

## Audit sampling (Lecture A834 – 10.48 minutes)

Audit sampling is dealt with in ISA (UK) 530 *Audit Sampling*. The definition of 'audit sampling' is:

*The application of audit procedures to less than 100% of items within a population of audit relevance such that all sampling units have a chance of selection in order to provide the auditor with a reasonable basis on which to draw conclusions about the entire population.*

ISA (UK) 530,  
para 5(a)

The term 'population' refers to the entire set of data from which a sample is selected and about which the auditor wishes to draw conclusions.

It is usually impracticable for the auditor to test every item in an accounting population because of time and cost constraints. This is recognised as one of the inherent limitations of auditing.

Remember, that the auditor only provides **reasonable** assurance (not absolute assurance) that the financial statements are free from material misstatement, whether caused by fraud or error. Hence, the auditor is not certifying that the financial statements are 100% accurate as they are not verifying 100% of the transactions which are included in the financial statements.

### 1.1 Sampling risk

Sampling risk is a component of detection risk. Detection risk is the risk that the auditor will not detect a misstatement which exists in an assertion that could be material, either individually or when aggregated with other misstatements. In the audit risk model, detection risk is the only risk that is under the control of the auditor.

The term 'sampling risk' is defined as:

*The risk that the auditor's conclusion based on a sample may be different from the conclusion if the entire population were subjected to the same audit procedure. Sampling risk can lead to types of erroneous conclusions:*

ISA (UK) 530,  
para 5(c)

- (i) *In the case of a test of controls, that controls are more effective than they actually are, or in the case of a test of details, that a material misstatement does not exist when in fact it does. The auditor is primarily concerned with this type of erroneous conclusion because it affects audit effectiveness and is more likely to lead to an inappropriate audit opinion.*
- (ii) *In the case of a test of controls, that controls are less effective than they actually are or in the case of a test of details, that a material misstatement exists when in fact it does not. This type of erroneous conclusion affects audit efficiency as it would usually lead to additional work to establish that initial conclusions were incorrect.*

The term 'non-sampling risk' is defined as:

*The risk that the auditor reaches an erroneous conclusion for any reason not related to sampling risk.*

ISA (UK) 530,  
para 5(d)

Auditors are faced with sampling risk in both tests of controls and in substantive procedures. Essentially, sampling risk is the risk that the auditor's sample from a population will not be representative (in other words, the sample is too small).

### **Sampling risk within tests of control**

Tests of control are designed to evaluate the operating effectiveness of controls in preventing or detecting and correcting material misstatement.

The risk to auditors where tests of controls is concerned is that control are either more or less effective than they actually are because the rate of errors in the sample is not the same as the actual rate of errors in the population.

Sampling risk affects tests of controls because the wrong conclusion over the operating effectiveness of controls could lead the auditor to relying too heavily on controls, hence failing to detect a material misstatement and therefore expressing an incorrect audit opinion. Or, the auditor could place less reliance on internal controls which results in more substantive procedures having to be applied, which results in audit inefficiencies due to more work having to be performed which increases the cost of the audit.

#### **Example – Attendance at the year-end inventory count**

During the initial audit planning meeting with the finance director of Minikin Enterprises Ltd, the audit senior was informed that all staff involved in the year-end inventory count are provided with detailed instructions drawn up by her and the company's production director, Joshua Johnson. The audit senior confirmed that at each warehouse there will be a number of teams counting the inventory in different numbered sections of each warehouse which has been mapped out on a floor plan. Each team will comprise two individuals: one will count the inventory and another will record the inventory on the sequentially numbered inventory count sheets.

The audit engagement team will be attending each warehouse on 31 August 2023 to carry out a sample of test counts in a two-way direction: from inventory count sheets to inventory (testing the existence assertion) and from the physical inventory to the inventory counting sheets (testing the completeness assertion). As each section of a warehouse has been counted, it will be crossed out on the floor plan to indicate that counting is complete in that area.

In this example, the sampling risk is the risk that the auditor's sample from the entire inventory count is not representative of the population (the population being the entire inventory). This can arise because the auditor's sample is inadequate (i.e. it is too small). In order to reduce sampling risk, the auditor must increase the size of the sample selected.

However, the auditor may consider that increasing the sample size need not be necessary on the grounds that Minikin Enterprises has a number of controls in place over the inventory counting process as follows:

- Detailed instructions are provided to counting staff by management.
- Each section of the warehouse has been numbered on the warehouse floor plan.

- Teams are comprised of two individuals – one counting and one recording.
- Sequentially numbered inventory counting sheets are being used.

Sampling risk can lead the auditor to incorrectly concluding that the above controls are more effective than they actually are. This means that the auditor's sample of inventory counts will be lower than would otherwise be the case (as they are placing reliance on the effectiveness of controls) and is more likely to lead to an inappropriate audit opinion being expressed because those items of inventory which have not been sampled may contain material misstatement due to the incorrect conclusion over the controls over the inventory count.

Conversely, sampling risk can lead the auditor to incorrectly concluding that the above controls are less effective than they actually are. This results in the auditor increasing sample sizes than would otherwise have been the case which creates additional work (and costs) and hence reduces audit efficiency.

### **Sampling risk within substantive procedures**

Substantive procedures are aimed at detecting material misstatement at the assertion level. Tests of details, which are one type of substantive procedure, are often performed on a sampling basis.

Remember that sampling risk is the risk that the auditor's sample from a population is not representative. If the sample is too small, the sampling risk is that the auditor fails to detect a material misstatement (detection risk). On the flip side, if the auditor has concluded that a material misstatement exists and hence requires a large sample to be tested, the auditor is carrying out more substantive procedures than is necessary which increases time spent on the audit.

#### **Example – Insufficient sample size**

During the audit of trade debtors, the audit senior picks a sample of 20 debtors. The population size is 330.

Here, the sample size is too low because it only represents 6.1% ( $20/330 \times 100$ ) of total trade debtors. There is a risk that those trade debtor balances which remain untested if the sample is not increased will contain a material misstatement. This increases detection and audit risk and hence the auditor should increase their sample accordingly so that it is representative of the population.

### **Non-sampling risk**

Non-sampling risk is the risk that the auditor's conclusion is inappropriate for any other reason, such as the application of inappropriate audit procedures or the failure to recognise a misstatement or deviation.

Non-sampling risk can also arise by the auditor misinterpreting the audit evidence obtained.

### Example – Non-sampling risk

Martyn Greaves is the audit supervisor of ABC & Co Accountants who is attending the inventory count of Ratchford Enterprises Ltd with a team of four other audit engagement team members. The inventory count is being carried out as at the year end 31 August 2023.

During August 2023, a significant problem arose in the company's inventory control system. A junior member of the warehouse team incorrectly inputted the selling prices of goods as opposed to their cost prices into the stock control system. This resulted in overstated inventory valuations for approximately 20% of the company's products. The issue only came to light due to complaints from customers who had been overcharged for goods they had purchased from the company.

Daniel Westhead (the production director) carries out monthly reviews of the prices input into the stock valuation system to ensure they are cost prices to ensure that stock is valued at the lower of cost and estimated selling price less costs to complete and sell. However, in August 2023, Daniel was absent due to illness and hence could not carry out the checks – nor did any other responsible official. Martyn Greaves has fully documented the controls over the inventory cycle, including the checks carried out by Daniel Westhead, but has not been made aware of this control deviation; nor has Martyn inquired of the finance director about any problems arising in the system during the year.

The issue here is that further inputting errors could have been made by the junior member of staff. A failure to recognise a misstatement or deviation is a non-sampling risk. Hence, Martyn Greaves could conclude that controls over the inventory cycle have been operating effectively enough during the year to reduce the risk of material misstatement, when, in fact, there has been a deviation from the internal control which should result in more substantive procedures being performed.

## 1.2 Statistical versus non-statistical sampling

ISA (UK) 530, para 5 defines 'statistical sampling' as:

*An approach to sampling that has the following characteristics:*

- (i) random selection of the sample items; and*
- (ii) the use of probability theory to evaluate sample results, including measurement of sampling risk.*

*A sampling approach that does not have characteristics (i) and (ii) is considered non-statistical sampling.*

ISA (UK) 530,  
para 5(g)

While statistical sampling requires the use of mathematical procedures, it still requires the auditor to exercise professional judgement – for example, in determining what constitutes a misstatement or deviation and what the performance materiality level is. In practice, a certain level of mathematical competence is required if valid conclusions are to be drawn from the sample evidence.

The table below outlines the advantages and disadvantages of statistical sampling:

Advantages	Disadvantages
It can be used by all levels of audit staff.	It can result in complex mathematical processes which need to be understood.
It is an efficient use of audit time because excessive sample sizes are not taken.	The principles of testing have to be properly applied in order for the tests to be valid.
It can result in a standard programme of testing.	

Non-statistical sampling means selecting an appropriate sample size based on the auditor's judgement of what is desirable. In contrast to statistical sampling, no time is spent on complex mathematical procedures and no specialist knowledge of statistics is required.

### 1.3 Sampling techniques

There are a variety of sampling techniques (both statistical and non-statistical) which the auditor can use in devising a sample of a population to perform audit procedures over. The technique used will ultimately be at the discretion of the auditor's professional judgement and there are various factors that need to be carefully considered by the auditor because not every technique will be appropriate in the circumstances.

ISA (UK) 530 recognises that there are many methods of selecting samples and states that the principle methods are as follows:

#### Random selection

This can be achieved through the use of random number generators or tables.

#### Systematic selection

Where the number of sampling units in the population is divided by the sample size to give a sampling interval. For example, every 20<sup>th</sup> sales invoice. While the starting point may be determined on a haphazard basis, the sample is more likely to be truly random if it is determined by the use of a computerised random number generator or by way of random number tables. It is important when auditors use this sampling technique that they ensure that the sampling units within the population are not structured in such a way that the sampling interval corresponds with a particular pattern in the population.

#### Monetary unit sampling

This is a type of value-weighted selection in which sample size, selection and evaluation results in a conclusion in monetary amounts. This technique selects items based on monetary values (usually focussing on higher value items).

## Haphazard selection

When the auditor adopts a haphazard technique it is not a structure technique. When no structured technique is followed, the auditor would nonetheless avoid any conscious bias or predictability (e.g. by avoiding difficult to locate items or always avoiding items on the first or last page of the nominal ledger account). This ensures that all items in the population stand a chance of selection. ISA (UK) 530 acknowledges that haphazard selection is inappropriate when using statistical sampling.

## Block selection

This involves selecting a block of contiguous (i.e. items next to each other) items from from the population and is often used when testing cut-offs. ISA (UK) 530 clarifies that such a technique would rarely be appropriate where the auditor intends to draw valid inferences about the entire population based on the sample.

## Stratification

Stratification is the process of breaking down a population into smaller sub-populations. Each sub-population is a group of sampling units which have similar characteristics.

### Example – Stratification

The draft financial statements of Hall Industries Ltd for the year ended 31 August 2023 shows total revenue of £38.6 million. The company's revenue streams are not the same and so to ensure complete coverage of all revenue streams (and to ensure that no material revenue stream is missed out), the auditor divides the population into strata's (layers) as follows:

	Number of sales invoices in the stratum	Value of the stratum	Test size
Manufacturing	1,625	£22.6m	80
Storage	2,113	£8.2m	30
Distribution	1,009	£5.1m	20
Repairs	998	£2.7m	20

The sample chosen is weighted towards the higher value items because they are most material. The important issue that the auditor considers where different revenue streams are concerned is that they should break the revenue figure down into sub-populations to ensure appropriate coverage.

## 1.4 Attribute sampling

Attribute sampling is a technique used by the auditor to test controls. It provides results based on two possible attributes: correct (compliant) or not correct (non-compliant). Attribute sampling means that an item being sampled either will, or will not, possess certain qualities (or attributes). The auditor selects a certain number of records to estimate how many times a certain feature will present itself in a population.

### Example – Attribute sampling

Heaton Enterprises Ltd has a policy that every purchase invoice over £10,000 must be authorised by a member of the board of directors. In this situation, every purchase over £10,000 either will or will not be authorised by a director.

The audit senior has extracted a sample from the purchases day book report showing all supplier invoices over £10,000. There are 150 invoices in the sample and she notes that six of the 150 invoices are not authorised by a director. This gives a population error rate of 4% ( $6 / 150 \times 100$ ).

The audit file contains the following details:

- Tolerable error is 7%
- Expected error is 5%
- Sampling risk is 2%
- Confidence level is 98% (confidence level plus sampling risk should always equal 100%)
- Population error rate is 4%

Keep in mind that the audit senior is only looking at a sample of invoices – not the entire population. Notwithstanding the fact that the 4% population error rate is less than the tolerable error of 7%, the auditor cannot conclude that the sample is sufficient. When using attribute sampling the auditor must add the sampling risk of 2% to the population error of 4%. These two figures added together are referred to as the 'upper deviation rate'.

The upper deviation rate is 6% which is below tolerable error of 7% and the auditor can place reliance on the control.

## 1.5 Factors to consider when selecting a sample

There are various factors that must be considered by the auditor when selecting a sample. Some of these are as follows (note, the list below is not designed to be comprehensive):

### The purpose of the procedure

What is the overall objective of the test? What contribution does the test make to the overall assessment of the financial statements presenting a true and fair view?

## The combination of procedures that are being performed

Are tests of control being carried out and can they contribute towards audit evidence? What other audit procedures are being carried out over the area being audited?

## The nature of the audit evidence sought

Is external, third-party audit evidence available? Can auditor-generated audit evidence be obtained?

## The possible misstatement conditions

Is the area being audited at a higher risk of material misstatement or are controls over the area weak or non-existent?

### Example – Factors when deciding on a sample

Dwyer Industries Ltd operates approximately 400 sales ledger accounts and the majority of these accounts are expected to owe the company money at the year end 31 August 2023. The audit engagement partner has decided that a trade debtors' circularisation will not be carried out this year due to the low response rate received in the previous year's audit and the fact that they are generally viewed as a weak form of audit evidence.

The audit engagement partner has, instead, requested extended post-year-end cash receipts testing be performed to corroborate the valuation and existence assertions.

Given the number of sales ledger accounts in existence, it is highly likely that year-end trade debtors will be material. The audit engagement partner has requested **extended** post-year-end cash receipts testing as a trade debtors' circularisation is not being carried out. When designing the sample, the auditor must consider:

- **The purpose of the procedure** – which is to provide reasonable assurance that the trade debtors amount in the balance sheet does not contain material misstatement and the valuation of debtors is appropriate.
- **The combination of the procedures that are being performed** – extended post-year-end cash receipts testing will be **in addition** to other audit procedures to support the trade debtors amount (such as agreeing the sales ledger control account to the list of balances and selecting a sample of year-end balances and agreeing back to goods dispatched notes and sales order).
- **The nature of the audit evidence sought** – the extended post-year-end cash receipts testing will confirm (or otherwise) that trade debtors exist at the year end and that they are appropriately valued as they will be traced to monies received post-year end.
- **Possible misstatement conditions** – the auditor must consider the possibility that some debtor balances may not be recoverable (especially if they cannot be traced to post-year-end cash receipts) and hence a provision for bad debts may be necessary to avoid overstate trade debtors and profit.



## **1.6 Factors that influence the sample size**

There are various sampling techniques and various factors which the auditor must consider and not all techniques and factors will apply in every audit. Sample sizes must be representative of the population because if they are too small there is a greater risk that the auditor will form an incorrect opinion on the financial statements (i.e. audit risk is increased). Conversely, if they are too large, there will be a resulting increase in audit inefficiencies (i.e. increased costs).

The most important factor that must be considered when determining the sample size is the risk of material misstatement. The higher the auditor's assessment of the risk of material misstatement, the larger the sample size must be. The auditor's assessment of the risk of material misstatement is affected by inherent and control risk. For example, if the auditor does not perform tests of controls, the auditor's risk assessment cannot be reduced for the effective operation of internal controls with respect to the particular assertion. Hence, in order to reduce audit risk to an acceptably low level, the auditor needs a low detection risk and will rely more on substantive procedures. The more audit evidence that is obtained from tests of details (that is, the lower the detection risk), the larger the sample size will need to be.

Conversely, the more the auditor is relying on other substantive procedures (tests of details or substantive analytical procedures) to reduce to an acceptable level the detection risk regarding a particular population, the less assurance the auditor will require from sampling and, therefore, the smaller the sample size can be.