Revisions in State Establishment-based Employment Estimates Effective January 2004

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With the release of estimates for January 2004, nonfarm payroll employment, hours, and earnings data for States and areas (tables B-7, B-14, and B-18) were revised to reflect the incorporation of March 2003 benchmarks and the recomputation of seasonal adjustment factors (State estimates). The revisions affect all unadjusted data from April 2002 forward, all seasonally adjusted data from 1999 forward, and selected series subject to historical revisions. This article offers background information on benchmarking methods and details the effects of the March 2003 benchmark revisions on State and area employment estimates.

Benchmark methods

The Current Employment Statistics (CES), or nonfarm payroll, survey is a Federal/State cooperative program that provides employment, hours, and earnings estimates for States and areas on a timely basis by estimating the number of jobs in the population from a sample of that population. As in other sample surveys, CES estimates are subject to both sampling and nonsampling error. Sampling error is an unavoidable byproduct of forming an inference about a population based on a sample. The larger the sample is relative to the population, the smaller the sampling error. The sample-to-population ratio varies across States and industries. Nonsampling error is not unique to sample surveys, as it includes errors in reporting and processing.

To help control both sampling and nonsampling error, the estimates are benchmarked annually to universe employment counts. These counts are derived primarily from employment data reported on unemployment insurance (UI) tax reports that nearly all employers are required to file with State Workforce Agencies. Benchmark levels replace the original sample-based estimates from April of the previous year to March of the benchmark year for each month. For the current 2003 benchmark, estimates from April 2002 to March 2003 were replaced with UI-based universe counts. Once the new level for March 2003 had been determined, the appropriate sample links were applied to the new level, and the estimates were recalculated for April 2003 forward. The sample links capture the over-the-month change of the sample estimates. A sample link for a given month is calculated by dividing employment reported by survey respondents for that month by employment reported by those same respondents for the previous month. The links used during the benchmark process may differ slightly from those used to derive the original estimates because they include data that were reported too late for inclusion in the previously published estimates, the use of new sample weights, and the inclusion of updated net births estimates. This process was completed and the revised data were released with the January 2004 estimates.

Improvements in the receipt of UI data and in the standardization of State operations have enabled nearly all States to replace estimates with UI data beyond March of the benchmark year. In the March 2003 benchmark, 26 States and the District of Columbia used third-quarter 2003 UI data (that is, through September 2003) in their benchmarking, and 24 States used second-quarter 2003 UI data (through June 2003). Recalculated sample links were then applied to these new levels to derive revised estimates for months after the replacement quarter.

Benchmark revisions

The percentage differences between March 2003 sample-based estimates and the revised March 2003 benchmark levels commonly are used to report the magnitude of the revisions. The average absolute percentage revision for State total nonfarm estimates was 0.6 percent for March 2003, down from 0.9 percent in March 2002. The average absolute revision from 1998 to 2003 was 0.7 percent. The range of the percentage revisions for the States at the total nonfarm level was from -1.9 to 1.4 percent in 2003.

For the 2003 benchmark, comparisons between major industry divisions may be made for 2003 only. (See table 1.) The noncomparability with data for previous years is a result of the conversion from the use of the Standard Industrial Classification (SIC) system to the 2002 North American Industry Classification System (NAICS), in that a historical time series of unbenchmarked NAICS data does not exist for previous years. Total nonfarm data remain comparable and are presented for all years.

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The direction of the revisions indicates whether the March 2003 benchmark levels were greater or less than the original sample-based estimates. Historically, State estimates have underestimated March employment levels during periods of economic growth and overestimated these levels during periods of economic decline. For the current benchmark, 14 States and the District of Columbia revised total nonfarm employment upward, while 34 States had downward revisions. (See table 2.) The tendency toward overestimation of employment is reflected by the mean -0.2-percent revision across all States for total nonfarm employment.

For metropolitan statistical areas (MSAs) published by the CES program, the range of percentage revisions was from -4.8 to 4.8 percent, with an average absolute percentage revision of 1.2 percent across all MSAs.[1] This compares with a range of -1.9 to 1.4 percent and an average absolute percentage revision of 0.6 percent at the State level. Generally, as MSA size decreases, the range of percentage revisions increases, as does the average absolute percentage revision. (See table 3.) Metropolitan areas with 1 million employees or more had an average absolute revision of 0.7 percent, while metropolitan areas with fewer than 100,000 employees had an average absolute revision of 1.4 percent.

[1] The CES program published employment series for 274 MSAs in 2003. The list of BLS standard MSAs is available at **http://www.bls.gov/sae/**.

Seasonal adjustment

To forecast seasonal adjustment factors for the upcoming year, CES first developed a historical NAICS time series (benchmarked to 2000 data) using a system of ratio tables in conjunction with SIC data from the previous decade. This step is necessary because a minimum of 3 years of data is required to perform seasonal adjustment. BLS uses a two-step seasonal adjustment process for adjusting State nonfarm payroll employment estimates. This process uses UI seasonal trends to adjust the benchmarked historical data, but incorporates sample seasonal trends to adjust the current sample-based estimates in the postbenchmark months. Sample-based NAICS data are available only from 2003 forward. By accounting for the differing seasonal patterns of the benchmark data and the sample-based estimates, this technique yields an improved seasonally adjusted series for analyzing over-the-month employment change. The latest seasonally adjusted nonfarm payroll employment data for all States and the District of Columbia

Table 1. **Differences between State employment estimates and benchmarks by industry, March 1998-2003**

Industry	1998	1999	2000	2001	2002	2003
	Average absolute percentage differences					
Total nonfarm	0.5	0.5	0.7	0.7	0.9	0.6
Natural resources and mining	(1)	(1)	(1)	(1)	(1)	3.8
Construction	(1)	(1)	(1)	(1)	(1)	2.6
Manufacturing	(1)	(1)	(1)	(1)	(1)	1.4
Trade, transportation, and utilities	(1)	(1)	(1)	(1)	(1)	1.0
Information	(1)	(1)	(1)	(1)	(1)	2.5
Financial activities	(1)	(1)	(1)	(1)	(1)	1.7
Professional and business services	(1)	(1)	(1)	(1)	(1)	2.1
Education and health services	(1)	(1)	(1)	(1)	(1)	1.0
Leisure and hospitality	(1)	(1)	(1)	(1)	(1)	1.3
Other services	(1)	(1)	(1)	(1)	(1)	2.1
Government	(1)	(1)	(1)	(1)	(1)	.8
	Average percentage revisions					
Total nonfarm:						
Range	-1.2 : 2.5	-1.3 : 1.8	-1.1 : 3.3	-2.9 : 0.9	-2.1 : 2.1	-1.9 : 1.4
Mean	.1	.1	.4	-.5	-.6	-.2
Standard deviation	.7	.6	.8	.7	.9	.7

[1] Due to noncomparability between NAICS and SIC industry definitions below total nonfarm levels, 1998-2002 differences are unavailable at the major industry level.

NOTE: The range indicates the lowest and highest percentage revision at the total nonfarm level. The mean is the sum of all of the items in a series divided by the number of items. The standard deviation is a widely-used measure of dispersion. It measures the extent to which the individual items in a series are scattered about the mean of the series and indicates the reliability of the mean. For example, the March 1999 standard deviation (.6) is lower than that of March 2000 (.8). This is an indication that there is higher variation among State total nonfarm revisions in March 2000 (that is, the mean is less representative of the group) than in March 1999 (that is, the mean is more representative of the group). The standard deviation is found by taking the difference of each item in a series from the mean of the series, squaring each difference, summing the squared differences, dividing the result by the number of items, and obtaining the square root of that figure.

Table 2. **Percent differences between nonfarm payroll employment benchmarks and estimates by State, March 1998-2003**

State	1998	1999	2000	2001	2002	2003
Alabama	0.3	-0.9	-1.0	-0.7	-0.8	([1])
Alaska	.7	-.6	.9	.4	1.0	0.6
Arizona	-.3	([1])	-.2	.2	.5	.2
Arkansas	.2	.2	-.2	-.4	-.6	-.6
California	-.2	([1])	.7	-.4	-1.2	-.5
Colorado	.3	.8	-.3	-.5	-.6	-.9
Connecticut	.1	.2	.1	-.7	-.1	-.6
Delaware	-.5	.2	-.2	-.4	-1.2	.1
District of Columbia	.6	-.1	3.3	.3	2.1	.2
Florida	-.4	-.6	-1.1	-.6	-.3	([1])
Georgia	-.1	.2	-.3	-1.6	1.0	-1.3
Hawaii	.1	.3	.9	-.5	.3	.2
Idaho	.2	-.9	-.8	.9	-1.2	.7
Illinois	.1	-.2	.6	-.7	-.9	-.9
Indiana	.4	-.2	.7	-1.5	-.8	.6
Iowa	-.3	-.6	-.1	-1.3	-1.2	-.4
Kansas	-.1	-1.0	-.5	-.4	-2.1	-1.8
Kentucky	-.1	.2	.2	-1.3	-2.0	-.2
Louisiana	-.3	-.8	.8	-1.4	-1.9	.4
Maine	.7	.6	.7	-.6	-.8	-.2
Maryland	1.4	.3	.2	-.4	.9	-.3
Massachusetts	-.9	.1	.6	-.3	-1.4	-.9
Michigan	-.3	-.8	1.6	-1.6	-2.0	-.4
Minnesota	.3	-.2	.6	.4	-.5	-.1
Mississippi	.5	1.1	-.1	-.9	-.8	-1.1
Missouri	.2	.1	.2	-.4	.6	1.4
Montana	-.1	([1])	-.3	-.5	-.2	1.0
Nebraska	-1.2	.7	1.4	-.7	-.6	-.2
Nevada	-1.1	1.8	.1	-.4	-2.1	1.4
New Hampshire	2.5	.5	.8	.6	-1.2	-.6
New Jersey	-.1	([2])	1.8	([1])	-.2	-1.0
New Mexico	.7	-.5	.2	.7	.1	-.4
New York	.9	.8	.2	-.5	-.9	.2
North Carolina	-.4	.4	.1	-1.3	-.9	-1.3
North Dakota	.1	([1])	.7	-.1	-1.1	.2
Ohio	.2	.5	.8	-.1	-1.5	-.1
Oklahoma	1.0	-.7	-.5	.8	-1.8	-.9
Oregon	-.9	-1.3	.2	.2	-.7	-.2
Pennsylvania	.5	.7	1.2	-.4	([1])	-.5
Rhode Island	-.1	-.4	1.0	-.1	-.5	.3
South Carolina	-.2	-.1	([1])	-2.9	-1.6	.9
South Dakota	.1	.4	-.7	-.5	-1.0	-.5
Tennessee	-.2	.5	.5	-.9	-2.1	-.4
Texas	.4	.1	.4	-.5	-.2	-.6
Utah	-.7	([1])	.2	-.4	-.1	-.2
Vermont	1.1	-.4	.9	([1])	.6	-1.9
Virginia	-.8	.6	.7	-.3	-.3	-.1
Washington	.3	-.1	1.1	-.8	-.2	-.4
West Virginia	-.2	-.3	.8	-.2	-.1	-.8
Wisconsin	-.2	1.0	.7	-.6	-1.4	-.5
Wyoming	1.6	1.4	1.9	.5	-.5	-.3

[1] Less than 0.05 percent.
[2] Data for New Jersey were not benchmarked in 1999 due to the unavailability of universe counts for that State.

are available on the Internet.[2] Data for the most recent 13 months are regularly shown in table B-7 of this publication.

Additional information

Historical State and area employment, hours, and earnings data are available at **http://www.bls.gov/sae/** on the BLS Internet site. Users may access the data via various retrieval tools at this address. Any questions on how to access the data through the Internet should be directed to *webmaster@bls.gov.* Inquiries for additional information on the methods or estimates derived from the CES survey should be sent to: U.S. Bureau of Labor Statistics, Room 4860, 2 Massachusetts Avenue, NE., Washington, DC 20212-0001. The telephone number is (202) 691-6559; fax (202) 691-6820. The e-mail address is *sminfo@bls.gov***.**

[2] Seasonally adjusted and unadjusted data may be accessed via the public data retrieval engine available at **http://data.bls.gov/cgi-bin/dsrv?sm**.

Table 3. **Benchmark revisions for total nonfarm employment in metropolitan statistical areas, March 2003**

Measure	All MSAs	MSAs grouped by level of total nonfarm employment			
		Less than 100,000	100,000 to 499,999	500,000 to 999,999	More than 1 million
Number of MSAs	274	85	128	36	25
Average absolute percentage revision	1.2	1.4	1.1	1.1	0.7
Range	-4.8 : 4.8	-4.8 : 4.8	-3.5 : 3.4	-2.7: 2.5	-1.6 : 1.8
Mean	-.2	-.3	-.1	-.5	-.3
Standard deviation	1.5	1.8	1.5	1.2	.8