2020 Advancing Mississippi Conference:

Economic Impact of Covid-19 Outbreak: Does Regional Economic Structure Matter in Mississippi?

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Introduction

- On-going Covid-19 pandemic
- Has (negatively) affected health (physical and mental), economy (federal/state budgets, industries, businesses, and households), education, etc.
- Extreme event that we could not expect
  - Business close and job losses
  - Decreasing household income
  - Decreasing tax revenue and increasing government spending
  - Active research by researchers, policymakers, and community developers

Motivation 1

- As a regional economist, I questioned why certain regions had worse effects than others under the COVID-19 pandemic
  - Why some regions are more resistant over the extreme event like this pandemic
  - How a region fast recovers from the event
  - what makes a region more economically resilient
- Under the current pandemic, industrial structure leads to the different magnitude of impact on the state economy?
- Recently, developing this topic in Kim and Lim (2020)
- Turning to Mississippi,
  - Is Mississippi economy resistant to this pandemic?

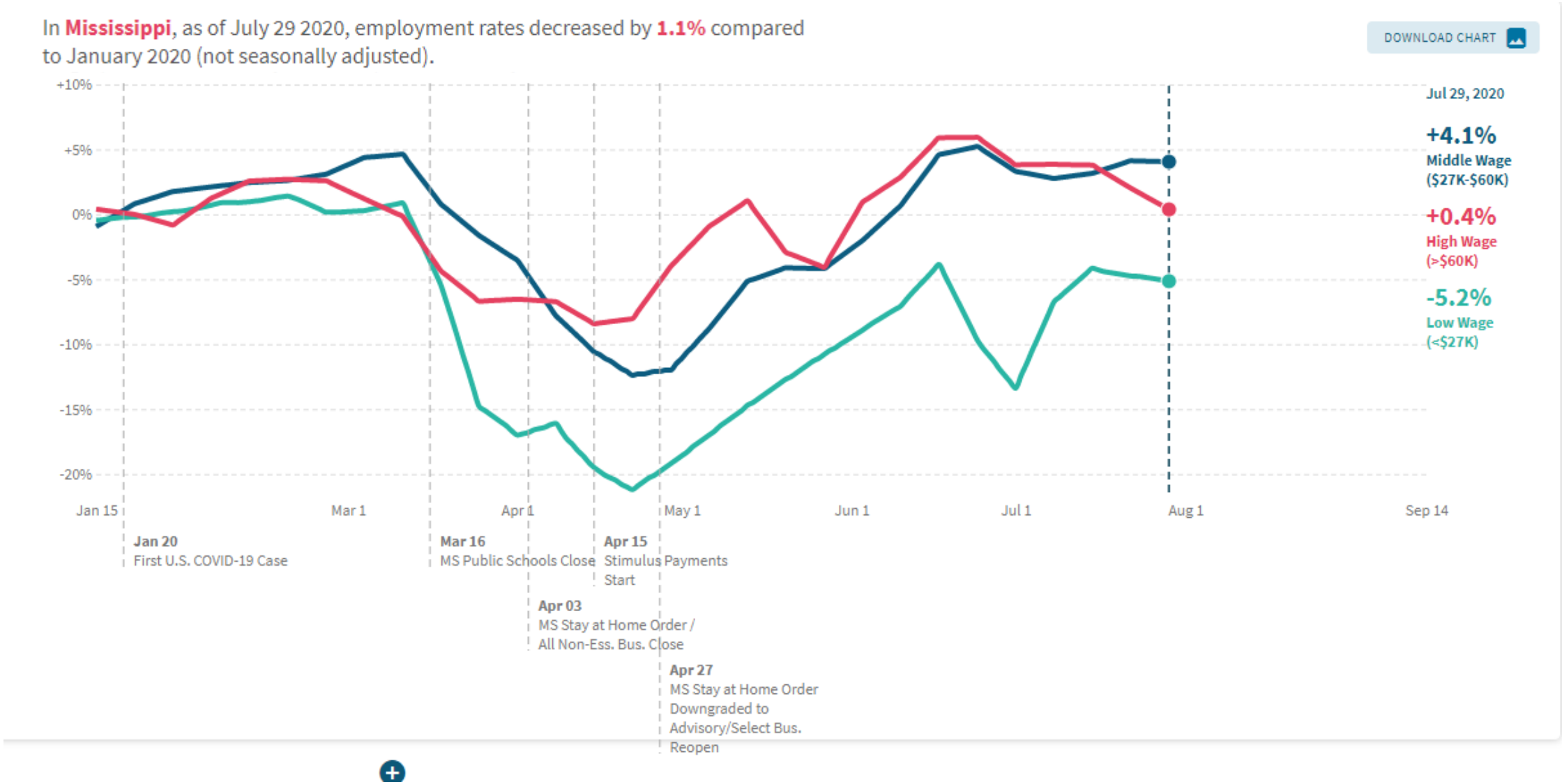
Motivation 2

- Is Mississippi less or more (negatively) affected by COVID-19 compared to other states?
  - Some states are better positioned economically to deal with the pandemic than the others → Case study
- Which state has been the most exposed to COVID-19
  - Nevada or Florida, which are the clusters of recreation or accommodations?
  - States specialized in industries highly affected by COVID-19 (high personal interactions and non-essential)
- Are the vulnerable industries to COVID-19 concentrated in MS?
  - If so, how are the industries related to the state economy?

Today

- It is good timing to discuss industry structure in Mississippi
  - We cannot expect when the extreme event happens again
  - If we can forecast the size of the impact and the path of effects
  - It helps us to build a strategy for economic resilience
- Today, I will show how the effect of COVID-19 in Mississippi in the perspective of industry structure
  - which industries are the most impacted by COVID-19
  - where those vulnerable industries are clustered
  - which state is more resistant than other states using the first quarter of GSP, 2020
  - the relationship b/w industry structure and the regional resistance

% Change in Employment compared to Jan 2020



How to define industries highly affected by COVID-19

- Categorized industries (6 digit-detailed code of NAICS)

	Essential	Non-essential
High personal interaction	Industry A	**Industry B**
Low personal interaction	**Industry C**	Industry D

- The level of personal interaction: on-site retail vs. online retails
- Essential vs. non-essential: grocery shops vs. restaurants

How to define industries highly affected by COVID-19

- Businesses in Industry B are more likely to close or reduce the demand
- Business in industry C might be less (directly) / or positively affected by COVID-19

Industry B	Industry C
Non-essential High personal interaction	Essential Low personal interaction
(retail trade:Retail B) 448 Clothing and clothing accessories stores 451 Sports, hobby, music inst, book stores 452 General merchandise stores 453 Miscellaneous store retailers (Transportation and warehousing: Trans B) 481111 Scheduled passenger air transportation 481211 Nonscheduled air psng chartering 483112 Deep sea passenger transportation 483114 Coastal and great lakes psng transport 483212 Inland water passenger transportation 487 Scenic and sightseeing transportation (Service B) 71 Arts, entertainment, and recreation 72 Accommodation and food services 81 Other services, except public administration	11 Agriculture, forestry, fishing and hunting 21 Mining, quarrying, and oil and gas extraction 22 Utilities (retail trade: Retail C) 441Motor vehicle and parts dealers 454 Nonstore retailers (Transportation and warehousing: Trans C) 481112 Scheduled freight air transportation 481212 Nonscheduled air freight chartering 482 Rail transportation 483111 Deep sea freight transportation 483113 Coastal and great lakes freight trnspt 483211 Inland water freight transportation 484 Truck transportation 488 Support activities for transportation 491 Postal service 492 Couriers and messengers 493 Warehousing and storage (Service C) 51 Information 52 Finance and insurance 54 Professional and technical services 55 Management of companies and enterprises 56 Administrative and waste services

Our expectation

- Industry specialization during COVID-19
  - Industry B concentrated → more negative effect
  - Industry C concentrated → less negative effect
- Industry Diversity
  - Better to the state economy?
- What other state attributes?

Table 1. Industry Classification (winner vs. loser)

	Essential	Non-essential
High personal interaction	Industry A	**Industry B**
Low personal interaction	**Industry C**	Industry D

Definition of specialization and diversity and Resistance Index

- Specialization of the industry: Location Quotient (LQ)-employments

$$LQ_{mi} = \left(\frac{E_{mi}}{E_i}\right) / \left(\frac{E_{mm}}{E_n}\right) = \frac{[share\ of\ industry\ B\ in\ the\ State]}{share\ of\ industry\ B\ in\ the\ US}$$

  - Interpretation: > 1 the region is more concentrated by Industry B (relative to the national average)

- Diversity: Relative Herfindahl-Hirschman Index(HHI)-number of firms

$$Div_i = 1/\sum_j |s_{ji} - s_j| = \frac{1}{\text{sum[diff. bw. regional and national shares of industries]}}$$

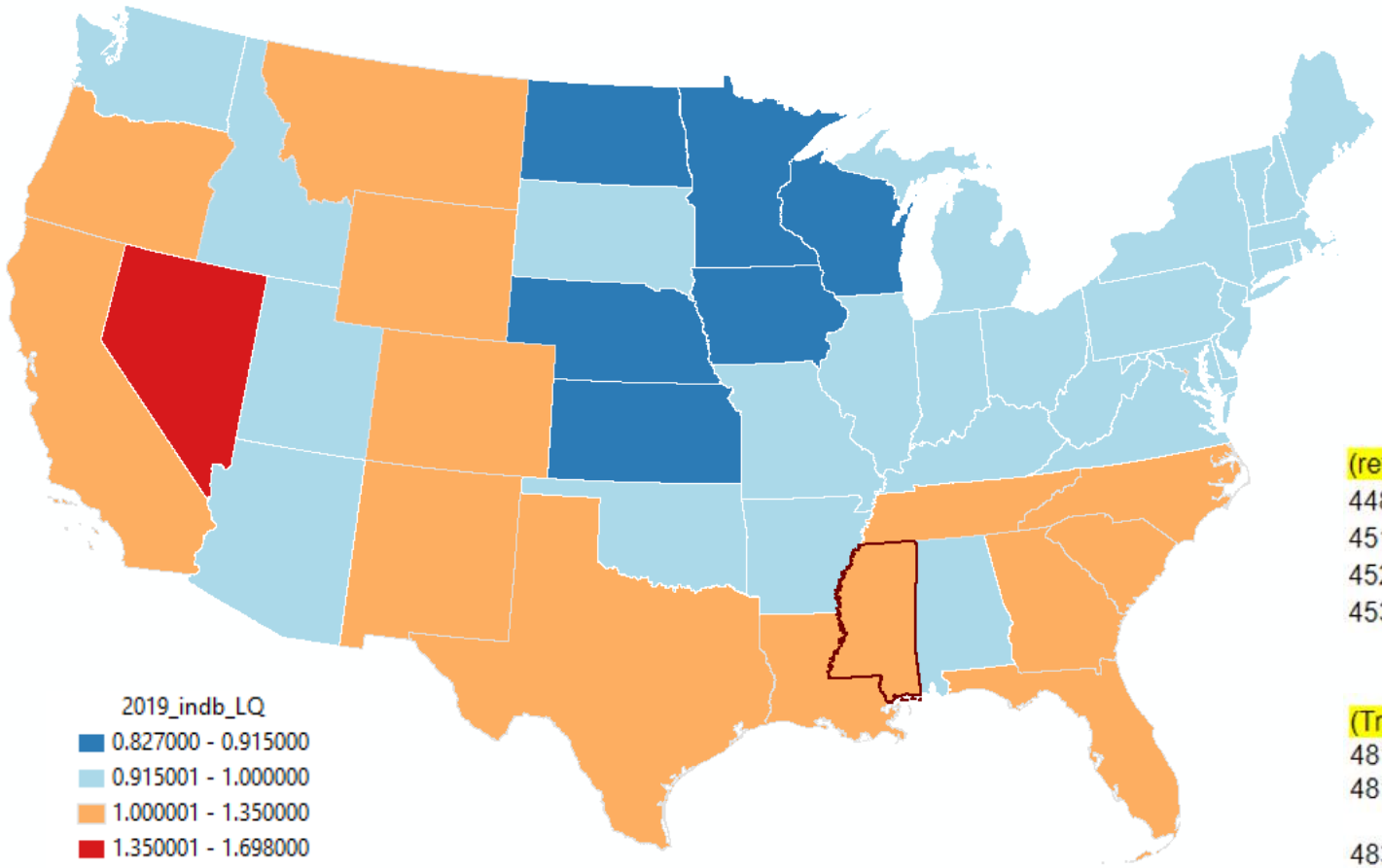
  - Interpretation: increasing value → more diverse industrial structure

- Resistance index developed by Lagravinese (2015)

$$\beta^N_{\text{res}} = [(E^R_t - E^R_{t-1})/E^R_{t-1} - (E^N_t - E^N_{t-1})/E^N_{t-1}]/|(E^N_t - E^N_{t-1})/E^N_{t-1}| = \frac{[\%\ change\ in\ GSP - \%\ change\ in\ GDP]}{|\%\ change\ in\ GDP|}$$

  - Interpretation: > 0 resistant (smaller relative loss or higher relative increase), < 0 non-resistant (higher loss or lower increase)

Concentration of Industry B in MS : 1.03



	MS	Southern States	US
Average	1.03	1.03	
Max		1.21 (FL)	1.70 (NV)
Min		0.95(AR)	0.83 (ND)

(retail trade:Retail B)
448 Clothing and clothing accessories stores
451 Sports, hobby, music inst, book stores
452 General merchandise stores
453 Miscellaneous store retailers

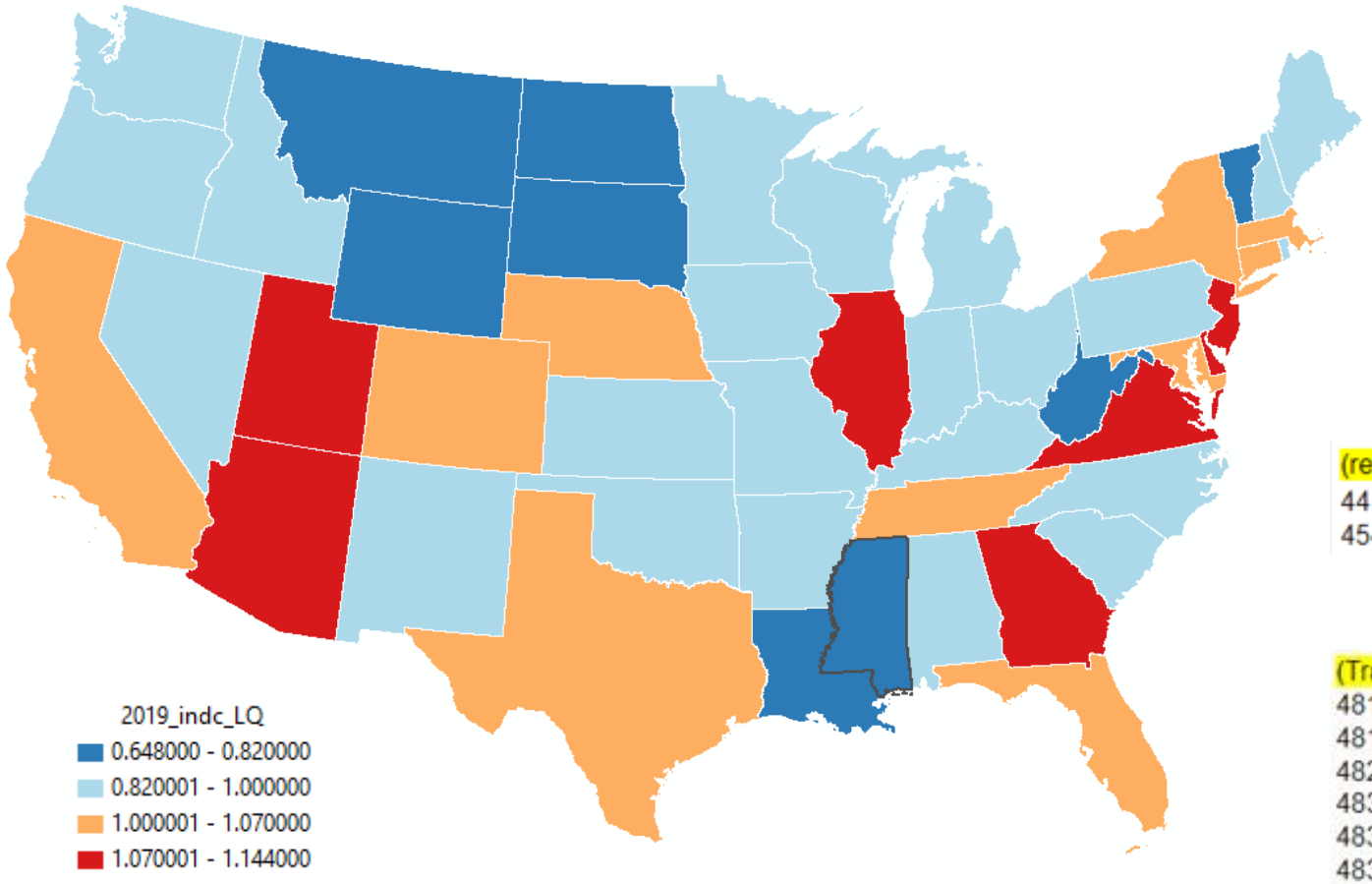
(Service B)
71 Arts, entertainment, and recreation
72 Accommodation and food services
81 Other services, except public administration

(Transportation and warehousing: Trans B)
481111 Scheduled passenger air transportation
481211 Nonscheduled air psng chartering

483112 Deep sea passenger transportation
483114 Coastal and great lakes psng transport
483212 Inland water passenger transportation

487 Scenic and sightseeing transportation

Concentration of Industry C : 0.77



	MS	Southern States	US
Average	0.77	0.95	
Max		1.12 (VA)	1.14 (NJ)
Min		0.77 (MS)	0.65 (WY)

(retail trade: Retail C)
441Motor vehicle and parts dealers
454 Nonstore retailers

(Service C)
51 Information
52 Finance and insurance
54 Professional and technical services
55 Management of companies and enterprises
56 Administrative and waste services

(Transportation and warehousing: Trans C)
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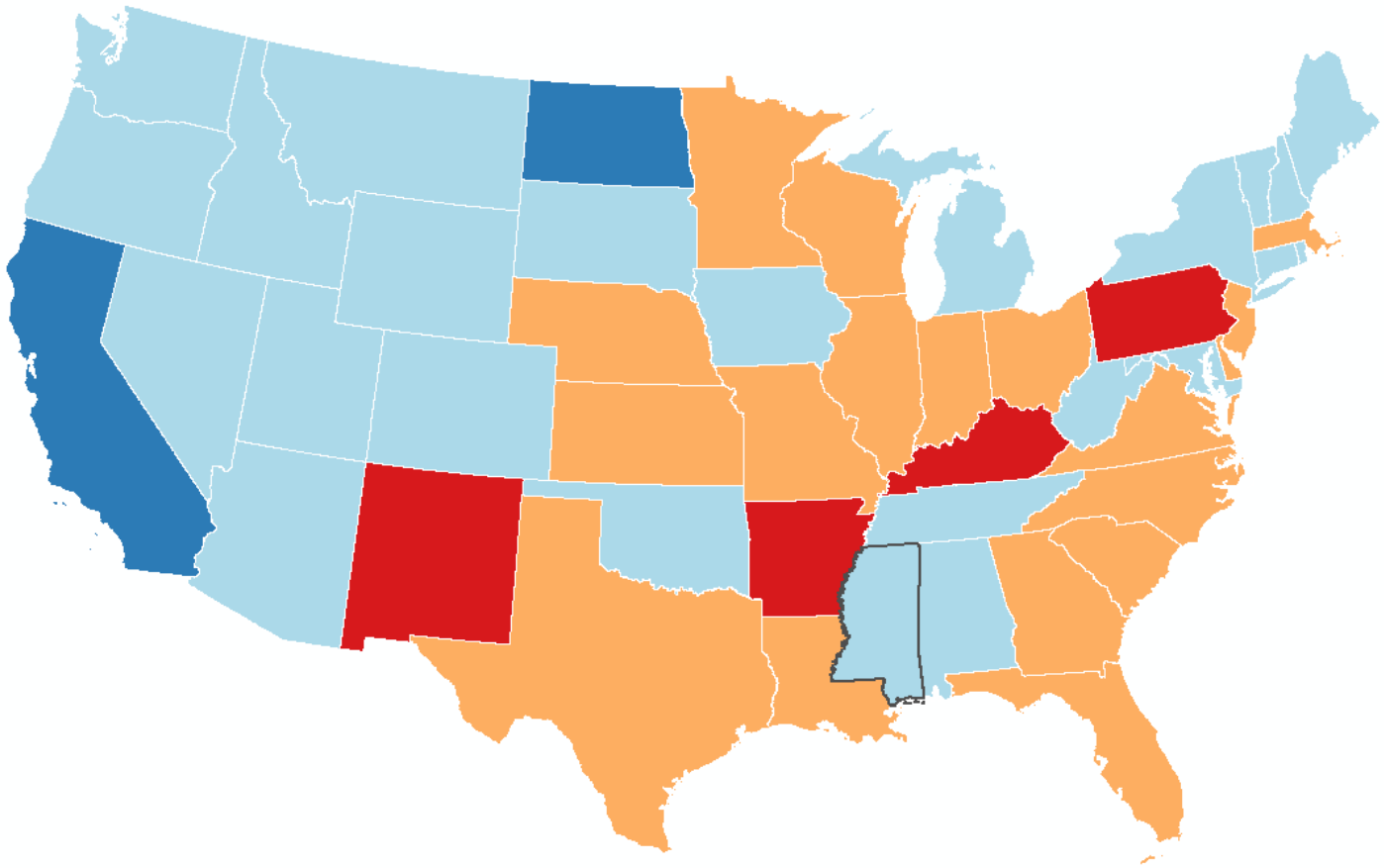
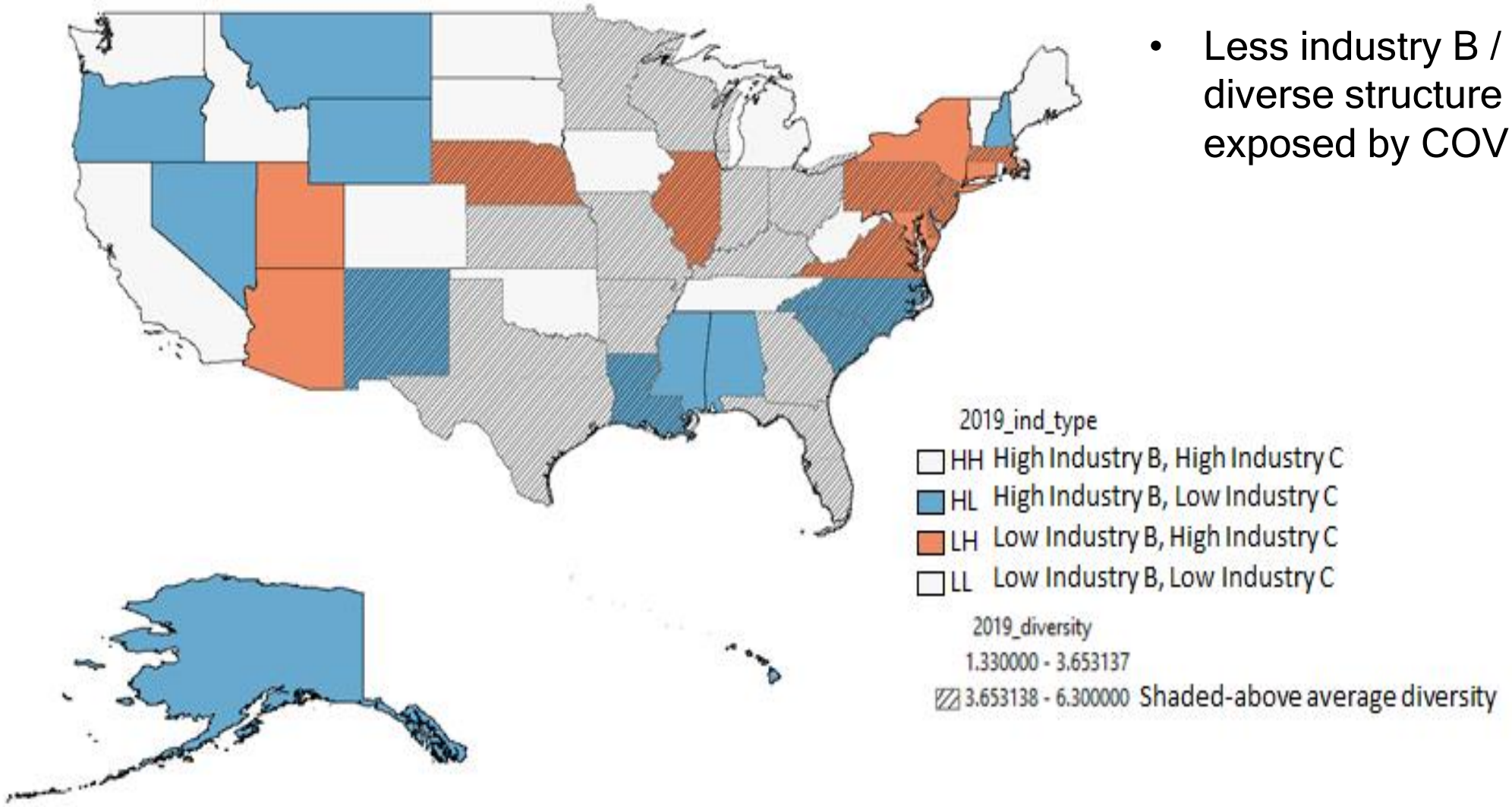
488 Support activities for transportation
491 Postal service
492 Couriers and messengers
493 Warehousing and storage

Industrial Diversity : 2.98



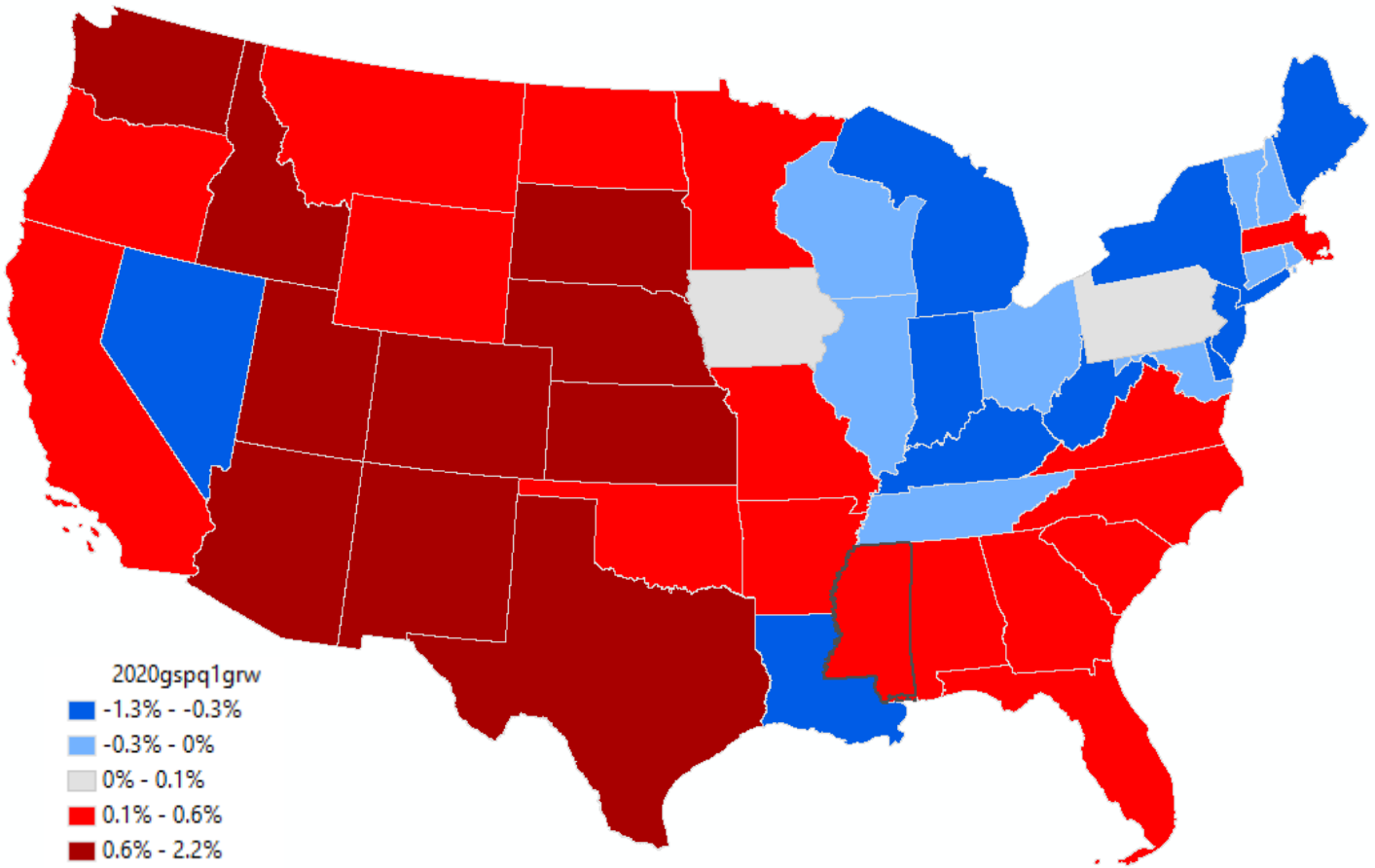
	MS	Southern States	US
Average	2.98	4.15	
Max		5.79 (KY)	6.3 (NM)
Min		2.98 (MS)	1.33 (DC)

Expectation of COVID-19 impact according to the industrial structure



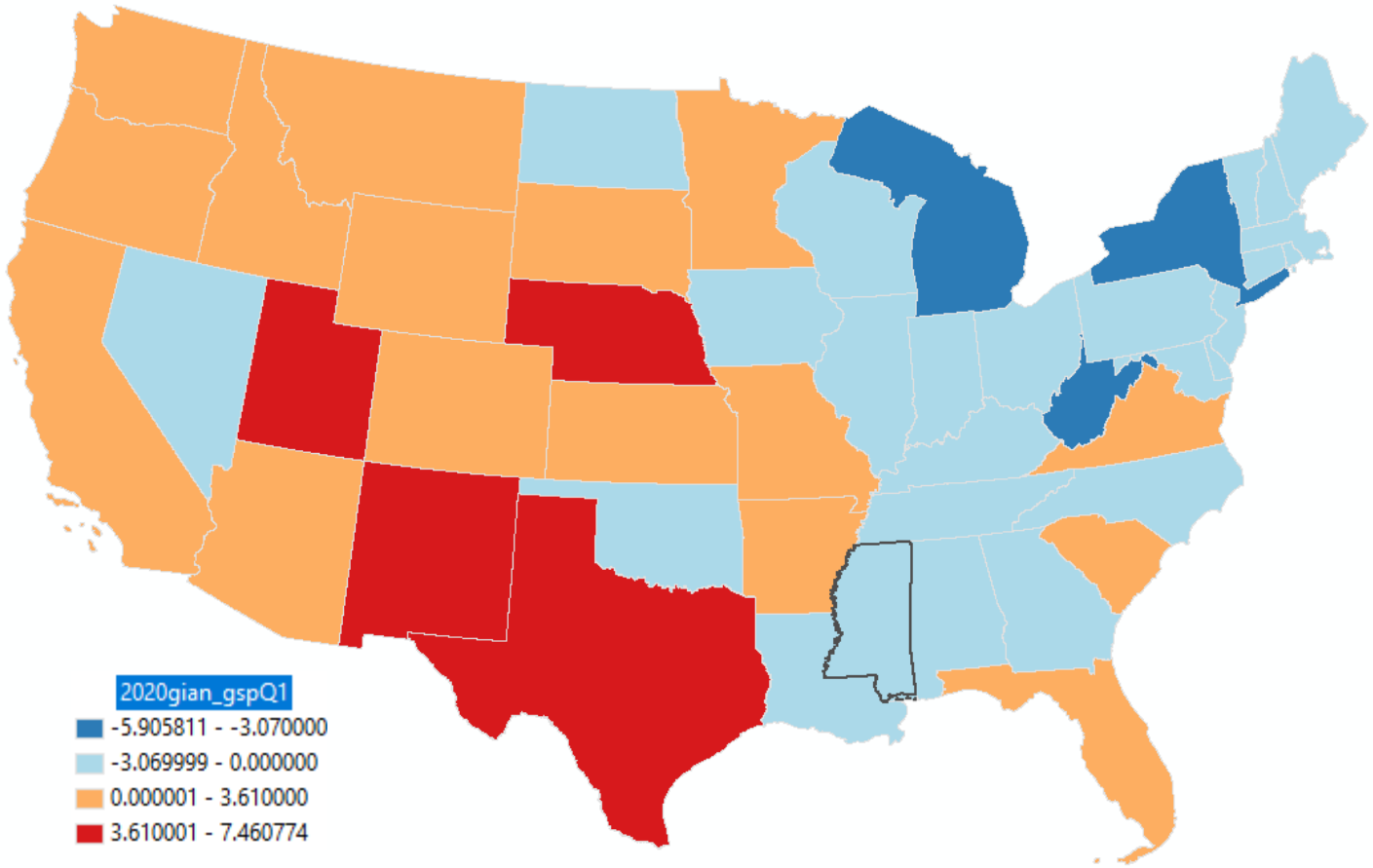
- Less industry B / more C / diverse structure → less exposed by COVID-19?

% Change in Gross State Product, Q1 2019-2020



	MS	Southern States	US
Average	0.22%	0.83%	0.26%
Max		2.24% (TX)	2.24% (TX)
Min		-0.32% (KY)	-1.30% (HI)
2018-2019	1.35%	3.12%	2.65%

Economic resistance, 2019-2020, Q1

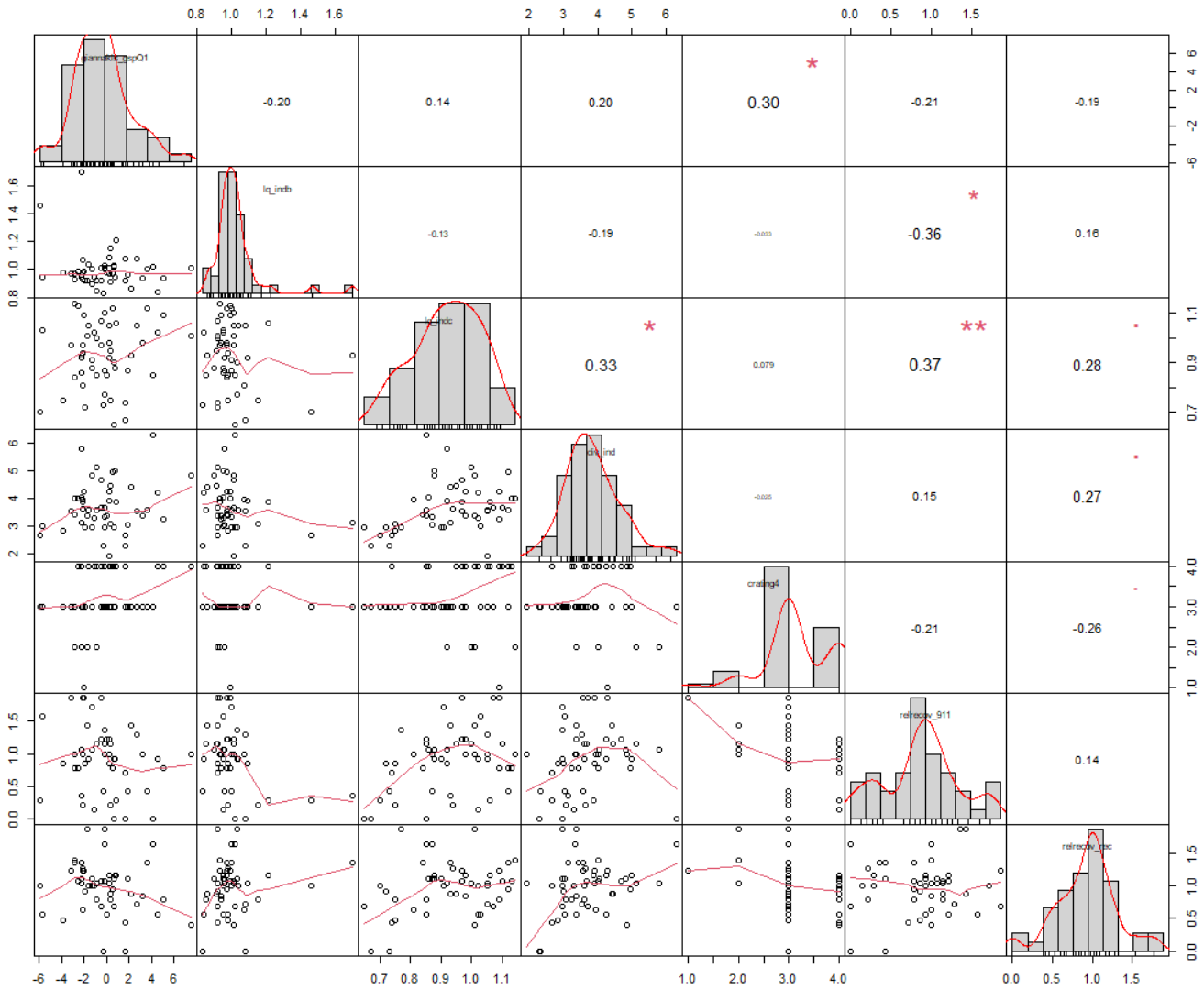


	MS	Southern States	US
Average	-0.16	2.13	-
Max		7.46 (TX)	7.46 (TX)
Min		-2.22 (KY)	-5.91 (HI)

Comparison of industry structure and economic resistance

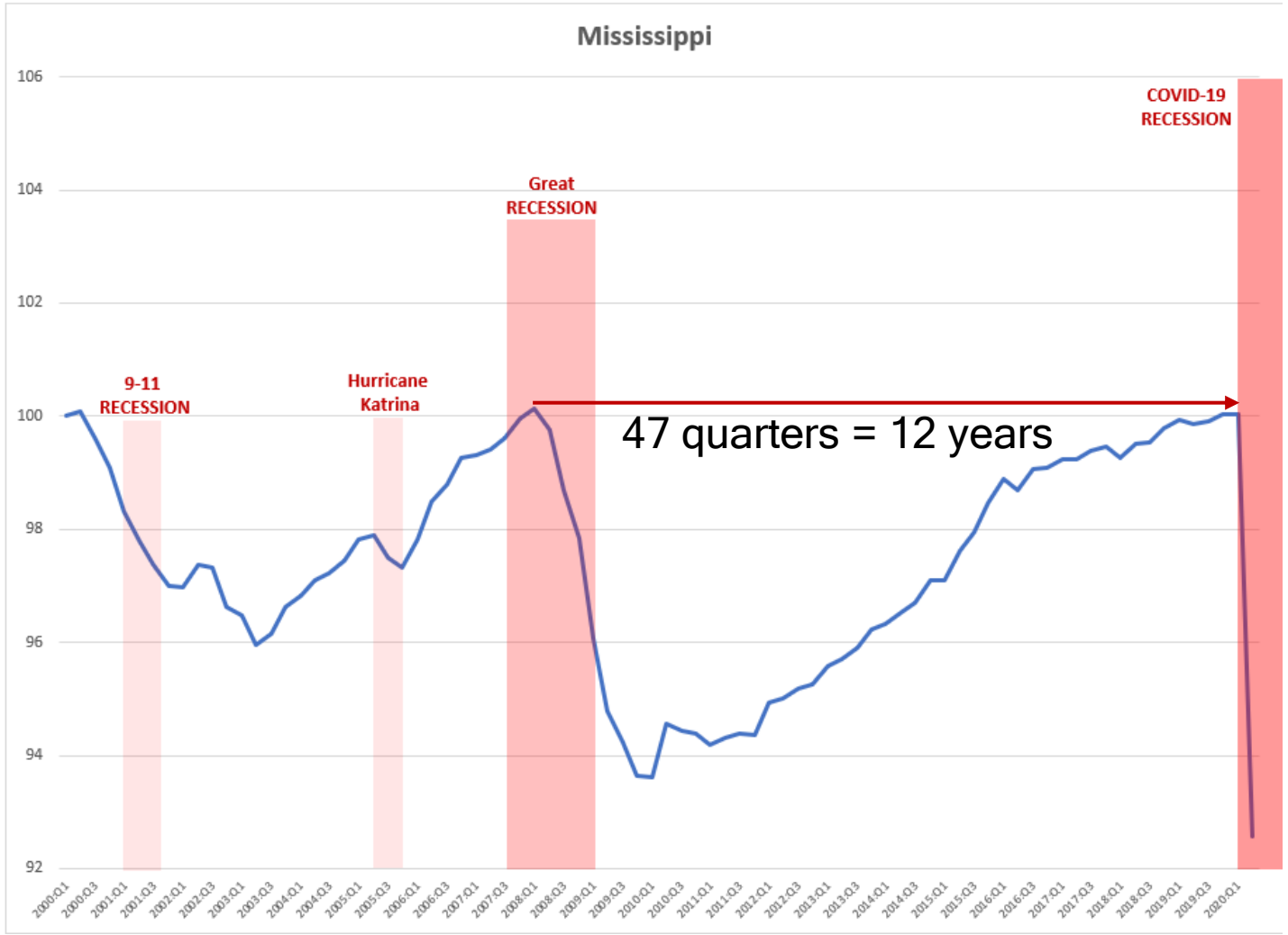
	MS	Southern States	US
Industry B	1.03	1.03	1.00
-Retail	1.23	1.11	1.01
-Trans and warehousing	0.12	0.70	0.87
-Service	1.01	1.01	1.01
Industry C	0.77	0.95	0.93
-Retail	0.98	1.01	1.03
-Trans and warehousing	1.25	1.22	1.17
-Service	0.66	0.91	0.92
Diversity	2.98	4.15	3.65
GSP change in Q1	0.22%	0.83%	0.26%
Resistance	-0.20	2.13	-

Correlation b/w economic resistance and regional attributes



- Economic Resistance to COVID-19
- More resistant economy with
  - Less concentration of Industry B
  - More concentration of Industry C
  - More diverse industrial structure
  - Better credit ratings
  - Recovery experience from 911 recession and 2008 economic recession

Concern: delayed response and recovery in Mississippi



Quarterly Employment from CES

US: 25 quarters = 6 years

Conclusion

- GSP in the first quarter 2020 shows
  - MS economy is less resistant to the COVID-19
  - It could be related to the industrial structure
    - More industries which are the most affected by COVID-19 but less industries which are less affected
    - Less diversified industry structure
    - Average level of credit rating

Future research

- Waiting for the 2nd and 3rd quarters GSP (in Oct. and Dec.) to capture clear COVID-effect and the degree of resistance and recovery
  - regional differences within MS
- Will expand this study with other extreme events
  - Natural disaster
  - Economic recession
- We cannot know when those events happen, but
- This study helps us 1) to forecast the magnitude of the effect and its path and 2) to build state and regional strategies of economic resilience

Thank you!
Any questions and comments?