

# **Principles of Auditing: An Introduction to International Standards on Auditing**

## **Chapter 8 Appendix – Audit Sampling and Other Selective Testing Procedures**

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# Audit sampling

- ‘Audit sampling’ (sampling) involves the application of audit procedures to less than 100% of items within an account balance or class of transactions such that all sampling units have a chance of selection.
- From the sample the auditor forms a conclusion about the population from which the sample is drawn.
- Audit sampling can use either a statistical or a non-statistical approach.

# Sampling terms

- ‘Population’ means the entire set of data from which a sample is selected and about which the auditor wishes to draw conclusions.
  - For example, all of the items in an account balance or a class of transactions constitute a population.
- ‘Error’ means either control deviations, when performing tests of control, or misstatements, when performing substantive procedures.
- ‘Sampling risk’ arises from the possibility that the auditor’s conclusion, based on a sample may be different from the conclusion reached if the entire population were subjected to the same audit procedure.

# Types of sampling risk

There are two types of sampling risk:

- The risk the auditor will conclude, in the test of control, that control risk is lower than it actually is, or in the case of a substantive test, that a material error does not exist when in fact it does.
- The risk the auditor will conclude, in a test of control, that control risk is higher than it actually is, or in the case of a substantive test, that a material error exists when in fact it does not.

# Terms: statistical sampling

- ‘Statistical sampling’ means any approach to sampling that has the following characteristics:
  - a. Random selection of a sample
  - b. Use of probability theory 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.

## More sampling terms

- ‘Sampling unit’ means the individual items constituting a population, for example checks listed on deposit slips, credit entries on bank statements, sales invoices or debtors’ balances, or a monetary unit.
- ‘Stratification’ is the process of dividing a population into subpopulations, each of which is a group of sampling units which have similar characteristics (often monetary value).
- ‘Tolerable error’ means the maximum error in a population that the auditor is willing to accept.

# Audit testing

- Audit sampling is used for both tests of controls (attributes sampling) and for substantive procedures (usually, variables sampling).
- For control sampling the auditor identifies:
  - the characteristics or attributes that indicate performance of a control
  - possible deviations which indicate in-adequate performance
  - presence or absence of attributes by testing.
- Substantive procedures audit sampling is used to verify assertions about a financial statement amount (for example, the existence of accounts receivable), or to make an independent estimate of some amount (for example, the value of obsolete inventories).

# Non-sampling risk

- Includes all aspects of audit risk that are not due to sampling.
- Examples are:
  - The failure to select appropriate audit procedures
  - The failure to recognise misstatements in documents examined
  - Misinterpreting the results of audit tests.

# Sampling risk

It is the risk that the auditor's conclusion, based on a sample, might be different from the conclusion that would be reached if the test were applied in the same way to the entire population.

- Tests of controls risks include the risk of assessing control risk too high or too low.
- Substantive test risks include incorrect rejection and incorrect acceptance.

# Sampling risk and non-sampling risk

When performing tests of control, the auditor may find no errors in a sample and conclude that control risk is low, when the rate of error in the population is, in fact, unacceptably high (sampling risk). Or there may be errors in the sample which the auditor fails to recognise (non-sampling risk).

- For example, the auditor may choose an inappropriate analytical procedure (non-sampling risk) or may find only minor misstatements in a test of details when, in fact, the population misstatement is greater than the tolerable amount (sampling risk).
- Sampling risk can be reduced by increasing sample size, while non-sampling risk can be reduced by proper engagement planning, supervision and review.

# Appropriate tests of control

Audit sampling for tests of control is generally appropriate when application of the control leaves evidence of performance (for example, initials of the credit manager on a sales invoice indicating credit approval, or evidence of authorisation of data input to a microcomputer based data processing system).

# Substantive tests of details

When performing substantive tests of details, audit sampling and other means of selecting items for testing and gathering audit evidence may be used to:

- verify one or more assertions about a financial statement amount (for example, the existence of accounts receivable); or
- to make an independent estimate of some amount (for example, the value of obsolete inventories).

In obtaining evidence, the auditor should use professional judgement to assess audit risk and design audit procedures to ensure this risk is reduced to an acceptably low level.

- Since detection risk covers all substantive procedures, the acceptable level of sampling risk is dependent on the amount of audit evidence obtained from substantive procedures as well as the assessments of inherent and control risk.
- There is no clear-cut formula that determines an exact level of acceptable sampling risk based on the risk assessments. It is generally accepted that audit evidence obtained from other procedures will increase the acceptable level of sampling risk.

# Selection of items for testing

Appropriate means of selecting items for testing are:

- Selecting all items (100% examination)
  - Rarely done – only for substantive tests
- Selecting specific items
  - (next slide)
- Audit sampling
  - Audit sampling can be applied using either non-statistical or statistical sampling methods.

# Specific items (judgemental) sampling

- A judgemental sample is selected from a population based on such factors as knowledge of the client's business, preliminary assessments of inherent and control risks and the characteristics of the population being tested.
- Specific items selected may include:
  - *High value or key items*
  - *All items over a certain amount*
  - *Items to obtain information*
  - *Items to test procedures.*
- This does not constitute audit sampling because it cannot be projected to the entire population.

# Statistical or non-statistical sampling approach?

**Non-statistical sampling** used in tests of control where the nature and cause of errors will often be more important than the statistical analysis of the mere presence or absence (the count) of errors.

When applying **statistical sampling**, the sample size can be determined using either probability theory or professional judgement, but the items selected must be at random to make the sample statistically valid.

## Design of the sample

- Consider the specific objectives to be achieved and the combination of audit procedures used.
- Define what constitutes an error and what population to use for sampling.
- When performing tests of control, the auditor generally makes a preliminary assessment of the rate of error the auditor expects to find in the population to be tested and the level of control risk.

# Sample population: appropriate and complete

- *Appropriate* to the objective of the sampling procedure, which will include consideration of the direction of testing. For example:
  - to test for overstatement of accounts payable, the population could be defined as the accounts payable listing;
  - to test for understatement of accounts payable, the population is subsequent disbursements, unpaid invoices, suppliers' statements, unmatched receiving reports, etc.

# Sample population: appropriate and complete (Continued)

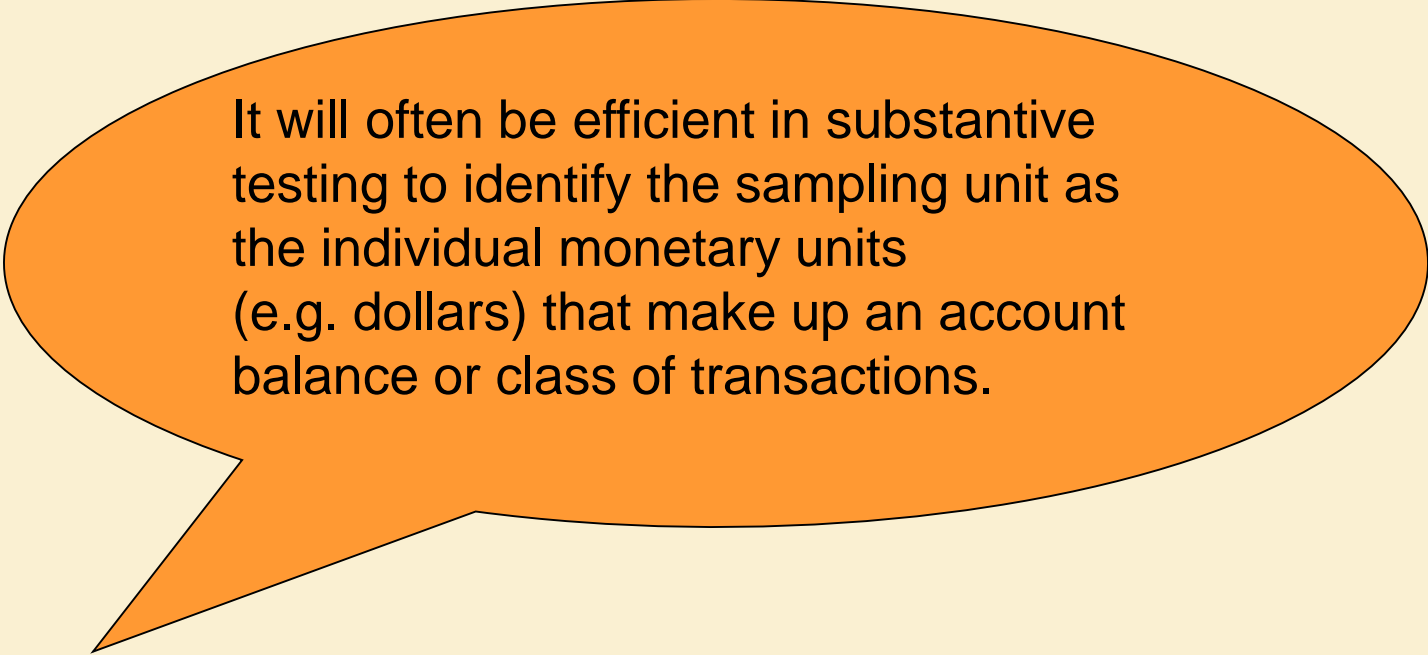
- *Complete*. For example:
  - If the auditor intends to select payment vouchers from a file, conclusions cannot be drawn about all vouchers for the period unless the auditor is satisfied that all vouchers have in fact been filed.
  - Similarly, if the auditor intends to use the sample to draw conclusions about the operation of an accounting and internal control system during the financial reporting period, the population needs to include all relevant items from throughout the entire period.

# Stratification

Audit efficiency may be improved if the auditor stratifies a population by dividing it into discrete sub-populations which have an identifying characteristic.

- In substantive procedures, an account balance or class of transactions is often stratified by monetary value.
- A population may be stratified according to a particular characteristic that indicates a higher risk of error, for example, when testing the valuation of accounts receivable, balances may be stratified by age.

# Value weighted selection



It will often be efficient in substantive testing to identify the sampling unit as the individual monetary units (e.g. dollars) that make up an account balance or class of transactions.

Monetary unit sampling is the most efficient and effective sampling technique in the auditor's toolbox. It is particularly useful when testing for overstatements, and it is advisable to use it in cases where the population is available in machine-readable format.

# Sample size

- Sample size is affected by the level of sampling risk that the auditor is willing to accept. The lower the risk the auditor is willing to accept, the greater the sample size will need to be.
- The tolerable rate is the maximum rate of deviation from policy that an auditor will accept without modifying the planned assessed level of control risk.
  - When the planned assessed level of control risk is low, and the degree of assurance desired from the sample is high, the tolerable rate should be low. (Especially when other tests of controls are not done.)

## Examples of factors influencing sample size for tests of control

FACTOR	EFFECT ON SAMPLE SIZE
An increase in the auditor's intended reliance on accounting and internal control systems	Increase
An increase in the rate of deviation from the prescribed control procedure that the auditor is willing to accept	Decrease
An increase in the rate of deviation from the prescribed control procedure that the auditor expects to find in the population	Increase
An increase in the auditor's required confidence level (or conversely, a decrease in the risk that the auditor will conclude that the control risk is lower than the actual control risk in the population)	Increase
An increase in the number of sampling units in the population	Negligible effect

## Examples of factors influencing sample size for substantive procedures

<b>FACTOR</b>	<b>EFFECT ON SAMPLE SIZE</b>
An increase in the auditor's assessment of inherent risk	Increase
An increase in the auditor's assessment of control risk	Increase
An increase in the use of other substantive procedures directed at the same financial statement assertion	Decrease
An increase in the auditor's required confidence level (or conversely, a decrease in the risk that the auditor will conclude that a material error does not exist, when in fact it does exist)	Increase

## Examples of factors influencing sample size for substantive procedures (Continued)

<b>FACTOR</b>	<b>EFFECT ON SAMPLE SIZE</b>
An increase in the total error that the auditor is willing to accept (tolerable error)	Decrease
An increase in the amount of error the auditor expects to find in the population	Increase
Stratification of the population when appropriate	Decrease
The number of sampling units in the population	Negligible Effect

# Selecting the sample

- The auditor should select items for the sample with the expectation that all sampling units in the population have a chance of selection.
- Statistical sampling requires that sample items are selected at random so that each sampling unit has a known chance of being selected. The sampling units might be physical items (such as invoices) or monetary units. With non-statistical sampling, an auditor uses professional judgement to select the items for a sample.

# Sample selection methods

- Use of a computerised random number generator or random number tables.
- Systematic selection, in which the number of sampling units in the population is divided by the sample size to give a sampling interval.
- Haphazard selection, in which the auditor selects the sample without following a structured technique. Haphazard selection is not appropriate when using statistical sampling.
- Block selection involves selecting a block(s) of contiguous items from within the population. Block selection cannot ordinarily be used in audit sampling.

# Performing the audit procedure

- If a selected item is not appropriate for the application of the procedure, the procedure is ordinarily performed on a replacement item.
  - Example another check substituted for voided check
- Sometimes however, the auditor is unable to apply the planned audit procedures to a selected item because, for instance, documentation relating to that item has been lost.
  - If suitable alternative procedures cannot be performed on that item, the auditor ordinarily considers that item to be in error.

# Nature and cause of errors

The auditor should consider the sample results, the nature and cause of any errors identified and their possible effect on the particular test objective and on other areas of the audit.

When conducting tests of control and errors are identified, the auditor needs to consider matters such as:

- a. the direct effect of identified errors on the financial statements;
- b. the effectiveness of the accounting and internal control systems and their effect on the audit approach when, for example, the errors result from management override of an internal control.

# Analysing errors discovered

- In analysing the errors discovered, the auditor may observe that many have a common feature, for example, type of transaction, location, product line or period of time.
- In such circumstances, the auditor may decide to identify all items in the population that possess the common feature, and extend audit procedures in that stratum.
  - In addition, such errors may be intentional, and may indicate the possibility of fraud.

# Projecting errors

For substantive procedures, the auditor should project monetary errors found in the sample to the population, and should consider the effect of the projected error on the particular test objective and on other areas of the audit.

**Panel A Ratio Estimation Method**

<i>Stratum</i>	<i>Error found (A)</i>	<i>Book value of sampled items (B)</i>	<i>Error ratio (C) = (A)/(B)</i>	<i>Total book value in stratum (D)</i>	<i>Projected error (C) × (D)</i>
Lower	33.13	1,650.20	2.0076%	159,222.33	3,196.60
Upper	429.24	24,261.28	1.7692%	363,577.67	6,432.56
Total				522,800.00	9,629.16

**Panel B Difference Method**

<i>Stratum</i>	<i>Error found (A)</i>	<i>Sample size (B)</i>	<i>Average error (C) = (A)/(B)</i>	<i>Total number of items in stratum (D)</i>	<i>Projected error (C) × (D)</i>
Lower	33.13	86	0.38523	8,836	3,403.91
Upper	429.24	171	2.51018	2,613	6,559.09
Total				11,449	9,963.00

**Illustration 8.A.2 Error Projection**

# Evaluation of sample results

- The auditor should consider the sample results, the **nature and cause of any errors** identified and their **possible effect** on the particular test objective and on other areas of the audit.
- For **substantive procedures**, the auditor should **project monetary errors** found in the sample to the population, and should consider the effect of the projected error.
  - The auditor projects the total error for the population to obtain a broad view of the scale of errors, and to compare this to the tolerable error.
  - Tolerable error is will be an amount less than or equal to the auditor's preliminary estimate of materiality.

# Evaluating the sample results

The auditor should evaluate the sample results to determine whether the preliminary assessment of the relevant characteristic of the population is confirmed or needs to be revised.

- In test of controls, an unexpectedly high sample error rate may lead to an increase in the assessed level of control risk.
- In a substantive procedure, an unexpectedly high error amount in a sample may cause the auditor to believe that an account balance or class of transactions is materially misstated.

# Thank you for your attention

## Any Questions?