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LAUS Technical Memorandum No. S-17-19

MEMORANDUM FOR : STATE WORKFORCE AGENCY ADMINISTRATORS  
AND BLS REGIONAL COMMISSIONERS

FROM : JAY A. MOUSA  
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SUBJECT : Review of Improved Fourth Generation Local Area  
Unemployment Statistics Models and Request for Feedback

**Purpose:** This memorandum provides states with information on proposed improvements to the fourth generation of Local Area Unemployment Statistics (LAUS) models. It details the plan for providing states with ongoing estimates incorporating these improvements for review, and requests state feedback on those estimates. The LAUS program office is strongly considering implementing these changes beginning with the next annual processing period.

**Background:** BLS continually researches potential improvements to its methodology. Following the implementation of the Current Population Survey (CPS) sample redesign in 2014, BLS researched improving the calculation of the generalized variance functions (GVFs) used in the LAUS model estimates and their associated error measures. These improved GVFs are now available to be implemented in the production of LAUS estimates. Furthermore, in response to state user feedback, BLS also conducted research into reducing volatility and distortions appearing in LAUS estimates. The Statistical Methods Staff (SMS) has developed improved seasonal adjustment and smoothed seasonal adjustment procedures to address those concerns.

**Summary of Improvements to Fourth Generation Models:** Improvements and changes to the LAUS employment and unemployment models are categorized into three groupings.

- (1) **Improvements to GVF calculation** (impacts NSA and SSA estimates). The GVFs will now be calculated using a more flexible method that responds to monthly changes in some key parameters, such as CPS response rate. For employment, CPS standard errors are generally 10 to 20 percent lower than those used in current production. Lower CPS standard errors indicate lower sampling error and higher reliability in the CPS. This results in the LAUS models placing increased weight on the survey data, making model estimates more responsive to changes in the CPS.

- (2) Improvements to Seasonal Factors. LAUS models simultaneously estimate and benchmark the seasonally adjusted data. The combination of these steps leads to distortions in the seasonal factors. Rather than use these distorted factors, the model will instead apply a series of linear filters derived from X-11 to the benchmarked not seasonally adjusted LAUS estimates, reducing volatility and producing more stable estimates of seasonality. Application of these filters in such a manner eliminates the need to remove residual seasonality.
- (3) Improvements to Smoothing Filter (impacts SSA estimates only). The Trend Cycle Cascade Filter (TCCF) currently used to smooth the benchmarked seasonally adjusted estimates is a long, multi-year filter, intended in part to remove any residual seasonality from the published estimates. Because of the improvements listed above in (2), the TCCF is no longer needed. LAUS will switch to the much stronger Reproducing Kernel Hilbert Space (RKHS) filter. This achieves a better balance of responsiveness to business cycles while mitigating variability due to distortions caused by benchmarking.

**Data for State Review:** With this memorandum, we are providing states with LAUS estimates from the improved fourth generation of LAUS models via EUSweb in the file “ST New 4th Gen Estimates.xlsx” (where “ST” is the state’s two-character abbreviation). The tab “Historical” includes data from 1976 – 2016 that have been estimated using the forward-back-forward historical estimator. SSA estimates were smoothed using the 13-month RKHS historical symmetric filter. The tab “Concurrent” includes 2017 data as estimated by the current year concurrent estimator; SSA estimates utilize the 7-month concurrent RKHS asymmetrical filter. All estimates are directly comparable to data currently published by BLS and contained in STARS. Data are available for all 50 states, the District of Columbia, New York City and the balance of New York State, and Los Angeles and the balance of California. The remaining five substate modeled areas and their respective balance-of-state areas will not be included in the initial estimates for review. Their provision should be available soon, however.

Because of the effect changing state historical NSA estimates has on substate estimates, we are considering a partial implementation in 2018. Specifically, we may keep the current official historical data unchanged for all years except the most recent five. Later, in a year when we implement revised OMB substate areas, we would replace the entire series to reflect the methodology changes described above.

Attachment 1 contains the model specification tables for the improved models. Columns B-D contain the standard deviation of the model’s Level, Slope and Seasonal components. Outlier designations are available in columns F-I. There have been no changes to outlier designations from the current fourth generation models, as detailed in attachment 2 to LAUS memo S-17-12. Finally, column E is the regressor coefficient (CoefXtrd) for the state-supplied inputs to the model (CES for employment, UI continued claims for unemployment). Attachment 2 describes the modifications made to the STARS tables thus far to reflect the output of the improved models.

**Data Provision for 2017 Estimates (Dual Estimation):** Throughout 2017, BLS will provide states with output from the improved models. The methodology updates do not require changes

to the STARS web interface, so there are no additional production steps required of states. The estimates and resulting draft STARS diagnostic tables will be produced by program office staff. Each month, BLS will provide these files to states via EUSweb no later than the Friday following the STARS due date.

**Actions required:** States should review the improved fourth generation data, including outlier designations as shown in Attachment 1. They should provide feedback or requests for changes to these by September 29, 2017. States should also review the concurrent 2017 estimates and diagnostic tables on an ongoing basis and provide comments to their regional office as they arise.

**Effective Date:** This memorandum is effective immediately.

**Workload Impact:** None; these activities are included in the Cooperative Agreement.

**Inquiries:** All inquiries should be directed to the appropriate BLS regional office.

**Attachments:**

Attachment 1- Revised Claims Model Specification

Attachment 2- Modifications to the Monthly STARS Tables