

# The Economic Impacts of COVID-19:

Evidence from a New Public Database  
Built Using Private Sector Data

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June 2021



# Motivation: Measuring the Impacts of COVID-19

- How has COVID-19 affected the American economy and what policies can best mitigate its adverse impacts going forward?
  
- Since Kuznets (1941), macroeconomic policy decisions have been based on data from surveys of households and businesses
  
- These data provide vital aggregate information (GDP, unemployment rates), but have two key limitations
  1. Some statistics available only at low frequencies, often with significant lags
  2. Some statistics cannot be disaggregated to examine variation across areas or subgroups

# This Project

- We build a publicly available economic tracker using transaction data from several private companies to measure daily economic activity by ZIP code, income group, and industry
- Use these new data to analyze economic impacts of COVID-19 pandemic:
  1. [Mechanisms] Why did COVID-19 lead to unprecedented job losses?
  2. [Policy Responses] Causal effects of fiscal stabilization policies enacted to date
- This work serves as a prototype motivating further development in collaboration with federal statistical agencies

Data

Impacts of  
COVID-19

Case Study:  
Stimulus

# Data Construction

# Data Partners

**Consumer Spending**

**affinity  
solutions**

**COINOUT**

**Small Business Revenues**

**WOMPLY**

**Employment**

**PAYCHEX**

**intuit.**

 **earnin™**

 **KRONOS®**

**Job Postings**

 **burningglass®**  
TECHNOLOGIES

**Education**

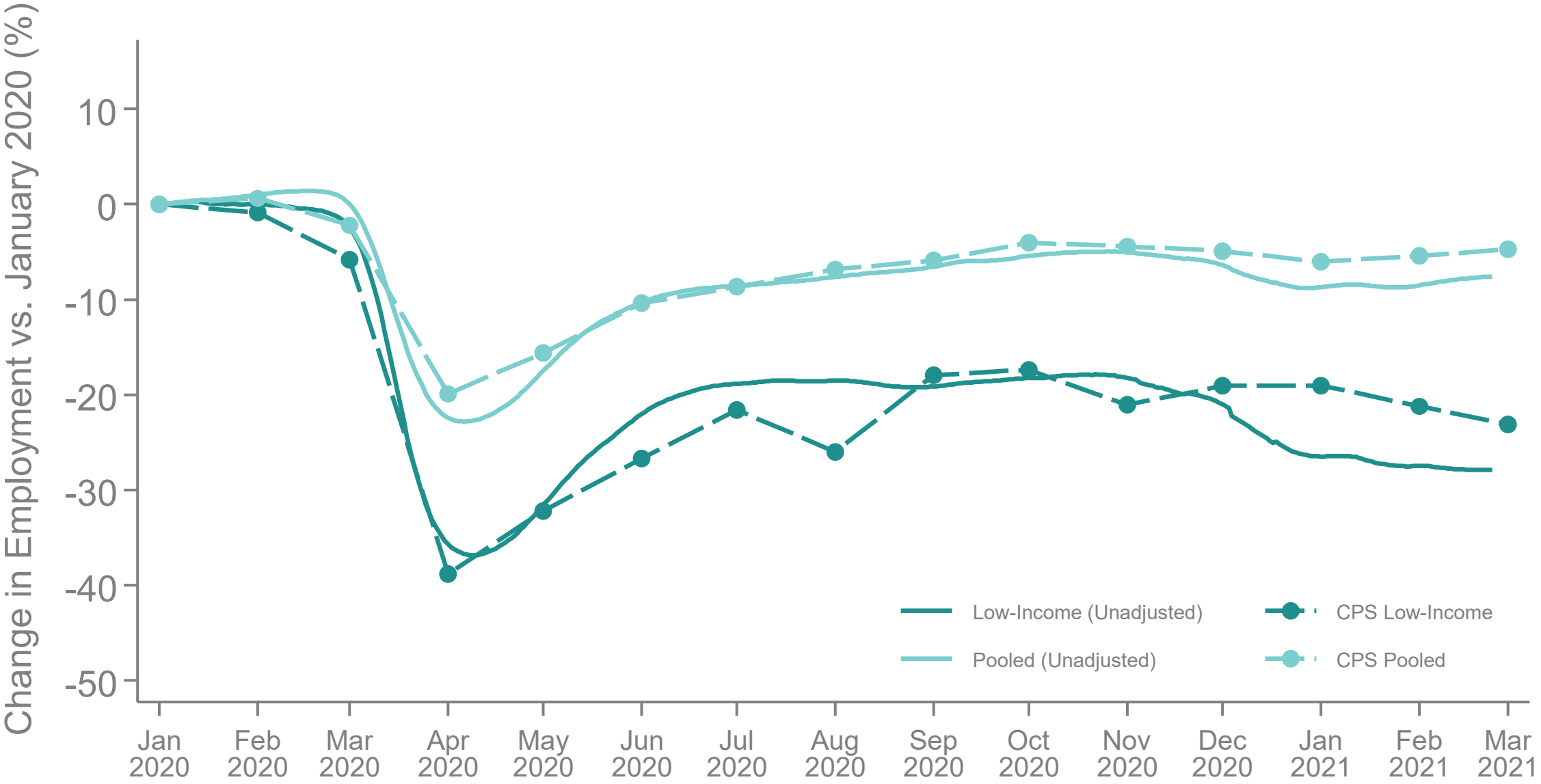
**ZEARN**

# Constructing Publicly Available Economic Indices Based on Private-Sector Data

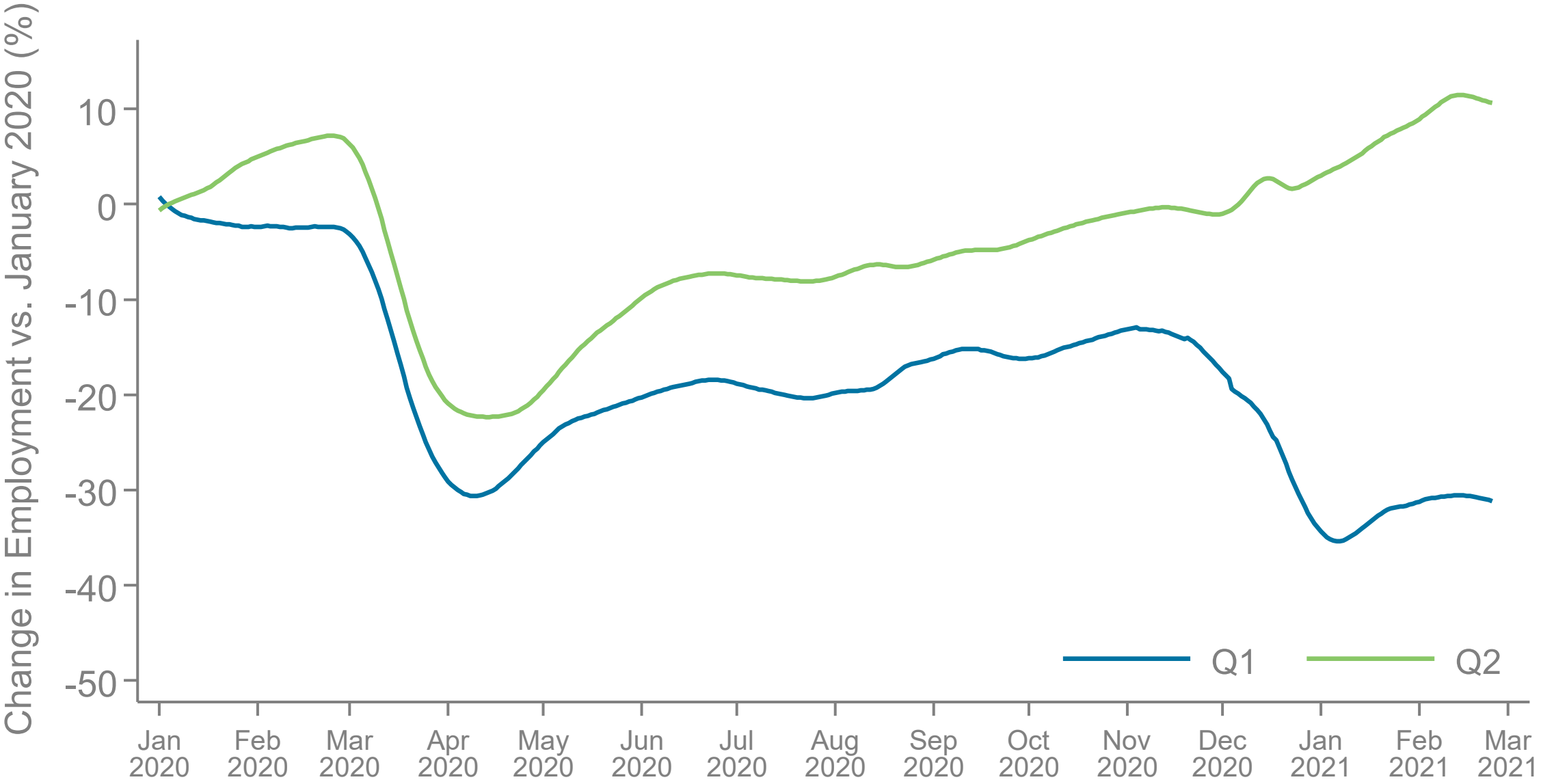
- Starting from raw data, construct series suitable for economic analysis as follows:
  1. **Clean** series to remove artifacts that arise in transaction data
  2. **Smooth** seasonal fluctuations using data from 2019
  3. **Protect privacy**: index to January 2020 values, exclude small cells, combine data from multiple companies
  4. **Benchmark** to national statistics to characterize group each dataset represents to mitigate bias from non-representative selection

# National Employment Trends (Paychex, Intuit, Earnin)

Tracker vs CPS



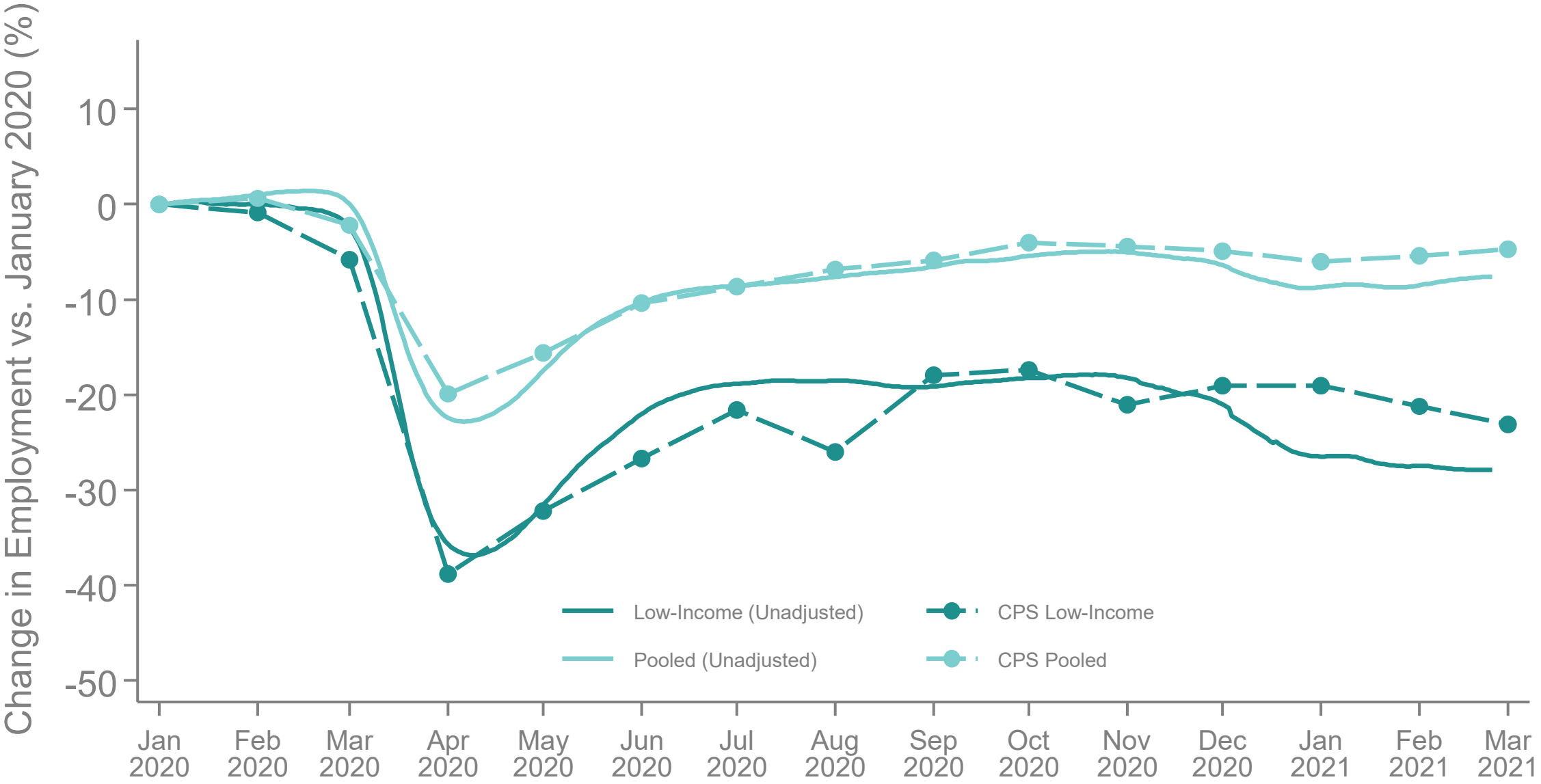
# Employment Trends - California





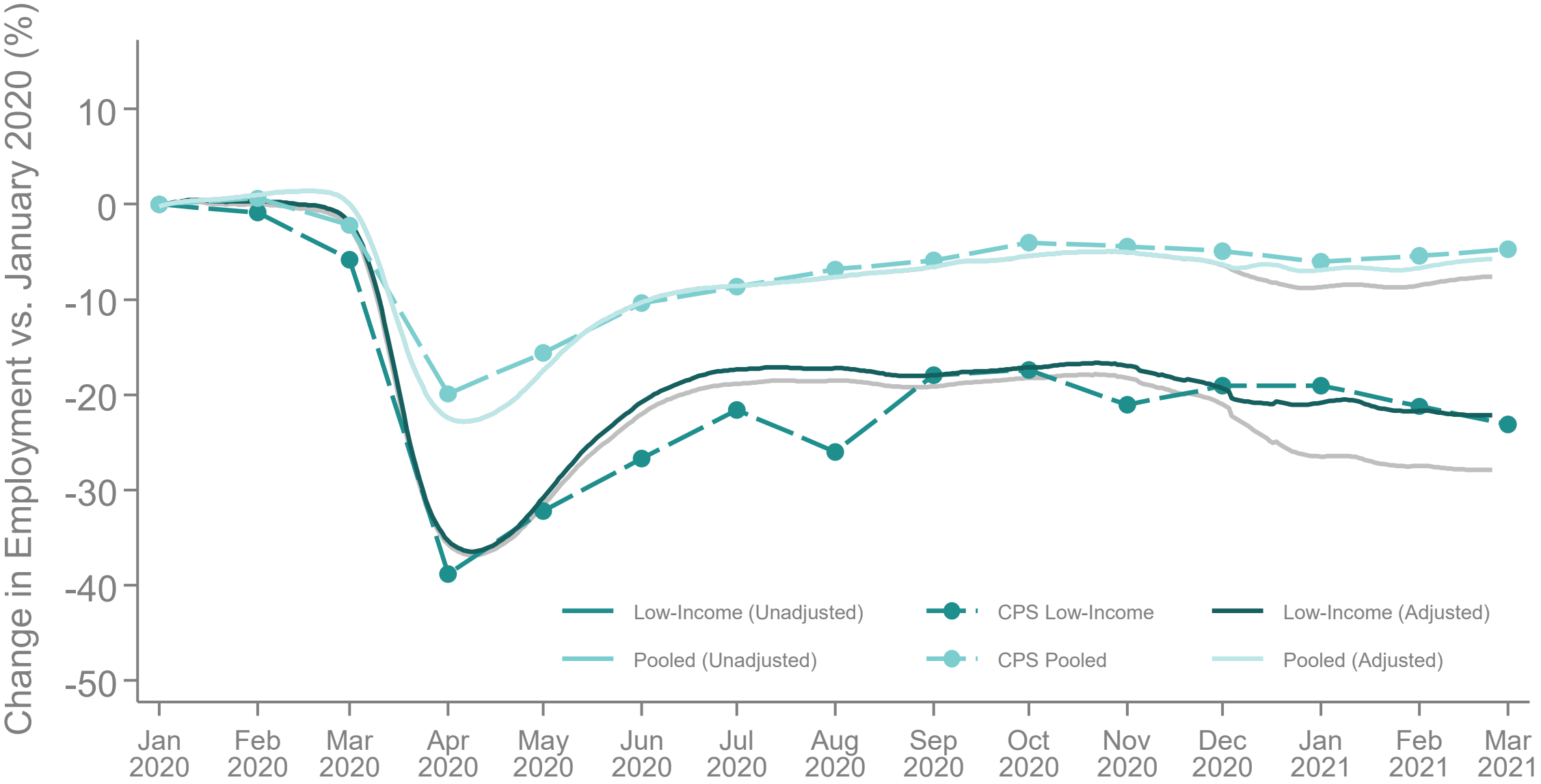
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Tracker vs CPS



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Tracker vs CPS



Data

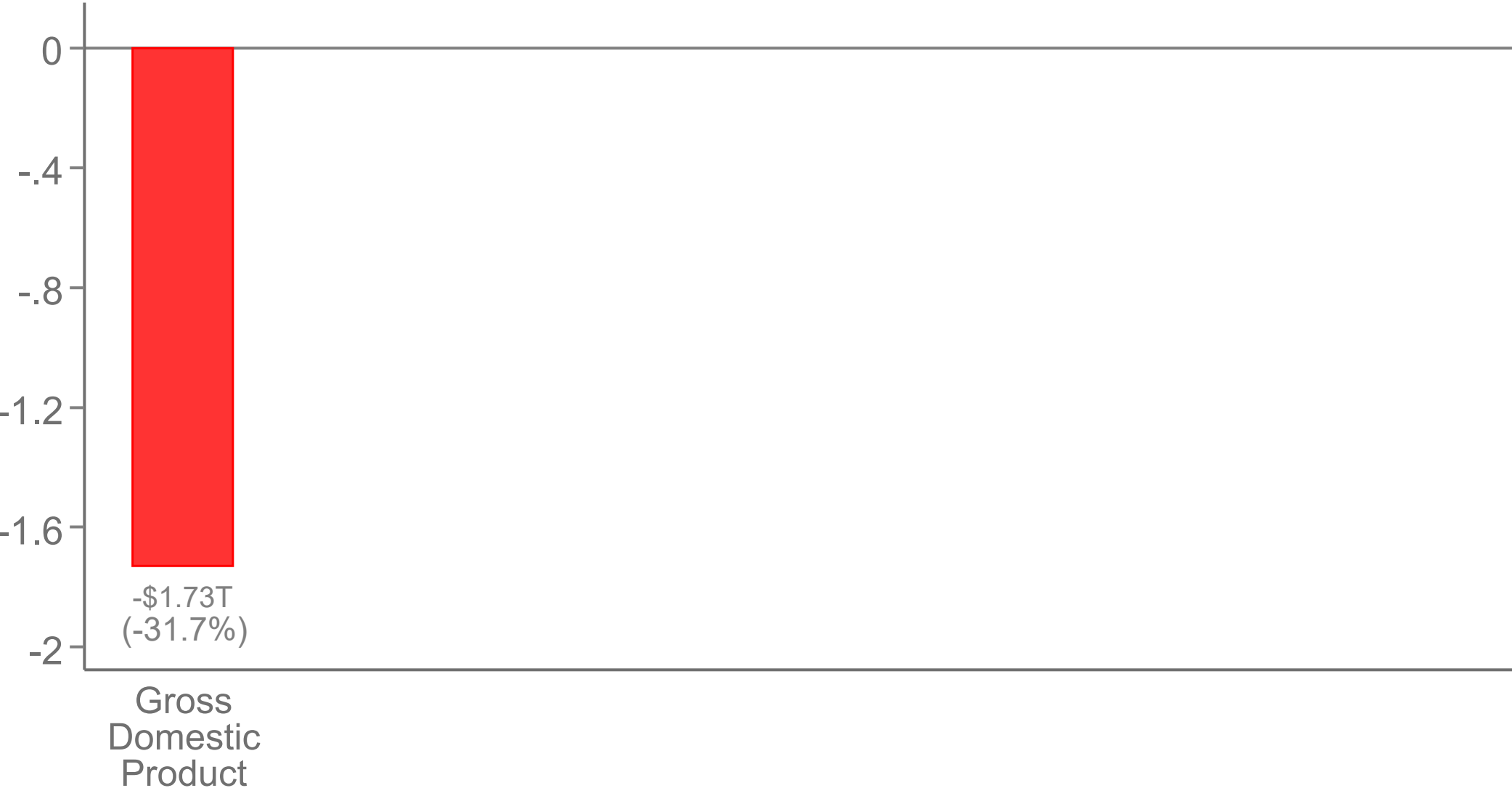
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# Impacts of COVID-19

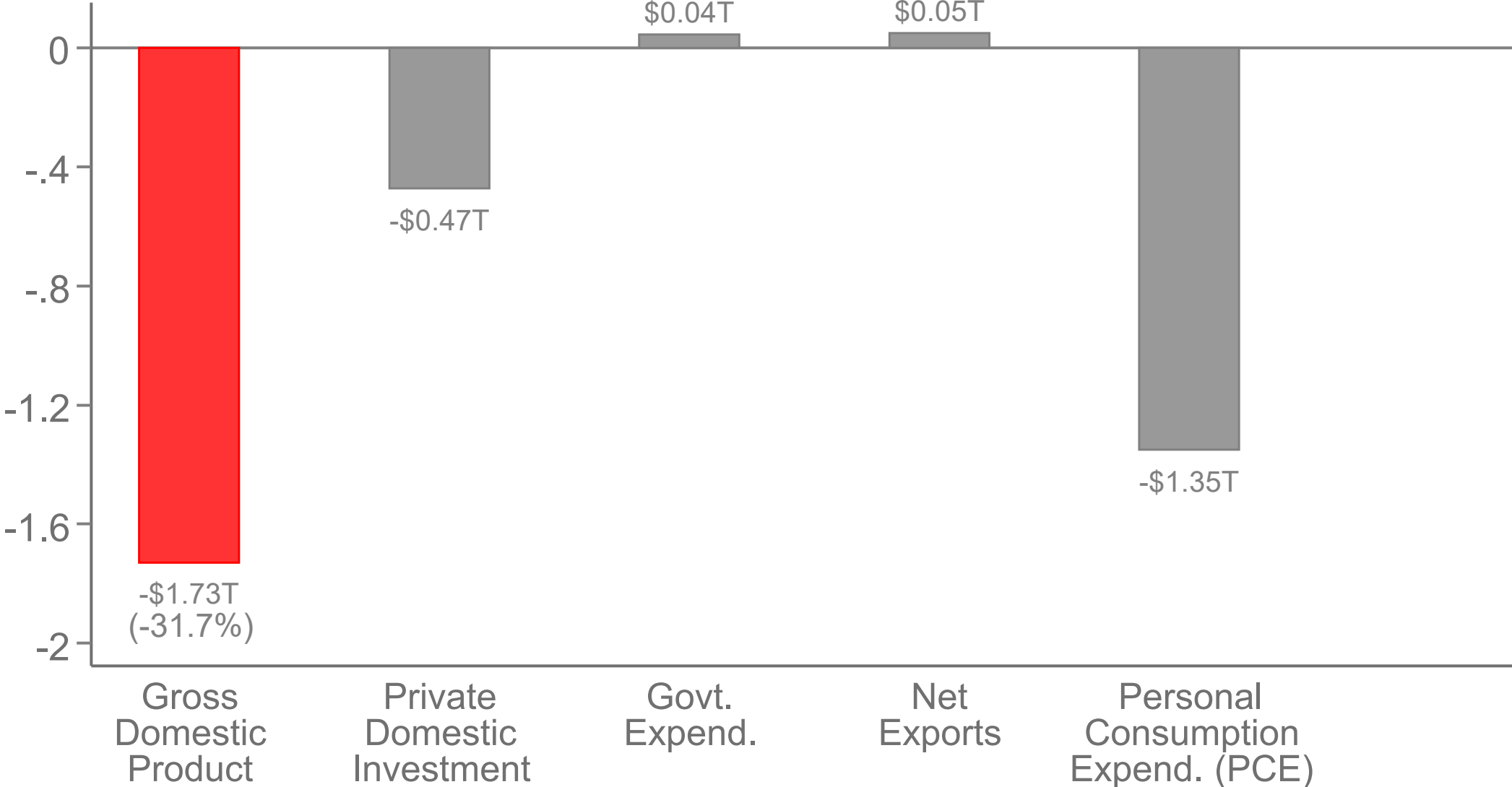
# National Accounts Data: Changes in GDP and its Components

Change in Real GDP from Q1 2020 to Q2 2020  
(in trillions of chained 2012 dollars)



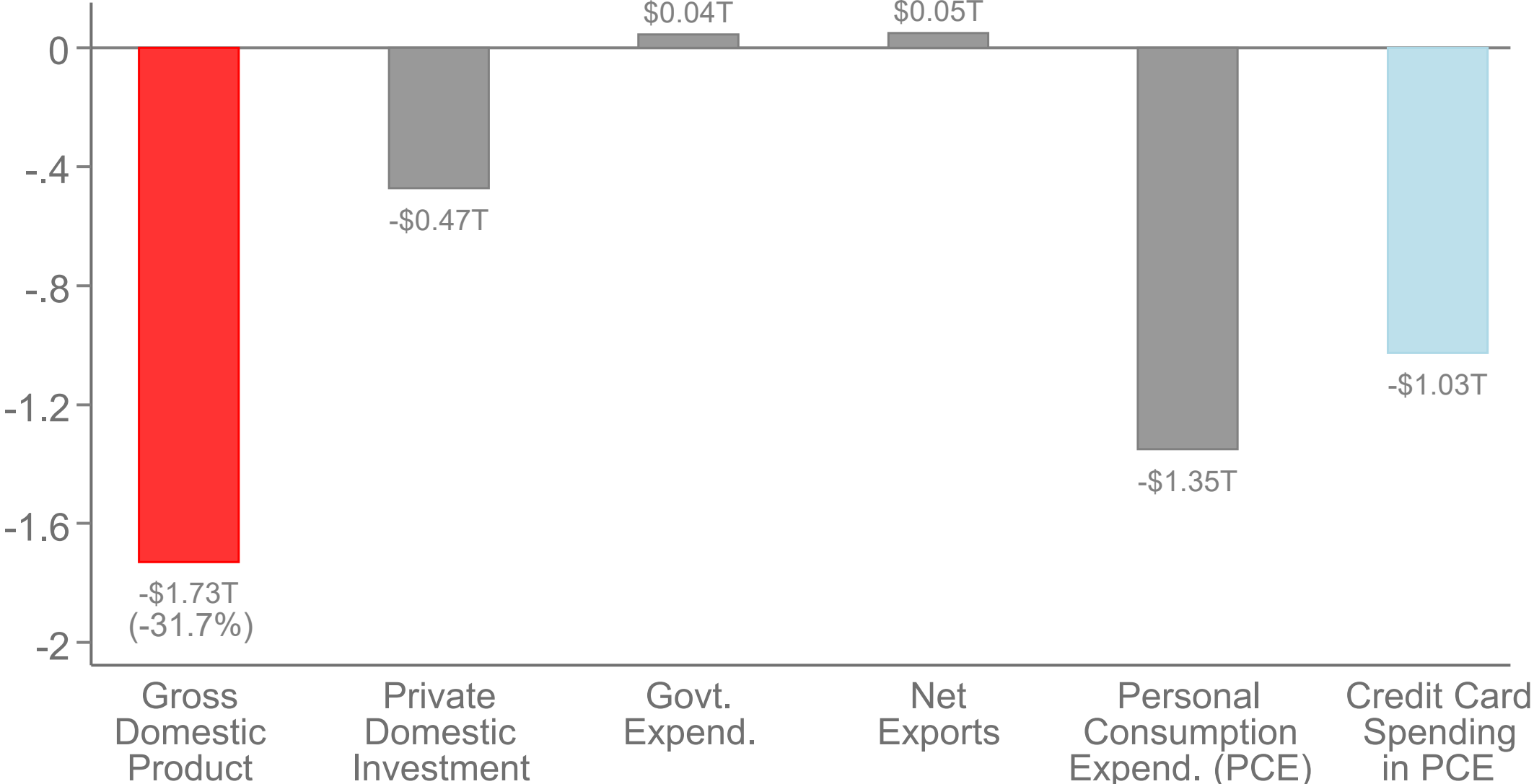
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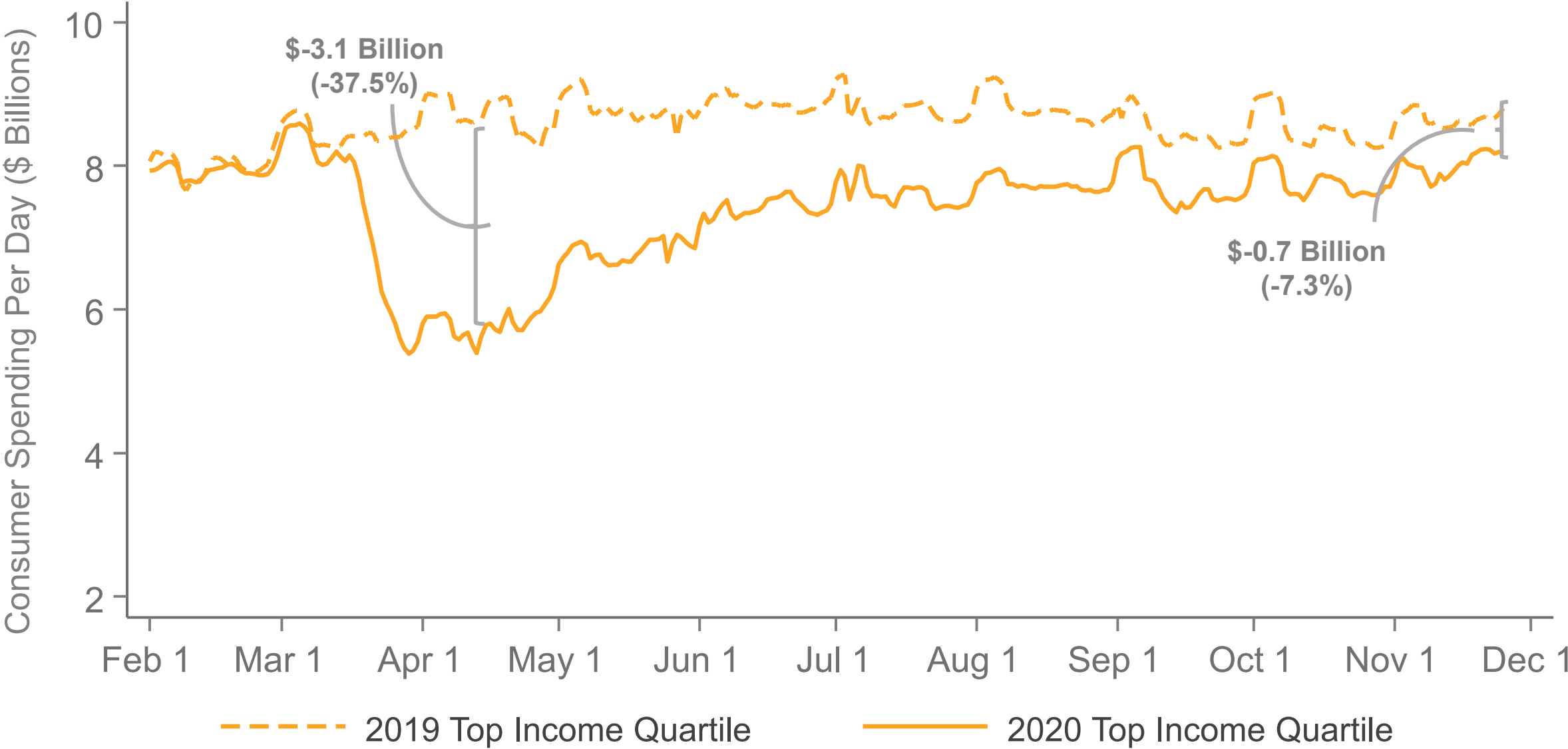


# National Accounts Data: Changes in GDP and its Components

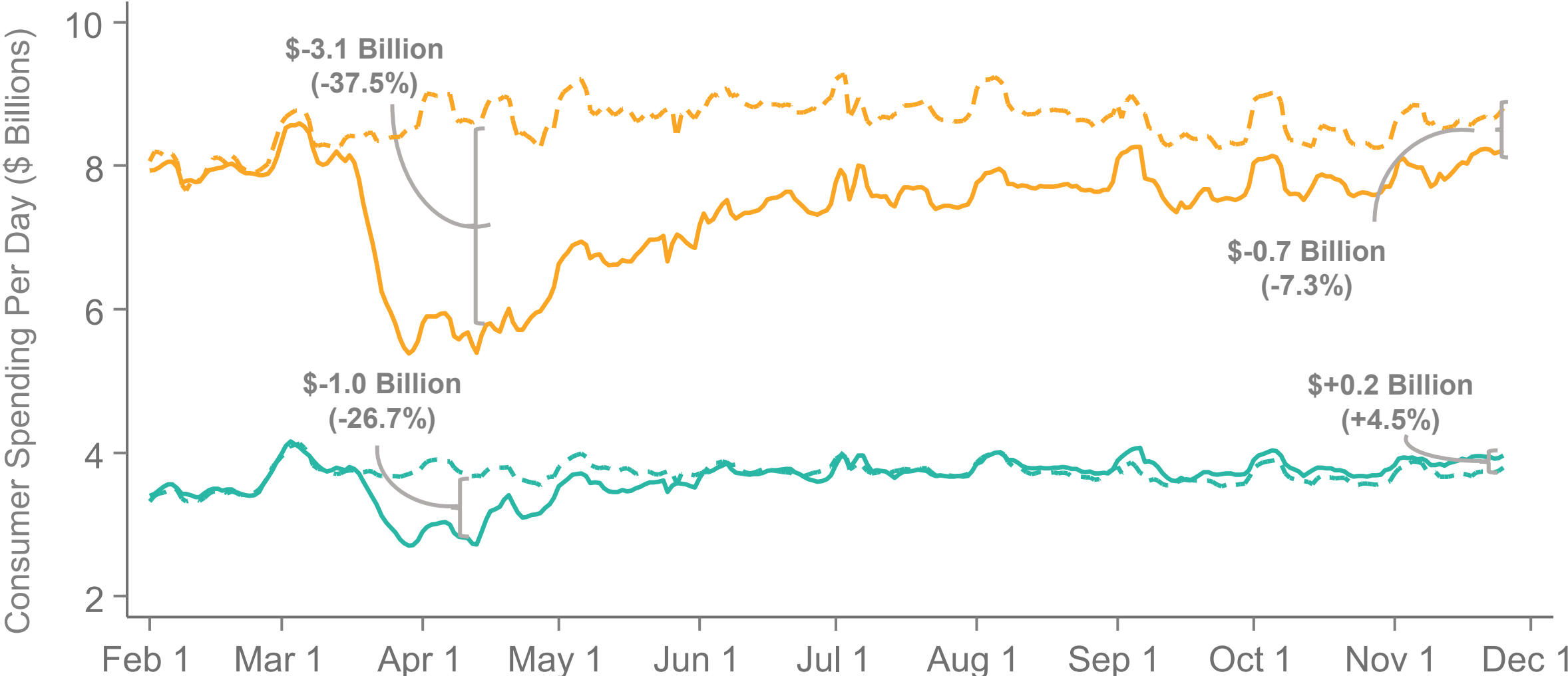
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# Consumer Spending by Income Quartile



# Consumer Spending by Income Quartile

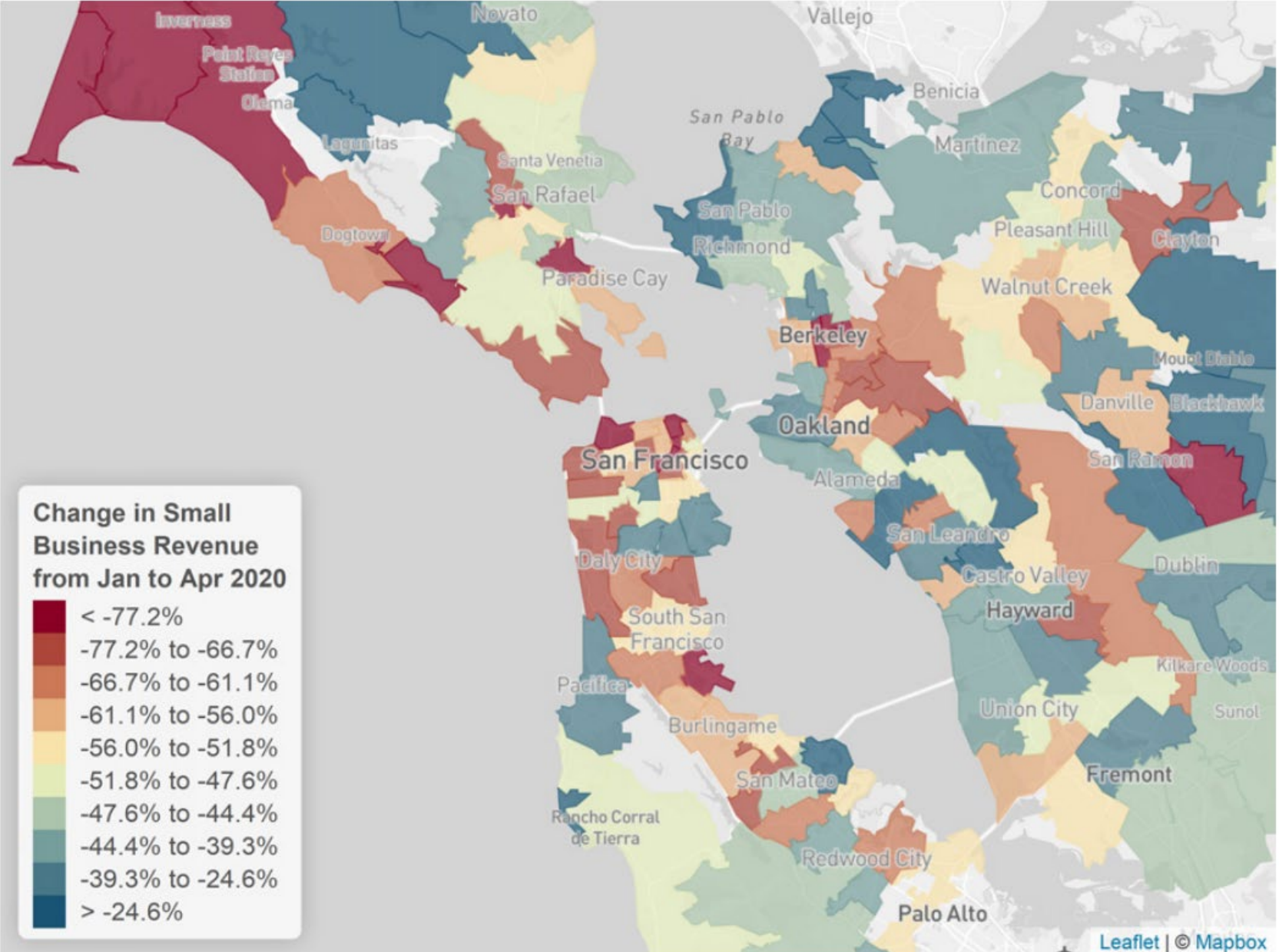


- 2019 Top Income Quartile
- 2019 Bottom Income Quartile
- 2020 Top Income Quartile
- 2020 Bottom Income Quartile



# Changes in Small Business Revenues from January to April by ZIP Code

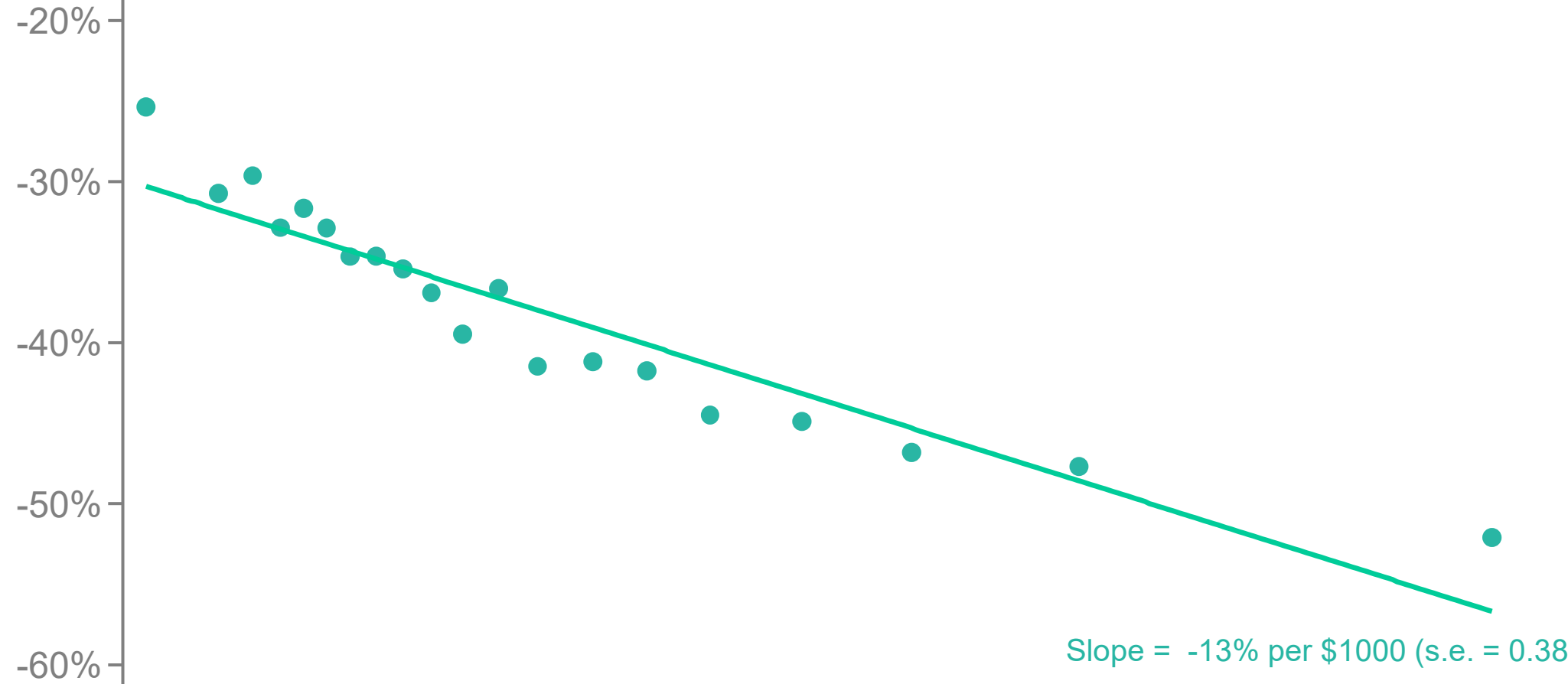
San Francisco



# Changes in Small Business Revenues vs. Rent, by ZIP Code

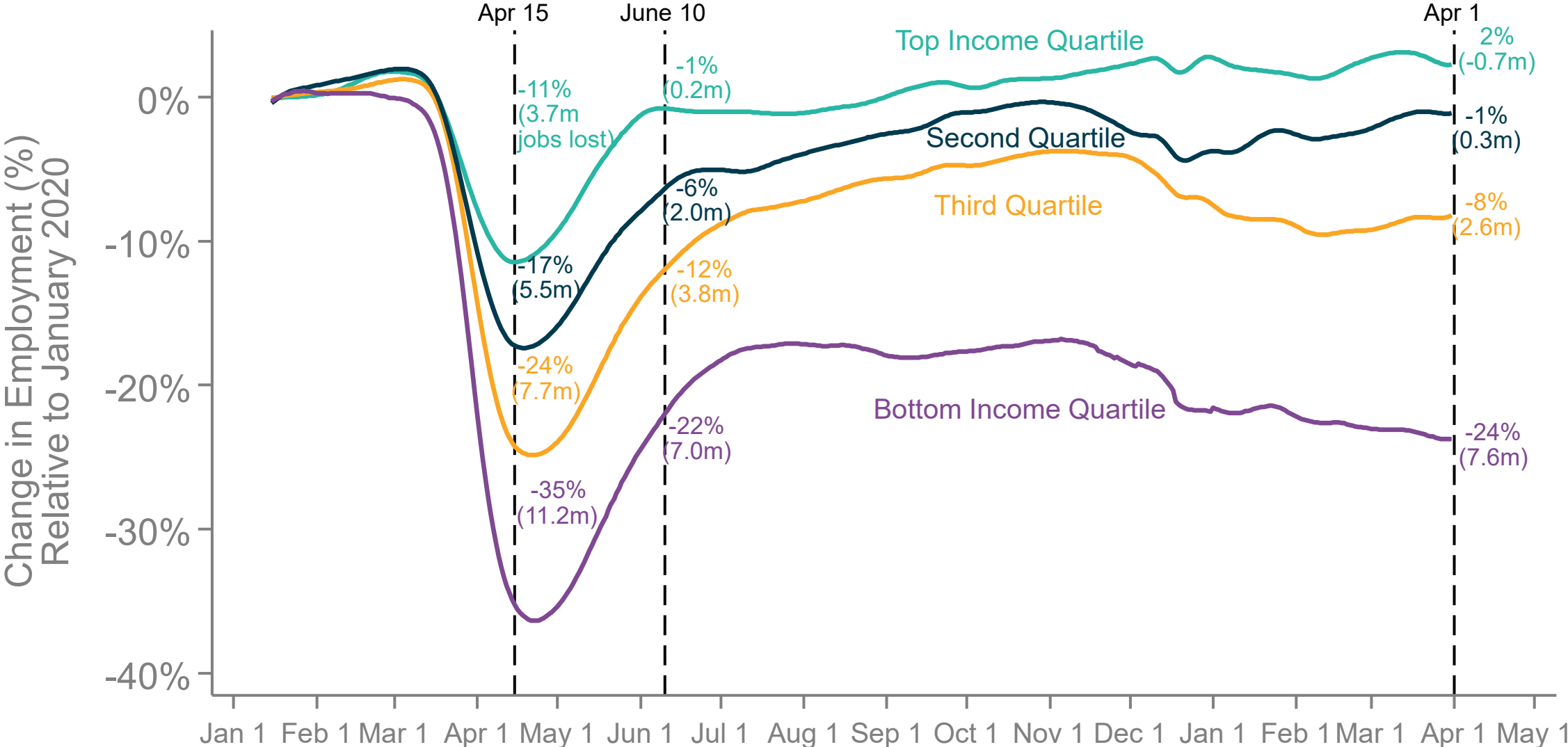
From January to April 2020

Change in Small Business Revenue  
Relative to January



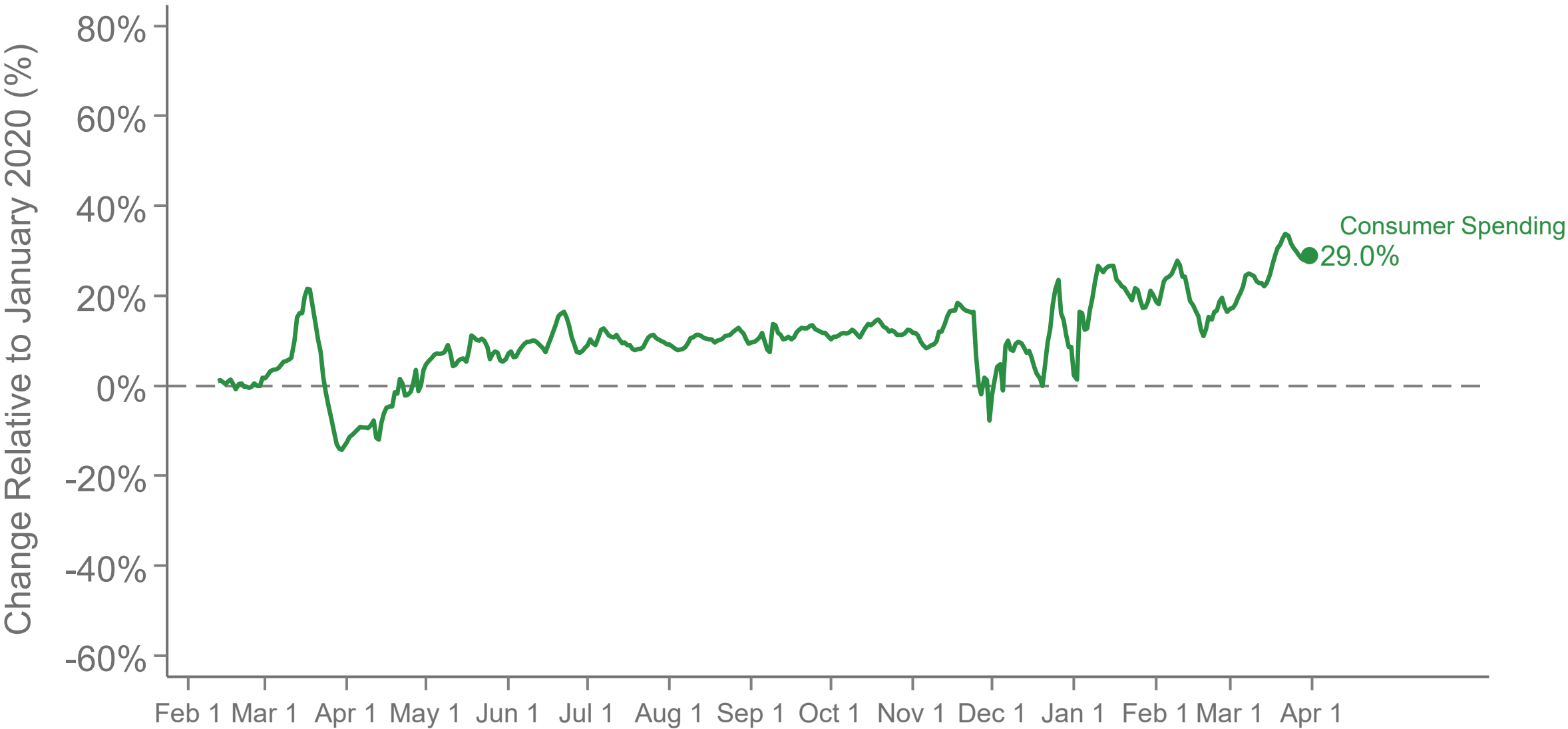
Median Two Bedroom Monthly Rent in 2018

# Employment Changes by Income Quartile



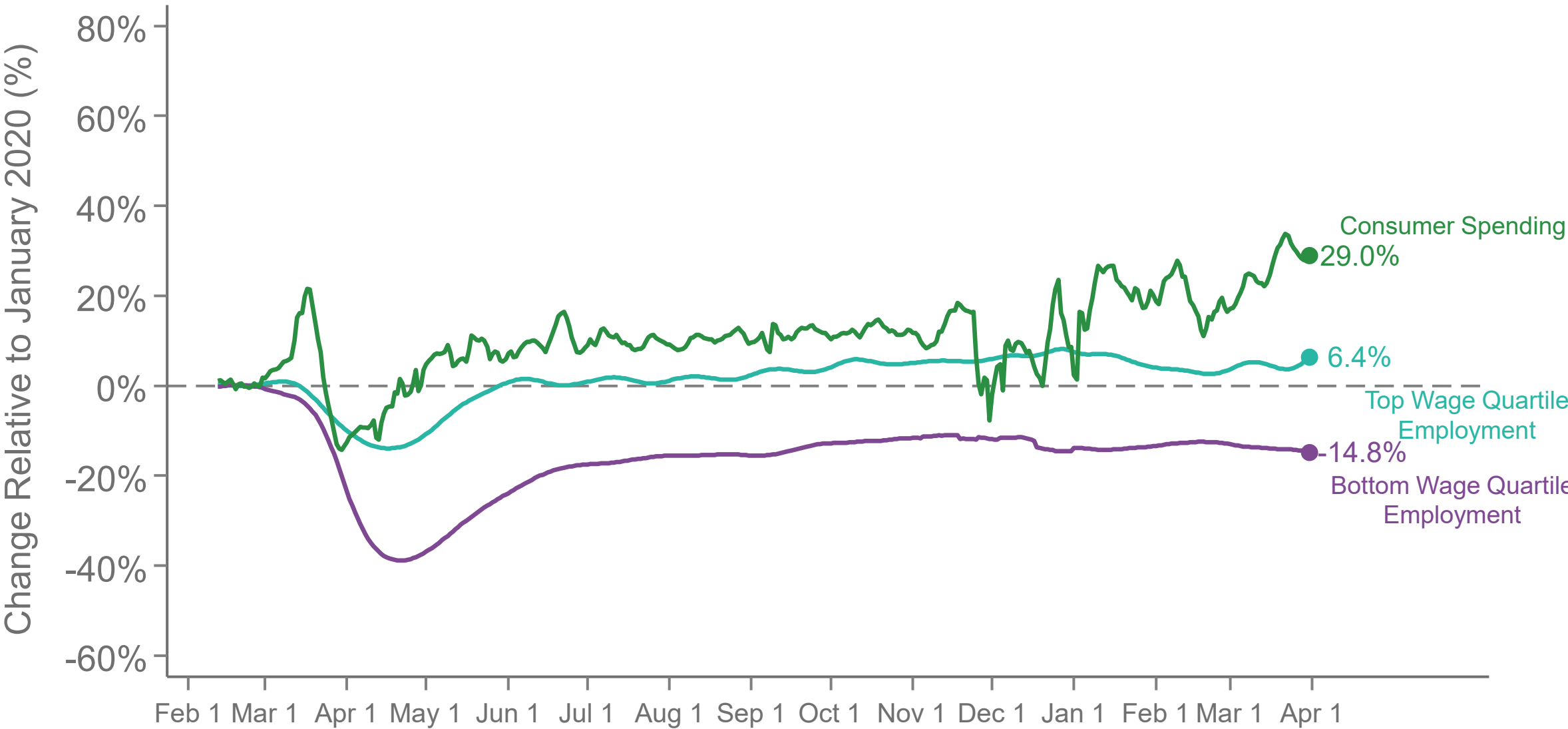
# National Trends in Consumer Spending vs. Employment Rates

## Retail Trade



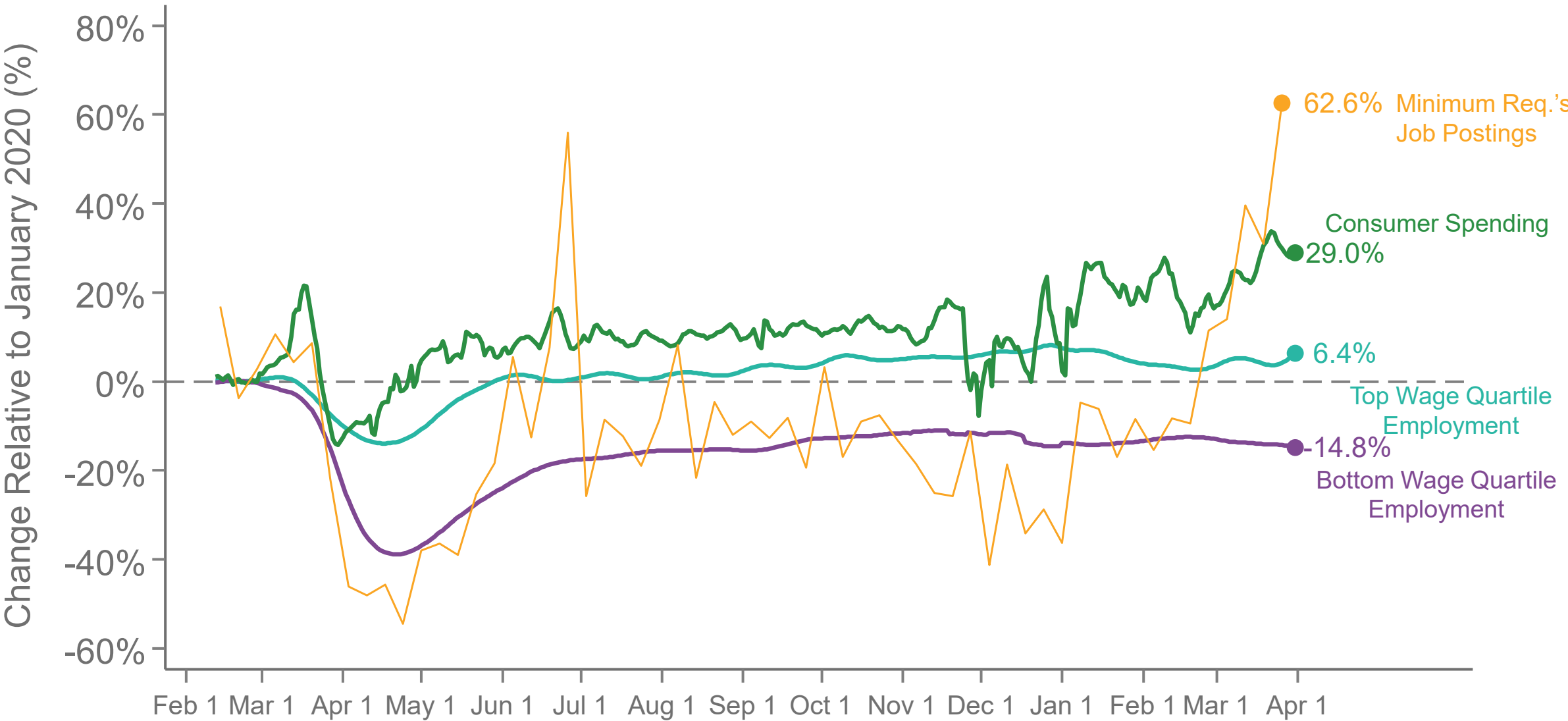
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# National Trends in Consumer Spending vs. Employment Rates

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# Effects of Stimulus Payments

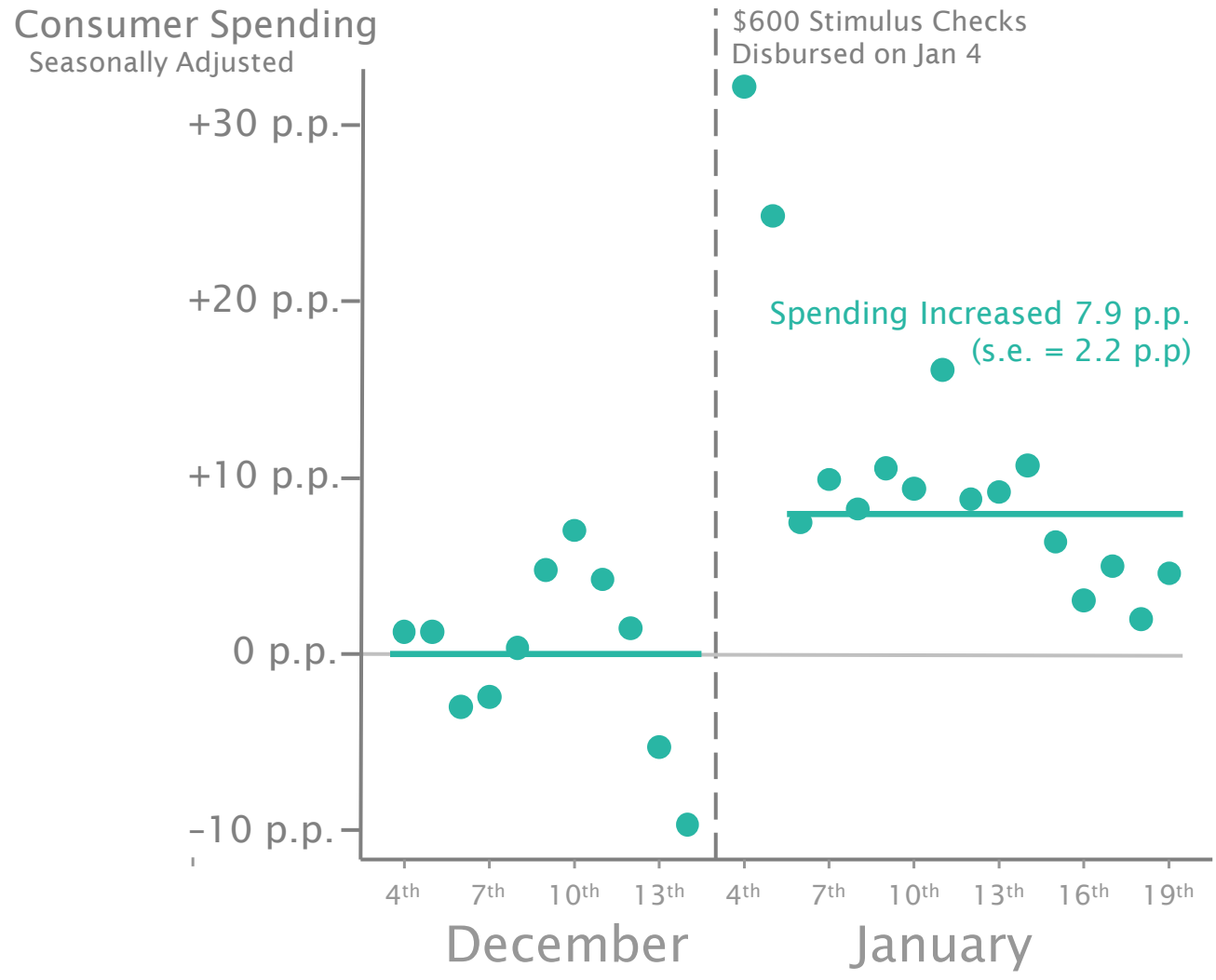
# Estimating the Effects of Stimulus Payments

- Coronavirus Aid, Relief, and Economic Security (CARES) Act of April 2020
  - **\$1200 checks** (phased out at higher incomes, supplement for children)
  - **April 15, 2020** deposits for the majority of payments
- Coronavirus Response and Relief Act of December 2020
  - **\$600 checks** (phased out at higher incomes, supplement for children)
  - **January 4, 2021 or January 6, 2021** deposits for the majority of payments
- **Were stimulus payments effective in increasing consumer spending?**



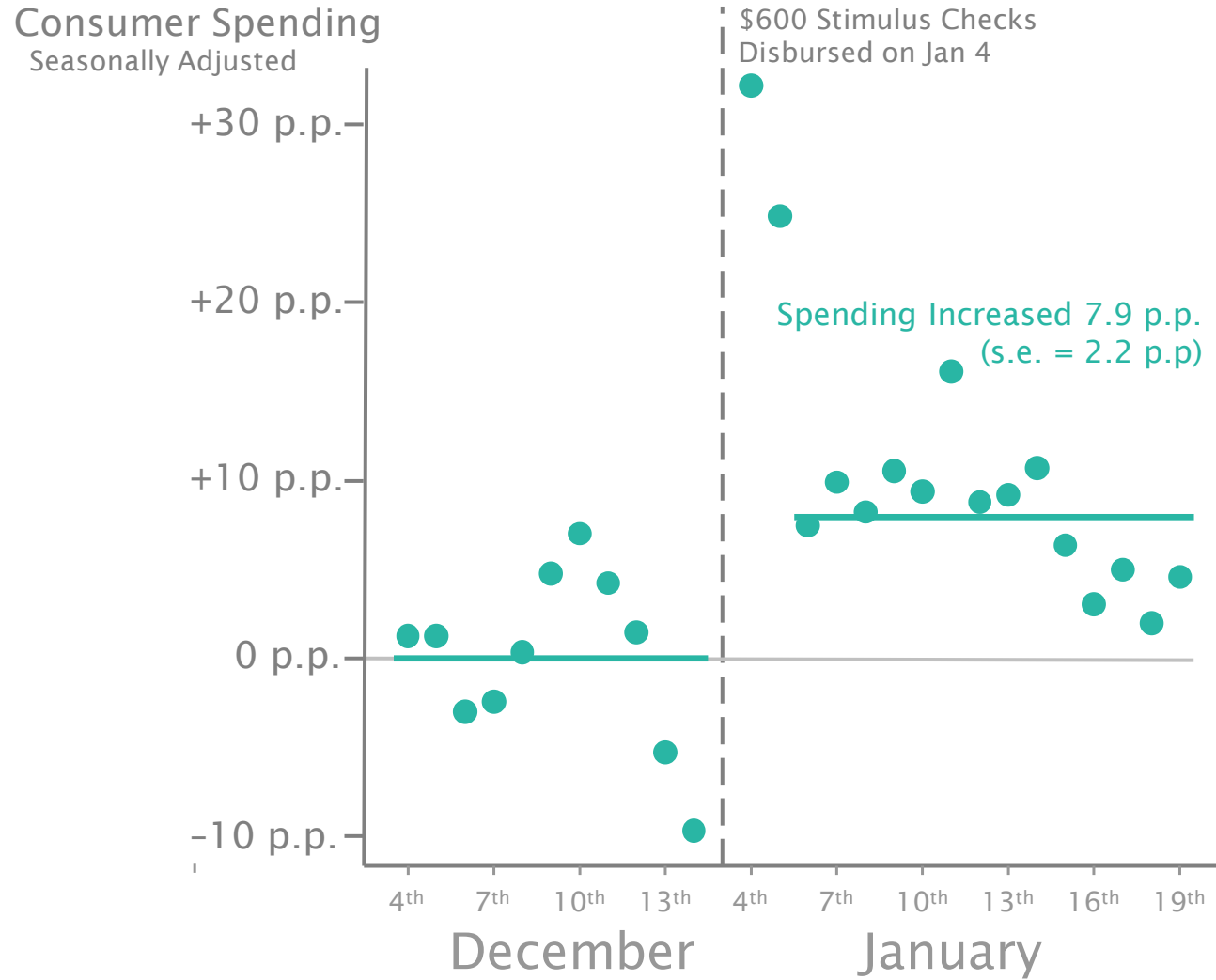
# Effect of the January 2021 Stimulus Checks on Daily Consumer Spending

Bottom Income Quartile ZIP Codes  
Median Household Income < \$46,000

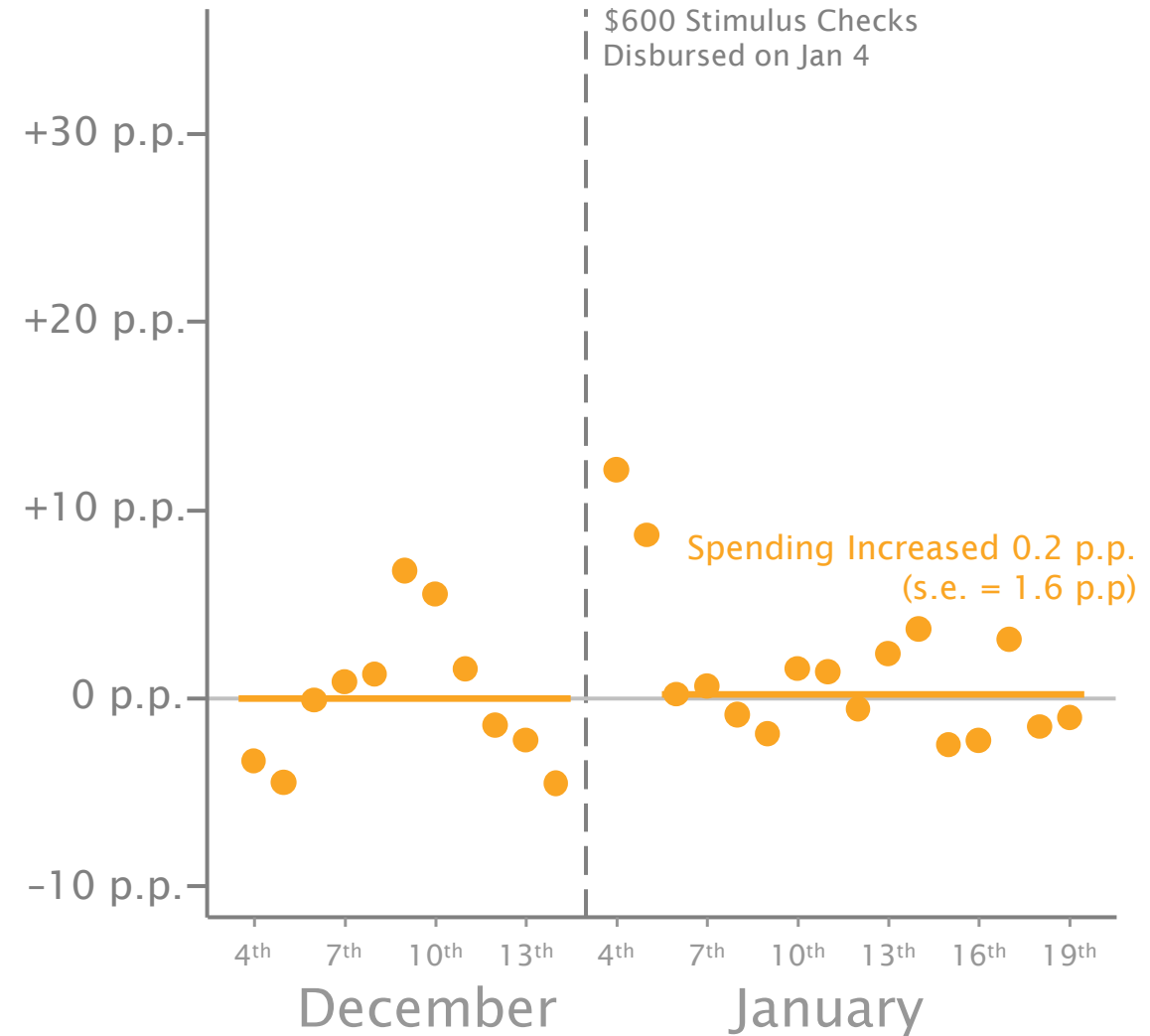


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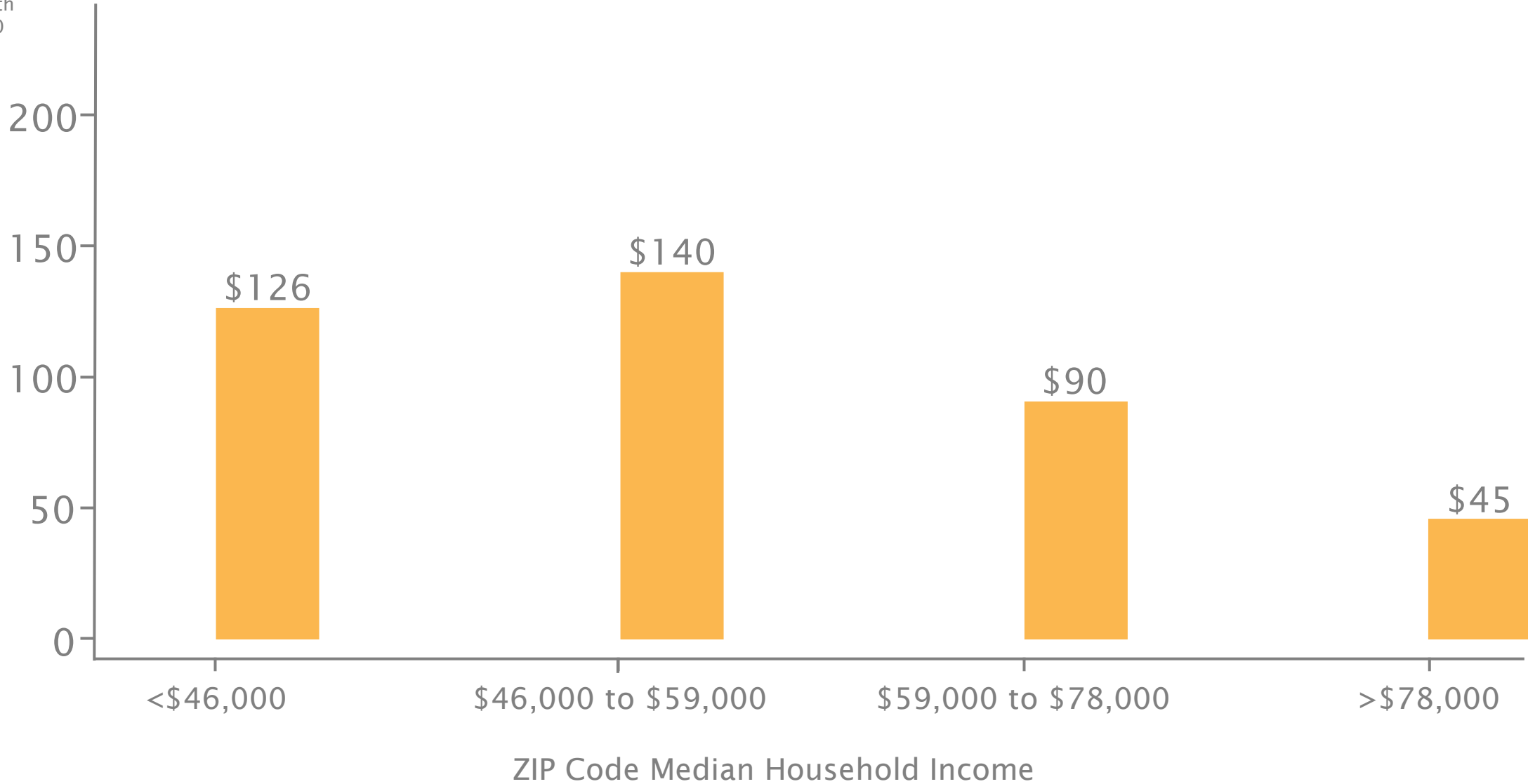
Top Income Quartile ZIP Codes  
Median Household Income > \$78,000



# Effect of the COVID Stimulus Bills on Spending, by Income Group

COVID Relief Act (January 2021)

Consumer Spending  
Estimate of 1-month  
spending per \$600



# Effect of the COVID Stimulus Bills on Spending, by Income Group

CARES Act (April 2020)  
COVID Relief Act (January 2021)

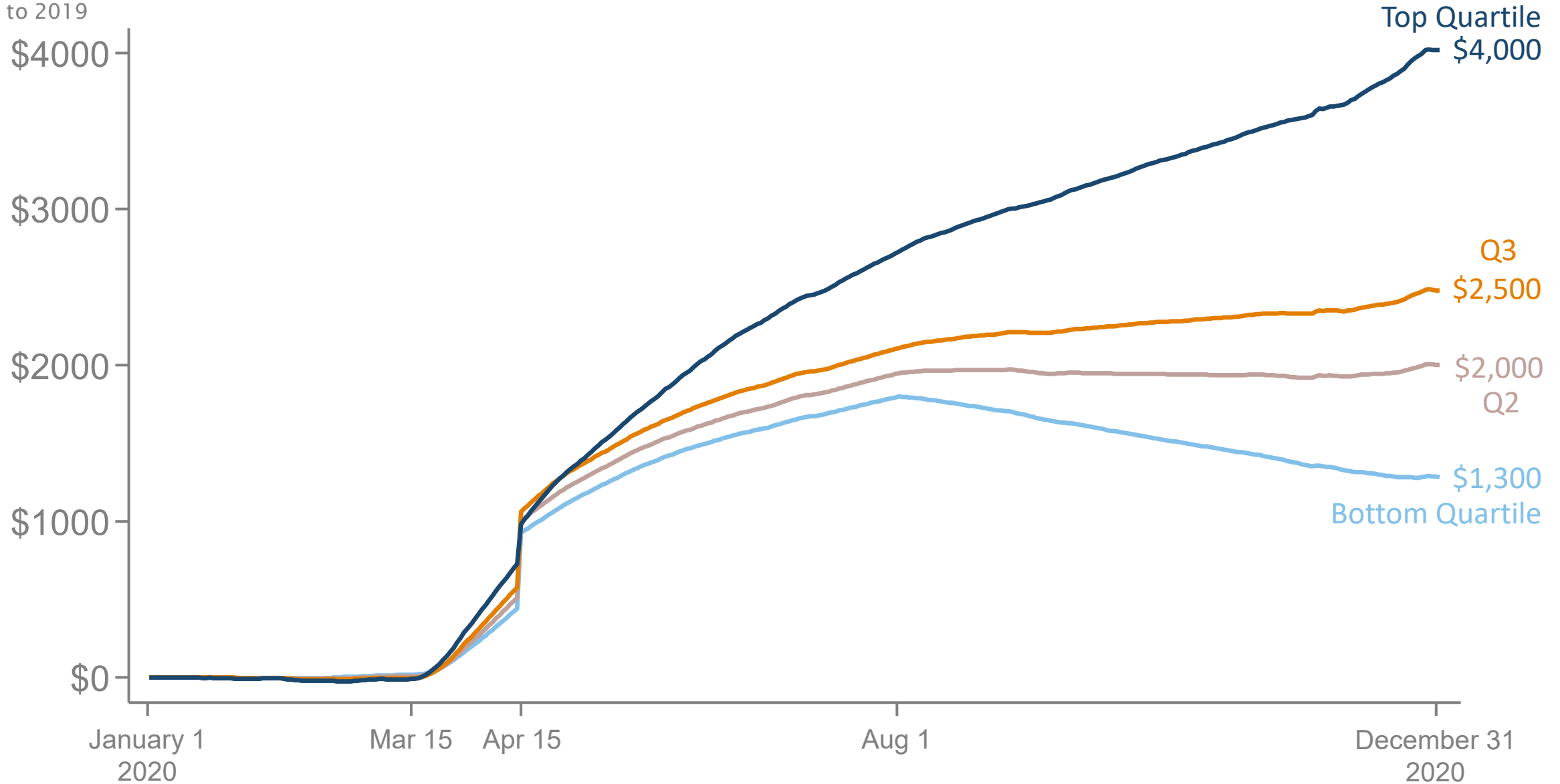
Consumer Spending  
Estimate of 1-month  
spending per \$600



# Estimated Cumulative Increase in Savings

$$\text{Savings} = \text{Earnings} + \text{Unemployment Insurance} + \text{Stimulus Checks} - \text{Spending}$$

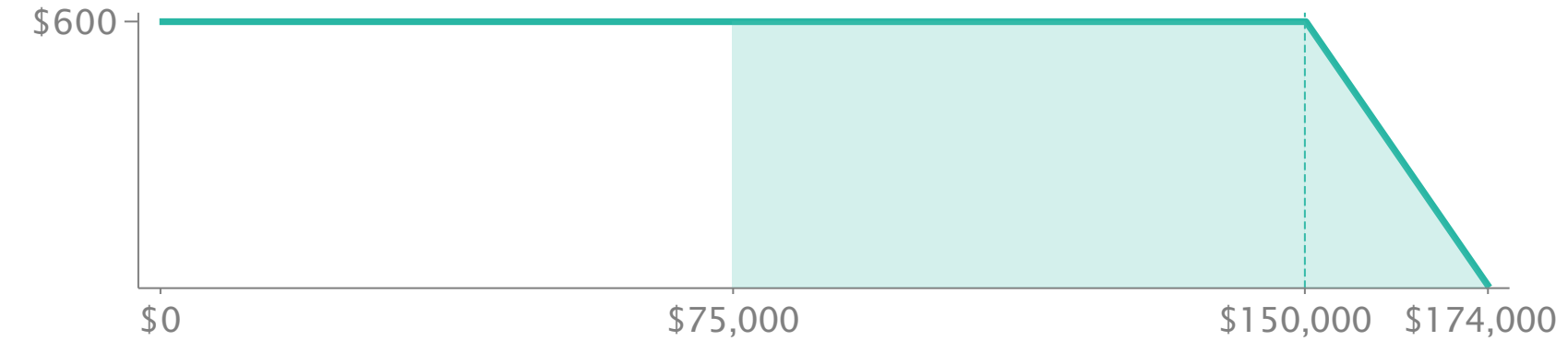
Δ Savings Per Person  
compared to 2019



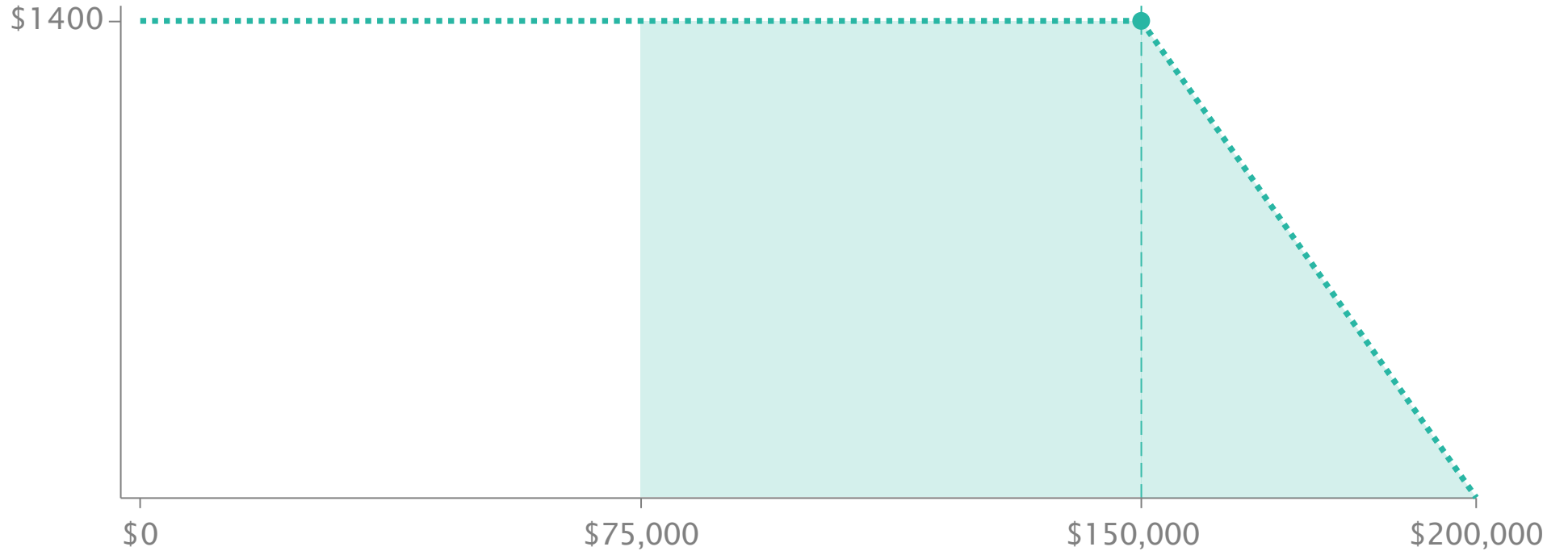
# Projected Effect of Stimulus Checks on Spending

Couple with No Children

**January 2021  
Stimulus Policy**



**March 2021  
Stimulus Policy  
Proposal**

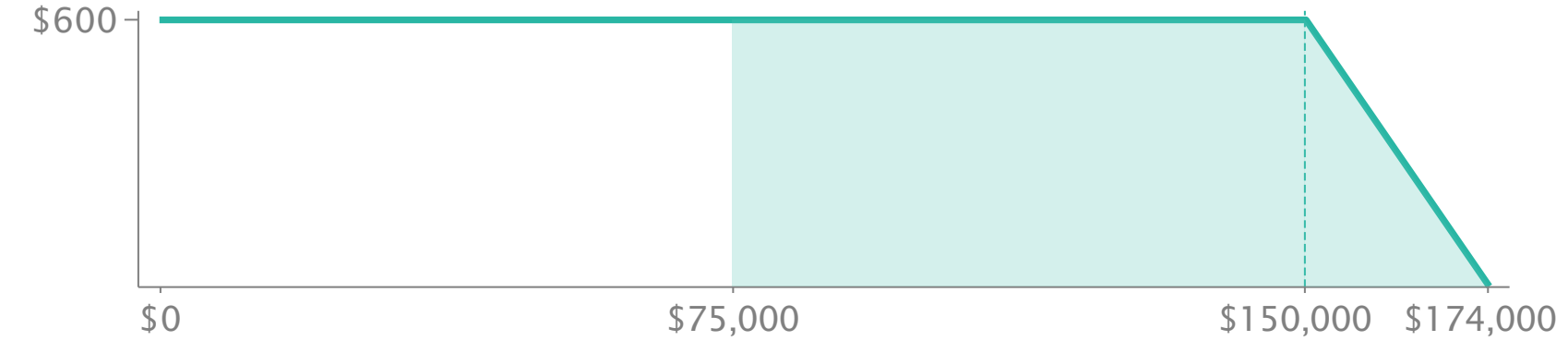


Household Income

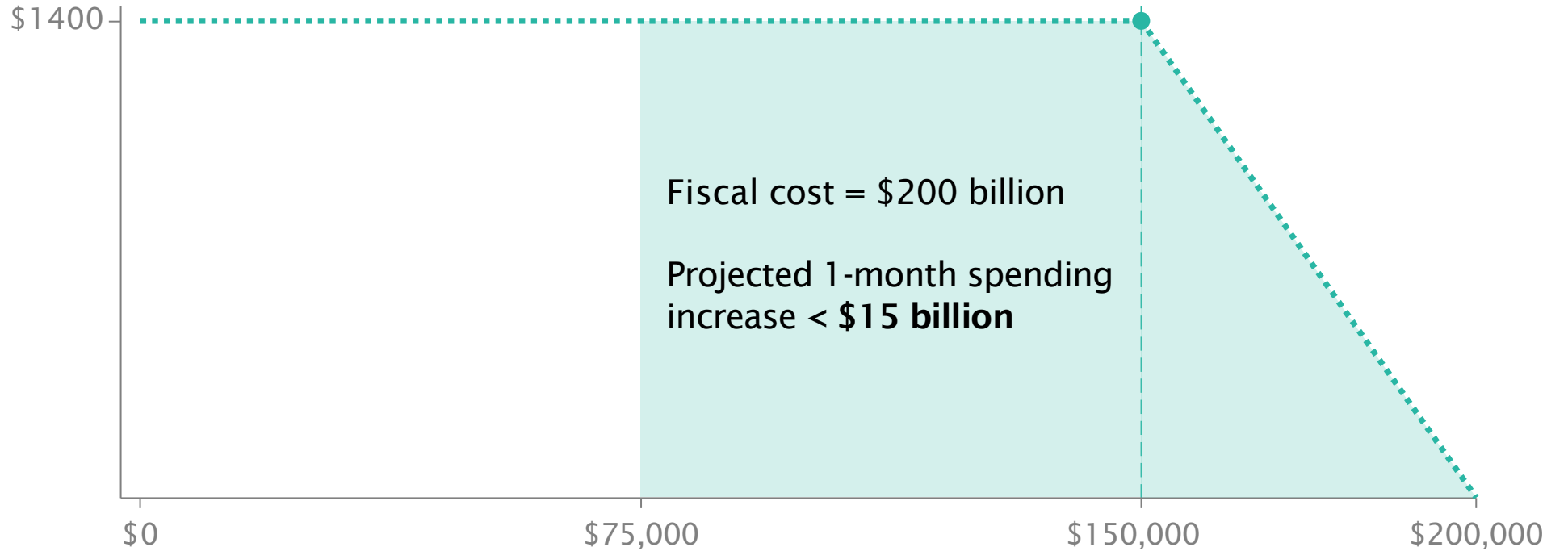
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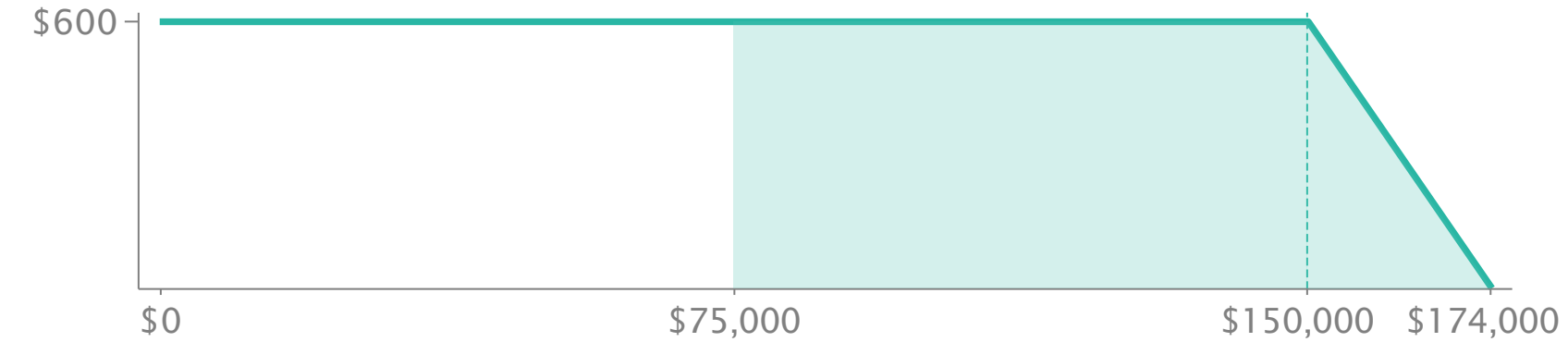


Household Income

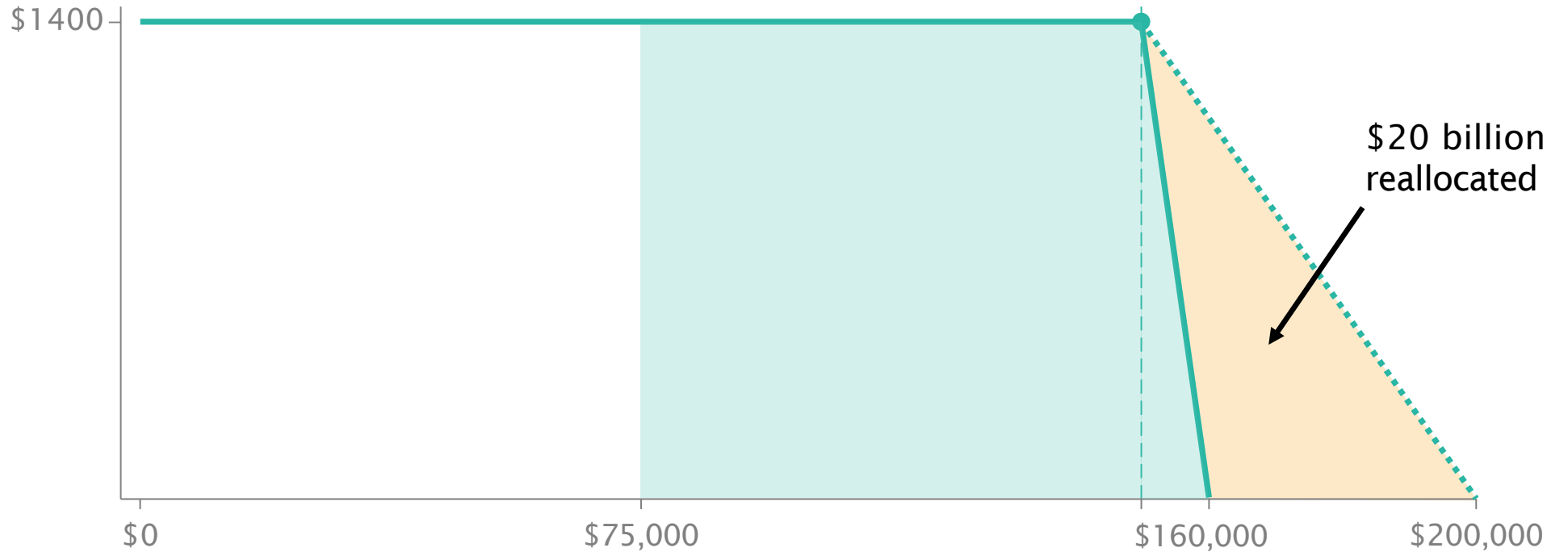
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Household Income



## Broader Implications and Future Work

1. Research: we hope these new public data ([www.tracktherecovery.org](http://www.tracktherecovery.org)) will be helpful in supporting future work in this recession and beyond
2. Policy: fine tuning based on state of the economy and observed policy impacts
  - Help target proposed \$100 billion in job re-training programs, avert jobless recovery
3. Contribute to Economic Statistics
  - On-going collaboration with federal statistical agencies using these data to improve existing methodologies and develop new statistics

# Appendix

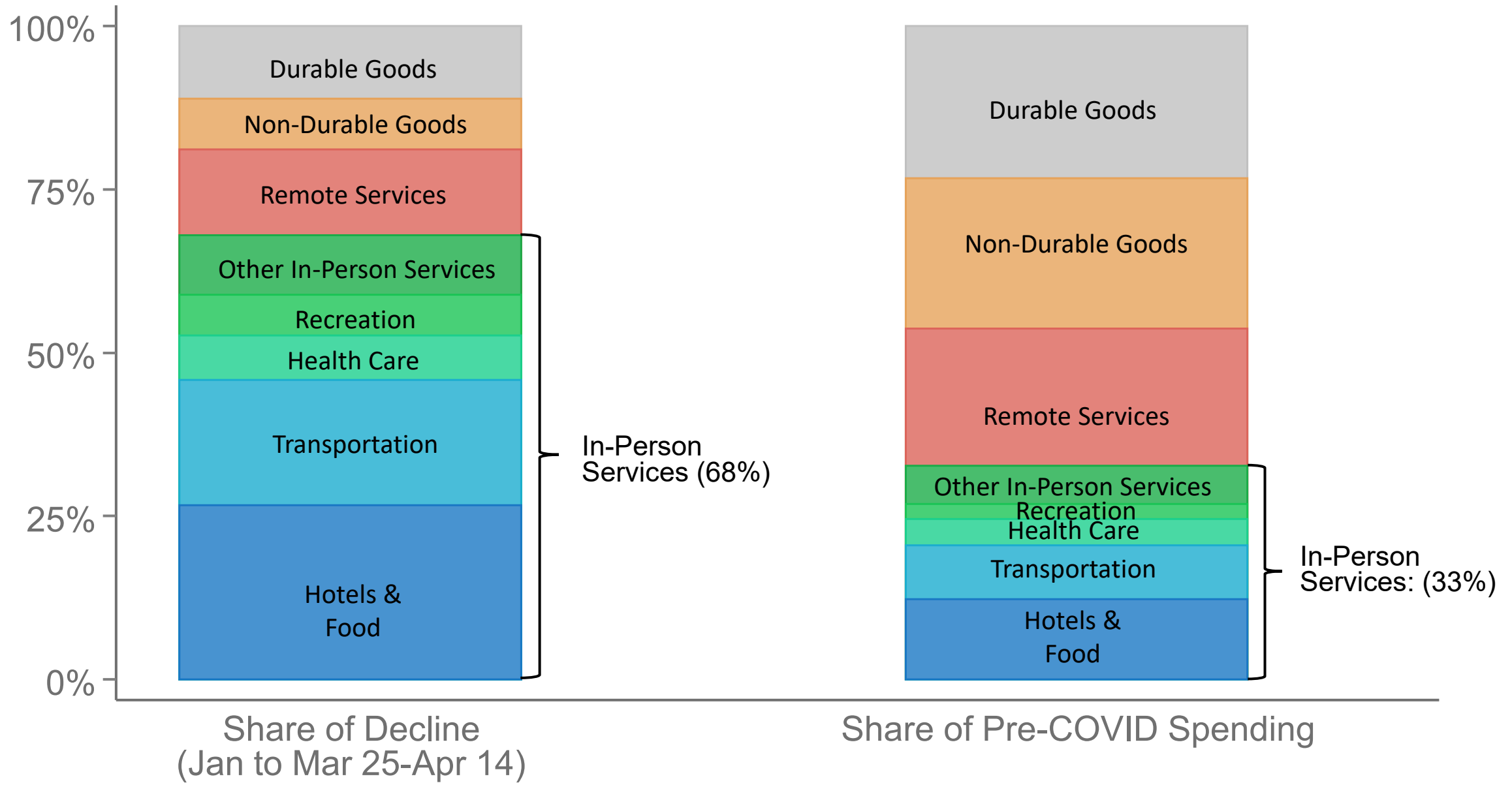
# Consumer Spending Benchmarking

Credit/Debit Card Data (Affinity Solutions) vs. National Accounts (Advance Monthly Retail Trade Survey)

Change in Consumer Spending  
Relative to January

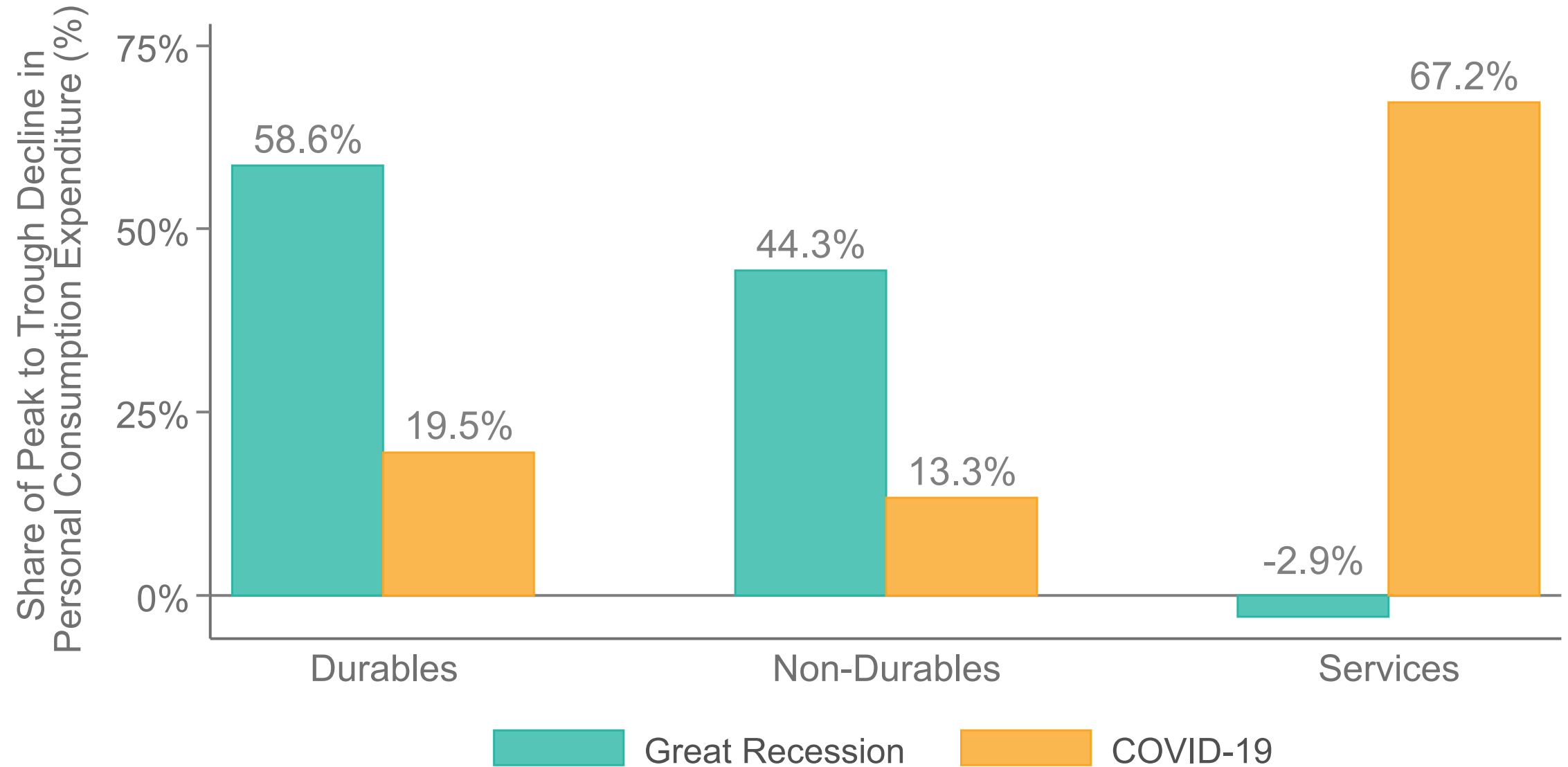


# Change in Consumer Spending by Sector



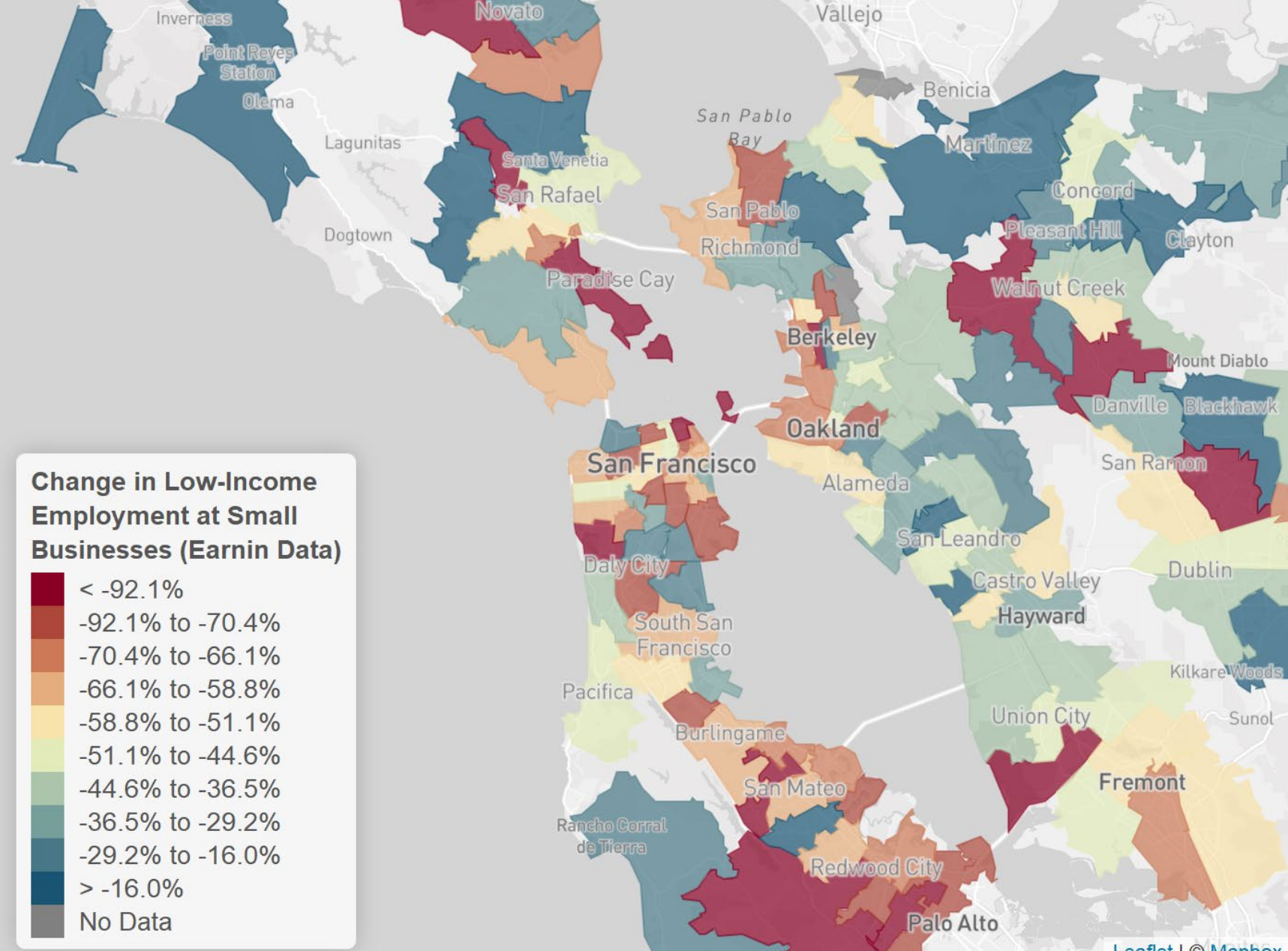
# Change in Consumer Spending by Sector

COVID vs Great Recession



# Changes in Bottom Quartile Employment Rates from January to April 2020 by ZIP Code

## San Francisco

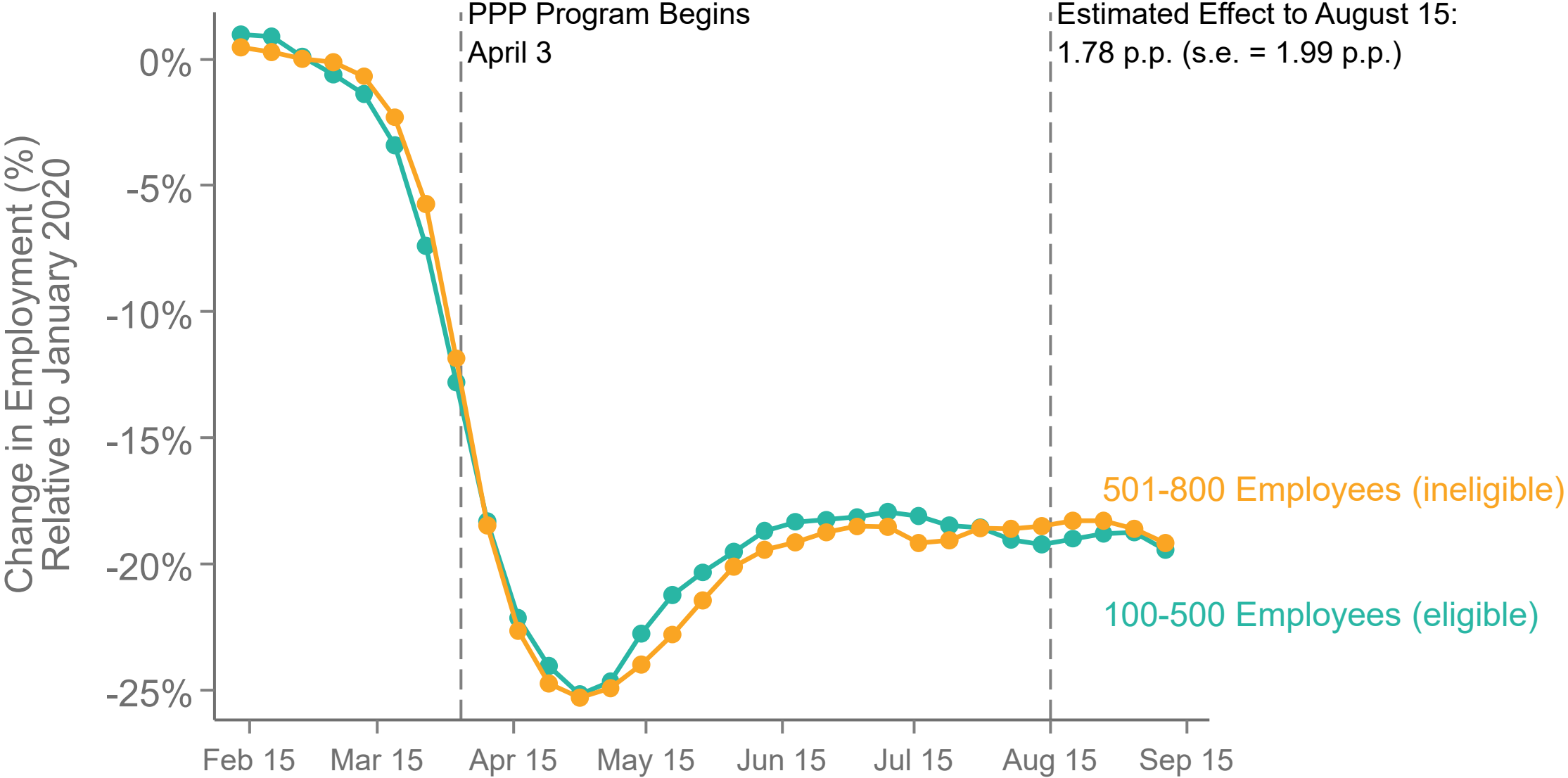


# Paycheck Protection Program

- CARES Act also provided \$500 billion in loans to small businesses starting on April 3
- Loans were forgivable if payroll was not reduced significantly relative to pre-COVID levels
- Firms with fewer than 500 employees were eligible for these loans (with some exceptions)

# Impact of Paycheck Protection Program on Employment

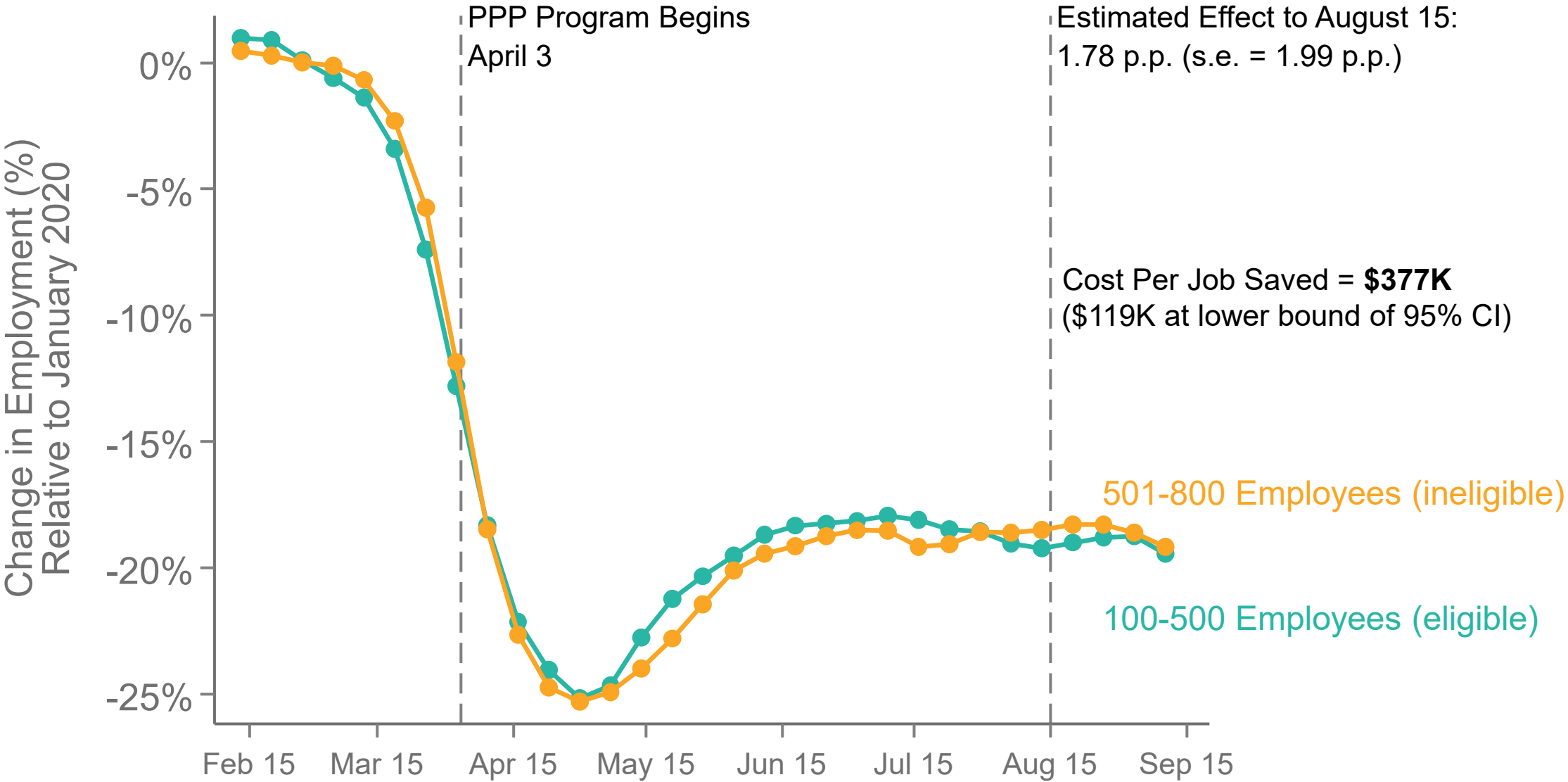
Reweighted to Match Industries (Excl. Food Services), with NAICS x County x Income Quartile FEs





# Impact of Paycheck Protection Program on Employment

Reweighted to Match Industries (Excl. Food Services), with NAICS x County x Income Quartile FEs



# Paycheck Protection Program

- Why has PPP had limited impact on employment despite substantial expenditure?
  - Businesses who took up loans may not have intended to lay off their workers to begin with
  - Ex: very high take-up rate among firms providing professional and scientific services despite low job losses in that sector
  - Consistent with evidence that loans flowed to areas with *smaller* employment losses in March [Granja, Makridis, Yannelis, Zwick 2020]