

Supporting Statement
U.S. Department of Commerce
U.S. Census Bureau
Quarterly Services Survey
OMB Control Number 0607-0907

B. Collections of Information Employing Statistical Methods

1. Universe and Respondent Selection

The QSS is a subsample of firms selected from the SAS sample of the industries listed in section “**19. NAICS Codes Affected**”.

Currently, there are approximately 12,900 firms selected for QSS. Of this number, about 5,200 are large companies selected with certainty (probability equal to one), and about 7,700 are smaller firms selected with a probability less than one. The firms represent NAICS 484; 49; 51; 52; 532; 54; 56; 62; 71 and 81. When the QSS expands, we will add to the sample about 500 certainty companies and about 2,000 noncertainty firms to cover NAICS subsectors 22; 481; 483; 485; 486; 487; 488; 521; 524; 531; 533 and 61 resulting in a total sample of approximately 15,400 firms.

2. Sampling Methodology and Estimating Procedures

2.1 Sampling Methodology

The sampling frame for the QSS sample is a subset of the SAS sample and has the same types of sampling units as the SAS frame—large, multiple-establishment firms and Employer Identification Numbers (EINs). Both sampling units represent clusters of one or more establishments owned or controlled by the same firm.

The primary stratification of the QSS frame is by industry group based on the detail required for the QSS publication. We use less detailed industry groupings to produce QSS estimates than the industry groupings used to produce SAS estimates. Therefore, the industry stratification for the QSS sample is broader than the industry stratification used for the SAS sample.

Within industry group, we substratify the sampling units by a measure of size related to their annual receipts as reported in SAS. We select sampling units expected to have a large effect on the precision of the estimates “with certainty.” This means they are sure to be selected and will represent only themselves (i.e., have a selection probability of one and a sampling weight of one). To identify the certainty units, we determine a substratum boundary (or cutoff) that divides the certainty units from the noncertainty units. We base these cutoffs on a statistical analysis of data extracted from the Census Bureau’s Business Register. We also use this analysis to determine the number of size substrata for each industry group

and to set sampling rates needed to achieve specified sampling variability objectives on receipts estimates for different industry groups.

We select the QSS sample independently within each size substratum contained in an industry stratum. We select firms with certainty if the estimated annual receipts exceeds the certainty cutoff. The selection procedure for the noncertainty portion of the sample follows a systematic, probability proportional-to-size scheme. Because the QSS sample is an independently selected subsample, it is possible that we select some units in the SAS sample at a lower sampling rate than desired for the QSS sample. We include such a unit in the QSS sample and assign a sampling weight equal to the unit's SAS sampling weight. The maximum sampling weight for an EIN selected for the QSS sample is 750.

Periodically, we update the QSS sample to represent EINs issued since the initial sample selection. These new EINs, called births, are EINs recently assigned by the Internal Revenue Service (IRS) on the latest available IRS mailing list for Federal Insurance Contributions Act (FICA) taxpayers and assigned an industry classification (if possible) by the Social Security Administration.

We sample EIN births on a quarterly basis using a two-phase selection procedure. To be eligible for selection, a birth must either have no industry classification or be classified in an industry within the scope of the Annual Retail Trade Survey (ARTS), the Annual Wholesale Trade Survey (AWTS), or SAS, and it must meet certain criteria regarding its number of paid employees or quarterly payroll. In the first phase, we stratify births by industry and a measure of size based on quarterly payroll. A relatively large sample is drawn and canvassed to obtain a more reliable measure of size, consisting of receipts in two recent months, company affiliation information, and a new or more detailed industry classification.

Using this more reliable information, we subject the selected births from the first phase to probability proportional-to-size sampling with overall probabilities equivalent to those used in drawing the initial ARTS, AWTS, and SAS samples. Because of the time it takes for a new employer firm to acquire an EIN from the IRS, and because of the time needed to accomplish the two-phase birth-selection procedure, we add births to the samples approximately nine months after they begin operation.

Updates to the QSS sample occur in the same manner and at the same time as updates to the SAS sample. The births selected for the QSS sample are a subset of the births selected for the SAS sample. These births are selected using sampling rates equivalent to those used in selecting the initial QSS sample.

2.2 Estimation Procedures

Direct expansion estimates for each quarter are computed as the sum of weighted data (reported or imputed), where the weight for each unit is the reciprocal of the

probability of selection of the unit into the sample. The direct expansion estimates are input into the benchmarking procedure to produce the published estimates, as described below.

2.2.1 Quarterly Revenue Estimates

With the initial release of the fourth quarter 2006 estimates, 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 were 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 were 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 direct-expansion estimates, or unmodified estimates, from the prior sample by a geometric mean. (Note that for select industries, the unmodified estimates from the prior sample has been restated on a 2002 NAICS basis, as described in the previous paragraph). The geometric mean is computed as the square root of the product of two ratios. The numerators of the ratios are the unmodified revenue estimates for second and third quarter 2006 from the current sample. The denominators of the ratios are the unmodified 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 2008 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 2007 from QSS to equal the corresponding census-adjusted, annual revenue estimate for employers obtained from SAS.
- For Subsectors 622 and 623, constrains the sum of the four quarterly revenue estimates for 2005 through 2007 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 (2007) 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 2007 is computed. Revenue estimates for quarters after the fourth quarter of 2007 are multiplied by this constant ratio, which is called a carry-forward factor, to derive published revenue 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 subsectors 622 and 623). Revenue estimates for the fourth quarter of 2003 for sectors 51, 54, and 56 and the fourth quarter of 2004 for subsectors 622 and 623 are multiplied by these constant ratios to derive published revenue estimates.

All other sectors will produce benchmarked estimates in a similar manner based on when they are phased into the survey.

2.2.2 Class of Customer and Other Estimates

Similar to revenue, the unmodified estimates for other data items from the prior sample are linked to the unmodified 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. In this way, 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 of 2005, 2006, and 2007 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.

2.3 Seasonal Adjustment

We seasonally adjust quarterly revenue estimates for selected kinds of business. We use the Census Bureau's X-12 ARIMA program to produce the seasonally adjusted estimates.

3. Methods to Maximize Response

The Census Bureau will take the following actions to maximize response rates:

- Customize mailing arrangements for selected large firms
- Conduct outside consultations
- Visit companies
- Customize computer-imprinted instructions to clarify reporting criteria for selected industries
- Offer Internet reporting
- Provide a web site with responses to frequently asked questions
- Plan follow-up actions to contact delinquent forms
- Provide a facsimile option to submit form
- Provide a toll-free number that companies can call for assistance

In instances where the survey coverage requires obtaining data from various subsidiaries or operating units of the company, specialized arrangements will be established to mail separate forms to each subsidiary or operating unit of the company. Customized mailings of this type have proven to be effective in obtaining more timely response and thus reducing follow-up costs, minimizing errors in reporting that result from coverage problems and reducing respondent burden.

The follow-up actions listed below with approximate time frames will be taken for delinquent companies in the QSS.

The facsimile reminder including form is conducted one day after the due date on the mail form. The facsimile form provides 5 business days, and telephone follow-up is one day after due date on fax form.

In addition to the traditional method of reporting (mail-back), the QSS provides respondents the option of reporting on-line (Census Taker), by telephone, or by facsimile. Such options have provided an incentive for firms to report the required information in the QSS. As a result, historical trend patterns yield a report response of approximately 80 percent.

4. Tests of Procedures

The Census Bureau will use procedures based on the results and experiences gained during cognitive interviewing of the QSS, as well as the considerable body of experience with related economic censuses and surveys.

5. **Contacts for Statistical Aspects and Data Collection**

Sample design and statistical methodology questions should be directed to Ruth Detlefsen, Assistant Division Chief for Research and Methodology, Service Sector Statistics Division, U.S. Census Bureau, 301-763-5171. Direct all other questions to Donna Hambric, Assistant Division Chief for Current Service and Transportation Programs, Service Sector Statistics Division, U.S. Census Bureau, 301-763-2639.

List of Attachments

1. QSS - Questionnaire Matrix
2. QSS - Questionnaires/Cover Letter
3. Letter of support from BEA
4. BEA Support for Expansion of SAS and QSS