The Usage of Attribute Sampling in Audit Missions for Financial Investment Companies: a Source of Efficiency or a Risk Factor?

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Abstract: Recent evolutions in financial markets tend to prove that auditors’ contribution to increase a company’s value is mostly required. Whenever risk assessment is involved, both financial and internal auditors bear a great responsibility for the opinion or recommendation that is issued. This assertion becomes even more relevant under circumstances that involve usage of audit techniques and procedures based on sampling, provided that audit firms need to remain competitive and efficient on the assurance services market related to financial information. The paper proposes research activities in order to obtain relevant answers regarding to the issue whether attribute sampling can really increase the efficiency of an audit mission, or it rather amplifies the audit risk. The entities selected to demonstrate how attribute sampling should be performed when assessing the effectiveness of internal controls are the Financial Investment Companies listed on Romanian regulated capital market, the Bucharest Stock Exchange.

Key-Words: risk assessment, attribute sampling, audit efficiency, confidence level, deviation rate, Financial Investment Companies, tests of internal controls.

1 Introduction
Obtaining and evaluating audit samples is often the most essential and challenging part of auditing financial statements prepared by investment companies, since the auditor should always consider whether the sample size is sufficiently large and adequate in structure as to make appropriate inferences regarding the assertions related to certain populations [1].

The main research objectives of this paper are concerned with planning and performing audit procedures based on attribute sampling techniques designated for assessing the effectiveness of internal controls implemented within Financial Investment Companies. We based our research on the assertion that the usage of attribute sampling is justified by the fact that any audit engagement should be effective in terms of time and cost. As a result, many if not most of the conclusions auditors reach about internal controls are based on testing samples rather than entire populations [2].

On the other hand, we admit that whenever attribute sampling techniques are involved, there is a certain level of sampling risk. Therefore, we are concerned on measuring whether the usage of attribute sampling techniques is indeed beneficial for a successful audit engagement in terms of efficiency or is a risk increasing factor.

According to ISA 530, audit sampling refers to “the application of audit procedures to less than 100% of items within a population of audit relevance such that all sampling units have a chance of selection in order to provide the auditor with a reasonable basis on which to draw conclusions about the entire population”. American SAS 39 defines audit sampling as “the application of an audit procedure to less than 100 percent of the items within an account balance or class of transactions for the purpose of evaluating some characteristics of the account balance or class of transactions”. Both definitions are relevant for clarifying the concept and induce the recommendation that an auditor should use sampling techniques in one of two situations during their examinations: evaluating internal control and performing substantive procedures on account balances and classes of transactions [3]. For the purpose of this paper we are strictly preoccupied by planning and performing attribute sampling techniques to determine the degree of reliance that may be associated with internal controls designed within Financial Investment Companies.
2 Problem Formulation

Attribute sampling is typically applied in compliance testing, where the auditor is concerned to establish whether or not a particular characteristic is present. In compliance testing, the characteristic is usually representative of whether a particular internal control procedure has been properly applied or performed. Attribute sampling may also be used for tests of transactions because it measures the frequency of occurrence [4].

Audit sampling cannot be used to test the operating effectiveness of all internal controls. Usually, sampling techniques can be used only when performance of internal control leaves some evidence of performance, such as a completed document or the initials of the person performing the control procedure. This evidence of performance allows the auditor to determine whether the internal control procedure was applied to each item included in the sample [5].

In sampling for testing internal controls, the auditor identifies the characteristics of a particular internal control procedure (attribute) and the deviations (absence of attribute). An attribute sampling plan is used most commonly to determine the operating effectiveness of a control in terms of deviations from a prescribed internal control procedure.

Whenever auditors apply to attribute sampling techniques during the performance of audit engagements, sampling risk is involved. This particular risk refers to the possibility that the selected sample may not be representative of the population and therefore the auditor is likely to draw inadequate conclusion regarding the effectiveness of internal controls, based on the sample.

Furthermore, attribute sampling techniques are the source of two relevant type of decision error met during the performance of audit missions: (i) Type I error dealing with the risk of incorrect rejection, occurs when one sample supports a conclusion that the internal controls are not operating effectively, when, in truth, they are. This is also known as the risk of assessing control risk too high; (ii) Type II error dealing with the risk of incorrect acceptance occurs when one sample supports a conclusion that the internal controls are operating effectively, even though, in reality, they do not. This is also known as the risk of assessing control risk too low. While Type I error relates to the efficiency of an audit engagement since the auditor should plan and perform more audit testing, Type II error relates to the effectiveness of the audit engagement since the auditor is likely to fail detecting a material misstatement in the financial statements. Because of the potentially severe consequences of a Type II decision error, auditors design their sampling applications to keep this risk to an acceptable low level. However, the auditor is able to reduce the sampling risk by increasing the likelihood of a sample being representative, by using professional care in designing the sample selection and evaluation of sample results.

Audit sampling also involves non-sampling risk that may arise from the possibility of sampling the wrong population when testing one particular internal control feature, the possibility of failing to detect deviations from the projected internal controls when performing an audit procedure or the possibility of misinterpreting a particular audit result. While statistical sampling allows the auditor to quantify and control sampling risk, no sampling method allows the auditor to measure non-sampling risk, which should be controlled by adequate training, proper planning and effective supervision [6].

2.1 Planning the Sample

Planning the sample should assure that audit procedures used to test a certain sample, are performed in a manner that provides the desired sampling risk and minimize the likelihood of non-sampling errors. Proper planning of attribute sampling involves completing major phases, described as it follows.

2.1.1 Determine the Test Objectives, Attribute and Failures

Control procedures can be implemented in many different forms, and the nature of the implementation affects the auditor’s approach to gathering evidence on the effectiveness of the procedures [7].

Usually, the relevant objectives related to attribute sampling for investment companies, take into account: (a) testing the designed and operating effectiveness of internal control; (b) measuring the reliance degree that can be placed on internal controls; (c) testing the accuracy of processing transactions with financial instruments and (d) determining compliance with laws, regulations and investment company policies.

2.1.2 Define the Population Characteristics

This planning phase may be divided into some distinctive sub-phases, such are:

- defining the period covered by tests. As a practical matter, tests of controls are often performed prior to the balance sheet date and may cover an interim period of the fiscal year. If the control procedures
are found to be effective, the auditor should take additional steps to ensure that they continue to be effective during the remainder of the year.
• **defining the sampling population**, meaning a certain internal control procedure that is applied for a certain class of transactions with financial instruments. The auditor must make sure that the population used for sampling is appropriate to the objectives previously defined and reflects a complete representation of the total population of interest;
• **defining the sampling unit** in relation to the control being tested, usually a certain type of document, an entry or a line item on a document;
• **defining the control deviation conditions**, meaning departures from or failures of adequate performance of internal control. For instance, when a sample item does not have one or more of the attribute, it is classified as a deviation.

### 2.1.3. Determine the sample size
An optimally determined sample size is considered to minimize sampling risk and promote audit efficiency. This planning phase requires considerable judgment and is highly correlated to the computation of the three key-factors:
• **desired confidence level**, which is the complement of the risk of incorrect acceptance. If the auditor sets control risk too low and over-reliance on the internal controls, the level of substantive procedures may be too low to detect material misstatements that may be present in the financial statement account. Generally, when the auditor decides to rely on internal controls, the confidence level is set at 90% or 95%, meaning he is willing to accept 10% or 5% risk of incorrect acceptance. Between the confidence level and the sample size there is a direct relationship, meaning that the more confident the auditor would like to be, the larger the sample size must be, all else equal.
• **tolerable deviation (failure) rate**, meaning the maximum deviation rate from a prescribed control that the auditor is willing to accept and still consider the control effective. The tolerable deviation rate is inversely related to the sample size, meaning that the lower the tolerable deviation rate is set, the larger the sample size must be, all else equal.
• **expected population deviation (failure) rate**, which is the rate the auditor expects to exist in the population, due to particular human involvement. If the auditor appreciates that the expected population deviation rate exceeds the tolerable deviation rate, the statistical sampling should not be performed, because no amount of sampling can reduce the population deviation rate below the tolerable deviation rate. Instead, the auditor should plan and perform additional substantive procedures rather than relying on the internal controls. There is a direct relationship between the expected population deviation rate and the sample size, so that the larger the expected deviation rate is, the larger the sample size, all else equal.

### 2.2 Selecting the Sample
Once the sample size has been determined, the auditor must decide how to select a representative sample of the application of internal controls throughout the period being tasted. ISA 530 requires that the sample items should be selected in such a way that the sample can be expected to represent the population, provided that all items must have an equal opportunity to be selected. In practice, the auditors may select audit samples by using several statistical methods: the random-number selection method, the systematic (interval) selection, the stratified sampling, the cluster (multistage) sampling or the value-weighted selection. For non-statistical sampling, the auditor may use professional judgement to select a representative sample. However, statistical sampling should benefit the auditor in designing an efficient sample, measuring the sufficiency of the evidence obtained and evaluating sample results.

### 2.3 Performing the Audit Procedures and Evaluating the Results
After the sample items have been selected, the auditors conduct audit procedures as they have been previously planned: inquiry of legal representatives, observation of employee’s performance of regular duties, inspection of documents, reports and electronic files, and re-performance of internal control procedures by the auditor [8]. Whenever a deviation is observed in testing internal controls, auditors should evaluate the qualitative aspects of the deviations identified, by investigating the nature, the causes and the consequences of each relevant type of deviation or exception. Under each relevant circumstance, the auditor should determine whether a particular deviation represents an unintentional error (misunderstanding of instructions, unintentional misfiling or carelessness) or a fraud and whether the deviation actually may result in a monetary misstatement to the financial statements.

After completing the audit procedures, the auditor summarizes the deviations for each internal control tested and evaluates the results on a quantitative basis by comparing evidence regarding
the deviation rate in the sample to the tolerable deviation rate determined when planning the sample. When evaluating the results of testing internal controls, the auditor is normally concerned only with whether the true deviation rate exceeds the tolerable deviation rate.

2.4 Drawing Sampling Conclusions

When drawing relevant conclusions about the statistical sampling application for tests of internal controls, the auditor compares the tolerable deviation rate to the computed upper deviation rate. The latter represents the sum between the sample deviation rate and an appropriate allowance for sampling risk and sets an upper limit on how high the population deviation rate might actually be, at a controlled level of sampling risk.

If the computed upper deviation rate is less than the tolerable deviation rate, the auditors may conclude that the tested internal controls can be relied upon. On the contrary, if the computed upper deviation rate exceeds the tolerable deviation rate, the auditors must conclude that internal controls are not effective, meaning are not operating at an acceptable level.

3 Problem Solution

We propose to describe a detailed illustration of attribute sampling techniques that may be planned and performed for Financial Investment Companies, as part of the control risk assessment procedures that are projected by auditors. The research methodology consists of: examining the legal framework applied to these entities (NSC Regulation no. 15/2004), reviewing the internal manual for control procedures adopted by the management, inspecting the list of transactions with financial instruments and the list of security holdings to define the populations, inquiring the legal representatives through specific control risk questionnaires and observing the common practice used by the external auditors of these entities. The five Financial Investment Companies listed on Bucharest Stock Exchange are: FIC Banat-Crisana (FIC 1), FIC Moldova (FIC 2), FIC Transilvania (FIC 3), FIC Muntenia (FIC 4) and FIC Oltenia (FIC 5).

Based on the research work, the relevant sequences of the attribute sampling program have been synthesized in the following paragraphs.

3.1 Determine the Test Objectives and Attributes

For any Financial Investment Company, control procedures should be in place to ensure that recorded financial instrument transactions have indeed occurred, are complete, accurate, properly classified and recorded in the proper time period.

For the specific research objectives, we determined as relevant the following internal control procedures projected and performed within Financial Investment Companies in relation to acquisition, holding and disposal of financial instruments [9]:

- Control 1: All acquisitions and disposal of financial instruments are approved by the Investment Committee according to the investment strategy and policies.
- Control 2: All acquisitions and disposal of financial instruments are properly classified and recorded in the correct period.
- Control 3: Financial investments are properly valued at the balance sheet date and related gains or losses are calculated with sufficient accuracy.
- Control 4: All rights, dividends or interests are properly classified, recorded and allocated for the correct period.

3.2 Determine Deviation Conditions

In relation with each internal control procedure defined, we determined as relevant the following deviation conditions:

- Control 1: Some acquisitions or disposals of financial instruments are not approved by the Investment Committee. Each of these deviations must be investigated to determine the cause of failure and the potential materiality.
- Control 2: Some acquisitions or disposals of financial investments are misclassified or allocated to the wrong period. These failures may bear a significant impact on the financial performances and require a special attention for presumptive fraudulent financial reporting.
- Control 3: Fair value computed for financial instruments held for trading is not accurate. Usually, the risk implied whenever these deviations are detected refers to an over-valuation of financial position. The auditor must adopt a vigilant attitude based on professional skepticism in order to detect any possible fraudulent reporting.
- Control 4: Some rights, dividends and interests related to financial instruments held in portfolio are misclassified, omitted or allocated in the wrong time period. Whenever these deviations are detected the auditor must investigate the cause with extreme caution, due to the fact that under such circumstances, misappropriation of assets may be favored.
3.3 Define the Population to be Sampled
The populations subject to attribute sampling refer to: (i) the total number of transactions that have been closed during the period 1st January – 31st December 2011; (ii) the total positions of tradable share holdings from the detailed list of investments reported under NSC Regulation no. 15/2004 requirements at 31st of December 2011.

The population size for each of the five Financial Investment Companies is represented in Table 1.

<table>
<thead>
<tr>
<th>Population Parameters/Entity</th>
<th>FIC 1</th>
<th>FIC 2</th>
<th>FIC 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Transactions (thousands of Euro)</td>
<td>7,754</td>
<td>32,317</td>
<td>34,791</td>
</tr>
<tr>
<td>Holdings of Securities traded on a regulated market (Items)</td>
<td>108</td>
<td>102</td>
<td>107</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population Parameters/Entity</th>
<th>FIC 4</th>
<th>FIC 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Transactions (thousands of Euro)</td>
<td>11,699</td>
<td>31,629</td>
</tr>
<tr>
<td>Holdings of Securities traded on a regulated market (Items)</td>
<td>94</td>
<td>40</td>
</tr>
</tbody>
</table>

Source: FIC 2011 Annual Reports

These populations were selected due to their relevance in subsequent substantive testing. While the first population allows substantive testing for a class of transactions (acquisition of financial instruments), the second allows substantive testing of account balances (holding of financial instruments). In practice, the number of transactions that have been closed is a more relevant indicator for the first population.

Data presented in Table 1 suggest that three Financial Investment Companies (FIC 2, FIC 3 and FIC 5) have a relatively similar value in stock acquisitions during the reporting period, with an average of 32,912 thousands of Euro. Considering the total positions in stock portfolio, we can group FIC 1, FIC 2 and FIC 3 as being close related with an average of 106 companies per each stock portfolio. These observations are of a great importance when determining other statistical parameters needed for sample sizing.

3.4 Define the Sampling Parameters
Table 2 reflects an example on how to fundament the decision for determining sample size in relation with each parameters required on each internal control procedure that has been previously defined for financial investments:

We conclude that the desired confidence level is 95% for Controls 2-4 (higher than in case of Control 1), due to the implications of possible fraudulent reporting or misappropriation of assets. As a consequence, the tolerable deviation rate is lower for Controls 2-4 than for Control 1, for the purpose of increasing the sample size. The expected population deviation rate was projected taken into account the human interference possibility, anytime the accounting information system is not fully protected against human error. Based on these statistical parameters, we determined that sample size is bigger for testing internal controls with a higher desired confidence level and a lower tolerable deviation rate.

3.5 Evaluate the Sample Results
After selecting the samples and testing the items for each internal control procedure, we determined in Table 3 the results computed as mean values for the five Financial Investment Companies.
By comparing the upper deviation rate (obtained from Statistical Sample Results Evaluation Table) with the tolerable deviation rate (set by the auditor using professional judgment), we were able to determine the following results:

(a) The tested internal control 1 and 2 can be relied upon, since the computed upper deviation rate is less than the tolerable deviation rate. Under these circumstances, using attribute sampling proves to increase both audit efficiency and effectiveness by diminishing the risk of incorrect acceptance through statistical methods. Nevertheless, using non-statistical sampling could alter the results in the sense of increasing the risk of overreliance.

(b) The tested internal control 3 and 4 cannot be relied upon, since the computed upper deviation rate is higher than the tolerable deviation rate. Under these circumstances, using attribute sampling is not recommended and the auditor should increase accordingly the amount of substantive tests. We consider that, if attribute sampling is used under such circumstances the audit effectiveness is altered by increasing the risk of assessing control risk too low, even if efficiency is maintained. Based on this assumption, it is very likely that the auditor might issue an inadequate opinion upon the financial statements, provided that material misstatements could not be prevented by substantive testing.

4 Conclusion

When auditing the financial statements prepared by the Financial Investment Companies, the use of sampling is a very common practice because of the need to obtain and evaluate evidence over large populations either of classes of transactions or account balances related to financial investments, in a cost-effective manner. Nevertheless, using sampling techniques involves the risk that the selected samples are not representative for the populations. In response, statistical theory allows auditors to measure this risk and manage it by determining the appropriate sample size.

Under either type of attribute sampling (statistical or non-statistical), the auditor is primarily concerned with obtaining sufficient evidence to support the planned level of control risk specified in the auditor’s preliminary audit strategy. When deciding whether to rely upon internal controls, auditors should maintain a vigilant attitude and a sense of professional skepticism in order to assure a proper balance in terms of efficiency and effectiveness associated to audit missions performed for Financial Investment Companies.

References:
[5] Whittington O.R., Pany K., Principles of Auditing & Other Assurance Services,