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Assessing U.S. fiscal space

Takeaways

Concerns about the sustainability of government debt across developed markets has reignited amid the sharp increase in borrowing during and after the COVID-19 pandemic and rising interest rates. We estimate the fiscal space—a measure of flexibility for government budget policy—left for the United States under a reasonable set of assumptions.

1. **We show that fiscal space is sensitive to several factors,** including the maximum primary balance the government is willing, or able, to implement. Assuming a maximum primary budget surplus of 2% of GDP, and macroeconomic projections from the Congressional Budget Office (CBO), we estimate that the maximum sustainable debt/GDP ratio for the United States is approximately 225%. This implies around 130 percentage points of fiscal space left today.

2. **However, we caution against complacency.** Based on the CBO's latest baseline projections, the United States will significantly eat into this fiscal buffer over the coming decades. What's more, the maximum sustainable debt burden will be lower than 225% of GDP should another severe recession occur, demographic trends worsen, or interest rates rise more than expected.

3. **We therefore underscore the importance of a prudent approach to the government's finances.** This includes minimizing unproductive spending, limiting contingent liabilities (and making them more targeted), and increasing taxes where revenues are low by international standards. This will increase the chances that the debt burden will be sustainable in the long run, especially if the economy is hit by another adverse economic shock.

Key concepts

Debt sustainability: If an economy's debt/GDP ratio is expected to continually increase over time, these dynamics are considered unsustainable. Eventually, the cost of servicing the increasingly large debt will become too burdensome, forcing the government to default.

Bondholders that are worried about debt sustainability may accelerate this process by demanding a higher interest rate to compensate for the increased risk of default, which would make it even more difficult for the government to meet its obligations.

Maximum sustainable debt burden: The theoretical level of debt/GDP beyond which the government will eventually default.

Fiscal space: The difference between an economy's current debt/GDP ratio and the maximum sustainable debt burden.

Primary balance: The difference between the amount of revenue a government collects and the amount it spends on providing public goods and services, excluding net interest payments. It is often expressed as a percentage of GDP.

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Introduction

The large borrowing by governments during and after the COVID-19 pandemic, coupled with central banks' recent tightening of monetary policy, has renewed concerns about debt sustainability across major developed markets. In this paper, we focus on the United States. We estimate the degree of fiscal space left under a reasonable set of assumptions.

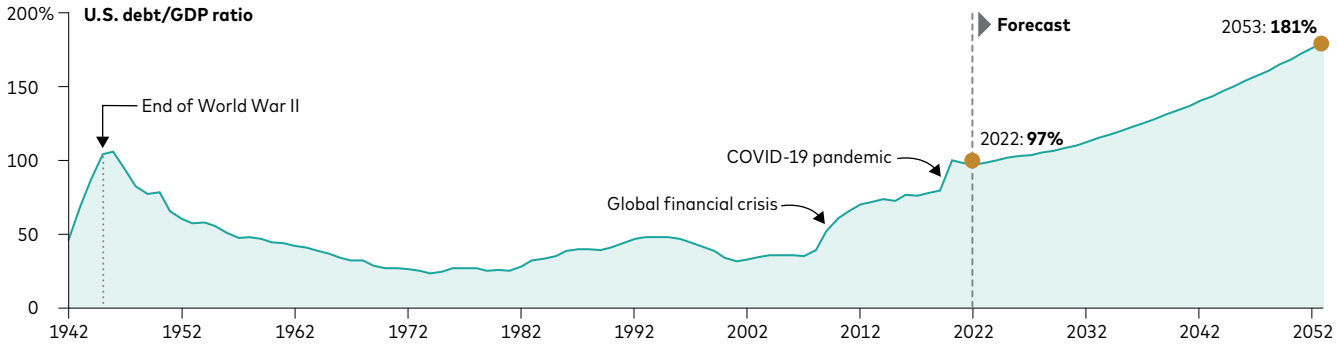
As **Figure 1** illustrates, the U.S. debt/GDP ratio has increased markedly following the pandemic, jumping from 80% in 2019 to around 100% in 2022, according to the CBO.[1] But what is arguably more concerning is that, under current tax and spending policies, the debt burden is forecast to increase significantly over the coming decades, reaching 180% of GDP by 2053.

The CBO's projection of a sharp rise in public debt poses two immediate questions. First, what key macroeconomic assumptions are driving that forecast? And second, is the sharp upward trend in the debt burden sustainable over the long term?

The next sections aim to shed light on both these questions.

FIGURE 1

The CBO's baseline projections suggest the U.S. debt/GDP ratio will exceed 180% by 2053



Sources: Vanguard annotations and the Congressional Budget Office, as of June 2023.

1 Based on June 2023 projections.

The drivers of government debt

This equation, which describes the drivers of a one-time, annual change in the debt/GDP ratio (Δd), shows why the U.S. debt burden is expected to increase significantly over the coming decades.

$$\Delta d = b + \frac{(r-g)}{(1+g)} d$$

In the equation, b is the size of the annual primary deficit (or surplus) as a percentage of GDP, r is the average interest cost on the existing debt stock, g is the nominal rate of economic growth, and d is the current debt/GDP ratio.

The evolution of the debt/GDP ratio depends on the level of annual primary budget deficits or surpluses (b) and the cost of servicing the existing debt adjusted for economic growth (r-g).

All else equal, running an annual budget deficit would directly increase debt year over year, while running a surplus would reduce it. In addition, if the cost of servicing debt exceeds economic growth (r > g), the debt/GDP ratio will increase; if growth outstrips interest costs (r < g), the ratio will fall. The impact of the r-g term on the annual change in the debt ratio is amplified at higher and higher levels of debt (d).

These variables may also be correlated. For example, if government borrowing is targeted toward pro-growth investments, there is likely to be a positive relationship between b and g. Similarly, there is likely to be a positive relationship both between economic growth and the equilibrium level of interest rates (e.g., Laubach and Williams, 2003) and between primary deficits and interest rates (e.g., Davis et al., 2023).

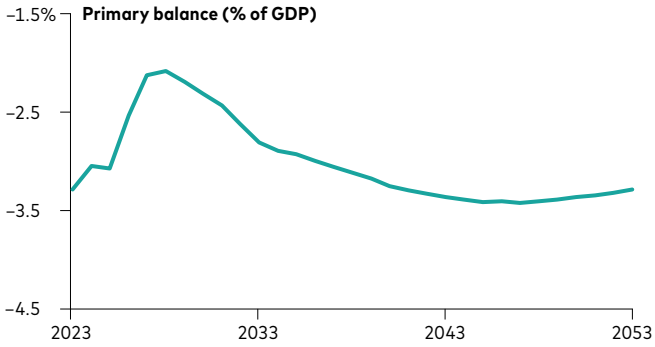
According to the CBO, both primary deficits and the spread between debt interest costs and economic growth are set to drive the U.S. debt/GDP ratio higher in the coming decades. Annual primary deficits are set to widen to close to 3.5% of GDP by 2050 (**Figure 2a**), while the growth-adjusted interest cost of debt (r-g) is projected to rise from around –2% (signifying an average interest rate cost that is lower than nominal GDP growth) to above 0.5% during the same period (**Figure 2b**).

In the next section, we present a framework that allows us to estimate the theoretical maximum level of debt/GDP that an economy can withstand, subject to certain macroeconomic assumptions. Once this limit is identified, we can quantify the fiscal space a government has available to it.

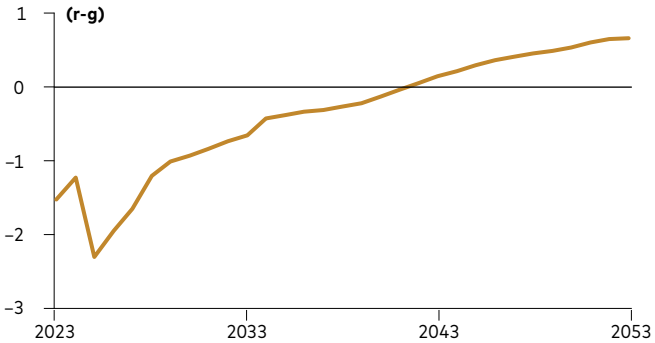
FIGURE 2

Two factors are set to fuel the rise in debt/GDP ratio

a. Primary deficits are anticipated to widen to around 3.5% by 2050



b. The cost of servicing debt, adjusted for economic growth (r-g), is expected to rise, too



Sources: Vanguard and the Congressional Budget Office, as of February 2023.

Quantifying fiscal space

Our framework builds on the work of Mendoza and Ostry (2008) and Ostry et al. (2010) and is illustrated in **Figure 3**.

The dark yellow line shows how growth-adjusted interest costs (r-g) evolve as the debt/GDP ratio increases. If r-g is positive, the line will slope upward, and the cost of servicing debt increases as debt levels climb.

The dark green line represents the government's reaction function to different levels of debt/GDP. As debt/GDP rises, and therefore as interest costs rise (assuming r > g), a government would be inclined to reduce the budget deficit (or increase the budget surplus) to ensure that debt dynamics remain stable.

This fiscal reaction function can be calibrated based on historical precedent. As long as the fiscal reaction function is steeper than the growth-adjusted interest curve, the government can tighten the fiscal belt enough to stop debt from rising further.

However, past a certain level of fiscal tightening, it may not be realistic or practical for a government to enforce an even tighter fiscal stance. This is because, at this point, the government's stance would be so unpopular, its position would be untenable with the broader population. Indeed, in many instances, austerity measures have been repealed because of public pressure. Two examples are Greece after the global financial crisis (Karnitschnig and Bouras, 2015) and Canada in the 1980s (Simon, Pescatori, and Sandri, 2012). At this level, the fiscal reaction function line gets cut off. The turquoise line shows the maximum primary surplus that a government is realistically able to implement.[2]

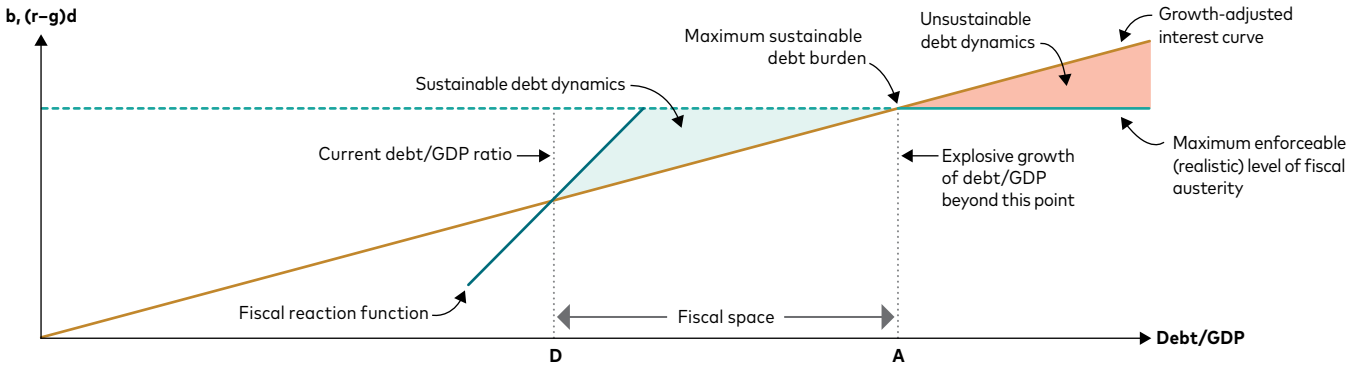
The *maximum sustainable debt burden* is defined as Point A, where the turquoise and dark yellow lines intersect. To the right of this point, the cost of servicing debt will exceed the maximum possible primary surplus that can be extracted via fiscal austerity, and the debt/GDP will be within the explosive-growth region, as depicted by the red shaded area. Beyond point A, government debt will be on an unsustainable trajectory.

Given the forward-looking and efficient nature of financial markets, at this point it is likely that investors will attach an increasingly large risk premium to the government's bonds, further increasing the spread between r and g. Under these self-reinforcing dynamics, the government would eventually have little choice other than to default.

Fiscal space is defined as the gap between the current debt/GDP ratio (D) and the maximum sustainable debt burden (A). It creates the government's "safety zone," as shown by the turquoise shaded area, that provides flexibility to tweak fiscal policy or adapt to changes in broader macroeconomic conditions.

FIGURE 3

Defining the maximum sustainable debt level



Source: Vanguard, based on Ostry et al. (2010).

2 Where this line lies can depend on several factors, including the ideological leaning of the government, demographic trends, the willingness of taxpayers to undergo needed increases in taxes, and the willingness of government program constituents to accept needed spending cuts.

Using reasonable assumptions, we calculate U.S. fiscal space of around 130% of GDP

We apply this framework to the United States. **Figure 4** plots the growth-adjusted interest cost curve (the dark yellow line), as per the CBO's forecasts, and extends for higher levels of debt/GDP. The maximum sustainable debt burden is then determined by the intersection of this line with the maximum level of fiscal austerity that the U.S. government would realistically be able (or willing) to implement.

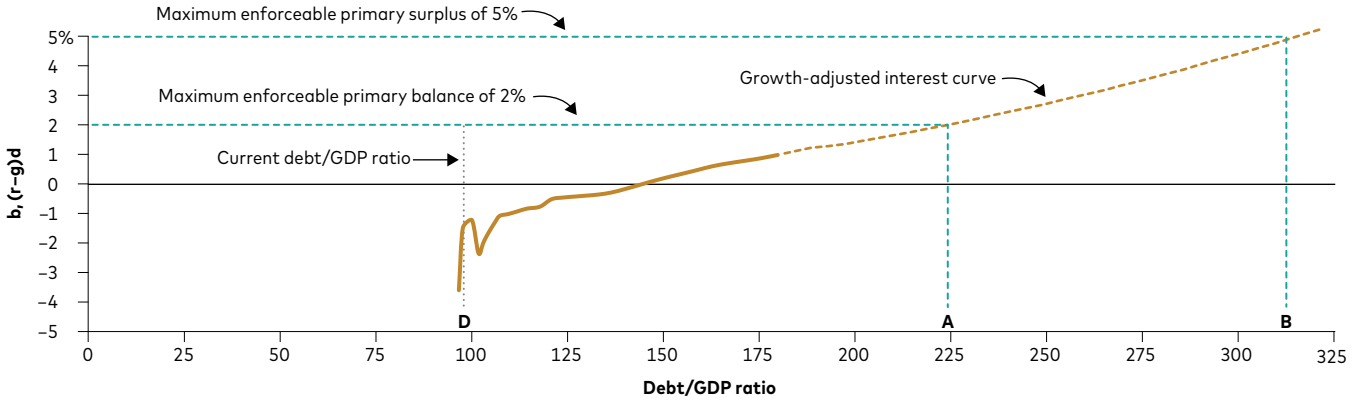
There is considerable uncertainty about where this level lies. As a starting point, we first assume a maximum primary surplus of 5% of GDP because, since 1930, the government has never run a surplus this high. Under this assumption, the maximum sustainable debt burden would be above 300% of GDP, as shown by point B in Figure 4. With debt today at around 100% of GDP, this calculation implies that more than 200 percentage points of fiscal space are left.

However, it is reasonable to question whether the government would realistically be willing or able to implement a budget surplus as high as 5%, if required. Indeed, using forecasts from the Office of Management and Budget and our own calculations, we estimate the U.S. government would need to generate more than $3 trillion in savings to achieve a 5% surplus in 2030. This would be the equivalent of scrapping both the Medicare and Medicaid programs and simultaneously increasing income tax revenue by 30%! Such sharp austerity would very likely be met with significant resistance.

In our view, a 2% primary surplus is probably a more realistic upper bound. In this scenario, the maximum sustainable debt burden would be around 225% of GDP, as shown by point A, implying that around 130% of fiscal space is available today.

FIGURE 4

Fiscal space calculations under different assumptions of the maximum primary balance



Sources: Vanguard calculations, using Congressional Budget Office data.

In general, the U.S. economy's debt dynamics become more concerning when more realistic levels of maximum fiscal austerity are considered. The lower the maximum fiscal surplus, the lower the debt limit and the tighter the fiscal space. **Figure 5** quantifies this under different maximum fiscal surplus assumptions. What is striking is that running even relatively small deficits would imply very little fiscal space today, let alone the 3.5% deficits the CBO is forecasting over the coming decades.

What's more, the longer the government delays the adjustment, the more painful the necessary austerity will be. This is because a tighter fiscal stance will be required to stabilize debt dynamics at higher levels of debt/GDP (**Figure 6**). For example, at today's debt level of close to 100% of GDP, a 2% primary budget deficit would be sufficient to keep debt on a sustainable path. However, if the government were to wait until debt is closer to 180% of GDP, a level the CBO expects the government to reach shortly after 2050, a 1% *surplus* would be required.

FIGURE 5

Fiscal space shrinks if the government is less able or willing to tighten the fiscal belt significantly

Maximum primary balance (% of GDP)	Maximum sustainable debt burden (% of GDP)	Fiscal space (% of GDP)
5	318	221
4	291	194
3	261	164
2	**226**	**129**
1	183	86
0	145	48
–1	110	13
–2	103	6

Notes: The maximum sustainable debt burden estimates are derived by using the Congressional Budget Office's February 2023 forecasts for interest rates and economic growth. Fiscal space estimates are derived assuming a current 2022 U.S. debt/GDP of 97% as per the CBO's latest calculations.

Sources: Vanguard calculations, using Congressional Budget Office data.

FIGURE 6

It's easier to stabilize the debt ratio through tighter fiscal policy at lower levels of debt

Debt/GDP ratio (%)	Primary balance required to stabilize debt ratio
100	–2.1
150	0.2
200	1.4
250	2.7
300	4.3

Sources: Vanguard calculations, using the Congressional Budget Office's June 2023 forecasts for interest rates and economic growth.

Fiscal space is sensitive to changes in macroeconomic conditions

Our framework also allows us to understand how different cyclical and structural factors can influence fiscal space. These include the impact of economic booms and recessions, changing demographic trends, and shifts in long-term growth and interest rate expectations.

This is important because macroeconomic shocks can suddenly move the government closer to (or further from) the debt limit. To quantify the extent to which this may happen, we estimate the U.S. government's historical fiscal reaction function using econometric techniques. **Figure 7** shows how fiscal space is expected to change, based on our model's output, under three distinct scenarios:

- A recession in which the output gap—the difference between actual and potential GDP—widens to –5%. (The gap is negative when the economy is weak or in recession and actual GDP is typically lower than potential GDP.)
- An adverse demographic scenario in which the dependent/population ratio[3] is 5 percentage points greater than expected by 2040.
- An increase of 1 percentage point in the spread between debt service costs (r) and economic growth (g).

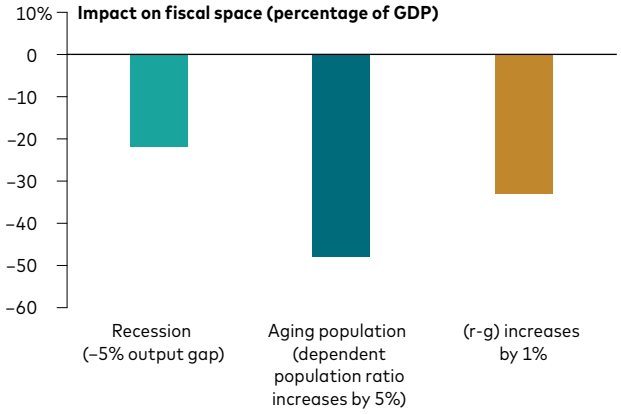
Our results imply that fiscal space will shrink in a recession and if demographic trends worsen. This is intuitive because in a recession, the government receives less tax revenue and increases its spending as unemployment increases and so is less able to tighten fiscal policy.

Similarly, as the population ages, a greater share depends on the government for support, making it more difficult to cut back on spending.

Finally, if economic growth is lower than expected or interest rates are higher than anticipated, this will shift the growth-adjusted interest cost curve as depicted in Figure 3 to the left and therefore reduce fiscal space.

FIGURE 7

Fiscal space is sensitive to macroeconomic fundamentals



Notes: The U.S. government's fiscal reaction function is modeled using a logistic relationship between debt/GDP and the primary balance, in addition to relevant cyclical and structural independent variables. Independent variables include the output gap as a percentage of potential GDP, the fiscal expenditure gap as a percentage of GDP, trade openness as a percentage of GDP, and the 20-year forward dependent population ratio. The debt limit is then calculated using the growth-adjusted interest curve derived from the Congressional Budget Office's interest rate and economic growth forecasts. The model is estimated using annual data from 1980 to 2019.

Sources: The Bureau of Economic Analysis, the U.S. Treasury, the International Monetary Fund, and the United Nations.

3 The dependent/population ratio is a measure of the number of dependents ages 0–14 and over age 65 compared with the total population ages 15–64.

Conclusion: A prudent approach to debt is warranted

The sharp increase in government debt following the COVID-19 pandemic, along with rising interest rates, has reignited concerns about debt sustainability. In addition to the level of debt, the spread between economic growth and interest rates as well as projected primary balances are crucial in determining how viable a government's finances are.

Estimates of fiscal space depend on the macroeconomic assumptions used, in particular the maximum primary balance a government is willing to implement. We think a primary surplus of 2% of GDP is a realistic upper bound for the United States. Using this assumption, and forecasts from the CBO, we estimate a maximum sustainable debt burden of around 225% of GDP.

At first glance, this suggests ample fiscal space today, given a current debt/GDP ratio of around 100%. However, based on the CBO's baseline projections, the U.S. government will significantly eat into this buffer over the coming decades. Fiscal space will also shrink significantly should another severe recession occur, demographic trends deteriorate, or growth-adjusted interest rates rise more than expected.

We therefore underscore the importance of a prudent approach to the government's finances. This includes minimizing unproductive spending, limiting contingent liabilities (and making them more targeted), and increasing taxes where revenues are low by international standards. This will help to narrow future budget deficits and support higher economic growth—both of which would improve the debt arithmetic and increase the chances of the debt burden being sustainable in the long term.

References

Davis, Joseph H., Ryan Zalla, Joana Rocha, and Josh Hirt, 2023. *R-Star Is Higher. Here's Why*; available at SSRN: ssrn.com/abstract=4478413 or dx.doi.org/10.2139/ssrn.4478413.

International Monetary Fund staff paper, 2016. *Assessing Fiscal Space: An Initial Consistent Set of Considerations*. November 18, 2016. Washington, D.C.: International Monetary Fund.

Karnitschnig, Matthew, and Stelios Bouras, "Greece's New Leaders Act Swiftly to Reverse Austerity," *The Wall Street Journal*, January 28, 2015.

Laubach, Thomas, and John C. Williams, 2003. Measuring the Natural Rate of Interest. *Review of Economics and Statistics* 85(4): 1063–1070; available at www.federalreserve.gov/pubs/feds/2001/200156/200156pap.pdf.

Mendoza, Enrique G., and Jonathan D. Ostry, 2008. International Evidence on Fiscal Solvency: Is Fiscal Policy "Responsible"? *Journal of Monetary Economics* 55(6): 1081–1093; available at www.sas.upenn.edu/~egme/pp/JMEprintout.pdf.

Ostry, Jonathan D., Atish R. Ghosh, Jun I. Kim, and Mahvash S. Qureshi, 2010. *Fiscal Space*. IMF Staff Position Note. September 1, 2010. Washington, D.C.: International Monetary Fund.

Simon, John, Andrea Pescatori, and Damiano Sandri, 2012. The Good, The Bad, and the Ugly: 100 Years of Dealing With Public Debt Overhangs. *IMF World Economic Outlook*, International Monetary Fund, October 2012.

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