AUDIT ASSURANCE

Comprehensive Guide to Audit Sampling for Tests of Controls and Substantive Tests of Transactions

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In the complex landscape of modern auditing, the sheer volume of financial transactions makes a 100% examination of data virtually impossible for most organizations. This is where **Audit Sampling** becomes a critical methodology. Specifically, Chapter 15 of the widely acclaimed textbook *Auditing and Assurance Services* by Arens, Elder, and Beasley (ranging from the 13th to the 16th editions) provides a rigorous framework for applying sampling techniques to **Tests of Controls** and **Substantive Tests of Transactions**. This guide delves deep into the technical mechanics, statistical foundations, and practical applications of audit sampling to help professionals and students master this essential discipline.

The Theoretical Framework of Audit Sampling

Audit sampling is defined as the application of audit procedures to less than 100 percent of the items within an account balance or class of transactions such that all sampling units have a chance of selection. The primary objective is to provide the auditor with a reasonable basis on which to draw conclusions about the entire population. Understanding the distinction between **Sampling Risk** and **Non-sampling Risk** is fundamental to this process.

1. Sampling Risk vs. Non-sampling Risk

Sampling Risk is the risk that the auditor's conclusion based on a sample may be different from the conclusion if the entire population were subjected to the same audit procedure. In the context of tests of controls, this manifests as:

- Risk of Overreliance (Type II Error): The risk that the auditor concludes controls are more effective than they actually are. This is the most dangerous risk as it leads to an inappropriate reduction in substantive testing.
- Risk of Underreliance (Type I Error): The risk that the auditor concludes controls are less effective than they actually are, leading to unnecessary audit work and inefficiency.

Non-sampling Risk, on the other hand, occurs when the auditor reaches an erroneous conclusion for any reason not related to sampling size. This could include failing to recognize exceptions or using inappropriate audit procedures.

2. Statistical vs. Non-statistical Sampling

While both methods are permitted under GAAS (Generally Accepted Auditing Standards), they differ in how they quantify risk.

Feature	Statistical Sampling	Non-statistical Sampling
Selection Basis	Uses laws of probability to select items.	Uses auditor judgment to select items.
Risk Quantification	Mathematically measures sampling risk.	Sampling risk is not mathematically quantified.
Selection Methods	Random, Systematic, or PPS (Probability Proportional to Size).	Haphazard or Block selection.
Implementation	Requires more rigorous training and software.	Lower initial cost but higher reliance on professional experience.

Technical Workflow: The 14-Step Audit Sampling Process

The Arens/Elder framework outlines a meticulous 14-step process for applying sampling to tests of controls and substantive tests of transactions. These steps are categorized into three main phases: Plan the Sample, Select the Sample and Perform the Audit Procedures, and Evaluate the Results.

Phase I: Plan the Sample

Step 1: State the Objectives of the Audit Test. The objectives are usually to test the operating effectiveness of specific internal controls or to determine if transactions contain monetary misstatements.

Step 2: Decide Whether Audit Sampling Applies. Sampling applies whenever the auditor intends to reach a conclusion about a population based on a subset. It may not apply to analytical procedures or 100% examinations of high-value items.

Step 3: Define Attributes and Exception Conditions. An **Attribute** is the characteristic being tested (e.g., "Is the invoice signed by the manager?"). An **Exception** (or deviation) occurs when the attribute is missing.

Step 4: Define the Population. The auditor must ensure the population is complete and appropriate for the audit objective. For example, if testing for unrecorded disbursements, the population should be the check register, not the physical invoices.

Step 5: Define the Sampling Unit. This is the individual item in the population. It could be a document, a line item, or a dollar unit.

Step 6: Specify the Tolerable Exception Rate (TER). This is the maximum rate of deviation the auditor is willing to accept in the population while still concluding that the control is effective.

Step 7: Specify the Acceptable Risk of Overreliance (ARO). This represents the auditor's desired level of assurance. A lower ARO requires a larger sample size.

Step 8: Estimate the Population Exception Rate (EPER). This is based on previous experience or a small pilot sample. If the EPER is low, the sample size will be smaller.

Step 9: Determine the Initial Sample Size. This is calculated using statistical tables or software based on ARO, TER, and EPER.

Phase II: Select the Sample and Perform Procedures

Step 10: Select the Sample. Methods include **Random Number Selection** (every item has an equal chance) or **Systematic Selection** (selecting every *n*-th item after a random start).

Step 11: Perform the Audit Procedures. The auditor examines the selected items and identifies any deviations from the defined attributes.

Phase III: Evaluate the Results

Step 12: Generalize from the Sample to the Population. This involves calculating the **Sample Exception Rate (SER)**, which is the number of exceptions divided by the sample size, and then determining the **Computed Upper Exception Rate (CUER)**.

Step 13: Analyze the Exceptions. The auditor must look beyond the numbers. Was the exception a result of intentional fraud, employee turnover, or a simple misunderstanding of instructions?

Step 14: Decide the Acceptability of the Population. If the CUER is less than or equal to the TER, the population is accepted as reliable. If CUER > TER, the auditor must take action, such as increasing sample size or adjusting the audit risk model.

Mathematical Foundations of Attribute Sampling

In attribute sampling, auditors use the **Binomial Distribution**to predict the occurrence of exceptions. The mathematical relationship between the variables determines the required sample size.

The Sample Size Inverse Relationship

The relationship can be summarized by the following logic:

- Increase in TER → Decrease in Sample Size
- Increase in ARO → Decrease in Sample Size
- Increase in EPER → Increase in Sample Size
- Increase in Population Size → Negligible effect (for large populations)

The **Computed Upper Exception Rate (CUER)** is the sum of the Sample Exception Rate (SER) and an **Allowance for Sampling Risk (ASR)**. Mathematically: $CUER = SER + ASR$

Practical Implementation: Attributes in Various Audit Cycles

To implement sampling effectively, auditors must define specific attributes for different transaction cycles. Below is a comparison of attributes for the Sales and Collection Cycle versus the Acquisition and Payment Cycle.

Audit Cycle	Sampling Unit	Example Attributes
Sales & Collection	Sales Invoice	1. Invoice supported by shipping document.2. Credit approved before shipment.3. Mathematical accuracy verified.
Acquisition & Payment	Voucher/PO	1. Purchase authorized by purchasing dept.2. Receiving report attached to invoice.3. Account classification is correct.
Payroll & Personnel	Time Card	1. Hours worked approved by supervisor.2. Pay rate matches personnel file.3. Proper tax withholding calculated.

Case Study: Testing Internal Controls in Accounts Payable

Consider an auditor at a mid-sized manufacturing firm testing the control: *"All payments over $5,000 must have a secondary signature by the CFO."*

Scenario Details:

- Population: 2,500 checks issued during the fiscal year.
- TER: 5%
- ARO: 10%
- EPER: 1%

Using standard statistical tables, the **Initial Sample Size**is determined to be 65 items. Upon testing, the auditor finds 2 exceptions where the secondary signature was missing.

Evaluation:

1. SER: 2 / 65 = 3.1%
2. CUER: Consulting a statistical table for ARO 10%, Sample Size 65, and 2 exceptions, the CUER is found to be 8.1%.
3. Decision: Since 8.1% (CUER) > 5% (TER), the auditor cannot rely on this control.

Resolution Strategies:

When the population is found unacceptable, the auditor has several paths:

- Expand the Sample: Increasing the sample size to see if the SER decreases. However, this is often inefficient.
- Revise TER or ARO: Only done if the original parameters were too conservative, which is rarely justifiable.
- Increase Substantive Testing: This is the most common response. The auditor will perform more detailed testing of account balances to ensure no material misstatements exist due to the control failure.
- Identify Compensating Controls: Search for other controls that might mitigate the risk of the failed control.

Field Guide: Troubleshooting Common Sampling Pitfalls

Even with advanced software, auditors often encounter challenges. Here are technical solutions for common issues:

1. Handling Voided Documents

If a selected item is a voided document (e.g., a voided check), the auditor should ensure the document was

properly voided according to company policy. If it was, the item is replaced with a new random selection. If it wasn't, it is treated as an exception.

2. Unused or Inapplicable Documents

Sometimes a sample unit is selected that does not apply to the attribute being tested (e.g., a shipping document selected for a test that only applies to credit sales, but the document was for a cash sale). In this case, the item is replaced.

3. The "Nonsampling" Error of Overlooking Exceptions

To mitigate the risk of auditors simply missing an error, firms use **Double-Blind Reviews**or peer reviews where a second auditor re-tests a small subset of the sample to ensure the first auditor correctly identified all deviations.

The Impact of Technology on Audit Sampling

In the era of Big Data, the traditional Chapter 15 approach is evolving. **Data Analytics** and **Artificial Intelligence (AI)** allow for the testing of 100% of populations in some instances. However, audit sampling remains relevant for:

- Physical Inspection: AI cannot physically count inventory or inspect the condition of assets (yet).
- Inquiry and Observation: Evaluating the "tone at the top" or observing segregation of duties still requires human judgment and sampling of behaviors.
- Manual Controls: Many SMEs (Small and Medium Enterprises) still rely on manual signatures and physical stamps that require manual sampling.

Modern audit software like ACL or IDEA integrates the statistical tables found in the Arens textbook, allowing auditors to input their TER, ARO, and EPER to instantly generate sample sizes and calculate CUER, reducing the risk of manual calculation errors.

Strategic Implications for the Senior Auditor

A senior auditor must view sampling not just as a compliance checkbox, but as a strategic tool. Effective sampling balances **audit effectiveness** (detecting errors) with **audit efficiency**(managing time and cost). By carefully defining attributes and setting realistic tolerable rates, the auditor can focus resources on high-risk areas while maintaining a scientifically defensible basis for their audit opinion.

Furthermore, the documentation of the sampling process is paramount. Workpapers must clearly state the 14 steps followed, the justification for the chosen TER and ARO, the specific items selected, and the detailed analysis of any exceptions found. This level of rigor is what differentiates a standard audit from a high-quality assurance engagement that can withstand regulatory scrutiny from bodies like the PCAOB or AICPA.

Ultimately, mastering the concepts found in *Auditing and Assurance Services*Chapter 15 ensures that the auditor provides the highest level of value to stakeholders, ensuring that the financial statements are free from material misstatement, whether caused by error or fraud.

Baca Juga (Artikel Terkait)

- **Mastering Audit Data Analytics: A Comprehensive Technical Guide to the AICPA Framework and Modern Implementation**
  URL: http://alaskawriters.com/comprehensive-guide-audit-data-analytics-aicpa-standards.pdf
- **Comprehensive Guide to Analytical Procedures in Audit Planning: Frameworks, Methodologies, and Implementation**
  URL: http://alaskawriters.com/analytical-procedures-audit-planning-guide.pdf
- **Comprehensive Guide to Audit Working Papers: Standards, Documentation, and Best Practices**
  URL: http://alaskawriters.com/comprehensive-guide-audit-working-papers-documentation-standards.pdf
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