

**Bureau of Labor Statistics**

**Local Area Unemployment Statistics**

**Research and Methods Branch**

**Report on Revision to Handbook Method Unemployment Estimation**

**March 2014**

**Executive Summary**

The Local Area Unemployment Statistics (LAUS) Program proposes implementing an updated approach to the estimation of substate unemployment. The first proposal is to employ the primary substate unemployment estimation methodology, known as the Handbook Method, at the level of individual counties (and equivalents) in States outside of New England. Currently, the Handbook Method is executed at the level of Labor Market Areas (LMAs), which consist of one or more counties. This proposal requires no changes to the calculations constituting the Handbook Method, since the data required as inputs already exist at the county level. By employing the Handbook Method at the county level, substate estimates will better represent local conditions by using more locally available data.

The second proposal involves updating the estimation of non-covered agricultural unemployment. Twelve-month-ago monthly agricultural sector data from the Quarterly Census of Employment and Wages (QCEW) will replace the annual average QCEW data currently used to approximate the level of household employment participating in the Unemployment Insurance (UI) Program. Also, a seasonal factor within the formula created from national Current Population Survey (CPS) data in the 1970s and 1980s will be eliminated. These changes will improve the ability of this subcomponent of unemployment to represent local seasonal patterns.

## **Objective of the Research**

Over the last several years, the LAUS Program, in cooperation with State partners, has conducted extensive research into improving the ability of States to correctly classify and allocate continued claims from the Unemployment Insurance Program to substate areas. With the adoption of new technology and practices for the classification and allocation of continued claims, the LAUS Program and its State partners now have confidence in the accuracy of this input at greater levels of geographic specificity.

Given the importance of continued claims to the estimation of unemployment in the Handbook Method, the LAUS Program investigated the possibility of expanding the use of the Handbook Method to the county level. Reliable data were found to exist at the county level to allow the use of the Handbook Method at this greater level of geographic specificity. Research also revealed the desirability of reducing the use of secondary methods of estimation when locally available data could be utilized to a fuller extent.

The LAUS Program also investigated several possibilities for improvement in the estimation of the non-covered agricultural unemployed, an atypical method used by request for areas within some States. First, research into the trends of these estimates revealed unusual seasonal patterns where relatively high seasonal unemployment coincided with seasonal periods of relatively high agricultural employment. State partners suggested that these patterns may not reflect actual economic conditions in those areas. Also, the LAUS Program sought to replace the seasonal factors used in the formula, which do not vary from year to year or between different geographical areas, with data that better reflect the recent experience of agricultural employment at the local level.

## **Description of the Current Methodology**

The Handbook Method estimates monthly unemployment for an area using available information without the expense of expanding a labor force survey like the Current Population Survey (CPS). Handbook unemployment estimates are computed as the sum of total continued claims (Line 8), unemployed exhaustees (Line 9), non-covered agricultural unemployment (Line 10), unemployed re-entrants into the labor force (Line

13), and unemployed new entrants into the labor force (Line 15). This sum is then captured in Line 16, total Handbook unemployment.

<b>Handbook Unemployment</b>	
<i>Line</i>	<i>Description</i>
5	UI Claims
6	UCFE Claims
7	Rail Road Claims
8	Total Claims (lines 5 + 6 + 7)
9	Unemployed Exhaustees
10	Non-covered Agricultural Unemployment
11	Unemployed excluding Entrants (lines 8 + 9 + 10)
12	Re-entrants Ratio
13	Re-entrants
14	New Entrants Ratio
15	New Entrants
16	Total Unemployment (lines 11 + 13 + 15)

Lines 5-7: Covered Unemployment

The covered category represents unemployed individuals that are covered by UI benefits programs. This category is further broken down into two groups: (1) those currently receiving UI benefits and (2) those who have exhausted their benefits. The number in the former group is obtained directly from an actual count of UI claimants for the reference week. These are represented in Lines 5, 6, and 7 for regular State UI, UCFE, and Railroad claims, respectively. Because claimants within each State’s UI system are associated with a postal address, claimants can be reliably assigned to a county or equivalent for the purposes of LAUS estimation.

Line 9: Exhaustees

Line 9 represents unemployed exhaustees. These are individuals who have exhausted all regular UI benefits to which they are entitled and are no longer tracked by the State’s UI system. When a claimant exhausts their benefits a final payment is indicated in their claim

record. Each week these final payments are pooled and survived based on duration of unemployment data from the CPS.

Although exhaustee data are available at the county level, the current method counts them at the LMA level and then allocates them to the LMA component counties based on each county's share of the LMA's total continued claims. This redistribution of the exhaustee data can distort the county counts of exhaustees.

This is particularly evident when a layoff occurs in one county in which the claimants later exhaust their UI benefits. In this case the county that experienced the layoff has a larger share of continued claims at the time of the layoff and thus a larger share of the LMA's pool of exhaustees. This results in the other county or counties making up the LMA having a smaller shares of continued claims and being allocated a smaller share of the pool of exhaustees at the time of the layoff. Later, once the claimants in the county affected by the layoff become exhaustees, there tends to be a sharp decline in that county's share of continued claims that proportionally reduces that county's share of the LMA's pool of exhaustees. Meanwhile, the other counties in the LMA tend to receive a larger share of the pool of exhaustees, because their share of the LMA's total continued claims rises as their counts of continued claims remain relatively unchanged.

The calculation of Handbook unemployment at the county level rather than at the LMA level would alleviate this phenomenon by maintaining exhaustee pools at a more local level. In the case of the example above, the Handbook Method's estimate of unemployed exhaustees will better reflect the actual number of exhaustees in a county by confining claims resulting from a layoff to the county in which the claimants reside.

#### Line 10: Non-covered Agricultural Unemployment

Line 10 designates the component of the Handbook Method used to the estimate the level of non-covered agricultural unemployment at the LMA level. "Non-covered" signifies an individual's not being eligible for benefits through the Unemployment Insurance Program. Eighteen States have requested and been approved to use this optional methodology.

The current methodology utilizes the following inputs provided for each LMA which is assigned to a State that has been approved to use the methodology:

- A01*: The LMA’s most recent annual average covered agricultural establishment employment estimate from the QCEW, as of the beginning of the current production year
- L03*: The current monthly level of total agricultural employment (i.e. both covered and non-covered) for the LMA as estimated by the Handbook Method before benchmarking to model-based control totals
- r*: The current monthly experienced unemployment rate excepting non-covered agriculture for the LMA as estimated by the Handbook Method before benchmarking to model-based control totals
- w*: One of twelve monthly factors, fixed across all areas and all years, based on a seasonal relationship created from national data on agricultural and wage and salary unemployment rates from the CPS in the period from 1977 to 1982, as listed below:

January	0.934
February	0.934
March	0.972
April	0.791
May	0.606
June	0.586
July	0.623
August	0.638
September	0.662
October	0.676
November	0.900
December	1.014

These inputs are combined in the formula below to produce an area’s Line 10 estimate:

$$Line\ 10 = \frac{(L03 - A01) * r}{\frac{1}{w} - r}$$

This formula exhibits several properties which act as implicit assumptions imposed on the estimate of the level of non-covered agricultural unemployment. Research into some of

these properties led to the updates proposed in this document. First, the use of the annual average QCEW input (A01) assumes that the level of covered agricultural employment does not vary throughout the year. Total agricultural employment (L03), however, can and does vary from month to month. The difference between the two, intended to approximate the level of non-covered agricultural employment, is therefore partly the function of an interaction between a seasonally varying input and an input that is fixed for the duration of the year.

The seasonal factor ( $w$ ) partly serves to compensate for this discrepancy in seasonality between A01 and L03. It also serves to differentiate the rate of unemployment among the non-covered agricultural labor force from that of the experienced labor force,  $r$ . However, it does so using a relationship founded in national-level data from several decades ago, imposing the assumption that this seasonal relationship holds across time and diverse local geographies. LAUS examined currently available CPS data to evaluate the possibility of updating this variable, but national monthly estimates of this population are statistically unreliable. This unreliability is even more pronounced at lower levels of geography.

#### Lines 12-15: Entrants

The entrant unemployment category is not estimated directly, because unemployment for these persons is not immediately preceded by a period of employment, which is required to receive UI benefits. The CPS produces monthly estimates of entrant unemployment, but these estimates suffer from statistical volatility due to the small sample sizes involved at the State level and below. Therefore, estimates for new entrants and re-entrants are derived from weighted 5-year averages based on current and historical State data from the CPS. These averages are then allocated to all LMAs based on each LMA's percentage share of its State's age-specific population. For new entrants, the LMA's percentage share of the population aged 16 to 19 years is used. For re-entrants, the LMA's percentage share of the population aged 20 years and over is used. These estimates, when summed with those from the covered unemployment category, produce what is known as an LMA's Handbook unemployment estimate.

In the case of interstate LMAs (LMAs incorporating areas in more than one State), the part of the LMA specific to a given State (known as an intrastate part) is allocated a portion of the State's average entrant unemployment using the method above. This estimate of entrant unemployment is then summed with that of other intrastate parts to create the estimate of entrant unemployment for the LMA.

#### Additivity Adjustment

LMA Handbook unemployment estimates are then controlled to Statewide unemployment estimates in a process known as additivity adjustment. All Handbook unemployment estimates specific to a State are summed, and then an individual area's share of that sum is used to proportionally allocate the State's total official not seasonally adjusted unemployment. The allocated amount is the official not seasonally adjusted level of unemployment.

#### Disaggregation

To calculate estimates at the county level in the case of an LMA that consists of more than one county, additivity-adjusted official LMA-level unemployment estimates are disaggregated. The preferred technique is the known as the Population-Claims method. This method utilizes a county's proportion of its LMA's UI claims data to allocate a share of the LMA's additivity-adjusted covered unemployment to the county. Additivity-adjusted new entrant and re-entrant unemployment are allocated based on the county's share of the teenaged and adult populations, respectively.

This method is counterintuitive in the case of entrant unemployment among interstate LMAs. As noted above, entrant unemployment is allocated to the intrastate parts of interstate LMAs prior to the step of disaggregation. The distribution of a given population is not identical to the distribution of unemployment among that population, yet the current method use of shares of population both to disaggregate entrant unemployment from States to the intrastate parts of an interstate LMA and then to disaggregate the (now additivity-adjusted) interstate LMA's entrant unemployment into its intrastate parts. This process complicates estimation with an additional step without bringing additional information on local circumstances.

## **Development and Evaluation of Alternative Methods**

### County-Level Estimation Using the Handbook Method

Research noted several drawbacks to the current methodology of Handbook Method estimation at the LMA level. First, slowly changing exhaustee counts in Line 9 are currently allocated by quickly changing continued claims, even though the necessary data for directly estimating exhaustees at the county level now exists. Second, counterintuitive disaggregation methods are used in the case of LMAs which cross State boundaries. These disaggregation methods involve interstate disaggregation ratios being applied to all types of unemployment, even entrant unemployment, which is first estimated by allocating State-specific data to the intrastate parts of interstate LMAs.

Calculating Handbook unemployment at the county level instead of the LMA level solves these issues. The vast majority of data needed for Handbook estimation is available at the county level. Currently, values are often recomputed as counties are summed to the LMA and then disaggregated back to the county level. This results in discrepancies between unemployment disaggregated to the county level using current methods and a directly estimated equivalent for a given county. Directly estimating county-level unemployment in the Handbook Method will render substate estimates more reflective of locally available data of comparable reliability to that used in the current LMA-level estimation.

### Line 10

There are multiple limitations to any effort to measure the non-covered agricultural unemployed. First, no direct estimates of this population currently exist. Research by the LAUS Program relies on CPS national estimates of the unemployment of persons formerly employed in unincorporated agriculture, an approximation of the concept sought. Even these national estimates display high sampling error. Second, no direct estimates of non-covered household agricultural employment exist. Participation versus non-participation in the UI Program is not a component of the CPS Questionnaire, and QCEW measures the employed participating in the UI Program only as they exist on establishment payrolls. Establishment employment differs from household employment in several ways, including the treatment of multiple job holders and the distinction between place of work and place



of residence. Any method for the estimation of non-covered agricultural unemployment, particularly at the local level, will necessarily be indirect given available data.

The concentration of non-covered agricultural unemployment in LMAs of low population, as estimated by the current methodology and asserted by State partners utilizing the methodology, is another important aspect of the estimation of Line 10. While Line 10 is a small proportion of unemployment as estimated using the Handbook Method in aggregate, Line 10 has on occasion constituted a quarter or more of unemployment in a subset of areas during some months.

Given the limited data available and the importance attributed to Line 10 estimation by the LAUS Program's State partners, the LAUS Program considered alternative uses of existing data sources. To avoid the issues raised by the use of annual average QCEW data, LAUS obtained access to QCEW data for internal use in estimating Line 10, non-covered agricultural unemployment. Monthly QCEW employment in the agricultural sector at the LMA level is often suppressed in publication to protect the confidentiality of respondents in the program. LAUS, in consultation with the QCEW program, has come to the conclusion that present security measures and the manipulation of the data involved in the estimation of substate unemployment are sufficient to protect respondent-identifiable information potentially present in monthly QCEW agricultural data.

By using year-ago monthly data to approximate covered agricultural employment, the residual meant to approximate non-covered agricultural employment (represented in the formula as (L03- A01)) will gain a plausible and local seasonality. LAUS therefore took the step of removing the seasonal factor  $w$ , which had no basis in data that was either current or local. The proposed formula is presented below, with A01 now representing the year-ago monthly QCEW agricultural employment estimate:

$$Line\ 10 = \frac{(L03 - A01) * r}{r}$$

The formula now imposes the assumption that the presumed unemployment rate among the subset of the labor force associated with non-covered agriculture will be identical to that of the remainder of the experienced labor force as estimated by the Handbook Method.

However, the LAUS Program and its State partners are aware of no reliable, current local data to inform a different unemployment rate among this population.

### **Recommendations**

The LAUS Program recommends the use of the new approach of estimating unemployment at the county level. The data is currently available at the county level, and the new approach solves the misallocation and disaggregation issues in the estimation of unemployed exhaustees and unemployed entrants. These changes in methodology should be incorporated into the 2015 redesign.

The LAUS Program recommends the use of the new approach to estimating non-covered agricultural unemployment within the Handbook Method employment as explained above. Using a monthly QCEW input will improve the seasonal properties of the estimate. Removing the uniform national seasonal adjustment factor will remove an assumption imposed on local data which could neither be rendered current nor local. These changes in methodology should be incorporated into the 2015 redesign.