

1. Joint Meeting of the Board of Trustees
and
Investment Advisory Committee

December 12, 2017



Public Agenda Item #1.1

Call Meeting of the Board of Trustees to Order

December 12, 2017

Public Agenda Item #2.1

Consideration of Appointment to the Investment Advisory Committee
– (Action)

December 12, 2017

Tom Tull, CFA, Chief Investment Officer

IAC Skills Assessment

ERS

	Investment	Global	Fixed	Private	Real	Hedge		
	Experience	Equity	Income	Equity	Estate	Funds	Infrastructure	Derivatives
IAC Chair James Hille, CFA, CAIA CIO - Texas Christian University Endowment	26 years	X	X	X	X	X		
IAC Vice-Chair Caroline Cooley CIO - Diversified Funds Crestline Investors, Inc.	33 years					X		X
Bob Alley, CFA Retired - AIM Advisors, Inc. as Chief Fixed Income Officer	42 years	X	X	X				
Ken Mindell Sr. VP, Treasurer & Director of Investments Rosewood Management Corporation	37 years	X	X	X	X	X		X
Dr. Laura Starks Charles E. & Sarah M. Seay Regents Chair in Business Administration Director, AIM Investment Center The University of Texas Austin	29 years	X	X	X	X	X		
Lenore Sullivan Managing Director (Volunteer) TMV Capital Management Formerly, Partner at Perella Weinberg Partners	37 years			X	X		X	
Gene L. Needles, Jr. Chairman, President and CEO American Beacon Advisors	24 years	X	X	X	X	X		X
Margaret “Didi” Weinblatt, Ph.D., CFA Retired – USAA Investment Management Company as Vice President of Mutual Fund Portfolios	37 years	X	X					X
Mari Kooi Retired - Wolf Asset Management International, LLC as Chief Executive Officer	30 years	X	X	X		X		X

Questions?

(Action Item)

Public Agenda Item #3.1

Call Meeting of the Investment Advisory Committee to Order

December 12, 2017

Public Agenda Item #4.1

Review and Approval of the Minutes to the August 23, 2017
Joint Meeting of the Board of Trustees and Investment Advisory
Committee - (**Action**)

December 12, 2017

Questions?
(Action Item)

Public Agenda Item #5.1

Educational Presentation: A National Perspective of State and
Local Pensions

December 12, 2017

Catherine Terrell, Deputy Executive Director

Keith Brainard, Research Director, National Association of State
Retirement Administrators

A National Perspective of State and Local Pensions

Keith Brainard
Research Director

National Association of State Retirement Administrators

Employees Retirement System of Texas
December 2017

Comparison of Retirement Benefits in the U.S.

Private Sector

- ▲ 60% of full-time private sector workers participate in an employer-sponsored retirement plan; 21% of part-time workers participate
- ▲ In total, 49% of all private sector workers participate in an employer-sponsored retirement plan
- ▲ Fewer than one in five have a traditional pension (DB) plan
- 12 ▲ Social Security coverage is universal

Public Sector

- ▲ Nearly all full-time workers have access to an employer-sponsored retirement benefit; most have access to a traditional pension (DB plan)
- ▲ 87% of full-time employees participate in a pension plan, as do 80% of all, including part-time workers; virtually all others are in a DC plan
- ▲ Three-fourths participate in Social Security

Public pensions in the U.S.: Vital Statistics

- ▲ ~\$4.1 trillion in assets
- ▲ ~14 million active (working) participants
 - ▲ 10 percent of the nation's workforce
- ▲ 10.3 million retirees and their survivors receive ~\$280 billion annually in benefits
- ▲ Annual contributions = \$192 billion
 - ▲ \$141 billion from employers; \$51 billion from employees
 - ▲ Approximately 5.0 percent of all state and local government spending goes to public pensions
- ▲ Of 6,000+ public retirement systems, the largest 75 account for 80+ percent of assets and members
- ▲ Aggregate funding level = ~72%

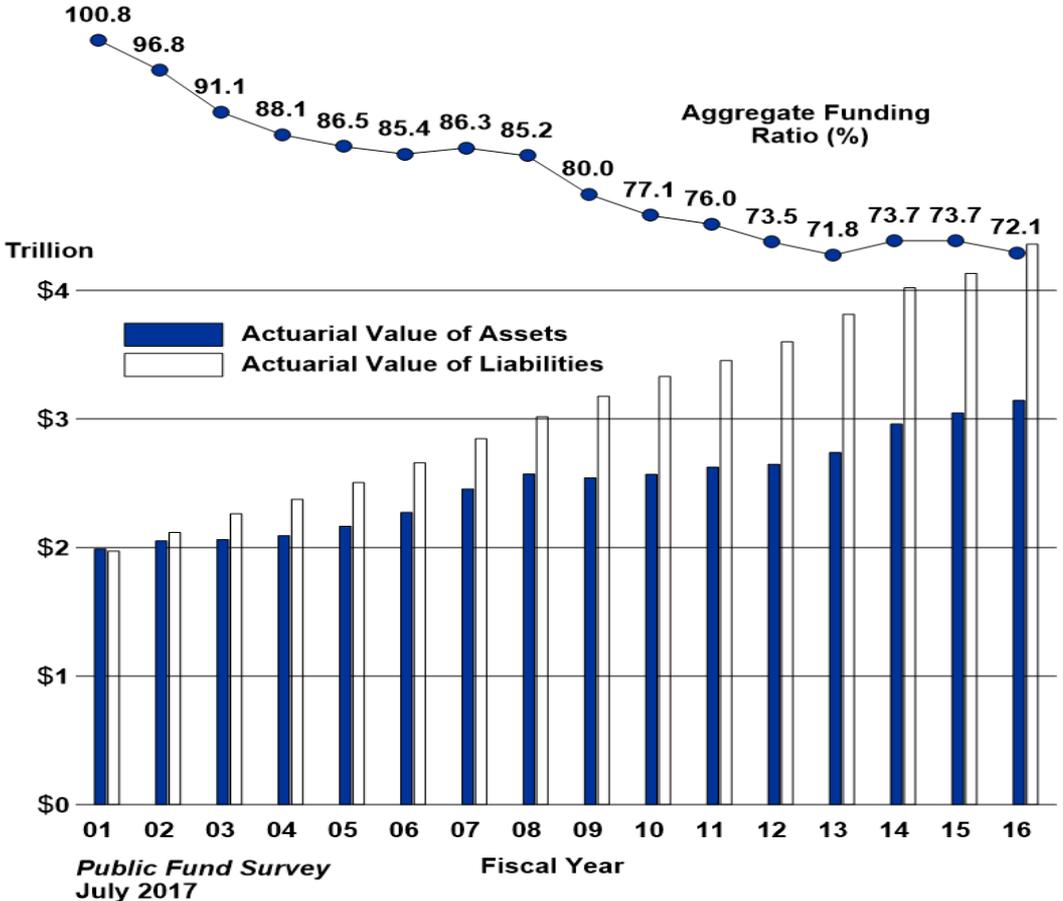
Public pensions in Texas: Vital Statistics

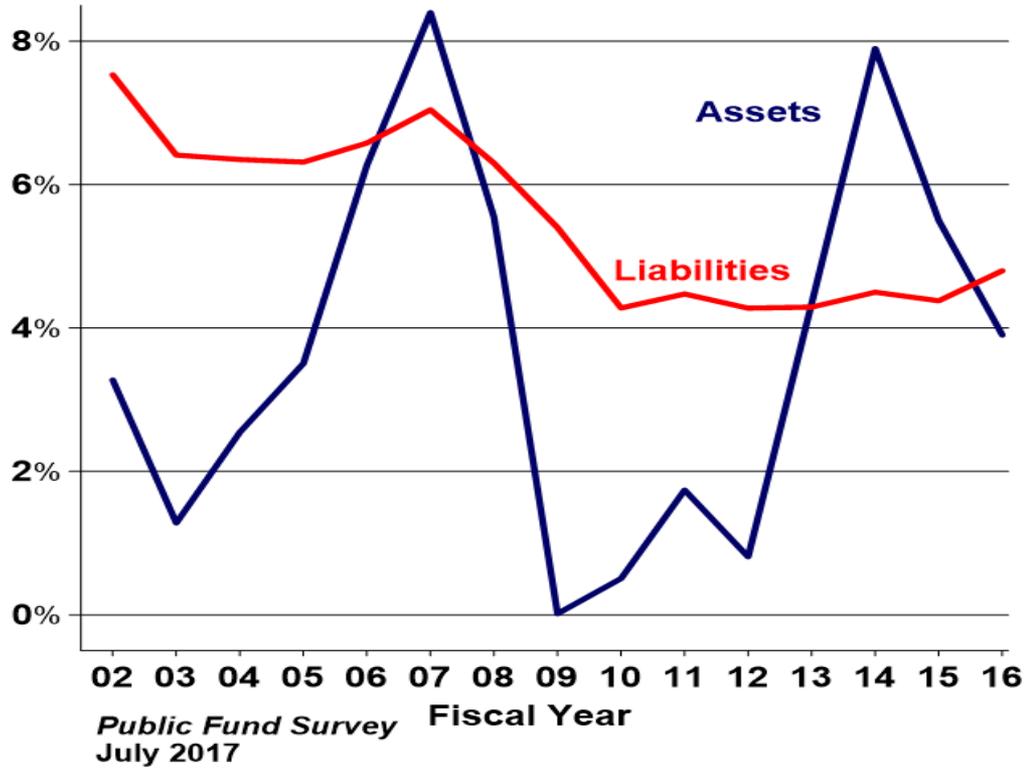
- ▲ ~ \$240 billion in assets
- ▲ ~ 1.35 million active (working) participants
- ▲ ~ 680,000 retirees and their survivors receive around \$15.9 billion annually in benefits
- ▲ Annual contributions = \$11.3 billion
 - ▲ \$6.5 billion from employers; \$4.8 billion from employees
- ▲ ~93 public retirement systems
- ▲ TRS, ERS, TMRS, and TCDRS account for more than 90 percent of all assets and participants
- ▲ TRS alone accounts for more than one-half

About the funding data

- ▲ Data is culled, analyzed and graphed by NASRA staff from the Public Plan Database, CAFRs and other source documents
- ▲ PPD is an online compendium of public pension information maintained by the Center for Retirement Research at Boston College, in collaboration with NASRA and the Center for State & Local Government Excellence
- ▲ www.publicplansdata.org
- ▲ FY 16 information presented here is not yet complete and is subject to change
- ▲ Complete analysis of FY 16 will be published this fall as the Public Fund Survey Summary of Findings for FY 16

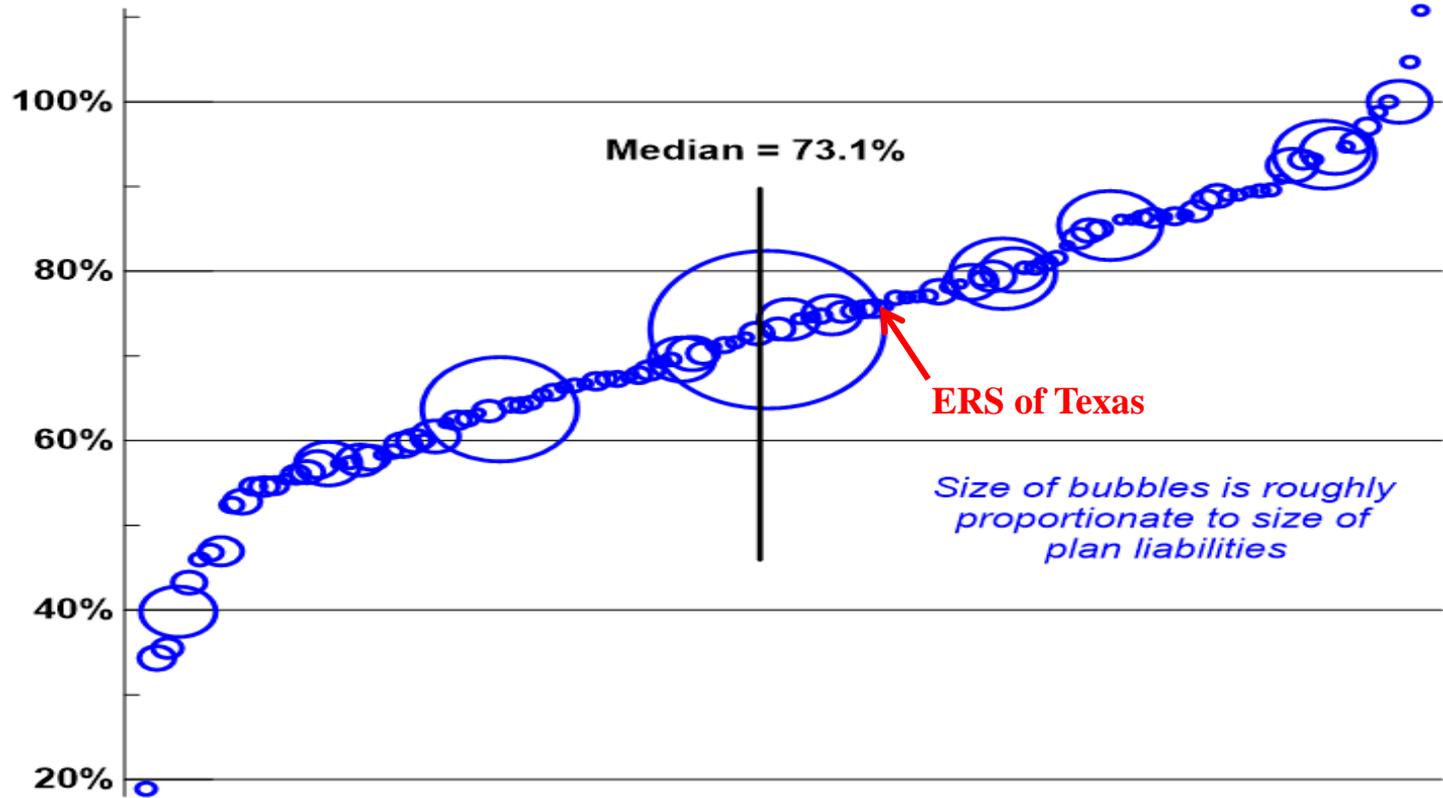
Change in aggregate actuarial funding level and actuarial values of assets and liabilities, FY 01 to FY 16





Median change from prior year in actuarial value of assets and liabilities, FY 02 to FY 16

Distribution of public pension funding levels, FY 16



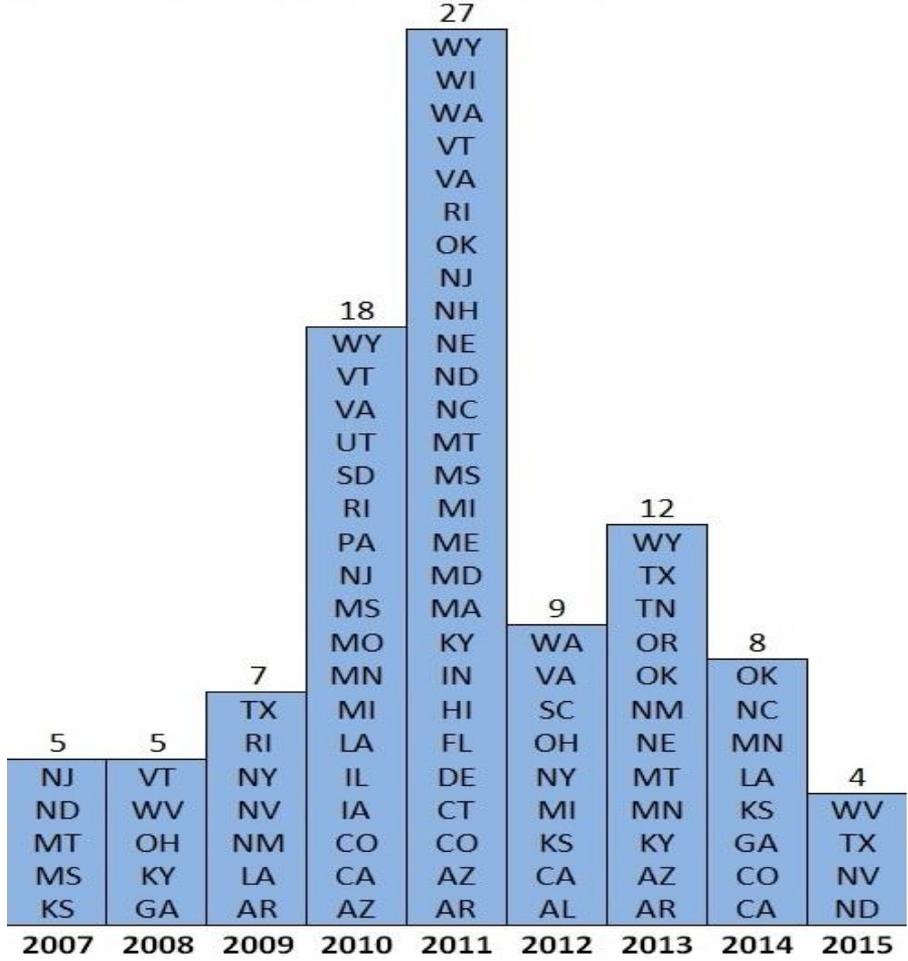
The meaning and implications of an actuarial funding ratio

- ▲ An actuarial funding ratio is the most popular and recognized metric of a pension plan's condition
- ▲ By itself, this ratio is not a reliable indicator of the condition of a pension plan
- ▲ The actuarial funding ratio is akin to a single snapshot of a movie that last for decades
- ▲ Other key considerations in evaluating a pension plan's condition:
 - ▲ The fiscal condition of the pension plan's sponsoring government(s)
 - ▲ The commitment of the sponsoring government to pay required plan costs
 - ▲ The current and required cost of the plan
 - ▲ The reasonableness of the plan's actuarial assumptions and methods
 - ▲ The trend, or direction of the plan's funding condition
 - ▲ The plan's demographics

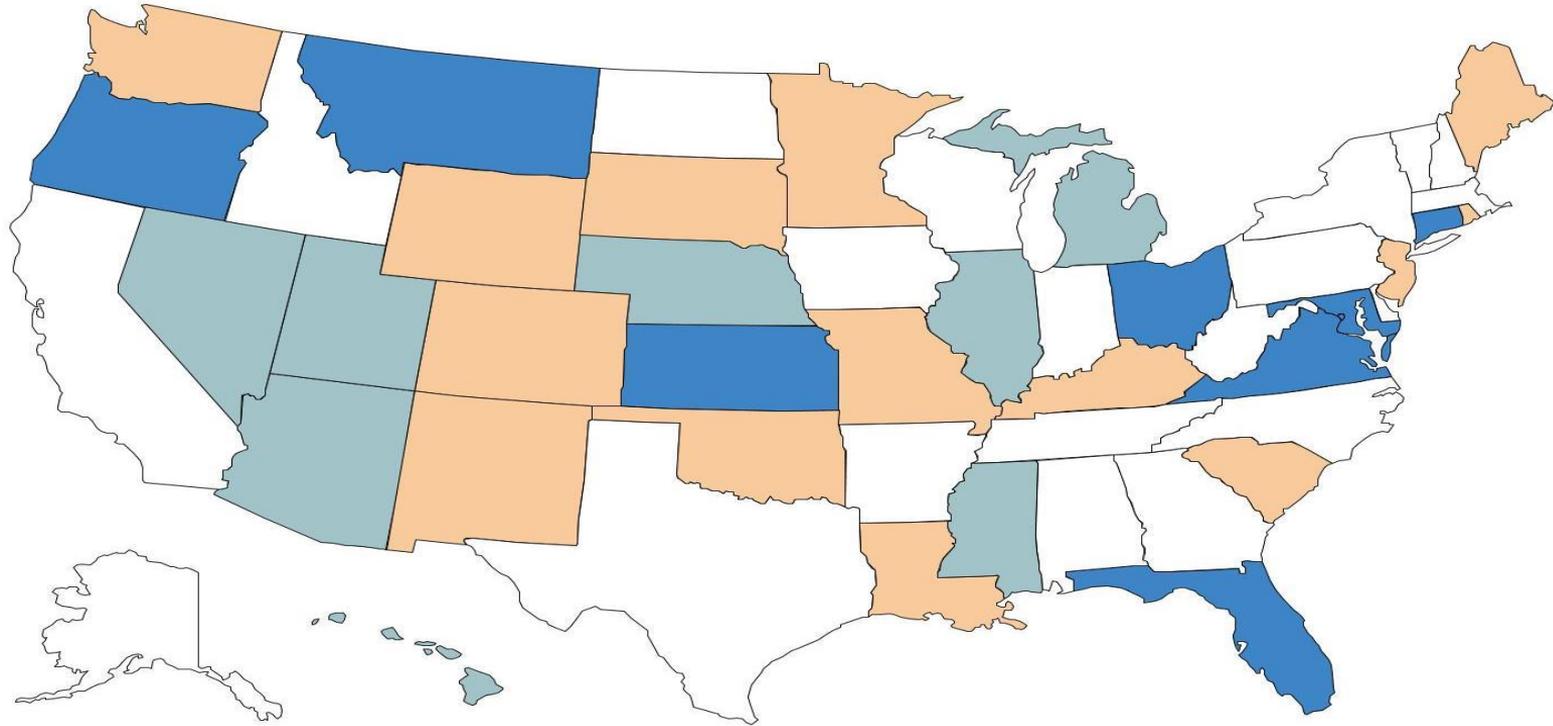
Pension reforms in recent years

- ▲ Every state modified public pension benefits or financing arrangements, or both, since 2009
- ▲ Lower benefits:
 - ▲ higher retirement age
 - ▲ more required years of service
 - ▲ lower multiplier
 - ▲ longer vesting period
 - ▲ reduced, suspended or eliminated COLAs
- ▲ Increased use of hybrid retirement plans
- ▲ Limited use of defined contribution plans
- ▲ Many municipal plans also have been reformed

States that reformed pension plans, by year, 2007-2015



States that reduced automatic COLAs

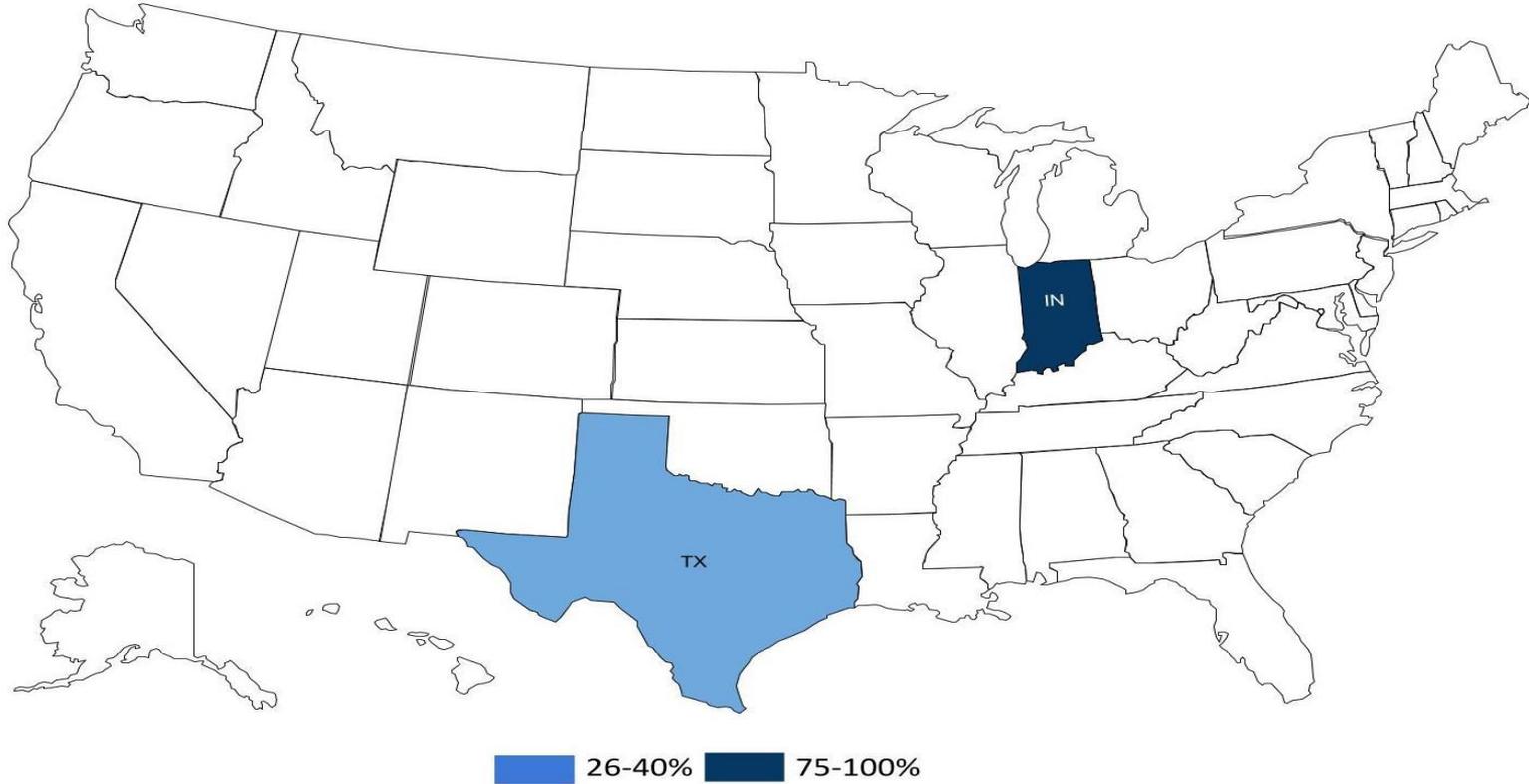


Affecting New Hires Only **Affecting Current Employees & New Hires** **Affecting Retirees**

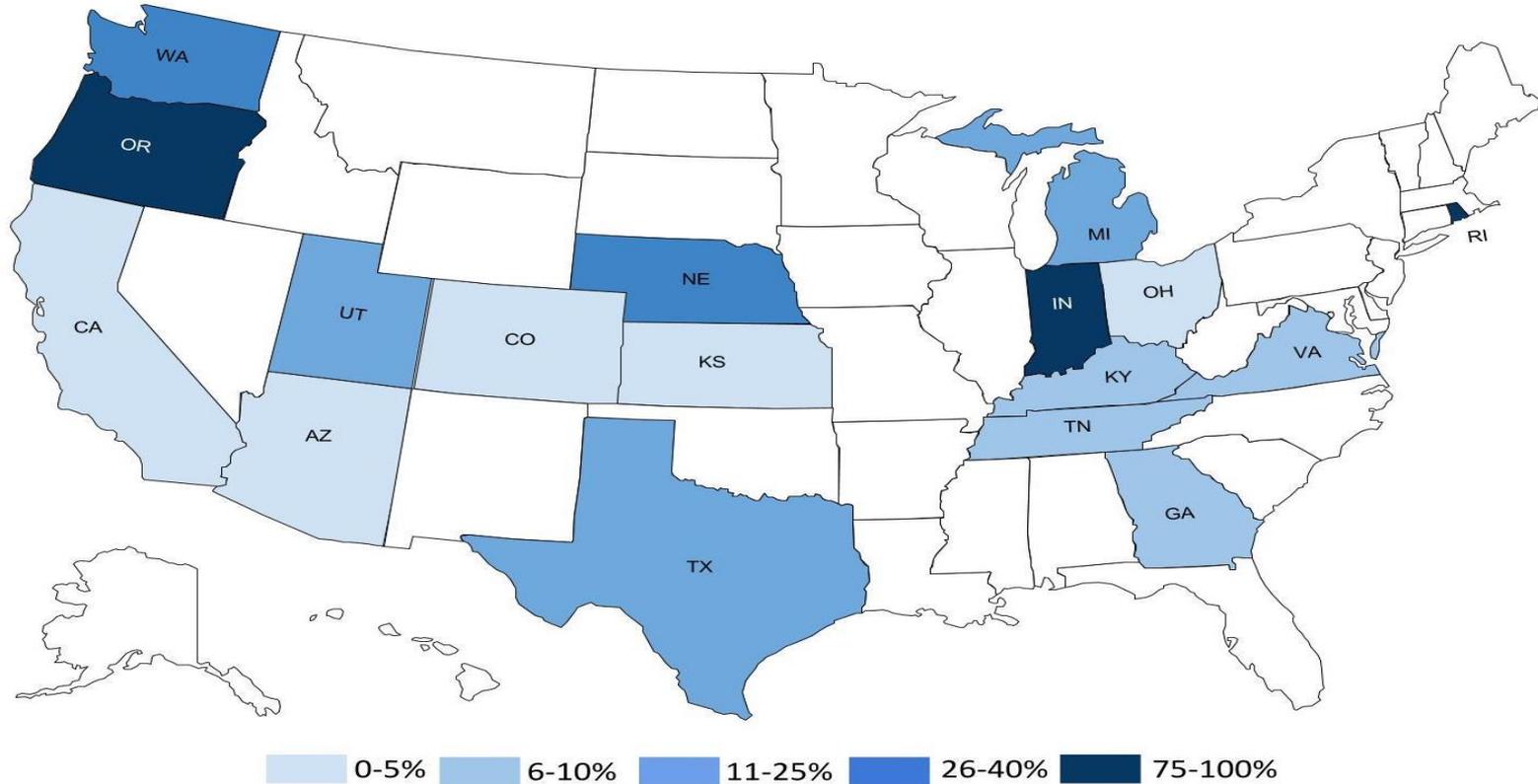
Hybrid Plans

- ▲ New hybrid plans are being created by legislatures nearly every year
- ▲ Mostly DB-DC, some cash balance plans
- ▲ Usually apply to new hires only
- ▲ DB-DC plans maintain a DB component, with a lower benefit accrual rate
- ▲ Cash balance plans contain key features of DB plans, but also transfer some investment risk to workers

Statewide Hybrid Plans, 1995



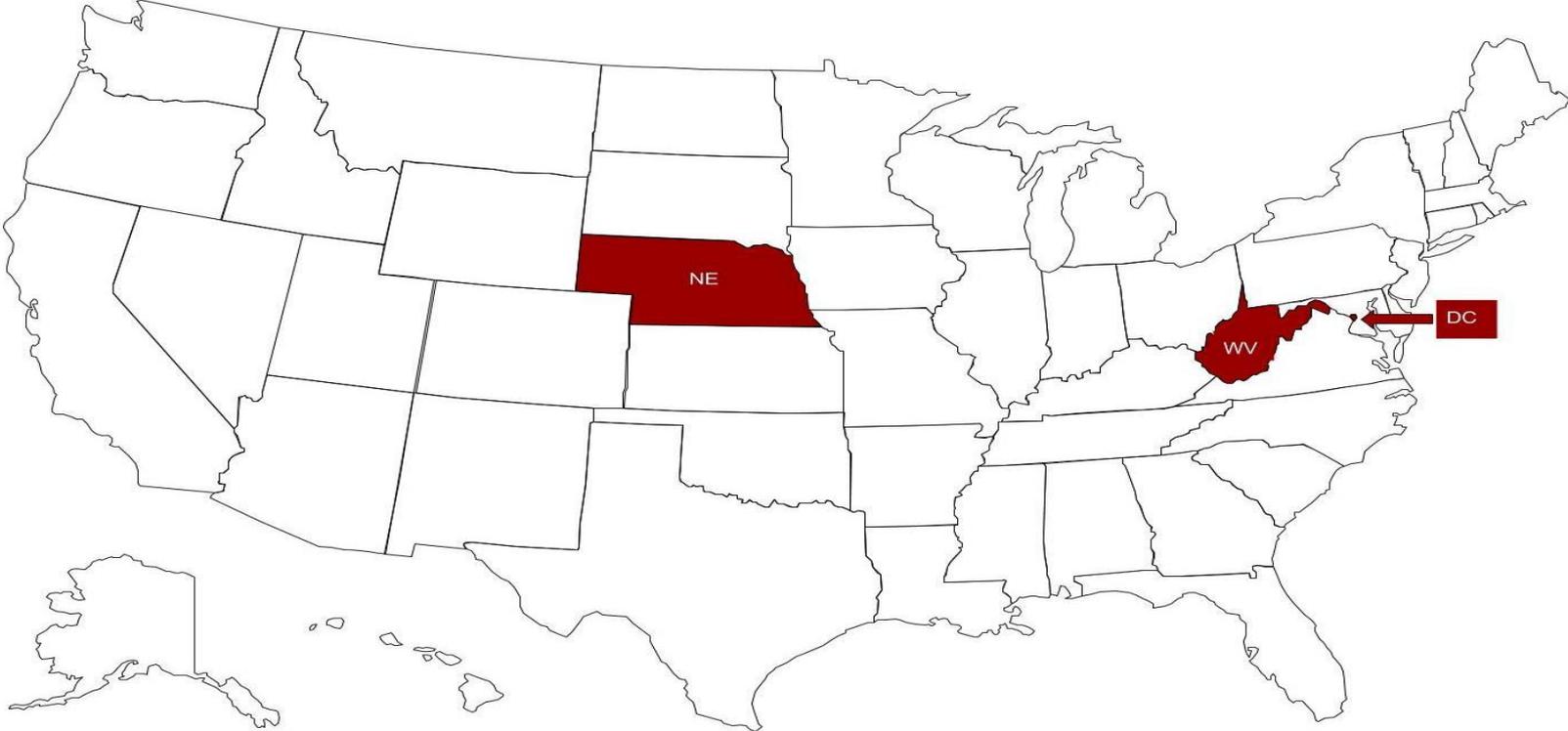
Statewide Hybrid Plans, 2017



Defined Contribution Plans

- ▲ The number of mandatory and optional DC plans as workers' primary retirement benefit has grown
- ▲ Mandatory:
 - ▲ District of Columbia for general employees
 - ▲ Michigan for state employees hired since 3/1/97
 - ▲ Alaska for all hires since 7/1/06
 - ▲ Oklahoma for state employees hired since 11/1/15
- ▲ Alaska has a DC plan as the primary retirement benefit, combined with non-Social Security participation
- ▲ Two states—Nebraska and West Virginia—moved away from DC plans as the primary retirement benefit

Statewide Defined Contribution Plans, 1995



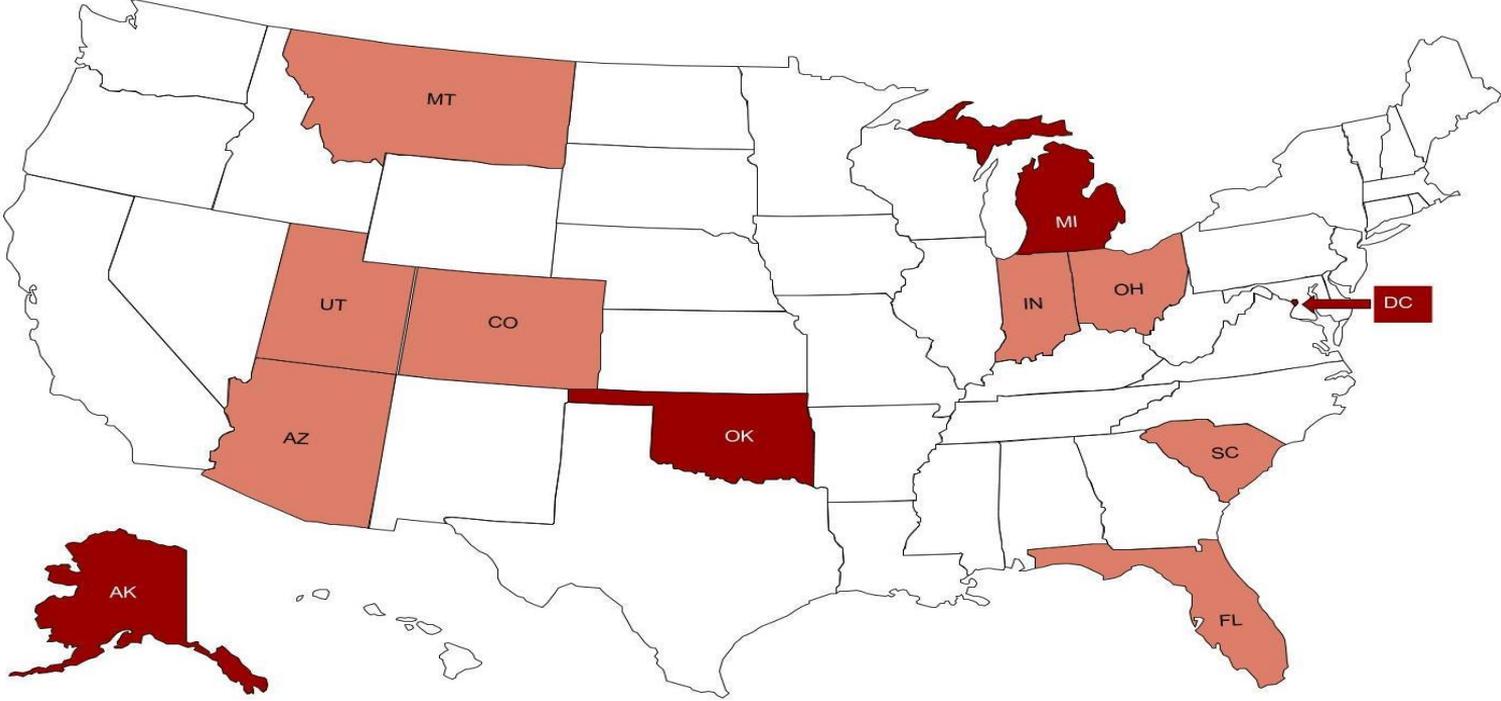
Optional Mandatory

NASRA

For broad employee groups: teachers, general employees, and public safety personnel



Statewide Defined Contribution Plans, 2017



Optional Mandatory

NASRA

For broad employee groups: teachers, general employees, and public safety personnel



Legal protections

- Public pension benefits already earned are protected by contract clauses of the US Constitution and state constitutions
- The right to future benefits varies from state to state
- Some states include specific pension protections in their constitutions

Legal rulings

- Many state pension reforms that affected current plan participants provoked lawsuits
- An unprecedented number of legal rulings on public pension issues have been issued since 2010
- Rulings have run the gamut, from affirming to rejecting states' authority to reduce benefits and increase contributions
- Rulings in some states have contradicted rulings in other states on the same basic issues
- Federal bankruptcy rulings in 2014 in Detroit and Stockton, CA permitted reductions in pension benefits despite strong pension legal protections in those states

Texas' 10 Percent Constitutional Cap on Employer Contributions

- ▲ Texas is one of five states whose constitution specifically addresses pension contribution requirements
 - ▲ Others are Arizona, Louisiana, Maine, Montana
- ▲ Texas is unique in imposing a constitutional limit on employer contributions
- ▲ Other state constitutional provisions require the pension plan to be adequately funded

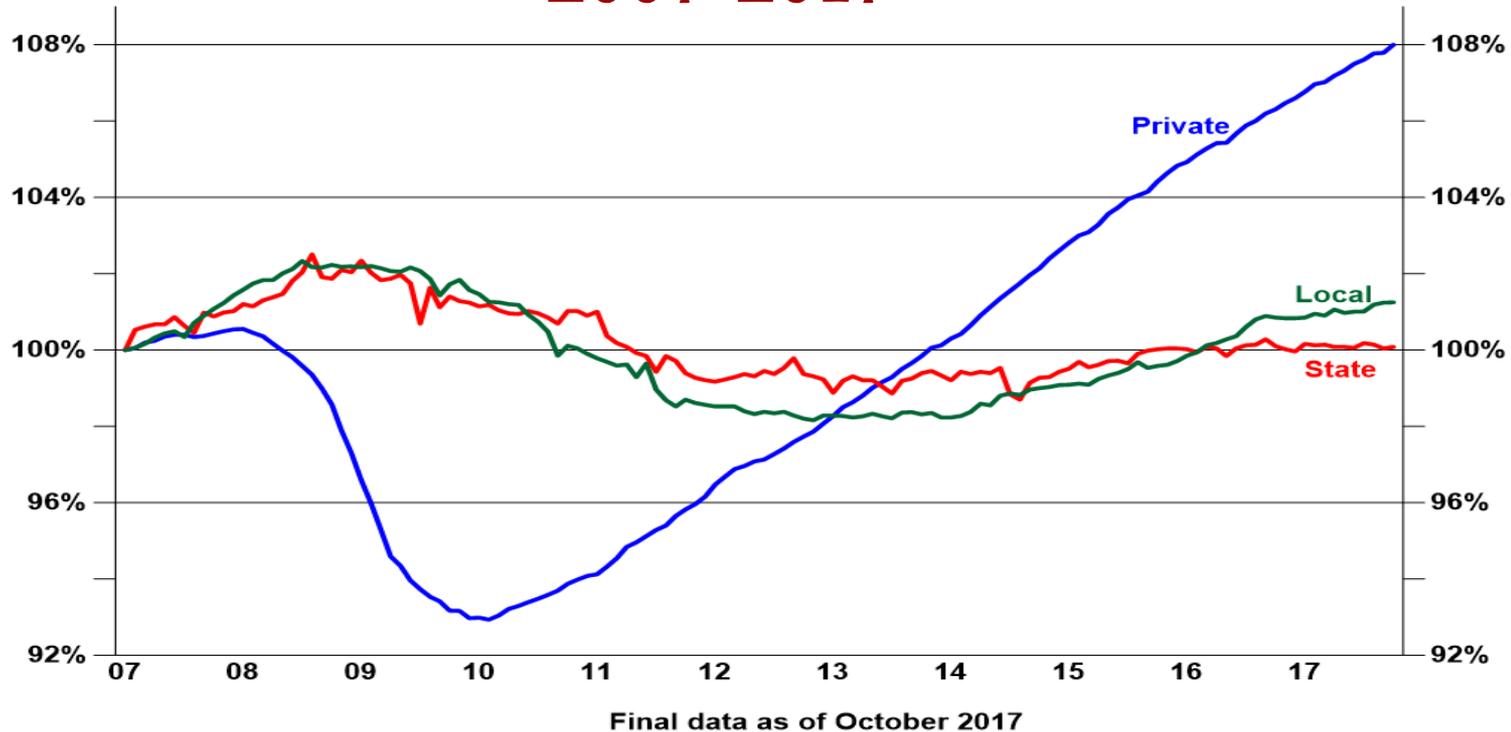
Possible solutions to the Constitutional Cap on Employer Contributions

- ▲ Calculate the state pension contribution over multiple years, such as a typical funding period of 30 years
- ▲ Funding a pension plan takes place over many years, not one, and measuring that cost over multiple years is a more accurate measure of the cost of the plan
- ▲ This approach to measuring pension contributions would permit the employer contribution rate to exceed 10 percent in any one year, as long as it does not exceed that rate for the period

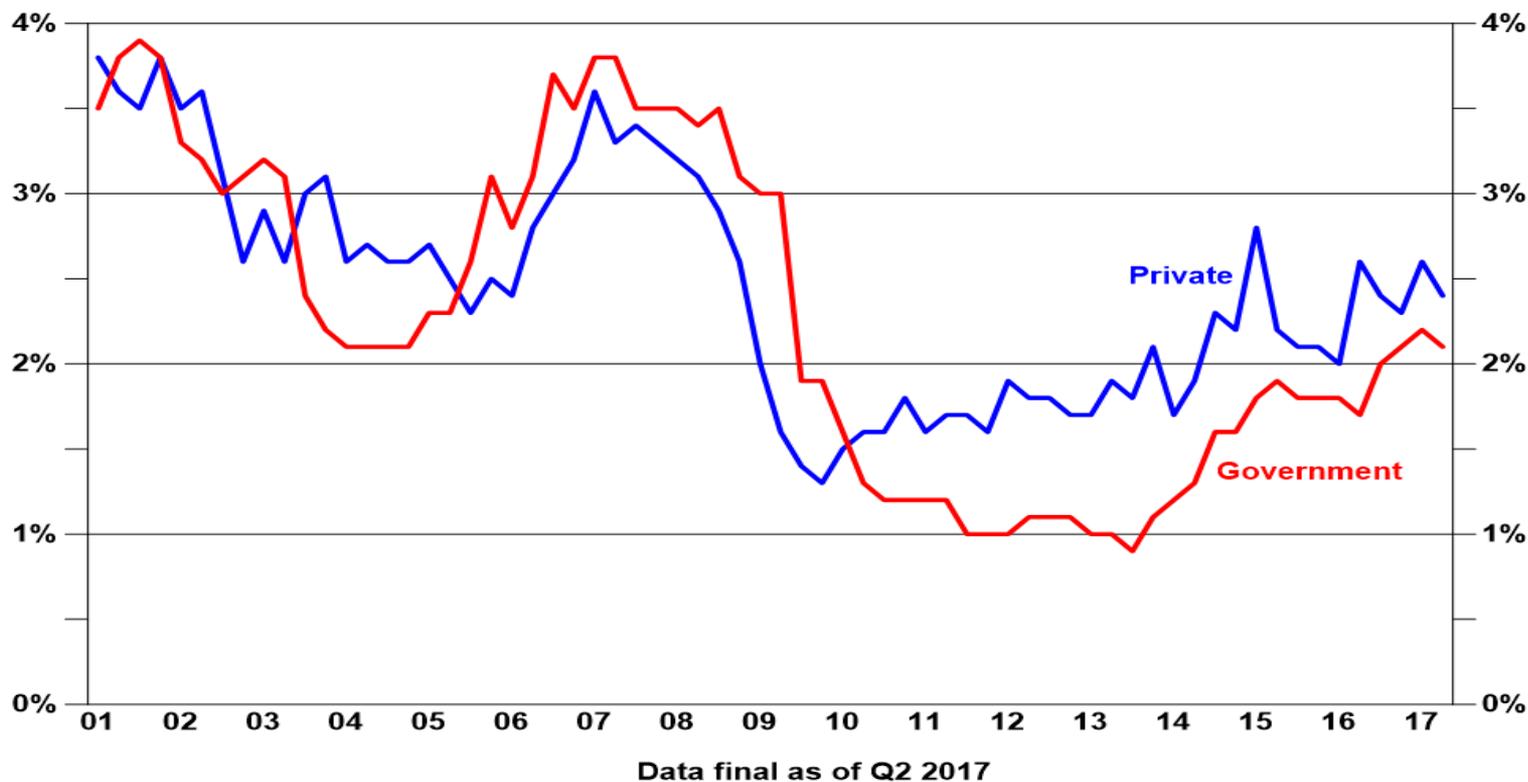
Possible Solutions to the Constitutional Cap on Employer Contributions (cont.)

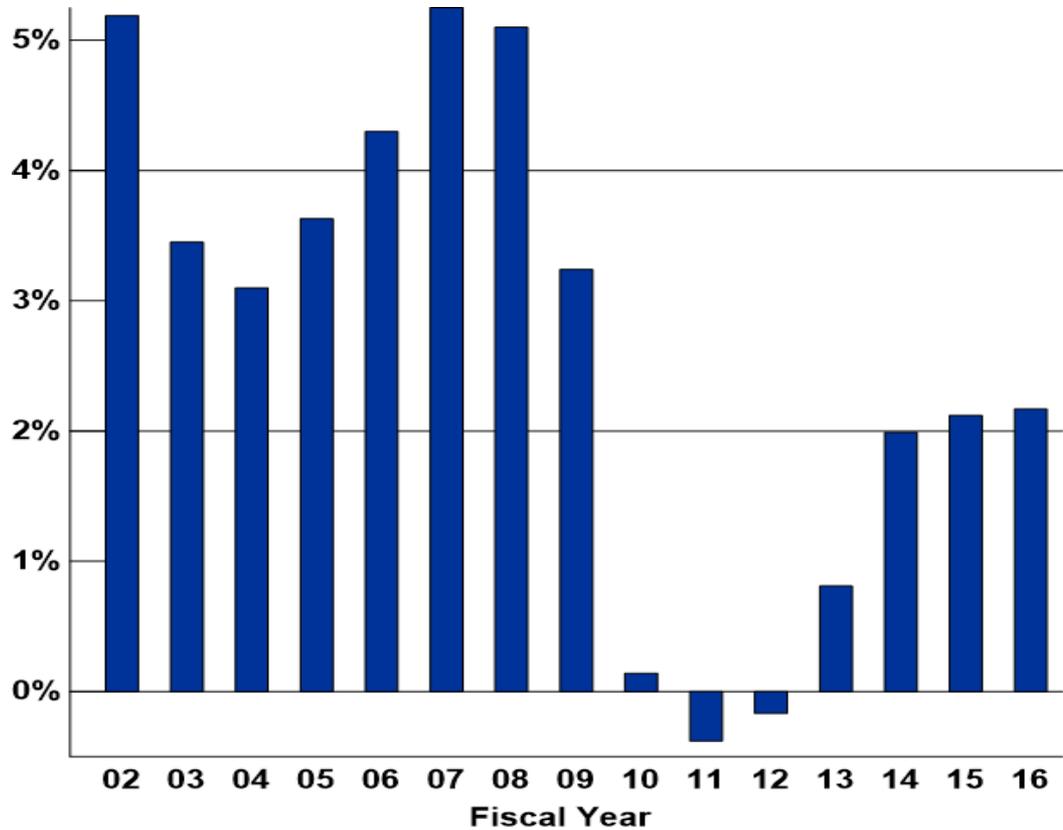
- ▲ Make a lump sum appropriation to reduce the ERS unfunded pension liability
- ▲ An employer pension contribution typically is calculated on an actuarial basis as a percentage of payroll
- ▲ A lump sum appropriation would be considered a payment to reduce the pension debt, not a contribution
- ▲ Alaska in 2014 transferred \$3 billion from its rainy day fund to the state pension funds

Cumulative change in employment, private sector and state and local government, 2007-2017

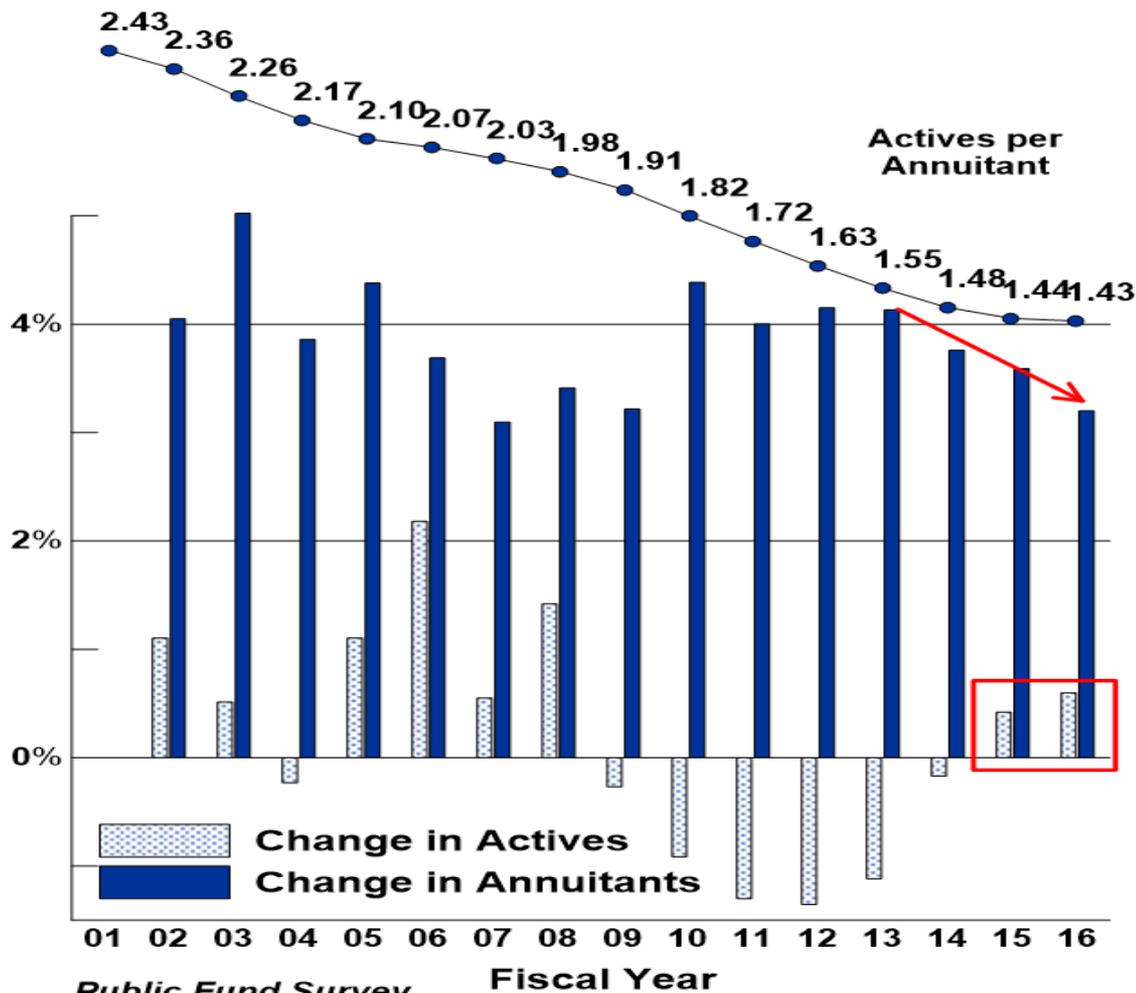


Annualized quarterly change in wage and salary costs for private and state and local government employees, 01-17

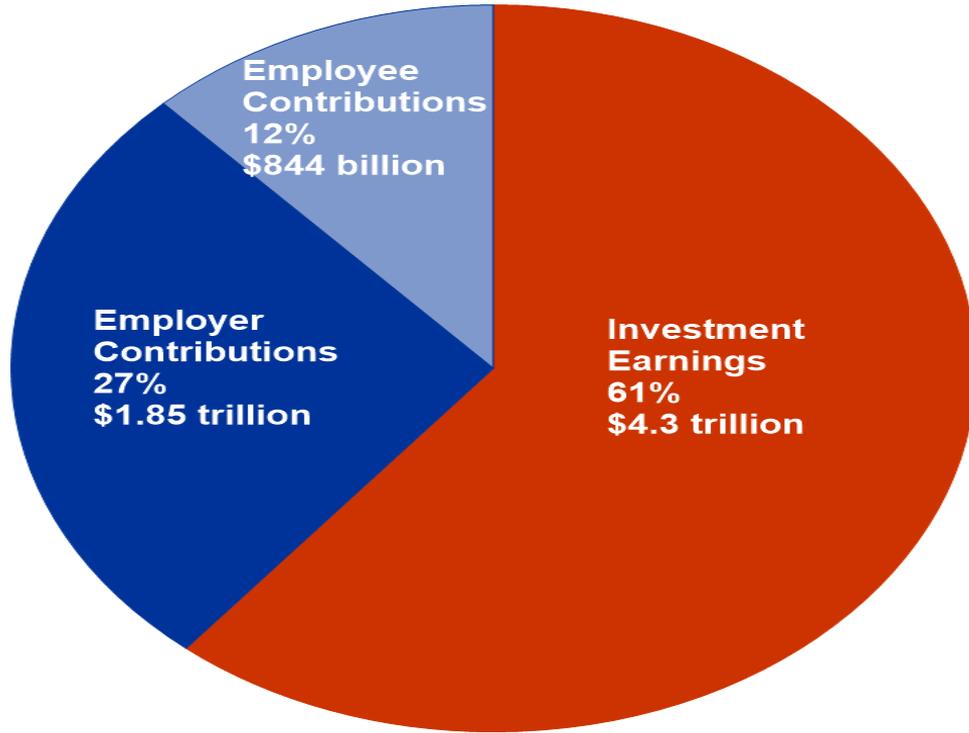




**Median annual
change in payroll,
FY 02 to FY 16**



**Median
change in
number of
actives and
annuitants,
FY 01 to FY 16**

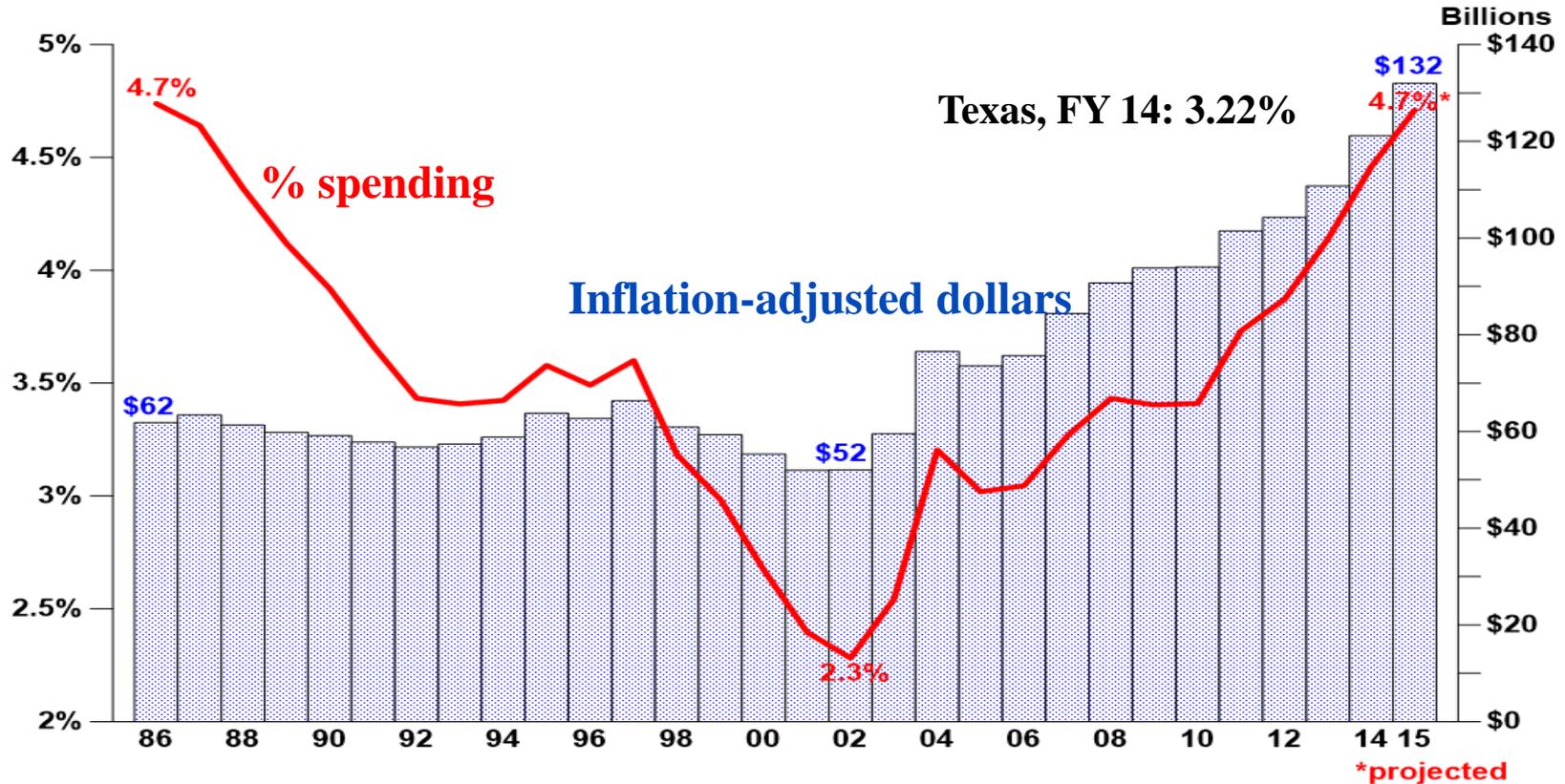


Sources of public pension revenue, 1987-2016

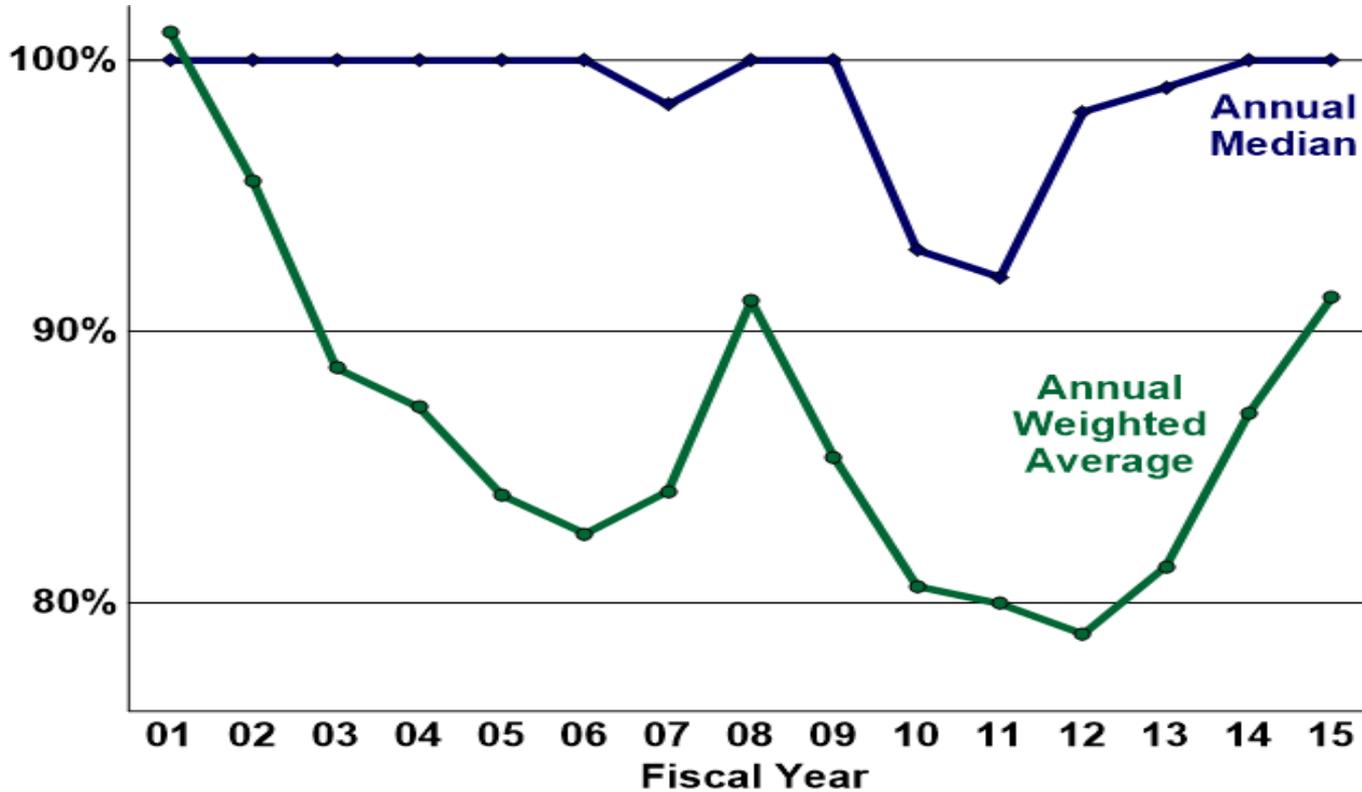
Taxpayer spending on pensions

- ▲ Spending varies widely among states
- ▲ Pension benefit levels affect the spending number
- ▲ Social Security participation is an important factor
- ▲ Not all states contribute as much as they should
- ▲ Spending is higher for cities than for states
 - ▲ A larger portion of city budgets is spent on personnel
 - ▲ A larger percentage of municipal employees serve as public safety officers, whose retirement benefits are more expensive due to shorter careers

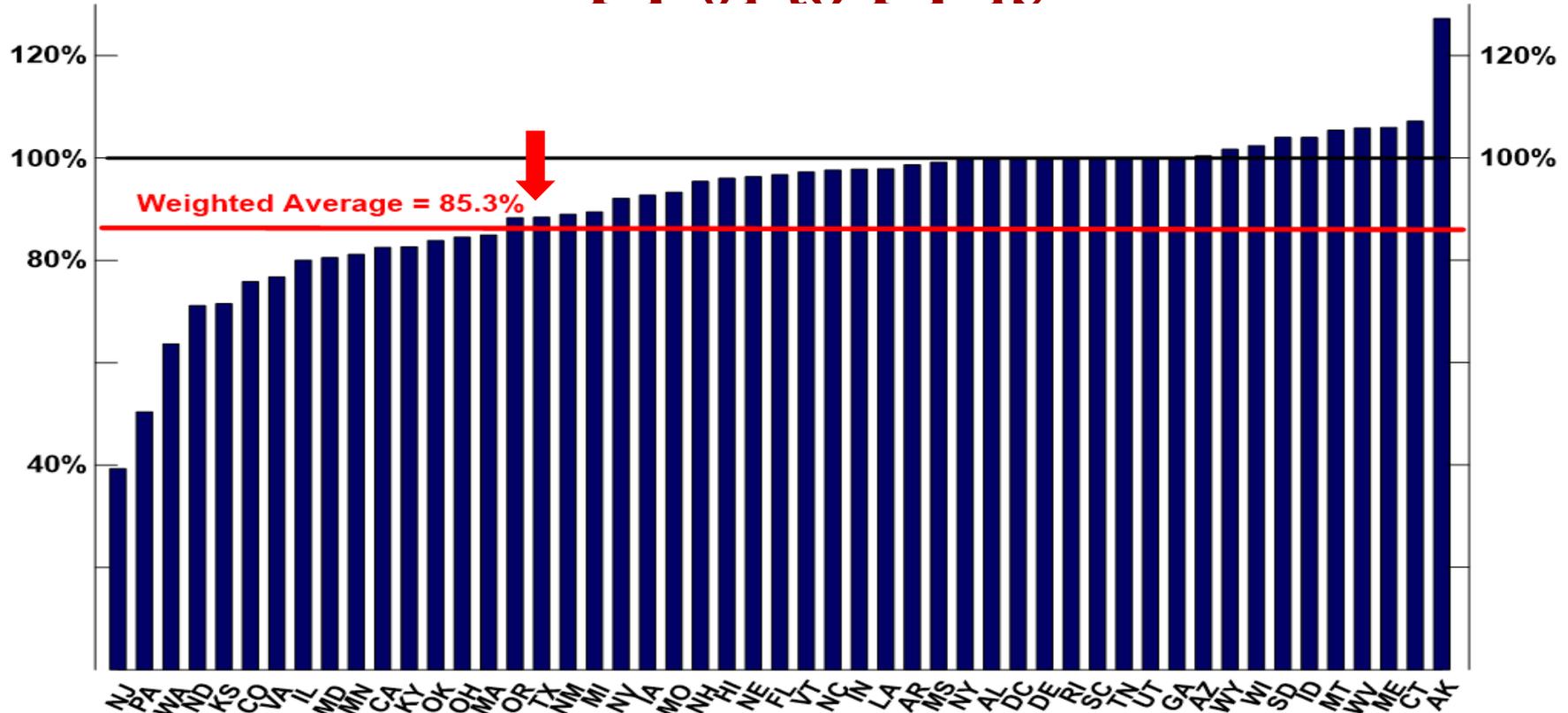
Employer (taxpayer) spending on public pensions, 1986 to 2015



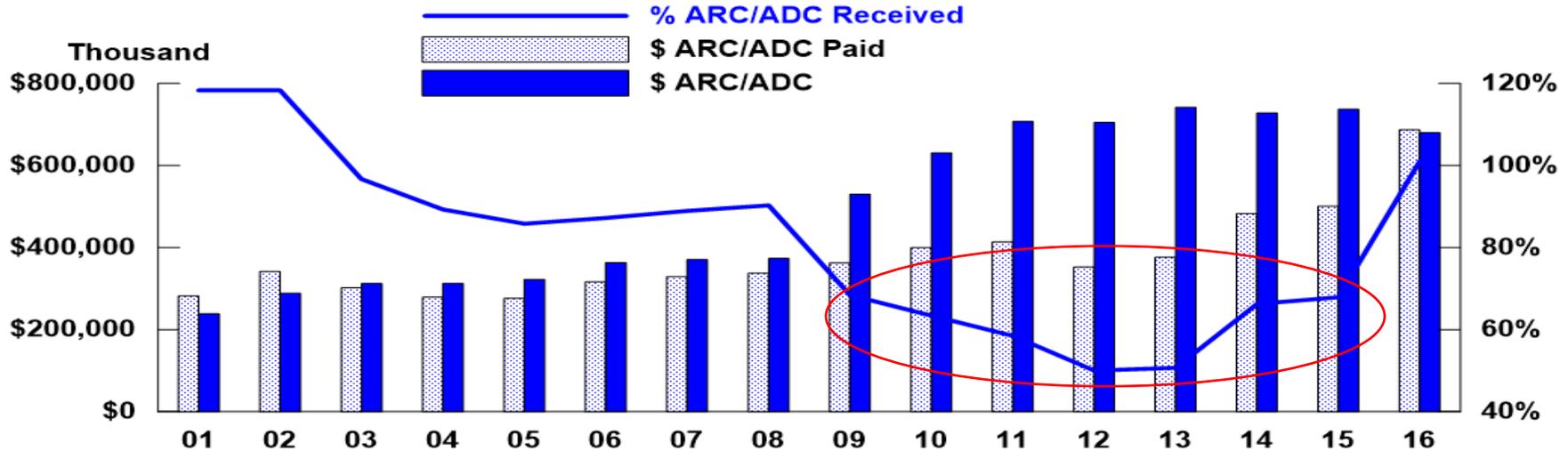
Annual Required Contribution/Actuarially Determined Employer Contribution Effort, FY 01 to FY 15



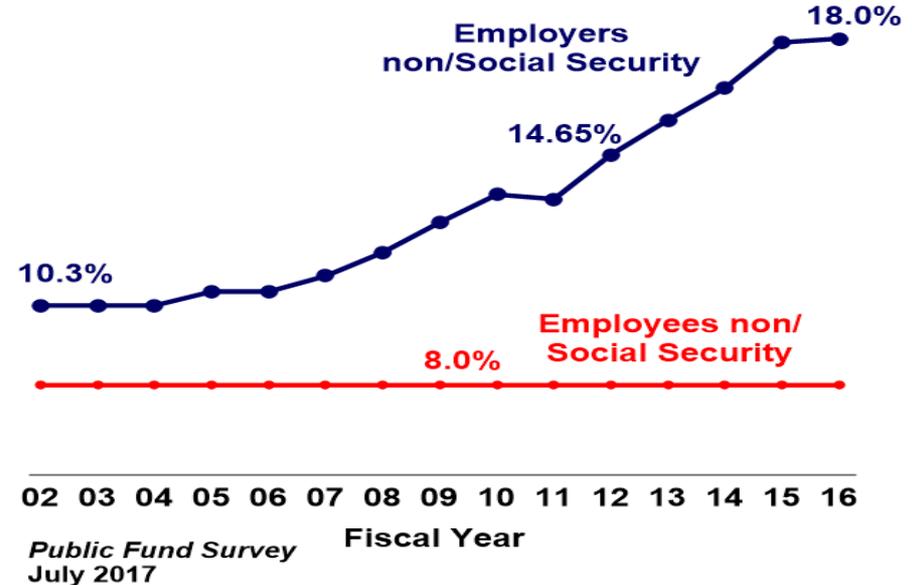
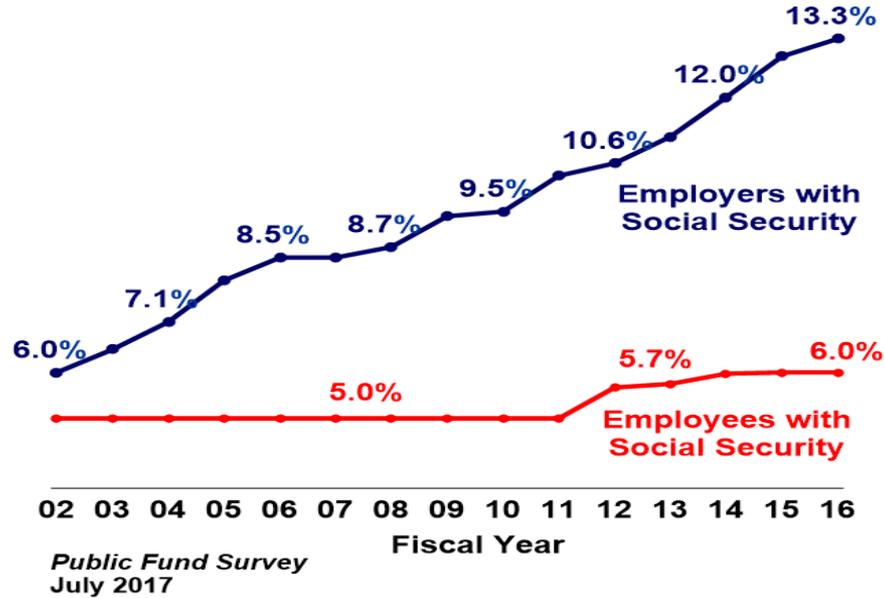
Weighted Average ARC/ADC Paid by State FY 01 to FY 15



ERS of Texas ARC/ADC Experience, FY 01 to FY 16



Median contribution rates, Social Security eligible and ineligible

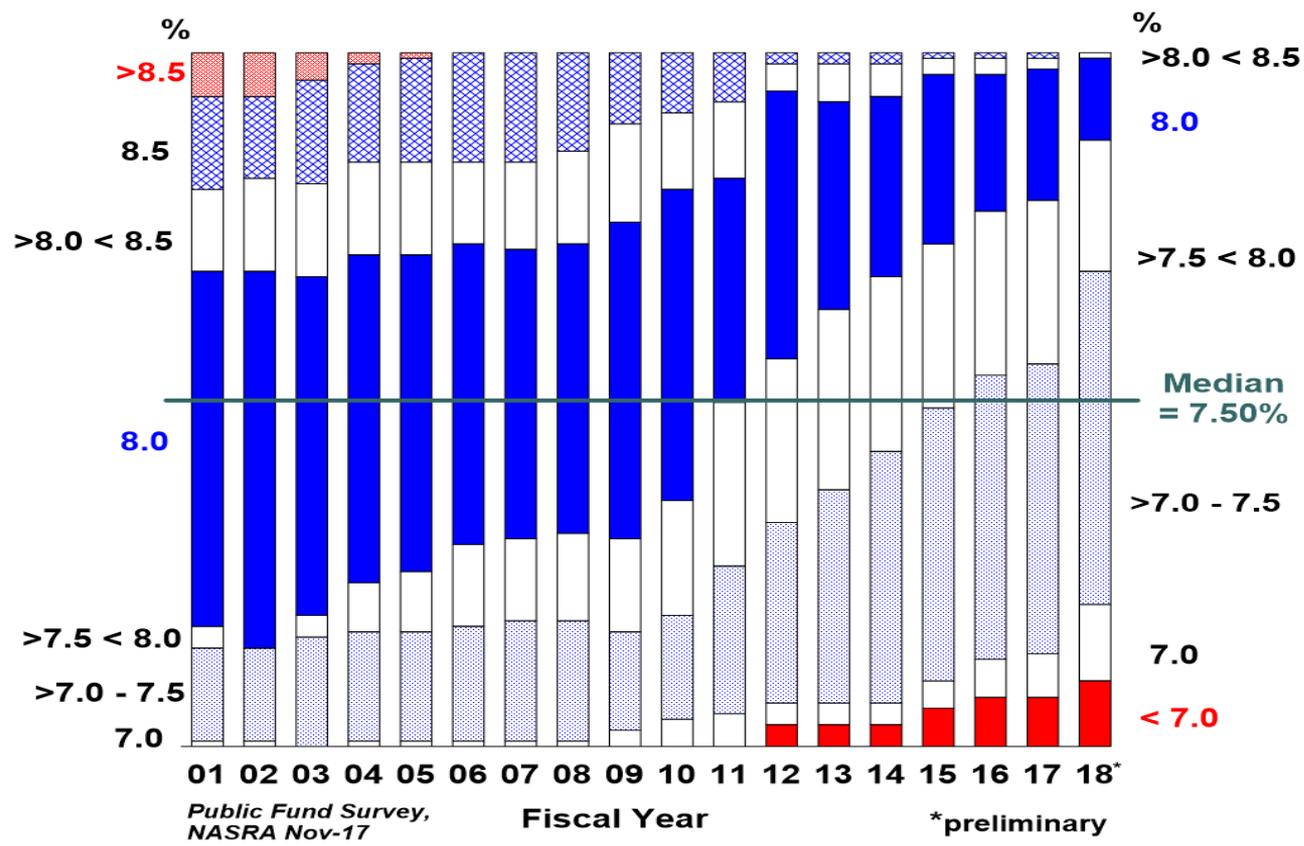


Methods states are using to amortize unfunded pension liabilities

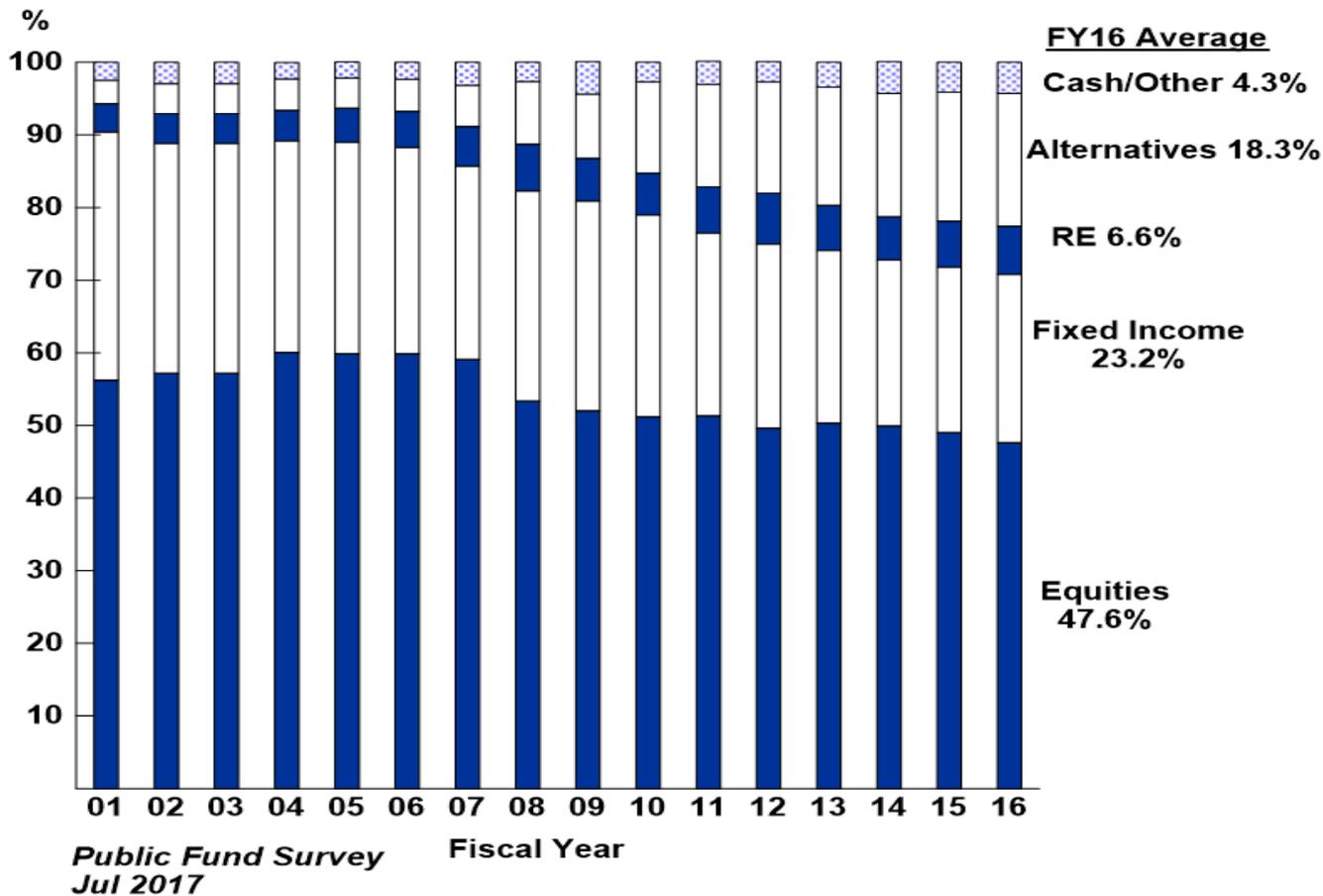
- Pay the actuarially determined contribution
- Commit a portion of the budget surplus to the unfunded liability, either ad hoc or in statute (AK, HI, RI)
- Issue pension obligation bonds
- Establish a dedicated funding stream, such as revenue from tobacco, liquor, gambling, or severance taxes (KS, MT, OK)
- Dedicate a portion of sales, use, and/or corporate income tax revenues (OK)
- Reduce the funding amortization period/change the method
- Transfer ownership of the state lottery to the pension fund (NJ)
- Funding Policies@NASRA.org <http://www.nasra.org/funding>

Change in distribution of nominal investment return assumptions, FY 01 to FY 18

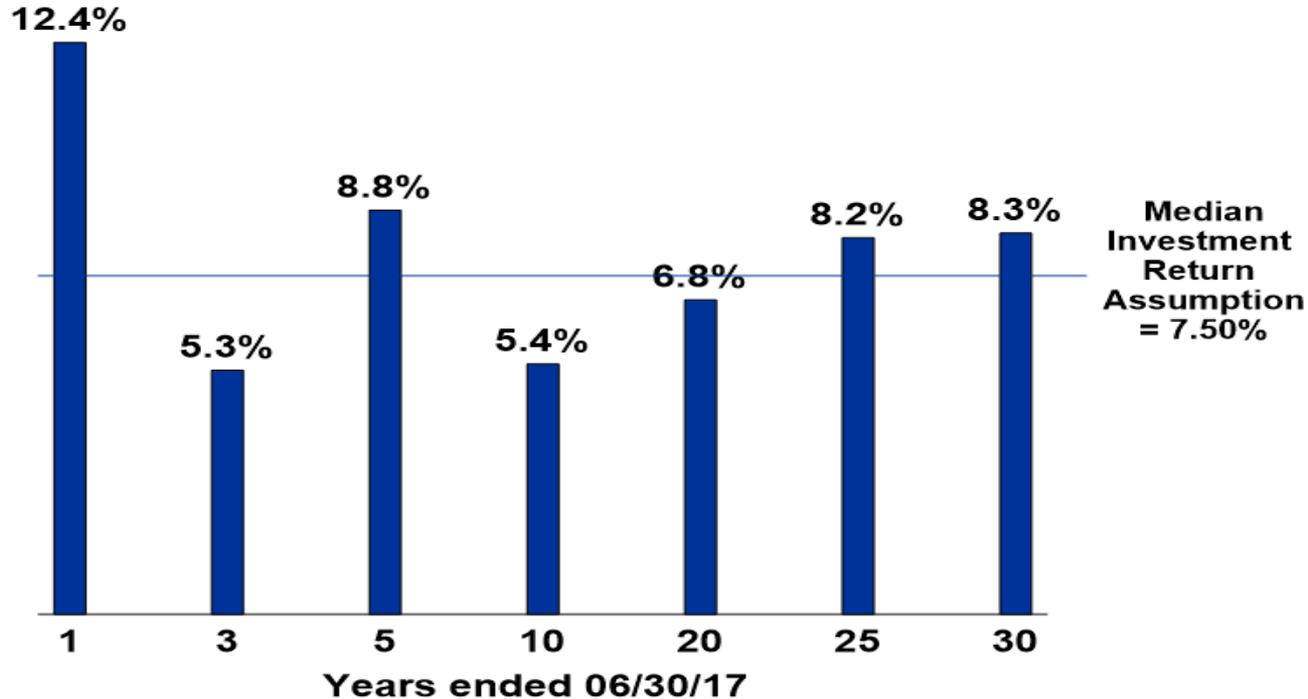
ERS of TX: 7.5%



Change in average public pension fund asset allocation, FY 01 to FY 16



Median annualized public pension fund returns for periods ended 6/30/17



Callan Associates

Pension challenges facing state and local government

- ▲ For some states and cities, adequately funding their pension will be a challenge, especially for those with large unfunded liabilities
- ▲ Funding challenges are exacerbated by
 - ▲ low interest rates
 - ▲ declining projected returns
 - ▲ improving mortality
 - ▲ maturing population
- ▲ Providing a retirement benefit that aligns with key stakeholder objectives

Pension challenges facing state and local governments, continued

- ▲ Understanding and responding appropriately to multiple pension measures (books, budgets, and bonds):
 - ▲ Books: GASB statements provide standardized financial reporting
 - ▲ Budgets: Actuarial funding calculations identify the amount needed to fund the benefit
 - ▲ Bonds: Bond rating agencies assess the degree to which pension obligations affect a government's ability to repay bonded debt

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Questions?

Public Agenda Item #6.1

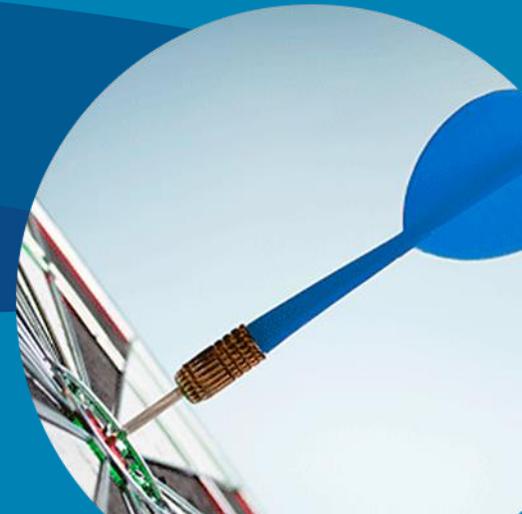
Review of Retirement Program Actuarial Valuations and Financial Status

December 12, 2017

Jen Jones, Senior Program Specialist
Ryan Falls and Joe Newton, Gabriel Roeder Smith

Actuarial Valuations of the ERS Retirement Funds as of August 31, 2017 December 12, 2017

Ryan Falls, FSA, EA, MAAA
Joe Newton, FSA, EA, MAAA

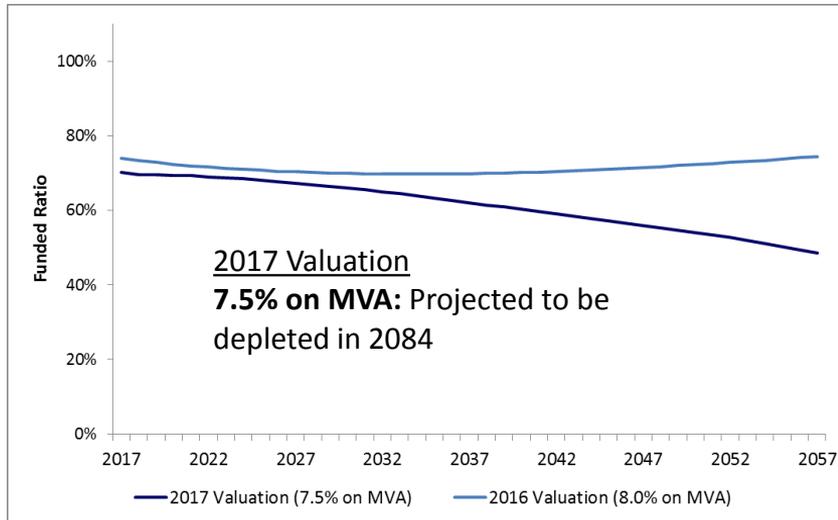


Agenda

- Purpose of Actuarial Valuation
- Summary of Changes in Actuarial Assumptions and Methods
- Impact of Asset Returns
- ERS Funding Valuation Results
- LECOSRF and JRS2 Funding Valuation Results
- Accounting Results at August 31, 2017

Where are we headed now?

- Recently revised expectations about important factors, such as future investment returns and life expectancy, altered the trajectory of the ERS Plan
- Additional contributions or benefit reductions are needed to improve the projected funded status based on the current benefits



2016 Valuation
8.0% on MVA: Projected to eliminate UAAL in 2089

Projections assume that all assumptions are met, including a 7.5% return (8.0% for 2016) on the market value of assets (unless otherwise noted), and future contributions continue at current levels.

Projections on market value and AVA are the same due to resetting the AVA to market as of August 31, 2017.

Purpose of Actuarial Valuation

Purpose of Actuarial Valuation

- Prepared as of August 31, 2017 using member data, financial data, benefit and contribution provisions, actuarial assumptions and methods as of that date
- Purposes:
 - Measure the actuarial liabilities and funding levels
 - Determine adequacy of current statutory contributions
 - Provide other information for reporting
 - GASB 67/68, Consolidated Annual Financial Report
 - Explain changes in actuarial condition of the plans
 - Track changes over time
 - Analyze future outlook

Summary of Changes in Actuarial Assumptions and Methods

Summary of Assumption/Method Changes

- Major Changes
 - Reduced the nominal investment return assumption to 7.50%
 - Decreased core inflation assumption from 3.50% to 2.50%
 - Set the general wage inflation (GWI) assumption to 0.50% above inflation
 - Nominal GWI becomes 3.00% (Inflation + 0.50%)
 - For regular State employees, decreased individual salary increase assumption schedules by the same 1.00% as the change in core inflation
 - Nominal annual increase for long service employees decreased from 5.00% to 4.00%
 - For LECOs, decreased individual salary increase assumption schedules by 0.50%
 - 1.00% decrease due to change in core inflation but 0.5% increase in the individual merit and promotion component
 - Nominal annual increase for long service employees decreases from 5.00% to 4.50%
 - Updated mortality tables, including assumption for continued future mortality improvement
 - New assumption based on actual experience of ERS annuitants

Summary of Assumption/Method Changes

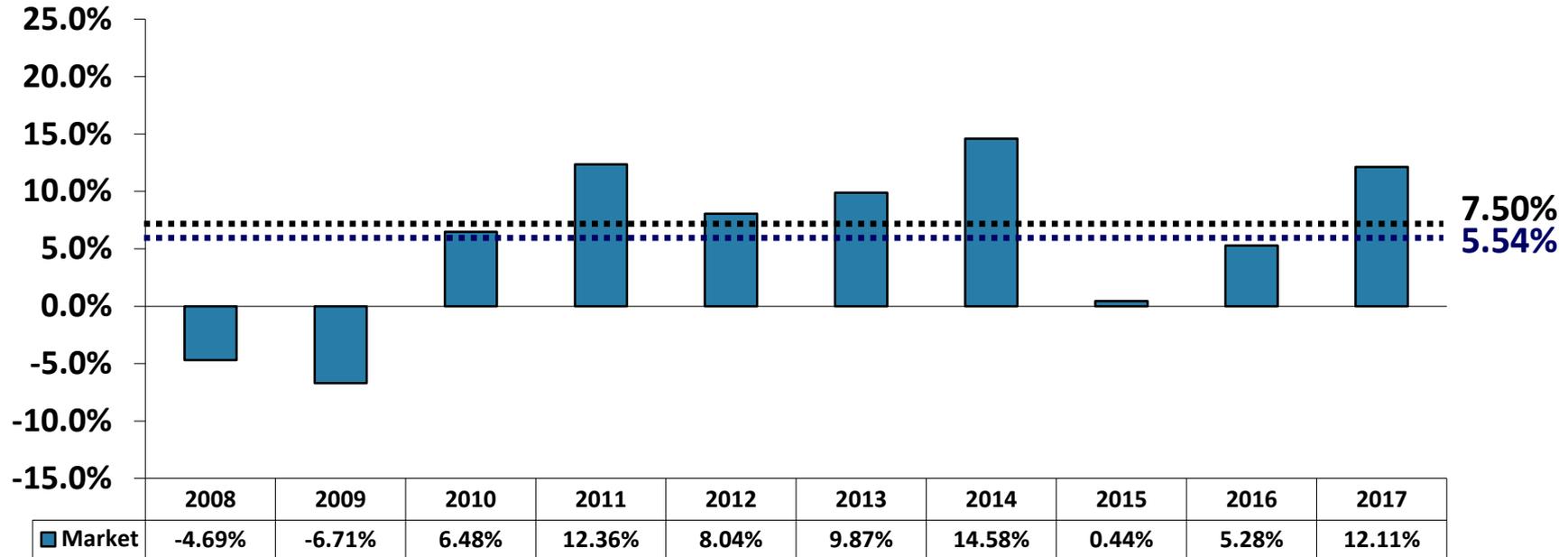
- Minor Changes
 - Changed the asset smoothing method to a traditional individual year deferral method, but allow direct offsetting of gains and losses
 - Reset the actuarial (smoothed) value market value as of August 31, 2017
 - New method to apply prospectively
 - Changed actuarial cost method to Individual EAN (from Ultimate EAN)
 - Reduced rates of disability and retirement
 - Slightly increased rates of termination
 - Increased administrative expense load from 0.25% of payroll to 0.33% for ERS
 - Lowered LECOSRF from 0.10% to 0.08% and lowered JRS2 from 0.50% to 0.33%

Impact of Asset Returns

Asset Experience

- Asset returns
 - Market Value (gross): 12.15%
 - Market Value (net): 12.11%
 - Actuarial (or smoothed) Value: 2.8%
 - Primarily due to recognizing \$2 billion in unrecognized losses from the prior asset smoothing method
 - Less than expected, thus creates a loss on the unfunded liability
- Gains on the market value
 - Helps offset a portion of liability losses due to assumption/method changes

Estimated Yields Based on Market Value of Assets

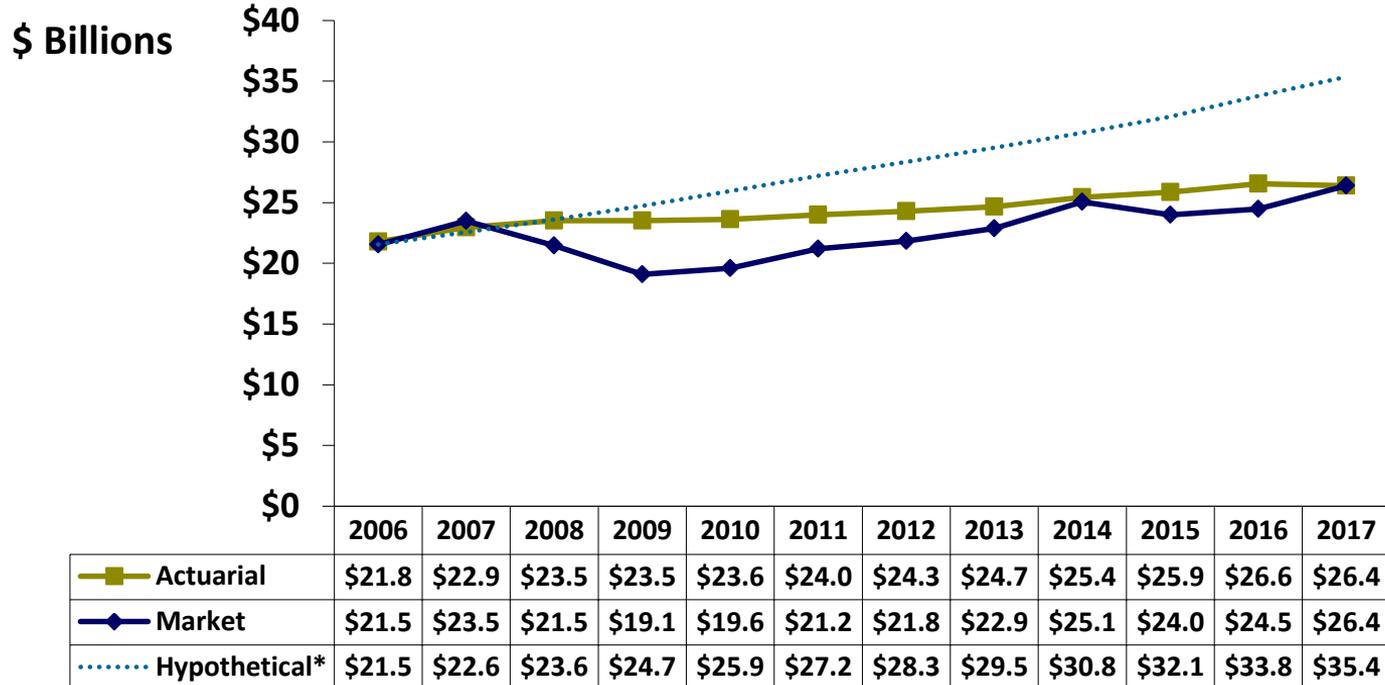


8.34% average compound net return (on market value) over last 5 years.

5.54% average compound net return (on market value) over last 10 years.

6.41% average compound net return (on market value) over last 20 years.

Actuarial, Market and Hypothetical* Values of Assets for ERS



* Hypothetical uses 2006 market value and projects forward using actual cash flows and investment returns consistent with actuarial assumptions in effect.

ERS

Funding Valuation Results

at August 31, 2017

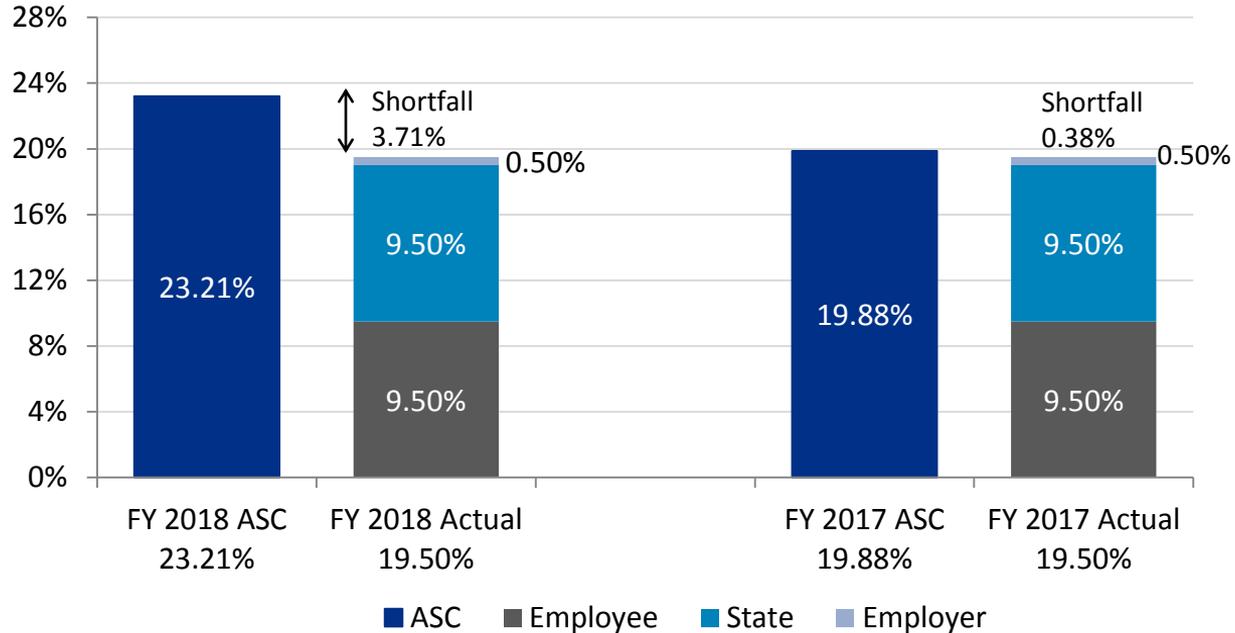
Funded Status (ERS)

(\$ in millions)

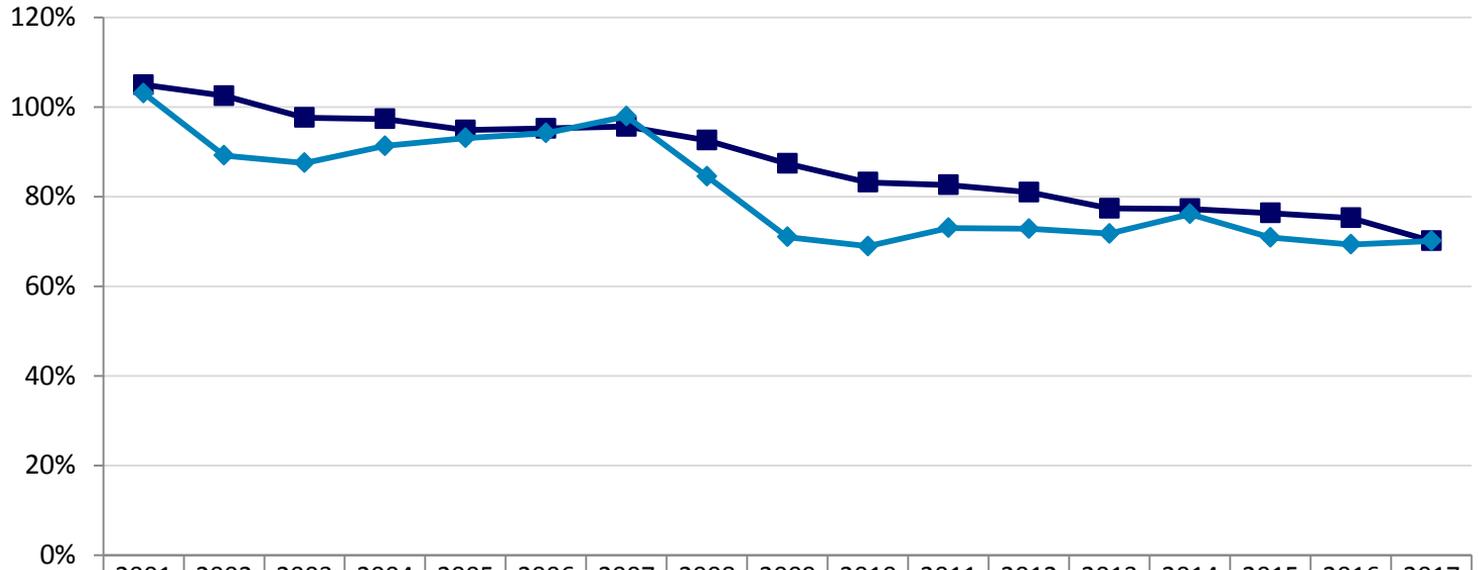
Actuarial Valuation as of August 31, 2017		
	AVA	MVA
Actuarial Accrued Liability	\$37,630	\$37,630
AVA / MVA	<u>26,372</u>	<u>26,372</u>
Unfunded Accrued Liability	\$11,258	\$11,258
Funded Ratio	70.1%	70.1%
Funding Period	Never	Never

Actuarial Valuation as of August 31, 2016		
	AVA	MVA
Actuarial Accrued Liability	\$35,303	\$35,303
AVA / MVA	<u>26,557</u>	<u>24,465</u>
Unfunded Accrued Liability	\$8,746	\$10,838
Funded Ratio	75.2%	69.3%
Funding Period	35	73

Actuarially Sound Contribution (ERS)



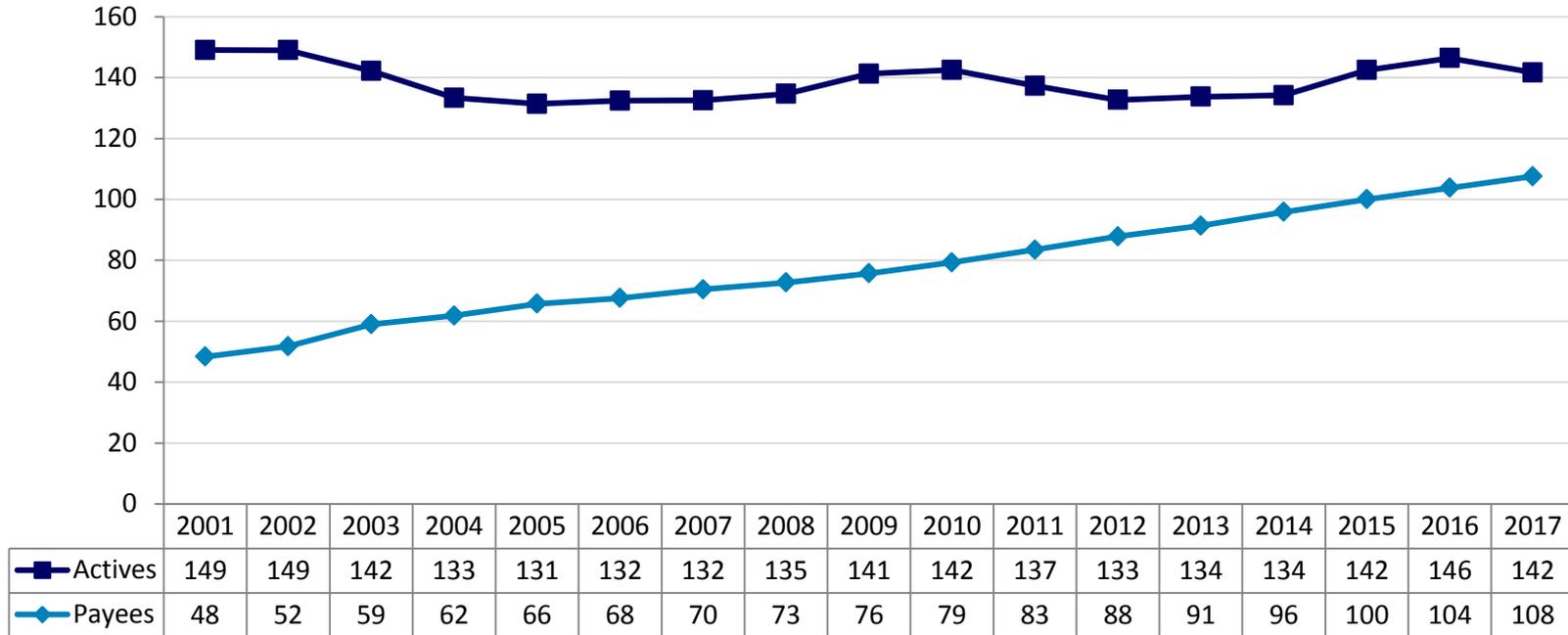
Funded Ratio History (ERS)



■ Funded Ratio on AVA	104.9	102.5	97.6%	97.3%	94.8%	95.2%	95.6%	92.6%	87.4%	83.2%	82.6%	81.0%	77.4%	77.2%	76.3%	75.2%	70.1%
◆ Funded Ratio on MVA	103.0	89.1%	87.5%	91.3%	93.1%	94.2%	97.9%	84.5%	71.0%	68.9%	73.0%	72.8%	71.7%	76.1%	70.9%	69.3%	70.1%

Membership (ERS)

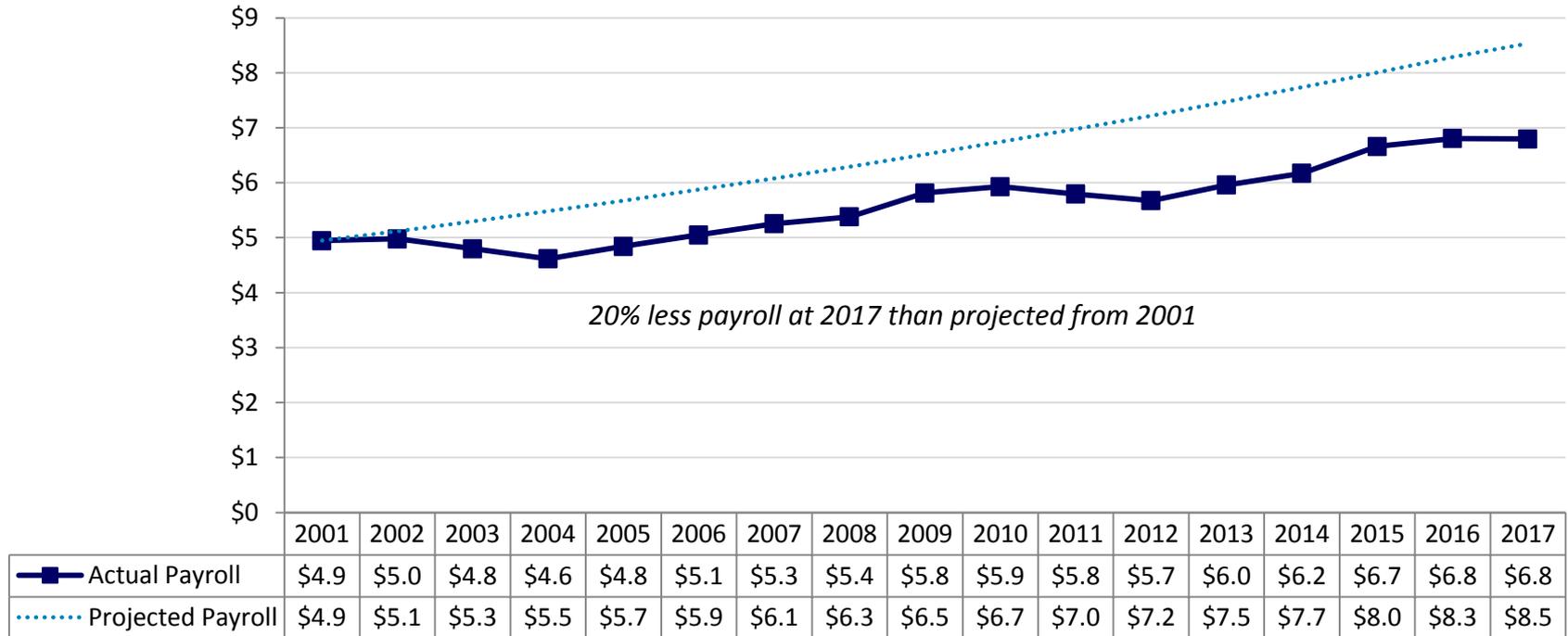
(counts in 1000's)



Active membership increase in 2015 includes approximately 7,000 new members from the elimination of the 90-day wait on September 1, 2015.

Payroll – Actual vs. Expected* (ERS)

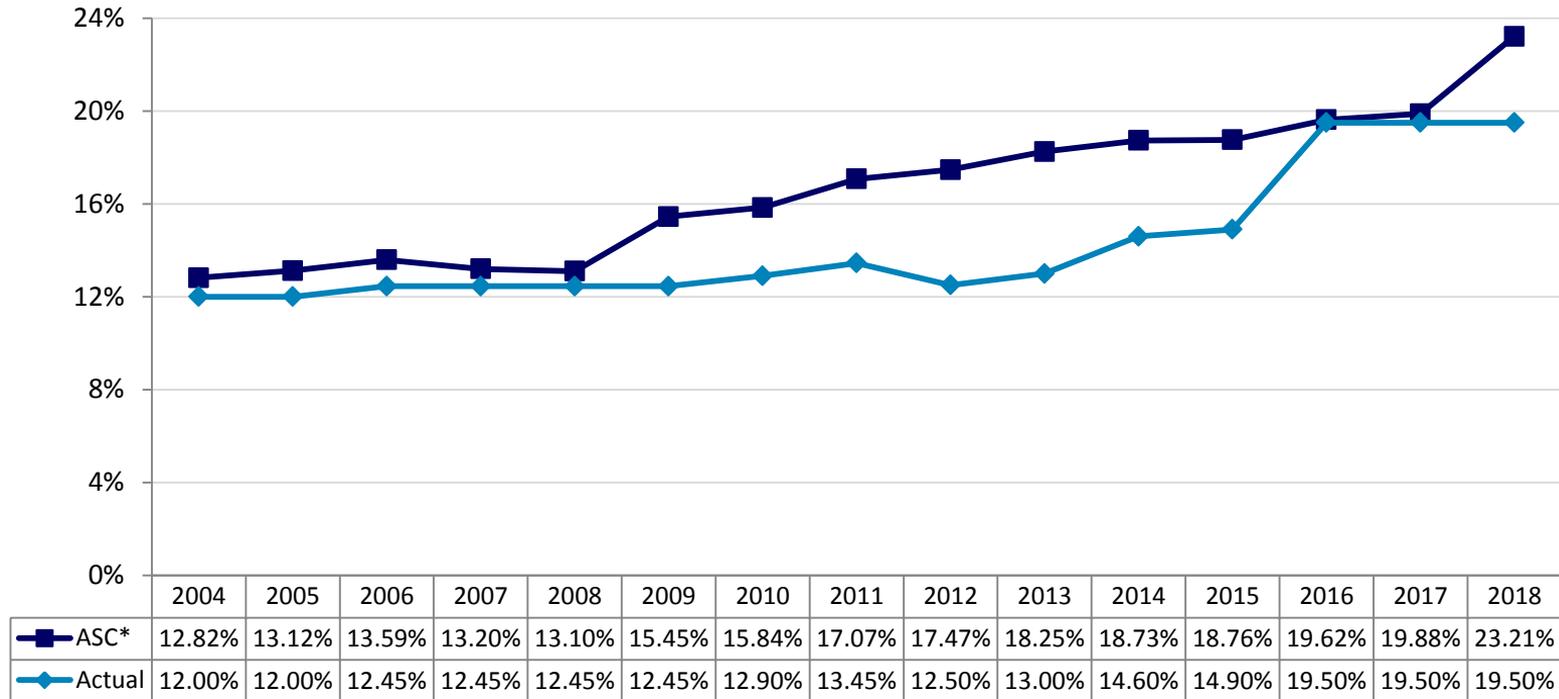
(\$ in billions)



*Projected from 2001 using payroll growth assumption in effect

Actual vs. Actuarial Contributions* (ERS)

(% of Payroll, by Fiscal Year)



*Actuarially Sound Contribution defined as normal cost plus 31-year amortization of unfunded

Short-term Projections Using Alternate One-Year Investment Returns (ERS)

	August 31, 2017 Results	Market Return for 12 month period ending August 31, 2018				
		-7.5%	0.0%	7.5%	15.0%	22.5%
UAAL (\$ in billions)	\$11.3	\$12.6	\$12.2	\$11.8	\$11.4	\$11.0
Funded Ratio on AVA	70.1%	67.6%	68.6%	69.6%	70.6%	71.6%
ASC	23.21%	23.93%	23.60%	23.27%	22.94%	22.62%
Funding Period on AVA	Never	Never	Never	Never	Never	Never
Funded Ratio on MVA	70.1%	59.7%	64.6%	69.6%	74.6%	79.6%
Funding Period on MVA	Never	Never	Never	Never	88	37

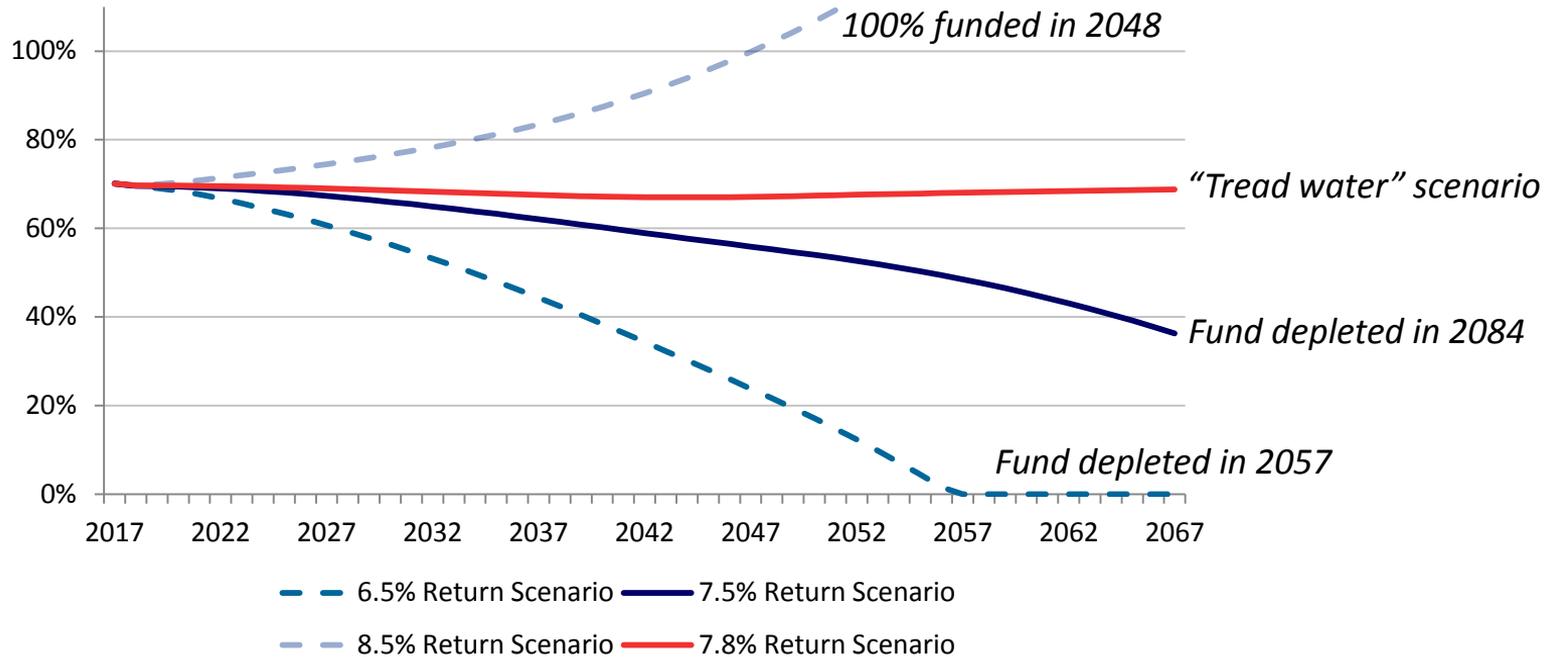
Projections assume that all assumptions are met (except asset returns, as noted) and future contributions continue at current levels.

5-Year Funded Ratio and ASC Projections (ERS)

Projection Assuming 7.5% Investment Returns			
Actuarial Valuation as of August 31,	Funded Ratio on AVA	ASC	Funding Period on AVA
2017	70.1%	23.21%	Never
2018	69.6%	23.27%	Never
2019	69.6%	23.33%	Never
2020	69.4%	23.40%	Never
2021	69.2%	23.47%	Never

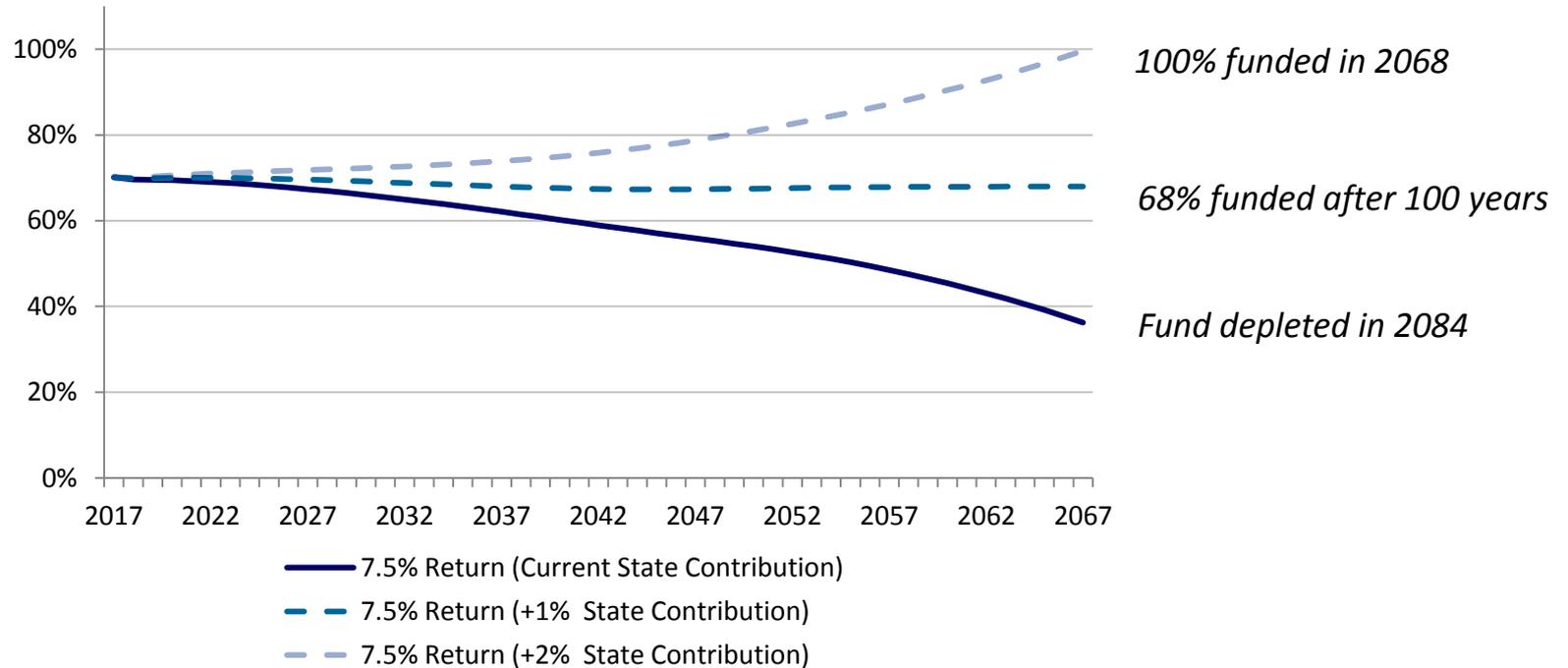
Projections assume that all assumptions are met, including an 7.5% return on the market value of assets, and future contributions continue at current levels.

Funded Ratio Projections (ERS)



Projections assume no changes to current assumptions and except actual asset returns, as noted, all other assumptions are met and future contributions continue at current levels.

Funded Ratio Projections (ERS)



Projections assume no changes to current assumptions and except State Contribution rates, as noted, all other assumptions are met.

LECOSRF and JRS2 Funding Valuation Results at August 31, 2017

LECOSRF and JRS2 Results

- LECOSRF had a reduction in funded status
 - Contributions are not sufficient to sustain the plan
 - Projected depletion date in 2044
- JRS2 had a reduction in funded status
 - However, current statutory rates sufficient to sustain the plan

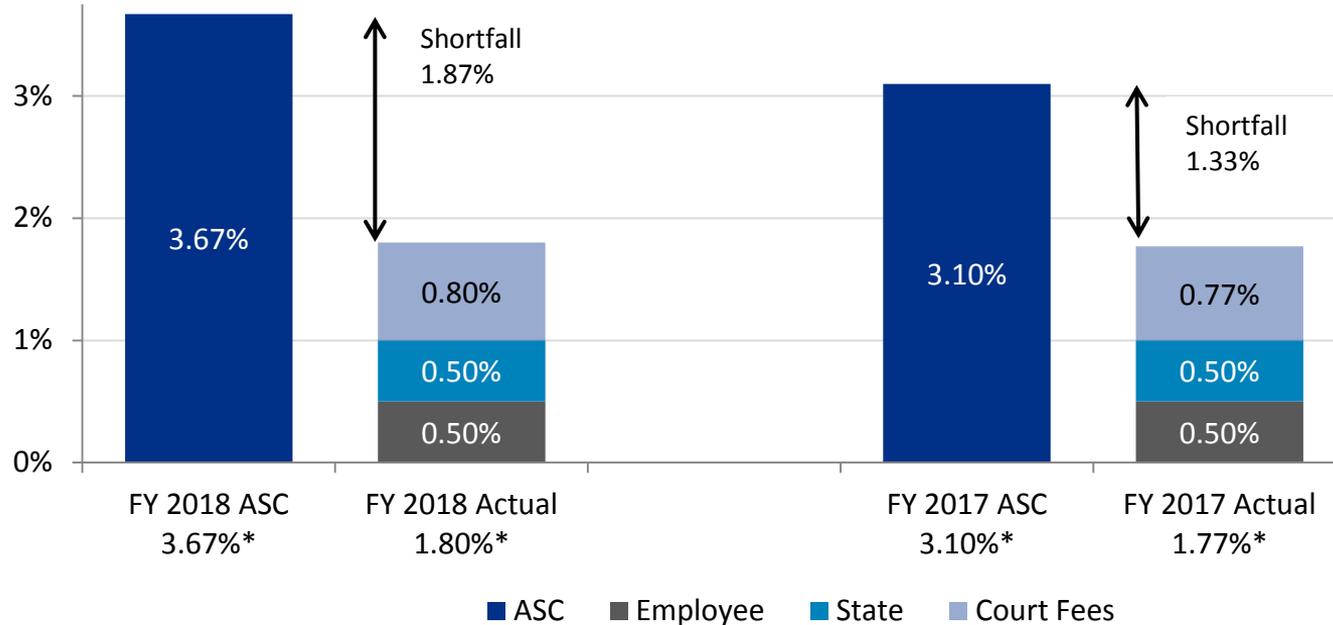
Funded Status

(\$ in millions)

Actuarial Valuation as of August 31, 2017		
	LECOSRF	JRS2
Actuarial Accrued Liability	\$1,400	\$464
Actuarial Value of Assets	<u>924</u>	<u>421</u>
Unfunded Accrued Liability	\$476	\$43
Funded Ratio	66.0%	90.8%
Funding Period	Never	63

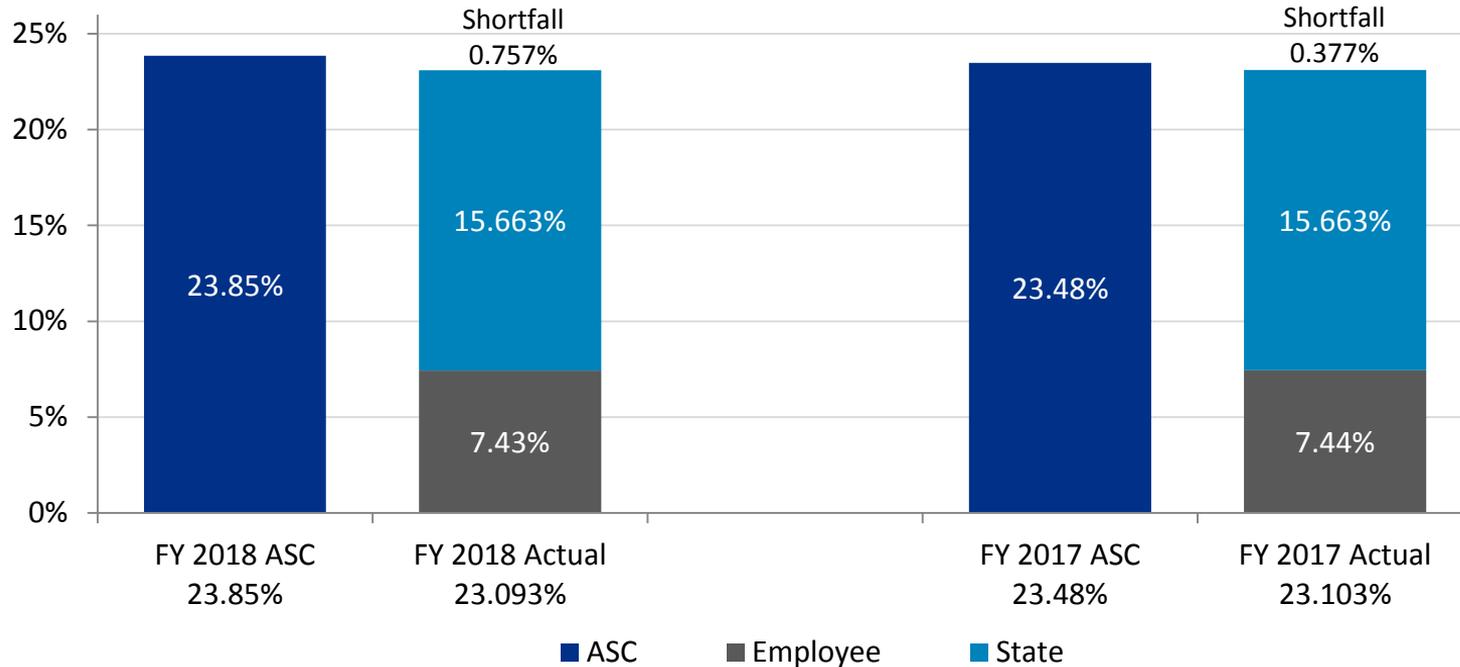
Actuarial Valuation as of August 31, 2016		
	LECOSRF	JRS2
Actuarial Accrued Liability	\$1,312	\$426
Actuarial Value of Assets	<u>933</u>	<u>396</u>
Unfunded Accrued Liability	\$379	\$30
Funded Ratio	71.1%	92.9%
Funding Period	Never	49

Actuarially Sound Contribution (LECOSRF)



**The 0.80% amount for LECOSRF is projected to be about \$18.8 million for FY18, based on a 4-year average of actual revenues. The amount of court fees received by LECOSRF is not based on a percent of payroll and is expected to decline as a percent of payroll going forward.*

Actuarially Sound Contribution (JRS2)



Accounting Results as of August 31, 2017

Accounting Valuation Results

- ERS adopted GASB 67 for plan year ending August 31, 2014
- GASB 68 measures were included in Texas state reporting starting in fiscal year ending August 31, 2016
 - State has elected to utilize one year reporting lag
 - GASB 67/68 valuation as of August 31, 2016 used for August 31, 2017 reporting
- GASB 73 outlines new reporting for JRS1

Determining Discount Rate

- Discount rate used in determining the Total Pension Liability (TPL) is a blend of two rates
 - Long-term expected rate of return on pension plan investments (7.50% based on current investment policy)
 - Can be used to discount plan obligations as long as there are projected assets sufficient to pay projected plan benefits
 - Yield or index rate for a 20-year, tax-exempt general obligation municipal bond (3.42% as of August 31, 2017)
 - Used to discount plan obligations after the projected assets have been extinguished
 - JRS1 uses municipal bond rate since there are no trust assets

Accounting Valuation Results

- (\$ in millions)

August 31, 2017	ERS	LECOSRF	JRS2	JRS1
Single Discount Rate (SDR)	5.36%	4.21%	7.50%	3.42%
Total Pension Liability	\$48,237	\$2,164	\$464	\$277
Plan Fiduciary Net Position	<u>26,372</u>	<u>924</u>	<u>421</u>	<u>0</u>
Net Pension Liability (NPL)	21,865	1,240	43	277
August 31, 2016				
Single Discount Rate (SDR)	5.73%	3.69%	6.53%	2.84%
Total Pension Liability	\$44,223	\$2,214	\$486	\$328
Plan Fiduciary Net Position	<u>24,466</u>	<u>860</u>	<u>381</u>	<u>0</u>
Net Pension Liability (NPL)	19,757	1,354	105	328

Summary

Summary

- Changes in future expectations had a large impact on the projected funded status of the plans
- Asset experience exceeded expectations on a market basis
- For ERS and LECOSRF, current contribution level is not sufficient to sustain the system
 - Without an increase of contributions over the current schedule, or a reduction of benefits, the funded status will continue to decline
- Contribution rates and current level of plan benefits are sufficient to sustain JRS2
 - However, there is no margin for adverse deviation or response to additional cost pressures

Disclaimers

- This presentation is intended to be used in conjunction with the actuarial valuation reports issued in December 2017. This presentation should not be relied on for any purpose other than the purpose described in the valuation reports.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.

Questions?

Public Agenda Item #7.1

Review and Discussion of
Investment Performance for 3rd Calendar Quarter of 2017

December 12, 2017

Sharmila Kassam, CPA, Deputy Chief Investment Officer
Steve Voss & Mike McCormick, CFA, Aon Hewitt

ERS Trust Fund Dashboard

Performance

Fund	<u>CYTD</u>	<u>FYTD</u>
Performance:	11.9%	1.3%
Benchmark:	11.2%	1.2%
Excess Return:	0.7%	0.1%
3-Yr Tracking error		1.54

Largest Contributors (quarter):

- Outperformance of domestic and international public equity and real estate

Largest Detractors (quarter):

- Underperformance of the private equity portfolio

Profile

Market Value at 9/30/17:
\$27.8 Billion

Actuarial Accrued Liability 8/31/17:
\$37.6 Billion

Retirees and Beneficiaries 8/31/17:
107,530

Retirement Payments Annually 8/31/17:
\$2.2 Billion

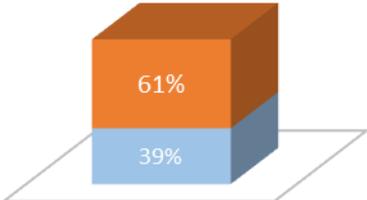
ERS Trust Funding Ratio 8/31/17:
70.1%

Compliance

Asset Allocation Compliance: Yes
Tracking Error Compliance: Yes
Investment Policy Compliance: Yes

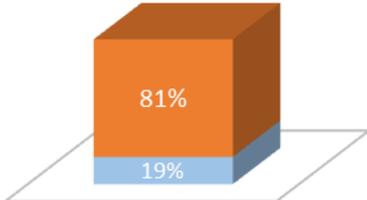
MANAGEMENT

■ External ■ Internal



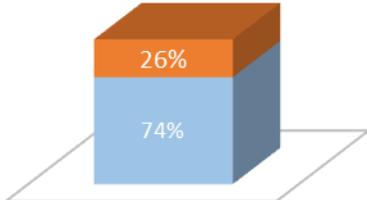
ALLOCATION

■ Risk Reducing ■ Return Seeking



LIQUIDITY

■ Liquid ■ Illiquid

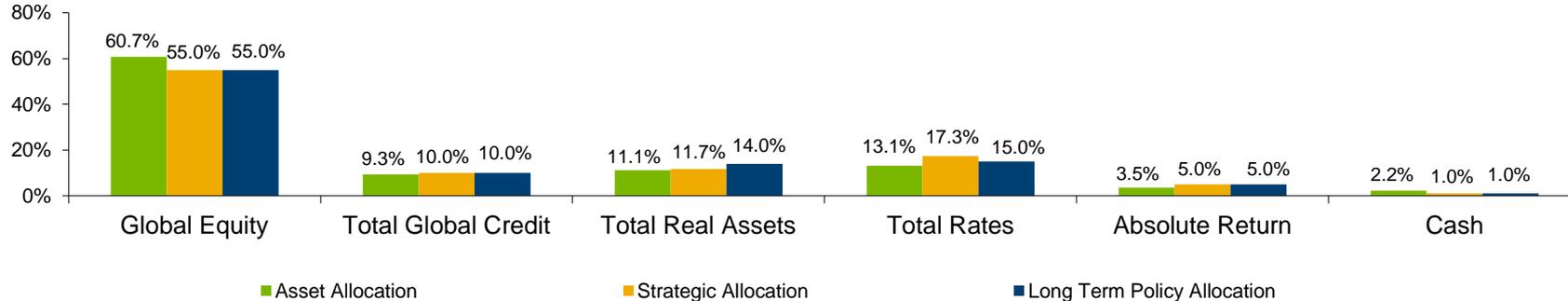


Total Fund: Asset Allocation

Summary of Cash Flow

	1 Quarter	Fiscal YTD	1 Year	3 Years	5 Years
Total Fund					
Beginning Market Value	26,979,126,647	27,531,798,643	25,570,386,973	25,493,748,098	23,053,697,254
+ Additions / Withdrawals	-267,395,492	-87,308,003	-1,010,234,702	-3,061,382,880	-5,764,697,717
+ Investment Earnings	1,085,590,898	352,831,413	3,237,169,782	5,364,956,834	10,508,322,516
= Ending Market Value	27,797,322,053	27,797,322,053	27,797,322,053	27,797,322,053	27,797,322,053

Employees Retirement System of Texas - Quarterly Asset Allocation Including Risk Management vs. Policy Target as of 9/30/2017



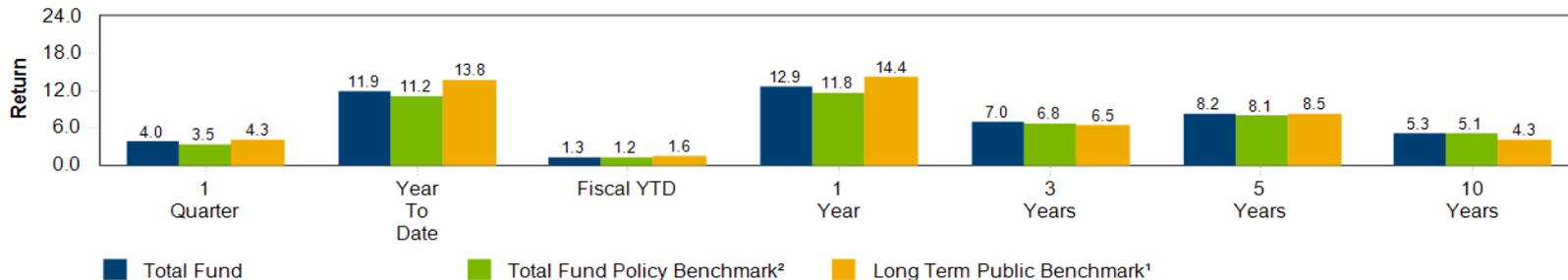
¹ All returns contained in this report are shown net of investment management fees. All returns longer than 1-year are annualized.

² Source data can be found on pages 31 and 40 of full report.

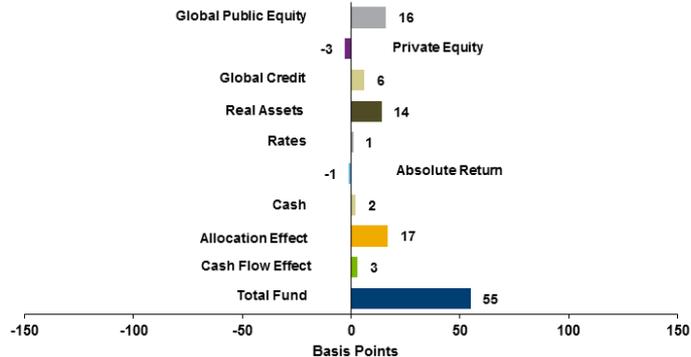
³ Due to rounding throughout the report, percentage totals displayed may not sum to 100%.

Total Fund: Performance

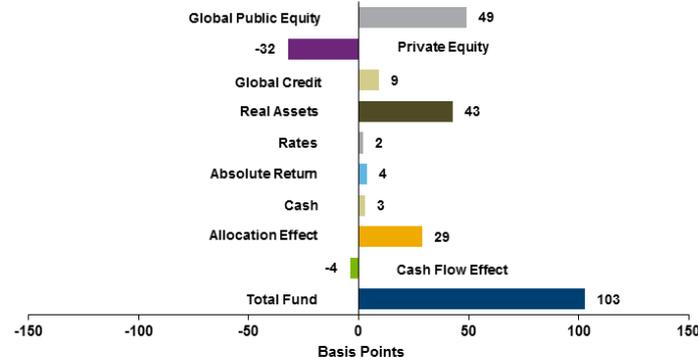
Return Summary



Total Fund Attribution Analysis
3 Months Ending 9/30/17



Total Fund Attribution Analysis
1 Year Ending 9/30/17

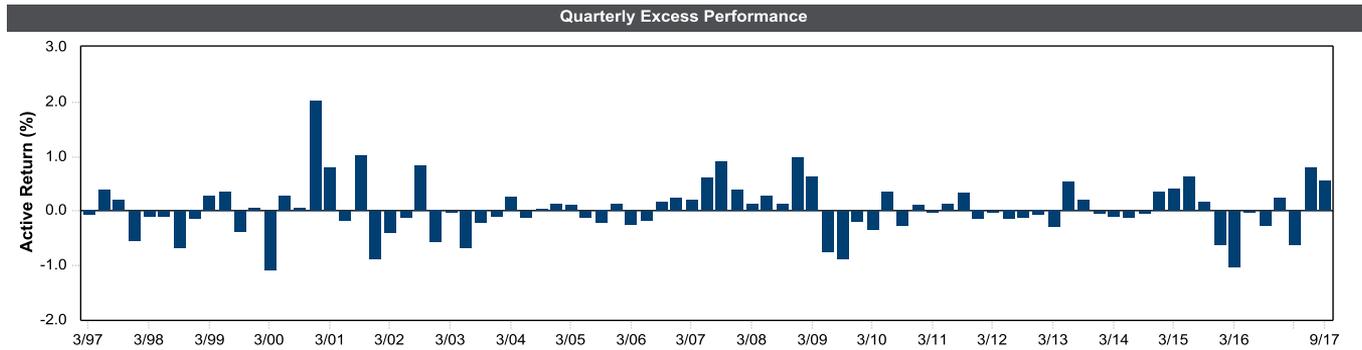
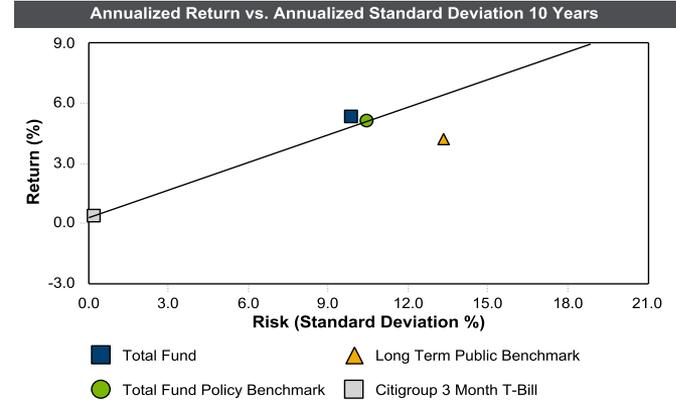
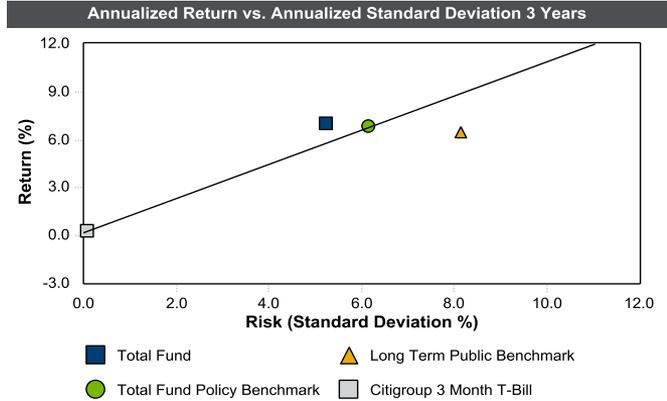


¹The Long Term Public Benchmark is a combination of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index.

²A detailed description of the Policy Index as of 9/30/2017 is provided in the appendix of the full report.

³Source data can be found on pages 30 and 32 of full report.

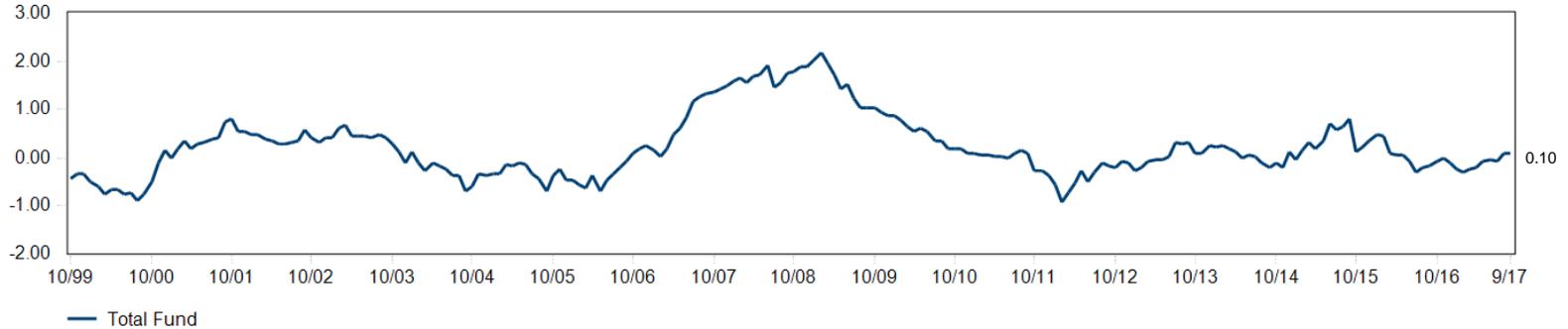
Total Fund: Risk



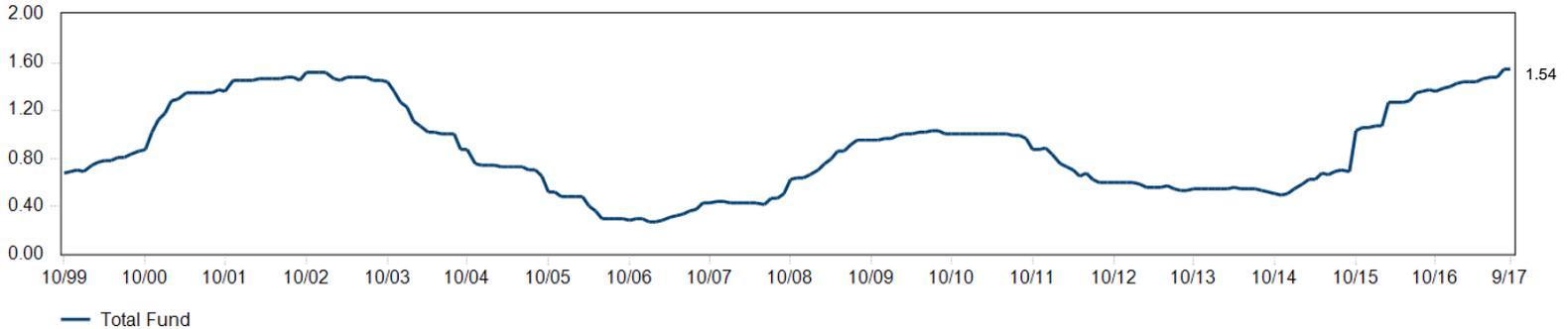
¹ Source data can be found on page 32 and 39 of full report.

Total Fund: Rolling Information Ratio and Tracking Error (36 months)

Information Ratio (Excess Return Ratio)¹



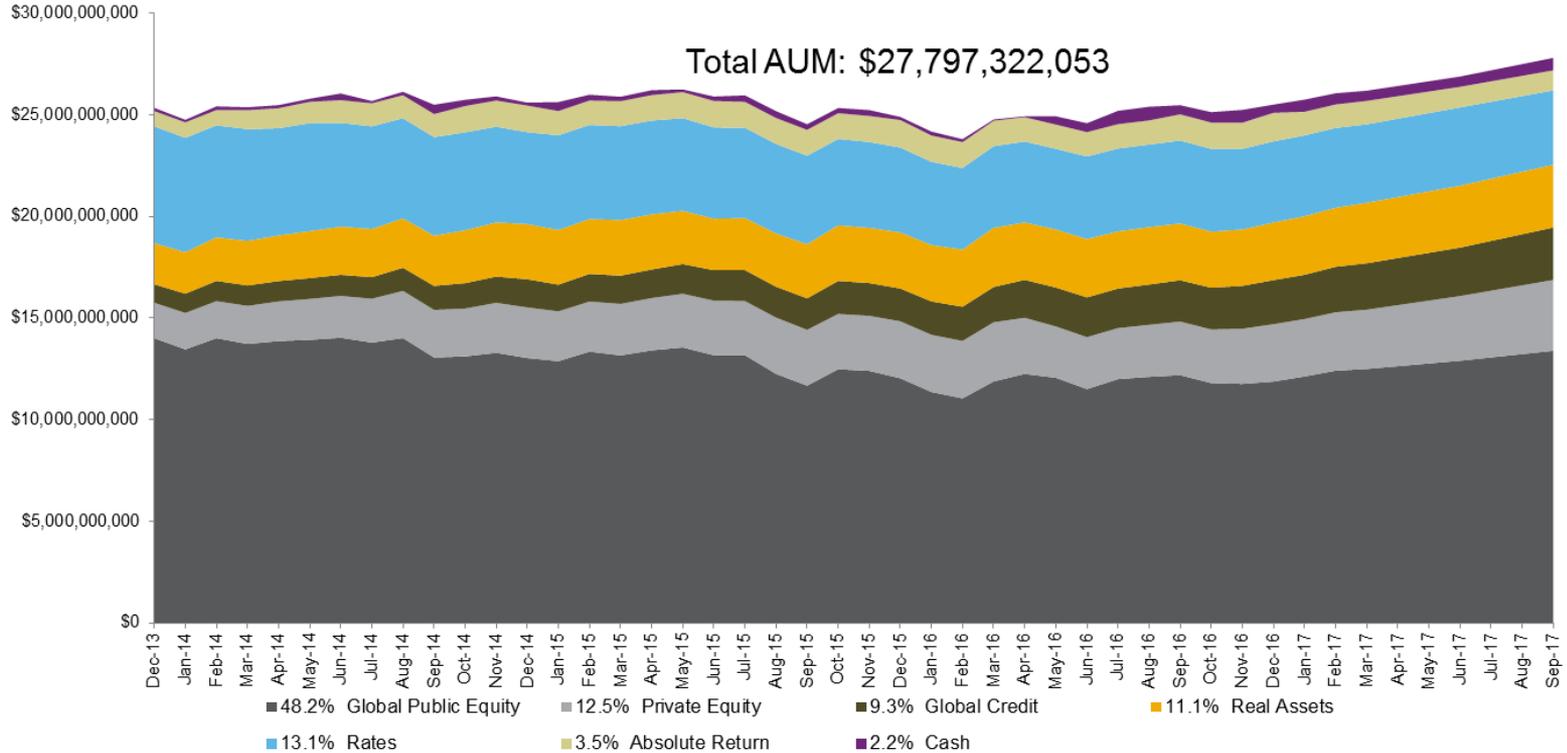
Tracking Error²



¹ Measured by dividing the active rate of return by the tracking error. The higher the Information Ratio, the more value-added contribution by the manager.

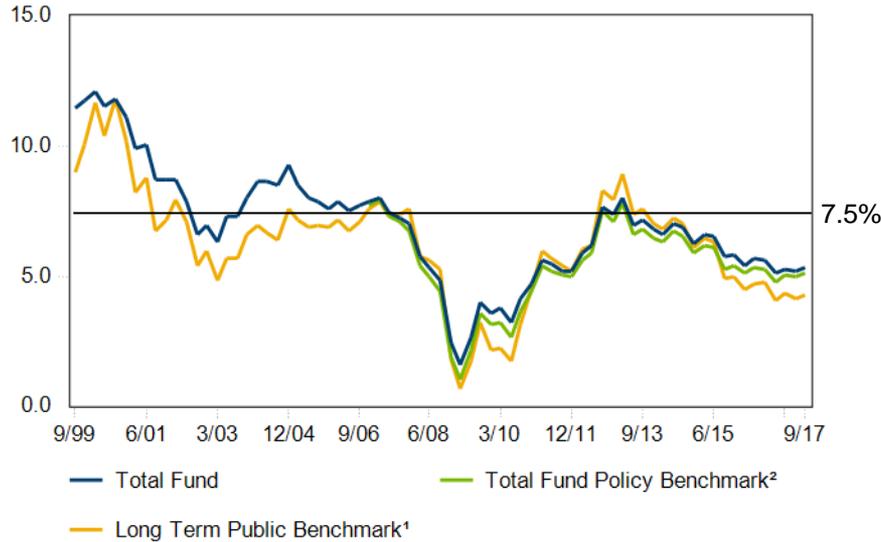
² A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

ERS Asset Allocation Evolution

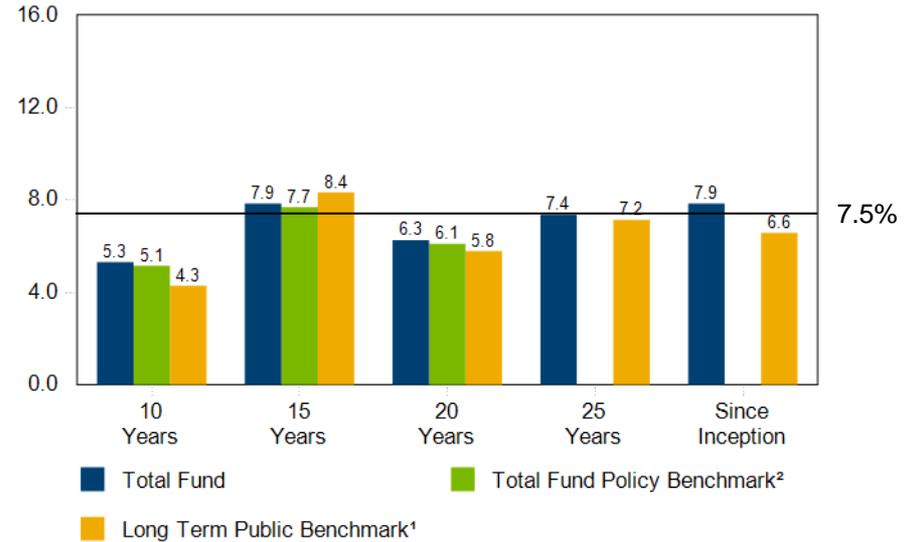


Long Term Investment Results

Rolling 10 Year Return



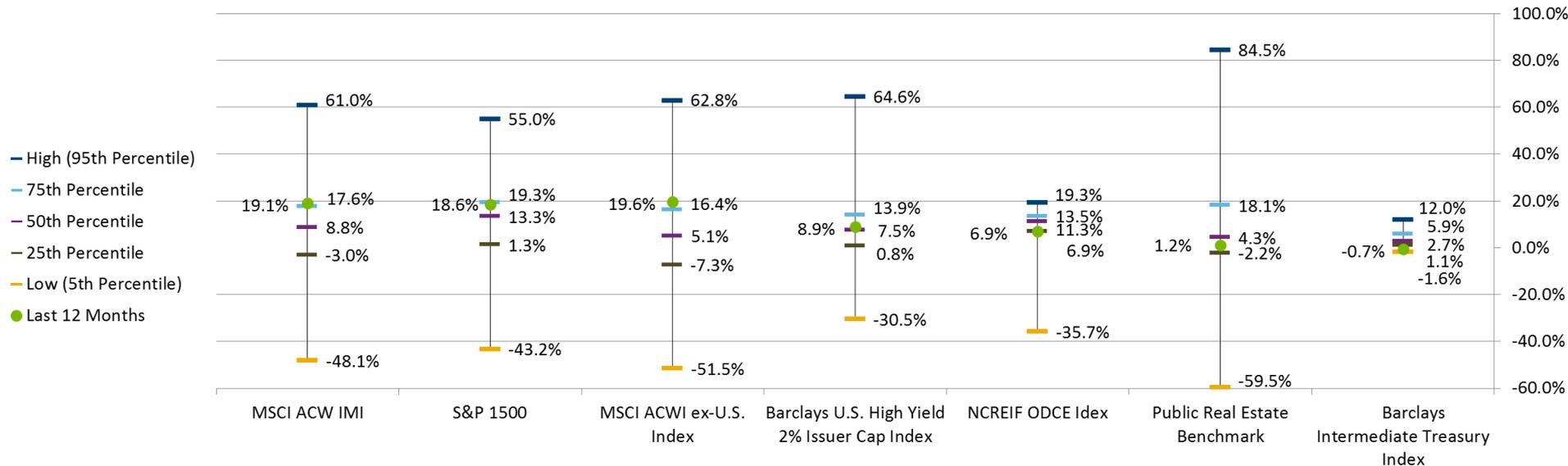
Return Summary



¹The Long Term Public Benchmark is a combination of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index.

²The Total Fund Policy Benchmark has an inception date of 11/30/1996.

Rolling 12-Month Capital Market Returns (10 Years ending 9/30/17)



- The chart above depicts the dispersion of rolling 12 month returns of various capital markets over the last 10 years.

Asset Class Returns Over Time (Annual Time Weighted Returns)

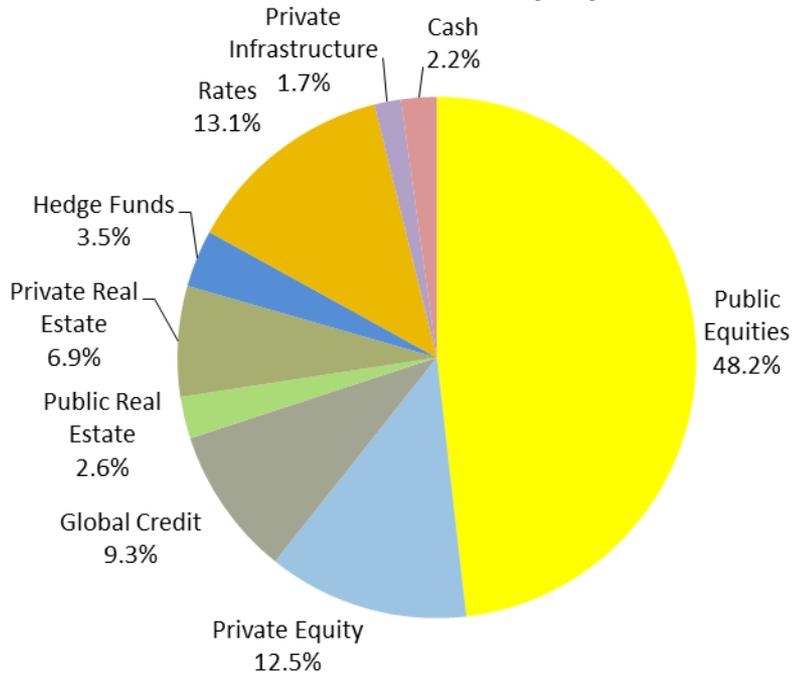
2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Public Real Estate 20.4		Public Real Estate 28.7		Public Real Estate 15.7		Global Credit 17.1
Private Equity 23.0			Private Equity 18.2		Public Equities 16.8	Public Equities 23.9	Private Real Estate 11.5		Private Equity 9.7
Private Real Estate 14.8		Global Credit 58.8	Private Real Estate 15.3		Global Credit 15.8	Private Equity 19.5	Private Equity 11.3		Public Equities 8.7
Private Infrastructure 14.2		Public Real Estate 38.3	Global Credit 14.9	Private Real Estate 15.0	Private Equity 13.0	Private Real Estate 12.9	Private Infrastructure 8.8		Private Real Estate 7.8
Public Equities 11.4		Public Equities 36.8	Public Equities 14.6	Private Equity 7.8	Private Real Estate 9.8	Private Infrastructure 9.4	Public Equities 4.1	Private Real Estate 14.0	Private Infrastructure 7.3
Hedge Funds 10.0		Hedge Funds 20.0	Private Infrastructure 10.8	Rates 6.6	Private Infrastructure 7.5	Hedge Funds 9.1	Hedge Funds 3.0	Private Equity 7.5	Hedge Funds 5.4
Rates 8.8		Private Equity 15.6	Hedge Funds 10.2	Private Infrastructure 5.2	Hedge Funds 6.4	Global Credit 7.4	Rates 2.6	Private Infrastructure 5.6	Public Real Estate 4.7
Global Credit 2.3	Rates 11.4	Private Infrastructure 0.9	Rates 5.3	Global Credit 5.0	Rates 1.7	Public Real Estate 4.4	Global Credit 2.5	Rates 1.2	Rates 1.1
Public Real Estate -7.0	Private Real Estate -10.7	Rates -1.4		Hedge Funds -5.3		Rates -1.3		Public Real Estate -0.1	
	Private Infrastructure -17.2	Private Real Estate -30.4		Public Real Estate -5.8				Hedge Funds -1.1	
	Hedge Funds -19.0			Public Equities -7.7				Public Equities -1.9	
	Private Equity -25.2							Global Credit -4.4	
	Global Credit -25.9								
	Public Equities -42.2								
	Public Real Estate -47.7								

***Private Real Estate** - NCREIF ODCE, **Public Equities** - MSCI ACWI IMI, **Hedge Fund** - HFRI Fund Weighted Composite Index, **High Yield** - Bloomberg Barclays High Yield, **Rates** - Bloomberg Barclays U.S. Treasury Intermediate, **Private Equity** - Burgiss Private Equity Time Weighted Return, **Infrastructure** - Burgiss Infrastructure Time Weighted Return, **Public Real Estate** - FTSE EPRA/NAREIT Developed

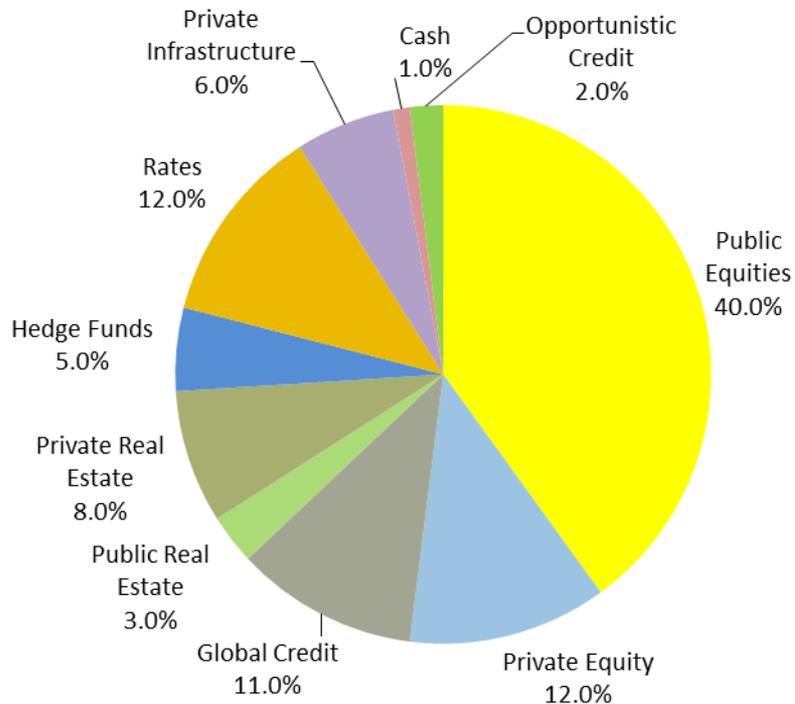
**Opportunistic Credit excluded because it is a new allocation

Interim Asset Allocation Targets (FY 2018 – FY 2019)

Asset Allocation as of 9/30/17



Interim Asset Allocation FY18 - FY19



Summary Analysis

- The Total Fund outperformed its benchmark by 103 bps during the trailing 12 month period.
 - The global public equity component contributed 49 bps of relative performance while the real assets component contributed 43 bps.
 - Private equity detracted 32 bps of relative performance while the cash flow effect detracted 4 bps of relative performance.
- At the end of the period global equity and cash were overweight 5.7% and 1.2% respectively while the total rates component was underweight 4.2% and all other asset classes were slightly underweight relative to the policy.
- Longer term investment results have been slightly positive, the Total Fund has produced risk adjusted returns superior to the benchmark and the Long Term Public Benchmark over the five and ten year period.
 - The Total Fund outperformed the benchmark in nominal terms by 16 bps and 20 bps over the trailing five and ten-year periods, respectively.
- The Total Fund has meaningfully outperformed the Long Term Public Benchmark over most longer-term periods.
- Diversification has been effective, the Total Fund Policy Benchmark has produced a return similar to the Long Term Public Benchmark at a meaningfully lower level of risk (volatility) over the trailing five and ten year period.

Questions?

Public Agenda Item #8.1

Discussion and Training Regarding Ethics

December 12, 2017

Paula A. Jones, Deputy Executive Director and General Counsel
Dr. Robert Prentice, Department Chair and Professor, University of Texas at Austin,
McCombs School of Business

Public Agenda Item #9.1

Private Equity Program Overview and Market Update

December 12, 2017

ERS

Wesley Gipson, *Director of Private Equity*

Ricky Lyra, *Private Equity Portfolio Manager*

Davis Peacock, *Private Equity Portfolio Manager*

Pavilion Alternatives Group

Bradford Young, *MD & Head of Global Advisory Services*

ERS Private Equity Program Overview

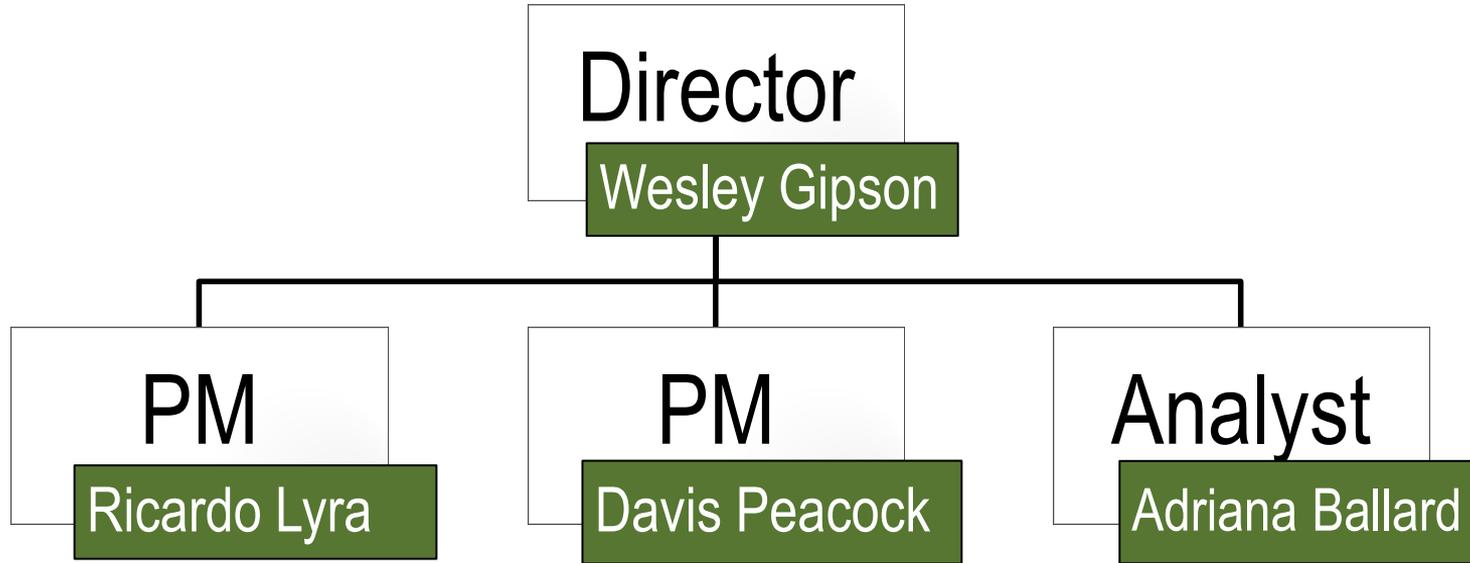


Agenda - Key Topics

- Private Equity Team
- Private Equity Primer – The Basics
- Strategy Discussion
- Portfolio Update
- Performance
- Savings
- Goals and Objectives for FY 2017/18

Private Equity Program Overview

Team



Private Equity Program Overview

The Basics: Primaries, Secondaries, and Co-investments



Primary

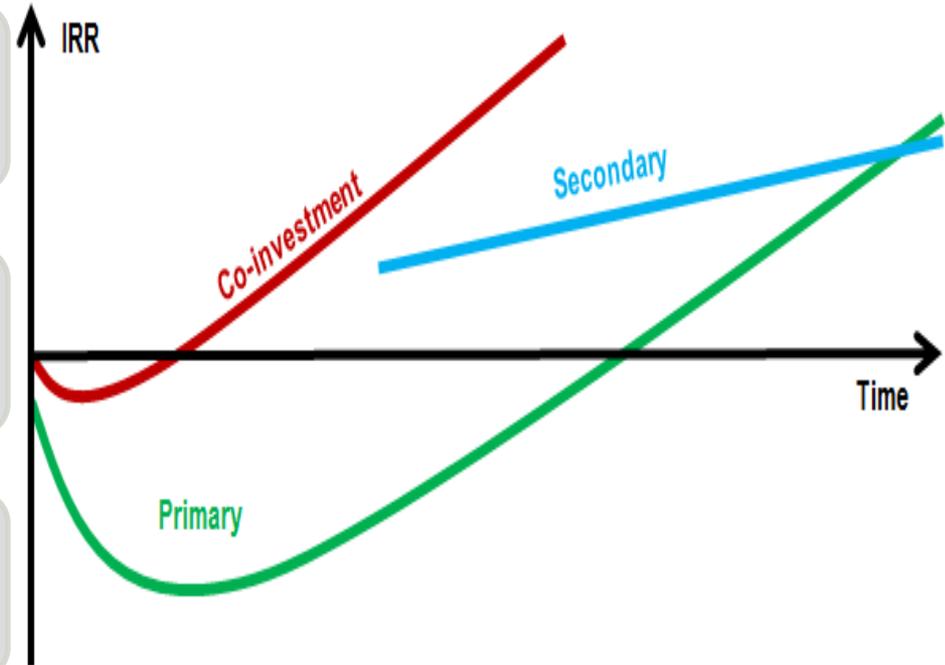
- 5 yrs. Investing, 10 yr. fund life
- “2/20” fees and carried interest
- 10 to 20 companies

Secondary

- Mature, existing LP Interest fund purchase
- 50 to 100% called
- Discounts and short-term liquidity

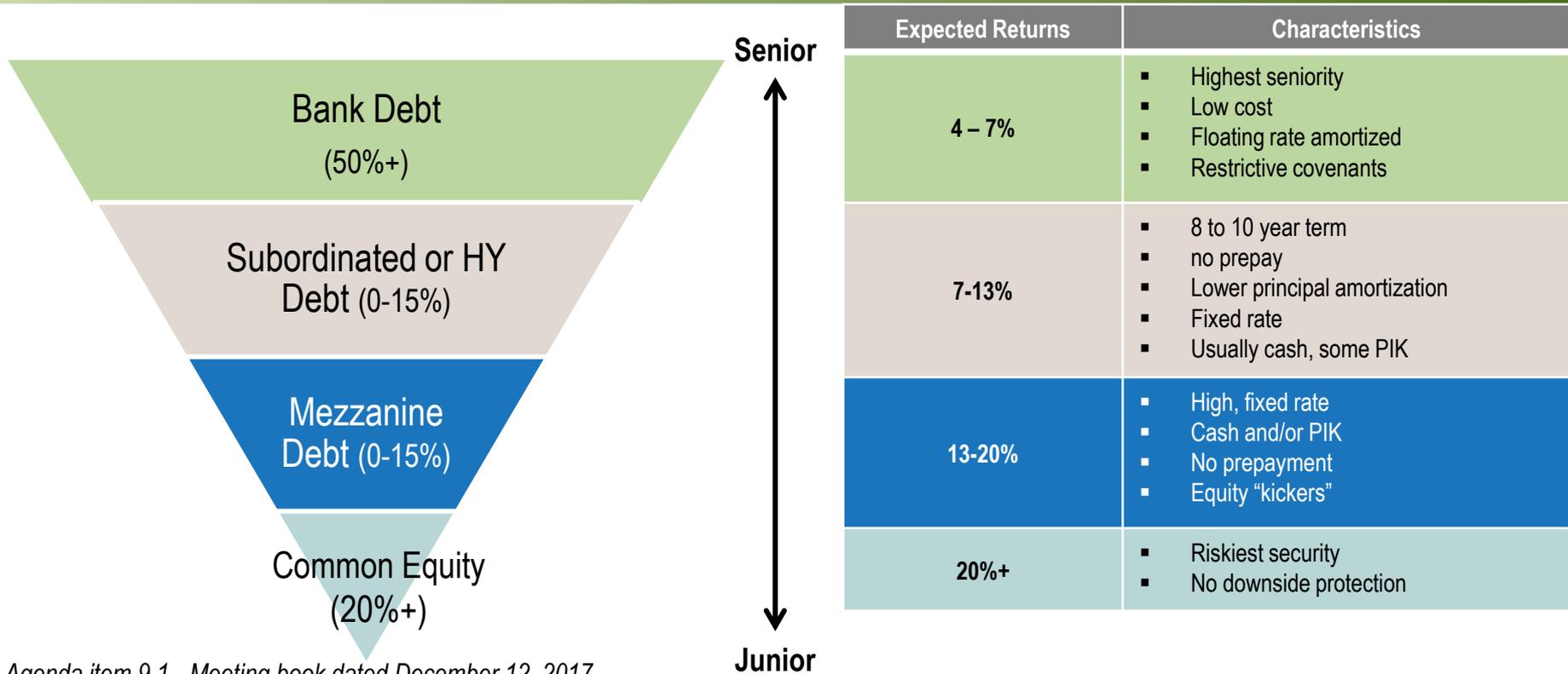
Co-investment

- Single company investment
- Alongside fund manager
- No fees - No carry



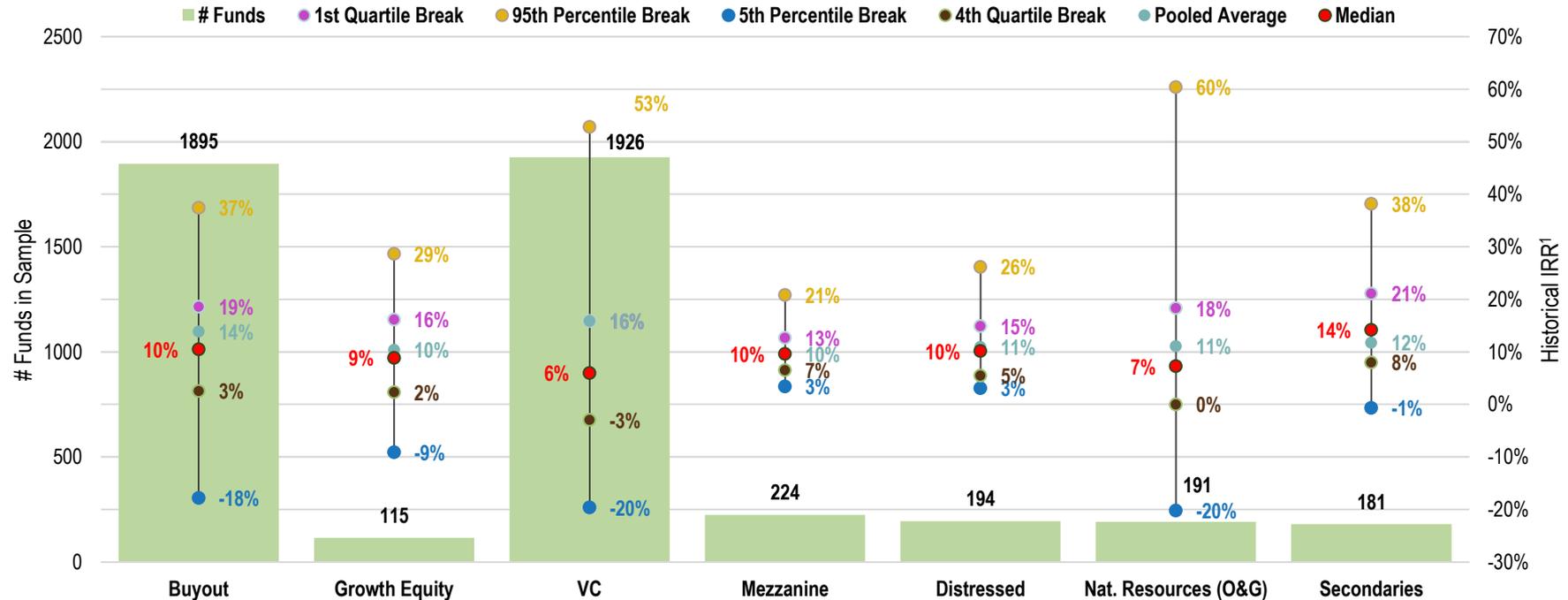
Private Equity Program Overview

Basics of a Deal: The Capital Stack



Private Equity Program Overview

Historical IRR Dispersion by Strategy

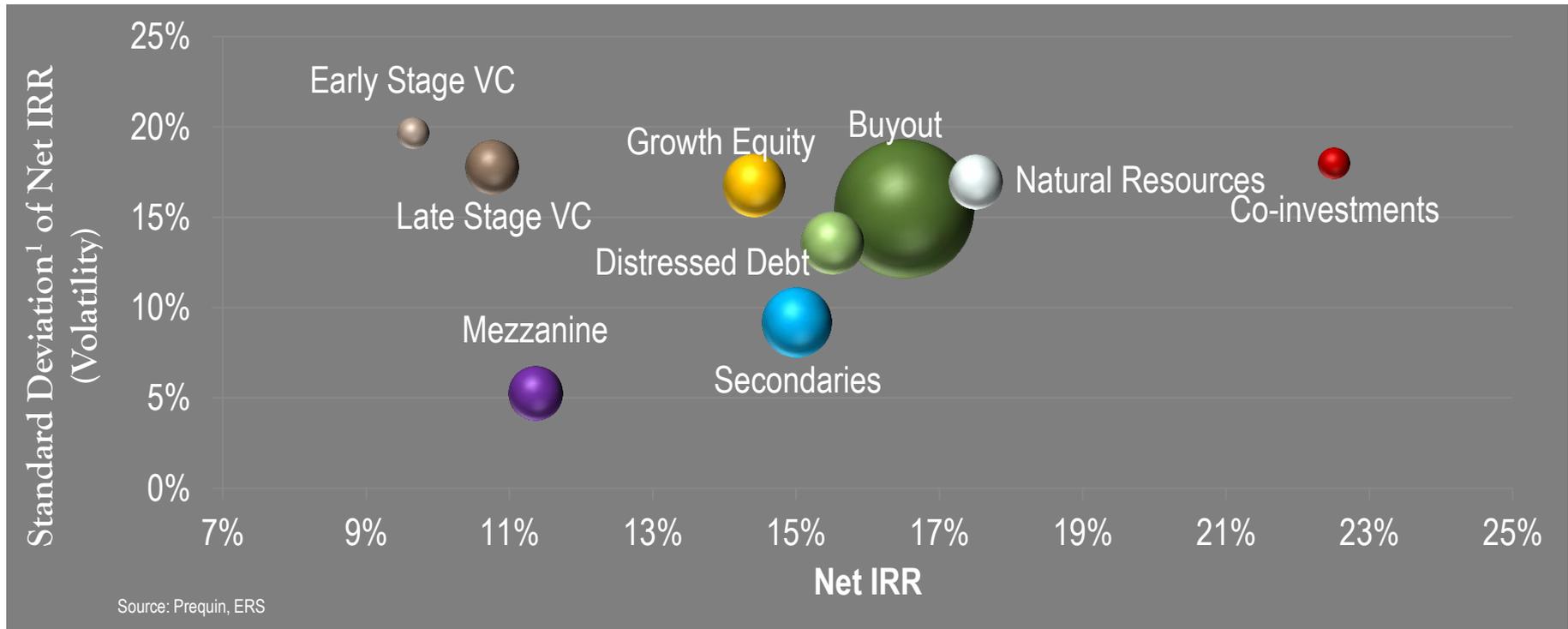


Source: Burgiss Private IQ

1. **IRR, Internal Rate of Return**, is equal to the discount rate that will bring a series of cash flows to a net present value (NPV) of zero (or to the current value of cash invested)

Private Equity Program Overview

Trailing 10 Year Volatility & Expected Returns

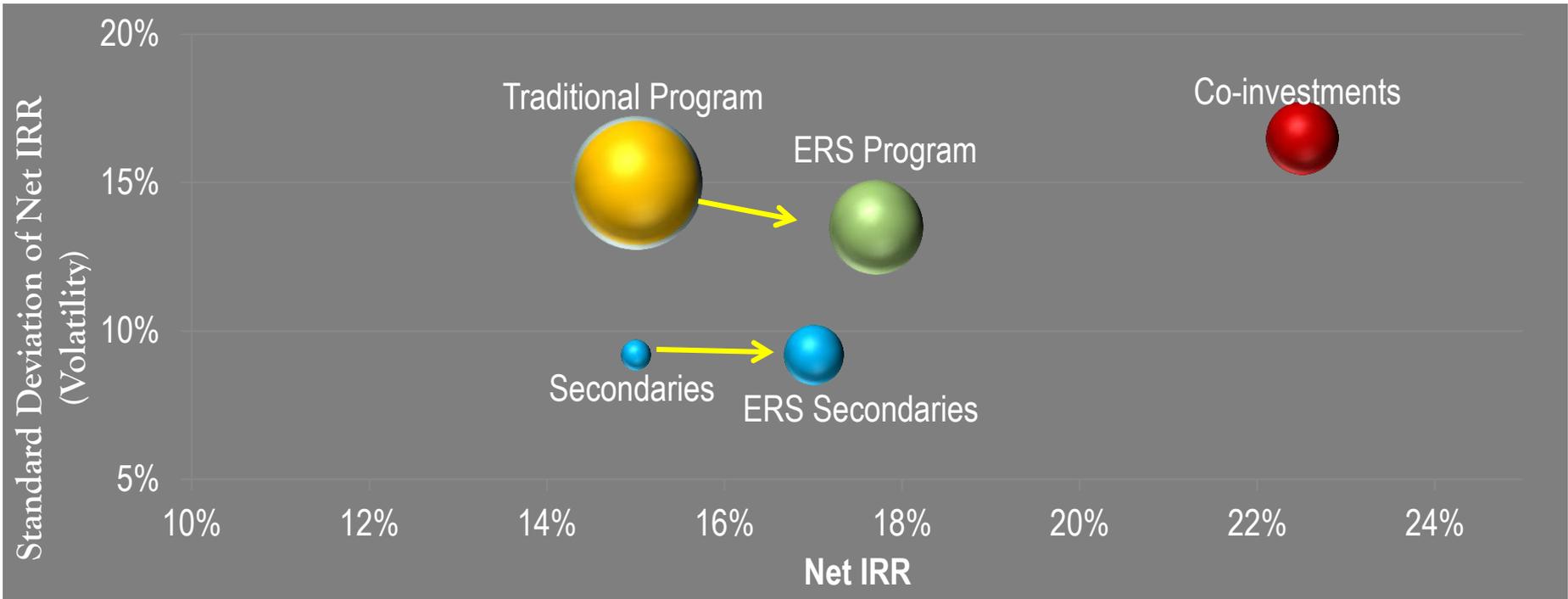


Source: Prequin, ERS

1. **Standard Deviation**, is a measure of volatility calculated by measuring the dispersion of a set of data from its mean.

Private Equity Program Overview

Traditional PE vs. ERS with Secondaries & Co-investments



Private Equity Program Overview

Portfolio Update as of 8/31/17

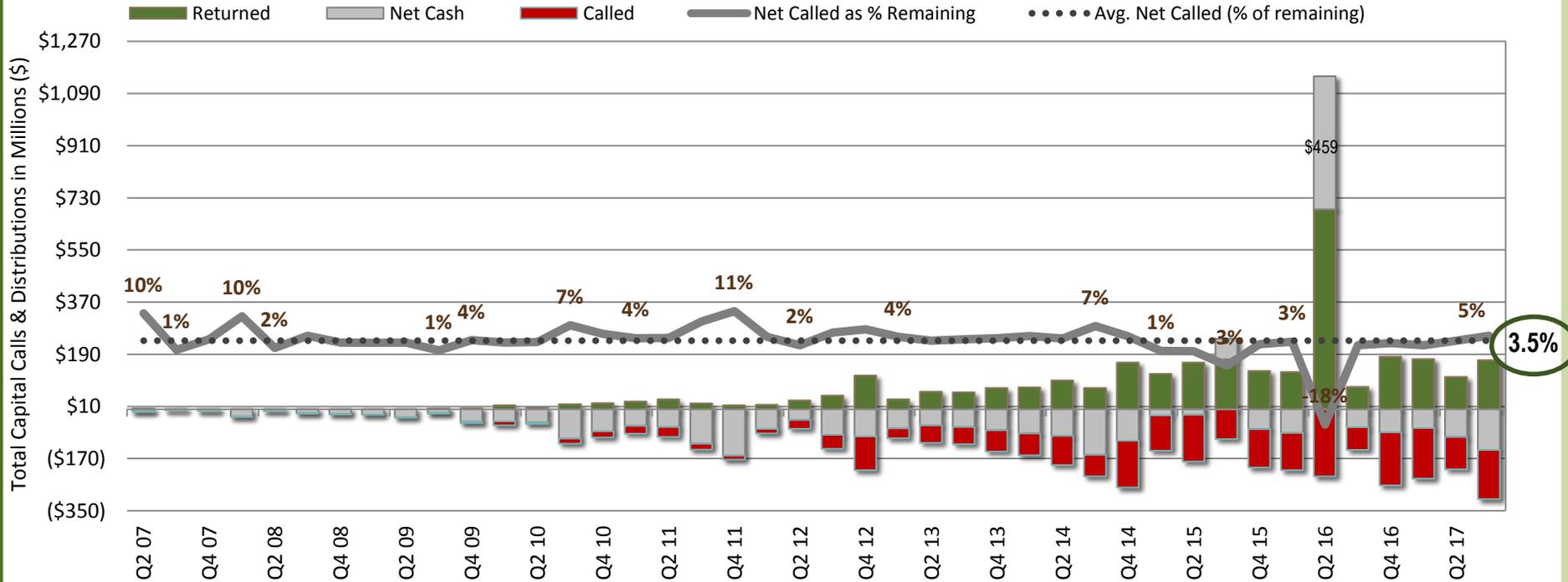


	Inception-FY16	FY17	Inception-FY17
Committed	\$6.1 billion	\$870 million	\$7.04 billion
Called	\$4.0 billion	\$926 million	\$4.9 billion
Distributed	\$2.7 billion	\$584 million	\$3.2 billion
Net Asset Value (NAV)	\$2.6 billion	\$810 million	\$3.4 billion
% of Trust	10.0%	230 bps	12.3%
Total Value Paid in Capital (TVPI) ¹	1.28x	0.04x	1.32x
Distributions Paid in Capital (DPI) ²	0.64x	0.0x	0.64x
Internal Rate of Return (IRR) ³	11.0%	16.9%	11.9%

1. **TVPI, Total Value to Paid in Capital**, is equal to (NAV + Distributions) / Paid in Capital;
2. **DPI, Distributions Paid in Capital**, is equal to Distributions / Paid in Capital;
3. **IRR, Internal Rate of Return**, is equal to the discount rate that will bring a series of cash flows to a net present value (NPV) of zero (or to the current value of cash invested)

Private Equity Program Overview

Cash Flow Since Inception



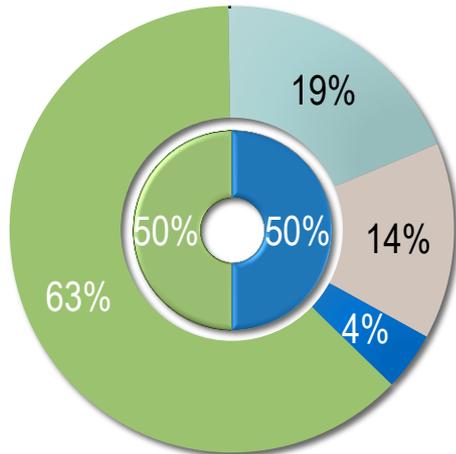
Private Equity Program Overview

Portfolio Diversification Guidelines vs. NAV



Geography

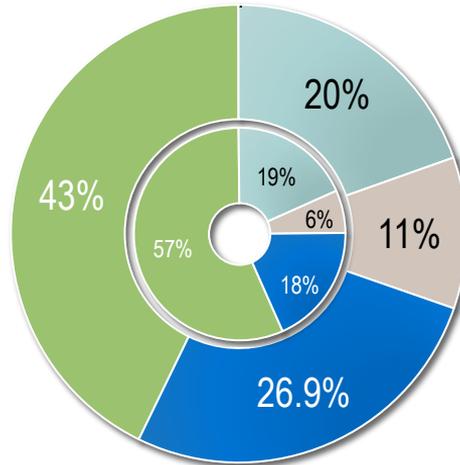
■ US ■ International



■ US ■ Europe ■ Asia ■ Latin America

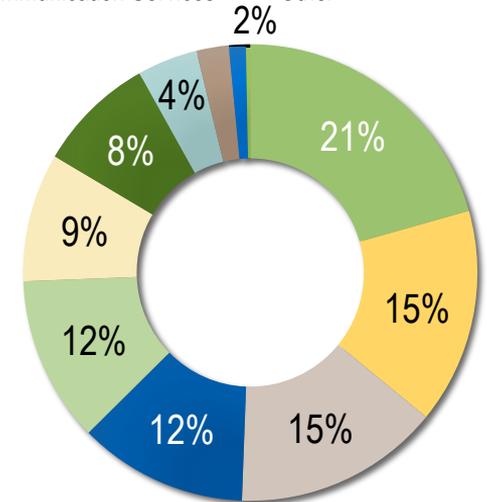
Strategy

■ Buyout ■ VC & Growth
■ Debt ■ Special Situations



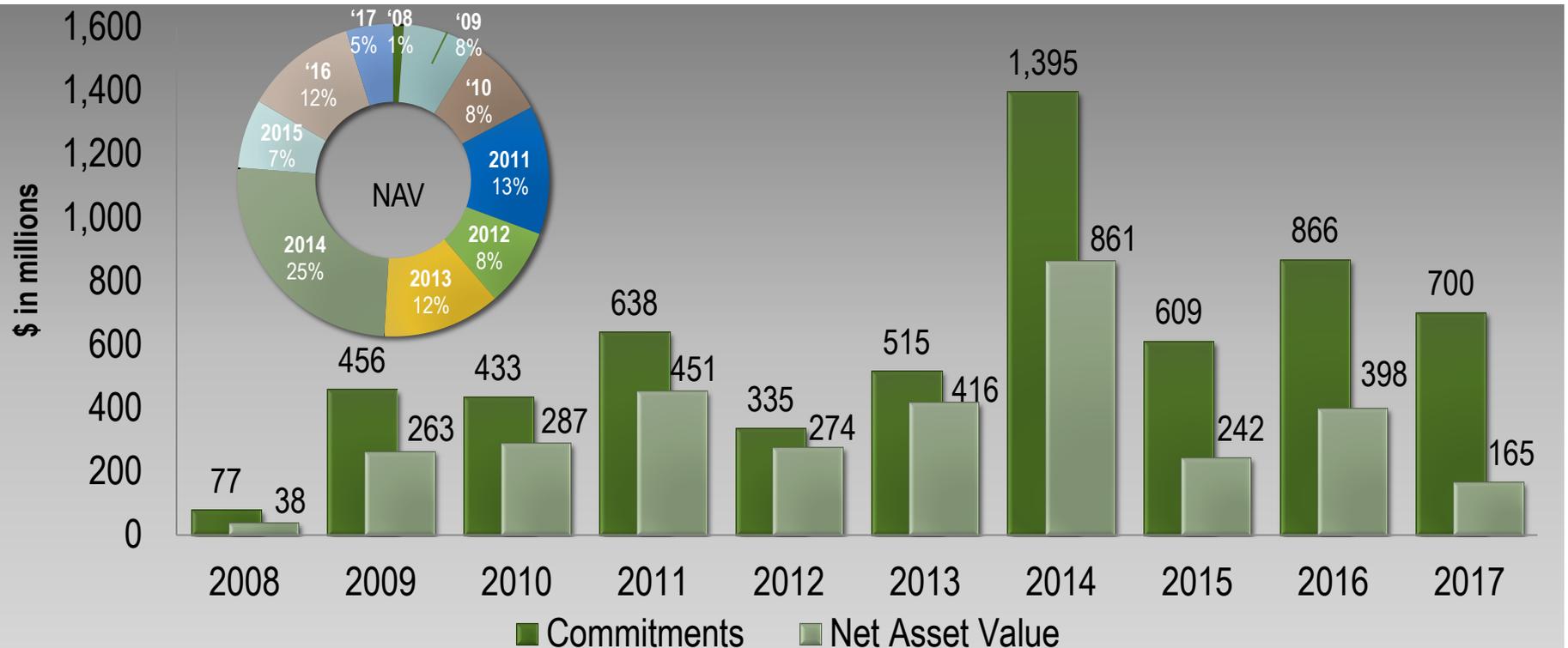
Sector

■ Diversified ■ Industrials
■ Energy ■ Information Technology
■ Consumer Discretionary ■ Financials
■ Health Care ■ Materials
■ Consumer Staples ■ Utilities
■ Telecommunication Services ■ Other



Private Equity Program Overview

Portfolio Diversification by Vintage Year



Private Equity Program Overview

Portfolio Diversification by General Partner



	General Partner	# of Funds	Commitment (\$mm)	Uncalled Capital (\$mm)	Net Asset Value (\$mm)	Economic Exposure (\$mm)	Economic Exposure (%)
1	Pavilion Alternatives	2	465.0	227.5	231.0	458.5	7.78%
2	LGT Capital	4	475.0	316.7	127.6	444.3	7.54%
3	Landmark Partners	4	450.0	294.6	119.2	413.8	7.02%
4	Castle Lake Capital	5	349.1	66.8	316.6	383.4	6.50%
5	Quantum Energy	6	309.0	162.9	215.6	378.4	6.42%
6	The Carlyle Group	7	316.3	154.1	171.6	325.7	5.53%
7	Advent International	4	299.2	87.9	216.2	304.1	5.16%
8	KSL Capital	4	300.0	176.4	88.0	264.3	4.48%
9	The Riverside Company	6	283.1	56.4	204.0	260.4	4.42%
10	Triton Partners	6	239.9	77.9	149.9	227.9	3.87%
Total Top 10		48	3,486.6	1,621.1	1,839.7	3,460.8	58.72%
Total		107	6,022.7	2,498.3	3,395.9	5,894.2	100.00%

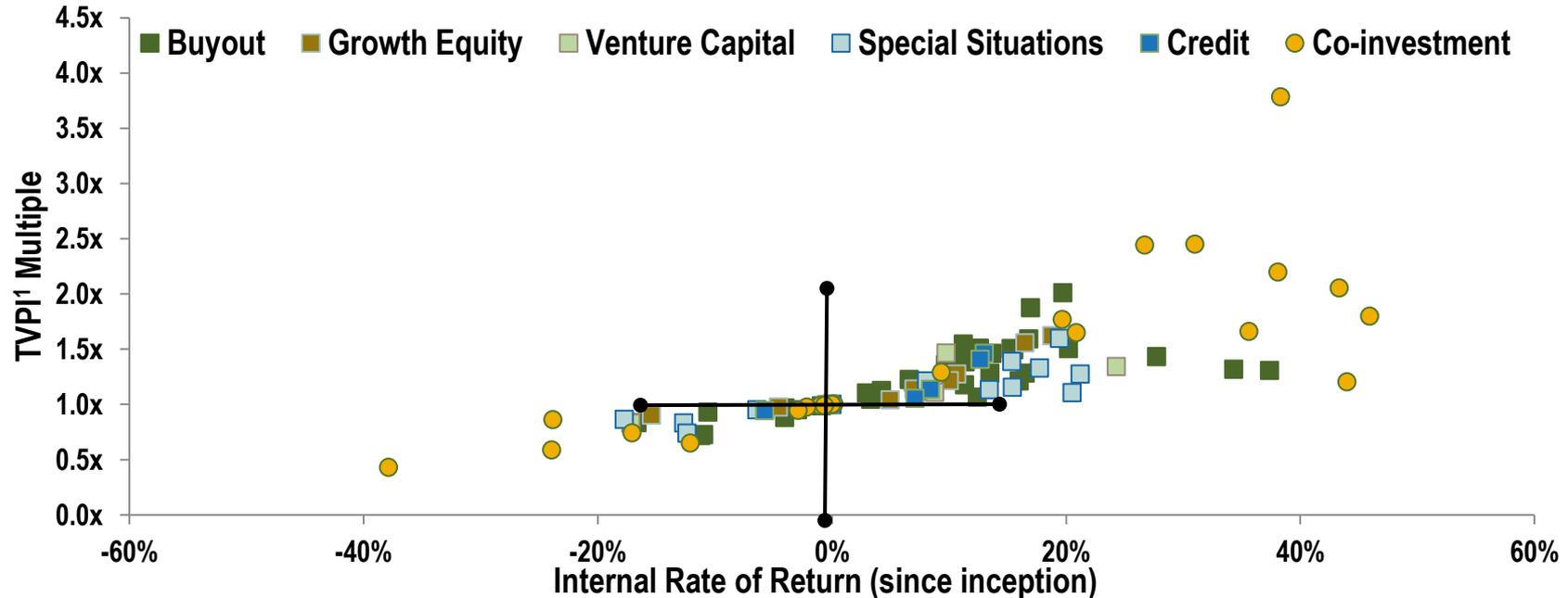
Notes:

- Amounts in USD
- Funds as of 8/31/17; Valuations as of 6/30/17
- Totals include active funds and co-investments

All values are internally determined by ERS and not the General Partners

Private Equity Program Overview

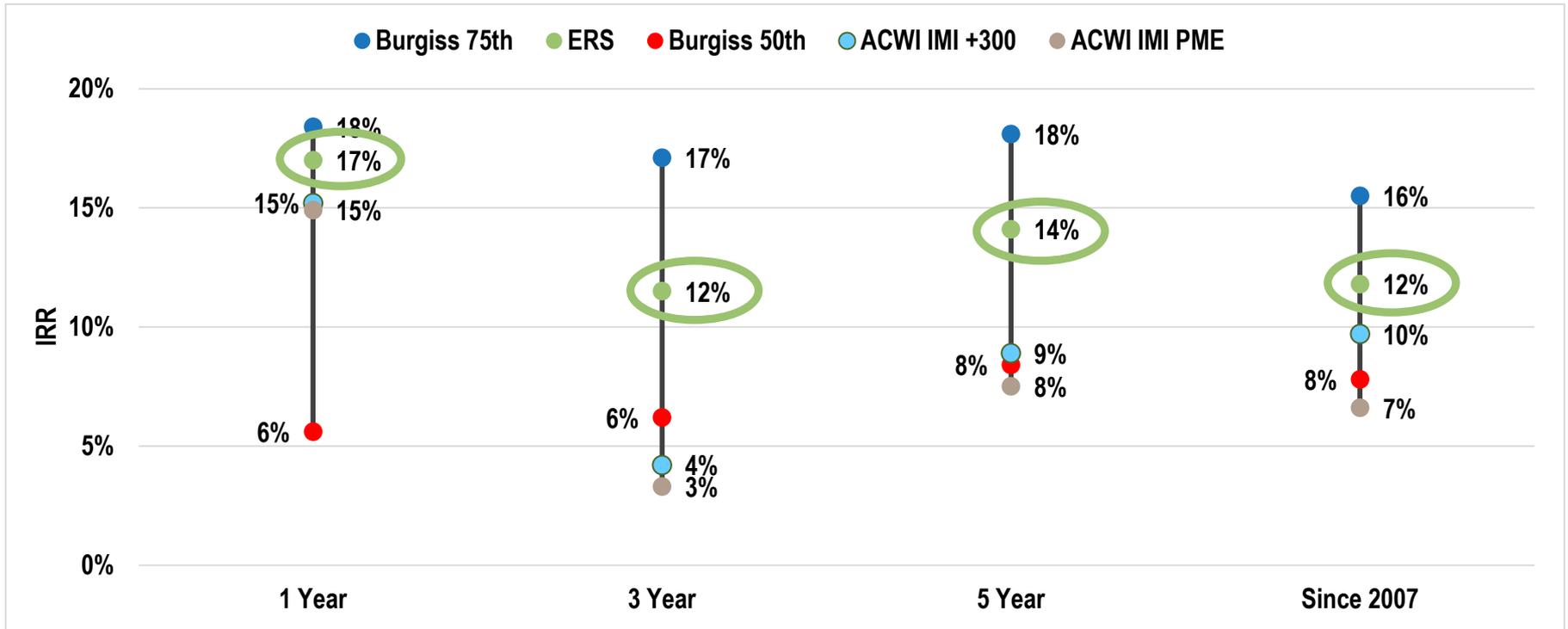
Performance Scatter by Strategy



1: TVPI = TVPI, or Total Value to Paid in Capital, is equal to (NAV + Distributions) / Paid in Capital

Private Equity Program Overview

Benchmark IRR Comparison as of March 31, 2017

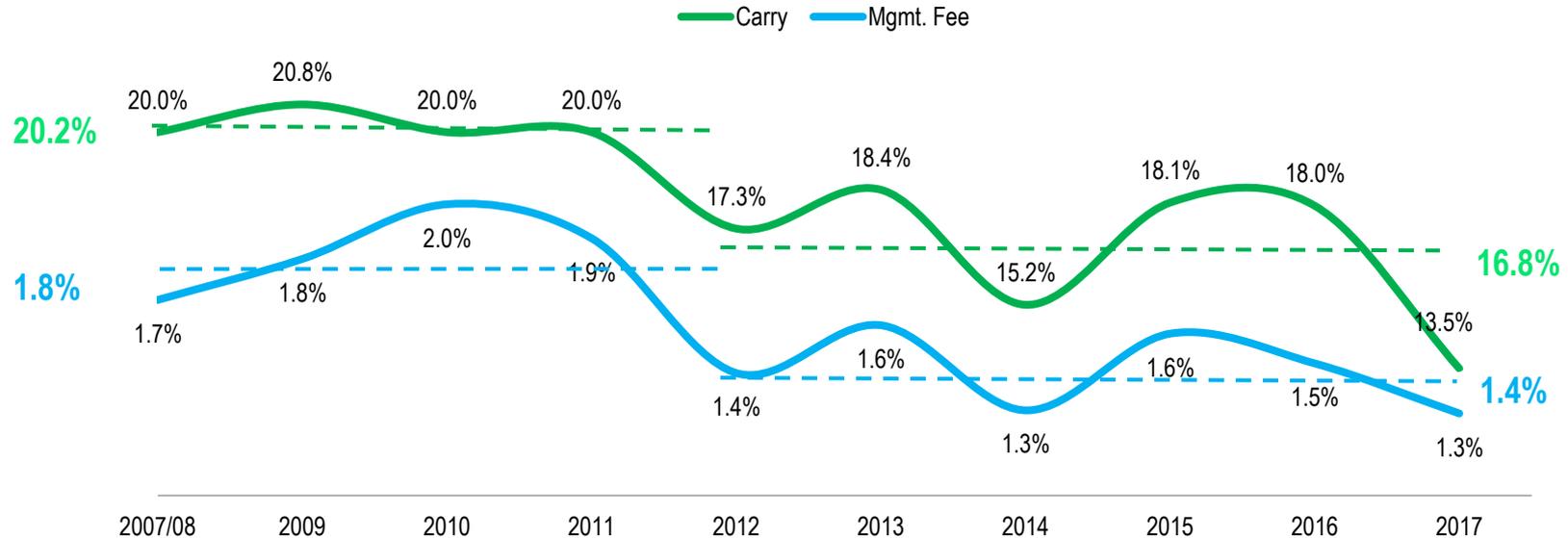


Private Equity Program Overview

Terms Evolution by Fiscal Year



Weighted Economic Terms - Buyouts



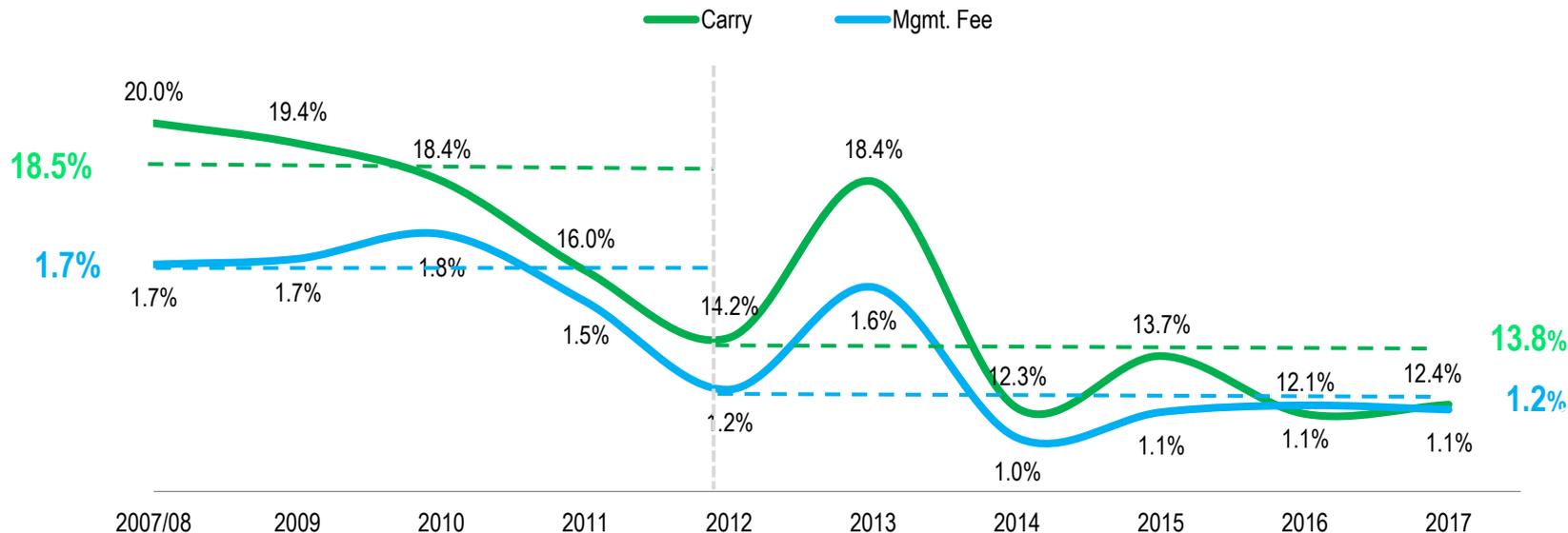
All values are internally determined by ERS and not the General Partners
Agenda item 9.1 - Meeting book dated December 12, 2017

Private Equity Program Overview

Terms Evolution by Fiscal Year



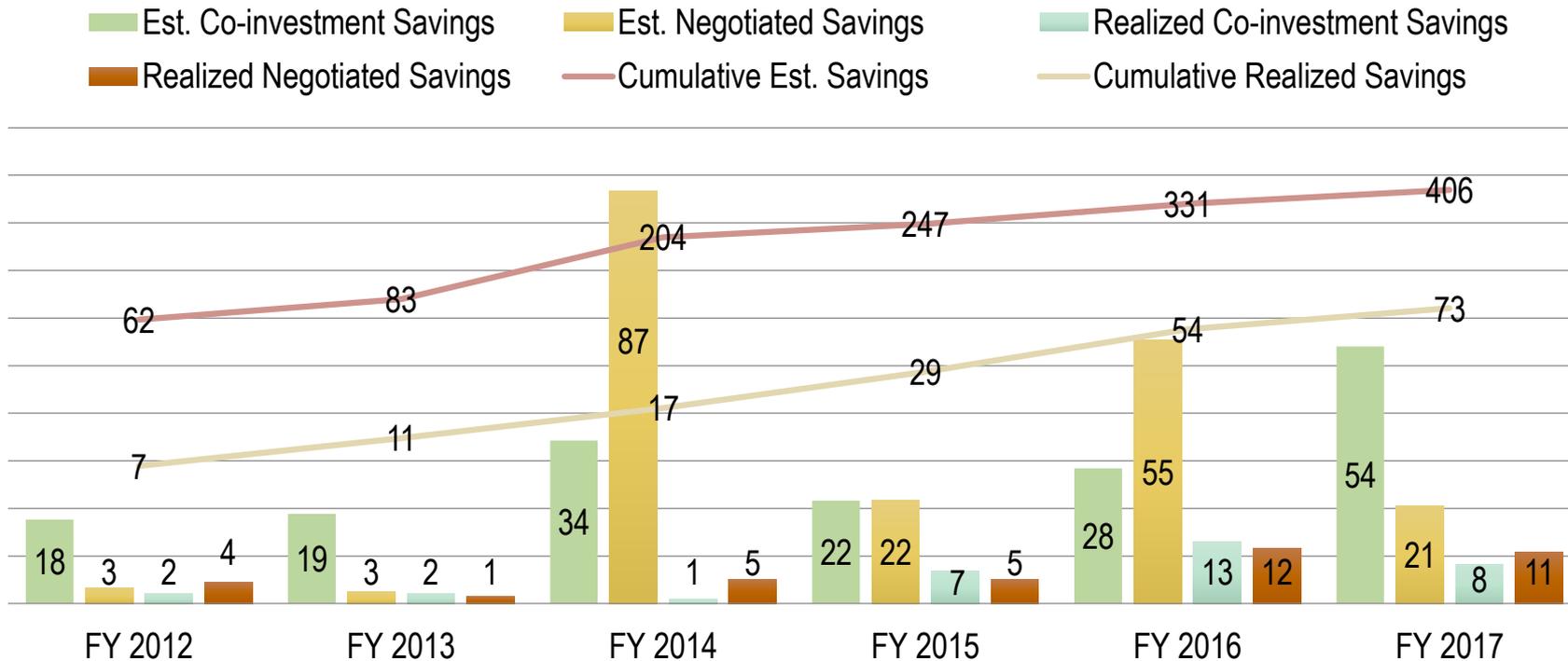
Weighted Economic Terms – All PE



All values are internally determined by ERS and not the General Partners
Agenda item 9.1 - Meeting book dated December 12, 2017

Private Equity Program Overview

Savings by Fiscal Year (Millions)



Private Equity Program Overview

Goals and Objectives for FYs 2017 & 2018



FY 2017

- Rebuild buyout portfolio
- Multiple Co-investments

FY 2018

- Secondaries Program
- Enhance Data & Reporting
- Execute on Tactical plan

Employees Retirement System of Texas

Private Equity Program Review & Market Outlook 2017



December 12-13, 2017

Attending Today

- Brad Young
 - *Managing Director, Head of Global Advisory Services*
- William (Billy) Charlton, Ph.D., CFA
 - *Managing Director, Head of Global Research & Analytics*

Agenda

- I. Pavilion Alternatives Group Update
- II. ERS Private Equity Program Update
- III. Private Equity Market Statistics & Outlook
- IV. Summary
- V. Appendix

I:

Pavilion Alternatives Group Update



Pavilion Financial Corporation

Broad platform of diverse resources provides deep experience and knowledge-sharing



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II:

ERS Private Equity Program Update

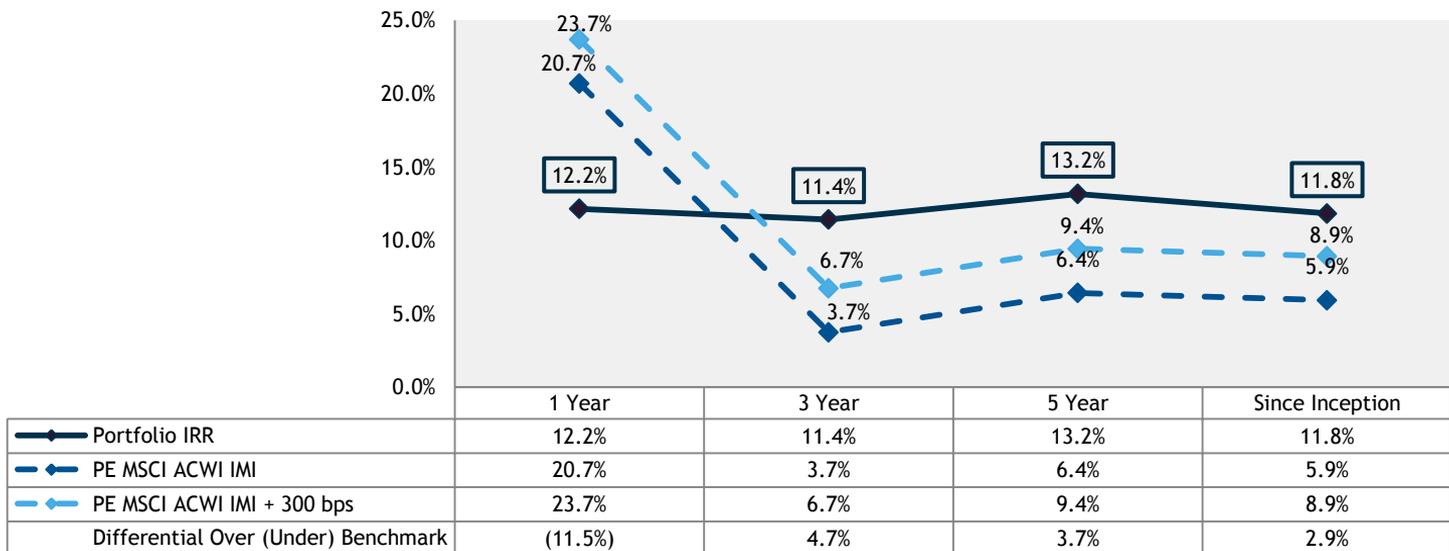


PAVILION

Comparison to Public Markets

The ERS private equity portfolio has outperformed public market equivalents over the longer investment horizons

Portfolio Performance Compared to Public Market Equivalents (PME)

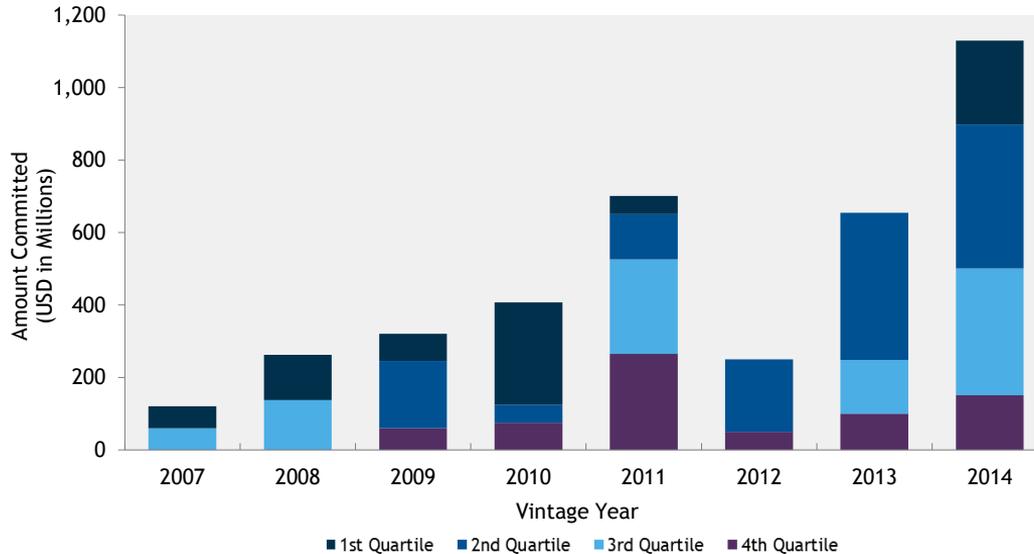


Figures use the Long Nickels PME method. This method runs an IRR using the original cash flows, but the ending value is the total of all the public market adjusted cash flows. The time frame used is since the inception of the Private Equity program on July 31, 2007. All 1, 3, 5, and 10 year figures are using cash flows from March 31, 2017 back until April 1 on the corresponding time frame. All figures are calculated using monthly aggregated cash flows.

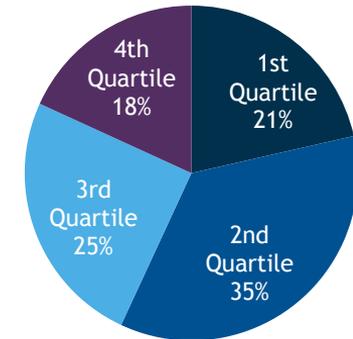
Portfolio Performance: Private Equity Funds

For the 2007-2014 vintage years, over 57% of funds in the ERS portfolio are ranked in the 1st or 2nd quartile as measured by total dollars committed

Portfolio Performance by Amount Committed, Quartile Ranking, and Vintage Year



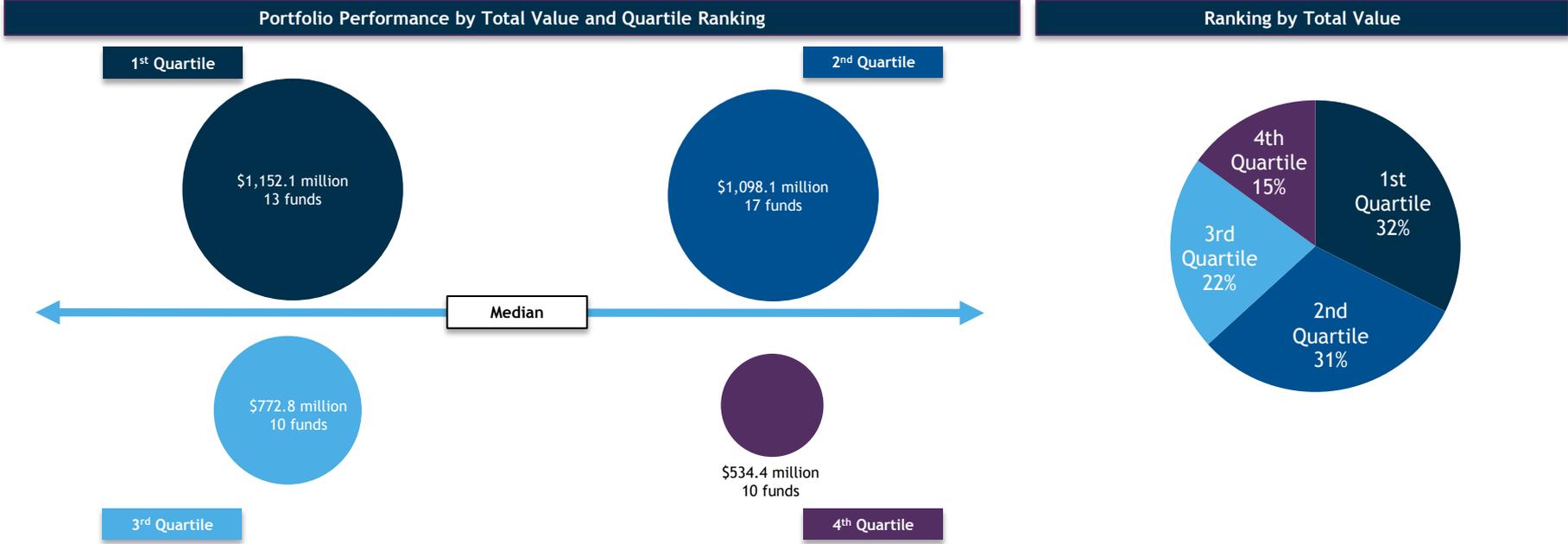
Ranking by Amount Committed



All figures as of March 31, 2017, and benchmark is Burgiss PrivateQ measured by TVPI. Only includes private equity funds with vintage years 2007-2014. Excludes infrastructure funds and direct co-investments.

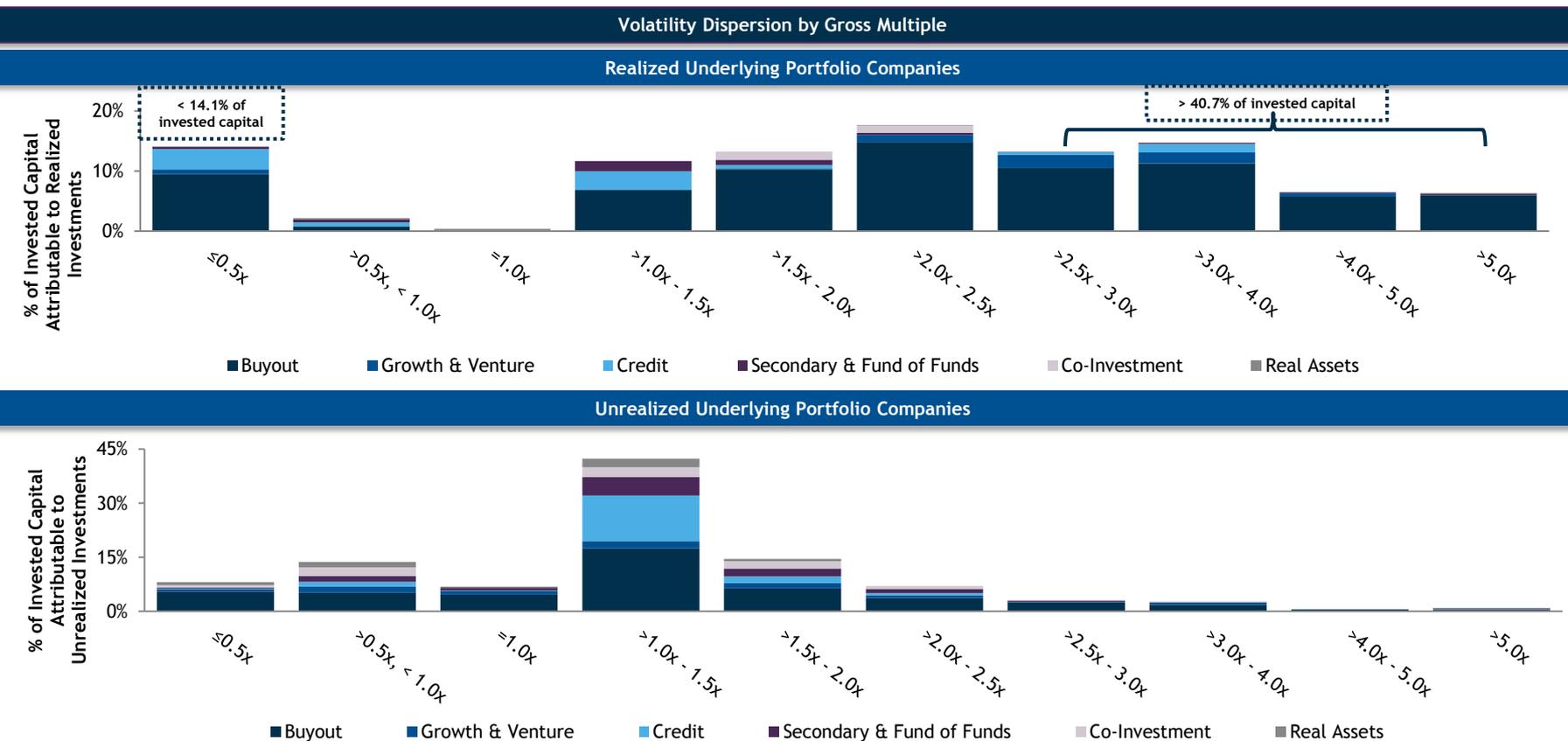
Portfolio Performance: Private Equity Funds

As measured by total value, approximately 63% of the funds in the ERS portfolio with vintages of 2007-2014 are in either the 1st or 2nd quartile



All figures as of March 31, 2017, and benchmark is Burgiss PrivateIQ measured by TVPI. Only includes private equity funds with vintage years 2007-2014. Excludes infrastructure funds and direct co-investments. Bubble size represents aggregate total value (NAV + distributions) by quartile.

Portfolio Performance: Underlying Holdings Analysis

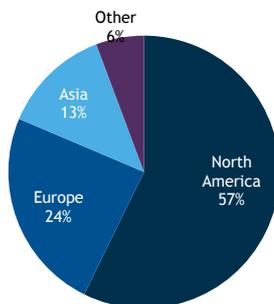


All figures as of March 31, 2017. Underlying companies for ERS PEIF I and ERS PEIF II have been classified as Fund of Funds. Includes co-investments.

Portfolio Performance: Underlying Holdings Analysis

Diversification and Performance

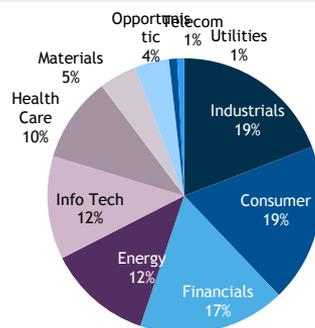
Remaining Value by Geography



Return by Geography

Geography	Realized		Unrealized		Total	
	Gross Gain / Loss	Gross Mult.	Gross Gain / Loss	Gross Mult.	Gross Gain / Loss	Gross Mult.
North America	\$ 563.3	2.53x	\$ 798.0	1.43x	\$ 1,361.3	1.61x
Europe	211.3	2.14x	351.7	1.42x	563.0	1.55x
Asia	40.0	1.87x	111.2	1.26x	151.2	1.32x
Other	9.4	1.95x	39.0	1.17x	48.4	1.21x
Grand Total	\$ 824.0	2.35x	\$ 1,299.8	1.38x	\$ 2,123.8	1.53x

Remaining Value by Industry



Return by Industry

Industry	Realized		Unrealized		Total	
	Gross Gain / Loss	Gross Mult.	Gross Gain / Loss	Gross Mult.	Gross Gain / Loss	Gross Mult.
Consumer	\$ 167.6	1.82x	\$ 177.1	1.25x	\$ 344.7	1.38x
Info Tech	81.5	2.09x	128.0	1.33x	209.4	1.46x
Health Care	89.8	2.66x	185.7	1.59x	275.4	1.75x
Industrials	125.0	2.33x	280.4	1.51x	405.5	1.63x
Financials	58.7	2.37x	235.7	1.36x	294.4	1.42x
Materials	223.0	3.67x	115.1	2.04x	338.1	2.74x
Energy	27.7	1.97x	74.5	1.18x	102.2	1.23x
Telecom	40.1	2.55x	9.2	1.28x	49.2	1.84x
Utilities	10.7	3.73x	5.6	1.18x	16.3	1.47x
Opportunistic	(0.0)	0.24x	88.6	1.46x	88.6	1.46x
Grand Total	\$ 824.0	2.35x	\$ 1,299.8	1.38x	\$ 2,123.8	1.53x

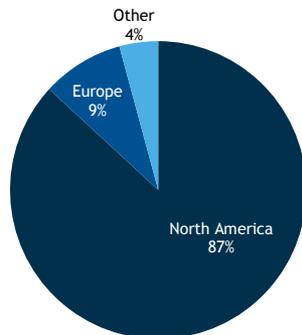
All figures are USD in millions as of March 31, 2017. Includes direct co-investments.

Portfolio Snapshot: Co-Investment Program

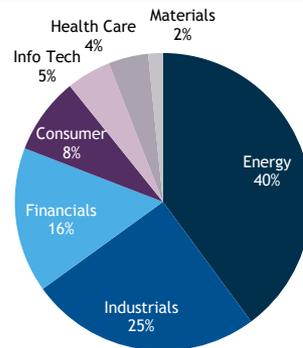
The ERS co-investment program is well-diversified across GPs, strategies and sectors, with an intentional weighting towards buyouts and North America

- From year-end 2011 thru Q1 2017, ERS has committed approximately \$425.9 million to 32 co-investments alongside 14 unique sponsors
- Nearly 58% of the co-investment commitments are allocated to buyout strategies
- Aside from The Carlyle Group, no single GP sponsor accounts for more than 11.5% of commitments
 - Carlyle accounts for approximately 24.9% of ERS' co-investment commitments, however these co-investments are diversified across two distinct strategies within the Carlyle platform
 - Approximately two-thirds of these co-investments are in energy assets and the remainder in financial services buyouts

Geographic Exposure by Committed Capital



Sector Exposure by Committed Capital

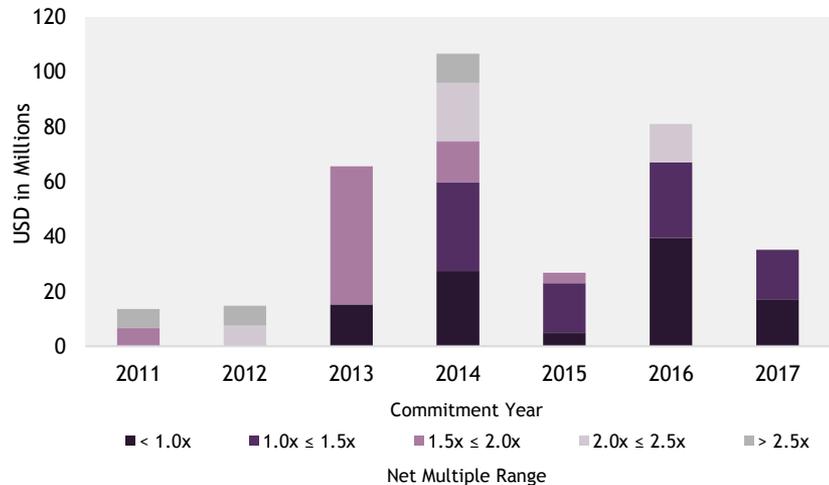


All figures as of March 31, 2017.

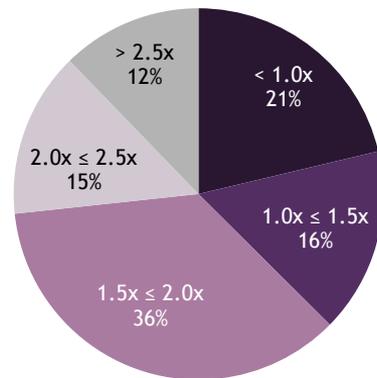
Portfolio Performance: Co-Investment Program

The ERS co-investment program is performing well and generating a 1.5x multiple as of March 31, 2017

Net Multiple by Amount Drawn and Commitment Year
(All Direct Co-Investments)



Net Multiple by Amount Drawn
(Only Includes Direct Co-Investments from 2011-2014)*



All figures as of March 31, 2017.

* Only includes co-investments made between 2011 and 2014 due to performance lag.

III:

Private Equity Market Statistics & Outlook



PAVILION

Private Equity Market Snapshot

Fundraising

- Private equity fundraising, especially for U.S. and global mega-funds, remains strong
- The average time to close funds continues to decline and the number of successful fundraises continues to increase

Deal Flow

- Private equity deal flow has remained flat in terms of value and decreased in terms of volume YoY

Pricing

- Pricing has remained robust in the U.S. with median EBITDA multiples of 10.5x
- Europe has seen a slight decline of EBITDA multiples to just under 9.0x

Credit Markets

- Both U.S. and Europe have strong credit markets with median debt levels of 5.9x in the U.S. and 4.7x in Europe

Asset Pricing

- Asset prices are expected to remain close to historical highs due to the increase in dry powder and the ready availability of debt

Returns

- Over longer investment horizons, private equity funds continue to generate returns above corresponding public equity markets

IV:

Summary



Summary

- The ERS private equity portfolio has consistently exceeded its investment benchmark over the longer investment horizons
- The ERS private equity portfolio is well diversified across geographies, sectors, and styles
- The ERS private equity portfolio is primarily populated with high quality fund managers
- The ERS co-investment program continues to provide concentrated exposure to portfolio companies while also decreasing the fees paid
- Pavilion continues to value its relationship with ERS

Questions?

Public Agenda Item #9.2

Proposed Revisions to the ERS Investment Policy:
Private Equity Guidelines and Procedures (**Action**)

December 12, 2017

Wesley Gipson, Director of Private Equity

Private Equity FY2018 Guidelines and Procedures

Staff Recommendation



- Recommended Revisions to Private Equity Guidelines and Procedures:
 - SECTION II.A. Propose to create stand alone guidelines for Secondaries and Energy and Natural Resources, removing them from umbrella Special Situations with the following allocation guideline revisions:
 - **Secondaries:** 5 to 30%
 - **Energy and Natural Resources:** 5 to 20%
 - **Special Situations:** 0 to 5%
 - **Buyouts:** 35 to 60% to account for increased Secondaries allocation

Questions?
(Action Item)

Public Agenda Item #9.3

Consideration of Proposed
Private Equity Annual Tactical Plan for Fiscal Year 2018 - (**Action**)

December 12, 2017

Wesley Gipson, Director of Private Equity

Private Equity FY2018 Tactical Plan

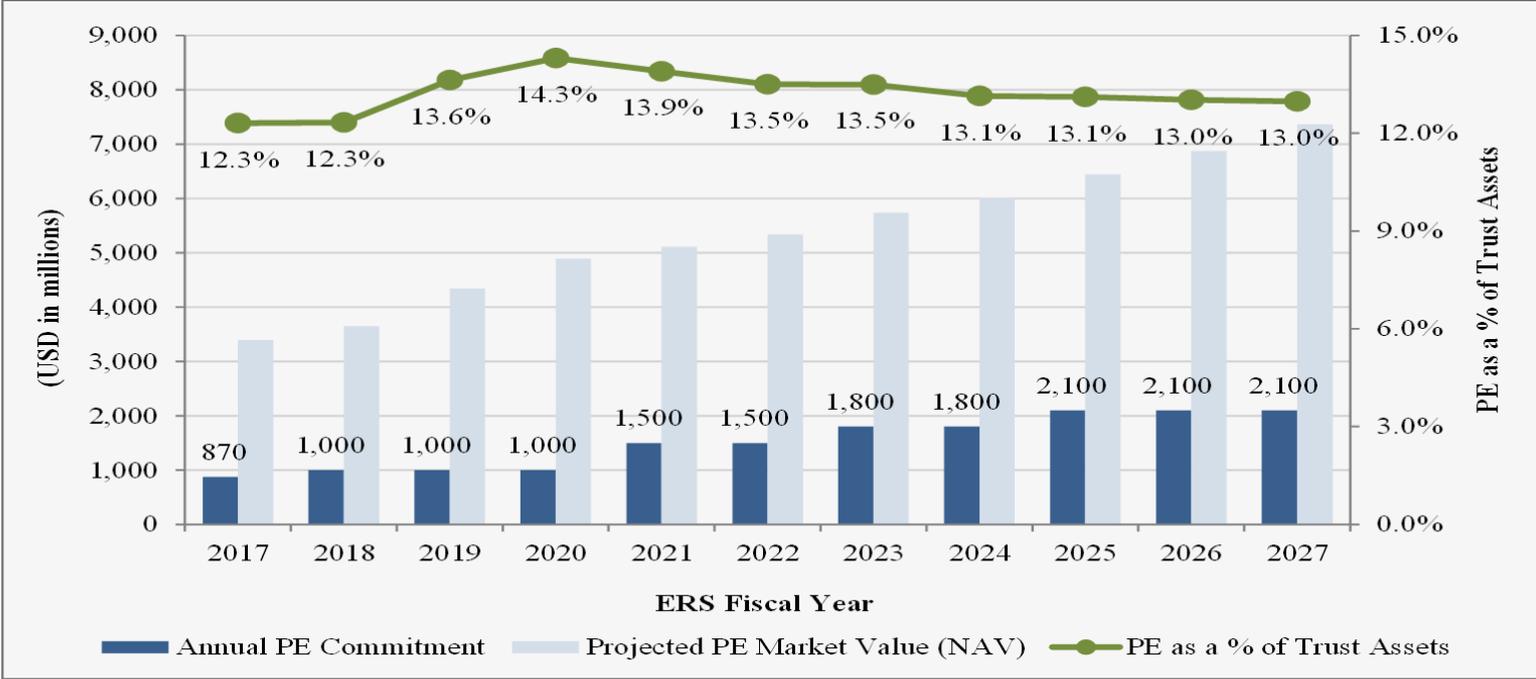
IAC and Board Approval Request



- Review and consideration of ERS Private Equity Annual Tactical Plan for FY2018:
 - No changes to Interim Tactical Plan approved at August BOT
 - Propose to invest in 6-10 funds with commitments totaling \$1.0 billion (including co-investments)
 - Commitment target range +/- 25% (\$0.75B - \$1.25B)

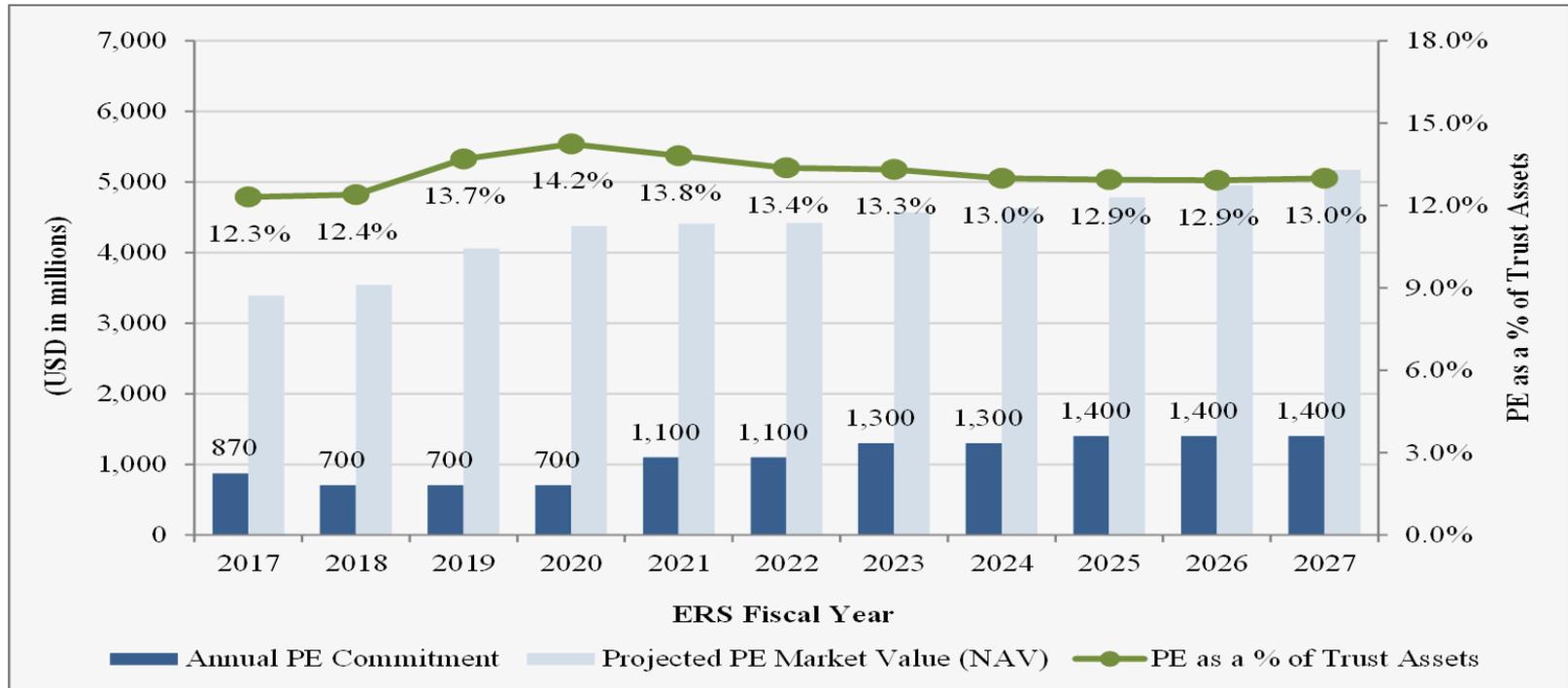
Private Equity FY2018 Tactical Plan

7.5% Trust Growth



Private Equity FY2018 Tactical Plan

Trust Growth Sensitivity - 3.75% (Conservative Scenario)



Questions?
(Action Item)

Public Agenda Item #10.1

Discussion of the Risk Management Program

December 12, 2017

Carlos Chujoy, CFA, Portfolio Manager

Stuart Williams, CFA, Portfolio Manager

Risk Management Program

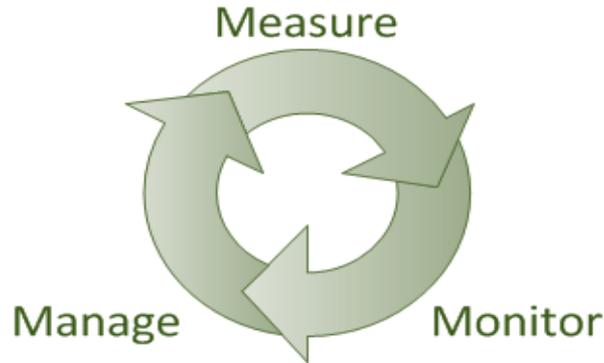
Agenda - Key Topics



- Risk Management Process
- Overview of Market Signals
- Review of Trust Level Risk
- Update on FY 2017 Initiatives
- Outlook for FY 2018

Risk Management Program

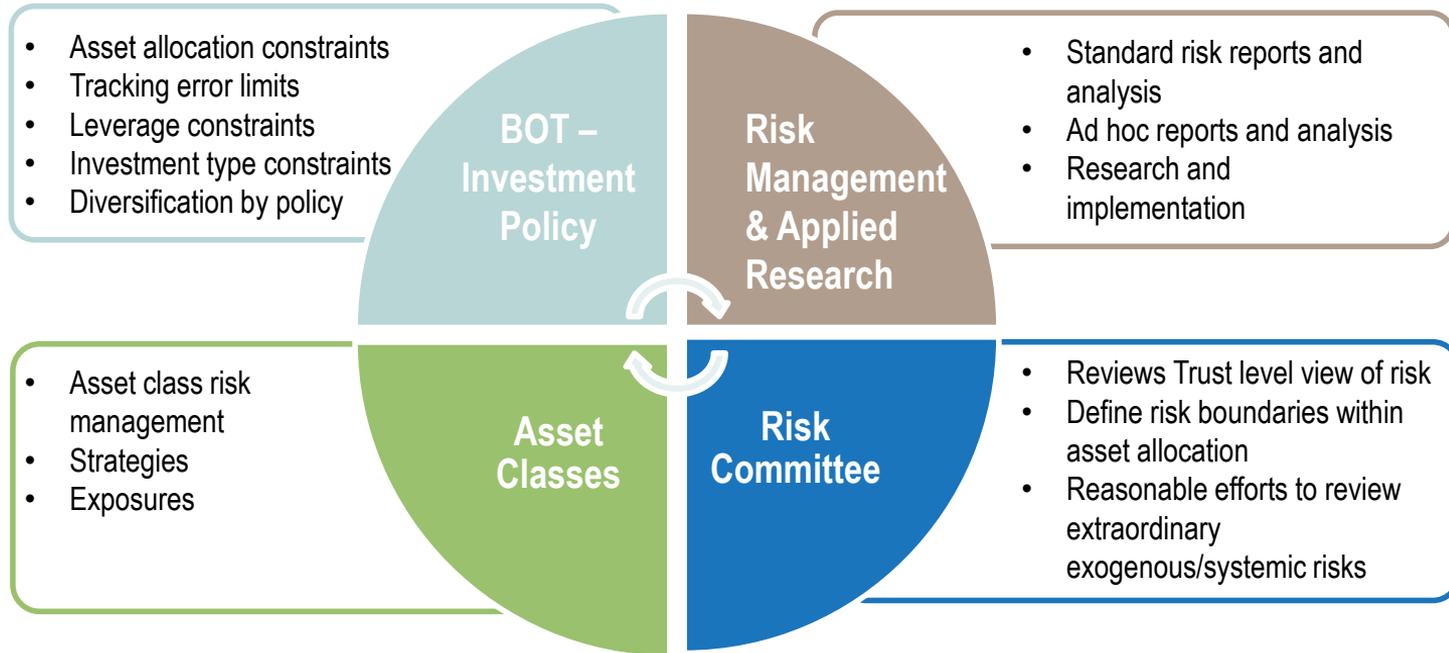
Risk Management Process



- Identify and **measure** salient investment risks relevant to the trust
- **Monitor** risks (define risk boundaries and tolerances)
- Respond to and **manage** investment risks

Risk Management Program

Integrated Aspects of Risk Management



Risk Management Program

Team



RMAR Team

- **Carlos Chujoy, CFA,**
Portfolio Manager
- **Stuart Williams, CFA,**
Portfolio Manager
- **Joy Seth, CFA,**
Investment Analyst
- **Satitpong Chantarajirawong, CFA,**
Investment Analyst
- **Yu Tang,**
Investment Analyst

Voting Risk Committee Members

- **Tom Tull, CFA,**
CIO
- **Sharmila Kassam, CPA, Esq.,**
Deputy CIO
- **Carlos Chujoy, CFA,**
Portfolio Manager
- **Leighton Shantz, CFA,**
Director of Fixed Income
- **John Streun, CFA,**
Director of Public Equities
- **Anthony Curtiss, CFA,**
Director of Hedge Funds

Risk Management Program

Asset Class and Trust Risk Monitoring



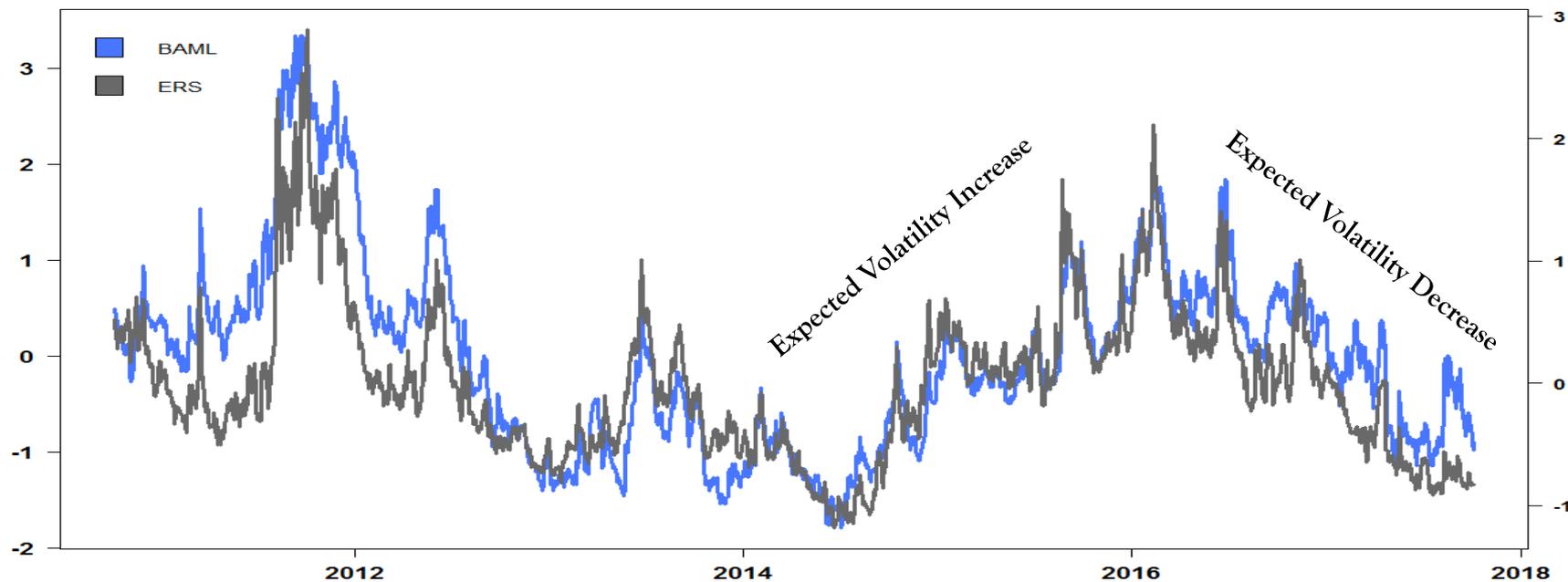
	Asset Allocation	Active Risk	Tail Risk	Sector	Factor Risk	Currency	Stress Test	Financial Leverage	Derivatives	Counterparty	Liquidity
Global Equity											
Public Equity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Private Equity	✓			✓		✓		✓		✓	✓
Fixed Income											
Global Credit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rates	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cash	✓	✓	✓		✓	✓			✓	✓	
Real Assets - Private	✓			✓		✓			✓	✓	
Real Assets - REITS	✓	✓		✓	✓	✓			✓	✓	
Absolute Return	✓		✓	✓	✓		✓		✓	✓	
Overall Trust	✓	✓	✓	✗	✓	✗	✓	✗	✓	✗	✓
	✓	risk is currently measured and monitored									
	✗	Tools and standards under development									
		not currently monitored or available									

Risk Management Program

Overview of Market Signals



Global Financial Stress Indicators



Risk Management Program

Overview of Market Signals



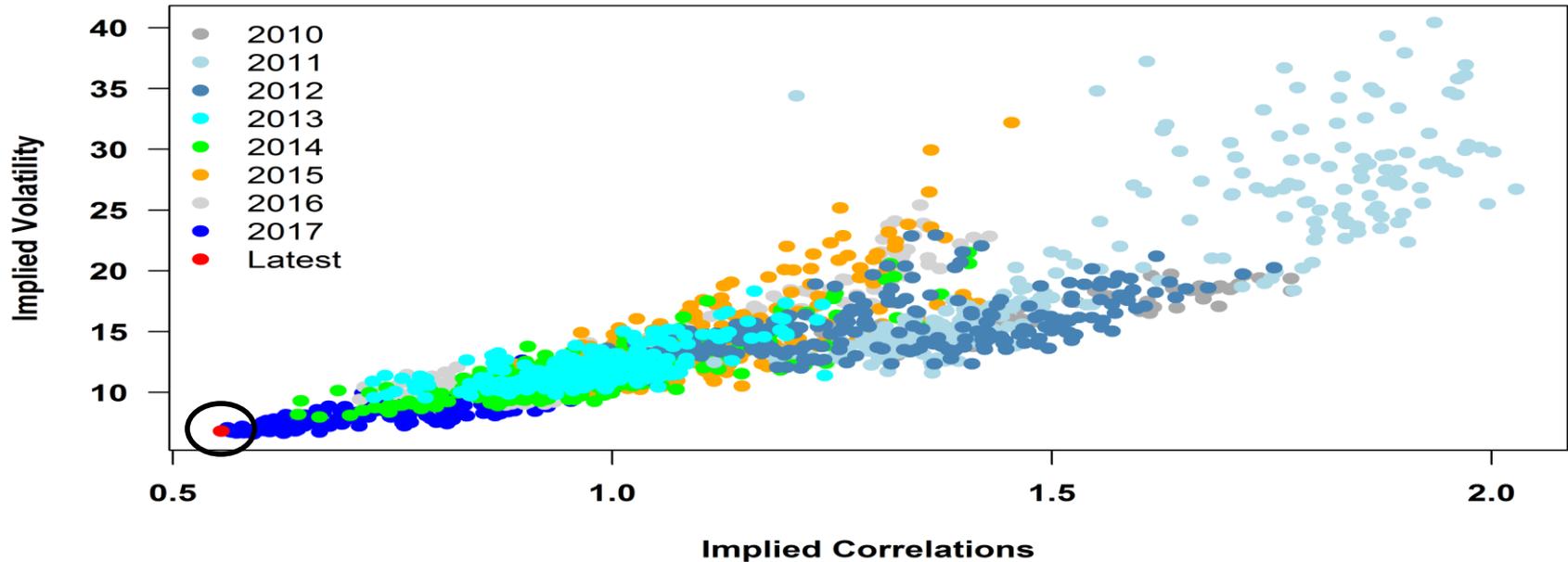
Cross Asset Class Stress Monitor			
Asset	Min	Current	Max
Equity	-1.44		4.34
Credit	-1.54		5.21
Rates	-1.8		3.26
Real Estate	-0.95		5.38
Commodity	-1.48		3.43
Currency	-1.46		2.11
Credit Default Swap	-1.46		2.26
Global Financial Stress Indicator	-1.82		3.38

Risk Management Program

Overview of Market Signals



Implied Correlations and Volatility at all time lows for the S&P500



Risk Management Program

FY2017 in Review



What could break this low volatility, low correlation environment?

- **More Fed rate hikes than the markets expects in 2018**
Run the risk of higher real rates and tightening financial conditions
- **Sharp falls in surprise indices**
A China growth shock could send rippling effects throughout global markets
- **Geopolitical risk coupled with economic concerns**
Cause volatility to be more than just a temporary issue
- **Concentration risk in certain parts of the market/portfolios**
- **Policy failure and return to deflationary regime (loss of political support)**
Fiscal spending, tax cuts, health care

Risk Management Program

FY2018 Outlook



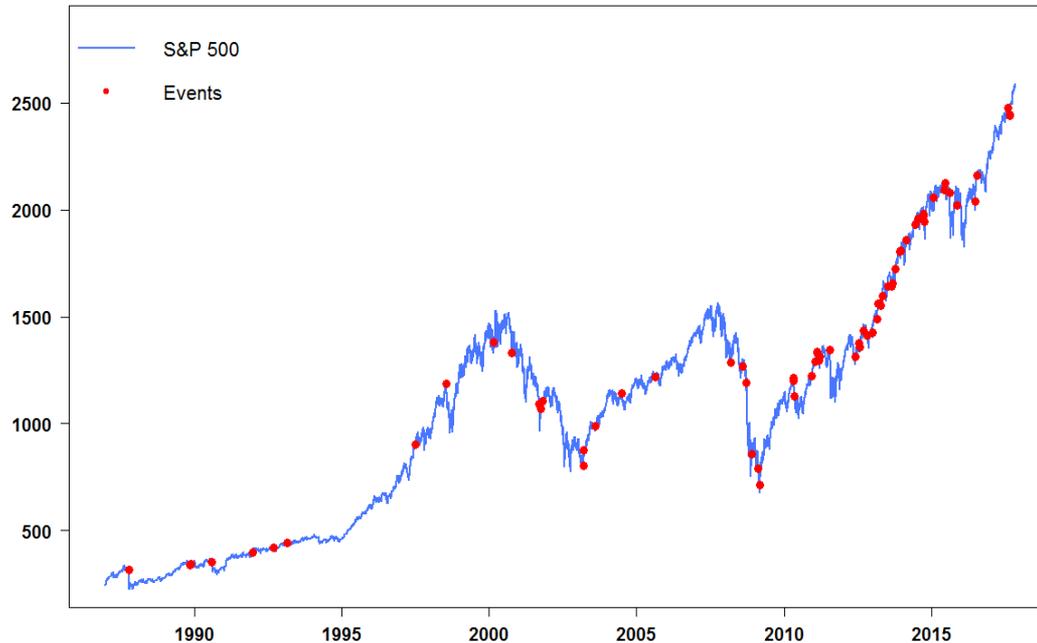
	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Mar 2018	June 2018	Dec 2018
	U.S. POLICY FAILURE						
Monetary and Fiscal Catalysts	FOMC	ECB		FOMC		ECB	
					FOMC RATE HIKE		
	TIGHTENING GLOBAL FINANCIAL CONDITIONS						
	RAISED EXPECTATION FOR RATE HIKES						
	CONTINUED EUROZONE GROWTH						
Economic Growth	FORECAST GLOBAL GROWTH RISING						
	EUROPE GROWTH			US GROWTH ABOVE POTENTIAL			
	CHINA GROWTH GRADUAL SLOWDOWN						
	US-Korea Tension				ITALY ELECTION		
Geo-Political Risk					CHINA POLICY CHANGE		
	German Election				US DEBT CEILING		
KEY :	Volatility Dampener	Lower Risk	Medium Risk	Higher Risk			

Risk Management Program

FY2017 in Review



Geopolitical Events and Performance of S&P500



Major Events

- Frequency of events increased post the financial crisis in 2008 leading to more uncertainty
- Most recent geopolitical events have been non-material
- Markets are driven primarily by underlying fundamentals

Risk Management Program

FY2017 Review of Trust Level Risk



Asset Class	Assets Under Management	Weight	Excess Weight	Annualized SD	T12M Return	T12M Excess Return	Annualized Return	Annualized Excess Return	IR	SR	TE	Beta	R^2
Total Fund	\$27,797,322,053	100.0	NA	5.45	12.15	1.07	5.88	0.23	0.15	1.02	1.54	0.84	95.53
Return Seeking Assets	\$22,544,049,847	81.1	4.44	7.25	15.21	1.10	6.86	0.23	0.11	0.90	2.03	0.83	96.10
Risk Reduction	\$5,253,272,206	18.9	-4.44	1.52	1.76	0.72	2.33	0.31	0.62	1.32	0.51	0.85	91.62

IR, Information Ratio – Ratio of portfolio returns above the returns of the benchmark divided by the volatility of returns.

SR, Sharpe Ratio – Average return earned in excess of the risk free rate per unit of volatility.

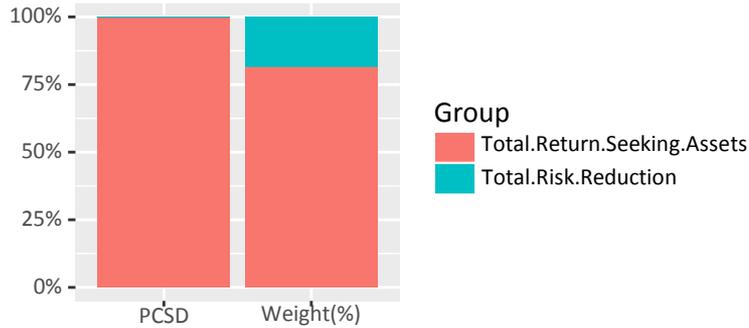
TE, Tracking Error – Difference between a portfolios returns and the benchmark.

Risk Management Program

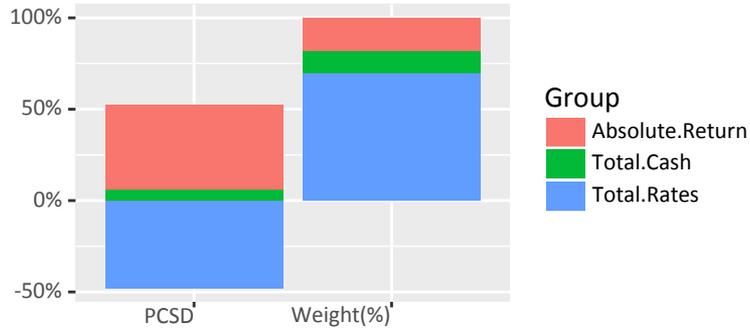
FY2017 Review of Trust Level Risk



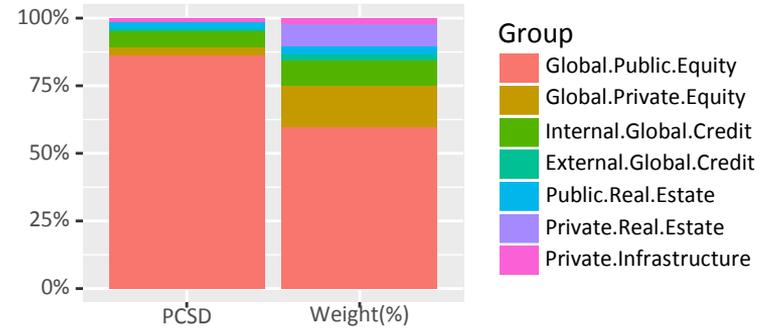
Return Seeking vs Risk Mitigating



Risk Mitigating



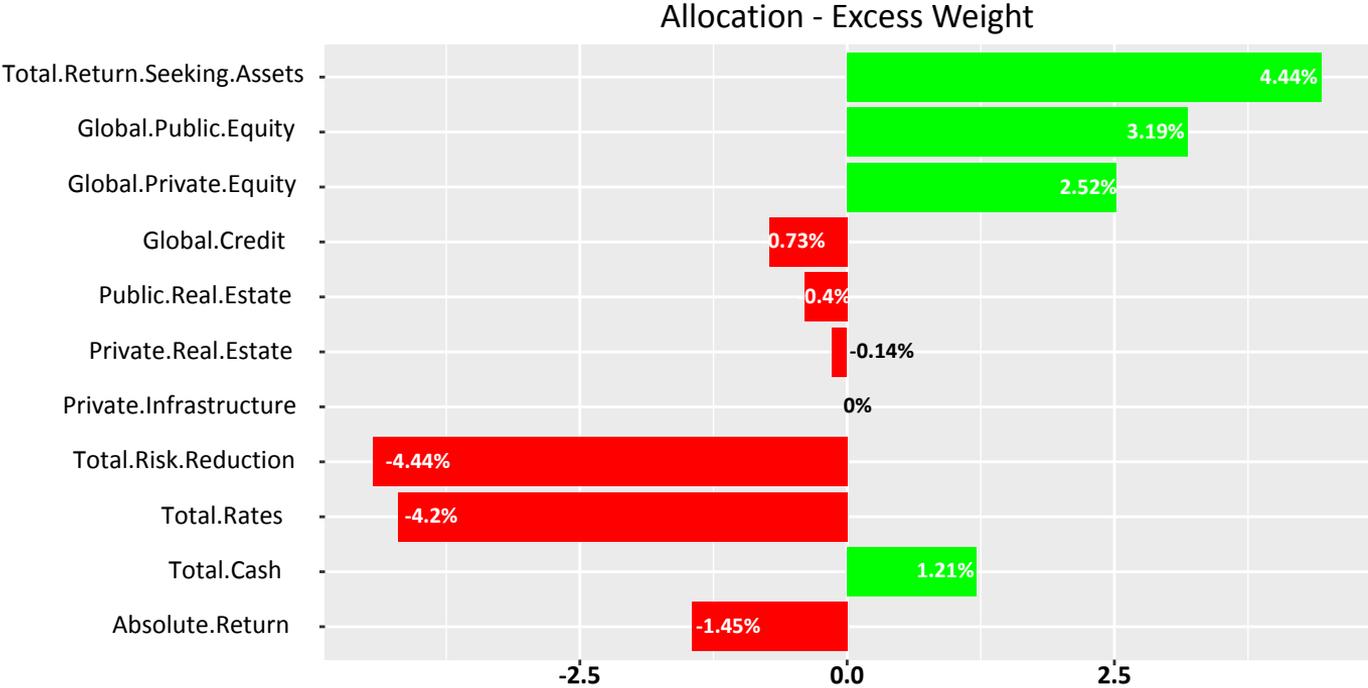
Return Seeking



PCSD: Percentage Contribution to Standard Deviation (Volatility)

Risk Management Program

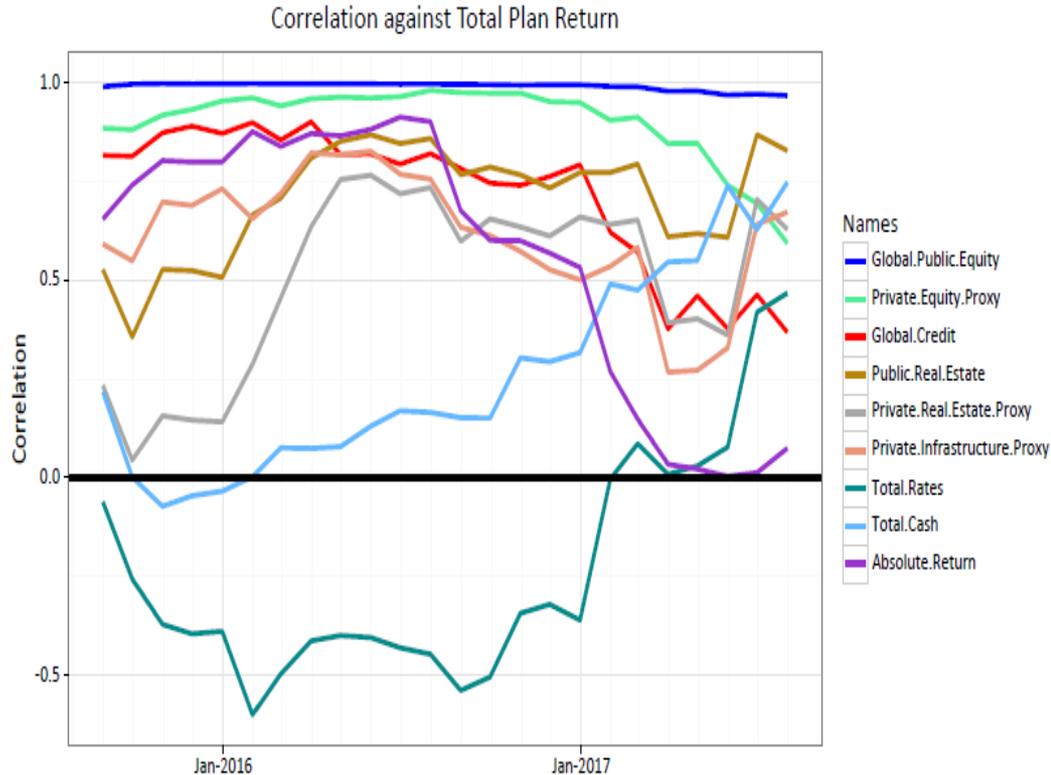
FY2018 Review of Trust Level Risk



Source: BNY Mellon, ERS. Data as of 9/30/2017

Risk Management Program

FY2017 Review of Trust Level Risk



Takeaways

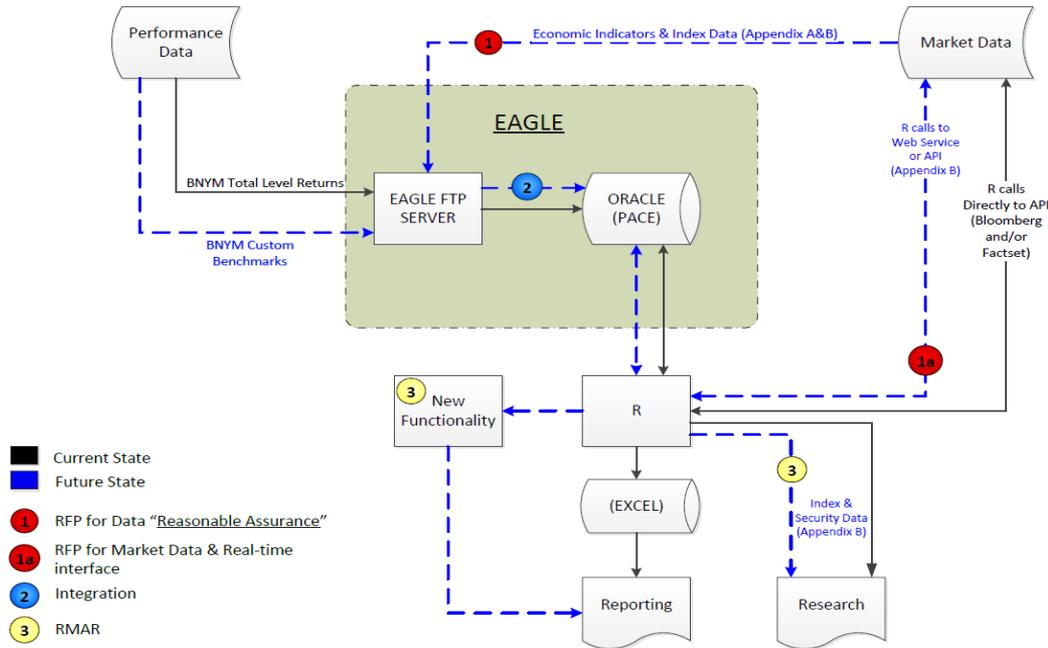
- Global Public Equity has the highest correlation to the Trust
- The correlation of low volatility assets to the Trust increased due to Trust volatility decreasing
- The repositioning of assets within the Absolute Return portfolio lowered its correlation to Trust returns

Risk Management Program

Update on FY 2017 Initiatives



Risk Management & Applied Research Data Flow



Agenda item 10.1 - Meeting book dated December 12, 2017

Big Data Project

- Goal to create a centralized database for all asset classes
- Required to feed internally developed applications (ie: risk, tactical asset allocation and derivatives) into one database
- Resulting in ERS owning the data, ensuring control, increased efficiency

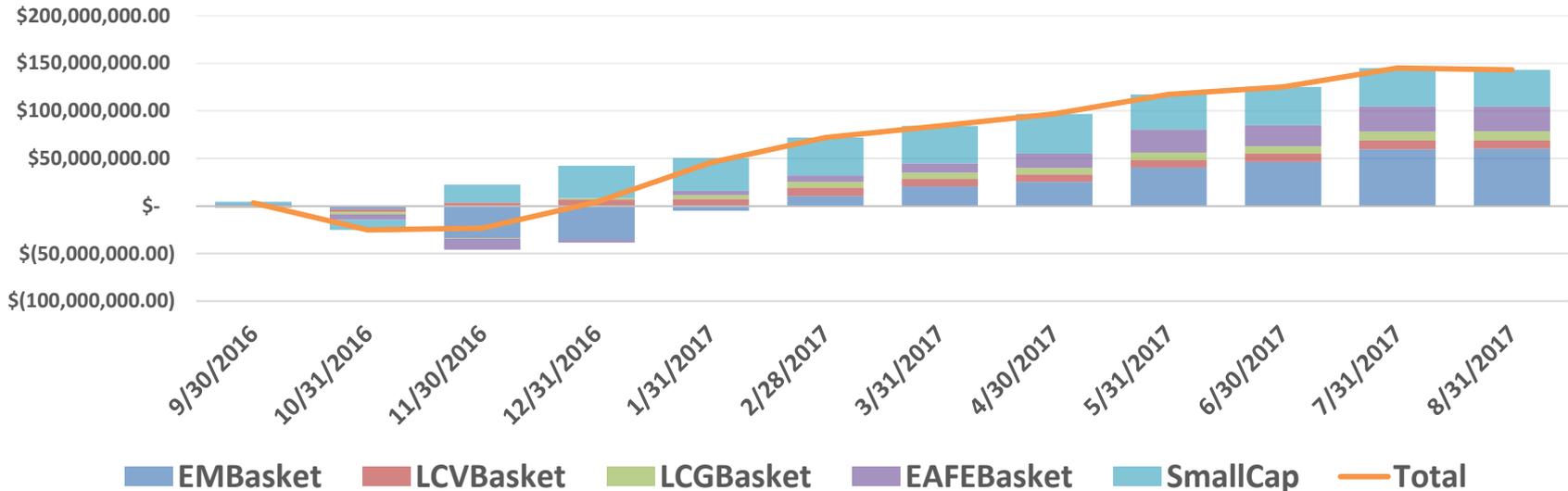
Risk Management Program

Update on FY 2017 Initiatives



Beta Management Tactical Asset Allocation Model – Paper Portfolio Results

CUMULATIVE PROFIT AND LOSS



Risk Management Program

Update on FY 2017 Initiatives



Equity Portfolio Management + Options Overlay

	Tactical Quantitative Fund Options (Paper Portfolio)	Tactical Quantitative Fund	S & P 500
Annualized Returns	18.19%	17.21%	16.23%
Annualized SD	8.61%	9.35%	8.33%
Max Drawdown	-3.39%	-4.21%	-4.34%
Annualized Sharpe Ratio	2.11	1.84	1.94
Beta	0.94	1.03	1.00

Risk Management Program

Outlook for FY 2018



- Dedicate time to perform deeper cross asset class analysis
- Augment the risk management capabilities by incorporating tail hedging and scenario analysis
- Integrate ERS' database with internally developed systems
- Develop systematic investment strategies for risk and exposure management

Questions?

Public Agenda Item #11.1

ERS' Emerging Manager Program:
Market Update and Program Overview

December 12, 2017

Sharmila Kassam, CPA, Deputy Chief Investment Officer

Panayiotis Lambropoulos, CFA, CAIA, FRM, Hedge Fund Portfolio Manager

Emerging Manager Program

Agenda



- Background
- Investments and Commitments as of September 30, 2017
- Calendar Year 2017 Highlights
- Calendar Year 2018 Initiatives

Emerging Manager Program

Background



Emerging managers, as defined in Statute, are investment managers with assets under management of \$2 billion or less.

	Public Equity	Private Equity	Private Real Estate	Hedge Funds	Fixed Income
Current Formal EM Program	Yes	Yes	Yes	No	No
Proposed Program Structure	Hybrid	Hybrid	Hybrid	Direct	Direct
EM Requirements					
Firm AUM	< \$2 billion	< \$2 billion	< \$2 billion	< \$2 billion	< \$2 billion
Track Record	3 Years	Prefer 3 Years	Prefer 3 Years	3 Years	3 Years
Fund	n/a	I, II, III	I, II, III	n/a	n/a
Fund Size	n/a	< \$1 billion	< \$500 million	n/a	n/a

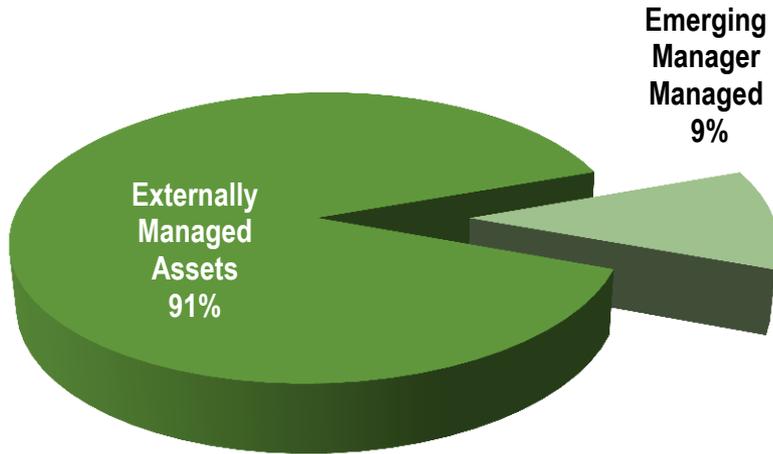
Staff has determined that, over the long term, inclusion of emerging managers should enhance and diversify ERS' portfolio and complement ERS' internal investment management.

Emerging Manager Program

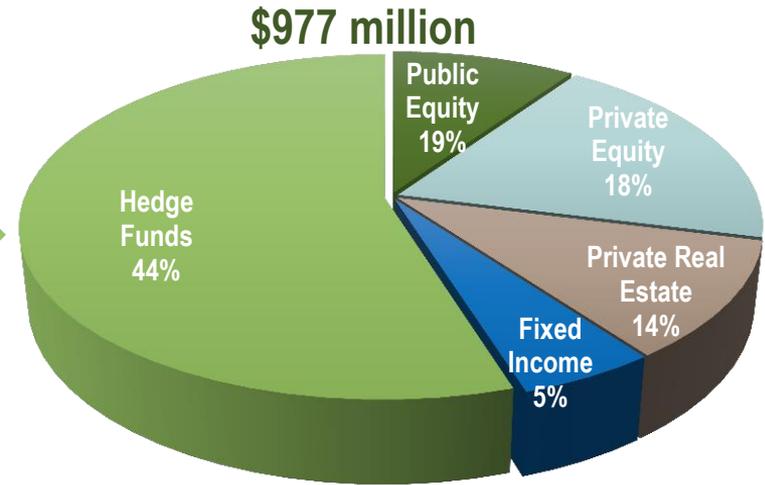
Investments and Commitments as of September 30, 2017



ERS' Total Externally Managed Assets
\$10.8 billion



Current Allocation by Asset Class



- Public Equity
- Private Equity
- Private Real Estate
- Fixed Income
- Hedge Funds

Emerging Manager Program

Calendar Year 2017 Highlights



- Refocused Public Equity Emerging Manager Program to better complement internally managed portfolios – international small cap focus
- Continued industry outreach and exposure at conferences seeking to discuss best practices and highlight performance contribution of emerging manager programs
- Dedicated efforts to building a Hedge Fund Emerging Manager Program

Emerging Manager Program

Performance



Private Real Estate	Net IRR (09/30) Since Inception	Private Equity	Net IRR (09/30) Since Inception	Global Public Equities	Time Weighted Returns - Gross ¹ (09/30) Since Inception
Total Emerging Manager Portfolio: inception – December 2010	17.44%	Total Emerging Manager Portfolio: inception - November 2010	18.52%	Total Emerging Manager Portfolio: inception - February 2017	21.38%
Total Private Real Estate Portfolio	12.88%	Total Private Equity Portfolio	11.77%		

Source: The Burgiss Group, LLC

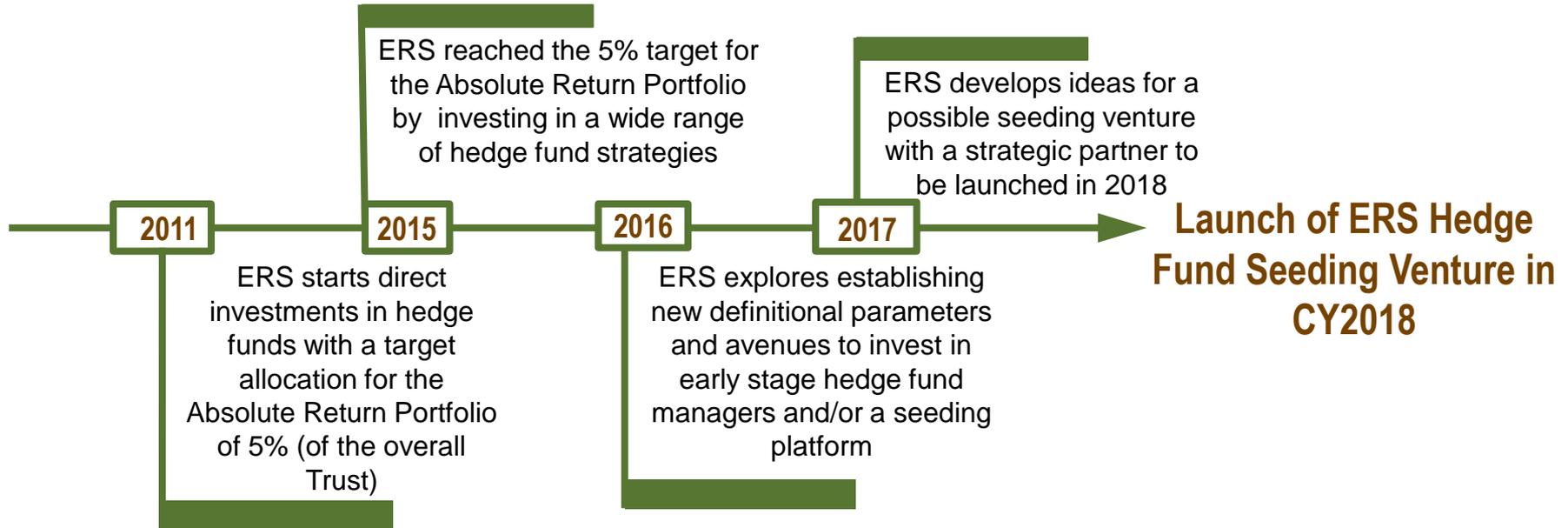
Source: The Burgiss Group, LLC

Source: BNY Mellon

1: Gross returns used as new
mandate has not paid out annual
performance fee

Hedge Fund Program Highlight

Hedge Fund Program Highlight - *Program Development*



Hedge Fund – Emerging Manager Program: *Paths for Consideration*



Stay Internal

Pros – Seek out managers suited for ERS’ investment objective by continuing to build on existing internal database and intellectual capital

Cons – Limited bandwidth and sourcing capability (especially internationally)

Limited operational infrastructure related to managed accounts

Partnership via a Seeding Venture

Objective – Customized to align internal goals & external resources through a true Partnership

Opportunities – Benefit from a global network of external resources without sacrificing economics/control

- Build an internal farm team
- Create another source of “alpha”
- Synthetically extend internal staff bandwidth

Challenges – Define and execute new model accomplishing the objective

- Integrate new and innovative value-centric model on the heels of a bold and visionary direction

Go External

Pros – Leverage additional investment and operational resources (especially internationally)

Cons – Less customized for ERS (mainly off the shelf products)

Structures/Products are typically more expensive fund of funds

Emerging Manager Program

Key Elements For Success



- Be Early
- Be Influential
- Develop a True Partnership
- Provide Capital That Meets Necessary Needs
- Make Impactful Investing And Commitment
- Provide Continued Support If Managers Perform
- Actively Participate in the Institutionalization of the Business

Emerging Manager Program

Calendar Year 2018 Initiatives



- Refine the process for emerging managers to have access to ERS staff
- **2018 REEM Conference** (January 10-11, 2018)
- **ERS Inaugural Open House for Emerging Managers** (February 1, 2018)
- **2018 ERS & TRS Emerging Manager Conference** (February 2, 2018)
- Focus on direct relationships with emerging managers in ERS portfolios
- Promote emerging manager program best practices

Questions?

(Action Item)

Public Agenda Item #12.1

ERS Investment Policy :

Proposed Opportunistic Credit Guidelines and Procedures – (**Action**)

December 12, 2017

Sharmila Kassam, CPA, Deputy CIO
Anthony Curtiss, CFA, Director of Hedge Funds

Current Asset Allocation

Introduction of Opportunistic Credit



Implementation Timeline	FY2017	1-2 Years	3-4 Years
Asset Class	Prior Allocation	Interim	Final
Global Equity	45.0%	40.0%	37.0%
Private Equity	10.0%	12.0%	13.0%
Global Credit*	10.0%	11.0%	11.0%
Real Estate**	10.0%	11.0%	12.0%
Infrastructure	4.0%	6.0%	7.0%
Opportunistic Credit***	--	2.0%	3.0%
Total Return-Seeking Assets	79.0%	82.0%	83.0%
Rates	15.0%	12.0%	11.0%
Absolute Return	5.0%	5.0%	5.0%
Cash	1.0%	1.0%	1.0%
Total Risk-Reducing Assets	21.0%	18.0%	17.0%
Expected Return (Median)	7.0%	7.1%	7.2%
Expected Risk (Volatility)	12.0%	11.7%	11.6%
Sharpe Ratio (Measure of Risk-Adj. Return)	0.383	0.403	0.413
Liquid Assets****	74%	67%	63%

* Diversified (7% high yield and 4% EMD); Enhanced Return (7% high yield and 4% EMD)

** Diversified (8% private real estate and 3% listed); Enhanced Return (9% private real estate and 3% listed)

*** Diversified (1% private credit and 1% real estate debt); Enhanced Return (1.5% private credit and 1.5% real estate debt)

**** Liquidity – Global Equity, Global Credit, Rates, and Cash (noting that certain satellite illiquid investments in Global Credit and Real Estate includes REITs that are liquid)

Opportunistic Credit –

What is it?



- Opportunistic credit is a unique approach to investing within the credit markets.
- Flexible mandate to identify unique and niche opportunities across the credit spectrum.
- Private credit and opportunistic credit can sometimes be used interchangeably. Although, private credit is often associated with direct lending which is a sub-strategy within opportunistic credit.
- In comparison to liquid market solutions, it could be compared to an unconstrained bond fund.

Opportunistic Credit –

Why does ERS need it?



- Given the current credit cycle, private opportunities are potentially more attractive relative to public markets.
- Opportunities within private markets occur primarily from the following: structural issues (i.e. banks not lending and Basel III), excess return from illiquid versus liquid, and market dislocations.
- The strategy sleeve can allow ERS to allocate to unique opportunities that do not neatly fit into more traditional asset classes. Hence, it can act as a complement to existing exposures.

Opportunistic Credit –

How does ERS invest?



- The mandate is flexibly structured through private market investment vehicles.
- In most instances, capital is committed and drawn over a specified period of time.
- At some point in time, the investment vehicle matures and starts returning capital over time. Depending on the strategy, distributions may be periodically received over its life (derisking the initial investment).
- Expectations are for most investments to be self-liquidating; extension risk is limited.

Opportunistic Credit

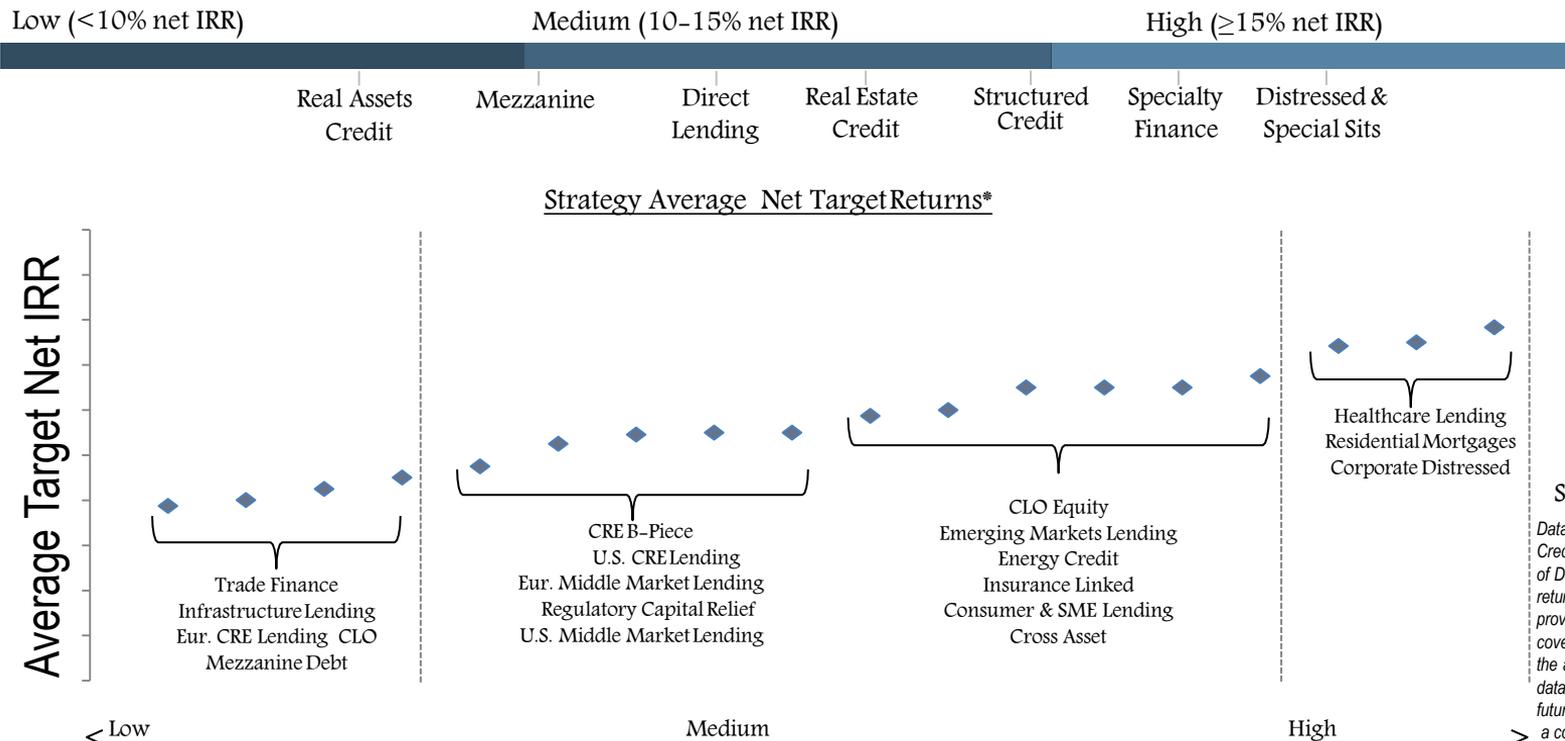
Diversification Across Strategies



Direct Lending	Distressed & Special Situations	Specialty Finance	Structured Credit	Real Estate Credit	Real Assets Credit
U.S. Direct Lending Sr. Focus Opportunistic Lower Middle Market - <i>(sponsored focus)</i> Lower Middle Market - <i>(non-sponsored focus)</i> Private BDCs	Corporate Distressed U.S. European Emerging Markets Global Single Trade Stressed Credit Real Estate Distressed U.S. European Global Cross-Asset U.S. European Emerging Markets Global Mezzanine U.S. Mezzanine Upper Middle Market Middle Market Lower Middle Market European Mezzanine	Consumer & SME Lending Marketplace Finance Lender/Platform Finance Factoring & Receivables Regulatory Capital Relief Royalties Healthcare Lending Venture Lending Insurance Linked Merger Appraisal Rights	CLO CLO Debt CLO Multi CLO Risk Retention 3 rd Party CLO Equity CRE Non-Agency CRE B-Piece Agency CRE B-Piece CMBS/CRE RMBS Consumer ABS Esoteric ABS Europe Structured Credit Structured Credit Multi-Sector	U.S. CRE Lending Bridge Lending Transitional Lending Core Lending European CRE Lending Bridge Lending Transitional Lending Core Lending Emerging Markets CRE Lending Residential Mortgages Residential NPLs Single Family Rental Mortgage Servicing Rights Residential Origination	Infrastructure Lending Sr. Focus Mezz Focus Energy Credit Direct Lending Opportunistic Credit Trade Finance Metals & Mining Finance Agriculture Credit Aviation Leasing Lending Opportunistic
U.S. Direct Lending Sr. Focus Opportunistic Lower Middle Market - <i>(sponsored focus)</i> Lower Middle Market - <i>(non-sponsored focus)</i> Private BDCs	U.S. Direct Lending Sr. Focus Opportunistic Lower Middle Market Country-Specific Funds	Emerging Markets Lending Asia Lending Africa Lending CEE/Middle East Lending Latin America Lending Pan-EM Lending	Global Middle Market Lending	SBIC Lending	

Opportunistic Credit

Diversity of Private Credit and Opportunistic Strategies



Source: **Aksia**

Data is sourced from Aksia's internal Private Credit & Opportunistic Strategies database, as of December 2016. Target Sector and Strategy returns are representative of information provided by the managers of funds that Aksia covers. Not all funds covered are included in the analysis due to insufficient amount of data. Target returns are not indicative of future performance and are provided only for a comparative analysis of target returns.

Opportunistic Credit

Overview



- **Return Profile** – On an aggregate basis to target 6.5 to 7.0%
- Complement existing asset class exposures
- Facilitate a collaborative effort across different asset classes within the Trust
- Underlying investments and structures will be illiquid
- Some strategies have floating rate components reducing sensitivity to rising interest rates
- Emphasis on cash flows with price appreciation as a secondary focus
- Some investments may provide for either equity kickers or have characteristics that resemble equity holdings

Opportunistic Credit – *Characteristics*



- Underlying investment vehicles will be closed-end
- Terms of investment vehicles will range from 5-10 years
- The portfolio will have long-bias characteristics with limited use of hedging
- Balance sheet leverage should not be greater than 2.5x
- Some strategies may have inherent leverage
- Emphasis on developed markets; emerging market opportunities considered
- Co-investment opportunities might be present to enhance returns
- The overall benchmark to the strategy will be *S&P / LTSA Leveraged Loan Index*

Opportunistic Credit

Characteristics



J-Curve Mitigation

- Management fees generally paid on invested capital
- Shorter term structures
- Periodic cash distributions

Downside Protection Risk

- Self liquidating
- Capitalization structure seniority
- Emphasis on strategies with consistent cash flows
- Deals have both covenants and collateral

Opportunistic Credit – *Proposed Strategy Target Ranges*



Strategy Class	Target Range*	
Direct Lending	0%	40%
Mezzanine Financing	0%	20%
Specialty Financing	0%	50%
Distressed & Special Situations	0%	15%
Structured Credit	0%	15%
Real Estate Credit	0%	40%
Real Asset Credit	0%	5%

Questions?

(Action Item)

Public Agenda Item #12.2

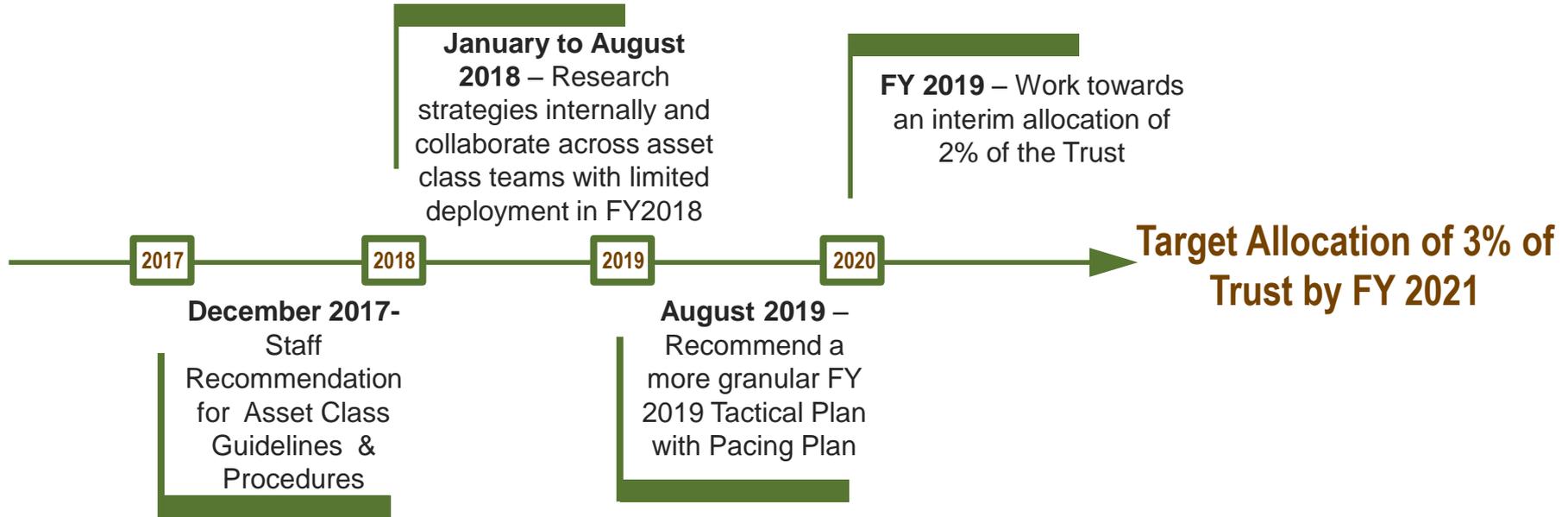
Proposed Opportunistic Credit
Annual Tactical Plan for Fiscal Year 2018 – (Action)

December 12, 2017

Sharmila Kassam, CPA, Deputy CIO
Anthony Curtiss, CFA, Director of Hedge Funds

Opportunistic Credit

Schedule of Deployment



Opportunistic Credit

Tactical Plan FY2018



- Expectations of 0-2 investments for FY2018
- Current sourcing efforts focused on Specialty Finance and Real Estate Credit
- Areas to monitor include Direct Lending and Mezzanine Financing due to low interest rates and an extremely competitive operating environment
- Expectations are for multiple consultants to be utilized
- Development of a pacing model will be critical to the further development of portfolio

Questions?

(Action Item)

Public Agenda Item #13.1

Contract Award Recommendation for
Real Estate Consulting Services – (Action)

December 12, 2017

Tom Tull, CFA, Chief Investment Officer
Gabrielle Schreiber, Director of Procurement and Contract Oversight
Robert Sessa, CFA, Director of Real Estate

Real Estate Consulting Services



Background

- Board approved R.V. Kuhns & Associates (RVK) as the real estate consultant on May 19, 2009 and, with extensions and amendments, the contract term was expected to end May 22, 2017.
- RVK's CEO notified ERS on February 3, 2017 that the real estate team left to start their own firm.
- RVK's contract was terminated on Feb 7, 2017.
- Board selected Aon Hewitt Investment Consulting as the interim consultant under an existing ERS Contract at the February 22, 2017 Board meeting.
 - Contract Effective: April 4, 2017
 - Contract Ends: August 31, 2018

Real Estate Consulting Services

Request for Proposal (RFP)



- ERS issued RFP on May 10, 2017 for a contract covering 6 years.
- Requested services include, but are not limited to:
 - Assist in the analysis and assessment of prospective managers, co-investments and other real estate investments;
 - Monitor portfolio performance against the designated benchmark;
 - Provide quarterly and annual quantitative and qualitative assessments of each partnership/real estate investment and the real estate portfolio as a whole; and
 - Periodically review ERS' existing policies and procedures and benchmark(s) for the real estate program and recommend changes as appropriate.
- Responses were due June 8, 2017

Real Estate Consulting Services

Request for Proposal (RFP)



ERS received 11 responses

Albourne America LLC

Alignium, LLC

Callan Associates, LLC

Cambridge Associates, LLC

Courtland Partners, Ltd.

Hamilton Lane Advisors, LLC

ORG Portfolio Management, LLC

Pension Consulting Alliance, LLC

RCLCO Fund Advisors, LLC

StepStone Group Real Estate LP

Townsend Holdings LLC, d/b/a

The Townsend Group

StepStone's Proposal was disqualified because it was not received by the submission deadline.

Cambridge's Proposal was disqualified due to not passing the Preliminary Review Evaluation

Real Estate Consulting Services

Preliminary Review Evaluation



Minimum Requirements were verified by ERS' Office of Procurement and Contract Oversight

- ✓ Principal Place of Business in the United States
- ✓ Professional Licenses and Registered Investment Advisor
- ✓ Willingness to Act as a Fiduciary to ERS
- ✓ Authorized to do Business in Texas
- ✓ Requisite Experience – Firm 5 years or greater or Individual with 10 years or more

Cambridge did not pass the Preliminary Review Evaluation

Real Estate Consulting Services

Proposal Review Evaluation

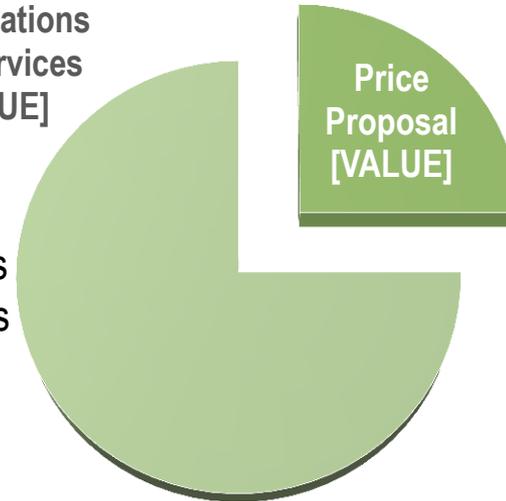


- Two main categories scored:
 - Price Proposal – scored by OPCO
 - Qualifications and Services – scored by subject matter experts from Investments and Legal

Proposal Evaluation Criteria

Qualifications
and Services
[VALUE]

- Firm Qualifications
- Staff Qualifications
- Methodology & Soundness of Approach
- Financial Standing
- Optional Services



Real Estate Consulting Services

Proposal Review Evaluation (Continued)



- Clarification Questions.
 - SMEs identified aspects of the Proposals that required further clarification.
 - Primary objective is to ensure mutual understanding of each vendor's Proposal.
- Reference Checks.
- Legal and Contractibility Review.

Real Estate Consulting Services

Finalist Evaluation



- Proposal Review Phase winnowed down the list to three finalists:
 - Alignium
 - PCA
 - Callan
- Finalist Evaluation:
 - Further Clarification Questions.
 - Best and Final Offers.
 - Face to Face Interviews.
 - Continued Legal and Contractibility Review.
 - Continued Reference Checks.

Real Estate Consultant

Finalist Evaluation



- Staff met with Executive Office.
- Staff and Executive Office discussed:
 - The scoring tool.
 - Risks identified during Finalist Evaluation Phase.

Questions?

(Action Item)

Public Agenda Item #14.1

Chief Investment Officer's Report

December 12, 2017

Tom Tull, CFA, Chief Investment Officer

Chief Investment Officer's Report

Investment Advisory Committee Appreciation



- Expansion of IAC members
- Appreciation and commendation for increased time commitments and involvement include:
 - IAC was an active part of the success of the asset allocation study
 - IAC members are increasing their assistance with the Tex\$aver program through Product Review Committee (Laura Starks, Gene Needles, Didi Weinblatt)
 - New Asset Class Investment Committee meeting participation as voting members (as of 10/17, seven meetings to date)

Chief Investment Officer's Report

Investment Challenges for FY2018



- Improving global growth and profits
- Potential higher interest rates; inflation
- Geopolitical and trade risks (NAFTA and China)
- China, Russia, North Korea
- US mid-term elections
- Brexit

Chief Investment Officer's Report

Investment Opportunities for FY2018



- Opportunistic Credit
- Private Equity Secondaries
- GTAA (Global Tactical Asset Allocation)
- Infrastructure

Chief Investment Officer's Report

Major Initiatives for FY2018



- Implementing the new asset allocation mix
- Advancing the derivatives program
- Evaluate the current and future state of investment's systems architecture
- Refresh Select Pool of external advisors/managers and initiate searches to refine mix of internal and external management
- Assess current and future savings through diligent negotiation of best economic deal terms
- Leverage internal investment resources to assist investment product monitoring in the Texa\$aver Program

Chief Investment Officer's Report

Major Initiatives for FY2018



- Support legislative initiatives for addressing unfunded pension liabilities
- Leverage external relationships for strategic resources and opportunities within each asset class to find better risk-adjusted returns
- Develop further the Investment Division career path development, communication, succession planning and team development

Questions?

Adjournment

Public Agenda Item #16.1

TexaSaverSM 401(k)/457 Program Review and Consideration of the Target Date Fund Offering

December 12, 2017

Georgina Bouton, CTCM, Assistant Director of Benefit Contracts

Nora Alvarado, CTCM, Manager of Account Management Team

Angelica Torres, CTCM, Program Account Manager

TexaSaver Program

Investment Funds



- Same investment offerings between plans
- Program uses
 - Mutual Funds - investment vehicles that pool money from many investors
 - Collective Investment Trust (CIT) Funds - investments formed from pooling assets from institutional investors

TexaSaver Program

Investment Funds



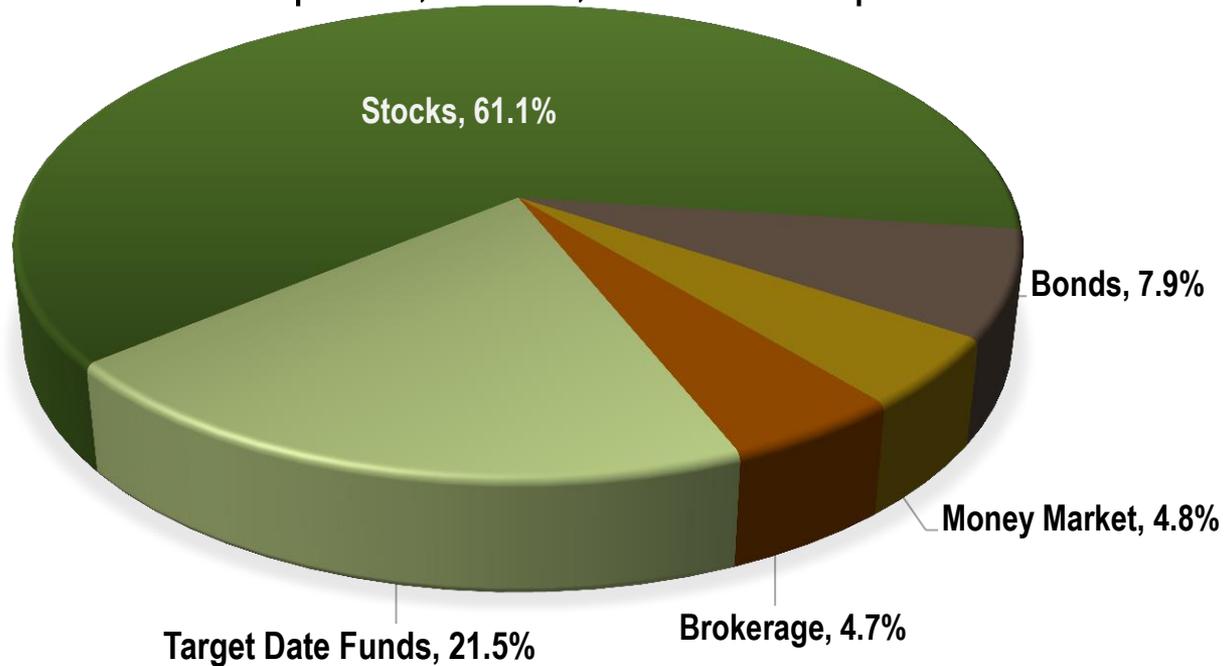
CHARACTERISTICS	MUTUAL FUND	CIT FUND
Professionally managed investments	Yes	Yes
Regulated by governmental agency	SEC	OCC
Fund Information	Publicly Available	Fund Fact Sheets <small>Information available on TexaSaver website</small>
Offering Document	Prospectus	Declaration of Trust
Investor Type	All Investors	Qualified Plans Only
Fund fees	Institutional & Retail Pricing May include 12(b)-1 fees	Low Institutional Pricing, No 12(b)-1 fees

Texa\$aver Program

Investment Funds



Offers diversified investments in equities, bonds, and cash equivalent funds



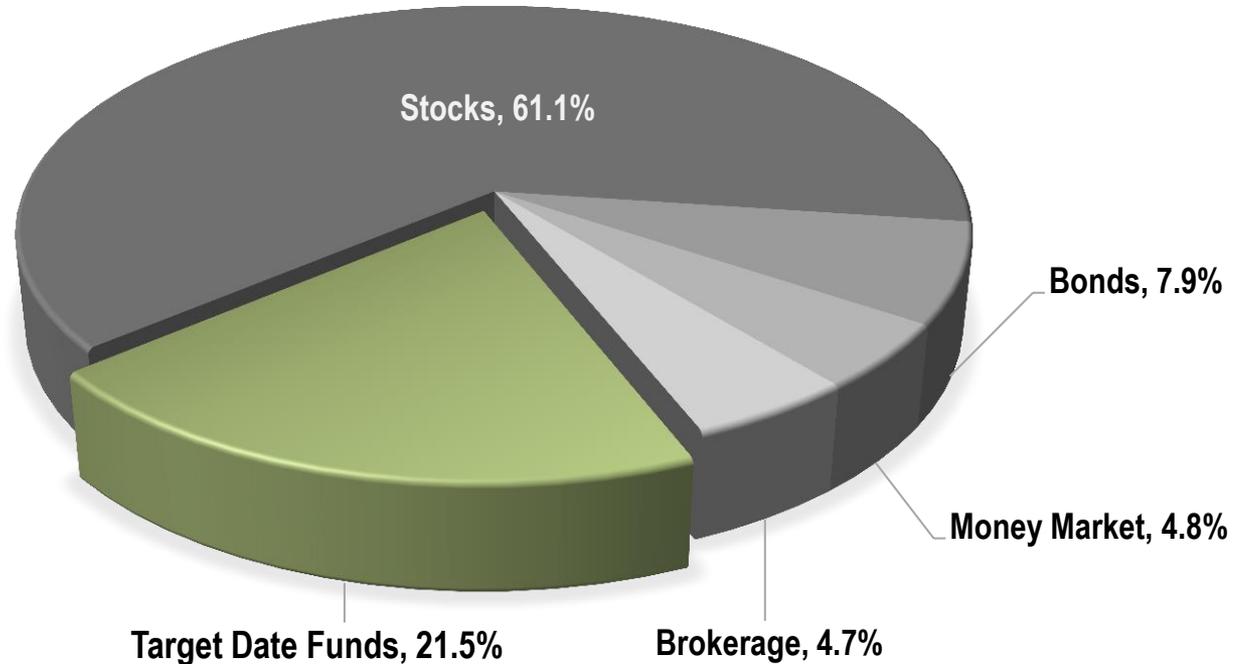
Texa\$aver Program

Target Date Funds



Offers diversified investments in equities, bonds, and cash equivalent funds

The total amount invested in Target Date Funds exceeds \$650 million



Texa\$aver Program

Product Review Committee (PRC)



- Executive Director
- Deputy Executive Director
- Director of Benefit Contracts
- Chief Investment Officer
- Deputy Chief Investment Officer
- Director of Fixed Income
- 3 Appointed Investment Advisory Committee members



Texa\$aver Program

Interim Target Date Funds



- July 10, 2017: Board ratified the selection of an interim Target Date Fund
 - Interim Fund: LifePath® Portfolio Index Fund F Series
- Use the fund selection and due diligence process defined within Program's Investment Policy
 - Product Review Committee (PRC) defines criteria
 - Empower Retirement identifies qualified funds (query, questionnaire)
 - PRC evaluates qualified funds; selects finalists
 - PRC conducts interviews; formulates recommendation

Texa\$aver Program



Adopted Fund Selection Process: Target Date Funds

Minimum Requirements and Preferred Criteria

- Empower queried Morningstar Direct using minimums
 - Results: 33 CITs (7 fund managers), 6 mutual funds (5 fund managers)
- Empower remitted fund search questionnaires
 - Responses: 10 CITs, 2 mutual funds

PRC subcommittee met on October 11, 2017

- Performed analysis of fund information
- Identified 4 fund offerings (3 fund managers) as finalists

Texa\$aver Program



Fund Selection Process: Target Date Funds Finalists

Finalist interviews held on November 8, 2017

- BlackRock, Inc.
LifePath Index Target Date Funds
- T. Rowe Price
T. Rowe Price Retirement Hybrid Trusts Class T6
T. Rowe Price Retirement Trusts
- Fidelity Institutional Asset Management (FIAM) Trust Company
FIAM Target Date

Texa\$aver Program



Fund Selection Process: Target Date Funds Finalists

BlackRock, Inc. LifePath Index Target Date Funds

- Low fees: 8 bps
- Management style: passive
- Equity allocation, retirement: 40%
- Morningstar Analyst Rating™:  Gold
- Overall Morningstar Ratings™ : 3★ ; 4★

BlackRock LifePath® Index	2020	2025	2030	2035	2040	2045	2050	2055	2060	Retiremt
Total Return, 3 Years (net)	3.60%	4.01%	4.38%	4.72%	5.00%	5.16%	5.18%	5.12%	%	3.27%
Total Return, 5 Years (net)	6.44%	7.34%	8.08%	8.76%	9.36%	9.87%	10.24%	10.54%	-	5.21%

Texa\$aver Program



Fund Selection Process: Target Date Funds Finalists

T. Rowe Price Retirement Hybrid Trusts Class T6

- Highest fund fees: 34 bps
- Blended Management style:
 - 60% active management
 - 40% passive management
- Equity allocation, retirement: 55%
- Overall Morningstar Ratings™:
5 ★

T.Rowe Price Ret Hybrid Fund	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Total Return, 3 Years (net)	4.80%	5.38%	5.84%	6.22%	6.47%	6.71%	6.77%	6.77%	6.77%	-
Total Return, 5 Years (net)	8.48%	9.48%	10.33%	11.07%	11.60%	11.97%	12.00%	12.00%	12.00%	-

Texa\$aver Program



Fund Selection Process: Target Date Funds Finalists

Fidelity Institutional Asset Management (FIAM) Trust Company

FIAM Target Date

- Higher fund fees: 28 bps
- Management style: active
- Equity exposure, retirement: 60%
- Overall Morningstar Ratings™ :
1★ (Income Fund); 4★; 5★

FIAM Target Date Fund	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	Income
Total Return, 3 years	5.15%	5.46%	5.73%	6.35%	6.76%	6.77%	6.77%	6.75%	6.74%		3.48%
Total Return, 5 Years	7.96%	8.53%	9.53%	10.33%	11.27%	11.36%	11.51%	11.56%	11.77%	-	4.75%

Texa\$aver Program

Fund Selection Process: Results and Findings



Key areas considerations reviewed by PRC included

- Historical fund performance
- Glide path
- Equity allocation at retirement
- Investment strategy
- Fund fees

Interim Target Date Fund Offering

Staff Recommendation



Based on recommendation of the PRC, Staff recommends that the Board adopt the _____ as the Program's Target Date Funds.

Questions?

Public Agenda Item #17.1

Executive Session – In accordance with Section 551.072, Texas Government Code, the Board of Trustees will meet in executive Session to deliberate the purchase , exchange, lease, or value of real property and the ERS building. Thereafter, the Board may Consider appropriate action in open session.

December 12, 2017

Public Agenda Item #18.1

*Recess of the Board of Trustees –
The Board of Trustees will reconvene as a Committee of the whole on
Wednesday, December 13, 2017 at 8:00 a.m. to consider
Audit and Board agenda items*

December 12, 2017