



## *Statistical Sampling for Sales and Use Tax Audits*

This brochure outlines the Tennessee Department of Revenue's utilization of statistical sampling in sales and use tax audits. Statistical sampling is used when the taxpayer has a volume of records that makes an examination of all records impractical.

### **Taxpayer Benefits**

- Statistical sampling is an accurate method of sampling.
- Used consistently over time, statistical sampling yields reliable results.
- Random selection ensures complete objectivity in the sample selection.
- The sample is representative of the audit population.
- The audit population may have records showing over- and under-payment of taxes. If so, both types of errors will be reflected in the sample.

### **Population Stratification and Sample Selection**

#### *Verifying the Electronic Data*

The data received from the taxpayer is verified for correctness and completeness.

#### *Selection of Accounts*

While all transaction types are subject to audit, refinement of the audit population conserves both department and taxpayer resources.

#### *Defining the Audit Population*

The audit population is the total set of unique transactions from which the sample is selected. Using the data records submitted by the taxpayer, records outside the audit period and records with no tax implication are removed. Data file records are combined to create unique transactions.

#### *Stratifying the Population*

Stratification is the process of dividing the population into groups called strata. Grouping is done in such a way that units within a stratum are more alike than units compared across strata. In sales and use tax audits, the audit population is stratified on the dollar amount of the transaction. Stratification improves efficiency, preserves validity, and offsets the effect of extreme values.

#### *Sample Size*

When determining total sample size, the department typically uses a 75% confidence level, 10% precision, and a

minimum sample size of 70 per stratum. Neyman allocation is used to divide the total sample between strata. Large valued transactions are 100% audited (detailed).

### ***Sampling Plan***

A customized sampling plan is provided to the taxpayer. The sampling plan provides a record identification summary, identifies the sampling unit, gives the detailed stratification, and indicates the total sample size and allocation of the sample to each stratum. The taxpayer is given the opportunity to respond to the sampling plan before the audit proceeds.

### ***Sample Selection***

Once the sample is allocated to the strata, each stratum is randomly sampled to select the unique transactions to be audited.

## **Audit Results**

Each transaction in the sample is examined by the auditor to determine taxability and the amount of error (tax owed minus tax paid).

### ***Average Tax Error***

For each stratum, the average tax error for the sample is determined by summing all the errors in the stratum sample and dividing by the stratum sample size.

### ***Projected Stratum Error***

The average sample error in each stratum is extrapolated to obtain the projected error per stratum.

### ***Estimated Total Tax Error***

To estimate the total tax error in the audit population, the strata projected errors are summed.

### ***Confidence Level and Confidence Interval***

Department policy requires that any assessed value be such that there is 75% confidence that the taxpayer owes at least as much as is being assessed. This is achieved by assessing at the lower limit (LCL) of a one-sided 75% confidence interval. In the case of a credit, the department wants to be 75% confident that the state owes the taxpayer at least as much as is being credited. Thus, refunds are determined by the upper limit (UCL) of a one-sided 75% confidence interval.

### ***Audit Decision***

A 75% one-sided confidence interval is computed and used to determine if the audit results in an assessment, no tax due, or a refund.

Total Population Assessment	75% One-Sided Confidence Interval	Decision
Assessment > \$0	LCL > \$0	Assess at the LCL.
Assessment > \$0	LCL < \$0	No tax due. No refund.
Assessment < \$0	UCL > \$0	No tax due. No refund.
Assessment < \$0	UCL < \$0	Refund at the UCL.

### ***Reporting of Results***

A full audit report is provided to the taxpayer upon conclusion of the audit.

## **For More Information**

A copy of the complete manual, Statistical Sampling for Sales and Use Tax Audits, is available upon request. The Tennessee Department of Revenue welcomes questions and comments.

**Phone:** Audit Support, (615) 741-4463

**E-Mail:** [support.data@state.tn.us](mailto:support.data@state.tn.us)

**Web Site:** [www.tennessee.gov/revenue](http://www.tennessee.gov/revenue)