Early Benchmark Methodology

The Federal Reserve Bank of Philadelphia has developed early benchmark estimates of monthly state payroll employment on a quarterly basis to predict the subsequent annual benchmark revisions by the Bureau of Labor Statistics (BLS). Our process enhances the monthly Current Employment Survey (CES) payroll employment data with the more comprehensive Quarterly Census of Employment and Wages (QCEW) payroll employment data. The CES provides a timely estimate of monthly state employment data, but the QCEW follows about five months later with a more complete picture, covering more than 95 percent of all employers. Our methodology was adapted from an approach pioneered by the Federal Reserve Bank of Dallas and modified to accommodate all 50 states and the District of Columbia.  

What Are the Timing and Scope of the Revisions?

Every March, the BLS releases revised estimates of monthly nonfarm payroll employment for states as part of its CES program. For these revisions, the BLS incorporates data from the QCEW, new seasonal adjustment factors, and other corrections to make the data revisions more accurate. Since the QCEW is released quarterly – just over five months after the end of a quarter – researchers at the Philadelphia Fed are able to create our own early benchmark estimates on a more timely basis.

Our early benchmark process does not attempt to be as comprehensive as the BLS process as we do not have access to all the data that the BLS uses. Therefore, we accept the BLS’s benchmarked CES estimates as the base employment level for each state. Once QCEW data are released for periods beyond the latest benchmarked CES estimates, we produce our early benchmark estimates.

Figure 1 on the next page illustrates the data published by the Philadelphia Fed and the BLS. The current CES estimates are based on an annual benchmark revision (released in March 2022). Because these CES estimates incorporated QCEW data through September 2021, period A depicts only the CES estimates – our process has little to add. Our first early benchmark estimate for the fourth quarter of 2021 (period B in Figure 1) was produced when fourth quarter QCEW data were released in June 2022. When QCEW data for the first quarter of 2022 were released in September 2022, we produced our early benchmark estimate for the first quarter of 2022 (period C) and revised our estimate for the fourth quarter of 2021 (period B). This process will be repeated when QCEW data for the second quarter of 2022 are released in December.

What Procedure Is Followed?

To achieve greater precision in the estimation of the overall employment growth rate, we link newly released QCEW data with benchmarked CES data at the sector level. This allows us to better capture the unique growth rate and seasonal pattern in each sector. We match CES industry sectors to their most similar QCEW sectors on a state-by-state basis, as some states have a more extensive list of sectors than others.

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1 For more details on the methodology developed by the Federal Reserve Bank of Dallas, see Early Benchmarking - Dallasfed.org.
2 For more details on the methodology used by the Bureau of Labor Statistics (BLS), see SAE Methods Overview Page.
The sector-level QCEW series are seasonally adjusted using the U.S. Census Bureau’s X-12 program. Within periods B and C in Figure 1, the growth rates of the seasonally adjusted QCEW series are used to project the CES levels for each sector from September 2021 – the last month with which the BLS had access to QCEW data for its annual benchmark.3 These sector-level series are then aggregated for each state to create our early benchmark estimates of payroll employment for October 2021 through March 2022.

**Figure 1: Delaware - 2022 Q1 Vintage**

![Graph showing total nonfarm payroll employment.(seasonally adjusted)](image)

In Figure 1 above, period D represents the months for which CES estimates are available but for which QCEW data have not yet been released. We use sector-level growth rates from the CES to project our March early benchmark estimates for April through July. The dotted line in period D of Figure 1 represents the extended projection of our early benchmark estimates.

**What Makes a Revision Significant?**

Every March, the BLS releases standard errors for their state CES estimates.4 We use these standard errors to create a range of expected variance due to sampling error for the state CES estimates. If our early benchmark revision estimates are outside of this range, we consider the revision to be “significant.”

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3 The BLS provides seasonally adjusted CES data.
4 For more details on the BLS’s standard errors of the CES State and Area Estimates, see [Reliability of CES State and Area Estimates](https://www.bls.gov/ces/detect/rteestimates.htm).