Local Area Unemployment Statistics in the U. S. 
Addressing Economic and Policy Needs

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Local Area Unemployment Statistics Program

• In the United States, the Local Area Unemployment Statistics (LAUS) program is responsible for the development of monthly estimates of the civilian labor force, total employment, total unemployment, and the rate for more than 7,300 areas in the nation.

• **Addressing Economic and Policy Needs:** focus
  – Publication and uses of LAUS data
  – Estimation approach
  – Recent program improvements to model-based estimation
    • Real-time benchmarking in 2005
    • Smoothed seasonal adjustment in 2010
  – Implementation strategies
The LAUS Program in brief

- **Data:** Civilian labor force, total employment, total unemployment, unemployment rate.

- **Geography:** Regions and divisions, States, DC, Puerto Rico, metropolitan, micropolitan and small labor market areas, counties, cities and towns in New England, cities of 25,000+ population elsewhere.

- **Estimation:** Model-based, with varying levels of sophistication depending on data availability.

- **Frequency:** Monthly.

- **Uses:** Current economic analyses and Federal fund allocations.

- **Concepts:** Consistent with those of the Current Population Survey which provides the official measurement of the labor force for the nation.
Unemployment rates by state, seasonally adjusted, June 2010

(U.S. rate = 9.5 percent)
Unemployment rates by county,
Bureau of Labor Statistics
July 2009 – June 2010 averages

(U.S. rate = 9.7 percent)
Unemployment rates by metropolitan area,
Bureau of Labor Statistics not seasonally adjusted, June 2010

(U.S. rate = 9.6 percent)
LAUS publications and data releases

• The LAUS data are one of the most timely sub-national economic indicators.
  – National unemployment data are issued the first Friday of the month following the reference period (the week including the 12th of the month).
  – In most months, all LAUS data for the month are issued by the end of the month following the reference period.

• LAUS news releases and reports
  – Monthly *Regional and State Employment and Unemployment*
    • Issued two weeks after the National Release
  – Monthly *Metropolitan Area Employment and Unemployment*
    • Issued 12 days after the Region/State release
  – All other LAUS areas: BLS internet release
    • Issued the same day as the Metropolitan Area release

• Internet/website: [http://www.bls.gov/lau/home.htm](http://www.bls.gov/lau/home.htm)
  – Contains LAUS data, tables, maps, documentation
Administrative uses of LAUS data

- LAUS data have been used in federal program administration since the 1960s.
- LAUS data are used in allocations because of the geographic detail, timeliness of release, and accuracy and consistency of estimation.
- The general premise: there is a relationship between the services provided by the program and unemployment, and places with higher rates and/or more unemployed persons need more funds.
  - Often, the allocation is made from the national total to States, then within States to areas.
Administrative uses of LAUS data

- Current programs cover myriad of activities:
  - Employment and training programs
  - Funding of State agency operations
  - Extended unemployment insurance benefits
  - Economic development
  - Emergency assistance
  - Immigration visas
  - Preferential treatment in government contracting

- FY 2010 amount associated in full or in part with LAUS estimates under regular programs is about $60.0 billion.

- American Recovery and Reinvestment Act provides funds (about $145 billion) for existing/new programs.
History of LAUS model-based estimation

• Beginning in the late 1970’s, State CPS annual average employment and unemployment data were used as “benchmarks” for monthly LAUS estimates.
  – Benchmark: a relatively accurate measure used to periodically adjust a less accurate series.

• Starting in 1989, LAUS relied on time-series models that use State CPS data as a monthly input and the Denton method of benchmarking using CPS annual averages.
  – Historically, the trade-off has been between monthly smoothness and end-of-year revision.

• First generation: Implemented in 1989.
  – Small annual revision, significant month-to-month volatility.

  – Smoother month-to-month movement, larger annual revision.
  – Issues with the endpoint of the benchmark and sum of States.
History of LAUS model-based estimation

- Issues with second generation State labor force estimates:
  - General tendency to underestimate unemployment and overestimate employment on a current basis.
  - Sum-of-State differences, model-based to national CPS.
  - Inability to reflect shocks to the economy like 9/11.
  - Large annual revisions through benchmarking in a number of States each year.
  - Discontinuity between December and January and lack of comparability over the year, affecting analysis.
Second generation sum-of-States issue: total employment

LAUS Sum-of-States minus CPS Employment, January 2000 - December 2004

Recession Begins 9/11
Second generation sum-of-States issue: the unemployment rate

LAUS Sum-of-States minus CPS Unemployment Rate,
January 2000 - December 2004

Recession Begins
9 / 11

LAUS - CPS

Recession Begins
9 / 11
Chart 3. Effects of Shocks to the Economy on Unemployment Rates
New York City & Florida, January - December 2001

New York City (Third Gen.)
New York City (Second Gen.)
Florida (Third Gen.)
Florida (Second Gen.)
Current LAUS models

- Third generation: Implemented in 2005 in all States
  - Smaller annual revision, no sum-of-State issue, but increased monthly volatility in current estimates of some States

- LAUS State employment and unemployment estimates are developed by bivariate models.

- State estimates are controlled to Census division model estimates of employment and unemployment which are in turn controlled to the national estimates.

- The process of controlling the State estimates to national estimates on a monthly basis is called real-time benchmarking.
Structure of LAUS Estimation

- National CPS estimates developed from the household survey
  \[\uparrow\]
- Division Model estimates of Signal developed using univariate models and controlled to National estimates
  \[\uparrow\]
- State Model estimates of Signal developed using bivariate models and controlled to the Division estimates
  \[\uparrow\]
- Area/balance of State Model estimates of the signal developed using univariate models and controlled to State estimates
- Nonmodeled area estimates developed and controlled to State or balance of State estimates
  \[\uparrow\]
- County and city estimates disaggregated from area estimates
Current LAUS models: real-time benchmarking

• The purpose of real-time benchmarking is to reflect shocks to the economy as they occur, without imposing large end-of-year revisions.

• At the State level, sampling error is very large and real shocks are hard to detect. Therefore, the model treats much of the CPS change as error (or noise).

• Division-level estimates are based on CPS data with a lower level of sampling error, and thus are able to detect more of the real change.

• At the national level, these shocks are much easier to detect.

• Thus, real-time benchmarking to national employment and unemployment estimates provide States with an external adjustment to shocks.
Features of the current LAUS models

- Annual revisions are reduced by incorporating the relatively accurate national CPS benchmark on a current basis.

- Sum-of-State discrepancies in the not seasonally adjusted series are eliminated.

- The Denton method is replaced by real-time benchmarking for the not seasonally adjusted series.
  - December-January break was eliminated.
  - Over-the-year comparability was improved.

- Seasonally adjusted estimates are developed directly and not through the application of another model (X-11, X-12).

- Reliability measures are generated for the seasonally adjusted and not seasonally adjusted estimates and for over-the-month and over-the-year change.
Issues in current State model estimation

• As early as 2005, States noted occasional increases in volatility in current monthly seasonally adjusted estimates.

• Volatility that masks real movement in the series may be related to
  – Sampling error in the CPS
  – Uncertainty at the end-point of estimation
  – Real-time benchmarking
    • Benchmark adjustment factors fluctuate and the relative relationship of the State within the division may be affected.
    • Month-to-month direction of change may be affected, especially for seasonally adjusted series.

• BLS did not consider this a problem, but research began on smoothed seasonal adjustment (SSA) in 2007.
Issues in current State model estimation

• Through calendar 2008, LAUS model estimation with real-time benchmarking to the not seasonally adjusted national levels of employment and unemployment worked well, even as the economy began to change—no sum-of-States issues.

• In 2009, issues with the historical method of annual revision to the seasonally adjusted series surfaced, as the procedure did not adequately respond to the rapid deterioration in the labor market.
  • Historical benchmarking of seasonally adjusted series still used the Denton method and resulted in general lowering of unemployment rates in the latter months of 2008, particularly December.
  • Different procedures for annual revision and current estimation caused a significant December-January break.

• The approach of smoothed seasonal adjustment (researched for current estimates) appeared to address the issues in historical revision of seasonally adjusted estimates.
Smoothened Seasonal Adjustment for States

- Smoothed Seasonal Adjustment for both current estimation and historical revision of seasonally adjusted State estimates was implemented with current estimates for 2010.

- SSA addresses the issues of current volatility.
  - For current estimates, SSA uses the seasonally adjusted estimate for the current month and previous 6, with greater weights on the last 3.
  - In analyzing SSA, estimates don’t change direction as rapidly as the seasonally adjusted estimates because of the smoothing mechanism.

- SSA addresses distortion in annual revision.
  - For historical revision, SSA uses a centered multi-month moving average smoother.
  - Eliminated the use of the annual average of the not seasonally adjusted series as the control total and replaced it with the same monthly pro-rata factor used to control not seasonally adjusted estimatea.
  - Used a smoother to suppress irregular variation that the prior step introduces.
Seasonal Adjustment versus Smoothed Seasonal Adjustment

(Dark circle indicates significant change from last month)

Minnesota Unemployment Rate

- Concurrent SA
- Historical SA

- Concurrent Smooth SA
- Historical Smooth SA

Jan-08 Jan-09 Mar-08 Mar-09 May-08 May-09 Jul-08 Sep-08 Nov-08
Seasonal Adjustment versus Smoothed Seasonal Adjustment

(Dark circle indicates significant change from last month)
Some thoughts on implementation strategies to ensure the quality of the estimation

- To the extent possible, identify shortcomings in methodology and engage in research to address them.
  - Research on real-time benchmarking of State labor force estimates began in 1999 and was completed in 2003.
  - Work on smoothed seasonal adjustment began in 2007.

- Allow for sufficient time to evaluate proposed methods, especially in a real-time setting.
  - For real-time benchmarking, dual estimation was conducted for a year (2004).
  - Smoothed seasonally adjusted current estimates were provided to States for comment in 2008. Historical revised estimates were provided for comment in 2009.

- Provide ample documentation at various levels of sophistication for the full range of users.