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ROCKEFELLER  
INSTITUTE  
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# *Public Pension Funding Risks*

Session: The State of State  
Pension Funding and Underfunding

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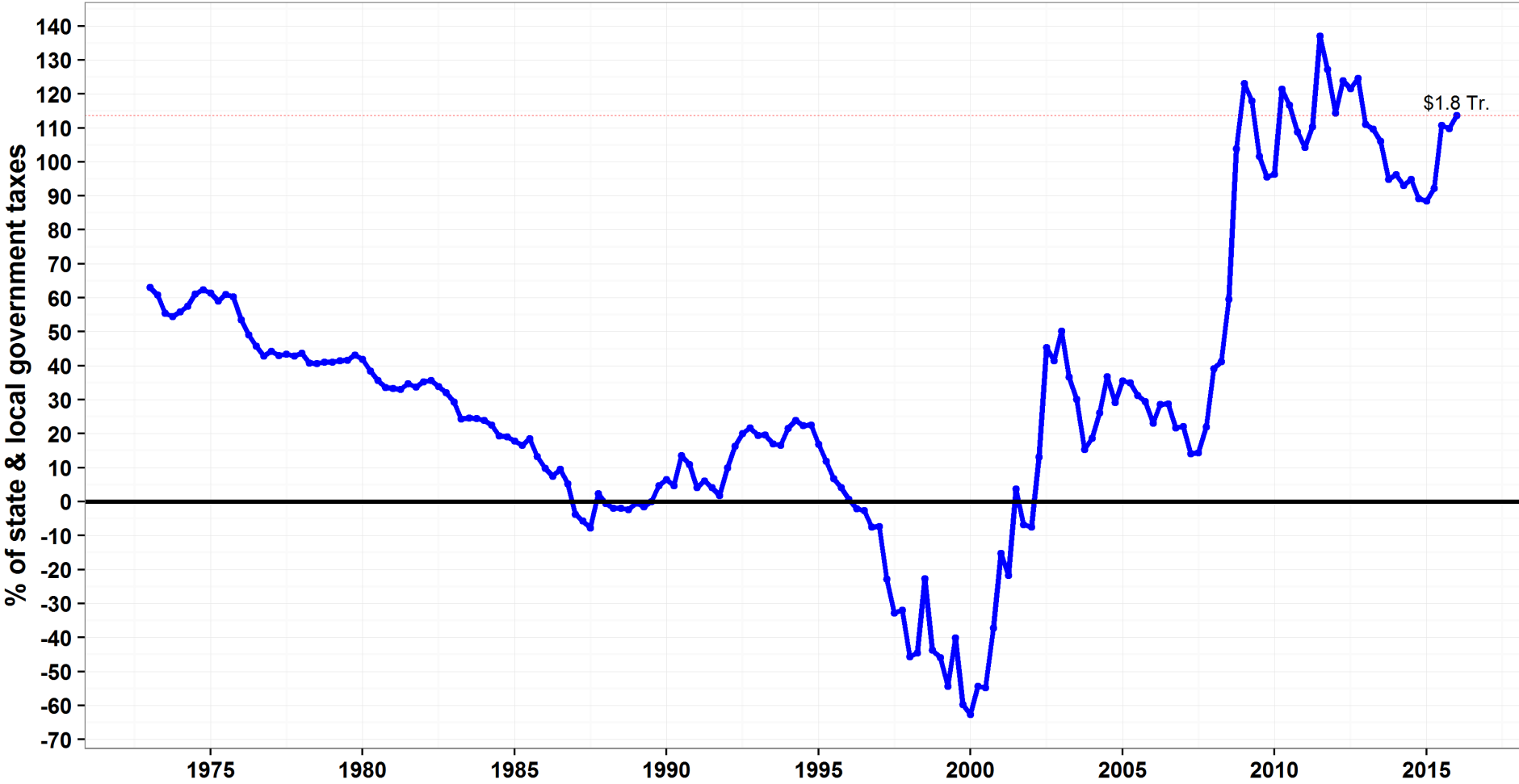
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The State University  
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# Pension underfunding as % of SLG taxes is near record, despite reforms & large contribution increases

## Unfunded liability of state and local government defined benefit pension plans as percent of state & local taxes



Source: Federal Reserve Board, Financial Accounts of the United States  
Note: Liabilities are as valued by the Bureau of Economic Analysis, not actuaries.

# Sometimes heard: “pension contributions are a small share of state and local government budgets” ...

## For United States as a whole, S&L govt contributions:

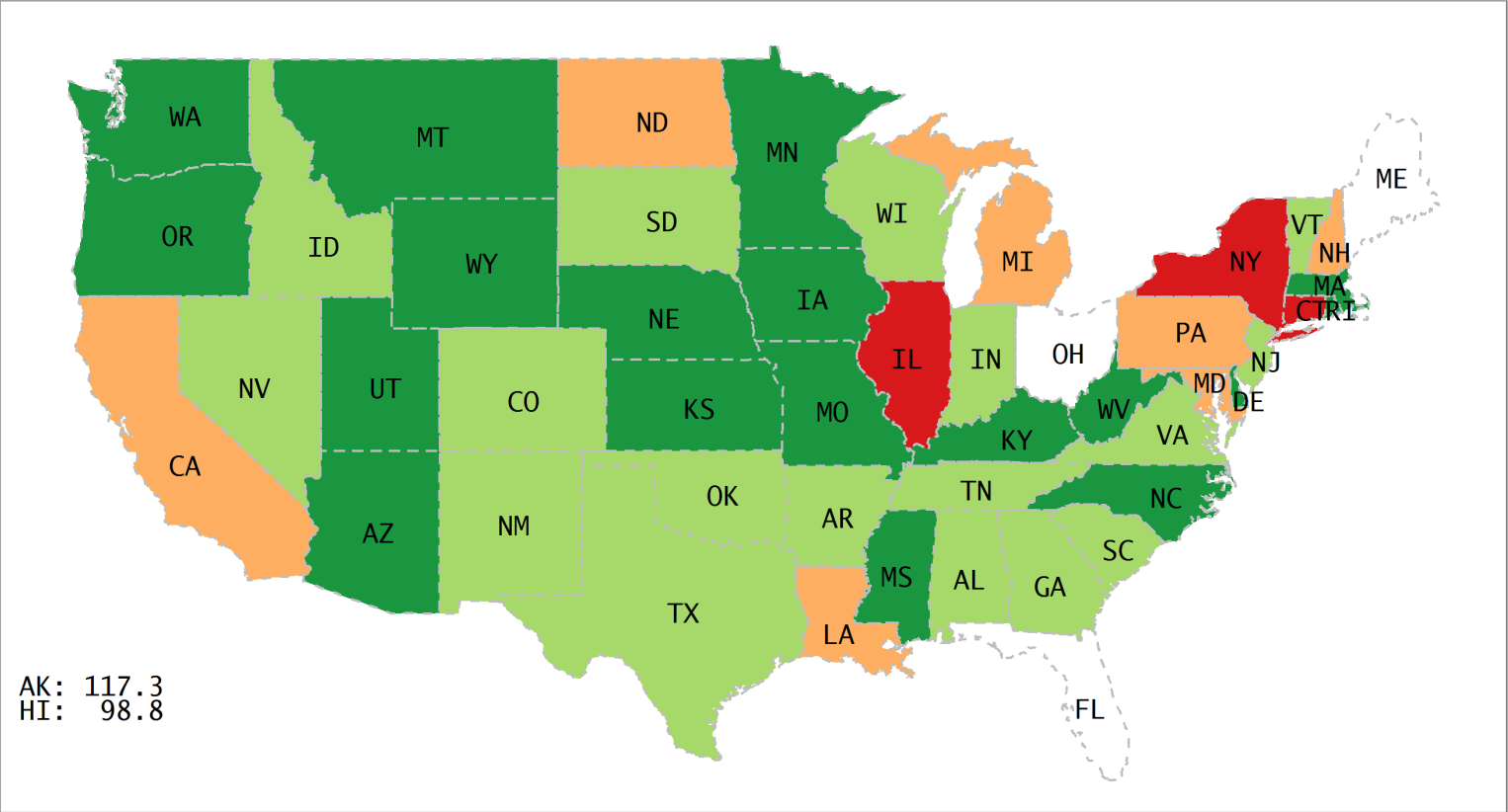
- Increased from 4.6% of S&L taxes to 8.5%, 2000 to 2015
- Annual payment is up \$48b after inflation, 2007 to 2015, compared to +\$80b for taxes – pension contribs increased *59 cents for every \$1 increase in tax revenue*. Not much left for other priorities.
- \$16.5b below actuaries’ “required” contributions in 2014; 33 plans were underpaid by \$100m or more
- \$120-200b below contributions needed for secure funding under generous assumptions; could be even more still; govts hope *investment risk-taking* will make up the difference

## Contribution stress varies greatly:

- Annual real per-capita S&L govt contribs up >\$75 in 30 states
- Up >\$150 in 10 states. Much more in some cities
- Some S&L govts avoid (near term) fiscal stress by underpaying

# Contributions up dramatically in some states, moderately in others

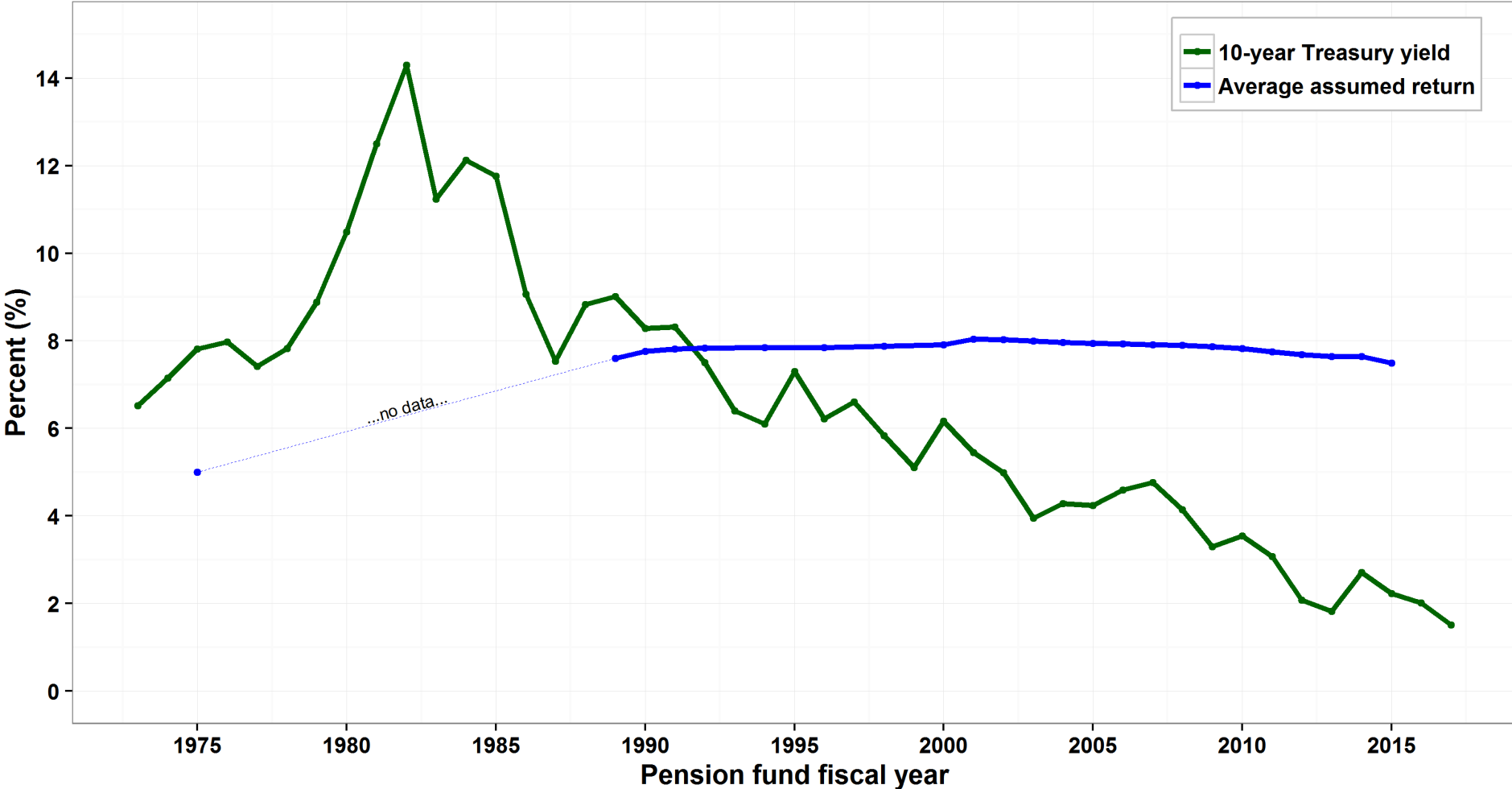
**Change in state & local government pension contributions, Inflation-adjusted dollars per capita, 2007 to 2015**



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 and Alaska in 2015, contributions for 2008 and 2014 were used for these states and years, respectively

# As Treasuries fell, pension plans' assumed investment returns did not, "necessitating" greater risk-taking

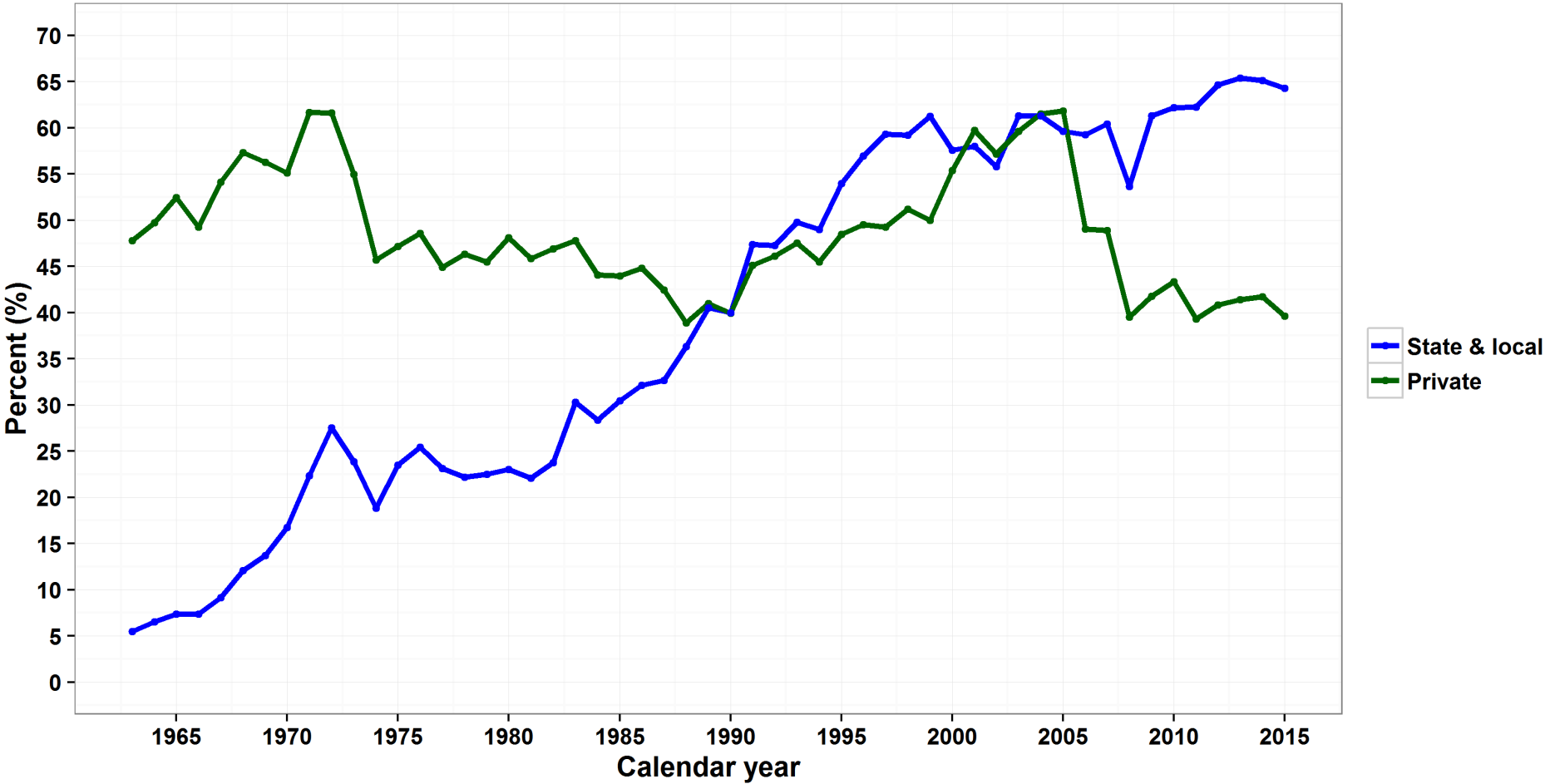
Assumed investment returns of state and local retirement systems and risk-free returns



Note: Assumed returns not available for 1976-1988 but likely were near dashed blue line

# Public plans increased their exposure to equity-like assets while private plans moved the other way

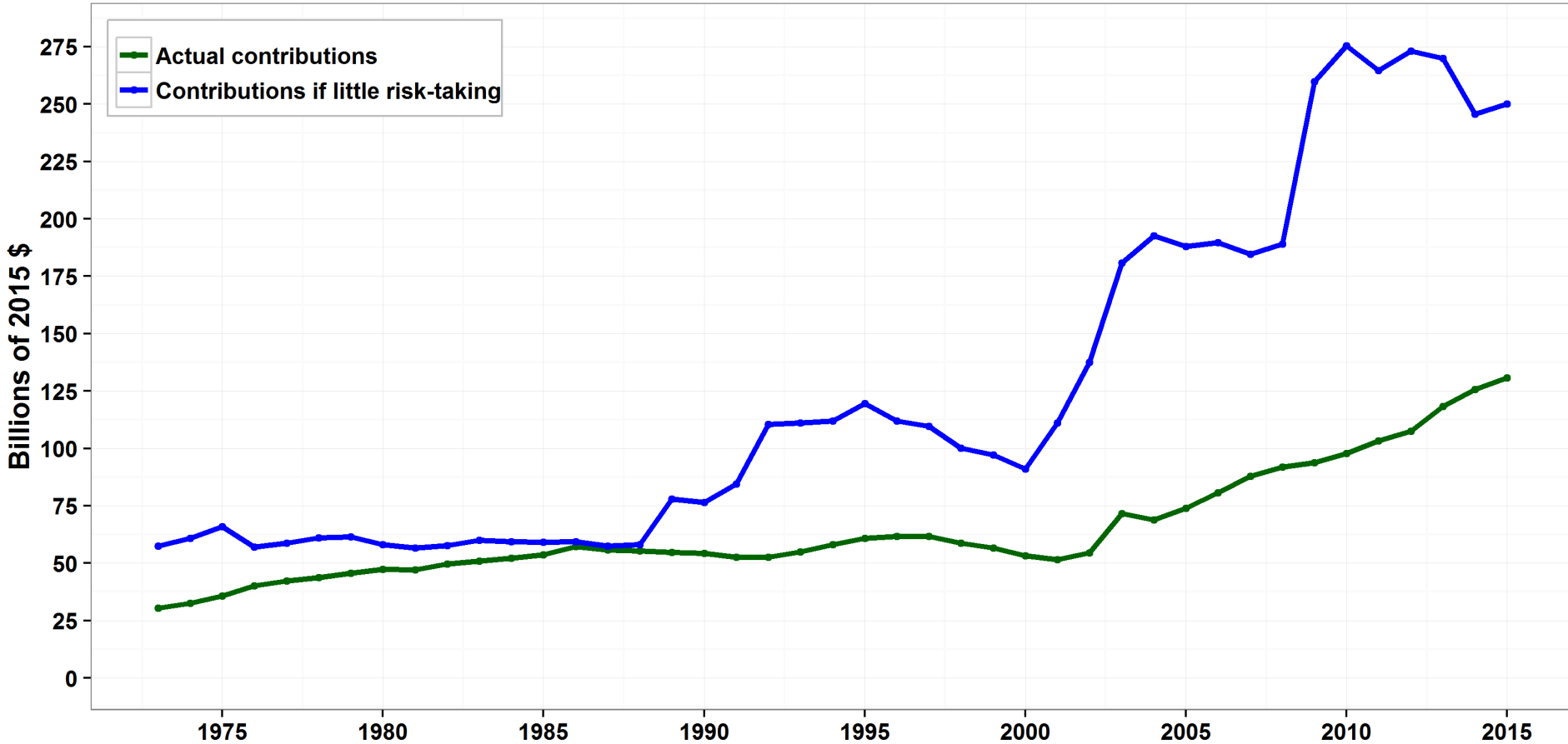
Equity-like investments as percentage of invested assets of defined benefit plans  
State and local government and private sector plans



Source: Authors' analysis of Financial Accounts of the United States, Federal Reserve Board

# Governments hope that successful (but risky) investing will keep contributions low

State and local government inflation-adjusted pension contributions  
Versus contributions needed to keep unfunded liabilities from growing, if little risk taken



Source: Rockefeller Institute analysis of Bureau of Economic Analysis NIPA Table 7.24. 'Little-risk' contributions are based on BEA estimates of ABO liability, which were calculated using low-risk market-based discount rates. In recent years, the rate was 5%. Liabilities and contributions estimated with risk-free rates would be considerably higher. Note that little-risk contributions would be higher still if we included amounts needed to amortize unfunded liabilities.

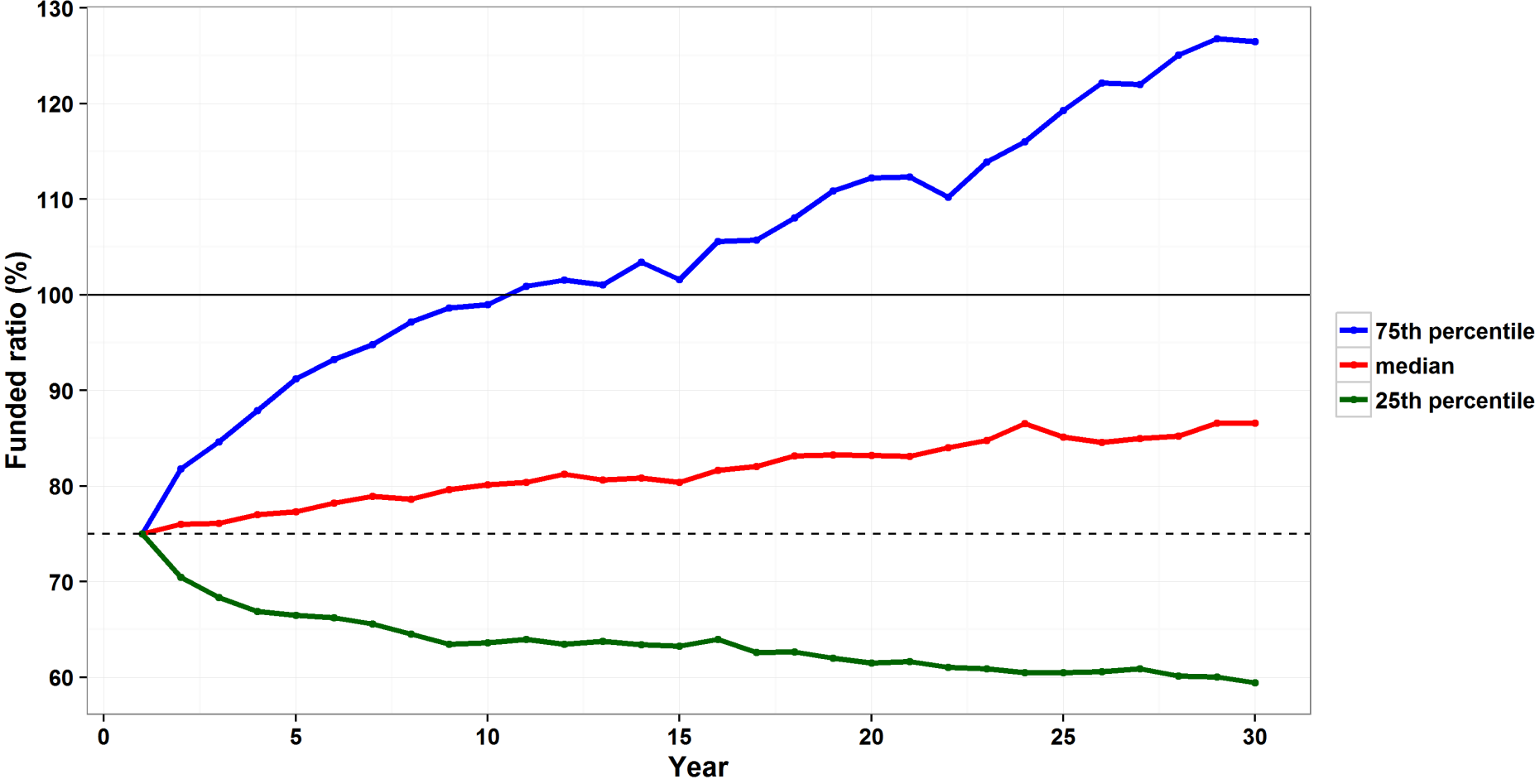
# Public pension risk and potential consequences

- **Incentives:** Standards and practice environment encourages risk-taking
- **Magnitude:** One measure of risk is “standard deviation”: Under plausible assumptions, typical std. dev. currently is *at least 12%* -- plans have about 1 in 6 chance of falling short by *at least 12% in a single year*:
  - \$3.6 Tr. assets x 12% ~ \$430b in a single year: about what SLGs spend annually on highways, police, fire, and corrections combined
  - Even with generous amortization, would require higher contribs of \$24b now, increasing 3.5% annually for 30 years – equivalent to about a 50% cut in parks spending for 30 years, or 25% cut in highway capital for 30 years – FROM ONE YEAR OF BAD RETURNS.
- **Erroneous popular belief:** “pension funds are long-term investors, can ride out ups and downs, much less risk over the long term”. Wrong. As investment horizon lengthens, likely range around expected return shrinks, but it is compounded over more years. *Likely range around assets, which are what plans need to pay benefits, widens as the time horizon extends.*
- **Big risks even if expected returns are reasonable:** Even if 7.5% is a reasonable long-run assumption – a big if – no guarantee it will be achieved in any given time period. Substantial risk of a funding crisis, and of significant contribution increases. (And “risk” of very good outcomes, too.)
- **Risks are increasing:** Public pension plans are maturing, with lower numbers of active workers per beneficiaries, higher net cash outflows, and higher asset-payroll ratios. This may lead to higher risks of pension plan underfunding, all else equal, unless pension funds invest in less volatile assets.



# Likely range of funded status increases as time horizon lengthens – i.e., risk increases with time

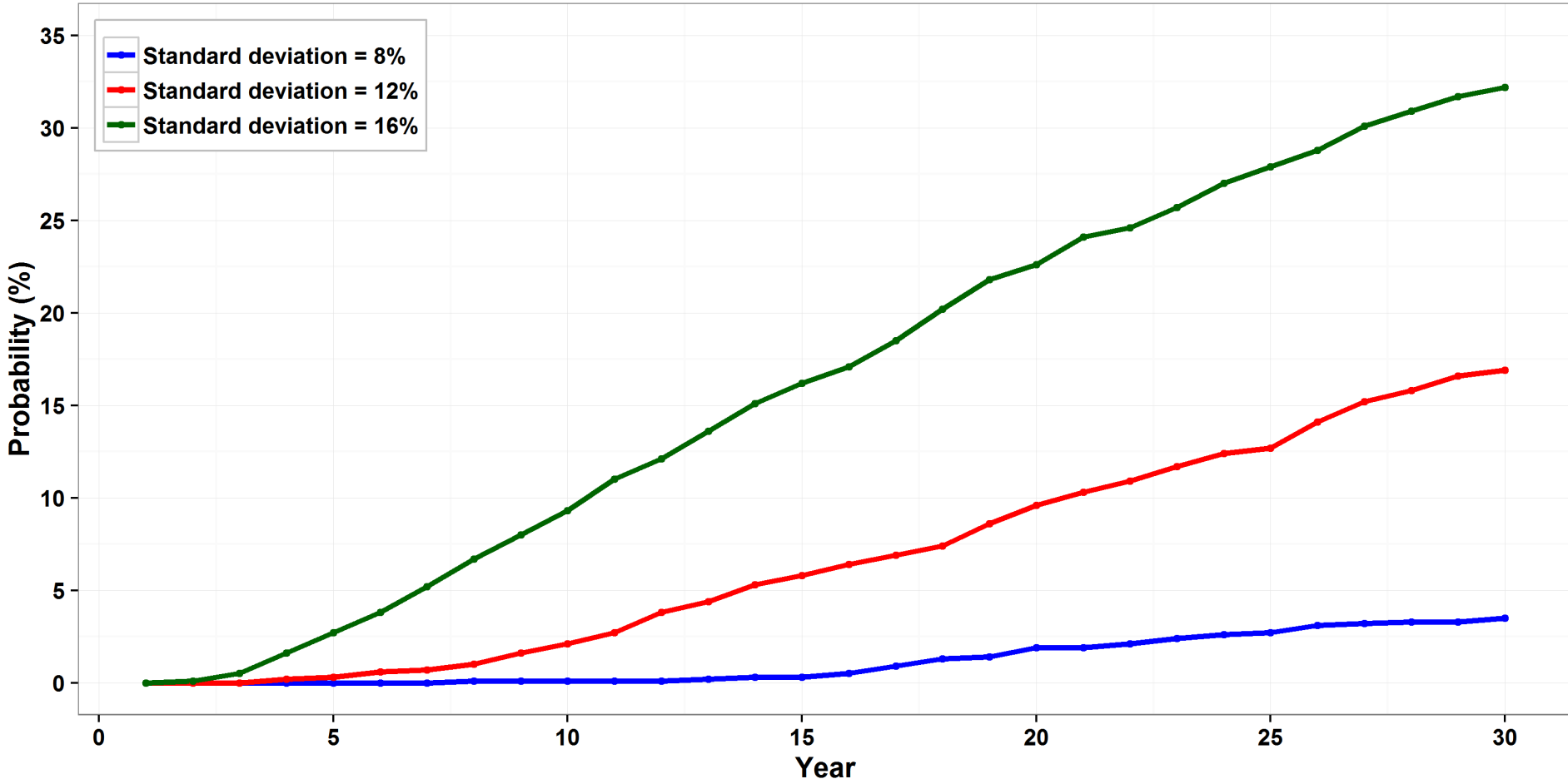
Funded ratio quartiles  
Average plan with common funding policy (see note)



Note: Initial funded ratio of 75%, expected compound return of 7.5%, standard deviation of 12%  
30-year level-percent open, 5-year asset smoothing

# Risk of a funding crisis rises as investment-return volatility rises

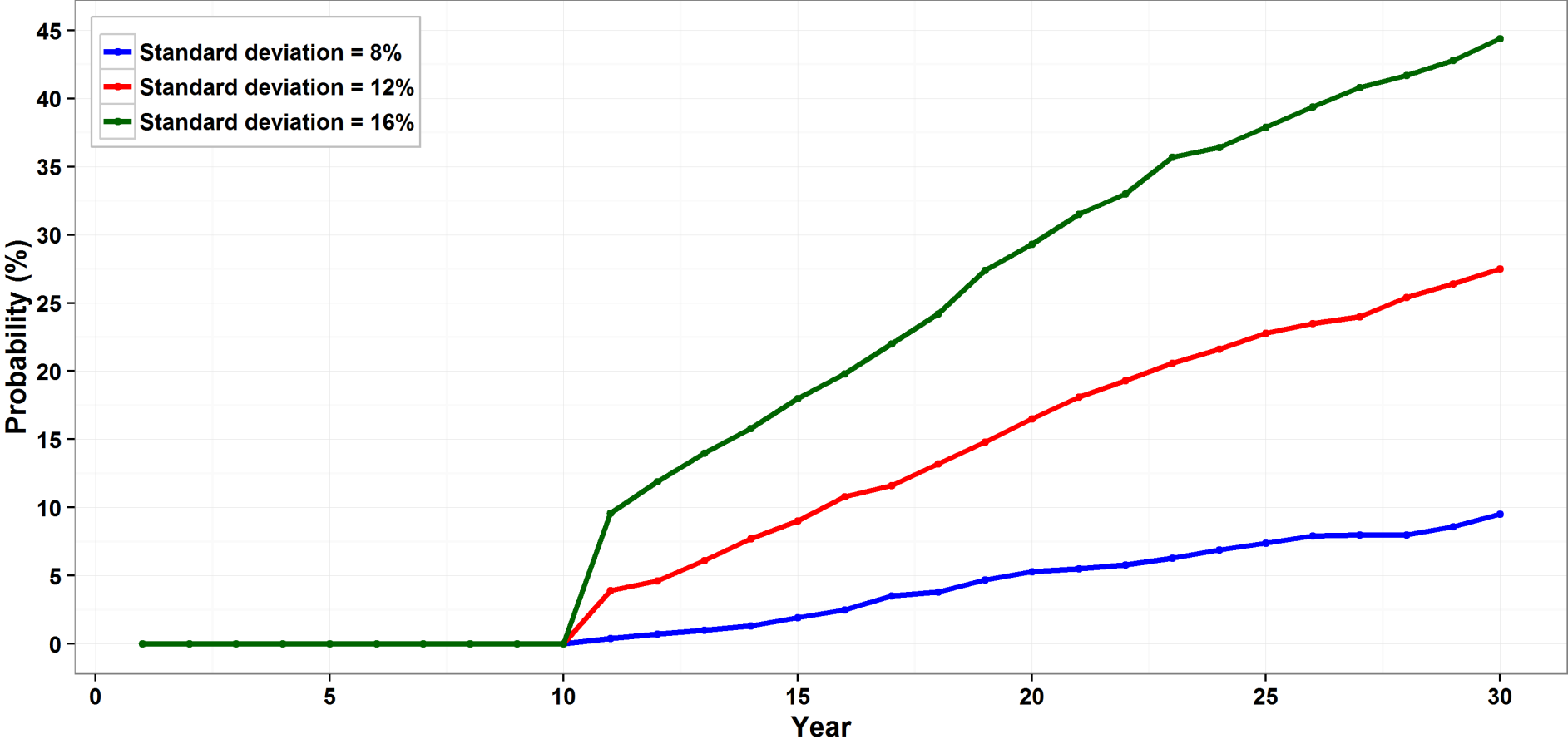
Probability of funded ratio falling below 40% at any time prior to and including the given year  
Average plan with common funding policy (see note)



Note: Initial funded ratio of 75%, expected compound return of 7.5%, standard deviation as shown  
30-year level-percent open, 5-year asset smoothing

# Risk of sharply higher employer contributions rises as investment-return volatility rises

Probability of employer contribution rising by more than 10% of payroll in any previous 10-year period  
Average plan with common funding policy (see note)



Note: Initial funded ratio of 75%, expected compound return of 7.5%, standard deviation as shown  
30-year level-percent open, 5-year asset smoothing

# Conclusions

- Public pension plans are taking far more risk than in the past, in the hope that investing success will keep contributions low.
- Result is substantial risk that funded status will fall into crisis territory, and required contributions will rise sharply.
- Can lead to cuts in services, tax increases, benefit cuts.
- There is no “rule” for the right level of risk. The interests of those who *bear* risk should be considered. Under current practices, pension plans *take* risk but taxpayers and other stakeholders in govt (including future generations) *bear* risk.
- Risk-taking recently has been unsuccessful: typical plan fell about 4% short in 2015 fiscal year and 7+% short in 2016: ~11% short → ~\$400b for U.S. as a whole (> 1 year of all sales taxes collected by all state and local govts). Not yet reflected in contributions, which will have to rise as a result.
- Maybe risk-taking will be more successful in future years. Maybe not.

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