The Potential for Alternative Data in Official Statistics

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Any views expressed here are those of the presenter and not those of the Board of Governors of the Federal Reserve System or the Federal Reserve System.
Outline

• Official statistics as ground truth
• Value/uses of alternative data
• Pandemic-related data challenges
• Two risks with alternative data
Official Statistics as Ground Truth

• During a pandemic, basic facts are needed for policy development
  – What is the size distribution of firms?
  – How many businesses have closed?
  – How much cash do business have on hand?
  – What are the longer-term risks to firm creation?

• Creates important role for official statistics
  – Alternative data are often suggestive but not dispositive
Official Statistics as Ground Truth

Share of Employment in Small Businesses

- Utilities
- Information
- Finance and Insurance
- Administrative and Support and Waste Management and…
- Transportation and Warehousing
- Retail Trade
- Mining, Quarrying, and Oil and Gas Extraction
- Manufacturing
- Health Care and Social Assistance
- Educational Services
- Wholesale Trade
- Professional, Scientific, and Technical Services
- Arts, Entertainment, and Recreation
- Accommodation and Food Services
- Real Estate and Rental and Leasing
- Construction
- Other Services (except Public Administration)

Source: Census Bureau’s Statistics of U.S. Businesses.
Note: “Small business” here means as an enterprise with fewer than 500 employees.
Official Statistics as Ground Truth

**Fraction Reporting Temporary Closings**
- National Average
- Retail Trade
- Food Services

**Fraction Requesting/Receiving PPP Assistance**
- Requested
- Received

*Note: Survey question - “In the last week, did this business temporarily close any of its locations for at least one day?”*
*Source: Census Bureau Small Business Pulse Survey.*

*Note: Survey question - “Since March 13, 2020, has this business requested/received financial assistance from any of the following resources?“*
*Source: Census Bureau Small Business Pulse Survey.*
Official Statistics as Ground Truth

**New Business Applications**

Year-over-year percent change

- **2020**
- **2017-2019 average**

Last value week of May 30


Note: Data derived from applications with planned wages for EIN.
Source: U.S. Census Bureau.
Value of Alternative Data

Value of alternative data vs. Size of shock or arrival rate of shocks
Uses of Alternative Data

- Create *timely alternative estimates* that complement official estimates.

*Note: Paid employment denotes workers who were issued a paycheck in a given pay period, while active employment also includes unpaid workers who remain active in the payroll system (e.g., are on unpaid furlough). Data extend through May 23.*
Uses of Alternative Data

- Verify changes in official statistics
- Answer questions that require more granular data
Uses of Alternative Data

- Fill in *knowledge gaps*
- Examples timeliness, frequency, coverage, geography, industry, products, ...

*Initial UI Claims*

- Index, 7-day moving average
- Number (thousands)

**Note:** Series for claims is not seasonally adjusted. Source: Department of Labor and Google Trends.
Uses of Alternative Data

- Indicators w/o counterpart in official statistics may nonetheless help with a *narrative* about economic developments

- Example: Extensive vs. intensive margins

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*Google Mobility Index*

Percent change from baseline

- Work
- Grocery
- Retail and Recreation

*Daily Visits to Select Locations*

Year-over-year percent change

- Doctor/Dentist
- Auto Mechanic
- Gas Stations

Note: Baseline defined as median of Jan. 3 to Feb. 6 period. Source: Google Mobility Reports.

Source: SafeGraph, using cell phone geo-location data.
Pandemic-related Data Challenges

• Understanding establishment closures in real-time
  – Does non-response indicate a closure?
  – Are closures temporary or permanent?
  – Should a value of zero be imputed?
  – Always a challenge but more pronounced in a pandemic

• Aggregating data when weights are shifting rapidly

• Applies both to official statistics and to alternative data
Alternative Data Risk #1: Bias

• “Big Data Paradox: The bigger the data, the surer we fool ourselves” (Xiao-Li Meng, 2018)

• How to mitigate?
  – Reweight using low-frequency, benchmark information from official statistics
  – Careful selection of sources for alternative data
  – Use multiple sources
Alternative Data Risk #2: Lack of Diversity in Data Sources

• Alternative data source that becomes a critical input may expose an agency to:
  – Risk of hold-up in contract negotiations
  – Risk of disruption from contract termination
  – Risk of reduced innovation (from not looking at additional data sources)
  – Risks from non-response or data transmission problems

• Could take months or years to recover from an unexpected contract termination
An Example: Nonresponse/Transmission Risk

• “Traditional” data
  – In 2012, four firms accounted for 45% of revenue in “petroleum and coal products manufacturing”
  – Nonresponse → industry-level non-disclosure

• Alternative data
  – Four payroll processors issue ~50% of employees’ paychecks
  – One payroll processor covers a share of employment that is comparable to the BLS’s responses to the establishment survey
  – Using payroll processing data as a survey substitute could create a non-disclosure risk for the entire economy
Even so...

• Alternative data are worth pursuing...
  – The questions they help answer are important
  – A few data sources almost cover the population

• ...but take steps to mitigate risks...

• ...and don’t lose sight of official statistics’ comparative advantage...
Comprehensive (often low-frequency) Data

• It is not flashy or timely, but...

• ...it is critical to informed policymaking

• ...it is needed for industry definitions and to benchmark high-frequency data (including alternative data)

• ...it helps bound our understanding
  – What establishments are in the path of a hurricane?
  – If a policy targets small firms, how much funding may be needed?

• (Higher-frequency official statistics are still useful though!)