The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data

Michael Stepner, University of Toronto

with Raj Chetty, Harvard
John N. Friedman, Brown
Nathaniel Hendren, Harvard
and the Opportunity Insights Team

June 2022

OPPORTUNITY INSIGHTS

Measuring the Impacts of Macroeconomic Shocks and Policies

- How has COVID-19 affected the American economy?

- 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 limitations

    1. Available only at low frequencies, sometimes with significant lags
    2. Cannot be disaggregated to examine variation across areas or subgroups

→ We build a new publicly available database using transaction data from private companies to address these challenges and apply it to analyze the impacts of COVID-19

Data

A New Public Database Built From Private Sector Data

- Many papers have used transaction data to analyze economic impacts of COVID crisis
  [e.g., Alexander & Karger 2020, Baker et al. 2020, Bartik et al. 2020, Cajner et al. 2020, Chen et al. 2020, Chiou & Tucker 2020, Cox et al. 2020, Kurman et al. 2020, Kahn et al. 2020, Autor et al. 2020, Granja et al. 2020, Mongey et al. 2020]

- Here, we construct and analyze ***public*** statistics based on private sector data rather than directly analyzing confidential sources of microdata

  - Challenge: constructing public statistics that are sufficiently granular for research yet sufficiently aggregated and masked to protect privacy

- Combining data on spending, employment, and other outcomes offers a more complete picture of chain of macroeconomic events than studies that focus on one set of outcomes

Data Partners

Consumer Spending

affinity solutions

COINOUT

Small Business Revenues

WOMPLY

Employment

PAYCHEX

intuit

earnin

Job Postings

burningglass TECHNOLOGIES

Education

2EARN

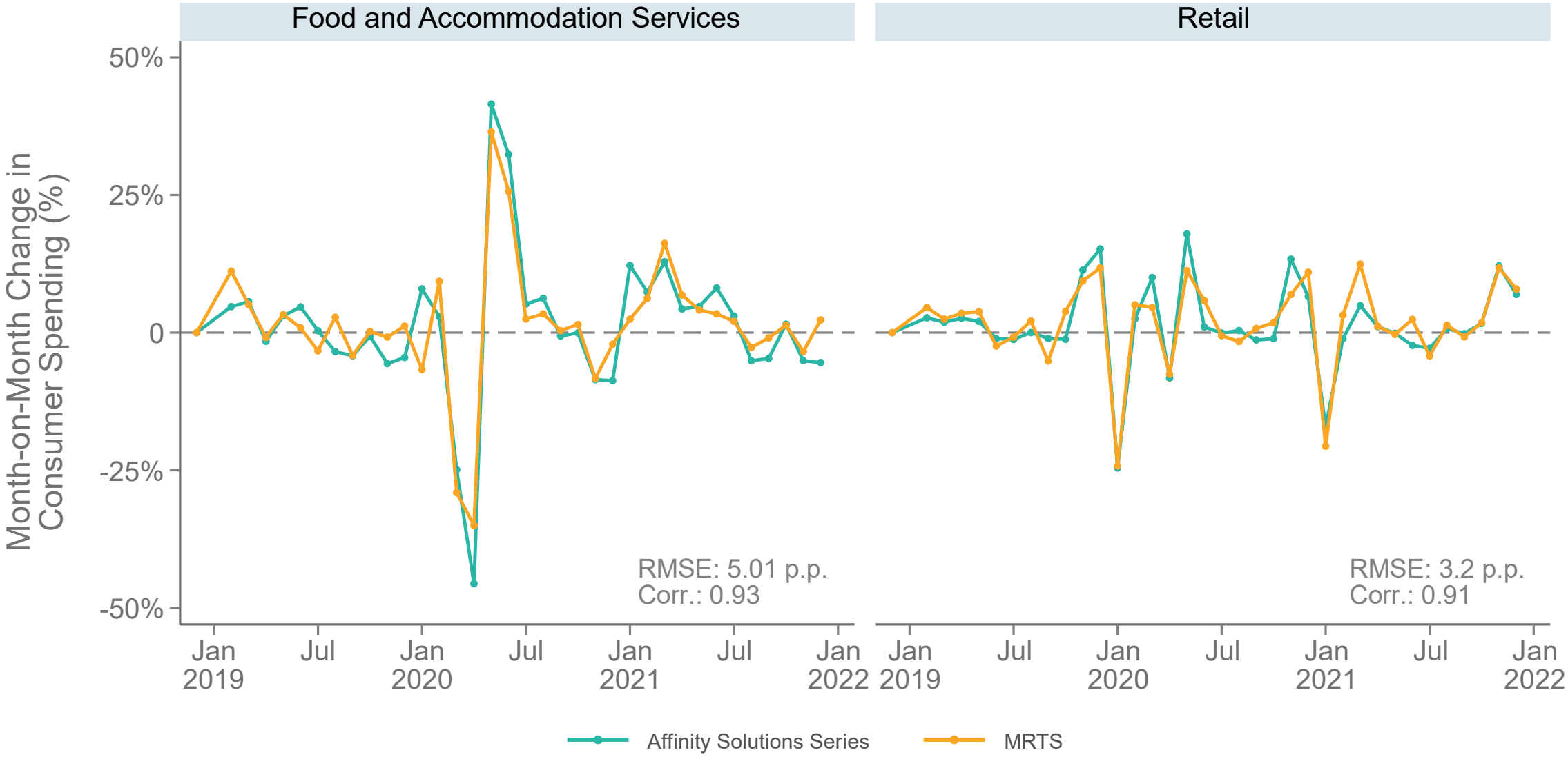
Constructing Publicly Available Economic Indices Based on Private-Sector Data

- 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

Consumer Spending: National Accounts vs. Credit/Debit Card Data

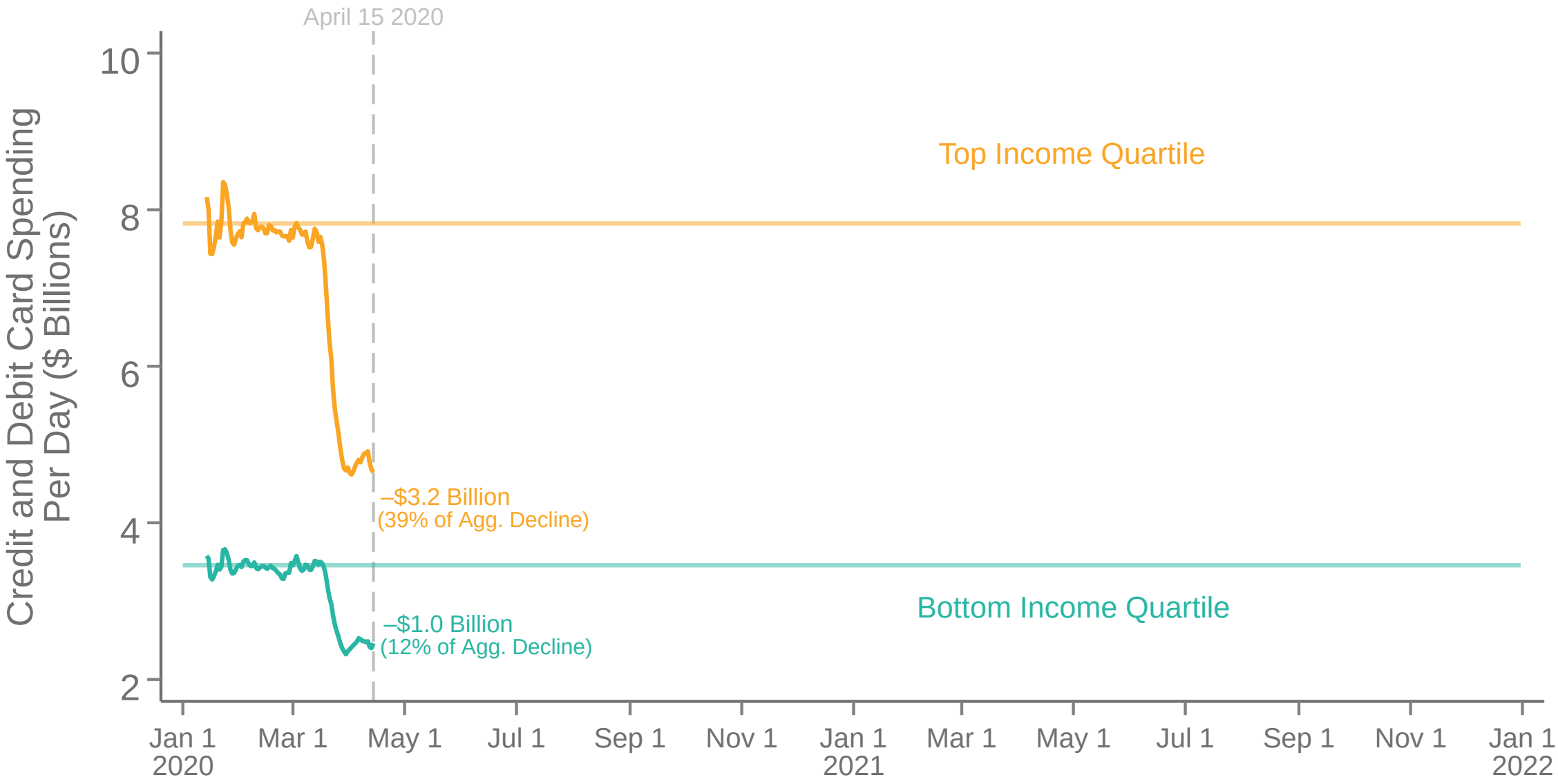
Retail and Food Services in Affinity Solutions vs. Monthly Retail Trade Survey



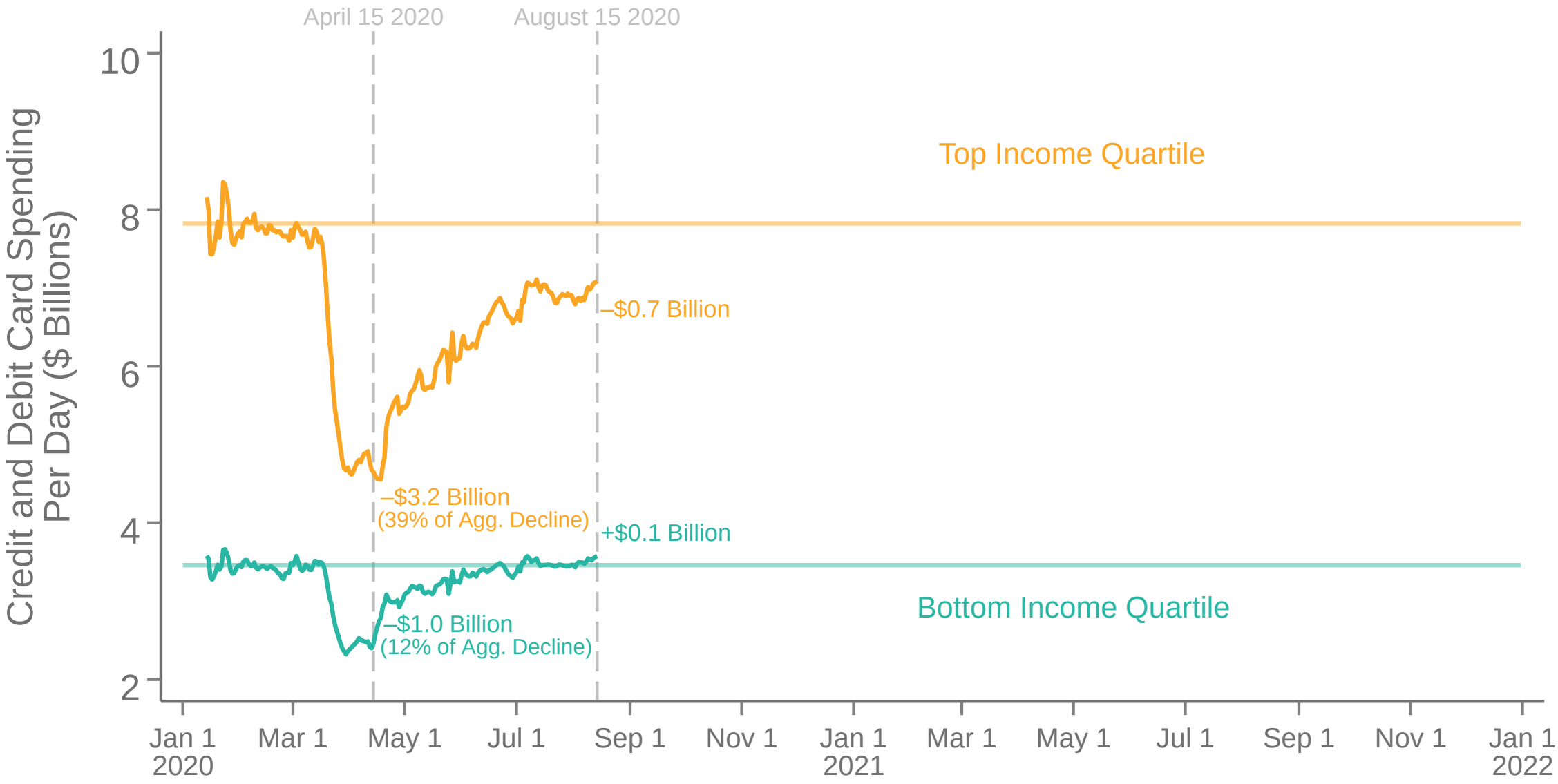
Impacts of COVID-19

Spending

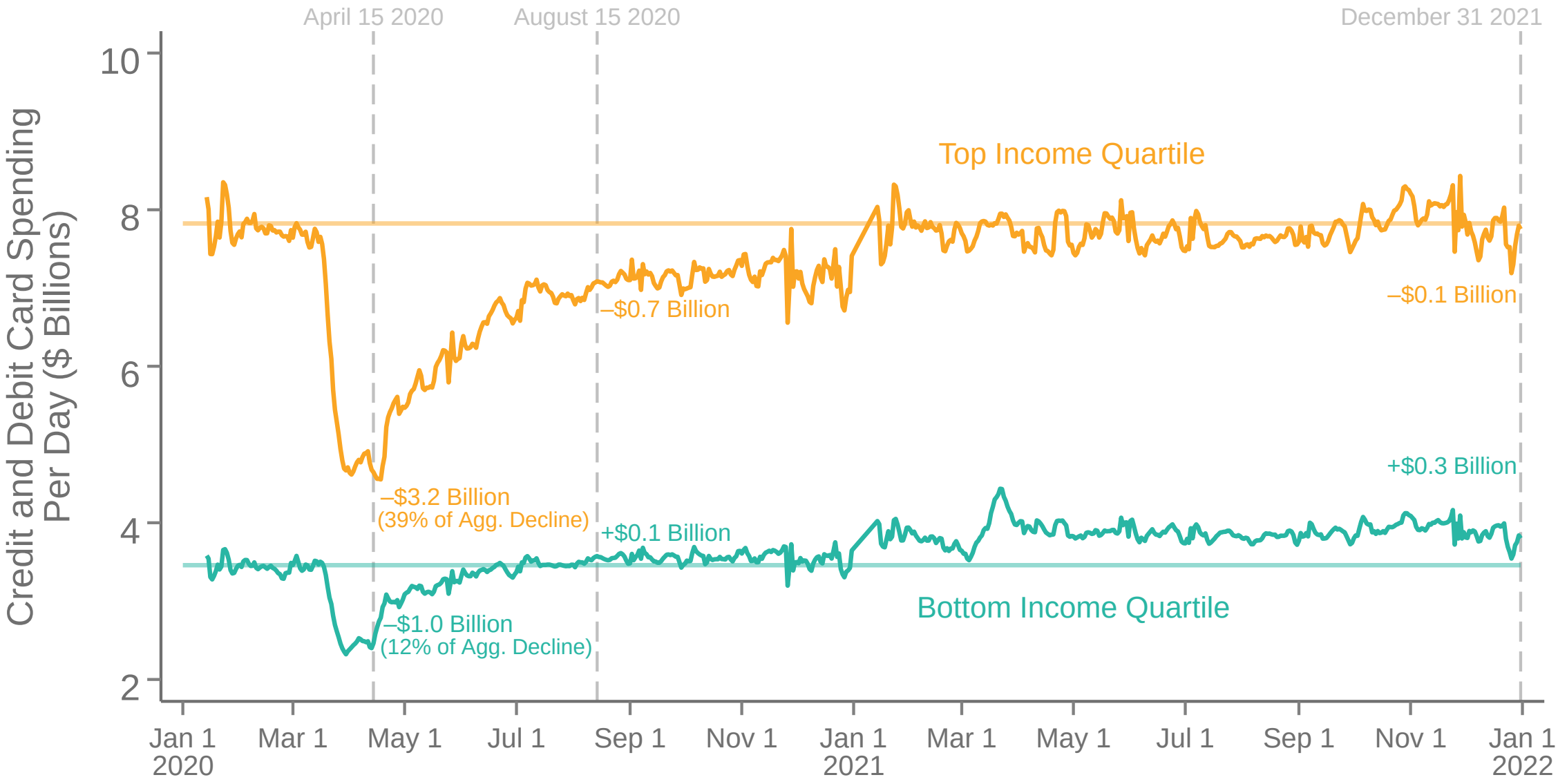
Consumer Spending by Income Quartile



Consumer Spending by Income Quartile



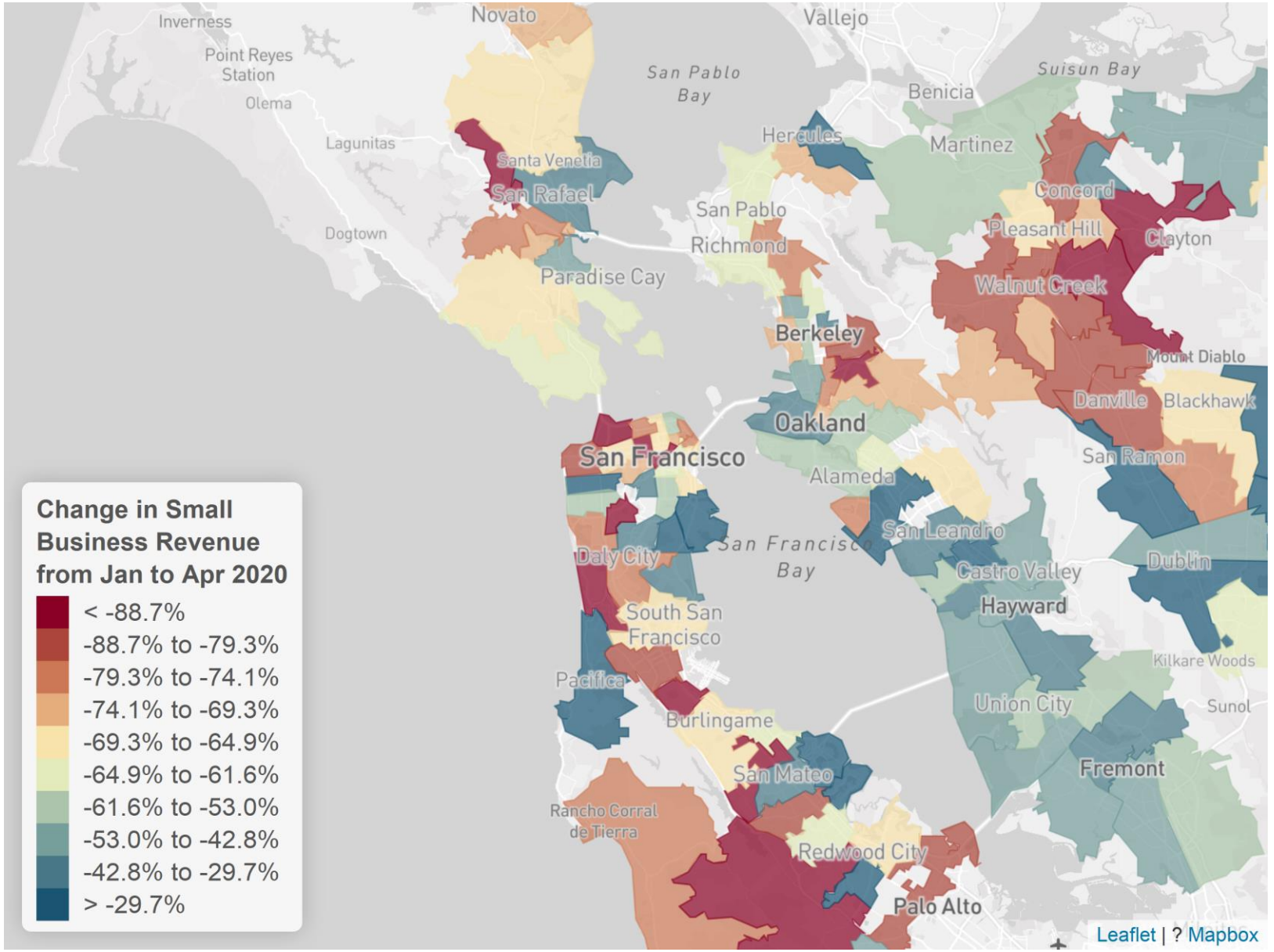
Consumer Spending by Income Quartile



Business Revenues

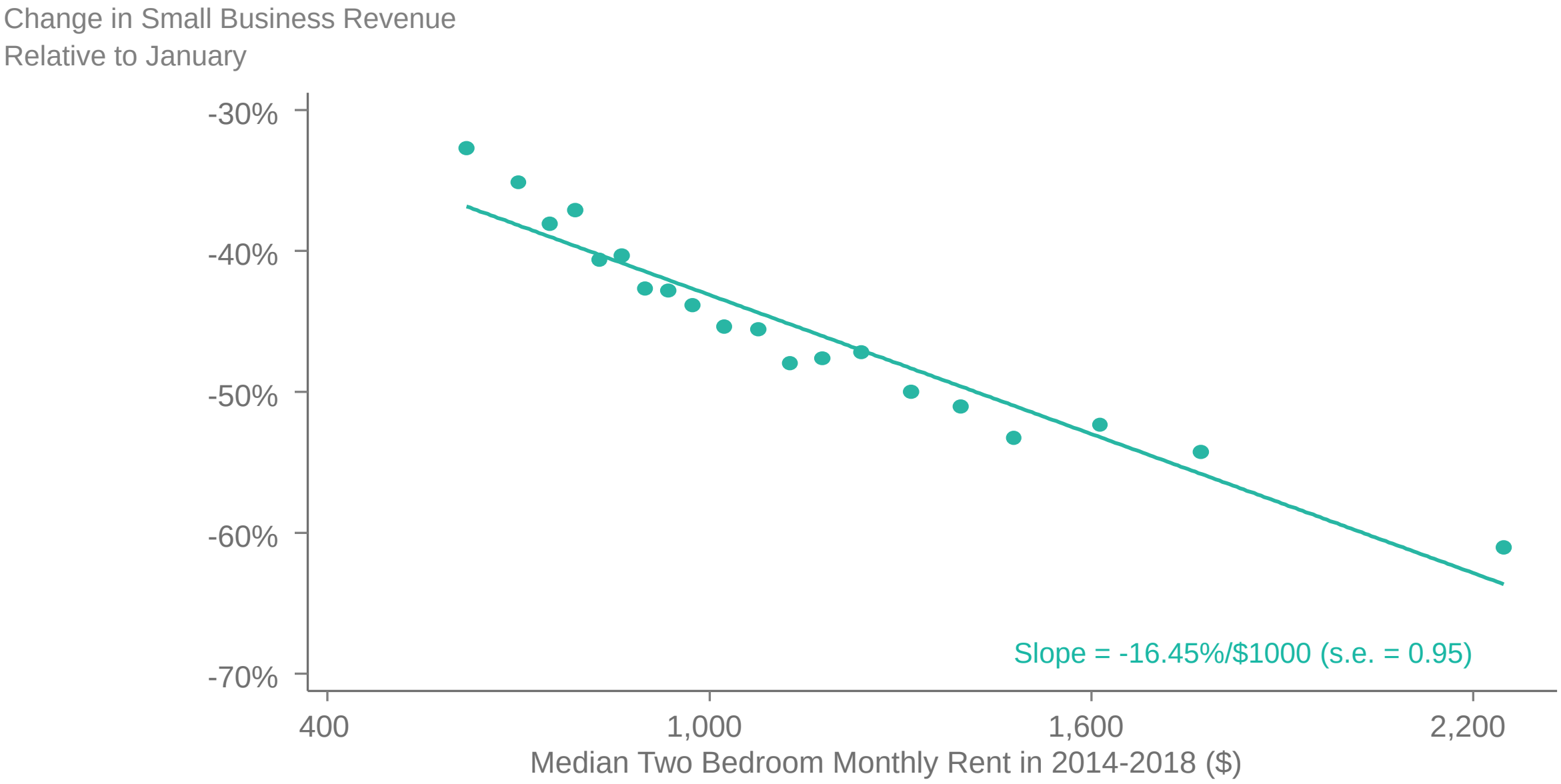
Changes in Small Business Revenues from January to April by ZIP Code

San Francisco



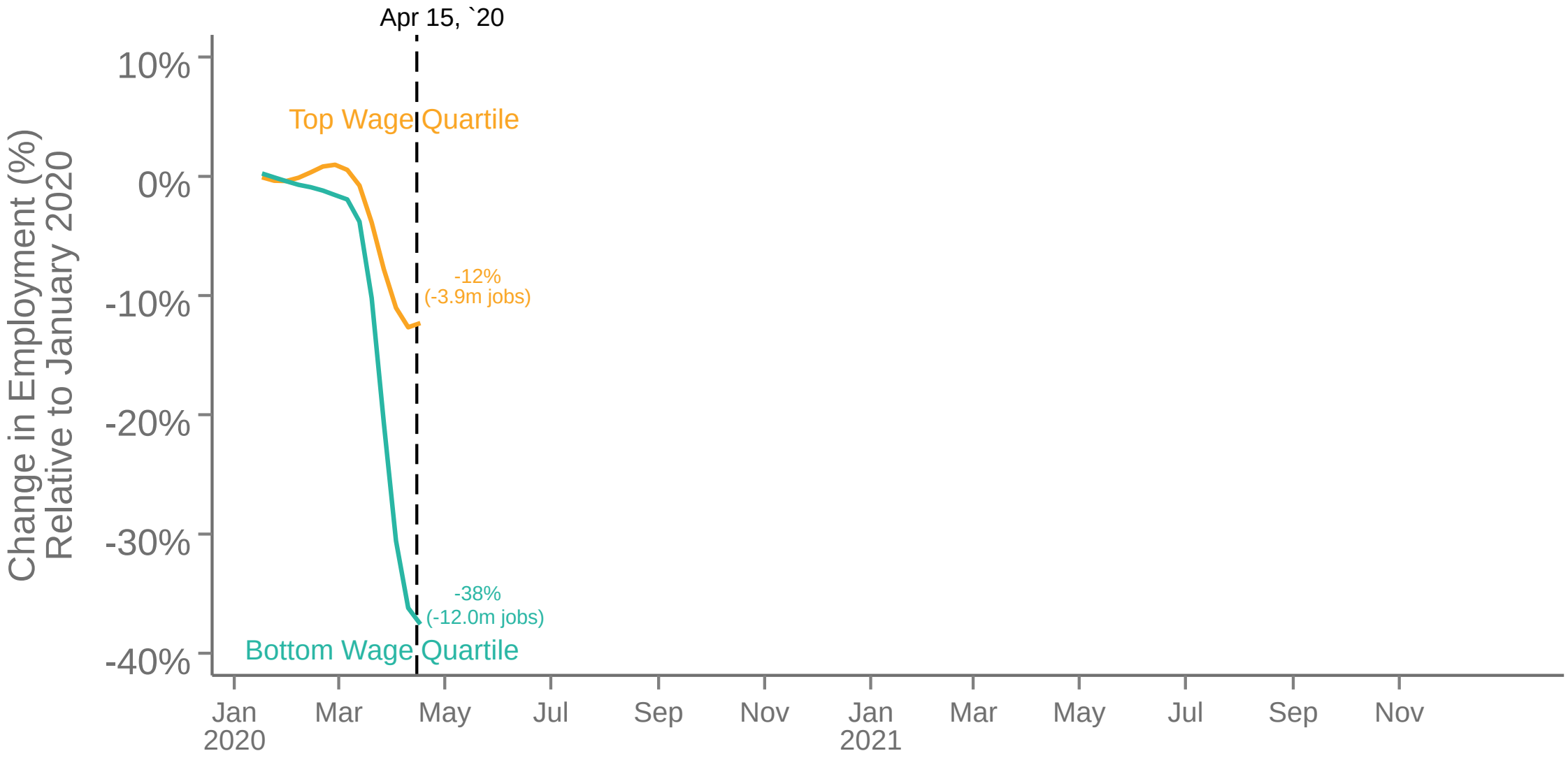
Changes in Small Business Revenues vs. Rent, by ZIP Code

From January to April 2020

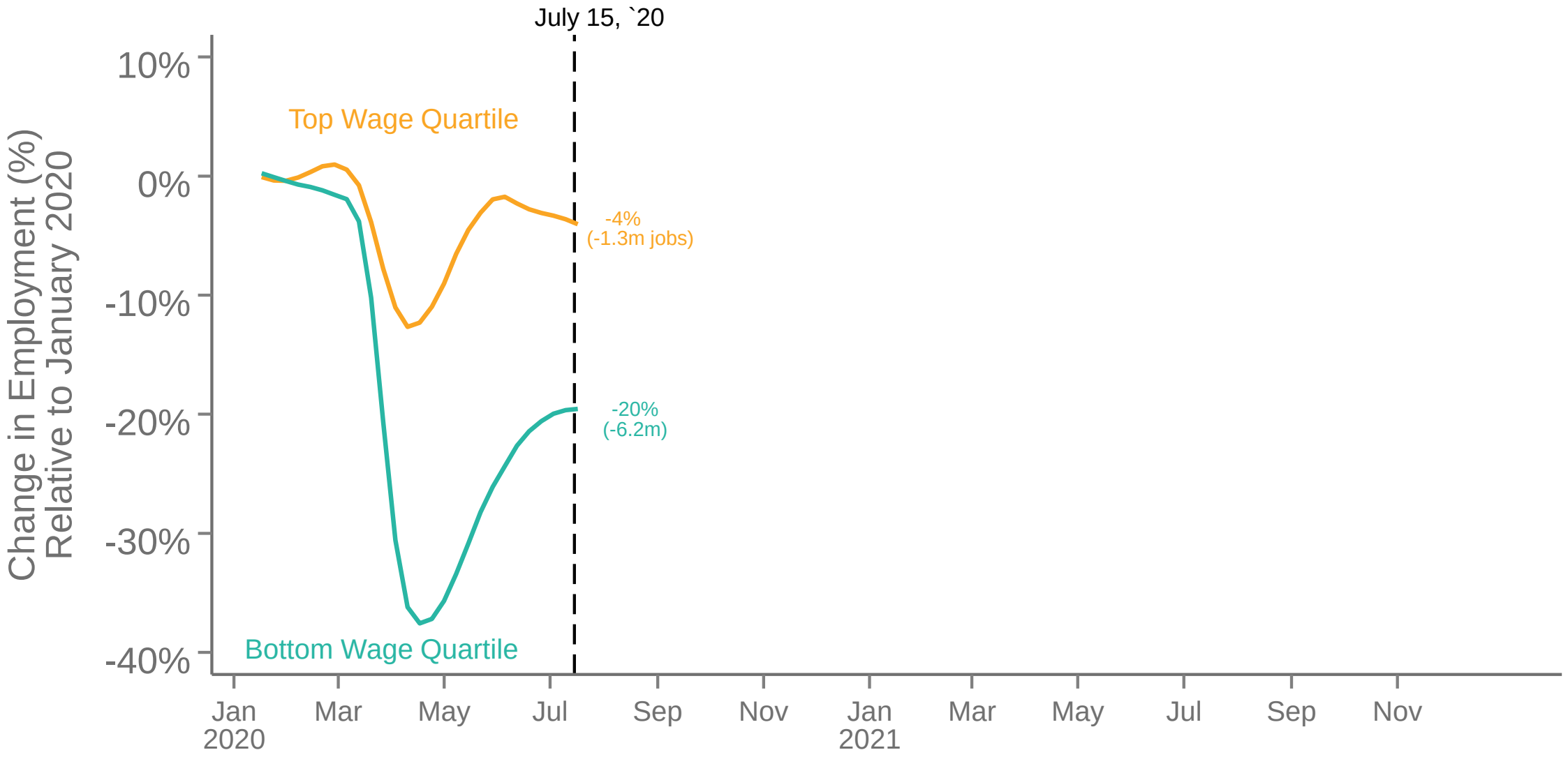


Employment

Employment Changes by Wage Quartile

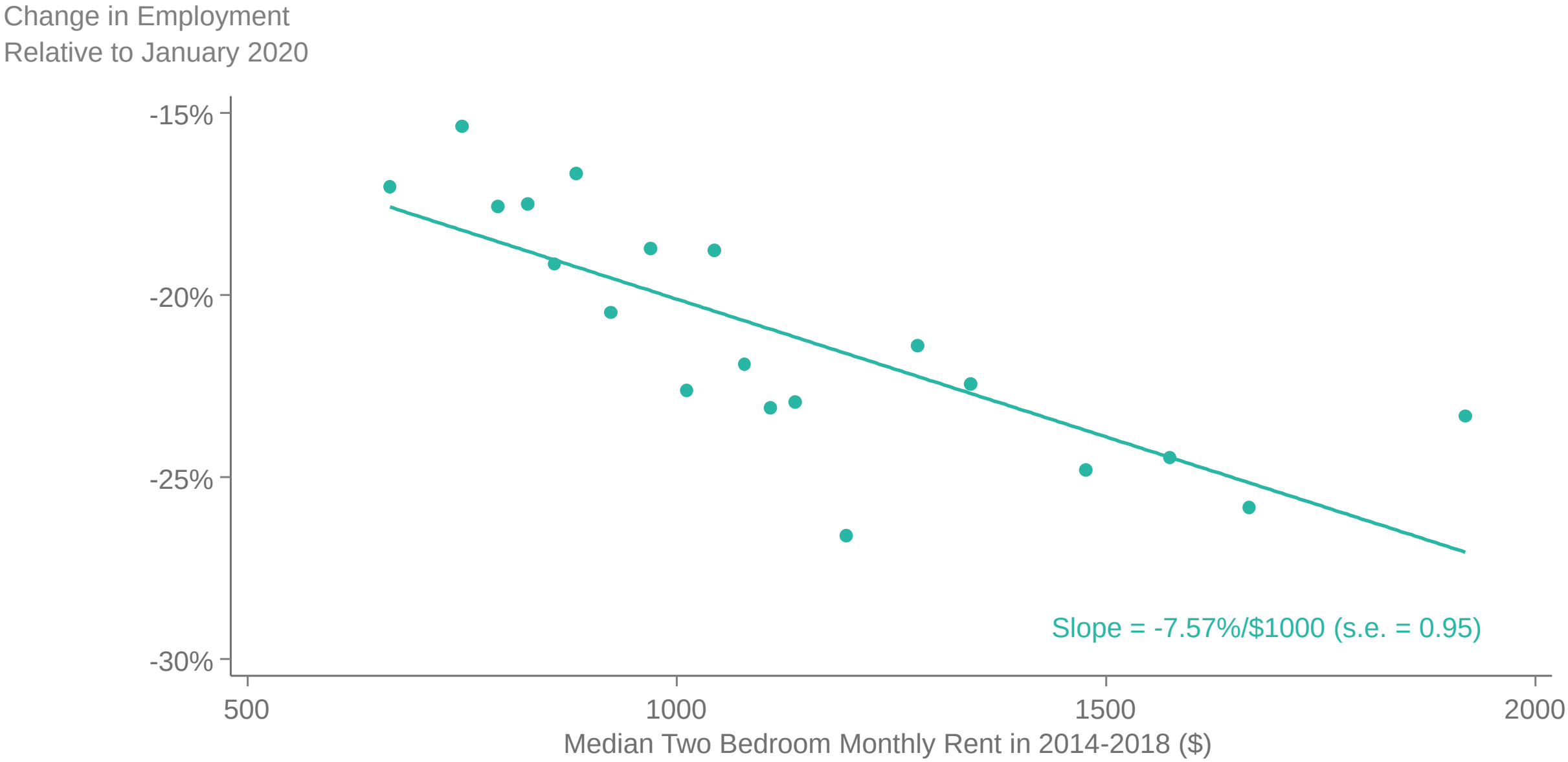


Employment Changes by Wage Quartile



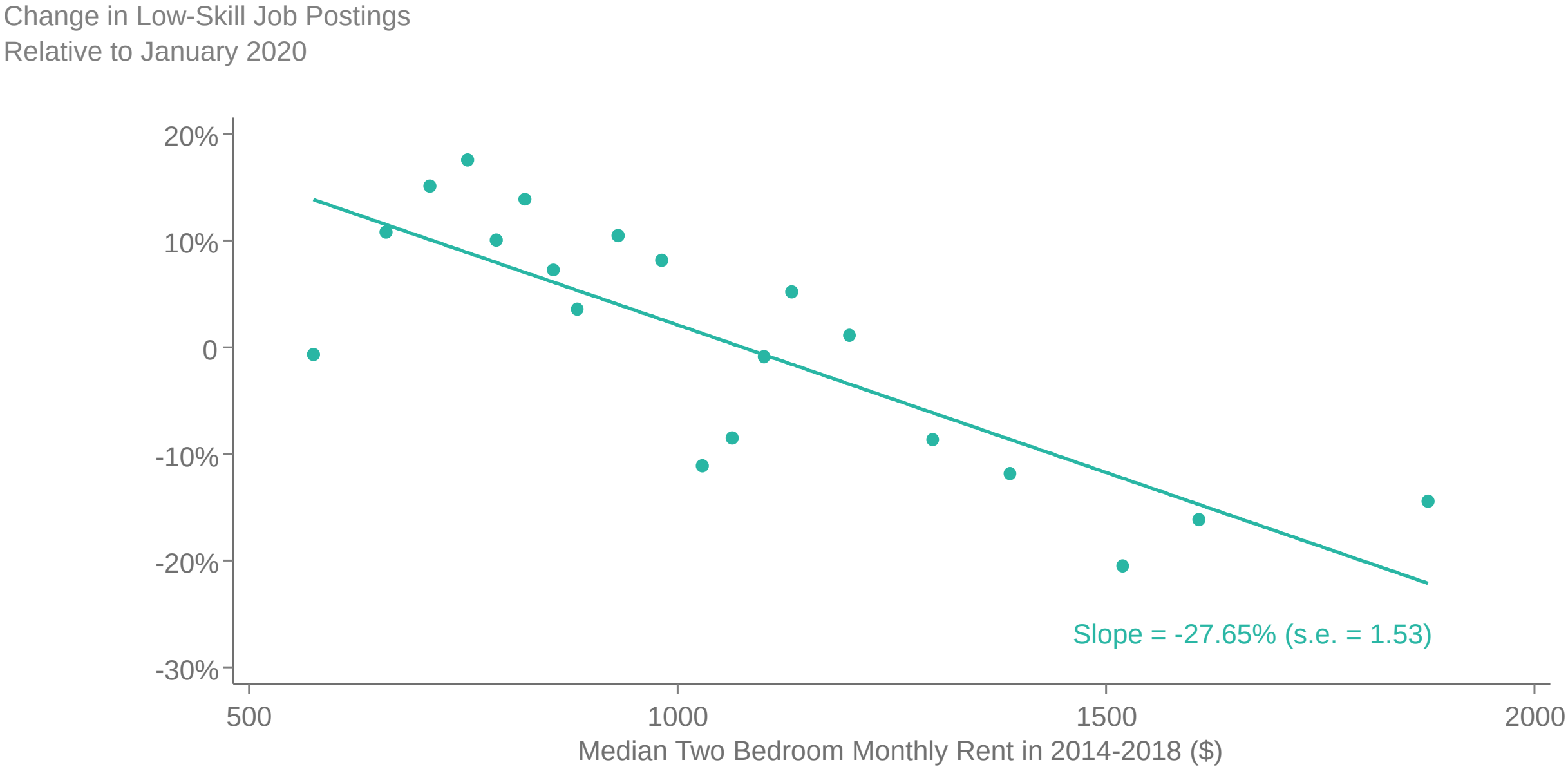
Changes in Bottom-Wage-Quartile Employment vs. Rent, by County

From January to July 2020



Changes in Low-Skill Job Postings vs. Rent, by County

From January to July 2020

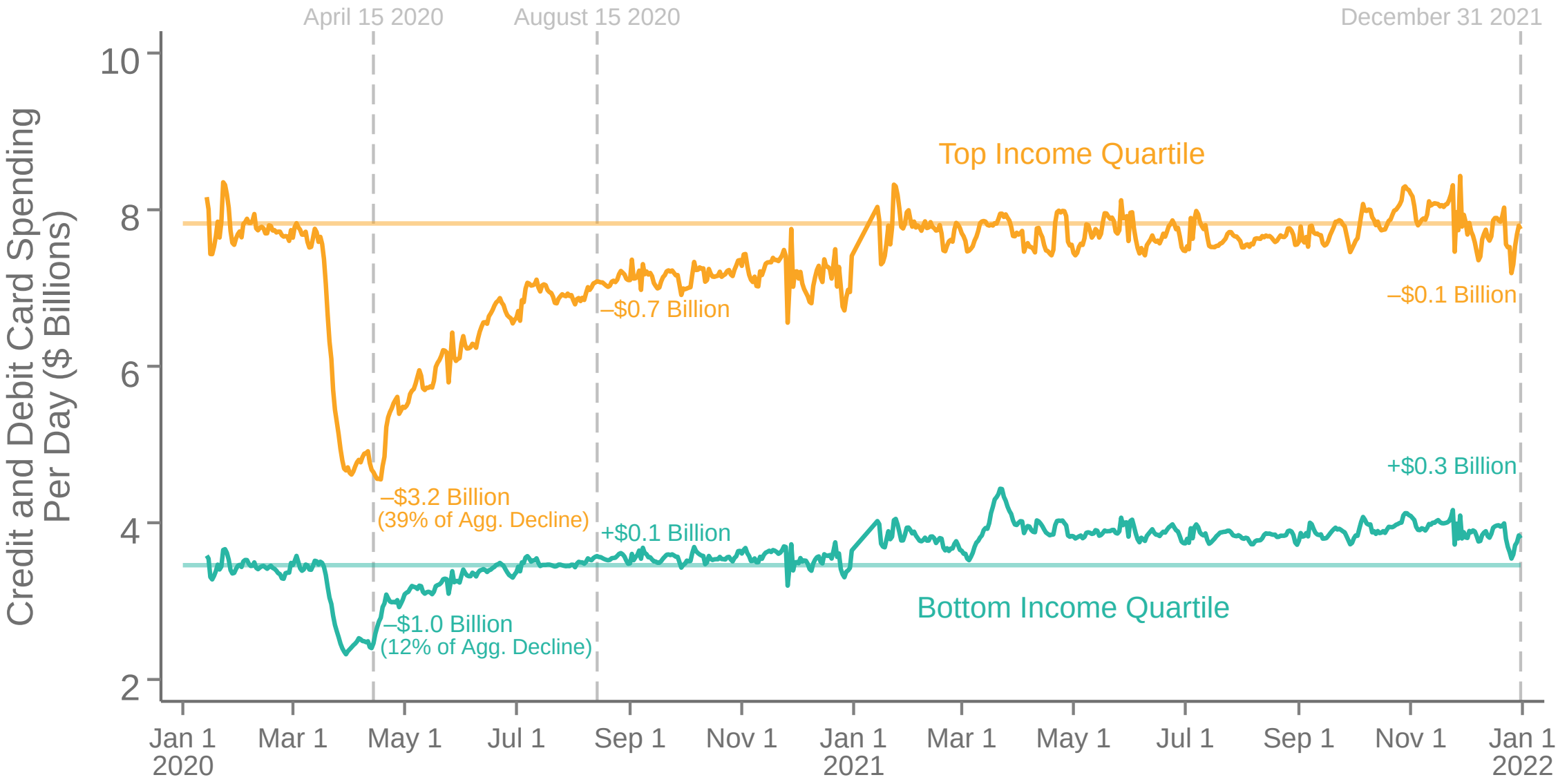


Change in Spending for Low-Income Households

From January to April 2020, By Workplace Rent

Recovery

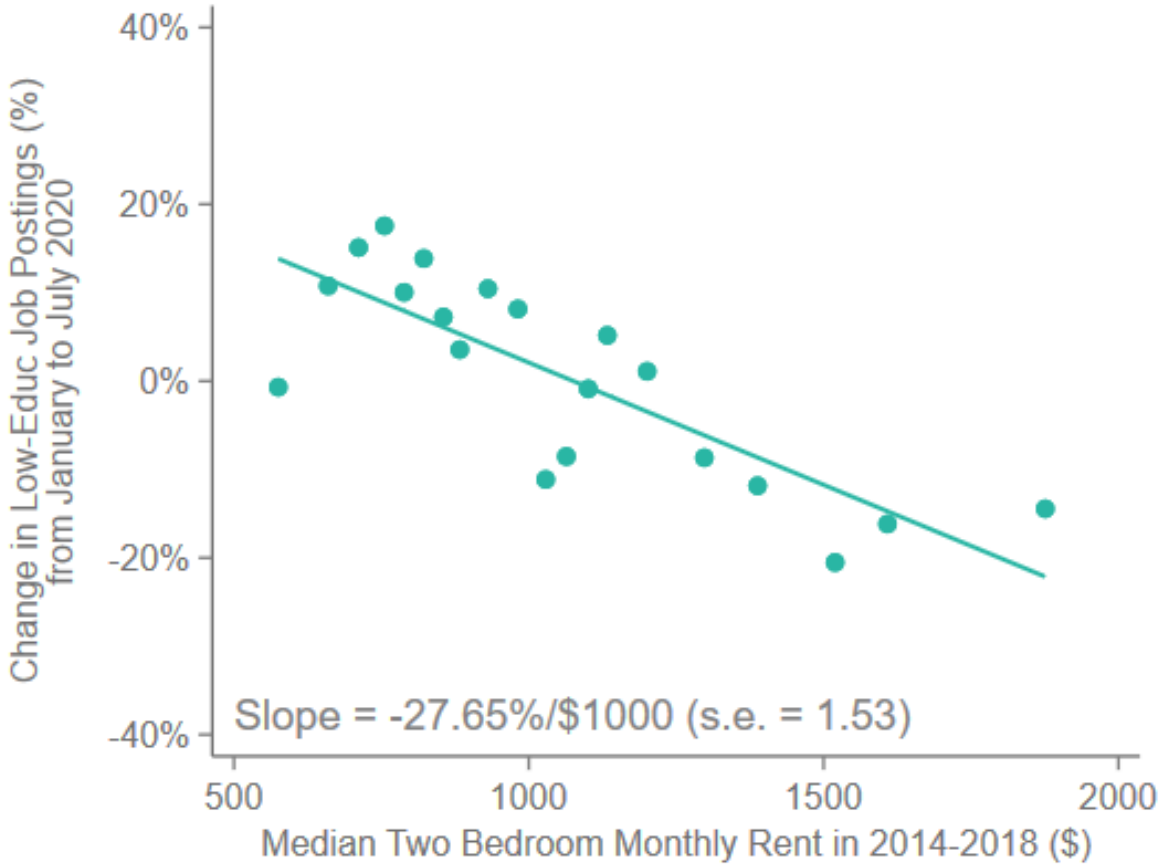
Consumer Spending by Income Quartile



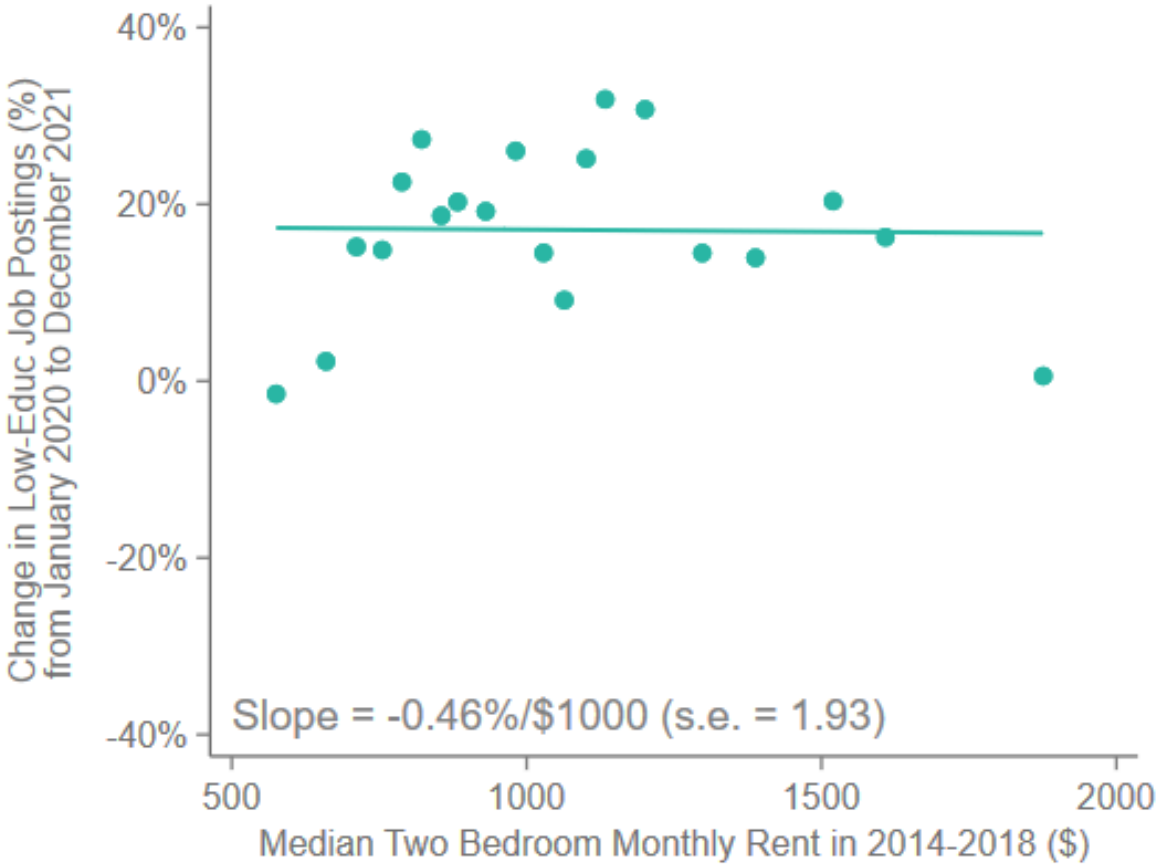
Changes in Low-Skill Job Postings vs. Rent, by County

Gradient Flattens Over Time

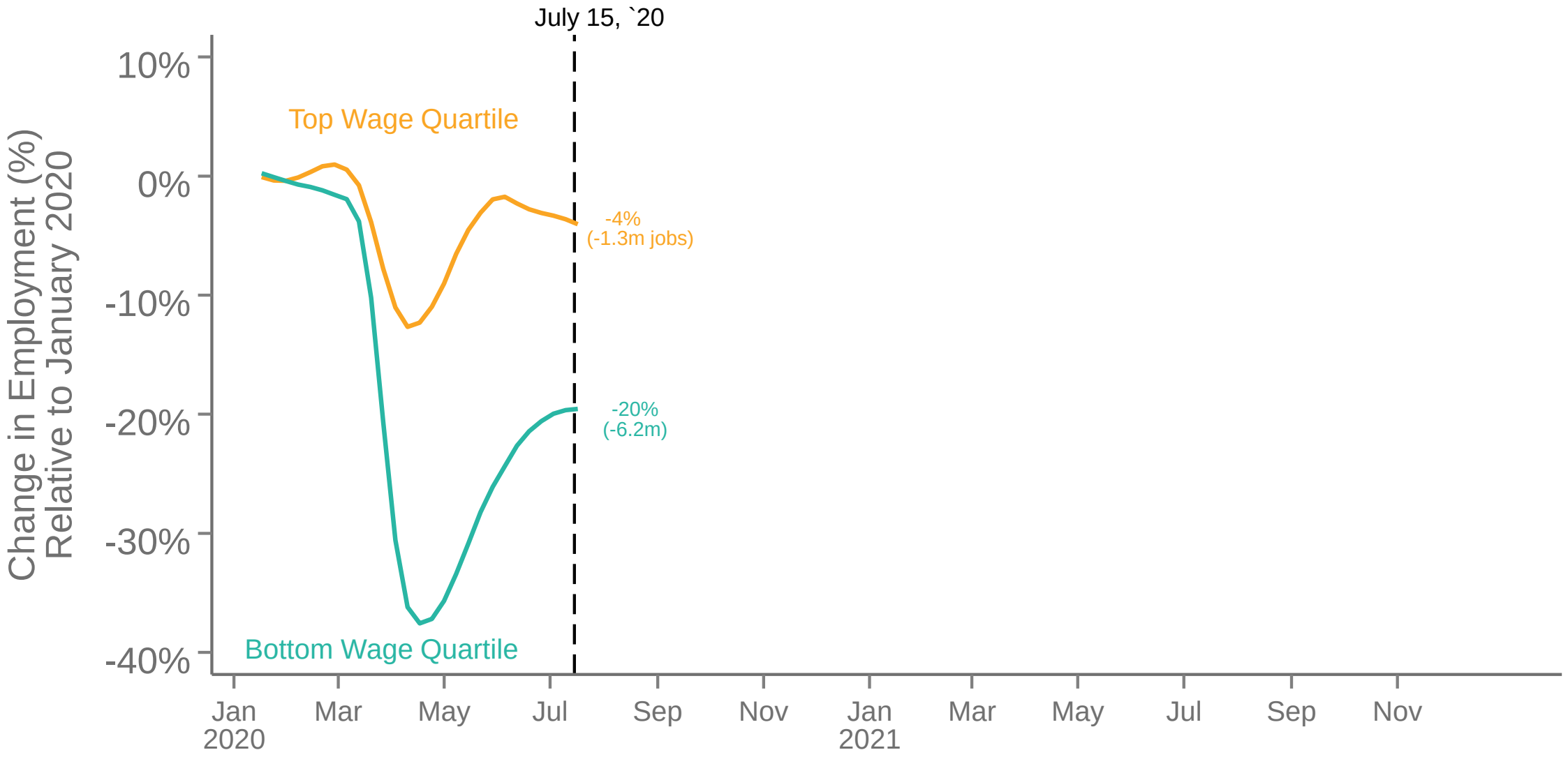
July 2020



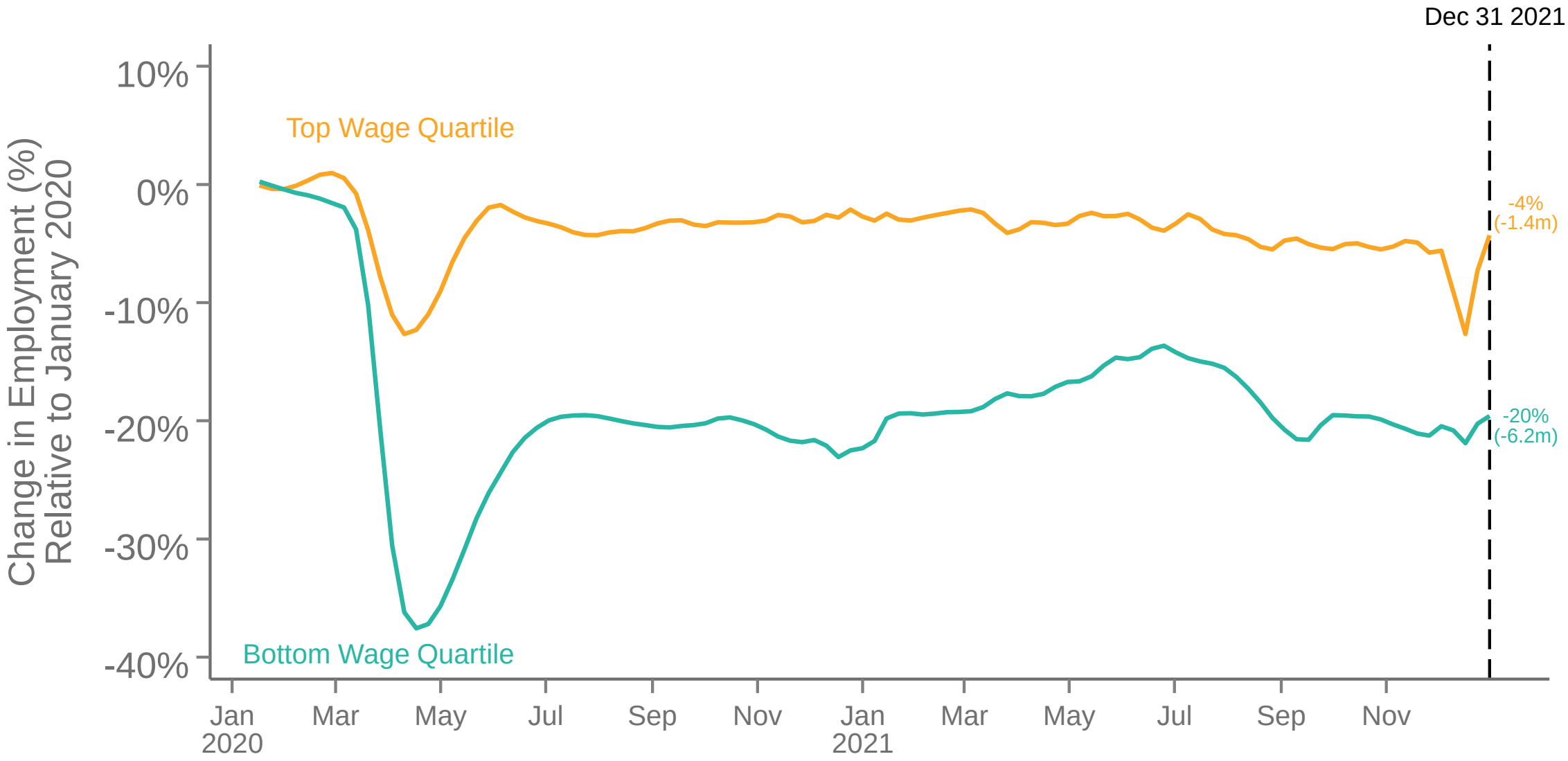
December 2021



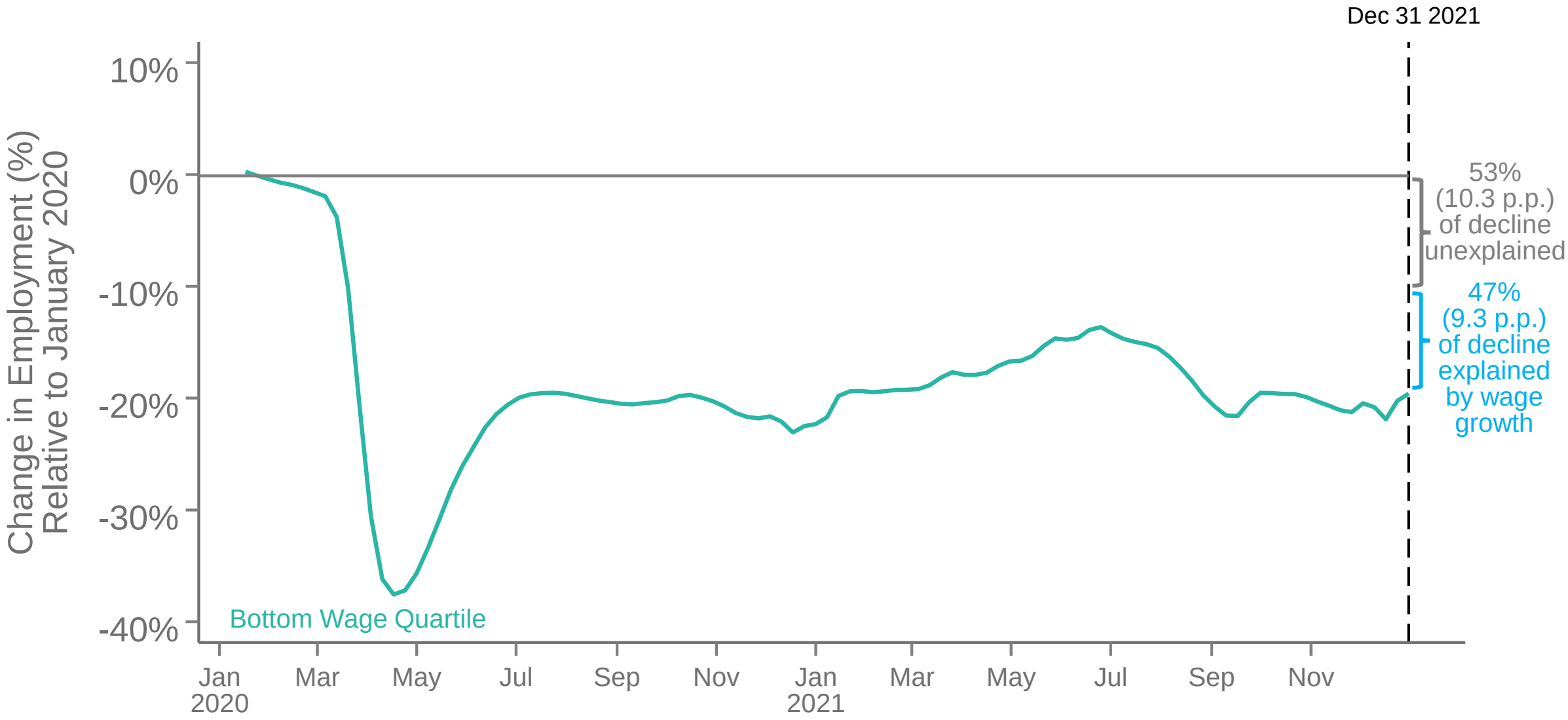
Employment Changes by Wage Quartile



Employment Changes by Wage Quartile



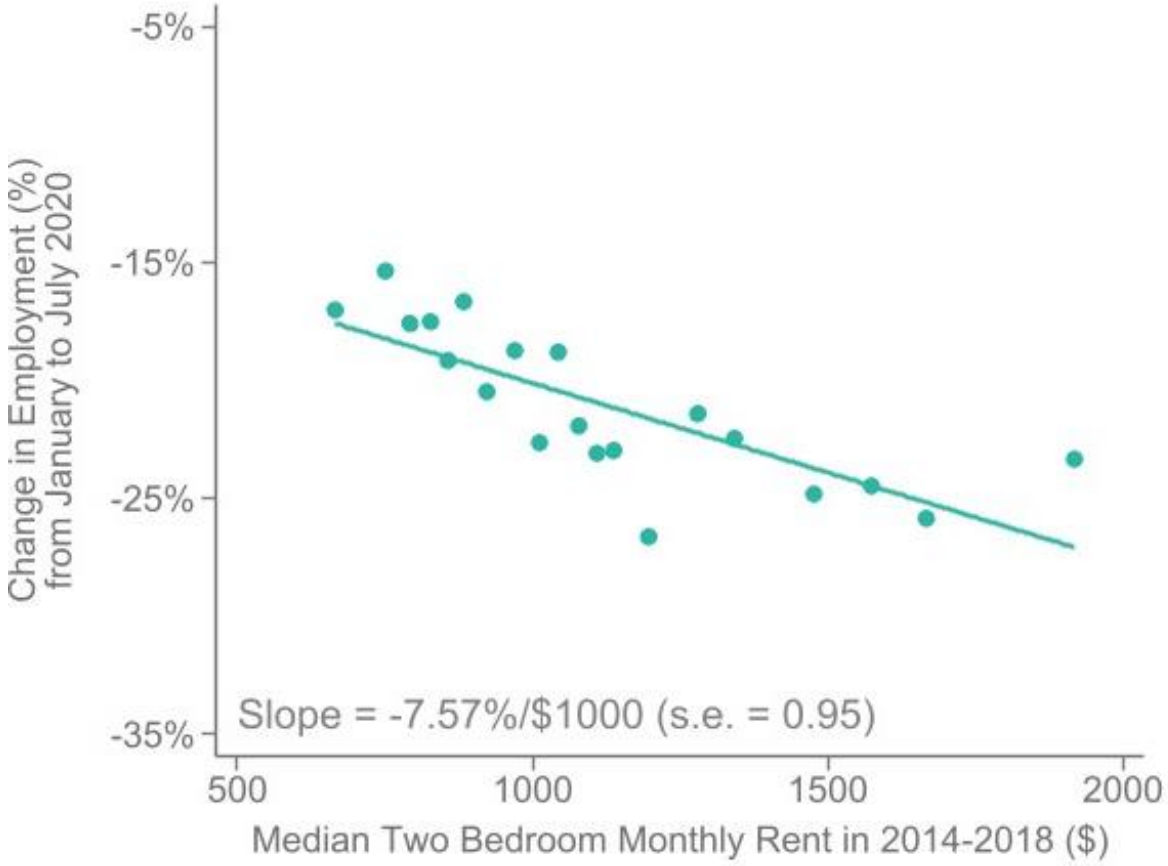
Employment Changes by Wage Quartile



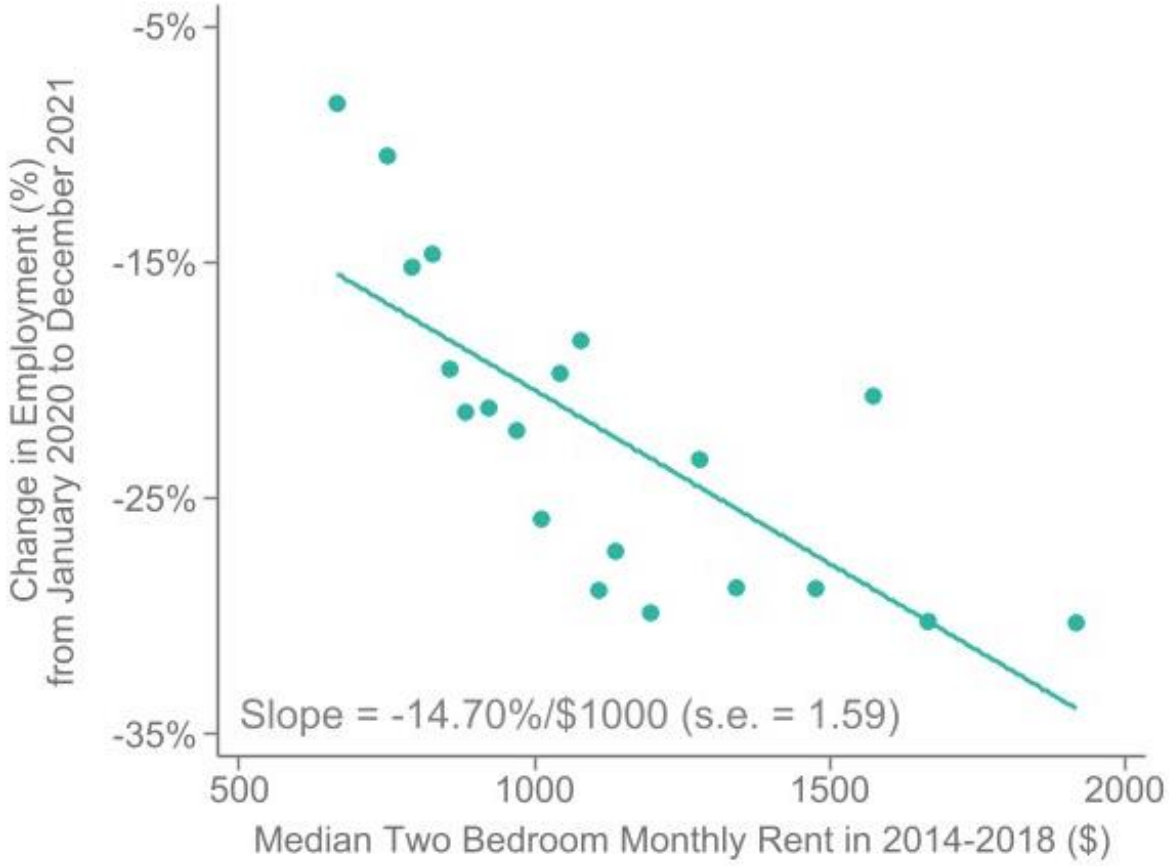
Changes in Bottom-Wage-Quartile Employment vs. Rent, by County

Gradient Does Not Flatten Over Time

July 2020

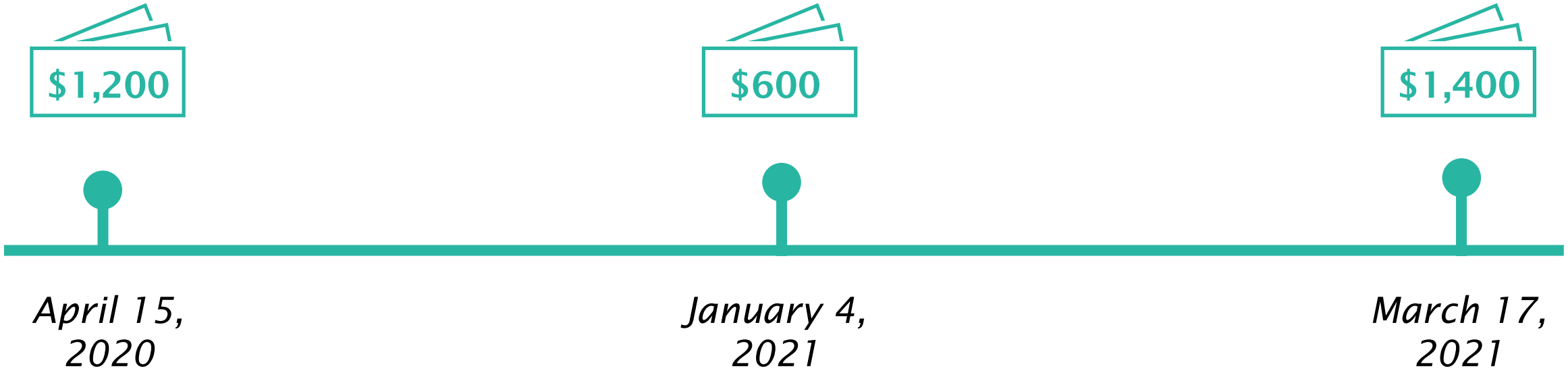


December 2021

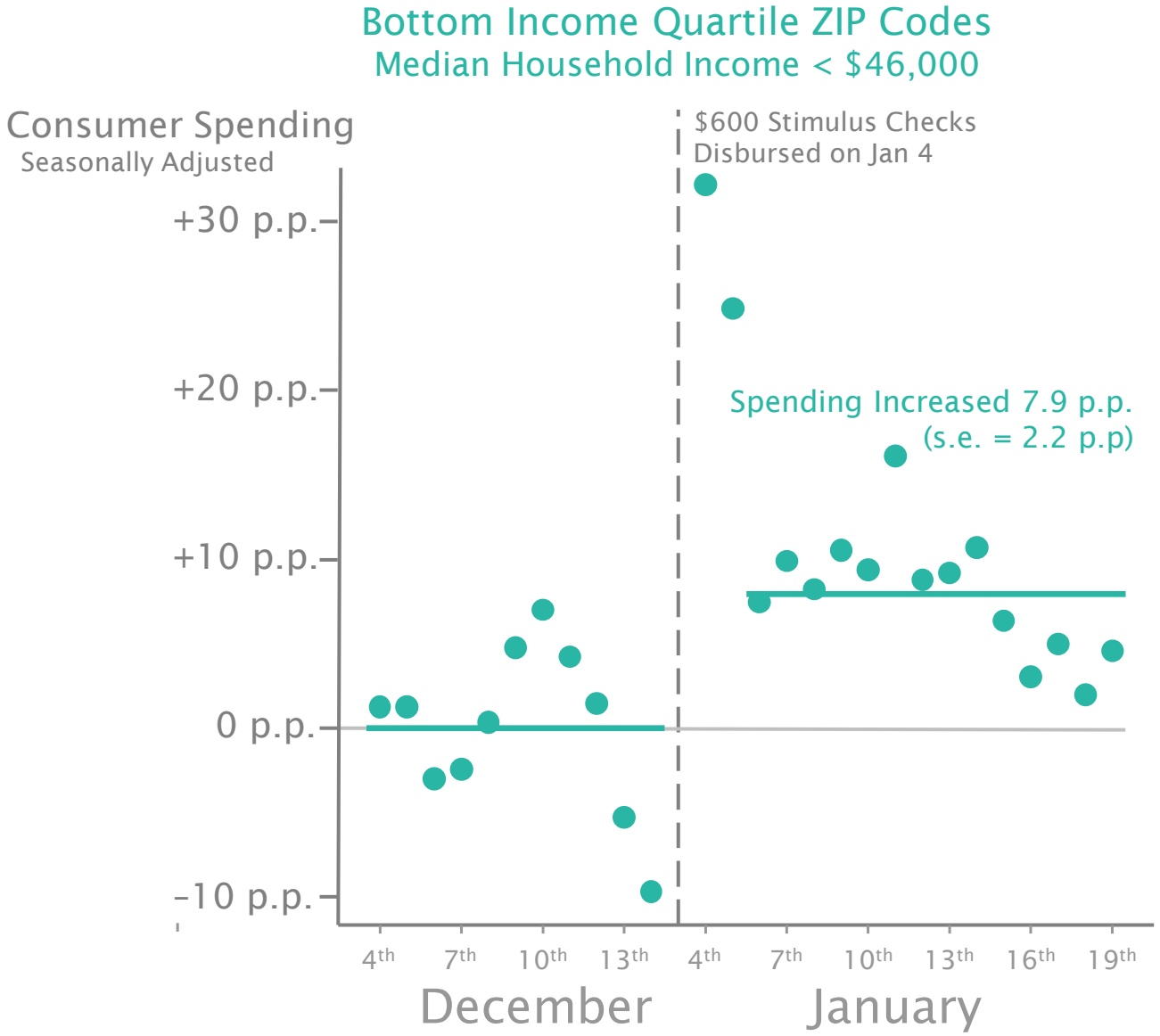


Stimulus Payments

Three Rounds of Stimulus Payments to Households During the COVID-19 Pandemic



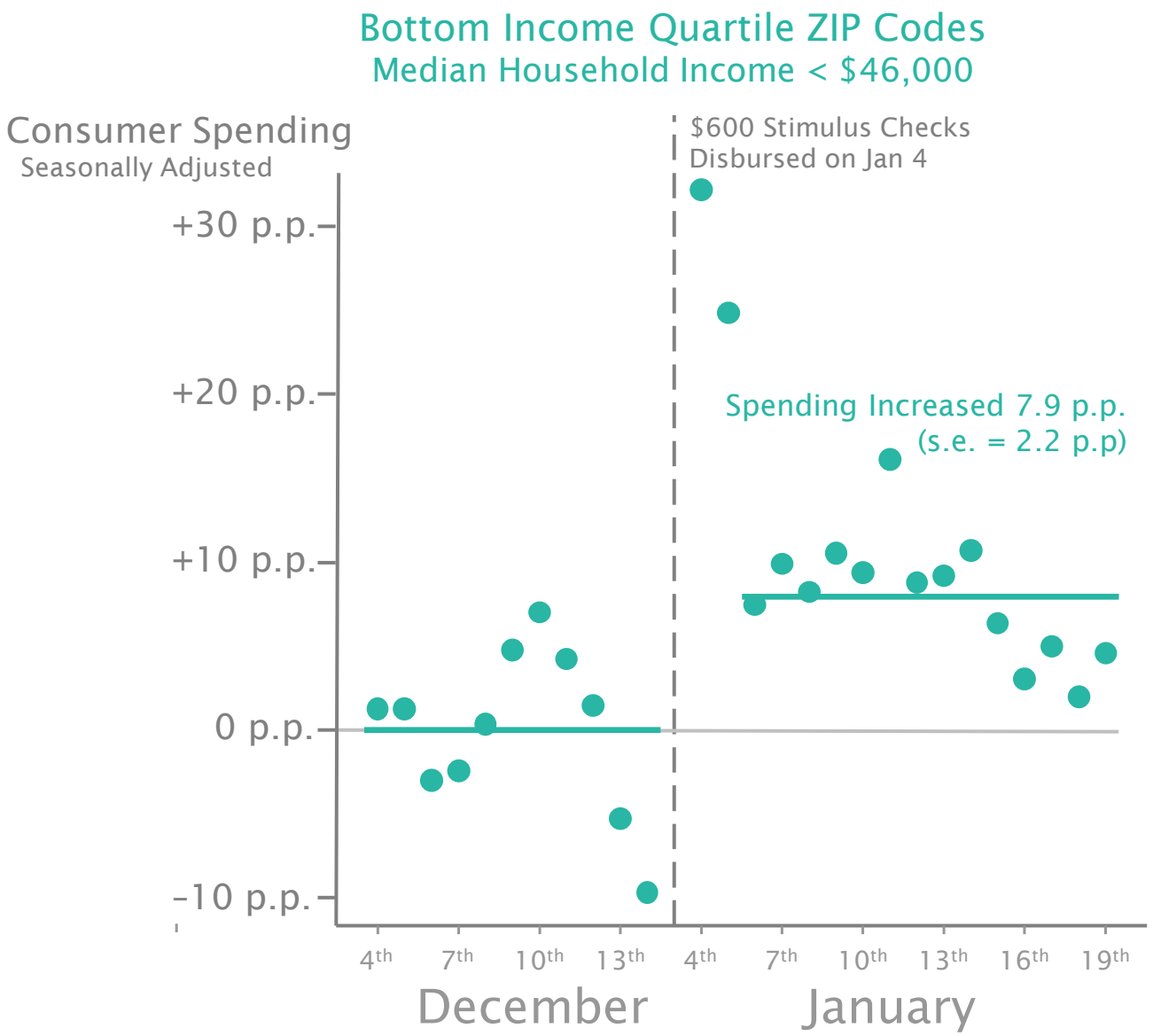
Effect of the **January 2021** Stimulus Checks on Daily Consumer Spending

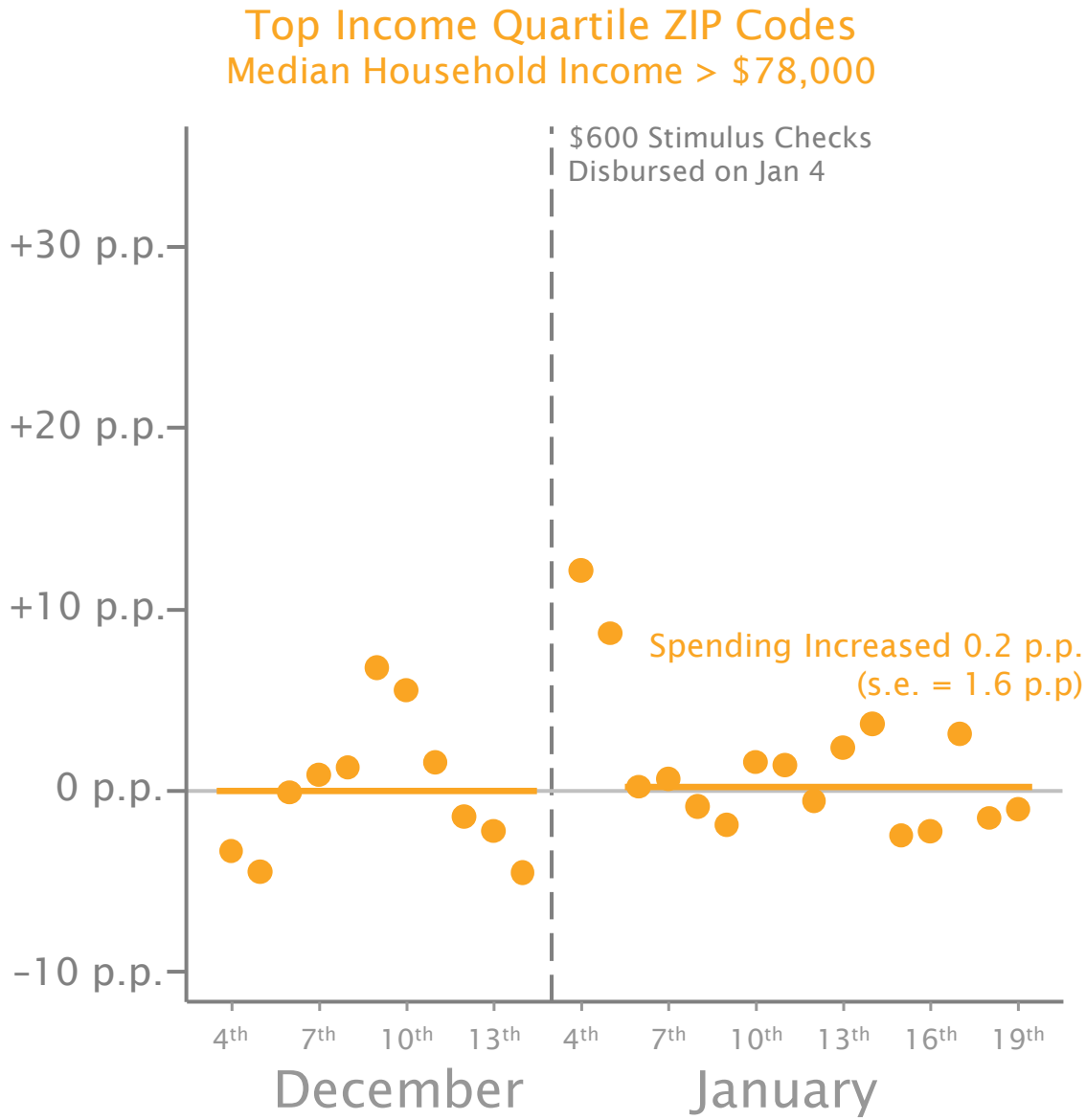


permutation

holidays

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

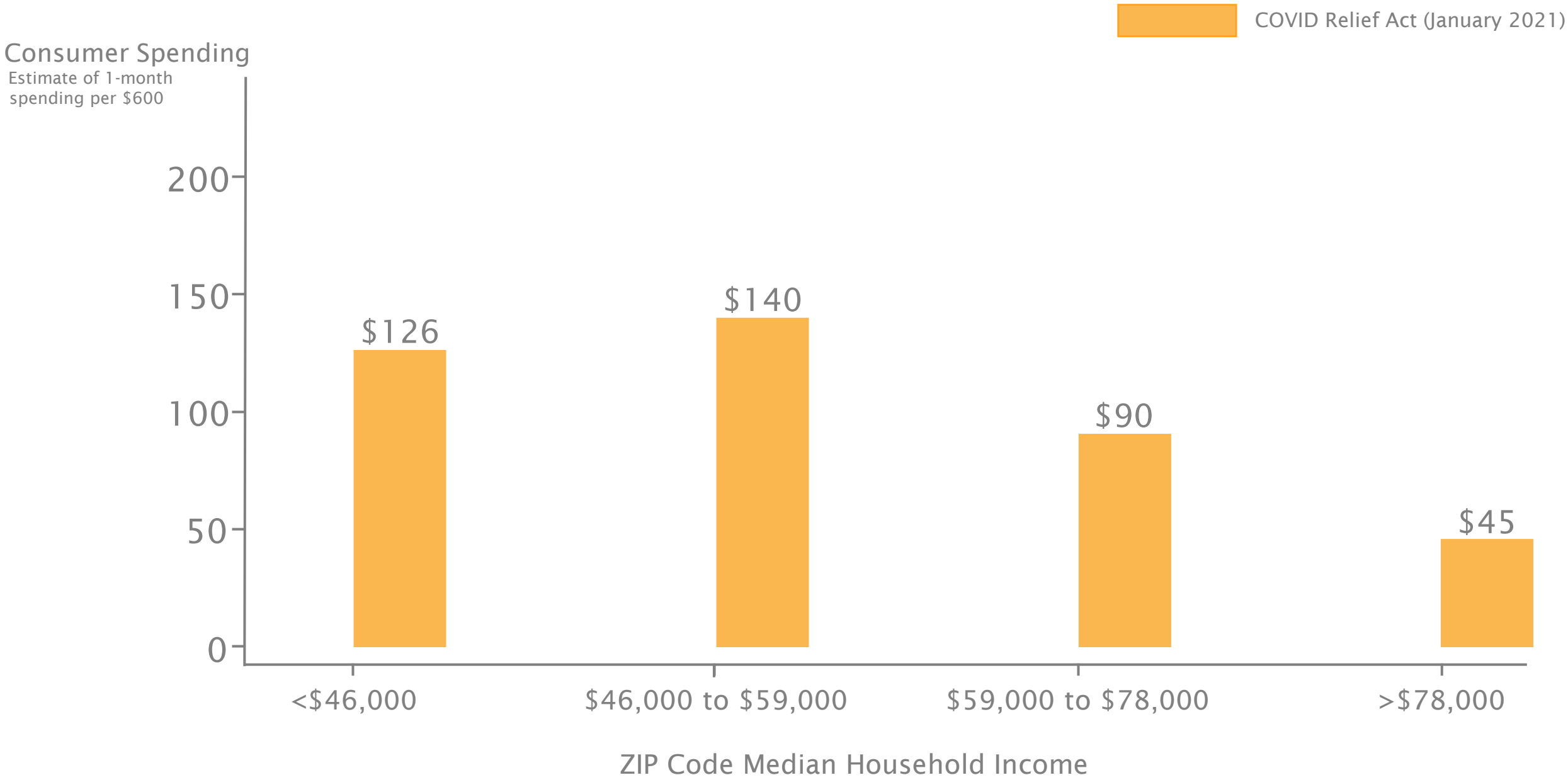




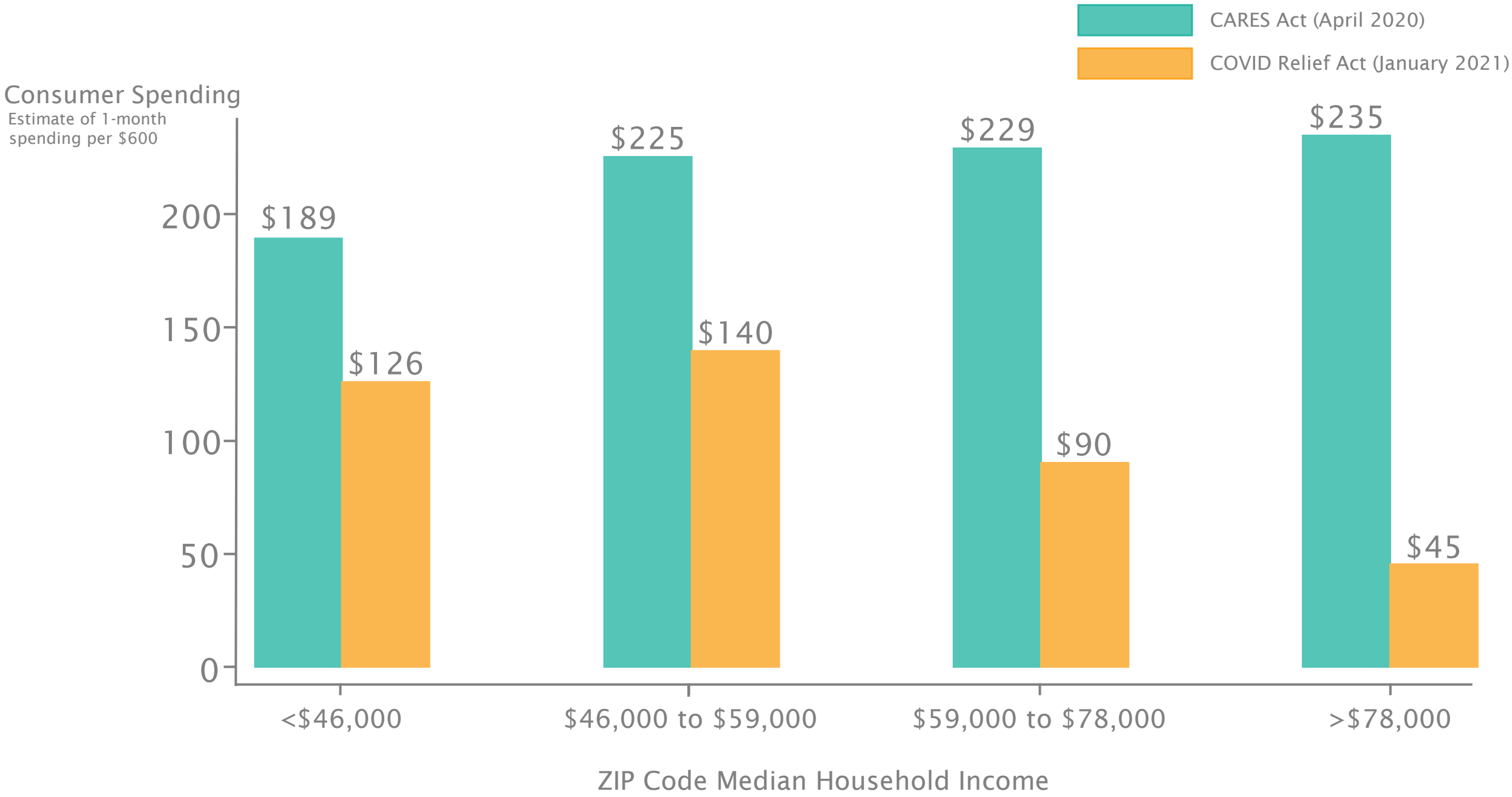
permutation

holidays

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



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

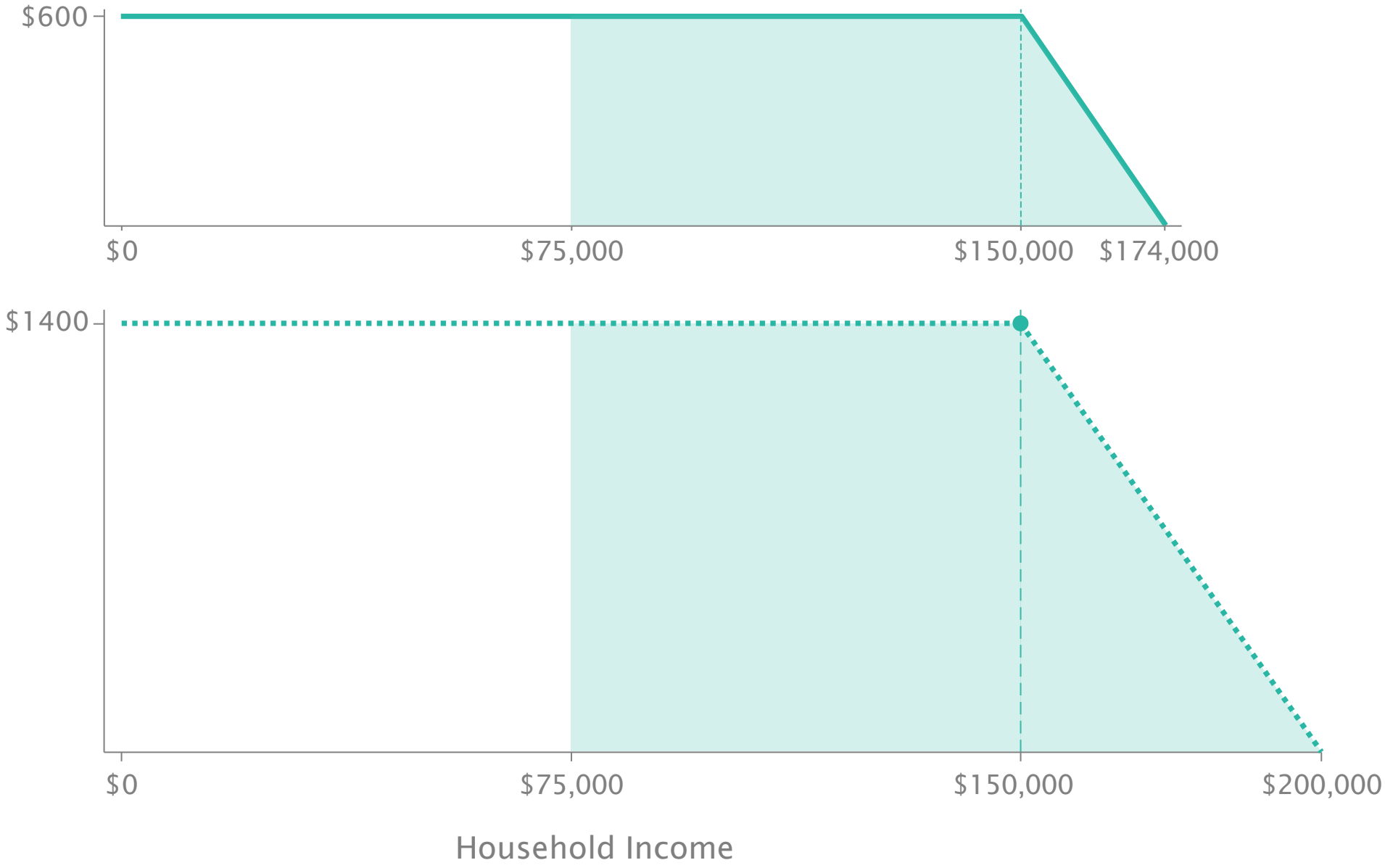


Projected Effect of Stimulus Checks on Spending

Couple with No Children

January 2021 Stimulus Policy

March 2021 Stimulus Policy Proposal

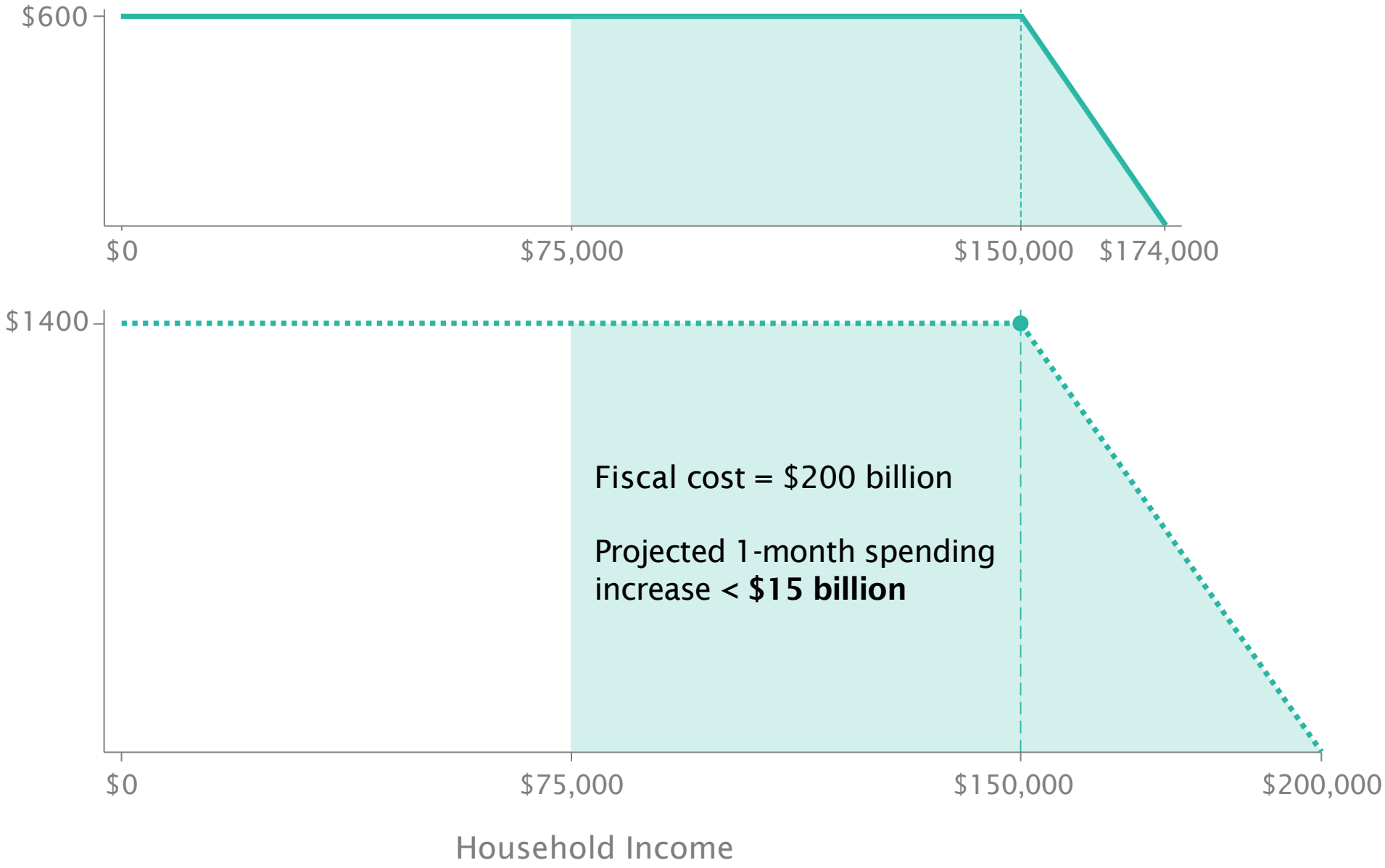


Projected Effect of Stimulus Checks on Spending

Couple with No Children

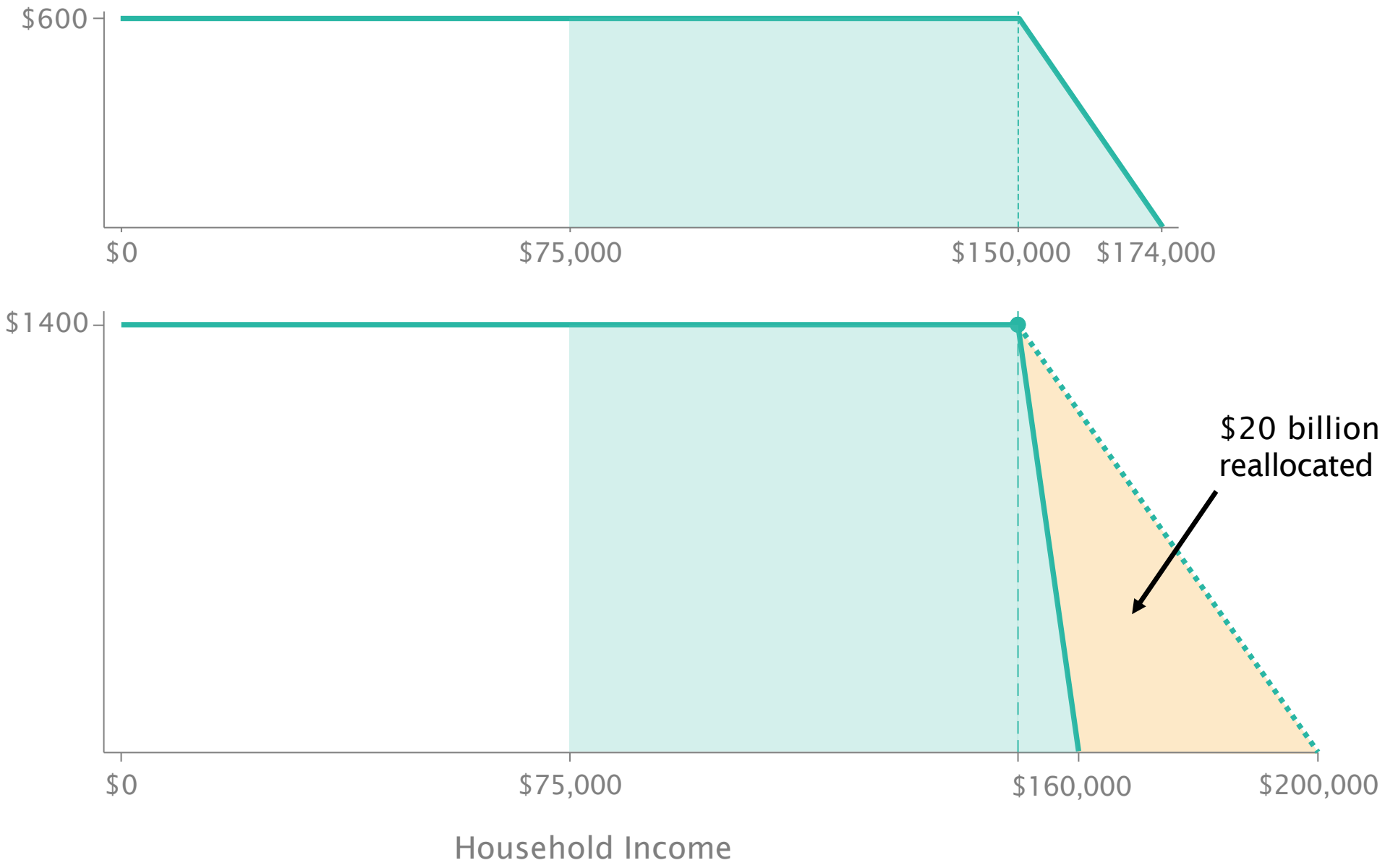
January 2021 Stimulus Policy

March 2021 Stimulus Policy Proposal

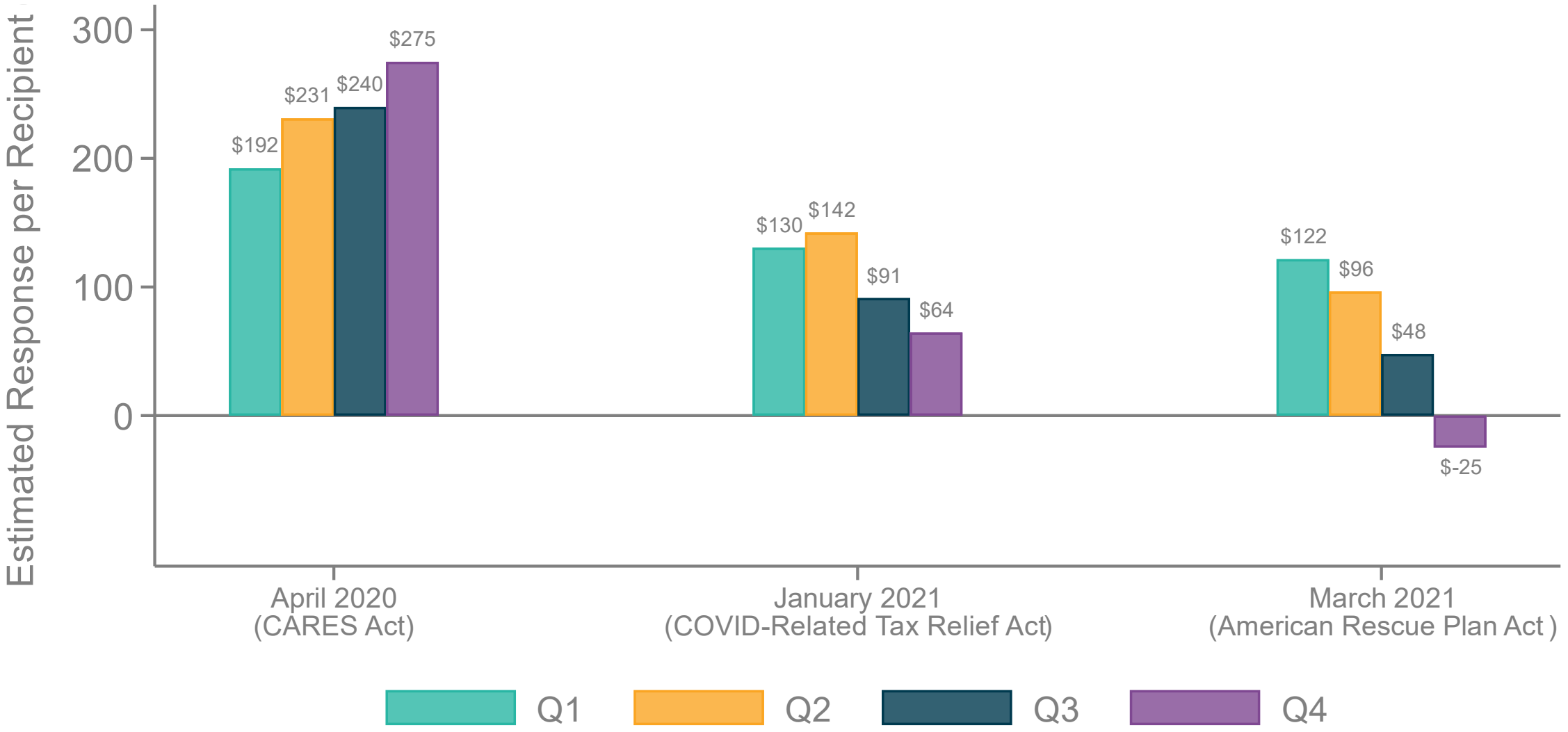


Projected Effect of Stimulus Checks on Spending

Couple with No Children



Effect of the COVID Stimulus Bills on Spending (per $600 check), by Income Group



Broader Implications

Widespread Use of Economic Tracker Statistics

- Publicly available data from Economic Tracker has been an input into many other analyses of COVID and associated policies. For instance:

1. UI Expansions (Coombs et al. 2022)
2. Employment Support (PPP) (Granja et al. 2020)
3. Eviction Moratoria (An et al. 2021)

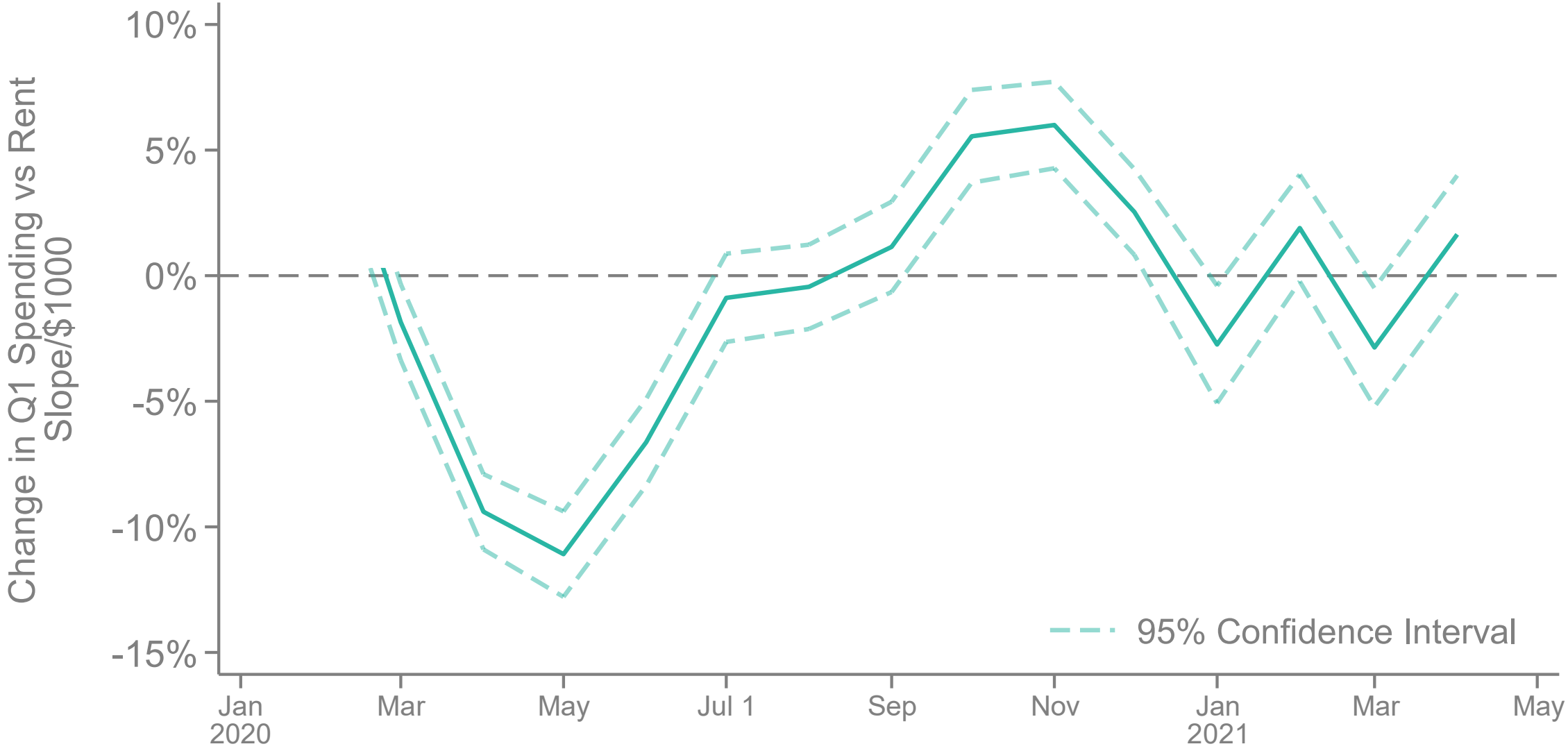
Broader Implications and Future Work

- RETINA: Real Time National Accounts
  - Current paper demonstrates that it is feasible to construct public statistics from private sector data that are useful for research and policy analysis but protect privacy
  - US national statistical agencies are exploring feasibility of augmenting current data releases with granular, real-time data based on the prototype constructed here
  - Ongoing collaboration with Statistics Canada to create visualization tool to explore granular data releases in real time, based on the prototype constructed here

- Policy: New data may permit real-time fine tuning of policy based on observed state of the economy and empirical impacts of policies
  - Similar but much more flexible than state-contingent policies based on unemployment rates

Government Policy Limits the Downward Spiral Over Time

Low-Income Spending vs. Workplace Rent Gradient, by Month



Broader Implications and Future Work

- RETINA: Real Time National Accounts
  - Current paper demonstrates that it is feasible to construct public statistics from private sector data that are useful for research and policy analysis but protect privacy
  - US national statistical agencies are exploring feasibility of augmenting current data releases with granular, real-time data based on the prototype constructed here
  - Ongoing collaboration with Statistics Canada to create visualization tool to explore granular data releases in real time, based on the prototype constructed here

- Policy: New data may permit real-time fine tuning of policy based on observed state of the economy and empirical impacts of policies
  - Similar but much more flexible than state-contingent policies based on unemployment rates
  - **Ex: could we have known there had "enough" stimulus in Dec 2020 from flattened spending gradient by rent?**