** = Total Value/Total Paid-In.

Glossary of Terms — Private Equity

- **J Curve**: The curve realized by plotting the returns generated by a private equity fund against time (from inception to termination).
- **Core/Satellite**: The use of FOFs (Fund of Funds) for core private equity exposure coupled with primary investments utilized to take advantage of point-in-time market conditions and additional strategy diversification.

Fund Classifications by Strategy

- **Venture Capital:**
  - *Seed* – An entrepreneur has a new idea or product, but no established organization or structure. Investors tend to provide a few hundred thousand dollars and perhaps some office space to an entrepreneur who needs to develop a business plan.
  - *Early-stage* – The organization has been formed and has employees, and products are in the developmental stage. Early-stage investors back companies when they have a completed business plan, at least part of a management team in place, and perhaps a working prototype.
  - *Later Stage* – An established infrastructure is in place, and the company has a viable product that is market-ready and generating revenues. Later-stage investors typically provide financing for expansion of a company that is producing, shipping, and increasing its sales volume.
- **Corporate Finance/Buyouts**: A fund investment strategy involving the acquisition of a product or business, from either a public or private company, utilizing a significant amount of debt and some equity.

Glossary of Terms — Private Equity

Fund Classifications by Strategy (cont'd)

- **Mezzanine:** A fund investment strategy involving subordinated debt (the level of financing senior to equity and below senior debt).
- **Distressed Debt:** A fund investment strategy involving investment in equity or debt of companies that are unable to service existing debt, often including companies in, or preparing to enter bankruptcy.
- **Infrastructure:** A fund investment strategy involving investment in equity and debt securities in transportation, communication, sewage, water, and electric systems. These systems tend to be high-cost investments however they are needed for a country to be efficient and productive.
- **Fund-of-Funds:** A fund set up to distribute investments among a selection of private equity fund managers, who in turn invest the capital directly. Fund-of-funds are specialist private equity investors and have existing relationships with firms. They may be able to provide investors with a route to investing in particular funds that would otherwise be closed to them.
- **Co-Investments:** The syndication of a private equity financing round or an investment by a general partner alongside a private equity fund, in a financing round.

Section 2:
Pension Plan Portfolio Review

PE Portfolio Overview

Inception to 6/30/2016 and 6/30/2015

Portfolio Detail	6/30/2016
Number of Investments	37
Commitments	$1,414,862,458
Unfunded Commitments	$605,278,478
Total Paid-In	$946,740,653
Total Distributions	$397,874,796
Net Asset Value	$739,006,522
Total Value	$1,136,881,318
DPI	0.42x
TVPI	1.20x
IRR since inception	8.0%

See Appendix A for notes on data. Data above is for the PE portfolio only.

- TRS commenced investing in private equity in 2006, making three investments in the first year and now totaling 37 investments.
- The portfolio has been relatively consistently built out since this time and earlier investments are now distributing capital back to the plan.
- As at 6/30/2016, total commitments stood at $1.4 billion of which $605.3 million was unfunded.
- The TVPI and IRR stand at 1.20x and 8.0% respectively.

AON
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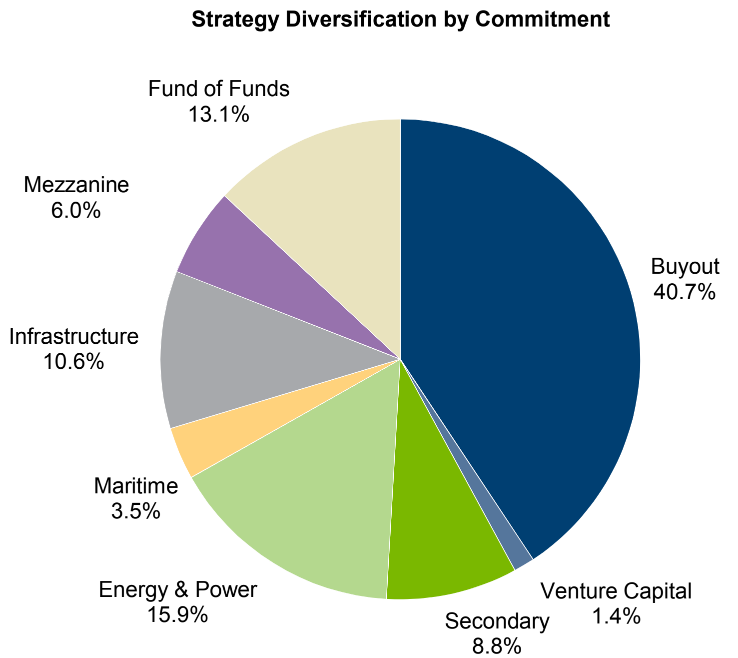
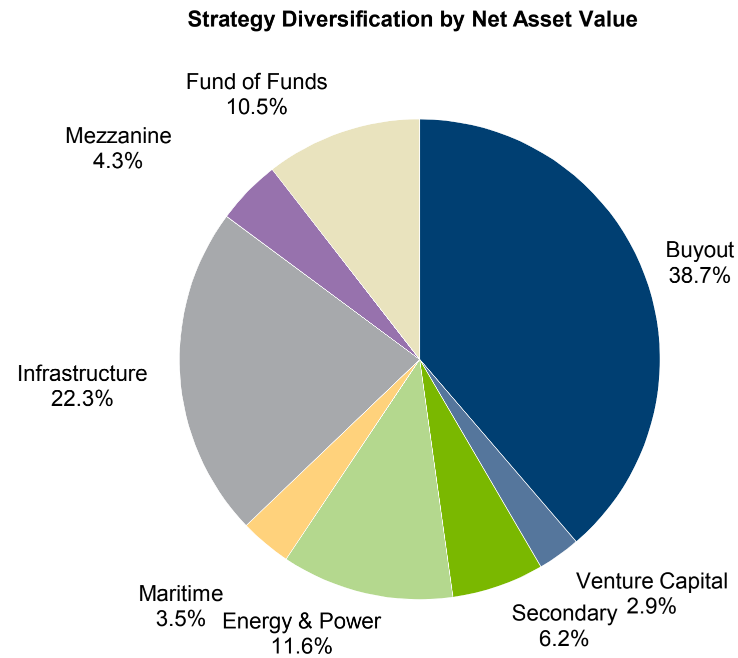
PE Strategy Diversification

As of 6/30/2016

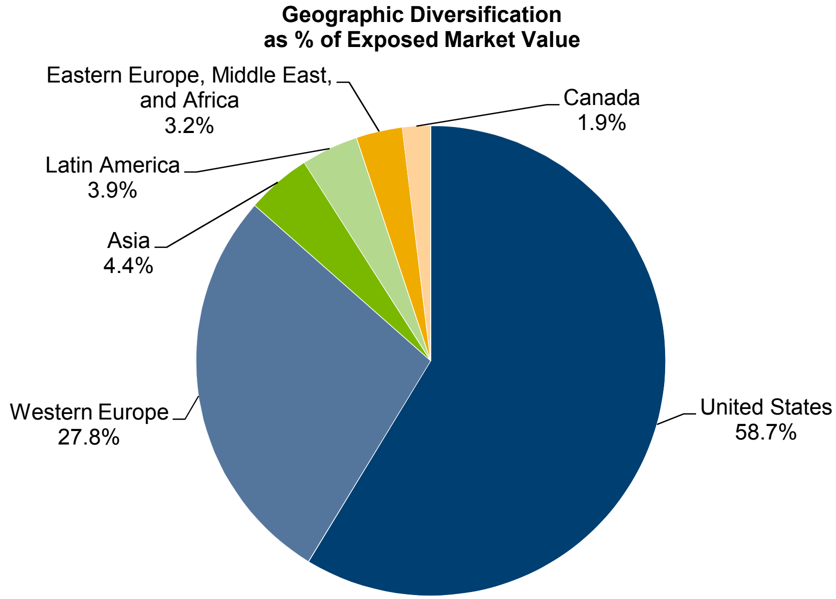




See Appendix A for notes on data. Data above is for the PE portfolio only.

- As the portfolio is maturing, TRS may want to consider implementing strategy diversification targets.
- Overall the portfolio is relatively well diversified across different private equity and infrastructure strategies.
- The similarity of the diversification charts by commitment and by NAV shows the maturity of the portfolio and demonstrates that diversification has been a consideration since inception.

PE Geographic Diversification
As of 6/30/2016



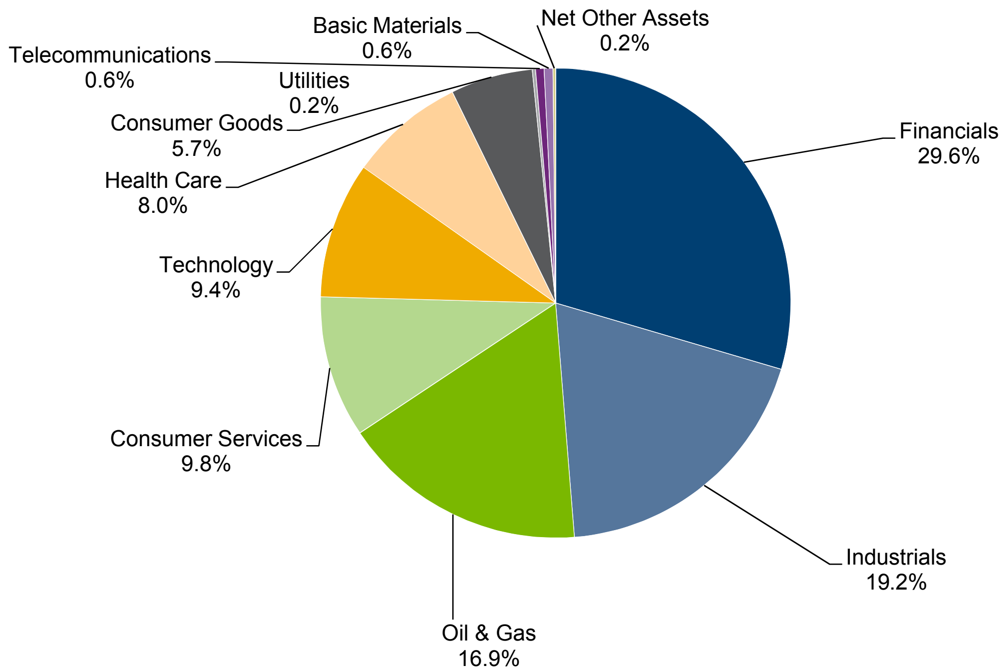
See Appendix A for notes on data. Data above is for the PE portfolio only.

- As the portfolio is maturing, TRS may want to consider implementing geographic targets.
- Overall, the portfolio is well diversified. The balance between U.S. and non-U.S. markets is within acceptable weight ranges compared to the market.

PE Industry Diversification

As of 6/30/2016

Industry Diversification
as % of Exposed Market Value

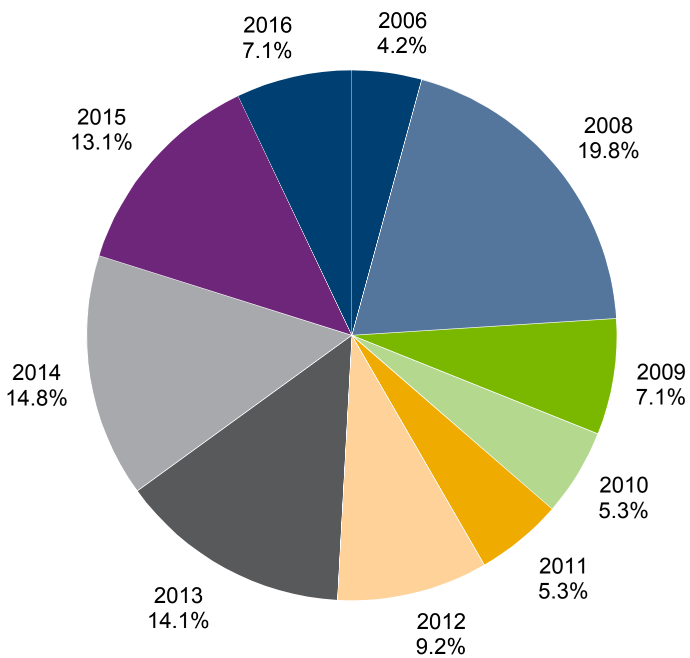


See Appendix A for notes on data. Data above is for the PE portfolio only.

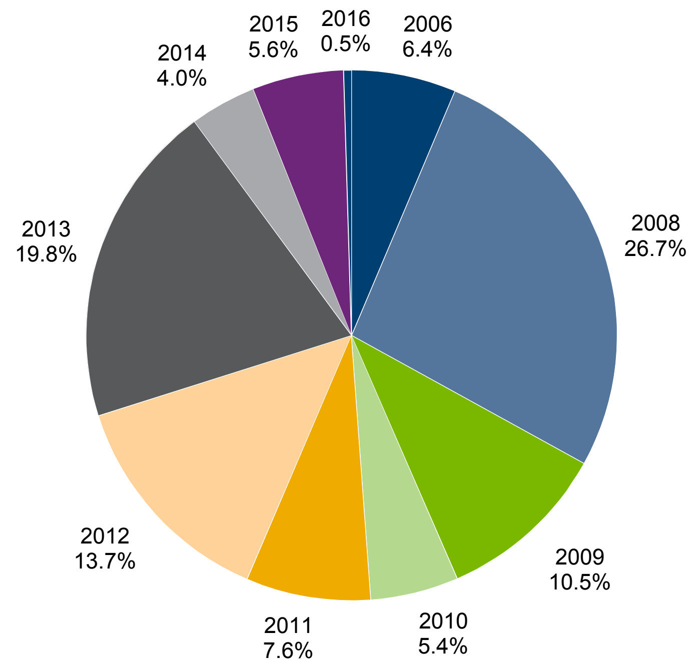
- As the portfolio is maturing, TRS may want to consider implementing industry targets.
- The portfolio is relatively well diversified but has a substantial weighting to Financials. This portion of the portfolio is particularly susceptible to economic cycles, a risk that could be reduced through further diversification towards other industries.

PE Vintage Year Diversification
As of 6/30/2016

Vintage Year Diversification by Commitment



Vintage Year Diversification by Net Asset Value



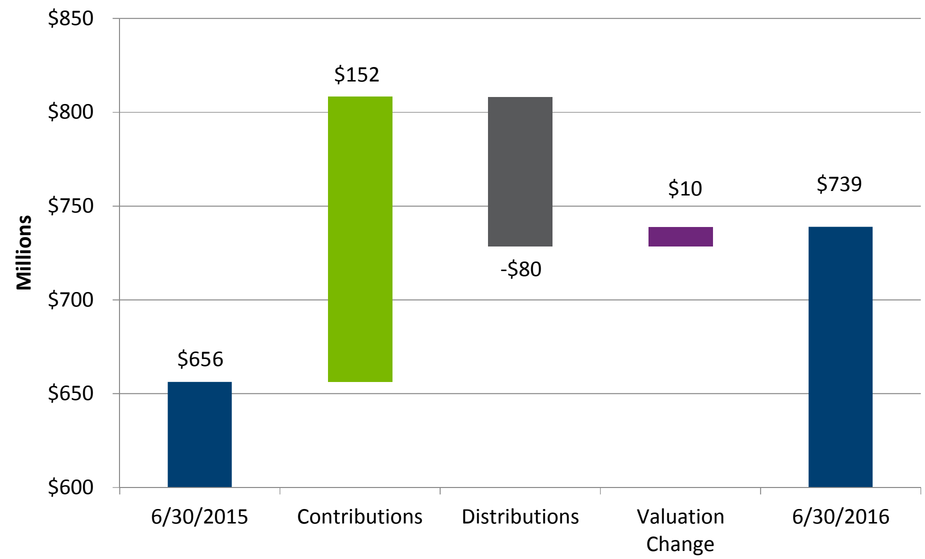
See Appendix A for notes on data. Data above is for the PE portfolio only.

- The portfolio's first commitment occurred in 2006. Since this time, commitments have been made at a relatively consistent pace, with the exception of 2007 when no commitments were made.
- TRS performs a pacing analysis annually in order to determine commitments for the next year.
- AHIC recommends continuing a consistent commitment pace going forwards, in order to mitigate vintage year risk.
- The differences between the commitment and NAV charts is as expected with the more recent commitments not yet having being funded.

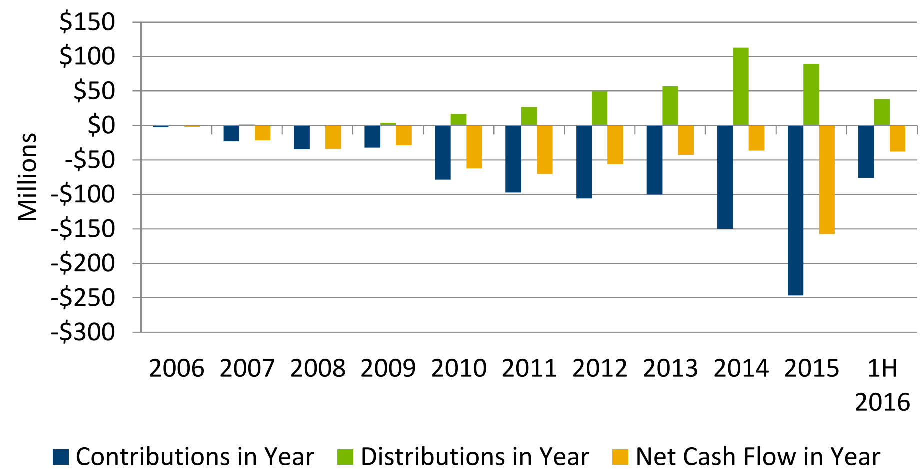
PE Cash Flows

As of 6/30/2016

- The NAV of the TRS portfolio increased by $82 million over the year to 6/30/2016 as contributions and appreciation outpaced distributions.
- The value of the existing assets did not change substantially over the course of the year.



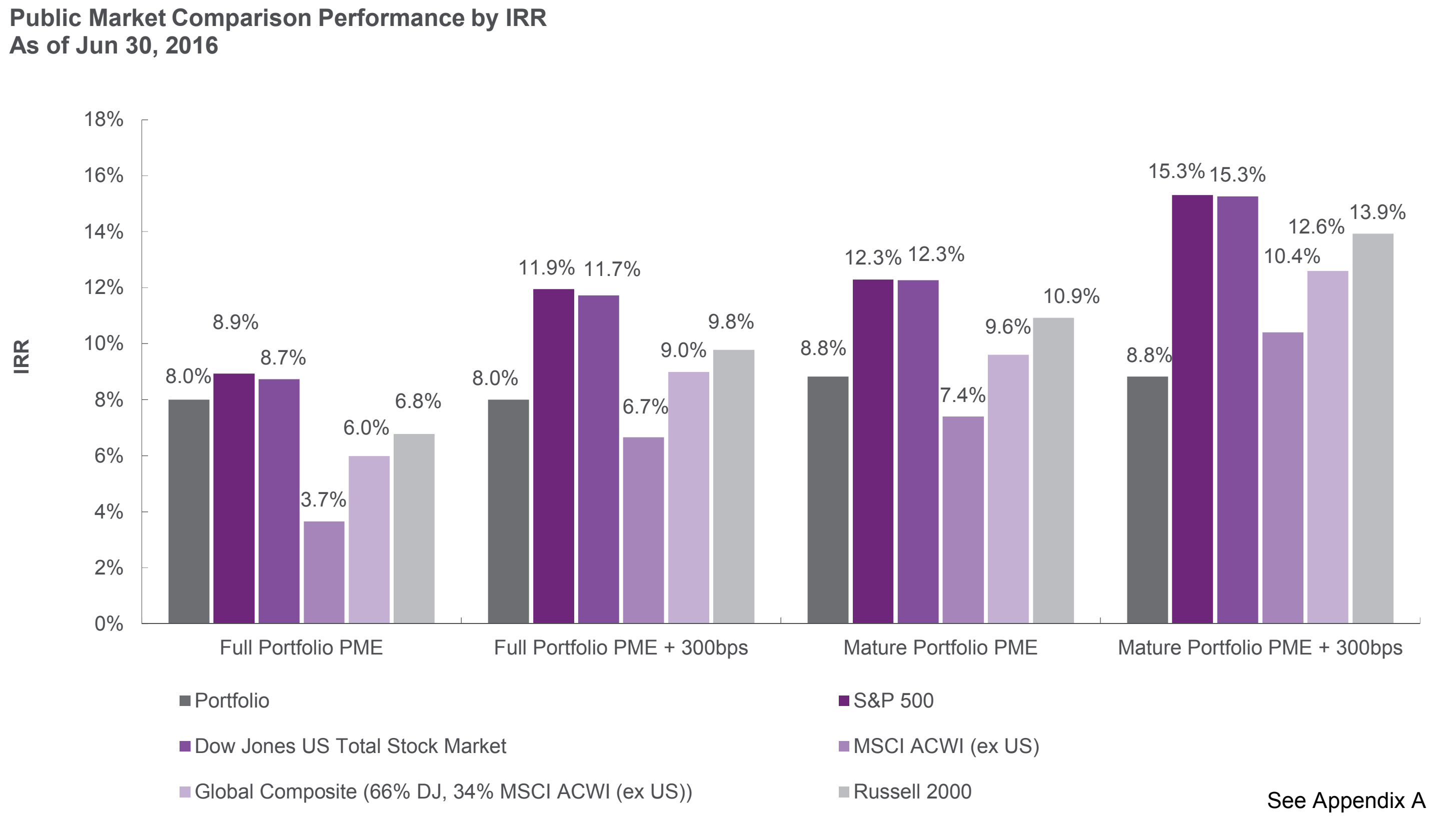
- The portfolio has been making commitments since 2006, and as it matures we would expect it to become cash flow positive within the next few years.
- Underlying managers have been steadily increasing the rate of capital calls since 2012.



See Appendix A for notes on data. Data above is for the PE portfolio only.

PE Portfolio Performance vs. Public Market Equivalents

As of 6/30/2016



See Appendix A for notes on data.
Data above is for the PE portfolio only.

- The chart above shows a Public Market Equivalent (PME) analysis for the TRS portfolio using a variety of public market benchmarks, including the TRS benchmark (S&P 500 + 300bps).
- The PME is shown for the full PE portfolio and for the mature portfolio (funds that have passed their investment periods).
- AHIC's best thinking is to use a blended index of the Dow Jones U.S Total Stock Market (66%) and the MSCI ACWI (ex US) (34%) with an additional premium.

PE Vintage Year Performance vs. Benchmark

Inception to 6/30/2016

Vintage Year	Number of Investments	Commitments	Unfunded Commitments	Total Paid-In	Total Distributions	Net Asset Value	Total Value	DPI	TVPI	IRR	Quartile
2006	3	$60,000,000	$1,458,338	$65,066,226	$43,521,883	$47,042,902	$90,564,785	0.67x	1.39x	6.2%	2nd
2008	7	279,500,000	28,561,540	313,182,562	225,759,732	196,977,198	422,736,930	0.72x	1.35x	10.1%	2nd
2009	4	100,000,000	22,597,794	89,074,789	45,589,934	77,319,125	122,909,059	0.51x	1.38x	14.4%	2nd
2010	2	75,000,000	21,251,198	66,146,003	16,380,336	39,656,348	56,036,684	0.25x	0.85x	-11.2%	4th
2011	2	75,000,000	12,813,479	68,159,702	18,642,231	56,015,591	74,657,822	0.27x	1.10x	4.0%	4th
2012	4	130,362,458	38,653,614	107,980,679	22,245,675	101,066,716	123,312,391	0.21x	1.14x	8.0%	3rd
2013	4	200,000,000	60,240,696	151,369,992	16,480,128	146,410,754	162,890,882	0.11x	1.08x	8.0%	3rd
2014	4	210,000,000	180,994,172	32,607,625	2,309,915	29,882,208	32,192,123	0.07x	0.99x	-1.7%	3rd
2015	4	185,000,000	142,412,809	49,447,913	6,944,961	41,069,187	48,014,148	0.14x	0.97x	-11.1%	2nd
2016	3	100,000,000	96,294,838	3,705,162	0	3,566,493	3,566,493	0.00x	0.96x	159.1%	1st
Total Portfolio	**37**	**$1,414,862,458**	**$605,278,478**	**$946,740,653**	**$397,874,795**	**$739,006,522**	**$1,136,881,317**	**0.42x**	**1.20x**	**8.0%**	**N/A**

See Appendix A for notes on data. Data above is for the PE portfolio only.

- The performance of each vintage year varies between the 1st and 4th quartile when compared to the All PE benchmark.
- More recent vintage years are not mature enough to draw reliable conclusions with respect to performance.

PE Largest Relationships

Inception to 6/30/2016

Manager	Number of Investments	Commitments	Unfunded Commitments	Total Paid-In	Total Distributions	Net Asset Value	Total Value	DPI	TVPI
IFM	1	$100,000,000	$0	$100,000,000	$1,547,403	$107,370,019	$108,917,422	0.02x	1.09x
KKR	3	150,000,000	43,686,380	142,308,345	107,496,513	83,753,117	191,249,630	0.76x	1.34x
Fort Washington	5	160,000,000	96,863,057	63,136,943	40,132,147	58,212,998	98,345,145	0.64x	1.56x
Alinda	1	50,000,000	4,741,058	65,201,498	26,203,705	57,421,125	83,624,830	0.40x	1.28x
Hellman and Friedman	1	50,000,000	2,796,574	47,526,637	16,925,620	48,637,997	65,563,617	0.36x	1.38x
NGP	2	100,000,000	45,748,779	57,197,532	15,610,479	43,901,161	59,511,640	0.27x	1.04x
Oaktree	4	80,000,000	40,778,890	53,044,709	22,806,215	41,311,354	64,117,569	0.43x	1.21x
Carlyle	2	85,000,000	48,490,879	49,497,599	12,874,386	35,904,096	48,778,482	0.26x	0.99x
Audax	3	75,000,000	42,910,645	42,949,145	16,990,114	35,679,763	52,669,877	0.40x	1.23x
APAX	1	35,362,458	7,271,302	31,123,851	3,041,833	34,282,505	37,324,338	0.10x	1.20x
Actis	1	50,000,000	25,157,595	28,090,868	2,740,565	28,716,419	31,456,984	0.10x	1.12x
JP Morgan	1	50,000,000	7,449,921	44,087,490	3,981,000	25,630,816	29,611,816	0.09x	0.67x
Riverstone/Carlyle	1	50,000,000	-15,933	56,044,069	38,432,055	24,571,146	63,003,201	0.69x	1.12x
Lexington Capital Partners	2	65,000,000	33,956,399	38,415,067	28,625,546	23,679,608	52,305,154	0.75x	1.36x
Landmark	2	60,000,000	22,637,013	42,108,952	30,900,898	22,144,778	53,045,676	0.73x	1.26x
Chrysalis	1	20,000,000	0	20,000,000	0	21,257,684	21,257,684	0.00x	1.06x
Parish Capital	1	25,000,000	6,866,700	18,955,943	9,713,274	19,450,659	29,163,933	0.51x	1.54x
Riverstone	2	75,000,000	56,224,717	28,765,960	11,872,499	17,165,524	29,038,023	0.41x	1.01x
Gavea	1	30,000,000	24,300,000	7,050,000	1,350,000	5,485,514	6,835,514	0.19x	0.97x
Public Pension Capital	1	100,000,000	95,914,502	6,067,295	136,492	4,430,239	4,566,731	0.02x	0.75x
Capital South	1	4,500,000	-500,000	5,168,750	6,494,051	0	6,494,051	1.26x	1.26x
Total Portfolio	**37**	**$1,414,862,458**	**$605,278,478**	**$946,740,653**	**$397,874,795**	**$739,006,522**	**$1,136,881,317**	**0.42x**	**1.20x**

See Appendix A for notes on data. Data above is for the PE portfolio only.

- The top five exposures represent 48% of the portfolio by NAV and are made through 11 underlying fund investments.
- Within the PE portfolio, there are no significant concentrations.

Illiquid Performance by Strategy

Inception to 6/30/2016

Sector	Number of Investments	Commitments	1 Year	3 Year	5 Year	Since Inception
Buyout	17	$775,362,458	7.57	14.21	11.71	9.76
Energy & Power	5	225,000,000	-21.47	-8.70	-4.10	0.93
Fund of Funds	6	185,000,000	3.22	15.21	14.79	13.36
Infrastructure	2	175,000,000	6.58	10.50	8.03	7.84
Maritime	2	80,000,000	-35.72	-19.83	-20.63	-21.63
Mezzanine	6	115,000,000	7.31	11.09	10.97	8.73
Secondary	4	125,000,000	-0.30	11.12	13.69	14.03
Venture Capital	1	20,000,000	8.12	6.58	0.63	0.93
Total Private Equity	**43**	1,700,362,458	0.53	8.19	7.81	8.00
Distressed Debt	4	$225,000,000	-14.42	-0.94	1.77	2.17
Opportunistic	3	200,000,000	5.10	N/A	N/A	4.78
PPIP	2	114,000,000	N/A	10.59	20.35	19.99
Speciality Lending	3	150,000,000	3.43	6.95	N/A	6.98
Total Additional	**12**	689,000,000	-4.53	2.00	7.31	9.08
Net Lease	1	$50,000,000	1.16	N/A	N/A	2.81
Opportunistic	4	200,000,000	14.20	20.01	21.08	20.28
Secondary	1	50,000,000	48.72	N/A	N/A	42.60
Value Add	4	200,000,000	10.74	14.03	N/A	12.97
Total Real Estate	**10**	500,000,000	13.44	17.38	17.84	17.42
Total Portfolio	**65**	**$2,889,362,458**	**1.80**	**8.33**	**9.04**	**9.25**

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

- The secondary and fund of fund sectors are the best performing current investments within the PE portfolio.
- Longer term performance is required to make reasonable judgements.
- The fund of fund exposure through Fort Washington has been beneficial to the overall portfolio in terms of performance.

Illiquid Performance by Investment

Inception to 6/30/2016

Investment	Vintage	Sector	Commitments	Total Paid In	Total Distributions	Market Value	Total Value	DPI	TVPI	IRR	Quartile
Actis Global 4, L.P.	2012	Buyout	$50,000,000	$28,585,831	$3,235,528	$27,288,000	$30,523,528	0.11	1.07	4.0%	4th
APAX IX	2016	Buyout	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
APAX VIII	2012	Buyout	35,362,458	31,123,851	3,041,833	34,095,858	37,137,691	0.10	1.19	13.3%	2nd
Audax Private Equity Fund IV, L.P.	2012	Buyout	20,000,000	20,000,000	4,590,778	21,009,331	25,600,109	0.23	1.28	17.2%	1st
Audax Private Equity Fund V, L.P.	2016	Buyout	30,000,000	890,632	0	1,059,944	1,059,944	0.00	1.19	19.0%	1st
Carlyle Europe Partners IV	2015	Buyout	50,000,000	23,316,526	4,865,437	15,966,066	20,831,503	0.21	0.89	-18.4%	3rd
Carlyle Global Financial Services Partners II	2013	Buyout	35,000,000	26,181,073	8,008,949	18,394,705	26,403,654	0.31	1.01	1.1%	3rd
Gavea V	2014	Buyout	30,000,000	7,050,000	1,350,000	5,485,514	6,835,514	0.19	0.97	-4.4%	3rd
Hellman & Friedman Capital Partners VIII, L.P.	2014	Buyout	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Hellman and Friedman VII	2009	Buyout	50,000,000	47,528,305	16,927,288	50,938,887	67,866,175	0.36	1.43	16.3%	2nd
KKR 2006	2006	Buyout	25,000,000	30,984,713	30,496,173	14,981,559	45,477,732	0.98	1.47	7.9%	3rd
KKR Americas Fund XII	2016	Buyout	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
KKR European III	2008	Buyout	75,000,000	93,643,646	76,760,619	53,327,324	130,087,943	0.82	1.39	11.2%	2nd
KKR European IV	2015	Buyout	50,000,000	17,679,986	239,721	15,444,234	15,683,955	0.01	0.89	-27.0%	3rd
Oaktree European Principal Fund III (US) L.P.	2011	Buyout	25,000,000	21,437,500	3,037,015	23,218,830	26,255,845	0.14	1.22	7.9%	3rd
Oaktree European Principal Fund IV (US) L.P.	2016	Buyout	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Public Pension Capital , L.P.	2014	Buyout	100,000,000	6,067,295	136,492	4,430,239	4,566,731	0.02	0.75	-27.5%	4th
Total Buyout		Buyout	775,362,458	354,489,358	152,689,833	285,640,491	438,330,324	0.43	1.24	9.8%	N/A
NGP Natural Resources X, L.P.	2011	Energy & Power	50,000,000	46,722,202	15,605,216	32,796,761	48,401,977	0.33	1.04	1.7%	1st
NGP Natural Resources XI, L.P.	2014	Energy & Power	50,000,000	10,475,330	5,263	11,104,400	11,109,663	0.00	1.06	11.1%	1st
Riverstone Global Energy and Power Fund V, LP	2012	Energy & Power	25,000,000	28,765,960	11,872,499	17,165,524	29,038,023	0.41	1.01	0.6%	2nd
Riverstone Global Energy and Power Fund VI	2015	Energy & Power	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Riverstone/Carlyle IV	2008	Energy & Power	50,000,000	56,044,069	38,432,055	24,986,223	63,418,278	0.69	1.13	4.3%	2nd
Total Energy & Power		Energy & Power	225,000,000	142,007,561	65,915,033	86,052,908	151,967,941	0.46	1.07	0.9%	N/A
Fort Washington Private Equity Investors IX	2016	Fund of Funds	35,000,000	1,414,530	0	2,271,362	2,271,362	0.00	1.61	60.6%	1st
Fort Washington Private Equity Investors IX-K	2016	Fund of Funds	35,000,000	1,400,000	0	2,153,509	2,153,509	0.00	1.54	53.8%	1st
Fort Washington V	2006	Fund of Funds	15,000,000	14,081,513	13,025,710	10,860,980	23,886,690	0.93	1.70	10.5%	1st
Fort Washington VI	2008	Fund of Funds	40,000,000	34,253,400	27,106,437	32,045,955	59,152,392	0.79	1.73	14.5%	1st
Fort Washington VIII	2013	Fund of Funds	35,000,000	11,987,500	0	14,076,914	14,076,914	0.00	1.17	21.3%	1st
Parish Capital III, L.P.	2009	Fund of Funds	25,000,000	18,955,943	9,713,274	19,845,617	29,558,891	0.51	1.56	16.4%	1st
Total Fund of Funds		Fund of Funds	185,000,000	82,092,886	49,845,421	81,254,337	131,099,758	0.61	1.60	13.4%	N/A

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

Illiquid Performance by Investment

Inception to 6/30/2016

Investment	Vintage	Sector	Commitments	Total Paid In	Total Distributions	Market Value	Total Value	DPI	TVPI	IRR	Quartile
Alinda II	2008	Infrastructure	50,000,000	65,201,498	26,203,705	57,736,120	83,939,825	0.40	1.29	8.0%	2nd
IFM Global Infrastructure (US) Fund	2013	Infrastructure	125,000,000	100,000,000	1,547,403	107,370,019	108,917,422	0.02	1.09	7.8%	1st
Total Infrastructure		Infrastructure	175,000,000	165,201,498	27,751,108	165,106,139	192,857,247	0.17	1.17	7.8%	1st
JP Morgan Maritime Fund	2010	Maritime	50,000,000	44,087,490	3,981,000	23,609,549	27,590,549	0.09	0.63	-25.6%	4th
JP Morgan Maritime Fund II	2016	Maritime	30,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Total Maritime		Maritime	80,000,000	44,087,490	3,981,000	23,609,549	27,590,549	0.09	0.63	-25.6%	N/A
Audax Mezzanine Fund III, L.P.	2010	Mezzanine	25,000,000	22,058,514	12,399,336	14,025,532	26,424,868	0.56	1.20	9.2%	3rd
Audax Mezzanine Fund IV, L.P.	2016	Mezzanine	30,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Capital South III	2008	Mezzanine	5,000,000	5,168,750	6,494,051	0	6,494,051	1.26	1.26	8.8%	2nd
Oaktree Mezzanine Fund III Class A	2009	Mezzanine	16,600,000	15,006,169	17,728,872	6,275	17,735,147	1.18	1.18	10.3%	2nd
Oaktree Mezzanine Fund III Class B	2009	Mezzanine	8,400,000	7,586,040	1,222,168	9,224,194	10,446,362	0.16	1.38	8.2%	2nd
Oaktree Mezzanine Fund IV, L.P.	2014	Mezzanine	30,000,000	9,015,000	818,160	8,862,055	9,680,215	0.09	1.07	8.2%	2nd
Total Mezzanine		Mezzanine	115,000,000	58,834,473	38,662,587	32,118,056	70,780,643	0.66	1.20	8.7%	N/A
Landmark Equity Partners XIV, L.P.	2008	Secondary	30,000,000	28,907,533	23,977,122	13,679,429	37,656,551	0.83	1.30	12.0%	3rd
Landmark Equity Partners XV, L.P.	2013	Secondary	30,000,000	13,201,419	6,923,776	7,984,980	14,908,756	0.52	1.13	11.1%	4th
Lexington Capital Partners VII	2008	Secondary	30,000,000	29,963,666	26,785,743	14,900,077	41,685,820	0.89	1.39	14.6%	2nd
Lexington Capital Partners VIII	2015	Secondary	35,000,000	8,451,401	1,839,803	8,191,108	10,030,911	0.22	1.19	27.7%	4th
Total Secondary		Secondary	125,000,000	80,524,019	59,526,444	44,755,594	104,282,038	0.74	1.30	14.0%	N/A
Chrysalis III	2006	Venture Capital	20,000,000	20,000,000	0	20,949,775	20,949,775	0.00	1.05	0.7%	3rd
Total Venture Capital		Venture Capital	20,000,000	20,000,000	0	20,949,775	20,949,775	0.00	1.05	0.7%	N/A
Total Private Equity		Private Equity	1,700,362,458	947,237,285	398,371,426	739,486,849	1,137,858,275	0.42	1.20	8.0%	N/A
Avenue Special Situations Fund VI, LP	2010	Distressed Debt	100,000,000	138,651,283	101,278,868	48,863,922	150,142,790	0.73	1.08	2.7%	N/A
Oaktree Opportunities Fund IX, L.P.	2012	Distressed Debt	50,000,000	50,000,000	0	47,869,097	47,869,097	0.00	0.96	-2.0%	N/A
Oaktree Opportunities Fund X, L.P.	2015	Distressed Debt	25,000,000	3,750,000	0	4,476,735	4,476,735	0.00	1.19	22.7%	N/A
Oaktree Opportunities Fund Xb, L.P.	2015	Distressed Debt	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Total Distressed Debt		Distressed Debt	225,000,000	192,401,283	101,278,868	101,209,754	202,488,622	0.53	1.05	2.2%	N/A
AG Select Partners Advantage Fund, L.P.	2012	Opportunistic	50,000,000	7,306,327	6,180,150	1,233,376	7,413,526	0.85	1.01	0.7%	N/A
Marathon European Credit Opportunity Fund II	2014	Opportunistic	75,000,000	66,000,000	9,543,949	61,379,421	70,923,370	0.14	1.07	4.4%	N/A
Marathon European Credit Opportunity Fund III	2016	Opportunistic	75,000,000	33,750,000	0	34,809,315	34,809,315	0.00	1.03	3.4%	N/A
Total Opportunistic		Opportunistic	200,000,000	107,056,327	15,724,099	97,422,112	113,146,211	0.15	1.06	4.8%	N/A

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

Illiquid Performance by Investment

Inception to 6/30/2016

Investment	Vintage	Sector	Commitments	Total Paid In	Total Distributions	Market Value	Total Value	DPI	TVPI	IRR	Quartile
AG GECC PPIF, LP	2009	PPIP	54,000,000	53,812,024	83,449,322	0	83,449,322	1.55	1.55	19.3%	N/A
Marathon Legacy Securities PPIP	2009	PPIP	60,000,000	60,000,000	98,209,215	0	98,209,215	1.64	1.64	20.6%	N/A
Total PPIP		PPIP	114,000,000	113,812,024	181,658,537	0	181,658,537	1.60	1.60	20.0%	N/A
Highbridge PSS Loan Fund III-L, LP	2013	Speciality Lending	50,000,000	51,879,771	14,392,240	44,508,589	58,900,829	0.28	1.14	6.9%	N/A
Oaktree EDF	2013	Speciality Lending	50,000,000	28,620,000	20,980,182	9,800,638	30,780,820	0.73	1.08	9.3%	N/A
Oaktree European Capital Solutions Fund	2015	Speciality Lending	50,000,000	23,622,500	10,762,223	12,616,240	23,378,463	0.46	0.99	-4.8%	N/A
Total Speciality Lending		Speciality Lending	150,000,000	104,122,271	46,134,645	66,925,467	113,060,112	0.44	1.09	7.0%	N/A
Total Additional		Additional	689,000,000	517,391,905	344,796,149	265,557,333	610,353,482	0.67	1.18	9.1%	N/A
AG Net Lease Realty Fund III, L.P.	2013	Net Lease	50,000,000	18,000,000	715,819	18,366,637	19,082,456	0.04	1.06	4.6%	4th
Total Net Lease		Net Lease	50,000,000	18,000,000	715,819	18,366,637	19,082,456	0.04	1.06	2.8%	N/A
Blackstone Real Estate Partners VII L.P.	2011	Opportunistic	50,000,000	63,699,206	40,987,915	51,587,656	92,575,571	0.64	1.45	20.6%	1st
Blackstone Real Estate Partners VIII L.P.	2015	Opportunistic	50,000,000	19,009,795	177,249	20,597,999	20,775,248	0.01	1.09	16.8%	1st
Carlyle Realty Partners VI, L.P.	2011	Opportunistic	50,000,000	52,816,811	48,491,775	29,013,847	77,505,622	0.92	1.47	21.3%	1st
Carlyle Realty Partners VII, L.P.	2014	Opportunistic	50,000,000	19,964,745	1,702,252	23,271,805	24,974,057	0.09	1.25	29.7%	1st
Total Opportunistic		Opportunistic	200,000,000	155,490,557	91,359,191	124,471,307	215,830,498	0.59	1.39	20.3%	N/A
Landmark Real Estate Partners VII, L.P.	2014	Secondary	50,000,000	22,429,345	3,989,639	24,278,965	28,268,604	0.18	1.26	43.9%	1st
Total Secondary		Secondary	50,000,000	22,429,345	3,989,639	24,278,965	28,268,604	0.18	1.26	43.9%	1st
Rockwood Capital Real Estate Partners Fund IX	2012	Value Add	50,000,000	37,814,081	10,026,659	38,465,191	48,491,850	0.27	1.28	15.9%	2nd
Rockwood Capital Real Estate Partners Fund X, L.P.	2016	Value Add	50,000,000	0	0	0	0	N/A	N/A	N/A	N/A
The Realty Associates Fund X, L.P.	2012	Value Add	50,000,000	50,000,000	14,601,725	51,504,059	66,105,784	0.29	1.32	13.0%	3rd
The Realty Associates Fund XI	2016	Value Add	50,000,000	12,500,000	0	12,180,329	12,180,329	0.00	0.97	-2.6%	2nd
Total Value Add		Value Add	200,000,000	100,314,081	24,628,384	102,149,579	126,777,963	0.25	1.26	13.0%	N/A
Total Real Estate		Real Estate	500,000,000	296,233,983	120,693,033	269,266,488	389,959,521	0.41	1.32	17.4%	N/A
Total Portfolio			**$2,889,362,458**	**$1,760,863,173**	**$863,860,608**	**$1,274,310,670**	**$2,138,171,278**	**0.49**	**1.21**	**9.3%**	**N/A**

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

- Overall the PE portfolio is diversified via funds, however there are exposures to some funds of different strategies from the same manager.
- Not all managers perform well across strategies. Focus should be placed on not re-upping with under performing managers.
- Section 3 shows that the private equity markets are becoming increasingly competitive and that it is therefore becoming more difficult to select top quartile managers.

Real Estate Portfolio

Comments

- Additions to the portfolio in the Non-Core space over the past five years have been quite accretive to overall performance.
- The portfolio has a good mix of direct investing across the risk spectrum and taking advantage of niche sectors where available (i.e. single-family rental in Blackstone VIII) while retaining proper diversification.
- There continue to be positive dynamics in the real estate secondaries space for additional potential commitments; Landmark RE Partners VII currently displays the strongest rate of return within the portfolio.

Section 3:
Medical Trust Portfolio Review

PE Portfolio Overview
Inception to 6/30/2016

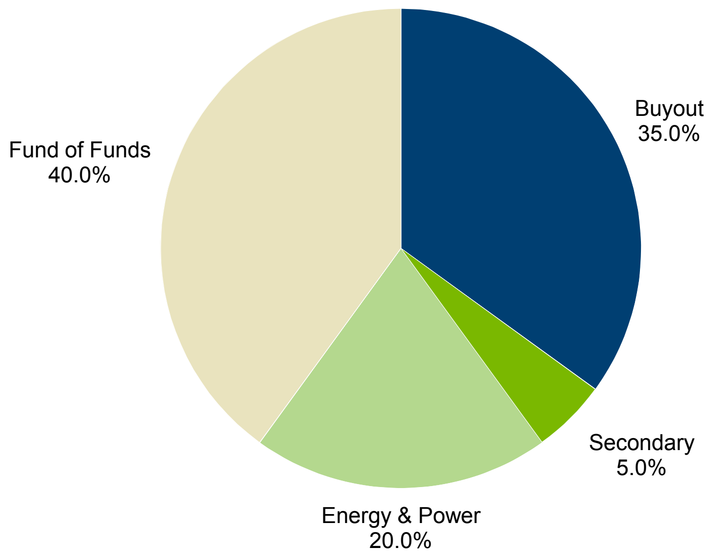
Portfolio Detail	6/30/2016
Number of Investments	12
Commitments	$100,000,000
Unfunded Commitments	$76,133,510
Total Paid-In	$25,962,046
Total Distributions	$3,517,303
Net Asset Value	$23,957,291
Total Value	$27,474,594
DPI	0.14x
TVPI	1.06x
IRR since inception	9.9%

See Appendix A for notes on data. Data above is for the PE portfolio only.

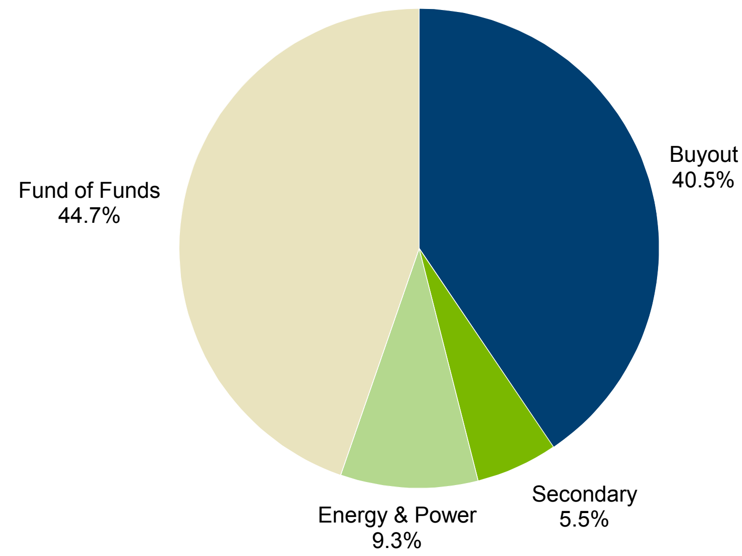
- TRS Medical Trust commenced investing in private equity in 2011, making one investment in the first year and now totaling 12 investments.
- The portfolio has been relatively consistently built out since this time and earlier investments are now starting to distribute capital back to the plan.
- As at 6/30/2016, total commitments stood at $100.0 million of which $76.1 million was unfunded.
- The TVPI and IRR stand at 1.06x and 9.9% respectively.

PE Strategy Diversification
As of 6/30/2016

Strategy Diversification by Commitment



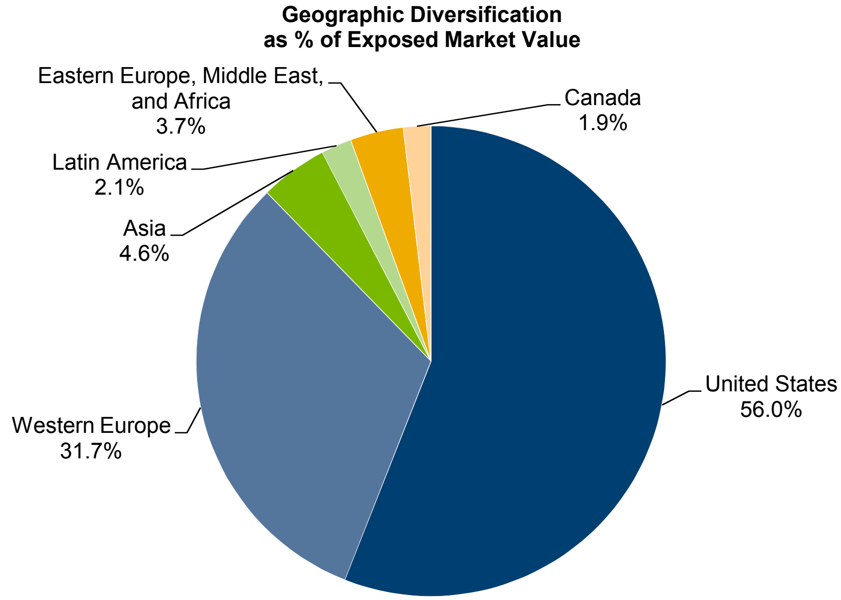
Strategy Diversification by Net Asset Value



See Appendix A for notes on data. Data above is for the PE portfolio only.

- As the portfolio is maturing, TRS may want to consider implementing strategy diversification targets.
- The portfolio is relatively well diversified across different private equity strategies for its size and maturity. Diversification is also achieved through the fund of funds.
- Further commitments to secondary funds should be considered as a way to mitigate the J-curve.

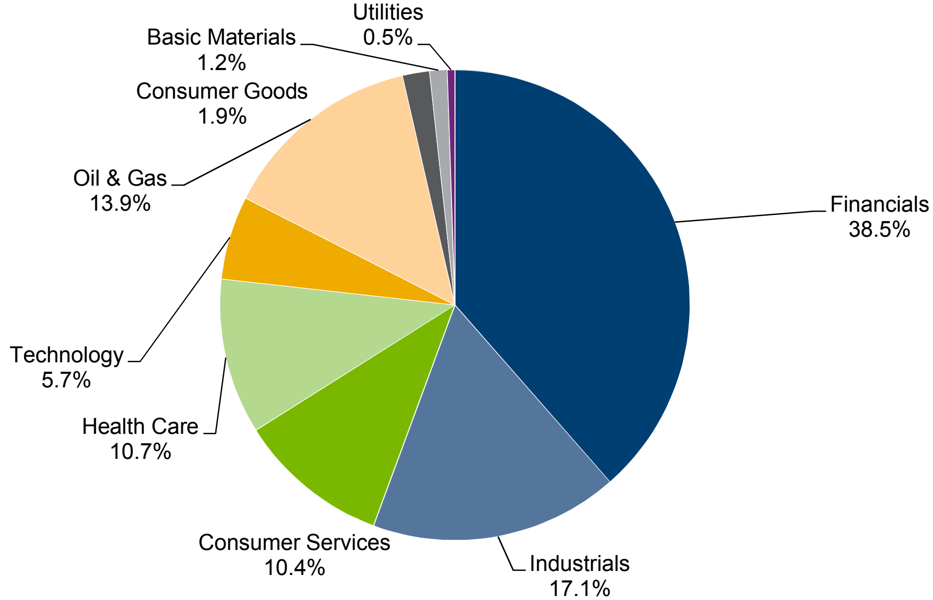
PE Geographic Diversification
As of 6/30/2016



See Appendix A for notes on data. Data above is for the PE portfolio only.

- As the portfolio is maturing, TRS may want to consider implementing geographic targets.
- Overall, the portfolio is well diversified. The balance between U.S. and non-U.S. markets is within acceptable weight ranges compared to the market.

PE Industry Diversification
As of 6/30/2016



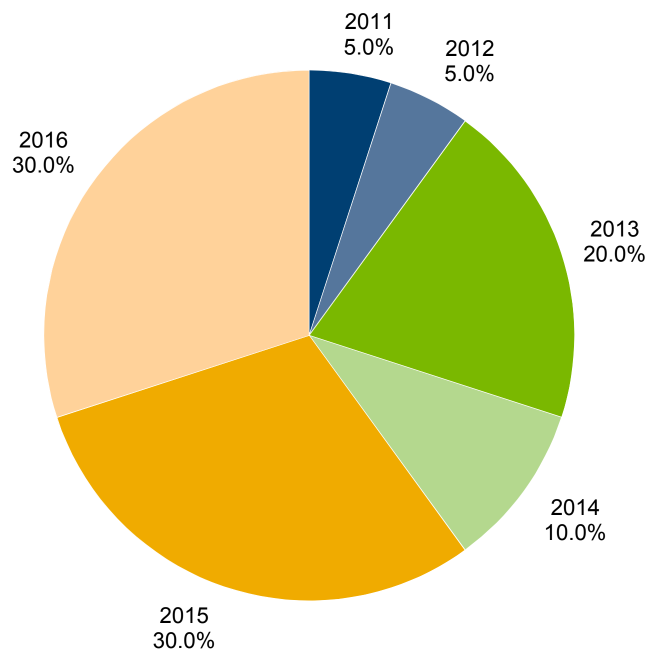
See Appendix A for notes on data. Data above is for the PE portfolio only.

- As the portfolio is maturing, TRS may want to consider implementing industry targets.
- The portfolio is relatively well diversified but has a substantial weighting to Financials. This portion of the portfolio is particularly susceptible to economic cycles, a risk that could be reduced through further diversification towards other industries.

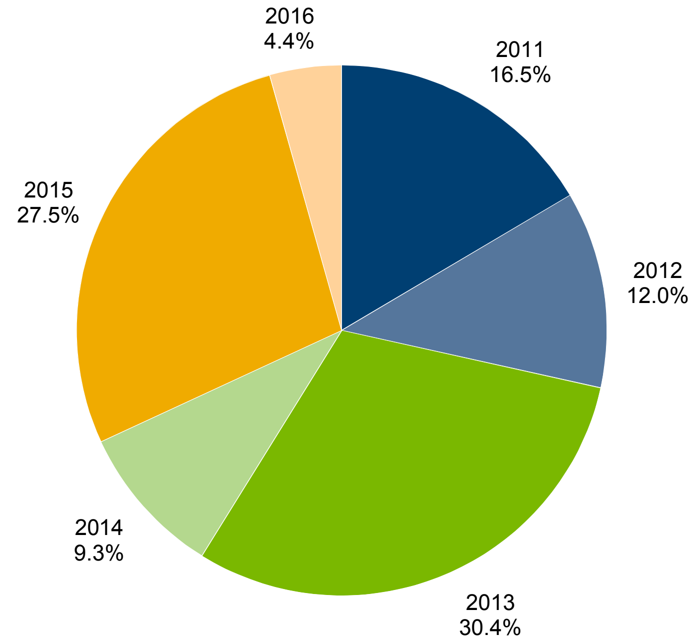
PE Vintage Year Diversification

As of 6/30/2016

Vintage Year Diversification by Commitment



Vintage Year Diversification by Net Asset Value



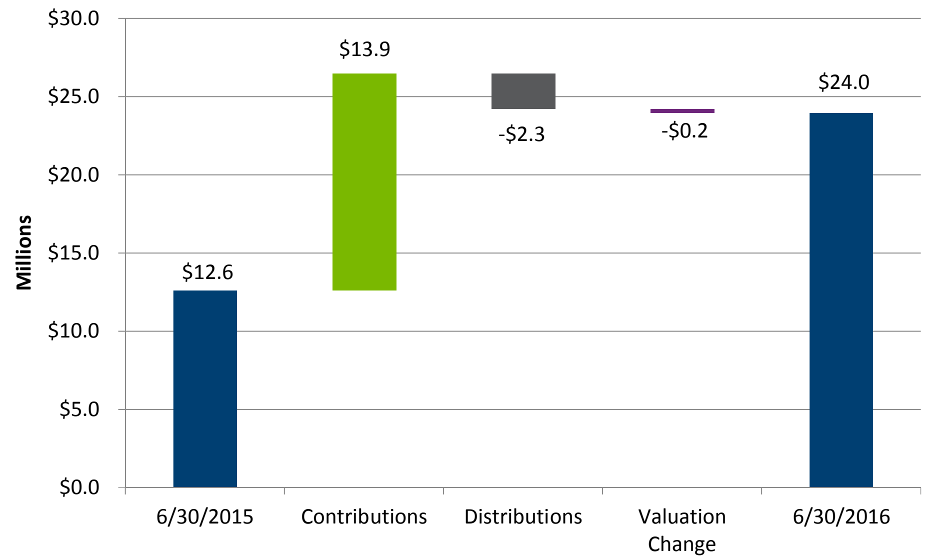
See Appendix A for notes on data.
Data above is for the PE portfolio only.

- The portfolio's first commitment occurred in 2011. Since this time, commitments have increased in pace through vintage years.
- TRS performs a pacing analysis annually in order to determine commitments for the next year.
- AHIC recommends a consistent commitment pace going forwards, in order to mitigate vintage year risk.
- The differences between the commitment and NAV charts is as expected with the more recent commitments not yet having being funded.

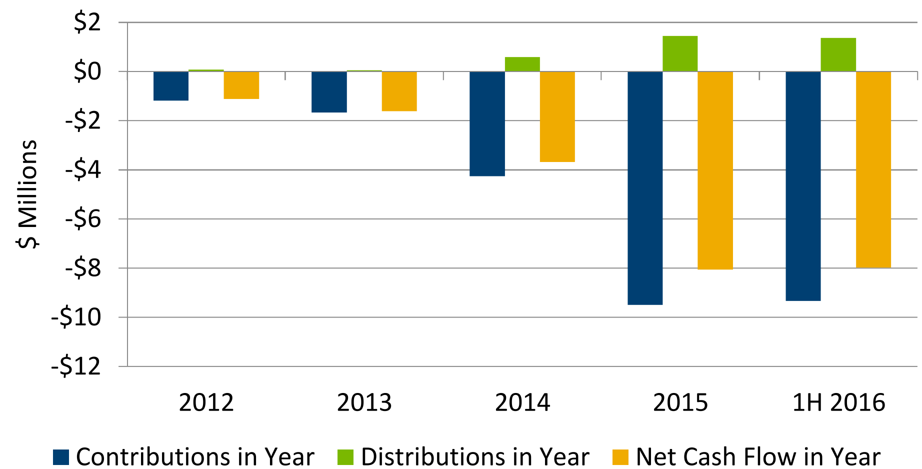
PE Cash Flows

As of 6/30/2016

- The NAV of the TRS portfolio increased by $11.4 million over the year to 6/30/2016 as contributions outpaced distributions and depreciation.
- The value of the existing assets did not change substantially over the course of the year.



- The TRS Medical Trust portfolio is not yet cash flow positive. The portfolio has been making commitments since 2011 so we would not expect it to become cash flow positive for a few more years.
- The rate of capital calls has steadily been increasing since 2012 as would be expected for a portfolio in the build out phase.



See Appendix A for notes on data. Data above is for the PE portfolio only.

PE Vintage Year Performance vs. Benchmark

Inception to 6/30/2016

Vintage Year	Number of Investments	Commitments	Unfunded Commitments	Total Paid-In	Total Distributions	Net Asset Value	Total Value	DPI	TVPI	IRR	Quartile
2011	1	$5,000,000	$887,500	$4,112,500	$1,067,197	$3,951,254	$5,018,451	0.26x	1.22x	11.9%	2nd
2012	1	5,000,000	2,515,759	2,809,087	274,056	2,870,842	3,144,898	0.10x	1.12x	4.0%	3rd
2013	3	20,000,000	12,953,249	7,650,238	1,153,966	7,273,964	8,427,930	0.15x	1.10x	21.7%	1st
2014	1	10,000,000	7,904,932	2,095,068	1,052	2,220,882	2,221,934	0.00x	1.06x	11.1%	2nd
2015	3	30,000,000	22,967,917	8,199,306	1,021,032	6,590,725	7,611,757	0.12x	0.93x	-21.4%	3rd
2016	3	30,000,000	28,904,153	1,095,847	0	1,049,624	1,049,624	0.00x	0.96x	141.0%	1st
Total Portfolio	**12**	**$100,000,000**	**$76,133,510**	**$25,962,046**	**$3,517,303**	**$23,957,291**	**$27,474,594**	**0.14x**	**1.06x**	**9.9%**	**N/A**

See Appendix A for notes on data. Data above is for the PE portfolio only.

- The performance of each vintage year varies between the 1st and 3rd quartile when compared to the All PE benchmark.
- The portfolio is too immature to make any reliable comments on performance.
- The fund of fund exposure through Fort Washington has been beneficial to the overall portfolio.
- Please note that a PME analysis was not carried out on the Medical Trust portfolio due to its immature nature.

PE Largest Relationships

Inception to 6/30/2016

Sector	Number of Investments	Commitments	Unfunded Commitments	Total Paid-In	Total Distributions	Net Asset Value	Total Value	DPI	TVPI
Fort Washington	5	$40,000,000	$29,638,530	$10,361,470	$1,067,197	$10,707,821	$11,775,018	0.10x	1.14x
Carlyle	1	10,000,000	6,336,435	4,663,307	973,088	3,501,878	4,474,966	0.21x	0.96x
KKR	1	10,000,000	6,631,482	3,535,999	47,944	3,088,847	3,136,791	0.01x	0.89x
Actis	1	5,000,000	2,515,759	2,809,087	274,056	2,870,842	3,144,898	0.10x	1.12x
NGP	1	10,000,000	7,904,932	2,095,068	1,052	2,220,882	2,221,934	0.00x	1.06x
Landmark	1	5,000,000	3,403,249	2,200,238	1,153,966	1,316,367	2,470,333	0.52x	1.12x
Audax	1	10,000,000	9,703,123	296,877	0	250,654	250,654	0.00x	0.84x
Riverstone	1	10,000,000	10,000,000	0	0	0	0	N/A	N/A
Total Portfolio	**12**	**$100,000,000**	**$76,133,510**	**$25,962,046**	**$3,517,303**	**$23,957,291**	**$27,474,594**	**0.14x**	**1.06x**

See Appendix A for notes on data. Data above is for the PE portfolio only.

- The top exposure represents 45% of the portfolio by NAV and are made through 5 underlying fund of fund investments.
- Fund of funds can be useful to help achieve diversification in smaller and less mature portfolios.
- As the portfolio grows through time, consideration should be given to other asset classes that could supplement the fund of funds allocation.

Illiquid Performance by Strategy

Inception to 6/30/2016

Sector	Number of Investments	Commitments	1 Year	3 Year	5 Year	Since Inception
Buyout	5	$45,000,000	-7.00	-2.20	N/A	-3.35
Energy & Power	2	20,000,000	11.10	N/A	N/A	11.10
Fund of Funds	5	40,000,000	1.14	11.56	N/A	12.10
Mezzanine	1	10,000,000	N/A	N/A	N/A	19.01
Secondary	1	5,000,000	-0.58	N/A	N/A	11.10
Total Private Equity	**14**	120,000,000	-3.19	5.55	N/A	9.90
Distressed Debt	1	$10,000,000	N/A	N/A	N/A	N/A
Opportunistic	2	15,000,000	5.17	6.21	N/A	4.20
Speciality Lending	2	15,000,000	N/A	N/A	N/A	3.10
Total Additional	**5**	40,000,000	5.07	6.12	N/A	6.14
Opportunistic	2	20,000,000	27.76	N/A	N/A	20.28
Secondary	1	10,000,000	48.73	N/A	N/A	44.00
Value Add	2	20,000,000	N/A	N/A	N/A	N/A
Total Real Estate	**5**	50,000,000	26.87	N/A	N/A	28.61
Total Portfolio	**24**	**$210,000,000**	**5.59**	**9.22**	**N/A**	**8.75**

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

- The mezzanine, secondary, energy & power, and fund of funds sectors have all performed well within the PE portfolio.
- The nature of secondary investments mean that they would be expected to be one of the strongest performing in the earliest years of the portfolio build out.
- Longer term performance is required to make reasonable judgements.

Illiquid Performance by Investment

Inception to 6/30/2016

Investment	Vintage	Sector	Commitments	Total Paid In	Total Distributions	Market Value	Total Value	DPI	TVPI	IRR	Quartile
Actis Global 4, L.P. - Medical	2012	Buyout	$5,000,000	$2,858,583	$323,553	$2,727,000	$3,050,553	0.11	1.07	4.0%	4th
APAX IX	2016	Buyout	10,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Carlyle Europe Partners IV	2015	Buyout	10,000,000	4,663,307	973,088	3,193,214	4,166,302	0.21	0.89	-18.4%	3rd
KKR Americas Fund XII	2016	Buyout	10,000,000	0	0	0	0	N/A	N/A	N/A	N/A
KKR European Fund IV -Medical	2015	Buyout	10,000,000	3,535,999	47,944	3,088,847	3,136,791	0.01	0.89	-27.0%	3rd
Total Buyout		Buyout	45,000,000	11,057,889	1,344,585	9,009,061	10,353,646	0.12	0.94	-3.4%	N/A
NGP Natural Resources XI, L.P.	2014	Energy & Power	10,000,000	2,095,068	1,052	2,220,882	2,221,934	0.00	1.06	11.1%	1st
Riverstone Global Energy and Power Fund VI (Medica	2015	Energy & Power	10,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Total Energy & Power		Energy & Power	20,000,000	2,095,068	1,052	2,220,882	2,221,934	0.00	1.06	11.1%	N/A
Fort Washington Private Equity Investors IX	2016	Fund of Funds	10,000,000	398,970	0	640,640	640,640	0.00	1.61	60.6%	1st
Fort Washington Private Equity Investors IX-K	2016	Fund of Funds	10,000,000	400,000	0	615,290	615,290	0.00	1.54	53.8%	1st
Fort Washington Private Equity Opportunities Fund III	2013	Fund of Funds	5,000,000	2,025,000	0	2,713,013	2,713,013	0.00	1.34	40.0%	1st
Fort Washington VII	2011	Fund of Funds	5,000,000	4,112,500	1,067,197	4,127,737	5,194,934	0.26	1.26	11.9%	3rd
Fort Washington VIII - Medical	2013	Fund of Funds	10,000,000	3,425,000	0	4,021,976	4,021,976	0.00	1.17	21.3%	1st
Total Fund of Funds		Fund of Funds	40,000,000	10,361,470	1,067,197	12,118,656	13,185,853	0.10	1.27	12.1%	N/A
Audax Private Equity Fund V, L.P. Medical	2016	Mezzanine	10,000,000	296,877	0	353,315	353,315	0.00	1.19	19.0%	1st
Total Mezzanine		Mezzanine	10,000,000	296,877	0	353,315	353,315	0.00	1.19	19.0%	N/A
Landmark Equity Partners XV, L.P. - Medical	2013	Secondary	5,000,000	2,200,238	1,153,966	1,330,829	2,484,795	0.52	1.13	11.1%	4th
Total Secondary		Secondary	5,000,000	2,200,238	1,153,966	1,330,829	2,484,795	0.52	1.13	11.1%	N/A
Total Private Equity		Private Equity	120,000,000	26,011,542	3,566,800	25,032,743	28,599,543	0.14	1.10	9.9%	N/A
Oaktree Opportunities Fund Xb, L.P. (Medical)	2015	Distressed Debt	10,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Total Distressed Debt		Distressed Debt	10,000,000	0	0	0	0	N/A	N/A	N/A	N/A
Marathon European Credit Opportunity Fund II	2014	Opportunistic	5,000,000	4,400,000	636,263	4,091,961	4,728,224	0.14	1.07	4.4%	N/A
Marathon European Credit Opportunity Fund III (Medica	2016	Opportunistic	10,000,000	4,500,000	0	4,641,242	4,641,242	0.00	1.03	3.4%	N/A
Total Opportunistic		Opportunistic	15,000,000	8,900,000	636,263	8,733,203	9,369,466	0.07	1.05	4.2%	N/A
Highbridge Principal Strategies-Specialty Loan Fund III-	2013	Speciality Lending	5,000,000	5,187,977	1,439,224	4,450,859	5,890,083	0.28	1.14	6.9%	N/A
Oaktree European Capital Solutions Fund (Medical)	2015	Speciality Lending	10,000,000	6,500,000	3,998,575	2,531,383	6,529,958	0.62	1.00	2.2%	N/A
Total Speciality Lending		Speciality Lending	15,000,000	11,687,977	5,437,799	6,982,242	12,420,041	0.47	1.06	3.1%	N/A
Total Additional		Additional	40,000,000	20,587,977	6,074,062	15,715,445	21,789,507	0.30	1.06	6.1%	N/A

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

Illiquid Performance by Investment

Inception to 6/30/2016

Investment	Vintage	Sector	Commitments	Total Paid In	Total Distributions	Market Value	Total Value	DPI	TVPI	IRR	Quartile
Blackstone Real Estate Partners VIII-Medical	2015	Opportunistic	10,000,000	3,801,957	35,450	4,119,599	4,155,049	0.01	1.09	16.8%	1st
Carlyle Realty Partners VII, L.P.	2014	Opportunistic	10,000,000	3,992,949	340,451	4,654,362	4,994,813	0.09	1.25	29.7%	1st
Total Opportunistic		Opportunistic	20,000,000	7,794,906	375,901	8,773,961	9,149,862	0.05	1.17	20.3%	N/A
Landmark Real Estate Partners VII, L.P.	2014	Secondary	10,000,000	4,485,869	797,928	4,855,792	5,653,720	0.18	1.26	44.0%	1st
Total Secondary		Secondary	10,000,000	4,485,869	797,928	4,855,792	5,653,720	0.18	1.26	44.0%	1st
Rockwood Capital Real Estate Partners Fund X, L.P.	2016	Value Add	10,000,000	0	0	0	0	N/A	N/A	N/A	N/A
The Realty Associates Fund XI	2016	Value Add	10,000,000	2,500,000	0	2,436,066	2,436,066	0.00	0.97	N/A	N/A
Total Value Add		Value Add	20,000,000	2,500,000	0	2,436,066	2,436,066	0.00	0.97	N/A	N/A
Total Real Estate		Real Estate	50,000,000	14,780,775	1,173,829	16,065,819	17,239,648	0.08	1.17	28.6%	N/A
Total Portfolio			**$210,000,000**	**$61,380,294**	**$10,814,691**	**$56,814,007**	**$67,628,698**	**0.18**	**1.10**	**8.8%**	**N/A**

See Appendix A for notes on data. Please note that the above data includes investments that had not been made at the time of the PE portfolio review.

- The PE portfolio is too immature to make any reliable comments on performance.
- Not all managers perform well across strategies. Focus should be placed on not re-upping with under performing managers.
- Section 3 shows that the private equity markets are becoming increasingly competitive and that it is therefore becoming more difficult to select top quartile managers.

- The Non-Core Real Estate portfolio is off to a great start on performance, however longer term rate of return is expected to moderate.
- The RE portfolio has a good mix of direct investing across the risk spectrum and is taking advantage of niche sectors where available (i.e. single-family rental in Blackstone VIII) while retaining proper diversification.
- There continue to be positive dynamics in the real estate secondaries space for additional potential commitments; Landmark RE Partners VII currently displays the strongest rate of return within the portfolio.

Section 4:
Portfolio Policy, Investment Process and Private Equity Environment

Portfolio Policy

Current and AHIC Best Thinking

- The portfolio currently has a policy which states "*The retirement system shall prudently diversify its private equity and venture capital investments by: manager, investment type (buyout versus venture funds), strategy (targeted market sectors or industries), and vintage year*".

- AHIC recommends having explicitly stated targets within the private equity portfolio. This helps with performance measurement as well as risk management.

- Targets can be assigned for strategy, geographic exposure, industry exposure and vintage year exposure. Generally ranges are kept wide to reflect the illiquid nature of private equity portfolios.

- Limits can also be placed on exposures to individual managers.

Investment Process

Current and AHIC Best Thinking

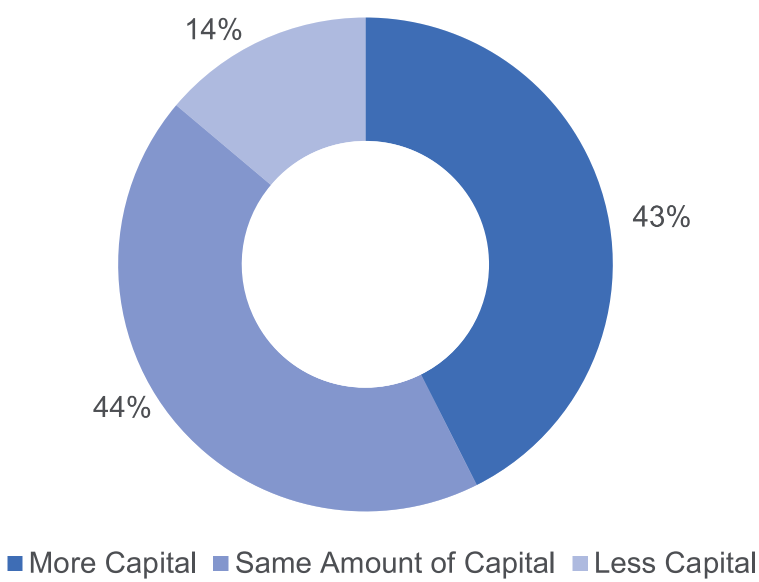
- TRS has had a long relationship with Fort Washington and invests in several of their funds. During the build out phase of the portfolio, Fort Washington was were used as a source of information – i.e. who is in the market and in what sectors, or to get their thoughts on particular managers.
- TRS has not utilized the Fort Washington relationship in this way for several years as the team has developed their own network and systems to source investments.
- Some of the ways the team sources investments include:
  - Preqin, P&I, contacting other pension funds to see what they are looking at and being contacted directly by managers.

- The internal process has been well adapted to the increasing size and requirements of the portfolio.
- The private equity universe is increasingly competitive and as such access to top tier managers is becoming harder, as shown on the next two slides.
- As the portfolio continues to mature TRS should continue to build out resources to manage the portfolio.

Fulfilling Investor Requirements

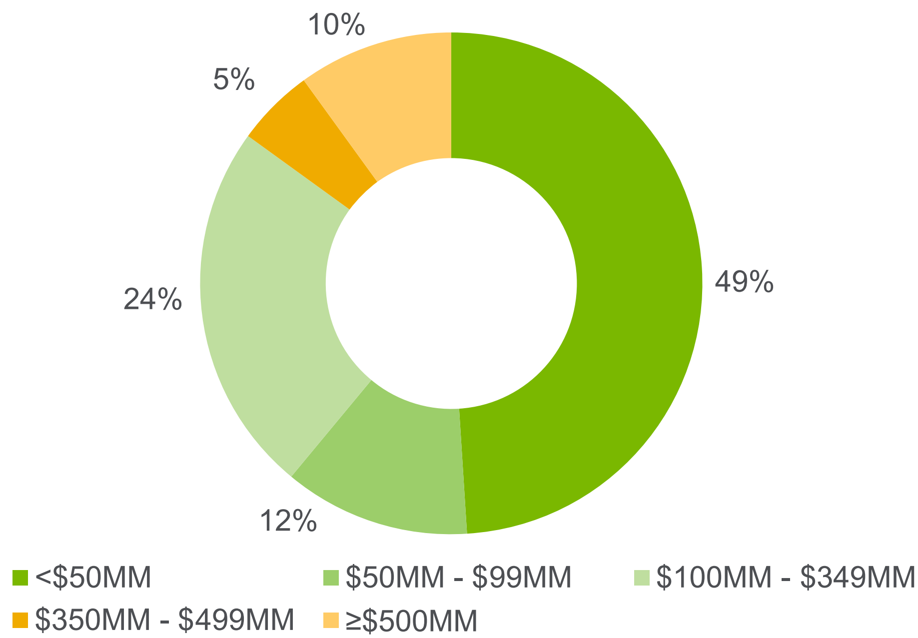
Can Be Challenging to Access Top Tier Managers

Investors' Expected Commitment to PE Funds over Next 12 Months Relative to Past 12 Months
As of June 30, 2016



Source: Preqin

New Capital Investors Anticipate Committing to PE over the Next 12 Months
As of June 30, 2016



- Expect similar to increased levels of private equity commitments over the next 12 months, with the large majority of institutions surveyed (87%) planning to either increase or commit the same amount of capital over the next 12 months. Furthermore, 43% of investors expect to commit more to private equity over the upcoming year. Additionally, as depicted above, 15% of institutions surveyed indicated that they plan to commit $350 million or more to the private equity asset class over the next 12 months.
- Access to top tier managers will remain difficult unless the investor already has a pre-existing relationship. Given significant investor interest in private equity, successful managers have been able to increase fund sizes substantially compared to both predecessor funds as well as their targeted fund size. More specifically, only 25% of private equity funds closed in 2015 were unable to meet their targeted fund size, while 48% were able to exceed their target commitment amount. Furthermore, 21% of private equity managers achieved 125% of their fundraising target or higher in 2015.

Appendix A:
Notes on Data

Notes on Data

- All data in this report has been provided by TRS.
- All slides apart from ‘Performance By Strategy’ and ‘Performance By Investment’ show the PE portfolio only. The data for the illiquid portfolio was provided at a later date, updated numbers and new investments are therefore included.
- All reports appear to be direct data pulls from Private I. No audit or data check has been performed by AHIC relating to the authenticity of the data.
- All benchmark data is as at 6/30/2016 and is provided by Burgiss.
- Geographic and industry data is based on current market values and are determined by the underlying investments made by the fund. The geographic and development focus are assigned based on the region where the greatest amount of capital was invested. Similarly, the industry focus corresponds to the sector where the greatest amount of capital was invested. The sectors correspond to the Global Industry Classification Standard (GICS) developed by MSCI and Standard & Poor’s.
- Total Value = Total Distributions + Net Asset Value.
- DPI = Total Distributions/Total Paid-In.
- TVPI = Total Value/Total.
- Burgiss sector benchmarks are as shown below. Each fund was benchmarked against it’s relevant sector, if a direct comparison could not be made it was benchmarked against the all PE universe:
  – Buyout, Distressed Securities, Mezzanine, Special Situations, Energy, Venture Capital.

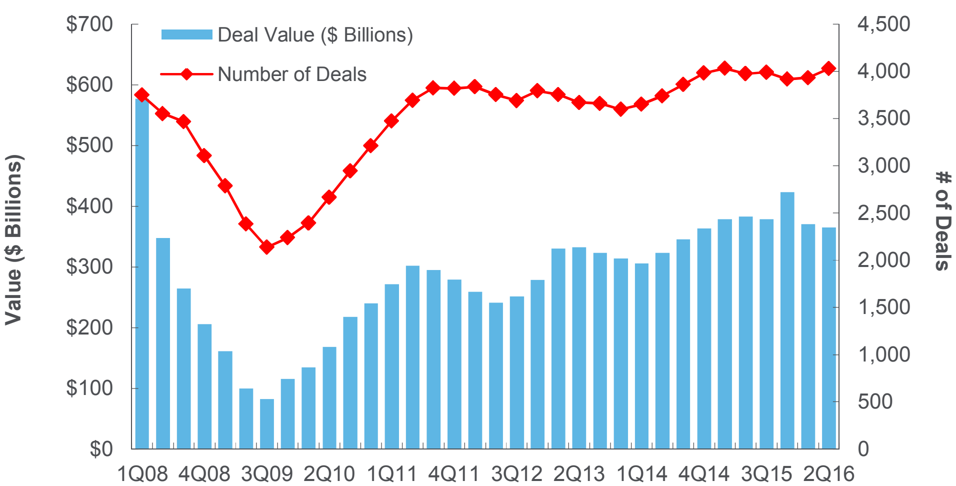
Appendix B:
Private Equity Market Overview

Private Equity Overview

Total Funds Raised

Source: Preqin

LTM Global Private Equity-Backed Buyout Deal Volume



Source: Preqin

Fundraising

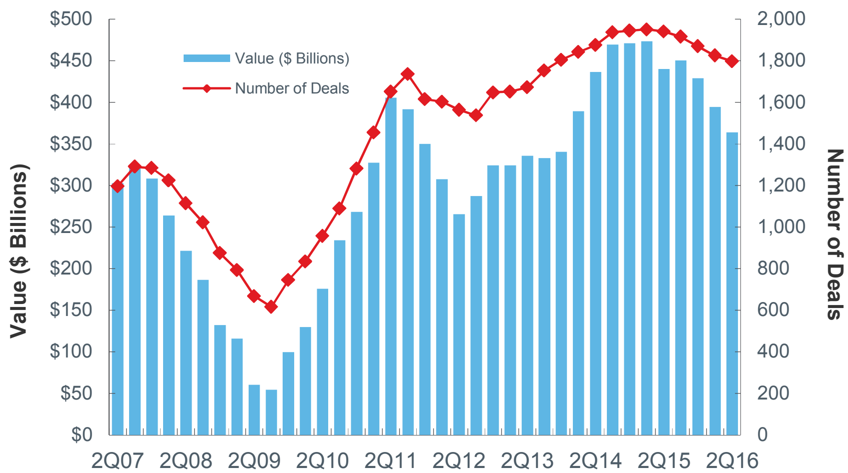
- In 2Q 2016, $130.9 billion was raised by 250 funds, which was down 25.7% and 16.4% on a capital basis compared to the prior quarter and same period last year, respectively. On an LTM basis, private equity fundraising totaled $478.1 billion, which was up 4.0% quarter over quarter and remained well above the five year annual average of $395.5 billion [1].
  - The majority of capital raised was by funds with target geographies in North America, comprising 54.3% of the total. Capital targeted for Europe made up 33.5% of the total funds raised during the quarter, while the remainder was attributable to managers targeting Asia and other parts of the world [1].
- Dry powder was up roughly 4.7% compared to 1Q 2016's peak of $1.1 trillion and remained well above the five year average level of $910.4 billion [1].

Activity

- On an LTM basis, 4,028 deals were completed as of 2Q 2016 for an aggregate deal value of $364.8 billion compared to 3,931 transactions totaling $370.7 billion at 1Q 2016 [1].
- Average deal size was $84.7 million during the quarter, up 61.6% from the prior quarter, but down 1.1% from the five year quarterly average.
- European LBO transaction volume was €16.0 billion in 2Q 2016 and €47.8 billion on a LTM basis, compared to 1Q 2016's quarterly and LTM totals of €16.9 billion and €40.5 billion, respectively. 2Q's volume represented a 40.9% increase over the five year quarterly average [3].
- At the end of 2Q 2016, average purchase price multiples for all U.S. LBOs were 10.1x EBITDA, down from 10.5x as of the end of 1Q 2016 [3].
  - This was 0.8x and 1.1x turns (multiple of EBITDA) above the year end five and ten year average levels, respectively.
- European multiples remained flat quarter over quarter, averaging 9.8x EBITDA for all transaction sizes, with large and medium transactions each running at 11.0x and 10.5x, respectively [3].
- Debt continued to be broadly available in the U.S.
  - 1H 2016 U.S. average leverage levels were 5.3x compared to the ten and five year averages of 5.1x and 5.3x, respectively [3].
  - The amount of debt issued supporting new transactions decreased quarter over quarter from 92.7% to 70.5%, but remains well above the 47.1% average level over the prior five years [3].
  - In Europe, average senior debt/EBITDA through 1H 2016 was 4.8x, down slightly from 4.9x at the end of 1Q 2016. However, this remained above the five year and ten year average levels of 4.5x and 4.4x, respectively.
- Globally, exit value totaled $92.0 billion on 464 deals in 2Q 2016, up 30.7% and 19.3%, respectively, from 1Q 2016 [1].

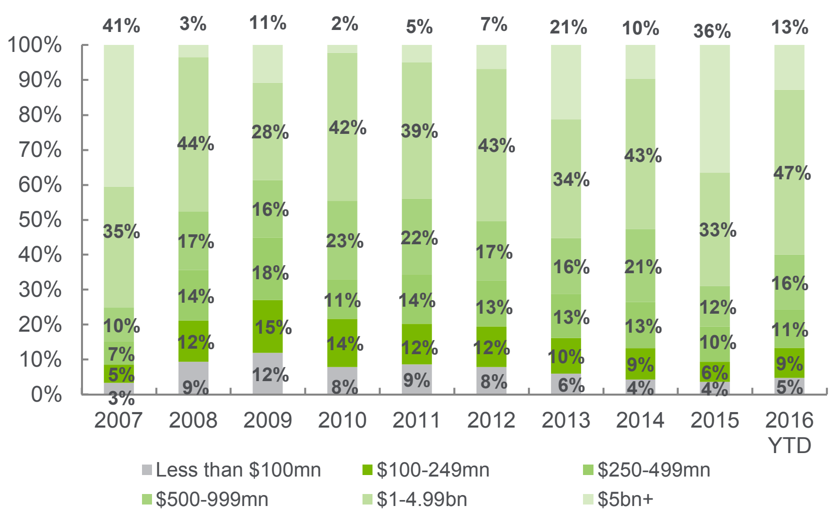
Buyouts / Corporate Finance

LTM PE Exit Volume and Value



Source: Preqin

M&A Deal Value by Deal Size



Source: Preqin

Fundraising

- $70.7 billion was closed on by 77 buyout and growth funds during 2Q 2016, compared to $53.1 billion raised by 75 funds a quarter ago [1].
  - This was up 51.8% over the five year quarterly average and significantly higher than the $28.8 billion raised during the same period last year.
  - TPG Partners VII was the largest partnership raised during the quarter, with a final close totaling $10.5 billion.
- Dry powder was estimated at $615.1 billion, surpassing 1Q 2016's record level of $592.8 billion [1].
  - Aside from large cap funds, which decreased 1.6% quarter over quarter, buyout dry powder increased across all fund size categories. Small and middle market fund dry powder increased by 3.8% and 3.3%, respectively, with middle market levels surpassing the previous record mark of $99.8 billion observed in 1Q 2016 [1].
  - Mega fund dry powder stood at an estimated $194.7 billion, which was up 11.6% quarter over quarter, but below the full year record mark of $217.5 billion set in December 2008.
  - North American dry powder increased approximately 3.8% from the prior quarter's peak level of $284.7 billion.

Activity

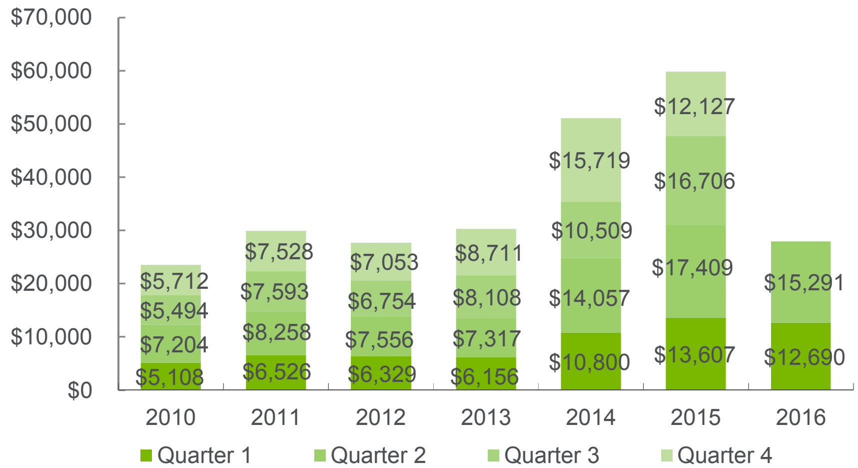
- Global private equity-backed buyout deals totaled $89.5 billion in the second quarter, which was up 79.8% and 8.8% from the prior quarter and five year quarterly average, respectively [1].
  - 1,057 deals were completed during the quarter, which was up 11.3% and 10.1% from 1Q 2016 and the five year quarterly average, respectively.
  - Deals valued at $5.0 billion or greater comprised an estimated 12.8% of total deal value, down from 24.4% as of 1Q 2016 [1].
- Entry multiples for all transaction sizes in 2Q 2016 stood at 9.7x EBITDA. This was down from 1Q 2016 and full year 2015 levels of 10.5x and 10.3x, respectively [3].
  - Both large cap and middle-market purchase price multiples decreased quarter over quarter. Middle-market purchase price multiples matched their lowest quarterly level since 3Q 2012 (7.2x EBITDA) and stood at 8.2x through 1H 2016. Large cap purchase prices averaged 10.1x EBITDA, compared to 11.2x in 1Q 2016.
  - The average purchase price multiple across all European transaction sizes averaged 9.8x EBITDA through 1H 2016. Purchase prices for transactions of €1.0 billion or more increased from 10.5x in 1Q 2016 to 11.0x in 2Q 2016. Transactions between €500.0 million and €1.0 billion were unchanged quarter over quarter, and stood at 10.5x [3].
  - The portion of average purchase prices financed by equity for U.S. deals was 46.8% through 1H 2016, up from 43.8% at year end 2015. This remained above the five and ten year full year averages of 41.1% and 41.4%, respectively. 2Q 2016 mezzanine usage decreased from 0.4x to 0.1x quarter over quarter and fell below the 0.2x level observed in 2015 [3].
- Average exit value improved 9.6% quarter over quarter to $198.3 million, but was down 5.6% compared to the five year quarterly average [1].

Opportunity

- Operationally focused managers targeting the lower and middle markets with expertise in multiple sectors

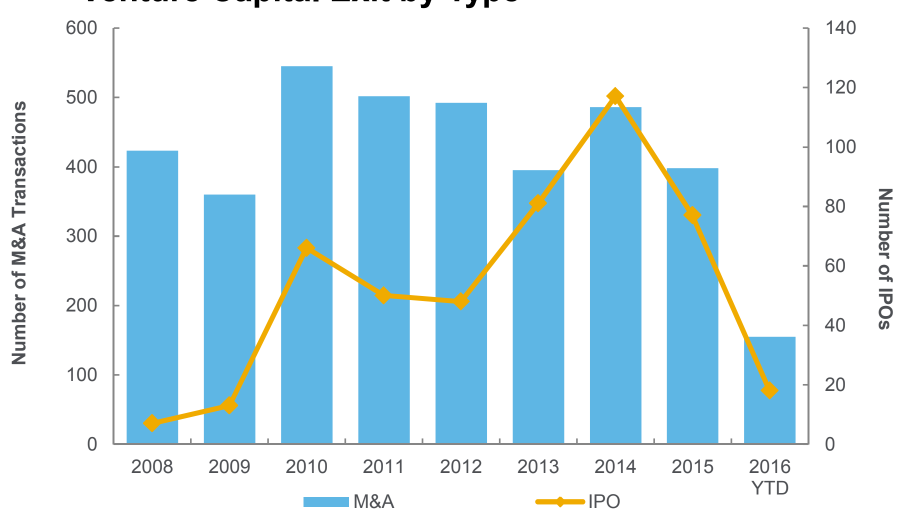
Venture Capital

Venture Capital Investments by Quarter ($MM)



Source: PWC/NVCA MoneyTree Report and NVCA

Venture Capital Exit by Type



Source: Thomson Reuters and National Venture Capital Association

Fundraising

- $18.1 billion of capital closed in 2Q 2016, up significantly from the prior quarter and five year quarterly average levels of $11.8 billion and $11.6 billion, respectively [1].
- Dry powder was estimated at $163.9 billion at the end of the second quarter, which was up 6.8% from 1Q 2016 and 39.3% higher than the five year average level. An estimated 57.6% of dry powder was targeted for North America, followed by approximately 24.5% earmarked for Asia [1].
- The average fund size raised was approximately $187.0 million in 2Q 2016, compared to the five year quarterly average of $136.0 million. Fundraising continues to be a barbell in terms of capital, with the majority of funds raising $200.0 million or less and approximately 14 funds targeting $1.0 billion or more [1].
- 19 new funds and 48 follow-on funds were raised during 2Q 2016, compared to 16 and 51, respectively, in the first quarter of 2016 [8].

Activity

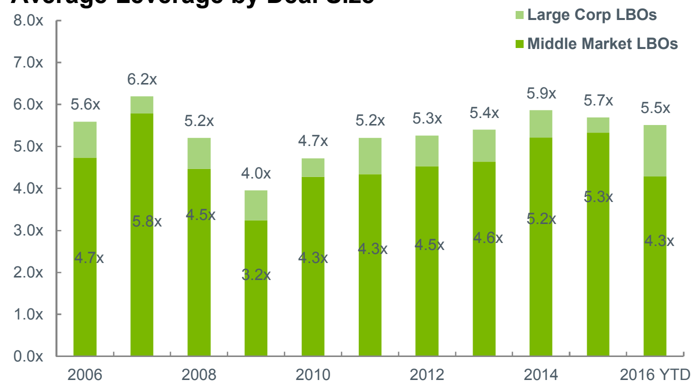
- $15.3 billion of capital was deployed across 961 deals in the second quarter compared to 1,011 deals totaling $12.7 billion in 1Q 2016 [7]. This was 12.2% lower than 2Q 2015 on a capital basis, but remains well above the five year quarterly average level of $9.9 billion.
  - Financing rounds exceeding $100.0 million remained depressed for the third straight quarter totaling just 35 deals. This was down slightly with 1Q 2016, which saw 40 deals completed, but well below 3Q 2015's total of 73 [14].
  - The number of unicorns, or companies with valuations of $1.0 billion or more, increased from five in 1Q 2016 to seven in 2Q 2017. However, this remains well below the 25 unicorns observed in 3Q 2015 [14].
- Median pre-money valuations decreased for both Series A and Series D+ transactions, down 28.6% and 11.8%, respectively. Series C transaction valuations increased 20.8% quarter over quarter, while Series B valuations remained flat [9].
- The proportion of down rounds reached their highest level since 2011 at 21.0%. This was up significantly from the estimated 6.0% level observed in 1Q 2016 [9].
- Venture-backed IPO and M&A activity remained subdued in 2Q 2016.
  - There were 12 venture-backed initial public offerings in 2Q 2016, which was up from just six in 1Q 2016, but down substantially compared to the 29 observed in 2Q 2015.
  - The number of M&A transactions totaled 64 deals, representing decreases of 29.7% and 20.0% compared to 1Q 2016 and 2Q 2015, respectively [8].

Opportunity

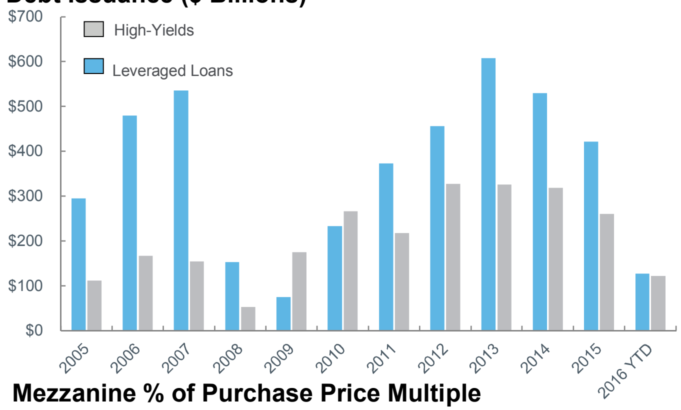
- Early stage continues to be attractive, although we are monitoring valuation increases
- Smaller end of growth equity
- Technology sector

Leveraged Loans & Mezzanine

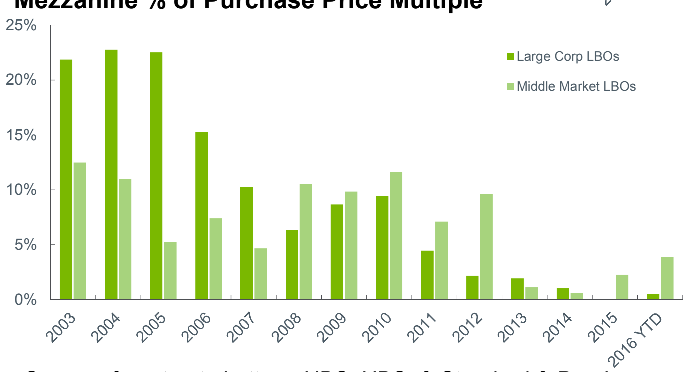
Average Leverage by Deal Size



Debt Issuance ($ Billions)



Mezzanine % of Purchase Price Multiple



Sources from top to bottom: UBS, UBS, & Standard & Poor's

Leveraged Loans

Fundraising

- New CLO issuance totaled $18.9 billion in 2Q 2016, up substantially compared to 1Q 2016's total of just $7.1 billion. However, YTD CLO issuance is tracking well below the $55.9 billion priced during 1H 2015 [2].
- High-yield debt issuance picked up in 2Q 2016, with $84.0 billion in issuance compared to just $38.0 billion in 1Q 2016. On a YTD basis, 1H 2016's issuance of $122.0 billion is well below 1H 2015's pace of $184.0 billion. This is notable given that 2015 marked the lowest full year issuance since 2011 [2].
- Mutual fund net outflows stood at $5.6 billion at the end of 2Q 2016, up from 1Q 2016's total of $4.9 billion [2].

Activity

- Average leverage levels for large cap LBOs and middle market LBOs were 5.5x and 4.3x, respectively, through 1H 2016, down from 2015 levels of 5.7x and 5.3x, respectively. Leverage for all LBO transactions ended the quarter at 5.3x, compared to 5.6x at year end 2015 and was comprised primarily of senior debt, with subordinated debt levels of just 0.1x [3].
- New leveraged loan issuances in 2Q totaled just $38.4 billion, down 56.6% from the prior quarter. This represented the lowest quarterly total since we began tracking this information in 2011. On a YTD basis, 1H 2016's total of $126.8 billion is 10.6% lower than leverage loan volume during the same period last year [2].
- 70.5% of new leveraged loans were used to support M&A and growth activity during the quarter, down from 91.9% a quarter ago, but above the prior five year average of 46.2% [3].
- European leveraged loan issuance increased by 14.1% quarter over quarter to €13.3 billion [3].
  - This was above the five year quarterly average level of €10.1 billion, but below the ten year quarterly average issuance of €12.7 billion.
- Leveraged loan spreads for B rated issues decreased to L+437 bps from L+465 bps a quarter ago. BB-index spreads decreased to L+332 bps from L+343 bps at 1Q 2016 [2].

Opportunity

- Funds with the ability to source deals directly and the capacity to scale for large transactions
- Funds with the flexibility to focus on both Europe and U.S. opportunities

Mezzanine

Fundraising

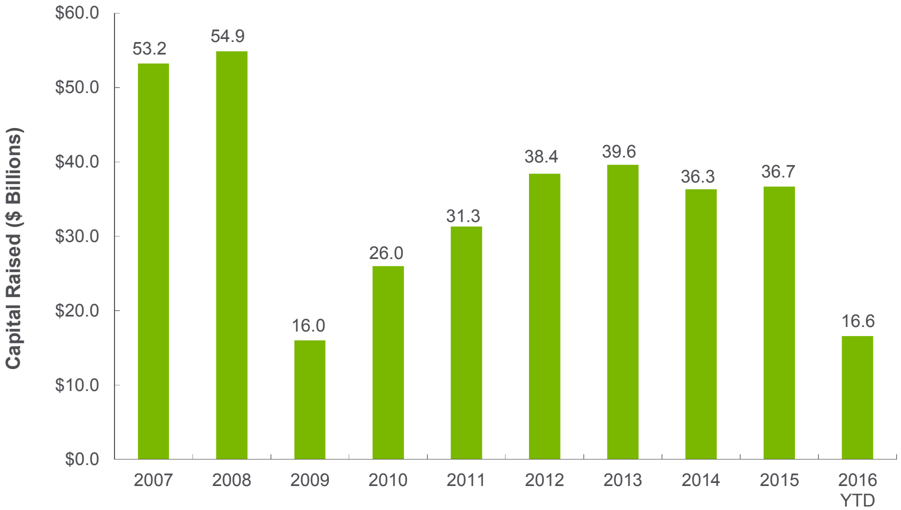
- Six funds closed on $2.5 billion during the quarter, up from 3Q 2016's total of $1.2 billion raised by three funds. This was also up compared to 2Q 2015's total of $1.9 billion raised by nine funds, but was 28.2% lower than the five year quarterly average [1].
- Estimated dry powder was $46.2 billion at the end of 2Q 2016, up 10.9% from 1Q 2016 [1].
- Fundraising remains competitive with an estimated 77 funds in market targeting $33.5 billion of commitments in addition to continued market participation from private lending platforms and business development companies (BDCs) [1].

Opportunity

- Funds with the ability to source non-sponsored deals in the lower middle market
- Funds with the capacity to scale for large sponsored deals

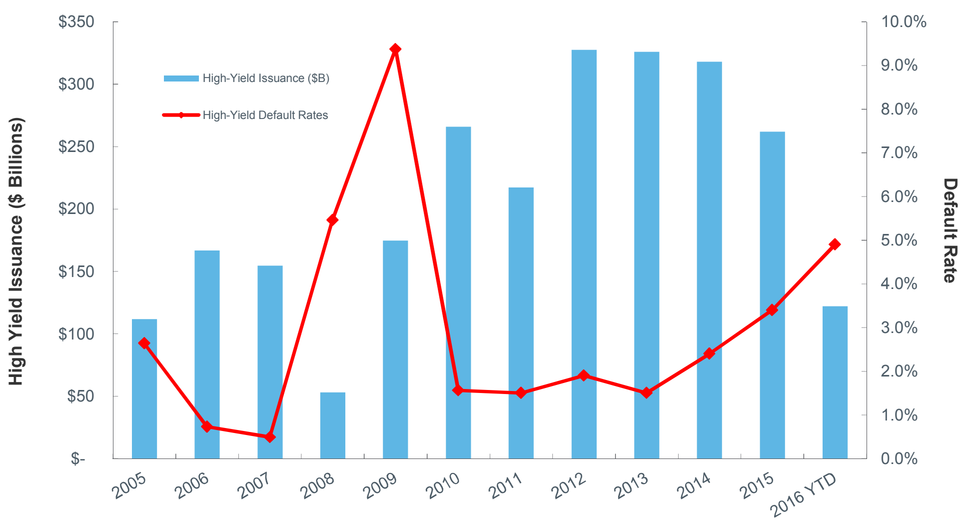
Distressed Private Equity

Distressed Debt, Turnaround, & Special Situations Fundraising



Source: Thomson Reuters

High-Yield Bond Volume vs Default Rates



Source: UBS & Fitch Ratings

Fundraising

- $9.6 billion was closed on by 14 funds in 2Q 2016, compared to $7.0 billion by seven funds in 1Q 2016 and $13.9 billion by 19 funds in 2Q 2015 [1].
  - This was 4.1% higher than the five year quarterly average [1].
  - MHR Institutional Partners IV was the largest partnership raised during the quarter, closing on $2.3 billion.
- Dry powder was estimated at $92.3 billion at the end of 2Q 2016, 2.2% and 22.3% above the prior quarter end and five year average levels, respectively [1]. This represents a new record level for the fourth straight quarter.
- Roughly 94 funds were in the market at the end of 2Q 2016, seeking an aggregate $64.2 billion in capital commitments [1].
  - Several large funds were in the market including Oaktree, Apollo, Centerbridge, Cerberus, and Bain, all of which were targeting fund sizes of $3.0 billion or larger.

Activity

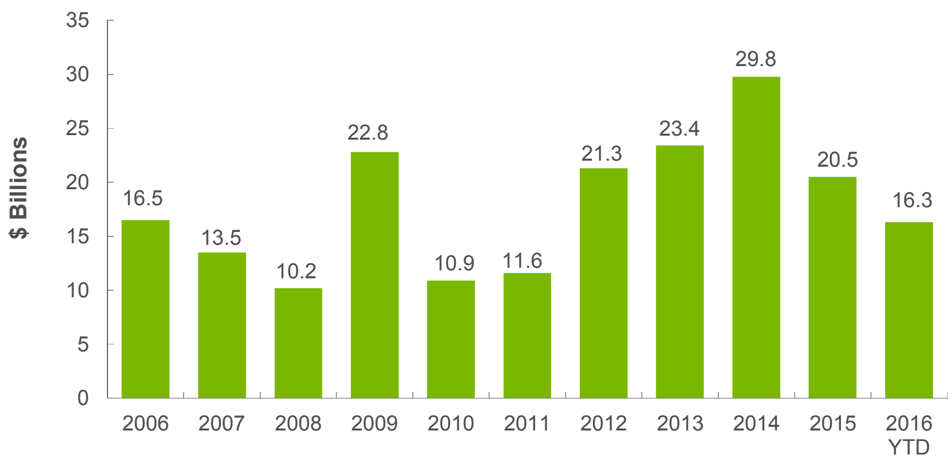
- Distressed debt and bankruptcy restructuring activity totaled $27.2 billion in 2Q 2016, bringing 1H 2016 activity to $52.6 billion, which was down 32.2% from the same period a year ago [5].
  - U.S. activity accounted for $18.9 billion on a YTD basis, representing a 27.7% decrease from 1H 2015.
- High-yield defaults totaled $50.2 billion through 1H 2016, already surpassing 2015's full year total of $48.3 billion. The LTM U.S. high-yield default rate was 4.9%, marking the highest level since May 2010 [6]. Default rates are expected to rise further in 2016 due to ongoing developments and challenges in the energy and mining/minerals sectors [6].
- While debt remains broadly available, we have seen default rates creep up recently and sponsors be more accepting of mezzanine debt in the capital structure.
- Increasing purchase prices and elevated levels of leverage may result in an increase in distressed opportunities looking out over the next two to three years, or sooner if there is a stall in the economy.

Opportunity

- Funds capable of performing operational turnarounds
- Funds with the flexibility to invest globally

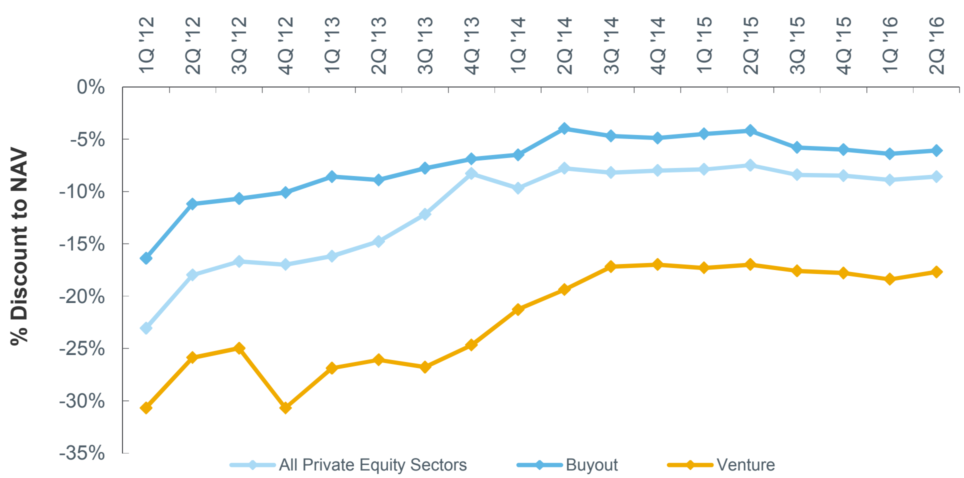
Secondaries

Secondary Fundraising



Source: Preqin

Secondary Pricing



Source: UBS

Fundraising

- Nine funds raised $12.5 billion during the second quarter, up from $3.8 billion by five funds in 1Q 2016. On an LTM basis, secondary capital raised totaled $25.7 billion, up from the $21.3 billion five year annual average [1].
  - Ardian Secondary Fund VII closed on a record $10.8 billion during the quarter, surpassing the prior mark of $10.1 billion set by Lexington Capital Partners VIII in 2015 [1].
- At the end of 2Q 2016, dry powder was estimated at a record level of $58.0 billion, which was up 5.4% from the beginning of 2016 [2].
- At the end of 2Q 2016, there were an estimated 59 secondary and direct secondary funds in market, targeting approximately $31.5 billion. Strategic Partners Fund VII was the largest fund in the market targeting $5.5 billion [1].

Activity

- As of the end of 2Q 2016, nearly 900 potential buyers and approximately 600 potential sellers of secondary interests have been identified. Private equity fund of fund managers represented the largest group of potential buyers (21.0%), while public pension funds accounted for the highest proportion of sellers (13.0%) [1].
- In 1H 2016, private equity transaction volume totaled $15.3 billion, representing a decrease of 7.3% from the level observed in1H 2015. 65.3% of YTD deal volume was traditional LP positions and 34.7% were secondary direct transactions [13].
  - Although leveraged buyout funds continued to be the most purchased private equity funds during 1H 2016 (78.1%), volume decreased 17.9% compared to the same period last year [13].
- Transaction and fund leverage and deferred payment structures continue to be prevalent and are used as a means to improve pricing and deal returns in an increasingly competitive environment [2, 13].
  - There are currently more than 12 providers of leverage compared to seven providers in 1Q 2015 and two providers in 2Q 2013 [2].
  - In 1H 2016, an estimated 26.0% of secondary transactions included a deferred payment structure [2].
- The average discount rate for all private equity sectors decreased quarter over quarter from 8.9% to 8.6% and remains very favorable for potential sellers. The average buyout pricing discount decreased 0.3% to 6.1% during 2Q 2016 [2].
- Despite increased focus on public market volatility, pricing is expected to remain attractive for sellers given record levels of transaction volume and dry powder [2].

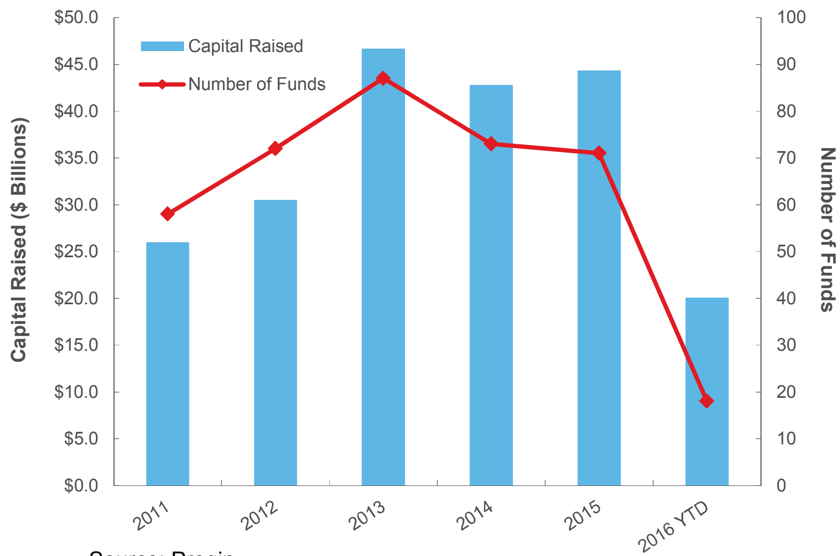
Opportunity

- Funds that are able to execute complex and structured transactions
- Niche strategies
- Fund restructurings

Empower Results®

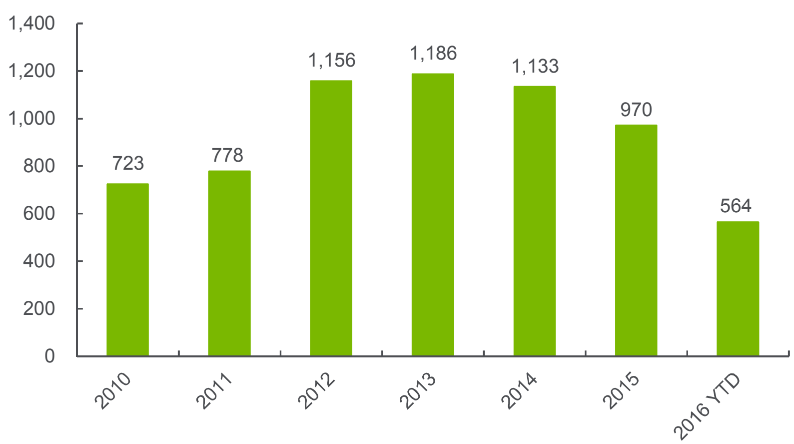
Infrastructure

Global Infrastructure Fundraising



Source: Preqin

Number of Deals Completed



Source: Preqin

Fundraising

- $4.2 billion of capital was raised by eight funds in 2Q 2016 compared to $15.9 billion of capital closed on by 10 partnerships in 1Q 2016 [1].
  - Funds raised in 1H 2016 averaged 108.0% of their target size, which was up from 104.0% as of 1Q 2016 and represents the highest total in the last eight years [1].
  - Carlyle Power Partners II was the largest partnership raised during the quarter, closing on $1.5 billion [1].
- As of the end of 2Q 2016, there were an estimated 167 funds in the market seeking roughly $115.0 billion [1].
  - Funds focused on North American infrastructure assets were targeting an estimated $64.3 billion in capital, followed by European focused funds, which were targeting approximately $27.9 billion [1].
  - Global Infrastructure Partners III and Brookfield Infrastructure Fund III were the two largest funds in the market as of 2Q 2016, each targeting commitments of $12.5 billion.
- At the end of the quarter, dry powder stood at a record $142.0 billion, up from last quarter's total of $124.0 billion. Just over half of the dry powder was targeted for North America, compared to 24.6% for Europe and 22.5% for Asia and the rest of the world [1].
- Fundraising remains very competitive given the number of funds and aggregate target level of funds in market. Institutional investors continue to have an appetite for the asset class despite the record levels of dry powder and increased investment activity from strategic and corporate buyers as well as institutional investors. This raises concerns surrounding the relative availability and pricing of assets.

Activity

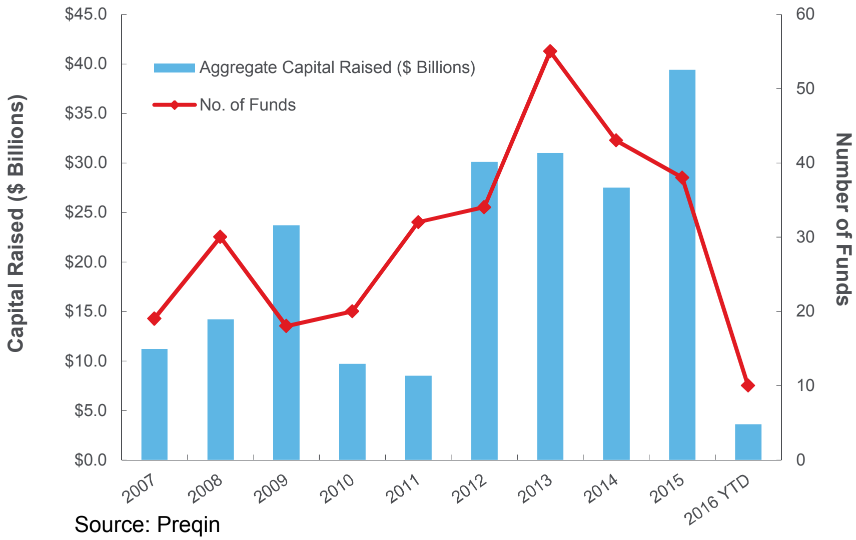
- Infrastructure managers completed 225 deals with an estimated aggregate deal value of $96.8 billion in 2Q 2016 compared to 339 deals totaling $161.1 billion a quarter ago [1].
  - The average deal value in 2Q 2016 was $430.0 million, up 9.5% from 1Q 2016.
  - Europe accounted for 37.2% of the deals in the second quarter, while 28.3% and 25.6% of deals were transacted in North America and Asia, respectively [1].
  - 41.3% of 2Q 2016 deals were secondary stage transactions, while greenfield and brownfield deals accounted for 39.1% and 19.6%, respectively [1].
- Core and core plus infrastructure deals continued to comprise the majority of the activity at 85.5% of deals across the energy, transportation, and utilities sectors. Renewable energy was the dominant industry at 34.8%, followed by transportation at 24.9%. Social infrastructure accounted for 14.5% of transactions [1].

Opportunity

- North American energy infrastructure due to soft commodity price environment
- Emerging markets for those with the appropriate risk appetite

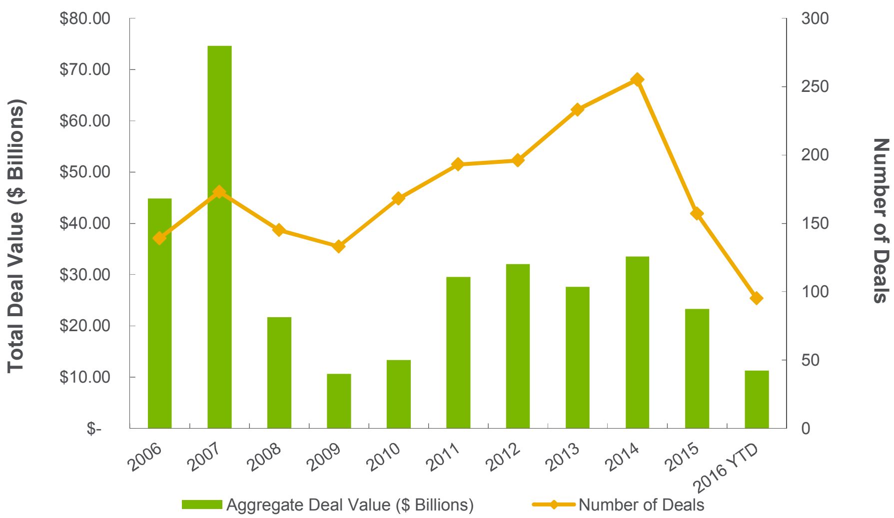
Natural Resources

Natural Resources Fundraising



Source: Preqin

Energy & Utilities Deal Activity



Source: Preqin

Fundraising

- During 2Q 2016, seven funds closed on $3.0 billion compared to three funds totaling $0.6 billion in 1Q 2016 [1].
  - On a YTD basis, this tracked substantially behind 1H 2015, which saw $27.6 billion raised by 18 funds [1].
  - BCP Energy Services Fund was the largest fund raised during the quarter, closing on $750.0 million.
- At the end of 2Q 2016, there were roughly 110 funds in the market targeting an estimated $54.1 billion in capital, compared to 89 funds seeking an estimated $45.6 billion in 1Q 2016 [1].
  - Riverstone and Energy & Minerals Group were seeking the most capital with target fund sizes of $7.5 billion and $4.0 billion, respectively.
- Dry powder was estimated at $74.7 billion at the end of 2Q 2016, which was up 3.8% quarter over quarter and surpassed the record level of $73.5 billion observed in 3Q 2015 [1].

Activity

- Energy and utilities industry managers completed an estimated 95 deals totaling a reported $11.3 billion through 1H 2016, representing 48.5% of 2015's full year deal value [1].
- Crude oil prices ended 2Q 2016 up considerably from 1Q 2016, during which time prices reached their lowest month end levels since 2003.
  - WTI crude oil prices increased from $37.55/bbl at the end of 1Q to $48.76/bbl at the end of 2Q 2016 [11].
  - Brent crude oil prices improved to $48.25/bbl, up 26.3% from 1Q 2016 [11].
- Natural gas prices (Henry Hub) increased by 49.7% during the second quarter, ending at $2.59 per MMBtu, which marked the highest month end price since September 2015 [11].
- A total of 417 crude oil and natural gas rotary rigs were in operation in the U.S. at the end of 2Q 2016, down 12.6% and 51.8% from the prior quarter and same period last year, respectively. Crude oil rigs represented 79.3% of the total rigs in operation [11].
- The price of iron ore (Tianjin Port) decreased 7.5% quarter over quarter to $51.36 per dry metric ton [12].

Opportunity

- Acquire and exploit existing oil and gas strategies preferred over early stage exploration in core U.S. and Canadian basins
- Deep value natural resource credit opportunities
- Select midstream opportunities
- Mining and minerals

Notes

1. Preqin
2. UBS
3. Standard & Poor's
4. Aon Hewitt Investment Consulting
5. Thomson Reuters
6. Fitch Ratings
7. PriceWaterhouseCoopers/National Venture Capital Association MoneyTree Report
8. Thomson Reuters and National Venture Capital Association
9. Cooley Venture Financing Report
10. Federal Reserve
11. U.S. Energy Information Administration
12. Bloomberg
13. Setter Capital Volume Report: Secondary Market H1 2016
14. KPMG and CB Insights

Notes:

FY: Fiscal year ended 12/31
YTD: Year to date
YE: Year end
LTM: Last twelve months (aka trailing twelve months or TTM)
PPM: Purchase Price Multiples: Total Purchase Price / EBITDA
/bbl: Price per barrel
MMBtu: Price per million British thermal units

Appendix C:
Introduction to Private Equity

What is Private Equity?

An investment in equity capital that is not quoted on a public exchange

- **The oldest form of equity and was historically available only to company founders and their friends and family.**
- **Began growing as an investment for institutions in the 1980s through the development of private equity funds and the availability of debt to help finance company acquisitions.**
- **Can be invested in companies providing any type of product or service.**
- **Can generate excess returns to the public markets due to investment manager skill. Managers attempt to create value by:**
  - **Acquiring controlling and/or non-controlling interests in private companies**
  - **Actively building/repositioning and selling those companies**
- **Is illiquid because it is not a publicly listed security and requires significantly more time and effort to sell.**
- **Can have higher risk due to its illiquidity and typically smaller company size and use of leverage.**

	Size	Ownership	Financials	Operational Focus	Value Generated
Public Companies	Mature	Shareholders	Publicly Disclosed	Short-term	Operational Improvements
Private Companies	Seed Stage to Mature	Founder, Management, Select employees, and Investors	Confidential	Long-term	Operational Improvements and Financial Engineering

Private Equity Sub-Strategies

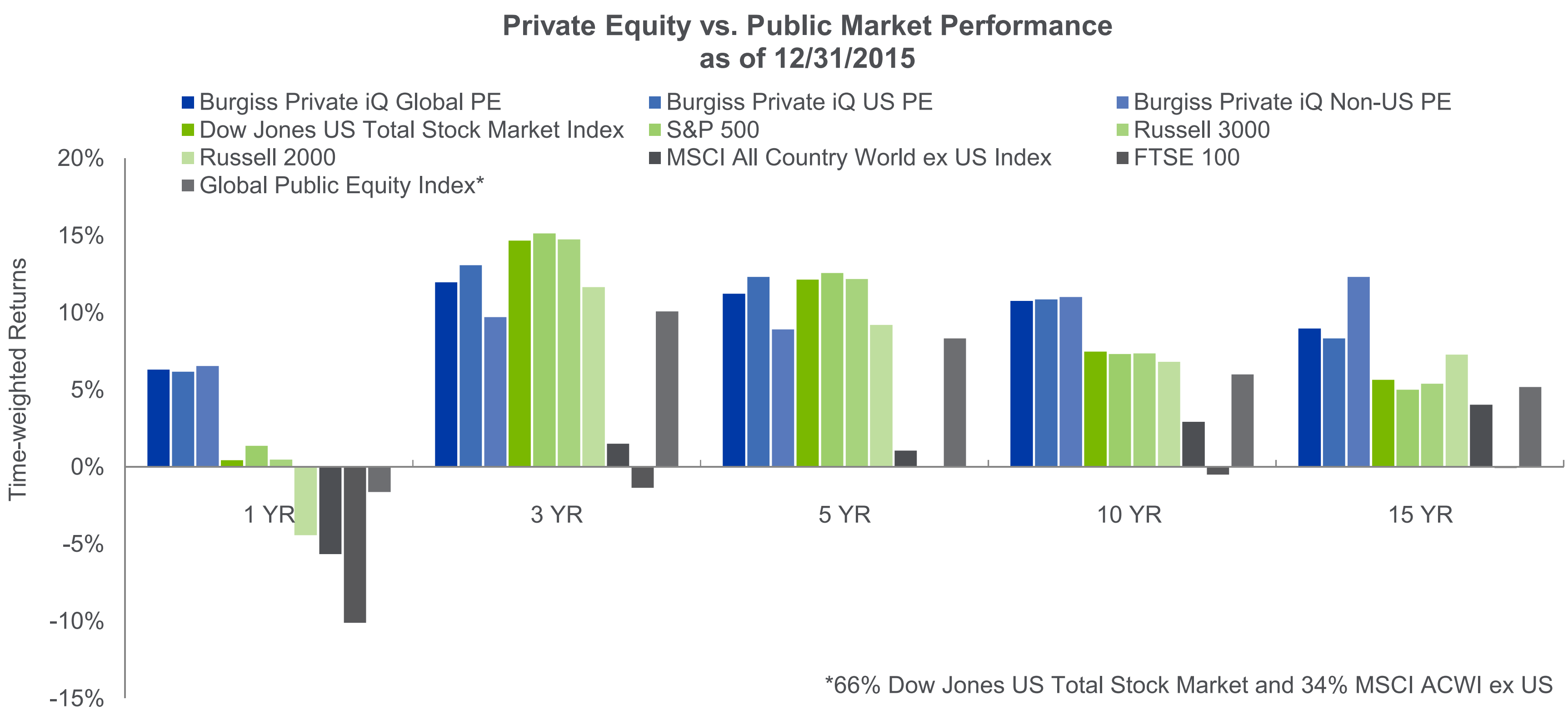
Private Equity manager strategies differ by:

- Size of target companies
- Maturity of product or service
- Geography
- Industry
- Use of leverage in capital structure

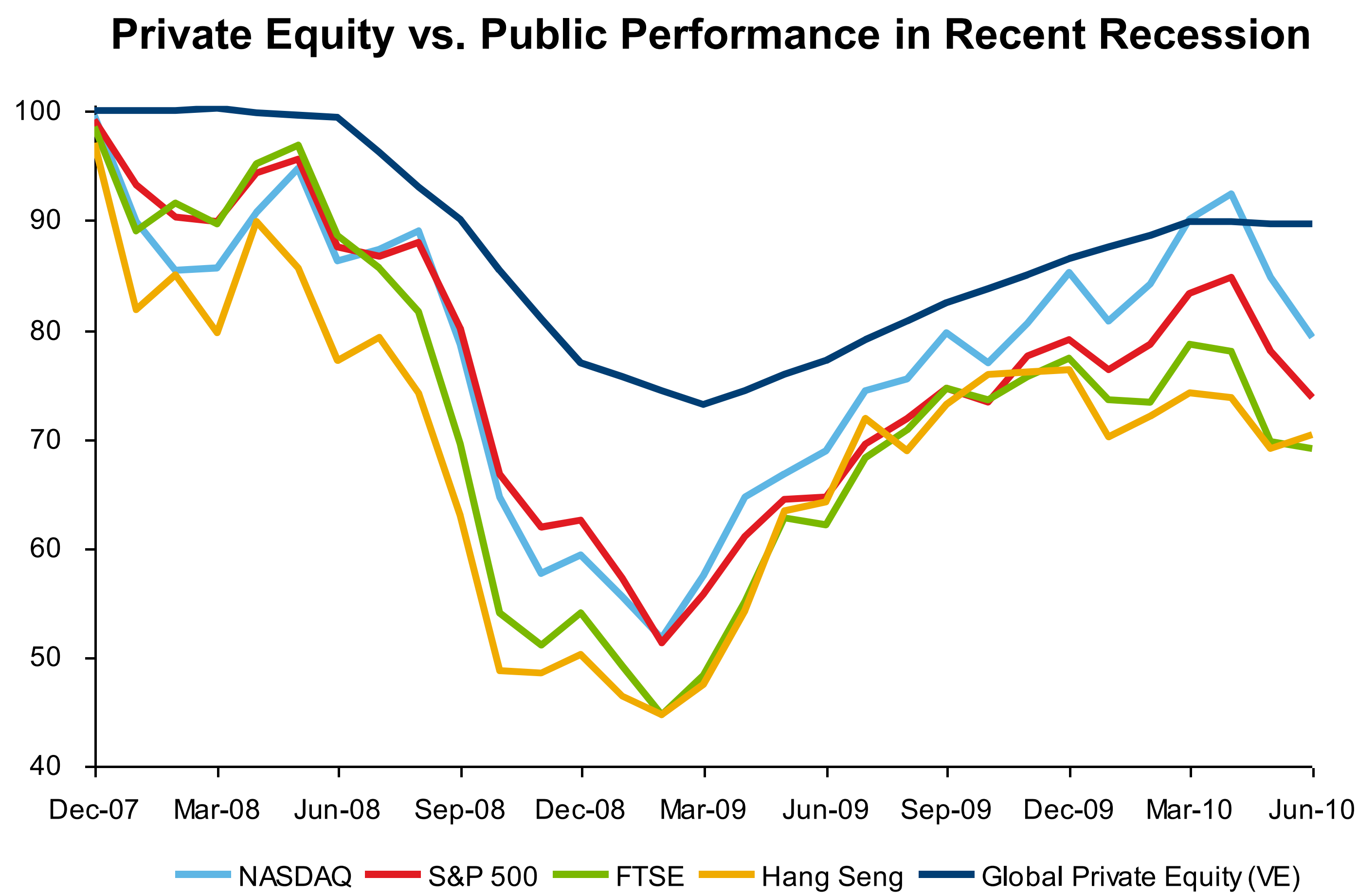
- **Value creation approach:**
  - **Value buy**
  - **Cost reduction**
  - **Change / augment management**
  - **Professionalize company**
  - **Drive growth**
    - **Market Expansion**
    - **New Products**

Buyouts	Venture Capital	Special Situations
▪ Small ▪ Medium ▪ Large ▪ Mega	▪ Seed ▪ Early ▪ Expansion ▪ Late ▪ Growth Equity	▪ Distressed Debt ▪ Secondaries ▪ Royalty ▪ Infrastructure ▪ Sector-Focused (e.g. Clean Technology and Energy)

Benefits Of Private Equity: Superior Long-Term Returns



Benefits of Private Equity: Superior Returns



Sources: Bloomberg, Thomson One Venture Economics

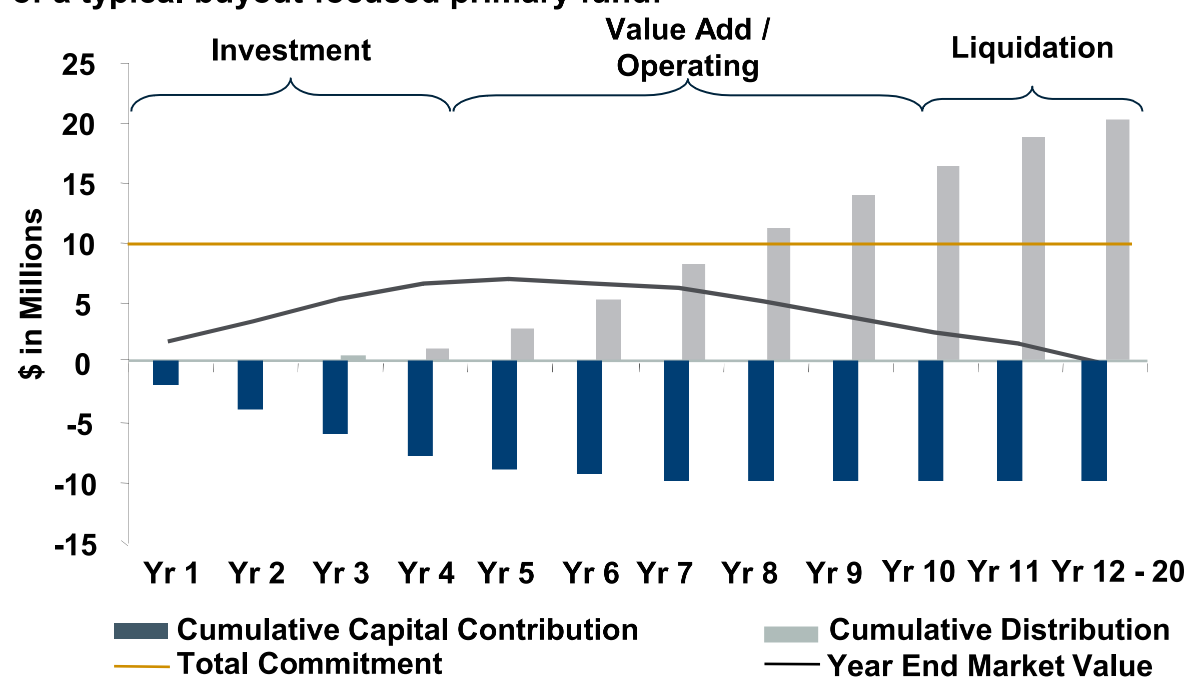
Benefits of Private Equity: Diversification

- Access to a portion of the investable universe usually not available through the public markets
  - Company size
  - Niche industries or new products or services
    - Related opportunities are often too small for large public companies to pursue
- Private companies are a significant driver of economic growth not accessible through traditional public investment strategies

	Size	Ownership	Financials	Operational Focus	Value Generated
Public Companies	Mature	Shareholders	Publicly disclosed	Short-term	Operational improvements
Private Companies	Seed stage to mature	Founder, management, select employees, and investors	Confidential	Long-term	Financial engineering and operational improvements

Private Equity Cash Flow Profile

Cash flow profile of a typical buyout focused primary fund:

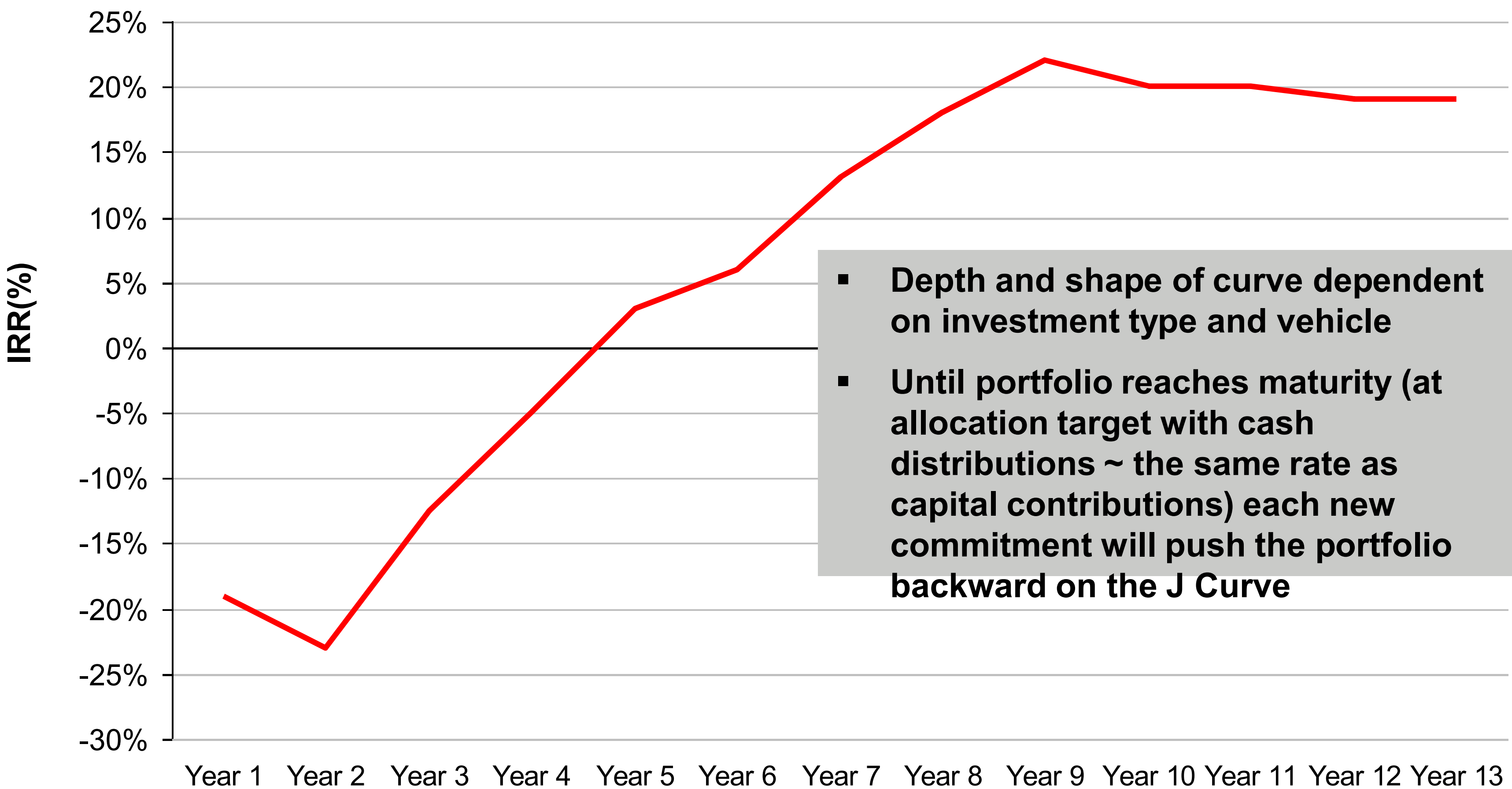


Cash Flow Characteristics	Portfolio Build Impact
▪ Cash is drawn and paid back over the life of the investment. ▪ Typically the maximum amount of a commitment outstanding at the peak is ~ 65%.	▪ Investors must continually reinvest capital to maintain target allocation. ▪ Investors must commit ~ 2x the target allocation. ▪ Can take 7 to 8 years to reach target allocation.

The benefits of investing in private equity and infrastructure are realized over the long term and it requires a long term strategic commitment by investor

J Curve

The curve generated by plotting the returns generated by a private equity or infrastructure fund against time (from inception to termination)

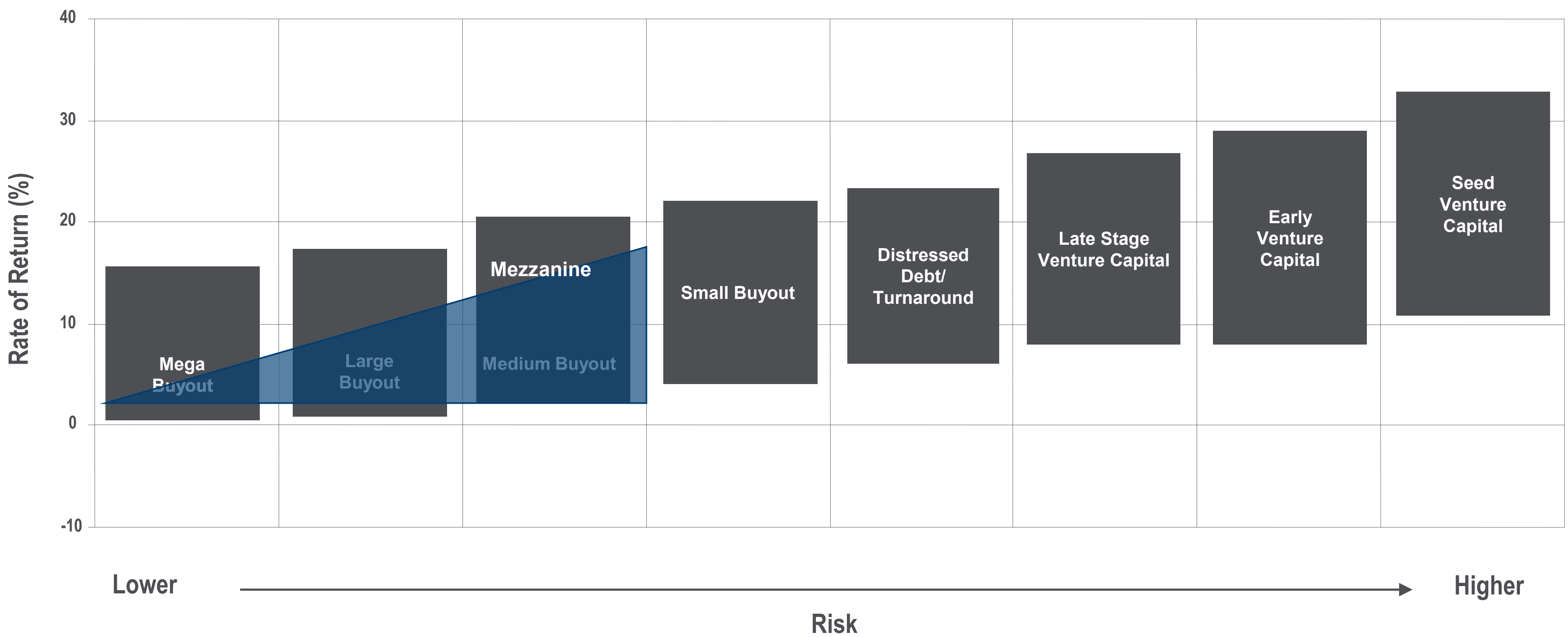


- **Depth and shape of curve dependent on investment type and vehicle**
- **Until portfolio reaches maturity (at allocation target with cash distributions ~ the same rate as capital contributions) each new commitment will push the portfolio backward on the J Curve**

Private Equity Considerations: Terms and Structure

	Private Equity Characteristics
Illiquidity	▪ Fund term 10-12 years ▪ Secondary market for partnership interests inefficient
Higher Fees	▪ 1.5-2% investment fee ▪ 20% carried interest (incentive fee) with 8% preferred return hurdle
Structure	▪ Limited partnership structure ▪ Complex legal documents negotiated with side letters
Cash Flows	▪ Commitment drawdown over 3-4 years ▪ Capital calls have 10 days notice
Leverage	▪ Venture capital: none ▪ Growth equity: none to low ▪ Buyout: 50-70% debt/total capitalization, depending on strategy

Private Equity Risk/Return Spectrum



AHIC View of Opportunities in Private Equity Today

		Overweight	Neutral	Underweight
Corporate Finance	Small-Market	✓		
	Middle-Market	✓		
	Large		✓	
	Mega		✓	
Venture Capital	Seed / Early Stage		✓	
	Late Stage			✓
	Growth Equity	✓		
	Balanced			✓
Special Situations	Mezzanine		✓	
	Distressed	✓		
	Secondaries		✓	
	Energy	✓		
	Green Investments			✓
	Royalty		✓	

Note: Underweight does not indicate zero investment. Aon Hewitt prioritizes top performing managers over sector selection.

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ATTN: AHIC Compliance Officer

TO:	Board of Trustees of the Teachers’ Retirement System of Kentucky
FROM:	Gary L. Harbin, CPA
DATE:	November 21, 2016
RE:	Report of the External Auditor

Mountjoy Chilton Medley will be present at the meeting to report to the Board on the Fiscal Year 2016 Audit.