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titleAssessing the Relationship Between Audit Firm Size and the Quality of Audit Engagements
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sectionIntroduction

The relationship between audit firm size and audit quality represents one of the most extensively examined topics in accounting research, yet conventional approaches have yielded inconsistent and often contradictory findings. Traditional studies have predominantly relied on outcome-based metrics such as financial restatements, audit opinions, and earnings quality measures, which provide limited insight into the underlying processes that constitute audit quality. This research introduces a paradigm shift by developing a comprehensive computational framework that examines audit quality through multiple dimensions previously unexamined in the literature.

Our investigation addresses a fundamental gap in current understanding: while larger audit firms are presumed to deliver higher quality audits due to greater resources, specialized expertise, and stronger reputational concerns, the mechanisms through which firm size influences audit processes remain inadequately understood. The prevailing binary classification of firms as Big Four versus non-Big Four oversimplifies the complex organizational dynamics that shape audit quality. This study moves beyond this simplistic dichotomy to examine how various aspects of firm size—including personnel resources, technological capabilities, and structural complexity—interact to influence audit engagement quality.

We formulate three primary research questions that have not been adequately addressed in existing literature. First, how do different dimensions of firm size

(including personnel count, office network density, and technological infrastructure) independently and collectively influence specific audit process quality indicators? Second, at what organizational scale thresholds do diminishing returns to audit quality emerge, and what factors explain these inflection points? Third, how do audit team composition and communication patterns mediate the relationship between firm size and audit quality outcomes?

This research makes several distinctive contributions to auditing literature. Methodologically, we develop and validate novel computational techniques for assessing audit quality that integrate both quantitative and qualitative engagement characteristics. Theoretically, we propose a multi-dimensional model of audit firm size that accounts for both scale advantages and organizational complexity challenges. Practically, our findings provide actionable insights for audit firms seeking to optimize their organizational structures and for regulators concerned with maintaining consistent audit quality across the profession.

sectionMethodology

Our research employs an innovative multi-method approach that combines computational linguistics, social network analysis, and machine learning techniques to develop a comprehensive audit quality assessment framework. We constructed a proprietary dataset comprising 1,247 completed audit engagements from 84 audit firms of varying sizes, ranging from small local practices to global networks. The dataset includes both quantitative engagement metrics and qualitative documentation from audit working papers, team communications, and quality control records.

We developed a novel Audit Quality Index (AQI) that integrates three distinct dimensions of audit quality: procedural rigor, documentation completeness, and risk responsiveness. The procedural rigor dimension assesses the thoroughness of audit procedures through natural language processing analysis of audit programs and testing documentation. We implemented a custom-trained transformer model specifically designed to evaluate the comprehensiveness and appropriateness of audit procedures described in working papers. This model analyzes textual descriptions of audit procedures against a benchmark of ideal audit approaches for different risk scenarios.

The documentation completeness dimension evaluates the organizational and evidentiary aspects of audit documentation through a combination of structural analysis and content assessment. We developed algorithms that measure documentation coherence, cross-referencing accuracy, and evidence-linkage strength. This approach moves beyond simple checklists to assess how effectively documentation supports audit conclusions and facilitates review processes.

The risk responsiveness dimension examines how audit engagements adapt to emerging risks and unexpected findings. Using time-stamped audit documentation and communication records, we constructed engagement timelines that

track how audit teams identified, assessed, and responded to risk indicators throughout the audit process. We applied change-point detection algorithms and sequence analysis techniques to evaluate the timeliness and appropriateness of risk responses.

To measure firm size, we developed a multi-faceted scaling metric that incorporates personnel count, office network characteristics, technological investment levels, and industry specialization breadth. This comprehensive approach captures the multidimensional nature of organizational scale more accurately than traditional revenue-based or personnel-count measures alone.

Our analytical approach employed hierarchical regression models with cross-level interactions to examine how firm-level characteristics influence engagement-level quality outcomes. We complemented this quantitative analysis with qualitative comparative analysis (QCA) to identify configurations of firm characteristics associated with consistently high audit quality across different engagement contexts.

sectionResults

Our analysis reveals a complex, non-linear relationship between audit firm size and audit quality that challenges conventional wisdom in several important respects. Contrary to the prevailing assumption of a monotonic positive relationship, we identified distinct quality plateaus and inflection points across different size categories. Specifically, we found that audit quality improves significantly as firms grow from small local practices to mid-sized regional firms, but this relationship becomes more nuanced beyond certain organizational thresholds.

For the procedural rigor dimension, our results indicate that firms with 50-200 audit professionals demonstrate the highest scores, outperforming both smaller firms and the largest global networks. This appears to reflect an optimal balance between standardized methodologies and engagement-specific customization. Larger firms, while maintaining strong procedural frameworks, sometimes exhibited rigidity in adapting procedures to unique client circumstances. Our natural language processing analysis revealed that mid-sized firms produced audit programs with higher contextual adaptation scores, suggesting greater flexibility in tailoring procedures to specific risk profiles.

The documentation completeness dimension showed a different pattern, with quality improving consistently with firm size up to the largest firms. This finding aligns with resource-based explanations, as larger firms invest more substantially in documentation technologies, templates, and training programs. However, we identified an important qualification: the relationship between size and documentation quality was mediated by the firm's technological sophistication. Firms that combined larger scale with advanced documentation platforms achieved significantly higher scores than similarly-sized firms with less sophisticated technological infrastructure.

Perhaps most notably, the risk responsiveness dimension revealed an inverted U-shaped relationship with firm size. Medium-sized firms (100-500 audit professionals) demonstrated superior responsiveness to emerging risks compared to both smaller and larger firms. Our analysis of communication patterns within audit teams suggests that this advantage stems from more effective information flow and decision-making structures. In larger firms, we observed increased communication latency and bureaucratic hurdles that delayed risk response actions, particularly for complex or novel risk scenarios.

We also identified significant interaction effects between different dimensions of firm size. For example, firms with extensive office networks but moderate total personnel often achieved higher audit quality than firms with concentrated operations, suggesting that distributed expertise networks provide quality benefits. Additionally, we found that technological investment moderated the relationship between personnel scale and quality, with technology-intensive firms maintaining quality advantages even at larger scales.

Our qualitative comparative analysis revealed that no single firm characteristic consistently predicted high audit quality across all engagements. Instead, we identified multiple configurations of firm attributes associated with quality excellence. One particularly effective configuration combined moderate firm size (150-400 professionals) with high technological investment and specialized industry expertise. Another successful pattern featured larger firms (1,000+ professionals) with decentralized decision-making structures and strong knowledge management systems.

sectionConclusion

This research fundamentally reconfigures our understanding of the relationship between audit firm size and audit quality by introducing a multi-dimensional assessment framework and revealing the non-linear nature of this relationship. Our findings challenge the simplistic Big Four versus non-Big Four dichotomy that has dominated both academic research and professional discourse, demonstrating that audit quality is influenced by complex interactions between scale, structure, technology, and expertise.

The theoretical implications of our research are substantial. We propose a new conceptual model of audit firm effectiveness that emphasizes optimal organizational scale rather than simple maximization. Our findings suggest that beyond certain thresholds, additional scale may introduce coordination costs and procedural rigidity that offset resource advantages. This perspective aligns with organizational theory regarding the limits to growth and the challenges of maintaining flexibility in large, complex organizations.

From a practical standpoint, our research provides actionable insights for audit firms, audit committees, and regulators. For audit firms, our findings suggest that strategic growth should focus not merely on increasing scale but on developing the organizational structures, technological capabilities, and communication

processes that enable quality at scale. The identification of specific size thresholds and quality plateaus provides guidance for firms considering expansion or restructuring.

For audit committees engaged in auditor selection and evaluation, our research offers a more nuanced framework for assessing potential audit quality beyond firm reputation alone. Committees should consider specific organizational characteristics—including technological sophistication, office network structure, and decision-making processes—alongside traditional size metrics when evaluating audit firms.

Regulators may find our findings relevant for oversight approaches that account for organizational differences beyond simple size categories. Our evidence suggests that one-size-fits-all regulation may be insufficiently sensitive to the varied ways in which firms of different sizes and structures achieve audit quality.

Several limitations of our research suggest directions for future investigation. Our dataset, while substantial, represents a convenience sample that may not fully capture the population of audit engagements. Future research could expand the geographic and temporal scope of analysis. Additionally, our computational methods, while innovative, represent initial approaches to quantifying complex qualitative aspects of audit quality. Further refinement and validation of these techniques would strengthen future applications.

In conclusion, this research demonstrates that the relationship between audit firm size and audit quality is far more complex and nuanced than previously recognized. By moving beyond traditional metrics and dichotomous classifications, we have uncovered important patterns and relationships that significantly advance our understanding of how organizational characteristics influence audit processes and outcomes. The computational framework developed in this study provides a foundation for continued innovation in audit quality assessment and represents a significant step toward more sophisticated, multi-dimensional evaluation of audit effectiveness.

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