# The Revenue and Distributional Impacts of Unemployment Insurance Reform: Evidence from California

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**Abstract**

In the United States, unemployment insurance (UI) is funded through employer-side payroll taxes that are experience-rated based on previous UI claims. States differ significantly with respect to the financing of their programs, and a majority of state programs do not currently meet minimum UI trust fund solvency standards. A common culprit in the least solvent states is a very low tax base of earnings on which UI taxes are levied. We focus on California, the least solvent of the 50 state UI programs, with debt currently to the federal government of $21 billion, and which has the lowest base of taxable earnings at $7000 per year. We use matched employer-employee administrative data to estimate the impact of financing reforms to California's UI system. We find that raising the taxable earnings base would replenish the state's UI trust fund and would increase experience rating by reducing the number of systematically subsidized firms. While this improves vertical equity of the UI system, it would also worsen horizontal equity by imposing much larger percentage increases in tax costs on the firms with the fewest layoffs. Alternatively, matching the higher tax base with both higher maximum and lower minimum rates could improve both experience rating and horizontal equity.

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## 1 Introduction

Unemployment insurance (UI), which provides weekly benefits for unemployed workers, plays an important role in the safety net as one of the largest social insurance programs in the United States. Since its inception by the Social Security Act of 1935, it has been a federally mandated benefit that has been administered at the state level. All employers with at least one stable employee or with an annual payroll of $1500 or more must contribute payroll taxes towards UI. The importance of UI was highlighted during the Covid-19 recession, with more than 21 million workers receiving benefits at the height of the recession in May 2020.

There is a large and influential literature exploring the effects of UI benefit generosity on worker behavior (Feldstein and Poterba, 1984; Meyer, 1990; Katz and Meyer, 1990; Card et al, 2015). This literature highlights a clear protection-distortion tradeoff – more generous UI cushions the effects of job loss on consumption (Gruber, 1997) but reduces the worker's incentive to find a job (Marinescu and Skandalis, 2021). Optimal policy strives to balance the two, yet there is substantial variation across states with respect to the generosity of UI benefits.

Meanwhile, there is much less research exploring the effects of UI financing, despite similarly large variation across states. In the United States, UI is funded by a dedicated payroll tax that is paid by employers; it is partially experience-rated, such that employers whose workers claim more UI benefits have higher future taxes than otherwise similar employers. Experience rating creates an analogous protection-distortion tradeoff in a world of imperfect capital markets. Increasing taxes on firms that are viable in the long run but are suffering short run shocks can lead to excessive firm closures, but protecting firms from the consequences of their layoffs can lead to persistent subsidies to inefficient firms and excessive layoffs (Feldstein, 1976; Topel, 1983). Interestingly, the U.S. is the only industrialized country that experience rates employers' UI taxes.

When firms are not fully experience-rated, states may not collect sufficient revenues to finance their UI benefit payments.[1] This can lead to significant revenue shortfalls, particularly when benefit outlays increase during recessionary times. Perhaps the best example of this problem is the state of California. Appendix Figure A.1 shows the UI trust fund balance for the state of California over the past few decades. Balances are cyclical, typically falling during and immediately after each recession and replenishing during the recovery. While the state was previously able to slowly replenish its reserves after recessions, in the two most recent recessions the state's UI trust fund became insolvent and required substantial loans from the federal government. And even a few years after the most recent recession, California's UI program remains in deficit, and the outstanding debt has increased despite improving economic conditions, from $17.7 billion at the end of 2020 to $21.3 billion at the end of 2024.[2]

California is an extreme example, as it is the only state in the nation whose trust fund is still in debt to the federal government, but the problem of insufficient funding is widespread. As of January 1, 2025, 32 states plus Washington, D.C. do not meet the standard for trust fund solvency defined by the U.S. Department of Labor.[3] This is partly because of the large system deficits that arose out of the Covid crisis, but even back in 2019 – nearly a decade after the Great Recession – 23 states did not meet that standard. In 2020, a total of 22 states depleted their UI trust funds and needed to borrow from the federal government in order to pay out unemployment benefits. In subsequent years, most of these states have paid off their loans using a combination of CARES (Coronavirus Aid, Relief, and Economic Security) Act and ARPA (American Rescue Plan

[1] Even with perfect experience rating funds may fall short due to firm exits- we return to this point below.
[2] Because Covid-related claims were forgiven during the pandemic, even surviving firms are no longer "on the hook" for repaying the incurred debt.
[3] The Department of Labor uses the Average High Cost Multiple (AHCM) as a benchmark for trust fund solvency, which compares the state's current trust fund balance (divided by total annual wages), to the average of the three highest benefit cost rates in the last twenty years. Minimum solvency standards require an AHCM ratio greater than or equal to 1 (U.S. Department of Labor, 2025).

Act) funding, general appropriations, and bonds, such that currently only California still has outstanding UI debt to the federal government.

The states that are furthest from this fiscal standard share a common feature: relatively low UI tax bases, that are not automatically indexed to match wage growth.[4] As of 2024 four states – Arkansas, California, Florida, and Tennessee – only tax the first $7000 of annual earnings, which is the minimum federally allowable UI tax base, while an additional 14 states have maximum annual taxable earnings at or below $10,000 annually. In contrast, UI tax bases are significantly higher in indexing states such as Washington ($68,500), Hawaii ($59,100), and Idaho ($53,500). In recent work, Lachowska, Vroman, Woodbury (2020) show that states that indexed their UI tax bases had much higher UI trust fund reserves going into the Covid-19 pandemic.

While it is obvious that (all else equal) a higher UI tax base would help to address trust fund shortfalls and finance UI benefit increases by increasing revenues, raising the base also has a broad and complex set of implications for the nature of UI financing; it changes the degree of experience rating, vertical equity across employees, and horizontal equity across firms. These impacts may or may not be desirable either economically or politically. To our knowledge, no previous analysis has used large-scale administrative data to rigorously explore the impact of changing the UI tax base on the nature of system financing and the distribution of UI costs. In this paper we do so for California – the nation's most populous state and the one with the most insolvent UI program.

To carry out a full distributional analysis of the effect of changing UI financing parameters, we develop a simulation model for California's UI program. We use data from 2014 to 2019, a period of declining unemployment prior to the pandemic-induced recession, to model firm UI

[4] There are 32 states (plus Washington, D.C.) that do not index their taxable earnings base.

claims. We then apply our simulation model to the distribution of firms in 2022, the latest calendar year for which we have complete administrative data. While our model will focus only on California, there are important lessons for other states with systematically low tax bases and that do not meet minimum solvency standards such as Florida ($7,000), New York ($12,500), and Texas ($9,000).

We document several important and policy-relevant findings. First, simulating the status quo shows that California's UI system is not even solvent under non-recessionary conditions; without additional reforms, California will continue to accrue UI debt because of the forgiveness of employers' pandemic-related UI claims. In contrast to the aftermath of previous recessions and as shown in Appendix Figure A.2, the average employer tax rate actually *fell* from 4 percent in 2020 to 3 percent by 2023. In order to offset this debt, the federal government will eventually exact larger and larger surcharges from California employers until the outstanding debt is repaid.[5] To prevent further insolvency would require raising the base of taxable earnings. Under our simulation model, doubling the tax base from $7,000 to $14,000 per worker raises an incremental $23 billion over the next decade; gradually tripling it to $21,000 raises an additional $18 billion.

Second, raising the tax base increases experience rating in the system significantly in the near term, but by much less in the long run. A tax base increase lowers the number of firms persistently at California's maximum UI tax rate of 6.2 percent, as they pay back their past accumulated UI claims at a faster rate. Eventually, however, firms begin to bunch at California's minimum UI tax rate of 1.5 percent as they build up larger and larger UI reserves. These firms also

[5] California's surcharge in 2025 is equal to 1.2% on the first $7000 of earnings per worker and will grow by 0.3% each year the debt remains outstanding. New York also has a 1.2% surcharge in effect due to their outstanding debt, though they are in the process of paying this off (N.Y. Governor's Office, 2025).

face imperfect experience rating; with enough reserves built up they face no marginal tax increase from additional UI claims (unless they experience a mass layoff).

Third, raising the tax base will increase vertical equity at the very bottom of the income distribution, as workers earning below the new taxable threshold are partially shielded from such tax increases. This has the additional desirable property of strengthening the connection between UI taxes paid and UI benefits received. Presently, an employer in California pays the same UI tax for a worker earning $8,000 annually as for a worker earning $40,000 annually. But if both of those workers are laid off, the latter worker will receive a UI benefit that is five times greater, while costing the employer five times as much in terms of future UI taxes. Of course, the ultimate impact of an increase in the taxable wage base on vertical equity will partially depend on how firms react to tax base increases in terms of wage setting and employment decisions, along with any corresponding effect on UI claiming. While this paper does not fully estimate such behavioral responses, we provide some empirical evidence regarding the impact of employer-specific UI taxes on employment, taxable earnings, and firm exit.

Fourth, there is a decrease in horizontal equity (across employers) in the revenues raised from a base increase. The firms with the lowest layoff rates would see the largest proportional rise in their taxes – because California's nonzero minimum UI tax rate prevents these firms from receiving a further tax rate decrease even after UI claims have been paid off.

To address these issues, we consider alternative reforms that pair a tax base increase with additional changes to the UI tax schedule. We find that a financing system that pairs a base increase with both a simultaneous rise in the maximum rate and a decline in the minimum rate further promotes experience rating and horizontal equity across firms, while having minimal impact on the vertical equity benefits of raising the base.

Our paper proceeds as follows. Section 2 provides a background discussion of UI financing and discusses the relevant previous literature. Section 3 describes our novel employer-employee matched data, while Section 4 discusses our simulation model. Section 5 presents our baseline results on the implications of UI tax reforms. Section 6 raises some additional considerations and Section 7 concludes.

## 2 Background of Unemployment Insurance Financing

Unemployment insurance in the United States is administered at the state level and funded through employer-side payroll taxes that are updated annually. States are free to determine their own experience-rated tax formulas and taxable wage bases, as long as they meet federal requirements. One such federal mandate, the minimum size of the annual taxable wage base, is currently set at only $7,000, which has not been updated since 1982. As a result, there is even greater variation in state tax bases than the current variation in state UI benefit generosity. In 2024, taxable wage bases ranged from a minimum of $7,000 annually (in California, Florida, and Tennessee), to a maximum of $68,500 in Washington. In contrast, the highest weekly maximum UI benefit of $1,079 in Washington is only 4.6 times the lowest maximum of $235 in Mississippi.

All states assign experience-rated employer-specific tax rates that are an increasing function of previous UI claims charged to the employer. In California, as well as 28 other states, tax rates are determined by the employer's current Reserve Ratio, which is essentially equivalent to keeping employer-specific UI savings accounts. The reserve ratio is calculated by dividing each employer's current UI reserves (past UI tax contributions minus past UI claims) by their average taxable payroll over the past three years as shown in the following equation:

$$ReserveRatio_{it} = \frac{Reserves_{i,t-1} + Contributions_{it} - Claims_{it}}{\frac{TaxablePay_{i,t-2} + TaxablePay_{i,t-1} + TaxablePay_{it}}{3}}$$

An employer *i*'s reserves in year *t* are simply equal to the difference between the sum of its previous UI tax contributions and the UI benefits paid to its previous workers.

Reserve ratios are then converted into employer-specific UI tax rates according to a preset schedule; as a firm's reserves increase relative to taxable payroll, its UI tax rate decreases. Figure 1 depicts the tax schedule California uses to convert employer reserve ratios into UI tax rates. The minimum tax rate of 1.5% is assigned to employers with reserve ratios of more than 20%, while the maximum tax rate of 6.2% is assigned to employers with reserve ratios below zero. The rate declines almost linearly between these two extremes, so that (for example) an employer with a reserve ratio of 10% has a tax rate of 3.85%. To prevent employers from accumulating an insurmountably negative balance, the lowest possible reserve ratio is -21%. Any accumulated claims beyond this point are ignored.

In terms of UI financing, the main levers of adjustment are: taxable earnings (called the taxable wage base), the minimum tax rate, the maximum tax rate, and the slope of the tax schedule. An additional important factor is whether states choose to use a reserve-ratio or benefit-ratio formula to calculate experience rating. While not within the scope of this paper, a benefit-ratio formula would allow "forgiveness" of past UI claims since a firm that paid back only a portion of the cost of its recent UI claims by the end of the state's payback period (typically 3 or 5 years) would be forgiven from its remaining debt. Forgiveness is not typically a possibility in reserve ratio states unless the employer goes out of business or reaches a reserve ratio of -0.21, although California and many other states forgave employers for UI benefits paid to their past workers during and for many months after the pandemic-induced recession.

The current structure of the UI system leads to imperfect experience rating through three mechanisms. The first is a taxable wage base that is small relative to the typical benefits that workers receive when unemployed. With a low taxable wage base, it takes significantly longer for firms to repay the system for the benefits paid to their workers. The second is a maximum rate that protects firms – at least in the short term – from the financial consequences of additional layoffs once at the maximum. Furthermore, an employer with a reserve ratio near -0.21 is completely shielded from the consequences of additional layoffs. The third is a minimum rate which does not impose marginal costs of layoff for firms without much past layoff history once they achieve a reserve ratio that is beyond the "kink point" in the tax schedule where experience rating begins.

Imperfect experience rating has desirable features in a dynamic labor market with capital market failures. Firms are able to restructure their workforce during economic downturns, while delaying the costs of adjustment until the restructured firm has the resources to repay the costs to the UI system. But it also has the undesirable feature of subsidizing systematically high layoff firms that may not be economically viable even in the long run absent this subsidy. Feldstein (1978), Topel (1983), and Card and Levine (1994) show that higher implicit UI subsidies lead to systematically higher layoff rates. Anderson and Meyer (1993, 1997) document that experience rating is highly imperfect and that certain industries persistently pay much less in UI taxes than their laid-off workers receive in benefits.

Determining the optimal degree of experience rating is challenging and beyond the scope of this paper, but we provide evidence below on how changes to the UI taxable wage base influence experience rating. This result seems especially important given the enormous variation across states in the taxable wage base for UI and the scarcity of empirical evidence regarding the labor

market consequences of a low tax base as in California or Florida ($7,000 each) versus a much higher tax base as in Washington ($68,500 in 2024) and Idaho ($53,500 in 2024).

## 3 Data and Descriptives

*California UI Data*

In this paper, we combine de-identified employer- and worker-level data from California's Employment Development Department (EDD). For the universe of private-sector employers, we observe quarterly employment in the state of California from 2014:Q1 to 2023:Q2, as well as each employer's California UI tax contributions, employer-specific reserve ratios (which determine employer-level UI tax rates), and NAICS industry code. The data only includes information about an employer's California-based workforce. To the extent that a firm employs workers in other states or outside the U.S., this is not captured by our data. We match this employer-level data to quarterly job-level earnings for all workers covered by the UI system.[6] We do not, however, have any data on individual UI claims nor any worker demographic information.

Table 1 provides summary statistics for the employer-level (Panel A) and job-level datasets (Panel B) in 2022. We exclude single-employee firms and any employers that are not eligible for regular experience-rating.[7] Table 1 also provides a comparison of firms operating in 2022 that are included in our later simulation sample versus firms operating in that year that are excluded. The two main groups of excluded firms are: firms who entered later than 2021:Q2, and firms who

[6] Because the employer-level and worker-level datasets are sourced from two different reporting forms, there is some degree of misreporting. In any given year approximately 97% of firms' total wages match within 1% of the sum of worker-level wages (and 99% match within 10%). Thus, we always use worker-level earnings to calculate measures of earnings and tax contributions.

[7] These include federal/state/local government employees, as well as some hospitals and nonprofit organizations. Single-employee firms are flagged as employers that are never observed to have employment greater than 1. Taken together, these excluded categories make up 9% of reported employment in the state.

exited before 2023:Q1. Existing firms that did not report employment in the first two quarters of 2022 are also excluded. We discuss the limitations arising from these exclusions below.

As Panel A shows, California had approximately 865,000 experience-rated employers in 2022, with their maximum monthly employment averaging 19 workers. Due to excluding new entrants and exiters, employers in our simulation sample are larger on average. Because of the low UI tax base of $7,000, average taxable earnings are substantially lower than average total earnings. On average, only 11% of workers' earnings are taxable under UI. Additionally, more than half of all jobs were held by a worker with more than one experience-rated job during 2022, illustrating an important benefit of our data that allows us to link workers who either switch employers or who work for multiple employers simultaneously.

The fact that taxable wages are calculated at the employer rather than worker level implies that, conditional on total earnings, multiple job holders often face larger tax burdens than single job holders with the same total earnings. For example, as a result of California's low $7,000 annual tax base, UI taxes would be twice as high for someone earning $10,000 annually from employer A and $10,000 annually from employer B versus a similar worker earning $20,000 annually from just one of these two employers.[8] Appendix Figure A.5 summarizes the distribution of worker-level earnings in 2022, distinguishing between single and multiple job holders. Across both single and multiple job holders, the share earning less than $21,000 is roughly 31 percent, although single job holders are twice as likely to be earning less than $7,000 (15 percent versus 7.5 percent).

Before proceeding to our analyses, we compare California's labor force statistics to those from the rest of the nation (Table 2) using data from the American Community Survey. In terms of demographics, California has a lower White share, lower Black share, and higher Hispanic and

[8] This comparison assumes that the two employers have the same UI tax rate.

Asian shares than the rest of the United States. Weekly earnings are also about 20 percent higher in California, though this is partially offset by the substantially higher price level in California relative to the rest of the U.S.[9] In terms of industry composition, California has a larger share of employment in Agriculture, which is also the industry that utilizes the highest rates of UI benefits within California. California also has higher shares of white-collar sectors such as Information (this includes both Silicon Valley and the Film/Music industry) and Prof/Sci/Tech Services, and relatively less in Manufacturing.

Even though average weekly earnings are 20 percent higher in California than in the U.S. overall, its UI benefits are much less generous, with a maximum weekly benefit in 2024 of $450 versus an average across all 50 states and Washington, D.C. that is 20 percent higher at $540. On the financing side, California's UI taxable wage base is equal to the minimum allowable $7,000, which is less than one-third the national average of $21,900 in that same year.

*Descriptive Figures*

Figure 2 shows the distribution of employer tax rates over the 2014-2022 period, weighted by employment. Due to low taxable earnings and a maximum tax rate of only 6.2%, a significant share of California's employers are persistently stuck at the maximum tax rate. From 2014 to 2019, as California's unemployment rate fell from 8 percent to 4 percent, the share of employees working for employers at the maximum tax rate declined by almost half. However, of the employers that survived from 2014-2019, 10% of them (19% of employment) were at the maximum rate every one of these six years. As a result, these firms face zero marginal tax costs for additional layoffs, as they continue to pay the same maximum tax of $434 per worker (6.2 percent of $7000),

[9] The average price level in California was 12.5 percent higher in 2022 than in the U.S. overall (BEA, 2023) https://www.bea.gov/news/2023/real-personal-consumption-expenditures-state-and-real-personal-income-state-and

regardless of their layoff trajectory. Layoffs do, however, further reduce the reserve ratio for these firms, meaning that it would take them longer to pay back their accumulated UI debt and achieve a positive reserve ratio (although firms cannot fall below a reserve ratio of -0.21).

In the wake of the Covid-19 pandemic, California forgave pandemic-related UI claims, such that UI claims utilized by a firm's workers were no longer subtracted from their firm-specific reserve balance. This moved even more firms away from and strictly below the maximum rate, so that by 2022 only about 10% of employment faced the maximum tax. This stands in sharp contrast with previous recessions, when average employer UI tax rates tend to rise as many firms' reserve ratios decline (due to UI benefits exceeding UI taxes paid during the recession).

Figure 3 illustrates that with an annual tax base of just $7,000, the industry sectors with the highest effective tax rates (relative to total wages) are not always the ones with the highest statutory tax rates (relative to taxable wages). This figure graphs mean statutory employer rates on the x-axis and the effective rates on the y-axis. The red dots represent the 45-degree line where effective and statutory rates are equal; all industries are on average below this line as they all have sizeable shares of workers earning more than $7,000. A variety of industries with many low-income workers, such as agriculture and food/hospitality, have effective rates that are only 20-30 percent below their statutory rates. In contrast, higher earning industries have a much larger gap. For example, in the information sector, the statutory rate of 3.3% is more than five times the effective rate of 0.6% given that industry's much higher average earnings.

## 4 Simulation Model

In the fourth quarter of every year, California uses a Reserve Ratio (RR) formula to calculate employer tax rates for the following year. The RR takes the ratio of the employer's current

UI reserves in the numerator, and the employer's average taxable payroll over the last 3 years in the denominator. UI tax rates are then determined using a fixed schedule that maps Reserve Ratios to rates (EDD, 2025). As shown in Figure 1, employers with a reserve ratio of less than 0.00 face the maximum possible UI tax rate of 6.2 percent while those with a reserve ratio of more than 0.20 have the lowest possible rate of just 1.5 percent.

Simulating a significant policy change such as a tax base increase requires dynamic modeling, because an increase in the taxable wage base will mechanically increase the denominator of each firm's reserve ratio. In other words, each firm with a positive reserve ratio will see their reserve ratio gradually fall (and their tax rate rise as a result) in the three years following a base increase, because an employer's taxable payroll automatically increases even if there is no change in its actual payroll. This leads to a mechanical *increase* in tax rates following a base increase, even if both payroll and employment are held fixed.

Therefore, to simulate the steady-state employer tax distribution after a base increase, it is necessary to model how firm reserve ratios evolve for multiple years after the initial change. To do so, we need to make assumptions about how both taxable wages and UI claims evolve over time. For simplicity, we fix each employer's payroll at its 2022 levels, so that there is no tax-induced employment growth or decline, and no change in taxable earnings. To the extent that employers hire fewer workers or reduce wages in response to the tax change, this would lead to less tax revenue than our model predicts. The impact of any such response would, however, likely be modest. Consider our proposal to double the tax base from $7,000 to $14,000, which would mechanically raise total taxable earnings by $101 billion in our simulation model. If there was full pass-through to workers in the form of lower wages, taxable payroll would fall by an additional $3.2 billion (the difference in year 1 UI revenues under a 14k versus 7k tax base). This implies

that full incidence on wages would cause UI revenues to be $0.1 billion ($3.2 billion * 3.2 percent) lower than our simulation model predicts.

This assumption also inherently shuts down any effect of a revised taxable wage base on the entry of new employers or the exit of existing employers. On the entry margin, a revision in the tax base could be bundled with a corresponding reduction in the new employer tax rate such that average per-worker UI taxes are unchanged. As for the exit margin, it is possible that greater front-loading of UI taxes for high-layoff firms would cause more of them to exit. This would lead our model to overstate the incremental revenues from a tax base increase, which we recognize is a limitation of our model that we discuss further below.

In terms of UI claims, we infer employer-level claims using the panel aspect of our data, and this is discussed in greater detail in Appendix B. Intuitively, we can "back out" UI claims paid using the formula above along with observable UI taxes paid. We then use our inferred UI claims to predict future UI claims, as discussed in Appendix B.2. Each firm's future UI claims are predicted as a function of their current UI claims, with the prediction model fitted to the underlying distribution of UI claims in 2019, the last year before the pandemic-induced recession.

One final limitation of our model that is worth noting is that we assume no change to the overall macroeconomic environment or to relative economic performance by industry, firm size, and so forth. Of course, all of these are likely to change and thus our model's predictions about the effects of changes in the tax base and other UI policy levers will inevitably be either too optimistic or too conservative. But the virtue of our model is that it allows us to more accurately isolate the effect of UI policy levers from the effects of other important drivers of the economic environment that are also changing over time.

## 5 Results

*Effect of Raising the Tax Base on Revenues and Tax Rates*

Total UI tax revenues under each policy simulation are summarized in Table 3. The first row of the table shows our projected revenues with no policy change. Note that revenue collections are actually net negative, meaning that without additional reforms, California will continue paying out more in UI claims than it collects in UI contributions. This is due primarily to firms persistently at the maximum tax rate, as the maximum caps the amount of taxes these firms pay (at $434 per worker) despite their higher benefit claims.

The second row of Table 3 shows the implications of doubling the tax base to $14,000; note that while this is a major change, it would only move California from being tied for last in the nation to about the median (24$^{th}$) in the nation in terms of tax base size. Such a change raises UI tax revenues immediately and significantly. In the first year, net revenues rise from $0.78 billion to $3.99 billion. But the revenue gain that results from a larger tax base declines substantially over time because with the larger base, firms would shift downward on the tax rate schedule as they pay back their UI tax obligations more rapidly.

Figure 4 illustrates the evolution of tax rates in our simulation model, and is employment weighted so we refer to effects per employee and not per firm.[10] We begin in year 2 (the first year that tax rates adjust) with a distribution that features 7.7% of employment at that maximum rate, and 6.6% at the minimum, with a median rate of 2.6%. In the first few years after a base increase, the share of employees at the maximum rate declines quickly, and these firms are shifted towards the middle of the rate distribution. Likewise, the share of employees near the minimum also declines because expanding the tax base mechanically increases the denominator of the reserve

[10] The corresponding simulation for the baseline scenario (no base increase) is illustrated by Appendix Figure A.3. Under business as usual, the share of employment at the maximum tax rate continues to grow over time.

ratio (and thus lowers the reserve ratio for positive balance firms). By year 4, the median UI tax rate has increased to 3.1%. Over time, however, the distribution of employer tax rates shifts downwards. The share of employment at the minimum is falling until year 7, at which point it begins to grow rapidly, such that by year 9 the minimum rate is the modal rate. By the 10th year after the base increase, net revenues are approximately $1 billion higher under the doubling of the tax base, which is 70 percent lower than the year 1 increase.

That said, along the way, the state would have made almost $23 billion in incremental revenues, which would go a long way towards achieving trust fund solvency. In terms of the AHCM benchmark, California would need to raise UI revenues equal to 1.83 percent of total payroll in order to achieve solvency by Department of Labor standards. In our simulation sample this corresponds to a revenue target of $21.3 billion, which is achievable only if we ignore California's existing UI debt of $21.3 billion as of Dec 2024.[11]

In the third row of Table 3, we show the impact of gradually tripling the tax base to 21k (from 10k in year 1, to 13k in year 2, to 17k in year 3, and to 21k in year 4 and beyond), which would still only place California 20th in the nation in the size of its tax base (and would still be only about one-third of nearby Washington). Once again, this causes the largest jump in revenues as the base increase begins to take effect, but by year 10 annual revenues are only $1.5 billion higher than for the base increase of 14k. Meanwhile, over this period California would be able to raise a total of $42 billion in net revenue, but only an additional $17.8 billion in incremental revenues beyond the $24 billion raised by the 14k base. In Appendix Figure A.4, we once again

[11] An additional reform that could help to repay the existing UI debt would be a flat surcharge on all employers to cover the forgiven pandemic-related claims. Unlike regular UI taxes, the contributions collected from a surcharge would not be counted towards a firm's UI reserves. At the existing 7k base, an additional 1% of taxable payroll surcharge would raise $1.29 billion per year. Adding this surcharge at a 14k base would raise $2.3 billion per year and would basically double what the state earns from moving to a 14k base.

show the evolution of the tax rate distribution, which is very similar in pattern with the increase to a 14k base. Due to the gradual transition and the larger steady state base increase, it takes slightly longer for employers to bunch at the minimum tax rate in this scenario than in the previous one.

*Vertical Equity*

A key impact of expanding the taxable earnings base is an improvement in vertical equity. By collecting revenues further up the distribution of earnings, a larger tax base will reduce the burden of tax payments borne by firms employing the lowest earning workers. Out of all California-based jobs in 2022 with earnings of $500 or more, 27 percent paid less than $7k in wages for the year, while 40 percent paid less than $14k.

Figure 5 illustrates the impact of a base increase across the earnings distribution. Jobs are bucketed into bins, beginning with earnings of $500-$999 per year (we drop jobs earning less than $500), and then thousand-dollar bins up until $15k per year, at which point the bins become even broader. This shows, unsurprisingly, that higher tax bases are more vertically equitable. The effective tax rate from a $7000 tax base falls quickly after $7000; similarly for $14,000 and $21,000. This means that larger tax bases increase the burden further up in the income distribution.

While these are job level earnings, vertical equity becomes even more pronounced when we analyze changes at the worker level. Out of the 8.6 million jobs earning less than $14,000, two-thirds were held by workers with more than one job during the year. When a worker holds two low-earning jobs, they are subject to twice the amount of taxable earnings relative to a worker holding a single job. Figure 6 illustrates how a base increase ameliorates this inequality in tax burden across workers' total annual earnings. For workers earnings less than $7,000 a year, there is virtually no change in tax cost from a base increase. As we progress up the earnings distribution,

this gap widens. Workers earning between 14k and 21k per year face double the tax burden under a 21k base versus a 7k base, workers earning between 21k and 50k face a 160 percent increase in tax burden, and those earning 50k or more face a 180 percent increase in tax burden. This is also in part because the distribution of multiple job holders is skewed towards lower incomes. Appendix Figure A.5 shows that workers earning between 14k and 21k annually are twice as likely to be single job holders than multiple job holders; workers earning above 50k are almost 4 times as likely to be a single job holder.

*Horizonal Equity*

Another important consideration in changing the UI financing system is the impact on horizontal equity. We assess horizontal equity by illustrating the relationship between which firms pay out the most UI benefits and which firms pay the most taxes.

Figure 7 ranks firms on the x-axis by their three-year average claim rate in years 1-3, to compare higher versus lower layoff firms. On the y-axis, we show the change in steady-state (year 5) tax revenues from raising the taxable earnings base from 7k to either 14k or 21k. The panels on the left graph the change in dollars per worker, while the panels on the right graph the change in proportional terms (a value of one represents a doubling of tax revenues, and a value of two represents a tripling). While firms with higher UI claims face larger tax increases in dollar terms, this is not the case in proportional terms. Doubling the tax base to 14k roughly doubles the taxes collected from firms with low layoffs, but as layoffs rise the proportional tax increase falls, before rising again somewhat for the highest layoff firms. Even for the highest layoff firms, the proportional increase in tax costs is lower than for the lowest layoff firms. This result is even more striking when increasing the tax base to 21k. In that case, revenues increase by over 200% for low-

layoff firms, but fall dramatically with layoff rates such that high layoff firms see their tax costs rise by closer to 150%.

This is a striking finding, driven by the fact that a tax base increase compresses the distribution of employer tax rates towards the middle (as illustrated in Figure 4), such that firms with low layoffs will actually face a mechanical tax increase as they are forced to build up a larger reserve ratio. Meanwhile, the low 6.2% maximum tax rate shields high layoff firms from paying the full cost of their UI claims.

*Experience Rating*

Another important implication of raising the tax base is what it does to the level of experience rating in the California UI system. While deriving optimal experience rating is beyond the scope of this paper, many have emphasized the particular problem of firms consistently subsidized by imperfect experience rating (e.g. Anderson and Meyer, 1993). Simply comparing the mean employer-specific tax rate across policies does not reflect the degree of experience rating at the extremes of the UI tax schedule, where employers face zero marginal tax costs from layoffs (in the short run). Thus, we focus on two subgroups of employers – the firms "stuck" at either the maximum or minimum tax rate for 3 consecutive years or more – and we calculate the corresponding share of UI claims these firms represent. As noted earlier, an imperfectly experience-rated system will subsidize firms that are systematically high-layoff while taxing firms that are systematically low-layoff. When firms that are persistently at the maximum tax rate generate a disproportionate share of UI claims for the state, their layoffs are systematically being subsidized.

The first two columns of Table 4 report, for our baseline policy scenarios, the share of UI claims that accrue to employers who were consecutively at the maximum or minimum tax rate in the first three years of our simulation. Under the baseline scenario with no base increase, 17.5% of UI claims are generated by firms at the maximum rate, while 3.6% of claims are generated by firms at the minimum rate. That is, 79% of firms are on the experience rated "sloped" part of the tax schedule, while 21% are not. It is worth noting that these shares are artificially depressed because by 2022 firms had already experienced an unprecedented forgiveness of pandemic-related UI claims. Appendix Table A.2 simulates the share of UI claims using the firm distribution from 2019, and in that world 14.8 percent of firms would be persistently at the maximum tax rate, generating 37.1 percent of UI claims.

Doubling the tax base to 14k causes the proportion of UI claims at the maximum rate to fall by 22 percent (from 17.5% to 13.7%). Overall, doubling the base causes the share of firms not experience rated (either at the maximum or minimum tax rate) to fall from 21% to 14.5%, a roughly 33% decrease. The improvement is somewhat smaller in level terms when considering the 2019 distribution of firms (in Appendix Table A.2); raising the tax base to 14k reduces the share of firms at either the maximum or minimum rate by about 5%, which in that case is only a 13% decrease. In summary, raising the taxable wage base has the effect of reducing the share of firms that are "permanently" subsidized by the UI system, although the changes are relatively modest.

*Additional Reform: Adjust the Minimum & Maximum Rate*

The limitations of the impact on experience rating, as well as the horizonal inequities, suggest that states such as California may want to consider complementary reforms to increasing

the base of taxable earnings. We consider two additional adjustments to the tax schedule: raising the maximum tax rate and lowering the minimum tax rate.

The maximum rate of 6.2% in California is approximately the median (27th out of 50 states); a 50% increase in the maximum rate to 9.3% would move California to the 9th highest state in terms of the maximum rate. Likewise, California currently has the highest minimum rate among all 50 states (only Washington, D.C.'s is higher), and a total of 13 states have a minimum rate of zero. When we model lowering the minimum tax rate, we also flatten the slope of the tax schedule itself in order for the policy to bind. This is because in the absence of a slope change, the mechanical increase in tax rates caused by the base increase would result in less than 1 percent of employment being impacted by the minimum rate change (summarized in Table A.1).

By changing both the maximum and minimum tax rates, we can both increase experience rating in the system – since fewer firms will bunch at the maximum and minimum rates – and horizontal equity – since firms with low claim rates will see drops in their tax burdens from a larger base. As the bottom panel of Table 3 shows, adding these tax schedule changes on top of a base increase will lower total revenues collected by the UI system. This is because a base increase alone would have increased the rate at which firms with low layoffs are forced to subsidize high layoff firms. Once we allow tax rates to fall for firms at or near the minimum, total contributions will also fall accordingly.

Figure 8 illustrates the evolution of tax rates in our simulation model, with an initial share of firms bunched at the minimum. This policy has the added benefit of "easing" the transition to a higher tax base by allowing firms' tax rates to fall while the tax bases increase. Over time, however, the distribution shifts away from the minimum tax rate, so that by year 4 and onwards less than

one percent of employment faces the minimum tax rate of zero (compared to the 17 percent of employment at the minimum rate of 1.5% in year 10 shown in Figure 4).

Such a change also appreciably increases both the horizontal equity and experience rating of the UI system. As Figure 9 shows, for firms throughout the claims distribution taxes go up by about 50% from this combined change, and taxes now rise proportionally more for the highest layoff firms. This is a much more horizontally equitable distribution than what is shown in Figure 7. In terms of experience rating, the increase in the maximum tax rate also rapidly reduces the share of firms consecutively stuck at the maximum and minimum rates (Table 4). Just changing the max and min while keeping the base fixed at 7k already reduces the share of firms at the max or min rates from 21 percent to 12 percent. If we combine the move to a 14k base with this new max and min, we end up with only 3.1 percent of firms at the max or min rate. That is, a higher base along with a change to the minimum and maximum tax rates reduces the share of firms systematically not experience-rated by 85 percent.

*Impact of Firm Entry and Exits*

To simulate the impact of reforming California's UI tax schedule, we must make some simplifying assumptions. Most notably, we fix the firm distribution as of 2022, such that there is no new entry or exit. From 2015-2022, 5.4% of employers (2% of employment) are new entrants and 4.4% of employers (1.5% of employment) are exiting, so these two margins roughly cancel each other out in terms of payroll. If we sum total reserves across exiting firms in 2022, exiters actually have a positive balance of $24 million on net, that would be credited back to the system.

However, it is likely that exiting firms make up a much larger share of UI claims relative to new entrants. We are unable to observe the UI claims generated by exiting firms in their final

year, and even a range would be difficult to estimate because exit rates are not monotonically increasing in employer reserve ratios.[12] If we assume that UI claims resulting from exit equate to 20% of taxable payroll in year t-1, these claims would amount to roughly $40 million per year. While this affects the total revenues collected by the state of California, it does not directly change our results on experience rating or vertical and horizontal equity. Furthermore, even if the increase in the taxable wage base to either $14k or $21k were to increase exit rates by 25 percent (from 1.5 percent of employment to 1.9 percent), the reduction in incremental revenue would be small relative to the revenue increasing effects for those employers that remain.

## 6 Other Considerations

*Behavioral Responses to Changes in UI Financing*

A limitation of our simulation model is that it does not consider the endogenous response of employer wage setting and employment to changes in financing. The existing literature estimating the incidence of UI payroll taxes on wages has shown evidence of responses on both the employment (Johnston, 2021; Guo, 2024; Huang, 2024) and earnings margin (Anderson and Meyer, 2000), although employment effects are strongest for temporary tax increases that affect a subset of employers rather than market-wide impacts.

To investigate the possibility of behavioral responses, we exploit the kink in the tax rate schedule that occurs once firms hit California's maximum tax rate of 6.2%. Once a firm's UI claims cause them to hit a reserve ratio of zero or lower, the maximum tax rate prevents them from facing any additional UI tax increases. We estimate a regression kink design (RKD) around this threshold

[12] Appendix Figure A.6 shows that in 2014-2016, exit rates were roughly constant across the reserve ratio distribution. Since 2020, however, exit rates have increased the most for firms at both extremes of the distribution, as well as for firms just below the maximum tax rate.

to test for a change in slope in the firm's outcome variables of interest. Our analysis sample covers 2015-2019, and includes employers with reserve ratios between -0.05 and 0.05, that ever employed 3 or more workers, and with taxable wages of at least 10k in the prior year.

Appendix Figure A.7 shows no evidence of bunching around the kink in the tax schedule, which provides support for a key identifying assumption of the RKD model that the number and average characteristics of firms are not changing systematically at the kink. Figure 10, which plots the raw data, shows a clear change in slope to the left and right of the threshold when plotting UI contributions on the y-axis. However, there is no statistically significant effect on taxable wages, the outcome that is most relevant for our simulation model. This is confirmed by the RKD estimates reported in column 2 of Table 6 and suggests that our assumption that total taxable earnings would not change substantially in response to UI tax base changes is reasonable.

In terms of employment growth and exit, Figure 10 shows no change in slope but suggestive evidence of a level change for firms that hit the kink, and the RKD estimates in Table 6 show that firms that hit the flat portion of the tax schedule increase their employment growth by 0.9 percentage points, and are 0.3 percentage points less likely to exit, relative to a scenario in which the tax rate continues to increase beyond 6.2 percent to the left of the kink point. This implies that a 1 percentage point decrease in the reserve ratio (which corresponds to a 0.235 percent increase in the UI tax rate) leads to a 0.2 percentage point drop in employment growth, implying a semi-elasticity of roughly 0.85. This suggests that the revenue gains we estimate from expanding the taxable wage base or raising the maximum UI tax would be partially offset by an increase in firm exits and a reduction in employment.

However, it is important to note that these RKD estimates are local to the subset of relatively high-layoff firms with reserve ratios just above and below the maximum tax rate

threshold and may not extend to the broader population of employers. Furthermore, the employment responses to annual changes in firm-specific UI tax rates are likely to be more pronounced than the response to a permanent tax base increase. Nevertheless, if we were to take the employment growth estimate at face value, a doubling of the tax base from 7k to 14k would translate to almost a doubling of the statutory UI tax rate (almost, because not all workers have earnings above 14k). This implies that in year 1, an upper bound on the potential behavioral response would be a 2.5 percentage point drop in employment growth on average (multiplying 0.85 by 2.9, the mean tax rate in our sample). Such a response would cause our simulation model to overstate the additional revenues generated by a tax base increase, although the effect would decline over time as employer tax rates gradually adjust downward as a result of the base increase.

*Employer Taxes and UI Benefits Generosity*

Another motivation for California or any other state to increase revenues to its UI system through tax base increases is that it could finance raising the generosity of UI benefits. Since 2005, the maximum weekly benefit in California's UI system has stood at $450 (thereby declining in inflation-adjusted terms) while the average weekly benefit among all other states increased by 56 percent. During that period, California fell from the 7$^{th}$ most generous state on this metric of benefit generosity to the 32$^{nd}$ most generous by 2024.

To investigate whether states with increases in their taxable wage base tend to have larger increases in the generosity of their maximum weekly UI benefits, we estimate state-by-year level two-way fixed effects difference-in-differences specifications of the following type:

$$(1) \quad \log(\text{benefit}_{st}) = a_t + b_1 \log(\text{base}_{st}) + m_s + e_{st}$$

$$(2) \quad \log(\text{benefit}_{st}) = a_t + b_1 \log(\text{base}_{st}) + b_2 \text{min rate}_{st} + b_3 \text{max rate}_{st} + m_s + e_{st}$$

Given that UI benefits and the UI taxable wage base are jointly determined, we do not assign a strict causal interpretation to our results, which are summarized in columns 1 and 2 of Table 6. In both cases, the coefficient estimate for the taxable wage base is highly statistically significant. Both estimates imply that on average, a within-state increase of 10 percent in a state's taxable wage base is associated with approximately a 2.1 percent increase in its maximum weekly UI benefit. In contrast, the coefficient estimates for both the minimum and maximum tax rates are much smaller in magnitude and neither point estimate is statistically significant. These results strongly suggest that a state's taxable wage base for unemployment insurance often coincides with and may facilitate an increase in the generosity of UI benefits in a state.

One possible explanation for the strong within-state relationship between UI benefit generosity and the UI tax base is indexing. About one-in-three states index their UI tax bases to average wages in the state, and in most cases these same states index their maximum weekly UI benefits as well (Duggan et al, 2023). For these states, a relationship between these two variables would to some extent be mechanical. In most of the remaining states, it is usually necessary for policymakers to enact legislation to revise either the tax base or the maximum weekly benefit. States that index have significantly higher average tax bases than non-indexing states ($43.0k versus $11.3k in 2024) and significantly higher average weekly benefits ($653 versus $483) as well.

To investigate whether the relationship between within-state variation in UI benefits and the UI tax base varies between indexing and non-indexing states, we next estimate specification

(1) separately for the two groups of states. As expected, the relationship is somewhat stronger for the 17 indexing states than in the 34 remaining states, as a comparison of the estimates for $\beta_1$ in columns (3) and (4) for indexing (0.325) and non-indexing (0.203) states shows, though it is statistically significant for both groups of states.[13] Taken together, these results demonstrate that state-level changes in UI benefit generosity are strongly positively associated with changes in the UI taxable wage base for both indexing and non-indexing states. This also suggests a potential confounding factor of many previous studies that have leveraged within-state variation in UI benefit generosity to estimate the effects on worker behavior including unemployment duration and wages.

## 7 Conclusion

The voluminous economics literature on the UI system has focused almost exclusively on the effects of UI benefit generosity on worker behavior and employment outcomes, with much less focus on the structure of UI system financing. This is despite variation in financing regimes across states which in some ways dwarfs their differences in benefits – in particular the taxable wage base, which varies by a factor of ten between the highest and lowest tax base states. This variation is closely associated with system solvency – and, as we also show, with benefit generosity as well.

We document the impact of the taxable wage base on potential revenues, vertical and horizontal equity, and experience rating using a unique data set of matched employer-employee administrative data from California. We find that raising the tax base can help California meet its financing shortfalls, raise vertical equity, and improve experience rating. But we also find that such a change worsens horizontal equity, raising taxes much more proportionally for the lowest

[13] And in a companion specification not shown here, we find that this difference in the estimate for $b_1$ between the two groups of states is not statistically significant.

layoff firms. We show that an alternative reform that pairs a higher tax base with a broader tax schedule can improve horizontal equity and experience rating, though at some revenue cost.

Due to the pandemic-reduced recession in 2020, 22 states were forced to borrow from the federal government in order to continue to pay UI benefits. As of 2025 all states except for California have now paid back these loans, relying on ARPA funds and general revenues rather than through UI financing alone. Most recently, New York's governor authorized an $8 billion payment from general funds to repay their outstanding UI debt. Nevertheless, a majority of states do not currently meet solvency standards for their UI programs, and are at risk in the event of another recession. These states will need financing reforms that thoughtfully balance equity and efficiency considerations. We show that raising the taxable wage base in conjunction with an adjustment in the minimum and maximum tax rates can be a powerful tool to both raise revenues and simultaneously improve both program equity and experience rating.

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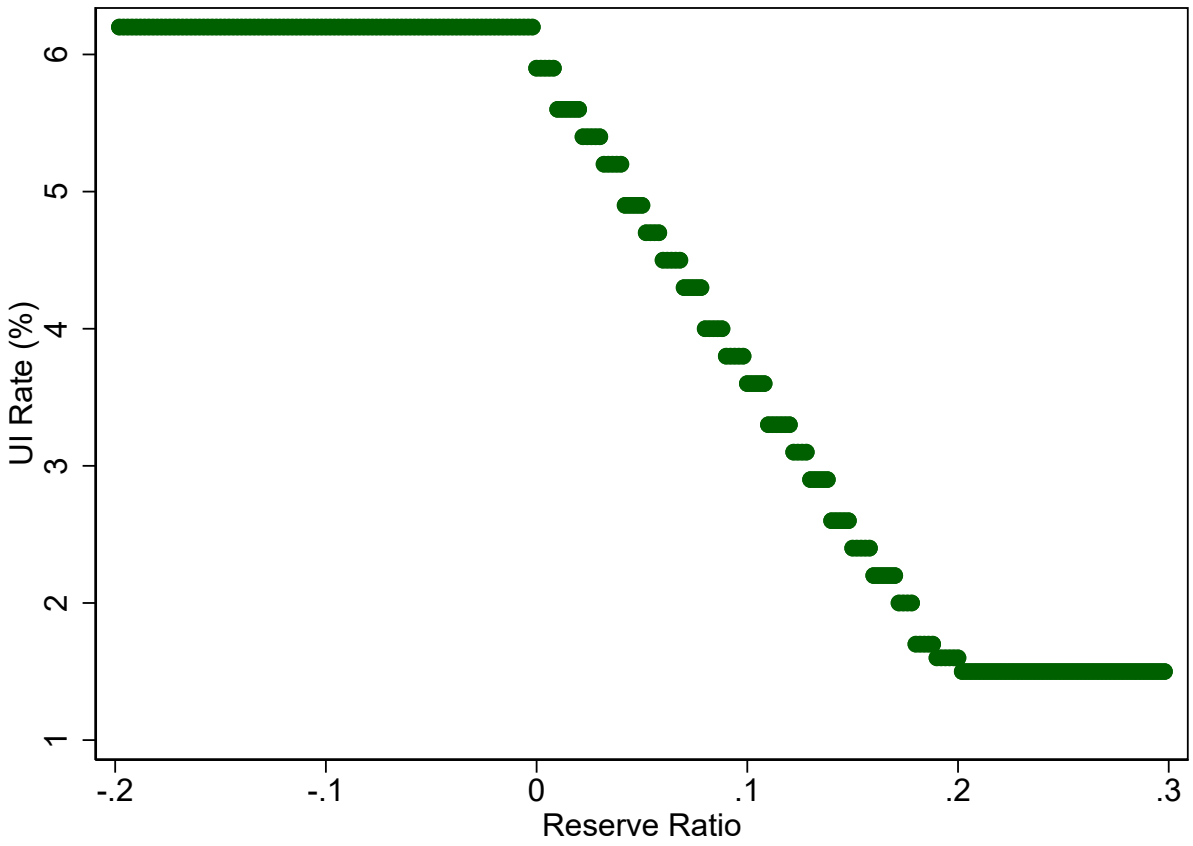
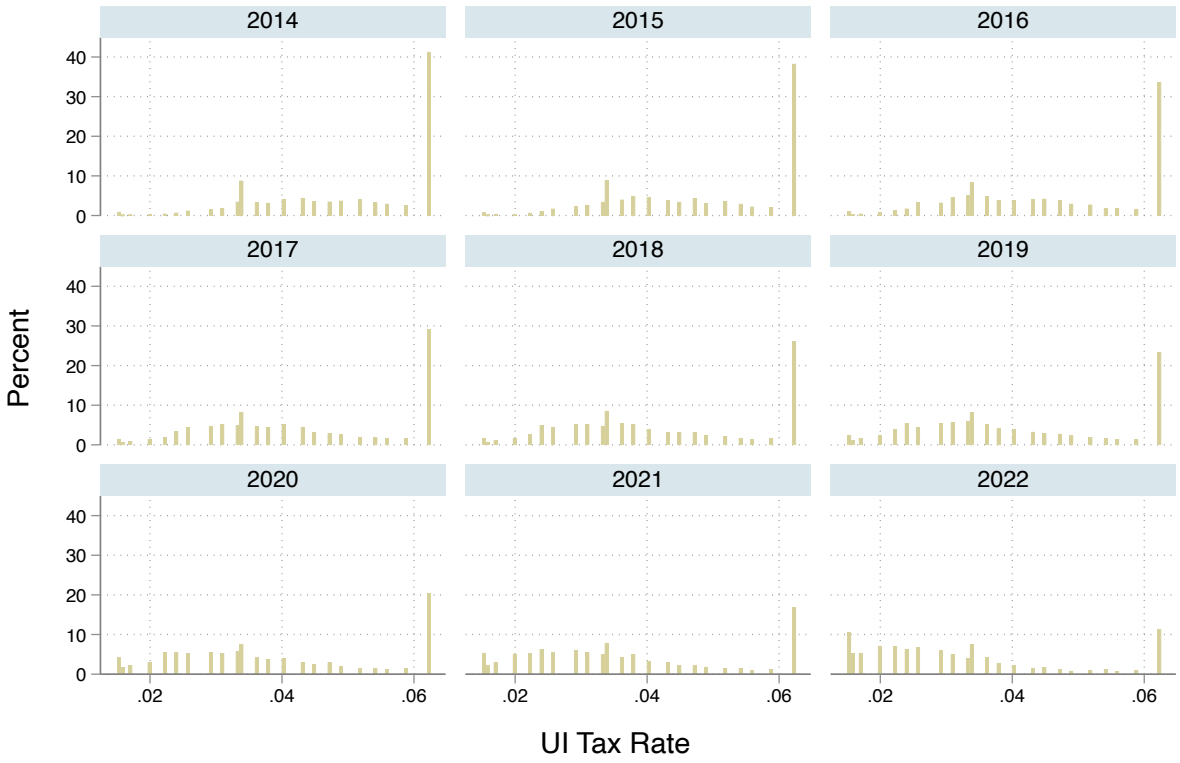
Figure 1: California Tax Rate Schedule



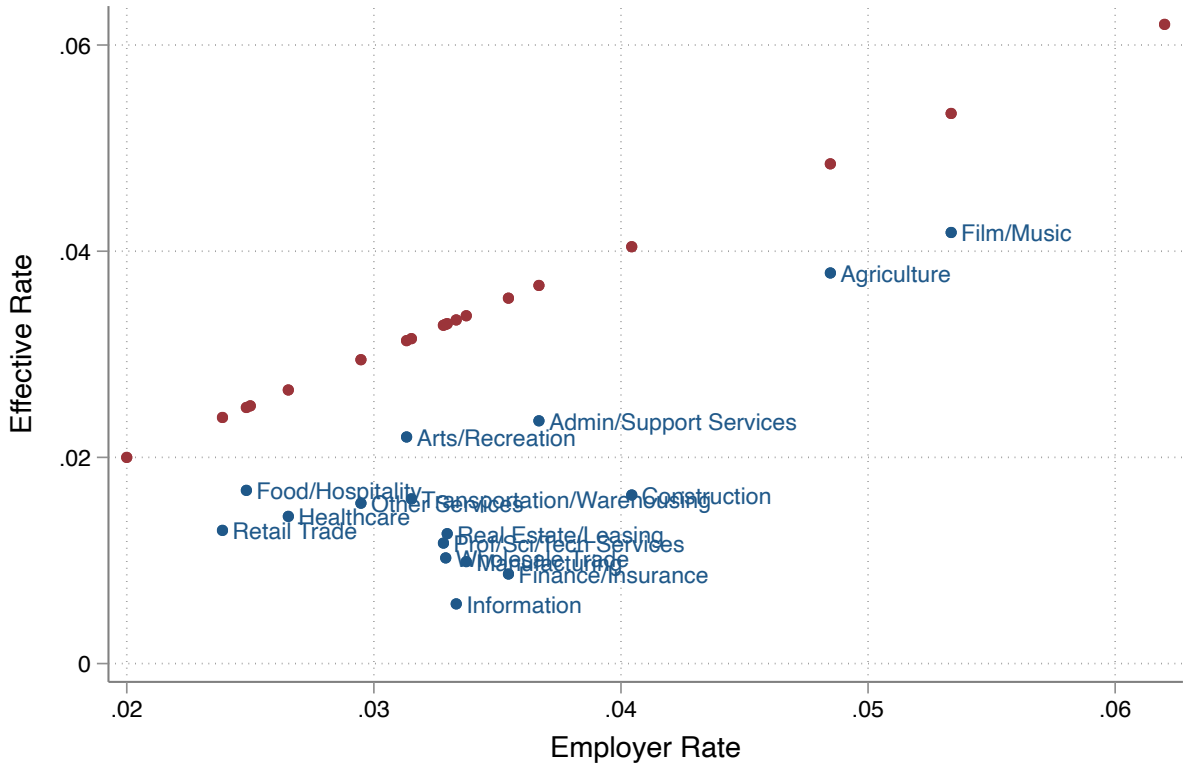

Notes: UI tax rates range from a maximum of 6.2% (RR below 0) to a minimum of 1.5% (RR above 0.2), and California's taxable wage base is $7000.

Figure 2: Employer Tax Rates, by Year



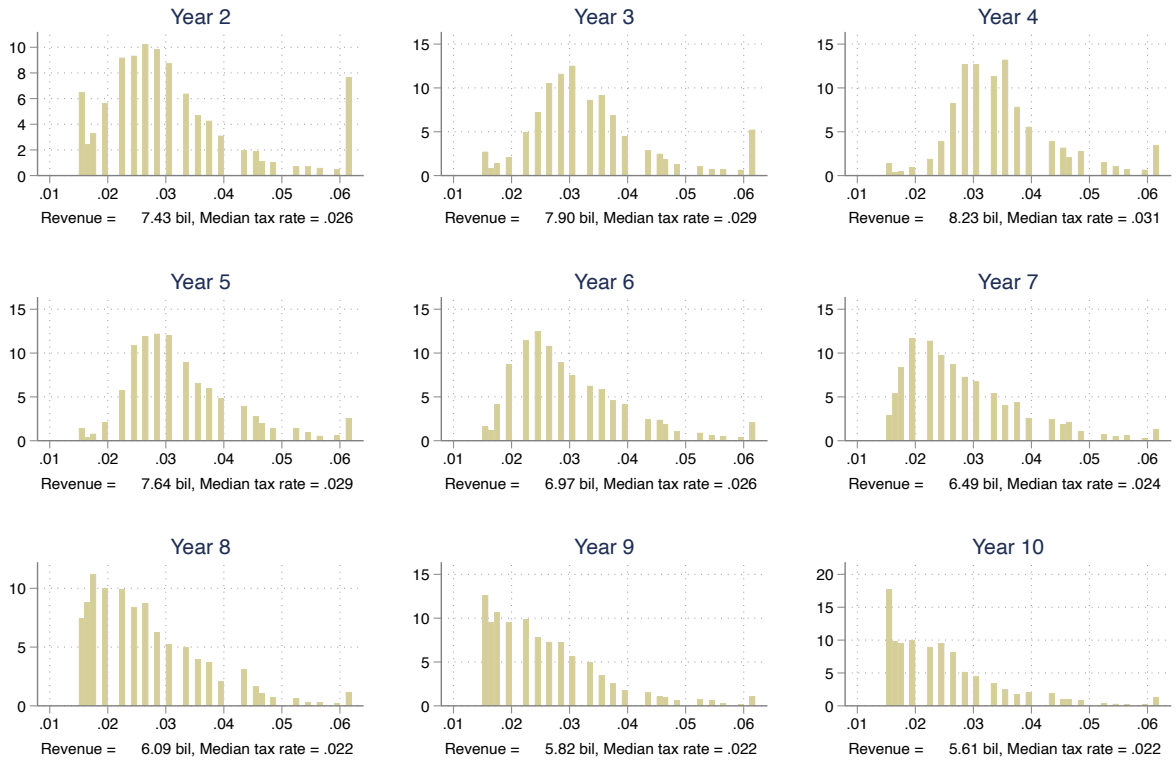

Notes: Histograms are weighted by employment. UI tax rates range from a minimum of 1.5% to a maximum of 6.2%, and new employers are assigned a rate of 3.4%.

Figure 3: Scatterplot of Statutory versus Effective Rates, by Sector (2022)




Notes: Orange dots represent the 45 degree line. Each plotted point takes the average across all workers in a 2-digit NAICS sector. NAICS 512 (Film/Music) is separately plotted from the rest of NAICS 51 (Information).

Figure 4: 10-Year Simulation of Doubling Tax Base to 14k

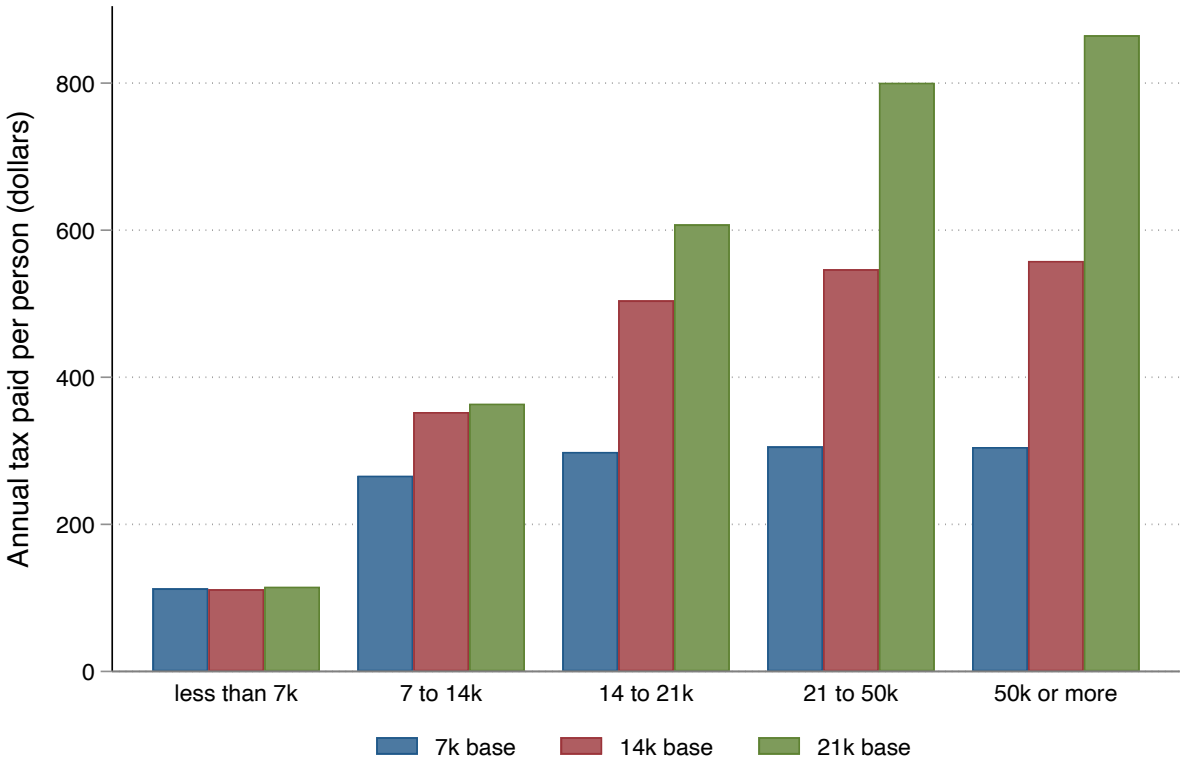



Notes: N = 708,204. Histograms are weighted by employment. Models a doubling of the tax base that begins in 2022, with rates adjusting in 2023 (Year 2).

Figure 5: Mean Tax Cost by Job-level Earnings

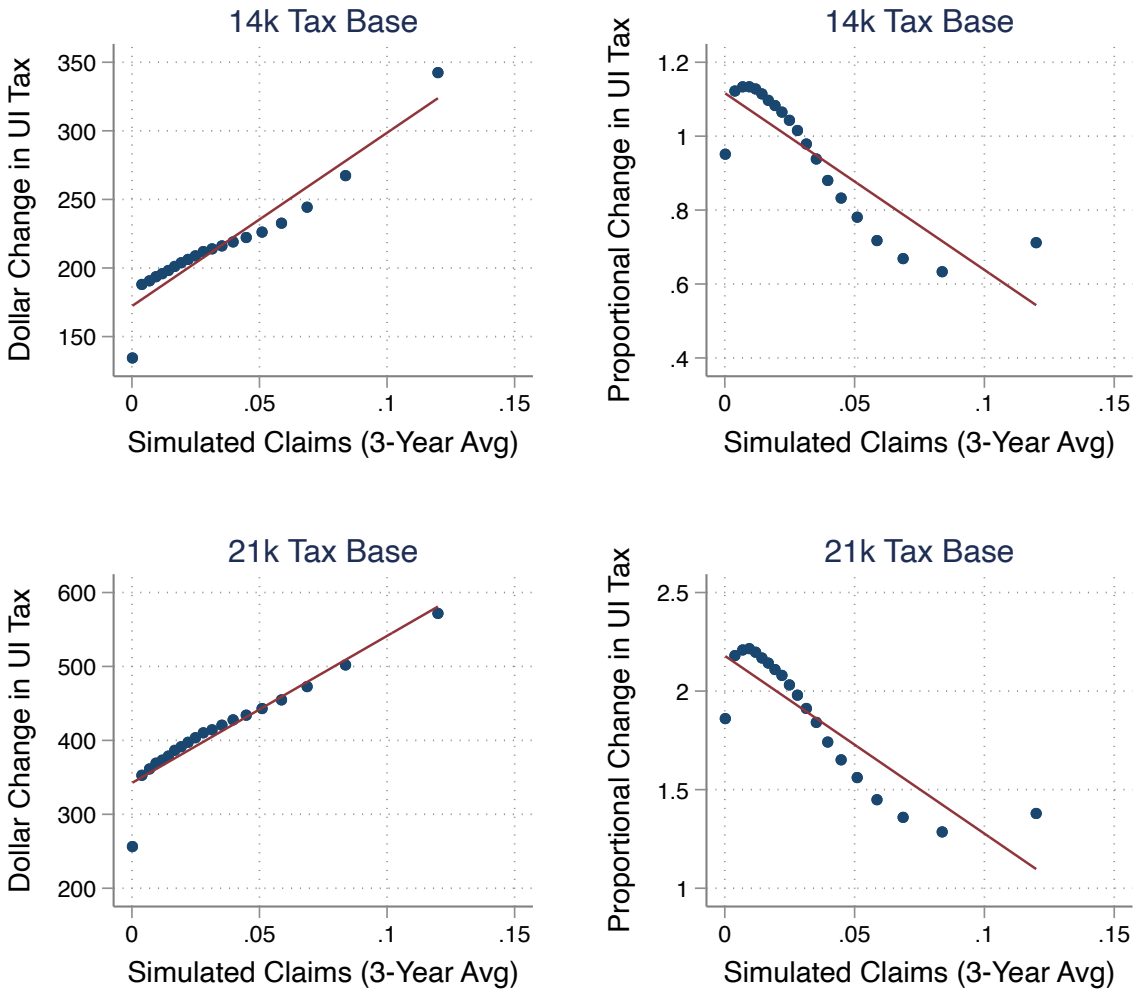

Notes: Panel A plots mean statutory Year 5 tax rates over $1k earnings bins. Panel B plots the mean increase in Year 5 taxes paid relative to a 7k base. Bin 15 includes earnings from 15-20k, bin 20 includes earnings from 20-25k, bin 25 from 25-50k, bin 50 from 50-100k, and bin 100 includes earnings 100k+. Jobs with earnings below $500 (7.7%) are dropped.

Figure 6: Mean Tax Cost by Worker-level Earnings



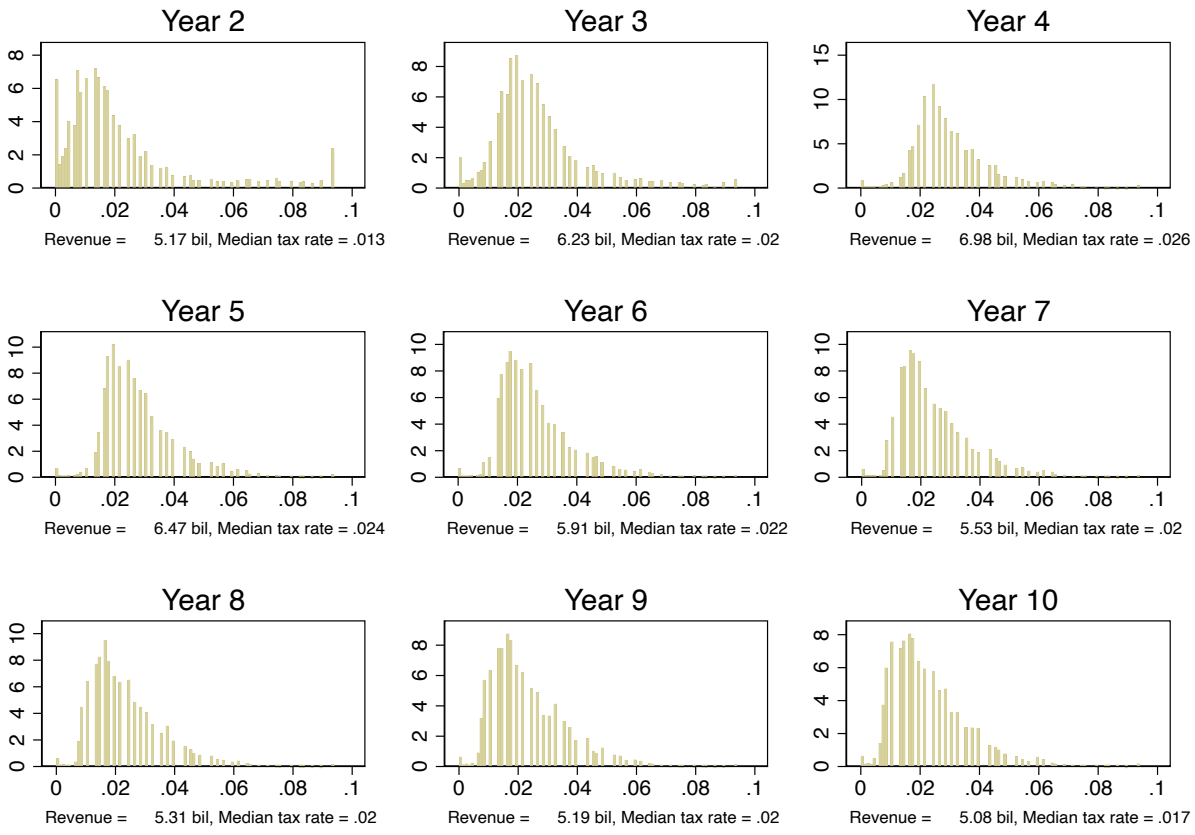

Notes: Plots the mean increase in Year 5 taxes paid per person, by workers' total annual earnings.

Figure 7: Experience Rating Across Base Increases



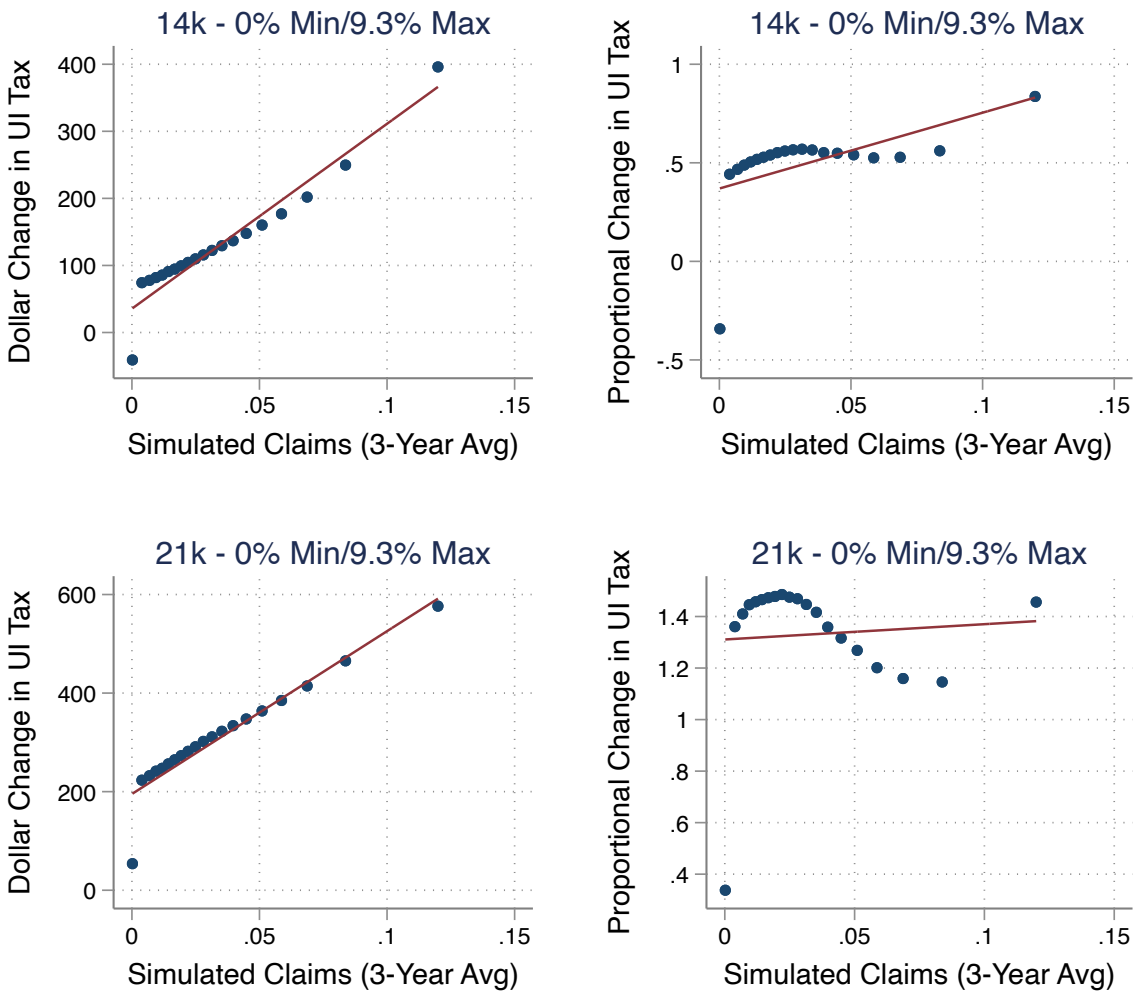

Note: The x-axis plots ventiles of simulated claims, calculated as a percentage of each firm's original taxable payroll. On the y-axis, the change in UI tax is calculated as the difference between Year 5 taxes paid under a base increase, and Year 5 taxes paid under the 7k base. On the left side, the dollar change is calculated by dividing the tax increase by maximum monthly employment. On the right side, the proportional change is calculated by dividing the tax increase by Year 5 taxes paid under the 7k base. Excludes 28,664 firms with taxable payroll of less than $7000.

Figure 8: 10-Year Simulation of 14k Tax Base, 0% Min rate, and 9.3% Max rate



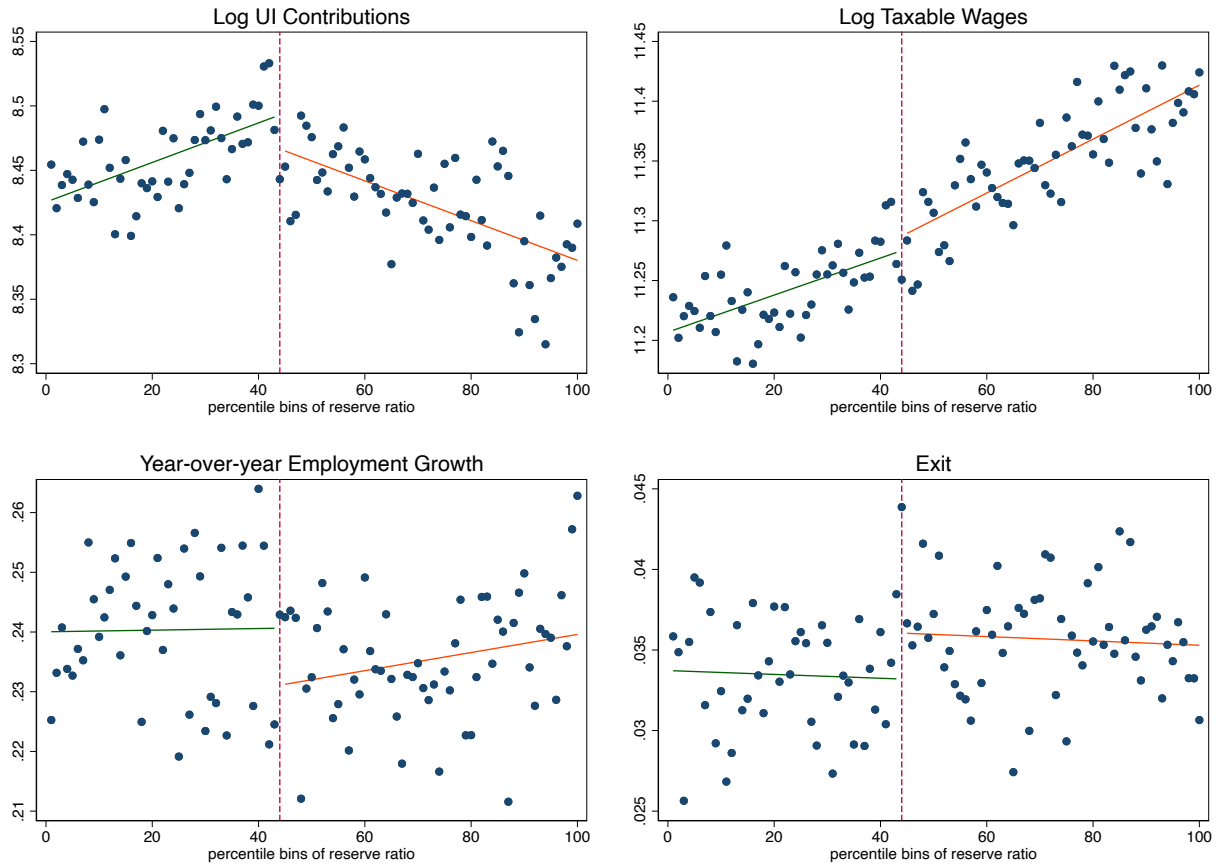

Notes: N = 708,204. Histograms are weighted by employment. Models a doubling of the tax base that begins in 2022, with rates adjusting in 2023 (Year 2). Starting in year 2, the maximum tax rate is increased from 6.2 to 9.3 percent, such that the new maximum occurs at an RR of -0.12. The minimum tax rate is decreased from 1.5 to 0 percent with a corresponding flattening of the slope between 0 and 6.2%, such that the new minimum still occurs at an RR of 0.2.

Figure 9: Experience Rating Across Alternative Reforms




Note: Excludes 28,664 firms with taxable payroll of less than $7000. The x-axis plots ventiles of simulated claims, calculated as a percentage of each firm's original taxable payroll. On the y-axis, the change in UI tax is calculated as the difference between year 5 taxes paid under a base increase, and year 5 taxes paid under the baseline 7k base. On the left side, the dollar change is calculated by dividing the tax increase by maximum monthly employment. On the right side, the proportional change is calculated by dividing the tax increase by year 5 taxes paid under the 7k base.

Figure 10: Firm Outcomes Around RKD Threshold




Note: N = 292,770. Includes employers with reserve ratios between -0.05 and 0.05 that ever employed 3 or more workers, and with taxable wages of at least 10k in year $t-1$. Each graph plots the binned scatterplot of an outcome variable, with unconditional best fit lines to the left and right of the reserve ratio equals zero threshold.,

Table 1: Summary Statistics (2022)

*A. Employer Level*

| | All Firms | Simulation | Excluded |
|---|---|---|---|
| UI tax rate | 3.0% | 2.9% | 3.4% |
| Share at min rate | 20.6% | 23.0% | 9.8% |
| Share at max rate | 7.2% | 8.0% | 3.3% |
| Reserve Ratio | 12.7% | 14.3% | 5.6% |
| Employment | 19 | 22 | 7 |
| Taxable wages ($k) | 158 | 182 | 50 |
| Total wages ($k) | 1397 | 1650 | 253 |
| Share new entrant | 7.4% | 0% | 40.9% |
| Share exiter | 4.0% | 0% | 22.1% |
| N | 864,708 | 708,204 | 156,504 |

*B. Job Level*

| | All Firms | Simulation | Excluded |
|---|---|---|---|
| UI tax rate | 3.2% | 3.2% | 3.4% |
| Share at min rate | 10.1% | 10.3% | 5.8% |
| Share at max rate | 13.6% | 14.1% | 4.4% |
| Taxable wages | 5456 | 5474 | 5069 |
| Total wages | 48499 | 49415 | 28760 |
| Share w/ only one employer | 46.7% | 47.5% | 31.2% |
| N | 24,643,851 | 23,551,020 | 1,092,831 |

Notes: Excludes non-experience rated firms. Simulation sample covers firms that entered by 2021:Q2 and survived until 2023:Q1. Bottom panel excludes 5.4 million jobs that do not match to employer-level data.

Table 2: California versus Rest of United States (2019)

| | California | United States |
|---|---|---|
| | *Labor Force Composition* | |
| Age | 41.6 | 41.7 |
| Female | 45.7% | 47.6% |
| White | 59.7% | 74.3% |
| Black | 5.4% | 13.3% |
| Hispanic | 37.9% | 15.4% |
| Asian | 16.3% | 5.0% |
| HS Grad or Equiv | 87.9% | 91.1% |
| College | 37.1% | 34.7% |
| Weekly Earnings | $1367 | $1107 |
| | *Industry Shares* | |
| Agriculture | 3.2% | 0.8% |
| Construction | 5.8% | 5.9% |
| Manufacturing | 8.6% | 10.1% |
| Retail Trade | 11.2% | 12.6% |
| Information | 3.6% | 2.0% |
| Prof/Sci/Tech Services | 8.8% | 7.3% |
| Healthcare | 15.7% | 15.8% |
| Food/Hospitality | 11.1% | 11.1% |
| | *Unemployment Insurance* | |
| Maximum Weekly Benefit | $450 | $452 |
| UI Claim Rate | 3.1% | 1.8% |
| Average Weekly Benefit | $335 | $354 |
| Average Duration (weeks) | 17.4 | 13.9 |
| UI Taxable Wage Base | $7000 | $18,739 |

Sources: American Community Survey, Quarterly Census of Employment and Wages, and Department of Labor UI Data

Table 3: Net Revenues Raised

| Policy | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 | Yr 6 | Yr 7 | Yr 8 | Yr 9 | Yr 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7k baseline | 0.78 | -0.17 | -0.56 | -0.34 | -0.28 | -0.35 | -0.11 | -0.16 | -0.06 | -0.09 | -1.34 |
| 14k baseline | 3.99 | 3.26 | 3.15 | 3.46 | 2.88 | 2.10 | 1.80 | 1.33 | 1.16 | 0.92 | 24.05 |
| gradual to 21k | 2.23 | 2.68 | 4.33 | 6.50 | 6.23 | 5.53 | 4.96 | 3.90 | 3.08 | 2.39 | 41.81 |
| *Comparison to Alternative Policies* | | | | | | | | | | | |
| 7k baseline | 0.78 | -0.17 | -0.56 | -0.34 | -0.28 | -0.35 | -0.11 | -0.16 | -0.06 | -0.09 | -1.34 |
| 0% min/9.3% max | 0.78 | -1.31 | -1.44 | -0.91 | -0.63 | -0.56 | -0.21 | -0.23 | -0.08 | -0.10 | -4.69 |
| 14k baseline | 3.99 | 3.26 | 3.15 | 3.46 | 2.88 | 2.10 | 1.80 | 1.33 | 1.16 | 0.92 | 24.05 |
| 0% min/9.3% max | 3.99 | 1.00 | 1.41 | 2.19 | 1.72 | 1.02 | 0.85 | 0.50 | 0.42 | 0.24 | 13.34 |
| gradual to 21k | 2.23 | 2.68 | 4.33 | 6.50 | 6.23 | 5.53 | 4.96 | 3.90 | 3.08 | 2.39 | 41.81 |
| 0% min/9.3% max | 2.23 | 0.64 | 2.44 | 4.85 | 4.64 | 3.95 | 3.38 | 2.38 | 1.71 | 1.15 | 27.37 |

$N = 708,204$. Net revenues calculated as annual contributions minus annual claims.
Year 1 claims = \$3.3b, Year 2 claims = \$4.2b, and average claims in Years 3-10 = \$4.7b.
Gradual transition increases base to 10k in year 1, 13k in year 2, 17k in year 3, and 21k in years 4-10.

Table 4: Share of UI Claims

| | 3-years at max rate | 3-years at min rate | Rest of firms | 3-years at max rate | 3-years at min rate | Rest of firms |
|---|---|---|---|---|---|---|
| | *Baseline Schedule* | | | *0% min rate/ 9.3% max rate* | | |
| 7k base | 17.5% | 3.6% | 79.0% | 9.5% | 2.8% | 87.8% |
| 14k base | 13.7% | 0.88% | 85.5% | 2.5% | 0.67% | 96.9% |

Measures based on first three years of simulation model. 7k baseline has 5.3% of firms at max and 16.3% at min. 14k baseline has 3.4% at max and 8.2% at min.

Table 5: Regression Kink Discontinuity Estimates (2015-2019)

| | (1) log(Contributions) | (2) log(Taxable wages) | (3) Empl Growth | (4) Exit |
|---|---|---|---|---|
| D | 0.036*** | 0.003 | 0.009** | -0.003** |
| | (0.003) | (0.003) | (0.004) | (0.001) |
| Reserve Ratio | -4.060*** | 0.202*** | 0.372*** | -0.085*** |
| | (0.076) | (0.076) | (0.092) | (0.031) |
| D*Reserve Ratio | 4.142*** | -0.108 | -0.191 | 0.061 |
| | (0.115) | (0.115) | (0.140) | (0.047) |
| $\log(\text{taxwages}_{t-1})$ | 0.994*** | 0.994*** | -0.074*** | -0.003*** |
| | (0.001) | (0.001) | (0.001) | (0.000) |
| $\log(\text{emp}_{t-1})$ | 0.000*** | 0.000*** | 0.000*** | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Constant | -2.801*** | 0.014 | 1.072*** | 0.071*** |
| | (0.009) | (0.009) | (0.010) | (0.004) |
| $R^2$ | 0.889 | 0.889 | 0.045 | 0.011 |
| Mean Outcome | 8.439 | 11.303 | 0.238 | 0.035 |
| Year FE | X | X | X | X |
| 4-digit NAICS FE | X | X | X | X |
| $N$ | 292,770 | 292,770 | 292,770 | 292,770 |

Includes employers with reserve ratios between -0.05 and 0.05 that ever employed 3 or more workers, and with taxable wages of at least 10k in year $t-1$. D is an indicator for having a negative reserve ratio (ie: assigned the maximum tax rate). Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: UI Taxes and Benefit Generosity (1983-2024)

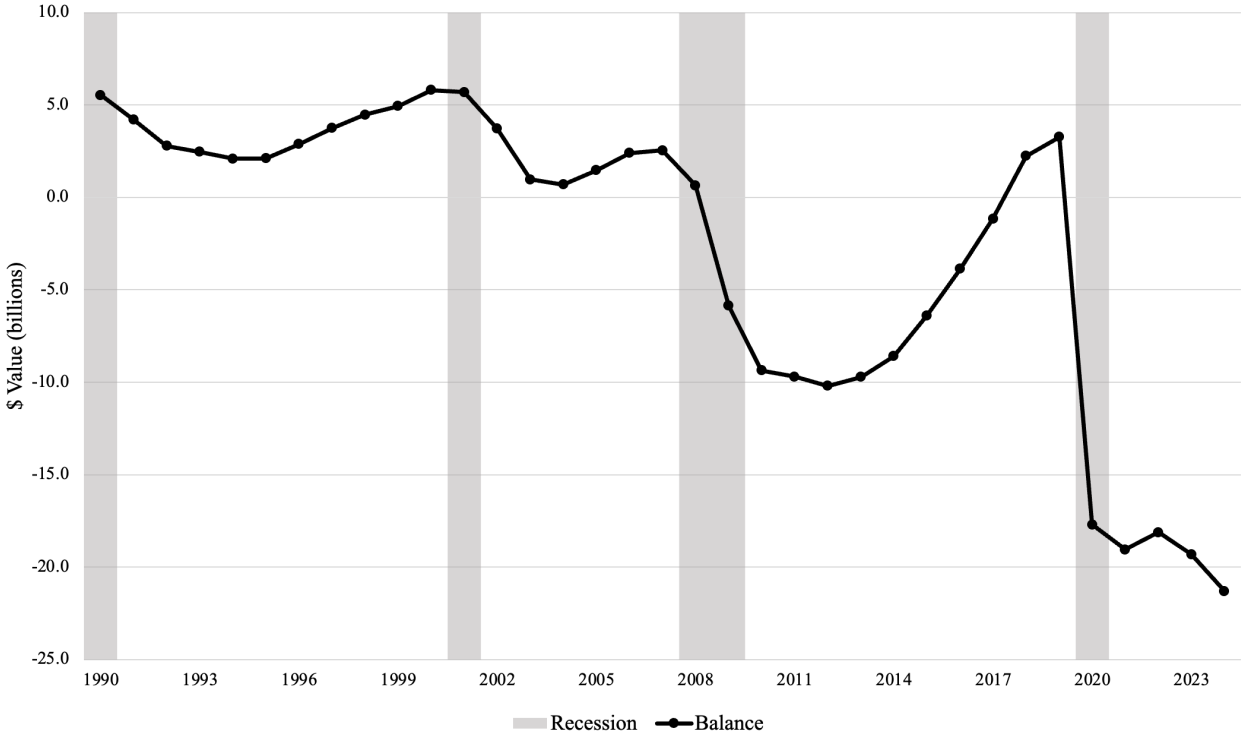
| | All States | | Indexed | Non-indexed |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| log(base) | .214*** | .215*** | .325* | .203** |
| | (.058) | (.057) | (.166) | (.089) |
| min rate | | .008 | | |
| | | (.014) | | |
| max rate | | .012 | | |
| | | (.008) | | |
| State and Year FEs | X | X | X | X |
| $N$ | 2,142 | 2,137 | 714 | 1,428 |

Regressions at the state and year level. Robust standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

# Supplemental Appendix

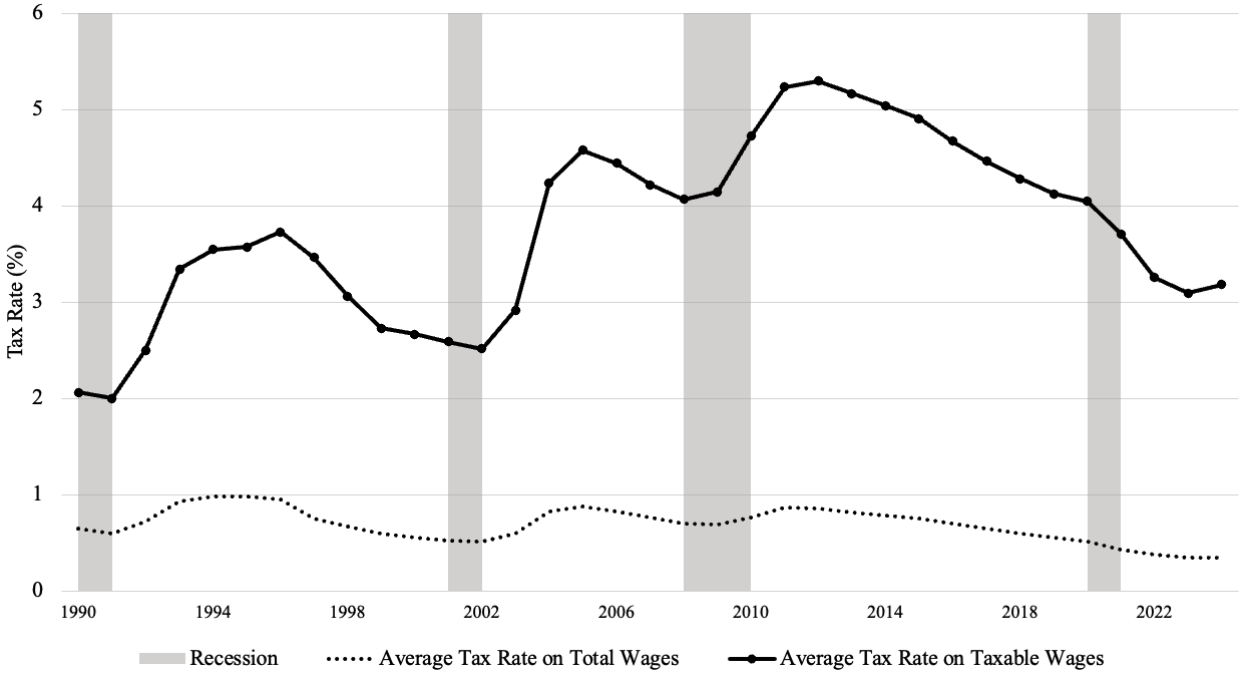
## A Appendix Figures and Tables

Figure A.1: California UI Trust Fund Balance (1990-2024)



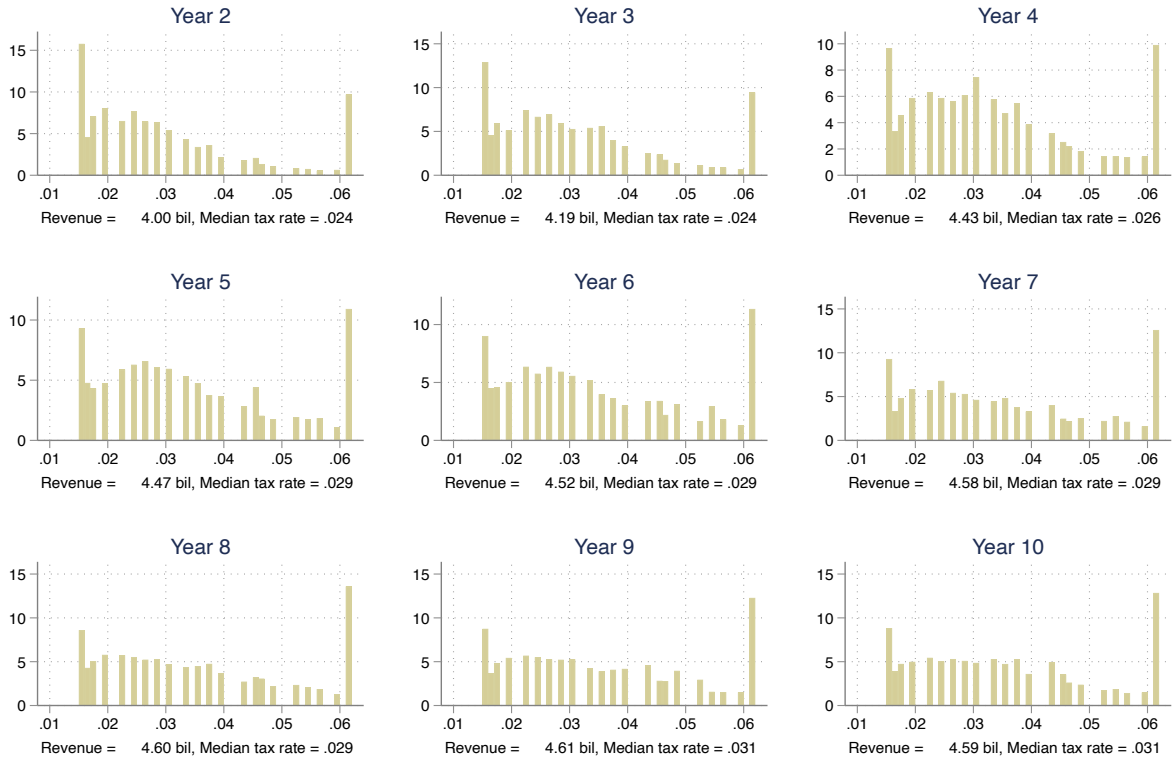

Source: U.S. Department of Labor

Figure A.2: California UI Tax Rate (1990-2024)



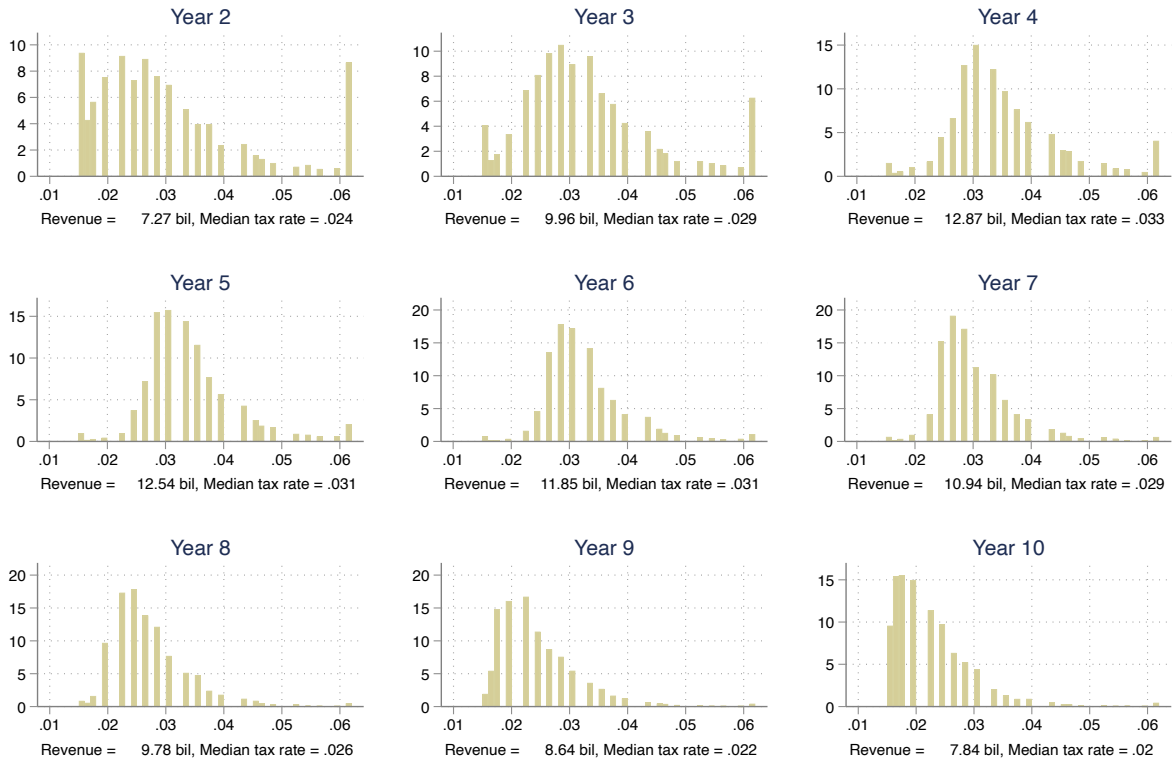

Source: U.S. Department of Labor

Figure A.3: 10-Year Simulation of Baseline 7k Tax Base



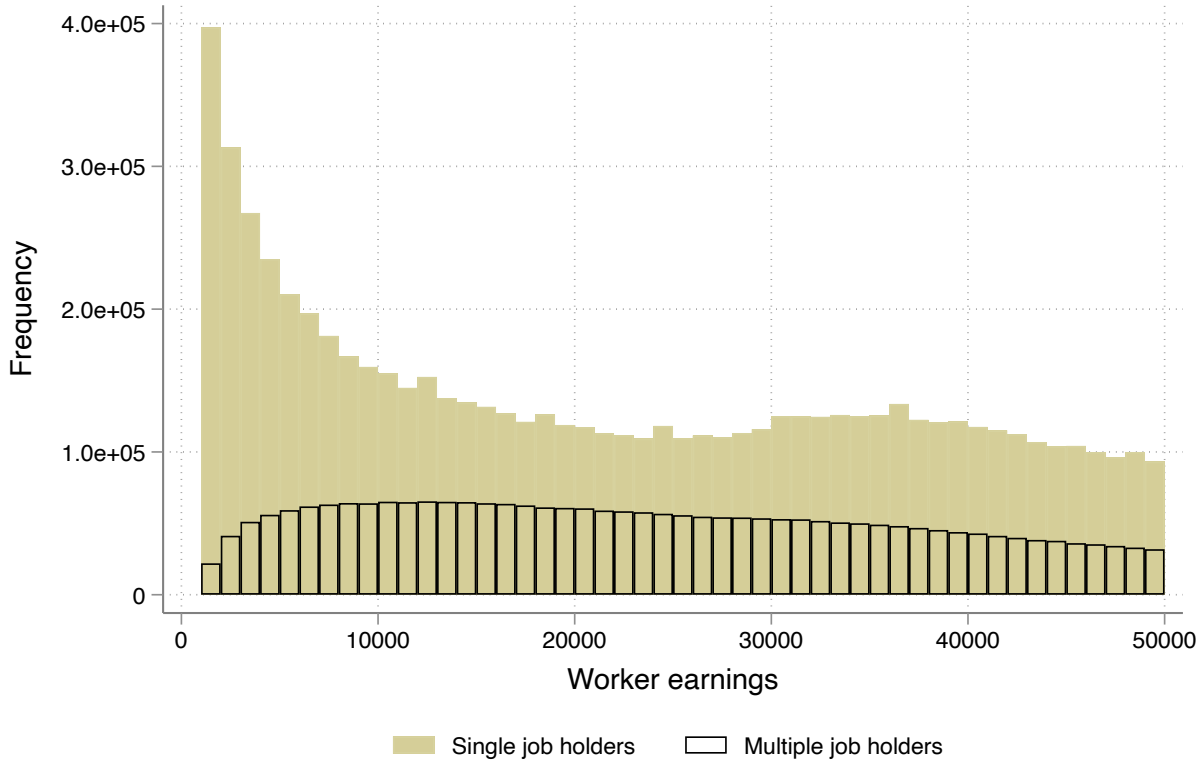

Notes: N = 708,204. Histograms are weighted by employment.

Figure A.4: 10-Year Simulation of Gradual Transition to 21k Tax Base



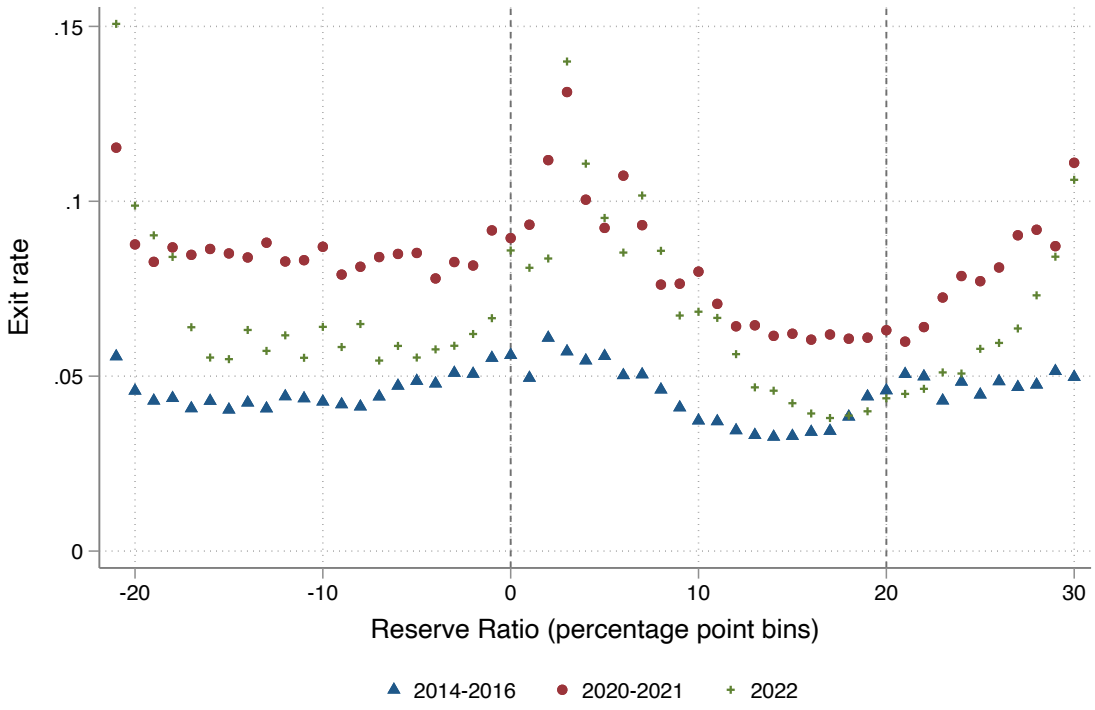

Notes: N = 708,204. Histograms are weighted by employment. Models a gradual transition to 21k, with base increases to 10k in year 1, 13k in year 2, 17k in year 3, and 21k in years 4-10.

Figure A.5: Distribution of Worker-level Earnings



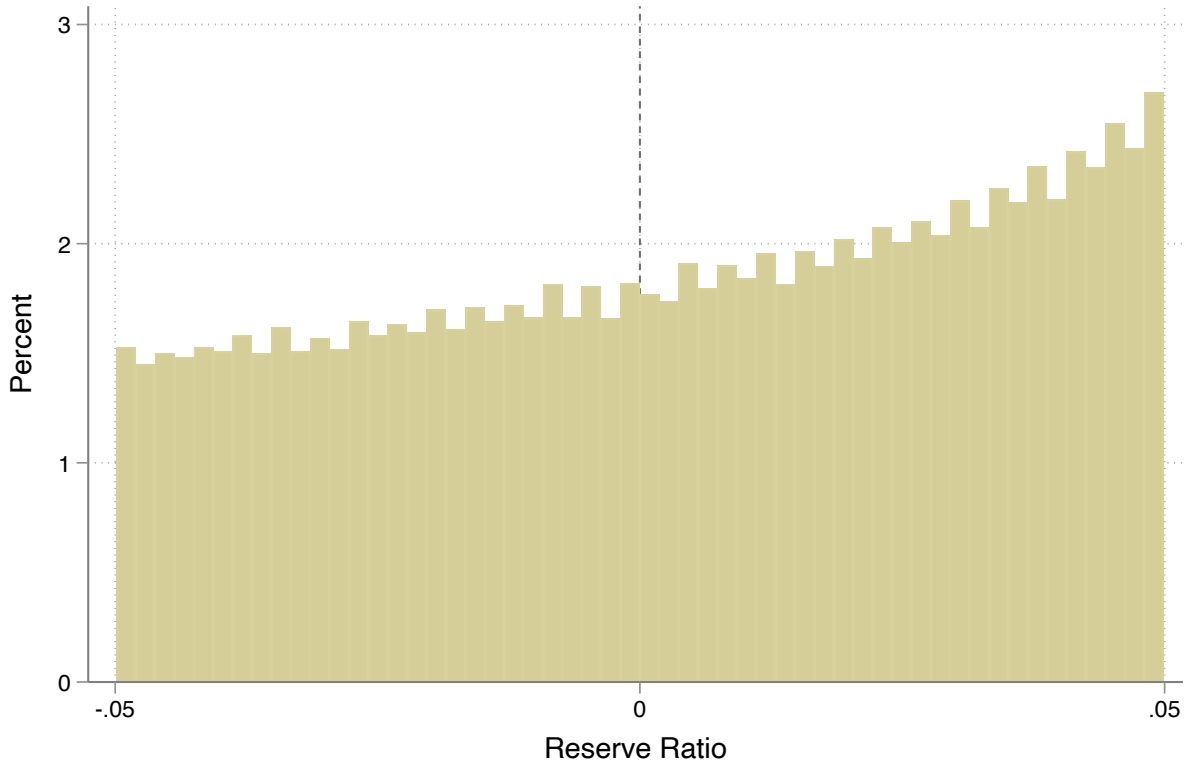

Notes: N = 9,455,452. Aggregates earnings over all jobs included in our simulation sample. Workers with earnings below $1000 or above $50,000 are dropped. There are 5.23 million single job holders earning 50k or more, and there are 1.34 million multiple job holders earning 50k or more.

Figure A.6: Exit Rates Across Reserve Ratio Distribution




Notes: Plots the share of exiting firms in each percentage point bin of reserve ratios. The dashed lines indicate the maximum rate at zero, and the minimum rate at 20.

Figure A.7: No evidence of bunching around maximum tax rate threshold




Notes: N = 292,770. Includes employers in 2015-2019 with reserve ratios between -0.05 and 0.05 that ever employed 3 or more workers, and with taxable wages of at least 10k in year $t-1$.

Table A.1: Net Revenues Raised Under Alternative Minimum Rate Policies

| Policy | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 | Yr 6 | Yr 7 | Yr 8 | Yr 9 | Yr 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7k baseline | 0.78 | -0.17 | -0.56 | -0.34 | -0.28 | -0.35 | -0.11 | -0.16 | -0.06 | -0.09 | -1.34 |
| 9.3% max | 0.78 | 0.02 | -0.21 | -0.12 | -0.11 | -0.14 | -0.22 | -0.23 | -0.1 | 0.08 | -0.24 |
| 0% min/9.3% max | 0.78 | 0.08 | -0.36 | -0.18 | -0.14 | -0.24 | -0.00 | -0.09 | 0.01 | -0.02 | -0.15 |
| 0% min + slope change | 0.78 | -1.31 | -1.44 | -0.91 | -0.63 | -0.56 | -0.21 | -0.23 | -0.08 | -0.10 | -4.69 |
| 0.75% min | 0.78 | 0.10 | -0.35 | -0.17 | -0.13 | -0.23 | 0.00 | -0.08 | 0.02 | -0.01 | -0.06 |
| 0.75% min + slope change | 0.78 | -0.48 | -0.81 | -0.50 | -0.38 | -0.41 | -0.13 | -0.17 | -0.05 | -0.07 | -2.20 |
| 14k baseline | 3.99 | 3.26 | 3.15 | 3.46 | 2.88 | 2.10 | 1.80 | 1.33 | 1.16 | 0.92 | 24.05 |
| 9.3% max | 3.99 | 3.53 | 3.39 | 3.49 | 2.83 | 2.12 | 1.52 | 1.13 | 0.99 | 0.97 | 23.97 |
| 0% min/9.3% max | 3.99 | 3.60 | 3.26 | 3.46 | 2.84 | 2.03 | 1.74 | 1.27 | 1.08 | 0.82 | 24.10 |
| 0% min + slope change | 3.99 | 1.00 | 1.41 | 2.19 | 1.72 | 1.02 | 0.85 | 0.50 | 0.42 | 0.24 | 13.34 |
| 0.75% min | 3.99 | 3.62 | 3.27 | 3.47 | 2.85 | 2.04 | 1.74 | 1.27 | 1.08 | 0.82 | 24.15 |
| 0.75% min + slope change | 3.99 | 2.51 | 2.44 | 2.86 | 2.29 | 1.53 | 1.29 | 0.89 | 0.84 | 0.53 | 19.09 |

$N = 708,204$. Net revenues calculated as annual contributions minus annual claims. Year 1 claims = \$3.3b, Year 2 claims = \$4.2b, and average claims in Years 3-10 = \$4.7b. The 4th row of each panel correspond to the 0% min/9.3% max scenarios in Table 3.

Table A.2: Share of UI Claims - 2019 Distribution

| | 3-years at max rate | 3-years at min rate | Rest of firms | 3-years at max rate | 3-years at min rate | Rest of firms |
|---|---|---|---|---|---|---|
| | *Baseline Schedule* | | | *0% min rate/ 9.3% max rate* | | |
| 7k base | 37.1% | 0.4% | 62.5% | | | |
| 14k base | 32.5% | 0.2% | 67.4% | 15.4% | 0.1% | 84.5% |

Based on first three years of simulation model using 2019 distribution of firms. 7k base has 14.8% of firms at max and 3.9% at min. 14k has 12.5% at max and 1.9% at min.

# B Simulation Model

## B.1 Inferring Employer-level UI Claims

While we observe annual reserve ratios and tax contributions for experience-rated firms, we do not observe the underlying measures of employer-specific UI claims. However, it is possible to use the Reserve Ratio (RR) formula and data starting from 2018:Q3 to impute a firm's UI claim rates in 2022 (technically 2021:Q3 to 2022:Q2), which will be used as an input into our simulation model.:

$$RR_{2023} = \frac{Reserves_{2023}}{\frac{1}{3}(TaxablePay_{2019:Q3-2022:Q2})}$$
$$\text{where } Reserves_{2023} = Reserves_{2022} + Contrib_{2021:Q3-2022:Q2} - Claims_{2021:Q3-2022:Q2}$$

We can then solve for Claims in the following expression:

$$Claims_{2021:Q3-2022:Q2} = Reserves_{2022} - Reserves_{2023} + Contrib_{2021:Q3-2022:Q2}$$
$$\text{where } Reserves_{2022} = RR_{2022} * \frac{1}{3}(TaxablePay_{2018:Q3-2021:Q2})$$
$$Reserves_{2023} = RR_{2023} * \frac{1}{3}(TaxablePay_{2019:Q3-2022:Q2})$$

One limitation of our administrative data is that Reserve Ratios are left censored at -0.21 (ie: this is the lowest value recorded). This creates two problems:

(1) Once a firm hits a reserve ratio of -0.21, we can't infer anything about whether their reserves are going up or down. This results in a systematic underestimation of UI claims for firms at the maximum tax rate, and some share will even get imputed a UI claims rate of zero.

(2) For firms far below -0.21, the simulation will assume a reserve ratio of -0.21 when calculating future tax rates, thereby forgiving a portion of the firm's negative balance.

As a solution, we will replace imputed claim rates with a claim rate of 15% for all firms that have a reserve ratio of -0.21 in both the current and prior year. Additionally, for the purposes of our simulation model, we adjust each firm's reserve ratio to equal -0.27 if the firm was censored in the last two years This measure was constructed by adding to -0.21 the standard deviation of the reserve ratio among non-censored firms at the maximum tax rate (0.056), and only affects 0.5% of firms in 2023.

## B.2 Predicting Future Claims

To predict the UI claims each employer utilizes every year in our simulation model, we fit a simple model of claims in year $t+1$ using observed claim in year $t$. In order to estimate this model, we use the distribution of UI claim in 2018 to predict the distribution of UI claims in 2019. These measures of UI claims are inferred based on the method described in the previous section.

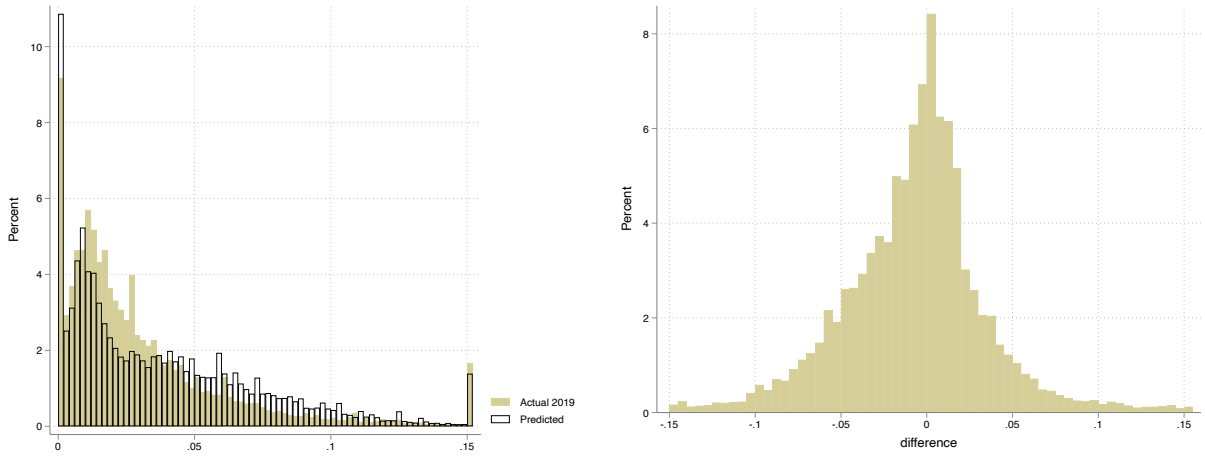
We estimate the following regression, weighted by 2018 employment:

$$log(1 + rate_{i,2019}) = \Sigma_{n=1}^{10} \beta_n [bin_i = n] + \gamma log(1 + rate_{i,2018}) + \delta zero_{i,2018} + \epsilon_i$$

Because total claims (in dollars) are a function of employer size, we calculate the claim rate $rate_{i,t}$ by dividing total claims in year $t$ by mean taxable payroll over the last three years (ie: the denominator of the RR formula). We also include an indicator $zero_i$ for having a claim rate of zero, as well as deciles of claim rates for non-zero claims ($bin_i$).

When using this linear probability model to predict future claims, it is possible to get negative values. To deal with this, we set any value below -0.03 equal to zero. Any remaining negative values $\hat{rate}_i$ are set equal to max(0, rnormal(0.01,0.005)). Additionally, we simulate large exogenous shocks by randomly assign $\hat{rate}_i = 0.15$ to one percent of the firm population. The figure below summarizes our model fit. The prediction model matches the actual claims distribution relatively well, and differences are symmetric about zero.

Figure A.8: Model Fit




Notes: Left panel plots distribution of 2019 claims rates, where yellow bars represent the actual rates, and black bars represent the predicted rates using our model. Rates above 0.15 are winsorized. Right panel plots a histogram of the difference between each firm's actual 2019 claim rate and their predicted 2019 rate. All plots are employment-weighted.

While this model is only based on the prior year's claims, in reality some firms are persistently at the maximum or minimum tax rate. To build in some of this persistence, we also flag firms that are far beyond the maximum tax rate (ie: are observed to have reserve ratios below -0.2 for two or more years). For these firms, we replace their predicted claims with $max(\hat{rate}_i, 0.07)$. Meanwhile, we also flag firms that are far below the minimum tax rate (ie: are observed to have reserve ratios above 0.3). These firms are automatically assigned a claims rate of zero.