

**Michigan Department of Treasury  
Tax Compliance Bureau  
Audit Division**



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**Audit Sampling  
Manual**

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**June 2015**

## **Disclosure**

This manual is not intended as a statement of law, Department policy, or of the Treasurer's official position. The information contained in this manual has been prepared as instructional text. The purpose of this manual is to explain sampling procedures for sales and use tax audits.

Any references in this manual to Rules, Revenue Administrative Bulletins (RABs), Internal Policy Directives (IPDs) and Letter Rulings are based on the most recent versions available as of the date of this edition. The materials will be reviewed regularly and revised as needed. Where changes in the law supersede and conflict with anything in this document then the new law shall control.

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## **Chapter 1 – Introduction**

### **Overview**

Audit sampling is defined by the American Institute of Certified Public Accountants in its Clarified Statement on Auditing Standards (SAS) No. 122 (AU-C sec. 530.05):

“The selection and evaluation of less than 100 percent of the population of audit relevance such that the auditor expects the items selected (the sample) to be representative of the population and, thus, likely to provide a reasonable basis for conclusions about the population. In this context, **representative** means that evaluation of the sample will result in conclusions that, subject to the limitations of sampling risk, are similar to those that would be drawn if the same procedures were applied to the entire population.”

This audit sampling manual covers the procedures for sampling the taxpayer’s records as part of sales and use tax audits. The primary objective of an audit is to determine, with the least possible expenditure of time for both the taxpayer and the Department, the accuracy of reported tax. Sampling allows an audit to be conducted efficiently and can be as reliable as a detailed audit. This manual addresses sampling techniques (statistical and non-statistical) that may be used when auditing taxpayers who maintain electronic or manual records. Either approach to audit sampling, non-statistical or statistical, can provide sufficient evidence to form a conclusion about the correct amount of sales or use tax that should be reported over the audited period. According to SAS No. 122, both approaches require the auditor to use professional judgment in planning, performing, and evaluating a sample. Therefore, this manual is intended to provide guidelines for audit sampling and supplement the formal classroom sampling training. It is not intended to establish rigid rules; rather it will explain the general goals of sampling and allow the auditor discretion in developing and implementing an appropriate sampling plan. The auditor is responsible for his/her work and should consult with the audit supervisor if there are questions regarding information contained in this manual or in the classroom training.

### **Role of the Tax Auditor**

In an audit, the auditor works with the taxpayer to identify available records and the information captured in those records that is needed for the audit. Using the Department’s authorized software, the auditor will convert the taxpayer’s data into a format which will allow the auditor to sort, sample, analyze, and evaluate the data. The tax auditor’s responsibilities include:

- Determining the audit period

- Determining which records or information must be reviewed
- Determining audit areas to be sampled and those to be detailed
- Determining how the audit will be conducted
- Determining the timing and scheduling of the audit fieldwork
- Coordinating the schedule of all participants in the audit
- Determining the availability and accessibility of electronic records
- Communicating with the taxpayer's information technology personnel to determine what electronic records are needed to complete an audit
- Converting the data using the Department's authorized sampling software
- Analyzing the data and selecting the sample
- Documenting the sample selection process and the results

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## **Chapter 2 - Statistical Audit Sampling**

### **Auditing in an Electronic Environment**

With the capabilities of technology used in the electronic audit process, the examination of taxpayer's transactions does not have to be limited to small time periods or blocks of transactions. Receiving electronic data from the entire audit period does not mean that all of the data will have to be examined. However, selecting a sample from the entire audit period will generally provide a more accurate sample than selecting from a period that does not extend through the entire audit period.

The use of electronic sampling in the audit process should result in an increase in audit efficiency and quality. Increasing the Department's sampling and analytical capabilities may result in the examination of fewer records than in a manual audit. Audits using electronic records are less time consuming, less disruptive, and more cost effective for the State and the taxpayer. Auditors will determine the feasibility of electronic sampling based upon the type of data available. With proper planning, the quality of audits is improved. The following factors must be considered:

- Efficiency
- Effectiveness
- Quality

Some benefits of using statistical sampling:

- Better working paper documentation
- The audit work is more objective and defensible
- An efficient and effective audit is designed
- Opportunity for cost reductions when conducting audits
- Randomness is assured in selection of the sampled items
- The results of the sample are evaluated by providing an objective measure of the sampling risk

The electronic audit process is dependent upon the use of the taxpayer's computer accounting system, although paper documents may also be necessary. If the Department authorized electronic sampling software is used, the auditor can utilize the



software's data conversion capabilities to audit through a taxpayer's computer system, as opposed to auditing around it. **Data conversion** is the process of converting data imported from a computer system into a form that enables the data to be analyzed.

**Overview of Statistical Audit Sampling Procedures**

<p>Identification of Audit Candidates</p>	<ul style="list-style-type: none"> <li>•Schedule pre-audit conference to discuss the sampling method and determine audit potential &amp; feasibility</li> <li>•Audits identified that can provide electronic records</li> </ul>
<p>File I.D. &amp; Data File Request</p>	<ul style="list-style-type: none"> <li>•Identify appropriate electronic files to be used in audit</li> <li>•Request electronic data files, related file layouts, descriptions &amp; data dictionaries</li> <li>•Identify data files &amp; data field definitions that are crucial in defining audit populations and determining if an adequate audit trail to source documents exist</li> </ul>
<p>Data Integrity &amp; Testing</p>	<ul style="list-style-type: none"> <li>•Evaluate &amp; review level of internal controls</li> <li>•Verify integrity &amp; completeness of data using control total reports</li> <li>•Trace test transactions to source documents to test audit trail</li> </ul>
<p>Population Definition</p>	<ul style="list-style-type: none"> <li>•Identify population group(s) to be segregated for separate reviews</li> <li>•Further refine scope of examination by selecting or eliminating certain transactions or accounts</li> </ul>
<p>Population Evaluation</p>	<ul style="list-style-type: none"> <li>•Evaluate defined audit population(s) to identify possible optimal stratifications</li> </ul>
<p>Population Analysis - Sampling or Detail Information</p>	<ul style="list-style-type: none"> <li>•Identify sampling units</li> <li>•Analyze group(s) by stratifying into dollar ranges</li> <li>•Each dollar-value strata is considered its own population for sampling and projection of error purposes</li> <li>•Determine high and low dollar ranges and number of strata breaks</li> <li>•Using sampling software, select the sample</li> </ul>
<p>Report Generation</p>	<ul style="list-style-type: none"> <li>•Export selected sample and detail transactions to auditor exception lists</li> <li>•Generate audit schedules and/or reports (workpapers/taxpayer requests)</li> </ul>

## ***Identifying Audits for Statistical Analysis***

Electronic sampling is most beneficial when auditing business activities with extensive electronic accounting systems. The Tax Audit Questionnaire may give an early indication as to whether the taxpayer's accounting records are electronic. Because the transactional level is the level on which sales and use tax are determined, the benefit of electronic sampling is maximized if performed on transaction-level detail. If the taxpayer's electronic records only maintain data on the summary level, individual transactional tax decisions cannot be made or enhanced by using electronic sampling techniques. Therefore, the level of detail kept in the taxpayer's electronic records must be determined before the extent and scope of electronic sampling can be determined.

**Note: Each population and taxpayer's system is different and there is no set method for sampling taxpayer's data. Due care and some flexibility must be used in determining sampling methods.**

When it has been determined that a taxpayer maintains electronic records for all or part of the audit period, the following items should be considered:

- Large volume of transactions for sales and/or accounts payable
- Prior audit history
- High hours spent on previous audits of the taxpayer
- Taxpayer complexities
- Sales to many jurisdictions
- Multiple locations

## ***Statistical Audit Sampling***

Statistical sampling procedures should be used when electronic records are available, including determining the optimal strata-breaks and the size of the sample. The American Institute of Certified Public Accountants Clarified Statement on Auditing Standards (SAS) No. 122, AU-C sec. 530.05, defines statistical sampling as:

“An approach to sampling that has the following characteristics:

- a. Random selection of the sample items

- b. The use of an appropriate statistical technique to evaluate sample results, including measurement of sampling risk

A sampling approach that does not have characteristics *a* and *b* is considered non-statistical sampling.”

### ***Steps in the Statistical Sampling Process***

For sampling to be efficient and accurate, planning at each step in the sampling process is needed. The auditor should have a sufficient understanding of the taxpayer’s accounting system, types of records available, how the records are filed, and how they can be retrieved. Equally, the taxpayer should have a sufficient understanding of the sampling process in order to help the auditor sample efficiently and accurately.

The Department uses a variable sampling plan for audits using statistical sampling. Variable sampling is a statistical plan to project a quantitative characteristic, such as a dollar amount. The following are the general steps for selecting a statistical sample of electronic records using the Department’s authorized software:

1. Define the population, select accounts of interest and determine the sampling frame to be sampled
2. Determine the sampling unit (e.g., invoice or line items on an invoice)
3. Verify control totals
4. Determine sampling criteria
5. Draw the sample (run the sampling application)
6. Complete the audit of the sample
7. Evaluate the results
8. Project the results

### ***Pre-Audit Planning***

Proper planning of an audit is essential in the flow of information. The efficiency and effectiveness of an electronic record audit is directly dependent upon the initial planning stage.

All indications may point to the fact that an audit will benefit from the use of electronic sampling techniques. However, the actual use of electronic sampling is dependent on

several factors. Most of these factors must be discussed with the taxpayer before the final decision can be made. These factors could include:

- Whether the proper electronic records are available
- What information is contained in the electronic records
- For what period of time the electronic records are available and accessible
- Taxpayer's receptiveness to this audit approach
- Taxpayer's receptiveness to releasing its electronic records
- The time frame in which the audit must be completed
- The identification of appropriate target populations
- The choice of item sampled (sampling unit)
- The availability of population totals to be used for projection
- Sample size

The pre-audit conference held with a taxpayer provides the auditor with the opportunity to gather information and gain an understanding of a taxpayer's business operation and system of record keeping. This conference should also help the taxpayer in understanding the proper documentation to be supplied and the records needed by the auditor. When supplied the proper documentation and records, the auditor has the ability to complete the audit in an efficient and effective manner. All the knowledge gained in a pre-audit conference will help auditors prepare an effective audit plan.

**Note: In an electronic audit, the initial gathering of information is essential to the planning of that audit. This is probably one of the biggest differences between a manual audit and an electronic audit.**

The following general information needs to be obtained in the pre-audit conference:

- Identify the taxpayer's business activities
- Establish the taxes and the periods to be audited
- Company structure - type of ownership, number of locations, each location's business activities

- Records that are needed for the audit
- Records maintained and the location of records
- Tax reporting procedures
- Internal controls for tax reporting
- Chart of accounts
- Authorization to contact a taxpayer representative(s) who will be responsible for phases of the audit

The specific electronic data issues that must be addressed are directly related to the above information that the auditor must obtain:

- The type of electronic records needed
- Detail transactional level records
- Sales tax - invoice or invoice line item
- Use tax - account distribution level
- **Note: Summary records will not provide the necessary information**
- The fields of information needed
- The fields that are required to provide an audit trail to the source documents
- The number of electronic records containing the required data fields
- How much data is accessible
- Periods:
  - Availability of current records
  - Availability of archived records
- The possible techniques and approaches that will be taken when using electronic records
- Separate examinations that may be required for different groups of transactions

- Various sampling alternatives

The pre-audit conference may also include discussion of the following:

### ***Business Processes***

An auditor should review the taxpayer's general business practices and history, as any changes could affect the sample. The auditor should consider:

- Internal controls in place
- Changes in business practices and structure
- Changes in management and in accounting staff
- Changes in locations, seasonal and business cycle changes
- Type of products or services, pricing, product lines, etc.
- Tax laws, rules and rates during the audit period

### ***Accounting System, Record Storage and Tax Reporting***

An auditor should also review the taxpayer's accounting systems, records storage and reporting procedures.

### ***Special Considerations for Accounting***

- What accounting methods does the taxpayer use to account for sales and or purchases transactions? Have there been any changes in accounting methods?
- How do the accounting procedures for financial reporting, federal income tax, and state tax reporting differ? Are there audited financial statements available?
- Is there an accounting procedures manual?
- What accounting records are available for sales and purchases; journals, invoices, voucher and check registers, expense and capital records, etc.? Are electronic records available? If yes, in what type of format are the electronic records stored?
- Are there customer and vendor lists available for the audit periods?

- Is there a centralized accounting system or divisional systems? Is there an audit trail between financial statements, trial balance, ledgers to source documents?

### ***Special Considerations for Record Storage***

- What is the volume of source documents? Can an accurate estimate be made?
- Are summary totals available for source documents (e.g., sales or purchase totals)?
- How are numbers assigned to source documents such as invoices, vouchers, checks, purchase orders, etc.? How are numbers assigned to different units?
- How are source documents prepared and filed? What information is available?
- What types of electronic formats are available? Can electronic records be traced to the hard copy source documents?

### ***Special Considerations for Tax Reporting***

- Is more than one sample required?
- Are summary or other records available to assist in making a proper tax determination?
- Is all tax return information available? Have there been any changes in reporting?
- Are there any other special reporting procedures that may affect sampling?

### ***Taxpayer Cooperation***

The cooperation of a taxpayer must be gained in the pre-audit conference. As in a manual audit, gaining the cooperation of a taxpayer is directly related to the flow of information received from and provided to a taxpayer. To gain a taxpayer's cooperation, the program should be fully explained and any concerns of the taxpayer should be addressed. The auditor should explain to the taxpayer that the advantages of completing audits using electronic records are greater than the disadvantages. Some of the advantages of allowing the auditor to use the taxpayer's electronic records include:

- Improved efficiency
- Improved effectiveness



- Improved quality of the audits produced
- Less time for audit completion
- Less time spent at the taxpayer's location

The auditor and the taxpayer should develop the sampling plan together. It is important that the taxpayer understand the objectives and the techniques that will be used to choose a sample and make a tax determination based on the taxpayer's records. The auditor should explain how the sample will be selected and how the results of the sample will be projected over the entire population or audit period.

### ***Potential Delays in Processing Taxpayer Files***

There are a number of factors that may cause a delay in the taxpayer releasing electronic records:

- All the necessary electronic data must be researched and identified
- Additional conferences may be necessary to review the electronic data identified
- Records from earlier periods of the audit period may be archived and must be retrieved
- Time must be scheduled within the taxpayer's Information Technology department to obtain electronic files for audit purposes

After the data is received, problems with the data may result in additional delays. Possible delays include:

- Unreadable/corrupted data
- Incomplete data
- Lack of data integrity
- Additional fields of information necessary for analyzing the data

To minimize delays, the taxpayer and the auditor should maintain regular communication.

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### **Chapter 3 - Population, Sampling Frame, Sampling Unit Defined**

Sampling cannot be accomplished without each one of these key elements defined. The key elements of sampling are:

- Target Population and Sampling Frame
- Sampling Units

#### **Target Population and Sampling Frame**

A **population (universe)** is a group of all possible units with some common characteristic, such as sales or purchase transactions.

The **target population** is the total of the items of interest. Items of interest are those items in a population (universe) that are the focus of the audit (transactions that have potential for error) and to which the results of the audit sample will be applied. The target population should exclude items that do not share the attributes of the items of interest. For example, to conduct a use tax audit for untaxed purchases, the auditor should exclude payroll and inventory accounts from the target population. If these items were selected in the sample, the results would not be representative of the desired target population. However, it does not invalidate the sample.

The **sampling frame** is a group of items from which the sample is taken. For greater efficiency and accuracy, the sampling frame should include only those items from the desired target population (items of interest). Items of interest are not exclusive to only accounts, but can pertain to locations, time periods, etc.

When determining the appropriate sampling frame, similar items of interest can be excluded from the sampling frame, which results in unsampled items of interest. This requires an assumption that uniformity between sampled and unsampled items exists and results of the sampled items are projected to all items of interest (i.e., both sampled and unsampled items).

The following are examples of characteristics of a population that can be used to refine the target population or sampling frame.

- General ledger accounts / types of accounts
- Transaction identification numbers or codes, sales or purchase invoice numbers
- Prices / values / time periods

- Tax return categories / types of deduction / tax accruals
- Divisions / departments / product lines / customer types

Sometimes, the population (universe) can be naturally broken down into target populations, with each target population separately sampled. An example of separate target populations is an equipment retailer with sales of new and used equipment, rentals of equipment, and sales of parts. When auditing for sales, the target populations can be broken down into new and used equipment sales, rentals, and parts. The target population could be broken down further by dollar values as well.

### ***Sampling Units***

A sampling unit is one of the individual elements that comprise the sampling frame. The characteristics of the sampling unit are measured to estimate those characteristics of the target population. A sampling unit may be source documents (individual transactions), account balances (a summary of many transactions), a block of transactions (clusters), or individual line items on a source document (components of an individual transaction). It is preferable to choose the sampling unit that provides the lowest level of detail. For example, choosing the invoice as the sampling unit rather than a folder of invoices is preferable. However, the sampling unit may be determined by what is available.

The type of sampling unit will have an effect on the results of the audit as a whole. It is best if the characteristics of each sampling unit are similar to reduce sampling errors. **Sampling errors** can occur when sampling units vary considerably from each other. For example, if a check is used to pay multiple invoices, sampling checks may vary little among themselves. However, a single invoice may vary considerably from other invoices in the population. The population dollar total will be identical, but the differences in the sampling units (checks and invoices) will have an effect on the sampling error.

### ***Selecting the Sampling Unit***

The following are the Department's preferred sampling units. These are meant to be guidelines in helping the auditor to decide which sampling unit should be used if all things considered were equal. Since this is rarely ever the case, auditor judgment will be needed in selecting the appropriate sampling unit.

- Electronic records (from line items to invoice level)

Examples of sampling units and sampling frames:

- Use Tax (Expense Purchases)

<u>(Sampling Unit)</u>	<u>(Sampling Frame)</u>
Purchase Orders	Purchase Orders
Sequence Checks	Check Sequence
Line Item	Purchase Journal Posting

- Sales Tax (Deductions)

<u>(Sampling Unit)</u>	<u>(Sampling Frame)</u>
Sales Invoices	Invoice Number
Sequence Line Item	Sales Journal
Cash Register Tapes	Daily Cash Register Totals

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## **Chapter 4 - Population Considerations - Special Topics**

This section addresses the types of special transactions that may exist in a population as well as a sample and how they will be handled. These special transactions are:

- Missing items
- Negative transactions (Credits and Debits)
- Extraordinary items
- Bad debts
- Voids and duplicates
- Installment sales or purchases
- Reclassifications and corrections
- Statute of Limitations
- Sales and use tax paid in error

These special transactions will directly affect the quality of the sample and its projection. Special transactions should be discussed with the taxpayer in the initial discussion regarding the sampling procedure.

### ***Missing Items***

In detail examinations, the fact that a few documents are missing or unsubstantiated can be immaterial in relation to the total. In a manual sample review, an auditor may never know there are missing items. As a result, the exceptions are projected over the population, which will magnify the effect of the missing items.

For example, in a block sample, a \$50 invoice may be considered relatively immaterial. That same invoice in a statistical sample may be considered much more relevant since fewer transactions are typically reviewed. The \$50 item in the statistical sample may be the equivalent in value to a \$5,000 item in a block sample.

There are three basic options when encountering a missing item:

1. The item can be considered an error (exception).

**Example:**

A transaction represented the only purchase from a vendor. The purchase represented an item of interest. The taxpayer was unable to obtain an invoice from the vendor. The auditor treated the purchase as an error.

2. The item can be accepted as reported with no adjustment.

**Example:**

A missing item represented a common purchase made from a vendor that seemed to always charge tax. All other transactions of a like kind in the audit period showed tax being charged. The auditor treated the item as a non-error.

3. Partial adjustment based on alternative evidence or procedures.

**Example:**

A missing invoice from a vendor with a history of errors was included as a sample item. A history of other transactions could be obtained on this vendor. The auditor used the proportionate error(s) found in the other transactions and applied it to the missing invoice, representing a partial error.

Generally, missing items should be treated as an error or exception unless the taxpayer can provide evidence clearly supporting the item is not in error. The three examples above are not totally inclusive. Auditor judgment should be used to determine what is most appropriate.

***Negative Transactions (Credits and Debits)***

Negative items are often present in a population. These items reduce the total amount of a general ledger sales or expense account and are often the result of accounting errors or returns of merchandise. Such items could be correcting entries, adjusting entries, voided invoices, credit memos, or other similar transactions. For clarification purposes, negative transactions do not refer to sample items for which the auditor has made a determination that sales or use tax was paid in error. The Department provides separate guidelines for sales and use taxes paid in error and discovered during the audit.

The problem of what to do with negative transactions in a population occurs frequently. In a perfect world, each negative transaction should be matched with its corresponding positive transaction. However, if the invoice detail is not complete or the volume is great, it may not be possible to match each negative transaction to the positive transaction that generated it. The preferred method would be to remove each negative

and its corresponding positive from the population prior to sampling. Remaining unmatched negatives must also be removed. If an error is found in the sample, the taxpayer may offset the error with the corresponding unmatched negative transaction. The negative transaction should normally occur within the current audit period. It is within the acceptable limits to consider evidence from outside the sample when determining the value of error for the sample item selected. All transactions, related documents, and accounting entries should be followed to their logical conclusion.

The best guideline for dealing with negative transactions is to understand the different types of negative transactions and their effect on the population under audit. Some examples of negative transactions that may occur in a sample are:

- Credit memos for returned sales
- Debit memos on returned purchases
- Credit memos for sales tax only
- Credit entries for returned goods
- Credit entries to correct posting errors
- Credit entries to reduce book values of assets
- Credit entries to post cash discounts given or taken
- Credit entries to remove items from a Construction in Progress (CIP) account

Alternative methods for handling negative transactions:

- Create separate populations for positive and negative transactions, stratify the dollars in each population independently of the other, select samples from each and project the error(s) against each population independently.
- Select a sample from the positive transactions and analyze negative transactions separately.

These guidelines should work for most audits; however, each sample must be judged on its own merits. The auditor should consult with the audit supervisor if the above guidelines cannot be applied.

### ***Extraordinary Items***

A one-time purchase from a particular vendor is not an extraordinary item if it represents goods purchased in the normal course of business.

On occasion, a taxpayer will contend that an item is extraordinary or nonrecurring and should not be included in the sample. Normally it is a purchase of a high dollar item or a one-time purchase from a particular vendor. In theory, samples should be representative of the population; therefore nonrecurring error(s) would not exist. If an item is found to distort the sample results or not be representative of the normal course of business, then the auditor and taxpayer should try to determine the best possible solution that resolves the issue. However, if the taxpayer is not in agreement, the auditor should discuss this issue with the audit supervisor. The most efficient way of handling nonrecurring items is to identify them and exclude them from the population prior to sampling. If the taxpayer is unable to identify nonrecurring items prior to drawing the sample, then they must be included with all other items. Normally, high dollar items will fall in the detail range, which will not be projected.

### ***Bad Debts***

A sale that is later substantiated as a bad debt should be handled appropriately based upon the sampling method used. During the sample review in a statistical sampling audit only, the bad debt should not be removed from the population after the sample has been selected.

### ***Voids and Duplicates***

In an electronic records audit, voids (canceled or unused invoices) and duplicates should be removed from the population prior to selecting the sample. In a manual records audit, voids and duplicates may be handled in the following manner:

Voids may be left in the sample and evaluated as a “zero” or non-error item. This may require an increase in sample size to maintain the quality of the sample. No actions or special audit procedures are necessary. However, audit results may be distorted when large amounts of voids and duplicates occur in the sample.

### **Example:**

Sales invoices are frequently voided. There are many voids and they are difficult to count. When a random number corresponds to a voided item, the void becomes a sample item. However, the sample base amount is not affected and the item is treated as a non-error.



## ***Installments***

If the sampling unit selected is part of an installment transaction, then the entire transaction should be examined. If an error is found, then it should be projected to the sample item proportionate to the entire transaction amount.

### **Example:**

A transaction is billed on four invoices. Each billing is for \$1,500, for a total of \$6,000. One of the invoices for \$1,500 is selected in the sample. Three more installment payments for \$1,500 exist but were not selected. One of the four invoices is not in the sampling frame. Upon review of the entire transaction, the following is determined:

The valuation for the sampling unit error is \$750. Of the \$6,000 total transaction, \$3,000 is in error.

*The formula to value the error is:*

$$\frac{\text{Total Transaction Amount Error}}{\text{Total Transaction Amount}} \times \text{Sampling Unit Amount} = \text{Sampling Unit Error}$$

*Calculation:*

$$\frac{\$3,000}{\$6,000} \times \$1,500 = \$750$$

When a sample item is part of an installment sales contract, this item should be reviewed in its entirety whether sampling manually or electronically. Only in a manual audit, should the item be removed from the sample and the population and treated separately. In an installment sale, sales tax is due on the full amount at the time of the sale. Do not confuse installment sales with lease contracts on which use tax can be paid on the monthly lease payments.

## ***Reclassifications and Corrections***

Reclassification and correcting entries may occur within or outside of the sampling frame. The treatment of these has a direct impact on the quality of the sample. Similar to negative transactions, reclassification or correcting entries should be viewed

along with related documents and accounting entries tracing the entries through the accounting system.

Reclassifications and corrections generally occur when the sampling frame is the detailed general ledger or special reports that include journal postings.

**Examples:**

- A reclassification of an expense item in a purchases examination to an account included inside or outside the sampling frame
- A correction to a billing that is not on a sales invoice

Only in a manual audit, if an item is found to distort the sample results or not be representative, it should be removed from the sample and the population and handled separately; that is, this sample result is not projected to the overall population.

If a portion of a sample is determined to be beyond the statute of limitations, the original sample will still be considered valid. The sample error rate should be determined as originally planned. The projection base should be adjusted to reflect only the portion of the audit period that remains in statute.

**Summary**

This section discussed the treatment of some special topics that can arise when sampling. Many other special areas exist within the scope of sampling and should be addressed on a case-by-case basis. This manual was designed to provide auditors with the fundamentals of sampling as they apply to sales and use tax audits and to promote consistency.

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## Chapter 5 - Determining Sample Size – Statistical Sample

The sample size in a statistical sample is the number of sampling units selected for examination from the population (universe). Generally, for optimal sample sizes, stratified random sampling is preferred. In a stratified random sample, a separate sample will be drawn from each stratum. A **stratum** is an individual group within the population on which a sample is drawn. Each stratum is usually determined by dollar amounts and each item has an equal chance of being selected. When stratifying, each item must appear in one and only one stratum.

Generally, stratified random samples will consist of a minimum of three strata: A low dollar range, a high dollar range and the sample range(s) that fall between the two. The auditor may choose to increase or decrease the number of strata based on the population. Before selecting the samples the auditor needs to consider the following:

- **Low Dollar Range (De-minimus)** – The low dollar range is a range of items the auditor may choose not to review as a part of the sample. However, if the total dollars in this range is material (as compared to the entire population), then further analysis should be considered. Other options are selecting a sample from within the low dollar range and projecting the results or applying the percentage of error from the adjacent stratum to the de-minimus stratum.
- **High Dollar Range (Detail)** – The high dollar range is a range of items which the auditor will review in detail, will not be included as part of the sample ranges, and will not be projected over the sample population. Based on the population, auditor judgment should be used in determining the high dollar amount.
- **Sample Ranges** – The sample ranges are individual strata that fall between the low and high dollar ranges. A separate sample will be selected from each stratum. Additional considerations should be made prior to sample selection.
- **Confidence Level** – The confidence level quantifies the accuracy of the sample. It's stated as a percentage and tells the auditor how sure he or she can be that the sample results reflect the actual results obtained by testing the entire population. It's the likelihood that the true population parameter lies within the range specified by the confidence interval.

**Example:** A confidence level of 90% says that the sample results will meet the true value of the population 90 times out of 100. It also says that 10 times out of 100, the sample results will not meet the true value of the population.

In general, a confidence level of 90% or 95% will be used. The confidence level

has a direct effect on the size of the sample. A confidence level of 95% will result in greater precision but will generate larger samples as compared to a 90% confidence level. In most instances, a reasonably high confidence level can be achieved without sampling a high percentage of the population.

- **Confidence Interval** – The confidence interval indicates the precision of the estimate and the uncertainty of the estimate. It tells the auditor that he or she can be sure that the results from the sample are correct within a certain plus or minus percentage.
- **Relative Error Tolerated** – This is more commonly known as precision. It is the amount of error the Department is willing to tolerate. It also means that the determined results should be within the desired precision rate. A precision of 5% or 10% is commonly used. Using a precision level of 10% will result in a smaller sample size and the sampling error will be greater.

**Note: The Relative Error Tolerated is not directly related to the 90% (or 95%) confidence level.**

- **Minimum Sample Items per Stratum** – This is the minimum number of items to be sampled within each stratum. A minimum of 30 items per stratum should be sampled to achieve optimal sample sizes. There is support for this value in statistical practice, and it is generally sufficient to give the sample credence with the taxpayer.
- **Value of Pre-Stratification Intervals** – The optimum break point calculation partitions the data into strata before determining the optimum point. These intervals are used in determining the number of strata and the optimal strata breaks.
- **Number of Desired Optimal Strata Break Points** – This is the number of partitions into which the data will be divided between the high and low dollar ranges. An increase or decrease in the number of strata will have a direct effect on the overall sample size.
- **Minimum Total Number of Items Selected** – This is the minimum total number of items to be selected for all sample ranges (excluding the detail range). If additional sample items are needed, then the minimum number of items selected should be set to the desired number. The desired number must exceed the original number of items selected.

**Once the auditor has taken the above into consideration, the sample can be selected using the Department's authorized electronic sampling software.**

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**Chapter 6 - Projection of the Sample Results**

The results of a sample should be applied only to the population from which it was selected. The projection base measures total book value of the target population, e.g., gross sales, deduction amounts, taxable sales, total purchases, and/or total expenses.

**Ratio Estimation**

There are many methods for projecting sample results. The ratio projection method is the method most frequently used and will be used by the Department for statistical random samples unless there are extenuating circumstances that prevent its use. This method requires the auditor to develop a ratio from the sample findings. The ratio is the total error divided by the sample base. The error ratio is then multiplied by the projection base to arrive at the estimated adjustment.

**Ratio Estimation (Sales Example):** A sample of 500 transactions was done on a population of sales invoices with an amount (reported value) of \$10,000,000. The total amount (reported value) of the sample was \$500,000. The error amount in the sample is \$60,000.

Formula:

$$\frac{\text{Sample Error}}{\text{Sample Base}} = \text{Projected Error Rate}$$

$$\text{Projected Error Rate} \times \text{Projection Base} = \text{Projected Error}$$

Calculation:

$$\frac{60,000}{500,000} = 0.12 \text{ (i.e., 12\%)}$$

$$0.12 \times 10,000,000 = 1,200,000$$

Projection Base (i.e., Population Base) by year:

In 2010 -  $0.12 \times \$1,000,000 = \$120,000$

In 2011 -  $0.12 \times \$2,000,000 = \$240,000$

In 2012 -  $0.12 \times \$3,000,000 = \$360,000$

In 2013 -  $0.12 \times \$4,000,000 = \$480,000$

**Ratio Estimation (Purchases Example):** An audit of purchases through purchase orders was done. The total purchase orders for the audit period was \$5,000,000. A random selection of 900 purchase orders showed additional unreported taxable purchases of \$3,000 from the sample of \$120,000.

Formula:

Sample Error  
----- = Projected Error Rate  
Sample Base

Projected Error Rate X Projection Base = Projected Error

Calculation:

3,000  
----- = 0.025 (i.e., 2.5%)  
120,000

$0.025 \times 500,000 = 12,500$

Population Base by year:

In 2010 -  $0.025 \times \$ 50,000 = \$1,250$

In 2011 -  $0.025 \times \$100,000 = \$2,500$

In 2012 -  $0.025 \times \$100,000 = \$2,500$

In 2013 -  $0.025 \times \$250,000 = \$6,250$

In some instances, electronic records may not be available for the entire audit period. However, it should be understood that the auditor must project to this period using the best method available. The taxpayer should be informed of the method during the pre-audit planning phase. Generally, the sample results from the period for which records are available will be projected to periods where electronic records were not available. The projection base used for periods outside of the sampling period should be the same as the target population base from which the sample was selected.

### ***Alternative Projection Bases***

- Gross Sales - Gross sales amounts are generally available and are easily verified from various sources. For these reasons, it is frequently used as the base for projection. In some instances, the errors in the sample relate to all different types of sales invoices (taxable and exempt).
- Non-Taxed Sales Amounts - Consideration should be given to using the total sales deductions as the projection base if the error(s) in the sample relate to tax exempt sales.
- Narrowed Base - In some instances, the error(s) can be isolated to a very narrow population. For example, during a sales tax audit, the error(s) might be found only within the resale deductions, and then the projection base should be the reported amount for resale within the target population. Another example of when to use a narrow projection base is when an audit of expenses finds the error(s) only in the area of the supplies expense account. In that case, the projection base should be the account for supplies expenses with in the target population.
- Inappropriate Bases - If the objective were to examine exempt sales or exempt purchases, then an inappropriate projection base would be reported taxable sales or purchases. The projection base is inappropriate because the reported taxable sales or purchases do not include exempt sales or exempt purchases.

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## **Chapter 7 - Sales Tax – Statistical Sampling**

### **Sales Tax Pre-Audit Conference**

When using electronic records, specific issues relating to the taxpayer's sales tax reporting system and business activities will affect the depth of information to be discussed at the pre-audit conference. The auditor will need the majority of this information to design the audit plan, whether the audit is conducted manually or electronically.

The specific issues related to sales tax are:

- What types of business activities does the taxpayer conduct?
  - Are certain business activities or classes of merchandise exempt by statute?
  - Can exempt and taxable business activities be distinguished easily?
  - Are exempt and taxable business activities or merchandise identified by a code or in a product listing?
- What individuals in the company make decisions regarding the taxable status of business activities and merchandise? Was any person who makes taxability decisions replaced during the audit period?
- Has the tax treatment of business activities and merchandise been consistent throughout the entire audit period? If not, can the period of inconsistent treatment be determined?
- Is the tax applied automatically or manually? Can the application be overridden?
- Are the taxpayer's business activities seasonal or cyclical?
  - Do seasons, economic cycles, etc. affect sales?
- What is the volume of invoices generated in a month?
- Is there a code that identifies Michigan destination sales?
- How does the taxpayer compute its tax liability?



- Are taxable sales backed into by deducting exempt sales?
- Are deductions reported on the return?
- Are deductions identified by a code?
- What records or reports does the taxpayer keep to determine its exempt and nontaxable sales?
- Are these records only summaries or is detail shown?
- Is there a sales tax accrual account?
- How is the customer's taxability determined?
  - Does the customer listing indicate tax status?
  - Does the customer listing indicate the customer's FE #?
  - Are blanket exemption claims accepted?
  - Are claims of exemption made on the customer's purchase order?
  - Can customers be considered partially exempt, 100% taxable, or always exempt?
  - Can the taxable status of a customer be overridden in the system?
- How are sales invoice files maintained for the audit period?
- What is the audit trail to the source documents (sales invoices)?

Obtaining this information in the pre-audit conference helps to reduce delays in the sampling process.

### ***Sales Tax – File Identification and Release of Data Files***

To use electronic sampling in a sales tax audit, detail sales transaction information must be available. The following is a list of data fields that the Department often requests in detail sales transactions. The fields identified in this list are only examples. These data fields are likely to vary from taxpayer to taxpayer. The fields are generally the same fields of information that an auditor would pick up from sales invoices and enter into sales tax exception schedules in a manual audit.

- Invoice number
- Invoice date
- Billed to customer - name and address (city/state/zip)
- Shipped to customer - name and address (city/state/zip)
- Destination state
- Selling price of item(s)
- Freight/handling/misc. charge (if applicable)
- Tax amount
- Total invoice amount
- Location / branch code (for multiple locations)
- Tax rate (if available)
- Tax status code (if available)
- Codes - why sale not taxable (if available)
- Item description (if available)
- Posting date (if different from invoice date)
- Resale / exemption number for exempt customers (if available)
- Any other fields that contain relevant information

**Note: This list is not meant to be all-inclusive or required. Any one missing field will not prevent the use of electronic sampling software.**

Typically the fields listed above would be found in the following list of files. Supplementary files containing customer master information may also be needed.

- Detail sales history
- Detail sales transactions

- Customer master
- Sales invoice history or sales invoice detail
- Product master

Once the necessary electronic files are identified, availability of data for the entire audit period must be discussed with the taxpayer. Ideally, the sales transactions for the entire audit period can be obtained. This does not mean that every sales transaction in the audit period must be examined. Sales transactions may be sampled.

### ***Sales Tax – Control Totals***

After the taxpayer's files have been converted into a usable format for analysis, the next step in the process is for the auditor to verify the integrity and completeness of the data files by reconciling control totals. Control total reports must be prepared for this purpose.

Examples of summaries that may serve as control total reports are:

- Sales by time period (e.g., monthly or annual)
- Sales by location and period
- Sales by customer
- Sales by type of sale (taxable and exempt sales)
- Sales by product/product code/product class
- Sales tax charged
- Sales by selling branch
- Sales by destination state

In whatever manner the control total report is prepared, the report should break down total sales, taxed sales, exempt sales, and tax charged. Every effort should be made to reconcile the control totals to the taxpayer's transactional data. The auditor should select various periods throughout the audit period and try to reconcile sales for those periods until a comfort level is reached. Auditor judgment should be used in verifying

these totals. The sales tax reporting procedures should also include a review to determine if the sales tax accruals agree with the reported amounts.

An electronic audit is based on the premise that the data received is reliable and complete. If control totals are not verified, subsequent audit tests will not be reliable. Further sampling should not be performed until the control totals are verified.

Differences in the control totals could result from:

- Electronic files are incomplete or inaccurate
- Historical records are incomplete or inaccurate
- Electronic data in the file has been incorrectly processed
- Time period differences between the electronic files and the accounting period
- Manual adjustments (e.g., journal entries)

If control totals do not reconcile, materiality should be considered in determining whether the auditor can accept the file. The auditor should also consult with the taxpayer to try to resolve the differences. However, the decision to accept control totals that do not reconcile rests with the auditor and the audit supervisor.

Verifying the reliability of the control totals also includes evaluating and reviewing the taxpayer's internal controls. In reviewing internal controls, transactions should be traced through the accounting system audit trail to the source documents. This ensures that all sales invoices can be located if selected for examination and gives the auditor a chance to profile the taxpayer's business activity and verify the accuracy of the data in the file.

Examples of questions to be considered are:

- Are sales of tangible personal property, intangibles and services each separately identified?
- Is the method of identifying these types of sales reliable?
- Is sales tax applied at the line item level or invoice level?
- Is the entire invoice subject to sales tax, or only specific line items?
- Is sales tax applied automatically or manually?

- Have automated tax decisions been manually overridden?
- What types of products and services does the taxpayer sell?
- How will products and services affect the analysis of the electronic data?
- Do data fields included in the electronic file agree with paper sales invoices?

The answers to these questions may also affect the design of the electronic sampling techniques used to examine a taxpayer's sales transaction records.

### ***Sales Tax – Population Analysis***

Analyzing the population involves identifying the transactions that the auditor wants to examine. The initial population needed for a sales tax audit is Michigan destination sales. To audit this sales population, sales should be separated into sub-populations based on certain defined characteristics. The sub-populations may also be referred to as **stratifications**. Stratifications separate the population into different groups for different examination purposes. Sales transactions should be divided into at least two separate sub-populations: taxed and non-taxed sales transactions.

When examining sales files, the most common definitions of sub-populations may be:

- Taxed sales, determined by sales tax on invoice
- Exempt sales
- Location/branch sales

Each sub-population must be tested and evaluated to see if the tax treatment has been handled properly. The evaluation and analysis of each sub-population will involve different audit techniques and examinations, just as in a manual audit.

### ***Sales Tax – Analysis of Taxed & Non-Taxed Transactions***

When examining **taxed transactions**, the auditor's main concern is: "Did the tax charged on the invoice make it to the tax return?" The control total reports for sales should identify total taxed sales as well as the sales tax charged on those sales. By following several transactions from the invoice to the tax return, the auditor will be able to verify that the system worked as described. Testing those taxed transactions and reconciling the sales tax to the monthly return may also allow the auditor to determine:

- The types of customers charged tax
- The types of products for which tax was charged
- If tax is being charged on the gross proceeds of the sale
- If tax was charged on labor, freight, handling charges, etc.
- If the tax charged made it to the return
- If the proper tax rate was charged on each transaction

When examining **non-taxed transactions**, the auditor's main concern is: "Does the taxpayer have an exemption claim on file to support the fact that tax was not charged?" Analyzing the electronic sales files could include summarizing all untaxed sales down to a customer level. A report, detailing the customer and the total dollars of sales, can be provided to the taxpayer for verification of tax exemption. If the taxpayer needs to contact customers for certificates, knowing the amount of sales for each customer may help the taxpayer work more effectively in obtaining the claims.

After the taxpayer has provided the exemption claims supporting tax-exempt sales, the detail for **each** unsupported non-taxed sale can be provided from the taxpayer's electronic records to include in the audit schedules.

There may be some situations where non-taxed sales can be eliminated without the review of claims. For example, in the review of a taxpayer's non-taxable product codes, the auditor determined that a particular product should be considered taxable. Using the electronic sampling software, the auditor can analyze by product code, and easily identify the total sales on which tax was not charged.

All the techniques introduced above attempt to narrow the scope of transactions that must be examined at the detail level.

### ***Sales Tax – Sampling or Detail Determination***

With the capabilities of electronic sampling software, in most sales tax applications, sales transactions can be reviewed in detail. Sales for the entire audit period could be examined in detail at high levels if the data received from the taxpayer include all sales transactions for the audit period. If data is obtained for less than a full audit period, a detail review of all sales for the shorter period could be performed. However, the error(s) must then be projected to the remainder of the audit period for which records were not available.

When conducting a sample of the sales, the auditor may want to stratify the customer's total sales dollars into dollar ranges. This method of sampling sales is called **Stratified Random Sampling**. The sales in the low dollar ranges could be sampled and high dollar range sales reviewed in detail.

Detail examinations are recommended but a variety of sampling techniques could also be used to review non-taxed sales. Sampling methods could include:

- Sampling at the customer level
- Sampling at the invoice level
- Sampling at the invoice line item level
- Sampling sales from select sales branches

The auditor must decide what to sample and the most effective and efficient method.

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## **Chapter 8 - Use Tax – Statistical Sampling**

### **Use Tax Pre-Audit Conference**

When using electronic records, specific issues relating to the taxpayer's use tax reporting system and business activities will affect the depth of information discussed at the pre-audit conference. The auditor will need the majority of this information to design the audit plan, whether the audit is conducted manually or electronically.

The specific issues related to use tax are:

- Does the taxpayer have a use tax accrual system?
  - Obtain a description of the accrual reporting system
  - Are use tax accruals maintained in a separate accrual account or charged to the same expense account as the purchase?
  - Does the taxpayer's use tax accrual system accrue use tax on individual invoices?
  - Does the taxpayer accrue use tax based on a percentage of its purchases?
  - How did the taxpayer establish the reported percentage?
  - How is use tax identified on the source documents?
  - Who is responsible for making taxability determinations?
  - Does the taxpayer issue purchase orders?
  - Does the taxpayer indicate its exemption claims on the purchase orders?
  - Is there a tax code that identifies taxability?
- Does the taxpayer have multiple locations?
  - What are the locations and what are the codes or identifications for each location?
  - Are books and records maintained for more than one company?



- What are the codes that identify each company?
- Are cost centers used to identify the taxpayer's different locations?
- What are the cost centers with Michigan activity?
- Does the structure of account numbers identify locations, and/or department?
- Obtain a chart of accounts
  - Was the same chart of accounts effective for the entire audit period?
  - What is the account structure?
  - Does the account structure identify the departments in the company?
  - Can utility accounts be determined?
  - Can industrial processing areas of the taxpayer's plant be identified from the account number?
- Does the taxpayer claim partial exemptions on any types of transactions?
- Does the taxpayer think it paid sales tax incorrectly at the source on exempt purchases?
- Does the taxpayer have a prepaid stores account?
  - Is the initial purchase of the stores recorded in the prepaid inventory account?
  - When stores are removed from physical inventory, how are transfers to the proper expense accounts recorded? Journal vouchers?
  - How is the tax treatment of inventory withdrawals handled? Who makes the decision?
  - How are withdrawals of inventory recorded?
- How are fixed asset purchases accounted for?
  - Are purchases charged to a construction in progress account?
  - Are purchases charged directly to the fixed asset accounts?

- Are fixed assets assigned project numbers?
- Are fixed asset project listings for the audit period available?
- Can capitalized and expensed portions of asset projects be easily identified?
- Does this listing provide adequate descriptions of the project?
- Are project summaries showing total expenditures on a project available?
- Are engineering and labor costs included in fixed asset costs?
- Are fixed assets assigned asset numbers?
- Are fixed asset descriptions by asset numbers available?
- Are fixed asset invoices filed separately from expense invoices?
- Does the taxpayer have a dollar threshold for capitalizing asset purchases?

Obtaining this information in the pre-audit conference helps to reduce delays in the sampling process.

***Use Tax – File Identification and Release of Data Files***

To ensure that electronic sampling software assistance can be provided on a use tax audit, detail purchase (expense) transaction information must be available. The following is a list of data fields that the Department often requests in detail purchase transactions. The fields identified in this list are only examples. These data fields are likely to vary from taxpayer to taxpayer. The fields are generally the same fields of information that an auditor would pick up from purchase invoices and enter into use tax exception schedules in a manual audit.

- General ledger account number
- General ledger account description (if available)
- Cost center (location/branch code)
- Posting date
- Invoice number

- Invoice date
- Vendor number
- Vendor name
- Vendor State
- Description of item purchased (if available)
- General ledger distribution amount
- Sales tax paid amount (if available)
- Self-assessed use tax amount (if available)
- Purchase order number

The following fields are useful depending on the situation:

- Batch number (for record retrieval)
- Voucher number (for record retrieval)
- Paid date (for record retrieval)
- Check number (for record retrieval)
- Ship-to location code (to identify MI activity)
- Any other field that contains relevant audit information

**Note: This list is not meant to be all-inclusive or required. Any one missing field does not prevent the use of electronic sampling software.**

The taxpayer's Information Technology staff are best suited for determining the location of the requested data fields and all the files that contain that information. Typically the fields listed above would be found in the following list of files. However, supplementary files containing customer master information may also be needed:

- Accounts payable detail distribution file
- General ledger detail distribution file (filenames can vary)

Once the necessary electronic files are identified, availability of data for the entire audit period must be discussed with the taxpayer. Ideally, the purchase transactions for the entire audit period can be obtained. This does not mean that every purchase transaction in the audit period must be examined. Purchase transactions may be sampled.

Expense transactions may be examined at high levels and eliminated as necessary for audit purposes. Elimination of inventory and industrial processing accounts in a manufacturer's audit will significantly reduce the population to be reviewed. When manually reviewing purchase invoices for a time period, inventory and industrial processing purchase invoices are physically examined to verify that they are indeed inventory or industrial processing purchases. The information obtained from the electronic data may make this physical inspection of those invoices unnecessary.

Limiting the file to anything less than the entire audit period jeopardizes the integrity and completeness of the file released to the Department. If computer files are obtained for less than a full audit period, a detail review of all purchases for the period received could be performed. However, the error(s) must be projected to the remainder of the audit period for which records were not available.

### ***Use Tax – Control Totals***

After the taxpayer's files have been converted into a usable format for analysis, the next step in the process is for the auditor to verify the integrity and completeness of the data files by reconciling control totals. Control total reports must be prepared for this purpose.

In preparing a control total report, the auditor will use the data in the file to recreate or reproduce a hardcopy historical summary report. The auditor should discuss the use of control totals and their purpose with the taxpayer at the pre-audit conference. The auditor should also discuss with the taxpayer what historical summary report it can provide for the purposes of verifying the control totals.

Examples of summary reports that may serve as control total reports are:

- Account balances by time period (e.g., monthly or annual)
- Account balances by time period and location
- Capital project / appropriation totals
- Capital project / appropriation totals distinguishing capitalized and expensed dollars

- Monthly use tax accrual summary

Every effort should be made to reconcile control totals. As in the sales tax audit, auditor judgment should be used in verifying the control totals. Control total reports for a use tax audit will be more voluminous than a sales tax audit. Hopefully, account balances by year can be verified, but control totals may have to be verified on a monthly basis. If the control totals cannot be verified for the periods and accounts selected, the auditor should judge whether more periods and/or account balances should be verified.

Differences in the control totals could result from:

- Electronic files are incomplete or inaccurate
- Historical records are incomplete or inaccurate
- Electronic data in the file has been incorrectly processed
- Time period differences between the electronic files and the accounting period

If control totals do not reconcile, materiality should be considered in determining whether the auditor can accept the data. The auditor should also consult with the taxpayer to try to resolve the differences. However, the decision to accept control totals that do not reconcile rests with the auditor and the audit supervisor.

If the taxpayer has a use tax accrual system that captures the detail use tax accruals in electronic format, the auditor can use the information for preparing control total reports. The use tax accrued in a taxpayer's system should be reviewed to determine if the file agrees with the taxpayer's reported amounts per the tax returns. Manual adjustments made after month end closing may affect the amount reported on the use tax returns.

The auditor will prepare many summary reports of the taxpayer's data files to familiarize themselves with what the file contains. Examples of summary reports that may be prepared are:

- Total purchases by period
- Total purchases by location
- Total purchases by account balances
- Total purchases by department
- Total purchases by cost center

- Total use tax accruals by location
- Total use tax accruals by period

The reports may give the auditor information as to where the most exposure to tax dollars can be found. The areas of greatest tax exposure are where the auditor should concentrate on the review of the individual transactions. The use of these reports is the decision of the auditor.

Verifying the reliability of the control totals also includes evaluating and reviewing the taxpayer's internal controls. In reviewing internal controls, transactions should be traced through the accounting system audit trail to the source documents. This ensures that all purchase invoices can be located if selected for examination and gives the auditor a chance to profile the taxpayer's business activity and verify the accuracy of the data entered in the file. The auditor should observe the taxpayer's business activity and method of accounting for the purchase transactions.

Examples of questions to consider:

- Are transactions charged to the proper accounts?
- Does the taxpayer accrue use tax or pay sales tax directly to the vendor?
- Who makes the decision about taxability for use tax?
- Is sales tax billed on vendor invoices deleted before payment is made?
- Are purchase orders used to make taxability claims?
- Is use tax applied at the transaction level or account level?
- Is the entire invoice subject to tax or are only specific line items?
- Do data fields included in the electronic file agree with paper sales invoices?
- When use tax is accrued on an invoice, is that use tax reported on the use tax return?
- When sales tax is paid to the vendor and captured as a separate field in the taxpayer's electronic data, can the auditor rely on this field?
- Has sales tax been paid incorrectly at the source on items that would qualify for exemption?

- If allowed a discount, does the taxpayer generally take the discount?

The answers to these questions may also affect the design of the electronic sampling techniques used to examine a taxpayer's purchase records.

### ***Use Tax – Population Definition***

Analyzing the population involves identifying the transactions that the auditor wants to examine. The initial population should be purchases for Michigan based activities.

In defining the population, purchases should be separated into sub-populations. The sub-populations may also be referred to as stratifications. **Stratifications** are used to separate the population into different groups for different examination purposes.

When examining accounts payable files, the most common definitions of sub-populations may be:

- Capital asset purchases
- Construction in progress purchases
- Expense purchases
- Michigan locations/cost centers
- Industrial processing accounts
- Consumable accounts
- Utilities
- Promotional items
- Purchases on which use tax has been accrued
- Purchases on which sales tax has been paid at source
- Michigan vendors

The majority of these populations are identified through the taxpayer's chart of accounts. The chart of accounts should be requested at the pre-audit conference and received as soon as possible. The auditor can start reviewing the chart of accounts to determine which accounts should be included in the examination of purchases.

The structure of a taxpayer's accounts may identify location, cost centers, departments, and the capital or expense accounts to which transactions are charged.

The taxpayer is more familiar with how the chart of account works than the auditor; therefore, the taxpayer's input should be used in the selection of accounts to ensure all accounts of interest are selected.

In selecting accounts of interest, the control totals from the taxpayer's historical documents may provide valuable information. The description of an account from the chart of accounts can indicate possible tax consequence of that account. The control totals may indicate that the account's transactions should not be included in the population for examination. For example if the account contains only one transaction in the audit period for less than \$100, the tax effect generated from including this transaction would be minimal, therefore it should not be included in the population for examination. When determining accounts of interest, materiality should be a consideration.

### ***Use Tax – Population Evaluation & Analysis***

In a use tax audit, auditors are concerned with transactions for which:

- Sales tax was paid at source
- Use tax was accrued and paid directly to the State
- Additional tax is due on the purchase

The electronic sampling techniques used for reviewing a taxpayer's purchases are dependent on whether the taxpayer has a use tax accrual system in place and whether the system is reliable. Any sub-population can be further divided into purchases for which use tax was accrued and purchases for which use tax was not accrued.

When a taxpayer has a use tax accrual system, the auditor should discuss the basis of the reporting procedures with the taxpayer. The taxpayer may have a very complex system of accruing use tax on purchases. The system should be well documented. Accruals can be summarized by period for the auditor to reconcile to the reported use tax.

Using electronic sampling techniques to examine a taxpayer's purchases will be valuable because it often narrows the scope of transactions that may have to be examined, reduces the number of source documents that may have to be pulled to support selected transactions, and provides a road map that identifies the easiest path to the transactions that are selected for review.



### ***Use Tax – Sampling or Detail Determination***

The capability of electronic sampling software provides the opportunity to select any sample from the entire audit period. For the sample to be selected from the entire audit period, the electronic files released must contain all the detail purchase or accounts payable records for the audit period. A sample selected from the entire audit period is more representative of the taxpayer's business.

Selecting the sample from the entire audit period does not mean that all vendor invoices for the audit period will be examined. It does mean that all transactions from the audit period have the chance of being selected for examination. Samples can be selected from transactions that are at:

- Invoice line item level
- Account distribution level
- Invoice level

When sampling is used to examine sub-populations, more sophisticated methods of sampling can be employed. The most common method of sampling used is **stratified random sampling**. In this method of sampling purchases, the transactions at the selected level are stratified into dollar ranges. Samples can be selected from low dollar ranges and high dollar ranges can be detailed. **Detail examinations are highly recommended when possible and may be required for capital asset purchases.**

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## **Appendix A – Non-Statistical Audit Sampling**

### **Auditing in a Manual Environment**

When electronic transactions are not available or suitable for an electronic audit, non-statistical sampling techniques may be used. Non-statistical sampling includes judgmental sampling and random sampling, which are not evaluated statistically.

A non-statistical sample does not measure the risk that the sample fails to accurately represent the population. However, non-statistical audit sampling techniques, particularly random selection, offer reasonable precision and accuracy for both the auditor and taxpayer. Used properly, non-statistical sampling techniques can be as defensible as any other sampling method.

Generally, the types of random **probability** sampling that are available include:

- **Simple Random Sampling** - Every unit in a population has an equal chance of being selected
- **Systematic Sampling** - Using a random starting point to select every nth item, such as every 10th invoice of a population
- **Cluster Sampling** - The sample would include a cluster of units in a population, which has been selected randomly

### **Pre-Audit Planning**

The pre-audit conference held with taxpayers provides auditors with the opportunity to gather information and gain an understanding of a taxpayer's business operation and system of record keeping. This conference should also help the taxpayer understand the proper documentation and records needed by the auditor. When supplied the proper documentation and records, the auditor can sample the records in an efficient and effective manner. The knowledge gained in a pre-audit conference will help auditors prepare an effective sampling plan. The auditor should review the business processes and accounting systems before developing either a statistical or a non-statistical sampling plan.

**Note: Each population and taxpayer system is different; there's no set method for sampling data. Flexibility must be used to design a good sampling plan.**

### ***Review Business Processes***

An auditor should review the taxpayer's general business practices and history, as any changes could affect the sampling plan. For example, the auditor should consider:

- Internal controls in place
- Changes in business practices and structure
- Changes in management and accounting staff
- Changes in locations, seasonal and business cycle changes
- Type of products or services, pricing, product lines, etc.
- Tax laws, rules and rates during the audit period

### ***Review Accounting System, Record Storage and Tax Reporting***

An auditor should review the taxpayer's accounting systems, records storage and reporting procedures. The following factors will affect the sampling plan:

- The identification of appropriate target populations
- The choice of item sampled (sampling unit)
- Potential for electronic audit
- The availability of electronic records
- The availability of population totals to be used for projection
- Sample size

### ***Special Considerations for Accounting:***

- What accounting methods does the taxpayer use to account for sales and/or purchases transactions? Have there been any changes in accounting methods?
- How do the accounting procedures for financial reporting, federal income tax, and state tax reporting differ? Are there audited financial statements available?
- Is there an accounting procedure manual?

- What accounting records are available for sales and purchases (journals, invoices, voucher and check registers, expense and capital records, etc.)? Are electronic records available? In what format are the electronic records stored?
- Are there customer and vendor lists available for the audit periods?
- Is there a centralized accounting system or divisional systems? Is there an audit trail between the financial statements, trial balances, ledgers, and source documents?

***Special Considerations for Record Storage:***

- What is the volume of source documents? Can an accurate estimate be made?
- Are summary totals available for source documents (e.g., sales or purchase totals)?
- How are numbers assigned to source documents (invoices, vouchers, checks, purchase orders, etc.)? How are numbers assigned to different units?
- How are source documents prepared and filed? What information is available?
- What type of electronic data is available? Can electronic transactional data be traced to the hard copy source documents?

***Special Considerations for Tax Reporting:***

- Is more than one sample required?
- Are summary or other records available to assist in making a proper tax determination?
- Is all tax return information available? Have there been any changes in reporting?
- Any other special reporting procedures that may affect sampling?

***Inform the Taxpayer***

The auditor and the taxpayer should develop the sampling plan together. It is important for the taxpayer to understand the sampling objectives, the techniques that will be used to sample the records, and that the sample will be used to make a tax determination. The auditor will explain how the sample will be selected and how the results of the sample will be projected over the entire population or audit period.

## ***The Sampling Process***

For the sample to be efficient and accurate, sufficient planning at each step in the sampling process is needed. The auditor should understand the taxpayer's accounting system, the types of records available, how the records are filed, and how they can be retrieved. Equally important, the taxpayer should understand the sampling process in order to help the auditor design a sampling plan that is both efficient and accurate. The key steps in non-statistical sampling processes for manual records are:

1. Define the population characteristics, select accounts of interest, and select the sampling frame
2. Determine the sampling unit (e.g., invoice or line items on an invoice)
3. Establish correspondence to the sampling unit (match random selection numbers to the sampling units)
4. Determine the sample size
5. Choose the method of selecting the sample
6. Identify the population base
7. Draw the sample
8. Audit the preliminary portion of the sample
9. Perform the intermediate short tests
10. Complete the audit of the sample
11. Evaluate the result
12. Project the results

### ***Population, Sampling Frame, Sampling Unit Defined***

A **population (universe)** is a group of all possible units with some common characteristic, such as sales or purchase transactions.

The **target population** is the total of the items of interest. **Items of interest** are those items in a population (universe) that are the focus of the audit (transactions that have potential for error) and to which the results of the audit sample will be applied. The target population should exclude items that do not share the attributes of the items of interest.

**Example:**

To conduct a use tax audit for untaxed purchases, the auditor should exclude payroll and inventory accounts from the target population. If these items were selected in the sample, the results would not be representative of the desired target population. However, it does not invalidate the sample.

The **sampling frame** is a group of items from which the sample is taken. For greater efficiency and accuracy, the sampling frame should include only those items from the desired target population (items of interest). Items of interest are not exclusive to only accounts, but can pertain to locations, time periods, etc.

The following are examples of characteristics of a population that can be used to refine the target population or sampling frame:

- General ledger accounts / types of accounts
- Transaction identification numbers or codes, sales or purchase invoice numbers
- Prices / values / time periods
- Tax return categories / types of deduction / tax accruals
- Divisions / departments / product lines / customer types

Sometimes, the population (universe) can be naturally broken down into target populations, with each target population separately sampled.

**Example:**

Separate target populations of an equipment retailer with sales of new and used equipment, rentals of equipment, and sales of parts. When auditing for sales, the target populations can be broken down into new and used equipment sales, rentals and parts. The target populations can be broken down further by dollar values as well.

## ***Sampling Units***

A sampling unit is one of the individual elements that comprise the sampling frame. The characteristics of the sampling unit are measured to estimate those characteristics for the target population. A sampling unit may be source documents (individual transactions), account balances (a summary of many transactions), a block of transactions (clusters), or individual line items on a source document (components of an individual transaction). It is preferable to choose the sampling unit that provides the lowest level of detail.

### **Example:**

The auditor may choose the invoice as the sampling unit rather than a folder of invoices is preferable as it provides a lower level of detail.

The type of sampling unit will have an effect on the results of the audit as a whole. It is best if the characteristics of each sampling unit are similar to reduce sampling errors.

**Sampling errors** can occur when sampling units vary considerably from each other.

### **Example:**

If a check is used to pay multiple invoices, sampling checks may vary little among themselves. However, a single invoice may vary considerably from other invoices in the population. The population dollar total will be identical, but the differences in the sampling units (checks and invoices) will have an effect on the sampling error.

## ***Selecting the Sampling Unit***

Auditor judgment will be needed in selecting the appropriate sampling unit. Because of the resulting number of transactions required for examination, the below hierarchy of preferred sampling units for manual records has been established:

- Transactions (e.g., invoice numbers, check numbers)
- Clusters (e.g., folders, contiguous group of invoices)
- Time Periods (i.e., transactions occurring in a certain time frame; days/batches, weeks, months, years, etc.)

The choice of sampling unit will have a direct bearing on how many transactions must be reviewed. For example, when there are approximately 480,000 transactions in a 4-year audit period:

Sampling Unit Chosen	Number of Sampling Units in the Sampling Frame	Possible Minimum Sample Size	Number of Transactions to Be Audited
Transaction	480,000	250	250
Cluster of 40 Transactions	12,000	30	1,200
Days	1,461	30	9,870
Weeks	204	20	47,060
Months	48	6	60,000

**Examples of sampling units and sampling frames:**

- Use Tax (Expense Purchases)

Sampling Unit	Sampling Frame
Purchase orders	Purchase order sequence
Checks	Check sequence
Purchase journal posting	Line item

- Sales Tax (Deductions)

Sampling Unit	Sampling Frame
Sales invoices	Invoice number sequence
Sale journal	Line item
Cash register tapes	Daily cash register totals



## ***Establishing Correspondence***

Before any random numbers can be selected and a sample can be drawn, the sampling unit and sampling frame must be studied to determine if there is some type of numbering scheme that allows us to match each sampling unit to a random number. This is known as correspondence. The random number generator software will be used to select random numbers, and correspondence is simply the method of matching the random numbers to the sampling units. The auditor should look for a preexisting numbering scheme, such as invoice, check, or purchase order numbers. If a preexisting numbering scheme is not available, one can be established with any numbering sequence that the taxpayer might use, such as line item numbers on a purchase journal, numbers of microfilm tapes, rolls of microfiche, numbers of folders, or drawers of invoices.

**Note: The choice of the target population, the sampling frames, the sampling units, and the available population numbers are all closely related. When possible, the recommended hierarchy of sampling units should be adhered to. However, this will depend on the availability of records and what is practical.**

## ***Determining Sample Size***

The key elements in determining the sample size are addressed in this section. These elements are:

- Items of interest
- Minimum sample sizes
- Calculation of sample size

### ***Items of Interest***

Transactions that have potential for error are called **items of interest**. The target population should contain only those items that are of interest to the auditor.

### **Example:**

In a sales tax audit, one of the audit objectives is to examine non-taxed sales. In determining the sample size the sample should include only sales that were non-taxed. Examination of these items will satisfy the audit objective more efficiently and accurately than including all sales in the sampling frame or population.

### **Minimum Sample Sizes**

The following guidelines will be used to determine the minimum number of items (i.e., minimum sample size) required for a given sample. Initially, all samples should contain at least **250 items of interest**.

**The number of Items of Interest in the sampling frame will greatly affect the minimum sample size.**

Audit populations may contain many items that are not of interest, such as sales that were taxed or inventory purchases. If the items that are not of interest are not removed from the audit target population and sampling frame, a larger sample size will be required to obtain the minimum number of items of interest.

The formula for determining the minimum sample size for a transaction sample is:

$$\text{Minimum Sample Size} = \frac{\text{Minimum Number of Items of Interest}}{\text{Percentage of Items of Interest in the Population}}$$

#### **Example:**

##### Sales Tax Audit

The examination of reporting procedures indicates that the taxpayer is reporting 60% of its sales as non-taxable. In this case, non-taxed sales are the items of interest.

Gross Sales Reported	\$100,000
Less: Taxable Sales	<u>(40,000)</u>
Non-taxed Sales	60,000 or 60% of the total population (Gross Sales) are items of interest in the population base.

Computation:

$$\frac{250 \text{ minimum}}{60\% \text{ in Population}} = 416.67 \text{ transactions}$$

Round up to 417 transactions. These 417 transactions comprise the minimum sample size to examine 250 items of interest in the population stated above.

## ***Cluster Sampling***

Transaction sampling begins to lose its efficiency when the sample size exceeds 1,000 transactions. When the transaction sample exceeds 1,000 transactions, a **cluster sample** should be used. Clusters are contiguous groups of transactions. For cluster sampling, the minimum number of clusters is 30. However, when the number of clusters exceeds 80, cluster sampling is no longer viable and ceases to be efficient.

## ***Time Period Sampling***

Although transaction sampling is the recommended method for conducting a sample, this may not always be possible because of the taxpayer's accounting system or the way in which records are stored. There are instances when time period sampling may be the best approach.

In time-period sampling, the sampling unit is a measure of time (days, weeks, months). The sample should be randomly selected and the following minimum sample size criteria should be used:

- Days or Batches – Minimum that should be used is 30
- Weeks – Minimum number of weeks to be used is 20
- Months – Minimum number of months to be used is 6<sup>1</sup>

## ***Selecting the Sample***

This section discusses the various methods for selecting a sample.

- Simple random selection
  - Populations with numbering sequences
  - Populations without numbering sequences
- Steps in performing simple random sampling
- Systematic random selection
  - With a single start point

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<sup>1</sup> Due to the unique record keeping conditions related to cash basis taxpayers, please refer to Appendix C.

- With multiple starting points
- Random time period sampling

**Simple Random Selection**

Simple random sampling removes the auditor’s bias in the selection of the sample. In simple random sampling, each sampling unit in the sampling frame has an equal chance of being selected. A simple random sample is chosen by using the random number generator software.

Simple random sampling should be used when correspondence can be established. In order to establish correspondence, the random numbers selected by the software must be matched to the actual sampling units.

The presence of a preexisting numbering scheme is a major factor in determining how the sample is selected. It is important to determine the kind of numbering sequence used in the population.

**Populations with numbering sequences** - Many populations will have consecutive numbering sequences such as invoice number, voucher number, check number, and purchase order number.

- Numbering sequence **without** breaks -When the invoice numbers establish the correspondence, the beginning and ending invoice numbers should be identified within the audit period. The random number generator software will select the sample based upon the determined minimum sample size and the beginning and ending invoice numbers.
- Numbering sequence **with** breaks - There may be breaks in a consecutive numbering sequence.

**Example:**

The auditor is using check numbers as the sampling unit and there are two checking accounts in the audit period. In this instance, the random number generator software will be used to assign random numbers to each range of checks.

	First Account	Second Account
Beginning Check Number	1,131	1,001
Ending Check Number	8,060	10,344

**Populations without numbering sequences** - In many audit situations, the numbering sequences on invoices, checks or vouchers will not exist, or cannot be used because there are too many breaks in the numbering sequence. In that event, correspondence has to be developed using alternative methods.

**Developing number sequences manually and from other records** - When natural numbering sequences are not available, the auditor can create correspondence by manually numbering the items of interest in a journal or other summary document. Natural correspondence should be used whenever possible, as this method is a time consuming process.

Some examples of naturally formed correspondences are:

- Number of items per page, pages per binder
- Number of items per batch
- Line item numbers in a journal
- Sales destination report

### ***Steps in Performing Simple Random Sampling***

Up to this point, random sampling steps have been addressed independently, except for locating the sampling units. Locating sampling units may require conversion of a random number to a physical location (e.g., invoice number, line number, page number, or volume number). The steps in performing a simple random sample in an audit situation are:

1. Establish correspondence
2. Estimate the volume of records
3. Compute the minimum sample size
4. Randomly select the sampling units
5. Locate the sampling units

Transaction sampling works well in situations where there are multiple invoice numbering sequences or where there is no useable sequence. Generally, some sort of correspondence can be established. The steps in performing simple random sampling are illustrated in the following example:

**Example 1:** Steps in determining selecting a **transaction sample**, with a single number range.

Facts:

- Taxpayer is a retailer
- 35% of its sales are claimed as non-taxable
- There are 4 outlets and each outlet maintains its own number sequence
- A destination run (detail summary document) lists all invoices for all locations in the audit period
- The destination run has 4,380 pages with 50 invoices per page
- The auditor is interested in verifying deductions for the audit period

Steps:

1. Establish correspondence: Use the number of items per page in the summary document or any of the other recommended methods.
2. Estimate the volume of records: 50 invoices per page X 4,380 pages = 219,000 invoices. This number should be a reasonable estimate, but does not have to be the actual number.
3. Compute the minimum sample size:  $250/35\% = 714.28$ ; rounded to 715 invoices in the sample
4. Randomly select the sampling units using the random number generator: The beginning number is 1 and the ending invoice number is 219,000. Request that a sample of 715 sampling units be selected.
5. Locate the sampling units: Convert the selected sampling unit numbers to page and line numbers in the summary document. Sampling units selected in numerical sequence began with (117) (583) (650), etc. A formula for converting these numbers to line and page numbers in the summary document is:

$$\frac{\text{(Random Number)}}{\text{(Number of Lines per Page)}} = \text{(Page Number)}$$

Selected Random Number	Formula Page No.	Formula Result	Actual Page No.	Formula Line No.	Actual Line No.
117	117 / 50	2.34	3	.34 X 50	17
583	583 / 50	11.66	12	.66 X 50	33
650	650 / 50	13.00	13	Last line	50

In this example, the taxpayer had only one sales summary journal. If the taxpayer summarizes sales by year in separate volumes of the sales journal, the procedures would be roughly the same.

**Example 2:** Steps in selecting the sample for a **transaction sample**, with several number ranges.

Facts:

- The taxpayer has no pre-existing number sequence
- A sale summary document was maintained by year
- For this example, assume 450 is the minimum sample size

The following table illustrates the summary documents:

Range	Periods	Pages	Lines Per Page	Lines on Last Page
1	First Year	61	50	23
2	Second Year	58	50	3
3	Third Year	51	60	59

Steps:

1. Establish correspondence: Number of items per page.
2. Estimate the volume of records: Estimated by the following calculation

(Full Pages X Number of Lines per Page) + Lines on Partial Pages = Number of Records

Range	Year	Volume	Formula	Result
1	First	Book 1	$(60 \times 50) + 23$	3,023
2	Second	Book 2	$(57 \times 50) + 3$	2,853
3	Third	Book 3	$(50 \times 60) + 59$	3,059
Total Records				8,935

3. Compute the minimum sample size: Minimum sample size is 450
4. Randomly select the sampling units using the random number generator: Select the sample using multiple starting points
5. Locate the sampling units: Convert selected sampling unit number to page and line number in the taxpayer's books and records

Ref	Location	Volume	Formula	Result	Page #	Formula	Line #
1	449	Book 1	$449 / 50$	8.98	9	$.98 \times 50$	49
1	1,412	Book 1	$1,412 / 50$	28.24	29	$.24 \times 50$	12
2	544	Book 2	$544 / 50$	10.88	11	$.88 \times 50$	44

### ***Systematic Random Selection***

Under some circumstances, the best method of selecting the sampling units is to use systematic random selection. In a situation similar to the previous example, the auditor could perform a systematic sample with a random starting point.

1. Estimate the volume of records
2. Compute the minimum sample size
3. Calculate the interval for systematic selection
4. Select a random starting point
5. Select the sampling units
6. Locate the sampling units



## Systematic Selection with a Single Starting Point:

**Example:** Using the facts in Example A, the taxpayer has a destination run (detail summary document) which lists all invoices. However in this case, each retail outlet maintains its own summary document. To construct a random sample with single starting points:

1. Estimate the volume of records:

Store	Full Pages	Lines Per Full Page	Lines on Last Page	Total Lines
1	734	70	55	51,435
2	802	70	27	56,167
3	790	80	41	63,241
4	687	70	67	48,157
Total				219,000

2. Compute the minimum sample size:  $(250 / 35\% = 714.28)$  or 715

3. Compute the interval between sampling units:

$$\frac{219,000 \text{ transactions in population}}{715 \text{ minimum sample size}} = 306.29. \text{ Round down to } 306.$$

4. Select a random starting point using the random number generator: Select a random starting point by generating a random number from 1 and 306. This will insure that each record has an equal chance of being selected and makes this a probability sample. In the following example, assume the random starting point is item No. 140.

5. Select the sampling units:

Random Start	Interval of Sampling Units	Item # in Sampling Frame	Description
140	n/a	140	1 <sup>st</sup> unit in sample
n/a	306	446	2 <sup>nd</sup> unit in sample
n/a	306	752	3 <sup>rd</sup> unit in sample
n/a	306	1,058	4 <sup>th</sup> unit in sample

6. Locate the sampling units: Convert selected sampling unit number to page and line number in the taxpayer's books and records using the same process discussed earlier.

### ***Random Time Period Selection***

When taxpayer records or business processes do not lend themselves to transaction sampling, time periods may be used. For example, a sample of days might be appropriate for a retail outlet that operates on a cash basis and uses register tapes with daily summaries and cash deposits to verify and record sales.

#### **Example A:**

Steps in determining a random time period sample selection with random days and **no breaks in days**.

Facts:

- An audit of Brian's 24-Hour Pharmacy was being done for the period 1/1/10 through 12/31/12
- The market was open 365 days a year
- Every day, there was a nightly reconciliation of the cash receipts
- Correspondence could not practically be made to transactions
- Cluster sampling was also not an option
- The auditor wanted to take a random sample to ensure that procedures were correct in arriving at daily taxable sales
- Sales of some items were exempt, and required special reporting procedures on the tax returns

Steps:

1. Establish Correspondence: Manual correspondence will be accomplished by relating days to random numbers.

2. Estimate the number of days (volume determination):

Years	Days Open	Reported Sales Volume
2010	365	\$488,865
2011	365	\$523,677
2012	366	\$501,311
Total	1,096	\$1,513,853

3. Compute Minimum Sample Size: When using days, the minimum sample size is 30 days. The sample may be increased at a later date.
4. Use random number generator to randomly select 30 days.
5. Locate the sampling units: The day packets corresponding to the selected days were then provided by the accountant.

**Example B:**

Steps in determining a random time period sample selection with random days **and breaks in days.**

Facts:

- An audit of Fred's Furniture was being done for the period 1/1/12 through 12/31/14
- It was determined that a sample of days was required to verify daily gross taxable sales reporting. However, a problem resulted because business was not done on all days of the year
- Fred's Furniture is closed for Christmas, Fourth of July, Thanksgiving and New Year's Day. They also close October 1 of every year for inventory. They were closed due to a fire for 5 days beginning May 11, 2012

Steps:

1. Establish Correspondence: Manual correspondence will be accomplished by relating days to random numbers.

2. Estimate the number of days (volume determination):

Year	Days in the Year	Days Open	Reported Sales Volume
2012	366	356	\$2,044,540.76
2013	365	360	\$1,980,912.12
2014	365	360	\$2,146,420.87
Total	1,096	1,076	\$6,171,873.75

3. Compute Minimum Sample Size: As days are used, the minimum sample size is 30 days. The sample may be increased at a later date

4. Use random number generator to randomly select 30 days

5. Locate the sampling units

**Example C:**

Steps in determining a random time period sample selection for expense purchases.

Facts:

- An audit of Rick's River Boat Manufacturing was being done for 1/1/10 through 12/31/12
- It was determined that a sample of months was required to verify expense purchases
- The taxpayer provided a chart of accounts and a detailed general ledger with year-end summaries by account

Steps:

1. Establish Correspondence: Manual correspondence will be accomplished by relating months to random numbers. In this case, numbers 1 through 36 would be assigned to each month of the audit period
2. Determine Accounts of Interest: From the general ledger, the auditor should select only the expense accounts that have relevance to sales or use tax. Inventory, interest, dividends, and other accounts that have no sales or use tax implications should be removed from both the sample and the population base
3. Compute Minimum Sample Size: The minimum number of months is six months

4. Use the random number generator to randomly select six months
5. Locate the sampling units: Once the sample months have been selected, the auditor should use the general ledger detail to locate the expense purchases and request the invoices

### ***Evaluating Sample Quality***

A sample should be representative of the population from which it was drawn. Sample evaluation should be done at several points during the auditing process. Sample evaluation is an ongoing process that involves auditor judgment, technical knowledge, and familiarity with the industry being audited.

There are three distinct evaluation periods in an audit. These are discussed in detail below:

- Initial Sample Evaluation
- Intermediate Sample Evaluation
- Final Evaluation

Normally, sample evaluation is performed to verify the representativeness of the sample before source documents are retrieved. During an electronic audit, the information to evaluate the sample and the population is readily available for evaluation. A manual audit may require more work, depending on the records available.

A sample that is not representative of the population does not produce results that can be used to make conclusions about the population and will be difficult to defend. One way to evaluate the sample is to compare the average sampling unit with the average population unit. This comparison should be within a 15% variance. If more than 15%, the auditor should evaluate the sample, considering the possibility of increasing or replacing the original sample.

For demonstration purposes, the evaluation process is applied to a month sample; however, this can be applied to days, weeks, and transactions.

Facts:

- An audit is performed on a retailer with one location
- Total sales for the audit period were \$2,286,000

- The following six-month sample was randomly selected from the audit period, which began on January 1, 2012 and ended December 31, 2014

Random Selection Order	Month/Year	Total Sales
6	04/2012	79,375
4	11/2012	89,123
2	12/2012	64,137
5	06/2013	64,750
3	01/2014	83,025
1	08/2014	72,575
Totals	6	452,985

### ***Initial Sample Evaluation***

The initial evaluation would compare the average dollar value of the units in the sample to the average dollar value of the units in the population.

#### **1. Computations of averages**

- Sample Average - ( $\$452,985 / 6 = \$75,498$ )
- Population Average - ( $\$2,286,000 / 36 = \$63,500$ )

#### **2. Precision Variance**

- The formula is the absolute value of the following fraction:

$$\frac{(\text{Sample Average} - \text{Population Average})}{\text{Population Average}}$$

- Computation

$$\text{Variance} = \text{Absolute Value } [(75,498 - 63,500) / 63,500] = 18.89\%$$

The average unit value in the sample is larger than the average unit value in the population and is not within the recommended 15% variance. The random selection of months does not guarantee that the sample will be representative of the population. Closer examination of the months selected reveal that the problem may be that 2 of the

months selected were during the Christmas shopping season, which is usually when retailers do most of their business.

The solution to the problem would be to select another random sample, which may provide a more representative sample, or the sample could be expanded until it becomes more representative of the population. The preferred solution probably would be to select another sample(s) until it is representative of the population. Expanding the sample has the disadvantage of increasing the amount of time it will take to locate and examine the sampling units once the evaluation is completed. However, whether or not the initial sample should be expanded or new one selected may depend on how much time the auditor and taxpayer have already invested in the initial sample. Once the sample is expanded or replaced, the original sample will no longer be usable, even if the new tax determination is less favorable than expected.

Other time periods (day, week) and transaction samples would be evaluated in the same way to ensure that the sample is representative of the population.

	Sample	Population
Dollar value	Sample base dollars	Population base dollars
# of sampling units	(Transactions, clusters, days, weeks)	(Transactions, clusters, days, weeks)
Average	Average sampling unit	Average population unit

### ***Intermediate Sample Evaluation***

Decisions made in the sampling process prior to this point have been based on:

- Auditor judgment
- Familiarity with the industry being sampled
- Summary figures available
- Review of the taxpayer's accounting procedures

Now the auditor has facts on which to verify prior assumptions. Several computations and comparisons should be made and documented in the audit file.

- 25% Short-Test (stop or go test)

By using the stop or go test, the auditor can evaluate the quality of the sample and verify completeness of the population. This is also referred to as the **short-test**. A

short-test requires that sampling units be examined in the order selected. This step is normally performed after 25% of the sampling units have been examined.

If no errors are found from the short-test, the auditor has the following options:

1. **Abandon the sample:** The decision to stop may be based on cost/benefit considerations. The risk of abandoning the sample is that a material error may be overlooked. In populations with low error rates, even large samples may uncover no errors. If no errors are found at the stop or go point, the auditor may wish not to abandon the sample, but continue to see if any error(s) occur.

**Example to abandon:**

The auditor performed a short-test at the 25% point. No errors were found. Prior audits of the taxpayer found no errors. In the auditor's judgment, any material error(s) would be unlikely. The auditor abandoned the sample and accepted the population as reported correctly.

**Example to continue:**

The auditor found no errors in the sample at the short-test. However, a relatively small error rate could translate into a high-dollar error. The auditor had no knowledge or evidence as to what error(s) might be in the population. It was decided to continue the sample.

2. Look at more sample items and evaluate again
3. Evaluate how representative the sample items are: Compare the average sampling unit with the average population unit to see if it is within the 15% guideline. Large differences in this comparison may indicate that the sample is not representative to the population. This can also indicate that the sampling units were selected from a portion of a population rather than the entire population that generated the summary amounts. To overcome this problem, the following may be considered:
  - Exclude outlying transactions that may be skewing the result of this calculation and recalculate the ratio
  - Expand the short-test by looking at additional sampling units
  - Draw a new sample and evaluate
  - Redefine the frame



- Review and Evaluate the Exceptions
  - Compare the average dollar value of all errors to each individual error. This may help identify particular classes of errors or items that appear to be outliers. Further refinement of the sampling frame may be indicated.
- Compute and Compare Percentages
  - Compute and compare the percentage of non-taxed sales/purchases charged to accounts of interest in the sample to the percentage of non-taxed sales/purchases charged to the same accounts of interest in the population.
  - If both of these percentages are computed on the dollar value of the transactions, a difference may indicate an inadequately defined frame. Dollar-value or invoice-mix problems will need to be addressed.
- Compute Error Rate
  - Compute the percentage of error by dividing all of the error(s) identified by the total of all items reviewed. This percentage of error can be used to compute the potential value of the sample by projecting that error to the appropriate population total.
  - These tests performed on the sample at this point may save time by allowing modification of the sample before more time is spent. It is important to perform these tests to verify and document completeness of the population being examined even if no errors are noted in the short-test.

### ***Final Sample Evaluation***

When the examination of the full sample is complete, quality as well as quantity must be evaluated before a projection is made.

### ***Time Period Sample Evaluation***

When doing time-period samples, an additional evaluation step is required. The purpose of this evaluation is to identify any unusual time-periods.

1. Sort errors by time-period and total

2. Divide the error(s) for each period by the sample base for each period to determine the percentage of error for each period
3. Compare each period's percentage of error to the overall error percentage

**Note: If unusual time-periods were identified, a possible solution would be to stratify or adjust.**

***Projection of the Sample Results***

The results of a sample should be applied only to the population from which it was selected. The error(s) in the sample should be projected over the base that best measures the population in which the error(s) were discovered. The projection base measures total book value of the sampling frame (e.g., gross sales, deduction amounts, taxable sales, total purchases, or total expenses). There are many methods of projecting sample results.

***Ratio Estimation***

The ratio projection method is the most frequently used and preferred method. There are other acceptable methods; however, they are only used when extenuating circumstances prevent the use of the ratio projection method. This method requires the development of an error ratio from the sample findings. The error ratio is the total dollar error divided by the sample base. The error ratio is then multiplied by the projection base (also called the "population base") to arrive at the estimated adjustment.

**Example (Sales):**

A sample of 500 transactions was done on a population of sales invoices with an amount (reported value) of \$10,000,000. Sales by year were: 2010, \$1,000,000; 2011, \$2,000,000; 2012, \$3,000,000; and 2013, \$4,000,000. The total amount (reported value) of the sample was \$500,000. The error amount in the sample is \$60,000.

**Formula:**

$$\frac{\text{Sample Error}}{\text{Sample Base}} = \text{Projected Error Rate} \times \text{Projection Base} = \text{Projected Error}$$

Calculation:

$$\frac{\$60,000}{\$500,000} = 0.12 \text{ (i.e., 12\%)} \times \$10,000,000 = \$1,200,000$$

Projection Base (i.e., Population Base) by year:

$$\text{In 2010} - 0.12 \times \$1,000,000 = \$120,000$$

$$\text{In 2011} - 0.12 \times \$2,000,000 = \$240,000$$

$$\text{In 2012} - 0.12 \times \$3,000,000 = \$360,000$$

$$\text{In 2013} - 0.12 \times \$4,000,000 = \$480,000$$

**Example (Purchases):**

An audit of purchases through purchase orders was done. The total purchase order amounts for the audit period was \$500,000. Purchases by year were: 2010, \$50,000; 2011, \$100,000; 2012, \$100,000; and 2013, \$250,000. A random selection of 900 purchase orders totaling \$120,000 showed unreported taxable purchases of \$3,000.

Formula:

$$\frac{\text{Sample Error}}{\text{Sample Base}} = \text{Projected Error Rate} \times \text{Projection Base} = \text{Projected Error}$$

Calculation

$$\frac{\$3,000}{\$120,000} = .025 \text{ (i.e., 2.5\%)} \times \$500,000 = \$12,500$$

Population Base by year:

$$\text{In 2010} - 0.025 \times \$ 50,000 = \$1,250$$

$$\text{In 2011} - 0.025 \times \$100,000 = \$2,500$$

$$\text{In 2012} - 0.025 \times \$100,000 = \$2,500$$

$$\text{In 2013} - 0.025 \times \$250,000 = \$6,250$$

***Projection Base***

In some situations, several bases may be available. The choice of which base to use depends on what is available and most appropriate.

- Gross Sales as the Projection Base - Gross sales amounts are generally available and are easily verified from various sources. For these reasons, it is frequently used as the basis for projection. In some instances, errors in the sample relate to all different types of sales invoices (taxable and as well as exempt).
- Non-taxed Sales Amounts as the Projection Base - Consideration should be given to sales deduction amounts as the projection base if the error(s) in the sample relate to tax-exempt sales.
- Alternative Bases - In some instances, the error(s) can be isolated to a very narrow population.

**Example:**

During a sales tax audit, the error(s) were found within the resale deduction only. Then, the projection base should only be the amount reported as resale. If auditing for expenses and the error(s) are found only in the area of the supplies expense account, then the projection base should be the account for supplies expenses.

- Inappropriate Bases - If the objective were to examine exempt sales, then an inappropriate projection base would be the reported taxable sales. It is inappropriate because reported *taxable* sales do not include exempt sales. However, total sales may be appropriate because both taxable and exempt sales are included.

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## **Appendix B – Sales and Use Tax Paid In Error**

### **Sales and Use Tax Paid in Error**

#### **1. Sales Tax and Seller's Use Tax Paid in Error**

- If the overpayment to a single vendor is based on \$5,000 or less in purchases per year, the sample item will be listed as a credit and left in the sample. This credit amount will be included in the calculation of the total error that is projected over the population
- If the overpayment is based on more than \$5,000 in purchases per year from a single vendor, those purchases must remain in the sample population as a non-exception, and detailed separately. It is the taxpayer's responsibility to detail overpayments relating to each individual vendor for the audit period and to request credit directly from the vendor

#### **2. Use Tax Self-Accrued and Direct Pay Accounts in Error. When use tax is paid in error to the State, credit will be given in the audit.**

- If the overpayment is based on \$5,000 or less in purchases per year from a single vendor, the sample item will be listed as a credit and left in the sample. This credit amount will be included in the calculation of the total error that is projected over the population
- If the overpayment is based on more than \$5,000 in purchases per year from a single vendor, those purchases will remain in the sample and the population. If, in the auditor's judgment, these errors cannot be proven to consistently occur throughout the audit period, or the dollar amount of these errors is substantial, these items will be shown as a non-exception and the taxpayer will be required to support the overpayment on an actual basis. If these overpayments can be proven to consistently occur throughout the audit period, the credits will be left in the sample and projected.

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## **Appendix C – Cash Basis Auditing**

### **Purpose**

This appendix provides information and procedures for the sampling method used in a cash basis sales tax audit. After reviewing this guide, an auditor will have a better understanding of:

- Special considerations that warrant applying the cash basis audit sampling plan (time period)
- Sampling methods used for taxpayers operating in a cash basis environment

The information and instructions which follow are not intended to be rigid and inflexible, but are designed as guidelines to simplify and attain uniformity in cash basis auditing. While the guidelines are flexible, the reasons for major deviations from procedures outlined in this appendix should be fully explained in the audit schedules.

Effective April 10, 2014, the Department cannot base a tax deficiency determination on an indirect audit procedure unless the Department has a documented reason to believe that the records maintained or filed are inaccurate or incomplete and that additional taxes are due. **Indirect audit procedure** is defined in MCL 205.68(8)(a) and MCL 205.104a(4) as “an audit method that involves the determination of tax liabilities through an analysis of a taxpayer’s business activities using information from a range of sources beyond the taxpayer’s declaration and formal books and records.” Therefore, an auditor should always document the condition of the taxpayer’s books and records and the auditor’s reasons for determining that the books and records are inaccurate or incomplete before applying the cash basis audit sampling plan.

### **Non-Statistical Cash Basis Audit Sampling**

When data is not available or suitable for electronic sampling, non-statistical sampling techniques may be used (e.g., detail review, block sampling). Non-statistical audit sampling techniques, particularly when applied to a random selection, offer acceptable levels of precision and accuracy for both the auditor and taxpayer.

### **Pre-Audit Planning – Field Interview**

The field interview held with taxpayers provides an auditor with the opportunity to gather information and gain an understanding of a taxpayer’s business operation and system of record keeping. This interview and survey should also help the taxpayer understand the proper documentation and the records that should be supplied to the auditor. When supplied the proper documentation and records, the auditor can sample the

records in an efficient and effective manner. All the knowledge gained in a field interview will help auditors prepare an effective sampling plan.

### ***Review Business Processes - Field Interview***

An auditor should review and document the taxpayer's general business practices and history, as any changes could affect the sample. For example:

- Description of business including number of locations and business activities at each
- Changes in business activity, ownership, or other businesses owned
- Employee turnover
- Types of merchandise sold and corresponding mark-up
- Store layout (deli counter, gas station, pharmacy, hardware, souvenirs, gifts, deli counter, ATM, lotto machine, or another business within store)
- Merchandise vendors by category (cigarettes, beer/wine, groceries, prepared food, fuel, and phone cards)
- Seasonal and business cycle changes
- Tax laws, rules, and rates during the audit period

### ***Review Accounting System, Record Storage and Tax Reporting – Field Interview***

An auditor should review the taxpayer's accounting systems, records storage and reporting procedures. The following factors will affect the sampling plan:

- The identification of appropriate target populations
- The choice of item sampled (sampling unit)
- Potential for electronic audit
- The availability of electronic records and the level of detail contained in the electronic records
- The availability of population totals to be used for projection
- Sample size

### ***Special Considerations for Accounting:***

- What accounting methods does the taxpayer use to account for sales and/or purchases transactions? Have there been any changes in accounting methods?
- How do the accounting procedures for financial reporting, federal income tax, and state tax reporting differ? Are there audited financial statements available?
- What accounting records are available for sales and purchases:
  - SUW tax returns
  - Federal tax returns
  - Michigan tax returns
  - General ledgers
  - Profit and loss statements
  - Sales journal
  - Cash register tapes
  - Daily sales records
  - Purchase journal
  - Purchase invoices
  - Bank statements
  - Cancelled checks
  - Check register/stubs
  - Physical inventory reports
  - Categorical mark-up worksheets
- Are electronic records available?
- What level of detail is contained in the electronic records? In what format are the electronic records stored?
- Is there an accounting system? Is there an audit trail between financial statements, trial balance, ledgers, and source documents?
- Who records the z-ring, reconciles daily sheets, and prepare daily bank deposits?
- How are sales reported to the accountant? What monthly sales and purchase reports are provided by accountant?
- What methods of payment (cash, check, and/or credit card) are used to pay vendors?
- How are cash paid outs accounted for and reported to accountant?



- How is spoilage/breakage accounted for?
- How is theft accounted for?
- How often is a physical inventory conducted?
- How is merchandise consumed by store or owner personal use accounted for?

***Special Considerations for Record Storage:***

- How are numbers assigned to source documents such as invoices, vouchers, checks, purchase orders, etc.? How are different locations identified?
- Where are sales, purchase, financial, and banking records stored and what are the retention periods?

***Special Considerations for Tax Reporting:***

- How many cash registers are used to record sales? What cash register keys are used to record sales for each product?
- What procedures are in place to ensure that taxability of sales is recorded correctly?
- What is the reporting process from cash register to tax returns?
- Who programs the POS (Point-of-Sale) System and what level of override capability exists?
- Are there open key categories available for use in addition to the POS scanner?
- Are there any other special reporting procedures that may affect a sample?

***Inform the Taxpayer***

The auditor and the taxpayer should develop the sampling plan together. It is important that the taxpayer understand the objectives and the techniques that will be used to make a tax determination from a sample based on the taxpayer's records. The auditor should explain how the sample will be selected and how the results of the sample will be projected over the entire population or audit period.

## ***Time Period Sampling***

Although transaction sampling is the recommended method for conducting a sample, this may not always be possible due to the taxpayer's accounting system or the way in which records are stored. Transaction sampling will not accomplish the sampling objectives in cases where the taxpayer's sales records do not contain sufficient information as to the taxability of the item(s) sold at the transaction level. For example, cash register tapes which indicate whether each sale is in a taxable or exempt category (e.g., grocery, non-taxable, deli), but which do not identify the individual items sold (e.g., 20 oz. Coke, King Size Snickers, 7" Turkey Sub, etc.) are not sufficient to independently determine the taxable status of each sale; therefore, it is not possible to verify the taxability of sales through transaction sampling. In these instances, time period sampling will be the best approach.

### ***Steps in the Cash Basis Sample Process – Random Time Period (detail transaction level sales data or records do not exist)***

For sampling to be efficient and accurate, sufficient planning at each step in the sampling process is needed. The auditor should have a sufficient understanding of the taxpayer's accounting system, types of records available, how the records are filed, and how they can be retrieved. Equally important, the taxpayer should understand the sampling process in order to help the auditor conduct a sample that is both efficient and accurate.

#### **1. Define the population:**

- The population is purchase and sales transactions
- The target population is merchandise purchase and sales transactions
- The sampling frame is merchandise purchase and sales transactions and should be based on the following factors:
  - The time periods for which the taxpayer has completed general ledgers/purchase ledgers
  - The time periods for which the taxpayer has purchase invoices available
  - The time periods for which the taxpayer had a change in product mix
  - The time periods for which vendors will be able to supply the Department with data

2. Define the sampling unit: The sampling unit is merchandise purchase and sales transactions.
3. Establish correspondence: Manual correspondence will be accomplished by relating months to random numbers.
4. Determine the sample size: The sample size will be based on the length of the taxpayer's inventory turn cycle. Inventory owned by small, cash based retailers usually turns over several times within one year. The inventory turnover ratio will be calculated and used to ensure that the sample period encompasses at least one complete inventory cycle. The minimum sample size will be two months.

The inventory turnover ratio is calculated as follows:

$$\frac{\text{cost of goods sold (merchandise)}}{((\text{beginning} + \text{ending merchandise inventory}) / 2)} = \text{inventory turns per year}$$

$$\frac{12 \text{ months per year}}{\text{inventory turns per year}} = \text{inventory turn cycle time (months)}$$

$$\text{inventory turn cycle time rounded up to the nearest whole number} = \text{minimum number of consecutive months to be examined}$$

**Example:**

Cost of goods sold is \$175,000. Beginning merchandise inventory is \$25,000 and ending merchandise inventory is \$15,000.

$$\frac{\$175,000}{((25,000 + 15,000)/2)} = 8.75 \text{ inventory turns per year}$$

$$\frac{12 \text{ months per year}}{8.75 \text{ inventory turns per year}} = 1.3714 \text{ month inventory turn cycle}$$

$$1.3714, \text{ rounded up} = 2 \text{ months}$$

Therefore, a minimum of two consecutive months should be examined to assure that one inventory cycle has been included.

5. Choose the method of selecting the sample: The sample will be selected using a random number generator.

6. Identify the population base
7. Draw the sample: Use a random number generator to output three months. The taxpayer will then be given the option to select one of the three months and a second month that immediately precedes or follows the random month selected. Months chosen by the taxpayer for the test period should represent normal business activity. Additional months may be added to encompass at least one complete inventory cycle. Consecutive months are mandatory to eliminate timing differences.
8. Prepare and present to taxpayer Notification of Sampling Procedures
9. Evaluate the sample quality: The precision variance should be less than or equal to 15%.

$$\left| \frac{(\text{Selected Months Sales Average} - \text{Monthly Sales})}{\text{Monthly Sales Average}} \right| = \text{Precision Variance}$$

If the precision variance is greater than 15%, have the taxpayer select alternative months and repeat the calculation. Continue until precision variance is within allowable range. If spares are exhausted, repeat step 7 and draw another sample.

10. Complete examination of records.
11. Project the results: The purchase spread is used to determine the percentage of food and other non-taxable merchandise purchased compared to the total merchandise purchased. Categorical mark-ups are factored into this analysis when information is provided by the taxpayer that agrees with the mark-ups reported in the taxpayer's records. A comparison of the audit-determined food percentage and the percentage of food for human consumption deduction reported on the sales tax returns will be made and a reported food deduction that exceeds the amount determined by the purchase spread ratios will result in disallowed deductions.

When a purchase spread is conducted, sales records for the same sample period are also reviewed. This is done in part to observe the relationship between sales and purchases for the sample period. Adjustments may be made to sales based on either the purchase or sales information. To the extent any error(s) or amounts are noted in the sample months that require a projection, the auditor may project based on the ratio estimation method or by determining a monthly average. Expansion of the sample or

detailed methods may also be used. Determination on how to proceed will be based on the information and records available, the auditor's professional judgment, and any other pertinent facts and circumstances of the case.

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## Glossary

**Block Size** - The measurement (in bytes) of a group of records read by a computer at one time in order to maximize efficiency. Block size is usually an exact multiple of the record length (e.g., if the record length is 150, the block size could be 1,500 or 3,000) Example: "The record length for the file is 224, the blocking factor is 100 and the block size is 22,400."

**Block Factor** - The number of records in a block. The record length times the blocking factor is equal to the block size.

**Confidence Interval** - A confidence interval is an estimate combined with a probability statement. For example, we might say that we are 95% confident that the true population mean is greater than *a* and less than *b*. Confidence intervals indicate the precision of the estimate and the uncertainty of the estimate.

**Confidence Level** - The likelihood that the true population parameter lies within the range specified by the confidence interval. The confidence level has a direct effect on the size of the sample. For example, a confidence level of 90% says that the sample results will meet the true value of the population 90 times out of 100. It also says that 10 times out of 100, the sample results will not meet the true value of the population. In general, a confidence level of 90% or 95% will be used. A confidence level of 95% will result with greater precision but will generate larger samples as compared to a 90% confidence level.

**Control Total Reports** - Total generated with the taxpayer data used to reconcile back to the taxpayer's hardcopy historical books and records. The purpose of a control total is to assure the integrity of electronic data by determining that all data was received and converted correctly.

**Count** - Number of records/transactions

**Data Conversion** – The process of converting data imported from an electronic system into a form that enables the data to be analyzed.

**De-Minimus** – A range of items the auditor is willing to accept as correct without actually reviewing (Low Dollar Range). However, if the total dollars in this range is material (the percentage of dollars in the range compared to the entire population), then further analysis should be considered. Other possible options would be selecting a sample from within the low dollar range and projecting the results or applying the percentage of error from the adjacent stratum to the de-minimus stratum.

**Field** - A data item on a record, e.g., an invoice number or a date.

**File** - An organized collection of related records, such as a customer file, which is usually arranged in a sequence according to a key contained in each record.

**File Integrity** - The accuracy and reliability of data in a file.

**High Dollar Range** - A range of items which the auditor will review in detail, will not include as part of the sample, and will not project over the population when the population includes data from the entire audit period.

**Items of Interest** - Those items in the population that we are interested in reviewing and drawing a conclusion about.

**Line Item Record** - A record relating to a detailed line item on a source document such as a sales invoice or payment voucher. A single invoice or voucher may include multiple line items.

**Low Dollar Range** – See de-minimus.

**Master File** - A file of relatively permanent data that is updated periodically. Examples are customer or vendor masters that contain names and addresses.

**Population** - A group of all possible units with some common characteristic, such as sales or purchase transactions. A population is the aggregate of all items or (units) that we want to sample in order to draw a conclusion about. Also referred to as the “universe.”

**Population File** – An electronic file created from the original taxpayer file and containing the records the auditor defined to be a part of the population to be examined.

**Record** - A collection of related data items or related fields.

**Relative Error Tolerated** - This is more commonly known as precision. It is the amount of sampling error the department is willing to tolerate. It also means that the total deficiency calculated should be within 5% of the true amount due. It can be changed to 10%, but a 10% precision sample will pull less sample items and the error may be greater.

**Note: The Relative Error Tolerated is not directly related to the 90% (or 95%) confidence level.**

**Sampling Frame** - A group of items from which the sample is taken.

**Sample Ranges** – Individual strata that fall between the low and high dollar ranges. A separate sample will be selected from each stratum.

**Sample Size** – The number of sampling units selected for examination from the sampling frame.

**Source Documents** - A hard copy invoice, bill, purchase order, etc. It is a document that the taxpayer's personnel use to enter data into their electronic system.

**Standard Deviation** - A measure of the distribution of data, standard deviation is an indication of how far from the average the values in the data set are.

**Strata** - The plural of “stratum.”

**Stratum** - A section, level, layer or division within a population on which a sample is drawn. Each stratum is usually determined by dollar amounts and each item in a stratum has an equal chance of being selected.

**Summary Reports** - A report reflecting specified field(s) being summarized and totaled. These reports assist the auditor in determining whether specific accounts would be included or excluded during the population definition process.

**Target Population** – The total population of the items of interest identified from the population.

**Universe** – See Population.