Ranking the States by Fiscal Condition

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ABSTRACT

Based on the fiscal year 2013 Comprehensive Annual Financial Reports of the 50 states, this study ranks states' fiscal solvency using 14 metrics that assess whether the states can meet their short-term bills and long-term obligations. State finances are analyzed according to five dimensions of solvency: cash, budget, long-run, service-level, and trust fund. These five dimensions are combined to produce an overall ranking of state fiscal solvency.

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In the six years since the Great Recession, states' long-run fiscal condition remains mixed. When considering both the short- and long-term pictures of state finances, there is ample reason for vigilance owing to several factors, especially new spending commitments for Medicaid and growing long-term obligations for pensions and health care benefits. In fiscal year (FY) 2014, Medicaid spending increased by 11.3 percent over that of the previous year. In 2013 and 2014, credit rating agencies downgraded several states, including Connecticut, Maine, and Kansas, for structural budgetary imbalance. Three states—Illinois, Pennsylvania, and New Jersey—were flagged for their underfunded pensions.[1]

State budgets also show improvements for FY 2013 and FY 2014, including modest revenue growth, smaller budget gaps, tax cuts, and increased general fund spending.[2] Budgetary balance is only one aspect of a state's fiscal health, indicating that revenues are sufficient to cover a desired level of spending. But a balanced budget by itself does not mean the state is in a strong

1. See Paul Merrion, "Moody's Slams Illinois Pension 'Paralysis' in Rating Cut," *Crain's Chicago Business*, June 6, 2013, http://www.chicagobusiness.com/article/20130606/NEWS02/130609865/moodys-slams-illinois-pension-paralysis-in-rating-cut; Romy Varghese, "Pennsylvania's Rating Cut by S&P after Fitch Downgrade," *Bloomberg*, September 25, 2014, http://www.bloomberg.com/news/2014-09-26/pennsylvania-s-rating-cut-by-s-p-after-fitch-downgrade.html; and Michelle Kaske and Elise Young, "N.J. Rating Cut by S&P as Christie Gets Record Downgrade," *Bloomberg*, September 10, 2014, http://www.bloomberg.com/news/2014-09-10/new-jersey-has-credit-rating-lowered-by-one-step-to-a-by-s-p.html.

2. National Association of State Budget Officers (NASBO), "The Fiscal Survey of the States," Fall 2014, vii–x, 41, https://www.nasbo.org/sites/default/files/NASBO%20Fall%202014%20Fiscal%20Survey%20of%20States.pdf. According to NASBO, in the aggregate, the states returned to prerecession general fund spending levels of $667 billion in FY 2012. This trend continued into FY 2013 and FY 2014, with aggregate general fund spending of $696 billion and $729 billion, respectively, or an increase of 8.2 percent over the period. NASBO projects that increased spending will continue into 2015. Revenue growth has been modest over the same period. The report notes that revenues grew by 7.2 percent in FY 2013 and by 1.3 percent in FY 2014 and are projected to grow by 3.1 percent in 2015. FY 2013 revenue growth was largely attributable to a one-time gain as taxpayers shifted income for reporting to 2012.

fiscal position. State spending may be large relative to the economy and thus be a drain on resources. The state may define budgetary balance to exclude certain funds or to mask debts, thus obscuring the true cost of spending or the resources required to finance long-term obligations.[3]

The long and erratic recovery of state finances raises two questions: How can states establish healthier fiscal foundations? And how can states guard against economic shocks or identify long-term fiscal risks? Before taking policy or budgetary action, it is important to identify where states may have fiscal weaknesses. One approach to help states evaluate their ongoing fiscal performance is to use basic financial indicators that measure short- and long-run fiscal position. Such metrics may be used to create tools such as an "early warning system" that can be used to better track and identify areas for fiscal, budgetary, or institutional improvements.

This paper aims to lay the basic foundations of such a tool: an intuitive and easy-to-use set of fiscal measures that can be easily communicated to the public, based on an update of Sarah Arnett's 2013 report, "State Fiscal Condition: Ranking the 50 States" (published by the Mercatus Center at George Mason University), which ranks the states' fiscal positions using data from each state's FY 2012 Comprehensive Annual Financial Report (CAFR).[4] The FY 2012 rankings are based on 11 financial indicators that measure the solvency of state governments, indicating how well a state can keep up with its short-term expenses and longer-term obligations. This year's study augments the original rankings with three additional indicators that make up a fifth index or ranking, "trust fund solvency." The five dimensions (or indexes) of solvency in this study—cash, budget, long-run, service-level, and trust fund—are then combined into one overall ranking of state fiscal condition.

For FY 2013, there is not much change in the rankings from the previous year. States with large long-term debts, large unfunded pension liabilities, and structural budgetary imbalances continue to hover near the bottom of the rankings. These states are Illinois, New Jersey, Massachusetts, Connecticut, and New York. Just as they did last year, states that depend on natural resources for revenues and that have low levels of debt and spending place at the top of the rankings. The top five states are Alaska, North Dakota, South Dakota, Nebraska, and Florida.

3. Eileen Norcross, "Fiscal Evasion in State Budgeting" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, July 2010).
4. Sarah Arnett, "State Fiscal Condition: Ranking the 50 States" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, January 2014).

Rankings simply list the relative order of states' fiscal performance. This year's study also provides more detail on the absolute performance of individual states and includes the data for each of the 14 financial indicators that make up each solvency index. Including the individual indicators allows for a more direct interpretation of each state's fiscal performance. Since the new rankings involve a different set of indicators for service-level solvency and incorporate an additional dimension of fiscal health—trust fund solvency—the final overall rankings of the states are not strictly comparable to last year's. However, three of the individual rankings—cash solvency, budget solvency, and long-run solvency—are calculated using the same method and are comparable across the two years.

RANKING STATE FISCAL CONDITION FOR FY 2013: DEFINITIONS AND DATA

It has become easier to consistently track and analyze state finances in the last decade with Governmental Accounting Standards Board (GASB) Statement No. 34, a requirement that state and municipal governments report government-wide financial statements in the CAFR based on the full-accrual method of accounting.[5] With more than 10 years of CAFRs available online, scholars and the public have access to a standardized and audited set of financial statements for state governments, enabling measurement and comparison.[6]

Defining Fiscal Solvency

Scholarship by XiaoHu Wang, Lynda Dennis, and Yuan Sen "Jeff" Tu uses these financial statements and advances the development of financial metrics to assess state finances, a method extended and modified in this paper.[7] Measuring short- and long-term solvency is a way of determining whether a state can meet its current and future spending commitments without incurring

5. "Summary of Statement No. 34: Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments," GASB website, June 1999, http://www.gasb.org/st/summary/gstsm34.html. See also Bruce W. Chase and Laura B. Triggs, "How to Implement GASB No. 34," *Journal of Accountancy*, October 31, 2001, http://www.journalofaccountancy.com/issues/2001/nov/implementgasbno34.htm.
6. GASB Statement No. 34 was issued in June 1999. Implementation was staggered between June 2001 and June 2003 based on total government revenues.
7. XiaoHu Wang, Lynda Dennis, and Yuan Sen "Jeff" Tu, "Measuring Financial Condition: A Study of U.S. States," *Public Budgeting & Finance* 27, no. 2 (2007): 1–21.

additional debt or resorting to budgetary gimmicks.[8] Individual indicators, such as measures of state deficits or surpluses and ratios of revenues to expenses or assets to liabilities, help form a general picture of fiscal health. While the indicators presented here are relatively intuitive to interpret, no single measure, or even a group of measures, can definitively capture a state's true fiscal picture. Financial metrics help flag patterns but cannot necessarily reveal what is causing fiscal stress or provide specific remedies. For that, a deeper analysis is needed.

Arnett applies the method developed by Wang, Dennis, and Tu to rank the states' fiscal health according to four dimensions of solvency.[9] These are (1) cash solvency (or liquidity), or the state's ability to pay its immediate bills over a 30- or 60-day time frame; (2) budget solvency, or the degree to which the state will end the fiscal year in surplus or deficit; (3) long-run solvency, or the state's ability to meet long-term spending commitments; and (4) service-level solvency, or how much fiscal "slack" a state has to increase spending should citizens demand more services. In addition to calculating the ratios associated with these four dimensions of solvency, Arnett weights and combines each dimension to produce an overall ranking of each state's fiscal condition.

This year's study makes two changes to last year's methodology. First, service-level solvency is changed to measure taxes, revenues, and expenditures relative to state personal income rather than on a per capita basis. This change is made to assess how much fiscal slack the state has to obtain revenues from its economy in the event of rapidly rising obligations, or an economic shock.

Second, since the liability figures reported in state CAFR statements of net assets and statements of activities do not measure the full size of unfunded pension and debt obligations, a fifth dimension of solvency is created to augment the long-run solvency rankings. Trust fund solvency is comprised of three ratios that measure total government debt and total liabilities from unfunded pensions and other postemployment benefits (OPEB) relative to state personal income.

Data

To update the fiscal rankings for 2013, four dimensions of solvency—cash, budget, long-run, and service-level—are constructed based on data taken from two state CAFR statements: the statement of net assets and the statement of

8. Gimmicks may include deferring payments to vendors, skipping pension contributions, transferring money from trust funds, and issuing bonds to cover the transfer.
9. Arnett, "Ranking the 50 States."

activities and changes in net position. Total primary government spending is assessed, which includes spending on both governmental and business-type activities of the state government. The fifth dimension of solvency in this year's study, trust fund solvency, consists of total outstanding debt data taken from each CAFR's statistical section. The schedule, ratios of debt outstanding by type, includes debt issued for governmental and business activities of government for total primary government debt. Data measuring the states' unfunded pension obligations come from the individual annual reports for the state governments' pension plans. OPEB come from CAFR statements. In a few cases, these data are augmented with Standard & Poor's OPEB data from its 2014 report, "Diverging Trends Underlie Stable Overall U.S. OPEB Liability."[10]

The statement of net assets is also known as the statement of net position, and it contains the same information as a balance sheet.[11] It compares total assets to total liabilities, indicating the government's position (or stock). The statement of net assets shows how much is left after the government pays its long-term obligations in that fiscal year.[12]

The statement of activities records the flow of government spending and revenue collection, providing an account of the cost of public services and how they are financed.[13] It lists the types and amounts of revenues collected (taxes, fees) and the types of spending (programmatic, intergovernmental transfers, debt payments) by category. The statement of activities shows how any shortfalls between revenues and expenses are reconciled.[14]

These statements are measured on a full accrual basis of accounting and under an economic resources measurement focus. Any transaction that occurred in that fiscal year is recorded, even if cash did not change hands. Table 1 defines each line item used to construct the fiscal ratios.

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10. "Diverging Trends Underlie Stable Overall U.S. OPEB Liability," RatingsDirect, Standard & Poor's Ratings Services, McGraw Hill Financial, November 17, 2014, http://www.standardandpoors.com/ratingsdirect.
11. GASB, "The User's Perspective: Touring the Financial Report, Part I: The Statement of Net Assets," March 2007, http://www.gasb.org/cs/ContentServer?c=GASBContent_C&pagename=GASB%2FGASBContent_C%2FUsersArticlePage&cid=1176156736184.
12. Dean Michael Mead, *An Analyst's Guide to Government Financial Statements*, 2nd ed. (Norwalk, CT: GASB, 2012), 10.
13. International Public Sector Accounting Standards Board, "The Road to Accrual Accounting in the United States," International Federation of Accountants, February 28, 2006, 17, http://www.ifac.org/sites/default/files/publications/files/the-road-to-accrual-account-1.pdf.
14. GASB, "The User's Perspective: Touring the Financial Report, Part II: The Statement of Activities," May 2007, http://gasb.org/cs/ContentServer?c=GASBContent_C&pagename=GASB%2FGASBContent_C%2FUsersArticlePage&cid=1176156736216.

TABLE 1. FINANCIAL STATEMENT DATA USED TO CONSTRUCT INDICATORS

Financial statement	Line item	Definition	Notes
Statement of net assets (net position)	Cash	Cash balances at the end of the fiscal year	
Statement of net assets (net position)	Cash equivalents	Short-term, highly liquid investments either readily convertible to cash or within three months of maturity	
Statement of net assets (net position)	Investments		Most investments are reported at fair value.
Statement of net assets (net position)	Receivables	Funds due from transactions with government (the timing of these collections may vary, depending on type)[a]	There are three types of transactions: (1) exchange transactions (e.g., individuals pay the state for college tuition, health services); (2) exchange-like transactions between the state and another party, where the value of the exchange is not equal to the benefits (e.g., licenses, permits, regulatory fees); (3) nonexchange transactions, where the government gives value to another party without receiving equal value in exchange.[b]
Statement of net assets (net position)	Current assets	Assets that are converted into cash or consumed within the year	
Statement of net assets (net position)	Current liabilities	Obligations due within the year	Resources include accounts payable, short-term debt, and voucher warrants.
Statement of net assets (net position)	Noncurrent liabilities	Long-term liabilities due over a few years or several decades, often with interest[c] (listed in order of maturity)	Liabilities include outstanding bonds, net pension obligations,[d] compensated absences, and pollution remediation obligations.
Statement of net assets (net position)	Unrestricted net assets	Assets that may be used for any purpose	"Used for any purpose" does not imply the resource is liquid. A deficit in unrestricted net assets may signal the issuance of new debt and does not indicate fiscal trouble.
Statement of net assets (net position)	Restricted net assets (net position)	Assets that are restricted for a particular purpose (e.g., capital projects, debt service)	Assets are restricted by enabling legislation. They may be expendable or nonexpendable, such as the principal used to fund an endowment.
Statement of net assets (net position)	Total net assets (total net position)	Combined net assets, including capital assets such as land, buildings, equipment, and infrastructure (e.g., roads, bridges, tunnels), less any outstanding debt used to acquire those assets	Capital assets are reported net of related debt. The resources needed to repay capital debt must be provided from other sources since the capital assets themselves cannot be liquidated to fund these liabilities.
Statement of net assets (net position)	Total assets	Sum of current, noncurrent, and capital assets	
Statement of net assets (net position)	Total liabilities	Sum of short- and long-term liabilities	
Statement of activities	Total taxes	All revenues due from taxes levied	Category excludes unrestricted grants, contributions, transfers, and investment earnings.
Changes in net position	Total revenue	Total taxes plus total general revenue	Category includes unrestricted grants, contributions, transfers, and investment earnings.

Financial statement	Line item	Definition	Notes
Statement of activities	Total expenses	Total spent on governmental programs, debt service, unemployment compensation, loans, intergovernmental revenue sharing, lotteries, and the operation of government and commissions	On an accrual basis, expenses include costs that were incurred that year (such as earned pension benefits that will not be paid until a future date).
Statement of activities	Change in net assets	General revenues and changes in net assets totaled and added to net (expense) revenue totals to produce the change in net assets over the reporting period	Governments report the amount of net assets at the beginning of the year and add or subtract changes in net assets for the year to present ending net assets.[e]
Ratio of debt outstanding (statistical section)	Total primary government debt	Debt issued for governmental activities and business activities includes general obligation debt, revenue bonds, capital leases, and other project-based bonds	Total primary government debt excludes off-budget debts of special enterprises such as universities, special authorities, or utilities, since these are not legally guaranteed by the full faith and credit or taxing authority of the state government.
Annual report for state pension plans	Unfunded pension liability	Pension plan assets subtracted from pension plan liabilities to calculate the size of the pension plan's unfunded liability (or liability without any assets backing it)	These figures are reported in the annual reports of pension plans; in the fiscal rankings, the liability is recomputed based on a low-risk or guaranteed discount rate.
Notes to the basic financial statement	OPEB[f] liability	The OPEB obligation stated in the notes to the basic financial statement	These data were cross-checked with Standard & Poor's OPEB data.

Source: Dean Michael Mead, *An Analyst's Guide to Government Financial Statements* (Norwalk, CT: Governmental Accounting Standards Board, 2012).

(a) Ibid., 66. Examining receivables balances over time may help to show if the government's ability to collect monies is improving or declining.

(b) "Minnesota Management & Budget Statewide Operating Policy," No. 0104-03, July 12, 2012, revised August 2, 2013. The Governmental Accounting Standards Board (GASB) classifies nonexchange transactions into four types: (1) derived tax revenues, or the payment of income or sales taxes to the state; (2) nonexchange revenues, such as property taxes; (3) government-mandated nonexchange revenues, or federal grants to be used to carry out a mandate; and (4) voluntary nonexchange transactions, such as donations.

(c) States vary in reporting what is included in noncurrent liabilities. The notes to the financial statement provide more detail. See "Touring the Financial Statements, Part IV: Note Disclosures," GASB website, December 2009, http://gasb.org/cs/ContentServer?c=GASBContent_C&pagename=GASB%2FGASBContent_C%2FUsersArticlePage&cid=1176156722430.

(d) GASB, "GASB Improves Pension Accounting and Financial Reporting Standards," news release, June 25, 2012, http://www.gasb.org/cs/ContentServer?pagename=GASB/GASBContent_C/GASBNewsPage&cid=1176160126951. According to GASB, "net pension obligation" (NPO) is the difference between the annual required contribution (ARC) to fund the benefits earned in that year plus the cost of past earned benefits minus the employer's actual fiscal year contribution. "Accounting for Pensions by State and Local Governmental Employees" (Statement No. 27, GASB, 1994). The NPO only recognizes a portion of the annual expense of the pension plan and is not a measure of the outstanding pension liability. If the state has historically made the full ARC, the NPO is zero. This standard for recording the expense of the pension plan was replaced in FY 2014 with new guidance, GASB Statement No. 68. "Summary of Statement 68 Accounting and Financial Reporting for Pensions—an Amendment of GASB Statement No. 27," GASB website, June 2012, http://www.gasb.org/jsp/GASB/Pronouncement_C/GASBSummaryPage&cid=1176160219492.

(e) "Touring the Financial Report, Part II: The Statement of Activities," GASB website, May 2007, http://gasb.org/cs/ContentServer?c=GASBContent_C&pagename=GASB%2FGASBContent_C%2FUsersArticlePage&cid=1176156736216.

(f) OPEB stands for other postemployment benefits.

The line items in table 1 are used to construct 14 indicators that assess five dimensions of a government's solvency. Table 2 defines each indicator and provides a basic interpretation.

TABLE 2. FINANCIAL INDICATORS USED TO MEASURE FISCAL CONDITION

Financial indicators		Definition	Interpretation	Solvency dimension
1.	Cash ratio	(cash + cash equivalents + investments)/current liabilities	Higher ratio indicates greater cash solvency	cash
2.	Quick ratio	(cash + cash equivalents + investments + receivables)/ current liabilities	Higher ratio indicates greater cash solvency	cash
3.	Current ratio	current assets/ current liabilities	Higher ratio indicates greater cash solvency	cash
4.	Operating ratio	total revenues/total expenses	1 or greater indicates budget solvency	budget
5.	Surplus (or deficit) per capita	change in net assets/ population	Positive ratio indicates budget solvency	budget
6.	Net asset ratio	restricted and unrestricted net assets/total assets	Higher value indicates greater long-run solvency	long-run
7.	Long-term liability ratio	long-term (noncurrent) liabilities/total assets	Lower value indicates greater long-run solvency	long-run
8.	Long-term liability per capita	long-term (noncurrent) liabilities/population	Lower value indicates greater long-run solvency	long-run
9.	Tax income ratio	total taxes/ state personal income	Higher value indicates lower service-level solvency	service-level
10.	Revenue income ratio	total revenues/ state personal income	Higher value indicates lower service-level solvency	service-level
11.	Expenses income ratio	total expenses/ state personal income	Higher value indicates lower service-level solvency	service-level
12.	Debt income ratio	total primary government debt/state personal income	Higher value indicates lower level of trust fund solvency	trust fund
13.	Unfunded pension income ratio	unfunded pension liability/ state personal income	Higher value indicates lower level of trust fund solvency	trust fund
14.	OPEB income ratio	OPEB/state personal income	Higher value indicates lower level of trust fund solvency	trust fund

Note: OPEB stands for other postemployment benefits.

The indicators in table 2 are applied to data gathered from the CAFRs of the 50 states for FY 2013. For an overview of state performance, table 3 provides basic statistics, including the mean, median, standard deviation, and maximum and minimum values for each ratio.

TABLE 3. DESCRIPTIVE STATISTICS FOR FY 2013 STATE GOVERNMENT FINANCIAL INDICATORS

	N	Mean	Median	Standard deviation	Maximum	Minimum
Cash ratio	50	2.23	1.59	2.16	13.32	0.34
Quick ratio	50	3.02	2.28	2.26	13.59	0.78
Current ratio	50	3.37	2.61	2.28	13.69	1.15
Operating ratio	50	1.07	1.04	0.11	1.56	0.93
Surplus or deficit per capita	50	$472.61	$209.72	$1,294.59	$8,043.47	−$486.53
Net asset ratio	50	0.03	0.06	0.40	0.82	−1.40
Long-term liability ratio	50	0.40	0.28	0.39	2.04	0.03
Long-term liability per capita	50	$2,767.63	$1,928.55	$2,126.93	$8,662.17	$254.92
Taxes/income ratio	50	0.06	0.06	0.02	0.13	0.03
Revenues/income ratio	50	0.14	0.13	0.05	0.44	0.08
Expenses/income ratio	50	0.13	0.13	0.04	0.28	0.08
Debt/income ratio	50	0.04	0.04	0.03	0.12	0.00
Pensions/income ratio	50	0.29	0.27	0.12	0.67	0.12
OPEB/income ratio	49	0.04	0.03	0.05	0.22	0.00

Source: Author's analysis of FY 2013 Comprehensive Annual Financial Reports for all 50 states and annual reports for state pension plans.

Note: OPEB stands for other postemployment benefits.

MEASURING AND RANKING THE STATES: FIVE DIMENSIONS OF SOLVENCY

To rank the states based on their short- and long-term fiscal prospects as last year's study did, the 14 indicators are bundled according to the dimension of solvency they measure.[15] Each indicator is first standardized as a z-score before the indicators are summed to create an index or rank. This section discusses and interprets each dimension of solvency and the indicators of which the index is comprised. Appendix B contains a more detailed description of the methodology.

15. Following Arnett's methodology, the 14 financial indicators are computed based on the data available in the state CAFRs. To compare these metrics across the states, they must be put on a similar scale. Each indicator is standardized. The z-score is calculated, giving the financial indicators a mean of zero and a standard deviation of one. The indicators are summed together according to the dimension of solvency measured. For example, the standardized values of the cash ratio, current ratio, and quick ratio are summed together to arrive at a measure of cash solvency for each state. The states are then ranked in order of their cash solvency measure.

Cash Solvency

The first three ratios—cash ratio, quick ratio, and current ratio—measure governments' cash position relative to current or short-term liabilities, or cash solvency. Can the government pay bills that are due over a 30-to-60-day horizon? The cash ratio is the sum of the most liquid assets—cash, cash equivalents, and investments—divided by current liabilities.

As table 3 shows, in FY 2013, states' mean cash ratio is 2.23. On average, states have two times as much cash as short-term liabilities. The cash ratio only includes the most liquid assets. Fourteen states have cash ratios of less than one, meaning they have less cash on hand than short-term liabilities. These states are Rhode Island, Arizona, Wisconsin, Pennsylvania, North Carolina, Maryland, New Jersey, New Hampshire, New York, California, Illinois, Massachusetts, Connecticut, and Maine. By contrast, five states have several times more cash than short-term liabilities: Alaska, Florida, South Dakota, Ohio, and Wyoming.

The quick ratio, a measure of cash reserves, includes cash, cash equivalents, and investments. It also includes receivables that are less liquid and not immediately accessible. The sum of these cash items is divided by current liabilities. A quick ratio greater than one indicates sufficient reserves of cash and assets that may be converted to cash to cover short-term liabilities.[16] On average, states report a quick ratio of 3.02 for FY 2013. All but three states (California, Illinois, and Maine) have a quick ratio greater than one.

The third component of cash solvency is the current ratio, or the percentage of current liabilities covered by current assets. For FY 2013, the average current ratio is 3.37. A ratio of two indicates sufficient assets to cover short-term liabilities (i.e., assets are two times larger than short-term liabilities). As table A1 in appendix A shows, a dozen states have a current ratio of less than two: New Jersey, North Carolina, Rhode Island, Wisconsin, New York, Pennsylvania, Maine, Arizona, California, Illinois, Massachusetts, and Connecticut. States with a robust current ratio, or current assets that are at least five times the amount of short-term liabilities, are Alaska, South Dakota, Florida, Ohio, Wyoming, Alabama, North Dakota, and Montana.

With a few exceptions, most states have enough cash to cover short-term expenses. These three ratios in table A1 of appendix A are used to construct the cash solvency index that ranks the states in order of their performance, as displayed in table 4.

16. Arnett, "Ranking the 50 States," 12, citing Steven A. Finkler, *Financial Management for Public, Health and Not-for-Profit Organizations*, 2nd ed. (Upper Saddle River, NJ: Prentice Hall, 2005).

TABLE 4. RANKING OF STATES BY CASH SOLVENCY (FY 2013)

Rank	State	Cash index
1	Alaska	14.36
2	Florida	6.17
3	South Dakota	5.71
4	Ohio	4.92
5	Wyoming	4.17
6	Montana	2.42
7	North Dakota	2.26
8	Alabama	2.18
9	Nebraska	1.68
10	Tennessee	1.62
11	Utah	1.57
12	Missouri	1.01
13	Idaho	0.51
14	Delaware	0.14
15	Oklahoma[a]	0.14
16	Iowa	0.04
17	Nevada	−0.01
18	South Carolina	−0.08
19	New Mexico[b]	−0.10
20	Arkansas	−0.14
21	Washington	−0.27
22	Mississippi	−0.47
23	Oregon	−0.58
24	Louisiana	−0.69
25	Hawaii	−0.89
26	Indiana	−0.99
27	Colorado	−1.22
28	Georgia	−1.25
29	Kansas	−1.27
30	Virginia[c]	−1.27
31	Minnesota	−1.29
32	Vermont	−1.38
33	Texas	−1.41
34	Michigan	−1.42
35	West Virginia	−1.45
36	Kentucky	−1.51
37	New Hampshire	−1.76
38	New Jersey	−1.78
39	Maryland	−1.79
40	Rhode Island	−1.90
41	Wisconsin	−1.93
42	North Carolina	−1.98
43	New York	−2.16
44	Arizona	−2.27
45	Pennsylvania	−2.29
46	California	−2.60
47	Massachusetts[d]	−2.60
48	Connecticut	−2.67
49	Illinois	−2.72
50	Maine	−2.73

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports (CAFRs) for all 50 states.

Note: The cash solvency index is the sum of the standardized values of the cash, quick, and current ratios.

(a) Delaware's cash solvency score is 0.1392 and Oklahoma's is 0.1351. This is why Delaware is ranked 14th and Oklahoma is ranked 15th, though the rounded scores are the same.

(b) As of October 1, 2014, New Mexico had not released its FY 2013 CAFR. This analysis uses inflation-adjusted figures from New Mexico's FY 2012 CAFR.

(c) Kansas's cash solvency score is −1.2681 and Virginia's is −1.2733. This is why Kansas is ranked 29th and Virginia is ranked 30th, though the rounded scores are the same.

(d) California's cash solvency score is −2.6022 and Massachusetts's is −2.6047. This is why California is ranked 46th and Massachusetts is ranked 47th, though the rounded scores are the same.

The rank is a z-score, or a standardized value of the summed cash solvency indicators, which indicates how many standard deviations an individual state's score is above or below the mean for all 50 states. For example, Florida's cash index is 6.17 standard deviations above the mean, giving the state a second-place ranking for cash solvency. By contrast, New York's cash

"The rank is a z-score, or a standardized value of the summed cash solvency indicators, which indicates how many standard deviations an individual state's score is above or below the mean for all 50 states."

solvency score is −2.16, or two standard deviations below the mean. New York's negative z-score score is driven by a low cash ratio of 0.59, which means New York has half the amount of liquid cash it needs to cover current liabilities. The z-score measures relative position in the ranking and does not translate into a direct measure of fiscal health. The underlying metrics in table A1 in appendix A must be viewed together in order make a quantitative statement about individual states' financial conditions.

Budget Solvency

Two ratios are associated with budget solvency, which measures whether the state can meet its fiscal year obligations. The operating ratio is the proportion of total revenues available to cover total expenses. A ratio of greater than one indicates that revenues exceed expenses and the state can pay for spending in that fiscal year from reported revenues. The average operating ratio for FY 2013 is 1.07.

Table A2 in appendix A shows three states, Massachusetts, Louisiana, and New Jersey, with operating ratios that are slightly less than one (0.98, 0.97, and 0.93, respectively), indicating that revenues are slightly less than total expenses and the state must take action to address a shortfall. The other indicator of budget solvency is surplus or deficit per capita, measured as the change in net assets divided by the state's population. Net assets indicate whether the government has resources remaining after paying its debts.[17] Most states report a surplus, with an average of $473 and a median of $210 across the states. Eight recorded a deficit within FY 2013: Illinois, Maryland, New York, New Mexico, Kentucky, Massachusetts, Louisiana, and New Jersey.

The operating ratio and surplus or deficit per capita are used to construct the budget solvency index, which allows for a ranking of the states according to budget solvency, as shown in table 5.

17. Ibid., 13.

TABLE 5. RANKING OF STATES BY BUDGET SOLVENCY (FY 2013)

Rank	State	Budget index
1	Alaska	10.35
2	North Dakota	7.19
3	Wyoming	3.29
4	Utah	0.77
5	Florida	0.44
6	Montana	0.29
7	Idaho	0.13
8	Texas[a]	0.13
9	Oregon	0.07
10	Arizona	0.03
11	Wisconsin[b]	0.03
12	Minnesota	0.02
13	South Dakota	−0.03
14	South Carolina	−0.05
15	Nebraska	−0.06
16	Nevada	−0.08
17	Iowa	−0.11
18	North Carolina	−0.15
19	Rhode Island	−0.19
20	Colorado	−0.28
21	Oklahoma[c]	−0.28
22	Michigan	−0.30
23	California	−0.36
24	Maine[d]	−0.36
25	Tennessee	−0.38
26	Missouri	−0.40
27	New Hampshire[e]	−0.40
28	Kansas	−0.44
29	Virginia	−0.48
30	Hawaii	−0.51
31	Indiana	−0.53
32	Ohio	−0.54
33	Georgia[f]	−0.54
34	Mississippi	−0.55
35	Washington	−0.66
36	Alabama	−0.70
37	West Virginia[g]	−0.70
38	Arkansas	−0.74
39	Pennsylvania	−0.79
40	Vermont	−0.81
41	Delaware[h]	−0.81
42	Connecticut	−0.90
43	Illinois	−0.97
44	Maryland	−0.98
45	New York	−0.99
46	New Mexico[i]	−1.00
47	Kentucky	−1.02
48	Massachusetts	−1.28
49	Louisiana	−1.39
50	New Jersey	−1.97

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports (CAFRs) for all 50 states.

Note: The budget solvency index is the sum of the standardized values of the change in net assets per capita and the operating ratio.

(a) Idaho's budget solvency score is 0.1267 and Texas's is 0.1260. This is why Idaho is ranked seventh and Texas is ranked eighth, though the rounded scores are the same.

(b) Arizona's budget solvency score is 0.0321 and Wisconsin's is 0.0284. This is why Arizona is ranked 10th and Wisconsin is ranked 11th, though the rounded scores are the same.

(c) Colorado's budget solvency score is −0.2817 and Oklahoma's is −0.2842. This is why Colorado is ranked 20th and Oklahoma is ranked 21st, though the rounded scores are the same.

(d) California's budget solvency score is −0.3555 and Maine's is −0.3646. This is why California is ranked 23rd and Maine is ranked 24th, though the rounded scores are the same.

(e) Missouri's budget solvency score is −0.4001 and New Hampshire's is −0.4043. This is why Missouri is ranked 26th and New Hampshire is ranked 27th, though the rounded scores are the same.

(f) Ohio's budget solvency score is −0.5365 and Georgia's is −0.5446. This is why Ohio is ranked 32nd and Georgia is ranked 33rd, though the rounded scores are the same.

(g) Alabama's budget solvency score is −0.6971 and West Virginia's is −0.6986. This is why Alabama is ranked 36th and West Virginia is ranked 37th, though the rounded scores are the same.

(h) Vermont's budget solvency score is −0.8107 and Delaware's is −0.8146. This is why Vermont is ranked 40th and Delaware is ranked 41st, though the rounded scores are the same.

(i) As of October 1, 2014, New Mexico had not released its FY 2013 CAFR. This analysis uses inflation-adjusted figures from New Mexico's FY 2012 CAFR.

The z-scores for budget solvency are measures of relative ranking, or how close each state is to the mean value for the states. Most states are tightly clustered around the mean for the two indicators that make up budget solvency; there is not much variation in performance among the states. The exceptions are at the tails, with Alaska receiving a score of 10.35 for budget solvency, or 10 standard deviations greater than the mean value. This extreme value is owing to Alaska's ample assets. At the bottom of the ranking are five states with budget solvency scores one standard deviation less than the mean. A look at table A2 for the underlying metrics for New Mexico, Kentucky, Massachusetts, Louisiana, and New Jersey shows that each of these states ran operating deficits during FY 2013.

Long-Run Solvency

The long-run solvency index is made up of three metrics. Net asset ratio is the proportion of net assets to total assets. Net assets are those left over after the government has paid its debts, and are a subset of total assets, which include capital such as land and government buildings. The greater the amount of net assets relative to total assets, the more the government has on hand to cover long-term liabilities. A portion of net assets is restricted for dedicated purposes. As table 3 shows, in FY 2013, the mean net asset ratio was 0.03. The higher the net asset ratio, the greater the assets available to pay long-term bills. Some states report a robust net asset ratio, as table A3 shows, with net assets representing 30 to 82 percent of total assets: Alaska, Wyoming, North Dakota, New Mexico, Texas, Oklahoma, Montana, Idaho, and South Dakota. Conversely, several states have negative ratios, indicating potential difficulty in meeting long-term obligations. These states include New Jersey, Illinois, Massachusetts, Connecticut, California, Kentucky, New York, Maryland, Rhode Island, Pennsylvania, Wisconsin, North Carolina, and Vermont.

The long-term liability ratio represents the proportion of long-term liabilities relative to total assets. Long-term liabilities include outstanding bonds, loans, claims and judgments (rendered against the government in a lawsuit), and compensated employee absences. A low proportion of long-term liabilities to total assets signals good fiscal health. The average long-term liability ratio in FY 2013 is 0.40, indicating that, on average, long-term liabilities are roughly 40 percent of total assets. Table A3 in appendix A shows that the states with long-term liabilities of 10 percent or less of total assets are Nebraska, Alaska, Wyoming, South Dakota, and Tennessee. By contrast, several states are in a poor position, with long-term liabilities representing 1.5 to 2 times the amount

of total assets. These states include Connecticut, Illinois, Massachusetts, and New Jersey.

The third metric in the long-run solvency index is long-term liabilities per capita. In FY 2013, the average long-term liability per capita is $2,768. Nebraska has the lowest long-term liability per capita, at $254, and New Jersey has the highest long-term liability per capita, at $8,662. A smaller number is considered less of a burden on the state's fiscal resources.

Since two of these measures, the long-term liability ratio and long-term liability per capita, indicate better fiscal health with a lower (rather than a higher) number, constructing a ranking requires taking the inverse of the long-term liability ratio and long-term liability per capita to construct the long-run solvency index.[18] Table 6 ranks the states according to their long-run solvency.

The z-scores for long-run solvency range from 10.09 for Nebraska, indicating the state is 10 standard deviations above the mean for long-run solvency in the states, to a low of −5.21 for New Jersey, or five standard deviations below the mean. The wide dispersion in scores is likely driven by the size of long-term liabilities per capita.

Service-Level Solvency

Service-level solvency attempts to capture how much "fiscal slack" states have by measuring the size of taxes, expenses, and revenues relative to state personal income. It is a general measure of whether a government has room to raise taxes or increase spending given its current levels relative to one measure of the economy: total state personal income. States with high levels of taxes, revenues, or expenditures relative to state personal income may find they have little room to obtain increased revenues in the event of a sudden economic shock or rapidly rising obligations.[19]

Service-level solvency is made up of three ratios measuring government spending: total taxes to state personal income, total revenues to state personal income, and expenditures to state personal income. While a higher

18. Ibid., 11.

19. Service-level solvency measures the extent to which the government has room to increase revenues or taxes, not whether or how the government should dedicate tax revenues. It may be that some services can be better provided by nongovernmental entities or by the private sector. However, this analysis is not intended to evaluate how much spending the government should undertake in different areas, nor the performance of that spending. Service-level solvency indicators are not definitive, since one must also consider the structure and efficiency of the tax system.

TABLE 6. RANKING OF STATES BY LONG-RUN SOLVENCY (FY 2013)

Rank	State	Long-run index
1	Nebraska	10.09
2	Alaska	5.45
3	Indiana	3.98
4	Tennessee	2.99
5	South Dakota	2.76
6	Oklahoma	2.58
7	Wyoming	2.31
8	Idaho	1.77
9	Montana	1.70
10	North Dakota	1.09
11	South Carolina	0.90
12	Maine	0.89
13	Iowa	0.67
14	New Mexico[a]	0.66
15	Colorado	0.59
16	Texas	0.46
17	Utah	0.42
18	Alabama	0.31
19	Missouri[b]	0.31
20	Kansas	0.22
21	Arizona	−0.06
22	Arkansas	−0.07
23	Minnesota	−0.08
24	North Carolina	−0.09
25	Michigan	−0.27
26	Nevada	−0.30
27	Virginia[c]	−0.30
28	West Virginia	−0.34
29	Mississippi	−0.35
30	Georgia	−0.53
31	Florida	−0.55
32	New Hampshire	−0.58
33	Oregon	−0.64
34	Louisiana	−0.83
35	Vermont	−0.84
36	Pennsylvania	−0.93
37	Ohio	−1.09
38	Wisconsin	−1.14
39	Delaware	−1.31
40	Rhode Island	−1.40
41	Washington	−1.47
42	Hawaii	−1.49
43	Maryland	−1.73
44	Kentucky	−2.07
45	New York	−2.11
46	California	−2.47
47	Connecticut	−3.69
48	Massachusetts	−3.74
49	Illinois	−4.48
50	New Jersey	−5.21

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports (CAFRs) for all 50 states.

Note: The long-run solvency index is the sum of the standardized values of the net asset ratio, long-term liability ratio, and long-term liability per capita.

(a) As of October 1, 2014, New Mexico had not released its FY 2013 CAFR. This analysis uses inflation-adjusted figures from New Mexico's FY 2012 CAFR.

(b) Alabama's long-run solvency score is 0.3119 and Missouri's is 0.3080. This is why Alabama is ranked 18th and Missouri is ranked 19th, though the rounded scores are the same.

(c) Nevada's long-run solvency score is −0.2979 and Virginia's is −0.3049. This is why Nevada is ranked 26th and Virginia is ranked 27th, though the rounded scores are the same.

value indicates the state might find it difficult to respond to sudden budgetary demands or growing obligations, one shortcoming of service-level solvency is that it cannot capture the structure of the state's tax system (whether it is efficient, equitable, volatile, progressive, or regressive) or possible institutional

barriers to using revenues to address budget shortfalls. Some examples best illustrate the limitation and subjectivity of this measure.

Alaska, North Dakota, and Wyoming have high levels of revenues and taxation relative to state personal income, largely owing to these states' revenue from natural resources (petroleum, natural gas, and mining). These states rank at the bottom for service-level solvency because high levels of revenues and taxes relative to state income mean these governments have little room to increase taxes should fiscal pressures emerge. But these high levels of taxation and revenues are drawn almost exclusively from one source not directly related to state personal income. The score may more aptly indicate these states' great dependency on natural resources for revenues relative to other potential sources, such as resident income. It could be that these states are spending beyond a sustainable level in the event that natural resources drop in price; revenues derived from personal income might not be sufficient to fill the gap.

New Jersey ranks relatively high in service-level solvency, at 20. Looking at the metrics behind the rank, total state personal income in New Jersey is $493 billion. Taxes, revenues, and expenditures account for 6 percent, 12 percent, and 12 percent of total personal income, respectively. On this basis, New Jersey appears to have plenty of room to find revenues to address its ongoing budgetary shortfalls and growing pension burden. Yet institutional factors complicate the picture. New Jersey's income tax is highly progressive, with the state deriving nearly 50 percent of its revenues from the top 10 percent of income-tax filers. These are revenues highly vulnerable to market downturns.[20]

In addition, New Jersey's income tax revenues are constitutionally dedicated to the Property Tax Relief Fund, which funds school aid, municipal aid, and property tax rebates. New Jersey's biggest reason for fiscal stress is its large, rapidly growing pension and health care obligations. Yet the current tax structure, a largely mandated budget, and legal barriers to how income-tax revenues may be used make finding the revenues to fund long-term pension obligations difficult. These outlier cases show that service-level solvency is the most subjective of the five indexes in this study, and care should be taken in interpreting the scores and underlying ratios. Table 7 ranks the states by service-level solvency. Table A4 in appendix A provides the individual scores for each of the three indicators (taxes, revenues, and expenses to total state personal income).

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20. Capitol Matrix Consulting, "Revenue Volatility in New Jersey: Causes, Consequences and Options," New Jersey Chamber of Commerce, May 2012, http://www.njchamber.com/pdf/NJ_Volatility_Final_5-7-2012.pdf.

TABLE 7. RANKING OF STATES BY SERVICE-LEVEL SOLVENCY (FY 2013)

Rank	State	Service-level index	Rank	State	Service-level index
1	Nevada	8.40	26	Washington	0.05
2	New Hampshire	6.57	27	California	−0.18
3	South Dakota	4.50	28	Iowa	−0.71
4	Florida	4.30	29	Idaho	−0.77
5	Virginia	4.05	30	Montana	−0.80
6	Nebraska	3.41	31	Massachusetts	−0.83
7	Colorado	2.98	32	Connecticut	−0.92
8	Missouri	2.94	33	Michigan	−0.93
9	Texas	2.50	34	Wisconsin	−1.02
10	Tennessee	1.72	35	Rhode Island	−1.05
11	Maryland	1.50	36	Maine	−1.28
12	Utah	1.44	37	Oregon	−1.42
13	Alabama	1.32	38	Minnesota	−1.47
14	Kansas	1.23	39	New York	−1.52
15	Oklahoma	1.17	40	Kentucky	−1.65
16	Georgia	1.14	41	Mississippi	−2.25
17	Pennsylvania	0.72	42	Arkansas	−2.68
18	Louisiana	0.49	43	Wyoming	−2.93
19	Ohio	0.48	44	Hawaii	−2.96
20	New Jersey	0.44	45	West Virginia	−3.34
21	Indiana	0.43	46	Delaware	−3.83
22	Arizona	0.39	47	Vermont	−4.15
23	Illinois[a]	0.39	48	New Mexico[b]	−4.23
24	North Carolina	0.35	49	North Dakota	−4.81
25	South Carolina	0.07	50	Alaska	−7.22

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports (CAFRs) for all 50 states.

Note: The service-level solvency index is the sum of the standardized values of tax per capita, revenue per capita, and expenses per capita.

(a) Arizona's service-level solvency score is 0.3887 and Illinois's is 0.3861. This is why Arizona is ranked 22nd and Illinois is ranked 23rd, though the rounded scores are the same.

(b) As of October 1, 2014, New Mexico had not released its FY 2013 CAFR. This analysis uses inflation-adjusted figures from New Mexico's FY 2012 CAFR.

The rankings are z-scores, which measure how far the state is from the mean value for the states. Nevada is 8.4 standard deviations from the mean for service-level solvency largely because Nevada has the smallest values for taxes, revenues, and expenditures per capita among the states. By contrast, Alaska has the largest values for revenues and expenditures, placing it seven standard deviations below the mean.

Trust Fund Solvency

The ratios used to construct the long-run solvency rankings of state fiscal condition are based on state liability numbers as reported in the statement of net assets and statement of activities. As such, these liability figures only capture a portion of the state's total liabilities and exclude the total amount of pension obligations. In this section, the long-run fiscal rankings are augmented with an estimate of states' total indebtedness in the form of bonded debt, risk-adjusted pension liabilities, and OPEB.

An estimate of state indebtedness also helps to inform the interpretation of service-level solvency. How much fiscal slack a state has not only is a matter of its capacity to increase taxes or revenues or decrease spending, but also hinges on overall debt loads and their impact on future resources. Debt affordability, or the amount of debt relative to the state's capacity to pay for it, is calculated by dividing total primary debt by total personal income for that state.[21] This debt-to-personal-income ratio assesses the level of overall bonded debt to the total income of state residents, or the base from which states derive tax revenues. Pension obligations and OPEB are assessed separately, as these come with legal protections that vary among the states. Table A5 in appendix A presents the three ratios that make up trust fund solvency: the ratio of risk-adjusted unfunded pension liabilities to state personal income, the ratio of unfunded OPEB liabilities to state personal income, and the ratio of total primary government debt to state personal income.

Defining State Debt

A state's debt may be defined narrowly to only include bonds issued to pay for government spending or projects.[22] General obligation (GO) bonds are backed by the full faith and credit of the state and are repaid out of general revenues. GO bonds have a low probability of default, as the government has the power to tax and thus secure funds for repayment. Another form of state debt is revenue bonds, which are backed by a dedicated revenue source. These are slightly less guaranteed than GO bonds, since they hinge on a specific

21. Bureau of Economic Analysis, "State Personal Income 2014," press release, March 25, 2015, http://www.bea.gov/newsreleases/regional/spi/sqpi_newsrelease.htm. Total personal income is defined as "the income received by all persons from all sources. Personal income is the sum of net earnings by place of residence, property income, and personal current transfer receipts. . . . It is derived as the sum of state estimates and the estimate for the District of Columbia; it differs from the estimate of personal income in the national income and product accounts."

22. Jennifer Weiner, "Assessing the Affordability of State Debt" (Research Report 13-2, New England Public Policy Research Center, Federal Reserve Bank of Boston, December 2013).

(and potentially more risky) source of revenue. Other common forms of debt include certificates of participation (COPs) and lease-purchase agreements. These are backed by lease revenue paid to the state for the use or purchase of public facilities or equipment. Together, these categories constitute total primary government debt.

While a majority of states limit the amount of GO debt that may be issued, several states prohibit the issuance of GO debt, including Arizona, Colorado, Kansas, and Kentucky. In practice, this means these states often rely on other forms of debt, including revenue bonds and COPs. Other states limit the amount of debt that may be issued or restrict its usage to specific purposes.[23]

Table A6 in appendix A presents the total primary government debt of states for both governmental and business-type activities, as reported in the CAFR in the ratios of debt outstanding schedule.[24] Nebraska and Wyoming had the lowest levels of total debt per capita in FY 2013, at $16 and $54, respectively. The states with the highest per capita debt were New Jersey ($4,556), Hawaii ($5,357), and Connecticut ($5,481). These three states also had the highest debt levels relative to personal income, one measure of the tax base. Hawaii's total primary government debt represented 12 percent of residents' personal income in FY 2013. Connecticut had the second-highest level of debt to personal income, at 9 percent, followed by New Jersey and Alaska, at 8 percent.

Pension Obligations

In addition to selling bonds, which represent a legal promise to repay a creditor both principal and interest at some future date for funds lent to the government, states also make legal promises to public-sector workers in the form of deferred compensation paid out as pension benefits or health care benefits known as other postemployment benefits.

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23. A study by the National Association of State Treasurers finds that 27 states have constitutional or statutory limits on GO bonds, while only four states limit revenue or nonguaranteed debt. Nineteen states limit the total amount of revenue bonds outstanding. Denison, Hackbart, and Moody find that debt limits on general obligation debt may lead governments to issue "more complex and specialized bonds." See Dwight V. Denison, Merl Hackbart, and Michael Moody, "State Debt Limits: How Many Are Enough," *Public Budgeting & Finance* 26, no. 4 (2006): 22–39.

24. This analysis does not consider "component unit debt," or the debts incurred by special authorities. State governments may create off-budget entities with the authority to issue debt, such as state universities, public utilities, housing authorities, or public hospitals and health systems. While potentially of importance to a state's overall fiscal health, generally, these debts do not come with the state's guarantee of repayment. Additionally, the quality of reporting on off-budget enterprise debt varies considerably among the CAFRs of the 50 states. To include it would produce a potentially misleading picture of the relative debts of states.

Pension benefits enjoy statutory or constitutional legal protections in state law, putting them on similar legal footing as GO debt. Not all states offer the same degree or kind of legal protection for pension benefits.[25] Some states protect only the benefits that an employee has earned to date, known as accrued benefits. An estimated 21 states protect pension benefits that have not yet been earned.[26] Owing to these legal guarantees of payment, economists make the case that public pension liabilities should be valued like government debt: that is, they represent a commitment to the employee that has a low or no probability of default.

A defined benefit pension is a promise to pay an employee a formula-determined amount upon retirement. It is funded with employee and employer contributions and with the return on investment on those contributions. To determine how much a state government should contribute today to fund the benefits it will pay out in the future, the pension's future value must be "discounted" to a present value. Essentially, discounting is the reverse of calculating compound interest; it "backs out" the interest from a future value to arrive at a present value. This calculation requires selecting an interest rate, called a "discount rate." How to select the discount rate is a source of debate between government actuaries and economists.[27]

Until FY 2014, public plans valued pension liabilities based on GASB Statement No. 27 (GASB 27), which states that a pension liability may be discounted based on the rate of return the plan expects to achieve on its investments.[28] On average, most public plans assume they will earn between 7 and 8 percent annually on plan assets, and they use this as the discount rate to calculate the value of the plan's liability.[29] There are a few problems with this approach. First, according to economic theory, the value of the plan's

25. Amy Monahan, "Public Pension Plan Reform: The Legal Framework," *Education, Finance & Policy* 5 (2010), Minnesota Legal Studies Research No. 10-13, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1573864.

26. Liz Farmer, "How Are Pensions Protected by State?," Governing.com, January 28, 2014, http://www.governing.com/finance101/gov-pension-protections-state-by-state.html.

27. Eileen Norcross, "Getting an Accurate Picture of State Pension Liabilities" (Mercatus on Policy, Mercatus Center at George Mason University, Arlington, VA, December 2010).

28. "Accounting for Pensions by State and Local Governmental Employees" (Statement No. 27, GASB, 1994).

29. For a comprehensive discussion of pension valuation among private, public, US, and international plans, see US Government Accountability Office, Report to the Chairman, Committee on Health, Education, Labor and Pensions, "Pension Plan Valuation: View on Using Multiple Measures to Offer a More Complete Financial Picture," GAO, September 2014, http://www.gao.gov/assets/670/666287.pdf.

liability is independent of the value of the plan's assets, much as the value of a homeowner's mortgage is independent of the value of his or her personal savings. Economic theory holds that a stream of future cash flows (in this case, a stream of future pension benefit payments) should be valued based on the certainty and timing of those payments.[30] State pension plans come with a legal guarantee of payment, but there is no guarantee that the plan's assets will return 7.5 percent each year. GASB 27 implies that it is possible to secure a promised stream of future benefits based on uncertain investment returns without any risk.

Instead, the discount rate selected to value future payments should match the guarantee and certainty of payment. Public pensions are similar in guarantee to government debts. This similarity suggests that the discount rate should match the yield on a government debt instrument, such as the yield on notional 15-year Treasury bonds (currently 3.38 percent). One result of dropping the discount rate from 7.5 percent to 3.38 percent is to dramatically increase the present value of the liability and the annual required contribution to fund the plan. For every 1 percent change in the discount rate, the pension liability changes by as much as 20 percent.[31] The impact of this assumption became clear during the Great Recession, as plans did not meet expected asset returns and large funding gaps emerged.

New accounting standards established by GASB Statement No. 68 (GASB 68) apply a mixed approach to measuring public sector pension plan liabilities.[32] GASB 68 suggests that plans continue to use the expected return on plan assets to value the funded portion of the liability and to apply the return on a tax-exempt, 20-year, high-grade municipal bond to value the unfunded portion of the liability. The effect of GASB 68 is that plans that are deeply underfunded under GASB 27 will show much larger funding gaps than plans that are relatively better funded under GASB 27. One shortcoming of GASB 68 is that it allows plans to continue valuing a portion of pension liabilities with reference to risky asset returns, thus obscuring the full value of the liability and leading

30. Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance, and the Theory of Investment," *American Economic Review* 48 (1958): 261–97; M. Barton Waring, *Pension Finance: Putting the Risks and Costs of Defined Benefit Plans Back under Your Control* (Hoboken, NJ: Wiley, 2011).

31. V. Gopalakrishnan and Timothy F. Sugrue, "The Determinants of Actuarial Assumptions under Pension Accounting Disclosures," *Journal of Financial and Strategic Decisions* 8, no. 1 (Spring 1995).

32. "Summary of Statement 68 Accounting and Financial Reporting for Pensions—an Amendment of GASB Statement No. 27," GASB website, June 2012, http://www.gasb.org/jsp/GASB/Pronouncement_C/GASBSummaryPage&cid=1176160219492.

to distorted valuations among plans.[33] Practically speaking, in FY 2015, governments will report higher pension liabilities on their books, though this higher liability will not be tied to any requirement to increase plan funding.[34]

For this year's fiscal rankings report, pension asset and liability data come from the most recent actuarial reports of the plans that states offer their employees, including plans in which the state manages the plan but does not make a direct contribution, and responsibility for unfunded benefits may ultimately rest on local rather than state governments.[35] The plans included in the analysis are listed in table A10 in appendix A.

Table A7 of appendix A presents the plans' total assets and liabilities, unfunded liability, funded ratio, and unfunded liability for state pensions. Since the numbers in state actuarial reports are calculated under GASB 27 and do not reflect the full value of pension liabilities, table A8 of appendix A presents these figures based on a reestimation of plan liabilities by valuing the plans based on their statutory guarantee and the time horizon over which benefits are due, or based on the risk-free rate, or the yield on notional 15-year Treasury bonds at the time the actuarial valuation was performed. The net effect increases the total unfunded liability of state pension plans from $1.0 trillion to $3.9 trillion.

OPEB

Other postemployment benefits are the health and other nonpension benefits that state governments offer their employees. These benefits do not carry the same legal protection as pensions and represent a liability that may be impaired, reduced, or eliminated. Thus, in terms of assessing states' liabilities, OPEB pose less of a risk to taxpayers and provide less of a guarantee to beneficiaries.

When including the total pension and OPEB liabilities payable to public-sector employees over the coming decades, many states are in an acute situation in terms of the large claims on future revenues. In particular, the states that

33. John W. Mortimer and Linda R. Henderson, "Measuring Pension Liabilities under GASB Statement No. 68," *Accounting Horizons* 28, no. 3 (2014): 421–54.
34. Using pension data from FY 2010, Mortimer and Henderson find that average funded ratios across state pension plans fall from 73.4 percent to 56.3 percent under GASB 68. Furthermore, the most poorly funded plans under GASB 27 deteriorate significantly under GASB 68, while plans that are well funded under GASB 27 are barely affected by the new composite approach. This points to the underlying inconsistency and inaccuracy of the approach suggested by GASB 68.
35. It is not clear where the burden may fall in the event that a state-managed and locally financed plan runs into trouble. The outcomes and legal responsibility would rest on how a court might interpret the statutory or constitutional language applying to that individual plan. For that reason, plans that are state operated but locally financed are included in this survey. This survey does not include plans that are locally operated and locally financed.

have performed poorly in the fiscal rankings—Illinois, New Jersey, Connecticut, Hawaii, and Pennsylvania—are also notable for their large, unfunded pension liabilities and largely unfunded OPEB. States that have scored relatively well in the fiscal rankings should also heed the underlying practices that can lead a state into a downward spiral. Misleading estimates of pension liabilities under GASB 27 may have also led states to systematically undercontribute to their pension systems, thereby weakening pension plans and creating larger unfunded liabilities.

As table A5 in appendix A shows, in Alaska, the unfunded pension liability is 67 percent of state personal income, on a risk-free basis. The metrics that contribute to trust fund solvency send a clear signal that unfunded pension systems are a long-run fiscal risk for most states. Table 8 ranks the states by trust fund solvency.

OVERALL RANKING OF THE STATES

To construct an overall fiscal ranking for the states, the scores for the five dimensions of solvency are weighted and added together. For FY 2013, similar weights are applied to each dimension. The short run is given greater weight. Cash and budget solvency scores are each assigned a weight of 35 percent. Long-run, service-level, and trust fund solvency are each assigned a weight of 10 percent, since these indexes measure a longer horizon, with solvency affected by future policy decisions and economic factors. Table 9 ranks the states by fiscal condition.

As with last year's study, the top performing states, Alaska and North Dakota, rely on natural resources for revenues and are able to meet short-term commitments owing to a high volume of cash relative to short-term liabilities. If more emphasis (weight) were given to the long run, these states would fare relatively worse. The individual solvency rankings show that Alaska performs well in the short run, on a cash and budget solvency basis, but has large pension liabilities relative to state income. Nebraska and Florida perform well on a short-run and longer-run basis owing to low levels of debt, spending, and long-term obligations relative to state personal income. Table 10 shows the descriptive statistics for the five most fiscally solvent states.

By contrast, as table 11 shows, the states that rank toward the bottom include states with ongoing structural deficit problems and difficulty achieving annual budget balance, in addition to long-term debt and pension pressures. These states include New Jersey, Illinois, Massachusetts, Connecticut, and New York.

TABLE 8. RANKING OF STATES BY TRUST FUND SOLVENCY (FY 2013)

Rank	State	Trust fund index
1	Nebraska	8.26
2	Oklahoma	6.69
3	Wisconsin	2.44
4	Tennessee	1.99
5	Vermont	1.88
6	Indiana	1.67
7	Wyoming	1.24
8	South Dakota	1.21
9	North Carolina	0.86
10	Delaware	0.61
11	Florida	0.49
12	Texas	0.38
13	Washington	0.36
14	North Dakota[a]	0.36
15	Virginia	0.30
16	New Hampshire	0.23
17	Maryland	0.11
18	Idaho	–0.08
19	Georgia	–0.11
20	Iowa	–0.18
21	New York	–0.21
22	Massachusetts[b]	–0.21
23	Maine	–0.28
24	Kansas	–0.30
25	Arizona	–0.31
26	Pennsylvania	–0.44
27	Utah	–0.53
28	Missouri	–0.54
29	Montana	–0.60
30	New Jersey	–0.64
31	Arkansas	–0.74
32	West Virginia	–0.76
33	South Carolina	–0.77
34	Rhode Island	–0.79
35	Michigan	–0.81
36	Alabama	–0.83
37	Louisiana	–0.93
38	Minnesota	–1.03
39	Colorado[c]	–1.03
40	California	–1.11
41	Oregon	–1.12
42	Connecticut	–1.17
43	Hawaii	–1.50
44	Nevada	–1.59
45	Illinois[d]	–1.59
46	Kentucky	–1.62
47	Mississippi	–1.65
48	Ohio	–1.75
49	New Mexico[e]	–1.80
50	Alaska	–2.08

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports (CAFRs) for all 50 states.

(a) Washington's trust fund solvency score is 0.3617 and North Dakota's is 0.3560. This is why Washington is ranked 13th and North Dakota is ranked 14th, though the rounded scores are the same.

(b) New York's trust fund solvency score is –0.2093 and Massachusetts's is –0.2141. This is why New York is ranked 21st and Massachusetts is ranked 22nd, though the rounded scores are the same.

(c) Minnesota's trust fund solvency score is –1.0251 and Colorado's is –1.0266. This is why Minnesota is ranked 38th and Colorado is ranked 39th, though the rounded scores are the same.

(d) Nevada's trust fund solvency score is –1.5860 and Illinois's is –1.5873. This is why Nevada is ranked 44th and Illinois is ranked 45th, though the rounded scores are the same.

(e) As of October 1, 2014, New Mexico had not released its FY 2013 CAFR. This analysis uses inflation-adjusted figures from New Mexico's FY 2012 CAFR.

TABLE 9. RANKING OF STATES BY FISCAL CONDITION (FY 2013)

Rank	State	Fiscal condition index	Rank	State	Fiscal condition index
1	Alaska	8.26	26	Georgia	–0.58
2	North Dakota	2.97	27	North Carolina	–0.63
3	South Dakota	2.84	28	Wisconsin	–0.64
4	Nebraska	2.75	29	Arkansas	–0.66
5	Florida	2.74	30	Delaware	–0.69
6	Wyoming	2.67	31	Minnesota	–0.70
7	Ohio	1.30	32	Arizona	–0.78
8	Tennessee	1.10	33	Mississippi[a]	–0.78
9	Oklahoma	0.99	34	Michigan	–0.80
10	Montana	0.98	35	Louisiana	–0.85
11	Utah	0.95	36	New Mexico[b]	–0.92
12	Nevada	0.62	37	Maryland	–0.98
13	Alabama	0.60	38	Rhode Island	–1.06
14	Missouri	0.49	39	Vermont	–1.08
15	Idaho	0.32	40	Hawaii[c]	–1.08
16	Indiana	0.07	41	Pennsylvania	–1.14
17	South Carolina	–0.03	42	Maine	–1.15
18	Iowa	–0.04	43	West Virginia	–1.20
19	Texas	–0.12	44	California	–1.41
20	New Hampshire	–0.13	45	Kentucky	–1.42
21	Virginia	–0.21	46	New York	–1.49
22	Colorado	–0.27	47	Connecticut	–1.83
23	Washington	–0.43	48	Massachusetts	–1.84
24	Kansas	–0.48	49	New Jersey	–1.86
25	Oregon	–0.50	50	Illinois[d]	–1.86

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports (CAFRs) for all 50 states.

Note: The fiscal condition index is the sum of the cash, budget, long-run, service-level, and trust fund solvency indexes weighted as follows: (0.35 × cash solvency score) + (0.35 × budget solvency score) + (0.1 × long-run solvency score) + (0.1 × service-level solvency score) + (0.1 × trust fund solvency score).

(a) Arizona's fiscal condition score is –0.7833 and Mississippi's is –0.7838. This is why Arizona is ranked 32nd and Mississippi is ranked 33rd, though the rounded scores are the same.

(b) As of October 1, 2014, New Mexico had not released its FY 2013 CAFR. This analysis uses inflation-adjusted figures from New Mexico's FY 2012 CAFR.

(c) Vermont's fiscal condition score is –1.0785 and Hawaii's is –1.0815. This is why Vermont is ranked 39th and Hawaii is ranked 40th, though the rounded scores are the same.

(d) New Jersey's fiscal condition score is –1.8563 and Illinois's is –1.8586. This is why New Jersey is ranked 49th and Illinois is ranked 50th, though the rounded scores are the same.

TABLE 10. DESCRIPTIVE STATISTICS FOR THE TOP FIVE PERFORMERS IN OVERALL FISCAL SOLVENCY

	Alaska	North Dakota	South Dakota	Nebraska	Florida	State mean
Cash ratio	13.32	3.64	5.56	3.40	6.76	2.23
Quick ratio	13.59	4.37	7.86	4.39	7.80	3.02
Current ratio	13.69	5.67	7.98	4.59	7.81	3.37
Cash solvency score	14.36	2.26	5.71	1.68	6.17	0.00
Operating ratio	1.56	1.51	1.07	1.07	1.12	1.07
Surplus or deficit per capita	$8,043.47	$4,539.68	$322.81	$306.57	$434.51	$472.61
Budget solvency score	10.35	7.19	–0.03	–0.06	0.44	0.00
Net asset ratio	0.82	0.56	0.31	0.28	0.07	0.06
Long-term liability ratio	0.04	0.14	0.09	0.03	0.33	0.28
Long-term liability per capita	$4,102.10	$3,934.74	$740.56	$254.92	$2,180.11	$1,928.55
Long-run solvency score	5.45	1.09	2.76	10.09	–0.55	0.00
Taxes/income ratio	0.13	0.13	0.04	0.05	0.04	0.06
Revenues/income ratio	0.44	0.24	0.10	0.10	0.10	0.14
Expenses/income ratio	0.28	0.16	0.09	0.09	0.09	0.13
Service-level solvency score	–7.22	–4.81	4.50	3.41	4.30	0.00
Debt/income ratio	0.06	0.04	0.01	0.00	0.03	0.04
Pensions/income ratio	0.67	0.20	0.17	0.15	0.19	0.29
OPEB/income ratio	0.21	0.00	0.00	N/A	0.01	0.04
Trust fund solvency score	–2.08	0.36	1.21	8.26	0.49	0.00

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports for all 50 states.

Note: Each solvency score is the sum of the standardized values of the preceding financial indicators. For example, cash solvency score is composed of the cash, quick, and current ratios. OPEB stands for other postemployment benefits.

TABLE 11. DESCRIPTIVE STATISTICS FOR THE LOWEST FIVE PERFORMERS IN OVERALL FISCAL SOLVENCY

	New York	Connecticut	Massachusetts	New Jersey	Illinois	State mean
Cash ratio	0.59	0.40	0.48	0.74	0.49	2.23
Quick ratio	1.57	1.11	1.13	1.93	0.79	3.02
Current ratio	1.64	1.15	1.19	1.98	1.26	3.37
Cash solvency score	−2.16	−2.67	−2.60	−1.78	−2.72	0.00
Operating ratio	1.00	1.00	0.98	0.93	1.00	1.07
Surplus or deficit per capita	($16.66)	$29.37	($171.14)	($486.53)	($3.80)	$472.61
Budget solvency score	−0.99	−0.90	−1.28	−1.97	−0.97	0.00
Net asset ratio	−0.30	−0.82	−0.86	−1.40	−1.17	0.03
Long-term liability ratio	0.63	1.26	1.47	2.04	1.44	0.40
Long-term liability per capita	$4,616.19	$8,350.33	$5,947.43	$8,662.17	$5,709.65	$2,767.63
Long-run solvency score	−2.11	−3.69	−3.74	−5.21	−4.48	0.00
Taxes/income ratio	0.06	0.07	0.06	0.06	0.06	0.06
Revenues/income ratio	0.15	0.13	0.14	0.12	0.12	0.14
Expenses/income ratio	0.15	0.13	0.14	0.12	0.12	0.13
Service-level solvency score	−1.52	−0.92	−0.83	0.44	0.39	0.00
Debt/income ratio	0.05	0.09	0.07	0.08	0.06	0.04
Pensions/income ratio	0.23	0.35	0.23	0.27	0.45	0.29
OPEB/income ratio	0.06	0.10	0.04	0.14	0.06	0.04
Trust fund solvency score	−0.21	−1.17	−0.21	−0.64	−1.59	0.00

Source: Author's analysis of the most recent Comprehensive Annual Financial Reports for all 50 states.

Note: Each solvency score is the sum of the standardized values of the preceding financial indicators. For example, cash solvency score is composed of the cash, quick, and current ratios. OPEB stands for other postemployment benefits.

EVALUATING THE PERFORMANCE OF THE TOP AND BOTTOM FIVE STATES

Solvency scores only point to general fiscal performance. The management discussion and analysis, another section of the CAFR, provides a descriptive report on the government's financial statements that enables a better understanding of states' fiscal performance. Drawing on this source, as well as pension plan actuarial reports and other state sources, I provide a brief discussion of the fiscal performance of the top five and bottom five ranked states.

The Top Five States

1. Alaska. Alaska ranks far above the other states in overall fiscal performance and on most individual metrics. The state's exceptional levels of budget solvency in FY 2013 are largely owing to Alaska's natural endowment of oil. Petroleum provides the primary source—60 percent—of revenues for Alaska's budget. A decrease in oil production and wellhead value from $100 per barrel to $55 per barrel since FY 2013, as well as lower tax rates owing to the More Alaska Production Act, have led to a decline in this revenue source in FY 2015.[36] Overly optimistic revenue estimates have left the state with a $3.5 billion operating deficit in FY 2015.[37] Dependency on oil revenues is a source of increasing risk for the state and is likely to affect its fiscal position in future years.

According to Alaska's FY 2013 CAFR, federal aid—including funds for Medicaid and transportation—represents about 23 percent of total revenues in Alaska, and investment earnings make up the balance.[38] The state levies no tax on income or sales, but rebates a portion of the state's investment earnings to residents each year. Sixty percent of Alaska's net assets consist of investments in the Alaska Permanent Fund, the majority of which ($40.8 billion) is principal that cannot be spent.[39] Roughly $22.6 billion of Alaska's net assets

36. SB 21, the More Alaska Production Act, was signed into law in May 2013. The act provides a tax credit against the corporate income tax for qualifying oil and gas service-industry expenditures. See Alaska Department of Revenue, "SB 21—Oil and Gas Production Tax," accessed December 16, 2014, http://dor.alaska.gov/MAPActDocuments.aspx.
37. Dermot Cole, "Alaska's Fiscal Dilemma: The State Dependence on Oil Begins," *Alaska Dispatch News*, March 15, 2015, http://www.adn.com/article/20150315/alaskas-financial-dilemma-state-dependence-oil-begins.
38. Alaska Department of Administration, Division of Finance, "State of Alaska Comprehensive Annual Financial Report for the Fiscal Year July 1, 2012–June 30, 2013," 7–12, http://doa.alaska.gov/dof/reports/resource/fy13/2013cafr.pdf.
39. Alaska Permanent Fund Corporation, "Alaska Permanent Fund FY 2013 Annual Report," 24, http://www.apfc.org/_amiReportsArchive/FY2013AnnualReport.pdf.

are unrestricted for use. In FY 2013, Alaska increased appropriations by $2.1 billion, mainly to support education programs.[40]

Alaska's total debt represents 8 percent of the personal income of its residents, which is double the national average of 4 percent. Since FY 2012, long-term debt has increased by 9.45 percent, mostly owing to the issuance of GO bonds.[41] Alaska's unfunded pension obligation is $25 billion on a risk-free basis, or 67 percent of residents' personal income. Given the state's dependence on oil revenues and the decline in oil prices and drilling, Alaska may not be able to keep spending at current levels and meet long-term obligations. Based on FY 2013 financials, Alaska's overall fiscal picture is strong, but signs of volatility are emerging from the long-term risks in the cost of unfunded pension liabilities and the state's heavy dependency on oil revenues.

2. North Dakota. In recent years, North Dakota's economy has benefited from the dramatic growth of its energy sector. This growth has generated a steep increase in both income and sales tax revenues. The CAFR for FY 2013 reports that total general fund revenues increased by 6 percent, while the state's special revenue fund increased by 73 percent, largely driven by oil, gas, and coal tax revenues.[42] The increase in revenues allowed for increased general government expenditures in the form of tax distributions to the counties.[43] Total debt decreased by 13 percent in FY 2013 and represents 4.1 percent of residents' total personal income, or $2,266 per capita.

The decline in oil prices also threatens North Dakota's strong fiscal performance. Initial revenue projections for FY 2015 were predicated on oil production bringing in $74 to $82 a barrel, but a drop in the price of oil led to a $4 billion drop in revenue estimates since December 2014.[44] Much like Alaska, North Dakota's dependence on oil revenues, while responsible for its high levels of cash and budget solvency in FY 2013, presents a potential longer-term risk depending on changes in oil prices.

Another area of long-term concern is the state's pension system. According to its own estimates, North Dakota's unfunded pension liability is $2.28 billion, leaving the system 61 percent funded. When valued on

40. Ibid.
41. Ibid.
42. State of North Dakota, "Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2013," 20–30, http://www.nd.gov/fiscal/docs/cafr2013/2013cafr.pdf.
43. Ibid.
44. James MacPherson, "North Dakota Lawmakers Anxiously Await Revenue Forecast," *Washington Times*, March 15, 2015, http://www.washingtontimes.com/news/2015/mar/15/north-dakota-lawmakers-anxiously-await-revenue-for/.

a guaranteed-to-be-paid basis, unfunded liabilities total $7.7 billion, and the system is 32 percent funded. On a risk-free basis, unfunded pension benefits account for 20 percent of state residents' total income.

3. South Dakota. South Dakota has low levels of debt and taxation and no income tax. According to the FY 2013 CAFR, the state derives its revenues mainly from the sales tax, which accounts for 22 percent of total revenues.[45] The growth in revenues from FY 2012 to FY 2013 was largely owing to a $101.1 million increase in investment earnings.[46]

South Dakota limits its GO debt to $100,000. The state primarily incurs debt through revenue bonds used to finance education construction and other projects. In FY 2013, debt per capita was among the lowest in the United States at $595, representing 1.3 percent of residents' personal income. The South Dakota Retirement System is 100 percent funded according to the FY 2013 actuarial report. However, when valued based on the guarantee of payment, an unfunded liability of $6.5 billion emerges, representing 17 percent of residents' personal income and leaving the system about 58 percent funded. OPEB liabilities are relatively small at $68 million, but as with many states, the system operates on a pay-as-you-go basis.

4. Nebraska. Nebraska's fiscal indicators show a $569 million increase in net assets in FY 2013 owing to increases in tax revenues: income tax revenues were up 14 percent from FY 2012, or $297 million.[47] A large portion of the state's net assets (68 percent) consists of investment in capital assets, while the majority of Nebraska's liabilities are comprised of

"The state's exceptional levels of budget solvency in FY 2013 are largely owing to Alaska's natural endowment of oil. Petroleum provides the primary source—60 percent—of revenues for Alaska's budget."

45. Bureau of Finance and Management, "South Dakota Comprehensive Annual Financial Report for the Fiscal Year ended June 30, 2013," 15–32, http://bfm.sd.gov/cafr/sd_cafr_2013.pdf.
46. Ibid.
47. State of Nebraska, "Comprehensive Annual Financial Report for the Year Ended June 30, 2013," 15–26, http://das.nebraska.gov/accounting/cafr/cafr2013.pdf.

workers' compensation claims.[48] Total liabilities were $1.7 billion in FY 2013, resulting in little debt: $16 per capita.

Nebraska operates defined benefit pension plans for school employees, judges, and the state patrol, and cash balance plans for state and county employees. Based on actuarial reports, these plans carry an unfunded liability of $2.5 billion, or a funded ratio of 79 percent. On a guaranteed-to-be-paid basis, the systems carry an unfunded liability of $13.6 billion, or 15 percent of residents' personal income, leaving the system 41 percent funded.

5. Florida. Florida's strong cash position is owing to higher revenue collections: in FY 2013 Florida saw gains in nearly all revenue sources. The sales tax, Florida's main source of revenue, grew by 6.4 percent. Revenues from the documentary stamp and sales tax, which are tied to the real estate market, are still below pre–financial crisis levels, but also grew in FY 2013. Stronger revenues also contributed to higher-than-average levels of budgetary solvency. An operating ratio of 1.12 indicates that Florida's revenues exceeded expenses by 12 percent. The state recorded a surplus of $434.51 per capita.

Florida's long-run position is mixed, giving it a long-run solvency ranking of 31. After paying for its debts, Florida's net assets exceeded its total assets by 7 percent in FY 2013. This low ratio is owing to a negative balance of $10.8 billion in unrestricted assets, attributable to education bonds. These liabilities are tied to school district assets that are not recorded in the state government's CAFR.[49] Total liabilities are 33 percent of total assets, and long-term liabilities per capita are $2,180—slightly lower than average for the states.

Total taxes, revenues, and expenses as a percentage of total state personal income are low relative to other states, at 4 percent, 10 percent, and 9 percent respectively, and account for Florida's fourth-place ranking in service-level solvency. Unfunded pension liabilities are $155 billion on a risk-adjusted basis, or 19 percent of state personal income. OPEB adds a further $4.8 billion and is unfunded or pay-as-you-go. Total debt in Florida is $27.8 billion, or 4.2 percent of state personal income. These ratios are better than the average for the states, giving Florida an overall ranking of 11 for trust fund solvency.

48. Ibid.

49. State of Florida, "Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2013," 14–19, http://www.myfloridacfo.com/division/aa/reports/2013CAFR.pdf.

The Bottom Five States

50. Illinois. Illinois's position remained weak in FY 2013. While income tax revenues increased by $1.5 billion, the state's long-term liabilities continued to grow, primarily in the form of pension obligations and OPEB.[50] Total bonded debt was $34 billion, or $2,615 per capita (5.6 percent of residents' personal income).

The total unfunded liability for Illinois's pension plans was $106 billion. On a guaranteed-to-be-paid basis, the unfunded liability swells to $275 billion, with an average funded ratio of 25 percent across the state's five plans, accounting for 45 percent of residents' personal income. OPEB add $34 billion in unfunded obligations.

49. New Jersey. New Jersey ranks 49th for fiscal condition in FY 2013, largely owing to two factors: structural budgetary imbalance and climbing pension and OPEB obligations. New Jersey has struggled to balance its budget for more than a decade. The state's tax system depends heavily on the income tax and in particular on high earners, leaving revenue collections vulnerable to market downturns. Over two decades, the state did not make consistent annual payments to the pension system. Additionally, debt was incurred to finance school construction and the pension system.

The result is an accumulation of unfunded liabilities as well as ongoing structural imbalance in the budget, and rising outstanding obligations that are placing increasing demands on state resources. The state's CAFR reports that long-term debt obligations increased by $6.6 billion, $5 billion of which represents the annual required pension contribution.[51] New Jersey's unfunded pension obligation totals $42 billion; it is 60 percent funded according to actuarial reports issued in FY 2013. On a market valuation or "guaranteed-to-be-paid" basis, the unfunded liability is $135 billion, or 27 percent of residents' personal income. On a risk-free basis, the system is 32 percent funded. Total bonded debt is $40 billion, or $4,556 per capita, representing 8.2 percent of New Jersey residents' total personal income.

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50. Judy Baar Topinka, State of Illinois Comptroller, "Comprehensive Annual Financial Report: Fiscal Year Ended June 30, 2013," 16–31, http://www.ioc.state.il.us/index.cfm/resources/reports/cafr/cafr-archives/fy-2013/.

51. State of New Jersey, "Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2013," 16–27, http://www.nj.gov/treasury/omb/publications/13cafr/pdf/fullcafr2013.pdf.

"New Jersey has struggled to balance its budget for more than a decade. The state's tax system depends heavily on the income tax and in particular on high earners, leaving revenue collections vulnerable to market downturns."

48. Massachusetts. According to its CAFR, Massachusetts had a net deficit of $21 billion in FY 2013.[52] Most of the increase from FY 2012 was owing to liabilities for state pensions and health care obligations. Other state liabilities include transportation-related debts and $6 billion in construction costs for the Massachusetts School Building Authority.[53] Revenues increased by $857 million in FY 2013 in most tax categories, including income, sales, and corporate taxes.[54] Massachusetts's total primary government debt is $25 billion, or 6.6 percent of residents' total personal income ($3,810 per capita).

Massachusetts's two primary pension plans, the State Employees Retirement System and the Massachusetts Teachers' Retirement System, have total unfunded liabilities of $26 billion, meaning that they are 61 percent funded. On a guaranteed-to-be-paid basis, total unfunded liabilities amount to $90 billion, or 23 percent of residents' personal income, and are 32 percent funded. OPEB add a further unfunded liability of $15 billion.

47. Connecticut. In FY 2013, Connecticut realized a net deficit of $10.5 billion during the year, largely owing to long-term obligations—including net pension and OPEB obligations and compensated absences—that exceed available resources.[55] Connecticut's position improved slightly during FY 2012 owing to an increase in income and inheritance tax revenues.[56] Higher-than-anticipated revenues resulted in an estimated budget surplus of $364 million. The surplus is a measure of the degree to which revenues match current expenses. Connecticut presented a balanced budget for the fiscal year, but has a deficit when

52. Commonwealth of Massachusetts, "Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2013," 21–37, http://www.mass.gov/legis/journal/desktop/2013/cafr.pdf.
53. Ibid.
54. Ibid.
55. Office of the State Comptroller, "State of Connecticut Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2013," 15–25 http://www.osc.ct.gov/2013cafr/CAFR13.pdf.
56. Ibid.

accounting for the long-term position of the state.[57] Bonded debt increased in FY 2013 owing to $263 million in new GO bonds. Total primary government debt was $19.7 billion, or $5,481 per capita, representing 9 percent of residents' personal income.

Pension obligations are a significant source of fiscal stress for the state. In FY 2013, according to the state's actuarial reports for its five pension plans, total unfunded liabilities amounted to $26 billion, for an average funded ratio of 50 percent. On a guaranteed-to-be paid basis, unfunded liabilities rise to $76 billion, for an average funded ratio of 25 percent, making Connecticut's pension system among the weakest in the nation. On a risk-free basis, unfunded pension liabilities represent 35 percent of residents' personal income. OPEB liabilities total $23 billion and operate on a pay-as-you-go basis.

46. New York. New York's net position worsened in FY 2013 by $326 million, in part owing to the issuance of debt for reasons other than for capital assets or governmental activities.[58] The general fund reported a surplus of $1.1 billion, owing to the increase in income and business tax revenues.[59] Total government debt amounted to $58 billion, or $2,946 per capita (5.4 percent of residents' personal income). New York's three major pension plans, the State Employees Retirement System, Police and Fire Retirement System, and Teachers' Retirement System, have a total unfunded liability of $31 billion, making them, on average, 88 percent funded. On a guaranteed-to-be-paid basis, the total unfunded liability amounts to $251 billion, or 23 percent of residents' personal income, resulting in an average funded ratio of 48 percent.

CONCLUSION

Fiscal metrics are a valuable tool for assessing the short- and longer-run outlook for state finances. Adapting Arnett's FY 2012 metrics to the comprehensive annual financial reports of the 50 states for FY 2013, this study finds that not much has changed in the last fiscal year. The top performers in FY 2012—Alaska, North Dakota, South Dakota, Nebraska, and Wyoming—remain at the top largely owing to their fiscal robustness and high levels of cash to cover the short term. The worst performers in FY 2012—New Jersey, Massachusetts, Connecticut, Illinois, and California—continue to exhibit fiscal weakness

57. Ibid.
58. State of New York, "Comprehensive Annual Financial Report for the Fiscal Year Ended March 13, 2013," 19–28, http://www.osc.state.ny.us/finance/finreports/2013cafr.pdf.
59. Ibid.

in budget solvency, long-term liabilities, unfunded pension obligations, and short-term indicators.

This study provides an additional level of detail compared with last year's rankings by reporting the individual results for each financial ratio for each state. In addition, it provides and measures states' debt levels, unfunded pension obligations, and OPEB relative to residents' personal income in order to gauge the size of these long-term commitments to residents' personal income—a proxy for the tax base. The most alarming finding is the level of unfunded pension obligations relative to personal income across the states. When calculated as though they are fully guaranteed to be paid, states' unfunded pension obligations account for a large portion of residents' personal income. States that appear fiscally robust over the short term—Alaska and North Dakota—also face underlying risks with unfunded pension benefits. While these obligations are due over decades, this metric is a flag that unfunded liabilities represent a potential drain on future resources and state economies. It also points to the need for improvement in how states measure and report on pension obligations. Though GASB 68 is a recent reform meant to more accurately measure state pension plans, this new method introduces a new distortion. Systems that appear well-funded under now-phased-out accounting standards (GASB 27) will begin to show larger unfunded liabilities under GASB 68, while states that are relatively well funded under GASB 27 will only show modest increases in liabilities. Plans are not assessed consistently under GASB 68, presenting an inaccurate picture of many systems. The pension metrics presented in this paper are calculated on a risk-free basis and show that policymakers in all states need to accurately measure long-term liabilities with reference to current bond rates.

The five dimensions of solvency each shed light on a particular time frame in governments' finances. While the final rankings give more weight to the short run, caution is needed in attaching too much meaning to the final score. Short-term solvency does not necessarily mean long-run stability. States that are highly dependent on volatile or uncertain revenue streams may be at risk for long-run fiscal stress. The long run is also subject to change, as states may undertake pension or budget reforms that will change the long-run outcome.

Rankings cannot capture states' full fiscal performance, but they can provide a snapshot of fiscal health. By providing the metrics behind the rankings and by supplementing CAFR data with pension and OPEB data, more refined metrics may be developed to help inform the public of states' fiscal health.

APPENDIX A: DATA TABLES

TABLE A1. COMPONENTS OF CASH SOLVENCY: CASH, QUICK, AND CURRENT RATIOS FOR THE STATES

State	Cash ratio	Quick ratio	Current ratio
Alabama	3.86	4.43	5.19
Alaska	13.32	13.59	13.69
Arizona	0.94	1.19	1.40
Arkansas	2.28	2.91	3.10
California	0.59	0.92	1.29
Colorado	1.48	2.18	2.24
Connecticut	0.40	1.11	1.15
Delaware	2.29	3.16	3.48
Florida	6.76	7.80	7.81
Georgia	1.37	2.18	2.26
Hawaii	1.84	2.32	2.47
Idaho	2.66	3.19	3.91
Illinois	0.49	0.79	1.26
Indiana	1.54	2.26	2.60
Iowa	2.33	3.15	3.23
Kansas	1.30	2.23	2.26
Kentucky	1.03	1.87	2.35
Louisiana	1.76	2.30	3.03
Maine	0.34	0.78	1.40
Maryland	0.76	1.77	2.10
Massachusetts	0.48	1.13	1.19
Michigan	1.11	1.92	2.42
Minnesota	1.48	2.01	2.24
Mississippi	2.28	2.31	2.96
Missouri	2.26	4.23	4.43
Montana	4.09	4.53	5.40
Nebraska	3.40	4.39	4.59
Nevada	1.89	3.32	3.39
New Hampshire	0.65	1.44	2.61
New Jersey	0.74	1.93	1.98
New Mexico	2.05	3.13	3.23
New York	0.59	1.57	1.64
North Carolina	0.80	1.53	1.88
North Dakota	3.64	4.37	5.67
Ohio	5.14	7.12	7.36
Oklahoma	2.53	3.06	3.32
Oregon	1.94	2.57	2.80
Pennsylvania	0.83	1.19	1.48
Rhode Island	0.96	1.55	1.86
South Carolina	2.11	2.82	3.51
South Dakota	5.56	7.86	7.98
Tennessee	3.05	4.38	4.83
Texas	1.32	1.88	2.26
Utah	2.95	4.51	4.67
Vermont	1.28	2.11	2.14
Virginia	1.47	2.11	2.18
Washington	1.64	2.79	3.59
West Virginia	1.52	1.80	2.05
Wisconsin	0.87	1.70	1.74
Wyoming	5.42	5.71	6.78

TABLE A2. COMPONENTS OF BUDGET SOLVENCY:
OPERATING RATIO AND SURPLUS OR DEFICIT PER CAPITA

State	Operating ratio	Surplus or deficit per capita ($)
Alabama	1.02	90.02
Alaska	1.56	8,043.47
Arizona	1.08	351.07
Arkansas	1.02	99.09
California	1.04	260.07
Colorado	1.05	255.86
Connecticut	1.00	29.37
Delaware	1.01	75.18
Florida	1.12	434.51
Georgia	1.03	149.93
Hawaii	1.03	220.58
Idaho	1.09	372.03
Illinois	1.00	−$3.80
Indiana	1.03	151.57
Iowa	1.06	371.30
Kansas	1.04	192.58
Kentucky	1.00	−24.68
Louisiana	0.97	−183.62
Maine	1.04	239.58
Maryland	1.00	−10.31
Massachusetts	0.98	−171.14
Michigan	1.05	257.91
Minnesota	1.07	437.74
Mississippi	1.03	164.51
Missouri	1.05	185.63

State	Operating ratio	Surplus or deficit per capita ($)
Montana	1.09	493.46
Nebraska	1.07	306.57
Nevada	1.08	235.64
New Hampshire	1.04	195.11
New Jersey	0.93	−486.53
New Mexico	1.00	−20.37
New York	1.00	−16.66
North Carolina	1.06	289.70
North Dakota	1.51	4,539.68
Ohio	1.03	162.12
Oklahoma	1.05	248.70
Oregon	1.08	436.90
Pennsylvania	1.01	68.89
Rhode Island	1.05	352.68
South Carolina	1.07	318.40
South Dakota	1.07	322.81
Tennessee	1.05	198.87
Texas	1.09	397.26
Utah	1.14	538.47
Vermont	1.01	79.71
Virginia	1.04	166.93
Washington	1.02	140.16
West Virginia	1.02	116.65
Wisconsin	1.07	419.29
Wyoming	1.28	2,137.64

TABLE A3. COMPONENTS OF LONG-RUN SOLVENCY:
NET ASSET RATIO, LONG-TERM LIABILITY RATIO, AND LONG-TERM LIABILITIES PER CAPITA

State	Net asset ratio	Long-term liability ratio	Long-term liability per capita ($)
Alabama	0.08	0.20	1,309
Alaska	0.82	0.04	4,102
Arizona	0.13	0.27	1,664
Arkansas	0.15	0.25	1,913
California	−0.43	0.79	4,319
Colorado	0.25	0.22	1,360
Connecticut	−0.82	1.26	8,350
Delaware	0.00	0.46	5,682
Florida	0.07	0.33	2,180
Georgia	0.03	0.38	1,706
Hawaii	0.00	0.62	7,896
Idaho	0.32	0.12	1,029
Illinois	−1.17	1.44	5,709
Indiana	0.21	0.11	413
Iowa	0.22	0.19	1,353
Kansas	0.14	0.23	1,422
Kentucky	−0.33	0.56	3,837
Louisiana	0.05	0.40	2,726
Maine	0.03	0.16	931
Maryland	−0.16	0.64	4,336
Massachusetts	−0.86	1.47	5,947
Michigan	0.01	0.34	1,340
Minnesota	0.13	0.28	1,638
Mississippi	0.06	0.26	1,943
Missouri	0.05	0.19	1,277

State	Net asset ratio	Long-term liability ratio	Long-term liability per capita ($)
Montana	0.34	0.12	1,199
Nebraska	0.28	0.03	254
Nevada	0.08	0.39	1,546
New	0.05	0.41	1,830
New Jersey	−1.40	2.04	8,662
New Mexico	0.38	0.19	2,102
New York	−0.30	0.63	4,616
North Carolina	−0.04	0.22	1,299
North Dakota	0.56	0.14	3,934
Ohio	0.06	0.56	3,728
Oklahoma	0.35	0.12	703
Oregon	0.15	0.38	3,165
Pennsylvania	−0.09	0.41	1,887
Rhode Island	−0.12	0.52	2,863
South Carolina	0.23	0.20	1,083
South Dakota	0.31	0.09	740
Tennessee	0.13	0.10	551
Texas	0.35	0.22	2,053
Utah	0.26	0.20	1,856
Vermont	−0.02	0.38	2,197
Virginia	0.01	0.30	1,483
Washington	0.01	0.66	7,735
West Virginia	0.11	0.25	2,443
Wisconsin	−0.08	0.38	2,726
Wyoming	0.72	0.09	3,322

TABLE A4. COMPONENTS OF SERVICE-LEVEL SOLVENCY:
TAXES, REVENUES, AND EXPENSES TO TOTAL STATE PERSONAL INCOME

State	Taxes/ personal income	Revenues/ personal income	Expenses/ personal income
Alabama	0.05	0.12	0.12
Alaska	0.13	0.44	0.28
Arizona	0.05	0.13	0.12
Arkansas	0.06	0.17	0.17
California	0.06	0.13	0.12
Colorado	0.04	0.11	0.10
Connecticut	0.07	0.13	0.13
Delaware	0.09	0.18	0.18
Florida	0.04	0.10	0.09
Georgia	0.04	0.12	0.12
Hawaii	0.09	0.16	0.16
Idaho	0.06	0.14	0.13
Illinois	0.06	0.12	0.12
Indiana	0.06	0.12	0.12
Iowa	0.06	0.14	0.13
Kansas	0.06	0.11	0.11
Kentucky	0.07	0.15	0.15
Louisiana	0.04	0.13	0.14
Maine	0.07	0.14	0.14
Maryland	0.05	0.11	0.11
Massachusetts	0.06	0.14	0.14
Michigan	0.07	0.14	0.13
Minnesota	0.08	0.14	0.13
Mississippi	0.06	0.16	0.16
Missouri	0.04	0.10	0.10
Montana	0.06	0.14	0.13
Nebraska	0.05	0.10	0.09
Nevada	0.03	0.08	0.08
New Hampshire	0.03	0.09	0.09
New Jersey	0.06	0.12	0.12
New Mexico	0.07	0.22	0.22
New York	0.06	0.15	0.15
North Carolina	0.06	0.12	0.12
North Dakota	0.13	0.24	0.16
Ohio	0.05	0.13	0.12
Oklahoma	0.05	0.12	0.11
Oregon	0.06	0.16	0.14
Pennsylvania	0.05	0.12	0.12
Rhode Island	0.06	0.15	0.14
South Carolina	0.06	0.13	0.12
South Dakota	0.04	0.10	0.09
Tennessee	0.05	0.11	0.11
Texas	0.04	0.11	0.10
Utah	0.06	0.12	0.10
Vermont	0.10	0.19	0.19
Virginia	0.05	0.09	0.09
Washington	0.05	0.13	0.13
West Virginia	0.08	0.18	0.18
Wisconsin	0.06	0.14	0.13
Wyoming	0.09	0.18	0.14

TABLE A5. COMPONENTS OF TRUST FUND SOLVENCY:
PRIMARY DEBT, PENSIONS, AND OTHER POSTEMPLOYMENT BENEFITS TO PERSONAL INCOME

State	Primary debt/ personal income	Pensions/ personal income	OPEB/ personal income
Alabama	0.03	0.30	0.05
Alaska	0.08	0.67	0.21
Arizona	0.04	0.25	0.00
Arkansas	0.03	0.29	0.02
California	0.07	0.34	0.04
Colorado	0.02	0.34	0.01
Connecticut	0.09	0.35	0.10
Delaware	0.07	0.18	0.14
Florida	0.03	0.19	0.01
Georgia	0.04	0.23	0.05
Hawaii	0.12	0.42	0.22
Idaho	0.02	0.24	0.00
Illinois	0.06	0.45	0.06
Indiana	0.00	0.16	0.00
Iowa	0.03	0.24	0.00
Kansas	0.03	0.25	0.00
Kentucky	0.05	0.47	0.03
Louisiana	0.07	0.31	0.03
Maine	0.02	0.25	0.03
Maryland	0.05	0.21	0.03
Massachusetts	0.07	0.23	0.04
Michigan	0.02	0.31	0.06
Minnesota	0.03	0.35	0.00
Mississippi	0.05	0.48	0.01
Missouri	0.02	0.28	0.01
Montana	0.01	0.31	0.01
Nebraska	0.00	0.15	n/a
Nevada	0.03	0.47	0.01
New Hampshire	0.02	0.21	0.03
New Jersey	0.08	0.27	0.14
New Mexico	0.05	0.54	0.05
New York	0.05	0.23	0.06
North Carolina	0.02	0.17	0.06
North Dakota	0.04	0.20	0.00
Ohio	0.04	0.52	0.03
Oklahoma	0.02	0.25	0.00
Oregon	0.07	0.37	0.00
Pennsylvania	0.03	0.26	0.03
Rhode Island	0.06	0.30	0.02
South Carolina	0.02	0.30	0.06
South Dakota	0.01	0.17	0.00
Tennessee	0.01	0.14	0.01
Texas	0.04	0.20	0.05
Utah	0.05	0.27	0.00
Vermont	0.02	0.14	0.03
Virginia	0.02	0.21	0.01
Washington	0.07	0.20	0.01
West Virginia	0.05	0.29	0.05
Wisconsin	0.06	0.12	0.00
Wyoming	0.00	0.32	0.01

Note: OPEB stands for other postemployment benefits.

TABLE A6. STATE DEBT

State	Total general obligation bonds ($ thousands)	Total primary government debt ($ thousands)	Personal income ($ thousands)	Ratio of debt to personal income	Total primary debt per capita ($)
Alabama	699,733	5,064,992	176,340,520	0.03	1,050
Alaska	893,966	3,001,064	36,866,615	0.08	4,103
Arizona	0	10,355,167	245,070,457	0.04	1,580
Arkansas	812,213	3,189,765	108,603,298	0.03	1,082
California	84,233,264	123,462,086	1,856,614,186	0.07	3,245
Colorado	0	6,110,374	247,068,771	0.02	1,178
Connecticut	14,228,228	19,678,384	218,131,742	0.09	5,481
Delaware	1,941,602	3,033,403	41,487,286	0.07	3,308
Florida	12,656,000	27,849,000	$811,376,557	0.03	1,442
Georgia	9,072,784	14,815,392	$378,156,381	0.04	1,493
Hawaii	5,600,789	7,457,930	63,468,314	0.12	5,357
Idaho	0	1,393,119	58,272,226	0.02	873
Illinois	27,398,638	33,664,223	605,201,478	0.06	2,615
Indiana	0	1,156,910	253,779,172	0.00	177
Iowa	0	3,701,234	138,337,469	0.03	1,204
Kansas	0	4,105,632	128,540,565	0.03	1,423
Kentucky	0	8,148,292	159,171,693	0.05	1,860
Louisiana	3,838,301	12,754,199	190,589,832	0.07	2,772
Maine	369,725	956,359	54,358,810	0.02	720
Maryland	8,005,802	16,829,087	319,125,495	0.05	2,860
Massachusetts	25,249,471	25,319,601	383,152,205	0.07	3,810
Michigan	2,048,000	7,751,000	386,471,202	0.02	784
Minnesota	7,182,627	7,903,802	257,465,551	0.03	1,469
Mississippi	4,225,448	5,378,747	101,441,549	0.05	1,802
Missouri	378,150	4,126,999	245,771,389	0.02	685
Montana	139,595	288,202	39,962,564	0.01	287
Nebraska	0	29,031	88,113,758	0.00	16
Nevada	1,845,240	3,160,122	109,471,162	0.03	1,145
New Hampshire	1,011,362	1,649,705	67,513,196	0.02	1,249
New Jersey	2,400,910	40,386,343	492,896,761	0.08	4,556
New Mexico	296,890	3,660,813	74,996,363	0.05	1,755
New York	3,688,000	57,645,000	1,070,235,797	0.05	2,946
North Carolina	3,999,580	9,133,763	380,953,792	0.02	937
North Dakota	180,757	1,585,194	38,471,723	0.04	2,266

State	Total general obligation bonds ($ thousands)	Total primary government debt ($ thousands)	Personal income ($ thousands)	Ratio of debt to personal income	Total primary debt per capita ($)
Ohio	8,667,232	17,289,241	474,973,111	0.04	1,498
Oklahoma	136,585	2,626,719	161,187,913	0.02	689
Oregon	5,401,103	10,860,505	156,605,034	0.07	2,785
Pennsylvania	11,821,622	17,207,461	590,170,522	0.03	1,348
Rhode Island	1,103,945	2,807,771	49,409,582	0.06	2,673
South Carolina	1,376,697	3,440,390	171,088,428	0.02	728
South Dakota	0	496,095	38,897,143	0.01	595
Tennessee	2,712,630	2,941,566	256,968,697	0.01	456
Texas	15,759,000	44,695,000	1,160,078,868	0.04	1,715
Utah	3,361,000	5,001,000	106,288,727	0.05	1,751
Vermont	545,390	572,479	28,501,222	0.02	914
Virginia	791,992	6,991,929	403,424,740	0.02	854
Washington	18,660,000	23,054,000	332,654,857	0.07	3,343
West Virginia	498,776	3,494,545	65,888,889	0.05	1,883
Wisconsin	10,748,439	13,751,921	248,335,453	0.06	2,401
Wyoming	0	31,246	30,779,416	0.00	54

TABLE A7. PENSION LIABILITIES UNDER STATE DISCOUNT RATE ASSUMPTIONS

State (number of plans)	Assets ($ thousands)	Liabilities ($ thousands)	Unfunded liability ($ thousands)	Funded ratio (%)	Unfunded liability/ personal income (%)
Alabama (3)	28,136,859	42,516,832	14,379,973	66	8
Alaska (4)	9,871,967	18,043,760	8,171,792	55	22
Arizona (4)	37,043,542	51,851,937	14,808,395	71	6
Arkansas (5)	20,112,946	27,000,094	6,887,148	74	6
California (8)	479,253,000	621,948,000	142,695,000	77	8
Colorado (6)	39,451,273	64,562,838	25,111,565	61	10
Connecticut (5)	25,765,325	51,301,764	25,536,439	50	12
Delaware (7)	8,169,157	8,967,951	798,794	91	2
Florida (1)	131,680,615	154,125,953	22,445,338	85	3
Georgia (7)	70,214,980	87,253,847	17,038,867	80	5
Hawaii (2)	12,748,828	21,243,744	8,494,916	60	13
Idaho (3)	12,409,219	14,574,790	2,165,571	85	4
Illinois (6)	92,449,065	198,061,363	105,612,298	47	17
Indiana (7)	27,348,957	42,387,818	15,038,861	65	6
Iowa (4)	27,018,839	33,742,768	6,723,929	80	5
Kansas (1)	13,278,490	25,325,245	12,046,755	52	9
Kentucky (5)	26,253,322	55,203,784	28,950,462	48	18
Louisiana (5)	26,146,110	44,772,078	18,625,968	58	10
Maine (1)	11,452,000	14,395,300	2,943,300	80	5
Maryland (8)	39,515,619	60,362,848	20,847,229	65	7
Massachusetts (2)	42,104,859	68,520,660	26,415,801	61	7
Michigan (6)	57,210,000	91,428,200	34,218,200	63	9
Minnesota (11)	48,822,058	73,962,470	25,140,412	66	10
Mississippi (4)	20,928,347	36,343,989	15,415,642	58	15
Missouri (6)	45,495,882	59,138,405	13,642,523	77	6
Montana (8)	8,022,250	10,910,032	2,887,782	74	7
Nebraska (5)	9,581,947	12,067,045	2,485,098	79	3
Nevada (1)	29,108,500	41,984,500	12,876,000	69	12
New Hampshire (2)	6,112,228	10,780,073	4,667,845	57	7
New Jersey (5)	62,404,358	104,136,185	41,731,827	60	8
New Mexico (6)	22,459,639	33,680,655	11,221,017	67	15
New York (3)	230,680,400	261,516,900	30,836,500	88	3
North Carolina (4)	80,717,873	84,520,500	3,802,627	96	1
North Dakota (4)	3,570,600	5,851,500	2,280,900	61	6

State (number of plans)	Assets ($ thousands)	Liabilities ($ thousands)	Unfunded liability ($ thousands)	Funded ratio (%)	Unfunded liability/ personal income (%)
Ohio (4)	151,711,817	211,078,582	59,366,765	72	12
Oklahoma (7)	22,604,179	33,988,284	11,384,105	67	7
Oregon (1)	54,784,100	60,405,200	5,621,100	91	4
Pennsylvania (3)	86,089,304	133,539,272	47,449,968	64	8
Rhode Island (5)	7,524,960	12,333,734	4,808,774	61	10
South Carolina (5)	29,555,334	45,202,202	15,646,868	65	9
South Dakota (1)	8,803,700	8,803,700	0	100	0
Tennessee (2)	36,680,782	40,069,332	3,388,550	92	1
Texas (7)	168,956,440	208,826,077	39,869,637	81	3
Utah (8)	23,405,396	29,171,564	5,766,168	80	5
Vermont (3)	3,468,330	4,898,560	1,430,230	71	5
Virginia (4)	53,069,000	81,207,000	28,138,000	65	7
Washington (11)	63,127,000	67,508,500	4,381,500	94	1
West Virginia (8)	10,432,348	16,500,616	6,068,268	63	9
Wisconsin (1)	85,276,100	85,328,700	52,600	100	0
Wyoming (9)	7,186,844	9,132,959	1,998,715	79	6
TOTAL	2,618,214,688	3,601,613,251	992,375,559		

Source: "Accounting for Pensions by State and Local Governmental Employees" (Statement No. 27, Governmental Accounting Standards Board, 1994).

TABLE A8. PENSION LIABILITIES DISCOUNTED USING RISK-FREE DISCOUNT RATE

State (number of plans)	Market value of liability (MVL) ($ thousands)	Market value of unfunded liability ($ thousands)	Funded ratio (%)	Unfunded liability/ personal income (%)
Alabama (3)	81,916,108	53,779,249	34	30
Alaska (4)	34,756,234	24,884,266	40	67
Arizona (4)	99,369,077	62,325,535	37	25
Arkansas (5)	51,981,556	31,868,610	39	29
California (8)	1,115,469,392	636,216,392	43	34
Colorado (6)	124,206,610	84,755,337	32	34
Connecticut (5)	102,169,578	76,404,253	25	35
Delaware (7)	15,699,087	7,529,930	52	18
Florida (1)	286,805,212	155,124,597	46	19
Georgia (7)	156,509,256	86,294,276	45	23
Hawaii (2)	39,531,412	26,782,584	32	42
Idaho (3)	26,192,765	13,783,546	47	24
Illinois (6)	367,803,704	275,354,639	25	45
Indiana (7)	68,582,197	41,233,240	40	16
Iowa (4)	60,704,652	33,685,814	45	24
Kansas (1)	45,337,399	32,058,909	29	25
Kentucky (5)	100,772,303	74,518,981	26	47
Louisiana (5)	85,831,175	59,685,065	30	31
Maine (1)	24,982,294	13,530,294	46	25
Maryland (8)	106,893,323	67,377,704	37	21
Massachusetts (2)	132,017,028	89,912,169	32	23
Michigan (6)	176,107,116	118,897,116	32	31
Minnesota (11)	138,322,972	89,500,914	35	35
Mississippi (4)	70,023,047	49,094,700	30	48
Missouri (6)	113,490,058	67,994,176	40	28
Montana (8)	20,301,928	12,279,678	40	31
Nebraska (5)	23,147,460	13,565,513	41	15
Nevada (1)	80,890,478	51,781,978	36	47
New Hampshire (2)	20,060,094	13,947,866	30	21
New Jersey (5)	197,867,932	135,463,575	32	27
New Mexico (6)	62,674,633	40,214,994	36	54
New York (3)	481,930,176	251,249,776	48	23
North Carolina (4)	146,680,930	65,963,056	55	17
North Dakota (4)	11,273,938	7,703,338	32	20

State (number of plans)	Market value of liability (MVL) ($ thousands)	Market value of unfunded liability ($ thousands)	Funded ratio (%)	Unfunded liability/ personal income (%)
Ohio (4)	399,360,498	247,648,681	38	52
Oklahoma (7)	63,526,945	40,922,766	36	25
Oregon (1)	112,404,990	57,620,890	49	37
Pennsylvania (3)	239,147,342	153,058,039	36	26
Rhode Island (5)	22,165,301	14,640,341	34	30
South Carolina (5)	81,234,150	51,678,816	36	30
South Dakota (1)	15,278,363	6,474,663	58	17
Tennessee (2)	72,009,724	35,328,942	51	14
Texas (7)	395,982,079	227,025,639	43	20
Utah (8)	52,425,039	29,019,643	45	27
Vermont (3)	7,386,770	3,918,440	47	14
Virginia (4)	136,082,480	83,013,480	39	21
Washington (11)	128,272,102	65,145,102	49	20
West Virginia (8)	29,653,721	19,221,373	35	29
Wisconsin (1)	115,700,199	30,424,099	74	12
Wyoming (9)	16,995,062	9,808,218	42	32
TOTAL	6,557,925,893	3,939,711,205		

TABLE A9. OTHER POSTEMPLOYMENT BENEFITS: RETIREE HEALTH BENEFITS

State	Total unfunded OPEB liability ($ thousands)	Funded ratio (%)	OPEB/personal income (%)
Alabama	8,026,876	10	5
Alaska	7,883,447	54	21
Arizona	3,372,782	33	1
Arkansas	2,150,866	0	2
California	65,973,000	1	4
Colorado	1,596,624	6	1
Connecticut	22,580,814	0	10
Delaware	5,766,000	4	14
Florida	4,878,629	0	1
Georgia	18,496,661	0	5
Hawaii	13,671,926	0	22
Idaho	112,013	10	0
Illinois	34,488,085	0	6
Indiana	315,401	34	0
Iowa	293,200	0	0
Kansas	278,200	0	0
Kentucky	4,844,905	65	3
Louisiana	8,543,178	0	4
Maine	92,800	41	0
Maryland	8,791,856	1	3
Massachusetts	15,377,400	3	4
Michigan	22,551,600	7	6
Minnesota	651,890	0	0
Mississippi	690,339	0	1
Missouri	3,168,044	4	1
Montana	447,074	0	1
Nebraska	n/a	n/a	n/a
Nevada	947,000	0	1
New Hampshire	1,900,000	0	3
New Jersey	66,803,700	0	14
New Mexico	3,687,626	6	5
New York	67,714,000	0	6
North Carolina	23,097,279	3	6
North Dakota	n/a	n/a	0
Ohio	4,742,998	40	1
Oklahoma	4,621	0	0
Oregon	236,100	35	0
Pennsylvania	16,270,690	1	3
Rhode Island	858,737	27	2
South Carolina	9,724,138	78	6
South Dakota	67,800	0	0
Tennessee	1,623,943	0	1
Texas	61,208,246	0	5
Utah	267,759	37	0
Vermont	932,201	2	3
Virginia	3,676,000	29	1
Washington	3,706,856	0	1
West Virginia	1,600,000	0	2
Wisconsin	1,171,844	0	0
Wyoming	24,463	0	0

Note: OPEB stands for other postemployment benefits.

TABLE A10. PENSION PLANS

State	Plan
Alabama	Employees' Retirement System of Alabama
	Teachers' Retirement System of Alabama
	Judicial Retirement Fund
Alaska	Public Employees' Retirement System
	Teachers' Retirement System
	Judicial Retirement System
	National Guard and Naval Militia Retirement System
Arizona	Arizona State Retirement System
	Public Safety Personnel Retirement Systems
	Corrections Officer Retirement Plan
	Elected Officials' Retirement Plan
Arkansas	Arkansas Public Employees Retirement System
	Arkansas District Judges Retirement System
	Arkansas Teacher Retirement System
	Arkansas State Police Retirement System
	Arkansas Judicial Retirement System
	Arkansas State Highway Employees Retirement System
California	Public Employees' Retirement Fund
	Legislators Retirement Fund
	Judges' Retirement Fund
	Judges' Retirement Fund II
	California State Teachers' Retirement System: defined benefit plan
	California State Teachers' Retirement System: cash balance plan
	California State Teachers' Retirement System : defined benefit supplement
	University of California Retirement Plan
Colorado	Fire and Police Pension Association: defined benefit plan
	Fire and Police Pension Association: hybrid plan
	The State Division Trust Fund
	The School Division Trust Fund
	The Local Government Division Trust Fund
	The Judicial Division Trust Fund
Connecticut	State Employees' Retirement System
	Teachers' Retirement System
	Judges
	Municipal Employees Retirement System
	Probate Judges and Employees Retirement System

State	Plan
Delaware	State Employees' Plan
	New State Police Plan
	Revised Judicial Plan
	Diamond State Port Corporation Plans
	Volunteer Fireman Pension Plans
	County and Municipal Plan—General
	County and Municipal Plan—Police and Firefighter
Florida	Florida Retirement System
Georgia	Employees' Retirement System of Georgia
	Public School Employees Retirement System
	Legislative Retirement System
	Georgia Judicial Retirement System
	Georgia Military Pension Fund
	Teachers Retirement System
	Firefighters' Pension Fund
Hawaii	Employees' Retirement System
	Police and Firefighters
Idaho	Public Employee Retirement System of Idaho
	Firefighters' Retirement Fund
	Judges' Retirement Fund
Illinois	State Employees' Retirement System
	Judges' Retirement System
	General Assembly Retirement System
	Teachers' Retirement System
	State Universities Retirement System
	Illinois Municipal Retirement System
Indiana	Public Employees' Retirement Fund
	Teachers' Retirement Fund
	1977 Police Officers' and Firefighters' Pension and Disability Fund
	Judges Retirement System
	State Excise Police, Gaming Agent, Gaming Control Officer, and Conservation Enforcement Officers' Retirement Plan
	Prosecuting Attorneys' Retirement Fund
	Legislators' Retirement System

State	Plan
Iowa	Iowa Public Employees' Retirement System
	Judicial Retirement Fund
	Peace Officers' Retirement, Accident and Disability System
	Municipal Fire and Police Retirement System
Kansas	Kansas Public Employees Retirement System
Kentucky	Kentucky Employees Retirement System
	Teachers' Retirement System
	Judicial Retirement Plan
	Legislative Retirement Plan
	State Police Retirement System
Louisiana	Firefighters' Retirement System
	Louisiana State Employees' Retirement System
	Teachers Retirement System of Louisiana
	Louisiana School Employees' Retirement System
	Louisiana State Police Retirement System
Maine	Maine Public Employees Retirement System
Maryland	Teachers' Retirement System
	Employees' Retirement System
	State Police Retirement System
	Judges' Retirement System
	Law Enforcement Officers' Pension System
	Correctional Officers Retirement System
	Employees Retirement System: Municipal
	Law Enforcement Officers' Pension System: Municipal
Massachusetts	State Employees' Retirement System
	Massachusetts Retirement System
Michigan	Legislative Retirement System
	State Police Retirement System
	State Employees' Retirement System
	Public School Employees' Retirement System
	Judges' Retirement System
	Municipal Employees' Retirement System of Michigan

State	Plan
Minnesota	State Employees Retirement Fund
	State Patrol Retirement Fund
	Correctional Employees Retirement Fund
	Judicial Retirement Fund
	Legislators Retirement Fund
	Elective State Officers Fund
	General Employees Retirement Fund
	Public Employees Police and Fire Fund
	Public Employees Correctional Fund
	Municipal Employees Retirement Fund
	Teachers Retirement Association
Mississippi	Public Employees' Retirement System
	Mississippi Highway Safety Patrol Retirement System
	Municipal Retirement System
	Supplemental Legislative Retirement System
Missouri	Missouri State Employees' Plan
	Judicial Plan
	Missouri Department of Transportation and Highway Patrol Employees' Retirement System
	University of Missouri Retirement Plan
	Public School Retirement System
	Public Education Employee Retirement System
Montana	Montana Municipal Police Officers' Retirement System
	Firefighters' United Retirement System
	Sheriffs' Retirement System
	Highway Patrol Officers' Retirement System
	Game Wardens' & Peace Officers' Retirement System
	Judges Retirement System
	Volunteer Firefighters' Compensation System
	Teachers' Retirement System
Nebraska	Nebraska School Employees' Retirement System
	Nebraska Judges' Retirement System
	Nebraska State Patrol Retirement System
	State Employees Retirement Benefit Fund
	County Employees' Retirement System

State	Plan
Nevada	Public Employees Retirement System
New Hampshire	New Hampshire Retirement System
	Judicial Retirement Plan
New Jersey	Public Employees Retirement System (state)
	Public Employees Retirement System (local)
	Teachers' Pension and Annuity Fund
	State Police Retirement System
	Judicial Retirement System
New Mexico	Public Employees Retirement Fund
	Legislative Retirement Fund
	Judicial Retirement Fund
	Magistrate Retirement Fund
	Volunteer Firefighters Retirement Fund
	Educational Retirement Board
New York	Employees' Retirement System
	Police and Fire Retirement System
	Teachers' Retirement System
North Carolina	Teachers' and State Employees' Retirement System
	Consolidated Judicial Retirement System
	Legislative Retirement System
	Local Government Employees' Retirement System
North Dakota	Public Employees Retirement System
	Highway Patrolmen's Retirement System
	Retirement Plan for Employees of Job Service North Dakota
	Teachers' Fund for Retirement
Ohio	Ohio Public Employee Retirement System
	School Employees Retirement System
	State Teachers Retirement System
	Police and Fire Pension Fund
Oklahoma	Oklahoma Public Employees Retirement System
	Teachers Retirement System of Oklahoma
	Uniform Retirement System for Justices and Judges
	Oklahoma Firefighters Pension and Retirement System
	Oklahoma Police Pension and Retirement System
	Oklahoma Law Enforcement Retirement System
	Wildlife Conservation Retirement Plan

State	Plan
Oregon	Public Employees Retirement System
Pennsylvania	State Employees' Retirement System
	Public School Employees' Retirement System
	Municipal Retirement System
Rhode Island	Employees' Retirement System of Rhode Island
	Teachers' Retirement System
	Municipal Employees' Retirement System
	Judicial Retirement Board Trust
	State Police Retirement Board Trust
South Carolina	South Carolina Retirement System
	Police Officers Retirement System
	General Assembly Retirement System
	Judges and Solicitors Retirement System
	National Guard Retirement System
South Dakota	South Dakota Retirement System
Tennessee	Tennessee Consolidated Retirement System
	State Employees, Teachers, Higher Education Employees Plan
Texas	Employees Retirement System
	Law Enforcement and Custodial Officer Supplemental Retirement Fund
	Judicial Retirement System I
	Judicial Retirement System II
	Teacher Retirement System
	Municipal Retirement System
	County and District Retirement System
	Emergency Services Retirement System
Utah	Noncontributory Retirement System
	Contributory Retirement System
	Public Safety Retirement System
	Firefighters Retirement System
	Judges Retirement System
	Utah Governors and Legislators Retirement Plan
	Tier 2 Public Employees Retirement System
	Tier 2 Public Safety and Firefighters Retirement System

State	Plan
Vermont	State Employees' Retirement System
	State Teachers Retirement System
	Municipal Employees' Retirement System
Virginia	Virginia Retirement System
	State Police Officers' Retirement System
	Virginia Law Officers' Retirement System
	Judicial Retirement System
Washington	Public Employees' Retirement System Plan 1
	Public Employees' Retirement System Plan 2/3
	Teachers' Retirement System Plan 1
	Teachers' Retirement System Plan 2/3
	School Employees' Retirement System
	Law Enforcement Officers' and Fire Fighters' Retirement Plan 1
	Law Enforcement Officers' and Fire Fighters' Retirement Plan 2
	Washington State Patrol Retirement System
	Public Safety Employees' Retirement System
	Judicial Retirement System
	Judges' Retirement Fund
West Virginia	Public Employees' Retirement System
	Deputy Sheriff Retirement System
	Emergency Medical Services Retirement System
	Municipal Police Officers and Firefighters Retirement System
	Teachers' Retirement System
	Public Safety Death, Disability, and Retirement Fund
	State Police Retirement System
	Judges' Retirement System
Wisconsin	Wisconsin Retirement System
Wyoming	Public Employees Pension Plan
	State Patrol, Game and Fish Warden and Criminal Investigator Plan
	Volunteer Fireman's Pension Plan
	Paid Firemen's Pension Plan A
	Paid Firemen's Pension Plan B
	Judicial Pension Plan
	Law Enforcement Pension Plan
	Volunteer Emergency Medical Technician Pension plan
	Air Guard Firefighters Pension Plan

TABLE A11. CORRELATION MATRIX FOR FINANCIAL INDICATORS WITHIN EACH SOLVENCY INDEX

Cash solvency	**Cash ratio**	**Quick ratio**	**Current ratio**
Cash ratio	1.000		
Quick ratio	0.980	1.000	
Current ratio	0.978	0.990	1.000
Budget solvency	**Operating ratio**	**Surplus or deficit per capita**	
Operating ratio	1.000		
Surplus or deficit per capita	0.945	1.000	
Long-run solvency	**Net asset ratio**	**Long-term liability ratio**	**Long-term liability per capita**
Net asset ratio	1.000		
Long-term liability ratio	0.541	1.000	
Long-term liability per capita	0.300	0.658	1.000
Service-level solvency	**Taxes/income ratio**	**Revenues/income ratio**	**Expenses/income ratio**
Taxes/income ratio	1.000		
Revenues/income ratio	0.825	1.000	
Expenses/income ratio	0.810	0.968	1.000
Trust fund solvency	**Debt/income ratio**	**Pensions/income ratio**	**OPEB/income ratio**
Debt/income ratio	1.00		
Pensions/income ratio	0.378	1.00	
OPEB/income ratio	0.614	0.375	1.00

Note: OPEB stands for other postemployment benefits.

TABLE A12. CORRELATION MATRIX FOR CASH, BUDGET, LONG-RUN, SERVICE-LEVEL, AND TRUST FUND INDEXES

	Cash	Budget	Long-run	Service-level
Cash	1.000			
Budget	0.718	1.000		
Long-run	0.532	0.436	1.000	
Service-level	–0.135	–0.388	0.049	1.000
Trust fund	0.024	–0.037	0.575	0.216
	Overall rank w/o trust			
Overall rank w/o trust	1			
Overall rank with trust	0.0996			

Note: OPEB stands for other postemployment benefits.

APPENDIX B. METHODOLOGY

This study calculates 14 financial metrics, as described in table 2, to create five dimensions of solvency: cash, budget, long-run, service-level, and trust fund. The individual metrics are grouped and summed together according to which dimension of solvency they contribute to.

For some metrics, a higher value indicates a higher degree of solvency. These include the cash ratio, quick ratio, current ratio, operating ratio, surplus or deficit per capita, and net asset ratio. For several metrics, a lower value indicates higher solvency. To construct a ranking that is intuitive to interpret, the following metrics are transformed by taking their inverse: long-term liability ratio, long-term liability per capita, taxes per capita, revenue per capita, expenses per capita, pension affordability ratio, OPEB affordability ratio, and debt affordability ratio.

To illustrate how a ranking is calculated from the individual indicators, table B2 uses Alabama's financials to calculate the cash solvency index score for that state. The financial data are expressed in thousands.

$$\text{cash solvency index score} = \sigma\ (\text{z-scores for cash ratio, quick ratio, current ratio}).$$

1. Calculate Each Ratio

cash ratio = (cash + cash equivalents + investments)/current liabilities
Alabama cash ratio = $7,219,595/$1,871,150
Alabama cash ratio = 3.86
Interpretation: Alabama has 3.86 times enough cash to cover its current liabilities. "Cash" includes the most liquid items such as petty cash and deposits, and excludes items that may take longer to convert to cash. Cash is all the money available to pay bills immediately.

quick ratio = (cash + cash equivalents + investments + receivables)/current liabilities
Alabama quick ratio = $8,290,441/$1,871,150
Alabama quick ratio = 4.43
Interpretation: Alabama has 4.43 times the amount of cash it needs to cover current liabilities. This ratio also includes less liquid forms of cash such as investments that expire in one year and receivables or obligations owed to the government.

current ratio = current assets/current liabilities
Alabama current ratio = $9,709,437/$1,871,150
Alabama current ratio = 5.19
Interpretation: The current ratio includes all the elements of the cash and current ratios plus internal balances and government-wide inventories. Alabama has 5.19 the level of assets it needs to cover current liabilities.

These three metrics form the components of the cash solvency index score. Owing to wide variations in the size of individual states' financials, each of these metrics is put on the same scale so that fiscal performance across states may be meaningfully compared. To do this, the z-score of each indicator is calculated. The z-score, also known as a standard score, measures how far away the value for one state's indicator is from that indicator's mean value for all 50 states. The z-score is calculated by subtracting the mean of the population from the value of the indicator and dividing by the standard deviation of the population. The formula is as follows:

$$Z = \frac{X - \mu}{\sigma}$$

Table B1 indicates what various z-score values represent.

TABLE B1. MEANING OF Z-SCORE VALUES

Z-score	Interpretation
0	Value is equal to the mean
< 0	Value is less than the mean
> 0	Value is greater than the mean
1	Value is 1 standard deviation greater than the mean
−1	Value is 1 standard deviation less than the mean
2	Value is 2 standard deviations greater than the mean
−2	Value is 2 standard deviations less than the mean

The z-scores for each indicator are grouped and summed according to the dimension of solvency being measured.

Continuing with the example, I calculate Alabama's cash solvency index score by standardizing each of the previous indicators (cash ratio, quick ratio, and current ratio) based on the mean and standard deviation for the 50 states for those ratios.

2. Calculate the Z-Score for the Cash Ratio, Given the Following

mean value for the cash ratio for the 50 states = 2.23
standard deviation for the cash ratio for the 50 states = 2.16
Alabama cash ratio = 3.86

$$Z_{\text{cash ratio}} = \frac{X - \mu}{\sigma}$$
$$Z_{\text{cash ratio}} = \frac{3.8 - 2.23}{2.16}$$
$$Z_{\text{cash ratio}} = 0.755.$$

3. Calculate the Z-Score for the Quick Ratio, Given the Following

mean value for the quick ratio for the 50 states = 3.02
standard deviation for the quick ratio for the 50 states = 2.26
Alabama quick ratio = 4.43

$$Z_{\text{quick ratio}} = \frac{X - \mu}{\sigma}$$
$$Z_{\text{quick ratio}} = \frac{4.43 - 3.02}{2.26}$$
$$Z_{\text{quick ratio}} = 0.623.$$

4. Calculate the Z-Score for the Current Ratio, Given the Following

mean value for the current ratio for the 50 states = 3.37
standard deviation for the current ratio for the 50 states = 2.28
Alabama current ratio = 5.19

$$Z_{\text{current ratio}} = \frac{X - \mu}{\sigma}$$
$$Z_{\text{current ratio}} = \frac{5.19 - 3.37}{2.28}$$
$$Z_{\text{current ratio}} = 0.80.$$

5. Calculate the Cash Solvency Score or Rank

$$\Sigma\,(Z_{\text{cash ratio}}, Z_{\text{quick ratio}}, Z_{\text{current ratio}})$$
$$= \Sigma\,(0.755, 0.623, 0.80)$$
$$= 2.18$$

Alabama's cash solvency score is two standard deviations above the mean value for the 50 states. Alabama is ranked seventh among the states for cash solvency.

The other four dimensions of solvency are computed accordingly:

budget solvency index = sum of z-scores (operating ratio + surplus/deficit per capita)
long-run solvency index = sum of z-scores for (net asset ratio + inverse of long-term liability ratio + inverse of long-term liability per capita)
service-level solvency index = sum of z-scores (inverse of tax income ratio + inverse of revenue income ratio + inverse of expenses income ratio)
trust fund solvency index = sum of z-scores of (inverse of pension income ratio + inverse of OPEB income ratio + inverse of debt income ratio)

To arrive at an overall final ranking that aggregates each dimension of solvency, the ranking for each dimension of solvency is assigned a weight. Cash solvency and budget solvency are each assigned a weight of 35 percent. Long-run solvency, service-level solvency, and trust fund solvency are each assigned a weight of 10 percent.

These weights are selected based on the budgetary immediacy of each dimension. Changing the weights would change the ranking of the states. This study gives more weight to the short term and medium term rather than the long term, which includes total pension and health care obligations. States' ability to meet these obligations depends on unknowns, such as future budget and legal, fiscal, and economic circumstances. After applying these weights, the final overall solvency score is assigned to each state. As table B2 shows for Alabama, summing each individual solvency score and multiplying it by the assigned weight yields a final overall solvency score of 0.59, meaning Alabama's overall solvency is slightly above the mean for the population of states. Alabama is ranked 12th for overall fiscal solvency.

TABLE B2. ALABAMA'S FIVE INDEX SCORES AND CALCULATION OF OVERALL SOLVENCY

State	Cash solvency score (0.35)	Budget solvency score (0.35)	Long-run solvency score (0.10)	Service-level solvency score (0.10)	Trust fund solvency score (0.10)	Overall solvency (sum of five rankings)
Alabama	2.18	−0.70	0.31	1.32	−0.83	2.28
Score multiplied by weight	0.76	−0.25	0.03	0.13	−0.08	0.60

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