PKF Guidance Paper on Audit Sampling

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Contents

1. Audit Sampling

Sampling is addressed in International Standard on Auditing (ISA) 530 Audit Sampling. A number of ISAs make reference to sampling as it relates to the subject matter of each ISA, e.g. ISA 320 Materiality in Planning and Performing an Audit, ISA 450 Evaluation of Misstatements Identified during the Audit, and ISA 600 Special Considerations – Audit of Group Financial Statements (Including the Work of Component Auditors). This guidance paper is not a substitute for a proper understanding and application of the ISAs.

This sampling paper specifically excludes a sampling approach for Compliance auditing in an engagement.

The PKF International Audit Methodology does not assume that sampling is always required or desirable. The methodology guides the auditor to obtain a thorough understanding of the entity and its environment, the applicable financial reporting framework and the entity's system of internal control, in order to identify risks and then determine the nature and scope of testing required and whether substantive analytical procedures and other corroborating evidence, or the use of automated data tools and techniques for performing data analytics, might provide sufficient appropriate audit evidence thus reducing the need for sampling.

In cases where a sample selection is required for either controls testing, or where substantive analytical procedures and other corroborating evidence do not provide sufficient appropriate audit evidence, sampling is considered appropriate. The guidance in this paper should then be applied.

Even where IDEA or other data analytics software solutions are used to stratify populations and select items for testing, the principles and guidance below apply.

Introduction: What is sampling and why do we need to do it?

ISA 330 The Auditor's Procedures in Response to Assessed Risks states that "the auditor shall design and perform further audit procedures whose nature, timing, and extent are based on and are responsive to the assessed **risks of material misstatement at the assertion level**."

In order to obtain sufficient and appropriate audit evidence to be able to draw reasonable conclusions on which to base the auditor's opinion, the auditor has a responsibility to design and perform appropriate audit procedures. (ISA 500 *Audit Evidence*)

To be able to design and perform these audit procedures, the auditor must determine the appropriate means for selecting items for testing to ensure that sufficient appropriate audit evidence can be gathered to meet the objectives of the audit procedures. Guidance is provided on the means available to the auditor for selecting items for testing, **one of which** is audit sampling.

ISA 530 *Audit Sampling* defines audit sampling as "the application of audit procedures to less than 100% of the items within a population of audit relevance such that all sampling units have a chance of selection to provide the auditor with a reasonable basis on which to draw conclusions about the entire population".

Audit sampling may be used when performing tests of controls and substantive tests of detail on account balances, transactions, and events. When the auditor has decided to use audit sampling in performing audit procedures, whether for performing test of controls or substantive test of detail procedures, the auditor has to address the following matters:

(a) the sampling design to adopt *(ISA 530 para 6)*;

(b) the sample size *(ISA 530 para 7)*;

(c) the selection of items for testing *(ISA 530 para 8)*; and

(d) evaluating the results from the sample *(ISA 530 para 15).*

2. Definitions

Audit risk is defined as the risk that the auditor expresses an inappropriate audit opinion when the financial statements are materially misstated. Audit risk is a function of the risk of material misstatement and detection risk.

Population is defined as the entire set of data from which a sample is selected and about which the auditor wishes to draw conclusions.

Sampling risk is defined as the risk that the auditor's conclusion on a sample may be different from the conclusion that would have been reached had the entire population been subject to the same audit procedure. Setting sampling risk incorrectly can have one of two outcomes on an audit – if it is set too low the risk of an erroneous audit opinion increases, whereas if it is set too high it will impact on audit efficiency.

Sampling unit is defined as the individual items constituting a population.

An anomaly is a misstatement or deviation that is demonstrably not representative of misstatements or deviations in a population.

Statistical sampling is an approach to sampling that has the following characteristics:

(a) Random selection of the sample items; **and**

(b) The 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.

Stratification is a process of dividing a population into subpopulations, each of which is a group of sampling units which have similar characteristics (often monetary value).

Tolerable misstatement is a monetary amount set by the auditor in respect of which the auditor seeks to obtain an appropriate level of assurance that the monetary amount set by the auditor is not exceeded by the actual misstatement in the population. Tolerable misstatement is the application of performance materiality as defined in paragraph 9 of ISA 320 *Materiality in Planning and Performing an Audit*.

The tolerable rate of deviation is the rate of deviation from prescribed internal control procedures (test of controls) set by the auditor in respect of which the auditor seeks to obtain an appropriate level of assurance that the rate of deviation (number of deviations allowed within the control) set by the auditor is not exceeded by the actual rate of deviation (number of deviations identified when the control is tested) in the population.

3. When Should We Perform Sampling?

Sampling may be required when performing both tests of controls and substantive tests of detail.

When placing reliance on the operating effectiveness of controls, sampling may be needed to test those controls. The application of sampling for controls testing is dependent on the nature and frequency of the control you intend relying upon.

Substantive testing does not imply that sampling must be done!

Before concluding that sampling is appropriate, the auditor should attempt to perform the following:

(a) Using automated data tools and techniques, including data analytics, that identify "outliers", stratify the population, or test the entire population;

(b) Other substantive procedures (for example substantive analytical procedures or external third-party confirmations);

(c) Stratifying by dividing a population into subpopulations, each of which is a sampling unit which have similar characteristics (e.g., higher risk, large values, etc) and selecting only specific items when that reduces risk to an acceptable level. Refer to stratifying populations and the concept of a targeted approach.

When performing substantive tests of detail, sampling may be required only when the untested amount of the population of an account balance, class of transactions, events, or disclosure still remains material after performing the above procedures or where the above procedures could not be performed.

4. The Sample Design

When designing an audit sample, the auditor's consideration includes the specific purpose to be achieved and the combination of audit procedures that is likely to best achieve that purpose.

In fulfilling the requirement of paragraph 9 of ISA 500 *Audit Evidence*, when performing audit sampling, the auditor performs audit procedures to obtain evidence that the population from which the audit sample is drawn is complete.

Consideration of the nature of the audit evidence sought and possible deviation or misstatement conditions or other characteristics relating to that audit evidence will assist the auditor in defining what constitutes a deviation or misstatement and what population to use for sampling.

In considering the characteristics of the population from which the sample will be drawn, the auditor may determine that stratification or value-weighted selection is appropriate. Where the auditor has concluded that it is necessary to perform sampling, appropriate audit procedures must be performed on the population from which a sample will be selected in order to ensure that the population is complete.

5. Stratifying Populations and the Concept of a Targeted Approach

Depending on the characteristics of a population, the auditor may apply stratification to separate a larger population into discreet, more homogeneous subpopulations, each of which is a group of sampling units that have similar characteristics, suitable for sampling or selection of specific items (a targeted approach).

By doing this, the auditor is often able to reduce the sample size without impacting the sampling risk. For example, grouping similar size items together may reduce the variability between sample items and improve precision. By grouping higher risk items together, more sampling effort can be directed to transactions with a higher risk of misstatement. It is Important to note that the risk assessment must be updated to reflect the different risks associated with each category. Each category should then be separated out so that the risk can be appropriately documented. Using software such as IDEA or Inflo provides an efficient solution using various types of data tools and techniques to stratify populations. Monetary Unit Sampling (MUS), discussed in more detail later in this paper, automatically creates stratification by being biased towards selecting the higher values in the population for the sample.

The population is often stratified by monetary value but may also be stratified according to a particular characteristic that indicates a higher risk of misstatement (e.g., the type of loan or the age of the receivable or inventory). The auditor uses judgement when selecting specific items for testing based on the auditor's understanding of the entity, the assessed risk of material misstatement, and the characteristics of the population being tested or items that exceed tolerable misstatement.

Target or specific items selected, as an example, may include:

(a) High value or key items;

(b) All items over or under a certain amount;

(c) Unusual items or items with any particular characteristics that have a bearing on the identified risk, and/or

(d) Related party transactions and events/balances.

To draw a conclusion on the entire population that was stratified, the auditor will need to consider the risk of material misstatement to the non-selected items, if the cumulative non-selected items are material. The auditor will often need to obtain sufficient appropriate audit evidence regarding the remainder of the population or the subpopulation. This could include evidence from work performed elsewhere, e.g. tests of controls and substantive analytical procedures, or a sample could be selected from the remaining population for detailed substantive testing.

When the remaining non-selected items of a subpopulation is more than performance materiality or tolerable misstatement, a further sample is selected for specific or detailed substantive testing.

When the remaining non-selected items of a single subpopulation is less than performance materiality or tolerable misstatement, no further testing is required unless the untested items, in aggregate with the other individually immaterial subpopulations, exceed performance materiality or tolerable misstatement. In these circumstances a further sample is selected for specific or detailed substantive testing. Refer to **Appendix 2** for more on stratification.

The same approach is recommended when the population is not divided. i.e. the population will be treated as a single subpopulation. Refer to Value-Weighted selection

Misstatements identified for target or specific items selected are not projected over the population but are recorded as actual misstatements. Misstatements identified from items tested using sampling are projected for each subpopulation separately. Projected misstatements for each subpopulation are then combined when considering the possible effect of misstatement on the total class of transactions, events, or account balance.

5.1 Value-weighted selection

When performing detailed substantive tests, it may be efficient to identify the sampling unit as the individual monetary units that make up the population. Having selected specific monetary units from within the population, the auditor may then examine the particular items that contain those monetary units.

One benefit of this approach to defining the sampling unit is that audit effort is directed to the larger value items because they have a greater chance of selection. In this method, larger value items are tested separately and therefore reduces the remaining population which can result in smaller sample sizes. This approach may be used in conjunction with the systematic method of sample selection and is most efficient when selecting items using random selection.

5.2 Monetary unit sampling (MUS)

MUS, also called probability-proportional-to-size or dollar unit sampling is a type of sample selecting technique used to determine the accuracy of amounts within a population. With monetary unit sampling, each dollar in a transaction is a separate sampling unit. MUS is a type of value-weighted selection in which the sample size, selection and evaluation, results in a conclusion in monetary terms. This sample selection procedure selects items for the sample in proportion to their relative size, usually their monetary amounts.

5.3 Splitting samples

In certain circumstances, when performing audit work on interim audits, it may be appropriate to pro-rata sample sizes and perform a particular test/procedure in two or more parts. This is most commonly encountered when performing tests of controls on transactions and events for the period but can also be applied to substantive sampling.

The sample should be split in a logical manner. For example:

- *Where transactions and events are evenly distributed through-out the year* (No. of months passed / 12) * Total Sample size. The remainder of the sample is to be tested at year-end.

Where transactions and events are not evenly distributed through-out the year

- Value to date / (Value to date + Budgeted value to year end for remaining period) * Total Sample size. The remainder of the sample is to be tested at year-end.

The “total sample size” may need to be re-assessed at year-end for changes in the risk assessment, tolerable misstatement and tolerable rate of deviation. A top up sample size may be necessary to ensure that the combined sample size agrees to the total sample size.

When splitting samples (interim and final audit stages), it is important to evaluate results for the combined sample and the testing results at completion of the tests.

6. Sampling – Tests of Controls

Reliance on controls may permit reduced substantive testing (and related sample sizes) and may, in conjunction with substantive analytical procedures, provide sufficient audit evidence in some less significant account balances or class of transactions. In addition, controls testing is required for risks for which substantive procedures alone will not be sufficient.

In considering the characteristics of a population, for tests of controls, the auditor assesses the expected rate of deviation based on the auditor's understanding of the relevant controls or on the examination of a small number of items from the population. This could be obtained from the evaluation of those controls as required by ISA 315 (Revised) *Identifying and Assessing the Risks of Material Misstatement*. (Please refer to the International Audit Methodology, section 201.10 on understanding the components of an entity's system of internal controls).

6.1 Using audit evidence obtained in previous audits

Provided the auditor can confirm that the controls tested have not changed and have not been interrupted during the period of reliance, it may be appropriate to use audit evidence about the operating effectiveness of controls obtained in previous audits (excluding controls involving significant risks, which need to be tested annually when reliance is placed on the operating effectiveness of these controls).

In determining whether it is appropriate to use audit evidence about the operating effectiveness of controls obtained in previous audits, and, if so, the length of the time period that may elapse before retesting a control, the auditor shall consider the following:

> In determining whether it is appropriate to use audit evidence about the operating effectiveness of controls obtained in previous audits, and, if so, the length of the time period that may elapse before retesting a control, the auditor shall consider the following:
>
> (a) The effectiveness of other components of the entity's system of internal control, including the control environment, the entity's process to monitor the system of internal controls, and the entity's risk assessment process;
>
> (b) The risks arising from the characteristics of the control, including whether it is manual or automated;
>
> (c) The effectiveness of general IT controls;
>
> (d) The effectiveness of the control and its application by the entity, including the nature and extent of deviations in the application of the control noted in previous audits, and whether there have been personnel changes that significantly affect the application of the control;
>
> (e) Whether the lack of a change in a particular control poses a risk due to changing circumstances; and
>
> (f) The risks of material misstatement and the extent of reliance on the control.

If the auditor plans to use audit evidence from a previous audit about the operating effectiveness of specific controls, the auditor shall establish the continuing relevance of that evidence by obtaining audit evidence about whether significant changes in those controls have occurred subsequent to the previous audit. The auditor shall obtain this evidence by performing inquiry combined with observation, inspection and/or reperformance (i.e. evaluation of those controls which may include walk-through tests), to confirm the understanding of those specific controls, and:

(a) If there have been changes that affect the continuing relevance of the audit evidence from the previous audit or it is a control that mitigates a significant risk, the auditor shall test the controls in the current audit.

(b) If there have not been such changes since they were last tested and are not controls that mitigate a significant risk, the decision to rely on audit evidence obtained in previous audits is a matter of professional judgement. In addition, the length of time between retesting such controls is also a matter of professional judgement but is required to be tested at least once in every third year.

It is recommended that the auditor obtains written management representation that no significant changes to these controls have occurred subsequent to the previous period.

6.2 Controls over significant risks

If the auditor plans to rely on controls over a risk that the auditor has determined to be a significant risk, the auditor shall test those controls in the current period.

6.3 Sample sizes

In the absence of monitoring controls, usually by the most senior person in the cycle, caution should be exercised when determining whether to test controls. This assessment of the expected rate of deviation should be assessed and considered when designing an audit sample and in determining the sample size. If the expected rate of deviation is unacceptably high, the auditor will normally decide not to perform tests of controls. Results of the design and implementation procedures are a good indicator on whether controls have been well designed and implemented.

Minimum sampling sizes for control testing, including the sample size extension (in the event of a control failure) and how to interpret testing results have been suggested in the table that follows.

The sample sizes may be increased based on the auditor's professional judgement. Above all, the sample selection process must be **documented** and the final sample size **justified** detailing all of the auditor's considerations.

Table 1 – Test of controls sample sizes

Nature of control and frequency of performance**	Test of controls minimum sample size*	Control failure in minimum sample	Extension testing (if required)	Control failures from the additional sample	Conclusion
Manual*** key control performed daily or multiple times per day	22	0	-	-	Satisfactory
		1	Additional sample of 16	0	Satisfactory
				1 +	Unsatisfactory
		2	Additional sample of 30	0	Satisfactory
				1 +	Unsatisfactory
Manual key control performed weekly	5	0	-	-	Satisfactory
		1	Additional sample of 10	0	Satisfactory
				1 +	Unsatisfactory
		2 +	-	-	Unsatisfactory
Manual key control performed monthly	4	0	-	-	Satisfactory
		1 +	-	-	Unsatisfactory
Manual key control performed quarterly	2	0	-	-	Satisfactory
		1 +	-	-	Unsatisfactory
Manual key control performed annually	Test annually	0	-	-	Satisfactory
		1	-	-	Unsatisfactory
Automated application control	If supported by effective IT general controls, test 1 application for each automated control for each type of transaction	0	-	-	Satisfactory
		1	Additional sample of 12****	0	Satisfactory
				1 +	Unsatisfactory
		2 +	-	-	Unsatisfactory
IT general controls	Follow guidance above for both manual and automated aspects of IT general controls	-	-	-	-

** The minimum sample size suggested here has been based on a reasonably high effectiveness rate with a 90% confidence level and a 10% tolerable rate of deviation.*

***If the occurrence of controls does not fall into one of the categories described above (e.g. less than daily but more than weekly) and where the number of occurrences ranges between 50-250 times during the year, professional judgment should be used to determine the minimum sample size (e.g., approximately 10% of the occurrences).*

****A manual key control is a control procedure that is preventative and/or detective by nature.*

*****Extending the sample is appropriate if the sample tested in the design and implementation test did not fail.*

6.4 Using audit evidence obtained during an interim period

If the auditor obtains audit evidence about the operating effectiveness of controls during an interim period, the auditor shall:

(a) Obtain audit evidence about significant changes to those controls subsequent to the interim period; and

(b) Determine the additional audit evidence to be obtained for the remaining period. Additional audit evidence may be obtained by extending test of controls over the remaining period or testing the entity's monitoring of controls.

Also see "Splitting Samples" above for further guidance.

6.5 Sample item selection

There are many methods of selecting samples. The auditor should consider the use of the following methods to select items for controls testing:

(a) Random selection (applied through (computerised) random number generators, manual selections or other appropriate automated data tools and techniques);

(b) Systematic selection, in which the number of sampling units in the population is divided by the sample size to give a sampling interval. Although the starting point may be determined haphazardly, the sample is more likely to be truly random if it is determined by use of a computerised random number generator or random number tables. When using systematic selection, the auditor would need to determine that sampling units within the population are not structured in such a way that the sampling interval corresponds with a particular pattern in the population;

(c) Block selection, which involves selection of a block(s) of contiguous items from within the population. While it may be an appropriate audit procedure to examine a block of items, block selection cannot usually be used in audit sampling (when the auditor intends to draw conclusions about the entire population based on the sample) because most populations are structured such that items in a sequence can be expected to have similar characteristics to each other, but different characteristics from items elsewhere in the population.

The sample selected should be spread throughout the period of desired reliance so that the entire period is covered. The auditor must ensure that the sample selection process is **documented** and the final sample size **justified** detailing all of the auditor's considerations.

6.6 Evaluating the results of controls testing

Using the evidence obtained during controls testing, the auditor determines whether the control tested is operating satisfactorily for the period under review or not. In making that determination, the auditor must investigate all control deviations identified during controls testing. A control deviation can be categorised into the following:

(a) Control failure, or

(b) An anomaly

The consequences of each have a very different effect on the subsequent sampling for the auditor.

If the test of control reveals **control failures**, the auditor should consider the cause and document their conclusions. Control failures arise when either:

(a) The control was not performed at the appropriate time in the specified manner; or

(b) The control failed to prevent or detect and correct an error or misstatement.

If the cause can be established, then the auditor shall:

(a) Determine whether there were any other similar failures; or

(b) Design substantive procedures with a view to detect whether these control failures resulted in undetected and uncorrected errors.

Before the auditor can conclude that the control test is unsatisfactory, the auditor may extend the sample size tested when a control failure is identified. The sample size extensions are described in the table used to determine the sample size for test of controls.

Further detection of control failures will indicate that the control has not operated satisfactorily. Should no further deviations be detected, the auditor may conclude that the operation of the control was satisfactory.

Where a control deviation appears to be an isolated event, commonly referred to as an "**anomaly**" (defined as a misstatement or deviation that is demonstrably not representative of misstatements or deviations in a population), the

auditor is not required to extend the sample in order to determine whether the control is operating effectively. The auditor must ensure that the anomaly is adequately investigated and documented as part of its audit evidence.

The conclusion reached about the operating effectiveness of controls using the guidance above and, in the table, will have one of the following effects on the audit approach applied to substantive testing:

Conclusion on controls testing	Possible effect on the audit approach
Satisfactory	Where tests of operating effectiveness identify neither controls failures or unacceptable anomalies, and the actual rate of deviation in the population does not exceed the rate of deviation set by the auditor, control risk may be reduced to low. This reduces the risk that a material misstatement might go undetected and/or uncorrected thus it may be possible to obtain sufficient appropriate audit evidence without the use of detailed substantive testing using sampling (i.e. substantive analytics may suffice). If this is not the case, detailed substantive tests using sampling is required. In this case a satisfactory test of controls allows for a smaller sample size and thus a low confidence level may be selected when determining a sample size for detailed substantive testing.
Unsatisfactory	This increases the risk that a material misstatement may go undetected and/or uncorrected and thus the auditor would require increased assurance from substantive testing than previously planned. The increased assurance can be obtained from: Performing substantive analytics and reduced detailed substantive testing using sampling; or Increasing the sample size for detailed substantive testing and therefore the auditor may not use a low confidence level when determining a sample size for detailed substantive testing.

7. Sampling – Substantive Tests of Details

In terms of the PKF International Audit Methodology, the auditor determines whether an account balance, class of transactions, event or related disclosures are at risk of material misstatement. This assessment is made after a thorough understanding of the entity and its environment, the applicable financial reporting framework and the entity's system of internal control is obtained and documented. The auditor will consider the inherent characteristics that make up the account balance, class of transaction, event or related disclosures which is susceptible to material misstatement.

When at the assertion level, an account balance, class of transactions, an event, or related disclosure has been assessed to be susceptible to risk of material misstatement, the auditor must design the most appropriate audit approach to reduce detection risk to the desired level. The auditor should consider the following approach to obtain sufficient and appropriate audit evidence before substantive sampling is performed:

(a) Tests of control;

(b) Well-designed substantive analytical procedures;

(c) Specific substantive audit procedures responsive to the identified risks;

(d) Selecting specific items for substantive testing (e.g., target testing items over a certain amount, high value items, items exhibiting a certain characteristic, items to obtain certain information, etc); or

(e) Considering work done in related areas or dual-purpose tests.

PKF encourages the use of automated data analytic tools to obtain this required audit evidence, regardless of the approach being followed.

If sufficient and appropriate audit evidence was not obtained using the approach in (a) – (e), or the auditor has determined that substantive sampling is the most efficient approach to obtaining sufficient audit evidence, then the auditor shall proceed to perform substantive sampling to address the risk remaining after considering the results of procedures already performed.

7.1 Application of sampling when addressing remaining risk

Sampling is now applied as follows in relation to selecting items for detailed substantive testing (note that this is dependent on appropriate planning and risk assessment procedures having been performed, including risk assessment analytical review procedures). The table below shows how the remaining risk of material misstatement can be addressed with the use of sampling:

Assertion and assessed risk	Sampling implications
Assertions in **immaterial areas** with the risk of material misstatement assessed as **low**	No substantive testing and therefore no substantive sampling are performed unless: (a) The individual immaterial areas in aggregate exceed performance materiality; or (b) Testing for completeness and/or cut-off.
Assertions in **material areas** with the risk of material misstatement assessed as **low**	Substantive sampling will be performed if assurance gained from test of controls or substantive analytics was insufficient to reduce the risk of material misstatement to an acceptable level or such procedures were not performed.
Assertions in material areas with the **remaining risk** of material misstatement assessed as **medium or high**	Substantive sampling will be performed if assurance gained from test of controls or substantive analytics, specific tests of detail and work done in related areas was insufficient to reduce the risk of material misstatement to an acceptable level or such procedures were not performed. The remaining risk of material misstatement categorised as medium or high will directly impact the extent of audit work to be performed, thus influencing the sample size.

Assertions in areas for which **significant risks** have been identified	Substantive procedures are always required for significant risks but where sufficient assurance has been gained from substantive analytical procedures and the remaining risk of material misstatement has been reduced to an acceptable level, substantive tests of detail may not be required to be performed. In determining when substantive sampling will be performed and the related sample size, the auditor must consider if: Controls testing is performed**; No controls testing is performed; Control testing indicates that the control is not operating; Substantive analytics is performed**; No substantive analytics is performed; or Specific procedures and work done in related areas do not provide sufficient assurance. **The remaining risk of material misstatement will directly impact the extent of audit work to be performed after considering the assurances gained from performing this test, thus influencing the sample size. The remaining risk of material misstatement should be reduced when other forms of testing are performed satisfactorily, thus reducing the sample size for substantive test of detail. ***If the operating effectiveness of controls over a significant risk area are not being tested, substantive tests of detail must be performed. It is not sufficient to rely on substantive analytical procedures alone.

7.2 Sample sizes

In determining a sample size, the following should be considered:

(a) The nature and size of the population being tested;

(b) The results of other tests performed that will also provide audit evidence in relation to the balance/transaction and event/disclosure and assertion being tested;

(c) The remaining level of assessed risk associated with the assertion being tested for the account balance, class of transaction* or event or related disclosures;

(d) The confidence level (the risk that the results of the test would have been different had the entire population been subjected to the same audit procedures);

(e) Tolerable misstatement;

(f) Expected misstatement (i.e. the amount of error the auditor expects to find in the population based on prior experience or adjusted and unadjusted misstatements); and

(g) The existence of any actual or suspected or alleged fraud.

** Where significant audit risks relating to the population have been identified, this will require either a larger sample size to be selected, or the inclusion of specific audit procedures to address the significant risk identified.*

The auditor uses the following approach to determine the sample size for detailed substantive testing:

(a) Determine the **auditor's desired confidence level (refer to table 2a and 2b)**, and

(b) Determine the **tolerable misstatement as a percentage of the remaining population** which the auditor finds acceptable.

(c) Determine the ratio of **expected error to tolerable misstatement**

Once the elements required for determining the sample size is assessed by the auditor, the auditor must refer to either appendix 4 or appendix 5 to determine the corresponding sample size for substantive sampling purposes.

7.3 The auditor's desired confidence level

The auditor's confidence level relates to how sure the auditor wants to be that the results of the sample do not indicate a true (actual) misstatement that exceeds the tolerable misstatement for the test. The required confidence level is considered to be directly related to the remaining risk of material misstatement in the population being tested and evidence obtained from other audit procedures.

In accordance with ISA 315 (Revised), the auditor will have identified and assessed risks on the spectrum of inherent risk, by considering and assessing inherent risk factors and their combined effect on the likelihood and magnitude of a misstatement. The auditor will have also evaluated the design and implementation of internal controls that address some of those risks, as required by ISA 315.26. What is left is the risk of material misstatement. This is simply the remaining risk after taking into account the effect of internal controls put in place to mitigate the inherent risks.

ISA 315 (Revised) requires an iterative approach to risk assessment. Prior to determining sampling sizes, the auditor should reassess whether the evaluation of likelihood and magnitude are still appropriate in their determination of the inherent risk associated with an account balance or class of transactions to be sampled. The assessment of controls risk should also be reassessed to incorporate the results from the testing of the operating effectiveness of controls.

Where the population differs from the balance or class of transactions that would have previously been considered during the risk assessment phase, the auditor should assess the inherent risk of the remaining population and consider whether there are any controls that specifically address that risk, along with the results of controls testing (design, implementation and operating effectiveness testing). This may be the case, for example, whereby a balance or class of transactions has been stratified for target testing but where the remaining population is to be tested using a sampling method.

To determine the auditor's confidence level for sampling purposes, the auditor must now assess the risk of material misstatement that remains as high, medium or low (refer to tables 2a and 2b). This is after considering the risk assessment and the procedures performed to date (e.g., controls testing, substantive analytical procedures, target testing, etc).

Where the auditor ordinarily utilises a more granular assessment (e.g., significant, high, medium, low, insignificant), professional judgement should be applied to establish an appropriate and consistent basis to align the risk of material misstatement with the resulting audit risk for substantive sampling purposes (i.e., high, medium, low). For example, it may be considered appropriate to align 'significant/high' = high, 'medium' =medium and 'low/insignificant' = low.

Table 2a – Determining the auditor's confidence level (when the auditor plans to test the operating effectiveness of controls)

Inherent risk*	Control risk**	Resulting RoMM for substantive sampling	Resulting auditor's confidence level
High	High	High	**High (90%)**
High	Medium	Medium	**Medium (75%)**
High	Low	Medium or Low	**Medium (75%) or Low (50%)**
Medium	High	Medium	**Medium (75%)**
Medium	Medium	Medium	**Medium (75%)**
Medium	Low	Low	**Low (50%)**
Low	High	Low	**Low (50%)**
Low	Medium	Low	**Low (50%)**
Low	Low	Low	**Low (50%)**

Table 2b – Determining the auditor's confidence level (when the auditor does NOT plan to test the operating effectiveness of controls*)**

Inherent risk*	Resulting RoMM for substantive sampling***	Resulting auditor's confidence level
High	High	High (90%)
Medium	Medium	Medium (75%)
Low	Low	Low (50%)

** Inherent risk is taken from the auditor's risk assessment*

*** Control risk is taken from the auditor's risk assessment and updated to reflect the results of testing of the operating effectiveness of controls. Where the evaluation of the design and implementation of the controls mitigate the risk that the control addresses and the auditor determine that the appropriate control is in place, control risk may be reduced to medium or low but only where the operating effectiveness of the control has been tested and the results reflected in this assessment. When results from tests of operating effectiveness (in line with test of controls sample guidelines discussed earlier) show that the actual rate of deviation in the population does not exceed the rate of deviation set by the auditor, control risk may be assessed as low.*

**** If the auditor does not plan to test the operating effectiveness of controls, the auditor's assessment of control risk shall be such that the assessment of the risk of material misstatement is the same as the assessment of inherent risk (ISA 315.34).*

For a discussion of the effect of each of these considerations on the desired confidence level please see **appendix 1**.

7.4 Tolerable misstatement as a percentage of the remaining population

The next step is to determine the tolerable misstatement as a percentage of the remaining population, using the following formula:

Tolerable misstatement/value of the population being sampled**

***the value of the population in the calculation must be reduced by individual items that have been selected from that population.*

As a general principle, tolerable misstatement equals performance materiality for all account assertions. However, professional judgement should be applied to determine whether a lower tolerable misstatement would be appropriate considering the circumstances of and factors relevant to the particular engagement. Typically, tolerable misstatement is between 65% and 100% of performance materiality. Examples of some factors that may be relevant to consider when reducing tolerable misstatement below the performance materiality amount are as follows:

- Expected total amount of factual and projected misstatements
- Management's attitude toward proposed adjustments
- Disaggregation risks from locations, subsidiaries, or samples within an account where separate procedures are applied for each location but that will be aggregated in reaching audit conclusions
- Requirement for estimation or accounts will not be able to be determined with precision
- Portion of an account or area included in each test.

Notes:

i. If such factors are pervasive to the financial statements, they may be considered in the initial determination of performance materiality at the financial statement level instead of considered in each assertion level tolerable misstatement.

ii. Depending on whether one performance materiality has been calculated or whether multiple levels of specific performance materiality's have been calculated (example one for income statement items and another for balance sheet items), the materiality value applied in the calculation of the tolerable misstatement might differ depending on the population being sampled.

If the calculation of the tolerable misstatement (performance materiality or specific performance materiality/value of the population) results in a tolerable misstatement level that is less than 0,50%, the auditor shall use the starting point sample sizes suggested for a tolerable misstatement of 0.50%.

7.5 Determine the ratio of expected error to tolerable misstatement

The last component to determine the sample size is the ratio of expected error to tolerable misstatement. This is determined using the auditor's professional judgement and the expected error within the population being sampled. The error expected for the whole population is typically determined with consideration of past experience.

As a starting point, the general principle is that the ratio of expected error to tolerable misstatement is **5%.**

In assessing the expected error, the auditor may consider the following:

- Expected errors are for the whole population that is being sampled, not just the sample.
- If the population was sampled in the prior year, the auditor shall consider using the prior year extrapolated errors.
- Use judgment to consider the differences in extrapolation calculations for MUS and non-statistical and possible impacts on your population.
- In populations that were not sampled in the prior year, consider using 5% of TM as a starting point, as recommended above.
- Consider prorating expected errors between interim and year end.
- Always run a sensitivity analysis to determine the most appropriate expected error. Consider the cost/benefit of using different expected errors.

After assessing the expected error, the auditor may use a ratio of expected error to tolerable misstatement set at 0% where the auditor believes that the population will be free of error. The auditor should be mindful, that if the ratio of expected error to tolerable misstatement is set too low, the sample will be insufficient to conclude that the population is free of material misstatement and additional testing must be performed. If set too high, the audit is inefficient.

7.6 Determining the sample size

The suggested sample sizes per assertion, excluding completeness and cut-off, is based on the auditor's assessment of the 3 elements detailed earlier in this guidance paper. Refer to **appendix 4** or **appendix 5** to determine the appropriate sample size.

Where the sample selection method is Monetary Unit Sampling (MUS) or a similar statistical sample selection method, the auditor shall use **appendix 4** to determine the appropriate sample size. If the sample selection method is haphazard or any other non-statistical method, the auditor shall determine the sample size using **appendix 5**.

Appendix 4 (extract):

Ratio of expected error to tolerable misstatement - 5%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	5	8	24	31	42	49	62	83	124	250	500
M (75%)	3	5	15	19	25	30	37	50	74	148	297
L (50%)	2	3	8	10	13	15	18	25	37	73	147

Appendix 5 (extract):

Ratio of expected error to tolerable misstatement - 5%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	6	10	29	37	50	59	74	100	149	300	600
M (75%)	4	6	18	23	30	36	44	60	89	178	356
L (50%)	2	4	10	12	16	18	22	30	44	88	176

The appendices provide a **guideline starting point** to the auditor on the appropriate sample sizes to be selected, however the sample size may be increased based on the auditor's understanding of the entity and its environment and risk appetite.

Above all, the sample selection process must be **documented,** and the final sample size be **justified** detailing all of the auditor's considerations.

7.7 Completeness assertion

Completeness assertion means that all account balances, class of transactions, events or related disclosures that should have been recorded have been recorded.

The auditor should use professional judgement in determining an appropriate sample size for testing the completeness assertion. The auditor should consider, at a minimum, the following:

(a) Materiality,

(b) The assessed risk of material misstatement, and

(c) The degree of confidence the auditor requires.

7.8 Cut-off assertion sample

Cut-off means that transactions and/or events have been recorded in the correct accounting period.

The auditor should use professional judgement in determining an appropriate sample size for testing the cut-off assertion. The auditor should consider, at a minimum, the following:

(a) Risk of material misstatement assessment for the cut-off assertion,

(b) The nature of the client, and

(c) Whether controls around cut-off were tested and they were operating effectively – that is reliance can be placed on controls.

7.9 Sample item selection

There are many methods of selecting samples, the auditor shall consider the use of the following methods:

(a) Random selection (applied through (computerised) random number generators or other automate data tools and applications); - Use **appendix 4**

(b) Systematic selection, in which the number of sampling units in the population is divided by the sample size to give a sampling interval. Although the starting point may be determined haphazardly, the sample is more likely to be truly random if it is determined by use of a computerised random number generator or random number tables. When using systematic selection, the auditor would need to determine that sampling units within the population are not structured in such a way that the sampling interval corresponds with a particular pattern in the population; Use **appendix 4**

(c) Monetary Unit Sampling is a type of value-weighted selection in which sample size, selection and evaluation results in a conclusion in monetary amounts. Use **appendix 4**

(d) Haphazard sample is a non-statistical sample selection method that attempts to approximate a random selection by selecting sampling units without any conscious bias, that is, without any special reason for including or omitting items from the sample. Use **appendix 5**

(e) Block selection involves selection of a block(s) of contiguous items from within the population. While it may be an appropriate audit procedure to examine a block of items, block selection cannot usually be used in audit sampling (when the auditor intends to draw conclusions about the entire population based on the sample) because most populations are structured such that items in a sequence can be expected to have similar characteristics to each other, but different characteristics from items elsewhere in the population.

7.10 Replacing a sample item

The auditor shall perform audit procedures, appropriate to the purpose, on each item selected.

If the audit procedure is not applicable to the selected item, the auditor shall perform the procedure on a replacement item. An example of when it is necessary to perform the procedure on a replacement item is when a voided cheque is selected while testing for evidence of payment authorisation. If the auditor is satisfied that the cheque has been properly voided such that it does not constitute a deviation, an appropriately chosen replacement is examined.

If the auditor is unable to apply the designed audit procedures, or suitable alternative procedures, to a selected item, the auditor shall treat that item as a deviation from the prescribed control, in the case of tests of controls, or a misstatement, in the case of tests of details. An example of when the auditor is unable to apply the designed audit procedures to a selected item is when documentation relating to that item has been lost.

7.11 Projecting misstatements

The auditor is required to project misstatements for the population to obtain a broad view of the scale of misstatement, but this projection may not be sufficient to determine an amount to be recorded.

When a misstatement has been established as an anomaly, it may be excluded when projecting misstatements to the population. However, the effect of any such misstatement, if uncorrected, still needs to be considered in addition to the projection of the non-anomalous misstatements.

The extrapolated, or projected, error is an estimate of the total error and not a known amount and as such cannot be used to determine the amount of the adjustment to be made by the client. Should any adjustment be required the auditor should request the client to investigate the error and make corrections.

The results of audit procedures applied to a sample of items within a stratum can only be projected to the items that make up that stratum. To draw a conclusion on the entire population, the auditor will need to consider the risk of material misstatement in relation to whatever other strata make up the entire population.

If a class of transactions and events or account balance has been divided into strata, the misstatement is projected for each stratum separately. Projected misstatements for each stratum are then combined when considering the possible effect of misstatements on the total class of transactions and events or account balance.

Once the corrections have been done the auditor can either select another sample to ensure that the error has been adjusted correctly or be satisfied that the actual error has been reduced to below the level of tolerable misstatement.

In considering the effect of the errors on the class of transaction or individual account balance being tested, the cumulative amount of any uncorrected anomalous errors as well as the extrapolated errors must be considered. This cumulative amount is then compared to the auditor's overall materiality, performance materiality and triviality level.

The effect of the cumulative (known and projected) misstatement is as follows:

Amount of the cumulative (known and projected) misstatement:	Effect:
Greater than overall materiality	The actual value of the error will need to be determined (cannot use the estimated extrapolated error) and the client may be required to adjust for the error as the financial statements are not free from material misstatements.
Above triviality and lower than overall materiality (i.e. amounts above planning materiality and below overall materiality)	The actual value of the error may, based on professional judgement, need to be determined (cannot use the estimated extrapolated error). If the actual error is below materiality but above triviality level, it may then be included on the schedule of uncorrected misstatements. It is recommended that all misstatements above triviality should be communicated to management or those charged with governance.
Above triviality and lower than performance materiality	The estimated error may be included on the schedule of uncorrected misstatement as there is less chance that the actual error may be greater than performance materiality, thus there is less risk that by using the estimated error a material misstatement has been left uncorrected. It is recommended that all misstatements above triviality should be communicated to management or those charged with governance.
Below triviality	Determine whether the cumulative effect of misstatements below triviality exceeds triviality.

There are several methods the auditor can use to extrapolate the amount of misstatement found in a statistical or nonstatistical sample to estimate the amount of misstatement in the population. The method of extrapolation to be applied may also depend on the sample selection method adopted.

Where sample sizes have been determined using non-statistical methods, the auditor has a choice of three methods of extrapolation, examples of which are provided in the appendix.

7.12 Evaluating the results of audit sampling

In the case of tests of details, the projected misstatement plus anomalous misstatement, if any, is the auditor's best estimate of misstatement in the population. When the projected misstatement plus anomalous misstatement, if any, exceeds tolerable misstatement, the sample does not provide a reasonable basis for conclusions about the population that has been tested.

The closer the projected misstatement plus anomalous misstatement is to tolerable misstatement, the more likely that actual misstatement in the population may exceed tolerable misstatement. Also, if the projected misstatement is greater than the auditor's expectations of misstatement used to determine the sample size, the auditor may conclude that there is an unacceptable sampling risk that the actual misstatement in the population exceeds the tolerable misstatement.

Considering the results of other audit procedures helps the auditor to assess the risk that actual misstatement in the population exceeds tolerable misstatement, and the risk may be reduced if additional audit evidence is obtained.

If the auditor concludes that audit sampling has not provided a reasonable basis for conclusions about the population that has been tested, the auditor may:

(a) Request management to investigate misstatements that have been identified and the potential for further misstatements and to make any necessary adjustments; or

(b) Tailor the nature, timing and extent of those further audit procedures to best achieve the required assurance. For example, in the case of tests of controls, the auditor might extend the sample size, test an alternative control or modify related substantive procedures.

8. Documentation

The auditor shall prepare audit documentation that is sufficient to enable an experienced auditor, having no previous connection with the audit, to understand:

(a) The nature, timing and extent of the audit procedures performed to comply with the ISAs and applicable legal and regulatory requirements;

(b) The results of the audit procedures performed, and the audit evidence obtained; and

(c) Significant matters arising during the audit, the conclusions reached thereon, and significant professional judgements made in reaching those conclusions.

In documenting the nature, timing and extent of audit procedures performed using sampling, the auditor is expected to record the identifying characteristics for each sample selected:

(a) The sample size and the information the auditor used to determine the sample size;

   i. Test of controls: nature of control and frequency of performance.

   ii. Substantive test of detail:

      - Auditor's desired confidence level;
      - Tolerable misstatement as a percentage of the remaining population; and
      - Ratio of expected error to tolerable misstatement

(b) The population or source of the population when not the general ledger;

(c) The sample selecting method applied and in addition for each method, the auditor is expected to document the following:

   i. For systematic sampling: the random starting point;

   ii. For interval sampling: the interval unit and the interval starting point;

   iii. For target sampling: the criteria applied for selecting the sample (e.g. items above materiality) and the justification as to why the criteria is appropriate.

It is imperative that the auditor assess and documents the accuracy and completeness of the population prior to selecting the sample, when the source is not the general ledger.

Appendix 1: Sampling Methods – Further Information

Methods of choosing sample sizes

The auditor can apply either statistical or non-statistical sampling methods to determine sample sizes.

Statistical sampling

This sampling method uses random selection and the probability theory to evaluate sample results. This method of sample size determination is not preferred as it is not always practical or appropriate. Although the results of this sampling method can be used to derive statistically valid conclusions about the population as a whole, it is more effective when applied to large homogenous populations.

The auditor's desired confidence level

In determining the desired confidence level, the following factors should be considered:

Specific risks and assertions

In obtaining audit evidence the auditor should use professional judgement to assess the risk of material misstatement and design further audit procedures to ensure that risk is reduced to an acceptably low level.

The higher the auditor's assessment of the risk of material misstatement, the larger the sample size needs to be. This is due to the fact that the auditor's assessment of this risk (audit risk) is affected by inherent risk and control risk.

Inherent Risk Guidance

- Inherent risk is the susceptibility of an assertion about a class of transaction, account balance or disclosure that could be material, either individually or when aggregated with other misstatements, before consideration of any related controls.
- The auditor shall assess inherent risk by assessing the likelihood and magnitude of misstatement. In doing so, the auditor shall take into account how, and the degree to which:
  - (a) Inherent risk factors affect the susceptibility of relevant assertions to misstatement; and
  - (b) The risks of material misstatement at the financial statement level affect the assessment of inherent risk for risks of material misstatement at the assertion level.
- Inherent risk factors may be qualitative or quantitative and are characteristics of events or conditions that affect susceptibility to misstatement, whether due to fraud or error, of an assertion about a class of transactions, account balance or disclosure, before consideration of controls.
- Qualitative inherent risk factors relating to the preparation of information required by the applicable financial reporting framework include:
  - Complexity
  - Subjectivity
  - Change
  - Uncertainty
  - Susceptibility to misstatement due to management bias or other fraud risk factors insofar as they affect inherent risk.
- Other inherent risk factors, that affect susceptibility to misstatement of an assertion about a class of transactions, account balance or disclosure may include:
  - The quantitative or qualitative significance of the class of transactions, account balance or disclosure; or
  - The volume or a lack of uniformity in the composition of the items to be processed through the class of transactions or account balance, or to be reflected in the disclosure.

- The degree to which inherent risk varies is referred to as the 'spectrum of inherent risk'. The auditor uses professional judgment to assess the inherent risk within a range, from lower to higher, on the spectrum of inherent risk. The judgment about where in the range inherent risk is assessed may vary based on the nature, size and complexity of the entity, and takes into account the assessed likelihood and magnitude of the misstatement and inherent risk factors. A significant risk is an identified risk of material misstatement for which the assessment of inherent risk is close to the upper end of the spectrum of inherent risk due to the degree to which inherent risk factors affect the combination of the likelihood of a misstatement occurring and the magnitude of the potential misstatement should that misstatement occur.
- Appendix 2 of ISA 315 (Revised) has further explanation about the inherent risk factors, as well as matters that the auditor may consider in understanding and applying the inherent risk factors in identifying and assessing the risks of material misstatement at the assertion level.

Control Risk Guidance

- Control risk is the risk that a misstatement that could occur in an assertion about a class of transaction, account balance or disclosure and that could be material, either individually or when aggregated with other misstatements, will not be prevented, or detected and corrected, on a timely basis by the entity's system of internal control.
- If the auditor plans to test the operating effectiveness of controls, the auditor shall assess control risk. If the auditor does not plan to test the operating effectiveness of controls, the auditor's assessment of control risk shall be such that the assessment of the risk of material misstatement is the same as the assessment of inherent risk.
- Control risk is high when the auditor does not plan to evaluate the design and implementation of the related controls and/or when the results show that the auditor cannot rely on the controls due to poor design, implementation or where testing has shown that the controls are not operating effectively.
- Control risk is reduced to medium or low when control evaluations show that the related controls have been designed and implemented effectively and when results from tests of operating effectiveness (in line with test of controls sample guidelines discussed earlier) show that the actual rate of deviation in the population does not exceed the rate of deviation set by the auditor.

Audit Risk for sampling and determining the desired confidence level

- Audit risk is the risk that the auditor expresses an inappropriate audit opinion when the financial statements are materially misstated.
- Audit risk is a function of the risks of material misstatement (i.e. the level of risk remaining after considering the mitigating effect of controls on inherent risk and any other procedures already performed) and detection risk (i.e. The risk that the procedures performed by the auditor to reduce audit risk to an acceptably low level will not detect a material misstatement).
- To decrease audit risk, detection risk must be low and in order for detection risk to be low, more audit evidence needs to be obtained from substantive audit procedures, thus the larger the sample sizes for these procedures will have to be.
- The more audit risks identified in a particular area, the higher the level of desired confidence needed. The extent to which the auditor increases their desired level of confidence will be influenced by the auditor's professional judgement.

Other tests which also test the same balance, transaction, event, and assertion(s)

As accounting is based on a double entry system, consideration must be made of the procedures which have been planned for the related areas of the financial statements and the results of the procedures already performed in this regard.

However, it must be noted that the scope of testing, including the sample size, can only be reduced when the procedures planned/performed on the related area(s) also provide evidence over the balance, class of transactions, events, and the specific assertion(s) under consideration. For example, the extent of revenue testing cannot be entirely scoped out

purely because of testing done on the accounts receivable balance as these are the balances at period end and would only provide audit evidence on revenue transactions still receivable at period end. In addition to this, the risk of material misstatement (related to the account balance or class of transaction and event under consideration) should be similar to that of the related item on whose testing we plan to place reliance.

The existence of errors found when testing the related area will influence the sample size of the area being tested for that same assertion.

Further, if the client had effective controls in operation (which have been evaluated and then tested), the sample size can be reduced greatly provided the sample for the tests of controls was large enough in the circumstance and no unacceptable deviations were detected.

Applying the sampling table for substantive test of detail

Example

1. The value of the trade receivables population is CU2,000,000. Performance materiality was determined to be CU300,000.

   The level of tolerable misstatement that can be accepted is determined to be 15%.

   (CU300,000/CU2,000,000*100 = 15%) and the ratio of expected error to tolerable misstatement is 5%

   Sample size based on low risk will be

   - If using statistical sampling selection method (using appendix 4), the sample size is between 3 and 8.
   - If using non-statistical sampling selection method (using appendix 5), the sample size is between 4 and 10.

   In this case, based on professional judgement,

   - If using statistical sampling selection method (using appendix 4), the sample size could be 5 items.
   - If using non-statistical sampling selection method (using appendix 5), the sample size could be 7 items.

2. The value of the inventory population is CU4,000,000. Performance materiality was determined to be CU300,000.

   The level of tolerable misstatement that can be accepted is determined to be 7.5%.

   (CU300,000/CU4,000,000*100 = 7.5%) and the ratio of expected error to tolerable misstatement is 5%

   Sample size based on medium risk will be

   - If using statistical sampling selection method (using appendix 4), the sample size is between 19 and 25.
   - If using non-statistical sampling selection method (using appendix 5), the sample size is between 23 and 30.

   In this case, based on professional judgement,

   - If using statistical sampling selection method (using appendix 4), the sample size could be 23 items.
   - If using non-statistical sampling selection method (using appendix 5), the sample size could be 27 items.

3. The value of the revenue population is CU20,000,000. Performance materiality was determined to be CU300,000.

   The level of tolerable misstatement that can be accepted is determined to be 1.5%.

   (CU300,000/CU20,000,000*100 = 1.5%) and the ratio of expected error to tolerable misstatement is 5%

   Sample size based on high risk will be

   - If using statistical sampling selection method (using appendix 4), the sample size is between 124 and 250.
   - If using non-statistical sampling selection method (using appendix 5), the sample size is between 149 and 300.

   In this case, based on professional judgement,

   - If using statistical sampling selection method (using appendix 4), the sample size could be 200 items.
   - If using non-statistical sampling selection method (using appendix 5), the sample size could be 220 items.

The amount of error the auditor expects to find in the population

Where errors are found, the auditor must establish what the reasons for the errors are and whether the errors arose during a certain period, or whether they arose on a particular type of transaction. This will assist the auditor to focus his/her additional audit procedures in the right area so as to establish the potential extent of other errors that may have arisen in similar circumstances.

Where clear reasons cannot be established, the desired level of confidence should be increased. Should any further errors be identified in this case, the auditor's approach should be reconsidered.

Any deviation or misstatement is evidence of a control issue to be assessed as to its possible severity

Appendix 2: Stratification and Target Testing – Further Information

The following example illustrates the use of stratification and target testing

You are provided with the following population

Revenue

Account number	Account description	Cumulative amount at year end
R001	Revenue from sale of goods	12,000,000
R002	Revenue from sale of services	6,500,000
R003	Revenue from repairs	800,000
R004	Revenue from site call outs	400,000

Materiality	1,400,000
Performance materiality (75%)	1,050,000

in analysing the accounts, the following transactions were above performance materiality

Account number: R001

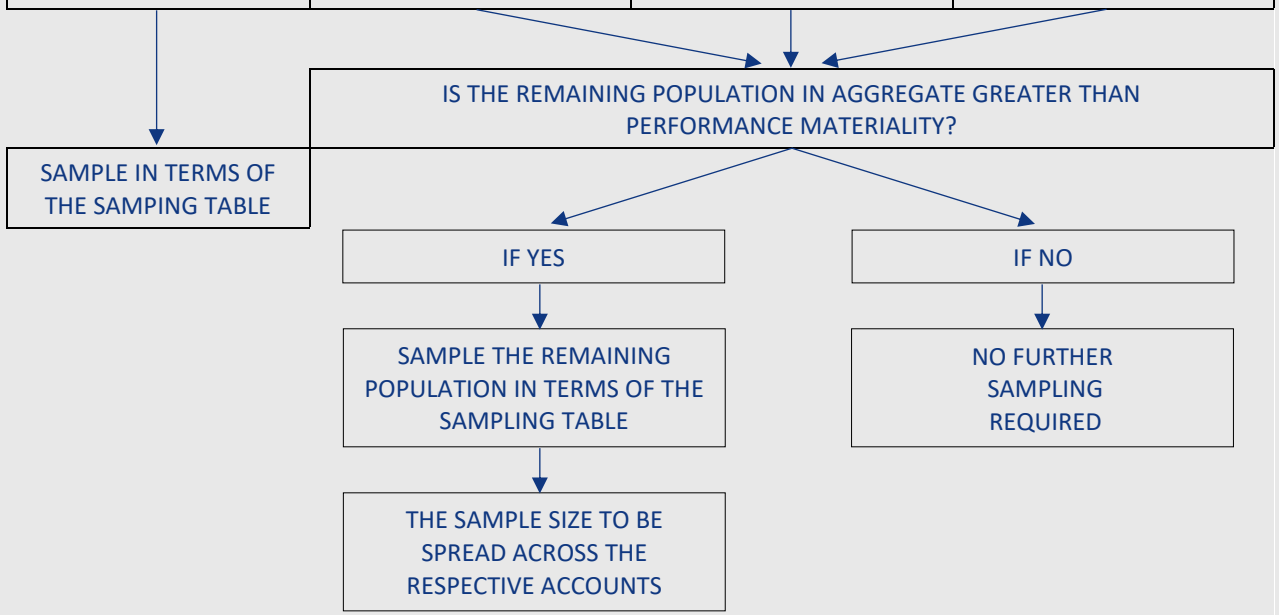
Date	Inv number	Amount
02-Feb-17	1356	1,560,000
09-Jun-17	1478	1,100,000
04-Aug-17	1566	2,567,000
08-Sep-17	1789	1,060,000
31-Dec-17	1899	3,240,000
		9,527,000

Account number: R002

Date	Inv number	Amount
03-Mar-17	1379	1,100,000
04-Apr-17	1399	2,267,000
21-Nov-17	1801	2,378,000
		5,745,000

In determining the sampling approach, the following process can be followed:

	R001	R002	R003	R004
Population	12,000,000	6,5000,000	800,000	400,000
Individually homogenous items selected separately	9,527,000	5,745,000	-	-
Remaining population	**2,473,000**	**755,000**	**800,000**	**400,000**
Is the remaining population greater than performance materiality?	**Yes**	**No**	**No**	**No**



If the remaining population, after stratification, results in the sub-population (R001, R002, R003 and R004) being individually and cumulatively immaterial, no further sampling is required. Where the sub-populations (R001, R002, R003 and R004) are individually immaterial, after stratification, but material in aggregate, the aggregate remaining sub-population may be subject to sampling and a representative sample would need to be selected for testing.

Appendix 3: Projecting Misstatements – Further Information

Methods of projecting errors/misstatements identified

Projecting methods:

The auditor would apply –

- Example 1: where the auditor finds that the amount of misstatement relates closely to the value of the items tested;
- Example 2: where the auditor finds that the misstatements are fairly constant for all items in the population; and
- Example 3: where monetary unit sampling has been applied to select a sample size determined using judgmental (nonstatistical) sampling methods.

Example 1: Misstatement Ratio

The calculation of a misstatement rate within the sample selected and the application of the misstatement rate to the Currency Unit (CU) value of the population

CU value of misstatements in the sample / CU value of the sample x CU value of the population = CU value of projected misstatement

Total error in sample: CU 100

Total value of sample: CU 2,000

Total value of the population: CU 5,000

Misstatement rate = CU 100 (sample error) / CU 2,000 (sample value)

= 0.05 (misstatement rate)

CU value of projected misstatement = CU 5,000 (population) x 0.05 (misstatement rate)

= **CU 250**

Example 2: Average Misstatement

Projection of the average difference between the audited and recorded amounts of each item in the sample to all items in the population.

These relate to recurring errors that are similar in nature identified in the sample set tested and could have a similar effect on the remainder of the population. This projection method determines the average error for the sample selected for testing. The average misstatement per item in the sample is then projected against the total number of items in the population.

CU value of misstatements in the sample/ Number of items in the sample x Number of items in the population = CU value of projected misstatement

Error in sample: CU 100

Number of items in sample: 20

Number of items in the population: 150

Average misstatement = CU 100 (sample error) / 20 (number of items in sample)

= CU5 per sample item

CU value of projected misstatement = CU5 (average misstatement) x 150 (items in the population)

= **CU 750**

Example 3: Interval Misstatement Rate

(CU value of misstatement 1 / CU value of recorded item 1 x CU value of interval +

(CU value of misstatement 2 / CU value of recorded item 2 x CU value of interval + …. +

(CU value of Misstatement N / CU value of recorded item N x CU value of interval

= CU value of projected misstatement

Population: CU100,000

Sample size: 100 units

Interval: CU1,000 (CU100,000/100 units)

Testing revealed two misstatements:

1. Overstatement of CU100 on a unit of CU100
2. Overstatement of CU100 on a unit of CU200

CU Value of the projected misstatement = (100/100 x CU1,000) + (100/200 x CU1,000)

= CU1,500

Appendix 4:
Statistical Sample Sizes

Ratio of expected error to tolerable misstatement - 0%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	5	8	24	29	39	47	58	77	116	231	461
M (75%)	3	5	14	18	24	28	35	47	70	139	278
L (50%)	2	3	7	9	12	14	18	24	35	70	139

Ratio of expected error to tolerable misstatement - 5%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	5	8	24	31	42	49	62	83	124	250	500
M (75%)	3	5	15	19	25	30	37	50	74	148	297
L (50%)	2	3	8	10	13	15	18	25	37	73	147

Ratio of expected error to tolerable misstatement - 10%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	5	9	27	34	46	54	68	91	136	274	547
M (75%)	3	5	17	20	27	32	40	53	80	159	319
L (50%)	2	3	8	10	14	16	19	26	39	77	155

Ratio of expected error to tolerable misstatement - 20%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	7	12	35	43	57	69	86	114	171	341	682
M (75%)	4	7	19	24	32	38	48	64	95	190	380
L (50%)	2	3	9	11	15	18	22	29	44	87	173

Ratio of expected error to tolerable misstatement - 40%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	12	20	58	72	96	115	143	191	286	572	1144
M (75%)	6	10	29	37	49	58	73	97	145	289	578
L (50%)	3	4	12	15	19	23	29	38	57	114	228

Appendix 5:
Haphazard Sample Sizes

Ratio of expected error to tolerable misstatement - 0%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	6	10	29	35	47	56	70	92	139	277	553
M (75%)	4	6	17	22	29	34	42	56	84	167	334
L (50%)	2	4	8	11	14	17	22	29	42	84	167

Ratio of expected error to tolerable misstatement - 5%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	6	10	29	37	50	59	74	100	149	300	600
M (75%)	4	6	18	23	30	36	44	60	89	178	356
L (50%)	2	4	10	12	16	18	22	30	44	88	176

Ratio of expected error to tolerable misstatement - 10%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	6	11	32	41	55	65	82	109	163	329	656
M (75%)	4	6	20	24	32	38	48	64	96	191	383
L (50%)	2	4	10	12	17	19	23	31	47	92	186

Ratio of expected error to tolerable misstatement - 20%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	8	14	42	52	68	83	103	137	205	409	818
M (75%)	5	8	23	29	38	46	58	77	114	228	456
L (50%)	2	4	11	13	18	22	26	35	53	104	208

Ratio of expected error to tolerable misstatement - 40%											
	Tolerable misstatement as a percentage of the population										
Confidence level	<50%	30%	10%	8%	6%	5%	4%	3%	2%	1%	0.50%
H (90%)	14	24	70	86	115	138	172	229	343	686	1373
M (75%)	7	12	35	44	59	70	88	116	174	347	694
L (50%)	4	5	14	18	23	28	35	46	68	137	274

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