

Increasing Federal Support for State Medicaid and CHIP Programs in Response to Economic Downturns

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Abstract

State governments face large declines in tax revenues and increased demand for state programs during recessions and their aftermath. Because states generally must balance their budgets annually, this fiscal pressure forces states to cut programs, raise taxes, or both. These fiscal changes deprive states' residents of valuable public services and substantially reduce overall economic activity, thereby depriving residents of privately produced goods and services as well. To prevent this outcome, this chapter proposes to transfer federal funds to state governments during periods of economic weakness by automatically increasing the federal share of expenditures under Medicaid and the Children's Health Insurance Program when a state's unemployment rate exceeds a threshold level. The increase in a state's matching rate would be proportional to the amount by which the state's unemployment rate exceeds the threshold and would phase down automatically as the state's economy recovers. We calibrate our proposal to offset around two-thirds of the budget shortfalls that emerge in economic downturns. We present historical and prospective simulations of our proposal demonstrating that it would meaningfully reduce the severity of economic downturns at a manageable federal fiscal cost.

Introduction

State governments face significant fiscal pressures during recessions. Economic activity declines, which reduces receipts from sales taxes, income taxes, and other taxes. In addition, the number of people eligible for means-tested programs operated by state governments rises, putting upward pressure on state spending on these programs. Unlike the federal

government, state governments generally must balance their budgets annually, so the budget shortfalls that emerge when the economy is weak require states to take steps to increase revenues, reduce spending, or some combination of the two.

These state responses to fiscal pressure have significant negative effects. Most directly, state residents lose valuable public services supported by state governments, including education, transportation, and public safety. Reductions in state spending or increases in state taxes also reduce aggregate demand, thereby deepening the economic downturn both in the state implementing the changes and in other states as well. This amplification of economic downturns is substantial: recent empirical work implies that transfers to state governments sufficient to avoid \$1.00 of cuts to state programs would produce at least \$1.70 in additional economic activity under economic circumstances similar to those that were observed during and after the most-recent recession (Chodorow-Reich 2019). States' fiscal responses to economic downturns thus also reduce the consumption of privately produced goods and services.

We argue below that there are reasons to be particularly concerned that the fiscal pressures that arise during economic downturns may spur states to cut the two largest safety net programs they support: Medicaid and the Children's Health Insurance Program (CHIP). These programs, which are jointly funded by the states and the federal government, provide health insurance—and long-term care—to low-income people and people with disabilities, so cuts to these programs have the potential to seriously harm vulnerable state residents.

To address these problems, this chapter presents a proposal that would automatically increase the federal share of expenditures on Medicaid and CHIP during recessions. When a state's unemployment rate exceeds a threshold level, the share of these programs financed by the federal government (commonly referred to as the state's matching rate) would rise by an amount proportional to the excess of the state's unemployment rate over this threshold. The increase in the matching rate that would apply in most instances—4.8 percentage points for every percentage point the state's unemployment rate exceeded the threshold—is calibrated to offset around two-thirds of the budget shortfalls that emerge in economic downturns, accounting for effects on both the revenue and outlay sides of state budgets. As the state's economy recovers, the state's matching rate would gradually and automatically phase down to its level under current law.

Our proposal builds on—and improves upon—past practice. Congress has legislated temporary increases to Medicaid matching rates on a

discretionary basis in 2003, 2009, and 2010 to address recessions and their aftermath. Our proposal would create an automatic mechanism to ensure that states would receive this assistance in a timely fashion even if a recession hit amid political gridlock. It would also ensure that the amount of this assistance would be appropriately calibrated to the magnitude of the economic shock and the duration of the subsequent recovery. Indeed, we undertake detailed simulations of our proposal and compare it to the actions Congress has taken historically. These results demonstrate that the state fiscal relief delivered during the Great Recession and its aftermath was too small to offset the fiscal shock that states experienced and ended well before state economies had fully recovered from that economic downturn.

The chapter proceeds as follows. The first section provides greater detail on the rationale for providing additional federal support to states during economic downturns and the rationale for doing so through Medicaid and CHIP in particular. The second section presents our proposal for increasing Medicaid and CHIP matching rates during recessions. The third section presents simulations of how our proposal would have affected the federal budget and the economy historically, as well as projections of how our proposal would function in the future. The fourth section addresses possible questions or concerns about our proposal. The final section concludes.

The Challenge

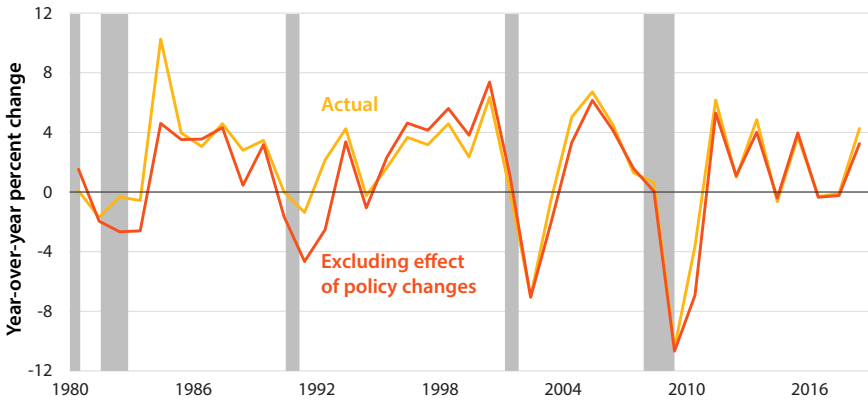
Declines in state revenues and increased demands on transfer programs, together with states' balanced budget requirements, lead states to reduce spending, increase taxes, or do both during recessions and their aftermath. Those responses do significant harm by deepening recessions and slowing the subsequent recoveries both in the state implementing the changes and in other states, thereby depriving residents of valuable publicly and privately produced goods and services. This section examines these negative effects in greater detail and then discusses how the federal government can help mitigate them.

BACKGROUND ON CYCLICAL PRESSURES ON STATE BUDGETS

Consumption, income, and asset values fall in recessions, which drives sharp reductions in state governments' receipts from income taxes, sales taxes, and other taxes, as depicted in figure 1. These declines are large. On average from 1985 to the present, a 1-percentage-point increase in the unemployment rate—an increase in unemployment about one-fifth as large as the increase in unemployment during the 2007–9 recession—has been associated with a 3.7 percent reduction in state tax revenues per capita, holding state tax policy constant.¹ In 2017, 3.7 percent of state tax

FIGURE I.

Change in Real per Capita State Tax Revenues, 1980–2018



Source: Bureau of Economic Analysis (BEA) 1978–2018a, 1978–2018b; National Association of State Budget Officers (NASBO) 2018b; U.S. Census Bureau (Census) 1978–2018; authors' calculations.

Note: Shaded areas denote recessions. Years are defined to run from July to June to align with most states' fiscal years. Changes in real per capita state tax revenues are adjusted for policy changes using estimates from NASBO, as described in online appendix A.



revenues was \$36 billion or 0.2 percent of GDP. State tax revenues appear to have become more cyclically sensitive in recent years, likely a reflection of changes both in the economy and in states' tax systems (Boyd and Dadayan 2014; McGranahan and Mattoon 2012).

In addition, the number of people eligible for means-tested programs operated by state governments rises during recessions, which puts upward pressure on spending on those programs. The overwhelming majority of states' spending on such programs is on Medicaid and CHIP (joint state-federal programs that provide health insurance (and long-term care) to low-income people), so these programs are also the main source of cyclical spending pressure. These programs are structured so that the federal government pays for a specified share of each state's costs, commonly referred to as the federal matching rate. The matching rate varies across states and enrollee types, but is projected to average slightly above 60 percent in Medicaid and around 70 percent in CHIP over the next decade (Congressional Budget Office [CBO] 2018d). State governments finance the remainder, so when enrollment rises, states' costs rise as well. As discussed later, we estimate that the cyclical budget pressures created by these programs are less than one-tenth as large as the pressures that arise from declines in revenues, largely reflecting the fact that state spending on these programs accounted for only 16 percent of states' spending from nonfederal funds during fiscal year 2017 (National Association of State

Budget Officers [NASBO] 2018a). Nevertheless, these programs do add to the overall cyclical pressures on state budgets.

Unlike the federal government, almost all states have some form of balanced budget requirement on their operating budgets. These requirements vary in their stringency, and states do have some ability to circumvent them, at least for short periods, through approaches such as drawing down budget stabilization (often called rainy-day) funds or shifting expenditures from one fiscal year to the next, as Randall and Rueben (2017) discuss in detail. Even so, state-balanced budget requirements bind to a significant degree in practice. A state that does find ways to borrow, moreover, risks sending a negative signal to financial markets, driving up the interest rate it faces, and frustrating its efforts to borrow to get through a downturn. Indeed, Randall and Reuben (2017) review evidence that states' attempts to circumvent their balanced budget requirements increase the interest rates they face on bonds issued to finance capital projects (for which borrowing generally is permitted). States thus have far less ability to borrow than the federal government, so the fiscal pressures that arise during recessions lead states to take steps to increase revenues, reduce spending, or some combination of the two.

Tax increases played a relatively minor role in state governments' responses to the fiscal shocks they experienced during the past two recessions, as illustrated in figure 1 by the fact that adjusting observed revenue trends for changes in state tax law makes relatively little difference during these periods.² This is something of a change from the 1990–91 recession, when states implemented significant revenue increases that partially offset a cyclical decline in revenues, as noted by McGranahan and Mattoon (2012). Most of the adjustment, therefore, involved spending cuts. For example, McNichol (2012) estimates that, in state fiscal years 2008 through 2012, states used spending cuts to close about two-thirds of budget shortfalls not financed with federal fiscal relief.

NEGATIVE EFFECTS OF STATES' RESPONSES TO CYCLICAL BUDGET PRESSURES

Whether states' efforts to close budget shortfalls that emerge during economic downturns occur through increased taxes or reduced spending, the result will be to reduce economic output, thereby deepening recessions, slowing recoveries, and depriving families of valuable public and private goods and services.

Reductions in state spending directly reduce the provision of public services such as education, transportation, and public safety. The loss of these services does substantial direct harm. To take one example, recent

research has examined the consequences of cutbacks in state education spending spurred by the 2007–9 recession and found that they resulted in substantial reductions in student achievement (Jackson, Wigger, and Xiong 2018; Shores and Steinberg 2017). Additionally, when aggregate demand is depressed, as it is during a recession and its aftermath, those who were previously employed delivering public services are unlikely to be reemployed in other sectors, leading them to reduce their spending and thereby spurring reductions in the production of *private* goods and services.³ Similarly, increases in taxes or reductions in transfers reduce families' demand for private goods and services, thereby reducing output in the private sector.

The overall macroeconomic effect of these changes can be large. The decline in real per capita state and local government consumption spending in the wake of the 2007–9 recession directly reduced GDP by 0.7 percent in the third quarter of 2012, the quarter in which real per capita spending reached its trough. Importantly, this figure understates the reduction in output attributable to the steps that states took to close their budget shortfalls. Notably, it does not account for reductions in private spending attributable to either tax increases or reductions in income among those who supply services to state governments. Additionally, spending by state and local governments would likely have grown in real per capita terms in the absence of the recession, so this calculation likely understates the reduction in such spending that is attributable to fiscal pressure caused by the recession.

RATIONALE FOR A FEDERAL POLICY RESPONSE

Because state governments are limited in their ability to borrow, they lack the tools to address these problems on their own. They also lack the right incentives to do so, because states face a significant collective action problem. When a state reduces spending or increases taxes, it bears only a portion of the aggregate economic cost of doing so because the fiscal contraction also has substantial spillovers to other states; the state implementing the contraction will spend less on imports from other states, thereby reducing economic activity in the rest of the country. In the presence of these spillovers, states that rationally followed their own economic interests would collectively do too little to counteract a recession.

These considerations suggest an important role for federal policy.⁴ Recent research has found that federal aid to state governments during periods of economic weakness that is financed by higher federal budget deficits can be a highly effective policy response. Research analyzing a temporary increase in the share of Medicaid costs borne by the federal government that was included in the American Recovery and Reinvestment Act of 2009

(ARRA)—an important precedent for the proposal we advance in this chapter—has found that this funding significantly reduced the severity of the recession, while allowing states to make smaller cuts to public spending and employment (Chodorow-Reich 2019; Chodorow-Reich et al. 2012). Research examining other state grant programs included in ARRA has also consistently found strong positive effects of these programs on economic activity (Chodorow-Reich 2019). Indeed, drawing on this evidence base, Chodorow-Reich (2019) estimates that federal transfers that allow state governments to avoid \$1.00 in cuts to state programs would increase overall economic activity by at least \$1.70, holding monetary policy constant. Similarly, the CBO estimates that transfers to state and local governments are among the most effective forms of fiscal stimulus (Whalen and Reichling 2015).

Unfortunately, as illustrated in detail later in this chapter, the ad hoc federal efforts to help state budgets made in response to the 2007–9 recession and prior recessions were too small and too short-lived and, in the 2001 recession, were started too late. It is also easy to envision scenarios in which political gridlock might prevent—or at least seriously delay—delivery of any state fiscal relief at all. This gridlock indicates a need for a federal program that would automatically deliver fiscal relief to state governments that is calibrated to the magnitude and persistence of weakness in state economies.

MECHANISMS FOR DELIVERING FISCAL RELIEF

The federal government could deliver fiscal relief to states in multiple ways. One approach would be to provide general fiscal relief—that is, unconditional transfers of funds—to states experiencing economic weakness. This approach could largely accomplish the objective of preventing states from implementing damaging fiscal adjustments during recessions.

However, as discussed in detail in the next section, we instead propose that the federal government modify the formula that determines the federal share of expenditures under states' Medicaid and CHIP programs to automatically increase the federal share when state economies are weak. This approach would have the same broad benefits for state budgets as a general fiscal relief program, but would have several important advantages.

First, delivering fiscal relief by increasing the federal share of expenditures under Medicaid and CHIP would particularly discourage states from cutting these programs and thereby better protect states' low-income residents. States have responded to recent economic downturns by tightening eligibility rules, reducing the scope of covered benefits, and

reducing the amounts they pay medical providers for health-care services (Smith et al. 2002, 2003, 2009, 2010, 2011, 2012). Reductions in Medicaid and CHIP eligibility directly reduce financial security and access to care for those losing coverage (e.g., Baicker et al. 2013). Reductions in provider rates also have the potential to undermine beneficiary access to care by causing some providers to cease participating in the program. These access concerns are likely particularly acute with respect to physician services. In 2016 Medicaid's physician payment rates were 28 percent lower than the corresponding Medicare payment rates, which are themselves typically below the rates paid in private insurance, and smaller fractions of physicians accept new Medicaid patients than accept Medicare or private insurance (Holgash and Heberlein 2019; Zuckerman, Skopec, and Epstein 2017).

Second, delivering fiscal relief via Medicaid and CHIP would discourage states from responding to fiscal pressure in ways that are likely to do particularly serious macroeconomic damage. Because of the state-federal matching structure of Medicaid and CHIP, when a state reduces its spending, the federal government reduces its spending by the same amount or more, thereby greatly magnifying the resulting reduction in aggregate demand. For example, in a state with a base Medicaid matching rate of 55 percent (the Medicaid matching rate for a state with per capita income equal to the national average), policy changes that reduce a state's contribution to its Medicaid program by \$1.00 reduce federal spending on that state's program by an additional \$1.22. States may not fully internalize these effects on aggregate demand, either because they are inattentive to the macroeconomic consequences of their fiscal choices or because they underweight those consequences due to the collective action problem described earlier.

Third, delivering fiscal relief via Medicaid and CHIP would economize on administrative costs. The federal government already finances the majority of state spending on Medicaid and CHIP. Our proposal would build on this existing framework by modifying the existing matching rate formula to depend on the unemployment rate, thereby avoiding the administrative costs associated with setting up a whole new mechanism.

Finally, delivering state fiscal relief through Medicaid and CHIP may be more politically feasible than other approaches. Both Republican and Democratic presidents and Congresses have delivered State fiscal relief in this manner on a discretionary basis. Further, the Medicaid and CHIP programs attract support from a range of influential constituencies, most notably medical providers. By contrast, there has been more congressional opposition to fiscal relief for states that is not tied to a specific activity, which would complicate that approach.

We note that the federal share of program costs in Medicaid and CHIP already depends on states' economic circumstances in one important respect. Specifically, the federal share is higher in states with per capita income below the national average and lower in states with per capita income above the national average. However, the income data used in this formula are very lagged; when setting the matching rate for a given year, the Centers for Medicare and Medicaid Services (CMS) measures per capita income for these purposes by averaging per capita income for the years three, four, and five years prior. Additionally, because this calculation is based on a state's income *relative* to the national average, the nationwide average federal share of Medicaid and CHIP costs does not change appreciably in response to a national economic downturn. Thus, while this formula fulfills Congress's original objective of delivering greater assistance to states that have persistently lower incomes, it does essentially nothing to offset cyclical pressures on state budgets.

We also note that we are far from the first authors to discuss creating a mechanism that would automatically deliver fiscal relief to state governments during recessions, whether through Medicaid or other mechanisms. For example, the Government Accountability Office (GAO) has previously proposed creating a mechanism that would automatically increase the federal share of Medicaid spending in response to recessions, which we discuss in detail later in the chapter (GAO 2006, 2011a, 2011b). Many others have also considered creating new programs or making modifications to existing programs that would provide fiscal relief to state governments during periods of economic weakness, including Bernstein and Spielberg (2016), Clemens and Ippolito (2018), Kamin (2015), and Mattoon, Haleco-Meyer, and Foster (2010).

Proposal for Delivering State Fiscal Relief through Medicaid and CHIP

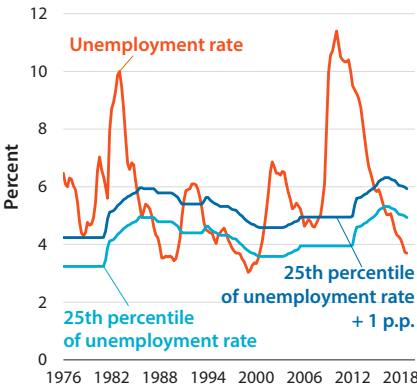
To reduce states' need to make contractionary fiscal changes during hard economic times, we propose to automatically increase the federal share of expenditures under a state's Medicaid and CHIP programs when the state's unemployment rate exceeds a threshold level. Our proposal would determine the amount of assistance each state received based on the amount by which its unemployment rate exceeded this threshold, with the objective of offsetting two-thirds of the deterioration in state budgets associated with increases in unemployment above the threshold. Fiscal relief would phase out automatically as a state's economy improved. The remainder of this section describes in detail how this assistance would be determined and administered.

MECHANISM FOR TRIGGERING AND CALCULATING THE INCREASED MATCHING RATE

Our proposal bases each state’s eligibility for fiscal relief on its unemployment rate. A state would be eligible for relief in any quarter in which its unemployment rate exceeded a threshold level, set at the 25th percentile of the distribution of the state’s unemployment rates over the preceding 15 years, plus 1 percentage point. This approach is motivated by an assumption that most state economies are likely to be close to full employment a meaningful fraction of the time, but substantially above full employment relatively infrequently. Under that assumption, the 25th percentile of the distribution of the state’s unemployment rate over a suitable historical period is likely to provide a reasonable approximation of the state’s unemployment rate at full employment. We add 1 percentage point to that amount to allow for normal fluctuations around full employment, as well as to ensure that assistance is targeted to serious economic downturns and is not triggered by small fluctuations in state unemployment rates.

To make this concrete, figures 2 and 3 illustrate how this estimate would have changed over time in two states—North Carolina (a relatively populous state) and Maine (a relatively less populous state)—as well as the distribution of unemployment rates in these states over the past 15 years.

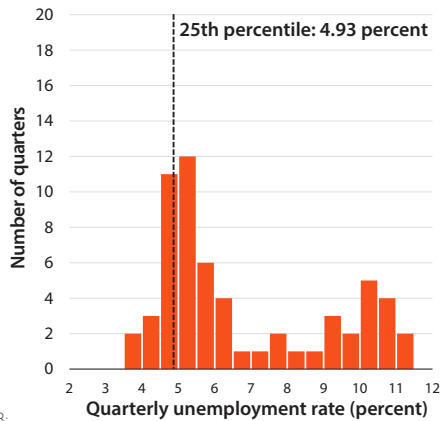
FIGURE 2A.
Unemployment Rate and Proposed Threshold Level in North Carolina, 1976–2018



Source: Bureau of Labor Statistics (BLS) 1960–2018, 1976–2018; authors’ calculations.

Note: The 25th percentile series in figure 2a is calculated over the prior 15 years. The vertical dashed line in figure 2b is the 25th percentile of North Carolina unemployment rates from 2003:Q4 through 2018:Q3. State unemployment rates for years prior to 1976 (which are needed to estimate the threshold level in the early years of the sample) are estimated using the methodology described in online appendix B.

FIGURE 2B.
Distribution of North Carolina Unemployment Rate, 2003–18



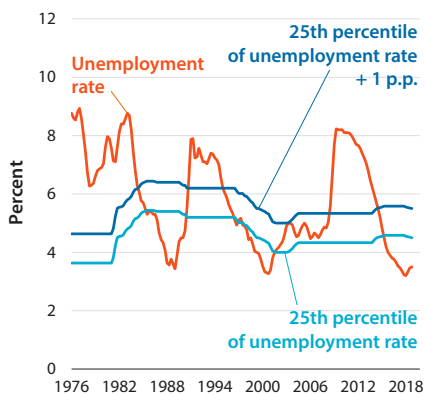
The figures illustrate that there are important differences in unemployment dynamics across states. For example, in North Carolina the 2007–9 recession was by far the most severe recession observed during the period we examine, while the 1990–91 recession was the mildest (figure 2a). By contrast, in Maine the 1990–91 recession was relatively severe, while the 2001 recession was quite mild (figure 3a). These differences across the states illustrate the importance of tailoring the amount of assistance provided to each state’s particular economic circumstances.

Under our proposal, the state’s base Medicaid matching rate would increase by 3.8 percentage points for each percentage point by which the state’s unemployment rate exceeded the threshold level. States that have expanded Medicaid under the Patient Protection and Affordable Care Act (ACA) would receive an additional 1.0 percentage point increase in the base matching rate per percentage point of excess unemployment. The same percentage point increase would also apply to the CHIP matching rate and the matching rates that apply to Medicaid administrative spending, but not to the matching rate for the ACA Medicaid expansion population.⁵

The additional matching rate increase for expansion states has two objectives. First, it would (more than) offset the costs of increased enrollment

FIGURE 3A.

Unemployment Rate and Proposed Threshold Level in Maine, 1976–2018

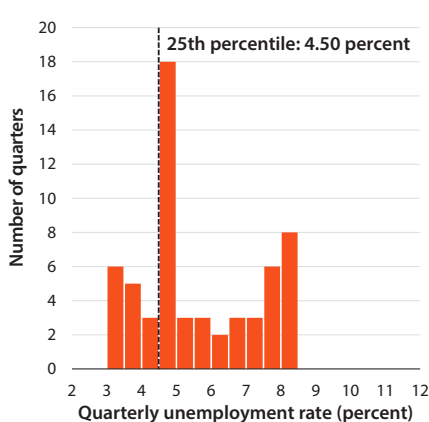


Source: BLS 1960–2018, 1976–2018; authors’ calculations.

Note: The 25th percentile series in figure 3a is calculated over the prior 15 years. Vertical dashed line in figure 2b is the 25th percentile of Maine unemployment rates from 2003:Q4 through 2018:Q3. State unemployment rates for years prior to 1976 (which are needed to estimate the threshold level in the early years of the sample) are estimated using the methodology described in online appendix B.

FIGURE 3B.

Distribution of Maine Unemployment Rate, 2003–18

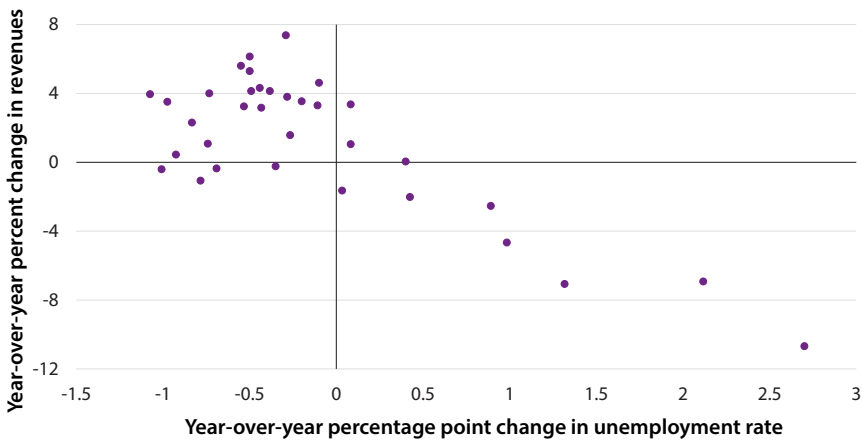


in the Medicaid expansion population. We take this approach rather than directly increasing the matching rate for the expansion population because, as discussed below, we wish to cap matching rates at 90 percent, but the matching rate for the expansion population is already 90 percent. Second, it would create an additional incentive for states to adopt the ACA's Medicaid expansion. Simulation evidence demonstrates that expansion is likely to make Medicaid enrollment rise considerably more in response to recessions, so encouraging the remaining states to adopt expansion would help make Medicaid a more effective automatic stabilizer (Jacobs, Hill, and Abdus 2017). Expansions implemented during a recession or its aftermath would also provide a well-timed (albeit not repeatable) fiscal stimulus. Of course, Medicaid expansion would also have important health policy benefits that are beyond the scope of this proposal (Council of Economic Advisers [CEA] 2017).

We have calibrated the increase in the matching rate under our proposal with the goal of offsetting approximately two-thirds of the historical deterioration in state budgets associated with increases in unemployment in excess of the threshold level (in states that have adopted the ACA's Medicaid expansion), although our proposal could easily be adapted to achieve a more ambitious or less ambitious target.⁶ To quantify the effects of

FIGURE 4.

Changes in Real per Capita State Tax Revenues and Changes in the National Unemployment Rate, 1985–2018



Source: BEA 1978–2018a, 1978–2018b; BLS 1983–2018; Census 1978–2018; NASBO 2018b; authors' calculations.

Note: Changes in real per capita state tax revenues are adjusted for policy changes using estimates from NASBO, as described in online appendix A. Years are defined to run from July to June to align with most states' fiscal years.

increases in unemployment on state tax revenues, we examine the historical relationship between changes in unemployment and changes in state revenues, adjusting for the effect of policy changes; as shown in figure 4, there is a strong correlation between changes in unemployment and changes in state tax revenue. On the outlay side of state budgets, the main source of cyclical pressure is likely to be increases in Medicaid and CHIP enrollment, so we examine the historical relationship between unemployment and enrollment in these programs. Notably, we find that declines in state revenues account for the large majority—more than 90 percent—of the fiscal pressure associated with increases in unemployment. Full details of our calculations are presented in online appendix A.⁷

Matching rates would be capped at 90 percent under our proposal. While it is appropriate to increase matching rates in weak economies to discourage states from making cuts to their Medicaid and CHIP programs, it is prudent to continue to provide states with some incentive to manage their programs efficiently. To ensure that states still received the full intended amount of fiscal relief, any leftover increase in the matching rate could be applied to costs incurred in an earlier year, which does not raise the same incentive concerns. Specifically, states could apply that leftover increase in the matching rate to a quarter in any fiscal year that concluded at least one year before the most recent quarter in which a state's unemployment rate was below the threshold level.

Regardless, the cap would bind relatively infrequently in practice. Over the historical period examined in the policy simulations presented later, the cap would have limited the increase in a state's matching rate in fewer than one-eighth of quarters in which a state qualified for assistance. The cap is most frequently limiting for CHIP expenditures, which the federal government matches at a higher rate under current law. Medicaid expenditures would have been constrained in only about 6 percent of quarters in which a state would have qualified for assistance.

CALCULATION OF PRELIMINARY MATCHING RATE ESTIMATES PRIOR TO START OF QUARTER

To allow states to draw down funds at the increased matching rate in real time during the quarter, CMS would produce an estimate of the increase in each state's matching rate before the start of each quarter based on a projection of the state's unemployment rate for that quarter. The projection would equal the state's unemployment rate two quarters prior plus the change in the state's unemployment rate from three quarters prior to two quarters prior; our analysis of historical data suggests that this simple projection rule would perform reasonably well.⁸ Given the timeline on

which estimates of state unemployment rates are published (which is discussed in more detail below), estimates could be produced slightly more than two months before the start of each quarter.

The matching rate would be updated once the actual unemployment rate for the quarter was available, but states would be held harmless for projection errors. That is, if the matching rate increase that was calculated using the actual unemployment rate exceeded the amount that was calculated based on the projected unemployment rate, states would receive the larger amount. However, states would not need to repay the excess if the estimated increase in the matching rate based on the projected unemployment rate turned out to be too large.

SOURCE OF DATA ON STATE UNEMPLOYMENT RATES

We propose to measure state unemployment rates using the Local Area Unemployment Statistics (LAUS) published by the Bureau of Labor Statistics (BLS).⁹ The LAUS unemployment rate estimates are produced using a statistical model that combines data from the Current Population Survey (CPS) and unemployment insurance claims data (BLS 2018a). Combining these data sources allows BLS to produce relatively precise estimates of state-level unemployment rates in close to real time despite the comparatively limited state-level sample sizes of the CPS. Indeed, as an empirical matter the LAUS unemployment rate estimates are at most marginally more volatile than the CPS estimate of the national unemployment rate.¹⁰ Estimates for each month are published by BLS before the end of the subsequent month. Other federal programs already use the LAUS estimates for purposes similar to the one we envision here. For example, the LAUS estimates are one of the factors considered when determining state eligibility for extended benefits under the unemployment insurance program, as well as state eligibility for waivers from work requirements in the Supplemental Nutrition Assistance Program.

MAINTENANCE OF EFFORT REQUIREMENT

States wishing to receive increased matching rates under our proposal would be required to maintain Medicaid and CHIP eligibility rules that are at least as generous as those that were in place one year before the most recent quarter in which a state's unemployment rate was below the threshold level.¹¹ This maintenance of effort requirement, together with the increased matching rate itself, would help ensure that state Medicaid and CHIP programs continue to provide effective coverage to low-income populations during recessions. Congress included similar maintenance of effort requirements when it increased Medicaid matching rates on a temporary basis in 2003, 2009, and 2010.

ADMINISTRATIVE CONSIDERATIONS

We believe it would be feasible for CMS to augment its existing financial reporting and payment methodologies to account for the new financial flows under our proposal. The quarterly frequency at which the matching rate would vary under our proposal aligns with the frequency with which states report estimated and actual expenditures under existing reporting processes. Consistent with this, CMS successfully administered the temporary increases in Medicaid matching rates legislated in 2003, 2009, and 2010. Notably, the matching rate increases legislated in 2009 and 2010 varied across states, based in part on changes in state unemployment rates, similar to the matching rate increases under our proposal.

Analysis of the Historical and Future Effects of Our Proposal

In this section of the chapter, we first simulate the effects our proposal would have had on the federal budget and the national economy in the past. We then turn to projecting how our proposal would affect the budget and the economy in the future. Online appendix B provides considerable additional detail on our methods and data sources.

SIMULATION OF HISTORICAL MACROECONOMIC AND FISCAL EFFECTS

Figures 5a and 5b illustrate the breadth and depth of the matching rate increases that would have occurred under our proposal in years stretching back to 1976 based on the state unemployment rates actually observed over that period. As illustrated by the yellow line in figure 5a, all states would have received an increase in their matching rates in connection with the 2007–9 recession as well as the early 1980s recessions. By contrast, around the less severe 1990–91 and 2001 recessions, only around two-thirds of states would have had unemployment rates high enough to qualify for an increased matching rate.

As illustrated in figure 5b, the magnitude of the assistance provided varies far more widely across downturns.¹² Following the comparatively mild 1990–91 and 2001 recessions, the average increase in the matching rate would have peaked in the single digits, reflecting the fact that even the states that would have qualified for an increased matching rate generally would have exceeded their threshold unemployment levels by relatively small amounts and thus received modest increases in their matching rates. By contrast, following the 2007–9 recession the average increase in the matching rate would have peaked at 20 points. Following the early 1980s

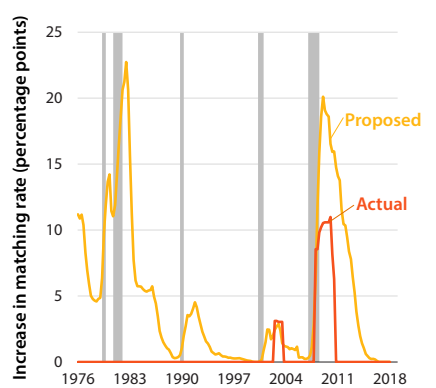
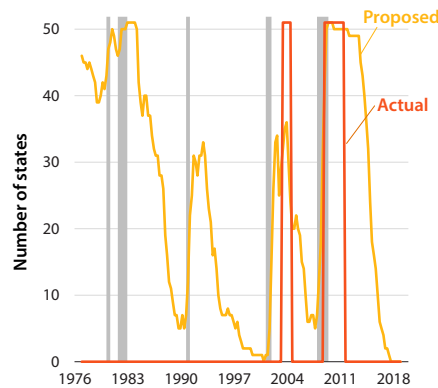
recessions, the average matching rate increase would have peaked at almost 23 percentage points.

One consistent pattern across business cycles is that the matching rate increases under our proposal would not have peaked until after the end of each recession, reflecting the fact that the unemployment rate typically peaks after a recession formally ends and economic growth resumes. This is not necessarily a problem. The objective of our proposal is to offset the fiscal pressures that states face during economic downturns, and the analysis presented in online appendix A indicates that these pressures tend to emerge contemporaneously with increases in the unemployment rate.¹³ States may also have a greater ability to avoid spending cuts or tax increases in the very early phases of economic downturns. For example, McNichol (2012) finds that, in the 2007–9 recession, states closed about two-thirds of their budget shortfalls for fiscal year 2008 by drawing down rainy-day funds or implementing timing shifts, before largely turning to other approaches in fiscal year 2009 and later years.

Increases in matching rates under our proposal also tend to persist for a long period following the end of a recession. This is also appropriate. State government revenues tend to remain depressed (and demands on Medicaid

FIGURE 5A.
Proposed and Actual Number of States Receiving an Increased Matching Rate, 1976–2018

FIGURE 5B.
Proposed and Actual Average Increase in Matching Rate across States, 1976–2018



Source: BLS 1960–2018, 1976–2018; CRS 2012; Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (ASPE) 2003, 2015; Medicaid and CHIP Payment and Access Commission (MACPAC) 2019; authors’ calculations.

Note: Shaded areas denote recessions. The proposed series is simulated as described in online appendix B. The average increase in figure 5b weights all states equally.

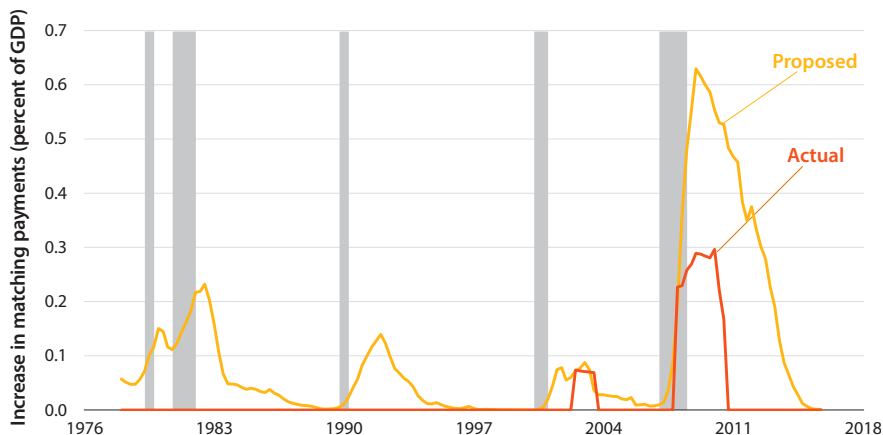
and CHIP tend to remain elevated) until the economy is once again approaching full employment. This implies that the potential for damaging fiscal adjustments is likely to persist well after the end of a recession and, therefore, that assistance to states should continue as well.

Figure 6 shows the increase in federal Medicaid and CHIP matching payments under our proposal as a share of GDP. (These estimates do not incorporate any effects of changes in state Medicaid and CHIP policy in response to the incentives under our proposal; we discuss this issue further in the context of our prospective simulations presented later.) The temporal patterns resemble those in figure 5b, with the notable exception that the increase in outlays in connection with the 1990–91 recession and the early 1980s recessions are modest in comparison to the increase in matching rates shown in figure 5b. This reflects the fact that Medicaid spending was far lower during these earlier business cycles, both because the eligible population was smaller and because overall health costs were significantly lower.

It is also worth comparing results under our proposal to the temporary increases in Medicaid matching rates enacted in connection with the 2001 and 2007–9 recessions; outcomes under those packages are depicted by the orange lines in figures 5a, 5b, and 6. Our proposal compares favorably.

FIGURE 6.

Proposed and Actual Additional Federal Matching Payments as a Share of GDP, 1978–2016



Source: ASPE 2003, 2015; BEA 1978–2016; BLS 1960–2018, 1976–2018; Centers for Medicare and Medicaid Services (CMS) 2013, 2019a, 2019b; CRS 2012; Health Care Financing Administration (HCFA) 1982, 1983, 1986, 1987, 1988, 1991, 1998; MACPAC 2019; authors' calculations.

Note: Shaded areas denote recessions.

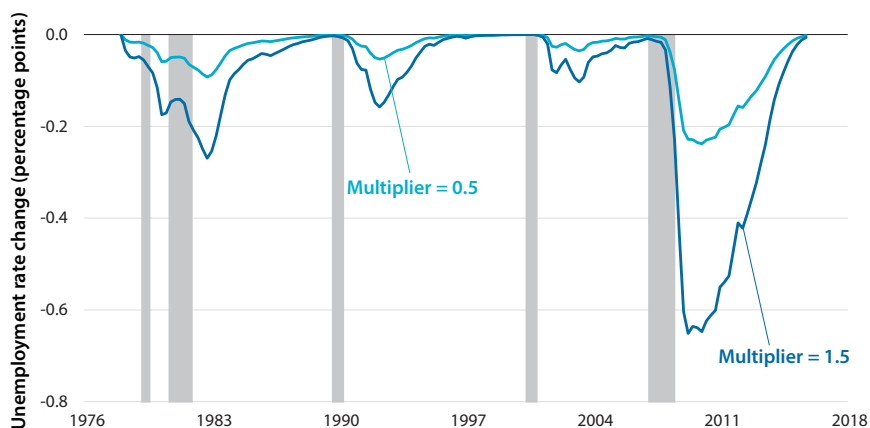
During the 2001 recession and its aftermath, our proposal begins payments earlier, consistent with when unemployment starts to rise, and payments are more concentrated in states experiencing larger downturns. During the 2007–9 recession and its aftermath, the increase in the matching rate peaks at a substantially higher level and persists for a far longer period, which is appropriate in light of the depth of the 2007–9 recession and the long period before the economy was again approaching full employment. It is important to note that the orange lines in figures 5a, 5b, and 6 do not account for the roughly one-third of the state fiscal relief included in ARRA and subsequent legislation that was delivered through non-Medicaid mechanisms (CBO 2009, 2011). Including those funds would close about half the gap between our proposal and historical experience in the immediate aftermath of the recession, but would have little effect on the differences after 2011.

Finally, we estimate the macroeconomic effects of our proposal. Consistent with the discussion earlier in the chapter, our proposal would have increased the overall level of economic activity by reducing the need for states to make contractionary fiscal changes in connection with past recessions. But the magnitude of those effects seems likely to have varied significantly over the historical period examined here. The recessions of the early 1980s were the result of deliberate decisions by the Federal Reserve to tighten monetary policy, so it is likely that the stimulative effects of our proposal would have been offset in large part by tighter monetary policy. By contrast, around the later recessions it is likely that any monetary policy offset to our proposal would have been small to nonexistent. This is particularly true around the 2007–9 recession, since the Federal Reserve brought short-term interest rates down to zero and standard policy rules suggested it would have preferred to stimulate the economy even more.

To account for these differences, figure 7 depicts the effects of our proposal on the unemployment rate under two assumptions about the fiscal multiplier (i.e., the increase in overall economic output per \$1.00 increase in government spending net of taxes) relevant to our proposal. The first value of 1.5 is intended to capture periods in which the offset from monetary policy is small to nonexistent. This value could be somewhat conservative; Chodorow-Reich (2019) reviews a large number of recent studies that estimate fiscal multipliers using quasi-experimental cross-sectional variation in fiscal policy and concludes that the fiscal multiplier is at least 1.7, holding monetary policy constant.¹⁴ The second value of 0.5 is intended to capture periods where monetary policymakers act relatively aggressively to offset the fiscal stimulus under our proposal. These two monetary policy scenarios and the associated fiscal multipliers roughly correspond to those CBO uses when analyzing the macroeconomic effects of changes in fiscal

FIGURE 7.

Simulated Change in National Unemployment Rate under Proposal, 1978–2016



Source: BEA 1978–2016; BLS 1960–2018, 1976–2018; CEA 2009; CMS 2013, 2019a, 2019b; HCFA 1982, 1983, 1986, 1987, 1988, 1991, 1998; authors' calculations.

Note: Shaded areas denote recessions. Simulations are conducted separately for assumed fiscal multipliers of 0.5 and 1.5.



policy, as described in CBO (2014). Regardless of the multiplier that is chosen, we assume that the associated effects on output follow the time path assumed by the CEA (CEA 2009) for transfers to states, and we translate these effects on output into effects on unemployment using the historical relationship between changes in unemployment and output growth from 1985 to the present.

Our proposal would have significantly reduced the national unemployment rate during and after prior downturns and particularly during the most recent downturn. Under a multiplier of 1.5, our proposal would have reduced the unemployment rate by more than 0.6 percentage points at its peak following the 2007–9 recession. This reduction in unemployment would have been larger and considerably longer-lasting than that achieved under the increase in Medicaid matching rates that was actually enacted (not shown). On the other hand, our proposal would have offset only a relatively small portion of the overall increase in the unemployment rate during the recession, which indicates that a proposal like ours would ideally be combined with other efforts aimed at strengthening automatic stabilizers.

PROJECTIONS OF FUTURE MACROECONOMIC AND FISCAL EFFECTS

We turn next to estimating the future fiscal and macroeconomic effects of our proposal. Estimating these effects is challenging since it depends on

the expected frequency and depth of future recessions, both of which are highly uncertain. While different assumptions are plausible, we assume that the future behavior of the unemployment rate will resemble experience from 1985 to the present. We focus on this period rather than the longer historical period examined in the last section because we believe it better captures the economic dynamics and monetary policy behavior likely to be observed in the future.

Based on the frequency and amount by which state unemployment rates exceeded the threshold from 1985 to the present, we estimate that—in expectation and in the long run—our proposal would increase Medicaid and CHIP matching rates by 3.2 percentage points on a nationwide average basis before accounting for any reduction in future unemployment rates that would be caused by our proposal. It is important to note that this estimate is an average over a range of possible future outcomes. The most likely outcome for any specific future year is that unemployment will be close to its full employment level, in which case few states, if any, would qualify for higher match rates under our proposal (and those match rate increases would be small). There is some probability, however, that unemployment will turn out to be elevated in that future year, in which case many states would qualify for large matching rate increases.

Before accounting for changes in economic activity (or state behavior) that would be spurred by our proposal, this increase in expected matching rates translates into an expected cost of \$33 billion (0.11 percent of GDP) in 2029 based on CBO projections of Medicaid and CHIP spending (CBO 2018a). The expected cost of our proposal would be smaller in the near term since the U.S. economy is not currently in a recession, which reduces the likelihood that our proposal would incur significant costs over the next several years. Accounting for this fact, we estimate an expected federal cost over the 10-year budget window from 2020 through 2029 of \$192 billion.

In considering these costs, it is important to keep in mind that policymakers have increased matching rates under Medicaid and CHIP on a discretionary basis in response to each of the two most-recent recessions, so a portion of this amount would be spent even if policymakers merely continued past practice. On average from 1985 to the present, these discretionary actions have increased Medicaid matching rates by 0.9 percentage point. If policymakers took the same approach in future downturns (and applied that increase to the same set of spending that is covered under our proposal), that would generate expected federal costs of \$54 billion over the 10-year budget window from 2020 through 2029.¹⁵ Our proposal's 10-year cost of \$192 billion would therefore constitute a \$139 billion increase beyond current policy.

As in the historical analysis, reducing the need for states to make contractionary fiscal changes during recessions would increase overall economic activity. To quantify these effects, we assume a fiscal multiplier of 1.3, reflecting an assumption that assistance under our proposal would mainly be triggered in periods in which it would provoke little or no offsetting response from monetary policy. Under this assumption, we estimate that our proposal would increase the expected level of GDP by 0.12 percent in the long run and reduce the expected level of the unemployment rate by 0.10 percentage points. As above, these estimates represent an average over years in which our proposal would have no effect on economic activity because it would not be triggered and years in which it would have large effects.

These increases in economic activity would reduce our proposal's fiscal cost in two ways. First, the reduction in unemployment would directly reduce the amount of assistance delivered under our proposal. Second, the increase in overall economic activity would increase federal revenues. Based on CBO (2018a) estimates of marginal tax rates under current law, we estimate that between 22 percent and 25 percent of the overall increase in output would accrue back to the federal government in the form of higher revenues, depending on the year. Accounting for these effects reduces the expected cost of our proposal to \$19 billion (0.06 percent of GDP) in 2029. Over the 10-year-budget window from 2020 through 2029, accounting for this macroeconomic feedback would reduce the cost of our proposal from \$192 billion to \$114 billion.

We note, however, that the dynamic analysis presented here is incomplete in two respects. First, this analysis implicitly assumes that states will not change their Medicaid and CHIP spending decisions based on our proposal. However, we believe that our proposal would reduce the extent to which states cut their Medicaid and CHIP programs during cyclical downturns since the higher matching rate would reduce both the savings that states realize from any particular program that is cut and the overall pressure on state budgets. This would, in turn, increase the proposal's cost to the federal government since the federal government receives a portion of the savings associated with these cuts. We have not attempted to quantify these costs here, since we are unaware of any existing estimates of how states' Medicaid and CHIP spending decisions change in response to temporary changes in matching rates. To provide a sense of scale, however, state actions that increased total Medicaid and CHIP spending by 1 percent during the 10-year period from 2020 through 2029 would increase federal spending by \$56 billion, so these costs could be substantial.

Second, we have not accounted for how our proposal would be financed. One reasonable approach to financing our proposal would be to implement other reforms aimed at reducing federal health-care spending; such changes would, at most, very slightly change the estimated effects on output and employment reported above. Alternatively, policymakers could finance our proposal by increasing taxes or borrowing. Either approach would only very slightly reduce the positive effects on output and employment reported above.¹⁶

Questions and Concerns

1. Why base the amount of assistance that states receive on state, rather than national, economic conditions?

In general, targeting greater fiscal relief to states experiencing greater economic weakness increases the benefits generated for any given amount of federal expenditure. This is for two main reasons. First, the direct damage done by an additional \$1.00 of cuts to state programs is likely to rise as state governments make progressively deeper cuts since states are likely to seek to avoid cutting their highest priority programs as long as possible. This logic suggests that the amount of assistance each state receives should vary roughly in proportion to the size of state budget shortfalls, as it would under our proposal.

Second, at any given point in time, fiscal expansion is likely to generate larger increases in output in state economies with greater excess capacity, so targeting assistance to states with higher unemployment rates increases the boost to overall economic activity generated by our proposal. Indeed, if the sole policy objective were increasing overall output during recessions, it could be appropriate to target virtually all assistance to the states experiencing the very deepest downturns, although constraints on states' ability to absorb and deploy those funds would likely temper this conclusion to some degree.

There is nevertheless at least one valid argument for taking some account of national economic conditions when determining the amount of state fiscal relief. In particular, our proposal would assist states experiencing idiosyncratic economic weakness even if the national economy is strong. Such assistance is likely to provide a smaller boost to aggregate output, both because a portion of the resulting increase in demand for goods and services would spill over to other states that are not demand-constrained and, related, because monetary policymakers would be more likely to make offsetting policy changes. We believe fiscal relief would still be worth providing in these instances, both because a substantial portion of the

increase in aggregate demand would fall on goods and services produced inside the state and because of the direct benefits of mitigating cuts to state services. Nevertheless, if policymakers faced a constraint on the total cost of the proposal, this argument would offer a rationale for providing less assistance to states experiencing idiosyncratic economic weakness in the context of a strong national economy and for using the savings to increase the assistance provided when the national economy is weak. In practice, however, our historical simulations find that 97 percent of the total outlays under our proposal would have occurred in quarters when the national unemployment rate exceeded 5.5 percent. Thus, as a practical matter we do not believe that the improvement in targeting from this type of change would be sufficient to justify the increase in complexity.

There are two other considerations that might argue for placing more weight on national economic conditions in determining the amount of assistance states receive, but we doubt that either is relevant in practice. First, if state-level estimates of unemployment rates are noisy (due, e.g., to limited survey sample sizes at the state level), then combining state-specific data with national data can provide a more accurate picture of actual economic conditions in each state, thereby improving the targeting of assistance. This logic implies that, if our proposal relied on raw state-level estimates from the CPS to target assistance, then incorporating national data would likely be an improvement. However, the statistical model BLS uses to produce the LAUS estimates from the raw CPS data already does a version of this national-state blending and seeks to further reduce noise by supplementing the raw CPS data with state-level administrative tallies of unemployment insurance claims (BLS 2014, 2018a). Indeed, as noted earlier, the resulting LAUS unemployment rate estimates are at most marginally more volatile than the CPS estimate of the national unemployment rate. We therefore believe that the LAUS estimates approximate the best possible estimate of state unemployment rates using the data available in real time.

Second, a portion of the decline in state tax revenues that occurs in connection with recessions could be driven by national factors such as declines in equity prices. In that case, incorporating information on national economic conditions could provide a more accurate picture of the relative fiscal stress faced by different states and thereby improve the targeting of assistance. We explore this question empirically in online appendix A and find that, at least at time horizons longer than one year, the national unemployment rate plays little or no role in explaining movements in state revenues after accounting for the state unemployment rate. This suggests that placing significant weight on national factors when determining the

level of assistance any given state should receive would not meaningfully improve targeting.

In addition to these economic arguments, we note that past practice provides ample precedent for accounting for state economic conditions when determining Medicaid and CHIP matching rates. The existing matching rate formula already incorporates data on state per capita income (although, as discussed earlier, it does so in a way designed to capture only persistent income differences, so it does not provide meaningful countercyclical support). Similarly, the increase in Medicaid matching rates enacted on a discretionary basis in response to the 2007–9 recession determined support in part based on state unemployment rates. Our proposal would thus not break fundamentally new ground in this regard.

2. Should a state become eligible for assistance if it has experienced a significant increase in its unemployment rate, even if its unemployment rate remains below the threshold level?

At least at the national level, an increase in the unemployment rate of more than 0.5 percentage points over a two-quarter period has been a reliable indicator that the economy is entering a recession (Boushey et al. 2019). In general, triggering fiscal relief based on increases in the unemployment rate would initiate fiscal relief modestly earlier than our approach of triggering fiscal relief when the unemployment rate crosses a threshold level. Additionally, unlike simply reducing the threshold level, triggering fiscal relief based on increases in the unemployment rate would not increase the amount of assistance delivered late in economic recoveries.

The question is whether triggering state fiscal relief significantly earlier in economic downturns would be desirable. While there are plausible arguments that steps to increase aggregate demand are particularly valuable early in an economic downturn, state fiscal relief may not be the best tool for doing so. As noted earlier, states are less likely to have exhausted their other options for coping with budget shortfalls early in an economic downturn, so fiscal relief may be less likely to affect states' tax and spending decisions and thus less likely to affect aggregate demand.

State budget shortfalls are also likely to be relatively small early in a downturn, so delivering significant assistance through this mechanism would likely require states to increase spending above (or reduce taxes below) where it would have been, absent the recession. While there are strong arguments for helping states avoid disruption to their existing tax and spending policies when a recession hits, it is far less clear that helping states shift to a more expansionary posture is preferable to simply implementing expansionary policies at the federal level.

Starting fiscal relief earlier in a downturn would tend to incur similar incremental fiscal cost in mild recessions and severe ones. If those additional costs had to be accommodated without increasing the overall cost of our proposal, the required changes would likely reduce assistance by a greater amount in severe recessions than in mild ones. For example, obtaining the requisite savings by reducing the increase in the matching rate for each percentage point increase in the unemployment rate would likely have this effect. All else equal, we view shifting assistance from relatively severe recessions to relatively mild ones as unappealing.

3. How does your proposal compare to the Government Accountability Office's proposal to increase Medicaid matching rates during economic downturns?

The GAO has previously proposed to temporarily increase states' Medicaid matching rates during national economic downturns (GAO 2006, 2011a, 2011b). Under the 2011 version of the GAO proposal, when at least 26 states experienced year-over-year declines in their three-month average employment-population ratio for two consecutive months, states would be eligible to receive temporary increases in their Medicaid matching rates. Eligibility for an increased matching rate would end two quarters after the number of states with declining employment-population ratios fell below 26.

In quarters in which the national criterion is satisfied, each state would receive an increase in its matching rate based on the increase in its unemployment rate and the reduction in aggregate wages and salaries relative to the best quarter of the preceding eight quarters. The unemployment component of the formula is intended to capture increases in Medicaid enrollment, while the wages and salary component is intended to capture declines in state revenues. Both components would be calculated as a proportional reduction in a state's base share of funding, so a state with a high base matching rate, such as Mississippi, would receive a smaller increase in the matching rate for a given increase in its unemployment rate than a state with a low base matching rate, such as Colorado.

While our proposal and the GAO proposal have similar aims and some features in common, we believe our proposal has two significant advantages over the GAO's. First, in a protracted downturn our proposal would continue assistance until state economies had largely recovered, whereas the GAO proposal would end assistance soon after employment stopped declining, even if employment remained quite depressed. For example, in the first quarter of 2011 neither Michigan nor North Carolina would have received assistance under the GAO proposal even though the unemployment rate was above 10 percent in both states. By the fourth

quarter of 2011, no state would have received assistance under the GAO proposal even though the national unemployment rate still averaged 8.6 percent. This outcome reflects the structure of the national trigger in the GAO proposal, which is based on the number of states experiencing *declines* in the employment-population ratio, and the short eight-quarter lookback period for calculating the amount of assistance each state receives. By contrast, the much longer 60-quarter base period under our proposal would ensure that assistance continued as long as unemployment rates remained elevated (unless a recovery lasted far longer than any observed historically).

Second, our proposal would deliver substantially more assistance than the GAO proposal in the quarters in which it was in effect. For example, following the 2007–9 recession the average increase in matching rates under our proposal would have peaked at 20 percentage points, whereas the average increase under the GAO proposal would have peaked at just 4.5 percentage points.¹⁷ This disparity reflects a fundamental difference in objectives. Similar to our proposal, the GAO proposal aims to offset the costs to state governments of increased Medicaid enrollment. However, the GAO proposal seeks to offset declines in state tax revenues only to the extent those revenues were being used to finance Medicaid. By contrast, our proposal is calibrated to offset (two-thirds of) the decline in all state revenues and thereby comprehensively address cyclical pressures on state budgets. We note that because revenues are fungible, even to the extent one's objective is simply to insulate Medicaid from fiscal pressure, that likely requires addressing states' full budget shortfalls, and not just the portions directly related to Medicaid.¹⁸

A final important difference between our proposal and the GAO's is that the GAO uses a national trigger to determine whether any states qualify for assistance, whereas our proposal makes a state-by-state determination (although both proposals calculate state-specific matching rate increases). As discussed above, our approach provides greater flexibility to respond to regional downturns, but a national trigger that lacked the other problematic features of the GAO's trigger could, in principle, modestly improve the targeting of a fixed amount of assistance.

4. How would your proposal address cyclical pressures faced by local governments?

Approximately one-third of total revenues received by local governments are transfers from state governments (Tax Policy Center 2019). State budget shortfalls often lead state governments to reduce those transfers to localities, thereby transmitting that fiscal pressure to the local level (Evans,

Schwab, and Wagner 2019; Jackson, Wigger, and Xiong 2018). By insulating state governments from cyclical fiscal pressures, our proposal would help insulate localities as well.

Our proposal would not protect local governments against cyclical declines in revenues from taxes they collect directly, but such declines may not be particularly large. Local governments' tax revenues consist overwhelmingly of property taxes, and housing prices do not move in lockstep with broader economic activity. Indeed, neither the 1990–91 nor 2001 recessions saw major declines in housing prices. Housing prices did decline during the Great Recession, but that decline began before the recession began, and it is far from clear that the housing price decline would have been associated with a recession absent the underlying fragilities in the financial system that the decline in housing prices exposed. Moreover, due to the procedures that localities use to update property assessments, changes in housing prices take some time to affect revenues, which will tend to further attenuate linkages between local government revenues and the business cycle (Lutz 2008; Lutz, Molloy, and Shan 2011).

5. Would the high matching rates under your proposal encourage states to spend inefficiently on their Medicaid and CHIP programs?

We do not view this as a significant practical concern. Our proposal likely would induce states to implement smaller cuts to their Medicaid and CHIP programs during hard economic times, both by reducing the marginal cost of spending on these programs and by lowering the overall level of fiscal stress that states face. In principle, our proposal could even lead states to spend more on their programs in hard economic times than they do during good economic times. However, we view this outcome as less likely in practice since our proposal would not completely eliminate the cyclical pressures on state budgets, and states would anticipate having to reverse any such increases once the temporary higher matching rate ended.

Regardless of whether our proposal merely mitigates cuts or leads states to *increase* spending on Medicaid and CHIP during hard economic times, we view such changes as more likely to be a positive than a negative. As noted earlier, state Medicaid programs generally pay physicians considerably less than Medicare or private insurers, and there is evidence that these low payment rates can create access problems for beneficiaries. Payment rates for hospitals are higher, but are still only at rough parity with Medicare, on average (Medicaid and CHIP Payment and Access Commission [MACPAC] 2017c). We thus see relatively little risk that our proposal would lead states to set excessive provider payment rates.

We are even less concerned that states might maintain or adopt overly expansive eligibility rules or benefit packages.¹⁹ The populations that states are allowed to cover through Medicaid and CHIP under federal law generally either have low incomes or some other characteristic, such as a disability, that makes financing their coverage a high-value use of public funds. Similarly, there are relatively few optional benefits permitted under Medicaid for which there is a strong case that the costs of providing such coverage exceed the benefits.

We would be more concerned that states would spend inefficiently on their Medicaid and CHIP programs during economic downturns if our proposal entirely eliminated states' exposure to program costs. But avoiding such a scenario is precisely why our proposal would cap matching rates at 90 percent. Furthermore, as noted earlier, matching rates would almost always remain below 90 percent in practice. This structure ensures that states would retain significant incentives to operate their programs efficiently.

Conclusion

States experience significant fiscal pressures during recessions and their aftermath, and the actions they take in response deepen economic downturns and thereby deprive states' residents of valuable public and private goods and services. We have described a proposal that would automatically deliver fiscal relief to state governments during periods of economic weakness by increasing the share of Medicaid and CHIP expenditures financed by the federal government. In so doing, our proposal would reduce states' need to undertake damaging fiscal adjustments during hard economic times, while providing particular protection to low-income people who rely on Medicaid and CHIP for their health insurance. As such, we believe our proposal could be an important component of a broader effort to strengthen the U.S. economy's system of automatic stabilizers.

Acknowledgments

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Endnotes

1. The methodology behind this estimate is discussed in detail in online appendix A. All appendices can be found at the end of the online version of this chapter.
2. These calculations use estimates of the effect of enacted state revenue changes reported by NASBO (2018b). These estimates are discussed in more detail in online appendix A.
3. This discussion assumes that the fiscal multiplier—the increase in overall output spurred by a \$1.00 increase in government spending—exceeds one. As discussed in detail later in the paper, recent research finds that this is likely to be the case during recessions and their aftermath. However, public spending is frequently worthwhile even when the multiplier is well below 1. Indeed, in periods when the economy does not have excess capacity, increasing production of public services requires an essentially one-for-one reduction in the production of private goods and services—corresponding to a multiplier of 0—yet many public services are still quite worth delivering. Our proposal would thus continue to be well-justified even if the fiscal multiplier were substantially less than 1.
4. The appropriate structure of a fiscal relief program depends on the relative importance of borrowing constraints and collective action problems in driving state responses to recessions. To the extent that borrowing constraints bind, then any policy that transfers funds to states during periods of economic weakness will discourage states from implementing contractionary policy changes. If states are not borrowing constrained, however, then ameliorating the collective action problem would require either changing states' incentives to tax and spend at the margin or simply implementing expansionary policies directly at the federal level. In practice, we believe states are seriously borrowing constrained, so transferring resources to states during periods of economic weakness will have significant benefits. Nevertheless, as discussed below, the existence of a collective action problem is one of our rationales for delivering that assistance through Medicaid and CHIP in particular. More generally, it is important for policymakers to recognize that the fiscal decisions made in one state have important consequences for other states' economies.
5. Technically, the annual amount of federal funding available under CHIP is capped by Congress (in most years). In practice, however, Congress has set this cap at a high enough level that CMS has been able to fulfill all state requests for federal matching funds. To ensure that this would continue to be the case, our proposal would automatically increase CHIP allotments to accommodate the increase in the matching rate under our proposal.
6. The ratio of Medicaid and CHIP spending to state tax revenues may rise over time due to increases in the relative cost of health care and other factors. This increase in the ratio of spending to tax revenues would increase the amount of assistance delivered under our proposal relative to state tax revenues, likely causing our proposal to offset more than two-thirds of the deterioration in state budgets associated with economic downturns. To avoid this outcome, policymakers could index the increase in the matching rate to the ratio of Medicaid and CHIP spending to state tax revenues. We have not included such an indexing provision in our proposal to simplify exposition, but it would be straightforward to add one.
7. Appendices can be found at the end of the online version of this chapter.
8. This projection rule achieves an R^2 of approximately 0.94. We considered a range of alternative projection rules, some of which were considerably more complicated, and none performed meaningfully better.
9. Quarterly unemployment rates would be measured as a simple average of the seasonally adjusted estimates for the three constituent months of the quarter. Unfortunately, the LAUS program provides estimates of unemployment rates only for the 50 states and the District of Columbia. For U.S. territories we would determine the increase in the matching rate by using the national unemployment rate. Additionally, annual Medicaid payments to the territories are capped. To ensure that the territories could receive the intended amount of assistance, our proposal would increase each territory's cap by the increase in the matching rate multiplied by the territory's total Medicaid spending subject to the higher match.
10. For 1976 to the present, the standard deviation of quarter-over-quarter changes in the national unemployment rate is 0.31 percentage points. The corresponding figure for state unemployment rates, as measured using the LAUS estimates, is 0.34 percentage points in the median state.

11. We tie the maintenance of effort requirement to eligibility rules one year prior to the beginning of assistance under our proposal in order to avoid creating incentives for states to curtail eligibility during months in which it expects to become eligible for an enhanced matching rate but has not yet actually become eligible.
12. For the purposes of these historical simulations, we treat all states as Medicaid expansion states since expansion was not an option for most of this period. These estimates are also most relevant for understanding how our proposal would function in the future since most states have adopted the ACA's Medicaid expansion and we expect that more will do so in the future, particularly if our proposal were implemented.
13. Figures 5a, 5b, and 6 depict the amount of assistance ultimately paid for each quarter after that quarter's unemployment rate is known. Our simulations indicate that, at the start of recessions, the amount paid prospectively for each quarter tends to lag the amounts ultimately paid to some degree.
14. Technically the 1.7 multiplier estimate reported by Chodorow-Reich (2019) applies to increases in government purchases. In principle, the full amount of state fiscal relief need not be used in this way, since some might be used to reduce taxes or replenish rainy-day funds. However, Chodorow-Reich presents evidence that, at least in the context of the increase in the Medicaid matching rate included in ARRA, virtually all the additional funding does appear to have been used to increase government purchases.
15. Accounting for non-Medicaid state fiscal relief enacted in response to the 2007–9 recession would add modestly to this amount.
16. For example, suppose that policymakers financed the proposal through borrowing. CBO (2014) assumes that for each \$1.00 increase in the deficit, investment falls by \$0.33. If the 10-year cost of the proposal were the \$114 billion we estimate in our partial dynamic analysis and the marginal product of an additional \$1.00 of capital is \$0.10 per year, then the reduction in output in 2030 would be roughly \$3.8 billion ($=\$114 \text{ billion} \times 0.33 \times 0.1$) or about 0.01 percent of GDP. Alternatively, the \$114 billion 10-year cost could be financed by an increase in the average labor tax rate equivalent to 0.1 percent of CBO's projection of total wage and salary income over that period. Assuming the average marginal tax rate on labor income under current law is 30.8 percent, in line with CBO's Spring 2018 baseline (CBO 2018c), and the elasticity of wage and salary income with respect to the net-of-tax rate is 0.2, that translates into a reduction in output of \$3.9 billion in 2029 or about 0.01 percent of GDP. Additionally, on a dollar-for-dollar basis these reductions in output would have smaller effects on actual economic well-being than the increases in output spurred by our proposal. Our proposal would increase output by reducing the number of people who are involuntarily unemployed (or underemployed) and thereby lead to first-order improvements in well-being for the affected individuals. By contrast, individual decisions to adjust labor supply or savings behavior in response to marginal changes in tax rates or interest rates have no first-order effect on individual well-being.
17. For both proposals, we report the increase in the matching rate weighting all states equally.
18. The measure the GAO uses to gauge decline in revenues—the change in wage and salary income—may also understate the actual decline in state revenues. In unreported analysis, we found that the proportional decline in state tax revenues tended to be larger than the decline in broad measures of state tax bases.
19. MACPAC (2017a) provides an overview of optional populations and benefits in Medicaid.

References

- American Recovery and Reinvestment Act of 2009 (ARRA) Pub. L. 111–5 (2009).
- Baicker, Katherine, Sarah L. Taubman, Heidi L. Allen, Mira Bernstein, Jonathan H. Gruber, Joseph P. Newhouse, Eric C. Schneider, Bill J. Wright, Alan M. Zaslavsky, and Amy N. Finkelstein. 2013. “The Oregon Experiment—Effects of Medicaid on Clinical Outcomes.” *New England Journal of Medicine* 368 (18): 1713–22.

- Bernstein, Jared, and Ben Spielberg. 2016. "Preparing for the Next Recession: Lessons from the American Recovery and Reinvestment Act." Center on Budget and Policy Priorities, Washington, DC.
- Boushey, Heather, Ryan Nunn, Jimmy O'Donnell, and Jay Shambaugh. 2019. "The Damage Done by Recessions and How to Respond." In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, edited by Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington, DC: The Hamilton Project and the Washington Center for Equitable Growth.
- Boyd, Donald J., and Lucy Dadayan. 2014. "State Tax Revenue Forecasting Accuracy: Technical Report." Nelson A. Rockefeller Institute of Government, State University of New York, Albany, NY.
- Bureau of Economic Analysis (BEA). 1978–2016. "Gross Domestic Product (GDP)." U.S. Department of Commerce, Suitland, MD. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 1978–2018a. "Gross Domestic Product: Chain-Type Price Index (GDPCTPI)." U.S. Department of Commerce, Suitland, MD. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 1978–2018b. "Population (B230RC0Q173SBEA)." U.S. Department of Commerce, Suitland, MD. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 1994–2017. "Regional Data: SAINC1 Personal Income Summary: Population." U.S. Department of Commerce, Suitland, MD.
- Bureau of Labor Statistics (BLS). 1960–2018. "Civilian Unemployment Rate (UNRATE)." Bureau of Labor Statistics, U.S. Department of Labor, Washington DC. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 1976–2018. "Local Area Unemployment Statistics, State Unemployment Rate." Bureau of Labor Statistics, U.S. Department of Labor, Washington DC. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 1983–2018. "Civilian Unemployment Rate, Not Seasonally Adjusted (UNRATENSA)." Bureau of Labor Statistics, U.S. Department of Labor, Washington DC. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 1991–2017. "Local Area Unemployment Statistics, State Unemployment Rate, Not Seasonally Adjusted." Bureau of Labor Statistics, U.S. Department of Labor, Washington DC. Retrieved from FRED, Federal Reserve Bank of St. Louis, St. Louis, MO.
- . 2003–13. "Current Population Survey Annual Social and Economic Supplement." Bureau of Labor Statistics, U.S. Department of Labor, Washington DC. Retrieved from IPUMS-CPS, University of Minnesota.
- . 2014. "Report on Revision to State and Area Time-Series Models." Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC.
- . 2018a. "Local Area Unemployment Statistics: Estimation." *Handbook of Methods*. Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC.
- . 2018b. "Questions and Answers on Upcoming Changes to Seasonal Adjustment for Model-Based Estimates." Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC.
- Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller. 2011. "Robust Inference with Multiway Clustering." *Journal of Business & Economic Statistics* 29 (2): 238–49.
- Centers for Medicare and Medicaid Services (CMS). 2013. "2013 Statistical Supplement: Table 13.1." Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services, Baltimore, MD.
- . 2017. "2017 Actuarial Report on the Financial Outlook for Medicaid." Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services, Baltimore, MD.
- . 2019a. "Expenditure Reports From MBES/CBES." Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services, Baltimore, MD.

- . 2019b. “National Health Expenditure Data.” Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services, Baltimore, MD. Accessed April 12, 2019. <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/index.html>.
- Chernick, Howard, Cordelia Reimers, and Jennifer Tenant. 2014. “Tax Structure and Revenue Instability: The Great Recession and the States.” *IZA Journal of Labor Policy* 3 (3): 1–22.
- Chodorow-Reich, Gabriel. 2019. “Geographic Cross-Sectional Fiscal Multipliers: What Have We Learned?” *American Economic Journal: Economic Policy* 11 (2): 1–36.
- Chodorow-Reich, Gabriel, Laura Feiveson, Zachary Liscow, and William Gui Woolston. 2012. “Does State Fiscal Relief During Recessions Increase Employment? Evidence from the American Recovery and Reinvestment Act.” *American Economic Journal: Economic Policy* 4 (3): 118–45.
- Clemens, Jeffrey, and Benedic Ippolito. 2018. “Implications of Medicaid Financing Reform for State Government Budgets.” *Tax Policy and the Economy* 32 (1): 135–72.
- Congressional Budget Office (CBO). 2009. “H.R. 1, American Recovery and Reinvestment Act of 2009.” Congressional Budget Office, Washington, DC.
- . 2011. “Senate Amendment 4575, Containing Proposals Related to Education, State Fiscal Relief, the Supplemental Nutrition Assistance Program, Rescissions, and Revenue Offsets (Became H.R. 1586 and, Subsequently, Public Law 111-226).” Congressional Budget Office, Washington, DC.
- . 2014. “How CBO Analyzes the Effects of Changes in Federal Fiscal Policies on the Economy.” Congressional Budget Office, Washington, DC.
- . 2018a. “The Budget and Economic Outlook: 2018 to 2028.” Congressional Budget Office, Washington, DC.
- . 2018b. “Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2018 to 2028.” Congressional Budget Office, Washington, DC.
- . 2018c. “Key Methods That CBO Used to Estimate the Macroeconomic Effects of the 2017 Tax Act—Supplemental Material for *The Budget and Economic Outlook: 2018 to 2028*.” Congressional Budget Office, Washington, DC.
- . 2018d. “Options for Reducing the Deficit: 2019 to 2028.” Congressional Budget Office, Washington, DC.
- Congressional Research Service (CRS). 2012, March 15. “Medicaid’s Federal Medical Assistance Percentage (FMAP), FY2013.” Congressional Research Service, Washington, DC.
- Council of Economic Advisers (CEA). 2009. “Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009.” Council of Economic Advisers, White House, Washington, DC.
- . 2017. “Reforming the Health Care System.” In *Economic Report of the President, 195–298*. Washington, DC: Council of Economic Advisers, White House.
- Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (ASPE). 2003. Notice. “Federal Financial Participation in State Assistance Expenditures; Temporary Increase of Federal Matching Shares for Medicaid for the Last 2 Calendar Quarters of Fiscal Year 2003 and the First 3 Quarters of Fiscal Year 2004.” *Federal Register* 68 (116): 35889–90.
- . 2015. “Federal Medical Assistance Percentages or Federal Financial Participation in State Assistance Expenditures.” Last updated January 13, 2016. Department of Health and Human Services, Washington, DC.
- Dorn, Stan, Bowen Garrett, John Holahan, and Aimee Williams. 2008. “Medicaid, SCHIP and Economic Downturn: Policy Challenges and Policy Responses.” Henry J. Kaiser Family Foundation, San Francisco, CA.
- Evans, William N., Robert M. Schwab, and Kathryn L. Wagner. 2019. “The Great Recession and Public Education.” *Education Finance and Policy* 14 (2): 298–326.
- Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, and J. Robert Warren. 2018. “Integrated Public Use Microdata Series, Current Population Survey: Version 6.0 [dataset].” IPUMS, Minneapolis, MN.

- Government Accountability Office (GAO). 2006. "Medicaid: Strategies to Help States Address Increased Expenditures during Economic Downturns." Government Accountability Office, Washington, DC.
- . 2011a. "Improving Responsiveness of Federal Assistance to States during Economic Downturns." Government Accountability Office, Washington, DC.
- . 2011b. "Prototype Formula Would Provide Automatic, Targeted Assistance to States during Economic Downturns." Government Accountability Office, Washington, DC.
- Health Care Financing Administration (HCFA). 1982. *The Medicare and Medicaid Data Book, 1981*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- . 1983. *The Medicare and Medicaid Data Book, 1983*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- . 1986. *The Medicare and Medicaid Data Book, 1984*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- . 1987. *Medicare and Medicaid Data Book, 1986*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- . 1988. *Medicare and Medicaid Data Book, 1988*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- . 1991. *Medicare and Medicaid Data Book, 1990*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- . 1998. *Medicare and Medicaid Statistical Supplement, 1998*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration, Office of Research and Demonstrations.
- Holahan, John, A., and Bowen Garrett. 2009. *Rising Unemployment, Medicaid and the Uninsured*. San Francisco, CA: Henry J. Kaiser Family Foundation.
- Holgash, Kayla, and Martha Herberlein. 2019. "Physician Acceptance of New Medicaid Patients: New Findings." Presentation, January Medicaid and CHIP Payment and Access Commission (MACPAC), Public Meeting, Washington, DC.
- Jackson, C. Kirabo, Cora Wigger, Heyu Xiong. 2018. "Do School Spending Cuts Matter? Evidence from the Great Recession." Working Paper 24203, National Bureau of Economic Research, Cambridge, MA.
- Jacobs, Paul D., Steven C. Hill, and Salam Abdus. 2017. "Adults Are More Likely to Become Eligible for Medicaid During Future Recessions If Their State Expanded Medicaid." *Health Affairs* 36 (1): 32–39.
- Kamin, David. 2015. "In Good Times and Bad: Designing Legislation That Responds to Fiscal Uncertainty." *Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association* 108, 1–41.
- Kodrzycki, Yolanda K. 2014. "Smoothing State Tax Revenues over the Business Cycle: Gauging Fiscal Needs and Opportunities." Working Paper 1411, Federal Reserve Bank of Boston, Boston, MA.
- Lutz, Byron F. 2008. "The Connection Between House Price Appreciation and Property Tax Revenues." *National Tax Journal* 61 (3): 555–72.
- Lutz, Byron, Raven Molloy, and Hui Shan. 2011. "The Housing Crisis and State and Local Government Tax Revenue: Five Channels." *Regional Science and Urban Economics* 41 (4): 306–19.
- Mattoon, Richard, Vanessa Haleco-Meyer, and Taft Foster. 2010. "Improving the Impact of Federal Aid to the States." *Economic Perspectives* 34 (3) 66–82.

- McGranahan, Leslie, and Richard Mattoon. 2012. "Revenue Cyclicalities and Changes in Income and Policy." *Public Budgeting & Finance* 32 (4): 95–119.
- McNichol, Elizabeth. 2012. "Out of Balance: Cuts in Services Have Been State's Primary Response to Budget Gaps, Harming the Nation's Economy." Center on Budget and Policy Priorities, Washington, DC.
- Medicaid and CHIP Payment and Access Commission (MACPAC). 2017a. *June 2017 Report to Congress on Medicaid and CHIP*. Washington, DC: Medicaid and CHIP Payment and Access Commission.
- . 2017b. *MACStats: Medicaid and CHIP Data Book*. Washington, DC: Medicaid and CHIP Payment and Access Commission.
- . 2017c. "Medicaid Hospital Payment: A Comparison across States and to Medicare." Issue Brief. Medicaid and CHIP Payment and Access Commission, Washington, DC.
- . 2019. "Exhibit 6. Federal Medical Assistance Percentages and Enhanced Federal Medical Assistance Percentages by State, FYs 2015–2019." Medicaid and CHIP Payment and Access Commission, Washington, DC.
- Musumeci, MaryBeth, and Julia Foutz. 2018. "Medicaid's Role for Children with Special Health Care Needs: A Look at Eligibility, Services, and Spending." Issue Brief. Henry J. Kaiser Family Foundation, San Francisco, CA.
- National Association of State Budget Officers (NASBO). 2018a. *State Expenditure Report: Fiscal Years 2016–2018*. Washington, DC: National Association of State Budget Officers.
- . 2018b. *The Fiscal Survey of States: Fall 2018*. Washington, DC: National Association of State Budget Officers.
- Patient Protection and Affordable Care Act (ACA), Pub. L. 111-148, 124 Stat. 119 through 124 Stat. 1025 (2010).
- Randall, Megan, and Kim Reuben. 2017. *Sustainable Budgeting in the States: Evidence on State Budget Institutions and Practices*. Washington, DC: State and Local Finance Initiative, Urban Institute.
- Shores, Kenneth, and Matthew P. Steinberg. 2017. "The Impact of the Great Recession on Student Achievement: Evidence from Population Data." Working Paper 17-09, Stanford Center for Education Policy Analysis (CEPA), Stanford, CA.
- Smith, Vernon, Eileen Ellis, Kathy Gifford, Rekha Ramesh, and Victoria Wachino. 2002. *Medicaid Spending Growth: Results from a 2002 Survey*. San Francisco, CA: Henry J. Kaiser Family Foundation.
- Smith, Vernon K., Kathleen Gifford, Eileen Ellis, Robin Rudowitz, and Laura Snyder. 2010. "Hoping for Economic Recovery, Preparing for Health Reform: A Look at Medicaid Spending, Coverage and Policy Trends: Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2010 and 2011." San Francisco, CA: Henry J. Kaiser Family Foundation.
- Smith, Vernon K., Kathleen Gifford, Eileen Ellis, Robin Rudowitz, Molly O'Malley Watts, and Caryn Marks. 2009. *The Crunch Continues: Medicaid Spending, Coverage and Policy in the Midst of a Recession: Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2009 and 2010*. San Francisco, CA: Henry J. Kaiser Family Foundation.
- Smith, Vernon, Rekha Ramesh, Kathy Gifford, Eileen Ellis, and Victoria Wachino. 2003. *States Respond to Fiscal Pressure: State Medicaid Spending Growth and Cost Containment in Fiscal Years 2003 and 2004: Results from a 50-State Survey*. San Francisco, CA: Henry J. Kaiser Family Foundation.
- . 2011. *Moving Ahead Amid Fiscal Challenges: A Look at Medicaid Spending, Coverage and Policy Trends Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2011 and 2012*. San Francisco, CA: Henry J. Kaiser Family Foundation.
- . 2012. *Medicaid Today; Preparing for Tomorrow A Look at State Medicaid Program Spending, Enrollment and Policy Trends: Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2012 and 2013*. San Francisco, CA: Henry J. Kaiser Family Foundation.

- State Health Access Data Assistance Center (SHADAC). 2003–13. “State Health Compare.” University of Minnesota, Minneapolis, MN. Retrieved from IPUMS-CPS, University of Minnesota.
- . 2009. *SHADAC-Enhanced Current Population Survey Health Insurance Coverage Estimates: A Summary of Historical Adjustments*. Minneapolis, MN: University of Minnesota.
- Tax Policy Center. 2019. “Briefing Book: The State of State (and Local) Tax Policy.” Tax Policy Center, Urban Institute and Brookings Institution, Washington, DC.
- U.S. Census Bureau. 1978–2018. “Quarterly Summary of State and Local Government Tax Revenue, Table 3. State Tax Collections by Type of Tax.” U.S. Census Bureau, Suitland, MD. Retrieved from Haver Analytics, New York, NY.
- Whalen, Charles J., and Felix Reichling. 2015. “The Fiscal Multiplier and Economic Policy Analysis in the United States.” Working Paper 2015-02. Congressional Budget Office, Washington, DC.
- Zuckerman, Stephen, Laura Skopec, and Marni Epstein. 2017. “Medicaid Physician Fees after the ACA Primary Care Fee Bump.” Health Policy Center, Urban Institute, Washington, DC.

Appendix A. Methodology for Determining the Size of the Matching Rate Increase

As described in the main text, we aim to calibrate our proposal to offset approximately two-thirds of the shortfall in state government budgets created by an economic downturn. Recessions are likely to affect state budgets through two main channels: (1) reducing state government revenues, and (2) increasing enrollment in Medicaid and CHIP. We quantify each effect by examining the historical relationship between the unemployment rate and, respectively, state revenues and Medicaid/CHIP enrollment. We then use these estimates to estimate the size of the matching rate increase required to offset the effects of these changes on state budgets.

REDUCTIONS IN STATE TAX REVENUES

To quantify the effect of increases in unemployment on state tax revenues, we examine the historical relationship between changes in the national unemployment rate and changes in aggregate state tax revenues (at the national level), adjusted for the effect of enacted state tax legislation. Related approaches to studying the cyclical behavior of state tax revenues have been used extensively in past work; see McGranahan and Mattoon (2012) for a review of that past work.

To this end, we obtain quarterly data on aggregate state tax revenues from the U.S. Census Bureau's Quarterly Summary of State and Local Tax Revenue. Using these quarterly data, we calculate the total revenues collected over the four-quarter period ending in the second quarter of each year, a period chosen to align with most states' fiscal years. We convert these amounts to real per capita terms using the GDP price index and the Bureau of Economic Analysis's population estimates.

Focusing solely on the relationship between the unemployment rate and *actual* state tax revenues could lead us to understate the decline in revenues associated with increases in the unemployment rate to the extent that states respond to fiscal pressures by increasing taxes. To address this concern, we use estimates from the National Association of State Budget Officers (NASBO) of the change in state revenues in each fiscal year attributable to tax legislation enacted during the

preceding legislative session (NASBO 2018b).ⁱ We subtract this amount (converted to real per capita terms) from the actual revenue collected in each year to obtain an estimate of what state tax revenues would have been in each fiscal year absent those policy changes.

Using these data, we regress the year-over-year change in (the natural logarithm of) real per capita state tax revenues, excluding the effect of policy changes, on the percentage point change in the national unemployment rate. That is, we estimate the following regression specification by ordinary least squares:

$$\ln\left(\frac{R_t - E_t}{P_t N_t}\right) - \ln\left(\frac{R_{t-1}}{P_{t-1} N_{t-1}}\right) = \alpha + \beta(u_t - u_{t-1}) + \varepsilon_t,$$

where P_t denotes the level of the GDP price index in (fiscal) year t , N_t denotes population in year t , R_t denotes actual aggregate state tax revenues in year t , E_t denotes the estimated revenue effect in fiscal year t of state tax legislation enacted during the prior legislative session, u_t denotes the national unemployment rate in year t , and ε_t is an error term.

We estimate this regression over the period from fiscal year 1985 through the present, consistent with our standing assumption that the macroeconomic dynamics during this period are a reasonable reflection of those likely to be observed in the future. In practice, however, we find that our estimates are only modestly sensitive to the period used for estimation. Some other authors report evidence that state tax revenues have become more cyclical in recent years (Chernick, Reimers, and Tennant 2014; Kodrzycki 2014; McGranahan and Mattoon 2012), although McGranahan and Mattoon (2012) find that much of that change reflects changes in states' propensity to raise taxes during economic downturns, and our approach controls for changes in tax policy.

We note that the coefficient on changes in the unemployment rate from this regression captures cyclical changes in revenues beyond those directly caused by a change in the unemployment rate per se (such as changes in wages or changes in asset prices) to the extent those changes are correlated with changes in the unemployment rate. That is appropriate in the context of our proposal since we

ⁱ This adjustment could miss a portion of the effect of legislative changes to the extent that states phase in those changes over multiple years. In that case, our estimates could continue to modestly underestimate the decline in revenues associated with a 1-percentage-point increase in the unemployment rate holding tax policy fixed.

want to capture the full effect of an economic downturn on state budgets. This approach could be problematic if changes in the unemployment rate happened to be correlated with changes in noncyclical factors that affect state revenues, but we suspect this is a relatively small concern in practice, and the direction of any resulting bias is unclear.

Figure 4 in the main text displays the data underlying this regression in graphical form, and table A1 reports the regression results. The figure depicts a remarkably tight relationship between changes in unemployment and changes in state tax revenues. In our baseline regression specification, reported in the first column of the table, a 1-percentage-point increase in the unemployment rate is associated with a 3.7 percent reduction in state tax revenues, holding state tax laws constant; this coefficient is precisely estimated and highly statistically significant. It is conceivable that the effects of an economic downturn on state revenues might take more than one year to appear, in which case the coefficient estimate in the first column could be an underestimate. Thus, in the second column of table A1 we examine a regression specification that allows changes in unemployment to affect revenues with a lag; the results from this specification imply that lagged effects are not particularly important in this context and may have the opposite sign.

For reference, the third column of table A1 reports the results of a regression specification in which the dependent variable reflects the raw change in state tax revenues without adjusting for changes in tax policy. Consistent with the hypothesis that states might raise taxes during recessions, this specification finds that changes in the unemployment rate are associated with a modestly smaller decline in unadjusted state revenues than adjusted revenues. However, the difference is relatively slight, suggesting that states have largely responded to fiscal shocks primarily through means other than raising taxes in the recent past.

To convert the coefficient in the first column of table A1 to an estimate of the increase in Medicaid and CHIP matching rates required to offset the revenue shortfall associated with a 1-percentage-point increase in the unemployment rate, we multiply this coefficient by the ratio of state tax receipts in federal fiscal year 2016 to the amount of Medicaid and CHIP spending subject to the increased matching rate in the same year. This calculation implies that, for each percentage-point increase in unemployment, the matching rate would need to increase by 6.8 percentage points to fully offset the associated revenue shortfall. Correspondingly,

TABLE A1.

Relationship between Change in Real per Capita State Tax Revenue and Change in the National Unemployment Rate, 1985–2018

Independent variable	Regression specification			
	(1)	(2)	(3)	(4)
Change in unemployment rate, year $t-1$ to year t	-3.7 (0.5)	-4.1 (0.5)	-3.1 (0.6)	-3.6 (0.6)
Change in unemployment rate, year $t-2$ to year $t-1$		0.7 (0.3)		
Revenue change adjusted for legislation?	Yes	Yes	No	No
Start of sample period	1985	1985	1985	1996
N	34	34	34	23

Source: Bureau of Economic Analysis (BEA) 1978–2018a, 1978–2018b; Bureau of Labor Statistics (BLS) 1983–2018; National Association of State Budget Officers (NASBO) 2018b; U.S. Census Bureau (Census) 1978–2018; authors' calculations.

Note: Regression equation is specified as described in the text. The dependent variable is the change in the natural logarithm of real per capita state tax revenues. The independent variables are percentage-point changes in the unemployment rate. For ease of interpretation, coefficients have been converted from log points to percentage points. The constant term is not shown. Newey-West standard errors assuming the error term exhibits an autocorrelation structure with at most three lags are shown in parentheses. Years are defined to run from July to June to align with most states' fiscal years.

offsetting two-thirds of the shortfall would require an increase of 4.5 percentage points. This method of calibrating the increase in the matching rate slightly overstates the required matching rate increase since, as discussed in the next section, Medicaid and CHIP spending will tend to be higher in years in which states would qualify for an increased matching rate under our proposal, which would in turn increase the value of any given increase in the matching rate. The extra assistance provided would be concentrated in the most serious downturns, so this minor technical flaw may not be a substantive problem.

Since our proposal determines assistance to each state based on the state unemployment rate, it would, in principle, be preferable to examine the cyclical behavior of revenues in state-level data. Among other advantages, such an approach could shed light on whether our approach of determining the amount of assistance a state receives based solely on the state's own unemployment rate is appropriate or whether it would be appropriate to place some weight on changes in the national unemployment rate.

We have not used state-level data in our base estimates due to data limitations. State-level (as opposed to national) estimates of the revenue effects of enacted state tax legislation are not available for the entire historical period we examine (and are not available in easily machine-readable form for any year we examine). Machine-readable state-level data on actual state tax collections are available only for fiscal year 1996 to the present.ⁱⁱ However, we did undertake some analyses of unadjusted changes in state tax revenues in state-level data for this shorter period. These analyses, presented in table A2, shed some light on the results likely to emerge from a state-level analysis.

Indeed, the results in table A2 imply that our approach of estimating the relationship between revenues and unemployment at the national level and applying that estimate to changes in state unemployment rates is likely to give reasonable results in practice. The first column of table A2 indicates that a 1-percentage-point increase in a state's unemployment rate (as measured in the LAUS data) is associated with a 3.1 percent reduction in state tax revenues.ⁱⁱⁱ Reassuringly, this estimate is similar to the comparable national-level estimate of a 3.6 percent reduction in state tax revenues reported in the fourth column of table A1.

In the second column of table A2, we examine whether changes in the national or state unemployment rate do a better job of predicting unadjusted changes in state tax revenues. These results suggest that both the state and national unemployment rate have some independent predictive power for changes in state tax revenues in the short run, although changes in state-level unemployment play a modestly larger role and the effect of changes in the national unemployment rate is less precisely estimated. However, the results presented in the third column suggest that the effect of changes in the national unemployment rate disappears (and may actually reverse sign) at longer time horizons, whereas the role of changes in the state unemployment rate appears to increase over time. In the context of our proposal, which would continue assistance for as long as the unemployment rate remains elevated, the estimates for longer time horizons are likely more relevant,

ⁱⁱ State-level revenue data back to 1962 are available from Census in non-machine-readable form, and state-level estimates on the revenue effects of enacted state tax legislation are available back to the late 1980s. Incorporating these data would be a useful direction for future work.

ⁱⁱⁱ We note that we do not include year fixed effects in these regressions since such fixed effects would eliminate variation in state unemployment rates associated with national changes in economic conditions. Variation in state unemployment rates associated with changes in national conditions is likely of particular relevance for determining how much the assistance to states should adjust in response to change in unemployment rates.

so we view these results as providing some support for our decision to determine the amount of assistance states receive based solely on a state's own unemployment rate.

Increased Medicaid and CHIP Enrollment

TABLE A2.

Relationship between Change in Real per Capita State Tax Revenue and Change in the Unemployment Rate, 1996–2017

Independent variable	Regression specification		
	(1)	(2)	(3)
<i>State unemployment rate</i>			
Change from year $t-1$ to year t	-3.1 (0.4)	-1.9 (0.6)	-1.9 (0.6)
Change from year $t-2$ to year $t-1$			-0.5 (0.6)
Change from year $t-3$ to year $t-2$			-1.1 (0.6)
Change from year $t-4$ to year $t-3$			-0.1 (0.6)
<i>National unemployment rate</i>			
Change from year $t-1$ to year t		-1.4 (0.9)	-1.9 (0.9)
Change from year $t-2$ to year $t-1$			1.2 (0.9)
Change from year $t-3$ to year $t-2$			1.7 (0.7)
Change from year $t-4$ to year $t-3$			0.2 (0.8)
N	1,122	1,122	1,122

Source: BEA 1978–2018a, 1994–2017; BLS 1983–2018, 1991–2017; Census 1978–2018; NASBO 2018b; authors' calculations.

Note: The dependent variable is the change in the natural logarithm of real per capita state tax revenues. The independent variables are percentage-point changes in the specified unemployment rate. Observations are at the state-fiscal-year level. For ease of interpretation, the coefficients have been converted from log points to percentage points. The constant term is not shown. Standard errors are clustered on the basis of both fiscal year and state using the two-way clustering method of Cameron, Gelbach, and Miller (2011). Years are defined to run from July to June to align with most states' fiscal years.

To quantify the effect of changes in Medicaid and CHIP enrollment on state budgets, we examine the recent historical relationship between state-level unemployment rates and enrollment in state Medicaid and CHIP programs. Our approach is closely related to the approach used by Dorn et al. (2008) and Holahan and Garrett (2009) to project how the Great Recession would affect Medicaid and CHIP enrollment.

We obtain state-level estimates of the number of people enrolled in Medicaid and CHIP for calendar years 2002 through 2012 from the CPS Annual Social and Economic Supplements.^{iv} We focus on this period because it postdates most of the ramp-up of CHIP enrollment following the program's creation in 1997 but predates the implementation of the ACA's Medicaid expansion. We omit calendar year 2013, which also predates implementation the ACA's Medicaid expansion, because coverage data for that year were collected using a new survey design that makes estimates incomparable to prior years. We measure Medicaid and CHIP coverage using an edited version of the CPS coverage variables produced by the State Health Access Data Assistance Center (SHADAC) that aim to measure coverage status as consistently as possible over time, which are published by IPUMS (Flood et al. 2008; SHADAC 2009).^v

We use these data to estimate the relationship between a state's uninsured rate and the (natural logarithm of) the share of the state's population enrolled in Medicaid and CHIP. We do so using the following regression equation, which we estimate separately for children (people ages 0 to 18 years) and nonelderly adults (people ages 19 to 64) using the usual fixed effects estimator:

$$\ln(m_{st}) = \alpha_s + \delta_t + \beta u_{st} + \varepsilon_{st},$$

where s indexes states, t indexes years, m_{st} is the share of the age group in question that has Medicaid or CHIP coverage in state s in year t , u_{st} is the unemployment rate in state s in year t (as measured in the LAUS data), α_s is a full set of state fixed effects, δ_t is a full set of time fixed effects, and ε_{st} is an error term.

The results of these regressions are reported in table A3. We estimate that a 1-

^{iv} Each year's survey collects data on coverage status for the preceding calendar year, so we use the surveys fielded in 2003 through 2013.

^v The SHADAC variable we rely on captures all non-Medicare, nonmilitary public coverage, not just Medicaid and CHIP coverage. The fact that this measure is slightly over-inclusive is unlikely to meaningfully alter our results.

TABLE A3.

Relationship between the Medicaid Enrollment Rate and the Unemployment Rate, 2002–12

Independent Variable	Regression Specification	
	(1)	(2)
Unemployment rate	2.4 (0.8)	2.0 (1.3)
Age group	0 to 18 years	19 to 64 years
N	561	561

Source: BLS 1991–2017, 2003–13; State Health Access Data Assistance Center (SHADAC) 2003–13; authors' calculations.

Note: Regression equation is specified as described in the text. The dependent variable is the natural logarithm of the Medicaid enrollment rate. The independent variable is the state's unemployment rate. For ease of interpretation, coefficients have been converted from log points to percentage points. The constant term and state and year fixed effects are not shown. Standard errors clustered at the state level are shown in parentheses.

percentage-point increase in a state's unemployment rate translates to a 2.4 percent increase in the share of the state's children enrolled in Medicaid and a 2.0 percent increase in the share of the state's nonelderly adults enrolled in Medicaid. These estimates, particularly the estimate for nonelderly adults, are relatively imprecise; indeed, the estimate for nonelderly adults is not statistically different from zero at standard confidence levels. The estimates are also more sensitive to specification changes, such as changes in the sample period, than the revenue results, although the point estimates are positive across virtually all the other specifications we examined (not reported).

One limitation of our approach is that it examines the relationship between unemployment and actual Medicaid and CHIP enrollment and thereby incorporates the effect of any eligibility restrictions states enacted in response to fiscal pressures during past periods of economic weakness. This could lead us to understate the increase in Medicaid and CHIP enrollment caused by economic downturns to some degree. Prior work, including the work by Dorn et al. (2008) and Holahan and Garrett (2009), as well as the studies reviewed by those authors, has aimed to address this problem by directly controlling for states' Medicaid and CHIP eligibility rules. We have not implemented such an approach here, but this would be a useful refinement for future work. In any case, our estimates are of

similar magnitude to the estimates obtained in prior work.^{vi}

The final step is to convert the estimates in table A3 into an estimate of the increase in states' Medicaid and CHIP matching rates that would be required to offset the costs to state governments attributable to higher enrollment. To do so, we assume that economic downturns increase four types of enrollment: Medicaid enrollment among nondisabled children; CHIP enrollment; Medicaid enrollment among nondisabled, nonelderly adults eligible for reasons other than the ACA's Medicaid expansion; and Medicaid enrollment among nondisabled, nonelderly adults eligible under the ACA's Medicaid expansion. We assume no change in enrollment

TABLE A4.

Calculation of Increase in Matching Rate Required to Offset Increased State Costs Attributable to Higher Medicaid and CHIP Enrollment

	Medicaid			CHIP
	Nondisabled children	Nonelderly, nondisabled adults		
		Eligible due to expansion	Otherwise eligible	
Long-run federal share (m_g)	57%	90%	57%	70%
Increase in enrollment per percentage-point increase in unemployment rate (ϵ_g)	2.5%	3.2%	3.2%	2.5%
Spending as share of total spending eligible for higher match (s_g)	19.6%	13.0%	15.5%	3.0%
Contribution to matching rate increase	0.21%	0.04%	0.21%	0.02%

Source: BLS 1991–2017, 2003–13; Centers for Medicare and Medicaid Services (CMS) 2017, 2019a, 2019b; Congressional Budget Office (CBO) 2018d; Medicaid and CHIP Payment and Access Commission (MACPAC) 2017b; SHADAC 2003–13; authors' calculations.

^{vi} We considered simply relying on the estimates from this prior work. However, the estimates in prior work are based largely on periods when CHIP did not yet exist and Medicaid eligibility rules were markedly narrower, which might limit their applicability in a more contemporary setting.

among elderly or disabled Medicaid enrollees. It is straightforward to show that, on average nationwide and under the assumption that new enrollees in a given enrollment group have the same average costs as current enrollees, the required increase in the matching rate for a 1-percentage-point increase in the unemployment rate can be calculated using the following formula:

$$\text{Required increase in matching rate} = \sum_g (1 - m_g) \varepsilon_g s_g,$$

where g indexes the four Medicaid and CHIP enrollment groups listed above, m_g is the average federal share of spending on enrollment group g , ε_g is the percent increase in enrollment in enrollment group g caused by each percentage-point increase in the unemployment rate, and s_g is total spending on that enrollment group as a share of the total amount of Medicaid and CHIP spending that is eligible for an increased matching rate under our proposal.

Table A4 reports the values we assume for each of these parameters for each enrollment group. We use federal shares that reflect those likely to prevail on average over the long term in both programs under current law; federal shares will typically be somewhat higher than this during periods when our proposal is in effect, so this leads us to modestly overestimate the required increase in the matching rate.^{vii} As above, the extra assistance provided would be largest in deeper economic downturns, so this technical shortcoming may not be a substantive problem. We assume that the responsiveness of enrollment to changes in unemployment matches the most relevant estimate from table A3, except that we scale those estimates up to account for the fact that the enrollment rates used in our regressions included people with disabilities.^{viii} We calculate the relevant

^{vii} This problem could be avoided by making the adjustment to a state's matching rates a proportional adjustment to the state share of spending under these programs rather than a linear, additive adjustment. The GAO proposal discussed in the main text takes such an approach. While we could take such an approach here, that would require calculating the total increase in the matching rate under our proposal in two steps since the linear, additive structure is more appropriate for the portion of the matching rate adjustment designed to offset declines in revenues. It would also require having different increments to the matching rate for different categories of expenditures. We believe the modest improvement in accuracy from such a change would not be worth the significant increase in complexity.

^{viii} For each year from 2002 through 2012, we obtain estimates of the number of nondisabled children, nondisabled adults, and nonelderly disabled people enrolled in Medicaid from CMS (2017), and we obtain estimates of CHIP enrollment from the National Health Expenditure Accounts. Based on Musumeci and Foutz (2018), we assume that 1.7 million of the nonelderly people qualifying on the basis of a disability are children. These data then imply that, on average during the 2002 through 2012 period, 94 percent of children enrolled in Medicaid or CHIP and 62 percent of nonelderly adults enrolled in Medicaid were nondisabled.

spending shares using data for fiscal year 2016 from CMS (2017), MACPAC (2017b), and the data sources described in subsequent sections.

The calculations reported in table A4 indicate that fully offsetting the increase in state government spending on Medicaid and CHIP caused by a 1-percentage-point increase in the unemployment rate would require an increase in the matching rate of 0.5 percentage points, while offsetting two-thirds of those costs would require an increase in the matching rate of slightly more than 0.3 percentage points. Together with the 4.5-percentage-point increase in the matching rate required to offset declines in revenues discussed in the past section, this indicates that meeting our objective of offsetting two-thirds of the fiscal pressure associated with a 1-percentage-point increase in the unemployment rate would require a total increase in the matching rate of 4.8 percentage points. Under our proposal, Medicaid expansion states would receive an increase of this magnitude.

Appendix B. Methodology for Policy Simulations

METHODOLOGY FOR SIMULATING HISTORICAL EFFECTS OF THE PROPOSAL

To simulate the policy historically, we use estimates of states' unemployment rates from the most recent vintage of the LAUS estimates to determine whether each state was eligible for an increase in its matching rate in each quarter back to 1976:Q4, as well as the amount of any increase in the matching rate.^{ix} A complication in producing these historical estimates is that each state's threshold unemployment rate is based on unemployment rates in the state over the prior 15 years, which are only available for 1976 and later. To fill this gap, we impute each state's unemployment rate for quarters prior to 1976:Q1 using a state-specific regression of each state's unemployment rate on the national unemployment rate in that quarter and two leads and two lags of the national unemployment rate, estimated using data for 1976 to the present.

One potential downside of using the most recent vintage of the LAUS estimates in our simulations is that the LAUS estimates are revised after their initial release as newer source data become available. Because the amount of assistance states received would have been based on the original, unrevised estimates, basing our simulations on the revised estimates could distort our results. To investigate this concern, we obtained each prior vintage of the LAUS estimates dating back to mid-2007 through the Federal Reserve Bank of St. Louis's ALFRED data access tool and then reran our simulations based on the LAUS estimates that would have been available in real time. We note that BLS implemented significant revisions to the full LAUS methodology in 2015 and to seasonal adjustment procedures in 2018, so this comparison may overstate the differences in results that would be expected to arise simply from the release of updated source data in the future (BLS 2014, 2018a, 2018b). We found that the aggregate amount of assistance states would have received during this period changed by only 4.4 percent when we moved from the real time data to the revised data. At the state-quarter level, the correlation between the simulated increase in the matching rate using the real time data and the revised

^{ix} LAUS estimates are available back to 1976:Q1, but computing the prospective estimate of a state's matching rate under our proposal requires three prior quarters of data. Additionally, as noted in the main text, in the historical simulations we treat all states as receiving the additional increase in the matching rate for states that have adopted the ACA's Medicaid expansion.

data was 0.98.

Once we simulate the historical increase in each state's matching rate, we apply those amounts to historical data on Medicaid and CHIP spending in each state.^x For fiscal years back to 1997, we obtain the relevant data from annual Medicaid and CHIP Financial Management Reports (FMRs) published by CMS. We obtain data on Medicaid spending by state for several prior years from two different sources. For fiscal years 1979–83 and 1985–86, we use various editions of the Medicare and Medicaid Data Book published by the Health Care Financing Administration (HCFA 1982, 1983, 1986, 1987, 1988, 1991); these sources separately report medical and administrative spending. For fiscal year 1996, we use the 1998 edition of the Medicare and Medicaid Statistical Supplement (HCFA 1998); this source reports only medical spending.

As noted in the main text, our proposal increases matching rates for expenditures only on people who are outside the ACA's Medicaid expansion population. Unfortunately, for 2014 the FMR data do not separate out expenditures on the expansion population from other expenditures. However, CMS does report expenditures on the expansion population in a separate set of quarterly reports. For 2014, therefore, we obtain expenditures on the expansion population from these other reports and subtract that amount from the totals in the FMR data.

For years where state-level data on a particular expenditure category are not available, we interpolate expenditures using the following approach. First, we obtain national Medicaid expenditure totals for each fiscal year from the 2013 edition of the Medicare and Medicaid Statistical Supplement (for medical spending) and the National Health Expenditure Accounts (for administrative spending).^{xi} Second, we assume that each state's *share* of the total national spending in each category changes linearly between the years for which we have data and then multiply the interpolated state-by-year shares by the national totals. All the spending data we use are fiscal year totals, so we assume that spending is spread evenly over the four quarters of the fiscal year.

^x Our simulations ignore the fact that our proposal caps matching rates at 90 percent (and allows states to carry back excess matching rate amounts to prior years). Instead, we calculate matching rate increases as if the cap did not apply. Due to data limitations, our simulations also omit assistance that would be provided to U.S. territories. Incorporating these features of our proposal would have a negligible effect on our estimates.

^{xi} Because administrative spending in the National Health Expenditure data is reported on a calendar year basis, we convert this to a fiscal year basis as a weighted average of the relevant calendar years.

To estimate the macroeconomic effects our proposal would have had if in effect historically, we use the fiscal multipliers and related assumptions described in the main text. To convert the estimated changes in output into changes in the unemployment rate, we use the historical relationship between changes in the unemployment rate and GDP growth (i.e., a version of Okun’s law) for 1985 to the present. We estimate that this relationship has a slope of -1.16 .

An important complication is that the amount of assistance states would have received would have depended on the path of state unemployment rates, and our proposal would have changed those unemployment rates. Our simulations of the proposal’s effects on the unemployment rates (but not our other historical simulations) account for this interdependence. To do so, we first make the following timing assumptions: (1) the increase in a state’s matching rates calculated based on the CMS projection of the state’s unemployment rate for that quarter affects federal Medicaid and CHIP matching payments in real time during the quarter; and (2) when a state’s actual unemployment rate for a quarter turns out to exceed the CMS projection, the additional matching payments occur in the subsequent quarter. These timing assumptions, which are broadly consistent with how funds would actually flow under our proposal, ensure that the amount of state fiscal relief paid in any given quarter depends solely on the unemployment rate in prior quarters. Next, we use the resulting outlay stream to estimate how our proposal would have changed the national unemployment rate in each quarter given the multiplier and other assumptions described above. Finally, we assume that each state’s unemployment rate for a given quarter would have equaled the unemployment rate actually observed for that state in that quarter plus the simulated national change in the unemployment rate for that quarter. This assumption that effects are nationally homogenous simplifies our simulations but likely does not meaningfully alter our results.

METHODOLOGY FOR PROJECTING FUTURE EFFECTS OF THE PROPOSAL

We project the future effects of our proposal on the federal budget and the macroeconomy in several steps. We first estimate the average amount of *excess* unemployment—the average amount by which state unemployment rates exceed the threshold level specified in our proposal (treating states where the unemployment rate is below the threshold level as zeros)—from 1985 to the present. In doing so, we weight all states equally, reflecting an assumption that any historical correlations between the size of state Medicaid programs and their level

of excess unemployment were largely idiosyncratic and unlikely to be replicated in the future.

In our simulations that do not include macroeconomic feedback, we assume that the expected amount of excess unemployment will match this historical benchmark in the long-run steady state, although we note that there is considerable uncertainty about future unemployment dynamics. We assume that the economy will have reached its (stochastic) steady state by 2025. Because the economy is not currently in recession, the expected amount of “excess” unemployment will be smaller over the next several years; we assume that it phases up linearly to its steady state level from zero in 2020.

The expected amount of “excess” unemployment allows us to compute the national average increase in the expected matching rate for Medicaid and CHIP expenditures. To do so, we require an estimate of what share of Medicaid and CHIP expenditures will occur in states that have adopted the ACA’s Medicaid expansion and thus be eligible for the additional increase in the matching rate available to Medicaid expansion states. Consistent with CBO’s Spring 2018 baseline projections, we assume that this fraction is 55 percent in fiscal year 2020 and phases up linearly to two-thirds by fiscal year 2028 (CBO 2018b). Since our projection window extends through 2029, we assume that this linear trend continues in 2029.

We apply the expected matching rate increase for each year to projections of Medicaid and CHIP spending from CBO’s Spring 2018 baseline projections (CBO 2018a). CBO only reports federal spending on these programs, so we infer total spending under the assumption that the average federal share in the baseline is: 57 percent for Medicaid benefit expenditures on nonexpansion populations; 90 percent for Medicaid benefit expenditures on the expansion population; 64 percent, on average, for Medicaid administrative expenditures, as estimated by CBO (2018d); and 70 percent for CHIP expenditures. We extend CBO’s projections through fiscal year 2029 under the assumption that growth from 2028 to 2029 matches growth from 2027 to 2028.

We estimate the macroeconomic consequences of our proposal in a simple fiscal multiplier framework. As with the historical simulations, one complication in doing so is that the assistance delivered under our proposal would affect the unemployment rate, but the unemployment rate itself affects the amount of

assistance delivered. We account for this feedback using a simple framework with a single period and a single representative state. (Abstracting from dynamics and state heterogeneity likely has little effect on our estimates.) Under these assumptions, in instances where the actual unemployment rate exceeds the threshold level, the unemployment rate can be written as

$$u = u_0 - \alpha m \tau (u - \underline{u}),$$

where u denotes the actual unemployment rate, u_0 is the unemployment rate absent our proposal, \underline{u} is the threshold unemployment rate under our proposal, τ is the dollar amount of assistance delivered per percentage-point increase in the unemployment rate, m is the assumed fiscal multiplier, and α is a coefficient that converts increases in GDP to reductions in unemployment. This equation can be solved to yield:

$$u - \underline{u} = \frac{u_0 - \underline{u}}{1 + \alpha m \tau},$$

demonstrating that the actual amount of excess unemployment equals the baseline amount of excess unemployment, reduced by a scaling factor. The magnitude of the scaling factor depends on the amount of assistance delivered and the intensity of the macroeconomic feedback.

We calibrate the baseline amount of excess unemployment in the same manner as for the earlier simulations that do not include macroeconomic feedback. We calibrate α based on the estimate of the historical relationship between the unemployment rate and GDP growth for 1985 to the present described above. Specifically, we set α to equal the reciprocal of the slope coefficient from this regression, multiplied by negative one and divided by CBO's projection of GDP in the year of interest. We adopt a fiscal multiplier of 1.3 as described in the text. We set τ based on the increase in the matching rate per percentage-point increase in the unemployment rate multiplied by projected spending on categories of spending subject to the increased matching rate, estimated based on CBO projections in the same way as in the static simulations. We convert changes in unemployment back to changes in GDP by dividing by α .

To determine the effect of increases in output on federal revenues, we use estimated marginal tax rates under current law for labor and capital income from CBO's Spring 2018 baseline projections (CBO 2018a). We take a weighted average of these two marginal tax rates based on CBO's projection of the labor share of

output and multiply the result by the estimated increase in GDP to obtain the estimated effect on federal revenues. Reductions in unemployment would cause reductions in federal program costs that this method does not capture, so these estimates may modestly understate the fiscal benefits of the increase in economic activity under our proposal.