Changes to Methodology: State Coincident Indexes (Last updated: June 28, 2024)

The following changes have been made to the state coincident index methodology.

June 28, 2024

Finalization of the Annual Retrending Process

Effective with the release of the May 2024 state coincident indexes, our retrending process incorporates the Bureau of Economic Analysis's (BEA) fully released annual GDP by state and related components for 1997 through 2023. The BEA issued annual revisions for 1997 through 2016 in late May.

May 22, 2024

Temporary Change to the Annual Retrending Process

On March 29, 2024, the Bureau of Economic Analysis (BEA) released preliminary 2023 annual estimates of gross domestic product (GDP) by state with significant revisions following a new methodology previously announced in the 2023 Comprehensive Update of the Regional Economic Accounts. This update revises the annual quantity indexes for real GDP by state, which are inputs for the retrending process of our state coincident indexes.

The two most important changes (that follow) do not have a significant impact on the state coincident indexes, nor do they change our index year.

- The reference year for chained-dollar GDP measures was changed from 2012 to 2017.
- The industry classification of regional measures was updated to follow the 2017 North American Industry Classification System (NAICS).

Currently, the BEA has released annual GDP by state and related components for 2017 through 2023 and will release data for 1997 through 2016 at a later date.

Effective with the release of the April 2024 state coincident indexes, our retrending process calculates the long-term average growth of state GDP by combining historical data through 2016 with the revised data from 2017 to 2023. We will incorporate the BEA's complete annual revisions when released.

March 27, 2024

Change to the Estimation Process

Effective with the release of the Philadelphia Fed's state coincident indexes for January 2024, the annual estimation process to derive smoothing weights for each of the 50 states and the U.S. uses observations from January 1978 through January 2024, excluding observations for the year 2020. The observations from 2020 are treated as missing data to exclude the impacts of the extreme, idiosyncratic shock from the pandemic and to preserve states' historic business cycle characteristics. Monthly updates — which incorporate the smoothing weights derived from the annual estimation process — include all observations.

April 2, 2021

Change to the Estimation Process

Effective with the release of the Philadelphia Fed's state coincident indexes for January 2021, the annual estimation process for all 50 states and the U.S. restricts observations from 1978 to 2019. As part of the indexes' major goal of tracking business cycles in each state, this restriction is implemented to preserve states' historic business cycle characteristics and exclude the extreme, idiosyncratic shock from the pandemic. However, the monthly update continues with observations from 2020 and 2021, using smoothing weights from the annual estimation. This restriction will remain in effect until further notice.

April 2, 2020

Changes to Input Series

Since the introduction of the state coincident indexes in 2005, the Federal Reserve Bank of Philadelphia's Research Department has utilized the same input series, namely nonfarm payroll employment, the unemployment rate, average hours worked in manufacturing, and wage and salary disbursement. These input series exclusively reflect the labor market dynamics. As part of a longer-term project to enhance the coincident indexes to track business cycles in each state more accurately, the Bank's researchers have implemented two changes effective with the January 2020 release of the state coincident indexes:

- **Include proprietors' income to broaden the income component** — The proprietors' income component potentially allows the coincident indexes to capture changes in capital movement outside of the labor market.
- **No longer exclude large changes in these input series** — Our practice in the past has excluded large changes within these input series. Therefore, some turning points have been

smoothed out or lessened. By including these large changes, the coincident indexes would track state business cycles more accurately.

April 3, 2018

Indexing to 2007 Annual Averages

Effective with the release of the Philadelphia Fed's state coincident indexes for January 2018, all 50 state indexes and the U.S. index are indexed to their 2007 annual averages (previously indexed to July 1992). This change more directly ties the current indexes to the peak of the prior economic cycle.

April 10, 2017

Methodological Changes

Since the introduction of the state coincident indexes in 2005, the Federal Reserve Bank of Philadelphia's Research Department has utilized the same software and procedures,[1] essentially unchanged, as the core estimating process for the indexes. As part of a longer-term project to update the methodology of the coincident indexes to take into account advances in statistical theory and data and improve the accuracy of these indicators, the Bank's researchers have implemented three changes effective with the January 2017 release of the state coincident indexes:

- **Annual estimation** — The coefficients of each state model will be estimated only once a year, for the reference month of January, rather than every month as in the past. This will improve the efficiency of our monthly process and the transparency of our output.
- **New smoothing weights** — A new algorithm for smoothing the series, as suggested in Koopman and Harvey (2003),[2] is being used.
- **New estimation** — A variance restriction to the underlying (latent) factor equation is being imposed during the estimation process in order to lessen the degree of customization required in the model to avoid large variance estimates. This may affect some state indexes more significantly than others.

April 6, 2016

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[1] Clayton-Matthews, Alan. *DSFM Manual* (version 4/17/2001) mimeo, University of Massachusetts–Boston (2001).
[2] Koopman, Siem Jan, and Andrew Harvey. "Computing Observation Weights for Signal Extraction and Filtering," *Journal of Economic Dynamics & Control*, 27 (2003), pp. 1317–1333.

New Method for Computing Seasonally Adjusted Employment

The Federal Reserve Bank of Philadelphia's Research Department has produced the state coincident indexes since January 2005 using seasonally adjusted indicator series for each state's payroll employment, unemployment rate, average hours worked in manufacturing, and wage and salary disbursements. In particular, over this period, we computed our own estimates of the seasonal factors for each state's employment data.

Beginning with our release of the January 2016 state coincident indexes, we have decided to rely upon the seasonal factors produced by the U.S. Bureau of Labor Statistics rather than our own internal procedures. Going forward, we think this change will improve the accuracy of the coincident indexes.

This methodological change had little effect on our coincident indexes for most states. However, the effect was somewhat greater for Hawaii, Oregon, and Tennessee.