Successful attributes sampling starts with a well-laid plan.

BY JOHN R. MARTIN

Sampling Made Simple

AUDITORS ARE OFTEN CALLED upon to test internal controls through attributes sampling. The process involves selecting a sample of transactions from a population of data and testing for the presence or absence of certain attributes or qualities. For instance, an auditor may select a sample of accounts payable transactions and test to see whether each record contains a signature of approval by an authorized signer. Or, an auditor may select a sample of customer records from a database to check for correct address information.

Attributes sampling is simple, or so it may seem. Although modern computer-assisted audit tools have added considerable efficiency to the data extraction, testing, and recording processes associated with sampling, auditors risk making critical errors by relying too heavily on this technology and failing to invest enough time in developing a solid sampling plan. Consequently, results can become questionable at best, and invalid at worst.

The popular saying, "If you fail to plan, you plan to fail," certainly applies to attributes sampling. A sampling plan supports the validity of the work performed and is key to defining the test objective and selecting a sample that is representative of the total population. A thorough plan provides detailed information about the population and minimizes the overall audit risk. In particular, effective planning reduces methodology risks such as testing the wrong population or testing a sample that is not representative.

Before plugging numbers into audit software for testing procedures, internal auditors should take the time to build an effective attributes sampling plan. The following 10 steps can be used as a model for developing a plan that will mitigate the risk of error and help increase the validity of testing data.

1. CONDUCT PRE-SAMPLING RESEARCH Before initiating sampling routines, internal auditors must understand what they're testing. Preparation should include reviewing the procedures to be tested, listening to audit clients, and documenting system controls. For example, suppose an audit client suggests that the customer address database is not being maintained correctly, thereby causing excessive undeliverable postage costs and reducing opportunities to inform customers about new product offerings. The auditor would need to learn how address information is entered into the customer database, how often information is updated, and who or what is involved in this effort. In general, presampling research is complete when the auditor understands all of the variables impacting the population to be tested.

2. DEFINE THE OBJECTIVE Although some practitioners may be inclined to skip this step to expedite testing, failing to define the test objective adequately can be a costly mistake, leading to poor sample selection and weakened support for work performed. Consider what you will say when the audit is complete. Although you can't necessarily predict the final outcome at this point, consider what type of information will be presented in the testing conclusion. In the customer database example above, for instance, management would likely receive little benefit from a conclusion that simply states that problems exist within the database. Instead, they find more value in a report that identifies the specific problems that exist in the database such as variances in the address error rate by customer type or location. Considering clients' needs up front can help auditors craft a focused
objective and tailor the testing to produce value-added results.

3. **DEFINE THE POPULATION** A well-defined, complete population is a key building block for a solid attributes sampling plan. Specifically, auditors need to decide what to include in and exclude from the population. The time period examined, for example, is an important consideration. Establishing exact beginning and ending dates for all population items improves the precision of the population and later helps ensure the validity of the sample.

If the population is maintained on a computer database, be sure to specify the field definitions that comprise the population and any querying language used to extract your data. These details will provide a clear path to the population and enable others to identify the population’s source quickly, if necessary.

4. **EXAMINE THE POPULATION** To ensure the validity of testing data, auditors must verify that their samples are representative of the population examined. An auditor cannot make this determination, however, without first knowing what the population looks like.

To gain a better understanding of the target population, internal auditors can begin by identifying the population’s largest and smallest items. Auditors should then calculate the average, as well as the average spread, and examine the dates on which population items were created. For example, are items distributed evenly throughout the period or skewed toward the beginning, middle, or end?

5. **DEFINE A SAMPLING UNIT** A sampling unit represents an individual piece of the population selected for sampling. The total population count, then, is the sum of all sampling units.

Invest time and thought in determining what constitutes a sampling unit and what does not, as such preparations will pay off when you interpret the test results. Also, think about how each type of sampling unit under consideration might impact your conclusion. For example, suppose research conducted on a customer address audit indicates that sales to large business clients are increasing and that no complaints exist regarding the accuracy of these customers’ profile information. Under these circumstances, the risk of problems with large business client addresses would likely be considered low, and the addresses would probably not constitute a useful sampling unit. If your sample contains a significant number of sampling units that will not support the test objective, then the objective will not be achieved.

6. **DEFINE THE NUMBER OF SAMPLING UNITS** Count the number of items that meet your definition of a sampling unit. Although this procedure may sound redundant at first glance, counting helps focus the population definition and serves as a driving factor in determining the appropriate sample size.

7. **DEFINE THE SAMPLE SELECTION METHOD** The method of sample selection should be defined as specifically as possible. Questions to consider include:
- Will the sample be selected by “blind pencil stab,” or will a computer be used to select a random sample from a database?

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If a random sample is selected, then what factor will be randomized?
■ Will a random number be assigned to each sampling unit, or will you input a range of account numbers in a program that generates statistical samples?
Be sure to document the selection method in enough detail so that anyone can re-perform the testing. Also document any computer query language used, as applicable.

8. DOCUMENT FACTORS USED TO DETERMINE SAMPLE SIZE
Sample size is determined by several factors, including population size, tolerable error, acceptable sampling risk, degree of reliance, and risk assessment results. Be sure that the sampling plan defines the risk assessment in enough detail to support the assessment. In addition, define the meaning of "high," "moderate," and "low" risk as they apply to the test. Or, if the risk assessment is a numerical factor, define the scale and the way in which it is applied to the test. Also, be sure to identify the tolerable error as well as the method used to define it. Finally, document the method used to determine both the acceptable sampling risk and the degree of reliance that can be placed on the results.

9. SELECT THE SAMPLE
Documenting steps one through eight provides a detailed sampling plan. With this plan in place, the auditor is ready to select a sample for testing.
The specific steps to follow for selecting the sample are influenced by the tools that the auditor plans to use. Computer aided tools such as audit software packages should provide guidance on selecting a sample. In the absence of such tools, auditors can use a random number table to assign a random number to each sampling unit and then arrange the sampling units based on their assigned numbers and select sampling units from the top down or bottom up.

10. CHECK THE SAMPLE
Before initiating the testing process, take time to examine the sample once more. Does it look like the population? Are sample items spread throughout the time period in roughly the same proportion as the population? Is the average size and spread between sampling units similar to the population? If the sample looks nothing like the population, reevaluate the population and double-check the sample selection technique.

WELL-LAI D PLANS
A solid sampling plan will improve the quality and reliability of test results and reduce risk associated with the testing process. With a well-documented sampling plan, auditors can improve their understanding of the population and testing results. Ultimately, the planning process and resulting test data will help position internal auditors to provide value-added audit services for the client.

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