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Stress-Testing States: Looking Toward the Next Recession

Introduction

State governments are at a crucial juncture. Two years of rapid, stimulus-fueled growth are quickly coming to a close and the specter of another recession is beginning to take shape. While a recession in the coming year is still far from certain, recessions and their place in the business cycle are a fact of life. Therefore, preparing for recessions is an equally inescapable concept, with potentially devastating consequences for those who treat it as an afterthought. While this is true even in times of seeming economic stability, the multitude of risks currently threatening the U.S. economy make an examination of a potential recession and resulting budget shortfalls more important than ever.

Stress-Testing States: Looking Toward the Next Recession

BY EMILY MANDEL, HALEY CURTIN AND BRIDGET RYAN

State governments are at a crucial juncture. Two years of rapid, stimulus-fueled growth are quickly coming to a close and the specter of another recession is beginning to take shape. While a recession in the coming year is still far from certain, recessions and their place in the business cycle are a fact of life. Therefore, preparing for recessions is an equally inescapable concept, with potentially devastating consequences for those who treat it as an afterthought. While this is true even in times of seeming economic stability, the multitude of risks currently threatening the U.S. economy make an examination of a potential recession and resulting budget shortfalls more important than ever. To help state

governments better prepare themselves for the next recession, Moody's Analytics has taken to performing annual stress tests on states' budgets. After shifting our methodology over the past two years to focus on the potential impact of the COVID-19 recession, this paper will return to our original objective, estimating the amount of fiscal stress likely to be applied to state budgets under a likely next recession scenario, and comparing that stress with the amount of money states have set aside in reserve. This report is meant to inform policymakers and other key stakeholders about the broad fiscal risks of the next recession on state budgets and their economies and is limited by the amount of data available to us across all 50 states. This should not serve as a substitute for states performing their own comprehensive stress tests. To best mitigate the risks of recession, states are encouraged to undertake their own stress-testing exercises using their own data, which will always be more comprehensive and detailed than what was available for the purposes of this report.

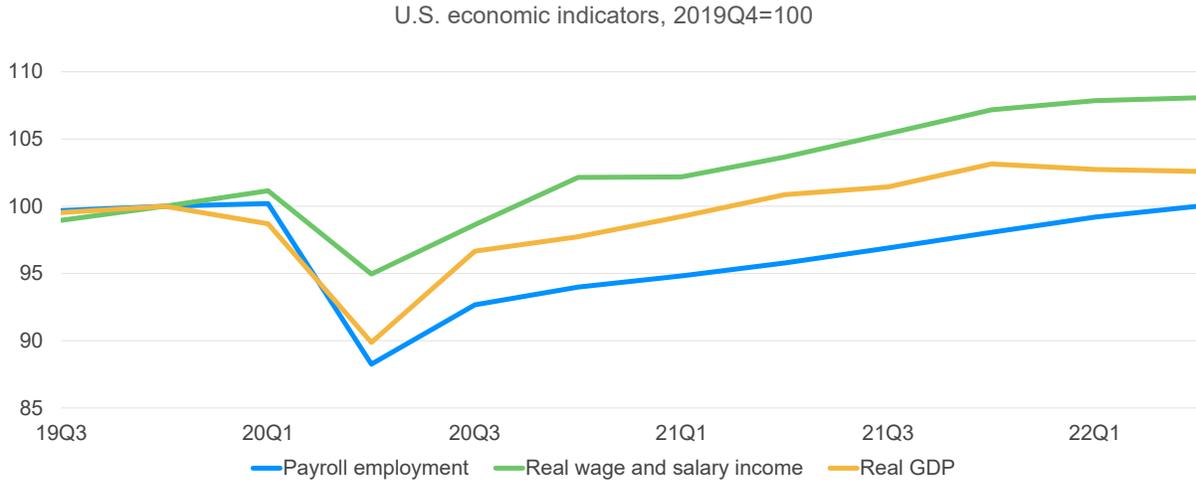
Where states are now

The speed with which the economy recovered from the COVID-19 pandemic defied expectations. Incomes proved much more resilient than was first thought possible as we found ways to work around COVID-19, and the federal government plunged truly massive amounts of fiscal stimulus into the breach. As a result, the U.S. economy will enter any coming recession having, in many ways, fully recovered from the COVID-19 recession (see Chart 1).

Stress-Test Findings

- » Thirty-nine states have the cash balances they need to weather a moderate recession.
- » Four states have most of the cash balances they need to weather a moderate recession.
- » Seven states have significantly smaller cash balances than they would need to weather a moderate recession.

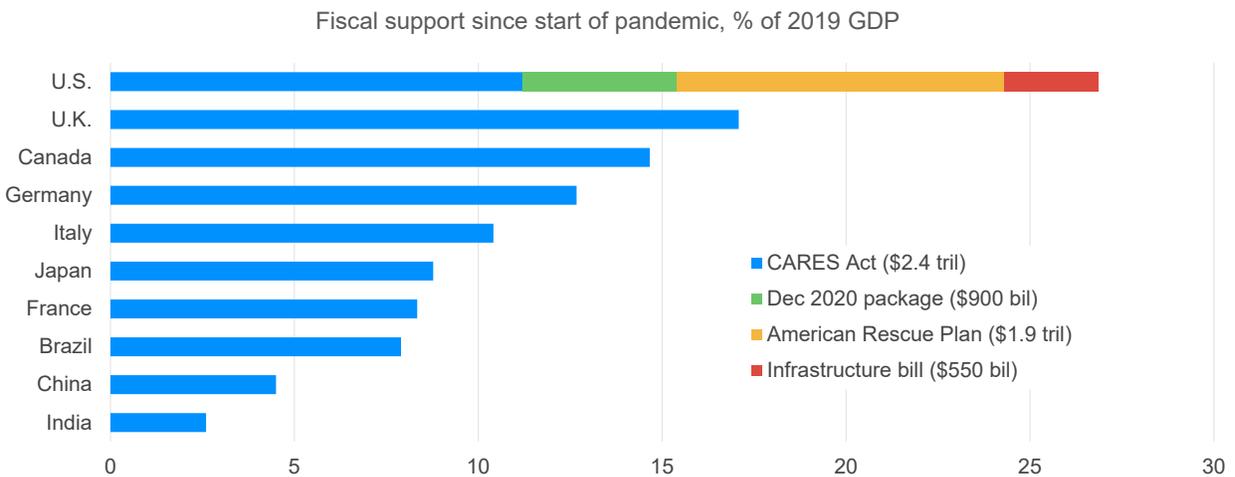
Chart 1: Economic Recovery Has Exceeded Expectations



Sources: BLS, BEA, Moody's Analytics

Federal stimulus was key to this rapid recovery (see Chart 2). Stimulus funds have served the joint purpose of both fueling a faster recovery in economic activity—and thereby contributing to higher tax revenues—as well as filling state coffers directly through targeted aid. We estimate that without any federal stimulus to cushion the downturn and accelerate the economic recovery, state tax receipts would have been more than half a trillion dollars lower over the first two years of the pandemic.

Chart 2: Record Level of Fiscal Support



Sources: BEA, National Finance Ministries, Moody's Analytics

Federal stimulus bills passed during the pandemic have also provided state and local governments with approximately \$885 billion in direct aid.¹ The American Rescue Plan alone allocated \$200 billion for states and territories to spend on a wide variety of uses from revenue replacement to public health, infrastructure

¹ Committee for a Responsible Federal Budget, "State and Local Governments Flush with Cash," November 3, 2021.

and economic development. States are required to allocate the funds by the end of 2024 and have fully spent them by the end of 2026.

The long-term impact of these onetime funds on states' budgets will vary considerably based on their uses. Many states tapped stimulus dollars to repay federal loans to their unemployment trust funds, a onetime cost. Revenue replacement has also been a popular usage, with federal regulations allowing states to offset revenue losses incurred during the pandemic, but not to finance revenue declines driven by tax cuts.

However, other uses may come with longer-term price tags. For example, many states are grappling with difficulties in hiring workers, and while employee compensation is an approved use of the stimulus funds, higher salaries would need to be sustained after the funds are exhausted. Even seeming onetime uses may have longer-term costs. For instance, investment in water and sewage infrastructure, another allowed usage, may be a constructive use of the money given the high upfront costs, but states will also need to budget for ongoing operation and maintenance expenses.

Another source of fiscal support for states, the enhanced federal Medicaid match, will expire shortly after the White House declares an end to the national Public Health Emergency. At the start of the pandemic the Families First Coronavirus Response Act authorized a temporary 6.2-percentage point increase in the federal contribution to state Medicaid expenses. The increased match will remain in place until the end of the quarter in which the PHE ends. Federal expenditures on the enhanced match have averaged about \$8.8 billion per quarter since the start of the pandemic, meaning until states' Medicaid rolls meaningfully decline, states will be on the hook for approximately this amount quarterly once the PHE expires. For the purposes of this exercise we assumed that the PHE will draw to a close in the first quarter of 2023.

However, the biggest wild card for states will be the speed at which recent growth in state tax revenues cools. Census data show state tax revenues have surged massively since the pandemic's initial shock and are up 25% over the past four quarters compared with the corresponding period immediately preceding the pandemic. Many of the factors that fueled this growth are now abating. Rapid wage growth has likely peaked, the stock market remains off its early-winter highs, and spending on taxable goods will cool as consumers with already-stocked homes confront higher prices. Slowing revenue growth could easily turn into outright declines if the economy enters a period of significantly slower growth let alone an outright recession. States that shuttled surplus tax revenues into rainy-day reserves and avoided spending onetime stimulus funds on recurring expenses will be better able to weather any such downturn.

Risk of recession

Strength in the labor market signals that the U.S. economy has avoided recession so far, but the risk of the economy falling into recession over the next year and a half is uncomfortably high. While states have little time to prepare themselves for such a shock, the plethora of heightened risks the economy now faces mean that recession planning should be top of mind for policymakers.

While some recessions, such as that caused by the COVID-19 pandemic, are impossible to foresee, the risks that could initiate a recession in the near term are clearer than usual. The Federal Reserve has embarked on an aggressive course of monetary tightening to bring down inflation. If this policy overshoots, it could ignite a panic in financial markets, causing asset prices to plummet. Additionally, higher interest rates could also

cut off the flow of credit, slowing growth. If any of these risks were to come to fruition, a recession would be the unavoidable result.

Should another recession occur in the next year, tightening Fed policy is the most likely of triggers. With inflation stubbornly sitting at 40-year highs, the Fed may even intentionally take us into another recession to snuff out higher prices as quickly as possible. A policy misstep becomes more likely considering other risks the economy faces from abroad. If the Russian invasion of Ukraine worsens or persists longer than anticipated, import bans and self-sanctioning of Russian oil purchases would once again drive up the price of energy. The resulting pressure on prices would narrow the Federal Reserve's path to gradually cool the economy while reining in inflation. The pandemic is another wild card. An increase in cases, particularly in China, would snarl supply chains and place additional pressure on costs.

This paper assesses the budgetary impacts of a moderate recession that begins in early fiscal 2023. Under this scenario, real GDP declines 2.3%, and the unemployment rate peaks in late 2023 at just less than 8%. For context, the headline magnitude of contraction under such a scenario is less severe than the Great Recession, but more severe than either the 1991 or 2001 recessions. However, the unique attributes of this recession will make the fiscal impacts to certain states even more severe than the Great Recession or other stress-testing exercises we have conducted in the past. As inflation is slower to be brought under control than in the baseline outlook, the hit to real incomes is especially severe, surpassing that sustained in the Great Recession. For this reason, some states see significantly more severe levels of fiscal shock in this exercise than in past exercises.

Stress-testing budgets

Moody's Analytics pioneered the concept of stress-testing the public sector nearly a decade ago in the wake of the Great Recession, and more recently we have taken to releasing annual state stress-testing exercises each fall.^{2,3} The mechanics of stress-testing are relatively simple and depend on the use of economic scenarios that are fed through two sets of quantitative models estimating state general fund revenues and spending needs, with no qualitative overlays applied to the model output.

This results in purely model-driven estimates intended to help measure the potential magnitude of fiscal stress that states will experience, and are not necessarily a direct reflection of a state's ability to weather that level of stress. Furthermore, the projections included in this analysis were performed by Moody's Analytics, not Moody's Investors Service. Therefore, the content of this analysis should not be misconstrued as having any bearing on past, current or future ratings actions. For a more detailed description of the methodology and assumptions behind these projections, please see Appendix B.

For this year's stress test, we calculate the impact of a recession on states' budget balances over the two-year horizon of fiscal 2023 and fiscal 2024. We place this fiscal shock in the context of state revenues and reserves from fiscal 2021, as data for fiscal 2022 are still preliminary.

Measuring fiscal shock

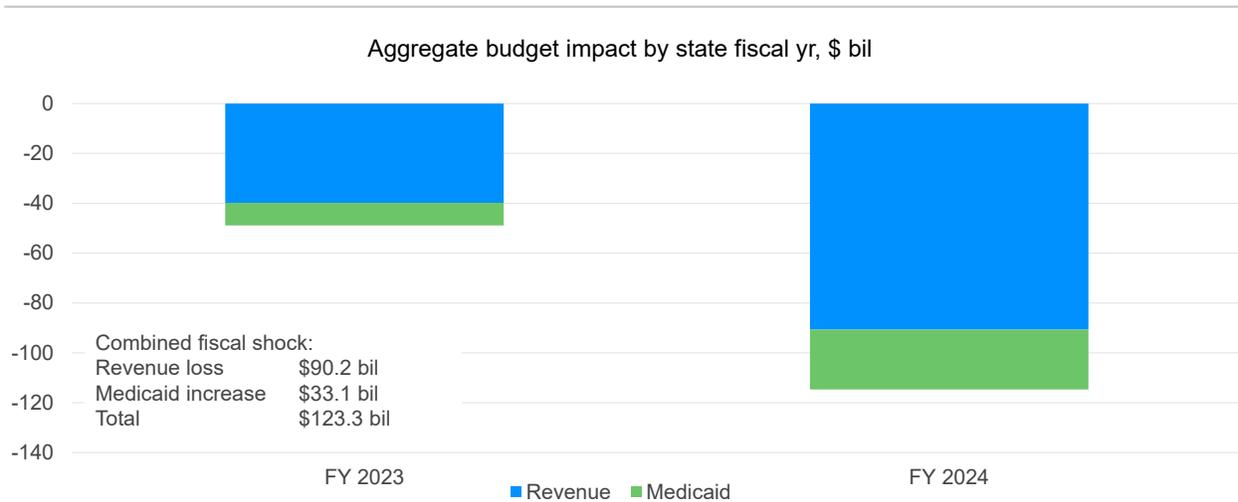
The results of our analysis reveal that state budgets will sustain a substantial degree of stress under a likely next recession scenario. Through the end of fiscal 2024, the combined fiscal shock of lower reve-

² Dan White, "Stress-Testing State and Local Reserves," Moody's Analytics Regional Financial Review, August 2014.

³ Sarah Crane and Colin Seitz, "Stress-Testing States 2019," Moody's Analytics Regional Financial Review, October 2019.

nues and higher spending needs is equal to \$123 billion, or 12% of states' general fund budgets (see Table 1 and Chart 3).

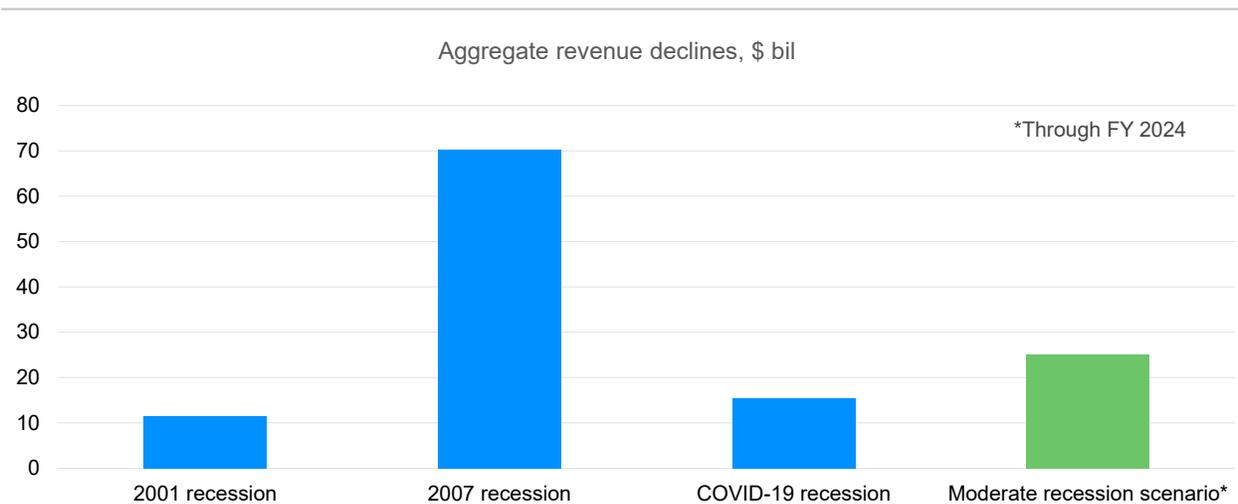
Chart 3: State Budget Breakdown



Source: Moody's Analytics

As usual, revenue declines account for the lion's share of stress. About three-quarters of this fiscal shock would come by way of lower general fund revenues. Within the context of past downturns, the level of stress can be seen more clearly (see Chart 4). The level of aggregate nominal revenue declines would be larger than the decline states experienced in fiscal 2020 from the COVID-19 pandemic but smaller than that sustained during the Great Recession. However, the characteristics of the downturn scenario, particularly its high inflation and severe hit to incomes, result in much larger fiscal impacts across a number of

Chart 4: Historical Revenue Comparison



Sources: NASBO, Moody's Analytics

Table 1: Stress-Test Results – Moderate Recession Scenario

	Tax revenue shortfall		Medicaid spending increase		Combined fiscal shock	
	%	\$ mil	%	\$ mil	%	\$ mil
Sum of states	-8.8%	\$(90,193.24)	3.2%	\$33,091.06	-12.1%	\$(123,284.30)
Alabama	-9.8%	\$(1,098.78)	4.2%	\$469.60	-14.0%	\$(1,568.37)
Alaska	-66.1%	\$(1,098.16)	1.7%	\$28.77	-67.8%	\$(1,126.92)
Arizona	-22.2%	\$(3,136.40)	4.4%	\$617.40	-26.6%	\$(3,753.80)
Arkansas	-13.2%	\$(905.92)	3.1%	\$213.83	-16.4%	\$(1,119.75)
California	-7.7%	\$(14,296.00)	3.3%	\$6,161.83	-11.0%	\$(20,457.83)
Colorado	-15.0%	\$(2,138.68)	4.1%	\$583.52	-19.1%	\$(2,722.19)
Connecticut	-10.8%	\$(2,216.87)	1.3%	\$270.16	-12.1%	\$(2,487.03)
Delaware	-0.7%	\$(35.12)	1.7%	\$91.42	-2.3%	\$(126.54)
Florida	-8.2%	\$(3,065.09)	5.4%	\$1,999.22	-13.6%	\$(5,064.31)
Georgia	-6.8%	\$(1,937.48)	1.7%	\$500.09	-8.5%	\$(2,437.57)
Hawaii	-13.7%	\$(1,132.58)	1.3%	\$107.41	-15.0%	\$(1,240.00)
Idaho	8.3%	\$415.95	4.0%	\$202.88	4.3%	\$213.07
Illinois	-17.6%	\$(7,875.01)	3.4%	\$1,504.31	-20.9%	\$(9,379.32)
Indiana	-7.7%	\$(1,512.33)	3.6%	\$708.72	-11.2%	\$(2,221.05)
Iowa	-13.0%	\$(1,146.27)	2.8%	\$245.18	-15.8%	\$(1,391.44)
Kansas	-19.3%	\$(1,708.75)	2.4%	\$214.22	-21.7%	\$(1,922.97)
Kentucky	-15.2%	\$(1,968.87)	3.7%	\$482.86	-18.9%	\$(2,451.73)
Louisiana	-12.4%	\$(1,329.08)	3.2%	\$341.61	-15.6%	\$(1,670.70)
Maine	-18.8%	\$(849.34)	3.8%	\$169.58	-22.5%	\$(1,018.92)
Maryland	-6.7%	\$(1,393.78)	2.4%	\$500.21	-9.1%	\$(1,893.98)
Massachusetts	-3.2%	\$(1,250.16)	2.2%	\$855.63	-5.4%	\$(2,105.79)
Michigan	-19.2%	\$(2,406.84)	7.4%	\$927.66	-26.6%	\$(3,334.50)
Minnesota	-6.0%	\$(1,593.25)	3.0%	\$810.16	-9.0%	\$(2,403.41)
Mississippi	-16.8%	\$(1,135.19)	2.2%	\$151.64	-19.1%	\$(1,286.84)
Missouri	-10.6%	\$(1,192.13)	5.5%	\$618.31	-16.1%	\$(1,810.44)
Montana	-12.6%	\$(372.80)	1.6%	\$48.86	-14.2%	\$(421.66)
Nebraska	-5.4%	\$(318.90)	2.5%	\$148.79	-7.9%	\$(467.69)
Nevada	-17.2%	\$(769.64)	2.9%	\$128.88	-20.1%	\$(898.51)
New Hampshire	-18.1%	\$(332.93)	6.1%	\$112.82	-24.2%	\$(445.75)
New Jersey	-8.9%	\$(4,303.92)	1.5%	\$729.37	-10.5%	\$(5,033.29)
New Mexico	-1.0%	\$(86.80)	1.5%	\$132.97	-2.5%	\$(219.76)
New York	-7.8%	\$(5,760.81)	3.0%	\$2,197.08	-10.7%	\$(7,957.89)
North Carolina	1.1%	\$333.69	3.9%	\$1,146.25	-2.7%	\$(812.57)
North Dakota	-12.5%	\$(235.45)	2.5%	\$46.42	-15.0%	\$(281.87)
Ohio	-4.7%	\$(1,253.44)	4.9%	\$1,302.41	-9.5%	\$(2,555.85)
Oklahoma	-14.4%	\$(1,190.52)	3.9%	\$318.99	-18.2%	\$(1,509.51)
Oregon	-13.1%	\$(2,012.76)	3.1%	\$476.15	-16.2%	\$(2,488.91)
Pennsylvania	-11.3%	\$(4,569.48)	4.2%	\$1,705.75	-15.5%	\$(6,275.22)
Rhode Island	-14.0%	\$(619.93)	3.0%	\$131.27	-16.9%	\$(751.20)
South Carolina	-16.6%	\$(1,838.67)	3.2%	\$353.25	-19.8%	\$(2,191.91)
South Dakota	-14.9%	\$(290.50)	2.3%	\$44.26	-17.2%	\$(334.75)
Tennessee	3.0%	\$546.20	4.2%	\$779.55	-1.3%	\$(233.35)
Texas	-5.4%	\$(3,273.50)	2.4%	\$1,451.05	-7.8%	\$(4,724.55)
Utah	-4.4%	\$(442.04)	2.5%	\$256.19	-6.9%	\$(698.23)
Vermont	-7.8%	\$(167.87)	3.7%	\$79.04	-11.4%	\$(246.90)
Virginia	-2.6%	\$(613.10)	4.1%	\$966.24	-6.7%	\$(1,579.34)
Washington	-11.0%	\$(2,955.43)	2.6%	\$714.08	-13.6%	\$(3,669.52)
West Virginia	-21.4%	\$(1,068.40)	3.1%	\$153.89	-24.5%	\$(1,222.29)
Wisconsin	-11.4%	\$(2,236.67)	4.3%	\$851.07	-15.8%	\$(3,087.74)
Wyoming	-27.5%	\$(353.47)	3.1%	\$40.21	-30.7%	\$(393.68)

*All percentages are shown as a % of fiscal 2021 general fund revenues as estimated by NASBO.

Source: Moody's Analytics

states. The remaining quarter of the fiscal shock we estimate states would experience would be a result of higher mandatory spending needs, which we calculate by forecasting additional spending on Medicaid.

Variation across states' tax and industrial structures provide for a relatively wide distribution of revenue shocks across the country. While we find that the average state would experience a shock equal to about 12% of fiscal 2021 revenues, these shocks vary from a high of 66% in Alaska to very minor surpluses in a small handful of states including Idaho.

States with a larger-than-average share of high-wage, white-collar jobs are expected to see smaller revenue shocks in the recession scenario. This trend is visible in the relatively small revenue declines expected in California and much of the Northeast. In addition, we find that the speed and extent to which a state's economy has already recovered from the COVID-19 recession impacts the severity of the recession, and hence the accompanying revenue impacts.

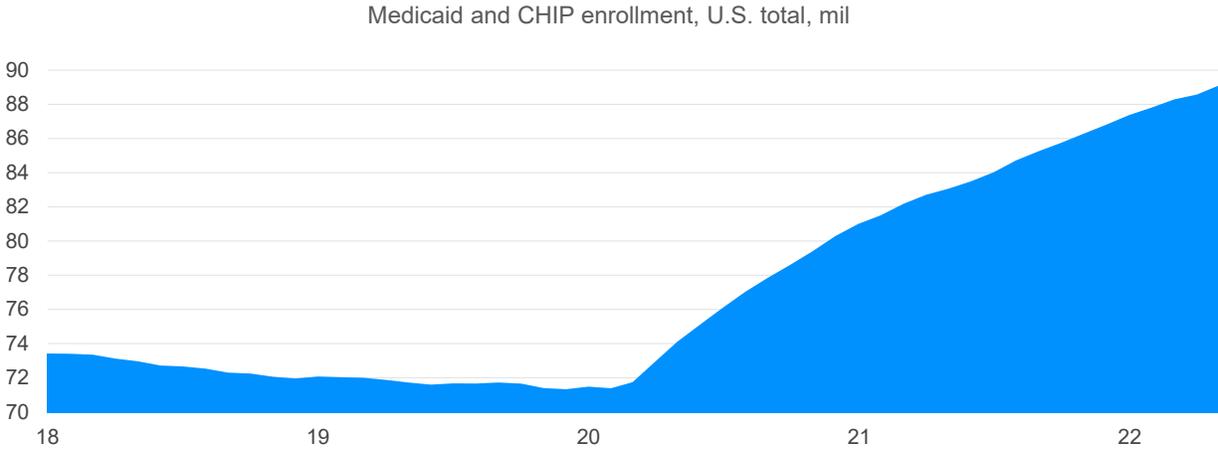
While not uniform, in general states that opened their economies earlier and rebounded relatively quickly from the COVID-19 recession will be better positioned for their economies to weather a new economic shock. Residents of states that were quicker out of the gate in the last recovery are likely to have a larger cushion of savings with which to buffer their spending. These states also often have the benefit of faster-growing populations, and an expanding tax base can help to offset declines in per capita tax revenue during a downturn.

Because this year's moderate recession scenario is influenced by high inflation—a situation not encountered in our previous stress-testing exercises—energy states will face a more nuanced outlook than normal. Oil prices remain higher in fiscal 2023 in the recession scenario, before dropping below the baseline outlook in fiscal 2024. On net this leads to smaller revenue shocks in many energy states than in previous stress tests, although energy states' revenues remain exceptionally vulnerable given their high volatility.

Variations in fiscal stress from higher Medicaid spending were less significant across states but still meaningful. We expect that the median state will experience an increase in Medicaid expenditures of just over 3% in a moderate recession scenario. Increases in unemployment are the predominant driver of higher Medicaid enrollment during periods of economic stress. Consequently, the degree that states will experience higher Medicaid expenditures during the recession scenario will be tied to the underlying volatility in their labor markets and industrial makeups.

The outlook for Medicaid spending has a higher-than-normal degree of uncertainty in this exercise. While the enhanced Medicaid match enacted through the Families First Coronavirus Response Act effectively rushed funds directly to one of the government programs most directly affected by the pandemic, one of the act's key provisions prohibited states from removing anyone from Medicaid rolls during the PHE, even if they were no longer eligible for the program (see Chart 5). After almost three years, the PHE's expiration is imminent, and state Medicaid directors will be left with the monumental task of sorting through the backlog of eligibility checks, or redeterminations. When and how quickly those enrollees are eventually allowed to roll off of Medicaid rolls could materially alter the findings of this exercise.

Chart 5: Medicaid Rolls Swelling Because of Pandemic and Enhanced Federal Aid



Sources: KFF, Moody's Analytics

Measuring preparedness

Despite facing a significant shock from lower revenues and higher expenses, record levels of cash allow most states to sail through our hypothetical recession scenario (see Chart 6). Altogether states ended fiscal 2021 with more than \$268 billion in cash, a huge sum that equates to over a quarter of state general fund revenues (see Chart 7). Thanks to these resources, 39 states have overall cash balances large enough to weather a moderate recession without having to raise taxes or cut government spending. Meanwhile, four states have most of the cash they need to survive a recession relatively unscathed, while seven others would need to take extraordinary fiscal actions to keep their budgets afloat (see Chart 8).⁴

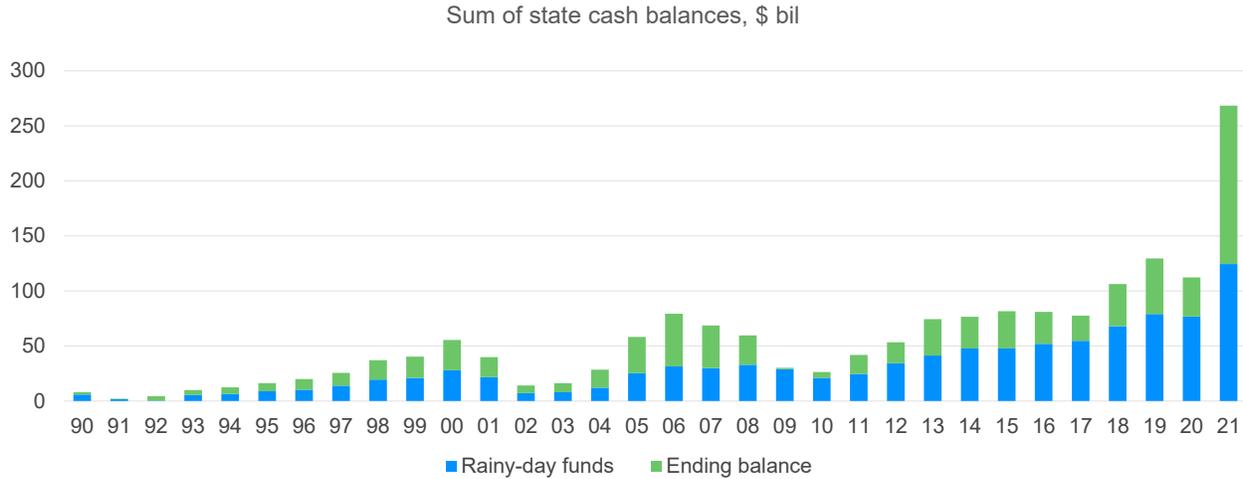
Chart 6: Cash Balances Sufficient to Fill Budget Gap Nationally



Sources: NASBO, Moody's Analytics

⁴ NASBO's Spring 2022 "Fiscal Survey of the States" reports that Alaska finished fiscal 2021 with an ending balance of -\$565 million. Consequently, it fares better when considering only rainy-day reserves as opposed to total cash balances.

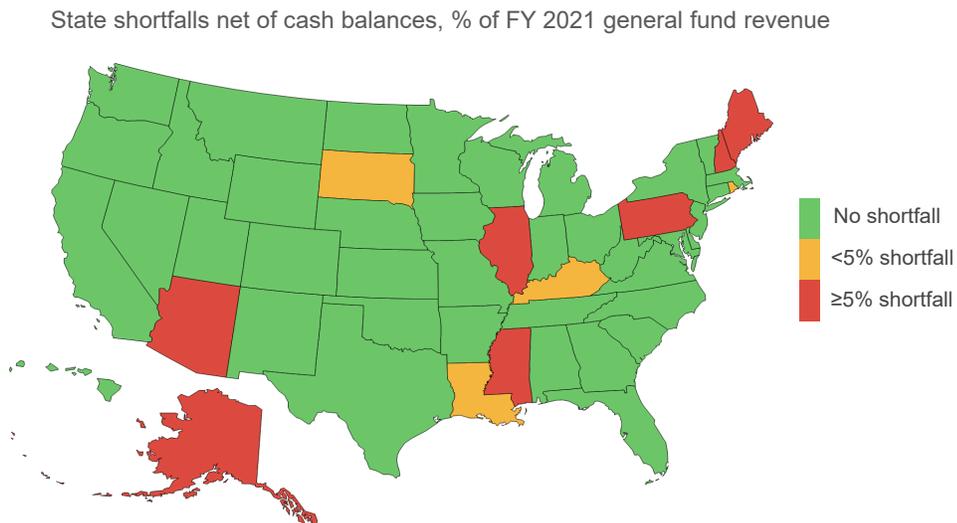
Chart 7: Reserves Are at an All-Time High



Sources: NASBO, Moody's Analytics

Things look less rosy when we look strictly at those balances explicitly designated as “rainy-day” reserves (see Chart 9). When these recessionary fiscal shocks are set against only those balances specifically classified as rainy-day funds, just 18 states have sufficient funds set aside. This is a difference that can carry a big distinction. Fund balances are not always equivalent to available reserves, as they can often be obligated for other uses and are not explicitly set aside for fiscal emergencies. Data from the National Association of State Budget Officers' most recent “Fiscal Survey of the States” indicate that less than half of total state balances are actually designated as reserves. The remainder are balances that have accumulated either because of revenues exceeding budget targets or spending coming in below expectations on a onetime basis. More detailed state-by-state estimates can be found in Appendix A.

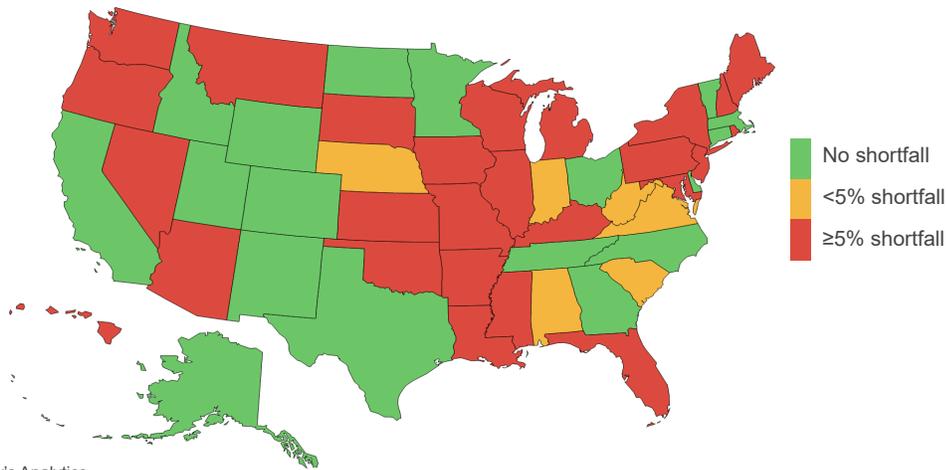
Chart 8: Most States Prepared for a Moderate Recession...



Sources: NASBO, Moody's Analytics

Chart 9: ...But Not All Cash Is Earmarked for a Rainy Day

State shortfalls net of rainy-day funds, % of FY 2021 general fund revenue



Sources: NASBO, Moody's Analytics

This gap between existing fund balances and funds explicitly marked as rainy-day reserves was especially large in fiscal 2021 as most states saw revenues come in far above projections. With substantial federal stimulus also needing to be allocated, much of these unanticipated tax revenues were left unspent but not moved into explicit reserves. Ending balances more than doubled from fiscal 2020, compared with only a two-thirds increase in rainy-day reserves. In total, 35 states reported increases in fiscal 2021 from the previous year, while six states made no changes to their rainy-day balances at all. States that were pummeled the worst by the 2020 recession, particularly energy states, were more likely to actually draw down their reserves instead of adding to them. However, most energy states also went into the pandemic with larger-than-normal reserve funds.

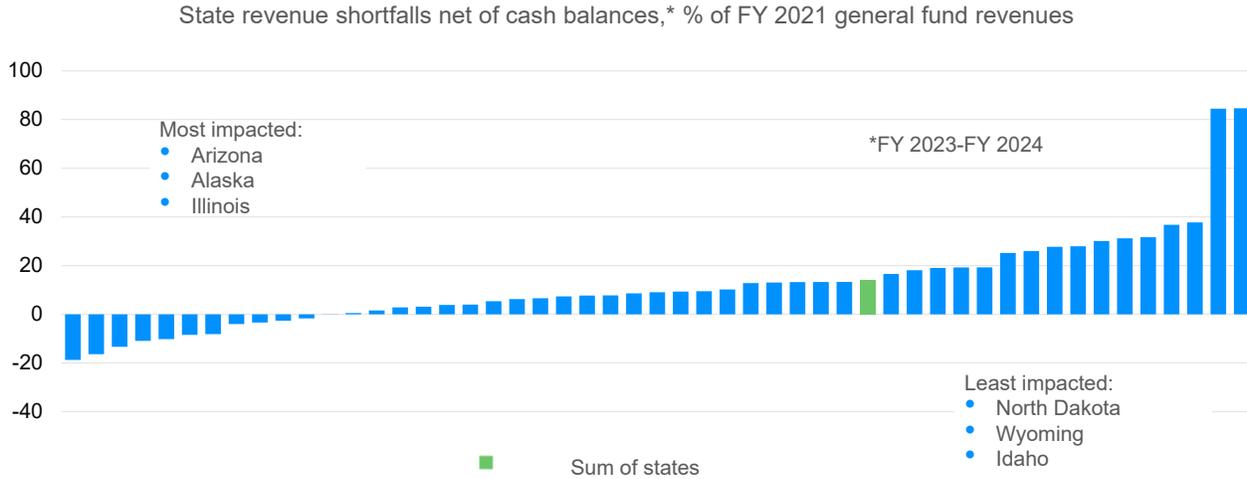
Putting money away for a rainy day is a great accomplishment, but it is also only part of the battle. Fund balances alone are not enough to ward off the effects of a recession. Research shows that in addition to having adequate balances, among other things, the purpose of reserves should be explicit to prevent some of the indecision that can cost states valuable time during a recession.⁵ During the Great Recession, several states with sizable reserves used those funds late, if at all, while policymakers debated the funds' true purpose. As a result, several state rainy-day funds were marginalized during one of the largest downpours in American history, and the pace of economic recovery after the recession suffered as a result.

Takeaways

The results of this year's state stress-testing exercise are an encouraging sign, coming as states face the very real possibility of a recession within the next year. At least 39 states have the cash balances needed to weather at least a moderate recession, with four more within striking distance (see Chart 10). With only about half of states' cash reserves explicitly set aside in rainy-day funds, however, uncertainty surrounds the degree to which states would be willing and able to quickly funnel their cash balances into filling recession-driven shortfalls. When considering only rainy-day funds and not other cash balances, just 18 states are prepared for a moderate recession, with rainy-day reserves in six additional states close to sufficient.

⁵ Emily Raimes, et al., "Fiscal Stress Test: Ability to Withstand Next Recession Depends on Reserves, Flexibility," Moody's Investors Service: Sector In-Depth (April 21, 2016).

Chart 10: Wide Range of Revenue Impacts



Sources: NASBO, Moody's Analytics

Overall, this means that the amount of fiscal drag from states and local governments should be considerably less during the next recession and ensuing recovery than the U.S. experienced during and after the Great Recession. This will contribute to a faster recovery, particularly in those states that are most prepared. However, a small handful of states are still not ready and, even in those that are, continued improvement must be made in two key areas.

First, states must continue to focus on the distinction between rainy-day funds and total balances. Many states that performed well on this year's stress tests did so because they had significant amounts of cash from budget surpluses, though they were not necessarily designated as actual reserves. This is a dangerous policy that can prevent those funds from being properly used during the next recession. What is more, if they are not specifically designated as reserves, there is also risk that policymakers may appropriate some of those balances for other purposes before the next recession comes along, leaving them unavailable in an emergency.

Second, having a plan is just as important as having a fund. Most states have the resources to weather a recession but have not yet put together a plan for what to do with them when the business cycle does eventually turn. The importance of being purposeful with rainy-day reserves and developing a plan before it starts to rain cannot be overstressed. It is encouraging to see more state governments such as Maine, North Carolina and Utah implementing their own stress-testing exercises as a part of their normal budget procedures. Over the long run these types of practices allow policymakers to better maximize their state's long-term economic outlook by focusing more on forward-looking policy and investment decisions as opposed to day-to-day funding challenges and therefore should be viewed as best practices among states.

Appendix A

Table 2: State stress-test results as a % of fiscal 2021 general fund revenues

	Rainy-day balances*	Total balances*	Fiscal shock moderate recession	Rainy-day surplus/short-fall**	Total surplus/short-fall**
North Dakota	39.9%	99.6%	-15.0%	24.9%	84.6%
Wyoming	115.1%	115.1%	-30.7%	84.4%	84.4%
Idaho	15.7%	33.5%	4.3%	20.0%	37.7%
California	27.9%	47.8%	-11.0%	16.8%	36.8%
Delaware	4.7%	34.0%	-2.3%	2.3%	31.7%
Tennessee	7.9%	32.5%	-1.3%	6.6%	31.2%
Nebraska	6.9%	38.0%	-7.9%	-0.9%	30.1%
Florida	4.5%	41.5%	-13.6%	-9.1%	27.9%
Texas	17.0%	35.5%	-7.8%	9.2%	27.7%
New Mexico	28.5%	28.5%	-2.5%	26.0%	26.0%
North Carolina	6.7%	27.9%	-2.7%	3.9%	25.2%
Oregon	8.9%	35.5%	-16.2%	-7.2%	19.3%
Michigan	11.0%	45.9%	-26.6%	-15.6%	19.2%
Utah	8.8%	26.0%	-6.9%	1.9%	19.0%
Ohio	10.0%	27.6%	-9.5%	0.5%	18.1%
Minnesota	10.4%	25.6%	-9.0%	1.3%	16.6%
Sum of states	12.2%	26.3%	-12.1%	0.1%	14.2%
Vermont	19.9%	24.8%	-11.4%	8.5%	13.3%
Montana	3.8%	27.5%	-14.2%	-10.4%	13.3%
Connecticut	23.0%	25.4%	-12.1%	10.9%	13.2%
Alabama	10.8%	27.1%	-14.0%	-3.2%	13.1%
South Carolina	15.4%	32.6%	-19.8%	-4.4%	12.8%
Missouri	5.4%	26.3%	-16.1%	-10.7%	10.2%
Maryland	3.0%	18.6%	-9.1%	-6.1%	9.5%
Massachusetts	11.9%	14.7%	-5.4%	6.5%	9.3%
West Virginia	19.9%	33.6%	-24.5%	-4.6%	9.1%
Indiana	6.6%	19.9%	-11.2%	-4.7%	8.6%
Virginia	6.4%	14.5%	-6.7%	-0.4%	7.8%
Oklahoma	6.5%	25.9%	-18.2%	-11.7%	7.7%
Iowa	9.1%	23.2%	-15.8%	-6.7%	7.4%
Georgia	15.0%	15.1%	-8.5%	6.5%	6.6%
Wisconsin	8.8%	22.0%	-15.8%	-6.9%	6.2%
Nevada	2.2%	25.5%	-20.1%	-17.9%	5.4%
Hawaii	3.9%	19.0%	-15.0%	-11.2%	4.0%
New Jersey	5.1%	14.3%	-10.5%	-5.4%	3.8%
Colorado	22.2%	22.2%	-19.1%	3.1%	3.1%
Kansas	0.9%	24.6%	-21.7%	-20.8%	2.9%
New York	3.3%	12.3%	-10.7%	-7.4%	1.6%
Arkansas	3.1%	16.9%	-16.4%	-13.3%	0.5%
Washington	0.1%	13.7%	-13.6%	-13.5%	0.1%
South Dakota	11.1%	15.5%	-17.2%	-6.1%	-1.7%
Kentucky	4.6%	16.3%	-18.9%	-14.3%	-2.6%
Rhode Island	5.1%	13.6%	-16.9%	-11.8%	-3.4%
Louisiana	5.1%	11.6%	-15.6%	-10.5%	-4.0%
Maine	11.0%	14.4%	-22.5%	-11.5%	-8.1%
Pennsylvania	7.1%	7.1%	-15.5%	-8.4%	-8.4%
New Hampshire	14.0%	14.0%	-24.2%	-10.2%	-10.2%
Mississippi	8.0%	8.2%	-19.1%	-11.0%	-10.9%
Arizona	6.9%	13.2%	-26.6%	-19.7%	-13.3%
Alaska	85.4%	51.4%	-67.8%	17.6%	-16.4%
Illinois	0.0%	2.2%	-20.9%	-20.9%	-18.7%

*Rainy-day and total balances are calculated as of the end of fiscal 2021 by NASBO. All numbers are shown as a % of fiscal 2021 general fund revenues also estimated by NASBO.

**The estimated shortfalls refer to the amount of fiscal shock that would not be covered by actual reserves under a moderate recession scenario. A negative percentage means a state would not be able to make up for the entire fiscal shock associated with a moderate recession.

Source: Moody's Analytics

Appendix B: How We Stress-Test State Budgets

Simplifying assumptions

Though the results of this exercise are relatively clear-cut, they do need some context. These results are based on projections using Moody's Analytics economic scenarios and historical state budget data from the National Association of State Budget Officers. The way in which certain funds or reserves are accounted for may differ significantly from one state to the next, causing some of the findings in this report to differ from what has been reported by individual states.

To perform the stress tests, several simplifying assumptions were made. First, state balanced-budget requirements were assumed to hold true. State and local governments, in general, are not permitted to issue long-term debt for operations. There are some practical ways around this, particularly with regard to public pensions and other post-employment benefits, but for the purposes of this exercise, we assume that state spending habits are constrained by the amount of revenue collected.

Second, the levers used to stress state budgets are limited to changes in general fund revenues and Medicaid spending. As revenues decline during a recession, subnational governments have less to spend, even as there is more demand for government services. To avoid having to drastically cut spending or raise taxes, governments would need to hold in reserve at least enough funds to make up for declines in revenue and meet higher demands for services. These services obviously extend beyond Medicaid. Funding demands for other general fund programs would also increase, along with programs that typically fall outside the state general fund such as unemployment insurance. However, these programs pale in comparison with the scope of Medicaid in terms of their state general fund impact. Therefore, the recessionary effects estimated on the spending side of the ledger in this exercise should be considered a lower bound. More precise spending effects could be estimated by individual states, both for social service programs and discretionary needs such as education, by injecting more detailed spending data into the process.

Third, as final data for fiscal 2022 state tax revenues and Medicaid expenditures were unavailable at the time of publication, we assume that states maintained a balanced budget for that year, with fiscal 2021 ending balances and rainy-day reserves remaining available for use in the recession scenario. In addition, the way in which certain funds or reserves are accounted for may differ significantly from one state to the next, causing some of the findings in this report to differ from what has been reported by individual states.

As in our previous stress-testing exercises, alternative scenarios for revenues are judged compared with the underlying rate of inflation. The recession scenario forecast in this paper was compared with a baseline constructed of 2019 state general fund revenues, grown out by the rate of inflation through the forecast period. Though state policymakers may have originally included more revenue growth in their budget projections, it is more realistic to compare changes in revenue with the previous year's figures plus inflation as opposed to a potentially optimistic or inconsistent baseline revenue forecast. This gives us a true measure of how much funding would be necessary to strictly maintain current levels of real spending and avoid disruptive fiscal corrections during and after a recession.

Because of the substantial volatility in state revenues throughout the COVID-19 recession, both because of distortions to tax revenues caused by changes to filing deadlines and onetime federal stimulus packages, this approach was determined to yield a more reliable baseline outlook for state funding requirements than

would have been achieved by using data from within the pandemic period. In addition, neither the baseline nor alternative scenarios account for the tax code changes recently passed by some states. Modeling these tax law changes would require significantly more granular data and falls outside the scope of this paper.

Modeling methods

General fund revenues were forecast using the Moody's Analytics proprietary state revenue models. These models rely on ordinary least squares regression techniques to tie underlying forecasts for major economic variables to future changes in state revenues. The regressions are based on historical general fund revenue data reported by NASBO in its semiannual "Fiscal Survey of the States" publications and attempt to control for past legislative tax changes, which can distort historical revenue data during economic downturns. These forecasts are prepared using an individual regression equation for each state, allowing the use of specific economic drivers custom-tailored to each state's specific tax and industrial structure.

Spending needs were forecast using the Moody's Analytics proprietary Medicaid models. This is accomplished through OLS regression techniques tying forecasts for measures of underlying economic growth, specifically the number of unemployed people in the economy, to future levels of Medicaid enrollment. Enrollment forecasts are married to costs per enrollee to develop a full estimate of future state Medicaid spending needs. Costs per enrollee are assumed to increase in line with the Moody's Analytics forecast for the medical care consumer price index.

The Medicaid projections account for the enhanced FMAP provisions enacted as part of the Families First Coronavirus Response Act. We assume that the federal Public Health Emergency expires in January, with the 6.2-percentage point enhanced federal match terminating at the end of March. This assumption is held constant across both the baseline and recession scenarios. Finally, the Medicaid projections assume a current law baseline, meaning that no new states are assumed to expand their Medicaid programs during the forecast period.

More information

More information regarding the theory and practice of stress-testing public sector entities can be found in the following two papers:

Dan White, "*Stress-Testing State and Local Reserves*," Moody's Analytics Regional Financial Review, July 2014.

Sarah Crane and Colin Seitz, "*Stress-Testing States 2019*," Moody's Analytics Regional Financial Review, October 2019.

About the Authors

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