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Research Paper

Understanding the impact of COVID-19 intervention policies on the hospitality labor market

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ABSTRACT

Using new high-frequency data that covers a representative sample of small businesses in the United States, this study investigates the effects of the COVID-19 pandemic and the resulting state policies on the hospitality industry. First, business closure policies are associated with a 20–30% reduction of non-salaried workers in the food/drink and leisure/entertainment sectors during March-April of 2020. Second, business reopening policies play a statistically significant role in slowly reviving the labor market. Third, considerable differences exist in the impact of policies on the labor market by state. Fourth, the rise of new COVID-19 cases on a daily basis is associated with the continued deterioration of the labor market. Lastly, managerial, practical, and economic implications are described.

1. Introduction

The hospitality industry plays an essential role in the U.S. economy and labor market. In 2017, it supplied around 20% of the U.S. GDP and employed about 30% of the U.S. labor force (International Trade Administration, 2018). The contact-heavy nature of service industries leaves them vulnerable to unforeseen circumstances, particularly to infectious diseases, such as COVID-19, which originated in China during December 2019 and quickly spread to the rest of the world (Benzell et al., 2020). As a result of the pandemic, national quarantine measures led to a significant decline in job postings and employment throughout the entire U.S. labor market (Kahn et al., 2020). Employment in leisure and entertainment (e.g., small museums, miniature golf locations, dance companies, small amusement centers, historical sites, etcetera) in the U. S. has declined by 56%, and employment in accommodation and food services (e.g., family-owned restaurants and bars) plummeted by 53% between February 15th and April 11th (Cajner et al., 2020). Moreover, the World Travel and Tourism Council estimates anywhere from 98 to almost 200 million travel and tourism jobs are in jeopardy worldwide (WTTC, 2020), and McKinsey and Company (2020) forecast that 44–57 million U.S. jobs across all industries may be impacted by the pandemic, where roles in food services and accommodation are predicted to be the most drastically affected.

While there is evidence that the resulting state mitigation policies to combat COVID-19 have reduced the spread of the virus (Courtemanche et al., 2020), it has come at a cost. Political differences have resulted in the adoption of extreme, one-size-fits-all state policies in the form of stay-at-home orders (SAHOs) and nonessential business closure policies, which have had profound effects on economic activity (Makridis and Rothwell, 2020). While states have begun reopening their economies, the recent surge in infections has raised calls for modified quarantine policies. In this sense, understanding the quantitative effects of state restrictions and reopening policies on economic activity is especially timely and vital.

A data-driven approach is used to address the following questions:

1. How do business closure and business reopening policies affect employment in the hospitality industry?

2. What are the characteristics of the labor market trends amid COVID-19?

This paper makes the following contributions. First, new, high-frequency payroll data is introduced and linked with information on the number of COVID-19 cases, deaths, and other state-level intervention policies from March to June of 2020. This finding documents the recent patterns in labor market activity among small businesses concentrated in the hospitality industry. Second, variations in the

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adoption of state policies are exploited, allowing for heterogeneity across industries, to assess how different approaches have affected the labor market. Third, practical implications and recommendations for small businesses in the hospitality and tourism sectors are provided that seek to assist in safely reopening in the context of COVID-19.

2. The hospitality industry and infectious diseases

Although it serves as the most recent reminder, COVID-19 is not the only infectious disease the world has experienced since the new millennium began. Echoes from the past include but are not limited to the severe acute respiratory syndrome (SARS) disease in 2003, the H1N1 influenza pandemic during 2009, the Ebola outbreak in 2014, and the Middle East Respiratory Syndrome (MERS) during 2015. Concern related to diseases and their economic effects on travel and tourism is not an unpopular topic, as much literature gravitates toward disease-related discussion (Bloom and Cadarette, 2019; Fauci and Morens, 2012; Hall, 2019; Page and Yeoman, 2007).

General effects to consider when confronted with infectious diseases include ease of diffusion, mortality rate, the age group most affected, the most likely medium of transmission, and how the media's representation of a disease affects people's perceptions that influence travel-related decisions. Additionally, the fear associated with contracting the disease, as well as the fear connected to contributing to the diffusion of the disease, which can affect trade practices and foreign investments, must be evaluated (Bloom and Cadarette, 2019). Relative to traveling, Tatem et al. (2006) point out that modern forms of transportation afford people the luxury to travel around the world easily; however, it is this advantage that similarly increases the mobility of diseases. Hall (2010) generally agrees by emphasizing that the hypermobility of tourism and the interconnectedness of the world's economy could invite more sub-optimal crisis-related circumstances in the future. Gössling et al. (2020) identify modern practices that may give rise to more pandemics in the future, which include transportation methods, the density and concentration of people, processes in the food and beverage industry, food consumption characteristics, and the rate at which the population of the world is increasing. To understand previous diseases and their effects on the hospitality and tourism industry, a look toward the past helps to frame the historical context.

2.1. Severe Acute Respiratory Syndrome (SARS)

During 2003, the World Health Organization (WHO) warned the world about the risks related to traveling to China due to the SARS outbreak in the country. Tourists elected to keep their distance as the media spread the news and presented the dangers associated with traveling to the area at the time. The level of preparation was not sufficient and called for China's economy to largely close. Ultimately, the Center for Disease Control and Prevention (CDC) says the disease ended up traveling to 29 countries with a total of 8098 cases around the world, with only eight occurring in the U.S. (CDC, 2017). The disease claimed around 800 lives worldwide (WHO, 2006), and a vaccine was developed just as SARS began to disappear. Ultimately, the SARS situation died down after several months, but severely impacted China's economy for a short while. Before SARS in 2002, tourism provided about 5.4% of the GDP of China, which at the time amounted to just over $67 billion; in the time after the pandemic, estimations reveal China experienced almost a $17 billion reduction in tourism revenue (Zeng et al., 2005).

Internationally, the effects of SARS on the tourism industry in some countries were felt as well. Toronto, Canada, was forced to respond to the situation by reducing costs, which included layoffs and closing businesses or parts of companies. Over 12,000 hospitality and tourism jobs were eliminated, mostly affecting food and beverage and accommodation workers, while other sectors endured severe reductions in working hours (Tew et al., 2008). Additionally, Tew et al. (2008) state, "The tourism fear factor related to Canada as a destination choice was felt nationwide even though the crisis was isolated in the Toronto region" (p.335). The lastingness and overgeneralization of such a fear-related effect could slow recovery across the tourism industry as travelers remain wary and choose to stay away from a region entirely. The story of SARS shows how being caught off-guard can be extremely detrimental to a country's economy and demonstrates how taking extreme measures early on, such as closing down businesses and public venues, could prevent a disease from spreading further. Zeng et al. (2005) state that after experiencing such a crisis that an affected area must intensively market its offerings to attract tourists, an area in which it seems the tourism industry succeeded as it rapidly bounced back in less than seven months.

2.2. H1N1 (Swine Flu)

First detected in Mexico in 2009, the H1N1 pandemic spread to the U.S. fairly quickly. One study estimates a wide range of deaths from the virus's first appearance, between 150,000–575,000 around the world (CDC, 2012), with approximately 13,000 in the U.S. out of over 60 million cases in the country (CDC, 2019b). This situation resulted in the implementation of measures similar to the ones in China during SARS, where travel was restricted, and Mexico had no choice but to lock itself down. Unfortunately, H1N1 aligned itself with a global financial crisis, making times particularly challenging for Mexico because, at the time of H1N1, tourism was Mexico's largest service industry and contributed 8% to the country's total GDP. Mexico lost about $665 million in tourism receipts as a result of the disease (Rassy and Smith, 2013). When compared to SARS' impact on China, H1N1's effect on Mexico proved to be far more devastating due to the Mexican economy's reliance on the hospitality and tourism industry, where leisure activities, restaurants, and hotels were the most severely affected areas (Monterrubio, 2010).

Internationally, some of the world's top tourist destinations suffered major losses due to H1N1; the U.S. lost around $250 million, Canada lost $31 million, and the United Kingdom (U.K.) lost almost $20 million (Rassy and Smith, 2013). Mexico implemented tax cuts for businesses and planned major investments in marketing and advertising to promote over 100 popular destinations in the country to once again attract tourists to inject cash into the economy (Monterrubio, 2010). Even though Mexico essentially shut itself down in an effort to prevent further devastation, the detrimental economic effects were ephemeral. As Rassy and Smith (2013) state, "Shocks were relatively easy to absorb by the affected sectors" (p.832), where the perception of risk related to the disease plays an important role, and marketing strategies become imperative to restore lost confidence.

2.3. Ebola Virus Disease

Ebola, the deadliest disease covered in the discussion, was first noticed in Guinea, located in West Africa toward the end of 2013, and soon became an outbreak in early 2014. The CDC reported almost 29,000 cases of Ebola around the world and nearly 12,000 deaths; the U.S. was relatively spared with eleven cases and two deaths (CDC, 2019a). This disease was particularly iniquitous as 20% of the total number of cases identified were children. Ebola called for the use of personal protective equipment, as well as abstaining from contact with infected individuals and wild animals. Baker (2015) shares that the World Bank estimates that Guinea, Sierra Leone, and Liberia collectively lost almost $1.6 billion due to the epidemic and that as a continent, Africa's return to grace in the eyes of travelers would not be so simple. Africa is the second-largest continent in the world. Yet, many travelers associate the risk of contraction with visitation to any African country, even ones that were not close to the affected areas. Sifolo and Sifolo (2015) similarly state that even though Guinea, Sierra Leone, and Liberia are not considered particularly dependent on tourism, the African continent as a whole suffered due to the international perception of Ebola. Ultimately, countries such as South Africa and Kenya suffered losses in tourism

revenue. This effect is similar to the one noted by Tew et al. (2008) during the SARS crisis in Toronto, where fear propagates and proves its power by preventing people from traveling.

2.4. Middle East Respiratory Syndrome (MERS)

In South Korea, during 2015, a traveler who was returning home from the Middle East arrived with a virus that resulted in an outbreak of MERS involving about 186 cases and about 38 deaths. Heightened concerns related to MERS and its spread lasted for a couple of months as people were quarantined for safety to reduce the diffusion of the disease, and travel advisories were issued. In terms of tourism, Joo et al. (2019) estimate that due to the MERS outbreak, the Republic of Korea (ROK) missed out on over 2 million tourists and lost around $2.6 billion in revenue; however, it did not significantly affect overall GDP growth for the ROK during 2015, where it actually experienced relative growth of 5% compared to the previous year, which is likely due to the ROK not being a heavily tourism-dependent region. It should be noted that since the outbreak, MERS has continued to infect individuals periodically, and WHO confirms almost 2500 cases and 900 deaths around the globe (WHO, 2019).

2.5. Coronavirus disease 2019 (COVID-19)

In China, toward the end of 2019, patients with upper-respiratory system ailments began frequently showing up in hospitals. Stay-at-home and lockdown measures were put into action in the region of origin, Wuhan, China; however, international travel had already played its role in spreading the deadly virus as it was found to be present in over 140 countries around the world during March 2020. Without any vaccination available or any other universally effective treatment option, the world was caught off-guard. As of this writing, the U.S. leads the world in total cases, with almost 5.5 million confirmed cases and more than 160,000 deaths (CDC, 2020a). Around the world, there are currently over 21 million cases and 771,000 related deaths (WHO, 2020). The virus continues to spread as pharmaceutical companies scramble to discover a vaccine.

Relative to the labor market and employment, data released by the United States Bureau of Labor Statistics (BLS) indicates that as of May 2020, around 5.5 million people are unemployed in the leisure and hospitality supersector, which includes areas such as arts, entertainment, recreation, accommodation, and food services (BLS, 2020a). Furthermore, the devastation to this sector brought on by COVID-19 is highlighted when examining the unemployment rates in April and May 2020, revealing rates of about 39% and 36%, respectively. During the previous decade, the highest industry unemployment rate occurred during January 2010 at 14.2% (BLS, 2020b). While the sector managed to significantly lower its unemployment rate throughout the last ten years, unfortunately, COVID-19 has devasted the industry's labor market, and the lasting effects remain to be seen.

Therefore, the following hypotheses are developed:

H1. The increase of daily new COVID-19 cases, all else equal, is associated with the decline of employment in the hospitality industry.

H2. The state-level business closure policy, all else equal, is associated with the decline of employment in the hospitality industry.

2.6. Resilience, resistance, and reopening

Gössling et al. (2020) state that the SARS and MERS events reveal no significant long-term effects related to tourism development and that if nothing else, the situations might highlight the resiliency of the tourism industry when it comes to adapting to and surviving such circumstances; however, they warn against overgeneralizing the same logic to COVID-19, as each disease is different and it seems diseases are developing at higher rates. Similarly, Zeng et al. (2005) say, "While tourism appears to exhibit little resistance but considerable resilience, its recovery post-crisis does need some special strategies to cope with long-term impacts" (p.307). This is demonstrative of how the industry must not only rely on its resilience but also begin fortifying its resistance to unforeseen circumstances, especially disease outbreaks that could affect a large portion of the world's population. Relative to costs and recovery for crises related to infectious diseases, Joo et al. (2019) describe that, "Costs may depend on the specific infectious disease, country-specific behavioral responses to infectious disease threats, and country-specific industry composition, population density, and healthcare infrastructure" (p.107). Chillingly, in an extreme case, Bloom and Cadarette (2019) warn that the World Bank believes a pandemic where around 28 million people die could cause a global GDP loss of about 5%. The world's industries and economies must be aware of the increasing number of potential threats lurking in the future. Preemptive policies and actions should be refined to reduce the calamitous effects of a novel disease.

The features of each state in the U.S. in terms of factors such as population and industry-related geography must be taken into account when considering resilience, resistance, and reopening across the country. State populations vary widely; they range from over 39.5 million (California) down to approximately 580,000 (Wyoming) (United States Census Bureau, 2020). Population aside, states further differentiate themselves through the agency of the industries which they possess and the businesses that drive their economies. While some inherent advantages may be endowed by a state's physical features due to its location and geographical characteristics (i.e., Idaho's climate is suitable for growing potatoes), so too can the migration of particular types of businesses enhance or alter the industrial "landscape" of certain a state (i.e., Silicon Valley becoming a hub for innovation in California). Since states are unique in terms of their industries and population size, their resilience and resistance may depend on the nature of the industries on which they rely, and how vulnerable the industries are relative to the safety measures necessitated by the COVID-19 pandemic. Ultimately, these differences could affect policies and procedures regarding reopening on a case-by-case basis. For instance, about 10% of Florida's GDP stems from tourism-related activities, while Texas heavily depends on its manufacturing, as well as its mining, oil, and quarrying industries (Lang, 2019). Labor market recovery and reopening strategies in Florida and Texas could look very different due to their relative industry differences. Furthermore, the sheer number of people that each state must safely organize and oversee during reopening may call for distinct procedures and rates for reopening. In this context, the following hypotheses are developed:

H3. The state-level business reopening policy, all else equal, is positively associated with the recovery of the labor market.

H4. The state-level business closure and reopening policies cast differential impacts on the labor market across states.

3. Data

This study integrates three primary data sets from different sources to shed light on the dynamics of the labor market amid the COVID-19 pandemic:

3.1. HomeBase employment data

Homebase is a company that provides virtual scheduling and time-tracking tools for contracted, small-to-medium firms (e.g., number of employees below 10). The Homebase data received by the authors includes anonymized employment data, such as daily working hours and locations. While the coverage in some sectors (e.g., professional services) is weak, the data is reasonably representative of the non-salaried workforce, particularly in the hospitality industry (Chetty et al., 2020). This paper focuses on two sector categories in the data: (1) food and

drink and (2) entertainment and leisure. This data set covers 47 states and Washington, D.C.; data about Virginia, Iowa, and Arkansas is not included. The data that the authors received ranges from March 1, 2020, to June 13, 2020.

3.2. State policies data on COVID-19

Official announcements from state governments regarding COVID-19 intervention policies and the implementation dates were identified by checking states' websites. Dates on nonessential business closure, business reopening, and stay-at-home/shelter-in-place policies were collected for 50 states and Washington, D.C. All the states and Washington, D.C. have designated specific dates for nonessential business closure and business reopening; only seven states (such as Iowa and Arkansas) did not have the stay-at-home/shelter-in-place policy.

3.3. Daily data for COVID-19 cases

Data related to COVID-19 cases and deaths by state were obtained from the website of the Center for Disease Control and Prevention, as their information is updated daily (CDC, 2020a).

4. Descriptive evidence and stylized facts

The Homebase employment data are aggregated at the state level with the following critical variables reported daily: number of open businesses, number of non-salaried employees, and non-salaried employees' total working hours. The daily percentage changes in open businesses, non-salaried employees, and working hours are calculated relative to the averages of the same day of the week in January of 2010. There are significant firm shutdowns, layoffs, and working hour reductions from March to April of 2020 (Fig. 1).

The leisure industry is most affected by COVID-19 (about 66% firm shutdowns, and a 76% reduction in non-salaried employees, and 75% working hour reductions in April), followed by food and drink services. This is likely attributable to combined factors such as the decline of consumer mobility, fear of contracting and spreading the disease, and state intervention policies (e.g., the stay-at-home/shelter-in-place order and nonessential business closure in April). New COVID-19 cases and daily deaths show signs of leveling from April to early June (Fig. 2); there is an upward trajectory of open businesses, non-salaried employees, and employees' working hours (Fig. 1). This trend is visually aligned with company reopening policies issued by different states. Additionally, South Carolina is the first state that reopened businesses (April 20th, 2020), and Delaware is the last that reopened businesses (June 1st, 2020).

5. Methodology and empirical approach

5.1. Modeling national trends

To understand the roles that state policies and daily COVID-19 cases play in influencing the labor market, the following mixed-effects regression models for state-level longitudinal data for two sectors (food/drink and leisure/entertainment) are developed. Each sector is tested separately. The percentage change of daily working hours, number of open businesses, and non-salaried workers are respectively used as dependent variables. States and dates of reporting are included as categorical indicators to control for state-specific characteristics and inherent seasonality of the employment data. The structure of the regression models is represented as:

$$y_{ijk} = \beta_{0j} + \beta_{1j} \cdot p_{ik} + \beta_{2j} \cdot c_{ik} + s_i + d_k + \varepsilon_{ijk} \quad (1)$$

Where y_{ijk} represents the percentage change of working hours/open businesses/non-salaried workers for state i, industry j on date k compared with the averaged days of January. p_{ik} is a binary indicator of a state policy in effect in state i on date k. c_{ik} refers to the number of

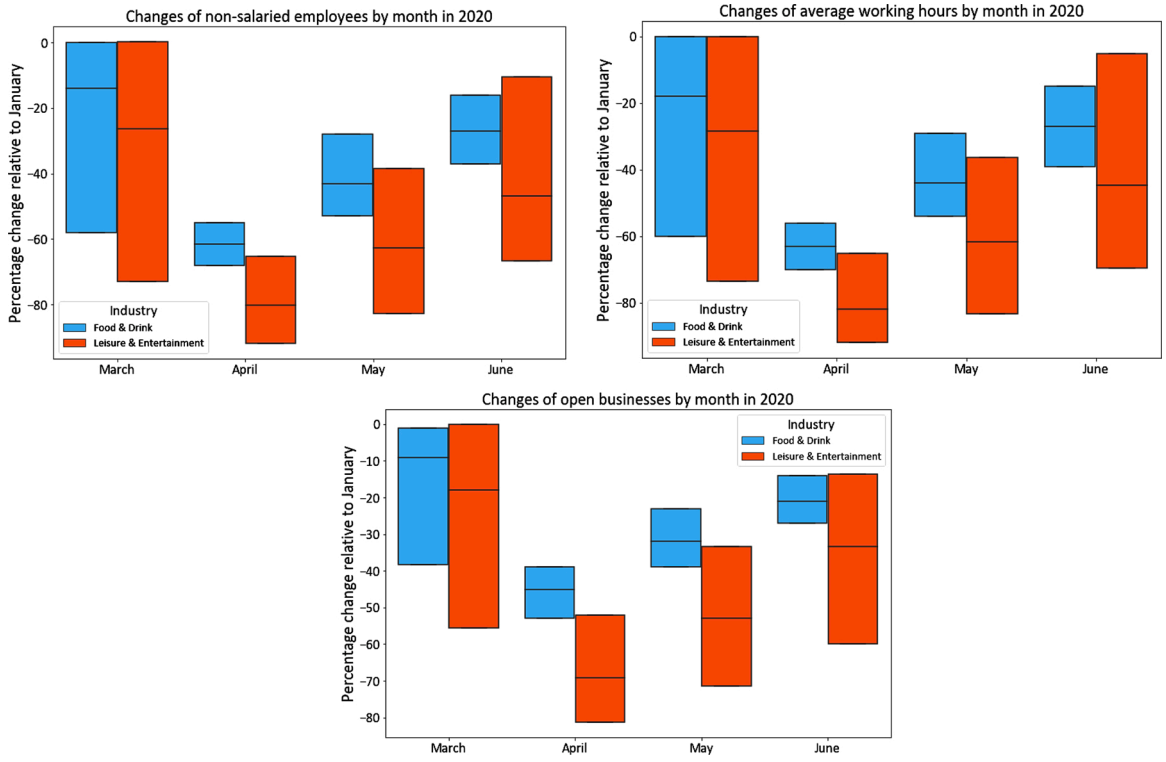


Fig. 1. Summary statistics on the percentage changes of average daily working hours, open businesses, and the number of non-salaried employees from March to June of 2020 relative to January of 2020 for the food/drink and leisure/entertainment industries. Three levels of each variable (upper bound, mean, and lower bound) by month are reported for each industry.

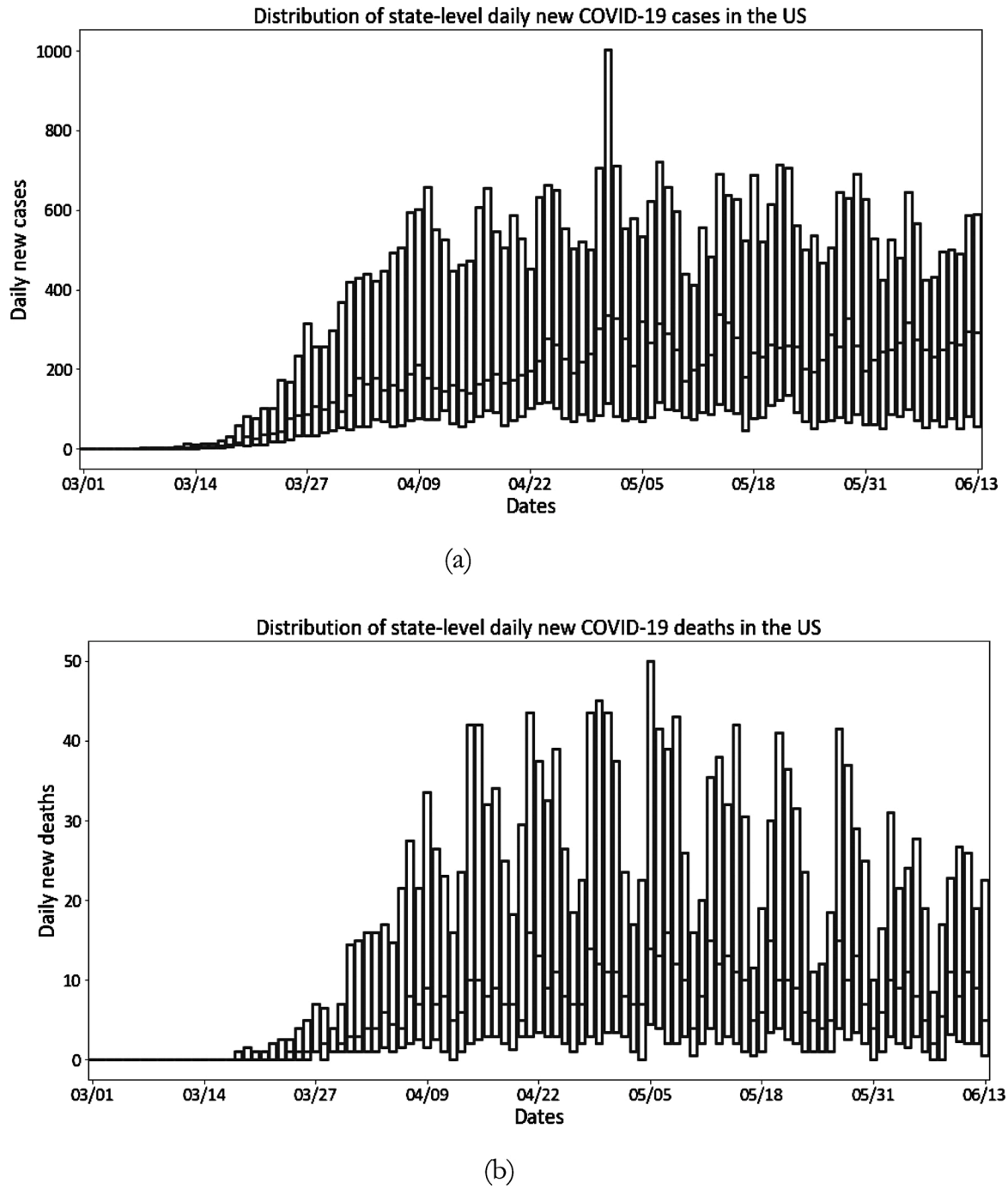


Fig. 2. State-level daily new COVID-19 cases (a) and daily new deaths due to COVID-19 (b). Three levels of the daily counts (upper bound, mean, and lower bound) are reported.

daily COVID-19 (in the natural logarithm form) in state i on date k. s_i and d_k respectively describe the fixed effect for state i and date k. ε_{ijk} is a normally distributed white noise error term. β_{0j}, β_{1j}, and β_{2j} are parameters (state averages for industry j) to be estimated. Standard errors are clustered at the state level to allow for arbitrary degrees of autocorrelation (Bertrand et al., 2004). Two sets of models are tested. One set of models focuses on the data from March 1st to the date before business reopening in each state; p_{ik} refers to the nonessential business closure policy for state i on date k, where 1 means this policy is in effect and 0 otherwise. The other set of models use the data from the date after business closure through the latest date in the dataset (June 13th); p_{ik} indicates the business reopening policy in state i on date k (1 means in effect and 0 otherwise).

5.2. Modeling state-level differences

After understanding the overall policy impact at the national average level, this study further explores the differential impacts of business closure/reopening policies on the labor market among the states. The model is run separately for each state i and for each industry j, so only the fixed effect for seasonality is included. This model is represented as:

$$y_{ijk} = \beta_{0ij} + \beta_{1ij} \cdot p_{ik} + \beta_{2ij} \cdot c_{ik} + d_k + \varepsilon_{ijk} \quad (2)$$

Compared with Eq. (1), the parameters β_{0i}, β_{1i}, and β_{2i} are different

for different states. d_k denotes the fixed effect for date k. This analysis is based on states adopting intervention policies at different times, which is conducive to within-state variations of the labor market conditions before and after the implementation of the policies. Additionally, state-level recovery signs are compared, given that some states have reopened sooner than others. Similar to Section 5.1, the business closure policy and business reopening policy are tested separately for the two periods of data.

6. Main results

6.1. National trends

Table 1 shows the regression results by industry for the business closure policy. The signs of the estimated coefficients are consistent across all models. Overall, the implementation of the business closure policy is associated with an approximately 15–30% reduction in non-salaried employees, working hours, and the number of open businesses. The most significant blow is related to the leisure industry (close to a 30% drop), followed by the food and drink industry. Additionally, the number of daily COVID-19 cases is negatively associated with all the dependent variables during the study period, showing the lasting effect of the pandemic on the hospitality industry.

Furthermore, the correlations between daily COVID-19 cases and business closure policies suggest that the closure policies limitedly contribute to reducing the spread of COVID-19. However, other confounding factors, such as insufficient testing sites at the beginning of the outbreak and the lag between testing and result reporting, may have impacted this result.

Table 2 exhibits the results of the regression by industry for the business reopening policy. The implementation of the business reopening policy seems to contribute to the recovery of the labor market, as it is associated with about a 20% increase in non-salaried employees, working hours, and open businesses. Note that the recovery rate of the leisure industry is only about similar to other industries, given that it has received the most significant impact from the business closure policy in the previous stage. The number of daily COVID-19 cases is still negatively associated with labor market performance. Thus far, all three hypotheses proposed in this paper are supported. The regional differences in the labor market conditions under these policies are discussed in the following section.

6.2. Regional differences

The results from Eq. (2) for 47 states and Washington, D.C. by industry are represented in Figs. 3 and 4. All the coefficients have consistent signs and similar values for all three dependent variables; therefore, only the results for daily working hours are reported. The state policies exert different levels of impact on the labor market for different states. For example, the coefficient related to the business closure policy for small businesses in the food industry in Minnesota is −74%; however, a much smaller effect (between 0 and −10%) is appreciated when applied to states such as Alabama and Georgia.

Regarding the business reopening policy, the most positive impact on the working hours for the food industry lies in states such as Delaware, Wyoming, and Montana (above 40%), and the smallest positive impact exists in states such as New York, Washington DC, and New Jersey. For the leisure industry, the top states that experienced the most significant drop rates due to the business closure policy are Hawaii, Kentucky, and Rhode Island. For the food industry, New Hampshire, Hawaii, and South Dakota experience the most significant drop rates (over 50% declines) from the business closure policy; the top states that recover the fastest are South Dakota, Indiana, and New Hampshire.

In all the models tested, the number of daily COVID-19 cases has a negative relationship with all the labor market variables. It implies that if COVID-19 is still infecting the population with no confirmed cure or vaccine, the employment conditions of the hospitality industry are unlikely to recover to the prior-COVID-19 level. The regional differences in the labor market responses signify the importance of appropriate policies for stimulating the economy and curbing the spread of the disease. The proposed Hypotheses 3 and 4 are supported.

7. Implications and recommendations

The present study discusses the effects of intervention policies necessitated by COVID-19 on the food/drink and leisure/entertainment sectors of the U.S. economy. First, this section reviews managerial implications and practical recommendations for reopening in the context of intervention policies. Second, the economic implications of such policies are described.

7.1. Managerial implications and practical recommendations for reopening

Given the disparate magnitude and timing of COVID-19′s effects across the country's distinct states, there does not appear to be a universally appropriate resolution for reopening. Phased reopening procedures across the country will affect areas differently due to the types of businesses reopening, the level of local dependence or interest in the kinds of businesses reopening, and the overall rate of reopening. The results of this study suggest that managers should 1) embrace reopening policies and 2) adopt new standards to modify their operations, given the absence of an effective, widely available vaccine. Until a functional immunization is developed, distributed, and administered, the hospitality and leisure sectors will likely not return to the level of success they appreciated before COVID-19. These suggestions may assist managers in overcoming challenges that revolve around supporting employees, ensuring safe reopening, and regaining consumer confidence. Managers must also consider the risks, such as legal ramifications or business license suspensions, of not complying with mandated intervention policies. Additionally, non-compliance could be especially counterproductive in the leisure and hospitality sectors since their services inherently rely on human interaction to conduct business.

Businesses of all sizes should be prepared to alter previously accepted standards and practices. In some cases, managers may need to sacrifice the aesthetic appeal of their business environments to recommence

Table 1
Business Closure Policies on Hours Worked, Employment, and Open Firms in Food/Drink and Leisure/Entertainment.

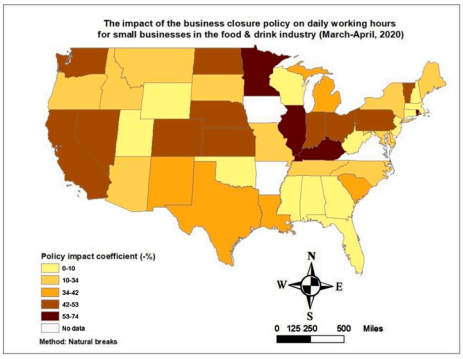
Industry	Food & drink			Leisure & entertainment		
Dependent variable	Working hours	Employees	Open businesses	Working hours	Employees	Open businesses
Business closure policy	−0.21 (0.009)***	−0.22 (0.008)***	−0.17 (0.007)***	−0.26 (0.015) ***	−0.29 (0.015)***	−0.28 (0.015)***
COVID19 new cases (ln)	−0.05 (0.002)***	−0.05 (0.002)***	−0.04 (0.001) ***	−0.08 (0.004)***	−0.08 (0.004)***	−0.07 (0.003)***
Intercept	−0.11 (0.016) ***	−0.09 (0.016)***	−0.04 (0.013) ***	−0.05 (0.032) ***	−0.04 (0.031)***	−0.01 (0.029) ***
Sample size	3655	3655	3655	3071	3071	3071
R-squared	0.78	0.77	0.78	0.77	0.76	0.71

Note: Data sources: (1) Homebase employment data for small businesses in the food/drink and leisure/entertainment industries; (2) date-stamped business closure policy at the state level; and (3) Daily COVID-19 cases by state from the U.S. CDC website.

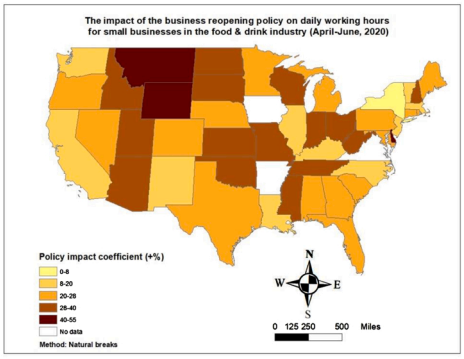
Table 2
Business Reopening Policies on Hours Worked, Employment, and Open Firms in Food/Drink and Leisure/Entertainment.

Industry	Food & drink			Leisure & entertainment		
Dependent variable	Working hours	Employees	Open businesses	Working hours	Employees	Open businesses
Business open policy	0.26 (0.004)***	0.25 (0.003)***	0.18 (0.003)***	0.27 (0.008)***	0.26 (0.007)***	0.17 (0.007)***
COVID19 new cases	−0.01 (0.002)***	−0.01 (0.002)***	−0.02 (0.002)***	−0.024 (0.004)***	−0.03 (0.004)***	−0.02 (0.004)***
Intercept	−0.30 (0.018)***	−0.27 (0.017)***	−0.16 (0.014) ***	−0.33 (0.042)***	−0.33 (0.039)***	−0.35 (0.036)***
Sample size	4037	4037	4037	3071	3071	3071
R-squared	0.60	0.73	0.69	0.58	0.58	0.51

Note: Data sources: (1) Homebase employment data for small businesses in the food/drink and leisure/entertainment industries; (2) date-stamped business closure policy at the state level; and (3) Daily COVID-19 cases by state from the U.S. CDC website.

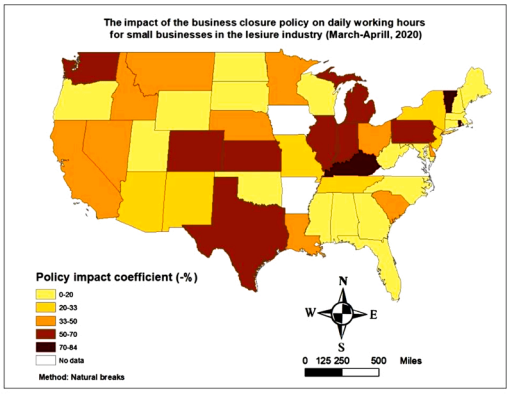


(a) The impact of business closure policy on working hours in the food and drink industry.



(b) The impact of business reopening policy on working hours in the food and drink industry.

Fig. 3. Comparison of policy impact coefficients by state for the food and drink industry.



(a) The impact of business reopening policy on working hours in the leisure industry.

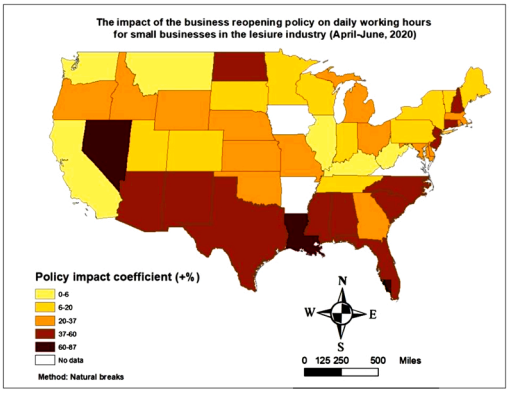


Fig. 4. Comparison of policy impact coefficients by state for the leisure industry.

operations safely. Some foodservice and lodging companies have installed physical barriers, such as plexiglass shields, and placed numerous safety-related decals, such as arrows or lines, on their floors and walls to modify their environments relative to the current threat. Such adherence to local mandates and national safety guidelines may help to restore the confidence of consumers and employees interacting throughout service-oriented encounters. Furthermore, managers should consider that creating an environment where safety compliance is more effortless may encourage consumers and employees to engage in behaviors conducive to reducing the diffusion of COVID-19.

In order to successfully participate in safe reopening processes, managers need to remain vigilant in following efficacious safety guidelines provided by reputable institutions, as well as stay up to date on the local mandates for where their businesses are located. The CDC supplies recommendations on their website regarding sanitation procedures, such as disinfecting surfaces and handwashing, as well as safe behaviors, such as social distancing and wearing masks when appropriate (CDC, 2020b). Additionally, the U.S. Chamber of Commerce presents an interactive map of the country on their own site that provides reopening guidelines for each state, which includes general guidance for workplaces, as well as industry-specific state regulations (U.S. Chamber of Commerce, 2020).

Relative to technologically oriented solutions, Brynjolfsson et al. (2020) document a surge in the popularity of remote work but emphasize that the adoption of such arrangements has been heterogeneous, particularly in hospitality services, since the sector requires a high level of in-person interaction. Therefore, leisure and hospitality managers should evaluate ways to absorb technology into their operations to work toward reducing the transmission of the virus, while positively contributing to their operational efficiency. For example, the utilization of digital restaurant menus may reduce the use of a traditionally high-touch menu, as well as eliminate the costs associated with repeatedly printing disposable paper menus.

7.2. Economic implications

While there have been severe economic declines associated with the introduction of state mitigation policies, the public has generally accepted the policies on faith in terms of being necessary to reduce the

spread of the virus. Makridis and Wu (2020) show that areas with higher social capital were able to weather the effects of the pandemic much better than their counterparts because of greater trust and compassion for community neighbors. Higher social capital has also allowed these counties to rely more on voluntary social distancing, rather than explicit state-wide mandates. Increasing evidence has highlighted the economic ramifications of intervention policies as the virus continues to spread. Further analysis of these policies has led some to identify ways to take precautions without requiring business closure and a sudden stop in physical activity. For example, Makridis and Rothwell (2020) describe how middle-of-the-road policies, such as wearing masks, can reduce the spread of the virus without imposing a high cost on the economy, in contrast to more restrictive policies. For example, SAHOs have had limited public health benefits over the long-run, but they have led to significant economic consequences, as highlighted by the present study. Since there can be such significant variation across counties in a given state, politicians should allow for greater flexibility and local autonomy in formulating appropriate responses.

Currently, policymakers are continuing to debate about the prospect of an additional stimulus package, on top of the $2 trillion in the CARES Act. Given the adverse effects of the pandemic on the hospitality industry, continued caution is required. If, for example, infections continue to grow, then further policy efforts might be necessary to provide liquidity to small businesses. Unfortunately, the first round of the Paycheck Protection Program (PPP) did not achieve all of its intended effects (Granja et al., 2020): many of the small businesses that needed funding did not receive it. If a second legislative effort is pursued, it will be crucial for policymakers to take stock from the CARES Act and design a more carefully targeted funding effort. However, independent of Congressional legislation, this study's results suggest that states should pursue reopening strategies and actively publicize all the efforts that are undertaken to ensure that reopening is carried out safely.

8. Conclusions

This paper addresses how public intervention policies affect the hospitality labor market in the U.S. under COVID-19. By using high-frequency data from HomeBase on a representative sample of small businesses that is linked with data on infections and state mitigation policies, this study finds that business closure policies are associated with economically and statistically significant declines in employment and the number of small businesses operating in the hospitality industry. Moreover, this paper's statistical analysis and spatial visualization shed light on the regional differences in firms' shutdowns, workers' layoffs, and working hours. The number of daily new COVID-19 cases contributes to the decline of the labor market throughout the study period, which affirms the vulnerability of the hospitality industry to the COVID-19 pandemic.

This study has the following limitations. First, this paper utilizes data from HomeBase, which only covers small businesses in a limited set of industries. Since large companies exhibit different employment dynamics, this paper's results might provide only a partial picture. However, since small businesses have felt the bulk of the burden (Cajner et al., 2020), these results are an essential starting point. Second, other exogenous variables, such as consumer activities and expenditure records, could be further utilized to understand their impact on the labor market. Future research should explore more significant heterogeneity in treatment effects by industry and firm, distinguishing between the response of firms that had, for example, a more substantial digital presence (e.g., Uber Eats) with those that were more traditional. Finally, given that Chetty et al. (2020) found that the decline in consumer spending was greater in traditionally higher-income areas, further research is required to understand how businesses in these areas have responded during the reopening.

Declaration of Competing Interest

None.

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