LED Data Quality:
The Prevalence of “Holes” in Unemployment Insurance Wage Reports

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Recent QA Experience: State UI Collections

- Significant drops in Unemployment Insurance (UI) wage data reports have been noted in recent QA reviews
  - At least four states have commented that reengineering of collection processes had contributed to data shortfalls
- One common impact of these issues is for a firm to disappear in the UI data for one quarter – a “UI hole”
- This analysis provides some quantification of this issue in the historical data
Unemployment Insurance
Wage Records in LED

• **UI wage records are the individual level data**
  – For each person (SSN), contains the earnings paid by a firm (UI account number) in a specific quarter

• **These records are a critical input that make LED data products possible**
  – Can be linked to provide information on demographics (age, sex, race, ethnicity, education)
  – Can be linked to residential address information to create journey to work
  – Can be linked across time to establish work history and generate detailed measures of employment dynamics
How State Data Are Combined in LED Processing

**Quarterly Census of Employment and Wages:**
- Firm and Establishment Level (Single/Multi-unit)
- Geography
- Industry
- Ownership

**Unemployment Insurance Wage Records:**
- Firm-Worker Level *(Usually)*
- Earnings
- Job history
- Link to Demography

UI Account Number:
- Firm Level *(SEIN)*
Calculation of Employment: QCEW vs. LED

- The QCEW aggregates employment reported at the establishment level
  - It is not required that a wage record be in the UI system
  - Edits/imputations may be applied if record is missing
- LED data products aggregate individual wage records to calculate employment
  - If wage record is not present, LED measures cannot count employment
  - Wage record imputation not currently part of LED processing
Potential Issues with UI Wage Data

• Non-reporting
  – Individual large employers/systematic large-scale
  – Single-quarter vs. persistent or recurrent

• Identifier issues
  – Incorrect account number, or inconsistent with QCEW reported account
  – Mistakes in the SSN (e.g., truncation)

• Spikes in reporting due to unusual events
  – e.g., court settlements, other small payments

• Incorrect earnings reported for the quarter
Focus on Non-Reporting: What is a UI Wage Hole?

• A one quarter drop in UI wage record reporting by an employer
  – Employer reports previous levels of wage records in the following quarter

• Consistent reporting on QCEW
  – The QCEW record may have been reported by the firm or imputed by the state

• Without corrected input data or wage record imputation, this scenario would give rise to a difference between the QCEW and QWI employment estimates.
Impact of a UI Wage Hole on QWI Measures

• Drop in employment in current AND next quarter (QWI and OnTheMap)
  – “Beginning of Quarter” employment definition requires firm reports wages for individual in two consecutive quarters

• Increase in separations in previous quarter, accessions (hires) in following quarter
  – Proportionally larger than employment impact

• Potential impact on other QWI measures
Methodology:
Identification of UI Wage Hole

• Reference firm-level reports of three consecutive quarters UI and QCEW data
  – Firm reports consistent levels of employment in three quarters (avg. emp. +/- 25% previous Q)
  – UI wage record count in before/after quarter 80% of maximum employment on QCEW
  – Beginning of quarter employment in middle quarter <20% of QCEW Month 1
  – Minimum firm size of 5 (from QCEW)

• This rule will catch both non-reporting and identifier issues (UI Account or SSN misreported)
Methodology: What is not being identified?

- Long-term non-reporting of wage records will not be captured
- Firms with erratic employment levels on QCEW are excluded
- Firms with concordance issues between UI and QCEW data are excluded
  - Some of the states which appear best on these measures are known to have significant concordance issues
Cross-State Analysis: Percentile Charts

• Calculations:
  – Percentage of firms in a state with UI reporting holes, by year-quarter
  – Percent of statewide employment at firms with UI reporting holes, by year-quarter

• Within each quarter, states are ordered by each measure, selected percentiles reported
  – 25, 50 (median), 75, 90, 100 (Maximum)
Cross-State Analysis: Firms with UI Reporting Holes

Percent of Firms with UI Holes: Maximum and Percentiles Across States
Cross-State Analysis: Firms with UI Reporting Holes (zoom)
Cross-State Analysis: Employment in UI Reporting Holes

Percent of Employment at Firms with UI Holes: Maximum and Percentiles Across States
Cross-State Analysis: Employment in UI Reporting Holes
(zoom)
Percentile Analysis

- Between 0.2% and 0.4% firms in the median state display UI reporting holes
- Quite a bit of variability on the high end
- There may be some improvement over time in the percent of firms affected
- Employment weighted numbers somewhat higher than firm counts
Cross-State Analysis:
Selected State Histories

• Individual states have highly divergent experiences
• The following slides highlight five selected states displaying different patterns
  – Slides report employment weighted percentages
State A:
Low Percentage of Holes

Percent of Employment at Firms with UI Holes:
Selected States
State B:
Low Percentage of Holes

Percent of Employment at Firms with UI Holes:
Selected States
State C:
High Percentage of Holes
State D:
Declining Percentage of Holes
State E:
Increasing Percentage of Holes
Assessment of Selected States

- Considerable divergence between different states
  - Using the same rule to identify firms with holes, some states have exactly zero, others several thousand
- Some states have consistent low levels of UI reporting holes
- In others can be quite erratic from quarter to quarter
- Levels can get better or worse over time
What can be done to improve?

• LEHD actions
  – Continued monitoring for underreporting, especially from large firms
    • Contact state in quarters of particular concern
  – Development of state-specific report?
  – Implementation of wage record imputation
    • These UI holes are a prime target for imputation
    • Recurrent or more erratic reporting issues are more problematic to identify and correct

• State actions
  – Keep up with second submissions, resubmit older wage data when more complete data is available
  – Investigate, pursue anomalies identified in reviews
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