Sampling Strategies in Financial Statement Audits
Devising a Sampling Methodology That Meets AICPA Standards and Strengthens the Auditor's Opinion

A Live 110-Minute Teleconference/Webinar with Interactive Q&A

Today's panel features:
Lyn Graham, CPA, Independent CPA, Short Hills, N.J.
Collette Cummins, Senior Manager, Auditing Methodologies, Grant Thornton, Chicago
Ann Thornton, Audit and Advisory Services Director, Deloitte & Touche, McLean, Va.
Harold Zeidman, Partner, KPMG, New York

Wednesday, April 28, 2010

The conference begins at:
1 pm Eastern
12 pm Central
11 am Mountain
10 am Pacific

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Sampling Strategies in Financial Statement Audits

Webinar

April 28, 2010

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Today’s Program

Background On Relevant Guidance; Slides 6-12

Evolution Of Sampling Techniques (Lynford Graham)

The Audit Risk Model, And Its Applicability Slides 13-22
(Collette Cummins)

Current Sampling Priorities And Best Practices Slides 23-33
(Harold Zeidman)

Basic Implementation Questions Slides 34-41
(Ann Thornton)
Background On Relevant Guidance; Evolution Of Sampling Techniques

Lynford Graham, CPA, PhD, CFE
Bentley University
Audit Objective

- Gather *sufficient* evidence to support an audit opinion that the financial statements are free of *material misstatement*.

- Seeking a **high** assurance (or a low risk).

- Sampling tests of controls and tests of balances and transactions are important sources of audit evidence.
Implications To Entities

- *Lower-risk* entities require less testing and can reduce audit costs.

- Entities with *reliable* controls can reduce audit costs; risks are “covered” by controls.

- Internal auditors’ attention to controls and financial reporting accuracy will allow external auditors to *rely* on their work and reduce audit costs.
Further Implications

• All public companies must report on the effectiveness of internal controls (SEC requirement – SOX Section 404).
  – Some non-public companies also report.

• Auditors of accelerated filers also report.

• Tests of controls provide the support for the company assertion re: controls’ effectiveness.

• Quality testing by entities can reduce auditor testing and reduce auditor costs.
Recent Trends And Implications

• More attention was given to controls after frauds and business failures such as Enron, Worldcom, etc.
  – Many studies of fraud and misstatement

• Improving controls *reduces* risks and audit costs.

• Year one investment costs vs. subsequent returns from improved financial reporting processes
This Seminar

- Provide insight into the way business and reporting risks influence sample sizes of controls and transactions

- Benchmark internal audit/management control test levels that external auditors can rely on for their work

- Illustrate how your actions can influence audit strategies that result in lower audit costs
Professional Sampling Standards

• Audit sampling (SAS 39 and SAS 111, 107)

• AICPA Audit Sampling Guide (2008)
  – Sufficiency of sample sizes to meet audit objectives
  – Determining sample sizes – tables, formulae
  – Evaluating sample results and implications
  – Practical application issues
The Audit Risk Model, And Its Applicability

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Audit Risk Model

- Audit risk (AR) is the risk that the auditor may unknowingly fail to appropriately modify his or her opinion on financial statements that are materially misstated [AU 312.02].
- Not possible to reduce audit risk to 0%; 5% audit risk is generally considered low risk

\[
AR = IR \times CR \times DR
\]

- Components of audit risk (AR)
  - Inherent risk (IR)
  - Detection risk (DR)
  - Control risk (CR)
Risk Of Material Misstatement

\[ RMM = IR \times CR \]

- **Inherent risk (IR)**
  - The susceptibility of an account balance to material misstatement, without consideration of internal controls [AU 312.27]
- **Control risk (CR)**
  - The risk that the entity’s controls will not prevent or detect material misstatements on a timely basis [AU 312.27]

- As RMM increases, more audit evidence is required. Conversely, as RMM decreases, less audit evidence is required.
# Audit Risk Model

<table>
<thead>
<tr>
<th>Audit Risk</th>
<th>Inherent Risk</th>
<th>Control Risk</th>
<th>Risk of Material Misstatement</th>
<th>Detection Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>5%</td>
</tr>
<tr>
<td>Low Risk</td>
<td>Maximum Risk</td>
<td>Maximum Risk</td>
<td>Maximum Risk</td>
<td></td>
</tr>
<tr>
<td>Low Risk</td>
<td>Maximum Risk</td>
<td>High Risk</td>
<td>High Risk</td>
<td></td>
</tr>
<tr>
<td>Low Risk</td>
<td>High Risk</td>
<td>Moderate Risk</td>
<td>Moderate Risk</td>
<td></td>
</tr>
</tbody>
</table>
Detection Risk

• The risk that the auditor will not detect a material misstatement that exists in the financial statements

\[ \text{DR} = \text{AP} \times \text{TD} \]

• Analytical procedures risk (AP)
  – The risk that substantive analytical procedures will fail to detect material misstatements in the financial statements

• Test of details Risk (TD)
  – The risk that tests of details of transactions and balances will fail to detect material misstatements in the financial statements
## Audit Risk Model

<table>
<thead>
<tr>
<th>Risk of Material Misstatement</th>
<th>Detection Risk</th>
<th>Analytical Procedures Risk</th>
<th>Test of Details Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>5%</td>
<td>100%</td>
<td>5%</td>
</tr>
<tr>
<td>Maximum Risk</td>
<td></td>
<td>Maximum Risk</td>
<td>95% Confidence</td>
</tr>
<tr>
<td>75%</td>
<td>6.67%</td>
<td>75%</td>
<td>8.33%</td>
</tr>
<tr>
<td>High Risk</td>
<td></td>
<td>High Risk</td>
<td>92% Confidence</td>
</tr>
<tr>
<td>37.5%</td>
<td>13.33%</td>
<td>50%</td>
<td>26.67%</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td></td>
<td>Moderate Risk</td>
<td>73% Confidence</td>
</tr>
</tbody>
</table>
## SAS 111 Appendix A

### Table 1

**Allowable Risk of Incorrect Acceptance (TD)**
for Various Assessments of RMM and AP; for AR = .05

<table>
<thead>
<tr>
<th>Auditor's subjective assessment of risk of material misstatement</th>
<th>Auditor's subjective assessment of risk that substantive analytical procedures and other relevant substantive procedures might fail to detect aggregate misstatements equal to tolerable misstatement.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RMM</strong></td>
<td><strong>AP</strong></td>
</tr>
<tr>
<td>10%</td>
<td>10% 30% 50% 100%</td>
</tr>
<tr>
<td>30%</td>
<td>55% 33% 16% 10%</td>
</tr>
<tr>
<td>50%</td>
<td>33% 20% 10% 5%</td>
</tr>
<tr>
<td>100%</td>
<td>50% 16% 10% 5%</td>
</tr>
</tbody>
</table>

* The allowable level of AR of 5 percent exceeds the product of RMM and AP, and thus, the planned test of details may not be necessary unless specified by regulation or other Standards (e.g., confirmation or inventory observation procedures).

**Note:** The table entries for TD are computed from the illustrated model: TD equals AR/(RMM × AP). For example, for RMM = .50, AP = .30, TD = .05/(.50 × .30) or .33 (equals 33%).
How Does The Audit Risk Model Affect Audit And Sample Sizes?

• Sampling procedures are used in:
  – Tests of controls
  – Tests of details

• Tests of controls sample sizes are usually smaller than tests of details sample sizes (attribute sampling vs. substantive sampling).
  – Tests of controls sample sizes are often 20 to 30 items.
  – Tests of details sample sizes can be very large, especially if controls are not effective.

• Tests of controls do not always involve sampling.
  – Automated controls vs. manual controls
  – Small populations (e.g., controls that operate quarterly or monthly)
Sampling Concepts

- Population
- Materiality
- Sampling risk – Complement of the desired level of assurance (i.e., 5% sampling risk is 95% confidence level)
  - Risk of incorrect acceptance
  - Risk of incorrect rejection
- Tolerable misstatement
- Expected misstatement
### Sample Size Table – Appendix C
(Source: AICPA Audit Sampling Guide)

<table>
<thead>
<tr>
<th>Risk of Incorrect Acceptance</th>
<th>Ratio of Expected to Tolerable Misstatement</th>
<th>50%</th>
<th>30%</th>
<th>10%</th>
<th>8%</th>
<th>6%</th>
<th>5%</th>
<th>4%</th>
<th>3%</th>
<th>2%</th>
<th>1%</th>
<th>0.50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>—</td>
<td>6</td>
<td>10</td>
<td>30</td>
<td>38</td>
<td>50</td>
<td>60</td>
<td>75</td>
<td>100</td>
<td>150</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>5%</td>
<td>0.30</td>
<td>12</td>
<td>20</td>
<td>60</td>
<td>75</td>
<td>100</td>
<td>120</td>
<td>150</td>
<td>200</td>
<td>300</td>
<td>600</td>
<td>1,199</td>
</tr>
<tr>
<td>5%</td>
<td>0.50</td>
<td>24</td>
<td>39</td>
<td>116</td>
<td>145</td>
<td>193</td>
<td>231</td>
<td>289</td>
<td>385</td>
<td>577</td>
<td>1,154</td>
<td>2,308</td>
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<tr>
<td>10%</td>
<td>—</td>
<td>5</td>
<td>8</td>
<td>24</td>
<td>29</td>
<td>39</td>
<td>47</td>
<td>58</td>
<td>77</td>
<td>116</td>
<td>231</td>
<td>461</td>
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<tr>
<td>10%</td>
<td>0.30</td>
<td>9</td>
<td>15</td>
<td>44</td>
<td>55</td>
<td>73</td>
<td>87</td>
<td>109</td>
<td>145</td>
<td>217</td>
<td>433</td>
<td>866</td>
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<tr>
<td>10%</td>
<td>0.50</td>
<td>16</td>
<td>27</td>
<td>80</td>
<td>100</td>
<td>134</td>
<td>160</td>
<td>200</td>
<td>267</td>
<td>400</td>
<td>799</td>
<td>1,597</td>
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<tr>
<td>15%</td>
<td>—</td>
<td>4</td>
<td>7</td>
<td>19</td>
<td>24</td>
<td>32</td>
<td>38</td>
<td>48</td>
<td>64</td>
<td>95</td>
<td>190</td>
<td>380</td>
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<tr>
<td>15%</td>
<td>0.30</td>
<td>7</td>
<td>12</td>
<td>35</td>
<td>43</td>
<td>57</td>
<td>69</td>
<td>86</td>
<td>114</td>
<td>171</td>
<td>341</td>
<td>681</td>
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<tr>
<td>15%</td>
<td>0.50</td>
<td>13</td>
<td>21</td>
<td>61</td>
<td>76</td>
<td>101</td>
<td>121</td>
<td>151</td>
<td>202</td>
<td>302</td>
<td>604</td>
<td>1,208</td>
</tr>
</tbody>
</table>
Current Sampling Priorities And Best Practices

Harold I. (Hal) Zeidman, KPMG
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Statistical Sampling

• Any approach to sampling that has the following characteristics:
  – Random selection of sample, and
  – Use of probability theory to evaluate sample results, including measurement of sampling risk
• A sampling approach that does not have characteristics above is considered non-statistical sampling
• Audit sampling uses the laws of probability for selecting and evaluating a sample from a population for the purposes of reaching a conclusion about the population
Approaches To Sampling

• Control tests
  – Generally, use attribute sampling

• Substantive tests
  – Statistical sampling
    • Monetary unit sampling
    • Classic variables sampling
  – Non-statistical sampling
    • Various approaches often derived from statistical sampling
    • Sample size penalties often built in to account for non-statistical selection and evaluation
Attribute Sampling

• Statistical sampling that reaches a conclusion about a population in terms of rate of occurrence
  – Binomial distribution: Probability distribution applicable to attribute sampling that assumes a random variable can only have two values, success or failure
    • Coin flip: With each flip, each outcome has a 50% chance
  • Application to controls testing: A control either works or it does not work
    – Biased coin flip: Each outcome does not have a 50% chance
      • Likely a greater chance that the control is working
      • Can use statistics to take this into account when determining sample sizes
Monetary Unit Sampling

- An attribute-based statistical sampling plan that, given a risk level and a target precision level, selects items from the financial statements as a whole, with probability proportional to size, and provides a statistical conclusion
  - MUS treats the monetary unit in the population as the sampling unit
  - We cannot test the individual monetary unit
    - Instead, we test the logical unit that contains the monetary unit selected, e.g., an invoice
  - Population proportional to size results in an automatically stratified sample, as the larger the item, the better chance of being selected
    - Individually significant items are automatically selected
Classic Variables Sampling

- Term used to describe the family of sampling plans, all of which rely on large sample assumptions of normality
  - Normal distribution concept
    - “Bell curve”
  - Confidence levels
  - Complex formulas and calculations typically require computer programs to assist in determining samples
Pros/Cons Of MUS Sampling
(Source: AICPA Sampling Guide)

• Pros
  – MUS easier to apply; sample size more easily determined
  – MUS does not require direct consideration of the population characteristics
  – MUS does not require stratification due to the selection technique
  – MUS sample size is efficient when the auditor expects (and finds) no errors
  – MUS sample designed more easily and can begin before a final and full population is available.

• Cons
  – Not designed to test for understatements of a population (reciprocal population needed)
  – Selection of zero balance items or negative items requires special design considerations
  – When misstatements are found, MUS may overstate the allowance for sampling risk at a given risk level
Pros/Cons Of Classic Variables Sampling
(Source: AICPA Sampling Guide)

• Pros
  – CVS might provide a smaller sample size when many errors are expected
  – CVS often more appropriate when understatement is a concern
  – CVS may be easier to expand sample size when necessary
  – CVS does not require special consideration for zero value or negative items
• Cons
  – CVS is more complex and may require programs for sample design
  – CVS requires an estimate of the standard deviation of the characteristic of interest in the population
  – CVS utilizes the normal distribution theory which may not be appropriate in certain circumstances
Non-Statistical Sampling

• Issues with using non-statistical sampling techniques
  – Cannot measure sampling risk
  – Selection methods typically not random

• Certain approaches to consider when using non-statistical sampling techniques
  – May find it desirable to increase sample size because of these issues
  – May need to develop an expectation as a proxy for sampling risk
Extrapolation Of Errors

- Error extrapolation is the auditor’s best point estimate of true error
  - Total projected misstatement = known misstatement + projected misstatement
  - Error tolerance can be built into sample size determination
  - Conclusion to accept or reject based on total projected misstatement and assessment of sampling risk
  - Errors in individually significant items tested do not result in any projected misstatement
  - Need to consider qualitative aspects of errors in order to project over appropriate part of population
Practical Examples

• Accounts receivable tests of details
  – Credit balances are netted with debit balances or removed from the population and no or few errors expected - MUS likely best approach

• Inventory tests of details
  – Physical inventory procedure - May not be able to use MUS, as population may not be available in advance

• Understatement of accounts payable – Use reciprocal population
  – Cash distributions subsequent to year-end and invoices on hand at the test date
Basic Implementation Questions

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Basic Implementation Questions

- What sample size should I use?
- What is the best selection method?
- What if my error rate/amount exceeds my expected error rate/amount?
- What do I do with sample items for which the test is inapplicable or not possible to complete?
What Sample Size Should I Use?

• Understand objectives of the application or test and definition of an error

• Determine the population subject to testing

• Define the sampling population(s), including any certainty stratum

• Consider what is practical, as well as judgmental parameters and estimates that drive sample size

• Determine whether fixed or sequential sampling plan is preferable
Define The Sampling Populations

• Define the sampling population before determining sample size.

• Identify the sampling unit
  – The lowest level of detail that can be tested

• One or more sampling populations?
  – Controls that apply to certain transactions only
  – Debits, credits and zero balances
  – Characteristics that imply different risks of error
  – Certainty stratum – based on dollars or risk
Sample Size Is A Judgment

- Sample size is not a statistical “truth” but rather a mathematical formula with parameters including judgments and an estimate of what the sample results will be.

- The judgmental parameters
  - Desired level of assurance
  - Tolerable rate of deviation/misstatement

- An estimate of how much error will be found in the sample
  - If the actual sample error exceeds the estimated error, sample size must be reconsidered.
  - Sequential sampling is an option if no basis for estimating sample error, but otherwise it is not typically recommended.

- Never ignore what is practical
What Is The Best Selection Method?

• Determine what is practical
  – Is sampling frame available in an electronic data set?
  – Is a selection tool available that can directly access the frame?
• Typically, when practical, auditors use random for control testing or monetary unit selection for substantive testing.
• Haphazard is typically used when the sampling frame is manual and/or is not maintained in one cohesive format.
  – Haphazard is intended to imply that selection was performed without bias; it does not imply selection without due care.
• Regardless of the selection method, the resulting sample should be assessed as to whether it is representative of the population.
What If Errors Exceed Expectations?

- Do not immediately rush to do more sampling
  - If practical, track error results as sample testing is in progress, so you can halt testing as soon as errors exceed expectations.
- Analyze root cause of errors
  - Pattern or relationship? Do erroneous items have common characteristic(s)?
  - Caused by lack of or breakdown in controls?
  - Reconsider definition of error (particularly for control testing)
- Compare sample findings with other sources of evidence.
- Can population be segmented into sub-populations with different error expectations, before designing additional testing?
What To Do With Inapplicable Or Unresolved Sample Items?

• These are two very different scenarios!

• Inapplicable sample items imply there are inapplicable population items.
  – Redefine population and segment into two populations
  – Determine whether remaining applicable sample items are sufficient

• Incomplete examination of a sample item would normally lead to a conclusion that the item is in error. But, consider:
  – Alternative evidence that could be used to examine the item
  – Objectives of the test and definition of an error
  – Whether there is more than one attribute (for control testing)