State of Wisconsin

Department of Revenue

Non-Statistical Sampling

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CAUTION

The information in this publication reflects the interpretations by the Wisconsin Department of Revenue of laws enacted by the Wisconsin Legislature as of December 31, 2016. Laws enacted after that date, administrative rules, and court decisions may change the interpretations in this publication.

I. INTRODUCTION

This publication provides information about non-statistical sampling used in field audits by the Wisconsin Department of Revenue. It explains when and why sampling is used, the factors considered in determining if sampling will be used, how sampling results are calculated and special situations that can affect sampling results. The most common non-statistical sampling methods used in audits (alpha sample, time-based sample, and systematic sample) are explained in Part IV. Throughout this publication the word "sampling" refers to non-statistical sampling.

II. WHAT IS SAMPLING AND WHY IS IT USED?

Sampling is selecting representative items from a universe (a group of items), examining those selected items and drawing a conclusion about the entire universe based on that examination of the selected items.

Sampling is generally used in field audits when it is not efficient to review 100% of the records. Sampling may also be used if records are missing or other circumstances make reviewing all of the records difficult (for example, a change in computer systems).

Not all transactions will be sampled. Even if a sample is used to review a certain set of records or transactions, it is possible that other records may require a 100% examination. Examples of records that normally require a 100% examination include sales invoices for vehicle sales by an automobile dealership and purchase invoices for business assets (for example, machinery and equipment).

The use of sampling in sales and use tax audits is authorized by sec. 77.59(2), Wis. Stats.

III. DETERMINING WHETHER SAMPLING IS TO BE USED

Prior to the start of a field audit, the auditor will ask several questions to determine the best method to review the records. Among the areas of interest are:

1) Business Processes:
   - Business organization (divisions, locations, plants, stores, etc.)
   - Changes in business operations during the audit period (business expansion, acquisition, plant closing, etc.)
   - Economic cycles
   - Significant changes in tax or accounting staff
   - Unusual occurrences

2) Accounting System, Record Maintenance, and Reporting:
   - Accounting or ERP system used (QuickBooks, Sage, Oracle, SAP, etc.)
   - Changes to accounting or record keeping systems
   - Availability of electronic records and data including detailed source documents and summary records
   - Sufficient audit trail from tax returns and financial statements to ledgers to source documents
   - Sales and purchases transaction volume
   - Location and filing method of paper records and documents

3) Products or services sold or manufactured
4) Typical customers or vendors
5) Changes to relevant tax laws, rules, and rates during the audit period

The above factors are considerations in determining whether sampling will be used. The volume of the sales and/or purchase transactions and the method of filing the records are typically the most important factors in determining if a sample will be used and the method of sampling.

If sampling is used, the decision on the sampling method is usually made by the auditor and approved by the audit supervisor. The auditor will explain the sample to the taxpayer prior to the review of the records. When the nature of a taxpayer's business presents problems which affect the sample, a department sampling specialist may be consulted. In such cases a meeting may be scheduled with the taxpayer, the auditor and the sampling specialist to address the problem areas.

After the sampling method is established, the auditor will review the transactions selected to determine what errors, if any, have occurred. After the dollar amount of the errors has been determined, the results of the sample are computed by projecting the errors found and allocating the results over the period of the audit.

IV. SAMPLING METHODS

The type of sampling method used is usually determined by the manner in which the records to be examined are maintained and filed. The availability of electronic records and data may eliminate or change the need for sampling. Electronic records and data are increasingly more common and offer more sampling options. Paper records are most often maintained in alphabetic order, chronological order, or by project number. Therefore, the most common sampling methods used are the alpha sample, the time-based sample, and systematic sample.

A. Alpha Sample

When records are kept alphabetically by customer or vendor name, the alpha sample selection method is generally used. Vendors are assigned alphabetically to each year of the audit in such a manner that an equal share of the documents are examined each year (that is, approximately one-fourth of the purchase invoices will be reviewed for each year in a four year audit of purchases, one third of each year will be reviewed in a three year audit, etc.). For example, assume the audit covers a four year period. An alpha sample of vendor invoices could be set up as follows:

- Year 1 - Vendors A through D
- Year 2 - Vendors E through J
- Year 3 – Vendors K through R
- Year 4 – Vendors S through Z

B. Time-Based Sample

When records are kept chronologically, a time-based sampling method is generally used. The most common time-based method is to select one month's transactions for review for each year under audit. For example, assume the audit covers four calendar years. A one-month-per-year sample of sales invoices could be set up as follows:

- Year 1 - October sales invoices
- Year 2 - July sales invoices
- Year 3 - February sales invoices
- Year 4 - April sales invoices

The months selected would be representative of the annual business cycle (in terms of business activity: one busy month; one slow month; and two average months).

Based on the nature of the taxpayer's business activity, daily and weekly time based samples may also be used.

C. Systematic Sample

When records are kept by job or project number, a systematic sample may be used. Systematic sampling involves selecting samples at a given interval after establishing a random starting place. Based on the nature of the taxpayer's business activity, systematic samples may be stratified by job or project amount (for example, all projects over a certain dollar amount are reviewed 100%.)

V. HOW ARE THE RESULTS OF THE SAMPLE CALCULATED?

Various methods can be used to take the errors found in a sample and project them into an additional measure of tax for the audit period. The most common projection methods used are explained below.

A. Alpha Sample

The formula for determining the additional measure of tax for the audit period in an alpha sample is:

(Errors from Sample) X (Periods in Audit) = Total Additional Measure of Tax

For example, assume the following errors were obtained from a four year alpha sample of purchases:

	ADDITIONAL MEASURE OF USE TAX FROM SAMPLE
Year 1 - Vendors A through D	$1,000
Year 2 - Vendors E through J	$1,200
Year 3 - Vendors K through R	$1,300
Year 4 - Vendors S through Z	$1,500
Total	$5,000

The average annual additional measure of tax is $5,000 (the sum of the four years' errors found in the sampled purchases). This amount is multiplied by 4 (the number of years audited) to arrive at the total additional measure of tax for the four year audit period, $20,000.

The total additional measure is then allocated over the four year audit period. One method of allocating the total additional measure uses total sales. Assuming that the company had the following sales, the total additional measure of tax, $20,000, would be allocated as follows:

	GROSS SALES PER YEAR	**% GROSS SALES PER YEAR TO TOTAL GROSS SALES**	**ADDITIONAL MEASURE OF USE TAX ALLOCATED TO EACH AUDIT YEAR**
Year 1	$ 4,000,000	16%	$ 3,200
Year 2	$ 5,000,000	20%	$ 4,000
Year 3	$ 6,000,000	24%	$ 4,800
Year 4	$10,000,000	40%	$ 8,000
Totals	$25,000,000	100%	$20,000

The allocation method does not change the amount to be projected. It only affects what portion of the total additional measure is allocated to each year. In the above example, Year 1 has a percentage of gross sales to total gross sales of 16% ($4,000,000 ÷ $25,000,000). Therefore, 16% of the total $20,000 error, or $3,200, is allocated to Year 1, etc.

An allocation based on gross sales as shown above is one example of an allocation method used by the department. Other allocation methods may also be used by the department (for example, time or other measurements of activity such as gross purchases). The selection of an allocation method depends on the facts and circumstances of each case.

B. Time-Based Sample

In a time-based sample, the errors from each year are totaled. The ratio projection method or average projection method is then used to determine the additional measure of tax for the audit period.

Ratio Projection Method:

The formula for determining the additional measure of tax for the audit period in a time-based sample, using the ratio projection method, is as follows:

$$\frac{\text{(Errors from Sample)}}{\text{(Amount of Sales, Purchases, etc., from Sample Period)}} \times \text{(Amount of Sales, Purchases, etc., from Audit Period)} = \text{Total Additional Measure of Tax}$$

For example, assume the following errors were obtained from a one-month-per-year sales tax sample:

	ADDITIONAL MEASURE OF SALES TAX FROM SAMPLE
Year 1 - October	$1,000
Year 2 - July	$1,200
Year 3 - February	$ 800
Year 4 - April	$2,000
Total	$5,000

Assume that sales for the months sampled and yearly sales are as follows:

	MONTHLY SALES	**YEARLY SALES**
Year 1 - October	$ 650,000	$ 8,000,000
Year 2 - July	$ 850,000	$10,000,000
Year 3 - February	$1,100,000	$15,000,000
Year 4 - April	$2,000,000	$22,200,000
Totals	$4,600,000	$55,200,000

The errors for the sample months total $5,000. A ratio is computed by dividing the $5,000 in sample errors by the total monthly sales for the months sampled, $4,600,000. In this example, the error ratio for the sample is .1087% ($5,000 ÷ $4,600,000). This ratio is then multiplied by the yearly sales to arrive at the total additional measure of sales tax from the sample.

	YEARLY SALES	**ERROR RATIO**	**ADDITIONAL MEASURE OF SALES TAX ALLOCATED TO EACH AUDIT YEAR**
Year 1	$ 8,000,000	.001087	$ 8,696
Year 2	$10,000,000	.001087	$10,870
Year 3	$15,000,000	.001087	$16,304
Year 4	$22,000,000	.001087	$24,130
Totals	$55,200,000		$60,000

The total additional measure of sales tax from the sample as projected using the ratio method is $60,000.

Average Projection Method:

The formula for determining the additional measure of tax for the audit period in a time-based sample using the average projection method is as follows:

$$\frac{\text{(Errors from Sample)}}{\text{(Number of Periods Sampled)}} \times \text{(Total Number of Periods in the Audit)} = \text{Total Additional Measure of Tax}$$

Assume the same facts as in the ratio projection method example above. The average monthly adjustment is $1,250 ($5,000 total sample errors ÷ 4, the number of months sampled). This average monthly adjustment is then multiplied by the 48 months in the audit period to arrive at the total additional measure of tax, $60,000. This additional measure is allocated to each year as follows:

	GROSS SALES PER YEAR	**% GROSS SALES PER YEAR TO TOTAL GROSS SALES**	**ADDITIONAL MEASURE OF SALES TAX ALLOCATED TO EACH AUDIT YEAR**
Year 1	$ 8,000,000	14.5%	$ 8,700
Year 2	$10,000,000	18.1%	$10,860
Year 3	$15,000,000	27.2%	$16,320
Year 4	$22,200,000	40.2%	$24,120
Totals	$55,200,000	100.0%	$60,000

C. Systematic Sample

In a systematic sample, similar to a time-based sample, the errors from each project sampled are totaled. The ratio projection method is then used to determine the additional measure of tax for the audit period.

The formula for determining the additional measure of tax for the audit period in a systematic based sample is as follows:

$$\frac{\text{(Errors from Sample)}}{\text{(Billing Amount of Projects from Sample Period)}} \times \text{(Billing Amount of Projects from Audit Period)} = \text{Total Additional Measure of Tax}$$

Assume that projects for the audit period were stratified by project amount and sampled as follows:

STRATUM	**LOWER/UPPER LIMITS**	**SAMPLED PROJECTS**	**TOTAL PROJECTS**
0	$1,000 and Below	$ 0	$ 50,000
1	$1,000.01 - $10,000	$125,000	$500,000
2	$10,000.01 - $100,000	$500,000	$5,000,000
100	$100,000.01 and Above	$3,000,000	$3,000,000
Totals		$3,625,000	$8,550,000

Assume further that the projects in each stratum were billed in the years of the audit period as shown below:

STRATUM	SAMPLED PROJECTS	PROJECTS BILLED IN EACH YEAR				TOTAL PROJECTS
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	
0	$ 0	$11,000	$13,000	$15,000	$11,000	$50,000
1	$125,000	$75,000	$110,000	$135,000	$180,000	$500,000
2	$500,000	$1,300,000	$1,800,000	$1,000,000	$900,000	$5,000,000
100	$3,000,000	$800,000	$1,100,000	$500,000	$600,000	$3,000,000
Totals	$3,625,000	$2,186,000	$3,023,000	$1,650,000	$1,691,000	$8,550,000

The errors from Stratum 1 total $5,000. A ratio is computed by dividing the $5,000 in sample errors by the sampled projects for the Stratum 1, $125,000. In this example, the error ratio for the sample is 4.00% ($5,000 ÷ $125,000). This ratio is then multiplied by the yearly project amounts in Stratum 1 to arrive at the total additional measure of sales tax from the sample.

STRATUM 1	YEARLY PROJECT TOTAL	ERROR RATIO	ADDITIONAL MEASURE OF SALES TAX ALLOCATED TO EACH AUDIT YEAR
Year 1	$ 75,000	.04	$3,000
Year 2	$110,000	.04	$4,400
Year 3	$135,000	.04	$5,400
Year 4	$180,000	.04	$7,200
Totals	$500,000		$20,000

A separate projection rate is computed for each sampled stratum. The errors examined at 100% (Stratum 100) are added to the appropriate periods (without projection).

VI. SPECIAL SITUATIONS

A. Unusually Large Dollar Transactions

When a large dollar error is included in the sample results, the overall sample projection could be distorted. For example, a $15,000 error is discovered in a sales tax sample when most errors range from $500 to $2,500.

The solution to this situation is to remove the $15,000 transaction from the sample projection. If a large item is removed from the sample, then additional records must be examined. One common approach is to examine all sales over a certain dollar amount. Any resulting errors would be included in the additional measure of tax, but would *not* be projected. A sales journal might be used to identify the large dollar sales. The facts and circumstances of the taxpayer's business determine what an unusually large error is.

These principles also apply to samples involving claims for refunds of overpayments.

B. Missing Records

Sometimes business records are missing for part or most of the audit period. The most common reasons for missing records are catastrophic events (for example, fire, and flood), human error (for example, mislabeling or destroying documents) or business decisions (for example, business has been sold, the records are in off-site storage). It is the taxpayer's responsibility to retain the necessary records to determine the correct sales and use tax liability (sec. 77.61(4)(a), Wis. Stats.). When records are missing, the results from the review of the available records will be projected into the period for which records are not available.

For example, if sales records for Year 1 and 6 months of Year 2 were destroyed in a fire, the records for the remaining 6 months of Year 2 and Years 3 and 4, would be reviewed using a sample or a 100% examination. The results of the Year 2,

3 and 4 examinations would be projected into the period for which the records no longer exist. A ratio is generally used. Assume a one-month-per-year sample with the following results:

	ADDITIONAL MEASURE OF SALES TAX FROM SAMPLE	MONTHLY SALES
Year 1 - September	$ 400	$ 700,000
Year 2 - May	$1,050	$8,500,000
Year 3 - January	$1,350	$1,250,000
Totals	$2,800	$2,800,000

The error rate computation would be the $2,800 in total additional measure divided by $2,800,000 in total sales for the months sampled, which is .001. The error rate would be multiplied by the total sales for each year (including the period for which records were unavailable) to arrive at the total additional measure of sales tax as follows:

	YEARLY SALES	ERROR RATIO	ADDITIONAL MEASURE OF SALES TAX ALLOCATED TO EACH AUDIT YEAR
Year 1	$ 6,000,000	.001	$ 6,000
Year 2	$ 8,000,000	.001	$ 8,000
Year 3	$11,000,000	.001	$11,000
Year 4	$15,000,000	.001	$15,000
Totals	$40,000,000		$40,000

C. Misclassified and Misfiled Items

Transactions that are misclassified or misfiled do not require an adjustment to the projection. The audit covers the records as they exist, not as they should be maintained.

An example of a misclassified item would be a $5,000 purchase of office furniture that was expensed rather than capitalized. An example of a misfiled item would be a sale in the month of June that was included with the sales from the month of July.

If misclassified or misfiled items result in an unusually large error being included in the sample, an adjustment to the projection will be made. For example, if an office furniture purchase of $5,000 substantially exceeded other expensed purchases, a specific adjustment for the item would be made rather than projecting the error. Likewise, if a June sale, which was filed in with the July records, was not representative of the typical sales made, a specific adjustment for the item would be made rather than projecting the error.

D. Double Inclusion

In an alpha sample the same type of error could be included twice. This situation occurs when a specific type of item is purchased exclusively from a single vendor and that vendor changes during the audit period. For example, during Years 1 and 2 all office supplies are purchased exclusively from ABC Office Supply; in Years 3 and 4 office supplies are purchased exclusively from OPQ Office Supply. None of the office supply purchases were taxed. If the alpha sample for Year 1 included the letters A through D and in Year 3 included the letters K through R, the total amount of error from untaxed office supply purchases would be overstated. The overstatement occurs because the errors from ABC Office Supply and OPQ Office Supply are both multiplied by four when the alpha sample results are calculated.

One solution to the problem would be to review the purchases from both vendors in their entirety. Another solution would be to weigh the purchases from each office supply vendor by multiplying the errors by a factor (50%) before any sample projection.

E. Law Changes

Law changes can affect a sample if the taxability of a particular type of transaction changes during the audit period. For any sample selection method, the universe of the sample must be defined (or redefined) to separate transactions before and after the law change.

For example, a taxpayer is in the business of selling widgets and other products. A law change exempts widgets from sales tax starting in Year 4 of the audit. Two separate samples would be conducted. One sample would cover the first three years when the widgets are taxable, the second sample would cover the period when the widgets were exempt.

F. Claims for Refund

If the taxpayer believes that tax was paid in error on certain transactions included in the sample population, the taxpayer can choose to either:

1. Compile a claim for refund for each transaction (specific basis), **or**
2. Compile a claim for refund on transactions in the sample so the refund can be projected along with the other adjustments (see projection details below).

Option 1: Specific Basis

Auditing the Buyer/Purchaser or the Seller/Vendor

If the taxpayer chooses to compile the claim for refund for each transaction, the auditor will generally review the claim, and any adjustments to the claim would be done on a 100% basis rather than through sampling.

If any claim for refund transaction is also included in the sample, the transaction in the sample will be treated as zero error since specific adjustments will be made as part of the examination of the refund claim.

Option 2: Projections of Overpayments

Auditing the Buyer/Purchaser

Tax paid in error (overpayments) on purchase transactions can be projected in a sample, regardless of whether the tax was paid to the vendor or directly to the State (self-assessed). As a result of projecting the overpayments, all transactions in the universe of the sample are considered as having been refunded, even though a transaction was not selected for the sample. This means that no additional refund, either to the seller or to the buyer, is allowed for any transaction that was in the universe of the sample, whether the transaction was selected for review or not.

The auditor is not required to investigate each purchase to determine if tax was paid in error. It is the taxpayer's responsibility to review the sampled purchases and prove the exempt status of any purchase on which tax was paid. However, if information comes to the auditor's attention that tax may have been paid in error, the auditor will inform the taxpayer to investigate the transaction further to determine if an error has occurred.

Auditing the Seller/Vendor

Tax paid/collected in error on sales transactions can be projected in a sample. As a result of projection the overpayments, all transactions in the universe of the sample are considered as having been refunded, even though a transaction was not selected for the sample. This means that no additional refund, either to the seller or to the buyer, is allowed for any transaction that was in the universe of the sample, whether the transaction was selected for review or not.

The auditor is not required to investigate each sale to determine if tax was paid in error. It will be the taxpayer's responsibility to review the sampled sales and prove the exempt status of any sale on which tax was paid. However, if information comes to the auditor's attention that tax may have been paid in error, the auditor will inform the taxpayer to investigate the transaction further to determine if an error has occurred.

The auditor will determine whether tax has already been refunded to the buyer on the transaction in question (either through field audit or claim for refund). If the buyer was audited for the period of the transaction, the auditor must determine whether the transaction was included/excluded from the universe of any sample of the buyer's audit as well as any specific adjustments made in the audit report.

Note: Once the taxpayer makes the decision to pursue a refund through the sample or a specific basis, the taxpayer may not change course and pursue the other method.

If the taxpayer intends to file a claim for refund, the taxpayer should inform the auditor and sampling specialist as early in the audit as possible so the refund claim can be verified and processed as efficiently as possible.

VII. COUNTY, STADIUM AND ANY OTHER SALES-BASED TAX PROJECTIONS

The same sample used to compute an adjustment for state sales and/or use tax purposes may also be used to compute county, stadium or other sales-based tax adjustments.

VIII. COMPLETION OF THE SAMPLE

After the auditor has reviewed the sampled transactions and discussed errors with the taxpayer, sample computations are made. The sample results are reviewed by the audit supervisor and/or the sampling specialist, prior to being presented to the taxpayer. The auditor will then explain the sample results to the taxpayer.

IX. PROJECTING SAMPLE RESULTS TO OTHER OPEN YEARS

The Department of Revenue may project field audit results forward to subsequent years under certain conditions. The taxpayer and department must agree to the computations. The department and taxpayer both benefit from projecting audit results forward. Benefits to the taxpayer include:

- Time saved by not having to prepare amended returns or go through another audit for projection forward years
- Less interest since the tax due is paid sooner

Whether an audit can be projected forward depends on the facts and cirucumstances of each case. Factors that may indicate the audit is not a good prospect for projection forward include the following:

- Changes in the taxpayer's business operations
- Changes in the method of reporting taxes or in personnel responsible for the reporting
- Tax law changes that affect the taxpayer
- Unagreed issues in the period audited

However, these factors do not automatically preclude a projection forward.

In most cases, only one audit cycle (up to 4 years) of projection forward will be considered. If you have any questions about the projection forward process, please discuss with the auditor that is handling your audit.

X. QUESTIONS ABOUT THE SAMPLE

All questions about sampling should be addressed to the auditor and/or the auditor's supervisor. It is a goal of the Department of Revenue that every sampling procedure be understood by the taxpayer.