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Audit Sampling: A Simplified Updated View

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The process of audit sampling probably dates back to the Industrial Revolution. Corporate transactions became so numerous during and after that era that it became impossible for the auditors to examine every transaction in auditing the assertions of financial statements. Interestingly enough, however, there have been very few guidelines set forth in auditing authoritative pronouncements over the years related specifically to audit sampling. In June of 1981, the Auditing Standards Board (ASB) of the American Institute of Certified Public Accountants (AICPA) issued Statement on Auditing Standards (SAS) No. 39 entitled "Audit Sampling."

The purpose of this article is to highlight the significant elements of SAS No. 39 and to provide insight as to the effects of this pronouncement upon the auditing process. In today's business environment the independent auditor, the internal auditor and the management accountant are three important participants in the financial statement auditing process. Knowledge of authoritative guidelines on audit sampling by all three parties should assist in increasing audit efficiency and lessening audit costs.

Audit Sampling Prior to SAS No. 39

The justifiable basis of audit sampling arises directly from the auditor's (CPA's) standard short-form audit report as promulgated by the AICPA. The first paragraph of that audit report states in part that "Our examination . . . included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances." The second paragraph of the audit report then expresses an "opinion" on the fairness of the financial statements. The implication from reading the report should be clear that not *all* accounting records were examined by the auditor but only a portion or "sample" of the accounting records were examined.

Further justification for application of tests and use of samples is found in the third standard of field work of the Generally Accepted Auditing Standards (GAAS) of the AICPA. The third standard requires "sufficient competent evidential matter" to be collected by the auditor to "afford a reasonable basis for an opinion regarding the financial statements under examination." Reasonableness, of course, does not mean absolute certainty and audit samples are the means of gathering evidence to afford reasonableness.

The second standard of field work concerns a study and evaluation of internal control and the interpretation of this standard by the SAS's is also related to audit sampling. In order to evaluate internal control, there must be some assurance, but not a complete certainty, that the internal control system is operating as intended. Therefore, pertinent control procedures should be tested as to their effectiveness through tests of samples of documentary data and by observation. These tests are called tests of compliance.

The most often used method for selecting samples of transactions over the years has been judgment sampling. In this method the size and composition of each audit sample is predetermined by the auditor based on the experience and knowledge of the auditor. This method has the obvious disadvantage of leaving a great uncertainty concerning the risk absorbed by the auditor. With this uncertainty or risk in mind, auditors developed statistical audit sampling which measured risk taken but did not eliminate judgments in applying the approach.

Authoritative literature in auditing was lacking as related to either judgment or statistical sampling until 1972. The only references in the literature prior to 1972 which related to audit sampling were those previously mentioned concerning the second and third standards of field work of GAAS and interpretations thereof. Most of those references evolved in the 1930's and 1940's.

In 1972 the Committee on Auditing Procedure of the AICPA (predecessor to the ASB) adopted two statements which were incorporated as appendixes to SAS No. 1, Sec. 320. These appendixes provided guidance for the use of statistical sampling by the auditor. The most significant aspects of these appendixes (SAS No. 1, Sections 320A and 320B) were: (1) authoritative approval of statistical sampling but notation that use of judgment is not

The auditor's risk derives from not examining every transaction or piece of data.

reduced by this sampling approach; (2) discussion of the statistical term of "precision" and "reliability"; and (3) discussion of audit factors involved in applying statistical sampling and setting precision and reliability levels as related to compliance tests and substantive tests (direct tests of account balances). As noted in the second appendix (SAS No. 1, Sec. 320B): "This Appendix does not discuss any of the statistical theory or techniques required to execute a valid statistical sample ..." The discussion linked materiality to precision and reasonableness desired to reliability levels and discussed the effects on audit risk of various levels of precision and reliability."

Until 1981, then, specific guidance in the authoritative auditing literature as to the appropriate procedures for audit sampling was sparse. This situation was changed with the issuance in June 1981 of SAS No. 39, "Auditing Sampling."

The Updated View — SAS No. 39

SAS No. 39 provides guidance for planning, performing and evaluating audit samples. The end result of this statement most likely will be a more structured approach to audit sampling, both judgmental and statistical. The statement itself approves both of the above named sampling approaches but uses the term "nonstatistical sampling" to replace judgmental sampling. The structure specified for the auditor's sampling approach is significant because the following of the statement's guidelines should eliminate some of the variations that have existed between auditors in sampling and provide documentation of their work in complying with the statement guidelines.

Figure 1 outlines the general content of SAS No. 39 and the following paragraphs discuss the significance of this content to the parties involved in the auditing process.

Sampling and Nonsampling Risk

The auditor's risk derives from not examining every transaction or piece of data which underly the financial statements. One way to view this risk is to divide the risk into sampling risk and nonsampling risk. The first risk, sampling risk, is the uncertainty that the results of an audit sample will not be representative of the population as a whole thus leading to an erroneous conclusion about the population. The items composing an account balance and the evaluation of a sample thereof is an example of risk involvement from an auditor's standpoint. Nonsampling risk represents uncertainty involved in the auditing process other than from sampling. An error made by the auditor in performing audit procedures and not discovered upon review is an example of nonsampling risk. SAS No. 39 is primarily concerned with sampling risk and discusses two aspects of this risk for tests of compliance of internal control and for direct tests of account balances.

Many auditors and accountants associated in some way with the auditing process may become uneasy when new or unfamiliar technical terms are used related to a process with which they are knowledgeable to varying degrees. This uneasiness, if occurring when reading SAS No. 39, should not be evidenced after considering closely and in a not so technical way the contents of SAS No. 39. Most of the terminology used in SAS No. 39 incorporates the basic philosophy financial auditing has used since its inception. Some unfamiliar terms may be introduced but these terms are basically related to aspects of auditing which have not changed much over many years. Such is the case when considering the two following aspects of sampling risk for direct tests of account balances as specified by SAS No. 39: (1) the risk of incorrect acceptance and (2) the risk of incorrect rejection. Although these terms are new, the basic underlying concepts involved are not new.

Financial statements consist of many account balances and in taking samples of these balances the auditor faces uncertainity as to whether the balances are fairly stated. The auditor attempts to gather evidence to support fair presentation of the balances but doubt will always remain as to fairness. This doubt represents risk in the auditing process. The auditor may gather enough evidence to support fair presentation, but, in fact, the balance of an account may be materially misstated. The risk that the preceding will happen is called the risk of incorrect acceptance by SAS No. 39. On the other hand, the auditor may gather evidence which indicates (through sampling) that the account balance is materially misstated when, in fact, the balance is fairly stated. The auditor, of course, does not know that the incorrect conclusion has been made. The risk of rejecting the account balance as not fairly stated when, in fact, the balance is fairly stated is called the risk of incorrect rejection by SAS No. 39. In statistical sampling the risk of incorrect acceptance is referred to as the Type II or beta risk while the risk of incorrect rejection is known as the Type I or aplha risk. SAS No. 39 applies to both statistical and nonstatistical sampling and the application of the two types of sampling risk does not require statistical expertise when viewed in connection with SAS No. 39.*

In testing internal control, the two types of sampling risks again may be applied but in slightly different terminology. The risk of overreliance on internal control is noted by SAS No. 39 as "the risk that the sample supports the auditor's planned degree of reliance on the control when the true compliance rate does not justify such reliance." The risk of underreliance occurs when evi-

*Much of the discussion of audit risk, precision and reliability in these appendixes is common with the treatment of these concepts in SAS No. 39 and thus further discussion is deferred to a subsequent section.

*The statement does suggest that the risks may be quantified (usually in percentage terms) but such a quantification depends upon auditor judgment.

FIGURE 1

An Outline of SAS No. 39* "Audit Sampling"

I. Purpose — To provide guidance for planning, performing and evaluating audit samples.

II. Uncertainty in audit sampling — Consists of two types of sampling risks in relation to direct tests of details of account balances or tests of compliance of internal control procedures.
   A. Direct tests of account balances
      1. Risk of incorrect acceptance
      2. Risk of incorrect rejection
   B. Tests of compliance of internal control
      1. Risk of overreliance
      2. Risk of underreliance

III. Planning audit samples
   A. Considerations for direct tests of account balances
      1. Audit objective of test
      2. Materiality level allowable
      3. Allowable risk of incorrect acceptance
      4. Characteristics of population
   B. Considerations for tests of compliance of internal control procedures
      1. Audit objective of test
      2. Maximum rate of deviations allowed
      3. Allowable risk of overreliance
      4. Characteristics of the population
   C. Sample size — determined after assessing the planning considerations

IV. Selecting audit samples — Use of a selection methods that affords all items in population the chance of selection.

V. Performance and evaluation of audit samples.
   A. Project error or deviation results of sample to entire population for assessment.
   B. Consider qualitative aspects of errors or deviations in sample results.

VI. Effective Date — Effective for examinations of financial statements on or after June 25, 1982.

* Auditing Standards Board of American Institute of Certified Public Accountants, *Statement on Auditing Standards No. 39*, "Auditing Sampling" (June 1981).

dence from a sample does not support the auditor's planned reliance on internal control but, in fact, the procedure(s) being tested does have a compliance rate which supports such reliance.

Rejection of an account balance as being materially misstated and evidence of unreliable internal control ordinarily result in additional audit procedures that are performed until doubts (risks) in these area are satisfied. The greatest effect on the auditing process related to this type of risk (risk of incorrect rejection or risk of underreliance) is additional audit time and cost to reduce the risk. The other type of risk (risk of incorrect acceptance or risk of overreliance) is the prime danger in auditing and this risk should be considered very carefully in planning, selecting and evaluating audit samples. The suggestions of SAS No. 39 concerning the consideration of this type of risk are explained in the next section.

Planning Audit Samples

In terms of planning the audit samples there are certain guidelines suggested by SAS No. 39 which the independent auditor must follow. The internal auditor, on the other hand, may be able to assist the independent auditor in a most efficient manner by being knowledgeable of these guidelines. The management or corporate accountant may also add to the efficiency of the independent audit by being aware of the factors involved in planning audit samples. Such awareness by the corporate accountant, for example, would enable the structuring of data files so samples could easily be drawn or providing a visible documentation trail which could easily be sampled. The same reasoning used for knowledge needed for planning audit samples may also be applied to selecting audit samples and performing and evaluation audit samples which are discussed in the sections following this one.

Undoubtedly the best sample results will come from a well planned sample. For direct tests of details of account balances, SAS No. 39 suggests the following considerations:

(1) The relationship of the sample to the relevant audit objective.

Although statistical terms are new, the basic underlying concepts involved are not new.

(2) Preliminary estimates of materiality levels.

(3) The auditor's allowable risk of incorrect acceptance.

(4) Characteristics of the population, that is, the items comprising the account balance or class of transactions of interest.

In reference to the first consideration suggested by SAS No. 39 in planning audit samples for direct tests, the primary audit objective is to test the fairness of the account balance. The population to be tested should be clearly identified. As noted by SAS No. 39 this population which *should* make up the account balance may include items which are not presently included in the balance. For instance, the omission of recording a sale on account would result in a missing amount from both the accounts receivable and sales account balances. In testing the accounts, the auditor should include a consideration of sampling shipping documents to plan for the discovery of unrecorded sales.

The second consideration in planning for direct tests is related in estimates of materiality levels. The auditor must specify in monetary terms, according to SAS No. 39, the maximum amount of error for an account balance to be tested which could exist without causing a material misstatement of the financial statements. The maximum amount of monetary error is named the *tolerable error* by SAS No. 39. If accounts receivable had a balance of $100,000, the auditor might be willing to accept an error, based on sampling results, of up to $10,000 wihout modifying the auditor's judgment that the balance was not fairly stated. The $10,000 then becomes the tolerable error. Note that a sample may have a much smaller error than $10,000 but when this smaller error is projected to the population as a whole, the projected error may or may not be greater than $10,000. Using the preceding example, assume a sample of the accounts receivable balance representing approximately one-fifth of the account balance results in a $1,500 total error between book values and audited values with book value being overstated. When projected to the entire balance on a proportionate basis ($1,500 divided by one-fifth), the error overstatement would be $7,500. This error is less than the tolerable error of $10,000 and if corroborating evidence was supportive, the account balance could be accepted as fairly stated.*

The risk of incorrect acceptance has been previously explained and also noted as a prime consideration in planning audit samples. In considering this risk, the auditor considers the reliance to be placed on internal control, the other auditing procedures performed, the relative risk as related to the environmental factors and materiality of account balance as related to the financial statements as a whole. Strong internal control, numerous additional audit procedures or a relatively small account balance may enable the auditor to absorb a relatively large risk of incorrect acceptance in a particular audit sample. The interactive stengths or weaknesses of the preceding factors will affect the level of risk. Also the audit consists of many samples so the risk of incorrect acceptance may vary from sample to sample. SAS No. 39 does not require the risk to be quantified in percentage terms, but in order to comply with the statement it would appear that documentation of the considerations of the risk of incorrect acceptance would be necessary.

The items composing an account balance should be considered carefully in planning audit samples. Some items may be larger in dollar value than others. Some items may be of greater relative importance or risk than others, e.g., a receivable from a related party or a receivable from a stockholder. Thus the items of larger values or relative importance should be given greater consideration for inclusion in sample.

The considerations for planning an audit sample for a compliance test of an internal control procedure as specified by SAS No. 39 are:

(1) The relationship of the sample to the objective of the compliance test.

(2) The maximum rate of deviations from prescribed control procedures that would support planned reliance.

(3) The auditor's allowable risk of overreliance.

(4) Characteristics of the population, that is, the items comprising the account balance or class of transactions of interest.

In reviewing the considerations in planning for audit samples of tests of compliance, the primary objective of a compliance test is to test the extent that an internal control procedure is operating as such a procedure was so intended to operate. The auditor should have some familiarity with the expected rate of deviations from the procedure (usually stated in terms of a percentage rate deviation) and should select the maximum rate of deviation that the auditor would accept and still rely on the selected control procedure. This maximum rate is entitled by SAS No. 39 as the *tolerable rate*. The higher the tolerable rate the smaller sample needed and vice-versa. The allowable risk of overreliance must be planned also. Normally in internal control tests, this risk should be kept low because of the subsequent reliance on internal control as basis for reducing the extent of tests of account balances. A typical example might consist of testing the verification of extension prices on a sales invoice. The control procedure is the extending and footing of invoice by a second person and then initialing such verification. The deviation is an incorrect but undetected verification by the second individual. The auditor should know the number of sales invoices for a period (the population),

*The account receivable example illustrated here *is not* used in SAS No. 39 nor are any other numerical illustrations as used in this article from SAS No. 39. Also the statement (SAS No. 39) *does not* suggest the proportionate method of projecting sample results as the only method that may be used in projecting sample results.

estimate a deviation rate (e.g., two percent are incorrectly verified) and set an allowable risk of overreliance (e.g., five percent). A sample of invoices is then selected, tested and evaluated by the auditor.

Finally, in determining the size of samples to be taken by the auditor, either for tests of account balances or compliance tests, the considerations previously discussed must be evaluated by the auditor and sample size then determined. For statistical sampling, the considerations are quantified and sample size determined on a formula basis (or through use of appropriate statistical tables). For nonstatistical sampling, a judgment is made in regard to sample size after due consideration of the relevant factors.* Regardless of the approach, the sample size determination process should be well documented.

Sample Selection

For sample selection SAS No. 39 emphasizes that all items in the population should have an opportunity to be selected. This concept applies to samples used in either direct testing of account balances or tests of compliance of internal control procedures. Random-based selection of items is the only selection approach specifically mentioned in SAS No. 39.

Sample Performance and Evaluation

An audit of financial statements involves gathering evidence from audit procedures applied to financial statement items. Audit samples of many kinds of data will be part of the evidence collected but not the entire body evidence supporting the audit opinion. All evidence should be judged in aggregate concerning the financial statements taken as a whole. This includes the evidence gathered from audit samples. Audit samples also consist of only part of the evidence gathered to support fairness of each account balance or major class of transactions considered material. Each audit sample must be evaluated in relation to the account balance or internal control procedure related to an account balance.

SAS No. 39 recommends projecting the sample results to the entire population being tested. In direct tests, the error results would be projected; in compliance tests the deviation rate would be projected. That statement simply notes that there are several acceptable ways to project samples results to entire population but does not recommend any particular approach.

The qualitative aspects of errors or deviations should be evaluated as well as the quantitative effects. SAS No. 39 notes the qualitative aspects of errors in direct tests of account balances are as follows:

(1) The nature and cause of misstatements.

(2) The possible relationships of the misstatements to other phases of the audit.

In reference to (1), an error in the form of an irregularity has greater connotation than an error in the form of an unintentional mistake.

For compliance tests, qualitative aspects of deviations include:

(1) The nature and cause of deviations.

(2) The possible relationship of the deviations to other phases of the audit.

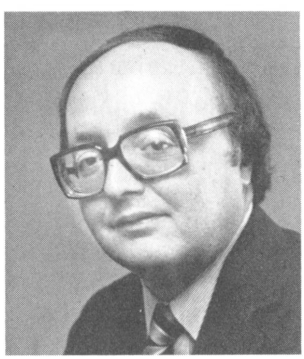
If the sample results for either a direct test or compliance test do not provide evidence which, in the auditor's judgment, support the predetermined materiality level (direct tests) for an account balance or degree of predetermined reliance (compliance test) on internal control, then further audit plans should be altered to compensate for the conflicting results.

Conclusion

For the first time in modern financial auditing history, the authoritative literature of financial auditing contains specific requirements for audit sampling. These requirements are specified in SAS No. 39 entitled "Audit Sampling" issued by the ASB in June 1981.

SAS No. 39 identifies and provides guidelines concerning the audit sampling risks involved in samples used in connection with direct tests of details of account balances and/or major classes of transactions and in tests of compliance of internal accounting control procedures. Guidelines are also provided for planning, selecting and performing and evaluating samples used in the preceding connection.

The statement (SAS No. 39) is a big step in providing a structured approach to audit sampling. The benefits of SAS No. 39 will be realized to their greatest potential only if all parties involved in the auditing process (the auditors and the auditees) are sufficiently familiar with the audit sampling guidelines provided in SAS No. 39. Ω



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* In statistical sampling the terms precision and reliability are related to sample size determination. Precision is related to tolerable error and tolerable rate while reliability is the complement of the risk of incorrect rejection and risk of underreliance. Relating precision and reliability to SAS No. 39 should be undertaken only by those sufficiently knowledgeable with statistical sampling as applied to the audit process.