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Lessons for Automatic Fiscal Stabilizers from the Great Recession and the COVID Recession

Karen Dynan
Harvard University and NBER

Douglas Elmendorf
Harvard University and NBER

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Abstract

This paper simulates economic developments as if the discretionary fiscal stimulus enacted in the past two recessions had not occurred and additional automatic fiscal stabilizers had been deployed instead. For the calibration of key economic relationships most consistent with the empirical literature, we find that more sustained fiscal stimulus would have pushed unemployment down more rapidly following the Great Recession and that more limited stimulus would have caused inflation to increase much less following the COVID recession. We caution, though, that our estimates are uncertain given the large number of assumptions embedded in the calculations. Under different assumptions about the supply side of the economy when resource utilization is high, the stimulus enacted in early 2021 was not a significant cause of the observed runup in inflation that followed, and substituting an automatic stabilizer would have made little difference to inflation.

The United States has experienced two significant economic crises in the 21st century—the so-called Great Recession that began in 2007 amid the global financial crisis, and the recession that began in 2020 following the onset of the COVID pandemic. During both recessions, monetary and fiscal policymakers responded vigorously. The Federal Reserve cut the federal funds rate essentially to zero and implemented a range of other policies to help stabilize the financial system and support economic activity. Congress and the president enacted large amounts of countercyclical fiscal policy, with direct budgetary costs equaling roughly 10 percent of pre-crisis annual output for the Great Recession and 23 percent of pre-pandemic annual output for the COVID recession.

These policy actions sharply reduced the economic losses and human costs of the recessions and helped the economy return to a growth path. Those accomplishments are especially noteworthy because policymakers had little previous experience dealing with the unusual events that started those recessions. Yet, economic outcomes during those periods were far from ideal. Whether alternative policy approaches could reduce the impact of future recessions is an important topic for research and reflection, and study of the Great Recession and the COVID recession can aid in that process.

Two negative aspects of those recessions merit particular attention from researchers and policymakers. First, elevated unemployment persisted long after the Great Recession began, with the unemployment rate remaining above six percent for six years in total. Second, prices surged following the COVID recession, with inflation reaching its highest level in four decades.

In hindsight, many analysts have argued that different paths for fiscal policy could have ameliorated both of those outcomes: If fiscal policy had been more expansionary following the Great Recession, higher aggregate demand might have increased the demand for workers and pulled down the unemployment rate more rapidly. If fiscal policy had been less expansionary following the COVID recession, aggregate demand might have exceeded the productive capacity of the economy by less and inflation might have been lower.

Yet, observing in retrospect that alternative paths for fiscal policy might have improved certain outcomes does not explain how policymakers should have known to choose those paths in real time. One naturally wishes for policymakers to have better foresight, but economic forecasting is highly inexact, and enacting discretionary fiscal stimulus almost always involves considerable lags. Moreover, achieving certain preferred outcomes does not imply that alternative policies would have been better on balance.

Therefore, we direct our attention in this paper to the possibility of expanding *automatic* fiscal stabilizers so that fiscal stimulus evolves more mechanically with economic conditions. We simulate economic developments as if an additional stabilizer had been in place before the Great Recession and the COVID recession and as if no discretionary fiscal actions had been taken during those periods. Then we compare several aspects of the simulated outcomes to the corresponding aspects of the realized outcomes.

For the calibration of key economic relationships that we view as most consistent with the empirical literature, we find that more sustained fiscal stimulus would have pushed unemployment down more rapidly following the Great Recession with little upward pressure on inflation. Similarly, we find that more limited fiscal stimulus would have caused inflation to increase much less following the COVID recession with unemployment only slightly higher. The cumulative federal borrowing to finance fiscal stimulus would have been less than what actually occurred, as substantially more borrowing during the Great Recession period would have been more than offset by much less borrowing during the COVID period.

However, those findings do not demonstrate that additional automatic stabilizers would have been better than discretionary fiscal actions in all ways. For instance, we analyze one specific stabilizer, although we comment on others. In addition, we presume that this stabilizer would have supplanted only the broad-based actions following the global financial crisis and that the targeted actions dealing with mortgage-market and other financial problems still would have occurred. Further, the additional stabilizer would have responded more slowly to the economic fallout from COVID than the actual fiscal actions in the spring of 2020 and would not have focused on public health; by contrast, some of the policies adopted then were intended not to spur output but rather to support incomes while people stayed away from work and other activities. More generally, the additional stabilizer would have affected households, businesses, and state and local governments differently in many ways than the discretionary actions that were taken.

Our estimates are inherently uncertain and should be viewed as suggestive rather than conclusive. To illustrate the uncertainty, we offer supplementary results based on different assumptions about the effect of fiscal stimulus on aggregate demand and about the effect of increases in demand on inflation and inflation-adjusted output. The most noteworthy difference from our core results arises if increases in demand beyond potential output continue to raise inflation-adjusted output rather than inflation: In that case, fiscal stimulus during the COVID period was not a significant cause of the runup in inflation, and substituting an automatic stabilizer would not have changed inflation much.

One might wonder whether the unusual nature of the past two recessions means that few lessons should be drawn from them. Certainly, every business cycle has distinctive characteristics, and lessons from previous cycles should be applied carefully to future ones. The COVID recession in particular had some characteristics that seem unlikely to be repeated soon. But several important features of the recent recessions may well recur: Interest rates may remain low enough that the effective lower bound on the federal funds rate might be binding in a future downturn, putting more pressure on fiscal policy to bolster demand; elevated unemployment may again prove persistent, as happened not only following the Great Recession but also following the two previous recessions; and discretionary countercyclical policy may generate an overshooting of potential output, especially given the uncertain nature of supply constraints and the possibility that adverse supply shocks will recur. Therefore, the ability of expanded automatic stabilizers to calibrate fiscal stimulus more effectively than the discretionary countercyclical measures enacted during the past two recessions offers important lessons for future countercyclical fiscal policy.

Countercyclical Fiscal Policy: Discretionary Actions and Automatic Stabilizers

Countercyclical economic policy has two principal goals—to minimize the shortfalls in output relative to its potential along with the associated macroeconomic costs, and to minimize the human costs from job loss, reduced income growth, and other dislocations. These goals generally align, because supporting aggregate demand when it is weak relative to potential aggregate supply (a feature of most recessions) raises output and income and reduces unemployment.

Both fiscal policy and monetary policy can be used to achieve these goals, and fiscal policy can be deployed through both automatic stabilizers and discretionary actions. During the Great Recession, Auerbach and Gale (2009, page 328) explained that there had been a "consensus a decade ago against the use of discretionary fiscal policy as a stabilization tool, … [but] the associated exclusive focus on automatic stabilizers and the use of monetary policy seems now to have come to an abrupt halt." Discretionary countercyclical fiscal policy indeed experienced an important resurgence during the Great Recession and the COVID recession, but a recognition that different fiscal policy might have led to yet better outcomes has renewed professional interest in augmenting automatic stabilizers.

Both automatic stabilizers and discretionary actions can have valuable effects on the economy in the short run. In addition, such policies can reduce the deleterious effects of recessions over the longer run. For example, countercyclical fiscal policy can reduce the

risk of a permanent reduction in potential output arising from firms' slowing investment when the economy is weak and workers' experiencing losses of labor-market attachment after long periods of unemployment. It can also mitigate the persistent negative effects that recessions can have on individual workers and their families. For evidence on these points, see Couch and Placzek (2010), Dynan and Elmendorf (2025a), Furceri and Jalles (2019), Hoynes et al. (2012), and Yagan (2019), among many others.

However, there are costs as well as benefits to countercyclical fiscal policy. Three costs loom largest.

One cost is that countercyclical fiscal policy can boost aggregate demand beyond potential aggregate supply and thereby increase inflation. In turn, higher inflation tends to be deeply unpopular, as shown by household surveys generally (see Stantcheva 2024) and exemplified by the 2024 election results (see Steinberg et al. 2024). Overshooting of potential output can occur because economic forecasts are often inaccurate and policies affect economic outcomes with lags. The risk of overshooting is especially large when changes in economic circumstances reduce available supply, perhaps by decreasing available resources or by causing a reallocation of resources among economic sectors or locations.

Another cost of countercyclical fiscal policy is that it can reduce economic wellbeing by distorting incentives. For example, Holzer et al. (2021) found that the increase in unemployment insurance benefits during the COVID recession raised the unemployment rate, lowered the employment-to-population ratio, and slowed transitions from unemployment to employment.

A further cost of countercyclical fiscal policy is that decreases in taxes and increases in government spending require the government to borrow more, and the additional debt typically diminishes output in the long run unless there is an offsetting reduction in government borrowing later. Moreover, the additional debt reduces the ability of the government to respond to emerging challenges and increases the risk of a fiscal crisis, as discussed by Dynan and Elmendorf (2025b). These costs can be avoided if the short-term boost to output per dollar of additional borrowing is large enough and the effect of current output on future output is large enough, but those conditions are not usually satisfied.

These benefits and costs occur with both discretionary fiscal actions and automatic fiscal stabilizers. Yet, the magnitudes of the benefits and costs can differ between those two approaches.

The key advantage of automatic stabilizers is that the timing and magnitude of fiscal stimulus adjust continuously to economic conditions rather than being changed by policymakers in discrete steps at distinct times. As a result, stimulus can generally respond more promptly and at a more appropriate scale to both shortfalls and excesses of aggregate demand, thereby reducing the probability of prolonged excess unemployment and the probability of higher inflation. Moreover, the existence of automatic stabilizers might "boost the confidence of households and businesses [before a recession started] since they would know that a significant slowdown would be met immediately by a substantial fiscal stimulus" (Feldstein 2007); with greater confidence in future demand, households might be less likely to cut spending and businesses less likely to lay off workers. These advantages in timing and magnitude motivate this paper's focus on exploring how an expansion of the existing system of automatic stabilizers might improve economic outcomes.

Yet, the mechanistic nature of automatic stabilizers also comes with disadvantages. Four such disadvantages warrant particular attention.

First, policymakers sometimes have information about economic conditions and the economic outlook that is not evident in the latest official data on economic activity. The initial spread of COVID provides a powerful example, as the fact that large parts of the economy would shut down was clear before cuts in production and employment showed up in official data. In such circumstances, discretionary measures can respond more quickly than automatic stabilizers would—as happened in March 2020.

Second, depending on economic circumstances, certain sorts of fiscal support may produce a larger effect on output per dollar of budgetary cost than other sorts of support. For example, the various mortgage programs established during the Great Recession period probably had an outsized impact on aggregate demand by limiting the damage to an already weak housing market and financial system. Discretionary policy can be tailored to fit the circumstances, whereas automatic stabilizers employ the same types of changes in taxes and spending in all circumstances. However, attempts to tailor policies do not always result in a great fit; for example, the Coronavirus Aid, Relief, and Economic Security Act (CARES) enacted in March 2020 raised unemployment compensation for some workers far above their pre-unemployment wages (Ganong et al., 2020).

Third, automatic stabilizers that respond to shortfalls in output or employment generate fiscal stimulus in response to adverse supply shocks as well as adverse demand shocks, and spurring demand when supply declines may not be appropriate. Specifically, when demand drops, fiscal stimulus that is appropriately calibrated can increase output and employment without causing excessive inflation, which policymakers presumably would

favor. However, when supply drops, fiscal stimulus can increase output but also will raise inflation, which is a combination of effects that policymakers might or might not prefer. The specific potential stabilizer that we analyze in this paper is triggered by changes in the unemployment rate; Blanchard (2025) estimated that demand shocks account for 60 to 80 percent of the variance of the unemployment rate at an eight-quarter horizon.

Fourth, policymakers might prefer discretionary fiscal actions over automatic stabilizers so that they can be seen to react to economic circumstances and can receive political credit for doing so. Of course, policymakers also want to avoid the political cost of recessions, and they may recognize that their ability to respond quickly to downturns is limited.

These advantages and disadvantages imply that the design of automatic stabilizers is crucial to their effectiveness and that automatic stabilizers will not supplant discretionary actions entirely. We address both of those issues in what follows.

Potential New Automatic Stabilizers

Economists have long considered the possibility of expanding automatic fiscal stabilizers, and interest in this approach increased after the Great Recession. The Federal Reserve provided very substantial support during and after that recession, dropping the federal funds rate essentially to zero and easing financial conditions further through unconventional tools. On the fiscal side, policymakers enacted substantial amounts of discretionary stimulus at the beginning of the recession and somewhat more in the following years, as summarized in the top part of table 1.

Because extensions of expiring tax and spending provisions put in place before the global financial crisis do not seem relevant for comparing discretionary and automatic countercyclical policy, we exclude them from the table and from our analysis. For example, for the 2010 and 2012 tax acts, the only provisions we include are those that reduced payroll taxes, extended unemployment benefits, and accelerated depreciation allowances. Note that both the figures shown in the table and the estimates of automatic stabilizers that we cite shortly overstate the true budgetary costs of the policies because they do not take account of the budgetary feedback from stronger economic growth.

Despite the substantial stimulus provided, the severity of the downturn and the weak and prolonged recovery raised questions about whether larger and longer-lasting economic stimulus would have been appropriate. Drawing on that experience, Boushey et al. (2019) argued that “a more-robust set of automatic stabilizers” should be adopted (page 41).

Table 1: Discretionary Countercyclical Fiscal Policy

Legislation	Change in Spending	Change in Revenue	Change in Deficit
Great Recession			
Economic Stimulus Act of 2008 (2/13/08)	42	-82	124
American Recovery and Reinvestment Act (2/17/09)	663	-173	836
Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, certain provisions as described in the text (12/17/10)	56	-136	192
Middle Class Tax Relief and Job Creation Act of 2012, certain provisions as described in the text (2/22/12)	30	-93	123
Total	*791*	*-484*	*1275*
COVID Recession			
Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020 (3/6/20)	8	0	8
Families First Coronavirus Response Act (3/18/20)	97	-94	192
Coronavirus Aid, Relief, and Economic Security (CARES) Act (3/7/20)	1314	-408	1721
Paycheck Protection Program and Health Care Enhancement Act (4/24/20)	483	0	483
Consolidated Appropriations Act, 2021, Divisions M and N (12/27/20)	862	-5	868
American Rescue Plan Act of 2021 (3/11/21)	1803	-53	1856
Total	*4567*	*-560*	*5128*

Note: Figures are CBO's estimates in billions of dollars, drawn for the Great Recession from CBO (2008, for 2008-18), CBO (2015, for 2009-19), CBO (2011, page 9, for 2011-20), and CBO (2012a, for 2012-22), and for the COVID recession from Swagel (2021, for 2020-2030). Enactment dates are shown in parentheses.

The case for enhancing automatic stabilizers was strengthened further in the COVID recession. The Federal Reserve again dropped the federal funds rate essentially to zero and implemented other ways to support economic activity, and fiscal policymakers enacted huge amounts of discretionary fiscal support, as summarized in the bottom part

of table 1. Again we exclude legislation focused on long-term issues rather than countercyclical support.

Following the COVID recession, many observers thought that economic stimulus had overshot the desired mark. In the wake of both that experience and the experience following the Great Recession, Edelberg, Furman, and Geithner (2022) asserted that "fortified automatic stabilizers would help reduce both errors of doing too little and errors of doing too much" (page 40).

The structure and scale of the existing automatic stabilizers reflect tax and spending policies designed with objectives other than macroeconomic stabilization in mind.[1] Accordingly, the existing stabilizers cannot be changed without affecting those other objectives, so we presume that expanding automatic stabilizers would require the implementation of new stabilizers.[2]

In considering potential new automatic stabilizers, three design characteristics are crucial: What types of taxes and spending should adjust? What should be the trigger for adjustment? And how much should taxes and spending adjust? We take up those questions in turn after briefly describing the impact of the existing automatic stabilizers.

Existing Automatic Stabilizers

Automatic federal stabilizers are elements of federal taxes and spending that vary with output, income, or employment in ways that tend to stabilize the economy. When the economy weakens, tax receipts decline and spending for social programs rises, which bolsters consumer spending and offsets some of the economic weakness; when the economy is booming, tax receipts increase and spending for social programs falls, which restrains consumer spending and offsets some of the boom.

The scale of these automatic fiscal stabilizers can be seen in information provided by the Congressional Budget Office (CBO). CBO (2024a) estimated that, during fiscal years 2009 through 2012, automatic stabilizers reduced revenue by roughly $600 billion and raised

[1] Like most previous analyses, this paper addresses automatic stabilizers of the federal government. State and local governments have not been a stabilizing economic force in the past, as the countercyclicality of their tax collections has been more than offset by the procyclicality of their purchases (Sheiner and Ng 2019). Moreover, nearly all states have requirements to aim for balanced budgets on an annual basis, which limits their ability to undertake fiscal stimulus.

[2] Blanchard (2025) labeled such stabilizers "quasi-automatic" on the grounds that they are designed to be triggered by changes in observable quantities. The Government Accountability Office (2025) provided a useful analysis of design principles for automatic stabilizers.

spending by roughly $500 billion, for an increase in budget deficits of about $1.1 trillion or 1¾ percent of potential gross domestic product (GDP) over those years.[3] That amount is nearly as large as the amount of discretionary countercyclical fiscal measures shown in table 1. Moreover, CBO (2024a) estimated that automatic fiscal stabilizers reduced revenue and raised spending by a combined total of roughly $700 billion in fiscal years 2013 through 2017, during which discretionary fiscal stimulus was no longer a focus of attention for most policymakers.

CBO (2024a) also estimated that, in fiscal years 2020 and 2021, automatic stabilizers reduced revenue by about $300 billion and raised spending about half as much, for an increase in budget deficits of roughly $450 billion or about 1 percent of potential GDP. The amount of discretionary countercyclical fiscal policies in those years was more than ten times as large.

For Potential New Automatic Stabilizers, What Types of Taxes and Spending Should Adjust?

Spurred in part by the wide array of changes in taxes and spending enacted during the past two recessions, researchers have evaluated many different types of countercyclical fiscal policy. For example, see Blanchard (2025) on stabilization using a potential value-added tax, Chodorow-Reich et al. (2022) on support for businesses, Chodorow-Reich and Coglianese (2019) and Ganong et al. (2022) on expansions of unemployment insurance, Dutta-Gupta (2019) on the Temporary Assistance for Needy Families (TANF) program, Dynan and Elmendorf (2020) on cuts in payroll taxes, Fiedler et al. (2019) on Medicaid, Gelman and Stephens (2022) and Sahm (2019) on payments to individuals, Gerardi et al. (2022) and Goodman and Wachter (2022) on housing policy, Haughwout (2019) on infrastructure investment, Hong and Lucas (2023) on credit policies, Hoynes and Schanzenbach (2019) on the Supplemental Nutrition Assistance Program (SNAP, or food stamps), and Sheiner (2022) on aid to state and local governments.

One recurring topic in those analyses is how effective different policy changes would be at spurring aggregate demand. Generating a larger boost to demand per dollar of direct budgetary cost improves both the fiscal and economic payoff of a policy change. It reduces the increase in government debt, because the larger increase in demand and thus output

[3] CBO reported differences in federal revenue, spending, and deficits arising from estimated automatic responses to cyclical conditions. But CBO explained that the federal budget has displayed more cyclicality than is reflected in the agency's estimated automatic responses: Because discretionary measures enacted when the economy was weak have increased deficits beyond what would have occurred automatically, and because CBO does not attribute to the stabilizers any economic shifts "that have not been reliably estimated to have a sufficiently regular relationship with cyclical developments" (page 8) but may still be correlated with cyclical conditions.

feeds back to the budget with a larger increase in revenue and reduction in government spending, partially offsetting the direct budgetary cost. At the same time, it increases the likelihood that the short-run benefits of higher output, income, and employment outweigh the long-run economic costs of the additional government debt that is incurred. Thus, all else equal, policymakers probably favor changes in taxes and government outlays from which beneficiaries have high marginal propensities to spend.

A second recurring topic in those analyses is how effective different policy changes would be at benefiting the people or activities that are hurt most by economic downturns. Because countercyclical policy is intended to reduce not only the macroeconomic effects of downturns but also the effects on people who might lose their jobs and incomes, policymakers probably want to focus tax reductions and spending increases on certain people. Indeed, Romer and Romer (2022) argued that countercyclical fiscal policy should be viewed through the lens of social insurance, and therefore that benefits should be targeted at people who are "suffer[ing] direct economic harms" (page 11). For example, they noted that "if individuals could purchase pandemic insurance, they would want to be insured for the duration of the pandemic … [but in fact] the various extensions of duration, expansions of coverage, and increases in [unemployment insurance] benefits were tied to calendar time rather than to … the state of the economy" (page 13); varying such benefits through an automatic-stabilizer-type formula would address that issue.

A third recurring topic in comparisons of different automatic stabilizers is the administrative feasibility of adjusting elements of taxes or spending at a high frequency as the economy evolves. Existing payments to or from the federal government—such as payroll tax collections or unemployment insurance benefits—can be varied in a fairly straightforward manner from month to month. Analysts have traditionally thought that direct payments to individuals and families were more challenging to vary at a high frequency, but the experience during the COVID recession demonstrated that administrative advances have overcome earlier obstacles. Gelman and Stephens (2022) concluded that "stimulus payments can now reach most people fairly quickly" (page 115), although families who have not filed taxes previously may not end up receiving such payments.

For Potential New Automatic Stabilizers, What Should Be the Trigger for Adjustment?

As the economy slowed in late 2007, Feldstein (2007) argued that "fiscal stimulus [should be] enacted now and triggered to take effect if the economy deteriorates substantially in 2008." He proposed that stimulus begin when payroll employment declined on a three-month basis and end either when employment began to rise or when employment reached its pre-downturn level (with the latter approach keeping stimulus in place for longer).

Elmendorf and Furman (2008) analyzed Feldstein's proposed trigger as well as a variant in which fiscal stimulus begins only when the three-month change in payroll employment is negative for three straight months. Elmendorf and Furman explained that, looking back over time, that variant would have avoided some very short periods of stimulus that Feldstein's proposal would have generated but also would have initiated stimulus more slowly when recessions began.

Sahm (2019) shifted attention to the unemployment rate as a trigger. She proposed that "lump-sum annual payments … be made to individuals … when the national unemployment rate rises by at least 0.50 percentage points … [, and p]ayments in subsequent years … be made only in the case of severe, prolonged recessions that lead to cumulative unemployment rate increases of at least 2.0 percentage points" (page 67).

Those proposals and others highlight four important issues with triggers for automatic stabilizers. One issue is an unavoidable tradeoff between the speed of responding to a recession and the probability of responding to short-lived negative developments that do not precipitate a recession. Because economic data are noisy—especially in their earliest releases when measurement error tends to be highest—they present a signal-extraction problem regarding the onset of economic downturns (Dynan and Elmendorf 2001). Setting a trigger for launching fiscal stimulus involves balancing risks in that signal-extraction problem.

A second issue is the need to identify conditions for fiscal stimulus to end as well as to begin. Appropriate timing for the initiation of stimulus is important because a quick fiscal response can minimize the self-reinforcing dynamics of downturns and because a key potential advantage of automatic stabilizers is to overcome the usual lags of discretionary fiscal policymaking. But appropriate timing for the cessation of stimulus is important also, because the issuance of government debt is costly in the long run and because many observers have argued that stimulus ended too quickly following the Great Recession and too slowly following the COVID recession.

A third issue regarding triggers for automatic stabilizers is the data to be used. The key criteria are timeliness (so stabilizers respond quickly to economic changes), breadth (so stabilizers respond to overall economic conditions rather than sectoral developments), accuracy (so stabilizers respond to true changes in conditions), and linkage to economic slack (so stabilizers respond to demand shocks more than supply shocks). Thus, Feldstein, Elmendorf and Furman, and Sahm all used data from the monthly employment situation report from the Bureau of Labor Statistics. Within that report, the unemployment rate has the advantage relative to payroll employment that it measures slack in resource

utilization rather than total resources used, and therefore offers a natural metric for the degree of slack (as we discuss below) and is less affected by some shocks such as the surge in immigration in the early 2020s. In addition, it is subject to fewer and less meaningful revisions than payroll employment, which makes the triggering of stimulus less sensitive to the volatility of real-time data (although this sensitivity can be addressed to some extent for employment growth by the use of moving averages). An alternative beyond the employment report is to use data on output from the national income and product accounts. However, those data are released with longer lags and are subject to substantial revisions. Some data on output are available with shorter lags (such as industrial production), but they cover only part of the economy. Moreover, output responds to shifts in potential supply as much as to shifts in demand.

A fourth issue with triggers for automatic stabilizers is whether the traditional focus on underutilization of resources is sufficient or whether inflation should be included as well. One can imagine formulas for automatic stabilizers that correspond to the well-known Taylor-style rules for monetary policy, in which policy responds to both resource utilization and inflation. Moreover, inflation as measured by the consumer price index (CPI) is reported with only a month's lag, analogous to labor-market data. Future research could explore the possibility of including inflation in a trigger for automatic stabilizers.

For Potential New Automatic Stabilizers, How Much Should Taxes and Spending Adjust?

Suppose that policymakers want to respond to recessions by closing all of the cyclical shortfalls in output and employment—perhaps on the grounds that any shortfalls relative to potential have short-term costs and could generate long-term costs as discussed earlier. With this objective, how much would taxes and spending need to change in response to, say, an increase in the unemployment rate of one percentage point?

Estimates by Ball et al. (2017) of the Okun's Law relationship imply that each one-percentage-point increase in the unemployment rate corresponds roughly to a two-percent drop in inflation-adjusted output. For simplicity, posit that each one-dollar reduction in taxes or increase in government spending raises aggregate demand by one dollar and that aggregate supply is completely elastic at the existing inflation rate. Under those assumptions, offsetting a one-percentage-point increase in the unemployment rate and associated decline in output would require fiscal stimulus equal to two percent of output (or roughly $600 billion in 2025).

That figure is large relative to major components of the federal budget. If stimulus of that amount was implemented through the personal income tax, it would be roughly a one-quarter reduction in such tax revenue; if implemented by reducing payroll taxes, it

would be roughly a one-third cut; and if implemented by increasing federal payments for Medicaid, it would represent nearly a doubling of those payments.

Moreover, policymakers might prefer to close only part of the employment and output gaps—perhaps because of the long-run costs of greater government debt and because of the risk of overshooting potential output and raising inflation, as discussed earlier. With that possibility in mind, Dynan and Elmendorf (2020) analyzed an automatic stabilizer in which each one-percentage-point increase in the unemployment rate triggered a cut in the payroll tax rate of one percentage point. Such a cut would amount to about $115 billion in 2025 (based on CBO 2024b). If cutting the payroll tax raises aggregate demand dollar-for-dollar and aggregate supply is completely elastic, this policy would close about one-fifth of the hypothesized employment and output gaps.

Methodology for Estimating the Effects of an Additional Automatic Fiscal Stabilizer

How would economic and budgetary outcomes have differed during the past two recessions if an additional automatic fiscal stabilizer had been in place and if discretionary fiscal actions had been foregone? In this section we describe our methodology for simulating those differences.

Specification of an Additional Automatic Stabilizer

We analyze the potential effects of a specific additional automatic stabilizer. As described above, three characteristics of automatic stabilizers are fundamental: the type of change in taxes or spending, the timing of stimulus, and the amount of stimulus.

Regarding the type of change in taxes or spending, we examine payments to households like the Economic Impact Payments that were provided in three rounds during 2020 and 2021. Those payments, sometimes called “stimulus checks,” were for amounts that varied by household size and phased out for households with higher incomes; see Gelman and Stephens (2022) for more detailed information. We focus on this approach because it is easy to communicate and straightforward to administer quickly. We do not formally evaluate other delivery mechanisms for automatic stimulus, such as changes to unemployment insurance or payroll taxes. However, the strengths and limitations of other tools are well covered in the literature cited earlier. In addition, we note briefly later how some of our results can be interpreted as showing the effects of alternative stimulus measures.

On the timing of stimulus, we identify the onset of a recession as the month in which the unemployment rate rises one-half percentage point above its third lag. The Bureau of Labor Statistics would report the unemployment rate for that month at the beginning of the following month, and we assume that stimulus payments are made by the beginning of the month after that, based on Gelman and Stephens' description of the quick timing of Economic Impact Payments following legislative action. Thus, stimulus from the automatic stabilizer starts in a month when the second lag of the unemployment rate first exceeds the fifth lag by one-half percentage point or more. That fifth lag becomes the base unemployment rate for the cycle. Further stimulus is provided each month until the second lag of the unemployment rate falls below 5 percent, at which time stimulus stops. We use this specified threshold rather than the base rate for a cycle because the unemployment rate might not return to the base rate if that value occurred in an overheated economy or if the natural rate of unemployment rose during the recession.

The amount of stimulus each month equals the product of two factors: the "unemployment gap," which is defined as the difference between the second lag of the unemployment rate and the base rate for the cycle; and the last available quarterly estimate of GDP (which varies depending on the month of the quarter but, even at its timeliest, lags the last available estimate of unemployment). Thus, if the unemployment rate was one percentage point above its pre-recession level, the additional automatic stabilizer would provide fiscal stimulus equal to one percent of output. Because Okun's law implies that output would be two percent below its potential in those circumstances, the stimulus amount would equal roughly one-half of the output gap.

We also provide estimates for a more aggressive approach. This approach involves an amount of stimulus that is twice as large in every month in which unemployment is sufficiently elevated. For this more aggressive stabilizer, the amount of stimulus is roughly equal to the output gap. Nonetheless, we show that the stimulus would have continued for sustained periods until the underlying forces weighing on the economy dissipated.

Modeling Approach

Assessing the effects of counterfactual policies on economic outcomes is inherently difficult, and that difficulty is amplified when the underlying economic circumstances are unusual. Therefore, any estimates of economic outcomes if alternative fiscal policies had been implemented during the Great Recession and the COVID recession are fraught with uncertainty. Yet, a potential expansion of automatic fiscal stabilizers cannot be reasonably evaluated without some estimates, however uncertain, of the differences those additional stabilizers would have made during previous recessions.

We considered two potential approaches to producing such estimates. One approach is to use a full model of the economy to simulate outcomes under different policies. This approach would make use of the estimation, calibration, and other specifics of that model, which provides some advantages. However, models that were built to align with typical economic circumstances may not capture well the unusual conditions and behavior spurred by the global financial crisis and the COVID pandemic, so significant adjustments would be needed. In addition, large-scale models of the economy are complex in ways that can be useful for some purposes but may obscure the factors that are most important for the topic of this paper.

The other approach we considered—and then adopted—is to use rules of thumb for key economic relationships to simulate outcomes under different policies. This approach starts with the unusual outcomes that were experienced during the past two recessions, subtracts the effects of discretionary fiscal actions as projected by the rules of thumb, and adds the effects of an additional automatic fiscal stabilizer as projected by those same rules. Estimates derived from this approach are only as reliable as the rules of thumb that are applied, just as estimates from a full model are only as reliable as the model. But using rules of thumb has the substantial advantage of greater transparency for the most important economic factors.

Three economic relationships matter most for our analysis: the effect of fiscal stimulus on aggregate demand, the effect of aggregate demand on output and inflation, and the effect of output on unemployment. For many macroeconomic analyses, the reaction of the Federal Reserve to economic developments is another key relationship. However, the federal funds rate was essentially at zero from the end of 2008 to the end of 2015 and from the spring of 2020 to the spring of 2022, and other tools for easing monetary policy were deployed as well, so the Fed could not readily ease further during the time periods we focus on. In addition, the Fed did not tighten policy until the unemployment rate fell back nearly to the natural rate after the Great Recession and until inflation picked up after the COVID recession, so there is no reason to suppose it would have tightened policy in response to the alternative fiscal stimulus we study. Therefore, our analysis does not incorporate any changes in monetary policy in response to different fiscal policies.

We describe our approach to the three relationships that are central to our analysis in the following sections. Then we summarize our simulation process.

The Effect of Fiscal Stimulus on Aggregate Demand

For fiscal stimulus and aggregate demand, we follow the “multipliers” methodology used by CBO during and after the Great Recession and the COVID recession. As described by

CBO (2020) and Seliski et al. (2020), the "output multiplier" is the dollar change in GDP per dollar of budgetary change in taxes or government spending, and it equals the product of two factors: One factor is a policy's direct effect on purchases of goods and services from close to one for enhanced unemployment compensation to close to zero for business tax provisions that primarily affect cash flow (Seliski et al., page 25). The other factor is a "demand multiplier" that captures the net indirect effect from both reinforcing changes (such as firms with higher sales deciding to increase investment) and opposing changes (such as greater demand raising interest rates, which reduces investment). Both of these factors can display lag patterns, which CBO specifies on a quarterly basis.

CBO draws values for multipliers from the extensive research literature on the impact of fiscal policies—a literature that offers a wide range of estimates. Ramey (2019) provided a valuable review, and later Ramey (2025) analyzed several instances of payments to households during economic downturns (including the 2008 tax rebates but not the 2020-21 stimulus checks) and concluded that "temporary cash transfers to households likely provided little or no stimulus to the macroeconomy" (Abstract). Yet, a large number of researchers who studied transactions data on spending or survey data on spending intentions found that the marginal propensity to consume out of stimulus checks was decidedly positive; see Gelman and Stephens (2022) for a review. Moreover, other research on consumption has generally concluded that households are much more responsive to current income than is implied by the permanent income hypothesis; see CBO (2020) and Seliski et al. (2020) for additional citations.

CBO's chosen values, which we describe shortly, represent a judicious reading of the evidence, being neither as low as some estimates or as high as some others.[4] We present later some sensitivity analysis of our results using multipliers that are smaller or larger than our base case.

CBO allows, appropriately, for considerable variation in multipliers based on economic conditions. For example, Seliski et al. explained that, at the time of their writing, "output is projected to remain well below its potential level and inflation below the Federal Reserve's long-run objective over the next several years" (page 5), so the direct changes in demand and the reinforcing feedback would generate an increase in aggregate demand that would be passed through to output in the short run. Based on the midpoints of the ranges provided by Seliski et al., each dollar of direct payments to households was assumed to increase output by a cumulative 83 cents, with most of the effect occurring in the quarter

[4] CBO's assumed multipliers may have evolved in some ways over time, owing to the emergence of new evidence. We use the agency's most recent assumptions in simulating the effects of the hypothesized additional automatic stabilizer during the Great Recession as well as the COVID recession.

when the payments are made. We adopt that cumulative amount and lag pattern as our main multiplier.

Seliski et al. also explained that, during the COVID era, CBO used "delayed and reduced estimates" (page i) of both direct effects and demand multipliers to capture the impact of social distancing. The agency assumed that each dollar of direct payments to households would increase output by a cumulative 49 cents at the peak of social distancing in the spring of 2020 and that social distancing would decline over the following year and a quarter. We adopt CBO's figure for the spring of 2020 and the agency's dissipation of the social distancing effect by the middle of 2021. But we assume that some of the foregone spending was made up after COVID vaccinations became available, because spending surged in 2021 to a degree that is difficult to explain without the release of pent-up demand, even recognizing the very large stimulus from the American Rescue Plan (ARP) Act. Specifically, we assume that pent-up spending equaled one-half of the spending foregone due to the difference between CBO's standard and social-distancing multipliers, beginning partly in the first quarter of 2021 and continuing through 2022.

The Effect of Aggregate Demand on Output and Inflation

We turn to the textbook graph of aggregate demand and supply, with inflation-adjusted output on the horizontal axis and inflation on the vertical axis. That framework is roughly equivalent to the textbook Phillips curve.[5]

A large research literature regarding the Phillips curve and aggregate supply curve has shown that those curves are nearly flat when resource utilization is at levels typically observed : In other words, changes in resource utilization move the economy along a nearly flat portion of the Phillips curve, and shifts in the aggregate demand curve move the economy along a nearly flat portion of the aggregate supply curve. What happens when resource utilization is high is less clear. A growing number of papers, drawing in part on the experience of high utilization and high inflation during the past several years, provide substantial evidence that, when resource utilization is high, changes in utilization move the economy along a much steeper portion of the Phillips curve, and shifts in the aggregate demand curve move the economy along a much steeper portion of the aggregate supply curve. Relevant references include Ball et al. (2025), Benigno and Eggertsson (2023 and 2024), Demirel and Wilson (2023), Furlanetto and Lepetit (2024), Gagnon and Collins (2019), Gagnon and Sarsenbayev (2022), Harding et al. (2023), Hazell et al. (2022), and Smith et al. (2023).

[5] Mankiw (2019, pages 435 to 449) showed how to derive that aggregate demand-aggregate supply framework from one that has the price level on the vertical axis.

In light of this new evidence, we model the effect of aggregate demand on inflation and output using a convex aggregate supply curve. Calibrating the degree of convexity is challenging. Resource utilization has rarely been as high as it was in 2021 and 2022, so the precise nature of aggregate supply under those conditions is not known. Moreover, much of the recent research has quantified resource utilization using the ratio of the job vacancy rate to the unemployment rate (sometimes including squared and cubed versions of that ratio), but modeling the vacancy rate, which depends on matching efficiency and other factors, is beyond the scope of this paper. Therefore, we quantify resource utilization as the percentage difference between output and potential output, and, for transparency, we assume that inflation responds to that difference according to a piecewise function.

Specifically, we parameterize the supply curve as follows:

- When output is below its potential, inflation does not respond to changes in output (an admittedly extreme version of the "nearly flat" Phillips curve found in some earlier research, but useful for highlighting the role of convexity);
- When output is above its potential by up to one percent, inflation rises one-for-one with percentage increases in output; and
- When output is further above its potential, inflation rises five-for-one with percentage increases in output.

In addition, we reduce potential output during the COVID pandemic to allow for the impact of social distancing on labor supply and the effectiveness of people's work. Relative to CBO's estimates of potential output, which make no adjustment for social distancing, we assume that social distancing reduced potential output by 4 percent in March through May of 2020, by decreasing amounts that reached 2 percent in October 2020, and then by more slowly decreasing amounts that reached zero by the summer of 2022.

These assumptions about the slope and position of the aggregate supply curve are admittedly speculative but are driven by the following evidence: First, CBO (2021) projected that the ARP enacted in early 2021 would push output nearly 1½ percent above potential by the end of 2021 and nearly 2½ percent above potential in 2022—large overshoots by historical standards and thus an opportunity for researchers to learn about the behavior of aggregate supply at high levels of resource utilization. Second, Dynan and Elmendorf (2024) presented a collection of information regarding the timing and breadth of the surge in inflation and the tightness of the labor market, and they inferred that the principal cause of higher inflation was the strength of demand working against inelastic supply rather than shocks to supply. Third, the job vacancy rate shot upward in 2021, finishing the year more than 50 percent above its value at the end of 2020, and then declined a little in 2022 before dropping sharply in 2023; that pattern indicates that

aggregate demand pushed up along a very steep aggregate supply curve in 2021 and fell back along that steep curve a bit in 2022 and much further in 2023. Fourth, Benigno and Eggertsson's (2024) graphs relating inflation to measures of resource utilization including the vacancy rate (pages 14, 15, and 19) showed a dramatic steepening as utilization rises, and they concluded that roughly three-quarters of the rise in inflation excluding food and energy (so-called "core" inflation) was due to an increase in aggregate demand (page 25). Fifth, the Federal Reserve Bank of San Francisco (2025) attributed roughly half of the observed increase in core inflation to an increase in aggregate demand.

In contrast to this recent evidence, the Great Recession and its aftermath offered no opportunity to learn about aggregate supply at high levels of resource utilization because output was well below its potential. For the same reason, the assumed upward-sloping parts of the aggregate supply curve do not affect our simulation of alternative fiscal policy during and after the Great Recession, although they matter importantly for our simulation of alternative fiscal policy during and after the COVID recession.

Based on the available evidence, we set the slope and position of the aggregate supply curve such that the fiscal stimulus enacted in response to COVID explains about half of the elevation of core inflation that occurred in the second half of 2021 and in 2022. However, recognizing the great uncertainty about aggregate supply, we also present results under the alternative assumption that social distancing did not reduce potential output and the two upward-sloping segments of the aggregate supply curve are a tenth as steep as in our primary specification. We measure inflation using the price index for personal consumption expenditures excluding food and energy, the core PCE price index.

This modeling of inflation does not include lagged inflation or any measure of expected inflation. Moreover, this modeling does not include any lags of resource utilization. Thus, inflation is assumed to depend only on the contemporaneous balance between aggregate supply and aggregate demand. Note also that we do not incorporate any effect of shifts in actual output on potential output.

When the economy is operating on an upward-sloping part of the aggregate supply curve, shifts in aggregate demand generate changes in inflation-adjusted ("real") output that are smaller than the shifts in demand. The sizes of the changes in output—and in inflation—depend on the slope of the aggregate demand curve as well as that of the aggregate supply curve. We assume that the aggregate demand curve has a slope of -1, so each percentage-point difference in output corresponds to a percentage-point difference in inflation. That assumption aligns with the view that nominal demand can be taken as given at a point in time with supply constraints determining how nominal demand is divided into real output and inflation—a view advocated by Furman (2023) and Bolhuis et al. (2025).

The Effect of Output on Unemployment

The third key economic relationship for our analysis is the effect of output on unemployment. We use Okun's law as estimated by Ball et al. (2017, Table 2): A decrease in output of one percent raises the unemployment rate by one-half percentage point, with one-quarter percentage point of that increase occurring in the contemporaneous quarter, one-eighth percentage point in the next quarter, and one-eighth percentage point in the quarter after that. Those estimates are consistent with the textbook treatment of this topic, and we are not aware of significant disagreements in the research literature.

Simulation Process

We conduct our simulations in three steps. First, we construct counterfactual historical paths for inflation-adjusted GDP, inflation, and unemployment under the assumption that the existing automatic stabilizers were in place but no discretionary fiscal actions were enacted. To construct these paths, we generally use CBO's estimates for the effects of the enacted fiscal actions on output as if they were estimates of the effects on aggregate demand. That approach is appropriate for all of the fiscal actions we study except for the ARP, for which we make special adjustments as described later. Then we use our assumed frameworks for aggregate supply and demand and for Okun's law to generate estimates of the effects of those demand shifts on output, inflation, and unemployment. We subtract those estimated effects from the realized outcomes for those variables to obtain counterfactual paths. The appendix provides details on this step.

Orchard et al. (2025) urged researchers to evaluate the plausibility of historical counterfactuals using contemporaneous forecasts or other points of reference. Unfortunately, such evaluations are difficult: Forecasts are generally unreliable during economic downturns, CBO publishes forecasts only a few times each year and not generally on the eve of discretionary fiscal actions, and other analysts usually include in their forecasts the fiscal actions they anticipate. Still, we agree with the spirit of Orchard et al.'s recommendation, and we think that our constructed counterfactuals look reasonable.

Second, we generate monthly counterfactual paths that correspond to the quarterly counterfactual paths. Monthly paths are needed in order to simulate automatic stabilizers triggered by the monthly unemployment rate. Output is not available at the monthly frequency, so we use linear interpolation to compute monthly data. For unemployment and inflation, we add the difference between the actual quarterly averages and the counterfactual quarterlies to the actual monthlies so as to preserve some of the original month-to-month variation.

Third, we simulate the impact of the hypothesized additional automatic stabilizer. This simulation is an iterative monthly process: When the counterfactual unemployment rate rises enough to initiate fiscal stimulus, the stimulus provides a boost to output and potentially inflation in that month and subsequent ones. The sizes of those effects depend on the multipliers (with a cubic spline interpolation used to convert CBO's quarterly figures to monthly figures) and on our aggregate supply and demand framework. The stimulus-induced boost to output lowers unemployment over time, and the reductions in unemployment affect the existence and size of automatic fiscal stimulus in subsequent months.

Those simulated economic outcomes given the additional automatic stabilizer can be compared to the realized outcomes based on the discretionary fiscal actions that were taken. In addition, the cumulative amount paid out through the automatic stabilizer can be compared to the cumulative amount of discretionary fiscal stimulus that was provided.

The next two sections present our core results for the COVID recession and the Great Recession, including both the additional stabilizer we analyze as a base case and a more aggressive additional stabilizer that aims to close a larger share of the output gap. A subsequent section presents sensitivity analysis of our core results.

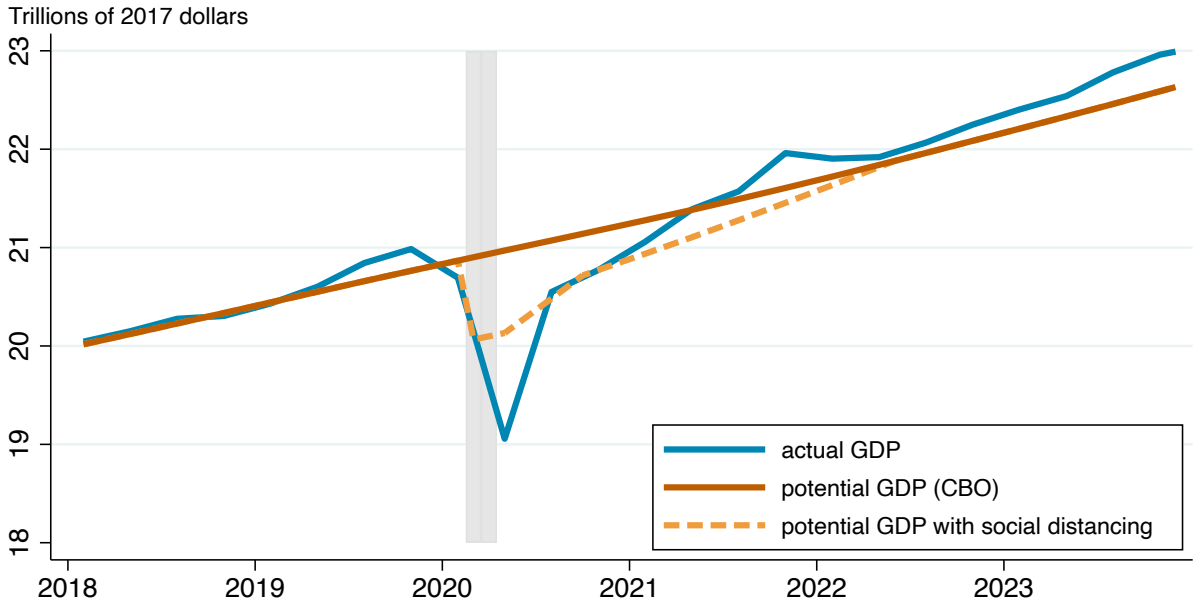
How Would the Additional Automatic Stabilizer Have Mattered in 2020 through 2023?

When the COVID pandemic began in the spring of 2020, real GDP dropped sharply, as shown in figure 1. It rebounded to a significant extent later in the year and then increased more gradually, rising above our estimate of potential GDP with social distancing by early 2021 and above CBO's estimate of potential GDP (without social distancing) by late 2021.

In the absence of discretionary fiscal actions and any additional automatic stabilizers—but with the automatic stabilizers that existed at the time—real GDP would have recovered much more gradually. That difference is shown in figure 2.

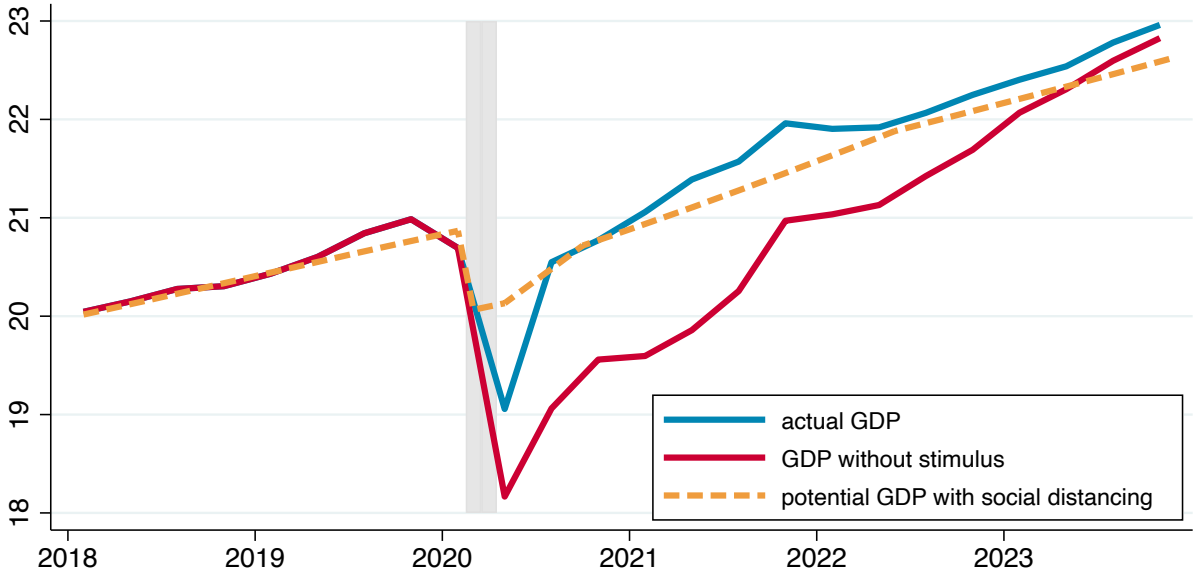
The additional automatic stabilizer that we described earlier would have begun making payments to households in May 2020 based on the rise in the unemployment rate between December 2019 and March 2020. The payments would have surged in June to more than 10 percent of GDP, as shown in figure 3, because of the upward jump in the unemployment rate in April. Then, as the unemployment rate gradually receded—in part because of the underlying economic recovery and in part because of the additional stimulus—the payments would have declined as well.

Figure 1: Potential Real GDP with Social Distancing (COVID Recession Era)



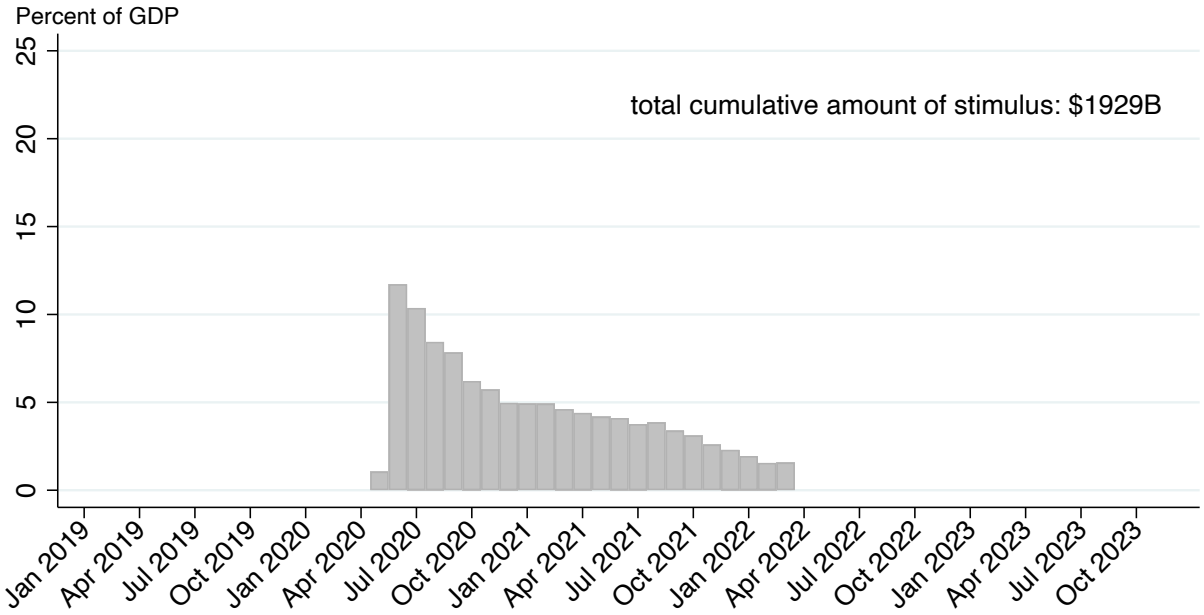
Data source: Bureau of Economic Analysis, Congressional Budget Office, and authors' calculations.
See text for description of social distancing assumptions. Shaded area corresponds to recession.

Figure 2: Real GDP (COVID Recession Era)



Data source: Bureau of Economic Analysis, Congressional Budget Office, and authors' calculations.
Shaded area corresponds to recession.

Figure 3: Fiscal Stimulus with Base Automatic Stabilizer (COVID Recession Era)



See text for description of base automatic stabilizer.

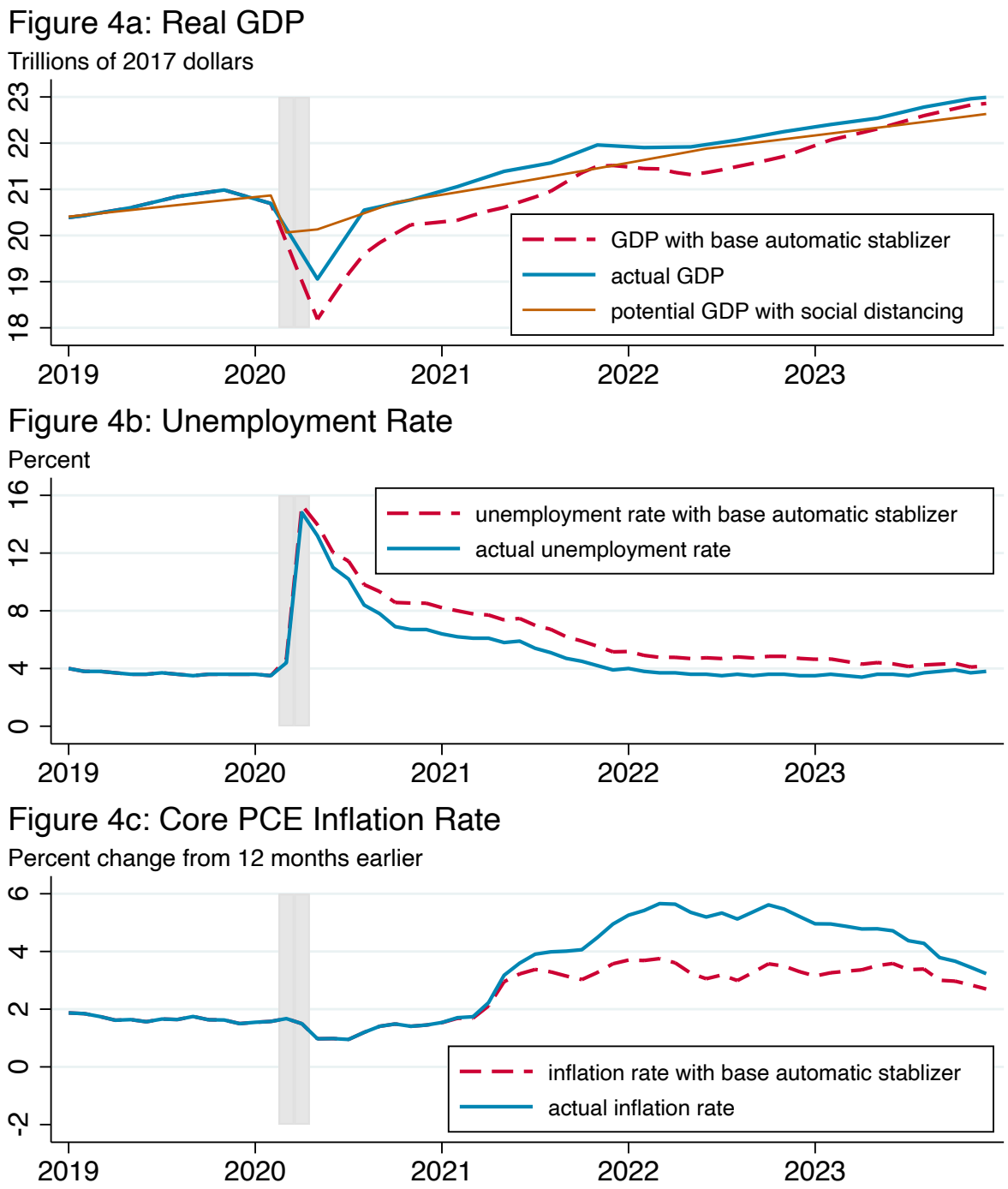
The additional stimulus would have ended in March 2022 when the unemployment rate fell back below 5 percent. Cumulative payments would have been $1.9 trillion, far less than the $5.1 trillion of stimulus that was provided through discretionary actions, as shown in table 1 earlier.

This string of payments to households would have boosted the level of real GDP from the spring of 2020 until the summer of 2023. The estimated effect peaks at nearly 0.8 percent of GDP in the spring of 2021 (not shown). Because the hypothesized payments would have been a good deal smaller than the discretionary stimulus that was enacted, aggregate demand would have been less strong, and real GDP would have rebounded more slowly, as shown in figure 4a. With the slower rebound in output, the unemployment rate would have declined more gradually. As shown in figure 4b, the simulated unemployment rate stays above 4 percent until the spring of 2023 rather than falling to 4 percent by the end of 2021 as occurred with the enacted stimulus.

The smaller boost to aggregate demand would have left output below estimated potential output, as shown in figure 4a, so inflation would have been notably lower. Given the discretionary fiscal actions and other economic developments during the pandemic, annualized core PCE inflation peaked close to 6 percent and stayed above 4 percent from the fall of 2021 until the summer of 2023, as shown in figure 4c. By contrast, with the

additional hypothesized stabilizer, annualized core PCE inflation would have stayed below 4 percent during the entire period.

Figure 4
Outcomes with Base Automatic Stabilizer (COVID Recession Era)



See text for description of base automatic stabilizer.

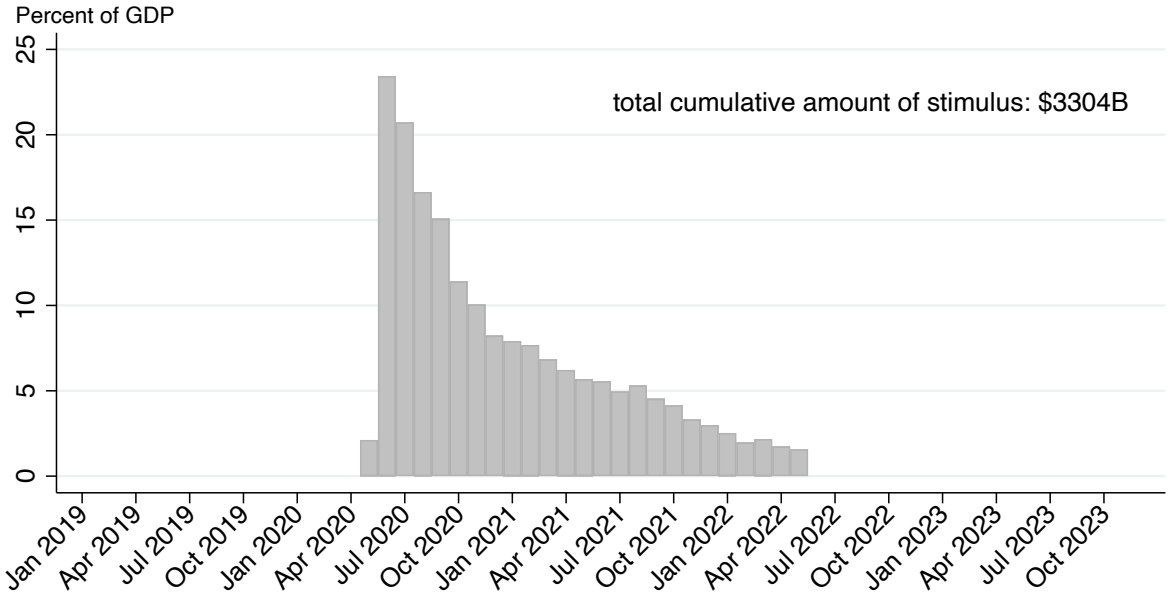
The macroeconomic effects of our base case can be interpreted as the effects of a stabilizer that disburses larger amounts of money to beneficiaries who spend a smaller share of that money. However, in that case, the total payments would be larger than the amount we reported above.

An alternative to the additional stabilizer we analyze as a base case would be a more aggressive additional stabilizer that aims to close a larger share of the output gap. Therefore, we report next on the effects of a stabilizer that adheres to the same triggers as the base stabilizer but makes payments to households that are twice as large for any given unemployment rate.

Not surprisingly, estimated fiscal stimulus during the early months of the pandemic is twice as large with this more aggressive stabilizer as with the base stabilizer, as shown in figure 5. However, the larger stimulus causes the unemployment rate to decline more quickly than in the base case, so the amount of stimulus falls off quickly as well. Cumulative payments would have been $3.3 trillion, less than twice the $1.9 trillion total for the base stabilizer and still well below the $5.1 trillion budgetary cost of the enacted discretionary policies.

With larger stimulus payments in 2020 than under the base rule, real GDP returns to its potential more rapidly—and nearly as rapidly as occurred under the enacted policies, as shown in figure 6a. Correspondingly, the unemployment rate declines almost as rapidly as under the enacted policy, as shown in figure 6b. Yet, because even this more aggressive stabilizer never pushes output noticeably above estimated potential output, it generates no upward pressure on inflation. As a result, inflation follows essentially the same path as with the base stabilizer and stays well below the inflation that actually occurred, as shown in figure 6c.

Figure 5: Fiscal Stimulus with More Aggressive Stabilizer (COVID Recession Era)



See text for description of automatic stabilizers.

Figure 6
Outcomes with Different Automatic Stabilizer (COVID Recession Era)

Figure 6a: Real GDP

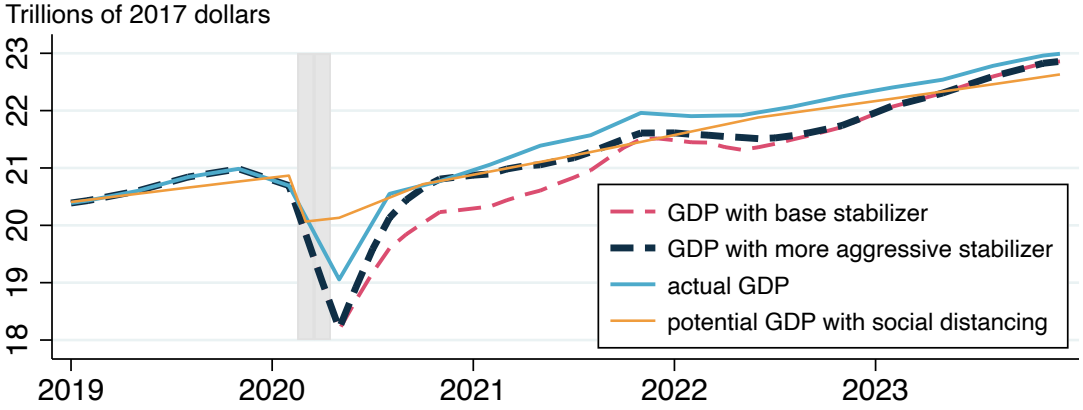


Figure 6b: Unemployment Rate

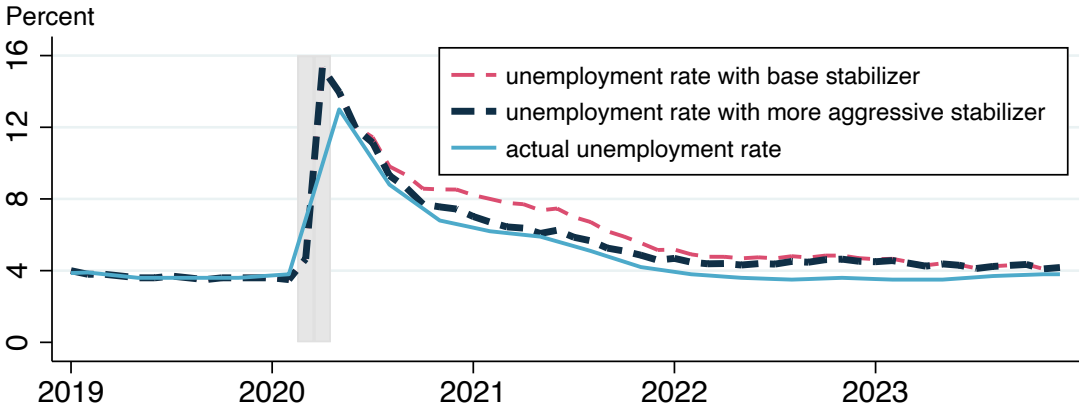
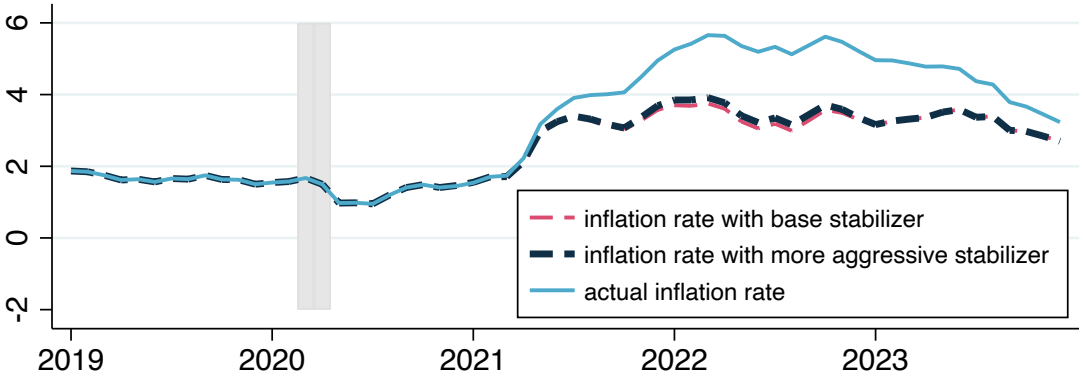


Figure 6c: Core PCE Inflation Rate

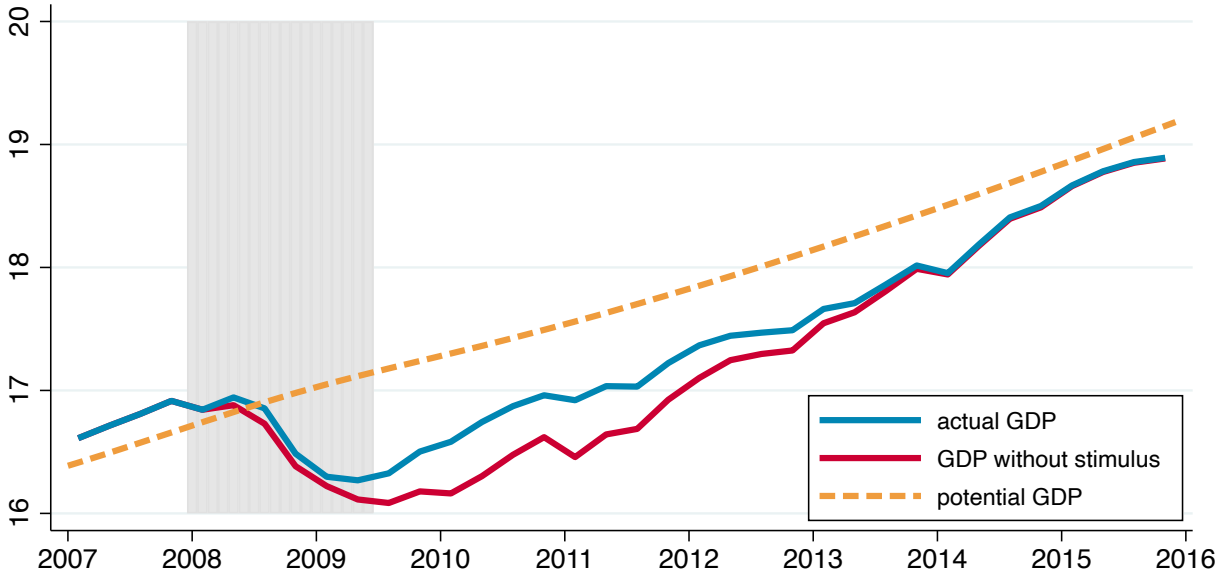


See text for description of base automatic stabilizer.

How Would the Additional Automatic Stabilizer Have Mattered in 2008 through 2015?

We now turn to the Great Recession period. Real GDP stalled in the first half of 2008 and then fell markedly in the second half of the year and the first half of 2009, as shown in figure 7. Real GDP began to increase again in the second half of 2009, but its gradual rise then and in the following years closed very little of the output gap. Even in 2015, real output remained well below its potential. The figure also shows that in the absence of discretionary fiscal actions and any additional automatic stabilizers (but with the stabilizers that existed at the time), real GDP would have recovered even more slowly.

Figure 7: Real GDP (Great Recession Era)

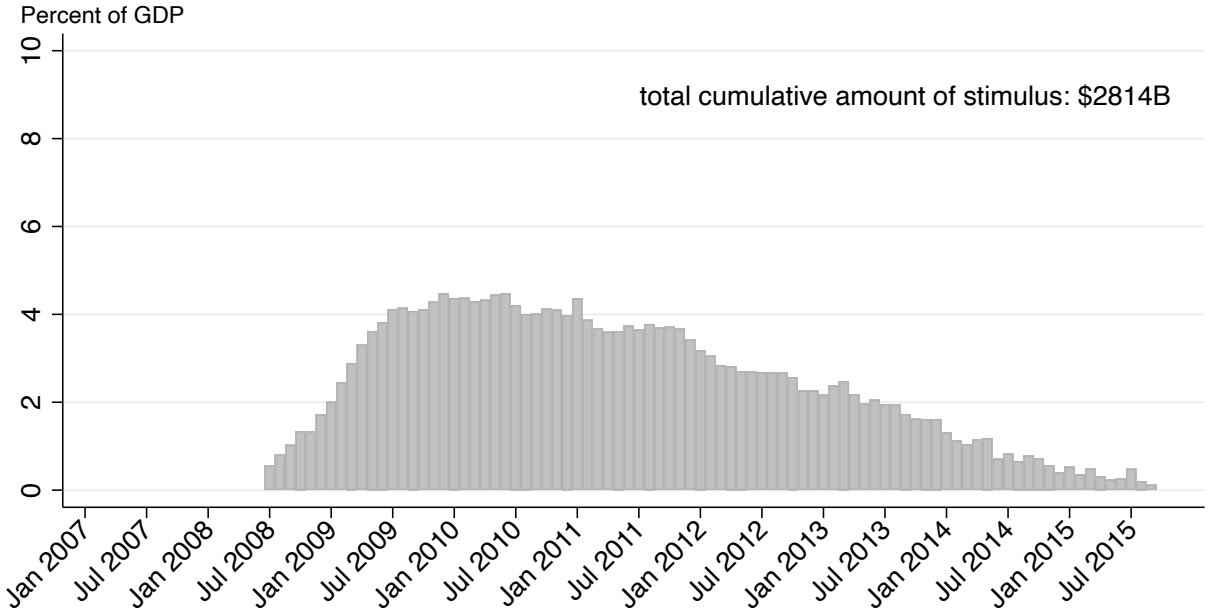


Data source: Bureau of Economic Analysis, Congressional Budget Office, and authors' calculations.
Shaded area corresponds to recession.

The base additional automatic stabilizer that we described earlier would have begun making payments to households in July 2008, triggered by the rise in the unemployment rate over the preceding months. As shown in figure 8, the payments would have climbed rapidly until they reached 4 percent of GDP in the summer of 2009 and then stayed close to that level until late 2011. The stimulus would have ebbed only slowly thereafter and would not have ended until the summer of 2015. Cumulative payments would have been $2.8 trillion, more than twice the $1.3 trillion increase in deficits that occurred through discretionary fiscal actions, as shown in table 1 earlier. Taking these figures together with those we presented above for the COVID recession, the cumulative budgetary cost of the hypothesized automatic stabilizer for the two recessions would have been $4.7 trillion,

roughly one-quarter less than the cumulative $6.4 trillion budgetary cost of the enacted discretionary actions.

Figure 8: Fiscal Stimulus with Base Automatic Stabilizer (Great Recession Era)



See text for description of base automatic stabilizer.

These payments to households would have boosted the level of real GDP beginning in the summer of 2008. The estimated effect peaks at 0.6 percent of GDP throughout 2010 (not shown). Because the hypothesized payments would have been larger than the discretionary stimulus that was enacted, aggregate demand would have been bolstered, and real GDP would have rebounded a little more rapidly, as shown in figure 9a. With the faster rebound in output, the unemployment rate would have declined a bit faster, as shown in figure 9b. Even with the larger boost to aggregate demand, output would have stayed below its estimated potential through 2015 (as shown in figure 9a). Therefore, inflation in this scenario would have matched the low level of realized inflation, as shown in figure 9c.

Again, an alternative to the additional stabilizer we analyze as a base case would be a more aggressive additional stabilizer that aims to close a larger share of the output gap. We repeated the analysis with a stabilizer that makes payments to households that are twice as large for any given level of the unemployment rate.

Figure 9
Outcomes with Base Automatic Stabilizer (Great Recession Era)

Figure 9a: Real GDP

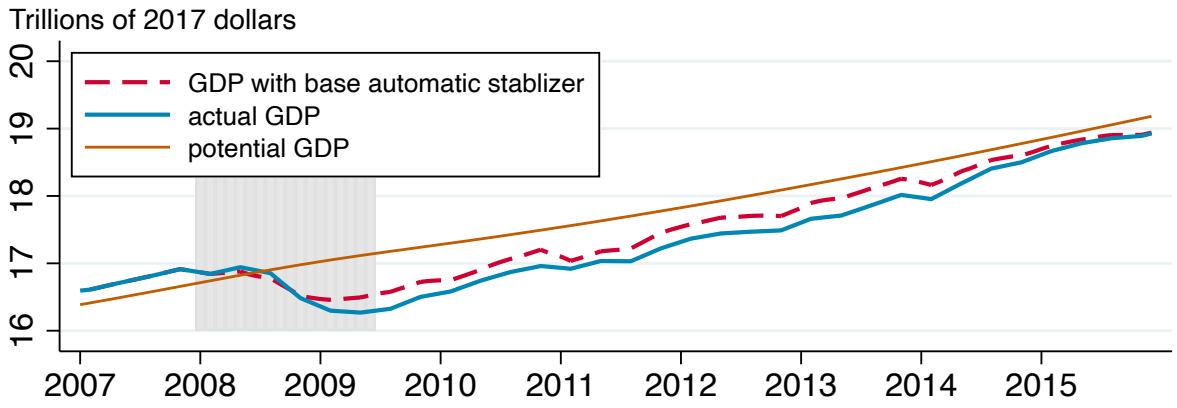


Figure 9b: Unemployment Rate

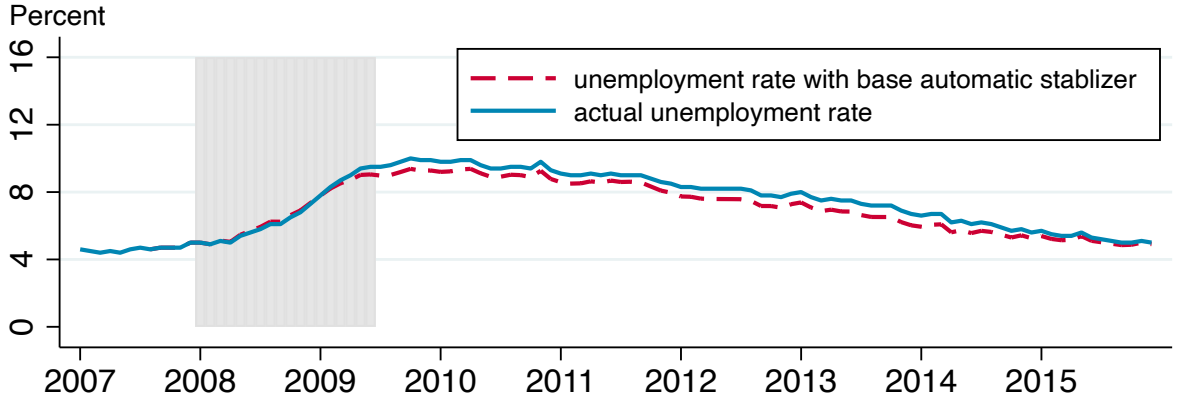
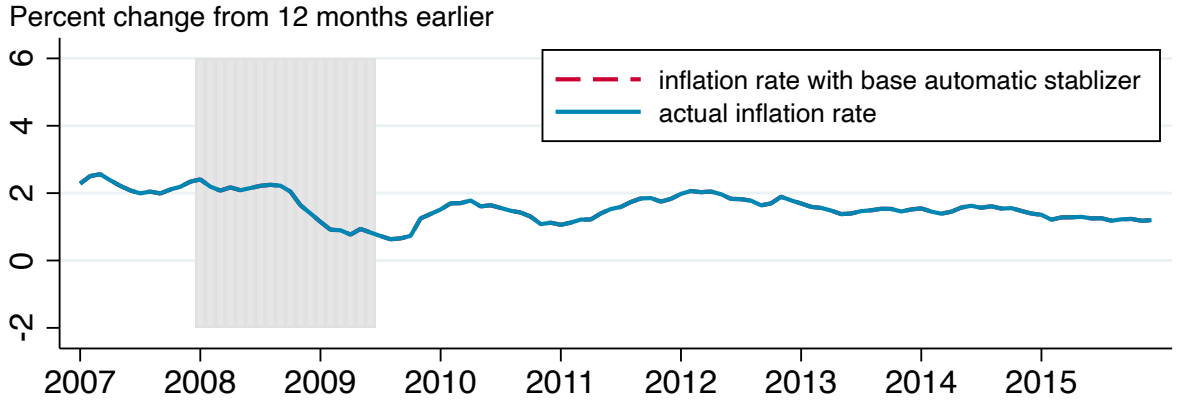


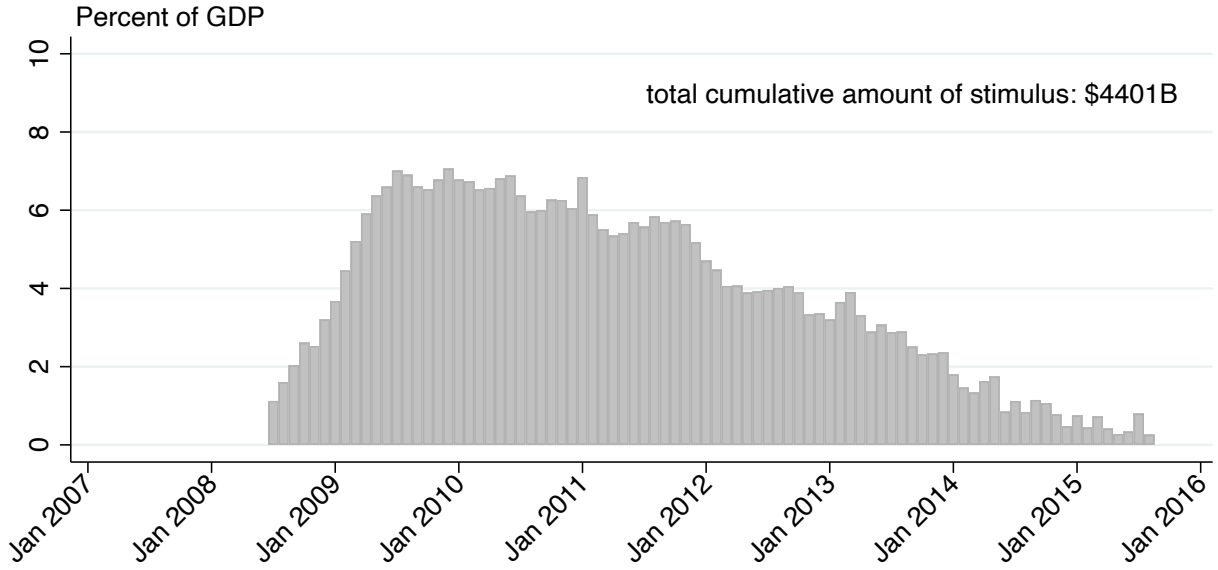
Figure 9c: Core PCE Inflation Rate



See text for description of base automatic stabilizer.

Estimated fiscal stimulus during 2009 is nearly twice as large with this more aggressive stabilizer as with the base stabilizer, as shown in figure 10. The payments would have declined slowly because the unemployment rate would have remained elevated even with this additional stimulus, and the stimulus would not have ended until mid-2015. Cumulative payments would have been $4.4 trillion, more than three times the $1.3 trillion increase in deficits that occurred through discretionary fiscal actions, as shown in table 1 earlier. Taking these figures together with those we presented above for the COVID recession, the cumulative budgetary cost of the more aggressive automatic stabilizer for the two recessions would have been $7.7 trillion, about one-fifth more than the cumulative $6.4 trillion budgetary cost of the enacted discretionary actions.

Figure 10: Fiscal Stimulus with More Aggressive Stabilizer
Great Recession Era



See text for description of base automatic stabilizer.

With larger stimulus payments than under the base rule, real GDP returns to its potential very quickly, as shown in figure 11a. Correspondingly, the unemployment rate declines more quickly than under the base rule, as shown in figure 11b. Yet, because even this more aggressive stabilizer does not push output above estimated potential output, it generates no upward pressure on inflation. As a result, inflation follows the same low path as with the base stabilizer, as shown in figure 11c.

Figure 11
Outcomes with Different Automatic Stabilizers (Great Recession Era)

Figure 11a: Real GDP

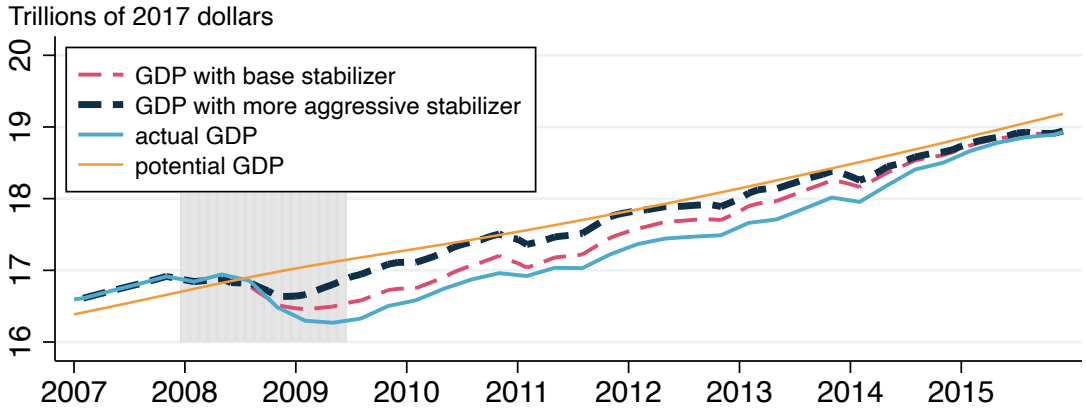


Figure 11b: Unemployment Rate

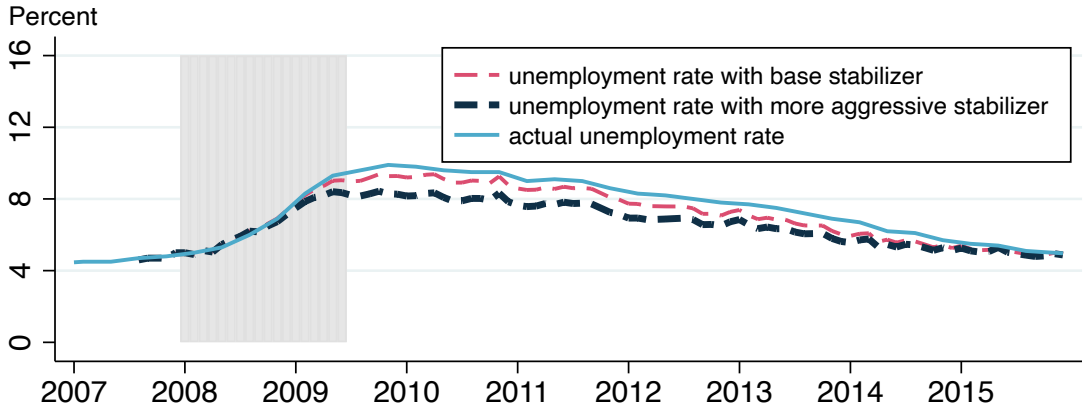
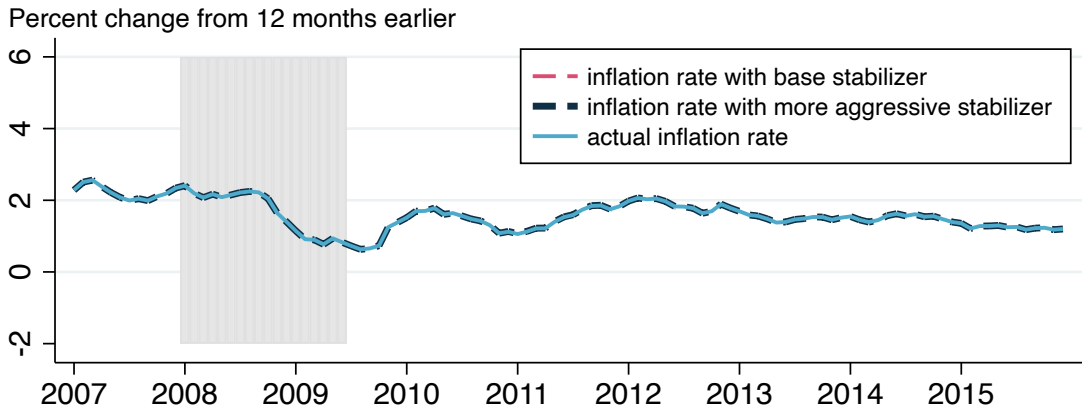


Figure 11c: Core PCE Inflation Rate



See text for description of automatic stabilizers.

Sensitivity Analysis

Two of the key economic relationships in our analysis are the effect of fiscal stimulus on aggregate demand and the effect of aggregate demand on inflation and inflation-adjusted output. In this section we analyze the sensitivity of our results to alternative assumptions about those relationships. We confine our attention to the base additional stabilizer described earlier.

Approach to the Analysis

Our primary assumption for the effect of fiscal stimulus on aggregate demand is the multipliers chosen by CBO: We construct counterfactual paths as if discretionary fiscal actions had not been taken by subtracting from realized outcomes CBO's estimates of the effects of those discretionary actions, and we simulate paths as if the hypothesized additional stabilizers had been in place by applying CBO's multipliers to the payments from those stabilizers.

Suppose instead that multipliers are only *half* as large as CBO assumes. We generate results under this assumption by subtracting *half* of CBO's estimates of the effects of discretionary actions in constructing counterfactual paths and by applying *half* of CBO's multipliers in simulating paths with additional stabilizers. Or suppose instead that multipliers are *half again* as large as CBO assumes. We generate results under this assumption by subtracting *one and a half* times CBO's estimates of discretionary actions and applying *one and a half* times CBO's multipliers.

Our primary assumption for the effect of aggregate demand on inflation and inflation-adjusted output is a convex aggregate supply curve in which inflation does not respond to output when output is below its potential, rises one-for-one with percentage increases in output when output is above its potential by up to one percent, and rises five-for-one with percentage increases in output when output is further above its potential.

Suppose instead that the two upward-sloping segments of the aggregate supply curve are only one-tenth as steep as in our primary specification. In this alternative, inflation does not respond to output when output is below its potential, rises one-tenth-for-one with percentage increases in output when output is above its potential by up to one percent, and rises one-half-for-one with percentage increases in output when output is further above its potential. We generate results by using this supply curve for constructing a counterfactual path and for simulating the path under the hypothesized additional stabilizer.

Results for the COVID Recession

With our primary assumptions about aggregate demand and supply, the base stabilizer produces a shortfall of output relative to its potential (incorporating an impact from social distancing that was discussed earlier) equal to 2.9 percent in the fourth quarter of 2020, 0.0 percent a year later, and 1.6 percent a year after that, as shown in figure 4a above and the top panel of table 2. Those figures can be compared with realized gaps of 0.0 percent, -2.1 percent (that is, output exceeded its potential by that amount), and 0.7 percent in the corresponding quarters, also shown in figure 4a and table 2. The base stabilizer causes the unemployment rate to decline more slowly than the realized outcome, as shown in figure 4b and table 2, and the inflation rate to stay much lower than the realized outcome, as shown in figure 4c and table 2.

With our alternative assumption of smaller multipliers, the base stabilizer produces smaller shortfalls of output, lower unemployment, and notably higher inflation, as shown in table 2. The principal reason for these differences is that assuming smaller multipliers changes the interpretation of the realized economic outcomes: If less of the recovery is attributed to support from enacted fiscal policies, then the economy appears to have been rebounding more rapidly from intrinsic forces. As a result, payments from the base stabilizer are smaller; moreover, those payments are assumed to have less effect on demand per budgetary dollar. But the implied greater underlying strength of the recovery leads to more output and less unemployment. In addition, because fiscal stimulus is assumed to matter less for demand, it matters less for inflation—so more of the realized inflation is attributed to other factors, and the scaling back of fiscal stimulus by substituting the automatic stabilizer for discretionary actions reduces inflation by less.

With our alternative assumption of larger multipliers, all of those implications are reversed, as shown in table 2. In this case, *more* of the recovery in output is attributed to support from enacted fiscal policies, so the economy appears to have been rebounding *less* rapidly from intrinsic forces. As a result, payments from the base stabilizer are slightly larger; also, they have more effect on demand per budgetary dollar. Still, the implied lesser underlying strength of the recovery leads to less output and more unemployment. In addition, because fiscal stimulus is assumed to matter more for demand, it matters more for inflation, and the scaling back of fiscal stimulus therefore reduces inflation by more.

Table 2: Sensitivity Analysis

	Actual	Primary assumptions	Smaller multipliers	Larger multipliers	Flatter supply curve
COVID Recession					
Output gap					
2020: Q4	0.0	2.9	1.6	3.7	2.9
2021: Q4	-2.1	0.0	-0.2	0.0	0.9
2022: Q4	-0.7	1.6	0.7	2.2	1.9
Unemployment rate					
2020: Q4	6.8	8.5	7.7	9.2	8.5
2021: Q4	4.2	5.5	5.2	5.6	6.0
2022: Q4	3.6	4.8	4.4	5.0	4.9
Inflation rate					
2020: Q4	1.4	1.4	1.4	1.4	1.4
2021: Q4	4.5	3.3	4.2	2.3	4.0
2022: Q4	5.4	3.5	4.9	1.8	4.6
Payments from auto. stabilizer ($ trillions)	n.a.	1.9	1.7	2.1	2.2
Great Recession					
Output gap					
2009: Q4	4.3	3.0	4.5	1.9	n.a.
2010: Q4	3.1	1.9	3.3	0.8	
2011: Q4	3.1	1.9	3.1	0.9	
Unemployment rate					
2020: Q4	9.9	9.3	9.9	8.8	n.a.
2021: Q4	9.5	9.0	9.7	8.4	
2022: Q4	8.6	8.1	8.8	7.7	
Inflation rate					
2020: Q4	1.1	1.1	1.1	1.1	n.a.
2021: Q4	1.2	1.2	1.2	1.2	
2022: Q4	1.8	1.8	1.8	1.8	
Payments from auto. stabilizer ($ trillions)	n.a.	2.8	3.3	2.5	n.a.

Note: Variables are defined in the text.

With our alternative assumption of a flatter aggregate supply curve, the base stabilizer produces a slightly larger shortfall of output, slightly higher unemployment, and notably higher inflation than with our primary assumption, as shown in table 2. As with assuming different multipliers, assuming a flatter supply curve changes the interpretation of the realized economic outcomes: If the stimulus to demand from enacted fiscal policies raised inflation by less, then it raised inflation-adjusted output by more, and the economy appears to have been rebounding less rapidly from intrinsic forces. Payments from the base stabilizer persist for longer because of the higher unemployment rate, but the slightly lesser underlying strength of the recovery leads to a bit less output and a bit more unemployment. More importantly, because fiscal stimulus is assumed to have much less effect on inflation, more of the realized inflation is attributed to other factors. As a result, the scaling back of fiscal stimulus by substituting the automatic stabilizer for discretionary actions reduces inflation by less.

Results for the Great Recession

With our primary assumptions about aggregate demand and supply, the base stabilizer produces a shortfall of output relative to its potential equal to 3.0 percent in the fourth quarter of 2009, 1.9 percent a year later, and 1.9 percent a year after that, as shown in figure 9a above and the bottom panel of table 2. Those gaps compare with realized gaps of 4.3 percent, 3.1 percent, and 3.1 percent in the corresponding quarters, also shown in figure 9a and table 2. The base stabilizer causes the unemployment rate to decline more quickly than the realized outcome, as shown in figure 9b and table 2, and has no effect on the inflation rate, as shown in figure 9c and table 2.

The implications of the alternative assumption of smaller multipliers are different for the Great Recession than for the COVID Recession. Because discretionary fiscal stimulus was much more limited for the Great Recession, assuming smaller multipliers does not change the interpretation of the realized economic outcomes (and thus the interpretation of the economy's underlying recovery) very much. Instead, the principal effect of assuming smaller multipliers is that the additional automatic stabilizer does not boost output as much per dollar of stimulus. Payments from the base stabilizer are somewhat larger because the unemployment rate is higher, but not by enough to compensate for the smaller multipliers. The result is that the base stabilizer produces larger shortfalls of output and higher unemployment, as shown in table 2. Because output remains below its potential, the base stabilizer has no effect on inflation.

The implications of the alternative assumption of larger multipliers are essentially the mirror image. Assuming larger multipliers does not change the interpretation of the realized economic outcomes very much. Instead, the principal effect of assuming larger

multipliers is that the additional automatic stabilizer boosts output more per dollar of stimulus. Payments from the base stabilizer are somewhat smaller because the unemployment rate is lower, but not by enough to offset the impact of the larger multipliers. All told, the base stabilizer produces smaller shortfalls of output and lower unemployment, as shown in table 2. Because output remains below its potential, the base stabilizer has no effect on inflation.

The alternative assumption of a flatter aggregate supply curve has no effect on our results for the Great Recession and its aftermath. Output remains below its potential under both the enacted fiscal policies and our hypothesized additional automatic stabilizer, so the slope of the supply curve when output exceeds its potential is not relevant.

Conclusion

During and after the past two recessions, monetary and fiscal policymakers implemented strong countercyclical policies. Those policies succeeded in helping to restore growth in output and employment and to buffer households to some extent from the human costs of downturns. However, many observers argue in retrospect—and some argued as events unfolded—that different timing and amounts of countercyclical support for economic activity could have resulted in even better outcomes. In particular, the persistence of elevated unemployment following the Great Recession and the surge in inflation following the COVID recession have drawn critical scrutiny.

Our main results lend support to the view that substituting an additional automatic fiscal stabilizer for the discretionary fiscal actions that were enacted in response to the last two recessions could have improved outcomes. Analysis based on the key economic relationships most consistent with the empirical literature finds that this substitution could have lowered unemployment more quickly in the early 2010s, minimized the runup in inflation in the early 2020s, and increased federal government debt by less than actually occurred. Our precise results should not be taken too literally given the large number of assumptions embedded in the calculations, but they are suggestive.

We conclude with several cautions. Most importantly, some alternative calibrations of the key economic relationships, particularly those related to the slope of the aggregate supply curve when resource utilization is high, yield different conclusions. In addition, an additional automatic stabilizer aimed generally at supporting demand and improving household economic conditions would not have addressed the specific problems associated with mortgage markets during the global financial crisis and with public health during COVID. Nor would an additional automatic stabilizer based on labor market

conditions observed with a lag have responded as quickly to the emergence of COVID as discretionary policy did.

References

Auerbach, Alan J., and William G. Gale. 2009. "Activist Fiscal Policy to Stabilize Economic Activity." In *Financial Stability and Macroeconomic Policy*. Federal Reserve Bank of Kansas City.

Auerbach, Alan, Yuriy Gorodnichenko, Peter B. McCrory, and Daniel Murphy. 2022. "Fiscal Multipliers in the COVID19 Recession." *Journal of International Money and Finance* 126 (September).

Ball, Laurence, Daniel Leigh, and Prakash Loungani. 2017. "Okun's Law: Fit at 50?" *Journal of Money, Credit and Banking*, vol. 49 no. 7: 1413-1441.

Ball, Laurence M., Daniel Leigh, and Prachi Mishra. 2025. "The Rise and Retreat of US Inflation: An Update." National Bureau of Economic Research Working Paper 33806. May.

Benigno, Pierpaolo, and Gauti Eggertsson. 2023. "It's Baaack: The Surge in Inflation in the 2020s and the Return of the Non-Linear Phillips Curve." National Bureau of Economic Research Working Paper 31197. April.

Benigno, Pierpaolo, and Gauti B. Eggertsson. 2024. "Revisiting the Phillips and Beveridge Curves: Insights from the 2020s Inflation Surge." National Bureau of Economic Research Working Paper 33095. October.

Blanchard, Olivier. 2025. "Fiscal Policy as a Stabilization Tool." Peterson Institute for International Economics Working Paper 25-6. April.

Bolhuis, Marijn A., Judd N. L. Cramer, and Lawrence H. Summers. 2025. "The Post-Pandemic Inflation Was Demand-Driven." Mimeo. March.

Boushey, Heather, Ryan Nunn, and Jay Shambaugh, editors. 2019. *Recession Ready: Fiscal Policies to Stabilize the American Economy*. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Chodorow-Reich, Gabriel, and John Coglianese. 2019. "Unemployment Insurance and Macroeconomic Stabilization." In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Chodorow-Reich, Gabriel, Ben Iverson, and Adi Sunderam. 2022. "Lessons Learned from Support to Business during COVID-19." In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Congressional Budget Office. 2008. *Cost Estimate for H.R. 5140, Economic Stimulus Act of 2008*. February.
Congressional Budget Office. 2009. *The Budget and Economic Outlook: An Update*. September.
Congressional Budget Office. 2010. *Policies for Increasing Economic Growth and Employment in 2010 and 2011*. January.
Congressional Budget Office. 2011. *The Budget and Economic Outlook: Fiscal Years 2011 to 2021*. January.
Congressional Budget Office. 2012a. *Budgetary Effects of the Conference Agreement for H.R. 3630*. February.
Congressional Budget Office. 2012b. *Economic Effects of Policies Contributing to Fiscal Tightening in 2013*. November.
Congressional Budget Office. 2013. *The Budget and Economic Outlook: Fiscal Years 2013 to 2023*. February.
Congressional Budget Office. 2015. *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output in 2014*. February.
Congressional Budget Office. 2020. *The Effects of Pandemic-Related Legislation on Output*. September.
Congressional Budget Office. 2021a. *Additional Information About the Economic Outlook: 2021 to 2031*. February.
Congressional Budget Office. 2021b. *Additional Information About the Updated Budget and Economic Outlook: 2021 to 2031*. July.
Congressional Budget Office. 2024a. *Effects of Automatic Stabilizers on the Federal Budget: 2024 to 2034*. November.
Congressional Budget Office. 2024b. *Options for Reducing the Deficit: 2025 to 2034*. December.
Couch, Kenneth A., and Dana W. Placzek. 2010. Earnings Losses of Displaced Workers Revisited. *American Economic Review*, vol. 100 no. 1: 572–89.
Council of Economic Advisers. 2014. *2014 Economic Report of the President*. Washington: US Government Printing Office.
Demirel, U. Devrim and Matthew Wilson. 2023. "Effects of Fiscal Policy on Inflation: Implications of Supply Disruptions and Economic Slack." Congressional Budget Office Working Paper 2023-05. April.
Dutta-Gupta, Indivar. 2019. "Improving TANF's Countercyclicality through Increased Basic Assistance and Subsidized Jobs." In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.
Dynan, Karen, and Douglas Elmendorf. 2001. "Do Provisional Estimates of Output Miss Economic Turning Points?" Federal Reserve Board FEDS Paper 2001-52, November.

Dynan, Karen, and Douglas Elmendorf. 2020. “National Fiscal Policies to Fight Recessions in US States.” *AEA Papers and Proceedings*, vol 110 (May): 131–36.

Dynan, Karen, and Douglas Elmendorf. 2024. “Fiscal Policy and the Pandemic-Era Surge in US Inflation.” Peterson Institute for International Economics Working Paper 24-22. December.

Dynan, Karen and Douglas Elmendorf. 2025a. “Changes in Racial Gaps in Retirement Security over Time.” In *Reducing Retirement Inequality: Building Wealth and Old-Age Resilience*, ed. Olivia S. Mitchell and Nikolai Roussanov. Oxford: Oxford University Press.

Dynan, Karen, and Douglas Elmendorf. 2025b. “Putting US Fiscal Policy on a Sustainable Path.” National Bureau of Economic Research Working Paper 33751. May.

Edelberg, Wendy, Jason Furman, and Timothy F. Geithner. 2022. “Lessons Learned from the Breadth of Economic Policies during the Pandemic.” In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Elmendorf, Douglas and Jason Furman. 2008. “If, When, How: A Primer on Fiscal Stimulus.” *Tax Notes*, January 28.

Federal Reserve Bank of San Francisco. 2025. “Supply- and Demand-Driven PCE Inflation.” Website.

Feldstein, Martin. 2007. “How to Avert a Recession.” *The Wall Street Journal*. December 5.

Fiedler, Matt, Jason Furman, and Wilson Powell III. 2019. “Increasing Federal Support for State Medicaid and CHIP Programs in Response to Economic Downturns.” In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Furceri, Davide, and João Tovar Jalles. 2019. “Fiscal Counter-Cyclicality and Productive Investment: Evidence from Advanced Economies.” *The B.E. Journal of Macroeconomics*, vol. 19 no. 1: 1-15.

Furlanetto, Francesco, and Antoine Lepetit. 2024. “The Slope of the Phillips Curve.” Federal Reserve Board Finance and Economics Discussion Series 2024-043. June.

Furman, Jason. 2023. “Comments on Ben Bernanke and Olivier Blanchard’s ‘What Caused the US Pandemic-Era Inflation?’.” Brookings Institution. May.

Gagnon, Joseph E., and Madi Sarsenbayev. 2022. “25 Years of Excess Unemployment in the Advanced Economies: Lessons for Monetary Policy.” Peterson Institute for International Economics Working Paper 2022-17. October.

Gagnon, Joseph, and Christopher Collins. 2019. “Low Inflation Bends the Phillips Curve.” Peterson Institute for International Economics Working Paper 2019-6. April.

Ganong, Peter, Pascal J. Noel, and Joseph S. Vavra. 2020. “US Unemployment Insurance Replacement Rates During the Pandemic.” National Bureau of Economic Research Working Paper 27216. May.

Ganong, Peter, Fiona Grieg, Pascal Noel, Daniel M. Sullivan, and Joseph Vavra. 2022. "Lessons Learned from Expanded Unemployment Insurance during COVID-19." In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Gelman, Michael and Melvin Stephens Jr. 2022. "Lessons Learned from Economic Impact Payments during COVID-19." In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Gerardi, Kristopher, Lauren Lambie-Hanson, and Paul Willen. 2022. "Lessons Learned from Mortgage-Borrower Policies and Outcomes." In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Goodman, Laurie S. and Susan Wachter. 2022. "Lessons Learned from Rental Policies and Outcomes." In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Government Accountability Office. 2025. *Economic Downturns: Considerations for an Effective Automatic Fiscal Response*. July.

Harding, Martín, Jesper Lindé, and Mathias Trabandt. 2023. "Understanding Post-COVID Inflation Dynamics." International Monetary Fund Working Paper 22-10. January.

Haughwout, Andrew. 2019. "Infrastructure Investment as an Automatic Stabilizer." In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Hazell, Jonathon, Juan Herreño, Emi Nakamura, and Jón Steinsson. 2022. "The Slope of the Phillips Curve: Evidence from US States." *The Quarterly Journal of Economics*, vol. 137 no. 3: 1299-1344.

Holzer, Harry J., R. Glenn Hubbard, and Michael R. Strain. 2024. "Did Pandemic Unemployment Benefits Increase Unemployment? Evidence from Early State-Level Expirations." *Economic Inquiry*, vol. 62 no. 1: 24-38.

Hong, Gee Hee, and Deborah Lucas. 2023. "COVID-19 Credit Policies around the World: Size, Scope, Costs, and Consequences." *Brookings Papers on Economic Activity 2023*, no. 1 (September): 289-345.

Hoynes, Hilary, Douglas L. Miller, and Jessamyn Schaller. 2012. "Who Suffers during Recessions?" *Journal of Economic Perspectives*, vol. 26 no. 3: 27–48.

Hoynes, Hilary, and Diane Whitmore Schanzenbach. 2019. "Strengthening SNAP as an Automatic Stabilizer." In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Mankiw, N. Gregory. 2019. *Macroeconomics*. Tenth edition. New York: Worth Publishers / Macmillan Learning.

Orchard, Jacob, Valerie A. Ramey, and Johannes F. Wieland. 2025. "Using Macro Counterfactuals to Assess Plausibility: An Illustration Using the 2001 Rebate MPC." *The Economic Journal*.

Ramey, Valerie A. 2019. "Ten Years After the Financial Crisis: What Have We Learned from the Renaissance in Fiscal Research?" *Journal of Economic Perspectives*, vol. 33 no. 2: 89-114.

Ramey, Valerie A. 2025. "Do Temporary Cash Transfers Stimulate the Macroeconomy? Evidence from Four Case Studies." National Bureau of Economic Research Working Paper 33503. April.

Romer, Christina D., and David H. Romer. 2022. "A Social Insurance Perspective on Pandemic Fiscal Policy: Implications for Unemployment Insurance and Hazard Pay." *Journal of Economic Perspectives*, vol. 36 no. 2: 3–28.

Sahm, Claudia. 2019. "Direct Stimulus Payments to Individuals." In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Seliski, John, Aaron Betz, Yiqun Gloria Chen, U. Devrim Demirel, Junghoon Lee, and Jaeger Nelson. 2020. "Key Methods That CBO Used to Estimate the Effects of Pandemic-Related Legislation on Output." Congressional Budget Office Working Paper 2020-07. October.

Sheiner, Louise. 2022. "Lessons Learned from Support for the State and Local Sector during COVID-19." In *Recession Remedies: Lessons Learned from the US Economic Policy Response to COVID-19*, ed. Wendy Edelberg, Louise Sheiner, and David Wessel. Washington: Brookings Institution.

Sheiner, Louise, and Michael Ng. 2019. "How Stabilizing Has Fiscal Policy Been?" In *Recession Ready: Fiscal Policies to Stabilize the American Economy*, ed. Heather Boushey, Ryan Nunn, and Jay Shambaugh. Washington: The Hamilton Project and the Washington Center for Equitable Growth.

Smith, Simon, Allan Timmermann, and Jonathan H. Wright. 2023. "Breaks in the Phillips Curve: Evidence from Panel Data." National Bureau of Economic Research Working Paper 31153. April.

Stantcheva, Stefanie. 2024. "Why Do We Dislike Inflation?" *Brookings Papers on Economic Activity*. Washington: Brookings Institution.

Steinberg, David, Daniel McDowell, and Erdem Aytac. 2024. "The Impact of Inflation on Support for Kamala Harris in the 2024 Presidential Election." November.

Swagel, Phillip L. 2021. *CBO's Budget and Economic Analysis During the Pandemic," Presentation at Brown University*. Congressional Budget Office. October.

Yagan, Danny. 2019. "Employment Hysteresis from the Great Recession." *Journal of Political Economy* 127, no. 5: 2505-2558.

Appendix

This appendix presents details on how we construct counterfactual economic outcomes presuming that the existing automatic stabilizers were in place but no discretionary fiscal actions were enacted. We begin with the Great Recession and then turn to the COVID recession.

The Great Recession and Its Aftermath

Choosing the discretionary fiscal actions to exclude in the counterfactual for the Great Recession is not entirely straightforward. The early 2010s saw considerable fiscal legislation that was less about the slow economic recovery than about longstanding issues in tax policy (in what ways might the tax cuts originally enacted in 2001 and 2003 and scheduled to expire in 2010 be extended?) and spending policy (what activities should the government do or not do?). Legislation that extended expiring policies put in place before the global financial crisis is not relevant for comparing discretionary versus automatic countercyclical policy, so we do not adjust for it. In addition, policymakers enacted multiple pieces of legislation to address the unusual problems that emerged in the financial system and mortgage markets. Automatic stabilizers cannot address sectoral issues of that sort effectively, so we do not adjust for that legislation either.

In the end, our counterfactual economic outcomes are constructed to eliminate the effects of the following discretionary countercyclical actions: the Economic Stimulus Act of 2008 (ESA); the American Recovery and Reinvestment Act (ARRA) enacted in 2009; the provisions of the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (often called "the 2010 tax act") that reduced payroll taxes temporarily, extended unemployment benefits, and accelerated businesses' depreciation allowances; and the provisions of the Middle Class Tax Relief and Job Creation Act of 2012 ("the 2012 tax act") that extended the payroll tax reduction and certain unemployment benefits.[6]

For those fiscal actions, we treat CBO's estimates of their effects on output as if they were estimates of their effects on aggregate demand. That approach is appropriate because output was below its potential when those actions affected the economy, and therefore

[6] The Council of Economic Advisers (2014, page 101) listed other laws enacted between 2009 and 2012 that provided small amounts of fiscal support for the economy. Our analysis does not adjust for that legislation.

increases in inflation were unlikely—which means that changes in output would have roughly equaled shifts in aggregate demand.

Specifically, we use: the quarterly figures published by CBO (2009, page 38) for the ESA, extrapolated by us to the subsequent year; the quarterly figures published by CBO (2015) for ARRA; a quarterly interpolation of the annual figure published by CBO (2012b, page 3) for the effects of the payroll tax reduction and extended unemployment benefits in the 2010 tax act; the multiplier published by CBO (2010) applied to the budget figures in CBO (2011, page 9) for accelerated depreciation in the 2010 tax act; and the multiplier published by CBO (2012b, page 8) applied to the budget figures in CBO (2012a) for the relevant provisions of the 2012 tax act.

Given those estimated shifts in aggregate demand and our assumed frameworks for aggregate supply and demand and for Okun's law, constructing the effects of those fiscal actions on the economy is straightforward: The effects on output are equal to the effects on aggregate demand, the effects on inflation are zero, and the effects on unemployment flow directly from the output effects. We subtract those estimated effects from the realized outcomes for those variables to obtain counterfactual economic outcomes.

The COVID Recession and Its Aftermath

For the COVID recession, our counterfactual economic outcomes are constructed to eliminate the effects of the following discretionary countercyclical actions: the four pieces of legislation to address the pandemic in March and April of 2020; the provisions of the appropriations act in December 2020 that were generally viewed as responding to the pandemic; and the American Rescue Plan (ARP) act in March 2021. We do not adjust for other fiscal legislation enacted in 2021 and 2022 (in particular, the Infrastructure Investment and Jobs Act and the CHIPS Act) because those laws were not intended as countercyclical policies but rather focused on long-term issues and had limited short-term macroeconomic effects.

For the fiscal actions in 2020, we again treat CBO's estimates of their effects on output as if they were estimates of their effects on aggregate demand because output was again below its potential when those actions affected the economy. Thus, we use: the quarterly figures published by CBO (2020) for the Coronavirus Aid, Relief, and Economic Security Act (CARES) and other legislation enacted in the spring of 2020; and our quarterly interpolation of the annual figures published by CBO (2021a) for the pandemic-related provisions of the appropriations bill in December 2020.

Given those estimated shifts in aggregate demand and our assumed frameworks for aggregate supply and demand and for Okun's law, constructing the effects of those fiscal actions on the economy is just as described above: The effects on output are equal to the effects on aggregate demand, the effects on inflation are zero, and the effects on unemployment flow directly from the output effects. We subtract those estimated effects from the realized outcomes for those variables to obtain counterfactual economic outcomes.

For the ARP, we adopt a slightly different approach because CBO expected that legislation to push output above its potential and to increase inflation by 0.2 percentage point in 2021 and 2022 and 0.1 percentage point in 2023. When an increase in aggregate demand hits an upward-sloping part of the aggregate supply curve, inflation rises, and inflation-adjusted output increases less than the increase in demand. Given our assumption that the aggregate demand curve has a slope of -1, it is natural to presume that CBO's implicit estimates of the ARP's effects on demand exceeded its estimates of the effects on output by the estimated increases in inflation. Therefore, we obtain estimates of the ARP's effect on demand by adjusting our quarterly interpolation of CBO's (2021b) annual output figures by corresponding amounts.

Constructing the effects of the ARP on the economy also is more complicated because of the closeness of output to its potential and the upward-sloping aggregate supply curve. We simulate the effects of the ARP's increase in demand on output and inflation using our framework and starting from CBO's projection published in February 2021 just before enactment of the ARP; the effects on unemployment flow directly from the output effects. We finish as before by subtracting the estimated effects from the realized outcomes to obtain counterfactual outcomes.