

Metrics and Measurements for State Pension Plans

November 17, 2016

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Fiscal Sustainability Metrics

Net Amortization

- Measures whether contributions are sufficient to reduce pension debt if plan assumptions hold – focus of the presentation today.

Stress Test & Sensitivity Analysis

Cash Flow

Net Amortization

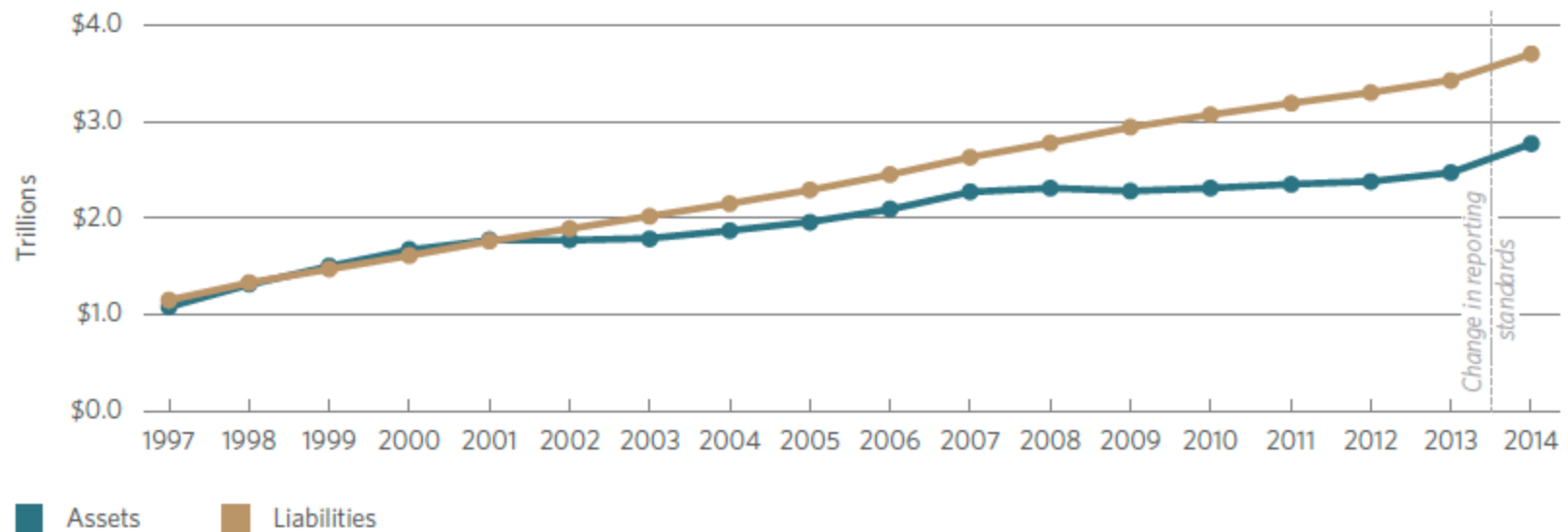
Why Measure Fiscal Sustainability?

- Overall state pension funds continue to face substantial shortfalls between actuarial liabilities and the assets on hand.
- Current funding levels indicate where pension plans are; forward looking sustainability measures indicate where pension plans are headed.
- Key question is whether current policies offer a credible and sustainable path to closing funding gaps over time.
- Identifying long-term challenges now makes it easier to find a long-term solution.
- Contribution policy is the key lever to achieve improved funding over time—state and local pension plans cannot invest or cut their way out of funding challenges.

State Pension Funding Over Time

State Pension Funding Gap Between 1997 and 2014

The difference between assets and liabilities for state pension plans totaled more than \$900 billion in 2014

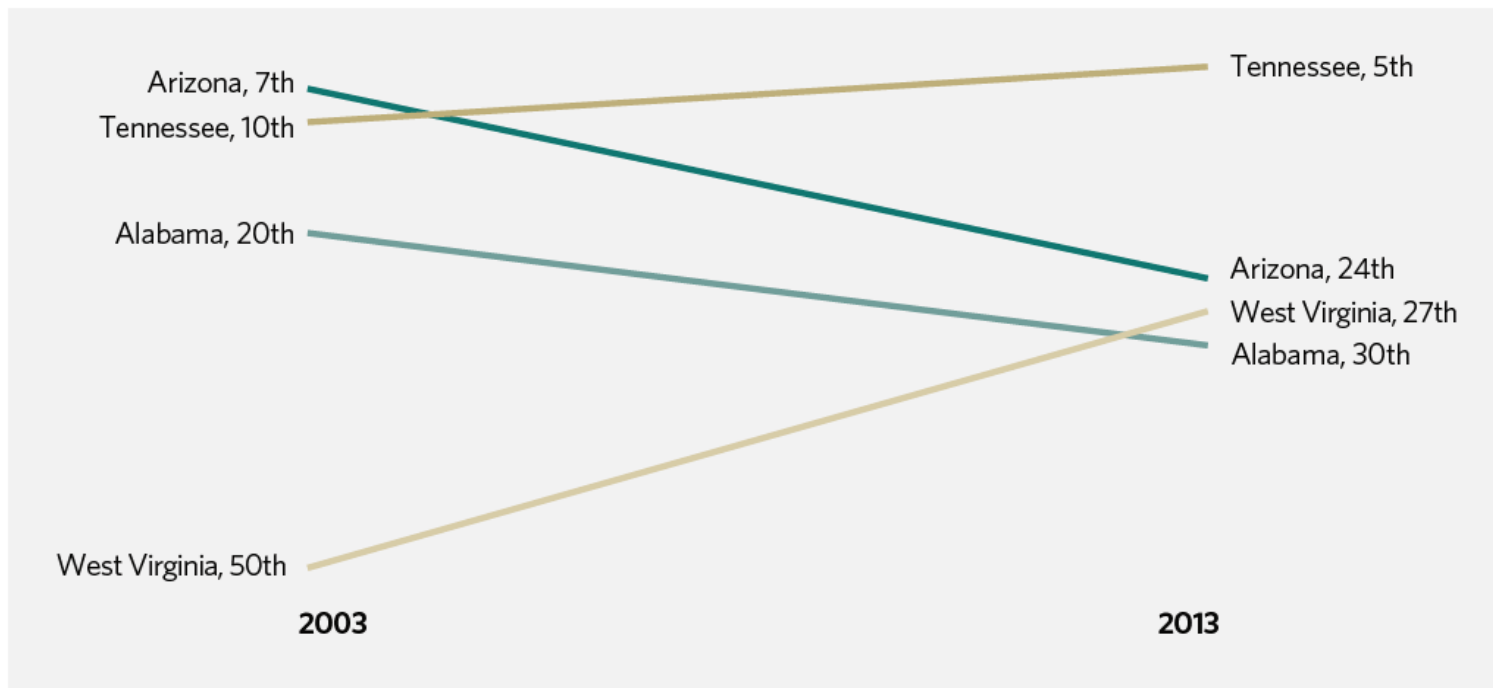


Note: Data for this graph were collected from Comprehensive Annual Financial Reports (CAFRs), actuarial reports and valuations, or other public documents, or were provided by plan officials.

Source: The Pew Charitable Trusts

Different ARC Calculations, Different Results

Comparison of 4 states that made 100% of ARC payments
Funding rank 2003 and 2013



Sources: Comprehensive Annual Financial Reports (CAFRs), actuarial reports and valuations, or other public documents, or as provided by plan officials

Net Amortization as a New Measure of Contribution Adequacy

- Net amortization measures whether contribution policies are expected to make progress on paying down the pension debt in a given year.
- Calculated as the difference between contributions and the sum of the cost of new benefits and interest on the pension debt.
- Positive amortization indicates employer contributions were projected to be sufficient to pay down a portion of pension debt; negative amortization indicates pension debt expected to grow.
- No single measure of contribution policy will tell the whole story. Net amortization provides important information about contribution policy in the current reporting year—long-run projections can help provide a more complete analysis.
- Based on publicly available data.

Example of Net Amortization Calculation

North Carolina and South Carolina both paid their ARC but follow very different contribution policies.

		North Carolina	South Carolina
1	Pension debt, beginning of 2014	\$7,467,231	\$20,225,470
2	Effective interest rate for pension debt	7.3%	7.5%
3=1*2	Interest on pension debt	\$541,695	\$1,516,910
4	Cost of new benefits	\$2,234,931	\$895,467
5	Employee contributions, with interest	\$1,223,208	\$779,138
6=3+4-5	Employer benchmark for net amortization	\$1,553,417	\$1,633,240
7	Employer contributions, with interest	\$1,692,560	\$1,178,570
8=7-6	Expected reduction in pension debt	\$139,143	-\$454,670
9=7/6	Percentage of benchmark contributed	109%	72%

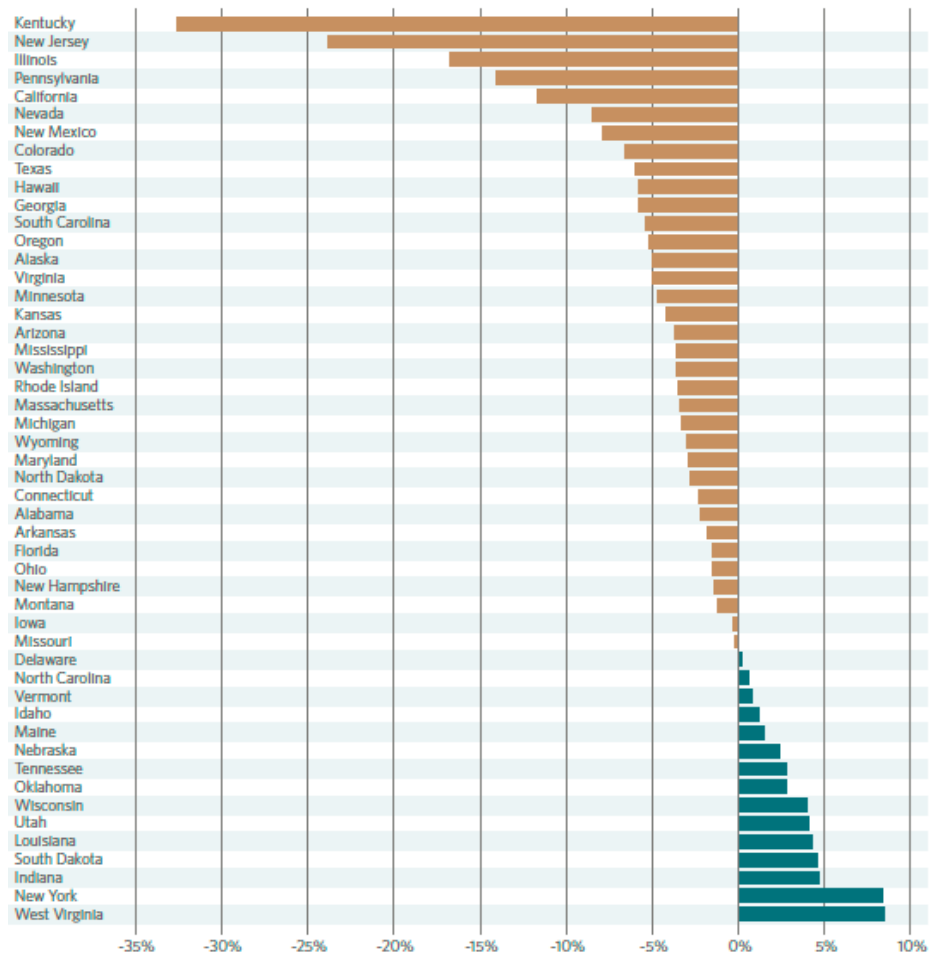
Overall, North Carolina's pension promises are 99% funded compared to South Carolina at 61%.

Source: State Comprehensive Annual Financial Reports and state pension plan actuarial valuations and financial reports. All dollar figures in thousands.

Most States Fall Short of Net Amortization

Net Amortization as a Share of Covered Payroll

15 states achieved positive amortization in 2014



Source: State Comprehensive Annual Financial Reports and state pension plan actuarial valuations and financial reports. All dollar figures in thousands.

Cash Flow

Cash Flow

- The difference between the sum of employer and employee contributions and the sum of benefit payments and other direct expenditures.
- Measured as a percentage of plan assets, shows how much investment returns would need to deliver to keep asset levels stable.
- Particularly useful for plans facing fiscal distress to assess sustainability as well as liquidity requirements.

Examples of Cash Flow

Cash flow calculated as the difference between the sum of employer and employee contributions and the sum of benefit payments and other direct expenditures.

State	Contributions	Benefit Payments	Cash Flow	As Share of Assets
Alabama	\$1,821,794	-\$3,082,318	-\$1,260,524	-4.1%
Alaska	\$794,130	-\$1,074,703	-\$280,573	-2.8%
Arizona	\$2,696,682	-\$3,583,326	-\$886,644	-2.5%
Arkansas	\$888,529	-\$1,482,184	-\$593,655	-2.8%
California	\$18,745,630	-\$30,658,423	-\$11,912,793	-2.8%
Colorado	\$2,104,539	-\$4,103,234	-\$1,998,695	-4.6%
Connecticut	\$2,653,883	-\$3,321,339	-\$667,456	-2.8%
Delaware	\$316,754	-\$559,281	-\$242,527	-3.0%
Florida	\$3,215,497	-\$9,139,933	-\$5,924,436	-4.4%
Georgia	\$2,462,254	-\$5,334,560	-\$2,872,306	-3.9%
Hawaii	\$859,255	-\$1,143,548	-\$284,293	-2.3%
Idaho	\$532,324	-\$761,290	-\$228,966	-1.8%
Illinois	\$8,438,282	-\$9,539,756	-\$1,101,474	-1.6%
Indiana	\$2,078,255	-\$2,379,202	-\$300,947	-1.1%
Iowa	\$1,116,258	-\$1,863,076	-\$746,818	-2.9%
Kansas	\$1,033,981	-\$1,442,240	-\$408,259	-2.8%
Kentucky	\$1,329,403	-\$2,739,104	-\$1,409,701	-7.1%
Louisiana	\$2,475,755	-\$3,400,862	-\$925,107	-3.3%
Maine	\$492,882	-\$829,048	-\$336,166	-3.0%
Maryland	\$2,501,128	-\$3,225,060	-\$723,932	-1.8%
Massachusetts	\$3,120,448	-\$4,822,644	-\$1,702,196	-3.6%
Michigan	\$2,823,206	-\$5,818,776	-\$2,995,571	-5.8%
Minnesota	\$1,977,162	-\$4,112,918	-\$2,135,756	-4.1%
Mississippi	\$1,535,387	-\$2,264,432	-\$729,045	-3.3%
Missouri	\$2,213,872	-\$3,286,902	-\$1,073,030	-2.3%

State	Cash Flow	As Share of Assets	Cash Flow	As Share of Assets
Montana	\$519,174	-\$675,423	-\$156,249	-1.8%
Nebraska	\$483,582	-\$583,481	-\$99,899	-1.0%
Nevada	\$1,563,657	-\$1,852,304	-\$288,647	-1.0%
New Hampshire	\$529,014	-\$636,375	-\$107,361	-1.7%
New Jersey	\$4,184,541	-\$9,490,654	-\$5,306,113	-6.9%
New Mexico	\$1,182,596	-\$1,880,158	-\$697,562	-3.0%
New York	\$6,082,242	-\$10,390,066	-\$4,307,824	-2.4%
North Carolina	\$2,815,498	-\$5,181,353	-\$2,365,855	-3.0%
North Dakota	\$253,624	-\$294,381	-\$40,757	-1.0%
Ohio	\$5,440,353	-\$12,276,122	-\$6,835,769	-4.9%
Oklahoma	\$1,633,294	-\$2,093,588	-\$460,294	-1.9%
Oregon	\$930,500	-\$3,894,600	-\$2,964,100	-5.1%
Pennsylvania	\$4,409,010	-\$9,060,217	-\$4,651,207	-6.1%
Rhode Island	\$423,096	-\$823,077	-\$399,981	-6.6%
South Carolina	\$1,888,181	-\$2,944,306	-\$1,056,125	-3.9%
South Dakota	\$211,128	-\$384,824	-\$173,696	-1.9%
Tennessee	\$1,305,180	-\$2,124,896	-\$819,717	-2.2%
Texas	\$5,845,885	-\$10,980,168	-\$5,134,283	-3.6%
Utah	\$1,028,318	-\$1,341,697	-\$313,379	-1.2%
Vermont	\$218,696	-\$289,997	-\$71,300	-2.0%
Virginia	\$2,695,588	-\$4,028,886	-\$1,333,298	-2.3%
Washington	\$2,263,680	-\$3,525,451	-\$1,261,771	-2.0%
West Virginia	\$897,859	-\$1,077,487	-\$179,628	-1.6%
Wisconsin	\$1,929,696	-\$4,598,686	-\$2,668,990	-3.0%
Wyoming	\$305,872	-\$492,151	-\$186,279	-2.5%

Source: State Comprehensive Annual Financial Reports and state pension plan actuarial valuations and financial reports. All dollar figures in thousands.

Stress Test & Sensitivity Analysis

Measuring and Managing Cost Uncertainty

- With interest rates at historically low levels, there is increased attention around both the level of risk in pension fund portfolios and the potential for unplanned costs if return targets are not achieved.
- Public pension funds have taken steps to address these concerns by:
 - Increasing contributions
 - Modifying investment return targets and/or asset allocations
 - Implementing changes to benefit plan design
- Stress-testing investment returns and pension costs can further aid policymakers in their efforts to better understand and plan for cost uncertainty.
 - See: Washington state, CALPERs, Society of Actuaries Blue Ribbon panel recommendations

Investments – Key Trends: More in Stocks and Less in Bonds

Public Pension Investments, 1954-2014

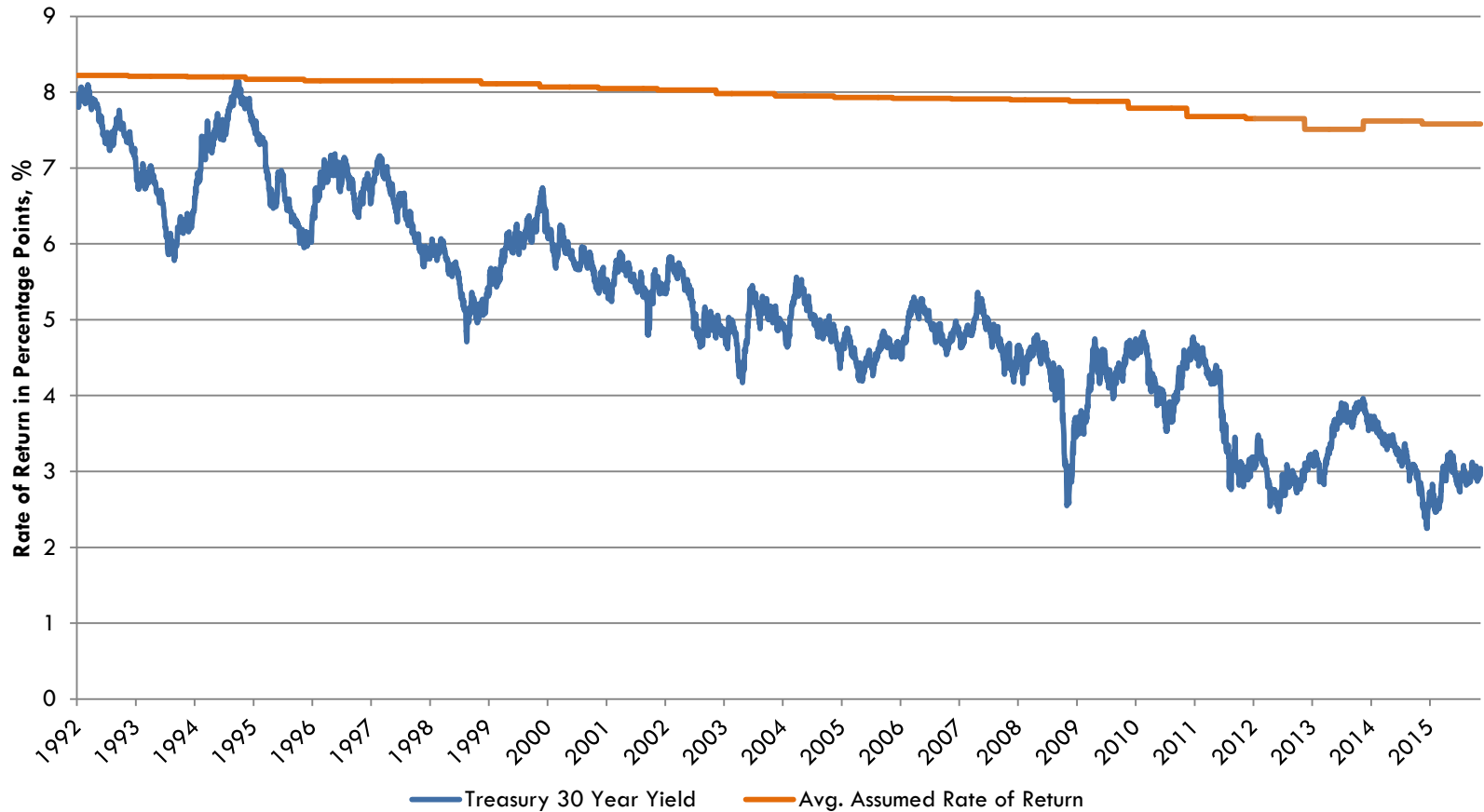
Allocations to equities and alternative investments have increased, while those to fixed-income investments have declined



Source: U.S. Board Of Governors of the Federal Reserve System, *Financial Accounts of the United States*, 1954 to 2014; Pew Analysis of State Financial Reports

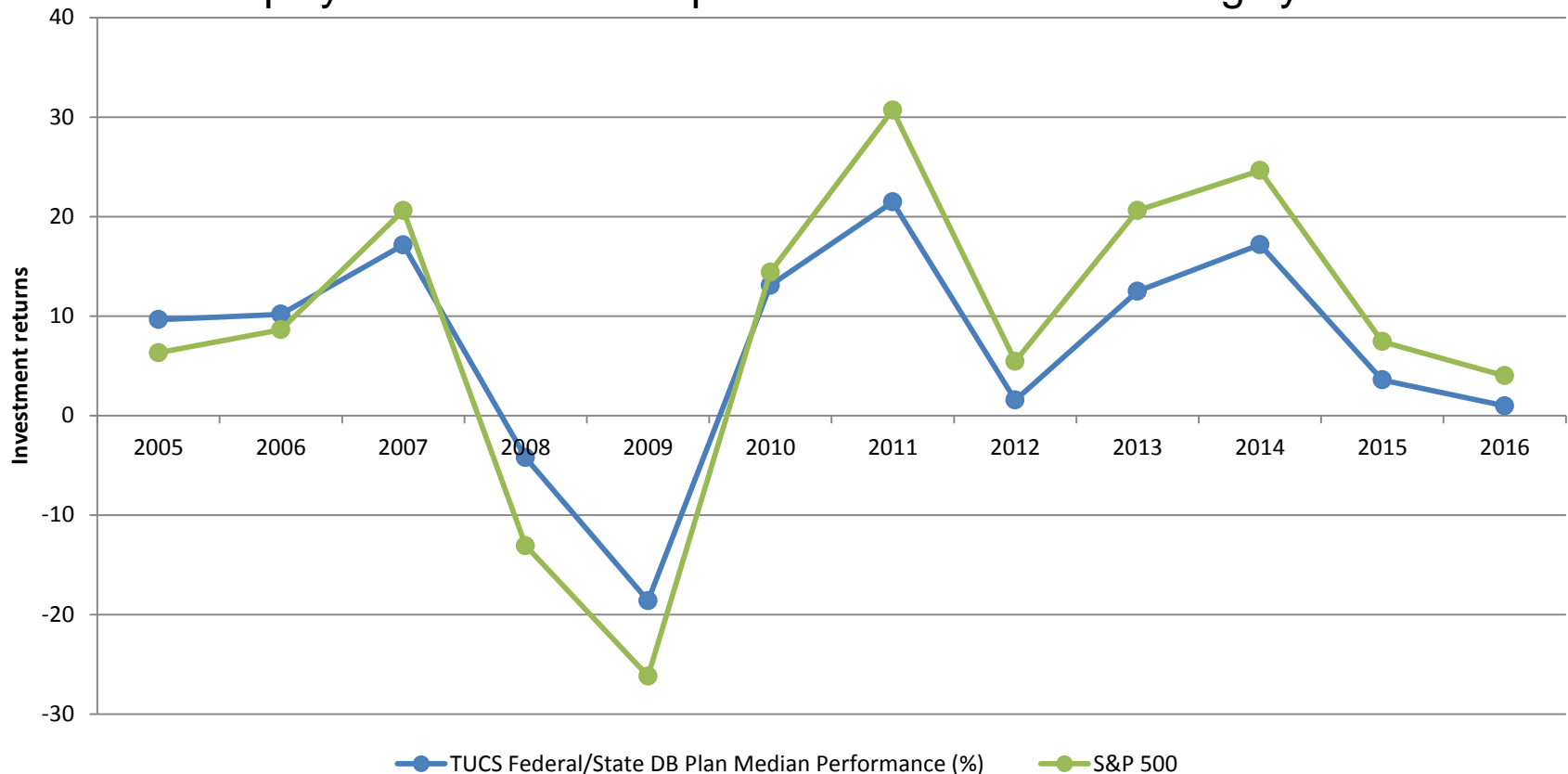
Pension Fund Risk Premium at Historic High

US Public Fund Average Increasing Risk Premium – Plan’s Assumed Rate of Return Remains Relatively Stable, While Bond Yields Have Declined



Average Annual Stock Market and Pension Fund Returns

Equity investments and pension fund returns are highly volatile

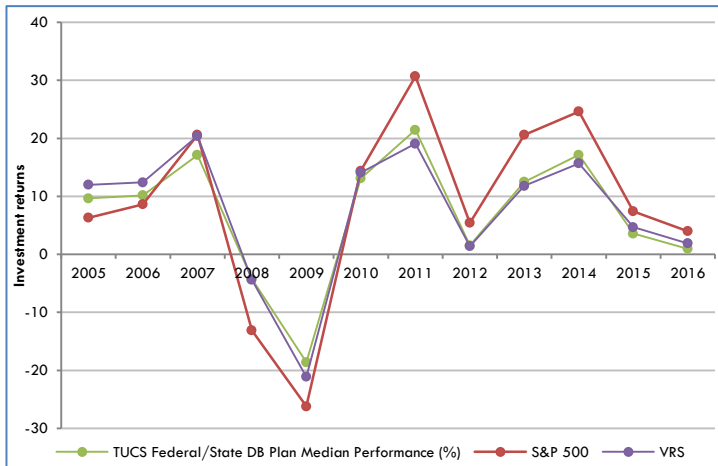


Note: SCRS data is reported *net of fees* from 2009 to 2016 and *gross-of-fees* from 2005 to 2008. TUCS data is reported *gross of fees*.

Sources: SCRS June 30th CAFRS and Investment Reports and the Wilshire®, Trust Universe Comparison Service®

Sample Stress Tests and Sensitivity Analysis

Average Annual VRS, Stock Market, and Pension Fund Returns



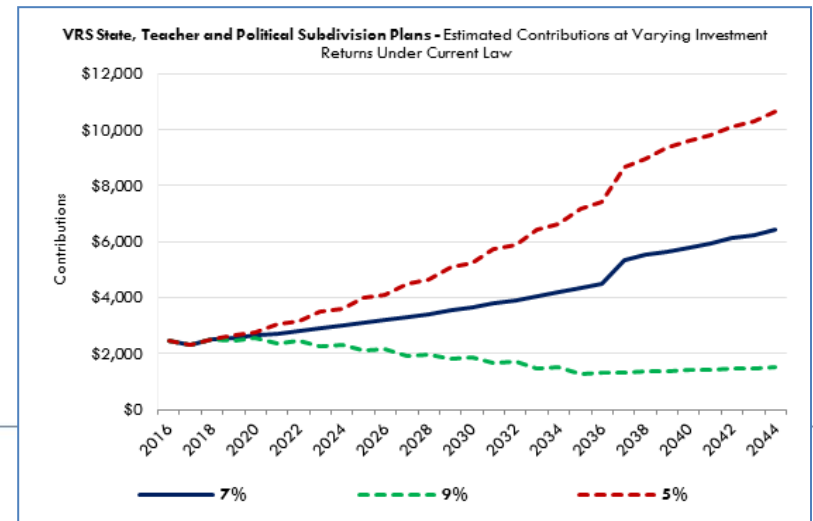
Sensitivity of Employer Contribution Rate to Assumed Rate of Return, State Workers



Stress Testing – 5% Return, Contributions Held Constant
Figures in Millions



Pension Cost to Investment Returns



Conclusions

- With a reported pension funding gap of \$934 billion for state-run pensions alone, the fiscal health of state and local retirement systems remains a key policy concern.
- Just 15 states made payments in 2014 that were sufficient to keep pension debt from growing based on plan's own assumptions—low returns in 2015 and 2016 show that public pension systems can't invest their way out of their funding challenges.
- In 2014, states and local governments fell short of the net amortization benchmark by \$29 billion.
- States like North Carolina, Tennessee, and West Virginia show that good policy can keep public pension systems well funded or help a distressed system turn around.
- Policymakers in both well-funded and poorly-funded states need appropriate measures of fiscal sustainability to understand whether current policies will achieve or maintain full-funding and ensure that assets are available to pay promised benefits.

Public Sector Retirement Systems Project

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