

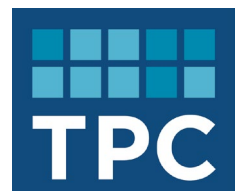


RESEARCH REPORT

Beyond the Crystal Ball: State Revenue Forecasts before, during, and after the COVID-19 Pandemic

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June 2024





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Contents

Acknowledgments	5
Executive Summary	6
Key Findings	6
Policy Recommendations	7
Beyond the Crystal Ball: State Revenue Forecasts before, during, and after COVID-19	8
Description of Data	8
Data on Forecasting Errors	8
Survey of State Officials	9
Other Data	10
Revenue Forecast Errors	11
Forecasting Errors as Percentage of Actual Revenue	13
State Tax Structures and Revenue Volatility	18
Personal Income Taxes	20
Severance Taxes	26
Assessing the Difficulties of Revenue Forecasting	27
Analyzing the Relationship between Revenue Volatility and Forecasting Accuracy	31
Managing Revenue Volatility and Forecasting Errors	35
Survey Findings: Revenue Forecasts	38
Revenue Forecasting Procedures	38
Budget Cycle	40
Forecasting Entities	40
Forecast Horizon	41
Forecast Updates	41
Forecast Timing	43
Revenue Forecast Methods	46
Recent Changes to Forecast Practices	51
Revenue Forecast Indicators	55
States' Perceived Revenue Forecast Errors	59
Revenue Forecasting Challenges	62
Recent Tax Legislation and Its Role in State Forecasts	68
Revenue Picture for Fiscal Years 2023 and 2024	71
Policy Recommendations	74
Enhance Forecasting Models and Methods	74
Enhance Collaborative Decisionmaking in Revenue Forecasting	75

Improve Transparency and Stakeholder Engagement	75
Address Structural and Policy-Related Challenges	76
Strengthening Fiscal Reserves and Managing Revenue Volatility	76
Notes	77
References	78
About the Author	79
Statement of Independence	80

Acknowledgments

Support for this project was provided by The Pew Charitable Trusts. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the author and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute’s funding principles is available at urban.org/fundingprinciples.

Thanks to our external reviewers Donald Boyd, Ralph Franklin, Scott Pattison, and Daniel Williams; Jeff Chapman, Airlie Loiaconi, Angela Oh, and Alan van der Hilst from The Pew Charitable Trusts; Richard Auxier and Tracy Gordon for their thoughtful reviews of and feedback on the report; and Alex Dallman for copyediting.

Executive Summary

This report provides an in-depth examination of the challenges and complexities involved in state revenue forecasting across different economic phases. It spans from the post–Great Recession expansion through the COVID-19 pandemic and subsequent recovery and leverages a combination of state revenue forecasts, actual revenue collections, and a survey of state revenue forecasting officials. Our goal was to provide a nuanced understanding of forecasting accuracy, the impact of economic indicators on state revenue performance, and the influence of various factors on forecasting errors.

Key Findings

- **Forecasting accuracy and errors:** States generally underestimate revenue during economic expansions and overestimate during recessions. Notably, the COVID-19 pandemic era saw historically significant underestimation errors due to the unprecedented nature of the crisis and the extraordinary federal fiscal stimulus, which led to an unexpected surge in state tax revenues (see [figure 1](#) on page 14).
- **Revenue volatility:** The volatility of state revenues, particularly from income taxes and severance taxes, poses challenges for accurate forecasting. This volatility is influenced by economic conditions, tax structures, and external factors, such as policy changes and market fluctuations.
- **Impact of economic indicators:** Economic conditions, federal and state policy changes, technological advancements, consumer behavior shifts, demographic changes, and external factors, such as geopolitical crises, significantly affect state revenue performance and forecasting accuracy. In particular, the volatility in stock and energy markets presents substantial challenges for states dependent on financial sectors or natural resources.
- **Rainy day funds:** States with robust rainy day funds were better positioned to manage the fiscal consequences of the COVID-19 pandemic and are likely to be more resilient in the face of future economic challenges.
- **Forecasting challenges:** The report highlights the increasing difficulty of forecasting state revenues accurately due to the aforementioned factors. Additionally, the reliance on economic

forecasts that are themselves subject to errors adds another layer of complexity to the revenue forecasting process.

Policy Recommendations

State revenue forecasters face multifaceted challenges in an environment marked by rapid and significant economic, demographic, and technological changes. However, policymakers, budget officers, and other stakeholders involved in state fiscal management can improve the accuracy of revenue forecasts, better manage fiscal risks, and ensure the sustainable provision of public services by:

- depoliticizing the revenue forecasting process,
- extending the forecast horizon for long-term fiscal planning,
- regularly updating revenue forecasts,
- incorporating a broad range of economic indicators,
- strengthening fiscal reserves and rainy day funds, and
- enhancing transparency and public engagement.

The findings and recommendations of this report are crucial for policymakers, budget officers, and stakeholders involved in state fiscal management, offering insights that can help navigate the uncertainties of state revenue forecasting in the years to come.

Beyond the Crystal Ball: State Revenue Forecasts before, during, and after the COVID-19 Pandemic

This report builds upon prior research conducted by the Rockefeller Institute of Government in collaboration with The Pew Charitable Trusts. It delves into an analysis of state revenue forecasting from 2013 onwards, encompassing three distinct economic phases: the post-Great Recession expansion, the COVID-19 pandemic era, and the subsequent postpandemic period.

For this report, we have collected state revenue forecasts and actual revenue collections directly from all 50 states and conducted a survey with state revenue forecasting officials for more detailed data and information. The report examines how differences in revenue structures and revenue volatility impact forecasting errors. In addition, we explore the impact of various economic indicators on state revenue performance and forecasting accuracy.

Finally, we provide policy recommendations aimed at enhancing the accuracy of revenue forecasting and effectively managing the outcomes of this process.

Description of Data

Data on Forecasting Errors

For this study, we collected actual and forecasted revenue data for fiscal years 2013 to 2023, using the official revenue forecasts that states typically publish online. Our analysis focused on overall state revenues and detailed the three key state tax sources: personal income tax, corporate income tax, and sales tax. Notably, the timing of official revenue forecasts varies across states, complicating the assessment of forecast errors. This issue was particularly evident during and shortly after the COVID-19 pandemic, as the timing of forecasts often prevented states from incorporating various policy changes.

The previous study by the Rockefeller Institute of Government primarily used actual and forecasted revenue data published by the National Association of State Budget Officers (NASBO). However, for this report, we directly collected data from the states for several reasons. First, NASBO's

data, being self-reported and gathered via surveys, tends to lack year-to-year consistency. Second, NASBO's historical records excluded actual and forecasted figures for total state revenues, only beginning to include these figures from fiscal year 2018 onwards. Third, NASBO's figures for some states are often preliminary, with occasional data gaps for certain states in some years. Although NASBO's surveys provide valuable historical context, our direct data collection approach offers more detailed and consistent information. Specifically, we gathered data from published official revenue forecasts and included data for total state tax revenues. This ensures that the information collected from each state is consistent and comprehensive.

Although NASBO data have limitations, we included it in our analysis to provide a more extensive view, especially for examining historical forecast errors. NASBO provides revenue collections and forecasts for personal income taxes, corporate income taxes, and sales taxes from its Fall Fiscal Survey of the States for each year from 1990 to 2023, covering 34 years. In contrast, our independently compiled database covers only the last decade due to the difficulty of collecting older records.

Inherent to any self-reported dataset, the NASBO data presented some anomalies that necessitated addressing. We excluded data under certain conditions: cases where either actual revenues or forecasts were reported but not both, instances where original and current estimates for two or more taxes were identical (suggesting potential inaccuracies), and situations with implausibly large forecast errors. Notably, California's data was absent in the NASBO dataset for fiscal years 2001 and 2009. Given California's economic significance, we augmented the NASBO data with figures directly received from California officials.

Survey of State Officials

In addition to analyzing revenue forecasting errors based on actual and forecasted revenue data, we also conducted a survey of state government officials involved in revenue forecasting and policy-making (including revenue forecasters, budget officers, economists, policymakers, and legislators) to gain a deeper understanding of state revenue forecasting procedures. This analysis included investigating changes in state revenue forecasting methods since the Great Recession and evaluating the pandemic's impact on forecasts and state expectations for revenue performance.

Survey questions were designed to help us get a better understanding of when estimates that underlie state budgets are developed because that influences the difficulty of the forecasting job, and to ensure we understood how these forecasts are used in the budgeting process. More specifically, the survey questions were targeted at getting more information about the parties involved in the forecasting processes, whether there is a formal group that plays a major role in the revenue estimating

process, the timing of forecasts, and the frequency of forecast updates. We also asked questions about general procedures and practices of revenue estimating processes in the states, the models used for revenue forecasting, the data and information utilized for forecasting the major sources of tax revenues, state officials' perceptions of the revenue performance for fiscal years 2023 and 2024, and the main revenue forecasting challenges.

The survey was conducted May through July 2023, with some follow-ups where needed. We emailed the survey questionnaire in a PDF fillable form to state budget officers representing both executive and legislative branches of government in all 50 states. We received 44 responses from the state officials representing the executive branch and 28 responses from state officials representing the legislative branch. Michigan was the only state for which we did not receive a response from either the executive or legislative branch. Although surveys provide valuable insights and data, it is crucial to acknowledge their inherent limitations and interpret the findings with appropriate caution. We recognize that survey responses may not always capture the complete picture or convey the full complexity of revenue forecasts.

Other Data

In addition to collecting actual and forecasted revenue data from state government websites and NASBO as well as data and information collected via surveys, we have collected additional secondary data. To estimate the size of revenue forecast errors across various tax revenue sources and states, we included state tax revenue data from the Census Bureau. Additionally, we collected secondary data from federal government agencies to assess the impact of economic and demographic factors on state revenue performance and forecasting errors. This additional data comprises

- state demographics data from the Census Bureau,
- state personal income and gross domestic product (GDP) data from the Bureau of Economic Analysis,
- state employment, unemployment, and labor force participation data from the Bureau of Labor Statistics,
- state income tax filing data by income bracket and for various sources of income from the Internal Revenue Service (IRS), and
- state capital gains tax rates from individual state government fiscal agency websites.

Finally, we retrieved GDP and unemployment forecast data from the Federal Reserve Bank of Philadelphia, conducted by the Survey of Professional Forecasters.¹

Revenue Forecast Errors

Forecast error is a widely used measure in statistics, economics, and other disciplines, which assesses the accuracy of a forecast. Forecast error is defined as the difference between actual revenues and forecasted figures. Therefore, revenue forecast error is usually calculated as the actual value minus the forecasted value, which accounts for both overestimations and underestimations. Specifically, a positive forecasting error indicates that the actual revenue exceeded the forecast, signifying an underestimate. Conversely, a negative forecasting error signifies that the actual revenue fell short of the forecast, indicating an overestimate (Boyd and Dadayan 2014).

All revenue forecasts are subject to error, regardless of the expertise of the forecaster, forecasting models, and statistical techniques utilized for forecasting revenues. Forecasting state revenues with accuracy was particularly challenging during and shortly after the global COVID-19 pandemic, due to various external factors.

First, state revenue forecasts are usually based on the forecasts of economic indicators (i.e., GDP growth rates, interest rates, S&P500, income, employment, unemployment, home prices, energy prices, auto sales, etc.) provided by professional forecasting firms, which are often subject to substantial errors. Moreover, economic conditions can change rapidly and unpredictably (like during the initial phase of the pandemic), significantly affecting key sources of tax revenues.

Second, forecasting revenues is challenging due to changes in federal and state policies, including alterations in tax laws, regulations, rates, and tax breaks. Significant policy changes, especially those enacted mid-year, can substantially alter revenue forecasts.

Third, rapid technological change, especially in certain industries like retail (e.g., the rise of e-commerce), finance, and manufacturing, has altered the economic landscape and impacted the tax base and revenue streams.

Fourth, consumer spending patterns and preferences are changing continuously, influenced by the global health crisis, by technology, and other factors. The shifts in consumer behavior impact sales tax revenues, which is one of the largest sources of state tax revenues. Other taxes also can be affected by shifts in consumer behavior.

Fifth, changing demographics, such as overall population growth, aging population, declining birth rates, and changing migration patterns, is affecting the labor market and labor force, consumer spending, and demand for public services, thus impacting the tax base and revenue forecasts.

Sixth, volatility in the stock and energy markets also adversely affects revenue streams. States with economies heavily dependent on financial sectors or natural resources are particularly vulnerable, having experienced significant impacts due to the recent instabilities in global financial markets and commodity price fluctuations.

Seventh, a range of external factors, including geopolitical crises, global health emergencies, and natural disasters such as wildfires, earthquakes, and hurricanes, along with broader environmental shifts, also have a significant negative impact on state economies and, as a result, on state revenues.

Eighth, political uncertainty and shifts in federal and state leadership, along with various political dynamics, can markedly influence public perceptions, investment choices, and spending behaviors, all of which influence state revenues.

Finally, seasonality introduces another layer of difficulty in revenue forecasting. Economic activities and tax revenues can fluctuate significantly throughout the year due to seasonal patterns, causing short-term volatility in tax revenues. Additionally, nonrepetitive, irregular seasonality factors can lead to significant revenue forecast errors particularly due to the lack of a consistent historical pattern to model and extrapolate from.

In their forecasting practices, state revenue forecasters generally adopt a conservative approach, prioritizing the avoidance of overestimates due to their belief that the repercussions of overestimating are more severe than those of underestimating. Over the past three decades, the magnitude of revenue forecast errors has been on a notable rise, presenting increasingly complex challenges for policymakers. This trend poses significant challenges for effective policy planning. To illustrate the scale of this issue, consider California: a mere 3 percentage-point deviation in revenue forecasting can translate to an excess or shortfall of over \$6 billion. Such a substantial discrepancy would present policymakers with daunting fiscal challenges, likely leading to significant budgetary adjustments and policy reevaluations.

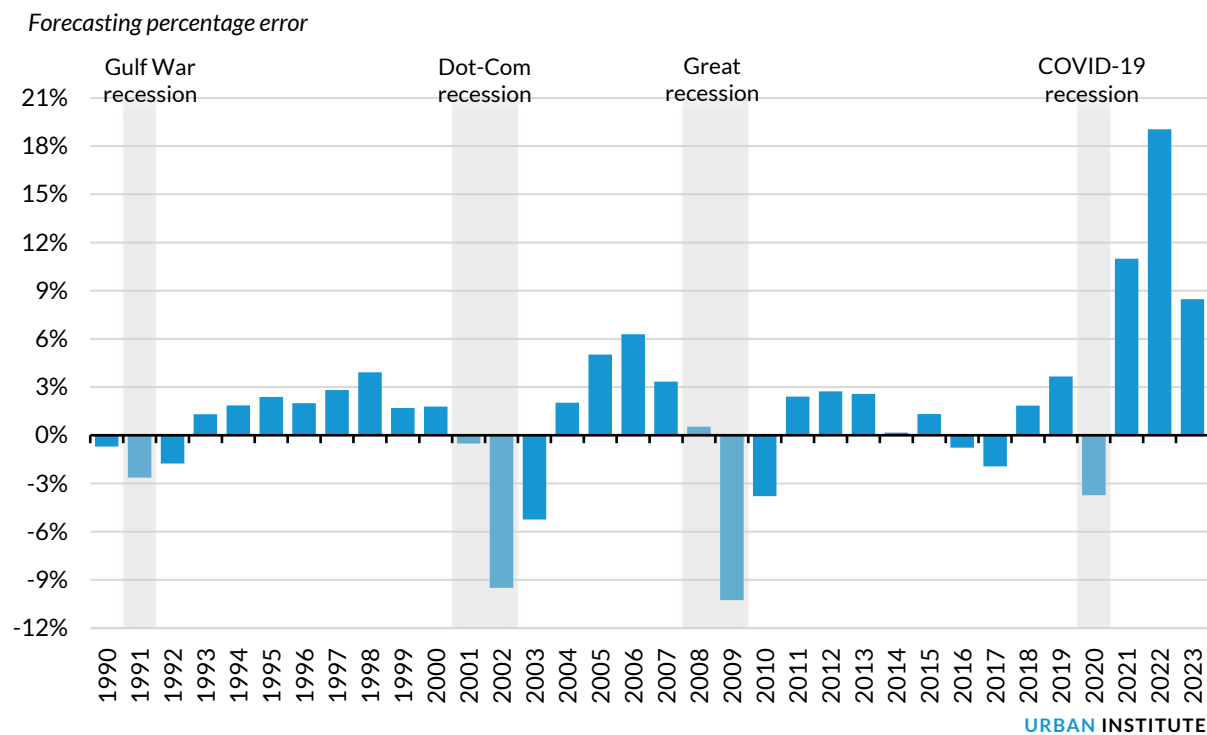
In this report, our analysis of forecast errors is anchored on two key statistical measures: the *median* and the *standard deviation*. The median is our measure of choice due to its robustness against outliers, which can significantly skew the mean and lead to erroneous interpretations of the data's core trend. Complementing the median, we utilize the standard deviation to gauge the dispersion of errors. This measure reveals the extent to which these errors deviate from the average error, offering crucial insights into their variability. This dual-measure strategy not only captures the central trend of forecast errors but also their spread.

Forecasting Errors as Percentage of Actual Revenue

Using NASBO data, we have examined revenue forecasting errors in the past four economic downturns: the Gulf War Recession (July 1990–March 1991), reflecting the spike in oil prices and high inflation that prompted the Federal Reserve to raise interest rates, and the economic impacts of military conflict; the Dot-Com Recession (March 2001–November 2001), marked by the burst of the internet bubble; the Great Recession (December 2007–June 2009), a period of severe global financial crisis; and the COVID-19 Recession (February–April 2020), which was triggered by the global COVID-19 pandemic.

Figure 1 presents median forecasting errors for the three primary sources of tax revenue over a 34-year period, from fiscal year 1990 through 2023. This figure illustrates a consistent trend: states tend to underestimate revenue during periods of economic expansion and overestimate it during and shortly after recessions due to lagged effects. Notably, the overestimation errors were particularly pronounced during the recessions of 2001 and 2007. In contrast, the period following the COVID-19 recession saw historically significant underestimation errors. This trend highlights the challenges in revenue forecasting amid varying economic conditions.

FIGURE 1
Median State Revenue Forecast Errors for Big 3 Revenue Sources, Fiscal Years 1990–2023



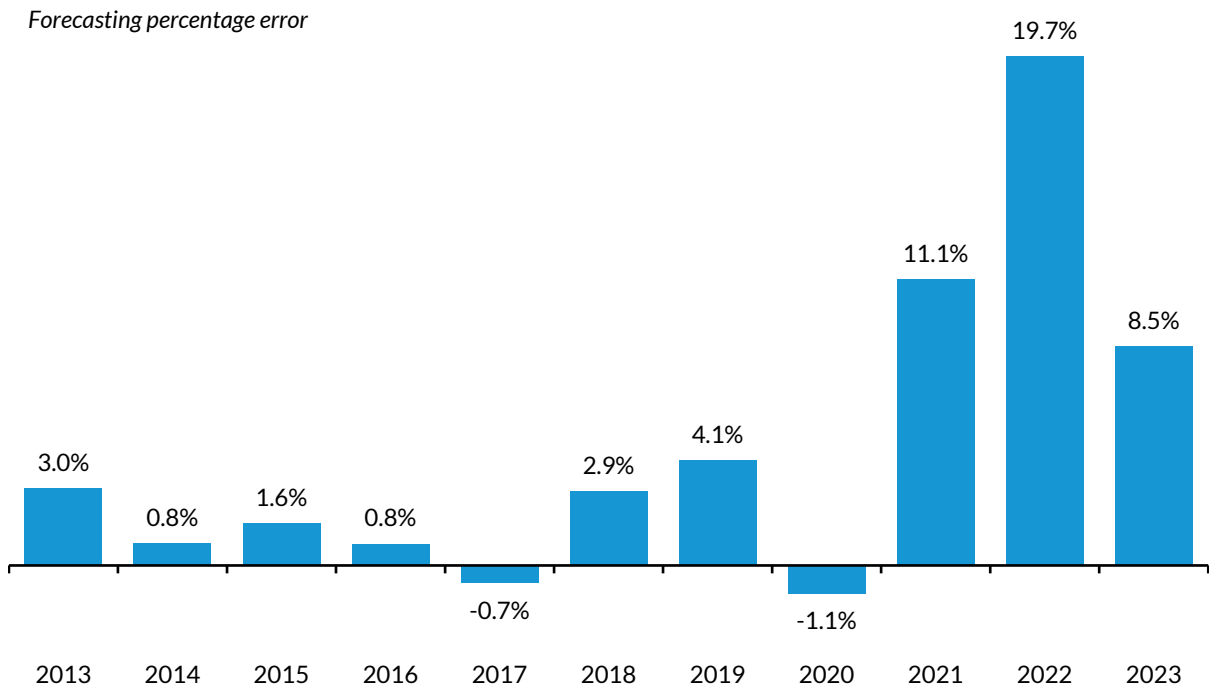
Source: NASBO Fall Fiscal Surveys; analysis by the author.

Notes: Forecasting error is the sum of personal income, corporate income, and sales taxes.

As mentioned above, we have also compiled comprehensive actual and forecasted revenue data for all states from fiscal years 2013 to 2023. This dataset focuses on total state own-source revenues, excluding federal transfers, and breaks down the major tax revenue sources: personal income tax, corporate income tax, and sales tax.

Figure 2 displays median state forecasting errors for total own-source revenues from fiscal years 2013 to 2023. This period encompasses the post–Great Recession expansion, the COVID-19 Recession, and the subsequent recovery phase. Remarkably, the median forecast error during COVID-19 Recession (fiscal year 2020) was significantly smaller than in the three preceding recessions. However, the subsequent fiscal years 2021 and 2022 saw the largest forecast errors recorded. This trend is due to the unprecedented nature of the pandemic and the extraordinary federal fiscal stimulus, which led to an unexpected revenue surge and substantial underestimation of revenues by most states. Additional contributors to the temporary surge in state tax revenues included heightened inflation, a robust stock market performance in 2021, increased spending on taxable goods, and a notable surge in initial public offerings, among other factors (Dadayan 2022a). Revenue growth has weakened substantially in fiscal year 2023. And most recent state revenue forecasts suggest stabilization, anticipating weak growth in fiscal year 2024 and modest growth in fiscal year 2025 (Dadayan 2024).

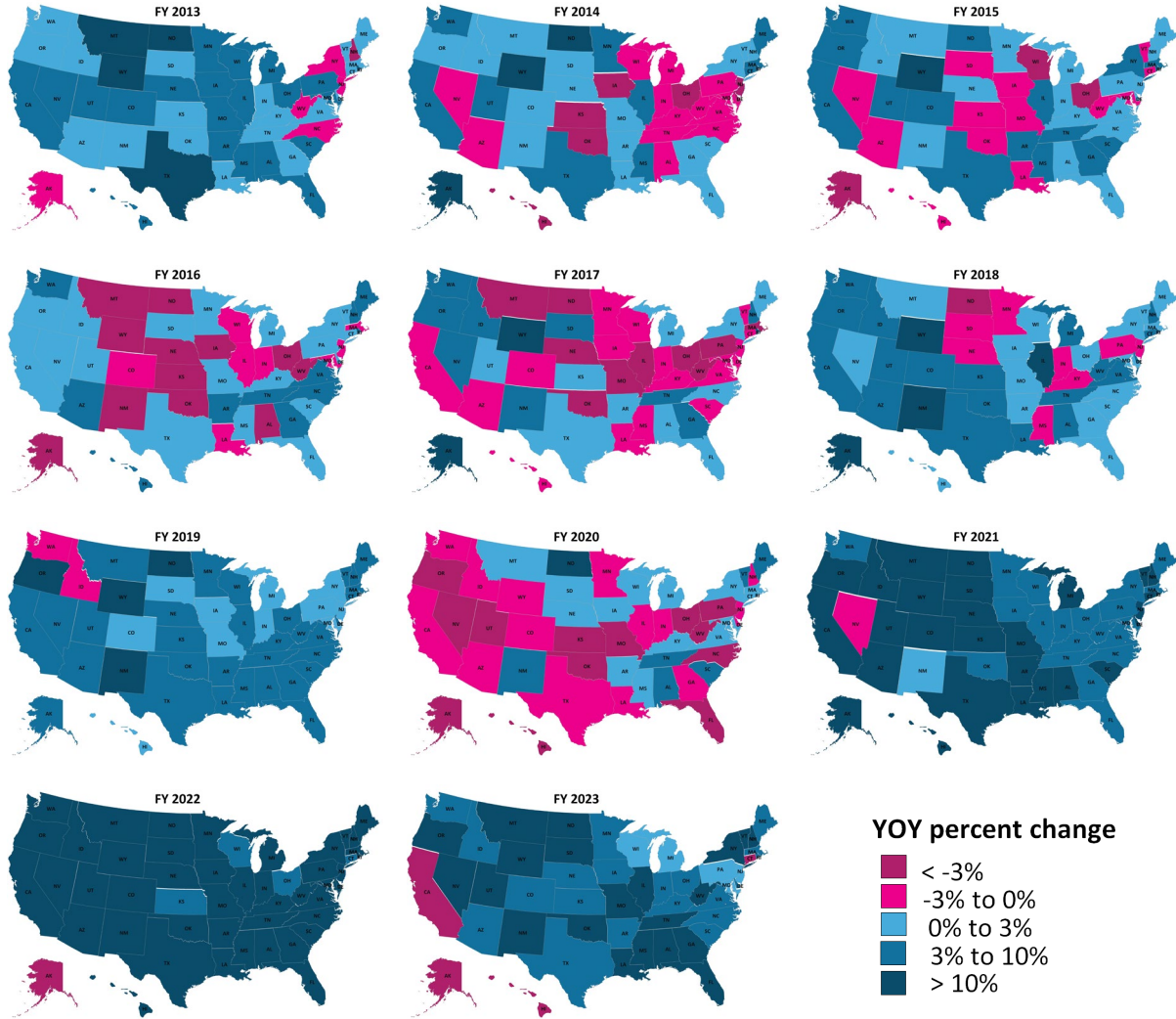
FIGURE 2
Median State Revenue Forecast Errors for Own-Source Revenues, Fiscal Years 2013–23



Source: Individual state government fiscal agency websites; analysis by the author. URBAN INSTITUTE

Figure 3 highlights the variations in own-source revenue forecast errors across different states and over time. Notably, the revenue shortfalls in fiscal years 2015 and 2016 were predominantly linked to the decline in oil prices, adversely affecting oil-dependent states.

FIGURE 3
Percentage Forecast Errors for State Tax Revenues, Fiscal Years 2013–23



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Sources: Individual state government fiscal agency websites; analysis by the author.

During the COVID-19 Recession, the overall fiscal impact turned out to be less severe than initially anticipated. However, fiscal year 2020 did see significant revenue declines in certain states. This trend was particularly pronounced in states with economies heavily reliant on tourism and service industries, such as Hawaii and Nevada, as well as in those dependent on the oil sector and severance taxes, including Alaska, New Mexico, North Dakota, and Wyoming. The initial phase of the pandemic caused

significant revenue drops in tourism and service-oriented states due to actions that individuals, businesses, and governments took to contain the spread of the virus. States with economies tied to the oil industry also faced revenue challenges, exacerbated by the sharp decline in oil prices and reduced travel and commuting during the early months of the pandemic. In contrast, nearly all states saw a revenue surge in fiscal years 2021 and 2022, which led to significant and unprecedented underestimations in revenue forecasts across the states.

Table 1 presents the distribution of median forecast errors for different tax categories across states for fiscal years 2013–23. The data indicate a higher frequency and magnitude of forecast errors in corporate income tax revenues compared with personal income tax revenues, with the smaller forecast errors observed in sales tax revenues. The pattern indicates a possible recurring bias in revenue forecasts, characterized by a tendency to underestimate revenues. This trend may reflect a strategic approach by forecasters aimed at minimizing the risk of facing unexpected revenue shortfalls.

TABLE 1
Number of States by Median Forecast Error and Tax, 2013–23

Size of median forecast error	Personal income tax	Corporate income tax	Sales tax	Big 3	Total tax
< -2%	1	2	0	1	0
-2% to 0%	6	1	12	2	3
0% to 2%	11	2	19	14	14
2% to 3%	6	2	7	13	10
3% to 4%	6	2	4	9	9
4% to 5%	5	0	1	4	6
5% to 10%	5	10	2	5	6
> 10%	3	27	0	2	2
Total	43	46	45	50	50

Sources: Individual state government fiscal agency websites. Analysis by the author.

Table 2 displays the median forecast errors and standard deviations by state for major sources of tax revenues as well as for overall tax revenues for fiscal years 2013–23. Corporate income tax revenues display a median forecast error of 6.2 percent, which is substantially higher than the median forecast errors for personal income tax at 2.4 percent, and sales tax at 1.1 percent. This significant disparity highlights the complex nature of projecting corporate profits, which are subject to considerable fluctuation. The standard deviation shows the spread of revenue forecast errors around the median. A high standard deviation indicates wide yearly variation and less predictability. Corporate income tax revenues had a standard deviation over twice that of personal income tax and three times that of sales tax, highlighting the complexity and uncertainty in forecasting corporate income tax revenues.

TABLE 2

Median Forecast Errors and Standard Deviations by Tax and State, Fiscal Years 2013–23

State	Median Forecast Error, 2013–23				Standard Deviation, 2013–23			
	PIT	CIT	Sales	Total	PIT	CIT	Sales	Total
United States	2.4%	6.2%	1.1%	3.7%	7.5%	16.6%	4.9%	6.5%
Alabama	4.9	0.4	1.1	4.0	11.3	10.9	6.1	8.7
Alaska	-	(14.7)	-	(1.5)	-	39.3	-	102.1
Arizona	3.5	15.4	1.9	3.0	10.9	33.1	5.8	8.3
Arkansas	2.4	13.3	(0.9)	3.4	9.0	19.1	5.2	7.0
California	5.1	5.4	(1.5)	4.3	17.4	21.1	10.2	14.3
Colorado	3.3	15.3	1.6	3.2	9.0	28.4	6.3	8.0
Connecticut	(0.9)	14.8	3.5	1.6	9.7	17.9	6.1	5.2
Delaware	2.4	6.3	-	2.0	6.1	46.8	-	6.3
Florida	-	3.0	1.2	2.0	-	14.3	7.8	7.9
Georgia	1.9	12.3	1.6	3.5	9.6	24.9	8.2	8.7
Hawaii	3.8	35.6	(0.6)	0.4	18.1	434.1	4.7	10.3
Idaho	1.6	8.0	2.5	2.3	12.1	29.3	4.9	9.3
Illinois	5.5	13.5	2.3	6.2	8.0	31.5	5.0	7.5
Indiana	1.2	8.2	(0.4)	0.2	6.2	22.0	4.1	5.0
Iowa	(0.8)	7.0	(1.3)	1.0	5.6	11.2	4.4	6.0
Kansas	(3.2)	18.9	1.6	2.6	13.2	29.7	5.4	7.1
Kentucky	2.3	29.2	6.0	2.4	5.2	15.7	5.1	5.7
Louisiana	7.1	30.9	2.3	2.7	6.5	41.0	8.6	8.1
Maine	3.6	10.8	2.5	4.1	8.5	20.6	4.8	5.8
Maryland	1.1	7.2	(1.1)	0.6	4.9	12.0	6.0	5.0
Massachusetts	3.4	10.5	0.9	3.1	9.6	11.9	6.2	8.7
Michigan	1.9	5.9	1.3	1.6	9.0	20.0	8.1	7.8
Minnesota	1.5	20.1	(1.0)	3.1	6.7	15.3	2.6	5.7
Mississippi	4.0	14.4	2.2	6.2	10.1	19.3	6.6	7.4
Missouri	(0.3)	6.9	0.4	1.3	9.1	19.8	5.4	9.2
Montana	2.3	10.3	-	2.8	14.4	29.1	-	13.5
Nebraska	1.0	16.9	(0.7)	2.3	10.9	18.5	5.2	8.1
Nevada	-	-	(0.3)	2.6	-	-	8.6	6.9
New Hampshire	9.3	13.8	-	4.4	9.7	13.8	-	6.8
New Jersey	(0.2)	2.4	(0.4)	(0.0)	8.5	22.7	5.7	10.3
New Mexico	10.1	(13.6)	1.0	3.0	9.7	92.5	13.9	8.7
New York	1.0	(0.9)	0.1	1.9	7.7	21.4	3.0	6.7
North Carolina	2.8	11.1	1.2	2.1	7.4	12.7	7.3	6.2
North Dakota	15.5	53.4	9.2	15.6	25.3	86.0	42.4	20.7
Ohio	4.1	6.0	3.3	2.6	13.6	8.9	3.8	5.6
Oklahoma	1.5	29.0	(1.0)	0.1	8.5	57.4	7.0	10.3
Oregon	5.0	14.6	-	6.1	13.3	27.0	-	14.4
Pennsylvania	(0.6)	11.0	0.4	1.3	6.6	16.8	4.0	5.8
Rhode Island	0.9	2.5	2.3	7.0	8.6	22.7	6.2	5.0
South Carolina	2.3	13.1	1.2	4.0	8.6	24.8	8.3	7.9
South Dakota	-	16.0	1.5	1.5	-	43.2	6.1	5.7
Tennessee	14.7	14.4	3.2	4.8	33.7	12.8	6.0	6.1
Texas	-	-	4.1	7.0	-	-	6.3	5.7
Utah	6.2	24.4	0.7	5.1	8.6	29.7	6.7	8.2
Vermont	3.3	28.7	0.7	2.3	8.5	16.1	4.4	6.4
Virginia	4.1	3.3	0.4	3.1	6.5	15.2	6.2	6.3
Washington	-	-	3.6	4.2	-	-	3.1	3.6
West Virginia	1.7	1.0	(0.3)	(0.8)	9.1	35.5	7.6	11.3
Wisconsin	(1.3)	5.9	1.4	0.6	4.0	19.1	1.9	3.3
Wyoming	-	-	2.6	22.8	-	-	14.3	13.4

Sources: Individual state government fiscal agency websites. Analysis by the author.

Note: CIT = corporate income tax; PIT = personal income tax.

Among individual states, those that experienced the largest revenue forecast errors were states that are heavily reliant on the oil and gas industry—and consequently on severance tax revenues. These states face two kinds of heightened volatility: (1) their economies are volatile, reflecting variability in oil and gas prices and production, and (2) their tax structure heavily depends on these volatile economic elements. Both factors significantly complicate revenue forecasting. This was especially evident in Alaska, North Dakota, and Wyoming; all three states are dependent on energy production. Alaska has a very high median error for corporate income tax revenues and an extraordinarily high standard deviation for total revenue forecast errors, which reflects the state's reliance on volatile oil revenues that are hard to predict. Both North Dakota and Wyoming showed exceptionally high median errors and standard deviations, again indicating significant volatility and unpredictability of revenues from oil production. Median forecasting errors for total tax revenues were negative only in four states—New Jersey, Ohio, Oklahoma, and West Virginia, suggesting a general tendency among state revenue forecasters to avoid overestimating revenue.

Overall, considerable variation exists in forecast accuracy and variability among states, reflecting unique economic conditions, tax structures, and forecasting challenges in each state due to the inherent unpredictability of certain revenue sources.

State Tax Structures and Revenue Volatility

States have diverse tax structures, dependencies on distinct tax sources, and varied economic profiles. [Figure 4](#) presents the median shares of state tax revenue from key sources during fiscal years 2013–23.

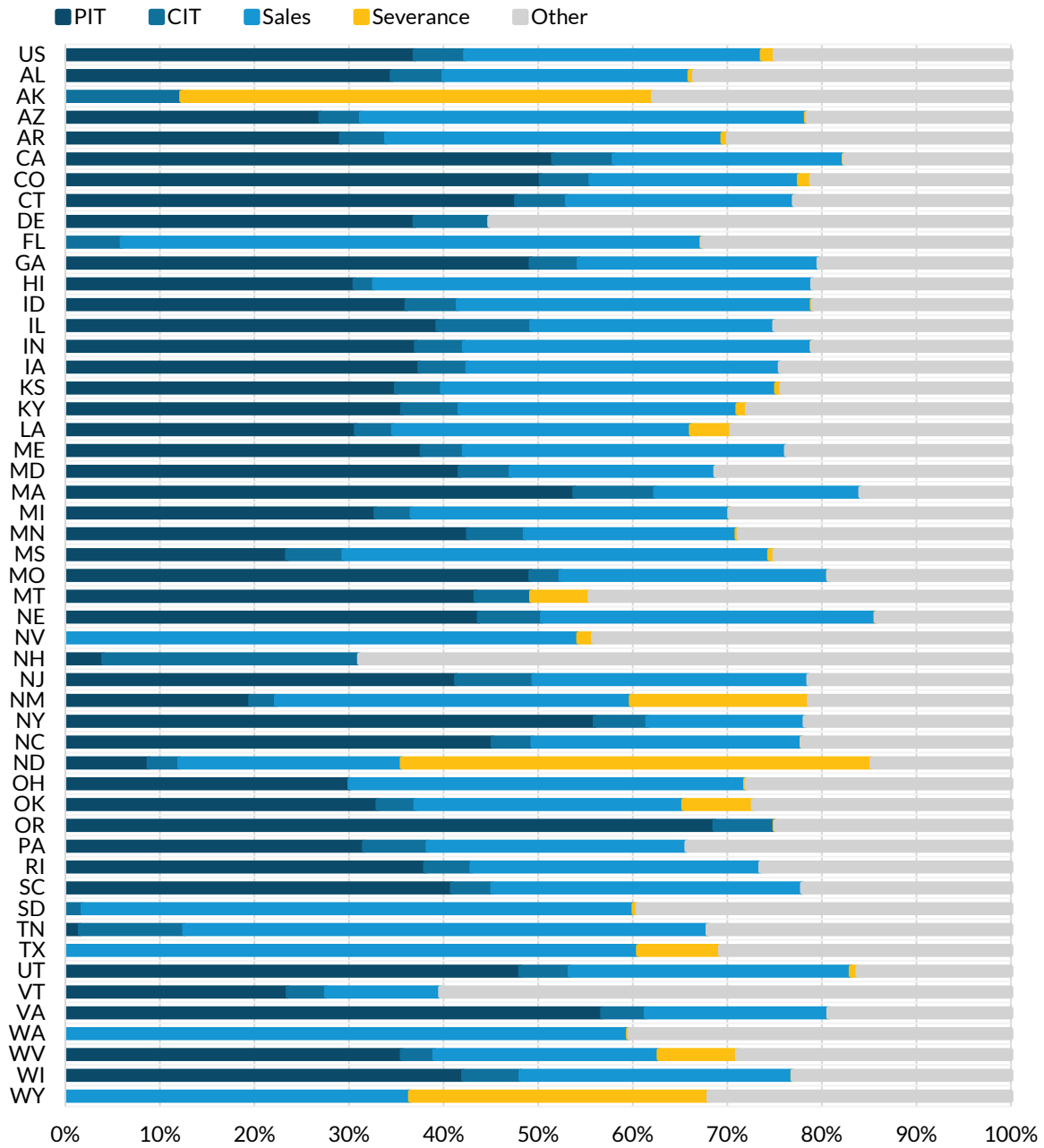
Personal income taxes: Five states—Oregon, Virginia, New York, Massachusetts, and California—have the highest reliance on personal income tax, with more than 50 percent of their own-source revenues raised from personal income taxes.

Corporate income taxes: Although corporate income tax revenues usually account for a smaller portion of the state total tax revenues, New Hampshire and Alaska see significant contributions from corporate income tax.

Sales taxes: Florida, Texas, Washington, South Dakota, Nevada, and Tennessee depend on sales taxes for more than half of their own-source revenue. The absence of a broad-based personal income tax in these states shifts the revenue reliance to consumption taxes.

Severance taxes: Alaska, North Dakota, Wyoming, and New Mexico raise a significant portion of their tax revenue from severance taxes. These states depend heavily on natural resource industries, such as oil and mining, which contribute substantially to their state revenues.

FIGURE 4
State Tax Revenue Shares from Major Sources, Median for Fiscal Years 2013–23



Source: US Census Bureau; analysis by the author.
 Note: CIT = corporate income tax; PIT = personal income tax.

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Given that states differ in their reliance on specific revenue sources, it is understandable that those heavily dependent on a particular source or on volatile revenues encounter unique challenges in accurate revenue forecasting (The Pew Charitable Trusts 2015). This is particularly evident in oil-rich states like Alaska, North Dakota, Wyoming, and New Mexico, where severance taxes account for over one-third of own-source revenues, as well as in Oregon, where personal income taxes account for approximately two-thirds of its own-source revenues. As mentioned above, these states have notably higher standard deviation in revenue forecasting errors, reflecting the unpredictability and volatility inherent in their primary revenue sources. In fact, Alaska, North Dakota, and Wyoming had the highest overall revenue volatility in the last two decades (Theal, Janson, and Venu 2023).

Personal Income Taxes

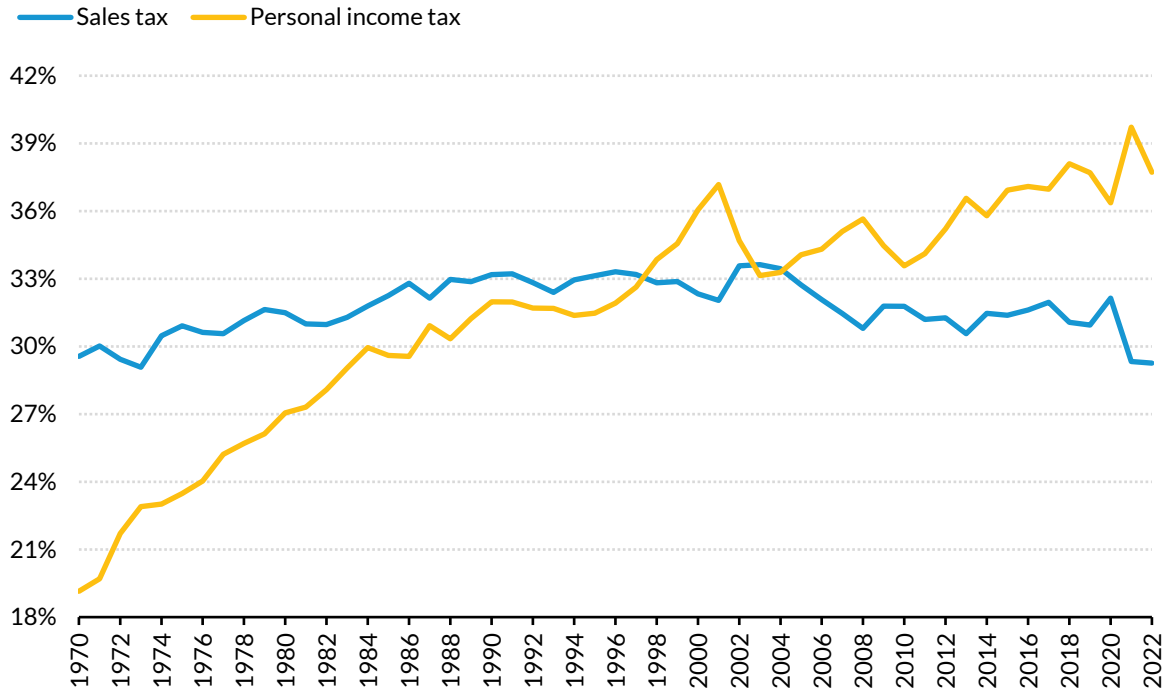
In fiscal year 2022, states collected \$1.5 trillion in tax revenues, with personal income taxes contributing \$554 billion, or around 38 percent, of this total. Reliance on personal income tax revenues largely varies among states, ranging from over 60 percent in Oregon to nothing at all in seven states without a personal income tax. Over the last 50 years, the share of state revenues coming from personal income tax has seen a substantial increase, rising from one-fourth of total taxes in 1970 to over one-third in 2022. This growth has been driven by the rate of income tax liability increasing faster than income growth itself. Contrastingly, sales tax revenues as share of total tax revenues saw less fluctuations (see [figure 5](#)).

The variability of state personal income taxes can be attributed to the progressive nature of income taxation. States with progressive tax systems collect a larger proportion of income tax revenue from high-earning individuals. For instance, in 2021, individuals earning \$500,000 or above—comprising about 1.6 percent of tax filers—were responsible for nearly 30 percent of the total federal income tax liability. This reflects a significant concentration of tax liability among high-income earners, especially pronounced in states with progressive income tax structures. Such high-income taxpayers often receive a sizable amount of their income from nonwage sources like investments, which are subject to market fluctuations, making their tax liability highly volatile. Moreover, these taxpayers may have the ability to influence the timing of this income, particularly in the case of capital gains, adding an additional layer of unpredictability to state tax revenues.

In 2021, capital gains made up a substantial 35.9 percent of the adjusted gross income (AGI) for taxpayers earning above \$500,000, but just 4.4 percent for those earning below this threshold. Similarly, income from partnerships and S Corporations constituted 18.1 percent of AGI for the higher earners compared to a mere 1.7 percent for the lower earners. In stark contrast, wages and salaries

formed a smaller portion of the AGI—32.5 percent for those with incomes over \$500,000, as opposed to 73.2 percent for those earning less, highlighting the varying income compositions across different income levels.

FIGURE 5
Personal Income and Sales Taxes as Share of State Total Tax Revenues, Fiscal Years 1970–2022



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Source: US Census Bureau; analysis by the author.

Table 3 illustrates the variability in growth rates between personal income, AGI, and major components of AGI, underscoring in particular the fluctuating impact of capital gains on state budgets. Although personal income is a broader measure of income in a state’s economy, AGI, as the common starting point for state tax calculations, presents a more erratic profile influenced heavily by nonwage income. For instance, in years like 2014, 2017, 2018, and 2021, the growth in AGI outpaced personal income growth, driven by substantial increases in capital gains and other nonwage income. Conversely, in years such as 2013, 2015, 2016, and 2019, AGI growth lagged behind personal income, often due to declines in capital gains. This pattern highlights the disproportionate effect that capital gains, which are subject to market fluctuations, have on AGI.

Because of higher reliance on nonwage income, state personal income tax revenues became far more volatile in the recent years, showing steep growth during economic booms and steep declines during economic downturns, posing challenges for state fiscal stability.

TABLE 3

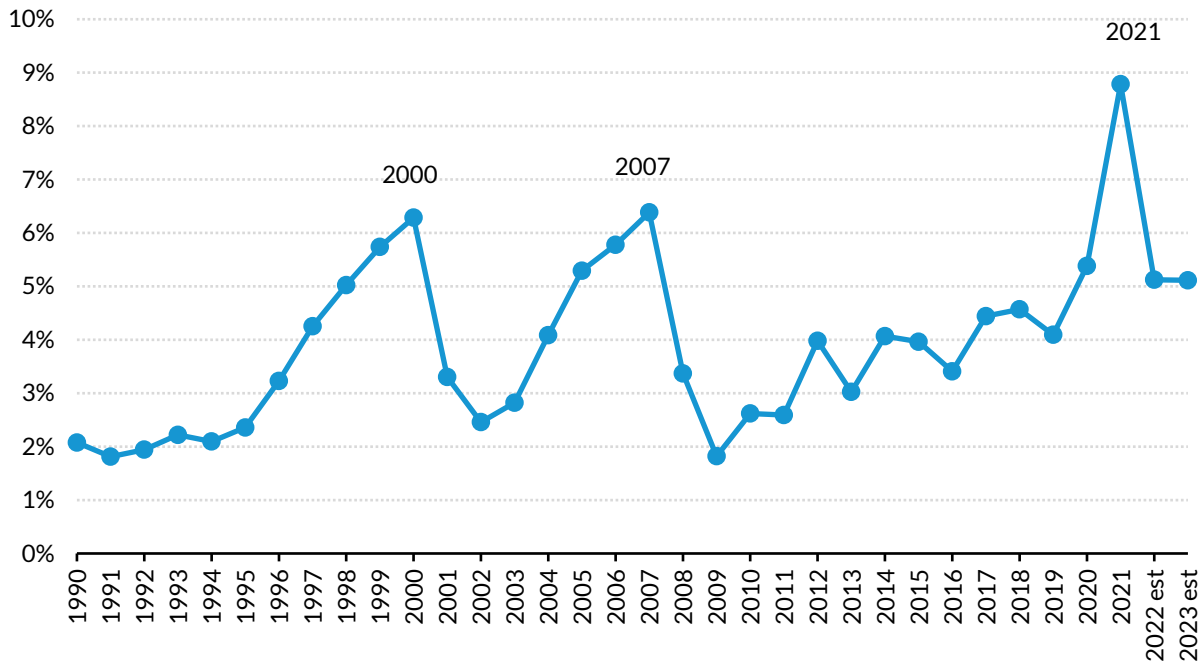
Year-over-Year Growth in Personal Income, AGI, and Major AGI Components

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Personal income	1.1%	5.1%	4.7%	2.7%	4.9%	5.1%	4.7%	6.9%	9.1%
AGI	-0.3%	7.2%	4.6%	0.5%	7.8%	5.8%	2.7%	5.1%	17.7%
Wages and salaries	2.3%	4.3%	1.7%	0.1%	5.1%	4.4%	4.6%	1.6%	7.4%
Capital gains	-19.5%	43.2%	-2.4%	-3.2%	38.3%	8.1%	-6.5%	29.6%	82.9%
Partnership & S-corporation	-1.2%	9.6%	8.2%	-0.2%	8.3%	1.0%	0.3%	3.9%	37.3%
All other elements of AGI	-3.1%	6.9%	3.3%	0.6%	7.5%	12.0%	0.6%	8.9%	17.3%

Sources: IRS, Statistics of Income (AGI and components) and Bureau of Economic Analysis (personal income). Analysis by the author.

Capital gains play a crucial role in state budgets and have become increasingly important when measured as a share of GDP. Figure 6 shows capital gains as a share of GDP from 1990 through 2021 and provides Congressional Budget Office estimates for 2022 and 2023.² Figure 7 shows the year-over-year percentage change in federal capital gains realizations versus the calendar-year-average S&P 500 index from 1990 through 2023. As shown in figure 6, capital gains are very volatile, and as shown in figure 7, capital gains and the stock market usually increase and decrease at similar times, but movements in capital gains generally are far greater.

FIGURE 6
Capital Gains as Percentage of GDP, 1990–2023

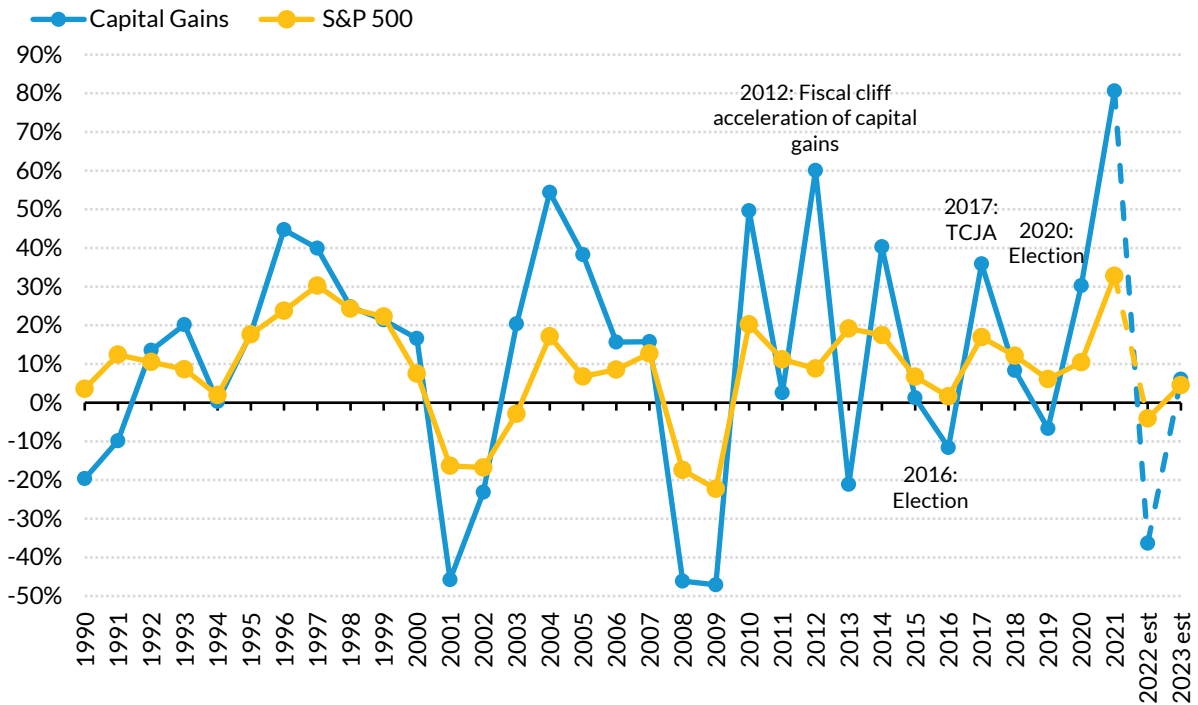


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Sources: Congressional Budget Office (capital gains) and Bureau of Economic Analysis (GDP), analysis by the author.

FIGURE 7

Year-over-Year Percent Change in Capital Gains Realizations vs S&P 500



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Sources: Congressional Budget Office (capital gains) and Yahoo Finance (S&P 500), analysis by the author.

Note: TCJA = Tax Cuts and Jobs Act.

Capital gains taxation has a dynamic nature, particularly for high-income individuals, which becomes especially pronounced during periods of rapid market growth. “When financial markets rise rapidly, high-income taxpayers can have huge increases in the values of corporate stock and other assets. Whether and when these gains will turn into income tax revenue is complex” (D. J. Boyd 2011, p. 1).

There were notable spikes in the years 2000, 2007, and 2021, with capital gains as a share of GDP more than doubling since the 1990s. The spike in 2000 coincided with the dot-com bubble, where excessive speculation in internet-related companies drove stock prices up and resulted in high levels of capital gains. After experiencing sharp declines in 2001 and 2002, capital gains rebounded, climbing consistently until peaking again in 2007. The spike in 2007 can be attributed to the housing market boom and subsequent financial market peaks before the Great Recession. The financial crises that ensued in 2008 and 2009 precipitated steep falls in capital gains, echoing the broader market and economic downturns. After 2009, capital gains generally trended upwards, with a significant spike in 2021 driven by temporary factors, before experiencing a decline in 2022. The spike in 2021 was largely linked to the economic recovery post-COVID-19 lockdowns, and a booming stock market. It is

important to note that while the stock market significantly influences capital gains—often accounting for more than half of all such gains—it is not the sole determinant. Other assets, including bonds, real estate, and broader economic factors, also contribute to the dynamics of capital gains, underscoring the complex interplay between various economic indicators and capital gains realizations.

It is also important to emphasize the impact of tax policy expectations on investment decisions. Capital gains fluctuations in recent years highlight how taxpayer behavior responds to anticipated changes in tax policy. In 2016, despite a rising stock market, capital gains dipped by 11.6 percent, possibly because high-income taxpayers reallocated their incomes in anticipation of tax cuts proposed by then-presidential candidate Donald Trump. This behavior aligns with strategies to defer income to benefit from expected lower tax rates, and to expedite deductions within a higher tax period. The surge in capital gains in 2017 can be largely attributed to the Tax Cuts and Jobs Act (TCJA), which, among other changes, introduced a cap on the state and local tax (SALT) deduction starting January 1, 2018. In preparation, taxpayers likely moved income into 2017 to make use of the more favorable, uncapped SALT deductions available at that time. Similarly, the spike in capital gains in 2020 could be related to the outcome of the presidential election, where fears of increased capital gains taxes under President Biden's administration led taxpayers to accelerate income into the year 2020, thereby locking in the existing lower tax rates.

States vary widely in their reliance on capital gains. [Table 4](#) shows, for each of the forty-one states with a broad-based income tax: (1) capital gains as a share of AGI, (2) the state's top tax rate on capital gains from corporate equities, and (3) the state's reliance on the personal income tax as a share of total taxes. Additionally, the table introduces a 'capital gains importance' ranking, derived by multiplying the share of capital gains by the state's top capital gains tax rate, and then ranking the states accordingly. This ranking serves as an index to assess the relative significance of capital gains within each state's income tax revenue. States ranking higher are those with a greater reliance on capital gains, whereas those ranking lower have a lesser reliance. The measure should be taken as a broad indicator of capital gains reliance within the income tax; small differences between states should not be considered meaningful. [Table 4](#) also shows the personal income tax as a share of total taxes, though this is not factored into the “capital gains importance” ranking. States that both rank highly on capital gains and depend significantly on personal income tax are more vulnerable to the uncertainties of capital gains volatility, and thus can have higher personal income forecast errors. During the Great Recession, “the most important source of variation was differences in income concentration and capital gains shares in the top 5 percent of taxpayers” (Chernick, Reimers, and Tenna 2014, p. 1).

TABLE 4

Income-Tax States Ranked by a Measure of Capital Gains Dependence, 2021

State	Capital gains as share of AGI	Top capital gains tax rate on corporate equities	Rank (1 = highest), considering capital gains share & top rate together	Personal income tax as share of total taxes
United States	13.8	5.9		39.7
California	15.4	13.3	1	58.0
New York	17.3	8.8	2	58.8
Connecticut	17.5	7.0	3	46.5
New Jersey	11.2	10.8	4	38.5
Montana	17.0	6.9	5	48.7
Oregon	11.1	9.9	6	63.3
Idaho	15.7	6.9	7	38.0
Vermont	11.9	8.8	8	30.1
Minnesota	10.5	9.9	9	47.7
Arkansas	15.5	5.9	10	29.6
Massachusetts	18.1	5.0	11	54.2
Hawaii	11.2	7.3	12	41.7
South Carolina	11.3	7.0	13	41.1
Utah	16.0	5.0	14	52.8
Georgia	13.4	5.8	15	51.1
Colorado	16.8	4.6	16	54.5
Maine	10.5	7.2	17	38.1
Wisconsin	9.7	7.7	18	40.5
Nebraska	10.9	6.8	19	45.0
Illinois	14.1	5.0	20	39.4
Iowa	7.7	8.5	21	36.1
Virginia	11.3	5.8	22	52.8
Kansas	11.2	5.7	23	39.7
Rhode Island	10.4	6.0	24	40.5
Louisiana	9.8	6.0	25	32.1
Maryland	10.1	5.8	26	40.4
Arizona	12.9	4.5	27	31.5
North Carolina	10.9	5.3	28	45.8
New Mexico	9.3	5.9	29	15.9
Missouri	10.1	5.4	30	51.1
Delaware	7.9	6.6	31	39.8
Alabama	9.7	5.0	32	34.4
Oklahoma	9.1	5.0	33	33.3
Ohio	9.3	4.8	34	30.5
Michigan	9.7	4.3	35	34.8
Kentucky	8.1	5.0	36	35.6
North Dakota	13.3	2.9	37	11.5
Pennsylvania	11.0	3.1	38	32.2
West Virginia	4.9	6.5	39	37.3
Mississippi	6.2	5.0	40	26.9
Indiana	9.3	3.2	41	39.7

Sources: IRS, Statistics of Income (capital gains and AGI), individual state government fiscal agency websites (capital gains tax rates), and US Census Bureau (taxes). Analysis by the author.

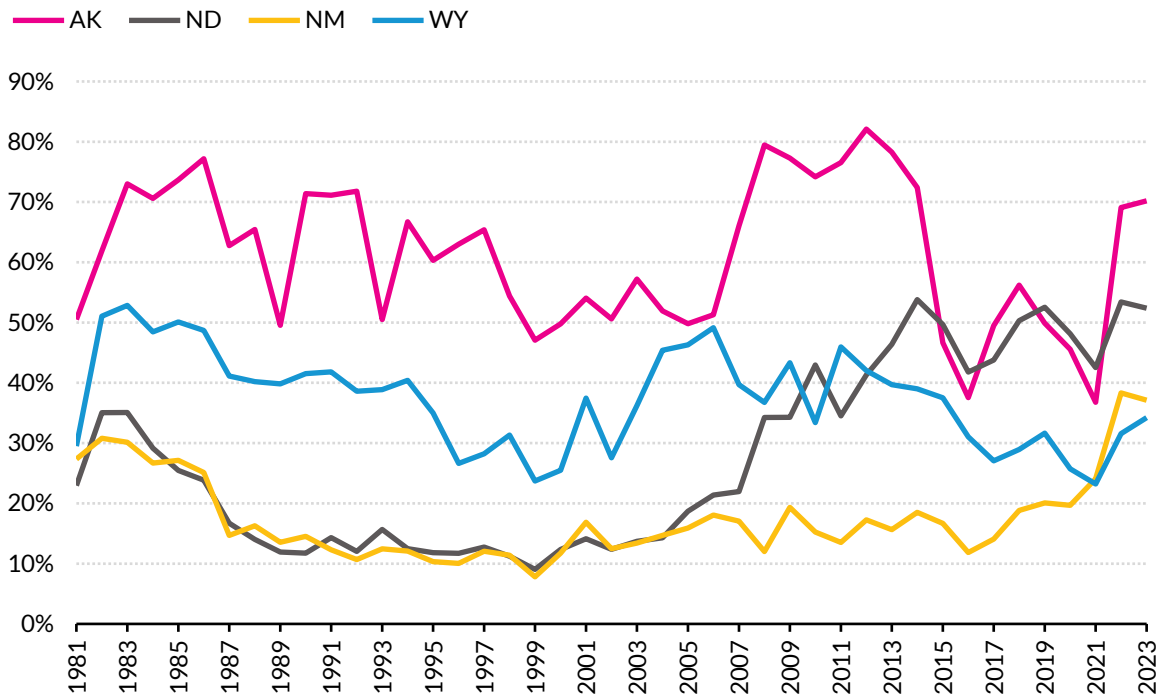
Note: AGI = adjusted gross income.

Severance Taxes

For oil-dependent states, economic growth and tax revenues are highly dependent on energy price changes. Declines in oil prices lead to cuts in production and employment, weakening mineral-state economies. Because some of the oil and mineral-dependent states do not have diversified tax structures and economies, declines in oil prices create fiscal challenges and budget shortfalls (Dadayan 2022b).

Figure 8 presents the share of total tax revenues derived from severance taxes over the past four decades in Alaska, New Mexico, North Dakota, and Wyoming. Severance taxes, which come from the extraction of natural resources, constitute a significant and volatile portion of these states' revenues, with fluctuations largely tied to the changing prices of commodities and levels of production. Among these four states, Alaska's revenue from severance taxes shows the most dramatic fluctuations, with peaks surging above 80 percent at times, reflecting its heavy reliance on and the volatility inherent in this revenue source. New Mexico's and North Dakota's share of severance taxes show a rising trend from the mid-2000s onward, correlating with the states' shale oil extraction boom. Wyoming, while less volatile than Alaska, also exhibits variability, with severance taxes making up roughly one-third of its total tax revenues in recent years.

FIGURE 8
Severance Taxes as Share of Total Tax Revenues, Selected States



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Source: US Census Bureau; analysis by the author.

Figure 8 indicates that while all three states rely on severance taxes to varying degrees, the proportion of revenue that these taxes contribute fluctuates greatly over time, reflecting the inherent volatility in relying on commodities for state income. It also underscores the challenges for the forecasters in these states in budget planning due to the unpredictable nature of severance tax revenues.

Assessing the Difficulties of Revenue Forecasting

Assessing revenue forecast errors across states or over varying periods is challenging due to the complex forecasting nature. Forecasting difficulty can vary significantly, influenced by factors such as the inherent volatility of certain taxes, the uncertainty of specific periods, and the economic variability of some states. Therefore, larger forecast errors in a given year or state might not necessarily reflect a lack of skill on the part of the forecaster. Instead, these discrepancies often indicate a more challenging forecasting environment. This complexity underscores the importance of considering the context in which forecasts are made when evaluating the accuracy of revenue forecasts (Boyd and Dadayan 2014).

As noted above, nearly all states had significantly underestimated revenues for fiscal years 2021 and 2022. Large revenue forecast errors across all states are a testimony of a rather challenging task. Revenue forecasters usually include measures of economic conditions in regression models, such as GDP, unemployment rates, personal income, and housing prices among others. Although it is useful, the broad measures of economy alone do not determine the performance of tax revenues. For example, federal and state policy decisions can have a significant impact on state revenue performance. In addition, the performance of capital gains can vary substantially even under stable economic conditions, leading to large revenue forecast errors.

Adding to the complexity, the economic indicators and forecasts that are integrated into the state revenue forecast models are often subject to large forecast errors. As an example, during the December 2022 meeting, the Federal Open Market Committee projected 0.5 percent growth in real GDP for 2023, yet the actual growth was 2.5 percent.³ Forecasts from TD Bank, Deloitte, Goldman Sachs, and other esteemed organizations offered slightly varied predictions for real GDP growth, again resulting in large forecast errors.

Table 5 displays a comparison of forecasted and actual figures for real GDP growth and unemployment rates from 2013 to 2024, complete with forecast errors. The forecast errors for both the real GDP growth and unemployment rates vary from year to year, but overall were relatively close

to the actual figures from 2013 to 2019. The forecast errors were significantly large for 2020, mostly due to the unexpected economic impact of the COVID-19 pandemic. Notably, large forecast errors persisted in 2021, 2022, and 2023, which highlight the challenges in predicting economic indicators in a period that is marked by considerable volatility and uncertainty. Given the substantial deviations in economic forecasts during this period, it is not surprising that the size of the errors in state revenue forecasts was also unusually large, reflecting the difficulty of making accurate predictions amid such unprecedented economic fluctuations.

TABLE 5

Forecasted and Actual Values for Real GDP Growth and Unemployment Rate

Year	Real GDP Growth				Unemployment Rate			
	Forecast	Actual	Difference	Forecast error	Forecast	Actual	Difference	Forecast error
2013	2.0	2.1	0.1	5.9%	7.8	7.4	(0.4)	-5.5%
2014	2.6	2.5	(0.1)	-2.9%	7.0	6.2	(0.8)	-11.9%
2015	3.0	2.9	(0.1)	-1.8%	5.6	5.3	(0.3)	-5.7%
2016	2.6	1.8	(0.8)	-30.0%	4.8	4.9	0.1	1.4%
2017	2.2	2.5	0.3	11.7%	4.7	4.4	(0.3)	-7.3%
2018	2.5	3.0	0.5	18.7%	4.1	3.9	(0.2)	-5.0%
2019	2.7	2.5	(0.2)	-8.6%	3.7	3.7	(0.0)	-0.8%
2020	1.8	-2.2	(4.0)	-223.0%	3.7	8.1	4.4	118.1%
2021	4.0	5.8	1.8	45.0%	6.3	5.3	(1.0)	-15.9%
2022	3.9	1.9	(2.0)	-50.4%	4.1	3.6	(0.5)	-12.2%
2023	0.7	2.5	1.8	262.2%	4.2	3.6	(0.6)	-14.3%
2024	1.7	-	-	-	4.1	-	-	-

Sources: Survey of Professional Forecasters, Federal Reserve Bank of Philadelphia (forecasts for GDP growth and unemployment rate), Bureau of Economic Analysis (GDP), and Bureau of Labor Statistics (unemployment rate). Analysis by the author.

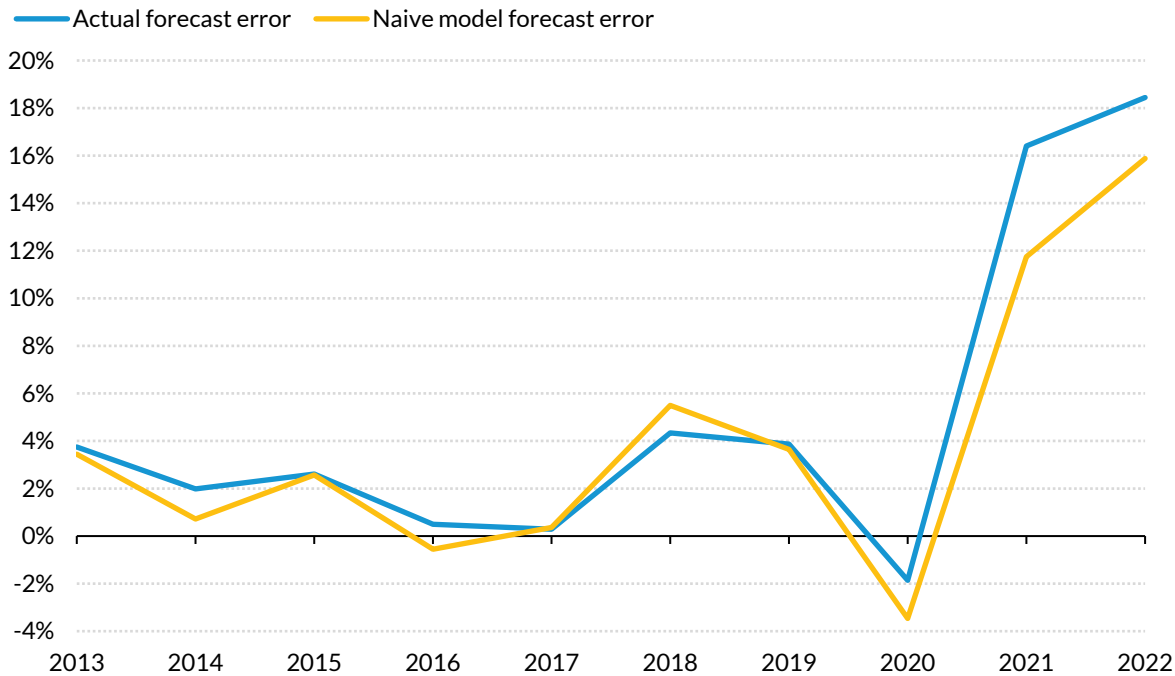
Building upon previous research, we formulated a methodology to gauge the difficulty of revenue forecasting. This involved creating a “naïve” model, which projects tax revenues for each state and each year, utilizing data that forecasters would have typically had access to at the time. The effectiveness of this model lies in its ability to reveal the inherent complexity of forecasting: we calculate the model’s forecast errors and use these as a direct measure of the forecasting difficulty. Essentially, if this model struggles to accurately predict an outcome, it indicates that the forecast for that specific tax, state, or year is inherently challenging. This approach not only standardizes the evaluation of forecast difficulty but also helps in understanding the nuances and complexities involved in state revenue forecasting.

In our approach, we adopted a naïve forecasting model that employs an exponential smoothing method with a trend component. This technique effectively utilizes historical data to forecast tax revenues for each state for a year ahead. For our naïve model we utilized comprehensive state-by-state tax revenue data from the Census Bureau for major sources of taxes. Central to this model is a

retrospective analysis that spans 10 years for every forecast. By doing so, the model integrates long-term trends and patterns into its projections, providing a comprehensive year-ahead forecast for state tax revenues.

The main advantage of the naïve model is its uniform application to every data point and its reliance on historical data that would have likely been available to forecasters at the time. However, it is important to acknowledge the limitations inherent in this model, primarily due to its simplistic nature. Exponential smoothing models forecast future values based solely on the past data of the variable in question and do not factor in turning points in the economy. Therefore, naïve models are less reliable during economic downturns or upturns. Another important consideration is the broader context in which revenue forecasters operate. Unlike the narrow focus of the naïve model, actual forecasters have access to a wide array of information sources, including economic analyses, news updates, and expert opinions. This wealth of information, which extends beyond the scope of data traditionally used in uniform modeling, allows forecasters to make more nuanced and potentially accurate predictions. Consequently, while the naïve model serves as a useful baseline for comparison, the real-world accuracy of state revenue forecasters is likely to surpass that of the naïve model.

FIGURE 9
State Total Tax Revenue Forecasting Errors for United States, Fiscal Years 2013–22



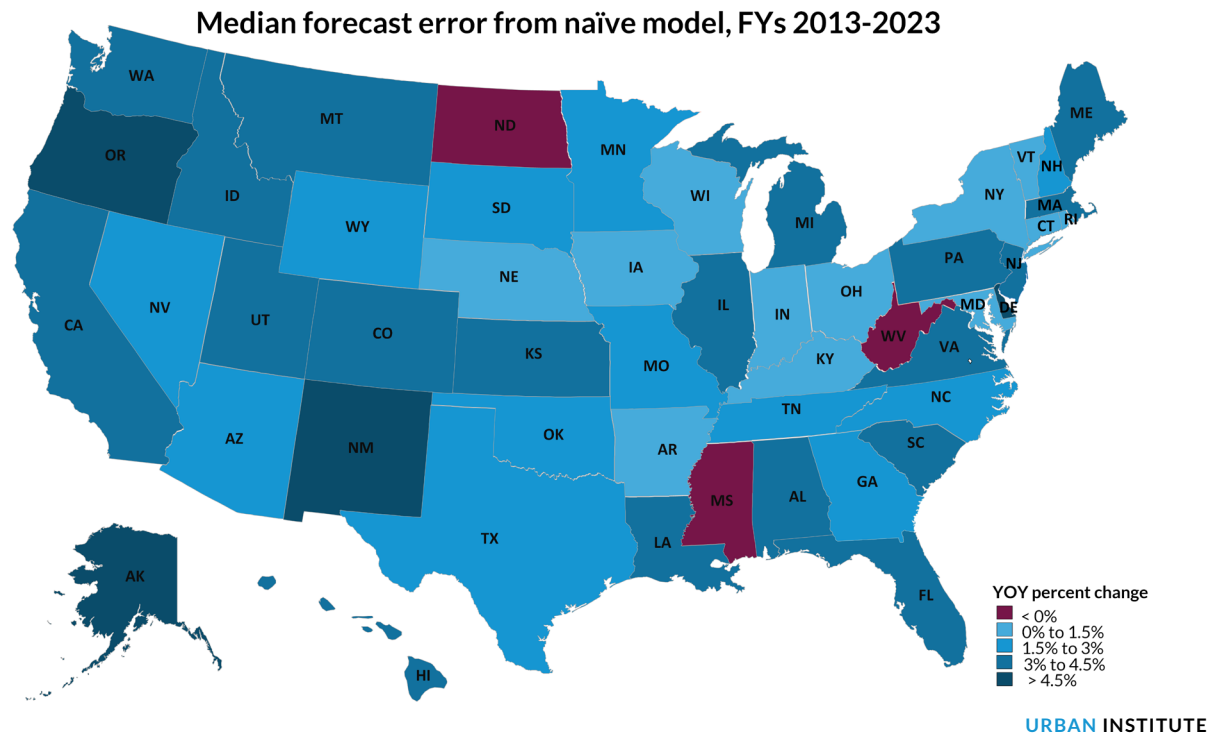
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Sources: US Census Bureau and individual state government fiscal agency websites; analysis by the author.

Figure 9 illustrates the comparison between the actual forecast error and the naïve model forecast error for state total tax revenues in the United States from 2013 to 2022. Overall, the naïve model does a fairly good job of capturing the difficulty state forecasters face. From 2013 to 2019, both the actual forecast error and the naïve model's forecast error seem to fluctuate around the same range and the forecast errors track each other closely, suggesting that the actual forecasts did not consistently outperform the naïve model by a significant margin. However, there is a noticeable divergence since 2020. Both forecast errors sharply increased in 2021 and 2022 and the actual forecast error was somewhat higher compared to the naïve model's forecast error. In other words, the state revenue forecasting models did not accurately capture the post-pandemic economic conditions.

Figure 10 shows the geographic distribution of the median absolute percentage forecast error from our naïve model for fiscal years 2013–23. Forecasting challenges are more pronounced in states that are resource-rich, smaller, and have less diversified revenue streams. This implies that the larger forecast errors observed in these states are not merely a reflection of poor forecasting practices. Instead, it indicates that specific characteristics inherent to these states complicate revenue forecasting.

FIGURE 10
Forecast Difficulty Measure for State Total Taxes



Sources: US Census Bureau (tax revenue); analysis by the author.

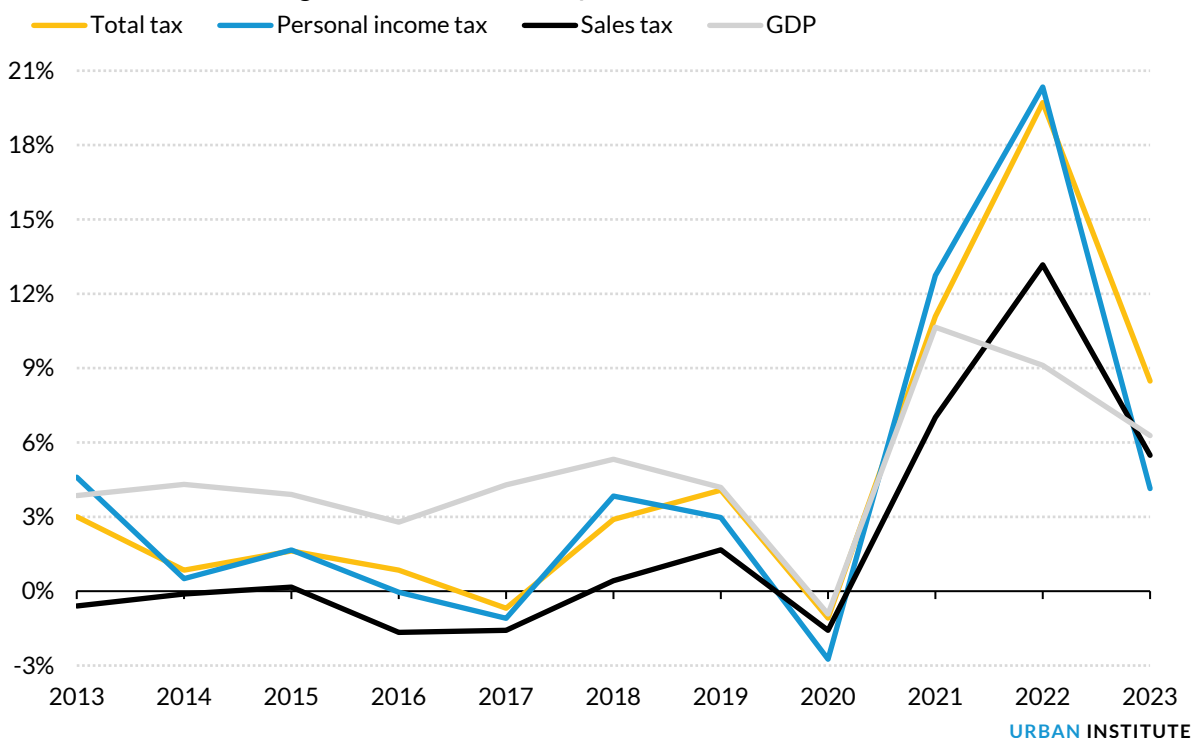
Analyzing the Relationship between Revenue Volatility and Forecasting Accuracy

Over the past two decades, tax revenue streams have become increasingly volatile, which complicates the already complex task of forecasting. Nearly all state tax revenues exhibit some degree of volatility (McNichol 2013). Economic fluctuations, such as those caused by market shifts, changes in consumer behavior, and unpredictable policy impacts, have led to more pronounced swings in both personal and corporate tax revenues.

Figure 11 shows states' revenue forecast errors and the year over year percentage change in GDP for fiscal years 2013 through 2023.

FIGURE 11

State Revenue Forecasting Errors and Year-over-year Growth in GDP



Sources: Individual state government fiscal agency websites and Bureau of Economic Analysis (GDP); analysis by the author.

Early in the decade, forecast errors for total tax, personal income tax, and sales tax showed moderate fluctuations, reflecting a mix of overestimations and underestimations. Despite the economic disruption caused by the COVID-19 pandemic, state revenue forecasts for fiscal year 2020 were relatively accurate. This accuracy can be attributed to the timing of the pandemic beginning in mid-March 2020. As a result, the significant impact on revenue collections was not felt until May 2020,

reflecting April 2020 economic activity. Since fiscal year 2020 ended in June 2020, the pandemic's effect on fiscal year 2020 revenue was not significant. However, there was a pronounced spike in errors during 2021 and 2022, largely caused by the tumultuous economic conditions surrounding the COVID-19 pandemic, which contributed to the difficulty in making accurate forecasts. In fiscal year 2023, forecast errors dramatically decreased, largely due to a return to more stable economic conditions. The fluctuations in GDP growth mirror these forecasting challenges, with the sharp post-pandemic rise and fall highlighting the period's economic instability. Despite the recent stabilization, the preceding years of large errors underscore the complexities of state revenue forecasting during a period characterized by extraordinary economic events.

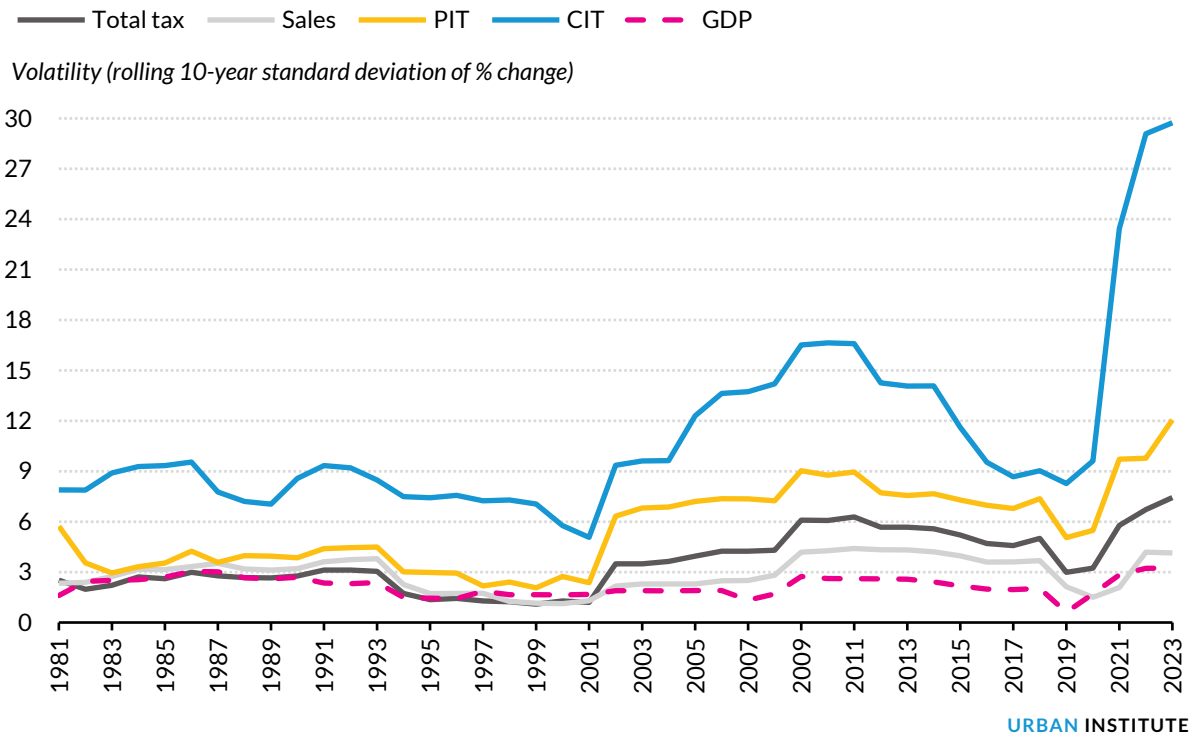
A key indicator of volatility is the standard deviation of the percentage change in a variable, such as tax revenue, which reflects the extent of variation from its average. For tax revenue, a zero standard deviation implies no volatility, as in the case where a state's revenue consistently grows by 5 percent annually. Conversely, if the growth rate fluctuates significantly—rising as high as 20 percent or dipping into negative territory—the standard deviation increases, indicating higher volatility and making forecasting accuracy more challenging. This measure is equally applicable to economic factors like GDP, and tracking its changes over time can reveal whether volatility is increasing or decreasing.

Figure 12 presents the 10-year rolling standard deviation of annual percentage changes in state tax revenues (covering total taxes, sales tax, personal income tax, and corporate income tax) as reported by the Census Bureau, as well as the change in nominal GDP for the United States, spanning from 1982 to 2022. Each data point on the graph represents the standard deviation of annual percentage changes for the preceding decade. For instance, the initial data point for taxes in 1982 reflects the variability in annual percentage changes from 1973 to 1982. This 10-year window moves with time, so a 2022 point calculates the standard deviation from 2013 to 2022. This approach allows for a comparison of volatility among different variables and an analysis of volatility trends over time, showing whether it has been increasing or decreasing.

The figure illustrates that before 2002, the annual volatility of total taxes consistently remained below 3.5 percent. Since 2002, particularly around economic downturns, there has been a notable increase in volatility across all tax categories, with revenue volatility exceeding 6.0 percent during 2009–11—reflecting financial changes from 2000 to 2009, in contrast to earlier stability. Despite some stabilization after 2011, volatility remained significantly higher than pre-2002 levels. In recent years, especially after 2020, there has been an escalation in volatility for all tax categories, likely influenced by the economic uncertainty and disruptions of the COVID-19 pandemic.

FIGURE 12

Volatility of State Tax Revenue and GDP (Rolling 10-Year Standard Deviation of Percent Change)



Sources: US Census Bureau (tax revenue) and Bureau of Economic Analysis (GDP); analysis by the author.

Corporate income taxes have shown the greatest volatility, with a significant increase in recent years. Personal income tax and sales tax volatility have also risen, with personal income tax consistently experiencing more fluctuation than sales tax, while the volatility of total taxes has generally been between the two.

Furthermore, the figure demonstrates that tax volatility surpasses that of GDP, a broad measure of the economy. Although economic volatility has increased since the Great Recession, it has been modest relative to the surge in tax volatility, indicating that the increase in tax revenue volatility is due to factors beyond just economic volatility.

Our analysis of Census tax data reveals a widespread uptick in tax revenue volatility, with 39 states experiencing increased volatility since fiscal year 2015 and 49 states since fiscal year 2020. North Dakota has seen the highest revenue volatility since fiscal year 2015, primarily attributed to the state's growing dependence on severance taxes, as previously mentioned. In general, states with the largest revenue volatility are those dependent on severance taxes and income taxes from high-income earners. This volatility is primarily driven by fluctuations in oil prices, affecting severance tax revenues and stock

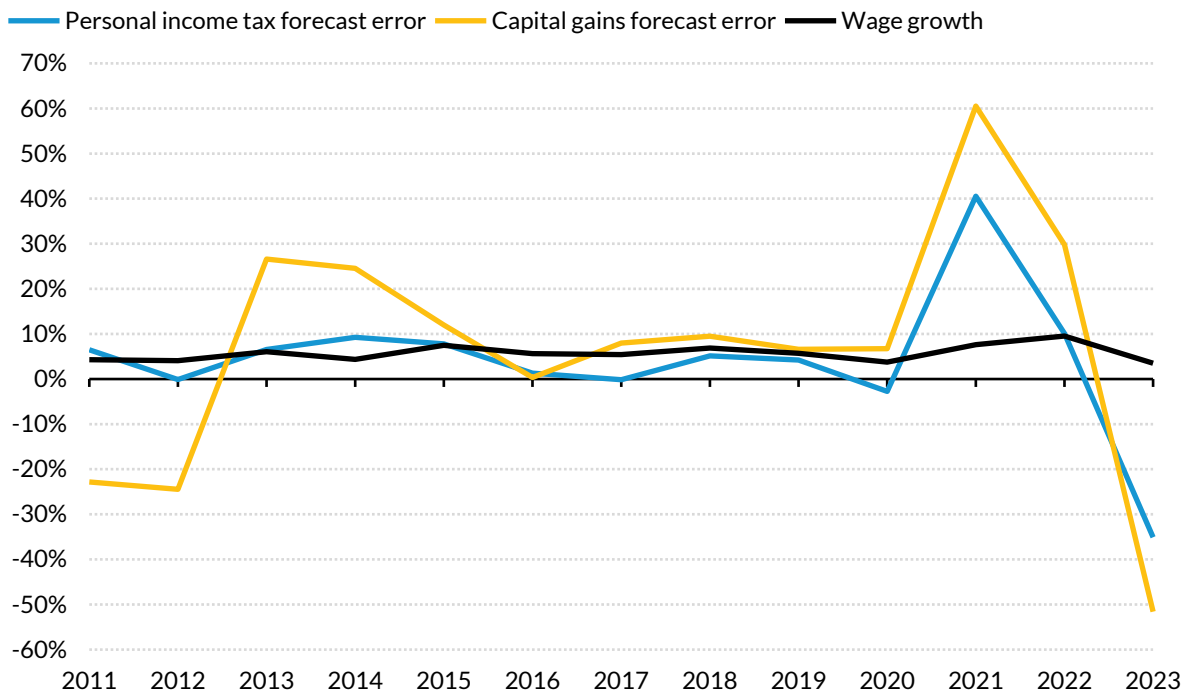
market volatility, which impacts the income of wealthy taxpayers. Consequently, these states face greater fiscal unpredictability, directly tied to the volatile nature of oil and financial markets.

The heightened volatility in personal income tax revenues is primarily due to a growing dependence on capital gains and other forms of nonwage income, coupled with the increasing instability of these revenue sources. Figure 13 and figure 14 illustrate this with data from two states: California and Massachusetts. Both states have detailed public information on actual and forecasted tax revenues from capital gains. The figures below indicate annual percentage forecast errors for personal income taxes and for capital gains as well as year over year growth in wages. Forecast errors for capital gains clearly are far larger than forecast errors for personal income tax revenues, while growth in wages is more stable and predictable.

The combined effects of overall economic volatility and the dependency on fluctuating capital gains complicate the accuracy of revenue forecasts. Consequently, many states frequently update their revenue projections throughout the budget cycle.

FIGURE 13

Forecasting Errors in Personal Income and Capital Gains and Wage Growth in California

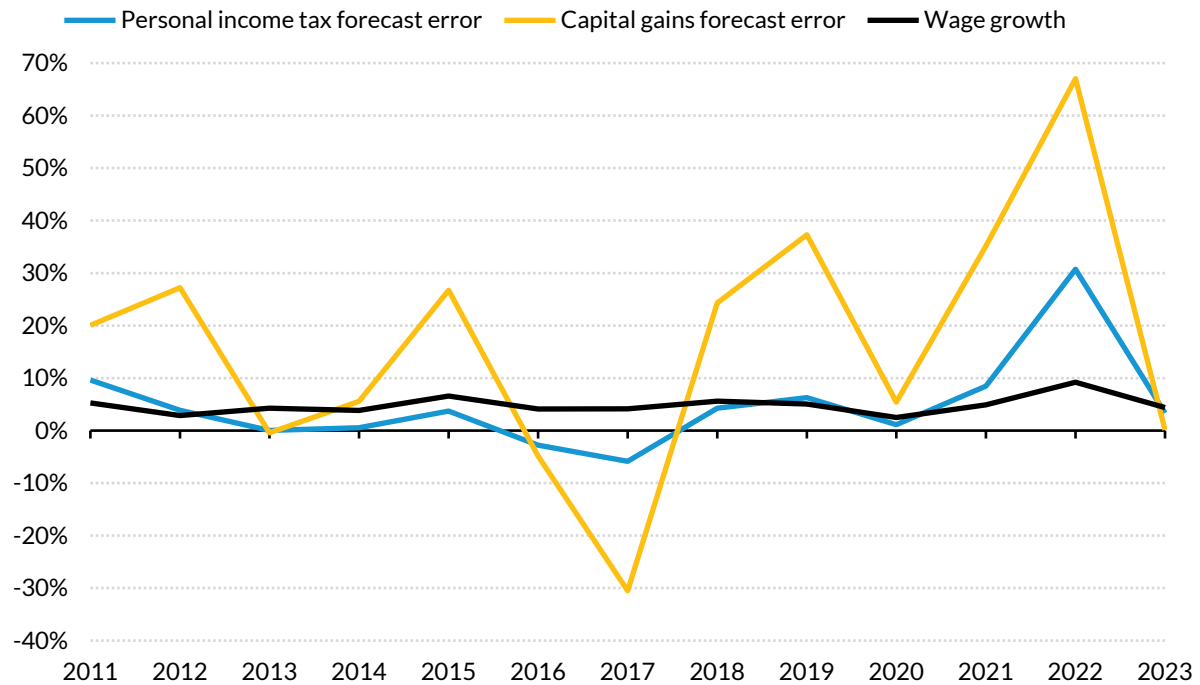


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Sources: State of California, Department of Finance (taxes) and Bureau of Economic Analysis (wages); analysis by the author.

FIGURE 14

Forecasting Errors in Personal Income and Capital Gains and Wage Growth in Massachusetts



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Sources: Massachusetts Department of Revenue (taxes) and Bureau of Economic Analysis (wages); analysis by the author.

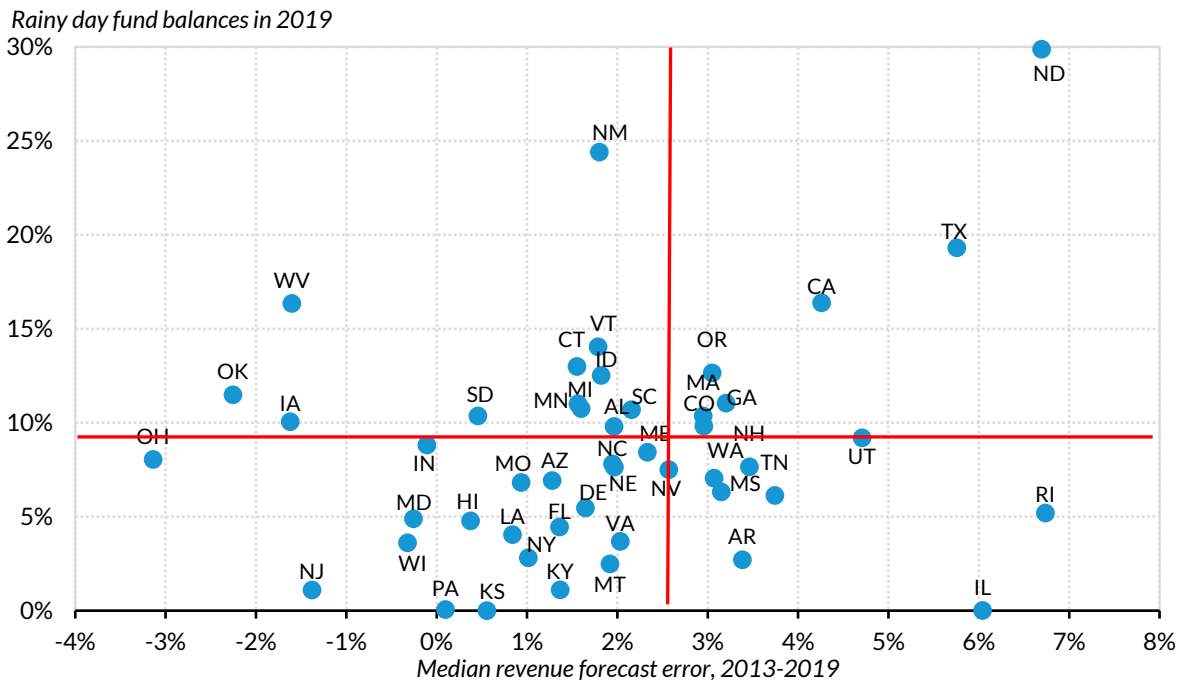
Federal policies can exacerbate volatility with effects that are unintended and difficult to quantify at the state level. For instance, the adoption of pass-through entity taxes (PTET) as a workaround for SALT deductions has not only increased the volatility of income tax collections but has also significantly complicated state forecasting efforts. Therefore, forecasters will need to place an increased emphasis on closely monitoring and accounting for policy changes. Although economic conditions and other relevant factors have traditionally been the primary drivers of revenue projections, the impact of policy shifts cannot be overlooked.

Managing Revenue Volatility and Forecasting Errors

States employ various strategies to manage tax revenue unpredictability, with rainy day funds being crucial for mitigating revenue volatility and forecasting errors. Establishing and maintaining rainy day funds, or budget stabilization funds, allows states to set aside surplus revenues during good economic times to be used during economic downturns.

It might be expected that states with highly volatile and unpredictable tax revenues would have larger rainy day funds as a buffer against shortfalls. However, as shown in figure 15, there is a weak correlation between the size of a state's rainy day fund before the pandemic and the median forecast errors previously encountered. Data for Alaska and Wyoming are excluded since they are outliers (both states rely on volatile revenue sources and had large rainy day fund balances in 2019, which both states use to mitigate revenue volatility). We advise caution when interpreting this data for individual states due to their distinct tax structures and economic sectors, which influence their fiscal management.

FIGURE 15
Forecast Accuracy and Rainy Day Fund Balances as a Percent of General Fund Spending Just before the COVID-19 Pandemic



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Sources: Individual state government fiscal agency websites and NASBO (rainy day funds); analysis by the author.

Notes: The red line indicates means. Alaska and Wyoming are outliers and excluded from the figure.

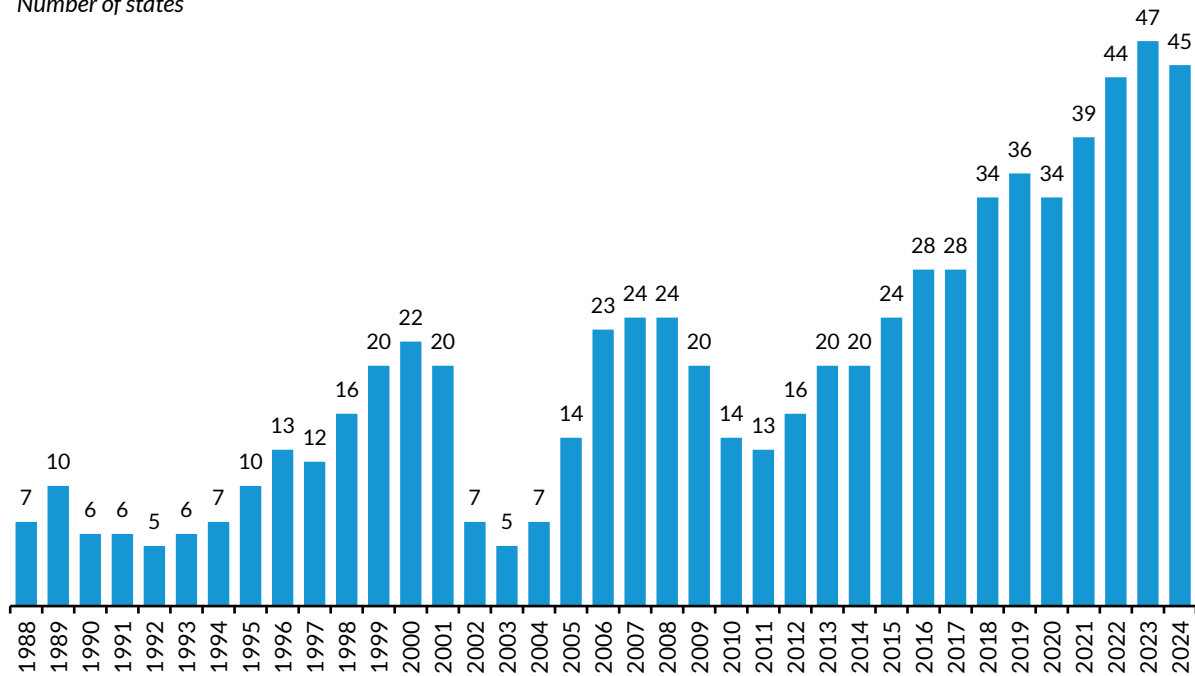
States have been bolstering their rainy day funds, reaching an all-time high by fiscal year 2023. Figure 16 tracks the number of states with rainy day fund balances exceeding 5 percent of their general fund spending for fiscal years 1988 through 2024. This trend indicates a significant increase in the number of states exceeding the 5 percent threshold, particularly after the financial uncertainty of the Great Recession, peaking in the most recent years from 2022 to 2024. The increase in states' rainy day fund balances reflects not only their conservative fiscal approaches following economic challenges but also the benefits of federal stimulus aid, which has provided additional financial support. However, with

potential economic challenges ahead, states may see shifts in their fiscal health. The potential for a recession and other economic, demographic, technological, and political changes pose uncertainties. Nevertheless, the robust rainy day funds place them in a stronger position to handle fiscal pressures compared with the aftermath of previous economic downturns.

FIGURE 16

Number of States with Rainy Day Fund Balances of over 5 Percent of General Fund Spending, by Year

Number of states



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Sources: NASBO (rainy day funds); analysis by the author.

In summary, the size of state revenue forecast errors was unprecedented in fiscal years 2021 and 2022, largely due to the COVID-19 pandemic's economic impact and uncertainty. Additionally, the unprecedented federal fiscal relief as well as changes in consumer spending behavior contributed to revenue forecasting challenges. Large forecasting errors weren't limited to revenue projections but extended to broader economic forecasts, such as GDP growth and unemployment rates. Factors like geopolitical tensions, heightened inflation, and a buoyant stock market in 2021 also influenced the accuracy of these forecasts. Increases in forecasting errors in the past decade were also driven by increases in revenue volatility, largely driven by greater reliance on increasingly volatile capital gains. In the post-Great Recession period states had built up larger rainy day funds, which are critical for managing the effects of revenue volatility, particularly during the economic downturns.

Survey Findings: Revenue Forecasts

As mentioned above, the Urban Institute conducted a survey of state government officials involved in fiscal policy decisions and revenue forecasting. Our survey focused on the following areas:

- Revenue forecasting procedures (entities engaged, timing and frequency)
- Revenue forecasting methods and recent changes to forecasting practices
- Revenue forecasting indicators
- Revenue forecasting errors in the most recent years
- Tax legislation and its impact on state revenue forecasts
- Revenue picture for fiscal years 2023 and 2024
- Revenue forecasting challenges

We sent out surveys to representatives in the executive and legislative branches in every state. In total, we have information from 49 states, including 23 states where we received information from both branches. As noted above, Michigan was the only state for which we did not receive a response from either branch. In this section, we present a summary of the findings derived from our survey responses.

Revenue Forecasting Procedures

Budgeting processes and rules governing revenue forecasting vary across states. In some states, revenue forecasts are prepared exclusively by a single entity, either the executive or legislative branch, or both independently. Other states utilize a consensus revenue forecasting process, which involves collaborative efforts between representatives from both the executive and legislative branches to jointly develop revenue projections. In states like New York, both branches prepare their own revenue forecasts in addition to consensus forecasts. Additionally, a few states rely on an independent formal group, typically composed of university economists and experts from the private or public sectors, to produce revenue forecasts. Regardless of the approach, a depoliticized forecast is generally regarded as more objective, as it minimizes the influence of political agendas and biases. [Table 6](#) provides a summary of state revenue forecasting practices, incorporating survey data and information from state government fiscal agency websites. Each state is hyperlinked to its revenue forecast website and indicates whether the state operates on an annual or biennial budget, the entity responsible for preparing revenue forecasts, the number of years revenues are projected beyond the upcoming fiscal year, and the frequency of revenue forecast updates within the fiscal year.

TABLE 6

State Revenue Forecasting Practices

State	Budget cycle	Who Prepares State Revenue Forecasts			Years revenue is forecasted beyond next FY	Times forecasts are updated in a given FY
		Executive branch	Legislative branch	Consensus forecast		
Alabama	Annual	x	x		none	1
Alaska	Annual	x			9	2
Arizona	Annual	x	x		2	3
Arkansas	Biennial (odd)	x			1	2
California	Annual	x	x		3	3
Colorado	Annual	x	x		1	4
Connecticut	Biennial (odd)			x	2	3
Delaware	Annual			x	1	5
Florida	Annual			x	4	2 to 3
Georgia	Annual	x			none	2
Hawaii	Biennial (odd)			x	5	4
Idaho	Annual	x	x		3	2
Illinois	Annual	x	x		2	3
Indiana	Biennial (odd)			x	1	1 to 2
Iowa	Annual			x	none	3
Kansas	Annual			x	none	2
Kentucky	Biennial (even)			x	none	1
Louisiana	Annual			x	3	2
Maine	Biennial (odd)			x	3	2
Maryland	Annual			x	4	3
Massachusetts	Annual			x	none	1
Michigan	Annual			x	1	2
Minnesota	Biennial (odd)	x			3	2
Mississippi	Annual			x	none	2
Missouri	Annual			x	none	1
Montana	Biennial (odd)	x	x		3	1
Nebraska	Biennial (odd)			x	3	2 to 3
Nevada	Biennial (odd)			x	1	0
New Hampshire	Biennial (odd)	x	x		1	0
New Jersey	Annual	x			none	2
New Mexico	Annual			x	3	3
New York	Annual			x	4	5
North Carolina	Biennial (odd)			x	1	1 to 2
North Dakota	Biennial (odd)	x	x		1	1
Ohio	Biennial (odd)	x	x		1	1
Oklahoma	Annual	x			none	1
Oregon	Biennial (odd)	x			7	4
Pennsylvania	Annual	x			4	2
Rhode Island	Annual			x	1	2
South Carolina	Annual			x	3	3
South Dakota	Annual	x	x		none	1
Tennessee	Annual			x	none	1
Texas	Biennial (odd)	x			1	1
Utah	Annual			x	1	2
Vermont	Annual			x	4	2
Virginia	Biennial (even)			x	6	2
Washington	Biennial (odd)			x	3	4
West Virginia	Annual	x			4	3
Wisconsin	Biennial (odd)	x	x		1	2
Wyoming	Biennial (even)			x	4	2

Source: Survey responses and individual state government fiscal agency websites.

Note: FY = fiscal year.

Budget Cycle

Budget cycles vary by state, with 30 states operating on an annual cycle and 20 states adopting biennial budgets. Among states with biennial budgets, the biennium begins in an odd year for 17 states, whereas in three states—Kentucky, Virginia, and Wyoming—the biennium starts in an even year.

Forecasting Entities

In the survey conducted by the Urban Institute, state revenue forecasting officials were asked to indicate which entity plays a primary role in producing the official revenue forecast. The state forecasting officials were asked to specify which agencies are involved from the executive and legislative branches as well as whether there are other parties involved such as academicians, experts from the private sector or any other parties. According to the survey responses, in most states one or more agencies of the executive branch are involved in the revenue forecasting process. Revenue forecasts in 10 states are exclusively prepared by the executive branch, while in 12 states, they are separately prepared by both the executive and legislative branches. Some states have a collaborative revenue forecasting process, which means representatives from the executive and legislative branches work collaboratively on revenue projections. However, despite the involvement of both branches, each state has its own practice regarding which forecast to include in the final budget.

For instance, in California, officials noted that the executive branch's Department of Finance and the Legislative Analyst's Office typically prepare independent forecasts. Subsequently, one of these forecasts, or an amended version thereof, is chosen for adoption into the negotiated budget. Historically, it's the Department of Finance's revenue forecasts that are included in the Budget.

According to survey responses, only a few states directly involve academicians and private sector experts in the revenue estimating process, although they do rely on data and information provided by these experts. The executive branch does not take any role in producing revenue estimates only in very few states including Hawaii, Nevada, and Washington.

In Hawaii, the revenue forecasts are prepared by the Council on Revenues which is attached to the Department of Taxation for administrative purposes. It consists of seven members, three of whom are appointed by the Governor for four-year terms and two each of whom are appointed by the President of the Senate and the Speaker of the House of Representatives for two-year terms.⁴

In Nevada, the revenue forecasts are prepared by the State's Economic Forum, which was created in 1993 and is a panel of five economic and taxation experts from the private sector, all appointed by the Governor and serving a two-year term. All agencies of the state including the Governor and Nevada

Legislature are required to use the Forum’s forecast, which is provided shortly before the beginning of a new legislative session.⁵

In Washington, revenue estimates are provided by the Economic and Revenue Forecast Council, which is an independent agency and is not a part of the executive or legislative branches. The Council was created in 1984 and consists of six members, two of which are appointed by the Governor and four members from the Legislature.⁶

There is some ambiguity in the definition of consensus forecasting and states use various institutional arrangements for consensus revenue forecasting. Consensus groups may comprise a diverse array of participants, including staff from legislative and executive branches, elected representatives from different political parties, and impartial external members like academics and business professionals (Franklin, Bourdeaux and Hathaway 2019). Our survey results indicate that in 22 states, revenue forecasts are prepared by a consensus group that has a formal name. In six states there is no official consensus forecasting group, but there is an informal process for reaching agreement between the legislature and executive. For instance, Missouri officials noted: “Missouri is not required to have a consensus forecast, but all efforts are made to come to an agreement.” Consensus revenue forecasting groups normally have clear and routine responsibilities and processes in place.

Forecast Horizon

The forecast horizon for revenue projections beyond the forthcoming fiscal year spans a wide range, extending from no additional years to as much as nine years into the future, with Alaska setting the benchmark for the longest forecast period. Specifically, 12 states do not make their revenue forecasts for beyond the upcoming fiscal year publicly available, and 14 states extend their forecasts to cover just one additional year. Meanwhile, 20 states find a pragmatic balance by estimating their revenue for a span of two to four years beyond the forthcoming fiscal year. This approach navigates the necessity for longer-term fiscal planning while acknowledging the increased uncertainty of forecasts over a longer duration. Finally, 4 states provide revenue forecasts for a period of five years or more beyond the upcoming fiscal year.

Forecast Updates

The frequency of forecast updates within a fiscal year varies widely, from none to as many as five times annually. Delaware and New York update their forecasts most frequently, up to five times a year. In contrast, Nevada and New Hampshire reported no updates within the fiscal year. Most states update

their forecasts one to three times per fiscal year, which allows them to make necessary adjustments in response to economic shifts or legislative changes that could impact revenue. Specifically, 11 states update their revenue forecasts only once within the fiscal year, frequently in conjunction with the preparation of revenue forecasts for the subsequent fiscal year. Meanwhile, 18 states update their revenue forecasts twice during the fiscal year. In addition, 9 states perform updates three times a year, 4 states make updates four times a year, and another 4 states adjust their forecasts as needed, with the frequency of these updates ranging from one to three times within the fiscal year.

Revenue forecasts in most states are subject to off-schedule revisions under special circumstances, such as significant economic shifts, changes in revenue collection expectations, or prior to special legislative sessions. Notably, in response to the COVID-19 pandemic in 2020, many states revised their revenue forecasts to account for the impact of the global health crisis.

Although most states make revenue forecast updates publicly available, some do so internally only. For example, officials in California indicated that they provide revenue forecast updates according to a regular schedule. This includes an internal-only forecast in October, a forecast in November that is publicly released in January, and an April forecast that becomes publicly available in May. Officials in Pennsylvania noted that forecasts are generally revised monthly on an internal basis, but the official forecast from late June is used for the entire fiscal year.

On the other hand, some states have laws in place that specify the timing and frequency of revenue forecasts, typically tied to the budget preparation process or fiscal year schedule. Here are a few examples of states with such legal requirements.

Connecticut: State law mandates that the secretary of the Office of Policy and Management and the director of the Office of Fiscal Analysis issue consensus revenue estimates annually by November 10, with necessary consensus revisions in January and April.⁷

Colorado: The state's revenue forecasts are prepared jointly by the Legislative Council Staff and the Office of State Planning and Budgeting. These forecasts are updated four times a year: each March, June, September, and December.⁸

Maine: State law mandates the Consensus Economic Forecasting Commission to meet twice each fiscal year and prepare revenue forecasts due by April 1st and November 1st of each odd-numbered year and February 1 and November 1 of each even-numbered year.⁹

Minnesota: State law requires the Minnesota Management and Budget to produce official revenue forecasts twice a year, specifically in November and February.¹⁰

Oregon: The state's revenue forecasts are prepared by the Office of Economic Analysis. These forecasts are issued quarterly, with updates provided in March, June, September, and December.¹¹

Regular revenue forecast updates can enhance fiscal management and enable timely adjustments to changing economic conditions, hence improving accuracy and responsiveness (Shavit 2009).

Forecast Timing

The timing of forecasts relative to the start of the fiscal year is crucial. Forecasts made several months in advance face greater uncertainty due to the potential for unforeseen economic shifts or policy changes, making them inherently less accurate than those prepared closer to the fiscal year's start, as more recent economic data and trends can be incorporated. Therefore, maintaining flexibility in the forecasting process can help mitigate these timing constraints. By regularly updating forecasts and incorporating the latest economic data, tax policy changes, and emerging trends, forecasters can adapt their projections to better align with evolving conditions. The forecast flexibility enables more timely course corrections and adjustments, ultimately improving the accuracy of revenue estimates.

In our survey, we requested states to specify the months in which they typically prepare their official revenue forecasts for the adopted budget. This data was cross-referenced with information from state government websites. [Figure 17](#) shows the average number of weeks before the start of the fiscal year when revenue forecasts are completed in states with an annual budget cycle.

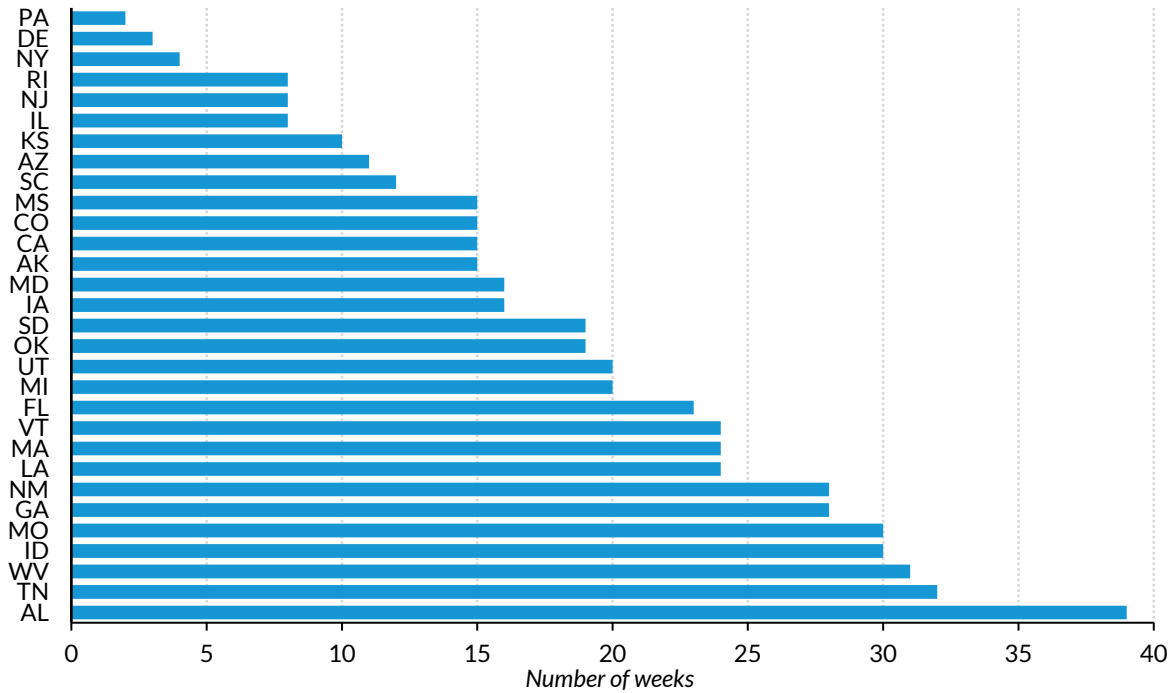
States vary significantly in how far in advance they prepare their revenue estimates. For example, in states operating on an annual budget cycle, Alabama stands out by preparing its revenue forecasts approximately 39 weeks prior to the start of the state fiscal year. In contrast, Pennsylvania updates its revenue estimates approximately two weeks before the beginning of the fiscal year.

Biennial budget states face an additional challenge. They often prepare forecasts near the start of their two-year budget cycle but may not revisit or update the forecast for the second fiscal year. This lack of regular updates can lead to significant forecast errors, especially if economic conditions shift unexpectedly during the biennium. However, some biennial states do update their forecasts regularly, which helps account for changing economic conditions and new policy changes that could impact revenues.

Among the states with a biennial budget cycle, Texas prepares revenue forecasts as early as 35 weeks before the start of the first year of the biennium while New Hampshire uses updated forecasts just about two weeks before the start of the first year of the biennium (see [figure 18](#)).

FIGURE 17

Average Lead Time in Weeks for Completing Forecasts in States with an Annual Budget Cycle

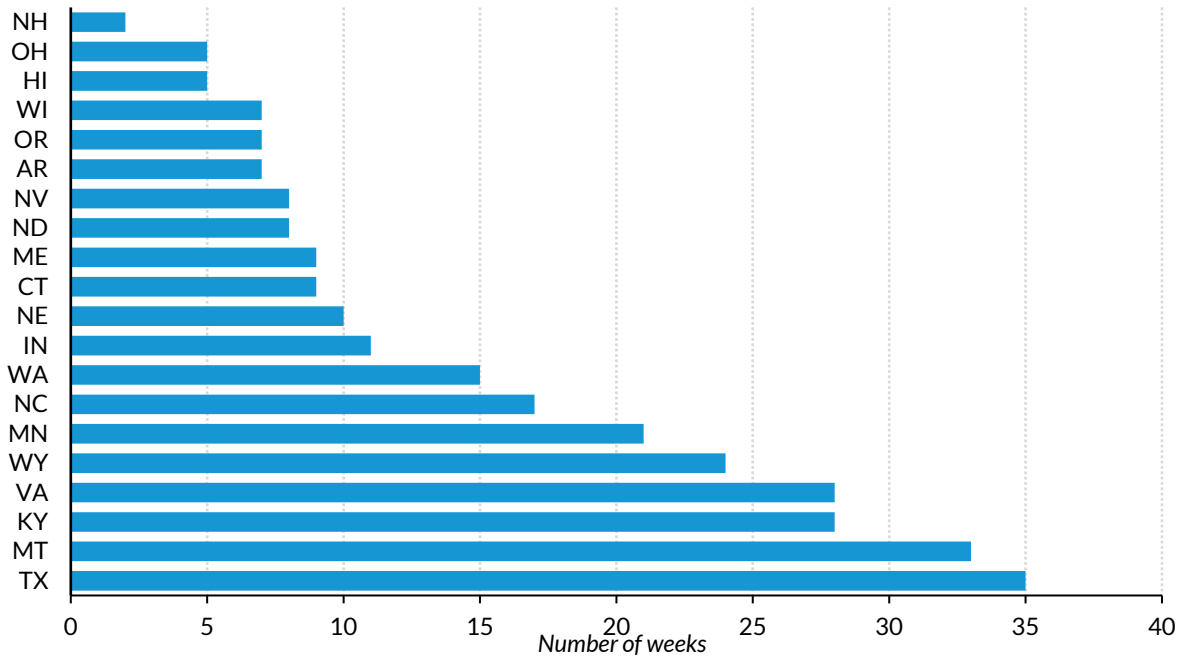


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Sources: Survey responses and individual state government fiscal agency websites; analysis by the author.

FIGURE 18

Average Lead Time in Weeks for Completing Forecasts in Biennial States (First Year of Biennium)



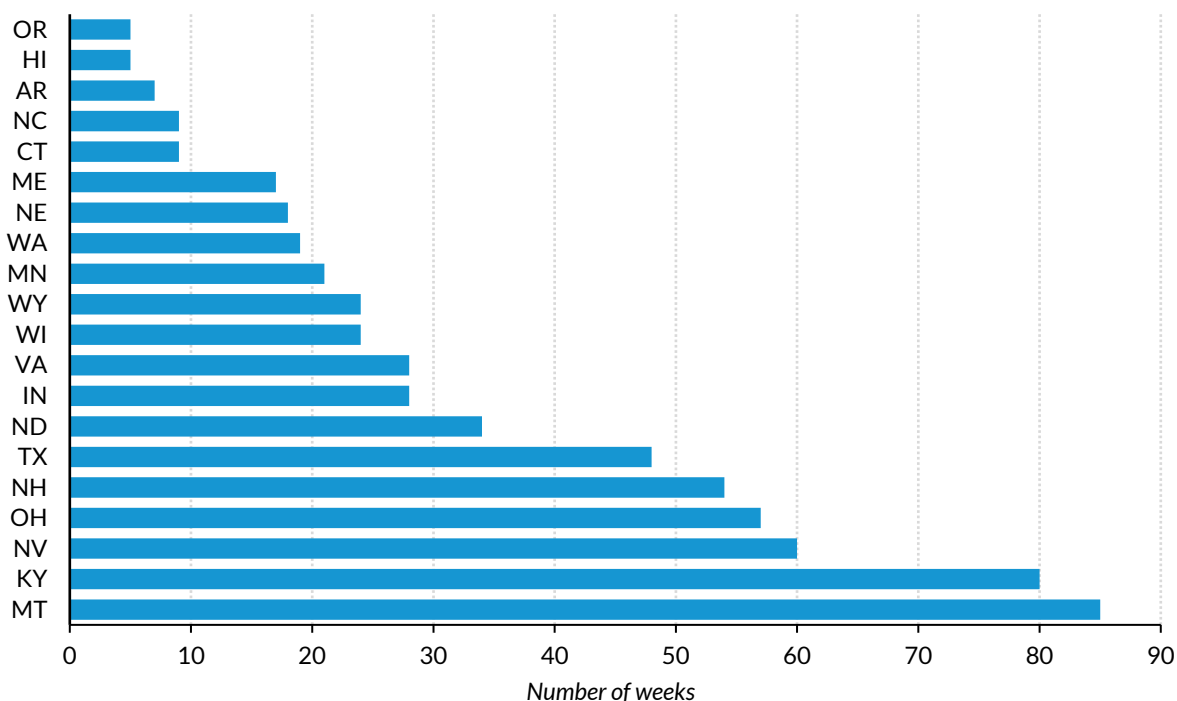
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Sources: Survey responses and individual state government fiscal agency websites; analysis by the author.

Figure 19 shows the average lag between forecast preparation and use for the second year of a biennium. Typically, the lag between forecast preparation/update and the start of the second year of a biennium is greater than the lag between forecast preparation and the start of the first year of the biennium. For example, in Montana the lag between forecast preparation and the first year of the biennium is 33 weeks, while the lag between forecast preparation and the second year of the biennium is roughly 85 weeks.

FIGURE 19

Average Lead Time in Weeks for Completing Forecasts in Biennial States (Second Year of Biennium)



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Sources: Survey responses and individual state government fiscal agency websites; analysis by the author.

In summary, states vary widely in revenue forecasting practices, including entities involved, forecast horizon, and forecast frequency. Although many states have robust revenue forecasting processes, there's room for improvement in others. Four key recommendations are as follows:

Depoliticize: Ensure revenue forecasts are based on objective data and analysis, free from political influence and bias. Implementing consensus revenue forecasting can potentially eliminate such biases.

Long-term fiscal planning: Extending the forecast horizon can significantly benefit long-term fiscal planning and decision-making.

Forecast frequently: Update revenue forecasts regularly, at key points in the budget process to reflect the latest economic conditions and trends, allowing for timely adjustments.

Forecast timing: Updating revenue forecasts close to the start of the fiscal year ensures the use of the most timely and accurate data and information for financial planning.

Revenue Forecast Methods

State revenue forecast methods vary in complexity and approach, often incorporating a mix of different techniques. We requested state officials to specify which forecasting models—static, macrodynamic, or microdynamic—they employ for state revenue projections. To ensure clarity, we offered the following explanations for each type of model:

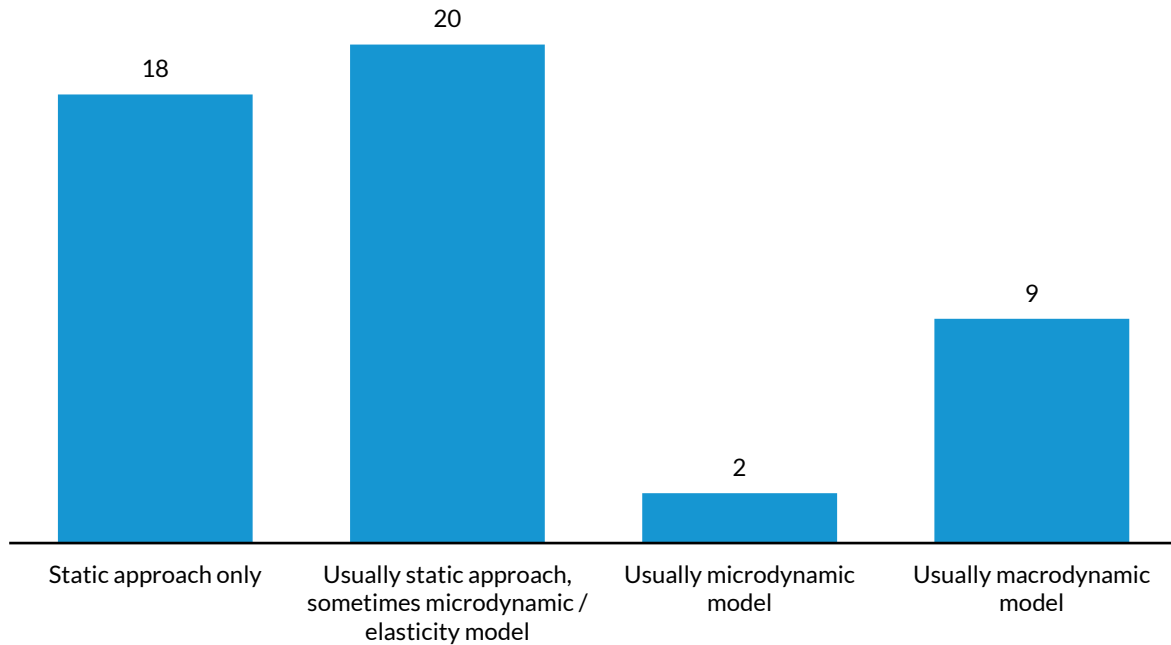
- **Static model:** forecasts do not account for changes in the behavior of households or businesses when measuring the impact of proposed tax changes.
- **Microdynamic model:** forecasts account for changes in the behavior of households or businesses when measuring the impact of proposed tax changes.
- **Macrodynamic model:** forecasts account for both direct and indirect impact of the proposed tax changes on the state’s economy.

The survey results indicate a preference for more static revenue forecasting methods, but also incorporating more complex microdynamic and macrodynamic models among some states (Figure 20). Eighteen states indicated using only static models, while 20 states indicated using predominantly static models with occasional consideration of microdynamic factors. Only two states report regularly using microdynamic models, which points to a cautious uptake of these more sophisticated, behaviorally responsive forecasting methods. Finally, nine states indicated using macrodynamic models, signaling a comprehensive approach that not only acknowledges individual behavior changes but also the broader economic implications of tax law changes. However, implementing these models comes with significant complexities and potential pitfalls. These models require sophisticated data, advanced analytical capabilities, and the ability to accurately capture and predict a wide range of economic variables and behaviors. Missteps can lead to inaccurate forecasts and misguided policies. Thus, while offering robust tools for revenue forecasting, macrodynamic models also demand careful handling and expertise.

FIGURE 20

States Tend to Rely on Static Models for Forecasts of Revenue When Policies Are Changing

Number of states



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Source: Survey responses; analysis by the author.

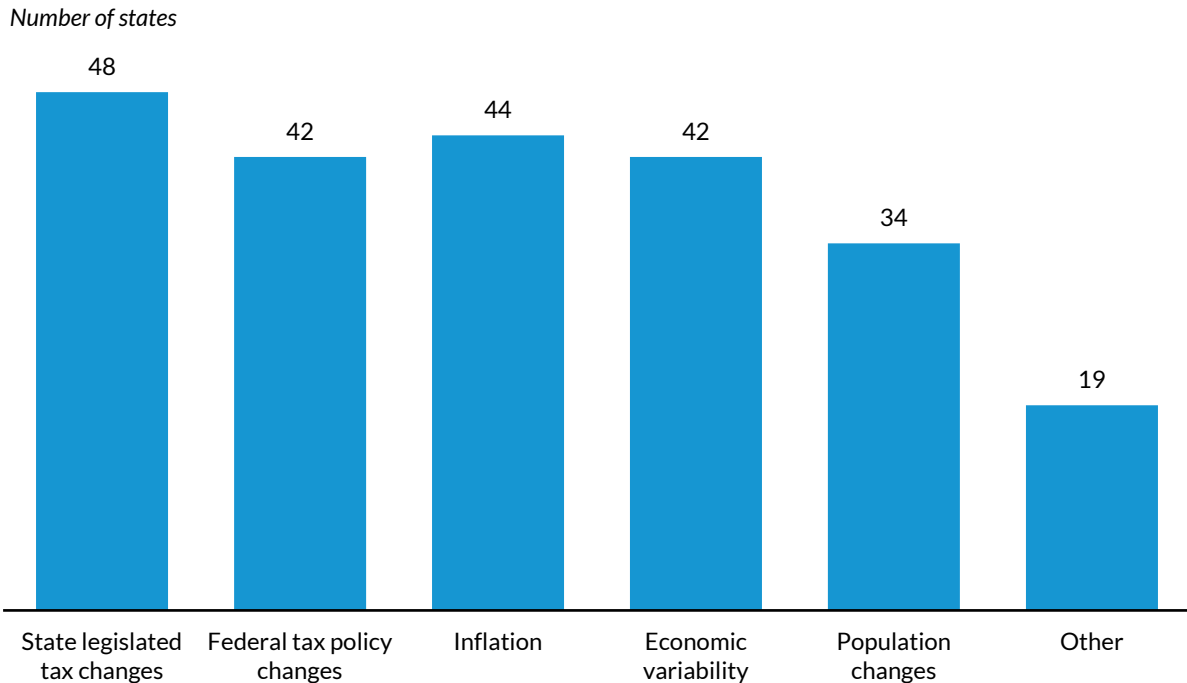
Overall, while many states rely on simpler static models, there's a clear tendency toward integrating dynamic elements into revenue forecasting, which reflects the importance of behavioral economics in fiscal policy.

We asked state officials to specify the factors considered in their revenue forecasting methodologies. As detailed in [Figure 21](#), a vast majority—48 states—incorporate state legislated tax changes into their revenue forecasts. Modifications in federal tax policies are also a significant component, with 42 states considering their effects. Both inflation and economic variability are factored in by 44 and 42 states, respectively, underscoring the importance of broader economic trends. Population shifts are acknowledged by 34 states but seem to carry less weight in revenue forecasting models. Some other considerations are reported by 19 states, with a diverse range of variables coming into play. Notably, officials from Alaska, New Mexico, Texas, West Virginia, and Wyoming pointed out the substantial impact of the oil and gas sector on revenue projections, reflecting the complexities faced by resource-dependent states amid fluctuating global energy markets. Respondents also mentioned some additional factors including stock market performance, tourism, taxpayer behavior, employment changes, local news, and even one-time collection factors as being part of states' revenue projection considerations. This array of factors points to a complex approach to revenue forecasting, where states

tailor their models to incorporate diverse influences on their respective budgets, beyond standard economic measures.

FIGURE 21

Factors Included in State Revenue Forecasts



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Source: Survey responses; analysis by the author.

The survey findings show that demographic shifts are not uniformly reflected in the revenue forecasts across states. Given the significant rise in the aging population and declines in birth rates over the last decade (Table 7), it is crucial to evaluate how these demographic shifts could affect consumer behavior, labor markets, and state revenue projections.

These changing demographic trends will impact workforce dynamics both immediately and in the long term. States will face increasing financial demands on healthcare and social security, necessitating strategic policy responses to alleviate the economic pressures of an aging population. Simultaneously, a decrease in younger demographics could signal evolving family trends with potential repercussions for future population patterns. Over the next decade, states with a substantial cohort in the 50-59 age range will witness a significant demographic shift as this group transitions into the 60-69 age bracket. This inevitable surge in the older population underscores the critical importance of accurately forecasting demographic trends and proactively planning for future societal needs.

TABLE 7

Percent Change in Population by Age Group, 2013–22

State	Total population	Age 0-4	Age 5-17	Age 18-59	Age 60-64	Age 65+
United States	5.5	(6.6)	0.3	1.2	16.7	29.5
Alabama	5.0	(1.5)	0.7	0.1	14.9	27.1
Alaska	(0.5)	(15.7)	(2.4)	(6.9)	6.9	53.4
Arizona	10.9	(9.2)	0.9	8.6	19.9	36.3
Arkansas	2.9	(5.9)	(0.2)	(0.6)	10.9	19.6
California	2.0	(14.9)	(4.2)	(1.2)	15.3	29.1
Colorado	10.8	(7.8)	0.1	9.0	15.1	42.0
Connecticut	0.8	(4.6)	(7.2)	(3.6)	19.9	20.6
Delaware	10.2	(3.0)	4.3	1.5	31.4	43.6
Florida	13.8	3.2	8.1	8.8	26.8	31.8
Georgia	9.4	(4.6)	3.1	5.9	22.2	37.8
Hawaii	2.2	(13.9)	0.6	(4.1)	2.2	33.1
Idaho	20.3	(1.4)	11.5	18.3	26.9	49.0
Illinois	(2.4)	(15.1)	(8.3)	(6.8)	11.7	23.5
Indiana	4.0	(3.7)	(0.1)	(0.4)	14.0	26.3
Iowa	3.4	(5.1)	1.5	(1.2)	11.7	22.3
Kansas	1.5	(12.7)	(1.6)	(2.7)	12.3	24.7
Kentucky	2.4	(5.1)	0.2	(2.8)	10.8	25.1
Louisiana	(0.8)	(9.1)	(2.9)	(6.8)	11.3	26.9
Maine	4.3	(5.8)	(5.3)	(2.7)	13.8	33.0
Maryland	4.0	(4.3)	1.8	(2.2)	18.8	31.7
Massachusetts	4.0	(5.9)	(3.8)	(0.4)	18.8	27.3
Michigan	1.2	(6.8)	(6.0)	(3.7)	11.8	26.4
Minnesota	5.6	(5.2)	3.6	(0.6)	19.7	32.5
Mississippi	(1.7)	(11.1)	(6.7)	(6.2)	10.6	22.4
Missouri	2.2	(6.1)	(1.0)	(2.8)	15.6	22.7
Montana	10.7	(6.3)	8.1	5.5	9.8	37.8
Nebraska	5.5	(5.0)	5.5	0.6	13.4	26.4
Nevada	14.4	(2.3)	7.8	11.1	22.1	41.1
New Hampshire	5.1	(4.0)	(7.9)	(1.8)	26.2	38.3
New Jersey	4.6	(2.3)	(0.4)	(0.4)	22.8	25.3
New Mexico	1.0	(20.4)	(5.9)	(3.1)	6.7	31.9
New York	0.3	(10.0)	(4.3)	(5.2)	15.4	25.3
North Carolina	8.7	(1.9)	1.5	4.9	18.8	32.7
North Dakota	7.8	1.1	16.4	0.9	14.3	26.6
Ohio	1.5	(5.0)	(2.9)	(3.4)	10.9	23.4
Oklahoma	4.3	(8.3)	3.8	1.0	13.2	20.7
Oregon	8.1	(10.8)	0.6	5.4	2.0	35.4
Pennsylvania	1.5	(6.2)	(2.5)	(3.8)	12.7	21.8
Rhode Island	3.6	(4.3)	(5.4)	(1.2)	20.2	26.7
South Carolina	10.8	(1.7)	5.7	5.3	18.8	38.5
South Dakota	8.0	(3.3)	9.0	1.4	19.3	31.7
Tennessee	8.5	1.2	3.7	4.8	16.4	28.5
Texas	13.4	(1.9)	8.5	11.6	24.9	36.2
Utah	16.6	(9.0)	8.9	18.3	26.8	43.6
Vermont	3.3	(10.0)	(5.7)	(3.7)	10.0	36.7
Virginia	5.2	(4.5)	1.9	(0.3)	17.3	32.5
Washington	11.8	(3.9)	6.1	8.7	12.8	38.6
West Virginia	(4.3)	(14.4)	(5.6)	(9.5)	(6.2)	17.4
Wisconsin	2.7	(9.1)	(3.3)	(3.3)	18.8	30.5
Wyoming	(0.2)	(19.2)	(0.2)	(7.7)	6.8	37.0

Source: US Census Bureau; analysis by the author.

Table 7 outlines state population growth rates from 2013 to 2022, revealing several critical trends:

- The total population for the nation increased by 5.5 percent, with the most significant increases seen in the age groups 60-64 (16.7 percent) and over 65 (29.5 percent), indicating a trend toward an aging population.
- The 0-4 age group experienced a nationwide decrease of 6.6%, pointing to falling birth rates.
- Idaho and Utah saw substantial overall population growth, at 20.3 percent and 16.6 percent respectively, well above the national average.
- On the other hand, six states—Alaska, Illinois, Louisiana, Mississippi, West Virginia, and Wyoming – recorded declines in their total populations.
- Every state reported population growth among those aged 65 and over, with western states like Arizona, Colorado, Idaho, and Nevada seeing substantial increases, suggesting they are popular retirement destinations.
- Most states saw a decline in younger age groups, a trend that could have implications for the planning of future educational systems and other services geared toward children.

We asked state officials to indicate whether their revenue forecasts are binding for budget appropriations. A total of 31 states affirmed that their forecasts are binding, 14 states reported that their forecasts are not binding, and officials in 4 states were uncertain.

Some states have constitutional or statutory provisions that make revenue forecasts binding, meaning that budget appropriations must align with these forecasts. In other states, while not legally mandated, it is a standard practice to adhere closely to revenue forecasts when setting appropriations. For instance, officials from California have noted the following: “We are constitutionally required to pass a balanced budget in which the revenue estimates for the budget year exceed the total of existing appropriations for the year, new appropriations proposed in the budget bill for the fiscal year, and any transfer to the reserve fund.” On the other hand, officials from New Jersey indicated the following: “The Governor certifies anticipated revenue collections for the upcoming fiscal year. There is no requirement that the revenue certification must be equal to the latest revenue forecasts by the Office of Revenue and Economic Analysis, although the certified revenue levels usually are.”

Recent Changes to Forecast Practices

As discussed above, during the Great Recession, states faced challenges with revenue forecasting, leading to large overestimations that had significant consequences. In fact, the median state tax revenue forecast was overestimated by more than 10 percent, with half of the states overestimating revenues by double digits (The Pew Charitable Trusts 2011). Due to the financial crisis, many states faced budget shortfalls and were forced to cut spending and take other actions to close budget gaps (Johnson, Collins and Singham 2010). These fiscal challenges faced during the Great Recession emphasized the critical role of accurate revenue forecasting, promoting some states to implement institutional reforms (Gordon 2011). Those adjustments included extending revenue forecasting horizons and adopting multiyear budgeting strategies. Some states also changed their rainy day fund policies to be better prepared for future economic downturns. Those changes included increasing deposit requirements, setting higher cap limits, linking deposits to volatility, and modifying withdrawal conditions, among others. For example, California passed Proposition 2 in 2014, which created new rules for the state's rainy day funds. More specifically, "Proposition 2 requires the state to deposit minimum amounts each year into reserves. In particular, Proposition 2 requires the state to set aside a share of capital gains revenues—a particularly volatile revenue source—that exceed a specific threshold" (Taylor 2018, p. 19).

We asked state officials to indicate if there have been any changes to their state's revenue forecasting process since the Great Recession such as frequency of forecasts, methodology changes or number of years forecasted. Out of the responses received, 22 reported modifications to their forecasting processes, 25 states reported no changes, and officials from 2 states were unsure.

States primarily implemented changes to their revenue forecasting processes either shortly after the Great Recession or as a response to the pandemic. A few states have adjusted their revenue forecast horizons, with changes including both extensions and reductions of the forecasting period. For instance, **Arizona** officials reported extending their forecast horizon in January 2015, increasing it from 2 to 4 state fiscal years to enhance long-term planning. Conversely, **Colorado** officials indicated reducing their revenue forecast horizon, shifting from a five-year to a three-year forecast due to the limited predictive value of the fourth and fifth years, aiming for a more focused and accurate forecasting approach. Officials in **West Virginia** also reported a shortening of the state's revenue forecasting timeframe, transitioning from a six-year to a five-year projection period.

Here is a summary of other permanent or temporary changes as noted by state officials in response to our survey question.

- **Alaska:** Officials in Alaska provided a long list of changes in revenue forecasting methodology over the years to improve accuracy and adapt to changing economic conditions, particularly in relation to oil revenues, which are a critical component of the state's revenue structure.¹²

Those changes include the following:

- » **2010 – Detailed revenue categorization:** The revenue forecast methodology was modified to break out general revenue into specific subcategories, such as restricted revenue and general fund revenue, as well as reclassified certain revenue sources.
- » **2011 – Oil price differential adjustment:** Altered the price difference assumption between Alaska North Slope oil and West Texas Intermediate oil from a fixed differential to using futures market projections to forecast the oil price differential.
- » **2012 – Petroleum production forecasting methodology:** Modified the petroleum production forecast methodology, moving away from a static model based on “best case” scenarios to a model based on probabilistic production outcomes.
- » **2013 – Production tax calculation changes:** Updated the calculation of production taxes to account for the transition from the Alaska's Clear and Equitable Share Act to the More Alaska Production Act, with the primary change being the removal of the progressive surcharge tied to the value of oil.
- » **2015 – Forecast inclusion of state's savings account and adjustment to corporate income tax methodology:** Introduced a new forecast component for the state's savings account. Refined the methodology for forecasting corporate income tax, which involved using companies' earnings-per-share numbers to forecast oil companies' future profit levels.
- » **2016 – Petroleum production modeling overhaul:** The methods for modeling petroleum production levels were changed to include probabilistic production levels, a shift to a pool level decline curve analysis, and the incorporation of risk factors for wells under development or evaluation. The Department of Revenue also transitioned from hiring an outside consultant to provide petroleum production forecasts to conducting them in-house, enhancing the specificity and accuracy of risk modeling.
- » **2018 – Revenue source classification modification:** The Department of Revenue modified the classification of some revenue sources, providing further clarity between restricted revenue and general fund revenue.
- » **2019 – Oil price forecasting methodology revision:** The methodology for forecasting the price of oil was altered, with the short-term oil price forecast being derived from

futures market expectations and the long-term forecast held constant in real terms, increasing with inflation.

- » **2021 – Oil price forecasting methodology revision:** The Department of Revenue further refined the oil price forecast methodology to utilize futures market projections for as many years as are available, followed by an assumption that prices will increase with inflation thereafter, aiming for a more accurate projection of oil prices and state revenue over the medium and long term.
- **Connecticut:** During the Great Recession, the state adopted a formal consensus revenue process with forecasts released three times per year. Before 2009, revenue forecasting between the executive and legislative branches was more informal at budget adoption.
- **Florida:** Revenue forecast methodology is frequently updated by analysts to produce better forecasts.
- **Idaho:** Starting in 2020, unofficial forecasts were added on alternate quarters, the forecast horizon was extended from three years to five years, and alternate forecast scenarios are now presented.
- **Kansas:** The state's consensus revenue forecasts included projections for an additional year beyond the upcoming budget period, spanning fiscal years 2012 to 2018.
- **Kentucky:** During the 2023 legislative session, two changes were made to the statutes that govern the Consensus Forecasting Group. First, the number of meetings in odd-numbered years was reduced from three meetings to two. Second, revenue estimates are now provided only for the upcoming biennium. Previously, the statutes called for a four-year forecast. The “planning estimates” were eliminated due to the unreliability of the outer years' forecasts.¹³
- **Montana:** Forecast methodologies are generally evaluated annually and updated as needed; changes are generally incremental and data driven.
- **North Carolina:** The state's legislative changes require a longer forecast period for transportation revenues starting in 2017.¹⁴
- **North Dakota:** Officials from the executive branch indicated implementing a fourth forecast in every two-year budget cycle as of 2018. In North Dakota, the Legislative Assembly approves the state budget, including the revenue forecast.¹⁵ Officials from the legislative branch indicated the following changes: “Beginning in 2015, after the oil price collapse, the Legislative Assembly has taken a more active role in developing the revenue forecast. Previously, the

Legislative Assembly generally adopted the executive budget revenue forecast. After the 2015 legislative session, the Legislative Assembly hired a private economic forecasting firm and assigned an interim committee to review revenue forecasting data. Since the 2017 legislative session, the Legislative Assembly has considered the revenue forecasts from both the executive budget and the private economic forecasting firm in its development of the official revenue forecast.”

- **New Jersey:** State officials prepared more frequent revenue forecasts for fiscal years 2020 and 2021, as necessitated by the global COVID-19 pandemic.
- **New Mexico:** In 2019, the state’s Consensus Revenue Estimating Group incorporated “stress testing” into revenue forecasts to project potential revenue changes in the event of economic downturns or oil market collapses. The stress testing is conducted for August, December, and January revenue forecasts.¹⁶
- **New York:** Officials indicated that the State’s Division of the Budget (DOB) implemented various strategies to enhance fiscal preparedness and ensure financial stability.¹⁷ These measures include the following:
 - » **Periodic impact assessment of potential recessions:** The DOB now calculates the impact of a potential recession on tax receipts, drawing from the experiences of events like 9/11 and the Great Recession as reference points.
 - » **Monitoring daily cashflows:** The DOB now monitors daily cashflows to anticipate liquidity needs and investigate large variances between actuals and projections, ensuring the State maintains adequate fund balances to cover committed expenses.
 - » **Limiting negative fund balances:** The state has successfully limited the days when fund balances could be negative, a feat achieved over the past 11 years.
 - » **Changes in income tax model:** The DOB shifted from nonwithholding econometric modeling to a ratio method (shares of liability explained by individual components over time); re-estimated model equations to accommodate pandemic-era fluctuations.
 - » **Changes in corporation franchise tax model:** The state transitioned from a quarterly model to an annual microsimulation model starting in fiscal year 2016.
- **Pennsylvania:** Officials indicated that during the COVID-19 pandemic the revenue forecasters applied adjustments to the revenue forecast methodology to account for discrepancies in tax receipts not adequately reflected by economic data. This included modifications to some

regression models, including altering the type of regression analysis and the economic or demographic variables used, to represent actual revenue collections more accurately.¹⁸

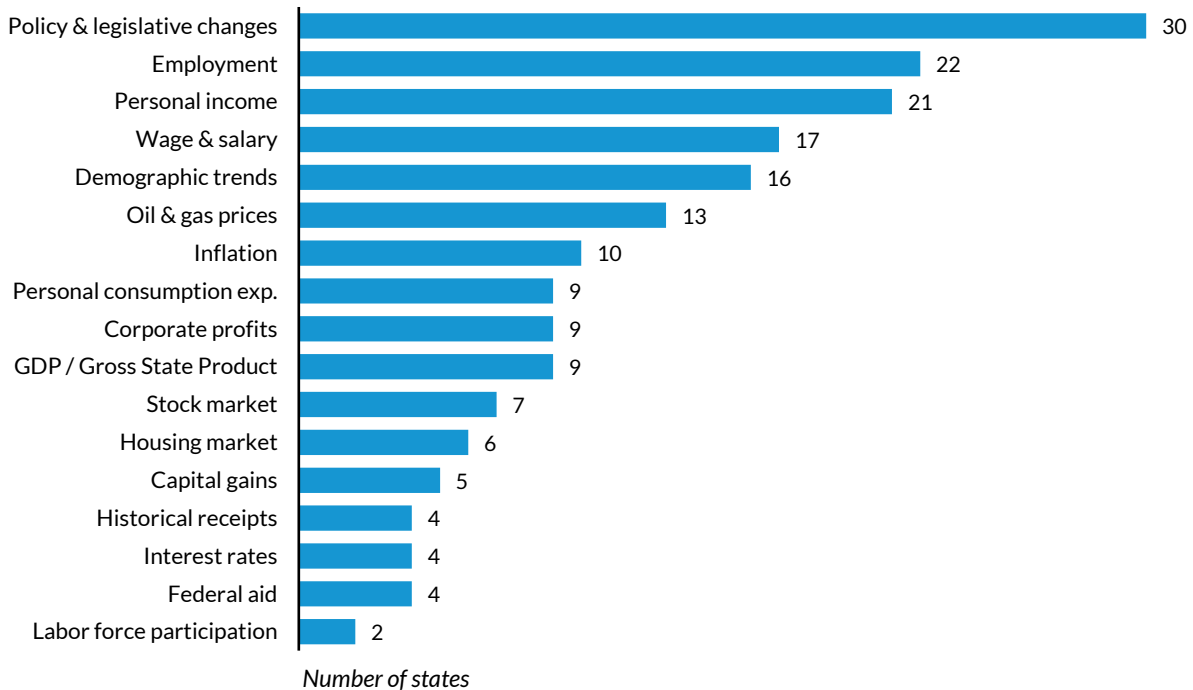
- **Tennessee:** During the Great Recession and immediately thereafter, Tennessee increased the frequency of its revenue forecasts, presenting them twice a year. This adjustment was an informal and temporary measure aimed at better managing the fiscal uncertainty and volatility brought about by the economic downturn.
- **Texas:** During the COVID-19 pandemic, revenue forecasters utilized high-frequency economic indicators as a supplement to conventional economic indicators like GDP and personal income, to be able to track a fast-changing economic environment.

Revenue Forecast Indicators

State economists and forecasters utilize a wide range of indicators to develop their revenue forecasts. To gain insight into this process, we posed an open-ended question to state officials, asking them to identify the key driver influencing their state's revenue forecasting.

FIGURE 22

State Revenue Forecast Indicators



Source: Survey responses; analysis by the author.

The classification of responses, as depicted on [figure 22](#), highlights a range of economic indicators, demographic trends, policy changes, and some other factors that are deemed significant in shaping state revenue forecasts.

Here's a summary of the main drivers for state revenue forecasts as indicated by the responses from various states:

Policy Changes

- **Policy and legislative changes**, both federal and state, are the most cited factors, with 30 states acknowledging their impact on revenue forecasts. These changes can include tax rate adjustments, new tax laws, and legislative decisions that impact revenue streams.

Demographic trends

- Respondents from 16 states have identified **demographic trends** as an important factor in revenue forecasts, given that population growth and migration patterns significantly affect the tax base and the demand for public services.

Economic indicators

- **Employment** and **personal income** were the most frequently cited economic factors, with 22 and 21 states respectively indicating their importance. These factors are closely tied to the overall economic health of a state, as they directly affect income tax revenues and consumer spending.
- **Wages and salaries** also play an important role in revenue forecasts, as indicated by 17 states. Wages and salaries influence personal income taxes.
- Respondents from 13 states identified **oil and gas prices** as significant factors in their revenue forecasting, reflecting the impact that energy market fluctuations can have on state finances. This is particularly the case in oil-dependent states like Alaska, North Dakota, and Wyoming among others.
- **Inflation** and **personal consumption expenditures** were noted by 10 and 9 states respectively, reflecting the impact of price levels on purchasing power and sales tax revenues.
- Nine states highlighted **corporate profits** as a key indicator in their revenue forecasts. Corporate profits directly impact corporate income tax revenues and can also influence other tax streams, such as personal income taxes (through employment and wages) and sales taxes (through consumer spending).

- Another nine states indicated the importance of *national GDP/Gross State Product*, comprehensive measures of economic activity. These indicators capture the overall health and growth trajectory of an economy, shaping tax revenues across multiple streams, including personal income, sales, and corporate taxes.
- Several states, notably those heavily dependent on the financial and technology sectors and home to a significant number of high-income taxpayers—like California, Connecticut, and New York—highlighted the importance of the *stock market* and *capital gains* on their revenue forecasts.

Other factors

- A few states indicated the role of the *housing market*, *historical receipts*, and *interest rates* in their revenue forecasts.
- *Federal aid* and *labor force participation* were also mentioned by respondents in a few states, reflecting the influence of federal support and the availability of working population on state budgets.

The analysis of responses indicate that state revenue forecasts encompass a mix of broad economic indicators, demographic trends, policy and legislated changes at both state and federal levels, commodity prices, investment returns, federal funding levels, and sector-specific factors, among others. These drivers reflect the diverse economic bases, industry reliance, and policy environments across the states, highlighting the complexity of revenue forecasting in the context of varying local conditions.

We also asked state officials to specify the taxes for which their state prepares separate forecasts. Survey responses indicate that states usually prepare separate forecasts for various tax sources as part of their revenue forecasting process. Performing separate forecasts for individual tax sources allows a more granular analysis and greater accuracy since different tax categories—such as personal income tax, corporate tax, sales tax, and property tax—may be influenced by different economic factors and may exhibit different trends and volatilities.

We inquired with state officials about the inclusion of specific indicators in their state’s personal income tax revenue forecasting models. Below is a consolidated summary of responses from 41 states with broad-based personal income tax.

- **Filing status:** Seventeen states forecast personal income tax revenue based on filing status categories such as single, married, or married filing separately.

- **Income class:** Fifteen states consider the income class of filers, differentiating between lower-, middle-, and upper-income classes for forecasting purposes.
- **Taxable income by source:** Twenty-nine states consider the source of taxable income, such as wages, capital gains, self-employment income, retirement income, etc.
- **Personal income tax components:** Thirty-six states include components of personal income tax in their forecasting models, such as withholding, estimated payments, final payments, and refunds.
- **Demographic patterns:** Eighteen states factor in demographic patterns which can influence income tax revenue.
- **Remote work patterns:** Only five states indicated accounting for remote work patterns, which have become more significant following the COVID-19 pandemic.
- **Historical tax laws and structural changes:** Thirty-eight states consider historical tax laws and other structural changes in their revenue forecasting models.
- **New tax laws and structural changes:** Thirty-seven states include new tax laws and other structural changes in their forecasts.

Respondents in Indiana, Massachusetts, New York, and Utah indicated that they account for all the above listed factors in their income tax revenue forecasting models, indicating a comprehensive approach to revenue prediction. Respondents in other states indicated considering a subset of factors, reflecting different approaches to revenue forecasting based on their unique tax structures and economic environments.

We further asked state officials about incorporating specific indicators into their state's sales tax revenue forecasting models. Here is a compiled summary of responses from 45 states with general sales tax.

- **Types of sales taxes:** Twenty-eight states indicated differentiating between general sales taxes and excise taxes in their sales tax revenue forecasting models. This indicates a broad approach to capturing the full spectrum of sales tax revenue, acknowledging the different roles that general sales and excise taxes play in state revenue.
- **Types of sales tax transactions:** Seventeen states differentiate between brick-and-mortar and remote transactions in their sales tax revenue forecasts. This distinction is increasingly important in the digital age, especially as remote transactions have surged notably, driven in part by the Wayfair decision and during the COVID-19 pandemic.

- **Categories of consumer spending:** Twenty-six states consider different categories of consumer spending, such as durable goods, nondurable goods, and services, in their sales tax revenue forecasts. This granularity helps in understanding consumer behavior and its impact on state sales tax revenue.
- **Other considerations:** States also factor in unique elements relevant to their economic context and tax structure. For instance, Iowa opts to not divide the projection into the categories mentioned above, indicating a different approach to forecasting. Minnesota includes historical and new tax laws, as well as the degree of taxability of different spending categories, showing the importance of legal and regulatory frameworks. Texas and Vermont mention specific considerations, such as sales tax remittances by major industry and competitive effects from other tax jurisdictions, respectively. Forecasters in Rhode Island occasionally consider sales tax components for which solid data exists, such as hotels, cars, meals, and beverage.

The summary and analysis of responses indicate that while a common set of factors are considered by many states, significant variation is also present in how each state approaches sales tax revenue forecasting. These differences can be attributed to the unique economic landscapes, consumer behaviors, and sales tax structures in each state. The inclusion of specific factors like remote transactions and industry-specific considerations reflects the evolving nature of the economy and the need for states to adapt their forecasting models to capture these changes accurately.

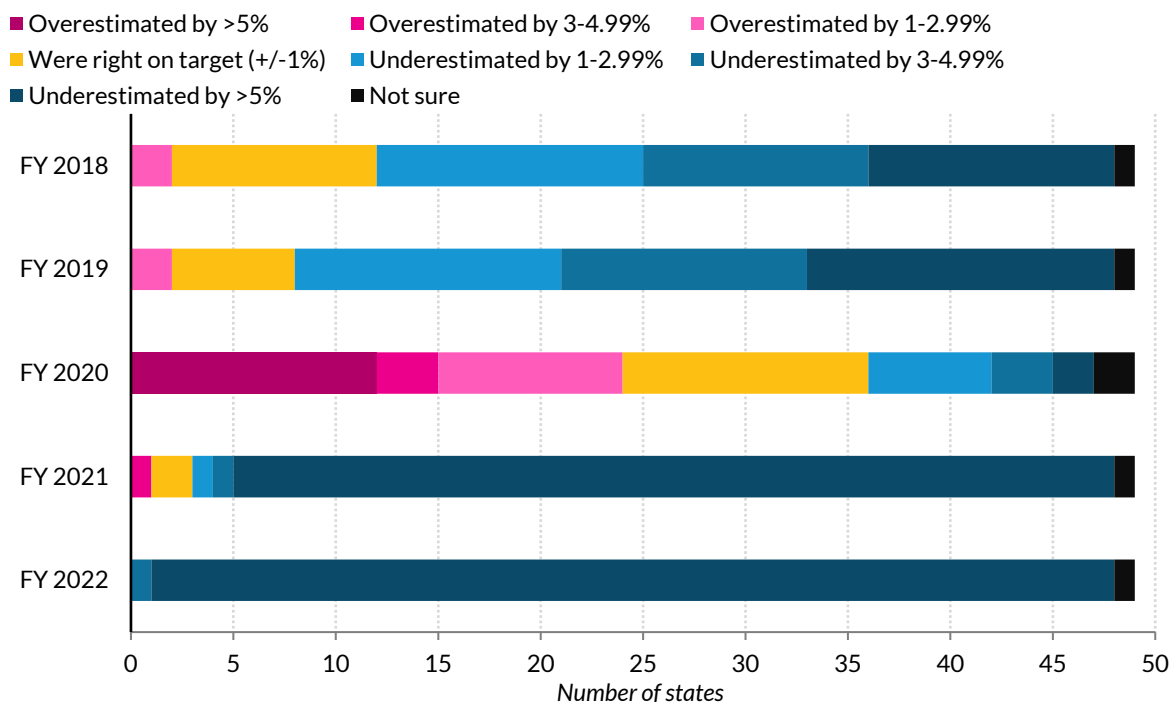
States' Perceived Revenue Forecast Errors

Perceived and actual revenue forecast errors can vary for multiple reasons. For instance, states may rely on updated forecasts to evaluate their fiscal performance. We requested state officials to indicate whether their state's official revenue forecasts for state own-source revenues were overestimated, underestimated, or accurate within a +/- 1 percent margin. [Figure 23](#) presents a summary of the responses from state officials for the fiscal years 2018 through 2022.

As illustrated in [Figure 23](#), for fiscal years 2018 and 2019, none of the states reported overestimating revenues by more than 3 percent. Additionally, revenue forecasts were on target, within a +/- 1 percent margin, in a fair number of states; with 10 states in fiscal year 2018 and 6 states in fiscal 2019. Furthermore, there was a moderate spread of states that either slightly underestimated or overestimated their revenues. This suggests a relatively balanced distribution of forecast accuracy across different states.

FIGURE 23

State Revenue Forecast Errors for Fiscal Years 2018–22



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Source: Survey responses; analysis by the author.

Notes: The figure reflects responses from 49 states.

As previously mentioned, states typically adopt a conservative approach when forecasting revenues. However, the economic disruptions caused by the COVID-19 pandemic led to an atypical outcome in fiscal year 2020, with 12 states overestimating their revenues by more than 3 percent. In contrast, only two states underestimated their revenues by more than 5 percent, and 12 states managed to forecast their revenues accurately within a +/- 1 percent margin. The revenue forecast errors for fiscal year 2020 are also complicated by technical factors, including the delayed income tax due date, which was moved from April 15, 2020, to July 15, 2020, in response to the pandemic. This delay caused some income tax revenue that would typically be attributed to fiscal year 2020 to be collected in fiscal year 2021 instead. The treatment of these delayed tax revenues varied by state, with some states allocating the delayed collections in fiscal year 2021, while others accrued them back to fiscal year 2020. This inconsistency in handling the delayed tax revenues adds an additional layer of complexity to interpreting the forecast errors for that fiscal year.

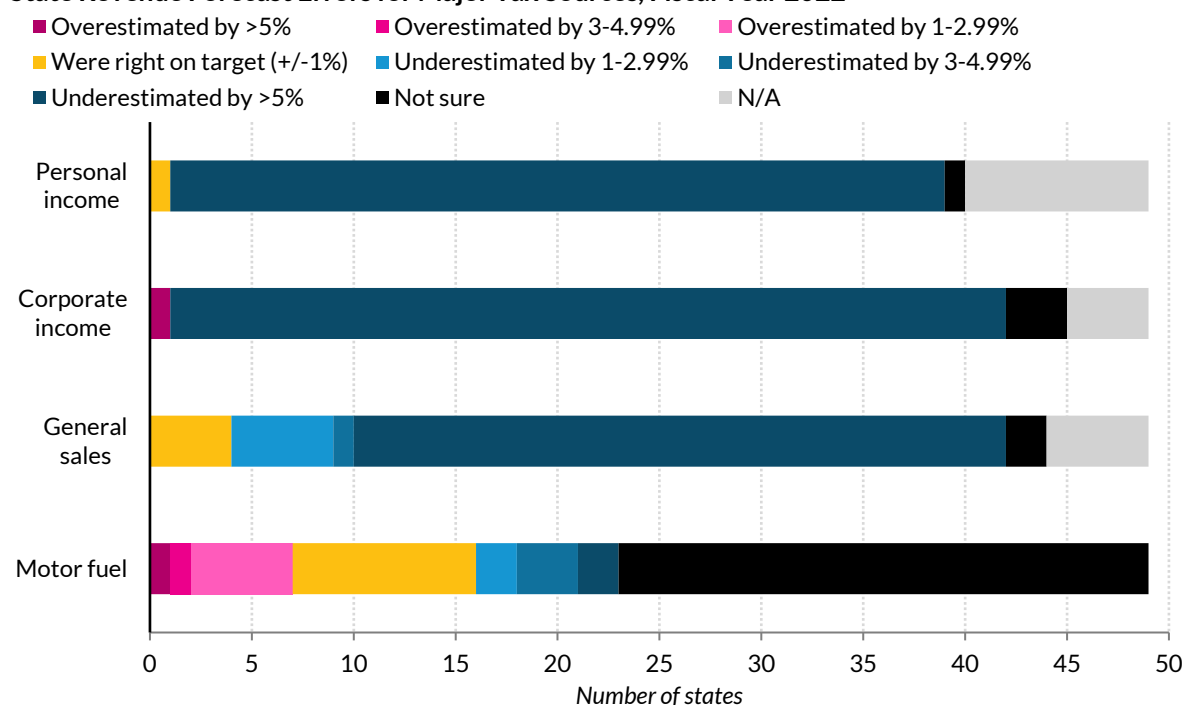
A marked shift toward underestimation occurred in fiscal years 2021 and 2022, with an overwhelming majority of states underestimating revenues by more than 5 percent. This widespread underestimation can be attributed to a confluence of complex factors, including persistent economic

repercussions of the COVID-19 pandemic, uncertainties surrounding the pace of economic recovery, the effects of federal fiscal assistance on state economies, the stock market's unexpectedly robust performance, shifts in consumer spending habits, and changes in the business environment, among others. These diverse and hard-to-predict factors made it extremely difficult for states to forecast revenues with accuracy, leading to significant underestimation across the board, regardless of states' industry reliance, tax structures, forecast methods or procedures.

Our survey requested state officials to provide insights into the accuracy of their official revenue forecasts for key tax sources for fiscal year 2022. The results, illustrated in figure 24, reveal a clear pattern: states predominantly underestimated the major sources of tax revenues.

FIGURE 24

State Revenue Forecast Errors for Major Tax Sources, Fiscal Year 2022



URBAN INSTITUTE

Source: Survey responses; analysis by the author.

Notes: The figure reflects responses from 49 states.

Specifically, personal income tax revenues were underestimated by over 5 percent in 38 states, corporate income taxes followed closely with 41 states underestimating by the same margin, and general sales taxes were underestimated by more than 5 percent in 32 states. The survey results indicate that officials in 26 states were uncertain about the accuracy of their motor fuel tax revenue forecasts. This uncertainty likely reflects the pronounced volatility in oil prices experienced in 2022 and the impacts of such fluctuations on motor fuel tax revenues. Regional factors and state-specific

measures, such as implementation of gas tax holidays, may have further complicated forecasting these revenues accurately. Despite these challenges, officials in nine states reported that their forecasts for motor fuel taxes were right on target, while officials in seven states reported underestimating motor fuel tax revenues by more than 1 percent.

In summary, the survey responses underscore the widespread challenges revenue forecasters faced in accurately forecasting revenue from all major tax sources, with a tendency toward underestimation, especially in corporate and personal income taxes. These findings demonstrate the complexity of projecting tax revenues accurately in a rapidly changing economic environment.

Revenue Forecasting Challenges

State revenue forecasters encountered a multitude of challenges during and after the COVID-19 pandemic due to the unprecedented impact of pandemic-related external factors on state budgets. These challenges affected the accuracy of revenue forecasts, complicating budget planning and fiscal policymaking.

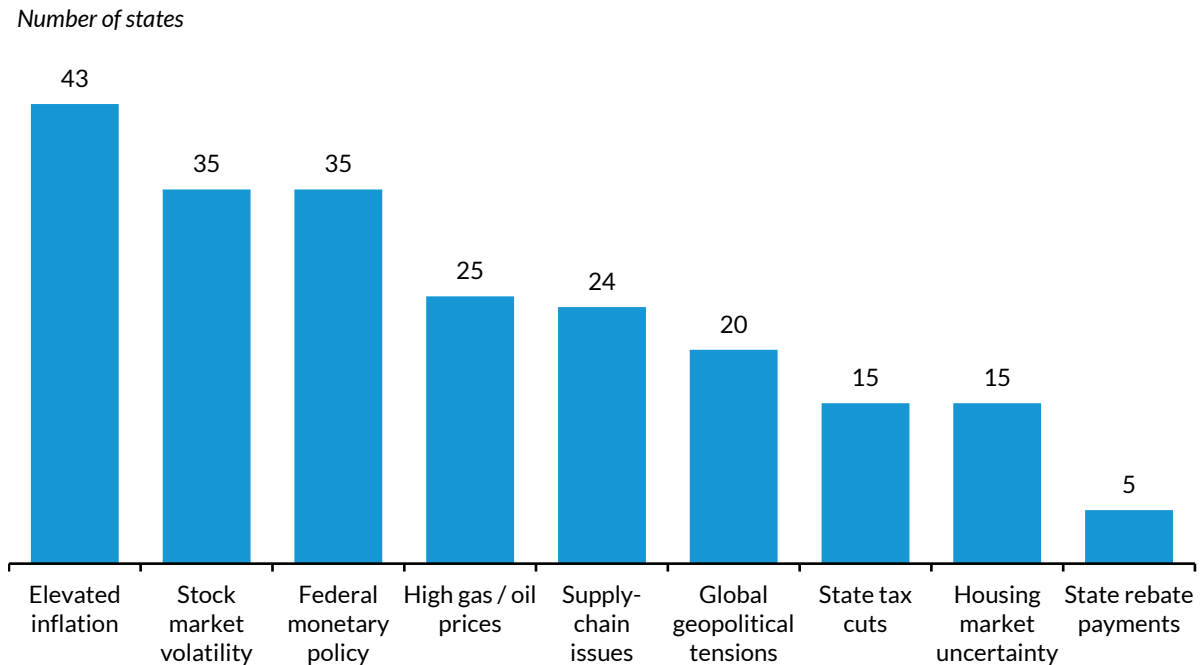
The pandemic revealed differences between states and industries, particularly in terms of work-from-home options and economic resilience. States and industries with a high concentration of higher-income professionals, such as those in tech, finance, and professional services, were able to swiftly transition to remote work. This shift allowed many employees to continue working and earning without significant disruption. In contrast, industries that rely heavily on direct person-to-person service contact, such as restaurants, retail, and hospitality, faced severe challenges. These sectors often had to shut down entirely or operate under stringent restrictions, leading to massive layoffs and financial losses. This dichotomy highlights the uneven economic impact of the pandemic, which posed challenges for state revenue forecasting, as the economic contributions of different sectors varied widely based on their ability to adapt to pandemic conditions.

Furthermore, policy changes during and after the pandemic, particularly retroactive ones, significantly contributed to state revenue forecast errors. For example, the retroactive waiving of the tax benefit rule for Paycheck Protection Program loans allowed businesses to deduct expenses covered by forgiven loans, which was not initially anticipated in revenue forecasts. This unexpected policy shift reduced taxable income and, consequently, tax revenues, leading to discrepancies between projected and actual revenues. Additionally, other federal and state policy changes enacted during and after the

pandemic, as well as unexpected economic performance resulting from these policies, further impacted revenues and complicated revenue forecasts.

To gain a deeper insight into the obstacles encountered by state forecasters, we requested state officials to identify all the factors that complicated the task of revenue forecasting for fiscal year 2022. We listed nine distinct factors, reflective of the primary challenges anticipated for fiscal year 2022. Additionally, officials were provided the option to specify any other factors. Figure 25 summarizes the responses from the state forecasters, indicating the number of states that identified each factor as a complicating element in their revenue projections for fiscal year 2022.

FIGURE 25
Key Challenges Impacting Revenue Forecasts for Fiscal Year 2022



URBAN INSTITUTE

Source: Survey responses; analysis by the author.

The most frequently cited challenge was elevated ***inflation***, noted by 43 states, underscoring its significant impact on the accuracy of revenue forecasts. Both ***stock market volatility*** and ***federal monetary policy*** were each recognized by 35 states, highlighting economic policy and market fluctuations as critical factors. ***High gas or oil prices*** were also a considerable concern for 25 states, potentially due to their effect on broader economic conditions and tax revenues. ***Supply-chain issues*** were selected by 24 states, pointing to the pandemic's lingering disruptions as a contributing factor to forecasting difficulties. ***Global geopolitical tensions*** were acknowledged by 20 states, suggesting that

international events had a measurable influence on state fiscal estimations. Fewer states, 15 each, reported *state tax cuts* and *housing market* uncertainty as complicating factors, which may reflect more localized economic considerations. Interestingly, *state rebate payments* were the least cited factor, with only 5 states considering it a significant issue. This may indicate that while rebate policies directly affect state budgets, they may not have posed as significant a forecasting challenge as the broader economic factors.

Officials from several states identified some additional challenges that impacted revenue forecasts for fiscal year 2022. Notably, 17 states highlighted the complex impact of federal stimulus measures on their revenue projections. Furthermore, officials from California, Idaho, Massachusetts, and Minnesota indicated that the newly enacted pass-through entity tax presented an additional layer of complexity in their revenue forecasting efforts. For example, officials in Idaho indicated the following: “The largest factor in revenue forecast error for fiscal year 2022 was the change from the IRS that made it possible for pass-through entities to take on tax liability for personal income filers. It completely changed the way we forecast personal and corporate income tax.” Additionally, officials from a few other states highlighted other influential factors, including elevated consumer spending and a surge in tourism, especially after the lifting of COVID-19 restrictions.

These insights underscore the breadth and depth of challenges encountered by state revenue forecasters, with macroeconomic factors like inflation, market conditions, and federal policies playing a dominant role for fiscal year 2022 revenue projections. The diversity of factors highlights the complicated task of accurately forecasting revenues within a highly unpredictable economic and geopolitical climate.

The survey was conducted during the spring and summer of 2023, which coincided with a period of financial turbulence for several banking institutions. In light of this, we queried state officials to indicate whether the banking crisis was being considered in their state's revenue forecasting models. This question aimed to determine how state revenue projections were being adjusted in response to the potential impact of the banking sector's instability. According to the survey responses, 18 states incorporated the banking crisis into their revenue forecasts, 23 did not, and officials in 8 states remained uncertain.

Officials from several states explained that their revenue forecasting models did not include distinct variables for the banking crisis. Instead, they relied on macroeconomic forecasts from vendors such as Moody's and S&P Global, which had already adjusted for the tighter credit conditions stemming from the banking crisis. Additionally, although some states acknowledged not explicitly incorporating the banking crisis into their revenue forecasts, it was considered during the forecasting process as a

potential downside risk. Following the stabilization of the banking sector, a subset of states that provided delayed responses to our survey reported that they no longer anticipated the likelihood of widespread banking failures or a credit crisis. As a specific case in point, officials from Colorado disclosed, “We had incorporated financial risk in our March forecast but removed these adjustments for our June forecast.” Officials from New York noted that the banking crisis had stabilized before their upcoming forecast cycle, leading them not to specifically incorporate it into their projections. “However, the resulting tightening in credit conditions has been accounted for in our overall economic forecast.” These narratives highlight the dynamic and responsive nature of state revenue forecasting practices, illustrating how forecasters adjust their models in response to changing external circumstances.

Beyond inquiring about specific revenue forecasting challenges for fiscal year 2022, we also sought to understand the broader, ongoing obstacles. Therefore, we asked state officials to detail the main revenue forecast challenges through an open-ended question.

The survey responses highlight a range of revenue forecasting challenges, which are often closely tied to the unique tax structures and industry dependencies of each state. A summary and analysis of the responses reveal several key themes.

Tax Structure-Related Challenges

- ***Progressive income tax structures:*** States like California, Connecticut, New York, and New Jersey, which have progressive income tax structures that rely heavily on higher-income earners, indicated forecasting challenges due to the volatility of capital gains. For example, officials from California pointed out: “Our progressive tax system is highly reliant on high-income earners, which leads to volatile tax revenues since their incomes can change significantly from one year to the next as stock-based compensation and bonuses make up a significant share of their income. Forecasting capital gains realizations is challenging due to its volatility and correlation with the performance of asset prices.”
- ***Corporate income tax volatility:*** At least 15 states explicitly indicated the volatility of corporate income taxes as a significant challenge. This volatility can be attributed to various factors, including economic conditions, federal tax reforms, and corporate behavior. The reduction of the corporate income tax rate from 35 percent to 21 percent pursuant to the TCJA further intensified the volatility in revenue forecasts. For instance, New Jersey officials highlighted the challenges introduced by the TCJA and the transition to combined reporting for the tax year 2019, stating, “For the corporation business tax, the shift to combined reporting for tax year 2019 and the federal TCJA complicated revenue forecasting because historical trend data had become less useful for forecasting.” Similarly, officials from California observed the inherent

difficulties in corporation tax forecasting, noting, “Policy changes such as the suspension of NOLs [net operating loss] and the limitation on credit use for businesses, which were in effect for taxable years 2020 and 2021 are also challenging. Corporation tax generally is challenging due to variability in receipts that is at times not well correlated with the economy.”

- **Pass-through entity taxes:** The recent implementation of PTET across several states has introduced additional complexity into revenue forecasting. States implemented PTET primarily to provide a workaround for the federal cap on SALT deductions, which was limited to \$10,000 by the TCJA of 2017. By allowing pass-through entities to pay state taxes at the entity level, states enable owners to deduct these taxes on their federal returns, effectively bypassing the SALT cap (Dadayan and Buhl 2023). Although PTET provides tax benefits to business owners, it introduces significant complexities in state income tax forecasting and administration. For example, officials from California highlighted this issue, stating, “The PTET has proved challenging as well, particularly because how personal income taxpayers adjust their payments in response to anticipated PTET credit usage will never be known.” Similarly, an official from Rhode Island mentioned, “The impact of the state's elective pass-through entity tax on both personal and corporate income taxes has caused data issues and has been hard to decipher.”

Industry Reliance-Related Challenges

- **Oil market fluctuations:** States with economies highly dependent on the oil and gas industry face forecasting challenges related to the unpredictability of these markets. Severance taxes, which are tied to the extraction of natural resources, are particularly difficult to forecast due to their dependence on volatile commodity prices. Officials from seven states—Alaska, New Mexico, North Dakota, Oklahoma, Texas, West Virginia, and Wyoming—mentioned the challenge of forecasting revenues due to oil market fluctuations. For example, officials from New Mexico remarked, “Severance tax volatility is the biggest challenge for revenue forecasts. New Mexico revenues are highly reliant on oil and gas, and it is difficult to estimate those revenues.” Similarly, officials from Oklahoma noted, “The overall revenue picture is heavily influenced by oil & gas prices.”

State-Specific Challenges

- **Natural disasters:** Certain states face unique challenges that are characteristic of their specific circumstances. For instance, Florida's response indicated that natural disasters, such as hurricanes, can impact its revenue forecasts by disrupting economic activities and complicating the predictability of state revenues.

Economic and Policy Uncertainty

- **Risk of recession:** Officials across various states have underscored the challenges posed by broader economic conditions, particularly the threat of a recession. This is a crucial aspect for revenue forecasters, given its significant potential to affect a state's fiscal stability. For instance, officials from Illinois have pointed out the difficulty in anticipating a recession, stating, “The threat of a recession and projecting when this could hit in our state and the extent that it will impact tax revenues.” Similarly, Arizona officials remarked on the “uncertainty regarding the timing, depth, and duration of the next recession,” emphasizing the challenge of incorporating potential economic downturns into revenue forecasts.
- **Policy and tax law changes:** Forecasters must also navigate the complexities arising from changes in state and federal tax laws and policies. These changes can significantly alter taxpayer behavior, further complicating the task of accurately projecting revenue streams. For instance, officials from Rhode Island noted, “Federal policy changes, such as the TCJA and APRA, have been hard to analyze and incorporate into revenue estimates.” For instance, officials from Louisiana highlighted the difficulties presented by “constant policy changes, numerous conditional tax rate triggers.” Meanwhile, Rhode Island officials remarked, “Federal policy changes, such as the TCJA and ARPA, have been hard to analyze and incorporate into revenue estimates.”

Data Challenges

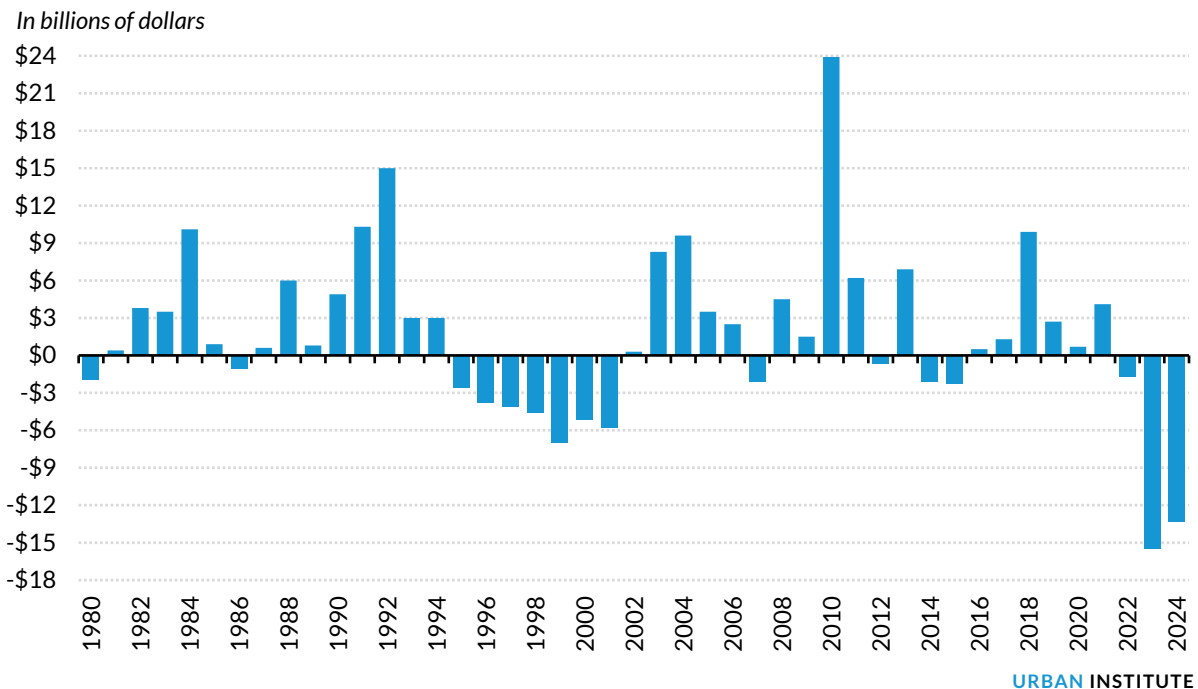
- **Lack of data:** Several states have pointed out the significant challenge posed by the lack of access to timely and high-frequency data, which hampers their ability to rapidly detect economic shifts and accordingly adjust revenue forecasts. For example, Iowa officials noted that revenue forecasts are completed prior to tax returns due in April and May, and, therefore, “very little is known about the most recent tax year when the final projection is made.” Similarly, Idaho officials stressed the challenge of not having access to primary data, and that “it is always summary and always lagging.” Maryland officials underscored the challenge of having insufficient data on nonwage income, by stating, “We have little good data on nonwage income which accounts for an increasing share of the income tax revenue and is highly volatile.”
- **Irrelevance of historical data:** The growing irrelevance of historical data, driven by frequent tax and policy changes, poses a major hurdle in revenue forecasting. For instance, officials from Montana, New Jersey, and Rhode Island have noted a noticeable decrease in the usefulness of historical trend data for forecasting purposes, attributing this decline to the effects of recent federal and state legislative and policy changes.

In summary, state revenue forecasters are encountering an increasing array of challenges that substantially limit their ability to forecast revenues accurately. These challenges require a sophisticated understanding of how tax policies, economic conditions, and sector-specific factors interact. Forecasters must constantly modify and enhance their forecast models and methods to keep pace. To this point, officials from Vermont noted the following: “Longer-term challenges will be presented by other unprecedented events, probably associated with climate change, war, and federal political challenges. All of these exacerbate uncertainty and require more model simulation and increased forecast frequency than has typically been done by state government.

Recent Tax Legislation and Its Role in State Forecasts

Historically, states have often responded to economic downturns by raising taxes to address budget deficits. On the other hand, during economic upturns, tax reductions are more commonplace. This trend was notably evident during the Great Recession, when states, grappling with falling revenues, enacted tax hikes or other fiscal strategies to maintain balanced budgets. However, the postpandemic period has seen a departure from this norm. [Figure 26](#) illustrates the estimated net revenue impact of legislated changes, including tax rate cuts and tax rate increases for fiscal years 1980 through 2024.

FIGURE 26
Estimated Net Revenue Impact of Tax Rate Changes, Fiscal Years 1980–2024



Sources: NASBO; analysis by the author.

Despite the economic challenges posed by the COVID-19 pandemic, many states have enacted significant tax cuts. The estimated net impact of the tax rate reductions amounted to \$15.5 billion for the fiscal year 2023, representing the largest tax rate cut in recorded history.

We requested state officials to report on any tax rate changes enacted in their states during the postpandemic period. [Table 8](#) summarizes the responses, detailing the count of states that enacted both tax rate reductions and increases across different tax categories from fiscal years 2021 to 2024.

TABLE 8
Number of States That Enacted Tax Rate Changes, Fiscal Years 2021–24

Tax source	Number of States That Enacted Tax Cuts				Number of States That Enacted Tax Increases			
	FY 2021	FY 2022	FY 2023	FY 2024	FY 2021	FY 2022	FY 2023	FY 2024
Personal income	7	14	20	19	2	1	2	0
Corporate income	5	8	9	10	0	1	0	0
General sales	0	0	1	3	0	0	0	1
Excise	0	0	1	2	1	1	4	4
Motor fuel	0	2	2	0	6	6	6	5

Source: Survey responses; analysis by the author.

Note: FY = fiscal year.

Survey results indicate a clear trend of states enacting tax rate cuts, particularly in personal and corporate income taxes. The number of states reducing personal income taxes peaked in the fiscal year 2023. Corporate income tax cuts also saw a steady increase. General sales tax and excise tax changes were less frequent, but there is a notable increase in excise tax increases, which is indicative of targeted revenue-raising measures. Conversely, motor fuel taxes experienced more hikes than reductions.

A few states have indicated the implementation of some other notable tax measures. Vermont, for instance, has approved a cannabis sales tax, while Washington has introduced a capital gains tax, a significant move given the state's absence of a broad-based income tax. Conversely, New Hampshire is progressing toward the gradual repeal of its interest and dividends tax, with the tax set to be completely phased out by 2025. Meanwhile, Kansas officials noted a phased elimination of the state sales tax on groceries, with a plan to reduce the rate to zero percent over three years.

Overall, the responses suggest a significant shift toward tax rate reductions in the postpandemic period, with states taking varied approaches to different tax categories. The long-term fiscal implications of these tax changes will depend on economic conditions and the balance between stimulating economic growth and maintaining revenue for public services.

We requested that states describe their methodologies for projecting the revenue implications of proposed state tax amendments. The responses reveal a diverse array of methodologies and practices across the states. Some states have established standardized practices, often utilizing static models or microsimulations, while others rely on consultations with specific departments and consensus processes. Here is a summary of the key approaches identified.

Microsimulation models: Several states, notably Arkansas, Montana, Nebraska, Oregon, and Utah, frequently rely on microsimulation models to evaluate the potential impact of proposed tax modifications. These models simulate the effects of tax changes on a micro-level, often using detailed taxpayer data to forecast the revenue impact accurately. These microsimulation models are most often used for estimating income tax changes, but not necessarily for other tax changes. For example, officials in Montana and Oregon have indicated that they employ microsimulation models for estimating the impact of income tax changes but utilize alternative modeling techniques for assessing changes in other tax categories.

Static models: A few states, including Arizona, California, North Dakota, New Hampshire, and South Carolina, typically employ static models for analyzing and estimating the direct effects of tax policy changes. Some states also use structural modeling or incorporate microsimulation alongside static analysis to refine their forecasts.

Separate fiscal agency estimates: Officials in several states indicated that their fiscal agencies are often responsible for estimating the impact of tax changes. Those estimates are often presented in the form of fiscal notes during the legislative process and are incorporated into the state's revenue forecasts. In Kansas, for instance, the Department of Revenue forecasts the revenue effects from tax changes, which are then integrated into consensus estimates. Conversely, in Louisiana, the Legislative Fiscal Office is tasked with producing a fiscal note that assesses the fiscal repercussions of state tax amendments. Those estimates are mechanically incorporated into the existing forecasts once the legislative session concludes. Wisconsin follows a similar approach, where a dedicated team estimates the impact of proposed tax changes, and once those changes are enacted, their estimated effects are factored into the revenue forecast. Meanwhile, in Washington, the Department of Revenue is responsible for estimating revenue effects of proposed tax changes. The initial forecast following the passage of new tax legislation adopts the Department of Revenue's estimate, subsequently integrating the tax change into the forecast for the affected tax, ensuring that revenue projections accurately reflect recent legislative actions.

Customized techniques and approaches: Survey responses from several states, including Arizona, California, Colorado, North Carolina, Ohio, Oregon, and Pennsylvania, highlight a diversity of specific methodologies and approaches these states deploy to integrate the estimated impacts of legislated changes into their revenue forecasts. Officials pointed out that the specific approach and methodology for estimating the fiscal impact of tax changes often depend on the type of tax involved and the specifics of the proposed change. For instance, officials from North Carolina detailed their approach: “For rate changes, we adjust our forecast fractionally to account for rate differences and the timing of tax payments to which the rate change would apply. For base changes (e.g., an increase in the standard deduction, reducing the number of alternate bases in the franchise tax), we will use microdata (either in-house for individual income tax changes or by request from our Department of Revenue for corporate tax changes). For changes not well represented in our microdata (e.g., expanding the sales tax base to repair services or exempting specific sources of income from taxable income), we use external data, including from similar policies in other states, to estimate the impact of proposed revenue changes.”

Tax changes significantly complicate the task of revenue forecasting for state governments. Overall, the responses illustrate that states employ a wide range of methods to incorporate proposed state tax changes into their revenue forecasts. Although some states have standardized practices for certain taxes, employing microsimulation models or static analyses, others rely on specific fiscal agency estimates. The choice of methodology often depends on the tax type and the specific nature of the tax change. This spectrum ranges from in-depth, tax-specific evaluations to more dynamic, adaptable strategies that consider the distinctive features of each tax proposal. The diversity in models, methodologies, approaches, and various parties involved underscores the complexity of accurately forecasting the revenue implications of tax amendments.

Revenue Picture for Fiscal Years 2023 and 2024

As the survey was conducted during fiscal year 2023, we asked states to describe the revenue picture for the ongoing fiscal year 2023 and the forthcoming fiscal year 2024 across various tax sources. [Table 9](#) summarizes the responses received, indicating the number of states expressing different levels of optimism or pessimism regarding revenue expectations

TABLE 9

State Perceptions of Revenue Picture Fiscal Years 2023 and 2024

Tax category	Fiscal year	Very optimistic	Optimistic	Neutral	Pessimistic	Very pessimistic	Don't know	NA/no response
Total revenues	2023	6	19	19	2	1	2	0
	2024	1	10	25	9	1	3	0
Personal income	2023	5	13	12	7	1	2	9
	2024	1	7	22	7	0	3	9
Corporate income	2023	15	15	8	4	0	2	5
	2024	3	10	21	6	1	3	5
General sales	2023	5	22	14	1	0	2	5
	2024	1	11	25	4	0	3	5
Motor fuel	2023	2	3	24	4	1	15	0
	2024	1	6	24	5	0	13	0
Severance	2023	5	3	9	2	1	3	26
	2024	1	3	11	4	1	3	26
Marijuana	2023	0	4	12	2	1	0	30
	2024	1	4	11	2	0	3	28

Source: Survey responses; analysis by the author.

Fiscal year 2023 revenue outlook: For fiscal year 2023, states generally expressed optimism about their total own-source revenues, with 25 states feeling optimistic and 19 states taking a neutral stance. Only 3 states expressed pessimism, with 2 being pessimistic and 1 very pessimistic. This optimism extends to specific tax categories as well, particularly corporate income tax, where 30 states were optimistic and 8 were neutral. States also expressed a high level of optimism for general sales tax revenues, with 27 states being optimistic and 14 neutral. State officials expressed a more mixed outlook for personal income tax and motor fuel tax categories. Although there was a significant level of optimism for personal income tax (5 very optimistic and 13 optimistic), there was also a notable level of pessimism (7 pessimistic, 1 very pessimistic). Only 5 states indicated optimism for motor fuel taxes, and 15 states indicated uncertainty. Finally, states, in general, took a neutral stand regarding severance and marijuana taxes.

Fiscal year 2024 revenue outlook: The outlook for fiscal year 2024 indicates a shift toward more cautious or neutral expectations across all tax categories. For total own-source revenues, the number of states feeling optimistic dropped to 11, with a significant increase in states feeling neutral (25) and pessimistic (10). This trend of increased neutrality and pessimism is consistent across personal income tax, corporate income tax, and general sales tax categories. The motor fuel and marijuana tax categories remained relatively stable, with a slight increase in states indicating optimism for both tax sources. Finally, there was an increase in states expressing neutrality or pessimism for severance taxes.

Overall, the survey results suggest a cautious outlook among states for fiscal year 2024 compared to fiscal year 2023, with a discernible trend of decreased optimism and increased pessimism. This shift may reflect concerns about economic uncertainties, potential legislative changes affecting tax revenues, or other external factors influencing state revenues. It's important to note that these perceptions might have evolved for some states since then, as evidenced by the latest revenue forecast revisions for fiscal year 2024, which generally trended downward (Dadayan 2024).

Policy Recommendations

Forecasters face significant challenges and complexities in projecting state revenues. This report highlights the variability in forecasting accuracy across different states and tax categories, with notable discrepancies arising from economic volatility, changes in federal and state policies, and unforeseen global events. The COVID-19 pandemic era in particular presented unprecedented challenges for state forecasters, leading to substantial underestimations of revenues in fiscal years 2021 and 2022. This period of unpredictability was further compounded by the extraordinary federal fiscal stimulus, heightened inflation, and a robust stock market performance, among other factors. These elements collectively contributed to an unexpected surge in state tax revenues, illustrating the difficulty of forecasting in an environment of rapid and significant changes. To address these challenges and improve the accuracy and reliability of state revenue forecasts, several policy recommendations emerge from this report's findings, some of which align with previous suggestions (McNichol 2014).

Enhance Forecasting Models and Methods

- **Incorporate a broad range of indicators:** Revenue forecasting models can incorporate a broad range of indicators, including state-specific factors, such as demographic shifts, industry trends, and consumer behavior. Many states have already adopted this practice, recognizing the importance of evolving and updating forecasting models to align with the current economic landscape and factors, such as demographics, politics, environmental issues, and technological advancements. A holistic approach to incorporating these indicators can significantly improve the accuracy of revenue forecasts by addressing the complex and interconnected elements that influence state economies.
- **Leverage advanced forecasting methods:** Traditional forecasting methods, while valuable, may not fully capture the complex patterns and dynamic factors affecting revenue streams. States are encouraged to adopt advanced forecasting methods, including the application of artificial intelligence (AI). AI has the potential to transform the forecasting landscape by offering more sophisticated techniques that can process a diverse array of data sources, including real-time data and behavioral analytics. The integration of AI into forecasting practices can lead to more accurate and efficient state revenue forecasts.
- **Update revenue forecasts regularly:** States can review and update their revenue forecasts regularly, at least semiannually, to reflect the latest economic conditions and trends, policy

changes, and other significant events and developments, such as technological advancements, natural disasters, or geopolitical crises. By updating revenue forecasts on a regular basis, states can maintain the relevance and responsiveness of their models. This practice contributes to the enhancement of forecast accuracy by allowing models to adjust to and incorporate new information and changing economic dynamics.

- **Long-term fiscal planning:** Extending the forecast horizon and adopting multiyear budgeting strategies can improve long-term fiscal planning and decisionmaking. Although many states currently offer revenue forecasts beyond the upcoming fiscal year, there remains room for improvement in these practices.

Enhance Collaborative Decisionmaking in Revenue Forecasting

- **Depoliticize revenue forecasting:** It is imperative for states to prioritize the objectivity of revenue forecasts by grounding them in unbiased data and analytical methods. This approach necessitates a deliberate effort to remove political influences or biases from the forecasting process.
- **Adopt or strengthen consensus forecasting practices:** States are encouraged to either adopt or enhance their consensus forecasting practices. This method involves a collaborative effort among representatives from both the executive and legislative branches, as well as independent experts, to create revenue forecasts. Although consensus forecasting is prevalent in many states, in others, revenue forecasts are conducted by a single entity or by both the executive and legislative branches independently, often without collaboration or reconciliation. By fostering or strengthening consensus forecasting approach, states can potentially mitigate the risks of political bias.

Improve Transparency and Stakeholder Engagement

- **Enhance transparency of forecasting processes:** States can make their revenue forecasting processes more transparent by publishing detailed information on the methodologies, assumptions, and data sources used. This practice can build trust among stakeholders and facilitate a more informed public discourse. Currently, only a few states adhere to this practice.

- **Engage a broad range of stakeholders:** States can involve a diverse group of stakeholders, including legislators, economists, business leaders, and the public, in the forecasting process. This engagement can provide valuable insights, foster consensus, and enhance the accuracy of revenue forecasts.

Address Structural and Policy-Related Challenges

- **Review and adjust tax structures:** States can periodically review and modernize their tax structures to adapt to the new economy. This may involve adjusting tax rates or reforming tax policies to create a more stable and predictable revenue stream.
- **Diversifying revenue sources:** States heavily reliant on volatile revenue sources, such as severance taxes, can diversify their tax structures to reduce the impact of economic fluctuations on state budgets.
- **Prepare for demographic and technological changes:** States can proactively address the fiscal implications of demographic shifts and technological changes. This includes planning for the aging population, addressing the declining labor force, adapting to new business models, and leveraging technology to enhance revenue collection and forecasting capabilities.

Strengthening Fiscal Reserves and Managing Revenue Volatility

- **Strengthen and maintain fiscal reserves:** States can continue strengthening and maintaining their fiscal reserves and rainy day funds to cushion against revenue shortfalls during economic downturns. These funds can provide a financial buffer, reducing the need for abrupt fiscal adjustments.
- **Managing revenue volatility:** States can establish clear rules for fund deposits and withdrawals, linked to revenue volatility and economic conditions. This approach ensures that states with more volatile revenue streams set aside larger reserves, better preparing them for economic fluctuations and fiscal stress.

By improving the accuracy of their revenue forecasts, states can better manage fiscal risks and ensure the sustainable provision of public services to their citizens.

Notes

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- ⁷ “Consensus Revenue, Office of Policy and Management,” State of Connecticut, accessed May 15, 2024, <https://portal.ct.gov/OPM/Bud-Other-Projects/Reports/Consensus-Revenue>.
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- ¹⁶ See “General Fund Consensus Revenue Estimate,” New Mexico Legislative Finance Committee, August 2023, https://www.nmlegis.gov/Entity/LFC/Documents/Revenue_Reports/General_Fund_Revenue_Forecast/2023.pdf.
- ¹⁷ See “Economic, Revenue and Spending Methodologies Reports,” New York State Division of the Budget, accessed May 15, 2024, <https://www.budget.ny.gov/pubs/supporting/methodology.html>.
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