FitchRatings

Public Finance
States
U.S.A.

2020 State Liability Report

Liability Burdens Fall in Final Year of Economic Expansion

State Median Long-Term Liabilities

(Fiscal Years 2016–2019)

	% of Personal Income			
	2016	2017	2018	2019
Long-Term Liabilities	6.0	6.0	5.7	5.0
Direct Debt	2.3	2.3	2.3	2.1
Fitch-Adjusted NPL	3.0	3.6	3.1	2.7

NPL – Net pension liabilities.
Source: Fitch Ratings, Fitch Solutions.

State long-term liability burdens continued to decline in fiscal 2019, the last full year of the long economic expansion that followed the Great Recession. The median ratio of states' direct debt and Fitch Ratings-adjusted net pension liabilities to personal income measured 5% in fiscal 2019, down from 5.7% one year earlier and 6% in fiscal 2016. The ratio declined for 42 states in fiscal 2019 and increased for eight. Data used in this report have yet to be affected by the economic disruptions caused by the coronavirus pandemic.

Personal Income Rises Faster Than Liabilities

Improving ratios in fiscal 2019, as in recent years, have been driven by economic strength rather than by declining liabilities. Economic growth had been solid before the pandemic, with median state personal income rising 4.1% annually since fiscal 2016 (the first year in which all 50 states reported under the current pension accounting standard). Long-term liabilities also increased but at a slower pace than personal income, and thus, burdens fell over the period.

Debt Levels Remain Stable

The burden of direct debt, which states manage carefully within affordability frameworks, largely kept pace with economic growth. The median direct debt burden has remained within a narrow range of 2.1%–2.3% of personal income since fiscal 2016. Direct debt outstanding, which represents about 40% of state liabilities, has barely grown, rising a median 0.1% annually.

Volatility Inherent in Pension Data

The median Fitch-adjusted net pension liability burden has fluctuated within a wider range since fiscal 2016, between 2.7% and 3.6% of personal income. (Pension liabilities in these metrics are adjusted by Fitch to reflect a 6% investment return assumption if the liabilities are calculated at a higher investment return assumption.) Net pension liabilities are subject to market volatility given the accounting requirement to report pension assets at fair market value.

Falling Rates Raise Reported Liabilities

Since fiscal 2016, the Fitch-adjusted net pension liabilities of states have risen a median 0.7% annually. Reported net pension liabilities — before Fitch's adjustment — have risen a median 4.4% annually, driven by steadily falling investment return targets.

Changes to assumptions, benefits and contributions over the last decade have not yet meaningfully lowered pension burdens. Lower investment return assumptions, which raise calculated liabilities, have outweighed the favorable impact of other changes, which affect pensions only incrementally. Although accounting valuation data used in state audits and this report are only a rough proxy for the funding valuations that determine contributions, higher liabilities signal that contribution demands will likely continue rising.

Related Research

Pandemic Upends U.S. State 2021 Budgets (Revenue Outlook Uncertain) (August 2020)

Market Fall to Hit Pensions Now, Govt. Contributions Later (March 2020)

Demographic Trends and Pension Pressures (Aging Populations and Underfunded Pensions May Present Fiscal Challenges for States) (Feb. 2020)

U.S. State and Local Pension Investments (Concerns Grow with Riskier Allocations, Lower Returns) (May 2019)

Revised Pension Risk Measurements (Enhancing Pension Analysis in U.S. Public Finance Tax-Supported Rating Criteria) (May 2017)

Analysts

Douglas Offerman
+1 212 908-0889
douglas.offerman@fitchratings.com

Eric Kim
+1 212 908-0241
eric.kim@fitchratings.com

Arlene Bohner
+1 212 908-0554
arlene.bohner@fitchratings.com

2019 Economic Growth Eases Burdens

The median state long-term liability burden measured 5% of personal income in fiscal 2019. This level was below the 5.7% level where it stood in fiscal 2018 and was the lowest since fiscal 2016, the first year that all 50 states reported under the more consistent GASB 68 accounting standard for pensions.

Both components of the median long-term liability burden fell in fiscal 2019. The median ratio of direct state debt to personal income stood at 2.1% in fiscal 2019, below the 2.3% level reported last year. The median ratio of Fitch-adjusted net pension liabilities to personal income stood at 2.7% in fiscal 2019, below the 3.1% reported in fiscal 2018 (*for further information on Fitch's pension liability adjustment, see text box on page 4*).

Personal income levels rose levels in 2019, reflecting solid economic performance, the last full year of the economic expansion that followed the Great Recession. The median state increase in personal income was 3.6%, and personal income rose in all 50 states.

By contrast, state long-term liability levels fell a median of 1.4%; outstanding direct debt and Fitch-adjusted net pension liabilities combined declined in 31 states. Twenty-eight states reported lower direct debt, and 33 states reported lower Fitch-adjusted net pension liabilities.

State Rankings Largely Unchanged

Five states carried long-term liability burdens above 20% of personal income in fiscal 2019, a level that Fitch views as elevated: Illinois, Connecticut, New Jersey, Hawaii and Alaska *(see chart below and Appendix for additional information)*. Thirty-seven states carried long-term liability burdens below 10% of personal income, which Fitch views as low.

For states carrying the highest liability burdens, long-term liability burden rankings have changed little over time. The ten states with the highest burdens in fiscal 2019 have occupied the top 10 slots in each of the last four years. Illinois maintained its 50th-ranked position and Connecticut its 49th-ranked position through this period.

The same dynamic mostly held true for states carrying the lowest liability burdens. Most of the 10 states with the lowest burden metrics in fiscal 2019 have remained in this category over the last four years, led by first-ranked Nebraska followed by second-ranked Tennessee.

Every year, Fitch publishes the state liability report to identify the ratios of long-term liabilities to personal income for the 50 states, and the components of this ratio represented by outstanding direct debt and by Fitch-adjusted net pension liabilities.

Under Fitch's U.S. Public Finance Tax-Supported Rating Criteria, the primary metric for assessing state long-term liability burdens incorporates outstanding direct debt and net pension liabilities adjusted to a 6% investment return assumption, if the pensions are calculated based on a higher rate.

The calculation of individual state metrics and 50-state medians relies on annual outstanding direct debt data reported in audited financial statements or bond disclosure documents, and on pension data as reported in audits.

Multi-notch changes in rankings typically reflect either pension funding practices that are materially different from most states or the rare change to policy or funding practices that have a sudden impact on reported data. Oklahoma joined the lowest-ranked states in fiscal 2019, given past reforms and a long-standing practice of contributing more than the actuarial contribution, including dedicating shares of various tax revenues to its pensions; it ranked 10th lowest in fiscal 2019, up from 14th lowest two years earlier. Meanwhile, North Carolina has fallen out of the lowest-ranked states, to 11th in fiscal 2019 from sixth in fiscal 2016.

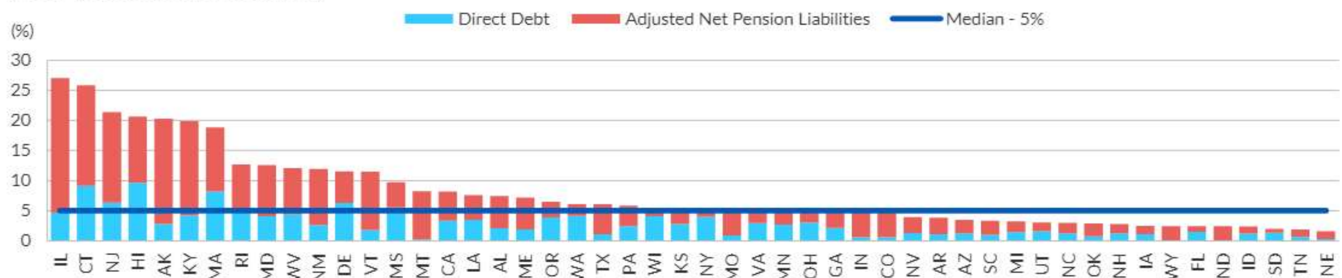
Benefit reforms in Colorado and Minnesota, including court-permitted reductions to cost-of-living adjustments (COLAs), rapidly lowered their rankings and burden ratios as of fiscal 2019. Colorado's ratio stood at 4.1% of personal income in fiscal 2019, having fallen from 5.8% the previous year, while Minnesota stood at 2%, compared to 4.8% two years earlier.

Individual State Debt Practices Stable

While the median burden of states' direct debt to personal income is low, the ratio for each state has varied considerably, reflecting institutional factors and policy choices such as the division of responsibilities among state, school, and local levels of government, reliance on pay-go versus bond-funded capital spending, and the willingness to borrow.

Fitch's calculation of direct debt includes all long-term fixed governmental obligations, most commonly general obligation and

State Direct Debt and Adjusted Net Pension Liabilities
(% of Personal Income, Fiscal 2019)



Source: Fitch Ratings, Fitch Solutions.

appropriation securities but also dedicated tax bonds, contract obligations under public-private partnerships, and privately placed debt. It excludes debt fully supported by user charges.

Nine states had direct debt burdens measuring less than 1% of personal income. Wyoming continued to have the lowest debt burden, at less than one-tenth of 1% of personal income.

Seven states had debt burden ratios above 5% of personal income. All but one of them are geographically smaller states in which the state government is responsible for functions, such as school capital, that routinely fall to lower levels of government in larger states. Hawaii, where K-12 schools are a part of state government, had the highest debt burden ratio, at 9.6% of personal income.

Handful of High Pension Burden States

Higher pension burdens have been confined to a small number of states. Seven states had ratios of Fitch-adjusted net pension liabilities to personal income above 10% in fiscal 2019. They were led by Illinois, with a ratio at 22.3% of personal income, followed by Alaska at 17.5%. Most but not all higher pension burden states have a history of poor contribution practices, which led to surging liabilities and contributed to credit stress over time.

As with higher debt burden states, one key commonality among high pension burden states is that the state directly carries some or all of the unfunded pension liability associated with certain public workers outside of state government, known as a special funding situation. For most of these states, the net pension liability of local school teachers is carried by the state. This factor is far less of a driver of pension liabilities for lower burden states, although a few report special funding situations *(see chart on page 4)*.

By contrast, 34 states had ratios of Fitch-adjusted net pension liabilities to personal income at 5% or less, highlighting the manageability of pension burdens relative to their economic bases.

Importantly, a low pension burden does not necessarily imply that a state's pension situation will remain sustainable over time. Funding challenges arising from insufficiently conservative actuarial assumptions, excessively risky investment allocations, or inadequate contribution practices may still be present, pushing pension obligations upward, even if the level at present remains small as a share of personal income.

South Carolina's pension burden ratios have been well below 5% since the new reporting standard took effect and stood at 2.3% of personal income in fiscal 2019. A history of maintaining assumptions that did not ensure funding progress, until necessary statewide changes in 2017, weakened funded ratios and is forcing the state and other employers to shoulder steady increases in contributions through fiscal 2023.

Trend of Slow Decline Since 2016

The experience of states in fiscal 2019 mirrored longer term trends in place since implementation of the new pension accounting standard in fiscal years 2015 and 2016, a period of solid economic growth.

Since fiscal 2016, median liability burdens have trended downward. The ratio of long-term liabilities to personal income fell to 5% in fiscal 2019 from 6% in fiscal 2016. Over that time, median personal income by state grew by 4.1% on a compound annual basis; direct debt and Fitch-adjusted net pension liabilities have also risen but by a lesser degree, lowering their burden relative to personal income.

Direct debt by state has risen by only 0.1% on a compound annual basis. States have generally maintained a careful approach to debt management over time, including through limits on debt authorization and issuance and maximum targets for debt outstanding and debt service. The median direct debt burden has been confined to a narrow range, between 2.3% and 2.1% of personal income.

Pension Liabilities Grow Faster Than Debt Over Time

The median pension burden has swung across a wider range than the median debt burden, between 3.6% and 2.7% of personal income. This reflected the high degree of volatility inherent in net pension liability calculations, rather than a broader trend toward lower pension obligations among states *(as discussed on page 4)*.

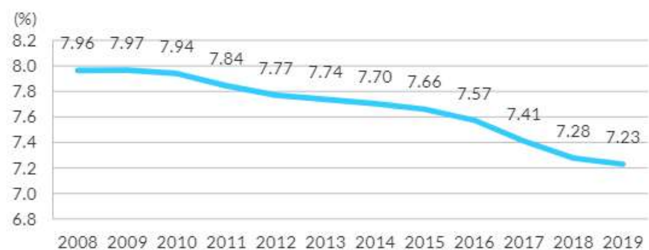
Fitch-adjusted net pension liabilities have grown a median 0.7% on a compound annual basis since fiscal 2016, well above the 0.1% rate for debt. This rise reflected the net impact of multiple factors that shape the calculation of defined benefit net pension liabilities, including asset performance falling short of investment return targets, the accrual of new benefits, benefit modifications, actuarial and experience changes, and shifts in the proportion of multi-employer plans attributable to states.

Falling Discount Rates Reduced Fitch's Adjustment

Growth has been far higher based on reported net pension liabilities, rather than the Fitch-adjusted liabilities. Reported net pension liabilities have risen 4.4% on a compound annual basis since fiscal 2016, exceeding the growth rate for personal income.

The gap between the compound growth rates for Fitch-adjusted net pensions and the figures reported by states stemmed from the impact of pension systems lowering their investment return assumptions (and, thus, raising their liabilities). Since the Great Recession, pension managers have gradually adopted more conservative targets for long-term asset performance, interest rates and demographics, among other factors. Defined benefit pension investment return assumptions had averaged 8% a decade ago, but more recently have moved closer to 7% as plans continue to gradually shift expectations downward *(see chart below)*.

Average Investment Return Assumption
Major State Pension Plans, FY 2008-2019



Source: Fitch Ratings, Fitch Solutions.

Because the Fitch-adjusted net pension liability figures assume a consistent 6% rate (except for plans with discount rates below 6%), the 0.7% compound growth rate noted earlier strips out the impact of falling discount rates on reported figures.

As plans continue to reduce their investment targets, the gap between reported net pension liabilities and the Fitch-adjusted net pension liabilities will continue to shrink. In fiscal 2016, Fitch's adjustment to a 6% discount rate raised states' median total pension liabilities by 20%, and net pension liabilities 76%; by fiscal 2019, Fitch-adjusted total pension liabilities were 14% higher, and net pension liabilities 54% higher.

Contributions Rise as Rates Fall

Another consequence of falling investment return assumptions is that contributions will have to rise to ensure progress paying down unfunded liabilities over time. Actuarial determined contributions derive from funding valuation assumptions and statutory frameworks, which often vary considerably from accounting valuations. However, investment return assumptions in both valuations typically follow one another closely, with major changes often phased-in gradually to blunt the impact on the funding contribution rates charged to employers.

As part of its assessment of governments' expenditure flexibility, Fitch tracks the annual carrying cost of long-term liabilities. This ratio measures debt service, actuarially determined pension contributions derived from funding valuations and actual amounts for other post-employment benefits (OPEB) relative to governmental expenditures.

In contrast to the long-term liability burden metric, Fitch's carrying cost metric includes actual for OPEB, reflecting the practical view that most governments will continue to pay at least the current benefit costs for retirement health care benefits even while retaining considerably more discretion to modify OPEB liabilities.

Carrying costs for states closely track their long-term liability burden metrics. In fiscal 2019, Illinois had the highest carrying cost, at 26.3% of governmental expenditures, while Nebraska had the lowest carrying cost, at 0.9%. Nine of the 10 states with the highest carrying costs also had the highest long-term liability burdens *(see chart on page 5)*.

Big Differences in 2019 Asset Volatility

Pension investment experience varied widely among states in fiscal 2019, resulting in a relatively weak 4.5% median increase in the fiduciary net position attributable to state pension obligations, well below the average 7.2% investment return target assumed by most state plans. In 2018, the median increase in fiduciary net positions was 9.5%.

Fitch's Adjustment to Net Pension Liabilities

Fitch views the high investment return assumptions used by most defined benefit plans as a significant source of long-term risk, resulting in valuations that understate retirement obligations and the contributions necessary to reduce liabilities over time.

Using pension data reported by plans and governments under GASB statements 67 and 68, Fitch adjusts total pension liabilities to reflect a consistent 6% investment return assumption, if a plan uses a higher discount rate. This adjustment increases the total pension liability based on a duration calculation using interest rate sensitivity information disclosed in financial statement notes. Under the calculation, most plans see total pension liabilities rise between 9% and 15% for each 1% change in the investment return assumption.

Recalculated net pension liabilities are aggregated for all state-reported plans. States' obligations typically cover direct state workers and special funding situations when the state assumes responsibility for the pensions of non-state workers, usually local school teachers. Fitch-adjusted net pension liabilities associated with self-supporting enterprises may be excluded, and Fitch-adjusted net pension assets are excluded as excess assets cannot be used to offset other liabilities. Plans using discount rates below 6% — largely those subject to reporting blended discount rates and asset depletion dates under GASB's reporting methodology —are not adjusted by Fitch.

Because pensions are measured for accounting purposes using their market values of assets, volatility is inherent both in reported net pension liabilities and the ratio of net pension liabilities to personal income. (Funding valuations, which determine the actuarial contribution for most plans, typically stagger asset gains and losses based on varying multi-year recognition processes to prevent contribution volatility and support budget predictability for governments.)

For the small number of states with pensions having a Dec. 31 measurement date, market volatility in the last quarter of 2018 led

State Fitch-Adjusted Net Pension Liabilities
(Direct State Pensions and Special Funding Situations, FY 2019)

Source: Fitch Ratings, Fitch Solutions.

to severe asset underperformance relative to their annual investment return targets. Colorado, Indiana, Ohio, Pennsylvania, Utah, Wisconsin and Wyoming all have one or more major pension systems with Dec. 31 measurement dates, and these plans experienced outright fiduciary net position declines as of Dec. 31, 2018 that affected state reported pensions in fiscal 2019.

Coronavirus Recession Will Have Delayed Impact

The fiscal 2019 data used in Fitch's 2020 state liability update reflected the position of states near the end of the long economic expansion that followed the Great Recession. Audited financial statements, and therefore Fitch's ratios, have yet to reflect the impact of the coronavirus recession in 2020.

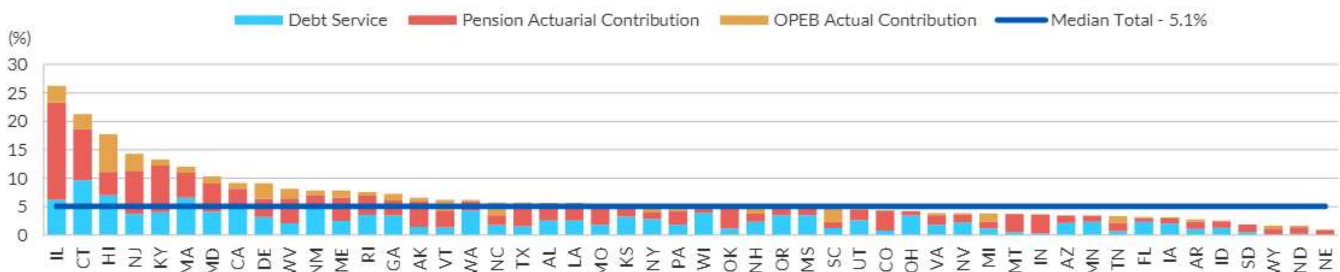
The pandemic and its economic disruptions will affect state liability metrics on a staggered basis in the coming years, although the degree remains unknown. The recession's impact will be felt first in the 2020 state personal income data to be used in next year's report; employment losses and the presence of federal stimulus earlier in the pandemic will have offsetting impacts on personal income gains in 2020, though the economy may end the year on a weaker note given the expiration of federal stimulus and renewed outbreaks.

Economic performance will also affect investment portfolio performance measured for fiscal 2020 pension system audits, with most states' own audits affected one year later, in fiscal 2021.

Those pensions with a June 30 measurement date — the vast majority of state plans — will suffer a setback in asset performance, albeit to a lesser degree than initially expected. At the late March trough, the S&P 500 index was down 34% from its pre-coronavirus February peak. Markets recovered quickly after that. According to Milliman Consulting's Milliman 100 Public Pension Funding Index, from July 2020, annual returns through June 30 were just 3.84%. This figure is well below the average 7.2% investment return assumption among major state plans noted earlier.

One state most exposed to the initial market shock of the pandemic is New York, given the March 31 fiscal year-end for the state and its major plans. In July, New York's Comptroller announced a 2.7% investment loss for the year ended March 31, well below the plans' 6.8% return assumption. Investment losses will be recognized gradually over five years, putting upward pressure on employer contribution rates beginning in 2022 and reversing several years of flat to declining contribution rates.

State Carrying Costs for Long-Term Liabilities
(% of Governmental Expenditures, FY 2019)



Source: Fitch Ratings, Fitch Solutions.

Appendix

State Direct Debt and Adjusted Net Pension Liabilities as of Fiscal 2019[a]

	Issuer Default Rating[b]	Direct Debt ($000)	Debt to Personal Income		Reported NPL ($000)	Adjusted NPL ($000)[c]	Adjusted NPL % PI		Debt + Adjusted NPL ($000)	Debt + Adjusted NPL % PI	
			(%)	Rank			(%)	Rank		(%)	Rank
Alabama	AA+	4,500,882	2.1	25	7,095,693	11,545,658	5.3	37	16,046,540	7.4	33
Alaska	A+	1,294,300	2.8	31	4,545,808	8,036,956	17.5	49	9,331,256	20.3	46
Arizona	NR	4,118,588	1.2	15	4,946,036	7,600,980	2.3	19	11,719,568	3.5	15
Arkansas	NR	1,482,561	1.1	11	2,238,513	3,678,293	2.7	26	5,160,854	3.8	16
California	AA	88,640,519	3.4	34	83,673,164	127,394,581	4.8	33	216,035,100	8.2	35
Colorado	NR	2,041,315	0.6	6	11,052,118	14,488,567	4.1	30	16,529,882	4.7	18
Connecticut	A+	25,222,245	9.2	49	35,070,959	46,068,772	16.7	48	71,291,017	25.9	49
Delaware	AAA	3,326,143	6.3	46	1,602,078	2,782,719	5.2	35	6,108,862	11.5	39
Florida	AAA	16,958,700	1.5	21	6,160,019	10,571,699	0.9	2	27,530,399	2.4	6
Georgia	AAA	10,919,276	2.1	26	7,413,424	13,205,467	2.6	23	24,124,743	4.7	20
Hawaii	AA	7,785,329	9.6	50	6,837,450	8,896,368	11.0	45	16,681,697	20.7	47
Idaho	AA+	996,259	1.2	14	384,894	977,772	1.2	4	1,974,031	2.4	4
Illinois	BBB-	34,962,013	4.7	43	139,475,965	166,364,190	22.3	50	201,326,204	27.0	50
Indiana	AAA	1,887,317	0.6	5	12,037,000	13,530,514	4.1	31	15,417,832	4.7	19
Iowa	AAA	1,824,380	1.1	13	1,244,035	2,253,768	1.4	8	4,078,148	2.5	8
Kansas	NR	4,355,176	2.8	30	2,115,143	3,510,529	2.3	18	7,865,705	5.1	26
Kentucky	AA-	8,248,263	4.2	41	24,664,199	30,598,293	15.6	47	38,846,556	19.9	45
Louisiana	AA-	7,736,885	3.5	35	6,182,012	9,028,494	4.1	29	16,765,379	7.6	34
Maine	AA	1,296,355	1.9	24	2,342,881	3,584,464	5.3	36	4,880,819	7.2	32
Maryland	AAA	15,943,230	4.1	38	20,606,429	33,167,228	8.5	41	49,110,458	12.6	42
Massachusetts	AA+	41,777,415	8.2	48	39,391,880	54,330,233	10.6	44	96,107,648	18.8	44
Michigan	AA	6,997,251	1.4	20	6,902,110	9,063,837	1.8	13	16,061,088	3.3	13
Minnesota	AAA	8,989,628	2.7	29	3,040,544	6,744,895	2.0	16	15,734,523	4.7	22
Mississippi	AA	6,401,526	5.5	45	3,037,391	4,848,735	4.2	32	11,250,261	9.7	37
Missouri	AAA	2,656,960	0.9	9	8,484,391	11,702,522	3.9	28	14,359,482	4.8	24
Montana	AA+	130,531	0.2	3	2,419,819	4,245,553	8.0	40	4,376,084	8.2	36
Nebraska	NR	338,445	0.3	4	482,801	1,326,910	1.3	6	1,665,355	1.6	1
Nevada	AA+	2,074,655	1.3	18	2,262,538	4,140,560	2.6	25	6,215,215	3.9	17
New Hampshire	AA+	1,096,424	1.3	17	930,984	1,311,733	1.5	10	2,408,157	2.8	9
New Jersey	A-	39,741,375	6.3	47	93,738,048	94,392,216	15.1	46	134,133,591	21.4	48
New Mexico	NR	2,413,153	2.7	28	6,827,287	8,441,180	9.3	42	10,854,333	11.9	40
New York	AA+	55,774,240	4.0	37	2,401,700	13,370,285	1.0	3	69,144,525	5.0	25
North Carolina	AAA	6,313,615	1.3	16	4,659,857	8,649,948	1.7	12	14,963,563	3.0	11
North Dakota	NR	52,966	0.1	2	887,491	1,010,926	2.3	20	1,063,892	2.4	5
Ohio	AA+	17,772,497	3.0	33	6,552,544	9,929,011	1.7	11	27,701,508	4.7	21
Oklahoma	AA	1,430,374	0.8	8	1,871,686	3,981,104	2.1	17	5,411,478	2.9	10
Oregon	AA+	8,731,008	3.9	36	3,193,464	5,816,029	2.6	24	14,547,037	6.5	31
Pennsylvania	AA-	18,253,136	2.5	27	19,429,940	25,050,823	3.4	27	43,303,959	5.8	28
Rhode Island	AA	3,027,563	5.1	44	3,629,827	4,530,534	7.6	38	7,558,097	12.7	43
South Carolina	AAA	2,388,943	1.0	10	3,957,008	5,430,072	2.3	21	7,819,015	3.3	14
South Dakota	AAA	636,931	1.3	19	-	304,073	0.6	1	941,004	2.0	3
Tennessee	AAA	2,233,344	0.7	7	1,615,416	4,089,999	1.2	5	6,323,343	1.9	2
Texas	AAA	17,001,227	1.1	12	58,757,564	75,932,022	5.0	34	92,933,249	6.1	29
Utah	AAA	2,504,494	1.6	22	1,301,809	2,242,806	1.4	9	4,747,300	3.0	12
Vermont	AA+	618,623	1.8	23	2,352,046	3,348,815	9.7	43	3,967,438	11.5	38
Virginia	AAA	14,865,483	2.9	32	6,382,981	9,607,349	1.9	14	24,472,831	4.8	23
Washington	AA+	20,511,429	4.2	40	3,731,271	9,429,843	1.9	15	29,941,272	6.1	30
West Virginia	AA	3,335,343	4.4	42	3,200,480	5,822,499	7.7	39	9,157,842	12.1	41
Wisconsin	AA+	12,756,062	4.1	39	985,538	3,913,993	1.3	7	16,670,055	5.4	27
Wyoming	NR	16,291	0.0	1	644,088	871,149	2.4	22	887,440	2.5	7
Median			**2.1**				**2.7**			**5.0**	
Low			**0.0**				**0.6**			**1.6**	
High			**9.6**				**22.3**			**27.0**	

[a]Aggregate pension data by state are calculated by Fitch for state pension systems whose NPL is reported in the notes and required supplementary information sections of states' comprehensive annual financial reports. [b]Issuer Default Rating as of October 2020. [c]Fitch-adjusted figures lower the investment return assumption to 6%, if higher, and recalculate the TPL upward based on a calculation of the individual plan's sensitivity to changes in the investment return assumption, derived from sensitivity data in financial statement notes. NR – Not rated. NPL – Net pension liability. TPL – Total pension liability. Note: Personal income (PI) data from U.S. Bureau of Economic Analysis as of Sept. 24, 2020.

Sources: Fitch Ratings, Fitch Solutions. U.S. Bureau of Economic Analysis.

ALL FITCH CREDIT RATINGS ARE SUBJECT TO CERTAIN LIMITATIONS AND DISCLAIMERS. PLEASE READ THESE LIMITATIONS AND DISCLAIMERS BY FOLLOWING THIS LINK: HTTPS://FITCHRATINGS.COM/UNDERSTANDINGCREDITRATINGS. IN ADDITION, RATING DEFINITIONS AND THE TERMS OF USE OF SUCH RATINGS ARE AVAILABLE ON THE AGENCY'S PUBLIC WEB SITE AT WWW.FITCHRATINGS.COM. PUBLISHED RATINGS, CRITERIA, AND METHODOLOGIES ARE AVAILABLE FROM THIS SITE AT ALL TIMES. FITCH'S CODE OF CONDUCT, CONFIDENTIALITY, CONFLICTS OF INTEREST, AFFILIATE FIREWALL, COMPLIANCE, AND OTHER RELEVANT POLICIES AND PROCEDURES ARE ALSO AVAILABLE FROM THE CODE OF CONDUCT SECTION OF THIS SITE. FITCH MAY HAVE PROVIDED ANOTHER PERMISSIBLE SERVICE TO THE RATED ENTITY OR ITS RELATED THIRD PARTIES. DETAILS OF THIS SERVICE FOR RATINGS FOR WHICH THE LEAD ANALYST IS BASED IN AN EU-REGISTERED ENTITY CAN BE FOUND ON THE ENTITY SUMMARY PAGE FOR THIS ISSUER ON THE FITCH WEBSITE.

Copyright © 2020 by Fitch Ratings, Inc., Fitch Ratings Ltd. and its subsidiaries. 33 Whitehall Street, NY, NY 10004. Telephone: 1-800-753-4824, (212) 908-0500. Fax: (212) 480-4435. Reproduction or retransmission in whole or in part is prohibited except by permission. All rights reserved. In issuing and maintaining its ratings and in making other reports (including forecast information), Fitch relies on factual information it receives from issuers and underwriters and from other sources Fitch believes to be credible. Fitch conducts a reasonable investigation of the factual information relied upon by it in accordance with its ratings methodology, and obtains reasonable verification of that information from independent sources, to the extent such sources are available for a given security or in a given jurisdiction. The manner of Fitch's factual investigation and the scope of the third-party verification it obtains will vary depending on the nature of the rated security and its issuer, the requirements and practices in the jurisdiction in which the rated security is offered and sold and/or the issuer is located, the availability and nature of relevant public information, access to the management of the issuer and its advisers, the availability of pre-existing third-party verifications such as audit reports, agreed-upon procedures letters, appraisals, actuarial reports, engineering reports, legal opinions and other reports provided by third parties, the availability of independent and competent third-party verification sources with respect to the particular security or in the particular jurisdiction of the issuer, and a variety of other factors. Users of Fitch's ratings and reports should understand that neither an enhanced factual investigation nor any third-party verification can ensure that all of the information Fitch relies on in connection with a rating or a report will be accurate and complete. Ultimately, the issuer and its advisers are responsible for the accuracy of the information they provide to Fitch and to the market in offering documents and other reports. In issuing its ratings and its reports, Fitch must rely on the work of experts, including independent auditors with respect to financial statements and attorneys with respect to legal and tax matters. Further, ratings and forecasts of financial and other information are inherently forward-looking and embody assumptions and predictions about future events that by their nature cannot be verified as facts. As a result, despite any verification of current facts, ratings and forecasts can be affected by future events or conditions that were not anticipated at the time a rating or forecast was issued or affirmed.

The information in this report is provided "as is" without any representation or warranty of any kind, and Fitch does not represent or warrant that the report or any of its contents will meet any of the requirements of a recipient of the report. A Fitch rating is an opinion as to the creditworthiness of a security. This opinion and reports made by Fitch are based on established criteria and methodologies that Fitch is continuously evaluating and updating. Therefore, ratings and reports are the collective work product of Fitch and no individual, or group of individuals, is solely responsible for a rating or a report. The rating does not address the risk of loss due to risks other than credit risk, unless such risk is specifically mentioned. Fitch is not engaged in the offer or sale of any security. All Fitch reports have shared authorship. Individuals identified in a Fitch report were involved in, but are not solely responsible for, the opinions stated therein. The individuals are named for contact purposes only. A report providing a Fitch rating is neither a prospectus nor a substitute for the information assembled, verified and presented to investors by the issuer and its agents in connection with the sale of the securities. Ratings may be changed or withdrawn at any time for any reason in the sole discretion of Fitch. Fitch does not provide investment advice of any sort. Ratings are not a recommendation to buy, sell, or hold any security. Ratings do not comment on the adequacy of market price, the suitability of any security for a particular investor, or the tax-exempt nature or taxability of payments made in respect to any security. Fitch receives fees from issuers, insurers, guarantors, other obligors, and underwriters for rating securities. Such fees generally vary from US$1,000 to US$750,000 (or the applicable currency equivalent) per issue. In certain cases, Fitch will rate all or a number of issues issued by a particular issuer, or insured or guaranteed by a particular insurer or guarantor, for a single annual fee. Such fees are expected to vary from US$10,000 to US$1,500,000 (or the applicable currency equivalent). The assignment, publication, or dissemination of a rating by Fitch shall not constitute a consent by Fitch to use its name as an expert in connection with any registration statement filed under the United States securities laws, the Financial Services and Markets Act of 2000 of the United Kingdom, or the securities laws of any particular jurisdiction. Due to the relative efficiency of electronic publishing and distribution, Fitch research may be available to electronic subscribers up to three days earlier than to print subscribers.

For Australia, New Zealand, Taiwan and South Korea only: Fitch Australia Pty Ltd holds an Australian financial services license (AFS license no. 337123) which authorizes it to provide credit ratings to wholesale clients only. Credit ratings information published by Fitch is not intended to be used by persons who are retail clients within the meaning of the Corporations Act 2001.