A New Claims-Based Unemployment Dataset: Application to Postwar Recoveries Across U.S. States

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Motivation

Macroeconomists are increasingly leveraging panel datasets and regional heterogeneity to identify economic relationships

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Regrettably, official state-level unemployment data only begin in 1976, a significant impediment to historical state-level analyses
Contributions

We digitize monthly state-level unemployment claims data back to 1947 from a series of primary sources.
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- Monthly data Jan 1947-May 2022, for all 50 states, DC, US
- Nearly three additional decades of monthly state-level data
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- Monthly data Jan 1947-May 2022, for all 50 states, DC, US
- Nearly three additional decades of monthly state-level data

With this new dataset we explore various features of post-war U.S. recessions at the national and state level:

- Backdated data span the first six post-war U.S. recessions
- Faster national labor market recoveries in the 1940s, 50s were associated with greater dispersion of recovery rates across states
- States with larger manufacturing sectors tend to see faster recoveries
Data Digitization and Construction
Digitization Overview

We digitize monthly state-level data on Initial Claims (IC) and Continued Claims (CC) from various government reports:

- Employment Security Activities, The Labor Market and Employment Security, Unemployment Insurance Statistics, Unemployment Insurance Review

Data Quality
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In total, we digitized just over 36,000 monthly observations.
Claims-based Unemployment Rates
Measuring Unemployment Rates

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Our claims data is an alternative – conceptually similar yet different – measure of \( U \)

- Use initial, continued claims as a measure of unemployed workers
Claims-Based Unemployment Rates

Our claims-based unemployment rate for state $i$ in month $t$ is computed as

$$ UR_{i,t}^{Claims} = \frac{IC_{i,t} + CC_{i,t}}{NP_{i,t} + IC_{i,t} + CC_{i,t}} $$

- Where are $IC + CC$ is our proxy for $U$
- We use nonfarm payroll ($NP$) employment as our measure of $E$ (only measure of state-level employment to 1940s)
Claims-Based Unemployment Rate Example: Ohio
Claims-Based Unemployment Rate: Ohio Unpacked

Correlation for overlapping sample: 0.82
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Practical benefit:
- Our data series provides roughly three decades of additional data
- Data spans six additional national recessions (1948-49 – 1973-75)
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Level difference to be expected:

- Narrower pool of benefit-eligible workers, benefit exhaustion
- Shouldn’t matter for business cycle analysis so long as series are highly correlated, identify similar inflection points
Claims-Based Unemployment Rates: National
State Business Cycles
Business Cycle Properties of the Data

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Using our data we first examine the timing and pace of national recoveries as litmus test:
- Our claims-based unemployment rate picks up consistent business cycle features as BLS national unemployment rate
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  - Our claims-based unemployment rate picks up consistent business cycle features as BLS national unemployment rate.

After we have some confidence in our claims-based unemployment rates, we explore state-level recoveries.
Recovery Rates and Recession Dating

Following Hall and Kudlyak (2022) we compute the pace of recovery as mean decline in log unemployment over recovery:

\[
\text{Recovery Pace} = -12 \cdot (\log UR_0 - \log UR_T)/T
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We first need to date business cycles first to determine start of recovery (0) and end of recovery (T) for each expansion. We adopt the relatively simple, unemployment-based recession dating algorithm proposed in Dupraz, Nakamura, and Steinsson (2019) (DNS, henceforth)

- Generates a close match to NBER dates, Hall and Kudlyak (2022) chronology of unemployment-based recession dates
Recession Dating: National

Table 1: Business Cycle Peaks and Troughs

| NBER Peak | NBER Trough | DNS Dating Algorithm | Official UR Peak | Official UR Trough |
|-----------|-------------|----------------------|------------------|-------------------|
| Nov. 1948 | Oct. 1949   | [Feb. 1948] Oct. 1949| [Jan. 1948] Oct. 1949 |
| July 1953 | May 1954    | Apr. 1953 Sep. 1954 | May 1953 Sep. 1954 |
| Aug. 1957 | Apr. 1958   | Dec. 1955 May 1958  | Mar. 1957 July 1958 |
| Apr. 1960 | Feb. 1961   | June 1959 Mar. 1961 | Feb. 1960 May 1961 |
| Dec. 1969 | Nov. 1970   | June 1969 Nov. 1970 | Sep. 1968 Dec. 1970 |
| Nov. 1973 | Mar. 1975   | Apr. 1973 May 1975  | Oct. 1973 May 1975 |
| Jan. 1980 | July 1980   | Nov. 1978 July 1980 | May 1979          |
| July 1981 | Nov. 1982   | June 1981 Oct. 1982 |                  |
| July 1990 | Mar. 1991   | Nov. 1988 Mar. 1991 | Mar. 1989 June 1992 |
| Mar. 2001 | Nov. 2001   | Apr. 2000 Mar. 2002 | Apr. 2000 June 2003 |
| Dec. 2007 | June 2009   | Apr. 2006 May 2009  | Oct. 2006 Oct. 2009 |
| [Feb. 2020] | Apr. 2020 | June 2019 May 2020  | Sep. 2019 Apr. 2020 |

Notes: Recession dates for CBUR and UR are generated by applying the DNS algorithm on these two series. For the UR, we use the DNS parameter of 1.5. For CBUR we choose a parameter of 1.0, which is able to capture the NBER recession events.
Recovery Pace: National Recoveries

![Graph showing recovery pace with recession dates and unemployment rates]
Recovery Pace: State-level Recoveries
Recovery Pace: National Rate vs. State-level Dispersion
State Recovery Rate Takeaways

Recession dates and the pace of recoveries at the national level using our claims-based unemployment rates line-up quite well with analogous results using the official unemployment rate.
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One thing that jumped out to us: the pace of recoveries is strongly correlated with the size of states’ manufacturing sector.
Recovery Pace by State Manufacturing Share

1949, ’54, ’58 Recoveries

1961-2009 Recoveries
Concluding Thoughts
Conclusion

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- As a first pass, we use this data to study the timing and pace of post-war economic recoveries for U.S. states.

- The data could be used for a whole host of other questions, and we’re excited about follow-up work.
Recession Dating: State-level Recessions vs. NBER

Share of States in Recession

- NBER Recessions
- Share of Recession States

CBUR Recession Dates
Digitization and Data Quality

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Each outlier was manually checked to evaluate if it was a legitimate change in claims or a “fat thumb” coding error.

- Example of legitimate outlier: surge in LA post-Katrina

- Example of “fat thumb” error: In MO June 1974 CC surged 4700% from 147,351 to 7,132,843 then back to 145,365:
  Population of MO was less than 5 million
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We used our best judgement in fixing the “fat thumb” errors.
Claims-Based Unemployment Rates: Data Frequency

The digitized monthly $IC, CC$ data reflect all claims filed with the state unemployment office in that month.
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- Conceptually approach similar to the BLS’s reference week used in sampling labor force activity, DOL’s insured unemployment.
- Monthly data are weighted by the split number of five-day workweeks in the month (weights as the sum or workdays in each given month, ignoring holidays, divided by five).
Claims-Based Unemployment Rates: Total Employment

Unemployment Rate

1950 1960 1970 1980 1990 2000 2010 2020

NBER Recession

Claims-Based UR

Claims-Based UR-Emp

Official UR
State-level Max Duration
Long-Term Unemployment Share
Alt. Claims-Based Unemployment Rate: IC Only

Graph showing unemployment rate trends from 1950 to 2020. The graph includes lines for NBER recession, IC+CC, and IC Only.
Comparison with the Insured Unemployment Rate

Our claims-based unemployment rates lie conceptually between BLS’s $UR$ and DOL’s Insured unemployment rate ($IUR$).

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- $IUR$, $CBUR$ are highly correlated, close in levels

- But monthly $IUR$ is only available for 1986+ at state level, 1971+ at national level
U.S. Claims-Based, Insured Unemployment Rates

Unemployment Rate

- Insured UR
- Claims-Based Unemployment Rate
- NBER Recession
Fitted Model: Intuition and Performance

Fitting exercise captures simple intuition: a state’s official unemployment rate is likely higher than national rate when they have a higher claims-based unemployment rate than national
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These simple regressions fit official state-level URs very well:

- Avg. $R^2 = 0.83$
- Avg. correlation coefficient $= 0.91, \in (0.81 - 0.97)$
Recession Dating: DNS Algorithm

Gist: identifying local minima and maxima of the unemployment rate, ignoring low frequency variation in the unemployment rate

- Let $u_t$ be a candidate for a cycle peak ($cp$)
- If $u_{t+h} > u_{cp}$ in all subsequent months until $u_{t+h+1} > u_{cp} + X$, confirm $cp$
- If $u_{t+h} < u_{cp}$, new candidate for $cp$
- After identifying a $cp$, proceed analogously to identify the next cycle trough ($ct$)...

Setting $X = 1.5$ identifies unemployment-based peak/troughs similar to those identified by NBER
Unemployment Rate-CBUR Cross Correlations

Cross-correlogram

Cross-correlations of UR and CBUR (Post-1970)

Lag

-10  -5  0  5  10

-1.00 -0.50 0.00 0.50 1.00
Unemployment Rate-IUR Cross Correlations

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Cross-correlations of UR and IUR (Post-1970)

Lag

-10 -5 0 5 10
Recovery Pace: National Recoveries w/ CBUR Dates
Recession Dating: State-level w/ CBUR Dates
Unemployment by Census Regions

Census Region I: CT, ME, MA, NH, RI, VT, NJ, NY, PA.
Census Region II: IN, IL, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD.
Census Region III: DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX.
Census Region IV: AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA.