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UNACCOUNTABLE AND UNAFFORDABLE

UNFUNDED PUBLIC PENSION LIABILITIES EXCEED

$ 6 TRILLION

ALEC American Legislative Exchange Council

LIMITED GOVERNMENT • FREE MARKETS • FEDERALISM

Unaccountable and Unaffordable 2017
Unfunded Public Pension Liabilities Top $6 Trillion

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INTRODUCTION

Absent significant reforms, unfunded liabilities of state-administered pension plans will continue to grow and threaten the financial security of state retirees and taxpayers alike. The fiscal calamity could be far deeper and prolonged than the Great Recession.

Unaffordable and Unaccountable 2017 surveys the more than 280 state-administered public pension plans, detailing their assets and liabilities. The unfunded liabilities (the amount by which the present value of liabilities exceeds current assets) are reported using the investment return assumptions used by states, along with alternative measures more consistent with prudent risk management and more reasonable long-term market performance expectations. This report clearly illuminates the pervasive pension underfunding across the nation and details the assumptions and trends contributing to this crisis.

The opening section outlines the valuation and reporting standards states must follow and provides an overview of the scope of the nation's pension crisis in terms of absolute and per capita underfunding. This section also calculates state pension plan funding ratios by revaluing the liabilities of each pension plan according to a risk-free rate of return assumption (the rate of return obtainable by investing in a risk-free asset, typified by United States government debt). This chapter also discusses the correlation between the best funded states and pro-growth policies.

The second section explores how discount rates (generally the assumed rate of future investment returns on fund assets) should function theoretically and examines which systems adjusted their discount rates between 2015 and 2016. The authors also explore the impact of incentives and political posturing on pension management and performance. Sensitivity analysis is used to convey the importance of discount rate assumptions in determining the extent of the underfunding problem.

The third section explains the mathematics and financial economics behind how we calculate unfunded liabilities. The methodology in this report presents a more comprehensive picture of the problem, which is often obscured by the states' flawed reporting of liabilities.

Section four contrasts states that provide clear, accessible, and timely reporting of their pension plans' financial details with those engaged in a combination of rare and sporadic reporting, confusing or minimal coverage or purposeful efforts to conceal or obfuscate their reports.

Lastly, section five reviews states that have taken substantive steps to reform pension policy. Using case studies from Michigan and Pennsylvania, the section explores possible routes to pension solvency.

It is our hope that providing a more realistic picture of unfunded pension liabilities across the states will convey the urgency and seriousness of this issue to taxpayers, retirees, and legislators alike.

SECTION 1: THE SCOURGE OF UNFUNDED PENSION LIABILITIES

Unfunded liabilities of public pension plans continue to loom over state governments nationwide. If net pension assets are determined using more realistic investment return assumptions, pension funding gaps are much wider than even the large sums reported in state financial documents. Unfunded liabilities (using a risk-free rate of return assumption) of state-administered pension plans now exceed $6 trillion—an increase of $433 billion since our 2016 report. The national average funding ratio is a mere 33.7 percent, amounting to $18,676 dollars of unfunded liabilities for every resident of the United States.

Much of this problem is due to state governments failing to make their annually required contributions (ARC). The ARC represents the annual appropriation needed to invest in order to cover the cost of future pension obligations accrued in the current, along with amortization of prior unfunded liabilities. The National Association of State Retirement Administrators (NASRA) has called the ARC the "unofficial measuring stick of the effort states and local governments are making to fund their pension plans."[i] Unfortunately, the vast majority of states consistently fail to make full ARC payments; some even skip payments altogether. According to a 2017 Pew Charitable Trusts report, only 32 states in FY 2015 made pension fund contributions sufficient enough to diminish accrued unfunded liabilities ("positive amortization").[ii] Each contribution that a state skips must be made up in the future, along with unrealized investment returns.

Current state workers and retirees are not the only people affected by this unfunded pension crisis. Taxpayers ultimately provide the wages for public sector employees and the financial resources to cover the promised benefits of traditional pension plans. And all residents are impacted when pension costs absorb limited government resources, rather than core government services such as education, public safety, and roads.

Nationwide, Liabilities Obscured by Accounting Assumptions

Faulty accounting and reporting methods obscure the magnitude of unfunded liabilities. Partly in response to the devastating impact of the Great Recession, the Governmental Accounting Standards Board (GASB) made two significant changes in 2012 (Statement No. 67*, Financial Reporting for Pension Plans* and Statement No. 68, *Accounting and Financial Reporting for Pensions*) to the methods used for measuring the financial health of pension plans. GASB intended these changes to increase transparency, consistency, and comparability of pension information. Public pensions are now required to report their assets and liabilities using a standardized actuarial cost method, to disclose investment returns, and to include unfunded pension liabilities on state balance sheets.

Unfortunately, states have found ways to work around these requirements and paint an unrealistically rosy picture of their pension funding status.

Pension promises for future years are discounted by an assumed rate of return to determine the present value of those future obligations. The higher this expected rate of return, the lower the value of current investment assets needed to ensure sufficient funds to pay promised future benefits. According to public finance scholars Robert Novy-Marx and Joshua D. Rauh, "states use discount rates that are unreasonably high."[iii] As former Social Security Administration deputy commissioner Andrew Biggs and economist Kent Smetters have

explained, "No matter how well a pension plan manages its investments, it cannot generate 8 percent returns with certainty."[iv]

Unfortunately, the plans analyzed in *Unaccountable and Unaffordable 2017* have not heeded this warning. Collectively, the unweighted average assumed discount rate for these plans is 7.34 percent. In effect, these state governments are relying on unlikely long-term investment gains to remedy decades of underfunding the pension funds.

The Center for State Fiscal Reform at ALEC analyzes the annual official financial documents of more than 280 state-administered pension plans using more realistic investment return assumptions in order to gain a clearer picture of the pension problem. The unfunded liabilities of each pension plan are revalued using a discount rate equal to a risk-free rate of return, best represented by debt instruments issued by the United States government. This year's study uses a risk-free rate of 2.142 percent, derived from an average of the 10- and 20-year U.S. Treasury bond yields over the course of 12 months spanning April 2016 to March 2017. Based on these revised investment return assumptions, we report on total unfunded pension liability, unfunded pension liabilities per capita, and the funding ratio of these plans.

Total Unfunded Pension Liability

Total unfunded pension liability reveals the fiscal strain on state budgets in raw dollar terms. Even in the best-case scenario, all states have significant funding gaps. Smaller states, such as South Dakota or Wyoming, employ fewer workers and thus face smaller burdens. More populous states with larger government workforces tend to have the largest unfunded liabilities. California, for example, has more than $987 billion in unfunded liabilities.

Unfunded Pension Liabilities Per Capita

Unfunded pension liabilities per capita is another alarming facet of pension funding. This metric reveals the personal share of liability for every resident in each state, an indicator of the severity of the taxes to be borne now or in the future by each taxpayer for promises made but not funded. In Alaska, each resident is on the hook for a staggering $45,689, the highest in the nation. Connecticut, Ohio, Illinois, and New Mexico follow for the five highest per person unfunded pension liabilities.

The Funding Ratio

The funding ratio is the most important measure of a pension fund's health. Applying the estimated risk-free rate of return to the actuarial assets and actuarial liabilities reported by pension plans generates a more realistic estimate of each state's funding ratio.

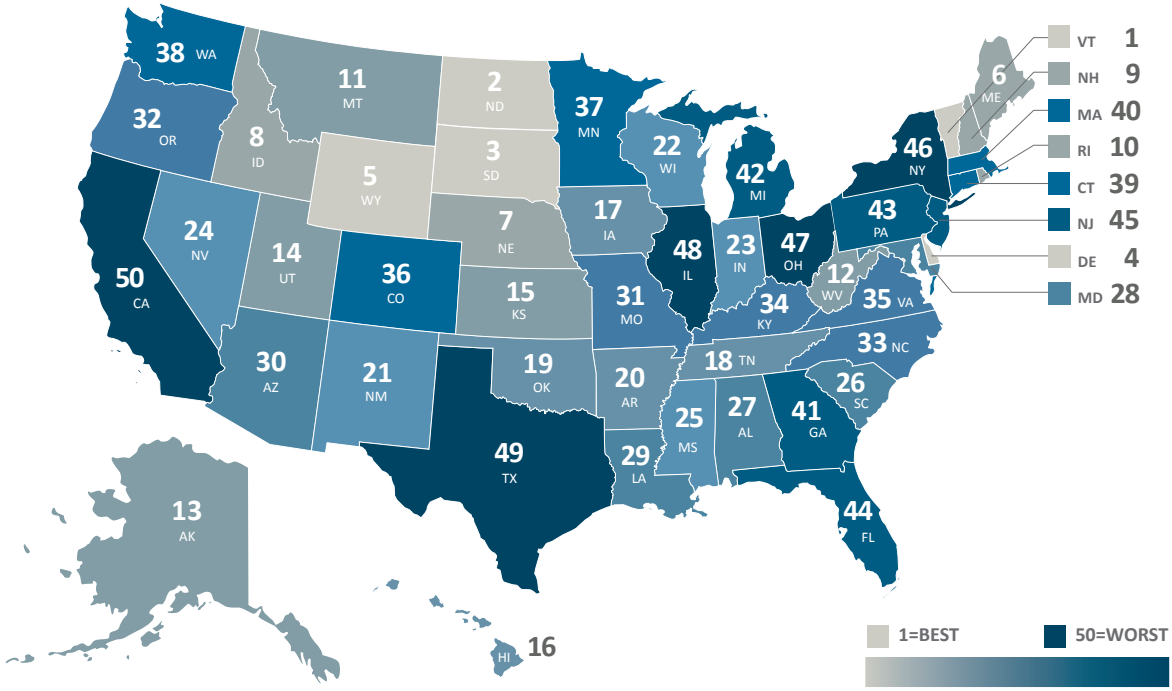
A relatively higher funding ratio enables a pension fund to better withstand periodic economic shocks without placing future benefits at risk. The Pension Protection Act of 2006 attempted to provide greater security to private sector defined-benefit (DB) pension plans by articulating acceptable funding ratio levels. The Government Accountability Office (GAO) explained in testimony to the Joint Economic Committee, "The Pension Protection Act of 2006 provided that large private sector pension plans will be considered at risk of defaulting on their liabilities if they have less than 80 percent funding ratios under standard actuarial

assumptions and less than 70 percent funding ratios under certain additional "worst-case" actuarial assumptions."[v] By 2011, this standard was fully phased in for private DB plans.

However, the Pension Protection Act does not apply to public sector DB pension plans. If the Pension Protection Act were applied to the public sector, every single state would be considered at risk of defaulting on their pension obligations assuming a risk-free rate of return. Even using the official optimistic return assumptions, 35 states would fall short of the standard.

Keep in mind, this 80 percent standard still falls far short of guidance provided by the American Academy of Actuaries. According to the Academy, "Pension plans should have a strategy in place to attain or maintain a funded status of 100percent or greater over a reasonable period of time."[vi]

FIGURE 1, TABLE 1 | Total Unfunded Liabilities of Public Pension Plans

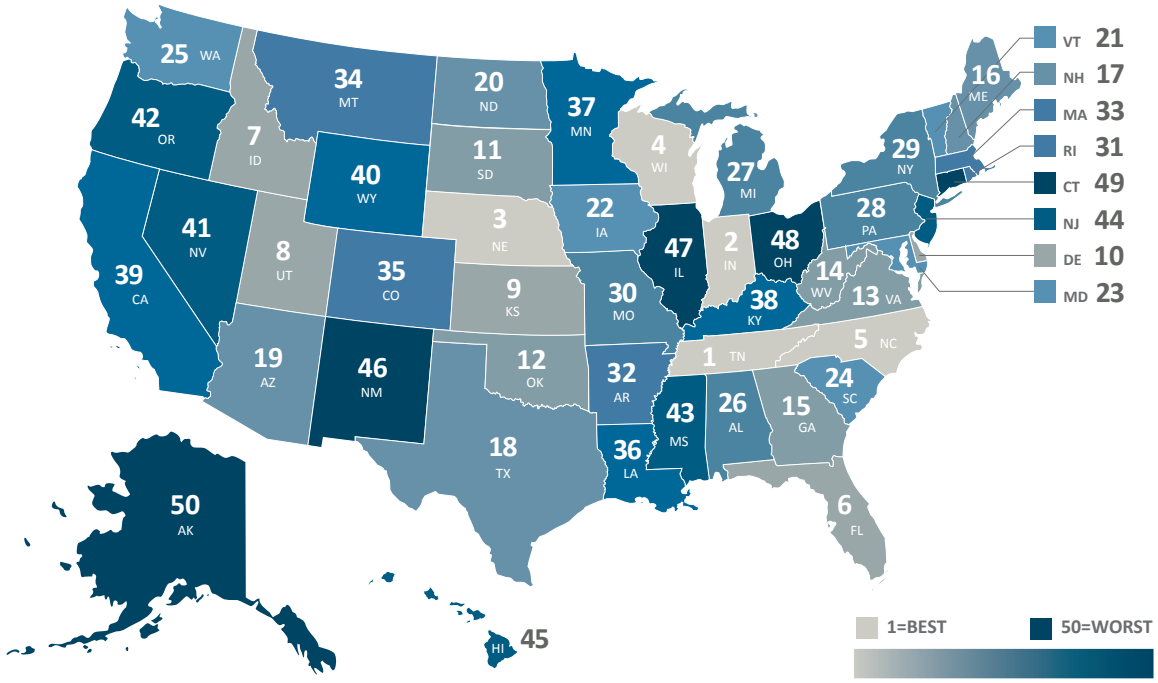


RANK		STATE	UNFUNDED LIABILITIES	
2017	2016		2016 REPORT	2017 REPORT
1	1	Vermont	$8,707,979,583	$9,508,596,530
2	2	North Dakota	$10,213,597,800	$11,531,251,530
3	4	South Dakota	$11,286,522,172	$11,710,286,670
4	3	Delaware	$11,262,866,330	$12,699,612,355
5	5	Wyoming	$13,642,969,825	$14,831,573,219
6	9	Maine	$17,676,038,583	$18,547,934,726
7	8	Nebraska	$17,367,830,965	$18,688,179,588
8	6	Idaho	$16,572,789,476	$18,849,519,045
9	7	New Hampshire	$17,320,649,176	$18,958,166,864
10	10	Rhode Island	$18,636,960,291	$19,724,353,926
11	11	Montana	$19,496,700,717	$20,986,614,425
12	12	West Virginia	$23,640,020,456	$25,091,326,534
13	13	Alaska	$31,715,653,280	$33,896,375,418
14	15	Utah	$37,987,328,775	$37,459,414,421
15	16	Kansas	$40,737,986,356	$38,541,732,859
16	14	Hawaii	$35,136,593,006	$40,089,375,714
17	18	Iowa	$46,424,775,242	$50,409,077,210
18	19	Tennessee	$47,826,122,962	$50,553,359,525
19	20	Oklahoma	$51,903,613,095	$53,161,039,762
20	17	Arkansas	$43,976,220,971	$58,430,317,385
21	22	New Mexico	$54,455,339,568	$58,515,336,352
22	21	Wisconsin	$52,842,437,646	$59,602,602,815
23	23	Indiana	$56,748,217,042	$60,569,292,356
24	25	Nevada	$69,697,815,811	$76,106,755,581
25	24	Mississippi	$64,300,123,348	$80,403,262,959

RANK		STATE	UNFUNDED LIABILITIES	
2017	2016		2016 REPORT	2017 REPORT
26	26	South Carolina	$74,095,092,870	$81,919,035,841
27	27	Alabama	$74,957,966,779	$82,106,200,573
28	29	Maryland	$93,343,409,896	$99,156,426,748
29	30	Louisiana	$94,320,807,435	$100,246,142,253
30	28	Arizona	$90,710,340,087	$102,397,274,547
31	35	Missouri	$99,369,429,995	$107,494,591,707
32	33	Oregon	$97,781,712,858	$109,451,211,506
33	32	North Carolina	$96,402,637,555	$111,048,459,937
34	31	Kentucky	$95,946,947,928	$111,369,923,048
35	37	Virginia	$107,648,590,922	$114,619,581,764
36	36	Colorado	$106,382,900,927	$118,394,342,516
37	39	Minnesota	$110,474,025,601	$118,715,398,465
38	38	Washington	$107,740,838,715	$120,597,886,756
39	34	Connecticut	$99,299,024,840	$127,788,768,899
40	41	Massachusetts	$126,677,266,263	$134,901,320,203
41	40	Georgia	$122,645,214,077	$143,074,967,721
42	42	Michigan	$156,941,092,013	$168,132,867,620
43	44	Pennsylvania	$211,586,194,586	$223,173,807,897
44	43	Florida	$210,153,896,482	$226,527,273,092
45	45	New Jersey	$235,489,469,324	$248,712,244,965
46	47	New York	$347,542,971,698	$345,252,415,832
47	46	Ohio	$331,420,701,160	$354,683,017,278
48	49	Illinois	$362,646,966,724	$388,342,219,353
49	48	Texas	$360,396,676,526	$397,325,058,758
50	50	California	$956,081,787,553	$987,774,192,764

Source: Data are based on ALEC Center for State Fiscal Reform's calculations. To read the full report and methodology, see ALEC.org/PensionDebt2017

FIGURE 2, TABLE 2 | Unfunded Liabilities Per Capita of Public Pension Plans

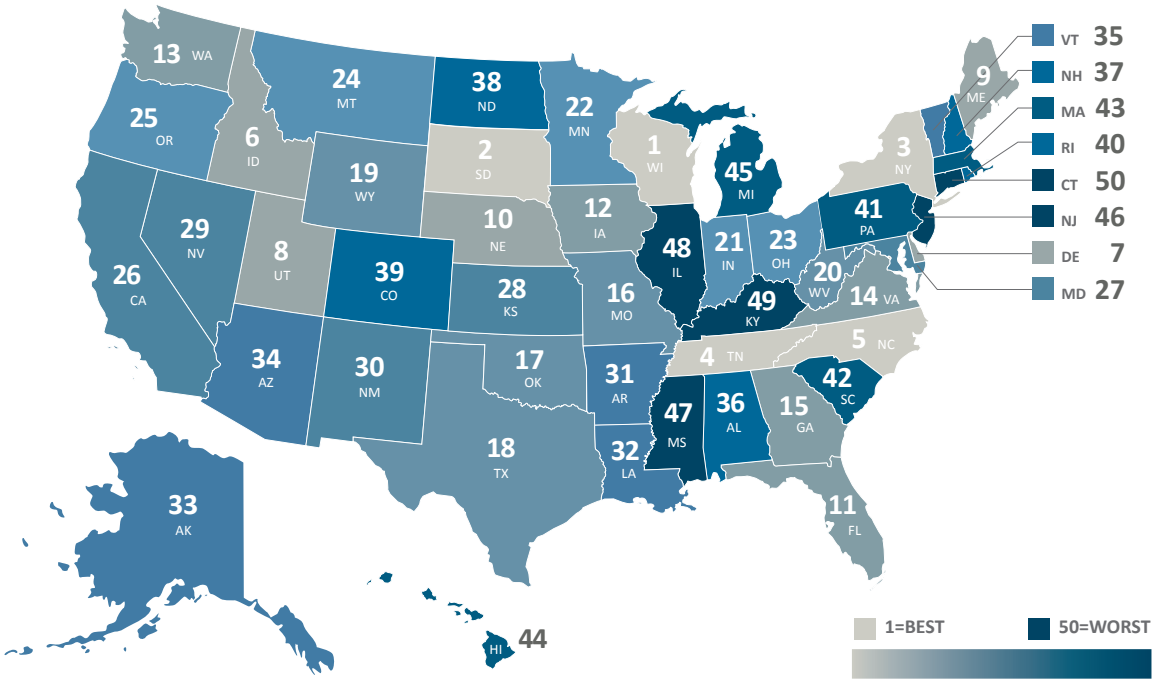


RANK		STATE	UNFUNDED LIABILITIES PER CAPITA	
2017	2016		2016 REPORT	2017 REPORT
1	1	Tennessee	$7,252	$7,601
2	2	Indiana	$8,582	$9,131
3	4	Nebraska	$9,171	$9,799
4	3	Wisconsin	$9,161	$10,314
5	5	North Carolina	$9,606	$10,944
6	7	Florida	$10,381	$10,990
7	6	Idaho	$10,027	$11,199
8	10	Utah	$12,702	$12,277
9	21	Kansas	$14,015	$13,257
10	8	Delaware	$11,930	$13,339
11	15	South Dakota	$13,156	$13,531
12	16	Oklahoma	$13,283	$13,549
13	12	Virginia	$12,865	$13,626
14	11	West Virginia	$12,840	$13,703
15	9	Georgia	$12,025	$13,877
16	17	Maine	$13,296	$13,930
17	13	New Hampshire	$13,022	$14,203
18	14	Texas	$13,139	$14,260
19	18	Arizona	$13,305	$14,774
20	19	North Dakota	$13,495	$15,214
21	20	Vermont	$13,909	$15,224
22	23	Iowa	$14,870	$16,081
23	27	Maryland	$15,570	$16,481
24	25	South Carolina	$15,137	$16,512
25	24	Washington	$15,047	$16,547

RANK		STATE	UNFUNDED LIABILITIES PER CAPITA	
2017	2016		2016 REPORT	2017 REPORT
26	26	Alabama	$15,443	$16,883
27	28	Michigan	$15,824	$16,935
28	30	Pennsylvania	$16,541	$17,457
29	31	New York	$17,600	$17,485
30	29	Missouri	$16,354	$17,642
31	32	Rhode Island	$17,655	$18,671
32	22	Arkansas	$14,768	$19,553
33	33	Massachusetts	$18,672	$19,804
34	34	Montana	$18,891	$20,131
35	35	Colorado	$19,524	$21,369
36	37	Louisiana	$20,202	$21,412
37	36	Minnesota	$20,151	$21,507
38	39	Kentucky	$21,685	$25,100
39	43	California	$24,519	$25,166
40	40	Wyoming	$23,259	$25,331
41	41	Nevada	$24,169	$25,886
42	42	Oregon	$24,296	$26,738
43	38	Mississippi	$21,509	$26,902
44	46	New Jersey	$26,355	$27,806
45	44	Hawaii	$24,655	$28,063
46	45	New Mexico	$26,176	$28,119
47	48	Illinois	$28,246	$30,336
48	49	Ohio	$28,558	$30,538
49	47	Connecticut	$27,701	$35,731
50	50	Alaska	$42,992	$45,689

Source: Data are based on ALEC Center for State Fiscal Reform's calculations. To read the full report and methodology, see ALEC.org/PensionDebt2017

FIGURE 3, TABLE 3 | Funding Ratio of Public Pension Plans



RANK		STATE	FUNDING RATIO	
2017	2016		2016 REPORT	2017 REPORT
1	1	Wisconsin	63.4%	61.5%
2	3	South Dakota	47.8%	48.1%
3	6	New York	44.9%	46.3%
4	4	Tennessee	47.3%	45.9%
5	2	North Carolina	47.9%	45.0%
6	5	Idaho	46.5%	43.2%
7	7	Delaware	44.7%	42.4%
8	9	Utah	41.7%	41.5%
9	8	Maine	42.1%	41.4%
10	11	Nebraska	40.3%	39.7%
11	10	Florida	40.5%	39.1%
12	13	Iowa	39.8%	38.8%
13	12	Washington	39.9%	38.2%
14	15	Virginia	37.4%	37.1%
15	14	Georgia	38.8%	36.2%
16	16	Missouri	36.9%	35.9%
17	23	Oklahoma	34.9%	35.6%
18	17	Texas	36.9%	35.6%
19	18	Wyoming	36.6%	35.5%
20	22	West Virginia	35.5%	35.0%
21	24	Indiana	34.8%	34.1%
22	25	Minnesota	34.5%	33.5%
23	26	Ohio	34.3%	33.4%
24	27	Montana	33.6%	33.3%
25	20	Oregon	36.3%	33.2%

RANK		STATE	FUNDING RATIO	
2017	2016		2016 REPORT	2017 REPORT
26	21	California	35.6%	32.9%
27	28	Maryland	33.1%	32.5%
28	38	Kansas	29.9%	32.1%
29	29	Nevada	32.7%	32.1%
30	30	New Mexico	32.1%	31.4%
31	19	Arkansas	36.4%	31.1%
32	32	Louisiana	31.3%	30.9%
33	31	Alaska	31.4%	30.2%
34	33	Arizona	31.2%	29.5%
35	34	Vermont	30.4%	29.4%
36	35	Alabama	30.3%	29.3%
37	43	New Hampshire	28.0%	28.8%
38	42	North Dakota	28.9%	28.7%
39	36	Colorado	30.3%	28.6%
40	39	Rhode Island	29.6%	28.6%
41	41	Pennsylvania	28.9%	28.1%
42	37	South Carolina	30.1%	28.0%
43	45	Massachusetts	27.7%	27.2%
44	40	Hawaii	29.2%	27.2%
45	46	Michigan	27.5%	26.9%
46	47	New Jersey	26.9%	25.7%
47	44	Mississippi	27.9%	24.2%
48	48	Illinois	23.8%	23.3%
49	49	Kentucky	23.4%	20.9%
50	50	Connecticut	22.8%	19.7%

Source: Data are based on ALEC Center for State Fiscal Reform's calculations. To read the full report and methodology, see ALEC.org/PensionDebt2017

The Best

Relative to other states, Wisconsin is in a league of its own with a 61.5 percent funding ratio (using a risk-free rate of return assumption). The next most responsibly managed state pension system, South Dakota, is 13 percentage points less funded than Wisconsin. The state of Wisconsin does far better than others in pursuing retirement security to current and past employees, alongside fiscal responsibility to taxpayers.

Wisconsin's relatively high funding ratio is due in large part to the unique design of the state's hybrid pension. A typical hybrid pension has a traditional DB and a defined-contribution (DC) 401(k) benefit, the proportions of which vary from plan to plan. Wisconsin's hybrid plan does not have a 401(k) benefit portion, but instead pays an annual dividend based on the health of the pension fund and the age of the retiree.[vii] Unlike a traditional DB plan, which provides a payout regardless of fund performance, a performance shortfall does not necessitate higher employee and/or taxpayer contributions to make up an additional gap between assets and liabilities. With this hybrid plan, underperformance simply results in a lower annual dividend, avoiding an underfunding issue.

The Worst

Connecticut ranks last with a dismal 19.7 percent funding ratio, down 3.1 percentage points from last year. Connecticut is one of four states to set retiree benefits through collective bargaining and is unique in that the legislature does not have to consent to contracts for them to go into effect.[viii] A total of 124 contracts have been passed without a vote in either chamber in the legislature.[ix]

Under these rules, politicians can abstain from making politically difficult decisions needed to protect taxpayers from future pension fund bailouts and retirees from the consequences of a future pension default. Such decisions could anger current public sector union membership, placing personal political careers at risk. In late 2016, Gov. Dan Malloy came to an agreement with the state employees union to extend the amortization period of the official unfunded liability to 2046. In other words, the state will delay paying down these liabilities.[x] Because the fund will have relatively fewer assets generating investment income over the next two decades as a result of this delay, a combination of higher taxes, reduced state services, and pension benefits cuts becomes more likely in future years. In addition, Connecticut continues to use an assumed rate of return in excess of 8 percent to estimate unfunded liabilities—more than 5.8 percentage points higher than the risk-free rate of return. Such baseless optimism threatens the state's fiscal solvency.

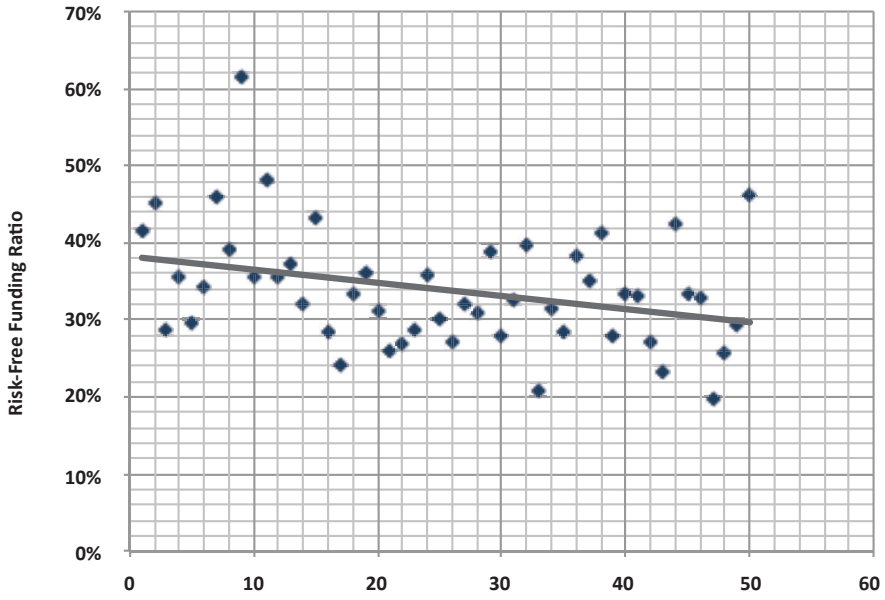
Fiscal Responsibility and Pro-Growth Policies

States that display fiscal responsibility and adopt pro-growth policies tend to have a higher funding ratio than states that do not. The American Legislative Exchange Council's annual *Rich States, Poor States* publication projects economic performance outlook for each state based on 15 policy variables, demonstrably associated with growth in migration, jobs, and income. The measure has been cross validated by the Mercatus Center's *State Fiscal Rankings* publication, which correlates closely with *Rich States, Poor States* rankings.[xi]

In Figure 4, the average funding ratio of each state between 2015 and 2016 is displayed against the state's average *Rich States, Poor States* rank for the same years. A trend line highlights the direction of the

relationship. States with a positive *Rich States, Poor States* ranking tend to have higher funding ratios, protecting their state employees from reduced benefits and their residents from higher taxes.

FIGURE 4 | Higher Risk-Free Funding Ratios Positively Correlates with More Competitive Economic Outlooks



Economic Outlook Ranking in Rich States, Poor States ALEC-Laffer Economic Competitiveness Index

Several possible causes could explain the correlation between state rankings and their respective funding ratios. Perhaps most importantly, an expanded tax base resulting from accelerated economic growth can yield revenue growth exceeding the rising costs of state and local government. The additional revenue generated may be used to meet pension investment obligations more consistently.

Lack of proper funding and artificially high estimates of future returns have prodded many pension funds into chasing higher returns. For instance, managers have shifted from fixed-income instruments (such as T-bonds and high-grade corporate bonds) to publicly traded equity and also to alternative investments. This alternatives class of investments (including private placement equity, real estate, and hedge funds) is particularly problematic. Although an opportunity for outsized gains may exist, these investments are often riskier, more difficult to value, and less liquid. Financial reporting standards or public documentation may be lacking as well. This added complexity also makes management of such investments more expensive.[xii]

Unfortunately for taxpayers, workers, and retirees, the growing problems of pension reporting and funding plague states nationwide. We hope that by clearly illustrating the current level of unfunded liabilities and the trends leading to its growth, the public and the lawmakers who serve them will begin to take meaningful steps toward pension reform. Addressing overly-optimistic assumptions, committing to annually required contributions, and considering modern alternatives to traditional pension plans are the only way forward.

SECTION 2: PENSIONS, POLITICS, AND INCENTIVES

While most of the public employee retirement debate revolves around the structure and funding of plans, the area of actuarial assumptions desperately needs reform. The current pension crisis stems from overt mismanagement, failures to meet the actuarially required contribution, and subtle mismanagement, such as outdated mortality tables and unrealistic actuarial assumptions. The use of overly-optimistic discount rates cannot be attributed to ignorance. Federal regulators require private sector pension managers to use a discount rate of approximately 4.5 percent, but turn a blind eye to the 7 or 8 percent assumed rates used by public sector managers.[xiii] Instead, the use of these unrealistically high assumed rates is likely the result of fund managers, politicians, and union leaders pursuing their self-interest. An inflated assumption of future returns artificially lowers the ARC for the current year by exaggerating the expected future value of current pension assets.

Discount Rates

The most important statistic in evaluating a pension's health is its funding ratio, which consists of the pension's current assets divided by the present value of its liabilities. The present value of liabilities is determined by the discount rate, sometimes referred to as the assumed rate of return. The discount rate formula is nearly identical to the compounding interest rate formula. As with compounding interest and future value, a small change in the discount rate has a massive impact on present value, and thus the funding ratio.

Private and public sector pension funds calculate their discount rates in different ways. Generally, private sector pensions must base theirs on trends in the bond market whereas public sector pensions use their historic rates of return.[xiv] As a result, private sector pension funds usually have more conservative assumed rates of return, which increase their annual required contributions and diminish the risk of insolvency. Conversely, public pension plans continue to assume excessively optimistic rates of return. Between 2000 and 2016, the average assumed rate of return was 7.83 percent, whereas the actual rate was nearly a point lower, 6.99 percent.[xv]

Table 4 contrasts funding ratios for each state utilizing each state's self-reported assumed rate of return, and a risk-free rate of 2.142 percent (the yield of a synthetic 15-year Treasury bond). "Normalizing" funding ratios to a uniformly applied discount rate alters the ranked health of public pension funds. For example, South Dakota reports having a slightly higher funding ratio than Wisconsin. However, normalizing the discount rate reveals South Dakota's pension plans to be far less funded than Wisconsin's.

The public sector estimates of future returns are woefully delayed in responding to market reality. While 46 percent of pension funds reduced their discount rates to reflect poorer-than-expected returns over the past two decades, their reaction is too little too late. Even the lower rates adopted in 2016 are well above the risk-free rate that would protect taxpayers from having to bail out pension plans.

TABLE 4 | Normalizing Funding Ratios to a Risk-Free Rate of Return Yields Noteworthy Results

STATE	OFFICIAL FUNDING RATIO USING REPORTED ARR	FUNDING RATIO USING RISK-FREE RATE
AK	70%	30%
AL	60%	26%
AR	70%	31%
AZ	67%	29%
CA	70%	33%
CO	60%	29%
CT	47%	20%
DE	86%	42%
FL	85%	39%
GA	78%	35%
HI	55%	27%
IA	84%	39%
ID	87%	43%
IL	47%	23%
IN	66%	34%
KS	67%	32%
KY	44%	21%
LA	68%	31%
MA	59%	27%
MD	71%	33%
ME	82%	41%
MI	62%	27%
MN	77%	36%
MO	81%	36%
MS	54%	24%

STATE	OFFICIAL FUNDING RATIO USING REPORTED ARR	FUNDING RATIO USING RISK-FREE RATE
MT	74%	33%
NC	94%	45%
ND	65%	29%
NE	91%	40%
NH	60%	29%
NJ	57%	26%
NM	70%	31%
NV	74%	32%
NY	95%	46%
OH	74%	33%
OK	76%	36%
OR	72%	33%
PA	58%	28%
RI	61%	29%
SC	60%	28%
SD	100%	48%
TN	99%	46%
TX	81%	36%
UT	86%	41%
VA	75%	37%
VT	67%	29%
WA	84%	38%
WI	100%	62%
WV	75%	35%
WY	79%	35%

The differences between private and public pension management show different postures toward risk, with the former being forced into conservative investments while the latter takes a remarkably optimistic view of the market. The California Public Employees' Retirement Systems' (CalPERS) two-tiered treatment of pension plans illustrates how management differences cannot be attributed to ability or sector, but are a response to incentives.

CalPERS implicitly recognizes these return assumptions may be grossly exaggerated. Using the risk-free rate of 2.14 percent, CalPERS currently faces more than $987 billion in unfunded liabilities. But CalPERS uses a 7.5 percent discount rate to value its liabilities. Because of this, the reported net pension liability in California far lower in FY 2015, at just $174 billion. Many municipalities are attempting to withdraw from the struggling fund, a tacit recognition of the dire situation. But CalPERS only permits an exit if the municipality agrees to lower its discount rate to 3.8 percent.[xvi] This rate is far closer to a risk-free rate than CalPERS' rate. The increased annual contributions required by the lower discount rate diminish the prospects of CalPERS from bailing out a municipal government's pension plan.

If CalPERS admits the efficacy of a 3.8 percent discount rate (rather than 7.5 percent) in shielding itself from municipal mismanagement, why not apply the same rate to its own pension funds in order to protect California taxpayers from state mismanagement?

Incentives and Political Capital

CalPERS' two-tiered treatment is only inconsistent from the perspective of the taxpayer; public pension fund managers, politicians, and union leaders support a higher-than-realistic discount rate because it is in their self-interest. All parties, except for the taxpayer, gain some short-term benefit from a high discount rate. Optimistic assumed rates of return for a pension fund translate into a lower ARC, and therefore smaller payroll contributions from workers and employers.

Minimizing pension contributions through a high discount rate, likely underfunding the plan, can be appealing to politicians. Pension contributions compete with revenue for other functions of government, but do not produce the accolades of a new construction project or social service program. Increasing the discount rate beyond realistic expectations allows a politician to seemingly maintain the support of public sector employees through generous pension benefits while shouldering future taxpayers, and elected officials, with the financial burden of these decisions. Meanwhile, the funds that should have been invested in order to meet future obligations are presently diverted to provide more visible public services or maintain relatively lower tax rates on unsuspecting residents. Through this process, fiscal reckoning is pushed into the future.

Across the pension bargaining table from politicians are union leaders with a self-interest in underestimating the annually required contribution needed to fund the pension promises to future retirees. The apparent immediate costs of an increase in promised future benefits can be masked by simply using a higher assumed rate of return on existing pension fund investments. For instance, applying an 8 percent discount rate rather than a 4 percent discount rate reduces the projected cost of a more comprehensive retiree healthcare plan by about two-thirds over time. Both the politician and the union negotiator have incentives to underestimate the costs and underfund promised pension benefits.

Even absent political pressures, pension fund managers and boards have incentives to maintain high discount rates. Regardless of whether such a reality exists, reducing a discount rate lowers the reported funding ratio and may imply poor investment management. A declining funding ratio paired with such accusations from both labor leaders and politicians can cost a manager or investment board executive their position.

The tensions between good financial management and politics are rarely made explicit. However, the reactions to a recent audit of the Public Employees Retirement System of Mississippi trace an outline of the various incentives.[xvii] The audit found that the discount rate was unrealistically high. Pat Robertson, the Executive Director of the Public Employees Retirement System of Mississippi, acknowledged this but explained the funding ratio would deteriorate under a more realistic discount rate, resulting in higher required contributions. The concern of rising pension costs exemplifies the impact of external politics. Comments from the Mississippi Alliance of State Employees President Brenda Scott made it clear that any increase in the annual contribution should come from the employer, or ultimately the taxpayer. The latter concern reveals the lengths the pension board is willing to go for self-preservation. A disinterested manager would aim for accuracy without preoccupation with the appearance of a lower funding ratio.

Data clearly suggest perverse incentives in fund management affect the assumed rate of return used by public pension funds in determining both annual required contributions and funding ratios.

Figure 5 divides states into two groups: those reducing the assumed rate of return for this most recent reported year vs. those leaving the assumed rate of return unchanged. Also visualized for the two groups of states are the changes in both the self-reported funding ratio (based on the official assumed rate of return) and the risk-free funding ratio (based on a uniform 2.142 percent rate of return).

On average, funds lowering their assumed rate of return experienced an increase in the risk-free funding ratio—often as a result of superior investment returns. Superior returns can generate the political capital necessary to reduce the discount rate and withstand any blowback from the resulting decline in the self-reported funding ratio.[xviii]

On the other hand, fund managers refraining from lowering the assumed rate of return—or in some cases actually increasing investment return expectations—tended to actually experience a decrease in the risk-free funding ratio. Of interesting note, this group of funds refraining from lowering their assumed rates of return reported less of a decline in their funding ratios compared with their counterparts, even as their risk-free funding ratios sank in comparison. In short, superior returns are correlated with lower official future expectations and more healthy risk-free funding ratios; subpar returns are correlated with higher official expectations and more toxic risk-free funding ratios.

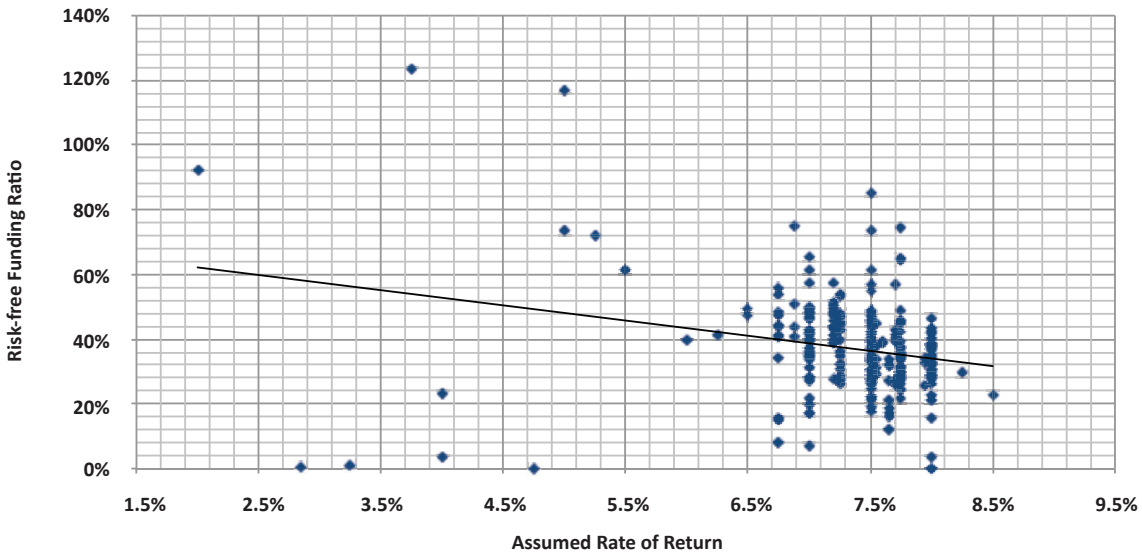
Raising the expected rate of return after a period of under-performance disguises unfunded pension liabilities by artificially lowering the present value of the future liabilities. This is a perverse incentive.

Long-Term Effects of Mismanagement

Discount rates have played a central role in long-term pension fund mismanagement. Figure 5 plots each plan by its assumed rate of return and normalized funding ratio. Outliers have been excluded to show the general trend more clearly, but the complete visualization can be found in the appendix. Plans with a lower assumed rate of return (discount rate) have a higher risk-free funding ratio, and thus a lower chance of defaulting on promises made to state workers or bailing out the plans at taxpayer expense.

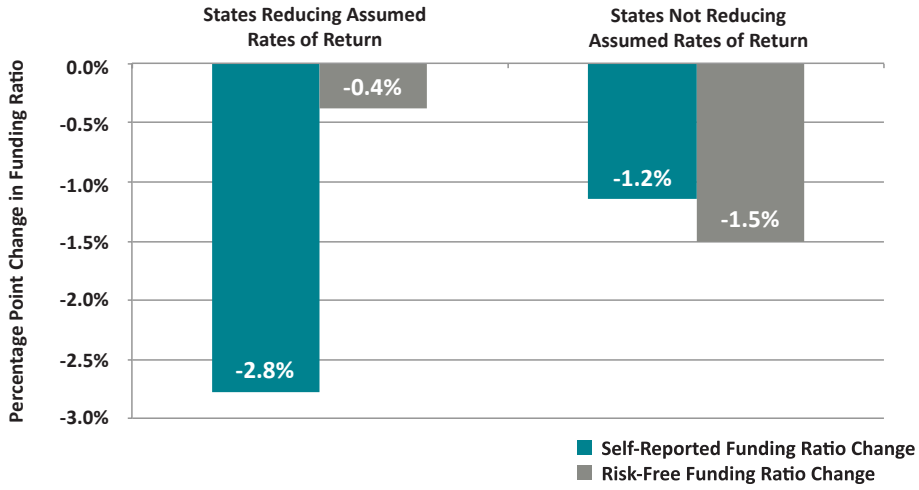
The correlation between realistic discount rates and higher risk-free funding ratios is not surprising. CalPER's dual treatment shows when a fund manager must protect a fund from shortfalls, they use a risk-free rate. As seen in Figure 6, the closer a fund's assumed rate of return is to the risk-free rate, the higher the risk-free funding ratio. Taxpayers and state workers benefit from use of more realistic return assumptions. Taxpayers are protected from future tax hikes or cuts in government services stemming from pension fund bailouts thanks to higher annual required contributions—contributions that are invested and grow over time. Public employees gain a more secure future due to diminished risk of potential defaults or benefit reductions.

FIGURE 5 | Risk-free Funding Ratios Increase as Assumed Rates of Returns Decrease



Risk-free Funding Ratios Increase as Assumed Rates of Returns Decrease

FIGURE 6 | Perverse Incentives in Fund Management Skew Reported Funding Ratios



Perverse Incentives in Fund Management Skew Reported Funding Ratios

SECTION 3: METHODOLOGY

This study covers more than 280 state-administered public pension plans representing $3 trillion in assets. Data are drawn from Actuarial Valuation Reports and Comprehensive Annual Financial Reports (CAFRs) as provided by each plan or by state administrators. In each case, figures are from the most current valuation available at the time of research. States that have not reported new valuations are noted in visualizations and in the appendix. To calculate each plan's unfunded liabilities, this report uses the actuarial value of assets (AVA) and actuarial accrued liability (AAL). Some plans provide only fair market valuations, in which case the fair market value of assets and liabilities were used in lieu of the AAL. While slightly different, fair market values do not vary dramatically from actuarial values. Therefore, the use of fair market values in these cases is unlikely to affect a state's unfunded liabilities and rankings.

This publication makes several assumptions about the structure of state liabilities and the quality of the states' actuarial assumptions to make more realistic estimates of state liabilities. States are not required to report their liability projected over a time series, such as reporting the total liability due per year for the next 75 years. This publication must assume the midpoint of the state's liability in order to recalculate state liabilities under different discount rates. Barring states reporting their liabilities in detail, 15 years is a fair estimate of the average midpoint for pension plans and is used in *Unaffordable and Unaccountable*. Other actuarial assumptions, such as mortality rates, are held constant, and thus implicitly assumed accurate in our estimates of state liabilities.

Unlike GASB-directed CAFRs and Actuarial Valuation Reports, ALEC uses a more realistic valuation to determine the unfunded liabilities of public pension plans. Many plans assume rates of return far higher than can be consistently expected of today's market, even under direction of the best asset managers. These decisions generate substantial perverse incentives for pension administrators and investment managers, often inviting politicized decision-making and risky fund allocations. ALEC uses a more prudent rate of return, based on the equivalent of a hypothetical 15-year U.S. Treasury bond yield. Since this is not presently offered as an investment instrument, the number is derived from an average of the 10- and 20-year bond yields. This year's number is averaged from the 12 months spanning April 2016 to March 2017. The resulting rate is 2.142 percent, a reduction of 0.202 percent compared to last year.

As the Society of Actuaries' Blue Ribbon Panel on Public Pension Plan Funding recommends, "the rate of return assumption should be based primarily on the current risk-free rate plus explicit risk premium or on other similar forward-looking techniques."[xix] Because federal government bonds are insured with the full faith and credit of the United States government, the rate of return for these bonds is the best proxy for a risk-free rate. A valuation of liabilities based on a risk-free rate contrasts sharply with the optimistic assumptions used by nearly every public sector pension plan.

The formula for calculating a more realistic present value for a liability requires first finding the future value of the liability. That formula, in which "i" represents a plan's assumed interest rate, is FV = AAL x (1+i) ^15. The second step is to discount the future value to arrive at the present value of the more reasonably valued liability. That formula is PV = FV / (1+i) ^15, in which "i" represents the risk-free interest rate.

Using a more reasonable valuation ensures state officials cannot overestimate their asset performance and underestimate their required contributions to the pension systems. The public sector's current assumed rates

of return significantly distort how much money is needed to fund the plans today to guarantee and eventually pay out future benefits. Ultimately, this will result in broken promises to state employees and financial hardship for taxpayers.

In addition to normalizing discount rates, this study uses several decision rules used when collecting and organizing data. One fundamental challenge is that *Unaffordable and Unaccountable* is an annual report on systems that often issue their data on a biannual schedule. In each of our publications, some states have not released new reports or valuations of their pension liabilities. In these cases, the previous year's figures are carried over. This, in effect, is stating that there was no measurable change from year to year. Ideally, states will begin to report their pension liabilities annually and in a timely manner, so changes can be measured.

SECTION 4: TRANSPARENCY

Transparency Is Essential

Transparency enables voters, taxpayers and all stakeholders to access, research and understand the operations of the government and hold lawmakers and officials accountable for their actions. The digital world makes sharing and retrieving information easier, and less expensive, than ever before. Governments no longer have the excuse that compiling, printing or sharing information would cost too much in time or money.

In this new era, government should place all financial information disclosable to the public online, in an accessible location and understandable format. For more than a decade, ALEC has called on state and local governments to put their budgets online, in an accessible format for all taxpayers to see.[xx]

In particular, state-administered public pension plans should disclose this and other relevant information on a regular and timely basis: the financial status of the system, all actuarial assumptions, the composition of the investment portfolio, investment decisions, investment performance, governance structures, benefits decisions and the findings of relevant independent assessments. All of this information should be made available without fee and organized in a reasonably comprehensible manner.

Case Studies—Pension Management Transparency in Action

Kentucky, North Carolina and Nebraska provide examples for every pension system to emulate in order to improve transparency. Each of these three states provides up-to-date, easily-found comprehensive financial reporting for their state-administered pensions. Conversely, Louisiana and Georgia fail to provide such financial reports in an acceptable manner.

The Commonwealth of Kentucky catalogues the majority of the state-administered systems in the Kentucky Retirement System's Comprehensive Annual Financial Report (CAFR). In addition, the financial, investments, actuarial and statistical sections of the report are laid out in a clear, organized, rationally flowing manner. In particular, the actuarial section contains all of the data required to compute unfunded actuarial accrued liability, and presents that key number along with the funding ratio for all of its plans. Rather than merely presenting required information such as the actuarial valuation of assets and liabilities, Kentucky provides the raw data along with computed key fundamentals.

Towards the front of the section, Kentucky Retirement Systems (KYRET) presents the funding levels of all its plans for pensions and other post-employment benefits (OPEB) for the current year and the prior year.

IMAGE 1 | Kentucky Retirement Systems CAFR

Funding Level				
	2016		2015	
System	Pension Fund	Insurance Fund	Pension Fund	Insurance Fund
KERS Non-Hazardous	16.0%	30.3%	19.0%	28.8%
KERS Hazardous	59.7%	125.3%	62.2%	120.4%
CERS Non-Hazardous	59.0%	69.6%	60.3%	68.7%
CERS Hazardous	57.7%	72.9%	58.0%	72.3%
SPRS	30.3%	67.2%	33.8%	65.8%

Source: Kentucky Retirement Systems, CAFR 2016

Furthermore, the written analysis and descriptions are understandable to the average reader. They provide comprehensive summaries of the actuarial assumptions used, definitions for any industry terminology and draw attention to portions warranting special consideration. The report also provides a comprehensive summary of all actuarial valuation data in a clear, organized format.

IMAGE 2 | Kentucky Retirement Systems CAFR

Summary of Actuarial Valuation Results					
	KERS Non-Hazardous	KERS Hazardous	CERS Non-Hazardous	CERS Hazardous	SPRS
Recommended Rate Fiscal 2015-2016					
Pension Fund Contribution	41.98%	20.48%	14.48%	22.20%	71.57%
Insurance Fund Contribution	8.41%	1.34%	4.70%	9.35%	18.10%
Recommended Employer Contribution	50.39%	21.82%	19.18%	31.55%	89.67%
Funded Status as of Valuation Date					
PENSION FUND					
↘ Actuarial Liability	$13,224,698,427	$936,706,126	$11,076,456,794	$3,704,456,223	$775,160,294
↘ Actuarial Value of Assets	$2,112,286,498	$559,487,184	$6,535,372,347	$2,139,119,173	$234,567,536
↘ Unfunded Liability on Actuarial Value of Assets	$11,112,411,929	$377,218,942	$4,541,084,447	$1,565,337,050	$540,592,758
↘ Funding Ratio on Actuarial Value of Assets	15.97%	59.73%	59.00%	57.74%	30.26%
↘ Market Value of Assets	$1,953,422,354	$524,678,968	$6,106,186,908	$2,003,669,273	$217,594,068
↘ Unfunded Liability on Market Value of Assets	$11,271,276,073	$412,027,158	$4,970,269,886	$1,700,786,950	$557,566,226
↘ Funding Ratio on Market Value of Assets	14.77%	56.01%	55.13%	54.09%	28.07%

Source: Kentucky Retirement Systems, CAFR 2016

Further into the actuarial section, each state-administered plan is evaluated in even greater detail on its own, with historical data presented for previous years. The inclusion of data for prior years provides an important benchmark by which to contrast management investment performance with market performance.

Looking to North Carolina, the strength of their pension reporting comes from the location, ease-of-access to the documents, along with the informational organization. Unlike most states which make pension fund financial documents available only through the pension organization itself (often distinct from any governmental agency), all pension fund financials are easily available from North Carolina's Department of State Treasurer. Even better, separate web pages host the CAFRs and Actuarial Valuation Reports, each categorized by year and plan name. Beyond that, the format consistency of format enhances ease of reading and understanding. Each report is well organized, and descriptively labeled. All financial fundamentals required to assess plan solvency—such as actuarial valuations and assumptions—are presented clearly.

Much like North Carolina, Nebraska's pension plans are all organized on a single website. All key financial reports are organized on the same webpage with separate sections for actuarial reports, GASB reports, investment reports and a plethora of valuable and informative documentation. Nebraska's Actuarial Valuations, which are catalogued by the plan's name and by year, are particularly admirable. Further, within each report, actuarial valuations and investment assumptions are easy to find and understand.

Unfortunately, most states fail to mirror the highly transparent examples set by Kentucky, North Carolina and Nebraska. This failure to respect taxpayers' right to publicly disclosable information results in a lack of accountability.

Across all states, Louisiana is quite possibly the most opaque in its reporting of pension finances. The large number of plans (16) is difficult to track. In addition, standards of timeliness, format, content or public availability appear nonexistent. Although some pension financial reports may be found on the website for the State's Division of Administration, most are years out-of-date. Worse, the lack of a centrally located page forces those seeking information to either use an archaic search function on the site or rely on Google to find direct links to PDFs of the reports. Such an expedition requires intimate knowledge of the proper search terms. The format of the discoverable reports often fails to provide actuarial valuations of assets or liabilities, obscuring the assumed rates of return.

Although Georgia does a far better job at providing actuarial valuation reports compared to Louisiana, much room for reporting improvement exists. Although many states also lack of a central repository for all state-administered pension funds financial statements, the high number of plans in Georgia exacerbates this problem. Like Louisiana, few or no reporting standards seem to exist. Locating actuarial reports online is excessively difficult, with an abundance of defunct, broken or "coming soon" websites. Requests for missing reports by researchers compiling data for *Unaccountable and Unaffordable 2017* were met with suspicion or otherwise obstructive behavior by plan administrators. Only after multiple requests did researchers receive needed information

Although a uniform approach is not feasible, the basic principles of transparency should be followed.

TABLE 5 | Transparency Leaders and Laggards

TRANSPARENCY LEADERS AND LAGGARDS	
MOST TRANSPARENT	LEAST TRANSPARENT
Kentucky	Alabama
Montana	California
Nebraska	Georgia
North Carolina	Louisiana

State-administered pension plans represent $3 trillion in assets and trillions more in pension promises. This transparency enhances the capacity of taxpayers and public workers to hold politicians and investment managers accountable for keeping promises made to workers while simultaneously safeguarding taxpayers from undue risk. All such stakeholders deserve comprehensible, navigable and accessible information.

SECTION 5: STATES ENACT BREAKTHROUGH REFORMS IN 2017

Despite more than $6 trillion dollars of unfunded liabilities across the nation, three states provided reason for optimism in 2017. Both Pennsylvania and Michigan enacted meaningful pension reforms to preserve retirement security, pave the way for additional improvements and prevent further growth in the heavy burden of unfunded liabilities. And Gov. Doug Ducey's 2016 reforms to the Arizona Public Safety Personnel Retirement System took effect this year as well.

Arizona

Arizona's pension system is just 29.5 percent funded, and to address this, Gov. Doug Ducey signed significant pension reforms in 2016 that took effect in July of 2017. These reforms addressed cost of living adjustments (COLAs), created a new plan design for all new employees and improved governance over pension plans. The reduction in costs for new hires alone is estimated to save Arizona taxpayers $1.5 billion over the next 30 years.[xxi]

The comprehensive reforms give new employees the choice to enter a DC plan or a DB hybrid plan as well as reduce the maximum salary on which benefits are calculated from $265,000 per year to $110,000 per year. Reforms like these can offer a model for other states that need to address long-term costs while at the same time protect retirement security for state employees.

Pennsylvania

Pennsylvania's pensions are the 11th lowest funded in the nation, with unfunded liabilities exceeding $17,400 for every man, woman and child in the Commonwealth. The comprehensive pension reforms enacted into law from Senate Bill 1 this year begin to address those daunting challenges.

Prior pension reform efforts made in 2010 assured the state made full pension payments, but failed to prevent pension liabilities from soaring to $223 billion dollars. Pennsylvania's ballooning liability is primarily due to the failure to reach the overly-optimistic annual assumed rates of return, such as 7.5 percent for the Public Schools Employees Retirement System and the State Employees Retirement System. Annual required contributions are based off of official return assumptions. Even if these contributions are fully met, subpar investment performance widens the gap between assets and the present value of future promised pension benefits.

Reforms in Pennsylvania's Senate Bill 1 create a defined-contribution component for every new state and school district employee by 2019. Employees will also have more retirement options; two defined-benefit-defined-contribution hybrids and a 401(k)-style plan. Similar hybrid models have been successfully implemented in Tennessee, Virginia and Washington.[xxii]

New workers can choose to participate solely in the defined-contribution (DC) plan, rather than also contributing to the defined-benefit (DB) plan. Current employees may elect to join one of these hybrids or the 401(k) plan, although current employees may also opt to remain in the existing DB plan.

These measures will help Pennsylvania keep its promises to employees and retirees alike. Better still, they can serve as a platform for further improvements. Preserving retirement security for existing and future employees, while putting in place a more fiscally sustainable benefit for new workers, means both public employees *and* taxpayers win.

Michigan

Michigan's unfunded liabilities exceed $16,900 for every resident in the state. The state's pension system needed significant structural changes to honor promises to public sector retirees while also protecting taxpayers. While state employees have been enrolled in a sustainable DC pension model since the late 1990s, public school and municipal employees were not included in those reforms.

In 2010, the state made some progress by implementing a hybrid plan for public school employees, but this year's comprehensive reforms in House Bill 4647 for public school employees further address the daunting $168 billion of unfunded liabilities statewide that remain.

Reforms in House Bill 4647 build on prior efforts by closing the current hybrid plan to new public school employees hired after February 1, 2018. New employees will join the existing DC plan by default unless they opt into the new hybrid plan instead. A key component of the DC plan is an automatic employer contribution of 4 percent of compensation. An employee can contribute up to an additional 3 percent annually, fully matched by the employer. This 100 percent match is a core component of the DC plan and provides a fully funded and flexible retirement option.

The new plan incorporates several features to enhance the pension system's fiscal health. Foremost, the new hybrid plan uses a more realistic assumed rate of return of 6 percent, though still 1.5 percentage points higher than the average private sector pension plan. Further, there are a series of conditional changes allowing the plan to correct itself, setting it on a path toward fiscal responsibility if the funds begin to falter. If investment return assumptions are not met, the costs of the increased Annual Required Contribution will be shared by the school system and employees equally. If the funding ratio falls below 85 percent for two consecutive years, new hires will be enrolled and remain in the default DC plan. Closing enrollment into the hybrid plan option if funding requirements are not met assures that unfunded liabilities cannot continue increasing. The hybrid plan continues to provide a DC component match of 50 cents per dollar contributed by the employee up to 1 percent of compensation in lieu of annual Cost of Living Increases (COLAs) to the DB component. Finally, in certain instances, the plan would raise the retirement age if longevity increases.

Over the past three decades, Michigan has underfunded the DB pension plans that remained after the reforms of the 1990s, which is reflected in a funding ratio of a mere 27 percent. (Important note: The DC plan for state workers was not similarly underfunded). If annual contributions had been prudently made, investment revenue from accumulated plan assets would be far higher than current levels. Fortunately, with the reforms of 2017, Michigan lawmakers have put their pension system on a much more sustainable path for the future. If implemented properly, these reforms could result in a national model for reform and establish Michigan as one of the brightest turnaround stories among the states.

Building on the momentum created by Arizona, Pennsylvania and Michigan, first-term Kentucky Gov. Matt Bevin has worked with the legislature to address the need for comprehensive pension reform. Kentucky ranks 49 out of the 50 states for their poor funding ratio, and unfunded liabilities exceed $25,000 for each resident

of Kentucky. The leadership from the governor and the legislature on this issue is a commendable first step in the right direction for the taxpayers and public sector employees and retirees of Kentucky. At press time, the special session date has not been set, but we are hopeful that policymakers in Kentucky follow in the footsteps of these aforementioned states and implement meaningful reform.

As states across the nation address the current pension funding crisis, they should look to Arizona, Pennsylvania and Michigan as examples. Implementing reforms that bolster stewardship, modernize pension plans for new hires, and assume realistic rates of return will protect taxpayers, employees and retirees alike.

APPENDIX: GLOSSARY OF TERMS

The following is a brief, nontechnical description of some of the terms used in this report. Readers who desire a more precise, technical explanation should consult the Governmental Accounting Standards Board (GASB) or their state's retirement systems.

Actuarial accrued liability (AAL)—The money that a plan should have on hand now to pay, sometime in the future, for the retirement benefits that an employee has earned to date.

Actuarial value of assets (AVA)—The total present value of all pension plan assets, which should not include the present value of future payments into the plan

Annual required contribution (ARC)—The amount of money an employer should deposit into a defined-benefit plan for a given year. It has two parts: the normal cost and an amount needed to amortize unfunded liabilities

Discount rate—An investment return, expressed as a percentage, that the retirement plan's managers hope to achieve. It may be tied to the yield of U.S. Treasury bills, a stock market index or other measure.

Funding ratio—A percentage that reflects how much money a retirement plan has to meet its obligations over the long term.

Moral hazard—The risk that occurs when the agent responsible for making decisions is not responsible for the cost that arises from the consequences of said decisions

Risk-free rate—A rate derived from an average of the 10 and 20-year U.S. Treasury bond yields. The rate in this year's edition is 2.142083 percent.

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