IQ and Audit Quality: Do Smarter Auditors Deliver Better Audit Quality?

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Purpose and contribution

• RQ: Individual audit partner’s IQ and quality of audit engagement?

• We add to auditing literature by exploring the association between audit partners’ cognitive ability measured by their IQ scores and various dimensions of audit quality.

• Audit quality has been shown to vary across individual auditors in charge of audit engagements (e.g., Cameran et al. 2017; Chen et al. 2010; Gul et al. 2013; Amir et al. 2014; and Knechel et al. 2015)

• No archival evidence on the role of auditors’ personal capability in delivering high-quality audits, mainly due to the lack of person-level data on audit partners
Should auditor’s IQ matter for audit quality?

Why should IQ matter?

• Auditing requires a great deal of subjective judgments and decisions from the auditor
  - Experimental evidence (Libby and Luft 1993)
• Incentives
  - Clients and audit firm itself reward partners for preferred performance (Knechel et al. 2013)

Why should IQ not matter?

• Audit firms’ risk management & control mechanisms
  - Limit individuals’ judgments and decision-making (Bedard et al. 2008)
• Knowledge sharing in audit firms
  - Promote the adoption of best practices among individuals (Dowling 2009)
• Audit teams
  - Reduce the role of an individual in audit production (Ramsey 1994)
• Qualifications for becoming an audit partner
  - Audit partners have passed several screens during their career

Role of auditor’s IQ in auditing is not obvious
Cognitive ability and IQ

Cognitive ability (intelligence, IQ) has been defined by the American Psychological Association as

“the ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought” (Neisser et al. 1996, p. 77)

An example: Armed Forces Qualification Test in the US
Cognitive ability and IQ

• Many studies have validated the use of IQ as a measure of cognitive ability for economic and social outcomes:
  
  • Income
    - *Salary and other income increases with IQ* (Lo 2017)
  
  • Job complexity
    - *IQ increases with the need for information processing skills required in complex tasks* (Hunter and Scmidt 1996)
  
  • Success in investment decisions
    - *IQ increases with risk-taking in investment decisions in an attempt to make greater return* (Grinblatt et al. 2011; 2012)
Three dimensions of audit quality

• Audit reporting
  • Going-concern reporting errors (Type 1, Type 2, and Total error)
  • High bankruptcy risk firms (> median bankruptcy score (Shumway 2001))

• Fees paid to the auditor
  • Audit fees, non-audit fees, and total fees

• Financial reporting quality
  • Jones- abnormal accruals (absolute, income- increasing, income-decreasing)
  • Auditor changes: three years before and after the change required (Bertrand and Schoar 2003)
Controls

- **Auditor:** industry specialization, experience (CPA years), client portfolio (number of clients), risk preferences (crime), reputation capital (proportion of listed clients)

- **Engagement:** client importance (relative size), length of tenure (years)

- **Client firm:** size (total assets), age, financial position and performance (leverage, current ratio, interest coverage, bankruptcy risk score, ROA, loss-making), difficult-to-audit-items

- **Fixed effects:** industry, year, audit firm, credit rating (client firm FE in abnormal accruals models)

In addition, in reporting errors-models: lack of equity; in fee models: joint-audit, exceptional FS items, foreign operations, and market value (PB), and in change analysis of abnormal accruals: audit firm change
Data

Panel data: private\(^1\) and listed\(^2\) Swedish companies from year 2000 to 2009
\(^1\)audit reporting and abnormal accruals, \(^2\)audit and non-audit fees

Multiple sources:
1) IQ scores: cognitive ability tests by the Swedish Military Forces
   • 387 Swedish male auditors
2) Crime: The Swedish National Police Board
3) Length of Career: Swedish professional institute of CPAs
4) Financial statements, audit reports, bankruptcies, and fees: commercial databases (credit bureau UC, Compustat Global Vantage for listed companies)
The sample (N=387): All Swedish male audit partners who has audited at least one Swedish listed company during 2000-2009.

Mean value (5)* of the whole population

Mean: 6.8
Median: 7
St.dev.: 1.3
Min: 2
Max: 9

* corresponds to an IQ score of about 100
## Audit partner’s IQ and reporting accuracy

### Univariate analysis

<table>
<thead>
<tr>
<th>Going-concern reporting error</th>
<th>Yes</th>
<th>No</th>
<th>Difference: Yes – No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean IQ</td>
<td>Mean IQ</td>
<td></td>
</tr>
<tr>
<td>Total error</td>
<td>6.67</td>
<td>6.80</td>
<td>–0.13*** (0.013)</td>
</tr>
<tr>
<td>N (# of audit partners)</td>
<td>738 (249)</td>
<td>59,183 (385)</td>
<td></td>
</tr>
<tr>
<td>Type 1 error</td>
<td>6.65</td>
<td>6.80</td>
<td>–0.15** (0.019)</td>
</tr>
<tr>
<td>N (# of audit partners)</td>
<td>504 (200)</td>
<td>59,052 (385)</td>
<td></td>
</tr>
<tr>
<td>Type 2 error</td>
<td>6.71</td>
<td>7.00</td>
<td>–0.29** (0.040)</td>
</tr>
<tr>
<td>N (# of audit partners)</td>
<td>234 (135)</td>
<td>131 (89)</td>
<td></td>
</tr>
</tbody>
</table>
Audit partner's IQ and reporting accuracy

\[
\text{Prob.} \left( GC_{ERROR_{jt}} = 1 \right) = \alpha + \beta IQ_i + \gamma' X_{ijt} + \text{Fixed effects} + \varepsilon_{jt}
\]

<table>
<thead>
<tr>
<th></th>
<th>Going-concern reporting error</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total error</td>
<td>Type 1 error</td>
<td>Type 2 error</td>
</tr>
<tr>
<td>( IQ_i )</td>
<td>(-0.115^{***} ) (0.001)</td>
<td>(-0.086^{**} ) (0.011)</td>
<td>(-0.254^{**} ) (0.010)</td>
</tr>
<tr>
<td>Control variables &amp; FE</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>33.61%</td>
<td>24.34%</td>
<td>67.97%</td>
</tr>
<tr>
<td>Clustered std. errors</td>
<td>Audit firm</td>
<td>Audit firm</td>
<td>Audit firm</td>
</tr>
<tr>
<td>LR-ratio (( \chi^2 ))</td>
<td>2,558.388^{***}</td>
<td>1,363.997^{***}</td>
<td>248.637^{***}</td>
</tr>
<tr>
<td>Correctly Classified</td>
<td>88.4%</td>
<td>84.3%</td>
<td>93.2%</td>
</tr>
<tr>
<td>N (# of events)</td>
<td>59,921 (738)</td>
<td>59,556 (504)</td>
<td>365 (234)</td>
</tr>
</tbody>
</table>
Audit partner’s IQ and fees (audit and non-audit)

Univariate analysis

<table>
<thead>
<tr>
<th>Quartile of fees</th>
<th>Total fees</th>
<th>Audit fees</th>
<th>Non-audit fees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean fees</td>
<td>Mean IQ</td>
<td>Mean fees</td>
</tr>
<tr>
<td>1 = lowest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quartile 1</td>
<td>N=299</td>
<td>0.479</td>
<td>6.57</td>
</tr>
<tr>
<td>Quartile 2</td>
<td>N=299</td>
<td>1.267</td>
<td>6.69</td>
</tr>
<tr>
<td>Quartile 3</td>
<td>N=300</td>
<td>2.923</td>
<td>6.95</td>
</tr>
<tr>
<td>Quartile 4</td>
<td>N=299</td>
<td>23.050</td>
<td>7.13</td>
</tr>
<tr>
<td>Diff: Q1 – Q4</td>
<td>−22.571</td>
<td>−0.56***</td>
<td>−12.97</td>
</tr>
</tbody>
</table>

Fees are in millions of Swedish Krones (SEK)
Audit partner’s IQ and fees (audit and non-audit)

\[ \ln(FEES_{jt}) = \alpha_0 + \alpha_1 IQ_i + \gamma' X_{ijt} + \text{Fixed effects} + \varepsilon_{jt}, \]

<table>
<thead>
<tr>
<th></th>
<th>Total fees</th>
<th>Audit fees</th>
<th>Non-audit fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>( IQ_i )</td>
<td>0.061***</td>
<td>0.065***</td>
<td>0.074**</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Control variables &amp; FE</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Adj. R-squared</td>
<td>89.32%</td>
<td>88.65%</td>
<td>74.18%</td>
</tr>
<tr>
<td>Clustered std. errors</td>
<td>Client firm</td>
<td>Client firm</td>
<td>Client firm</td>
</tr>
<tr>
<td>Observations</td>
<td>1,197</td>
<td>1,197</td>
<td>1,197</td>
</tr>
</tbody>
</table>
# Audit partner’s IQ and abnormal accruals

## Univariate analysis

<table>
<thead>
<tr>
<th>Level of abnormal accruals of the client firm</th>
<th>Absolute abnormal accruals</th>
<th>Income-increasing abnormal accruals</th>
<th>Income-decreasing abnormal accruals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Mean IQ</td>
<td>Mean</td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=58</td>
<td>0.024</td>
<td>6.66</td>
<td>N=29</td>
</tr>
<tr>
<td>Medium</td>
<td>0.082</td>
<td>6.19</td>
<td>N=29</td>
</tr>
<tr>
<td>High</td>
<td>0.220</td>
<td>6.45</td>
<td>N=29</td>
</tr>
<tr>
<td>Difference: Low – High</td>
<td>-0.196</td>
<td>0.21 ** (0.351)</td>
<td>-0.193</td>
</tr>
</tbody>
</table>

Auditor changes, 3 years of data required for both predecessor and successor auditors, N= 174
Audit partner’s IQ and abnormal accruals

\[ DA_{jt} = \beta_0 + \beta_1 IQ_i + \gamma X_{ijt} + \text{Fixed effects} + \epsilon_{jt}, \]

<table>
<thead>
<tr>
<th></th>
<th>Absolute abnormal accruals</th>
<th>Income-increasing abnormal accruals</th>
<th>Income-decreasing abnormal accruals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IQ</strong></td>
<td><strong>-0.024</strong>**</td>
<td><strong>-0.017</strong>**</td>
<td><strong>0.007</strong></td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.039)</td>
<td>(0.307)</td>
</tr>
<tr>
<td>Control variables &amp; FE</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Adj. R-squared</td>
<td>29.90%</td>
<td>17.03%</td>
<td>31.33%</td>
</tr>
<tr>
<td>Clustered std. errors</td>
<td>Client firm</td>
<td>Client firm</td>
<td>Client firm</td>
</tr>
<tr>
<td>Observations</td>
<td>174</td>
<td>174</td>
<td>174</td>
</tr>
</tbody>
</table>

Auditor changes, 3 years of data for both predecessor and successor auditors
Additional and Robustness Checks

Results remain unchanged in all analyses, if we:

1) Remove auditors with a very low IQ (IQ score < 4)
2) Control for the mean IQ of auditors within the same audit firm
3) Include only Big-N audit firms
   • going-concern reporting accuracy and fee analyses (not possible using auditor changes sample).
Additional and Robustness Checks

Results remain unchanged in the going-concern reporting error analyses, if we:

1) Define bankruptcy risk based on accounting losses
2) Include also low bankruptcy risk firms
3) Remove firms with a very high bankruptcy risk (10th decile)
4) Use rare event logistic regression modelling (Firth’s (1993) penalized maximum likelihood estimation method)
5) Use either all or first-time going-concern reports
Additional and Robustness Checks

Results remain unchanged in the **accruals analyses**, if we:

1) Remove auditor changes, where also the audit firm changed
Findings - summary

An audit partner’s IQ positively related to

1) Audit reporting accuracy
   • Less going-concern reporting errors (Type 1, Type 2, and Total error)

2) Audit fees, non-audit fees and total fees

3) Financial reporting quality
   • Lower absolute and income-increasing abnormal accruals, no support for income-decreasing accruals
Conclusion

• Contribution:
  • First *archival* evidence on auditors’ cognitive ability in auditing

• Conclusion on the nature of auditing services:
  • Even if auditing is extensively standardized through…
    • *standards and regulation on auditing*
    • *intra-firm risk management, knowledge sharing and group decision making support systems*,
  • …intellectual ability of the audit partner still makes a difference in the quality of the audit services delivered to the client
  • Our findings likely to interest audit firms and regulators of the profession
Thank you.