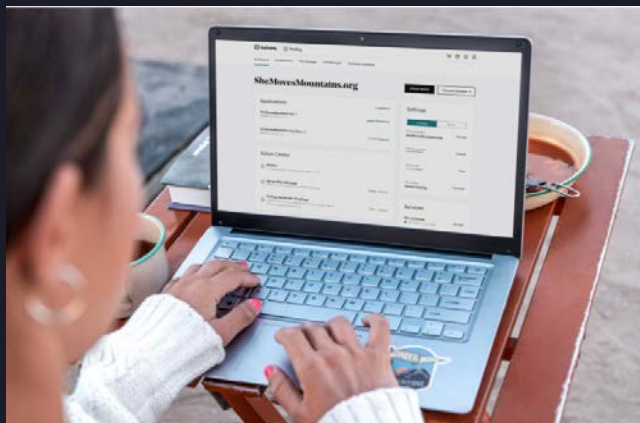


Digital Infrastructure, the Economy and Online Businesses: Evidence from GoDaddy's Microbusiness Data



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This presentation addresses these questions:

- **Q1. Why study broadband/digital infrastructure?**

- Could improve economic outcomes



- **Q2. Is there a relationship between broadband and economic outcomes?**

- ★ Could be driven by online business start-ups.



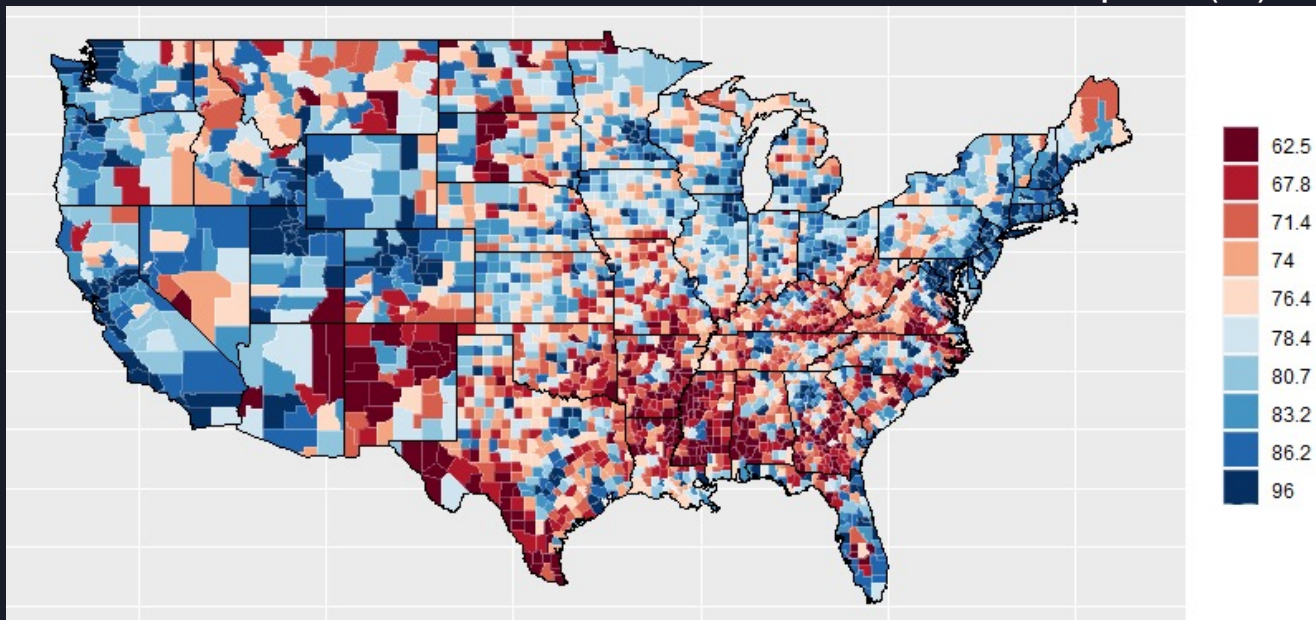
- **Q3. Are online businesses helping the economy through their prevalence and/or activity?**

Q1:

Why study broadband/digital infrastructure?

There is variation/disparity of broadband connectivity across the country

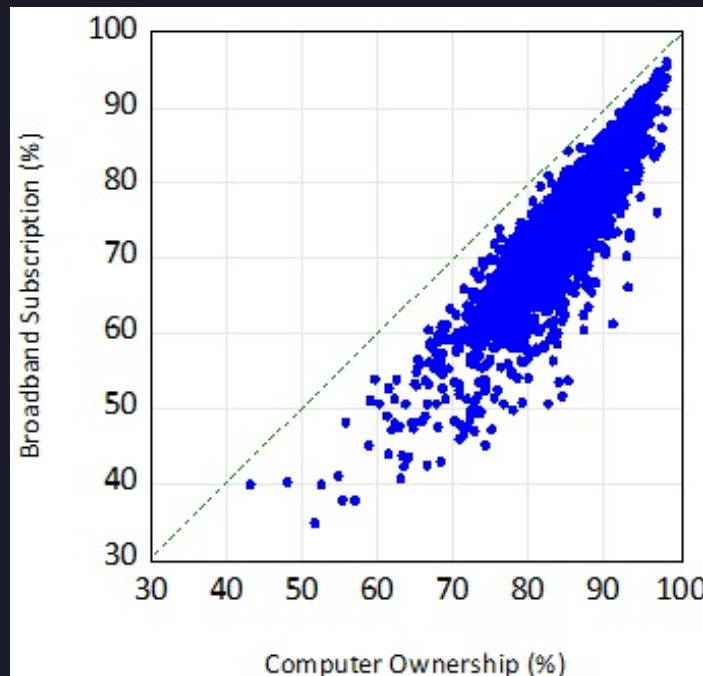
Fraction of Households with A Broadband Internet Subscription (%)



Blue colors indicate higher percentages. The subscription includes both fixed and mobile broadband. Source: 2019 ACS.

Other aspects of digital infrastructure: computers

Percent of Households with a Broadband Subscription and Percent with a Computer



County data from ACS 2019. Dots are U.S. counties

There is a high correlation between broadband access and computer ownership → we focus on **broadband**

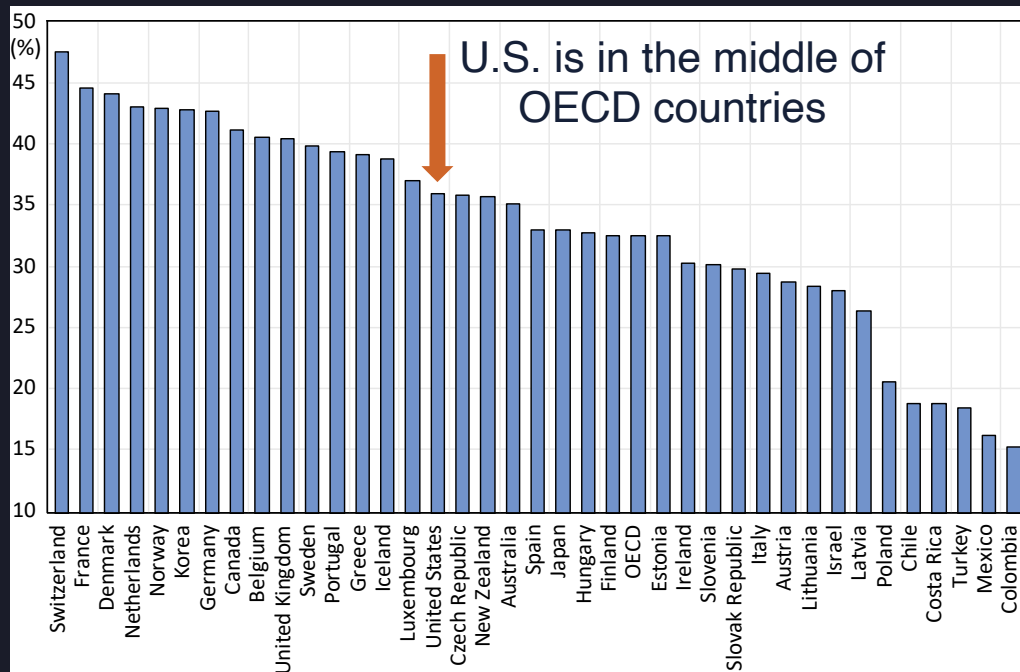
A political priority

Percent of People with a Broadband Subscription

White House:
\$65 billion on
broadband

California:
\$7 billion

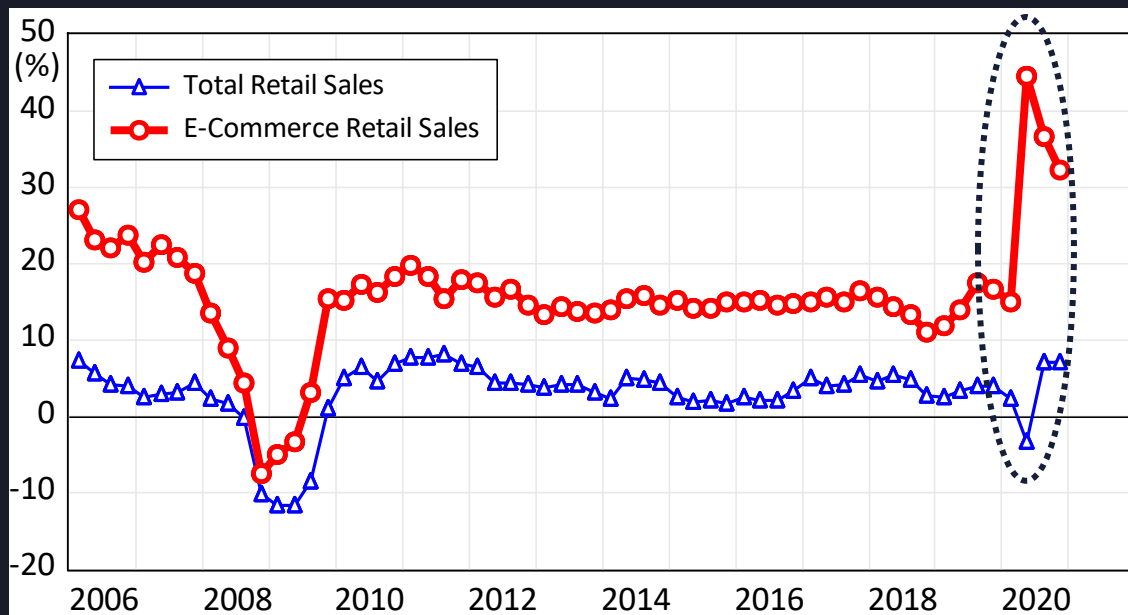
Why?



Source: OECD, June 2020

E-commerce growth exceeds total retail sales growth ... even more so in the pandemic

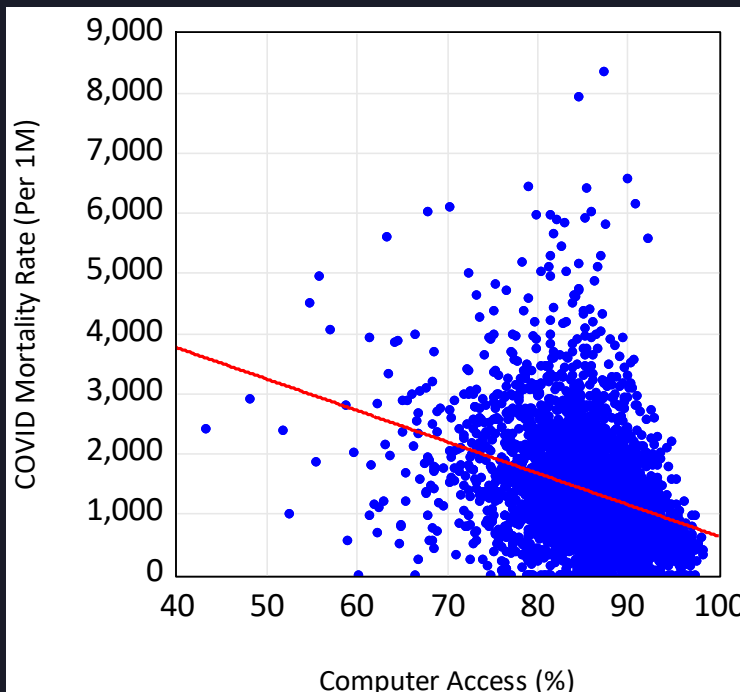
Year-over-year growth rates of U.S. retail sales



Source: U.S. Census Bureau.

Broadband could provide better access to health care

After controlling for various variables, counties with more broadband & computer access had a lower Covid-19 mortality rate



What about better economic outcomes?

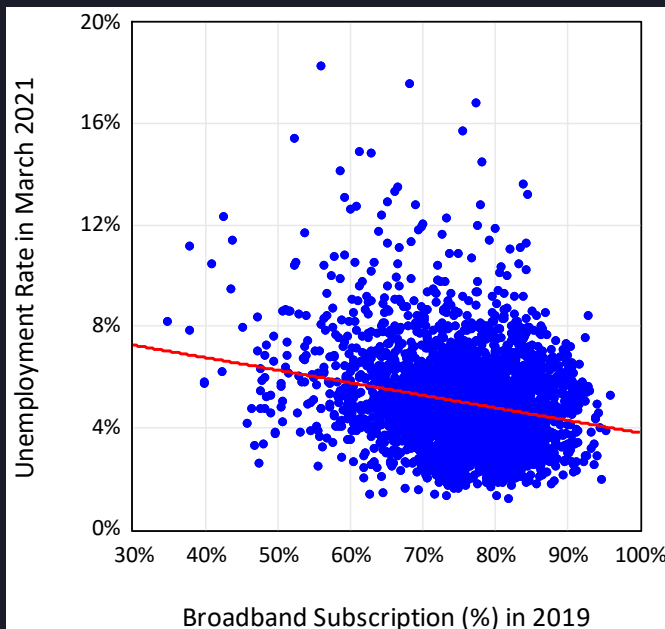
Source: Yu (2021): Health in America: What explains the variation in Covid-19 mortality rate across the U.S.
Computer access is from ACS 2019.
Covid-19 cumulative mortality rate is as of 1/23/2021.
Dots are U.S. counties.

Q2:

Is there a relationship between broadband and economic outcomes?

Yes: counties with more broadband access are also those with lower unemployment rates

Correlation Between Broadband Subscriptions and the Unemployment Rate



Source: ACS 2019; BLS Dots are U.S. counties

Equation 6. Dependent Var: Unemployment Rate in March 2021

coefficient	estimate	std error	t statistic	p value
(Intercept)	2.672877	0.499	5.358	0.000
broadband	-0.016156	0.005	-3.387	0.001
urate2002	0.803698	0.021	38.433	0.000
urate2004	0.057250	0.005	11.393	0.000
chci	-0.008786	0.004	-2.301	0.021
mincome	0.000015	0.000	5.250	0.000
population19	0.000001	0.000	10.447	0.000
pdensity	0.000134	0.000	8.490	0.000
casep	-0.051870	0.010	-5.218	0.000
deathp	0.000256	0.000	8.499	0.000

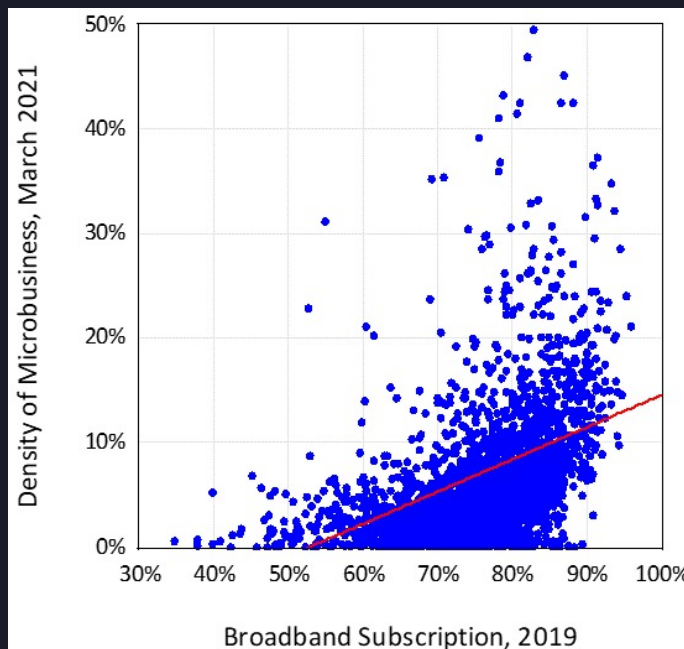
Observations: 2864

Adj. R2: 0.533

Why?

Is there a relationship between broadband and online microbusiness? Answer: Yes!

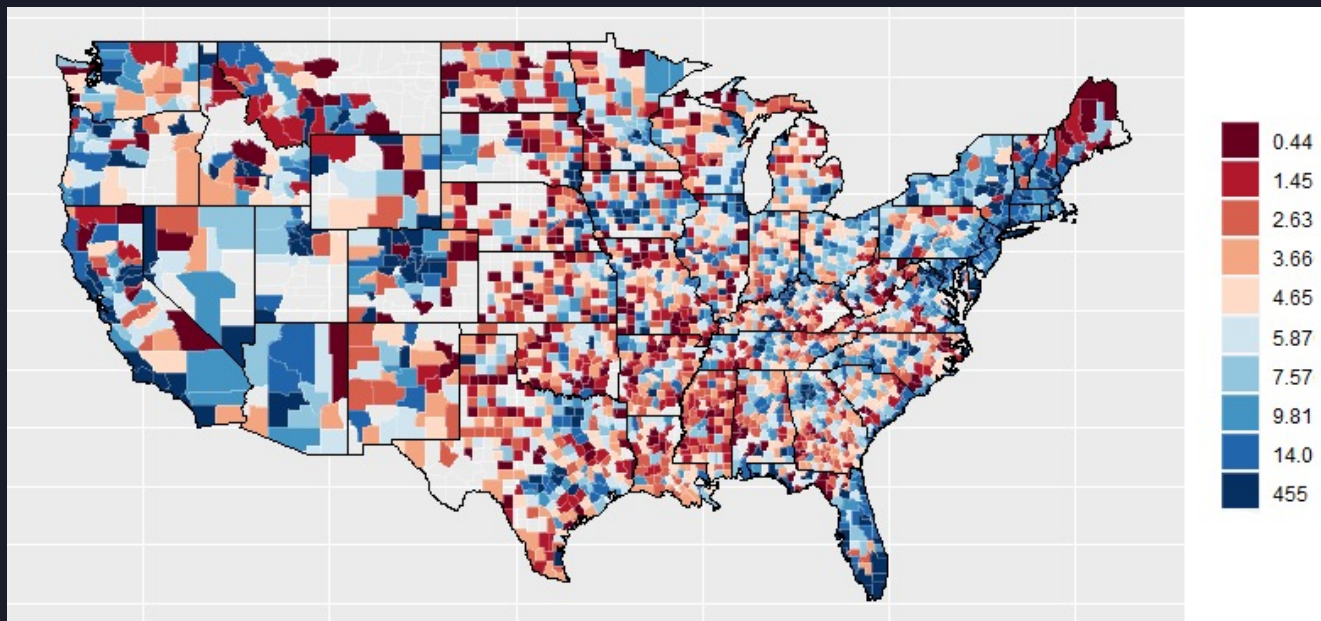
Correlation Between Broadband Subscriptions and the Density of Online Microbusinesses (number per 100 residents), by County



Source: GoDaddy,
UCLA Anderson
Forecast and ACS 2019
Dots are U.S. counties.

Online microbusinesses across the U.S.

Density of GoDaddy's Online Microbusinesses by County, March 2021 (# per 100 residents)



Note: Blue colors indicates higher values. Source: GoDaddy and UCLA Anderson Forecast

Q3: Are online microbusinesses helping the economy?

Is there a relationship between online microbusiness and economic outcomes?

Answer: Panel regression evidence suggests Yes!

Model	Dependent variable	Key explanatory variable	Other explanatory variables
11	Unemployment rate	Density of microbusiness (- and significant)	Covid-19 cases and deaths per capita, time and state controls
12	Employment to population ratio	Density of microbusiness (+ and significant)	Covid-19 cases and deaths per capita, time and state controls
13	Change in employment	Change in the number of microbusiness (+ and significant)	Lag of change in employment, Covid-19 cases and deaths, population, time and state controls

Source: GoDaddy, UCLA Anderson Forecast, and BLS. County Data from June 2018 to March 2021

Is this relationship driven by the prevalence or activity of online microbusinesses?

Microbusiness Index:

– Receptivity:

physical and intellectual infrastructure needed to access and use the Internet

– Reception (extensive margin):

the number of GoDaddy online microbusinesses created by residents of each locale

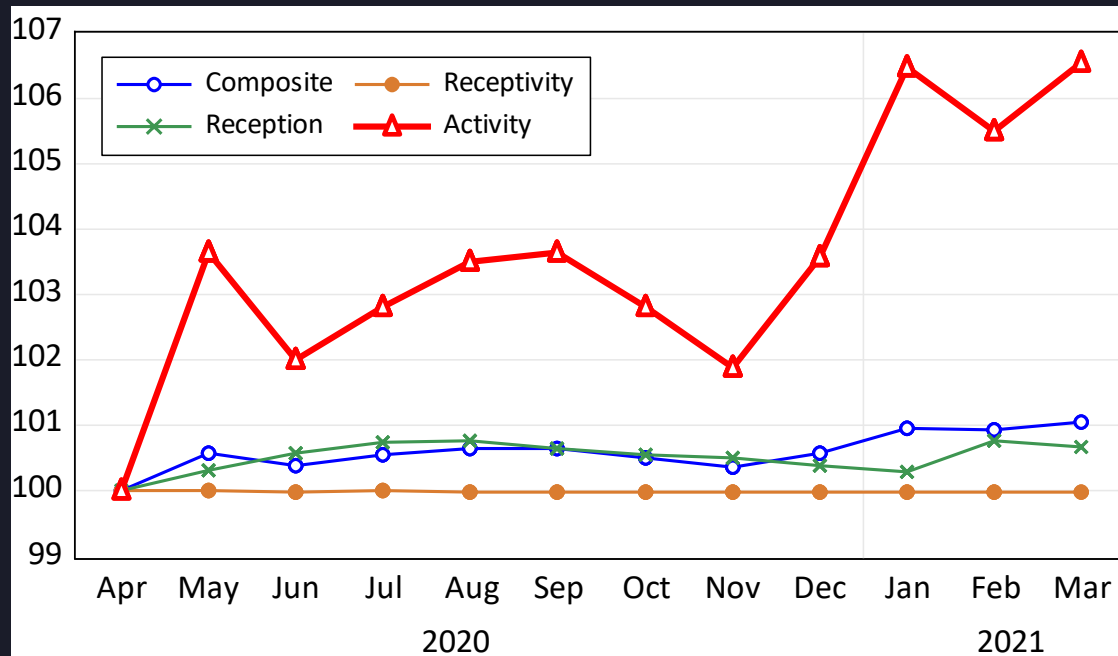
– Activity (intensive margin):

the frequency of owner and customer access to the websites created

Index Variables:

- The City Human Capital Index, the fraction of residents with broadband, the fraction of residents with computer access (from 2019 American Community Survey)
- GoDaddy customers: monthly growth rate and shoppers per capita
- GoDaddy microbusinesses: monthly growth rate and microbusinesses per capita
- the fraction of microbusinesses with a website
- the fraction of microbusinesses that use GoDaddy's full-service design and analytics service (WAM)
- the average web traffic index to microbusinesses websites
- the average economic footprint index for microbusinesses
- the average 'heartbeat' for microbusinesses (reflects the frequency and amount of website updates)
- the fraction of microbusinesses connected to SSL (allows connections between computers to be secure)
- average microbusiness age (how long the microbusiness has been in existence)

Microbusiness sub-index Activity shows economic cycle and seasonality

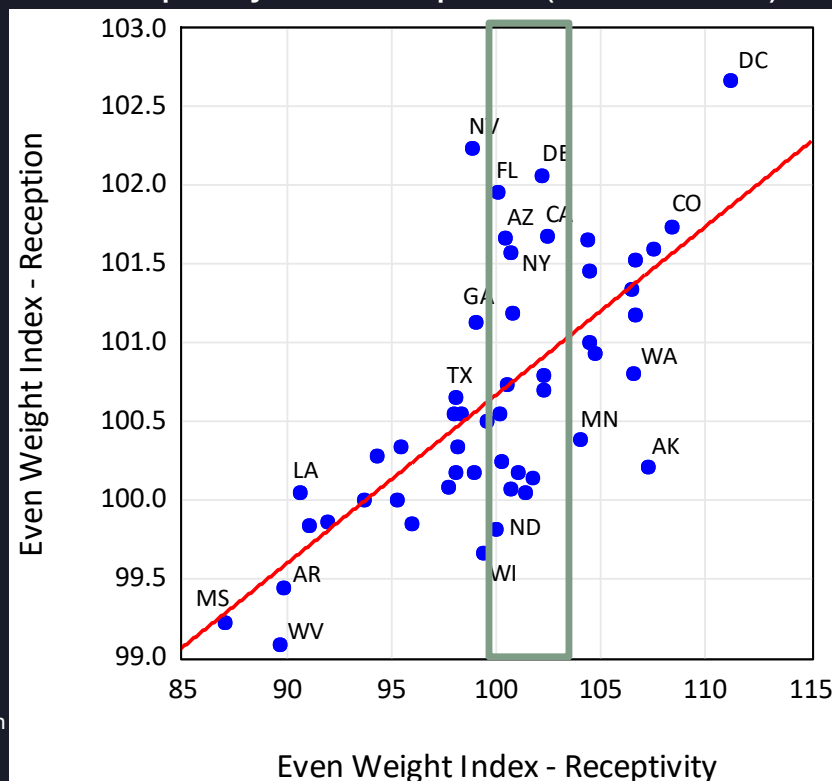


Source: GoDaddy and UCLA Anderson Forecast

There is a positive correlation between receptivity and reception

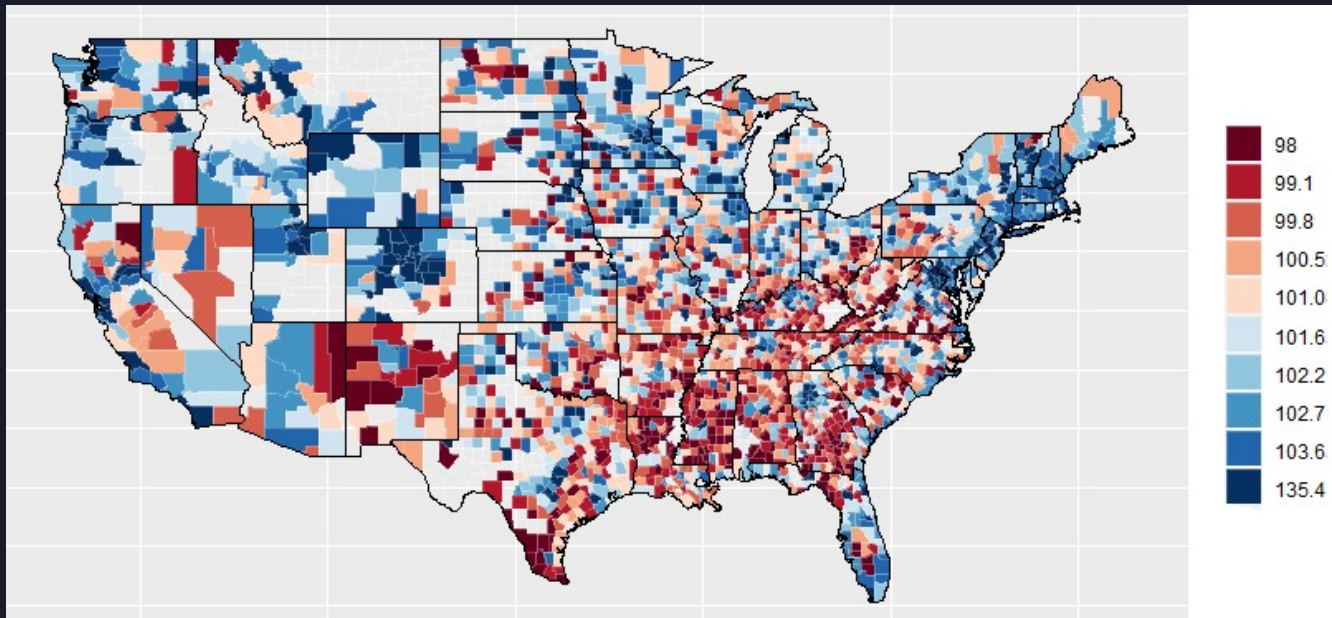
But given the same receptivity, some states have higher reception while others have lower.

Receptivity vs Reception (State Level)



Source: GoDaddy, UCLA Anderson Forecast and ACS 2019. Dots are U.S. states.

County microbusiness composite index shows variation/disparity



Note: Blue colors indicates higher values.

Source: GoDaddy and UCLA Anderson Forecast

Is the relationship between online microbusinesses and economic outcomes driven by prevalence or activity?

Model	Dependent variable	Key explanatory variable	Other explanatory variables
11B	Unemployment rate	Microbusiness index (- and significant)	Density of microbusiness, Covid-19 cases and deaths per capita, time and state controls
12B	Employment to population ratio	Microbusiness index (+ and significant)	Density of microbusiness, Covid-19 cases and deaths per capita, time and state controls
13B	Change in employment	Change in the index (not significant)	Change in the number of microbusiness, Lag of change in employment, Covid-19 cases and deaths, population, time and state controls

The microbusiness index provides **additional explanatory power** (over microbusiness density) for economic outcomes

Conclusions

- Digital infrastructure/broadband has a positive impact on local economic outcomes
- This positive impact is driven in part by online microbusinesses
- There are many factors that contribute to the success of online microbusinesses; broadband is just one of them