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In September...

Nonfarm Employment
  Connecticut.....................**1,626,100**
    Change over month .... **+0.12%**
    Change over year ....   **+0.1%**

  United States **133,500,000**
    Change over month .... **+0.09%**
    Change over year .... **+1.4%**

Unemployment Rate
    Connecticut..............................**8.9%**
    United States **7.8%**

Consumer Price Index
    United States **231.407**
      Change over year **2.0%**

Local Area Unemployment Statistics: A Primer

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Unexpected movements in recent unemployment rate numbers surprised and puzzled many data users in the state. While sometimes no plausible explanations can readily be found behind these statistics, the unemployment rate has been and is undoubtedly one of the most important economic indicators in Connecticut and the nation that cannot simply be ignored or dismissed. So do you ever wonder how the unemployment rate is calculated for Connecticut? How about for all nine labor market areas and for all 169 cities and towns? Given the intense focus on Connecticut's unemployment rate the last few months, it is worth spending time to build a common understanding of how the rate is determined.

In a nutshell, the unemployment rate for any area is the number of area residents without a job and looking for work divided by the total number of area residents in the labor force times 100. The labor force is the sum of employed and those unemployed who are actively seeking work. In other words:

Unemployment Rate = (# of unemployed / (# of employed + # of unemployed)) X 100

However, the methods used to produce this data are not so simple. Attempting to contact every household, as is done in the decennial census, to count every person that is unemployed would be far too time consuming and costly. At the same time, counting only those persons filing claims for unemployment benefits does not account for all persons who do not have a job and want to work. The Unemployment Insurance (UI) system does not account for the self employed, nor does it account for the unemployed who do not qualify for benefits.

Consequently, other methods must be used. This is where Local Area Unemployment Statistics (LAUS) comes in. LAUS is a joint effort by the U.S. Bureau of Labor Statistics (BLS) and the states. The LAUS program provides monthly and annual average estimates for the labor force, employment, unemployment, and the unemployment rate for some 7,300 areas. The areas include census regions and divisions, states, metropolitan areas, metropolitan divisions, micropolitan areas, combined areas, small labor market areas, counties and county equivalents, cities with a population of 25,000 and over, and all cities and towns in New England regardless of population. This article will highlight the LAUS concepts and definitions, methodology, seasonal adjustment, reliability, and its impact on the economy. It is hoped that LAUS will be better understood and properly interpreted so that many good business decisions and public policies can be made to help in improving our economy.

Concepts and Definitions

Civilian labor force includes all persons in the civilian noninstitutional population classified as either employed or unemployed. "Noninstitutional" means excluding those in penal and mental institutions and homes for the infirm, and persons in the Armed Forces. *Employed persons* are all persons who, during the reference week (the week including the 12th day of the month), (a) did any work as paid employees, worked in their own business or profession or on their own farm, or worked 15 hours or more as unpaid workers in an enterprise operated by a member of their family, or (b) were not working but who had jobs from which they were temporarily absent because of vacation, illness, bad weather, childcare issues, 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. *Unemployed persons* include all those who had no employment during the reference week, were available for work except for temporary illness, and had made specific efforts to find employment some point during the four week-period ending with the reference week. Persons 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. *Unemployment rate* is simply the ratio of unemployed to the civilian labor force expressed as a percent.

Methodology

The national unemployment rate is computed solely from a nationwide survey, called the Current Population Survey (CPS), of about 60,000 households (of which 1,600 is for Connecticut) conducted by the Census Bureau for the BLS. Residents of selected households are asked, among other questions, about their employment status. From their responses, the BLS then estimates the size of the labor force – all people employed and unemployed – and the number of people who are jobless.

The Bureau of Labor Statistics is responsible for the concepts, definitions, technical procedures, validation, and publication of the estimates that all state workforce agencies, including the Connecticut Department of Labor, prepare under agreement with BLS. With all states using the same procedures, the resulting data are comparable across the country.

"Household" data from CPS pertain to individuals and relate to where they reside. "Establishment" data, such as those from the Current Employment Statistics (CES) survey of businesses, however, pertain to jobs (persons on payrolls) and where those jobs are located. It is important for data users to distinguish the difference that the data developed through the LAUS program are based on the **household** concept of the CPS, and not on the **establishment** concept. These estimates can differ because the surveys have distinct definitions of employment and distinct survey and estimation methods. Among the major differences in definition are: 1) The household survey includes agricultural workers, the self-employed, unpaid family workers, and private household workers among the employed. These groups are excluded from the establishment survey. 2) The household survey includes people on unpaid leave among the employed. The establishment survey does not. 3) The household survey is limited to workers 16 years of age and older. 4) The household survey has no duplication of individuals because individuals are counted only once, even if they hold more than one job. In the establishment survey, employees working at more than one job and thus appearing on more than one payroll are counted separately for each appearance.

Both the payroll and household surveys are needed for a complete picture of the labor market. The

payroll survey provides a gauge of monthly change in nonfarm employment. The household survey provides a broader picture of employment including agriculture and the self-employed.

As stated before, national data comes directly from the CPS. The sample of the CPS is designed to be able to reliably estimate the U.S. unemployment rate on a monthly basis. However, below the national level, the CPS sample is too small and cannot support reliable estimation of even total employed and unemployed for states on a monthly basis, much less data for detailed geographic or demographic break-outs. In fact, the CPS sample does not cover all counties or towns. BLS does not regard CPS subnational tabulations covering less than a full calendar year to be reliable for publication or time-series analysis. BLS also does not account for seasonal fluctuations in the subnational monthly tabulations, making comparisons across consecutive months problematic even beyond the issues arising from volatility.

Consequently, alternative methods and additional information must be used to produce stable estimates at the state and local levels. For all states and the District of Columbia, statistical models have been developed to estimate the number of residents that are employed and unemployed. The models use time series regression techniques that are based on historical and current data for each state's economy. While all the state estimation models have important components in common, they differ somewhat from one another to better reflect individual state labor force characteristics.

The primary component of the state estimation models is the results from state residents' responses to the CPS. The inclusion of the household survey results ensures that people who have exhausted their unemployment benefits are represented in the estimate of unemployed state residents. It also accounts for new entrants and re-

entrants into the workforce, those who exhaust unemployment benefits and are still looking for work, those found ineligible for benefits or who simply choose not to file, and others not covered by unemployment insurance, such as some agricultural workers, private household workers, self-employed, and unpaid family workers. The numbers of persons filing claims for unemployment insurance and the current estimate of nonfarm jobs in the state are also added to the state estimation models for additional information.

More specifically, state monthly **"model-based"** estimates are produced using a **"signal-plus-noise"** time-series model. The term "model-based" refers to the fact that estimates are derived by a statistical model rather than direct sampling. This model postulates that the observed CPS estimate consists of a true, but unobserved, labor force value (the signal) plus noise that reflects the error arising from using a probability sample rather than a complete census of the population. The modeling process separates the two to produce an estimate of the signal.

These "model-based" estimates are controlled in **"real-time benchmarking"** to sum to national monthly labor force estimates from the CPS. Under "real-time benchmarking," a tiered approach to estimation is used. Model-based estimates are developed for the nine census divisions (Connecticut is under New England Division) 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 nonfarm payroll employment as 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. 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 aligned 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.

These models combine current and historical data from the CPS, nonfarm employment from the CES program, and State unemployment insurance systems, such as major strikes, continued unemployment insurance claims (which are filed after the initial claims), and Unemployment Compensation for Federal Employees (UCFE) claims. Estimates for seven large areas (such as New York City and Los Angeles) and their respective balances of State are also model-based.

Estimates for the remainder of the substate labor market areas are produced through the "Handbook method." This building-block approach is an effort to estimate labor force statistics 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. This procedure also uses data from several sources, including the CPS, the CES program, state UI systems and the decennial census, to create estimates that are adjusted to the statewide measures of employment and unemployment.

Below the labor market area level, such as cities and towns, estimates are prepared using disaggregation techniques using a "population-claims" method, which is based on inputs from the decennial census, annual population estimates, and current UI data (including weekly final payments data as well as continued monthly claims data). The ratio of claims in the town to the total number of claims within the LMA is used to disaggregate the estimate of unemployed to the town level. To ensure the quality of the claims data used in this technique, claimant records are processed

through a residency assignment system that verifies and/or corrects residence addresses and assigns the associated residency codes. This provides a more accurate count of claims by town. The estimates of unemployed entrants are allocated based on the latest available census distribution of adult and teenage population groups. Employment is disaggregated using decennial census employment-population ratios updated by current population estimates. Finally, Connecticut's substate LAUS estimates are not complete without the claims and employment data for Connecticut portion shared with its surrounding states, Rhode Island, Massachusetts, and New York. Once the number of employed and unemployed state residents is estimated, the labor force – the sum of the employed and unemployed – is determined, and the unemployment rate – the percentage of the labor force that is unemployed – is calculated for all LMAs and cities and towns.

Currently the LAUS estimates for each month are revised the following month (called "benchmarking") and at the end of each year for the last two years ("annual processing") as more current information becomes available on nonfarm jobs and unemployment claims, and from the household survey and other Census Bureau sources.

During the annual processing in February, in addition to annual revisions to the inputs, new **population controls** are also incorporated into the estimates. The term "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. These are updated annually by the Bureau of the Census and provided to BLS. The impact on LAUS estimates of new population

controls is to proportionately raise or lower the estimates of labor force levels (with unemployment rates, labor force participation rates, and employment/population ratios being unaffected) for census regions and divisions, the states and the District of Columbia, and seven substate areas. Revisions are typically made to the three most recent years of data.

Note that the official unemployment rate (also known as "U-3") discussed above has specific limitations. It does not differentiate between full-time and part-time jobs. It also does not account for people who are underemployed; that is, working in jobs for which they are overqualified because they cannot find a job that better matches their knowledge and experience, or working part time when they would prefer to work full time. It will not tell you how many people have become so discouraged in their job search that they have given up hope of finding a job. However, alternative measures derived from the household survey that provide estimates of unemployment that include these groups are also available by going to BLS's Alternative Measures of Labor Underutilization for States page, http://www.bls.gov/lau/stalt.htm.

Seasonal Adjustment

Over the course of a year, the size of Connecticut's labor force and the levels of employment and unemployment undergo regularly occurring fluctuations. These events may result from regular business patterns, seasonal changes in weather, major holidays, and the opening and closing of schools. The effect of such seasonal variation can be very large. Because these seasonal events follow a more or less regular pattern each year, their influence on the level of a series can be tempered by adjusting for regular seasonal variation. These adjustments make nonseasonal developments, such as declines in employment or increases in the participation of women in the labor force, easier to spot. For example,

in the household survey, the large number of youth entering the labor force each June is likely to obscure any other changes that have taken place relative to May, making it difficult to determine if the level of economic activity has risen or declined. Because seasonal employment changes at the end and beginning of the school year can be estimated, the statistics can be adjusted to make underlying employment patterns more discernable. The seasonally adjusted figures provide a more useful tool with which to analyze changes in month-to-month economic activity.

In 2010, a smoothed-seasonally adjusted (SSA) series was introduced to reduce the monthly volatility in the former estimates. The estimates are smoothed using the Henderson Trend Filter (H13) that suppresses irregular variation in real time. The H13 uses a filtering procedure, based on moving averages, to remove the irregular fluctuations from the seasonally-adjusted series, leaving the trend. Symmetric moving averages are used to smooth the historical series while asymmetrical averages are used in real time. This new approach also addresses longstanding issues related to end-of-year revision.

Reliability of the Estimates

Statistics based on the household surveys are subject to both sampling and nonsampling error. Presently, Connecticut's statewide unemployment rate for any month has a margin of error of +/- 0.7-0.8 percentage point, with 90% confidence that the true rate (if the entire population could be surveyed) falls within this range. The error range on the annual average is +/- 0.4 percentage point. Generally, estimates for smaller areas are less precise than for larger areas. Nevertheless, the unemployment rate provides a reasonable approximation of what it is supposed to measure.

So How Important is LAUS?

Some economists believe that the unemployment rate is not as

accurate as nonfarm employment in depicting the state of our current economy because of the smaller sample size of the CPS. The reality is that it is cost-prohibitive and time-consuming to count all of the unemployed. This is where the econometric models come in to make the LAUS estimates more reliable. Despite its limitations, as with any other survey-based indicators, LAUS serves as a timely and important economic gauge for the state and its local areas. In fact, there are no other labor statistics that provide such details on a town level every month.

LAUS data is crucial and is used by a wide variety of customers. Federal programs use the data for allocations of almost $61 billion to states and areas, as well as eligibility determinations for assistance. These include the Workforce Investment Act (WIA), the Emergency Food and Shelter Program, Food Stamp limitation waivers, the Public Works Program, the Temporary Emergency Food Assistance Program (TEFAP), and the Labor Surplus Area designation program. Under most programs, unemployment data are used to determine the distribution of funds to be allocated to each eligible area.

In the case of the Food Stamp waivers and Labor Surplus Area designations, the data are used in the determination of area eligibility for benefits. State and local governments use the estimates for planning and budgetary purposes and to determine the need for local employment and training services. Private industry, researchers, the media, and other individuals use the data to assess localized labor market developments and make comparisons across areas.

The CPS is the only household survey in the nation that is comprehensive and conducted every month. It is the foundation from which to produce LAUS. The states and BLS are continuously striving towards improving and refining the LAUS estimating processes, with a new generation of econometric modeling techniques in the offing, to accurately reflect changing structures of our economy within the boundary of budgetary limitations. The Connecticut Department of Labor is committed to serve data users by providing objective, unbiased insights to the current economic condition of our state each month.

Where Can I Find LAUS Data?

Connecticut Department of Labor's Office of Research currently publishes statewide estimates every month along with the national data. Both seasonally adjusted and not seasonally adjusted monthly data are available going back to 1976.

In addition to the statewide estimates, data for all 169 cities and towns, nine Labor Market Areas (LMA), five Workforce Investment Areas, and eight counties are available every month. Historical monthly with annual averages data for these areas are also available back to 1994. All these LAUS data can be accessed by going to LAUS page, http://www1.ctdol.state.ct.us/lmi/laus/default.asp. Seasonally adjusted monthly LAUS by LMA are also available upon request. ■

For more information on the LAUS background and its methodology, visit BLS's link: http://www.bls.gov/lau/laumthd.htm.

For answers on frequently asked questions, see http://www.bls.gov/lau/laufaq.htm.

GENERAL ECONOMIC INDICATORS

(Seasonally adjusted)	2Q 2012	2Q 2011	CHANGE NO.	CHANGE %	1Q 2012
General Drift Indicator (1986=100)*					
Leading	106.4	103.8	2.6	2.5	106.8
Coincident	107.3	107.3	0.0	0.0	107.2
Farmington Bank Business Barometer (1992=100)**	124.0	124.1	-0.1	-0.1	124.2
Philadelphia Fed's Coincident Index (July 1992=100)***	**SEP 2012**	**SEP 2011**			**AUG 2012**
(Seasonally adjusted)					
Connecticut	152.94	150.48	2.46	1.6	152.76
United States	151.73	147.57	4.15	2.8	151.41

*Sources: *The Connecticut Economy, University of Connecticut **Farmington Bank ***Federal Reserve Bank of Philadelphia*

The Connecticut Economy's **General Drift Indicators** are composite measures of the four-quarter change in three coincident (Connecticut Manufacturing Production Index, nonfarm employment, and real personal income) and four leading (housing permits, manufacturing average weekly hours, Hartford help-wanted advertising, and initial unemployment claims) economic variables, and are indexed so 1986 = 100.

The **Farmington Bank Business Barometer** is a measure of overall economic growth in the state of Connecticut that is derived from non-manufacturing employment, real disposable personal income, and manufacturing production.

The **Philadelphia Fed's Coincident Index** summarizes current economic condition by using four coincident variables: nonfarm payroll employment, average hours worked in manufacturing, the unemployment rate, and wage and salary disbursements deflated by the consumer price index (U.S. city average).