



www.rockinst.org
@RockefellerInst



Public Pensions: A Fiscal Imperative

**71st Annual Meeting of the Southern
Legislative Conference
Council of State Governments**

**Fiscal Affairs & Government
Operations Committee Session**

Biloxi, MS

Don Boyd, Director of Fiscal Studies
donald.boyd@rockinst.suny.edu

July 30, 2017

Outline

- Measuring pension-related fiscal stress
- National and regional picture
- Reaching for yield, and potential consequences
- Policy changes
- Ensuring funding security

Questions and discussion along the way

Why it's so hard to assess and compare pension fiscal stress

1. Plans report liabilities on **assumption that they will be successful investors**
 - a) Maybe yes, maybe no. You tell me how the stock market will do, I'll tell you magnitude of pension fiscal stress.
 - b) Another way: Report liabilities without assuming successful risk-taking. Third rail.
2. Actuarial contributions are **far lower** than they would be if plans did not assume successful investing
3. Actuarial contributions often **stretch out repayments** of unfunded liabilities over LONG periods
4. Some governments **underpay** actuarial contributions
5. Size of liabilities and payments **relative to economy and budget** are important – not just funded ratio.
6. Wide variation on these key characteristics

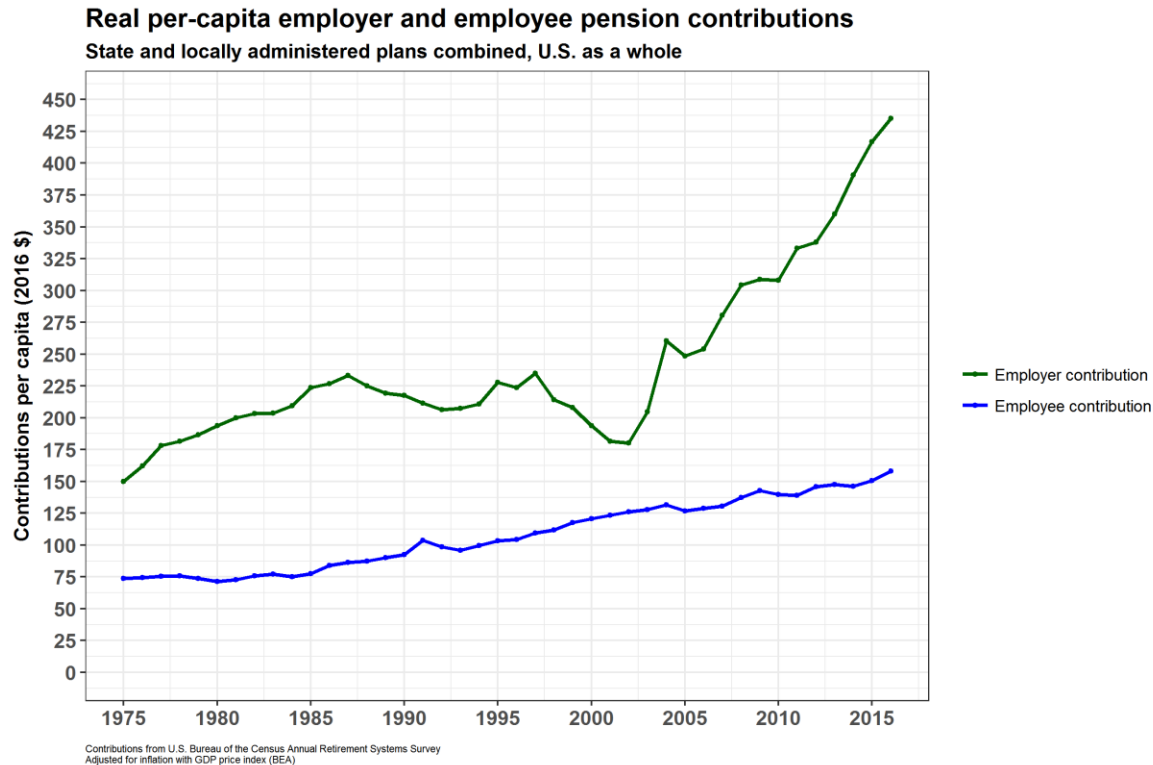
Some of the numbers that follow address these issues

1. Where practical, I use estimates produced by the Bureau of Economic Analysis and the Federal Reserve Board for liabilities and normal costs, rather than actuaries' numbers.
2. BEA/FRB generally use a **5% “discount rate”** for recent-year estimates. (Think of it as sort of like assuming a 5% investment return, although it's not quite the same thing.) There are other, smaller, differences from actuaries' numbers.
3. This produces higher estimates of liabilities and of needed contributions than actuaries produce. Differences are **big**. It is close to what many economists think and to what Moody's does. Some consider it still too generous.
4. Table and graph notes make clear when I use these estimates as opposed to actuaries' numbers.

National and regional picture

Employer contributions are up substantially

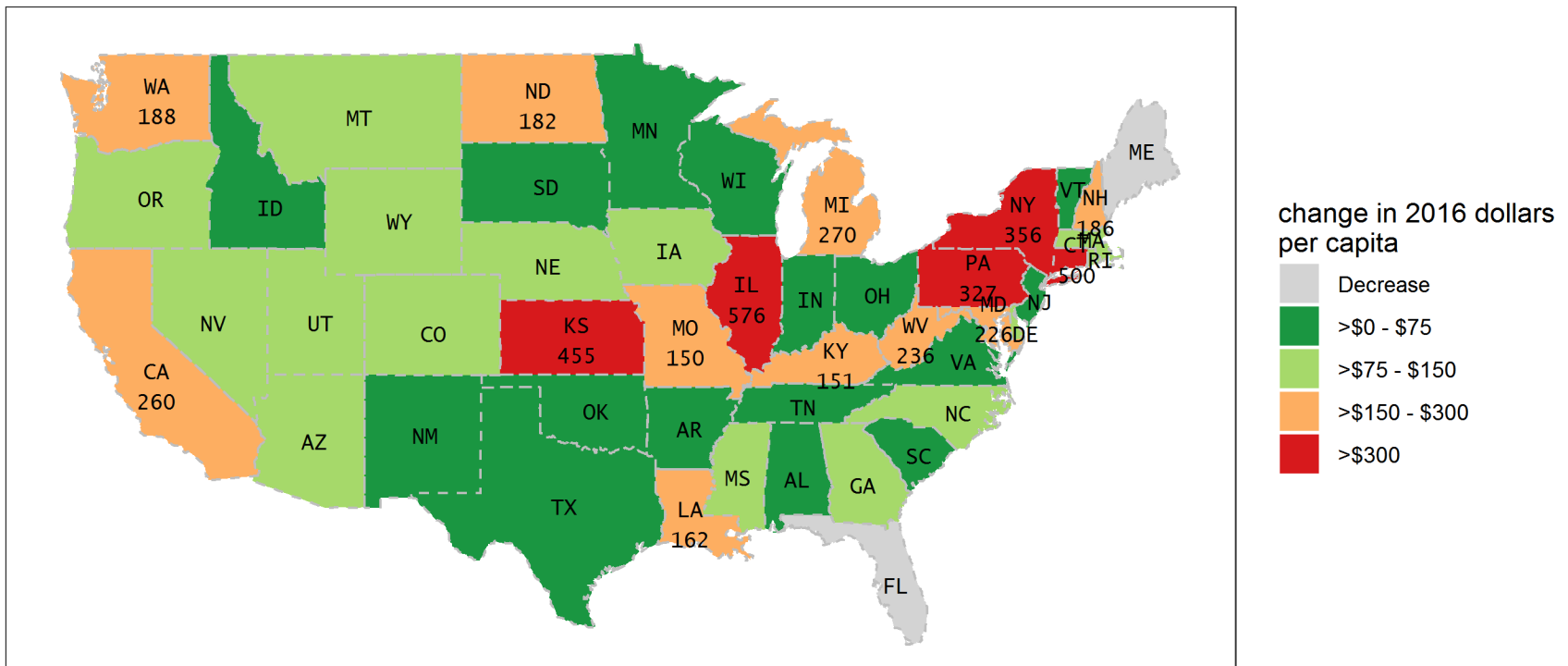
- Up \$155 per capita 2007 to 2016, adjusted for inflation
- Up \$55 billion, inflation-adjusted
- SLG taxes grew \$219b same period, inflation-adjusted
- Great variation around the country



Employer contribution increases generally have been smaller in southern states

Change in state & local government pension contributions

Inflation-adjusted dollars per capita, 2007 to 2016



Source: Rockefeller Institute analysis of Annual Survey of Public Pensions, U.S. Bureau of the Census

Note: Due to extraordinary contributions in West Virginia in 2007, contributions for 2008 were used as the base year

Employer contributions in southern states

Employer contributions per capita, in 2016 dollars

	2007*	2016	\$ change	% change	2016 contribution as % of US
United States	\$ 281	\$ 435	\$ 155	55%	100%
Alabama	214	257	43	20%	59%
Arkansas	238	283	45	19%	65%
Florida	222	199	(22)	-10%	46%
Georgia	182	283	102	56%	65%
Kentucky	204	355	151	74%	82%
Louisiana	413	575	162	39%	132%
Missouri	257	408	150	58%	94%
Mississippi	248	353	105	42%	81%
North Carolina	81	174	94	116%	40%
Oklahoma	302	345	43	14%	79%
South Carolina	199	258	60	30%	59%
Tennessee	186	213	27	14%	49%
Texas	173	234	61	35%	54%
Virginia	308	376	68	22%	87%
West Virginia	326	562	236	72%	129%

Source: Rockefeller Institute analysis of Census Bureau Annual Surveys of Public Retirement Systems. Includes all state and local plans in a state.

Note: *2008 used for West Virginia because 2007 was boosted by pension obligation bonds

Despite contribution increases, aggregate funded ratio has barely budged

Funded ratio of state and local government defined benefit pension plans



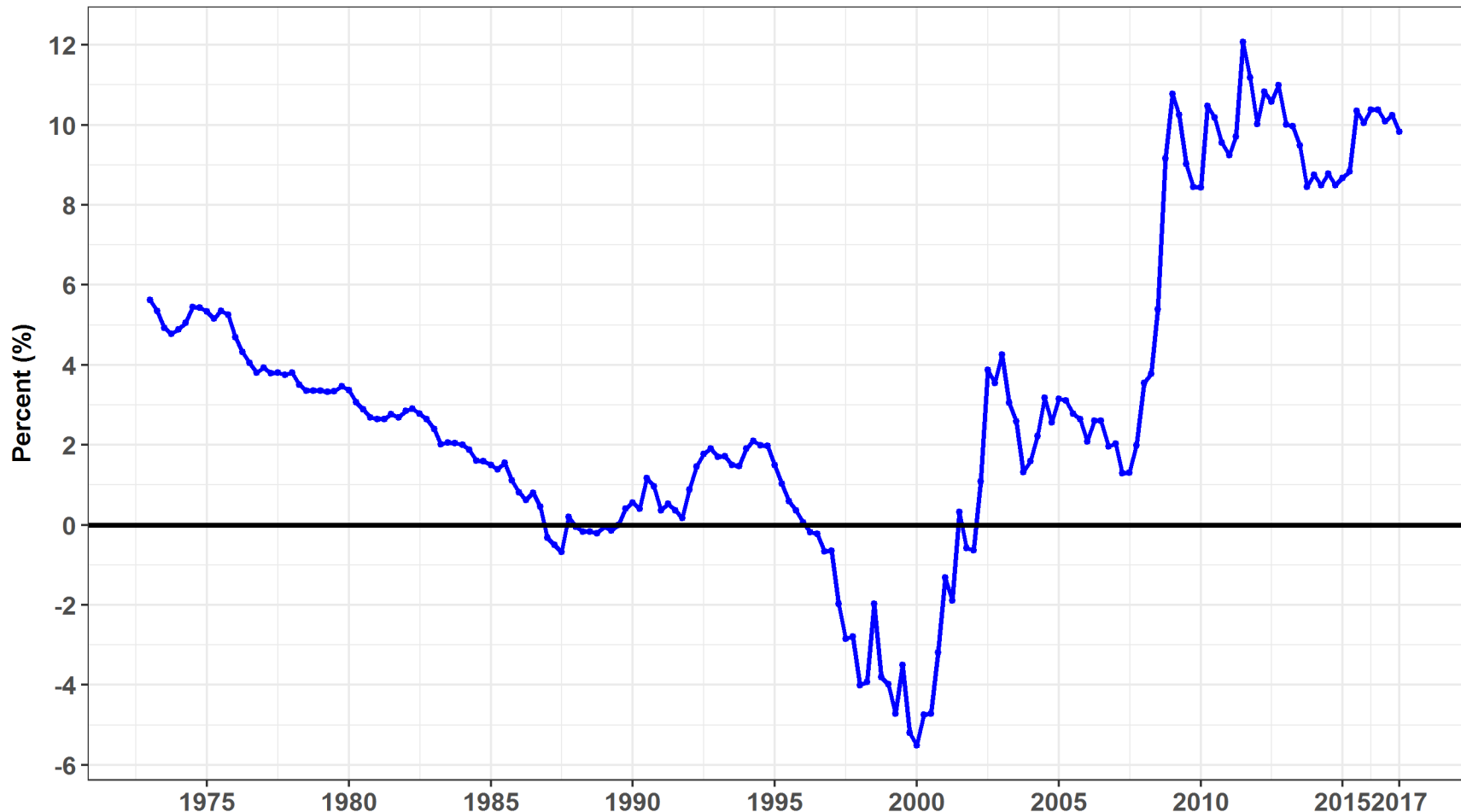
Source: Federal Reserve Board, Financial Accounts of the United States, Table L.120.b

Note: Liabilities are as valued by the Bureau of Economic Analysis, not actuaries.

And unfunded liability remains near record relative to economy

Unfunded liability of state and local government defined benefit pension plans

As percentage of Gross Domestic Product



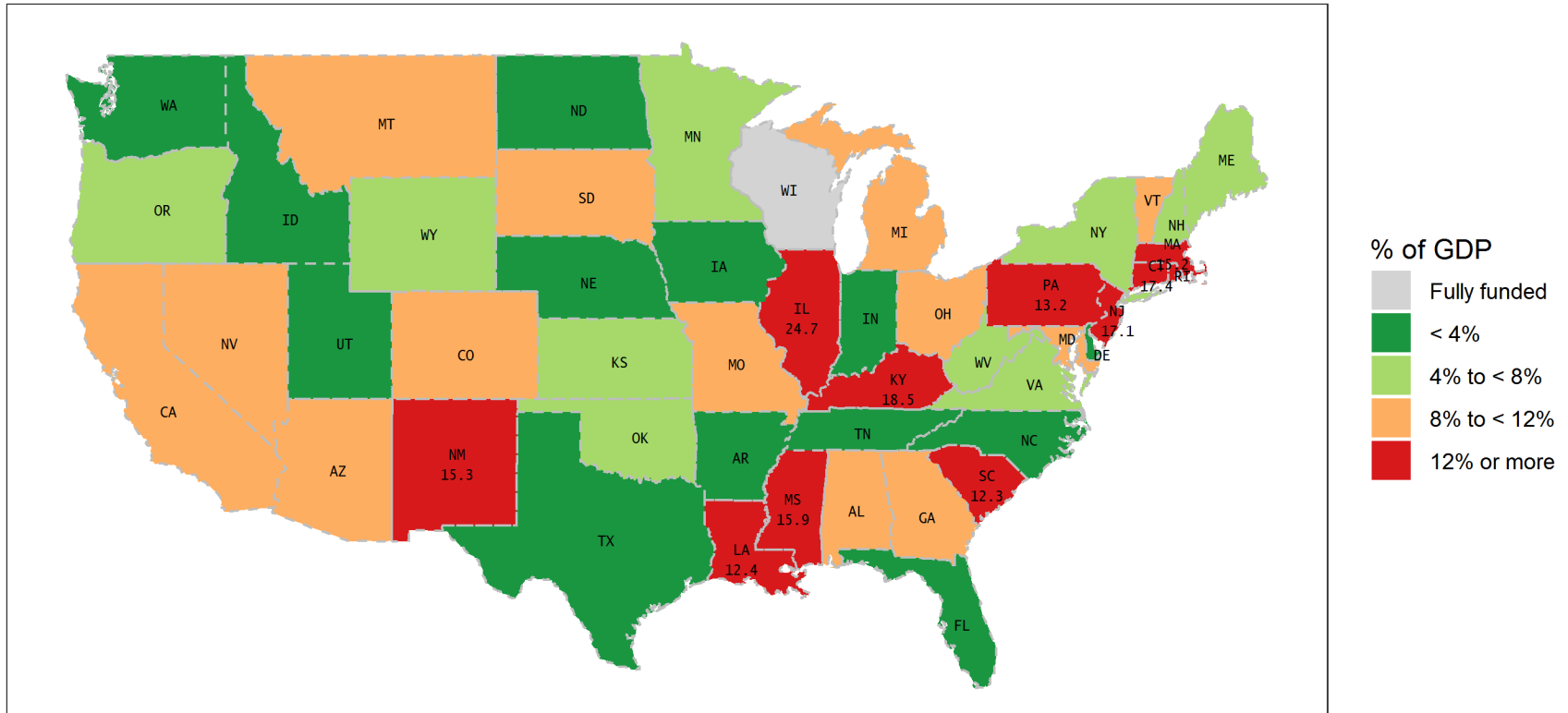
Source: Federal Reserve Board, Financial Accounts of the United States, Tables L.120.b and F.2

Note: Liabilities are as valued by the Bureau of Economic Analysis, not actuaries.

Unfunded liabilities relative to economy vary greatly. Large in some southern states

Unfunded liability as % of state gross domestic product, 2014

State & locally administered plans combined



Source: Federal Reserve Board Enhanced Financial Accounts

<https://www.federalreserve.gov/apps/fof/efa/efa-project-state-local-government-defined-benefit-pension-plans.htm>

These numbers differ from actuaries' estimates, and reflect discounting at 5%.

Unfunded liabilities in southern states

Unfunded liabilities in 2014 as measured by BEA and the FRB

	\$ billions	As % of GDP		Per capita	
		Percent	State % of US	\$ per person	State % of US
United States	\$ 1,443.1	8.4%	100.0%	\$ 4,530	100.0%
Alabama	17.9	9.1%	108.4%	3,702	81.7%
Arkansas	4.7	3.9%	46.7%	1,597	35.3%
Florida	30.1	3.6%	43.0%	1,515	33.4%
Georgia	44.0	9.3%	111.4%	4,365	96.4%
Kentucky	35.0	18.5%	221.5%	7,924	174.9%
Louisiana	30.4	12.4%	147.6%	6,539	144.3%
Missouri	27.6	9.8%	116.5%	4,560	100.7%
Mississippi	16.6	15.9%	189.4%	5,563	122.8%
North Carolina	12.2	2.6%	30.6%	1,224	27.0%
Oklahoma	10.4	5.4%	65.0%	2,671	59.0%
South Carolina	23.4	12.3%	147.4%	4,847	107.0%
Tennessee	4.4	1.5%	17.7%	679	15.0%
Texas	32.4	2.0%	24.1%	1,201	26.5%
Virginia	25.3	5.5%	65.4%	3,044	67.2%
West Virginia	4.1	5.5%	66.1%	2,229	49.2%

Source: Federal Reserve Board, Enhanced Financial Accounts, and U.S. Bureau of the Census (population).
Includes all state and local plans in a state.

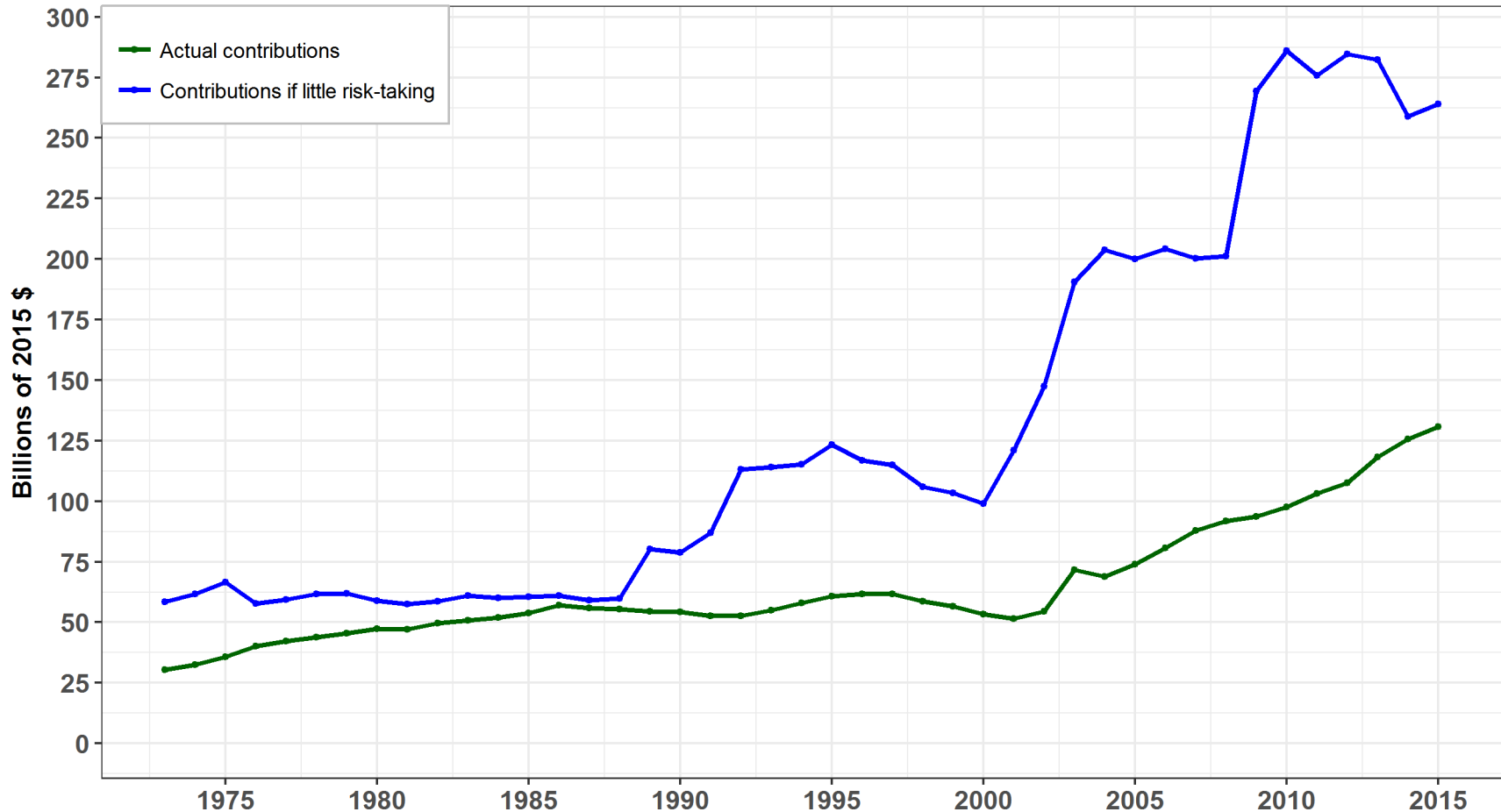
Reactions?

- Is this consistent with how you think of your systems? In some states the unfunded liabilities seem quite small relative to the economy.
- Is legislative interest in pensions and in pension reform consistent with these numbers – e.g., larger in the states where unfunded liabilities are a greater share of the economy?

Contributions would be MUCH higher still if plans lowered discount rates

State and local government inflation-adjusted pension contributions

Versus contributions needed to keep unfunded liabilities from growing, if little risk taken

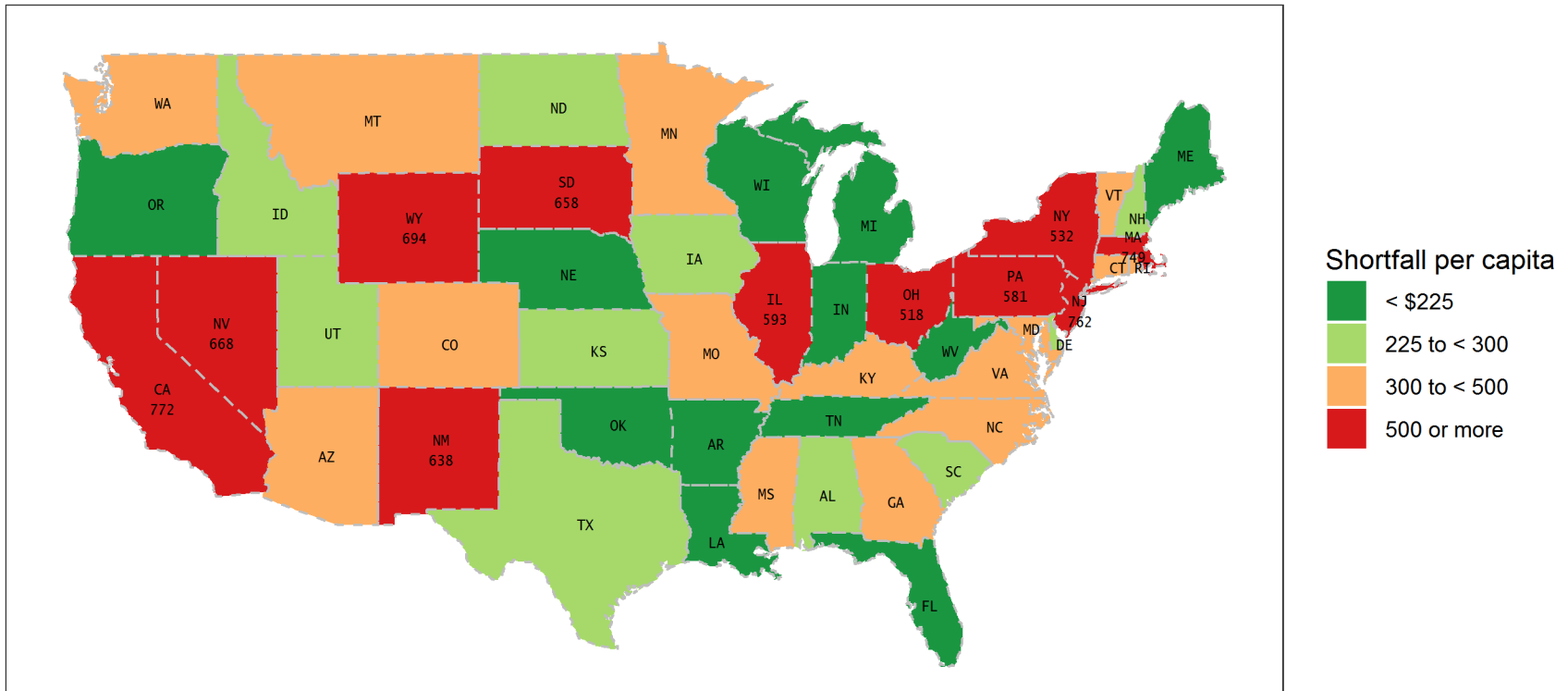


- 'Little-risk' contributions: Employer normal cost + interest on unfunded liability, as valued by U.S. Bureau of Economic Analysis (NIPA Table 7.24)
- Actual contributions also NIPA Table 7.24
- Adjusted for inflation with gross domestic product price index

Employer contributions at 5% discount rate would be MUCH higher, but varies greatly

Employer contributions shortfall relative to normal cost plus interest, 2014

Per capita, state & locally administered plans combined



Author's analysis and estimates based upon:

- Employer contributions from Census Bureau Annual Retirement System Survey (<https://www.census.gov/govs/retire>)
- Employer normal costs from Bureau of Economic Analysis (<http://www.bea.gov/regional/xls/PensionEstimatesByState.xlsx>)
- Unfunded liabilities from Federal Reserve Board (<https://www.federalreserve.gov/apps/fof/efa/efa-project-state-local-government-defined-benefit-pension-plans.htm>)

These numbers differ from actuaries' estimates, and reflect discounting at 5%.

Costs of staying even, based on economic measures

Tread-water cost in 2014, based upon economic concepts, compared to actual contributions

	<i>Per-capita "tread-water" cost</i>			Actual contributions	Cost minus contributions
	Normal cost	Interest on unfunded liability	Normal cost plus interest		
United States	\$ 562	\$ 227	\$ 788	\$ 382	\$ 407
Alabama	308	185	493	247	247
Arkansas	361	80	441	288	153
Florida	311	76	387	200	187
Georgia	345	218	563	224	339
Kentucky	408	396	804	314	490
Louisiana	408	327	735	738	(2)
Missouri	588	228	816	320	495
Mississippi	368	278	646	336	310
North Carolina	418	61	479	167	312
Oklahoma	378	134	512	313	198
South Carolina	269	242	512	235	277
Tennessee	375	34	408	197	211
Texas	420	60	480	235	245
Virginia	477	152	629	281	348
West Virginia	294	111	406	438	(32)

Source: Rockefeller Institute analysis and calculations, based on data from the Bureau of Economic Analysis and the Bureau of the Census. Includes all state and local plans in a state.

That's probably the direction they're headed – but very slowly

- Public plans have lowered assumptions over last few years, albeit VERY slightly
- Current assumptions still require substantial investment risk, leading to return volatility and budgetary and plan funding risk.
- Many plans (I think) wish to lower assumptions further. Good for benefit security, but drives contributions up.
- I expect a “show them no good news” approach – lower assumptions whenever returns are better than expected.
- Suggests repeated increases in contributions over the longer term

If investment environment changes – e.g., higher inflation, higher interest rates – then maybe not.

Reactions?

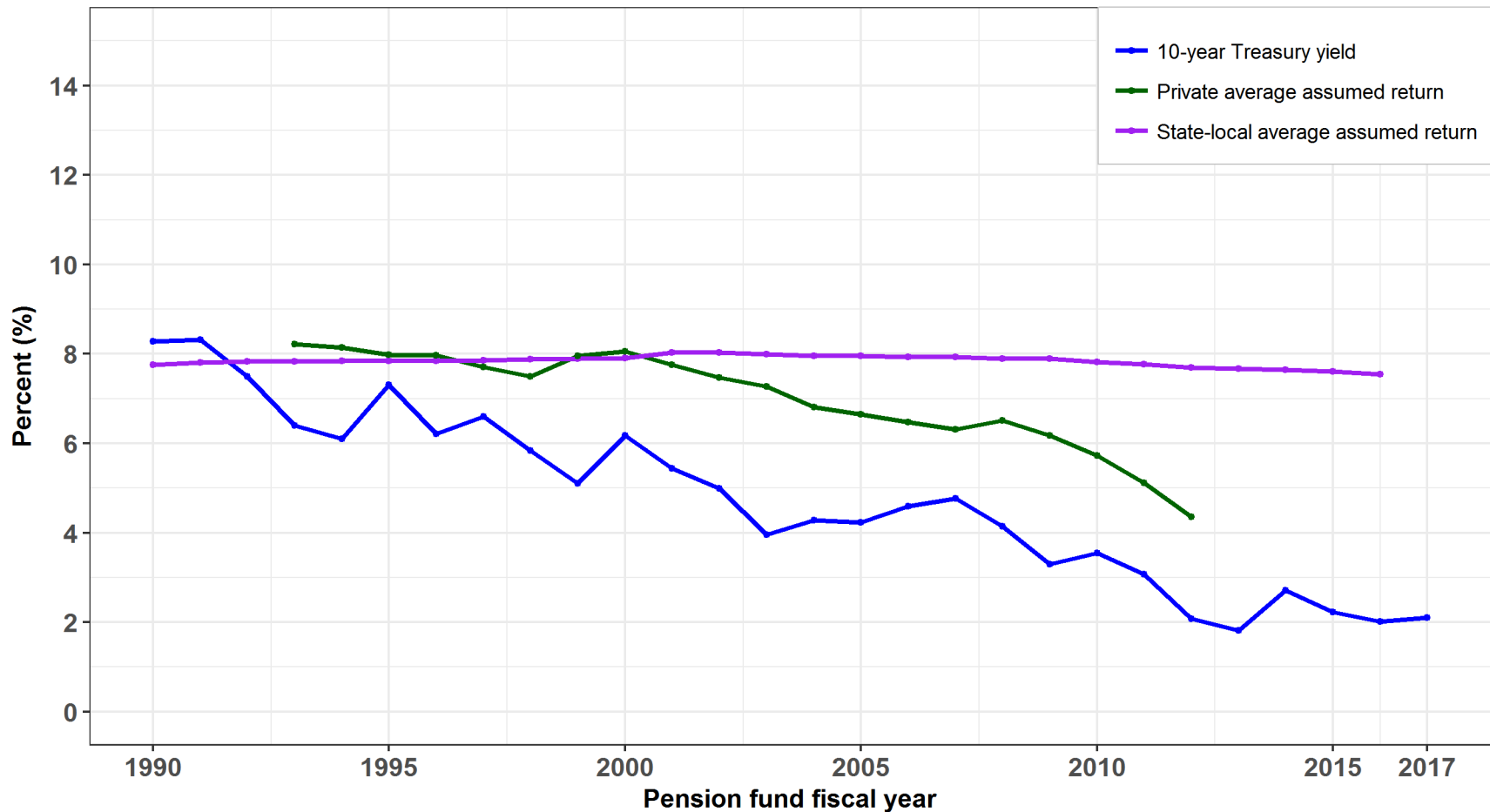
- How much (if at all) have investment return assumptions come down in the plans in your state?
- How much has this affected contributions?
- Do you expect new or further reductions in investment return assumptions?
- For how far into the future?
- If this happens, how will this affect:
 - Other parts of the budget?
 - Political support for pensions, or desire for further changes to benefits or other aspects of pensions?

Reaching for yield, and potential consequences

Public plans have lowered earnings assumptions, but not by much

Assumed investment returns and risk-free returns

Public and private retirement systems



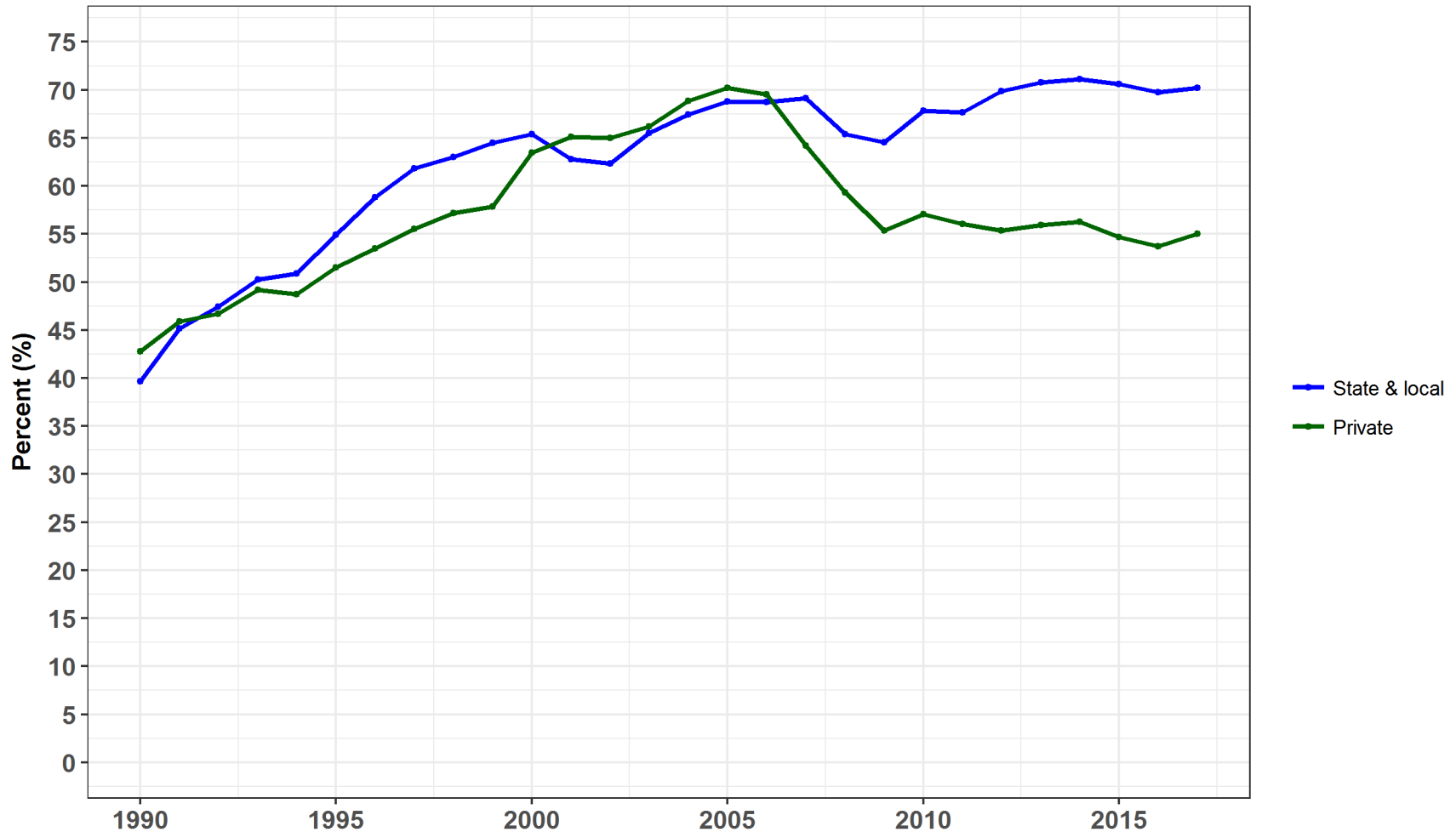
Notes:

- Public plan assumptions for 2001+ from Public Plans Database, Center for Retirement Research. Earlier years from multiple sources.
- Private plan assumptions provided via correspondence with authors of: Andonov, Aleksandar and Bauer, Rob and Cremers, Martijn, Pension Fund Asset Allocation and Liability Discount Rates (March 3, 2016). <http://ssrn.com/abstract=2070054>
- 10-Year Treasury yield from Federal Reserve Bank of St. Louis (FRED)

Public plans have moved into equity-like higher-risk investments

Equity-like investments as percentage of invested assets

State and local government and private sector defined benefit pension plans



Source: Authors' analysis of Z.1 Financial Accounts of the United States, Federal Reserve Board, Tables L.118.b, L.120.b, and L.122

Pension fund risk-taking & investment return volatility

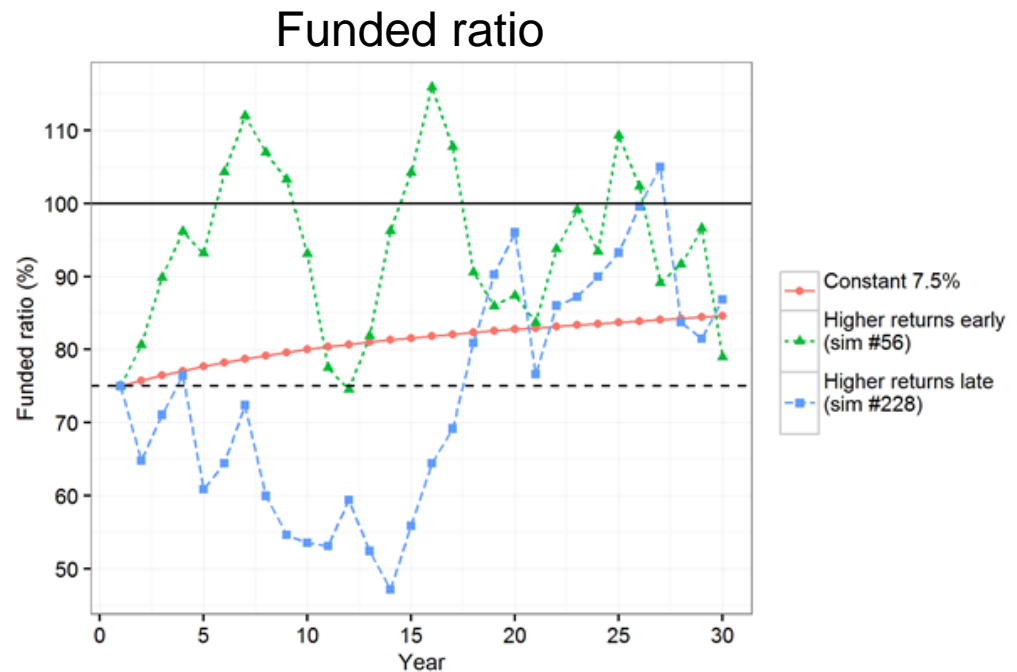
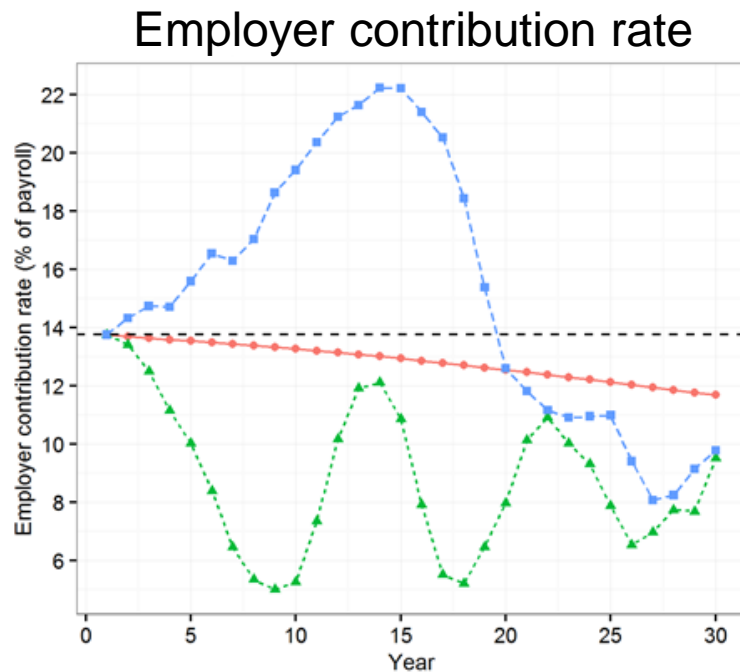
- Even if actual returns hit assumed returns over the long run (e.g., if your returns average 7.5% at the end of 30 years), the “**path**” over time can be a roller coaster. Some paths could result in:
 - Extreme increases or decreases in employer contributions, or
 - Extreme overfunding or underfunding,
Creating political risks to plan benefits and to budgets
- If assumption is generally correct, there’s **no guarantee that assumption will be hit**, even in the long run (e.g., 7.5% might be reasonable, but you might not hit it, even at 30 years). Risks of severe underfunding even if employer pays full actuarially determined contributions
- No guarantee that assumption is correct – could be too high or low (e.g., 7.5% might not even be reasonable).
- Risks and tradeoffs are related to funding policies

The path can be a roller coaster

Employer contributions and funded ratio can be highly variable, even if expected returns are correct on average.

Three individual simulations, all with 7.5% discount rate and 7.5% compound annual returns.

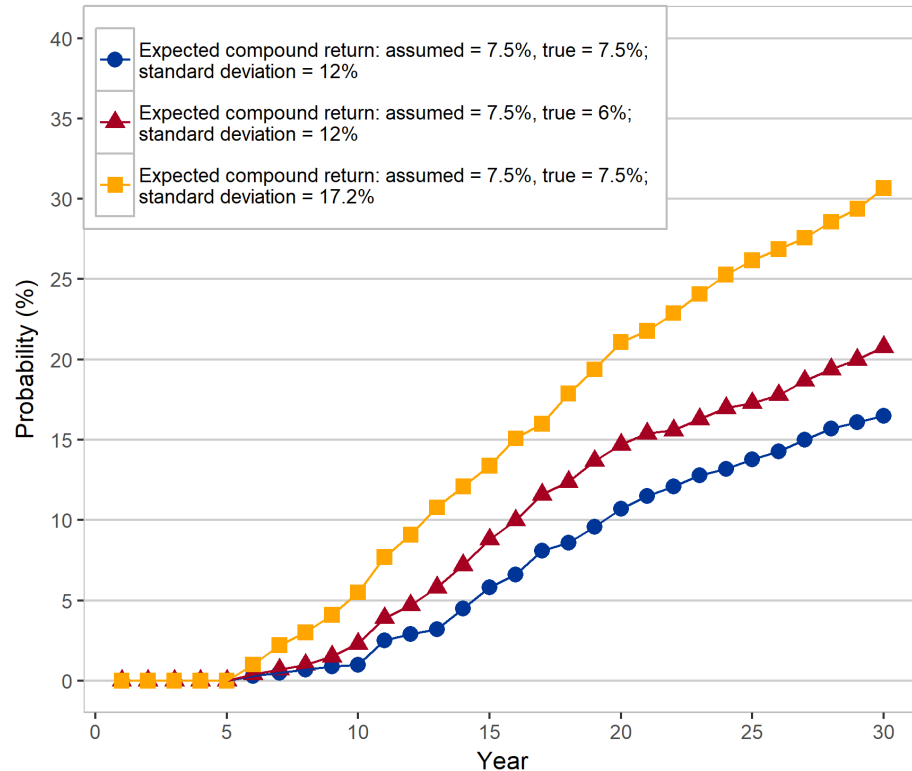
- **Deterministic run: constant returns**
- **Stochastic run** : high returns in early years



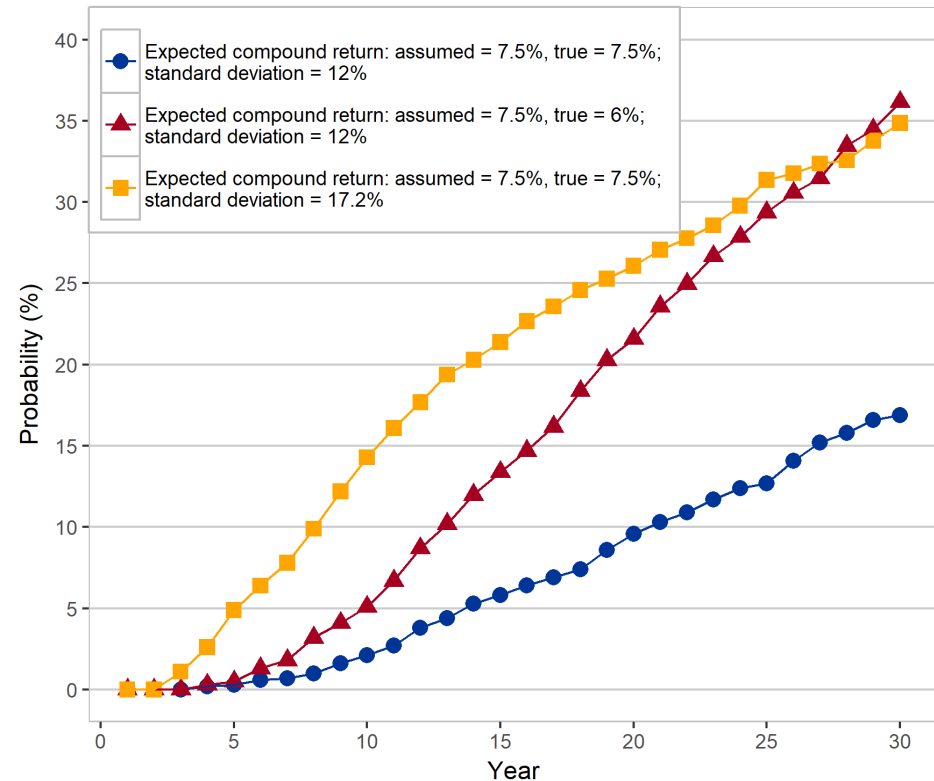
Employer and fund risks can be quite large if expected returns are too high

- Some current market forecasts suggest that it can be very difficult for public pension funds to achieve their assumed returns in the current market environment. To achieve the assumed return of 7.5%, the pension funds may need to invest in even riskier portfolios.
- We examined (1) “true” return of 6% when assumed is 7.5%, and (2) highly volatile returns (17% “standard deviation”), in comparison to a base case

Probability of employer contribution rising by more than 10% of payroll in any 5-year period up to the given year



Probability of funded ratio falling below 40% at any time prior to and including the given year



Risks are related to funding policies

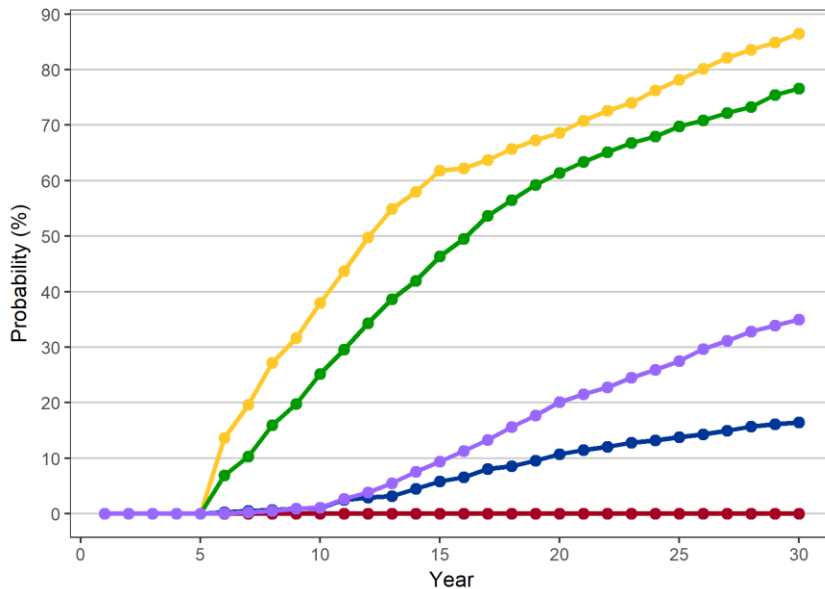
Risk measures

- **Contribution volatility:** Probability of sharp increase in employer contribution in any 5-year period
- **Risk of severe underfunding:** Probability of funded ratio falling below 40% during first 30 years

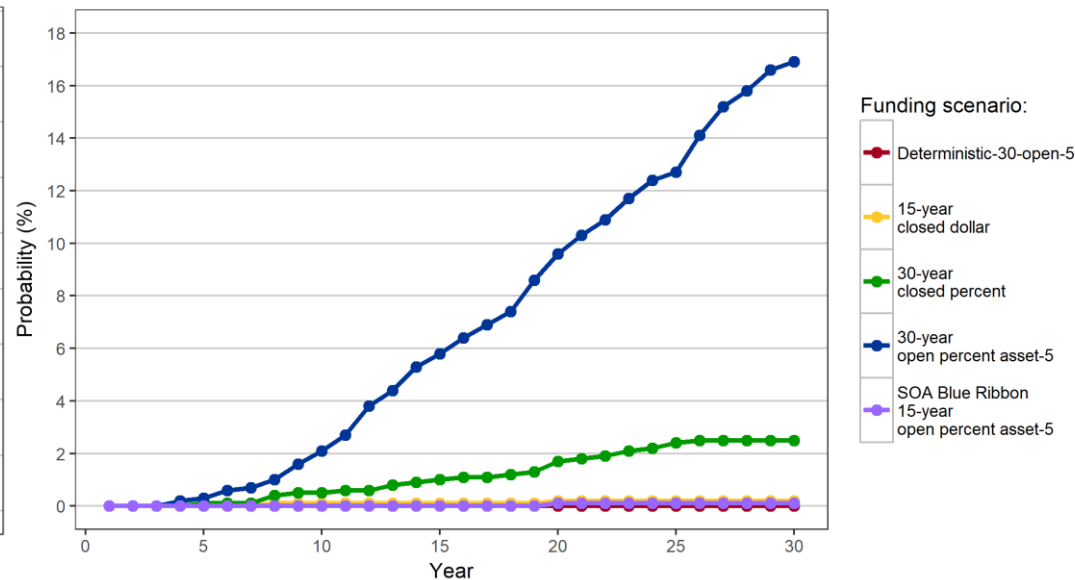
The **very stretched-out** policy of 30-year level percent amortization:

- Attractive to employer : **Very low** probability that contribution will rise above 10% in a 5-year period
- has a **far greater risk** of severe underfunding than other policies.

Probability that employer contributions will rise by more than 10% of payroll in a 5-year period



Probability that the funded ratio will fall below 40% during the first 30 years



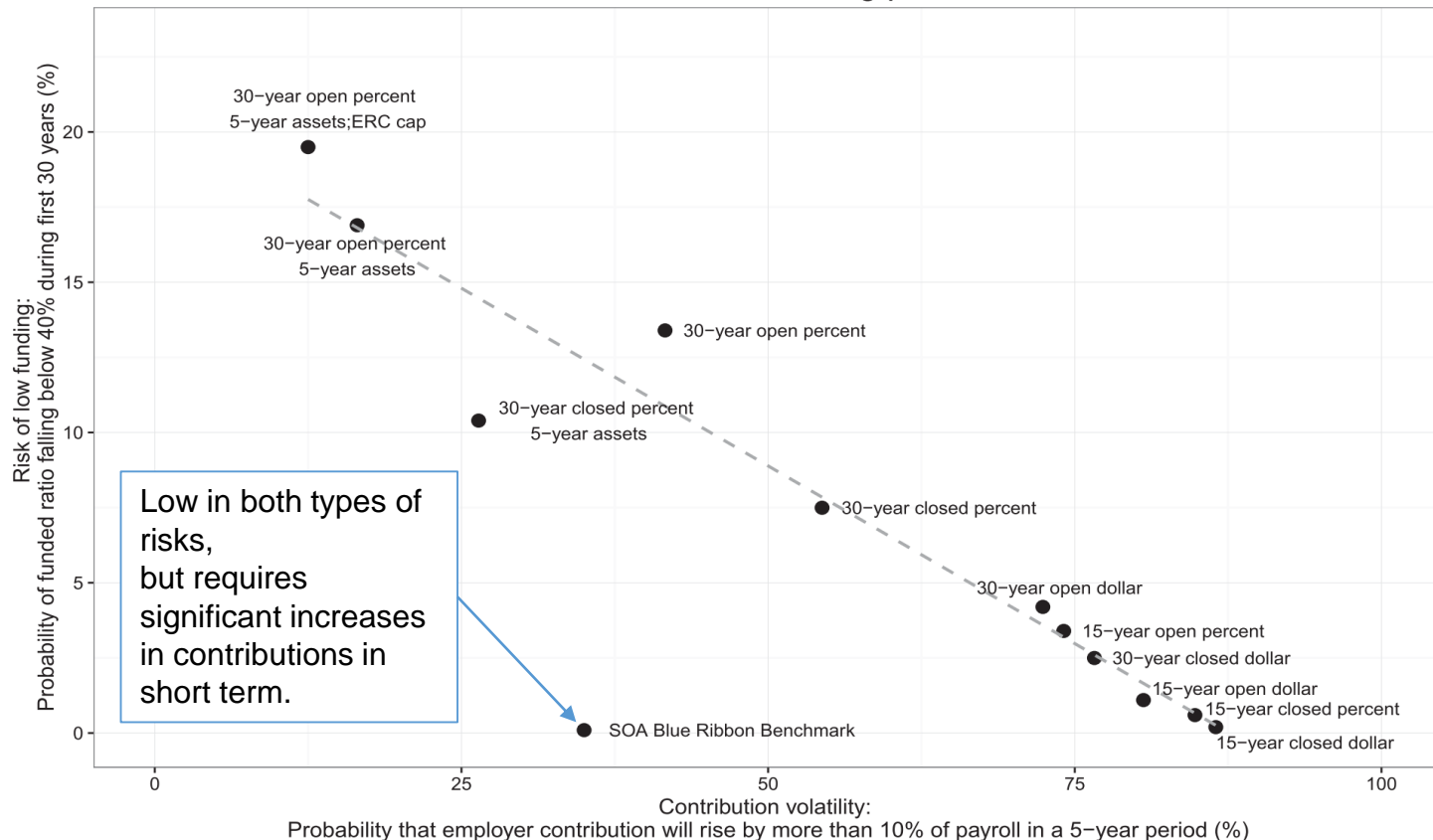
Funding scenario:

- Deterministic-30-open-5
- 15-year closed dollar
- 30-year closed percent
- 30-year open percent asset-5
- SOA Blue Ribbon
- 15-year open percent asset-5

The trade-off between contribution volatility and the risk of underfunding

- Contribution volatility: Probability of sharp increase in any 5-year period of employer contribution rate
- Risk of underfunding: Probability of funded ratio falling below 40% during first 30 years

Risk of severe underfunding and contribution volatility under selected funding policies



Reactions?

- To what extent is reaching for yield a concern in your state?
 - Are you concerned about risk to pension fund security and potential costs to future taxpayers?
 - Or is the most important issue keeping contribution costs low now, even if that means greater risks?
- To what extent are your states or plans using funding methods that stretch repayments over very long periods? Are changes in funding methods likely?

Policy changes / reactions?

- Since 2007 nearly every state has passed one or more pension policy changes
- What changes or reforms have you adopted in your states?
- What further changes are most likely going forward?
- How will changes affect state and local finances?
- How will they affect beneficiaries?
- How will they affect your competitiveness as an employer?

Ensuring secure funding

- Pay the actuarially determined contribution. Rain or shine. This is crucial for avoiding deep trouble.
- Calculate the actuarially determined contribution conservatively.
 - Short amortization period.
 - Closed period.
 - Don't smooth assets. Creates tempting opportunity to take risk that others must bear (classic moral hazard).
- Accept lower discount rates and lower risks
- Consider risk sharing.

All of this is difficult: Hard on taxpayers, potentially hard on beneficiaries. Good for plan funding security.

Concluding observations

- Even if plans have some good investment years (and FY 2017 was a good year), pension problems are likely to be with us for a while...
- ...if plans gradually lower discount rates, and lower risk, as I expect
- That will raise costs that policymakers must fund, possibly quite dramatically
- But it helps secure benefits and reduces the risk of potentially disastrous results



www.rockinst.org
@RockefellerInst



Public Pensions: A Fiscal Imperative

**71st Annual Meeting of the Southern
Legislative Conference
Council of State Governments**

**Fiscal Affairs & Government
Operations Committee Session**

Biloxi, MS

Don Boyd, Director of Fiscal Studies
donald.boyd@rockinst.suny.edu

July 30, 2017