



# Budget Model

## Why the Debt Ceiling Deadline is Closer Than Previously Expected

**Summary:** The deadline to raise the nation’s debt ceiling is closer than previously thought because tax receipts in April fell below projections. PWBM estimates that receipts are running \$150 billion below government projections for fiscal year 2023, most likely due to a decline in capital gains income and weakening corporate profit margins.

### Introduction

In February 2023, [the Congressional Budget Office \(CBO\) projected](#) that the U.S. Treasury would run out of operating funds between July and September 2023 unless the debt ceiling is raised.<sup>1</sup> Last week, [Treasury Secretary Janet Yellen](#) and [CBO](#) moved up the projected date to early June 2023 due to lower-than-expected tax receipts in April. However, neither Secretary Yellen nor CBO provided further details as to why tax receipts fell below expectations.

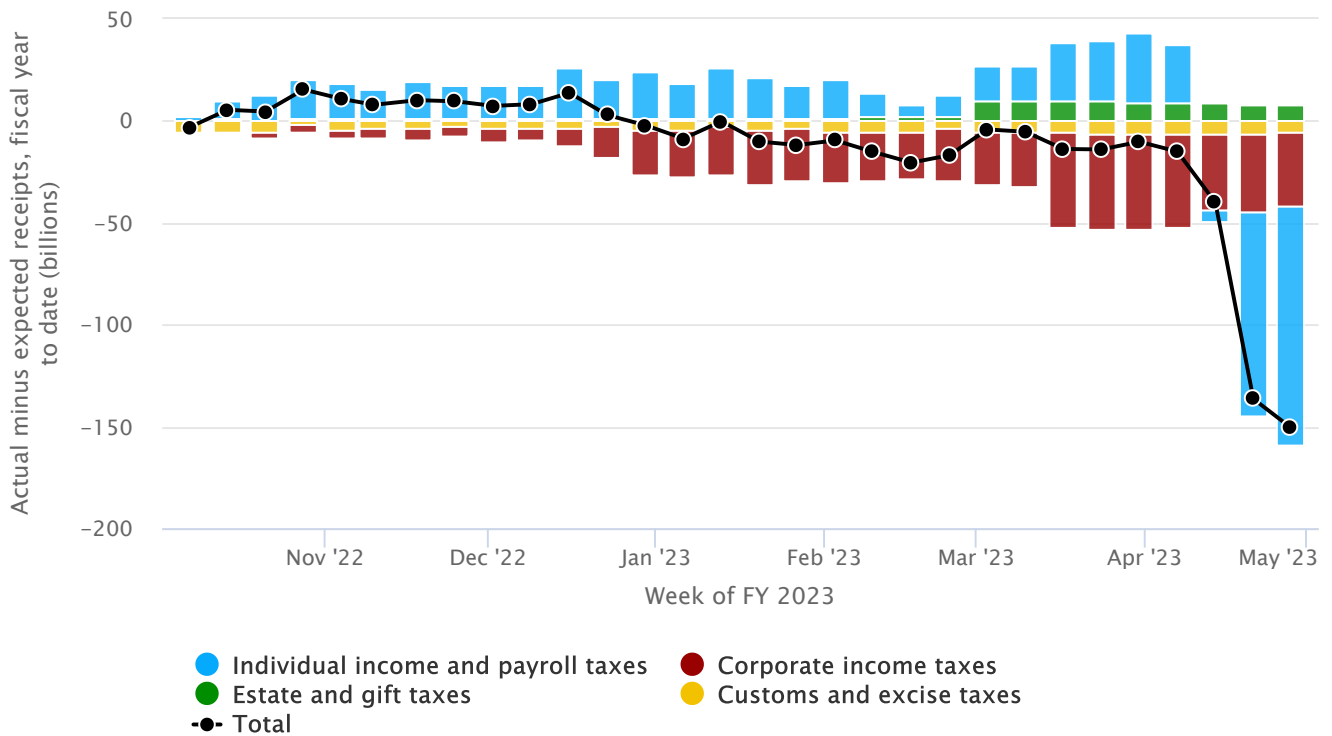
### Projected Versus Realized Tax Receipts

Figure 1 shows PWBM’s estimate of the gap between projected receipts and actual receipts since the start of the 2023 fiscal year, which we refer to as the tax receipts gap. For each week, the tax receipts gap shows whether cumulative tax collections in the year so far are running higher or lower than what is implied by CBO’s projections for the full fiscal year.<sup>2</sup> The colored bars show the fiscal year cumulative tax receipts gap by major tax category (individual and payroll, corporate, estate and gift, customs and excise). The solid line shows the cumulative total tax receipts gap including all tax categories.

Figure 1 shows that by the end of April 2023, the total receipts gap stood at \$150 billion. About \$117 billion of this gap came from lower individual income and payroll taxes. About \$36 billion of the gap came from lower corporate receipts. The other major tax categories had smaller positive and negative gaps that mostly offset.

Figure 1. The Tax Receipts Gap by Week of Fiscal Year 2023

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Source: Penn Wharton Budget Model using data or projections from the Treasury Department and Congressional Budget Office.

The tax receipts gap in a given week is the difference between cumulative tax receipts since the start of the fiscal year and cumulative receipts expected by that point of the year. Expected receipts are the amounts consistent with CBO’s February 2023 projections for total receipts in 2023, given the expected timing of tax payments over the fiscal year.

### Accounting for Uncertainty

The tax receipts gap depends on the timing of tax payments over the fiscal year, which is largely predictable but does vary from year to year.<sup>3</sup> That means there is some uncertainty around estimates of the tax receipts gap.

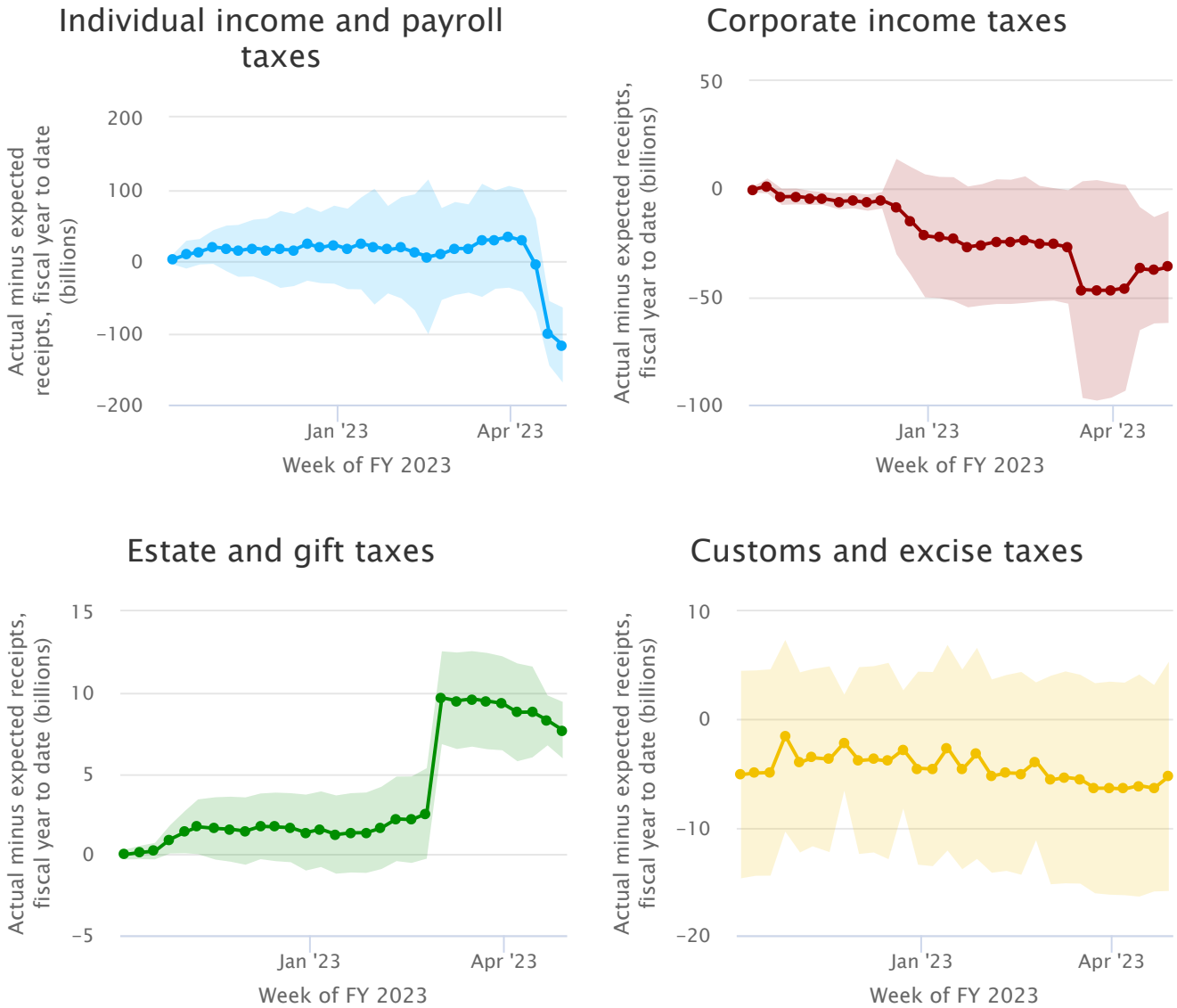
Figure 2 plots the receipts gap in 2023 for each major tax category (solid line) along with prediction intervals that show the degree of uncertainty at a 90% confidence level (shaded areas). If realized tax receipts are statistically consistent with their projected values, then the shaded interval around the *gap* between the two will include zero. If the shaded area does not include zero, it means that realized tax receipts are outside the normal amount of uncertainty consistent with the projected values. (See the appendix for a description of how the receipts gap and uncertainty are estimated.) Figure 2 shows that by the end of April 2023, the 90% uncertainty intervals no longer include zero for most receipts.

*Individual and payroll taxes:* The \$117 billion gap in individual and payroll receipts at the end of April is far outside of the 90 percent confidence interval. Moreover, uncertainty around the gap diminishes after the April tax filing season because the tax filing season drives most of the uncertainty about total receipts over the full

fiscal year.<sup>4</sup> Tax payments outside the filing season are usually regular and stable, so it is unlikely that higher-than-expected receipts later in 2023 will offset the shortfall accumulated in April.

Figure 2. The Tax Receipts Gap by Type of Tax and Week of Fiscal Year 2023

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Source: Penn Wharton Budget Model using data or projections from the Treasury Department and Congressional Budget Office.

The shaded areas show prediction intervals at a 90% confidence level.

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*Corporate income taxes:* This tax receipts gap is driven by the timing of quarterly estimated tax payments, when businesses pay installments on their annual tax liability. Uncertainty around the corporate receipts gap is higher, but PWBM’s estimates point to a persistent corporate receipts gap since the first quarterly payment of the fiscal year in December. One likely explanation is that corporate profit margins have fallen faster than

expected. Profit margins expanded significantly in the aftermath of the pandemic but have been declining gradually since 2022 as consumer demand and labor market conditions stabilized.

*Estate and gift taxes:* These receipts were generally in line with CBO projections until the end of February, when receipts jumped \$7 billion in a single day – an amount equal to more than 20 percent of total estate and gift tax receipts in all of 2022. This surge was [first noted](#) by PWBM staff but its source remains unclear and it appears to be a one-off event.

*Customs duties and excise taxes:* These receipts have mostly tracked CBO's projections so far this year. But these taxes are affected by a variety of factors with no regular pattern and the timing of payments is highly uncertain.

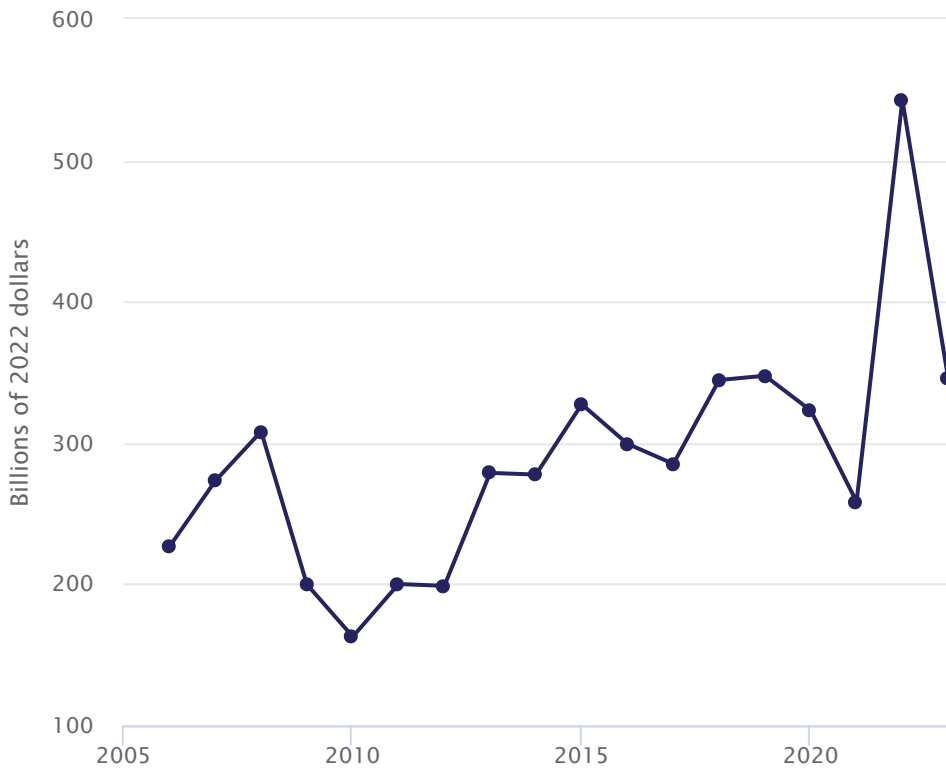
## A Closer Look at the Individual Tax Receipts Gap

The emergence of a large tax receipts gap during the 2023 tax filing season indicates that payments of nonwithheld individual income taxes in April were lower than CBO projected in February.<sup>5</sup> Nonwithheld taxes include taxes on capital gains and other asset income, which tend to track movements in asset prices and are therefore volatile. Though they make up a small share of total receipts, nonwithheld taxes contribute disproportionately to uncertainty around revenue projections.

Figure 3 shows total receipts of nonwithheld taxes in the month of the tax filing deadline over the last two decades, adjusted for inflation. Filing month receipts of nonwithheld taxes surged to over \$500 billion last year but dropped sharply back to pre-pandemic levels of around \$350 billion in 2023. In [a post last year](#), PWBM linked the high level of nonwithheld tax receipts in April 2022 to record growth in household asset values in 2021, which generated a surge in capital gains and other taxable asset income. This dynamic appears to have reversed in 2023: asset price declines and market volatility in 2022 reduced the amount of capital gains and other asset income, which in turn reduced the amount of nonwithheld tax due at filing.

### Figure 3. Receipts of Nonwithheld Individual Income Tax in the Tax Filing Month

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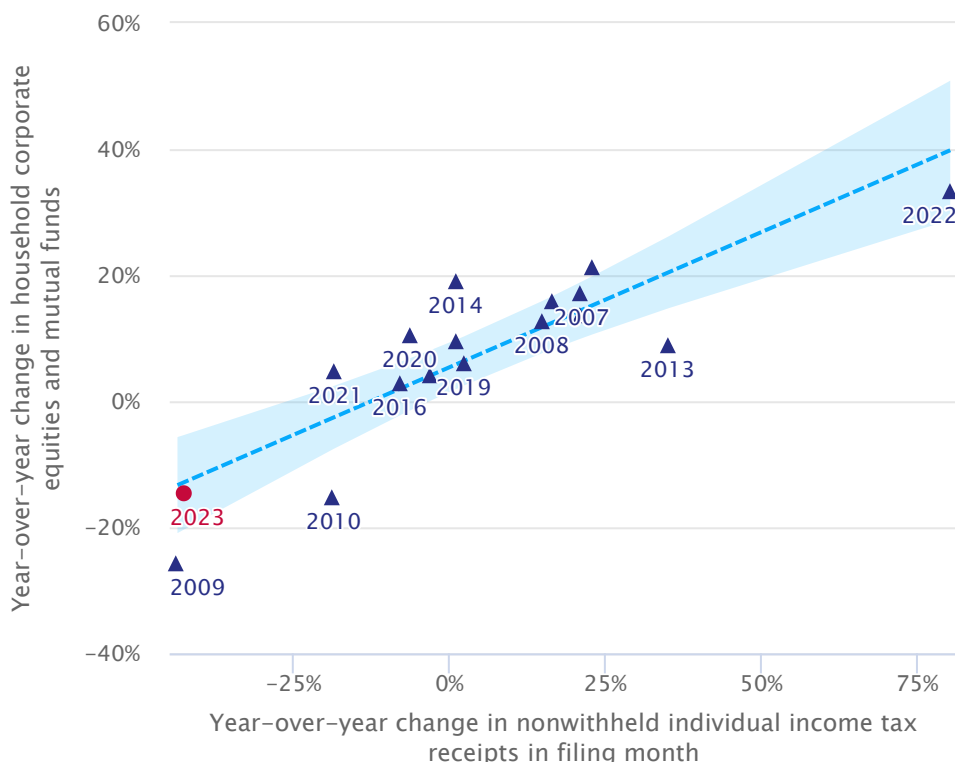


Source: Penn Wharton Budget Model using data from the Treasury Department and Bureau of Economic Analysis. Figures are adjusted for inflation using the price index for Personal Consumption Expenditures. The tax filing month is generally in April but was moved to July in 2020 and to May in 2021.

Figure 4 shows that both the 2022 surge and the 2023 collapse in nonwithheld tax receipts can be explained by the parallel rise and fall in household wealth over 2021 and 2022 (the tax years covered by returns filed in 2022 and 2023). It plots yearly changes in nonwithheld tax due at filing against growth in the value of corporate equities and mutual fund shares owned by households. These asset classes account for much of the capital gains and other asset income reported by households when they file, which in turn drives how much tax is owed at filing. The leads to a close historical relationship between asset values and nonwithheld tax paid during the tax filing season, as seen in Figure 4.

Figure 4. Nonwithheld Tax Receipts and Household Equity Wealth

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Source: Penn Wharton Budget Model using data from the Treasury Department and Federal Reserve. The labeled year refers to the year a tax return is filed and nonwithheld taxes are paid. Changes in household equities and mutual fund shares are for the prior year, the period covered by the corresponding tax return. Year-over-year changes are calculated as the difference from the previous year in the natural logarithm of each quantity. The shaded areas represent 95 percent confidence intervals around the linear trend (dashed line).

Figures 3 and 4 point to a possible explanation for why receipts in April were so much lower than anticipated: CBO underestimated the decline in capital gains and other taxable asset income from 2021 to 2022, and as result overestimated the amount of nonwithheld tax owed when taxpayers filed their returns in April. In its February projections, CBO anticipated that capital gains tax receipts in fiscal year 2023 would be \$60 billion lower than in fiscal year 2022. Notably, CBO projected capital gains receipts in 2023 about 50 percent higher than in the years preceding the pandemic (in inflation-adjusted terms). Figure 3 shows that nonwithheld tax receipts fell by around \$200 billion and were close to pre-pandemic levels in 2023, consistent with a much sharper fall in capital gains tax receipts. While there is not enough detail in either CBO’s published projections or the data available at this point to draw unambiguous conclusions, the difference of \$140 billion is similar in size to the shift in the individual income tax receipts gap that emerged over the month of April.

## Appendix

PWBM’s estimates of the receipts gap are based on a conditional forecast of tax payments in each week of the 2023 fiscal year. The forecast assumes that CBO’s revenue projections for the full fiscal year are accurate and predicts when in the year we can expect that revenue to be collected. The receipts gap is then calculated as the difference between realized tax receipts and expected tax receipts at any point in the year.

The forecast of expected receipts comes from a model relating total receipts in a fiscal year to cumulative receipts to date in each week of the year. The model aims to answer the question, "If total revenues this fiscal year are  $X$ , how much should have already been collected by week  $Y$  of the fiscal year?" It accounts for predictable features of the calendar that change from year to year, such as tax payment deadlines and holidays, but otherwise relies on the timing of tax payments in previous years to predict the timing of payments in the current year. The model is estimated using data from 2013 to 2019, and 2022.<sup>6</sup>

Figure A. Actual and Expected Receipts in Fiscal Year 2023

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Source: Penn Wharton Budget Model using data or projections from the Treasury Department and Congressional Budget Office.

Expected receipts are amounts consistent with CBO's February 2023 projections for total receipts in 2023, given the expected timing of tax payments over the fiscal year.

Figure A shows cumulative receipts expected by each week of fiscal year from the model (blue) and actual receipts through the end of April (orange). The shaded areas around expected receipts are prediction intervals that show the degree of uncertainty at a 90% confidence level. Prediction intervals account for uncertainty

about the model (like the more common confidence interval) as well as uncertainty about predictions from the model (even if the model is accurate on average, any actual observation likely differs from the average). The size of the interval depends on differences across previous years in the timing of tax payments, which occur for a number of reasons. For example, the time it takes the IRS to process returns and payments after the tax filing deadline varies from year to year, adding uncertainty to receipts in late April. The receipts gaps and uncertainty intervals plotted in Figure 2 are derived from the values in Figure A.

*This analysis was produced by [Alex Arnon](#). [Mariko Paulson](#) prepared the brief for the website.*

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1. In January, [Secretary Yellen said](#) it was unlikely funds would be exhausted before early June. ↩
2. The tax receipts gap is calculated as the difference between cumulative tax receipts since the start of the fiscal year and the level of receipts consistent with CBO's projections for the full fiscal year. PWBM estimates the level of receipts in each week consistent with CBO's projections based on the historical timing of weekly receipts relative to total receipts in a fiscal year. This is necessary because CBO only publishes budget projections at an annual (fiscal year) frequency. ↩
3. In 2020 and 2021, the tax filing deadline was moved from April, resulting in major differences in the timing of tax payments. These years are excluded from PWBM's estimates of the expected timing of tax payments in 2023. ↩
4. Most individual income and payroll taxes are withheld from earnings throughout the year and as result are generally stable and predictable. Individual income taxes paid at the time of filing are the most variable component of individual and payroll taxes and account for most of the overall uncertainty, even though they make up only around 5 to 10 percent of the total receipts. ↩
5. Most individual income taxes are withheld from wages as they are earned and paid immediately to the Treasury. Nonwithheld taxes are due when a taxpayer files their return, typically in April. ↩
6. In 2020 and 2021, the tax filing deadline was moved from April, resulting in major differences in the timing of tax payments.

The sample used to estimate the model does not meaningfully affect estimates of the total receipts gap in 2023. Daily tax payments data is available beginning in fiscal year 2006. Including earlier years in the sample slightly increases the estimated individual and payroll receipts gap and decreases the corporate receipts gap by an offsetting amount. ↩