CHAPTER 2

COUNTERING FUTURE RECESSIONS IN ADVANCED ECONOMIES: CYCLICAL POLICIES IN AN ERA OF LOW RATES AND HIGH DEBT

More than a decade after the global financial crisis, the world is struggling with the health and economic effects of a profound new crisis caused by the COVID-19 pandemic. Advanced economies entered this crisis with interest rates at historical lows and public debts, on average, higher than they had been over the past 60 years. They will come out from the crisis with even higher public debts. Drawing on analysis completed before the emergence of the pandemic, this chapter examines policymakers' options to respond to adverse shocks and build resilience when rates are low and debts high. Even when rates are low, central banks still have wide scope to use unconventional monetary policy tools to support the economy, although questions remain about side effects on future financial stability and threats to central bank independence with their use. When monetary policy is constrained, countercyclical fiscal policy needs to play a larger role. The analysis shows that, prior to the current crisis and over the past few years, declining interest rates relative to growth modestly reduced the average rise in debt ratios in advanced economies compared with earlier projections. Evidence suggests that fiscal stimulus using public spending is particularly potent when there is economic slack—as would be the case after the pandemic recedes—and rates are low while monetary policy is accommodative. Analysis shows that newly proposed measures for rules-based fiscal stimulus—stimulus automatically triggered by deteriorating macroeconomic indicators—can be highly effective in countering a downturn in such an environment. To ensure a prompt and effective response to adverse shocks in such conditions, policymakers should consider increasing the sensitivity of traditional automatic stabilizers and adopting rules-based fiscal stimulus measures.

Introduction

In responding to the COVID-19 pandemic, policymakers in advanced economies have initiated extraordinary discretionary fiscal and monetary policy support measures, in many cases larger than those undertaken in reaction to the global financial crisis in 2008 (see Chapter 1 of the April 2020 *World Economic Outlook*: *The Great Lockdown* (WEO)). As the pandemic is still unfolding and uncertainties about its path are high, even larger measures may be forthcoming over the next months.

In 2008 at the onset of the global financial crisis, advanced economy central banks reduced policy rates by an average 3 percentage points, somewhat greater than the cuts made during earlier recessions (Figure 2.1). The average government at that time provided expansionary fiscal stimulus, with primary balances to GDP declining by about 4 percentage points, markedly more than during previous recessions.[1] In parallel, central banks deployed more unconventional monetary policy tools, including forward guidance (public communication by the central bank about the likely future path of monetary policy and its objectives and intentions), large-scale financial asset purchases (quantitative and credit easing), and negative interest rates. These monetary and fiscal efforts are widely acknowledged to have averted a deeper slump.[2]

More than 10 years after the global financial crisis, advanced economies are in a new economic crisis caused by the pandemic, with policy rates considerably lower and public debt levels higher than they have been over the previous 60 years (Figure 2.2, panels 1 and 2). Given the historical size of monetary and fiscal policy actions after a recession starts and prevailing low rates and high debts, some observers have raised questions about monetary and fiscal policymakers' scope to stimulate their economies in the event of further adverse shocks.[3]

Against this backdrop, this chapter examines measures that policymakers can deploy to build resilience

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[1]Unlike the change in short-term policy rates, the change in the ratio of the primary fiscal balance to GDP is a mix of deliberate policy responses (whether discretionary or automatic) and the GDP decline from the recession. Alternative indicators that attempt to isolate the fiscal policy response are available, but do not cover as wide a sample of countries nor go back as far in time.

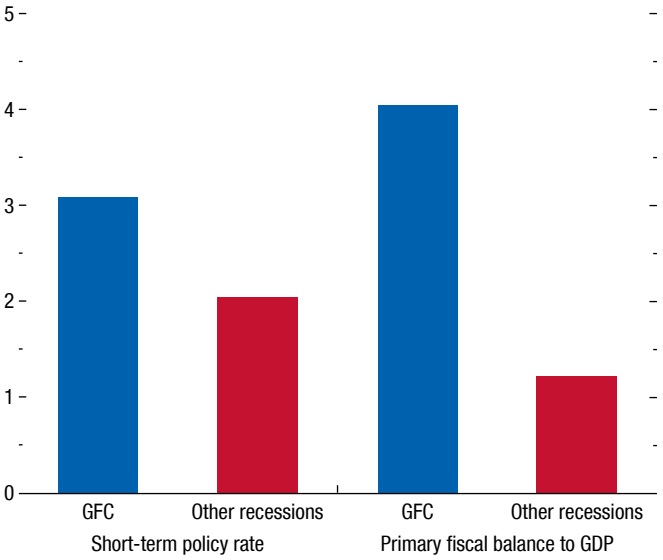
[2]See Chapter 2 of the October 2018 WEO.

[3]See Carney (2020), Summers (2020), and Yellen (2020), among others.

Figure 2.1. Monetary and Fiscal Responses to Crises and Recessions in Advanced Economies since 1960

(Percentage point decline in indicated policy variable)

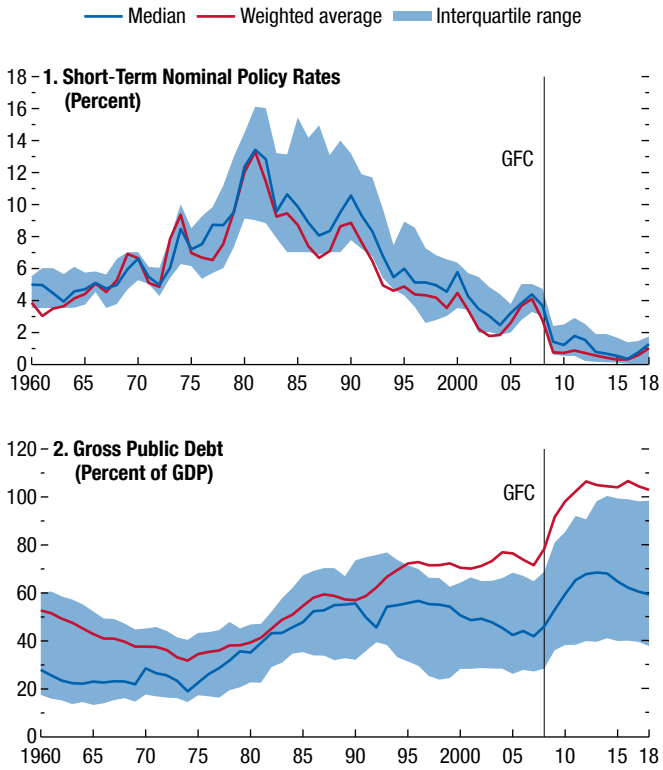
In response to the global financial crisis, central banks reduced policy rates by about one-third more, and the primary fiscal balance declined by about three times more than during other recessions.



Sources: Bank for International Settlements; Haver Analytics; IMF, *International Financial Statistics*; Mauro and others (2015); national sources; World Bank; and IMF staff calculations.
Note: The change in the indicated policy variable is dated to the year before a recession starts to the year after it ends. Recessions are defined to be years of negative output growth. All estimates are statistically significantly different from zero, and estimates for the GFC and other recessions are statistically significantly different from each other at the 10 percent level. GFC = global financial crisis associated recession (start in 2007–09).

Figure 2.2. Policy Rates and Public Debt in Advanced Economies

Reflecting long-term trends and the aftermath of the global financial crisis, the average advanced economy policy rate is near its lowest level since 1960 while average public debt to GDP is near its historical highs.



Sources: Bank for International Settlements; Haver Analytics; IMF Historical Public Debt Database; IMF, *International Financial Statistics*; Mauro and others (2015); national sources; and IMF staff calculations.
Note: The sample includes 35 advanced economies. For panel 1, when a country joins the euro area, it drops out. The euro area policy rate (set by the European Central Bank) enters in 1999, replacing the policy rates for euro area member states as they join. The weighted average uses nominal US dollar GDP weights. Time coverage across countries is unbalanced. GFC = global financial crisis (2008).

to shocks and counter future recessions in an era of low rates and high public debt. Drawing upon the literature and new analysis, it addresses the following questions:

- *Monetary policy*: Given low rates in many advanced economies, how can monetary policy best respond to adverse shocks?
- *Fiscal policy*: In view of historically high levels of debt in many advanced economies, to what extent have interest rate declines in recent years affected governments' capacities to borrow and provide fiscal support—their fiscal space as captured by public debt to GDP? Which fiscal stimulus measures appear to be most effective and how does their effectiveness differ with the degrees of economic slack and monetary accommodation? Could enhancements to existing automatic stabilizers and the adoption of rules-based fiscal stimulus—automatic fiscal stimulus triggered by the deterioration of macroeconomic indicators—help dampen economic fluctuations?

The main findings of the chapter are:

- Although the decline in rates in many economies has limited the scope for conventional interest rate cuts to counter a recession, further monetary accommodation is eminently possible using unconventional tools. However, relying on monetary policy alone for additional countercyclical actions

in this environment carries risks, with concerns about possible future side effects on financial stability and potential threats to central bank independence. Monetary policy can support fiscal stimulus in a recession by maintaining an accommodative stance.

- Earlier unanticipated declines in interest rates relative to growth have modestly reduced the rise in the public debt-to-GDP ratio compared to what was expected in many economies. These unexpected changes in interest rate–growth differentials have played a role roughly equal to unexpected developments in primary fiscal balances in explaining unexpected changes in debt. Low interest rate–growth differentials are likely to persist on average, but there are still risks that the interest rate–growth differential can change quickly for a given country, worsening their debt dynamics.
- The evidence suggests that public spending (investment and consumption) is the most potent fiscal instrument, generating large output effects with multipliers greater than one. Fiscal stimulus is especially powerful when the economy has slack and monetary policy is accommodative—circumstances that characterize a demand-driven downturn and will likely be relevant after the pandemic recedes. Discretionary fiscal measures have helped counter shocks in the past, but often come with a delay.
- Analysis shows that newly proposed rules-based fiscal stimulus measures—stimulus automatically triggered by deteriorations in macroeconomic indicators—could be highly effective in countering a downturn when interest rates are at their effective lower bound and discretionary fiscal policy lags are long. Such measures implement a fiscal stimulus according to a predetermined rule in response to a downturn, as captured by the behavior of a macroeconomic outcome variable, such as the unemployment rate rising. Compared to a scenario without rules-based fiscal stimulus, the adverse output and debt-to-GDP effects are smaller. Model simulations suggest that the stabilization achieved by adopting rules-based fiscal stimulus comes close to that when monetary policy actions are unconstrained.

Taken together, the findings suggest that, to ensure a prompt and adequate response to future adverse shocks—in particular, typical aggregate demand shocks—and improve the economy's resilience, policymakers should enhance fiscal policy's automaticity.[4] Designing and adopting new fiscal tools—like rules-based fiscal stimulus measures—and improving existing automatic stabilizers may take time and will require political agreement. In the context of the current crisis, putting them in place now could help insure against future shocks derailing or slowing the eventual recovery. Establishing sufficient automatic stabilizers and rules-based fiscal stimulus in advance of adverse future shocks will reduce the risks that contemporaneous political hurdles and implementation lags inhibit timely and effective fiscal stimulus.

There are some important caveats to this advice that argue for caution in extrapolating too broadly. The model simulations are constructed around historical aggregate demand shocks, which are different from the current pandemic shock in many ways. The economic shock from the pandemic is unprecedented in modern times, both in its magnitude and its nature (see Chapter 1 of the April 2020 WEO for a detailed discussion on the unique economic characteristics of the pandemic shock). The model does not incorporate possible sovereign risk feedbacks. It assumes that the economy is on sound fiscal footing, without any risk to the government's ability to borrow in financial markets. The analysis of how declines in the interest rate–growth differential impact fiscal constraints is conservative, only taking account of its consequences for borrowing costs relative to GDP, conditional on keeping the ratio of debt to GDP stable over the near term. It does not attempt to assess the implications of negative and persistent interest rate–growth differentials for long-term debt sustainability, which could suggest even greater scope for borrowing.[5] But countries that are facing high risks of a fiscal crisis may well encounter additional constraints on their actions.[6]

[4]See Chapter 2 of the April 2020 *Fiscal Monitor* for a broader discussion of how economies can better prepare for future downturns by following an IDEAS strategy: (1) establishing a pipeline of appraised investment projects, (2) formulating in advance discretionary measures to deploy quickly, and (3) enhancing traditional automatic stabilizers.

[5]See Barrett (2018), Blanchard (2019), Eichenbaum (2019), and Garín and others (2019), among others, for a recent discussion.

[6]See Bianchi, Ottonello, and Presno (2019); Mauro and Zhou (2020); and Moreno Badia and others (2020) for a discussion and cases where risks of a turn in market sentiment against a sovereign can limit their actions.

The chapter begins with a summary and discussion of the existing literature on monetary policy options when interest rates are close to the effective lower bound, noting their effectiveness but also some of their potential side effects and risks. The next section turns to fiscal policy, examining the potential implications of the evolution of $r - g$ these past few years for countries' fiscal borrowing constraints. Then, the chapter looks at the evidence on the potency of fiscal stimulus, examining how it varies by instrument, economic slack, and monetary policy's reaction. The penultimate section presents the findings from a model-based analysis of newly proposed rules-based fiscal stimulus to offset adverse shocks and stabilize the economy. The chapter concludes with a summary of the main takeaways and policy implications.

Monetary Policy Options When Interest Rates Are Low

As shown in Figure 2.2, panel 1, apart from a few episodes, interest rates in advanced economies have been heading downward for many years, with this trend accelerating after the global financial crisis. This pattern accords with views that the natural rate of interest (the interest rate consistent with stable inflation and full employment) has declined.[7] Varying perspectives on the underpinnings of this decline exist, ranging from structural deficiencies in aggregate demand (secular stagnation) to more supply-side factors, such as slowing long-term productivity growth or the long-lived effects of debt overhang following a deep recession.[8] More recently, in response to the pandemic, central banks in advanced economies have cut interest rates even further.[9] Low rates, and the associated limits on monetary easing through conventional interest cuts, may be a fact of life for the foreseeable future. Responding to these constraints, monetary policymakers in advanced economies have turned to "new" or unconventional monetary policy tools to achieve further easing, using forward guidance, large-scale asset purchase programs, and negative interest rates on bank reserves.[10]

During and after the global financial crisis, forward guidance reinforced central banks' accommodative stances by shaping expectations about interest rates and other monetary policy measures.[11] This departed from central banks' past communication styles by directly signaling their willingness to pursue extraordinary policy actions or to keep interest rates at a specific level for an extended period of time. The success of this strategy depends on the market's perceptions of the central bank's credibility in following through on their announcements. On one hand, central banks can choose to be more general in their communication, without making explicit commitments about specific policy actions. On the other hand, they can choose to be explicit with data or state-contingent commitments to maintain an announced policy path. There are trade-offs between these styles. The first allows policymakers room to maneuver if there are surprises, but at the risk that the market does not firmly believe their commitment. The second can influence market expectations substantially and reduce uncertainty, but at the cost of diminished flexibility to surprises. Forward guidance will continue to grapple with these trade-offs. Several studies find forward guidance to be effective in reducing borrowing costs and stimulating loan growth when rates are low, although the range of effect estimates is wide.[12]

With large-scale asset purchases, the central bank can still provide monetary stimulus by supporting long-term bond prices and lowering long-term yields, even if the short-term policy rate is near or at zero.[13]

[7]See Laubach and Williams (2003); Chapter 3 of the April 2014 WEO; Furman (2016); Holston, Laubach, and Williams (2017); Yellen (2018); and Rachel and Summers (2019); among others, for discussion and evidence on how the natural rate of interest in many economies has drifted down.

[8]See Summers (2013), Teulings and Baldwin (2014), and Rogoff (2015).

[9]Jordà, Singh, and Taylor (2020) documents that pandemics can depress the natural rate of interest for many decades after the pandemic has passed.

[10]Bernanke (2020) refers to unconventional monetary policy tools simply as "new," given that there is sufficient experience for them to be considered an ordinary part of the central bank toolkit. This section draws exclusively on the large existing literature on unconventional monetary policy and its effectiveness. Recent overviews include Bayoumi and others (2014); Borio and Zabai (2016); Dell'Ariccia, Rabanal, and Sandri (2018); BIS (2019a; 2019b); and Sims and Xu (2019).

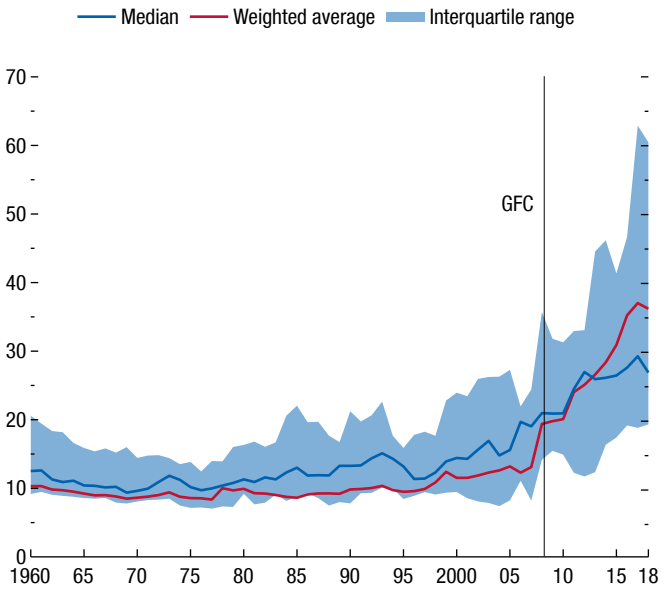
[11]See Moessner, Jansen, and de Haan (2017) for a review of the theory and practice of forward guidance.

[12]See He (2010), Campbell and others (2012), Kool and Thornton (2012), Woodford (2013), Filardo and Hofmann (2014), Charbonneau and Rennison (2015), Coenen and others (2017), Andrade and Ferroni (2018), Swanson (2018), and Moessner and Rungcharoenkitkul (2019), among others. It is important to highlight that it is inherently difficult to identify the exact impact of forward guidance due to its typically joint implementation with other unconventional monetary policy measures.

[13]See Borio and Zabai (2016) and BIS (2019a, 2019b) for more detailed descriptions on the implementation of large-scale asset purchases. See Gambacorta, Hofmann, and Peersman (2014) for empirical evidence on the effectiveness of quantitative easing.

Figure 2.3. Central Bank Balance Sheets
(Percent of GDP)

The size of central bank balance sheets increased significantly since the global financial crisis with the implementation of large-scale asset purchase programs.



Sources: European Central Bank; Ferguson, Schaab, and Schularick (2015); Haver Analytics; and IMF staff calculations.
Note: The central bank balance sheet is central bank total assets as a share of nominal GDP. After a country joins the euro area, it no longer enters separately from the euro area as a whole, reflecting the euro area's unified monetary policy from 1999 onwards. The euro area central bank balance sheet to GDP is Eurosystem total assets to total euro area GDP. The weighted average uses nominal US dollar GDP weights. Time coverage across countries is unbalanced. GFC = global financial crisis (2008).

Asset purchases were used extensively by advanced economies during and after the global financial crisis, leading to a marked increase in the size of central bank balance sheets over recent years (Figure 2.3). In the current pandemic, central banks in several advanced economies have launched new large-scale asset purchase programs. The Federal Reserve is buying US Treasury debt and mortgage-backed securities as needed to ensure smooth market functioning. The European Central Bank commenced a new €750 billion temporary public and private securities purchase program. The literature suggests that similar measures eased financial conditions and helped boost output and inflation across many economies during and after the global financial crisis, although a fair amount of uncertainty around these estimates remains. Model-based evidence using counterfactual simulations on the US economy shows that large-scale asset purchases alleviated the fall in annualized real GDP growth by almost 6 percentage points in the first quarter of 2009. Estimates for the United Kingdom point to a similar picture over the same period, with annualized output growth being higher by about 5 percentage points due to the Bank of England's gilt purchases on long-term yield spreads.[14] The purchase of large quantities of government bonds may also play a signaling role, convincing markets that the central bank is committed to a loose policy stance.[15] Some economists have highlighted undesirable secondary consequences that could follow from further large-scale asset purchases, including greater central bank balance sheet asset quality risks and threats to central bank independence arising from perceptions that it constitutes monetary financing.[16]

Negative interest rate policies have hitherto taken the form of relatively small interest rate charges on commercial banks' reserve holdings at the central bank in a few advanced economies.[17] The overall assessment has been that they have reinforced central banks' accommodative stance in economies where they have been implemented without marked harmful effects (Box 2.1).[18] However, it is possible that pushing rates even more negative or keeping them negative for longer could have sufficiently detrimental effects on bank profitability and, in turn, lead to lower lending and tighter financial conditions.[19] Recent empirical literature studying the impacts on Europe and Japan generally finds that lending volumes have increased and lending rates have fallen, providing aggregate demand support, while banks have modified their behavior to reduce the impact of negative rates on their profitability.[20] For policymakers to pursue even lower

[14]See Baumeister and Benati (2013) and Borio and Zabai (2016) for an overview of empirical estimates on the impacts of large-scale asset purchases on output.

[15]See Bauer and Rudebusch (2014) and Coenen and others (2017) on the interaction between forward guidance and large-scale asset purchases.

[16]See Dudley (2013) and Orphanides (2018). In addition to asset quality concerns, risks could rise from stretched asset price valuations.

[17]At the time of publication, there have been no further rate cuts in advanced economies with negative interest rates nor adoption of negative rates by those economies that are not currently using them.

[18]Chapter 4 of the April 2020 *Global Financial Stability Report* (GFSR) analyzes the impact of the lower-for-longer environment on bank profitability, including through a forward-looking scenario analysis.

[19]See BIS (2019a); Brunnermeier and Koby (2019); Eggertsson, Juelsrud, and Wold (2019); and Box 2.1 for a discussion of this theoretical possibility.

[20]See Basten and Mariathasan (2018); Demiralp, Eisenschmidt, and Vlassopoulos (2019); Eisenschmidt and Smets (2019); and Lopez, Rose, and Spiegel (2020).

negative interest rates in the future, a variety of legal, regulatory, and tax law changes could be required.

Given that policy rates are already very low in many advanced economies and unlikely to return to their pre-global financial crisis levels for a prolonged period, policymakers will need to rely more than before on these new monetary policy tools to counter future downturns. While there is broad agreement that unconventional monetary policy tools were effective in helping to stimulate the economy during the Great Recession, there is debate over their efficacy going forward and possible side effects, including increased financial risk-taking in the future. Strengthening macroprudential policies and preemptively implementing them could help deal with any potential financial sector vulnerabilities.[21] Nonetheless, these new monetary policy tools are still useful in easing financial conditions in a downturn. But it is important to avoid overreliance on them and to ensure that fiscal policy plays an appropriate role in stabilizing the economy. Monetary policy can support fiscal stimulus in a recession by remaining accommodative and keeping interest rates low. The next section looks at the scope for fiscal policymakers to stimulate in the low rate environment.

Fiscal Space, Public Debt, and Low Interest Rates

When considering a more expansionary fiscal stance, a government has to evaluate the trade-offs between actions today versus possible needs for stimulus in the future, given its available and expected fiscal resources. This means that fiscal policymakers' actions in responding to an adverse shock will be partly a function of their ability to raise spending or lower taxes relative to a preexisting baseline without endangering market access and debt sustainability—their fiscal space.[22] Fiscal space depends on a multitude of factors, including a country's macroeconomic context (domestic and external conditions and structural gaps), market perceptions and sentiment, and the dynamics of the public debt-to-GDP ratio.[23]

Although there is no unique indicator or set of indicators that fully captures a country's fiscal space, the public debt-to-GDP ratio is a key observable related to a country's ability to borrow from the market and its capacity to act countercyclically in a downturn. The literature suggests that countries with higher ratios of public debt to GDP prior to a crisis or downturn tend to have less countercyclical fiscal policies and worse outcomes.[24] Romer and Romer (2019) finds that fiscal policymakers in advanced economies are more reluctant to stimulate after an adverse shock when initial public debt-to-GDP ratios are higher. This reflects concerns about potential rises in risk premiums (and hence borrowing costs) and loss of market access, as well as a more general reduced willingness to act on the part of policymakers. Moreover, other work also points to monetary policy accommodation being less effective when public debt to GDP is high.[25]

In view of historically high levels of debt in many advanced economies, to what extent have interest rate declines in recent years affected governments' capacities to borrow and provide fiscal support? While lower interest rates imply lower interest payments on new government debt, they are not enough on their own to justify higher borrowing. It is also important to simultaneously assess how a government's ability to raise revenue to service the debt is evolving, which will be a function of the economy's size. Both the interest rate on debt and nominal growth—in particular, their difference—matter for the dynamics of an economy's public debt-to-GDP ratio.[26]

As an illustration of these effects, the chapter examines how debt dynamics evolved compared with forecasts since late 2015 through 2018—a period

[21]See recent debates by Bernanke (2020), Rogoff (2020), and Summers (2020). See Chapter 1 of the October 2019 GFSR on how macroprudential policy can mitigate financial stability risks from rates being "low for long." For an emerging market perspective, see Chapter 3 of the April 2020 WEO on how macroprudential regulation can stabilize GDP growth in the face of adverse global financial shocks.

[22]See IMF (2016, 2018) for a definition of fiscal space and a discussion of the various aspects and considerations driving its assessment by country. The quantification of a country's fiscal space makes no judgment on whether or not it should be used or further built up in a given situation. See also Debrun and others (2019) for a discussion on how to think about the sustainability of a country's debt.

[23]For country-specific, multi-dimensional assessments of fiscal space, please refer to IMF Country Reports. It is important to note that fiscal space assessments do not generally take into account the possibility of official financing. Typically, official financing may be an option for countries unable to access market financing, when fiscal space (as described here) is exhausted. For such countries, access to official financing may be more important than fiscal space in driving their ability to provide fiscal support.

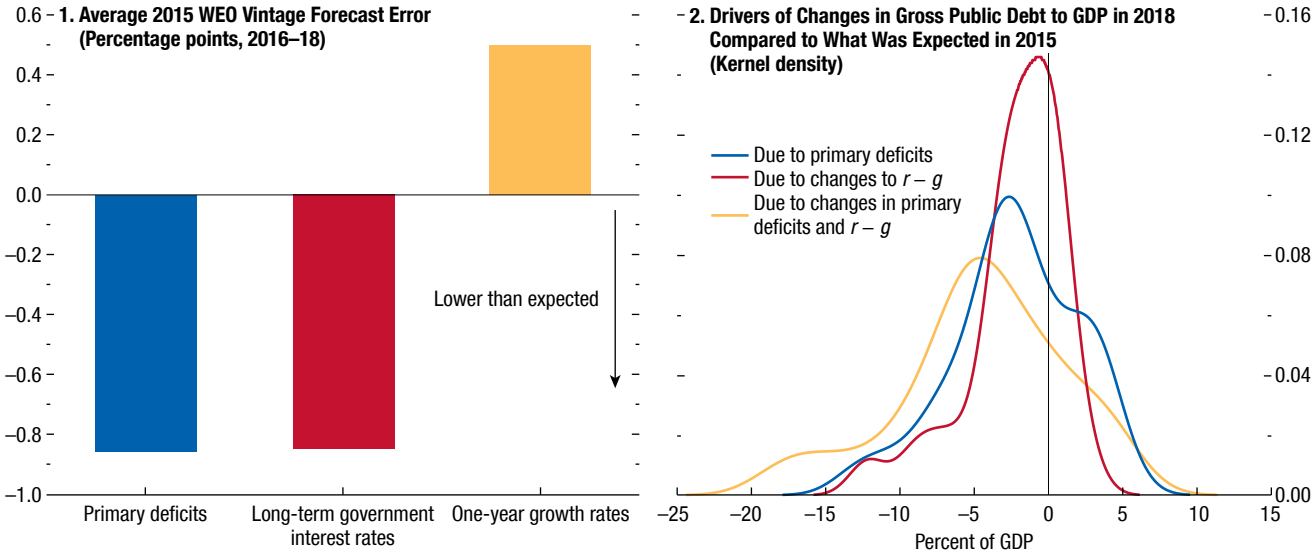
[24]See Jordà, Schularick, and Taylor (2016) and Romer and Romer (2018).

[25]See De Luigi and Huber (2018), which finds that expansionary monetary policy helps stabilize in a downturn, but less so when the economy is in a high public debt-to-GDP regime.

[26]See Online Annex 2.2 for the equation of motion describing the dynamics of the public debt-to-GDP ratio and its relationship to the paths of interest rates and nominal growth. All annexes are available at http://www.imf.org/en/Publications/WEO.

Figure 2.4. Sources of Unexpected Changes to Public Debt

Overall, lower $r - g$ has helped slow debt growth since 2016, but changes in primary deficits have played a larger role in debt dynamics.



Source: IMF staff estimates.
Note: The forecast error for each indicated variable in panel 1 is calculated as the average across the annual differences between actual outturn and forecast from the October 2015 WEO vintage over 2016–18. Panel 2 shows the density distributions of impacts on 2018 debt ratios (in percentage points) of changes to fiscal factors relative to their 2015 forecasts. The exercise takes as given that the expected medium-term ratio of public debt to GDP is stable. The October 2015 WEO projections are used as the starting point from which to take expectations, given that they incorporate the expected effects of the large-scale asset purchase programs undertaken prior to that date in advanced economies (including the European Central Bank's public sector purchase program). See BIS (2019a). The 2018 end point for the changes shown reflects the latest available final data across the sample. See Online Annex 2.2 for further details on data and the calculations.
$r - g$ = interest rate–growth differential; WEO = *World Economic Outlook*.

during which interest rates were on a declining path and growth recovering.[27] Interest rates and primary deficits were, on average, lower than expected since late 2015, while nominal growth was higher (Figure 2.4, panel 1).[28] Taken together, these unanticipated changes have pushed down the average debt-to-GDP ratio over 2016–18 below what was expected at the end of 2015, potentially increasing the amount of borrowing governments could undertake while keeping expected medium-term debt unchanged (Figure 2.4, panel 2).[29] Overall, a lower interest rate–growth differential helped slow debt growth since 2015, playing a roughly equal role in debt dynamics to changes in primary deficits.[30] The median unexpected decline in debt coming

[27]The October 2015 WEO projections are the starting point from which expectations are taken, given that they incorporate the expected effects of the large-scale asset purchase programs undertaken prior to that date in advanced economies (including the European Central Bank's public sector purchase program). See BIS (2019a) for details on the starting dates of the large-scale asset purchase programs across advanced economies in response to the global financial crisis. The 2018 end point for the changes shown reflects the latest available final data across the sample. See Online Annex 2.2 for discussion on the robustness of the findings to the starting date.

[28]The correlation between unexpected changes in the primary deficit-to-GDP ratio and the unexpected change in nominal growth is weakly negative but not statistically significant. The sign of the relationship is consistent with positive growth surprises lowering the primary deficit-to-GDP ratio, possibly through increased revenues.

[29]Alternative forecast vintages yield similar findings. See Online Annex 2.2 for further details. The exercise is similar in spirit to that in Deutsche Bundesbank (2017) for euro area economies.

[30]The share of explained deviations in unexpected debt changes from unexpected interest rate–growth differentials ($r - g$) changes is about 50 percent, based on the economic importance measures in Sterck (2019). In principle, the unexpected changes in debt due to $r - g$ and that due to the primary deficit-to-GDP ratio could be related. For example, a decline in $r - g$ arising from surprisingly higher growth may be associated with a decrease in the primary deficit-to-GDP ratio, reflecting improved tax revenue performance and a larger denominator. The accounting decomposition exhibited here does not attempt to attribute such comovements between $r - g$ and the primary deficit-to-GDP ratio to one or the other. However, analysis indicates that their correlation is essentially zero, suggesting that the rough shares provide a broadly accurate picture of the contributions of $r - g$ and the primary deficit-to-GDP ratio to unexpected debt changes. See Online Annex 2.2 for further details.

from lower interest rate–growth differentials is about 1 percent of GDP, while that from lower primary deficits is about 2 percent of GDP. However, for some countries (about one-third of advanced economies), debt outturns were worse than expected, with interest rate–growth differentials rising or primary deficits increasing more than anticipated.

An important caveat is that this backward-looking exercise focuses simply on the accounting contributions of unexpected falls in interest rate–growth differentials and the primary deficit to GDP since 2015 to the unexpected change in the debt-to-GDP ratio over the same period. Given that countries could choose to use the savings from unexpected and persistent falls in interest rate–growth differentials to undertake additional borrowing, some countries may have seen little reduction in their expected debt paths and little increase in their fiscal space.[31] Moreover, although the impact of small changes in the interest rate–growth differential may eventually be large, a meaningful impact may take a while to materialize, simply because countries often repay their debts over many years.

Even if lower interest rate–growth differentials do create additional borrowing capacity, countries with high debt levels may remain exposed to sharp increases in spreads, including during rollover crises.[32] For instance, sudden increases in risk premia—even if temporary—can cause public debt to GDP to grow sharply. This could include unanticipated negative events that prompt shifts in investor sentiment toward safe-haven assets—as has recently occurred with the pandemic—which can push up spreads unexpectedly for some countries. The exact implications of a lower interest rate–growth differential for a country's scope for fiscal stimulus depend on country-specific circumstances, but these estimates suggest that the decline in interest rates relative to nominal growth has improved the dynamics of public debt-to-GDP in the average advanced economy.

[31]Furthermore, as noted in footnote 28, this accounting decomposition neglects the possible comovement between unexpected changes in debt due to $r - g$ and to the primary deficit, which could either magnify or attenuate the unexpected decline in the debt-to-GDP ratio. See Garín and others (2019) for a model exhibiting such comovement and discussion of its possible consequences for debt dynamics.

[32]See Cole and Kehoe (2000) and Aguiar and others (2016) for more on the drivers of rollover crises and the potential for multiple equilibria. See also Mauro and Zhou (2020) for evidence suggesting an association between a high debt-to-GDP ratio and rollover crises, independent of initial interest rate–growth differentials.

The scope for fiscal support in future downturns depends on the persistence of interest rate–growth differentials, as countries' debts are repaid over many years. Growth and inflation surprises (highly likely with the pandemic shock across many countries) are associated with changes in the interest rate–growth differential, but are also transitory.[33] Other analysis suggests that the common component of the interest rate–growth differential across advanced economies is highly persistent, reinforcing the view that lower financing costs are likely to continue (Box 2.2). That said, it is important for fiscal policymakers to use wisely whatever fiscal space they have in responding to a recession, considering the instruments available and the context. This is the topic of the next section.

Fiscal Multipliers, by Instrument and Context

What is the best way for fiscal policymakers to deliver stimulus to lift aggregate demand—spending increases or tax cuts? How do fiscal policy's effects depend on the state of economy and the response of monetary policy? Fiscal multipliers—how much real output changes for an increase in fiscal stimulus—provide answers to these questions. Some theories of the business cycle and recent empirical research suggest that fiscal policy has larger effects during recessions and periods of economic slack.[34] Other studies point to powerful effects of fiscal stimulus when nominal interest rates are at the effective lower bound or monetary policy is accommodating.[35]

The size of multipliers varies by fiscal instrument—how stimulus is delivered. A meta-analysis of the vast literature on fiscal multipliers points to average estimates for public spending on goods and services (government purchases) of about 1, with that for public investment slightly higher than that for public consumption, although there is a large degree of variability (Figure 2.5). Multiplier estimates from taxes and transfers are about one-quarter that size, on average. Overall, the evidence suggests that public spending on goods and services is more effective.

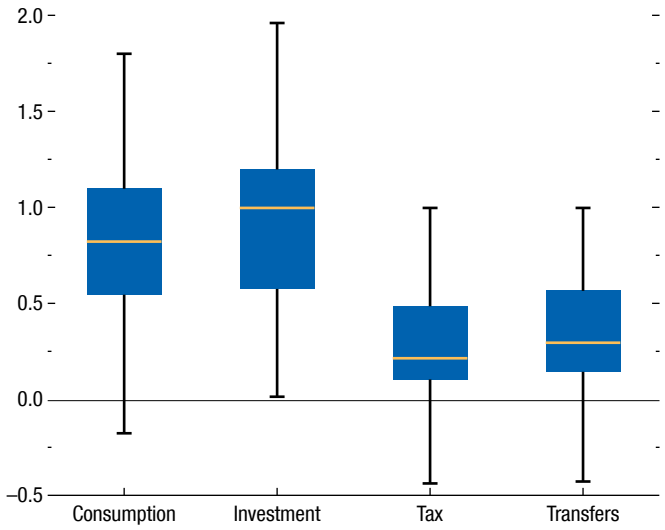
[33]See Online Annex 2.2.

[34]See Auerbach and Gorodnichenko (2012b); Baum, Poplawski-Ribeiro, and Weber (2012); DeLong and Summers (2012); Cottarelli, Gerson, and Senhadji (2014); Fazzari, Morley, and Panovska (2015); and Whalen and Reichling (2015).

[35]See Almunia and others (2010); Christiano, Eichenbaum, and Rebelo (2011); Blanchard and Leigh (2013); and Chodorow-Reich (2019).

Figure 2.5. Fiscal Multipliers: One-Year Horizon
(Units of real output)

Average fiscal multipliers for public spending from the literature are about 1, with that for public investment slightly higher than that for public consumption. Average multiplier estimates for taxes and transfers are about one-quarter that size.



Source: Gechert and Rannenberg (2018).
Note: The chart reports the median (gold line), the 25th and 75th percentiles (lower and upper boundaries of the blue box) and the extremes (lower and upper whiskers) of the distribution of fiscal multiplier estimates from the literature. The multiplier is defined to be the change in real output for a unit change in the indicated fiscal instrument.

Why might this be the case? Theoretically, multipliers would be higher when the fiscal stimulus feeds fully through to aggregate demand, as is the case with public spending on goods and services or via cash transfers to households with high propensities to consume out of current income.[36] Multipliers would also be expected to be larger when leakages from the economy are low (that is, the economy is more closed), when there is economic slack, or when monetary policy is accommodative (that is, when interest rates do not rise in response to fiscal stimulus). The empirical evidence on higher multipliers during recessions and under various monetary policy stances has, however, been mixed.[37]

Other country-specific characteristics can also impact the size of the multiplier. For instance, the public debt-to-GDP ratio at the time of the stimulus might affect the size of the multipliers through expectations of fiscal adjustments in the near future or sustainability concerns that could raise interest rates.[38]

Combining the recent estimation methodology proposed by Ramey and Zubairy (2018) and the identification scheme based on forecast errors in public spending from Auerbach and Gorodnichenko (2012a, 2012b, 2013, 2017), new estimates on the cumulative fiscal multiplier under economic slack and accommodative monetary policy suggest that fiscal policy is indeed powerful in these circumstances.[39] The baseline multiplier from public spending on goods and services estimated using this approach is about 1, on average, across horizons—broadly in line with the literature (Figure 2.6, panel 1). As expected, the picture changes once economic conditions are considered. If the unemployment rate in a country is above its average, the one-year fiscal multiplier rises to above 1.5, while it falls below 1 if the unemployment rate is below its average (Figure 2.6, panel 2). The statistically significant difference between these two multipliers bolsters the idea that fiscal policy effectiveness depends on the tightness of the labor market. In contrast, there is no strong evidence that the multiplier differs across the business cycle phase as captured by output growth (expansions versus recessions).[40]

When interest rates are low and close to their effective lower bound, the fiscal multiplier is above 2 and statistically significantly different from the multiplier when interest rates are far from the effective lower bound (Figure 2.6, panel 3). In other words, fiscal stimulus is extremely effective when monetary policy does not lean against it. These estimates are robust to alternative definitions of accommodative monetary policy. For instance, fiscal stimulus is more potent under a fixed exchange rate regime or currency union when monetary policy does not allow interest rates to rise or is unresponsive to the local fiscal impulse. Moreover, the multiplier estimated over the period since the

[36]See Jappelli and Pistaferri (2014) for a discussion and empirical evidence on how the marginal propensity to consume varies with household characteristics and its implications for fiscal policy. Public spending through targeted transfers to households with higher marginal propensities to consume generates higher fiscal multipliers than transfers to other households. See also McKay and Reis (2016).

[37]Differences across studies likely reflect differences in sample, identification, and estimation approaches. See Online Annex 2.3 for further discussion.

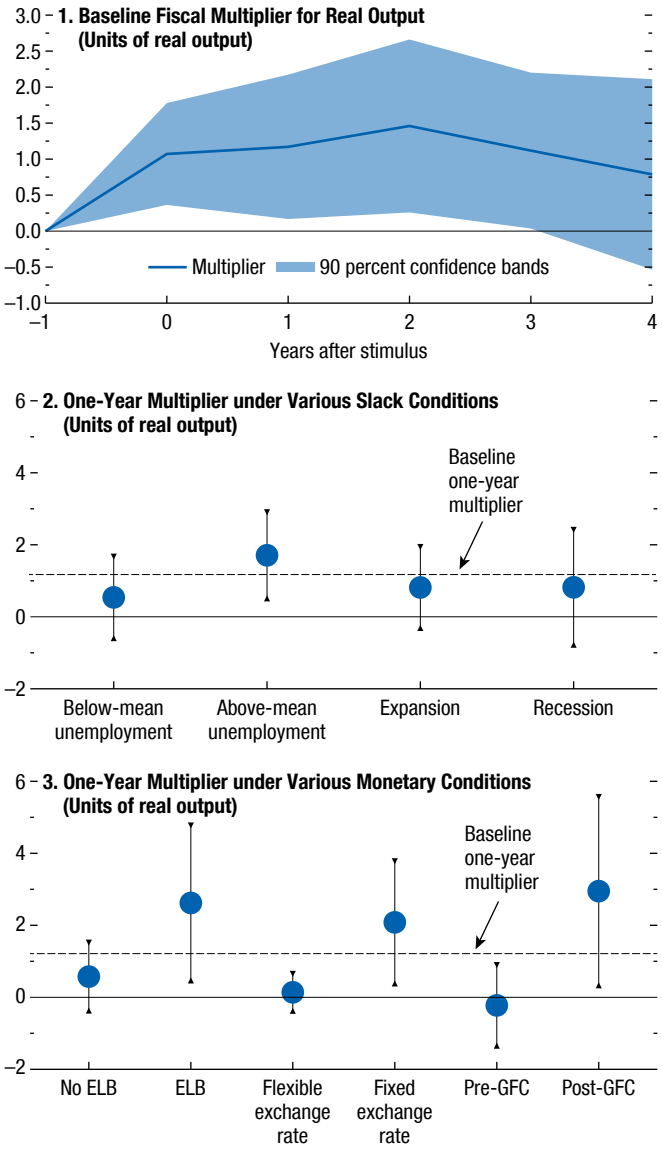
[38]See Corsetti, Meier, and Müller 2012; Ilzetzki, Mendoza, and Végh 2013; and Auerbach and Gorodnichenko 2017. See Online Annex 2.3 for further discussion.

[39]The shock to public spending on goods and services is computed as the real-time forecast errors of public consumption spending growth relative to GDP. See Online Annex 2.3 for further details.

[40]Expansions and recessions are defined as years of positive or negative growth, respectively.

Figure 2.6. Fiscal Multipliers

Fiscal multipliers are larger during periods of slack and when monetary policy supports fiscal stimulus—exactly the conditions that would apply were a downturn to occur when policy rates are so low.



Sources: Bank for International Settlements; Haver Analytics; Ilzetzki, Reinhart, and Rogoff (2019); IMF, *International Financial Statistics*; national sources; Organisation for Economic Co-operation and Development Economic Outlook; and IMF staff calculations.
Note: Panel 1 shows the response of real output over time to a unit public spending shock in year $t = 0$. The public spending shock is equivalent to a 1 percent of GDP increase in public consumption. Shaded area denotes the 90 percent confidence band. In panels 2 and 3, blue dots show the point estimates for the one-year multiplier under the indicated economic conditions (alternative slack or monetary conditions). Black whiskers show the 90 percent confidence interval around the estimate. The effective lower bound is considered to be binding when short-term policy rates are below 0.75 percentage points. Below- and above-mean employment are defined by country relative to their own experience. See Online Annex 2.3 for further details on the definitions of the economic conditions and on the model specification and estimation. ELB = effective lower bound on interest rates; GFC = global financial crisis.

global financial crisis—which is marked by low interest rates across most advanced economies—is higher than during the precrisis period and close to that estimated at the effective lower bound.[41] Taken together, the results suggest that the fiscal multiplier is larger during periods of labor market slack and when monetary policy is supportive of fiscal stimulus—exactly the conditions that would apply were a demand-driven downturn to occur when policy rates are so low. In the midst of the current pandemic shock, economic slack is likely less than standard metrics (such as the unemployment rate) would imply, because production possibilities are constrained while the disease is actively spreading. As the pandemic recedes, economic slack will increase, and fiscal multipliers will be larger. As noted, evidence from the existing literature suggests that public spending, especially in the form of shovel-ready and productive public investment, could be extremely powerful in stimulating the economy.

Discretionary fiscal measures, appropriately tailored to the specific circumstances and the nature of the negative shock that materializes, can offer powerful countercyclical support, particularly if the political willingness to act promptly and in a targeted fashion is high. Recently, many advanced economies have undertaken quick, sizable, and targeted discretionary fiscal actions to offset the effects of the unusual pandemic shock. In the past, action has sometimes been delayed because it requires political agreement as a precondition, which can be difficult to achieve.[42] Moreover, even if discretionary support measures are adopted promptly, implementation lags may hamper their delivery. For example, discretionary fiscal responses to the global financial crisis took several months to be announced, let alone adopted and implemented.[43] Putting in place institutions that automatically undertake fiscal stimulus to counter an adverse shock can potentially enhance the effectiveness and timeliness of the stabilizing response.

Traditional automatic stabilizers—such as the progressivity of the tax code, the unemployment insurance system, or the means-tested social safety net—are

[41]There is a large degree of overlap between the sample defined by the effective lower bound and that by the period since the global financial crisis. Among advanced economies, only Japan and the United States had extremely low rates before 2008 (Miyamoto, Nguyen, and Sergeyev 2018; Ramey and Zubairy 2018).

[42]For a prominent, early example of this argument, see Friedman (1948).

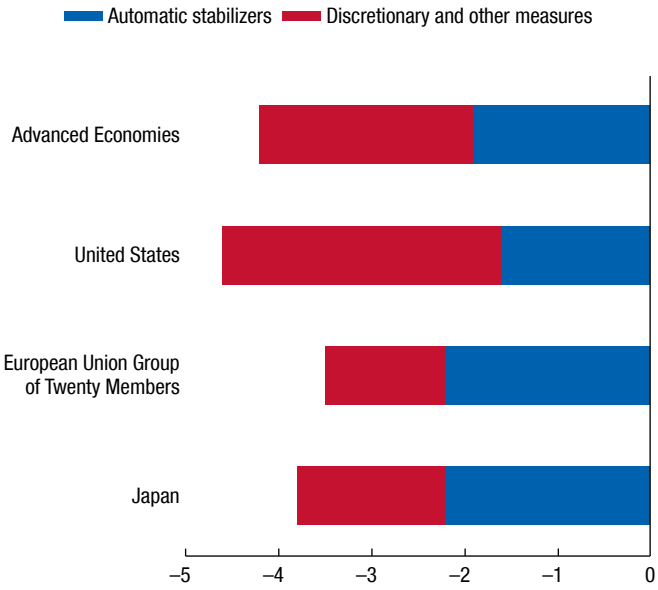
[43]See IMF (2013) for a breakdown of the lags for Group of Twenty countries.

mechanisms already built into government budgets that increase spending or decrease taxes automatically when the economy slows and then reverse when it turns around.[44] Because they do not require political action before being activated, established automatic stabilizers can respond swiftly to shocks and help stabilize the economy. The temporary and predictable nature of their stimulus also makes them appealing, enabling households and firms to incorporate them into their planning.

How much countries rely on discretionary measures versus automatic stabilizers varies widely, and using one does not preclude use of the other. The response to the global financial crisis involved a mix (Figure 2.7). Macroeconomic stabilization, though, has typically not been the primary aim in the design of traditional automatic stabilizers, which are more focused on social protection goals or equity considerations.[45] Recent proposals for new kinds of automatic stabilizers attempt to address stabilization objectives directly, explicitly linking the automatic activation of spending and tax measures to the state of the economy through a macroeconomic trigger, such as a rise in the unemployment rate.[46] The effectiveness and associated fiscal costs of rules-based fiscal stimulus to respond to a downturn are explored in the next section.

Figure 2.7. Average Overall Fiscal Balance Change from 2007 to 2008–10
(Percent of GDP)

The response to the global financial crisis involved a mix of automatic stabilizers and discretionary fiscal responses, but the latter took a while to be adopted and implemented.



Source: IMF (2009).
Note: Other measures include noncrisis-related spending or revenue measures (such as changes in defense spending), as well as the impact of nondiscretionary effects on revenues beyond the normal cycle.

Enhancing Stabilization with Rules-Based Fiscal Stimulus

To explore and evaluate the performance of rules-based fiscal stimulus, the chapter uses the IMF's workhorse G20MOD model calibrated for a representative advanced economy, adapted to allow for the possibility that the economy is at the effective lower bound of interest rates for a prolonged period of time, which is highly relevant to today's circumstances.[47] The model abstracts from sovereign risk concerns, focusing firmly on how policies can facilitate business cycle stabilization. The rules-based fiscal stimulus provides stimulus in response to rises in the unemployment rate above its natural level, which then unwinds as the rate comes down over time.[48] For the illustration here, it is roughly calibrated to the benchmark rule proposed by Sahm (2019)—one-half percentage point rise in the unemployment rate above its natural rate generates fiscal transfers targeted to liquidity-constrained (poorer) households equivalent to about 0.7 percent of GDP.[49]

[44]See Chapter 2 of the April 2020 *Fiscal Monitor* for a detailed discussion of traditional automatic stabilizers across countries and ways to strengthen their stabilizing properties.

[45]See Baunsgaard and Symansky (2009).

[46]For example, Sahm (2019) proposes direct payments to individuals as an automatic stabilizer at the onset of a recession. Eichenbaum (2019) argues for setting up a more general system of asymmetric, automatic stabilizers based on selected macroeconomic indicators hitting prespecified targets. Blanchard and Summers (2020) advocates such stabilizing fiscal policies, describing them as semiautomatic stabilizers.

[47]See Online Annex 2.4, Andrle and others (2015a), and Andrle and Hunt (forthcoming) for more details about the model structure, how it incorporates more realistic nonlinearities into the simulations, and its calibration.

[48]In other words, the stimulus measures are temporary, lasting only so long as the trigger is operating. For a detailed discussion of considerations in the selection of macroeconomic triggers, see Sahm (2019).

[49]See Online Annex 2.4 for further details on the design of the rules-based fiscal stimulus in the context of the model. In the model, liquidity-constrained households are unable to borrow and save, using all of their income for consumption (that is, they have a high marginal propensity to consume). Consequently, income transfers to them have more powerful expansionary effects on aggregate demand than those to households who might opt to save the additional income.

In addition to generating macroeconomic stimulus, a transfers-based instrument acts as a form of income insurance to the targeted population.

The model results suggest that a rules-based fiscal stimulus could be extremely powerful in countering a downturn, particularly when interest rates are stuck at the effective lower bound and monetary policy is constrained. Moreover, rules-based fiscal stimulus helps shape household and business expectations by promising a robust countercyclical response. This reduces uncertainty and lessens any drops in consumption and investment after adverse shocks.

Figure 2.8 compares the dynamic responses of a representative advanced economy to a typical negative aggregate demand shock under various types of monetary policy stance and fiscal policy reactions. If the economy is far from the effective lower bound on interest rates and monetary policy can operate fully, then real GDP follows the path of the blue line, dropping about 1.5 percent and then gradually converging to its trend path (Figure 2.8, panel 1). However, if the economy is at the effective lower bound, and monetary policy is unable to provide support on its own, then there is a large and persistent drop in GDP of almost 5 percent to such a shock (red line). In both cases, traditional automatic stabilizers are included and calibrated to their current sensitivity.[50] If the rules-based fiscal stimulus were operating, the drop in real GDP at the effective lower bound from the adverse demand shock is markedly smaller and actually close to the case where the economy is away from the effective lower bound and monetary policy is able to respond fully (gold line).[51]

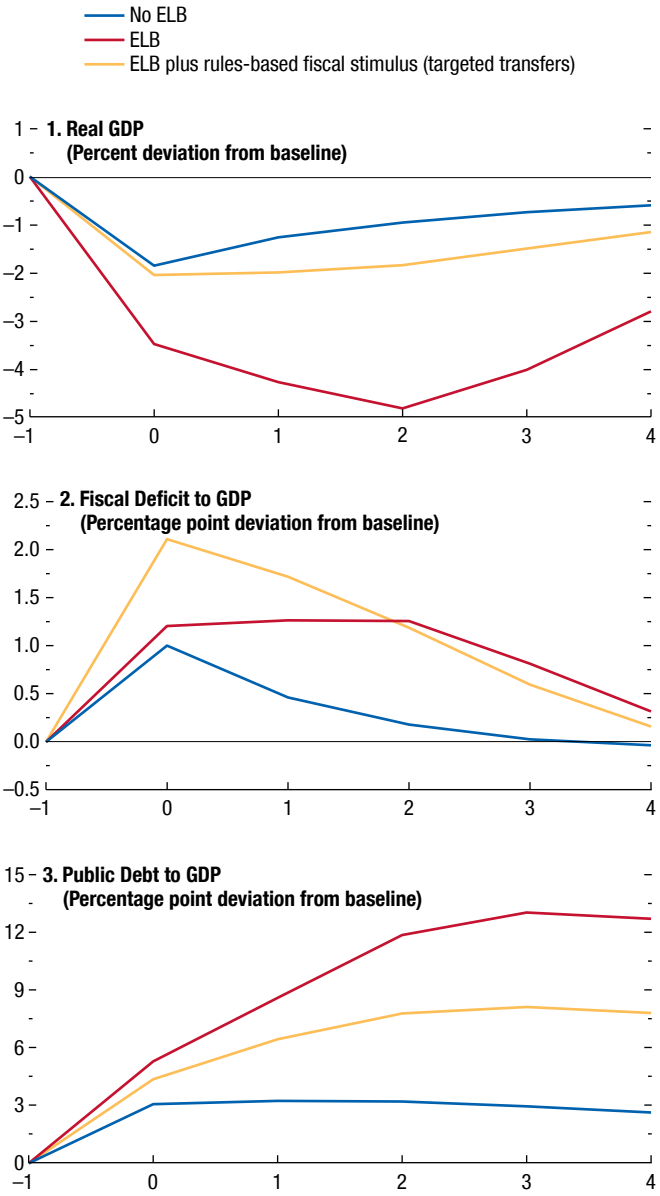
Importantly, this finding emerges without making any specific assumptions about fiscal multipliers. Instead, it arises as a natural consequence of the model structure and its deep parameters, calibrated to ensure consistency with empirical evidence on business cycle properties and microeconomic behavior. The implied fiscal multiplier from the model is about 1.2 when the economy is at the effective lower bound, while it is about 0.6 when the economy is away from the effective lower bound. Both parameter values are within the confidence bands of the

[50]The cyclical sensitivity of traditional automatic stabilizers is taken from Girouard and André (2005) and Price, Dang, and Botev (2015). See Online Annex 2.4 for further details.

[51]Increasing the sensitivity of existing automatic stabilizers alone does improve stabilization, but not to the same degree. See Online Annex 2.4 for a comparison of scenarios. See also Chapter 2 of the April 2020 *Fiscal Monitor* on ways to enhance the functioning of existing automatic stabilizers.

Figure 2.8. Responses of Economic Outcomes to a Negative Demand Shock

A rules-based fiscal stimulus could be extremely powerful in countering a downturn when interest rates are stuck at the effective lower bound and monetary policy is constrained. Debt-to-GDP dynamics are better with a rules-based fiscal stimulus than without when interest rates are at the effective lower bound. The prudent action at the effective lower bound is then to have a prompt and vigorous countercyclical fiscal response to a negative demand shock.



Source: IMF staff estimates.
Note: Targeted transfers go to liquidity-constrained households. See Online Annex 2.4 for further details on the model and analysis. *x*-axis represents number of years after shock. ELB = effective lower bound on interest rates.

empirical estimates described in the previous section. If anything, the implied fiscal multiplier from the model at the effective lower bound is conservative.

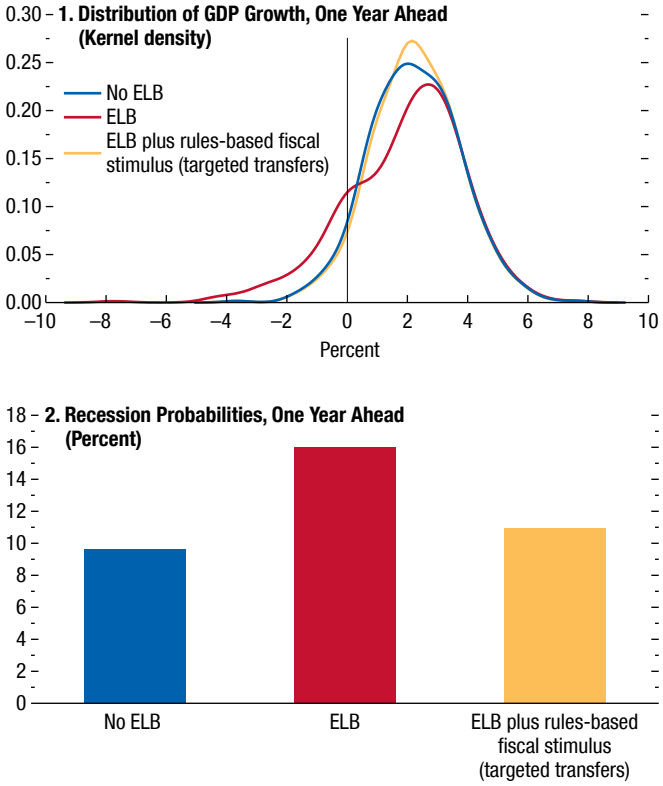
Nonetheless, the stabilization achieved by the rules-based fiscal stimulus does not come for free (Figure 2.8, panels 2 and 3). The smallest rises in the fiscal deficit-to-GDP and public debt-to-GDP ratios are achieved when the economy is away from the effective lower bound and monetary policy reacts to offset the negative shock (blue line). Yet, the difference in the responses at the effective lower bound between the cases with and without the rules-based fiscal stimulus operating is stark (gold and red lines). The deficit-to-GDP ratio at the effective lower bound rises more with a rules-based fiscal stimulus than without, reflecting the immediate increase in spending from the rules-based measures over and above that from the usual automatic stabilizers. This additional stimulus, though, improves the real GDP and price level paths such that the path of the debt-to-GDP ratio is lower than it would be without the stimulus.[52] In other words, fiscal costs as a share of output are lower if the economy has measures in place for a rules-based fiscal stimulus than if it does not when interest rates are at the effective lower bound. A prompt and large countercyclical fiscal response to a negative demand shock at the effective lower bound puts the debt-to-GDP ratio on a lower path than if it were not undertaken.

Moreover, the implementation of rules-based fiscal stimulus when the effective lower bound is binding also reduces the likelihood of recessions compared to not having it in place. Taking the historical experience of demand shocks, the chapter builds up the distribution of GDP growth under alternative automatic stabilizers to evaluate how they might impact the likelihood of a recession in a representative economy. The blue distribution (Figure 2.9, panel 1) shows the benchmark case, where the economy is away from the effective lower bound and monetary policymakers are able to respond fully. In this case, the probability of recession is about 10 percent (Figure 2.9, panel 2). When the effective lower bound binds periodically, though—as shown by the red distribution—there is a large left tail skew, representing greater chances of negative growth.

[52]Note that the rules-based fiscal stimulus helps stabilize real output, which also helps avoid a significant decline in inflation from an adverse shock. Together, the improved paths of real output and the price level contribute to more favorable dynamics of the debt-to-GDP ratio (given that nominal GDP is higher). See Online Annex 2.4 for further details.

Figure 2.9. Recession Likelihoods under Alternative Cyclical Policy Tools

When the effective lower bound binds regularly, an economy with a rules-based fiscal stimulus has a lower likelihood of recessions compared to that without.



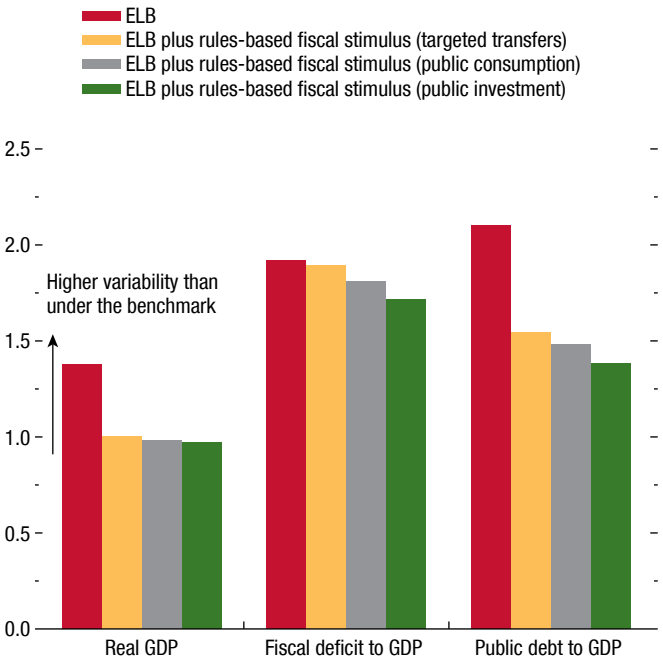
Source: IMF staff estimates.
Note: Targeted transfers go to liquidity-constrained households. Stochastic simulations are used to generate the distribution of output under the indicated scenario. The simulations draw from demand shock distributions centered at the baseline growth projection. Panel 1 takes demand shocks from the normal distribution calibrated to the empirical variance of the shocks. Panel 2 takes demand shocks from the empirical distribution. A recession is defined as a year with negative annual growth. See Online Annex 2.4 for further details on the stochastic simulation methods employed. ELB = effective lower bound on interest rates.

The probability of a recession in this case rises by over one-half to about 16 percent. However, if the economy had rules-based fiscal stimulus measures in place (the gold distribution), the distribution of GDP growth is much closer to that when the economy does not hit the effective lower bound—the left tail shrinks and the probability of a recession drops to about 11 percent, almost at that of the benchmark case.

The rules-based fiscal stimulus examined so far increases public spending through targeted transfers to liquidity-constrained households. However, alternative instruments could be considered. Consistent with the

Figure 2.10. Economic Fluctuations under Alternative Spending Instruments for Rules-Based Fiscal Stimulus
(Relative variability to the benchmark of unconstrained monetary policy)

Economic fluctuations are always lower with a rules-based fiscal stimulus—regardless of the spending instrument—than without when the effective lower bound binds regularly. Shovel-ready, useful public investment spending generates slightly lower variabilities of real GDP, public debt, and deficits than other instruments.



Source: IMF staff estimates.
Note: Relative variability is the ratio of the variance of the indicated variable to that under the benchmark scenario where the ELB does not bind regularly and monetary policy operates fully. Targeted transfers go to liquidity-constrained households. Stochastic simulations are used to generate the variability of output, the deficit, and debt under alternative rules-based fiscal stimulus instruments. See Online Annex 2.4 for further details on the model and stochastic simulation methods. ELB = effective lower bound on interest rates.

empirical evidence on fiscal multipliers, it appears that a rules-based stimulus using public investment could lead to lower variabilities of real GDP, public debt, and deficits than that using targeted transfers (Figure 2.10). Similarly, public consumption as the spending instrument also performs better than targeted transfers, but less well than public investment. It is important to note that public investment spending in the model is shovel-ready, efficiently delivered, and raises potential output—requirements that may be difficult to fulfill in practice. In general, though, economic fluctuations are always lower with rules-based fiscal stimulus measures in place—regardless of the spending instrument—than without.

When it comes to the practical implementation of enhancements to automatic stabilizers in an economy, many specific design choices—which the chapter has abstracted from—will matter:

- The macroeconomic trigger for the rules-based fiscal stimulus in the model simulations is based on deviations from the natural rate of unemployment, which can be difficult to measure in real-time. Sahm (2019) advocates for the 12-month moving average of the unemployment rate for the United States, but which exact trigger (and its measurement) works best may well vary by economy.
- Identifying liquidity-constrained households to target for transfers—the public spending instrument considered as the baseline for the rule—may be tough to do. Instead, easier-to-observe income variables could be used to identify qualifying households. This could have the benefit of ameliorating any rises in inequality in recessions, which tend to hit the poor harder.[53]
- Alternative spending instruments for the rules-based fiscal stimulus could be considered, which could help governments achieve other goals while also stabilizing the economy. For example, if it were possible to establish a priority list of needed public investments, then those projects could be brought online more quickly in a downturn, boosting long-term prospects.[54]
- Measures to increase the cyclical sensitivity of traditional automatic stabilizers will also help. But they would need to take careful account of any disincentive effects they may entail, as described in Chapter 2 of the April 2020 *Fiscal Monitor*.
- In general, country-specific characteristics and circumstances should guide the design choices for any rules-based fiscal stimulus, including the macroeconomic trigger variables (aligned with the business cycle) and instrument selection (based on country-specific needs and what delivers high multipliers).

[53]See Boushey and others (2019) for evidence from the United States on how recessions disproportionately impact disadvantaged groups.

[54]See Chapter 2 of the April 2020 *Fiscal Monitor* for a discussion of how to improve the efficiency of public investment and formulate a pipeline of appraised projects. Such investments could be green, supporting governments' climate change mitigation and adaptation objectives. See OECD, UN, and WBG (2018) for a discussion of the economic transformation and associated investments required to address climate challenges.

Summary and Concluding Remarks

Since the 1980s policy rates have gradually trended down and public debts up in advanced economies. The deep shocks of the global financial crisis and subsequent Great Recession called for concerted and strong expansionary monetary and fiscal responses, exacerbating these trends. Most recently, in responding to the COVID-19 pandemic, policymakers in advanced economies have initiated extraordinary discretionary fiscal and monetary policy support measures, which will further reinforce the prevalence of low interest rates and the upward trend in public debt. With average policy rates lower and public debts higher than they have been over the past 60 years, even before the pandemic, there are concerns about policymakers' ability to effectively respond to future downturns.

Against this background, this chapter asked how policymakers can best prepare for and counter future recessions. Even though rates are close to zero in many advanced economies, unconventional or "new" monetary policy tools remain available to central banks and can deliver further stimulus, if needed. However, there is unease in some quarters about their more intensive use, with concerns about their effectiveness going forward, side effects, and potential threats to central bank independence.

Attention then turned to how fiscal policy can best counter adverse shocks and ensure that there is not an excessive reliance on monetary policy for macroeconomic stabilization. While it is true that public debts are higher, the analysis suggests that greater abilities to service debt—as captured by the low or even negative interest rate–growth differentials—are improving countries' debt dynamics. Moreover, based on its past behavior, a low average interest rate–growth differential seems likely to persist. That said, country-specific vulnerabilities to shifts in market sentiment remain important considerations in determining fiscal space and deciding how expansionary fiscal policy can be in response to a downturn.

The choice of fiscal instrument and the macroeconomic context influence the effectiveness of fiscal stimulus against adverse shocks. Findings from the literature and new analysis point to public spending—investment, consumption, or transfers targeted to liquidity-constrained households—as the most effective in stabilizing output. In the case of transfers targeted to vulnerable populations, they also implicitly provide income insurance against adverse macroeconomic shocks. The findings also suggest that economic slack and interest rates near the effective lower bound make fiscal stimulus even more powerful, strengthening arguments for its use to counter future downturns where these conditions would exist.

Given historical delays in the implementation of discretionary fiscal support measures, there is a case for enhancing traditional automatic stabilizers and adopting rules-based fiscal stimulus measures to build economic resilience. The current shock has negatively impacted the economy with unrivaled speed and depth. The political will for action has rapidly coalesced, with governments adopting a number of support measures. However, the extraordinary size and speed of the shock have also complicated the timely delivery of support. A model-based analysis of a rules-based fiscal stimulus that automatically and temporarily increases public spending in response to rises in unemployment suggests that it could be a powerful stabilization tool, particularly when interest rates are at the effective lower bound and monetary policy is accommodative. Even though fiscal stimulus comes at a cost (deficits and debt rise), the rise in the public debt-to-GDP ratio is lower with a strong countercyclical fiscal response than it is without. In other words, the prudent action at the effective lower bound is to respond immediately and forcefully to an adverse shock with stimulus. Moreover, the likelihood of recessions when the economy is near the effective lower bound is lower when measures for a rules-based fiscal stimulus are in place. Unlike purely discretionary policy measures, rules-based fiscal stimulus helps shape household and business expectations before a shock occurs by promising a strong countercyclical fiscal response when monetary policy is constrained. This reduces uncertainty and dampens falls in consumption and investment when a negative shock materializes. In fact, the stabilization achieved by rules-based fiscal stimulus comes close to that when monetary policy actions are unconstrained.

To ensure a timely and effective response to a recession and improve the economy's resilience, policymakers should consider enhancing existing automatic stabilizers and adopting rules-based fiscal stimulus measures. While these recommendations cannot address a shock that has already happened,

such as the current pandemic, developing and putting them in place now could help insure the eventual recovery against future adverse shocks and bolster economic resilience going forward. They are doubly important when the economy is operating close to the effective lower bound on interest rates and discretionary fiscal policy lags are long. Discretionary fiscal measures—which may be more tailored to the specific shock—may still be essential, complementing the automatic response. Moreover, the high degree of synchronization of business cycles across advanced economies implies that a coordinated push to improve the responsiveness of fiscal policy to downturns would entail even greater gains.[55]

[55]See Online Annex 2.1 for evidence on the rise in synchronization of business cycles across advanced economies. See Gaspar, Obstfeld, and Sahay (2016) on how an internationally coordinated response to a common adverse shock is more beneficial.

Box 2.1. Can Negative Policy Rates Stimulate the Economy?

As conventional monetary policy has collided with the effective lower bound on policy rates since the global financial crisis, central banks in many advanced economies have expanded their toolkit to include asset purchases, forward guidance (public communication by the central bank about the likely future path of monetary policy and its objectives and intentions), and negative policy rates. This box illustrates recent pre-pandemic experiences with negative interest rate policy in several advanced economies, focusing on banks.

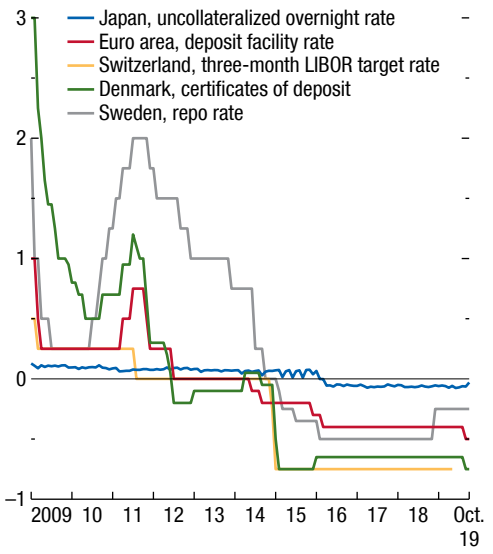
Following Denmark in 2012, a number of other countries, as well as the European Central Bank, introduced negative interest rates (Figure 2.1.1), while other countries continue to examine the possibility. Central banks have enforced negative interest rates through charging commercial banks for reserves they hold at the central bank, often at different rates across different levels of reserves.[1]

In principle, the effects of cutting interest rates below zero are similar to conventional policy cuts when the interest rate is above zero. Responding to the cost change, individual banks will reduce their excess reserves by increasing lending and purchasing other financial assets. In this way, the policy seeks to reduce lending rates to the broader economy, increase credit supply, boost prices across financial markets, and thus stimulate aggregate demand by raising corporate profits and reducing corporate delinquency and default rates. By allowing interest rates to become negative, central banks have greater room to be expansionary.[2]

However, monetary policy easing close to the effective lower bound may have both positive and negative effects, making monetary policy transmission more complex. The introduction of negative rates in the euro area signaled to the market that policy rates could go below zero, and the European Central Bank was able to lower and flatten the yield curve.[3] This policy change created a wedge between safer, more liquid and riskier, less liquid assets, and incentivized banks to rebalance their portfolio from liquid assets to corporate lending, with sizable positive real effects on firms.[4]

At the same time, banks are often reluctant to pass negative rates on to depositors, who could opt to simply withdraw and hold their funds in cash. Given that deposit rates are stuck at zero, banks can experience a compression of interest margins if loan rates decline (Figure 2.1.2), which could reduce profitability.[5] Because of this negative net worth effect, banks might

Figure 2.1.1. Monetary Policy Rates
(Percent)



Sources: National central banks; and Thomson Reuters Datastream.
Note: The data shown are at monthly frequency. The line for Switzerland is missing from June 2019 onwards, reflecting its switch from the three-month LIBOR rate to a new policy rate as its target. LIBOR = London Interbank Offered Rate.

The author of this box is Andrea Presbitero.

[1]See Agarwal and Kimball (2019) for a discussion of how to implement negative rates, including tiering.

[2]See Rogoff (2017).

[3]See Rostagno and others (2019).

[4]See Ruge-Murcia (2006) and Bottero and others (2019) for more details and evidence on this mechanism.

[5]However, there might be exceptions. There is evidence that at least some euro area banks have been able to pass negative rates on to depositors (Altavilla and others 2019). Second, the contractionary effect of negative rates depends on a reduction of bank profitability. See Rostagno and others (2019); Lopez, Rose, and Spiegel (2020); among others, as well the April 2020 *Global Financial Stability Report* for a discussion of the consequences of low rates more generally on bank profitability.

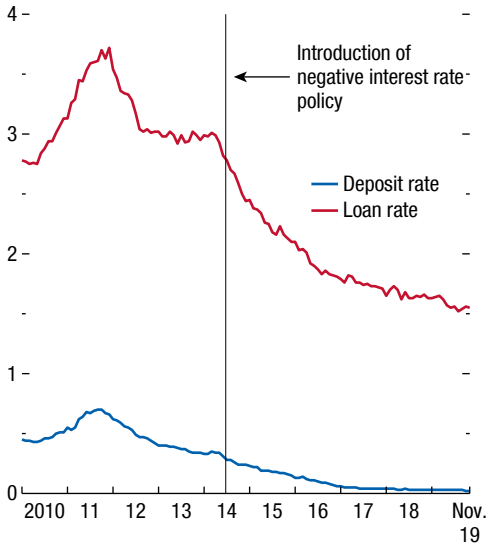
Box 2.1 *(continued)*

choose to reduce the supply of credit and take on more risk.[6] Accordingly, the loss of bank profitability from a decline in the spread between lending and deposit rates could weaken the transmission of monetary policy stimulus through the banking system and potentially have an adverse effect on aggregate output.[7]

The portfolio rebalancing and net worth channels are not mutually exclusive and their relative importance—and therefore, the overall effect of negative rates on the economy—is likely to differ depending on (1) local credit market conditions, such as banks' reliance on deposit funding and short-term liquid assets, which measure the banks' exposures to the two channels; and (2) banks' market power, which may affect their ability to pass negative rates on to depositors and their capacity to compensate the decline in net interest margin by charging higher fees for services. Moreover, higher asset prices and stronger aggregate demand from more expansionary monetary policy could raise banks' profitability through lower loan loss provisions and higher capital gains.

While recent studies lack compelling evidence that bank profitability has been severely curtailed by mildly negative policy rates, this might change if rates were to become deeply negative or stay mildly negative for longer periods. Most of the offsetting forces to a decline in profitability due to a compression of interest margins, such as capital gains, may not persist, so that margin compression might dominate in the medium term, making the net worth channel more prominent with adverse effects on banks' profitability and lending capacity. Finally, if negative rates were to last a prolonged period of time, the cumulative effects of increased risk-taking by the financial and corporate sectors could undermine financial stability.[8]

Figure 2.1.2. Loan and Deposit Rates to Nonfinancial Corporations in the Euro Area
(Percent)



Source: European Central Bank Statistical Data Warehouse.
Note: The deposit rate is the overnight rate for nonfinancial corporations. The loan rate is the cost of borrowing for nonfinancial corporations, defined as the interest rate on all business loans, including revolving loans and overdrafts.

[6]See Heider, Saidi, and Schepens (2019). In contrast, Arce and others (2018) shows that if capital requirements are tight due to micro- and macroprudential policies, banks with lower capital ratios experiencing lower profitability from negative interest rates do not necessarily take on more risk.

[7]See Brunnermeier and Koby (2019); Eggertsson, Juelsrud, and Wold (2019); and Wang and others (2019).

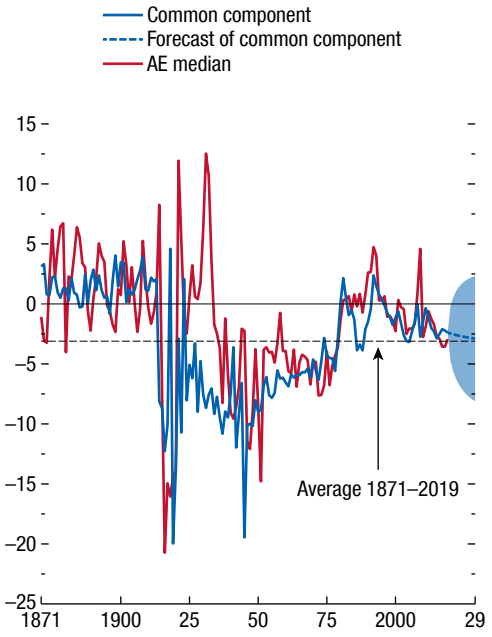
[8]See Committee on the Global Financial System (2018).

Box 2.2. The Persistence and Drivers of the Common Component of Interest Rate–Growth Differentials in Advanced Economies

As highlighted in the main text, unanticipated lower interest rates and higher growth rates in recent years have tempered the rise of debt-to GDP ratios of many advanced economies. As countries' debts are repaid over many years, the persistence of the interest rate–growth differential ($r - g$) is also a key determinant of the scope for fiscal support in a future downturn. The more persistent are declines in $r - g$, the larger the debt savings over the longer term, holding future primary deficits unchanged. If declines are temporary, with $r - g$ likely to revert toward higher levels, any additional room for borrowing could be much smaller (again, all else equal). This box examines the evolution of the interest rate–growth differential over time and how it might shed light on the likely persistence of this differential in the future.

A cross-country, long time series analysis of the interest rate–growth differential for a selection of advanced economies since 1871 suggests that the bulk of its variability is country-specific or transitory.[1] For example, growth and inflation surprises—which are highly likely in the current conjuncture given uncertainties about the path of the ongoing pandemic across countries—lead to transitory changes in the interest rate–growth differential. However, a common and highly persistent component accounts for about 20 percent of the overall variation (Figure 2.2.1). This component is more important than this figure might suggest, as it captures all the nontransitory variation, which is common across countries and is thus the critical component for understanding international trends in $r - g$.[2] A simple time series statistical model used to forecast this common component suggests that it is expected to remain broadly at current levels for the foreseeable future, with approximately an 85 percent chance that this differential is negative 10 years from now. In other words, low and negative $r - g$ looks more like a return to normal than an aberration.

Figure 2.2.1. Common Component of Interest Rate–Growth Differentials
(Percentage points)



Sources: Bank for International Settlements; Haver Analytics; IMF, *International Financial Statistics*; Jordà and others (2019); national sources; and IMF staff estimates.
Note: The sample includes 15 advanced economies. Blue shaded area shows 95 percent confidence interval of forecast. The forecast is estimated from a set of candidate autoregressive moving-average model with lags determined by the Akaike information criterion, which selects an AR(1) model. Confidence intervals are computed using post-1950 data. Expected inflation and growth computed as a smoothed average within distinct monetary eras: 1871–1913, 1914–18, 1919–38, 1939–45, 1946–71, 1972–90, 1991–2007, 2008–19. See Online Annex 2.2 for further details on the analysis. AE = advanced economy.

Complementing the simple statistical analysis of the common component of $r - g$, a regression analysis can help identify its deep drivers and allow an assessment of their likely persistence. Key factors highlighted in the literature include:[3]

- a persistent decline in global productivity (as captured by global total factor productivity growth), affecting both r and g;
- global population aging (as captured by the increasing share of the global population that is 40–64 years old) may affect both r and g through

The author of this box is Philip Barrett.

[1]The nominal interest rate used in this exercise is the short-term policy rate, as it excludes factors such as risk- and term-premia, which are themselves endogenous to other fiscal variables.

[2]Specifically, country fixed effects (capturing country-specific, time-invariant factors) and expectational errors in growth and inflation (which are purely transitory and unpredictable components) explain about 60 percent of the overall deviations in $r - g$ across countries and time. See Online Annex 2.2 for more details on the specification of the panel data model. All annexes are available at http://www.imf.org/en/Publications/WEO.

[3]See Andrade and others (2018), among others.

Box 2.2 *(continued)*

higher saving rates and potentially ambiguous effects on growth;[4]

- the rise of emerging market and developing economies (as captured by their share of world output), which have higher desired saving rates and a proclivity to save overseas; and
- financial repression that keeps interest rates low through regulations on financial market participants (as proxied by the opportunity cost of unremunerated reserve requirements in the United States as a share of GDP).[5]

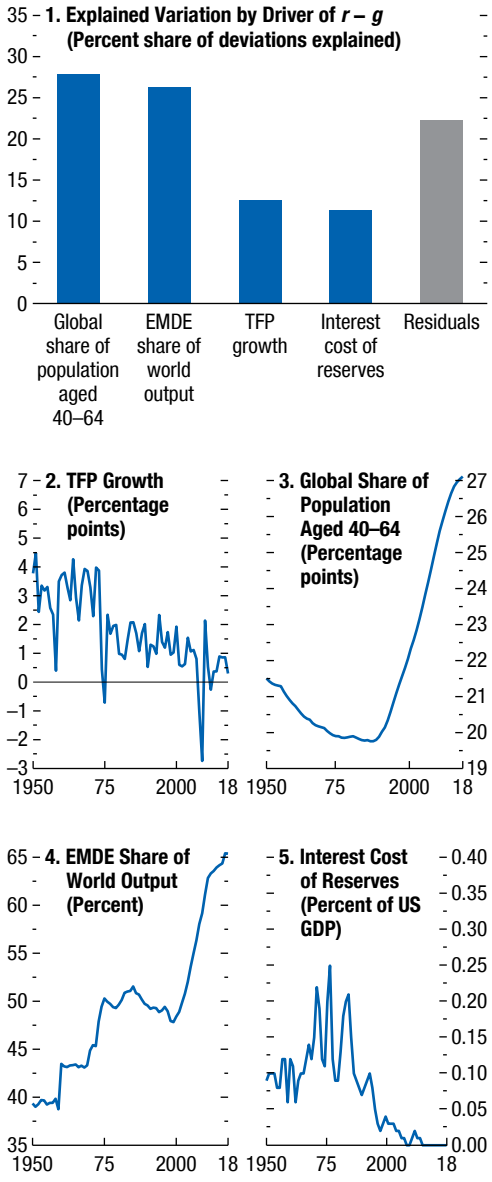
A regression analysis of the common component of $r - g$ since 1950 suggests that all these drivers are significant. However, the most important are the increase in the share of global population aged 40–64 and the rise of emerging market and developing economies in the global economy (Figure 2.2.2, panel 1). Since 1950 these two variables have steadily trended upward, in line with the long-term behavior of $r - g$. In contrast, global total factor productivity growth and the opportunity cost of required reserves in the United States have been more variable (Figure 2.2.2, panels 2–5).

Future movements in these variables could influence $r - g$ beyond the ways captured in the statistical forecasting model. For example, growth in the global population share of the middle-aged has slowed sharply over the past decade. In future, this share is expected to remain broadly constant at current levels. If past relationships continue to hold, then this will likely ease the downward pressure on interest rate–growth differentials

[4]The relationship between interest rates and population aging reflects life cycle considerations, with increased saving expected to occur just prior to retirement (Bloom, Canning, and Graham 2003). The debate on the relationship between growth and population aging remains unsettled, with some arguing that it will lower growth through lower labor force participation and technological change (Gordon 2016) while others argue that it raises growth through increased uptake of automation and other productivity-enhancing technologies (Acemoglu and Restrepo 2017).

[5]Required reserves are legally mandated reserve holdings of US banks at the Federal Reserve. The opportunity cost of required reserves is the interest saving that the US public sector gains from this requirement. Before 2009 banks received no interest on these reserves, which are unavailable for lending. Since 2009 the Federal Reserve has paid interest on required reserves, eliminating this interest saving for the United States. To the extent that the US banking system provides a backstop for global finance, unremunerated reserve requirements may be thought of as a tax on safe assets worldwide. See Online Annex 2.2 for details on how this measure correlates closely with that from Abiad, Detragiache, and Tressel (2010).

Figure 2.2.2. Drivers of the Common Component of Interest Rate–Growth Differentials



Sources: Federal Reserve; Maddison Project; United Nations; and IMF staff calculations.
Note: Panel 1 bars show the share of absolute variation in the common component of $r - g$, which is explained by the candidate drivers (panels 2–5) from a linear regression. See Online Annex 2.2 for further details on the data and analysis. EMDE = emerging market and developing economy; $r - g$ = interest rate-growth differential; TFP = total factor productivity.

Box 2.2 *(continued)*

as demand for savings declines. Similarly, the share of emerging market and developing economies is unlikely to continue to grow as sharply as in recent years. The ongoing health crisis may also have a longer-term impact on $r - g$ if the pandemic, or policy responses to it, affect demand for precautionary savings.

Although the impact of small changes in the interest rate–growth differential may eventually be large, a meaningful impact may take several years to materialize, simply because countries take many years to repay their debts. As a result, other factors may matter more in the near term. For instance, sudden increases in risk premia—even if temporary—can cause public debt to GDP to grow sharply. This could include unanticipated negative events that prompt shifts in investor sentiment toward safe-haven assets, which, in turn, can push up spreads unexpectedly for some countries.

Overall, the risk-free interest rate–growth differential serves as a useful baseline for the likely future path of public debt-to-GDP ratios. The evidence presented in this box suggests that low differentials are more likely a return to long-term normality than a rare event. Yet, this finding is potentially sensitive to changing long-term factors, including demographic pressures and the composition of the global economy, as well as short-term risks to spreads.

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