

2020

UNACCOUNTABLE AND UNAFFORDABLE

UNFUNDED
PUBLIC
PENSION
LIABILITIES
EXCEED
\$5.8 TRILLION



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Unaccountable and Unaffordable 2020

Unfunded Public Pension Liabilities Exceed \$5.8 Trillion

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INTRODUCTION

Unfunded state pension liabilities total \$5.82 trillion or \$17,748 for every man, woman and child in the United States. State governments are obligated, often by contract and state constitutional law, to make these pension payments regardless of economic conditions. As these pension payments continue to grow, revenue that would have gone to essential services like public safety and education, or tax relief, goes to paying off these liabilities instead.

Unfunded liabilities have increased by more than \$900 billion in this year's report due to several factors:

The 10 states with the largest unfunded liabilities, California, Illinois, Texas, Ohio, New York New Jersey, Pennsylvania, Florida, Georgia and Massachusetts have rapidly growing unfunded liabilities. They take up an increasing share of total unfunded liabilities in the country. These states make up 58% of all unfunded liabilities in the country, up from 57% last year. Pension investment returns have again fallen short of assumptions in this year's report, covering FY 2019, with an average of 6.5% return instead of the assumed 7.2%.

This study uses a risk-free discount rate, expressed as a percent, to determine the value of liabilities that pension plans must pay in the future. The "risk-free" aspect of our discount rate calculation follows the reality that states cannot default on their pension promises. This risk-free discount rate is based upon the yields of U.S. Treasury bonds, which means that the rate changes each year. This year, the risk-free discount rate lowered from 2.96% to 2.34%, increasing the present value of liabilities. We also measure liability values with a fixed discount rate of 4.5% to account for these changes in the risk-free discount rate.

Most state pension plans are structured as defined-benefit plans. Under a defined-benefit plan, an employee receives a fixed payout at retirement based on the employee's final average salary, the number of years worked and a benefit

multiplier. Pension plans pay these benefits to millions of public workers across the country. These plans accrue assets through employee contributions, tax revenue and, in the worst case, by taking on debt to pay pension promises today. Paying pension obligations by issuing bonds only kicks the can down the road to future taxpayers, as they will ultimately be responsible for solving the pension funding crisis.

States are obligated, in some cases constitutionally, to pay pension obligations. There are important reforms, however, that can prevent unfunded liabilities from growing in the future. By offering newly elected employees sustainable plans, such as hybrid and defined-contribution plans, similar to how 401(k) plans work for workers in the private sector, states can prevent the rapid growth of unfunded liabilities and give public workers greater flexibility with their retirement contributions, plus the ability to take their retirement savings with them to new positions or new careers.



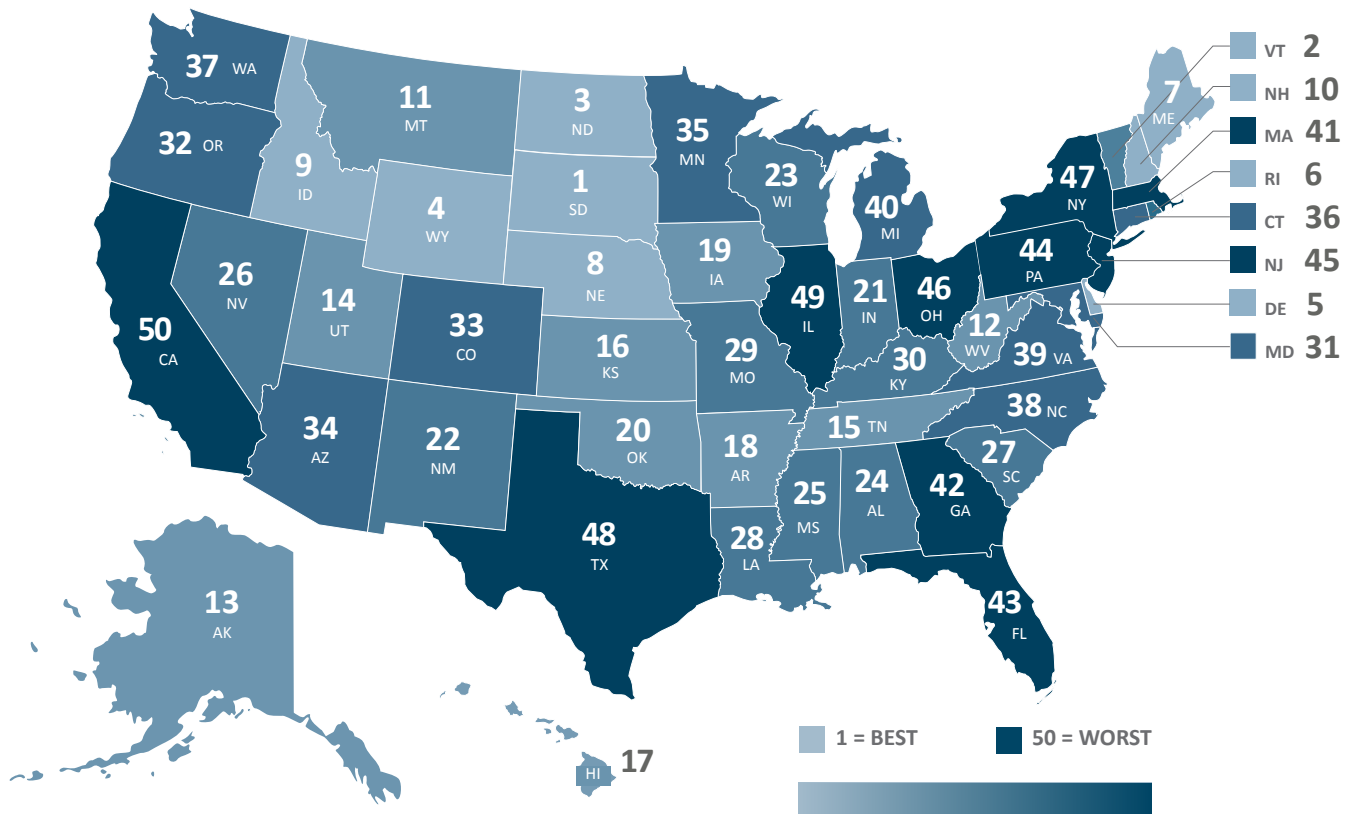
Because of the significant impact unfunded pension liabilities have on state budgets and individual taxpayers, the American Legislative Exchange Council (ALEC) produces publications to educate policymakers and the public about the danger unfunded pension liabilities pose to core government services and the economy. This report surveys more than 290 state-administered public pension plans, detailing assets and liabilities from FY 2011-2019. The unfunded liabilities are reported using three different calculations:

- Estimates from each respective state
- Estimates using a risk-free discount rate, which reflects constitutional and other legal protections extended to state pension benefits
- Estimates using a fixed rate of 4.5%, which compares funding ratios and controls for changes in discount rate assumptions over time

SECTION 1: KEY FINDINGS

Figure 1, Table 1

Total Unfunded Pension Liabilities, 2020



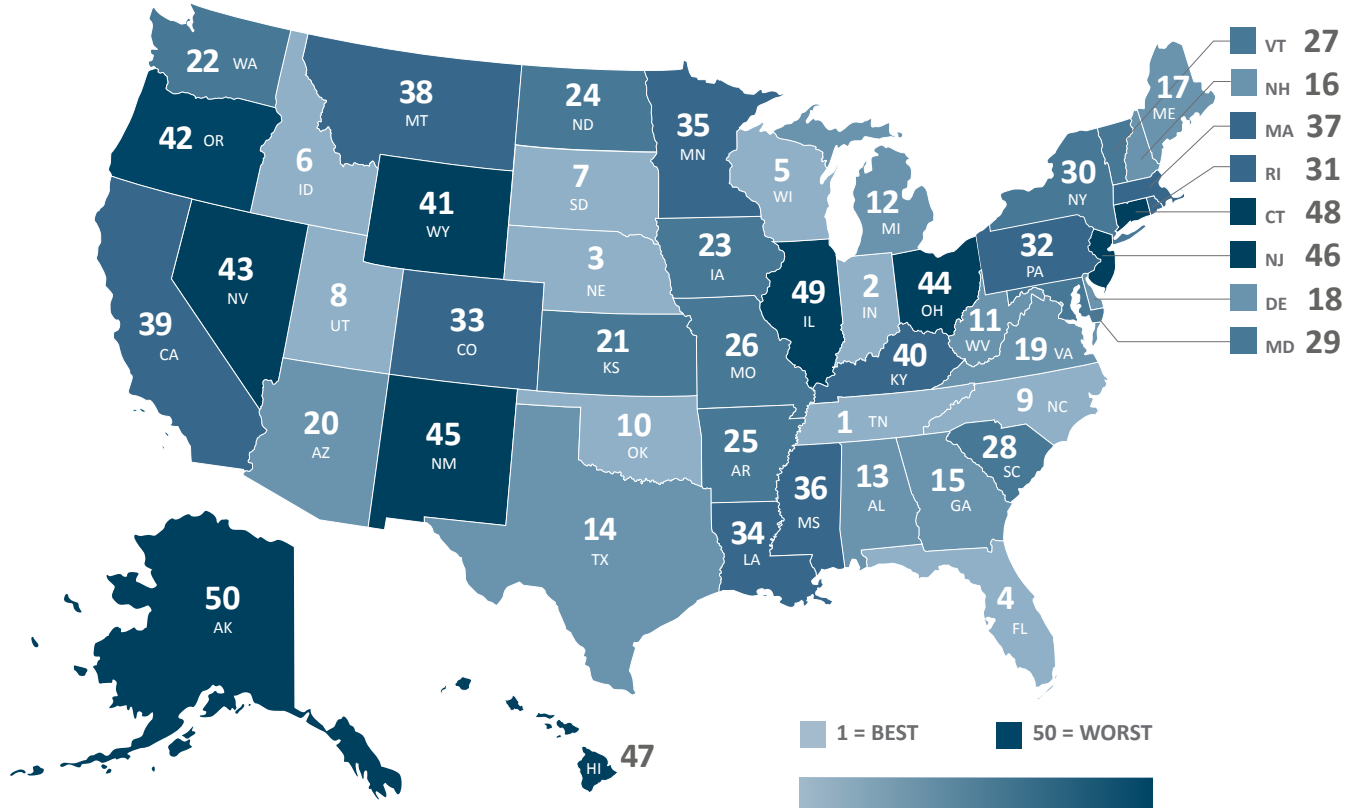
RANK	STATE	RISK-FREE UNFUNDED LIABILITIES
1	South Dakota	\$10,196,806,271
2	Vermont	\$10,209,419,265
3	North Dakota	\$11,997,434,609
4	Wyoming	\$13,591,478,905
5	Delaware	\$14,102,006,237
6	Rhode Island	\$18,963,459,987
7	Maine	\$19,082,764,864
8	Nebraska	\$19,099,526,006
9	Idaho	\$19,106,306,953
10	New Hampshire	\$19,198,501,296
11	Montana	\$23,149,588,259
12	West Virginia	\$24,360,561,619
13	Alaska	\$31,323,107,715
14	Utah	\$37,007,562,251
15	Tennessee	\$43,336,342,256
16	Kansas	\$43,342,547,992
17	Hawaii	\$44,001,806,975
18	Arkansas	\$47,715,577,572
19	Iowa	\$48,976,700,267
20	Oklahoma	\$52,065,124,476
21	Indiana	\$52,911,200,935
22	New Mexico	\$59,016,137,483
23	Wisconsin	\$59,208,864,425
24	Alabama	\$66,948,949,617
25	Mississippi	\$72,943,383,394

RANK	STATE	RISK-FREE UNFUNDED LIABILITIES
26	Nevada	\$77,022,271,739
27	South Carolina	\$85,441,291,234
28	Louisiana	\$89,951,703,249
29	Missouri	\$99,631,050,908
30	Kentucky	\$102,373,103,261
31	Maryland	\$102,753,627,887
32	Oregon	\$105,287,199,428
33	Colorado	\$106,868,209,172
34	Arizona	\$107,942,152,600
35	Minnesota	\$109,775,895,459
36	Connecticut	\$111,208,604,422
37	Washington	\$115,162,015,369
38	North Carolina	\$122,151,299,950
39	Virginia	\$126,298,279,304
40	Michigan	\$136,126,914,592
41	Massachusetts	\$146,216,045,340
42	Georgia	\$149,825,036,645
43	Florida	\$217,208,467,450
44	Pennsylvania	\$230,931,024,569
45	New Jersey	\$254,408,156,375
46	Ohio	\$323,656,378,765
47	New York	\$342,215,439,115
48	Texas	\$401,505,067,782
49	Illinois	\$405,246,695,783
50	California	\$894,649,357,458

Source: Data are based on ALEC Center for State Fiscal Reform calculations. To read the full report and methodology, see [ALEC.org/PensionDebt2020](https://www.alec.org/PensionDebt2020)

Figure 2, Table 2

Total Unfunded Pension Liabilities Per Capita, 2020

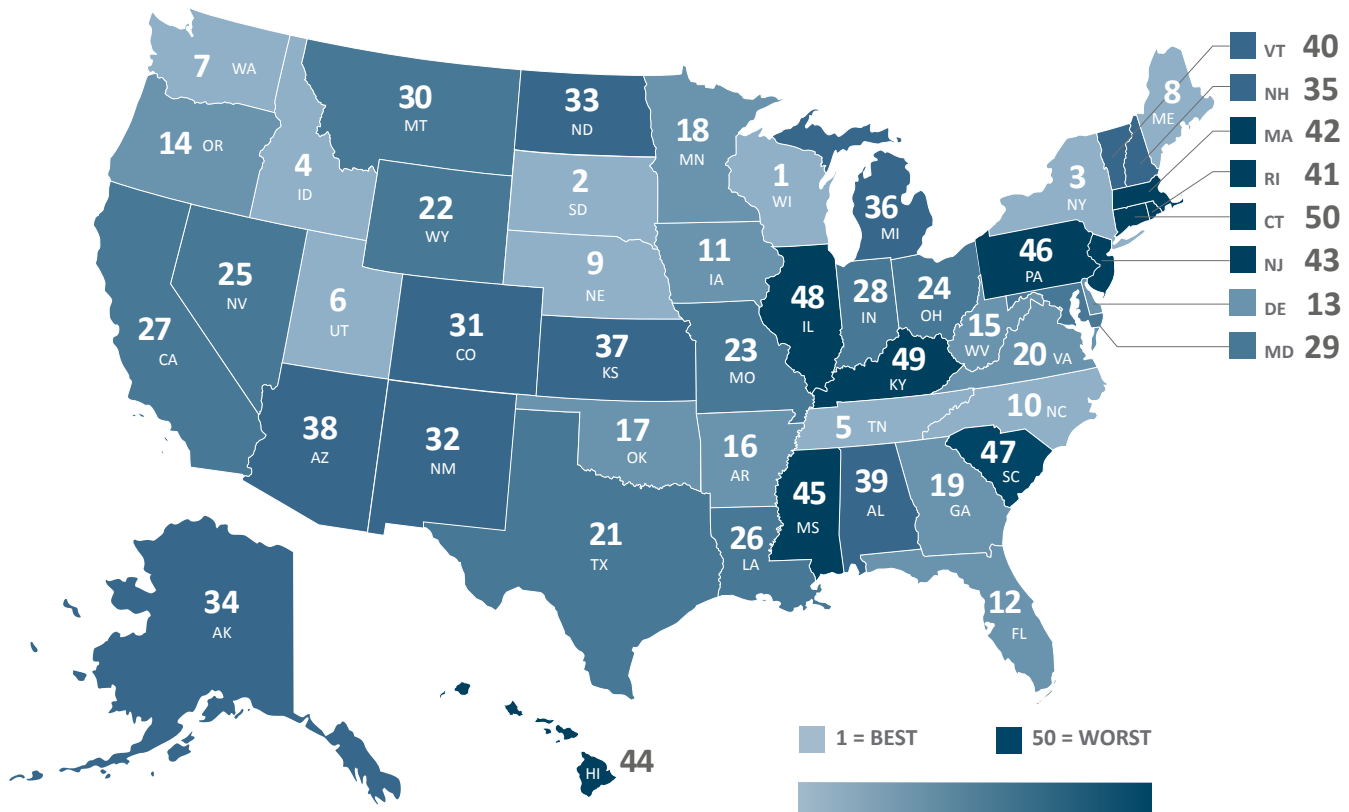


Source: Data are based on ALEC Center for State Fiscal Reform calculations. To read the full report and methodology, see [ALEC.org/PensionDebt2020](https://www.alec.org/PensionDebt2020)

SECTION 1: KEY FINDINGS

Figure 3, Table 3

Funding Ratios



FUNDING RATIOS

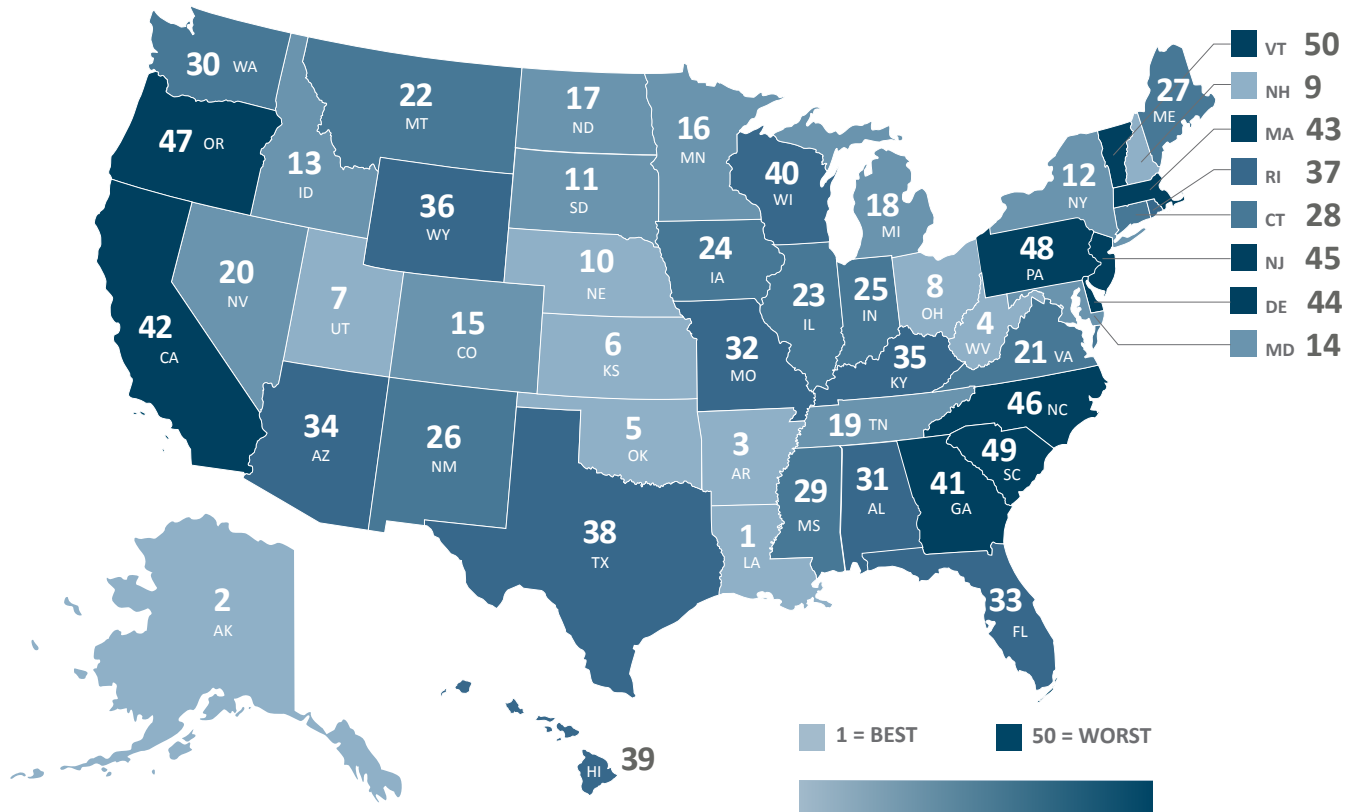
The funding ratio is one measurement of the health of a pension plan. It is the ratio of plan assets to plan liabilities, expressed as a percent. Each state pension plan should strive for a 100% funding ratio. The measurements here use the asset values reported by states and compares them to the liability values this report calculates by using a risk-free discount rate. The important distinction between a plan's measured liabilities and the risk-free liabilities are explained in Section 2.

RANK	STATE	FUNDING RATIO	RANK	STATE	FUNDING RATIO
1	Wisconsin	64.27%	26	Louisiana	36.52%
2	South Dakota	55.13%	27	California	36.42%
3	New York	49.32%	28	Indiana	36.41%
4	Idaho	48.16%	29	Maryland	35.14%
5	Tennessee	47.86%	30	Montana	33.96%
6	Utah	47.24%	31	Colorado	33.95%
7	Washington	46.71%	32	New Mexico	33.05%
8	Maine	44.14%	33	North Dakota	32.95%
9	Nebraska	43.82%	34	Alaska	32.71%
10	North Carolina	43.32%	35	New Hampshire	32.46%
11	Iowa	43.28%	36	Michigan	32.34%
12	Florida	42.96%	37	Kansas	32.27%
13	Delaware	40.91%	38	Arizona	32.09%
14	Oregon	40.00%	39	Alabama	31.72%
15	West Virginia	39.99%	40	Vermont	30.51%
16	Arkansas	39.27%	41	Rhode Island	30.41%
17	Oklahoma	39.24%	42	Massachusetts	28.96%
18	Minnesota	39.11%	43	New Jersey	28.63%
19	Georgia	39.04%	44	Hawaii	28.14%
20	Virginia	38.72%	45	Mississippi	28.13%
21	Texas	38.66%	46	Pennsylvania	27.78%
22	Wyoming	38.42%	47	South Carolina	27.42%
23	Missouri	38.05%	48	Illinois	25.05%
24	Ohio	38.02%	49	Kentucky	24.69%
25	Nevada	36.57%	50	Connecticut	23.87%

Source: Data are based on ALEC Center for State Fiscal Reform calculations. To read the full report and methodology, see [ALEC.org/PensionDebt2020](https://www.alec.org/PensionDebt2020)

Figure 4, Table 4

Change in Funding Ratios from Fiscal Years, 2012-2019



Note: This measurement uses the fixed discount rate of 4.5% to account for changes in the risk-free discount rate that occur year-over-year.

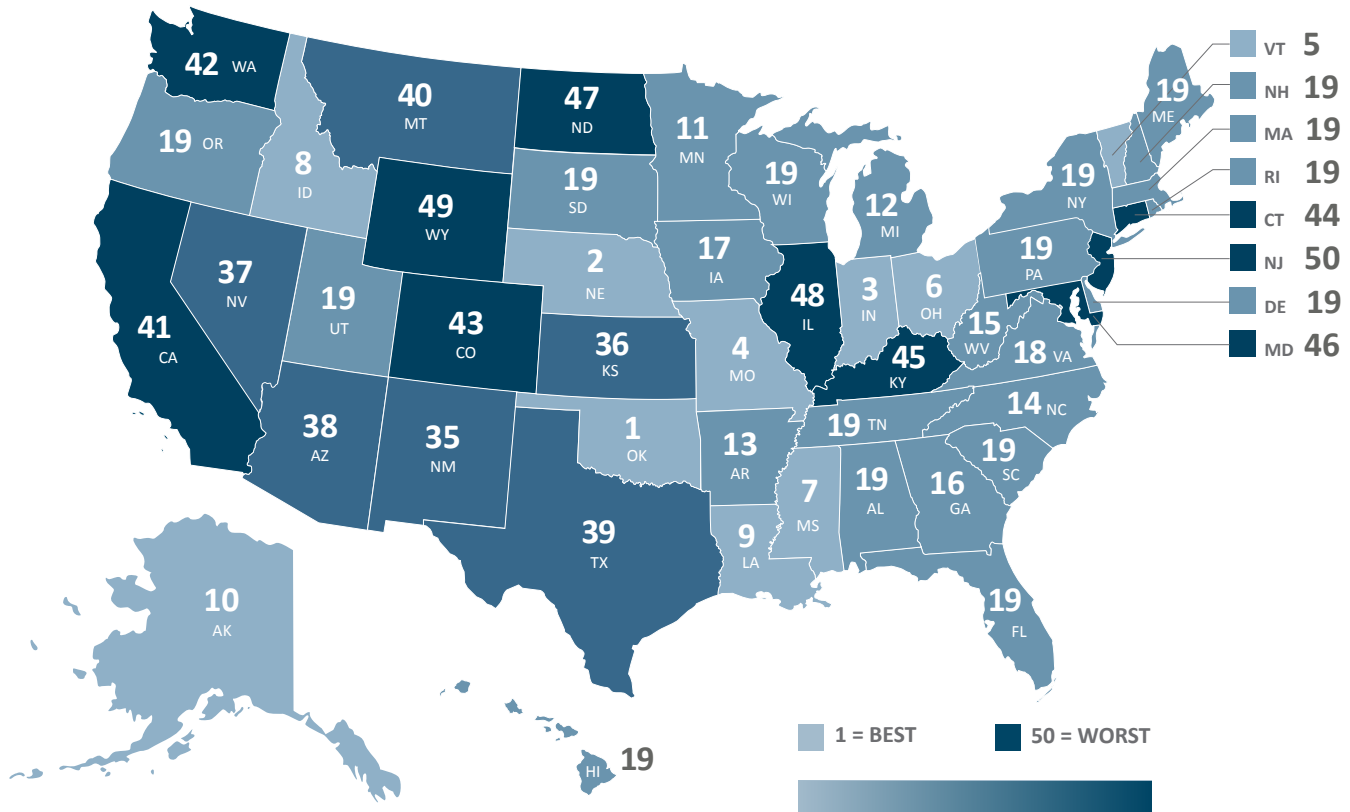
RANK	STATE	PERCENT CHANGE	RANK	STATE	PERCENT CHANGE
1	Louisiana	36.46%	26	New Mexico	13.34%
2	Alaska	35.79%	27	Maine	13.28%
3	Arkansas	34.88%	28	Connecticut	9.30%
4	West Virginia	32.27%	29	Mississippi	8.96%
5	Oklahoma	31.83%	30	Washington	8.77%
6	Kansas	28.21%	31	Alabama	7.46%
7	Utah	28.17%	32	Missouri	7.30%
8	Ohio	26.43%	33	Florida	7.07%
9	New Hampshire	25.07%	34	Arizona	6.44%
10	Nebraska	24.89%	35	Kentucky	4.40%
11	South Dakota	20.16%	36	Wyoming	4.14%
12	New York	19.92%	37	Rhode Island	3.98%
13	Idaho	19.02%	38	Texas	3.17%
14	Maryland	17.94%	39	Hawaii	2.94%
15	Colorado	17.33%	40	Wisconsin	1.51%
16	Minnesota	16.74%	41	Georgia	0.37%
17	North Dakota	16.42%	42	California	-1.28%
18	Michigan	16.10%	43	Massachusetts	-2.41%
19	Tennessee	16.05%	44	Delaware	-2.92%
20	Nevada	15.55%	45	New Jersey	-3.59%
21	Virginia	15.54%	46	North Carolina	-4.03%
22	Montana	15.11%	47	Oregon	-4.48%
23	Illinois	14.45%	48	Pennsylvania	-10.04%
24	Iowa	14.36%	49	South Carolina	-12.28%
25	Indiana	14.31%	50	Vermont	-23.70%

Source: Data are based on ALEC Center for State Fiscal Reform calculations. To read the full report and methodology, see [ALEC.org/PensionDebt2020](https://www.alec.org/PensionDebt2020)

SECTION 1: KEY FINDINGS

Figure 5, Table 5

Percent Actuarially Determined Contribution (ADC) Paid



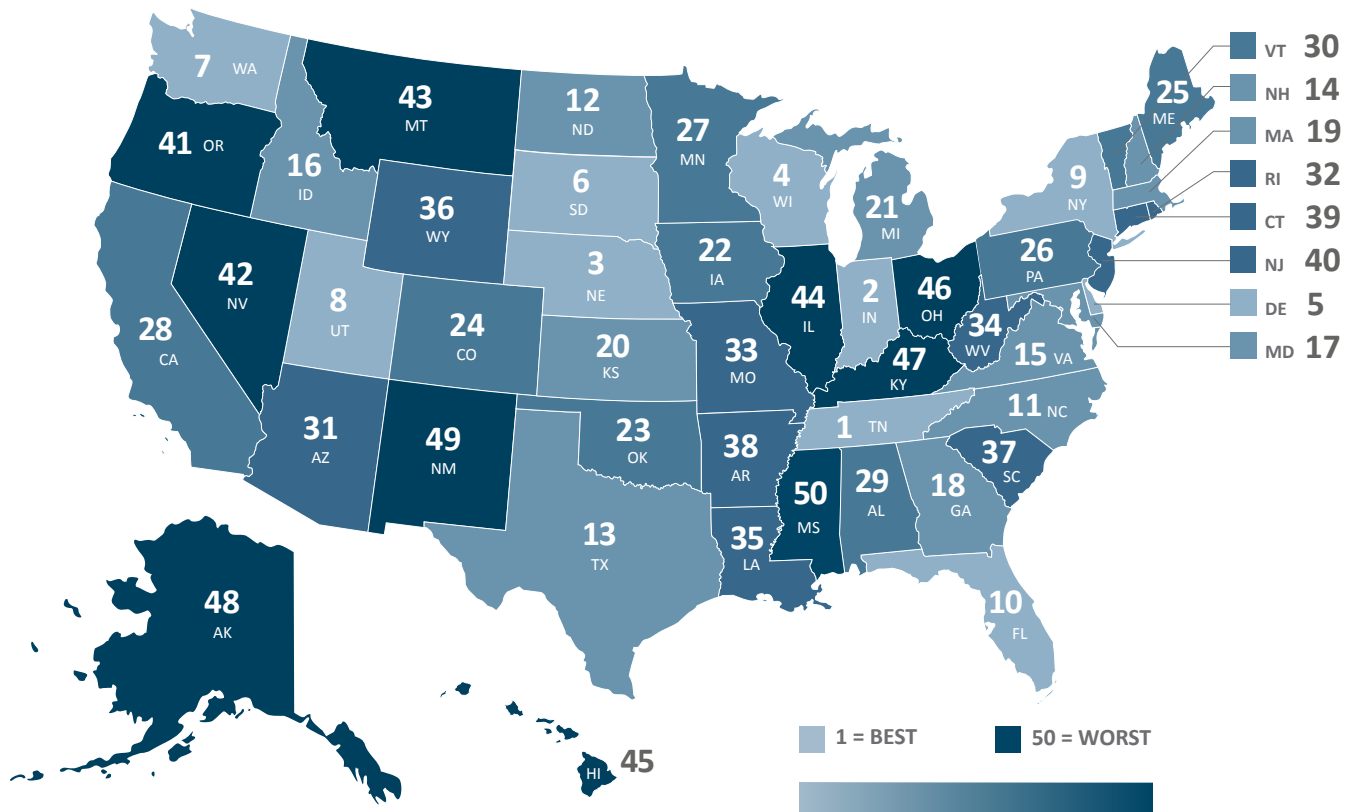
RANK	STATE	PERCENT ADC PAID
1	Oklahoma	121.18%
2	Nebraska	116.91%
3	Indiana	116.64%
4	Missouri	116.10%
5	Vermont	110.28%
6	Ohio	109.54%
7	Mississippi	105.34%
8	Idaho	104.42%
9	Louisiana	103.86%
10	Alaska	102.42%
11	Minnesota	102.39%
12	Michigan	101.37%
13	Arkansas	101.30%
14	North Carolina	101.10%
15	West Virginia	100.67%
16	Georgia	100.35%
17	Iowa	100.28%
18	Virginia	100.10%
19	Alabama	100.00%
19	Delaware	100.00%
19	Florida	100.00%
19	Hawaii	100.00%
19	Maine	100.00%
19	New Hampshire	100.00%
19	New York	100.00%

RANK	STATE	PERCENT ADC PAID
19	Oregon	100.00%
19	Pennsylvania	100.00%
19	Rhode Island	100.00%
19	South Dakota	100.00%
19	Tennessee	100.00%
19	Utah	100.00%
19	Wisconsin	100.00%
19	South Carolina	100.00%
19	Massachusetts	100.00%
35	New Mexico	99.57%
36	Kansas	98.68%
37	Nevada	98.31%
38	Arizona	97.32%
39	Texas	97.32%
40	Montana	96.67%
41	California	95.83%
42	Washington	95.49%
43	Colorado	94.01%
44	Connecticut	92.41%
45	Kentucky	90.13%
46	Maryland	89.25%
47	North Dakota	78.32%
48	Illinois	74.00%
49	Wyoming	71.95%
50	New Jersey	71.40%

Source: Data are based on ALEC Center for State Fiscal Reform calculations. To read the full report and methodology, see [ALEC.org/PensionDebt2020](https://www.alec.org/PensionDebt2020)

Figure 6, Table 6

Unfunded Liabilities as a Percentage of Gross State Product (GSP)



RANK	STATE	PERCENT CHANGE
1	Tennessee	11.40%
2	Indiana	14.03%
3	Nebraska	15.03%
4	Wisconsin	17.05%
5	Delaware	18.70%
6	South Dakota	19.13%
7	Washington	19.21%
8	Utah	19.63%
9	New York	19.76%
10	Florida	19.87%
11	North Carolina	20.78%
12	North Dakota	21.03%
13	Texas	21.28%
14	New Hampshire	21.67%
15	Virginia	22.79%
16	Idaho	23.61%
17	Maryland	23.99%
18	Georgia	24.31%
19	Massachusetts	24.55%
20	Kansas	25.03%
21	Michigan	25.14%
22	Iowa	25.14%
23	Oklahoma	25.27%
24	Colorado	27.38%
25	Maine	28.26%

RANK	STATE	PERCENT CHANGE
26	Pennsylvania	28.39%
27	Minnesota	28.82%
28	California	28.92%
29	Alabama	28.99%
30	Vermont	29.35%
31	Arizona	29.48%
32	Rhode Island	29.84%
33	Missouri	30.00%
34	West Virginia	31.16%
35	Louisiana	34.09%
36	Wyoming	34.28%
37	South Carolina	34.69%
38	Arkansas	35.83%
39	Connecticut	38.93%
40	New Jersey	39.45%
41	Oregon	41.85%
42	Nevada	43.36%
43	Montana	44.37%
44	Illinois	45.17%
45	Hawaii	45.23%
46	Ohio	46.34%
47	Kentucky	47.69%
48	Alaska	56.53%
49	New Mexico	56.75%
50	Mississippi	61.41%

Source: Data are based on ALEC Center for State Fiscal Reform calculations. To read the full report and methodology, see [ALEC.org/PensionDebt2020](https://www.alec.org/PensionDebt2020)

SECTION 2: POOR ASSUMPTIONS MAKE POOR PENSIONS

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State government balance sheets are experiencing increased pressure from growing pension liabilities. This pressure is becoming more apparent with improved financial reporting. The Governmental Accounting Standards Board (GASB) statements 67 and 68 went into effect in FY 2014 and 2015, respectively. These changes were discussed extensively in *Unaccountable and Unaffordable, 2019*.¹

Most pension plans use historical trends to estimate future conditions of assets and liabilities.² Past returns, however, are no guarantee of future performance. As state pension plans invest their funds in increasingly risky assets, the gap between expected rates of return and actual rates of return widens, with results falling far short of expectations. When investment returns come up short of expected returns, taxpayers and plan members must make up the difference through increased contributions or employees request the legislature to provide additional appropriations.

To reflect terminology used in the majority of pension plans, this report will now refer to the actuarial value of assets as the fiduciary net position – FNP – and the actuarial accrued liability will be referred to as the total pension liability – TPL – to reflect the terminology used by most plans.

It is also important to note that the data reflect FY 2019, one year before the economic impact of COVID-19. While FY 2020 financial reports have not been published, initial reports indicate that FY 2020 data will show unfunded liabilities increase and investment returns fall short of expectations.³

INVESTMENT RATE OF RETURN

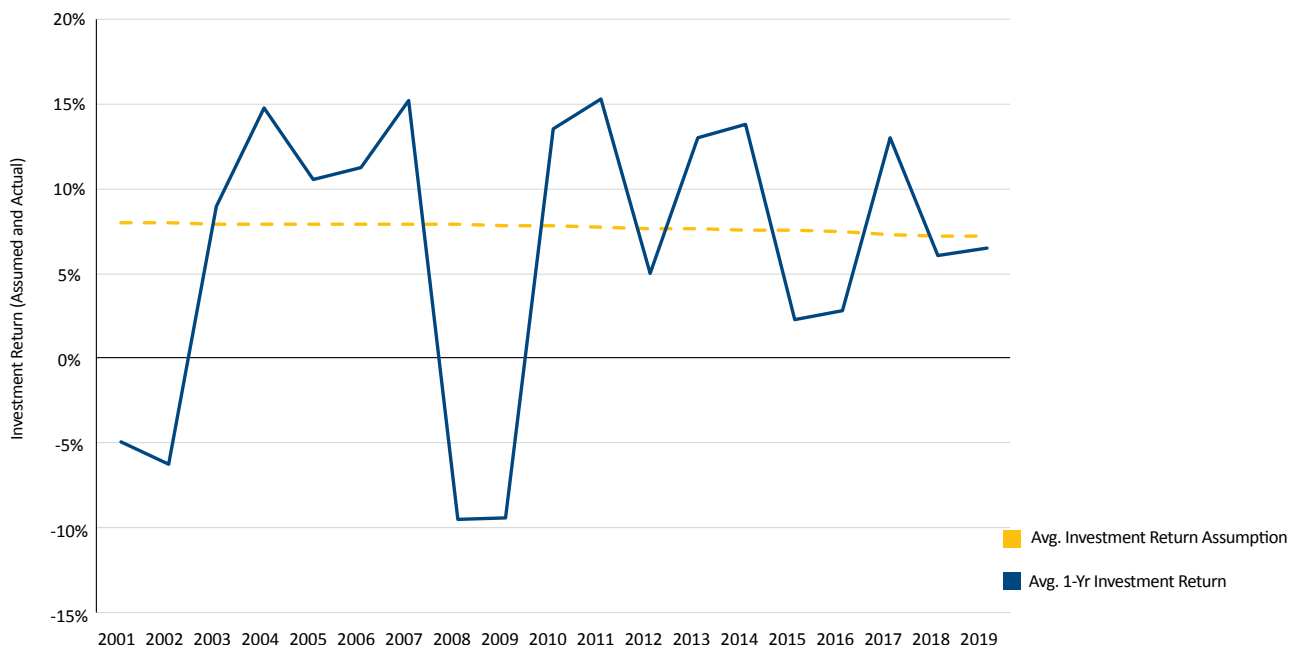
A plan's assumed investment rate of return is based on a pension plan's portfolio of investment assets and their earnings. How much these investments will earn is subject to interest rates and risks associated with the assets. The assumed rate of return is thus a reflection of the risk of the plan's investment assets. The

Table 7, Figure 7

Average Annual Investment Returns Relative to 1-Year Investment Return for All States, 2001-2019

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Avg. 1-Yr Investment Return	-4.91%	-6.22%	8.95%	14.76%	10.55%	11.29%	15.25%	-9.49%	-9.42%	13.54%
Avg. Investment Return Assumption	7.99%	7.98%	7.95%	7.92%	7.92%	7.91%	7.90%	7.88%	7.85%	7.80%

	2011	2012	2013	2014	2015	2016	2017	2018	2019	Avg.
Avg. 1-Yr Investment Return	15.31%	4.99%	13.05%	13.82%	2.32%	2.77%	13.06%	6.05%	6.54%	6.43%
Avg. Investment Return Assumption	7.74%	7.67%	7.63%	7.60%	7.54%	7.45%	7.33%	7.22%	7.20%	7.71%



Source: Public Plans Database, Boston College Center for Retirement Research

discount rate is the rate used to determine the value today of the amount a pension plan must pay retirees in the future. To make matters more confusing, investment rate of return and discount rate are often used interchangeably in state financial documents.

In the case of public pensions, however, investment rate of return and discount rate are not interchangeable, because there are different risk levels associated with pension assets and pension liabilities.⁴ Over the past four decades, pension asset funds have changed from low-risk, fixed income investments, such as U.S. Treasury bonds, to an increasingly volatile portfolio of stocks, bonds, and alternative investments.⁵ This is the result of lower bond yields over the past 30 years, the desire to chase higher returns, and the desire from some politicians and plan managers to use pension funds to advance their own economic development or political agendas — a perfect storm of bad incentives.

The figure below shows the disparity between assumed rates of return, noted by the dotted line, and the actual annual rates of return, noted by the solid line. Over the past 20 years, the average assumed rate of return was 7.71% while the actual 1-year investment return was 6.43%, more than a full percentage point lower. The result is actual 1-year investment returns over the past 20 years resemble a roller coaster. This roller coaster makes annual costs more difficult to predict, and, in years of downturn, states must increase future contributions to maintain current funding levels.

One aspect that has increased the volatility of investment returns is politically based investing practices. For instance, environmental, social, and governance (ESG) principles broadly advocate investing or divesting pension investments based on variety of causes.⁶ Examples include divestments from fossil fuels, tobacco and firearms.⁷ However, by allowing political causes or social issues to drive investment strategies, pension plans could miss out on millions of dollars in foregone investment returns. Missing out on those investment returns means plan managers and workers will need to increase their contributions to keep their pension plans solvent.

While data on pension investment returns for 2020 are slowly being published, at the time of this report not enough plans have published their data to provide an accurate average of assumed and actual investment returns for the year. As will be discussed in Section 3, many pension plans have struggled to meet target investments even with market recoveries in Q3 and Q4 of 2020.

Research by the University of Chicago Law School Professor Daniel Fischel found a hypothetical portfolio divested from fossil fuels produced returns 0.7 percentage points lower on average per year than the optimal risk-adjusted portfolio that did not divest from fossil fuels over a 50-year period from 1965-2014.⁸ This represents a massive 23 percentage point decline in investment returns over five decades.

California currently has the largest unfunded pension liabilities in the United States at over \$894 billion, or \$22,642 per capita. While poor investment decisions are not the sole cause of these massive unfunded liabilities, they are a contributor. For instance, the California Public Employee Retirement System and the California State Teachers Retirement System — CalPERS and CalSTRS respectively — divested from companies tied to tobacco starting in 2001.⁹ From 2001-2018, CalPERS lost \$3.6 billion in investment returns from tobacco divestment alone.¹⁰ California also divested from firearms manufacturers who manufacture guns that are illegal for sale in the state of California, which cost CalPERS \$11 million in investment returns from 2013-2018.¹¹

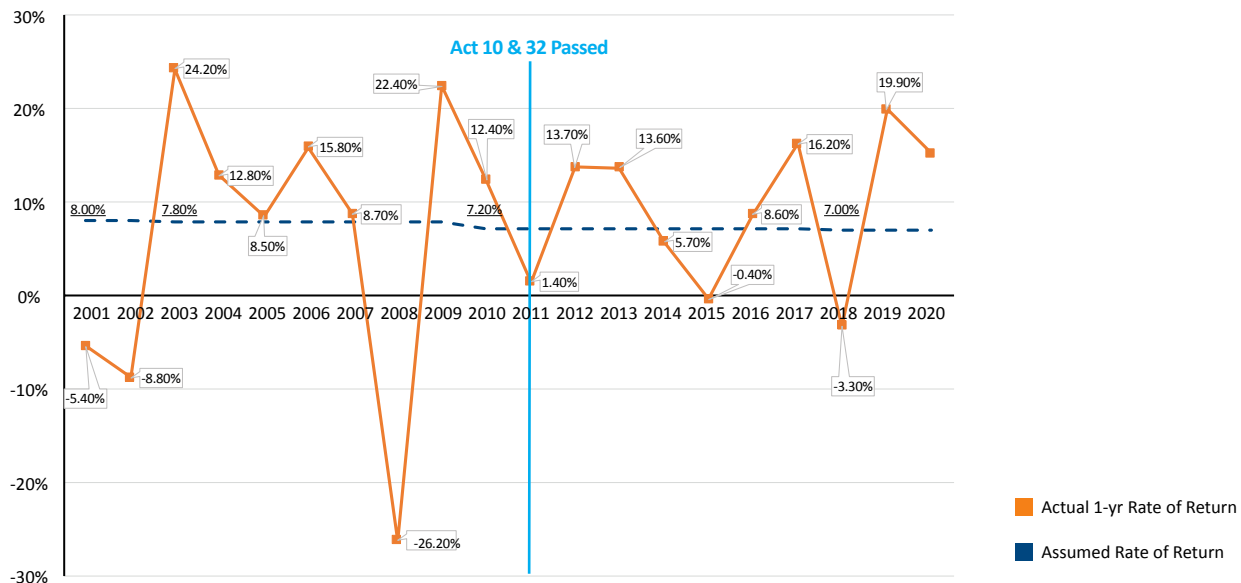
Contrast California with Wisconsin. Wisconsin does not incorporate ESG divesting into its investment strategy. The Board of Trustees of the Wisconsin Retirement System clearly states, “Asset classes and sub-asset classes are broadly defined to gain exposure to the entire investable opportunity set and capture the greatest depth of available investment opportunities to the extent they offer a risk-return trade-off commensurate with SWIB’s return objectives and risk tolerance.”¹²

Reforms passed by the Wisconsin Legislature and Governor Scott Walker in 2011, Acts 10 and 32 incorporated several cost and risk-sharing measures into the Wisconsin Retirement System (WRS), such as requiring all WRS participants to contribute half of all annual contribution payments for pension plans.¹³ By requiring participants and the state to split the annual contribution payment every year, Wisconsin’s pension reforms incentivize prudent investment practices to minimize financial risks and annual costs.¹⁴ As shown in Figure 8 below, Wisconsin exceeded their assumed rate of return by 8.21 basis points in 2020 when many pension plans struggled to meet their target investment. These reforms have helped the Wisconsin Retirement System maintain its status as one of the best funded pension systems in the country for all years measured in this report. These reforms helped safeguard the retirement savings of thousands of public employees in Wisconsin while keeping costs relatively low for both the state and public employees.

SECTION 2: POOR ASSUMPTIONS MAKE POOR PENSIONS

Figure 8

Wisconsin Employee Retirement System Assumed VS. Actual Investment Returns, 2001-2020



Source: Public Plans Database, Center for Retirement Research

DISCOUNT RATE: ASSUMED VS RISK-FREE

Discount rates are used to measure the level of risk for pension liabilities and help determine the present value of the amount of pension liabilities owed to public employees in the future.¹⁵ The Appendix discusses extensively how the present value of pension liabilities are calculated.

As stated previously, states are contractually obligated to pay pension liabilities. As pension asset investment volatility increases, there has been a major divergence between the risk premiums of pension assets and liabilities. 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."¹⁶

Because U.S. Treasury 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 discount rate. A valuation of liabilities based on a risk-free rate contrasts sharply with the overly optimistic assumptions used by nearly every public sector pension plan. As economist and pension scholar Joshua Rauh notes:

*"The logic of financial economics is very clear that measuring the value of a pension promise requires using the yields on bonds that match the risk and duration of that promise. Therefore, to reflect the present value cost of actually delivering on a benefit promise requires the use of a default-free yield curve, such as the Treasury yield curve. Financial economists have spoken in near unison on this point. The fact that the stock market, whose performance drives that of most pension plan investments, has earned high historical returns does not justify the use of these historical returns as a discount rate for measuring pension liabilities."*¹⁷

This report uses a more prudent discount rate calculated by averaging 10-year and 20-year U.S. Treasury bond yields to create a hypothetical 15-year bond yield to match the 15-year midpoint of the amortization schedule of pension liabilities. The discount rate calculated from these bond yields is the best proxy for a risk-free rate. The 15-year midpoint comes from GASB noting "the maximum acceptable amortization period [the length of time to pay liabilities] is 30 years," and our assumption that pension plans will take the full 30 years to pay off liabilities.¹⁸ Research has also shown that the midpoint of the stream of future benefits for a public pension plan is approximately 15 years in the future.¹⁹ Thus the midpoint of the

amortization period is used because a lump-sum payment in 15 years can be treated as an approximation of the annual benefit liability owed by the plan.²⁰

Since the risk-free discount rate depends upon the average yield of the U.S. Treasury bonds, there have been changes to the discount rate each year of this report. This year, the risk-free discount rate was 2.34%, a decrease from last year's 2.96%.

In addition, the risk-free discount rate creates a standard for measuring the present value of pension liabilities for plans throughout the 50 states. Discount rates can vary depending on the plan, even for different plans in the same state. Using a uniform risk-free rate allows for an accurate comparison of the value of liabilities across pension plans. The risk-free discount rate used in this year's report also sharply contrasts with the overly optimistic assumptions used in state financial documents, providing a more prudent estimate of the value of liabilities across pension plans.

The actuarially determined contribution rate is the portion (expressed as a percent) that the state must pay that is equal to the payroll of public employees eligible for a pension. For example, the PERA contribution rate for Fiscal Year (FY) 2019 was 23.28% of a payroll of just under \$3 billion – so that portion of the contribution was just under \$700 million.²¹ That amount is then added to the annual increase reserve contribution, the dollar amount the state needs to contribute to increase the plan's total assets. In FY 2019, that amount was just over \$17.5 million.²² Thus, the total ADC for the PERA plan in 2019 was roughly \$87 million.

If a plan is consistently making ADC payments, it is better able to adjust to fluctuating variables (i.e., cost of living adjustments and life expectancy) and pay off its liabilities within 30 years.

ACTUARIALLY DETERMINED CONTRIBUTION

The actuarially determined contribution (ADC) refers to a collection of terminology used by state plans in the comprehensive annual financial reports (CAFRs) valuations and GASB notes and statements. Other terms include “actuarially recommended contribution” and “annual required contribution,” used in previous editions of this report, but they all refer to the same definition. This report now uses the term, “actuarially determined contribution” instead of “annual required contribution” (ARC) to reflect the language currently used by most public pension plans.

An ADC is the amount of money state and local governments must annually contribute to pension plans to meet obligations to current and future retirees. The ADC is calculated based on certain parameters, including normal costs for the year and a component for amortization of the total unfunded actuarial accrued liabilities for a period no longer than 30 years. Each ADC is calculated a little differently, here is an example of the Colorado Public Employee Retirement Association (PERA) actuarially determined contribution:

(1) ADC = ADC Contribution Rate × Covered Payroll + Annual Increase Reserve Contribution

SECTION 3: REFORM CAN HELP STATES TRYING TO TREAD WATER

Unfunded pension liabilities have been a major focus of ALEC research for many years. The market downturn in March of 2020 significantly harmed retirement plans, and public pensions were no exception. Moody’s Investors Service noted that state governments and public employees would have to dramatically increase their annual contributions to keep liabilities from growing, let alone fulfilling previously unfunded liabilities.²³ In March, Moody’s anticipated liabilities would rise nearly 60% in FY 2021.²⁴ While the economy has begun to recover, most pension investments did not meet their assumed rates of return for 2020. Growing unfunded liabilities, even during the relatively prosperous FY 2019, July 2018-June 2019 for most states, show that states cannot simply invest their way out of pension funding problems.²⁵

MAKING THE SWITCH TO DEFINED-CONTRIBUTION

One of the best ways to solve the pension crisis is to change the way pension plans are structured. Changing from the current defined-benefit system to a well-run defined-contribution system will improve the health of state pension plans and give employees more control over their own retirement savings. The defined-contribution options allow employees to contribute to a 401(k) or similar retirement plan with employers matching a contribution. The key benefit of defined-contribution is its flexibility. Employees do not have to wait to become vested to access this account and, if they choose to leave the public sector, that 401(k) account will follow them. Defined-contribution is a retirement system that helps workers adapt to the job market of the future. In May 2020, the Bureau of Labor Statistics found that Americans born 1980-1984 held an average of 8 jobs from

ages 18 through 32, with over half of these jobs held from ages 18 to 22.²⁶ With younger workers frequently changing jobs, they need a plan that allows their retirement savings to move with them. A recent study by Andrew Biggs found that from 1989-2016 household retirement savings increased for every age, income, race, and educational group, thanks in part to defined contribution plans being introduced in the private sector.²⁷

One state that has implemented a hybrid system with elements of both defined-benefit and defined-contribution for all new public employee hires was Tennessee. An analysis of the Tennessee public pension systems found that switching to a hybrid system for all new hires in July 2014 and implementing prudent investment practices helped improve pension plan solvency and helped make Tennessee the state with the lowest unfunded liabilities per capita every year from 2016 to this current report.²⁸ Tennessee could greatly improve its pension funds by transitioning all new hires to a fully defined contribution system.

USING A RISK-FREE DISCOUNT RATE

One reform most pension plans can immediately adopt is lowering their discount rates to the private sector average of 4.5%, or for a more accurate measurement, to a risk-free rate to reflect the risk-free nature of state pension promises.²⁹ The risk-free rate used in ALEC pension reports varies from year to year based upon the average of 10-year and 20-year U.S. Treasury bond yields. The table below shows the risk-free discount rate by fiscal year:

As described in Section 2, the risk-free rate provides the most accurate depiction of pension promises because it reflects a state’s inability to default on pension promises.

Table 8		Risk-Free Rate by Year of Fiscal Year								
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
3.69%	3.63%	3.20%	2.17%	2.74%	2.81%	2.35%	2.03%	2.49%	2.96%	2.34%

Source: Federal Reserve Bank of St. Louis FRED Database and Authors’ Calculations

IMPLEMENTING COST SHARING

While states should consider the defined-contribution option, policymakers should also look to Wisconsin for necessary reforms to traditional pensions. Thanks to reforms passed by the Wisconsin Legislature and then-Governor Scott Walker in 2011, the Wisconsin Retirement System (WRS) incorporated several cost and risk-sharing measures.³⁰ These reforms included requiring all WRS participants, including public safety employees, to contribute half of all ADC payments for pension plans. By requiring participants and the state to split the ARC payment every year, it incentivizes prudent investment practices to minimize financial risks and annual costs.³¹ These reforms show, as Wisconsin has been the best funded pension system in the country from FY 2012-2018.³²

AVOIDING ESG INVESTMENTS

In a comment submitted to the Department of Labor Employee Benefits Security Administration, ALEC supported a rule clarifying the role of ESG investing and fiduciary management.³³ This rule states that ESG investing falls outside of current regulations requirement that pension plan managers select investments solely on financial considerations.

While the rule applied to private pension funds, the ALEC comment aimed to educate policymakers on what occurs to pension investments when such a rule does not exist.³⁴ Public pensions offered a clear counterexample. As mentioned in Section 2, California public pension systems have experienced increased volatility, higher costs, and billions lost in foregone investment returns.

Allowing more prudent investment strategies such as in Tennessee and Wisconsin help keep investment returns relatively stable, costs predictable and pension funds solvent. States can use this regulation as a model for their own public pension investments.

CONCLUSION

The strategies explained above illustrate ways states may limit the risks associated with pension mismanagement, but states can shed these risks entirely by reforming their pension systems. With sound pension reform, states can keep the promises they made to public employees to keep pensions funded. In addition, these reforms keep promises made to taxpayers to prevent unfunded liabilities from causing tax increases and crowding out essential government services. For public employees, implementing a defined-contribution system for new hires means all costs are realized in the present, taking away the possibility of employers underfunding employee benefits altogether. The employee can control where he invests his retirement savings as he sees fit.

APPENDIX: METHODOLOGY

This report features a complete dataset from FY 2012 and 2019. This report uses each plan's actuarial value of assets (FNP) and actuarial accrued liability (TPL) to calculate unfunded liabilities. This report, however, makes several assumptions regarding the structure and actuarial assumptions in state liabilities to present a more reasonable estimate of each state's liabilities than is commonly found in the state financial reports.

In addition, many plans use the phrase "rate of return" and "discount rate" interchangeably. Section 2 explains the differences between an investment rate of return and a discount rate. As discussed in Section 2, there is also a major difference between the assumed return on investments and actual return on investments.

Another important factor in understanding state pensions is how the discount rate affects the value of liabilities. Generally, the higher the discount rate, the lower the liability (and vice versa). Also mentioned in Section 2, assuming higher rates of return and discount rates creates perverse incentives for policymakers to overvalue the returns on investment and undervalue liabilities.

For this report, a 15-year midpoint, using a hypothetical 15-year U.S. Treasury Bond yield, is used to derive an estimated risk-free discount rate of 2.34%. This is calculated as the average of the 10-year and 20-year bond yields.

As stated in Section 2, the 15-year midpoint comes from the GASB recommendation that a pension plan take no longer than 30 years to pay off its pension liabilities. While state financial documents are not required to report their liabilities projected over a time series (i.e., reporting total liability due per year for the next 75 years), this report must assume the midpoint of state liabilities in order to recalculate state liabilities under different discount rates.

Applying the risk-free rate to pension liabilities allows for more accurate cross-state comparisons than simply comparing liability values as stated in state financial documents.

The valuations in this report are calculated based on the present value of those liabilities. While it is difficult to estimate how much future liabilities will cost (because of changes in variables like inflation and mortality rates) we can estimate the value of those future liabilities today by calculating their present value. Present value is the value today of an amount of money in the future.

The discount rate is the rate used to determine the present value of benefits a pension plan must pay retirees in the future.³⁵ A general rule is the higher the discount rate, the lower the present value of future pension liabilities and vice versa. This study uses a discount rate that is lower than the discount rate in many state financial documents. This is, in part, to show a more conservative valuation of those liabilities (compared to many state financial documents) and allow more accurate liability comparisons to be made between states.

Pension plan discount rates can vary even among plans within a state. The use of a risk-free discount rate normalizes discount rates across pension plans, providing the means to assess present value of liabilities across plans. This provides a basis of comparison for liabilities and funding ratios across the 50 states. Other variables provided by state financial documents such as mortality rates, demographics and health care costs were assumed to be correct and not normalized across plans.

A risk-free discount rate is a more prudent discount rate than many plans offer. The formula for calculating a risk-free present value for a liability requires first finding the future value of the liability. That formula, in which "i" represents a plan's assumed discount rate, is described in equation 1 below:

$$(1) \text{ Future Value} = \text{Total Pension Liability} \times (1 + i)^{15}$$

The second step is to discount the future value to arrive at the present value of the more reasonably valued liability. That formula in which "i" represents the risk-free discount rate or 4.5% fixed discount rate is described in equation 2 below:

$$(2) \text{ Present Value} = \frac{\text{Future Value}}{(1 + i)^{15}}$$

This methodology was developed by Bob Williams and Andrew Biggs when this report was created by State Budget Solutions, now a project of the ALEC Center State Fiscal Reform. It normalizes liability values across plans and presents a more prudent valuation of liabilities than many state benefits plans. The inclusion of the fixed discount rate of 4.5%, was added by the authors of *Unaccountable and Unaffordable, 2018*.³⁶ This discount rate controls for changes in the risk-free rate, year-over-year, and is similar to private sector pension discount rates that are mandated to use by federal law.

Furthermore, smaller plans that did report their investment rates of return tended to deviate from the national average more than larger plans, likely due to their smaller and less diversified funds. In some cases, smaller plans pool their assets with the state employee, teacher or police funds to reduce management costs. This created a comparison problem between states in terms of their investment rates of return. States with smaller plans tended to report a larger variance in their investment returns than states with consolidated funds as well as, problematically, states with smaller plans that did not report investment rates of return. For this reason, this report excludes smaller plans and uses the Boston College Center for Retirement Research Public Plans Database Investment rates of return to analyze larger state plan investment returns.

Membership figures are collected from CAFRs, valuations and GASB notes, and are divided into active employees and beneficiaries (i.e., current retirees, inactive employees entitled to benefits who have not yet retired and survivors entitled to benefits). Some state plans used the term “inactive” to refer to different aggregations of inactive employees, such as retirees, inactive employees entitled to a future benefit and inactive employees not entitled to a benefit. Supporting documents were used to parse the two groups. For example, the Connecticut Municipal Employee Retirement System, CMERS, uses the term “inactive members” in their GASB 68 report ambiguously but clarifies the figure in their GASB 67 report by parsing the total into retirees currently receiving benefits and inactive members entitled to a benefit.

Actuarially determined contributions (ADCs) and the percentage of actuarially determined contributions made were collected primarily from pension CAFRs, usually from tables titled “Schedule of Employer Contributions.” Actuarially determined contributions, actuarially recommended contributions, actuarially determined contributions net of taxes and fees are reported as ADC in our study.

REFERENCES

1. Savidge, Thomas; Williams, Jonathan; Williams, Bob; and Estes, Skip. *Unaccountable and Unaffordable*, 2019. American Legislative Exchange Council. 4 June 2020. Retrieved from: <https://www.alec.org/publication/unaccountable-and-unaffordable-2019/>
2. Andonov, Aleksandr and Rauh, Joshua D. "The Return Expectations of Institutional Investors" The Hoover Institution Economics Working Paper 18119. Nov 2018. Retrieved from: https://www.hoover.org/sites/default/files/research/docs/18119_rauh.pdf
3. "Tech sell-off continues after Covid vaccine breakthrough." *Financial Times*. 10 November 2020. Retrieved from: <https://www.ft.com/content/e0327258-31fe-4a09-9a17-76d5703e29d9>
4. Rauh, Joshua D. "Testimony Before the Joint Select Committee on Solvency of Multiemployer Pension Plans. United States Senate & United States House of Representatives." July 25, 2018. <https://www.pensions.senate.gov/sites/default/files/25JUL2018RauhSTMNT.pdf>
5. Williams, Jonathan; Lafferty, Theodore, Siconolfi Kati, and Young, Elliot. *Keeping the Promise: Getting Politics Out of Pensions*. American Legislative Exchange Council. 14 December 2016. Retrieved from: <https://www.alec.org/publication/keeping-the-promise-getting-politics-out-of-pensions/>
6. Hauenschild, Jonathon, Williams, Jonathan, and Savidge, Thomas. "Public Submission: Department of Labor Comment 0723. American Legislative Exchange Council 07302020." Employee Benefits Security Administration. 6 Aug 2020. Retrieved from: <https://www.regulations.gov/document/EBSA-2020-0004-0717>
7. Williams, et al. *Keeping the Promise*.
8. Fischel, Daniel. "Fossil Fuel Divestment: A Costly and Ineffective Investment Strategy." Compass Lexicon. Retrieved from: https://divestmentfacts.com/pdf/Fischel_Report.pdf
9. Gillers, Heather. "Calpers' Dilemma: Save the World or Make Money?" *The Wall Street Journal*. 16 June 2019. Retrieved from: <https://www.wsj.com/articles/calpers-dilemma-save-the-world-or-make-money-11560684601>
10. Ibid.
11. Ibid.
12. "Board of Trustees Wisconsin Retirement System Investment Policy." State of Wisconsin Investment Board. Updated 18 March 2020. Retrieved from: <https://www.swib.state.wi.us/statutes-guidelines>
13. Seyfert, Kerri. "The Wisconsin Retirement System Is Fully Funded and a Model for Other States." Reason Pension Integrity Project. 14 Jan 2020. Retrieved from: <https://reason.org/commentary/the-wisconsin-retirement-system-is-fully-funded-and-a-model-for-other-states/>
14. Ibid.
15. Henderson, David R. "Present Value." *The Concise Encyclopedia of Economics*. Liberty Fund. Accessed October 2020. Retrieved from: <https://www.econlib.org/library/Enc/PresentValue.html>
16. "Report of the Blue Ribbon Panel on Public Pension Plan Funding." Society of Actuaries. 2014. Retrieved from <https://www.soa.org/brpreport364/>
17. Rauh, Testimony Before the Joint Select Committee on Solvency of Multiemployer Pension Plans.
18. "Statement No. 27: Accounting for Pensions by State and Local Governmental Employers." Governmental Accounting Standards Board (GASB). November 1994. Retrieved from: <https://www.gasb.org/resources/ccurl/44/286/GASBS-27.pdf>
19. Waring, M. Barton. "Liability-Relative Investing." *The Journal of Portfolio Management*. Vol 30 No 4. Summer 2004. P 8-20. Retrieved from: <https://jpm.pm-research.com/content/30/4/8>
20. Norcross, Eileen. "Getting an Accurate Picture of State Pension Liabilities." Mercatus Center at George Mason University. Dec 2010. Retrieved from: <https://www.mercatus.org/system/files/Getting-an-Accurate-Picture-of-State-Pension-Liabilities.Norcross.12.13.10.pdf>
21. "Comprehensive Annual Financial Report for the Colorado Public Employee Retirement Administration (PERA) For the Year Ended December 31, 2019." Colorado Public Employee Retirement Association. 31 December 2019. P. 113 Retrieved from: <https://www.copera.org/sites/default/files/documents/5-20-19.pdf>
22. Ibid.
23. Comtois, James. "Public plans to face major losses in fiscal 2020." Moody's Pensions & Investments. March 25, 2020. <https://www.pionline.com/pension-funds/public-plans-face-major-losses-fiscal-2020-moodys>
24. Ibid.

25. "State Fiscal Year Map." GovTech by Governing Magazine. 7 April 2017. Retrieved from: <https://www.govtech.com/navigator/data/State-Fiscal-Year-Map.html>
26. "Americans at Age 33: Labor Market Activity, Education and Partner Status Summary," U.S. Bureau of Labor Statistics. May 2020. Retrieved from: <https://www.bls.gov/news.release/nlsyth.nr0.htm#:~:text=Employment%20Experiences%20from%20Age%2018,an%20average%20of%208.3%20jobs.>
27. Biggs, Andrew. "Changes to Household Retirement Savings Since 1989." American Enterprise Institute. May 2020. Retrieved from: <https://www.aei.org/research-products/report/changes-to-household-retirement-savings-since-1989/>
28. Savidge, Thomas. "Tennessee Public Pensions: A Model for Pension Reform." The Political Economy Research Institute at Middle Tennessee State University. August 2020. Retrieved from: https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/6292/TN_Public_Pensions_Savidge_2020.pdf?sequence=1&isAllowed=y
29. "ERISA 4022 Lump Sum Interest Rates." Pension Benefit Guaranty Corporation (PBGC). Last updated Nov. 2019. Retrieved from: <https://www.pbgc.gov/prac/interest/vls#How-these-rates-are-used>
30. Seyfert. "The Wisconsin Retirement System Is Fully Funded and a Model for Other States."
31. Ibid.
32. Savidge, et al. *Unaccountable and Unaffordable 2019*.
33. Hauenschild, et al. "Department of Labor Comment 0723."
34. Ibid.
35. Henderson. "Present Value."
36. Powers, Thurston; Williams, Bob; and Williams, Jonathan. *Unaccountable and Unaffordable, 2018*. American Legislative Exchange Council. 29 March 2019. Retrieved from: <https://www.alec.org/publication/unaccountable-and-unaffordable-2018/>

