What’s the Score?

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Outline

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  – Models
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INTRODUCTION
Internal Audit Quality

• The IIA defines the internal audit function as:
  “an independent, objective assurance and consulting activity
designed to add value and improve an organization's operations.
It helps an organization accomplish its objectives by bringing a
systematic, disciplined approach to evaluate and improve the
effectiveness of risk management, control, and governance
processes (IIA, 2000).”

• The quality of internal audit is important to Internal as well as
  External audit professions (Gramling and Vandervele, 2006)
Why is this important?

• High quality Internal audit functions are associated with lower levels of earnings management (Prawitt, Smith, and Wood, 2008)

• Control Assessment quality affects all organizations

• Quality Reviews: focus the efforts without losing the quality of internal audits

• Internal controls are aligned with risk assessments (Spira and Page, 2002)
PROBLEM
What is the problem about?

• Two types of control risk assessment used in this study:
  – Control Self Assessment (CSA): done by business process owners
  – Audit assessment: done by the internal auditors

• Preparer’s judgment: issue classification (Critical, Major, Non-major) and business process risk level (Low, Moderate, High)

• Quality review of control risk assessments

• Learning tool: a tool that helps non-experts improve decisions
What we would like to do

- **Real Time:** Use historic data from previous years to evaluate work paper assigned scores as they are submitted.

- **Teachable moment:** Use the model as a benchmark, and ask score approver to explain any deviations from this model.

- **Improve internal audit quality:** Use the teachable moment to encourage discussion related to scoring to reduce variations in scores.

- **Risk Based Sampling:** Focus on outliers, thus improving efficiency without affecting the quality.
How are the scores assigned?

- **Audit Score**
  - Internal Auditors Identify Issues
  - Classify Issues as Critical, Major or Non-Major
  - Assign the overall process an aggregate score

- **Control Self Assessment Score**
  - Business owners Identify Issues
  - Classify Issues as Critical, Major or Non-Major
  - Assign the overall process an aggregate score
METHODOLOGY
Data

• Description
  – Risk assessment scores (L, M, H)
  – 2 files:
    • Control self assessment scores: 9593 records
    • Audit scores: 924 records

<table>
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<tr>
<th></th>
<th>FY 08/09</th>
<th>FY 09/10</th>
<th>FY 10/11</th>
<th>All (08-11)</th>
</tr>
</thead>
<tbody>
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<td>AS</td>
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<td>305</td>
<td>275</td>
<td>924</td>
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<td>CSA</td>
<td>3310</td>
<td>3138</td>
<td>3145</td>
<td>9593</td>
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• Validation and Preprocessing
  – Aggregating issues counts and transformation of some variables
  – Filtered out records prior to FY 08/09
  – Grouped them by Fiscal years (see table above)
Ordered Logistic Regression

- Standard Logistic distribution

- Ordinal variables: variables are ranked, but real distance between ranks is unknown

- In this study, the Scores fall in three ordinal classes (Low, Medium, High)

- Formula
  \[
  \text{logit}[\Pr(Y > j)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k
  \]
  - logit = log odds
  - \Pr = probability
  - \( Y \) = ordered response variable
  - \( j \) = level of the response variable
Models

• Audit Score Model

\[ AS = \beta_0 + \beta_1 CC + \beta_2 MC + \beta_3 NMC \]

– AS = Audit Score
– CC = Number of critical issues (identified by the auditor)
– MC = Number of Major issues (identified by the auditor)
– NMC = Number of Non-Major issues (identified by the auditor)

• CSA Score Model

\[ CSA = \beta_0 + \beta_1 CC + \beta_2 MC + \beta_3 NMC \]

– CSA = Control Self Assessment score
– CC = Number of critical issues (identified by the CSA preparer)
– MC = Number of Major issues (identified by the CSA preparer)
– NMC = Number of Non-Major issues (identified by the CSA preparer)
Findings

Medium Risk- Outliers vs. Normal
Data 10/11 - Coefficients M09/10

- MR_Normal
- MR_Outliers

Over-rated

Under-rated

Number of Major Issues

Number of Non-Major Issues
More Graphs
More Graphs
CONCLUSION AND BUSINESS IMPACT
Conclusion and Business Impact

Our model can:

• Be effective in identifying anomalous scores

• Verify preparers’ judgment in assigning scores

• Increase the efficiency of quality reviews by focusing on exceptions (audit by exception)

• Be used as a consistency check (serve as a benchmark)

• Be used as a teaching technique to help non-experts (non-auditors) assign more accurate risk scores or explain unexpected scores
Thank You!