The Political Economy of COVID-19 Policy Choices

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Abstract

The first two years of the COVID-19 pandemic presented many challenges for state governors. States hold the police power, and governors regulated pursuant to that power, via gubernatorial executive orders. Statewide mandates regarding private and public sector closures typically involved exceptions for workers deemed critical to public health and the safety of the community, including those individuals providing basic essential services such as healthcare, power, water, and sanitation services.However, the timing of these orders varied across states, as did the orders' content, as governors amended and replaced prior orders. In this study, we argue that the political-economic environment of states was associated with specific COVID-policy choices.We marshal several evidentiary domains to conduct the analysis, including text analysis of governors' pandemic-related executive orders, and analysis of state political-economy types (revealing "open publics" and "private enclaves"). We leverage timing of the orders to analyze state governments' pandemic responsebetween states that are "open publics" and "private enclaves" as well as between states whose executive orders emphasize health or the economy.

We find that the state's political economy is associated with the governors' responses to the COVID epidemic in predictable ways.[1]

Keywords: executive orders, COVID-19, governance, capture, text analysis

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COVID-19 has caused more than 1,000,000 deaths in the United States (National Center for Health Statistics 2021). In addition to the devastating loss of life, were economic losses, including 18.1 million temporary layoffs in April, 2020 and by November of the first year of the pandemic there were 385,000 long-term unemployed, with another 448,000 individuals exiting the job market (Bureau of Labor Statistics 2021). The U.S. economy shrank by more than 32% in the second quarter of 2020 (the largest decrease since 1945) (Chen 2021). And while employment has substantially recovered in the aggregate, as late as October 2021, food or housing insecurity remained for tens of millions of Americans (tCenter on Budget and Priorities 2021) The health and economic consequences of the pandemic have challenged policy actors across the globe. In the United States, state governments, in particular, have borne the brunt of issuing regulatory provisions, including choices about whether to restrict businesses and resident's behaviors, along with measures to support their public health systems and state economy. Of course, these two priorities may be in tension. Shutdowns save lives from COVID-related deaths but bring risks of poverty-related struggles (Eichenbaum 2020). Governors took different approaches to striking the balance between COVID-related health threats and economic injury to the state and its residents.

In the early weeks of the pandemic, for example, Ohio's Republican governor, Mike DeWine, opted for an aggressive approach earning accolades from public health officials (Smith 2020). He issued shelter-in-place restrictions and business closures effective March 23, 2020, five days after the first COVID death in the state (Moreland A 2020)[2]. Kevin Stitt, DeWine's Republican counterpart in Oklahoma, in contrast, never issued a stay-at-home order and opted for a broad set of essential businesses to remain open (USA Today 2021). Industry advocates praised Stitt's approach, "I think having a business-minded governor he knew how to assess the health risk, but also realized the potential harm to the economy" (Felder 2020).[3] As of June 23, 2022, case and death rates in these two states had diverged, with Oklahoma's case rate exceeding Ohio's by 11.6%, even though Ohio

[2]Prior to the state's first infection, DeWine also cancelled a large festival. DeWine's order was two weeks after the first infection was reported in the state.

[3]Quote is from Devery Youngblood, the executive director of the Oklahoma Aggregates Association.

is a more densely populated state.[4]

Stay-at-home (SAH) orders, business closures, and essential worker designations varied in their content and timing across the states (Clouser McCann and Wood 2020; Helppie-McFall and Hsu 2020). For scholars interested in understanding the political economy of such policy choices, the usual suspects of party and pressure group preferences and strengths, along with population need are likely correlates (e.g., Bosancianu et al. 2020; Grossman et al. 2020).

In this project we consider the following research question: Under what conditions do states emphasize health versus economic concerns in COVID19 executive orders? We argue that the political economy and pressure group environment of the state impact the state's policy choices in balancing residents' health and economic risks associated with COVID residents. [5] Moreover, we posit that governors manage risk in ways that respond to the political-economic environment of their state, along with their own electoral concerns, not necessarily the risks their resident's face.

Variation in State Policies, People, and Outcomes

The current pandemic has highlighted many problems in the U.S. political, health, and economic systems and their dire consequences. For instance, Black and Latinx individuals– already more likely to lack health insurance and have less economic resilience–have almost twice the age-adjusted mortality rate of white people from COVID-19, fewer opportunities to work remotely, and are disproportionately among the low-income essential/front-line worker categories (Crain and Sherraden 2014; Gould and Shierholz 2020; McLaren 2020; McNicholas and Poydoc 2020). This essential workforce is disproportionately populated by employees without a college degree (or STARS).[6]

[4]Per the CDC daily case-count data– in Ohio, there have been 24,368 total cases per 100,000 with and a population density of 101 persons/ km^2; and in Oklahoma there have been 27,201 cases per 100,000 with a population density of 22 persons/km^2(countryeconomy.com 2021).

[5]In the broader project, we expect that individual-level differences related to essential worker status and degree of economic fragility are important factors that moderate how COVID risks and political institutions impact political efficacy and engagement.

[6]STARs are U.S. workers who are Skilled Through Alternative Routes: they do not have a bachelor's degree, have a high school diploma and have been active in the labor force in the past year (Blair et al. 2020).

These national-level outcomes hide even larger variation in inequities across states. Higher COVID mortality rates were documented in states with higher levels of economic inequality (Oronce et al. 2020). Risk differences along racial lines have also emerged – unsurprising given the racial wealth gap in the United States. Of the 28 states that report race and ethnicity along with COVID infections, Gross et al. (2020) found a 3.57 and 1.88 relative risk for Black individuals compared to white residents and Latinx residents to white residents, respectively. Eight of those states, though, revealed relative risks higher than 5.0, including a staggering 18-fold higher risk for Black people compared to white people in Wisconsin (Gross et al. 2020). We observe increased mortality among Black and Latinx residents in many other areas of public health, of course; COVID is just the latest iteration of generations of inequity.

Institutions matter, too, of course. A rich literature has delved into describing and understanding state-to-state differences in health and economic or fiscal regulations (Gostin, Burris and Lazzarini 1999; Rosenthal, Kaye and Flowers 2002; Gray, Lowery and Godwin 2007; Pacula, Boustead and Hunt 2014), infrastructure (Baker Jr et al. 2005; Mays et al. 2009; Hyde and Shortell 2012), and administration (Soss et al. 2001; Carey and Friel 2015; Siddiqi et al. 2016; Bailey et al. 2017), among other crucial institutions. In sum, variation in state policies, likely mediated by wealth and racial inequalities, has been linked to variation in health and economic outcomes for state residents in the aggregate.

The broader project endeavors to understand the individual-level variation in outcomes that emerge from aggregate patterns. State policies affect members of the polity differently, particularly as people are categorized by those policies and resulting risks, punishments, and rewards play out (Mettler et al. 1998; Schneider and Ingram 2005; Weaver and Lerman 2010; Lerman 2013) While this conference paper focuses on the political economic context that helps to define one source of risk – COVID-19 executive orders designating some workers as "essential" – the broader project explores the heterogeneous impacts of these risks.

State Policies Unevenly Distribute Risk

State policy choices around public health can have life and death *health* consequences for the states' residents. They can also have major *economic* impacts on residents. Neither of these sets of consequences – health or economic – fall equally on residents, or across states. The political aspects of governmental benefit distribution are well-documented. Public policies create winners (those that reap the rewards) and losers (those that bear the burdens), often due to how groups are socially constructed in society (Schneider and Ingram 2005).

Although political institutions scholars have well-tended theories regarding the allocation of benefits to those with more influence (Lasswell 1958)), less has explicated regarding the distribution of risk across groups. Social policies, according to Hacker (2004), reveal a tension between the "socialization" versus the "privatization" of risk. Socialized policies spread risk across people and circumstances. Over time in the United States, powerful interests have quietly revised public policies such that risk is carried privately (Hacker 2004; Mettler 2011). The privatization of risk, however, creates a comparatively heavier burden for more vulnerable and disadvantaged individuals.

COVID-19 was a common shock to the health and economic resilience of local and state populations (Lin and Meissner 2020), yet the health and economic risks of the pandemic were unevenly distributed across individuals within those geographies, particularly in the early months of the pandemic. Shutting down large parts of the retail and service industries in order to keep workers at home – and therefore, safe from the early waves of COVID – cost state and local economies billions of dollars. But it also saved lives (Chen 2021).

In the early months of the pandemic, statewide and local mandates regarding social and business shutdowns involved exceptions for workers deemed critical to public health and the safety of the community, categories of workers that varied from state to state (Helppie-McFall and Hsu 2020). State choices around which sectors to shut down exposed residents to different levels of health and economic risk. Essential workers experienced increased health risk as they were unable to work remotely. Many non-essential workers

faced increased economic risks, for example if they were furloughed or faced the possibility of job-loss or reduced pay. In the context of households, people may be exposed to increases in both kinds of risk.

Governors faced pressure from health advocates, from other political actors, from powerful interests within their states, and from their residents to make informed COVID policies. By focusing on the timing and the language of executive orders, we can examine the conditions under which governors emphasized health and economic concerns as well as the duration of stay-at-home orders and when they occurred. These political decisions, unlike many policy tools, had the potential for immediate impact on individuals and populations. In sum, the policy choices made in gubernatorial executive orders during 2020 and 2021 mattered for residents' health and economic well-being, but also revealed their political battles.

Theoretical Framework and Hypotheses

Impact on State Decisions. We begin with a set of five basic assumptions. First, as the influence of private economic interests in states increases, we expect those interests to have a larger voice in state policy actions. Second, private economic interests are more likely to prefer to have their own workforce, or at least some of it, maintain operations during the current crisis. Third, for states without dominant private economic interests, the influence on workforce designations can be informed by other policy actors, such as public health officials and substantive experts within states and across the country. Our fourth assumption is that governors are concerned about their electoral safety and political careers. As a result, they worry about election results and their party. We do not assume, however, that these political concerns take precedence.

Finally, we assume the language utilized by governors in their executive orders has meaning. Specifically, when governors are concerned about the economy of their state, their executive orders will feature economic issues. Governors who are worried about the health of their residents will incorporate such concerns into the words they use to craft their executive orders. Of course, though, governors face myriad pressures at the same

time. We expect, then, that executive orders reflect governors' responsiveness to these pressures, which likely varied over the course of the pandemic and with differences in the preferences of governors, but in a predictable fashion based on certain economic, demographic, political, and institutional concerns.

Economic Interests. We expect that states will face pressure to delay stay-at-home orders and to re-open the economy after shutting down to any degree. This pressure can emerge at any phase of the pandemic, though the governor's responsiveness to that pressure can vary. We think there are political-economic predictors for this difference which will be revealed in executive orders:

H1a: We expect economic language, oriented toward reopening businesses and schools, to increase with pressure from dominant economic actors of the state.

Moreover, we expect this pressure will explain the timing of stay home orders (SAH). In particular, where governors and other political actors face a private pressure system dominated by one set of actors, we expect SAH orders to emerge more slowly in comparison to states with a more competitive private interest landscape. We also expect a phased reopening to business closures that benefits the powerful interests in the states.[7]

To summarize:

H1b: States with concentrated and powerful economic interests will be slower to issue COVID-19 Stay Home orders than states without dominant private interests.

H1c: States with concentrated and powerful economic interests will rely more often on recommended SAH than required orders for their population in comparison to states without dominant private interests.

Demographic Concerns. In addition to the importance of powerful economic interests, we argue that underlying demographic factors for a state play a crucial role in gubernatorial executive order choices, particularly with respect to how they are crafted.When a state is facing a rapid increase in COVID cases, has more urban centers with dense

[7]We will test the phased reopening hypotheses in later versions.

populations that can spread COVID more quickly, or a population at higher risk for mortality due to comorbid factors, we expect that governor to have larger underlying health demographic needs than a governor leading a state with few or stable COVID cases, a sparse distribution of their population, and fewer comorbidities. In particular:

H2a: We expect public health language in executive orders created during the outbreak phase to increase with population factors that predict risk.

We also expect these demographic factors will help explain the timing of stay home orders (SAH). Governors facing a higher risk population, we posit, will issue stay-at-home orders more quickly and, in the face of these health risks, will utilize required orders more often:

H2b: States with higher health risks for residents will be faster to issue COVID-19 Stay Home orders than states with lower health risks.

H2c: States with higher health risks will rely more often on required SAH than recommended orders for their population.

Political Environment. Given our assumption that governors care about their political careers, we argue that the party of the governor will play a role in the degree to which executive orders focus on the economy and health, in particular. If Republican governors prefer to utilize rhetoric emphasizing businesses, the economy, and business owners, we would expect a higher proportion of their executive orders (all else constant) to focus on the economy compared to Democrats. If Democratic governors, in comparison, highlight vulnerable at risk populations, we might expect a higher proportion of their executive orders to focus on health compared to Republicans. Importantly, executive orders have policy impact and may be less about persuasive language and more about policy tools. If rhetoric is less useful in executive order language, we would expect no significant association with the party of the governor or the political bargaining environment of the state.

Specifically:

H3a: We expect Republican(Democratic) governors to have a higher proportion of economic(health) words in their executive orders, particularly when executives face legislature of the same party majority.

It is also likely these political factors may help explain the timing of stay home orders (SAH), with Republican governors more slowly producing stay-at-home orders:

H3b: States with Republican governors will be slower to issue COVID-19 Stay Home orders than states with Democratic governors.

In addition, as executive's electoral risks increase, we expect them to highlight the economy and returning to work, while downplaying health and electoral concerns, leading to our next hypothesis:

H4a: We expect governors to have a higher(lower) proportion of economic(health or infrastructure) words in their executive orders, as their electoral risks increase.

Beyond differences in population demographics, states and the residents within them faced different healthcare systems with varying degrees of capacity to handle COVID-19 cases. We expect that governors responded to case surges that could overwhelm their healthcare system by focusing on infrastructure concerns in their executive orders. More specifically:

H5a: We expect infrastructure language in executive orders to increase with high case rates and decrease with the capacity of the system to handle severe illness.

Finally, we examine which industries receive specific favors in the governors' executive orders. Because industries that dominate the economy tend to also receive favors from governments , our final hypothesis is that the relative economic power of an industry within the state should predict whether workers from that industry receive an exemption from the stay-home order from the government.[8] *H6: As industries' relative economic power within a state increase, the likelihood that their workers are deemed essential – and therefore the industry is at least partly exempted from the stay-home order – will increase, too.*

[8]We provide this hypothesis for feedback but have not tested it yet.

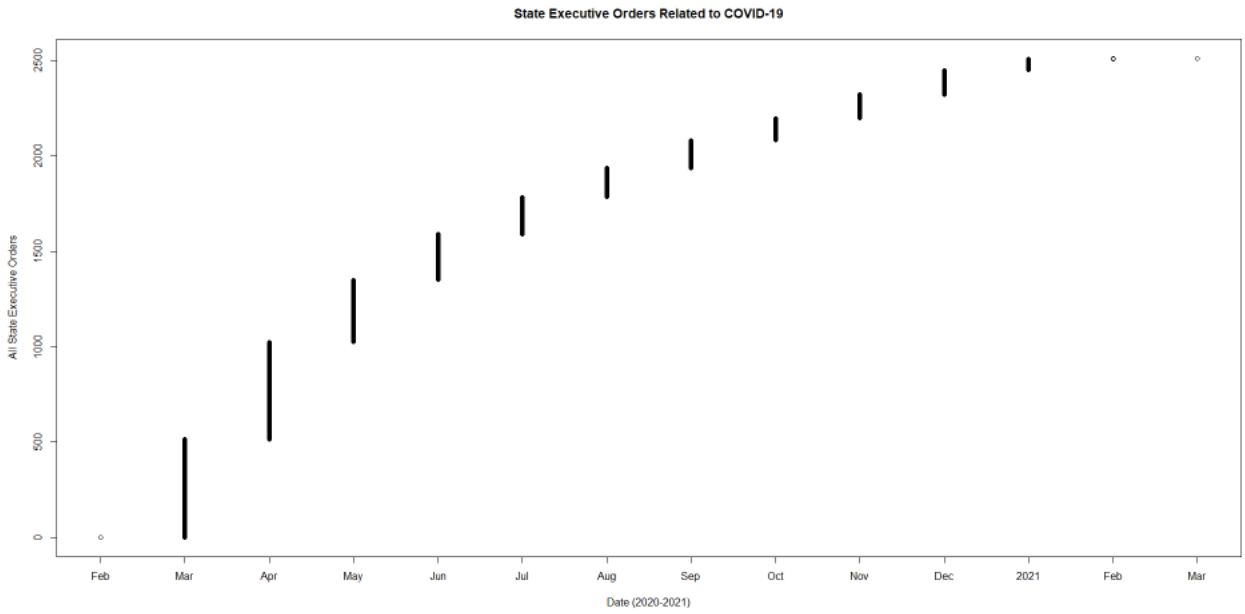


Figure 1: Timing of state Executive Orders, starting in February 2020 - March 2021

Measurement and Descriptive Statistics

With the help of a team of research assistants, we recorded features of each state's political economy and various features of executive orders, as we explain here. We begin with our dependent variables, stay-home order timing, topical theme of the executive orders (health, economy, or infrastructure), and who benefits from SAH exemptions. We then turn to our explanatory variables.

Measuring stay-home order timing

In order to address our questions of interest, we conducted in-depth archival work on the content of executive orders and the timing and easing of stay-at-home policies across all states. In total, we have gathered 3229 Executive Orders related to COVID issued from January 1, 2020 through March 31, 2021. Figure 1 shows the timing of the orders as the pandemic started and continued.

Pandemics spread across space over time. Because not all states are equally affected on any given day, we measure the timing of these orders based on the state's first recorded

COVID case.[9] Some states issued their orders before the state's first death, and others after. On average, states issued orders 5.4 days after their first recorded case and 8.8 days before their first recorded death from COVID-19.

Measuring topical emphasis of executive orders

Processing the text of the orders required a team of researchers. Each document was saved in plain text format, removing seals and images from the documents. Pre-processing of texts included removing symbols, numbers, and webpage citations.[10] We removed terms that were found in every document, including: covid, coronavirus, and health, as they did not aid our discrimination between topics in the documents. Relying on the *quanteda* and *stm* packages in R, we considered correspondence analyses, Wordfish, as well as LDA and structural topic modeling (Roberts, Stewart and Tingley 2019; Slapin and Proksch 2008; Benoit et al. 2018; Blei, Lafferty et al. 2007). To operationalize gubernatorial priorities in these policy documents, we rely on a structural topic model, allowing us to include state, the party of the governor, and the weeks since first infection within the state (state COVID week) of the document as predictors of the prevalence of topics.[11] Although our data generating process (i.e., gubernatorial documents are the product of state pressures and week of the pandemic) suggested two competing priorities that would dominate documents, perhaps unsurprisingly in retrospect, we find a model with three topics balances exclusivity and semantic coherence (i.e., topic quality).[12]

We explored topic models incorporating 2-78 overall topics, learning that the middle

[9] Also not that in our duration analyses we measure exposure from the time of the first case.

[10] We also removed the names of days, months, and counties, as well as state names, and officials' names. We converted all documents to lowercase. Our stopword list is provided in our supplemental appendix.

[11] We considered models using state alone, state + the state's COVID week, and state interacted with week as our predictors. As a result of our validation exercises and model fit, we report models where prevalence is modeled as state + state COVID week * party of the governor and content is modeled as a function of the governor's party.We provide model fit exercises in our supplemental appendices. Overall, we find that our results are fairly robust to these various assumptions.

[12] We include hypotheses regarding infrastructure above (generated prior to our models discussed below), as well.

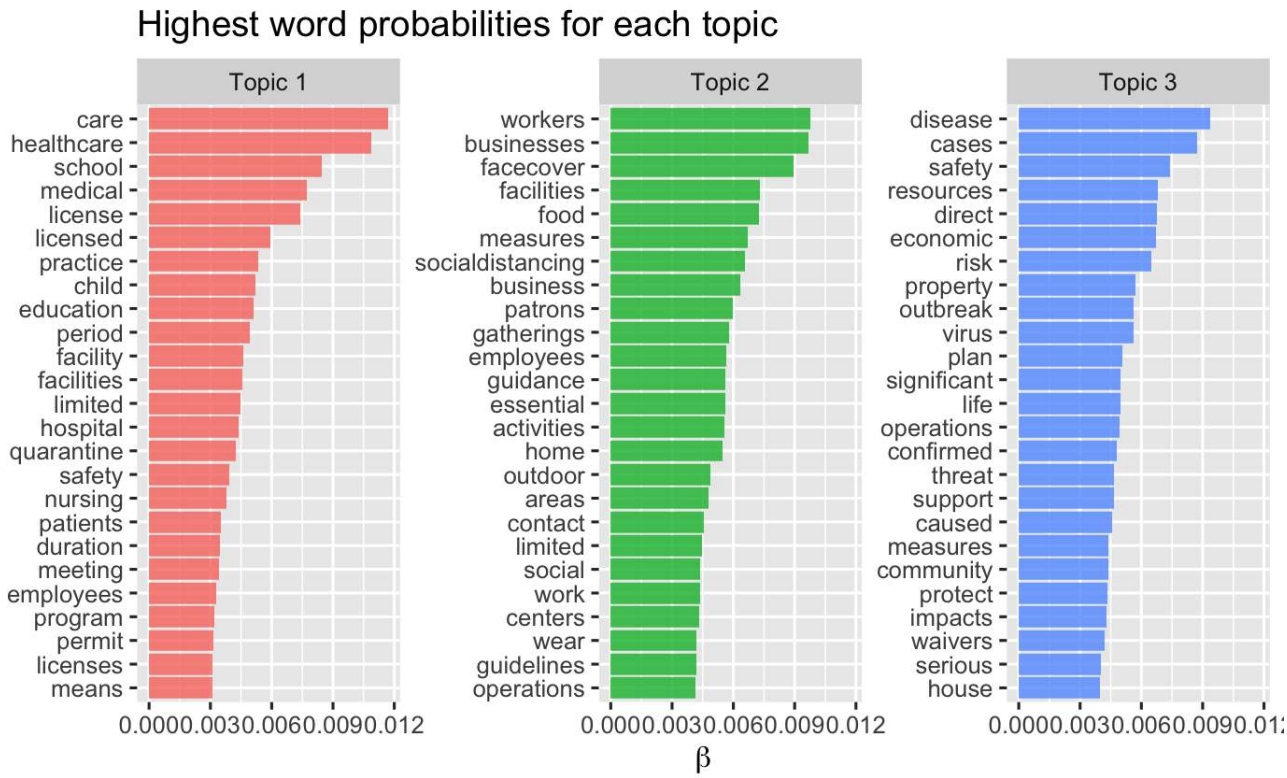


Figure 2: Highest word probabilities in the 3 topic model we use (where the probability that each word is generated from each topic is *beta*).

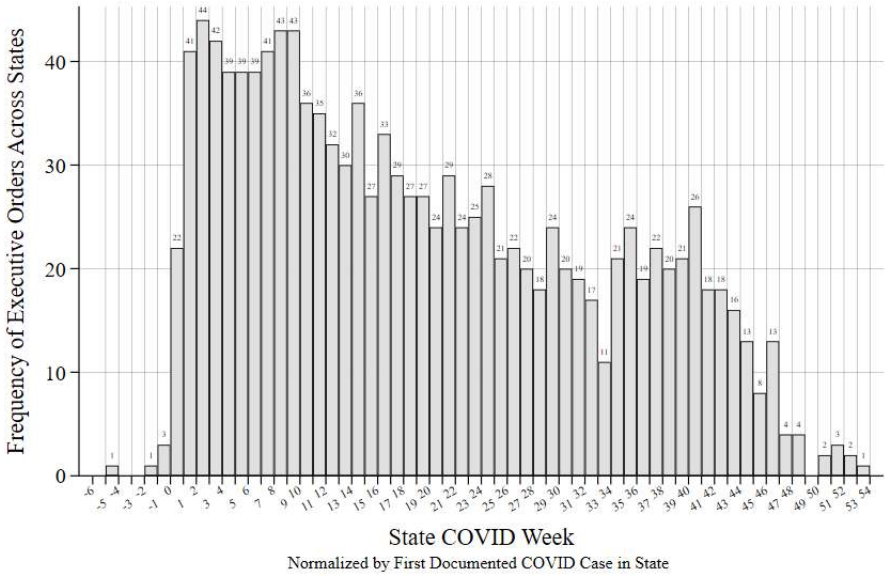
range of 3-7 offered the best combination of semantic coherence and exclusivity among topics./footnoteFollowing Roberts, Stewart and Tingley (2019) we began with a zero topic model, which yielded 77 topics (i.e., a correlated topic model as in Blei, Lafferty et al. (2007). We then examined 2 through 78 topics for overall fit. We found decreasing semantic coherence and increasing lower bound as topic number increases above 20 and only minimal gains in held out likelihood and residuals after k = 20. Topic quality improves as k increases from 2 through 7, but is still fairly good at k=3. Additional topics introduced in the 5 and 7 topic models cost parsimony for only minor gains in exclusivity. Given our theory that orders focus on health and economy with parallel concerns regarding infrastructure, we chose to proceed with a three topic model.

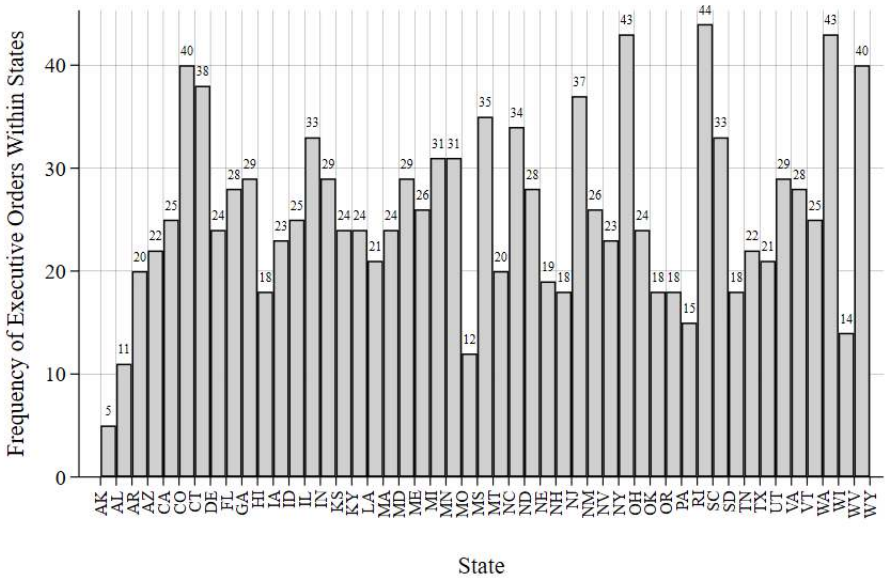
Figure 2 shows the most common words in the three topic model. The model left words unstemmed and used the party of the governor as a content variable, which provided gains in semantic coherence and also allowed us to examine the different ways governors regulated by political party. Most words in the top 25 listed for each topic are intuitively

part of the three topics we mention in our opening section. Those are infrastructure (Topic 1, focused on healthcare, school, medical, license, practice, and similar words), economy (Topic 2, focused on workers, businesses, face coverings, facilities, food, social distancing and similar) or health (Topic 3, focused on disease, cases, safety, outbreak, and virus, but also including words like "economic" and "property" that are not directly health-related.

We aggregate executive orders by week for each state and normalize the week by the state's first COVID case (i.e., Week 0 in a state is the week of the first confirmed case of COVID, Week -1 is the week preceding this case, and Week 10 is ten weeks after it). Using a weekly measure captures the general topical focus in a state in a given week in a fast-moving pandemic. After aggregating all orders within a state-week our 3,229 overall executive orders reduce to 1,267 documents.

As shown in Figure 3 , the greatest frequency of executive orders (summed across all states and by week within state) were issued in the second week after the first documented COVID case in a state (N=44), followed closely by weeks 8 and 9 (43 each). In Figure 4 , Rhode Island (n=44), New York (n=43), and Washington (n=43) issued executive orders more frequently, particularly in comparison to Alaska and Wyoming (n = 5 and 6, respectively).





Following our structural topic modeling, we estimate the proportion of each document (weekly aggregated executive orders) by state and week devoted to each of our three topics: health, economics, and infrastructure, which we refer to as θ. For example, a state equally focused on health and the economy but not on infrastructure, would have estimated prevalence of 0.5, 0.5, and 0.0, respectively. The mean topical prevalence (θ) is 0.302 for our economic topic, 0.335 for our health topic, and 0.300 for our infrastructure topic. As expected, though, topical focus varies over states. Across the weeks of the pandemic in 2020 through 2021, Delaware, Iowa, and Vermont focused more on economic words than health and infrastructure with an average economic topic θ of 0.708, 0.928, and 0.723, respectively. Other states, in comparison, used words in their executive orders that dealt more often with health concerns yielding a corresponding health θ of 0.884 in Ohio and 0.948 in Idaho. Some states featured infrastructure-based language more often than the other two topics, on average, including Hawaii (infrastructure $\theta = 0.892$) and Colorado (infrastructure $\theta = 0.787$).

As the pandemic continues to progress, many states' mixes of the three topics have changed as well.[13] Examining Figure 5 , on average we see an increase of the economic θ in week 20, which corresponds to the end of July to beginning of August in many states.

[13]Note that some state-weeks have no executive orders. For our statistical analyses below, because the executive order influences the legal environment, we carry forward the topics across weeks until the legal environment is altered by a new executive order in that state. For these descriptive graphs, however, we utilize just the weeks in which executive orders are issued for states.

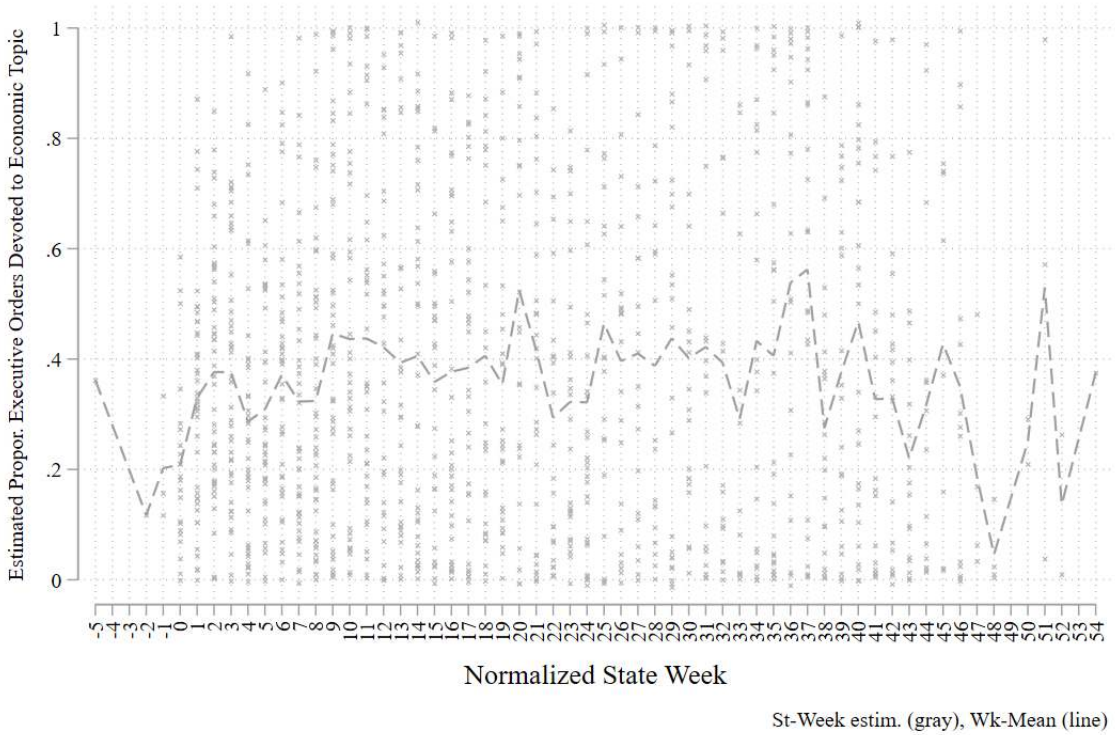


Figure 6 displays the three topics as emphasized over time in each state, in a map format.[14] This plot reveals differences in emphasis across states and over time. Contrast, for example, Idaho and New Hampshire's higher proportion of our health topic, to Nevada and Iowa's preponderance of economic-words, and Hawaii and Georgia's focus on infrastructure. In addition, some states exhibit a great deal of volatility with a number of peaks and valleys across topics such as in Kentucky or Connecticut.

[14]In our supplemental appendices we provide additional descriptive graphs regarding over time and geography variation.


Executive Orders Proportion
Covid Week
Topic
Economy
Health
Infrastructure
Wisconsin
Vermont
New Hampshire
Maine
Washington
Idaho
Montana
North Dakota
Minnesota
Illinois
Michigan
New York
Massachusetts
Oregon
Nevada
Wyoming
South Dakota
Iowa
Indiana
Ohio
Pennsylvania
New Jersey
Connecticut
Rhode Island
California
Utah
Colorado
Nebraska
Missouri
Kentucky
West Virginia
Virginia
Maryland
Delaware
Arizona
New Mexico
Kansas
Arkansas
Tennessee
North Carolina
South Carolina
Oklahoma
Louisiana
Mississippi
Alabama
Georgia
Hawaii
Alaska
Texas
Florida

The next subsection describes how we measured our explanatory variables. They span public health and political economy. We take them in turn.

Public health measures

Obviously, public health concerns should play into how states react to a pandemic. We capture COVID spread, population-based measures and institutional measures. For COVID spread, we measure the COVID case rate out of 100,000 and the weekly case difference compared to the prior week.[15] Our population-based measures are population density (a measure of spread risk)[16] and the obesity rate.[17] imilarly, we measure the capacity of hospitals in the state to handle a COVID surge. We measure capacity as the All Bed capacity per 1,000 people in the state's population.[18]

Because of our theory, which predicts that states will change emphasis over time, we measure all of these variables at the weekly level. However, the population measures do not fluctuate weekly in ways we can measure, justifying our modeling choice, described below, to cluster standard errors at the state level.

Measuring state political economy

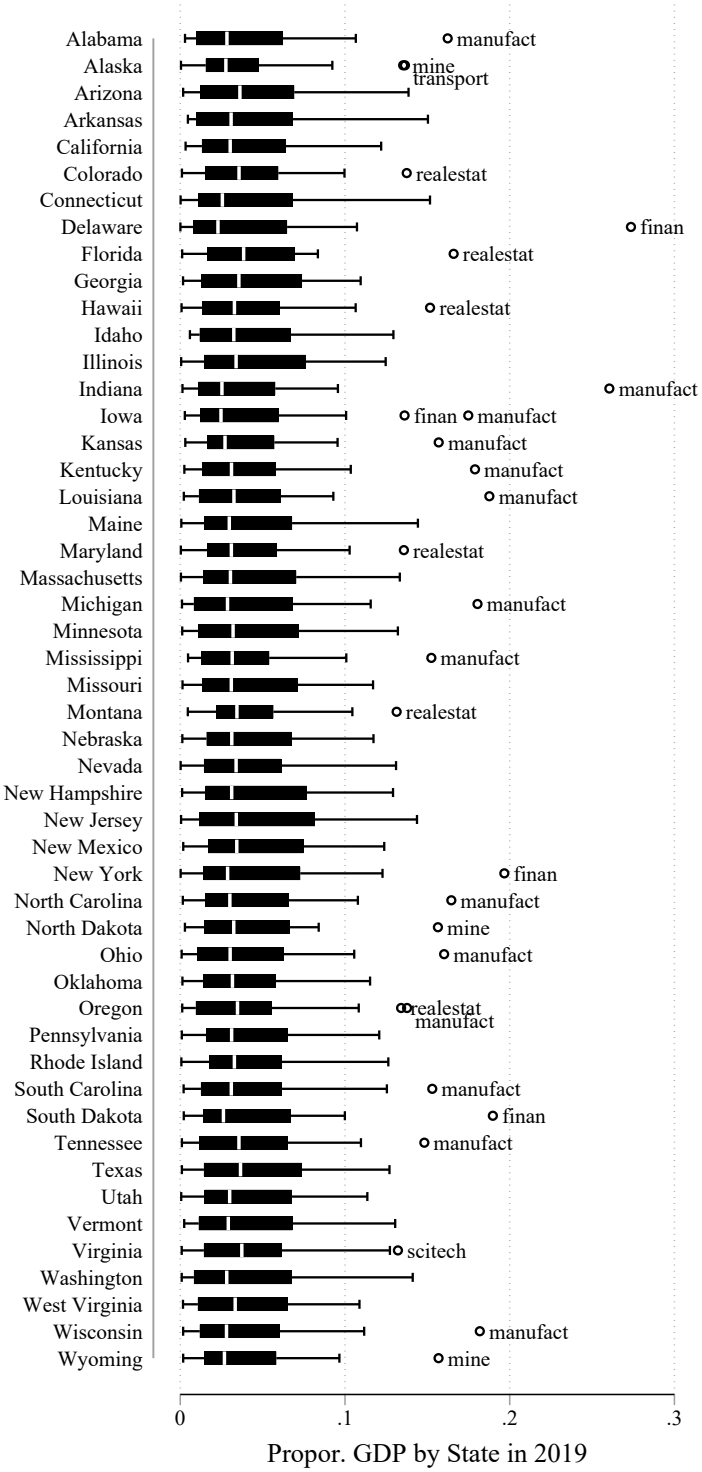
We measure state political economy with (1) electoral pressures on the governor and (2) private capital's pressures on the governor.

We use an indicator of whether a governor is Republican or not and an indicator of whether there is unified government. We also include an interaction between the two variables to capture differences political bargaining environments.

A governor's susceptibility to pressure varies over the electoral cycle and depending on how vulnerable she thinks she is to challengers in her next election. Therefore, we measure political risk of the governor as *weeks until the next gubernatorial election* and prior margin of victory for the incumbent governor (*Electoral Risk* in the model), as well as an interaction between the two.

[15] Source:
[16] Source:
[17] Source:
[18] Source:

We next turn to our measure of the influence of private economic interests in a state. While political influence itself is difficult to measure, we can measure the dominance of an industry. Industries may be dominant in terms of their contribution to the state's GDP, their dominance of the labor market, or both.



To that end, we capture both measures using data from the Bureau of Labor Statistics.

For *industrial economic dominance*, we measure the proportion of the state's GDP in 2019 that the most economically dominant industry – as measured by proportion of GDP – contributes. Figure 7 illustrates the distribution of proportions of GDP represented by the industries in each state. The labeled industries are extreme outliers, which contribute more than 1.5x the proportion of GDP of the 75th percentile industry. A breakdown of the main contributors to each state is in our supplemental appendix, available upon request.

Many states have fairly evenly distributed top three, the easy exceptions being: Delaware, Washington, D.C., and Indiana. For example, in California, manufacturing (0.117), real estate (0.122), and trade (0.107) are the top three industries and in New York the top industries are finance (.197), real estate (.123), and state and local government (.089). Delaware, in comparison, has the same top three as New York, but in different proportions (finance (.274), real estate (.107), and state and local government(.081)). Indiana has the same top three as California: manufacturing (.260), trade (.111), and real estate (.096).

But from Figure 7 , it is easy to see that there are 18 states with outliers in 2019. We consider those to be *private enclaves*. States without a clear outlier have a non-dominant economic pressure group, because we expect that no one industry will pose a risk of capture to the government, and indeed, competition among industries may help prevent capture. We use the this data to test our hypotheses. Each industry contributes a certain percentage to the state's GDP. Our current measure of economic dominance is simply an indicator taking a value of one for those states with an outlier industry.

Analysis

We now describe our methods and test our hypotheses.[19] For our hypotheses–H1a, H2a, H3a, H4a, and H5a–that focus on the proportion of language devoted to each topic (economic, health, and infrastructure), we rely on a panel-adjusted, linear probability model. For hypotheses H1b, H2b, and H3b, which summarize our expectations regarding

[19]Please note that these are our first cut at our analyses and we look forward to refining our approach.

the speed of a stay-at-home executive order, we utilize both panel-adjusted Poisson models (counting the days free of a stay-at-home order or the duration of the order) and Cox proportional hazard models.[20] For hypotheses focused on the likelihood of an advisory stay-at-home order, we estimate our models with panel-adjusted logits.

Testing H1-H5 (a)

H1a through H5a predict that public health, infrastructure and economic language will vary across states and over time based on economic, demographic, political, public health, and institutional pressures.

Our basic regression setup is as follows:

$$H, E, I = \beta_1 L + \beta_2 P + \beta_3 N + \beta_4 F$$

where H, E, I = the proportion of states' EO language categorized as *health*, *economic*, or *infrastructure* in our structural topic model in any given state-week, measured from the first confirmed COVID case in the state; and L = public health variables (average case rate in the state for that week, case rate change over the prior week, and obesity rate in the state), P = the political variables in the state (days until election and governor's margin of victory in the prior election), N = variables measuring the industry presence in the state, and F = the health infrastructure available in that state-week (ICU capacity).

Our unit of analysis is the state-week. We chose to use weekly measures rather than daily measures to simplify our data and because some states released thematically-based executive orders over a few days at a time. A wider scope of observation (here, 7 days), allows us to measure the overall themes in a given week. Because conditions change so quickly in the pandemic, we did not want to go to a longer time frame.

With respect to H1a, we expect economic language will be positively associated with having a dominant economic interest in the state (H1a), negatively associated with Republican governors with a unified state government (H3a), as well as increasing in electoral risk (H4a). In other words, we expect that $\beta_3 > 0$, $\beta_2(Republican) < 0$, and

[20] Competing Risk models are also in progress.

$\beta_2(electoralrisk) < 0$. We expect that, when analyzing the presence of health-type language in the Executive Orders, that the language will be increasing in our public health variables (U), and decreasing in our political variables (P), or that $\beta_1 > 0$ and $\beta_2 < 0$.

H5a predicts that infrastructure language will be increasing with public health risk factors (L) and decreasing in the capacity of the system to handle severe illness (F), or that $\beta_1 > 0$ and $\beta_6 < 0$.

Testing H1-H3 (b)

Hypotheses H1b, H2b, and H3b predict the timing of the executive orders. Specifically, H1b predicts that as the state becomes more of a "private enclave", dominated by one or a few industries, Stay Home Orders will be slower to emerge, conditional on the first COVID case in the state.

We use the same regression as above, with a different outcome variable, D, which is the number of days a state is free of a required stay-at-home order (SAH), or the span of time before the first SAH.

$$D = \beta_1 L + \beta_2 P + \beta_3 N + \beta_4 F$$

We expect that D will be increasing in N, and decreasing in L, or that $\beta_3 > 0$ and $\beta_1 < 0$.

Moving on from our counting and duration models, to test H2c, we currently utilize a 0,1 dependent variable coded as a zero from the first day of an infection in a state through each day that a stay-at-home order is not issued (specifically, a mandatory stay-at-home order for the general population). We rely on the same model framework as listed above, but with a logit estimator. We expect that the probability of issuing a mandatory stay-at-home order is increasing in health risks, or that $\beta_1 > 0$.

1 Results

Recall that we use a panel linear probability model with COVID week fixed effects with robust standard errors clustered by state to examine the influence of our predictors on the proportion of executive order language (by week) that is devoted to the economy (Model 1), health (Model 2), and Infrastructure (Model 3). Our results are presented in Table 1.

	(1) Econ. Topic	(2) Health Topic	(3) Infra. Topic
Dominant Private Interest	−0.019	−0.048	0.064
	(0.092)	(0.087)	(0.062)
Rep. Governor	0.306**	−0.092**	−0.215**
	(0.004)	(0.006)	(0.002)
Unified Govt	0.182*	−0.249**	0.068
	(0.090)	(0.078)	(0.087)
Rep. Governor × Unified Govt	−0.470**	0.566**	−0.097
	(0.093)	(0.073)	(0.095)
Electoral Risk	0.057**	−0.028**	−0.024**
	(0.008)	(0.008)	(0.006)
Time to Election	0.021	−0.016	−0.005
	(0.011)	(0.009)	(0.009)
Electoral Risk × Time to Election	0.032	−0.021	−0.010
	(0.030)	(0.034)	(0.024)
Hospital Capacity	0.125*	−0.095	−0.027
	(0.051)	(0.052)	(0.024)
Obesity Rate	0.010**	−0.001	−0.009**
	(0.003)	(0.003)	(0.003)
COVID Change Rate	0.000	−0.000	0.000
	(0.000)	(0.000)	(0.000)
Constant	−0.217	0.770**	0.438**
	(0.162)	(0.158)	(0.099)
Observations	42,853	42,853	42,853
Chi-squared	17,207	15,359	135,079
rho	0.676	0.648	0.746
r2_w	0.045	0.046	0.034
r2_b	0.051	0.311	0.385
r2_o	0.045	0.244	0.316
Num. Groups	50.000	50.000	50.000
Num. Clusters	50.000	50.000	50.000

Linear Prob. Models with time fixed effects.

Robust s.e., clustered on state with $^{p} < 0.10, *p < 0.05, **p < 0.01$.

Contrary to our expectation in Hypothesis 1a, we find no significant association between the presence of a dominant economic interest (measured by whether a state has boxplot outliers), and the proportion of executive order language that focuses on the economy. In fact, our measure of a dominant interest does not appear to be influential across any of these three models. One possibility, is that having one dominant private entity in a state does not yield language that is responsive to that interest. Another possibility is that the degree to which private industry in the state dominates the interest landscape is not simply about the degree to which they contribute to the gross state product in a year (i.e., we have not adequately measured our concept).

In our next hypothesis regarding executive order emphasis (H2a), we expected a higher degree of health language as obesity rates (one comorbidity with a higher risk of COVID complications). Further, we expected that as COVID change rates increased, we would see additional language devoted to health. As we show in Table 1 Model 2, we do not find support for either aspect of this hypothesis as we cannot reject the null hypothesis of no association between either variable and the proportion of language devoted to health.

Interestingly, however, we do find a larger emphasis on the economy (Model 1) and a reduced emphasis on infrastructure (Model 3) as obesity rates increase. More specifically, holding our other covariates at their mean, we find an increase of obesity rates by one unit (measured here as percentage of the population categorized as obese), is associated with approximately a one percentage point increase(decrease) in the degree to which orders discuss the economy(infrastructure).

We posited that Republican governors would be more likely (especially with a unified government) to lean heavily on economic words, whereas Democrats would do the same for health words. We find, in fact, the mixed results. First, Republican governors with a divided government are positively associated with a larger emphasis on the economy (specifically, increasing the proportion of economic words by 0.31 compared to Democrats with a divided government). Those same divided Republican governors (as expected) have significantly reduced focus on health in executive orders compared to divided Democratic governors with a reduction of 0.09 in the overall proportion. In other words, in an ex-

ecutive order with 1000 words, 90 less would focus on health. Unexpectedly, though, we find switching from divided to unified Democratic governors is associated with a significant decrease in the proportion of words in gubernatorial orders that focus on health (by 0.249). And, Republican governors with a unified government have a significantly higher (compared to divided Democrats) proportion of words devoted to health, whereas unified Democratic governors have a significantly higher proportion of words devoted to the economy compared ot divided Democrats. Overall these results suggest the political environment may impact the words chosen in executive orders in more nuanced ways than we have argued. We do find increasing electoral risk is positively associated with an economy focus and negatively with a health focus, but seemingly, unified governments may offer governors from both parties additional leeway to craft the words chosen in their executive orders. Perhaps because the legislature takes some of the burden off of governors. Alternatively, governors with a unified legislature may be able to pursue additional voters and supporters by focusing on topics outside of their party's usual wheelhouse.

In line with our expectation in H5a, we find a negative relationship between increasing hospital capacity and the degree to which gubernatorial orders discuss infrastructure concerns, although the finding does not reach traditional levels of statistical significance (Model 3). In our model examining economy as a topic in executive orders, though, we find that increasing hospital beds available by 1,000 beds per resident population yields an increase in the proportion of the language devoted to the economy in executive orders by over 0.125 (Model 1).

	(4) Days w/o SAH	(5) Length of SAH	(6) Advisory SAH
main			
Hospital Capacity	0.069	0.264	0.844**
	(0.184)	(0.143)	(0.271)
COVID Change Rate	24.851*	−13.384*	−44.098
	(9.856)	(6.378)	(24.328)
L.COVID Case Rate	0.081	−0.050**	−0.151
	(0.058)	(0.009)	(0.083)
Rep. Governor			1.083
			(0.910)
Unified Govt			1.246
			(0.662)
Rep. Governor × Unified Govt			−1.624
			(1.219)
Electoral Risk			0.418
			(0.244)
Time to Election			0.270
			(0.233)
Electoral Risk × Time to Election			−0.182
			(0.398)
Obesity Rate			−4.275
			(7.613)
Constant	0.664	0.224	−1.041
	(0.475)	(0.418)	(3.197)
/			
lnalpha	−1.139**	−1.061**	
	(0.223)	(0.218)	
Observations	50	44	124
Chi-squared	408.478	309.290	84.713
Log lik.	−286.591	−429.872	
Num. Groups	50.000	38.000	50.000
Num. Clusters			

Robust standard errors, clustered on state with $^{p} < 0.10, *p < 0.05, **p < 0.01$.

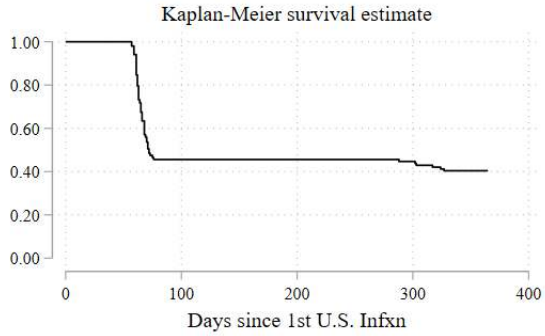
We highlight our count models and the panel-adjusted logit model in Table 2. We find increased capacity is associated with a higher probability of an advisory stay-at-home order, but otherwise we find no significant association in Model 6. In Table 3 we estimate the predicted average marginal effects of a change in one unit for each of our predictors on the count of days for Models 4 and 5.We find a positive association between increasing hospital capacity and the number of days before a stay-at-home order is issued

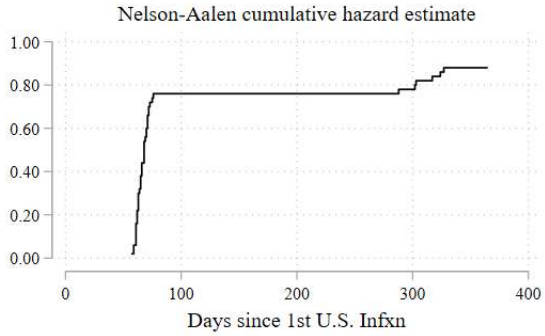
as well as with increasing change rates (week on week) and case rates (lagged one week). We only find a statistically significant relationship between change rates and the span of days before a SAH. With respect to the length of a SAH order, we find a statistically significant and negative association with increasing change rates and case rates.

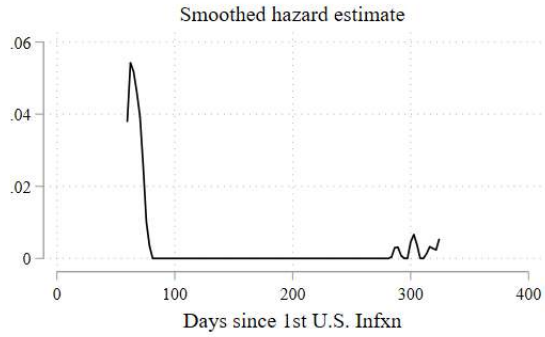
	(M4 Num. Days No SAH)	(M5 Length SAH)
Hospital Capacity	37.37	18.26
	(106.978)	(9.927)
COVID Change Rate	13450.3**	−927.4*
	(4685.801)	(444.756)
L.COVID Case Rate	44.06	−3.442**
	(22.602)	(0.685)
Observations	50	44

Robust s.e. clustered on state with $^{p} < 0.10, *p < 0.05, **p < 0.01$.
Average Marginal Effect on Predicted Num. of Days for Each Model.

To further examine the duration of and timing of stay-at-home orders, we begin with a few descriptive graphs of survival and hazard rates.



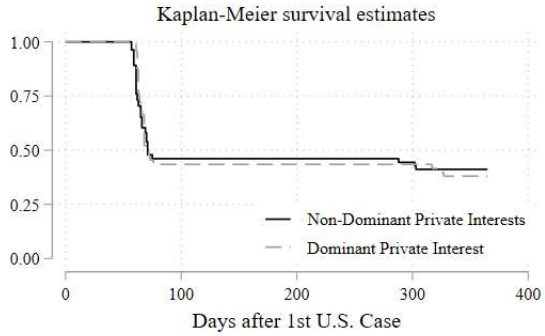


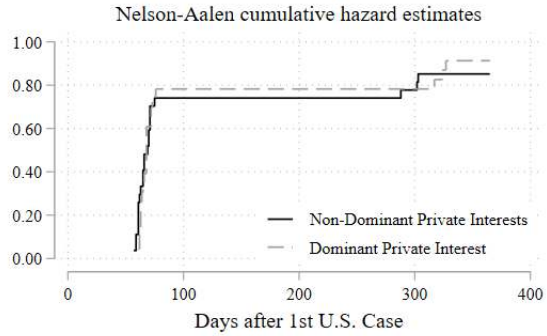


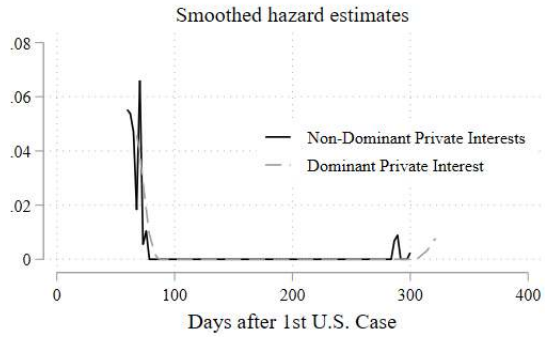
Examining the hazard estimates in the cumulative hazard and smoothed hazard plots reveal there are two segments of increased hazard of a required stay-at-home order: just before day 100 and again around day 300, albeit with a much lower peak. In the cumulative

hazard graph there is a sharp slope from week 50 through 75, followed by a flattening of the curve, and another, much slower increase around day 300. Thus, we can see the risk of a required shutdown happens around 50-75 days after the first US infection, after which there is a second shutdown period in the late fall 2020 and early winter of 2021.

Given our expectation that economic pressure has an impact on the timing of stay-at-home orders, we also example subsample plots.







We find that states with a more competitive private interest landscape more quickly initiated a required stay-at-home order for the general population in comparison to dominated states. States with a dominant private interest, however, reveal a larger spike in the hazard probability around April 1, 2020.

	(7) Time to SAH	(8) Time to SAH
Dominant Private Interest	1.189	1.150
	(0.207)	(0.172)
Rep. Governor	0.427*	0.334*
	(0.151)	(0.144)
Unified Govt	1.024	0.882
	(0.239)	(0.215)
Rep. Governor × Unified Govt	1.490	1.981
	(0.636)	(0.879)
Electoral Risk	0.955	1.081
	(0.091)	(0.096)
(mean) daystoelect	1.000	1.000
	(0.000)	(0.000)
Electoral Risk × (mean) daystoelect	1.000	1.000
	(0.000)	(0.000)
Hospital Capacity	0.722*	0.783
	(0.106)	(0.115)
Obesity Rate	1.013	1.013
	(0.015)	(0.014)
COVID Case Rate (100k, Raw IHME)	0.986	0.988
	(0.018)	(0.019)
Observations	18202	18202
Chi-squared	100.7	51.44
Log lik.	−163.9	−132.9
Num. Clusters	50	50

Cox Propor. Hazard Models, Robust standard errors, clustered on state with $^p < 0.10, *p < 0.05, **p < 0.01$.
Models examine 1st SAH and control for propor. economic, health, and infrastructure language.
Model 9 incorporates strata by urbanicity.

We examine the hazard ratios where analysis time ends at the adoption of the first stay-at-home order in the state. Although we still find a positive relationship with dominant private interests in the state and survival time, we cannot reject the null of no effect in this case. Focusing on Model 8, Republican governors with divided government have a 57.3 percent lower rate of SAH, compared to unified Democratic governors. As hospital capacity increases by 1000 beds, and all other variables are held constant, the rate of SAH decreases by 27.8 percent. In sum, we do not find support for H1b, that states with concentrated and powerful economic interests will be slower to issue COVID-19 Stay Home orders nor do we find support for H2b that states with higher health risks for residents

will have a faster rate of SAH. We do find some support regarding Republican governors (H3b), but only for with a divided government.

Discussion and Conclusion

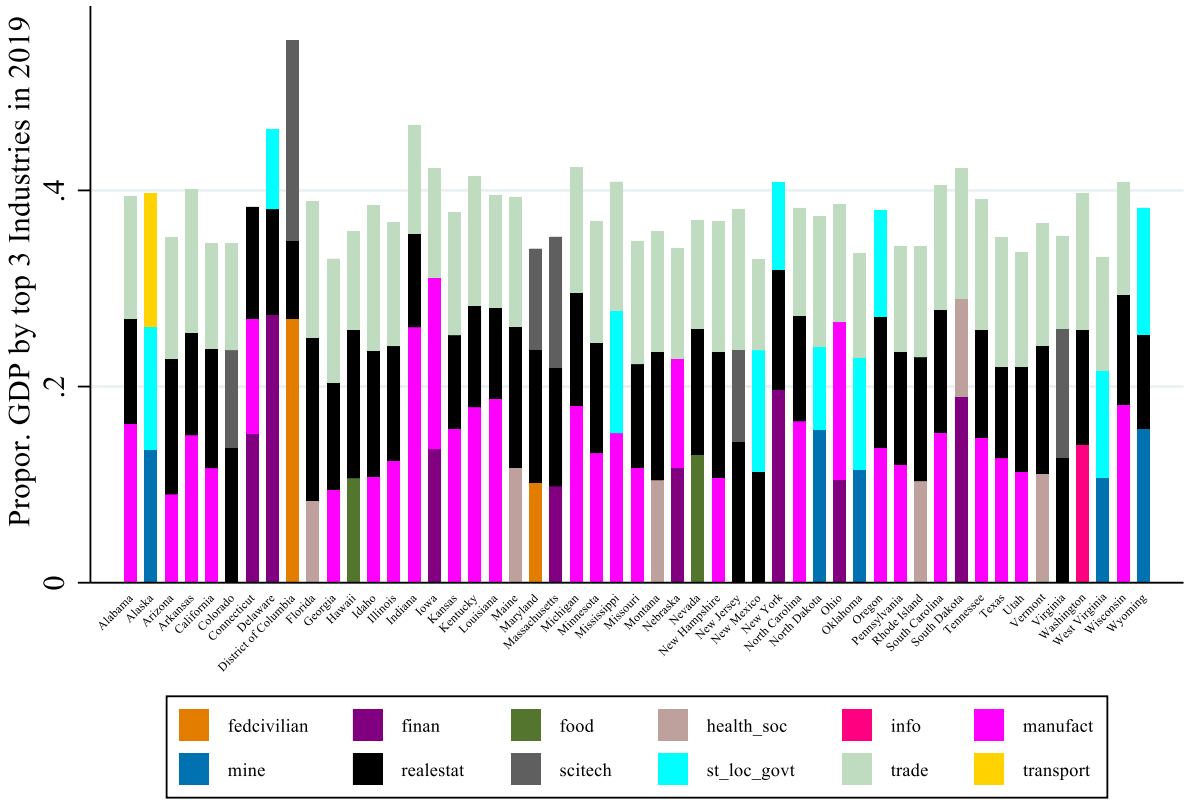
While we are clearly still working on this, even at this early stage it is clear that some of our predictors correlate with the prevalence of health, economic and infrastructure language. In this early-state project, we show that COVID executive orders are associated with features of the state's political economy.

We have much more work to do on this project and with these data. Future versions of this work will analyze which industries were more likely to have exemptions from the SAH orders and whether those industries were associated with important features of the state's political economy, or whether the relationship between industry and state is mediated by public health, structural protection for public health, other political pressures, and the fluctuating COVID situation.

It is easy to lose track of the forest for the trees in a project like this. But explaining the relationship between a state's political economy and its response to a global pandemic is important. Over a million Americans, and over six million people worldwide, have died from this disease. Particularly in the days before the vaccine was widely available, governors' responses could affect whether a vulnerable person was more or less exposed to the disease.

Appendix

Top Three Industries Per State, by Proportion GDP, in 2019



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