Did State Tax Policy Influence State-Level COVID-19 Restrictions?

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ABSTRACT:
During the COVID-19 pandemic, states grappled with the question of whether and to what extent to impose restrictions to slow the spread of COVID-19. We investigate whether state reliance on sales tax revenue, relative to other tax revenue sources, is associated with shorter durations of COVID-19 pandemic state mobility restrictions. We find that sales tax reliance is associated with states imposing shorter durations of stay-home orders, restaurant closures, bar closures, and movie theater closures. Meanwhile, falsification tests in non-taxable settings of elective medical procedures and prison visits yield no association with sales tax reliance. We control for state political preferences in our main tests and partition on state political preferences in a subsequent analysis, detecting evidence of a negative association between sales tax reliance and duration of stay-home orders and restaurant closures in both Democrat- and Republican-leaning states. Finally, we find evidence that European nations' reliance on consumption taxes was negatively associated with the duration of national stay-home orders. Our study suggests that perceptions of sales tax revenue shortfalls may have influenced states' COVID-19 responses. These findings provide far-reaching evidence of the role of financial policies in society and, in particular, the "real effects" of state tax policy on state public health policy.

Keywords: state tax, sales tax, COVID-19 restrictions

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I. INTRODUCTION

Researchers have long considered the role of financial policies in shaping non-financial policies. This study examines whether incentives related to maintaining or increasing tax revenue in the jurisdiction influence public health policies. We explore this topical area using the setting of COVID-19 stay-at-home orders and mandated business closures. A pandemic like COVID-19 has not been witnessed in almost 100 years, and it had countless effects on almost everyone's daily life. Once the COVID-19 pandemic started, state-level policymakers had little time to make important decisions. As we come out of this pandemic, it is important to understand what factors shaped policymakers' decisions.

One particular decision that affected Americans' daily lives was whether and to what extent their state of residence imposed restrictions on various activities. While there was some variation in COVID-19 infection rates across the country and nearly every American was subject to at least some restrictions, there was wide variation across states in the types and lengths of restrictions. The restrictiveness of policies did not necessarily align with the level of COVID-19 infection in a given state. Thus, it is worthwhile to understand the non-health-related factors that influenced these decisions. While states differ across many dimensions (i.e., political leaning, population density, poverty rate, unemployment, among others), one important difference that may help explain the variation in COVID-19 restrictions is from what sources the state collects tax revenues. Specifically, states vary substantially in their mix of revenues collected from two primary sources: individual income taxes and sales taxes. For example, Washington has no state individual income tax. However, Washington's state sales tax rate is 6.5 percent. Conversely, Oregon imposes a 9.

percent individual income tax rate but does not have a state sales tax. Even though most states impose an individual income tax and a sales tax, they differ substantially as to what portion of their revenues come from each type of taxation.

Stay-at-home orders and local business closures potentially negatively affected sales tax revenue. As states imposed restrictions, they were also foregoing the sales tax revenue that would have been collected on shopping, dining, entertainment, and other purchases had the restrictions not been ordered.[1] Consistent with this perception, Clemens and Veuger (2020) estimated that consumption would shrink by 16.9 percent from April 2019 to April 2020, yielding a $23 billion aggregate state sales tax revenue shortfall in the second quarter of 2020. Chernick et al. (2020) predicted that the effect of the pandemic on state tax revenues is increasing in a state's reliance on consumption taxes. Interestingly, COVID restrictions, and thus, their effect on sales tax revenue, were largely controlled by state policymakers, namely governors. For example, in a March 2021 Fox News Op-Ed, South Dakota Governor Kristi Noem rejoiced over her state's favorable economic condition through the pandemic, which she credited to her lack of restrictions (Noem 2021). Given the wide variation in whether and to what extent states rely on sales and income taxes for their revenues, we predict that states were inherently incentivized to impose fewer (more) restrictions related to COVID-19 if they rely more (less) on sales tax collections.

We use state-level tax revenue data and state-level COVID-19 restriction data to provide evidence for our research question. In particular, we examine four health-related policies: the length of state-imposed stay-at-home orders, restaurant closures, bar closures, and movie theater closures. In addition, as falsification tests, we examine two outcomes that should be uninfluenced

[1] While an unknown (at the time) amount of this revenue loss was offset by online purchasing, personal savings also skyrocketed (Aladangady, Cho, Feiveson, and Pinto 2022), leading to a perception that a sales tax revenue loss was occurring.

by consumption tax revenue incentives: the lengths of prohibitions on elective medical procedures (which are not subject to consumption taxes) and state-imposed prison visit closures. For each of these outcomes, we examine whether consumption tax incentives influence the length of the restriction with controls for state political leaning, population, population density, unemployment, poverty rates, minimum wage, and tax collections per capita.

Our analysis suggests that incentives related to maintaining consumption tax revenues are related to the length of these restrictions. In particular, we find that a higher proportion of sales tax revenue to total tax revenue in the state is associated with shorter stay-at-home orders, and states without a sales tax imposed longer stay-at-home orders than states with a sales tax. Both of these findings suggest that states that rely more heavily on sales tax revenue imposed shorter stay-at-home orders, consistent with consumption tax revenue incentives influencing health-related policies. When examining the length of restaurant, bar, and movie closures, we find that the closures were shorter when states relied more heavily on sales tax revenue, alcohol tax revenue, and amusement tax revenue, respectively. Consistent with the stay-at-home order findings, these results suggest that concerns about maintaining tax revenue influenced the length of COVID-19 restrictions. In our two falsification tests, we fail to find that a state's reliance on sales tax revenue relative to other tax revenue sources influenced the length of prison closures or prohibitions on elective medical procedures.

Even though we control for state political leaning in our primary analysis, we acknowledge the concern that our results could be a product of political ideology influencing both tax system design and health-related policy decisions. To address this concern, we first emphasize that our results go *in the opposite direction* of the typical argument that "small government" ideology states have lower sales taxes and shorter restrictions. To rule out such concerns empirically, we bifurcate

our sample into two groups based on state voting preferences in the 2012 and 2016 presidential elections. In this analysis, we find that consumption tax revenue incentives are related to the length of stay-at-home orders and restaurant closures in states where the majority of voters voted Republican in recent presidential elections as well as in states where the majority of voters did not vote Republican. For bar closures and movie theater closures, our findings hold only in the states that lean Democrat, which contradicts the concern that Republican states may just be more likely to rely more heavily on sales tax and have shorter closures in general. Thus, while we cannot entirely separate incentives due to political ideology from incentives due to tax system design, our findings suggest that the effects we identify are incremental to political leanings within the state.

Finally, we generalize our research question to the national level and look to Europe for an alternative setting where we expect consumption taxes, specifically the value-added tax (VAT), to be negatively related to the duration of pandemic restrictions. We find a significant negative association between European countries' reliance on VAT as a revenue source and the duration of their national stay-home orders. This result expands the reach of our study and addresses concerns that unique political preferences in the United States dominated state policy decisions.

Overall, our paper contributes to the "real effects" literature by providing evidence that financial incentives stemming from financial policies (i.e., tax system design) influence health-related policies. In particular, the COVID-19 pandemic left many states scrambling for tax revenues. During 2020, the Tax Policy Center estimated that states would face as high as a $200 billion shortfall in revenues due to the pandemic (NPR 2020). This estimated shortfall led to initiatives by the Federal government to infuse stimulus funds into states. However, in early 2021, many states began to note that their financial picture was not as dire as expected (Walsh 2021). Our paper sheds light on this outcome by highlighting the heterogeneity of state tax collections

and how these states may have strategically altered public health initiatives during the onset of the pandemic. These findings undermine the necessity for Federal oversight of state finances by providing evidence that states can modify different levers (i.e., pandemic mobility restrictions) depending on their financial structures (i.e., sales tax reliance), to mitigate financial outcomes as they face financial pressures. Put differently, our findings suggest that the "virtually flat" (Walsh 2021) state tax collections in 2020 were, at least in part, a result of states' responses to the pandemic that accounted for their own tax structures and systems. We believe our findings are some of the most far-reaching ever documented in the "real effects" literature, as our outcome variable (COVID-19 restrictions) affected almost every American.

We also extend prior studies examining the relation between taxation and the COVID-19 pandemic. Numerous studies document that political factors (Adolph et al. 2021; Baccini and Brodeur 2021; Corder et al. 2020; Gigliotti and Martin 2020; Gonzalez-Eiras and Niepelt 2022) affected states and their responses to the COVID-19 pandemic. Other studies suggest that the COVID-19 pandemic influenced state tax collections (Gordon et al. 2020; Fairlie and Fossen 2022; Goldman, Lusch, and Sadka 2022). To the best of our knowledge, we are the first to link these two streams of literature by examining whether and to what extent taxes and tax policy are associated with public health considerations. Our findings help contribute to our understanding of how tax systems can affect non-tax policy choices, and the implications have the potential to generalize beyond just a pandemic setting. For instance, as states continue to struggle with budget concerns (for example, California (White 2023)), our results suggest that states' reliance on sales tax may significantly influence non-tax policy decisions. These results enhance our understanding of the broader role that financial policies can have on the socio-political environment.

II. LITERATURE REVIEW AND PREDICTIONS

State Tax Collections

As with the federal government, states collect taxes to fund various aspects of their operations. However, unlike the Federal government, most states require balanced budgets, which means that they must plan and budget their tax collections carefully. While all states have an undeniable need for revenue, the sources from which revenues are gathered vary across states. The two primary tax revenue sources for states are individual income tax and sales tax, with remaining tax revenue coming from a variety of other taxes such as corporate income tax, excise taxes, wealth transfer taxes, property taxes, and mineral extraction taxes. However, the reliance states place on sales tax revenues relative to other sources differs. At the extreme, some states have no individual income tax and rely more heavily on sales taxes (e.g., Florida, Texas, among others). Meanwhile, other states have no sales taxes and rely more heavily on individual income taxes (e.g., Delaware, Montana, and Oregon). Figure 1 provides a visual representation of sales tax reliance for the 45 states and Washington DC that impose sales tax. For these jurisdictions with sales taxes, revenues represent between 12.18% (Vermont) to 61.16% (Florida) of total state tax revenues. We also note that neither low sales tax nor high sales tax reliance states are geographically clustered.

Each state is tasked with determining the structure that makes the most sense based on countless number of attributes and considerations.[2] For example, states with high levels of tourism may decide to place more emphasis on sales taxes, allowing states to capture revenue from nonresidents, who would not be subject to income tax within their state. Politicians are also key players in determining tax collections since they are the ones who pass tax laws in their respective

[2] Another aspect of tax structure is whether states impose a progressive income tax rate (higher earning taxpayers pay at a higher percentage than lower earning taxpayers) or a flat income tax rate. Prior literature suggests that income tax progressivity can significantly alter tax collections (Goldman, Lusch, and Sadka 2022). However, all state sales taxes, which are the focus of our study, use a flat tax rate.

states. The general trend among the political parties is that Republicans prefer lower taxes and allow capitalist markets to dictate income diffusion, whereas Democrats prefer higher taxes to help fund more programs to diffuse income. When considering total state tax collections in 2021, The Federation of Tax Administrators document that traditional Democrat-leaning states like Vermont, California, and Connecticut have the highest tax collections per capita, whereas states that traditionally lean Republican like Alaska and Texas have the lowest tax collections per capita.[3] Despite political trends seemingly having a clear effect on the total amount of tax collections in each state, the composition of tax collections varies substantially. For instance, states with no income tax collections include both Republican- (i.e., Texas) and Democrat- (i.e., Washington) leaning states. The same goes for states with no sales tax collections. These include Oregon and Delaware, which are traditionally viewed as Democrat-leaning states, New Hampshire, which is often viewed as a toss-up state, and Montana, which is often viewed as a Republican-leaning state. Thus, it is less clear that the source of tax collections is dominated by political affiliations.

Hypothesis Development

Given the widespread nature of the pandemic and the speed at which policymakers had to make decisions during the pandemic, researchers have been interested in examining the determinants and outcomes of COVID-19 policy decisions. In particular, restrictions intended to decrease mobility garnered particular interest from researchers as one non-medical intervention aimed at reducing the spread of COVID-19. For instance, policymakers implemented interventions such as stay-at-home orders, shelter-in-place orders, school closures, restaurant closures, and public

[3] https://taxadmin.memberclicks.net/2021-state-tax-revenue

gathering restrictions intending to decrease social contact between individuals to slow the spread of the virus.

While one might expect that health-related determinants such as infection rates and hospital capacity were the primary sources of inter-state variation in the adoption and stringency of such policies, research has documented that this was not the case. In fact, across numerous studies, the political environment of the state (e.g., the party of the governor, the party in control of the state legislature, and voting patterns of the electorate in presidential elections) consistently predict the speed with which mobility-focused restrictions were enacted as well as the duration and stringency of said restrictions (e.g., Adolph et al. 2021; Baccini and Brodeur 2021; Corder et al. 2020; Gigliotti and Martin 2020; and Gonzalez-Eiras and Niepelt 2022). This notion holds true even though the timing at which states reached an infection rate of at least one case per 100,000 residents was relatively uniform (Corder et al. 2020). In addition, across these studies, there is little consistent evidence that other state characteristics such as population density, the proportion of the population that is elderly, unemployment, and state fiscal health significantly influence these policy choices.[4]

One state-level characteristic that has not been examined in prior research is the design of the state's tax system. While some studies (e.g., Gigliotti and Martin 2020) control for state and local tax revenues per capita in their models and suggest that states with higher tax revenues per capita may be willing to implement restrictions more quickly and keep restrictions in place longer, no study, to our knowledge, has investigated whether the mix of tax revenues influences COVID-19 restrictions aimed at reducing mobility. Presumably, all jurisdictions expected tax revenue

[4] Some of these characteristics are significant in some studies; however, across all of these studies, there is not a consistent pattern in the associations of these variables like there is for the political variables. In addition, in the studies where some of these other characteristics load, they are second or third-order effects relative to the political variables.

effects of COVID-19; however, the distribution of tax revenue effects was not expected to be uniform across jurisdictions. Namely, jurisdictions that relied more heavily on consumption taxes relative to other tax revenue sources expected the largest effects because mobility restrictions directly restricted activities subject to consumption taxes. Accordingly, Chernick et al. (2020) evaluate the potential revenue effects of COVID-19 for 150 U.S. cities. While they find that the average projected 2021 revenue shortfall was 5.5 percent, revenue shortfalls varied significantly across jurisdictions. For example, Chernick et al. (2020) include three cities in Washington (36.4 percent of tax revenues from sales tax in 2018) and three cities in Oregon, which does not have a sales tax. They perform their analysis under two conditions: a less severe pandemic and a more severe pandemic. Under the less severe condition, the Oregon cities (with no reliance on sales tax) had projected shortfalls of 3.1 to 3.5 percent, and the Washington cities (which rely heavily on sales tax) had projected shortfalls of 6.3 to 6.7 percent. Likewise, under the more severe condition, the Oregon cities had projected shortfalls of 7.0 to 8.2 percent, and the Washington cities had projected shortfalls of 10.3 to 11.5 percent. Thus, under these projections, jurisdictions with a heavier reliance on consumption taxes were at a significantly higher risk of larger revenue shortfalls than jurisdictions with less reliance on consumption taxes.

While the aforementioned shortfalls discussed in Chernick et al. (2020) are based on projections, actual dips in retail sales were severe at the beginning of the pandemic, which is the period of time in which mobility-related COVID-19 restrictions such as stay-at-home orders were being implemented and subsequently removed. For example, Gordon et al. (2020) note that sales taxes were the first revenue source to be significantly influenced by COVID-19, with May 2020 state sales tax collections declining by 21 percent relative to May 2019.[5] Likewise, examining data

[5] Gordon et al. (2020) note that May sales tax collections likely reflect April sales as filing is generally one month after the actual transactions occur.

from California, Fairlie and Fossen (2022) find that taxable sales decreased 17 percent in the second quarter of 2020 relative to the second quarter of 2019, with significantly higher drops in sectors such as food & beverage and accommodations.

Based on the prior literature that has documented that non-health-related concerns influenced the design, implementation, and duration of COVID-19 restrictions and evidence that states with a higher reliance on sales taxes were projected to be more financially vulnerable early during the pandemic, we make the following prediction.

Hypothesis: State reliance on sales tax revenue is negatively associated with the duration of COVID-19 mobility restrictions.

Our prediction is not without tension. First, given that prior work has documented that the political orientation of the state's elected officials and electorate is an overwhelmingly strong predictor of COVID-19 restrictions, it is not clear whether other non-health-related determinants significantly influenced these decisions incremental to political orientation. In fact, it would be difficult to find a politician who would be forthright in declaring that they prioritized tax collections over public health decisions. Second, while sales tax revenues were projected to fall due to COVID-19, the aftermath tells a different story. In particular, Agarwal and Shybalkina (2023) document a dramatic increase in sales tax revenue for many jurisdictions. Thus, despite grim initial sales tax revenue impacts and projections, many jurisdictions weathered the pandemic fairly well due to increased sales tax collections on online sales. Similarly, Dean et al. (2022) document an unexpected increase in sales tax revenue in Utah driven by a shift in consumption from non-taxable services to taxable goods and a rise in sales tax collections from online sales. Both of these studies also note a distributional shift in sales tax collections from larger urban centers to more rural areas as rural residents were utilizing e-commerce more heavily instead of driving to urban centers.

III. RESEARCH DESIGN

We investigate our prediction empirically using state-level data in cross-sectional ordinary least squares (OLS) regressions.[6] This is a fruitful setting due to the heterogeneity in states' tax systems and states' COVID-19 restrictions and the relative homogeneity in other institutional characteristics, such as the design of the healthcare system, capital markets, rule of law, language, and cultural norms. In acknowledging that there could be some short comings of examining a U.S.-only sample, in additional analysis, we also consider the relation between the value-added tax (VAT) percentage in European countries and countries' length of stay-at-home orders, and we make similar inferences. However, given the strength of this research design using a U.S.-only sample, we choose to rely on it for our primary analysis.

Our dependent variables capture the duration of various COVID-19-related restrictions that would interfere with sales-tax-generating activities. We focus on early COVID-19 mobility restrictions, consistent with the widespread perception of state tax revenue shortfalls between March of 2020 and March of 2021. In March of 2021, it started to become clear that state tax revenues did not suffer the shortfalls that were originally predicted (e.g., Rosewicz, Theal, and Fall 2021). We provide detailed variable definitions and data sources in the Appendix. We gather data on state mobility restrictions from Raifman et al. (2020)'s COVID-19 US State Policy Database. First, as a general proxy, we use the natural logarithm of the duration of the state's stay-at-home order (*StayHome*). Second, we use several variables capturing specific taxable activity: the natural logarithms of the durations of the state's restaurant (*Rest_closure*), bar (*Bar_closure*), and movie

[6] While it would be feasible to conduct this study at the local level, state consumption taxes are more common than local consumption taxes and account for a far larger percentage of jurisdictional revenue. Further, generally, local sales taxes only appear incremental to state sales taxes; i.e., generally, local sales taxes do not exist apart from state sales taxes. Finally, in certain instances states sued local jurisdictions over the supremacy of restriction policies (e.g., McNamara 2021).

theater (*Movie_closure*) closures, respectively. Third, we employ two variables capturing non-taxable activity for use in a falsification test, as we would not expect any association between state tax revenue sources and these non-taxable activities: the natural logarithms of the state's prohibitions on elective medical procedures (*EMed_closure*) and prison visits (*Prison_closure*), respectively. We set all duration variables to zero when a state had no such closure.

Our independent variables of interest measure aspects of state taxation using data from the Census Bureau. First, we use the percentage of total tax revenues the state received from sales tax receipts in 2019 (*SalesTax%*). We use 2019 tax collection data since that captures the state's relative reliance on sales tax collections (in comparison to other tax collections) using the last available year of data before COVID-19. Alternatively, we use two binary variables set equal to one for states with no sales tax (*No_SalesTax*) or no individual income tax (*No_IncomeTax*), respectively, and zero otherwise. Second, we employ measures of specific taxes that relate to specific settings: *AlcoholTax%*, which measures the percentage of a state's 2019 total tax revenue that arises from excise taxes on alcohol for use in the context of restaurant and bar closures; and *AmusementTax%*, which measures the percentage of a state's 2019 total tax revenue that arises from amusement taxes for use in the context of movie theater closures.

As political, demographic, and economic characteristics may influence COVID-19-related restrictions, we include a vector of control variables related to these attributes. While they do not entirely eliminate the possibility that our findings are related to these correlations, including them as controls help mitigate that possibility. For instance, a potential correlated omitted variable in the relation between COVID-19 restrictions and state sales tax reliance could be the state's political leaning. Thus, we include control variables related to the state's political leaning to mitigate this alternative explanation as a potential outcome. We gather this data from Raifman et al. (2020), the

Census Bureau, and Ballotpedia as described in the Appendix. *GOP_governor* is a binary variable set equal to one when a state has a Republican governor in place as of January 1, 2020, and zero otherwise. *Pres_%_GOP* measures the average Republican vote attained in the state by candidates Mitt Romney and Donald Trump in the 2012 and 2016 presidential elections, respectively. *Population* is the natural logarithm of the state's 2018 population. *Density* is the natural logarithm of the state's 2018 population density (population per square mile). *Unemployment%* is the state's 2018 unemployment rate. *Poverty%* is the state's 2018 poverty rate.[7] *Min_wage* is the state's minimum wage as of January 1, 2020. Finally, *Tax_percapita* measures the total 2019 tax revenue per capita collected by the state (in thousands).

Our regressions take the general form:

$$\begin{aligned} Closure\ Duration_{i,\,2020} = {} & \beta_0 + \beta_1 SalesTax\%_{i,\,2019} + \beta_2 GOP\_governor_{i,\,2020} + \beta_3 Pres\_\%\_GOP_i \\ & + \beta_4 Population_{i,\,2018} + \beta_5 Density_{i,\,2018} + \beta_6 Unemployment\%_{i,\,2018} \\ & + \beta_7 Poverty\%_{i,\,2018} + \beta_8 Min\_wage_{i,\,2020} + \beta_9 Tax\_percapita_{i,\,2019} + \varepsilon_{i,2020} \end{aligned} \quad (1)$$

$$\begin{aligned} Closure\ Duration_{i,\,2020} = {} & \beta_0 + \beta_1 No\_SalesTax_{i,\,2020} + \beta_2 No\_IncomeTax_{i,\,2020} \\ & + \beta_3 GOP\_governor_{i,\,2020} + \beta_4 Pres\_\%\_GOP_i + \beta_5 Population_{i,\,2018} \\ & + \beta_6 Density_{i,\,2018} + \beta_7 Unemployment\%_{i,\,2018} + \beta_8 Poverty\%_{i,\,2018} \\ & + \beta_9 Min\_wage_{i,\,2020} + \beta_{10} Tax\_percapita_{i,\,2019} + \varepsilon_{i,2020} \end{aligned} \quad (2)$$

In equation (1), our variable of interest is *SalesTax%*, which we expect to be negative associated with *Closure Duration*. In equation (2), our variables of interest are *No_SalesTax*, which we expect to be positively associated with *Closure Duration*, and *No_IncomeTax*, which we do not predict will be associated with *Closure Duration.* Our expected results are consistent with the notion that closure durations are decreasing in the share of state tax revenue generated from consumption

[7] Demographic data from the Census Bureau is most recently updated before our sample in 2018. While this reflects two year before the start of the COVID-19 pandemic, these variables are unlikely to vary substantially during that time period.

taxes and that these results are particularly salient among observations with no state sales tax collections.

IV. SAMPLE AND DESCRIPTIVE STATISTICS

Our sample consists of the 50 United States and the District of Columbia. Since the District of Columbia has no governor but had a Democrat mayor serving in an equivalent role, we code its value of *GOP_governor* to zero. Our small sample prohibits us from winsorizing, but our variables' log and percentage specifications help mitigate concerns about outliers.

We present descriptive statistics in Table 1. The mean *StayHome* duration is 3.407, corresponding to 30.2 days; however, this variable is skewed as the median is 46 days. Restaurant closures averaged 60.3 days, bar closures averaged 110.5 days, and movie closures averaged 82.5 days. Elective medical procedures were prohibited for 10.1 days on average, with a median of 32 days, while prison visits were prohibited for an average of 326.7 days. Each of these variables contains significant variation across states.

Sales taxes make up, on average, 30.1 percent of a state's tax revenue, ranging from zero percent (Alaska, Delaware, Montana, New Hampshire, and Oregon) to 61.2 percent (Florida). Alcohol taxes and amusement taxes make up a small fraction of state revenue, but there is significant cross-sectional variation as the standard deviation of each variable is large compared to its mean and median. Figure 2 displays a map of the U.S. with states shaded from light to dark based on low sales tax reliance to high sales tax reliance. The length of each state's stay at home order (in days) is labeled on the state.

Fifty-one percent of states had a Republican governor, and the mean share of the Republican vote in the 2012 and 2016 Presidential elections was 48.7 percent. The mean *Population* of 15.169 corresponds to 3,870,677 residents. Mean *Unemployment*% is about 4.7

percent; on average, about 12.9 percent of residents live in poverty. The average minimum wage is about $9.16 per hour, and the mean *Tax_per_capita* of 3.620 corresponds to state tax revenue of $3,620 per capita.

Table 2 presents correlation coefficients among our variables. Considering the correlations on *SalesTax%* with our closure variables, we observe some nominally negative correlation coefficients, although the only statistically significant correlation is with *Rest_closure* (-0.31). Overall, the raw correlations among our dependent and independent variables of interest lack statistical significance.

Panel A of Table 3 splits the sample by median *SalesTax%*, then lists the mean closure duration and test statistics from a test of differences in means and from a Wilcoxon rank-sum test. We find bivariate evidence that stay-home order duration is longer in states with below-median reliance on sales tax. The means test also indicates that restaurant closures lasted longer in states with below-median reliance on sales tax. For the rest of the closures, we do not detect statistically significant differences in closure duration, although we do observe nominally longer closures of bars and movie theaters in states with below-median reliance on sales tax.

Panel B of Table 3 compares four states that have zero sales tax (Oregon, Montana, New Hampshire, and Delaware) with neighbors that we believe are politically, demographically, and economically similar.[8] We expect *StayHome*, *Rest_closure*, *Bar_closure*, and *Movie_closure* to be longer in the zero-sales-tax states versus the neighboring states. While we do not perform statistical tests in this small sample, anecdotally, our expectation is correct for general stay-home orders, restaurant closures, and bar closures, where we observe longer closures in the no-sales-tax states versus the neighboring states. Our expectation is incorrect for movie theater closures. Meanwhile,

[8] While Alaska also lacks a sales tax, we could not identify reasonable "neighbor" states for it, so we omitted Alaska from this analysis.

we expect no difference in *EMed_closure* or *Prison_closure*. In those settings, we observe shorter closures in the no-sales-tax states versus the neighbor states, which is consistent with our expectation that reliance on sales taxes would not lead to shorter closures in these settings.

V. FINDINGS

We present the results of our primary analysis in Table 4, where general stay-home order duration is the dependent variable. Column (1) uses *SalesTax%* as the independent variable of interest, on which we find a negative and statistically significant coefficient estimate (β = -1.580). The economic magnitude of the estimate is large, suggesting that a one standard deviation change in *SalesTax%* is associated with a 21.7 percent reduction in the duration of the stay-home order.[9] This magnitude equates to a stay-home order roughly 6.6 days shorter in the 75th percentile state versus the 25th percentile state. Column (2) compares the five states with no sales tax (*No_SalesTax*) to other states. We find a positive and statistically significant coefficient estimate on *No_SalesTax* (β = 0.805), indicating that states without sales tax had longer stay-home orders than states with sales tax. Meanwhile, the coefficient estimate on *No_IncomeTax* is statistically insignificant, suggesting that states with a sales tax but no income tax have similar duration of stay at home orders to other states with a sales tax. The economic magnitude corresponding to the coefficient estimate on *No_IncomeTax* indicates that this effect was about 124 percent longer in the no-sales-tax states and is nearly as large (in the opposite direction) as the effect of having a Republican governor (β = -0.880). In terms of our other coefficient estimates, the only other variable that loads consistently is that on *Tax_percapita.* This coefficient suggests that more tax collections per person is associated with shorter stay at home orders. The combined results from columns (1) and (2) support our expectation that sales tax reliance is associated with shorter restrictions.

[9] ((e^(1.58*0.155))-1)*100 = 21.7%.

We continue by examining specific settings drastically affected by COVID-19 restrictions and representing activity subject to consumption taxes. Table 5 presents the results of our restaurant, bar, and movie closures tests. We first perform the restaurant closure test on general sales taxes (Column 1), finding a negative and significant coefficient estimate consistent with our expectation that sales tax reliance is associated with shorter restaurant closures. Similarly, we find a positive and significant coefficient estimate on *No_SalesTax* in Column (2), indicating that states without sales tax had longer restaurant closures. Since many restaurants generate significant revenue from the sale of alcoholic beverages, we also consider whether alcohol excise taxes were associated with the duration of restaurant closures (Column (3)). The negative and significant coefficient estimate on *AlcoholTax%* indicates that states which collect more alcohol excise tax had shorter restaurant closures. We observe a similar result in Column (4), indicating that states that collect more alcohol excise tax had shorter bar closures. Finally, we test movie theater closures and present the results in Column (5). We find a negative and significant coefficient estimate on *AmusementTax%*, indicating that states which collect more amusement tax had shorter movie theater closures. Altogether, the results in Tables 3 and 4 support our empirical prediction that states more reliant on consumption taxes implemented shorter COVID restrictions and closures.

VI. ADDITIONAL ANALYSIS

Falsification Analysis

While our analysis thus far suggests that reliance on consumption taxes is associated with shorter stay-home orders and closures of taxable businesses, it is still possible that these relations are spurious due to the substantial number of potential variables that are difficult to control for. To help mitigate this concern, we conduct a falsification test using activities that are not subject to consumption taxes: specifically, the durations of prohibitions on elective medical procedures and

prison visits. We expect no relation between reliance on consumption taxes and these non-taxable activities. We test this prediction using *EMed_closure* and *Prison_closure* and present the results in Table 6. Column (1) documents a statistically insignificant coefficient estimate on *SalesTax%* in the elective medical procedure regression, while Column (2) shows a statistically insignificant result on *No_SalesTax*. Thus, a state's reliance on sales tax revenue is not associated with the length of the prohibition on elective medical procedures, consistent with our expectation that these non-taxable procedures would not relate to state tax policy. Similarly, Columns (3) and (4) document statistically insignificant coefficient estimates on the length of prison visit closures. We note that the nominal signs of these coefficient estimates, while not statistically different from zero, are nominally in the opposite direction of what we predicted and found in taxable settings (i.e., Table 5). We conclude from the evidence in Table 6 that reliance on consumption taxes is not associated with the duration of non-taxable activity closures.

Political Affiliation

Political affiliation is one of the strongest determinants of COVID-19 restrictions in our study, just as in other studies (e.g., Adolph et al. 2021; Baccini and Brodeur 2021; Corder et al. 2020; Gigliotti and Martin 2020; Gonzalez-Eiras and Niepelt 2022) and we control for political preferences in our primary analyses. Consequently, it is unlikely that our results can be explained by differences in political affiliation. However, to provide additional clarity on this potential correlated omitted variable, in our next analysis, we examine whether the reliance on consumption taxes remains a meaningful determinant of COVID-19 restrictions within states with similar political preferences. We partition our sample on whether the state's average vote for Republican candidates in the 2012

and 2016 Presidential elections exceeds 50 percent, re-estimate our analyses in these subsamples, and present the results in Table 7.[10]

Columns (1) and (2) in Table 7 show negative coefficient estimates on *SalesTax%,* indicating that greater reliance on sales tax leads to shorter stay-home orders regardless of whether the state leans Democratic or Republican.[11] Similarly, the negative coefficient estimates on *SalesTax%* shown in Columns (3) and (4) provide evidence that greater reliance on sales tax leads to shorter restaurant closures in both Democratic- and Republican-leaning states. In the bar and movie theater settings, whose results are shown in Columns (5) through (8), we only find a relation between sales tax reliance and the duration of closures in Democratic-leaning states. We find no such relation in the context of Republican-leaning states' bar or movie closures; however, we note that in a subsample of 24 observations, these tests may lack statistical power.

Next, we consider our falsification settings of prohibitions on elective medical procedures and prison visits. We find no evidence that sales taxes are tied to the duration of either of these bans in Democratic- or Republican-leaning states. Based on the results shown in Table 7, we conclude that the duration of general stay-home orders and restaurant closures are related to a states' reliance on sales tax, regardless of the state's political lean. Meanwhile, only in Democratic-leaning states do we find that the duration of bar and movie theater closures is related to a state's reliance on sales tax.

[10] The 50% threshold is salient as the share of third-party votes in most states is extremely small in Presidential elections.

[11] While the coefficient on *SalesTax%* is more negative for states with GOP%> 50%, we conduct an F-test to determine whether the coefficients are different. In untabulated analysis, we find the difference is insignificant, suggesting the effects of sales tax reliance on stay at home order duration is not different between Democrat and Republican-leaning states. This same pattern applies to all situations in Table 7 where both subsamples have a significant relation between *SalesTax%* and *StayHome,* suggesting no significant difference among the two subsamples.

European VAT Setting

To expand the reach of our research question, we continue by investigating whether consumption tax reliance relates to the duration of national stay-home orders in Europe. The European setting allows us to examine a similar situation that may be less confounded by political preferences than the state setting. Europe's primary consumption tax is the VAT, which is a tax assessed on goods and services at each stage of the production process. Just as U.S. states perceived sales tax shortfalls due to pandemic restrictions, we expect that European nations would have perceived VAT shortfalls due to pandemic restrictions. Therefore, paralleling our main hypothesis, we predict that a country's reliance on VAT will be negatively associated with the duration of its stay-home order.

We collect 2019 data on VAT revenue, total tax revenue, and poverty rates from the World Bank. We collect mandatory stay-home order data from Mathieu et al. (2020) and 2019 data on population, population density, unemployment, and minimum wages from Eurostat. Our sample contains data for 23 European countries. We present descriptive statistics for the European sample in Panel A of Table 8. Variable definitions appear in the Appendix. The mean of *StayHome* (3.705) indicates that the average national stay-home order lasted 40.65 days, which is similar to the duration we observed in the U.S. setting. The mean *VAT%* (0.208) indicates that the average sample country collects 20.8 percent of its tax revenue from the VAT, so the VAT is a meaningful source of tax revenue for European nations.

We re-estimate Equation 1 using the European data and present the results in Panel B of Table 8. We find a negative and statistically significant coefficient estimate on *VAT%* of -39.47, suggesting that reliance on VAT is associated with significantly shorter stay-home orders in Europe. The coefficient on population loads negatively, indicating that more populous countries

had longer stay-home orders. This coefficient is also consistent with smaller countries being generally able to virtually close their borders and enact more targeted restrictions as opposed to lengthy general stay-home orders. The coefficient on total tax per capita loads negatively and significantly, suggesting that countries that generate more tax revenue per capita had shorter stay-home orders. We note the relatively high R-squared of 0.706 suggests that our model explains the duration of stay-home orders well. Our findings in the European setting both expand the contribution of our study and mitigate concerns over American political preferences influencing public health policies. Furthermore, this test provides assurance that our findings generalize outside of the U.S. setting.

VII. CONCLUSION

The COVID-19 pandemic had far-reaching impacts, including restrictions on social mobility intended to slow the spread of the virus that affected nearly all Americans. Yet these restrictions were determined at the state and local levels, with significant heterogeneity that was unrelated to public health considerations. We identify an economic factor, state reliance on sales tax revenue, that helps explain the heterogeneity in COVID-19 restrictions. The perception that business closures would create sales tax revenue shortfalls created an incentive to reduce the length of such closures. We find empirical evidence that states more reliant on consumption taxes had shorter closures of taxable businesses. Meanwhile, reliance on consumption taxes is not related to restrictions on non-taxable activities such as elective medical procedures and prison visits. We also provide evidence that our findings do not appear to be a function of the state's political leaning. Finally, we look to the European setting and find parallel evidence that reliance on consumption taxes was associated with shorter national pandemic restrictions.

Our study contributes to literature examining the role of financial policies on non-financial policy decisions. Our findings intersect economics, tax policy, and public health by documenting evidence that longstanding state tax policy creates incentives for certain public health policies. Both consumption taxes and pandemic restrictions affected nearly every American, so the relation between them is especially intriguing, and we believe our study is the first to draw this connection. We also emphasize that it was not necessarily the reality of sales tax revenue shortfalls that drove this relation, as most states did not face tax revenue shortfalls *ex post*. Yet state policymakers did not accurately understand the tax revenue impacts of restrictions when they were enacted, and they likely perceived that restrictions would create sales tax revenue shortfalls. Our study highlights that economic misperceptions may have affected public health policy. More broadly, our study offers an interesting example of tax policy having widespread effects on non-tax policy. Future research should continue to investigate the incentives created by tax policy and its effects on seemingly unrelated policies.

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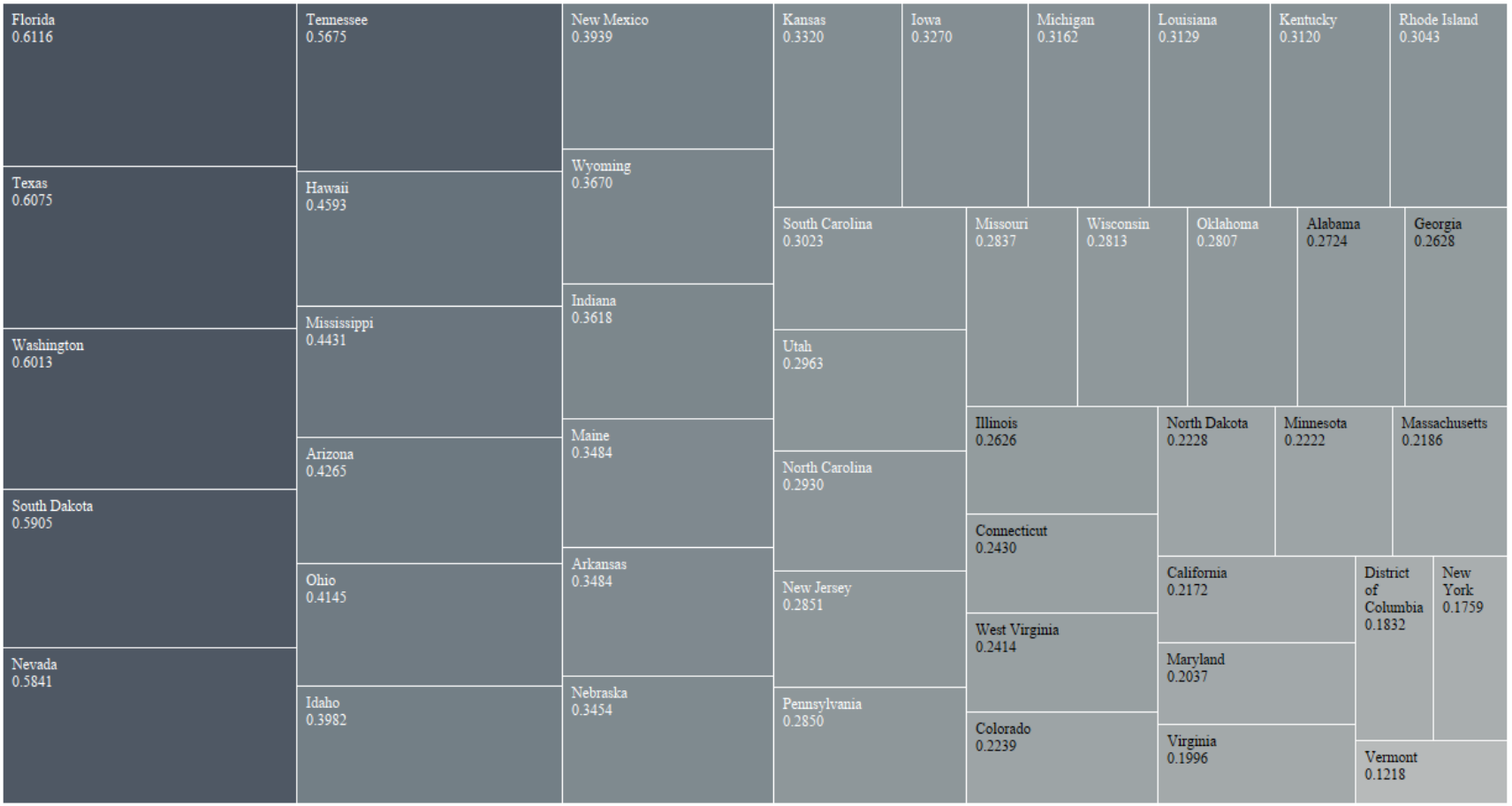
Appendix

Variable Definitions

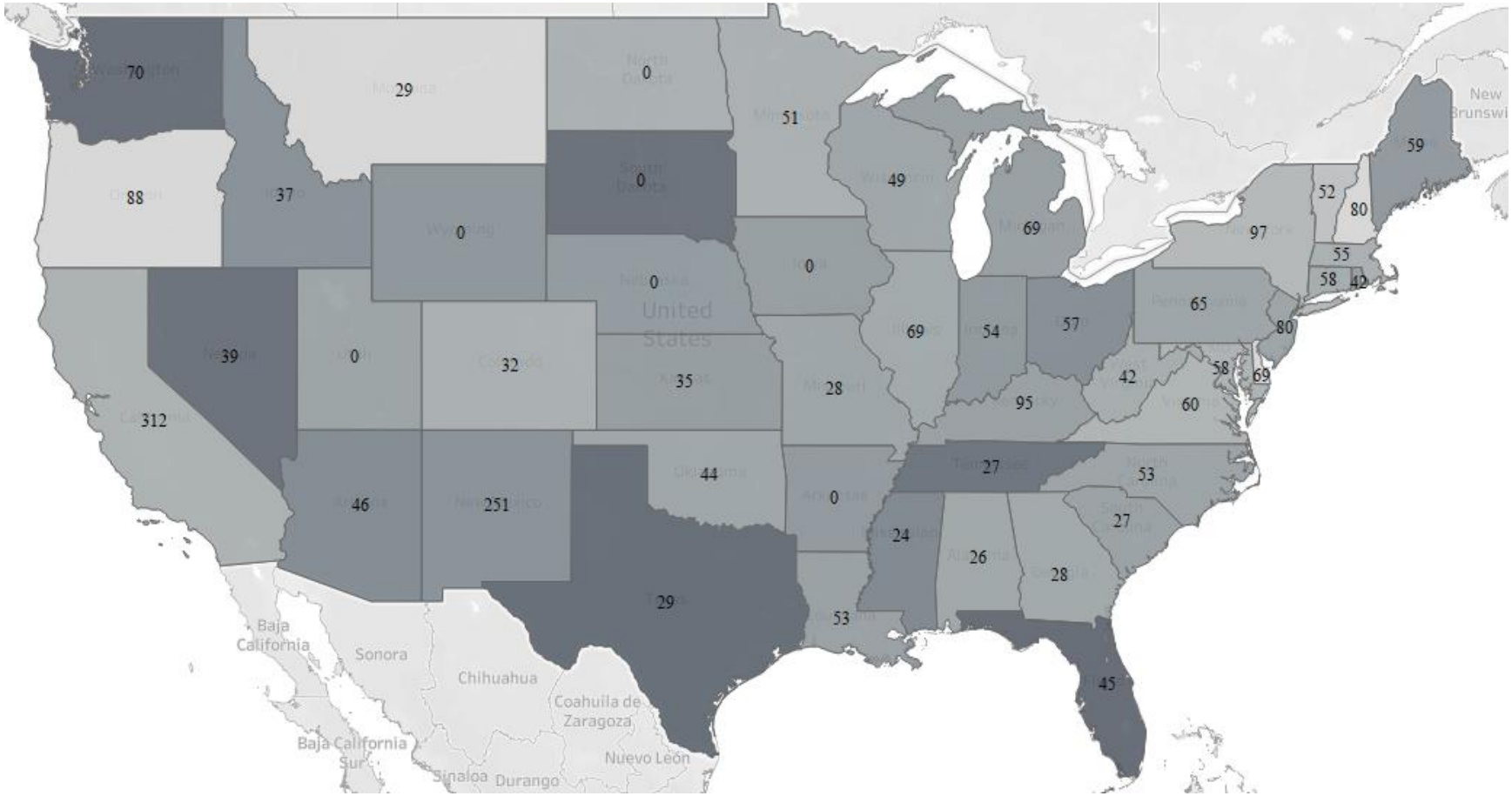
Variable	Construction	Source
StayHome	Natural logarithm of the number of days of the state's or nation's stay-home order; set to 0 when there was no closure	Raifman et al. (2020), Mathieu et al. (2020)
Rest_closure	Natural logarithm of the number of days of the state's restaurant closure; set to 0 when there was no closure	Raifman et al. (2020)
Bar_closure	Natural logarithm of the number of days of the state's bar closure; set to 0 when there was no closure	Raifman et al. (2020)
Movie_closure	Natural logarithm of the number of days of the state's movie theater closure; set to 0 when there was no closure	Raifman et al. (2020)
EMed_closure	Natural logarithm of the number of days of the state's prohibition on elective medical procedures; set to 0 when there was no closure	Raifman et al. (2020)
Prison_closure	Natural logarithm of the number of days of the state's prohibition on prison visits	Raifman et al. (2020)
SalesTax%	State's 2019 general sales and gross receipts tax revenue divided by total tax revenue	Census Bureau
No_SalesTax	Binary variable set equal to 1 when a state has no general sales tax, and 0 otherwise	Tax Foundation
No_IncomeTax	Binary variable set equal to 1 when a state has no individual income tax, and 0 otherwise	Tax Foundation
AlcoholTax%	State's 2019 selective sales and gross receipts taxes on alcoholic beverages divided by total tax revenue	Census Bureau
AmusementTax%	State's 2019 selective sales and gross receipts taxes on amusements divided by total tax revenue	Census Bureau
GOP_governor	Binary variable set equal to 1 when a Republican governor is in office as of March 1, 2020	Ballotpedia
Pres_%_GOP	State's average Republican candidate vote percentage in the 2012 and 2016 Presidential elections	Ballotpedia
Population	Natural logarithm of the state's 2018 population or country's 2019 population	Raifman et al. (2020), Eurostat
Density	State population per square mile or national population per square kilometer	Raifman et al. (2020), Eurostat
Unemployment%	State unemployment rate as of 2018 or national unemployment rate as of 2019	Raifman et al. (2020), Eurostat
Poverty%	State poverty rate as of 2018 or national poverty rate as of 2019	Raifman et al. (2020), World Bank
Min_wage	State hourly minimum wage as of January 1, 2020 or national monthly minimum wage as of 2019	Raifman et al. (2020), Eurostat
Tax_percapita	State's 2019 total tax collections (in thousands) divided by 2018 population or nation's 2019 total tax collections (in thousands of USD) divided by 2019 population	Census Bureau, Raifman et al. (2020), Eurostat, World Bank
VAT%	Nation's value added tax collections divided by total tax collections in 2019	World Bank

Figure 1
Sales Tax Reliance



Notes: This figure presents sales tax reliance (sales tax revenue as a proportion of total tax revenue) in 2019 for the 46 jurisdiction (45 states plus Washington DC) in our sample with a sales tax. Alaska, Delaware, New Hampshire, Montana, and Oregon lack a state sales tax.

Figure 2
Stay at Home Order Duration



Notes: In this figure, states are shaded from light (low sales tax reliance) to dark (high sales tax reliance). The length (in days) of state-imposed stay at home orders is labeled on each state. Not pictured: Alaska (no sales tax) with a 27 day stay-home order and Hawaii (45.93% sales tax reliance) and a 67 day stay-home order.

Table 1
Descriptive Statistics

							In Days		
Variable	25th Pct.	Mean	Median	75th pct.	Std. Dev.	25th Pct.	Mean	Median	75th Pct.
StayHome	3.332	3.407	3.829	4.174	1.459	28	30.2	46	65
Rest_closure	3.807	4.100	4.094	4.419	0.790	45	60.3	60	83
Bar_closure	4.094	4.705	4.644	5.398	1.021	60	110.5	104	221
Movie_closure	4.043	4.412	4.317	4.844	0.936	57	82.5	75	127
EMed_closure	0.000	2.317	3.466	3.738	1.818	1	10.1	32	42
Prison_closure	5.308	5.789	6.004	6.138	0.553	202	326.7	405	463
SalesTax%	0.222	0.301	0.293	0.367	0.155				
No_SalesTax	0.000	0.098	0.000	0.000	0.300				
No_IncomeTax	0.000	0.157	0.000	0.000	0.367				
AlcoholTax%	0.003	0.007	0.005	0.009	0.006				
AmusementTax%	0.000	0.009	0.002	0.009	0.018				
GOP_governor	0.000	0.510	1.000	1.000	0.505				
Pres_%_GOP	0.410	0.487	0.491	0.582	0.116		Number of Individuals		
Population	14.378	15.169	15.313	15.835	1.043	1,754,211	3,870,677	4,468,396	7,535,607
Density	3.752	4.547	4.535	5.394	1.493	43	94	93	220
Unemployment%	3.800	4.747	4.900	5.500	1.063				
Poverty%	10.900	12.912	12.800	14.300	2.841				
Min_wage	7.250	9.159	8.750	10.960	2.014				
Tax_percapita	2.702	3.620	3.310	4.062	1.641				

This table presents the 25th percentile, mean, median, 75th percentile, and standard deviation of the variables used in our study. For the logged variables, the raw number of days or individuals are presented in the right side of the table for ease of interpretation. Variables are defined in the Appendix.

Table 2
Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	*StayHome*	1.00																		
2	*Rest_closure*	**0.52**	1.00																	
3	*Bar_closure*	**0.57**	**0.78**	1.00																
4	*Movie_closure*	**0.57**	**0.90**	**0.80**	1.00															
5	*EMed_closure*	0.06	0.10	0.12	0.15	1.00														
6	*Prison_closure*	0.00	-0.02	-0.13	0.01	0.19	1.0													
7	*SalesTax%*	-0.18	*-0.31*	-0.16	-0.23	0.15	0.22	1.00												
8	*No_SalesTax*	0.12	0.08	-0.04	0.03	-0.16	-0.11	**-0.65**	1.00											
9	*No_IncomeTax*	-0.18	*-0.32*	*-0.29*	*-0.31*	0.10	0.04	*0.33*	0.22	1.00										
10	*AlcoholTax%*	0.05	-0.25	-0.17	-0.21	0.11	0.16	0.15	0.11	*0.34*	1.00									
11	*AmusementTax%*	0.05	-0.01	0.12	0.00	-0.07	0.10	0.15	-0.07	-0.19	-0.14	1.00								
12	*GOP_governor*	**-0.52**	**-0.49**	**-0.47**	**-0.46**	0.18	0.04	0.18	-0.07	*0.32*	0.07	-0.12	1.00							
13	*Pres_%_GOP*	**-0.49**	**-0.48**	**-0.45**	**-0.47**	0.07	0.16	0.23	-0.04	0.19	*0.30*	-0.02	**0.49**	1.00						
14	*Population*	**0.39**	*0.31*	*0.37*	*0.34*	*0.41*	0.07	0.27	*-0.34*	-0.06	0.11	0.06	-0.12	-0.04	1.00					
15	*Density*	**0.44**	*0.33*	*0.35*	*0.33*	0.01	-0.18	-0.02	-0.27	-0.25	-0.25	-0.05	-0.25	**-0.62**	**0.40**	1.00				
16	*Unemployment%*	**0.46**	0.23	*0.32*	*0.32*	0.15	0.12	-0.02	0.05	-0.04	0.18	0.19	-0.13	-0.26	0.15	*0.36*	1.00			
17	*Poverty%*	0.12	-0.13	-0.01	-0.05	0.18	0.17	0.24	-0.19	-0.12	0.25	0.06	0.08	0.27	0.09	0.02	**0.61**	1.00		
18	*Min_wage*	*0.30*	**0.39**	**0.39**	**0.42**	0.16	-0.22	-0.16	0.03	-0.07	-0.27	-0.11	*-0.31*	**-0.71**	0.01	*0.32*	0.18	-0.23	1.00	
19	*Tax_percapita*	0.10	*0.32*	0.18	0.22	-0.20	-0.19	-0.22	-0.11	*-0.25*	*-0.35*	-0.09	*-0.33*	**-0.70**	*-0.29*	**0.46**	0.16	-0.12	**0.50**	1.00

This table presents correlation coefficients among the variables in our study. **Bold** indicates statistical significance at $p < 0.01$. *Italics* indicate statistical significance at $p < 0.05$.

Table 3
Bivariate Analysis
Panel A: Comparison of mean closure duration

		Variable Means (natural log of number of days)					
	n	*StayHome*	*Rest_closure*	*Bar_closure*	*Movie_closure*	*EMed_closure*	*Prison_closure*
SalesTax% < median	25	3.824	4.274	4.816	4.506	2.244	5.661
SalesTax% ≥ median	26	3.006	3.932	4.598	4.322	2.387	5.913
difference		0.818	0.342	0.218	0.184	-0.144	-0.252
Prediction		+	+	+	+	0	0
t-stat from test of differences in means		2.067**	1.567*	0.758	0.699	0.781	-1.655
z-stat from Wilcoxon rank-sum test		1.708*	1.583	0.217	0.415	-0.068	-1.357

This table presents the mean closure durations (in days) for states with sales tax reliance above and below the sample median. It also includes the t-statistics from tests of difference in means, and the z-statistics from Wilcoxon rank-sum tests. *, **, and *** indicate statistical significance at $p < 0.10$, 0.05, and 0.01, respectively, in one-tailed tests when we make a directional prediction and in two-tailed tests when we do not make a directional prediction.

Panel B: Comparison of zero sales tax states versus neighbors

	Sales Tax Rate (2020)	*StayHome*	*Rest_closure*	*Bar_closure*	*Movie_closure*	*EMed_closure*	*Prison_closure*
OR	0%	88	263	264	311	39	381
WA	6.5%	70	197	221	335	60	422
difference	-6.5%	18	66	43	-24	-21	-41
MT	0%	29	45	45	56	0	419
WY	4%	0	57	57	57	0	713
difference	-4%	29	-12	-12	-1	0	-294
NH	0%	80	63	91	93	0	147
VT	6%	52	65	195	68	45	475
difference	-6%	28	-2	-104	25	-45	-328
DE	0%	69	77	154	74	0	173
NJ	6.625%	80	91	91	172	60	413
MD	6%	46	74	88	169	44	494
difference	-6.305%	8	-5	65	-96	-51	-279
average of no-sales-tax-states	0%	66.5	112.0	138.5	133.5	9.8	280.0
average of neighbors	5.825%	49.6	96.8	130.4	160.2	41.8	503.4
difference	-5.825%	16.9	15.2	8.1	-26.7	-32.1	-223.4

This table presents the closure durations (in days) for zero sales tax states and their nonzero sales tax neighbor(s) that are reasonably similar geographically, politically, and economically. We note the 2020 state sales tax rate and the difference in closure duration. For Delaware's neighbors, we use the mean of New Jersey and Maryland. The last three rows are averages of the observations above.

Table 4
Multivariate Analysis of Stay-Home Order Duration

VARIABLES	Prediction	(1) *StayHome*	(2) *StayHome*
SalesTax%	-	-1.580**	
		(0.802)	
No_SalesTax	+		0.805*
			(0.490)
No_IncomeTax			-0.226
			(0.389)
GOP_governor		-0.918***	-0.880**
		(0.303)	(0.347)
Pres_%_GOP		-6.260*	-5.788
		(3.239)	(3.577)
Population		0.260	0.290
		(0.166)	(0.176)
Density		0.0784	0.101
		(0.120)	(0.138)
Unemployment%		0.314*	0.301
		(0.186)	(0.206)
Poverty%		0.0547	0.0463
		(0.0840)	(0.0904)
Min_wage		-0.0219	-0.0161
		(0.118)	(0.119)
Tax_percapita		-0.339***	-0.285**
		(0.119)	(0.121)
Constant		2.340	0.930
		(3.843)	(4.448)
Observations		51	51
R-squared		0.620	0.616

This table presents the results of OLS regressions of stay-home order duration on tax variables and control variables. Standard errors in parentheses. *, **, and *** indicate statistical significance at $p < 0.10$, 0.05, and 0.01, respectively, based on heteroskedasticity-robust standard errors in one-tailed tests when we make a directional prediction and in two-tailed tests when we do not make a directional prediction.

Table 5
Multivariate Analysis of Restaurant, Bar, and Movie Theater Closure Duration

VARIABLES	Prediction	(1) *Rest_closure*	(2) *Rest_closure*	(3) *Rest_closure*	(4) *Bar_closure*	(5) *Movie_closure*
SalesTax%	-	-1.445*				
		(0.953)				
No_SalesTax	+		0.590*			
			(0.411)			
No_IncomeTax			-0.558			
			(0.507)			
AlcoholTax%	-			-32.27**	-35.21*	
				(17.50)	(21.81)	
AmusementTax%	-					-5.446*
						(4.120)
GOP_governor		-0.385**	-0.291	-0.468***	-0.601**	-0.510**
		(0.148)	(0.181)	(0.168)	(0.273)	(0.193)
Pres_%_GOP		-0.247	0.0953	-0.314	-1.307	-1.133
		(1.564)	(1.797)	(1.542)	(2.426)	(2.120)
Population		0.390**	0.398**	0.349**	0.345*	0.323*
		(0.167)	(0.161)	(0.148)	(0.188)	(0.177)
Density		-0.106	-0.109	-0.140*	-0.0988	-0.109
		(0.0884)	(0.0939)	(0.0783)	(0.104)	(0.127)
Unemployment%		0.156	0.197	0.262	0.312	0.326
		(0.193)	(0.221)	(0.229)	(0.290)	(0.273)
Poverty%		-0.0437	-0.0724	-0.0717	-0.0357	-0.0682
		(0.0608)	(0.0754)	(0.0670)	(0.0884)	(0.0900)
Min_wage		0.0270	0.0337	0.00883	0.0631	0.0630
		(0.0687)	(0.0669)	(0.0774)	(0.0994)	(0.0919)
Tax_percapita		0.150	0.174*	0.131	-0.0252	0.0314
		(0.101)	(0.102)	(0.0988)	(0.131)	(0.133)
Constant		-1.549	-2.256	-0.814	-0.409	-0.492
		(2.721)	(2.912)	(2.636)	(3.462)	(3.148)
Observations		51	51	51	51	51
R-squared		0.515	0.526	0.490	0.463	0.456

This table presents the results of OLS regressions of restaurant, bar, and movie theater closure duration on tax variables and control variables. Standard errors in parentheses. *, **, and *** indicate statistical significance at $p < 0.10$, 0.05, and 0.01, respectively, based on heteroskedasticity-robust standard errors in one-tailed tests when we make a directional prediction and in two-tailed tests when we do not make a directional prediction.

Table 6
Falsification Tests

VARIABLES	Prediction	(1) *EMed_closure*	(2) *EMed_closure*	(3) *Prison_closure*	(4) *Prison_closure*
SalesTax%	0	-0.503		0.720	
		(1.288)		(0.532)	
No_SalesTax	0		-0.103		-0.446
			(0.683)		(0.304)
No_IncomeTax			0.206		0.0248
			(0.469)		(0.210)
GOP_governor		0.984*	0.911	-0.0257	-0.0331
		(0.582)	(0.619)	(0.176)	(0.184)
Pres_%_GOP		0.947	0.852	-1.149	-1.415
		(4.645)	(4.864)	(1.693)	(1.635)
Population		0.927***	0.891***	0.0565	0.0325
		(0.252)	(0.264)	(0.109)	(0.123)
Density		-0.283	-0.275	-0.132	-0.149*
		(0.199)	(0.205)	(0.0824)	(0.0832)
Unemployment%		0.0324	0.0429	0.127	0.150
		(0.309)	(0.305)	(0.102)	(0.104)
Poverty%		0.119	0.114	-0.00586	-0.00862
		(0.124)	(0.122)	(0.0396)	(0.0391)
Min_wage		0.352**	0.348**	-0.0807	-0.0835
		(0.158)	(0.160)	(0.0586)	(0.0603)
TotalTax		0.00452	0.00294	-0.00681	-0.0412
		(0.188)	(0.207)	(0.107)	(0.115)
Constant		-16.20***	-15.72***	6.125***	7.035***
		(4.802)	(5.702)	(2.142)	(2.406)
Observations		51	51	51	51
R-squared		0.369	0.371	0.171	0.168

This table presents the results of OLS regressions of the durations of prohibitions on elective medical procedures and prison visits on tax variables and control variables. Standard errors in parentheses. *, **, and *** indicate statistical significance at $p < 0.10$, 0.05, and 0.01, respectively, based on heteroskedasticity-robust standard errors in two-tailed tests.

Table 7
Political Partition

	GOP% < 0.5	GOP% > 0.5	GOP% < 0.5	GOP% > 0.5	GOP% < 0.5	GOP% > 0.5	GOP% < 0.5	GOP% > 0.5	GOP% < 0.5	GOP% > 0.5	GOP% < 0.5	GOP% > 0.5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(11)	(12)	(9)	(10)
VARIABLES	*StayHome*		*Rest_closure*		*Bar_closure*		*Movie_closure*		*EMed_closure*		*Prison_closure*	
SalesTax%	-1.264*	-2.577**	-1.125**	-2.280*	-0.787*	-0.856	-0.984*	-1.441	-1.917*	3.496*	0.647	0.832
	(0.866)	(1.468)	(0.602)	(1.633)	(0.495)	(1.514)	(0.668)	(1.837)	(1.363)	(2.538)	(0.681)	(1.019)
GOP_governor	-0.618	-1.078*	-0.215*	-0.121	-0.105	-0.814***	-0.237	-0.508	1.609**	0.587	0.0309	-0.0949
	(0.588)	(0.552)	(0.111)	(0.306)	(0.292)	(0.260)	(0.190)	(0.305)	(0.655)	(0.950)	(0.278)	(0.308)
Population	0.133	0.452	0.256***	0.314	0.0714	0.763*	0.234***	-0.0180	1.128***	0.415	0.169	-0.315
	(0.152)	(0.382)	(0.0639)	(0.342)	(0.0714)	(0.363)	(0.0696)	(0.355)	(0.352)	(0.551)	(0.114)	(0.272)
Density	-0.0395	0.195	-0.224**	0.184	-0.199*	0.0946	-0.161	0.578**	-0.277	-0.436	-0.279*	0.115
	(0.181)	(0.348)	(0.0996)	(0.155)	(0.109)	(0.209)	(0.114)	(0.207)	(0.357)	(0.574)	(0.140)	(0.239)
Unemployment%	0.239	0.597*	0.161	0.400*	0.169	0.710***	0.176	0.769**	-0.552	0.368	0.230	0.187
	(0.214)	(0.312)	(0.177)	(0.217)	(0.207)	(0.216)	(0.201)	(0.265)	(0.739)	(0.353)	(0.240)	(0.185)
Poverty%	0.0374	-0.0411	-0.0155	-0.118	0.0345	-0.167**	0.0320	-0.252**	0.269	0.198	-0.0945	-0.0145
	(0.0914)	(0.207)	(0.0575)	(0.0767)	(0.0775)	(0.0767)	(0.0719)	(0.0893)	(0.203)	(0.235)	(0.0774)	(0.0937)
Min_wage	0.138	-0.0890	0.0977*	-0.00326	0.221***	0.145	0.158**	0.219	0.306	0.229	-0.110	-0.0464
	(0.117)	(0.254)	(0.0525)	(0.0965)	(0.0722)	(0.119)	(0.0604)	(0.149)	(0.203)	(0.227)	(0.0649)	(0.115)
Tax_percapita	-0.100	-0.331	0.0753	0.486	-0.0990*	0.731**	-0.0495	0.595*	0.0635	0.0758	0.162	-0.162
	(0.178)	(0.258)	(0.0479)	(0.323)	(0.0511)	(0.307)	(0.0645)	(0.333)	(0.205)	(0.394)	(0.114)	(0.197)
Constant	0.148	-3.665	0.220	-2.541	2.309**	-10.99*	-0.186	-0.716	-17.25***	-10.56	4.850***	10.13**
	(2.709)	(7.528)	(1.159)	(5.753)	(1.080)	(5.941)	(1.308)	(6.056)	(4.927)	(9.215)	(1.642)	(3.791)
Observations	27	24	27	24	27	24	27	24	27	24	27	24
R-squared	0.347	0.658	0.665	0.535	0.518	0.725	0.636	0.614	0.574	0.365	0.305	0.220

This table presents the results of OLS regressions of the durations of COVID-19 restrictions on tax variables and control variables where the sample is partitioned on states' political lean. GOP% equals *Pres_%_GOP*, which is the average Republican vote percentage in the 2012 and 2016 Presidential elections. Odd-numbered columns represent the Democratic-leaning subsample states and the District of Columbia, and even-numbered columns represent the Republican-leaning subsample states. Standard errors in parentheses. *, **, and *** indicate statistical significance at $p < 0.10$, 0.05, and 0.01, respectively, based on heteroskedasticity-robust standard errors in two-tailed tests.

Table 8
European VAT Analysis

Panel A: Descriptive statistics

Variable	25th Pct.	Mean	Median	75th pct.	Std. Dev.
StayHome	2.996	3.705	4.369	4.804	1.781
VAT%	0.182	0.208	0.213	0.226	0.038
Population	15.406	16.098	16.141	17.452	1.342
Density	4.275	4.643	4.678	5.306	0.856
Unemployment%	4.400	6.243	5.500	6.800	3.601
Poverty%	0.080	0.102	0.094	0.124	0.031
Min_wage	6.064	5.537	6.319	7.327	2.492
Tax_percapita	7.555	14.846	13.915	20.578	9.393

Panel B: Multivariate Analysis

VARIABLE	Prediction	(1) *StayHome*
VAT%	-	-39.47**
		(17.15)
Population		-0.371**
		(0.171)
Density		0.698
		(0.470)
Unemployment%		-0.00409
		(0.0680)
Poverty%		10.51
		(9.686)
Min_wage		0.206
		(0.128)
Tax_percapita		-0.133***
		(0.0374)
Constant		14.41*
		(7.175)
Observations		23
R-squared		0.706

This table presents the results of OLS regressions of stay-home order duration on tax variables and control variables. Standard errors in parentheses. *, **, and *** indicate statistical significance at $p < 0.10$, 0.05, and 0.01, respectively, based on heteroskedasticity-robust standard errors in one-tailed tests when we make a directional prediction and in two-tailed tests when we do not make a directional prediction.