

Chapter one: audit sampling

1.1. Definition and characteristics of audit sampling

Audit sampling is defined as the application of audit procedures to less than 100% of the population to enable the auditor to evaluate audit evidence about some characteristic of the items selected to form or assist in forming a conclusion concerning the population.

In other words, the standard recognizes that auditors will not ordinarily test all the information available to them because this would be impractical as well as uneconomical. Instead, the auditor will use sampling as an audit technique in order to form their conclusions. It is important at the outset to understand that some procedures that the auditor may adopt do not involve audit sampling, 100% testing of items within a population, for example. Auditors may deem 100% testing appropriate where there are a small number of high value items that make up a population, or when there is a significant risk of material misstatement and other audit procedures will not provide sufficient appropriate audit evidence. However, candidates must appreciate that 100% examination is highly unlikely in the case of tests of controls; such sampling is more common for tests of detail (i.e. substantive testing).

The use of sampling is widely adopted in auditing because it offers the opportunity for the auditor to obtain the minimum amount of audit evidence, which is both sufficient and appropriate, in order to form valid conclusions on the population. Audit sampling is also widely known to reduce the risk of 'over-auditing' in certain areas, and enables a much more efficient review of the working papers at the review stage of the audit.

In devising their samples, auditors must ensure that the sample selected is representative of the population. If the sample is not representative of the population, the auditor will be unable to form a conclusion on the entire population.

A **representative sample** is one in which the characteristics in the sample are approximately the same as those of the population. This means that the sampled items are similar to the items not sampled. Assume a client's internal controls require a clerk to attach a shipping document to every duplicate sales invoice, but the clerk fails to follow the procedure exactly 3 percent of the time. If the auditor selects a sample of 100 duplicate sales invoices and finds three are missing attached shipping documents, the sample is highly representative. If two or four such items are found in the sample, the sample is reasonably representative. If no or many missing items are found, the sample is non-representative.

In practice, auditors never know whether a sample is representative, even after all testing is complete. (The only way to know if a sample is representative is to subsequently audit the entire population.) However, auditors can increase the likelihood of a sample being representative by using care in designing the sampling process, sample selection, and evaluation of sample results. A sample result can be non-representative due to non-sampling error or sampling error. The

risk of these two types of errors occurring is called non-sampling risk and sampling risk. Both of these can be controlled.

Non-sampling risk is the risk that audit tests do not uncover existing exceptions in the sample. The two causes of non-sampling risk are the auditor's failure to recognize exceptions and inappropriate or ineffective audit procedures.

An auditor might fail to recognize an exception because of exhaustion, boredom, or lack of understanding of what to look for. In the preceding example, assume 3 shipping documents were not attached to duplicate sales invoices in a sample of 100. If the auditor concluded that no exceptions existed, that is a non-sampling error. An ineffective audit procedure for detecting the exceptions in question would be to examine a sample of shipping documents and determine whether each is attached to a duplicate sales invoice, rather than to examine a sample of duplicate sales invoices to determine if shipping documents are attached. In this case, the auditor has done the test in the wrong direction by starting with the shipping document instead of the duplicate sales invoice. Careful design of audit procedures, proper instruction, supervision, and review are ways to control non-sampling risk.

Sampling risk is the risk that an auditor reaches an incorrect conclusion because the sample is not representative of the population. Sampling risk is an inherent part of sampling that result from testing less than the entire population. For example, assume the auditor decided that a control is not effective if there is a population exception rate of 6 percent. Assume the auditor accepts the control as effective based on tests of the control with a sample of 100 items that had two exceptions. If the population actually has an 8 percent exception rate, the auditor incorrectly accepted the population because the sample was not sufficiently representative of the population.

Auditors have two ways to control sampling risk:

1. Adjust sample size
 2. Use an appropriate method of selecting sample items from the population
- Using an appropriate sample selection method increases the likelihood of representativeness.

1.2. Audit sampling methods

Audit sampling method refers to underline assumptions of sample determination. Audit sampling methods can be divided into two broad categories: statistical sampling and non-statistical sampling.

Statistical sampling differs from non-statistical sampling in that, by applying mathematical rules, auditors can quantify (measure) sampling risk in planning the sample (step 1) and in evaluating the results (step 3) that are discussed later below. (You may remember calculating a statistical result at a 95 percent confidence level in a statistics course. A 95 percent confidence level provides a 5 percent sampling risk.)

In **non-statistical sampling**, auditors do not quantify sampling risk. Instead, auditors select sample items they believe will provide the most useful information,

given the circumstances, and reach conclusions about populations on a judgmental basis. For that reason, the use of non-statistical sampling is often termed judgmental sampling.

1.3. Audit sample selection methods

Statistical sampling and non-statistical sampling methods have respective sample selection methods. For statistical sampling auditors use probabilistic sample selection method whereas non-probabilistic sample selection method is appropriate for non-statistical sampling.

When using **probabilistic sample selection**, the auditor randomly selects items such that each population item has a known probability of being included in the sample. This process requires great care and uses one of several the following methods.

Probabilistic sample selection methods include the following:

1. Simple random sample selection
2. Systematic sample selection
3. Probability proportional to size sample selection
4. Stratified sample selection

In **non-probabilistic sample selection**, the auditor selects sample items using professional judgment rather than probabilistic methods. Auditors can use one of the following non-probabilistic sample selection methods. Non-probabilistic (judgmental) sample selection methods include the following:

1. Directed sample selection
2. Block sample selection
3. Haphazard sample selection

1.4. Sampling for Exception Rates

Auditors use sampling for tests of controls and substantive tests of transactions to estimate the percent of items in a population containing a characteristic or **attribute** of interest. This percent is called the **occurrence rate** or **exception rate**. For example, if an auditor determines that the exception rate for the internal verification of sales invoices is approximately 3 percent, then on average 3 of every 100 invoices are not properly verified. Auditors are interested in the following types of exceptions in populations of accounting data:

1. Deviations from client's established controls
2. Monetary misstatements in populations of transaction data
3. Monetary misstatements in populations of account balance details

Knowing the exception rate is particularly helpful for the first two types of exceptions, which involve transactions. Therefore, auditors make extensive use of audit sampling that measures the exception rate in doing tests of controls and substantive tests of transactions. With the third type of exception, auditors usually

need to estimate the total dollar amount of the exceptions because they must decide whether the misstatements are material. When auditors want to know the total amount of a misstatement, they use methods that measure dollars, not the exception rate.

The exception rate in a sample is used to estimate the exception rate in the entire population, meaning it is the auditor's "best estimate" of the population exception rate. The term *exception* should be understood to refer to both deviations from the client's control procedures and amounts that are not monetarily correct, whether because of an unintentional accounting error or any other cause. The term *deviation* refers specifically to a departure from prescribed controls.

Assume, for example, that the auditor wants to determine the percentage of duplicate sales invoices that do not have shipping documents attached. Because the auditor cannot check every invoice, the actual percentage of missing shipping documents remains unknown. The auditor obtains a sample of duplicate sales invoices and determines the percentage of the invoices that do not have shipping documents attached. The auditor then concludes that the sample exception rate is the best estimate of the population exception rate.

Because the exception rate is based on a sample, there is a significant likelihood that the sample exception rate differs from the actual population exception rate. This difference is called the *sampling error*. The auditor is concerned with both the estimate of the sampling error and the reliability of that estimate, called *sampling risk*. Assume the auditor determines a 3 percent sample exception rate, and a sampling error of 1 percent, with a sampling risk of 10 percent. The auditor can state that the interval estimate of the population exception rate is between 2 percent and 4 percent (3 percent $\pm$ 1) with a 10 percent risk of being wrong (and a 90 percent chance of being right).

In using audit sampling for exception rates, the auditor wants to know the *most* the exception rate is likely to be, rather than the width of the confidence interval. So, the auditor focuses on the upper limit of the interval estimate, which is called the estimated or **computed upper exception rate (CUER)** in tests of controls and substantive tests of transactions. Using figures from the preceding example, an auditor might conclude that the CUER for missing shipping documents is 4 percent at a 5 percent sampling risk, meaning the auditor concludes that the exception rate in the population is no greater than 4 percent with a 5 percent risk of the exception rate exceeding 4 percent. Once it is calculated, the auditor can consider CUER in the context of specific audit objectives. If testing for missing shipping documents, for example, the auditor must determine whether a 4 percent exception rate indicates an acceptable control risk for the occurrence objective.

1.5. Application of Statistical and Non-statistical Sampling in Practice

Auditing standards permit auditors to use either statistical or non-statistical sampling methods. However, it is essential that either method be applied with due care. All steps of the process must be followed carefully. When statistical sampling is used, the sample *must be a probabilistic one* and appropriate statistical evaluation methods must be used with the sample results to make the sampling risk computations. Auditors may make non-statistical evaluations when using probabilistic selection, but it is never acceptable to evaluate a non-probabilistic sample using statistical methods.

Application of both statistical and non-statistical audit sampling involves three phases:

1. Plan the sample
2. Select the sample and perform the tests
3. Evaluate the results

The purpose of planning the sample is to make sure that the audit tests are performed in a manner that provides the desired sampling risk and minimizes the likelihood of non-sampling error. Selecting the sample involves deciding how a sample is selected from the population. The auditor can perform the audit tests only after the sample items are selected. Evaluating the results is the drawing of conclusions based on the audit tests.

1.5.1. Terms used in Audit Sampling

The following eight terms are commonly used in audit sampling. The first five are related with planning and the last three are related to evaluating results.

- 1. Characteristic or attribute:** The characteristic being tested in the application
- 2. Acceptable risk of assessing control risk too low (ARACR):** The risk that the auditor is willing to take of accepting a control as effective or a rate of monetary misstatements as tolerable, when the true population exception rate is greater than the tolerable exception rate. In choosing the appropriate ARACR for each attribute, auditors must use their best judgment. Their main consideration is the extent to which they plan to reduce assessed control risk as a basis for the extent of tests of details of balances.

Auditors normally assess ARACR at a lower level when auditing an accelerated filer public company because the auditor needs to be confident that the internal controls are effective to support the opinion on internal control over financial reporting. In audits of non-accelerated filers and private companies, the appropriate ARACR and extent of tests of controls depend on assessed control risk. For audits where there is extensive reliance on internal control, control risk will be assessed at low and therefore ARACR will also be as low. Conversely, if the auditor plans to rely on internal controls only to a limited extent, control risk will be assessed as high and so will ARACR. Level of assessed control risk is

also affected by Nature, extent, and timing of substantive tests and quality of evidence available for tests of controls

For non-statistical sampling, it is common for auditors to use ARACR of high, medium, or low instead of a percentage. For statistical sampling it is common for auditors to use a percent, such as 5% or 10%. A low ARACR implies that the tests of controls are important and will correspond to a low assessed control risk and reduced substantive tests of details of balances. Like for TER, there is an inverse relationship between ARACR and planned sample size. If the auditor reduces ARACR from high to low, planned sample size must be

- 3. Tolerable exception rate (TER):** Exception rate that the auditor will permit in the population and still be willing to conclude the control is operating effectively and/or the amount of monetary misstatements in the transactions established during planning is acceptable. Establishing the tolerable exception rate (TER) for each attribute requires an auditor's professional judgment. The suitable TER is a question of materiality and is therefore affected by both the definition and the importance of the attribute in the audit plan. If only one internal control is used to support a low control risk assessment for an objective, TER will be lower for the attribute than if multiple controls are used to support a low control risk assessment for the same objective. TER will normally be lower for tests of controls in the audit of an accelerated filer public company because the results of the tests of controls provide the basis for the auditor's report on internal control over financial reporting.

TER can have a significant impact on sample size. A larger sample size is needed for a low TER than for a high TER. Since a lower TER is used for significant account balances, the auditor requires a larger sample size to gather sufficient evidence about the effectiveness of the control or absence of monetary misstatements.

- 4. Estimated population exception rate (EPER):** Exception rate that the auditor expects to find in the population before testing begins. Auditors often use the preceding year's audit results to estimate EPER. If prior-year results are not available, or if they are considered unreliable, the auditor can take a small preliminary sample of the current year's population for this purpose. It is not critical that the estimate be precise because the current year's sample exception rate is ultimately used to estimate the population characteristics. If a preliminary sample is used, it can be included in the total sample, as long as appropriate sample selection procedures are followed.
- 5. Initial sample size:** Sample size decided after considering the above factors in planning. Four factors determine the initial sample size for audit sampling: population size, TER, ARACR, and EPER. Population size is not a significant factor and typically can be ignored, especially for large populations. Auditors using non-statistical sampling decide the sample size using professional judgment rather than using a statistical formula.

Once the three major factors affecting sample size have been determined, the auditor can decide an initial sample size. It is called an initial sample size because the exceptions in the actual sample must be evaluated before auditors can decide whether the sample is sufficiently large to achieve the objectives of the tests.

A combination of two factors has the greatest effect on sample size: TER minus EPER. The difference between the two factors is the *precision* of the initial sample estimate. A smaller precision, which is called a more precise estimate, requires a larger sample. At one extreme, assume TER is 4% and EPER is 3%. In this case, precision is 1%, which will result in a large sample size. Now assume TER is 8% and EPER is zero for an 8% precision. In this case the sample size can be small and still give the auditor confidence that the actual exception rate is less than 8%, assuming no exceptions are found when auditing the sample.

- 6. **Exception:** Exception from the attribute in a sample item.
- 7. **Sample exception rate (SER):** Number of exceptions in the sample divided by the sample size. It is improper for the auditor to conclude that the population exception rate is exactly the same as the sample exception rate, as there is only a slight chance they are identical.

When generalizing from the sample to the population, most auditors using non - statistical sampling subtract SER from TER and evaluate whether the difference (calculated sampling error) is sufficiently large. If the auditor concludes the difference is sufficiently large, the control being tested can be used to reduce assessed control risk as planned, assuming a careful analysis of the exceptions does not indicate the possibility of other significant problems with internal controls.

- 8. **Computed upper exception rate (CUER):** The highest estimated exception rate in the population at a given ARACR.

1.5.2. Steps In Audit Sampling

Auditors use 14 well-defined steps to apply audit sampling to tests of controls, substantive tests of transactions and test of details of balances. These steps are divided into the three phases described above. **Plan the Sample**

1. State the objectives of the audit test.
2. Decide whether audit sampling applies.
3. Define attributes and exception conditions.
4. Define the population.
5. Define the sampling unit.
6. Specify the tolerable exception rate.
7. Specify acceptable risk of assessing control risk too low.

8. Estimate the population exception rate.
9. Determine the initial sample size.

Select the Sample and Perform the Audit Procedures

10. Select the sample.
11. Perform the audit procedures.

Evaluate the Results

12. Generalize from the sample to the population.
13. Analyze exceptions.
14. Decide the acceptability of the population.

These steps are explained as follow:

1. State the Objectives of the Audit Test

The objectives of the test must be stated in terms of the transaction cycle being tested. Typically, auditors define the objectives of tests of controls and substantive tests of transactions:

- ✓ Test the operating effectiveness of controls
- ✓ Determine whether the transactions contain monetary misstatements

The objectives of these tests in the sales and collection cycle are usually to test the effectiveness of internal controls over sales and cash receipts and to determine whether sales and cash receipts transactions contain monetary misstatements. Auditors normally define these objectives as a part of designing the audit program.

2. Decide Whether Audit Sampling Applies

Audit sampling applies whenever the auditor plans to reach conclusions about a population based on a sample. The auditor should examine the audit program and select those audit procedures where audit sampling applies. To illustrate, assume the following partial audit program:

1. Review sales transactions for large and unusual amounts (analytical procedure).
2. Observe whether the duties of the accounts receivable clerk are separate from handling cash (test of control).
3. Examine a sample of duplicate sales invoices for
 - a. Credit approval by the credit manager (test of control).
 - b. Existence of an attached shipping document (test of control).
 - c. Inclusion of a chart of accounts number (test of control).
4. Select a sample of shipping documents and trace each to related duplicate sales invoices (test of control).

5. Compare the quantity on each duplicate sales invoice with the quantity on related shipping documents (substantive test of transactions).

Audit sampling does not apply for the first two procedures in this audit program. The first is an analytical procedure for which sampling is inappropriate. The second is an observation procedure for which no documentation exists to perform audit sampling. Audit sampling can be used for the remaining three procedures.

3. Define Attributes and Exception Conditions

When audit sampling is used, auditors must carefully define the characteristics (attributes) being tested and the exception conditions. Unless they carefully define each attribute in advance, the staff person who performs the audit procedures will have no guidelines to identify exceptions. Attributes of interest and exception conditions for audit sampling are taken directly from the auditor's audit procedures.

4. Define the Population

The population is those items about which the auditor wishes to generalize. Auditors can define the population to include any items they want, but when they select the sample, it must be selected from the entire population as it has been defined. The auditor should test the population for completeness and detail tie-in before a sample is selected to ensure that all population items are subjected to sample selection. The auditor may generalize *only* about that population that has been sampled. For example, when performing tests of controls and substantive tests of sales transactions, the auditor generally defines the population as all recorded sales invoices for the year. If the auditor samples from only one month's transactions, it is invalid to draw conclusions about the invoices for the entire year. The auditor must carefully define the population in advance, consistent with the objectives of the audit tests. In some cases, it may be necessary to define separate populations for different audit procedures.

5. Define the Sampling Unit

The sampling unit is defined by the auditor based on the definition of the population and objective of the audit test. The sampling unit is the physical unit that corresponds to the random numbers the auditor generates. It is often helpful to think of the sampling unit as the starting point for doing the audit tests. For the sales and collection cycle, the sampling unit is typically a sales invoice or shipping document number. For example, if the auditor wants to test the occurrence of sales, the appropriate sampling unit is sales invoices recorded in the sales journal. If the objective is to determine whether the quantity of the goods described on the customer's order is accurately shipped and billed, the auditor can define the sampling unit as the customer's order, the shipping document, or the duplicate sales invoice, because the direction of the audit test doesn't matter for this audit procedure.

6. Specify the Tolerable Exception Rate

Establishing the **tolerable exception rate (TER)** for each attribute requires an auditor's professional judgment. TER represents the highest exception rate the auditor will permit in the control being tested and still be willing to conclude the control is operating effectively (and/or the rate of monetary misstatements in the transactions is acceptable).

The suitable TER is a question of materiality and is therefore affected by both the definition and the importance of the attribute in the audit plan. If only one internal control is used to support a low control risk assessment for an objective, TER will be lower for the attribute than if multiple controls are used to support a low control risk assessment for the same objective. TER will normally be lower for tests of controls in the audit of an accelerated filer public company because the results of the tests of controls provide the basis for the auditor's report on internal control over financial reporting.

TER can have a significant impact on sample size. A larger sample size is needed for a low TER than for a high TER. For example, a larger sample size is needed for the test of credit approval if the TER is decreased from 9 percent to 6 percent. Since a lower TER is used for significant account balances, the auditor requires a larger sample size to gather sufficient evidence about the effectiveness of the control or absence of monetary misstatements.

7. Specify Acceptable Risk of Assessing Control Risk Too Low

Whenever auditors take a sample, they risk making incorrect conclusions about the population. Unless 100 percent of the population is tested, this is true for both non-statistical and statistical sampling. For audit sampling in tests of controls and substantive tests of transactions, that risk is called the **acceptable risk of assessing control risk too low (ARACR)**. ARACR measures the risk the auditor is willing to take of accepting a control as effective (or a rate of misstatements as tolerable) when the true population exception rate is greater than TER. ARACR represents the auditor's measure of sampling risk. Assume that TER is 6 percent, ARACR is high, and the true population exception rate is 8 percent. The control in this case is not acceptable because the true exception rate of 8 percent exceeds TER. The auditor, of course, does not know the true population exception rate. The ARACR of high means that the auditor is willing to take a fairly substantial risk of concluding that the control is effective after all testing is completed, even when it is ineffective. If the control were found to be effective in this illustration, the auditor would have over-relied on the system of internal control (used a lower assessed control risk than was justified).

In choosing the appropriate ARACR for each attribute, auditors must use their best judgment. Their main consideration is the extent to which they plan to reduce

assessed control risk as a basis for the extent of tests of details of balances. Auditors normally assess ARACR at a lower level when auditing an accelerated filer public company because the auditor needs to be confident that the internal controls are effective to support the opinion on internal control over financial reporting. In audits of non-accelerated filers and private companies, the appropriate ARACR and extent of tests of controls depend on assessed control risk. For audits where there is extensive reliance on internal control, control risk will be assessed at low and therefore ARACR will also be as low. Conversely, if the auditor plans to rely on internal controls only to a limited extent, control risk will be assessed as high and so will ARACR.

For non-statistical sampling, it is common for auditors to use ARACR of high, medium, or low instead of a percentage. For statistical sampling it is common for auditors to use a percent, such as 5% or 10%. A low ARACR implies that the tests of controls are important and will correspond to a low assessed control risk and reduced substantive tests of details of balances.

Like for TER, there is an inverse relationship between ARACR and planned sample size. If the auditor reduces ARACR from high to low, planned sample size must be increased. ARACR represents the auditor's risk of incorrectly accepting the control as effective, and a larger sample size is required to lower this risk. The auditor can establish different TER and ARACR levels for different attributes of an audit test, depending on the importance of the attribute and related control. For example, auditors commonly use higher TER and ARACR levels for tests of credit approval than for tests of the occurrence of duplicate sales invoices and bills of lading. This makes sense because the exceptions for the latter are likely to have a more direct impact on the correctness of the financial statements than the former.

8. Estimate the Population Exception Rate

Auditors should make an advance estimate of the population exception rate to plan the appropriate sample size. If the **estimated population exception rate (EPER)** is low, a relatively small sample size will satisfy the auditor's tolerable exception rate, because a less precise estimate is required. Auditors often use the preceding year's audit results to estimate EPER. If prior-year results are not available, or if they are considered unreliable, the auditor can take a small preliminary sample of the current year's population for this purpose. It is not critical that the estimate be precise because the current year's sample exception rate is ultimately used to estimate the population characteristics. If a preliminary sample is used, it can be included in the total sample, as long as appropriate sample selection procedures are followed.

9. Determine the Initial Sample Size

Four factors determine the **initial sample size** for audit sampling: population size, TER, ARACR, and EPER. Population size is not a significant factor and typically can

be ignored, especially for large populations. Auditors using non-statistical sampling decide the sample size using professional judgment rather than using a statistical formula. Once the three major factors affecting sample size have been determined, the auditor can decide an initial sample size. It is called an initial sample size because the exceptions in the actual sample must be evaluated before auditors can decide whether the sample is sufficiently large to achieve the objectives of the tests.

10. Select the Sample

After auditors determine the initial sample size for the audit sampling application, they must choose the items in the population to include in the sample. Auditors can choose the sample using any of the probabilistic or nonprobabilistic methods we discussed earlier in this chapter. To minimize the possibility of the client altering the sample items, the auditor should not inform the client too far in advance of the sample items selected. The auditor should also control the sample after the client provides the documents. Several additional sample items may be selected as extras to replace any voided items in the original sample

11. Perform the Audit Procedures

The auditor performs the audit procedures by examining each item in the sample to determine whether it is consistent with the definition of the attribute and by maintaining a record of all the exceptions found. When audit procedures have been completed for a sampling application, the auditor will have a sample size and number of exceptions for each attribute.

12. Generalize from the Sample to the Population

The **sample exception rate (SER)** can be easily calculated from the actual sample results. SER equals the actual number of exceptions divided by the actual sample size. It is improper for the auditor to conclude that the population exception rate is exactly the same as the sample exception rate, as there is only a slight chance they are identical. For non-statistical methods, auditors use two ways to generalize from the sample to the population.

1. Add an estimate of sampling error to SER to arrive at a computed upper exception rate (CUER) for a given ARACR. It is extremely difficult for auditors to make sampling error estimates using non-statistical sampling because of the judgment required to do so; therefore, they usually do not use this approach.
2. Subtract the sample exception rate from the tolerable exception rate to find the calculated sampling error (TER - SER), and evaluate whether it is sufficiently large to conclude that the true population exception rate is acceptable. Under this approach, the auditor does not make an estimate of the computed upper exception rate. Most auditors using non-statistical sampling follow this approach.

For example, if an auditor takes a sample of 100 items for an attribute and finds no exceptions (SER = 0) and TER is 5 percent, calculated sampling error is 5 percent (TER of 5 percent - SER of 0 = 5 percent). If the auditors had found four exceptions, calculated sampling error would have been 1 percent (TER of 5 percent - SER of 4 percent). It is much more likely that the true population exception rate is less than or equal to the tolerable exception rate in the first case than in the second one. Therefore, most auditors would probably find the population acceptable based on the first sample result and not acceptable based on the second.

When SER exceeds the EPER used in designing the sample, auditors usually conclude that the sample results do not support the preliminary assessed control risk. In that case, auditors are likely to conclude that there is an unacceptably high risk that the true deviation rate in the population exceeds TER. The auditor's consideration of whether sampling error is sufficiently large also depends on the sample size used. If the sample size in the previous example had been only 20 items, the auditor would have been much less confident that finding no exceptions was an indication that the true population exception rate does not exceed TER.

13. Analyze Exceptions

In addition to determining SER for each attribute and evaluating whether the true (but unknown) exception rate is likely to exceed the tolerable exception rate, auditors must analyze individual exceptions to determine the breakdown in the internal controls that allowed them to happen. Exceptions can be caused by many factors, such as carelessness of employees, misunderstood instructions, or intentional failure to perform procedures. The nature of an exception and its causes has a significant effect on the qualitative evaluation of the system. For example, if all the exceptions in the tests of internal verification of sales invoices occurred while the person normally responsible for performing the tests was on vacation, this will affect the auditor's evaluation of the internal controls and the subsequent investigation differently than if the exceptions arose from the incompetence of the regular employee.

14. Decide the Acceptability of the Population

When generalizing from the sample to the population, most auditors using non - statistical sampling subtract SER from TER and evaluate whether the difference (calculated sampling error) is sufficiently large. If the auditor concludes the difference is sufficiently large, the control being tested can be used to reduce assessed control risk as planned, assuming a careful analysis of the exceptions does not indicate the possibility of other significant problems with internal controls

When the auditor concludes that TER - SER is too small to conclude that the population is acceptable, or when SER exceeds TER, the auditor must follow one of four courses of action:

Revise TER or ARACR: This alternative should be followed only when the auditor has concluded that the original specifications were too conservative. Relaxing either TER or ARACR may be difficult to defend if the auditor is ever subject to review by a court or a commission. Auditors should change these requirements only after careful consideration.

Expand the Sample Size: An increase in the sample size has the effect of decreasing the sampling error if the actual sample exception rate does not increase. Of course, SER may also increase or decrease if additional items are selected. Increasing the sample size is appropriate if the auditor believes the initial sample was not representative, or if it is important to obtain evidence that the control is operating effectively. This is likely if the auditor is reporting on internal control, or if the control relates to highly significant account balances such as receivables or inventory.

Revise Assessed Control Risk: If the results of the tests of controls and substantive tests of transactions do not support the preliminary assessed control risk, the auditor should revise assessed control risk upward. This will likely result in the auditor increasing substantive tests of transactions and tests of details of balances. For example, if tests of controls of internal verification procedures for verifying prices, extensions, and quantities on sales invoices indicate that those procedures are not being followed, the auditor should increase substantive tests of transactions for the accuracy of sales. If the substantive tests of transactions results are unacceptable, the auditor must increase tests of details of balances for accounts receivable.

The auditor should decide whether to increase sample size or to revise assessed control risk on the basis of cost versus benefit. If the sample is not expanded, the auditor must revise assessed control risk upward and therefore perform additional substantive tests. The cost of additional tests of controls must be compared with that of additional substantive tests. If an expanded sample continues to produce unacceptable results, additional substantive tests will still be necessary.

For accelerated filer public companies, the auditor must evaluate the control deficiencies to determine their effect on the auditor's report on internal control. If the deficiencies constitute a material weakness but are corrected before year-end, the auditor may be able to test management's corrected controls. The auditor may also be able to identify additional compensating controls. If the auditor is unable to test corrected controls or identify compensating controls and the deficiencies are deemed to be material weaknesses, the audit report on internal control must be an adverse opinion.

Communicate with the Audit Committee or Management: Communication is desirable, in combination with one of the other three actions just described, regardless of the nature of the exceptions. When the auditor determines that the internal controls are not operating effectively, management should be informed in a timely manner. If the tests were performed prior to year-end, this may allow management to correct the deficiency before year-end. The auditor is required to communicate *in writing* to those charged with governance, such as the audit committee, regarding significant deficiencies and material weaknesses in internal control.

In some instances, it may be acceptable to limit the action to writing a letter to management when TER – SER is too small. This occurs if the auditor has no intention of reducing the assessed control risk or has already carried out sufficient procedures to his or her own satisfaction as a part of substantive tests of transactions.