CHAPTER 8
SPECIALIZED AUDIT TOOLS: SAMPLING AND GENERALIZED AUDIT SOFTWARE
LEARNING OBJECTIVES

1. Describe how auditors use sampling and generalized audit software to gather sufficient appropriate audit evidence
2. Explain the objectives of sampling for testing controls and account balances, and describe the risks associated with sampling
3. Compare and contrast non-statistical and statistical sampling and apply these sampling approaches
LEARNING OBJECTIVES

4. Describe attributes sampling and use it for tests of controls

5. Describe the sampling process used to gather evidence about misstatements in account balances and assertions

6. Describe monetary unit sampling and use it to test account balances and assertions
LEARNING OBJECTIVES

7. Describe how to use generalized audit software to automate the audit process
8. Apply the frameworks for professional decision making and ethical decision making to issues involving sampling and generalized audit software
PROFESSIONAL JUDGMENT IN CONTEXT - AUDIT SAMPLING

• Application of an audit procedure to less than 100% of items within an account balance or class of transactions for evaluating some characteristics of the balance

• Report of common issues by PCAOB in 2008
  • Sample sizes are too small to obtain enough evidence to form a conclusion about account balance or class
  • Failure in appropriately projecting effect of errors identified when testing items selected to the population
PROFESSIONAL JUDGMENT IN CONTEXT - AUDIT SAMPLING

- Failure in selection of the sample in such a way that it could be expected to be representative of the underlying population
- Inappropriately testing all the items in the sample
- What is sampling, and what risks does the auditor face when using sampling? (LO 1, 2)
- In testing controls and account balances and assertions, what type of sampling should be used? (LO 3, 4, 5, 6)
PROFESSIONAL JUDGMENT IN CONTEXT - AUDIT SAMPLING

• In testing controls and account balances and assertions, how many individual account items should be selected, and which ones should be selected? (LO 4, 5, 6)

• If a sample contains an error, how is that information used to come to a conclusion regarding errors in the overall population? (LO 3, 4, 5, 6)
LEARNING OBJECTIVE 1

DESCRIBE HOW AUDITORS USE SAMPLING AND GENERALIZED AUDIT SOFTWARE TO GATHER SUFFICIENT APPROPRIATE AUDIT EVIDENCE
TOOLS FOR GATHERING AUDIT EVIDENCE

• Sampling involves looking at less than 100% of transactions
  • Used for:
    • Tests of controls
    • Direct tests of account balances and assertions
  • Appropriate when an auditor wants to perform procedures such as:
    • Examining documents
    • Reperforming calculations
    • Sending confirmations
TOOLS FOR GATHERING AUDIT EVIDENCE

• Samples should be:
  • Representative of the population
  • Of sufficient size
  • Selected from appropriate underlying population

• **Generalized audit software (GAS):** Programs designed specifically for auditors
  • Facilitates and automates testing of 100% of population
  • Focuses attention on specific risk areas or transactions
  • Identifies duplicate items
<table>
<thead>
<tr>
<th>Financial Statement Assertion</th>
<th>Using Sampling to Gather Evidence</th>
<th>Using GAS to Gather Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence or occurrence</td>
<td>Take a sample of recorded transa...</td>
<td>Sort the file to identify th...</td>
</tr>
<tr>
<td>Completeness</td>
<td>Take a sample of subsequent cash...</td>
<td>Sort the file by vendor to id...</td>
</tr>
<tr>
<td>Rights or obligations</td>
<td>Perform in conjunction with exist...</td>
<td>Sort the file to scan for unus...</td>
</tr>
<tr>
<td>Valuation or allocation</td>
<td>Select items and trace back to sou...</td>
<td>Foot the file and test computa...</td>
</tr>
<tr>
<td>Presentation and disclosure</td>
<td>Verify estimates or other items fo...</td>
<td></td>
</tr>
</tbody>
</table>
LEARNING OBJECTIVE 2

EXPLAIN THE OBJECTIVES OF SAMPLING FOR TESTING CONTROLS AND ACCOUNT BALANCES, AND DESCRIBE THE RISKS ASSOCIATED WITH SAMPLING
OBJECTIVES OF SAMPLING AND RISKS ASSOCIATED WITH SAMPLING

Objectives

- Determining whether controls are operating effectively
- Estimating amount of misstatement in an account balance

Risks

- Auditor might not look at enough items
- Sample might not be representative of full population
SAMPLING UNITS

• Individual items to be tested

• **Population**: A group of transactions that make up an account balance for which the auditor estimates some characteristics or estimate the extent of misstatement in an account
RISKS ASSOCIATED WITH SAMPLING

Nonsampling risk

• When the auditor reaches an erroneous conclusion for any reason not related to sampling risk

Sampling risk

• When the auditor’s conclusion based on a sample might be different from the conclusion he or she would reach if the test were applied in the same way to the entire population
SAMPLING RISKS RELATED TO TESTS OF CONTROLS

Risk of incorrect acceptance of internal control reliability (risk of assessing control risk too low)

- The risk that the auditor will conclude that the state of internal controls is effective when internal controls are actually not effective

Risk of incorrect rejection of internal control reliability (risk of assessing control risk too high)

- The risk that the auditor will conclude that the state of internal controls is not effective when internal controls are actually effective
### EXHIBIT 8.2 - SAMPLING RISKS FOR TESTS OF CONTROL PROCEDURES

<table>
<thead>
<tr>
<th>Auditor’s Assessment of Control Risk</th>
<th>Actual State of Controls Based on the Entire Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effective</td>
</tr>
<tr>
<td>Low</td>
<td>Correct conclusion</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Risk of incorrect rejection of internal control reliability</td>
</tr>
<tr>
<td></td>
<td>Control failures in the population are lower than the sample indicates (also referred to as the risk of assessing control risk too high or the risk of underreliance). Leads to audit inefficiency.</td>
</tr>
</tbody>
</table>
SAMPLING RISKS RELATED TO TESTS OF DETAILS OF ACCOUNT BALANCES

Risk of incorrect acceptance of book value

• The risk that the auditor will conclude that the account balance does not contain a material misstatement when the account balance actually does contain a material misstatement

Risk of incorrect rejection of book value

• The risk that the auditor will conclude that the account balance contains a material misstatement when the account balance actually does not contain a material misstatement
## EXHIBIT 8.3 - SAMPLING RISKS FOR TESTS OF DETAILS OF ACCOUNT BALANCES

<table>
<thead>
<tr>
<th>Auditor’s Conclusion Based on Sample Evidence</th>
<th>Actual Condition of Book Value Based on the Entire Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book value does not contain a material misstatement</td>
<td>Does Not Contain a Material Misstatement</td>
</tr>
<tr>
<td></td>
<td>Correct conclusion</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Book value likely contains a material misstatement</td>
<td>Risk of incorrect rejection of book value</td>
</tr>
<tr>
<td></td>
<td>Leads to audit inefficiency.</td>
</tr>
</tbody>
</table>
LEARNING OBJECTIVE 3

COMPARE AND CONTRAST NONSTATISTICAL AND STATISTICAL SAMPLING AND APPLY THESE SAMPLING APPROACHES
• **Statistical sampling**: Application of probability theory and statistical inference, along with auditor judgment and experience, in a sample application

• **Nonstatistical sampling**: Application of auditor judgment and experience in a sample application
### EXHIBIT 8.4 - COMPARISON OF NONSTATISTICAL AND STATISTICAL SAMPLING

<table>
<thead>
<tr>
<th><strong>Nonstatistical Sampling</strong></th>
<th><strong>Statistical Sampling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample size</strong></td>
<td>Auditor judgment is quantified, and sample size is determined by probability theory.</td>
</tr>
<tr>
<td>Sample size is determined by auditor judgment.</td>
<td>The sample must be randomly selected to give each unit in the population an equal chance to be included in the sample.</td>
</tr>
<tr>
<td>Sample selection</td>
<td>The population of interest can also be directed; for example, the transactions during the last 10 days of the year can be statistically selected.</td>
</tr>
<tr>
<td>Selection involves any method that the auditor believes is representative of the population.</td>
<td></td>
</tr>
<tr>
<td>Judgment sampling can also be directed at a portion of the population, for example, all transactions during the last five days of the year.</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>Evaluation is based on statistical inference that is used to assist auditor judgment.</td>
</tr>
<tr>
<td>Evaluation is based on auditor judgment, and projections are based on sample results.</td>
<td>Training costs are higher because knowledge of statistical sampling methods and/or special computer sampling software is required.</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td>This type of sampling requires the auditor to define acceptable risk in advance.</td>
</tr>
<tr>
<td>Selection costs are lower because audit judgment is required only to determine an appropriate sample size and evaluate the results.</td>
<td></td>
</tr>
<tr>
<td>This type of sampling does not provide an objective way to control and measure sampling risk.</td>
<td></td>
</tr>
<tr>
<td><strong>Benefits</strong></td>
<td>This method helps the auditor to design an efficient sample, measure the sufficiency of the evidence, and evaluate the results by providing an objective measure of sampling risk.</td>
</tr>
<tr>
<td>This method can be based on the auditor’s prior expectations about errors in the account.</td>
<td>This method helps the auditor to gain efficiencies through computerized selection and statistical evaluation and to defend sample inferences because they are based on statistical theory.</td>
</tr>
<tr>
<td>This method may take less time to plan, select, and evaluate the sample.</td>
<td>This method helps the auditor to evaluate the sample by providing a quantitative measure of the most likely and maximum failure rate of a control procedure that is being evaluated for effectiveness, the most likely and maximum amount of misstatement in the recorded account balance or class of transactions, and the risk that the auditor may make an incorrect judgment about the state of controls or correctness of account balances.</td>
</tr>
</tbody>
</table>
LEARNING OBJECTIVE 4

DESCRIBE ATTRIBUTES SAMPLING AND USE IT FOR TESTS OF CONTROLS
ATTRIBUTES SAMPLING

• Estimates the rate of control procedure failures based on selecting one sample and performing the appropriate audit procedure
  • **Attribute**: Characteristic of the population of interest to the auditor
STEPS IN ATTRIBUTES SAMPLING

• Define the attributes of interest and what constitutes failure(s)
• Define the population from which the sample is to be taken
• Determine the sample size
• Determine the method of selecting the sample
STEPS IN ATTRIBUTES SAMPLING

• Select the sample items and perform the test of control
• Evaluate the sample results and consider the effect on planned substantive procedures
• Document all phases of the sampling process
STEP 1 - DEFINING ATTRIBUTES OF INTEREST AND WHAT CONSTITUTES FAILURE(S)

• Control failures should be precisely defined to:
  • Ensure that the auditor understands what to look for
  • Reduce any nonsampling risk
• Control failure does not automatically lead to a misstatement
STEP 2 - DEFINING THE POPULATION FROM WHICH SAMPLE IS TO BE TAKEN

- Factors that need to be addressed in defining the population
  - Period to be covered by the test
  - Sampling unit
  - Completeness of the population
STEP 3 - DETERMINING THE SAMPLE SIZE

• Optimal sample size minimizes sampling risk and promotes audit efficiency
• Audit judgments affecting determination of sample size
  • Sampling risk
• Tolerable rate of deviation (tolerable failure rate):
  • The level at which the control’s failure to operate would cause the auditor to conclude that the control is not effective and would likely change the auditor’s planned assessment of control risk in performing tests of account balances
STEP 3 - DETERMINING THE SAMPLE SIZE

- Expected population deviation rate (expected failure rate):
  - An anticipation of the deviation rate in the entire population
- Determination of sample size using attributes sample size tables
  - Selecting allowable sampling risk
  - Determining the tolerable rate of deviation
  - Using past knowledge
  - Determining sample size
STEP 3 - DETERMINING THE SAMPLE SIZE

• Working backward from sample size
  • Audit firms perform tests of controls with samples of 30 or 40 as a standard
    • Requires the auditor to tolerate a high rate of deviation in the sample resulting in greater risk for the audit firm

• Multiple attributes - Several controls or attributes tested using:
  • Same set of source documents
  • Same sampling risk used for all tests
STEP 4 - DETERMINING METHOD OF SELECTING THE SAMPLE

Simple random sampling

• Selecting a random sample by matching random numbers generated by a computer or selected from a random number table
• This is done with, for example, document numbers

Systematic sampling

• Dividing the number of physical units in the population by the sample size to determine a uniform interval
• **Systematic random sampling**: The first item is selected randomly from the interval
STEP 4 - DETERMINING METHOD OF SELECTING THE SAMPLE

Haphazard sampling
- Attempts to approximate a random selection by selecting sampling units without any conscious bias, or special reason for including or omitting certain items from the sample.

Block sampling
- Selecting a sample that consists of contiguous population items, such as selecting transactions by day or week.
STEP 5 - SELECTING SAMPLE ITEMS AND PERFORMING TEST OF CONTROL

• When selecting the sample, the auditor decides how to handle inapplicable, voided, or unused documents
  • If the inapplicable document does not represent the control being tested, it should be replaced by another randomly selected item
• When the selected item cannot be located it should be assessed as a failure
  • If many failures are found, it should be concluded that no reliance can be placed on the tested control procedure
STEP 6 - EVALUATING SAMPLE RESULTS AND CONSIDERING EFFECT ON PLANNED SUBSTANTIVE PROCEDURES

• Quantitative evaluation - Determining whether the upper limit of the possible deviation rate exceeds the tolerable deviation rate

• Qualitative evaluation - Determining whether the failures:
  • Were intentional or unintentional
  • Were random or systematic
  • Had a direct dollar effect on the account balance
  • Were of such magnitude that a material dollar amount of errors could occur and not be detected
STEP 6 - EVALUATING SAMPLE RESULTS AND CONSIDERING EFFECT ON PLANNED SUBSTANTIVE PROCEDURES

• If controls are not operating effectively, the auditor will choose to rely:
  • Less on substantive analytical procedures
  • More on tests of details for those accounts related to identified control failures
STEP 6 - EVALUATING SAMPLE RESULTS AND CONSIDERING EFFECT ON PLANNED SUBSTANTIVE PROCEDURES

• When control does not operate effectively based on attributes sampling:
  • Compensating control procedure is identified and tested and a larger sample taken
  • Assessment of control risk is set higher than originally planned
  • Nature, timing, and/or the extent of related substantive tests is modified
  • Analysis of the nature of control deviations and the determination of implications on type of misstatements is conducted
STEP 7 - DOCUMENT ALL PHASES OF THE SAMPLING PROCESS

• All preceding steps and related decisions regarding sampling process should be documented
  • Allows for appropriate supervision
  • Provides adequate support for conclusions reached
STEP 7 - DOCUMENT ALL PHASES OF THE SAMPLING PROCESS

• If nonstatistical sampling procedures are used to test operating effectiveness of controls:
  • Planning factors are not quantified
  • Auditor addresses deviation rates through the more global concepts of none, few, and many
  • Sampling risk is set as low, moderate, or high
STEP 7 - DOCUMENT ALL PHASES OF THE SAMPLING PROCESS

- If sampling is done as part of an audit of internal controls:
  - Sampling risk must be presumed to be low
  - Effect of these factors on sample size follows

<table>
<thead>
<tr>
<th>Factor</th>
<th>Condition Leading To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerable deviation rate</td>
<td>High</td>
</tr>
<tr>
<td>Expected population deviation rate</td>
<td>Low</td>
</tr>
<tr>
<td>Sampling risk (risk of overreliance)</td>
<td>High</td>
</tr>
<tr>
<td>Population size</td>
<td>Little effect</td>
</tr>
</tbody>
</table>
LEARNING OBJECTIVE 5

DESCRIBE THE SAMPLING PROCESS USED TO GATHER EVIDENCE ABOUT MISSTATEMENTS IN ACCOUNT BALANCES AND ASSERTIONS
STEPS IN SAMPLING ACCOUNT BALANCES AND ASSOCIATED ASSERTIONS

1. Specify the audit objective of the test and define a misstatement
2. Define the population from which the sample is to be taken
3. Choose an appropriate sampling method
STEPS IN SAMPLING ACCOUNT BALANCES AND ASSOCIATED ASSERTIONS

- Determine the sample size
- Select sample items and perform the substantive procedure
- Evaluate the sample results
- Document all phases of the sampling process
STEP 1 - SPECIFYING AUDIT OBJECTIVE OF THE TEST

• Determines the population to test

• **Misstatement**: An error, either intentional or unintentional, that exists in a transaction or financial statement account balance
  - Involves differences between recorded values and audited values
STEP 1 - SPECIFYING AUDIT OBJECTIVE OF THE TEST

• Categories of misstatement

**Factual or known misstatements**
- Those that have been specifically identified and about which there is no doubt

**Projected or likely misstatements**
- Best estimate of the actual amount of dollar misstatements in the population based on projecting the sample results to the population
- Calculated as the sampling interval multiplied by the tainting percentage
STEP 1 - SPECIFYING AUDIT OBJECTIVE
OF THE TEST

**Tolerable misstatement**

- Maximum amount of misstatement the auditor can accept in the population without requiring an audit adjustment or a qualified audit opinion

**Expected misstatement**

- Level of misstatement that the auditor expects to detect, and it is based on:
  - Projected misstatements in prior-year audits
  - Results of other substantive tests
  - Audit judgment
  - Knowledge of changes in personnel and the accounting system
STEP 2 - DEFINE THE POPULATION FROM WHICH THE SAMPLE IS TO BE TAKEN

- Define the sampling unit - Individual auditable elements made up of individual account balances
- Completeness of the population - Sample selected from a physical representation of the population should accurately represent the population
- Identify individually significant items - Significant portion of the total value of many accounting populations is concentrated in a few large-dollar items
STEP 2 - DEFINE THE POPULATION FROM WHICH THE SAMPLE IS TO BE TAKEN

- **Top-stratum**: Population items whose book values exceed the sampling interval and are all included in the sample
  - Consists of all account balances exceeding a specific dollar amount
- **Lower-stratum**: Items that are not in the top-stratum
- **Stratification**: Dividing the population into two or more subgroups
STEP 3 - CHOOSING AN APPROPRIATE SAMPLING METHOD

- Classical variables sampling
- Monetary unit sampling (MUS)
- Probability proportional to size (PPS) sampling: Each item in the population has a probability of being included in the sample proportionate to the dollar value of item
STEP 4, 5, & 6 - SAMPLING METHOD CHOSEN

- Irrespective of the method chosen, consideration must be given to:
  - Risk of misstatement in the account
  - Sampling risk
  - Auditor’s assessment of tolerable and expected misstatement
STEP 4, 5, & 6 - SAMPLING METHOD CHOSEN

- When the total estimated misstatement exceeds the tolerable misstatement, the auditor:
  - Asks the client to correct factual misstatements
  - Analyzes detected misstatements for common problem(s)
  - Designs an alternative audit strategy
  - Expands the sample
  - Changes the audit objective to estimate correct value
STEP 7 - DOCUMENTING ALL PHASES OF THE SAMPLING PROCESS

- All related decisions regarding the sampling process should be documented to:
  - Allow for appropriate supervision
  - Provide adequate support for conclusions reached
- Nonstatistical sampling for substantive tests of account balances and associated assertions are based on same audit considerations as those used for statistical sampling
STEP 7 - DOCUMENTING ALL PHASES OF THE SAMPLING PROCESS

• Auditor can:
  • Project only detected misstatements
  • Make a judgment as to whether the account is likely to be materially misstated
• In determining sample size all significant items should be tested
LEARNING OBJECTIVE 6

DESCRIBE MONETARY UNIT SAMPLING AND USE IT TO TEST ACCOUNT BALANCES AND ASSERTIONS
MONETARY UNIT SAMPLING (MUS)

- Sampling method based on attributes estimation sampling involving dollar misstatements
  - Results in an efficient sample size
  - Concentrates on the dollar value of the account balances
- Known as:
  - Dollar-unit sampling
  - PPS
  - Combined attributes-variables sampling
STRENGTHS OF MUS

Strengths

- Easier to apply than other statistical sampling approaches
- Automatically selects a sample in proportion to an item’s dollar amount
- Results in a highly efficient sample size if auditor expects no misstatements

Examples

- Accounts receivable confirmations
- Loans receivable confirmations
- Inventory price tests
- Fixed-asset additions tests
WEAKNESSES OF MUS

Weaknesses

• Not designed to test for understatement of a population
• Evaluation of the sample requires special considerations if auditor identifies understatements
• Selection of zero or negative balances requires special design considerations

Examples

• Accounts receivable confirmations
• Inventory test counts and price tests
DESIGNING AND SELECTING AN MUS SAMPLE

• Population for MUS - Number of dollars in the population being tested
  - Dollar chosen is associated with a tangible item

• Sample size in MUS is a function of:
  - Risk of incorrect acceptance
  - Ratio of expected misstatement to tolerable misstatement
  - Ratio of tolerable misstatement to total population value
DESIGNING AND SELECTING AN MUS SAMPLE

• Calculation of sampling interval
  \[\text{Sampling Interval} = \frac{\text{Population Size}}{\text{Sample Size}}\]

• Sample selected using the fixed-interval approach - Every nth dollar is selected after choosing a random start
  • Calculator or GAS used to select the sample

• **Logical units**: Balance or transaction that includes the selected dollar in a monetary unit sample
### EXHIBIT 8.8 - FIXED INTERVAL SAMPLE SELECTION

<table>
<thead>
<tr>
<th>Customer</th>
<th>Book Value ($)</th>
<th>Cumulative Amount ($)</th>
<th>Selection Amount ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Random start</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>220</td>
<td>20,220</td>
<td>22,000</td>
</tr>
<tr>
<td>2</td>
<td>2,200</td>
<td>22,420</td>
<td>44,000</td>
</tr>
<tr>
<td>3</td>
<td>22,000</td>
<td>45,300</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>880</td>
<td>51,428</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6,128</td>
<td>54,228</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2,800</td>
<td>45,023</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>45,023</td>
<td>99,251</td>
<td>66,000 &amp; 88,000</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>99,261</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>8,231</td>
<td>107,492</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>16,894</td>
<td>124,386</td>
<td>110,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>1,900</td>
<td>827,906</td>
<td></td>
</tr>
</tbody>
</table>
DESIGNING AND SELECTING AN MUS SAMPLE

- Population items with zero balances have no chance of being selected using PPS sampling.
- Negative balance population items require special consideration:
  - Exclude them from the selection process and test as a separate population.
  - Change the sign of negative items and add to the population before selection.
EVALUATING AN MUS SAMPLE

• Auditor calculates the total estimated misstatement in the account balance based on the sampling process
  • Four components included in the total
    • Factual misstatement for items in the top-stratum
    • Basic precision
    • Projected misstatement for items in lower-stratum
    • Incremental allowance for sampling risk
### EXHIBIT 8.10 - TOTAL ESTIMATED MISSTATEMENT CALCULATION SUMMARY

<table>
<thead>
<tr>
<th>Factual misstatement in top-stratum</th>
<th>If No Misstatements Detected</th>
<th>If Misstatements Detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic precision</td>
<td>0</td>
<td>Amount of factual misstatement</td>
</tr>
<tr>
<td>Projected misstatement in lower-stratum</td>
<td>Interval × confidence factor</td>
<td>Interval × confidence factor</td>
</tr>
<tr>
<td>Incremental allowance for sampling risk in lower-stratum</td>
<td>0</td>
<td>Calculate</td>
</tr>
<tr>
<td>= Total estimated misstatement</td>
<td>= Basic precision</td>
<td>Sum of the four</td>
</tr>
</tbody>
</table>

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EVALUATING AN MUS SAMPLE

• If no misstatement is found in sample, misstatement projection would be zero dollars
  • Total estimated misstatement will equal basic precision
• If a misstatement is found, calculate projected misstatement and incremental allowance for sampling risk
  • **Tainting percentage**: Equals amount of misstatement in the item divided by the item’s recorded amount
EXHIBIT 8.11 - EXAMPLE OF CALCULATION OF TOTAL ESTIMATED MISSTATEMENT WHEN OVERSTATEMENTS ARE DETECTED

<table>
<thead>
<tr>
<th>Book Value</th>
<th>Audit Value</th>
<th>Misstatement</th>
<th>Tainting Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>$45,023</td>
<td>$44,340</td>
<td>$683</td>
<td>NA</td>
</tr>
<tr>
<td>$2,000</td>
<td>$1,940</td>
<td>$60</td>
<td>3%</td>
</tr>
<tr>
<td>$8,300</td>
<td>$8,217</td>
<td>$83</td>
<td>1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Confidence Factor*</th>
<th>Tainting Percent</th>
<th>Sampling Interval</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factual misstatement in top-stratum</td>
<td></td>
<td></td>
<td>683</td>
</tr>
<tr>
<td>Basic precision</td>
<td>1.9</td>
<td>22,000 =</td>
<td>41,800</td>
</tr>
<tr>
<td>Projected misstatement in lower-stratum:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First largest tainting %</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second largest tainting %</td>
<td>1%</td>
<td>4%</td>
<td>22,000 =</td>
</tr>
<tr>
<td>Incremental allowance for sampling risk in lower-stratum</td>
<td></td>
<td></td>
<td>394**</td>
</tr>
<tr>
<td>Total estimated misstatement:</td>
<td></td>
<td></td>
<td>43,757</td>
</tr>
</tbody>
</table>

*Confidence factors come from the 15% column in Exhibit 8.9.

**See Exhibit 8.12 and the following discussion for the calculation of this value.
EXHIBIT 8.12 - ILLUSTRATION OF CALCULATING INCREMENTAL ALLOWANCE FOR SAMPLING RISK

<table>
<thead>
<tr>
<th>Projected Misstatement</th>
<th>Incremental Changes in Confidence Factor (Step 2)</th>
<th>Projected Misstatement × Factor (Step 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>660</td>
<td>$3.38 - 1.90 = 1.48$</td>
<td>$977 +$</td>
</tr>
<tr>
<td>220</td>
<td>$4.73 - 3.38 = 1.35$</td>
<td>$297$</td>
</tr>
<tr>
<td><strong>880</strong> (step 1)</td>
<td></td>
<td><strong>1,274 (step 4)</strong></td>
</tr>
<tr>
<td><em>Incremental allowance for sampling risk:</em></td>
<td></td>
<td><strong>1,274 - 880 = 394 (step 5)</strong></td>
</tr>
</tbody>
</table>
EVALUATING AN MUS SAMPLE

• If an understatement in the account balance exists:
  • It can be ignored for purposes of the sample evaluation
  • Performance of a separate analysis specifically for understatements
• MUS is not designed to test for the understatement of a population
LEARNING OBJECTIVE 7

DESCRIBE HOW TO USE GENERALIZED AUDIT SOFTWARE TO AUTOMATE THE AUDIT PROCESS
USING GENERALIZED AUDIT SOFTWARE TO OBTAIN EVIDENCE

• Auditor can use computer audit tools to increase the efficiency of audit procedures
• GAS programs - Aid in performing direct tests of account balances maintained on computer files
  • Computer aided audit technique (CAAT) - Perform common audit tasks on a variety of data files
TASKS PERFORMED BY GAS

- Analyze a file
- Select transactions based on logical identifiers
- Select samples
- Evaluate samples
- Print confirmations
- Analyze overall file validity
- Generate control totals
- Perform numerical analyses
- Perform other tasks
BENEFITS OF USING GAS

• Independent of the system being audited and needs a read-only copy of the file
• Includes many audit-specific routines
• Provides documentation of each test performed in the software that can be used as documentation in auditor’s work papers
• Helps auditors be more efficient in completing their audit responsibilities
### AUDITING IN PRACTICE - USING GAS TO TEST FINANCIAL ACCOUNT ASSERTIONS - RECEIVABLES

<table>
<thead>
<tr>
<th>Assertion</th>
<th>Use of GAS</th>
</tr>
</thead>
</table>
| Existence or occurrence    | 1. Statistically select samples for distributing confirmations  
                              | 2. Compare sales invoices with shipping documents and/or sales contracts  
                              | 3. Select data to perform sales cutoff tests around year end |
| Completeness               | 1. Select data to perform sales cutoff tests around year end  
                              | 2. Select a sample of shipping documents and electronically compare with invoices to determine if billed in the proper period |
| Rights or obligations      | 1. Statistically select samples for distributing confirmations  
                              | 2. Select contracts for audit review |
| Valuation                  | 1. Foot the file  
                              | 2. Age accounts receivable  
                              | 3. Statistically evaluate sample results and make projections of misstatements  
                              | 4. Build an estimation on uncollectible accounts based on past collection data  
                              | 5. Create a file of current-year write-offs to compare with previous years |
| Presentation and Disclosure| Not applicable |