Developing Experimental Statistics to Measure Economic Activity in Real Time

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Evolving Measurement for an Evolving Economy*

- Traditional surveys may miss aspects of rapidly evolving economy
- Surveys may not be sufficiently timely and/or granular to meet increasingly complex needs of data users
- Declining response rates to surveys
- Administrative records and third-party data sources have potential to complement federal surveys
- Surveys remain a critical part of economic measurement

*Jarmin, Ron. 2019. "Evolving Measurement for an Evolving Economy: Thoughts on 21st Century US Economic Statistics." *Journal of Economic Perspectives* 33(1): 165-184.

Potential Uses for Third-Party Data

- Produce experimental, alternative indicators that are more current and/or granular
- Blend with official data to increase detail/granularity
- Inputs for model-based estimation
- Selectively substitute for more expensive traditional data collection – only if/where demonstrated reliability is sufficient

Use of Third-Party Data Sources

Potential Pros

- Timely
- High frequency
- Big: Granular
- Inexpensive to generate: By-product of commercial activity
- Accurate: Minimal response error

Potential Cons

- Not representative
- Lack coverage
- Not measure the right things
- Lack stability
- Privacy issues
- Not transparent
- Expensive to acquire
- Expensive to process
- Vulnerable to external disruptions

Examples of Agency Work Exploring Third-Party Data Sources

- Bureau of Economic Analysis (BEA)
  - Alternative data and ML models to improve advance estimates – Chen et al. (2019)
  - Using card transaction data to provide timely estimates around the pandemic – Dunn et al. (2021)
- Bureau of Labor Statistics (BLS)
  - Motor fuel prices
  - Other alternative price data at various stages of research and development (see Appendix)
- U.S. Census Bureau
  - State-level retail sales estimates using blended data – Monthly Retail Trade - State Retail Sales (census.gov)
  - Construction statistics reengineering effort

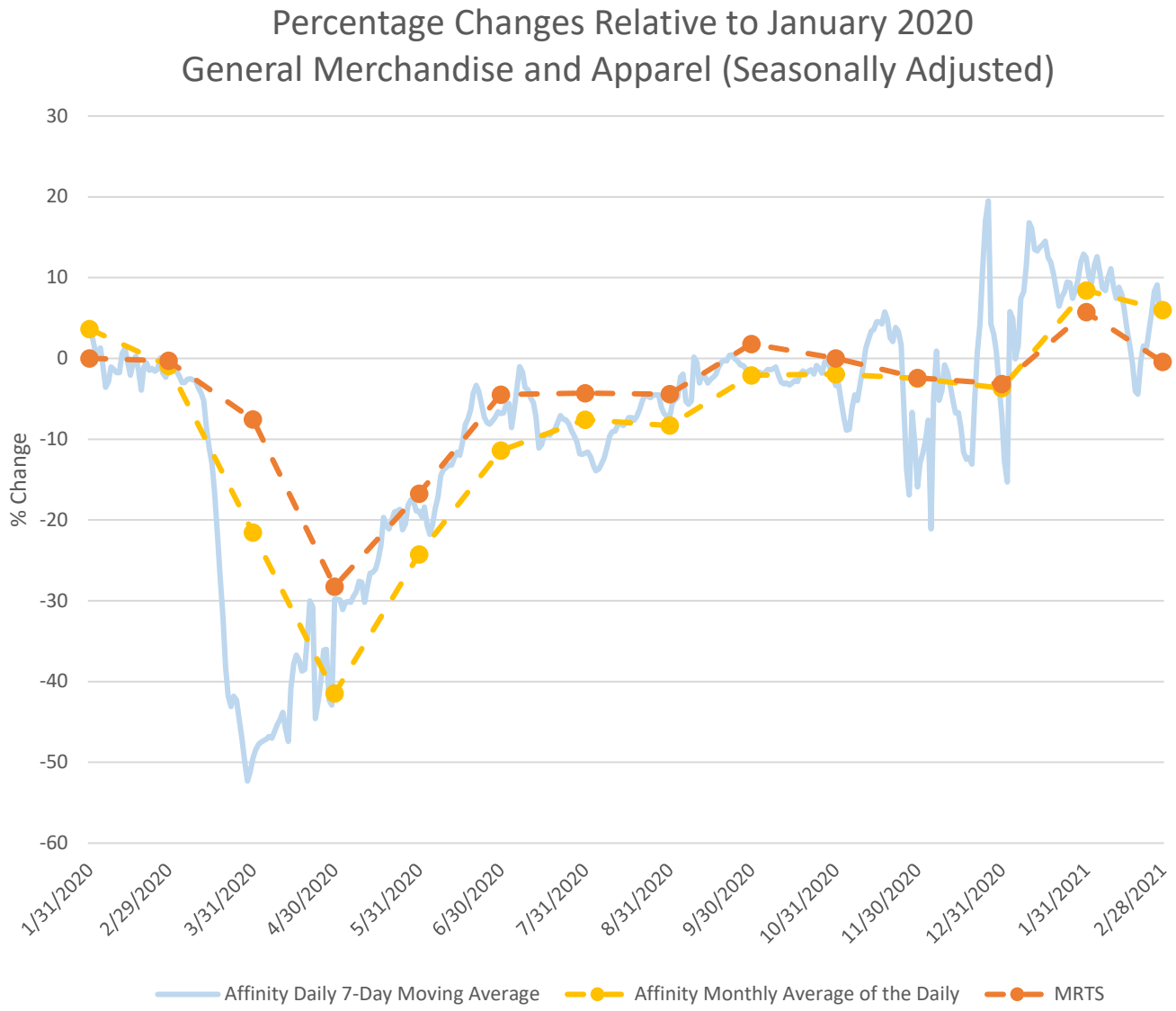
Project Overview

- BEA, BLS, and the Census Bureau are undertaking a research collaboration with Opportunity Insights (OI)
- Explore ways in which these alternative data sources may be used to complement and improve the data produced at the statistical agencies
- Goals
  - Benchmark statistical series in the OI Economic Tracker and assess the quality of the data
  - Refine methodologies
  - Develop and release new experimental economic statistics
  - Explore long term dissemination of experimental statistics

Project Status

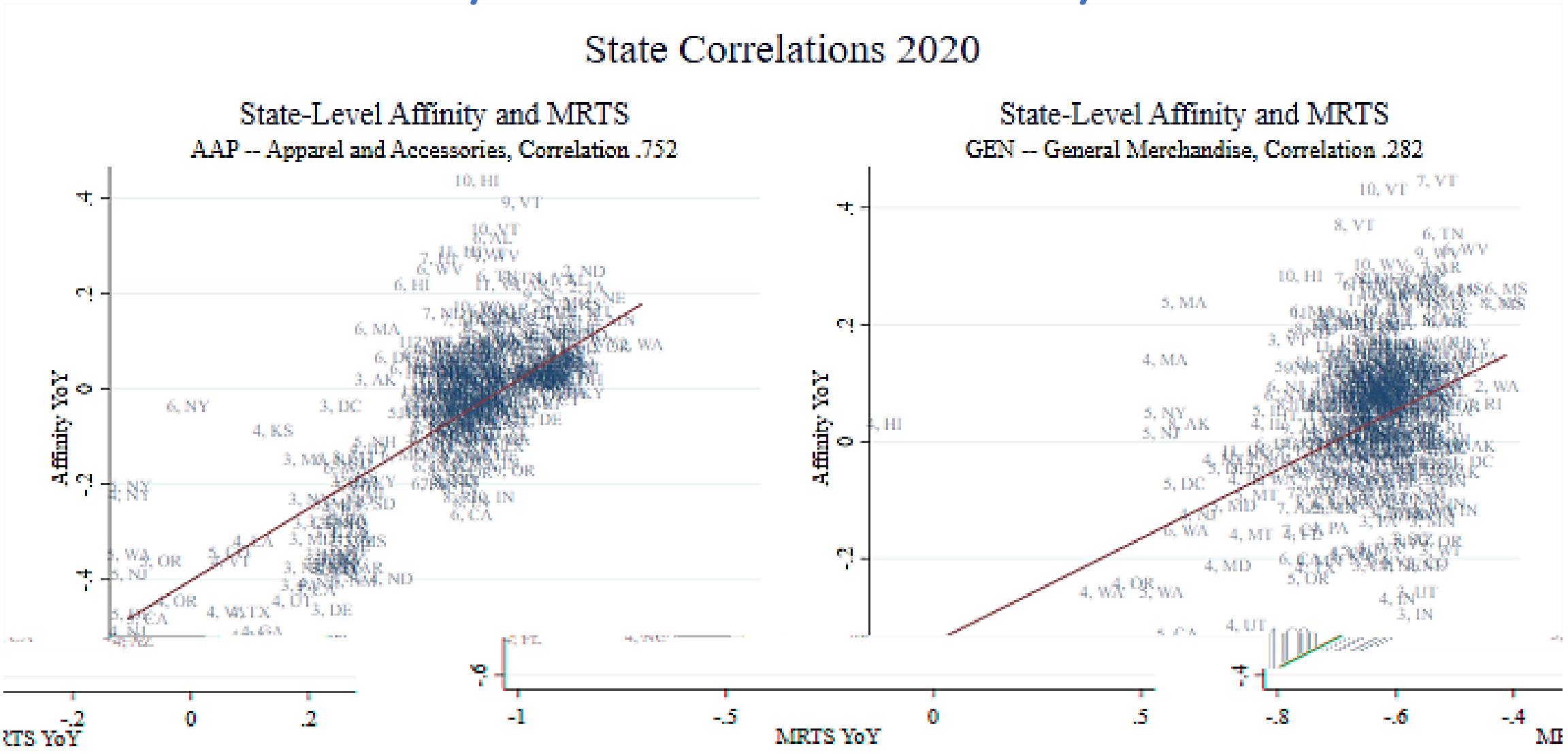
- Set up two collaborative cross-agency teams
  - Consumer Spending and Small Business Revenue
  - Employment and Earnings
- Agencies have undertaken quality assessments using publicly available data
- Agencies have recently been granted access to select restricted-use data and have just started assessing the quality of these data

Affinity and Monthly Retail Trade Survey (MRTS)



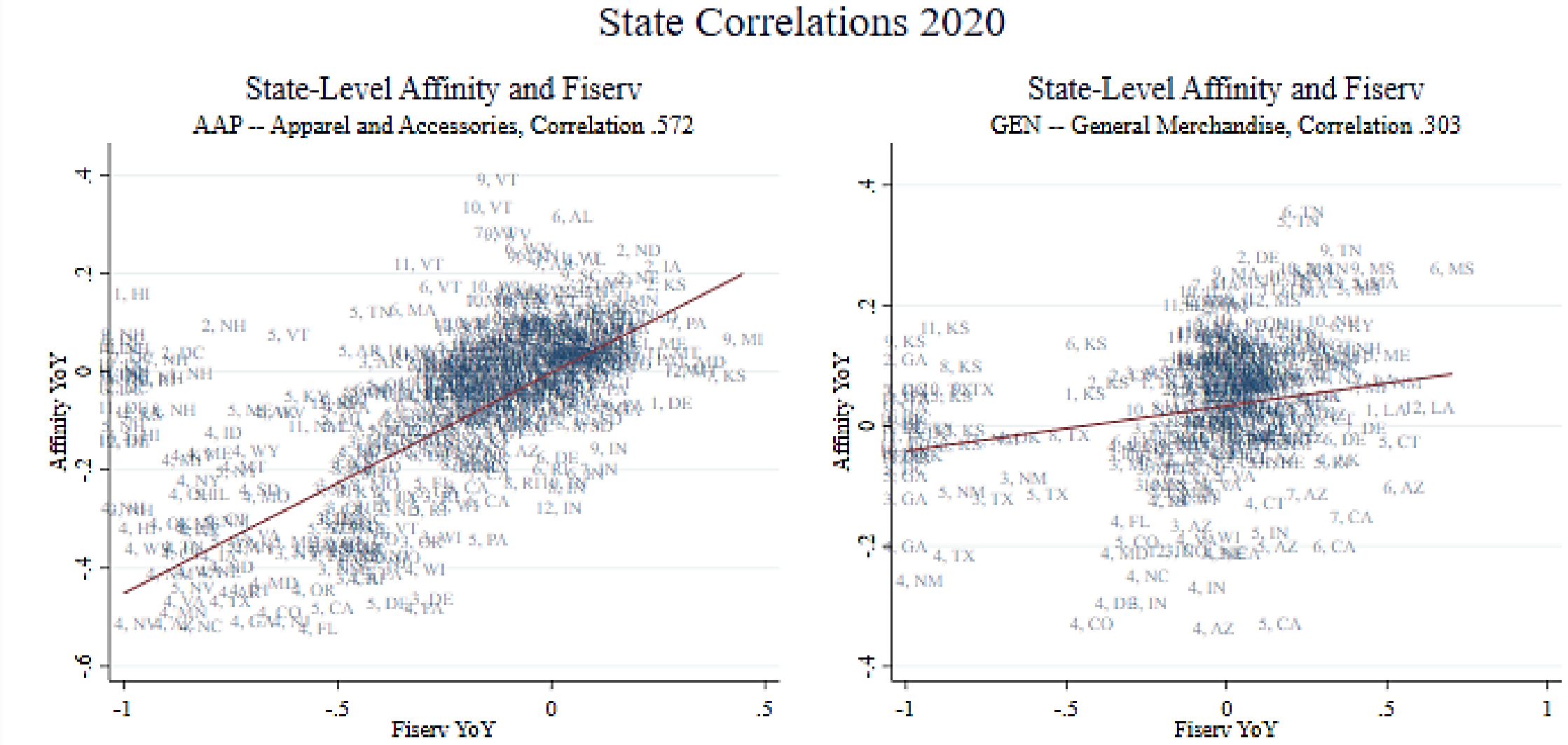
Note: Affinity Daily data is a percentage of a 7-day moving average of seasonally adjusted daily data relative to January 4-31, 2020. Affinity Monthly data is a monthly average of the Affinity Daily data. The MRTS data is a percentage change of seasonally adjusted data relative to the January 2020 MRTS value. In the graph, the Affinity Monthly and MRTS data is attributed to the last day of the data month.

State Year-over-year Correlations Affinity and State MRTS



Each graph plots state/month observations of year-over-year percentages between 2019 and 2020.
Plots and correlations weighted by state population in 2019.

State Year-over-year Correlations Affinity and Fiserv



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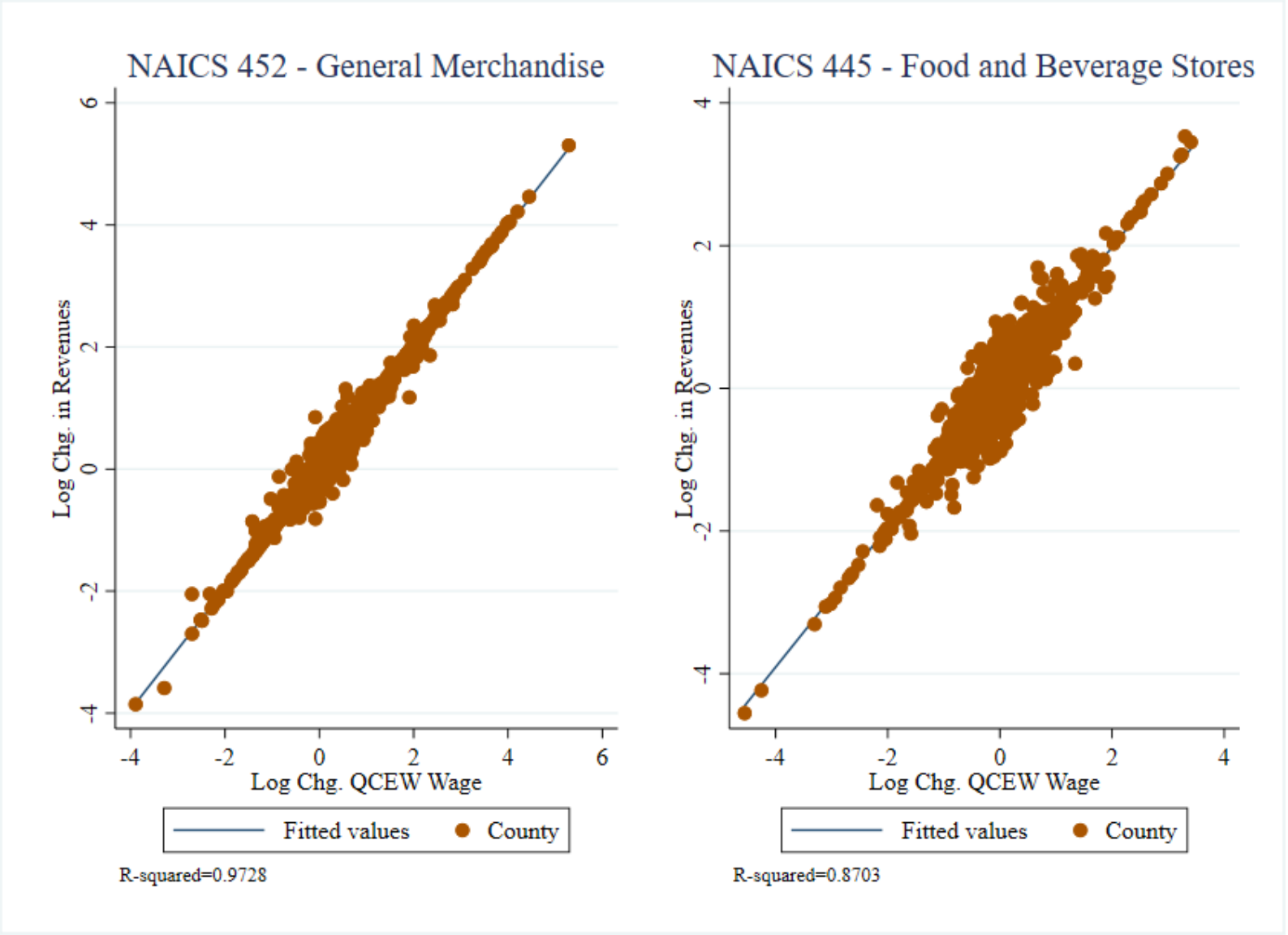
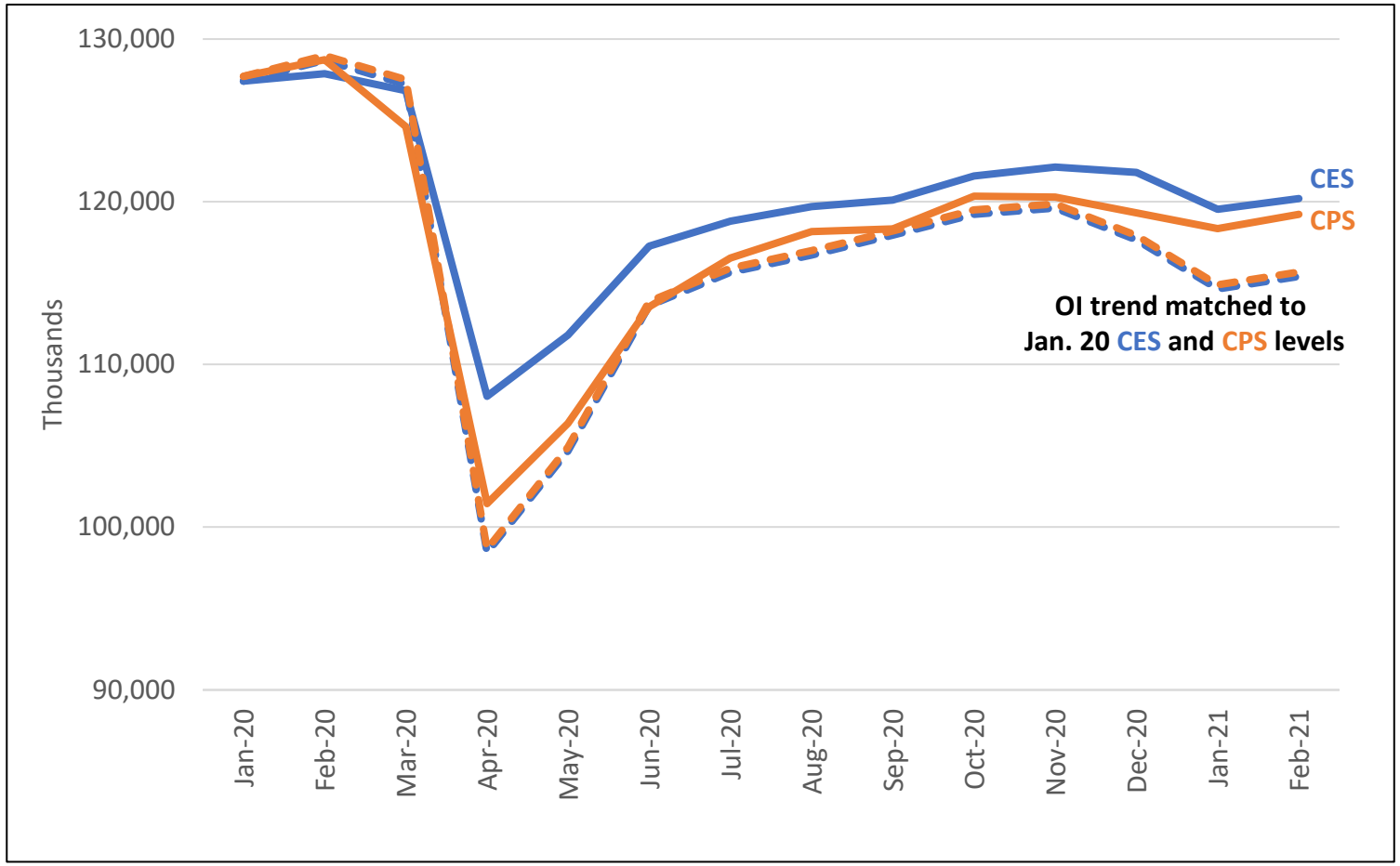
5-Year County Revenue Growth and Wage Growth

(Economic Census and Quarterly Census of Wages and Employment)

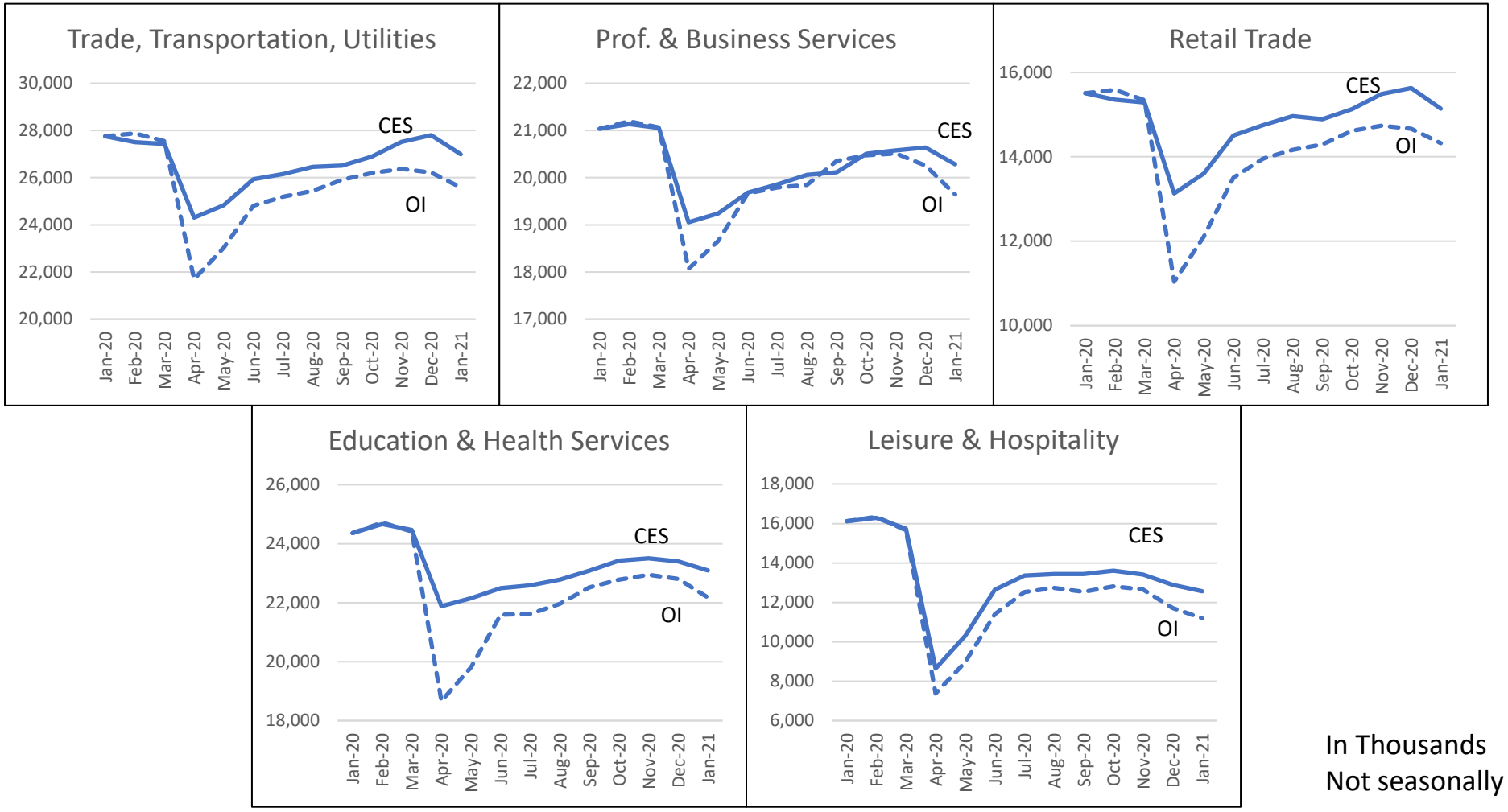


Employment - National



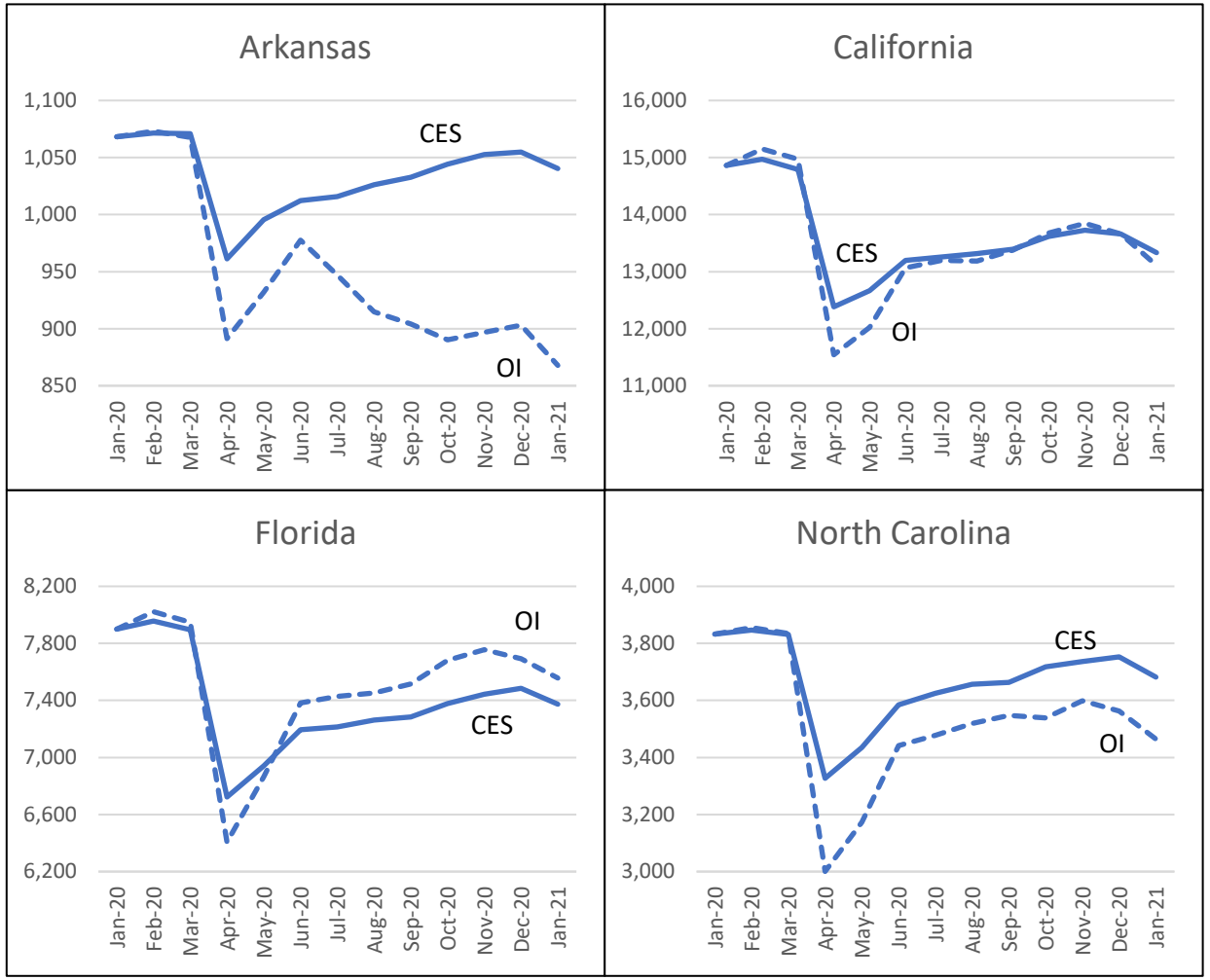
In Thousands
Not seasonally adjusted

Employment – Industry Patterns



In Thousands
Not seasonally adjusted

Employment – State Patterns



In Thousands
Not seasonally adjusted

Next Steps

Consumer Spending

- Additional comparisons to other data sources (e.g., QSS, MRTS, state retail sales, CEX, Fiserv and other sources)
- Mapping of NAICS and MCC codes

Employment

- Comparison to other data sources (e.g., CES, QCEW, and CPS)
- Explore weighting schemes

Small Business Revenue

- Will begin to benchmark these data once new data source is acquired

Firm Births and Deaths

- BLS will conduct research to improve modeling for the CES
- Census will research feasibility of developing firm birth and death statistics from OI data

Questions for the Committee

1. What value do you place on the agencies producing more real-time and granular estimates from these sources?

2. How much benchmarking/quality checking is necessary? How much discrepancy with official statistics is tolerable?

3. How should we communicate fitness for use, measurement error, and anomalies from estimates generated by third-party data?

Thank you!

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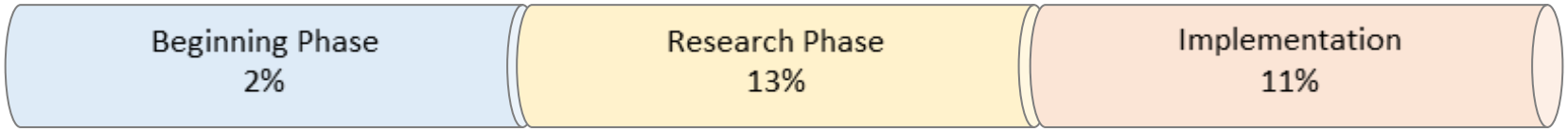
Appendix: CPI Alternative Data Pipeline



= 26% Relative Importance

1. Identify new sources

2. Collecting data 2%

Apparel
Web-scraping, one footwear retailer

General merchandise
Web-scraping, many item categories

Food away from home
Corporate data, one fast food company

3. Developing methodology 13%

Medical services
Purchased data, insurance payments to physician's services, hospital services

Wireless phone service
Purchased web-scraped data, offer prices for new plans

Residential telecommunication service
Purchased web-scraped data, offer prices for new plans

Airfare
Web-scrape aggregator site, near full item coverage

Vehicle leasing
Purchased data (JD Power), near full item coverage

Hotels
Web-scrape aggregator site, near full item coverage

Housing
HUD administrative data, government subsidized rental properties

4. Seeking approval 0%

5. Approved for implementation <1%

Airline
Corporate data, one airline

6. In development 3.7%

New vehicles
Purchased data (JD Power), full item coverage, targeted deployment 2022

7. Parallel testing 3.5%

Motor fuels
Secondary source data, full category coverage, targeted deployment June 2021

8. In production 3.5%

Used cars
Purchased data, longtime source

Postage
Publicly available data, longtime source

Respondent Y
Corporate data, March 2018

Respondent X
Corporate data, March 2016