Impacts of COVID-19 on Small Businesses

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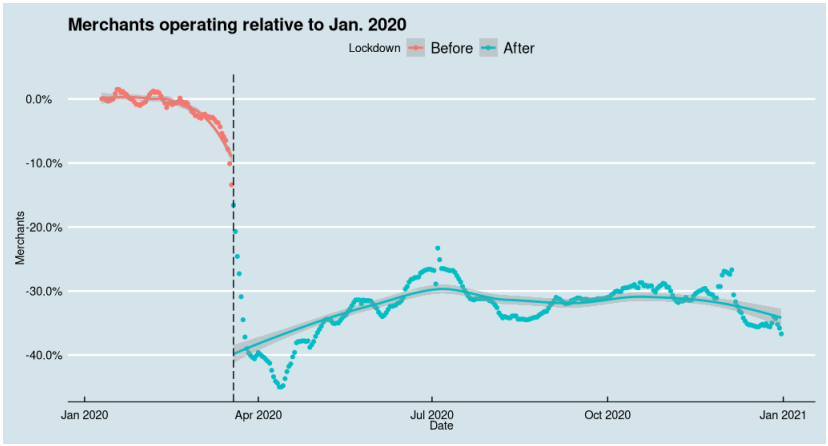
- The Data:
  - Sourced from the OIET (https://tracktherecovery.org/)
  - Dataset sourced from Womply, a small business industry agnostic platform. 500000+ businesses, 26k zup codes, 124b in annualized revenue processed. Relatively confident that this is a reasonable sample of the space
  - I've restricted my analysis to california for a couple of reasons, primarily because it's my home state, also because we had stricter/more clearly communicated lockdown policy, which I hope leads to a sharper visible discontinuity.
  - For this analysis, I've utilized both the number of business open and revenue, as a seven-day moving average seasonally adjusted and indexed to January 2020. Both variables are in terms of percent change relative to January 2020
  - The income catagories are based on zipcode median income, with high income being 4th quartile, middle being second and third, and low being first.
  - I also generated a post-lockdown dummy, which reads zero until 4/19/21, where california's first shelter-in-place order went into force.
- Techniques applied
  - RDD: Seemed like a pretty good option, as we have a sudden shock in the form of a lockdown order and pretty granular (daily) data.
  - diff-in-diff: Can we combine the initial RDD and also differentiate by income level? What do we expect to find? Will businesses in lower income areas get hit harder?
  - OLS. The bread and butter. Of course we're gonna use OLS. It's a no-brainer,
- The analysis
  - Business Closures



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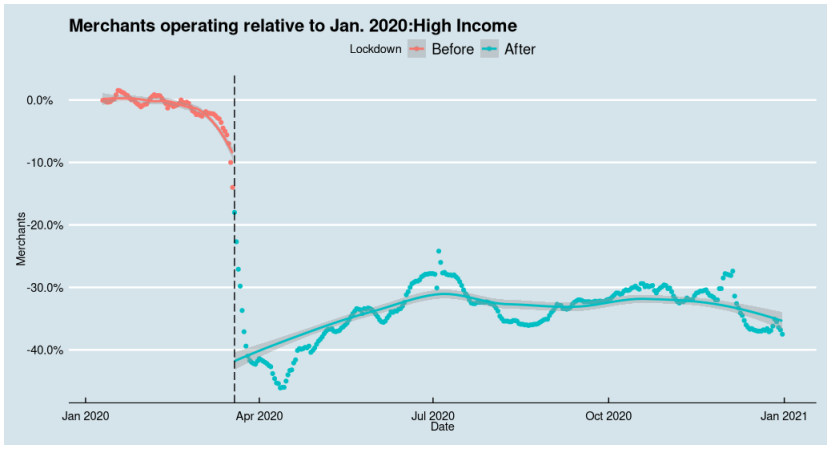
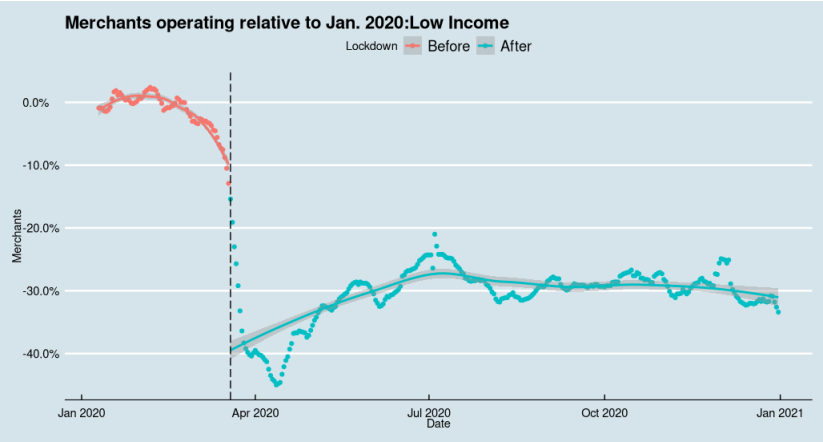
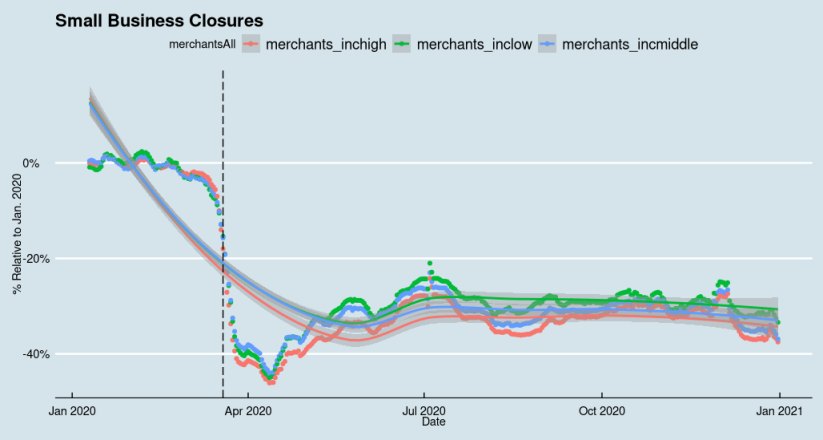
  - Our initial RDD, undifferentiated by income, shows a sharp increase in post-lockdown closures, with a nearly 30% difference across our discontinuity.



  - Merchants in high income areas actually seem to be doing slightly worse, which was initially unexpected. There's reasons for this which I'll go into later



- Merchants in low income areas were slightly less impacted than the average. Quite interesting, and seems counterintuitive

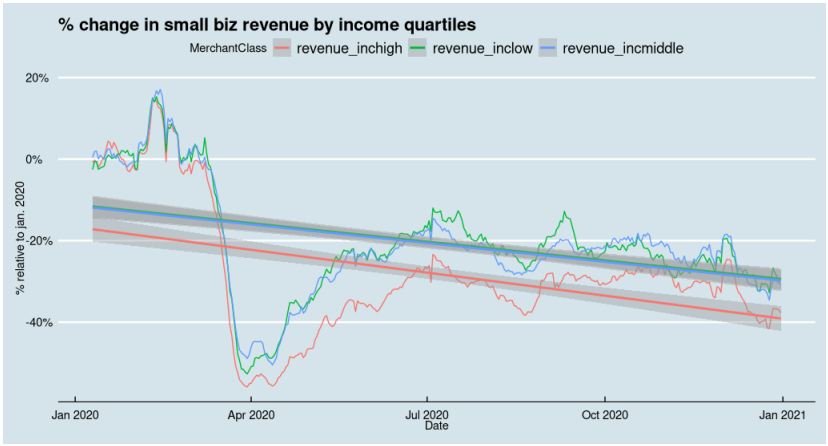


- Pulling it all together, it appears that merchants in the lowest income quartile did better than everybody else, after the initial shock. A better recovery requires more investgation

	Businesses Open: Relative to Jan. 2020
Low Income Closures	0.027***
	(0.003)
Middle Income Closures	0.015***
	(0.003)
Post-Lockdown	−0.307***
	(0.003)
Constant	−0.028***
	(0.003)
Observations	1,071
R^2	0.900
Adjusted R^2	0.900
Residual Std. Error	0.041 (df = 1067)
F Statistic	3,201.967*** (df = 3; 1067)
Note:	*p<0.1; **p<0.05; ***p<0.01

∗ In this table, high income is taken as the base case, and we see that businesses in lower income areas were nearly 3% less impacted than businesses in high income areas. One possible cause supported by that paper I found last week is the business sector composition in lower vs. higher income areas. Small businesses in lower income areas are possibly more likely to sell goods with less elastic demand, like basic needs, while SBs in higher income areas are more likely to be luxery good and service providers, e.g. the make-your-own-candle-lounge that went out of business in downtown santa cruz.

- Revenue



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* Revenue tells us a pretty similar story to closures. Small businesses in low income areas were overall the least impacted, though in this case, the difference between low and middle income is statistically insignificant

	Change In Revenue Relative to Jan. 2020
Low Income Revenue	0.076^{***}
	(0.006)
Middle Income Revenue	0.073^{***}
	(0.006)
Post-Lockdown	-0.301^{***}
	(0.006)
Constant	-0.039^{***}
	(0.007)
Observations	1,071
R^2	0.693
Adjusted R^2	0.692
Residual Std. Error	0.083 (df = 1067)
F Statistic	803.006^{***} (df = 3; 1067)
Note:	*p<0.1; **p<0.05; ***p<0.01

- I swear I'm not copying tables and just changing titles, it's just that the data really is similar. In this case, we see a 7% difference in revenue, favoring the lower-income zoned businesses. We see a larger effect from

post-lockdown, to the tune of a little over 30% revenue decrease.

- It's interesting to see the larger negative revenue impact on small businesses in high income areas, which leads to a few hypothesises.
  - Individuals in higher income areas don't rely on small businesses for basic needs. Either larger retailers fill the gap, or the small businesses in the area never provided basic needs in the first place
  - Rich people are cheapskates
  - some industrie/sectors exist predomininantly in low or high income areas, and the sectors existing predominantly in lower income areas were less affected than the sectors that exist mostly in high income areas. Mechanics and machine shops vs eyebrow threading and third wave cafes, for example.
  - https://www.sba.gov/sites/default/files/437-Entrepreneurship-in-Low-income-Areas.pdf From this paper sectors such as health care, trade, and misc services are over-represented by small businesses in lower income areas, which would support the hypothesis of smaller businesses providing more basic needs in lower income areas as compared to higher income areas. There's still a huge amount for me to do, but this initial analysis is promising.