



The California State Budget and Revenue Volatility

Fiscal Health in a Deficit Context

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EXECUTIVE SUMMARY

- California's Legislative Analyst's Office estimates that the state is facing a \$31 billion budget deficit in 2023-24. This is unsurprising considering California's budget relies on revenues derived from extremely unstable sources, namely personal income tax on wealthy individuals who are highly mobile and responsive to policy changes and taxes on capital gains realizations, which are related to volatile market returns.
- As fears of a national recession mount, the link between revenues and market returns places Sacramento in a precarious financial position. Our analysis estimates that in a recession in which real US GDP declines by 1 percent, accompanied by a decline in the S&P 500 Total Return Index of 20 percent, income tax liabilities in the state would fall by 14 percent, with revenues declining at approximately the same rate.
- Business income tax revenues are also volatile given evidence that firms, including pass-through entities and corporations, respond to state tax rates.
- To alleviate strain on California's fiscal health, legislators should focus on preserving the current tax base by incentivizing high-income taxpayers and businesses to stay in the state, smoothing revenues, and increasing spending transparency across the board.

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In his January 2023 Budget Proposal presentation, Governor Gavin Newsom likened California's tax structure to the graph of an electrocardiogram, defined by volatile revenues and periods

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of boom-and-bust. Indeed, in recent years, the instability of California’s tax base has become difficult to ignore. The state recorded its first population decline in over one hundred years in 2020, with the downward trend continuing in 2021 and 2022 (Christopher 2021). There has been extensive media coverage of the departures from the state of high-profile residents like Elon Musk and Larry Ellison, who took their companies with them to other states (Vranich and Ohanian 2022). Now, after years of record surpluses, the California Legislative Analyst’s Office initially projected a \$24 billion deficit in the face of the weakest revenue estimates since the Great Recession (Petek 2022) and has recently updated this projection to include an additional \$7 billion deficit (Petek 2023).

While this volatility is a major cause for concern for California’s economic and fiscal health, it is not surprising given the state’s tax structure. Fragility is baked into the system, which relies heavily on personal income tax on the wealthy and capital gains realizations. As national economic uncertainty continues to grow, Sacramento should focus on preserving its tax base, stabilizing revenues, and increasing spending transparency in order to receive a clean bill of fiscal health.

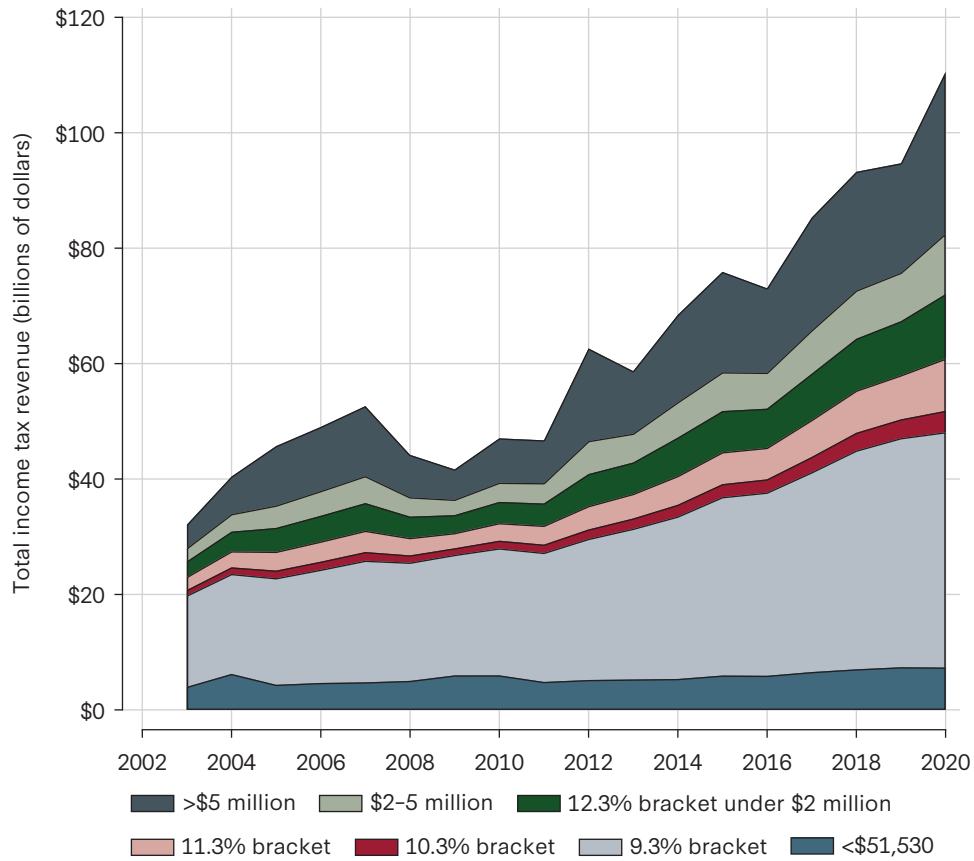
As discussed in Rauh (2022), the state relies very heavily on personal income taxes to generate revenues. In fact, over 60 percent of total revenues derived from personal income tax in six of the last seven budget cycles. Figure 1 shows that these personal income tax revenues have grown significantly over the last two decades. From calendar year 2003 to calendar year 2020, income tax revenues more than tripled in real terms, growing from just \$32 billion to nearly \$111 billion in 2015 dollars according to California Franchise Tax Board data. Income taxes increased over this time period from 44.6 percent to 59.7 percent of total taxes in California, as seen in table 1.

At the same time, an increasingly large share of that personal income tax revenue has come from the top tax bracket, particularly the highest earners within that bracket. As displayed in figure 2, the share of personal income tax paid by those earning over \$5 million was about 13 percent in 2003 but rose to over 20 percent in 2019. In fact, only 8,235 resident households—just 0.05 percent of the state’s households—paid 19.8 percent of all income taxes in 2019. This reliance on such a small number of people is especially concerning considering that research tells us that these high earners are particularly responsive to tax policy changes like Proposition 30 (2012) and the Tax Cuts and Jobs Act, as well as exogenous events like COVID-19.

These extremely high-income individuals are very mobile. In a study of the behavioral response to the Proposition 30 income tax increases of 2012, Rauh and Shyu (2022) find that departure rates for taxpayers who would wind up in the top bracket were 0.8 percentage points higher between 2012 and 2013 than the 1.5 percent average rate in previous years, representing a 53 percent increase in out-migration rates as a result of the tax increase.

Likewise, according to Rauh (2022) there was a substantial out-migration response following the federal Tax Cuts and Jobs Act of 2017, which capped the state and local tax deduction

FIGURE 1 Total income tax revenues by tax bracket



Note: This figure displays total income tax revenues by bracket for all income tax filers over time in 2015 dollars.

Source: Income tax data from California Franchise Tax Board (CA FTB).

TABLE 1 PERSONAL INCOME TAX REVENUES OVER TIME

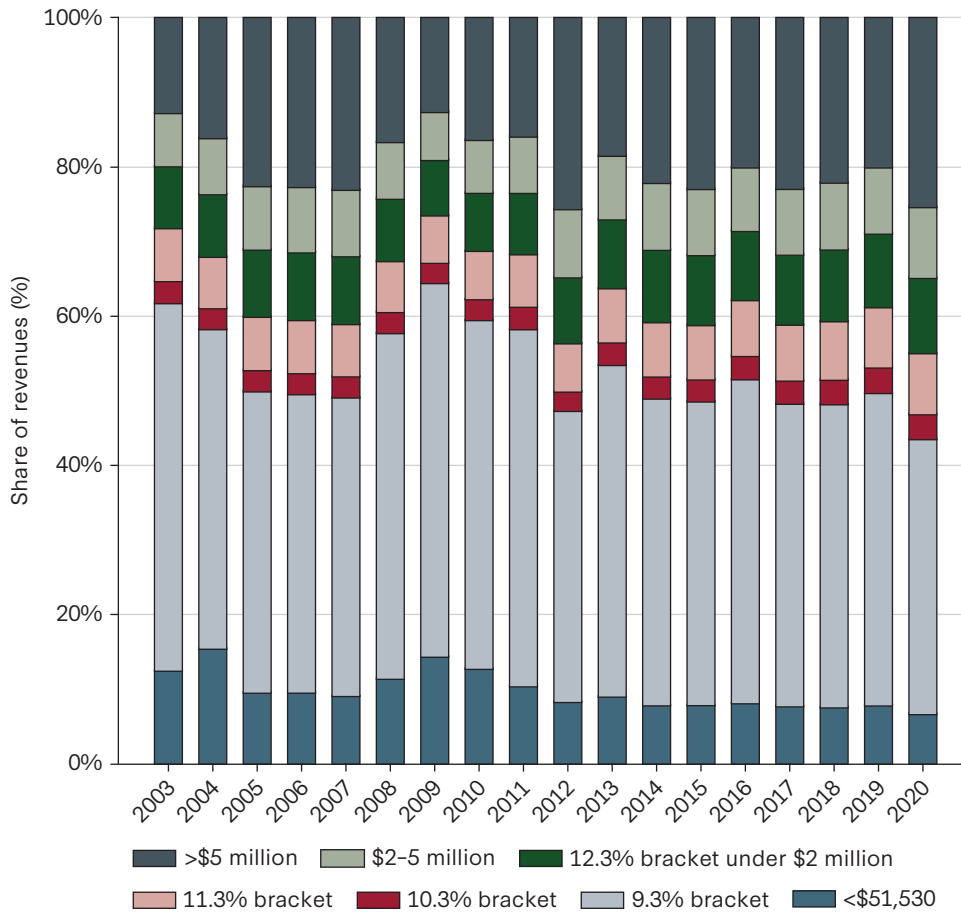
	Fiscal year 2003-4	Fiscal year 2020-21
Personal income taxes (PIT)	\$48	\$116
Total tax collection	\$108	\$194
PIT as % of total taxes	44.6%	59.7%
California gross state product (GSP)*	\$1,975	\$2,655
PIT as % of CA GSP	2.4%	4.4%
Total tax as % of CA GSP	5.4%	7.3%

*California gross state product is for the calendar year prior to the calendar year in which the fiscal year ends.

Note: All dollar values are reported in billions of 2015 dollars.

Sources: Personal income tax data and total tax data from California Department of Finance and California GSP from US BEA.

FIGURE 2 Share of total income tax revenues by bracket



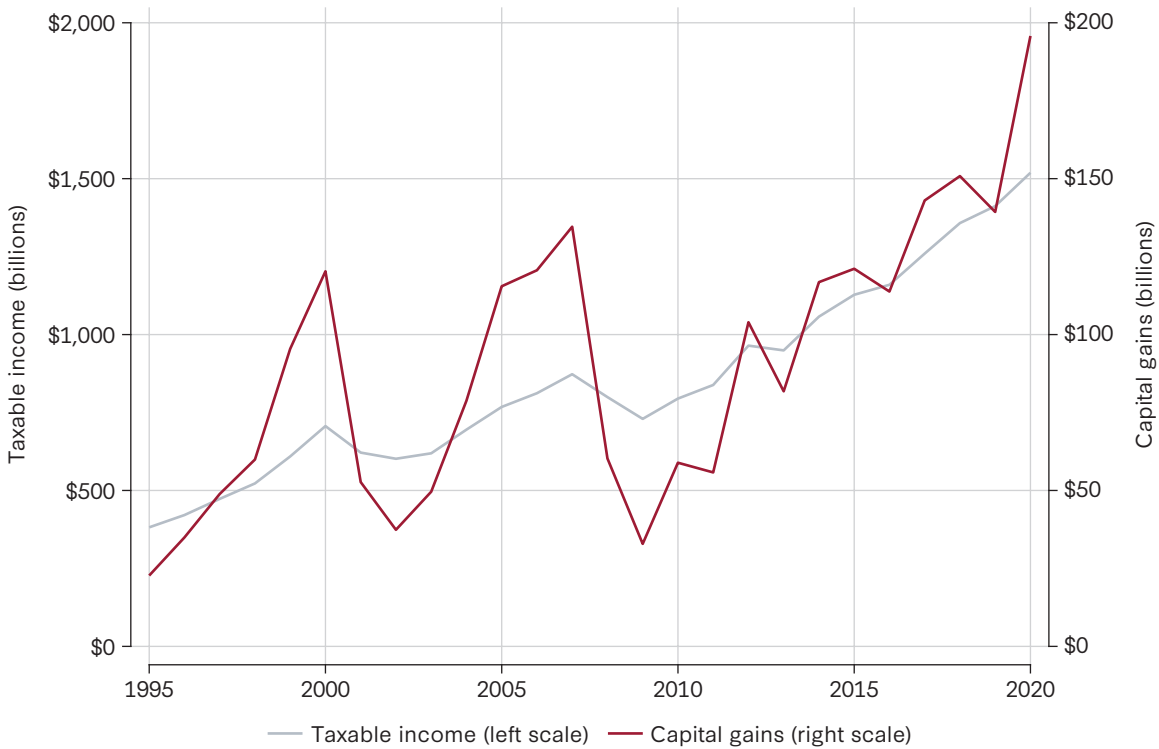
Note: This figure displays the share of total income tax revenues generated by each tax bracket in 2015 dollars.

Source: Income tax data from CA FTB.

at \$10,000, effectively increasing net federal taxes for many Californians and increasing the spread in total tax paid by California taxpayers and residents of lower-tax states. Out-migration for those earning more than \$5 million reached 2.1 percent in 2017, a 40 percent increase over the 1.5 percent income-weighted baseline average between 2013 and 2016. Furthermore, nearly half of movers at this income level departed to zero-income-tax states, suggesting that the increase in out-migration was tax motivated.

A similar picture emerged during the COVID-19 pandemic. For individuals earning over \$5 million, departure rates rose to 3.8 percent in 2020, 2.4 times the 1.6 percent average departure rate for this category from 2000 to 2018. Again, more than half of these movers left California for zero-income-tax states. These three migration spikes show that high earners are especially mobile. However, it is underappreciated that top-bracket taxpayers who remain in the state respond to policy changes as well in ways that reduce their reported taxable income. In the case of Prop 30, Rauh and Shyu (2022) estimate that in response to each additional percentage point of increase in the personal tax rate, taxable income declines by up

FIGURE 3 Taxable income vs. capital gains



Note: This figure displays taxable income and capital gains in nominal dollars over time.

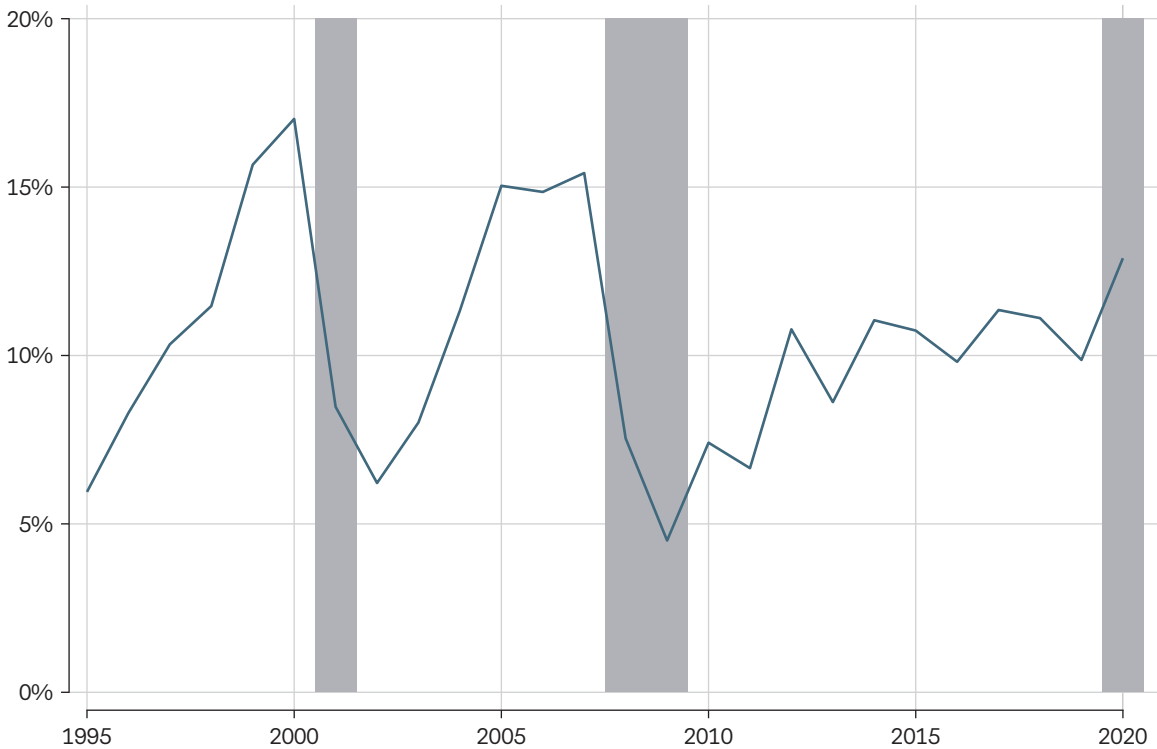
Source: Taxable income and capital gains data from CA FTB.

to 3 percent. High-income taxpayers are clearly doing something to limit their exposure to the higher tax rates, perhaps by reducing their business activity in the state or engaging in more tax planning. This intensive margin response, combined with the aforementioned out-migration effect, reduced the potential revenue gains of Prop 30 by 55.6 percent. This example shows that changes in the income of the top earners on which the state relies so heavily can significantly impact Sacramento's revenue-raising ability in any given year.

Exacerbating California's reliance on a relatively small number of highly mobile and highly responsible taxpayers is the fact that a significant share of the taxable income in the state is derived from income earned through the sale of capital assets, meaning that taxable income generally follows the same trends as capital gains income, seen in figure 3. As an income source, capital gains are historically volatile even for the highest earners (Hodge 2021). Figure 4 shows that since 1995, the sale of capital assets as a percentage of all taxable income has had a 12.5 percentage point range.

Perhaps unsurprisingly, capital gains as a share of all taxable income moves in close step with the business cycle over time, reaching a peak at 17.0 percent at the height of the dot-com bubble in 2000 before falling to 6.2 percent as the bubble burst in 2002. Similarly, the share of taxable income that was capital gains spiked to 15.4 percent in 2007 before tumbling to 4.5 percent in 2009 during the Great Recession.

FIGURE 4 Capital gains as a percentage of taxable income



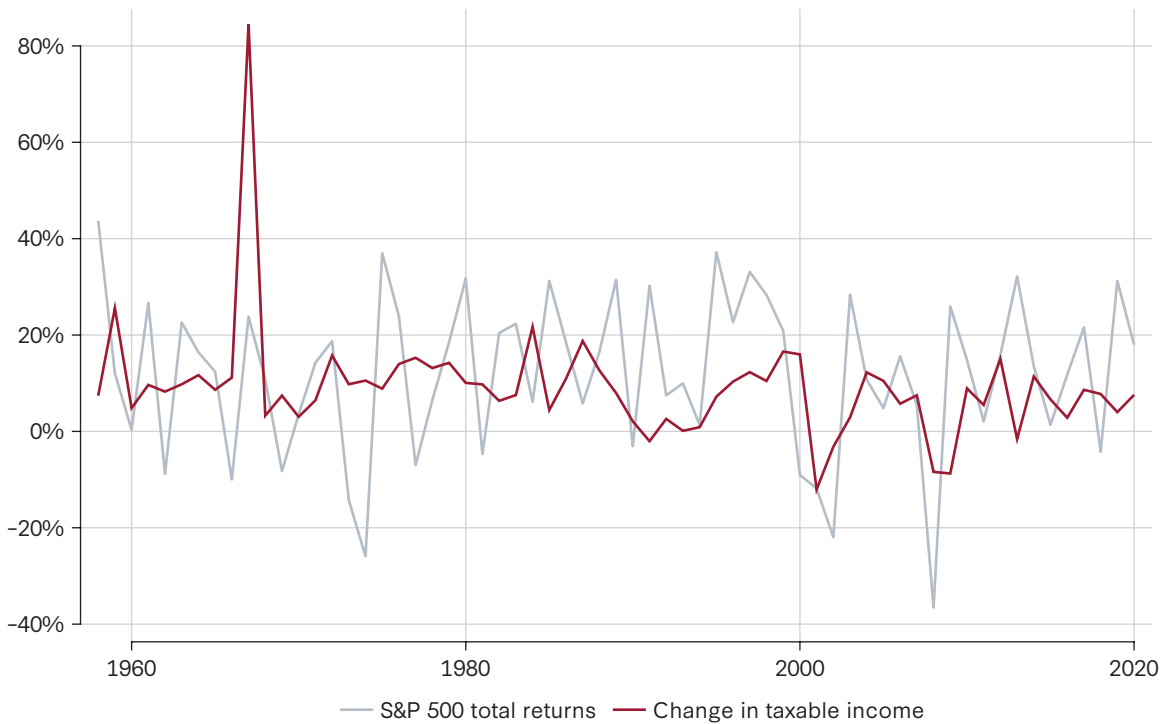
Note: This figure displays the percentage of taxable income in California that capital gains represent over time. Shading indicates a recession period as defined by the National Bureau of Economic Research (NBER).

Sources: Capital gains and taxable income data from CA FTB and recession data from NBER.

This relationship to the business cycle indicates that a portion of taxable income, and therefore California’s revenues, depends on highly volatile markets. Indeed, figure 5 shows that the year-over-year change in total taxable income reported in the state follows similar trends as the S&P 500 Total Return Index. The change in the S&P 500 Total Return Index reflects the overall return, including dividends, received by owners of large capitalization stocks in the US equities market. These returns on large company stock are also highly predictive of the returns on other equity investments such as smaller capitalization stocks, venture capital funds, and the ownership stakes in startup companies that undergo initial public offerings (IPOs). In fact, research shows that returns for these latter categories of equity investment, which are popular in California, move more than one-for-one with movements in the market for larger company stock.¹

Further analysis of this relationship shows that there is indeed a positive statistically significant relationship between the US equities market and taxable income and tax liability in California. Using data from 1958 to 2020, we model total taxable income as a function of the S&P 500 Total Return Index, real GDP growth in the US, and inflation in the state (see appendix table 1). We then estimate the relationship between the change in taxable income and change in total income tax liability specific to the pre-2012 and post-2012 period

FIGURE 5 S&P 500 Total Return Index vs. change in taxable income



Note: This figure displays the year-over-year growth of the S&P 500 Total Return Index and the change in total taxable income in California compared to the previous year.

Sources: Taxable income data from CA FTB and S&P 500 Total Return data from Damodaran (2023).

(see appendix table 2). This correlation helps to explain the instability of California’s fiscal health. When markets generate positive returns, we expect that the state will reap some of the benefits from the expansion, potentially accruing a budget surplus that allows for one-off investments or savings. However, if market valuations contract, as they have done over the past year, Sacramento becomes more likely to see depleted revenues as taxable income growth diminishes compared to previous years.

For example, our statistical analysis implies that a recession involving a decline in real GDP by 1 percent and accompanied by a 20 percent decline in the stock market and 3 percent inflation in the state would reduce California income tax liability by 14 percent, and tax revenue by approximately the same amount, relative to a year such as 2022 in which real GDP grew by 2.07 percent, California inflation was 5.57 percent, and the S&P 500 Total Return Index was -18.01 percent. While our estimates already paint a bad picture for California revenues during a recession, our model tends to underestimate revenue effects in downturn years and has somewhat overestimated tax revenue growth in recent years, as seen in appendix table 3, meaning future economic slumps could have an even harsher impact than we predict.

California also substantially relies on revenues from taxes on businesses, with corporate tax amounting to 18.7 percent of total revenues in the governor’s 2023–24 Proposed Budget.

Most companies in the state, including sole proprietorships and partnerships, are not taxed at the corporate level though. Instead, these businesses are considered pass-through entities, where income earned by the firm is passed through to its owners or shareholders to be taxed as personal income at California's personal income tax rates. Corporations, on the other hand, are subject to a corporate tax, the rates of which vary depending on the type of entity. Income earned by a C corporation in the state is taxed at a rate of 8.84 percent. S corporations, however, are different in that their income is taxed at both the corporate and the personal level in California. The net income of an S corp faces a 1.5 percent corporate rate, and then that income is taxed again at the personal level when it is passed to the company's shareholders. The corporate tax liability of most C and S corps in California is determined by a single sales factor apportionment formula, meaning the amount of tax owed is based solely on the percentage of a firm's sales that occur within the state.

Regardless of a business's structure, there is evidence that firms respond to state tax rates for relevant tax rules just as individuals do. Giroud and Rauh (2019) show that corporations indeed reduce the number of establishments, the number of employees, and the amount of capital in a state in response to corporate tax rate increases, while pass-through entities respond similarly to state personal income tax rates. Chow et al. (2022) likewise show that increased state corporate tax rates influence firms' headquarters location decisions. Ultimately, the reduced economic activity created by an unfavorable tax environment for businesses may result in net negative revenue effects for a state. Conversely, Suárez Serrato and Zidar (2016) find that cuts in the corporate tax rate result in establishment growth in an area, showing that lower overall tax burdens are attractive to businesses. Much as in the case of high-income earners explained above, the responsiveness of firms to tax rates suggests that reliance on business tax as a revenue generator introduces another layer of volatility for Sacramento to address.

The governor's 2023-24 Proposed Budget shows precisely why dependence on unstable revenue sources presents challenges for the state. The Governor's Office estimates that General Fund revenues will be \$29.5 billion less than the projections in the 2022 budget, creating a \$22.5 billion deficit for the 2023-24 fiscal year. The state's nonpartisan fiscal advisor, the Legislative Analyst's Office (LAO), takes an even more pessimistic view, initially predicting a \$24 billion budget problem but recently estimating an additional \$7 billion deficit due to smaller revenue projections. Both groups note that the state could face a much more significant gap should the economy enter into a more pronounced recession. The LAO predicts that total revenues could fall below their estimates in the 2021-22 through 2023-24 budget window by \$30 to \$50 billion if there is a major downturn, and the available budget reserves would not cover the subsequent deficit. Our models estimate that income tax receipts alone could fall by \$17.2 to \$24.3 billion just in 2023-24 should a recession occur soon (see appendix table 3). The LAO cites recent interest rate increases by the Federal Reserve, which are intended to slow inflation and cool the economy, as the reason for the state's low revenue projections. With the Fed indicating that further rate increases are expected in the coming months, it is likely that both GDP and stock markets could decline as the economy cools further, resulting in declines in taxable income and revenues as predicted in our earlier estimate.

It is critical that the state take steps now, not only to weather the current storm but also to set California on the right path for fiscal health in the future. First, because the state relies so heavily on a relatively small number of high-income taxpayers to generate revenues, it must be a priority to preserve that tax base by incentivizing, or rather refrain from disincentivizing, top earners to maintain residence in the state and grow their businesses, investments, and other economic activities in California. Our research shows that tax increases on high earners like Prop 30 produce migratory and income responses that deplete Sacramento's revenues. In the deficit context and beyond, the state should more seriously consider the impacts of "tax-the-rich" strategies on fiscal stability and avoid pushing people and investment out of California.

Similarly, it must be a priority to preserve business activity in the state from both a revenue and an economic growth standpoint. Firms, like individuals, shift their activity to take advantage of the lower tax burdens offered in other locations. While a broad reduction in business tax rates would ultimately be preferable for overall economic activity in California, business tax incentives can be an attractive alternative for boosting economic growth in targeted sectors or regions and may produce positive revenue effects. Though much of the research on incentives has deemed them wasteful spending (Bartik 2019), there is evidence that the California Competes Tax Credit (CCTC) has been effective at attracting, retaining, and expanding business activity in the state (Hyman et al. 2023). It is important to remember though that the extent to which this program is successful compared to other incentive programs hinges on oversight and the enforceability of credit recaptures for noncompliance with stated goals on job creation or capital investment. Bearing this in mind, a continuation or expansion of the CCTC may be desirable for attracting businesses to California as long as these standards can continue to be met.

Second, over the long term, California should consider ways to smooth revenues over time. In the past, when volatility has produced large surpluses, the state has been able to pursue one-time projects and investments, but when there is a downturn, as there is now, the state must make spending cuts, delay projects, or deplete reserves. This back-and-forth dynamic makes consistent investment in programs difficult. This situation is playing out currently, as the League of California Cities noted in a press release in response to the governor's Proposed Budget saying that while they appreciate the one-time funding for homelessness programs seen in previous budgets, the magnitude of the crisis requires ongoing state support for local solutions (League of California Cities 2023). This sort of commitment is not possible when revenues are so difficult to forecast. Sacramento should stabilize revenues over time by reducing its emphasis on volatile income like capital gains and instead seek out broader-based, secure sources. As noted by the LAO, reduced rates on higher-income earners would create a more favorable tax environment and stabilize personal income tax revenues (Petek 2023).

Short of changing its tax structure though, the state can reduce volatility and create a cushion against years of economic decline by improving its mechanism for building California's rainy-day funds in years of economic growth. Proposition 2 of 2014 took steps in the right direction, requiring the state to set aside 1.5 percent of general fund revenues and capital gains tax

revenues exceeding 8 percent of general fund revenues annually. Half of the funds set aside must then be transferred to the Budget Stabilization Account (BSA), while the other half must be used to pay down state debts. The ballot measure also caps the BSA at 10 percent of general fund revenues (LAO 2018). This design could be improved in two ways. First, a greater portion of capital gains tax revenues should flow directly into a rainy-day fund to grow the reserves in boom years and smooth out any revenue shortfalls during recessionary periods. These funds could be deposited in a new capital gains stabilization account. Second, the 10 percent cap on reserves should be reconsidered based on budget stress testing. Given the volatility of California's tax base and revenue sources, the state should assess the potential impact of a recession on revenues to determine if the 10 percent limit is adequate to withstand a downturn. While formally changing this cap may require voter approval, under some interpretations of Prop 2, the legislature can make optional deposits to the BSA that exceed the threshold, and it should consider doing so in years of strong revenue growth to create a better buffer against recession (LAO 2018).

Finally, to be truly good stewards of fiscal and economic health, California must increase spending transparency across the board. Especially in a deficit context, the state needs to make wise investment decisions and avoid wasteful and inefficient spending. To do so, there must be better data collection and reporting to the legislature and the public on spending and program outcomes so that officials can be held accountable. One area where transparency should be drastically improved is homelessness. While the state invests billions of dollars into homelessness programs each year, attempts at transparency and accountability have fallen short. Currently, it is not possible to ascertain where exactly homelessness funding is going or whether it is effective. For homelessness as well as other areas of the budget, the state must prioritize transparency and accountability so that taxpayer dollars are spent wisely in both fat and lean years.

Governor Newsom stated that reforms to address the state's volatile tax structure should be on the table, and he is right. In the face of dismal revenue estimates and a significant deficit, one that has potential to grow even larger if economic conditions worsen, California must seek out ways to stabilize its fragile fiscal position. While unexpected upswings have been beneficial for the state in the past, it is untenable to rely so heavily on just a few taxpayers, erratic market conditions, and fickle firms. This year's budget deficit is proof of that. Now is the time for California to take the necessary steps to maintain and grow its tax base, stabilize revenues, and establish transparency.

APPENDIX

APPENDIX TABLE 1 REGRESSION—CHANGE IN TAXABLE INCOME ON S&P 500 TOTAL RETURN INDEX

Variables	(1)	(2)	(3)	(4)
S&P 500 total returns	0.109 (0.082)	0.142** (0.069)	0.131* (0.076)	0.146** (0.067)
Nominal US GDP growth		1.263*** (0.265)		
Real US GDP growth			1.710*** (0.404)	1.747*** (0.382)
California inflation				0.646*** (0.205)
Constant	0.078*** (0.014)	-0.005 (0.022)	0.025 (0.020)	-0.003 (0.021)
Observations	63	63	63	63
R-squared	0.024	0.129	0.127	0.154

Note: This table shows the results of four regression models of the change in total taxable income reported in California on the year-over-year growth of S&P 500 Total Return Index using data from 1958 to 2020. Model 1 includes no control variables. Model 2 controls for annual growth in nominal US GDP. Model 3 controls for annual growth in real US GDP. Model 4 controls for annual growth in real US GDP and inflation in California. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Sources: Taxable income data from CA FTB, S&P 500 Total Return data from Damodaran (2023), nominal and real US GDP data from US BEA, and California inflation data from California Department of Industrial Relations.

APPENDIX TABLE 2 REGRESSION—CHANGE IN INCOME TAX LIABILITY ON CHANGE IN TAXABLE INCOME

Variables	(1)	(2)	(3)
Taxable income	1.309*** (0.147)	1.312*** (0.147)	1.287*** (0.138)
2012 and after		0.012 (0.025)	-0.067*** (0.024)
Taxable income X 2012 and after			1.145*** (0.347)
Constant	0.005 (0.014)	0.003 (0.016)	0.005 (0.015)
Observations	63	63	63
R-squared	0.667	0.667	0.678

Note: This table shows the results of three regression models of the change in total personal income tax liability in California on change in total taxable income in California using data from 1958 to 2020. Model 1 includes no control variables. Model 2 includes an indicator variable for years 2012 and after. Model 3 includes the indicator for years 2012 and after and an interaction term of taxable income and the indicator. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Source: Taxable income data from CA FTB.

APPENDIX TABLE 3 PREDICTED VALUES

	2007	2008	2021	2022	Hypo. 1	Hypo. 2
S&P 500 TR	5.48%	-36.55%	28.47%	-18.01%	-20.00%	-30.00%
Real US GDP growth	2.01%	0.12%	5.95%	2.07%	-1.00%	-1.50%
California inflation	4.07%	0.08%	6.52%	5.57%	3.00%	3.00%
Predicted Δ in taxable income	6.64%	-5.37%	18.46%	4.29%	-3.21%	-5.59%
Predicted Δ in income tax receipts	9.05%	-6.42%	38.70%	4.22%	-14.01%	-19.79%
Actual Δ in taxable income	5.75%	-8.41%				
Actual Δ in income tax receipts	8.70%	-16.13%	29.00%	-6.53%		

Note: This table reports the predicted values for change in total taxable income and total personal income tax receipts in California. Predicted change in taxable income is defined as $\hat{Y} = \beta_1 S + \beta_2 R + \beta_3 I + \epsilon$, where \hat{Y} is the estimated change in taxable income, S is the year-over-year growth in the S&P 500 Total Return Index, R is the annual growth in real US GDP, I is California inflation, and ϵ is a constant (Model 4 in appendix table 1). Predicted change in individual income tax receipts is defined as $\hat{Z} = \beta_1 \hat{Y} + \beta_2 T + \beta_3 \hat{Y}T + \epsilon$, where \hat{Z} is the estimated change in individual income tax receipts, \hat{Y} is the predicted change in taxable income, T is an indicator variable for years 2012 and after, $\hat{Y}T$ is an interaction of the predicted change in taxable income and the indicator variables, and ϵ is a constant (Model 3 in appendix table 2). Actual change in individual income tax receipts for tax years 2021 and 2022 is calculated using monthly income tax receipts reported in California State Budget documents, but actual change in taxable income has not yet been reported for tax years 2021 and 2022.

Sources: Taxable income and tax receipt data from CA FTB, S&P 500 Total Return data from Damodaran (2023), US GDP data from US BEA, and California inflation data from California Department of Industrial Relations.

NOTES

1. The sensitivity of an investment to returns in the overall stock market is referred to as its “beta.” Ibbotson and Harrington (2021) provide updated calculations showing that smaller company stocks have betas of more than one. Work by Korteweg and Nagel (2016) and Korteweg (2019) make similar findings for venture capital funds. Bernstein (2015) finds that the decision of firms to launch an initial public offering (IPO) depends on recent returns in publicly traded stock markets.

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Synopsis

California is expected to face a \$31 billion budget deficit in 2023–24. This comes as no surprise considering that the state budget relies primarily on notoriously volatile sources like a graduated personal income tax with high rates for high earners, including on capital gains. Our analysis shows that these income sources are closely linked to unstable markets, meaning an economic downturn in the coming months may significantly decrease the revenue outlook for the state. With fears of a national recession looming, California legislators should focus on preserving the current tax base, smoothing revenues, and increasing spending transparency.

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