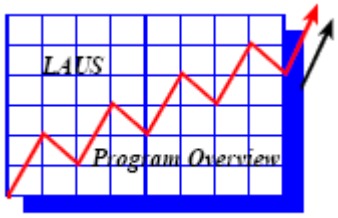


1 Local Area Unemployment Statistics Program: Introduction and Overview

Introduction

The Local Area Unemployment Statistics (LAUS) program is a Federal/State cooperative program which produces monthly employment and unemployment estimates for approximately 7,300 geographic areas. The areas include Census Regions, Census Division, all States, the District of Columbia, Puerto Rico, labor market areas (LMAs), counties, cities with a population of 25,000 or more, and all cities and towns in New England, regardless of population. These estimates, which are produced by State employment security agencies, are key indicators of local economic conditions. They are used by State and local governments for planning and budgetary purposes and as determinants of the need for local employment and training services and programs. LAUS estimates are also used to determine the eligibility of an area for preferential treatment or benefits under various Federal assistance programs.

The underlying concepts and definitions of all labor force data developed from the LAUS program are consistent with those of the Current Population Survey (CPS). Monthly estimates for all States, the District of Columbia, New York City, Los Angeles-Long Beach-Glendale, and the respective balances of New York and California, are produced using estimating equations based on time-series and regression techniques. These "signal plus noise" models combine current and historical data from the CPS, the Current Employment Statistics (CES) program, and State unemployment insurance (UI) systems. Models are also utilized for five additional substate areas and their respective State balances. The areas are: the Chicago-Naperville-Arlington Heights, IL metropolitan division; the Cleveland-Elyria, OH metropolitan area; the Detroit-Warren-Dearborn, MI metropolitan area; the Miami-Miami Beach-Kendall, FL metropolitan division; and the Seattle-

Bellevue-Everett, WA metropolitan division. Area and balance-of-State models are controlled directly to their respective State totals.

Monthly estimates for Puerto Rico are produced from a survey modeled on the CPS survey. This survey is conducted by Puerto Rico and provided to BLS by the Puerto Rican Bureau of Employment Security.

Estimates for substate areas (other than the substate modeled areas noted above) are produced using a standard methodology called the "Handbook" method and disaggregation techniques. The Handbook method uses data from several sources, including the CPS, CES, State UI systems, and the American Community Survey (ACS), to create estimates which are then adjusted to the State CPS-based measures of employment and unemployment. Handbook estimates are developed at the county level for all States except in New England, where they are developed at the minor civil division (MCD) level. MCDs represent all cities and towns in New England regardless of their population. Multi-county (and multi-MCDs) metropolitan areas, metropolitan divisions, and small labor market areas are the summation of the respective component counties (or MCDs). Estimates for areas below the county level are prepared for all cities with a population of 25,000 or more, using disaggregation techniques based on 5-year ACS population estimates and current UI statistics.

History

Since the late 1940s, subnational estimates of employment and unemployment have been developed by States under the guidance of the Federal government. These estimates were initially developed in response to a need to quantify labor dislocations during World War II. To meet this need, the War Manpower Commission developed an estimation program to supply figures on local area labor and material shortages. With the end of the war, the Labor Department's Bureau of Employment Security (BES), now the Employment and Training Administration (ETA), took over responsibility for manpower programs.

As the need for more detailed statistics increased, there was also a need for more conformity in estimation in the individual States. In 1950, BES introduced guidelines on estimation, entitled *Techniques for Estimating Employment*, and distributed them to the States. A decade later, revised and updated techniques were republished in the *Handbook on Estimating Unemployment*. This was a 70-step method of estimating procedures for producing unemployment data for the State and for labor market areas. The Handbook method used a series of "building blocks," including establishment employment and unemployment insurance data, to produce unemployment rates equivalent to the CPS but without the high cost of a household survey. As early as 1961, local area unemployment statistics were used to distribute federal funds to local areas under such programs as the Area Redevelopment Act.

In 1962, the President's Committee to Appraise Employment and Unemployment Statistics (the Gordon Committee) criticized the validity of the Handbook method. This was followed by a series of independent studies comparing the Handbook estimates to those from the Census or from the CPS. They reported the existence of biases and inaccuracies in the Handbook procedures. In 1971, the General Accounting Office, after a year-long audit of two States' unemployment estimating programs, came to the same conclusions, and also found that States were independently introducing their own changes into the Handbook Method. The GAO recommended that the States' procedures be reviewed and monitored in order to reestablish methodological conformity, in that any State change which improved the accuracy and comparability of the statistics be integrated into the methodology, and that "high priority" be given to a general improvement in the estimating methods.

In the early 1970's, the Bureau of Labor Statistics (BLS) was publishing CPS-based labor force statistics for selected States and large areas while BES was publishing Handbook-based statistics for all States and areas. Shortly after the GAO report was issued, the Office of Management and Budget (OMB), as part of its review of statistical programs in the Department of Labor, determined that general purpose statistics should be the responsibility of BLS. In November 1972, the responsibility for local area unemployment statistics was transferred to BLS. Therefore, beginning in 1973, BLS (with the cooperation of all States) published monthly labor force data for all States and labor market areas, based on the

Handbook procedures. One year later, BLS introduced the first major revisions to the program. The revisions had a two-fold purpose: to introduce more conformity between LAUS and CPS data, and to achieve a greater level of consistency of procedures among the States.

The most important of the methodological changes introduced by BLS in November 1973 was the direct use of CPS data. At that time, the CPS was a nationally-based sample. In order to identify usable State CPS data, a reliability criterion was established which required that State samples be sufficiently large to estimate the unemployment level with a coefficient of variation (CV) of no more than 10 percent at one standard error when the unemployment rate is 6 percent. Applying this standard resulted in the identification of 19 States and 30 metropolitan areas for which CPS data could be used directly as the annual average benchmark for 1970-73. During 1974, the Census Bureau revised the procedure used to weight the State sample data to reflect the universe, which resulted in a lower estimated variance. Thus, 8 more States were able to be benchmarked to the CPS. In 1975, BLS contracted with the Census Bureau to expand the sample by 9,000 households in the 23 remaining States and the District of Columbia, so that all States were able to be benchmarked to annual average CPS estimates in 1976.

In 1978, BLS broadened the reliability criterion for the use of CPS data by also considering monthly data, within the context of a budget proposal to expand the CPS to yield monthly employment and unemployment data for all States by June 1981. Under the expanded criterion, which specified a 10-percent CV on monthly data, monthly CPS levels were used directly for 10 States, 2 areas, and their respective balance-of-State areas. The use of annual average CPS data for the other 28 metropolitan areas was discontinued at that time, so that all substate areas not meeting the monthly reliability criterion would be treated the same. Ultimately, the budget proposal, which initiated the direct use of monthly State CPS data, was rejected as too costly.

In addition to the 1975-76 increase to the CPS to obtain reliable annual average data for all States, in 1980, 9,000 households were added to improve the reliability in the 40 nondirect-use States. A final sample increase of 6,000 was implemented in 1981 to improve the reliability of data in 30 specific metropolitan areas, 10 of their central cities, and the respective balance-of-State areas. In 1982, however, because of the Federal budget cut, the 1981 supplement and one-half of the 1980 supplement were eliminated.

Another part of the improvement commitment supported by the budget supplements was a $2.5 million effort to standardize and improve the unemployment insurance data, which provide the only current unemployment measure for all substate areas. Funding for this initiative was provided to BLS in 1975-76, and used through contracts with States to correct and augment unemployment insurance statistics to make them more appropriate for use in LAUS estimation. Inconsistencies within and among States were eliminated, quality control measures were instituted, and manual tallies were

replaced with computer-generated tabulations. Through such improvements as the use of place-of-residence of the claimant, the CPS reference week, and the elimination of claimants who had earnings due to employment, closer adherence to CPS concepts was achieved. The resultant improved unemployment insurance data were implemented in LAUS estimation in 1978.

In July 1985, the CPS redesign based on the incorporation of 1980 Census data was fully implemented. A key part of the redesign involved a change in the sample structure of the CPS from a national-based one to a State-based stratified sample. Based on the redesign and sample restructuring, the reliability of the CPS data at the State level was improved such that the monthly and annual CVs for direct use of CPS data were reduced to 8 percent.

In 1986, updated inputs to the Handbook based on 1980 Census data and a number of important methodological improvements in component groups of the Handbook employed and unemployed not covered by unemployment insurance were implemented.

Also in 1986, efforts to utilize econometric techniques to estimate monthly State employment and unemployment were strengthened. The earliest BLS attempts to explore regression methods go back to the late 1970's. In addition to internal work, BLS contracted with Mathematica Policy Research, Inc., which conducted extensive State and area research using time-series and cross-sectional models. Their final report was delivered in 1981.

Internal model research continued through the 1980's, resulting in the identification of variable coefficient models as a possible substitute for the nondirect-use State method used at that time—Handbook estimation adjusted to a six-month moving average CPS. In 1986, the State Research Group was established with participation of selected State research directors to facilitate the evaluation of model-based estimates and to ensure adequate communication of State needs. In 1987, a subsequent group of State research directors was established—the Regression Implementation Committee—to further evaluate the model approach during the one-year period of dual estimation in 1988. In addition to internal and State review of the model-based estimating method, Professor Art Dempster of Harvard University participated in the evaluation effort. The result of these efforts was the implementation of variable coefficient models in the nondirect-use States in January 1989.

Following the incorporation of the first generation of State econometric models, model research continued. Since seasonally-adjusted estimates were available for the direct-use States, efforts were focused on the seasonal adjustment of the model-based State estimates. A BLS workgroup was established in 1989 to evaluate the appropriateness of seasonally adjusting the model estimates using the X-11 ARIMA software used for the CPS. The workgroup's positive report in the fall of 1991 led to the introduction of monthly seasonally-adjusted nondirect-use State estimates in 1992.

Also in the early 1990's, a major effort was undertaken to improve the model specifications. Research was conducted to explicitly account for important characteristics of the CPS sample design. This led to better control of the effects of sampling error on the model estimates. In addition, a more flexible modeling of State-specific seasonal and trend effects was identified. The resultant second-generation models were referred to as "signal-plus-noise" models. These modeling results were provided to States for comment in early 1993, and were implemented in 1994.

In January 1996, the Bureau reduced the number of households in the CPS, to accommodate lower funding levels for the labor force program. One result was that the sample was no longer sufficient to provide monthly data directly for the 11 large States, New York City, and the Los Angeles Metropolitan Area. Monthly estimates for these States and areas are now produced based on the time-series modeling methodology used for the other 39 States and the District of Columbia. Also in January 1996, the LAUS substate estimation process was streamlined and input options were eliminated to accommodate the reduction of resources for the LAUS program.

In January 2005, a major program redesign was implemented. Work on the Redesign began in Fiscal Year 2001, with a budget initiative to enhance the quality and quantity of LAUS program statistics. Major LAUS Redesign components included improvements to the method of State and large area estimation including real-time benchmarking, extending the model-based estimation methodology to additional substate areas, improving the methods used in all other areas through better techniques and input data, and updating the geography with 2000 Census-based areas.

The 2005 LAUS Redesign introduced the third generation of LAUS models. The new generation models implemented direct model-based seasonal adjustment with reliability measures and improved the benchmarking procedure by incorporating real-time monthly benchmarking. At the same time, 6 area models were introduced along with corresponding balance-of-State models.

Real-time benchmarking addressed a number of concerns with the prior generation of LAUS models. It reduced annual revisions by incorporating the CPS benchmark on a current basis. It eliminated prior model biases and benchmarking issues. It ensured that national events and shocks to the economy were reflected in State estimates as they occurred. It also eliminated the discrepancy between the sum-of-States estimates and the national not-seasonally-adjusted totals. Measures of error on the seasonally-adjusted and not-seasonally-adjusted estimates and the over-the-month change were introduced for Division, State, and area model estimates.

The LAUS Redesign also included projects to improve methodology, update geography and decennial census inputs, and improve the quality of inputs to the estimates. The Redesign resulted in significant improvements to the accuracy of

the LAUS labor force estimates and has enhanced the ability to analyze labor market behavior. Methodological changes included improvements to substate unemployment estimation that addressed long-standing inadequacies with the previous method and an innovative approach to adjusting place-of-work employment to place-of-residence that more accurately reflects complexities of commuting. In addition, all LAUS areas were revised for the latest OMB and BLS geographic definitions.

In January 2010, BLS introduced additional improvements to the LAUS models with the implementation of smoothed seasonally adjusted (SSA) estimates. The SSA estimates incorporate a long-run trend smoothing procedure, resulting in estimates that are less volatile than those previously produced by the LAUS estimation methodology. The use of SSA methodology is effective in reducing the number of spurious turning points in current estimates. More importantly, SSA estimation can reduce revisions in historical estimates and remove the potential disconnection between historically benchmarked and current estimates.

The most current program redesign was implemented in 2015. This included the introduction of fourth generation models, the replacement of decennial census long-form data with ACS data, improved smoothed seasonal adjustment, and updated procedures for developing substate area estimation.

The fourth generation models introduced major improvements including model-based benchmarking where the models directly produce estimates that automatically sum to Census Division controls and thus eliminated the need for external pro-rata factors previously used to benchmark state estimates to Census Divisions. This approach provides greater flexibility, smoother monthly adjustment factors, and improved reliability measures. These models also allow for the additivity of outlier effects. Outlier estimates are separated from the benchmarking process, resulting in outliers being specific to where they occurred, rather than spread across all states within a Census Division. The new model structure uses CES and UI trend estimates as regressor values to explain trend variation in the CPS, which produces similar results to the bivariate models, but with a major reduction in computing time and allows for more flexibility with model development over the long term.

The LAUS program had been reliant on decennial Census long-form data as the basis for adjusting establishment-based employment estimates to residency-based employment estimates, for estimating certain employment and unemployment components in the Handbook methodology, and for disaggregating or apportioning labor market area estimates to smaller areas. With the discontinuation of the long form for the 2010 Census, these inputs were replaced by 5-year estimates from the ACS. These data are the most statistically reliable of the ACS estimates and cover all LAUS geography.

LAUS Time Line

Year	*Historical Developments Related to LAUS*
1933	Wagner-Peyser Act created Employment Service for registering the unemployed
1935	Social Security Act created Unemployment Insurance System
1937	Works Projects Administration began collecting household-based labor force data
1939-1945	War Manpower Commission developed program on local area labor and material shortages
1943	Responsibility for conducting household survey transferred to Bureau of the Census
1948	Monthly Report on the Labor Force renamed Current Population Survey (CPS)
1950	BES (now ETA) published the manual "Techniques for Estimating Unemployment"
1959	Responsibility for analyzing and publishing CPS data given to BLS; Census continues to conduct survey
1960	Manual for estimating area unemployment revised by BES, title changed to "Handbook on Estimating Unemployment" (70-Step Method)
1961	Area Redevelopment Act passed
1962	President's Committee to Appraise Employment & Unemployment Statistics (Gordon Committee) issued final report
1965	Public Works and Economic Development Assistance Act (PWEDA) passed
1972	Responsibility for LAUS program transferred to BLS
1973	Comprehensive Employment and Training Act (CETA) passed
1975	CPS sample expansion; CPS benchmarking extended to 27 States
1975	First round of UI Database Survey conducted by BLS
1976	CPS benchmarking extended to all States.
1976	Public Works Employment Act (PWEA) passed

LAUS Time Line *(Continued)*

Year	*Historical Developments Related to LAUS*
1976	National Commission on Employment and Unemployment Statistics (Levitan) and National Commission on Unemployment Compensation established
1978	Direct use of monthly CPS estimates for limited number of States and areas introduced
1978	First UI database improvements incorporated into the Handbook estimates
1979	Levitan Commission issued recommendations
1982	Job Training Partnership Act (JTPA) replaced CETA
1983	Second round of UI Database Survey conducted by BLS
1985	Updated State-based CPS sample based on 1980 Census introduced
1986	Major revisions to Handbook methodology incorporated
1989	Variable coefficient model estimates incorporated for nondirect-use States
1992	Seasonal adjustment of model-based estimates introduced.
1994	Second generation of LAUS models introduced; 1990 Census data incorporated into LAUS; new CPS questionnaire and data collection method implemented
1996	Direct-use States adopt model based estimation method; Handbook method streamlined to 13 steps
2005	Third generation of LAUS models introduced, bringing real-time benchmarking and model-based seasonal adjustment to the methodology; improvements to Handbook methodology include dynamic ratio adjustment for place-of-work employment and updated new and reentrant unemployed estimation; 2000 Census data incorporated into LAUS; and redesign of the State estimating system.
2010	Smoothed-seasonally-adjusted methodology implemented to develop official seasonally-adjusted estimates

LAUS Time Line *(Continued)*

Year	*Historical Developments Related to LAUS*
2015	Fourth generation of LAUS models improved State time-series estimation with the introduction of model-based benchmarking that accounts for errors in the estimates, additivity of outlier effects that allocates level shifts to the appropriate State, a more efficient model structure that reduces processing time, and enhanced smoothed seasonal adjustment procedures. Data from the ACS replaced decennial census inputs and updated procedures for developing substate estimates were also introduced.

Data Sources

LAUS estimates are designed to reflect the labor force concepts embodied in the CPS and, thus, are conceptually comparable to each other.

LAUS estimates are based on data from a number of different sources. Primary source data for the creation of employment and unemployment estimates include the CPS; the State UI systems; the CES program; the QCEW; Census' Population Estimates Program (PEP); and the American Community Survey. Each of these inputs to LAUS estimation is described in detail in the following four chapters. A brief summary of each data source is provided below.

The Current Population Survey

The CPS is a monthly sample survey of households, conducted by the Bureau of the Census under contract to the BLS. It provides statistics on the labor force status of the civilian noninstitutional population 16 years of age and over. CPS data are collected each month from a probability sample of approximately 60,000 occupied households and yield estimates of demographic, social, and economic characteristics of the population.

The BLS has responsibility for analyzing and publishing monthly employment and unemployment estimates for the Nation. CPS data are valuable inputs into LAUS monthly estimation due to their regular availability, comparability across States, and measurable statistical error. (See Chapter 2 for more details on the CPS.)

Unemployment Insurance Systems

Under the UI system, an employer must pay a tax for each employee covered by the State law. Coverage includes the State UI program and the Federal Civilian Employment program. This tax is, in effect, an insurance premium paid to provide for possible unemployment benefits. When any employee in a covered job becomes unemployed, he/she may file an initial claim to receive unemployment insurance benefits. A determination of whether the individual is covered by the State unemployment insurance system and, if so, how much in benefits is due, will then be made by the State. A qualifying claimant will receive weekly compensation until the maximum benefit amount is exhausted or until the person returns to work, whichever is earlier.

The UI administrative statistics created in this process are useful for LAUS estimation because they are current and are generally available for a great many geographic areas. (See Chapter 3 for more details on the UI system.)

Current Employment Statistics and Quarterly Census of Employment and Wages

Both the CES and QCEW programs are Federal/State cooperative ventures which obtain employment data from employers. The CES is a voluntary sample survey of establishments covered by State and Federal UI laws. It is designed to produce monthly estimates of employment, hours, and earnings for the Nation, all States, and most major metropolitan areas.

The QCEW data series is a universe of monthly employment and quarterly wage information by industry, county, and State. Completion of a quarterly contribution report, which is basis for the QCEW, is mandatory in industries covered by Federal and State UI laws.

Data obtained through these two programs are used in LAUS employment estimation. (See Chapter 4 for a detailed discussion of the CES and QCEW programs.)

American Community Survey

The ACS is a household survey developed by the Census Bureau to replace the long form of the decennial census program. The ACS is a large survey collected throughout the year using mailed and internet questionnaires, telephone interviews, and visits from Census Bureau field representatives to about 3 million household addresses annually. Starting in 2005, the ACS produced social, housing, and economic characteristic data for demographic groups in areas with populations of 65,000 or more. The ACS also accumulates samples over 3-year (discontinued with the 2011-2013 dataset) and 5-year intervals to produce estimates for smaller geographic areas, including census tracts and block groups.

Five-year estimates from the ACS are used in LAUS estimation for adjusting establishment-based employment estimates to residency-based employment estimates, for estimating certain employment and unemployment components in the Handbook methodology, and for disaggregating or apportioning labor market area estimates to smaller areas. (See Chapter 5 for additional details on the ACS.)

Summary of Estimation Methods

Monthly estimates of employment and unemployment are prepared for approximately 7,500 geographic areas, which include all States, labor market areas, counties, cities with a population of 25,000 or more, and all cities and towns in New England, regardless of population. At each level of geographic detail, the estimation method used depends on the most current data sources available.

Statewide Estimates

A tiered approach to estimation is used for statewide estimates. First, model-based estimates are developed for the nine Census divisions that geographically exhaust the nation using univariate signal-plus-noise models. The Division models are similar to the state models, but do not use unemployment insurance claims or payroll employment as input variables. The division estimates are benchmarked to the national levels of employment and unemployment on a monthly basis. The benchmarked division model estimate is then used as the benchmark for the states within the division.

Monthly labor force estimates for all States, the District of Columbia, the Los Angeles-Long Beach-Glendale metropolitan division, New York City, and the respective balances of California and New York are based on dynamic time-series regression models that utilize data from the CPS, UI systems, and the CES survey. Both seasonally-adjusted and unadjusted estimates are produced each month.

The model methodology is also utilized for five additional substate areas and their respective balances of States. The areas are: the Chicago-Naperville-Arlington Heights, IL metropolitan division; the Cleveland-Elyria, OH metropolitan area; the Detroit-Warren-Dearborn, MI metropolitan area; the Miami-Miami Beach-Kendall, FL metropolitan division; and the Seattle-Bellevue-Everett, WA metropolitan division. These models are covariate, like the state and area models mentioned above, in that they use UI and CES inputs. However, the substate area and the balance of state estimates produced by these models are benchmarked to the statewide control totals of employment and unemployment. (See Chapter 6.)

Substate Labor Market Estimates

States are divided into Labor Market Areas (LMAs), which exhaust the geographic area of the State. Independent estimates are produced for all counties except in New England, where they are produced for all New England City and Town Areas (NECTAs) using a standard procedure known as the "Handbook" method. The Handbook method is an effort to estimate employment and unemployment for an area using available information, comparable to what would be produced by a random sample of households in the area, without the expense of a large labor force survey like the CPS. The county and NECTA level Handbook estimates are controlled to the LAUS Statewide estimates to create the official estimates. County and NECTA estimates are aggregated to LMA level

estimates. LAUS estimates for cities with populations over 25,000 are derived by a disaggregation technique using population estimates and UI statistics, or data from the ACS. (See Chapters 7, 8, and 9 for further details.) At the end of the year, State and substate areas are revised and benchmarked to reflect updated, revised data. (See Chapter 10.)

LAUS Estimation Techniques

Area	Estimation Method
Nine Census Divisions	***Signal-plus-noise univariate regression model***
50 States	***Signal-plus-noise covariate regression model***
District of Columbia	***Signal-plus-noise covariate regression model***
New York City, Balance of NY State	***Signal-plus-noise covariate regression model***
Los Angeles, Balance of California	***Signal-plus-noise covariate regression model***
Chicago, Cleveland, Detroit, Miami, Seattle and balances of Illinois, Ohio, Michigan, Florida, and Washington	***Signal-plus-noise covariate regression model***
Remaining Labor Market Areas (LMAs) and counties	***Handbook, Additivity***
Cities over 25,000 population	***Disaggregation***

Publication and Administrative Uses of LAUS Estimates

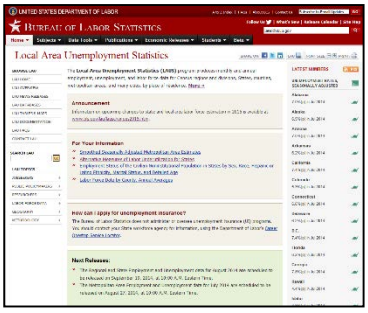
LAUS was given responsibility to develop and publish the most current national, State, and local labor force and unemployment data by the OMB in Statistical Policy Directive No. 11, "Standard Data Source for Statistical Estimates of Labor Force and Unemployment." This directive also requires the use of BLS-developed LAUS estimates by federal executive departments, agencies, and establishments in allocations of federal resources and eligibility determinations. The complete text of this Directive is provided at the end of this chapter.

Publication of LAUS Estimates

Each month, labor force, employment, unemployment, and unemployment rate estimates for all LAUS areas are published by BLS. Data from the LAUS program are made available to users in a variety of ways.


BLS NEWS RELEASE

REGIONAL AND STATE EMPLOYMENT AND UNEMPLOYMENT — JULY 2014



- The monthly "Regional and State Employment and Unemployment" news release is issued approximately two weeks after the national release of labor force data. It presents data for the Census Regions, and Divisions and all modeled LAUS estimates. The Bureau's public database, LABSTAT http://www.bls.gov/lau/), is also updated with these estimates at that time.

- The monthly "Metropolitan Area Employment and Unemployment" news release is issued about 12 days after the Region and State release and contains labor force and unemployment estimates for all metropolitan areas in the nation. These estimates are also issued in LABSTAT at that time.

- Estimates of labor force, employment, and unemployment for micropolitan areas, small labor market areas, counties, cities with a population of 25,000 or more, and all cities and towns in New England are issued in LABSTAT at the same time the Metropolitan area data are released.

- Annual average employment status data are provided each year in a press release entitled "State and Regional Unemployment, Annual Averages", which is typically issued at the end of February. It presents data on the population, civilian labor force, employed, unemployed, and unemployment rate for regions, Divisions, and States.

- The annual publication, Geographic Profile of Employment and Unemployment, provides annual average CPS data for Census Regions and

Divisions, the 50 States and the District of Columbia, 54 large metropolitan areas, 22 metropolitan divisions and 41 principal cities. Data are provided on the employed and unemployed by selected demographic and economic characteristics.

Legislative Uses of LAUS Estimates

Each year, LAUS estimates are used to distribute federal funds to States and areas or make eligibility determinations by a number of federal programs. The following table, "Administrative Uses of Local Area Unemployment Statistics", presents information on the federal programs that utilize LAUS data in allocating funds to States. Allocation formulas, reference periods, and geographic coverage information are presented. Total funding for these programs amounted to $90,341.7 million in Fiscal Year 2013. These programs are described in greater detail in the section below. The American Recovery and Reinvestment Act of 2009 used LAUS data to allocate an additional $144,350.0 million to States.

Department of Labor:

Employment and Training Administration, Workforce Investment Act, Title 1, Chapter 5: Adult Employment and Training Activities

Program Objectives: To provide millions of adult workers with workforce preparation and career development services, and help employers find the skilled workers they need. Activities promote and facilitate an integrated public workforce system through which a full array of services is offered. These services are available to workers and employers through the national network of One-Stop Career Centers. Programs provide high-quality employment and training services that address the needs of individuals in need of training, retraining, and skill upgrades. Additionally, investments in adult services are targeted to move workers in post-secondary educational pipelines and career pathways to prepare more workers to enter into and advance in good jobs in the high growth and emerging occupations of the global economy.

Employment and Training Administration, Workforce Investment Act, Title 1, Chapter 4: Youth Activities

Program Objectives: To increase the number of youth entering employment, post-secondary education, or advanced training; the number of youth attaining a degree or certificate; and literacy and numeracy gains. Provides tutoring, alternative secondary school offerings, summer employment opportunities linked to academic and occupational learning, paid and unpaid work experiences, occupational skill training, leadership development opportunities, supportive services, mentoring, follow-up services, and comprehensive guidance and counseling. Targeted to youth, aged 14 through 21, who are low income and have one or more of the following barriers: deficiency in basic literacy skills; school dropout; homeless, runaway, or foster child; pregnant or parenting; offender; or require additional assistance to complete an educational program, or to secure and hold employment.

Employment and Training Administration, Workforce Investment Act, Title 1, Chapter 5: Dislocated Worker and Training Activities

Program Objectives: To provide quality employment and training services to assist dislocated workers in finding and qualifying for meaningful employment, and to help employers find the skilled workers they need to compete and succeed in business. Dislocated workers are individuals who: have been terminated, laid off, or have received notice of termination or layoff from employment; are eligible for or have exhausted unemployment insurance; have demonstrated appropriate attachment to the workforce, but are not eligible for unemployment insurance and are unlikely to return to a

previous industry or occupation; have been terminated or laid off as a result of a permanent closure or substantial layoff; is employed at a facility that will be closed within 180 days; were self-employed but are now unemployed as a result of general economic conditions or because of a natural disaster; or are displaced homemakers who are no longer supported by another family member.

Employment and Training Administration, Employment Service Grants to States

Program Objectives: To assist persons to secure employment and workforce information by providing a variety of job search assistance and information services without charge to job seekers, including persons with disabilities and to employers seeking qualified individuals to fill job openings. Grants are made to the states to provide an integrated array of high-quality services that workers, job-seekers, and businesses can access under one roof in easy-to-reach locations, with many services also offered through self-service electronic access.

The Disability Employment Initiative awards competitive grants to state WIA-administering entities to improve educational, training, and employment opportunities and outcomes of youth and adults with disabilities who are unemployed, underemployed, and receiving Social Security disability benefits.

Employment and Training Administration, Labor Surplus Areas

Program Objectives: The purpose in classifying labor surplus areas is to put the Federal Government's procurement contracts into areas of high unemployment. Employers located in these labor surplus areas are eligible for preference in bidding on Federal procurement contracts to direct government funds into areas where people are in the most severe economic need.

Employment and Training Administration, Federal-State Extended Unemployment Compensation Program

Program Objectives: Unemployment compensation is designed to provide benefits to most workers out of work due to no fault of their own for periods between jobs. Most States pay a maximum of 26 weeks of benefits, though an increasing number of States pay less than 26 weeks. In periods of very high unemployment in individual States, benefits are payable for as many as 13 additional weeks, up to a maximum of 39 weeks. These "extended benefits" are funded on a shared basis: approximately half from State funds and half from Federal sources.

Employment and Training Administration, Youthbuild Program

Program Objectives: To provide programs for low-income young people ages 16 to 24 working full-time for 6 to 24 months toward their GEDs or high school diplomas while

learning job skills by building affordable housing for homeless and low-income people in their communities. Emphasis is placed on leadership development, community service, and the creation of a positive mini-community of adults and youth committed to each other's success. Students may earn AmeriCorps education awards through their homebuilding and other community service. At exit, they are placed in college, jobs, or both.

Employment and Training Administration, Senior Community Service Employment Program

Program Objectives: A community service and work-based job training program for older Americans. Authorized by the Older Americans Act, the program provides training for low-income, unemployed seniors. Participants also have access to employment assistance through American Job Centers.

SCSEP participants gain work experience in a variety of community service activities at non-profit and public facilities, including schools, hospitals, day-care centers, and senior centers. The program provides over 40 million community service hours to public and non-profit agencies, allowing them to enhance and provide needed services. Participants work an average of 20 hours a week, and are paid the highest of federal, state or local minimum wage. This training serves as a bridge to unsubsidized employment opportunities for participants. Participants must be at least 55, unemployed, and have a family income of no more than 125% of the federal poverty level. Enrollment priority is given to veterans and qualified spouses, then to individuals who are over 65, have a disability, have low literacy skills or limited English proficiency, reside in a rural area, are homeless or at risk of homelessness, have low employment prospects, or have failed to find employment after using services through the American Job Center system.

Veterans Employment and Training Service, Jobs for Veterans Act of 2002

Program Objectives: Employment and training services are provided to veterans of the United States Armed Forces through a nationwide network of approximately 3,000 One-Stop Career Centers. Priority of Service is granted for veterans and eligible spouses in all qualified job training programs including: state and local Workforce Investment Boards; private, national and/or pilot/demonstration operators of employment and training programs funded by the Department of Labor; those programs implemented by states or local service providers based on Federal Block grants administered by DOL; and any such program or service that is a workforce development program targeted to specific groups.

Department of Agriculture:

Temporary Emergency Food Assistance Program

Program Objectives: To make funds available to States for storage and distribution costs incurred by nonprofit eligible recipient agencies in providing nutrition assistance in emergency situations and to aid needy people. TEFAP was created to reduce excess USDA inventories of surplus commodities in storage, especially dairy products such as cheese, and to supplement the diets of low-income households at a time of high unemployment. Each State designates one agency to administer TEFAP. Once USDA commodities are made available to the States, State officials are responsible for determining the eligibility of organizations to receive the commodities and for entering into agreements regarding allocation and distribution. In addition, States are responsible for determining the types and amounts of each commodity to be made available to organizations within the State.

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 provided for the absorption of the Soup Kitchens/Food Banks Program into TEFAP..

Waivers to Supplemental Nutrition Assistance Program (SNAP) and Time Limits for Able-Bodied Adults without Dependents (ABAWD)

Program Objectives: The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 limits receipt of SNAP benefits to 3 months in a 3-year period for able-bodied adults who are not working, participating in a work program for 20 hours or more each week, or in workfare. States may request a waiver of this provision in areas with an unemployment rate above 10 percent, or for those residing in an area that has an insufficient number of jobs to provide employment for individuals.

In addition, waiver of this provision may also occur in recognition of the challenges that low-skilled workers may face in finding and keeping permanent employment. In some areas, including parts of rural America, the number of unemployed persons and the number of job seekers may be far larger than the number of vacant jobs. This may be especially so for persons with limited skills and minimal work history.

Department of Commerce:

Economic Development Administration, Public Works and Economic Development Program

Program Objectives: To assist States and local areas in the development and implementation of strategies designed to arrest and reverse the problems associated with long-term economic deterioration. Grants are provided to help distressed communities attract new industry, encourage business expansion, diversify local economies, and generate long-term, private sector jobs.

Among the types of projects funded are water and sewer facilities primarily serving industry and commerce; access roads to industrial parks or sites; port improvements; and business incubator facilities. Proposed projects must be located within an EDA-designated Redevelopment Area (RA) or Economic Development Center. Projects in other areas of an EDA-designated Economic Development District are also eligible if they will directly benefit a RA within the District. Projects must be consistent with an approved Overall Economic Development Program (OEDP). An applicant may be a state, political subdivision of a state, Indian tribe, special-purpose unit of government, or a public or private nonprofit organization or an association representing the RA or part thereof.

Economic Development Administration, Economic Adjustment Assistance Program

Program Objectives: The Economic Adjustment Program helps States and local areas design and implement strategies for facilitating adjustment to changes in their economic situation that are causing or threaten to cause serious structural damage to the underlying economic base. Such changes may occur suddenly (Sudden and Severe Economic Dislocation) or over time (Long-Term Economic Deterioration) and result from industrial or corporate restructuring, new Federal laws or requirements, reductions in defense expenditures, depletion of natural resources, or natural disasters.

Strategy grants provide the recipient with the resources to organize and carry out a planning process resulting in an adjustment strategy tailored to the particular economic problems and opportunities of the impacted area(s). Implementation grants may be used to support one or more activities identified in an adjustment strategy approved, though not necessarily funded, by EDA. Implementation activities may include, but are not limited to: the creation or expansion of strategically targeted business development and financing programs including grants for revolving loan funds, infrastructure improvements, organizational development, and market or industry research and analysis.

Department of Defense:

Defense Logistics Agency, Procurement and Technical Assistance

Program Objectives: Procurement Technical Assistance Centers (PTACs) serve as a resource for businesses pursuing and performing under government contracts, including contracts with the Department of Defense, other federal agencies, state and local governments and with government prime contractors. PTACs are hosted by organizations such as universities and local chambers of commerce. The training and assistance provided by the PTACs is usually free of charge. PTAC support to businesses includes registration in systems such as the System for Award Management, identification of contract opportunities, help in understanding requirements and in preparing and submitting bids.

The PTACs have a local presence in all 50 states, the District of Columbia, Puerto Rico, and Guam. They are funded through cost sharing cooperative agreements between the DLA and eligible participants, including states, local governments, nonprofit organizations, economic enterprises, and tribal organizations.

Department of Health and Human Services:

Administration for Children and Families, Temporary Assistance for Needy Families Contingency Fund

Program Objectives: Temporary Assistance for Needy Families (TANF) was established under the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 to replace Aid to Families with Dependent Children (AFDC), Job Opportunities and Basic Services (JOBS), and Emergency Assistance (EA) programs. In order to receive the new block grants under TANF, States must submit a State TANF plan outlining how they intend to conduct a program that provides assistance to needy families with children and provide parents with job preparation, work, and support services to enable them to leave the program and become self-sufficient. States must submit plans every two years and may submit amendments to keep the plan current whenever they wish to make changes in the administration or operation of the program. In addition to State plans, federally recognized Indian Tribes and approved Alaskan Native entities are also eligible to submit TANF plans to the Secretary of Health and Human Services.

Administration for Children and Families, Temporary Assistance for Needy Families–Job Search and Job Readiness Activities

Program Objectives: The time limit on participation in job search and job readiness is extended to 12 weeks if the state unemployment rate is at least 50 percent greater than the unemployment rate of the United States or if the state meets the definition of a "needy state" under Contingency Fund provisions. There are two ways for a state to qualify as a "needy state:" based on its unemployment rate, or based on increases in its Food Stamp caseload.

Substance Abuse and Mental Health Services Administration, Community Mental Health Block Grants

Program Objectives: Makes funds available to provide community mental health services. Support the grantees in carrying out plans for providing comprehensive community mental health services. Grantees can be flexible in the use of funds for both new and unique programs or to supplement their current activities. The program targets: Adults with serious mental illnesses and children with serious emotional disturbances. Funds may be distributed to local government entities and non-governmental organizations. They must ensure that community mental health centers provide such services as screening, outpatient treatment, emergency mental health services, and day treatment programs.

Substance Abuse and Mental Health Services Administration, Prevention and Treatment of Substance Abuse Block Grants

Program Objectives: Grantees use the block grant programs for prevention, treatment, recovery support, and other services to supplement Medicaid, Medicare, and private insurance services. Specifically, block grant recipients use the awards for the following purposes: Funding priority treatment and support services for individuals without insurance or for whom coverage is terminated for short periods of time; fund those priority treatment and support services that demonstrate success in improving outcomes and/or supporting recovery that are not covered by Medicaid, Medicare, or private insurance; fund primary prevention by providing universal, selective, and indicated prevention activities and services for persons not identified as needing treatment; and collect performance and outcome data to determine the ongoing effectiveness of behavioral health promotion, treatment, and recovery support services.

Department of Homeland Security:

Federal Emergency Management Agency, Emergency Food and Shelter Program

Program Objectives: To help meet the needs of hungry and homeless people in the U.S. and its territories by allocating Federal funds to the neediest areas, ensuring quick response, fostering public and private cooperation, ensuring local decision-making, and maintaining minimal reporting. The program began in 1983 to help meet the needs of hungry and homeless people throughout the United States and its territories by allocating federal funds for the provision of food and shelter to those impacted by natural disasters or emergencies. The program is governed by a national board composed of representatives of the American Red Cross; Catholic Charities, USA; Council of Jewish Federations; the National Council of the Churches of Christ in the USA; the Salvation Army; and the United Way of America. The national board awards funds to jurisdictions based upon a formula. Once an award is made, local boards decide which agencies are to receive funds, and then those agencies are paid directly by the national board.

Funds are used to provide the following, as determined by the local board in funded jurisdictions: (1) food, in the form of served meals or groceries; (2) lodging in a mass shelter or hotel; (3) one month's rent or mortgage payment; (4) one month's utility bill; (5) minimal repairs to allow a mass feeding or sheltering facility to function during the program year; and (6) equipment necessary to feed or shelter people, up to $300 per item.

Federal Emergency Management Agency, National Pre-Disaster Mitigation Program

Program Objectives: Provides funds for hazard mitigation planning and projects on an annual basis. The PDM program was put in place to reduce overall risk to people and structures, while at the same time, also reducing reliance on federal funding if an actual disaster were to occur. Grants are made to states, territories, and tribal governments and may be distributed to individual homeowners and businesses through state agencies and local governments.

U.S Citizenship and Immigration Services, Employment Creation Visa (EB-5) Program

Program Objectives: To stimulate the U.S. economy through job creation and capital investment by foreign investors. All EB-5 investors must invest in a new commercial enterprise and create or preserve at least 10 full-time jobs for qualifying U.S. workers within two years of the immigrant investor's admission to the United States. The investor may create or preserve either direct or indirect jobs. The required minimum investment is $1 million or $500,000 within a high-unemployment area or rural area in

the U.S.

Department of the Treasury:

Riegle Community Development and Regulatory Improvement Act of 1994, Bank Enterprise Award Program

Program Objectives: To promote the formation and expansion of Community Development Financial Institutions (CDFIs); promote community lending and investment activities by banks and thrifts; enhance the liquidity of community lending products; and enhance the capacity of CDFIs, banks and thrifts to engage in community lending and investment activities. The Bank Enterprise Award Program is intended to encourage banks and thrifts to invest in and support community development financial institutions and to increase the lending and services provided in distressed communities by traditional financial institutions.

Riegle Community Development and Regulatory Improvement Act of 1994, Community Development Financial Institutions Fund (CDFI)

Program Objectives: To increase economic opportunity and promote community development investments for underserved populations and in distressed communities in the United States.

The CDFI Fund was created for the purpose of promoting economic revitalization and community development through investment in and assistance to community development financial institutions (CDFIs). The CDFI Fund was established by the Riegle Community Development and Regulatory Improvement Act of 1994.

North American Development Bank, Community Adjustment and Investment Program

Program Objectives: To assist in the creation and/or preservation of private sector jobs within CAIP eligible communities. The CAIP does this primarily by assisting with the provision of credit. This can be accomplished with direct assistance or through the CAIP's partnership with certain loan programs of the Small Business Administration and the U.S. Department of Agriculture's Business and Industry Loan Guarantee Program.

Appalachian Regional Commission:

Area Development Program, Distressed Counties Grants

Program Objectives: Targets special resources to the most economically distressed counties in the Region, using a measure of economic distress based on three economic indicators: three-year average unemployment rates, per capita market income, and poverty rates. Besides allocating funding to benefit distressed counties, ARC has established other policies to reduce economic distress. ARC normally limits its maximum project funding contribution to 50 percent of costs, but it can increase its funding share to as much as 80 percent in distressed counties.

Small Business Administration:

Historically Underutilized Business Zones (HUBZones)

Program Objectives: To encourage economic development and create jobs in urban and rural communities by providing contracting preferences to small businesses located in and hiring employees from historically underutilized business zones. A firm may be determined to be a qualified HUBZone small business if it is located in a historically underutilized business zone, it is owned and controlled by one or more U.S. citizens, and at least 35 percent of its employees reside in a HUBZone.

Under the program, three types of contracts exist: (1) A competitive contract, in which at least two qualified small businesses are expected to submit offers, and at least one of which will be at a fair market price; (2) a sole source contract, and (3) an open competition award, in which a qualified HUBZone small business receives a price preference over another non-HUBZone bidder that is not small.

Office of Management and Budget Statistical Policy Directive Number 11

Standard Data Source for Statistical Estimates of Labor Force and Unemployment

Accurate, consistent, publicly available estimates of the labor force and of unemployment in the Nation, the States, and local areas are needed for use in the formulation, implementation, and evaluation of public policy.

1. Source of Data

Federal executive branch departments, agencies, and establishments (hereinafter Federal executive branch agency) shall use the most current national, State, or local area labor force or unemployment data published by the BLS, United States Department of Labor, with respect to all program purposes, including the determination of eligibility for and/or the allocation of Federal resources, requiring the use of such data unless otherwise directed by statute. In order to maintain equity among local areas, comparable data series are to be used for all program purposes. Further, unless otherwise required by statute, data adjusted for seasonal variation shall be used for all program purposes as soon as the BLS shall have published such data for local areas being examined for the program purpose then under consideration.

No Federal executive branch agency shall begin or continue collecting or using State or local area labor force or unemployment data other than that published by the BLS, without the written approval of the Secretary of Commerce. This does not preclude the collection of labor force and unemployment data by the Bureau of the Census, United States Department of Commerce, for the BLS or in its conduct of a periodic or other census or statistical survey, and the publication or other distribution thereof.

2. Data Consistency

With respect to any month, a consistent reference time period shall be used for all national, State, and local area labor force and unemployment data. The data for each State and area, to the extent technically feasible, shall be conceptually consistent with the data for the Nation as a whole and the State totals shall sum, within a range of acceptable sampling error, to the national total.

3. Data Publication

The BLS, in accordance with the provisions of Directive No. 4, Prompt Compilation and Release of Statistical Information, shall establish a monthly release date or dates for all regularly published labor force and unemployment data and shall provide the release date schedule to the Office of Federal Statistical Policy and Standards for publication in the *Statistical Reporter*.

The monthly publication or publications by the BLS shall contain data for the Nation as a whole, and for each State and each local area for which the BLS has agreed to publish data. No agreement between the BLS and other Federal executive branch agencies shall be used to limit the number or types of areas for which data are developed and/or published by the BLS. The data published by area shall at a minimum provide the current estimates before seasonal adjustment, and as soon as possible, and to the extent technically feasible, shall also provide the estimate adjusted for seasonality.

4. Notification of Data Need

Federal executive branch agencies requiring State and local area labor force or unemployment data shall notify the Commissioner, Bureau of Labor Statistics, United States Department of Labor, of their need for such data. The notification shall include information about the purpose for which the data are needed and the specification(s) (i.e., statistical reliability, geographic and other) for the data.

Any Federal executive branch agency required by legislation to use labor force or unemployment data other than that directed by this Directive and any Federal executive branch agency notified by the Commissioner, Bureau of Labor Statistics that the needed data cannot be provided according to specification shall notify the Director, Office of Federal Statistical Policy and Standards, Department of Commerce of that fact. The notification shall include identification of the program(s) affected, legislation implemented by those programs, data specifications, and a report on consultations with the Bureau of Labor Statistics in respect to such data.

5. Definitions

a. Labor Force and Unemployment Data. The term labor force and unemployment data is defined to include all counts or estimates of the total labor force, the civilian labor force, total employment, total civilian employment, total unemployment, and total unemployment rates. The term excludes data, obtained solely from administrative records of the unemployment insurance system, pertaining to counts of covered employment, the insured unemployed, and to the insured unemployment

rate.

b. Current Data. For the purposes of this Directive, the term current data means the most current, complete data published by the BLS.

c. Local Area. A local area, for purposes of this Directive, is any geopolitical unit of the United States of America and any combination or part of any such unit or units.

2 Inputs to LAUS Estimation
The Current Population Survey

Introduction

The Current Population Survey (CPS) is a monthly survey of about 60,000 eligible households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The survey has been conducted since the late 1940s. The CPS is the primary source of timely information on the labor force characteristics of the U.S. population.

The CPS sample is scientifically selected to represent the civilian noninstitutional population: that is, all persons aged 16 and over, residing in the fifty states and the District of Columbia, not on active duty in the Armed Forces, and not living in institutions (for example, a correctional institution or residential nursing or mental health care facility). The sample is a State-based design, with one-fourth of the households changed each month so that no household is interviewed for more than 4 consecutive months.

Households are interviewed for four consecutive months, are out of the sample for the next eight, then return to the sample for the same four calendar months a year later. Respondents are interviewed to obtain information about each member of the household 15 years of age and older in the reference week that usually includes the 12th of the month. The responses are used to publish data on those aged 16 and over.

The CPS provides the official employment and unemployment estimates for the nation as a whole. In addition, it provides national data on earnings, hours of work, and other statistics. These estimates are available by a variety of demographic characteristics including age, sex, race, marital status, and educational attainment. Also, data are available by occupation, industry, and class of worker. CPS Supplemental surveys collect data on a variety of topics including school enrollment, income, previous work experience, health insurance, volunteers, food security, and veterans.

CPS data are used by government policymakers and legislators as important indicators of our nation's economic situation and for planning and evaluating many government programs. They are also used by the media, students, academics, and the general public.

The CPS sample is too small to provide official monthly labor force estimates for individual states and other geographic areas. Monthly CPS employment and unemployment estimates serve as the primary input to LAUS models which generate monthly official estimates for census divisions, States, and selected substate areas. In addition, CPS estimates of all-other employment, agricultural employment, and entrant unemployment are used in the estimation for some substate areas.

Background

The Current Population Survey grew out of a program set up to provide direct measurement of monthly unemployment, a problem that became especially pressing during the Great Depression of the 1930s.

The Enumerative Check Census, taken as a part of the 1937 unemployment registration, was the first attempt to estimate unemployment on a nationwide basis using probability sampling. In addition, during the latter half of the 1930s, the research staff of the Work Projects Administration (WPA, known prior to 1939 as the Works Progress Administration) began developing techniques for measuring unemployment—first on a local-area basis and then nationally. This research and experience led to the Sample Survey of Unemployment, which the WPA began as a monthly activity in March 1940.

In August 1942, responsibility for the Sample Survey of Unemployment was transferred to the Bureau of the Census, and its title was changed to The Monthly Report on the Labor Force. In 1948, the survey was renamed as the Current Population Survey. BLS assumed responsibility for its publication and analysis in 1959.

The CPS is the oldest continuous household survey in the world. It has been regularly revised and updated to keep pace with statistical and technological advances. Improvements in the identification of households covered in the sample, sample design, methodology, and estimation procedures have been paired with modifications to the questionnaire and interview process to ensure increased reliability and efficiency. In 1957, the Bureau of the Census began seasonally adjusting selected CPS data series with its X-11 model. In January 1989 the X-11 model was updated to the X-11 Auto-Regressive Integrated Moving Average (ARIMA) method, and it was updated to the X-12 ARIMA method in January 2003. The latest version, X-13ARIMA-SEATS, was released July of 2012.

In response to a need for more data at the subnational level, the 1970s saw a series of State supplementary sample expansions to the CPS which, at that time, employed a national sample design. The expansions was recognized as inefficient ways of developing State estimates. In 1985, the national-based design was changed to a State-based sampling design. This design required that annual average State estimates fall within specified levels of reliability, while not adversely affecting the reliability of national estimates.

Important technological advances in data collection have also been implemented. In 1994, computer assisted telephone interviewing (CATI) and computer assisted personal interviewing (CAPI), along with a new questionnaire design, were phased in to aid in the collection and reliability of the data.

In September 2000, the Census Bureau began augmenting the monthly CPS sample in 31 states and the District of Columbia, as one part of the Census Bureau's plan to meet the requirements to produce certain estimates for the State Children's Health Insurance Program (SCHIP). States were identified for sample supplementation based on the standard error of their March estimate of low-income children without health insurance. The additional 10,000 households were added to the sample over a 3-month period. Thus, starting with July 2001 data, official labor force estimates from the CPS and Local Area Unemployment Statistics (LAUS) program reflected the expansion of the monthly CPS sample from about 50,000 to about 60,000 eligible households.

Survey Process

The CPS survey process consists of three main phases: sampling, data collection, and estimation.

Sampling involves (1) the determination, stratification, and selection of a sample of Primary Sampling Units (PSUs) and (2) the selection of sample households within those PSUs.

Data collection involves interviewers asking households about activities during the reference week, which is the week that contains the 12th day of the month. Labor force questions are usually completed for each household member 15 years of age and over. BLS determines the labor force status for each household member for the month using the information captured in the questionnaires.

Estimation is the process of taking sample data and making estimates for the population as a whole. Estimation involves a number of steps including data editing and imputation, basic weighting, non-interview adjustment, ratio adjustment, compositing of estimates, and seasonal adjustment.

CPS Labor Concepts and Definitions

In the CPS, persons are classified as "employed," "unemployed," or "not in the labor force." These classifications are mutually exclusive and based on a person's labor force status during the survey reference week (usually the week including the 12th of the month). Each person is classified according to the activities he or she engaged in during the reference week, as defined by the set of questions in the survey. Respondents are never asked specifically if they are unemployed, nor are they given any opportunity to decide their own labor force status. Interviewers do not determine a person's labor force status. They simply ask the series of questions and record the answers. (See Table 2-1 for the questions used to classify an individual as employed or unemployed.)

Because the CPS is a household-based survey, it counts each person only once, at their place of residence, even if they hold more than one job. It produces an unduplicated count of employed and unemployed persons. In contrast, the Current Employment Statistics (CES) survey is establishment-based and designed to produce counts of the number of jobs in the economy. Persons holding more than one job would be counted more than once. Since the LAUS program uses CPS concepts that reflect resident employed, adjustment must be made to make the CES data reflect a residency basis. (See section on Dynamic Residency Ratios.)

Labor Force

The primary purpose of the CPS is to classify the civilian noninstitutional population aged 16 years and over into one of three groups: employed, unemployed, or not in the labor force. Other information collected includes hours worked, occupation, and industry and related aspects of the working population. It should be noted that the major labor force categories are defined hierarchically and are mutually exclusive. Employed supersedes unemployed which supersedes not in the labor force. For example, individuals who are classified as employed, even if they worked less than full time, are not asked the questions about having looked for work, and hence cannot also be classified as unemployed. Similarly, an individual who is classified as unemployed is not asked the questions used to determine one's primary non-labor market activity. For instance, retired persons who are currently working are classified as employed, even though they have retired from their previous jobs. Consequently, they are not asked the questions about their previous employment nor can they be classified as retired.

The concepts and definitions underlying the collection and estimation of the labor force data are presented below.

Reference week: The CPS labor force questions ask about labor market activities for one week each month. This week is referred to as the "reference week." The reference week is defined as the 7-day period, Sunday through Saturday, that includes the 12th of the month. (On occasion, the reference week in November and December may be the week including the 5th of the month, to facilitate data collection during the holiday period.)

Civilian Noninstitutional Population (CNP): This includes all persons 16 years of age and older residing in the 50 states and the District of Columbia who are not inmates of institutions

(e.g. penal and mental facilities, and homes for the aged) and who are not on active duty in the Armed Forces. This is the base population used in the calculation of labor force statistics.

Employed persons: This includes all persons who, during the reference week, (a) did any work at all (at least 1 hour) as paid employees; worked in their own business, profession, or on their own farm; or who worked 15 hours or more as unpaid workers in an enterprise operated by a member of the family, or (b) were not working, but had jobs or businesses from which they were temporarily absent because of vacation, illness, bad weather, childcare problems, maternity or paternity leave, labor-management dispute, job training, or other family or personal reasons, whether or not they were paid for the time off or were seeking other jobs.

Each employed person is counted only once, even if he or she holds more than one job. Multiple jobholders are counted in the job at which they worked the greatest number of hours during the reference week. (See the discussion of multiple jobholders below.)

Included in the total are employed citizens of foreign countries who are residing in the United States and do not live on the premises of an embassy. Excluded are persons whose only activity consisted of unpaid work around their own home (such as housework, painting, repairing, etc.) or volunteer work for religious, charitable, or similar organizations.

The initial survey question, asked only once for each household, inquires whether anyone in the household has a business or farm. Subsequent questions are asked for each household member to determine whether any of them did any work for pay (or profit if there is a household business) during the reference week. If no work for pay or profit was performed and a family business exists, respondents are asked whether they did any unpaid work in the family business or farm. (See Table 2-0 for the questions used to classify an individual as employed.)

Multiple jobholders: This group includes all persons who, during the reference week, had either two or more jobs as a wage and salary worker, were self-employed and also held one or more wage and salary jobs, or worked as an unpaid family worker and also held one or more wage and salary jobs. A person employed only in private households (cleaner, gardener, baby-sitter, etc.) is not counted as a multiple jobholder, even if that person works for more than one employer. Working for several employers is considered an inherent characteristic of private household work. Also excluded are self-employed persons with multiple unincorporated businesses and persons with multiple jobs as unpaid family workers.

Since 1994, CPS respondents have been asked questions each month to identify multiple jobholders. First, all employed persons are asked “Last week, did you have more than one job (or business, if one exists), including part-time, evening, or weekend work?” Those who answer “yes” are then asked, “Altogether, how many jobs (or businesses) did you have?” Prior to 1994, this information had only been available through periodic CPS supplements.

Hours of work: Beginning with the CPS redesign in January 1994, both actual and usual hours of work have been collected. Prior to the redesign, only individuals who actually worked less than 35 hours in the reference week were asked how many hours they usually worked. All individuals who were at work 35 hours or more were automatically classified as full-time, regardless of the number of hours they usually work. In the revised CPS all respondents are

first asked how many hours they usually work, and are then asked in subsequent questions about their actual hours.

Published data on hours of work relate to the actual number of hours spent "at work" during the reference week. For example, persons who normally work 40 hours a week, but were off on the Veterans' Day holiday, would be reported as working 32 hours, even though they were paid for the holiday. For persons working in more than one job, the published figures relate to the number of hours worked on all jobs during the week.

Data on persons "at work" exclude employed persons who were absent from their jobs during the entire reference week for reasons such as vacation, illness, or industrial dispute. Data also are available on usual hours worked by all employed persons, including those who were absent from their jobs during the reference week.

At work part time for economic reasons: Sometimes referred to as involuntary part-time work, this category refers to individuals who gave an economic reason for working 1 to 34 hours during the reference week. Economic reasons include slack work or unfavorable business conditions, inability to find full-time work, and seasonal declines in demand. Those who usually work part time must also indicate that they want and are available to work full time to be classified as being part time for economic reasons.

At work part time for noneconomic reasons: This group includes those persons who usually work part time and were at work 1 to 34 hours during the reference week for a noneconomic reason. Noneconomic reasons include illness or other medical limitation, childcare problems or other family or personal obligations, school or training, retirement or Social Security limits on earnings, and being in a job where full-time work is less than 35 hours. The group also includes those who gave an economic reason for usually working 1 to 34 hours but said they do not want to work full time or were unavailable for such work.

Usual full- or part-time status: In order to differentiate a person's normal schedule from his/her activity during the reference week, persons are also classified according to their usual full- or part-time statuses. In this context, full-time workers are those who usually work 35 hours or more (at all jobs combined). This group includes some individuals who worked less than 35 hours in the reference week—for either economic or noneconomic reasons—as well as those who are temporarily absent from work. Similarly, part-time workers are those who usually work less than 35 hours per week (at all jobs), regardless of the number of hours worked in the reference week. This may include some individuals who actually worked more than 34 hours in the reference week, as well as those who were temporarily absent from work. The full-time labor force consists of employed persons who usually work full time and unemployed persons who are either looking for full-time work or are on layoff from full-time jobs. The part-time labor force consists of employed persons who usually work part time and unemployed persons who are seeking or are on layoff from part-time jobs.

Prior to 1994, persons who worked full time during the reference week were not asked about their usual hours. Rather, it was assumed that they usually worked full time, and they were classified as full-time workers.

Occupation, industry, and class-of-worker: For the employed, this information applies to the job held in the reference week. A person with two or more jobs is classified according to the job where he or she worked the greatest number of hours. An unemployed person is classified according to their last job.

The class-of-worker classification assigns workers to one of the following categories: wage and salary worker, self-employed worker, or unpaid family worker. Wage and salary workers are those who receive wages, salary, commissions, tips, or pay in kind from a private employer or from a government unit. The class-of-worker question also includes separate response categories for "private for-profit company" and "nonprofit organization" to further classify private wage and salary workers.

Self-employed persons are those who work for profit or fees in their own businesses, professions, trades, or farms. Only the unincorporated self-employed are included in the self-employed category since those whose business are incorporated technically are wage and salary workers because they are paid employees of a corporation.

Unpaid family workers are persons working without pay for 15 hours a week or more on a farm or in a business operated by a member of the household to whom they are related by birth or marriage.

Occupation, industry, and class-of-worker on second job: The occupation, industry, and class-of-worker information for individuals' second jobs is collected in order to obtain a more accurate measure of multiple jobholders, to obtain more detailed information about their employment characteristics, and to provide information necessary for comparing estimates of number of employees in the CPS and in the BLS establishment survey (the Current Employment Statistics).

For the majority of multiple jobholders, data on occupation, industry, and class-of-worker for the second jobs are collected only from a quarter of the sample—those in their fourth or eighth monthly interviews. However, for those classified as "self employed unincorporated" on their main job, class-of-worker of the second job is collected each month. This is done because individuals who are self-employed unincorporated on both jobs are not considered multiple jobholders.

Earnings: Information on what people earn at their main job is collected only for those who are receiving their fourth or eighth monthly interview. This means that earnings questions are asked of only one-fourth of survey respondents. Respondents are asked to report their usual earnings before taxes and other deductions and to include any overtime pay, commissions, or tips usually received. The term "usual" means as perceived by the respondent. If the respondent asks for a definition of "usual", however, interviewers are instructed to define the term as more than half the weeks worked during the past 4 or 5 months. Respondents may report earnings in the time period they prefer—for example, hourly, weekly, biweekly, monthly, or annually. (Based on additional information collected in the interview, earnings reported on a basis other than weekly are converted to a weekly amount in later processing.) Data are collected for wage and salary workers, excluding the self-employed who respond that their businesses were incorporated. Earnings data are used to construct estimates of the

distribution of usual weekly earnings and median earnings. Individuals who do not report earnings on an hourly basis are asked if they are, in fact, paid at an hourly rate and if so, what the hourly rate is. The earnings of those who reported hourly and those who are paid at an hourly rate are used to analyze the characteristics of hourly workers, for example, those who are paid the minimum wage.

Unemployed persons: All persons who were not employed during the reference week but were available for work (excluding temporary illness) and had made specific efforts to find employment some time during the 4-week period ending with the reference week are classified as unemployed. Individuals who were waiting to be recalled to a job from which they had been laid off need not have been looking for work to be classified as unemployed.

A relatively minor change was incorporated into the definition of unemployment with the implementation of the 1994 redesign. Under the former definition, persons who volunteered that they were waiting to start a job within 30 days (a very small group numerically) were classified as unemployed, whether or not they were actively looking for work. Under the new definition, by contrast, people waiting to start a new job must have actively looked for a job within the last 4 weeks in order to be counted as unemployed. Otherwise, they are classified as not in the labor force.

As the definition indicates, there are two ways people may be classified as unemployed. They are either looking for work (job seekers) or they have been temporarily separated from a job (persons on layoff). Job seekers must have engaged in active job search during the last 4-week period in order to be classified as unemployed. Active methods are defined as job search methods that have the potential to result in a job offer without any further action on the part of the job seeker. Examples of active search methods include going to any employer directly or to a public or private employment agency, seeking assistance from friends or relatives, placing or answering ads, or using some other active method. Other active methods include being on a union or professional register, obtaining assistance from a community organization, or waiting at a designated labor pickup point. Passive methods, which do not qualify as job search, include reading (as opposed to answering or placing) "help wanted" ads and taking a job training course. The response categories for active and passive methods are clearly delineated in separately labeled columns on the interviewers' computer screens.

Job search methods are identified by the following questions: "Have you been doing anything to find work during the last 4 weeks?" and "What are all the things you have done to find work during the last 4 weeks?" To ensure that respondents report all of the methods of job search used, interviewers ask "Anything else?" after the initial or subsequent job search method is reported.

A large number of people use the Internet to look for work. This may influence the types of responses CPS interviewers receive to the question "What are all the things you have done to find work during the last 4 weeks?" It is important to note that the Internet is a tool used to find work, similar to a phone, a bulletin board, or postal mail. The use of the Internet, itself, does not constitute a job search activity. In order to adequately categorize answers to the job search question, CPS interviewers are trained to focus on what the respondent did on the Internet to look for work. Many of the answers that interviewers receive about job search activities will be

classified the same regardless of whether the activities were conducted over the Internet, in person, or some other way. For example, if a respondent reports that he or she submitted an application online, it does not matter that the activity was done on the Internet; it still should be classified as "Sent out resumes/filled out applications." Similarly, browsing job ads on an Internet website is the same as looking through job ads in a printed newspaper. Both should be classified as "Looked at ads."

Use of the Internet presents unique challenges when coding respondents' answers to this question. In particular, the Internet offers a wide variety of methods for interacting with potential employers and researching available jobs. These methods can be referred to by many names that may change over time. Today, people email, tweet, post, update, or submit. Next month or next year, different terms may be used. Additional instructions are provided to CPS interviewers to address some of these challenges.

Persons on "layoff" are defined as those who have been separated from a job to which they are waiting to be recalled (i.e., their layoff status is temporary). In order to measure layoffs accurately, the questionnaire determines whether people reported to be on layoff did in fact have an expectation of recall; that is, whether they had been given an indication that they would be recalled within the next 6 months. As previously mentioned, persons on layoff need not be actively seeking work to be classified as unemployed.

See Table 2-0 for the questions used to classify an individual as unemployed.

Reasons for unemployment: Unemployed individuals are categorized according to their status at the time they became unemployed. The categories are:

1) *Job losers*: a group comprised of (a) persons on temporary layoff from a job to which they expect to be recalled and (b) permanent job losers, whose employment ended involuntarily and who began looking for work.
2) *Job leavers*: persons who quit or otherwise terminated their employment voluntarily and began looking for work.
3) *Persons who completed temporary jobs*: persons who began looking for work after their job ended.
4) *Reentrants*: persons who previously worked but were out of the labor force prior to beginning their job search.
5) *New entrants*: persons who never worked before and who are entering the labor force for the first time.

Each of these five categories of unemployed can be expressed as a proportion of the entire civilian labor force or as a proportion of the total unemployed.

Prior to 1994, new entrants were defined as job seekers who had never worked at a full-time job lasting 2 weeks or longer; reentrants were defined as job seekers who had held a full-time job for at least 2 weeks and had then spent some time out of the labor force prior to their most recent period of job search. These definitions have been modified to encompass any type of job, not just a full-time job of at least 2 weeks duration.

Duration of unemployment: The duration of unemployment is expressed in weeks. For individuals who are classified as unemployed because they are looking for work, the duration of unemployment is the length of time (through the current reference week) that they have been looking for work. For persons on layoff, the duration of unemployment is the number of full weeks (through the reference week) they have been on layoff.

Not in the labor force: Included in this group are all persons in the civilian noninstitutional population who are neither employed nor unemployed. Information is collected on their desire for and availability to take a job at the time of the CPS interview, job search activity in the prior year, and reason for not looking in the 4-week period prior to the survey week. This group includes *discouraged workers*, defined as persons not in the labor force who want and are available for a job and who have looked for work sometime in the past 12 months (or since the end of their last job if they held one within the past 12 months), but are not currently looking, because they believe there are no jobs available or there are none for which they would qualify. (Specifically, the main reason identified by discouraged workers for not recently looking for work is one of the following: Believes no work available in line of work or area; could not find any work; lacks necessary schooling, training, skills, or experience; employers think too young or too old; or other types of discrimination.)

Data on a larger group of persons outside the labor force, one that includes discouraged workers as well as persons who desire work but give other reasons for not searching (such as childcare problems, family responsibilities, school, or transportation problems) are also published regularly. This group is made up of persons who want a job, are available for work, and have looked for work within the past year but not during the last 4 weeks. This group is generally described as having some marginal attachment to the labor force.

Prior to January 1994, questions about the desire for work among those who were not in the labor force were asked only of a quarter of the sample. Since 1994, these questions have been asked of the full CPS sample. Consequently, since 1994, estimates of the number of discouraged workers as well as those with a marginal attachment to the labor force are published monthly rather than just quarterly.

Associated labor measures: Estimates of the number of employed and unemployed are used to construct a variety of measures. They include:

- *Labor force*: The labor force consists of the all persons 16 years of age and older classified as employed or unemployed in accordance with the criteria described above.
- *Unemployment rate*: The unemployment rate represents the number of unemployed as a percentage of the labor force.
- *Labor force participation rate*: The labor force participation rate is the proportion of the age-eligible population that is in the labor force.
- *Employment-population ratio*: The employment-population ratio represents the proportion of the age-eligible population that is employed.

Table 2-0. The CPS Survey Questionnaire for Employed and Unemployed

1. Does anyone in this household have a business or a farm?

2. LAST WEEK, did you do ANY work for (either) pay (or profit)?

   Parenthetical filled in if there is a business or farm in the household. If 1 is "yes" and 2 is "no", ask 3. If 1 is "no" and 2 is "no", ask 4.

3. LAST WEEK, did you do any unpaid work in the family business or farm?

   If 2 and 3 are both "no", ask 4.

4. LAST WEEK, (in addition to the business) did you have a job, either full or part-time? Include any job from which you were temporarily absent.

   Parenthetical filled in if there is a business or farm in the household.

   If 4 is "no", ask 5.

5. LAST WEEK, were you on layoff from a job?

   If 5 is "yes", ask 6. If 5 is "no", ask 8.

6. Has your employer given you a date to return to work?

   If "no", ask 7.

7. Have you been given any indication that you will be recalled to work within the next 6 months?

   If 1 is "no", ask 8.

8. Have you been doing anything to find work during the last 4 weeks?

   If "yes", ask 9.

9. What are all of the things you have done to find work during the last 4 weeks?

Employed classification: Individuals are classified as employed if they answered "yes" to question 2, or 3, or 4. For question 3, the individual must have worked 15 hours or more in the reference week or receive profits from the business/farm).

Unemployed classification: Individuals who are available to work are classified as unemployed, if they answered "yes" to either question 5, 6, or 7, or if they say "yes" to 8 and provide a job search method that could have brought them into contact with a potential employer.

Reliability of CPS Estimates

Because a survey is subject to nonsampling and sampling error, one cannot be a 100 percent confident of the accuracy of the estimate, but one can estimate the likely error in a probability sense. The larger the error the less reliable the estimate. The opposite is also true.

Nonsampling error can be attributed to many sources such as coverage, collection, and measurement errors. A well designed and conducted survey minimizes these errors, but they cannot be eliminated a 100 percent. (Such errors can occur with a census as well.)

Sampling error occurs because only a sample of the population has been surveyed. Standard errors can be estimated when the probability of selection of each member of a population can be specified. These standard errors can be used to compute confidence intervals that indicate the range within which the true population values likely lie.

Nonsampling Error

The full extent of nonsampling error is unknown, but special studies have been conducted to quantify some sources of nonsampling error in the CPS. The effect of the errors have been found to be small on estimates of change, such as month-to-month change; however, estimates of monthly levels are generally more severely affected.

Some specific types of nonsampling errors affecting the CPS include response error, nonresponse error, error in independent population controls, processing error, and coverage error.

Response Error: This error arises when respondent answers are incomplete (item nonresponse) or inconsistent. It includes the inability to obtain information about all persons in the sample, differences in the interpretation of questions, inability or unwillingness of respondents to provide correct information, and inability to recall information. These errors are studied by means of a reinterview program: a random sample of each interviewer's work is inspected through reinterview at regular intervals. This program is used to estimate various sources of error as well as to evaluate and control the work of the interviewer. Results indicate that the data published from the CPS are subject to moderate systematic biases.

Nonresponse Error: This error arises in situations when respondents fail to answer some or all of the questions. In a typical month, about 10 percent of occupied sample households are not interviewed because residents are not at home, refuse to cooperate, or are unavailable. Therefore, sample weights are adjusted to account for households not interviewed. To the extent that interviewed households differ from those not interviewed, the estimates are biased. Similarly, for relatively few households, some questions are left unanswered, either because respondents were unable or unwilling to answer or because of interviewer error. Entries for omitted items are usually imputed on the basis of the distributions of these items for persons of similar demographic characteristics.

Independent Population Controls: These are used to account for population changes in intercensal and post-censal years. They are extrapolated from the most recent prior decennial Census using data on births, deaths, and net migration. Although the use of independent population estimates in the estimation procedure substantially improves the statistical reliability of many CPS estimates, the independent estimates are also subject to error in both the base and the change factors. Base errors may arise in the decennial Census because of the under-enumeration of certain population groups or errors in age-reporting. Also, errors in estimated components of change since the base period of the Census affect the accuracy of intercensal and post-censal population estimates.

Processing Error: Although the CPS employs computer-assisted interviewing and a quality control program on coding and all other phases of data processing, some processing error is inevitable in large surveys. Net CPS processing error is probably negligible relative to sampling error and other nonsampling errors.

Coverage Error: Under-coverage in the CPS results from missed housing units and missed persons within sample households. The CPS covers about 92 percent of the decennial census population. It is known that CPS under-coverage varies with age, sex, race, and Hispanic origin. Generally under-coverage is larger for men than for women and larger for non-whites than for whites. Ratio-adjustment to independent age-sex-race-origin population controls, described later in the Estimation section, partially corrects for the biases due to survey under-coverage. However, biases exist in the estimates to the extent that missed persons in missed households or missed persons in interviewed households have different characteristics than interviewed persons in the same age-sex-race-origin group.

Sampling Error

When a sample, rather than the entire population, is surveyed, estimates differ from the true population values that they represent. The component of this difference that occurs because samples differ by chance is known as sampling error, and its variability is measured by the standard error of the estimate. When sample estimates from a given survey design are unbiased, the sample estimate and its standard error can be used to construct confidence intervals that contain the true population value being measured with known probabilities.

Theoretically, assuming unbiasedness, probability statements about confidence intervals are accurate in the context of repeated sampling. Using 90% confidence as an example, if an unbiased sampling and estimation process were repeated many times, then approximately 90% of confidence intervals generated from that process would contain the true population value. For a more complete explanation of confidence interval coverage refer to a standard survey methodology text, such as Chapter 1.7 in the 3rd Edition of Sampling Techniques by William G. Cochran (Wiley, 1977).

Examples of 90% and 95% confidence intervals are given below.

$\hat{x}$ = any sample estimate, such as level, rate, average, median, change over time, etc.

$se\left(\hat{x}\right)$ = estimated standard error of sample estimate $\hat{x}$

Then 90% and 95% confidence intervals, respectively, are calculated as

$$\left(\hat{x}-1.645*se\left(\hat{x}\right),\hat{x}+1.645*SE\left(\hat{x}\right)\right)$$

$$\left(\hat{x}-1.96*se\left(\hat{x}\right),\hat{x}+1.96*se\left(\hat{x}\right)\right)$$

BLS analyses are generally conducted at the 90-percent level of confidence

From the theoretical background, a practical interpretation follows: Given a 90% confidence interval, there is an approximate 90% chance that the interval contains the true population value. Since repeated sampling is unfeasible and the true population value is unknown, the practical interpretation of a confidence interval is reasonable for most CPS estimates, particularly over-the-month changes, which are less impacted by known bias and other nonsampling errors. The practical interpretation for the 95% (or any other confidence level) is analogous.

For estimates of change, such as over-the-month or over-the-year, confidence intervals can be used to assess if two estimates are significantly different. Small differences relative to an estimate's standard error are considered insignificant, since they may have arisen due to sampling error and not real change. If zero is included in a confidence interval of change, the change is considered insignificant at the given confidence level. If zero is not included, the change is considered significant at the given confidence level.

Standard error tables for national estimates are provided in the monthly publication *Employment and Earnings*, with State and Regional estimates provided on the LAUS website.

CPS Monthly and Annual Reliability Criterion

Data reliability is measured by calculating the coefficient of variation (CV) of the unemployment level; the CV is defined as the standard error of the estimate divided by the estimate itself. The CPS sample design takes into consideration both national and State reliability. The sample design, including the CHIP expansion, maintains a CV of 1.9 percent or better on national monthly estimates of unemployment level. An unemployment rate of 6 percent is assumed. This means a month-to-month change in the unemployment rate must be at least 0.2 percentage points to be considered statistically significant at a 90-percent confidence level.

For each of the 50 states and for the District of Columbia, the design maintains a CV of 8 percent or less on the annual average estimate of unemployment level, again assuming a 6 percent unemployment rate. Due to the national reliability criterion, samples for the more

populous States are substantially larger than the State design criterion requires. As a result, annual average unemployment estimates for large States such as California, Florida, New York, and Texas, for example, carry a CV of less than 5 percent.

Sample Design

Introduction

The CPS sample design has undergone several changes throughout its history. After each decennial census, the sample is redesigned and a new sample selected. Most changes are made to improve the efficiency of the sample design, increase the reliability of the sample estimates, or control cost. The current CPS sample is designed to produce reliable monthly unemployment estimates for the nation and reliable annual average estimates for the 50 States and the District of Columbia.

In the first stage of sampling, Primary Sampling Units (PSUs) are chosen to represent each state. In the second stage, Ultimate Sampling Unit (USU) clusters, composed of about four housing units each, are selected. Sample sizes and sampling rates are determined by the predetermined reliability requirements. While the best estimates of month-to-month change would be obtained by surveying the same households each month, indefinitely surveying a single sample of households would inevitably lead to respondent "fatigue," increasing the probability of respondent refusals and errors. Therefore, a sample rotation scheme is used, with chosen households interviewed for eight months.

Selection of Primary Sampling Units (First Stage of Sampling)

The entire area of the United States, consisting of all counties and independent cities, is divided into 1,987 PSUs from which 852 are ultimately selected. Each PSU consists of a county or group of contiguous counties and is defined within State boundaries.

Metropolitan areas within a State are used as a basis for forming many PSUs. Outside of metropolitan areas, two or more counties are normally combined to form PSUs except where the geographic area of the sample county is too large. Combining counties to form a PSU provides greater heterogeneity; a typical PSU includes urban and rural residents of both high and low economic levels, and encompasses, to the extent feasible, diverse occupations and industries. Another important consideration is that the PSU be sufficiently compact so that, with a small sample spread throughout, it can be efficiently canvassed without undue travel cost.

Stratification and Selection of Primary Sampling Units

PSUs are separated into strata within each State. Some PSUs are self-representing and the others are non-self-representing. Nationally, there are 506 self-representing PSUs that are generally the most populous PSUs in each State. All the self-representing PSUs are included in the CPS sample.

Nationally, there are 346 non-self-representing PSUs. Stratas are formed within states by combining two or more of the remaining PSUs that are similar in such characteristics as unemployment, proportion of housing units with three or more persons, number of persons employed in various industries, and average monthly wages for various industries. One PSU is selected to represent each stratum. The single PSU is called a non-self-representing PSU

because it represents not only itself but all PSUs within the stratum. The probability of selecting a particular PSU in a non-self-representing stratum is proportional to its 2010 population. For example, within a stratum, the chance that a PSU with a population of 50,000 would be selected for the sample is twice that for a PSU having a population of 25,000.

The sample of 852 PSUs will be kept for up to 10 years, the lifetime of the 2010 sample design. Modifications to sampling procedures are made so that if needed PSUs can be restratified and resampled before the end of the design.

Selection of Households Using Census Data

Because the sample design is State-based, the sampling ratios differ by State and depend on State population sizes as well as national and State reliability requirements. The State sampling ratios range roughly from 1 in every 200 households to 1 in every 3,000 households. For example, if the state sampling ratio is 1/3,000 then that is the ratio used to select housing units in self-representing PSUs. However for a non-self-representing PSU sampled with probability1/2, the ratio used to select housing units in that PSU would be 1/1,500 (1/3000 = ½ x 1/1500).

Housing units for the 2010 redesign were selected from the continually updated Master Address File. American Community Survey (ACS) block data were used to sort and stratify the housing units in the Master Address File. Normally, census blocks are bounded by streets and other prominent physical features such as rivers or railroad tracks. County, minor civil division (MCD), and census place limits also serve as block boundaries. In cities, blocks can be bounded by four streets and be quite small in land area. In rural areas, blocks can be several square miles in size.

For purposes of sample selection, housing units are separated into two frames, a unit frame and a group quarters frame. The unit frame mostly contains "regular" housing units with addresses that are easy to locate (e.g., most single family homes, townhouses, condominiums, apartment units, and mobile homes). The group quarters frame contains housing units where residents share common facilities or receive formal or authorized care or custody.

These frames are then sampled using sampling intervals which preserve each individual State's sampling ratio. To reduce the variability of the survey estimates and to ensure that the within-PSU sample reflects the demographic and socioeconomic characteristics of the PSU, blocks within the unit frame and group quarters frame are sorted using geography and block-level data from the ACS. Examples of the variables used for sorting include proportion of minority renter-occupied housing units, proportion of housing units with female householders, and proportion of owner-occupied housing units.

By grouping, sorting housing units by block, and systematically sampling within blocks, the sampling process insures that the ultimate sampling units (USUs) selected within the PSU reflect the demographic and socio-economic characteristics of the PSU as a whole. This design reduces the within-PSU variance, compared to the variances associated with a simple random sample of units within the PSU.

For 2010 sample design unit frame, sampling of housing units from the master address file occurs annually for the unit frame and for the group quarters frame the sample is selected 3 years at the time. This is a departure from previous designs where a sample was selected to last ten years that was subsequently supplemented by new construction samples. A housing unit selected by any demographic survey conducted by census will not be available for selection by a subsequent survey until 5 years after its last interview.

CPS State Sample Sizes and Sampling Ratios

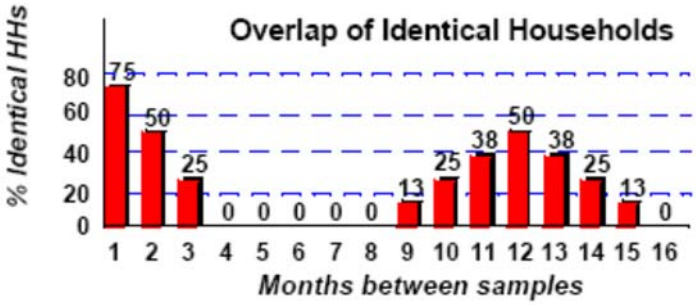
The CPS sample of housing units is selected from within the PSUs identified above. The CPS has a State-based sample design which allocates the sample in such a way that each of the States and the District of Columbia has the same minimum target reliability on their annual average estimates. A national reliability criterion is also set. Because the sample design is State-based, the sampling ratio differs by State and depends on the various demographic characteristics of each State. The State sampling ratios vary from approximately 1 in every 200 to 1 in every 3,000 households in each stratum of the State. In determining sample size, a number of factors are taken into account including population density, average household size, and variance in the unemployment rate across areas in the State.

The probability design of the CPS is self-weighting, meaning that each housing unit in a State is given an equal chance of selection. The sampling ratio used within a sample PSU depends on the probability of selection of the PSU and the sampling ratio for each State. In a sample PSU with a probability of selection of 1 in 10 and a state sampling ratio of 1 in 3,000, a within-PSU sampling ratio of 1 in 300 achieves the desired overall ratio of 1 in 3,000 for the stratum.

4-8-4 Sample Rotation

The best estimates of month-to-month change would be obtained from 100-percent sample overlap, surveying the same households every month. However, indefinitely surveying a single sample of households would lead to respondent “fatigue” or “exhaustion” and the increasing the probability of refusals and respondent errors.

Therefore, part of the sample is changed each month. Each monthly sample is divided into eight representative panels, or rotation groups. A given rotation group is interviewed for a total of 8 months, divided into two equal periods. It is in the sample for 4 consecutive months, leaves the sample during the following 8 months, and then returns for another 4 consecutive months. This is called a 4-8-4 panel rotation pattern. In any one month, one of the eight rotation groups is in the first month of enumeration, another rotation group is in the second month, and so on. Under this system, 75 percent of the sample is common from month to month and 50 percent from year to year for the same month. (See following chart.) This procedure provides a substantial amount of month-to-month and year-to-year overlap in the sample, thus providing better estimates of change and reducing discontinuities in the series of data without burdening any specific group of households with an unduly long period of inquiry. However, the overlap creates a correlated error which must be taken into account in the State-estimation modeling process. (See Chapter 6.)


Overlap of Identical Households
% Identical HHs
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0 0 0 0 0
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13
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Months between samples

Data Collection

The housing units which belong to the selected USUs (Ultimate Sampling Units) are called "designated" households. The list of designated households is a preliminary list of potential addresses to be sampled. Nationally, there are approximately 70,000 designated households on this list. This list of designated household units is then refined by subtracting housing units that have been demolished, converted to business use, relocated, or are in the sample by mistake (i.e., units are nonresidential). The result of this refining process is a list of about 72,000 "assigned" households.

This group of assigned households undergoes further refinement when interviewers canvas the areas removing vacant housing units, vacant sites for tents or mobile homes, units occupied by persons with usual residence elsewhere, or units converted to temporary nonresidential use. These are called "Type B" noninterviews. An additional noninterview type, "Type C", occurs when the CPS collector finds a building demolished, converted to permanent nonresidential use, or moved from a site.

The remaining households are called "eligible" households. These are occupied by one or more persons in scope to the CPS. There are approximately 60,000 eligible households nationally.

CPS data are collected each month during the week containing the 19th day of the month. Respondents are asked about their labor force activity for the entire preceding week—the week containing the 12th. A week is defined as Sunday through Saturday. The data are collected by approximately 1,500 interviewers.

Personal visits are preferred in the first month in which the household is in the sample. In other months, the interview generally is conducted by telephone. Approximately 70 percent of the households in any given month are interviewed by telephone. A portion of the households (10 percent) is interviewed via computer-assisted telephone interviewing (CATI), from three centralized telephone centers (located in Hagerstown, MD; Jeffersonville, IN; and Tucson, AZ) by interviewers who also use a computerized questionnaire.

On the first visit, the interviewer prepares a roster of the household members and completes a questionnaire for each person 15 years of age and older. The roster is updated with each visit. The interviewer does not ask directly if the person is employed, unemployed, or not in the labor force because of potential bias from the different interpretations these terms might have. Instead, a series of questions are asked that allow a basic assignment to one of these three categories to be made. A Computer Assisted Personal Interview (CAPI) is conducted by the interviewers during each visit. Each interviewer has a laptop computer with a computerized version of the CPS questionnaire. When the interviewer has completed a day's interviews, the data are transmitted to the Census Bureau's central computer in Washington, D.C. Once files are transmitted to the main computer, they are deleted from the laptops.

Of the 60,000 eligible households, about 10 percent are not interviewed in a given month due to temporary absence (vacation, for example) of the occupants, other failures to make contact after repeated attempts, inability of persons contacted to respond, unavailability for other reasons,

and refusals to cooperate (about half of the noninterviews). Information is obtained each month for about 55,000 housing units and 105,000 persons 16 years of age or older.

Training and Quality Control

Because of the crucial role interviewers have in the household survey, a great amount of time and effort is spent maintaining the quality of their work. Interviewers are given intensive training, including classroom lectures, discussion, practice, observation, home-study materials, and on-the-job training. At least once a year, they convene for daylong training and review sessions, and, also at least once a year, they are accompanied by a supervisor during a full day of interviewing to determine how well they carry out their assignments.

The data collection technology and the questionnaire provide an opportunity to build functions to assist and improve data quality into the system itself. For instance, computer-aided interview technology guides an interviewer through complex questions: previous answers are used to eliminate further questions that would elicit extraneous or impossible answers. Built-in range checks for responses alert interviewers to possible inaccuracies.

Quality control procedures for the CPS are extensive, with more than 20 percent of the CPS budget spent on training and quality control. The procedures include extensive data checking and editing of the raw data by Census staff. Using information from the completed questionnaire as well as additional comments provided by the interviewer in "real-time" comments file stored in the computer, the Census Bureau staff reviews and edits the information obtained for each person in the sample, and, where possible, identifies and corrects omissions, unintelligible entries, and other errors.

Quality control procedures also include monitoring "on line" CATI interviews by Census Bureau supervisory staff; a system of reinterviews, where a selection of the sample is interviewed again, and those responses are compared with initial interview responses; and monthly feedback to the field staff on any errors, omissions, or inconsistencies detected by the computer edits.

Weighting and Estimation Procedures

There are six main steps to the estimation process in the CPS; editing of raw data and imputation, basic weighting, nonresponse adjustment, ratio adjustment, compositing estimates, and seasonal adjustment. This process takes the raw data from the CPS interviews, edits it, weights it to account for sampling probabilities, adjusts for nonresponse and consistency with independently derived population counts for demographic sub-groups, combines current estimates with estimates for the prior month to reduce the variability of the data, and adjusts for seasonality.

Data Editing and Imputation

Raw CPS data are corrected for inconsistencies or missing items to make them suitable for use in estimation. This process involves two steps: editing of the raw data and imputing for missing or unacceptable data items.

Editing involves identifying and, where possible, correcting inconsistencies, omissions, illegible entries, and other errors in the raw data. When the data are received at the Census Bureau, they are reviewed for completeness and consistency. Responses to various survey questions are interpreted and combined to classify respondents as employed, unemployed, or not in the labor force.

Imputation involves correcting for item nonresponse—the case in which interviewed persons do not respond to all of the survey questions or their answers to some questions are deleted during the editing process. The empty data cells are filled using the "hot deck" method of imputation, which is based on the premise that persons with similar characteristics provide data that are a good approximation for the missing responses. In the "hot deck" method, data for all interviewed persons are cross-classified by age/sex/race and geography. Missing answers are imputed by using the data from the most recently processed record for a person in the same age/sex/race/geography group.

Basic Weighting

The basic weighting procedure begins the process of inflating the sample data to produce an estimate for the entire population. In basic weighting, data from each sample person are weighted by the inverse of the probability of the person being in the sample. This is roughly equal to the number of actual persons the sample person represents. Thus, adding the basic weights of all sample persons having a given characteristic yields a simple estimate of the number of persons in the population possessing that characteristic.

Nonresponse Adjustment

The weights for all interviewed households are adjusted to account for occupied sample households for which no information was obtained because of absence, impassable roads, refusals, or unavailability of the respondents for other reasons (Type A noninterviews). This adjustment is made separately for clusters of similar sample areas that are usually, but not necessarily, contained within a State. Similarity of sample areas is based on Metropolitan

Statistical Area (MSA) status and size. Within each MSA cluster, there is a further breakdown by "central city" and "balance of the MSA". The non-MSA clusters are not split. The proportion of sample households not interviewed is about 10 percent, depending upon weather, vacations, etc.

Sample units found vacant, demolished, or converted to nonresidential use (Types B and C noninterviews) are excluded from those counted for the numerator of this ratio because such units are out of the scope of the survey. This means that the weights are not adjusted upwards.

Ratio Adjustment

The distribution of the population selected for the sample may differ somewhat, by chance, from that of the population as a whole in such characteristics as age, race, sex, and State of residence. Because these characteristics are closely correlated with labor force participation and other principal measurements made from the sample, the survey estimates can be substantially improved when weighted appropriately by the known distribution of these population characteristics. This is accomplished through two stages of ratio adjustment, as follows:

1) First-stage ratio adjustment: The purpose of the first-stage ratio adjustment is to reduce the contribution to variance that results from selecting a sample of PSUs rather than drawing sample households from every PSU in the Nation. This adjustment is made to the CPS weights in two race cells, black and nonblack; and two age cells, 0-15 and 16+. It is applied only to PSUs that are non-self-representing in States that have a substantial number of black households. The first-stage ratio adjustment procedure corrects for differences that existed in each State cell at the time of a decennial census between a) the race distribution of the population in sample PSUs and b) the race distribution of all PSUs. Both a) and b) above exclude self-representing PSUs. This adjustment is not made to housing units but to the individual household-member record.

   The first-stage ratio adjustment factors do not depend on response data and remain the same from month to month during the entire intercensal period. The factors change when a new sample of PSUs is drawn after a decennial census. The factors also change if the non-self-representing PSU composition of a State changes for any other reason.

2) Second-stage ratio adjustment: The second-stage ratio adjustment procedure substantially reduces the variance of the estimates and corrects, to some extent, for CPS undercoverage at the national level. The CPS sample weights are adjusted to ensure that sample-based estimates of population match national independent population controls. Each month, independent estimates of various civilian noninstitutional population distributions at the national level are produced based on the decennial census and birth and death data from several sources. Since those characteristics are correlated with labor force status and other items of interest, weighted CPS sample estimates are forced to agree with the known distributions of selected population characteristics.

   Beginning in 2003, the second-stage ratio adjustment includes a national and a state coverage step, followed by three basic iterative steps. California and New York are split

into substate areas (Los Angeles-Long Beach-Glendale Metropolitan Division, New York City, and the respective balances of states). The coverage steps improve the efficiency of adjustments for subpopulations prone to undercoverage and to account for variations in race/gender/age differences between States.

Next, a three-step, iterative process successively is applied 10 times to adjust sample weights:

1) State step: gender-by-age cells defined for 53 States/areas.
2) Ethnicity step: 26 Hispanic and 26 non-Hispanic gender-by-age cells.
3) Race step: 34 white-alone, 26 black-alone, and 26 residual (including Asian) cells are defined race by gender and age.

Composite Estimation

The next step in the preparation of most CPS estimates makes use of a composite estimation procedure. The composite estimate consists of a weighted average of two estimates:

1.) The second-stage ratio estimate based on the entire sample from the current month.
2.) A composite estimate for the previous month, adjusted by an estimate of the month-to-month change based on the six rotation groups common to both months.

In addition, a bias-adjustment term is added to the weighted average to account for relative bias associated with month-in-sample estimates. This month-in-sample bias is exhibited by unemployment estimates for persons in their first and fifth months in the CPS being generally higher than estimates obtained for the other months.

These composite estimates are then used as controls in the composite weighting procedure. Both employment and unemployment are controlled in each defined cell, and not-in-labor force (NILF) is controlled as a residual. This is an iterative process, similar to that used for second-stage weighting. Each cell in the following three steps is further split by employed, unemployed, and not in the labor force.

1) State step: a single CPS 16+ cell is used for all 53 States/areas.
2) Ethnicity step: 10 Hispanic and 10 non-Hispanic gender-by-age cells.
3) Race step: 22 white-only, 14 black-only, and 10 Asian-only and residual gender-by-age cells.

The composite estimate results in a reduction in the sampling error beyond that which is achieved after the two stages of ratio adjustment by taking advantage of the 6/8 month-to-month sample panel overlap of the survey. The resultant gains in reliability are greatest in estimates of month-to-month change, although gains are also usually obtained for estimates of level in a given month, change from year to year, and change over other intervals of time.

Seasonal Adjustment

Over the course of a year, the size of the nation's labor force and the levels of employment and unemployment undergo sharp fluctuations due to seasonal events such as changes in weather, reduced or expanded production, harvests, major holidays, and the opening and closing of schools. The effect of such seasonal variation can be very large; seasonal fluctuations may account for 95 percent or more of the month-to-month changes in unemployment.

Because these seasonal events follow a more or less regular pattern each year, their influence on statistical trends can be eliminated by adjusting the statistics from month to month. These adjustments make nonseasonal developments, such as declines in economic activity or increases in the participation of women in the labor force, easier to spot.

Seasonal adjustment involves using past data to approximate seasonal patterns. The seasonally adjusted series therefore have a broader margin for error than the original data series. They are subject to the same errors as the original series plus the uncertainties of the seasonal adjustment process. Adjusted series are, however, useful in analyzing nonseasonal economic and social trends.

Since 1957 CPS data have been seasonally adjusted using various versions of the Census Bureau's X-11 model. In January 1989 the X-11 model was updated to the X-11 Auto-Regressive Integrated Moving Average (ARIMA) method. Beginning in January 2003, BLS started using the X-12-ARIMA (Auto-Regressive Integrated Moving Average) seasonal adjustment program to seasonally adjust national labor force data from the CPS. In January 2004, BLS converted to the use of concurrent seasonal adjustment to produce seasonally adjusted labor force estimates. Concurrent seasonal adjustment uses all available monthly estimates, including those for the current month, in developing seasonal factors. Previously, seasonal factors for the CPS data had been projected twice a year. As a result of this change in methodology, BLS no longer publishes seasonal factors for the labor force series. BLS began using the latest version, X-13ARIMA-SEATS, in 2015.

All national labor force and unemployment rate statistics, as well as the major employment and unemployment estimates, are computed by aggregating independently adjusted series. For example, for each of the major labor force components—employment and unemployment—data for four sex-age groups (men and women under and over 20 years of age) are separately adjusted for seasonal variation and are then added to derive seasonally adjusted total figures. The seasonally adjusted figure for the labor force is a sum of four seasonally adjusted civilian employment components and four seasonally adjusted unemployment components. The total for unemployment is the sum of the four unemployment components, and the unemployment rate is derived by dividing the resultant estimate by the estimate of the labor force. Because of the independent seasonal adjustment of various series, components will not necessarily add to totals. (See Chapter 6 for a discussion of model-based seasonal adjustment.)

CPS Data Available

Introduction

Information collected in the Current Population Survey (CPS) is made available by both the Bureau of Labor Statistics and the Census Bureau through a broad array of publication programs which include news releases, periodicals, and reports. This section lists some of the different types of products currently available at BLS and Census. In some months, supplemental questions are added to the CPS questionnaire to gather information on specific topics. For example, August's CPS supplement gathers data on veterans and October's CPS supplement collects data on school enrollment.

Bureau of Labor Statistics

The most popular publication with CPS data is the Employment Situation news release which contains national data and is released about 2 weeks after data collection is completed. The release includes a narrative summary and analysis of the major employment and unemployment developments. The news release is available at http://www.bls.gov/news.release/empsit.toc.htm.

Another publication which is widely used is the Geographic Profile of employment and unemployment. Annual averages labor force data from the CPS for the four Census regions and nine Census divisions, the 50 states and the District of Columbia, selected metropolitan areas, and selected cities are included in this publication. Data are provided on the employed and unemployed by selected demographic and economic characteristics.

The CPS news releases, publications, and reports can be obtained at the BLS website or by sending an email to cpsinfo@bls.gov or by calling 202-691-6378.

Table 2-1 provides a summary of the CPS data products provided by BLS.

Table 2-1. Selected BLS products from the Current Population Survey

Product	Description	Periodicity	Source
	News Releases		
Employment Situation	Seasonally adjusted and unadjusted data on the Nation's employed and unemployed workers by a variety of characteristics	Monthly	Monthly CPS
Usual Weekly Earnings of Wage and Salary Workers	Median usual weekly earnings of full-and part-time wage and salary workers by a variety of characteristics	Quarterly	Monthly CPS; outgoing rotation groups
College Enrollment and Work Activity of High School Graduates	An analysis of the college enrollment and work activity of the prior year's high school graduates by a variety of characteristics	Annual	October CPS supplement
Union Membership	An analysis of the union affiliation and earnings of the Nation's employed workers by a variety of characteristics	Annual	Monthly CPS; outgoing rotation groups
Work Experience of the Population	An examination of the employment and unemployment experience of the population during the entire preceding calendar year by a variety of characteristics	Annual	March CPS supplement
Persons with Disabilities	Labor Force characteristics of persons with disability	Annual	CPS annual averages
Families	Employment characteristics of families	Annual	CPS annual averages
Foreign Born	Labor Force characteristics of foreign-born workers	Annual	CPS annual averages
Youth Employment	Summer employment and unemployment among youth	Annual	CPS April-July data
Veterans	Employment Situation of Veterans	Annual	August CPS supplement
Volunteering	Volunteering in the United States	Annual	September CPS supplement
Displaced Workers	An analysis of workers who lost jobs in the prior 3 years due to plant or business closings, position abolishment, or other reasons by a variety of characteristics	Biennial	February CPS supplement
Tenure	Employee tenure	Biennial	January CPS supplement
	Periodicals		
Employment and Earnings Online	A monthly online periodical providing data on employment, unemployment, hours, and earnings for the Nation, states, and metropolitan areas	Monthly	CPS; other surveys and programs
Monthly Labor Review	A monthly periodical containing analytical articles on employment, unemployment, and other economic indicators, book reviews, and numerous tables of current labor statistics	Monthly	CPS; other surveys and programs
	Other Publications		
A Profile of the Working Poor	An annual report on workers whose families are in poverty by work experience and various characteristics	Annual	March CPS supplement
Geographic Profile of Employment and Unemployment	An annual publication of employment and unemployment data for regions, states, and metropolitan areas by a variety of characteristics	Annual	CPS annual averages

Uses of Unpublished CPS Tabulations

Unpublished tabulations such as the CPS rotation group data and the State demographic and economic file commonly known as the DEMECON tables are provided by BLS. These tabulations are used internally to analyze the movements in the CPS data and provide a better understanding of the current estimates.

Rotation Groups Analysis: These data are available monthly from the CPS and represent the raw data obtained from the monthly sample. As discussed earlier in this chapter, a given rotation group is interviewed for a total of 8 months, divided into two equal periods. It is in the sample for 4 consecutive months, leaves the sample during the following 8 months, and then returns for another 4 consecutive months.

Table 2-2 is an example of the monthly rotation group data.

CPS DATA FOR STATE/AREA, BY ROTATION GROUP						
	Civilian noninsti-tutional population	Civilian labor force				Not in Labor force
		Total	Employed	Unemployed		
				Level	Rate	
Sample Counts						
Total 16 years and over	3,089	1,675	1,622	53	3.2	786
First month in sample	355	180	171	9	5.0	102
Second month in sample	395	231	228	3	1.3	90
Third month in sample	419	217	210	7	3.2	104
Fourth month in sample	373	191	182	9	4.7	100
Fifth month in sample	420	231	223	8	3.5	93
Sixth month in sample	386	200	193	7	3.5	106
Seventh month in sample	365	207	200	7	3.4	98
Eighth month in sample	376	218	215	3	1.4	93
Incoming rotations	775	411	394	17	4.1	195
Outgoing rotations	749	409	397	12	2.9	193
Rotations common to month before	2,314	1,264	1,228	36	2.8	591
Rotations common to month after	2,340	1,266	1,225	41	3.2	593
Rotations common to year before	1,547	856	831	25	2.9	390
Rotations common to year after	1,542	819	791	28	3.4	396
Composite Weighted Counts						
Total 16 years and over	4,304.5	2,989.4	2,887.5	101.9	3.4	1,315.1
First month in sample	501.8	330.5	311.6	18.9	5.7	171.3
Second month in sample	543.7	400.2	393.2	7.0	1.8	143.5
Third month in sample	546.6	380.0	367.3	12.6	3.3	166.6
Fourth month in sample	514.8	346.6	330.9	15.7	4.5	168.1
Fifth month in sample	575.0	415.2	399.8	15.3	3.7	159.8
Sixth month in sample	532.5	352.5	340.4	12.1	3.4	179.9
Seventh month in sample	529.1	367.1	352.8	14.3	3.9	162.0
Eighth month in sample	561.2	397.4	391.6	5.8	1.5	163.8
Incoming rotations	1,076.7	745.7	711.4	34.2	4.6	331.1
Outgoing rotations	1,075.9	744.0	722.4	21.5	2.9	332.0
Rotations common to month before	3,227.8	2,243.8	2,176.1	67.6	3.0	984.0
Rotations common to month after	3,228.6	2,245.5	2,165.1	80.3	3.6	983.1
Rotations common to year before	2,197.7	1,532.2	1,484.6	47.6	3.1	665.5
Rotations common to year after	2,106.8	1,457.2	1,402.9	54.3	3.7	649.6

The Composite Weighted Counts are used to compare the monthly changes in the employment and unemployment of the sample groups. The new groups that are being introduced to the sample are the first and fifth groups for the current month. The groups that are leaving the sample are the fourth and eighth groups.

Table 2-3 provides an example of the spreadsheet used in rotation analysis. This spreadsheet examines three characteristic of the monthly 4-8-4 sample rotation including how groups entering and leaving the sample affect the monthly estimates, the labor force status of the groups remaining in the sample, and the net effect of the entire rotation change.

The comparison of the in-coming groups for the current month to the out-going groups of the previous months allows the analyst to determine whether a change in the employment or unemployment level is due to an economic change in the groups currently in the sample or is caused by the groups coming into or leaving the sample.

To calculate the *in-coming versus out-going rotation change*, add group 1 and group 5 of the current month and subtract group 4 and group 8 of the previous month.

$$In\text{-}versus\text{-}out\ rotation\ change = (Group1 + Group5)_t - (Group4 + Group8)_{t-1}$$

For example, the in-coming versus the out-going rotation change for employment in Table 2-5 is an increase of 33.8 and is derived from the sum of 311.6 (Group 1) and 399.8 (Group 5) for the current month less the sum of 333.9 (Group 4) and 343.7 (Group 8) of the previous month.

The *common rotation change* is the sum of the differences between the groups present in both the current month and the previous month. Each group of the prior month is moved up to the next consecutive group in the current month. There are no differences for groups 1 and 5 since these are incoming groups for the current month and did not exist in the prior month.

$$\begin{aligned} Common\ rotation\ change \\ &= (Group2_t - Group1_{t-1}) + (Group3_t - Group2_{t-1}) \\ &+ (Group4_t - Group3_{t-1}) + (Group6_t - Group5_{t-1}) \\ &+ (Group7_t - Group6_{t-1}) + (Group8_t - Group7_{t-1}) \end{aligned}$$

In the employment example in Table 2-3, the common rotation change is -12.5 and is the sum of 11.4, -0.4, 9.4, -28.2, -4.6 and -0.1.

The *net rotation change* is the in-coming verses the out-going rotation change less the common rotation change.

$$Net\ rotation\ change = (in\text{-}coming - out\text{-}going) - common\ rotation\ change$$

In our example the 12.5 over-the-month decrease in the employment levels of the common rotation groups for the current month is offset by the 33.8 higher employment levels of the incoming groups resulting in a net change increase of 21.3.

Table 2-3. CPS Rotation Group Analysis

Employment

Group	Prior Month	Current Month	Group	Change
		311.6	***1***	-
1	381.8	393.2	***2***	11.4
2	367.7	367.3	***3***	-0.4
3	321.5	330.9	***4***	9.4
4	333.9	399.8	***5***	-
5	368.6	340.4	***6***	-28.2
6	357.4	352.8	***7***	-4.6
7	391.7	391.6	***8***	-0.1
8	343.7	in vs. out rotation change		33.8
		common rotation change		-12.5
		net rotation change		21.3

Unemployment

Group	Prior Month	Current Month	Group	Change
		18.9	***1***	-
1	4.3	7.0	***2***	2.7
2	9.9	12.6	***3***	2.7
3	19.0	15.7	***4***	-3.3
4	15.7	15.3	***5***	-
5	11.6	12.1	***6***	0.5
6	12.9	14.3	***7***	1.4
7	5.9	5.8	***8***	-0.1
8	17.4	in vs. out rotation change		1.1
		common rotation change		3.9
		net rotation change		5.0

Unemployment Rate

Group	Prior Month	Current Month	Group	Change
		5.7	***1***	-
1	1.1	1.8	***2***	0.7
2	2.6	3.3	***3***	0.7
3	5.6	4.5	***4***	-1.1
4	4.5	3.7	***5***	-
5	3.1	3.4	***6***	0.3
6	3.5	3.9	***7***	0.4
7	1.5	1.5	***8***	0.0
8	4.8			

DEMECON Tables: These tables contain monthly and quarterly demographic and economic data from the CPS for States and regions including the District of Columbia, New York City and the Los Angeles - Long Beach metropolitan area.

The following tables appear in the DEMECON file:

1) Employment status of the civilian non-institutional population by sex, age, race, and Hispanic origin
2) Civilians not in the labor force by sex and age
3) Unemployed persons by sex, age, race, Hispanic origin, and reason for unemployment
4) Unemployed persons by sex, age, race, Hispanic origin, and duration of unemployment
5) Full- and part-time status of the civilian non-institutional population by sex, age, race, Hispanic origin

Since the data are available by age, race and sex, they are useful to gain insight on demographic groups that may be experiencing changes contributing to the month-to-month variations in the CPS estimates.

However, the data contained in DEMECON file are unofficial and generally do not meet the BLS publication standards for accuracy and reliability. Tables B-2 through B-5 in the Geographic Profiles bulletin provide generalized sampling error information for CPS annual average data. To obtain approximate error measures for the monthly estimates in this package, double the sampling errors in those tables.

Caution should be used in drawing inferences from these data, and they should not be released unless they are specifically requested. When providing data to users, a statement similar to the following should be used: *The data provided are unofficial, unpublished, data from the Bureau of Labor Statistics and do not meet BLS publication standards for accuracy and reliability. If you publish or cite these data, please refer to them as such.*

U.S. CENSUS BUREAU

The U.S. Census Bureau reports provide information on a recurring basis about a wide variety of social, demographic, and economic topics. In addition, special reports on many subjects have also been produced. Most of these reports have appeared in 1 of 3 series issued by the Census Bureau: P-20, Population Characteristics; P-23, Special Studies; and P-60, Consumer Income. Many of the reports are based on data collected as part of the March demographic supplement to the CPS. However, other reports use data from supplements collected in other months. Generally, reports are announced by press release, and are released to the public via the Census Bureau Public Information Office.

Supplement Data Files

Public use microdata files containing supplement data are available from the Census Bureau. These files contain the full battery of basic labor force and demographic data along with the supplement data. A standard documentation package containing a record layout, source and accuracy statement, and other relevant information is included with each file. The CPS homepage is the other source for obtaining these files. The CPS homepage can be accessed at http://www.census.gov/cps/.

3 Inputs to LAUS Estimation: The Unemployment Insurance System

The Federal-State Unemployment Insurance Program provides unemployment benefits to eligible workers who are unemployed through no fault of their own (as determined under State law), and meet other eligibility requirements of State law. Unemployment insurance payments (benefits) are intended to provide temporary financial assistance to unemployed workers who meet the requirements of State law.

Each State administers a separate unemployment insurance program within guidelines established by Federal law. The State law under which unemployment insurance claims are established determines eligibility for unemployment insurance, benefit amounts and the length of time benefits. In the majority of States, benefit funding is based solely on a tax imposed on employers.

The Federal-State Unemployment Insurance (UI) system was established in 1935 as part of the Social Security Act. It was intended by its founders to serve both as a counter-cyclical economic stabilizer for the economy and as a central part of the nation's economic security system for workers with a strong attachment to the labor force who are temporarily laid off or permanently lose their jobs. The program is funded through mandatory payroll taxes paid by employers.

Statistics from the UI systems are the only current measure of unemployment at the substate level available at the county and city levels. They are a key input to the unemployment models used to estimate unemployment for the 50 States, the District of Columbia, Los Angeles-Long Beach, the balance of California, New York City, the balance of New York, and the five modeled substate areas and their respective balances of state. Claims data from the UI systems are inputs to the Handbook method for estimating labor market area (LMA) unemployment and their use in the claims-based unemployment disaggregation yields more accurate sub-LMA estimates than are obtained from other approaches.

While these statistics are biased for estimating total unemployment between States in so far as they reflect the particular State's UI law, the statistics have the

advantage of being current and, with proper coding and tabulation, are consistent among areas within States.

Federal Role

The UI system is based on a dual program of Federal and State statutes. Much of the Federal program is implemented through the Federal Unemployment Tax Act (FUTA). Each State administers a separate UI program with guidelines established by Federal statute. The States also determine the eligibility, the benefit amount and the length of time that benefits are paid.

A combination of Federal and State taxes is levied on employers to support the UI program. The proceeds from the unemployment taxes are deposited into the Unemployment Trust Fund. Each State has a separate account in the Fund to which deposits are made.

Federal UI Programs

In addition to the regular State UI program which cover the bulk of nonfarm workers, separate Federal UI programs exist for specific types of workers. Railroad workers receive unemployment insurance benefits through the Railroad Retirement Board (RRB). Federal employees are covered through Unemployment Compensation for Federal Employees (UCFE). Former military personnel are covered through the Unemployment Compensation for Ex-Servicemen (UCX).

Special benefits programs exist for specific situations as well. During periods of high unemployment programs are activated that extend the time period that individuals can receive benefits. Workers who lose their jobs as a result of the nation's trade policies may receive special benefits after they exhaust their regular UI benefit through the Trade Adjustment Assistance program. Workers who lose their jobs due to a natural disaster may qualify for benefits through the Disaster Unemployment Assistance program.

Railroad Retirement Board (RRB)

The Railroad Unemployment Insurance Act provides two kinds of benefits for railroad employees: unemployment benefits and sickness benefits. Benefit payments are based on biweekly claims filed with the Railroad Retirement Board, the Federal agency responsible for administering the Railroad Unemployment Insurance Act. The funds to pay unemployment and sickness benefits are provided by payroll taxes on railroad employers only. Railroad employees do not pay unemployment insurance taxes.

Claims filed through the Railroad Unemployment Insurance Act for unemployment during the reference period including the 12th of the month are used in the calculation of monthly LAUS substate estimates.

Unemployment Compensation for Federal Employees (UCFE)

Unemployment Compensation for Federal Employees is the benefit program for unemployed Federal employees. Funding comes from the Federal Government and is distributed through State agencies. Federal wages are not reported to a State unemployment compensation agency until a claim is filed. The claimant's Federal wages will be "assigned" to the State of the last duty station or the State of residency if the duty station was outside the U.S or if covered work was done in the State after leaving Federal service. This is also the case if the employer was the Federal Emergency Management Agency (FEMA), since this is the only Federal agency that does not report wages to the last duty station.

UCFE claims filed for unemployment in the reference period including the 12th of the month are used in the calculation of monthly Statewide and substate LAUS estimates.

Unemployment Compensation for Ex-Service members (UCX)

Unemployment Compensation for Ex-Service members is the benefit program for ex-military personnel to provide weekly income to meet basic needs while searching for employment

Those who were on active duty with a branch of the U.S. military or active duty in reserve status as a member of a National Guard or Reserve component continuously for 90 or more days may be entitled to unemployment benefits based on that service. The military wages are assigned to the State where they first file a new claim after the separation from active duty.

Former employees of the National Oceanographic and Atmospheric Administration (NOAA) are also covered under the UCX program. UCX benefits are paid under the same conditions as benefits based on other employment. However, since LAUS measures the civilian labor force, UCX claims data are not used in the calculation of LAUS estimates.

Extended Benefits (EB) and Special Temporary Programs

Two types of UI programs grant additional weeks of unemployment compensation to individuals who have depleted their UI benefits under the regular UI program during economic downturns. One is the permanent program that is funded by both the State and the Federal governments, known as State Extended Benefits (EB), and the others are temporary programs that are financed by the Federal government and enacted for periods of higher unemployment.

In addition, a number of States have solely State-financed programs for extending the potential duration of benefits during periods of high unemployment, for claimants in approved training who exhaust benefits, or for a variety of other reasons.

Federal temporary extended benefits programs have been used periodically during economic downturns since the late 1950s. The first temporary program, Temporary Unemployment Compensation (TUC), was effective for the period of June 1958 to June 1959. Since then, temporary extended assistance programs have occurred seven times under different titles. These include

- Temporary Extended Unemployment Compensation (TEUC), April 1961 to June 1962;
- Temporary Compensation (TC), January 1972 to March 1973;
- Federal Supplemental Benefits (FSB), January 1975 to January 1978;
- Federal Supplemental Compensation (FSC), September 1982 to June 1985;
- Emergency Unemployment Compensation (EUC) November 1991 to April 1994;
- Temporary Extended Unemployment Compensation (TEUC); March 2002 to March 2004; and
- Emergency Unemployment Compensation (EUC08), July 2008 to January 2014.

All Special Extended Benefit Programs

Name	Effective Dates	Weeks of Benefits
Temporary Unemployment Compensation (TUC)	06/58 – 06/59	Up to 13
Temporary Extended Unemployment Compensation (TEUC)	04/61 – 06/62	Up to 13
Temporary Compensation(TC)	01/72 –03/73	Up to 13
Federal Supplemental Benefits (FSB)	01/75 –01/78	Up to 13 or 26
Federal Supplemental Compensation (FSC)	09/82 –06/85	Up to 8, 10, 12, or 14
Emergency Unemployment Compensation (EUC)	11/91 –04/94	Up to 7, 13, 20, 26 or 33
Temporary Extended Unemployment Compensation (TEUC)	03/02 –03/04	Up to 13 or 26
Emergency Unemployment Compensation (EUC 08)	07/08 –01/14	Up to 20, 34, 47, or 53

Source: Employment and Training Administration, Office of Workforce Security

State Extended Benefits (EB): The EB program has been a permanent part of the Federal-State UI system since 1970 and is available to workers who have exhausted regular unemployment insurance benefits during periods of high unemployment as defined by the trigger "on" criteria below.

The basic EB program provides up to 13 additional weeks of benefits when a State is experiencing high unemployment. Some States have also enacted voluntary programs to pay up to 7 additional weeks (20 weeks maximum) of extended benefits during periods of extremely high unemployment which is

defined as a State 3-month average smoothed seasonally adjusted unemployment rate greater than 8 percent.

A State may trigger "on" for extended benefits for a week if certain criteria are met based on the State's insured unemployment rate (the ratio of individuals collecting benefits to UI covered employment) or alternatively its total unemployment rate (the LAUS smoothed seasonally adjusted rate). There are three separate sets of criteria that can be used to determine if the EB program is activated in a State. One is mandatory and the other two are optional and enacted by State law.

For the mandatory trigger, a State must pay up to 13 weeks of EB if the insured unemployment rate (IUR) for the previous 13 weeks is at least 5 percent and is 120 percent of the average of the rates for the corresponding 13-week period in each of the 2 previous years. This comparison is called a "look back." Ten states have only the mandatory trigger in their State laws: Delaware, Florida, Georgia, Iowa, Kentucky, Michigan, North Dakota, South Dakota, Utah, and Wyoming.

State law may allow for the use of one of the following alternative triggers instead. However, if a State does not use an alternative trigger, the mandatory method must be used to determine trigger status.

One of the optional triggers allows a State to pay up to 13 weeks of EB if the IUR for the previous 13 weeks is at least 6 percent, regardless of the experience in the previous years. The majority of States have specified the use of this trigger.

The other optional trigger allows a State to pay up to 13 weeks of EB if the average total unemployment rate (TUR), smoothed seasonally adjusted, for the most recent 3 months is at least 6.5 percent and is 110 percent of the rate for the corresponding 3-month period in either of the 2 previous years. If such rate is at least 8.0 percent and is 110 percent of the rate for the corresponding 3-month period in either of the 2 previous years, the duration increases from 13 to 20 weeks. Eleven States including Alaska, Connecticut, Kansas, Minnesota, New Hampshire, New Jersey, North Carolina, Oregon, Rhode Island, Vermont, and Washington have permanent laws enacting the TUR options.

Summary of State Extended Benefits Trigger Options

Trigger Option	Number of States	States*	Potential Number of Weeks
5% IUR with look back	10	DE, FL, GA, IA, KY, MI, ND, SD, UT, WY	13
6% IUR without look back	31	AL, AZ, AR, CA, CO, DC, HI, ID, IL, IN, LA, ME, MD, MA, MS, MO, MT, NE, NV, NM, NY, OH, OK, PA, PR, SC, TN, TX, VA, WV, WI	13
TUR (6.5% and 8%)	11	AK, CT, KS, MN, NH, NJ, NC, OR, RI, VT, WA	20
Total	52	** States includes DC and PR.*	

Source: Employment and Training Administration, Office of Workforce Security

A State triggers "off" extended benefits if, for the period consisting of the reference week and the immediately preceding twelve weeks, the requirements of the selected method are not satisfied.

EB and Special Temporary Programs and LAUS Estimation: Claim counts from the EB and special temporary programs are not used in LAUS estimation. The LAUS substate methodology already includes an estimate of unemployed exhaustees — those persons who have exhausted the total benefit award under State unemployment insurance within their benefit year and are still jobless. This component is developed by using area-specific counts of individuals who received final payments under State UI and survival rates based on the duration of jobless spells in the Current Population Survey. *(See Chapter 7.)*

Claims data from permanent and temporary extensions of unemployment compensation have not been used directly in LAUS estimation primarily because of their temporal nature. Although individuals exhaust benefits continuously throughout the year, insured claims under permanent or temporary extended benefit programs for these people will be taken only when an extended UI benefit period is established, either by trigger or by special legislation. The administrative and methodological steps needed to incorporate such extended benefit program data into LAUS estimation is disproportionately complex, given the trigger on/trigger off nature of the program and the intricacies of the temporary program. Likewise, data from the regular EB and special EB programs are not to be incorporated into LAUS estimation. LAUS uses the estimate of unemployed exhaustees to represent those persons who claimed their total benefit award within the benefit year and are still jobless.

Trade Readjustment Allowances (TRA)

Trade Readjustment Allowances are benefits to persons whose jobs were affected by foreign imports. Benefits are provided through the Federal Trade and the North American Free Trade Agreement.

The Federal Trade Act provides special benefits under the Trade Adjustment Assistance (TAA) program to those who were laid off or had hours reduced because their employer was adversely affected by increased imports from other countries.

The North American Free Trade Agreement (NAFTA) provides special benefits under the NAFTA Transitional Adjustment Assistance (NAFTA-TAA) program. Individuals who were laid off, or had hours reduced because their employer was adversely affected by increased imports from Mexico or Canada, or because their employer shifted production to either of these countries may qualify for benefits. These benefits include paid training for a new job and financial help in searching for work in other areas or relocation to an area where jobs are more plentiful.

Individuals can qualify for these special benefits only after their regular unemployment compensation is exhausted. Thus claims data from the TAA and the NAFTA-TAA programs are not directly counted in LAUS estimates. Individuals who have exhausted their benefits in the regular UI program are already accounted for through final payment counts. See *UI Claims Data for LAUS Estimation* later in this chapter or *Labor Market Area Unemployment* in Chapter 7 for more information on final payments.

Disaster Unemployment Assistance (DUA)

Section 410 of the Robert T. Stafford Disaster Relief and Emergency Assistance Amendments of 1988 created a program for the payment of unemployment assistance to individuals whose unemployment is the direct result of a major disaster as declared by the President of the United States.

Suffering a monetary loss due to damage of property or crops does not automatically entitle claimants to DUA. Individuals may qualify for DUA if: they worked in or were scheduled to begin work in a county declared as a Federal disaster county and they cannot work as a direct result of a disaster. In addition, the work that cannot be performed must be their primary source of income and livelihood; and they must not qualify for regular unemployment insurance from any State.

This includes workers who suffer a loss or interruption of work as a direct result of a major disaster, and, self-employed individuals, including farmers and day care providers who lost or suffered a substantial reduction or interruption of self-employment activities as a direct result of a major disaster.

Although individuals may receive DUA benefits, they are not counted as unemployed. The definition of employed persons under the CPS includes all those who were not working but who had jobs or businesses from which they

were temporarily absent because of bad weather, whether they were paid for the time off or were seeking other jobs.

Self-Employment Assistance (SEA)

Self-Employment Assistance offers dislocated workers the opportunity for early re-employment. The program is designed to encourage and enable unemployed workers to create their own jobs by starting their own small businesses. Under the program, States can pay a self-employed allowance, instead of regular unemployment insurance benefits, to help unemployed workers while they are establishing businesses and becoming self-employed. Participants receive weekly allowances while they are getting their businesses started. To participate in the program an individual must be eligible for unemployment compensation, have been permanently laid off from his/her previous job and identified through the State's UI profiling system as likely to exhaust his/her benefits, and must participate in self-employment activities including entrepreneurial training and business counseling.

The following State have provisions for SEA: Delaware, Louisiana (law in place but no active program), Maine, Mississippi, New Hampshire, New Jersey, New York (expired 12/7/2015), Oregon, Pennsylvania, and Rhode Island.

Since individuals participating in a State SEA program are exempt from the State laws relating to availability for work, search for work, and refusal to accept work, SEA claims are not included in the claims counts for LAUS estimation.

Short-Time Compensation (STC)

The STC program, commonly known as work-sharing, provides partial UI benefits to individuals whose work hours are reduced from full-time to part-time on the same job. STC allows an employer, faced with potential layoffs because of reduced workload, to reduce the number of regularly scheduled hours of work for all employees rather than incur layoffs. Benefits are payable to workers for the hours of work lost, as a proportion of the benefit amount for a full week of unemployment.

The STC program currently has twenty-eight States and the District of Columbia participating: Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Iowa, Illinois, Kansas, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Hampshire, New York, Oklahoma, Oregon, Pennsylvania, Texas, Vermont, and Washington.

Workers are not obligated to meet the State's regular UI requirements of availability for work, actively seeking work, or refusal to accept work, but must be available for their normal workweek. Thus, any claim records associated with STC are not included in the LAUS estimation.

Office of Workforce Security Responsibilities

The Office of Workforce Security (OWS) of the Employment and Training Administration (ETA) oversees the UI system and works closely with State

employment security agencies. The OWS is responsible for Program Development and Implementation, Performance Review, Legislation, Policy and Research, Fiscal and Actuarial services, and Information Technology.

Each Thursday, the OWS releases the "Unemployment Insurance Weekly Claims Report" at 8:30 AM. This release can be found on the Department of Labor's website at www.doleta.gov.

The seasonally adjusted weekly initial claims series is a leading economic indicator. They are the most current data on the number of people filing for unemployment insurance. The seasonally adjusted continued claims data provide insight as to the duration of the claims initially filed.

Interstate Statistical Data Exchange

The OWS is responsible for administrating and maintaining the *Interstate Statistical Data Exchange,* which operates on the Interstate Connection Network (ICON). The ICON is a hub-oriented data communication network that enables 54 jurisdictions, including Canada, to exchange interstate wage and benefit transactions through batch applications. The ICON hub is located in Orlando, Florida and maintained by Xerox State & Local Solutions.

The reporting of initial claims and continued claims (referred to as *weeks claimed* by ETA) information by the Liable State to the Agent/Residence State is not only vital for the efficient payment of interstate claims benefits, but it also has the following important uses:

1) Interstate agent weeks claimed are needed for accurate counts of total continued claims without earnings for LAUS estimation.
2) Interstate initial claim and weeks claimed information identifies interstate claimants to the Agent/Residence State for purposes of providing re-employment assistance.
3) Interstate agent weeks claimed information is necessary to the Agent/Residence State's calculation of its insured unemployment rate that is the trigger mechanism for the State's Extended Benefit Program.
4) Interstate agent initial claims and weeks claimed are inputs to major economic indicators which describe emerging and continuing unemployment conditions in the Agent State.

The calculation of the State's total unemployment rate (LAUS estimate), which is the alternate trigger for the extended benefit program, includes the number of residents that regularly commute across the State line to work in another State and are unemployed and filing for benefits against another State. For this reason, the reporting of commuter weeks claimed, for the survey week, is included in the data reporting requirement of the Liable State to the Agent/Residence State.

Liable/Agent Data Transfer

The LADT record format was developed by the National Association of State Workforce Agencies' Interstate Benefit Committee in consultation with the

Unemployment Insurance (UI) Committee, the Labor Market Information Committee and the U.S. Department of Labor's Bureau of Labor Statistics and the Employment and Training Administration.

The Liable/Agent Data Transfer (LADT) (Appendix/Table 3-1) is a batch application that has a multi-purpose record format.

There are three types of records identified by the value in the Record Type field (position 472 – Field number 62) on the LADT record layout:

1) Telephone Initial Claim (TIC);
2) Weeks Claimed (WC) (A "Weeks Claimed" record can be either an interstate continued claim or a commuter claim);
3) Reopen/Transfer of Claim (Reopen/Transfer).

The origin of the record is identified by the value in the Liable State FIPS field (Field number 18 - positions 184 – 185 on LADT record layout) and will be either the alphabetic UI postal abbreviation or the numeric FIPS code.

The destination is determined by the value in the Agent State FIPS field (Field number 20 - positions 190 – 191 on LADT record layout) and will be either the alphabetic US postal abbreviation or the numeric FIPS code.

A commuter claim is identified in the Commuter Identification Code field (Field number 58 - position 412 on LADT record layout). An "X" in this field indicates a claim filed by a commuter from the Residence State, while a blank space indicates that it is not a commuter claim.

Commuter Claim data are included in the transmittal due the first Monday of each month. The weekending dates on commuter weeks claimed records must be xx/12/xx through xx/18/xx only. Each month's commuter data report must include detail data for the "current commuter reporting month" and "prior commuter reporting month." "Current commuter reporting month" is the most recently completed month. "Prior commuter reporting month" is the month proceeding the most recently completed month.

When each Liable State's file is received at the Hub, the records are edited and stored. As confirmation of receipt and processing of the file, the Liable State immediately receives, or can request output of, three reports: 1) the Liable Summary Report; 2) the LADT Error Report; and 3) the LADT Edit Counts Report.

After close of business on Tuesday, the Hub database is updated with each Liable State's file. On Wednesday morning of each week, LADT data are distributed to the destination Agent State(s). There are two reports distributed weekly and one monthly:

1) Agent State Summary Report – Interstate Claims (Appendix/Table 3-2) -
2) Agent State Detail Data Report (contains micro data of all records)

3) On the first Wednesday of each month, a third report, the Agent/Residence Commuter Weeks Claimed Report is also distributed.
(See Appendix/Table 3-3)

Weekly LADT Schedule	
Monday	The Liable State's detail data report is due at the Hub on Monday of each week.
	Commuter weeks claimed data must be included in the transmission due the first Monday of the month only.
Tuesday	Hub processing of all data received takes place after the close of business on Tuesday.
	Hub processing of all data received takes place after the close of business on Tuesday.
Wednesday	The Hub distributes Agent State detail data no later than 11:00 a.m. on Wednesday.

Additional information on the ETA, the OWS, and UI claims data can be found on the Internet at www.doleta.gov.

Information Technology Support Center (ITSC)

In 1994, the ETA and the Maryland Department of Labor, Licensing, and Regulation established the Information Technology Support Center (ITSC). The ITSC is a collaboration of State employment security agencies, the Department of Labor (DOL), and private sector partners. It promotes the appropriate application of information technology and assists in providing States with more accurate, efficient, cost effective, and timely service for unemployment insurance recipients.

Additional information on ITSC, UI programs, and statistics can be found on the Internet at www.itsc.state.md.us.

State UI Programs

Each State law, subject to Federal requirements, establishes guidelines determining employer coverage, individual employee eligibility, the amount and duration of benefits paid for claims, and disqualification provisions. State UI laws also determine the amount of payroll taxes used to fund regular UI benefits that employers must pay. A summary of changes in individual State UI laws can be found in each January issue of the Monthly Labor Review, published by BLS.

UI Coverage

Each State has determined its own laws regarding UI coverage, but they have been greatly influenced by the Federal government. The Federal Unemployment Tax Act (FUTA) provides tax incentives that have ensured States conformity with the minimum coverage standards set down in FUTA.

In general, a covered employer is defined under the FUTA as one who has a quarterly payroll of $1500 in the calendar year or preceding calendar year or who employs at least one worker for at least 20 days in 20 different weeks during the calendar year or the preceding calendar year. While many States have chosen to expand coverage beyond the FUTA standards, the notable exceptions and limitations are noted below.

Twenty-six weeks of regular UI benefits are provided by most States. The following states provide an amount of benefit weeks that is not equal to 26:

State	Weeks of benefits
AR	25
FL*	12-23
GA*	14-20
KS*	16-26
MA†	30
MI	20
MO	20
MT	28
NC*	12-20
SC	20

*State has variable weeks of benefits based on its unemployment rate based on base-period wages and unemployment rate

† Massachusetts offers 30 weeks of regular UI benefits if there is currently no Federal emergency unemployment compensation program)

Agriculture

For the majority of States, only employers with ten or more workers in twenty weeks, or who paid $20,000 or more in wages in any quarter, are subject to

unemployment insurance laws. Farm owners/operators are excluded from coverage in all States.

Domestic Service

Private households, social clubs, and college fraternities and sororities who employ domestic help and pay wages of $1,000 or more in a quarter are subject to unemployment insurance laws.

Nonprofit Organizations

Coverage is required for nonprofit organizations with four or more employees in 20 weeks. Almost half of the States, however, have elected more expansive coverage, typically covering any organization with even one employee in twenty weeks. Ministers employed by religious organizations to perform ministerial duties are excluded from nonprofit coverage.

Self-employed Individuals and Unpaid Family Members

As defined by the unemployment insurance laws, employment is the hiring of workers by others for wages. Self-employed individuals are therefore excluded, except in California, where they may elect to pay contributions for self-coverage. Relatives are not covered unless they receive pay from the official business payroll. However, the employment of minors by their parents, or parents by their children, is excluded.

Railroads

Interstate railroad workers are covered by the Railroad Unemployment Insurance Act administered by the Railroad Retirement Board. Workers on intrastate and scenic railroads may also be covered.

State and Local Government Elected Officials and Others

All State and local government employees are covered under State UI laws with the exception of elected officials, members of the judiciary, State national and air national guardsmen, temporary emergency employees, and policy and advisory positions.

Student Workers at Universities, Interns and Student Nurses

College and university students employed by the school at which they are enrolled, such as work-study students, are excluded from coverage. Many States also exclude the spouses of students who work at the university if the employment is part of a program to provide financial assistance to the student. Student nurses employed by hospitals as part of a training program are not covered. Similarly, medical school graduates working as interns in hospitals are excluded from coverage.

Armed Forces

Military personnel are excluded from State unemployment insurance coverage. They are covered under a separate program, Unemployment Compensation for Ex-Servicemen (UCX), but are not included in QCEW data. Civilian defense

workers, however, and all other Federal employees covered under the Unemployment Compensation for Federal Employees (UCFE) program are part of the data reported to the QCEW program.

Agents on Commission

Insurance and real estate agents that are paid only by commission are excluded from coverage in almost all of the States.

UI Process

Just as each State has its own UI laws, each State has its own benefit payment system for awarding UI benefits, providing documentation and fiscal control. The benefit payment system is tied in with the taxation records system of the State. Taxes levied from employers are deposited into the State's Unemployment Trust Fund account.

Initial Claim

When an individual becomes unemployed, he or she must file an initial claim to request determination for entitlement and eligibility to receive benefits. Depending on the UI services available within each State, an unemployed person may file an initial claim in person at an Employment Service office, over the telephone, by mail, or via the Internet. There are three initial claim types: new, additional and transitional.

The first claim in a benefit year filed to request benefits is referred to as a *new initial claim*. A claim filed within the same *benefit year* after intervening employment is call an *additional initial claim*. A benefit year is the one-year period during which an individual may receive UI benefits and is usually related to the date of the individual's first spell of unemployment and the filing of the claim.

A claim for benefits filed during the last week of a benefit year while a spell of unemployment is ongoing and requesting an establishment of a new benefit year and another eligibility determination is a *transitional initial claim*. A transitional initial claim is an operational or administrative document facilitating the transition from one benefit year to the next within a continuous spell of unemployment. Therefore, it is excluded from the count of initial claims, since that count represents new spells of unemployment.

Monetary Eligibility Determination

The new initial claim is evaluated, in accordance with the State's laws, to determine if the individual meets the monetary requirements necessary to establish a benefit year and receive benefits and, if so, how much compensation the individual is eligible to receive. Monetary eligibility for benefits is determined by the amount of employment (in weeks or quarters) and wages earned by the individual (in some combination of dollars and time worked) in a specific *base period*.

A base period is a period of time prior to the *benefit year* (or period similar to a benefit year) in which a claimant must have had a specified minimum amount of insured (covered) work in order to qualify for benefits. Wages earned during this period are used in determining the claimant's weekly benefit amount (WBA) and the claimant's maximum total annual benefits. In the majority of States, the base period is the first four quarters of the last five calendar quarters.

There are two types of base periods, an *individual* and a *uniform*. The *individual* base period varies as to the starting date for individual claimants, while a *uniform* base period starts on the same calendar year for all claimants.

A benefit year usually consists of a 1-year period or a 52-week period during which an individual may receive annual benefits. Nearly all States have what is called an individual benefit year in which the beginning date is dependent on the date the claim was filed.

Each State has its own formula for computing an individual's weekly benefit amount (WBA), total benefit award, and duration of benefits. States may also elect to provide benefits to dependents. See the annual ETA publication entitled Comparison of State Unemployment Laws (*http://workforcesecurity.doleta.gov/unemploy/statelaws.asp#Statelaw*) for more details.

Claims that do not meet the State-specified requirements for the monetary determination are denied benefits and result in a *monetary disqualification*.

Nonmonetary Determination

The new and additional initial claim is also subject to a nonmonetary determination, in which a State determines whether individuals are eligible to receive benefits based on the circumstances surrounding the loss of employment, ability to work, availability for work, and activity in seeking work.

Each State has its own nonmonetary requirements for an unemployed individual to receive benefits. All State laws provide that a claimant must have become unemployed through no fault of his/her own and must be able and available to work. The purpose of this is to provide benefits to individuals who are unemployed primarily as a result of economic causes.

The nonmonetary determination is broken down into *separation issues* and *nonseparation issues*.

Separation issues refer to situations surrounding the termination of the employment relationship. This includes incidences where the individual voluntarily quits without good cause, or voluntarily quits for personal reasons. (For LAUS purposes, these individuals would be counted as unemployed even though they do not qualify for UI benefits, *as long as they are willing and able to work, and are actively seeking employment*.)

Nonseparation issues pertain to situations in which the individual's actions, the type or seasonality of occupation, or income preclude eligibility. An individual can be precluded from receiving benefits if they are not willing or able to seek employment, or if they refuse suitable employment. Seasonal employees, such as school personnel and professional athletes, are not eligible for benefits during the time period between terms of employment. Disqualifying incomes includes pensions, severance pay and other UI compensation, such as EB, TRA or DUA benefits. Individuals disqualified because they were not able or willing to work would not be counted as unemployed for LAUS purposes. Those disqualified for

receiving UI because they have income from pensions or severance pay would be counted as unemployed, *as long as they are willing and able to work, and are actively seeking employment and the amount of money earned does not exceed the weekly benefit amount.*

An individual may pass the monetary eligibility requirements but may *not* receive benefits in the event of voluntary leaving without good cause, discharge or suspension or misconduct, refusal of suitable work, labor dispute, and false statements.

A claimant who does not meet the nonmonetary requirements and is denied benefits results in a *nonmonetary disqualification*.

Nonmonetary Penalties
The circumstances of a nonmonetary disqualification may preclude the individual from ultimately receiving benefits.

Separation Issues*:*
Voluntarily Leaving Work: Since the UI program is designed to compensate wage loss due to lack of work, voluntarily leaving work without good cause is an obvious reason for disqualification from benefits. All States have such provisions. In most States, the disqualification lasts until the worker is again employed and earns a specified amount of wages. However, in a few States the disqualification is a fixed number of weeks and can be up to 12 weeks depending on the reason why the individual needed to leave work. In addition, some States may also reduce the individual's benefit rights, usually equal in extent to the weeks of benefit postponement.

Discharge for Misconduct: A number of States have a variable disqualification for discharge for misconduct. In some States the range is small, for example, the week of occurrence plus 3 to 7 weeks. In others, the range is large, 5 to 26 weeks. Several States provide a fixed disqualification, and others disqualify for the duration of the unemployment, or longer. Some States may reduce or cancel all of the worker's benefit rights and some provide for disqualification for disciplinary suspensions.

Non-separation Issue:
Refusal of Suitable Work: Several States disqualify for a specified number of weeks (3 to 20) any workers who refuse suitable work; others postpone benefits for a variable number of weeks, with the maximum ranging from 1 to 12.

Monetary Penalties
The penalty for a monetary disqualification is in effect until the individual becomes subsequently employed and earns a specified amount of wages to become eligible.

Appeals

An individual whose claim has been denied for either monetary or nonmonetary reasons may request an opportunity for a fair hearing before a UI tribunal or UI

authority. A request can be made for a review by an appeals authority on the State's determination of the claim for benefits, the employer's contribution rate, or a decision made by a lower appeals authority.

The employer for whom the individual worked during the wage qualifying base period is charged with the liability for the claim payment. This employer may also challenge the UI decision of the individual's eligibility to receive benefits.

Continued Claim

Once a claimant passes the monetary (for new initial claims only) and nonmonetary eligibility requirements, the individual must satisfy mandatory requirements for each week of unemployment for which he/she claim benefits. These weekly requirements include actively seeking employment and being available for work. Certification, or certifying, is the form and process by which an individual attests to the facts that determine eligibility for a given week.

This certification process must be completed for each week that the individual claims benefits. Most States establish a 52-week period (benefit year) during which the individual may submit claims for benefits.

Individuals may also receive earnings from regular employment, or odd jobs, while certifying for a week of unemployment. In such cases, these claims are designated as *continued claims with earnings*. They are not used in LAUS estimation since they do not meet the LAUS definition of unemployed. (Even one hour of work results in the classification of the individual as "employed" in the CPS.) Continued claimant counts without earnings due to employment are the primary source of unemployment inputs for the Handbook method and an important input into State models.

Final Payments

A final payment is the last continued claim for which an individual can receive benefits within a benefit year. At this point, the individual has exhausted the maximum benefits as was calculated at the time of filing and monetary determination.

Final payment recipients, also referred to as UI *exhaustees*, are the primary input to the monthly estimate of unemployed exhaustees of the Handbook method. (See Chapter 7)

Benefits delivery arrangements

The State conducts UI activities under all of the following arrangements:

Intrastate Benefit Arrangements.

The State provides benefits to individuals who reside in and worked in that State. The State also provides benefits to individuals who worked (and would continue to seek work) in the State but reside in a border State. Intrastate claims filed in the State where the claimant worked but does not reside are referred to as *commuter claims*.

Interstate Benefit Arrangements.

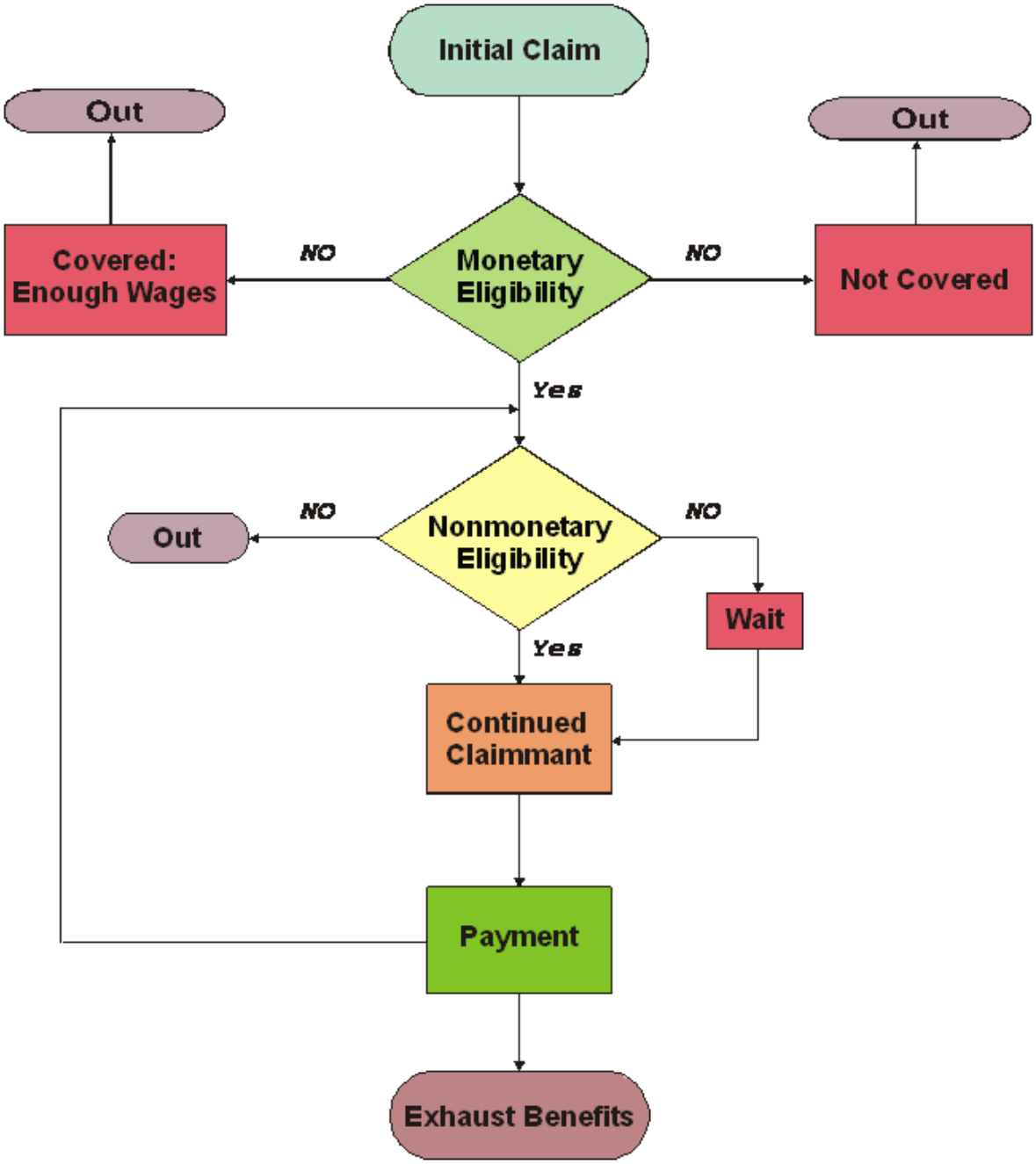
To encourage a claimant to move from a State where no suitable work is available to one where there is a demand for the type of service that the claimant is able to render, States have made agreements to protect the rights of workers who make such moves. These arrangements permit the collection of benefits from the State in which an individual has qualifying wages (*liable State*) even though the claimant is not physically present in that State. The State in which the individual is located may accept the claim, acting as Agent for the State that is liable for the benefits claimed. The liable State may also accept the claim directly from the claimant by telephone or internet means. Determinations on eligibility, disqualifications, and the amount and duration of benefits are made by the liable State.

Wage-Combining Arrangements.

This arrangement permits workers to combine their wages and employment in more than one State and file in a single State. This holds for situations where there are insufficient wages and employment to qualify for benefits in any one State and where, having sufficient wages and employment to qualify for benefits in one State, the benefit amount would be increased by combining wages and employment in other States. In addition, this arrangement permits workers having sufficient wages and employment to qualify for benefits in more than one State, to combine their wages in those and any other States in which they had wages and employment in the base period of the liable State.

UI Claims Process

The following chart illustrates the process of claims validation in a State.



UI Claims Data for LAUS Estimation

Counts of individuals associated with continued claims are used in the development of State and model-based area unemployment. Counts of individuals associated with two types of claims, continued claims and final payments, are used in the development of sub-state unemployment estimates.

Continued Claims

Continued claimant data for certifications to unemployment in the week including the 12th of the month from the State UI program are used each month in the development of State and area model-based total unemployment. The State UI program data, along with data from the UCFE, and RRB programs, are used each month to calculate monthly LAUS estimates for sub-state areas. Because the unemployment measurement is limited to the labor force status of the civilian population, claims data from the UCX program are excluded.

The continued claimant count is made up of persons who certified to a compensated or non-compensated week of unemployment.

- Compensated claims relate to those claimants who are receiving UI benefits. A claimant who has worked during the week and received any earnings while certifying for unemployment does not meet the criteria for the CPS definition of unemployed and is omitted from the count used in LAUS estimation even if the earnings do not result in a reduction in the benefit award.
- Noncompensated claims include individuals who are unemployed and are certifying weekly for benefits but are not receiving compensation for any of the following reasons:
    - They are certifying during the waiting week,
    - They are certifying while appealing a monetary or nonmonetary disqualification. Or
    - They are certifying while filing a pending claim.

These individuals are unemployed, are in the UI system, and are included in the continued claimant count for LAUS estimation.

The LAUS program recognizes three types of continued claims data: intrastate, commuters and interstate for both regular State UI and UCFE programs.

Intrastate claims

Intrastate claims are claims filed by unemployed persons in the State where they live and worked.

Commuter claims

Commuter claims refers to claimants who worked and would continue to seek work in one State while living in close proximity in another State. These

claimants are treated as if they reside in the State of prior employment and file intrastate claims in the State in which they had worked.

Interstate

Interstate refers to interstate claims filed by claimants who resided and became unemployed in one State, and, during their spell of unemployment, moved to another State and filed for UI benefits in the new State of residence. The State where the claimant first became unemployed is still liable for that spell of unemployment and the UI benefits that the claimant receives.

Interstate and commuter claims data are exchanged through the ICON system, which enables States to transmit, and to retrieve appropriate claims data. The file format used by ICON is called Liable-Agent Data Transfer (LADT).

Final Payments

Final payment recipients, also called UI benefit exhaustees, are continued claimants who file for a week of unemployment that exhausts their total benefit award.

Once claimants receive their final payment and leave the UI system, States are unable to track them. The LAUS methodology estimates the number of UI exhaustees who are still unemployed by applying a survival rate to the number of final payments. This survival rate is developed from CPS data on duration of unemployment. For further details regarding this process, see the Labor Market Area Unemployment section of Chapter 7.

Differences: UI Data versus the CPS

CPS data are used directly to produce official labor force estimates for the nation and they are the key input to LAUS model based estimates of unemployment for States and selected areas. Differences between the State UI count of continued claimants without earnings and CPS unemployed result primarily from differences in program coverage of the unemployed by the UI system.

Certain industries and occupations are excluded from UI coverage, including:

- employees of certain nonprofit organizations;
- insurance and real estate agents on commission;
- agricultural workers on small farms and certain seasonal farm workers;
- some domestic workers;
- self-employed persons;
- unpaid family workers;
- some State and local government employees;
- student nurses and interns in hospitals; and
- railroad workers (covered under the RRB program).

Certain unemployed individuals may not be able to receive UI benefits, including:

- people who have not worked long enough and therefore have insufficient wages to establish eligibility for benefits under UI;
- people who quit a job or were discharged for misconduct;
- people who have exhausted their benefits and could not re-establish a benefit year; and
- people with no recent earnings, such as new entrants or reentrants to the labor market.

The UI exclusions limit program coverage to unemployed individuals with recent employment experience and exclude unemployed new entrants and reentrants to the labor market. Also, much of agricultural unemployment is not represented in UI statistics.

BLS Standards for UI Data

LAUS labor force estimates produced for State and substate levels use the same definitions and concepts as the CPS so that the resultant estimates are consistent with the CPS and comparable within and across States. In order to further ensure this, BLS sets standards for the UI statistics used in LAUS estimation

Standards for Continued Claims and Final Payments

Two insured unemployed counts, continued claimants and final payment recipients, are used in the development of LAUS substate unemployment estimates. For the model-based unemployment estimation procedure, only continued claimants are used.

Continued claimants are persons certifying to a compensated or noncompensated week of unemployment under the State UI and UCFE programs. Because measurement is limited to the labor force status of the civilian population, the UCX program is excluded. The continued claimant count includes intrastate claimants, commuter claimants (based on State of residence), and interstate claimants (based on State of residence). UCFE program data are not used in developing unemployment estimates for modeled areas.

Persons receiving final payments are continued claimants certifying to a week of unemployment which represents the last regular benefit payment in the benefit year. Further benefits are not available until the beginning of a new benefit year.

The BLS standard of quality for these continued claims and final payment counts is as follows:

- the counts reflect the State and county of residence of the unemployed;
- the counts are unduplicated and based on the Social Security number and the claimant's week of unemployment for which the claimant certified;
- the counts include both compensated and noncompensated claimants as described above;
- for continued claimants, the claimant's week of certification is consistent with the CPS reference week., i.e., the week including the 12th of the month(see also the December reference week below);
- for persons receiving final payments, the counts are weekly, based on the week for which the claimant is certifying;
- the counts exclude persons with any earnings due to employment, regardless of their entitlement to full weekly UI benefits.

Reference Week for December and November

Normally, the reference period is the week including the 12th of the month. However, this is may not always be the case for the months of December and November.

In December, the actual reference week used by the CPS and, thus, LAUS, depends on the number of business days between the 12th of the month and Christmas day. As a result, the reference week is often the week that includes the 5th of the month, the week prior to the week that includes the 12th.

Similarly for November, if Thanksgiving occurs in the week of the 19th, then the reference week will be the week including the 5th.

Moving the reference period up a week allows adequate time for CPS data collection and processing prior to the Christmas and Thanksgiving holidays. The change in the reference week is also necessary because CPS response rates fall substantially during the days immediately before these holidays.

Standards for Initial Claims

While not part of direct LAUS estimation, initial claims are integral to the UI process itself. Also, initial claims counts may be used in atypical or exception procedures in the Handbook method to develop an estimate of those unemployed who are eligible for UI but delay filing or never file for unemployment benefits. (Estimates of delayed and never filers are not used in Handbook estimation, but it is useful to define the standards for initial claims.)

An initial claim is a notice filed by an individual to request determination of entitlement to and eligibility for compensation. A new initial claim is the first claim filed by the claimant within the benefit year. An additional initial claim is a second or subsequent claim filed by the claimant within the benefit year after an intervening period of employment. .

Reference Period

Unlike continued claims that relate to a certification period in the past, initial claims do not refer to a reference period, but rather represent a point in time. Information requested on the initial claim form typically includes the date of filing, and the date of separation and the separating employer.

Excluded Groups

For purposes of defining spells of insured unemployment, the following types of initial claims are excluded from consideration:

1) Invalid new initial claim where the individual is found to be monetarily ineligible for UI.

2) Transitional initial claim, where a new, unique spell of unemployment has not occurred. Such an initial claim is filed by a claimant during a spell of

unemployment in the last week of his/her benefit year, requesting an eligibility determination and establishment of a new benefit year. Because the claimant is in a continuous spell of unemployment and is also filing a continued claim, such transitional initial claims are excluded from the count representing new, emerging unemployment.

3) Reopened claim, where a claimant reopens a continued spell of unemployment after ceasing certifying to unemployment and withdrawing from the labor force. If this atypical action does not reflect an intervening spell of employment, the State may administratively reopen the claims series and allow the claimant to resume filing continued claims. These claims are not to be considered initial claims.

Standards for Residency Coding

With Federal funds allocated to areas below the State level, the use of claims data by residence is imperative, not only as a determinant of the labor market area's total unemployment estimate, but also in the development of county and sub-county estimates. These estimates are created through a method called disaggregation. For further details regarding this process see Chapter 9.

The residency requirement for claims data calls for the coding and tabulating of claimants by State, county of residence and place of residence. The geographic requirement applies to areas within the State paying the benefits (or acting as agent State for interstate claims) and to counties in contiguous States whose residents cross State lines to file intrastate claims in the State holding their wages and paying the benefits (commuter claimants).

The UI Database Survey

Beginning in 1975 an effort was undertaken by BLS to improve the UI data used in LAUS estimation. This effort started with a survey of the State UI database systems. There were two primary reasons for the survey. The first was to describe the methods States were using to obtain the UI statistics used in developing LAUS estimates, and the second was to provide input to determining the necessary modifications to State systems to achieve more uniform UI data series. Based on this survey, the BLS standards for UI statistics were developed.

A plan of action was developed to eliminate inconsistencies in UI statistics both between and within States as compared to official labor force concepts. Claimant data that represented an unduplicated count of individuals by State and county of residence for the appropriate reference period and with maximum adherence to the CPS definition of unemployment in terms of any earnings due to employment in the week of certification was the focus. These characteristics—unduplicated count of persons, residency, reference period, and exclusion of persons with any earnings—are essential elements for the UI claimant statistics used in unemployment estimation, and areas where improvement efforts have been concentrated.

To obtain an unduplicated count of persons, Social Security numbers are used. Also, the use of the week of certification prevents multiple counting because an individual can certify only once to a week of unemployment.

Basing the UI statistics on claimant residency rather than more program-related locations such as local office or place of employment ensures correspondence with official labor force concepts. Proper residency coding affects all LAUS uses of UI data.

The requirement that UI statistics relate to the week including the 12th of the month also ensures correspondence with the official labor force estimates. The exclusion of persons with any earnings makes the data consistent with the CPS, where one hour of pay qualifies an individual as employed.

The initial UI Data Base Survey was a three-day-long meeting of State research, State UI, and BLS staff. A detailed description of UI administrative and operational processes was obtained.

Based on the results of the UI Data Base Survey, contracts were established with all States to develop unique monthly statistical counts that reflect the BLS standards for UI statistics and that are used for LAUS estimation purposes. These State-developed tabulations have been replaced by tabulations developed by the Program to Measure Insured Unemployed Statistics (PROMIS).

The UI Claims Review and Validation Project

In 2001 a simplified form of the UI Database Survey was introduced. Entitled the *UI Review and Validation Project,* this examination of the data sources for UI inputs into LAUS was designed to be less of a burden for the States to participate in and to be conducted more frequently than the UI Database Survey. Due to the ever-changing nature of technology, UI laws, and administrative procedures, it is necessary to re-examine the data sources and procedures on a regular basis.

The project included reviewing and validating the quality of claimant data extracted from the unemployment insurance (UI) system databases in the States. In addition to the LAUS program, the Mass Layoff Statistics (MLS) program required UI statistics on initial claims for the event trigger, continued claims for describing the ongoing layoff, and final payments. Thus, the validation of UI data extract parameters and specifications used in the State were integral to quality assurance of not only the UI claims data inputs but also the LAUS estimates and the MLS statistics.

The validation procedure consisted of two separate stages, an initial examination of the current procedures in place for obtaining UI claims data for use in LAUS and MLS estimations and a follow up session to address any problems identified in the initial examination.

The initial examination involved an on-site visit to the State agency by BLS staff. The purpose of the visit was to interview the State staff who were responsible for processing and extracting UI claims data for LAUS and MLS estimation and to conduct a detailed examination of the UI source files and the extract programs

used for LAUS and MLS purposes. A standard questionnaire form was used to document the claimstaking method, the filenames where the claims are stored, and to determine if the extract program was capturing all the necessary claims data input.

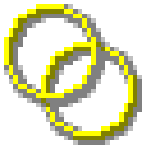
Upon completion of the questionnaire, examination of the UI source files, and a review of the extract program, a determination was made if the State's claims data inputs for LAUS and MLS meet the BLS standards for UI claims data. If any shortcomings were discovered, then a second stage was initiated to ensure that any deficiencies will be corrected.

In the second stage, problems identified in the initial inquiry were addressed. The BLS and the State staff determined solutions to ensure that the BLS data standards are met. Solutions included the re-writing of UI claims extract programs or other programs that process claims data for LAUS and MLS. In addition, the BLS and State staff determined the necessary resources needed to implement the corrections.

The validation process was an on-going project with each State being certified and re-validated periodically as UI polices and technologies change. Two events led to the elimination of this project. One was the limitation of travel to States due to budget restraints starting in 2008. The other was the increasing number of States implementing the PROMIS system.

The in-depth research and analysis required by States to gain approval to officially use PROMIS has provided a much more comprehensive examination of the participating State's UI system and claims extract programs. In many cases the set up of new UI database extract programs specifically for PROMIS has revealed inaccuracies hidden in the legacy system's extract program that went unknown and were not uncovered by the validation project. The PROMIS approval process has effectively removed the need for the *UI Review and Validation Project* at the present time.

Program to Measure Insured Unemployment Statistics (PROMIS)



The PROMIS system is a stand-alone PC-based system that stores all claimant information, including socioeconomic characteristics, and generates the UI inputs for LAUS estimation. In addition to generating input files, PROMIS can be used to develop tabulations at the State and area level of UI claimants by socioeconomic characteristics. PROMIS operates as the clearinghouse for multi-purpose input data, allowing flexibility to provide a more complete picture of the unemployment situation at substate levels.

The PROMIS system is designed to provide States with increased quality assurance and resource efficiency to develop monthly statistics. The implementation of PROMIS by a State involves the creation of a new UI database extract program. This enables the most up-to-date LAUS criteria to be incorporated into the extract program and for the program to be written in a current programming language. The extracts used by most States for their legacy

systems were developed decades ago and were often not updated as needed. These legacy extracts were written in programming languages that are now antiquated and thus are confusing and unfamiliar to current State staff. A rigorous examination of the PROMIS data and the legacy system data, which is also required, has often exposed flaws in the legacy extract that went unnoticed.

The PROMIS data quality is further enhanced by the Residency Assignment System, which corrects erroneous address information and assigns geocodes for States, counties, cities and towns. (See the Residency Assignment System section of this chapter on pages 3-29 to 3-47 for more information.) In addition, the use of PROMIS facilitates the implementation of claims-based disaggregation by providing claims data at the city and town level. (See Chapter 9 on Disaggregation for more details.)

The following files are produced by the PROMIS system:

- City Claims Input Files compiled by Counties and Cities
- State UI and UCFE Continued Claims Less Earnings (batch IDs: M03, M04, M05, M06, M07, M08) for the LAUS State System
- State UI and UCFE Continued Claims Less Earnings (batch IDs: M03, M04, M05, M06, M07, M08) compiled by Labor Market Area (LMA) for New England States
- Week 1 through Week 6 Final Payments (batch IDs: M10, M11, M12) for the LAUS State System
- Week 1 through Week 6 Final Payments (batch IDs: M10, M11, M12) compiled by Labor Market Area for New England States
- All UI and UCFE Continued Claims Less Earnings (batch IDs: M03, M04, M05, M06, M07, M08), and Week 1 through Week 6 Final Payments (batchM03, M04, M06, M07, M10, and M11
- All UI and UCFE Continued Claims Less Earnings (batch IDs: M03, M04, M05, M06, M07, M08), and Week 1 through Week 6 Final Payments (batch IDs: M10, M11, M12) compiled by Labor Market Area (LMA) for New England States, and one large file containing the output for batch IDs M03, M04, M06, M07, M10, and M11
- MicroData detail behind all LAUS output data (batch IDs: M03, M04, M05, M06, M07, M08, M10, M11, M12, C06 if New England State, C07 if non-New England State)
- 12-month LSS output files for LAUS annual processing: one consolidated file containing non-commuter output (batch IDs: M03, M04, M06, M07, M10, M11); one file containing City Claims (batch IDs: C06 if New England State or C07 if non-New England State); one consolidated file with each of the commuter outputs (batch IDs: M05, M08, M12)

For more information, see the PROMIS system user's guide available on the LAUS/MLS Intranet under Operations and Manuals.

Residency Assignment System

To assist States in correctly coding the residence of their UI claims records, the LAUS National Office has made available address correction and geocoding software called the Residency Assignment System (RAS). RAS corrects erroneous addresses, city, state and ZIP codes and assigns geocodes for States, counties, incorporated places, and minor civil divisions (MCD). It can also be customized to assign State specific codes and other geocodes available from the US Census Bureau.

States provide the input file(s) and corresponding format file(s) that defines the layout of the input file(s). States determine the layout of the output file and which geocodes are to be assigned. Geocodes include State and county FIPS codes, FIPS place codes, minor civil divisions (MCD) codes, longitude and latitude, and census tracts and blocks. In addition, other codes can be added such as State specific codes or other census geocodes. Project files are created by national office staff to reflect the output file layout and the geocoding requirements of each State.

States upload their input file via EUSweb to their State folder in either the LAUS directory or the PROMIS directory (if the State is approved for PROMIS). Each State can upload, download, rename or delete any of their files in their State folder. The system will automatically process the input file as long as the file is appropriately named (see the following section on input files).

A polling agent program searches each State folder for a new input file and automatically runs RAS when one is detected. Once the input file is processed, RAS places the output files in the State folder and saves the input in the Archive subfolder located within the State folder. The polling agent also notifies the State via email when the file has been processed. If for any reason the same file has to be processed again, the original input file can be moved or copied from the archive folder back into the State folder, and the system will automatically process it. The RAS output includes the processed file (*STout.txt)* with the correct addresses and geocode assignment.

APPENDIX TABLE 3-1

LIABLE/AGENT DATA TRANSFER RECORD

Required Fields by Record Type

Y = Required Field

N = Rule Number Listed at End of Layout

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
1	Social Security Number	N	1	9	Y	Y	Y	Y	Enter Claimant's Social Security Number
2	Claimant's Name - First	A/N	10	12	Y	Y			Enter the claimant's first name. First position cannot be blank. Enter at least one alphabetic character.
3	Claimant's Name - Middle Initial	A/N	22	1	Y	Y			Claimant's middle initial.
4	Claimant's Name - Last	A/N	23	23	Y	Y			Enter the claimant's last name. First position cannot be blank. Enter at least one alphabetic character.
5	Mailing Address - Street	A/N	46	30	Y	Y	Y	Y	Enter Claimant's - (Mailing) Street
6	Mailing Address - City	A/N	76	19	Y	Y	Y	Y	Enter Claimant's - (Mailing) City
7	Mailing Address - State	A/N	95	2	Y	Y	Y	Y	Enter Claimant's - (Mailing) State
8	Mailing Address - Zip Code	A/N	97	9	Y	Y	Y	Y	Enter Claimant's - (Mailing) Zip Code
9	Residence Addr - Street	A/N	106	30	6	6	6	6	Enter Claimant's - (Residence) Street
10	Residence Addr - City	A/N	136	19	6	6	6	6	Enter Claimant's - (Residence) City

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
11	Residence Addr - State	A/N	155	2	6	6	6	6	Enter Claimant's - (Residence) State
12	Residence Addr - Zip Code	A/N	157	9	6	6	6	6	Enter Claimant's - (Residence) Zip Code
13	Claimant's Telephone Number	N	166	10	Y	Y			Enter Area Code, Exchange, and Extension of the Claimant's Telephone Number
14	Year of Birth	N	176	4	Y	Y	Y	Y	Claimant's Year of Birth - Format is "CCYY".
15	Sex	N	180	1	Y	Y	Y	Y	Enter the sex of the claimant 1 = Male 2 = Female 3 = Unknown
16	Race	N	181	1	Y	Y			Claimant's Race Code 1 = White 2 = Black 3 = Asian 4 = American Indian/Alaskan Native 5 = Native Hawaiian/Other Pacific Islander 6 = Information Not Available

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
17	Education	N	182	2					Highest Grade Completed 01 - 12 Actual grade completed (12 = GED) 13 = 1 year of college or technical school 14 = 2 years of college or Associate degree/technical school 15 = 3 years of college 16 = 4 years of college or undergraduate degree 17 = 1 year of post graduate study 18 = 2 years of post graduate study or Masters degree 19 = Doctorate
18	Liable State FIPS	A/N	184	2	Y	Y	Y	Y	Liable State FIPS Code. The Liable State cannot be the same as the Agent State.
19	Liable State Office/Call Center Number	N	186	4	Y	Y			Enter number that identifies the Liable Interstate office/Liable Call Center that handles the claim.

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
21	Agent State Local Office/Call Center Number	N	192	4	Y	Y	Y	Y	Enter number that identifies the Local office/Call Center where the claimant filed the claim.
22	Residence State FIPS	N	196	2	5	5	1	5	Residence State FIPS Code. The Residence State cannot be the same as the Liable State.
23	Residence County FIPS	N	198	3	Y	Y	2	2	Residence County FIPS Code.
24	Residence City/Town FIPS	N	201	4	Y	Y	Y	Y	Residence City/Town FIPS Code.
25	Date Claim Taken	N	205	8	Y	Y			Enter the date the claim was taken. Format is "CCYYMMDD".
26	Effective Date of Claim	N	213	8	Y	Y			Enter effective date of the claim. Correlates with today's date, backdate reason, and Liable State. Format is "CCYYMMDD".
27	Program Type	N	221	1	Y	Y	Y	Y	Enter the program type: 1 = UI 5 = UCFE 7 = UCX

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
28	Entitlement	N	222	1	Y	Y	Y	Y	Enter the entitlement type: 0 = Regular 1 = Extended Benefits (EB) 2 = Federal Benefit Extension 3 = Additional Benefits (AB)
29	SOC Code	N	223	4	3	3	3	3	Enter at least the first 3 digits of the Claimant's Occupational Classification (SOC) Code (left justified) followed by a zero, or enter the first 4 digits of the SOC.
30	Initial Claim	N	227	1	Y				Enter Status of Claim: 1 = New 2 = Additional 3 = Transitional
31	BYB	N	228	8					Benefit Year Beginning Date. Format is "CCYYMMDD".
32	BYE	N	236	8					Benefit Year Ending Date. Format is "CCYYMMDD
33	WBA	N	244	3					Weekly Benefit Amount (Include Dependents Allowance)

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
34	MBA	N	247	5					Maximum Benefit Amount (Include Dependents Allowance)
35	Base Period Wages - 1st Qtr	N	252	7					Enter BP Wages for the 1st Qtr
36	Base Period Wages - 2nd Qtr	N	259	7					Enter BP Wages for the 2nd Qtr
37	Base Period Wages - 3rd Qtr	N	266	7					Enter BP Wages for the 3rd Qtr
38	Base Period Wages - 4th Qtr	N	273	7					Enter BP Wages for the 4th Qtr
39	Base Period Wages - 5th Qtr	N	280	7					Enter BP Wages for the 5th Qtr
40	Base Period Wages - Total	N	287	8					Enter Total BP Wages for all quarters
41	NAICS - (Employer with Most Wages)	N	295	6					Enter at least the first four digits of the North American Industry Classification System (NAICS) Code (left justified), followed by “00”, for the employer with which the claimant had the most wages, or enter the 6-digit code.

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
42	Last Employer - Name	A/N	301	30					Enter name of Last Employer.
43	Date Employment Began	N	331	8					Enter Date Employment Began with Last Employer. Format is "CCYYMMDD
44	Date Employment Ended	N	339	8					Enter Date Employment Ended with Last Employer. Format is "CCYYMMDD".
45	NAICS – (Last Employer)	N	347	6	4	4	4	4	Enter at least the first four digits of the North American Industry Classification System (NAICS) Code (left justified), followed by "00", for the claimant's Last Employer, or enter the 6 digit code.
46	Last Employer - Ownership Code	N	353	1	Y	Y	Y	Y	Valid entries are '1' through '5', default is '5'. 1 = Federal government 2 = State government 3 = Local government 4 = International or Foreign 5 = Private
47	Separation	N	354	1					Separation: 1 = Permanent 2 = Temporary

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
48	Recall Date	N	355	8					Enter date claimant is to return to work. If no recall date, enter all zeros, format is "CCYYMMDD".
49	Union	A/N	363	1					Y = Yes N = No
50	US Citizenship	A/N	364	1					Y = Yes N = No
51	Alien Registration Number	A/N	365	20					Enter claimant's Alien Registration Number, if applicable and available.
52	Week Ending Date	N	385	8			Y	Y	Week Ending Date of week claimed, format is "CCYYMMDD".
53	Earnings During Week Claimed	A/N	393	1	Y	Y	Y	Y	X = Yes. Indicated that claimant had earnings during the week claimed. Space = no
54	Date First Payment Issued	N	394	8					Enter the Date the First Payment was Issued. Format is "CCYYMMDD".
55	Exhaustee	A/N	402	1					X = Yes. Complete only upon exhaustion. Space = no
56	Weeks Compensated	N	403	2					Enter the number of weeks compensated during the benefit year.
57	$ Amount of Benefits Paid	N	405	7					Enter the total amount of benefits paid during the benefit year.

APPENDIX TABLE 3-1
LIABLE/AGENT DATA TRANSFER RECORD
Required Fields by Record Type
Y = Required Field
N = Rule Number Listed at End of Layout
(Continued)

FLD NBR	FIELD NAME	FIELD TYPE	BEGIN COLUMN	FIELD LENGTH	TIC	REOP/ TRAN	W/C - IB	W/C - COMM	DESCRIPTION
58	Commuter Identification Code	A/N	412	1				Y	X = Yes. Complete to identify claims filed by commuters from Residence State. Space = no
59	Reopen Claim/Transfer of Claim	N	413	1		Y			1 = Reopen claim. Complete when there is a break in claim series not caused by employment. 2 = Transfer of claim. Complete when there is a change in the Residence/Agent State with no break in claim series. 0 = Neither
60	Ethnic	N	414	1	Y	Y			Enter claimant's Ethnic group. Valid values are: 1 = Hispanic or Latino 2 = Non-Hispanic or Latino 3 = Not Available
61	Filler	A/N	415	57					(for future use)
62	Record Type	A/N	472	1	Y	Y	Y	Y	Required Entry to indicate Type of Record 1 = TIC (Telephone Initial Claim) 2 = Weeks Claimed 3 = Reopen/Transfer
63	Process Date	N	473	8	Y	Y	Y	Y	Enter the Date the claim was Processed. Format is "CCYYMMDD".

APPENDIX TABLE 3-1

LIABLE/AGENT DATA TRANSFER RECORD

Rule Number	Definition of Rule
1	On a Weeks Claimed (IB) – the Residence State FIPS can be the same as the Liable State FIPS as long as the Agent State FIPS is different.
2	Either Mailing Address or Field 23 (Residence County FIPS) should be provided. For New England States, either Mailing Address or Field 24 (Residence City/Town FIPS) should be provided.
3	SOC should be provided if possible. If not provided, a warning message will be returned. THE RECORD WILL BE PROCESSED.
4	Last Employer – NAICS should be provided if possible. If not provided, a warning message will be returned. THE RECORD WILL BE PROCESSED.
5	On a Weeks Claimed – Commuter, the value in the Residence State FIPS (field 20) will determine the receiving state.
6	Residence Address will be completed when the Liable State can provide a Residence Address that is different from the Mailing Address.

APPENDIX TABLE 3-2
Agent Summary Report - Interstate Claims

01/03/00 LIABLE/AGENT DATA TRANSFER PAGE 01
AGENT SUMMARY REPORT
STATE OF (Agent State Name) FIPS ID IS: 00
AGENT STATE COUNTS FOR THE SAT. ENDING DATE 01/01/00

INITIAL CLAIMS	UI	UCFE	UCX	TOTALS
REG	20	0	0	20
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	20	0	0	20

REOPEN/TRANSFER	UI	UCFE	UCX	TOTALS
REG	2	0	0	2
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	2	0	0	2

WEEKS CLAIMED - IB	UI	UCFE	UCX	TOTALS
REG	1358	24	11	1393
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	1358	24	11	1393

01/03/00 LIABLE/AGENT DATA TRANSFER PAGE 02
AGENT SUMMARY REPORT
STATE OF (Agent State Name) FIPS ID IS: 00
AGENT STATE COUNTS FOR THE SATURDAY ENDING DATE 01/01/00

INITIAL CLAIMS

01 AL ALABAMA	UI	UCFE	UCX	TOTALS
REG	0	0	0	0
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	0	0	0	0

02 AK ALASKA	UI	UCFE	UCX	TOTALS
REG	1	0	0	1
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	1	0	0	1

APPENDIX TABLE 3-3
Agent/Residence Summary Report - Commuter Claims

01/03/00 LIABLE/AGENT DATA TRANSFER PAGE 01
AGENT/RESIDENCE SUMMARY
REPORT FIPS ID IS: 00
STATE OF (Agent State Name)
CURRENT MONTH = 12/1999 PREVIOUS MONTH = 11/1999

COMMUTER CURRENT TOTALS	UI	UCFE	UCX	TOTALS
REG	184	2	0	186
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	184	2	0	186

COMMUTER PREVIOUS TOTALS	UI	UCFE	UCX	TOTALS
REG	442	0	1	443
EB	0	0	0	0
FSB	0	0	0	0
AB	0	0	0	0
TOTAL	442	0	1	443

01/03/00 LIABLE/AGENT DATA TRANSFER PAGE 02
AGENT/RESIDENCE SUMMARY
REPORT FIPS ID IS: 00
STATE OF (Agent State Name)

COMMUTER CURRENT		CURRENT = 12/1999 PREVIOUS = 11/1999			
01 AL	ALABAMA	UI	UCFE	UCX	TOTALS
	REG	0	0	0	0
	EB	0	0	0	0
	FSB	0	0	0	0
	AB	0	0	0	0
	TOTAL	0	0	0	0
02 AK	ALASKA	UI	UCFE	UCX	TOTALS
	REG	0	0	0	0
	EB	0	0	0	0
	FSB	0	0	0	0
	AB	0	0	0	0
	TOTAL	0	0	0	0

APPENDIX 3-4

Residency Assignment System User's Guide

The Residency Adjustment System (RAS) is accessed using the EUSweb. State LAUS technicians must have an EUSweb account. To obtain an account, State technicians should contact their regional office. A server account consists of the BLS assigned user ID along with a password and the necessary permissions to access the BLS firewall and LAUS server.

States upload their inputs files through either the LAUS Program menu or, if the State is participating in PROMIS, the PROMIS Program menu. RAS will automatically process the files and return them to the appropriate State folder. Email notification is automatically sent to State users to inform them that their file has been processed and is ready to be downloaded.

Input Files

To use RAS, three files are needed for each claims file type to be processed; these include the input file, the format file, and the definition file. States provide the input file and the format file. The format file describes the layout of the input file and must specifically identify the address fields. States are not limited to one file type. For example, separate files can be processed for continued claims, initial claims, LADT files or any other file a State may need to correct and geocode. Corresponding format files must accompany each file type and individual RAS job files must be setup for each file type.

Input File

The input file is a UI claimant record file that may consist of interstate claims, interstate claims and/or commuter claims. The data for the input file is obtained from the State's UI branch. The file must be submitted in a consistent format for periodic processing since any changes in the input file layout requires that the format file and associated jobs files be modified to reflect the new layout.

At a minimum, records must include street address, city, & zip. Other information, such as local office ID, claim dates, and claimant information, may remain in the file. The conversion process will not affect these fields. The input file must be an ASCII file in fixed record length format. As previously mentioned, for the system to automatically process the input file, it must be named appropriately with the State's alpha abbreviation. The following are accepted file names and their possible contents:

Standard Input File Names

File Name	File Type
ST.txt	generic file
*ST*LADT.txt	LADT file
*ST*COMM.txt	commuter claims file
*ST*COM.txt	commuter claims file variation
*ST*HIS.txt	generic history file
*ST*ANN.txt	generic annual file
*ST*PROMIS.txt	weekly PROMIS input file
*ST*LADTPROMIS.txt	weekly PROMIS LADT input file
*ST*INTRA.txt	intrastate claims file
*ST*REG.txt	regular claims file
*ST*CC.txt	Continued claims file
*ST*IC.txt	initial claims file
ST = State alpha abbreviation	

As long as the above criteria are met, the system can accept any file format. For example, the complete LADT file can be submitted. Each record in the LADT file contains 63 fields at a total of 473 bytes. The maximum number of fields per record and the total number of bytes per record are limited together to 32,767 bytes.

RAS can also filter out unwanted records, such as claims with earnings and UCX claims, prior to processing the input file. For large files, filtering out unwanted records will speed up the RAS processing time.

In addition, large input files can be compressed before they are uploaded to EUSweb using either WinZIP or PKZIP compression utility software. Compressed files, or zipped files, use the same naming conventions as above but must have the "ZIP" extension instead of the "TXT" extension. The polling agent will automatically unzip any files with the ZIP extension before sending them to RAS for processing. This feature will significantly reduce the amount of uploading time for large input files and eliminated EUSweb sessions from timing-out during the upload procedure.

Format File

The format file contains a list of each data field, its length and data type, and must have the "FMT" extension. The file identifies the fields and their locations within a record. Only the address fields (street, city, state, and ZIP code) need to be specifically identified for RAS. It also identifies unnecessary fields that can be ignored during processing or even removed before process begins. Data that the State does not want to identify, such as Social Security numbers, should be included in one large field along with other data. This way the positions of the sensitive data are not identified.

The following is an example of a format file. In this case, the Social Security number can be hidden in the "data" field which is 20 characters long.

Format File Example

```
data,20,c
address,30,c
city,19,c
state,2,c
zip,5,c
eor,2,b
```

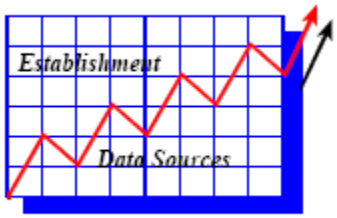
The data type is "c" for most of the fields indicating that the field is a character type. Only the "eor", or end of record, is a "b" for binary type. The eor indicator typically consists of two column lengths and is not visible unless using a text editor, such as Word or TextPad, which allows the viewing of all spaces. Although the eor is takes up two column places, it is usually identified as a single symbol, such as ¶ in Word or ◿ in TextPad. The eor indicator can be viewed by the clicking on the following button on the tool bar in Word or TextPad:

Output Files

States have much flexibility in how their output files are produced. The output can be as simple as having the same file layout as the input file only with corrections. It can also contain additional fields assigned by the system. RAS can overwrite existing address fields with corrected data or the corrected data can be written to new fields in any location in a record. FIPS for States, counties,

incorporated places, CDPs, MCDs and State specific codes can be also be written to any location in the record or appended to the end of each record. Several output files can be produced from one input file. Multiple output files can be designated by claim types, such as regular and commuter claims, or other criteria depending on the needs of the State.

Once a file has been processed, the output file will have the same name as the input file but will include the word “out” (ex. STOUT.TXT). Multiple output files would be named to reflect their contents.



4 Inputs to LAUS Estimation: Establishment Data Sources

Introduction

There are two establishment-based data sources for employment estimates. These are the Current Employment Statistics (CES) program and the Quarterly Census of Employment and Wages Program (QCEW). The next two sections provide an overview of these two programs.

The Current Employment Statistics Program

The Current Employment Statistics (CES) program is responsible for a Federal-State cooperative monthly survey of 144,000 business establishments nationwide that operates in all States, the District of Columbian, Puerto Rico, and the Virgin Islands. These 144,000 businesses and government agencies represent approximately 550,000 individual worksites. Each month, the survey provides detailed industry data on employment, hours, and earnings of workers on nonfarm payrolls for the nation, each State, and all metropolitan areas and areas in Puerto Rico defined by the U.S. Office of Management and Budget.

The CES is an establishment survey that measures payroll jobs, unlike the Current Population Survey (CPS) which is a household survey that measures employed persons.

CES Concepts

Establishment. An establishment is defined in the CES as an economic unit, such as a factory, mine, store, or office that produces goods or services. It generally is at a single location and is engaged predominantly in one type of economic activity. Where a single location encompasses two or more distinct activities, these are treated as separate establishments if separate payroll records are available and the various activities are classified under different industry codes.

Employment. Employment data refer to persons employed full- or part-time in nonfarm establishments during a specified payroll period. Temporary employees are included. In general, data refer to persons who worked during, or received pay for, any part of the pay period that includes the 12th of the month. Government employment covers only civilian employees; military personnel are excluded. Employees of the Central Intelligence Agency, the National Security Agency, the National Imagery and Mapping Agency, and the Defense Intelligence Agency also are excluded. Persons are considered employed if they receive pay for any part of the specified pay period, but they are not considered employed if they receive no pay at all for the pay period. Therefore, persons who are on paid sick leave (when pay is received directly from the firm), on paid holiday, on paid vacation, or who work during a part of the pay period even though they are unemployed or on strike the rest of the period are counted as employed. Not counted as employed are persons who are on layoff, on leave without pay, on strike for the entire period, or who were hired but have not yet reported to work during the pay period.

Since proprietors, the self-employed, and unpaid family workers do not have the status of paid employees, they are not included. Also excluded from the employed are farm workers and domestic workers in households. Salaried officers of corporations are included.

CES Estimation

The estimation methodology for the CES program combines annual benchmarks from the Quarterly Census of Employment and Wages program with monthly data from a sample survey to produce estimates of employment, hours, and earnings. All firms with 1,000 employees or more are asked to participate in the survey, as is a sample of firms across all employment sizes. In 2014, the CES sample consisted of about 150,000 businesses and government agencies that represented approximately 550,000 individual worksites drawn from a sampling frame of UI tax accounts. The sample rotation plan allows most firms to report for 4 years and then be rotated out of the sample for a similar period. The sample frame is the master list of establishments reporting to the Unemployment Insurance system.

Sample distribution is obtained by stratifying the universe of establishments for each industry into employment-size classes. A total sample size sufficient to produce adequate employment estimates is then determined and distributed among the size classes in each industry based on the average employment per establishment and the relative importance of each size class to its industry. Data are then collected from the establishments surveyed on the report form BLS 790 or its electronic equivalent.

Employment estimates are made at the publication industry (or cell) level and aggregated upward to broader levels of industry detail. A minimum guaranteed publication structure has been defined for all States and MSAs. The structure consists of “expanded” supersectors, which break Manufacturing; Trade,

Transportation, and Utilities; and Government into further publication detail. The guaranteed publication cells aggregate to the summary cells of goods-producing, service-providing, total private, and total nonfarm employment. All other published series have to pass a minimum sufficiency test of at least 30 unique unemployment insurance (UI) accounts in its sample, or a minimum universe employment count of 3,000 with at least 50 percent covered by the sample.

Guaranteed industries that do not pass the minimum sufficiency test are estimated using a regression model. The CES Small Domain Model (SDM) is a Weighted Least Squares model with three employment inputs: (1) an estimate based on available CES sample for that series, (2) an ARIMA projection based on trend from 10 years of historical data, and (3) an estimate based on the Statewide series for that industry. In addition to the guaranteed industries, Sectors may be modeled at the Statewide level. Approximately 44 percent of State and area CES series are model-based.

For each non-summary (non-aggregate) cell a total level of benchmark employment is obtained for a specific month (usually March). The sample data from reporters who responded for consecutive months provides a link relative sample ratio. This ratio is applied to the benchmark employment month to produce an April employment estimate. This process continues each month until the next annual benchmark cycle when estimates are replaced with population data. States also use a net birth/death factor to supplement the link relative estimator in the monthly estimation process. Birth/death factors are used to compensate for the inability to capture the entry of new firms into the sample, as well as the exit of firms that went out of business from the sample, on a timely basis.

Employment estimates are controlled at what is termed the Estimation Super Sector (ESS) cell level. ESS cells are those cells for which estimates are produced that also have the special function of controlling Basic cells. The Basic cell can be the same industry series as the ESS cell; or, if there are further industry breakouts into detailed estimating cells, the ESS cell will control the sum of the Basic cells. Estimates produced at the ESS level are generated using a larger sample size than estimates produced at detailed estimating cells; therefore, the estimates produced at the ESS level are statistically more robust and have less variance. Given these more desirable properties at the ESS level, CES uses a top-down estimation approach for published estimates.

CES State and Area estimation currently uses one of three separate estimators to turn sample data into employment estimates for a given cell. Which estimator is used for a cell depends on the characteristics of both that cell and the available data.

1. The Robust Estimator is used to estimate employment at the ESS and non-ESS levels when adequate sample exists.

2. The Small Domain Model (SDM) Estimator is used to estimate statewide employment at the non-ESS level when inadequate sample data exists. It is also used to estimate MSA employment at ESS and sub-ESS levels when inadequate sample data exists. It uses the cell's sample estimate as an input as well as a model-based input of the QCEW trend. At the MSA level, the SDM includes another input that uses the statewide link.

3. The Fay-Herriot (F-H) Estimator is used to estimate statewide employment at the ESS level when inadequate sample data exists. It uses the cell's robust estimate as an input as well as a model-based input of the QCEW trend combined with historical forecasts for all states and D.C. that have the CES series.

Benchmarks

In order to control both sampling and nonsampling error, CES payroll employment estimates are benchmarked annually to employment counts from a census of the employer population. These counts are derived primarily from employment data provided in unemployment insurance (UI) tax reports that nearly all employers are required to file with State workforce agencies. The UI tax reports are collected, reviewed, and edited by the staff of the BLS Quarterly Census of Employment and Wages (QCEW) program. All employers covered by UI laws are required to report employment and wage information to the appropriate State workforce agency four times a year. Approximately 97 percent of total nonfarm employment within the scope of the establishment survey is covered by UI. A benchmark for the remaining 3 percent is constructed from alternate sources, primarily records from the Railroad Retirement Board and County Business Patterns. As part of the benchmark process for benchmark year 2013, QCEW-derived employment counts replaced CES payroll employment estimates for all 50 States and the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and about 400 metropolitan areas and divisions for the period of April 2012 to September 2013.

UI tax reports are not collected on a timely enough basis to allow for replacement of CES payroll estimates for the fourth quarter, October 2013 to December 2013. For this period, estimates based on existing sample information are revised using the new series level from census-derived employment counts and updated business birth/death factors.

Reliability of Estimates

Although the relatively large size of the CES sample assures a high degree of accuracy, the estimates derived from it may differ from the figures that would be obtained if it were possible to take a complete census using the same procedures. Although the estimates are adjusted annually to new benchmarks, estimates

subsequent to the benchmark month have several potential sources of error. The amount added each month for new establishments, for example, may be too high or too low. Changes in the industrial classification of establishments that result from changes in their product or activity between benchmark months are not reflected. In addition, small sampling and response errors may accumulate over several months as a result of the link relative technique of estimation used between benchmarks.

The Quarterly Census of Employment and Wages Program

Background

The Quarterly Census of Employment and Wages (QCEW) program is a cooperative endeavor of BLS and the workforce agencies of the 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. Using data submitted quarterly by the agencies, BLS summarizes employment and wage data for workers covered by State unemployment insurance (UI) laws and for civilian workers covered by the program of Unemployment Compensation for Federal Employees (UCFE).

The QCEW program is a comprehensive source of employment and wage data by industry at the national, State, and county levels. Unlike the CPS and CES programs which are monthly sample surveys, the QCEW program is collected quarterly and provides a virtual census of nonagricultural employees and their wages. In addition, about half of all workers in agricultural industries are covered.

Sources of Data

There are five sources of data for the QCEW program. They are initial status reports, quarterly contribution reports, multiple worksite reports, Federal Government reports, and annual refiling survey forms.

Initial Status Reports

Initial status reports are filed by new employers with the State UI tax unit to initially register their business. These reports provide basic business identification and classification information to establish a UI account. The employer's liability for UI taxes is determined from information provided in this report.

Quarterly Contributions Report (QCR)

QCRs are filed quarterly by all UI-liable employers to the State UI tax unit. These reports provide the name and social security number of covered workers who worked or received pay for the pay period which included the 12th of each month, the total wages paid to covered workers, the portion of total wages subject to unemployment insurance tax, and the employer contribution amount.

Multiple Worksite Report (MWR)

The MWRs are filed quarterly with the State QCEW unit by most employers with more than one business establishment. The MWR provides establishment-level employment and wages data not otherwise available on the QCR.

Federal Government Reports

These reports are filed quarterly by most federal government agencies to report

employment and wages data to the State QCEW unit, in accordance with the Unemployment Compensation for Federal Employees (UCFE) program. Data for non-defense federal agencies are provided to the State QCEW unit; information for civilian employees of the Department of Defense is reported directly to BLS-Washington.

Annual Refiling Survey Forms

UI-liable employers are surveyed by the State QCEW units periodically to verify their location(s) and industry activity(ies). Employers are asked to verify physical location, mailing address, and industry and ownership information and to provide corrections if necessary

Data Compilation

State agencies code and summarize the raw data, check for missing information and errors, and prepare imputations of data for delinquent reports. Each establishment is classified by its industrial activity and then independently by one of five ownership categories. (The ownership categories into which establishments are classified are private industry, Federal government, State government, and local government.) An establishment is an economic unit, such as a factory, mine, or store, which produces goods or provides services. It usually is at a single physical location and engaged in one, or predominantly one, type of economic activity, for which a single industrial classification may be applied. The North American Industry Classification System is used to classify the industry of each establishment.

Employment data represent the number of workers on the payroll of covered employers during the pay period including the 12th day of the month. Persons on the payroll of more than one firm are counted in each firm. Workers are reported in the State and county of the physical location of their job. Persons on paid sick leave, paid holiday, paid vacation, and so on, are included, but those on leave without pay for the entire payroll period, are excluded. The employment count also excludes employees who earned no wages during the entire applicable period because of work stoppages, temporary layoffs, illness, or unpaid vacations, and employees who earned wages during the month but not during the applicable pay period.

UI Coverage

Each State has determined its own laws regarding UI coverage, but they have been greatly influenced by the federal government. The Federal Unemployment Tax Act (FUTA) provides tax incentives that have ensured States' conformity with the minimum coverage standards set down in FUTA.

In general, a covered employer is defined under the FUTA as one who has a quarterly payroll of $1500 in the calendar year or preceding calendar year, or one

worker in 20 weeks. While many States have chosen to expand coverage beyond the FUTA standards, the notable exceptions and limitations are noted below.

Agriculture

For the majority of States, only employers with ten or more workers in twenty weeks, or who paid $20,000 or more in wages in any quarter, are subject to unemployment insurance laws. Farm owners/operators are excluded from coverage in all states.

Domestic Service

Private households, social clubs, and college fraternities and sororities which employ domestic help and pay wages of $1,000 or more in a quarter are subject to unemployment insurance laws.

Nonprofit Organizations

Coverage is required for nonprofit organizations with four or more employees in 20 weeks. Almost half of the States, however, have elected more expansive coverage, typically covering any organization with even one employee in twenty weeks. Ministers employed by religious organizations to perform ministerial duties are excluded from nonprofit coverage.

Self-employed Individuals and Unpaid Family Members

As defined by the unemployment insurance laws, employment is the hiring of workers by others for wages. Self-employed individuals are therefore excluded, except in California, where they may elect to pay contributions for self-coverage. Relatives are not covered unless they receive pay from the official business payroll. However, the employment of minors by their parents, or parents by their children, is excluded.

Railroads

Interstate railroad workers are covered by the Railroad Unemployment Insurance Act administered by the Railroad Retirement Board and thus are not included in the QCEW data. Workers on intrastate and scenic railroads may be covered for UI and included in the QCEW data.

State and Local Government Elected Officials and Others

All State and local government employees are covered under State UI laws with the exception of elected officials, members of the judiciary, State national and air national guardsmen, temporary emergency employees, and policy and advisory positions.

Student Workers at Universities, Interns and Student Nurses

College and university students employed by the school at which they are

enrolled, such as work-study students, are excluded from coverage. Many States also exclude the spouses of students who work at the university if the employment is part of a program to provide financial assistance to the student. Student nurses employed by hospitals as part of a training program are not covered. Similarly, medical school graduates working as interns in hospitals are excluded from coverage.

Armed Forces

Military personnel are excluded from State unemployment insurance coverage. They are covered under a separate program, Unemployment Compensation for Ex-Servicemen, but are not included in QCEW data. Civilian defense workers, however, and all other federal employees covered under the Unemployment Compensation for Federal Employees (UCFE) program are part of the data reported to the QCEW program.

Agents on Commission

Insurance and real estate agents who are paid only by commission are excluded from coverage in almost all of the States.

Earnings Data

Total wages, for purposes of the UI quarterly reports submitted by employers, include gross wages and salaries, bonuses, tips and other gratuities, and the value of meals and lodging, where supplied. In a majority of the States, employer contributions to certain deferred compensation plans, such as 401(k) plans, are included in total wages. Total wages, however, do not include employer contributions to Old-Age, Survivors', and Disability (OASDI); health insurance; unemployment insurance; workers' compensation; and private pension and welfare funds.

Uses

The QCEW data serve as the basic source of benchmark information for employment by industry and by size of establishment in the Current Employment Statistics program. QCEW also serves as a national sampling frame for establishment surveys by the Producer Price Index, Occupational Employment Statistics, and other compensation programs.

Differences: Establishment Data Sources versus the CPS

The household and establishment data complement one another, each providing information that the other cannot supply. Population characteristics, for example, are obtained only from the CPS, whereas detailed industrial classifications are much more reliably derived from establishment reports. Certain differences can be accounted for, but others cannot. It is useful to be aware of the CPS/CES/QCEW differences for estimation and analysis purposes. Some of the important differences are discussed below.

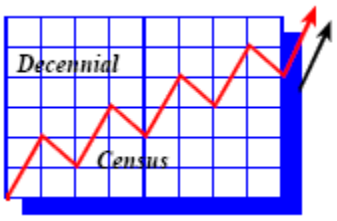
Place of Work vs. Place of Residence. CES and QCEW data are produced according to the location of the establishment; CPS data provide residency-based employment estimates.

Jobs versus Employed People: CES and QCEW develop estimates of jobs. The CPS estimates employed individuals. Workers holding more than one job may be included more than once in the CES and QCEW employment counts since they may appear on more than one payroll record or contribution report. Employed persons in the CPS are counted only once even if they hold multiple jobs.

Reference Period Differences. The reference period for the CPS is the calendar week including the 12th of the month, except in December when it is often the week including the 5th. The reference period for CES and QCEW is the payroll period including the 12th of each month, which could be weekly, biweekly, semi-monthly, or monthly.

Employment Coverage Differences. The CPS definition of employment is total employment, comprising wage and salary workers (including domestics and other private household workers), self-employed persons, and unpaid workers who worked 15 hours or more during the reference week in family-operated enterprises. Employment in both agricultural and nonagricultural industries is included. The CES and QCEW definitions reflect nonfarm wage and salary employment and do not include self-employed and unpaid family workers. QCEW includes some, but not all, domestics in private households and agricultural workers, whereas these categories of worker are out-of-scope for CES.

CES and QCEW estimates include 14- and 15-year olds while the universe for the CPS is limited to 16 years of age and older. CES does not cover workers who are on unpaid absence for the duration of the pay period. These workers may be considered employed in the CPS depending on their job attachment as determined in the course of the interview. Workers who are on strike for the entire pay period of the establishment are not included in the CES and QCEW estimates, but are considered employed in the CPS.



5 Inputs to LAUS Estimation: Census Data

Introduction

The Census of Population and Housing, conducted every ten years by the Bureau of the Census, is primarily intended to provide the population counts necessary for apportionment of seats to the U.S. House of Representatives and for determining legislative district boundaries.

Post-censal population estimates are used in the State CPS estimation methodology and for estimating certain unemployment components in the handbook methodology. Official Census Population Estimates Program (PEP) estimates are used to correct for discrepancies in ACS population estimates at smaller geographies. Ongoing population estimation is conducted by the Bureau of the Census through a Federal/State cooperative program. Statewide population estimates are produced annually for the United States, counties, and sub-county areas. Data are additive to the next level of geography, i.e., the State is the sum of its counties. Except for the decennial census year, population estimates pertain to July 1 of the reference year.

Prior to the 2010 census, the questionnaire came in two forms: the short form, which includes questions found on every form (100-percent questions) and the long form, which also includes sample questions. The majority of individuals received a short form where questions regarding household relationships, sex, race, age, marital status, Hispanic origin and housing are asked. Approximately one-sixth of the population received the long form where sample questions include the following topics: (1) social characteristics such as education, place of birth, ancestry, disability, and veteran status; (2) economic characteristics such as labor force status, occupation, industry, class of worker, place of work, work experience, and income; and (3) more detailed housing questions.

The 2010 census was limited to the short-form questionnaire which was sent to all households in the United States and Puerto Rico. Information previously gathered by the long-form questionnaire is now provided by the Census Bureau's American Community Survey (ACS), which is collected in a sample of approximately 3 million households annually. The ACS, released annually, has become a primary source of economic and demographic data at detailed geographic levels.

The LAUS program methodology uses ACS worker flows data for adjusting establishment-based employment estimates to residency-based employment estimates, for estimating certain employment components in the Handbook methodology, and for disaggregating or apportioning handbook area estimates to smaller areas.

The American Community Survey

The American Community Survey (ACS) is a relatively new survey conducted by the U.S. Census Bureau. It uses a series of monthly samples to produce annually updated estimates for the same small areas (census tracts and block groups) formerly surveyed via the decennial census long-form sample. Initially, five years of samples were required to produce these small-area data. The Census Bureau released its first 5-year estimates in December 2010, and new small-area statistics now are produced annually. The Census Bureau also produces 1-year data products for larger geographic areas (i.e., areas with a population of at least 65,000). The ACS includes people living in both housing units (HUs) and group quarters (GQs).

Topics covered by the ACS are virtually the same as those that were previously covered by the census long-form sample data. Estimates are produced for demographic characteristics, social characteristics, economic characteristics, and housing characteristics.

ACS Sample Size

The full implementation of the ACS, which began in 2005, sampled approximately 2.9 million housing unit addresses annually stateside. The 2011 ACS sampled approximately 3.3 million housing unit addresses—this corresponds to an increase in the targeted annual sample size of 3.54 million addresses that began with the June 2011 ACS sample. This increase in the targeted annual sample size has continued since then, resulting in a 2013 ACS sample of approximately 3.54 million housing unit addresses.

ACS "time-period" Estimates

In general, ACS data describe conditions over the time period during which the Census Bureau collected the data (1 or 5 years); in contrast, Census 2000 data described conditions around April 1, 2000. Thus, ACS data provide "time-period"

estimates, while prior long-form data provided approximate “point-in-time” estimates. The time-period nature of ACS data has several important consequences.

In the interpretation of 1-year estimates, ACS estimates describe the average characteristics of an area over a 1-year time period during which the Census Bureau collected the data. It is important to remember that while these estimates represent the average characteristics over a single calendar year, the 1-year estimates are not calculated as an average of 12 monthly values. Saying that ACS estimates are “averages” seems simple and straightforward, but an “average” may mean different things depending on the variable being studied. For example, educational attainment is a population characteristic that changes slowly. In this case, the ACS estimate is likely to provide a close approximation to conditions at any one point during the year even if the Census Bureau collected the data over the course of the year. Unemployment, on the other hand, fluctuates throughout the year. The ACS unemployment estimate therefore may not be a close approximation to the unemployment rate on any given day during the year. For 1-year ACS data, the estimates do not represent conditions at any one point during a year but do reflect data that is spread across the entire 1-year period.

The multiyear ACS estimates have the same interpretation as single-year estimates, but, in these cases, the aggregated estimates represent information collected over 5 years rather than 1 year. The longer data collection period means that there is more time for conditions to change during the course of measurement. In interpreting multiyear estimates, is should not be assumed that a multiyear estimate represents conditions at the end of the multiyear period. Two metropolitan areas may have the same 5-year average poverty rates but the poverty rates of the two metropolitan areas may be substantially different on the last day of the measurement period.

Comparisons involving single-year ACS estimates are straightforward because they involve comparisons of data collected in two independent samples. Comparisons involving multiyear ACS data are complicated by the fact that the estimates being compared may be based on some of the same data. It is important to distinguish between comparisons involving overlapping and nonoverlapping samples. The 2005–2009 5-year estimates and the 2010–2014 5-year estimates are said to be nonoverlapping because they use none of the same data. Comparisons involving overlapping estimates depict changes only as calendar year data sets are dropped and added to the sample. Any changes that may have occurred between the beginning and the end of the survey period are muted by the use of the same information (the overlapping samples) in both estimates. For example, changes between the 2005–2009 5-year estimates and the 2006–2010 5-year estimates are entirely driven by the changes between 2005 and 2010, because the 2006, 2007, 2008, and 2009 data are used in both estimates.

Overlapping estimates may give a sense of underlying trends but, because the number of observations dropped and added between samples may be small, a

suspected trend may be the result of the deletion and addition of a relatively small number of atypical cases. Nonoverlapping estimates will give the best indication of whether and how conditions may have changed. Thus, rather than comparing estimates from the 2005–2009 5-year data with the 2006–2010 5-year data, the 2005–2009 5-year estimates should be compared with the 2010–2014 5-year estimates. Typical statistical tests cannot be applied to overlapping samples because the overlap gives a false sense of the size of the samples being compared.

Nonsampling Error

The ACS data collection consists of 3 stages: 1) a mailed request to respond via Internet and later followed by an option to complete a paper questionnaire and return it by mail, if no response is received by Internet or mail then 2) computer-assisted telephone interview (CATI) follow-up for nonresponse, and 3) computer-assisted personal interview (CAPI) visit interviews on a subsample of the remaining nonresponding sample addresses. The Census Bureau carries out ACS nonresponse data collection with a permanent telephone and field interviewing staff thoroughly familiar with the survey and its content.

Studies have indicated that the ACS procedures produce lower unit nonresponse and item nonresponse than experienced by its predecessor survey, the decennial long form. While the impact of sampling variation can be easily translated into measures such as margins of error, it is difficult to actually measure how improvements in unit and item nonresponse translate into more accurate data.

Differences: ACS versus CPS/LAUS Estimates

Data Collection and Publication

The CPS reference period is typically the week including the 12th of the month, with interviews being conducted the following week (typically the week including the 19th of the month). CPS data are produced and published monthly. Annual average data are also developed at the end of the calendar year. The CPS uses a fixed reference period, as compared to the ACS, where the reference period is the week prior to when a respondent answers the survey. CPS interviews are conducted in the course of a single designated week each month, whereas respondents answer the ACS at times that vary throughout the month and year. ACS respondents are initially contacted by mail and encouraged to complete the survey via the Internet or to return a paper questionnaire. If they do not respond to their survey within a month of receiving it, they are then contacted by phone. Approximately 1 in 3 households that still do not provide answers are sub-sampled for an interviewer to contact them in person in the third month.

ACS responses can relate to any weekly period throughout the year and reflect different economic events. Respondents can choose to delay completion of the ACS form. ACS data are collected over a range of time periods. In the ACS, the reference is to activity in the “last week” whenever the respondent fills out the survey. In the CPS, the reference period is fixed. A varying reference week and time of data collection could be particularly problematic for shorter, transitory statuses or activities that could be influenced by seasonal variation. Unemployment, for example, is a status that is subject to both seasonal and cyclical variability.

The mode of collecting data also may affect the labor force estimates. All CPS interviews are conducted through personal visits or telephone calls by Census field representatives using laptop computers for data entry. ACS data are collected primarily by internet and mail, with telephone and personal visit collection used as follow-up to mail nonresponse. Data collected using paper forms do not have interviewers assisting respondents in interpreting questions.

Both the ACS and CPS are sample surveys used to make estimates for a larger population. Each person in the survey represents a larger number of similar individuals in the population. To do this, each survey utilizes population estimates produced by the Population Estimates Program at the Census Bureau. Each year, the Population Estimates Program publishes population estimates by demographic characteristics (age, sex, race, and Hispanic or Latino ethnicity) for the nation, States and counties. The reference date for estimates is July 1st.

Labor Force Estimates

In 2013, the numbers of persons the ACS classified as “employed,” “unemployed,” and “not in the labor force” for the nation were all higher than the official CPS estimates. The ACS unemployment rate was 8.4 percent in 2013, compared to the CPS 2013 annual average of 7.4 percent.

A number of factors may account for the difference in the estimates, including the following: overall questionnaire differences, differing requirements in the two surveys with regard to whether an individual is actively looking for work, and differing reference periods and modes of collection.

The ACS questions relating to labor force activity are less detailed than those in the CPS. For example, the ACS uses seven questions in determining labor force status, while the CPS uses sixteen. There are more detailed, probing questions in the CPS regarding employment status. In addition, the CPS information is always collected by trained interviewers and never through internet or mail questionnaires. The ACS instrument asks people if they are looking for work and available to take a job if offered one, but does not ask about the nature of the job search. The CPS questionnaire probes to see if people are actively looking for work (interviewing, calling contacts, etc.) versus passively looking for work (for example, looking at want ads in the paper). In the CPS, a person is unemployed only if that person has actively searched for work.

Effective 2008, changes were made to the ACS questionnaire that modified and improved existing questions for several subject areas. In particular, revised labor force questions were introduced to better capture data on employment status. The modifications had the impact of increasing the estimated number of employed persons from the ACS relative to CPS and LAUS estimates.

Uses of ACS Data in LAUS

Uses of ACS in Labor Force Estimates

ACS non-agricultural wage and salary employment ratios derived from the relevant ACS five-year dataset are used to disaggregate multicounty or multi-MCD area estimates of establishment-based non-agricultural wage and salary (NAWS) employment (M01) into the county components. M01 values at the county- or MCD-level are required for Handbook line 1 calculations. (See Chapter 7.)

In order to develop place-of-residence employment estimates for counties and MCDs, ACS nonfarm employment levels and ACS worker flows data are used in calculating residency adjustment factors that are applied to monthly establishment-based employment estimates. (See Chapter 7 Section on Dynamic Residency Ratios.)

Area shares of Statewide ACS agricultural and all-other employment (self-employed, unpaid family workers, and domestics in private households) are used in developing current month handbook area estimates of these employment components. (See Chapter 7.)

ACS employment estimates are used in the ACS-share disaggregation method, which is used in conjunction with the claims-based unemployment disaggregation method for county parts and cities. The use of ACS data for disaggregating unemployment estimates is required when UI claims data by county part or city of residence are not available. The method uses ratios of ACS unemployment in subareas to the respective larger area totals. (See Chapter 9.)

ACS worker flows data, which identify place of residence and place of work in employment estimates, are used in the designation of LMAs, including metropolitan areas, micropolitan areas, and small labor market areas.

Uses of Population Data

Census population data are used to resolve inconsistencies between ACS population estimates and the annual Census population estimates from the Population Estimates Program (PEP). ACS uses the PEP estimates for most counties and Minor Civil Divisions in their weighting methodology as controls, however some smaller areas are combined and controlled as one area. This can and does make some ACS and PEP population estimates differ. The LAUS program resolves these discrepancies by applying a ratio of the area's Census annual population estimate divided by the most recent 5-year ACS population estimate to ACS estimates used in Line 2 and 3 employment shares and disaggregation ratios. The impact of this population correction factor is twofold:

1. ACS small area labor force estimates estimates are rebased to official Census PEP estimates

2. 5-year ACS labor force estimates are updated to a current Census population vintage year basis. This allows employment and unemployment shares to keep pace with population change.

Decennial census population estimates for States, and the subsequent postcensal estimates, serve as the population controls in CPS estimation. In a ratio estimation procedure, known population totals are applied to sample ratios to improve the accuracy of the sample-based estimates of levels.

Age-specific population counts are used in the distribution of new entrant unemployed and reentrant unemployed estimates to States. They are also used in the disaggregation of handbook area entrants and reentrants to cities and county parts.

ACS Employment/Unemployment Data

Data	Use
Total Employment	*Disaggregation of employment estimates*
Total Unemployment	*Disaggregation of unemployment estimates*
Employment:	
Non-Agricultural Wage and Salary	*Determination of appropriate weighting for dynamic residency adjustment factors and to disaggregate multicounty or multi-MCD area M01 inputs into single county and single MCD M01 inputs.*
Agriculture	*ACS agricultural employment shares of Statewide CPS agricultural employment*
All-other	*ACS all-other employment shares of Statewide CPS all-other employment*
Commutation Data	*Definition of metropolitan, micropolitan, and small labor market areas; also used in dynamic residency ratio calculations*

Population Data

16+ civilian, non-institutional population for States	*CPS population controls*
Total population	*ACS population correction factors*
Total population 16-19, 20+	*Handbook area shares of Statewide CPS new and reentrant unemployment;* *Disaggregation of new and reentrant unemployment from handbook areas to disaggregated areas*

Post-Censal Population Estimation

Post-censal population estimates are used in the State CPS estimation methodology and the ACS population correction factors applied to ACS estimates used in Handbook lines 2 & 3 (all-other and agricultural employment, respectively) and in the development of disaggregation ratios. Ongoing population estimation is conducted by the Bureau of the Census through a Federal/State cooperative program. Population estimates are produced annually for the United States, states, and counties; sub-county estimates are produced biennially. Data are additive to the next level of geography, i.e., the State is the sum of its counties. Except for the decennial census year, population estimates pertain to July 1 of the reference year.

State and County Total Resident Population

The goal of the state and county total population estimates process is to produce total population estimates and estimates of the state population aged 18 and over for all states, counties, and equivalents in the United States. Parishes in Louisiana, boroughs in Alaska, and several independent cities (in Maryland, Missouri, Nevada, and Virginia) are treated as counties. The process focuses on the development of estimates for counties (and equivalents) only. State estimates exist only as a sum of the final estimates for counties.

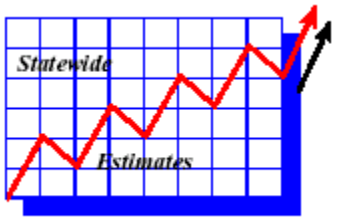
The process involves estimating the population separately for ages under 18, 18 to 64, and 65 and over. The three age groups are estimated for this process for two reasons. First, different input data are used for domestic migration depending on if the population is under age 65 (IRS tax exemptions) or 65 and over (Medicare enrollment). Second, estimates of the state population aged 18 and over are produced and provided to the Federal Election Commission.

Producing state and county total population estimates is similar to the production of national estimates, as they are both based on the balancing equation. However, state and county estimates are produced for annual July 1 dates, and they incorporate domestic migration. Even though there are slight differences in the way we calculate the first three months (April to July) from the estimates base (using only one quarter of a year of migrants, for example), the process is very similar for all other points in the time series.

First the GQ population and “age” the population one year are subtracted in order to produce an estimate of the household population at the start of each period. The aging process takes the proportion of the previous vintage county population age 17 and 64, applies that proportion to the current year, and moves that population into the next higher age group (e.g., the estimated number of 64 year olds would “age” into the group aged 65 and over).

Net migration rates calculated from IRS and Medicare data are then applied to the aged household population at the start of the period to create estimates of net domestic migration. Then add net domestic migrants, add births (for the under 18 population), subtract deaths, and add international migrants to produce an uncontrolled estimate of the household population at the end of the period for each age group. The GQ population is then added to create uncontrolled resident population estimates for each age group.

The next step in the process ensures consistency with the national estimates. First, the calculated resident population numbers are controlled to equal the national numbers by the three age groups. Second, the GQ change is added to the total household domestic net migration estimate for each age group and control that number to sum to zero at the national level by age group. Then final resident population by age group is rounded and the remainder (usually very small) is allocated to the largest population value in the country. Finally, the three age groups are aggregated into total estimates for counties, and sum these estimates to create final estimates for states.



6 *Development of Statewide Estimates*

Background

Historically, CPS samples have not been sufficiently large to produce reliable monthly estimates directly from the survey for all States. As a result, indirect methods have been used to estimate employment and unemployment. As far back as 1960, Statewide estimates of employment and unemployment were developed under uniform Federal procedures using the Handbook method. With the introduction of CPS State estimates in the 1970s, a six-month moving average ratio adjustment to CPS levels augmented the Handbook estimate. In the late 1970s, the Levitan Commission was established to review the measurement of the labor force in the United States. Among the recommendations made by the Commission in its report of 1978 was that BLS explore replacing the Handbook with an econometric approach to subnational estimation.

Building on work done by Mathematica Policy Research under contract to BLS, preliminary models were developed in the mid-1980s. In order to involve States directly in the research, the State Research Group, made up of State Research Directors and BLS staff, was established in 1986 with the support of the Interstate Conference of Employment Security Agencies (presently called the National Association of State Work Force Agencies). Regression and time-series techniques were employed, with the models

extensively evaluated using empirical methods as well as recognized statistical theory.

Modeling can address the small samples in each State which result in unacceptably high variation in the monthly CPS estimates of State employment and unemployment. To produce less variable labor force estimates as well as produce more stable seasonally adjusted estimates, BLS developed time-series models which ‘‘borrow strength’’ over time by using historical series of sample observations for a given State to increase its effective sample size. On average, the variance of month-to-month change in the model estimates is about one third of the size of the CPS variance.

A type of regression model known as the Variable Coefficient Model (VCM) best met the criteria. The VCM is so named because the coefficients in its equations are allowed to vary over time to reflect structural changes in a State's data. The changing coefficients are estimated by the "forward filter", a widely used statistical technique that evaluates structural change against sampling variability. The forward filter, also referred to as the Kalman Filter, enables the VCM to handle the different relative accuracies that result when an estimate draws upon data from several sources.

In 1988, a year of dual estimation of BLS and the States helped the states make the transition from the Handbook to the VCM. In 1989, this new method was implemented in 40 States and the District of Columbia. The remaining States were using monthly CPS estimates of employment and unemployment directly.

During the early 1990s, ongoing research at BLS brought about another improved model that better dealt with error estimation and incorporated new time-series variables. Known as the Signal-Plus-Noise model, it also uses variable coefficients and the forward filter. The Signal-Plus-Noise model was implemented in January 1994. In 1996, time-series modeling was extended to the 11 more populous direct-use States because of reductions in the size of the CPS sample.

The 2005 LAUS Redesign introduced a new third generation of LAUS models. The objectives of the new generation models were to implement direct model-based seasonal adjustment with reliability measures and to improve the benchmarking procedure by incorporating real-time monthly benchmarking. At the same time, 6 area models were introduced along with corresponding Balance of State models.

Real-time benchmarking addressed a number of concerns with the prior generation of LAUS models. It reduced annual revisions by incorporating the CPS benchmark on a current basis. It eliminated prior model biases and benchmarking issues. It ensured that national events and shocks to the economy will be reflected in State estimates as they occur. It also eliminated

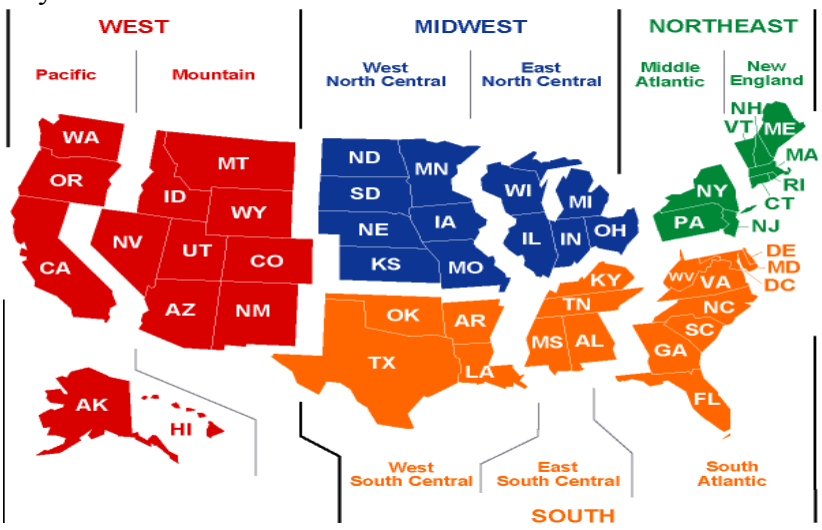
the discrepancy between the sum-of-States estimates and the national not-seasonally-adjusted totals. The following table illustrates differences between the LAUS sum-of-States unemployment rates and the national CPS rates for both seasonally-adjusted and not-seasonally-adjusted estimates in the years prior to the introduction of the third generation LAUS models.

Difference Between LAUS sum-of-States and CPS national unemployment rates, 1996-2004 (LAUS minus CPS)

Month	1996	1997	1998	1999	2000	2001	2002	2003	2004
Not Seasonally Adjusted									
January	-0.2	-0.2	-0.1	0.0	-0.1	-0.2	-0.4	-0.3	-0.2
February	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.1
March	-0.2	-0.3	-0.3	0.0	-0.3	-0.3	-0.4	-0.2	-0.3
April	-0.2	0.0	0.1	-0.1	-0.1	-0.2	-0.3	0.2	-0.2
May	-0.2	-0.1	0.0	0.0	-0.2	0.0	-0.2	-0.3	-0.2
June	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.3	-0.4	-0.2
July	-0.1	0.0	-0.1	-0.2	-0.1	-0.1	-0.3	-0.2	-0.2
August	0.0	-0.1	-0.2	-0.2	-0.2	-0.4	-0.3	-0.3	-0.2
September	0.0	0.0	-0.1	-0.1	0.0	-0.2	-0.1	-0.2	-0.1
October	-0.1	0.1	-0.1	0.0	0.0	-0.3	-0.1	-0.2	-0.2
November	-0.1	0.1	0.0	0.0	-0.1	-0.3	-0.4	-0.2	-0.2
December	-0.1	-0.1	0.0	0.0	-0.1	-0.4	-0.4	-0.1	-0.2
Seasonally Adjusted									
January	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1
February	-0.1	-0.3	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
March	-0.1	-0.2	-0.1	0.0	-0.1	-0.2	-0.1	0.0	-0.2
April	-0.2	-0.2	0.0	-0.2	-0.1	-0.2	-0.4	0.2	-0.3
May	-0.2	0.0	0.0	0.0	-0.2	-0.1	-0.3	-0.3	-0.3
June	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.4	-0.5	-0.2
July	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.3	-0.3	-0.2
August	0.1	0.0	-0.1	-0.1	-0.1	-0.3	-0.2	-0.2	-0.1
September	0.0	0.0	0.0	-0.1	0.0	-0.3	-0.2	-0.3	-0.2
October	-0.1	0.0	-0.1	0.0	0.0	-0.4	-0.2	-0.3	-0.3
November	-0.3	0.1	0.0	-0.1	-0.1	-0.4	-0.5	-0.3	-0.2
December	-0.2	-0.1	-0.1	-0.1	-0.1	-0.5	-0.4	-0.1	-0.2

The new models also addressed consistency issues, ensuring that the sum of State estimates equal that of the nation every month. As part of the real-time benchmarking procedure, each month each State's estimates were controlled to a Census Division. There are 9 Census Divisions which were in turn controlled to the national CPS. This controlling was done on a pro-rata basis,

with all State estimates within a given Census Division, for example, being adjusted by the same ratio.



In January 2010, BLS implemented smoothed seasonally adjusted (SSA) estimates as the official seasonally adjusted series for States' labor force data. SSA estimates incorporate a long-run trend smoothing procedure, resulting in estimates that are less volatile than those currently produced by the LAUS estimation methodology. The use of the SSA methodology is effective in reducing the number of spurious turning points in current estimates. More importantly, SSA estimation can reduce revisions in historical estimates and remove the potential disconnection between historically benchmarked and current estimates.

The 2015 Redesign introduced a new fourth generation of LAUS models. The Redesign changed how LAUS models incorporated time-series data other than CPS data by changing to a regression model. In the new regression models, time-series data used as covariates to the CPS have a fixed relationship with the trend in an area's estimates. This greatly reduces the amount of computer resources required to produce estimates, especially when revising historical estimates. Regression models are also more flexible, opening up future possibilities for the modeling of covariate data.

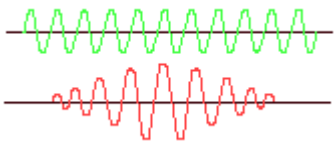
The fourth generation models of the 2015 Redesign also contained other features. They allow greater flexibility in the incorporation of outliers, such as the option to have outlier adjustments spread over multiple months. They also incorporate the process of real-time benchmarking, which had formerly been an added step following model estimation. Model-based benchmarking allows for the allocation of benchmark discrepancies according to the relative volatility of individual series instead of according to a single pro-rata adjustment.

Model Structure

The model structure introduced in 2015 utilizes both univariate and regressor modeling approaches. Univariate modeling is based only on the past values of CPS unemployment or CPS employment and is utilized for Division models. This approach combines a time-series model of the Signal and a Noise model of the CPS survey. The survey estimates used in the models are strengthened by the analysis of decades of monthly CPS sample data since 1976. For State and area estimates, a regressor modeling procedure is used. Regressor modeling of the series depends on the past values of the CPS and a related time series (payroll employment or UI claims) along with the relationship between the CPS and the input series. Related time series like payroll employment and UI claims help to interpret potentially spurious movements in the CPS, but the model ultimately aims to produce what the CPS would have estimated if it surveyed the entire population.

The State models incorporate five features that are tailored to the properties of each State's data series. These features include the smoothness of the trend, the stability of seasonal patterns, survey error, the relationship of the CPS trend to State input trends, and the presence and types of outliers.

Signal-Plus-Noise Approach



The State CPS estimates are broken out into the Signal, which represents the true value of the employed or the unemployed and the Noise, which represents survey error inherent in the CPS sampling procedures. The observed CPS estimate consists of a true but unobserved labor force value plus noise, which occurs because the estimates are derived from a probability sample and not exhaustive measurement of the entire population.

$$\text{CPS}_t = \text{Signal}_t + \text{Noise}_t$$

Where:

$\text{Signal}_t = \text{True Value}$

$\text{Noise}_t = \text{Survey Error}$

The signal-plus-noise estimation models are based on a modeling approach that accounts for and extracts the noise from the CPS time-series data, thus providing a better estimate of the signal. An important component of the noise in the CPS data is sampling error; its characteristics can be estimated from survey-design information. Two other factors that account for the noise are irregular movements in the data and occasional outliers. When there is a change in the CPS level of employment or unemployment, that change is a combination of the change in the true labor force signal and the change in the

noise. The goal of the models is to isolate the signal from the noise to obtain the best possible estimates of the true labor force values.

The models for employment and unemployment are a combination of two processes: signal estimation and noise estimation. Noise estimation consists of a model of sampling error predicted in the CPS. The design of the CPS contains two predictable sources of error which noise estimation incorporates. The first source is the sample size of the CPS for a given area, which indicates the potential magnitude of error in a given month's estimate. The second source is the reuse of sample across time, linking the error in a given month's estimate to that in other months which share potentially unrepresentative households with the given month's sample. Noise estimation responds to changes in CPS reliability as measured above. When the CPS is more reliable, the CPS monthly estimate is given more weight in determining the monthly signal estimate. When the CPS is less reliable, the broader historical pattern of the CPS is given more weight in determining the monthly signal estimate.

Signal estimation consists of a time-series model based on historical data relationships, so a long historical CPS time series is required. While the time-series model of the signal depends on past relationships, it does not require that these relationships be fixed over time. A very important feature of this model is a built-in self-tuning mechanism, known as the forward filter, which automatically adjusts the regression coefficients and trend and seasonal components to adapt to gradual structural changes as they occur.

Sudden, unpredictable changes in the time-series relationships are handled by incorporating outlier effects into the model.

Noise

Accounting for CPS Sampling Error

There are two properties of the CPS, all controlled through the models, which affect the time-series data: changing reliability and correlated sampling error.

Changing Reliability

Changing reliability is due to one or a combination of several factors. These factors include survey redesigns after decennial censuses, sample-size changes due to budget cuts or special supplementation, and variations in labor force levels. Because of these factors, the CPS sampling error variance is not fixed over time.

As the reliability of the CPS estimates changes, so do the weights used to estimate the signal. The estimated signal is a combination of an estimate based on the time-series model of the signal's historical data and current CPS estimates corrected by a model-based estimate of sampling error. The

reliability of the CPS can change over the years. As it improves, less weight is given to the time-series model and more weight to current CPS estimates. The reverse is true for periods when the reliability weakens. Thus, the estimated signal is a weighted average of a predicted signal based on historical data and the current CPS estimate. This is represented by the equation below:

$$\text{Signal}_t = (1 - w_t)\text{Signal}_{t,predicted} + w_t\text{CPS}_t$$

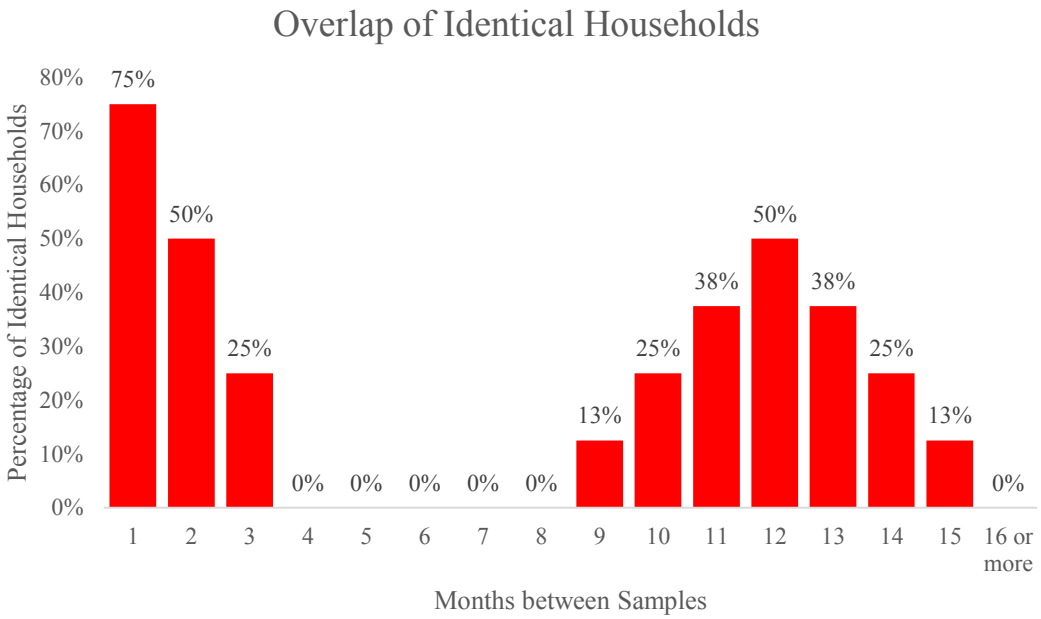
Where:

$\text{Signal}_t = \text{model estimate of the signal}$
$\text{Signal}_{t,predicted} = \text{model-based prediction of the signal}$
$0 \leq w_t \leq 1$

The lower the reliability of the CPS, the less weight is placed on the current CPS; the higher the reliability, the higher the weight.

Correlated Sampling Error

Because of the CPS 4-8-4 sample rotation method, there are significant overlaps in the samples used by the CPS. (See Chapter 2.) Each month three-fourths of the sample from the previous month is interviewed, one-eighth of the sample is interviewed for the first time, and one-eighth is resuming interviews after being out of the sample for 8 months. Each month one-half of the households from 12 months earlier are interviewed. The chart below shows the proportion of the households in the current sample that were also in the sample k months ago. For example, 75 percent of the households in the sample this month were in sample last month, 50 percent were in two months ago, etc. Note that samples from 4 to 8 months and over 15 months apart have no households in common.



The use of a rotation system requires the periodic replacement of the sample. To cover a decade under the 4-8-4 scheme, 15 samples are needed. A key feature of the replacement scheme is that successive samples are generated in a dependent way. Once an initial sample of households is selected, replacements are obtained from nearby addresses. For each original sample, the 14 succeeding ones needed to cover the decade are usually taken from the same neighborhood.

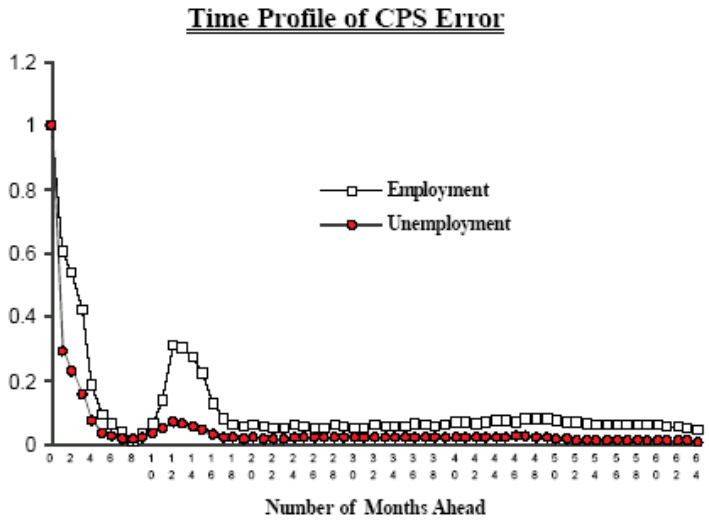
The overlap in the CPS sample is important because it introduces strong autocorrelation in the sampling error. That is, the current value of the sampling error (either an overestimate or an underestimate of the true value) will depend on its own past values. For example, suppose the unemployment rate for the sampled households in the current month is higher than the rate for the entire population. Since 75 percent of these households will remain in the sample next month, the unemployment rate is likely to be overestimated again.

The extent of this autocorrelation depends not only on the overlap in the sample but also on the stability of the labor force characteristic being estimated. The overwhelming majority of workers spend most of their time in the labor force as employed rather than unemployed. Accordingly, errors in the employment estimates will be more strongly autocorrelated than in unemployment estimates since employment is a more stable characteristic of the households being sampled.

While CPS estimates of standard error have been routinely produced for State CPS data, estimates of the error autocorrelations have not. Obtaining this information is potentially very costly, involving complex calculations on

huge micro data files. However, as part of BLS model research activities, a method has been developed to estimate the autocorrelations that requires only State CPS data for each rotation group.

The following graph presents the profile across time of a CPS error series for a typical State for both employment and unemployment. The vertical axis gives the weights that show how the effect of a CPS error occurring in a given month is distributed over future months, and the horizontal axis indicates the number of months following the occurrence of the error. For the current month (zero months ahead), the weight equals one since the full impact of the error is felt in the month that it occurs. A value of 0.6 for 1 month ahead, for example, indicates that 60 percent of the error in the current month carries over into the next month's estimate.



The strong autocorrelation in the CPS sampling error has important consequences. First, sampling error will account for long-run movements in the CPS. Ordinarily, we think of sampling error as having a transitory effect on a series. If completely random, its effects would quickly average out. This means the weights would drop to zero for all months following the occurrence of the error.

Another important consequence of correlated sampling error is that these errors are unlikely to average out over a 12-month period. If the error were completely random, the number of overestimates and underestimates should be about the same. However, because of the strong autocorrelation in the error, if the CPS underestimates one year, it is likely to do so the next year.

Signal

In addition to survey error, there are other sources of variation in the CPS time series. These sources are identified as the seasonal, trend and irregular components and are taken into account in the modeling procedure.

Based on the decomposition of a time series into the trend, seasonal, irregular, and survey error components, the mode of seasonal adjustment may be either additive or multiplicative. Formal tests are conducted to determine the appropriate mode of adjustment.

The additive mode assumes that the absolute magnitudes of the components of the series are independent of each other, which implies that the size of the seasonal component is independent of the level of the series. In this case, the seasonal factors represent positive or negative deviations from the original series and are centered around zero. The seasonally adjusted series values are computed by subtracting the corresponding seasonal factor from each month's original value.

In the multiplicative mode, the absolute magnitudes of the components of the series are dependent on each other, which implies that the size of the seasonal component increases and decreases with the level of the series. With this mode, the monthly seasonal factors are ratios, with all positive values centered around unity. The seasonally adjusted series values are computed by dividing each month's original value by the corresponding seasonal factor.

Time-Series Model of the CPS

$$\mathrm{CPS}_T = \begin{cases} T_t + S_t + I_t + e_t \\ T_t \times S_t \times I_t \times e_t \end{cases}$$

$$\mathrm{Signal}_T = \begin{cases} \mathrm{CPS}_t - e_t \\ \mathrm{CPS}_t \div e_t \end{cases}$$

Where:

$T_t = \text{trend component}$
$S_t = \text{seasonal component}$
$I_t = \text{irregular component}$
$e_t = \text{survey error}$

Model Estimation

The first step of the estimation process is to correct the CPS estimate for survey error.

$$\mathrm{CPS}_t - e_t^* = \mathrm{Signal}_t^*$$

The second step is to seasonally adjust the error-corrected CPS. The seasonal adjustment procedure is model-based. In a previous generation of models, seasonal adjustment was performed independently of the model by the use of ARIMA X-11 software. Once the seasonal factor is removed from the error-corrected CPS, the remainder consists of the trend and the irregular components.

$$\text{Signal}_t^* - S_t^* = T_t^* + I_t^*$$

Example

The following example illustrates an additive time-series model of the CPS. As mentioned above, the CPS is decomposed into trend, seasonal and irregular components.

$$\text{CPS}_t = T_t + S_t + e_t$$

Where:

T_t = global linear trend
S_t = fixed seasonal pattern
e_t = purely random (irregular)

The global linear trend model represents a linear relationship between the dependent variable (CPS_t) and *t*, where *t* indicates time. The magnitude and direction of growth are fixed by the slope. The growth per period is determined by the β value. The fixed intercept affects the level of the series. The initial level is determined by α but has no effect on growth. The smoothest possible trend would require that the growth lies on a straight line centered through the series.

$$T_t = \alpha + \beta t$$

$$t = 1, \ldots N$$

The fixed seasonal model consists of 12 coefficients, one for each month of the year. Each coefficient, or factor, measures the seasonal effect on the series for a given month. Additive seasonal factors have positive and negative values that indicate deviation above and below the trend level due to seasonality. Summing all 12 months of seasonal factors will equal 0. The fixed seasonal pattern repeats each year.

$$S_m = c_m$$

$$m = \text{month index } 1, 2, \ldots, 12$$

$$S_1 + S_2 + \cdots + S_{12} = 0$$

In this example the trend for time period t has an intercept of 10 and a slope of 0.26.

$$T_t^* = 10 + 0.26_t$$

$$S_1^* = 2.0, S_2^* = 3.5, S_3^* = 4.0, \ldots, S_{12} = 0$$

First, the CPS is corrected for survey error. The survey error model uses an autoregression approach with the current standard error as a weighted sum of its previous values plus the current random error, v_t. The coefficients are provided from sample survey information.

$$e_t = 0.34e_{t-1} + 0.19e_{t-2} + 0.10e_{t-3} + 0.02e_{t-4} + 0.02e_{t-5} + 0.02e_{t-6,\ldots} + v_t$$

A regression equation is used to model survey error to account for the overlap in CPS (autocorrelated error) and changes in reliability. The autocorrelated component, e_t, is adjusted by a variance inflation factor (VIF). The VIF is based on standard errors computed for the CPS.

$$e_t^{adj} = e_t * \mathrm{VIF}_t$$

Removing the estimated error from the CPS yields a value for the signal which equals the value for the signal computed from the trend and seasonal components.

$$\mathrm{CPS}_t - e_t^* = \mathrm{Signal}_t^*$$

$$\mathrm{Signal}_t^* = (10 + 0.26_t) + S_m$$

$$e_t^* = \mathrm{CPS}_t - \mathrm{Signal}_t^*$$

Next the error-corrected CPS is seasonally adjusted by removing the seasonal component.

$$\mathrm{Signal}_t^* - S_m^* = T_t^*$$

Variable Regression Coefficients

The simple model in the above section may be generalized to handle real series. Most series have changing trends and evolving seasonality. The trend component in the example above cannot respond to a change in the direction of the series. The seasonal component in the example above cannot respond to changes in the seasonal pattern.

Using variable regression coefficients (VC) allows the coefficients to vary over time so the model can adapt to changing patterns. In estimating the coefficients, more recent observations receive more weight than earlier

observations. Past data that are less relevant to current conditions are discounted.

When the trend coefficients vary over time, the trend is able to adapt to changing patterns. A poorly fitting fixed linear trend may miss important turning points in the series. A variable slope and level associated with the trend resolves this problem.

$$T_t = \alpha_t + \beta_t t$$

Similarly the seasonal component adapts to changing patterns and the seasonal factor for a given month *m* will change over time. Seasonal factors that are fixed may no longer reflect the current situation while seasonal factors are made adaptive with the variable coefficient.

$$S_{m,t} = c_{m,t}$$

In addition, the VC is a self-tuning mechanism where the model adapts itself without requiring special intervention. Each component has a "hyperparameter" associated with it that determines how much it changes over time. The hyperparameter is identified as σ_i. If $\sigma_i = 0$, then the component is fixed. If $\sigma_i > 0$, then the component changes continuously over time. The hyperparameters are estimated from historical State data.

Component	Fixed	Varying
Trend level (intercept)	$\sigma_{\text{level}} = 0$	$\sigma_{\text{level}} > 0$
Trend slope	$\sigma_{\text{slope}} = 0$	$\sigma_{\text{slope}} > 0$
Seasonal	$\sigma_{\text{seasonal}} = 0$	$\sigma_{\text{seasonal}} > 0$
Irregular	$\sigma_{\text{irregular}} = 0$	$\sigma_{\text{irregular}} > 0$

Outliers

CPS data are occasionally affected by outliers. These outliers are CPS values that are inconsistent with the expected behavior of either the signal or noise component. There are two possible causes of an outlier: an unrepresentative sample or a real non-repeatable event, such as bad weather or strikes. Because these outliers represent sudden changes, they may cause special problems for a model. In fact, we define an outlier as an observation that breaks the pattern of behavior predicted by the model. It is not necessarily an extreme value in the observed series. For example, a series may not change much from one month to the next, but an outlier may have occurred if the series normally has a large seasonal increase.

Even though there may be extreme observations in the CPS accompanied by a few large prediction errors, it is not necessarily good practice to make special adjustments to the model to fit those observations more closely. The purpose of the model is to capture the normal time-series behavior of the

signal. Thus, the model must be flexible enough to adapt to structural changes in the signal, but, if the model is too flexible, it will fail to filter out the noise. If there is prior information about the occurrence of an outlier, then an adjustment may be justified. Otherwise, adjusting the model for outliers is important only to the extent that they distort diagnostic testing, cause bias in parameter estimates, or lead to a deterioration in current performance.

Determining the type of outlier is crucial to deciding how to adjust the model for its effects. Even though there are many complex patterns of outliers, the three below tend to be the most common types of outliers that occur in time-series data:

- An additive outlier (AO) affects the series for only one month, such as a sudden increase followed by a decrease.
- A temporary change (TC) in the level of the series causes an abrupt change in the series followed by a gradual return to its former level.
- A permanent level shift (LS) refers to an abrupt shift that persists indefinitely into the future, or until an offsetting shift in the opposite direction occurs.

The outlier may be due to a real change in the labor force or result from the measurement process, which includes sampling and other types of measurement errors. The origin of the outlier determines whether it should be included in the signal or the noise component. Ideally, this should be resolved by seeking external information about the potential causes. In practice, such information is rarely available. Since highly transitory outliers in the CPS are more likely to be due to the measurement process than a real economic event, the usual procedure is to assign these types of outliers (AO and TC) to the noise component. On the other hand, a permanent shift in level is considered a real effect and assigned to the trend component of the signal. However, such identification requires that significant number of months of data be available following the occurrence of the outlier in order to identify the type of outlier that occurred. Therefore, outlier identification cannot be made in current estimates. Models are monitored on a current basis to detect the occurrence of outliers in the current year. Once enough data become available to identify the nature of the outlier, its effects are incorporated into the model specification as appropriate and implemented during the annual re-estimation of the models.

Trend

Local Linear Trend Models

Univariate models of local linear trend are used to separately estimate the trend component for CPS employment and unemployment, CES establishment employment, and UI continued claimant unemployed. The

local linear trend (T_t) of this type of model is comprised of a variable coefficient trend where the intercept and the slope change over time.

$$T_t = \alpha_t + \beta_{t-1}$$

Where:

$\alpha_t = T_{t-1} + \nabla_{\alpha,t}$
$\beta_{t-1} = \beta_{t-2} + \nabla_{\beta,t-1}$
∇= per period change

A change in the local trend can result from a change in the intercept or a change in the slope. When there is a change in the intercept, there will be a shift in the level. The slope, on the other hand, changes the trend more gradually.

The smoothness of trend is based on whether the intercept or the slope accounts for most of the change. It the intercept is dominant, the trend appears rough. If the slope is more important, then the trend looks smooth. Based on this, the local linear trend can appear in three forms: smooth, rough and general. The type of trend is determined from the data by empirically estimating the variability in the intercept and slope (hyperparameters).

A smooth trend can result from the trend having a fixed intercept and a fixed slope (global trend), or a fixed intercept and a changing slope. The trend line shows continuous change but not abrupt shifts. Turning points in the series are well defined with local peaks and troughs.

$$T_t = \alpha_t + \beta_{t-1}$$

Hyperparameters:

$\sigma_{\text{level}} = 0$
$\sigma_{\text{slope}} > 0$

A rough trend is caused by a changing intercept with no slope. All change is due to shifts in the level. This gives the trend line a jagged look with many small changes in direction. Occasional large shifts tend to be associated with major business fluctuations.

$$T_t = \alpha_t$$

Hyperparameters:

$\sigma_{\text{level}} > 0$

The general form has shifting intercepts and slopes. It may approach behavior of either the rough or smooth trend, depending on the relative size of the change in the intercept and slope components.

$$T_t = \alpha_t + \beta_{t-1}$$

Hyperparameters:

$\sigma_{\text{level}} > 0$

$\sigma_{\text{slope}} > 0$

Regressor Models

Trends of time series of the covariates to the CPS, CES establishment employment and UI continued claimant unemployment, are estimated using the local linear model and modeled seasonal adjustment methods described above. The trends are then related to the CPS by regression to allow the CPS's covariate time series to contribute a part of the variation in their respective CPS trends.

The local linear model approach takes steps to correct the CPS trend for survey error. It is represented in the following equation.

$$T_{\text{CPS},t} = \alpha_{\text{CPS},t} + \beta_{\text{CPS},t}$$

This creates what is now known as the CPS-specific trend, as it does not reflect any consideration of its respective covariate. The regressor model, which incorporates the State inputs previously modeled in the same fashion as above, is represented in the following equation where "X" references the UI or the CES.

$$T_{CPS,t} = T^*_{CPS,t} + \alpha_X T_{X,t}$$

Where:

$T_{CPS,t} = \text{total CPS trend}$

$T^*_{CPS,t} = \text{CPS} - specific\ trend$

$\alpha_X T_{X,t} = \text{component explained by covariate}$

The coefficient α_X quantifies the degree to which the covariate's estimated trend influences the estimation of the CPS trend. It is intended to be fixed throughout the entire time series. In practice, α_X is fixed and constant throughout the historical series at a single value estimated during the most recent round of Annual Processing. In the months of current-year estimation, the value is re-estimated during each round of monthly processing using the entire historical series, though it will only impact the data being created during processing until the next round of Annual Processing.

Area Models

In 2005, area models were introduced for the following areas:

- Chicago-Naperville-Arlington Heights, IL metropolitan division

- Cleveland-Elyria, OH metropolitan statistical area
- Detroit-Warren-Dearborn, MI metropolitan statistical area
- Miami-Miami Beach-Kendall metropolitan division
- New Orleans-Metairie-Kenner, LA metropolitan area
- Seattle-Bellevue-Everett metropolitan division.

(Model-based estimation of the New Orleans-Metairie-Kenner, LA, metropolitan area was suspended following Hurricane Katrina.)

Each of these area models is paired with a Balance of State (BOS) model. The BOS is modeled directly rather than computing it as a residual of a State model less the area model. This is done because modeling the BOS allows the modeling of its separate error component. If the residual approach were used, all the error would be allocated to the BOS. In addition, the BOS CPS data are sometimes more reliable than the area data.

At the area level, covariate models are used. Both the unemployment the employment models are additive. The area model and the BOS model for each State are controlled pro-rata to that State's model estimates.

Due to changes in the structure of the OMB-delineated geography of the Chicago-Naperville-Arlington Heights, IL metropolitan division, modeled estimates for this area begin in 1994, as opposed to 1990 as is conventionally done with substate estimates.

Description of the Estimation Process

Overview

The LAUS program uses two approaches to estimation, real-time and historical. Real-time estimation is a sequential process creating estimates one month at a time, immediately after each new CPS estimate becomes available. Historical estimation, on the other hand, is a batch process. Data are accumulated over time and processed together at once.

Real-time estimation produces up-to-date estimates without delay. However, there are some disadvantages. The model has less context with which to evaluate potentially spurious movements in the time series. This renders the trend component less smooth, since it is more likely to include error and seasonality. Time and resource constraints limit how much both inputs and outputs may be revised, so in practice we only revise the previous month when generating a new month's estimate.

The historical estimation process addresses the disadvantages associated with real-time estimation. It better estimates error and evolving seasonal patterns because it makes use of more contextual information, past and future; the remaining trend estimate is clearer. The passage of time makes available

more accurate unemployment insurance claimant and payroll employment data. Outlier identification becomes vastly easier. The only drawback is that the estimates are not timely.

Forward Filter

The real-time estimation procedure uses the *forward filter* algorithm. To produce the current month's estimate the forward filter requires only two inputs. One is the prior month's estimates of the signal and noise. The other input is the current month's CPS, CES, UI claims and population data. No other historical data are needed.

The forward filter produces estimates at time *t*, taking into account information available at this time. As new CPS data become available after t, the estimate at *t* is not revised with new CPS data. States have the opportunity to update their UI claims and CES data each month, but prior month estimates are not updated with the current month's data. Thus this procedure only goes forward and does not look backward.

The forward filter provides estimates without delay. It is computationally efficient as it requires no more work to process the last observation than it does the first. In current practice, real-time estimation employing the forward filter is carried out on both the most recent month for which CPS data is available (generating a *preliminary* estimate) and the prior month (generating a *revised* current-year estimate subject to future revision in Annual Processing).

Model Re-Estimation

Historical estimation utilizes a model re-estimation algorithm to revise the forward filter estimates to incorporate all data that become available after the estimate for reference month. It accounts for all information available after time *t*, i.e., over the whole available time series. Re-estimation is done once a year and requires processing both current-year and historical data.

The re-estimation process uses all available data and thus is more accurate than the forward filter procedure. It is less sensitive to the error present in the CPS. As a result, it provides much smoother model components. In practice, while the entire time series goes through model re-estimation, only several of the most recent years of the time series will include substantial revisions to inputs that therefore merit the publishing of newly revised estimates.

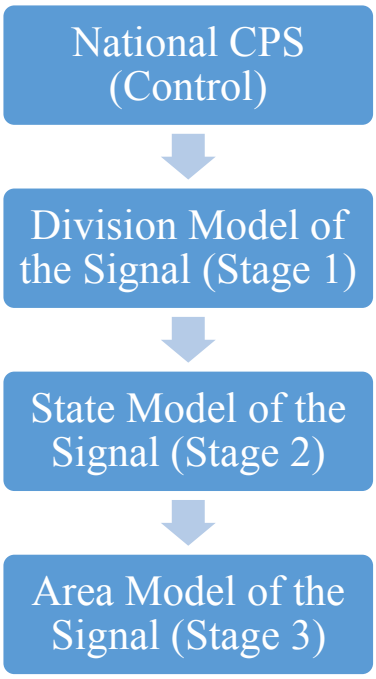
Real-Time Benchmarking

The purpose of benchmarking is to control for potential bias. Without benchmarking, State models can be slow to adapt to national shocks. Movements in the CPS time series at the level of the State are more likely to be interpreted as statistical noise even when such movements may be borne

out at the national level. To address these limitations, the present generation of models incorporate monthly controls so that they sum to the national not seasonally adjusted CPS. A much larger sample makes the national CPS a more reliable benchmark. This constraint ensures that model employment and unemployment estimates will adapt to national shocks without delay.

All benchmarking, whether in the current year or the historical series, is *real-time benchmarking* because each month's estimate is controlled to its respective estimate from the national CPS.

The procedure to benchmark estimates to the national CPS is comprised of three stages. In Stage 1 the model estimates are produced for the nine Census Divisions. As with the State models, the Division model structure is based on the decomposition of the CPS time series into trend, seasonal, error, and irregular components. No covariate series are used. The aggregated Division series are constrained to sum to the national CPS.



In Stage 2 the State model estimates in each Division are summed to the benchmarked Division model estimate from Stage 1 (New York city, the Los Angeles-Long Beach-Glendale, CA Metropolitan Division, and their respective balances of state are estimated as States here). In Stage 3 the area model estimates are summed to the benchmarked State estimate from Stage 2.

The benefits of real-time benchmarking to the national CPS are numerous. I makes estimates consistent with reliable monthly national estimates. It provides protection, particularly during real time estimation, from national shocks to the economy such as recessions or catastrophic events like the September 11 terrorist attacks. It provides more consistency between the current-year estimates and historical estimates. Revisions are smaller when transitioning from current-year estimates to historical estimates. However, this procedure may introduce additional variability into the current-year estimates due to fluctuations in the benchmark adjustment made each month.

The two approaches to benchmarking are external adjustments and internal adjustments. External adjustments are made after estimation and are referred to as pro-rata or ratio adjustment. This type is used in the real-time benchmarking of the area models. Internal adjustment occurs during

estimation and is the type currently used in the real-time benchmarking of State and Division models. The latter method can produce better reliability measures. In practice, the estimation process combines these approaches.

Using internal adjustment, Division model estimates of signal (i.e. not seasonally adjusted estimates) are benchmarked to the national not seasonally adjusted CPS. The nine Division models are combined into a "Super Model" whose summed value is constrained to the national CPS estimate. Each Division model is structured as follows:

Stage 1

$$\text{Signal}_{Div,t} = w'_{Div,t}\text{CPS}_{Div,t} + \left(1 - w'_{Div,t}\right)\text{Signal}^{pred}_{Div,t} + b_{Div,t}BDiff_{US,t}$$

Where:

$\text{Signal}_{Div,t}$ = benchmarked Division signal estimate

$\text{Signal}^{pred}_{Div,t}$ = unbenchmarked Division signal prediction

$\text{CPS}_{Div,t}$ = current Division CPS estimate

$$BDiff_{US,t} = \text{CPS}_{US} - \sum_{i=1}^{n_{Div}} \text{Signal}^{pred}_{i,t}$$

$$\sum_{i=1}^{n_{Div}} b_{i,t} = 1$$

$$w'_{Div,t} + b_{Div,t} = 1$$

Each Division is estimated to have contributed (via $b_{Div,t}$) to the overall benchmarking discrepancy $BDiff_{US,t}$ based on the magnitude of that Division's CPS sampling error and the historically observed stability of its trend and seasonal components. These factors together roughly correspond to the relative sizes of each constituent Division's labor force. In effect, Divisions expected to have more reliable unbenchmarked estimates are allocated a smaller proportion of the benchmarking discrepancy in each month.

In the same manner as above, State model estimates are benchmarked to their respective Division controls developed in the previous step. All States within a Division are combined into a "Super Model" whose summed value is constrained to the benchmarked Division estimate. Each State model is structured as follows:

Stage 2

$$\text{Signal}_{St,t} = w'_{St,t}\text{CPS}_{St,t} + \left(1 - w'_{St,t}\right)\text{Signal}^{pred}_{St,t} + b_{St,t}BDiff_{St,t}$$

Where:

$\text{Signal}_{St,t}$ = benchmarked State signal estimate
$\text{Signal}_{St,t}^{pred}$ = unbenchmarked State signal prediction
$\text{CPS}_{St,t}$ = current State CPS estimate

$$BDiff_{St,t} = \text{Signal}_{Div,t} - \sum_{i=1}^{n_{St}} \text{Signal}_{i,t}^{pred}$$

$$\sum_{i=1}^{n_{St}} b_{i,t} = 1$$

$$w'_{St,t} + b_{St,t} = 1$$

The final step, due to time and resource limitations, is to simply pro-rate the area model estimates by controlling them to the benchmarked State estimate:

Stage 3

$$\text{Signal}_{Area,t} = \text{Model}_{Area,t}\left(\frac{\text{Signal}_{St,t}}{\sum_{i=1}^{n_{Area}} \text{Model}_{i,t}}\right)$$

In real-time benchmarking, the model estimate that is directly adjusted is the not-seasonally adjusted estimate, the sum of the trend and seasonal components. Implicitly, all the components are also ratio adjusted by the same factor:

$$\text{Adjusted trend}_t = k_t \text{trend}_t$$

$$\text{Adjusted seasonal}_t = k_t \text{seasonal}_t$$

Where:

$$k_t = \left(\frac{\text{Signal}_t}{\text{Signal}_t^{pred}}\right)$$

Benchmarked model estimates may be somewhat more variable then the original model estimates. Change over time in the original model estimates are not exactly preserved due to fluctuation in the benchmark adjustment factor from month-to-month. Only if the adjustment factors are equal to a constant value over time will the proportionate change in the original model estimates be exactly preserved:

$$\frac{\text{Signal}_t}{\text{Signal}_{t-1}} = \frac{k_t \text{Signal}_t^{pred}}{k_{t-1} \text{Signal}_{t-1}^{pred}} = \frac{\text{Signal}_t^{pred}}{\text{Signal}_{t-1}^{pred}}$$

Where:

$$k_t = k_{t-1}$$

For seasonally-adjusted estimates, an additional step is employed at this time to reduce the volatility produced by real-time benchmarking. This step is called "smoothing" and is discussed in the next section.

Smoothed Seasonally Adjusted Estimates

There are a number of sources of volatility in LAUS estimates. These include sampling error in the CPS, real-time benchmarking, seasonality, uncertainty at the end points of the series, frequent level shifts in the trend, and real outliers in the current year (for example, Hurricane Katrina). Volatility is a problem for model estimation when month-to-month change is unexplained, is not related to predictable survey error or seasonal patterns, lacks persistence, and is difficult to explain in terms of long-run movements. Major sources of volatility in the models can be at least partially controlled by the model. Normal survey error behavior is controlled with the survey-error model. Outliers can be given special treatment. Seasonality, a significant source of volatility, is removed with seasonal adjustment.

The principal volatility that we want to try to control is that which arises from real-time monthly benchmarking. Apart from the inherent challenges of accurately assigning a variable benchmarking discrepancy from to month, benchmarking poses the additional challenge of constraining component estimates to a control which retains its seasonality, thereby imposing some of that seasonality via the process of real-time benchmarking. Because such imposed seasonality is not a part of the component area's series, it is not captured through the model's process of seasonal adjustment.

One approach to smoothing seasonally-adjusted benchmarked estimates is through the use of moving averages, or filters. Moving averages "move" through a time series from one period to the next by shifting the distribution of time periods to be included. The center of this distribution is at time t, the point being smoothed. The weights of all incorporated time periods add to one. A simple moving average applies the same weight to all time periods. A weighted moving average gives more weight to central observations, making it more responsive to change. Asymmetric moving averages are utilized for time periods with relatively fewer future observations (for example, real-time estimates). Asymmetric moving averages necessarily impose a lag on estimates.

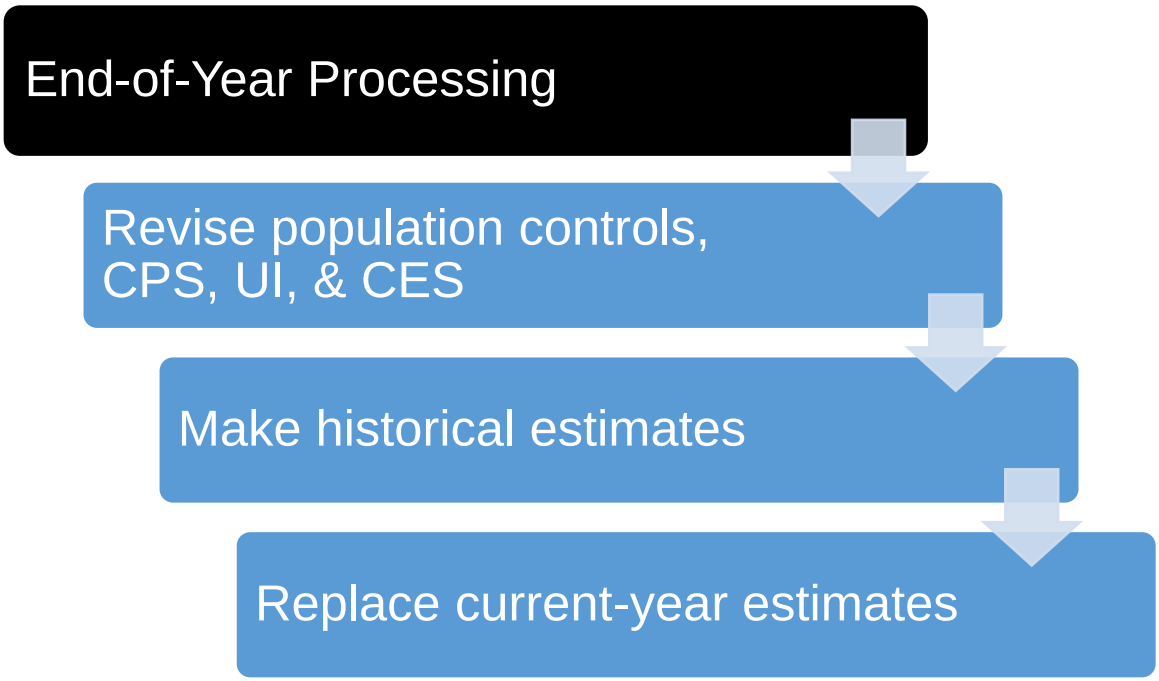
The LAUS program uses a set of filters to smooth all of the points in the series. Starting with a symmetric filter for points in the historical series, asymmetric filters can then be derived that converge to the symmetric as more data become available. This results in a "family of related filters" consisting of a given symmetric filter and all of the necessary asymmetric filters needed when there are not enough data points for the symmetric filter.

The family of filters is known as a Trend-Cycle Cascade Filter (TCCF). The TCCF consists of the weights of both the Henderson-13 trend filter and the X-11 3x5 seasonal filter cascaded into a single, coherent filter whose weights sum to one. The seasonal filter removes external seasonal patterns imposed by real-time benchmarking, while the trend filter removes the balance of month-to-month volatility not attributed to any particular source.

Annual Processing

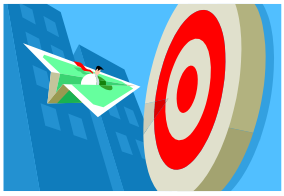
The above benchmarking procedure does not eliminate the need for end-of-year revisions; however, it does reduce the size of the revision compared to the previous method. The smaller annual revisions to the real-time model leads to less-over-the year distortion and facilitates analysis of the estimates between historical and current year estimates.

Annual Processing involves entering revised UI claims, CES payroll employment, and population estimates and performing model re-estimation. The resulting estimates replace the real-time benchmarked estimates.



Error Measures

In general, point estimates are never 100 percent accurate. To convey the limitations of the data to our data users it has been the Bureau of Labor Statistics' policy to publish error measure if the methodology permits. With the introduction of the new generation



of models in 2005, we are now able to publish error measures.

There are two uses of error measures. One is reliability which gives us an idea of how far are the estimates from the truth. The second is for analysis by giving us an idea of what we can say about the truth.

Standard Error

The standard deviation of errors in the estimates gives a measure of the dispersion of the error around a mean of zero. The larger the standard deviation (Stder), the more likely an individual estimate is far from the true values.

Example: A point estimate of 238,000 persons may have a Stder of 25,600 persons.

Coefficient of Variation

From the Stder other error measures that facilitate analysis can be computed. The coefficient of variation (CV) is a common reliability measure that is useful for comparing the estimates of different size or scale. The CV is computed by dividing the standard error by the estimate.

$$\text{CV} = \frac{\text{Stder}}{\text{Estimate}} = \frac{25{,}600}{238{,}000} = 0.11$$

Confidence Intervals

The Stder is also used to construct confidence intervals. A confidence interval for an estimate give us upper and lower limits around the estimate where the true value likely to be located with a given level of certainty or confidence.

$$\text{Estimate} \pm k * \text{Stder}$$

If $k = 1.96$, the significance is at a 95 percent confidence level. If $k = 1.645$, it is at a 90 percent level.

Significance

These error measures can be used to determine the difference between a State estimate and the estimate for the nation or another State is statistically significant. It is also used to reveal if the over-the-month change is significant.

$$z = \frac{\text{Estimate} - \text{Mean}}{\text{Stder}}$$

If $z \geq 1.96$, then the difference is significant at the 95 percent level. If $z \geq 1.645$, then it is significant at the 90 percent level.

Error measures assist the analysis of month-to-month change, the differences from the US and other State estimates and reliability.

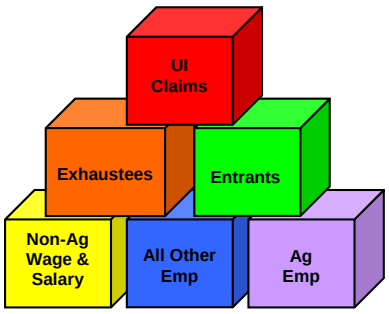
Availability of Measures

Error measures for both smoothed-seasonally-adjusted and not-seasonally-adjusted estimates are available monthly in the STARS tables. Table 2 provides standard errors (Stder) for the point estimates, while Table 3 provides standard errors for over-the-year change, and Table 7 provides standard errors for over-the-month change.

7 LAUS Estimation: Handbook Area Estimates

Introduction

In the late 1940s, when sub-national labor force estimation was first attempted, employment and unemployment estimates were developed for large labor market areas as well as States, underscoring the importance of substate labor market information. In the 1960s, techniques for developing substate estimates were published in the *Handbook on Estimating Unemployment*. Since then, subsequent iterations of substate estimating procedures have been referred to as the Handbook method and the areas for which these estimates are produced are referred to as Handbook areas. (See Chapter 1 for more history on the Handbook method.) Today, the LAUS program creates estimates for 4,756 Handbook areas, the counties (Minor Civil Divisions in New England) that exhaust the geography of all states, the District of Columbia, and Puerto Rico.



Estimates for most Handbook areas are produced independently by means of a building block approach, which uses current unemployment insurance (UI) data and current nonfarm employment estimates as basic inputs. In addition, components of the labor force not covered by the basic source data are developed using larger-area Current Population Survey and American Community Survey estimate relationships.

When the Handbook methodology was first introduced as a standard procedure for sub-national labor force estimation in 1960, it was viewed as an attempt to approximate the results of a CPS-type household survey, but without the prohibitive cost of conducting such a survey. The Handbook method utilized a system of estimates that was reflective of the labor market structure of the 1960's in terms of UI coverage. Over the years, refinements were made to the components and basic input data to improve comparability and consistency within the States and with the standard definitions of the labor force as embodied in the CPS.

Today, the Handbook methodology consists of 14 line items that can be broken out into employment and unemployment estimation procedures. This chapter will provide details for each Handbook line and the associated inputs entered into the LAUSToo system.

Handbook Line Items

Employment	
Line	*Description*
1	Non-agricultural Wage & Salary Employment
2	All-other Employment
3	Agricultural Employment
4	Total Handbook Employment (lines 1 + 2 + 3)
Unemployment	
Line	*Description*
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)
13	Re-entrants
15	New Entrants
16	Total Unemployment (lines 11 + 13 + 15)

Additivity

Prior to 1977, the Handbook estimates were the final LAUS estimates for Handbook areas. Beginning in that year, additivity of the substate Handbook estimates to statewide estimates was introduced to address methodology issues and Federal program allocation needs.

The sums of Handbook employment and unemployment for all Handbook areas in a State tend to be lower than statewide estimates due to the greater difficulty in obtaining some of the input data elements at the substate level. Forcing the Handbook area estimates to sum to the statewide totals corrects for any methodological deficiencies in a proportional manner, allowing for the complete, to-the-dollar distribution of federal funds to areas when LAUS data are used in the allocation algorithm.

Additivity is considered a separate methodological step that follows Handbook estimation. (See Chapter 9 for more details.)

Geography of Handbook Estimation

Prior to 2015, Handbook estimation generally occurred at the Labor Market Area (LMA) level. Exceptions to this general rule included Metropolitan Divisions that subdivided Metropolitan Statistical Areas and Expanded Estimating Areas in New England that comprised Metropolitan/Micropolitan NECTAs and one or more isolated MCDs or an Adjacent Small LMA. Beginning in 2015, Handbook estimation was shifted down to the county level outside of New England and to the Minor Civil Division (MCD) level in New England. This change has several benefits:

- Elimination of Interstate Handbook Areas

  Several transfers between States were eliminated. Prior to 2015, the States with intrastate parts of interstate areas transferred continued claims and final payments data for their respective parts to one State that was identified as the controlling State for the whole interstate area. The controlling State would then create Handbook estimates for the whole area and for the disaggregated intrastate parts and would transfer the Handbook part data back to the non-controlling States.

  The old process had several drawbacks. It caused input corrections in one State to ripple across neighboring States. It also included layered disaggregation steps that made replication of calculations difficult. By shifting Handbook calculation to the county/MCD level, the overall process has become more streamlined with fewer cross-State exchanges

and many aspects of the methodology have become easier to apply and understand.

- Increased Specificity of Exhaustee Estimation (Handbook Line 9)

  Previously, unemployed exhaustees were calculated at the LMA level using final payments data that had been entered by county or New England MCD. Exhaustees for each LMA were then distributed across the counties or MCDs that compose the LMA in proportion to each county's or MCD's share of the LMA's continued claims. This approach was problematic in that the distribution of continued claims could differ from the distribution of final payments. In effect, exhaustees were shifted away from the areas with the most final payments toward those with fewer final payments within each LMA.

  By moving Handbook calculations to the county or New England MCD level, final payments data now are utilized in calculations at the lowest geographic level possible and the disaggregation of exhaustees no longer occurs.

- Simplified Updates to OMB Geography

  Before 2015, major updates occurred on a decennial basis for Combined Statistical Areas, Metropolitan Statistical Areas, Metropolitan Divisions, Micropolitan Statistical Areas, and the NECTA equivalents of these areas in New England. Because many of these geographies were Handbook areas, the impact on LAUS was substantial. Historic Handbook data had to be realigned with new geography during annual processing. By conducting Handbook estimation by county and New England MCD, OMB geography updates are less disruptive to LAUS.

Weighed against the benefits above is one necessary new complication:

- Separate Geography for Handbook Estimation and for Entering NAWS Employment and Labor Disputants (M01 and M02)

  Prior to 2015, establishment-based Non-agricultural Wage & Salary (NAWS) employment data (M01) and labor disputant data (M02) were entered by Handbook area (i.e., at the LMA level with some exceptions). For some areas in select States, estimation and entry of M01 and M02 were shifted to the county level to mirror the change in geographic scope for Handbook estimation. In general, though, M01 and M02 continue to be entered by LMA.

  To accommodate the discrepancy between the geography of these inputs

and the geography of Handbook estimation, a new disaggregation component was added to the calculation of place-of-residence NAWS employment (Handbook line 1).

Handbook Area Employment

Employment comprises all persons who did any work at all as paid employees, worked in their own business, own profession, or on their own farm, or who worked 15 hours or more as unpaid workers in an enterprise operated by a member of the family. It also includes all those who were not working but who had jobs or businesses from which they were temporarily absent because of vacation, illness, bad weather, labor-management dispute, job training, child-care problems, maternity or paternity leave, or other family or personal reasons, whether or not they were paid for the time off or were seeking other jobs. (See Chapter 2 for more details.)

The Handbook method decomposes employment into three subcategories. The following table provides a brief summary of the employment inputs entered into LAUSToo for each Handbook line. The sections following the table discuss each item in greater detail.

Handbook Employment

Line	*Line Description*	*Input description (LAUSToo variable ID)*	*Input Source*
1	Non-agricultural Wage and Salary (NAWS) Employment	Dynamic Residency Ratios (DRRs)	BLS
		ACS NAWS Employment (F01)	BLS
		Establishment-based NAWS (M01)	State
		Labor-management Disputants (M02)	State
+ 2	All-other Employment	Statewide All-other Employment (SAO)	BLS
		ACS All-other Employment (F02)	BLS
+ 3	Agricultural Employment	Statewide Agricultural Employment (SAG)	BLS
		ACS Agricultural Employment (F03)	BLS
= 4	Total Handbook Employment		

Non-agricultural Wage and Salary Employment (Handbook line 1)

The Handbook calculation of residency-adjusted non-agricultural wage and salary employment begins with input data that pertain to jobs by place of work (establishment data) rather than employed people by place of residence (household data). The conceptual differences between (1) the establishment-based inputs entered into LAUSToo and (2) the desired household-based output require calculations to adjust the inputs to conform to CPS concepts. The Handbook line 1 calculations apply Dynamic Residency-adjustment Ratios (DRRs) to the establishment-based input data to bridge the conceptual gap.

The States provide two inputs that are entered into LAUSToo each month for the line 1 calculations:

- Establishment-based Non-agricultural Wage and Salary Employment (NAWS)
  - Also referred to as "place-of-work NAWS" or "pre-adjusted NAWS"
  - LAUSToo variable ID M01

- Labor-Management Disputants
  - Also referred to as workers involved in "work stoppages"
  - LAUSToo variable ID M02

BLS provides two inputs that are entered into LAUSToo for the line 1 calculations:

- Dynamic Residency-adjustment Ratios (DRRs)
- Population-adjusted ACS NAWS Employment (F01)

The following sections will provide details regarding the sources and development of these inputs.

Handbook line 1 input: Establishment-based Non-agricultural Wage and Salary (NAWS) Employment (M01)

For most States, there is no single source of M01 data. Obtaining the M01 inputs for all M01 input areas in a State usually requires the use of various data sources. The principal source is the Current Employment Statistics (CES) survey monthly estimates for over 400 Metropolitan Statistical Areas and Metropolitan Divisions, which are the required inputs for areas where CES estimates are produced. For those areas that are not within the CES program's scope, a sample-based

employment series developed under State auspices is the next best data source. If such a series is not available, a number of ways to produce the input can be used. Details for the most commonly used data sources and procedures are provided below.

Current Employment Statistics (CES) data

The CES survey, which is also referred to as the "payroll survey" or "establishment survey," yields employment estimates for all metropolitan areas and most metropolitan divisions. It is the principle source of the M01 input and sets the conceptual standard for M01 values derived from other sources. The CES not-seasonally-adjusted estimate of total nonfarm wage and salary employment should be used for LAUS estimation wherever it is available. No adjustment of CES data is necessary to conform to the definition of the LAUS M01 input.

The CES program conducts monthly revisions (data for the prior month are revised with the release of the current month) and annual benchmarking revisions (data for the latest 18 months are revised at the end of each year). The LAUS program incorporates these revisions during monthly and annual processing, respectively. Historic CES corrections that extend beyond the standard two-year LAUS annual processing period are incorporated if substantially large.

Quarterly Census of Employment and Wages (QCEW) data

QCEW data are often used to develop M01 inputs for Non-CES Areas. The QCEW program publishes counts of establishments, jobs and aggregate wage data that are derived from quarterly tax reports. The reports are submitted to State employment security agencies by employers that are subject to either (1) State UI laws or (2) the Unemployment Compensation for Federal Employees (UCFE) program. Each quarter, QCEW releases monthly data. Data for any given year are not final until data for the first quarter of the following year are released.

LAUS estimation generally occurs with only a one-month lag from the reference period. In contrast, the volume of data processed by the QCEW program requires a longer lag of 6 months between the reference quarter and the release of data. To reconcile the timely needs of the LAUS program with the longer lag of the QCEW program, extrapolation is used for monthly processing. During annual processing, actual QCEW data replace extrapolated data.

Adjustments made to both extrapolations of QCEW data and actual QCEW data are discussed below, followed by details of the extrapolation process.

Adjustments to QCEW data

Several steps are necessary to adjust QCEW job counts to conform to the definition of the LAUS M01 input. Essentially, these adjustments bring QCEW data into alignment with the CES data used for metropolitan areas.

1. Start with the QCEW total job count for the M01 input area.
2. Subtract agricultural jobs (All NAICS 11 codes except for 1133).
    - These are accounted for in the Agricultural Employment estimate (line 3).
3. Subtract private household workers (NAICS 814).
    - These are accounted for in the All-other Employment estimate (line 2).
4. Add Noncovered Employment (NCE).
    - This includes various categories of jobs that are not covered by unemployment insurance laws, but which are included in CES estimates. These include:
        - College students working for their schools,
        - Commissioned insurance agents, and
        - Religious employees.
    - Most States have a periodic survey that estimates NCE at the State and metropolitan area level. The LAUS technician should consult with the CES unit in their State to obtain NCE estimates for Handbook areas.
5. Add estimates of railroad employment.
    - These estimates are provided to States by the BLS national office.

Extrapolation of QCEW data

Due to the time lag associated with publication of QCEW data, extrapolation is necessary for LAUS monthly processing. A possible approach follows:

Extrapolation using Area-based Change Factors

- Historic over-the-month changes for each reference month are applied to the prior month's estimate.
- The historic monthly changes can be those for the prior year or averages of those for several prior years.
- For example, to estimate March 2010, take the over-the-month QCEW employment change from February 2009 to March 2009 and apply that factor to the February 2010 estimate.

Small Area Employment Estimates (SAEE)

BLS Small Area Employment Estimates are nine-month forecasts of QCEW data for Handbook areas for all States (except Maine). The forecast program utilizes historical monthly QCEW data for each Handbook area in a State. Once the most recent quarter of QCEW data are available to national office staff, ARIMA software is run producing employment forecasts for each Handbook area. Forecasted employment counts are aggregated to the M01 input area level and provided to some States via EUSWeb. States need to add NCE and railroad estimates to these forecasts before utilizing them as inputs to LAUS employment estimation.

BLS currently maintains SAEE models for every county and New England MCD outside of Maine. However, BLS provides data to states by M01 area, which means aggregations of forecasts are provided for some areas rather than just the components. These data include SAEE forecasts for CES areas, but these values are not to be used in official estimation as current CES estimates are the required input in monthly production for CES areas.

As of the 2015 LAUS program redesign, the total number of SAEE models is 5,195 (an additional 633 will be available once ME is completed). BLS provides forecasts for 1,944 M01 areas, plus an additional 651 CES areas (this would increase by 26 M01 and 7 CES areas when ME is completed).

Although not every State requests SAEE forecasts, they are produced and distributed to all States. To use SAEE forecasts directly in monthly production, States need to request approval through their Regional Office. However, formal approval is not required for States who wish to request the forecasts as a review tool in developing their own M01 inputs.

Small Domain Estimators

Illinois uses the National Opinion Research Center (NORC) Small Domain Estimator model to produce non-agricultural employment by industry for their non-CES areas. The model utilizes CES sample, QCEW employment, NCE estimates, allocation of employment for statewide reporters, and economic events not captured in the CES sample. At the end of each year, the model estimates are benchmarked to QCEW employment.

Pennsylvania uses a Small Domain Estimator that is based on the inverse relationship between unemployment insurance claims and employment—when workers get laid off, claims go up and employment goes down; when workers return to work, claims go down and employment goes up.

CES ACESweb and Composite Quota Estimator (CQE)

Some States utilize features within the CES ACESweb estimation production system to produce employment estimates for areas not included in the CES program. CES estimation utilizes a link relative estimation approach, where the over-the-month change in weighted sample employment for a sample cell is applied to the prior month's estimate.

Non-CES area, referred to as non-covered areas (NCA), estimates are an optional activity many states choose to generate in ACESweb each month, either for their own analysis, publication, and/or as a LAUS input. The generation of NCA estimates often requires considerable intervention due to small sample sizes and bias among reporters. Traditional methods of generating the NCA estimates in ACESweb often resulted in original figures that poorly reflected monthly employment levels.

The Composite Quota Estimator (CQE) provides States with a more standard method for producing monthly NCA estimates. This method incorporates historical information and accounts for both QCEW seasonal monthly movement and non-covered employment (NCE) movement. For LAUS purposes, the CQE can be utilized as either an alternative for States to develop their own non-CES Area (NCA) estimates or as an analytical tool to compare and track the NCA estimates that States are currently producing. The use of the CQE does not obligate States to replace their current method of creating NCA estimates. States need to coordinate with their Regional Offices to have estimates for NCAs set up in ACESweb.

Handbook line 1 input: Labor-Management Disputants (M02)

In addition to the non-agricultural wage and salary employment input (M01), data for workers absent from their jobs due to labor-management disputes are needed. Workers involved in these disputes can be either on strike (a work stoppage initiated by the workers of an establishment) or lockout (a work stoppage initiated by the management of an establishment). In both cases, the workers have jobs from which they are temporarily absent and are therefore considered employed under the CPS definition. (See Chapter 2.)

Counts of workers involved in labor disputes during the reference week are entered into LAUSToo for each Handbook area using the variable ID M02.

Data on labor-management disputes can be obtained from the CES Strike Report and the BLS Work Stoppages Program.

Handbook line 1 input: Dynamic Residency Ratios

The input data detailed in the previous section pertain to workers by their place of employment. The CPS definition of employment pertains to employed individuals by their place of residence. Because the goal of LAUS is to parallel CPS concepts, the establishment data gathered and entered into LAUSToo must undergo adjustment.

While there are several differences between establishment data and household data (see Chapter 4), the largest source of difference at the M01 input area level is the discrepancy between the location of establishments, where jobs are counted, and the location of residencies, where employed individuals live. The Dynamic Residency Ratios (DRRs) adjust the establishment-based inputs to a place-of-residence, or household, basis.

Development of Residency-adjustment Methodology

Prior to 2005, residency adjustment of the establishment-based M01 and M02 inputs was accomplished by a single ratio for each LMA. The ratio was calculated from 1990 Census data by dividing the number of residents employed in non-agricultural wage and salary jobs within each LMA (obtained from Census data) by the total number of wage and salary jobs in the LMA at the time of the Census.

Beginning in 2005, the single-ratio approach was replaced with the introduction of DRRs. The general concept behind the DRR methodology is that an LMA's resident employment is a function not only of the jobs available within the LMA (the pre-2005 approach), but also of the jobs available in neighboring LMAs.

Commutation data from the 2000 Census long form were used to determine the appropriate neighboring LMAs to include in the residency adjustment calculations of each area. The largest commuter areas for each LMA were identified and, to reduce the complexity of the calculations, the number of commuter areas was capped at four for each LMA. A minimum of 100 commuters was set for a commutation area to be included (for New England, the minimum was lowered to 50 commuters).

In 2015, several additional changes were introduced stemming from the elimination of the Census long form and its replacement with the American Community Survey (ACS).

When LAUS implemented DRRs, an important consideration was that it would be at least a decade until the DRR commuting areas would be updated using worker flows data from the next decennial census. For this reason, a relatively low threshold for the inclusion of commuting areas was applied in order to capture as

much change as possible in area commuting patterns over the ten-year time frame. With the replacement of the Census long form by the American Community Survey (ACS), the time between releases of worker flows estimates was reduced to every five years for the purpose of the OMB metro and micro area geography updates. It was determined that 10% of total commuter employment was a preferable threshold for including commutation areas in a residence area's DRR calculation. This new threshold achieved a desirable balance between operational streamlining and capturing as much economic information as necessary.

The DRR inputs and calculations are detailed below.

Inputs for DRR calculations:

1. ACS worker flows data
    - County-to-county (or, in New England, MCD-to-MCD) commuter flows from the ACS are aggregated to the M01 input area level.
    - The following are incorporated into the DRRs for each M01 input area:
        - Commuters residing and working within the same M01 input area, regardless of level of commuters, and
        - Up to the four largest commuter flows to neighboring M01 input areas, where the level of commuters is 10% or more of total commutation.
2. ACS Non-agricultural Wage and Salary Employment (ACS NAWS)
    - Total ACS employment is obtained and the following are subtracted:
        - Agricultural workers,
        - Self-employed workers in own not incorporated business,
        - Unpaid family workers, and
        - Private household workers.
3. Establishment-based NAWS Employment base
    - M01 and M02 average for the same 5-year time period as the corresponding ACS worker flows data set.
4. Annual Population Estimates (PEP population)
    - The Census Bureau's Population Estimates Program (PEP) creates annual total population estimates pertaining to July 1st of each year following the decennial Census. These estimates are called post-Census estimates. For July 1st of years between completed Censuses, PEP creates inter-Census estimates. PEP population for the same 5-year time period as the corresponding ACS worker flows data set are used along with ACS population to ensure proper population controlling of ACS data.
5. ACS Population

- Total population data from the ACS are typically but not always aligned with the PEP population described above. Because the PEP data are considered official, BLS uses them to adjust ACS data when PEP and ACS population diverge.

Handbook line 1 input: Residency-based ACS Non-agricultural Wage and Salary (NAWS) Employment (F01)

ACS NAWS data are used in the computation of DRRs, as noted above, and are also used in a later disaggregation step when the geography of the M01 input encompasses two or more Handbook areas. The disaggregation step apportions residency-adjusted NAWS data at the M01 area level to the Handbook area level. The ACS NAWS data used for this are adjusted on an annual basis using the latest available PEP data.

$$F01 = ACS\ NAWS\ x\ \frac{PEP\ Population}{ACS\ population}$$

The following equation displays the DRR calculations for Residence Area$_1$:

DRR 1:

$$\frac{\frac{Residents\ of\ Area_1\ working\ in\ Area_1}{Establishment\ NAWS\ Area_1}\ x\ \frac{ACS\ NAWS\ Area_1}{Commuters_{1+2+\cdots+n}}}{}\ x\ \frac{Average\ PEP\ population\ Area_1}{ACS\ population\ Area_1}$$

DRR 2:

$$\frac{\frac{Residents\ of\ Area_1\ working\ in\ Area_2}{Establishment\ NAWS\ Area_2}\ x\ \frac{ACS\ NAWS\ Area_1}{Commuters_{1+2+\cdots+n}}}{}\ x\ \frac{Average\ PEP\ population\ Area_1}{ACS\ population\ Area_1}$$

DRR *n*:

$$\frac{\frac{Residents\ of\ Area_1\ working\ in\ Area_n}{Establishment\ NAWS\ Area_n}\ x\ \frac{ACS\ NAWS\ Area_1}{Commuters_{1+2+\cdots+n}}}{}\ x\ \frac{Average\ PEP\ population\ Area_1}{ACS\ population\ Area_1}$$

The following table displays an example DRR calculation based on the equations above:

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Area	ACS NAWS Emp.	ACS Commuters from Area of Residence	Est.-based NAWS Emp.	5-year average PEP population	ACS population	Control ratio = [(B) for Area of Residence] / Σ (C) * (E) / (F)	DRR = (C) / (D) * (G)
Area of Residence	296,071	235,584	305,400	590,249	590,116	1.0616	0.818913
Commuter Area 1		43,370	127,450	590,249	590,116	1.0616	0.361252

The following table displays an example Handbook line 1 calculation using the DRRs from the table above where the geography of the M01 input is coterminous with a given Handbook area:

(A)	(B)	(C)	(D)	(E)
Area	DRR	Establishment-based NAWS Employment (M01)	Labor disputants (M02)	Residency-adjusted line 1 component = (B) * [(C) + (D)]
Area of Residence	0.818913	311,508	0	255,098
+ Commuter Area 1	0.361252	121,105	200	43,822
= Line 1 for Area of Residence				298,920

If the M01 input area above were to contain multiple Handbook areas, an additional disaggregation step would be built into the line 1 calculation as follows:

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Area	DRR	Establishment-based NAWS Employment (M01)	Labor disputants (M02)	ACS NAWS (F01) for Handbook Area	ACS NAWS (F01) for M01 Area	Residency-adjusted line 1 component = (B) * [(C) + (D)] * [(E) / (F)]
Area of Residence	0.818913	311,508	0	45,012	308,102	37,268
+ Commuter Area 1	0.361252	121,105	200	45,012	308,102	6,402
= Line 1 for Area of Residence						43,670

All-other Employment (Handbook line 2)

All-other employment includes the following types of workers that are not employed in agriculture:

(1) The self-employed, who work in their own not-incorporated business,

(2) Unpaid family members, who work for a business owned by a family member, and

(3) Private household workers (or "domestic workers").

These people are employed by the CPS definition and are the second largest category of total employment behind non-agricultural wage and salary workers.

Two sources of all-other employment data exist--the American Community Survey (ACS) and the CPS. The ACS provides more geographic detail while the CPS is available on a monthly basis. Total all-other employment is calculated using CPS estimates of all-other employment and ACS estimates of all-other employment data.

All-other employment from the CPS are published on a monthly basis only for the nation as a whole while unpublished data are available at the State level. Research has shown that the State CPS data can be used as a control total at the statewide level to develop ACS shares of all-other employment for the Handbook areas.

Development of All-other Employment Methodology

The CPS and the ACS were identified as the most appropriate sources for the all-other employment data that were previously obtained from the decennial Census long-form survey. For LAUS purposes, both ACS and CPS offer differing strengths and drawbacks. The goal is to utilize the strengths and to mitigate the drawbacks of each data source. For instance, the CPS data are only available at the State level, while the ACS data are available at the detailed geographic level needed for LAUS substate Handbook method estimation. Also, the CPS data are current and are available on a monthly basis, while the required ACS data are available on a yearly basis in the form of 5-year estimates.

Since the monthly CPS data are only available at the State level and the ACS provides more geographically detailed data, the ACS data are used to distribute the CPS data to substate areas. To do this, the ACS all-other employment estimate for a given area is divided by the sum of ACS all-other employment for all areas within the State. The resulting ratio for a given area is referred to as the "ACS share".

The ACS share is expressed as:

$$\mathbf{ACSshare} = \mathbf{ACS}\boldsymbol{o} \div \sum_{i=1}^{n} \mathbf{ACS}\boldsymbol{o}$$

Where:

$\mathbf{ACS}\boldsymbol{o}$ = area estimate of ACS all-other employment

$\sum_{i=1}^{n} \mathbf{ACS}\boldsymbol{o}$ = sum of areas' estimates of ACS all-other employment

The ACS shares are used to disaggregate CPS monthly statewide all-other employment to the area level. The precedent for disaggregating statewide CPS data comes from the Handbook methodology used to estimate new entrant and reentrant unemployment. This method assigns a portion of the CPS statewide new entrant and reentrant unemployment to individual areas based on a population-specific ratio derived for the specific area.

CPS all-other employment estimates at the State level tend to be volatile month-to-month and are not suitable for direct use. To mitigate the volatility of the CPS monthly statewide all-other employment estimates and obtain inputs more suitable for handbook estimation, five years of CPS data for a given month are used to develop weighted-average estimates. This allows the current month's CPS estimate to gain strength from prior year estimates while retaining the seasonality of the reference month (The following table shows the weights used, where "y" is the current year.). For consistency, the sum of 5-year State weighted averages is controlled to the current monthly national CPS estimate of all-other employment.

Year	Weight
y	0.40
y – 1	0.25
y – 2	0.20
y – 3	0.10
y – 4	0.05

Using a weighted average of statewide CPS all-other employment and the area ACS share to generate the Handbook area all-other employment estimate is expressed as follows:

$$\text{All-Other Emp}_{area} = (\text{CPS}_{wto} * \text{ACSshare}_{o}) * \text{CPS}_{r}$$

Where:

CPS_{wto} = Weighted average of the given month's CPS all-other employment for the state

ACSshare_{o} = ACS share of all-other employment for the area

$\mathbf{CPS_r}$ = Ratio for controlling sum-of-State weighted averages to national CPS all-other employment

Agricultural Employment (Handbook line 3)

Unlike the non-agricultural Handbook employment estimates, which split employment by class of worker—wage and salary (line 1) and "all-other" (line 2)—the agricultural Handbook employment estimate encompasses all classes of worker—wage and salary, self-employed, and unpaid family—in a single estimate.

The CPS and the ACS were identified as the most appropriate sources for the agricultural employment data that were previously obtained from the decennial Census long-form survey. As noted in the prior section, both ACS and CPS offer differing strengths and drawbacks for LAUS purposes. The goal was to utilize the strengths and to mitigate the drawbacks of each data source. For instance, the CPS data are only available at the State level, while the ACS data are available at the detailed geographic level needed for LAUS substate Handbook method estimation. Also, the CPS data are current and are available on a monthly basis, while the required ACS data are available on a yearly basis in the form of 5-year estimates.

Since the monthly CPS data are only available at the State level and the ACS provides more geographically detailed data, the ACS data area used to distribute the CPS data to substate areas. To do this, the ACS agricultural employment estimate for a given area is divided by the sum of ACS agricultural employment for all areas within the State. The resulting ratio for a given area is referred to as the "ACS share". The ACS share is expressed as:

$$\mathbf{ACSshare} = \mathbf{ACS}\boldsymbol{a} \div \sum_{\boldsymbol{i}=\mathbf{1}}^{\boldsymbol{n}} \mathbf{ACS}\boldsymbol{a}$$

Where:

$\mathbf{ACS}\boldsymbol{a}$ = area estimate of ACS agricultural employment

$\sum_{\boldsymbol{i}=\mathbf{1}}^{\boldsymbol{n}} \mathbf{ACS}\boldsymbol{a}$ = sum of areas' estimates of ACS agricultural employment

The ACS shares of agricultural employment are relatively stable from year to year and are used to disaggregate CPS monthly statewide agricultural employment to the area level. The precedent for using ACS data to disaggregate CPS agricultural employment comes from the Handbook methodology used to estimate new entrant and reentrant unemployment. This method assigns a portion of the CPS statewide new entrant and reentrant unemployment to individual areas based on a population-specific ratio derived for the specific area.

CPS agricultural employment estimates at the State level tend to be volatile month-to-month and are not suitable for direct use. To mitigate the volatility of the CPS monthly statewide agricultural employment estimates and obtain inputs more suitable for handbook estimation, five years of CPS data for a given month are used to develop weighted-average estimates. This allows the current month's CPS estimate to gain strength from prior year estimates while retaining the seasonality of the reference month the following table shows the weights used, where "y" is the current year.). For consistency, the sum of 5-year State weighted averages is controlled to the currently monthly national CPS estimate of agricultural employment.

Year	Weight
y	0.40
y – 1	0.25
y – 2	0.20
y – 3	0.10
y – 4	0.05

Using a weighted average of statewide CPS agricultural employment and the area ACS share to generate the Handbook area agricultural employment estimate is expressed as follows:

$$\text{Agricultural Emp}_{area} = (CPS_{wta} * ACSshare_a) * CPS_r$$

Where:

CPS_{wta} = Weighted average of the given month's CPS agricultural employment for the state

$ACSshare_a$ = ACS share of agricultural employment for the area

CPS_r = Ratio for controlling sum-of-State weighted averages to national CPS agricultural employment

Handbook Area Unemployment

Unemployment comprises all persons who do not have a job, have actively looked for work in the prior four weeks, and are currently available for work. Persons who were not working and were waiting to be recalled to a job from which they had been temporarily laid off are also included as unemployed.

Receiving benefits from an Unemployment Insurance (UI) program has no bearing on whether a person is classified as unemployed in the CPS survey; however, statistics from the UI system are the only current measure of unemployment available with a high degree of geographic detail. Because of this, LAUS makes extensive use of UI records in its Handbook estimation procedures for unemployment. Differences between the CPS concept of unemployment and Handbook estimates of unemployment are resolved via additivity controls to statewide estimates. (See Chapter 9.)

The Handbook method breaks unemployment into two main components—experienced unemployed and entrant unemployment—that are each subdivided into sub-components. Total Handbook unemployment (line 16) is experienced unemployed (line 11) plus new entrant and re-entrant unemployment (lines 15 and 13, respectively).

Description	*Handbook Line*
1. Experienced Unemployed (lines 8 + 9 + 10)	11
• Continued Claimants (lines 5 + 6 + 7)	8
o State UI	5
o Unemployment Compensation for Federal Employees (UCFE)	6
o Railroad Retirement Board (RRB)	7
• Exhaustees	9
• Non-covered Agricultural Unemployment	10
2. Entrant Unemployment	
• New Entrants	15
• Re-entrants	13
Total Handbook Unemployment (lines 11 + 13 + 15)	16

Experienced Unemployment (Handbook line 11)

The largest component of unemployment comprises people that were employed in the civilian labor force immediately before their current spell of unemployment. These people are called the experienced unemployed.

The Handbook method estimates this component using three subcomponents:

(1) Continued Claimants (line 8)

- Monthly counts of people receiving unemployment benefits during the reference week

(2) Exhaustee Unemployment (line 9)

- Estimates of people remaining unemployed after exhausting UI benefits

(3) Non-covered Agricultural Unemployment (line 10)

- Estimates of unemployed agricultural workers that are ineligible for UI benefits
- Atypical method only applicable for some States

Continued Claimants (Handbook line 8)

Actual counts of current UI claimants under State UI programs, the Unemployment Compensation for Federal Employees (UCFE) program, and the Railroad Retirement Board (RRB) program are included in the count of total continued claimants. Continued claimants are defined as persons without earnings certifying to a compensated or non-compensated week of unemployment during the reference week.

Continued Claimants

Line	*Line Description*	*Input description (LAUSToo variable ID)*	*Input Source*
5	State UI Continued Claims	Regular UI claims (M03)	State
		Interstate UI claims (M04)	State
		Commuter UI claims (M05)	State
+ 6	UCFE Continued Claims	Regular UCFE claims (M06)	State
		Interstate UCFE claims (M07)	State
		Commuter UCFE claims (M08)	State
+ 7	RRB Continued Claims	RRB claims (M09)	BLS
= 8	Total Continued Claims		

Unemployed Exhaustees (Handbook line 9)

Final payments to beneficiaries of State UI and UCFE programs are tracked by week and form the main input for exhaustee estimation. The exhaustee component represents a significant part of overall unemployment estimates and is a major contributor to inter-area variability in the estimates. Although States know the number of individuals who receive final payments, they are unable to track them after they leave the UI system. Each month, tabulations of weekly counts of persons who have received final payments from the UI system are used to estimate the number of people who do not immediately find a job or discontinue their job search after exhausting benefits.

Estimates are made to reflect unemployment in the same CPS reference week as continued claims, that is, the week including the 12th of each month. (In some years, the November and\or December reference weeks are the week including the 5th of the month. LAUS technical memoranda inform States when this occurs.) In addition, persons receiving final payments in previous weeks or months are carried forward into successive periods in decreasing numbers by applying a CPS-based "survival" or continuation rate. This rate refers to individuals who are still actively seeking and available for work. The estimate of current exhaustees for an area is therefore "built up" over the period including the 19th of the previous month through the week including the 12th of the current month, and includes an estimate of the prior month's unemployed exhaustees who remain unemployed in the current month. The level of the pool of exhaustees can rise or fall depending on the volume of final payments and the survival rate.

Inputs for Unemployed Exhaustees (line 9)

General Input Description	*Specific Input description (LAUSToo variable ID)*	*Input Source*
Weekly UI and UCFE Final Payments	Regular (M10)	State
	Interstate (M11)	State
	Commuter (M12)	State
Quarterly Survival Rates	Rate group limits (S05 – S08)	BLS
	Survival rates (S13 – S16)	BLS

Development of Exhaustee Methodology

Prior to 1987, a national average long-term survival rate was used to estimate the number of unemployed persons that had exhausted UI benefits. The survival rate was based on a formula developed by Hyman Kaitz that used national annual average CPS duration data as the prime input. The underlying premise which establishes the efficacy of the Kaitz method can be stated as follows: There is a close and parallel relationship between the rate of unemployment and the duration of unemployment spells (i.e., the survival rate). However, the application of a single national annual average survival rate to all States and areas, regardless of

recent local unemployment rate conditions, does not fully conform to Kaitz's theoretical model. Therefore, beginning in 1987, a more flexible, timely, and effective application of the basic Kaitz long-term survival rate methodology was made operational.

That method established an unemployment rate-based survival rate that can change at the area-level from month to month. Each quarter, the fifty States and the District of Columbia are divided into four unemployment rate groups. Each group represents a set of States within a given range of unemployment rates. In addition, each group contains roughly twenty-five percent of the nationally weighted unemployment. Using the Kaitz formula and quarterly average CPS State duration data, a survival rate is developed for each of the four unemployment rate ranges. Thus, on a monthly basis, areas will be assigned a survival rate that most closely relates to recent local unemployment rate conditions. In this manner, high unemployment rate areas select a higher survival rate and have higher exhaustee levels and Handbook unemployment estimates than low unemployment rate areas.

Research established a lagged correlation of two quarters between the unemployment rate and the survival rate. Adding an operational lag of one quarter results in the use of a given survival rate based on the area's unemployment rate nine months prior.

In implementing this procedure, the following occurs:

1. Every January, April, July, and October, four survival rates are issued based on CPS data for the most recent quarter (4th, 1st, 2nd, and 3rd).
2. Each month during a given quarter, areas are assigned a survival rate for the quarter of receipt (1st, 2nd, 3rd, and 4th).
3. The selection of the rate is based on the area's total unemployment rate nine months prior to the estimate month. This lag represents the two quarter lagged relationship between the unemployment rate and the survival rate plus a one-quarter operational lag.

Survival Rate Calculation

Survival rates are calculated using the 15-26 weeks unemployed and the 27 weeks and over unemployed duration data. The two classes of duration data are assumed to have an exponential distribution and the probability of falling into each of the classes is calculated based on that assumption by taking the integral of the exponential distribution function between the boundaries of each class (15-26 weeks or 27 weeks and over). The equation for the probability of failing into either class is known based on this calculation and the distribution of the two duration classes is known from the CPS duration data. All that is needed is to find the death rate (the likelihood that someone leaves the exhaustee pool each week) which maximizes the likelihood of having the distributions given in that quarter's

CPS duration data for the two classes, given the probability of falling into each class. The first derivative of the likelihood function is set to zero and solved for the death rate in order to find the local maximum. This maximum is equivalent to the death rate that maximizes the likelihood of having the distribution of duration classes given by the CPS data given the probabilities of a person falling in each class. This death rate is then used to calculate the long-term survival rate, which is used to calculate the exhaustee data. (See Apendix 7-1 for more details.)

Calculation of Exhaustees from Weekly Final Payments

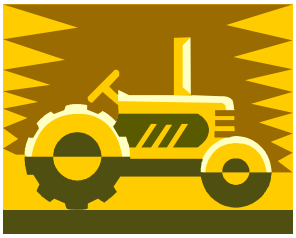
The following two tables illustrate the steps involved in calculating exhaustees. The example in the first table pertains to the two-month estimation period for March (revised prior month) and April (preliminary current month) of 2009. Each column of the worksheet is described in detail in the second table.

(A)	(B)	(C)	(D)	(E)	(F)
Reference Month	Week Ending Date	Total Final Payments	Survival Rate	Exhaustee Estimate[1]	Exhaustee Calculation = $[(C) + (E)]_{\text{prior week}}$ x $(D)_{\text{current week}}$
February	2/14/2009	31		365	= Starting Pool
March (rev.)	2/21/2009	30	0.959	380	= (31 + 365) * 0.959
	2/28/2009	29	0.959	393	= (30 + 380) * 0.959
	3/7/2009	16	0.959	405	= (29 + 393) * 0.959
	3/14/2009	17	0.959	403	= (16 + 405) * 0.959
April (prelim.)	3/21/2009	16	0.955	401	= (17 + 403) * 0.955
	3/28/2009	17	0.955	399	= (16 + 401) * 0.955
	4/4/2009	32	0.955	397	= (17 + 399) * 0.955
	4/11/2009	27	0.955	410	= (32 + 397) * 0.955
	4/18/2009		0.955	417	= (27 + 410) * 0.955

[1] The exhaustee estimate for the reference week is rounded to the whole integer and becomes the monthly Handbook Line 9 value. For the weeks between reference weeks, the exhaustee estimates are unrounded. Rounded values are displayed here for ease of reference.

Column	*Description*
(A)	Reference Month • The months for which estimates are being generated. • In the example, the estimation period pertains to March (revised) and April (preliminary) of 2009. Estimates for these periods were created during the month of May 2009. The last week of February is included to display the prior month's final payments and exhaustee pool.
(B)	Week Ending Date • The last day of each calendar week displayed by reference month. The last week of each reference month is the CPS reference week (usually the week including the 12th day of the month). • Each reference month starts in the week following the prior month's reference week and extends to the current reference week.
(C)	Final Payments • The count of people receiving their last unemployment benefit payment during the week indicated. • Final payments made from State UI programs and from the UCFE program are included. RRB final payments are not tracked. • Note that final payments made during the reference week are also counted as continued claims.
(D)	Survival Rate • The rate at which exhaustees and final payment recipients from the prior week remain unemployed in the current week.
(E)	Exhaustee Estimate • A weekly estimate of the number of unemployed people who have exhausted UI benefits. • The exhaustee estimate for the reference week is the monthly Handbook line 9 estimate.
(F)	Exhaustee Calculation • The survival rate for the current week is applied to the prior week's sum of final payments and exhaustee pool to yield the exhaustee pool for the current week. $Exhaustees_n = Survival\ Rate_n * (Exhaustees_{n-1} + Final\ Payments_{n-1})$ Where "n" is the current week and "n-1" is the prior week.

Non-covered Agricultural Unemployment (Handbook line 10)



Generally, this component is a small part of unemployment, but it is very important for some areas with large and highly seasonal agricultural sectors. For the 17 States that estimate non-covered agricultural unemployment, this component accounted for less than one percent of total Handbook unemployment; however, for individual areas within those 17 States, the component accounted for up to a quarter of the unemployed.

Direct estimation of agricultural unemployment may be used in States with at least one Handbook area where agricultural employment is 25 percent or more of total employment. States that qualify must obtain approval from BLS to estimate agricultural unemployment directly. In such cases, this direct estimation must be used in all Handbook areas of the State. Other States may request approval for atypical treatment of agricultural unemployment for a specific Handbook area if it can be demonstrated that the lack of such an estimate has a deleterious effect on estimates for that area.

The following formula details the calculation of non-covered agricultural unemployment. The table below the formula provides details.

If A01 > L03, then L10 = 0, otherwise

$$L10 = \frac{(L03 - A01) * \frac{(L08 + L09)}{(L04 + L08 + L09)}}{1 - \frac{(L08 + L09)}{(L04 + L08 + L09)}}$$

Where:

Identifier	*Description*
A01	Covered Agricultural Employment • Obtained from monthly QCEW data. When the current month's QCEW data are unavailable, data from the same month one year ago are used. Revisions will incorporate the current month's data when they are available.
L03	Handbook Agricultural Employment
L04	Total Handbook Employment
L08	Total Continued Claims
L09	Exhaustee Unemployment
L10	Non-covered Agricultural Unemployment

Entrant Unemployment (Handbook lines 13 and 15)

For many unemployed individuals, their current spell of unemployment was not immediately preceded by employment. These individuals entered the labor market from outside the labor force after having completed military service, family responsibilities, education, or other activities outside the civilian labor force. These individuals are known as unemployed entrants.

Unemployed entrants are further divided into two groups:

(1) Unemployed New Entrants

- Individuals who enter the labor market for the first time and do not find jobs.

(2) Unemployed Re-entrants

- Individuals who enter the labor market after a period of retirement from the labor force and are unable to find jobs.

Estimates of new entrants and re-entrants are created for each State, and the statewide estimates are then allocated to the Handbook areas within the State using annual population data. The table below lists the inputs necessary for entrant estimation in LAUSToo.

Inputs for Unemployed Entrants

Line		*Input/ Handbook Line description (LAUSToo variable ID)*	*Input Source*
		Statewide Unemployed Re-Entrants (SRE)	BLS
	x	Re-entrants allocation ratio	BLS
13	=	Unemployed Re-entrants (= SRE * Re-entrants ratio)	
		Statewide Unemployed New Entrants (SNE)	BLS
	x	New Entrants allocation ratio	BLS
15	=	Unemployed New Entrants (= SNE * New Entrants ratio)	

Statewide New Entrant and Re-entrant Unemployment (SNE and SRE)

Statewide new entrant and re-entrant estimates are available from the CPS; however, the data are volatile and are not suitable for direct use. To reduce the volatility of the CPS estimates and obtain inputs more suitable for Handbook estimation, five years of CPS data for a given month are used to develop weighted-average estimates. The following table shows the weights used, where "y" is the current year.

Year	Weight
y	0.40
y – 1	0.25
y – 2	0.20
y – 3	0.10
y – 4	0.05

Once the weighted estimates are calculated, the resulting data for the fifty states and the District of Columbia are controlled to monthly national CPS estimates of new entrant and re-entrant unemployment. This controlling step, which was added to the methodology in 2010, ensures that use of data from earlier years does not bias the overall level of Handbook entrant unemployment upwards or downwards during times of generally falling or rising unemployment, respectively.

Allocation of Statewide Entrants to Handbook Areas

Handbook calculations in LAUSToo distribute the statewide new entrant and re-entrant estimates to the Handbook area level using each area's share of statewide age-group population data. BLS obtains the population data from the U.S. Census Bureau each year. New entrants are distributed using Handbook area shares of the population aged 16 to 19 years, while shares of the population aged 20 or more years are used to allocate re-entrants.

Appendix 7-1

Survival Rate Formula

1. An exponential distribution was fitted to the distribution classes of "15 to 26 weeks" and "27 weeks and over". (The actuals bounds will be listed as 14.5 to 26.5 weeks and 26.5 weeks and over.) The exponential density function is:

$$f(t) = \lambda e^{-\lambda t} \qquad 0 \leq t < \infty$$

where:
λ = the single parameter to be estimated by the method of maximum likelihood (the survival rate)
t = duration in weeks

2. The probability of falling in each of the two classes is determined by integrating over the density:

where:
λ = the single parameter to be estimated by the method of maximum likelihood (the death rate)
t = duration in weeks

$$\int_{T_L}^{T_U} \lambda e^{-\lambda t} dt = -e^{-\lambda t} \Big|_{T_L}^{T_U} = e^{-\lambda T_L} - e^{-\lambda T_U}$$

where:
T_U = upper class boundary
T_L = lower class boundary

Prob (falling in 14.5-26.5) = $e^{-14.5\lambda} - e^{-26.5\lambda}$
Prob (falling in 26.5+) = $e^{-26.5\lambda}$

These locations are shifted by 13.5 weeks so that:

Prob (falling in 14.5-26.5) = $e^{-\lambda} - e^{-13\lambda}$
Prob (falling in 26.5+) = $e^{-13\lambda}$

Doing so indicates that the chances of surviving or not surviving in the exhaustee pool do not begin until week 13.5 for the purposed of determining the exhaustee rate. A result of this is that the function is now binomial, in that a person will only fall in one of the two duration classes.

3. The likelihood function (L), as used here, is defined as the joint probability (or product) of the probabilities of a person falling in either of the two duration classes. Maximizing L with respect to λ yields the maximum likelihood estimate of this parameter. The likelihood function appropriate here is the binomial:

$$L = \frac{K!}{k_1!\,k_2!}\left(e^{-\lambda} - e^{-13\lambda}\right)^{k_1}\left(e^{-13\lambda}\right)^{k_2}$$

where:

k_1 = number of unemployed in 14.5-26.5 week class

k_2 = number of unemployed in 26.5+ week class

K = total number unemployed in both classes ($k_1 + k_2$)

This equation is derived from the following:

$L(p) = \binom{n}{k}p^k(1-p)^{n-k}$ is the likelihood function for a binomial process.

$\binom{n}{k}$ is the combination of choosing 'x' from a set of 'n'. $\binom{n}{k} = \frac{n!}{k!(n-k)1}$

In this case we have: $\frac{K!}{k_1!(K-k_1)!}$ where (K-k_1) is equivalent to k_2

$p = \left(e^{-\lambda} - e^{-13\lambda}\right)$ or the probability of falling into the 14.5-26.5 week class

$(1-p) = \left(e^{-13\lambda}\right)$ or the probability of falling into the 26.5+ week class

4. The natural logarithm (ln) of the likelihood function (L*) is obtained because it is easier to work with and because the maximum of the likelihood function will occur at the same value of λ as will the maximum of the natural logarithm of the likelihood function

$$L^* = \ln(K!) - \ln(k_1!) - \ln(k_2!) + k_1\ln\left(e^{-\lambda} - e^{-13\lambda}\right) + k_2\ln(e^{-13\lambda})$$

5. The derivative of L* is obtained with respect to λ and set equal to zero to obtain the maximum likelihood estimate of λ. An equation will reach a local maximum or minimum where its first derivative is equal to zero. In this case, we are seeking to take the derivate of the above equation with respect to λ in order to find the value of λ for which the equation equals zero. This will be the maximum and will be the value of λ which maximizes the likelihood of the given distribution of the two duration classes.

$$\frac{\partial L^*}{\partial\lambda} = k_1\left(\frac{13e^{-13\lambda} - e^{-\lambda}}{e^{-\lambda} - e^{-13\lambda}}\right) - 13k_2 = 0$$

This can be written as:

$$\left(13 + 13\frac{k_2}{k_1}\right)e^{-13\lambda} = (13\frac{k_2}{k_1} + 1)e^{-\lambda}$$

Solving for λ yields:

$$\lambda = -\frac{1}{12}\left[\ln\left(13\frac{k_2}{k_1}+1\right) - \ln(13+13\frac{k_2}{k_1})\right]$$

6. The long-term survival rate (P_i) is a constant. The formula used is:

$$P_i = \frac{e^{-(i+1)\lambda}}{e^{-i\lambda}} = e^{-\lambda} \text{ for all i}$$

where λ has been estimated in Step 5 and i is the weeks duration for the 1-13 and 13+ weeks duration scale.

Thus the survival rate formula is as follows:

$$P_i = e^{\frac{1}{12}\left[\ln\left(13\frac{k_2}{k_1}+1\right)-\ln(13+13\frac{k_2}{k_1})\right]}$$

8 Geography

Introduction

The Local Area Unemployment Statistics (LAUS) program is responsible for estimation of unemployment rates for areas below the national level. This chapter will provide a comprehensive review of LAUS geography, beginning with the largest areas and proceeding through the area types in descending order by size.

For each type of geography, the source of the delineation, the role of the geography in LAUS estimation, and the estimation methodology will be noted. Detailed information regarding each estimation methodology can be found in the appropriate chapters.

Census Regions and Divisions

The U.S. Census Bureau has designated four census regions and nine divisions for which LAUS creates labor force estimates. The four census regions each comprise two or more census divisions. The nine census divisions each comprise three or more states. The table below summarizes the geographic composition of these areas.

LAUS creates estimates for census divisions using statistical models that incorporate data from the Current Population Survey (CPS). These models are benchmarked, or forced to sum to, the national estimates on a monthly basis. The benchmarked census division estimates are then used as benchmarks for their component states. Estimates for census regions are developed by summing the model-based data of their component census divisions.

Note that Puerto Rico, which is within the scope of the LAUS program, is not part of any census region or division.

Census Region	*Census Division*	*States*
Northeast	New England	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont
	Middle Atlantic	New Jersey, New York, and Pennsylvania
Midwest	East North Central	Illinois, Indiana, Michigan, Ohio, and Wisconsin
	West North Central	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota,
South	South Atlantic	Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia
	East South Central	Alabama, Kentucky, Mississippi, and Tennessee
	West South Central	Arkansas, Louisiana, Oklahoma, and Texas
West	Mountain	Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming
	Pacific	Alaska, California, Hawaii, Oregon, and Washington

States

LAUS publishes labor force estimates for the 50 states, the District of Columbia, and the Commonwealth of Puerto Rico. (While the District and Puerto Rico are not states, the LAUS program generally treats them as such for administrative purposes.)

Estimates for 48 states and the District of Columbia are developed using statistical models. In addition to using CPS data as the primary input, these models also incorporate Current Employment Statistics (CES) total

nonfarm employment data for the employment model and unemployment insurance (UI) claims data for the unemployment model. State model estimates are controlled, or forced to sum to, their respective census division estimates.

The two remaining states—California and New York—are treated differently. Due to their large sizes, both the modeled substate areas and the balances of state are treated as states for modeling purposes, summed to create labor force estimates for California and New York, and controlled directly to their respective census division estimates.

Estimates for Puerto Rico are not modeled, but directly derived from a separate survey similar to the CPS that is administered by the Puerto Rico Department of Labor.

Balances of State

Balance of state is the portion that remains after removing the modeled substate area within a state. There are seven balances of state that exist to facilitate model-based estimation for areas within their respective states. LAUS creates estimates for balances of states and their respective substate modeled areas using statistical models. Each month the balance of state estimates, along with the respective modeled substate area estimates, are controlled to the state model estimates.

As previously noted, the balance of state and substate modeled area estimates for California and New York are treated as states and are controlled directly to their respective census division estimates.

State	Balance of State	Substate Modeled Area
California	Balance of California	Los Angeles-Long Beach-Glendale, CA Metropolitan Division
Florida	Balance of Florida	Miami-Miami Beach-Kendall, FL Metropolitan Division
Illinois	Balance of Illinois	Chicago-Naperville-Arlington Heights, IL Metropolitan Division
Michigan	Balance of Michigan	Detroit-Warren-Dearborn, MI Metropolitan Statistical Area
New York	Balance of New York	New York city, NY
Ohio	Balance of Ohio	Cleveland-Elyria, OH Metropolitan Statistical Area
Washington	Balance of Washington	Seattle-Bellevue-Everett, WA Metropolitan Division

Labor Market Areas

In the late 1940s, when subnational labor force estimation was first

attempted, employment and unemployment estimates were developed for large labor market areas (LMAs) as well as for states, underscoring the importance of substate labor market information. Subsequently, all LMAs were identified in order to standardize and promote comparability for the collection and use of labor force information in administering various government programs. In the LAUS program, substate estimates of employment and unemployment are prepared for all LMAs in the Nation.

Generally, an LMA is defined as an economically integrated geographic area within which individuals can reside and find employment within a reasonable distance or can readily change employment without changing their place of residence. LMAs are either metropolitan areas, micropolitan areas, or small LMAs, and they exhaust the geography of the U.S. and Puerto Rico.

The Office of Management and Budget (OMB) is responsible for delineating metropolitan and micropolitan areas for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics. As of 2015, there are:

- 366 Metropolitan Statistical Areas, 10 of which contain 28 Metropolitan Divisions, and 524 Micropolitan Statistical Areas in the non-New England states.
- 21 Metropolitan New England City and Town Areas (NECTAs), 1 of which contains 10 NECTA Divisions, and 17 Micropolitan NECTAs in the 6 New England states.
- 7 Metropolitan Statistical Areas and 5 Micropolitan Statistical Areas in Puerto Rico.

The LAUS program is responsible for delineating small LMAs. LMAs are delineated in terms of counties or county equivalents in all areas except New England, where Minor Civil Divisions (MCDs) are used.

LMAs are delineated on the basis of population, urbanization, and commutation data. Since population and urban area data are inappropriate for delineating the generally less populous small LMAs, commutation data are used to determine which counties are deemed single-county LMAs and which are combined into multi-county LMAs. Regardless of population size, commuting flows are an indication of the degree of integration of labor markets among counties.

Federal Statistical Areas

Metropolitan Statistical Areas and Micropolitan Statistical Areas collectively are called Core Based Statistical Areas, or CBSAs. The Metropolitan and Micropolitan Statistical Area Standards do not equate to an urban-rural classification; most counties included in Metropolitan and Micropolitan Statistical Areas and many outside-CBSA counties contain both urban and rural territory and populations.

Core

A core is a densely settled concentration of population, comprising either an urbanized area of at least 50,000 population or an urban cluster of 10,000 to 49,999 population determined by the Census Bureau, around which a CBSA is defined. (See www.census.gov/geo/reference/ua/urban-rural-2010.html for information from the Census Bureau on urban and rural classification.)

Core Based Statistical Area (CBSA)

A CBSA is a statistical geographic entity consisting of the central county or counties associated with at least one urban core of at least 10,000 population, plus adjacent, outlying counties having a high degree of social and economic integration with the core as measured through commuting ties. Metropolitan and Micropolitan Statistical Areas are the two categories of CBSA. A Metropolitan Statistical Area is based on an urbanized area core, while a Micropolitan Statistical Area is based on an urban cluster core.

New England City and Town Area (NECTA)

A NECTA is a statistical geographic entity conceptually similar to a CBSA, except that Minor Civil Divisions, or MCDs, are used as its building blocks instead of counties. NECTAs are an alternative, equivalent set of areas delineated by OMB for the six New England states, in recognition of the primacy of cities and towns in local area governance within that census division. There are Metropolitan and Micropolitan NECTAs, depending on the population of the urban core.

Metropolitan Division and NECTA Division

A Metropolitan Division is a county or group of counties within a Metropolitan Statistical Area that contains a core population of at least 2.5 million. A Metropolitan Division consists of at least one main county or at least two secondary counties that represent an employment center, plus adjacent counties associated with this employment center through commuting ties. Metropolitan Divisions are subdivisions of very large Metropolitan Statistical Areas that often function as distinct social,

economic, and cultural areas with the larger region, and they retain their separate statistical identities. For a Metropolitan NECTA containing a core population of at least 2.5 million, NECTA Divisions are delineated where separate employment centers can be identified using MCDs as building blocks.

Combined Statistical Areas and Combined NECTAs

A Combined Statistical Area consists of two or more adjacent Metropolitan Statistical Area(s) and/or Micropolitan Statistical Area(s) linked through commuting ties. Areas are combined based on an employment interchange rate of at least 15 percent (either inflows or outflows). A Combined NECTA consists of two or more adjacent Metropolitan NECTA(s) and/or Micropolitan NECTA(s) similarly linked through commuting ties.

The standards underlying the 2010 Census-based federal statistical area delineations are available through the OMB website at www.whitehouse.gov/sites/default/files/omb/assets/fedreg_2010/06282010_metro_standards-Complete.pdf. Links to OMB update bulletins listing statistical area delineations based on these standards are available at www.census.gov/population/metro/data/omb.html.

Small Labor Market Areas

While CBSAs and NECTAs are delineated by the Office of Management and Budget (OMB), LAUS delineates small LMAs over territory outside of CBSAs (outside of NECTAs in the New England states). Similar to the federal statistical areas, multi-entity small LMAs are created based on commutation data from the American Community Survey (ACS) 5-year average dataset. However, unlike the federal statistical areas, no population criteria are applied in delineating small LMAs.

(1) Worker flows are examined, and counties are combined into one small LMA if either of the following conditions is met:

   (a) At least 25.0 percent of the employed residents of one county commute to work in another county.

   (b) At least 25.0 percent of the employment (persons working) in one county is accounted for by workers commuting from another county.

(2) Small LMAs, as is the case with metropolitan and micropolitan areas, are required to be contiguous. Counties are first combined based on the commutation criteria, and then potential multi-county small LMAs are checked for contiguity. Noncontiguous portions of potential small LMAs are considered separately. If the noncontiguous area contains more than one county, it is reevaluated using criteria (1)(a) and (1)(b) above. If the noncontiguous area consists of a single county, it is delineated as a separate small LMA.

(3) Subsequent to the verification of contiguity described in (2) above, commuting flows between adjacent small LMAs are evaluated. Those areas for which the measures and thresholds specified in (1a) and (1b) above are met merge to form one small LMA.

(4) For the New England MCD-based small LMAs, due to the large number of small MCDs, residual MCDs are added to contiguous small LMAs based on commuting flows and/or other economic ties. That is, if, after applying the commutation criteria, an MCD is identified as an individual small LMA, the MCD is added to a contiguous small LMA, especially if the MCD is very small.

A complete listing of the metropolitan, micropolitan, and small LMAs in use by the LAUS program is available through the BLS website at www.bls.gov/lau/lausmsa.htm.

Methodology for Labor Market Area Data

More than half of all non-New England counties and county equivalents are coextensive with federal statistical areas or small LMAs. Estimates for single-county Metropolitan Statistical Areas, Metropolitan Divisions, Micropolitan Statistical Areas, and small LMAs are produced using the Handbook method by virtue of their geographic equivalence to counties. For multi-county areas, estimates are aggregated from the Handbook-based estimates of the component counties. Estimates for large Metropolitan Statistical Areas containing Metropolitan Divisions similarly are aggregated from their Metropolitan Divisions, while estimates for Combined Statistical Areas are aggregated from their Metropolitan and/or Micropolitan Statistical Area components.

In the New England states, the Handbook method is used at the MCD level. No New England MCDs are coextensive with federal statistical areas, while only two MCDs are coextensive with small LMAs. Hence, estimates for all NECTA geography and virtually all small LMA geography in New England are aggregated from the Handbook-based estimates of their MCD components.

The largest component of household employment—nonagricultural wage and salary, or NAWS—is often estimated at the labor market area level and then distributed to the component counties or MCDs of multi-entity labor market areas using American Community Survey data. Thus, labor market area geography has an important role in the Handbook method. Some states have elected to estimate NAWS at the county level for their multi-county Micropolitan Statistical Areas and small LMAs.

Expanded Estimating Areas are unique to the New England states and were created to facilitate NAWS estimation for small, isolated MCDs. They comprise a Metropolitan or Micropolitan NECTA and at least one such MCD deemed too small for effective NAWS estimation by itself.

Counties

LAUS creates estimates using the Handbook method for non-New England counties and county equivalents in the U.S. and Puerto Rico. (County equivalents include Boroughs and Census Areas in Alaska; Parishes in Louisiana; Independent Cities in Missouri, Nevada, and Virginia; Municipios in Puerto Rico, and various county/city areas in other states). Estimates for counties in New England are aggregated from the Handbook-based estimates of their component MCDs.

New England Minor Civil Divisions (MCDs)

In much of New England, counties are statistical entities only, as defined by the Census Bureau. Governmental functions typically associated with the county level elsewhere in the U.S., rather, tend to be carried out by cities and towns (i.e., at the MCD level) in New England. As OMB recognizes the importance of MCDs in its delineation of NECTAs as an equivalent alternative to the county-based Metropolitan and Micropolitan Statistical Areas, the LAUS program acknowledges the primacy of MCDs in New England through its use of exhaustive Handbook estimation at the MCD level there.

Incorporated Places and Minor Civil Divisions Outside of New England

The LAUS program produces estimates for incorporated places with populations of 25,000 or more, plus MCDs with populations of 25,000 or more in the states of Michigan, New Jersey, New York, and Pennsylvania. Disaggregation techniques are used to create estimates for these areas.

Each year, typically by the end of May, the Census Bureau issues population estimates for sub-county areas with a reference point of July 1 of the prior year. (See www.census.gov/popest/index.html on the Census Bureau website.) These data are reviewed to determine sub-county areas newly meeting the 25,000-threshold for inclusion in the LAUS program. The list of new areas is provided to the affected states for addition during the next annual processing cycle. Sub-county areas falling below the 25,000-threshold generally are not considered for removal from the LAUS program except during decennial redesigns.

Incorporated Place Parts

There are incorporated places for which LAUS (1) creates estimates and (2) recognizes territory in more than one county. For any incorporated place estimated by LAUS, data for the county-specific parts are produced through disaggregation if the incorporated place has more than one county part with a nonzero labor force level in the base American Community

Survey 5-year dataset. These parts are then summed to the whole incorporated place. In a small number of cases, LAUS incorporated places are split across three or more counties where some parts are recognized but some part or parts are not, based on the American Community Survey dataset in use.

State-Specific Areas

States are given the option at the end of each year to inform BLS if they wish to add state-specific areas to the production database or modify existing state-specific areas. These are typically sub-county areas below the LAUS population threshold of 25,000—for which estimates generally are developed through disaggregation techniques—or workforce regions, for which estimates generally are developed through aggregation. BLS does not publish estimates for state-specific areas, and each state assumes this responsibility for its state-specific areas.

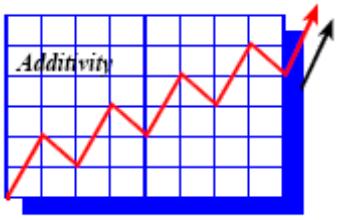
Areas of Substantial Unemployment

Areas of Substantial Unemployment, or ASUs, are (1) contiguous geographic areas (2) with populations of at least 10,000 and (3) unemployment rates of 6.5 percent or more. They are used by the Employment and Training Administration (ETA) to allocate funds to states under a provision of the Workforce Innovation and Opportunity Act. Under the Cooperative Agreement, states are required to submit ASUs to BLS through the ASU module of the production system each year, typically by mid-October, which BLS then validates on behalf of ETA. A state maximizes its allocation by configuring its ASUs to include as a high a share of its total unemployed as possible. Historically, ETA has permitted states to use census tracts to develop their ASUs, although LAUS areas can be used as well. (The granularity that tract-level data provides can be particularly useful when unemployment rates for LAUS areas are generally low.) The ASU module of the production system includes data for all census tracts for the sole purpose of facilitating ASU development. These data reflect a weak disaggregation technique from the county level (including in the New England states) based on volatile American Community Survey 5-year estimates. They are not of BLS publication quality and are not recommended for any other use.

Bureau of Labor Statistics Regions

The Bureau of Labor Statistics (BLS) has subdivided the Nation into regions for administrative purposes. LAUS does not create estimates for BLS regions.

BLS Region	*States*
Boston / New York	Connecticut, New York, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, and Puerto Rico
Philadelphia	Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia
Atlanta	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee
Chicago	Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin
Dallas / Kansas City	Arkansas, Colorado, Kansas, Louisiana, Missouri, Montana, New Mexico, Oklahoma, Texas, Utah, and Wyoming
San Francisco	Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, and Washington



9 *LAUS Estimation: Additivity*

Introduction

Linking substate labor force estimates to the CPS concepts begins with a set of Handbook employment and unemployment estimates. These Handbook estimates are prepared for all counties outside of New England and all Minor Civil Divisions (MCDs) in New England. Because of nonlinearity in the Handbook, the county or MCD employment and unemployment estimates will not necessarily equal the statewide totals. Hence, an additivity adjustment must be performed. This process introduces conformity between the Handbook and the statewide estimates by making the sum of the exhaustive county or MCD estimates additive to statewide level estimates.

The LAUS program uses a simple linear additivity adjustment method, referred to as the Handbook-Share technique, to adjust county or MCD estimates to the statewide estimates. This method consists of distributing the statewide estimates, based on the percentage share of each Handbook area estimate, over the total of the Handbook estimates. This method is applied to all areas for which an independent Handbook estimate is prepared. The adjustments for additivity are performed on a current basis, and whenever the statewide estimates are revised.

After the Handbook estimates have been adjusted for additivity to the statewide estimates, the estimates are referred to as “LAUS” estimates rather than Handbook estimates.

When estimates for areas below the county are needed, the LAUS estimates are then disaggregated into sub-county areas, such as cities and towns. Two methods for disaggregation exist based on the availability of UI claims and ACS data for apportioning county estimates to smaller areas. See Chapter 10 for a complete description of the disaggregation process.

Adjustment to Independent Statewide Estimates— The Handbook Share Method

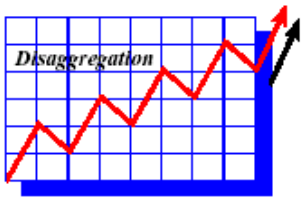
The process of reconciling, or linking, county or MCD labor force estimates to Statewide (model-based) estimates begins with a set of geographically exhaustive Handbook employment and unemployment estimates. A simultaneous adjustment for additivity of all county or MCD estimates to the statewide estimates is performed using the percentage distribution of the substate Handbook estimates, also known as the Handbook-Share method. The Handbook-Share method of apportioning the State estimates of unemployment and employment to areas assumes a proportional distribution throughout the State of the difference between the sum of substate Handbook estimates and the independent State estimates. This adjustment is performed for both preliminary and revised estimates.

The following worksheet illustrates simultaneous additivity and adjustments to counties and MCDs using the Handbook-Share method.

Simultaneous Additivity of County or MCD Estimates Using the Handbook-share Method

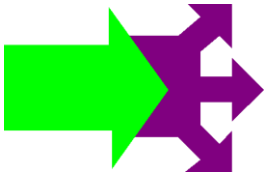
	Unemployment			Employment		
Area	***Handbook***	***Percent of Summed Handbook***	***Statewide****	***Handbook***	***Percent of Summed Handbook***	***Statewide****
State			*49,300*			*562,800*
County/MCD1	18,500	0.394456	19,447	190,600	0.3481279	195,926
County/MCD 2	9,300	0.198294	9,776	107,100	0.1956164	110,093
County/MCD 3	8,700	0.185501	9,145	103,400	0.1888585	106,290
County/MCD 4	2,300	0.049041	2,418	36,800	0.0672146	37,828
County/MCD 5	1,900	0.045120	1,997	25,900	0.0493059	26,624
County/MCD 6	6,200	0.132196	6,517	83,700	0.1528767	86,039
Sum of substate Areas	46,900	1.000000	49,300	547,500	1.000000	562,800

*For the State, enter the model-based estimate. The substate data are the product of the area's Percent of Summed Handbook and the statewide estimate for unemployment or employment.



10 LAUS Estimation: Disaggregation

Introduction



Disaggregation techniques are used to obtain current estimates of employment and unemployment for cities and parts of cities where the city lies in more than one county. Disaggregation involves prorating employment and unemployment for one or more counties to the disaggregated area. Since these areas are within counties, independent employment and unemployment estimates cannot be developed, as basic data are not always available and current LAUS estimating procedures are not applicable.

Disaggregation methods are used to develop estimates for cities with a population of 25,000 or more.

Two methods of disaggregation are appropriate for LAUS use.

1.) ACS-share employment disaggregation uses ACS 5-year employment estimates indexed to the July-1 post-censal population estimates from the most recent vintage available during the previous annual processing cycle.

2.) Claims-based unemployment disaggregation uses current UI claims data by city of residence, 2010 Census population data by age group, and the most recent Census Bureau population estimates.

The starting point for disaggregation is the estimate of employment and unemployment prepared for the Handbook Area in accordance with Handbook instructions outlined in Chapter 7 and the directions on adjustment for additivity to statewide totals in Chapter 9.

ACS-Share Disaggregation

Since current employment and unemployment estimates at the city level are required to implement numerous Federal economic assistance and employment and training programs, methods of disaggregation which reflect current economic conditions in these cities are necessary. Apart from the Census Bureau's American Community Survey (ACS), there are very few economic and demographic data series for small areas. Two exceptions are the monthly UI claims series and the population estimates prepared by the Census Bureau.

Specifically, the current data used in LAUS disaggregation are UI continued claims by place of residence for the week including the 12th of the month and total population estimates prepared annually pertaining to July 1 of the given year. The procedures which incorporate the use of these data are known as ACS-share and claims-based disaggregation.

ACS-Share Employment Disaggregation for Cities

American Community Survey employment estimates are available from the 5-year datasets published annually by the Census Bureau for a comprehensive set of areas, including all disaggregated cities and city parts. The most recent 5-year ACS employment estimate for the city or city part is divided by the ACS employment estimate for the corresponding county. Research showed that, while ACS uses Census Population Estimates Program (PEP) population estimates as controls, ACS population estimates and Census PEP estimates are not always consistent. In ACS estimation, smaller areas may be combined and controlled as a single area for the purpose of population estimation. We apply an additional factor of Census Bureau July-1 population divided by ACS 5-year population for both the county and the city to resolve this discrepancy. This population correction factor has the effect of controlling ACS estimates to the official Census population estimates, as well as updating employment estimates to current vintage-year Census population and allowing employment ratios to keep pace with population change. Below is the formula for the ACS-share employment disaggregation ratio:

$$ACS-Share\ Employment\ Disaggregation\ Ratio_{Disaggregation\ Area} = \frac{ACS\ Emp_{\substack{Disaggregation\ Area \\ ACS\ 5-Year}} * \frac{Census\ Pop_{\substack{Disaggregation\ Area \\ Annual\ PEP}}}{ACS\ Pop_{\substack{Disaggregation\ Area \\ ACS\ 5-Year}}}}{ACS\ Emp_{\substack{County \\ ACS\ 5-Year}} * \frac{Census\ Pop_{\substack{County \\ Annual\ PEP}}}{ACS\ Pop_{\substack{County \\ ACS\ 5-Year}}}}$$

Applying the ACS-share Employment Disaggregation Procedure

Each year, data are updated to produce the ACS-share ratios as follows:

Developing City Employment/Population Index-Shares

	ACS 5-year Estimates		Census July-1 Est.	Employment - Population Correction	*ACS-share ratio*
City	Employment	Population	Population	(I X III)/II	$IV_{City} \div IV_{County}$
	I	II	III	IV	V
A	18,300	28,000	30,000	19,607	0.338518
B	14,000	33,000	32,500	13,788	0.238048
County Total	55,900	124,500	129,000	57,920	

Step 1. *Data from the most recent ACS 5-year data set on total employment and population are entered in Columns I and II for all LAUS cities and city parts in the county.*

Step 2. *The most recent July-1 population estimates are entered in Column III.*

Step 3. *For each city a population correction factor is applied to its 5-year ACS employment estimate. Column IV equals Column I times Column III divided by Column II.*

Step 4. *The ACS-share employment disaggregation ratio is calculated for each city by dividing the population-corrected employment level in the city by the population-corrected employment level for the county.*

Claims-Based Unemployment Disaggregation

Research has shown that a strict claimant allocation method is not appropriate for disaggregating total unemployment because local data, such as Unemployment Insurance (UI) benefits claims, are not available for labor force entrant unemployed. Unlike most job losers, the labor force entrant unemployed are usually not eligible for UI benefits; they lack sufficient recent earnings due to employment. For this reason, claims data by city or city part of residence are used to distribute only the experienced unemployed component, i.e., those with recent job attachment.

Census population data are used in disaggregating unemployed new entrants and reentrants. Population aged 16 to 19 data are used in the disaggregation of new entrants; population data for those aged 20 and over are used in re-entrant disaggregation. Note that these age groups are the same as those used to calculate the youth population ratio for estimating county new entrant and reentrant unemployment using the Handbook procedure.

Age-group population estimates for counties from the post-censal demographic series are used for new entrant and reentrant unemployment disaggregation. Adjustments for out-of-scope population are made using institutionalized group quarters and military group quarters counts from the 2010 Census.

All new entrant and reentrant disaggregation ratios (R02 and R03, respectively) for cities and city parts are calculated using the July-1 post-censal population estimates. The calculations use population estimates from the latest post-censal vintage in conjunction with counts by age group from the 2010 Census.

Required Claims Data for Claims-Based Unemployment Disaggregation

The residency requirement for claims data is the coding and tabulating of claimants by county of residence. The geographic distribution by residence of claimants filing continued claims under State UI and UCFE certifying to unemployment in the week including the 12th of the month is used to disaggregate the county estimate of experienced unemployed to the city and city part level. Claimants with any earnings due to employment in the week including the 12th should be excluded from counts used in disaggregation. Though used for Handbook estimation, Railroad Retirement Board (RRB) and commuter claims should be excluded from the claims counts used in disaggregation.

Claims-Based Unemployment Disaggregation Procedure and Sequence

The procedure and sequence for claims-based unemployment disaggregation is presented below, along with an example. The example assumes the following Handbook data:

- *unemployment, excluding entrants (line 11)= 5,000*
- *reentrant unemployment (line 13)= 1,600*
- *new entrant unemployment (line 15)= 400*
- *total unemployment (line 16)= 7,000*
- *total county claimants without earnings = 4,500*
- *independent estimate of county unemployment(LAUS) = 12,000*

City Claimants and Allocation Ratios

City	Claimants	>20 yrs.	16-19 yrs.
1	1,500	.25	.2
2	1,250	.3	.35

New entrant and reentrant disaggregation ratios represent 2010 Census ratios of city to county age-group population counts adjusted based on population estimates from the latest post-censal vintage.

Step 1. *For a county, determine the percent of Handbook unemployment that is accounted for by the experienced unemployed, those jobless with recent job attachment, i.e., unemployment excluding entrants divided by total unemployment.*

Example: 5,000 ÷ 7,000 = 0.71

If any approved atypical adjustment was made to the UI data so that a claims count was removed from the Handbook claims line leading up to Unemployment Excluding Entrants, but is added to Total Unemployment, then that figure should be added to Unemployment Excluding Entrants for purposes of arriving at the experienced unemployed proportion.

Step 2. *Determine the proportion of county Handbook unemployment represented by reentrants unemployment divided by total unemployment.*

Example: 1,600 ÷ 7,000 = 0.23

Step 3. *Determine the proportion of county Handbook unemployment represented by new entrants unemployment divided by total unemployment.*

Example: 400 ÷ 7,000 = 0.06

Note: The proportions obtained in steps 1, 2, and 3 should sum to one (100%).

Example: 0.71 + 0.23 + 0.06 = 1

Step 4. *Apply each of the proportions in steps 1, 2, and 3 to the independent county estimate of total unemployed after additivity and adjustment to statewide controls. This results in a disaggregation of total county unemployment into three parts:*

A. experienced unemployed
B. reentrant unemployed
C. new entrant unemployed.

Example:

A $= 0.71 \times 12{,}000 = 8{,}571.$

B $= 0.23 \times 12{,}000 = 2{,}743$

C $= 0.06 \times 12{,}000 = 686$

Step 5. *Allocate the county estimate of experienced unemployed (estimate A in Step 4) to all cities based on the percent distribution of place-of-residence claims data.*

City	City Claims		County Claims		City Ratio		County Exp Unemp		City Exp Unemp
1	1,500	÷	4,500	=	0.33	x	8,571	=	2,857
2	1,250	÷	4,500	=	0.28	x	8,571	=	2,381

Step 6. *Allocate the county estimate of reentrant employment (estimate B in Step 4) to all counties based on the percent distribution of the county's population 20 years of age and older from the 2010 census adjusted based on population estimates from the latest post-censal vintage.*

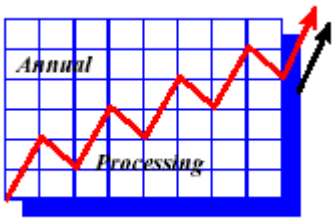
City	County Reentrants		20+ Pop Ratios		City Reentrants
1	2,743	x	25%	=	686
2	2,743	x	30%	=	823

Step 7. *Allocate the county estimate of new entrant unemployment (estimate C in Step 4) to all counties based on the percent distribution of the county's population 16-19 years old from the 2010 Census adjusted based on population estimates from the latest post-censal vintage.*

City	COUNTY New Entrants		16-19 Pop Ratios		City New Entrants
1	686	x	20%	=	137
2	686	x	35%	=	240

Step 8. *Derive the total unemployment estimate for each city by summing the city estimates derived in Steps 5, 6, and 7.*

City	Step 5		Step 6		Step 7		unemployment
1	2,857	+	686	+	137	=	**3,680**
2	2,381	+	823	+	240	=	**3,444**



11 *Annual Processing*

Introduction

In the current LAUS methodology, Handbook-based and model-based labor force estimates are revised annually to take advantage of the latest available information. This process is known as Annual Processing. State model performance is formally reviewed by state, regional, and national office staff, and adjustments are made to model specifications when necessary. Then new CPS population controls, revised Handbook components, and revised state-supplied data are incorporated into the state and substate estimates. In summary, annual processing consists of model evaluation and performance review, incorporation of CPS population controls, collection and incorporation of revised input data, re-estimation of state and substate estimates, and benchmarking or additivity. The sections which follow discuss these processes in detail.

Annual Model Review

A benefit of using a model-based estimation framework is the ability to adapt a state's model to the changing nature of the state economy and data. The variables in a model are based on the inter-relationships in the state's economy, including seasonal patterns and long-term trends, and the individual nature of the data sources available. The variable coefficients of the signal-plus-noise models allow the models to adjust gradually to structural changes in the economy and to discount unusual changes of input data, such as those resulting from CPS sampling variability. However, for some events, such as severe weather or spurious movement in the CPS, it is important to be able to review a model's performance and take direct corrective action. In some cases, intervention variables are added to the model to restore model performance; in other cases, model specifications are revised. (See Chapter 6 for a detailed discussion of intervention variables and model specifications.)

The LAUS model evaluation and performance review is conducted in the fall of each year. First, a technical memorandum is issued which requests state staff to review their model performance and provide comments and evaluations to the national office. The memorandum usually includes a list of suggested topics on model behavior for the states

to consider while reviewing their model performance. In addition, states are asked to provide information about their economy which might help to explain model behavior.

At the same time, the Statistical Methods Staff (SMS) review the model performance using statistical tests for diagnostic evaluation and outlier detection. This review focuses on statistical measures of model performance and is in addition to the battery of statistical tests which are run on the models each month. The tests help to determine whether any changes to current model specifications or outlier interventions are necessary. SMS shares the results of this research and their proposed actions with states, either via technical memorandum or in presentations during the annual state/regional meetings.

LAUS national office staff monitor model performance as part of their monthly duties. In addition, they summarize state issues and concerns regarding model performance and present resolutions and answers during the annual state meetings. Questions and issues raised by the states are also responded to in a formal LAUS technical memorandum, generally issued just after the conclusion of annual processing activities.

Population Controls

At the beginning of each year, new CPS population controls are introduced for use in division, state, and substate model estimation. These controls reflect both new data for the most recent year and revisions to data for earlier years. The new and revised controls are developed by the Census Bureau and delivered to BLS in late January.

Resident population at all levels of geography is estimated by updating a base population from the latest decennial census via estimates of the components of population change, consisting of births, deaths, and migration. The CPS universe, defined as the civilian noninstitutional population, is then estimated by subtraction of the resident military and institutional populations, primarily nursing homes, prisons and jails, mental hospitals, and juvenile facilities. Below the national level, this procedure is supplemented by estimations of domestic migration and by direct estimates of group quarters populations. Where appropriate, estimates of student and military populations are also used.

Population controlling occurs when the sample-based monthly CPS labor force estimates are adjusted so that they are consistent with these independently derived population estimates. Adjusting (controlling) the CPS sample-based labor force estimates to be consistent with independently derived population estimates reduces the variability of the CPS estimates, thus improving their quality.

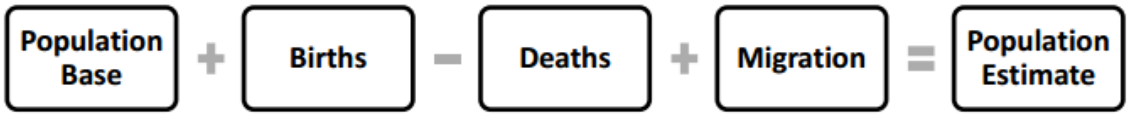
There are several ways CPS population controls affect LAUS estimates. For model-based estimates, the monthly impact is via the CPS inputs to the model estimates. For current estimation, monthly CPS population controls are incorporated into the CPS estimates through the second-stage ratio adjustment step of the CPS estimation process. (See Chapter 2 for a description of the second-stage estimation process.) For substate estimates, the monthly impact of CPS population controls is less direct, and occurs due to the additivity adjustment of substate estimates to their respective statewide or balance-of-state totals.

Annual CPS population controls are incorporated into CPS estimates through the revision of monthly CPS labor force estimates at the end of the year. During annual processing,

the revised CPS data are incorporated into the LAUS estimates when the models are re-estimated.

How Population Estimates are Calculated

Current estimates of the national population by age, sex, race, and Hispanic origin are derived each year by taking the decennial base population and adjusting it forward through time using components of population change. Census produces estimates using a component cohort method, derived from the following demographic balancing equation.



That is, the population at any given time point is the population at the last decennial Census, plus all U.S. births, less U.S. resident deaths, and adjusted for migration. While the equation is the same for all areas and demographic groups, differences in data availability dictate that no single methodology is capable of producing estimates for all areas and characteristic groupings.

Geographic and Demographic Consistency: Census creates population estimates via a 'top-down' approach. First, national estimates of monthly population are created by age, sex, race, and Hispanic origin, as estimates of the components of change are more reliable at the national level. Next, annual population estimates by demographic groups are created for counties. Annual state estimates are created by aggregating the county values. The national monthly population time series are then used to create monthly state and county estimates by age, race, sex and Hispanic origin in such a way that ensures geographic and demographic consistency in all areas.

County total population counts are created using a simple control, so that the sum of county total populations equals the national total. Demographic characteristics estimates are controlled via a two-way raking system. This ensures that the aggregation of subnational demographic population estimates sum to the national demographic population estimates (e.g., the sum of all county Hispanic population estimates must equal the national estimate). Simultaneously, the sum of different demographic population group estimates is also controlled to the total population for the state or county (for example, the sum of male and female population in a state must equal its total population).

Enumerated Base Population: The base for all postcensal population estimates begins with the most recent decennial census enumerated counts. These counts are modified in three ways to produce the April 1, 2010 population base.

1. The Count Question Resolution (CQR) program allows legal entities to challenge their jurisdiction's decennial census value. If this challenge is successful, it is incorporated into the base population.

2. Changes to legal boundaries reported by January 1 of the vintage year are used to create a population base and a full time series consistent with those new legal boundaries. This generally does not impact national or state estimates, but can impact counties, cities or towns.

3. Race categories are modified to be consistent with the race categories from available data input sources. The 2010 Census allowed for responses that included one or more race groups, as defined by the Office or Management and Budget (OMB). It also allowed for responses of "Some other race". If "Some other race" was chosen in combination with other races, the "Some other race" component was simply removed. If it was chosen alone, then the response was allocated to one of the other race categories using other household information if available. If not, a hot-decking procedure is used instead.

Vital Statistics (Births and Deaths): Vital statistic (birth and death) data come from two sources: The National Center for Health Statistics (NCHS) and the Federal-State Cooperative for Population Estimates (FSCPE). NCHS data are derived from birth and death certificates across the United States. The FSCPE contributes data on the geographic distribution of vital events within the state. Census also computes short-term projections of vital events to account for the lag in availability of vital statistics.

Adjustments to birth data are made to account for discrepancies between state race data categories and those of OMB, birth certificates that include race or Hispanic origin of parents but not of the child, and inconsistencies between imputed race distributions and those reported in the Census enumerated counts.

Modifications are also made to deaths data. Many states still use the 1977 OMB race categories. These are converted to the 1997 categories. In addition, Census accounts for the less reliable age-of-death reporting for person 70 years of age or older by redistributing all deaths occurring to the aggregate population "70 year and older" by sex, race, and Hispanic origin to a single year of life (70 to 99) or to 100+ years using life-table-based death rates.

For subnational estimates, direct data are used where available. Where data are not yet available, short-term projections are created by calculating county-level age-specific fertility and mortality rates. These rates are applied to the previous vintages population projections and reconciled with FSCPE data on the geographic distribution of total county vital events. These data are then controlled using the method described in a previous section, "Geographic and Demographic Consistency."

Net Migration (International and Domestic): Migration is the third major component of the balancing equation. For national population estimates, domestic migration (between county and/or state) nets to zero, so only international migration is used. For subnational estimates, both international and domestic migration are important components of change.

International migration, in its simplest form, is any change of residence across the borders of the United States. Census divides international immigration into (1) immigration of the foreign-born; (2) emigration of the foreign-born; (3) net migration between the United States and Puerto Rico; (4) net migration of natives to and from the United States; and (5) net movement of the Armed Forces population to and from the United States.

1. Immigration of the foreign-born is estimated separately for Mexico and "All other countries" using American Community Survey (ACS) data on residence one year ago

(ROYA). Adjustments are made to account for children less than one year of age (of whom the ROYA question is not asked). For county estimates, ACS Year of Entry (YOE) data are used to distribute the national total foreign-born immigration data by geographic and demographic detail. Responses with a YOE within the last five years are used as a proxy to distribute the national data to state and county characteristic population estimates for the foreign-born.

2. Emigration of the foreign-born is calculated by using ACS data on nine potential emigration groups. For each group, the associated group's population from one 5-year ACS estimate is aged forward using NCHS life tables. This creates an expected population at a later points in the same 5-year file. Six residuals are created by subtracting the estimated population from the actual population (three 2-year residuals, two 3-year residuals, and one 4-year residual). These are averaged together to created estimated emigration rates with reduced variability. These rates are applied to 1-year ACS data to obtain annual estimates of foreign-born emigration.

3. Migration between the United States and Puerto Rico is estimated using data from both the ACS and the Puerto Rico Community Survey (PRCS). Immigrants are derived from persons in the ACS reporting residence in Puerto Rico one year prior. Emigrants are persons in the PRCS reporting residence in the United States one year prior.

4. Migration of native-born migrants is created using census and population register data from over 80 different countries. Estimates of U.S. natives residing in each country are compared between two consecutive years. The difference between the two year's data is used to develop an average annual estimate of net native-born migration.

5. International movement of Armed Forces population is estimated from data collected by the Defense Manpower Data Center (DMDC). DMDC provides monthly tabulations of military personnel station or deployed outside of the United States, by demographic group and service branch. Changes in overseas military population, excluding deaths, is assumed to be movement of personnel into and out of the United States. County data from the DMDC is used to estimate net international movement at the county-level, with data from the most recent ACS five-year file used to improve the geographic distribution around some domestic military installations.

Domestic migration has no impact on national estimates, but is an important consideration in subnational population estimates. County-to-county net domestic migration (NDM) is based on data from three sources: Internal Revenue Service (IRS) tax exemptions, change in Medicare enrollment, and changes in the group quarters population.

NDM data are produced for three age groups: under 18, 18 to 64, and 65 plus. Address data from IRS tax returns for individual filers are compared to produce geographic data by age categories for the under 18 and 18-to-64 age groups. Not all persons are tax filers, so the level data cannot be used. Rather, these data are used to create NDM ratios for each age breakout.

IRS data coverage is lower for persons age 65 and over, so changes in Medicare enrollment from the Centers for Medicare and Medicaid (CMS) are used to calculate

migration ratios for this age group. Again, levels cannot be used, as not all persons are eligible and/or enrolled. Rather, an NDM rate is calculated by taking change in Medicare enrollment (less persons turning 65 (newly eligible), deaths, and net international migration) and dividing it by total Medicare enrollment at the start of the period.

For each age group, the calculated NDM rate is applied to household population estimates for the age group and area. This creates estimates of total county net domestic migration, as well as by demographic group. The county data are then controlled so that total domestic migration at the national level is zero.

Data for state and county estimates by demographic characteristics come primarily from a combination of IRS tax exemptions, the Social Security Numeric Identification File (NUMIDENT), and the Person Demographic Characteristics File (PDCF). The NUMIDENT provides information on age and sex. The PDCF is derived from previous decennial censuses and a variety of administrative records sources, and it is used to estimate the race and Hispanic origin of the exemptions. This gives estimates of in-movers and out-movers by characteristic.

To account for under-coverage in IRS data, ratios are computed for outgoing migration for each demographic grouping. Total out-movers are created by applying this ratio to the population estimates for each demographic group within a county. The sum of out-movers is then also distributed as county in-movers using the incoming county migration data. Because in-movers are not calculated directly from the population estimates, but rather by sharing out out-movers, total national domestic migration by demographic grouping always nets to zero; that is, each and every in-mover is also an out-mover somewhere else, and vice versa.

Civilian Non-Institutional Population: The universe for BLS household estimates in the Civilian Non-Institutional Population, ages 16 and older. To create population estimates to serve as controls for surveys such as the CPS, the total population estimates are adjusted to remove armed forces personnel, the institutionalized population (from estimates of non-military Group Quarters population), and persons under the age of 16.

For more information on the development of national and state population estimates, see the US Census Bureau documentation at http://www.census.gov/popest/methodology/2015-natstcopr-meth.pdf.

State Annual Population Controls

Each January, the Census Bureau provides BLS with revised population estimates for each state. There are three types of revisions that may be incorporated into the revised population estimates:

1. Base Population Updates: The most recent decennial base population may be updated by incorporating new Count Question Resolution (CQR) changes, as well as legal boundary changes and other geographic updates.

2. Changes to input data and methods of estimating components of change: The data used to estimate the individual components of population change are updated as more recent and/or complete data become available. In addition, Census may revise the actual methods of estimating the components of population change and/or the stock estimates for special populations. Generally, revisions to the inputs tend to affect estimates toward the end of the time series. Revisions to methodology often affect the series cumulatively from the data of the last Census and forward.

3. Changes to the method of estimating population: In addition to updating the method of estimating the components of population change, the Census Bureau may revise the method of estimating population using the components of change. This type of revision also affects the series from the census date forward.

Once BLS receives the population controls from the Census Bureau, they are used to adjust the state's CPS labor force data. This is done by ratio adjustment: each month's CPS employment and unemployment estimates is multiplied by the ratio of that month's revised population value divided by the original population value.

Under normal circumstances, the CPS unemployment rate is not affected by population re-controlling. As both the unemployment estimate (the numerator of the rate calculation) and the labor force estimate (the denominator of the rate calculation) have been adjusted by the same proportion, the ratio of the two is unchanged.

Annual Population Revisions Affecting Substate Area Estimates

Substate area estimates benefit from the monthly and annual CPS population revisions through the additivity process which assures consistency with the state totals. Substate estimates utilize county and place total population data in the disaggregation of labor market area estimates into smaller geographic entities. Total population estimates for counties, incorporated places, and minor civil divisions are revised by the Census Bureau each year.

Annual Re-Estimation

Each year, states are provided the schedule for annual processing activities in a technical memorandum. States are instructed to replace the model input data with revised Current Employment Statistics (CES) employment, striker, unemployment insurance (UI) claimant, and Unemployment Compensation for Federal Employees (UCFE) claimant data for every period for which they have revisions or corrections. The CES nonfarm wage and salary estimates should reflect the most recent Quarterly Census of Employment and Wage (QCEW) benchmark and include any changes beyond the regular two years of CES benchmarking. Claims counts should be updated wherever possible.

Model-based annual processing is done in multiple stages. Division-model outliers are simply the sum of state outliers, so all state outliers must be designated prior to any annual processing re-estimation. Outliers are rarely impacted by input revisions (either to the CPS via population controls or to the covariate CES or continued claims series). Therefore, calculation of outlier effects is done prior to the full run of annual processing. SMS re-specifies models and outliers in each series immediately following the completion of statewide estimation for December of the previous production year. Their work is based on their own review and that of each state partner (see earlier section "Annual Model Review").

Once models are re-specified, full annual processing operations may commence. Updated population controls from the Census Bureau are verified and applied to the CPS employment and unemployment series. These new estimates are used to update the inputs to variance and error calculations. LAUS division models are then re-estimated.

During this time period, the STARS web interface is placed into Annual Processing mode. Access to monthly production tools, including the data extract utility, are unavailable. States use STARS to provide revised input data to the program office. State groupings for model-based annual processing are on a Census division basis because real-time benchmarking is performed at the division level. Once all states in a division have entered their input data and the national office has validated them, the historical series for all states in the division are re-estimated and benchmarked. Typically, five years of model-based estimates are revised during annual processing.

Observations in time-series models borrow strength from other time periods. In re-estimation, the entire time series is used to re-estimate every observation. The estimation process is run forward from the beginning of the time series, run backward so that earlier observations benefit from later data, and then run forward again to the end of the year. This is possible because LAUS models use a Forward Filter to modify each of the model's coefficients with the addition of each monthly observation.

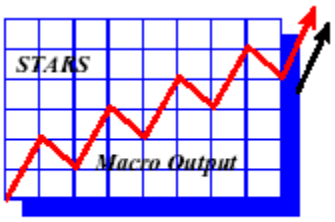
The Forward Filter acts as weighting mechanism, which allocates how much a model's coefficients will change (and thus the estimates) with each new period's data. Because the Forward Filter works by evaluating each successive observation, one after another, the models can produce estimates both forward and backward through time. During the initial forward pass, each successive estimate incorporates all of the information from the earlier months in the time series. At the end of the time series, the estimation process is performed backward through time, so that each past month's estimate can benefit from the more recent data. Finally, the process is performed moving forward through time

again, so that information from the first two passes can be incorporated into the entire time series.

As with monthly estimation, annually processed estimates are subject to real-time benchmarking. An estimation criterion is added to the estimating procedure, so that the sum of the not seasonally adjusted (NSA) estimates are forced to sum to those of a higher level of geography. Divisions are benchmarked to the national CPS total (including population re-controls, which means this does not exactly match national estimates as published by the BLS CPS program). States are controlled to their respective Census division benchmarked estimates, again via estimation criterion to allocate the benchmark discrepancy. Modeled areas and balances-of-state are controlled to their respective states via pro-rata ratio adjustment.

The ratio for benchmarking NSA estimates is applied to the seasonally-adjusted (SA) series. These benchmarked SA series are smoothed using the historical, two-sided Trend Cycle Cascade Filter (TCCF) smoother. This filter is symmetric in the middle of the time series, but grows increasingly asymmetric at the ends, as there are insufficient observations to maintain full symmetry. December of the most recent production year has no subsequent observations to incorporate into the TCCF, so its filter is identical to the current production filter. This method eliminates methodological discontinuities between December and January estimates.

Once the annually processed data have been verified and the program office is reasonably confident that no further input revisions are forthcoming, annual processing mode is turned off for the completed division(s). At this point, completed states are notified that annual processing has finished and STARS is now fully available. State users may then use the extract utility to extract the revised LAUS estimates, as well as run normal monthly processing activities for January of the new production year. These include viewing national office simulations, running state simulations, and transmitting January inputs for production. If any questions arise about the annually processed estimates, they should be directed to the appropriate BLS regional office.



12 *STARS Output Tables*

Introduction

All states use the monthly web based system called STARS (State Time Series Analysis and Review System) each month to produce their statewide labor force estimates, and to transmit these to the BLS national office.

In producing estimates, States provide input data such as CES employment, strikers, and unemployment insurance claims. These data are used not only to produce the estimates, but are also stored in a national office database and are available through STARS, along with data from the CPS, for use in various analytical studies and model interpretation. Each time STARS is run, it provides both BLS and State analysts with output containing a series of tables and graphs with information for examining employment trends, preparing releases, or understanding the nature of a month-to-month change in model estimates.

The primary functions of STARS are to:

- *integrate State/BLS data entry.*
- *calculate monthly state level estimates for the current month and revised estimates for the previous month for labor force, employment, unemployment, and the unemployment rate.*
- *provide error measures, analytical charts and tables.*

CPS data are loaded into STARS at the national office as soon as the monthly national press release is issued. State analysts can enter their inputs when they become available, review their listings, and once they are verified, final LAUS estimates are produced by the LAUS national office through the STARS system.

States also have the option to run estimates with preliminary numbers before the actual data are available without transmitting the estimates to BLS. This option available using the State Simulation module under the Monthly Processing menu.

A STARS User's Guide is available to assist users in creating and updating their monthly model-based estimates using the web-based STARS interface. The

user's guide is designed to introduce new users to the STARS interface and provide them with the basic skills required to operating STARS.

The latest version of the STARS User's Guide is available at the STARS website under the **Help** link on the login screen menu. Users are not required to log into STARS to access it. The user's guide can be viewed online, printed, or downloaded by individual chapter or in its entirety in PDF format. The guide can also be referenced while a user is logged into the system.

STARS Review Estimates

The **Review Estimates** link in the STARS Monthly Processing Menu enables you to review current, finalized estimation output tables, as well as archived historical estimation output tables for the selected State, sub-state areas (i.e., metropolitan areas, balance of State) and Census Division. Historical monthly estimation output is available from January 1978 through the month for which the most recent estimates have been processed. You can view the output tables online and print the tables on request. *(See Chapter 3, pages 23-29 of the STARS User's Guide.)*

The estimation output tables for the specified month and year will be displayed. Output tables are available at the State level, the area model level and the Census Division level.

Below is the header page that precedes the estimation output tables. It provides basic information about the estimation run. Starting at the top, it displays the reference month/year and the State. Then it lists the date and time for when the estimation was run. Next it provides a quick look at the inputs that were entered for the current and previous months.

```
Stars Official Estimates for State
**********************************************
STARS Output for  AUG15



Runtime=11SEP15:15:02:36
NOTE:  This is an official Output!
**********************************************



Input Entered:
--------------

JUL15 UI continued claims w/o earnings:          23,433

AUG15 UI continued claims w/o earnings:          23,172

JUL15 UCFE claims w/o earnings:                     108

AUG15 UCFE claims w/o earnings:                     111

JUL15 CES nonag w/s employment:               1,947,200

AUG15 CES nonag w/s employment:               1,948,340

JUL15 CES adjustment for major strikers:            0

AUG15 CES adjustment for major strikers:            0
```

Following the header page are 31 tables and 8 sets of charts. Explanations and examples of the tables and figures are provided on the following pages.

STARS Table 1: Year-to-Date Model Estimates

Table 1 provides all the year-to-date LAUS model estimates for labor force, employment, unemployment, and the unemployment rate. A quick comparison of current estimates to earlier estimates within the same calendar year can be made. Tables 1a and 1b indicate when the monthly changes are significant at the 5 percent level (**) and the 10 percent level (*). The error range for the unemployment rate at the 90 percent confidence interval is also displayed. Tables 1c and 1d show the over-the-month changes in the smoothed seasonally adjusted and not seasonally adjusted series. Developing trends and month-to-month changes can be observed. A comparison of the seasonally adjusted and not seasonally adjusted series can be made.

Table 1: Year-to-Date Benchmarked Model Estimates
Table 1a: Smoothed Seasonally Adjusted
(SSA Est. appear as the seasonally adjusted in BLS and State official publications and databases)

	Labor Force		Employment		Unemployment		
Month	Level	LFP	Level	EP	Level	Rate	Error Range +
JAN	2,136,020	56.2	2,007,587	52.9	128,433	6.0	5.2- 6.8
FEB	2,139,801	56.3	2,016,508	53.1	123,293	5.8	5.0- 6.6

Table 1b: Not Seasonally Adjusted

	Labor Force		Employment		Unemployment		
Month	Level	LFP	Level	EP	Level	Rate	Error Range +
JAN	2,106,032	55.5	**1,973,806	**52.0	**132,226	**6.3	5.5- 7.1
FEB	2,111,624	55.6	1,989,713	52.4	121,911	5.8	5.0- 6.6

***** Significant change at 5% level***
****** Significant change at 10% level***
+ 90% Confidence Interval

Table 1c: Over-the-Month-Change
Smoothed Seasonally Adjusted
(Change on rounded data)

	Labor Force				Employment				Unemployment			
	Level		LFP		Level		EP		Level		Rate	
Month	Change	%	Change	%	Change	%	Change	%	Change	%	Change	%
JAN	5,326	0.2	0.1	0.2	6,518	0.3	0.2	0.4	-1,192	-0.9	-0.1	-1.2
FEB	3,781	0.2	0.1	0.2	8,921	0.4	0.2	0.4	-5,140	-4.0	-0.2	-4.2

Table 1d: Over-the-Month-Change
Not Seasonally Adjusted
(Change on rounded data)

	Labor Force				Employment				Unemployment			
	Level		LFP		Level		EP		Level		Rate	
Month	Change	%	Change	%	Change	%	Change	%	Change	%	Change	%
JAN	-16,710	-0.8	-0.4	-0.7	*-31,470	-1.6	**-0.8	-1.5	*14,760	12.6	*0.8	14.5
FEB	5,592	0.3	0.1	0.2	15,907	0.8	0.4	0.8	-10,315	-7.8	-0.5	-7.9

***** Significant change at 5% level***
****Significant change at 10% level***
+ 90% Confidence Interval

STARS Table 2: Standard Errors for Year-to-Date Model Estimates

This table shows the monthly standard errors for each of the labor force components displayed in Table 1. The standard error refers to the variability of an estimate and is used in the construction of confidence intervals.

Table 2a: Smoothed Seasonally Adjusted

Month	Std of LF	Std of LFP	Std of EM	Std of EP	Std of UN	Std of UR
JAN	29,079	0.77	27,229	0.72	10,205	0.51
FEB	34,076	0.90	32,500	0.86	10,245	0.51

Table 2b: Not Seasonally Adjusted

Month	Std of LF	Std of LFP	Std of EM	Std of EP	Std of UN	Std of UR
JAN	38,914	1.02	37,383	0.98	10,808	0.53
FEB	38,878	1.02	37,469	0.99	10,372	0.50

STARS Table 3: Over-the-Year Changes

This table shows over-the-year changes and standard errors for the each of the basic types of labor force estimates. The level of change and the percent change are given in Tables 3a and 3b for the smoothed seasonally adjusted and not seasonally adjusted series respectively. Tables 3c and 3d show the standard errors for the over-the-year changes in the two series. The data for all years prior to the current year reflect the annual updating. The over-the-year changes give an indication of the state's labor force trends.

Table 3: Over-the-Year-Change

Table 3a: Smoothed Seasonally Adjusted
(Change on rounded data)

	Labor Force				Employment				Unemployment			
	Level		LFP		Level		EP		Level		Rate	
Month	Change	%	Change	%	Change	%	Change	%	Change	%	Change	%
JAN	-11,482	-0.5	-0.6	-1.1	15,064	0.8	0.2	0.4	**-26,546	-17.1	**-1.2	-16.7
FEB	-7,986	-0.4	-0.5	-0.9	23,654	1.2	0.4	0.8	**-31,640	-20.4	**-1.5	-20.1

Table 3b: Not Seasonally Adjusted
(Change on rounded data)

	Labor Force				Employment				Unemployment			
	Level		LFP		Level		EP		Level		Rate	
Month	Change	%	Change	%	Change	%	Change	%	Change	%	Change	%
JAN	-42,587	-2.0	* -1.4	-2.5	-12,236	-0.6	-0.6	-1.1	**-30,351	-18.7	**-1.3	-17.1
FEB	* -47,930	-2.2	**-1.5	-2.6	913	0.0	-0.2	-0.4	**-48,843	-28.6	**-2.1	-26.6

Tables 4-6: Components of Change

These tables show the components of the unemployment rate, unemployment and employment of both the model and the CPS and how they changed over the month.

Table 4 displays the components of change for the unemployment rate. Table 4a contains the level, trend and seasonal change for the model. It also includes components of change for the two inputs to the model. Table 4b contains the changes for the CPS, the signal and the noise. The same items are shown for the unemployment level in Table 5 and the employment level in Table 6.

Since each model estimate is the sum of its variable components, the analyst can see the influence that each variable has on the total estimate by examining the components of change. It may be that one input variable is the primary influence in the current over-the-month change in the estimate.

The analyst can determine if the variable components are behaving in their "normal" way for this time of year by comparison with last year's behavior.

Table 4: Components of Change Unemployment Rate

Table 4a: Model

	Signal		Trend					Seasonal
Month	Level	Change	Smooth Change	Res Change	CPS Spec. Change	Reg. Change	Total Change	Change
JAN	6.278	*0.745	-0.071	0.054	**1.384	-1.401	-0.017	**0.762
FEB	5.773	-0.505	-0.251	-0.224	-0.440	-0.034	-0.474	-0.031

Table 4b: CPS

Month	CPSUR	CPSUR Change	Signal Change	Noise Change
JAN	6.156	0.692	*0.745	-0.053
FEB	5.530	-0.626	-0.505	-0.121

***** Significant change at 5% level***
****Significant change at 10% level***

Table 5: Components of Change Unemployment Level

Table 5a: Model

	Signal		Trend					Seasonal
Month	Level	Change	Smooth Change	Res Change	CPS Spec. Change	UI Reg. Change	Total Change	Change
JAN	132,226	*14,760	-1,192	1,511	**29,851	-29,532	319	**14,441
FEB	121,911	-10,315	-5,140	-4,646	-9,144	-642	-9,786	-529

Table 5b: CPS

Month	CPSUN	CPSUN Change	Signal Change	Noise Change
JAN	129,204	13,365	*14,760	-1,395
FEB	117,596	-11,608	-10,315	-1,293

***** Significant change at 5% level***
****Significant change at 10% level***

Table 6: Components of Change Employment Level

Table 6a: Model

	Signal		Trend					Seasonal
Month	Level	Change	Smooth Change	Res Change	CPS Spec. Change	CES Reg. Change	Total Change	Change
JAN	1,973,806	*-31,470	6,518	4,804	245,925	-234,603	11,322	**-42,793
FEB	1,989,713	15,907	8,921	6,947	41,094	-25,226	* 15,868	40

Table 6b: CPS

Month	CPSEM	CPSEM Change	Signal Change	Noise Change
JAN	1,969,599	-34,593	*-31,470	-3,123
FEB	2,008,741	39,142	15,907	23,235

***** Significant change at 5% level***
****Significant change at 10% level***

Tables 7-8: Standard Errors

Table 7 shows the standard error for the model components of change for the not seasonally adjusted, seasonally adjusted, and smoothed seasonally adjusted series.

Table 7: Standard Error for Model Components of Change

	Not Seasonally Adjusted				Trend				SSA			
Month	UR	UN	EM	EP	UR	UN	EM	EP	UR	UN	EM	EP
JAN	0.34	6,981	13,062	0.34	0.28	5,909	9,551	0.25	0.20	3,913	7,436	0.20
FEB	0.35	7,179	12,428	0.33	0.29	6,143	8,685	0.23	0.19	3,801	6,847	0.18

Table 8a lists the monthly CPS estimates and table 8b shows the standard error for the CPS levels and changes.

Table 8a: CPS Estimates

Month	CPSUR	CPSUN	CPSEP	CPSEM	CPSPOP
JAN	6.2	129,204	51.9	1,969,599	3,797,520
FEB	5.5	117,596	52.9	2,008,741	3,798,925

Table 8b: CPS Standard Errors for Level and Change

	CPSUR		CPSUN		CPSEM	
Month	Rate	Change in Rate	Level	Change in Level	Level	Change in Level
JAN	0.80	0.87	16,514	17,944	52,162	41,743
FEB	0.76	0.87	15,780	17,991	52,107	41,708

Tables 9-10: State Data, Trend and Seasonal Factors

Table 9 displays the seasonal factors that are applied to the unemployment rate, the unemployment level, the employment level and the employment-population ratio to create seasonally adjusted estimates.

Table 9: Seasonal Factors (Concurrent)

Month	Rate	Unemployment	Employment	EP
JAN	0.46	8,293	-33,647	-0.89
FEB	0.43	7,764	-33,607	-0.88

In table 10a the levels, trends and seasonal factors of the UI claims and CES inputs are exhibited.

Table 10a: State Data, Trend & Seasonal Factors

	UIClaims			CES		
Month	Level	Trend	Seasonal Factor	Level	Trend	Seasonal Factor
JAN	23,497	19,906	3,591	1,923,066	1,947,164	-25,161
FEB	21,750	19,202	2,548	1,931,026	1,948,830	-17,520

In table 10b the regression coefficients for the UI claims and CES inputs are shown for both benchmark and not benchmarked estimates.

Table 10b: Trend Regression Coeff. for UI & CES

	UI Reg. Coeff.		CES Reg. Coeff.	
Month	BMK	Not BMK	BMK	Not BMK
JAN	1.4980	1.8548	0.8116	1.0701
FEB	1.5195	1.8691	0.7980	1.0695

Table 11: Diagnostics, Prediction Error and State Inputs

This table is useful for checking new data for unusual values. Before receiving new data into the model, values are predicted from the accumulated historical experience of the State inputs and CPS data. Observations that are far from the predicted value can identify outliers, which are unusually large changes; inliers, which are unusually small changes; or incorrect data due to mistakes.

Table 11: Diagnostics, Prediction Errors
Pred. Error = Actual-Predicted
Table 11a: CPS

	Unemployment				Employment			
	BMK		Not BMK		BMK		Not BMK	
Month	Level	Standard	Level	Standard	Level	Standard	Level	Standard
JAN	3,424	0.16	-120	-0.01	4,428	0.10	-26,458	-0.70
FEB	-13,510	-0.67	-13,170	-0.77	33,621	0.74	15,626	0.41

Table 11b: State Inputs

	UIClaims		CES	
Month	Level	Standard	Level	Standard
JAN	-5,023	-2.13	10,167	1.68
FEB	-728	-0.31	-2,721	-0.45

Table 12: Benchmark Adjustment Factors

State levels are benchmarked to the Division totals. Table 12 displays the State model adjustment for signal and trend applied for unemployment and employment.

Table 12: Benchmark Adjustment Factors

	Unemployment		Employment	
Month	Signal	Trend	Signal	Trend
JAN	1.02574	1.02393	0.97870	0.98287
FEB	0.98613	0.98852	0.98393	0.98888

Tables A-1, A-2, and A-3: Gen4 Monthly Analysis of Change Tables

These tables provide information on the monthly change of the official estimates. Table A-1 shows the unemployment rate series, A-2 shows the unemployment series, and A-3 shows the employment series. The effect of real-time benchmarking is shown for both the not seasonally adjusted and seasonally adjusted estimates. The directional persistence of the model from smoothing is also displayed here.

Table A-2a: Seasonally Adjusted

Unemployment			% Change						Bmk Factor		SSA	BMK	Not BMK	Claims
Year (1)	Mth (2)	ST (3)	Sgn SSA (4)	SSA (4b)	DP+ (4c)	Sgn BMK (5)	BMK (5b)	Not BMK (6)	% CH (7)	(7)/(6) (8)	Level (9)	Level (9c)	Level (10)	% CH (11)
2015	JAN	AL		-0.92	2.61		0.26	-6.55	7.28	-1.11	128,433	123,933	121,037	-18.82
2015	FEB	AL		-4.05	10.01		-8.03	-4.56	-3.63	0.80	123,229	113,984	115,518	-3.36
2015	MAR	AL		-0.17	-1.33	*	9.56	9.73	-0.16	-0.02	123,023	124,877	126,762	8.31
2015	APR	AL		1.72	-2.43		2.95	-0.09	3.03	-35.62	125,133	128,557	126,654	4.07
2015	MAY	AL	*	5.58	-9.15	**	11.32	7.00	4.04	0.58	132,111	143,112	135,514	3.27
2015	JUN	AL		0.57	3.75	*	-7.81	-5.43	-2.52	0.46	132,866	131,929	128,151	-4.63
2015	JUL	AL		0.22	0.29		4.32	1.93	2.34	1.22	133,161	137,628	130,624	-4.05

Table A-2b: Not Seasonally Adjusted

Unemployment		% Change			Bmk Factor		BMK	Not BMK	CPSUN				CNTWOER	
Year	Mth	Sgn (12)	BMK (13)	Not BMK (14)	% CH (15a)	(15a)/(14) (15b)	Level (16)	Level (17)	Level (17b)	Sgn (18)	% CH (19)	Standard PE (20)	% CH (21)	Standard PE (22)
2015	JAN	**	12.57	6.56	5.64	0.86	132,226	128,908	129,204		11.54	-0.01	-2.44	-2.13
2015	FEB		-7.93	-4.06	-4.03	0.99	121,743	123,669	117,596		-8.98	-0.78	-7.27	-0.29
2015	MAR		0.90	2.22	-1.29	-0.58	122,837	126,411	149,843	*	27.42	1.75	-4.27	0.76
2015	APR		-6.50	-9.80	3.65	-0.37	114,851	114,027	118,931	*	-20.63	-0.31	-1.10	0.41
2015	MAY	**	16.62	10.37	5.67	0.55	133,942	125,851	148,972	*	25.26	1.53	1.97	0.35
2015	JUN		8.15	10.92	-2.49	-0.23	144,864	139,594	136,821		-8.16	-1.02	7.52	-0.47
2015	JUL		1.61	0.46	1.15	2.51	147,202	140,233	150,830		10.24	0.77	3.28	-0.39

Figures 1-8

Also included in the STARS output are figures that visually display the input data and seasonal factors.

Figure 1 Unemployment Rate

Figure 1a charts the seasonally adjusted LAUS unemployment rate and the claims rates. Figure 1b displays the unadjusted LAUS and CPS unemployment rates with the claims rates.

Figure 2 Unemployment

Figure 2a charts the seasonally adjusted LAUS unemployment level and the claims level. Figure 2b displays the unadjusted LAUS and CPS unemployment levels and the claims level.

Figure 3 Employment

Figure 3a charts the seasonally adjusted LAUS employment and the CES employment level. Figure 3b displays the unadjusted LAUS and CPS employment and the CES employment level.

Figures 4-7 Unemployment Seasonal Factors

Seasonal factors indicate the expected seasonal variation in the series. Often differences in the seasonal patterns help to explain the difference between the CPS and State inputs series in their direction and magnitude of change.

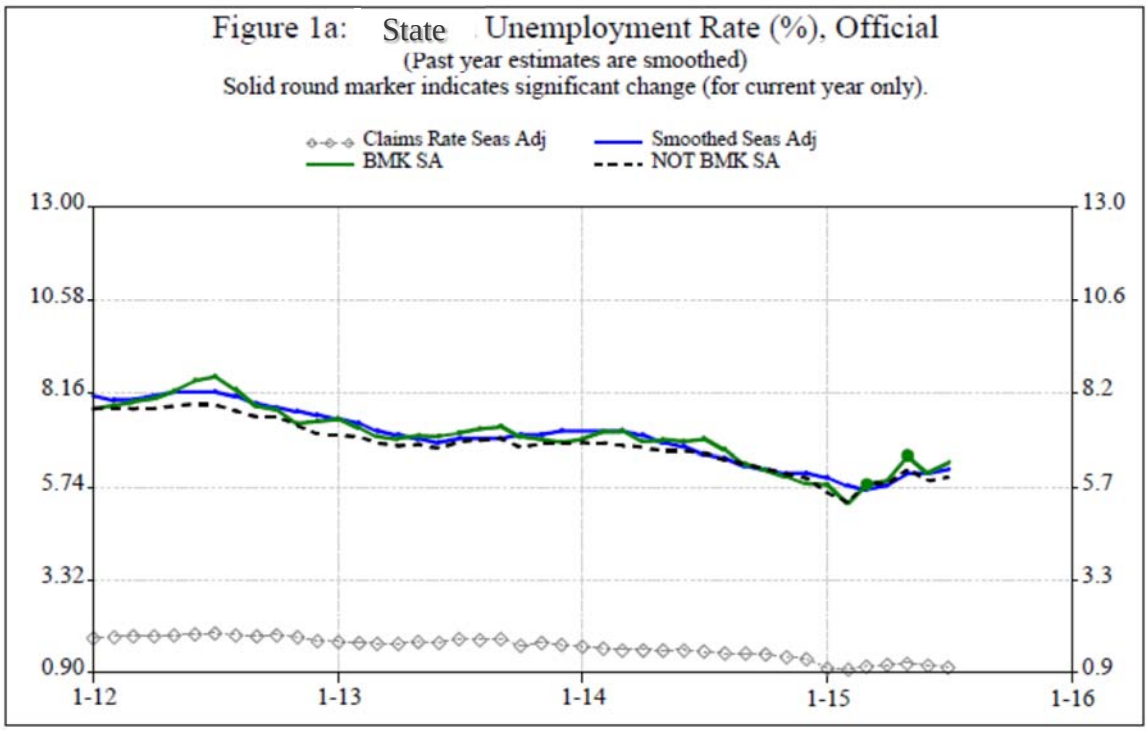
Figure 4a shows the seasonal factors and the seasonal means for the not benchmarked LAUS unemployment series. Figure 5a shows the seasonal factors and the seasonal means for the benchmarked LAUS unemployment series. Figures 4b and 5b show the seasonal factors and the seasonal means for the claims series.

Figure 6a shows the seasonal factors and the seasonal means for the not benchmarked LAUS employment series. Figure 7a shows the seasonal factors and the seasonal means for the benchmarked LAUS employment series. Figures 6b and 7b show the seasonal factors and the seasonal means for the CES employment series.

Figure 8 CPS Population

Figure 8 charts the CPS population estimate for the State.

Figure 1: Unemployment Rate



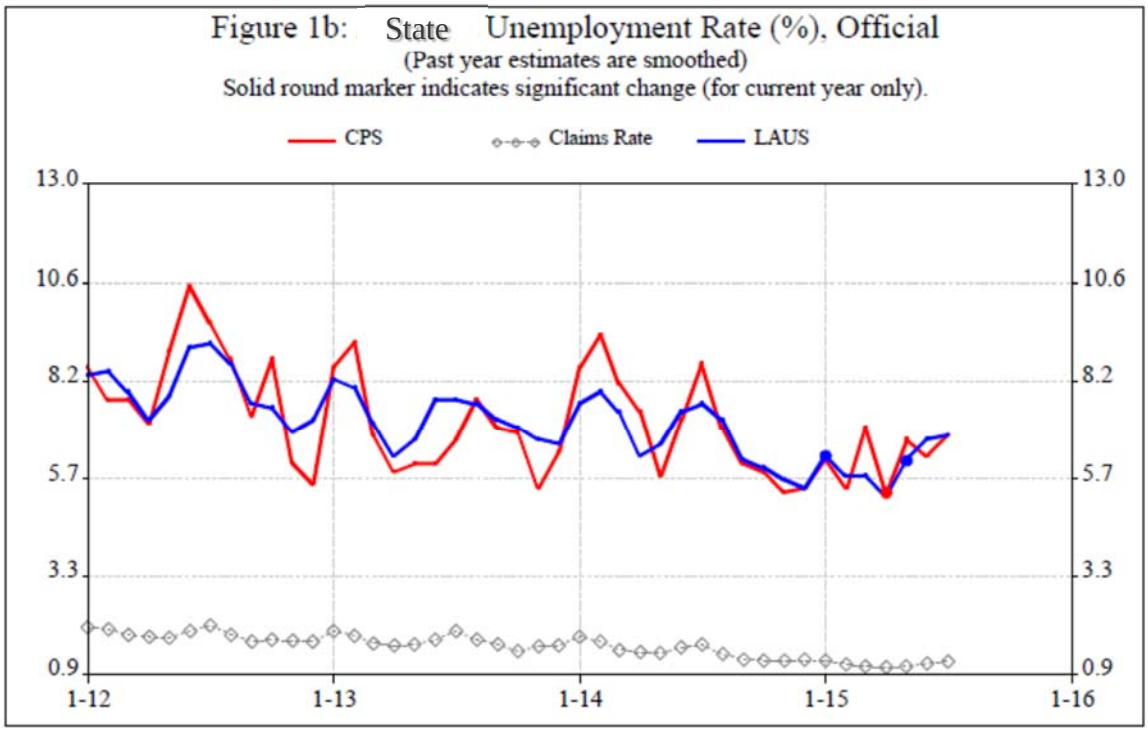
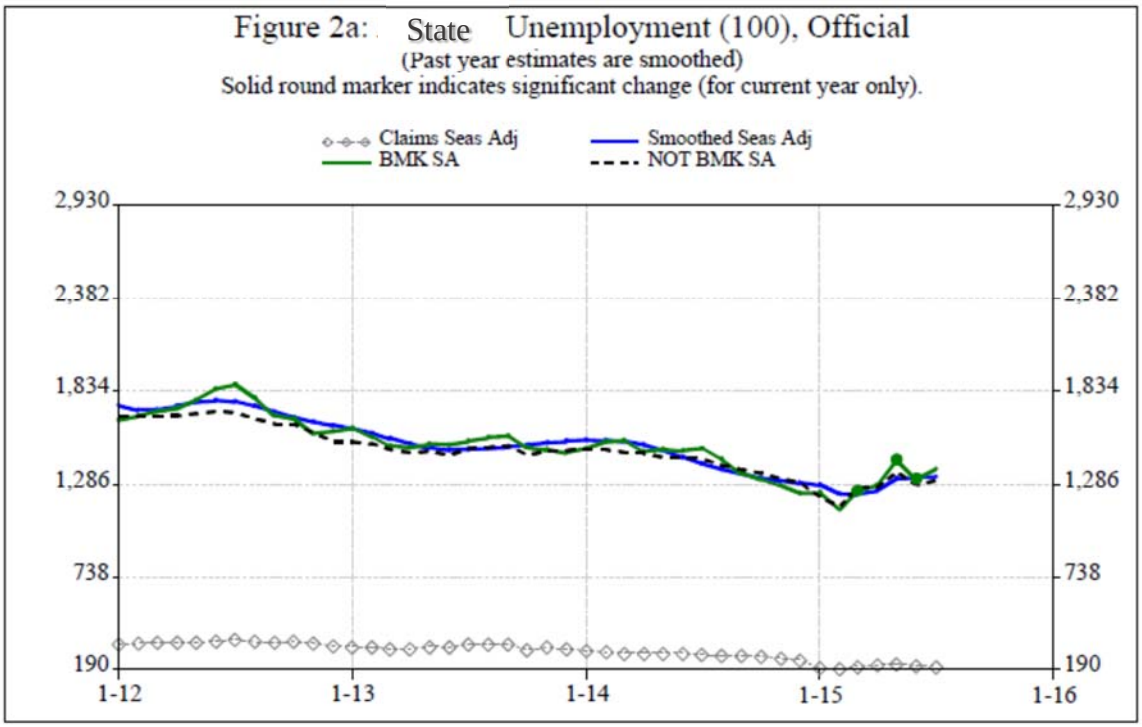


Figure 2: Unemployment Level



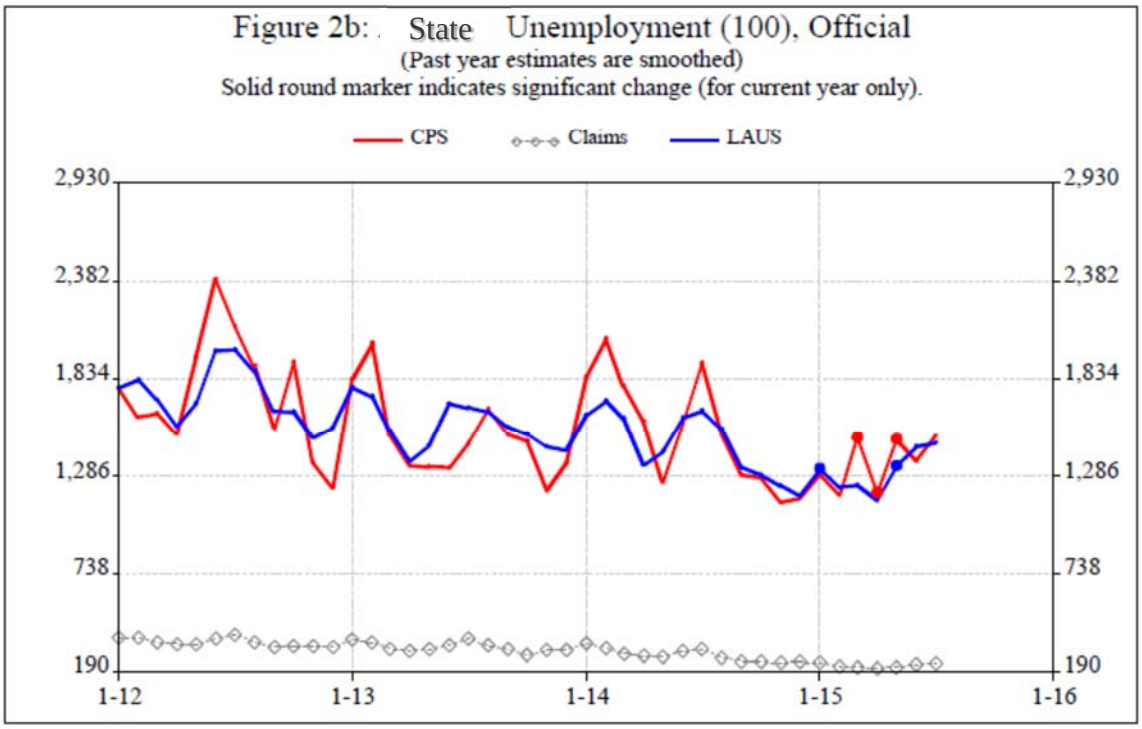
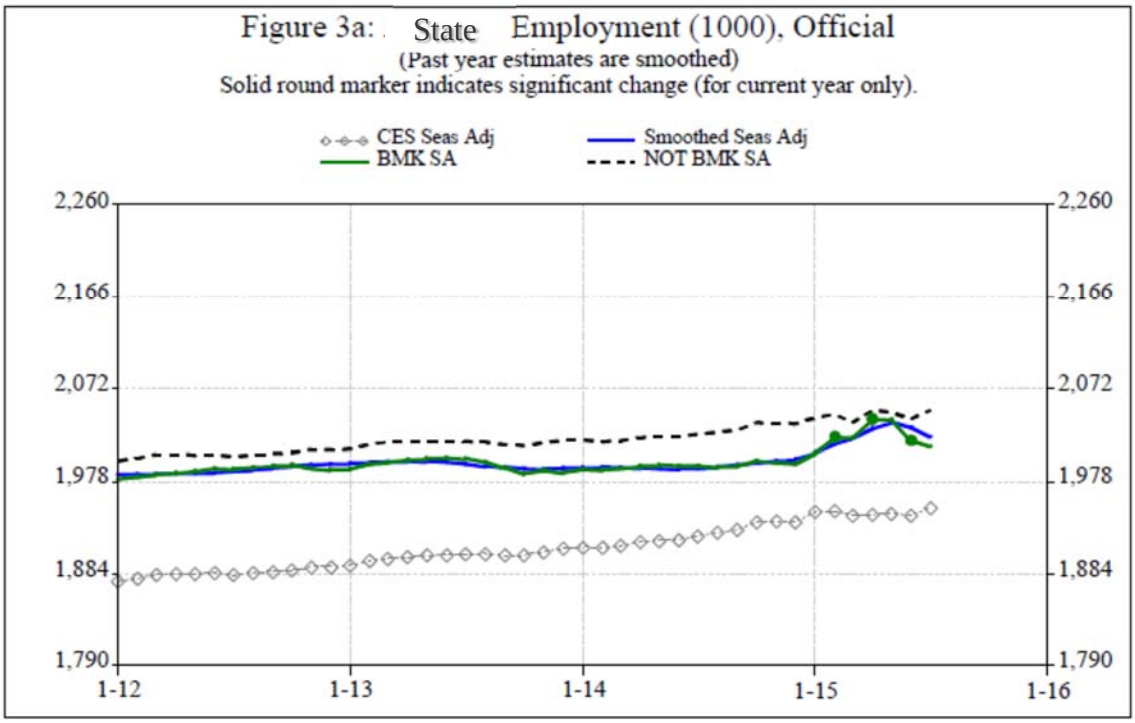


Figure 3: Employment Level



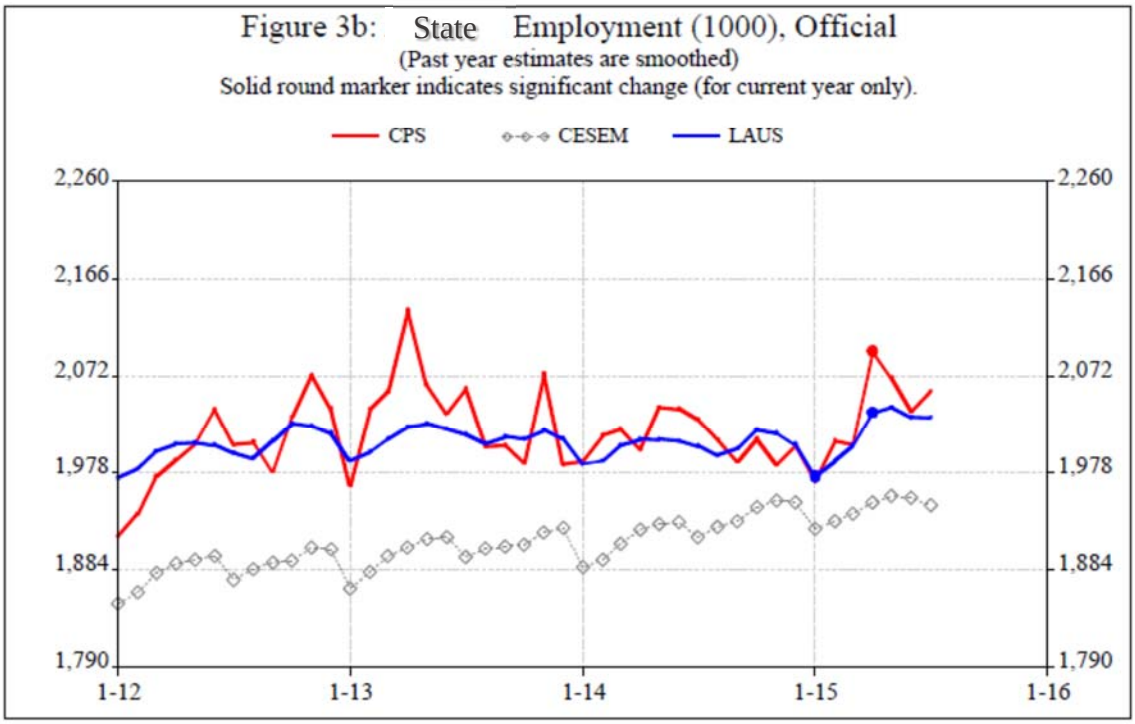
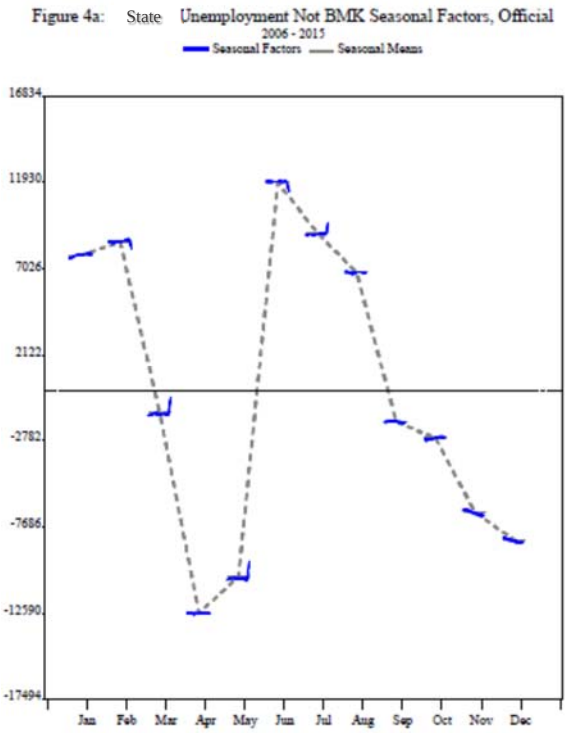
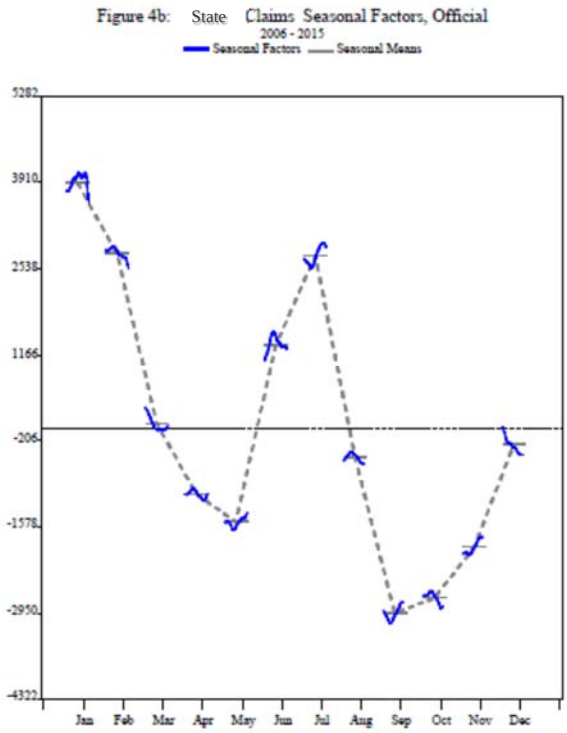
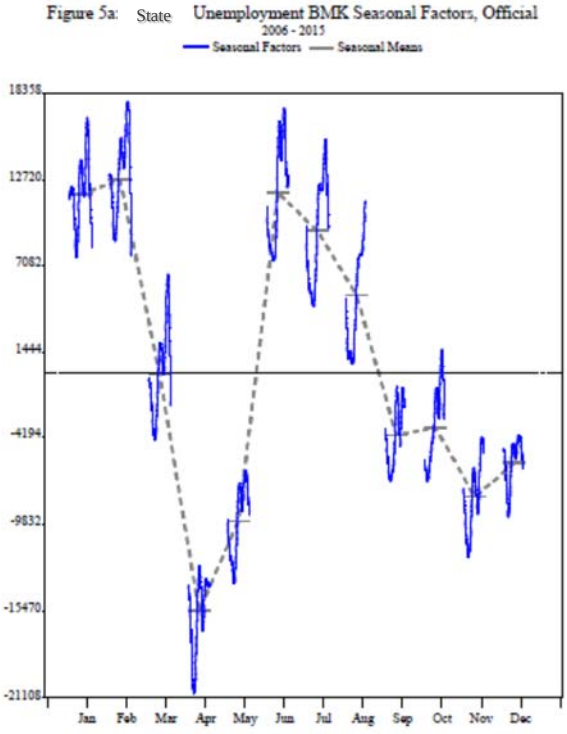


Figure 4-5: Unemployment Seasonal Factors







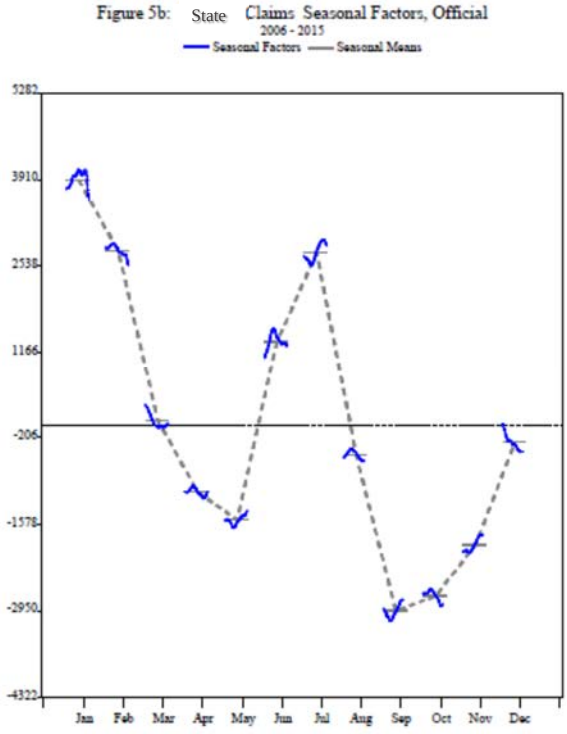
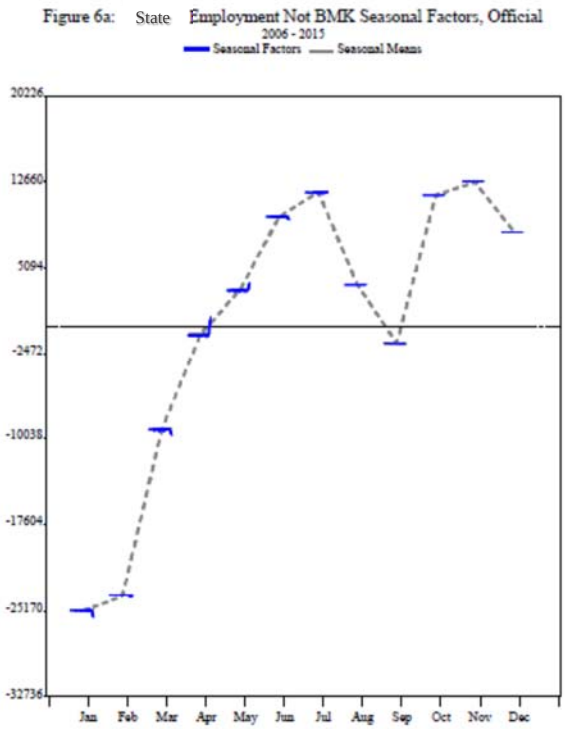
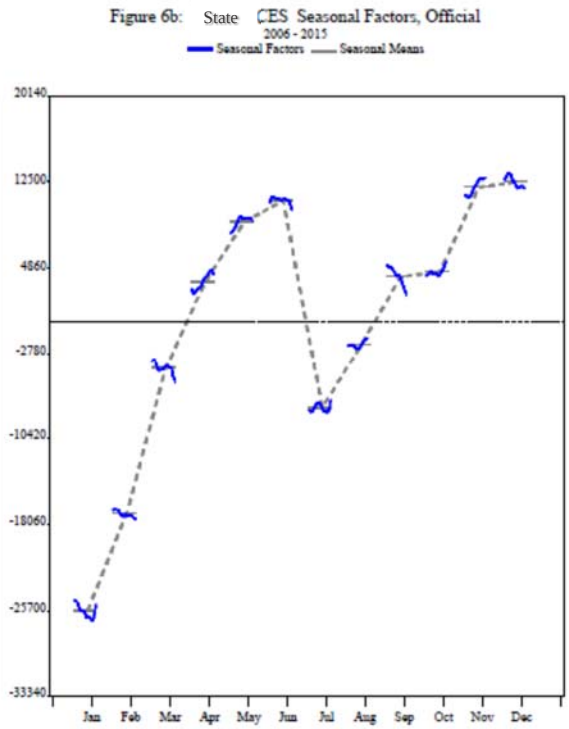
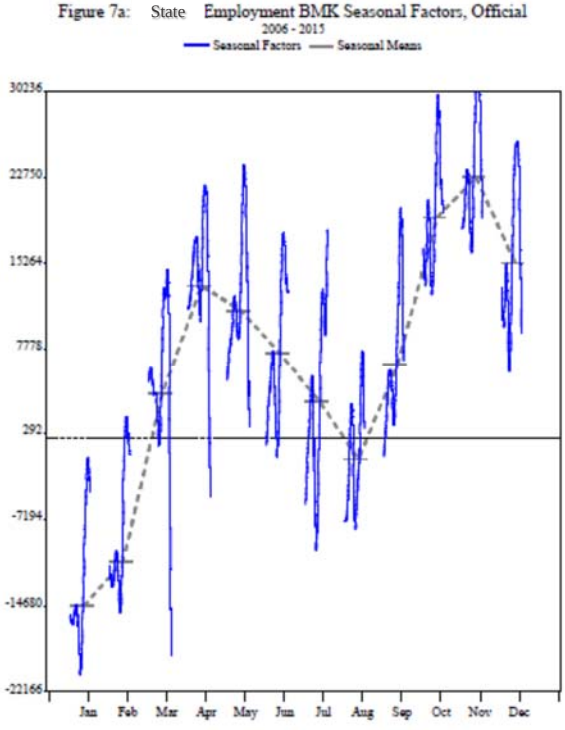


Figure 6-7: Employment Seasonal Factors







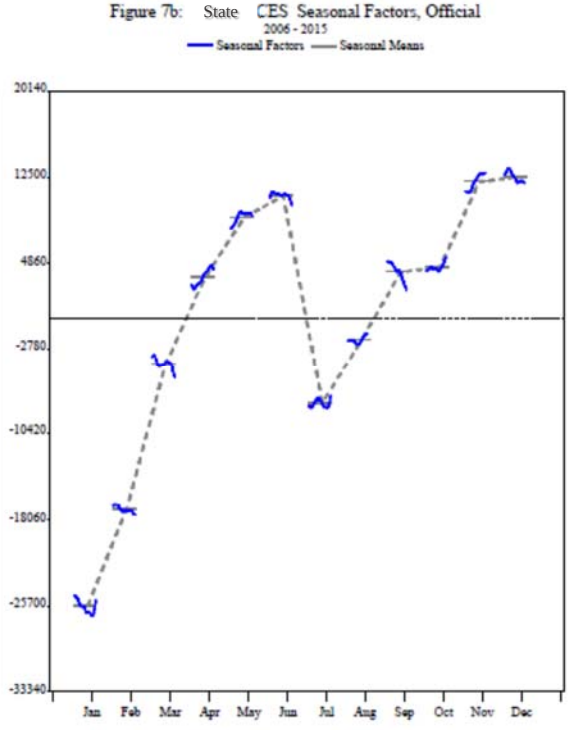
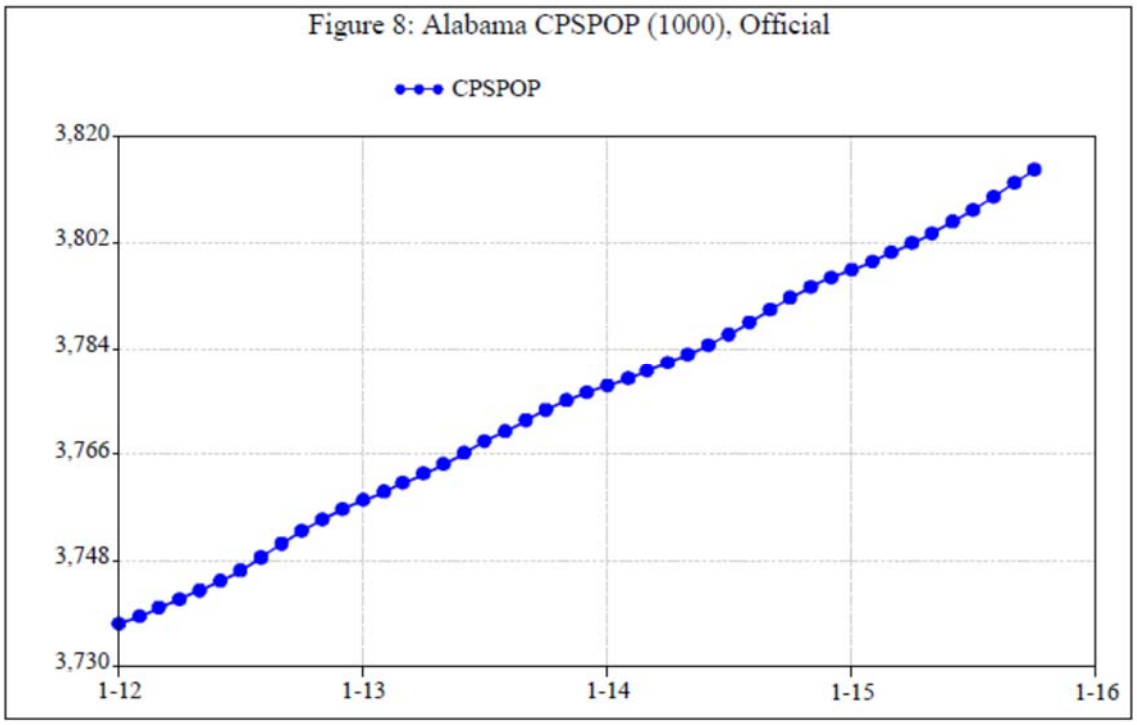
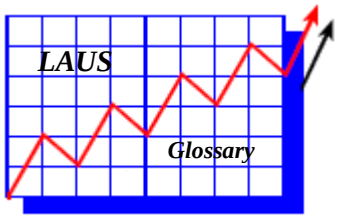


Figure 8: CPS Population Estimate





Glossary

Additional Benefits: (AB) See State Additional Benefits.

Additional Claim: A notice of new unemployment filed at the beginning of a second or subsequent series of claims within a benefit year or within a period of eligibility when there has been intervening employment. This is one of three types of initial claims.

Additivity Adjustment: The procedure which forces the exhaustive Handbook estimates to equal the State estimate is known as additivity adjustment. The process is usually linear unless an atypical procedure is in effect. The linear additivity adjustment is accomplished through the Handbook share procedure of linking counties and MCDs to the CPS-based State estimate.

Agent State: The State in which a claimant files an interstate claim for compensation against another (liable) State where wages were earned is the agent State. Usually, this is the claimant's State of residence.

All Other Nonagricultural Employment: This includes self-employed, unpaid family workers, and domestics in private households.

American Community Survey (ACS): A household survey developed by the Census Bureau to replace the long form of the decennial census program. The ACS is a large demographic survey collected throughout the year using mailed questionnaires, internet questionnaires, telephone interviews, and visits from Census Bureau field representatives to about 3.5 million household addresses annually.

Annual Processing (AP): A series of activities conducted annually which result in benchmarked State and substate estimates. These activities include the State submission of revisions to model inputs, revisions to substate inputs, incorporation of revised population controls, model re-estimation and smoothing, benchmarking, and seasonally adjusting the revised series.

Areas of Substantial Unemployment (ASU): This is defined under the Workforce Investment Act as an area of at least 10,000 population with an average of 6.5 percent unemployment or higher in the previous 12 months. It is used for determining eligibility for employment and training programs.

Auto Regressive Integrated Moving Average (ARIMA): A statistical approach designed to make forecasts of a time series based on only its past values. Part of the non-model-based X-11, including X-11 ARIMA and X-12 ARIMA, which has been the standard BLS approach to seasonal adjustment since the 1970s.

Autocorrelation: Identifies whether the error terms in a regression equation are not independent over time. If this is not accounted for in the equation for the regression line, poor coefficients and predicted values may result. All State models have coefficients adjusted to reflect autocorrelation.

Autocorrelation Coefficient or ρ (rho): A mathematically determined value that measures the relationship or correlation between successive error terms of the same series. A value of "0" means that there is no correlation and a value of "1" indicates total positive autocorrelation.

Base Period (Base Year): A base period is a specified period of twelve consecutive months (or in some States, 52 weeks preceding the beginning of a benefit year) during which an individual must have the required employment and/or wages in order to establish entitlement to compensation or allowances under an applicable program.

Benchmark: This is a point of reference (either an estimate or a count) from which measurement can be made or upon which adjustments are based.

Benefit Year: A period, generally a 52-week period, during which individual claimants may receive their maximum potential benefit UI amount.

Bias: The difference between the expected value of the estimate from a probability sample and the true value of the population parameter.

The Bureau of Labor Statistics (BLS): Is the principal fact-finding agency for the Federal Government in the broad field of labor economics and statistics. The BLS is an independent national statistical agency that collects, processes, analyzes, and disseminates essential statistical data to the American public, the U.S. Congress, other Federal agencies, State and local governments, business, and labor. The BLS also serves as a statistical resource to the Department of Labor. BLS data must satisfy a number of criteria, including relevance to current social and economic issues, timeliness in reflecting today's rapidly changing economic conditions, accuracy and consistently high statistical quality, and impartiality in both subject matter and presentation.

Bureau of the Census: A bureau of the U.S. Department of Commerce that serves as leading source of data about the nation's people and economy. The primary mission of the Bureau is to conduct censuses of population and housing every 10 years and of agriculture, business, governments, manufacturers, mineral

industries, and transportation at five year intervals. It also conducts the America Community Survey (ACS) as well as the Current Population Survey (CPS) for the BLS.

Census: A count or enumeration (as opposed to a sample or an estimate) of a specified population or some other characteristics in a given area (housing, industry, etc.)

Census Share: A method formerly used to disaggregate LMA employment and unemployment estimates to smaller areas by assigning the same proportion of the monthly, independent LMA estimate evidenced in the most recent census.

Census Tracts: Small, relatively permanent statistical subdivisions of a county that provide comparable population and housing census tabulations. Tracts are designed to be relatively similar in population characteristics, economic status, and living conditions. The average tract has about 4,000 inhabitants. Census tract boundaries are recommended by local census tract committees and approved by the Bureau of the Census.

Certification (Certifying): The process and form by which a claimant states and attests to facts which will determine eligibility for UI benefits for a given week. These include, for example, a search for work and availability for work.

Civilian Noninstitutional Labor Force: The sum of all employed and unemployed persons excluding persons under 16 years of age, inmates of institutions, and members of the Armed Forces.

Claim: A notice of unemployment filed by an individual to request a determination of unemployment insurance eligibility and the amount of benefit entitlement, or to claim benefits or waiting-period credit.

Claimant: A person who files either an initial claim or a continued claim under (1) any State or Federal unemployment compensation program or (2) any other program administered by the State agency.

Claims-Based Unemployment Disaggregation: A method for disaggregating LMA unemployment to subareas by using (1) claims by county of residence to distribute Handbook experienced unemployment and (2) CPS-based data to allocate Handbook new and reentrant unemployment. It is used in conjunction with the population-based indexed share employment disaggregation.

Class of Worker: There are three classes of workers: (1) wage and salary workers who receive wages, salary, commission, tips, or pay in kind from an employer; (2) self-employed persons who work for profit

or fees in their own business, profession, or trade, or on their own farms; and (3) unpaid family workers who work without pay for 15 or more hours a week on a farm or in a business operated by a household member to whom they are related by birth, marriage, or adoption.

Coefficients: The values of the intercept and slope in the formula for the regression line. Coefficients are estimated by a mathematical formulation which calculates coefficients by minimizing the squares of the differences between the actual values (Y) and the predicted values (Y'). They represent (mathematically) the relationship of the independent variable to the dependent variable and how the changes in one variable can be related to another. In the case by a of a variable coefficient model, the coefficients are allowed to change over time to reflect changes that are occurring in the relationships of the dependent and the independent variables.

Coefficient of Variation (CV): The measure of relative dispersion of data. The standard deviation divided by the arithmetic mean times 100 yields the coefficient of variation.

Combined Statistical Area: A geographic entity consisting of two or more adjacent Core Based Statistical Areas (CBSA) linked through commuting ties.

Commutation: Regular travel of a person from the place of residence to the job location or to the place of filing for UI benefits.

Commuter Claimant: Under the Intrastate Benefit Payment plan, a worker who travels regularly across a State line from home to work, and by mutual agreement between States, files in the State where the individual last worked when employed, and is treated as a resident of that State.

Compositing: An estimating technique which combines information from different sources, taking into account the relative accuracy of each source. In the LAUS regression models, the Kalman Filter technique can be thought of as a type of compositing. It combines CPS and model estimates using their variances as a measure of the accuracy of the data.

Continued Claim: A claim filed after the initial claim, by mail, internet, telephone, or in person, for waiting-period credit or payment for a certified week of unemployment.

Core: A densely settled concentration of population, comprising either an urbanized area (of 50,000 or more population) or an urban cluster (of 10,000 to 49,999 population) defined by the Census Bureau, around which a Core Based Statistical Area is defined.

Core Based Statistical Area (CBSA): A statistical geographic entity consisting of the county or counties associated with at least one core (urbanized area or urban cluster) of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties with the counties containing the core. Metropolitan and Micropolitan Statistical Areas are the two categories of Core Based Statistical Areas.

Correlation: A statistical term which indicates a structural, functional, qualitative correspondence between comparable entities. Correlation can be either positive (simultaneous increase or decrease in both variables) or in negative (increase in the value of one and decrease in the value of the other variable).

Correlation Coefficient: A mathematically determined value that measures the relationship or correlation between two time series. As with the autocorrelation coefficient, a value of "0" indicates no correlation and a value of "1" indicates a total positive correlation. A value of "-1" indicates total negative correlation, or meaning that as one series increases, the other series decreases.

Covered Employment: Those jobs covered by the unemployment compensation programs are considered covered employment. At this time, those not covered include some agricultural workers, employees of religious and small nonprofit organizations, household workers, and self-employed workers.

Current Employment Statistics (CES): A BLS monthly survey of about 144,000 businesses and government agencies, representing approximately 554,000 individual worksites that yields estimates of nonagricultural wage and salary employment, hours, and earnings by industry. These statistics are prepared monthly for the nation as a whole, and by cooperating State agencies for all 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and about 400 metropolitan areas and divisions.

Current Population Survey (CPS): A monthly survey conducted by the Bureau of the Census of approximately 60,000 assigned households of which 50,000 are eligible for interview. This survey of the civilian noninstitutional population of the United States provides monthly statistics on employment, unemployment, demographic characteristics, and related subjects which are analyzed by the Bureau of Labor Statistics.

Denial of Benefits: An action imposed by a State agency after a nonmonetary determination or an appeals decision which cancels, reduces, or postpones a claimant's benefit rights.

Dependent Variable: The variable for which estimates are desired, usually termed the "Y" variable. In the LAUS models, the dependent variable used in constructing the model is the monthly CPS estimate.

Determination: An official decision by the State UI agency regarding the unemployment claim of a person. (See monetary and nonmonetary determination.)

Directional Persistence (DP): A measurement of the strength of current movement in a smoothed seasonally adjusted (SSA) estimate. Directional Persistence indicates how much the seasonally adjusted (SA) estimate must change in the next period to reverse the direction of change in SSA estimate. If the SSA estimate is declining then the change in SA estimate for the next month must be greater than the DP value to increase the SSA. If SSA estimate is increasing then the change in SA estimate for the following month must be less the DP value to decrease the SSA estimate.

Disaggregation: A method to divide a statistic into its component parts. For example, the LMA unemployment is divided into each component county or city.

Disaster Unemployment Assistance (DUA): A program that provides unemployment assistance to individuals whose unemployment is a direct result of a major disaster as declared by the President of the United States.

Discouraged Workers: Individuals not in the labor force who want and are available for a job and who have looked for work sometime in the past 12 months (or since the end of their last job if they held one within the past 12 months), but are not currently looking, because they believe there are no jobs available or there are none for which they would qualify.

Dynamic Residency Adjustment Ratios (DRR): A method to adjust CES employment data for resident employment in an area that accounts for the relationship between employed residents and jobs in that area and in other areas within commuting distance and job growth within these areas.

Earnings Disregarded: The amount prescribed by State unemployment compensation laws that a claimant may earn without any reduction in weekly benefit amount for a week of total unemployment. This is also referred to as the forgiveness level for earnings. The amounts vary by State.

Earnings Due to Employment: These are earnings, either from the regular employer or from odd jobs, which a UI claimant may receive while certifying to a week of unemployment. The existence of these earnings classified the claimant as employed, even when earnings are less than the State's forgiveness level.

Employed: In the CPS, those individuals 16 years of age or older who worked at least one hour for pay or profit or worked at least 15 unpaid hours in a family business during the reference week are considered employed. Individuals are also counted as employed if they had a job but did not work because they were

ill, on vacation, in a labor dispute, prevented from working because of bad weather, or taking time off for personal reasons.

Employment/Population Ratio: The proportion of the civilian noninstitutional population who are classified as employed.

Employment and Training Administration (ETA): Agency under the Department of Labor that administers federal government job training and worker dislocation programs, federal grants to states for public employment service programs, and unemployment insurance benefits. These services are primarily provided through state and local workforce development systems.

Enumeration Districts (EDs): Administrative units used in the Census. They contain, on the average, about 750 people. The EDs provide a list of addresses for housing units which is used to help set up the sample file for the CPS.

Error: See Standard Error.

Establishment: An economic unit which produces goods or services, is generally found at a single physical location, and is primarily engaged in one type of economic activity.

Exhaustees: Individuals who have exhausted all of the unemployment insurance benefits to which they are entitled within a benefit year and cannot establish a new benefit year.

Extended Benefits (EB): The supplemental program, established by Public Law 91-373 that pays extended compensation during a period of specified high unemployment to individuals for weeks of unemployment after they have exhausted regular compensation. The program is financed equally from Federal and State funds and becomes operative at the State level. The State determines benefits and certain restrictions.

Extended mass layoff event: A layoff defined by the filing of 50 or more initial claims for unemployment insurance benefits from an employer during a 5-week period, with at least 50 workers separated for more than 30 days. Such layoffs involve both persons subject to recall and those who are terminated.

Extrapolation: A method to project values of a variable in an unobserved interval from values within an already observed interval.

Federal Information Processing Standards (FIPS): Standards for information processing that comprise a geographically exhaustive five digit code system wherein areas such as State, counties, territories, and metropolitan areas are uniquely identified. FIPS codes were officially replaced with the Geographic Names Information System (GNIS) as the Federal and national standard for geographic nomenclature. However, FIPS codes are still maintained by the Census Bureau and are sometimes referred to as either Census codes of Federal codes.

Final Payment: The last payment to a claimant which exhausts the individual's maximum potential benefit entitlement under a specific program is referred to as a final payment.

Forgiveness Level: See Earnings Disregarded.

Gain: A weighting factor used in the Kalman Filter in determining the current month coefficients. Using this factor, a portion of the difference between the current month's CPS and the preliminary model estimate is added or subtracted from the previous month's coefficient value. This is used to produce the current month's coefficient.

Geographic Names Information System (GNIS): The Geographic Names Information System (GNIS) is the Federal and national standard for geographic nomenclature. The GNIS contains information about physical and cultural geographic features of all types in the United States, associated areas, and Antarctica, current and historical, but not including roads and highways. The GNIS Feature ID has superseded the Federal Information Processing Standard (FIPS) 55 Place Code as the Federal feature identifier.

Handbook Method: A building-block estimation method that uses data from several sources—including the Current Population Survey, the Current Employment Statistics program, and unemployment insurance program—to produce labor force estimates at the substate level. Estimates for counties and MCDs are produced using this methodology.

Henderson Trend Filter (H13): A filtering procedure, based on moving averages, to remove the irregular fluctuations from the seasonally-adjusted series, leaving the trend. It is part of a set of trend filters developed by Robert Henderson (1916) for use in actuarial work that are used extensively by seasonal adjustment packages such as X-12-ARIMA.

Household: As defined by the Bureau of the Census, a household is all persons who occupy a housing unit. A housing unit is a room or group of rooms intended for occupancy as separate living quarters and consists of either a separate entrance or complete cooking facilities for the exclusive use of the occupants.

ICON (Interstate Connection): A centralized computerized system of reporting and exchanging unemployment insurance claims information between States.

Independent Variables: Variables used in the regression equation to predict the dependent variable, "Y". The independent variables are usually termed the "X" variables.

Information Technology Support Center (ITSC): Established by the Department of Labor to assist all state Unemployment Insurance agencies in the area of Unemployment Insurance Information Technology.

Initial Claim: Any notice of unemployment filed by an individual to initiate (1) a determination of entitlement to and eligibility for compensation (a new claim), (2) a subsequent period of unemployment within a benefit year or period of eligibility (an additional claim), or (3) a new claim filed to request a determination of eligibility and establishment of a new benefit year within an existing spell of unemployment (transitional claim).

Institutional Population: Persons residing in CPS-defined institutions, such as prisons, nursing homes, juvenile detention facilities, or residential mental hospitals. Persons residing outside of these institutions constitute the non-institutional population.

Insured Unemployment: Unemployment during a week for which waiting period credit or benefits are claimed under the regular unemployment insurance compensation programs, supplemental extended benefit programs, or the railroad unemployment insurance program, is considered insured.

Insured Unemployment Rate (IUR): The rate computed by dividing Insured Unemployed for the current quarter by Covered Employment for the first four of the last six completed quarters.

Intercept: The value of "Y" (dependent variable) where the regression line crosses the "Y" axis. The intercept is usually denoted by β_0.

Interpolate: A method to estimate values of a function between two known values.

Interstate claim: A claim filed in one (agent) State based on monetary entitlement to compensation in another (liable) State. The agent State is usually the claimant's State of residence. The liable State is the location of the establishment in which wage credits were earned.

Intrastate Claim: A claim filed in the same State in which the individual's wage credits were earned. A nonresident of the State, filing an intrastate claim is called a commuter claimant.

Job Leavers: Individuals who quit or otherwise terminate their employment voluntarily and immediately begin looking for work.

Job Losers: Unemployed persons who involuntarily lost their last job or who had completed a temporary job. This includes persons who were on temporary layoff expecting to return to work, as well as persons not on temporary layoff. Those not on temporary layoff include permanent job losers and persons whose temporary jobs had ended.

Kalman Filter: A statistical technique used in the signal-plus-noise models to adjust the model coefficient. The coefficients are updated each month with new information using the Kalman Filter Technique. This technique combines information from the model and CPS when making the new model estimate by taking into account the relative accuracy of each.

Labor Force: The total of all civilians classified as employed and unemployed. The labor force, in addition, includes members of the armed forces stationed in the United States.

Labor Market Area (LMA): An economically integrated area within which individuals can reside and find employment within a reasonable distance or can readily change jobs without changing their place of residence. LMAs include both the metropolitan and micropolitan areas delineated by the Office of Management and Budget (OMB) and the small labor market areas defined by the Bureau of Labor Statistics. The standards used by OMB to delineate metropolitan and micropolitan areas are reviewed and updated after each decennial census, and the application of the updated standards to population data from that census and commutation data from the American Community Survey (ACS) 5-year estimates ending in the decennial year results in a comprehensive revision of OMB areas. Five years later, OMB areas are further revised, based on the application of the same standards to the same decennial population data but updated commutation data from the non-overlapping ACS 5-year estimates (i.e., those ending in the fifth year of the decade). For small labor market areas, BLS examines commuting data for counties (cities and towns in New England) not included within metropolitan or micropolitan areas shortly after OMB announces its revisions, tying adjacent counties into multi-county configurations based on the same thresholds used by OMB for its metropolitan and micropolitan areas

Labor Surplus Area: Defined under the Defense Manpower Policy No. 4A as an area with at least 120 percent of the national unemployment rate. (There is a variable floor and ceiling rate of 6% and 10 %.)

LAUS Estimate: The official BLS-published employment and unemployment estimates. For States, they are based on the signal-plus-noise models. For areas, they are developed using the Handbook procedures and are controlled to the State levels.

LAUS Redesign: A multi-year, multi-project initiative implemented with January 2015 estimates that improved labor force estimates for State and substate areas. The redesign included improved time-series models, model-based benchmarking, improved treatment of outliers, improvements to the smoothed seasonal adjustment process, replacement of decennial census inputs with ACS estimates, updated procedures for developing substate estimates, and the implementation of 2010-Census based configurations for substate areas.

Least Squares: A basic regression n technique used to "fit" (calculate) a model equation to a time series of data. There are several different types of least square calculations but all are based on minimizing the sum of the squared differences between the data points and a regression line.

Liable/Agent Data Transfer (LADT): The record format used for the exchange of statistical data via the Interstate Connection (ICON). The LADT record format was developed to accommodate the exchange of data pertaining to: a) interstate weeks claimed; b) intrastate commuter weeks claimed; c) interstate initial claims (new, additional and transitional); and, d) interstate reopened claims and claim transfers by ICON for the exchange of interstate UI claims data among States.

Liable State: Any State against which a worker files a claim for compensation through the facilities of another (agent) State is the liable State. The State location of the establishment in which wage credits are earned is the liable State.

Link Relative Technique: A method for employment estimation that involves, for each estimating cell, comparing the ratio of all employees in one month to all employees in the preceding month. The all employee estimate for each month is obtained by multiplying this ratio by the all employee estimate for the previous month. The technique is used in the CES estimating methodology.

Local Area Unemployment Statistics (LAUS): The Federal/State cooperative program under which employment and unemployment estimates for States and local areas are developed. These estimates are prepared by State Employment Security Agencies in accordance with BLS definitions and procedures. They are used for planning and budgetary purposes, as an indication of need for employment and training programs, and to allocate Federal funds under WIA, FEMA, etc.

Mass Layoff Statistics (MLS): A former Federal-State cooperative program that used a standardized, automated approach to identify, describe, and track the effects of major job cutbacks, using data from each State's unemployment insurance database. This program was discontinued in 2013.

Mass Layoff Event: A layoff in which 50 initial claims or more have been filed against an establishment during a five-week period, regardless of the duration.

Mean Square Error (MSE): A measure of the total error that can arise in an estimate. It is equal to the variance plus the bias squared. Mean square error is a more comprehensive measure of estimation error than variance and is an important statistical and analytical tool.

Metropolitan Division (MD): A county or group of counties within a CBSA that contains a core with a population of at least 2.5 million. A Metropolitan Division consists of one or more main/secondary counties that represent an employment center or centers, plus adjacent counties associated with the main county or counties through commuting ties.

Metropolitan Statistical Area (MSA): A CBSA associated with at least one urbanized area that has a population of at least 50,000. The Metropolitan Statistical Area comprises the central county or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the central county as measured through commuting.

Micropolitan Area (MC): A CBSA associated with at least one urban cluster that has a population of at least 10,000, but less than 50,000. The Micropolitan Statistical Area comprises the central county or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the central county as measured through commuting.

Migration: The permanent movement of an individual's residence from one location to another.

Model: A mathematical equation that describes how one or more random variables are related to other (non-random) variables. In a time series, this relationship is computed over time. The LAUS signal-plus-noise models relate State CPS labor force estimates to different independent variables that show strong correlations to the monthly estimates.

Monetary Determination: A written notice issued to inform an individual whether or not the individual meets the employment and wage requirements necessary to establish entitlement to compensation under a specific unemployment insurance program. If an individual is entitled, the weekly and maximum benefit amounts the individual may receive are also determined.

Minor civil divisions (MCDs): The primary governmental or administrative divisions of a county in many states (parishes in Louisiana) and the county equivalents in Puerto Rico. The MCDs in 12 states (Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin) also serve as general-purpose local governments that can perform the same governmental functions as incorporated places. For the six New England States

(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) MCDs are the geographic unit for developing Handbook estimates.

Moving Average: A continuous process that uses a series of calculations made by initially taking the simple average, or arithmetic mean, of a consecutive number of items, and then dropping the first item and adding the next item in sequence and averaging, so that the number of items in the series remains constant.

New Claim: The first initial claim filed in person, by mail, telephone, or the Internet to request a determination of entitlement to and eligibility for compensation. This is one of three types of initial claims.

New England City and Town Area (NECTA): A statistical geographic entity used in New England that is defined using cities and towns as building blocks and is conceptually similar to the Core Based Statistical Areas (which are defined using counties as building blocks).

New England City and Town Area Division: A city or town or group of cities and towns within a NECTA that contains a core with a population of at least 2.5 million. A NECTA Division consists of a main city or town that represents an employment center, plus adjacent cities and towns associated with the main city or town, or with other cities and towns that are in turn associated with the main city or town, through commuting ties. Conceptually similar to Metropolitan Divisions.

New Entrants Unemployed: Individuals who enter the labor market for the first time and do not find jobs. They include students entering the labor market after graduation from school and others who have not previously held a full- time job lasting two weeks or longer.

Nonagricultural Wage and Salary Employment: In the CES program, this is a count of jobs by place of work on nonagricultural establishment payrolls (including employees on paid sick leave, paid holiday, or paid vacation) for any part of the pay period including the 12th of the month. It does not include proprietors, self-employed, unpaid volunteer or family workers, domestic workers in households, military personnel, and persons who are laid off, on leave without pay, or on strike for the entire reference period.

Noninstitutional Population: See Institutional Population.

Nonmonetary Determination: A process that determines whether a claimant meets legal criteria other than wage credits under State UI law. It is usually concerned with: (1) reason claimant left job (separation issues); and (2) job search (able, available, and actively seeking work).

Not in the Labor Force: All persons 16 years of age or older in the civilian noninstitutional population who are neither employed nor unemployed are considered not in the labor force. Some examples are students, housewives, retirees, etc.

Place-of-Residence Adjustment of Employment: Establishment-based data, which are on a place-of-work basis, are adjusted to reflect the place of residence of the employed. The current adjustment also corrects for multiple jobholding in the place-of-work series. See Dynamic Residency Ratio.

Population-Based Indexed Share Employment Disaggregation: A method that uses the annually prepared total population estimates and data from the Census to disaggregate labor market area total employment to the county or city level. This method is used only in conjunction with the claims-based unemployment disaggregation.

Population Controls: Refers to population data developed from various independent sources, such as vital statistics on births, deaths, migration, school enrollment, persons living in group quarters, inmates in institutions, etc., which are used in Current Population Survey estimation procedures to independently adjust sample-based labor force levels. Population controls are updated annually by the Bureau of the Census and provided to the Bureau of Labor Statistics.

Population Estimates: Annual population estimates prepared by the Census Bureau that entails updating population information from the most recent census with information found in the annual administrative records such as tax records, Medicare records and some vital statistics information.

Predicted Value: The value of Y' (Y prime) that one obtains by “plugging in" values of the independent variables into the formula for the regression line is the predicted value. The coefficients have already been determined by a mathematical formulation.

Prediction Period: A period of time which is outside the sample period. Coefficients for the regression line derived from the sample period are used to make predictions in subsequent periods. It is also called the "outside sample" period.

Primary Sampling Unit (PSU): The first stage of CPS sampling involves dividing the United States into primary sampling units, most of which comprise a metropolitan area, a large county, or a group of smaller counties with homogeneous demographic and economic characteristics.

Program for Measuring Insured Unemployment Statistics (PROMIS): A stand-alone PC-based system that stores all claimant information, including socioeconomic characteristics, and generates the UI inputs to LAUS and, potentially, other programs. PROMIS operates as the clearinghouse for multi-purpose input data, allowing flexibility to provide a more complete picture of the unemployment situation at substate levels.

Quarterly Census of Employment and Wages Program (QCEW): A federal/State cooperative program that produces a comprehensive tabulation of employment and wage information for workers covered by State unemployment insurance (UI) laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program.

Railroad Retirement Board (RRB): The RRB is an independent agency in the executive branch of the U.S. government which administers a comprehensive social insurance system for the nation's railroad workers and their families, providing protection against the loss of income resulting from old age, disability, death, unemployment, and temporary sickness.

Raking: This is the process which forces additivity among components to the aggregate estimate. It is performed on an iterative basis in the CPS.

Real-Time Benchmarking: A tiered approach to estimation in which the census division estimates are benchmarked to the national levels of employment and unemployment on a monthly basis. The benchmarked division model estimates are then used as the benchmark for the States within each division. The distribution of the monthly benchmark adjustment to the States is based on each State's monthly model estimate. In this manner, the monthly State employment and unemployment estimates will add to the national level. Substate estimates are then revised and forced to add to the new State estimates. In the past, this was done annually because the state data were benchmarked to the CPS annual average for each state. Under this approach, benchmarking occurs monthly.

Reentrants In the CPS: Persons who previously worked at a full-time job at least two weeks but who were out of the labor force for two weeks or more prior to beginning to look for work.

Reference Week: The week for which data are collected. For the CPS, the reference week is is defined as the 7-day period, Sunday through Saturday that includes the 12th of the month. (On occasion, the reference week in November and December may be week including the 5th of the month, to facilitate data collection during the holiday period.)

Regression: A statistical tool which utilizes the relation between two or more variables so that one variable can be predicted from the other(s).

Regression Equation: A statistical process for estimating the relationship between variables. In this example, the equation has an intercept (β_0), independent variables (X1 and X2) with coefficients (β_1 and β_2 respectively and an error term,ε). The equation is $Y = \beta_0 + \beta_1(X_1) + \beta_2(X_2) + \varepsilon$

Regression Line: A line fitted to the points in the scatter plot to summarize the relationship between the variables being studied. When it slopes down (from top left to bottom right), this indicates a negative or inverse relationship between the variables; when it slopes up (from bottom right to top left), a positive or direct relationship is indicated.

Reopened claim: A claim filed after a break in claimed weeks during a benefit year. This break could be caused by illness, disqualification, unavailability, or failure to report for any reason other than job attachment. It is not a break resulting from other employment.

Residency Adjustment System (RAS): A National Office software system that assists States in correctly coding the residency of their UI claims records. The system verifies and corrects erroneous addresses and assigns geocodes including State, county, city/town, longitude and latitude and census tract and block. RAS facilitates the city claims disaggregation process and is required for the use of PROMIS.

Rotation Group: One of eight systematic subsamples which comprise the total CPS sample. A rotation group is in the sample for four consecutive months one year, leaves the sample during the following eight months, and then returns for the same four calendar months of the next year.

Sample: A subset of a statistical population usually selected randomly for the purpose of making generalized statements about the whole.

Sample Period: A period of time which is used to derive coefficients for the regression line. It is also called the "inside sample" period.

Sampling Error: The measure of sampling variability, that is, the natural variations that might occur by chance because only a sample of the population is surveyed.

Sample Regression: A type of regression in which the dependent variable is calculated from a sample survey. Consequently there is an additional error (sampling error) to be considered.

Sampling Ratio: The proportion of units needed to be sampled to provide data of a specified level of statistical reliability. Sampling ratios vary by cell, depending on the degree of variability of the measured item.

Scatter Plot: A graph which plots the values of the dependent variable (Y) against the values of one of the independent variable (X). By convention, the "X" variable is plotted against the horizontal scale and the "Y" variable is plotted against the vertical scale.

Signal Extraction in ARIMA (Auto Regressive Integrated Moving Average) Time Series (SEATS): A model based approach to seasonal adjustment that provides error measure. SEATS is used to adjust metropolitan areas and divisions.

Self-Employment Assistance (SEA): An optional program to help unemployed workers to create their own jobs by starting small businesses. To be eligible for the program an individual must be eligible for unemployment compensation, have been permanently laid off from his/her previous job and identified through the profiling system as likely to exhaust his/her benefits, and must participate in self-employment activities including entrepreneurial training and business counseling.

Seasonal Adjustment: A statistical technique that eliminates the influences of weather, holidays, the opening and closing of schools, and other recurring seasonal events from economic time series. This permits easier observation and analysis of cyclical, trend, and other nonseasonal movements in the data.

Separation Issue: Nonmonetary determination in which the claimant acted in the termination of the employment relationship. For example, voluntary quit without good cause, or voluntary quit for personal reasons.

Series Break: An interruption in a time series caused either by a change in definition or in methodology which makes it improper to compare data from after the change with data from before the change.

Short-time compensation: A program, commonly known as work-sharing, that allows an employer, faced with the need for layoffs because of reduced workload, to reduce the number of regularly scheduled hours of work for all employees rather than incur layoffs. This program provides partial UI benefits to individuals whose work hours are reduced from full- time to part-time on the same job.

Signal-Plus-Noise Models: Econometric models used by the LAUS program to produce State labor force statistics. The models measure the true labor force value contained in the monthly CPS estimates (the signal) by extracting the noise associated with CPS sampling error.

Slope: A value that tells how much change in the dependent variable (Y) results from a change in one of the independent variables (X). It is defined as the change in "Y" divided by the change in "X".

Smoothed Seasonal Adjustment (SSA): Seasonally-adjusted estimates that incorporate a long-run trend smoothing procedure. A smoothed-seasonally adjusted series was introduced in 2010 to reduce the number of spurious turning points in the former estimates. The estimates are smoothed using the Henderson Trend Filter (H13) that suppresses irregular variation in real time.

Smoothing: In the time series regression, one month's data are used in estimating another and the best estimate is made when data from all the other months are incorporated. The process of forward-back-forward model re-estimation is referred to as smoothing because of its impact on monthly estimates. In LAUS, smoothing is part of the annual benchmarking processing to update the model estimates series.

Standard Deviation: A measure of dispersion around the mean value of a population frequently denoted by sigma (σ). It is the positive square root of the variance.

Standard Error: The term "Standard Error" can be used in many contexts. In general, it refers to the variability of an estimate. In sampling, it usually refers to the confidence interval of the sample estimate - the probability of including the true value with repeated sample. One standard error is about 68 percent confidence; and 1.645 times the standard error is the more commonly used 90 percent confidence. The model estimates also have confidence intervals. These relate to the variability of the estimate relative to the regression line.

State Additional Benefits (AB): State financed programs for extending the potential duration of benefits during periods of high unemployment for claimants in approved training who exhaust benefits, or for a variety of other reasons. Although some state laws call these programs “extended benefits,” the term “additional benefits” is used to avoid confusion with the federal-state EB program.

State Employment Security Agency (SESA): A generic name for the State agency usually responsible for the following three activities: (1) The Unemployment Insurance Program which includes UI tax collection, administration, and determination and payment of unemployment benefits. (2) The Employment or Job Service Program which is an exchange for workers so seeking work and employers seeking workers. (3) Research and Analysis which includes collection, analysis, and publication of labor market information.

Statistical Population: A group of entities or individuals that are of concern to a statistician for a particular investigation. This is sometimes referred to as simply a "population".

Stochastic: A term used to denote the randomness of a variable or process. A stochastic, or random, variable is one whose value changes. In the case of the LAUS regression models, the values of the model variables change from month to month.

Survey: The process used to collect data for the analysis of some aspect of a group or area.

Time Series: A consecutive set of observations over a specified period of time.

Time Series Independence: A condition present when successive values of a time series are nonrelated or noncorrelated.

Trade Readjustment Allowances (TRA): Benefits provided to individuals who were laid off or had hours reduced because their job was adversely affected by increased imports from other countries.

Transitional Claim: A new claim filed to request a determination of eligibility and establishment of a new benefit year within an existing spell of unemployment. This is one of three types of initial claims.

Trend-Cycle Cascade Filter (TCCF): A combination of the Henderson filter and a seasonal filter that suppresses the variability due to real-time benchmarking while simultaneously removing any residual seasonality that may be present in the series

Unemployment Compensation for Ex-Servicemen (UCX): This federal program provides unemployment benefits to ex-servicemen.

Unemployed: In the CPS, those individuals considered unemployed must be 16 years of age or older who do not have a job but are available for work and are actively seeking work during the 4-week period ending with the reference week (the week including the 12th of the month). The only exceptions to these criteria are individuals who are waiting to be recalled from a layoff and individuals waiting to report to a new job within 30 days. They are also considered unemployed.

Unemployed Disqualified: Persons who are able to work and are available for work but are disqualified from receiving benefits for separation issues or other nonmonetary reasons.

Unemployment Compensation for Federal Employees (UCFE): This federal program provides benefits to federal employees.

Unemployment Insurance (UI): Insurance premiums collected by the State and Federal governments from which unemployment compensation is paid.

Unemployment Rate: The number of persons unemployed, expressed as a percentage of the civilian labor force.

Variable: An entity that can take on a number of different values. It is frequently denoted by letters such as "X" or "Y". Examples of variables would be CPS unemployment or CES employment.

Variable Coefficient Model (VCM): A type of sample regression model in which the model's coefficients are allowed to change over time.

Variance: A mathematical measure of the dispersion of the values of a variable around its mean. The variance may arise from a sampling of the population under study, or may just measure the variability of population values around its means. The variance is frequently denoted as sigma squared (σ^2).

Waiting Week: A period of unemployment during which a claimant may not draw benefits and during which certain requirements essential to the establishment of claimant eligibility for benefits must be met.

Weeks Claimed: The number of weeks of benefits claimed, including weeks for which a waiting period or fixed disqualification period is being served. Interstate claims are counted by State of residence.

Worksharing: See short-time compensation.

X-11 ARIMA and X-12 ARIMA: A nonparametric approach to seasonal adjustment. Used for seasonally adjusting the national CPS data as well as LAUS estimates for some metropolitan areas. In 2003, BLS adopted the use of X-12-ARIMA as the official seasonal adjustment procedure for CPS labor force series, replacing the X-11-ARIMA program that had been used since 1980. Both X-12- and X-11-ARIMA are based on earlier versions of the widely used X-11 method developed at the U.S. Census Bureau in the 1960s.