

# The Bureau of Economic Analysis's State-level Public Pension Estimates

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ROCKEFELLER COLLEGE  
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# Important benefits of BEA state-level defined benefit public pension estimates for public pension analysis

- Comprehensive (all plans, estimated)
- 50 states + DC
- Time series (2000+, annual)
- Market-based discount rate
- Same discount rate, all plans
- Assets on market-value basis
- Includes estimates of normal cost, and data on actual contributions
- Quality control

These characteristics in combination allow state-level analysis (with caution) of liabilities and costs, and comparisons to contributions, on a reasonably consistent basis over time and across states. No other data source allows this (absent enormous work).

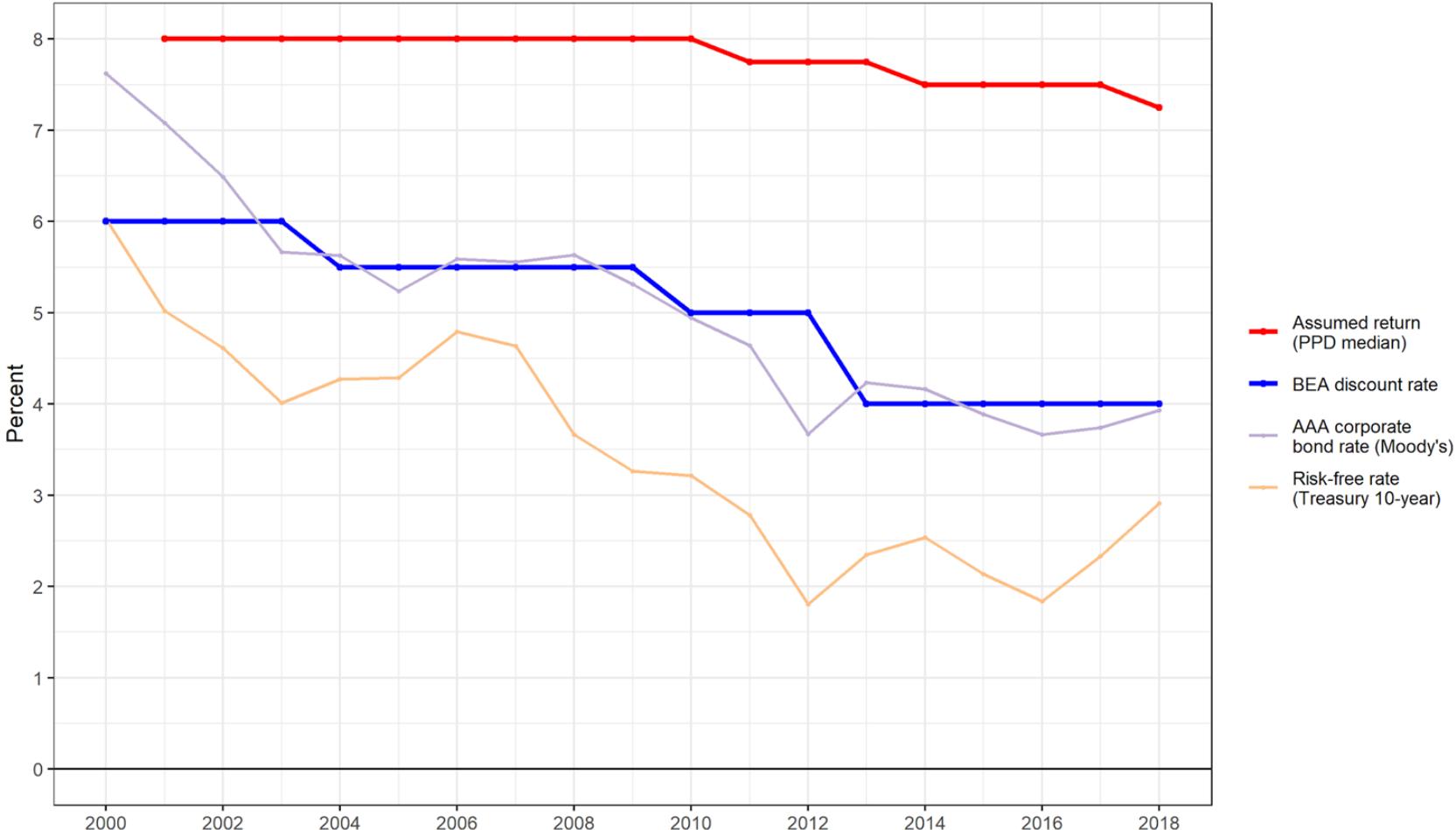
The data also allow detective work for individual states.

# Selected compilations of public DB pension data

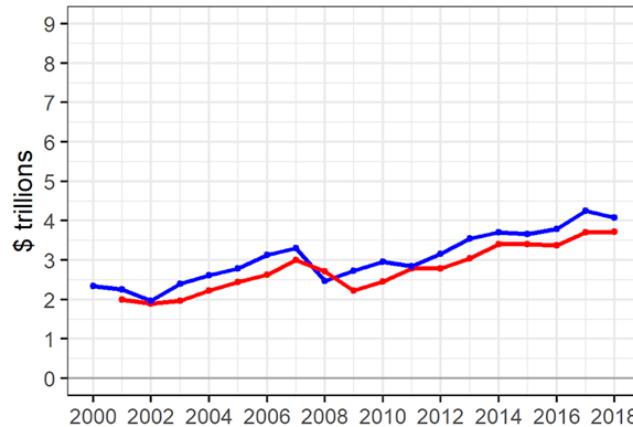
	BEA	<a href="#">Public Plans Database (PPD)</a> (Boston College...)*	<a href="#">Moody's adjusted net pension liabilities</a> *
Reported at:	State geography	Primarily plan-level	Primarily state-level totals for state plans, local plans
Universe	Complete -- estimated	~190 plans ~90% of assets	227 large SG plans; 50 large locals
Availability	Annual (CY), 2000-2018	Annual (FY), 2001-2018	Annual (FY), ~2011-2018
Discounting	Based on Moody's AAA corporate; 4% for 2018	Plan-chosen rates; 7.3% median for 2018	High-quality long-term taxable (FTSE PLI); ~4.1% 2018
MV assets Liability Unfunded; FR Employer NC Payroll; NC %	\$4.1 trillion \$8.6 trillion \$4.5 trillion; 47.3% \$167 billion \$928 b; ~17% (Boyd ests.)	\$3.7 trillion \$5.2 trillion \$1.5 trillion; 71.8% \$52 billion (noisy) \$733 billion; 7.1% (noisy)	~\$1.6 tr <a href="#">states</a> , \$0.5 tr <a href="#">local</a>
Other	Lumpy DR changes	Limited resources for QC	Paywall + inconvenient

\* These are the most prominent producers/providers/publishers of these data. There are some alternatives.

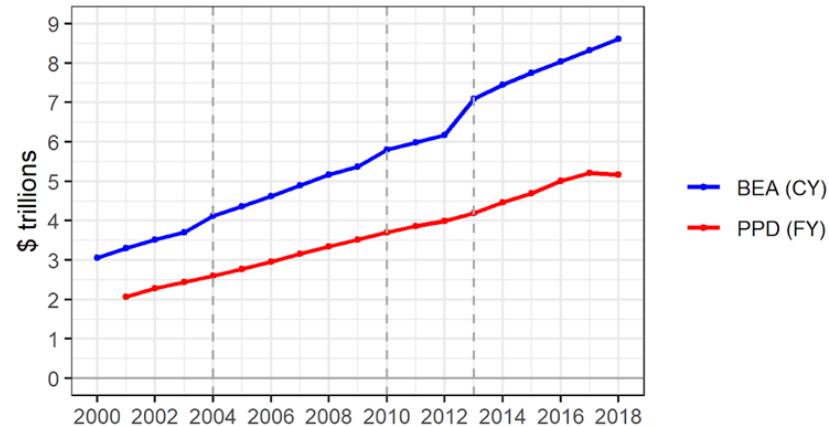
## Public plan return assumptions (discount rates), BEA discount rate, and selected market rates



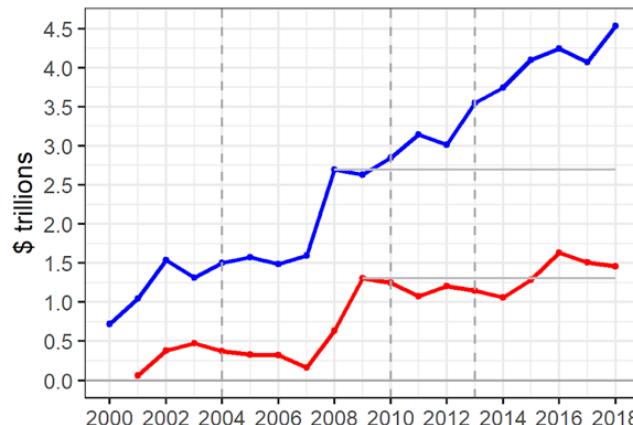
### Market value of assets



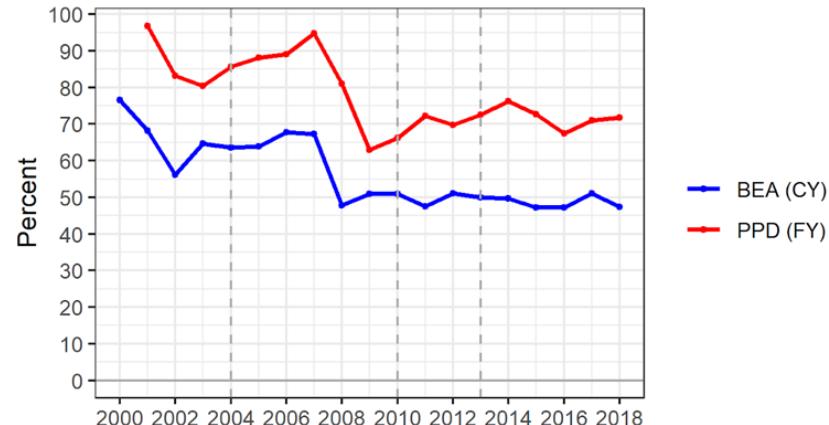
### Liabilities



### Unfunded liability



### Funded ratio



Note: Dashed vertical lines show years in which BEA discount rate was lowered

# **Other data sources do not allow aggregation of plans, and comparison to economic and tax base that must fund them**

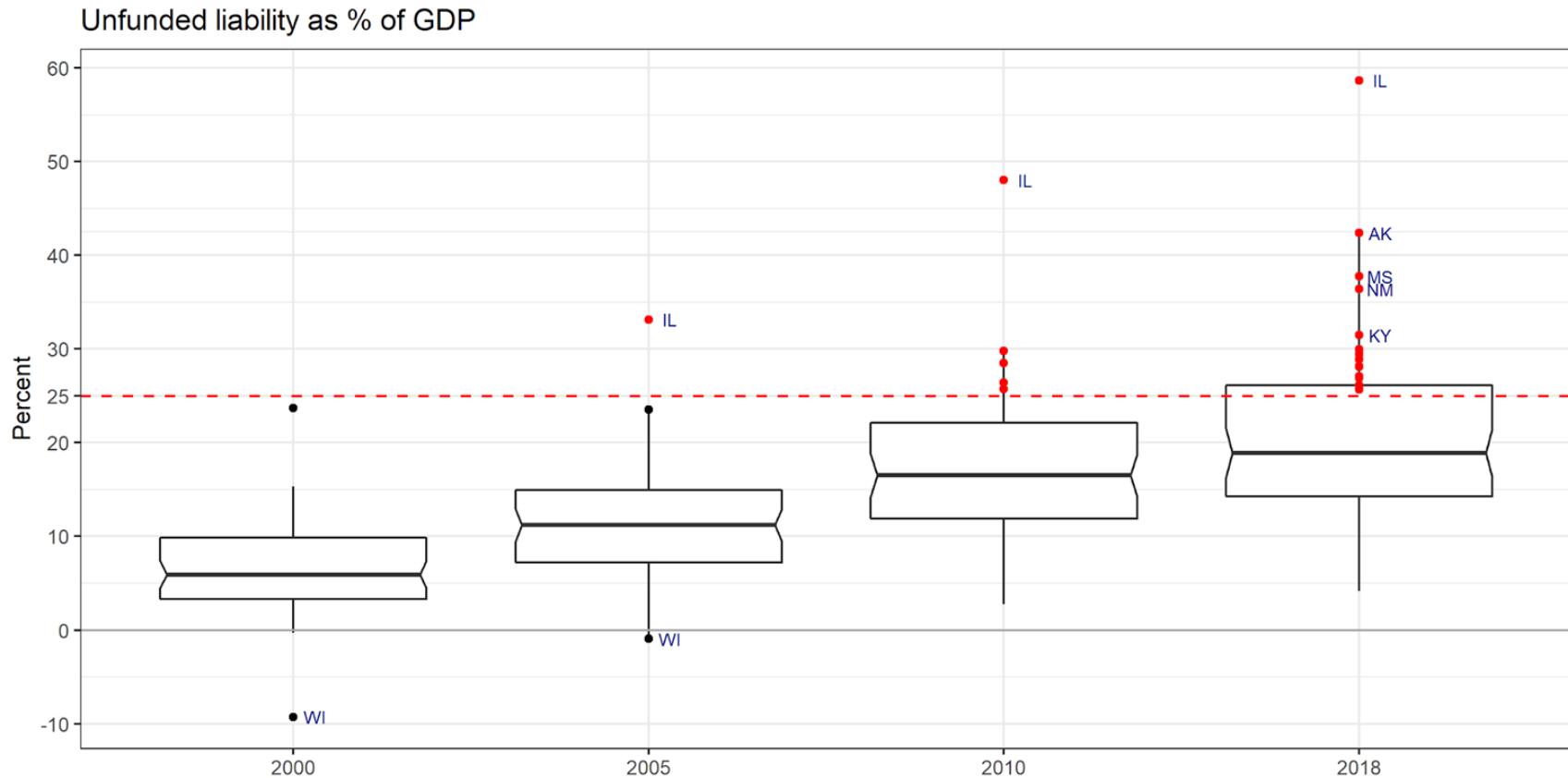
For example, Illinois taxpayers (largely) must pay for multiple underfunded plans:

- Illinois Teachers' Retirement System
- State Employees' Retirement System
- State Universities Retirement System
- Chicago-area funds: Municipal Employees, Laborers', Police, Firemen's; Chicago Public Schools; Cook County Employees'; Chicago Transit Authority
- Many lesser funds in the Chicago area and throughout the state, most of which are deeply underfunded

**BEA data allow this.** It is a valuable way to compare across states.

(It would be nice - but much harder still - to do this for smaller geographic areas.)

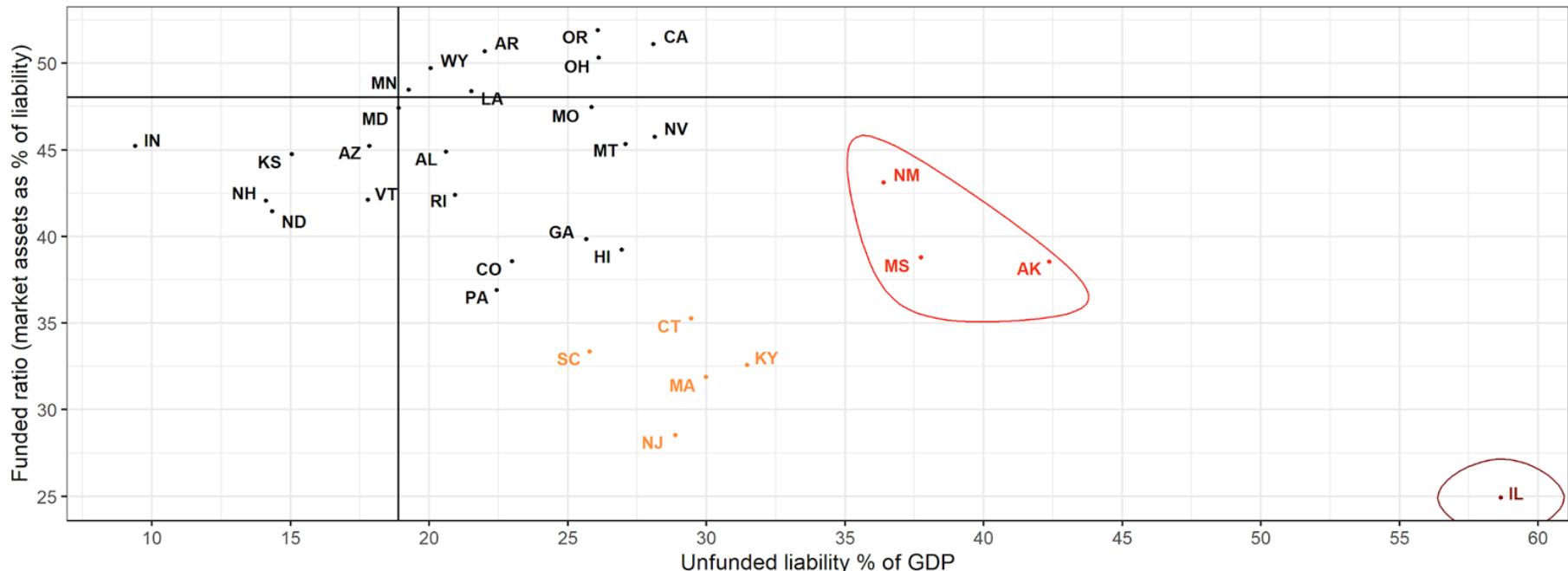
# There's no place like Illinois



# Ability to aggregate, and to examine unfunded liabilities as % of GDP, reveals pressure that funded ratio alone does not

Funded ratio vs. Unfunded liabilities as % of GDP, 2018

States with funded ratio, or unfunded liability as % of GDP, that is worse than median



Note: Crosslines mark 50-state medians

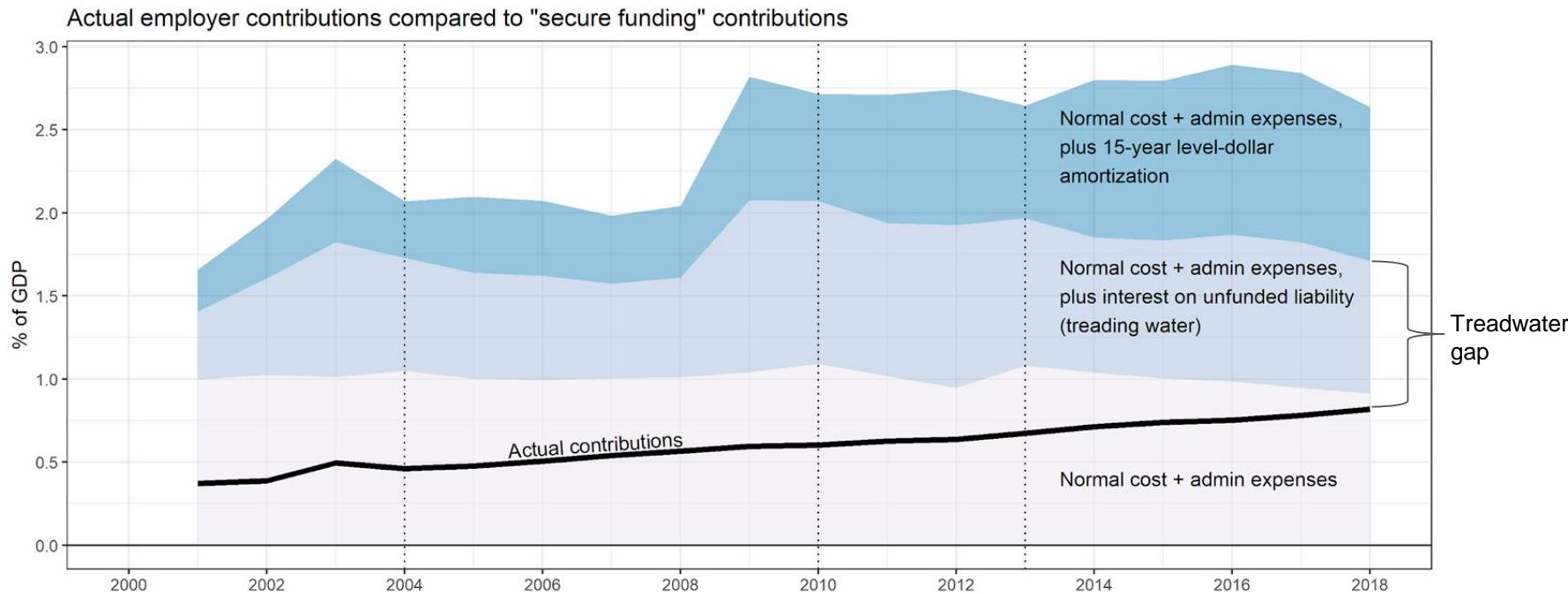
## **BEA data allow comparison of employer normal cost, potential additional costs, and actual contributions on $\simeq$ consistent basis**

- Employer normal costs (ENC) differ across plans due to varying earnings assumptions (among other reasons). Only partially available in compiled sources (PPD) and in idiosyncratic forms in plan source documents (CAFRs, valuations).
- Interest & amortization amounts differ across plans due to varying earnings assumptions, funding methods, other factors. Same availability issues as ENCs.

### **BEA data provide or allow:**

- ENC on consistent discount-rate basis. Comparison to actual employer contribution (AEC)
- Imputed interest on unfunded liability:  $\{(ENC + \text{interest}) == AEC\} \rightarrow \text{treading water.}$
- Estimation of amortization of unfunded liability under consistent method.
- Comparison of ENC, “treading water” contributions, and amortizing contributions, on a “secure funding” (low rate) basis, to actual contributions.

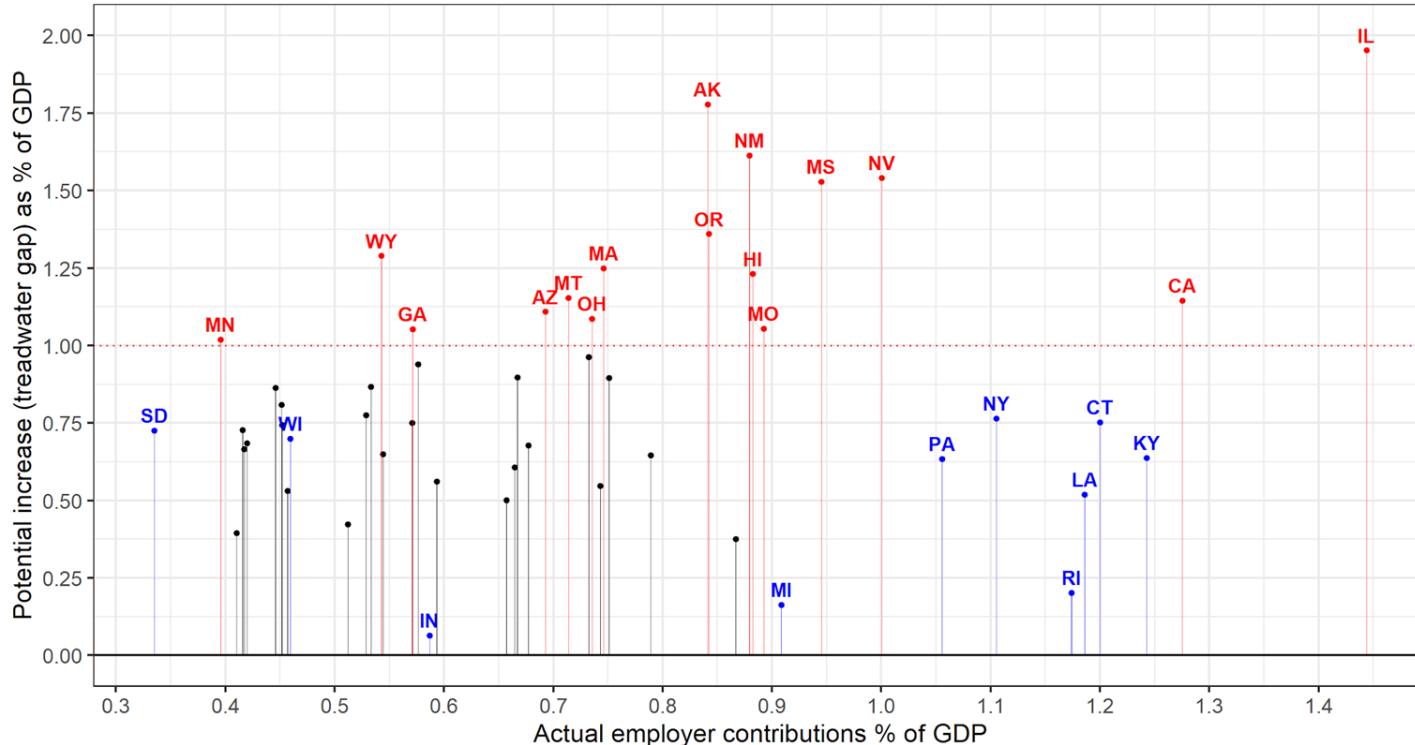
# BEA data allow us to compute gap between actual employer contributions and “secure funding”



Notes: Dotted vertical lines mark years in which BEA discount rate was lowered  
Top line reflects amortization of beginning-of-year unfunded liability, calculated anew each year.

# Treadwater gaps in 2018

Contribution increase needed to cover normal cost plus interest on unfunded liability, compared with actual employer contributions, as % of GDP in 2018



Note: Labeled states have gap > 1% of GDP or are otherwise noteworthy

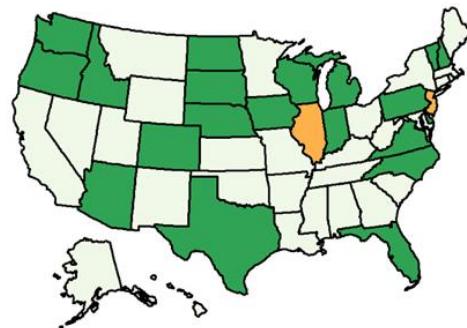
1% of GDP for US is roughly equivalent to:

- 49% of all state-local income or sales taxes, or
- 29% of all K12 spending, or
- 190% of all highway capital spending

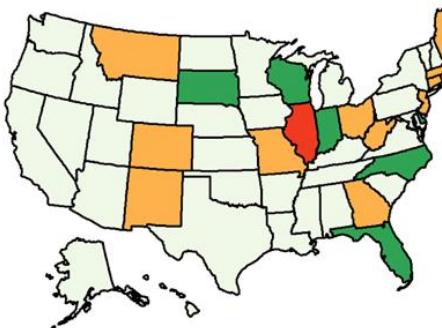
# Unfunded liabilities have grown in most states

Unfunded liabilities as percent of GDP

2000                    2005

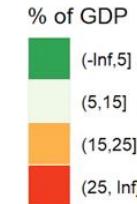
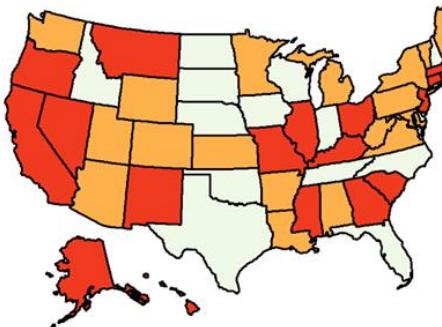
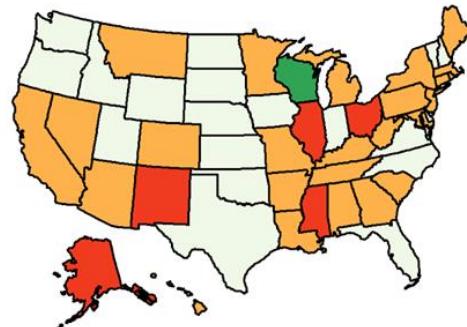


2005



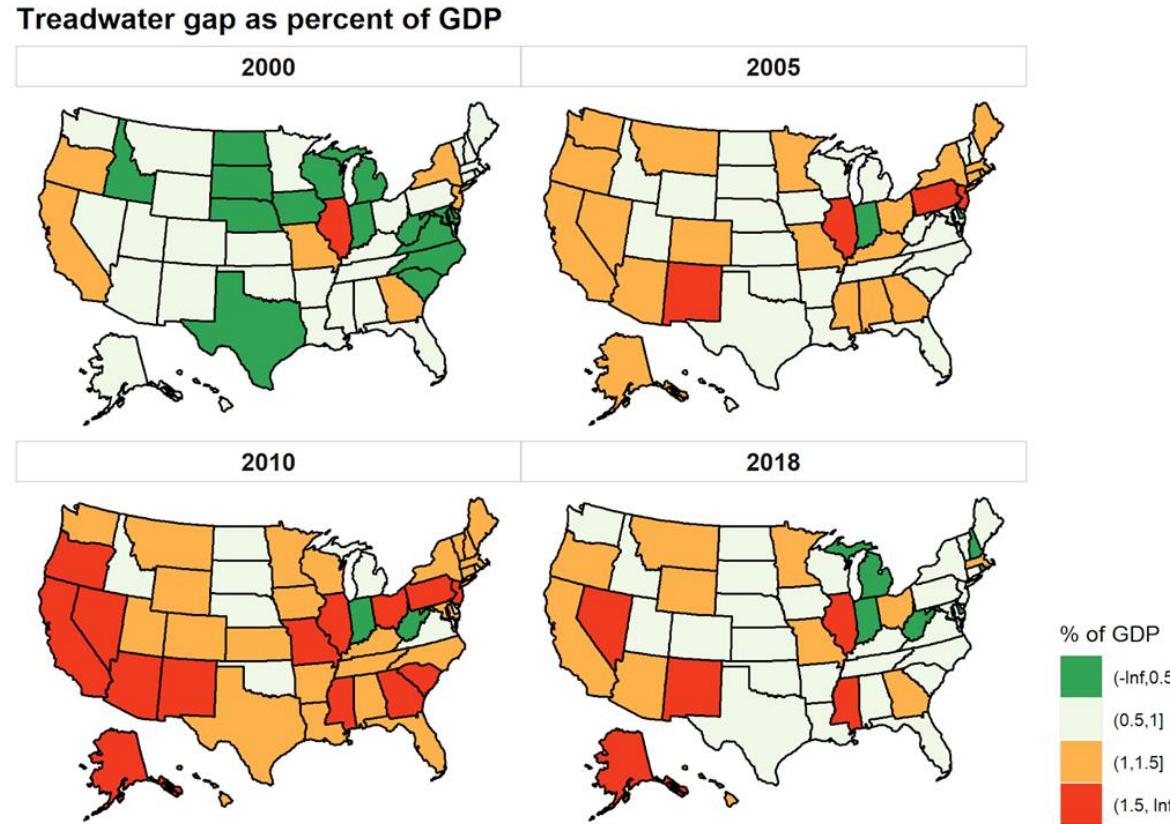
2010

2018



Source: Author's analysis of BEA state pension estimates

# But contribution increase needed to “tread water” has fallen recently (due to contribution increases and benefit cuts)



Source: Author's analysis of BEA state pension estimates

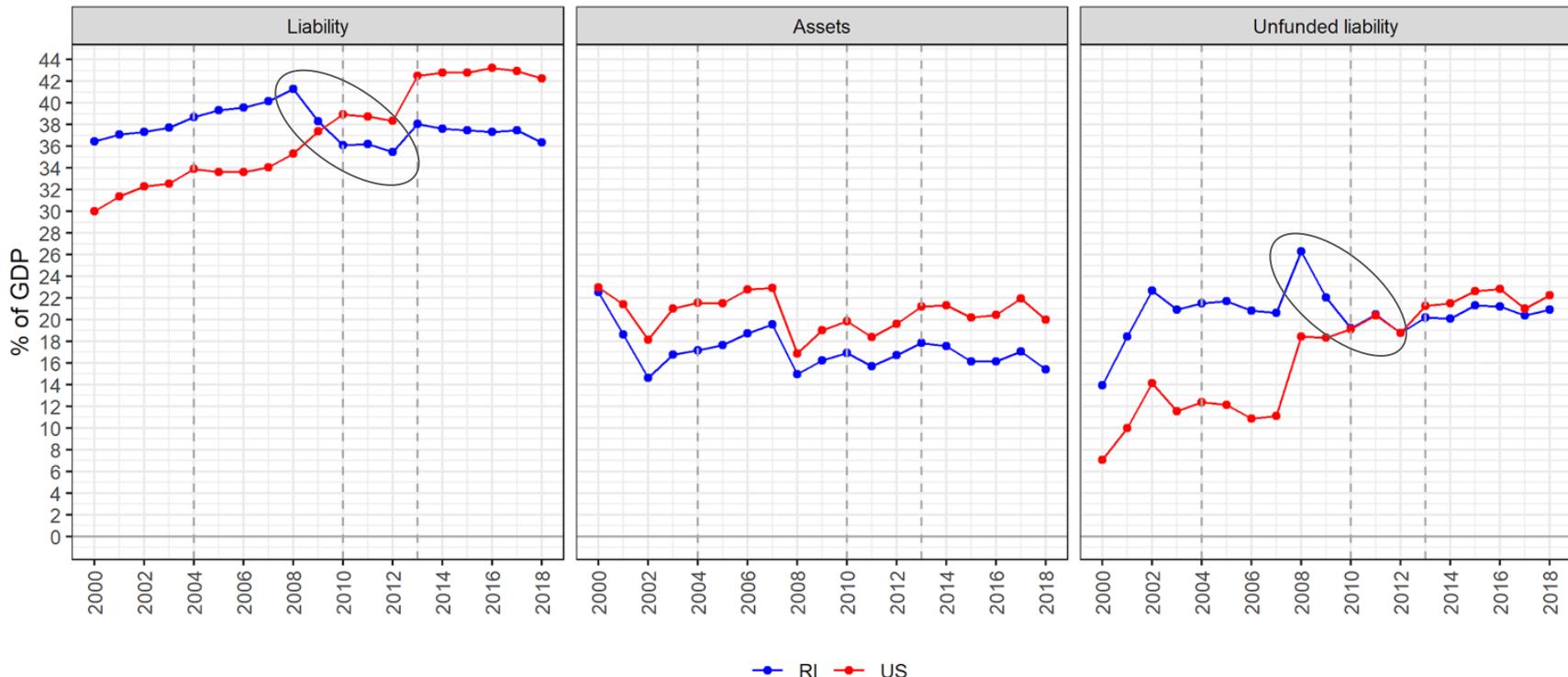
# Detective work on Rhode Island pension reforms/cuts

- Rhode Island enacted widely publicized pension reforms (benefit cuts) in the 2011 RI Retirement Income Security Act (RIRSA), including COLA suspension. Affected current workers and even retirees, in 2012 and beyond.
- Perhaps that is why the “Treadwater gaps in 2018” slide shows a very low gap for RI (and high contributions)?
- It's complicated:
  - RI long had much worse underfunding than other states
  - The General Assembly adopted major benefit cuts before RIRSA
    - 2005 substantial cuts, but mostly affecting new and recent hires
    - 2009 major cuts, more retroactive
  - The 2011 reforms were challenged and modified in a 2015 settlement agreement
  - RI lowered its earnings assumption from 8.25% to 7.5% in its 2010 valuation. Other changes.
  - RI moved to a hybrid DB-DC plan. We only have data here for the DB plans.
- Can BEA data help us understand what happened? Let's break it down.

# RI total liability decline from 2008 to 2010 drove the decline in unfunded liability, largely before the 2011 reforms took effect

Liability, assets, and unfunded liability as % of GDP

Rhode Island and the U.S.



# Decline in unfunded liability drove down imputed interest cost needed to “tread water”; normal cost changes appear smaller

Potential employer contribution costs as % of GDP

Rhode Island and the U.S.

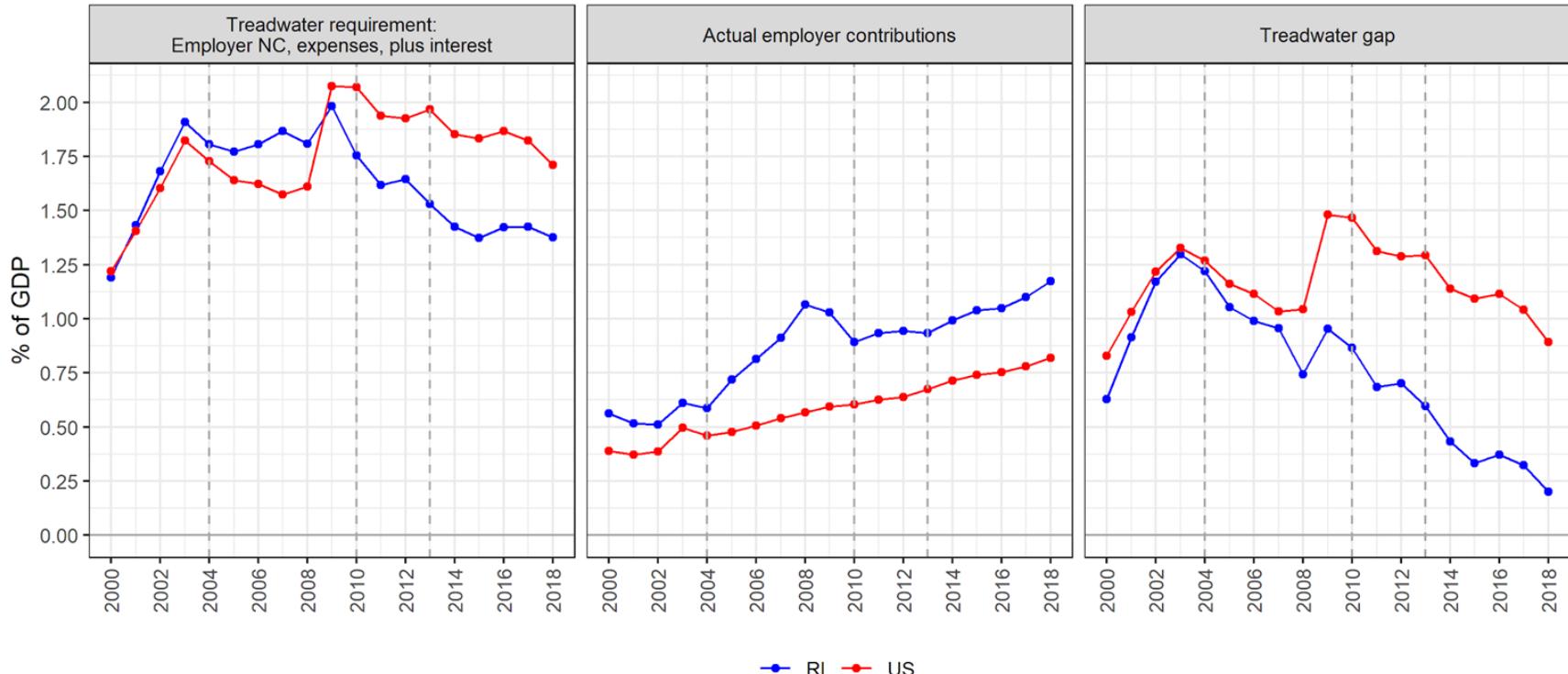


Note: BEA discount rate reductions increase unfunded liability but lower interest cost for a given unfunded liability. Net impact should be small.

# Decline in contributions needed to tread water, plus employer contribution increases, dramatically reduced RI's "treadwater gap"

Treadwater requirement, actual employer contributions, and gap as % of GDP

Rhode Island and the U.S.



# Detective work was moderately successful

- BEA data suggest that greatest impacts came from reforms that preceded the highly publicized 2011 reforms (which affected 2012+).
- Impact on potential costs came primarily through reductions in liability and resulting lower imputed interest on unfunded liability. Reductions in normal cost appear small.
- Generally can't reduce liability without a crisis political environment and permissive legal environment.
- My selective checks against CAFRs and other summary data suggest the BEA data are more representative of what happened than seemingly conflicting other data.
- Still, the conclusion that so much of this happened before the 2011 reforms is surprising to me (perhaps not to RI experts), and is a tentative conclusion.
- As with much detective work, answered questions lead to additional questions, such as: Impact of hybrid DB-DC plan? Impact of actuarial changes BEA does not capture, such as RIRSA's move to more-conservative mortality assumptions?

# Impact of BEA discount-rate changes

- BEA has lowered discount rates 3 times: from 6 to 5.5% in 2004, from 5.5 to 5% in 2010, and by a full point from 5 to 4% in 2013.
- Largely mirrored AAA corporates, but 2013 BEA reduction lagged the market.
- Large impact on liability; VERY large impact on employer normal cost.
  - Liability: In 2013, 14.9% growth: 11% due to DR change  
(data allow estimation of DR impact)
  - ENC: In 2013, 18.8% growth: 19+% greater than either neighboring year  
(data do not allow estimation of DR impact, so compare to neighboring years)
- These changes are appropriate but require caution when interpreting trends.
- May produce some odd numbers due to interaction with plan fiscal years and actuarial idiosyncrasies.

# If I were king....

BEA would:

- Update discount rate each year. However, DR changes generally similar to market.
- Provide a constant-discount-rate liability series using the latest year
- And a constant-discount-rate normal cost series, or data necessary to compute.
- Provide the data in a computer-friendly form, similar to other regional data.
- Provide details behind state data so that we could answer questions such as:

How much of the Illinois problem is due to Chicago and how bad is it in the rest of Illinois, with Chicago excluded?

- Provide a primer that shows the crosswalk from details to the released data. This might help policymakers & staff buy in to the numbers.

But I don't want this to detract from my key message: These data are great!