

MANUAL AUDIT SAMPLING

Sampling is the application of an audit procedure to less than 100% of the items within an account balance or class of transactions for the purpose of evaluating some characteristic of all the items within the balance or class of transactions.

Much of the information included in this manual was taken from the Statement on Auditing Standards No. 39 on Audit Sampling which provides guidance on the use of sampling in an audit of financial statements. This information has been adapted to fit the circumstances most often encountered in tax auditing.

HISTORY

The Department has used sampling in its audit procedures for many years. That sampling, for the most part, has been block sampling. That is, taking a period of time and testing 100% of the records during that time. Until 1990, the Department's policy on sampling was to take 100% samples from three test months per year selected for being the high, low and average months of the year. From 1990 forward the Department has adopted other systematic or random sampling techniques.

Random sampling techniques are both convenient and accurate when performed properly, for these reasons sampling is the rule rather than the exception in most audits performed by the Department. The convenience and accuracy extends to taxpayers as well. Audits based on sampling have been challenged. When challenged we have allowed the taxpayer to present detailed information to refute the results of the sample.

PURPOSE OF AUDIT SAMPLING

Sampling is performed because it is more efficient than testing 100% of a population. In tax audits, if the taxpayer and the Department can agree on a representative sample, it can save both parties time and money. By definition, any procedure that does not examine 100% of the items in question is a sampling procedure.

WHEN NOT TO SAMPLE

There are many audit procedures which do not involve sampling.

Inquiry and Observation:

- Reviewing records for the method of accounting and other information.
- Observing accounting procedures.
- Discussing methods of accounting and reporting with taxpayer.
- Scanning documents for possible issues.

Analytical Review Procedures:

- Comparing records reports and other information.
- Recomputing or estimating amounts.
- Reviewing trends in reporting.
- Comparing similar businesses.

One-Hundred Percent Examination:

- Reviewing all fixed asset purchases, where appropriate.
- Examining all contracts, where there are a small number.
- Reconciling each years gross receipts to CIT A sales factors or Schedule C receipts.

Zero Percent Examination:

This occurs when the auditor determines that a type of receipt, deduction, exemption or other item does not need to be tested.

Note: Even though 100% examination may be done where appropriate. It is not mandatory for any particular taxpayers or tax programs. Sampling procedures discussed below may be more cost effective.

SAMPLING RISK

Overall tax audit risk is made up of the risk of inaccurate records and the risk of misapplication of the tax law. Both of these risks are made up of two components as well.

1. Risk that there are errors (inherent risk).
2. Risk that procedures will not find errors (audit risk).

Audit risk, in turn is made up of two components, the risk that a procedure is not effective and sampling risk. Sampling risk is the probability that the sample results are not representative of the entire population. In general, factors that may lessen sampling risk include:

1. Taking larger size samples
2. Using random sample selection methods
3. Stratifying the sample
4. Properly defining the test objective
5. Properly defining a deviation
6. Exclusion of non-recurring, non-systematic errors.
7. Properly evaluating errors.

STATISTICAL VS. NON-STATISTICAL SAMPLING

The difference between statistical and non-statistical sampling is that statistical sampling allows the user to measure the sampling risk associated with the procedure. Statistical sampling applies the laws of probability to determine the percent likelihood that the sample does not accurately reflect the population.

In essence, the laws of probability say that large, relatively homogeneous populations have similar distributions and other features so that if a random sample is taken, it will consistently reflect the population within certain limits. In order for the sample to be a "statistical" sample, the results must be evaluated and two calculations made. These calculations tell the user how likely it is that the sample results are within a given range of the actual population.

For instance, a statistical sample would not only tell you that disallowed deductions are estimated at \$5,000, but that you have a 95% likelihood (confidence) of being within \$50 (precision) of the actual disallowed deductions.

A properly designed and applied non-statistical sample can provide results that are accurate and effective, but will not measure the sampling risk.

Generally, the decision to apply a statistical or non-statistical sampling application to a particular audit test is a matter of cost effectiveness. Statistical applications usually require more training for auditors and more time to apply. The department utilizes non-statistical random sampling procedures.

Many audit programs in both the public and private sector have developed standard sampling approaches which use predetermined allowances for acceptable sampling risk, expected and tolerable error. These approaches reduce the time and effort required to determine the sample size and evaluate results. The cost of these approaches is that they usually generate sample sizes somewhat larger than necessary to allow a margin for variance. The New Mexico Taxation and Revenue Department has elected to use fixed sample sizes of 250 and 500 items of interest for variable sampling. The sample sizes apply to homogeneous and non-

homogeneous populations respectively. Stratification of a population can reduce sample size in most cases. Provisions for sampling units based on time periods is also provided.

In any sampling approach, the auditor must evaluate the population that is being tested, must determine if any stratification should be done, must evaluate the cause of any exceptions and must apply the results from the sample to the remaining portion of the population.

DESIGNING A SAMPLING APPLICATION

There are several steps in designing a sampling application for an audit or investigation. The steps are discussed in detail in the next pages.

1. Define the objectives of the test
2. Determine the type of test to be performed
 - a. Variables Sampling
 - b. Attribute Sampling
3. Define the deviation conditions
4. Define the population
 - a. Decide what period will be covered by the test
 - b. Define the sampling unit
 - c. Consider the completeness of the population
 - d. Consider how the error rate will be extrapolated
5. Determine the method of selecting the sample
 - a. Random-Number sampling
 - b. Systematic sampling
 - c. Other sampling
6. Determine the sample size
 - a. Variables Sampling
 - b. Attribute Sampling
7. Perform the sample
 - a. Compare the sample to the population before completing the sample
8. Evaluate the sample results
 - a. Interpret results
 - b. Extrapolate results
 - c. Consider the qualitative aspects of the deviations
 - d. Reaching an overall conclusion about the population
9. Document the sampling procedure

DEFINE THE OBJECTIVES OF THE TEST-STEP 1

The auditor must have a definite question to be answered by the test. Examples of questions to be answered are.

1. Does the Sales Summary contain all invoices and is information recorded accurately?
2. How often are invoices voided without explanation?
3. Does the taxpayer record all supplies pulled from inventory in the inventory log?
4. Does the sales supervisor correctly batch sales by destination so that they can be recorded by state in the summary journal?
5. What is the amount of deductions not supported by NTTC's?
6. What is the percentage of sales of services to the government relative to total sales?
7. What percentage of supplies are pulled from inventory held for sale each month?
8. What percentage of supplies purchased outside NM have not had tax paid or accrued?

Auditors should record the objective of the test within the audit narrative and/ or other workpapers. Not only does that help the reviewer, but it also clarifies the objective for the auditor so that the proper audit procedure and sampling application can be defined. If the auditor can create a one sentence question, like the ones above,

to be answered, he or she is less likely to perform an inappropriate procedure or use the wrong sampling application.

DETERMINE THE TYPE OF TEST TO BE PERFORMED-STEP 2

The type of sampling application, whether statistical or non-statistical, is usually defined by the conclusion which the auditor is attempting to reach. "Variables sampling" is used to reach a conclusion about a population in terms of an amount. Variables sampling is commonly used to determine the dollar size of a population or to determine if the stated dollar size is correct.

"Attribute sampling" is used when the auditor is only concerned with acceptance or rejection of a hypothesis. It is used to reach a **yes or no answer** about a question.

The reason that defining the type of application is so important is that sample size is dependent on which type of application is being performed. Below is the same list of questions given on the previous page, and an explanation of the type of application required for each.

SAMPLING APPLICATION ANALYSIS

QUESTION TO BE ANSWERED	TYPE OF APPLICATION	EXPLANATION
Does the Sales Summary contain all invoices and is information recorded accurately?	Attribute	The auditor doesn't want to know what percentage or how much, only yes or no.
How often are invoices voided without explanation?	Variables	Here, the auditor wants to know a specific amount.
Does the taxpayer record all supplies pulled from inventory in the inventory log?	Attribute	Presumably, if there are supplies not recorded, the auditor will not "accept" the inventory record.
Does the sales supervisor correctly batch sales by destination so that they can be recorded by state in the summary journal?	Attribute	This is a yes or no question, which will result in accepting or rejecting the data in the summary journal.
What is the amount of deductions not supported by NTTC's?	Variables	The auditor needs to know a specific dollar amount.
What is the percentage of sales of services to the government relative to total sales?	Variables	If the auditor asked the question, "Is the percentage 20%," attribute sampling could be used. But here the auditor wants to know the exact rate.
What percentage of supplies are pulled from inventory held for sale each month?	Variables	Same as above
What percentage of supplies purchased outside NM have not had tax paid or accrued?	Variables	Same as above

Sampling applications can also be classified by the type of audit procedure in which they are used. "Compliance tests" are tests which determine whether controls are being complied with. The answer to a compliance test is yes or no. "Substantive tests" are tests which determine the amount of some class of items. Attribute sampling is most often used in compliance tests and variables sampling is most often used in substantive tests.

COMPLIANCE TESTS

Compliance tests are most often used by tax auditors to determine if controls which ensure the accuracy of records are in place and working correctly. These tests can be performed directly on the control feature itself or indirectly on the outcome of the control.

An example of a direct test would be a test to determine that invoices are pre-numbered, used in sequence and accounted for by those issuing the invoices. Such a test would be helpful in assuring the auditor that all invoices issued in a period are used or voided.

An example of an indirect test would be a tracing of a sample of invoices to a summary journal to determine that the controls over recording invoices in the summary journal are working. In this case, the controls themselves are not actually tested, but the results of those controls are examined, and the question of whether the summary record is reliable will be answered yes or no.

Note that tax auditors do not use formal compliance testing as frequently as other types of auditors. However, tax auditors do make judgments about the level of risk of incorrect records and the risk of misapplication of the tax law. These are the types of judgments that can be backed up by compliance tests.

The decision to test controls or the accuracy of records is based on auditor judgement and the circumstances of the audit. The decision should be documented. Compliance testing may help to limit the scope of the audit to areas of higher risk or point out problems with records that may have otherwise appeared reliable.

The main reason for performing compliance tests is to reduce the amount of substantive tests that need to be performed. Therefore, the decision of whether to perform compliance tests should weigh the possible compliance tests against the possible substantive tests that could be performed to determine which test will be most efficient and effective.

For instance, if an auditor decides that he can either test the taxpayer's summary records and use them to perform the audit, or, rely on comparing reports to bank statements, then he or she should determine which method will be more efficient. If a compliance test of the summary records is performed and the records prove to be unreliable, then the auditor may still have to rely on bank statements. However, it may be that using the summary records will be much more efficient than using bank statements. Therefore, testing those records is worth the time needed and the risk that the test results will be negative. Before relying on the summary records the auditor should perform a test of transactions to determine the records are reliable.

SUBSTANTIVE TESTS

Substantive tests are used to determine the amount, usually the dollar amount, of a specific group of items. If the auditor seeks to determine the amount of disallowed deductions, for instance, the result of the sample will be a dollar figure of disallowed deductions found in the sample. The assumption is that the same proportion of disallowed deductions will exist in the population. Therefore, the final result of the test will be a dollar amount of disallowed deductions for the population which will be used as a basis for assessment.

Often, samples can be designed to serve both compliance and substantive tests. When it is likely that records will be needed for both types of applications, the auditor should strive to pull one sample. This is called dual-purpose testing.

DEFINE THE DEVIATION CONDITIONS-STEP 3

If you are performing a direct test of controls, such as checking for supervisor approval before selling goods free of tax, a deviation will be any noted lapse in the control. In this case if the control is documented in some way, such as with initials of the supervisor on the invoice, a deviation would be the lack of initials. If

the control is not documented, you will have to rely on direct observation of the control being performed, or on indirect evidence.

If you are testing controls indirectly, you would look at the error which the control is intended to prevent and would base your deviation on what defines that error. In the case above, the control in place is intended to prevent salesmen from not charging tax on sales that should be taxed. A deviation would therefore be defined as an invoice that did not have tax and should have.

If you are performing a substantive test, the item(s) you are picking up might not necessarily be thought of as deviations. For instance, you may be trying to determine the average New Mexico inventory value over a period for testing the CIT property factor. However, the same principle applies. You need to define which items meet the criteria necessary to reach the objective of the test. In this example, that might be inventory control log entries backed up by shipping and receiving reports.

Auditors should be careful not to include factors in the deviation, which do not affect the objective of the test. For instance, in the first test described above, invoices where the customer name was misspelled would not affect the objective of the test and should not be treated as deviations. On the other hand, auditors should also be careful to include all factors, which may affect the objective of the test. For instance, if an invoice contains the initials of a supervisor from another Department who is not familiar with the customers who have Non Taxable Transaction Certificates (NTTC's) on file, the invoice should be picked up as a deviation, even though it contains a supervisor's initials.

Some of the most common problems faced by auditors performing any kind of test come from not properly defining the deviation, and finding out after the test has been performed that there were other conditions that should have been considered.

DEFINE THE POPULATION-STEP 4

The auditor should determine if the population from which the sample is selected is appropriate for the specific audit objective, because sample results can be projected to only the population from which the sample was selected. If a change in the business results in more than one distinct population, then each needs to be tested separately. The auditor should also evaluate the reliability of the data presented as the population. The data should be complete and should also tie to other records such as CRS-1s, journals, summary reports, etc.

Analysis may reveal that the taxpayer changed a specific control procedure during the period under audit. The auditor needs to decide whether to design one sample and test both controls or do two separate samples. The auditor might also discover that the non-taxable sales do not match the CRS-1 reports due to the exclusion of a particular type of sale or due to the inclusion of non-New Mexico sales.

DECIDE WHAT PERIOD WILL BE COVERED BY THE TEST

Generally, a sample should be drawn from the entire period to which the test results will be applied. However, there are many situations when this is not practical. In any test where the auditor decides to limit the period from which the sample will be drawn, the auditor should evaluate sample results, as well as the period outside the sample, and determine the following:

1. What were the results of the sample and could they reasonably be expected to apply to the period not sampled.
2. What is the nature of the remaining period, does it have similar characteristics to the period tested?
3. How large is the remaining period? Ideally, the period from which the sample is drawn should be as large as possible. Limiting the period to a day out of each year or a week from the total audit period is not a sound basis for extrapolating results to the period not sampled. The more the sample is spread throughout the audit period, the more reliable the results will be.
4. What is the nature and amount of the transactions involved? The more homogeneous the population and the greater the size, the more likely a sample taken from only part of the period under audit will be representative.
5. What tests can be done of the remaining period to further substantiate the sample results?

6. What other matters are relevant to the sample results? Have conditions which might affect the results changed in the remaining period?

DEFINE THE SAMPLING UNIT

A sampling unit is any of the individual elements constituting the population. The auditor should define the sampling unit in light of what is being tested and the type of records kept by the taxpayer. A sampling unit may be, for example, a document, an entry in a journal, a line item, or a single transaction.

It is possible to sample based on time period representations such as days, weeks, or months. The department has set minimums of 30, 25, and 9 respectively. The days, weeks, or months should be randomly selected from the entire audit period. Random sampling within the selected days, weeks, or months is encouraged. Regardless of the type of time period selected the number of items of interest (invoices, line items, transactions, etc) must be achieved for the population type. In most time period samples the items of interest will exceed the minimum required.

CONSIDER THE COMPLETENESS OF THE POPULATION

The population is physically represented by some form of record. For instance, sales invoices, entries in a sales journal or summary entries in a ledger may represent total sales. The auditor actually selects sampling units from this physical representation and so must confirm that all sample units from this record are included in the entire population. If the physical representation differs from the actual population, the auditor might make erroneous conclusions about the population. A simple example of this is testing a depreciation schedule where a page of the schedule is missing.

Therefore, the auditor should be careful to determine that the records used to draw the sample are complete and reflect the actual population being tested. One means of doing this is comparing different records and reconciling differences found.

DETERMINE THE METHOD OF SELECTING THE SAMPLE-STEP 5

Sample items should be selected in such a way that the sample can be expected to be representative of the population. Therefore, all items in the population should have an equal opportunity to be selected.

RANDOM-NUMBER SELECTION

The auditor may select a random sample by corresponding random numbers generated by a computer or selected from a random number table with document numbers. The random number generating software programs utilized by the department provide seed numbers which can be used to duplicate a specific list of random numbers. The seed number should be documented within the audit workpapers.

Examples of random selection:

When a listing is available, even if the items are unnumbered or have non-continuous or non-systematic numbering systems, the random number sampling can be accomplished by making use of the page and line number.

For instance, the auditor might want to obtain a random number sample of items sold to one customer. Assume that a computer listing is available which consists of pages containing a total of 20,000 items. The pages of the listing can be easily numbered or their numbers determined by counting. There may be the same number of lines on most pages, with perhaps fewer on some.

Assume that there are 400 pages in the listing with 50 lines on most pages. The auditor would draw two lists of random numbers, one for three digit numbers between 1 and 400 and one for two digit numbers between 1 and 50. Items would then be selected by pairing numbers from the first and second list to identify the page and line on which the item to be selected is located.

SYSTEMATIC SELECTION

For this method, the auditor determines a uniform interval by dividing the number of physical units in the population by the sample size then rounding up. A starting point is randomly selected and each item after that is selected at the uniform interval. If the population is arranged randomly, systematic selection is essentially the same as random number selection. However, if the population is not randomly arranged, for instance, if sales are listed by item, rather than in the order made, there may be problems with this method.

One way to ensure more randomness in a systematic sample is to re-compute the interval each time by use of a random-number table. In this approach the auditor would select a list of random numbers. The first number would be the starting point. The second number would tell the auditor the interval to count to the next item to be selected. For instance, if the first two random numbers are 503 and 219, the auditor would select item 503 to start, then item 722 ($503 + 219$). In this approach, the auditor might have to go through the population more than once to finish drawing all the items. The number of digits to be used for the random numbers should make intervals that are large enough to go through the entire population a least once.

DETERMINE THE SAMPLE SIZE STEP 6

ATTRIBUTE SAMPLING (YES/NO)

To perform an attribute test, sample size should be determined as follows:

1. If the sample is drawn from the entire audit period, use an initial sample of 50 items. If the sample is drawn from a block, or if the population is limited in some other way, the initial sample should be 100 items.
2. If **one or more** deviations are found in the sample, the auditor must either reject the item being tested, or may expand the sample. If the auditor chooses to expand the sample, an additional number of items equal to the initial sample should be tested.
3. If **one or more** additional deviations are found, the auditor must either reject the item being tested, or may expand the sample to the appropriate variables sample size and use the results to estimate the amount of error in the item being tested.

See the section on evaluating the sampling results to determine whether qualitative aspects of a deviation may determine whether a deviation can be overlooked in an attribute sample.

VARIABLES SAMPLING (NUMBERS)

A critical question must be answered before the sample size for a variables sample can be computed. **Is the population relatively homogeneous?**

Homogeneous populations can be tested using smaller size samples since there are fewer exceptional items to skew the results. Non-homogeneous populations require larger size samples.

Homogeneity is the tendency of items in a population to be similar, or closer to the same dollar value. For instance, a population containing sales of three kinds of mid-priced property will be far more homogeneous than a population containing all sales of a Department store.

If a population is non-homogeneous, the auditor can reduce the sample size through stratification and identifying individually significant items. See Step 7 on performing the sample for an explanation of how stratification should be done.

The Audit Sampling Workpaper, AUD-21, can be used to document whether a population is homogeneous or not. Whether or not this workpaper used, the auditor should document why the population was either determined to be homogeneous or non-homogeneous.

SAMPLING SIZE TABLE

This table gives sample sizes for any population over 500 items where variables testing is performed. Populations smaller than 500 items should be examined in detail

	SELECTION METHOD	POPULATION TYPE (see flow chart for determination of population type)	
		NON-HOMOGENEOUS	HOMOGENEOUS
UNLIMITED	1 INDIVIDUAL ITEM	500 items of interest	250 items of interest
	1 INDIVIDUAL ITEM STRATIFIED	100 items per strata (5 strata max)	75 items per strata (5 strata max)
LIMITED	2 DAY *	30 days (1000 items of interest)	30 days (500 items of interest)
	3 WEEK *	25 weeks (1000 items of interest)	25 weeks (500 items of interest)
	4 MONTH *	9 months (1000 items of interest)	9 months (500 items of interest)

(Note: the number to the left of the selection method is the order of preference for selection methods. A 1 indicates the most preferred methods and a 4 indicates the least preferred)

*LIMITED Month, week, and day samples should examine two times the minimum required items of interest for the population type being tested, whenever possible. Random sampling of items of interest within the time period selected is encouraged. When using the month selection method the auditor must evaluate all months that have unusual balances and determine the circumstances for variance before including the months in the sample or in the extrapolation procedure. **LIMITED SAMPLING IS ALWAYS OUR LAST CHOICE AND THE REASON FOR ITS USE SHOULD BE ADEQUETLY DOCUMENTED.**

If the auditor determines that the population to be sampled is diluted with transactions that are not of interest then the sample size should be increased. In the case of a test of deductions where taxable and non-taxable sales are commingled the auditor would first need to determine the percentage of non-taxable sales in the population and then use this percentage to compute the increased sample size.

$$(\text{non-taxable sales} \div \text{total sales}) \times 100 = \% \text{ of non-taxable sales}$$

$$250 \div (\% \text{ of non-taxable sales}) = \text{sample size}$$

PERFORM THE SAMPLE-STEP 7

After the sampling plan has been designed, the auditor selects the sample and examines the selected items to determine if they contain deviations. Test the viability of the sample plan using approximately 25% of the items you intended to select. If the planned procedures work and the results meet your expectations continue to sample the balance of the units. The sample should also be evaluated to determine if it is representative of the population. The average value of the sample should be similar to the average value of the population. If expectations are not met or if the average values are not similar to the sample the plan may need to be modified or a new sample may need to be selected.

The following problems may arise during the sample procedure.

VOIDED DOCUMENTS: If an auditor randomly or otherwise selects a voided item to be included in the sample, and has reasonable assurance that the item was properly voided, it should be replaced with another item selected in accordance with the sampling procedure. The rule here is not absolute, the auditor or supervisor may make a judgement decision based on the circumstances associated with the voided transaction.

CREDITS: Most populations will contain credits. It may be possible in certain situations to remove the credits prior to sampling, but care should be taken to avoid inflating the population's total value. If the credits offset debits it is important to remove both. When stratifying a population it is necessary to use absolute values in order to keep credits and matching debits within the same strata. A credit will generally not produce a reduction in the exception total (the numerator in the error calculation). One example of a credit that might generate a reduction in a compensating tax exception total is the return of an item which had compensating tax accrued and paid at the time of purchase. A reduction would be acceptable if a reversal of the accrual did not take place and if the auditor has reasonable assurance that the return is not an unusual event.

UNUSED OR INAPPLICABLE DOCUMENTS: The auditor's consideration of unused or inapplicable documents is the same. For example, a sequence of vouchers might include unused vouchers or an intentional omission of certain numbers. If the auditor selects such a document, he should obtain reasonable assurance that the voucher number actually represents an unused voucher and does not represent a deviation. The unused voucher may then be replaced with an additional voucher.

ERRORS IN RANDOM-NUMBER SELECTION: In a situation where the auditor generates a random number that is not part of the population, that number should be replaced with another random number which is part of the population.

INABILITY TO EXAMINE SELECTED ITEMS: If an item selected is missing and it cannot be determined what happened to the item, it should normally be considered a deviation.

STRATIFICATION

In order to make a population more homogeneous for variables sampling, the auditor can use stratification. Described below are some ways to stratify a population. This list is not all-inclusive and auditors may find other appropriate ways to stratify a population.

It is important to note that generally, stratification requires that the sample results be extrapolated to each strata separately. In other words, if an auditor divides the population into two groups, sales of tangibles and sales of services, to make both groups more homogeneous, then the results of the sample from the tangible group should only be extrapolated to the total tangible sales and the results of the sample from the services group should only be extrapolated to the service sales.

Where the sample is limited to specific time periods, the auditor will need to confirm that the data from the entire population can be stratified before the resulting error rates can be applied.

Stratification is most often performed during computer assisted audits. Computer software applications can easily segregate a population and provide subtotals. It is required that auditors contact the Computer Assisted Audit Team when working with a high volume of transactions or with large data files.

A minimum of three errors per strata is necessary for extrapolation to strata population.

The following are some methods of stratification.

BY DOLLAR AMOUNT - This is the most common type of stratification used by auditors. The auditor needs to identify the number of different ranges, and their dollar values, into which the population most usually falls.

For instance, if the auditor is testing sales of equipment and the taxpayer sells several low-priced, several medium-priced and two high-priced models, the auditor may decide to make strata from \$7,000 to \$12,000, \$12,001 to \$18,000 and \$18,001 to \$25,000. Remember, the results of the sample pulled from each strata would be extrapolated only to the total of that strata.

BY NATURE OF THE ITEMS: An easy way to stratify a total population is to stratify based on the nature of the transactions, such as sales of tangibles and sales of services.

Any relevant attribute can be used so long as stratifying by that attribute tends to make the population more homogeneous in dollar amounts.

BY NATURE OF THE TEST - Another way to stratify a population is to divide the items into groups according to the nature of the test to be performed. For instance, if the auditor is testing deductions for supporting documentation, the population could be divided into groups where an NTTC is required and where one is not required.

The methods for stratifying described above may be used separately or in combination. For instance, the auditor may stratify first by the nature of the items, then by dollar amount.

STRATIFICATION EXAMPLE:

Taxpayer A sells three types of computer equipment: laptops, desktops and network servers. The auditor decides to stratify the total population of sales by type of computer equipment, since that tends to create more homogeneous sub-populations. Since this is still a non-homogeneous, stratified population the sample size computed from the Sampling Size Table is 100 per strata.

There were \$2,000,000 total laptop sales during the period, \$3,000,000 total desktop sales and \$5,000,000 server sales. The auditor should allocate the total sample size as follows:

100 from laptop sales
100 from desktop sales
100 from network sales

The results were as follows:

5% under-reported laptop sales X \$2,000,000 = \$100,000
5% over-reported desktop sales X \$3,000,000 = (\$150,000)
10% under-reported network sales X \$5,000,000 = \$500,000

The total exception in this case would be the sum of the separately extrapolated sample results, the net amount of \$450,000 under reported.

(Note: this is another example of a credit reducing an exception total)

IDENTIFYING INDIVIDUALLY SIGNIFICANT ITEMS

When planning a sample for a substantive test, the auditor uses his or her judgment to determine which items, if any, in an account balance or class of transactions should be tested individually and which items, if any, should be subject to sampling. The auditor should perform a detailed test of each item for which, in his judgment, acceptance of some sampling risk is not justified. The auditor might also identify unusual balances and transactions as individually significant items.

Any items that the auditor has decided to test 100 % are not part of the items subject to sampling.

EVALUATING THE SAMPLING RESULTS-STEP 8

After completing the examination of the sampling units and summarizing the deviations from prescribed control procedures, the auditor evaluates the results. Whether the sample is statistical or non-statistical, the auditor uses judgment in evaluating the results and reaching an overall conclusion.

INTERPRETING RESULTS

The auditor must determine how the outcome of the sample affects the test conclusions and the overall audit approach. If the auditor is testing the reliability of a certain record, the outcome of the attribute sample will either show deviations or no deviations. If there are deviations, the auditor must expand the sample as described under Step 6 for attribute sampling or reject the record as unreliable. This in turn may affect the audit approach.

EXTRAPOLATING RESULTS (when 5 or more deviations are found)

If the test is a variables sample and five or more errors are found, the auditor must extrapolate the results to the remainder of the population. This procedure calculates the percentage of error (POE) found in the sample and applies that result to the population tested. To calculate the POE, take the dollar value of the deviations (or other sample result), divide by the dollar value of the total sample. Then multiply that POE times the dollar value of the population.

$$\frac{\$ \text{Deviations (or sample results)}}{\$ \text{Total Sample}} \times \$ \text{Population}$$

NOTE: If fewer than five deviations are found in a non-stratified sample the auditor should detail the exceptions instead of extrapolating. If working with a stratified sample the auditor should detail the errors in each strata sample that contains fewer than three errors.

There are three rules for extrapolating:

The numerator should be the sample representation of what the auditor is trying to determine about the population (or strata).

The denominator should be the sample representation of the population (or strata).

The population should be complete and should not include items that do not represent the population as defined by the test.

For instance, it would not be appropriate to draw a sample of deductions taken and test them for validity, then divide the exceptions found by total deductions tested and apply that percentage to gross receipts reported. In this example, gross receipts is not the population; deductions reported is the population.

CONSIDERING THE QUALITATIVE ASPECTS OF DEVIATIONS

In addition to evaluating the frequency of deviations, the auditor should consider the qualitative aspects of the deviations. Qualitative characteristics of the nature and cause of the deviations are:

Whether the deviations are errors or irregularities

Whether the deviations are due to misunderstanding instructions or carelessness, and

The relationship of the deviations to other phases of the audit.

NON-RECURRING ERRORS are defined as errors that are caused by factors that do not affect the rest of the population. An example of a non-recurring error is a sale that was never recorded due to the fact that the salesman died right after closing the sale.

Errors that are determined to be non-recurring should be extracted from the results of the sample and from the total sample. They should not be used to extrapolate sample results to the total population.

For example, the auditor knows that some sales allocated to Texas actually had New Mexico delivery addresses. A sample is taken of Texas sales to determine what percentage of sales allocated to Texas should be reallocated to New Mexico. The sample of 100 items, totaling \$2,000 showed three items that should have been included as New Mexico sales. One item was non-recurring and amounted to \$100. The other two items amounted to a \$40 total. The rate of error in the population would be computed as follows:

$$\$40/1,900 = 2.105\%$$

The \$100 error would not be used to extrapolate sample results, but would be picked up as a separate exception.

NON-SYSTEMATIC ERRORS are errors that are caused by factors that may affect the rest of the population but whose effects are not predictable. An example of a non-systematic error is an error caused by the taxpayer's occasional use of salesmen to do accounting work.

Errors that are determined to be non-systematic should also be extracted from the sample results. However, since such errors may be recurring in the population, the auditor should understand the cause of the errors and try determine the total population error.

For example, a sample test of \$1,000 worth of sales reveals a systematic, recurring error of \$100 and a non-systematic error totaling \$50 in the sample. Investigation of the non-systematic errors shows that these errors generally occur at the end of the third and fourth quarters. The taxpayer explains that they are caused by differences in estimates used in recording end of quarter sales for those quarters in order to prepare the financial reports. Sometimes these estimates are reversed and the actual amounts are entered and sometimes they are not. The \$50 found is a net under-reported amount due to these estimates. In this case it may be appropriate to examine all such entries to see which ones were reversed properly and which ones were not.

Alternatively, the auditor may conduct a separate sample of those estimates to determine the percentage difference resulting from improper reversal. If either of these is done, then the results of the entire test would be computed as shown in the following table.

Total dollar value of the population being tested	Minus	Total dollar amount of the estimated entries made	Times	\$100/950 (the ratio of systematic errors to sample less non-systematic errors)
Plus				
Total net difference caused by estimates not reversed (picked up by detail test).	OR	Extrapolated net difference based on sample of the estimates and the difference found.		

DOCUMENT THE SAMPLE PROCEDURES-STEP 9

Examples of items the auditor should include in the documentation of the sampling test are:

- A description of the purpose of the test
- The definition of the population, the sampling unit, and the item of interest (if different)
- The definition of a deviation.
- Was the population determined to be homogeneous or not and how was the determination made.
- How was the sample size determined?
- How were the sampling procedures performed?
- How were deviations evaluated?
- What were the results of the sample?
- How were the sample results used in the audit (how were they extrapolated)?

If a variables sample is planned, the population must be tested to determine if it is homogeneous.

TAXATION & REVENUE DEPARTMENT
 Taxpayer Name _____
 CRS ID# _____

AUDIT & COMPLIANCE DIVISION
 Auditor(s) _____
 Date _____

Tax Program _____

Audit Sample Period(s) _____

Audit Sampling Workpaper (AUD 21)	
Define the Purpose of the Test	
Describe the Test Procedures	
Variables or Attribute Sample	
Population Definition <ul style="list-style-type: none"> • Total \$Value • Number of Items • \$Range(High & Low Values) • Est Average \$Value OR <ul style="list-style-type: none"> • Standard Deviation • Average \$ Value <ul style="list-style-type: none"> • Homogeneous: Yes/No 	
Describe Strata by Layer <ul style="list-style-type: none"> • Total \$Value • Number of Items • \$Range • Est Average \$Value OR <ul style="list-style-type: none"> • Standard Deviation • Average \$ Value <ul style="list-style-type: none"> • Homogeneous: Yes/No 	
Sampling Unit Definition / Item of Interest <ul style="list-style-type: none"> • Sample Size per Population or Stratified Layer • POE per Population or Stratified Layer 	
Deviation Definition	
Sample Selection Method (specify authorized software program)	
Seed Number	
Source Documents Tested	
Other Items	

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TEST FOR HOMOGENEOUS POPULATIONS

