How To Help Restaurants Survive COVID-19

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Team 86

Introduction

Issue

Congress passed a $25 billion COVID-19 bailout for the airline industry but not one tailored to the restaurant industry, which is four times bigger in terms of sales and 18 times bigger in number of jobs.

Need

Restaurants need to know what investments are likely to help them survive.

Solution

Actionable insights in consumer behaviour by region.
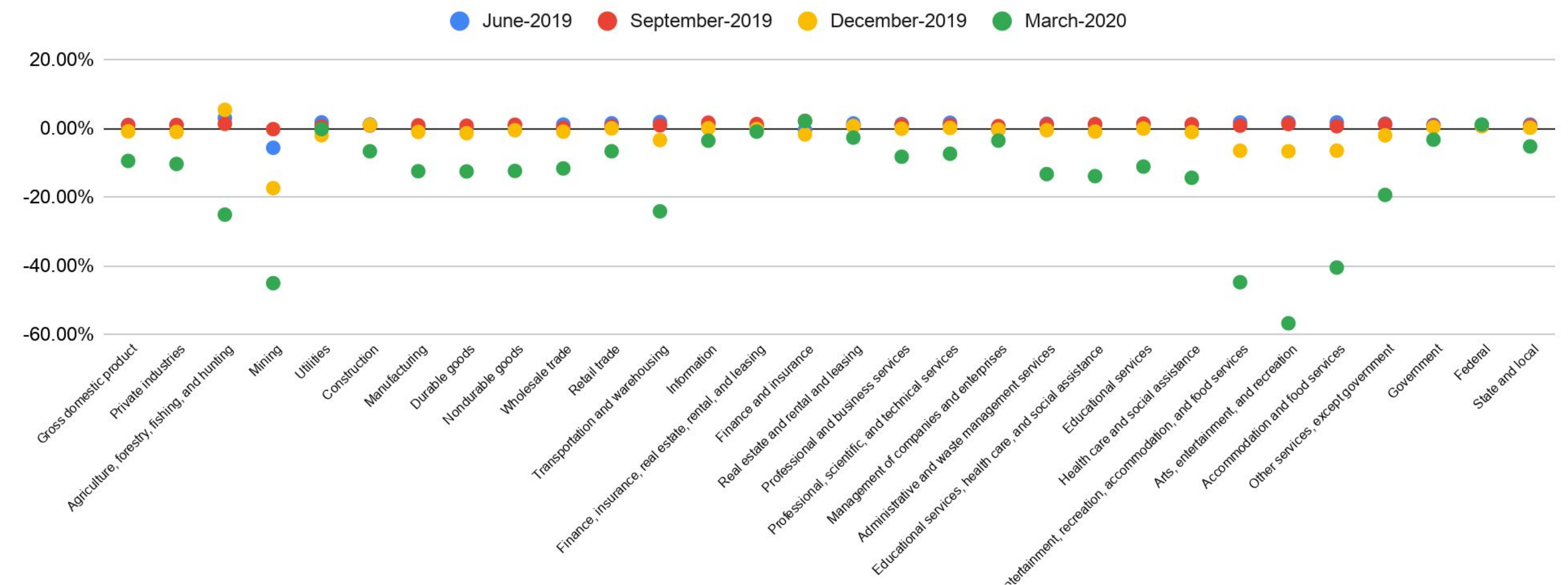
GDP

COVID Volatility

- 2020 challenged the services industry and complementary value chain to food services / accommodation across the board
- Arts, recreation, accomodation, and food services all experience over **40%** declines in GDP contribution
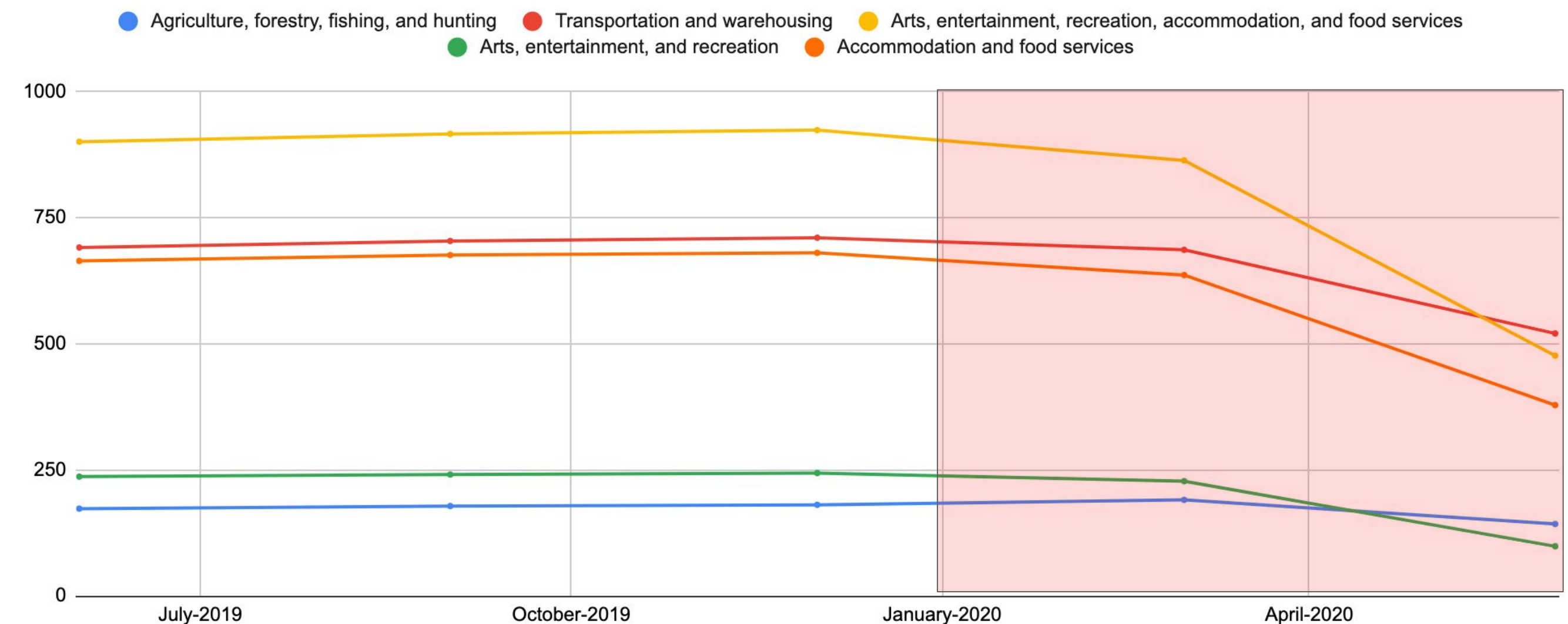
Food Services Impact

- In 2020 Q2, Accommodation and food services nominal value added was **1.9 percent of GDP** and decreased to $378.1 billion. Real value added decreased **88.4 percent** and contributed -4.38 percentage points to the change of -31.4 percent in real GDP

= COVID Impact

Volatility in Contribution to GDP

● June-2019 ● September-2019 ● December-2019 ● March-2020

Relevant Industries

● Agriculture, forestry, fishing, and hunting   ● Transportation and warehousing   ● Arts, entertainment, recreation, accommodation, and food services
● Arts, entertainment, and recreation   ● Accommodation and food services

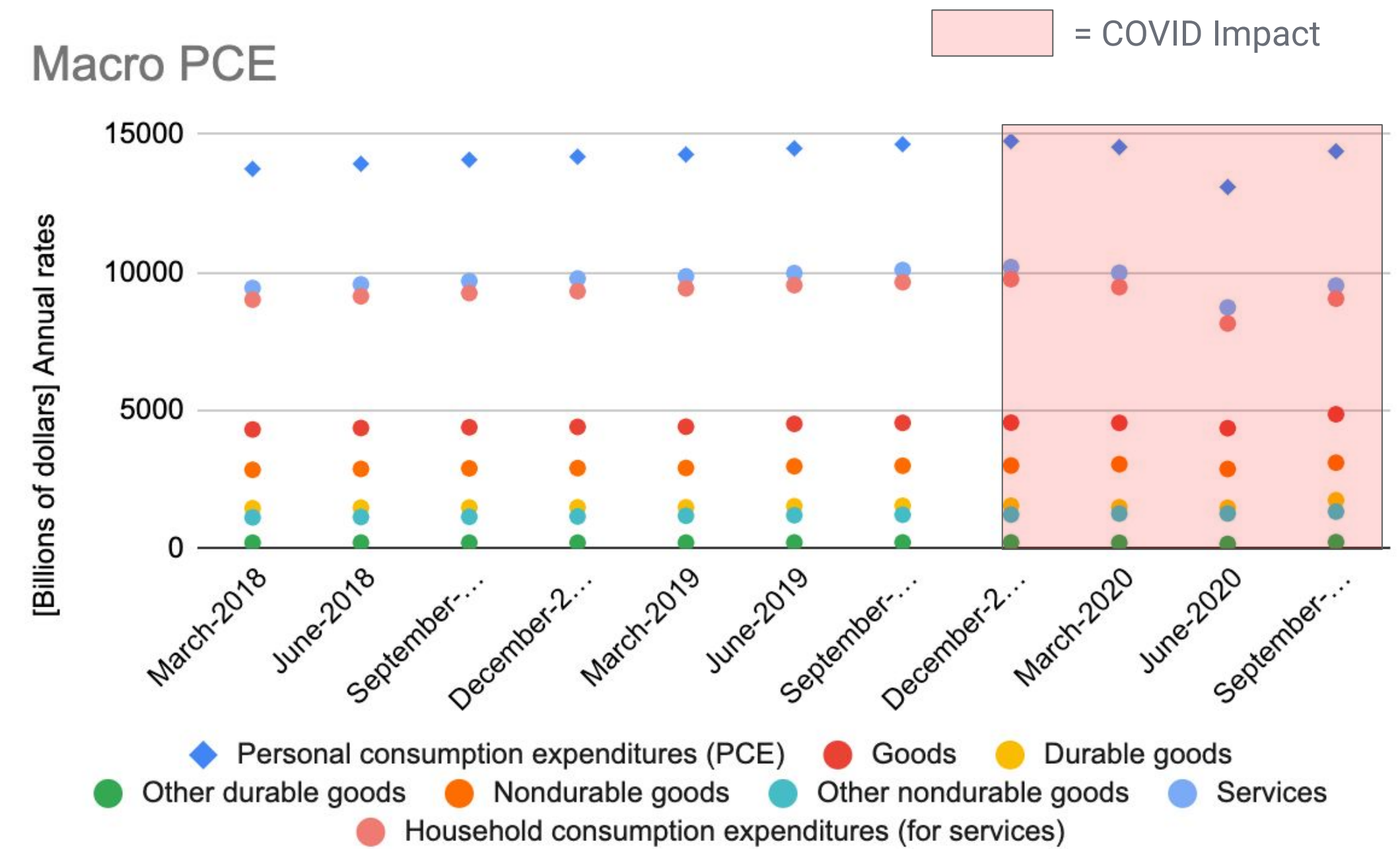Source: Bureau of Economic Analysis Data (GDP, Personal Consumption, Income, and Employment)

Personal Consumption Expenditures (PCE)

Macro Spending

- The first 2 quarters of 2020 showed negative trend in PCE across the board
- The driving factor behind the retracement was Service >> Household consumption expenditures (for services)
  - Suffered greatest loss of PCE in $ spent and % decline for Q1 and Q2 of 2020
- Q3 of 2020 increased PCE due to COVID Relief Act

Food Related Impact

- Not all Food Related Sectors were adversely affected during 2020
  - Food and beverages purchased for off-premises consumption actually increased by the highest margin
- Consumers did spend in 2020, however, their behaviour switched from food services, accomodations, and recreation, to groceries
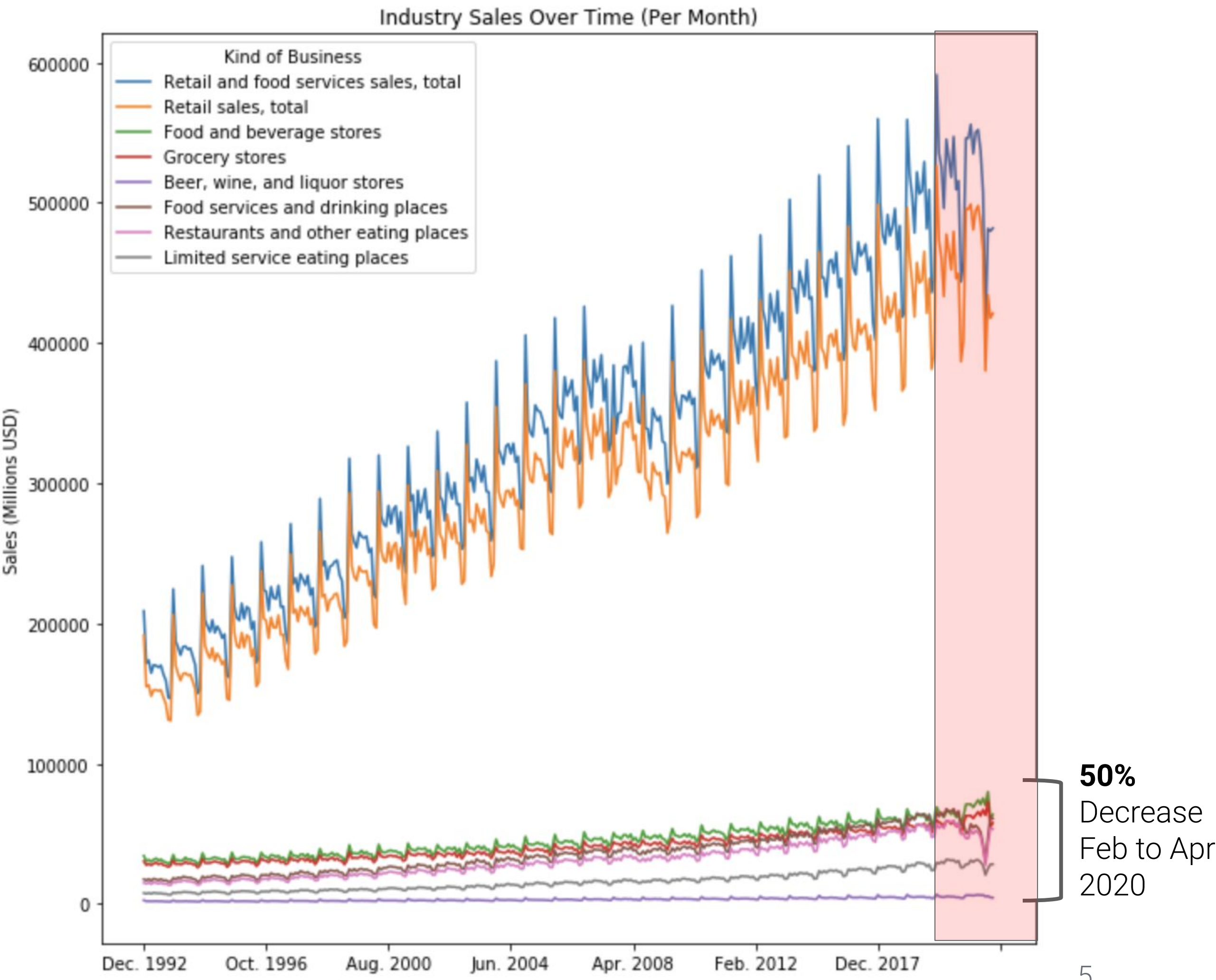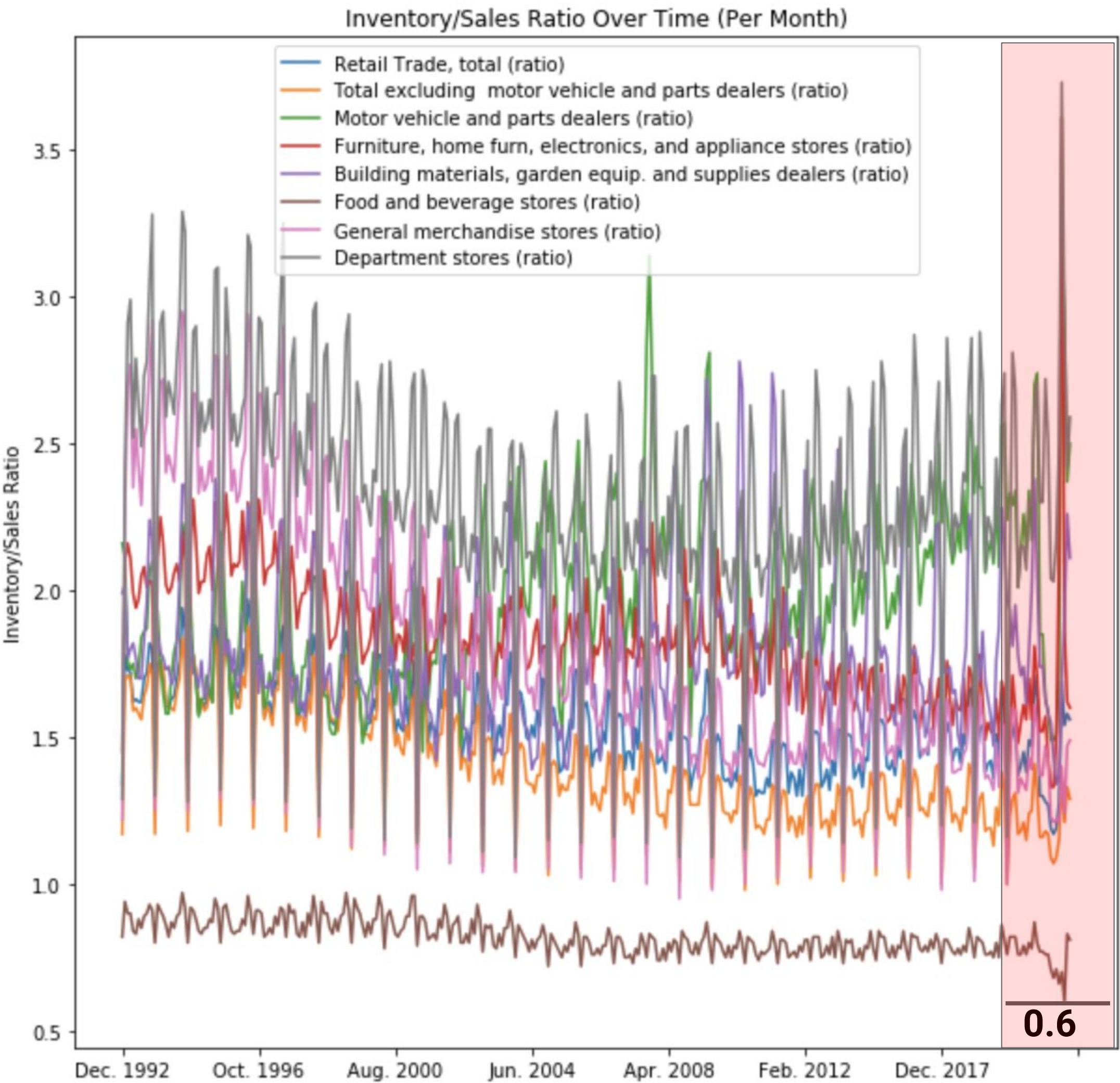
Source: Bureau of Economic Analysis Data (GDP, Personal Consumption, Income, and Employment)

Macro PCE

= COVID Impact

[Billions of dollars] Annual rates

Legend: Personal consumption expenditures (PCE) — Goods — Durable goods — Other durable goods — Nondurable goods — Other nondurable goods — Services — Household consumption expenditures (for services)

Personal consumption expenditures (PCE) vs. Food Related Areas

Legend: Personal consumption expenditures (PCE) — Food and beverages purchased for off-premises consumption — Food services and accommodations — Recreation services
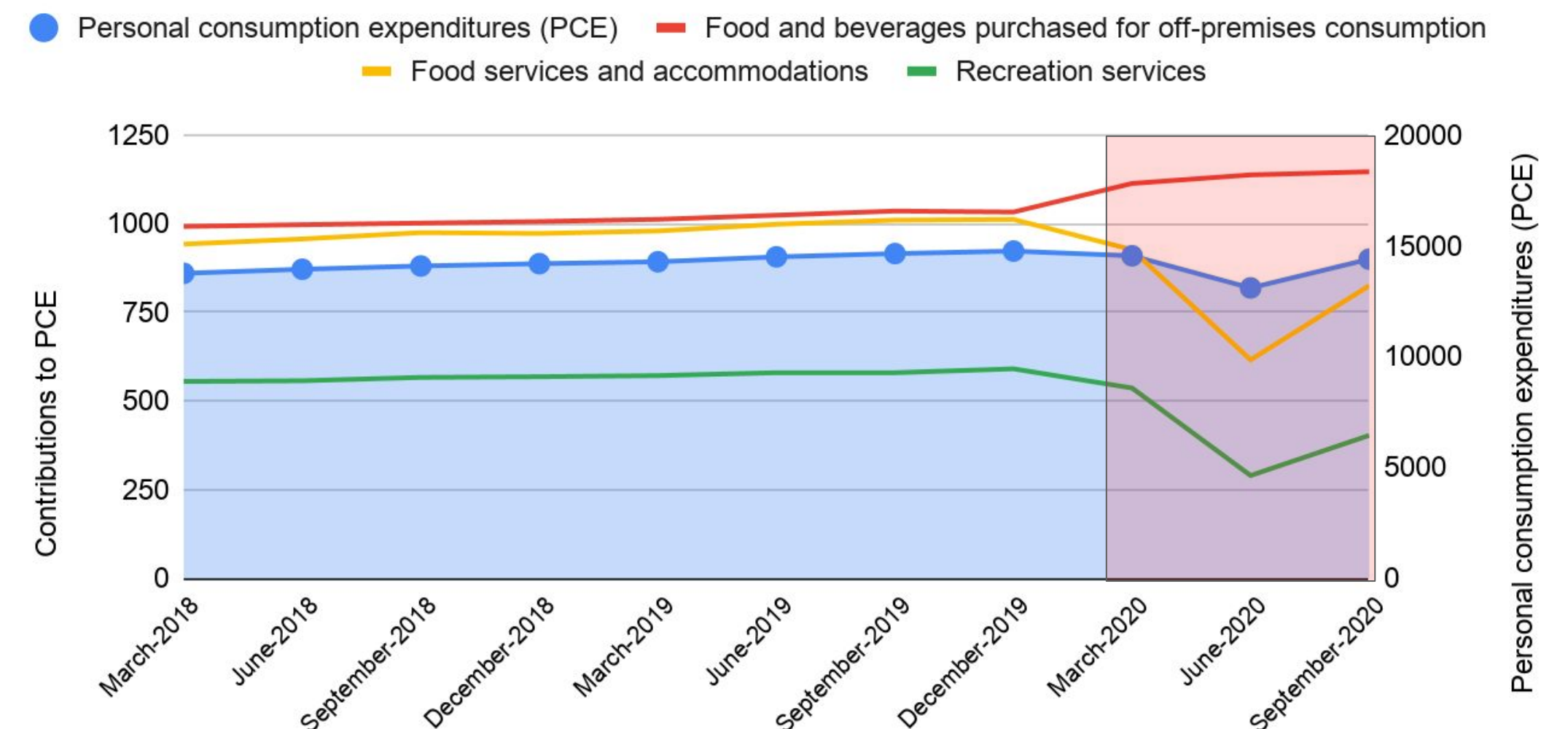
= COVID Impact

Inventory Sales

Following these trends, the restaurant industry could be classified as a **dying industry**

Inventory/Sales Ratio Over Time (Per Month)

Legend:
- Retail Trade, total (ratio)
- Total excluding motor vehicle and parts dealers (ratio)
- Motor vehicle and parts dealers (ratio)
- Furniture, home furn, electronics, and appliance stores (ratio)
- Building materials, garden equip. and supplies dealers (ratio)
- Food and beverage stores (ratio)
- General merchandise stores (ratio)
- Department stores (ratio)

0.6

Industry Sales Over Time (Per Month)

Kind of Business:
- Retail and food services sales, total
- Retail sales, total
- Food and beverage stores
- Grocery stores
- Beer, wine, and liquor stores
- Food services and drinking places
- Restaurants and other eating places
- Limited service eating places

50% Decrease Feb to Apr 2020

5

= COVID Impact

Unemployment

Impact

- The pandemic has caused historic unemployment numbers that even rivals the Great Recession. Leisure and Hospitality, a historically volatile industry, is hit disproportionately.

- In April 2020, Leisure and Hospitality hit **39.4%** unemployment compared to only **14%** for the total economy.
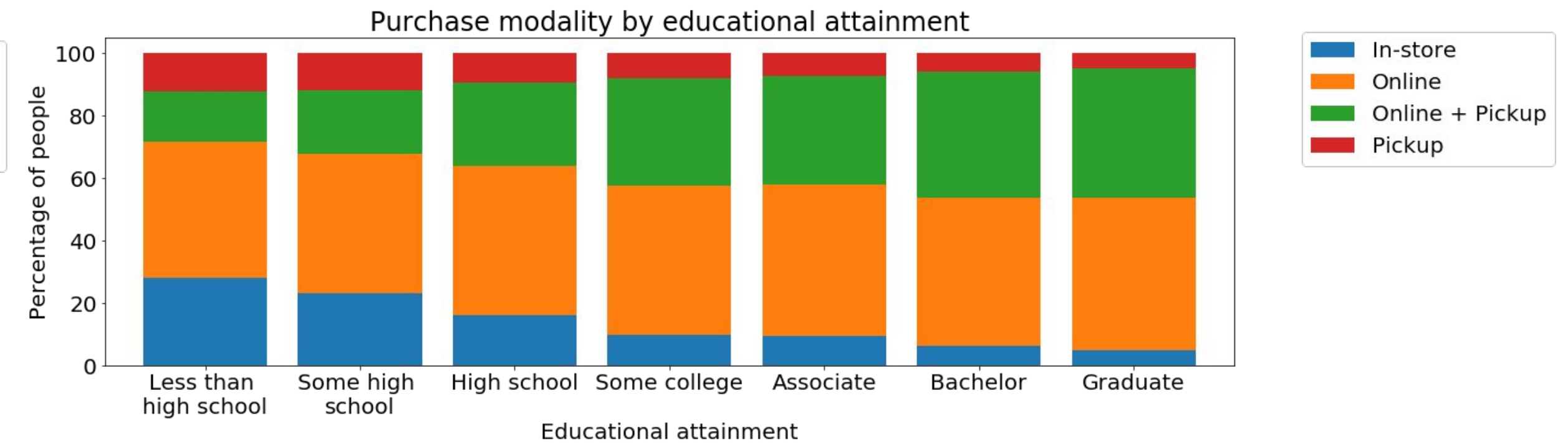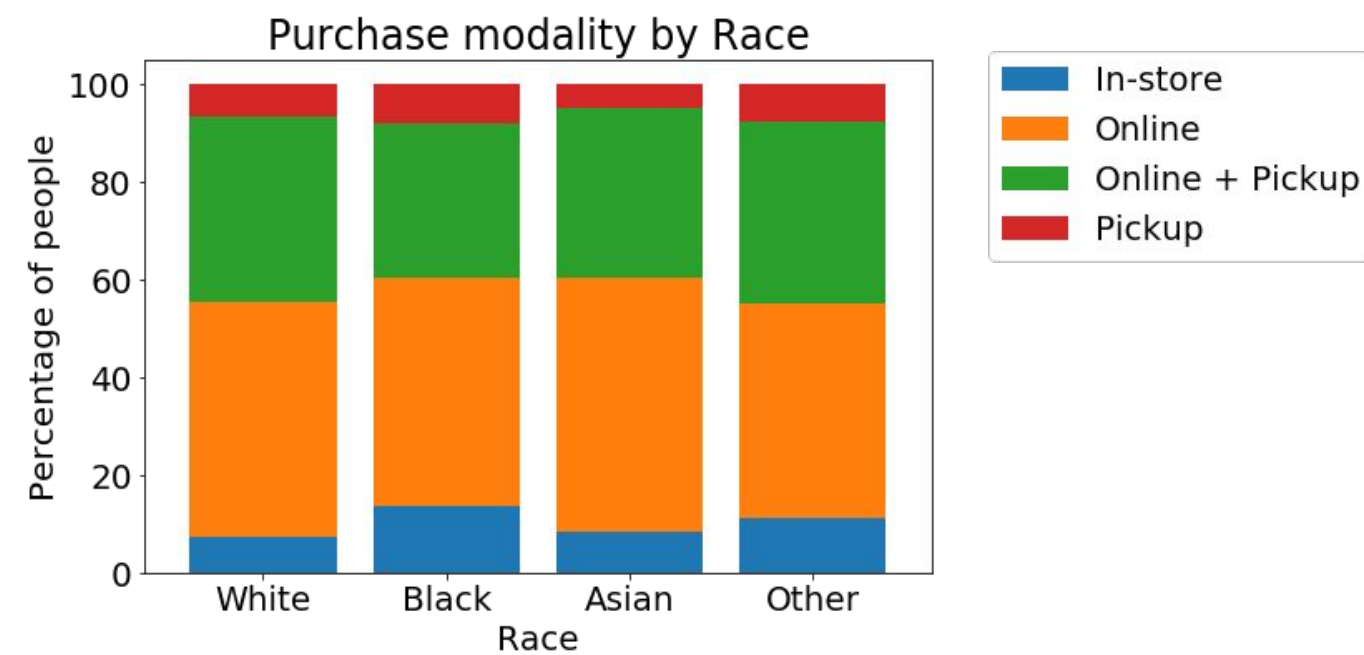
Monthly Unemployment Rate 2005 - 2020

39%

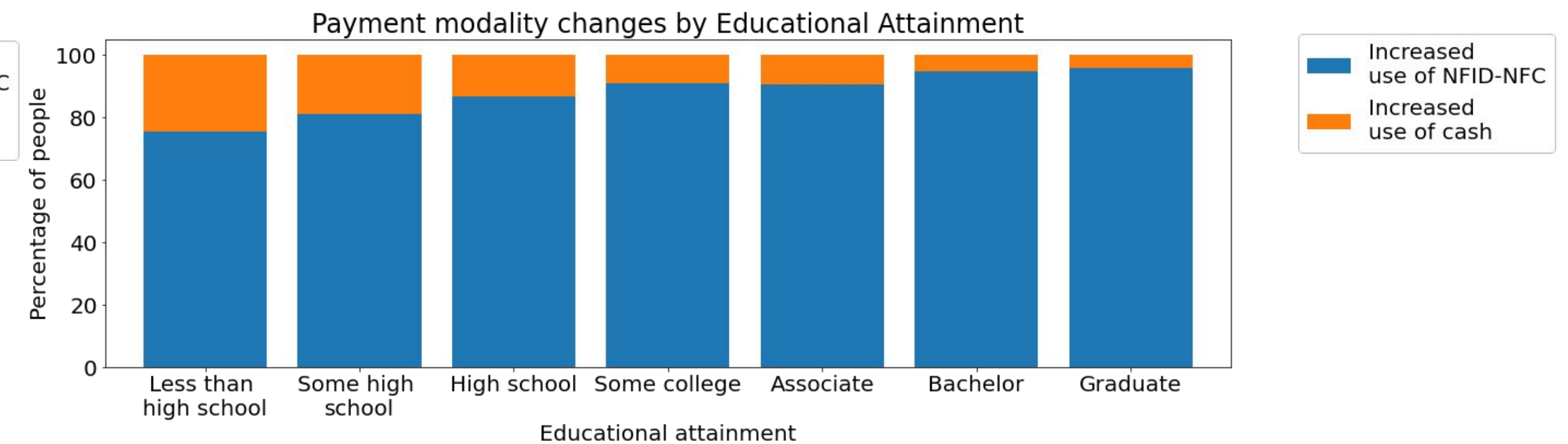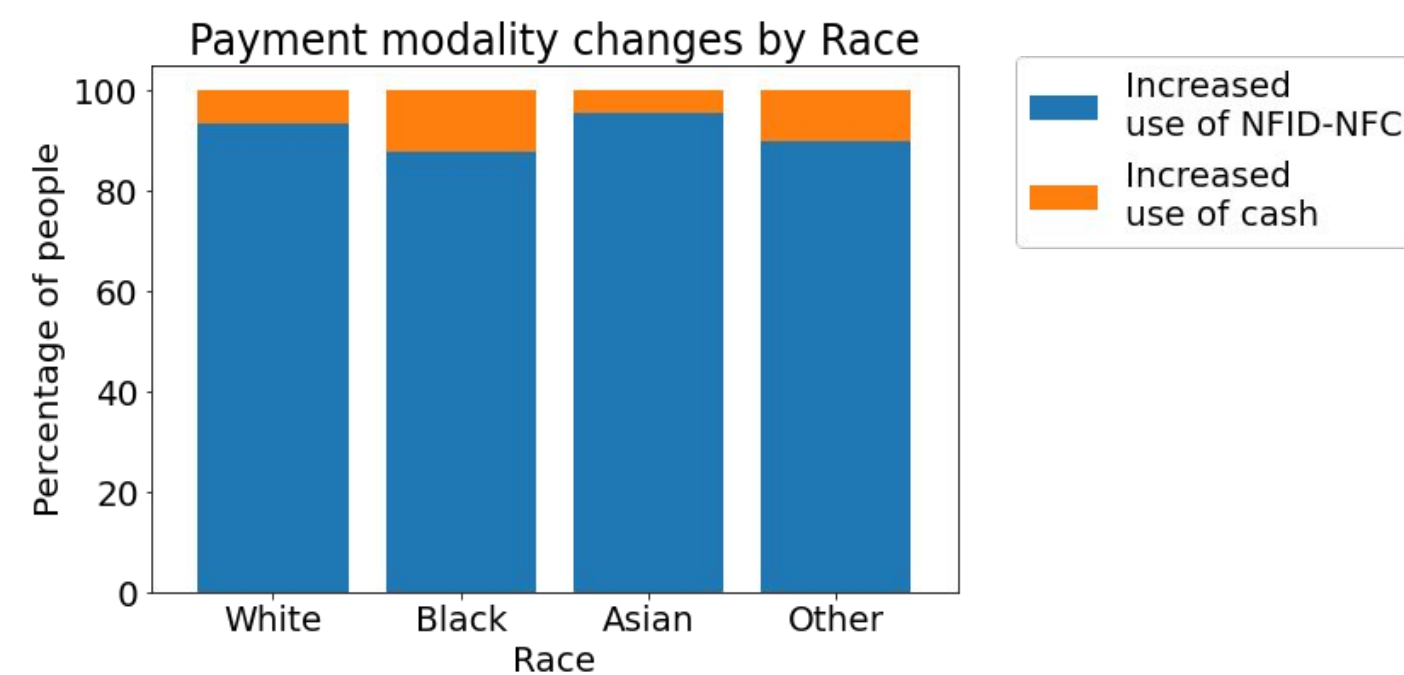Source: St. Louis Federal Reserve Bank
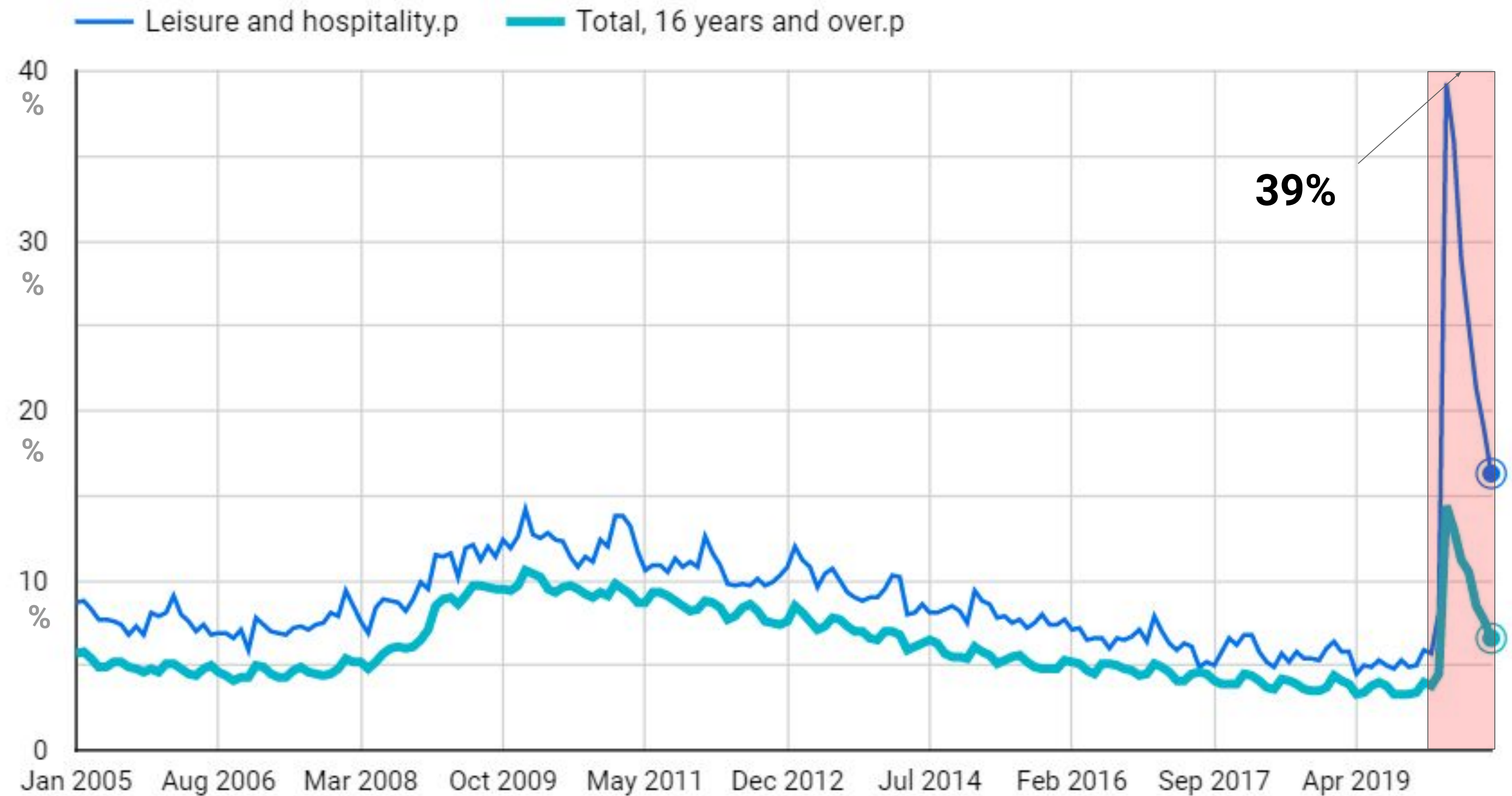
Overall Consumer Behaviors

Purchases

- **17%** made more in-store and pick-up purchases in the South and Midwest.
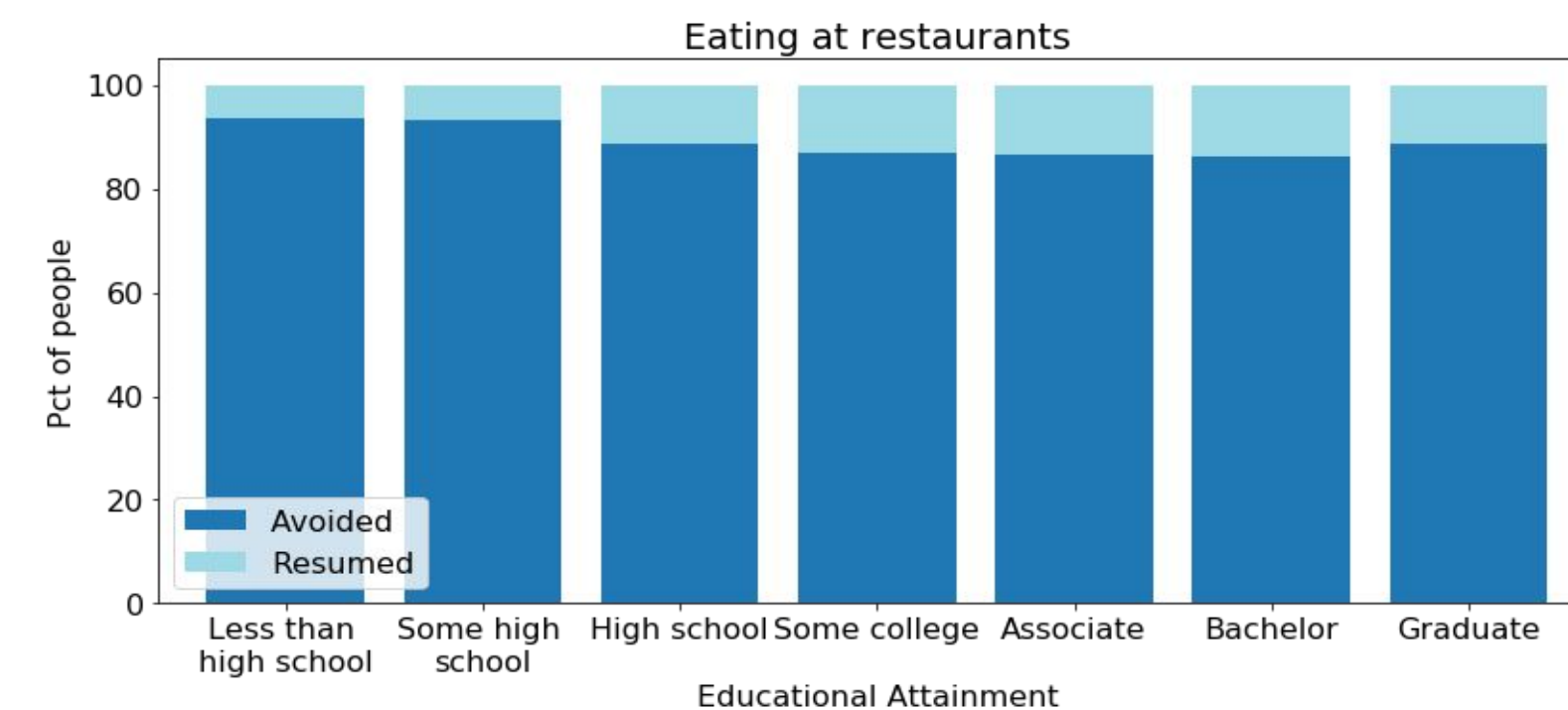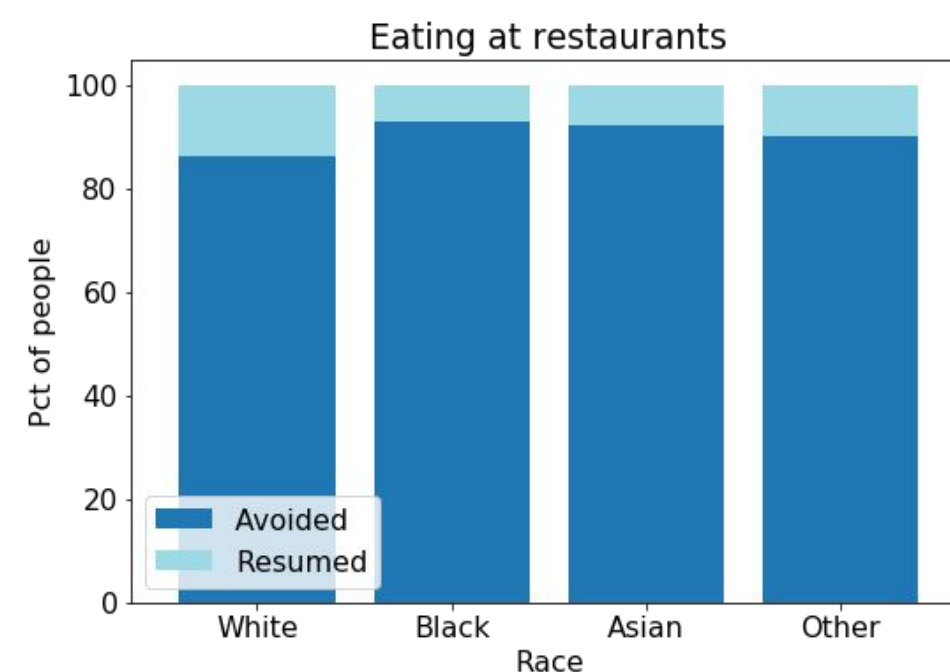- **13%** made the same choices in the West and Northeast.

Payment

- **West** and **Northeast** are the places with higher use of contactless payment methods.

Restaurants

- **86%** of the sample population avoided eating at restaurants.

Purchase modality by Race

Purchase modality by educational attainment

Payment modality changes by Race

Payment modality changes by Educational Attainment

Eating at restaurants

Eating at restaurants

Source: Household Pulse Survey 2020

7

Overall Mobility Patterns

Foot Traffic into food venues

- **Casual Dining** is the most disrupted food venue
- West and Northeast regions are recovering slowly from their regular foot traffic, related to the South and Midwest
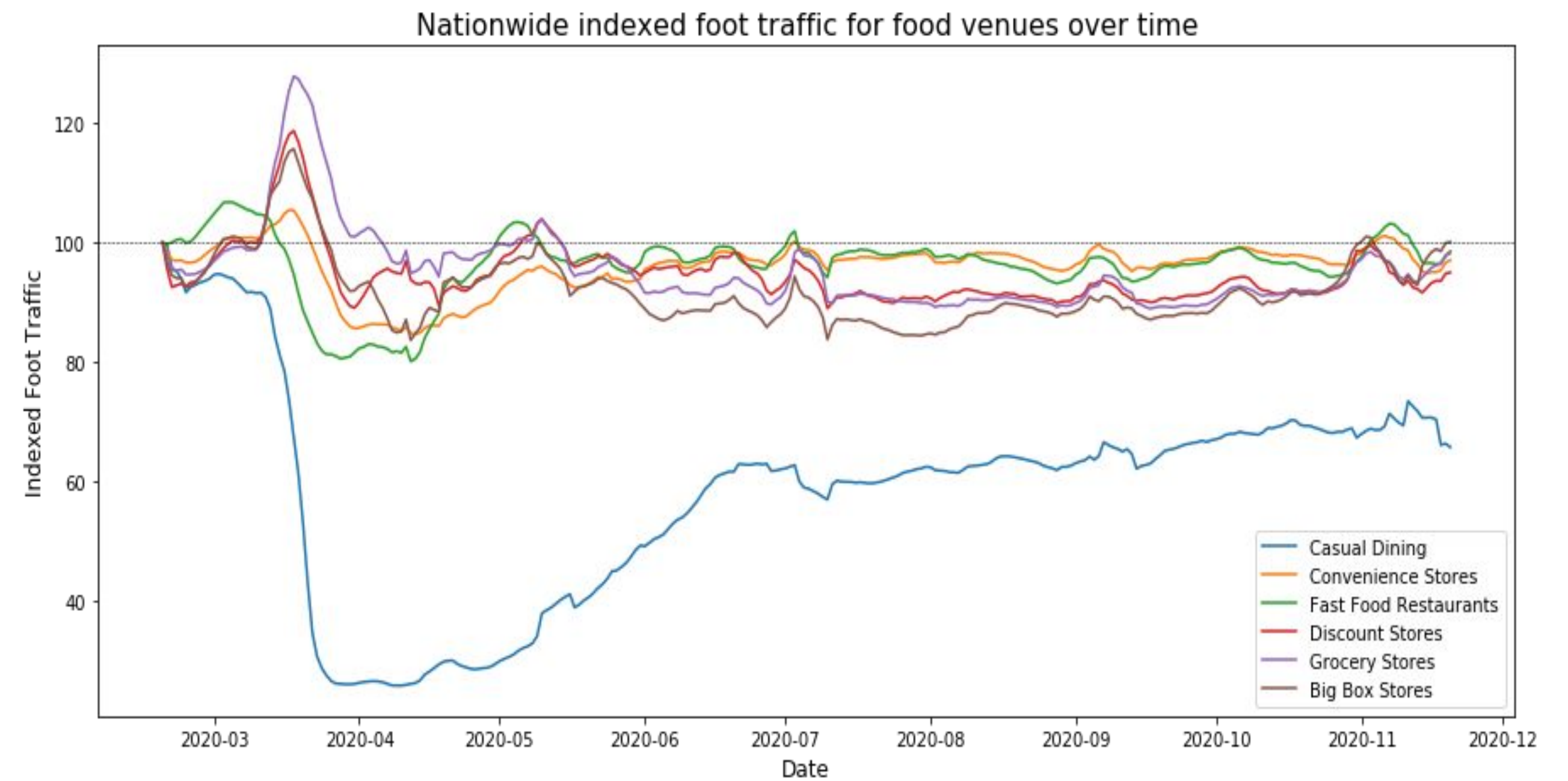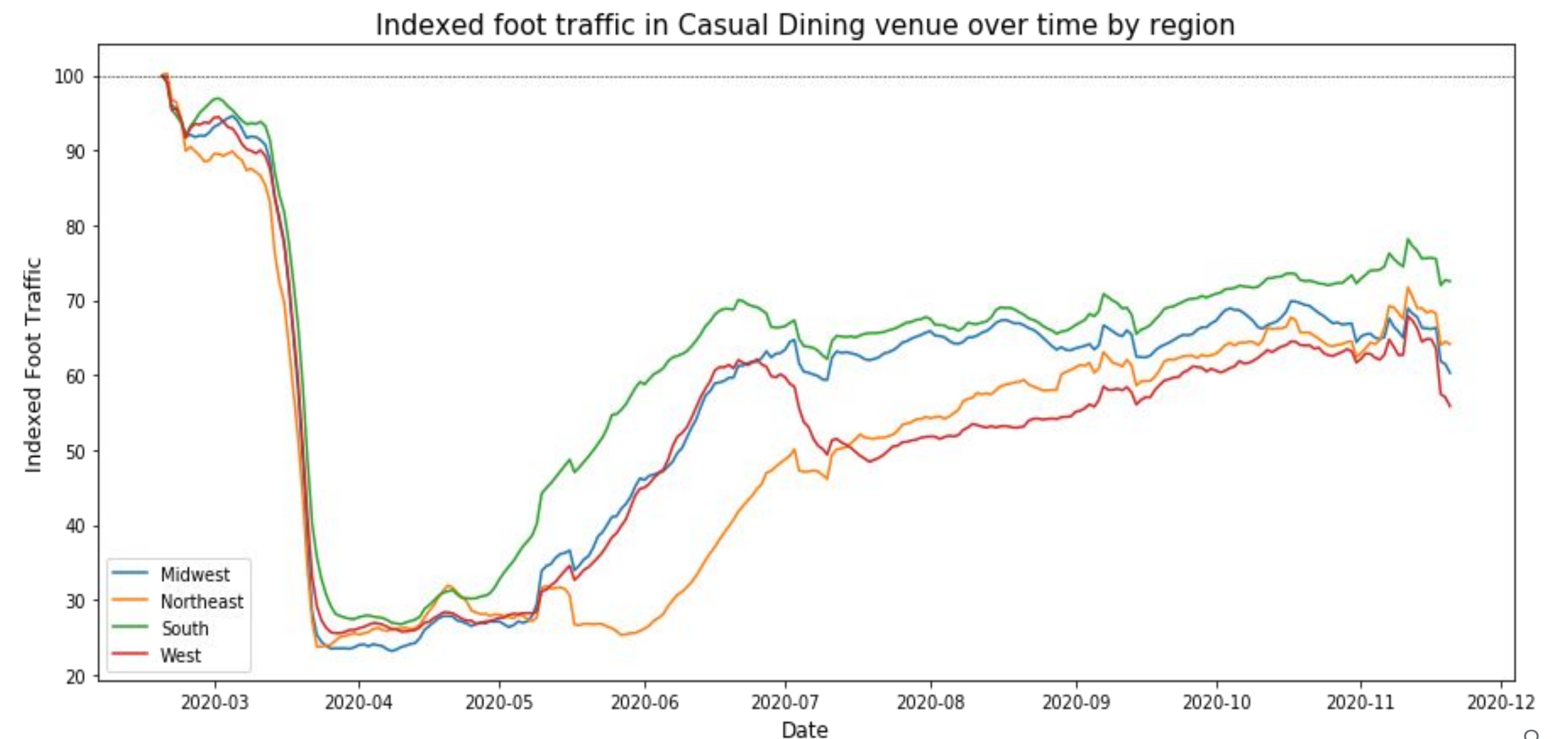
Route Requests

- States from West and Northeast also have the most disruptions on transit, driving, and walking directions requests.
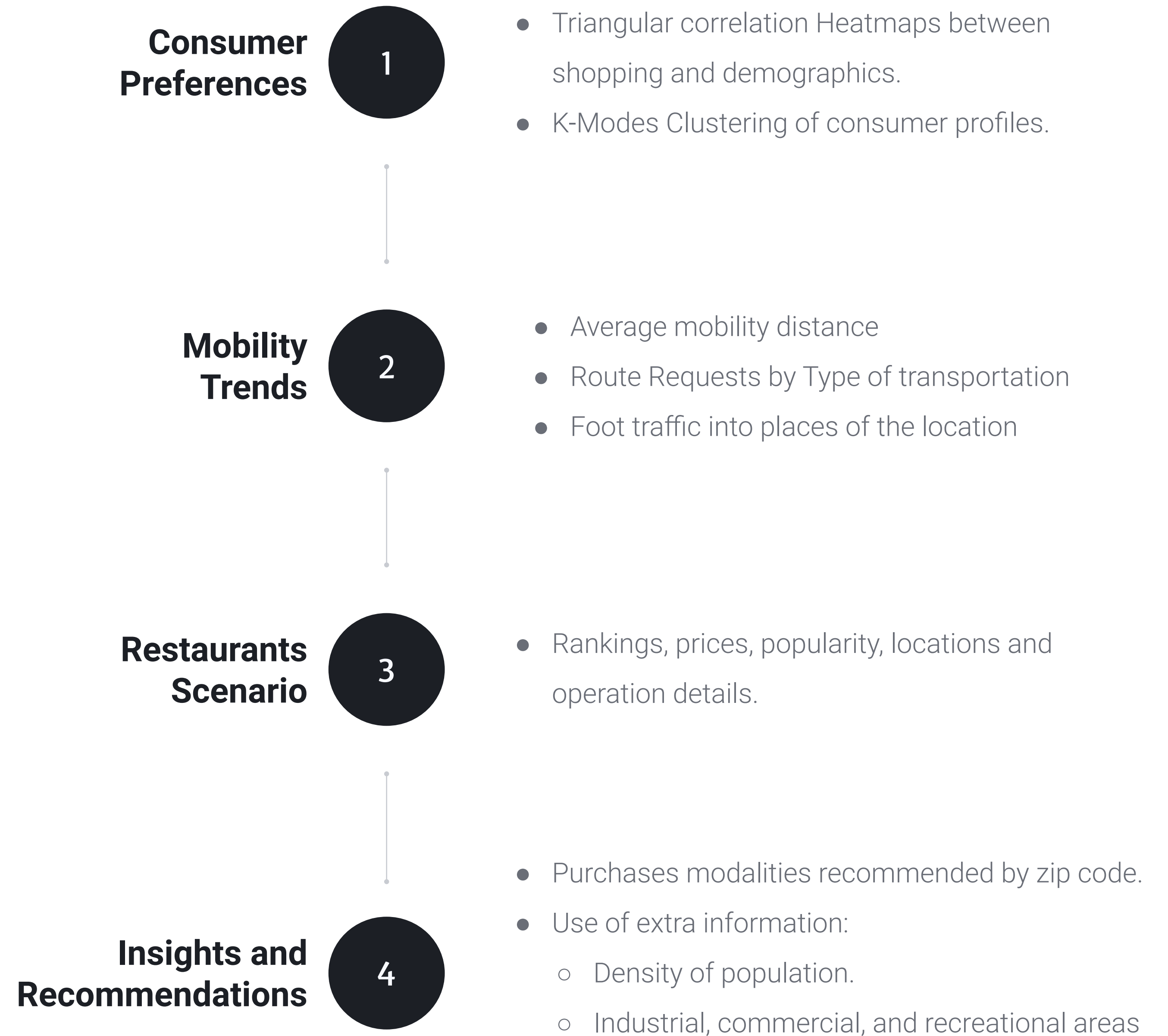
Mobility Regular Member of the Community

- Median mobility member in states from the Northeast and West are lower than the distance mobility in the South and Midwest regions.

Nationwide indexed foot traffic for food venues over time

Indexed foot traffic in Casual Dining venue over time by region

Source: COVID-19 Community Mobility Reports,Foursquare Foot Traffic Dataset and Descartes Lab Mobility Dataset

8

In-depth Analysis: Customer Preferences and the Restaurant Scenario in specific locations

Development of case studies in the West and South regions.

Consumer Preferences (1)
- Triangular correlation Heatmaps between shopping and demographics.
- K-Modes Clustering of consumer profiles.

Mobility Trends (2)
- Average mobility distance
- Route Requests by Type of transportation
- Foot traffic into places of the location

Restaurants Scenario (3)
- Rankings, prices, popularity, locations and operation details.

Insights and Recommendations (4)
- Purchases modalities recommended by zip code.
- Use of extra information:
  - Density of population.
  - Industrial, commercial, and recreational areas

Insights and Recommendations for cities analyzed

Dashboard Analysis

Foot traffic in specific venues, daily mobility of members, consumer profiles, businesses status

San Francisco

- Increase Delivery options:
  - Low and medium density residential areas
  - Commercial, Industrial areas
- Increase Pick-up options:
  - Mixed areas
  - Areas at most 1 km. from high density neighborhoods.

Miami

- Switch Delivery for Pick-up options:
  - Medium and high density residential areas.
  - Consider preferences by demographics (using consumer profiles created).
- Increase Pick-up options:
  - Areas at 6 km. from high density neighborhoods.
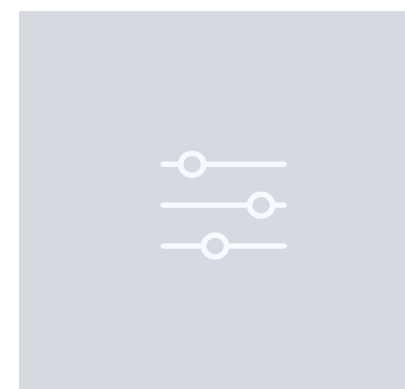
Next steps for further research
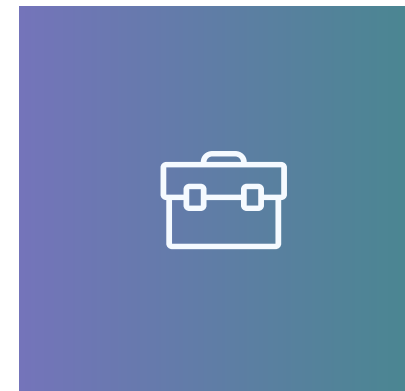
Concept

- Replicate analysis in different cities and metropolitan areas
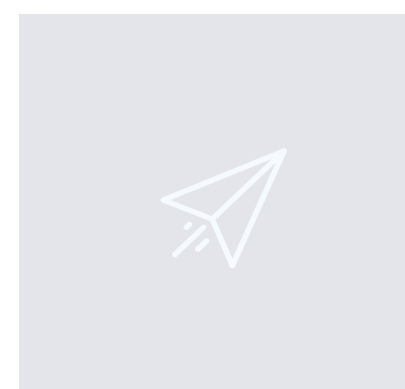
Process

- Filter consumer and mobility data from Database. Add more businesses with updated status by zip code

Analysis

- Include Causal-Inference between shopping variables and businesses decisions

Product

- Build automated reports by city (DataDog API)

Data Sources

Bureau of Economic Analysis Data

- GDP
- Personal Consumption
- Income
- Employment

Federal Reserve Bank of St. Louis

- Unemployment

Household Pulse Survey 2020

Restaurants Platforms

- Yelp Dataset
- OpenTable Data

Annual Retail Trade Survey

- Monthly Retail Sales and Inventories

Mobility Patterns

- Apple Mobility Reports
- Descartes Lab Mobility Changes
- Google Community
- Foursquare Community Mobility Data