

Economic Impacts of COVID-19 on Small Businesses in the Inland Region

June 2020

The logo for the University of California, Riverside (UCR), featuring the letters "UCR" in a bold, blue, sans-serif font. The letters are contained within a white rectangular box that has a yellow diagonal stripe running from the bottom-left corner to the top-right corner.

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Key Findings

- Almost 50% of the small businesses in the Riverside-San Bernardino-Ontario Metropolitan Statistical Area reported a large negative effect from the COVID-19 pandemic.
- Some sectors have been disproportionately affected by the pandemic. Namely, the Accommodation/Food Service sector and the Health Care/Social Assistance industry have seen the most job loss and decrease in number of hours worked, respectively.
- Due to the spatial agglomeration and clustering of small businesses of specific sectors in different localized areas, as well as the disproportionately sectoral impact of COVID-19, certain local areas with specialization in heavily impacted sectors suffered more compared with other areas as a consequence.

Introduction

After 12 years of economic expansion and record-breaking unemployment lows, the COVID-19 pandemic ushered in an era of rapid economic deterioration. In March, California's unemployment rate jumped over one percentage point - from 3.9% to 5.3% and rose to a record 15.5% in April according to the recently released labor market dataⁱ. Unemployment trends continue to worsen; about 4.8 million Californians have filed for unemployment benefits since mid-March. According to some April estimates, for every 3 new hires caused by the pandemic, there are 10 layoffs and over 40% of the layoffs may result in permanent job loss due to lack of demandⁱⁱ. Although the economic effects of COVID-19 are wide reaching, the pandemic has disproportionately affected different sectors of California's economy. The sectors with especially egregious losses are those that require human contact, particularly the service sectors. For instance, three service sectors - Arts, Entertainment, and Recreation; Accommodation and Food; and Other Services such as automotive repair, personal care, and dry cleaning, accounted for more than 80% job losses in California between February and April 2020ⁱⁱⁱ. As a result, local areas with a higher concentration of these aforementioned sectors have suffered incommensurately compared to other areas.

In this report, we quantify and map the heterogeneous economic impacts of COVID-19 on small businesses by sector in the Riverside-San Bernardino-Ontario metropolitan statistical area (MSA) with a focus on a fine spatial scale. We focus on two general aspects of the impacts: (1) overall impact (2) impacts on employment which is further differentiated by job loss and weekly working hour decrease. The latter is closely related to the well-being of the general population.

Data and Methodology

Two census surveys are utilized – (1) the most recent and first-time available Census Bureau’s Small Business Pulse Survey (SBPS)^{iv} and (2) County Business Patterns (CBP)^v 2017. SBPS is a weekly survey measuring the impact of COVID-19 on small businesses. This survey is differentiated by sector, and was first published in May of this year. It seeks to identify specific economic challenges created by the COVID-19 pandemic with the objective of informing businesses and policy making. For this report, we draw from the survey’s first week of data. We follow SBPS’s definition of small businesses - nonfarm single location businesses with less than 500 employees and receipts of at least \$1,000 as of April 2020’s Census Business Register. We focus on Questions 1, 5 and 6 of SBPS. These questions ask respondents about their businesses’ experiences with overall negative impact, job loss and weekly working hour decrease, respectively.

CBP is an annual series providing subnational economic data by industry. The smallest spatial unit in the public dataset is at the zip code level. Following the SBPS’s definition of small businesses, we aggregate the number of establishments with paid employees between 1 and 500 zip-code level and differentiate the businesses by sector. The most recent data - CBP 2017 is used. With the impact survey results from SBPS, and the zip-code level small business distribution, we could quantify and map the heterogeneous economic impacts of COVID-19 on small businesses at a detailed spatial scale: zip code areas in the Riverside-San Bernardino-Ontario MSA in Southern California.

To calculate local specializations, we use the location quotient (LQ) to quantify how concentrated each industry sector is in a zip code area as compared to the whole Riverside San Bernardino-Ontario MSA. LQ is a commonly used index for revealing what makes a particular local area “unique” in comparison to the regional or national average. For each zip code area, we calculate the weighted average of the standardized impact indices for “Overall Negative Impact (Q1)”, “Impact on Job Losses (Q5)” and “Impact on Decreasing Working Hours (Q6)”. Here, the weights are the sector-wise LQ values in each zip code area. We standardize the final index for each of the three categories to be within [0,1].

Results and Findings

A Comparison between the Riverside-San Bernardino-Ontario MSA and Los Angeles-Long Beach-Anaheim MSA

49% of respondents in the Riverside MSA reported a large negative effect in how their business has been affected (refer to Figure 1). Comparatively, the Los Angeles MSA reported a significantly higher large negative effect: 58% of small businesses in Los Angeles have experienced a large negative effect, almost 10% more than in Riverside-San Bernardino. Significantly fewer small businesses (4%) in the Los Angeles MSA reported a Moderate Negative Effect when compared with small businesses in the Riverside-San Bernardino-Ontario MSA.

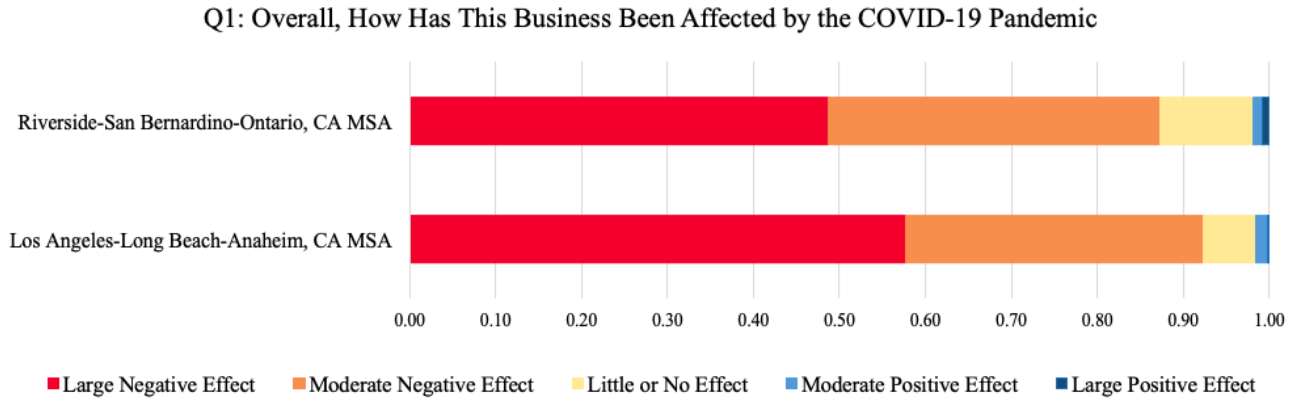


Figure 1: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

The change in the number of paid employees employed by small businesses for the two adjacent MSAs shows a similar pattern. Over half of the small businesses in both MSAs have not experienced any lay-off, while around 30% reported a decrease in their number of paid employees. The differences between these two MSAs are not statistically significant.

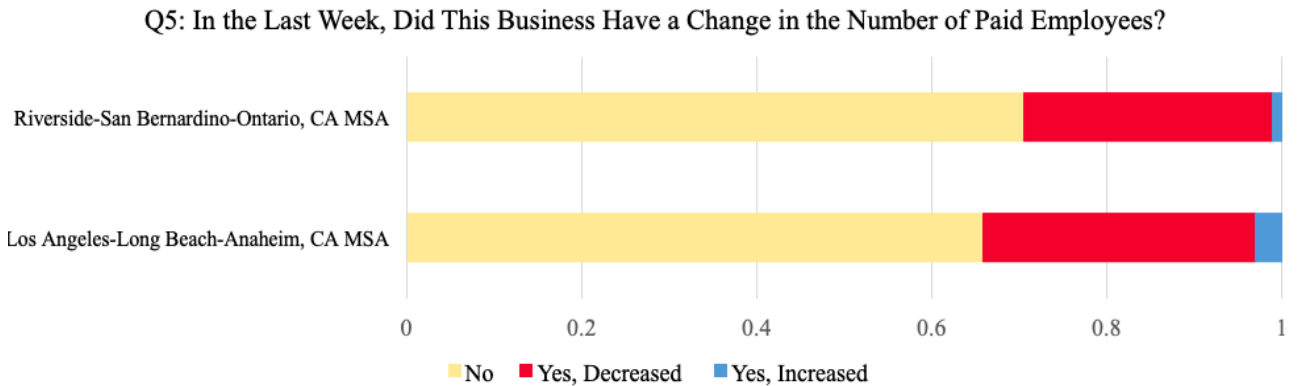


Figure 2: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

Although businesses in the Riverside-San Bernardino-Ontario MSA seemed to show better outcomes for overall affects and number of paid employees, the two-county Inland Region had a larger decrease in the number of hours work, although only by 5%, not significantly different from its costal neighbor.

Q6: In the Last Week, Did This Business Have a Change in the Total Number of Hours Worked by Paid Employees?

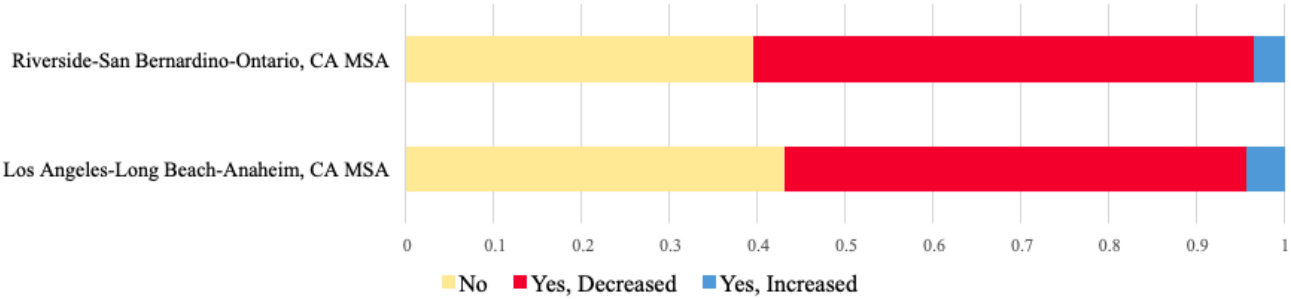


Figure 3: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

COVID-19 Impact on small businesses by sector in California

The small businesses in the greater Los Angeles Area, which includes Riverside, San Bernardino, Ventura and Orange Counties, have clearly experienced adverse effects due to the COVID-19 pandemic. These adverse effects have not been evenly distributed by sector. Figures 4-7 demonstrate COVID-19’s impact on small businesses by sector throughout California. The sectors with the largest negative impact overall are the Accommodation and Food services, and the Health Care and Social Assistance sectors. Because hotels, resorts, and general tourism are the mainstay of the Accommodation sector, a large negative impact was anticipated. However, the decline in Health Care and Social Assistance is relatively surprising at surface level. As California braced for a mass increase in COVID-19 patients, as part of Governor Gavin Newsom’s Stay-at-Home Order placed restrictions on non-urgent or elective dental, medical, and surgical procedures.^{vi} The resulting decrease in non-essential medical services like cosmetic surgeries and eye exams have been detrimental to the health care industry. Specific survey outcomes for overall negative impact are displayed in Figure 4.

Q1: Overall, How Has this Business been Affected by the COVID-19 Pandemic?



Figure 4: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

The Accommodation and Food Service sector did not fare better in terms of job losses. The Accommodation and Food Service Industry also experienced the greatest job losses in California. The Other Services (except Public Administration) sector experienced the second largest decrease in job losses. The Other Services industries include equipment and machinery repairing, promoting or administering religious activities, grantmaking, and pet care services. The sectors that experienced the fewest job losses due to COVID-19 were the Finance-Insurance and Educational Services Industries. The Finance-Insurance sector reported some of the lowest levels of negative effects across the three examined survey categories: overall negative impact, job losses, and working hour decrease. This is likely due to California designating many financial workers and their ancillary staff as ‘essential’^{vii}. The specific survey question and its outcomes for job loss are displayed in Figure 5.

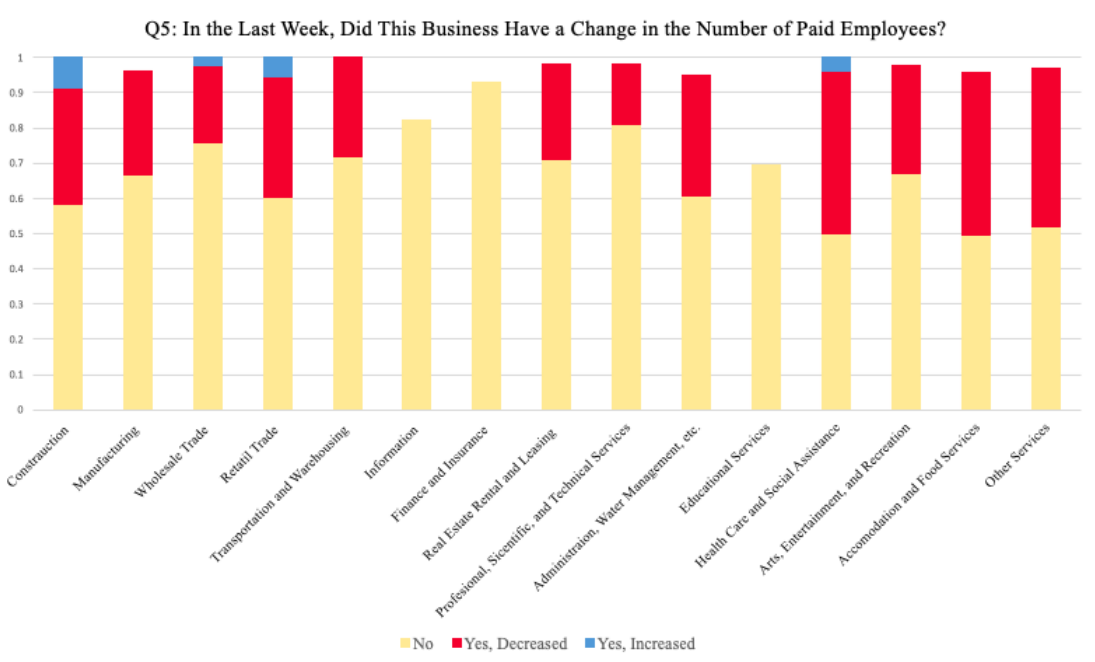


Figure 5: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

The sectors with the largest working hour decrease were the Health Care-Social Assistance and the Other Services (except Public Administration) sectors. Both the Health Care-Social Assistance and the Other Services also underwent the largest job losses. The specific survey question and its outcomes for job loss are displayed as Figure 6.

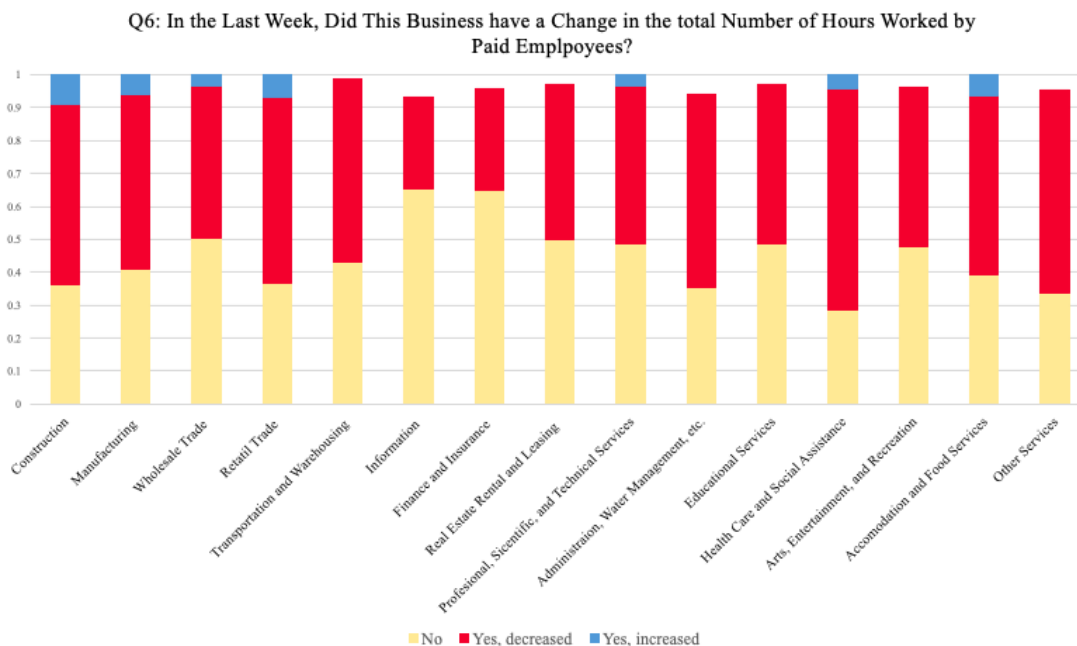


Figure 6: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

The effects of COVID-19 on the Californian economy have been extremely industry dependent. In terms of overall negative impact, job loss and working hour decrease, the Accommodation-Food Services, Health Care-Social Assistance, Other Services and the Administrative-Support industries have sustained the worst negative impacts as shown in Table 1 which ranks California’s sectors from most (1) to least (12) affected. The Administrative/Support/Waste Management/ Remediation Industry has an interesting set of outcomes: those industries ranked high on job losses and working hour decrease but reported one of the lowest negative impacts. The administrative sector generally performs routine support activities for the day-to-day operations of other organizations. Because of the COVID-19 stay-at-home order, in person support activity in many businesses has been suspended, and therefore many small businesses who support in-person business operations may have seen a large working hour decrease, but not necessarily mass layoffs or an overall negative impact, yet. The Retail Trade and the Arts, Entertainment, and Recreation industries ranked between 4 and 7 in all categories, showing a medium negative effect in overall negative impact, job loss and working hour decrease.

Table 1 Ranking sectors by severity of impacts from COVID-19

Rank	Overall Negative Impact	Job Loss	Working Hour Decrease
1	Accommodation and Food Services	Accommodation and Food Services	Health Care and Social Assistance
2	Health Care and Social Assistance	Other Services (except Public Administration)	Other Services (except Public Administration)
3	Other Services (except Public Administration)	Health Care and Social Assistance	Administrative and Support and Waste Management and Remediation Services
4	Arts, Entertainment, and Recreation	Administrative and Support and Waste Management and Remediation Services	Transportation and Warehousing
5	Educational Services	Arts, Entertainment, and Recreation	Retail Trade

6	Real Estate and Rental and Leasing	Manufacturing	Educational Services
7	Retail Trade	Retail Trade	Arts, Entertainment, and Recreation
8	Transportation and Warehousing	Transportation and Warehousing	Accommodation and Food Services
9	Information	Real Estate and Rental and Leasing	Real Estate and Rental and Leasing
10	Manufacturing	Construction	Manufacturing
11	Wholesale Trade	Wholesale Trade	Construction
12	Professional, Scientific, and Technical Services	Professional, Scientific, and Technical Services	Professional, Scientific, and Technical Services
13	Administrative and Support and Waste Management and Remediation Services	Information	Wholesale Trade
14	Finance and Insurance	Finance and Insurance	Finance and Insurance
15	Construction	Educational Services	Information

Source: Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020

Mapping heterogeneous impacts on Small businesses from COVID-19

Due to the sector dependent nature of COVID-19's economic impact and spatial agglomeration of industries, the economic effects are expected to vary by geography. The Riverside-San Bernardino two-county region is the home to a small number of small businesses in Educational Services (a total of 545 in 2017), Arts, Entertainment, and Recreation (667), and Information (744) sectors, as well as the home to a generally larger number of small businesses Retail Trade (10203), Health Care and Social Assistance (8970), Construction (7957), and Accommodation and Food Services (7530) sectors. To investigate the co-locate pattern, we calculate the correlation coefficient for the LQ values of small businesses between each pair of industry sectors. The results are visualized in Figure 7. Red colors represent positive correlation, meaning that the two sectors tend to locate in the same zip-code area, and blue colors represent the converse. Small businesses in selected sectors have a tendency to locate close to each other and thus constitute spatial clusters/agglomerations and specializations at a highly localized area (zip code). For instance, small businesses in Manufacturing and Wholesale Trade sectors tend to concentrate in the same local area, while small businesses in Retail Trade and Accommodation and Food Services Sectors are usually found in the same local area.

Figure 7 Pairwise correlation coefficients for zip code-level location quotients (LQs) in the Riverside-San Bernardino-Ontario MSA in 2017

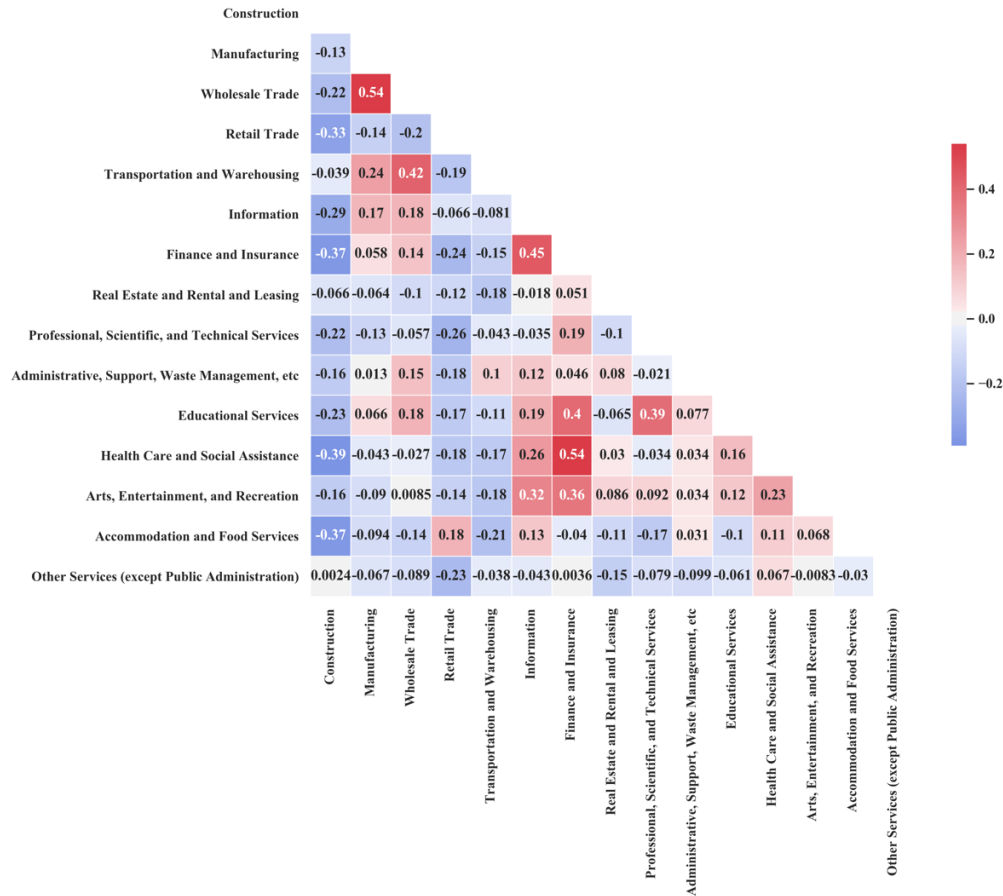


Figure 7: Prepared by the authors based on 2017 County Business Patterns (CBP).

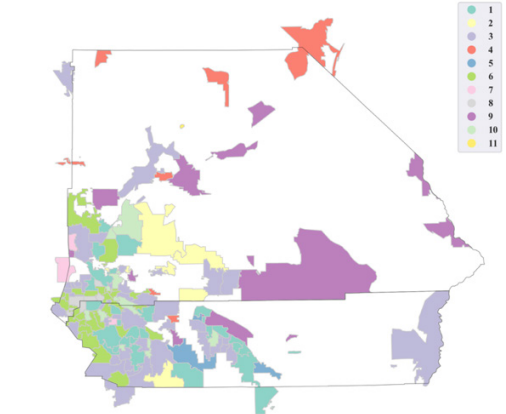
To identify specific types of co-locating behavior of small businesses of different sectors and where these types of localized specialization are located, we apply the k-means clustering algorithm to the sector-wise LQs for all zip code areas. 11 clusters are identified as shown in Figure 8, which offers a clearer observation of localized specialization in the Inland Region. Each cluster represents a unique type of specialization for a zip code area. Cluster 2 (in yellow) represents a high specialization in the Construction sector. Zip code areas classified to Cluster 4 (in orange) are highly specialized in Retail Trade sector while those classified to Cluster 8 (in grey) are specialized in the sectors of Wholesale trade and Transportation and Warehousing. Zip code areas in purple (Cluster 9) are highly specialized in Accommodation and Food and Other Services.

Table 2 Description of small business clusters

Cluster	Number of zip code areas	Average number of small businesses within each zip code area	Specialized Sectors
1	27	293	Administrative and Support and Waste Management and Remediation Services
2	9	27	Construction
3	42	653	Diversified in most sectors
4	6	46	Retail Trade
5	3	12	Real Estate and Rental and Leasing
6	26	928	Manufacturing
7	3	14	Transportation and Warehousing, Professional, Scientific, and Technical Services
8	6	717	Wholesale trade and Transportation and Warehousing
9	9	55	Accommodation and Food and Other Services
10	13	494	Health Care and Social Assistance, and Finance and Insurance
11	1	42	Professional, Scientific, and Technical Services, Educational Services, and Finance and Insurance

Source: Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020

Small businesses Clusters in Riverside-San Bernardino-Ontario MSA



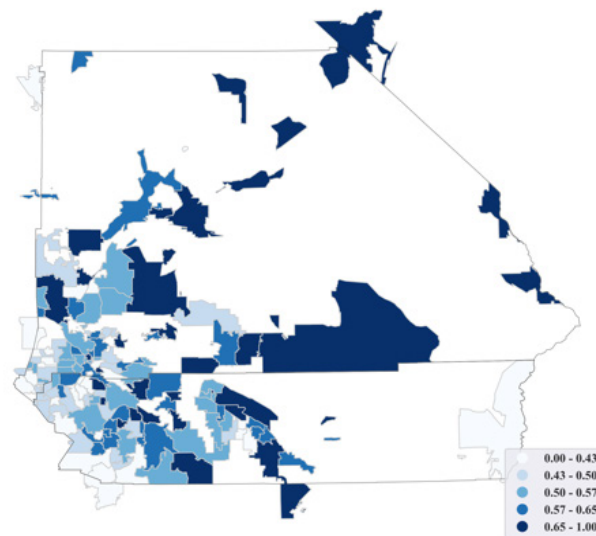
Source: 2017 County Business Pattern

Figure 8: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

Heterogeneous economic impact of COVID-19 on local areas

Figures 9-11 map the economic impacts of COVID-19 while taking account of local specialization and the specific aspect of the impact. The following three choropleth maps visualize the degrees of negative impacts for each of the survey questions regarding overall negative impact, job loss and working hour decrease. The degrees of negative impacts are classified into quintiles for a clearer visualization of the spatial patterns.

COVID-19 Impact on Small businesses Job Losses in Riverside-San Bernardino-Ontario MSA

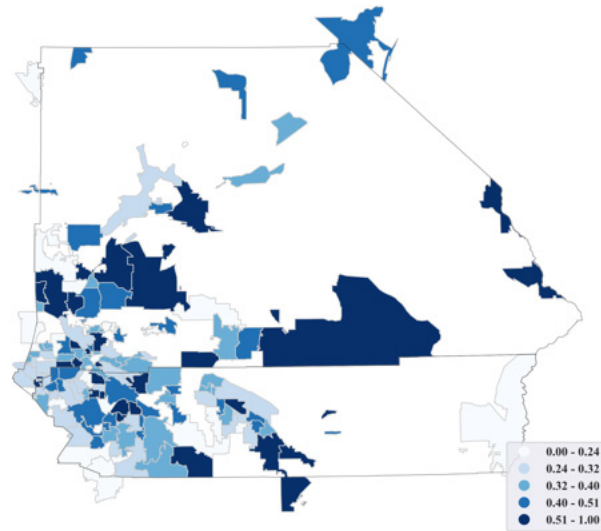


Source: 2017 County Business Pattern; Small Business Pulse Survey (Apr 26-May 2, 2020)

Figure 9: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

Areas suffering from a higher level of negative impacts tend to spatially cluster irrespective of the question we asked, as indicated by the spatial autocorrelation test. Zip code areas with a high concentration in Accommodation and food; and “other services” Sectors (Cluster 9) generally have a higher level of negative impact. Additionally, some areas have different impact levels across survey questions. Depending on the three survey questions, overall negative impact, job loss, and working hour decrease, some sectors that perform well on one question may not perform well on the others. Therefore, the overall negative impact, job loss, and working hour decrease, are somewhat independent of one another. This indicates that the COVID-19 impact on local areas can be differentiated by the specific question we ask.

COVID-19 Impact on Decreasing Working Hours in Riverside-San Bernardino-Ontario MSA

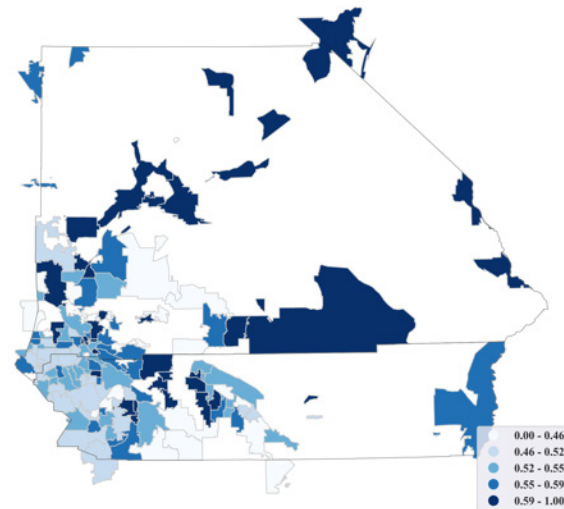


Source: 2017 County Business Pattern; Small Business Pulse Survey (Apr 26-May 2, 2020)

Figure 10: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

For example, we know from the earlier analysis that Construction Sector ranks last in terms of the overall negative impact, while it ranked slightly higher in terms of the job loss impact (10th) and negative impact on working hours (11th). Because of the varying impact on this sector, we expect local areas highly specializing in this sector will have different composite impact indices on these three maps. We know from the clustering map that yellow areas (Cluster 2) are highly specialized in construction. Take zip code area 92356 in San Bernardino County as an example, in 2017 half of 26 small businesses were in the Construction Sector, and its LQ for the Construction Sector was 4.484. This means that this local area had a much higher concentration (nearly five times) in Construction than the San Bernardino MSA as a whole. Due to the larger impacts on Construction in terms of job losses and working hour losses from COVID-19, this local area has a higher impact level for these two categories compared with the overall impact.

COVID-19 Overall Negative Impact on Small businesses in Riverside-San Bernardino-Ontario MSA



Source: 2017 County Business Pattern; Small Business Pulse Survey (Apr 26-May 2, 2020)

Figure 11: Prepared by the authors based on Small Business Pulse Survey (SBPS) April 26th - May 2nd, 2020.

Conclusion

By integrating the first-week release (April 26th-May 2nd, 2020) of Census Bureau's Small Business Pulse Survey (SBPS) specifically designed to provide timely data for measuring impact of COVID-19 on small businesses at the state level and the zip-code level small business distribution data from 2017 County Business Patterns (CBP), we show that the effects of COVID-19 vary across industry sectors and across space. These effects have ultimately been detrimental to the Californian economy and way of life. Some of the most affected sectors are those which heavily relied on activities that are now restricted by social and physical distancing like food service, accommodation, and social assistance. Unfortunately, due to the localized nature of some sectors, the economic effects are worse for some parts of the Inland Region. And although the Riverside-San Bernardino-Ontario MSA fared marginally better than Los Angeles for the same period, the Inland Region's small businesses have incurred mass economic disruption. The level of disruption caused by the pandemic has the potential to change the fabric of the small business economy in the region.

Governor Gavin Newsom's recent actions to move into the next phase of reopening the economy will be helpful for small businesses in various sectors, especially food service and retail sectors. We plan to rely on future releases of SBPS to track the development.

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