

# 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:

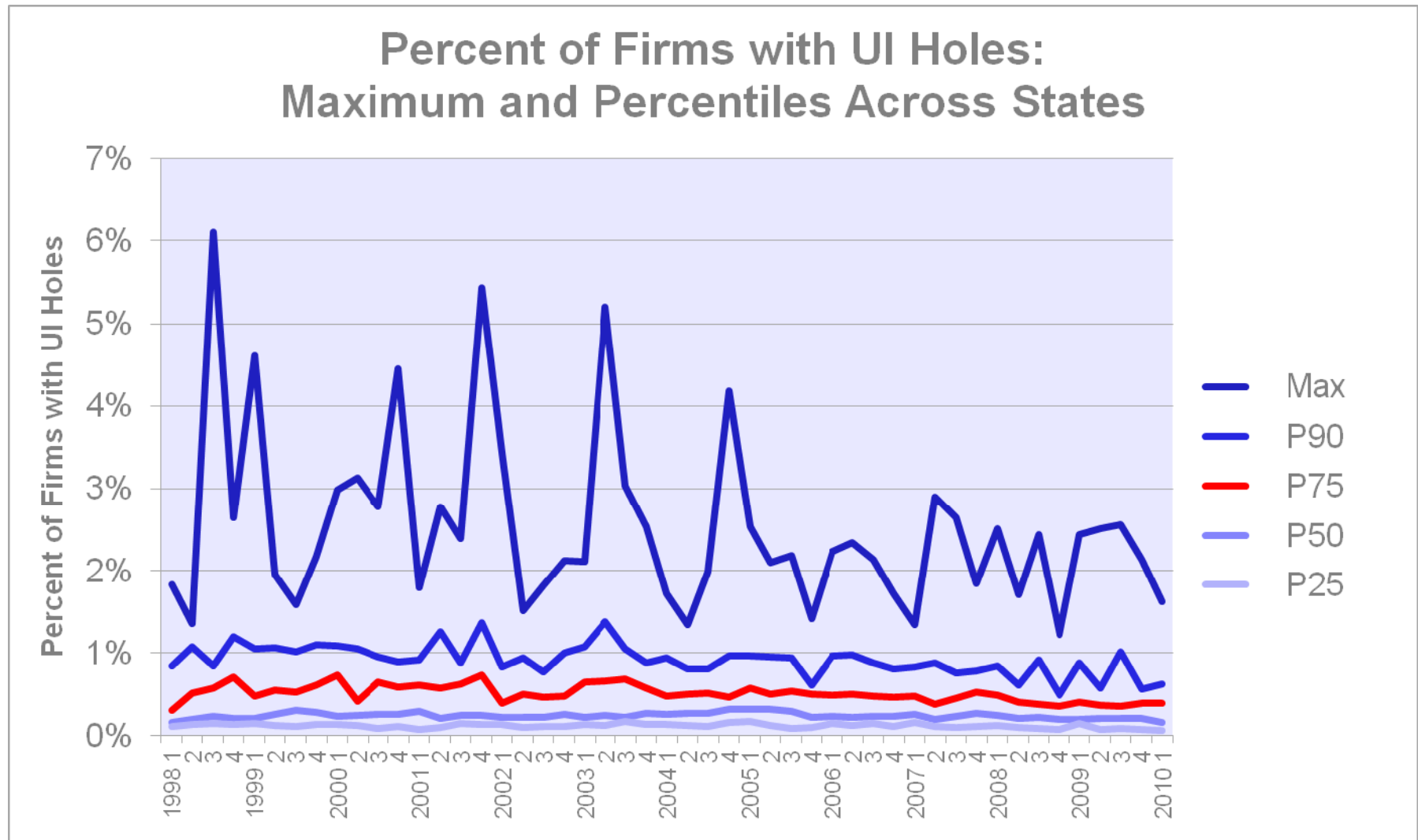
## What is not being identified?

- 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

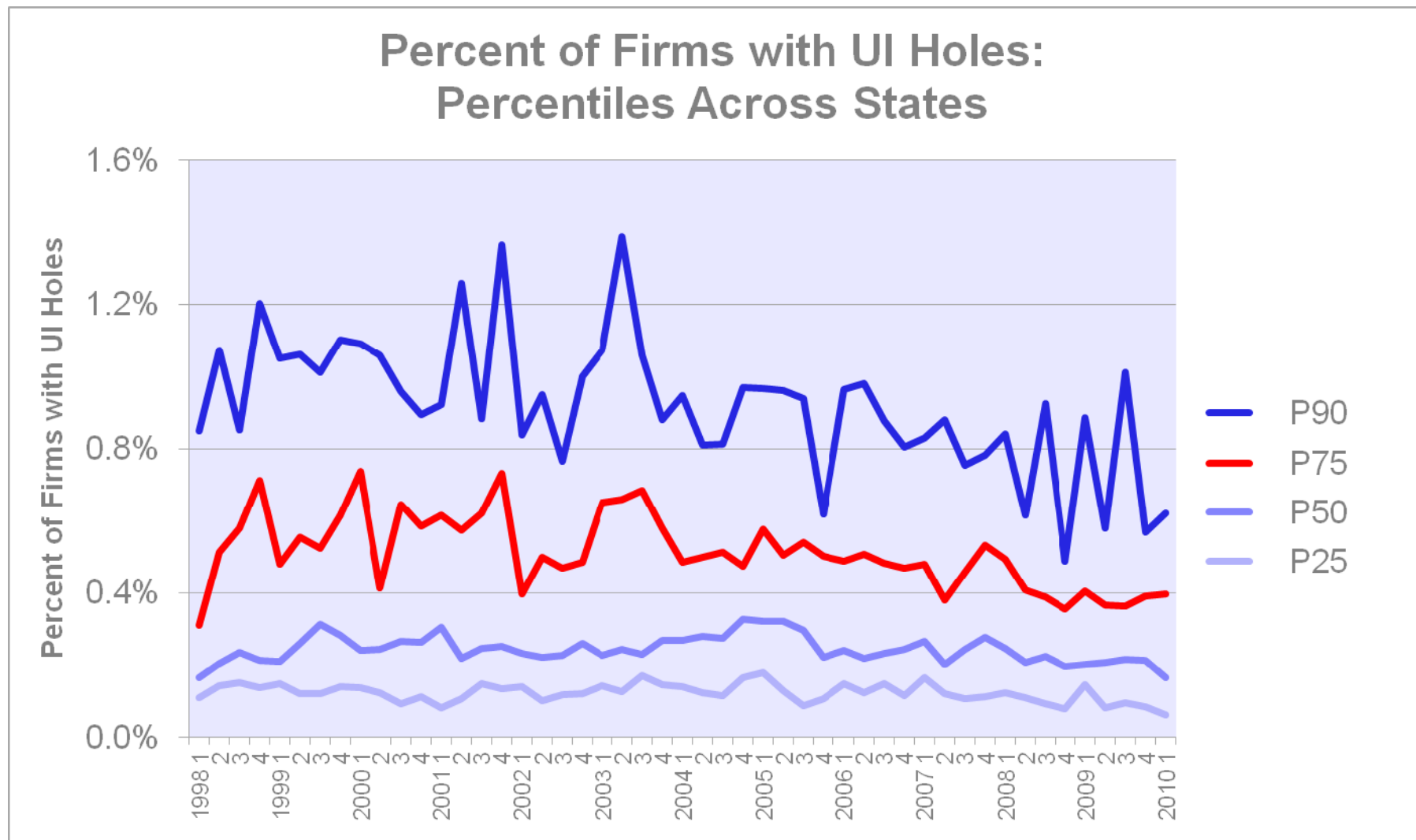
# Cross-State Analysis: Percentile Charts

- 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)

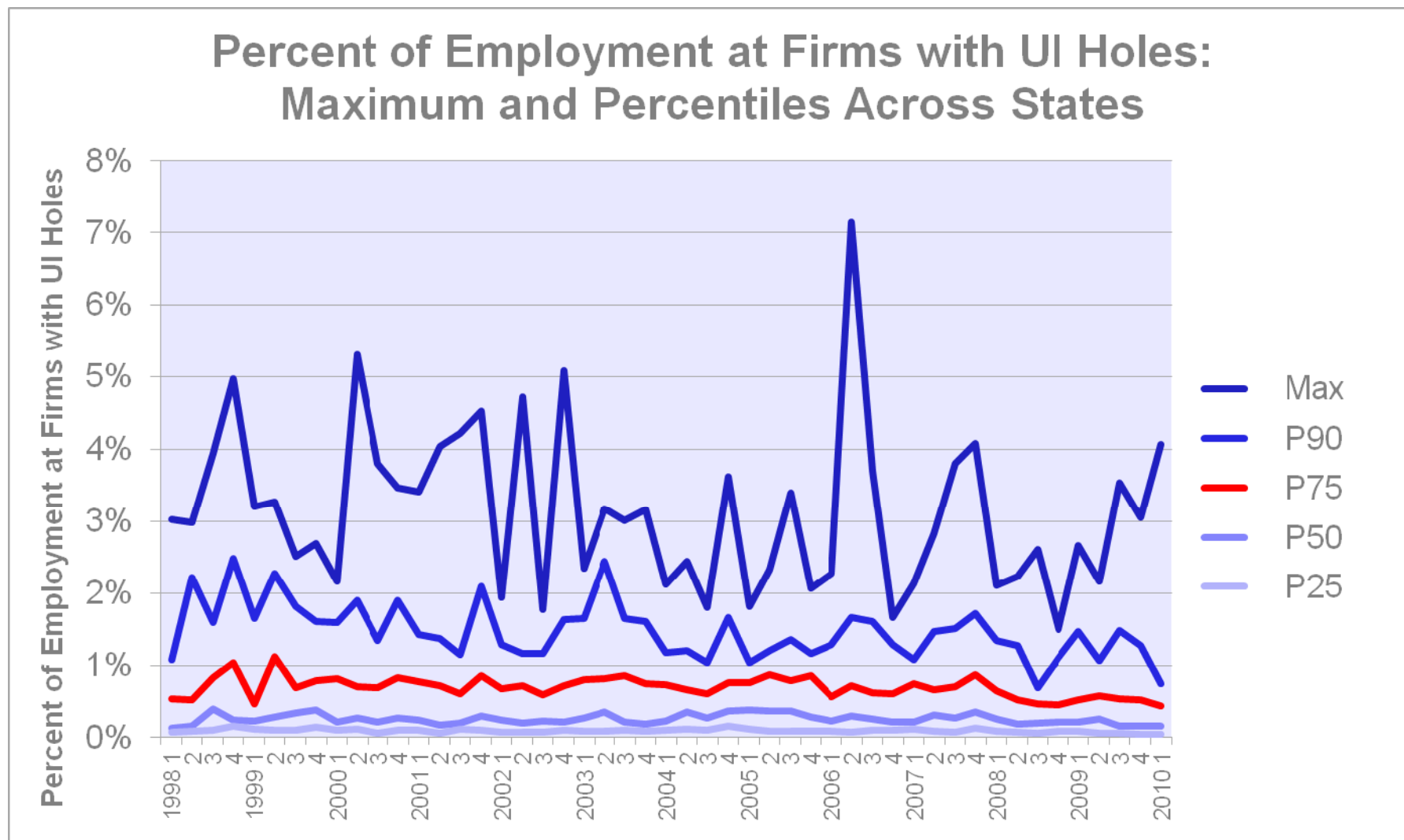
# Cross-State Analysis: Firms with UI Reporting Holes



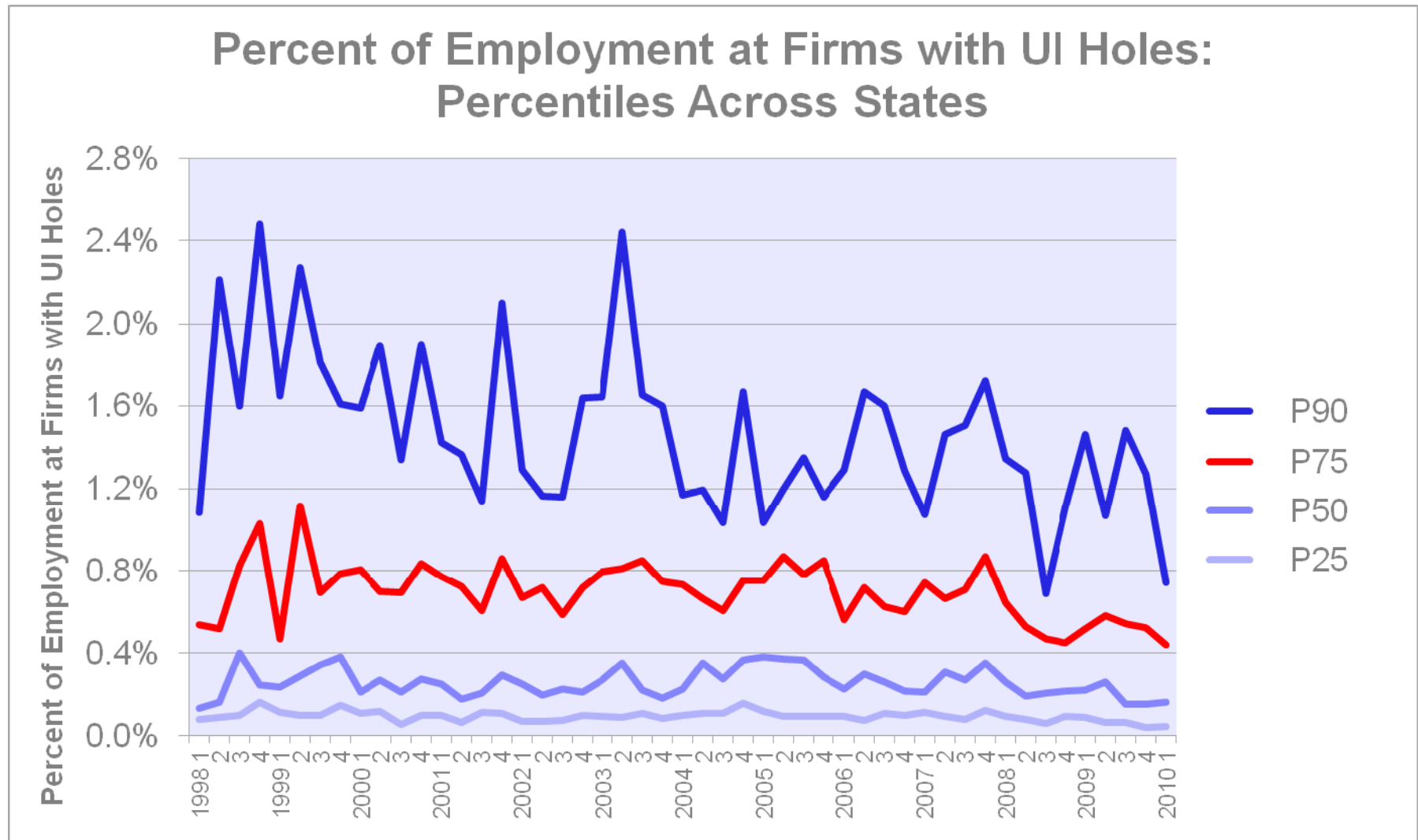
# Cross-State Analysis: Firms with UI Reporting Holes (zoom)



# Cross-State Analysis: Employment in UI Reporting Holes



# Cross-State Analysis: Employment in UI Reporting Holes (zoom)



# Percentile Analysis

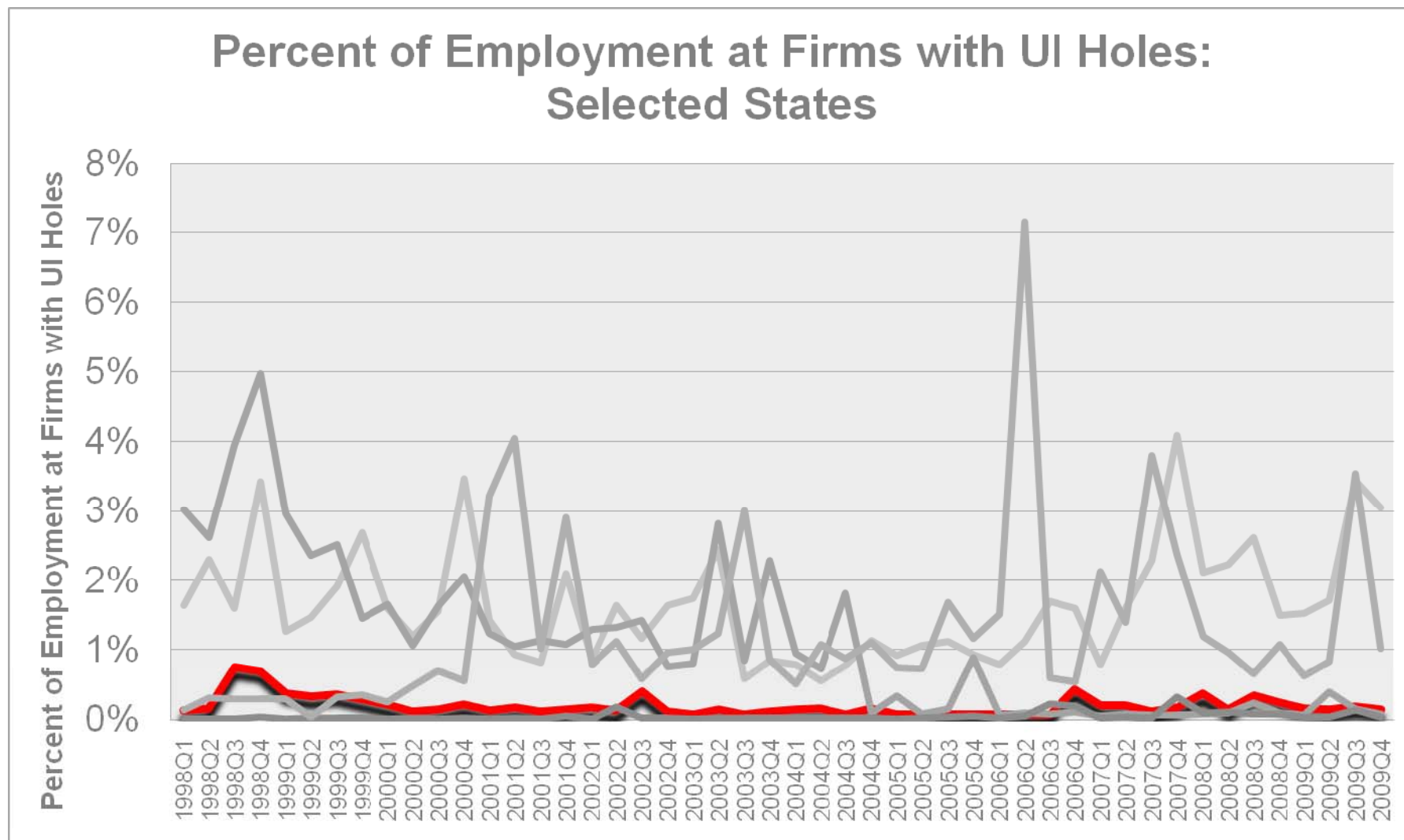
- Between 0.2% and 0.4% firms in the median state display UI reporting holes
- Quite a bit of variability on the high end
- There may be some improvement over time in the percent of firms affected
- Employment weighted numbers somewhat higher than firm counts



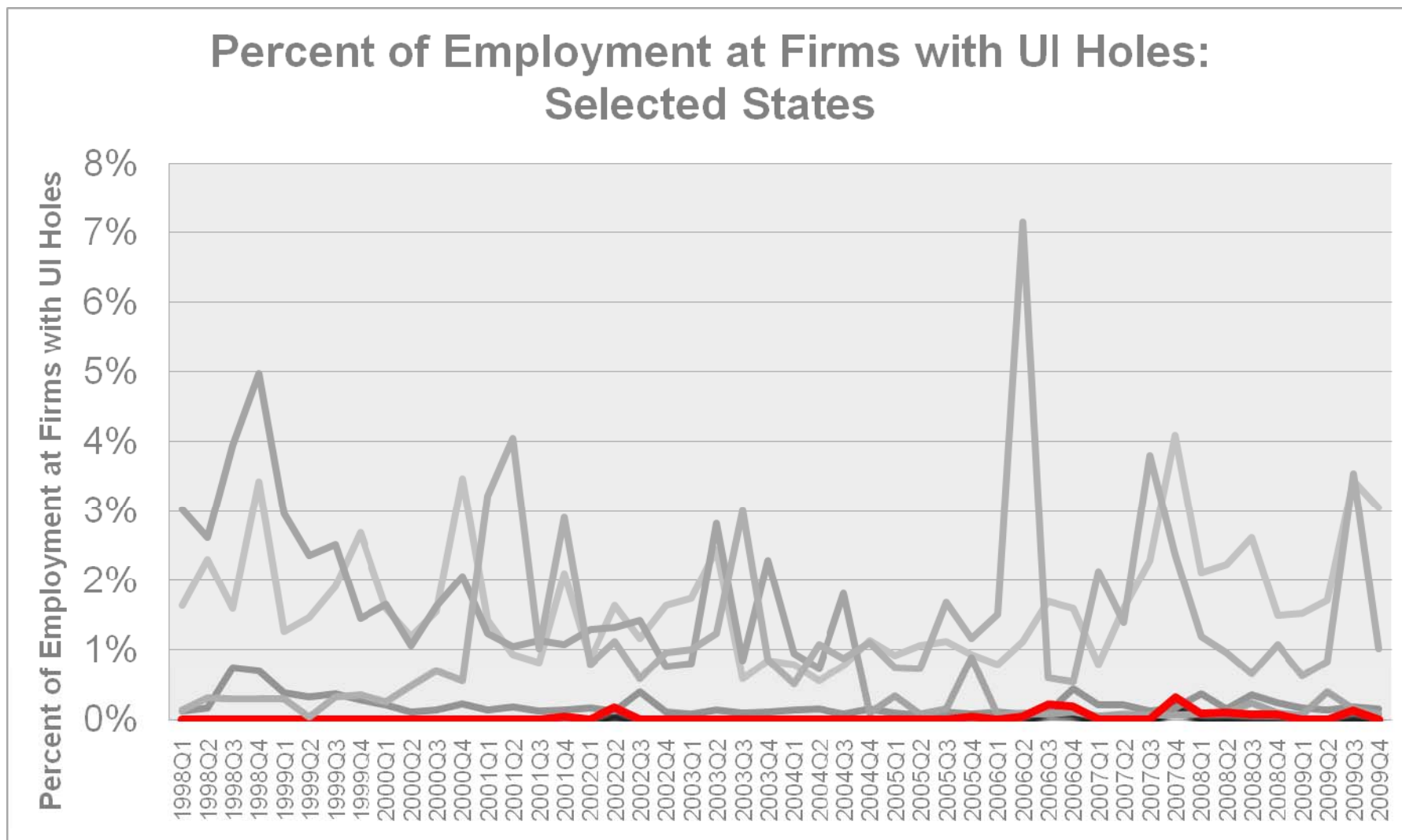
# Cross-State Analysis: Selected State Histories

- Individual states have highly divergent experiences
- The following slides highlight five selected states displaying different patterns
  - Slides report employment weighted percentages

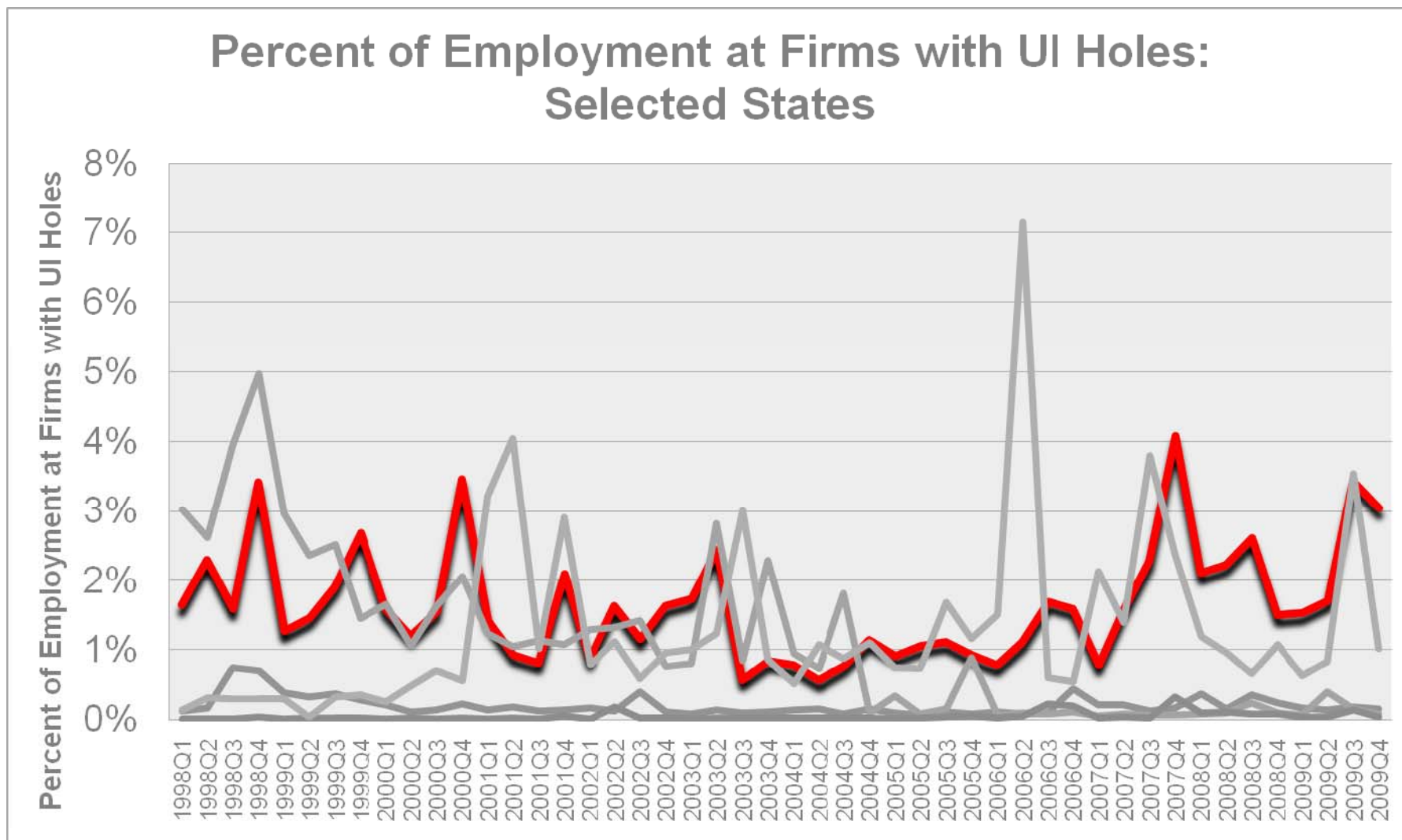
# State A: Low Percentage of Holes



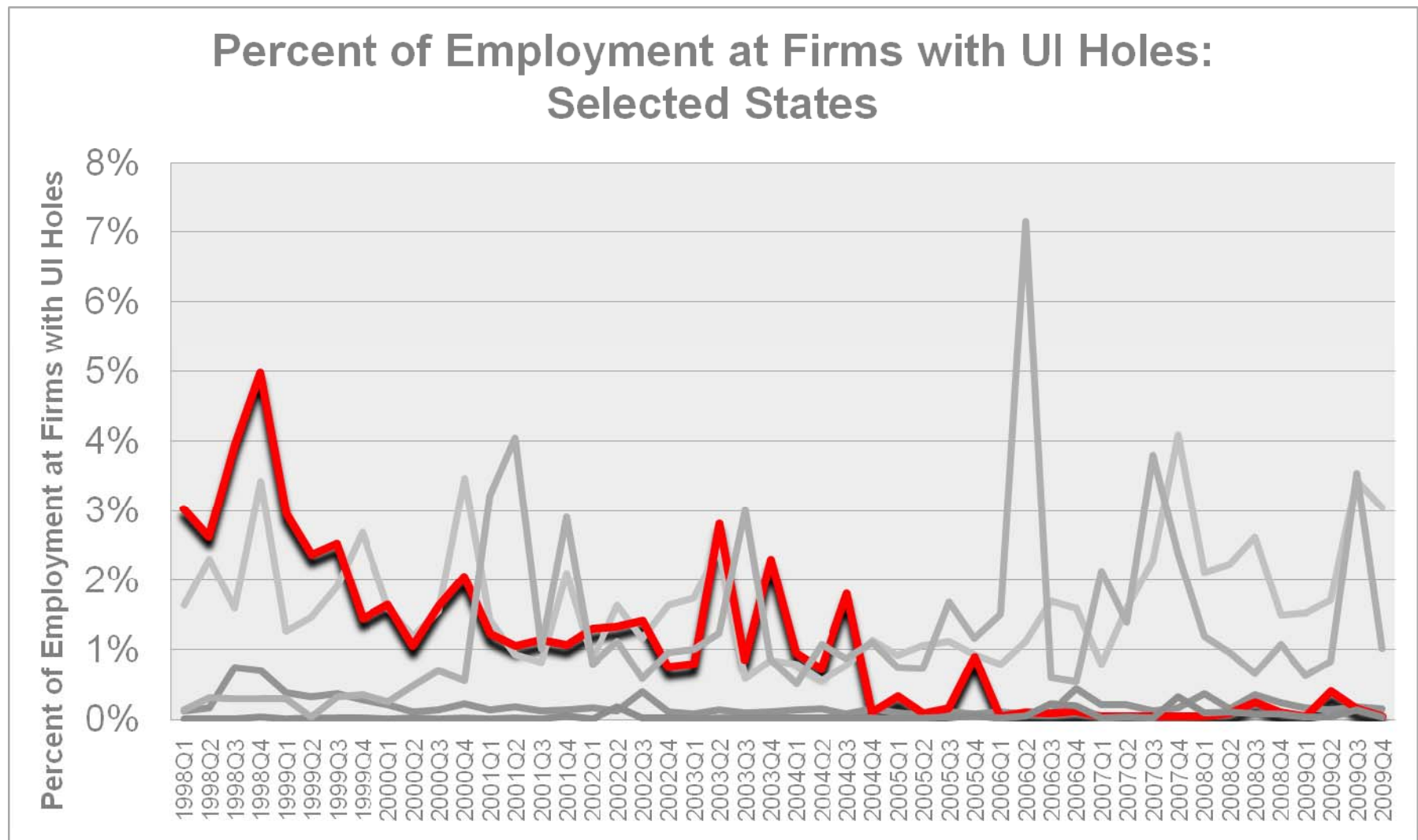
# State B: Low Percentage of Holes



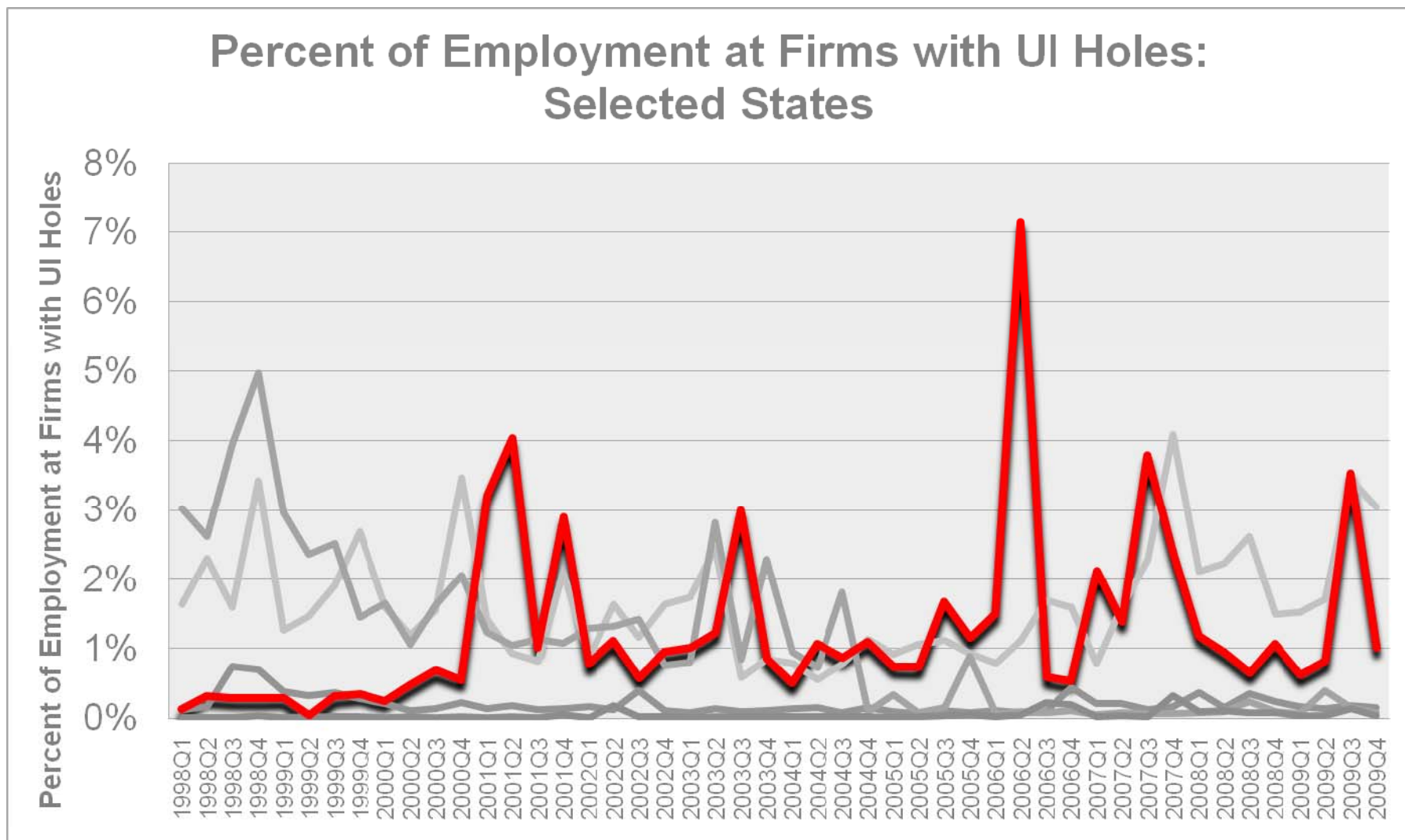
# State C: High Percentage of Holes



# 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



# Contact us:

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