

Annual Benchmark Report for Services: Fourth Quarter 2003 to Fourth Quarter 2009

INTRODUCTION

The U.S. Census Bureau produces the *Annual Benchmark Report for Services* to provide revised national estimates of quarterly revenue and expenses for select service industries. (See the **Coverage** section below for more information on the industries included in the Quarterly Services Survey.) The quarterly estimates shown in this report have been revised in a manner that adjusts them to annual revenue and expense estimates from the Service Annual Survey. For more information about the revision procedure, see the **Revisions to Previously Published Quarterly Estimates** section of this report.

This report contains the initial release of unadjusted quarterly revenue estimates for selected industries in Finance and Insurance and seasonally adjusted quarterly revenue estimates for Software Publishers, Motion Picture and Sound Recording industries, and Hospitals. We used the Census Bureau's [X-12 ARIMA](#) program to produce the seasonally adjusted estimates. The revised quarterly revenue estimates were input to the X-12 ARIMA program. For a list of Frequently Asked Questions about the seasonally adjusted estimates, see <http://www.census.gov/services/qss/qssseasfaq.html>

We develop the estimates in this report using data from the Quarterly Services Survey (QSS) and the Service Annual Survey (SAS). For each survey, we mail survey questionnaires to a probability sample of firms located in the United States and having paid employees. Therefore, the quarterly revenue estimates produced from QSS do not include revenue from non-employer firms (i.e., firms without paid employees).

Additional information on QSS and SAS can be found on the Census Bureau website at: <http://www.census.gov/services/index.html>.

COVERAGE

The estimates in this report are summarized by industry classification based on the 2002 North American Industry Classification System (NAICS).

NAICS groups establishments into industries based on the activities in which they are primarily engaged. This system, developed jointly by the statistical agencies of Canada, Mexico, and the United States, allows for comparisons of business activity across North America.

Estimates are presented for selected industries in the following NAICS sectors (2-digit NAICS codes) and subsectors (3-digit NAICS codes):

2002 NAICS Code	Kind of Business	First Published Quarter
51	Information	2003, Q4
54	Professional, scientific, and technical services	
56	Administrative and support and waste management and remediation services	
622	Hospitals	2004, Q4
623	Nursing and residential care facilities	
48pt-49	Transportation and warehousing	2009, Q1
532	Rental and leasing services	
621	Ambulatory health care services	
624	Social assistance	
71	Arts, entertainment, and recreation	
81	Other services (except public administration)	
52	Finance and insurance	2009, Q3

For the Information sector, NAICS 2002 includes substantial revisions from NAICS 1997. Consequently, estimates are shown for only fourteen quarters for the affected industries for this sector. The correspondence table for the Information sector from NAICS 1997 to NAICS 2002 is provided at the following website:

<http://www.census.gov/epcd/naics02/N02N9751.HTM>

Detailed information about NAICS can be found on the Census Bureau Web site at:

<http://www.census.gov/eos/www/naics>

REVISIONS TO PREVIOUSLY PUBLISHED QUARTERLY ESTIMATES

The current sample is based on the 2002 NAICS and replaces the prior sample, which was designed to produce estimates based on the 1997 NAICS. For more information on the NAICS industries covered by QSS, see the **Coverage** section.

We revise the previously published quarterly estimates to:

- Reflect historical corrections to data for the current QSS and SAS samples.
- Introduce results of the 2008 Service Annual Survey (SAS).
- Link the previously published estimates from the prior QSS sample to estimates from the current QSS sample.
- Incorporate updates to the seasonal adjustment models and parameters to reflect the revised estimates.

The remainder of this section describes the procedure used to produce the revised estimates.

Quarterly Revenue Estimates

Revisions in quarterly revenue estimates for NAICS sectors/subsectors 48pt-49, 532, 621, 624, 71, and 81 are not benchmarked at this time and only reflect historical corrections to data for the QSS. Estimates for these industries will be benchmarked when 2009 SAS estimates are available.

For industries affected by the change from 1997 to 2002 NAICS, published revenue estimates for fourth quarter of 2003 through third quarter of 2006 from the prior sample are restated on a 2002 NAICS basis, using revenue distributions from the 2002 Economic Census that link the two sets of classification codes. Of particular note, the estimates for Sector 51 are revised due to the creation of new industries for Internet Publishing and Broadcasting and Web Search Portals.

The revenue estimates for fourth quarter of 2003 through second quarter of 2006 from the prior sample are linked to the estimates starting with third quarter of 2006 from the current sample. The linkage is performed for each detailed NAICS level (including separate breakouts by tax status for Sector 62) by multiplying the Horvitz-Thompson estimates from the prior sample by a geometric mean. The geometric mean is computed as the square root of the product of two ratios. The numerators of the ratios are the Horvitz-Thompson revenue estimates for second and third quarter 2006 from the current sample. The denominators of the ratios are the Horvitz-Thompson estimates for second and third quarter 2006 from the prior sample.

After performing the above linkage, the resulting revenue estimates for fourth quarter of 2003 through fourth quarter of 2009 are input to the benchmarking program. The estimates for a given detailed NAICS level are revised to produce the published benchmarked estimates in a manner that:

- For Sectors 51, 54, and 56, constrains the sum of the four quarterly revenue estimates for 2004 through 2008 from QSS to equal the corresponding census-adjusted, annual revenue estimate for employers obtained from SAS. See the [2008 Service Annual Survey Report](#) for a description of how these estimates are derived.
- For NAICS 622 and NAICS 623, constrains the sum of the four quarterly revenue and expense estimates for 2005 through 2008 from QSS to equal the corresponding census-adjusted, annual revenue estimate for employers obtained from SAS. Because data for this sector were not collected in QSS prior to the fourth quarter of 2004, the 2004 results for this sector from SAS are not used in the benchmarking procedure.
- Minimizes the sum of the squared differences between the quarter-to-quarter changes of the input and revised revenue estimates.

A mathematical result of the benchmarking methodology is that all revised estimates following the end of the last benchmark year (2008) are derived by multiplying the corresponding input estimates by the ratio of the benchmarked-to-input estimate for the

last quarter of the last benchmark year. Therefore, for a given detailed NAICS level, a ratio of the benchmarked-to-input estimate for fourth quarter of 2008 is computed. Revenue estimates for quarters after the fourth quarter of 2008 are multiplied by this constant ratio, which is called a carry-forward factor, to derive published revenue and expense estimates. The carry-forward factor remains the same until the next benchmarking operation.

Likewise, a carry-backward factor is applied to derive published quarterly revenue estimates for quarters that precede the earliest annual constraint. The carry-backward factor for a given detailed NAICS level is the ratio of the benchmarked-to-input estimate for the first quarter of the first benchmark year (i.e., first quarter of 2004 for sectors 51, 54, and 56; first quarter of 2005 for sector 62). Revenue estimates for the fourth quarter of 2003 for sectors 51, 54, and 56 and the fourth quarter of 2004 for NAICS 622 and 623 are multiplied by these constant ratios to derive published revenue estimates.

Class of Customer and Other Estimates

Similar to revenue, the Horvitz-Thompson estimates for other data items from the prior sample are linked to the estimates starting with third quarter of 2006 from the current sample, using a geometric mean involving the item of interest. After applying the geometric mean, a further adjustment may be performed to revise the quarterly estimates from the prior and current samples. For revenue by class of customer, the estimate for a given quarter is multiplied by a ratio, where the numerator is the revised revenue estimate for the quarter, and the denominator is the revenue estimate for the quarter that was input to the benchmarking program. This procedure ensures, the estimated proportion of revenue by class is preserved after the revenue estimates are revised. For expenses, the estimates are benchmarked using a procedure similar to that for revenue, where the sum of the four estimates of quarterly expenses for each year equals the corresponding census-adjusted, annual estimate of expenses from SAS. For inpatient days and discharges, no further adjustment is made after the application of the geometric mean. Revised estimates for aggregate industry levels are obtained by summing the revised estimates for the appropriate detailed industries comprising the aggregate.

Seasonally Adjusted Estimates

New seasonal factors are computed and used to produce seasonally adjusted revenue estimates for all available quarters. The new seasonal factors are computed using revised estimates as input to the seasonal adjustment program.

ADDITIONAL INFORMATION

Survey Questionnaires

The Quarterly Services Survey questionnaires can be found on the Census Bureau Web site at: www.census.gov/qss.

Dollar Values

All dollar values presented are expressed in current dollars; that is, the estimates are not adjusted to a constant dollar series. Consequently, when comparing estimates to prior years, users also should consider price level changes.

Confidentiality

Title 13 of the United States Code authorizes the Census Bureau to conduct censuses and surveys. Section 9 of the same Title requires that any information collected from the public under the authority of Title 13 be maintained as confidential. Section 214 Title 13 and Sections 3559 and 3571 of Title 18 of the United States Code provide for the imposition of penalties of up to 5 years in prison and up to \$250,000 in fines for wrongful disclosure of confidential census information.